



NORTH BRANCH

—Minnesota—

Kevin Schieber
Mayor

Robert Canada
Councilmember/Acting Mayor

Travis Miles
Councilmember

Jeff Goulet
Councilmember

Peter Schaps
Councilmember

**CITY COUNCIL
REGULAR AGENDA
TUESDAY, FEBRUARY 11, 2025 @ 7:00 PM
CITY HALL, 6408 ELM STREET, NORTH
BRANCH, MN 55056**

1. CALL TO ORDER

2. PLEDGE OF ALLEGIANCE

3. ROLL CALL

4. AGENDA APPROVAL

a. Approve Agenda

ACTION

5. PRESENTATION & PROCLAMATION

6. PUBLIC COMMENT

Provides an opportunity for the public to address the Council on items that are not on the Agenda. Please raise your hand to be recognized. Please state your name and address for the record. This section is for the express purpose of addressing concerns of City services and operations. It shall not be used to clarify individual's views for political purposes.

7. CONSENT AGENDA

All matters listed under Consent Agenda are considered routine and/or non-controversial and will be approved by one motion. There will be no separate discussion of these items unless a Councilmember or citizen so requests, in which case the item will be removed from the Consent Agenda and considered in its normal sequence on the Agenda.

a. Claims Summary

ACTION

b. Approve City Council Meeting Minutes January 28, 2024

ACTION

c. Resolution - R-145-2025 Accepting the dedication of Outlot A, Wildridge Plat 12

ACTION

d. Resolution R-146-2025 Accepting Donations Received by the City of North Branch in 2024

ACTION

e. Approve the Financing Agreement with KS State Bank for the Purchase and Upfitting of Three Squad Cars

ACTION

- f. Approve application to conduct excluded bingo - St Gregory Knights of Columbus Council 10016 ACTION
- g. Resolution No. R-148-2025, Approving a Reduction to the Letter of Credit for Fox Run 1st Addition ACTION
- h. Receive Monthly Legal Staff Report INFO
- i. Resolution R-147-2025 SRTS CSAH 30 Improvent Project - Permanent ROW Easement and Temp Construction Easement ACTION
- j. Resolution R-149-2025 SRTS CSAH 30 Improvent Project - Cost Share Agreement ACTION
- k. Bulk Water Meter Purchase ACTION
- l. Adopt the 2025 General Specifications and Detail Plates for Street and Utility Construction ACTION

8. PUBLIC HEARINGS

9. STAFF REPORTS

- a. Approval to Tabling Council Action relating to Voluntary Resignation of Assignment of Deputy City Clerk until City Council meeting on February 25, 2025, at 7:00pm. ACTION
 - 1. Attorney-Client Privileged Advice Correspondence Forthcoming.

10. MAYOR/CITY COUNCIL

- a. PTOS Commission Update INFO
- b. Planning Commission Update INFO
- c. Workshop request for February 18, 7:00pm - Initiate discussion for the process of reviewing the 2018 Comprehensive plan. Questions and concerns have come up about various topics such as: size and modern day intent for the Central Business District, minimum size of lots/setback dimensions of new residential properties, lack of a public safety section in our Comp plan, high density zoning, etc. Work session will be for discussion on how the city can initiate this review. VERBAL UPDATE
- d. Schedule a meeting with our city administrator, for performance evaluation purposes, to discuss specific goals and expectations for 2025. Matthew Hill has been in his position for approximately three months, and now that he has started acclimating in his position with North Branch, I feel this is a good time to ensure mutual expectations between him and the council are better established. I propose we schedule this meeting the same day as our February 25th council meeting. INFO

11. ADJOURNMENT

Since we do not have time to discuss every point presented, it may seem that decisions are preconceived. However, background information is provided to the City Council on each Agenda item in advance from Staff and appointed Commissions; and decisions are based on this information and past experiences. In addition some items may also have been discussed preliminarily at Council Work Sessions. If you are aware of information that has not been discussed, please raise your hand to be recognized. Comments that are pertinent are appreciated. Items requiring excessive time may be continued to another meeting.



Prepared By: Sharon Wright, Finance Director

Presenter: Sharon Wright, Finance Director

Date: 01/07/2025

Board & Commission: City Council

Subject: Claims Summary

Claims Summary

Voting Requirements:

Voting Options Simple Majority

City of North Branch

ACH Checks

5651 TO 5702 - \$1,426,557.58

Checks

90885 to 90972 - \$255,975.77

Payroll

Jan 31, 2025 - \$122,545.94

Accounts Payable

Computer Check Proof List by Vendor

User: TiffaniFolstad
Printed: 01/31/2025 - 1:04PM
Batch: 00005.01.2025 - 01312025



Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: 1646 0131 AMER	Ameritas DEFERRED COMP	90.00	01/31/2025	Check Sequence: 1 101-00000-21705	ACH Enabled: False
	Check Total:	90.00			
Vendor: 1038 42605	Automatic Systems Co. WP#2 METER CALIBRATION	578.75	01/31/2025	Check Sequence: 2 615-49550-50300	ACH Enabled: False
	Check Total:	578.75			
Vendor: UB*00014	BRYAN WENELL & MAKENZIE MURPHY Refund Check 006073-000, 7326 384TH CT Refund Check 006073-000, 7326 384TH CT Refund Check 006073-000, 7326 384TH CT Refund Check 006073-000, 7326 384TH CT Refund Check 006073-000, 7326 384TH CT Refund Check 006073-000, 7326 384TH CT	26.24 8.17 19.02 0.34 1.06 0.51	01/31/2025 01/31/2025 01/31/2025 01/31/2025 01/31/2025 01/31/2025	Check Sequence: 3 615-00000-20200 612-00000-20200 602-00000-20200 615-00000-20200 615-00000-20200 602-00000-20200	ACH Enabled: False
	Check Total:	55.34			
Vendor: UB*00016	IRON EAGLE INDUSTRIAL SERVICES Refund Check 007134-000, 6793 ASH ST	236.23	01/31/2025	Check Sequence: 4 615-00000-20200	ACH Enabled: False
	Check Total:	236.23			
Vendor: 1269 FOR MARCH	IUOE Local 49 Fringe Benefit HEALTH	18,080.00	01/31/2025	Check Sequence: 5 101-00000-21706	ACH Enabled: False
	Check Total:	18,080.00			
Vendor: UB*00013	AMY KEYTE			Check Sequence: 6	ACH Enabled: False

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Refund Check 007842-000, 6179 OAK ST	92.74	01/31/2025	602-00000-20200	
	Refund Check 007842-000, 6179 OAK ST	39.84	01/31/2025	612-00000-20200	
	Refund Check 007842-000, 6179 OAK ST	5.18	01/31/2025	615-00000-20200	
	Refund Check 007842-000, 6179 OAK ST	52.61	01/31/2025	602-00000-20200	
	Refund Check 007842-000, 6179 OAK ST	34.10	01/31/2025	615-00000-20200	
	Refund Check 007842-000, 6179 OAK ST	127.91	01/31/2025	615-00000-20200	
	Check Total:	352.38			
Vendor: 1388	MN Dept Of Natural Resources			Check Sequence: 7	ACH Enabled: False
2025 PERMIT	ANNUAL PERMIT	4,305.17	01/31/2025	615-49550-50236	
	Check Total:	4,305.17			
Vendor: UB*00015	NORTH BRANCH RETAIL, LLC			Check Sequence: 8	ACH Enabled: False
	Refund Check 006402-000, 38550 TANGER DI	68.12	01/31/2025	615-00000-20200	
	Refund Check 006402-000, 38550 TANGER DI	20.14	01/31/2025	615-00000-20200	
	Refund Check 006402-000, 38550 TANGER DI	3.68	01/31/2025	615-00000-20200	
	Refund Check 006402-000, 38550 TANGER DI	105.18	01/31/2025	602-00000-20200	
	Refund Check 006402-000, 38550 TANGER DI	0.47	01/31/2025	615-00000-20200	
	Check Total:	197.59			
Vendor: UB*00017	NORTH BRANCH RETAIL, LLC			Check Sequence: 9	ACH Enabled: False
	Refund Check 006404-000, 38550 TANGER DI	25.38	01/31/2025	602-00000-20200	
	Refund Check 006404-000, 38550 TANGER DI	15.40	01/31/2025	602-00000-20200	
	Refund Check 006404-000, 38550 TANGER DI	211.10	01/31/2025	612-00000-20200	
	Refund Check 006404-000, 38550 TANGER DI	16.99	01/31/2025	615-00000-20200	
	Refund Check 006404-000, 38550 TANGER DI	16.45	01/31/2025	615-00000-20200	
	Refund Check 006404-000, 38550 TANGER DI	0.43	01/31/2025	615-00000-20200	
	Refund Check 006404-000, 38550 TANGER DI	2.47	01/31/2025	615-00000-20200	
	Check Total:	288.22			
Vendor: UB*00020	NORTH BRANCH RETAIL, LLC			Check Sequence: 10	ACH Enabled: False
	Refund Check 006403-000, 38550 TANGER DI	40.45	01/31/2025	602-00000-20200	
	Refund Check 006403-000, 38550 TANGER DI	52.79	01/31/2025	615-00000-20200	
	Refund Check 006403-000, 38550 TANGER DI	34.75	01/31/2025	615-00000-20200	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Refund Check 006403-000, 38550 TANGER DI	6.45	01/31/2025	615-00000-20200	
	Refund Check 006403-000, 38550 TANGER DI	1.22	01/31/2025	615-00000-20200	
	Refund Check 006403-000, 38550 TANGER DI	53.65	01/31/2025	602-00000-20200	
	Check Total:	189.31			
Vendor: UB*00021	NORTH BRANCH RETAIL, LLC			Check Sequence: 11	ACH Enabled: False
	Refund Check 006401-000, 38350 TANGER DI	39.28	01/31/2025	615-00000-20200	
	Refund Check 006401-000, 38350 TANGER DI	2.91	01/31/2025	615-00000-20200	
	Check Total:	42.19			
Vendor: UB*00022	TALLON PARENT			Check Sequence: 12	ACH Enabled: False
	Refund Check 006772-000, 8259 383RD ST	16.46	01/31/2025	602-00000-20200	
	Refund Check 006772-000, 8259 383RD ST	7.07	01/31/2025	612-00000-20200	
	Refund Check 006772-000, 8259 383RD ST	20.07	01/31/2025	602-00000-20200	
	Refund Check 006772-000, 8259 383RD ST	22.72	01/31/2025	615-00000-20200	
	Refund Check 006772-000, 8259 383RD ST	0.92	01/31/2025	615-00000-20200	
	Refund Check 006772-000, 8259 383RD ST	12.99	01/31/2025	615-00000-20200	
	Check Total:	80.23			
Vendor: 1484	Premium Waters Inc.			Check Sequence: 13	ACH Enabled: False
310406750	OPERATING SUPPLIES	25.29	01/31/2025	609-49750-50210	
310433086	OPERATING SUPPLIES	11.76	01/31/2025	609-49750-50210	
310459938	OPERATING SUPPLIES	34.44	01/31/2025	609-48000-50210	
310459953	OPERATING SUPPLIES	31.29	01/31/2025	609-49750-50210	
310485089	OPERATING SUPPLIES	11.76	01/31/2025	609-49750-50210	
	Check Total:	114.54			
Vendor: UB*00019	JOANNE SCHWAN			Check Sequence: 14	ACH Enabled: False
	Refund Check 012962-000, 7340 384TH CT	43.35	01/31/2025	615-00000-20200	
	Refund Check 012962-000, 7340 384TH CT	1.75	01/31/2025	615-00000-20200	
	Refund Check 012962-000, 7340 384TH CT	13.50	01/31/2025	612-00000-20200	
	Refund Check 012962-000, 7340 384TH CT	18.03	01/31/2025	602-00000-20200	
	Refund Check 012962-000, 7340 384TH CT	11.69	01/31/2025	615-00000-20200	
	Refund Check 012962-000, 7340 384TH CT	31.43	01/31/2025	602-00000-20200	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	119.75			
Vendor: 1865	Willow Grove of North Branch, Ltd Partnership			Check Sequence: 15	ACH Enabled: False
TIF 2018-1	TIF 2018-1	6,514.37	01/31/2025	291-46500-50454	
	Check Total:	6,514.37			
Vendor: UB*00018	WOODRICH HOMES LLC			Check Sequence: 16	ACH Enabled: False
	Refund Check 011824-000, 6723 MAIN ST	0.07	01/31/2025	602-00000-20200	
	Refund Check 011824-000, 6723 MAIN ST	0.05	01/31/2025	615-00000-20200	
	Refund Check 011824-000, 6723 MAIN ST	0.35	01/31/2025	615-00000-20200	
	Refund Check 011824-000, 6723 MAIN ST	6.28	01/31/2025	602-00000-20200	
	Refund Check 011824-000, 6723 MAIN ST	2.69	01/31/2025	612-00000-20200	
	Refund Check 011824-000, 6723 MAIN ST	8.67	01/31/2025	615-00000-20200	
	Check Total:	18.11			
Vendor: 1628	WSB & Associates, Inc.			Check Sequence: 17	ACH Enabled: False
FOR NOV 2024	R-025057-000-8	7,689.75	01/31/2025	101-00000-33418	
FOR NOV 2024	R-024317-000-10	980.00	01/31/2025	101-00000-21165	
FOR NOV 2024	R-023681-000-11	6,476.00	01/31/2025	101-41700-50303	
FOR NOV 2024	R-026028-000-5	2,171.25	01/31/2025	101-00000-21165	
FOR NOV 2024	R-027091-000-2	2,365.25	01/31/2025	602-49450-50303	
FOR NOV 2024	R-025057-000-8	4,057.75	01/31/2025	458-43000-50303	
FOR NOV 2024	R-019771-000-23	2,338.00	01/31/2025	612-49700-50303	
FOR NOV 2024	R-026028-000-5	675.00	01/31/2025	101-00000-21175	
FOR NOV 2024	R-026028-000-5	150.00	01/31/2025	101-00000-21173	
FOR NOV 2024	R-026028-000-5	7,278.25	01/31/2025	101-41910-50300	
FOR NOV 2024	R-024886-000-6	70.00	01/31/2025	101-00000-21164	
FOR NOV 2024	R-026799-000-3	3,306.25	01/31/2025	101-00000-21120	
FOR NOV 2024	R-026028-000-5	23.25	01/31/2025	101-00000-21176	
FOR NOV 2024	R-019036-000-13	973.50	01/31/2025	101-00000-21138	
FOR NOV 2024	R-020200-000-14	354.00	01/31/2025	101-00000-21144	
FOR NOV 2024	R-025975-000-5	3,481.50	01/31/2025	101-00000-21167	
FOR NOV 2024	R-023138-000-15	442.50	01/31/2025	101-00000-21154	
FOR NOV 2024	R-021289-000-21	4,975.50	01/31/2025	101-00000-21140	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
FOR NOV 2024	R-021646-000-12	727.00	01/31/2025	486-46500-50303	
FOR NOV 2024	R-025673-000-6	3,054.90	01/31/2025	615-49550-50530	
FOR NOV 2024	R-027398-000-1	814.00	01/31/2025	101-43000-50300	
FOR NOV 2024	R-027113-000-2	2,838.00	01/31/2025	602-49450-50303	
	Check Total:	55,241.65			
	Total for Check Run:	86,503.83			
	Total of Number of Checks:	17			

Accounts Payable

Computer Check Proof List by Vendor

User: TiffaniFolstad
Printed: 02/06/2025 - 2:54PM
Batch: 00001.02.2025 - 02062025



Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: 1005	Ace Solid Waste			Check Sequence: 1	ACH Enabled: False
11522275T067	REFUSE	102.31	02/06/2025	101-45500-50387	
11522275T067	REFUSE	107.28	02/06/2025	615-49550-50387	
11522275T067	REFUSE	308.52	02/06/2025	101-43000-50387	
11522275T067	REFUSE	58.13	02/06/2025	615-49550-50387	
11522275T067	REFUSE	245.56	02/06/2025	602-49450-50387	
11522275T067	REFUSE	190.59	02/06/2025	101-42280-50387	
11522275T067	REFUSE	140.44	02/06/2025	609-49750-50387	
11522275T067	REFUSE	210.45	02/06/2025	101-41940-50387	
	Check Total:	1,363.28			
Vendor: 2012	Alltrees, LLC			Check Sequence: 2	ACH Enabled: False
2658	SECURITY	695.15	02/06/2025	101-41420-50210	
	Check Total:	695.15			
Vendor: 1662	Amazon Capital Services			Check Sequence: 3	ACH Enabled: False
14JV-G97C-1YPD	OFFICE SUPPLIES	35.99	02/06/2025	101-42110-50210	
19CC-QXV6-VM6D	OPERATING SUPPLIES	13.30	02/06/2025	101-41940-50210	
1K6Y-DMPX-CXJK	TRAINING EQUIPMENT	290.76	02/06/2025	101-42110-50404	
1WFX-3J9N-MQ3Y	OFFICE SUPPLIES	55.72	02/06/2025	101-42110-50210	
	Check Total:	395.77			
Vendor: 1029	Artisan Beer Company			Check Sequence: 4	ACH Enabled: False
3741871	BEER	87.75	02/06/2025	609-48000-50252	
3743226	BEER	113.90	02/06/2025	609-49750-50252	
3743227	BEER	60.00	02/06/2025	609-48000-50252	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Check Total:		261.65			
Vendor: 1036	AT & T Mobility			Check Sequence: 5	ACH Enabled: False
287294264933X02	MOBILE SERVICES	2,361.23	02/06/2025	101-41420-50321	
Check Total:		2,361.23			
Vendor: 1049	Bellboy Corporation			Check Sequence: 6	ACH Enabled: False
0109441700	N/A SALES CREDIT	-120.11	02/06/2025	609-48000-50250	
0109455000	OPERATING SUPPLIES	97.44	02/06/2025	609-48000-50210	
0206498400	LIQUOR	909.65	02/06/2025	609-49750-50251	
0206498400	THC	117.25	02/06/2025	609-49750-50254	
0206574900	LIQUOR	1,186.70	02/06/2025	609-49750-50251	
0206574900	WINE	482.95	02/06/2025	609-49750-50253	
0206575700	LIQUOR	734.03	02/06/2025	609-48000-50251	
0206575700	N/A SALES	153.65	02/06/2025	609-48000-50250	
0206578500	LIQUOR	868.60	02/06/2025	609-49750-50251	
0206658200	THC	109.65	02/06/2025	609-48000-50254	
0206658200	LIQUOR	1,787.60	02/06/2025	609-48000-50251	
Check Total:		6,327.41			
Vendor: 1052	Bernicks			Check Sequence: 7	ACH Enabled: False
10313786	N/A SALES	123.00	02/06/2025	609-49750-50250	
10313786	BEER	4,382.30	02/06/2025	609-49750-50252	
10313786	LIQUOR	60.00	02/06/2025	609-49750-50251	
10313787	BEER CREDIT	-76.80	02/06/2025	609-49750-50252	
10313795	BEER	1,193.00	02/06/2025	609-48000-50252	
10313795	N/A SALES	36.90	02/06/2025	609-48000-50250	
10316494	N/A SALES	124.70	02/06/2025	609-49750-50250	
10316494	BEER	3,685.45	02/06/2025	609-49750-50252	
10316495	BEER	94.00	02/06/2025	609-49750-50252	
10316496	BEER CREDIT	-86.56	02/06/2025	609-49750-50252	
10316496	N/A SALES CREDIT	-27.60	02/06/2025	609-49750-50250	
10316499	THC	277.00	02/06/2025	609-48000-50254	
10316500	BEER	627.30	02/06/2025	609-48000-50252	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
10316501	BEER CREDIT	-12.36	02/06/2025	609-48000-50252	
	Check Total:	10,400.33			
Vendor: 1066	Breakthru Beverage MN			Check Sequence: 8	ACH Enabled: False
119721118	LIQUOR	58.50	02/06/2025	609-48000-50251	
119722258	WINE	398.60	02/06/2025	609-49750-50253	
119722259	LIQUOR	291.61	02/06/2025	609-49750-50251	
119819990	LIQUOR	1,258.68	02/06/2025	609-48000-50251	
119819991	N/A SALES	108.25	02/06/2025	609-48000-50250	
119819992	WINE	486.60	02/06/2025	609-48000-50253	
119820113	LIQUOR	1,159.85	02/06/2025	609-49750-50251	
119820114	WINE	547.60	02/06/2025	609-49750-50253	
413205428	LIQUOR CREDIT	-172.96	02/06/2025	609-49750-50251	
	Check Total:	4,136.73			
Vendor: 1076	Business Essentials			Check Sequence: 9	ACH Enabled: False
64827	OFFICE SUPPLIES	151.20	02/06/2025	101-41940-50210	
64827	OFFICE SUPPLIES	151.26	02/06/2025	602-49450-50210	
64827	OFFICE SUPPLIES	151.20	02/06/2025	101-43000-50210	
64827	OFFICE SUPPLIES	151.20	02/06/2025	101-45000-50210	
64827	OFFICE SUPPLIES	151.20	02/06/2025	615-49550-50210	
64827	OFFICE SUPPLIES	151.20	02/06/2025	101-45500-50210	
64827	OFFICE SUPPLIES	151.20	02/06/2025	101-42280-50210	
	Check Total:	1,058.46			
Vendor: 1082	Capitol Beverage Sales LP			Check Sequence: 10	ACH Enabled: False
3092043	N/A	108.00	02/06/2025	609-48000-50250	
3092043	THC	94.00	02/06/2025	609-48000-50254	
3092043	BEER	741.00	02/06/2025	609-48000-50252	
	Check Total:	943.00			
Vendor: 1092	Central Pension Fund			Check Sequence: 11	ACH Enabled: False
For Jan 2025	CENTRAL PENSION FUND	6,923.16	02/06/2025	101-00000-21705	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	6,923.16			
Vendor: 1099 NBPDP2025	Chisago County Chiefs/Police MEMBERSHIP DUES	50.00	02/06/2025	Check Sequence: 12 101-42110-50433	ACH Enabled: False
	Check Total:	50.00			
Vendor: 2231 5990 5996 6011	Christopher Clasen RINK ATTENDANT RINK ATTENDANT RINK ATTENDANT	243.00 951.75 810.00	02/06/2025 02/06/2025 02/06/2025	Check Sequence: 13 101-45000-50103 101-45000-50103 101-45000-50103	ACH Enabled: False
	Check Total:	2,004.75			
Vendor: 2206 13121 13141 13436 13553 923837	Core & Main LP LAB CHEMICALS LAB SUPPLIES CLEANING SOLUTION LAB TESTING SUPPLIES CHLORINE PUMP WATER PLANT 1	193.96 1,229.75 276.27 670.00 3,934.95	02/06/2025 02/06/2025 02/06/2025 02/06/2025 02/06/2025	Check Sequence: 14 602-49450-50210 602-49450-50210 602-49450-50210 602-49450-50210 615-49550-50404	ACH Enabled: False
	Check Total:	6,304.93			
Vendor: 1122 01-500111 01-500113	Crystal Springs Ice N/A SALES N/A SALES	49.20 178.92	02/06/2025 02/06/2025	Check Sequence: 15 609-48000-50250 609-49750-50250	ACH Enabled: False
	Check Total:	228.12			
Vendor: 1129 2382780 2382781 2382784 2382801 2382878 2388052 2388053 2388054	Dahlheimer Distributing THC LIQUOR BEER LIQUOR BEER THC N/A SALES LIQUOR	244.50 151.60 8,352.17 54.00 2,113.55 238.00 197.55 157.80	02/06/2025 02/06/2025 02/06/2025 02/06/2025 02/06/2025 02/06/2025 02/06/2025 02/06/2025	Check Sequence: 16 609-49750-50254 609-49750-50251 609-49750-50252 609-48000-50251 609-48000-50252 609-49750-50254 609-49750-50250 609-49750-50251	ACH Enabled: False

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
2388056	BEER	8,678.25	02/06/2025	609-49750-50252	
2388091	THC	140.00	02/06/2025	609-48000-50254	
2388092	LIQUOR	52.00	02/06/2025	609-48000-50251	
2388093	BEER	3,719.40	02/06/2025	609-48000-50252	
	Check Total:	24,098.82			
Vendor: 1160	Emergency Equip. Connections			Check Sequence: 17	ACH Enabled: False
2348	REPLACEMENT PARTS	179.90	02/06/2025	101-42110-50404	
	Check Total:	179.90			
Vendor: 1180	Ferguson US Holdings, Inc			Check Sequence: 18	ACH Enabled: False
542510	WATER METER COUPLERS/GASKETS	3,648.00	02/06/2025	615-49550-50210	
	Check Total:	3,648.00			
Vendor: 1216	Gopher State One-Call, Inc.			Check Sequence: 19	ACH Enabled: False
5010645	44 BILLABLE LOCATES JAN 2025	36.46	02/06/2025	602-49450-50300	
5010645	44 BILLABLE LOCATES JAN 2025	36.48	02/06/2025	615-49550-50300	
5010645	44 BILLABLE LOCATES JAN 2025	36.46	02/06/2025	612-49700-50300	
	Check Total:	109.40			
Vendor: 1220	Grainger			Check Sequence: 20	ACH Enabled: False
9290816099	PUMP REPAIR	129.82	02/06/2025	602-49450-50404	
	Check Total:	129.82			
Vendor: 1234	Hach Company			Check Sequence: 21	ACH Enabled: False
14289666	LAB TESTING CHEMICALS	603.10	02/06/2025	615-49550-50210	
14332263	WP #2 CHLORINE MONITOR	2,139.40	02/06/2025	615-49550-50404	
14346486	ANNUAL AGREEMENT	7,764.00	02/06/2025	602-49450-50300	
14346486	ANNUAL AGREEMENT	3,000.00	02/06/2025	602-49450-50210	
	Check Total:	13,506.50			
Vendor: 1246	Hohensteins, Inc.			Check Sequence: 22	ACH Enabled: False
789179	BEER	370.50	02/06/2025	609-49750-50252	
789186	BEER	381.00	02/06/2025	609-48000-50252	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Check Total:		751.50			
Vendor: 1265	Isanti-Chisago County Star			Check Sequence: 23	ACH Enabled: False
21132-01-2025	PUBLIC WORKS POSTING	129.60	02/06/2025	101-41940-50210	
21132-01-2025	HR GENERALIST POSTING	194.40	02/06/2025	101-41940-50210	
25928-01-2025	ORDINANCE NO 391-25	296.89	02/06/2025	101-41400-50351	
25928-01-2025	PUB HEAR NOT 2/4/25 -1869986	6.83	02/06/2025	101-41400-50351	
959927	PW/HR/PLANNER CLASSIFIED	429.00	02/06/2025	101-41940-50210	
Check Total:		1,056.72			
Vendor: 1650	John Hirsch's Cambridge Motors			Check Sequence: 24	ACH Enabled: False
5916	SQUAD 219 ENGINE MOUNT REPAIRS	3,270.99	02/06/2025	101-42110-50404	
Check Total:		3,270.99			
Vendor: 1279	Johnson Brothers Liquor Co.			Check Sequence: 25	ACH Enabled: False
121678	LIQUOR CREDIT	-100.82	02/06/2025	609-49750-50251	
2714638	LIQUOR	1,161.69	02/06/2025	609-49750-50251	
2714639	LIQUOR	100.98	02/06/2025	609-49750-50251	
2714640	WINE	273.10	02/06/2025	609-49750-50253	
2714641	WINE	2,488.03	02/06/2025	609-49750-50253	
2714642	LIQUOR	110.82	02/06/2025	609-49750-50251	
2714643	LIQUOR	302.94	02/06/2025	609-48000-50251	
2714644	WINE	111.64	02/06/2025	609-48000-50253	
2714645	WINE	1,478.40	02/06/2025	609-48000-50253	
2714646	LIQUOR	507.64	02/06/2025	609-48000-50251	
2715600	WINE	161.32	02/06/2025	609-49750-50253	
2715601	WINE	145.26	02/06/2025	609-48000-50253	
2718880	LIQUOR	974.50	02/06/2025	609-49750-50251	
2718881	WINE	489.10	02/06/2025	609-49750-50253	
2718882	LIQUOR	1,439.04	02/06/2025	609-49750-50251	
2718883	WINE	1,254.12	02/06/2025	609-49750-50253	
2718884	N/A SALES	53.77	02/06/2025	609-49750-50250	
2718885	LIQUOR	297.46	02/06/2025	609-49750-50251	
2718886	N/A SALES	88.64	02/06/2025	609-49750-50250	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
2718887	LIQUOR	1,481.00	02/06/2025	609-48000-50251	
2718888	LIQUOR	562.20	02/06/2025	609-48000-50251	
2718889	LIQUOR	287.32	02/06/2025	609-48000-50251	
	Check Total:	13,668.15			
Vendor: 1292	Knife River			Check Sequence: 26	ACH Enabled: False
1098031	WATER MAIN REPAIRS BIRCH/RED FOX RI	531.35	02/06/2025	615-49550-50407	
	Check Total:	531.35			
Vendor: 1320	Lynette Koalska			Check Sequence: 27	ACH Enabled: False
374822	ADVERTISING	274.25	02/06/2025	609-48000-50340	
374822	ADVERTISING	274.25	02/06/2025	609-49750-50340	
	Check Total:	548.50			
Vendor: 1658	Kramer Mechanical Plumbing & Heating, Inc.			Check Sequence: 28	ACH Enabled: False
32287	BUILDING REPAIRS	1,578.65	02/06/2025	620-49600-50401	
32287	BUILDING REPAIRS	1,578.64	02/06/2025	615-49550-50401	
	Check Total:	3,157.29			
Vendor: 1685	Lakes Brewing Company			Check Sequence: 29	ACH Enabled: False
002132	BEER	128.00	02/06/2025	609-49750-50252	
	Check Total:	128.00			
Vendor: 1878	Larkin Hoffman Attorneys			Check Sequence: 30	ACH Enabled: False
850982	DEC 2024 Legislative Representation	2,500.00	02/06/2025	101-41800-50300	
	Check Total:	2,500.00			
Vendor: 2234	Larson Plumbing and Heating			Check Sequence: 31	ACH Enabled: False
BP 13491	PERMIT REFUND	89.00	02/06/2025	101-00000-32218	
	Check Total:	89.00			
Vendor: 1302	Law Enforcement Labor Services			Check Sequence: 32	ACH Enabled: False
FOR FEB 2025	UNION DUES	876.00	02/06/2025	101-00000-21708	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	876.00			
Vendor: 1308	LegalShield			Check Sequence: 33	ACH Enabled: False
FOR FEB 2025	LEGAL SERVICES	46.85	02/06/2025	101-00000-21712	
	Check Total:	46.85			
Vendor: 1580	Loess Hills Holdings Inc			Check Sequence: 34	ACH Enabled: False
445605	WASTEWATER REPAIRS	1,677.76	02/06/2025	602-49450-50404	
	Check Total:	1,677.76			
Vendor: 1643	McDonald Distributing			Check Sequence: 35	ACH Enabled: False
5760606	BEER CREDIT	-20.80	02/06/2025	609-48000-50252	
788466	THC	166.76	02/06/2025	609-48000-50254	
788466	BEER	828.20	02/06/2025	609-48000-50252	
788466	LIQUOR	59.50	02/06/2025	609-48000-50251	
788521	LIQUOR	165.30	02/06/2025	609-49750-50251	
788522	N/A SALES	67.05	02/06/2025	609-49750-50250	
788522	BEER	5,827.20	02/06/2025	609-49750-50252	
788522	THC	143.52	02/06/2025	609-49750-50254	
788522	LIQUOR	33.60	02/06/2025	609-49750-50251	
788534	BEER CREDIT	-157.80	02/06/2025	609-49750-50252	
788543	BEER CREDIT	-10.60	02/06/2025	609-48000-50252	
789558	BEER	699.45	02/06/2025	609-48000-50252	
789586	BEER	4,778.45	02/06/2025	609-49750-50252	
789586	THC	177.01	02/06/2025	609-49750-50254	
789745	BEER CREDIT	-70.60	02/06/2025	609-49750-50252	
790667	BEER	4,274.05	02/06/2025	609-48000-50252	
790667	THC	285.00	02/06/2025	609-48000-50254	
790667	LIQUOR	46.30	02/06/2025	609-48000-50251	
	Check Total:	17,291.59			
Vendor: 2235	McMaster-Carr Supply Company			Check Sequence: 36	ACH Enabled: False
0128	SUPPLIES	50.11	02/06/2025	615-49550-50210	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	50.11			
Vendor: 1348 2704885	Metro Sales Inc. COPY MACHINE LEASE	259.00	02/06/2025	Check Sequence: 37 101-41420-50219	ACH Enabled: False
	Check Total:	259.00			
Vendor: 1353 16640100114525	Midcontinent INTERNET	920.39	02/06/2025	Check Sequence: 38 101-41420-50243	ACH Enabled: False
	Check Total:	920.39			
Vendor: 1364 1113023	Minnesota Elevator, Inc. FEBRUARY MONTHLY SERVICE	135.00	02/06/2025	Check Sequence: 39 101-41940-50300	ACH Enabled: False
	Check Total:	135.00			
Vendor: 1376 65593	MMUA PD Reserve Officer Drug Test	41.25	02/06/2025	Check Sequence: 40 851-42110-50430	ACH Enabled: False
	Check Total:	41.25			
Vendor: 1404 FOR FEB 2025 FOR FEB 2025	MN Teamsters #320 CITY SUPERVISORS CITY EMPLOYEES	931.00 874.00	02/06/2025 02/06/2025	Check Sequence: 41 101-00000-21708 101-00000-21708	ACH Enabled: False
	Check Total:	1,805.00			
Vendor: 1411 SB4-001 SB5-001 SB6-001	Moose Lake Brewing Co. LLC BEER BEER BEER	33.00 39.00 93.00	02/06/2025 02/06/2025 02/06/2025	Check Sequence: 42 609-48000-50252 609-49750-50252 609-48000-50252	ACH Enabled: False
	Check Total:	165.00			
Vendor: 2203 11662	Morris Electronics, Inc. PD IT SUPPORT	93.75	02/06/2025	Check Sequence: 43 101-42110-50300	ACH Enabled: False
	Check Total:	93.75			
Vendor: 1421	N.B. Area Chamber Of Commerce			Check Sequence: 44	ACH Enabled: False

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
SP HOME SHOW	SPRING HOME SHOW	100.00	02/06/2025	851-42110-50430	
	Check Total:	100.00			
Vendor: 2047	NEONLINK LLC			Check Sequence: 45	ACH Enabled: False
3021	WEB PORTAL ACCESS	84.20	02/06/2025	612-49700-50300	
3021	WEB PORTAL ACCESS	84.20	02/06/2025	602-49450-50300	
3021	WEB PORTAL ACCESS	84.20	02/06/2025	615-49550-50300	
	Check Total:	252.60			
Vendor: 1486	Jennifer Newman			Check Sequence: 46	ACH Enabled: False
15820	UNIFORMS-CB	143.25	02/06/2025	101-42110-50237	
	Check Total:	143.25			
Vendor: 1440	North Central Bus & Equip Inc.			Check Sequence: 47	ACH Enabled: False
318731	TRACTOR BEACON	207.04	02/06/2025	602-49450-50210	
	Check Total:	207.04			
Vendor: 1893	Parman Energy Group, LLC			Check Sequence: 48	ACH Enabled: False
281928	TRUCK OIL	1,885.69	02/06/2025	101-43000-50210	
	Check Total:	1,885.69			
Vendor: 1474	Phillips Wine & Spirits, Inc.			Check Sequence: 49	ACH Enabled: False
6918167	LIQUOR	476.18	02/06/2025	609-49750-50251	
6918168	LIQUOR	185.43	02/06/2025	609-48000-50251	
6918169	WINE	133.46	02/06/2025	609-48000-50253	
6921574	LIQUOR	195.11	02/06/2025	609-49750-50251	
6921575	LIQUOR	426.16	02/06/2025	609-49750-50251	
6921575	WINE	91.64	02/06/2025	609-49750-50253	
6921576	N/A SALES	89.46	02/06/2025	609-49750-50250	
6921577	WINE	1.82	02/06/2025	609-48000-50253	
6921578	LIQUOR	375.64	02/06/2025	609-48000-50251	
6921579	WINE	137.46	02/06/2025	609-48000-50253	
	Check Total:	2,112.36			

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: 1482	Post Haste Business Solutions			Check Sequence: 50	ACH Enabled: False
137197	4 IN CAR MAGNETS "RESERVE"	100.00	02/06/2025	101-42110-50210	
	Check Total:	100.00			
Vendor: 1484	Premium Waters Inc.			Check Sequence: 51	ACH Enabled: False
310539758	OPERATING SUPPLIES	11.76	02/06/2025	609-49750-50210	
310571151	OPERATING SUPPLIES	16.14	02/06/2025	609-49750-50210	
310571154	OPERATING SUPPLIES	25.29	02/06/2025	609-48000-50210	
	Check Total:	53.19			
Vendor: 2232	Pryes Brewing Company LLC			Check Sequence: 52	ACH Enabled: False
W-91547	BEER	466.00	02/06/2025	609-49750-50252	
W-91599	BEER	408.50	02/06/2025	609-48000-50252	
	Check Total:	874.50			
Vendor: 2019	Quadient, Inc			Check Sequence: 53	ACH Enabled: False
Q1697427	QUARTERLY BILL STUFFER	137.99	02/06/2025	612-49700-50210	
Q1697427	QUARTERLY BILL STUFFER	137.99	02/06/2025	602-49450-50210	
Q1697427	QUARTERLY BILL STUFFER	137.99	02/06/2025	615-49550-50210	
	Check Total:	413.97			
Vendor: 1494	Red Bull Distribution Company			Check Sequence: 54	ACH Enabled: False
2023244997	N/A SALES	404.32	02/06/2025	609-49750-50250	
	Check Total:	404.32			
Vendor: 2066	RMB Environmental Laboratories, Inc.			Check Sequence: 55	ACH Enabled: False
B016135	WEEKLY TESTING	124.60	02/06/2025	602-49450-50315	
	Check Total:	124.60			
Vendor: 1513	Safe-Fast, Inc.			Check Sequence: 56	ACH Enabled: False
303266	WORK GLOVES	113.28	02/06/2025	101-43000-50237	
303267	WORK GLOVES	206.88	02/06/2025	101-45000-50237	
303496	SAFETY GLASSES	36.00	02/06/2025	101-43000-50237	
303497	SAFETY GLASSES/GLOVES	44.35	02/06/2025	101-43000-50237	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
303499	GLOVES	25.90	02/06/2025	101-43000-50237	
	Check Total:	426.41			
Vendor: 1534	Southern Glazers Wine & Spirits of Minnesota			Check Sequence: 57	ACH Enabled: False
2580661	LIQUOR	1.55	02/06/2025	609-48000-50251	
2580662	WINE	815.38	02/06/2025	609-48000-50253	
2580662	LIQUOR	3,004.54	02/06/2025	609-48000-50251	
2581123	LIQUOR	3,800.33	02/06/2025	609-49750-50251	
2581124	WINE	128.94	02/06/2025	609-49750-50253	
2583165	LIQUOR	1,833.56	02/06/2025	609-48000-50251	
2583165	WINE	317.30	02/06/2025	609-48000-50253	
2583642	LIQUOR	2,186.88	02/06/2025	609-49750-50251	
2583643	WINE	1,002.18	02/06/2025	609-49750-50253	
48401	CREDIT	-118.07	02/06/2025	609-49750-50251	
	Check Total:	12,972.59			
Vendor: 2233	Standard Insurance Company			Check Sequence: 58	ACH Enabled: False
For FEB 2025	VISION	178.00	02/06/2025	101-00000-21706	
For JAN 2025	VISION	178.00	02/06/2025	101-00000-21706	
	Check Total:	356.00			
Vendor: 1542	Staples			Check Sequence: 59	ACH Enabled: False
7003782516		203.30	02/06/2025	101-41940-50210	
	Check Total:	203.30			
Vendor: 1550	Streichers			Check Sequence: 60	ACH Enabled: False
1740824	TRAINING SUPPLIES	151.00	02/06/2025	101-42110-50332	
	Check Total:	151.00			
Vendor: 1753	Summit Fire Protection			Check Sequence: 61	ACH Enabled: False
2995025	ANNUAL INSPECTION - 591054	500.00	02/06/2025	101-41940-50300	
2995025	ANNUAL INSPECTION - 591054	500.00	02/06/2025	101-42280-50300	
2995025	ANNUAL INSPECTION - 591054	500.00	02/06/2025	615-49550-50300	
2995025	ANNUAL INSPECTION - 591054	500.00	02/06/2025	602-49450-50300	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	2,000.00			
Vendor: 1557 70844	T.A. Schifsky & Sons, Inc. WATER MAIN REPAIR BIRCH/RED FOX RU	3,682.50	02/06/2025	Check Sequence: 62 615-49550-50407	ACH Enabled: False
	Check Total:	3,682.50			
Vendor: 1827 E-38733 E-38737 E-38737	Urban Growler Brewing Company, LLC THC BEER THC	855.00 282.50 80.00	02/06/2025 02/06/2025 02/06/2025	Check Sequence: 63 609-48000-50254 609-49750-50252 609-49750-50254	ACH Enabled: False
	Check Total:	1,217.50			
Vendor: 1598 3599276 3599322	Viking Coca-Cola Bottling Co. N/A SALES N/A SALES	109.50 232.05	02/06/2025 02/06/2025	Check Sequence: 64 609-49750-50250 609-49750-50250	ACH Enabled: False
	Check Total:	341.55			
Vendor: 1611 147474	Watson Company N/A SALES	922.85	02/06/2025	Check Sequence: 65 609-49750-50250	ACH Enabled: False
	Check Total:	922.85			
Vendor: 1621 011734575	Windstream CITY LAND LINES AND FAXES	363.24	02/06/2025	Check Sequence: 66 101-41420-50321	ACH Enabled: False
	Check Total:	363.24			
Vendor: 1624 62913	Winnick Supply, Inc. BUILDING MAINTENANCE	388.21	02/06/2025	Check Sequence: 67 101-43000-50210	ACH Enabled: False
	Check Total:	388.21			
Vendor: 1637 1663585 1722589 1740975 1780251	Ziegler Cat CREDIT FOR INV 1663585 RENTAL FORKS CAT ACCESS SUBSCRIPTION LOADER FENDER	-99.86 620.00 41.25 948.63	02/06/2025 02/06/2025 02/06/2025 02/06/2025	Check Sequence: 68 101-43000-50404 602-49450-50415 101-43000-50404 101-43000-50404	ACH Enabled: False

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
1780519	OPERATING SUPPLIES	225.00	02/06/2025	101-42280-50404	
1780519	OPERATING SUPPLIES	225.00	02/06/2025	101-43000-50210	
1780519	OPERATING SUPPLIES	225.00	02/06/2025	101-42110-50404	
1781324	GEN 3 & 4 PARTS	3,090.08	02/06/2025	620-49600-50404	
1781324	3 SQUAD BATTERIES	462.63	02/06/2025	101-42110-50404	
1781737	FUEL GUAGE	381.65	02/06/2025	101-43000-50404	
1783327	GEN FUEL FILTERS	331.80	02/06/2025	620-49600-50404	
1794703	PARTS	83.11	02/06/2025	101-43000-50404	
CM000253115	RETURNED PART	-948.63	02/06/2025	101-43000-50404	
	Check Total:	5,585.66			
	Total for Check Run:	169,471.94			
	Total of Number of Checks:	68			

Accounts Payable

Check Detail

User: TiffaniFolstad
Printed: 02/06/2025 - 2:20PM



Check Number	Check Date	Amount
1033 - Associated Bank		
5675	11/15/2024	
Inv Assoc Nov 2024		82.40
5675 Total:		82.40
5684	12/13/2024	
Inv		79.10
5684 Total:		79.10
1033 - Associated Bank Total:		161.50
1044 - Bank Charges, Miscellaneous		
5672	11/07/2024	
Inv RT Nov 2024		53.82
5672 Total:		53.82
5679	12/06/2024	
Inv RT Dec 2024		24.85
5679 Total:		24.85
1044 - Bank Charges, Miscellaneous Total:		78.67
1118 - Commissioner Of Revenue (W/H)		
5654	12/20/2024	
Inv 1220 STATE		9,840.48
5654 Total:		9,840.48
5659	01/03/2025	
Inv 0103 STATE		8,801.70
5659 Total:		8,801.70
5691	01/17/2025	
Inv 0117 STATE		8,857.09
5691 Total:		8,857.09
5698	01/31/2025	
Inv 0131 STATE		8,951.07

Check Number	Check Date	Amount
5698 Total:		8,951.07
1118 - Commissioner Of Revenue (W/H) Total:		36,450.34
1152 - Ehlers		
5667	01/27/2025	
Inv 2022A 2/1/2025		193,700.00
5667 Total:		193,700.00
1152 - Ehlers Total:		193,700.00
1362 - Minnesota Dept of Revenue		
5682	12/18/2024	
Inv LS#1 Dec 2024		24,910.00
Inv LS#2 Dec 2024		10,484.00
5682 Total:		35,394.00
5683	12/18/2024	
Inv Water Dec 2024		1,066.00
5683 Total:		1,066.00
1362 - Minnesota Dept of Revenue Total:		36,460.00
1365 - Minnesota Energy Resources		
5661	01/10/2025	
Inv 503985460-00004		2,017.82
Inv 505053332-00001		554.08
Inv 505590187-00001		21.00
Inv 506279043-00003		1,163.29
Inv 506279043-00004		555.48
Inv 506279043-00005		177.92
Inv 506279043-00006		176.01
Inv 506279043-00007		357.42
Inv 506279043-00008		139.63
Inv 506279043-00009		302.76
Inv 507851907-00001		227.92
5661 Total:		5,693.33
1365 - Minnesota Energy Resources Total:		5,693.33
1372 - Minnesota State Retirement		
5655	12/20/2024	
Inv 1220 MSRS		1,311.54
5655 Total:		1,311.54
5657	01/03/2025	

Check Number	Check Date	Amount
Inv 0103 MSRS		1,461.54
5657 Total:		1,461.54
5697	01/31/2025	
Inv 0131 MSRS		1,606.02
5697 Total:		1,606.02
1372 - Minnesota State Retirement Total:		4,379.10
1431 - Nationwide Retirement Solution		
5651	12/20/2024	
Inv 1220 nat		5.00
5651 Total:		5.00
5658	01/03/2025	
Inv 0103 NAT		5.00
5658 Total:		5.00
5692	01/17/2025	
Inv 0117 NAT		5.00
5692 Total:		5.00
5699	01/31/2025	
Inv 0131 NAT		5.00
5699 Total:		5.00
1431 - Nationwide Retirement Solution Total:		20.00
1468 - PERA (Payroll W/H)		
5653	12/20/2024	
Inv 1220 PERA		31,563.26
5653 Total:		31,563.26
5660	01/03/2025	
Inv 0103 PERA		35,466.84
5660 Total:		35,466.84
5693	01/17/2025	
Inv 0117 PERA		35,484.35
5693 Total:		35,484.35
5701	01/31/2025	
Inv 0131 PERA		34,178.30
5701 Total:		34,178.30

Check Number	Check Date	Amount
1468 - PERA (Payroll W/H) Total:		136,692.75
1475 - Pitney Bowes Bank Inc Purchase Power		
5662	01/10/2025	
Inv 0110 PB		100.00
5662 Total:		100.00
1475 - Pitney Bowes Bank Inc Purchase Power Total:		100.00
1585 - United States Treasury		
5652	12/20/2024	
Inv 1220 FED		43,363.06
5652 Total:		43,363.06
5656	01/03/2025	
Inv 0103 FED		37,471.46
5656 Total:		37,471.46
5689	01/17/2025	
Inv 0117 FED		37,907.33
5689 Total:		37,907.33
5700	01/31/2025	
Inv 0131 FED		38,534.87
5700 Total:		38,534.87
1585 - United States Treasury Total:		157,276.72
1592 - US Postal Service		
5674	11/27/2024	
Inv USPS Nov 2024		1,502.78
5674 Total:		1,502.78
5681	12/30/2024	
Inv USPS Dec 2024		1,297.52
5681 Total:		1,297.52
1592 - US Postal Service Total:		2,800.30
1818 - Old National Bank		
5663	01/27/2025	
Inv 2020A 2/1/2025		163,230.95
5663 Total:		163,230.95

Check Number	Check Date	Amount
1818 - Old National Bank Total:		163,230.95
1886 - US Bank - Bond Pymts		
5664	01/27/2025	
Inv 2013A 2/1/2025		101,000.00
5664 Total:		101,000.00
5665	01/27/2025	
Inv 2017B 2/1/2025		227,500.00
5665 Total:		227,500.00
5666	01/27/2025	
Inv 2017C 2/1/2025		199,506.25
5666 Total:		199,506.25
1886 - US Bank - Bond Pymts Total:		528,006.25
1899 - BlueCross/Blue Shield Minnesota		
5687	01/18/2025	
Inv 250101701717L		41,396.04
5687 Total:		41,396.04
1899 - BlueCross/Blue Shield Minnesota Total:		41,396.04
1941 - WEX, Inc.		
5668	12/06/2024	
Inv EE HSA 12-6-24		5,694.33
Inv ER HSA 12-6-24		106.46
5668 Total:		5,800.79
5669	01/03/2025	
Inv 0103 HSA		16,800.69
5669 Total:		16,800.69
5670	01/03/2025	
Inv 0103 ER VEBA		37,250.00
5670 Total:		37,250.00
5673	11/25/2024	
Inv WEX Nov 2024		109.50
5673 Total:		109.50
5680	12/26/2024	
Inv WEX Dec 2024		105.75

Check Number	Check Date	Amount
5680 Total:		105.75
5694	01/17/2025	
Inv 0117 HSA EE		6,050.69
5694 Total:		6,050.69
5695	01/06/2025	
Inv 0106 VEBA		6,000.00
5695 Total:		6,000.00
5696	12/20/2024	
Inv HSA 12/20/24		5,694.33
5696 Total:		5,694.33
1941 - WEX, Inc. Total:		77,811.75
1993 - Truist Government Finance		
5702	02/03/2025	
Inv 2017A 2/1/2025		38,794.00
5702 Total:		38,794.00
1993 - Truist Government Finance Total:		38,794.00
1998 - HEWLETT-PACKARD FINANCIAL SERVICES COMPANY		
5690	01/24/2025	
Inv 100000444615		1,849.78
5690 Total:		1,849.78
1998 - HEWLETT-PACKARD FINANCIAL SERVICES COMPANY Total:		1,849.78
2096 - Xpress Solutions Inc		
5676	11/05/2024	
Inv XBP Nov 2024		284.00
5676 Total:		284.00
5685	12/05/2024	
Inv XBP Dec 2024		242.00
5685 Total:		242.00
2096 - Xpress Solutions Inc Total:		526.00
2146 - Bremer Bank		
5677	11/22/2024	
Inv Bremer Fees		176.93

Check Number	Check Date	Amount
5677 Total:		176.93
5686	12/24/2024	
Inv Bremer Dec 24		254.67
5686 Total:		254.67
2146 - Bremer Bank Total:		431.60
2170 - Pathpoint Merchant Services LLC		
5671	11/04/2024	
Inv CC Fees Nov 24		468.58
5671 Total:		468.58
5678	12/02/2024	
Inv CC Fees Dec 24		229.92
5678 Total:		229.92
2170 - Pathpoint Merchant Services LLC Total:		698.50
Total:		1,426,557.58

North Branch City Council Minutes

TUESDAY, JANUARY 28, 2025, 7:00 PM

City Hall, 6408 Elm St., North Branch, MN 55056

Members present:

Robert Canada, Jeff Goulet, Mayor Kevin Schieber, Travis Miles, Peter Schaps and various staff

1. CALL TO ORDER

- a. Mayor Schieber called the meeting to order at 7:02 pm and led the Pledge of Allegiance.

2. PLEDGE OF ALLEGIANCE

3. ROLL CALL – All Council Members in attendance, member Goulet attending remotely.

4. AGENDA APPROVAL

Canada moved to approve the agenda, seconded by Miles. Roll call. The motion was carried unanimously.

5. PRESENTATION & PROCLAMATION

- a. None

6. PUBLIC COMMENT – Mayor Schrieber made a statement about public comment, Personnel Policies. Employee privacy is important.

- a. Kelly Neider, 39062 Grace Ridge, North Branch, goal is to stay involved and make sure council and staff are accountable to community. Commented on hiring HR Generalist. Has issues with Personnel Policy. Changes throughout the years. Turmoil among staff for many years. Investigators, Attorneys, Organizational consultants. Need to raise the standard.

7. CONSENT AGENDA Member Schaps made a motion to pull item G and approve consent agenda as amended, seconded by Member Goulet. Schaps stated that Ms. Tveit would prefer to wait until the investigation is concluded to make the decision. Mayor called for a Roll Call vote, Canada – Nay, Miles – Aye, Schaps – Aye, Goulet – Aye, Schieber – Nay. Passes 3-2

- a. Claims
- b. Approval of City Council Meeting Minutes of January 14, 2025
- c. Approval of Resolution R-139-2025 Amending the 2024 budget
- d. 2025 Pay Equity Report Submittal
- e. Approval the hire of Trey as Police Officer
- f. Approval of resolution R-144-2025 approving Flink Ave Trail Phase II – Engineering & construction inspection services.
- g. Pulled to item 9.d.
- h. Approval of low bid for 1 year contract for official newspaper.
- i. Approval of resolution R-143-2025 approving engineering services contract for the 2025 local street overlay project

8. PUBLIC HEARINGS

- a. None

9. STAFF REPORTS

- a. Police Chief Meyer reported on 2024 police activities. Canada asked on Crashes and if they were related to construction. Yes, as population increases, crashes will likely go up. Fraud, who does the investigations. Our internal Investigators. Schaps asked about squad checks. Meyer responded that they are daily check on vehicles. Mayor asked if anything surprises him. Meyer said that there was nothing surprising.
- b. Resolution R-140-225 amending comprehensive plan from R3 high density residential to Industrial – Nate Sondrol reviewed the proposed comprehensive plan amendment and rezoning in the industrial park. Land is owned by EDA. Currently zoned High Density Residential. Planning Commission and EDA recommended approval of both requests. Mayor Schieber make motion to approve resolution R-140-225, seconded by Schaps – roll call vote, Schaps – aye, Miles – Aye, Canada – Aye, Goulet – Aye, Mayor Schieber – Aye. Passes Unanimously.

- c. Ordinance amendment 392-25. Nate reviewed the information related to the zoning change. Motion made by Mayor Schieber to approve ordinance as presented, Seconded by Member Canada, Roll-call vote, Canada – Aye, Miles – Aye, Schaps – Aye, Goulet – Aye, Mayor Schieber – Aye. motion carried unanimously. Mayor makes a motion to table the item to the first meeting in February, February 11, with Administrator to discuss with Shawn Williams, the Department Head and the employee what the final decision is for the resignation of the 120 day assignment, seconded by Miles. Roll-call vote, Canada – Aye, Miles – Aye, Schaps – Aye, Goulet – Aye, Mayor Schieber – Aye. Motion passes unanimously.

10. MAYOR/CITY COUNCIL

The mayor offered an EDA update. Façade improvement loan program is being utilized. Mr. Sondrol offered some details on the program. Also talked about EDA with joint meeting with Planning Commission to review design standards. Robotics event, member Canada attended. Young adults were very impressive, 6 teams, trail runs for championship in Burnsville.

11. ADJOURNMENT

- a. Being no further business before the City Council, Schieber moved, seconded by Canada, to adjourn the meeting at 7:45p.m. Roll-call vote, Canada – Aye, Miles – Aye, Schaps – aye, Goulet – Aye, Mayor Schieber – Aye, motion passes unanimously.

Kevin Schieber, Mayor

ATTEST:

Mathew Hill, City Administrator



Prepared By: Nathan Sondrol, Community Development Director

Presenter: Nathan Sondrol, Community Development Director

Date: 01/27/2025

Board & Commission: City Council

Subject: Resolution - R-145-2025 Accepting the dedication of Outlot A, Wildridge Plat 12

Background Information

The original master plan for the Wildridge development included the concept of walkable, bikeable area with park, trails and open space throughout the development. As part of the development process over the past several years, there are multiple outlot's that have been platted as open space to comply with the master plan. The Wildridge development is entering the final phase (Wildridge Plat 13) with construction to take place in 2025. With the final phase of the development, the developer is looking to deed the remaining outlot to the city. The city would plan to keep these areas to remain as "open space" and storm water retention ponding.

Requested Action

Approve Resolution R-145-2025 accepting the dedication of Outlot A, Wildridge Plat 12 from Lake Drive Properties, L.P.

Voting Requirements:

Voting Options Simple Majority

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

CITY COUNCIL RESOLUTION NO. R-145-2025

WHEREAS, the masterplan for the Wilidridge Devleopment including the creation of outlots to be utilized as open space;

WHEREAS, Lake Drive Properties, L.P. is offering to deed Outlot A Wildridge Plat 12 to the city; and

WHEREAS, the outlot is currently used for a a public purpose for storm water retention and open space; and

WHEREAS, the City of North Branch is willing to accept deeds of said lots from Lake Drive Properties, L.P.; and

NOW THEREFORE BE IT RESOLVED THAT THE CITY OF NORTH BRANCH ACCEPTS THE OFFER OF DEED OF OUTLOT A, WILDRIDGE PLAT 12 FROM LAKE DRIVE PROPERTIES, L.P.

Passed by the City Council of North Branch, Minnesota this 11th day of February, 2025.

Kevin Schieber, Mayor

ATTEST:

Matthew Hill, City Administrator

(Top 3 inches reserved for recording data)

QUIT CLAIM DEED
Business Entity to Business Entity

Minnesota Uniform Conveyancing Blanks
Form 10.3.5 (2013)

eCRV number: _____

DEED TAX DUE: \$ 1.65

DATE: 1/27/2025
(month/day/year)

FOR VALUABLE CONSIDERATION, Lake Drive Properties, L.P.

(insert name of Grantor)

a Limited Partnership under the laws of Minnesota ("Grantor"),
hereby conveys and quitclaims to City of North Branch

(insert name of Grantee)

a Municipal Corporation under the laws of Minnesota ("Grantee"),
real property in Chisago County, Minnesota, legally described as follows:

Outlot A, Wildridge Plat 12, Chisago County, Minnesota.

Total Consideration for this property transfer is less than \$3000.00.

Check here if all or part of the described real property is Registered (Torrens) ☐

together with all hereditaments and appurtenances belonging thereto.

Check applicable box:

- ☒ The Seller certifies that the Seller does not know of any wells on the described real property.
- ☐ A well disclosure certificate accompanies this document or has been electronically filed. (If electronically filed, insert WDC number: _____.)
- ☐ I am familiar with the property described in this instrument and I certify that the status and number of wells on the described real property have not changed since the last previously filed well disclosure certificate.

Grantor

Lake Drive Properties, L.P.

(name of Grantor)

By: 

(signature)

Dennis Jensen

Its: Limited Partner

(type of authority)

By: _____

(signature)

Its: _____

(type of authority)

State of Minnesota, County of

Chicago

This instrument was acknowledged before me on

1/27/2025

(month/day/year)

, by Dennis Jensen

(name of authorized signer)

as Limited Partner

(type of authority)

and by

(name of authorized signer)

as

(type of authority)

of Lake Drive Properties, L.P., a Minnesota Limited Partnership

(name of Grantor)

(Stamp)



A handwritten signature in blue ink, appearing to read "Loria Helms", written over a horizontal line.

(signature of notarial officer)

Title (and Rank):

My commission expires:

1/31/2025

(month/day/year)

THIS INSTRUMENT WAS DRAFTED BY:

(insert name and address)

Lake Drive Properties, L.P.
 14551 Lake Drive
 Forest Lake, MN 55025

TAX STATEMENTS FOR THE REAL PROPERTY DESCRIBED IN THIS INSTRUMENT SHOULD BE SENT TO:

(insert legal name and residential or business address of Grantee)

City of North Branch
 64058 Elm Street
 North Branch, MN 55056



Prepared By: Sharon Wright, Finance Director

Presenter: Sharon Wright, Finance Director

Date: 01/27/2025

Board & Commission: City Council

Subject: Resolution R-146-2025 Accepting Donations Received by the City of North Branch in 2024

BACKGROUND INFORMATION:

Minnesota cities generally have the authority to accept gifts and donations. However, Minnesota law requires cities to accept all donations by passing a formal resolution. The attached is the annual acceptance of donations received by the City of North Branch.

Voting Requirements:

Voting Options Simple Majority

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

CITY COUNCIL RESOLUTION NO. R-146-2025

RESOLUTION R-146-2025 ACCEPTING DONATIONS RECEIVED BY THE CITY OF NORTH BRANCH IN 2024

WHEREAS, Minnesota Statutes Section 465.03 (gifts to municipalities) provides that donations to the City be accepted by resolution of the City Council; and

WHEREAS, the City of North Branch received donations in the year 2024 from various individuals and organizations as itemized on the attachment.

NOW, Therefore, Be it Resolved by the City Council of North Branch, Minnesota that the donations on the attachment are accepted in accordance with the terms prescribed by the donors.

EXHIBIT A

FUND 851:

Date	Name	Purpose	Amount
9/6/2024	Anonymous Donor	PD Donation	100.00
11/13/2024	PDI Foods LLC	McHero Night Donation	571.20
11/14/2024	PDI Foods LLC	McHero Night Donation	75.00
10/14/2024	American Legion Post 85 Riders	PD Donation	250.00
Total Fund 851			996.20

FUND 208:

Date	Name	Purpose	Amount
9/24/2024	North Branch Liquor Store	Firefighter Cash Donations	585.39
11/13/2024	North Branch Fire Relief Association	Fire Equipment Donation	30,000.00
12/30/2024	North Branch Fire Relief Association	Fire Equipment Donation	46,451.13
Total Fund 208			77,036.52
Total Donations to City of North Branch			78,032.72



Prepared By: Dan Meyer, Police Chief

Presenter: Dan Meyer, Police Chief

Date: 02/04/2025

Board & Commission: City Council

Subject: Approve the Financing Agreement with KS State Bank for the Purchase and Upfitting of Three Squad Cars

As part of the 2025 budget discussions, we discussed the police department's squad car replacement plan and provided the city council with the option of financing the purchase and upfitting of four new squad cars in 2025 from KS State Bank. The City currently uses KS State Bank to finance a fire department pumper truck that was purchased in 2019. During the discussions, there was consensus among the city council to move forward with financing for the purchase and upfitting of three squad cars with the first payment being made in 2026.

Attached are quotes from Anderson and Koch Ford for the purchase of three 2025 Ford Police Interceptor Utility vehicles. Anderson and Koch Ford matched the MN state bid price set for these vehicles. Also attached is a quote for the equipment and upfitting for one squad from Guardian Fleet Safety. KS State Bank provided a 60-month (5 year) financing proposal of \$223,134.18 which would cover the total cost of all three vehicles including equipment and upfitting. The annual payments under the terms of the financing plan will be \$52,812.83 with the first payment due on February 5, 2026.

Requested City Council Action:

Approve the financing terms as set forth in the proposal from KS State Bank and authorize the Chief of Police and Finance Director to sign the agreements necessary to effect the purchase and financing of the new squad cars.

Voting Requirements:

Voting Options Simple Majority

ANDERSON & KOCH

North Branch, MN
651 674 4465
www.andersonandkochford.com

Date: 1/27/2025
Salesperson: Robert Forrest
Manager: Jesse Wersal
Customer ID #: MEYD01158

FOR INTERNAL USE ONLY

BUSINESS NAME	CITY OF NORTH BRANCH	Home Phone : (651) 674-8848
CONTACT		
Address :	6408 Elm St. PO Box 910	Work Phone : (651) 277-5237
	NORTH BRANCH, MN 55056-0910	
	CHISAGO	
E-Mail :	DANM@CI.NORTH-BRANCH.MN.US	Cell Phone :

VEHICLE			
Stock # : R004	New / Used : New	VIN :	Mileage: 0
Vehicle : 2025 Ford Police Interceptor Utility		Color :	
Type : Base All-Wheel Drive			
Body Size :	Style :	Weight : 0	Unit Class :
Market Value Selling Price		50,850.00	
Discount		6,120.16	
Adjusted Price		44,729.84	
Plus			
Tax/Title/Fees & Payoff			

Customer Approval: _____ Management Approval: _____
By signing this authorization form, you certify that the above personal information is correct and accurate, and authorize the release of credit and employment information. By signing above, I provide to the dealership and its affiliates consent to communicate with me about my vehicle or any future vehicles using electronic, verbal and written communications including but not limited to eMail, text messaging, SMS, phone calls and direct mail. Terms and Conditions subject to credit approval. For Information Only. This is not an offer or contract for sale.



Preview Order R004 - K8A - Police Inter Utility AWD: Order Summary Time of Preview: 01/27/2025 13:10:12 Receipt: NA

Dealership Name: Anderson & Koch Ford, Inc.

Sales Code : F58598

Dealer Rep.	Robert Forrest	Type	Fleet	Vehicle Line	Explorer	Order Code	R004
Customer Name	City of North	Priority Code	D2	Model Year	2025	Price Level	515

DESCRIPTION	MSRP	DESCRIPTION	MSRP
K8A0 POLICE INTER UTILITY AWD	\$49515	SPOT LAMP LED DR - WHELEN	\$420
.119 INCH WHEELBASE	\$0	KEYED ALIKE -KEY CODE C	\$50
TOTAL BASE VEHICLE	\$49515	SIDE MARKER LIGHTS SKULL CAPS	\$340
AGATE BLACK METALLIC	\$0	REAR LIGHTING SOLUTION	\$460
CLOTH BUCKETS/VINYL REAR SEATS	\$0	REAR DR HNDL AND LOCKS INOPR	\$0
ONYX INTERIOR	\$0	PRICE CONCESSION INDICATOR	\$0
EQUIPMENT GROUP 500A	\$0	REMARKS TRAILER	\$0
.FM STEREO	\$0	REAR CONSOLE MOUNTING PLATE	\$60
3.3L TI-VCT V6 ENGINE	\$-2330	8" REAR CAMERA	\$0
10-SPEED AUTO TRANSMISSION	\$0	SPECIAL DEALER ACCOUNT ADJUSTM	\$0
HID PLUNG W/R HNDL INOPERABLE	\$160	SPECIAL FLEET ACCOUNT CREDIT	\$0
JOB #2 ORDER	\$0	FUEL CHARGE	\$0
FORD FLEET SPECIAL ADJUSTMENT	\$0	NET INVOICE FLEET OPTION (B4A)	\$0
BADGE DELETE	\$0	PRICED DORA	\$0
GLOBAL LOCK/UNLOCK	\$0	ADVERTISING ASSESSMENT	\$0
FRONT WARNING AUX LIGHT	\$580	DESTINATION & DELIVERY	\$1595
50 STATE EMISSIONS	\$0		
TOTAL BASE AND OPTIONS		MSRP	
DISCOUNTS		\$50850	
TOTAL		NA	
		\$50850	

ORDERING FIN: QH107 END USER FIN: QH107 PO NUMBER: 01272025

INCENTIVES

Acc. Code ID :10 Contract/Ref # :03-3205 Bid Date :02/13/24State : MN

DISCOUNTS:

\$-1800.00

Customer Name:
Customer Address:

Customer Email:

Customer Phone:

ANDERSON & KOCH

North Branch, MN
651 674 4465
www.andersonandkochford.com

Date: 1/27/2025
Salesperson: Robert Forrest
Manager: Jesse Wersal
Customer ID #: MEYD01158

FOR INTERNAL USE ONLY

BUSINESS NAME CITY OF NORTH BRANCH Home Phone : **(651) 674-8848**
CONTACT
Address : 6408 Elm St. PO Box 910
NORTH BRANCH, MN 55056-0910 Work Phone : **(651) 277-5237**
CHISAGO
E-Mail : DANM@CI.NORTH-BRANCH.MN.US Cell Phone :

VEHICLE

Stock # : R005 New / Used : **New** VIN : Mileage: 0
Vehicle : 2025 Ford Police Interceptor Utility Color :
Type : Base All-Wheel Drive
Body Size : Style : Weight : 0 Unit Class :

Market Value Selling Price	50,850.00
Discount	6,120.16
Adjusted Price	44,729.84

Plus

Tax/Title/Fees & Payoff

Customer Approval: _____ Management Approval: _____
By signing this authorization form, you certify that the above personal information is correct and accurate, and authorize the release of credit and employment information. By signing above, I provide to the dealership and its affiliates consent to communicate with me about my vehicle or any future vehicles using electronic, verbal and written communications including but not limited to eMail, text messaging, SMS, phone calls and direct mail. Terms and Conditions subject to credit approval. For Information Only. This is not an offer or contract for sale.



Preview Order R005 - K8A - Police Inter Utility AWD: Order Summary Time of Preview: 01/27/2025 13:14:22 Receipt: NA

Dealership Name: Anderson & Koch Ford, Inc.

Sales Code : F58598

Dealer Rep.	Robert Forrest	Type	Fleet	Vehicle Line	Explorer	Order Code	R005
Customer Name	City of North	Priority Code	D2	Model Year	2025	Price Level	515

DESCRIPTION	MSRP	DESCRIPTION	MSRP
K8A0 POLICE INTER UTILITY AWD	\$49515	SPOT LAMP LED DR - WHELEN	\$420
.119 INCH WHEELBASE	\$0	KEYED ALIKE -KEY CODE C	\$50
TOTAL BASE VEHICLE	\$49515	SIDE MARKER LIGHTS SKULL CAPS	\$340
AGATE BLACK METALLIC	\$0	REAR LIGHTING SOLUTION	\$460
CLOTH BUCKETS/VINYL REAR SEATS	\$0	REAR DR HNDL AND LOCKS INOPR	\$0
ONYX INTERIOR	\$0	PRICE CONCESSION INDICATOR	\$0
EQUIPMENT GROUP 500A	\$0	REMARKS TRAILER	\$0
.FM STEREO	\$0	REAR CONSOLE MOUNTING PLATE	\$60
3.3L TI-VCT V6 ENGINE	\$-2330	8" REAR CAMERA	\$0
10-SPEED AUTO TRANSMISSION	\$0	SPECIAL DEALER ACCOUNT ADJUSTM	\$0
HID PLUNG W/R HNDL INOPERABLE	\$160	SPECIAL FLEET ACCOUNT CREDIT	\$0
JOB #2 ORDER	\$0	FUEL CHARGE	\$0
FORD FLEET SPECIAL ADJUSTMENT	\$0	NET INVOICE FLEET OPTION (B4A)	\$0
BADGE DELETE	\$0	PRICED DORA	\$0
GLOBAL LOCK/UNLOCK	\$0	ADVERTISING ASSESSMENT	\$0
FRONT WARNING AUX LIGHT	\$580	DESTINATION & DELIVERY	\$1595
50 STATE EMISSIONS	\$0		
			MSRP
TOTAL BASE AND OPTIONS			\$50850
DISCOUNTS			NA
TOTAL			\$50850

ORDERING FIN: QH107 END USER FIN: QH107 PO NUMBER: 01272025

INCENTIVES

Acc. Code ID :10 Contract/Ref # :03-320S Bid Date :02/13/24State : MN

DISCOUNTS:

\$-1800.00

Customer Name:
Customer Address:

Customer Email:

Customer Phone:

ANDERSON & KOCH


North Branch, MN
651 674 4465
www.andersonandkoch.com

Date: 1/27/2025
Salesperson: Robert Forrest
Manager: Jesse Wersal
Customer ID #: MEYD01158

FOR INTERNAL USE ONLY

BUSINESS NAME CONTACT	CITY OF NORTH BRANCH	Home Phone : (651) 674-8848
Address :	6408 Elm St. PO Box 910 NORTH BRANCH, MN 55056-0910 CHISAGO	Work Phone : (651) 277-5237
E-Mail :	DANM@CI.NORTH-BRANCH.MN.US	Cell Phone :

VEHICLE			
Stock # : R003	New / Used : New	VIN :	Mileage: 0
Vehicle : 2025 Ford Police Interceptor Utility		Color :	
Type : Base All-Wheel Drive			
Body Size :	Style :	Weight : 0	Unit Class :

Market Value Selling Price	50,850.00
Discount	6,120.16
Adjusted Price	44,729.84

Plus

Tax/Title/Fees & Payoff

Customer Approval: _____ Management Approval: _____
By signing this authorization form, you certify that the above personal information is correct and accurate, and authorize the release of credit and employment information. By signing above, I provide to the dealership and its affiliates consent to communicate with me about my vehicle or any future vehicles using electronic, verbal and written communications including but not limited to eMail, text messaging, SMS, phone calls and direct mail. Terms and Conditions subject to credit approval. For Information Only. This is not an offer or contract for sale.



Preview Order R003 - K8A - Police Inter Utility AWD: Order Summary Time of Preview: 01/27/2025 13:05:10 Receipt: NA

Dealership Name: Anderson & Koch Ford, Inc.

Sales Code : F58598

Dealer Rep.	Robert Forrest	Type	Fleet	Vehicle Line	Explorer	Order Code	R003
Customer Name	City of North	Priority Code	D2	Model Year	2025	Price Level	515

DESCRIPTION	MSRP	DESCRIPTION	MSRP
K8A0 POLICE INTER UTILITY AWD	\$49515	SPOT LAMP LED DR - WHELEN	\$420
.119 INCH WHEELBASE	\$0	KEYED ALIKE -KEY CODE C	\$50
TOTAL BASE VEHICLE	\$49515	SIDE MARKER LIGHTS SKULL CAPS	\$340
AGATE BLACK METALLIC	\$0	REAR LIGHTING SOLUTION	\$460
CLOTH BUCKETS/VINYL REAR SEATS	\$0	REAR DR HNDL AND LOCKS INOPR	\$0
ONYX INTERIOR	\$0	PRICE CONCESSION INDICATOR	\$0
EQUIPMENT GROUP 500A	\$0	REMARKS TRAILER	\$0
.FM STEREO	\$0	REAR CONSOLE MOUNTING PLATE	\$60
3.3L TI-VCT V6 ENGINE	\$-2330	8" REAR CAMERA	\$0
10-SPEED AUTO TRANSMISSION	\$0	SPECIAL DEALER ACCOUNT ADJUSTM	\$0
HID PLUNG W/R HNDL INOPERABLE	\$160	SPECIAL FLEET ACCOUNT CREDIT	\$0
JOB #2 ORDER	\$0	FUEL CHARGE	\$0
FORD FLEET SPECIAL ADJUSTMENT	\$0	NET INVOICE FLEET OPTION (B4A)	\$0
BADGE DELETE	\$0	PRICED DORA	\$0
GLOBAL LOCK/UNLOCK	\$0	ADVERTISING ASSESSMENT	\$0
FRONT WARNING AUX LIGHT	\$580	DESTINATION & DELIVERY	\$1595
50 STATE EMISSIONS	\$0		
TOTAL BASE AND OPTIONS		MSRP	
DISCOUNTS		\$50850	
TOTAL		NA	
		\$50850	

ORDERING FIN: QH107 END USER FIN: QH107 PO NUMBER: 01272025

INCENTIVES

Acc. Code ID :10 Contract/Ref # :03-3205 Bid Date :02/13/24State : MN

DISCOUNTS:

\$-1800.00

Customer Name:
Customer Address:

Customer Email:

Customer Phone:

Guardian Fleet Safety
 7020 State Highway 24
 PO Box 70
 Clear Lake MN 55319
 Phone: (320) 245-4000
 sales@guardianfleetsafety.com
 www.guardianfleetsafety.com



GUARDIAN
 FLEET SAFETY

Quote:
 Date Quoted:
 Payment Terms:
 Service Writer:
 PO #:

101969
 2/3/2025
 Net 30
 Don Starry

QUOTE

Page: 1 of 6

Quote To:

North Branch PD
 6408 Elm St
 PO Box 910
 North Branch MN 55056

Phone: 651-674-8848

Date: 2/3/2025

Expires: 2/17/2025

Reference:

Sales Person: Don Starry

- No strip
- Vehicle has factory spotlight
- Activate factory headlight flasher
- Flash tallights with blueprint
- PA mic in door
- Ignition override

Line	Part	Rev	Expected Qty	Unit Price	Ext. Price
Description		Drawing			
1	FULL BUILD CONFIG1 2025 Ford PIU	A1	1.00EA	27,428.22	27,428.22

Bill of Materials

ASM	Qty	UM	Part:	Unit Price	Ext Amount
1	1		FRONT CONFIG1 / FRONT CONFIGURATION1		
	1	EA	100525 / Bumper - PIU-Westin WESTiN Heavy Duty Steel Bumper for 2020+ Ford Interceptor Utility. Requires Light and/or solid channel - sold separate.	410.00	410.00
	1	EA	100526 / PIU - PIT Wrap WESTiN Heavy Duty PIT Wraps for 2020+ Ford Interceptor Utility.	420.40	420.40
	1	EA	100527 / PIU - Headlight Loops WESTiN Heavy Duty Steel Headlight Loops for 2020+ Ford Interceptor Utility	274.67	274.67
	1	EA	100763 / Opticom Strobe NOVA Mounted on push bumper	257.47	257.47
	1	EA	100767 / Opticom Power Supply High Priority Opticom Power Supply (Requires Strobe, Sold Separately)	491.68	491.68
	1	EA	100540 / Short Light Channel 2 SoundOff WESTiN Short Light Channel for Two (2) SoundOff Signal nFORCE Lights	34.71	34.71
	1	EA	100685 / nFORCE Replacement Module - Red/White nFORCE Replacement Module Red/White for Crossbar of WESTiN Push Bumper	105.86	105.86

QuotForm:001:00



QUOTE

Bill of Materials

ASM	Qty	UM	Part:	Unit Price	Ext Amount
1	1		FRONT CONFIG1 / FRONT CONFIGURATION1		
	1	EA	100686 / nFORCE Replacement Module - Blue/White nFORCE Replacement Module - Blue/White for Crossbar of WESTiN Push Bumper	105.86	105.86
	1	EA	102074 / BSM12-B-D Barrage Series 12 LED Red/White Surface Mount Lighthead. 5 Year Warranty. SAE Class 1. Black Flange. Mounted in pitwrap	124.50	124.50
	1	EA	102075 / BSM12-B-E Barrage Series 12 LED Blue/White Surface Mount Lighthead. 5 Year Warranty. SAE Class 1. Black Flange. Mounted in pitwrap	124.50	124.50
2	1		CABIN CONFIG1 / CABIN CONFIGURATION1		
	1	EA	100586 / Console - PIU Gamber Johnson Console for 2020+ Ford Interceptor Utility Low-Profile Console Box (Accessories sold separate)	339.74	339.74
	1	EA	100581 / Cup Holder - Gamber Gamber Johnson Dual Cup Holder	59.14	59.14
	1	EA	100579 / Pocket - Large - 6" Gamber Johnson Large Console Pocket	49.29	49.29
	1	EA	100847 / 3 Hole Outlet - No USB 3 hole outlet- 12v -No USB 15 Amp	15.50	15.50
	1	EA	100573 / Printer Armrest Gamber Johnson Printer Armrest. Holds PocketJet and PrintTEK Printers and Thermal Printer Roll.	354.86	354.86
	1	EA	100777 / Printer - PocketJet 822 Brother PocketJet PJ822 Thermal Printer. USB-C and Power Cable sold separate.	412.30	412.30
	1	EA	100931 / Printer USB C Cable Printer usb c cable	16.96	16.96
	1	EA	100743 / Power Cable - Printer 12v Power Cable for Printek and PocketJet Thermal Printers	21.43	21.43
	1	EA	100557 / Hint Mount - PIU / Universal Police Interceptor Utility 2011-2021-Mounts to seat and side of console	758.89	758.89



QUOTE

Bill of Materials

ASM	Qty	UM	Part:	Unit Price	Ext Amount
2	1		CABIN CONFIG1 / CABIN CONFIGURATION1		
1	EA	100647 /	Red/White Dome Light SoundOff Red/White Interior Dome Light w/Switch for Driver's Compartment.	132.58	132.58
1	EA	100790 /	12VS Radio Cage -Stock seat - PIU 12VS Radio Cage -Stock seat - PIU	584.10	584.10
1	EA	100518 /	Window Bars - PIU - Westin WESTiN Steel Punched Window Bars	245.07	245.07
4	EA	102262 /	Commander 3" R/W Dome Light 1 for cage light activated by switch on siren controller or when rears doors are open, 3 for cargo(1 on headlinder in cargo area,2 on hatch) activated by switch on D pillar	75.60	302.40
1	EA	100744 /	Gunlock-Dual Gun Rack-Setina Setina Dual Weapons Rack with 1 Handcuff Lock (For Rifles) and 1 Clamp Lock for Shotguns. Mounts to the Recessed Panel on Cages Between Front Seats. Note: Freestanding Mounts (For vehicles without cage) Sold Separate	509.00	509.00
1	EA	100782 /	10VS C2 RP Uncoated Poly Partition PIU SETINA 10VS C2 RP Horizontal Sliding Window With Slotted Poly Window Security Screen Recessed Panel Partition for 2020+ Ford PIU	962.10	962.10
1	EA	100582 /	Electronics Box - Gamber Metal Electronics Storage Box for Cargo Area of Vehicle. Universal Design Allows Transferring to Different Vehicles. Projects Electronics from Damage While Providing a Single and Easy to Access Location for all Electronics.	468.37	468.37
1	EA	100909 /	bluePRINT Light & Siren Control Kit SoundOff Signal Advanced bluePRINT Light and Siren Control System. Kit includes: (2) Siren Speakers (1) Dual Tone Control Siren Amp (1) Control Head (1) Remote Node and Harness (1) Sync Module	2,075.54	2,075.54
1	EA	100600 /	Stalker 2X Kit	3,434.34	3,434.34



QUOTE

Bill of Materials

ASM	Qty	UM	Part:	Unit Price	Ext Amount
2	1		CABIN CONFIG1 / CABIN CONFIGURATION1		
			Stalker Radar 2X Vehicle Kit. Includes 5 window display, remote, antennas, tuning forks, 3 year warranty and vehicle specific wiring. (Note: Some non-standard police vehicles may require an additional GPS module)		
			Matched NASPO Contract Price		
1	EA		102074 / BSM12-B-D Barrage Series 12 LED Red/White Surface Mount Lighthead. 5 Year Warranty. SAE Class 1. Black Flange.	124.50	124.50
			Mounted in cargo window		
1	EA		102075 / BSM12-B-E Barrage Series 12 LED Blue/White Surface Mount Lighthead. 5 Year Warranty. SAE Class 1. Black Flange.	124.50	124.50
			Mounted in cargo window		
2	EA		102252 / MP6SM6-LB Generic L-Bracket Micropluse 6 Lights	20.00	40.00
			MP6SM6-LB Generic L-Bracket Micropluse 6 Lights		
1	EA		100760 / Keyboard - TG3	240.49	240.49
			Rugged keyboard with adjustable red backlighting and a touchpad that comes with a coiled cord		
3	EA		100768 / Magnetic Mic	41.99	125.97
			Magnetic Mic Clip for Radio/PA/Radar Remote		
1	EA		101630 / 5-yr NetCloud Mobile Essentials Plan and R920 router with WiFi (300Mbps modem), no AC power supply or antennas, North America	1,460.71	1,460.71
			5-yr NetCloud Mobile Essentials Plan and R920 router with WiFi (300Mbps modem), no AC power supply or antennas, North America		
1	EA		100872 / Sharkee Antenna 5 in 1	266.46	266.46
			Panorama Sharkee IN2440 5 in 1 Multiband Antenna.		
1	EA		CUSTOMER SUPPLIED PART / CUSTOMER SUPPLIED PART	0.00	0.00
			M500 camera system Price TBD(Don S. working on quote)		
1	EA		CUSTOMER SUPPLIED PART / CUSTOMER SUPPLIED PART	0.00	0.00
			Docking station(Don S. working to get model needed)		
1	EA		100877 / Triple Stack Drawer - PIU	1,870.20	1,870.20



QUOTE

Bill of Materials

ASM	Qty	UM	Part:	Unit Price	Ext Amount
2	1		CABIN CONFIG1 / CABIN CONFIGURATION1		
			SETINA Triple Stack Drawer System for 2020+ Ford PIU Top: TOA Open Basket Middle: BSP Single Handle Lockable Large Drawer Bottom: TPA Electronics Tray (SOLD SEPARATE)		
1	EA	100886	TPA Radio Tray	350.99	350.99
			Radio / Electronics Tray Add On to the Setina Double Stack Cargo Rack		
3	1		ROOF CONFIG1 / ROOF CONFIGURATION1		
1	EA	100651	mPOWER Lightbar 54" Tinted	2,497.33	2,497.33
			54" SoundOff Signal mPOWER Lightbar full Dual Color in front and side, with 3 Tri-Color Modules in rear for Rear Scene Lighting. Fully Tinted, black top. Better Resistance to dust. Thinnest lightbar on the market at only 1" tall. Includes vehicle specific mounting strap kit.		
1	EA	100827	Strap - PIU SoundOff	81.43	81.43
			Strap Kit for 2020+ Ford PIU. Fits SoundOff Signal Lightbars.		
1	EA	100771	NMO Cable Kit UHF Male	35.10	35.10
			Laird Solid Copper Core NMO Cable Kit with UHF-Male Connector		
1	EA	100617	Low Profile Dual Band antenna 700/2500- PCTEL	43.64	43.64
			PCTEL Low Profile Dual Band Antenna 700/2500 Cell/PCS		
4	1		SIDES CONFIG1 / SIDES CONFIGURATION1		
1	EA	100708	Intersector - Red/White	207.37	207.37
			Intersector Under-mirror Warning Light, Dual Color - Red/White		
1	EA	100709	Intersector - Blue/White	207.37	207.37
			Intersector Under-mirror Warning Light, Dual Color - Blue/White		
5	1		REAR CONFIG1 / REAR CONFIGURATION1		
2	EA	102074	BSM12-B-D Barrage Series 12 LED Red/White Surface Mount Lighthouse. 5 Year Warranty. SAE Class 1. Black Flange.	124.50	249.00

Guardian Fleet Safety
 7020 State Highway 24
 PO Box 70
 Clear Lake MN 55319
 Phone: (320) 245-4000
 sales@guardianfleetsafety.com
 www.guardianfleetsafety.com



GUARDIAN
 FLEET SAFETY

Quote:
 Date Quoted:
 Payment Terms:
 Service Writer:
 PO #:

101969
 2/3/2025
 Net 30
 Don Starry

QUOTE

Page: 6 of 6

Bill of Materials

ASM	Qty	UM	Part:	Unit Price	Ext Amount
5	1		REAR CONFIG1 / REAR CONFIGURATION1		
			1 mounted on plastic above rear plate, 1 mounted on rear bumper		
	2	EA	102075 / BSM12-B-E Barrage Series 12 LED Blue/White Surface Mount Lighthead. 5 Year Warranty. SAE Class 1. Black Flange.	124.50	249.00
			1 mounted on plastic above rear plate, 1 mounted on rear bumper		
7	1		BUILD LABOR CONFIG1 / BUILD LABOR CONFIGURATION1		
	1	EA	BUILD LABOR / BUILD LABOR	4,640.00	4,640.00
	1	EA	100912 / HARNESS - FULL	486.90	486.90
	1	EA	100910 / SHOP SUPPLIES FULL	150.00	150.00
	1	EA	100914 / SHIPPING	236.00	236.00
	1	EA	100917 / DECALS	650.00	650.00
			Graphics and installation per customer design		

Lines Total 27,428.22

Total Taxes 0.00

Quote Total 27,428.22

APPROVAL - City of North Branch, Minnesota

1 message

Aaron Lindsten <alindsten@ksstate.bank>

Tue, Feb 4, 2025 at 10:15 AM

To: "danm@ci.north-branch.mn.us" <danm@ci.north-branch.mn.us>

Cc: "sharonw@ci.north-branch.mn.us" <sharonw@ci.north-branch.mn.us>

Hi Dan,

I am pleased to notify you that KS StateBank has approved financing for City of North Branch, Minnesota. Below is a summary of the approved transaction.

Would you like us to proceed and email eSign documents to Sharon and yourself for signature? Do you have an estimated delivery date for the vehicles?

Legal Name of Obligor:	City of North Branch, Minnesota
Contract:	3363727
Description of Equipment:	Three (3) 2025 Ford Police Interceptors with Upfitting
Total Cost of Equipment:	\$223,134.18
Down Payment:	\$0.00
Trade In:	\$0.00
Amount to Finance:	\$223,134.18
Structure:	60 Months / Annual Payments (5 Payments)
Payment Amounts:	5 @ \$52,812.83
First Payment Due Date:	02/05/26
Transaction Rate to Obligor:	5.890%
Rate Expiration Date:	02/18/25
Credit Approval Expiration Date:	06/04/25

Escrow/VPA Needed?	VPA
Estimated Delivery / Closing Date:	Unknown
Contract Sent To:	eSign
Email:	
Additional Terms, Conditions, & Documentation Requirements:	
None	

*All properly executed documents must be returned to Baystone Government Finance and the transaction funded on or before the expiration date in order to guarantee the transaction rate listed above. If funding does not occur by the expiration date, or there is a change of circumstance prior to funding which adversely affects the expectations, rights, or security of Obligee or its assignees, including a significant change in market rates, Obligee or its assignees reserve the right to adjust and determine a new interest rate factor and payment amount, or withdraw this proposal in its entirety.

Thank you for giving us the opportunity to fulfill your financing needs!

Aaron Lindsten | Vice President

p. 800-752-3562 Ext. 7351

f. 785-473-2610

alindsten@ksstate.bank

www.baystone.net





Prepared By: Matthew Hill, City Administrator

Presenter: Matthew Hill, City Administrator

Date: 02/04/2025

Board & Commission: City Council

Subject: Approve application to conduct excluded bingo - St Gregory Knights of Columbus Council 10016

The Knights of Columbus have a long history of bingo events in the City of North Branch. This year the two events will be held at the Church of St Gregory the Great on April 11 and November 14, 2025. The Clerk's office signs off on the application prior to them sending it to the Minnesota Alcohol & Gambling Enforcement office so that they can issue a permit to carry out such an event as requested.

This request has been placed in the consent agenda for approval and signature.

Voting Requirements:

Voting Options Simple Majority

LG240B Application to Conduct Excluded Bingo**No Fee****ORGANIZATION INFORMATION**

Organization Name: St, Gregory Knights of Columbus Council 10016 Previous Gambling Permit Number: XB-34708-24-033

Minnesota Tax ID Number, if any: _____ Federal Employer ID Number (FEIN), if any: 42-1759703

Mailing Address: 38359 Egret Trail

City: North Branch State: MN Zip: 55056 County: Chisago

Name of Chief Executive Officer (CEO): Gregory A. Haas

CEO Daytime Phone: (763) 222-5021 CEO Email: ghaas1@gmail.com
(permit will be emailed to this email address unless otherwise indicated below)

Email permit to (if other than the CEO): _____

NONPROFIT STATUS

Type of Nonprofit Organization (check one):

☒ Fraternal ☐ Religious ☐ Veterans ☐ Other Nonprofit Organization

Attach a copy of at least one of the following showing proof of nonprofit status:

(DO NOT attach a sales tax exempt status or federal employer ID number, as they are not proof of nonprofit status.)

- ☐ **Current calendar year Certificate of Good Standing**
Don't have a copy? This certificate must be obtained each year from:
MN Secretary of State, Business Services Division
60 Empire Drive, Suite 100
St. Paul, MN 55103
Secretary of State website, phone numbers:
www.sos.state.mn.us
651-296-2803, or toll free 1-877-551-6767
- ☐ **Internal Revenue Service-IRS income tax exemption 501(c) letter in your organization's name**
Don't have a copy? Obtain a copy of your federal income tax exempt letter by having an organization officer contact the IRS at 877-829-5500.
- ☒ **Internal Revenue Service-Affiliate of national, statewide, or international parent nonprofit organization (charter)**
If your organization falls under a parent organization, attach copies of both of the following:
1. IRS letter showing your parent organization is a nonprofit 501(c) organization with a group ruling; and
2. the charter or letter from your parent organization recognizing your organization as a subordinate.

EXCLUDED BINGO ACTIVITY

Has your organization held a bingo event in the current calendar year? ☐ Yes ☒ No

If yes, list the dates when bingo was conducted: _____

The proposed bingo event will be:

- ☒ one of four or fewer bingo events held this year. Dates: 4/11/2025, 11/14/2025
- OR-**
- ☐ conducted on up to 12 consecutive days in connection with a:
- ☐ county fair Dates: _____
- ☐ civic celebration Dates: _____
- ☐ Minnesota State Fair Dates: _____

Person in charge of bingo event: Gregory Haas Daytime Phone: (763) 222-5021

Name of premises where bingo will be conducted: Church of St. Gregory the Great

Premises street address: 38725 Forest Blvd.

City: North Branch If township, township name: _____ County: Chisago

LOCAL UNIT OF GOVERNMENT ACKNOWLEDGMENT (required before submitting application to the Minnesota Gambling Control Board)

CITY APPROVAL for a gambling premises located within city limits On behalf of the city, I approve this application for excluded bingo activity at the premises located within the city's jurisdiction. Print City Name: _____ Signature of City Personnel: _____ Title: _____ Date: _____ The city or county must sign before submitting application to the Gambling Control Board.	COUNTY APPROVAL for a gambling premises located in a township On behalf of the county, I approve this application for excluded bingo activity at the premises located within the county's jurisdiction. Print County Name: _____ Signature of County Personnel: _____ Title: _____ Date: _____ TOWNSHIP (if required by the county) On behalf of the township, I acknowledge that the organization is applying for excluded bingo activity within the township limits. (A township has no statutory authority to approve or deny an application, per Minnesota Statutes, Section 349.213.) Print Township Name: _____ Signature of Township Officer: _____ Title: _____ Date: _____
---	---

CHIEF EXECUTIVE OFFICER'S SIGNATURE (required)

The information provided in this application is complete and accurate to the best of my knowledge.

Chief Executive Officer's Signature: _____ Date: _____
 (Signature must be CEO's signature; designee may not sign)

Print Name: Gregory A. Haas

MAIL OR FAX APPLICATION & ATTACHMENTS

Mail or fax application and a copy of your proof of nonprofit status to:

Minnesota Gambling Control Board
 1711 West County Road B, Suite 300 South
 Roseville, MN 55113
 Fax: 651-639-4032

An excluded bingo permit will be mailed to your organization. Your organization must keep its bingo records for 3-1/2 years.

Questions?

Call a Licensing Specialist at 651-539-1900.

Bingo hard cards and bingo number selection devices may be borrowed from another organization authorized to conduct bingo. Otherwise, bingo hard cards, bingo paper, and bingo number selection devices must be obtained from a distributor licensed by the Minnesota Gambling Control Board. A list of licensed distributors is available on the Gambling Control Board's website at www.mn.gov/gcb.

This form will be made available in alternative format
 (i.e. large print, braille) upon request.

Data privacy notice: The information requested on this form (and any attachments) will be used by the Gambling Control Board (Board) to determine your organization's qualifications to be involved in lawful gambling activities in Minnesota. Your organization has the right to refuse to supply the information; however, if your organization refuses to supply this information, the Board may not be able to determine your organization's qualifications and, as a consequence, may refuse to issue a permit. If your organization supplies the information requested, the Board

will be able to process the application. Your organization's name and address will be public information when received by the Board. All other information provided will be private data about your organization until the Board issues the permit. When the Board issues the permit, all information provided will become public. If the Board does not issue a permit, all information provided remains private, with the exception of your organization's name and address which will remain public. Private data about your organization are available to Board

members, Board staff whose work requires access to the information; Minnesota's Department of Public Safety; Attorney General; Commissioners of Administration, Minnesota Management & Budget, and Revenue; Legislative Auditor, national and international gambling regulatory agencies; anyone pursuant to court order; other individuals and agencies specifically authorized by state or federal law to have access to the information; individuals and agencies for which law or legal order authorizes a new use or sharing of information after this notice was given; and anyone with your written consent.



Prepared By: Nathan Sondrol, Community Development Director

Presenter: Nathan Sondrol, Community Development Director

Date: 02/06/2025

Board & Commission: City Council

Subject: Resolution No. R-148-2025, Approving a Reduction to the Letter of Credit for Fox Run 1st Addition

Overview / Background

Graphic Homes, LLc (Developer) is seeking a reduction to its Letters of Credit pledged to the City for the purpose of securing the construction of public improvements required with the Fox Run 1st Addition development ("Development"). Public improvements with those projects include, but are not limited to: streets, sidewalks and trails, stormwater systems, and water and sanitary sewer main lines; security for grading and erosion control is also required. Security amounts required of the Developer were \$1,272,343 for Fox Run 1st Addition. Reductions requested would leave \$339,965.13, or 26.7% of the total. The project is not in position to submit to the City an Offer of Dedication for the public improvements, meaning those improvements are not fully complete and not ready to enter the required one (1) year warranty period. City staff have reviewed and are in agreement with the reduction requests.

Staff Recommendation

City staff recommend approval of the security reductions as presented.

Recommended City Council Action

Motion to approve Resolution No. R-148-2025, authorizing a reduction in the letter of credit security amount for the construction of public improvements for Fox Run 1st Addition from \$784,794 to \$196,243.50.

Voting Requirements:

Voting Options Simple Majority

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

CITY COUNCIL RESOLUTION NO. R-148-2025

**A RESOLUTION AUTHORIZING A FINANCIAL SECURITY REDUCTION
FOR FOX RUN ADDITION**

WHEREAS, in accordance with the Development Agreement (“Agreement”) for Fox Run 1st Addition (“Development”), dated March 26, 2024, Graphic Homes, Inc. (“Developer”), agreed to install certain public improvements (“Improvements”) for said Development, and provide Financial Guarantee (“Security”), in the form of Letter of Credit, covering the installation and construction of those “Improvements;” and,

WHEREAS, the Developer has completed certain Improvements as of December 30, 2024, as required by the Agreement for the Development, and has requested an initial reduction to the Security; and,

WHEREAS, Agreement required an original Security deposit provided to the City totaling \$1,272,343.00, of which the Developer is requesting a reduction of said Security to \$339,965.13, which is 26.7% of the original Security as required by the Agreement, to reflect the work completed.

NOW, THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF NORTH BRANCH, MINNESOTA, a reduction in the Security for the Development from \$1,272,343.00 to \$339,965.13 is hereby authorized.

BE IT FURTHER RESOLVED, the Developer shall furnish to the City a replacement Letter of Credit, or cash deposit, in the amount reduced as stated above, and in accordance with the standard Letter of Credit template as provided by the City.

BE IT FURTHER RESOLVED, no further reductions to the Security for the Development shall be authorized until the Developer is prepared to submit an Offer of Dedication for the completion and warranty of the Improvements and/or the City fully accepts the Improvements as required for the Development.

December 30, 2024

Matthew Hill
City Administrator
City of North Branch
PO Box 910 - 6408 Elm Street
North Branch, MN 55056

Re: Fox Run 1st Addition
Letter of Credit Reduction Request #1

Dear Mr. Hill:

Graphic Homes, Inc. has requested to reduce the letter of credit associated with Fox Run 1st Addition located within the City of North Branch. We have reviewed the request and receipt of payment from Gustafson Excavating, Inc. for work completed to date.

We recommend approval of the letter of credit reduction in the amount of **\$932,377.87** as shown below:

Letter Of Credit Summary

Original LOC Amount	\$1,272,343.00
Reduction Request #1	\$932,377.87
Remaining LOC Amount	\$339,965.13

Based on our review of work done to date and the costs remaining at this time, the remaining letter of credit amount of \$339,965.13 is adequate to cover the total cost of completion and retainage.

Please contact me with any questions.

Sincerely,

WSB



Justin Messner, PE
City Engineer

RECEIPT AND WAIVER OF MECHANIC'S LIEN RIGHTS

Dated: December 3rd, 20 24

The undersigned hereby acknowledges receipt of the sum of \$ \$1,100,000.00

CHECK ONLY ONE

- 1) x as partial payment for labor, skill and material furnished
- 2) as payment for all labor, skill and material furnished or to be furnished
(except for the sum of \$ retainage or holdback)
- 3) as full and final payment for all labor, skill and material furnished or to be furnished to the
following described real property:

Fox Run Phase 1

and for value received hereby waives all rights acquired by the undersigned to file or record mechanic's liens against said real property for labor, skill or material furnished to said real property (only for the amount paid if Box 1 is checked, and except for retainage shown if Box 2 is checked). The undersigned affirms that all material furnished by the under signed has been paid for, and all subcontractors employed by the undersigned have been paid in full, EXCEPT:

NOTE: If this instrument is executed by a Corporation, it must be signed by an officer, And if executed by a partnership, it must be signed by a partner.

Gustafson Excavating
By 
President
(Title)
6610 410th St. North Branch, MN 55056
(Address)



Schedule of Values - Engineering Estimate

FOX RUN 1ST ADDITION
GRAPHIC HOMES, INC
38814 3RD AVENUE
NORTH BRANCH, MN 55056

LHB PROJECT #: 210538

PROJECT ENGINEER: ADAM BESSE

December 5, 2024

LINE #	DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT	PERCENT COMPLETE	REMAINING QTY	REMAINING AMOUNT
General								
1	Mobilization	LS	\$8,500.00	1.00	\$8,500.00	95%	0.05	\$425.00
2	Traffic Control	EA	\$1,500.00	1.00	\$1,500.00	95%	0.05	\$75.00
	GENERAL SUBTOTAL				\$10,000.00			\$500.00
Removals & Erosion Control								
3	Storm Drain Inlet Protection	EA	\$200.00	35.00	\$7,000.00	100%	0	\$0.00
4	Class II Rip-Rap	CY	\$50.00	162.06	\$8,103.24	100%	0	\$0.00
	REMOVALS AND EROSION CONTROL SUBTOTAL				\$15,103.24			\$0.00
Utilities								
Storm Sewer								
5	12" RC Pipe Sewer	LF	\$26.50	1,489.40	\$39,469.10	100%	0	\$0.00
6	15" RC Pipe Sewer	LF	\$30.50	122.20	\$3,727.10	100%	0	\$0.00
7	18" RC Pipe Sewer	LF	\$31.00	129.20	\$4,005.20	100%	0	\$0.00
8	24" RC Pipe Sewer	LF	\$60.00	716.70	\$43,002.00	100%	0	\$0.00
9	27" RC Pipe Sewer	LF	\$75.00	47.60	\$3,570.00	100%	0	\$0.00
10	12" HDPE Pipe Sewer	LF	\$26.00	44.90	\$1,167.40	100%	0	\$0.00
11	16" HDPE Pipe Sewer	LF	\$28.50	145.90	\$4,158.15	100%	0	\$0.00
12	24" HDPE Pipe Sewer	LF	\$36.50	462.90	\$16,895.85	100%	0	\$0.00
13	30" HDPE Pipe Sewer	LF	\$75.00	343.40	\$25,755.00	100%	0	\$0.00
14	12" Pipe Apron	EA	\$750.00	5.00	\$3,750.00	100%	0	\$0.00
15	18" Pipe Apron	EA	\$1,000.00	2.00	\$2,000.00	100%	0	\$0.00
16	24" Pipe Apron	EA	\$1,200.00	3.00	\$3,600.00	100%	0	\$0.00
17	27" Pipe Apron	EA	\$1,400.00	1.00	\$1,400.00	100%	0	\$0.00
18	48" Manhole	EA	\$3,250.00	6.00	\$19,500.00	100%	0	\$0.00
19	48" Catch Basin	EA	\$3,250.00	27.00	\$87,750.00	100%	0	\$0.00
20	60" Pond Overflow Structure	EA	\$7,500.00	2.00	\$15,000.00	100%	0	\$0.00
	STORM SEWER SUBTOTAL				\$274,749.80			\$0.00
Sanitary Sewer								
21	8" PVC SDR 35 Sanitary Sewer	LF	\$30.00	1,843.60	\$55,308.00	100%	0	\$0.00
22	8" PVC SDR 26 Sanitary Sewer	LF	\$40.00	222.50	\$8,900.00	100%	0	\$0.00
23	48" Manhole	EA	\$3,250.00	16.00	\$52,000.00	100%	0	\$0.00
24	Connect to Existing Sanitary Sewer	EA	\$1,200.00	2.00	\$2,400.00	100%	0	\$0.00
25	4" Sanitary Service Connection	LF	\$20.00	1,412.00	\$28,240.00	100%	0	\$0.00
26	Tracer Wire	LF	\$0.51	3,478.10	\$1,773.83	100%	0	\$0.00
	SANITARY SEWER SUBTOTAL				\$148,621.83			\$0.00
Water								
27	8" C900 PVC Watermain	LF	\$32.50	2,325.00	\$75,562.50	100%	0	\$0.00
28	6" Hydrant	EA	\$6,500.00	4.00	\$26,000.00	100%	0	\$0.00
29	8" Gate Valve and Box	EA	\$2,450.00	12.00	\$29,400.00	100%	0	\$0.00
30	Ductile Iron Fittings	LB	\$3.20	2,518.00	\$8,057.60	100%	0	\$0.00
31	1" Corporation Stop	EA	\$150.00	34.00	\$5,100.00	100%	0	\$0.00
32	2" HDPE Water Service	LF	\$15.00	1,503.00	\$22,545.00	100%	0	\$0.00
33	Connect to Existing Watermain	EA	\$1,250.00	2.00	\$2,500.00	100%	0	\$0.00
	WATER SUBTOTAL				\$169,165.10			\$0.00
Site								
Paving (Road)								
34	2.0" - 2360 Bituminous Wear Course (SPWEA240,C)	TON	\$75.00	842.47	\$63,185.56	0%	842	\$63,185.25
35	Bituminous Tack Coat	GAL	\$3.00	316.92	\$950.75	0%	317	\$950.76
36	2.5" - 2360 Bituminous Base Course (SPNWB230,C)	TON	\$75.00	1,053.09	\$78,981.95	100%	0	\$0.00
37	6" Aggregate Base (CV) Class 5	CY	\$30.00	1,656.03	\$49,680.76	100%	0	\$0.00
38	Concrete Curb & Gutter S418	LF	\$15.00	4,247.31	\$63,709.58	100%	0	\$0.00
Paving (Bituminous Trail)								
39	3.0" - SP 9.5 Bituminous Wear Course (SPWEA240,B)	TON	\$75.00	346.65	\$25,999.11	100%	0	\$0.00
40	6" Aggregate Base (CV) Class 5	CY	\$30.00	354.18	\$10,625.43	100%	0	\$0.00
Paving (Concrete Sidewalk)								
41	Concrete Walk	SY	\$50.00	1,493.64	\$74,681.96	100%	0	\$0.00

LINE #	DESCRIPTION	UNIT	UNIT COST	QTY	AMOUNT	PERCENT COMPLETE	REMAINING QTY	REMAINING AMOUNT
42	6" Aggregate Base (CV) Class 5	CY	\$30.00	165.96	\$4,978.80	100%	0	\$0.00
	PAVING (ROAD, TRAIL, & SIDEWALK) SUBTOTAL				\$372,793.91			\$64,136.01
	Surfacing							
43	Install Sign	EA	\$320.00	5.00	\$1,600.00	100%	0	\$0.00
44	Truncated Domes	SF	\$30.00	166.00	\$4,980.00	100%	0	\$0.00
45	24" Solid Line Preform Thermo Ground In	LF	\$25.59	75.00	\$1,919.25	0%	75	\$1,919.25
46	Crosswalk Preform Thermoplastic Ground In	SF	\$16.18	120.00	\$1,941.60	0%	120	\$1,941.60
	SURFACING SUBTOTAL				\$10,440.85			\$3,860.85
CONSTRUCTION TOTAL					\$1,000,874.73			\$68,496.86
NOTES								



Prepared By: Matthew Hill, City Administrator

Presenter: Matthew Hill, City Administrator

Date: 02/06/2025

Board & Commission: City Council

Subject: Receive Monthly Legal Staff Report

Receive Monthly Staff Report

Voting Requirements:

Voting Options Simple Majority

MEMORANDUM

To: The Honorable Kevin Schieber
City of North Branch City Council

VIA EMAIL ONLY

cc: Matthew Hill, City Administrator

From: Christopher M. Hood

Date: February 6, 2025

Re: Legal Staff Report for February 11, 2025 City Council Meeting

- - - - -

We are submitting this memorandum to update the City of North Branch City Council on the work we performed as City Attorney during January 2025. The matters listed below are discussed in a general manner only for sake of brevity and to maintain any attorney-client privileged and/or confidential information/data.

Summary of City Matters

1. **Personnel and Labor Matters**

Attorneys researched, reviewed, analyzed, and drafted multiple documents and correspondence for IUOE union negotiations, and attended negotiations meetings. Attorneys researched, reviewed, analyzed, and drafted multiple documents, advice memoranda, and other correspondence, and attended meetings for a personnel issue. Attorneys advised and responded to various other questions and prepared correspondence regarding labor and employment matters, including preparation of a job description.

2. **Municipal Matter**

Attorneys researched, reviewed, analyzed, and responded to questions related to a municipal cannabis store proposal. Attorneys drafted EDA loan documentation templates. Attorneys researched, reviewed, and drafted a road maintenance agreement.

3. **Land Use and Real Estate Matters**

Attorneys reviewed and advised on questions related a development agreement and title commitment. Attorneys researched, reviewed and drafted an easement agreement and cost share agreement for a county road project.

4. **Staff Communications**

Attorneys also make occasional day-to-day communications with the City Administrator, City Engineer and City staff regarding the above-referenced matters, among others.

CMH/sc



Prepared By: Nathan Sondrol, Community Development Director, Shawn Williams, Public Works Director

Presenter: Nathan Sondrol, Community Development Director, Shawn Williams, Public Works Director

Date: 02/03/2025

Board & Commission: City Council

Subject: Resolution R-147-2025 SRTS CSAH 30 Improvement Project - Permanent ROW Easement and Temp Construction Easement

Background

The City is partnering with Chisago County for the construction of a trail and crosswalk improvements along the west side of CSAH 30 from Maple Street to 377th Street and a roundabout improvement at the intersection of CSAH 30 and 377th Street. These improvements are included as part of the overall CSAH 30 Improvement project from Maple Street to Co Rd 17.

The City Council approved a letter of understanding (LOU) between Chisago County and the City for the project that outlined the roles and responsibilities for each entity for the project at the September 24, 2024, meeting and approved the plans and specs and authorized obtaining bids at the same meeting.

Chisago County obtained bids and awarded Knife River Corporation the contract with the low quote for the project in the amount of \$6,586,316.60. The City Council approved the award of the low bid and the city's contribution to the project at the October 26, 2024 meeting with the City's contribution for the project would be \$1,718,103.56 with a breakdown of the costs below. The project is bid on unit quantities and final project cost will be based on actual quantities used. The city requires a 5% contingency for all projects. The funding for the project was identified in the 2025 budget discussions and through srts grant funding.

CSAH 30 SRTS CITY COSTS		
Total	\$1,718,103.56	Funding Source
City	\$1,145,628.06	Reserves
SRTS	\$322,475.50	Grant
Developer	\$250,000.00	Developer

As part of the project, permanent right-of-way and temporary construction easements are required for the west leg of the roundabout. The developer, Graphic Homes, inc (CR Real Estate LLC) has agreed to provide the ROW and temporary construction easements for the proposed improvements.

The approval of the resolution would formally accept the required easements to construct the portion of the project to the developer property.

Requested Action

Recommend approval of Resolution R-147-2025 ACCEPTING PERMANENT ROW EASEMENT, TEMPORARY CONSTRUCTION EASEMENT WITH CR REAL ESTATE LLC FOR THE CSAH 30 CORRIDOR IMPROVEMENT PROJECT

Voting Requirements:

Voting Options Simple Majority

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

CITY COUNCIL RESOLUTION NO. R-147-2025

A RESOLUTION APPROVING CSAH 30 IMPROVEMENT PROJECT ACCEPTING PERMANENT ROW EASEMENT, TEMPORARY CONSTRUCTION EASEMENT AND COST SHARE AGREEMENT WITH CR REAL ESTATE LLC FOR THE CSAH 30 CORRIDOR IMPROVEMENT PROJECT

WHEREAS, the city received a safe routes to school grant for the construction of a multi-use trail along the east side of County Road 30 from 379th St - Maple St and along the south side of Maple Street from Co Rd 30 to 7th Ave; and,

WHEREAS, the City is partnering with Chisago County for the construction of the trail and crosswalk improvements to be part of the reconstruction project of CSAH 30 from Maple Street to Co Rd 17 including a roundabout improvement project at 377th Street.

WHEREAS, the city council approved a letter of understanding between the City and Chisago County to outline roles and responsibilities of the project on September 24, 2024, and

WHEREAS, the city engineer, WSB, estimated the City of North Branch funding amount for the project at \$1,596,608.22, which consists of \$1,179,469.36 in roadway and storm sewer improvements and \$417,138.86 in CSAH 30 Safe Routes to School Trail improvements and the funding for the project was identified in the preliminary 2025 budget discussions and through SRTS grant funding.

WHEREAS, the City Council approved the plans and specs and authorized obtaining bids for the project at the September 24, 2024, and

WHEREAS, the county advertised bids in their legal paper and on Quest CDN for the 2024 overlay project and on October 29, 2024, 23 bids were received and read aloud. The low bid was received from Knife River Corporation-North Central for the amount of \$6,586,316.60

WHEREAS, the city portion of the project is \$1,718,103.50, with funds coming from reserves (\$1,145,628.06), SRTS grant (\$322,475.50) and the adjacent developer (\$250,000)

WHEREAS, permanent right-of-way easements and temporary construction easements are required for portions of the project and the developer, CR Real Estate, LLC is agreeing to provide these; and

NOW, THEREFORE BE IT RESOLVED THAT: The City of North Branch Council approve the acceptance of the permanent right-of-way and temporary construction easements with CR Real Estate LLC.

**PERMANENT PUBLIC RIGHT-OF-WAY EASEMENT
AND TEMPORARY CONSTRUCTION EASEMENT**

This Agreement is made this ___ day of _____, 2025, by and between CR Real Estate LLC, a limited liability company organized under the laws of the State of Minnesota, 25635 Vassar Street NE, Stacy, Minnesota 55079, referred to hereinafter as “Grantor,” and the City of North Branch, Minnesota, a municipal corporation organized under the laws of the State of Minnesota, 6408 Elm Street, North Branch, Minnesota 55056, referred to hereinafter as “Grantee”; (collectively referred to herein as the “parties”).

AGREEMENT

That for and in consideration of the sum of One and 00/100ths Dollars (\$1.00) and other good and valuable consideration, paid this date by Grantee to Grantor, the receipt and sufficiency of which is hereby acknowledged, the Grantor and Grantee do hereby agree as follows:

1. The undersigned Grantor hereby grants and conveys to the Grantee two Permanent Easements for right-of-way, drainage, sidewalk, pedestrian and bicycle trail, utility, and roadway purposes, identified herein as Parcel 1: (PID: 11.00592.11) and Parcel 2: (PID: 11.00592.13), respectively (collectively the “Permanent Easements”), over, under and across that part of the tract of land legally described on Exhibit A, which is attached hereto and incorporated herein by reference, in the City of North Branch, Chisago County, Minnesota; which Permanent Easements are respectively legally described on Exhibit B, which is attached hereto and incorporated by reference (the “Permanent Easement Areas”).
2. The undersigned Grantor hereby grants and conveys to the Grantee two Temporary Easements for construction purposes identified herein as Parcel 1: (PID: 11.00592.11) and Parcel 2: (PID: 11.00592.13), respectively (collectively the “Temporary Easements”) over, under and across that part of the tract of land legally described on Exhibit A, in the City of North Branch, Chisago County, Minnesota, which Temporary Easements are respectively legally described on Exhibit C, which is attached hereto and incorporated by reference (the “Temporary Easement Areas”). The purpose of the Temporary Easements are to allow Grantee, or its employees, agents, permittees and licensees, to use the respective Temporary Easement Areas in connection with a right-of-way construction project, which will include

the construction of a roadway, utility, trail, and drainage facilities (the "Work"). The Temporary Easements shall expire no later than the earlier of: (a) one (1) year following the date on which the contractor hired to complete the Work first conducts Work within the Temporary Easement Areas; or (b) two (2) years from the date of this Agreement.

3. The Permanent Easement Areas and Temporary Easement Areas described above are depicted together on the schematic drawing/maps for each individual parcel, identified as Parcel 1: (PID: 11.00592.11) and Parcel 2: (PID: 11.00592.13), on Exhibit D, which is attached hereto and incorporated herein by reference.
4. The Grantor states and hereby covenants that the Grantor is the lawful owner of the above-described real property, is lawfully seized and possessed of said real property, and that the Grantor has good and lawful right to grant the Permanent Easements and Temporary Easements described herein.
5. The Grantee shall have the right to construct, excavate, grade, inspect, install, remove, demolish, operate, maintain, place, replace, reconstruct, improve, enlarge and repair, as it may find reasonably necessary, the above-identified public facilities and improvements and such other improvements appurtenant thereto, in the Permanent Easement Areas and Temporary Easement Areas respectively described herein.
6. The Grantee shall have the right, at its sole cost and expense, to conduct such Work and activities in the Temporary Easement Areas, as are reasonably necessary to complete Work to Grantee's satisfaction. The Grantee and its employees, agents, permittees and licensees shall have the right of ingress and egress to and from the Temporary Easement Areas, including but not limited to ingress and egress for equipment, materials, supplies and vehicles, at all times and without notice to Grantor, provided that such ingress and egress is not over, under, upon or across any portion of Grantor's Property that is not within the Permanent Easement Areas or Temporary Easement Areas.
7. The Grantee and its employees, agents, permittees and licensees shall have the right of ingress and egress to and from the Permanent Easement Area at all times and without notice to Grantor by such route, in the judgment of the Grantee, as shall occasion the least practical damage and inconvenience to the Grantor.
8. The Grantee shall have the right to trim, remove and keep the Permanent Easement Area and Temporary Easement Areas clear of all buildings, structures, roots, shrubbery, trees, bushes, undergrowth and all other obstructions that may interfere with or endanger the Grantee's exercise of any of the rights pursuant to this Permanent Easement and Temporary Easement.
9. The Grantor shall not erect, construct or locate in the Permanent Easement and Temporary Easement Areas any new structure or object that was not in existence on the date of this Permanent Easement and Temporary Easement, which would prevent the Grantee's reasonable access to the Permanent Easement and Temporary Easement Areas or prevent the public's full enjoyment of the rights granted hereunder, without the written consent of the Grantee.

10. The Grantee shall restore, at Grantees' expense, any and all disturbed areas within the Permanent and Temporary Easement Areas back to as close to original condition as, in Grantee's judgment, is reasonably practicable given the rights granted hereunder. No construction materials may remain in, on or under the Temporary Easement Area at the end of the term of the Temporary Easement.
11. The Grantee shall defend, indemnify and hold harmless Grantor from and against claims and demands for, or litigation with respect to, all damages which may arise out of or be caused by the Grantee's Work or improvements within the Permanent Easement and Temporary Easement Areas and the public's use thereof. The indemnification provision herein shall not apply to the negligence or intentional misconduct of Grantor.
12. The provisions hereof shall inure to the benefit of and bind the successors and assigns of the respective parties hereto, and all covenants shall apply to and run with the land.
13. This Permanent Easement and Temporary Easement shall be recorded as soon as practicable following its execution with the understanding that the Grantee has complete and absolute sole ownership, use and control of the public right-of-way facilities and improvements constructed in the Permanent Easement Area, and such other improvements appurtenant thereto, in accordance with the grant of rights conveyed herein.
14. Grantor and Grantee agree to correct any legal descriptions contained herein if there is a mistake discovered, including any mistakes or discrepancies revealed by an accurate survey of the property identified herein, and to accordingly replace the corresponding corrected exhibit herein, as applicable.
15. This Agreement shall be governed by and construed under the laws of the State of Minnesota without reference to its conflict of laws principles.
16. Any notice or other communication required or permitted under this instrument must be in writing and may be given by personal delivery, by being deposited with any nationally recognized overnight carrier that routinely issues receipts, or by being deposited with the United States Postal Service, postage prepaid, certified mail, addressed to the party for whom it is intended at its address set forth above. Any such notice shall be deemed delivered upon (but not until) receipt or refusal of receipt. Either party may change its address for notices by giving 10 days prior written notice of such change to the other party in a manner set forth above.

[Remainder of page intentionally left blank.]

GRANTEE:

CITY OF NORTH BRANCH, MINNESOTA

By: _____
Kevin Schieber, Its Mayor

ATTEST:

By: _____
Matthew Hill, Its City Administrator

STATE OF MINNESOTA)
) ss.
COUNTY OF CHISAGO)

The foregoing instrument was acknowledged before me this _____ day of _____, 20____, by Kevin Schieber, as Mayor, and Matthew Hill, as City Administrator, on behalf of the City of North Branch, a municipal corporation under the laws of the State of Minnesota, Grantee.

Notary Public

THIS INSTRUMENT WAS DRAFTED BY:

FLAHERTY & HOOD, P.A,
525 Park Street, Suite 470
St. Paul, MN 55103
(651) 225-8840

EXHIBIT A

LEGAL DESCRIPTION OF REAL PROPERTY

The real property referenced in this instrument are respectively legally described as follows:

LEGAL DESCRIPTIONS:

Parcel 1: (PID: 11.00592.11)

Lot 11, Block 1, Townsedge, Chisago County, Minnesota.

Parcel 2: (PID: 11.00592.13)

Outlot B, Townsedge, Chisago County, Minnesota.

EXHIBIT B

LEGAL DESCRIPTIONS OF PERMANENT EASEMENTS

LEGAL DESCRIPTIONS

Parcel 1: (PID: 11.00592.11)

Commencing at the northeast corner of said Lot 11; thence South 02 degrees 13 minutes 28 seconds West, assumed bearing along the east line of said Lot 11, a distance of 1203.65 feet to the point of beginning of said easement area to be described; thence North 87 degrees 53 minutes 56 seconds West, a distance of 145.30 feet; thence North 02 degrees 06 minutes 04 seconds East, a distance of 66.00 feet; thence South 87 degrees 53 minutes 56 seconds East, a distance of 57.85 feet; thence North 79 degrees 48 minutes 36 seconds East, a distance of 70.40 feet; thence easterly, a distance of 19.41 feet along a tangential curve concave to the north having a radius of 377.33 feet and a central angle of 02 degrees 56 minutes 49 seconds to said east line; thence South 02 degrees 13 minutes 28 seconds West, not tangent to the last described curve and along said east line, a distance of 85.60 feet to the point of beginning.

Parcel 2: (PID: 11.00592.13)

Commencing at the most northerly point of said Outlot B; thence South 00 degrees 03 minutes 23 seconds East, assumed bearing along the east line of said Outlot B, a distance of 447.52 feet; thence South 89 degrees 56 minutes 37 seconds West, along said east line, a distance of 10.00 feet to the point of beginning of said easement area to be described; thence continuing South 89 degrees 56 minutes 37 seconds West, a distance of 7.82 feet to the west line of said Outlot B; thence South 02 degrees 13 minutes 28 seconds West, along said west line, a distance of 273.06 feet; thence southeasterly, a distance of 55.00 feet along a non-tangential curve concave to the southwest having a radius of 777.33 feet, a central angle of 04 degrees 03 minutes 14 seconds, and a chord which bears South 19 degrees 55 minutes 40 seconds East a distance of 54.99 feet to said east line; thence North 00 degrees 03 minutes 23 seconds West, not tangent to the last described curve and along said east line, a distance of 324.56 feet to the point of beginning.

EXHIBIT C

LEGAL DESCRIPTIONS OF TEMPORARY EASEMENTS

LEGAL DESCRIPTIONS:

Parcel 1: (PID: 11.00592.11)

Commencing at the northeast corner of said Lot 11; thence South 02 degrees 13 minutes 28 seconds West, assumed bearing along the east line of said Lot 11, a distance of 1203.65 feet to the point of beginning of said easement area to be described; thence North 87 degrees 53 minutes 56 seconds West, a distance of 145.30 feet; thence South 02 degrees 06 minutes 04 seconds West, a distance of 35.00 feet; thence South 87 degrees 53 minutes 56 seconds East, a distance of 145.22 feet to said east line; thence North 02 degrees 13 minutes 28 seconds East, along said east line, a distance of 35.00 feet to the point of beginning.

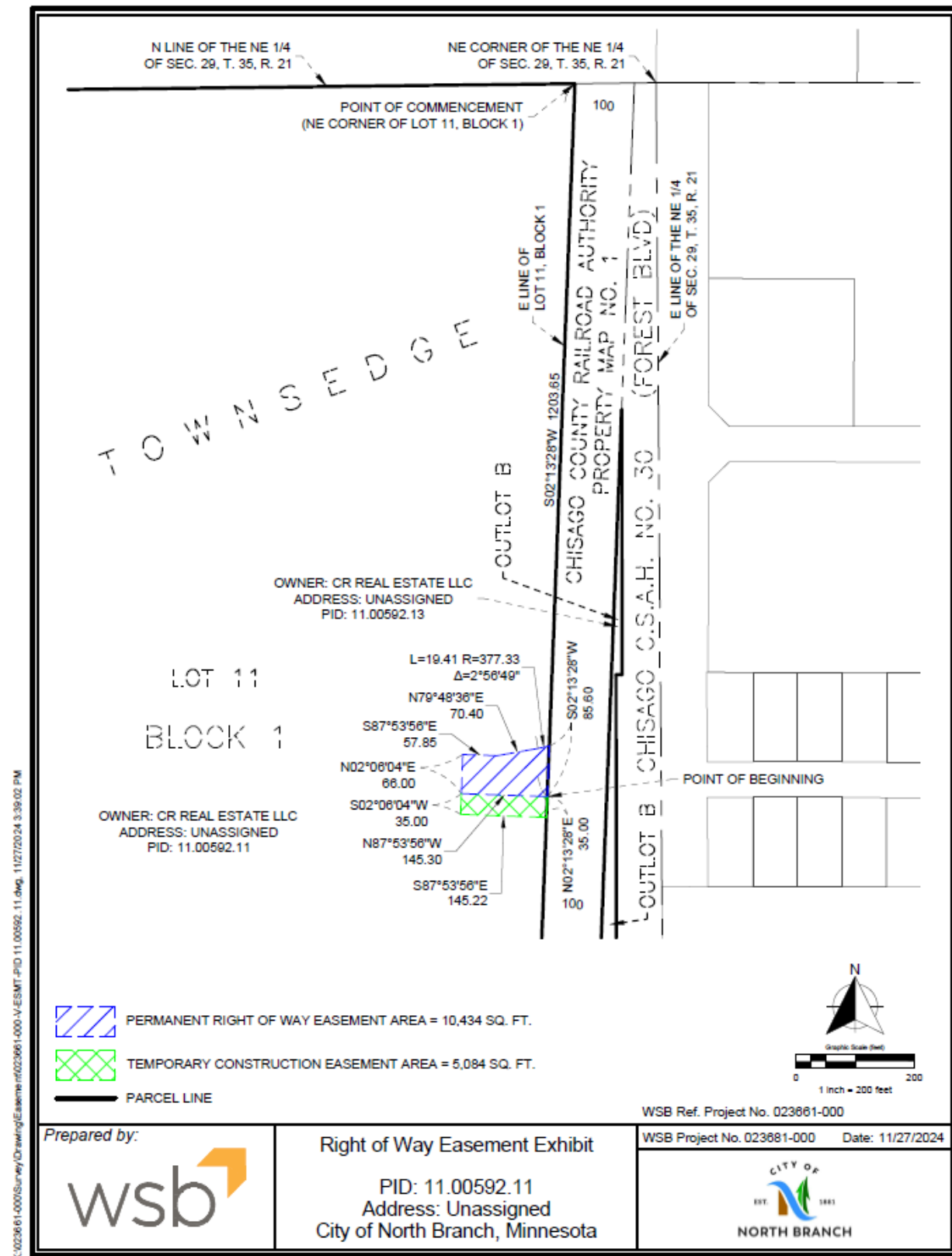
Parcel 2: (PID: 11.00592.13)

Commencing at the most northerly point of said Outlot B; thence South 00 degrees 03 minutes 23 seconds East, assumed bearing along the east line of said Outlot B, a distance of 447.52 feet; thence South 89 degrees 56 minutes 37 seconds West, along said east line, a distance of 10.00 feet; thence continuing South 89 degrees 56 minutes 37 seconds West, a distance of 7.82 feet to the west line of said Outlot B; thence South 02 degrees 13 minutes 28 seconds West, along said west line, a distance of 273.06 feet to the point of beginning of said easement area to be described; thence southeasterly, a distance of 55.00 feet along a non-tangential curve concave to the southwest having a radius of 777.33 feet, a central angle of 04 degrees 03 minutes 14 seconds, and a chord which bears South 19 degrees 55 minutes 40 seconds East a distance of 54.99 feet to said east line; thence South 72 degrees 05 minutes 57 seconds West, not tangent to the last described curve, a distance of 22.08 feet to said west line; thence North 02 degrees 13 minutes 28 seconds East, along said west line, a distance of 58.53 feet to the point of beginning.

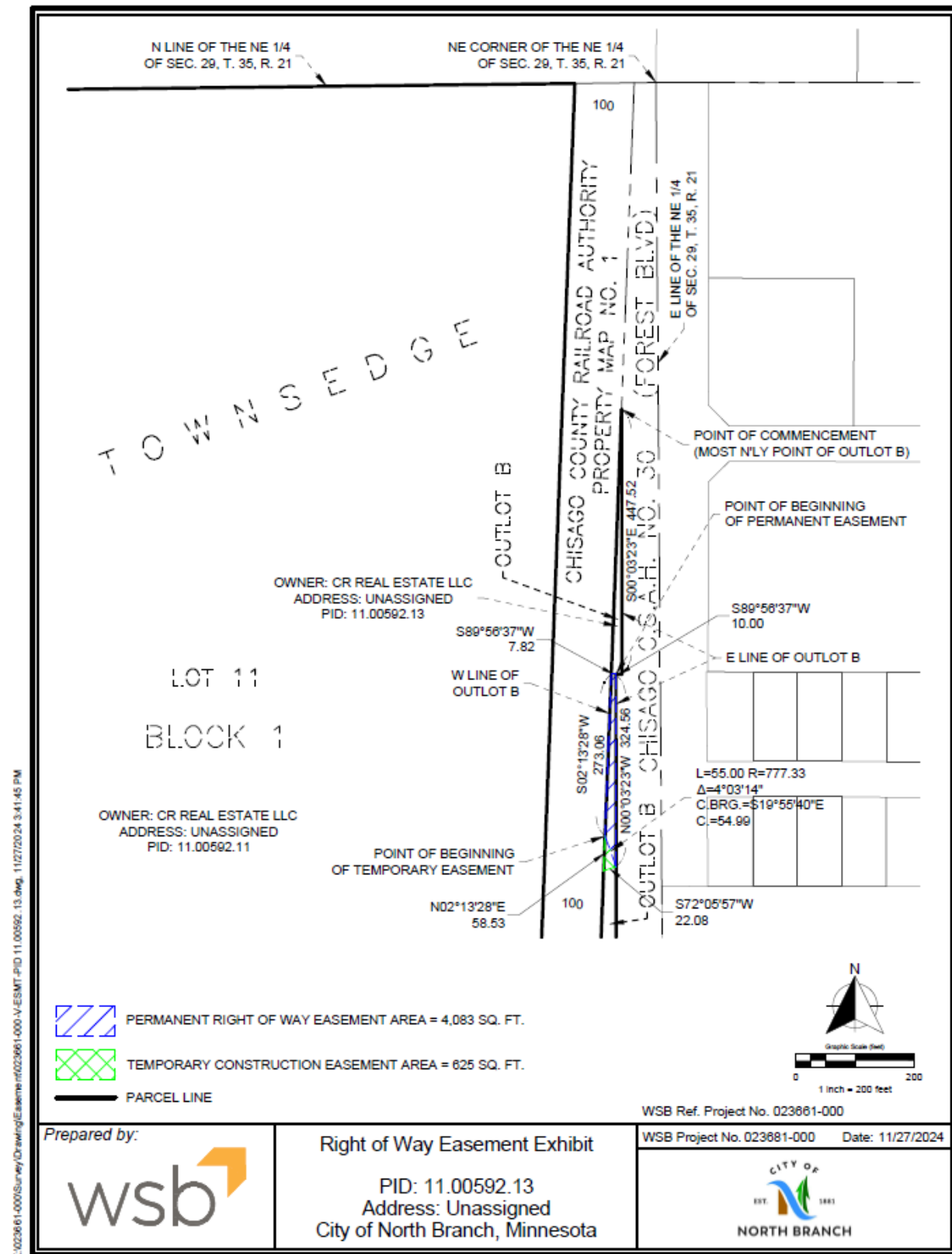
EXHIBIT D

DEPICTIONS OF PERMANENT AND TEMPORARY EASEMENTS

Parcel 1: (PID: 11.00592.11)



Parcel 2: (PID: 11.00592.13)





Prepared By: Nathan Sondrol, Community Development Director, Shawn Williams, Public Works Director

Presenter: Nathan Sondrol, Community Development Director, Shawn Williams, Public Works Director

Date: 02/06/2025

Board & Commission: City Council

Subject: Resolution R-149-2025 SRTS CSAH 30 Improvement Project - Cost Share Agreement

Background

The City is partnering with Chisago County for the construction of a trail and crosswalk improvements along the west side of CSAH 30 from Maple Street to 377th Street and a roundabout improvement at the intersection of CSAH 30 and 377th Street. These improvements are included as part of the overall CSAH 30 Improvement project from Maple Street to Co Rd 17.

The City Council approved a letter of understanding (LOU) between Chisago County and the City for the project that outlined the roles and responsibilities for each entity for the project at the September 24, 2024, meeting and approved the plans and specs and authorized obtaining bids at the same meeting.

Chisago County obtained bids and awarded Knife River Corporation the contract with the low quote for the project in the amount of \$6,586,316.60. The City Council approved the award of the low bid and the city's contribution to the project at the October 26, 2024 meeting with the City's contribution for the project would be \$1,718,103.56 with a breakdown of the costs below. The project is bid on unit quantities and final project cost will be based on actual quantities used. The city requires a 5% contingency for all projects. The funding for the project was identified in the 2025 budget discussions and through srts grant funding.

CSAH 30 SRTS CITY COSTS		
Total	\$1,718,103.56	Funding Source
City	\$1,145,628.06	Reserves
SRTS	\$322,475.50	Grant
Developer	\$250,000.00	Developer

The developer conducted and EAW for the Townsedge development that required the installation of turn lanes on CSAH 30 to the development. The developer has agreed to contribute funds to the cost of the construction of the roundabout in lieu of the installation of the turn lanes. The cost share agreement with developer, Graphic Homes, inc (CR Real Estate LLC) would outline the roles and responsibilities for the proposed improvements. The cost share agreement is being finalized and will provided asap.

Requested Action

Recommend approval of Resolution R-149-2025 APPROVING THE COST SHARE AGREEMENT WITH CR REAL ESTATE LLC FOR THE CSAH 30 CORRIDOR IMPROVEMENT PROJECT

Voting Requirements:

Voting Options Simple Majority

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

CITY COUNCIL RESOLUTION NO. R-149-2025

A RESOLUTION APPROVING CSAH 30 IMPROVEMENT PROJECT ACCEPTING PERMANENT ROW EASEMENT, TEMPORARY CONSTRUCTION EASEMENT AND COST SHARE AGREEMENT WITH CR REAL ESTATE LLC FOR THE CSAH 30 CORRIDOR IMPROVEMENT PROJECT

WHEREAS, the city received a safe routes to school grant for the construction of a multi-use trail along the east side of County Road 30 from 379th St - Maple St and along the south side of Maple Street from Co Rd 30 to 7th Ave; and,

WHEREAS, the City is partnering with Chisago County for the construction of the trail and crosswalk improvements to be part of the reconstruction project of CSAH 30 from Maple Street to Co Rd 17 including a roundabout improvement project at 377th Street.

WHEREAS, the city council approved a letter of understanding between the City and Chisago County to outline roles and responsibilities of the project on September 24, 2024, and

WHEREAS, the city engineer, WSB, estimated the City of North Branch funding amount for the project at \$1,596,608.22, which consists of \$1,179,469.36 in roadway and storm sewer improvements and \$417,138.86 in CSAH 30 Safe Routes to School Trail improvements and the funding for the project was identified in the preliminary 2025 budget discussions and through SRTS grant funding.

WHEREAS, the City Council approved the plans and specs and authorized obtaining bids for the project at the September 24, 2024, and

WHEREAS, the county advertised bids in their legal paper and on Quest CDN for the 2024 overlay project and on October 29, 2024, 23 bids were received and read aloud. The low bid was received from Knife River Corporation-North Central for the amount of \$6,586,316.60

WHEREAS, the city portion of the project is \$1,718,103.50, with funds coming from reserves (\$1,145,628.06), SRTS grant (\$322.475.50) and the adjacent developer (\$250,000)

WHEREAS, permanent right-of-way easements and temporary construction easements are required for portions of the project and the developer, CR Real Estate, LLC is agreeing to provide these; and

NOW, THEREFORE BE IT RESOLVED THAT: The City of North Branch Council approve the acceptance of the permanent right-of-way and temporary construction easements with CR Real Estate LLC.

COST SHARE AGREEMENT

THIS COST SHARE AGREEMENT (the “Agreement,”) is made and entered into as of this ____ day of _____, 2025, by and between the **CITY OF NORTH BRANCH**, a municipal corporation under the laws of the State of Minnesota (the “City”), and **CR REAL ESTATE LLC**, a limited liability company under the laws of the State of Minnesota, 25635 Vassar Street NE, Stacy, Minnesota 55079 (“Developer”); (individually, the City and Developer may be referred to as a “Party”; collectively, as the “Parties”).

RECITALS

WHEREAS, Developer owns certain real property located in the City, Chisago County, Minnesota (PID Nos. 11.00592.11 and 11.00592.13), legally described on **Exhibit A**, which is attached hereto and incorporated herein by reference (the “Property”); and

WHEREAS, the City and Chisago County have entered into an agreement whereby the City will cost share and reimburse Chisago County to construct certain improvements to CSAH No. 30, including but not limited to construction of a roundabout (the “CSAH 30 Project”); and

WHEREAS, Developer desires to develop the Property and has requested to include certain additional improvements in the CSAH 30 Project in order to facilitate Developer’s future development of the Property; and

WHEREAS, as part of CSAH 30 Project, Developer has requested that a turn lane to serve such future development of the Property along with sewer and water utilities therein be constructed as part of the CSAH 30 Project to be paid for by Developer (the “Developer’s Improvements”); and

WHEREAS, Developer has granted to the City Permanent Public Right-of-Way Easements and Temporary Construction Easements, dated February 11, 2025, for the purposes stated in such easement agreement for the CSAH 30 Project, including the Developer’s Improvements; and

WHEREAS, Developer has requested this Agreement be entered into whereby the Developer will cost/share and reimburse the City for all costs and expenses incurred by the City with respect to the construction of the Developer’s Improvements; and

WHEREAS, the Parties agree that the description of the Developer’s Improvements to be constructed as part of the CSAH 30 Project, and the costs thereof to be paid by Developer to reimburse the City for all costs incurred by the City regarding the same, are contained in and attached hereto as **Exhibit C**; and

WHEREAS, the City is willing to undertake in cooperation with Chisago County, as part of the CSAH 30 Project the construction of the Developer’s Improvements as soon as practicable pursuant to the terms and conditions set forth herein, and subject to the requirements of applicable law, final design and approval of plans and specifications by the City and Chisago

County, bidding of the CSAH No. 30 Project including Developer's Improvements by Chisago County, construction contract(s) award(s) by Chisago County, completion of financing for the CSAH 30 Project by Chisago County, and construction of the CSAH 30 Project including the Developer's Improvements by Chisago County; and

WHEREAS, the City and Developer now desire to enter into this Agreement defining the terms and conditions under which Developer will cost share and reimburse the City for all costs incurred by the City related to the Developer's Improvements as contained in this Agreement and described in **Exhibit C**.

NOW, THEREFORE, in consideration of the mutual covenants and promises contained herein, the Parties agree as follows:

ARTICLE ONE **Definitions and Terms**

- 1.1 **"City"** means the City of North Branch, a Minnesota municipal corporation, 6408 Elm Street, North Branch, MN 55056.
- 1.2 **"County"** means Chisago County, a Minnesota political subdivision, 313 N. Main Street, Center City, MN 55012.
- 1.3 **"CSAH 30 Project"** means the construction of the CSAH No. 30 improvements project pursuant to the Final Design, including the Developer's Improvements.
- 1.4 **"Effective Date"** means the date first above written.
- 1.5 **"Expiration Date"** means the date that Developer has fully performed their obligations hereunder to the satisfaction of the City to reimburse the City for the Total Developer's Improvements Cost as specified in this Agreement and described **Exhibit C** incurred by the City for construction by Chisago County of the Developer's Improvements as part of the CSAH 30 Project.
- 1.6 **"Developer"** means CR Real Estate LLC, a limited liability company under the laws of the State of Minnesota, whose address for notices purposes is 25635 Vassar Street NE, Stacy, MN 55079.
- 1.7 **"Developer Improvements"** means a roadway turn lane and sewer and water utility lines constructed by Chisago County to serve the Property as part of the CSAH 30 Project with all costs of the Developer's Improvements to be paid by Developer to the City to reimburse the City for all such costs incurred by the City regarding the same, all as specified in this Agreement and described in **Exhibit C**, which is attached hereto and incorporated herein by reference.

- 1.8 ***“Final Design”*** means the final architectural and engineering design plans and specifications for the CSAH 30 Project approved by the City and County. The Final Design shall consist of construction plans and bidding documents pursuant to Minn. Stat. § 471.345, as applicable and determined by the City and County in their sole judgment and discretion.
- 1.9 ***“Property”*** means that certain real property located in the City, Chisago County, Minnesota (PID Nos. 11.00592.11 and 11.00592.13), legally described on **Exhibit A**, which is attached hereto and incorporated herein by reference.
- 1.10 ***“Substantial Completion Date”*** means the date on which the County Engineer determines that the CSAH 30 Project is substantially complete.
- 1.11 ***“Total Developer’s Improvements Cost”*** means the actual cost to construct the Developer’s Improvements portion of the CSAH 30 Project, inclusive of all sums paid to contractors for the construction of the Developer’s Improvements, all sums paid to professionals to manage the construction of the Developer’s Improvements, and all interest that may accrue on any bonds issued to fund any portion of the Developer’s Improvements in the amount of \$250,000.00, as described in **Exhibit C**.

ARTICLE TWO

Term of Agreement

- 2.1 This Agreement shall be in effect and binding on the Parties beginning on the Effective Date and terminating on the Expiration Date, unless earlier terminated pursuant to this Agreement.

ARTICLE THREE

Representations and Warranties

- 3.1 **Representations and Warranties of the City:** The City represents and warrants that the City is a municipal corporation organized and existing under and by virtue of and pursuant to the laws of the State of Minnesota and has the power to enter into this Agreement and carry out its obligation hereunder.
- 3.2 **Representations and Warranties of Developer:** Developer makes the following representations and warranties:
- 3.2.1 Developer is a limited liability company organized and existing under and by virtue of and pursuant to the laws of the State of Minnesota, is in good standing in the State of Minnesota and has the power and authority to enter into this Agreement and to perform its obligations hereunder and is not in violation of the laws of the State or City Code.
- 3.2.2 Neither the execution and delivery of this Agreement, nor the fulfillment of or compliance with the terms and conditions of this Agreement is prevented, limited

by or conflicts with or results in a breach of, the terms, conditions or provision of any contractual restriction, evidence of indebtedness, agreement or instrument of whatever nature to which Developer is now a party or by which it is bound, or constitutes a default under any of the foregoing.

3.2.3 Developer will cooperate with the City with respect to any litigation commenced with respect to the Property, as applicable.

3.2.4 Developer shall promptly advise the City in writing of all litigation or claims affecting this Agreement and all written complaints and charges made by any governmental authority materially affecting this Agreement or materially affecting Developer, the Property, or its activities.

3.2.5 Developer has the resources and capability to satisfy the financial obligations contained in this Agreement.

3.2.6 Developer acknowledges the City's contributions to the CSAH 30 Project, including the Developer's Improvements, and further warrants that Developer will not seek subsidies or other financial assistance from the City to cover any costs, expenses or obligations made the responsibility of Developer hereunder.

ARTICLE FOUR

Final Design

4.1 Final Design: The City and County shall retain design professional(s) and complete and approve the architectural and engineering design for the CSAH 30 Project as determined by the City and County in their sole judgment and discretion.

ARTICLE FIVE

CSAH 30 Project Funding for Developer's Improvements

5.1 Developer Cost Share: Developer shall reimburse the City for all costs incurred by the City for the construction of the Developer's Improvements as part of the CSAH 30 Project in the amount of \$250,000.00 and as described in **Exhibit C**.

5.2 Timing of Developer Reimbursement Payment: As consideration for the Developer's Improvements constructed as part of the CSAH 30 Project, Developer shall pay to the City the Total Developer's Improvements Cost in Section 5.1 of this Agreement, to be paid within 60 days of the Substantial Completion Date.

5.3 Developer Security: To guarantee compliance with the terms of this Agreement, Developer shall furnish the City, along with and at the time of execution of this Agreement, a letter of credit in a form substantially as provided in **Exhibit B** and acceptable to the City and from a bank approved by the City (the "Security") in the amount of the required reimbursement payment provided in Section 5.1 of this Agreement. The Security may be in the form of annually renewable letters of credit.

Individual security instruments may be for shorter terms provided they are replaced at least 30 days prior to their expiration. The City may draw down the Security, without notice, for any violation of the terms of this Agreement or if the Security is allowed to lapse prior to the end of the required term by presenting the bank/escrow agent/surety with a written demand or an affidavit signed by the City Administrator or the City Administrator's designee attesting to the City's right to draw down and receive funds under the Security. If the Security is drawn down, the proceeds shall be used to cure the default. If any payment required herein by Developer is not timely made to the City in accordance with this Agreement, the City may draw the Security down in the amount not timely paid. Upon receipt of proof satisfactory to the City Administrator that Developer has paid all amounts required to be paid to the City under this Agreement, the Security shall be released by the City.

ARTICLE SIX

Construction

- 6.1 **Project Construction:** The County shall be responsible for all aspects of construction of the CSAH 30 Project in accordance with the Final Design approved by the City and County, in their sole judgment and discretion and pursuant to the following requirements:
- 6.1.1 **Competitive Bids:** The County shall solicit competitive bids and award the contract(s) for construction of the CSAH 30 Project in accordance with the Final Design and in compliance with the Uniform Municipal Contracting Law, Minn. Stat. § 471.345.
- 6.1.2 **Lowest Responsible Bid:** The County shall identify, in its sole judgment and discretion, the lowest responsible bid(s) for the contract(s) to construct the CSAH 30 Project.
- 6.1.3 **Conditions Precedent:** The County's obligations to award the contract(s) for construction of the CSAH 30 Project and to cause the CSAH 30 Project to be constructed under this Article is subject to the conditions precedent that the City timely receives full execution of this Agreement.
- 6.1.4 **Substantial Completion:** Upon satisfaction of the conditions herein, the County shall award the contract(s) for construction of the CSAH 30 Project and exercise all reasonable diligence to cause the construction of the CSAH 30 Project to be substantially completed as soon as practicable thereafter in accordance with the Final Design.
- 6.1.5 **Ownership of Developer's Improvements:** Notwithstanding this Agreement, the Developer's Improvements to be constructed, whether existing on the Effective Date or installed thereafter, shall at all times following the Substantial Completion Date be and remain under the sole ownership of the City and County, as applicable to the City's and County's right-of-way interests.

ARTICLE SEVEN
Indemnification

- 7.1 **Mutual Indemnification:** Each Party (the “Indemnifying Party”) shall indemnify and hold harmless the other Party, and its respective officers, employees and members and agents (the “Indemnified Party”), from and against any and all claims and demands for, or litigation with respect to, all damages which may arise out of or be caused by the Indemnifying Party or its agents, employees, contractors or subcontractors with respect to the Indemnifying Party’s performance of its obligations under this Agreement. The Indemnifying Party shall defend the Indemnified Party against the foregoing, or litigation in connection with the foregoing, at the Indemnifying Party’s expense, with counsel reasonably acceptable to the Indemnified Party. The Indemnified Party, at its expense, shall have the right to participate in the defense of any claims or litigation and shall have the right to approve any settlement, which approval shall not be unreasonably withheld. The indemnification provision of this Section shall not apply to damages or other losses proximately caused by or resulting from the negligence or willful misconduct of the Indemnified Party. All indemnification obligations shall survive termination, expiration or cancellation of this Agreement. Nothing this Agreement shall be construed to waive any immunities or limitations to which the City is entitled under Minn. Stat. Chapter 466 or otherwise.
- 7.2 **Waiver and Release:** The City and Developer agree that the City has no obligation to the Developer under this Agreement if for any reason the CSAH 30 Project and/or the Developer’s Improvements are not constructed, or are not constructed completely, or are not constructed to Developer’s satisfaction, and Developer hereby waives and releases the City from any and all claims or liability of any kind or nature whatsoever related thereto or arising therefrom or from this Agreement.

ARTICLE EIGHT
Termination

- 8.1 **Termination:** This Agreement shall remain in effect until such time as Developer shall have fully performed all of its duties and obligations under this Agreement. Notwithstanding the foregoing, this Agreement may be terminated; (i) by mutual written agreement of the Parties at any time; or (ii) by the City for default of Developer, upon 15 days’ written notice to Developer, unless the Developer cures the default within the notice period. Developer’s obligation to make full reimbursement payment to the City for all costs incurred by the City for the Developer’s Improvements shall survive termination, expiration or cancellation of this Agreement.

ARTICLE NINE
Default and Remedies

- 9.1 **Developer Default:** If Developer shall default in the payment of any sum required to be paid by Developer under this Agreement, and such default shall continue for 15 days after written notice to Developer, or if Developer shall default in the observance or

performance of any of the other covenants, obligations or conditions in this Agreement, which Developer is required to observe or perform, and such default shall continue for 15 days after written notice to Developer, or if the interest of Developer in this Agreement shall be levied upon under execution or other legal process, or if any voluntary petition in bankruptcy or for corporate reorganization or any similar relief shall be filed by Developer, or if any involuntary petition in bankruptcy shall be filed against Developer under any federal or state bankruptcy or insolvency act and shall not have been dismissed within 15 days following the filing thereof, or if a receiver shall be appointed for Developer or any of the property of Developer by any court and such receiver shall not be dismissed within 15 days from the date of appointment, or if Developer shall make an assignment for the benefit of creditors, or if Developer shall abandon or vacate the Property, then the City may treat the occurrence of any one or more of the foregoing events as a breach of this Agreement and thereupon at its option may terminate this Agreement, in addition to exercising any and all other rights and remedies provided at law or in equity, including but not limited to drawing down the Security. In addition to the remedies and amounts payable set forth or permitted herein, upon the occurrence of an event of default by Developer, Developer shall pay to the City all fees and expenses, including reasonable attorney's fees, incurred by the City as a result of the event of default and related to enforcing this Agreement, whether or not a lawsuit or other action is formally taken.

ARTICLE TEN

Miscellaneous

- 10.1 **Notices:** Any notice, demand, or other communication required or permitted to be given hereunder shall be deemed delivered and effectively given when delivered personally to the representatives of the City and Developer identified below or three (3) business days after being mailed by registered or certified mail, addressed as provided herein above:

To City:
City of North Branch
Attn: City Administrator

To Developer:
CR Real Estate LLC
Attn: Candi Rindahl, Manager

Either Party may change its address or the identity of its designated representative named above by written notice to the other Party in the manner stated in this paragraph.

- 10.2 **Voluntary and Knowing:** The Parties, by executing this Agreement, state that they have carefully read this Agreement and understand fully the contents thereof; that in executing this Agreement they voluntarily accept all terms described in this Agreement without duress, coercion, undue influence, or otherwise, and that they intend to be legally bound thereby.
- 10.3 **Authorized Signatories:** The Parties each represent and warrant to the other that (i) the persons signing this Agreement are authorized signatories for the entities represented; and (ii) no further approvals, actions or ratifications are needed for the full enforceability

of this Agreement against it; each Party indemnifies and holds the other harmless against any breach of the foregoing representation and warranty.

- 10.4 Governing Law: This Agreement shall be deemed to have been made and accepted in Chisago County, Minnesota, and the laws of the State of Minnesota shall govern any interpretations or constructions of this Agreement without regard to its choice of law or conflict of laws principles.
- 10.5 Data Practices: The Parties acknowledge that this Agreement is subject to the requirements of Minnesota's Government Data Practices Act, Minn. Stat. § 13.01 *et seq.*
- 10.6 Records – Availability and Retention: Pursuant to Minn. Stat. § 16C.05 subd. 5, Developer agrees that the City, the State Auditor, or any of their duly authorized representatives at any time during normal business hours and as often as they may reasonably deem necessary, shall have access to and the right to examine, audit, excerpt, and transcribe any books, documents, papers, records, etc., which are pertinent to the accounting practices and procedures of Developer and involve transactions relating to this Agreement. Developer agrees to maintain these records for a period of six years from the date of termination of this Agreement.
- 10.7 Compliance with laws: The Parties shall abide by all Federal, State and local laws, statutes, ordinances, rules and regulations now in effect or hereinafter adopted pertaining to this Agreement.
- 10.8 Dispute Resolution: The City and Developer agree to negotiate all disputes between them in good faith for a period of 15 days from the date of notice of dispute prior to proceeding to formal dispute resolution or exercising their rights under law.
- 10.9 No waiver: Any party's failure in any one or more instances to insist upon strict performance of any of the terms and conditions of this Agreement or to exercise any right herein conferred shall not be construed as a waiver or relinquishment of that right or of that party's right to assert or rely upon the terms and conditions of this Agreement. Any express waiver of a term of this Agreement shall not be binding and effective unless made in writing and properly executed by the waiving party.
- 10.10 Severability: The invalidity or unenforceability of any provision of this Agreement shall not affect the validity or enforceability of any other provision. Any invalid or unenforceable provision shall be deemed severed from this Agreement to the extent of its invalidity or unenforceability, and this Agreement shall be construed and enforced as if the Agreement did not contain that particular provision to the extent of its invalidity or unenforceability.
- 10.11 Headings, Captions and Recitals: Headings and captions contained in this Agreement are for convenience only and are not intended to alter any of the provisions of this Agreement and shall not be used for the interpretation of the validity of this Agreement

or any provision hereof. The recitals set forth at the beginning of this Agreement are incorporated herein by reference and made a part of this Agreement.

- 10.12 Survivability: All covenants, indemnities, guarantees, releases, representations and warranties by any Party or Parties, and any undischarged obligations of the City and Developer arising prior to the expiration of this Agreement (whether by completion or earlier termination), shall survive such expiration.
- 10.13 Exhibits: The exhibits attached to this Agreement are considered an integral part of it as if fully set forth within it.
- 10.14 Entire Agreement: All prior understandings, discussions and agreements are merged in the governing terms of this Agreement, which is a complete and final written expression of the intent of the parties. Every warranty or representation binding upon the City is set forth in this Agreement. The City makes no further warranties or representations and Developer has not relied on any other warranties or representations, express or implied, relative to the terms of this Agreement. In the event of a conflict or inconsistency between the terms of this Agreement and those of any other agreement between the Parties, the terms of this Agreement shall govern.
- 10.15 Modification/Amendments: Any alterations, variations, modifications, amendments or waivers of the provisions of this Agreement shall only be valid when they have been reduced to writing, approved by Developer's Board of Directors and the North Branch City Council, and signed by an authorized representative of the City and Developer.
- 10.16 Execution: This Agreement may be executed simultaneously in two or more counterparts that, when taken together, shall be deemed an original and constitute one and the same document. The signature of any Party to the counterpart shall be deemed a signature to the Agreement, and may be appended to, any other counterpart. Facsimile and email transmissions of executed signature pages shall be deemed as originals and sufficient to bind the executing Party.

[Signature page to follow]

EXHIBIT A

Legal Description of Property

Parcel (11.00592.11)

Lot 11, Block 1, Townsedge, Chisago County, Minnesota.

Parcel (11.00592.13)

Outlot B, Townsedge, Chisago County , Minnesota.

EXHIBIT B

Form of Letter of Credit

IRREVOCABLE LETTER OF CREDIT

No. _____

Date: _____

TO: City of North Branch
6408 Elm Street
North Branch, MN 55056

Dear Sir or Madam:

We hereby issue, for the account of CR Real Estate LLC, a limited liability company under the laws of the State of Minnesota, and in your favor, our Irrevocable Letter of Credit in the amount of \$250,000.00, available to you by your draft drawn on sight on the undersigned bank.

The draft must:

- a) Bear the clause, "Drawn under Letter of Credit No. _____, dated _____, 2025, of _____ (Name of Bank)";
- b) Be signed by the Mayor or City Administrator of the City of North Branch.
- c) Be presented for payment at _____ (Address of Bank) _____, on or before 4:00 p.m. on November 30, 2025.

This Letter of Credit shall automatically renew for successive one-year terms unless, at least forty-five (45) days prior to the next annual renewal date (which shall be November 30 of each year), the Bank delivers written notice to the North Branch City Administrator that it intends to modify the terms of, or cancel, this Letter of Credit. Written notice is effective if sent by certified mail, postage prepaid, and deposited in the U.S. Mail, at least forty-five (45) days prior to the next annual renewal date addressed as follows: North Branch City Administrator, North Branch City Hall, 6408 Elm Street, North Branch, MN 55056, and is actually received by the City Administrator at least thirty (30) days prior to the renewal date.

This Letter of Credit sets forth in full our understanding, which shall not in any way be modified, amended, amplified, or limited by reference to any document, instrument, or agreement, whether or not referred to herein.

This Letter of Credit is not assignable. This is not a Notation Letter of Credit. More than one draw may be made under this Letter of Credit.

This Letter of Credit shall be governed by the most recent revision of the Uniform Customs and Practice for Documentary Credits, International Chamber of Commerce Publication No. 600.

We hereby agree that a draft drawn under and in compliance with this Letter of Credit shall be duly honored upon presentation.

BY: _____

_____ Its _____

EXHIBIT C

Description of Developer's Improvements and Cost

**EXHIBIT C
TO
DEVELOPMENT AGREEMENT**

IRREVOCABLE LETTER OF CREDIT

No. _____
Date: _____

TO: City of North Branch
6408 Elm Street
North Branch, MN 55056

Dear Sir or Madam:

We hereby issue, for the account of CR Real Estate LLC, a limited liability company under the laws of the State of Minnesota, and in your favor, our Irrevocable Letter of Credit in the amount of \$250,000.00, available to you by your draft drawn on sight on the undersigned bank.

The draft must:

a) Bear the clause, "Drawn under Letter of Credit No. _____, dated _____, 2025, of _____ (Name of Bank)";

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c) Be presented for payment at _____ (Address of Bank) _____, on or before 4:00 p.m. on November 30, 2025.

This Letter of Credit shall automatically renew for successive one-year terms unless, at least forty-five (45) days prior to the next annual renewal date (which shall be November 30 of each year), the Bank delivers written notice to the North Branch City Administrator that it intends to modify the terms of, or cancel, this Letter of Credit. Written notice is effective if sent by certified mail, postage prepaid, and deposited in the U.S. Mail, at least forty-five (45) days prior to the next annual renewal date addressed as follows: North Branch City Administrator, North Branch City Hall, 6408 Elm Street, North Branch, MN 55056, and is actually received by the City Administrator at least thirty (30) days prior to the renewal date.

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We hereby agree that a draft drawn under and in compliance with this Letter of Credit shall be duly honored upon presentation.

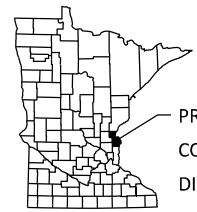
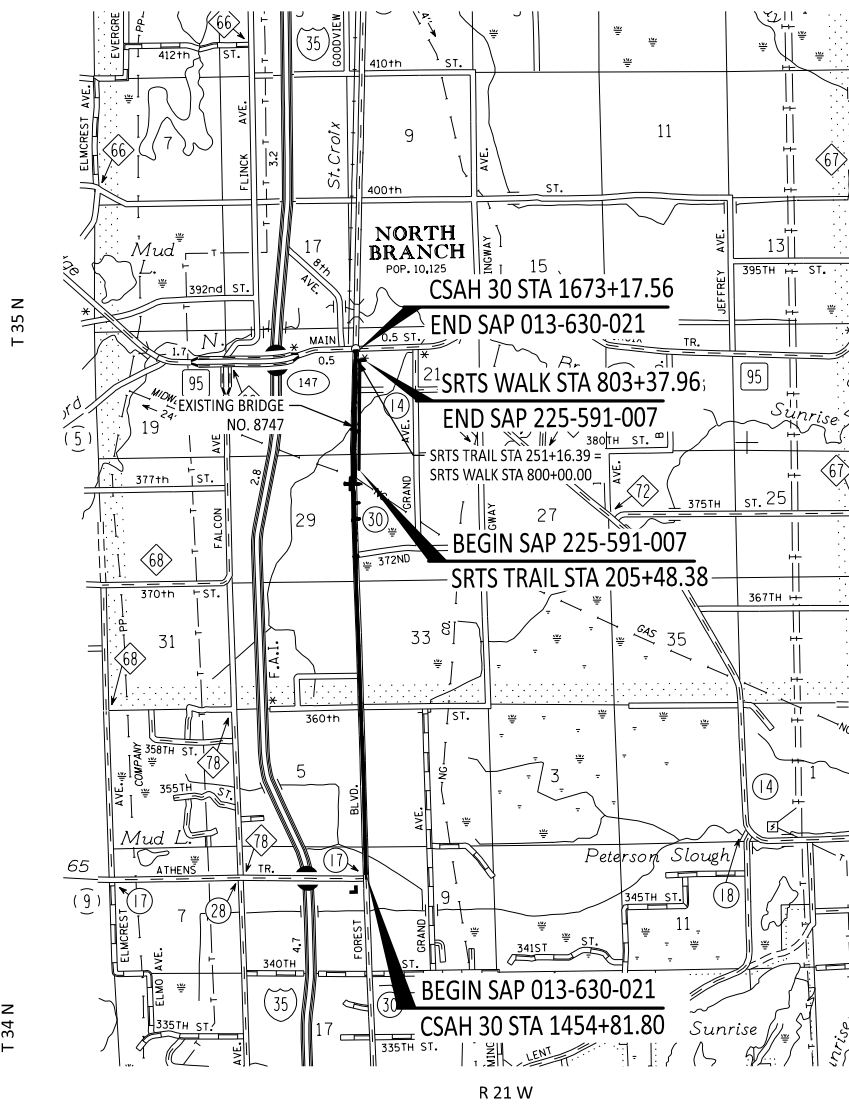
BY: _____

_____ Its _____

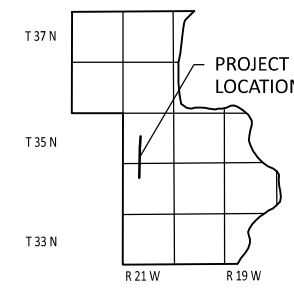
MINNESOTA DEPARTMENT OF TRANSPORTATION
CHISAGO COUNTY, MINNESOTA

CONSTRUCTION PLAN FOR GRADING, BITUMINOUS SURFACING, ROUNDABOUT, DRAINAGE, LIGHTING AND APPURTENANT WORK

LOCATED IN CSAH 30 FROM 250' NORTH OF CSAH 17 (ATHENS TRAIL) TO TH 95 IN NORTH BRANCH (Geographic Description)



PROJECT LOCATION
COUNTY: CHISAGO
DISTRICT: METRO

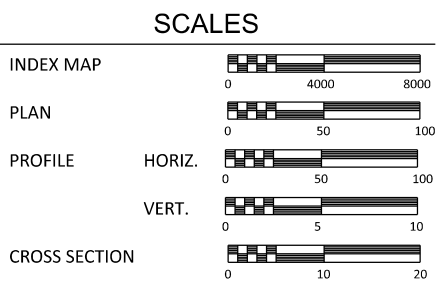


CHISAGO COUNTY

	CSAH 30	
	SAP 013-630-021	
GROSS LENGTH	21,835.76 ft	4.136 miles
BRIDGES-LENGTH	N/A ft	N/A miles
EXCEPTIONS-LENGTH	N/A ft	N/A miles
NET LENGTH	21,835.76 ft	4.136 miles

DESIGN DESIGNATION	SAFE ROUTES TO SCHOOL TRAIL SAP 225-591-007
GROSS LENGTH	4,905.97' = 0.929 MILES
BRIDGES-LENGTH	NA
EXCEPTIONS-LENGTH	NA
NET LENGTH	4,905.97' = 0.929 MILES
DESIGN SPEED	20 MPH
BASED ON SIGHT DISTANCE	STOPPING
HEIGHT OF EYE / HEIGHT OF OBJECT	4.5' / 0.0'
DESIGN SPEED NOT ACHIEVED AT	ROAD CROSSINGS

PLAN REVISIONS		
DATE	SHEET NO.	APPROVED BY



DESIGN DESIGNATION	RECONDITIONING	RECONSTRUCTION
STATION RANGE	1454+81.80 - 1582+20.00	1582+20.00 - 1673+17.56
GROSS LENGTH	12,738.20 FT	9,097.56 FT
R VALUE	40	40
ADT (Current Year) 2025	4,590	4,590
ADT (Future Year) 2045	6,183	6,183
D (DIRECTIONAL DISTR.)	50/50	50/50
HEAVY COMMERCIAL	9.54%	9.54%
ESALS	1,802,000	1,802,000
DESIGN SPEED	55 MPH	30 - 40 MPH
BASED ON SIGHT DISTANCE	STOPPING	STOPPING
HEIGHT OF EYE / HEIGHT OF OBJECT	3.5' / 2.0'	3.5' / 2.0'
FUNCTIONAL CLASS	MINOR ARTERIAL	MINOR ARTERIAL
NO. OF TRAFFIC LANES	2	3
NO. OF PARKING LANES	0	0
SHOULDER WIDTH	8 FT	6 FT / 8 FT
TON DESIGN	10	10
DESIGN SPEED NOT ACHIEVED AT	NA	ROUNDABOUT

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/UESI/CI 38-22, ENTITLED "STANDARD GUIDELINE FOR THE INVESTIGATING AND DOCUMENTING EXISTING UTILITIES".

SAP 013-630-021
SAP 225-591-007 / SAP 225-102-004

MINN. PROJECT NO. LOCAL FUNDS

GOVERNING SPECIFICATIONS

THE 2020 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MINNESOTA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING THE LATEST EDITION OF THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.

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SHEET NO.	DESCRIPTION
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14 - 15	EARTHWORK TABULATION
16 - 17	CONSTRUCTION NOTES
18 - 28	TYPICAL SECTIONS
29 - 30	MISCELLANEOUS DETAILS
31 - 47	STANDARD PLATES
48 - 82	STANDARD PLAN SHEETS
83 - 91	CONSTRUCTION STAGING & TRAFFIC CONTROL
92 - 96	ALIGNMENT PLANS & TABULATION
97 - 107	INPLACE TOPOGRAPHY & UTILITIES PLAN
108 - 118	REMOVAL PLAN
119 - 139	CONSTRUCTION PLAN & PROFILE
140 - 142	PROFILES
143	SANITARY AND WATERMAIN PLAN
144 - 155	INTERSECTION DETAILS
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178 - 189	TURF ESTABLISHMENT & EROSION CONTROL PLAN
190 - 207	SIGNING & PAVEMENT MARKING PLAN
208 - 212	TRAFFIC CONTROL SIGNAL SYSTEM
213 - 216	LIGHTING & RRFB PLAN
BR1 - BR5	BOX CULVERT PLAN
X1 - X65	CROSS SECTIONS

THIS PLAN CONTAINS 286 SHEETS

ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES WILL BE COMPLIED WITHIN THE CONSTRUCTION OF THIS PROJECT.

wsb

SIGNATURE: TYPED OR PRINTED NAME: NICHOLAS E. HENTGES, PE

DESIGN ENGINEER: 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: 9/12/2024 LICENSE NUMBER 44620

APPROVED: CITY ENGINEER - CITY OF NORTH BRANCH

APPROVED: CITY ENGINEER - CITY OF STACY

APPROVED: CHISAGO COUNTY ENGINEER

DISTRICT STATE AID ENGINEER

REVIEWED FOR COMPLIANCE WITH STATE AID RULES / POLICY

STATE AID ENGINEER: APPROVED FOR STATE AID FUNDING

SAP 013-630-021
SAP 225-591-007 / SAP 225-102-004

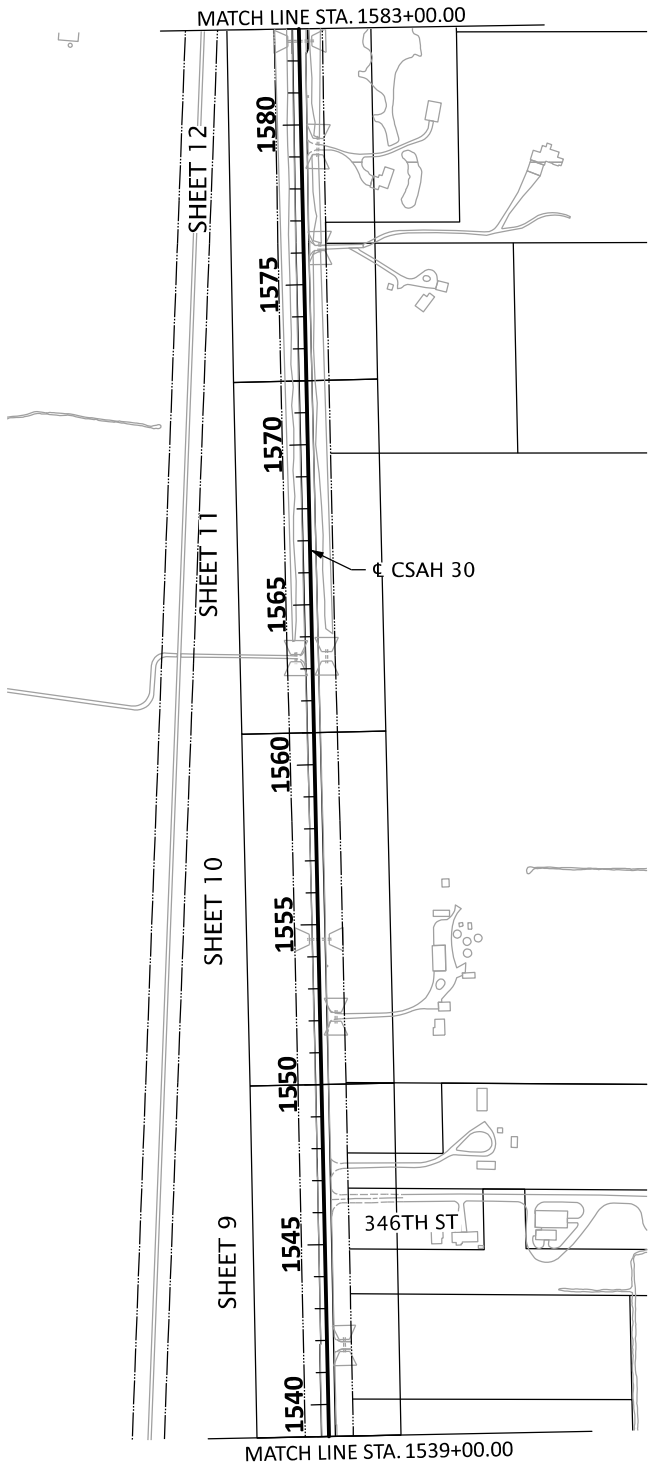
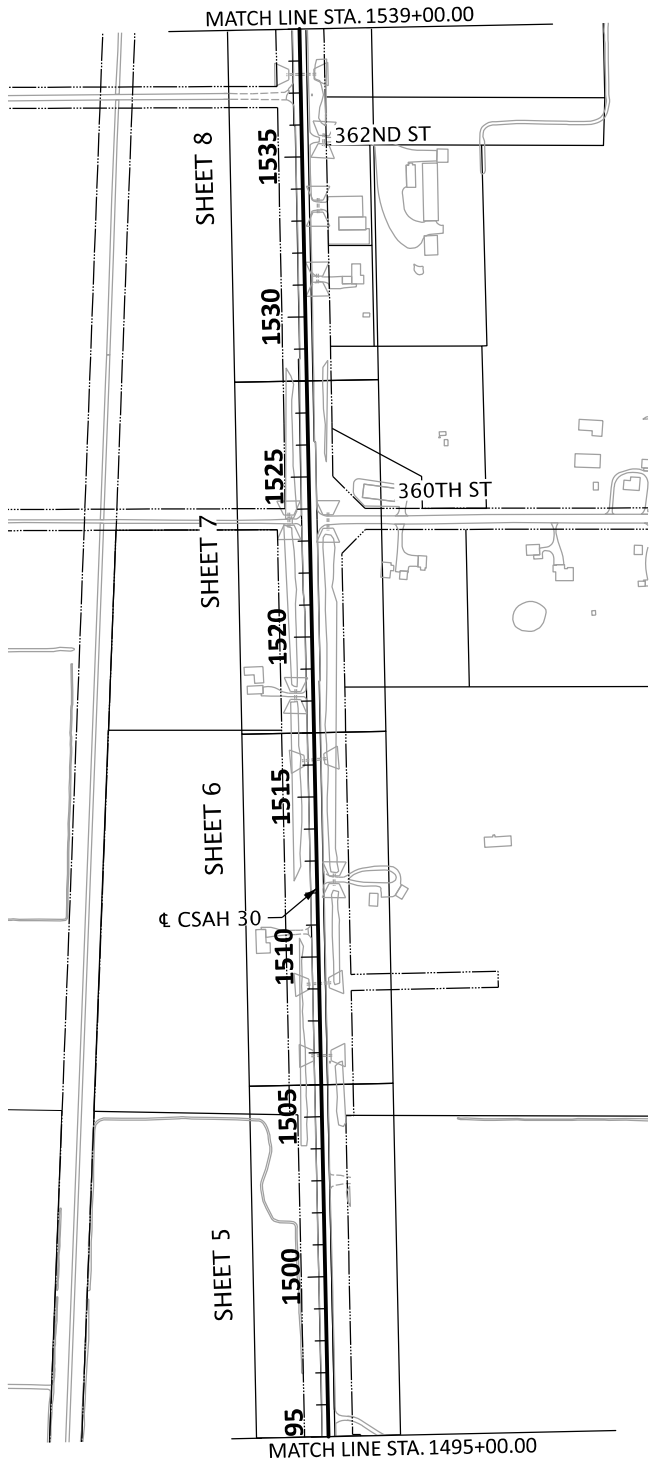
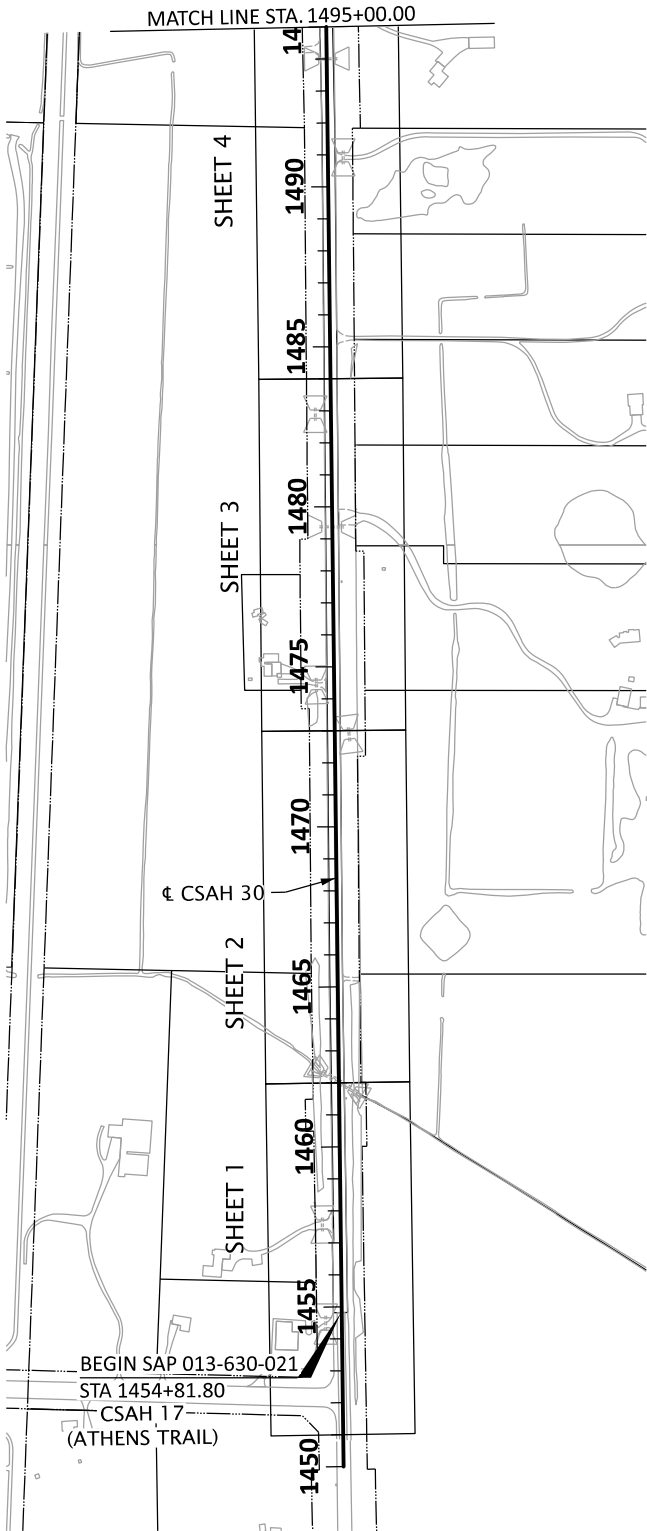
SHEET NO. 1 OF 216 SHEETS

Date Printed: 9/12/2024
WSB Filename: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_rsh

CSAH 30 (Forest Blvd)

CSAH 30 (Forest Blvd)

CSAH 30 (Forest Blvd)



SECTION		INPLACE TOPOGRAPHY & UTIL PLANS	REMOVAL PLANS	CONSTRUCTION PLAN & PROFILE	DRAINAGE PLAN	TURF & EROSION CONTROL PLAN	SIGNING & PAVEMENT MARKING PLAN
1	PLAN SHEET INDEX PER SECTION	97	108	119	-	179	193
2		97	108	120	-	179	193
3		98	109	121	-	180	194
4		98	109	122	-	180	194
5		99	110	123	-	181	195
6		99	110	124	-	181	195
7		100	111	125	-	182	196
8		100	111	126	-	182	196
9		101	112	127	-	183	197
10		101	112	128	-	183	197
11		102	113	129	-	184	198
12		102	113	130	-	184	198

LEGEND

	INPLACE PAVEMENT		CONSTRUCTION LIMITS
	PROPOSED CONSTRUCTION		WETLAND DELINEATION - AREA OF ENVIRONMENTAL SENSITIVITY
	PROPOSED R/W		
	TEMPORARY EASEMENT		
	PERMANENT EASEMENT		
	INPLACE RAILROAD RIGHT OF WAY		
	INPLACE RIGHT OF WAY		

DATE: 9/12/2024 1:58:16 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



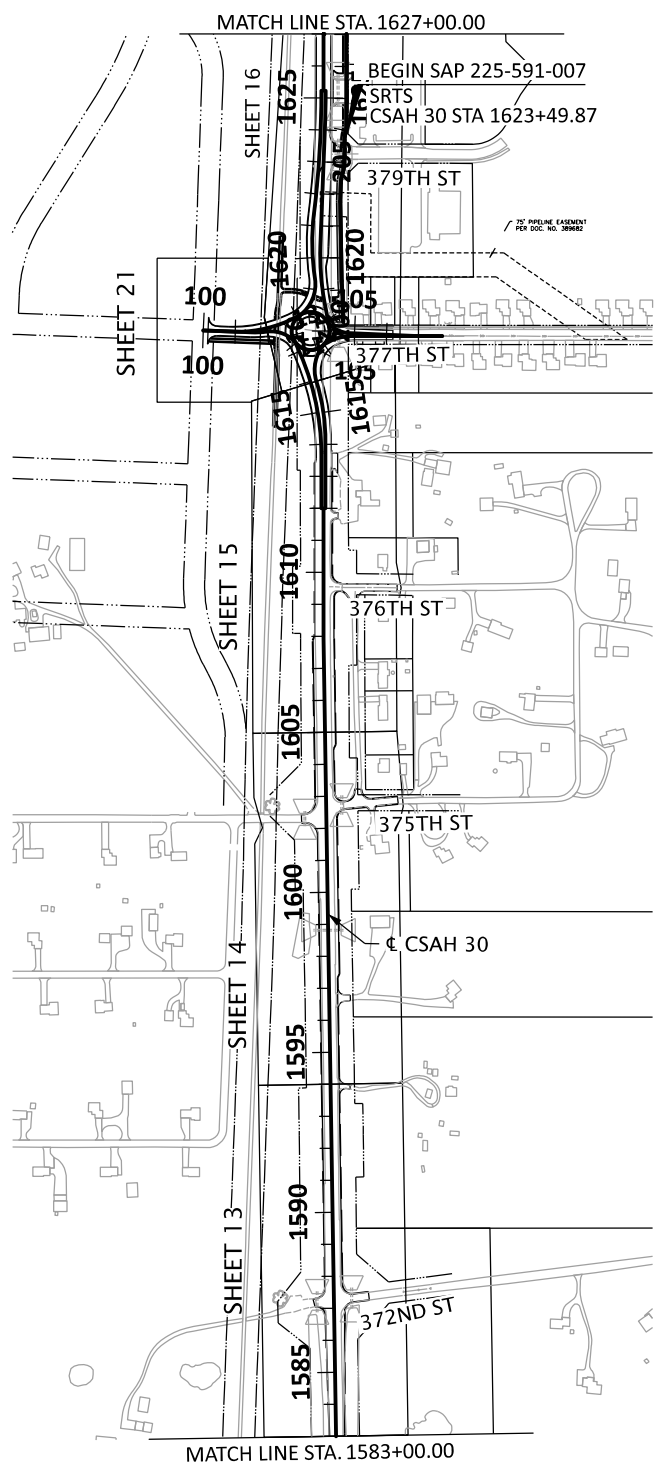
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

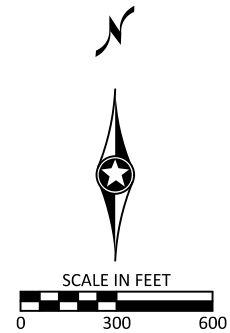
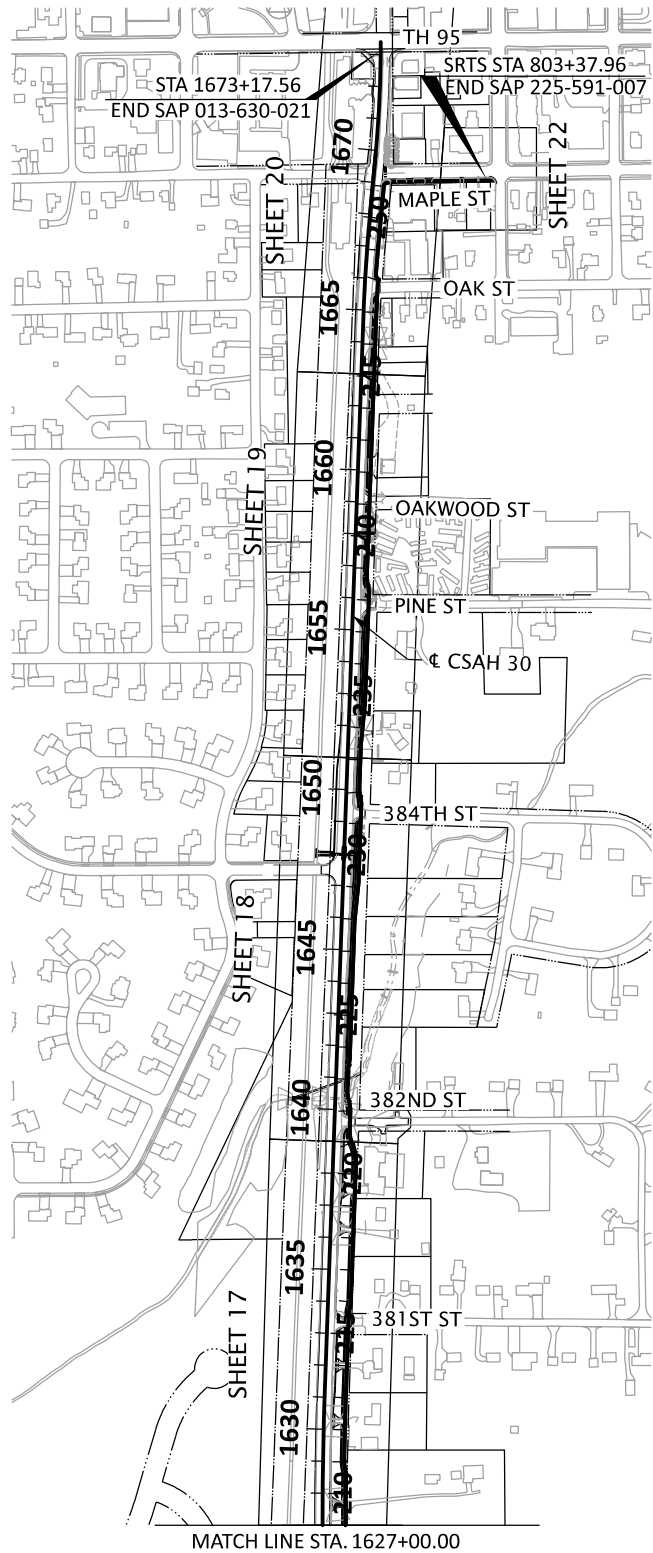
GENERAL LAYOUT
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
2
OF
216
SHEETS

CSAH 30 (Forest Blvd)



CSAH 30 (Forest Blvd)



SECTION	INPLACE TOPOGRAPHY & UTIL PLANS	REMOVAL PLANS	CONSTRUCTION PLAN & PROFILE	DRAINAGE PLAN	TURF & EROSION CONTROL PLAN	SIGNING & PAVEMENT MARKING PLAN
13	103	114	131	164	185	199
14	103	114	132	164	185	199
15	104	115	133	165	186	200
16	104	115	134	165	186	200
17	105	116	135	166	187	201
18	105	116	136	166	187	201
19	106	117	137	167	188	202
20	106	117	138	167	188	202
21	107	118	139	-	189	203
22	107	118	139	-	189	203

LEGEND			
	INPLACE PAVEMENT		CONSTRUCTION LIMITS
	PROPOSED CONSTRUCTION		WETLAND DELINEATION - AREA OF ENVIRONMENTAL SENSITIVITY
	PROPOSED R/W		
	TEMPORARY EASEMENT		
	PERMANENT EASEMENT		
	INPLACE RAILROAD RIGHT OF WAY		
	INPLACE RIGHT OF WAY		

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NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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NICHOLAS E. HENTGES, PE
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	SHEET 3 OF 216 SHEETS
GENERAL LAYOUT	
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

DATE: 9/12/2024 3:53:03 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_est

STATEMENT OF ESTIMATED QUANTITIES													
TAB	SHEET	ITEM NUMBER	DESCRIPTION	NOTES	UNITS	PROJECT TOTAL	SAP 013-630-021			50% SAP 013-630-021 50% SAP 225-102-004		SAP 225-591-007	CITY LOCAL FUNDS
							ROADWAY		STORM SEWER	ROADWAY	STORM SEWER	SAFE ROUTES TO SCHOOL	
							RECONDITIONING	RECONSTRUCTION					
							QUANTITY	QUANTITY					
		2021.501	MOBILIZATION		LUMP SUM	1	0.06	0.48	0.19	0.13	0.04	0.05	0.05
		2051.501	MAINT AND RESTORATION OF HAUL ROADS		LUMP SUM	1		1					
A	8 - 9	2101.502	CLEARING		EACH	51				1		50	
A	8 - 9	2101.502	GRUBBING		EACH	51				1		50	
A	8 - 9	2101.505	CLEARING		ACRE	0.7		0.1		0.5		0.1	
A	8 - 9	2101.505	GRUBBING		ACRE	0.7		0.1		0.5		0.1	
M	BR1	2104.502	REMOVE BOX CULVERT		EACH	2			2				
M	BR1	2104.502	REMOVE BOX CULVERT END		EACH	4			4				
A	8 - 9	2104.502	REMOVE GATE VALVE AND BOX		EACH	4				2		2	
A	8 - 9	2104.502	REMOVE HYDRANT		EACH	4				2		2	
I	190 - 191	2104.502	REMOVE DELINEATOR / MARKER		EACH	5		5					
I	190 - 191	2104.502	REMOVE SIGN		EACH	25		22		1			2
A	8 - 9	2104.502	REMOVE LIGHT FOUNDATION		EACH	6		5		1			
A	8 - 9	2104.502	SALVAGE LIGHTING UNIT		EACH	6		5		1			
I	190 - 191	2104.502	SALVAGE SIGN		EACH	5		5					
A	8 - 9	2104.502	SALVAGE MAIL BOX SUPPORT		EACH	14		8		2			4
A	8 - 9	2104.503	SAWING CONCRETE PAVEMENT (FULL DEPTH)		LIN FT	695		671		24			
A	8 - 9	2104.503	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)		LIN FT	758		648				70	40
A	8 - 9	2104.503	REMOVE PIPE CULVERTS		LIN FT	914		806		108			
A	8 - 9	2104.503	REMOVE WATER MAIN		LIN FT	110							110
A	8 - 9	2104.503	REMOVE CURB AND GUTTER		LIN FT	1120		1002				78	40
A	8 - 9	2104.503	REMOVE GUARDRAIL-PLATE BEAM		LIN FT	465		465					
A	8 - 9	2104.503	REMOVE STEEL CASING		LIN FT	100							100
A	8 - 9	2104.503	REMOVE TENSION CABLE GUARDRAIL		LIN FT	505		505					
A	8 - 9	2104.504	REMOVE PAVEMENT	(3) (4)	SQ YD	10531		8185		2346			
A	8 - 9	2104.504	REMOVE CONCRETE DRIVEWAY PAVEMENT		SQ YD	431		431					
A	8 - 9	2104.504	REMOVE BITUMINOUS DRIVEWAY PAVEMENT		SQ YD	710		540				161	9
A	8 - 9	2104.504	REMOVE BITUMINOUS PAVEMENT	(4)	SQ YD	35469		32033		2861			575
A	8 - 9	2104.518	REMOVE BITUMINOUS WALK		SQ FT	10035				10035			
A	8 - 9	2104.518	REMOVE CONCRETE WALK		SQ FT	970		237					733
J	192	2104.602	REMOVE SIGN SPECIAL		EACH	1				1			
J	192	2104.602	SALVAGE SIGN SPECIAL		EACH	7		7					
J	192	2104.602	SALVAGE SIGN PANEL SPECIAL		EACH	3		3					
F	15	2106.507	EXCAVATION - COMMON	(P)	CU YD	21939		13054		4649		3080	1156
F	15	2106.507	EXCAVATION - SUBGRADE	(P)	CU YD	20851		16494		3510			847
F	15	2106.507	SELECT GRANULAR EMBANKMENT (CV)	(P)	CU YD	24404		18751		4794			859
M	BR1	2106.507	SELECT GRANULAR EMBANKMENT MOD 10% (CV)	(P)	CU YD	11			11				
F	15	2106.507	COMMON EMBANKMENT (CV)	(P)	CU YD	13075		4181		1278		7277	339
		2106.601	DEWATERING	(2)	LUMP SUM	1		1					
		2130.523	WATER	(6)	M GALLON	400		400					
B , E	10 , 13	2211.507	AGGREGATE BASE (CV) CLASS 5	(P)	CU YD	12188		9420		1630		801	337
B , E	10 , 13	2221.509	SHOULDER BASE AGGREGATE CLASS 5 MOD		TON	494		494					
A	8 - 9	2232.504	MILL BITUMINOUS SURFACE (2.0")		SQ YD	40837	36863	3974					

- NOTES
- (1) GEOTEXTILE FILTER TYPE 4 IS INCIDENTAL.

(2) TO BE USED FOR GROUNDWATER LOWERING AS NECESSARY FOR ANY GRADING, EXCAVATION AND UTILITY CONSTRUCTION.

(3) BITUMINOUS PAVEMENT OVER CONCRETE PAVEMENT. SEE CONSTRUCTION NOTES, CONSTRUCTION PLAN & PROFILE, AND CROSS SECTIONS FOR MORE DETAILS.

(4) SEE GEOTECHNICAL REPORT FOR INPLACE PAVEMENT THICKNESSES.

(5) CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF TEMPORARY MAIL SERVICE AND FINAL MAIL BOX PLACEMENT (INCIDENTAL).

(6) TO BE USED FOR DUST CONTROL AND/OR AS DIRECTED BY THE ENGINEER.

(7) TO BE USED IN PEDESTRIAN RAMP LANDINGS PER MNDOT STANDARD PLAN 5-297.250 (SHEET 6 OF 6).

(8) SEE MISCELLANEOUS DETAILS FOR CONCRETE TRUCK APRON DETAILS.

(9) REFER TO THE BR1 THRU BR5 DETAILS IN THE PLAN SET.

(10) SANITARY STRUCTURE TO BE 48" IN DIAMETER.

(11) CYLINDER STYLE DELINEATORS TYPE X4 - 3 SHALL BE INSTALLED ON ALL GUIDE POSTS (INCIDENTAL).

(12) TRAFFIC CONTROL ITEM INCLUDES ANY AND ALL COSTS NECESSARY FOR CONTRACTOR TO STAGE AND CONSTRUCT PROJECT.

(13) 2 CASTING ASSEMBLIES TO BE USED FOR THE SANITARY SEWER STRUCTURES. 69 CASTINGS TO BE USED FOR STORM SEWER STRUCTURES.

(14) TO BE USED FOR TEMPORARY ADDRESS SIGNS.

(15) TO BE USED IF EXISTING TRAFFIC LOOPS ARE DAMAGED DURING CONSTRUCTION.

(P) DENOTES PLAN QUANTITY.

BASIS FOR QUANTITIES	
UNIT WEIGHT OF BITUMINOUS MIX: - 2360 MIX.....113 LBS/SY-IN	
TACK COAT - NEW PAVEMENT.....0.05 GAL/SY - MILLED PAVEMENT.....0.085 GAL/SY	
BITUMINOUS MATERIAL FOR FOG SEAL.....0.1 GAL/SY	
AGGREGATE BASE.....1.8 TON/CU YD SHOULDER BASE AGG CL 5 MOD.....1.8 TON/CU YD	
EROSION CONTROL & TURF ESTABLISHMENT - SEE TURF PLANS FOR RATES, VARIES BASED ON SEED MIX	

NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH
Plan By:
MKV
Checked By:
MAN
Approved By:
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NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA		SHEET 4 OF 216 SHEETS
ESTIMATED QUANTITIES		
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		

DATE: 9/12/2024 3:53:04 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_est

STATEMENT OF ESTIMATED QUANTITIES													
TAB	SHEET	ITEM NUMBER	DESCRIPTION	NOTES	UNITS	PROJECT TOTAL	SAP 013-630-021			50% SAP 013-630-021 50% SAP 225-102-004		SAP 225-591-007	CITY LOCAL FUNDS
							ROADWAY		STORM SEWER	ROADWAY	STORM SEWER	SAFE ROUTES TO SCHOOL	
							RECONDITIONING	RECONSTRUCTION					
						QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY
B	10	2355.506	BITUMINOUS MATERIAL FOR FOG SEAL		GALLON	2163	2163						
B	10	2357.506	BITUMINOUS MATERIAL FOR TACK COAT		GALLON	11170	3326	7319		403			122
B	10	2360.509	TYPE SP 12.5 NON WEARING COURSE MIXTURE (3,B)		TON	5102		4799		303			
B , E	10 , 13	2360.509	TYPE SP 12.5 WEARING COURSE MIXTURE (3,C)		TON	17081	4413	11693		641			334
B	10	2360.509	TYPE SP 12.5 WEARING COURSE MIXTURE (4;F)		TON	477				477			
B	10	2360.509	TYPE SP 12.5 NON WEARING COURSE MIXTURE (4;F)		TON	239				239			
M	BR1	2411.507	STRUCTURE EXCAVATION CLASS E		CU YD	2743			2743				
M	BR1	2412.502	9X4 PRECAST CONCRETE BOX CULVERT END SECTION	(9)	EACH	2			2				
M	BR1	2412.503	9X4 PRECAST CONCRETE BOX CULVERT	(9)	LIN FT	200			200				
M	BR1	2451.507	GRANULAR BEDDING (CV)		CU YD	183			183				
G	171	2501.502	18" GS PIPE APRON		EACH	14		14					
H	172 - 173	2501.502	15" RC PIPE APRON		EACH	2			2				
G	171	2501.502	18" RC PIPE APRON		EACH	8		8					
G	171	2501.502	24" RC PIPE APRON		EACH	6		6					
H	172 - 173	2501.502	30" RC PIPE APRON		EACH	3			1		2		
H	172 - 173	2501.502	36" RC PIPE APRON		EACH	1			1				
H	172 - 173	2501.502	15" RC SAFETY APRON		EACH	2					2		
G	171	2501.502	18" RC SAFETY APRON		EACH	2		2					
G	171	2501.503	18" CAS PIPE CULVERT		LIN FT	320		320					
G	171	2501.503	18" RC PIPE CULVERT DESIGN 3006 CLASS III		LIN FT	260		251					9
G	171	2501.503	24" RC PIPE CULVERT DESIGN 3006 CLASS III		LIN FT	300		300					
	165 - 167	2502.503	4" PERF TP PIPE DRAIN		LIN FT	450		450					
	143	2503.503	12" PVC PIPE SEWER		LIN FT	280							280
H	172 - 173	2503.503	15" RC PIPE SEWER DESIGN 3006 CLASS V		LIN FT	3307			1944		1363		
H	172 - 173	2503.503	18" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	1012			1012				
H	172 - 173	2503.503	24" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	2054			2054				
H	172 - 173	2503.503	30" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	947			477		470		
H	172 - 173	2503.503	36" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	267			267				
	143	2503.602	CONNECT TO EXISTING MANHOLES (SAN)		EACH	1							1
	143	2503.603	20" STEEL CASING PIPE		LIN FT	90							90
	143	2504.602	CONNECT TO EXISTING WATER MAIN		EACH	4							4
	143	2504.602	HYDRANT		EACH	4							4
A	8 - 9	2504.602	ADJUST HYDRANT AND GATE VALVE		EACH	1						1	
A	8 - 9	2504.602	ADJUST GATE VALVE AND BOX		EACH	2				2			
	143	2504.602	6" GATE VALVE AND BOX		EACH	4							4
	143	2504.603	6" WATERMAIN DUCTILE IRON CL 52		LIN FT	44							44
	143	2504.603	10" WATERMAIN DUCTILE IRON CL 52		LIN FT	170							170
	143	2504.603	16" STEEL CASING PIPE		LIN FT	150							150
H	172 - 173	2506.502	CASTING ASSEMBLY	(13)	EACH	70			50		18		2
A	8 - 9	2506.502	ADJUST FRAME AND RING CASTING		EACH	2		1					1
H	172 - 173	2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN G		LIN FT	96			87		9		
H	172 - 173	2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48-4020		LIN FT	324			223		101		
H	172 - 173	2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60-4020		LIN FT	29			17		12		

- NOTES
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BASIS FOR QUANTITIES

UNIT WEIGHT OF BITUMINOUS MIX:
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TACK COAT
- NEW PAVEMENT.....0.05 GAL/SY
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BITUMINOUS MATERIAL FOR FOG SEAL.....0.1 GAL/SY

AGGREGATE BASE.....1.8 TON/CU YD
SHOULDER BASE AGG CL 5 MOD.....1.8 TON/CU YD

EROSION CONTROL & TURF ESTABLISHMENT
- SEE TURF PLANS FOR RATES, VARIES BASED ON SEED MIX

NO.	DATE	BY	CHK	REVISIONS

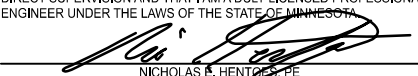
Design By:
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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024

LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

ESTIMATED QUANTITIES

SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET

5

OF

216

SHEETS

DATE: 9/12/2024 3:53:05 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_est

STATEMENT OF ESTIMATED QUANTITIES													
TAB	SHEET	ITEM NUMBER	DESCRIPTION	NOTES	UNITS	PROJECT TOTAL	SAP 013-630-021			50% SAP 013-630-021 50% SAP 225-102-004		SAP 225-591-007	CITY LOCAL FUNDS
							ROADWAY		STORM SEWER	ROADWAY	STORM SEWER	SAFE ROUTES TO SCHOOL	
							RECONDITIONING	RECONSTRUCTION					
A	8 - 9	2506.602	ADJUST FRAME AND RING CASTING (SPECIAL)		EACH	2		1		1			
	143	2506.603	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL	(10)	LIN FT	11							10.5
A	8 - 9	2506.603	RECONSTRUCT DRAINAGE STRUCTURE SPECIAL		LIN FT	6.2							6.2
M	BR1	2511.504	GEOTEXTILE FILTER TYPE 7		SQ YD	398			398				
M	BR1	2511.507	RANDOM RIPRAP CLASS I		CU YD	7			7				
G, H	171 - 173	2511.507	RANDOM RIPRAP CLASS II	(1)	CU YD	62.8		35.8	18.8		8		
M	BR1	2511.507	RANDOM RIPRAP CLASS III		CU YD	400			400				
C	11	2521.518	4" CONCRETE WALK		SQ FT	19101		485		14310		3546	760
C	11	2521.518	7" CONCRETE WALK	(8)	SQ FT	3525				3525			
B	10	2521.518	3" BITUMINOUS WALK		SQ FT	49336				11408		37928	
C	11	2521.602	DRILL AND GROUT REINF BAR (EPOXY COATED)	(7)	EACH	93				33		60	
C	11	2521.618	CONCRETE CURB RAMP WALK		SQ FT	4449		528		1619		2302	
C	11	2531.503	CONCRETE CURB AND GUTTER DESIGN B612		LIN FT	270		163					107
C	11	2531.503	CONCRETE CURB AND GUTTER DESIGN B624		LIN FT	9892		9004		286		32	570
C	11	2531.503	CONCRETE CURB AND GUTTER DESIGN R424		LIN FT	374				374			
C	11	2531.503	CONCRETE CURB AND GUTTER DESIGN S524		LIN FT	3687				3687			
E	13	2531.504	6" CONCRETE DRIVEWAY PAVEMENT		SQ YD	340		340					
E	13	2531.504	8" CONCRETE DRIVEWAY PAVEMENT		SQ YD	628		503					125
C	11	2531.618	TRUNCATED DOMES		SQ FT	580				160		420	
	133 - 137	2540.602	INSTALL MAIL BOX SUPPORT	(5)	EACH	14		8		2			4
L	213	2545.502	LIGHTING UNIT TYPE 9-30		EACH	11				11			
	134 - 138	2545.502	LIGHT FOUNDATION DESIGN E		EACH	6		5		1			
L	213	2545.502	LIGHT FOUNDATION DESIGN STEEL E		EACH	11				11			
L	213	2545.502	SERVICE CABINET -TYPE L1		EACH	1				1			
L	213	2545.502	SERVICE EQUIPMENT		EACH	1				1			
L	213	2545.502	EQUIPMENT PAD B		EACH	1				1			
L	213	2545.503	2" NON-METALLIC CONDUIT		LIN FT	1500				1500			
L	213	2545.503	UNDERGROUND WIRE 1/C 8 AWG		LIN FT	6500				6500			
	134 - 138	2545.602	INSTALL LIGHTING UNIT		EACH	6		5		1			
G, H	171 - 173	2554.502	GUIDE POST TYPE B	(11)	EACH	21		13	4		4		
	136	2557.503	WIRE FENCE DESIGN 48V-9322		LIN FT	50		50					
		2563.601	TRAFFIC CONTROL	(12)	LUMP SUM	1	0.06	0.48	0.19	0.13	0.04	0.05	0.05
		2563.613	PORTABLE CHANGEABLE MESSAGE SIGN		UNIT DAY	100		100					
		2563.618	CONSTRUCTION SIGN SPECIAL	(14)	SQ FT	7		7					
I	190 - 191	2564.602	INSTALL SIGN		EACH	5		5					
J	192	2564.602	INSTALL SIGN SPECIAL		EACH	7		7					
J	192	2564.602	INSTALL SIGN PANEL SPECIAL		EACH	3		3					
I	190 - 191	2564.602	DELINEATOR / MARKER		EACH	3		1		2			
I	190 - 191	2564.602	DELINEATOR / MARKER PANEL		EACH	13		6		4			3

- NOTES
- (1) GEOTEXTILE FILTER TYPE 4 IS INCIDENTAL.

(2) TO BE USED FOR GROUNDWATER LOWERING AS NECESSARY FOR ANY GRADING, EXCAVATION AND UTILITY CONSTRUCTION.

(3) BITUMINOUS PAVEMENT OVER CONCRETE PAVEMENT. SEE CONSTRUCTION NOTES CONSTRUCTION PLAN & PROFILE, AND CROSS SECTIONS FOR MORE DETAILS.

(4) SEE GEOTECHNICAL REPORT FOR INPLACE PAVEMENT THICKNESSES.

(5) CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF TEMPORARY MAIL SERVICE AND FINAL MAIL BOX PLACEMENT (INCIDENTAL).

(6) TO BE USED FOR DUST CONTROL AND/OR AS DIRECTED BY THE ENGINEER.

(7) TO BE USED IN PEDESTRIAN RAMP LANDINGS PER MNDOT STANDARD PLAN 5-297.250 (SHEET 6 OF 6).

(8) SEE MISCELLANEOUS DETAILS FOR CONCRETE TRUCK APRON DETAILS.

(9) REFER TO THE BR1 THRU BR5 DETAILS IN THE PLAN SET.

(10) SANITARY STRUCTURE TO BE 48" IN DIAMETER.

(11) CYLINDER STYLE DELINEATORS TYPE X4 - 3 SHALL BE INSTALLED ON ALL GUIDE POSTS (INCIDENTAL).

(12) TRAFFIC CONTROL ITEM INCLUDES ANY AND ALL COSTS NECESSARY FOR CONTRACTOR TO STAGE AND CONSTRUCT PROJECT.

(13) 2 CASTING ASSEMBLIES TO BE USED FOR THE SANITARY SEWER STRUCTURES. 69 CASTINGS TO BE USED FOR STORM SEWER STRUCTURES.

(14) TO BE USED FOR TEMPORARY ADDRESS SIGNS.

(15) TO BE USED IF EXISTING TRAFFIC LOOPS ARE DAMAGED DURING CONSTRUCTION.

(P) DENOTES PLAN QUANTITY.

BASIS FOR QUANTITIES	
UNIT WEIGHT OF BITUMINOUS MIX: - 2360 MIX.....113 LBS/SY-IN	
TACK COAT - NEW PAVEMENT.....0.05 GAL/SY - MILLED PAVEMENT.....0.085 GAL/SY	
BITUMINOUS MATERIAL FOR FOG SEAL.....0.1 GAL/SY	
AGGREGATE BASE.....1.8 TON/CU YD SHOULDER BASE AGG CL 5 MOD.....1.8 TON/CU YD	
EROSION CONTROL & TURF ESTABLISHMENT - SEE TURF PLANS FOR RATES, VARIES BASED ON SEED MIX	

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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



NICHOLAS E. HENTGES, PE

DATE: 9/12/2024

LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

ESTIMATED QUANTITIES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 6 OF 216 SHEETS

DATE: 9/12/2024 3:53:06 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_est

STATEMENT OF ESTIMATED QUANTITIES													
TAB	SHEET	ITEM NUMBER	DESCRIPTION	NOTES	UNITS	PROJECT TOTAL	SAP 013-630-021			50% SAP 013-630-021 50% SAP 225-102-004		SAP 225-591-007	CITY LOCAL FUNDS
							ROADWAY		STORM SEWER	ROADWAY	STORM SEWER	SAFE ROUTES TO SCHOOL	
							RECONDITIONING	RECONSTRUCTION					
							QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY
I	190 - 191	2564.618	SIGN		SQ FT	682		441		173			68
	209	2565.602	RIGID PVC LOOP DETECTOR 6'X6'	(15)	EACH	9		9					
	215 - 216	2565.616	PEDESTRIAN CROSSWALK FLASHER SYSTEM		SYSTEM	3		1		1			1
		2573.501	STABILIZED CONSTRUCTION EXIT		LUMP SUM	1		1					
		2573.501	EROSION CONTROL SUPERVISOR		LUMP SUM	1		1					
D	12	2573.502	STORM DRAIN INLET PROTECTION		EACH	78		58		16			4
D	12	2573.502	CULVERT END CONTROLS		EACH	17		9				8	
D	12	2573.503	SILT FENCE, TYPE MS		LIN FT	8278		6915		474		889	
D	12	2573.503	SEDIMENT CONTROL LOG TYPE STRAW		LIN FT	3678		2078		729		597	274
M	BR1	2573.602	TEMPORARY STREAM DIVERSION SYSTEM		EACH	1			1				
D	12	2574.508	FERTILIZER TYPE 1		POUND	2270		1782		397			91
D	12	2574.508	FERTILIZER TYPE 3		POUND	1114		542		154		404	14
D	12	2575.504	RAPID STABILIZATION METHOD 4		SQ YD	31170		24484				5450	1236
D	12	2575.505	SEEDING		ACRE	12.3		8		1.9		1.8	0.6
D	12	2575.505	DISK ANCHORING		ACRE	8.4		6.4		1.5			0.5
D	12	2575.508	HYDRAULIC STABILIZED FIBER MATRIX		POUND	9445		4609		1306		3420	110
D	12	2575.509	MULCH MATERIAL TYPE 3		TON	12.4		9.7		2.2			0.5
D	12	2575.523	RAPID STABILIZATION METHOD 3		M GALLON	22		11		3		8	1
D	12	2575.608	SEED TURFGRASS		POUND	645		314		89		234	8
D	12	2575.608	SEED MESIC INSLOPE		POUND	648		441		105		80	22
K	192	2582.503	4" SOLID LINE PAINT		LIN FT	9597	3065	6532					
K	192	2582.503	6" SOLID LINE PAINT		LIN FT	44609	25698	18911					
K	192	2582.503	24" SOLID LINE PAINT		LIN FT	545		503					42
K	192	2582.503	4" BROKEN LINE PAINT		LIN FT	3950	2610	1340					
K	192	2582.503	6" DOTTED LINE PAINT		LIN FT	37		37					
K	192	2582.503	10" DOTTED LINE PAINT		LIN FT	88	88						
K	192	2582.503	4" DOUBLE SOLID LINE PAINT		LIN FT	6680		5904					776
K	192	2582.503	4" SOLID LINE PAINT GROUND IN (WR)		LIN FT	2869		1089		1543			237
K	192	2582.503	6" SOLID LINE PAINT GROUND IN (WR)		LIN FT	3856		1815		2041			
K	192	2582.503	6" DOTTED LINE PAINT GROUND IN (WR)		LIN FT	46		23		23			
K	192	2582.503	12" DOTTED LINE PREFORM THERMO GROUND IN		LIN FT	86				43			43
K	192	2582.518	PAVEMENT MESSAGE PAINT		SQ FT	1105	79	995		31			
K	192	2582.518	CROSSWALK PREFORM THERMOPLASTIC		SQ FT	474		474					
K	192	2582.518	CROSSWALK PREFORM THERMOPLASTIC GROUND IN		SQ FT	360				180			180

- NOTES
- (1) GEOTEXTILE FILTER TYPE 4 IS INCIDENTAL.

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(P) DENOTES PLAN QUANTITY.

BASIS FOR QUANTITIES

UNIT WEIGHT OF BITUMINOUS MIX:
- 2360 MIX.....113 LBS/SY-IN

TACK COAT
- NEW PAVEMENT.....0.05 GAL/SY
- MILLED PAVEMENT.....0.085 GAL/SY

BITUMINOUS MATERIAL FOR FOG SEAL.....0.1 GAL/SY

AGGREGATE BASE.....1.8 TON/CU YD
SHOULDER BASE AGG CL 5 MOD.....1.8 TON/CU YD

EROSION CONTROL & TURF ESTABLISHMENT
- SEE TURF PLANS FOR RATES, VARIES BASED ON SEED MIX

NO.	DATE	BY	CHK	REVISIONS	Design By: NEH	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  NICHOLAS E. HENTGES, PE DATE: 9/12/2024 LICENSE NO. 44620			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA		SHEET 7 OF 216 SHEETS
				Plan By: MKV	ESTIMATED QUANTITIES SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004							
				Checked By: MAN								
				Approved By: NEH								

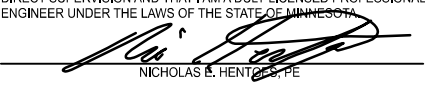
DATE: 9/12/2024 1:58:42 PM
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REMOVALS TABULATION														A
LOCATION	CLEARING	GRUBBING	CLEARING	GRUBBING	REMOVE BITUMINOUS PAVEMENT	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	REMOVE CONCRETE DRIVEWAY PAVEMENT	REMOVE PAVEMENT	MILL BITUMINOUS SURFACE (2.0")	REMOVE CONCRETE WALK	REMOVE BITUMINOUS WALK	REMOVE CURB AND GUTTER	SAWING BIT PAVEMENT (FULL DEPTH)	SAWING CONC PAVEMENT (FULL DEPTH)
	ACRE	ACRE	EACH	EACH	SQ YD	SQ YD	SQ YD	SQ YD	SQ YD	SQ FT	SQ FT	LIN FT	LIN FT	LIN FT
SAP 013-630-021														
CSAH 30														
STA 1454+81.68 TO STA 1462+00									2223					
STA 1462+00 TO STA 1473+00									2934					
STA 1473+00 TO STA 1484+00									2934					
STA 1484+00 TO STA 1495+00									2934					
STA 1495+00 TO STA 1506+00									2934					
STA 1506+00 TO STA 1517+00									2934					
STA 1517+00 TO STA 1528+00									4774					
STA 1528+00 TO STA 1539+00									3336					
STA 1539+00 TO STA 1550+00									3266					
STA 1550+00 TO STA 1561+00									2934					
STA 1561+00 TO STA 1572+00									2934					
STA 1572+00 TO STA 1582+20									2726					
TOTAL RECONDITIONING SAP 013-630-021									36863					
STA 1582+20 TO STA 1594+00					4603			1759					40	72
STA 1594+00 TO STA 1605+00					4650			1200					25	18
STA 1605+00 TO STA 1613+73					3929	53		728					15	24
STA 1622+85 TO STA 1627+00	0.1	0.1			2590		431	80				70	40	125
STA 1627+00 TO STA 1639+00					6070	312		282					77	168
STA 1639+00 TO STA 1651+00					5729			775					32	216
STA 1651+00 TO STA 1663+00					3541	175		2667				236	55	24
STA 1663+00 TO STA 1673+17.56					780			694	3974	237		696	292	24
SUBTOTAL RECONSTRUCTION	0.1	0.1			31892	540	431	8185	3974	237		1002	576	671
SIDE STREETS														
362ND ST														
STA 101+23.92 TO STA 102+94														
364TH ST														
STA 119+57 TO STA 201+26.54														
372ND ST														
STA 299+60 TO STA 300+23.68					141								25	
375TH ST													25	
STA 399+60.04 TO STA 401+25														
376TH ST														
STA 499+65 TO STA 501+30.52														
382ND ST														
STA 599+61 TO STA 601+30.70													22	
SUBTOTAL SIDE STREETS RECONSTRUCTION					141								72	
TOTALRECONSTRUCTION SAP 013-630-021	0.1	0.1			32033	540	431	8185	3974	237		1002	648	671
SAP 013-630-021 / SAP 225-102-004 (50/50)														
1613+73 TO 1616+00					594			616			994			
1616+00 TO 1618+75	0.5	0.5	1	1	1065			693			5546			
1618+75 TO 1622+85					1202			1037			3495			24
TOTAL SAP 013-630-021 / SAP 225-102-004 (50/50)	0.5	0.5	1	1	2861			2346			10035			24
SRTS: SAP 225-591-007														
TRAIL														
STA 800+00.00 TO STA 803+37.96			6	6		161						78	70	
CSAH 30														
STA 205+48.38 TO 209+01.30			1	1										
STA 209+01.30 TO STA 221+02.28			7	7										
STA 221+02.28 TO STA 233+05.61	0.1	0.1	7	7										
STA 233+05.61 TO STA 245+06.61			20	20										
STA 245+06.61 TO STA 251+16.39			9	9										
TOTAL SAP 225-591-007	0.1	0.1	50	50		161						78	70	
CITY LOCAL FUNDS														
377TH ST														
STA 101+53.82 TO STA 102+82						9				733				
STA 105+78 TO STA 107+64.69					575								40	
CSAH 30														
STA 101+53.82 TO STA 102+82												40		
TOTAL CITY LOCAL FUNDS					575	9				733		40	40	
TOTAL	0.7	0.7	51	51	35469	710	431	10531	40837	970	10035	1120	758	695

NOTES:
- SAWING OF EXISTING CURB AND GUTTER, CONCRETE WALK, AND BITUMINOUS TRAILS IS INCIDENTAL.
- SEE GEOTECHNICAL REPORT FOR INPLACE BITUMINOUS AND CONCRETE PAVEMENT THICKNESS

NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH
Plan By:
MKV
Checked By:
MAN
Approved By:
NEH

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.

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024
LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

QUANTITY TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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OF
216
SHEETS

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REMOVALS TABULATION															A
LOCATION	REMOVE PIPE CULVERTS	RECONSTRUCT DRAINAGE STRUCTURE SPECIAL	REMOVE WATERMAIN	REMOVE STEEL CASING	REMOVE GUARDRAIL - PLATE BEAM	REMOVE TENSION CABLE GUARDRAIL	ADJUST FRAME & RING CASTING	ADJUST FRAME & RING CASTING (SPECIAL)	SALVAGE MAILBOX SUPPORT	SALVAGE LIGHTING UNIT	REMOVE LIGHT FOUNDATION	ADJUST GATE VALVE AND BOX	ADJUST HYDRANT & GATE VALVE	REMOVE HYDRANT	REMOVE GATE VALVE AND BOX
	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
SAP 013-630-021															
CSAH 30															
STA 1454+81.68 TO STA 1462+00															
STA 1462+00 TO STA 1473+00															
STA 1473+00 TO STA 1484+00															
STA 1484+00 TO STA 1495+00															
STA 1495+00 TO STA 1506+00															
STA 1506+00 TO STA 1517+00															
STA 1517+00 TO STA 1528+00															
STA 1528+00 TO STA 1539+00															
STA 1539+00 TO STA 1550+00															
STA 1550+00 TO STA 1561+00															
STA 1561+00 TO STA 1572+00															
STA 1572+00 TO STA 1582+20															
TOTAL RECONDITIONING SAP 013-630-021															
STA 1582+20 TO STA 1594+00	229								2						
STA 1594+00 TO STA 1605+00	208								1						
STA 1605+00 TO STA 1613+73									1						
STA 1622+85 TO STA 1627+00	194														
STA 1627+00 TO STA 1639+00	116								2						
STA 1639+00 TO STA 1651+00					465					1	1				
STA 1651+00 TO STA 1663+00	32					435			1	3	3				
STA 1663+00 TO STA 1673+17.56	27					70	1	1		1	1				
SUBTOTAL RECONSTRUCTION	806				465	505	1	1	7	5	5				
SIDE STREETS															
362ND ST															
STA 101+23.92 TO STA 102+94															
364TH ST															
STA 119+57 TO STA 201+26.54															
372ND ST															
STA 299+60 TO STA 300+23.68															
375TH ST									1						
STA 399+60.04 TO STA 401+25															
376TH ST															
STA 499+65 TO STA 501+30.52															
382ND ST															
STA 599+61 TO STA 601+30.70															
SUBTOTAL SIDE STREETS RECONSTRUCTION									1						
TOTALRECONSTRUCTION SAP 013-630-021	806				465	505	1	1	8	5	5				
SAP 013-630-021 / SAP 225-102-004 (50/50)															
1613+73 TO 1616+00									2						
1616+00 TO 1618+75	108							1		1	1	2		2	2
1618+75 TO 1622+85															
TOTAL SAP 013-630-021 / SAP 225-102-004 (50/50)	108							1	2	1	1	2		2	2
SRTS: SAP 225-591-007															
TRAIL															
STA 800+00.00 TO STA 803+37.96															
CSAH 30															
STA 205+48.38 TO 209+01.30														1	1
STA 209+01.30 TO STA 221+02.28															
STA 221+02.28 TO STA 233+05.61															
STA 233+05.61 TO STA 245+06.61													1		
STA 245+06.61 TO STA 251+16.39														1	1
TOTAL SAP 225-591-007													1	2	2
CITY LOCAL FUNDS															
377TH ST															
STA 101+53.82 TO STA 102+82															
STA 105+78 TO STA 107+64.69		6.2	110	100					4						
377TH ST															
STA 101+53.82 TO STA 102+82							1								
TOTAL CITY LOCAL FUNDS		6.2	110	100			1		4						
TOTAL	914	6.2	110	100	465	505	2	2	14	6	6	2	1	4	4

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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.	
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

QUANTITY TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

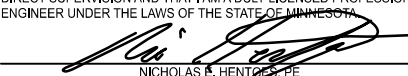
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BITUMINOUS & AGGREGATE TABULATION									B
LOCATION	3" BITUMINOUS WALK	TYPE SP 12.5 NON-WEARING COURSE MIX (SPNWB330B)	TYPE SP 12.5 WEARING COURSE MIX (SPWEB340C)	TYPE SP 12.5 NON-WEARING COURSE MIX (SPNWB430F)	TYPE SP 12.5 WEARING COURSE MIX (SPWEB440F)	AGGREGATE BASE (CV) CLASS 5	BITUMINOUS MATERIAL FOR FOG SEAL	BITUMINOUS MATERIAL FOR TACK COAT	SHOULDER BASE AGGREGATE CLASS 5 MOD
	SQ FT	TONS	TONS	TONS	TONS	CU YD	GAL	GAL	TONS
CHISAGO COUNTY SAP 013-630-021									
CSAH 30									
STA 1454+81.68 TO STA 1462+00			263				114	199	
STA 1462+00 TO STA 1473+00			349				206	263	
STA 1473+00 TO STA 1484+00			349				206	263	
STA 1484+00 TO STA 1495+00			349				206	263	
STA 1495+00 TO STA 1506+00			349				206	263	
STA 1506+00 TO STA 1517+00			349				206	263	
STA 1517+00 TO STA 1528+00			581				67	437	
STA 1528+00 TO STA 1539+00			406				171	306	
STA 1539+00 TO STA 1550+00			394				179	298	
STA 1550+00 TO STA 1561+00			349				206	263	
STA 1561+00 TO STA 1572+00			349				206	263	
STA 1572+00 TO STA 1582+20			326				190	245	
TOTAL RECONDITIONING SAP 013-630-021			4413				2163	3326	
STA 1582+20 TO STA 1594+00		652	1698			1349		1040	124
STA 1594+00 TO STA 1605+00		707	1733			1357		1080	129
STA 1605+00 TO STA 1613+73		558	1373			1128		855	102
STA 1622+85 TO STA 1627+00		284	568			559		377	
STA 1627+00 TO STA 1639+00		785	1570			1283		1043	
STA 1639+00 TO STA 1651+00		834	1668			1386		1107	
STA 1651+00 TO STA 1663+00		793	1585			1307		1053	
STA 1663+00 TO STA 1673+17.56		186	841			369		601	
SUBTOTAL RECONSTRUCTION		4799	11036			8738		7156	355
SIDE STREETS									
362ND ST									
STA 101+23.92 TO STA 102+94									
364TH ST									
STA 199+57 TO STA 201+26.54									
372ND ST									
STA 299+60 TO STA 300+23.68			36			31		15	5
375TH ST									
STA 399+60.04 TO STA 401+25			108			95		44	17
376TH ST									
STA 499+65 TO STA 501+30.52			124			108		50	2
382ND ST									
STA 599+61 TO STA 601+30.70			135			118		54	
SUBTOTAL SIDE STREETS RECONSTRUCTION			403			352		163	24
TOTAL RECONSTRUCTION SAP 013-630-021		4799	11439			9090		7319	379
SAP 013-630-021 / SAP 225-102-004 (50/50)									
1613+73 TO 1616+00	1081	99	197			270		132	
1616+00 TO 1618+75	4365			239	477	712			
1618+75 TO 1622+85	5962	204	408			648		271	
TOTAL SAP 013-630-021 / SAP 225-102-004 (50/50)	11408	303	605	239	477	1630		403	
SRTS: SAP 225-591-007									
WALK									
STA 800+00.00 TO STA 803+37.96						41			
TRAIL									
STA 205+48.38 TO 209+01.30	2827					54			
STA 209+01.30 TO STA 221+02.28	12114					227			
STA 221+02.28 TO STA 233+05.61	9547					185			
STA 233+05.61 TO STA 245+06.61	10931					214			
STA 245+06.61 TO STA 251+16.39	2509					53			
TOTAL SAP 225-591-007	37928					774			
CITY LOCAL FUNDS									
377TH ST									
STA 101+53.82 TO STA 102+82			184			182		73	
STA 105+78 TO STA 107+64.69			121			134		49	
TOTAL CITY LOCAL FUNDS			305			316		122	
TOTAL	49336	5102	16762	239	477	11810	2163	11170	379

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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.	
	NICHOLAS E. HENTGES, PE
DATE: 9/12/2024	LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
QUANTITY TABULATIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 10 OF 216 SHEETS

DATE: 9/12/2024 1:58:45 PM
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CONCRETE									C
LOCATION	CURB AND GUTTER DESIGN B624	CURB AND GUTTER DESIGN B612	CURB AND GUTTER DESIGN R424	CURB AND GUTTER DESIGN S524	4" CONCRETE WALK	CONCRETE CURB RAMP WALK	7" CONCRETE WALK	DRILL & GROUT REINFORCEMENT BARS (EPOXY COATED)	TRUNCATED DOMES
	LIN FT	LIN FT	LIN FT	LIN FT	SQ FT	SQ FT	SQ FT	EACH	SQ FT
SAP 013-630-021									
CSAH 30									
STA 1582+20 TO STA 1594+00									
STA 1594+00 TO STA 1605+00									
STA 1605+00 TO STA 1613+73									
STA 1622+85 TO STA 1627+00	856	116				194			
STA 1627+00 TO STA 1639+00	2411								
STA 1639+00 TO STA 1651+00	2465	47			485	334			
STA 1651+00 TO STA 1663+00	2456								
STA 1663+00 TO STA 1673+17.56	816								
TOTALRECONSTRUCTION SAP 013-630-021	9004	163			485	528			
SAP 013-630-021 / SAP 225-102-004 (50/50)									
1613+73 TO 1616+00				896	2672	53			
1616+00 TO 1618+75	286		374	1193	4327	1531	3525	33	160
1618+75 TO 1622+85				1598	7311	35			
TOTAL SAP 013-630-021 / SAP 225-102-004 (50/50)	286		374	3687	14310	1619	3525	33	160
SRTS: SAP 225-591-007									
WALK									
STA 800+00.00 TO STA 803+37.96	32				1954	63		3	12
TRAIL									
STA 205+48.38 TO 209+01.30						97			20
STA 209+01.30 TO STA 221+02.28						185			40
STA 221+02.28 TO STA 233+05.61						622		30	128
STA 233+05.61 TO STA 245+06.61						839		9	144
STA 245+06.61 TO STA 251+16.39					1592	496		18	76
TOTAL SAP 225-591-007	32				3546	2302		60	420
CITY LOCAL FUNDS									
377TH ST									
STA 101+53.82 TO STA 102+82	317	82							
STA 105+78 TO STA 107+64.69	253				760				
CSAH 30									
STA 1622+85 TO STA 1627+00		25							
TOTAL CITY LOCAL	570	107			760				
TOTAL	9892	270	374	3687	19101	4449	3525	93	580

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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NICHOLAS E. HENTGES, PE	
DATE: 9/12/2024	LICENSE NO. 44620





CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
QUANTITY TABULATIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

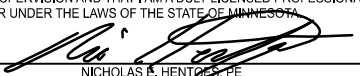
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TURF ESTABLISHMENT & EROSION CONTROL														D
LOCATION	SEEDING	DISK ANCHORING	SEED TURFGRASS	SEED MESIC INLSOPE RESIDENT/RURAL	FERTILIZER TYPE 3 22-5-10 RESIDENT/BLVD	FERTILIZER TYPE 1 20-10-20 RURAL INSLOPE	MULCH MATERIAL TYPE 3	HYDRAULIC STABILIZED FIBER MATRIX	RAPID STABILIZATION METHOD 3	RAPID STABILIZATION METHOD 4	STORM DRAIN INLET PROTECTION	CULVERT END CONTROLS	SILT FENCE, TYPE MS	SEDIMENT CONTROL LOG, TYPE STRAW
	ACRE	ACRE	POUND	POUND	POUND	POUND	TONS	POUND	MGAL	SQ YD	EACH	EACH	LIN FT	LIN FT
SAP 013-630-021														
CSAH 30														
STA 1582+20 TO STA 1594+00	0.9	0.9		58		306	1.6			4217		3	2596	952
STA 1594+00 TO STA 1605+00	1.3	1.3		73		389	2.1			5363		4	2031	215
STA 1605+00 TO STA 1613+73	1.0	1.0		59		312	1.7			4298		1	1414	320
STA 1622+85 TO STA 1627+00	0.6	0.4	50	35	86	97	0.5	734	1.5	1329	3			
STA 1627+00 TO STA 1639+00	1.5	0.7	160	90	279	203	1.1	2378	5.0	2789	12		159	159
STA 1639+00 TO STA 1651+00	1.0	0.7	53	59	92	222	1.2	778	2.0	3054	18	1	137	137
STA 1651+00 TO STA 1663+00	0.6	0.5	31	35	54	131	0.7	455	1.0	1797	12			
STA 1663+00 TO STA 1673+17.56	0.3	0.3	6	10	9	40	0.3	75	0.5	543	13			
SUBTOTAL RECONSTRUCTION	7.2	5.8	300	419	520	1700	9.2	4420	10	23390	58	9	6337	1783
SIDE STREETS														
372ND ST														
STA 299+60 TO STA 300+23.68	0.2	0.2		4		19	0.1			246			121	121
375TH ST														
STA 400+61.31 TO STA 403+23	0.2	0.2		6		27	0.2			365			316	
376TH ST														
STA 499+65 TO STA 501+30.52	0.2	0.2		7		36	0.2			483			141	174
382ND ST														
STA 403+00 TO STA 406+92	0.2		14.0	5	22			189	0.5					
SUBTOTAL SIDE STREETS RECONSTRUCTION	0.8	0.6	14.0	22	22	82	0.5	189	0.5	1094.0			578.0	295
TOTAL RECONSTRUCTION SAP 013-630-021	8	6.4	314	441	542	1782	9.7	4609	10.5	24484	58	9	6915	2078
SAP 013-630-021 / SAP 225-102-004 (50/50)														
1613+73 TO 1616+00	0.4	0.4		18.0		94	0.5			1279.0				
1616+00 TO 1618+75	0.7	0.7	13.0	41.0	22	196	1.1	182	0.5	2701.0	11			274
1618+75 TO 1622+85	0.8	0.4	76.0	46.0	132	107	0.6	1124	2.5	1470.0	5		474	455
TOTAL SAP 013-630-021 / SAP 225-102-004 (50/50)	1.9	1.5	89	105	154	397	2.2	1306	3.0	5450	16		474	729
SRTS: SAP 225-591-007														
WALK														
STA 800+00.00 TO STA 803+37.96	0.2		14	5	24			197	0.5					
TRAIL														
STA 205+48.38 TO 209+01.30	0.2		13	5	20			171	0.5			1		312
STA 209+01.30 TO STA 221+02.28	0.2		21	7	36			302	1.0			6		
STA 221+02.28 TO STA 233+05.61	0.6		110	37	192			1635	3.5				889	285
STA 233+05.61 TO STA 245+06.61	0.4		59	20	102			867	2.0			1		
STA 245+06.61 TO STA 251+16.39	0.2		17	6	30			248	0.5					
TOTAL SAP 225-591-007	1.8		234	80	404			3420	8.0			8	889	597
CITY LOCAL FUNDS														
377TH ST														
STA 101+53.82 TO STA 102+82	0.4	0.3	8	18	14	77	0.4	110	0.5	1061	2			
STA 105+78 TO STA 107+64.49	0.2	0.2		4		14	0.1			175	2			274
TOTAL CITY LOCAL	0.6	0.5	8	22	14	91	0.5	110	0.5	1236	4			274
TOTAL	12.3	8.4	645	648	1114	2270	12.4	9445	22	31170	78	17	8278	3678

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
QUANTITY TABULATIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

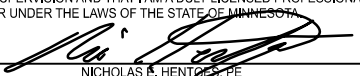
SHEET 12 OF 216 SHEETS

DATE: 9/12/2024 1:58:46 PM
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DRIVEWAY TABULATION					E
LOCATION	TYPE SP 12.5 WEARING COURSE MIX (3,C) (SPWEB340C)	AGGREGATE BASE (CV) CLASS 5	SHOULDER BASE AGGREGATE CLASS 5 MOD	6" CONCRETE DRWY PAVEMENT	8" CONCRETE DRWY PAVEMENT
	TONS	CU YD	TONS	SY	SY
SAP 013-630-021					
CSAH 30					
STA 1582+20 TO STA 1594+00			22		
STA 1594+00 TO STA 1605+00			44		
STA 1605+00 TO STA 1613+73			49		
STA 1622+85 TO STA 1627+00		84			503
STA 1627+00 TO STA 1639+00	126	122		172	
STA 1639+00 TO STA 1651+00					
STA 1651+00 TO STA 1663+00	55	55		87	
STA 1663+00 TO STA 1673+17.56	13	23		81	
SUBTOTSUBTOTAL RECONSTRUCTIONAL	194	284	115	340	503
SIDE STREETS					
375TH ST					
STA 400+61.31 TO STA 403+23	34	26			
376TH ST					
STA 499+65 TO STA 501+30.52	26	20			
SUBTOTAL SIDE STREETS RECONSTRUCTION	60	46			
TOTALRECONSTRUCTION SAP 013-630-021	254	330	115	340	503
SRTS: SAP 225-591-007					
WALK					
STA 800+00.00 TO STA 803+37.96	36	27			
TOTAL SAP 225-591-007	36	27			
CITY LOCAL FUNDS					
377TH ST					
STA 101+53.82 TO STA 102+82					
STA 105+78 TO STA 107+64.49	29	21			
CSAH 30					
STA 1622+85 TO STA 1627+00					125
TOTAL CITY LOCAL	29	21			125
TOTAL	319	378	115	340	628

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
QUANTITY TABULATIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 13 OF 216 SHEETS

DATE: 9/12/2024 1:58:55 PM
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EARTHWORK TABULATION				F
STATION	EXCAVATION		EMBANKMENT	
	COMMON	SUBGRADE	COMMON	SELECT GRANULAR (CV)
	(CU YD)	(CU YD)	(CU YD)	(CU YD)
SAP 013-630-021 - CSAH 30-1				
1582+00.00 TO 1583+00.00 R1	160	218	16	222
1583+00.00 R1 TO 1584+00.00 R1	135	277	31	286
1584+00.00 R1 TO 1585+00.00 R1	190	290	41	306
1585+00.00 R1 TO 1586+00.00 R1	198	295	45	326
1586+00.00 R1 TO 1587+00.00 R1	218	316	44	345
1587+00.00 R1 TO 1588+00.00 R1	190	329	28	333
1588+00.00 R1 TO 1589+00.00 R1	253	308	91	316
1589+00.00 R1 TO 1590+00.00 R1	320	309	51	316
1590+00.00 R1 TO 1591+00.00 R1	383	310	46	316
1591+00.00 R1 TO 1592+00.00 R1	430	314	48	316
1592+00.00 R1 TO 1593+00.00 R1	426	315	28	316
1593+00.00 R1 TO 1594+00.00 R1	374	315	27	316
1594+00.00 R1 TO 1595+00.00 R1	306	314	30	316
1595+00.00 R1 TO 1596+00.00 R1	258	310	51	316
1596+00.00 R1 TO 1597+00.00 R1	251	310	40	316
1597+00.00 R1 TO 1598+00.00 R1	190	296	80	338
1598+00.00 R1 TO 1599+00.00 R1	180	292	94	349
1599+00.00 R1 TO 1600+00.00 R1	158	292	91	349
1600+00.00 R1 TO 1601+00.00 R1	112	227	77	275
1601+00.00 R1 TO 1602+00.00 R1	109	164	62	207
1602+00.00 R1 TO 1603+00.00 R1	80	185	16	225
1603+00.00 R1 TO 1604+00.00 R1	113	162	81	207
1604+00.00 R1 TO 1605+00.00 R1	143	164	98	219
1605+00.00 R1 TO 1606+00.00 R1	154	162	102	241
1606+00.00 R1 TO 1607+00.00 R1	154	161	104	241
1607+00.00 R1 TO 1608+00.00 R1	139	161	98	228
1608+00.00 R1 TO 1609+00.00 R1	136	157	82	207
1609+00.00 R1 TO 1610+00.00 R1	131	179	47	198
1610+00.00 R1 TO 1611+00.00 R1	134	161	69	174
1611+00.00 R1 TO 1612+00.00 R1	161	312	40	316
SUBTOTAL CSAH 30-1	6186	7606	1758	8436
SAP 013-630-021 - CSAH 30-NB				
1612+00.00 TO 1613+00.00 R1	299	306	15	306
1613+00.00 R1 TO 1614+00.00 R1	418	294	32	297
1623+00.00 R1 TO 1624+00.00 R1	83	253	80	292
1624+00.00 R1 TO 1625+00.00 R1	95	229	103	293
1625+00.00 R1 TO 1626+00.00 R1	96	259	93	290
SUBTOTAL CSAH 30-NB	991	1341	323	1478

EARTHWORK TABULATION				F
STATION	EXCAVATION		EMBANKMENT	
	COMMON	SUBGRADE	COMMON	SELECT GRANULAR (CV)
	(CU YD)	(CU YD)	(CU YD)	(CU YD)
SAP 013-630-021 - CSAH 30-2				
1626+00.00 TO 1627+00.00 R1	72	134	86	152
1627+00.00 R1 TO 1628+00.00 R1	74	118	68	152
1628+00.00 R1 TO 1629+00.00 R1	83	122	80	152
1629+00.00 R1 TO 1630+00.00 R1	81	132	78	152
1630+00.00 R1 TO 1631+00.00 R1	80	120	64	170
1631+00.00 R1 TO 1632+00.00 R1	79	107	69	195
1632+00.00 R1 TO 1633+00.00 R1	74	106	62	196
1633+00.00 R1 TO 1634+00.00 R1	76	112	59	168
1634+00.00 R1 TO 1635+00.00 R1	85	120	89	152
1635+00.00 R1 TO 1636+00.00 R1	85	130	89	152
1636+00.00 R1 TO 1637+00.00 R1	83	150	71	160
1637+00.00 R1 TO 1638+00.00 R1	76	179	59	191
1638+00.00 R1 TO 1639+00.00 R1	80	147	63	196
1639+00.00 R1 TO 1640+00.00 R1	69	122	45	165
1640+00.00 R1 TO 1641+00.00 R1	193	202	120	292
1641+00.00 R1 TO 1642+00.00 R1	50	148	48	194
1642+00.00 R1 TO 1643+00.00 R1	44	126	45	152
1643+00.00 R1 TO 1644+00.00 R1	43	132	43	152
1644+00.00 R1 TO 1645+00.00 R1	43	124	45	152
1645+00.00 R1 TO 1646+00.00 R1	41	126	45	152
1646+00.00 R1 TO 1647+00.00 R1	47	122	45	172
1647+00.00 R1 TO 1648+00.00 R1	71	142	40	219
1648+00.00 R1 TO 1649+00.00 R1	84	140	49	240
1649+00.00 R1 TO 1650+00.00 R1	62	148	40	207
1650+00.00 R1 TO 1651+00.00 R1	47	141	38	193
1651+00.00 R1 TO 1652+00.00 R1	43	147	39	167
1652+00.00 R1 TO 1653+00.00 R1	54	145	45	185
1653+00.00 R1 TO 1654+00.00 R1	60	299	47	339
1654+00.00 R1 TO 1655+00.00 R1	91	311	48	339
1655+00.00 R1 TO 1656+00.00 R1	148	325	39	329
1656+00.00 R1 TO 1657+00.00 R1	234	296	45	296
1657+00.00 R1 TO 1658+00.00 R1	324	295	37	295
1658+00.00 R1 TO 1659+00.00 R1	385	295	25	295
1659+00.00 R1 TO 1660+00.00 R1	451	295	28	295
1660+00.00 R1 TO 1661+00.00 R1	497	295	29	295
1661+00.00 R1 TO 1662+00.00 R1	530	295	25	295
1662+00.00 R1 TO 1663+00.00 R1	531	288	27	295
1663+00.00 R1 TO 1664+00.00 R1	389	288	25	295
1664+00.00 R1 TO 1665+00.00 R1	183	288	33	295
1665+00.00 R1 TO 1666+00.00 R1	64	197	33	202
1666+00.00 R1 TO 1667+00.00 R1	44	81	21	81
1667+00.00 R1 TO 1668+00.00 R1	31	57	14	61
1668+00.00 R1 TO 1669+00.00 R1				
1669+00.00 R1 TO 1670+00.00 R1				
SUBTOTAL CSAH 30-2	5877	7547	2100	8837
SAP 013-630-021 - CSAH 30 TOTAL	13054	16494	4181	18751

NOTES:

1. THE EXCAVATION - COMMON QUANTITY INCLUDES TOPSOIL STRIPPING.
2. SEE THE GEOTECHNICAL REPORT FOR INPLACE BITUMINOUS AND CONCRETE PAVEMENT DEPTHS.
3. TOPSOIL PLACEMENT IS INCLUDED IN COMMON EMBANKMENT.
4. PLACING, HAULING AND DISPOSING OF EXCAVATED MATERIALS IS CONSIDERED INCIDENTAL.
5. ALL STOCKPILE AREAS SHALL BE APPROVED BY THE ENGINEER.
6. SOILS NOT USED ON THE PROJECT SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OUTSIDE OF THE RIGHT OF WAY. NO DIRECT COMPENSATION WILL BE PAID FOR THE PREPARATION OF AN ACCEPTABLE DISPOSAL PLAN OR FOR OFF-PROJECT DISPOSAL OF MATERIALS. DISPOSAL SITES SHALL BE LEFT IN A WELL GRADED CONDITION WITH ALL SOLID WASTES AND BOULDERS ADEQUATELY COVERED.
7. UNLESS DIRECTED OTHERWISE BY THE PROJECT ENGINEER, ANY MATERIAL THAT IS FOUND TO BE UNNECESSARY FOR THE CONSTRUCTION OF THE ROADWAY EMBANKMENT AND DISPOSAL OF SAME BECOMES NECESSARY, ON OR OFF THE PROJECT, THE DISPOSAL AND ALL RELATED ITEMS WILL BE CONSIDERED INCIDENTAL.

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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DATE: 9/12/2024	LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
EARTHWORK SUMMARY AND TABULATIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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OF
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SHEETS

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EARTHWORK TABULATION				F
	EXCAVATION		EMBANKMENT	
STATION	COMMON	SUBGRADE	COMMON	SELECT GRANULAR (CV)
	(CU YD)	(CU YD)	(CU YD)	(CU YD)
SAP 013-630-021 / SAP 225-102-004 (50/50)				
1614+00.00 R1 TO 1615+00.00 R1	532	317	62	347
1615+00.00 R1 TO 1616+00.00 R1	682	290	114	327
1616+00.00 R1 TO 1617+00.00 R1	700	430	201	586
1617+00.00 R1 TO 1618+00.00 R1	631	670	206	1163
1618+00.00 R1 TO 1619+00.00 R1	479	516	166	743
1619+00.00 R1 TO 1620+00.00 R1	609	300	199	386
1620+00.00 R1 TO 1621+00.00 R1	502	331	119	448
1621+00.00 R1 TO 1622+00.00 R1	327	333	110	427
1622+00.00 R1 TO 1623+00.00 R1	188	323	101	367
TOTAL SAP 013-630-021 / SAP 225-102-004 (50/50)	4649	3510	1278	4794
CITY OF NORTH BRANCH - 377TH ST				
100+00.00 R1 TO 100+50.00 R1	122	126	18	129
100+50.00 R1 TO 101+00.00 R1	195	135	26	135
101+00.00 R1 TO 101+50.00 R1	254	139	24	139
101+50.00 R1 TO 102+00.00 R1	447	139	183	145
105+00.00 E1 TO 105+50.00 R1	50	127	17	128
105+50.00 R1 TO 106+00.00 R1	47	129	22	130
106+00.00 R1 TO 106+50.00 R1	20	51	9	53
377TH ST SUBTOTAL	1136	847	299	859
CITY OF NORTH BRANCH - 377TH ST				
1624+00.00 R1 TO 1625+00.00 R1	20		40	
CITY - TOTAL	1156	847	339	859
SAP 225-591-007 - SRTS TRAIL (CSAH 30 STATIONS)				
1623+50.00 R1 TO 1624+00.00 R1	28		66	
1624+00.00 R1 TO 1625+00.00 R1	93		210	
1625+00.00 R1 TO 1626+00.00 R1	134		57	
1626+00.00 R1 TO 1627+00.00 R1	102		66	
1627+00.00 R1 TO 1628+00.00 R1	135		38	
1628+00.00 R1 TO 1629+00.00 R1	106		36	
1629+00.00 R1 TO 1630+00.00 R1	64		30	
1630+00.00 R1 TO 1631+00.00 R1	90		26	
1631+00.00 R1 TO 1632+00.00 R1	73		28	
1632+00.00 R1 TO 1633+00.00 R1	51		65	
1633+00.00 R1 TO 1634+00.00 R1	66		83	
1634+00.00 R1 TO 1635+00.00 R1	60		86	
1635+00.00 R1 TO 1636+00.00 R1	64		82	
1636+00.00 R1 TO 1637+00.00 R1	82		64	
1637+00.00 R1 TO 1638+00.00 R1	106		45	
1638+00.00 R1 TO 1639+00.00 R1	58		96	
1639+00.00 R1 TO 1640+00.00 R1	70		52	

EARTHWORK TABULATION				F
	EXCAVATION		EMBANKMENT	
STATION	COMMON	SUBGRADE	COMMON	SELECT GRANULAR (CV)
	(CU YD)	(CU YD)	(CU YD)	(CU YD)
1640+00.00 R1 TO 1641+00.00 R1	73		741	
1641+00.00 R1 TO 1642+00.00 R1	67		453	
1642+00.00 R1 TO 1643+00.00 R1	50		303	
1643+00.00 R1 TO 1644+00.00 R1	52		324	
1644+00.00 R1 TO 1645+00.00 R1	73		529	
1645+00.00 R1 TO 1646+00.00 R1	72		501	
1646+00.00 R1 TO 1647+00.00 R1	65		426	
1647+00.00 R1 TO 1648+00.00 R1	61		410	
1648+00.00 R1 TO 1649+00.00 R1	51		264	
1649+00.00 R1 TO 1650+00.00 R1	45		106	
1650+00.00 R1 TO 1651+00.00 R1	48		286	
1651+00.00 R1 TO 1652+00.00 R1	57		187	
1652+00.00 R1 TO 1653+00.00 R1	51		307	
1653+00.00 R1 TO 1654+00.00 R1	55		348	
1654+00.00 R1 TO 1655+00.00 R1	48		252	
1655+00.00 R1 TO 1656+00.00 R1	35		64	
1656+00.00 R1 TO 1657+00.00 R1	56		60	
1657+00.00 R1 TO 1658+00.00 R1	38		50	
1658+00.00 R1 TO 1659+00.00 R1	36		48	
1659+00.00 R1 TO 1660+00.00 R1	62		34	
1660+00.00 R1 TO 1661+00.00 R1	67		85	
1661+00.00 R1 TO 1662+00.00 R1	62		103	
1662+00.00 R1 TO 1663+00.00 R1	97		14	
1663+00.00 R1 TO 1664+00.00 R1	77		16	
1664+00.00 R1 TO 1665+00.00 R1	46		107	
1665+00.00 R1 TO 1666+00.00 R1	28		80	
1666+00.00 R1 TO 1667+00.00 R1	34		6	
1667+00.00 R1 TO 1668+00.00 R1	31		8	
1668+00.00 R1 TO 1669+00.00 R1	30		7	
SRTS TRAIL - SUBTOTAL	2949		7249	
SAP 225-591-007 - SRTS WALK				
800+00.00 R1 TO 800+50.00 R1	29		4	
800+50.00 R1 TO 801+00.00 R1	28		6	
801+00.00 R1 TO 801+50.00 R1	28		5	
801+50.00 R1 TO 802+00.00 R1	13		4	
802+00.00 R1 TO 802+50.00 R1	10		4	
802+50.00 R1 TO 803+00.00 R1	15		3	
803+00.00 R1 TO 803+50.00 R1	8		2	
SRTS WALK - SUBTOTAL	131		28	
SAP 225-591-007 TOTAL	3080		7277	
PROJECT TOTAL	21939	20850	13075	24404

- NOTES:
- THE EXCAVATION - COMMON QUANTITY INCLUDES TOPSOIL STRIPPING.
 - SEE THE GEOTECHNICAL REPORT FOR INPLACE BITUMINOUS AND CONCRETE PAVEMENT DEPTHS.
 - TOPSOIL PLACEMENT IS INCLUDED IN COMMON EMBANKMENT.
 - PLACING, HAULING AND DISPOSING OF EXCAVATED MATERIALS IS CONSIDERED INCIDENTAL.
 - ALL STOCKPILE AREAS SHALL BE APPROVED BY THE ENGINEER.
 - SOILS NOT USED ON THE PROJECT SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OUTSIDE OF THE RIGHT OF WAY. NO DIRECT COMPENSATION WILL BE PAID FOR THE PREPARATION OF AN ACCEPTABLE DISPOSAL PLAN OR FOR OFF-PROJECT DISPOSAL OF MATERIALS. DISPOSAL SITES SHALL BE LEFT IN A WELL GRADED CONDITION WITH ALL SOLID WASTES AND BOULDERS ADEQUATELY COVERED.
 - UNLESS DIRECTED OTHERWISE BY THE PROJECT ENGINEER, ANY MATERIAL THAT IS FOUND TO BE UNNECESSARY FOR THE CONSTRUCTION OF THE ROADWAY EMBANKMENT AND DISPOSAL OF SAME BECOMES NECESSARY, ON OR OFF THE PROJECT, THE DISPOSAL AND ALL RELATED ITEMS WILL BE CONSIDERED INCIDENTAL.

NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH
Plan By:
MKV
Checked By:
MAN
Approved By:
NEH

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.


NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
EARTHWORK SUMMARY AND TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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CONSTRUCTION /SOILS NOTES

GENERAL NOTES

1

CONTRACTOR SHALL NOTIFY PROPERTY OWNERS 72 HOURS IN ADVANCE OF DISRUPTION OF ACCESS TO PROPERTY.

2

CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES AND PIPING NOT MARKED FOR REMOVAL AT ALL TIMES DURING CONSTRUCTION.

3

WHERE SURVEY CONTROL MONUMENTS OR IRONS ARE ENCOUNTERED, THE ENGINEER SHALL BE NOTIFIED BEFORE ANY SUCH ITEMS ARE REMOVED. THE CONTRACTOR SHALL CAREFULLY PRESERVE AND PROTECT ALL MONUMENTS AND IRONS UNTIL THE OWNER AND AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.

4

NO TREES OR SHRUBS ARE TO BE REMOVED WITHOUT BEING MARKED FOR REMOVAL BY THE ENGINEER.

5

THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING ANY EXCAVATION

GRADING, BASE AND SURFACE

6

GRADING GRADE IS DEFINED AS THE BOTTOM OF THE AGGREGATE BASE LAYER.

7

SELECT GRADING MATERIAL ON THIS PROJECT, WHETHER OBTAINED LOCALLY OR FROM BORROW, SHALL CONSIST OF ALL SOILS EXCEPT TOPSOIL, DEBRIS, PEAT, MUCK, SILT, MARL AND ORGANIC OR OTHER UNSTABLE MATERIAL.

8

UNSUITABLE MATERIALS ARE MARL, SILT, SILTY LOAM, TOPSOILS, DEBRIS, PEAT, MUCK AND ORGANIC OR OTHER UNSTABLE SOILS. UNSUITABLE MATERIALS MAY NOT BE PLACED WITHIN A 1 (V):1.5(H) SLOPE DOWNWARD AND OUTWARD FROM THE GRADING EMBANKMENT PI OR ABOVE THE ELEVATION OF THE BOTTOM OF THE SELECT GRANULAR CORRECTION MATERIAL.

9

SELECT GRANULAR MATERIAL IS DEFINED AS MATERIAL MEETING THE REQUIREMENTS OF MNDOT SPEC. 3149.

10

STRIP SOD AND TOPSOIL FROM AREAS TO BE DISTURBED BY CONSTRUCTION AND REUSE AS SLOPE DRESSING. FOR ESTIMATING PURPOSES, 6" WAS USED.

11

ALL TOPSOIL STRIPPING WILL BE CONSIDERED TO BE EXCAVATION-COMMON.

12

IN FILL SECTIONS, TOPSOIL AND OTHER UNSUITABLE MATERIALS SHALL BE ELIMINATED FROM BENEATH THE ROAD CORE.

13

IN ANY PROPOSED WIDENING CONSTRUCTION, MATCH THE EXISING SOIL IN THE UPPER 5 FEET OF ROADWAYS TO BE WIDENED WITH SOIL OF A SIMILAR CLASS, COLOR, MOISTURE CONTENT AND, AND PERFORMANCE CHARACTERISTICS. GRANULAR MATERIALS SHALL NOT BE PLACED ADJACENT TO EXISTING NON-GRANULAR MATERIALS. CONSTRUCT WIDENING IN UNIFORM LIFTS.

14

EXCESS MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE PROJECT LIMITS.

15

THE CONTRACTOR'S PERSONNEL OR ANY OTHER PERSONNEL MAY NOT USE THE NEW ROAD SURFACE OR ROADBED FOR THE PURPOSE OF STOCKPILING AGGREGATE MATERIAL, OR ANY OTHER MATERIAL, WITHOUT APPROVAL OF THE ENGINEER.

16

THE BOTTOM OF ALL SUBCUTS SHALL BE SHAPED AND COMPACTED BY THE "QUALITY COMPACTION METHOD". THE CONTRACTOR SHALL USE A MINIMUM OF 4 PASSES OF AN APPROVED COMPACTION DEVICE.

17

COMPACTION OF ALL AGGREGATE BASE MATERIAL SHOULD BE IN ACCORDANCE WITH THE "PENETRATION INDEX METHOD" REQUIREMENTS.

18

COMPACTION OF ALL GRANULAR AND SELECT GRANULAR MATERIAL SHOULD BE IN ACCORDANCE WITH MNDOT "SPECIFIED DENSITY METHOD" REQUIREMENTS.

19

PROVIDE A 1V:20H ON LONGITUDINAL TAPERS AND A 1V:4H ON TRANSVERSE TAPERS BETWEEN CHANGES IN SUBGRADE AND SUBCUT DEPTHS.

20

AS A PRECAUTIONARY MEASURE FROM A SOILS STANDPOINT, TRAFFIC LANES TO BE USED DURING CONSTRUCTION MUST BE DELINEATED TO KEEP VEHICLES A SAFE DISTANCE AWAY FROM THE ADJACENT EXCAVATION. THE DELINEATION SHOULD COINCIDE WITH POINTS ESTABLISHED BY PROJECTING A 1(V):2(H) OR GREATER (FLATTER) SLOPE BETWEEN THE EDGE OF THE TRAFFIC SURFACE AND THE BOTTOM OF THE EXCAVATION.

21

TEST ROLLING WILL BE REQUIRED AS PER MNDOT SPEC. 2111.3 AND ON ALL SUBGRADE AND AGGREGATE BASE PORTIONS OF THE PERMANENT CONSTRUCTION. USE A TR10 AS SPECIFIED IN MNDOT SPEC. 2111.3.A.2. ALL TEST ROLLING CONSIDERED INCIDENTAL

22

COMPACTION OF ALL MAINLINE, SHOULDER, AND SIDE STREET BITUMINOUS PAVEMENTS SHALL BE THE "MAXIMUM DENSITY METHOD".

23

COMPACTION OF TRAIL, AND DRIVEWAY BITUMINOUS PAVEMENTS SHALL BE THE "ORDINARY COMPACTION METHOD".

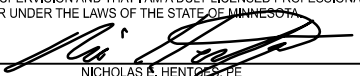
CONSTRUCTION /SOILS NOTES	
24	PAVEMENT SURFACE SMOOTHNESS WILL BE EVALUATED ON THIS PROJECT.
25	ALL PAVED DRIVEWAYS AND SIDE STREETS SHALL BE SAWCUT OR HAVE MILLED JOINT AT THE MATCH POINTS.
26	PROVIDE FOR A UNIFORM BITUMINOUS TACK COAT BETWEEN ALL BITUMINOUS COURSES. THE TACK COAT SHALL BE IN ACCORDANCE WITH MN/DOT SPECIFICATION 2357.
27	ALL GRADING SHALL BE SHAPED AND COMPACTED TO SEAL THE SURFACE AND PROVIDE DRAINAGE AT THE END OF EACH WORKING DAY. ALL EROSION AND SEDIMENT CONTROL BMPs ARE TO BE IN GOOD CONDITION AT THE END OF EACH WORKING DAY.
28	ALL TRENCHING, EXCAVATION, BACKFILLING, AND COMPACTION FOR CONSTRUCTING STORM CULVERTS WILL BE INCIDENTAL AND PERFORMED AS SPECIFIED.
REMOVALS	
29	EROSION CONTROL MEASURES ARE TO BE IN PLACE PRIOR TO REMOVAL AND/OR RECLAMATION OF EXISTING BITUMINOUS MATERIAL.
30	TEMPORARY EROSION CONTROL DEVICES AND THEIR SUGGESTED LOCATIONS ALONG WITH PAY ITEMS FOR THEIR USE DOES NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITIES TO CONDUCT CONSTRUCTION IN A MANNER THAT WILL SUFFICIENTLY CONTROL EROSION. RESPONSIBILITIES FOR CONTROL OF EROSION ARE SET FORTH IN MNDOT SPEC. 1717, 1803, 2101, 2106, 2573, 2575 AND AS AMENDED BY THE SPECIAL PROVISIONS.
31	THE EXISTING PAVEMENT THICKNESSES ARE ASSUMED AS FOLLOWS: CSAH 30: 4" - 9" BITUMINOUS PAVEMENT OVER 6" - 8" OF AGGREGATE BASE. 7" CONCRETE PAVEMENT LOCATED ALONG CSAH 30 THAT RANGES IN DEPTHS OF OVER 2' TO DIRECTLY UNDER THE BITUMINOUS PAVEMENT. SEE TYPICAL SECTIONS, PROFILES AND CROSS SECTIONS FOR MORE DETAIL. THE ABOVE INFORMATION WAS TAKEN FROM THE PROJECT GROUND PENETRATING RADAR EVALUATION THAT IS PROVIDED IN THE PROJECT MANUAL. NO GUARANTEE IS MADE TO THE EXACT PAVEMENT THICKNESSES. THE CONTRACTOR SHALL INVESTIGATE AND MAKE THEIR OWN DETERMINATION OF THE EXISTING PAVMENT THICKNESS. (INFORMATION WAS TAKEN FROM THE PROJECT SOILS BORINGS AND/OR RECORD DRAWINGS)
TURF ESTABLISHMENT	
32	FAILURE TO PROPERLY INSTALL, REMOVE SEDIMENT, OR MAINTAIN EROSION CONTROL DEVICES MAY RESULT IN A DEDUCTION TO THE CONTRACTOR. SEE PROJECT SPECIFICATIONS 1717 FOR MORE DETAILS.
33	PLACE A MINIMUM OF 6 INCHES OF TOPSOIL ON ALL AREAS SCHEDULED FOR PERMANENT TURF ESTABLISHMENT.
34	PERMANENT TURF ESTABLISHMENT SHALL BE CONSTRUCTED USING TYPICAL CONSTRUCTION REQUIREMENTS. SEE TURF ESTABLISHMENT PLANS FOR TURF ESTABLISHMENT TYPES AND LOCATIONS.
35	THE CONTRACTOR SHALL BE REQUIRED TO SUPPLY WATER TO SEEDED AREA DURING THE 30 CALENDAR DAY MAINTENANCE PERIOD, A MINIMUM OF EVERY THREE DAYS TO MAINTAIN A 3 INCH MOIST SOIL SURFACE, OR AS DIRECTED BY THE ENGINEER.
36	THE CONTRACTOR SHALL BE REQUIRED TO FINE GRADE RESIDENT'S MOWED YARDS TO THE SATISFACTION OF THE ENGINEER.
CONSTRUCTION /SOILS NOTES	
MISCELLANEOUS	
37	ANYTHING DISTURBED OR DAMAGED OUTSIDE THE STAKED CONSTRUCTION AREA SHALL BE RESTORED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE PROPERTY OWNER.
38	ALL CONSTRUCTION STAKING WILL REQUIRE A 48 HOUR ADVANCE NOTICE.
39	WHERE SEDIMENT DEPOSITS IN WATERS OF THE STATE THE MATERIAL MUST BE REMOVED IN 7 DAYS PER NPDES PERMIT. THE CONTRACTOR IS HEREBY REMINDED OF HIS RESPONSIBILITY UNDER STATE LAW TO CONTACT ALL UTILITIES THAT MAY HAVE
40	FACILITIES IN THE AREA. CONTACT MUST BE MADE THROUGH GOPHER STATE ONE-CALL.
41	THE CONTRACTOR MUST CONTACT EACH UTILITY COMPANY, PRIOR TO THE START OF CONSTRUCTION, TO DETERMINE ANY AND ALL SPECIAL REQUIREMENTS IN REGARDS TO WORKING AROUND THE PRIVATE UTILITIES WITHIN THE PROJECT LIMITS.

NO.	DATE	BY	CHK	REVISIONS	Design By: NEH Plan By: MKV Checked By: MAN Approved By: NEH	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  NICHOLAS E. HENTGES, PE DATE: 9/12/2024 LICENSE NO. 44620			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA		SHEET 16 OF 216 SHEETS
										SOILS AND CONSTRUCTION NOTES SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		

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STAGING AND TRAFFIC CONTROL NOTES	
GENERAL NOTES	
1	ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MN MUTCD) INCLUDING THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.
2	THE CONTRACTOR SHALL MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL COORDINATE DRIVEWAY CLOSURES WITH THE RESIDENTS FOR CONCRETE CURB & GUTTER, CONCRETE APRON CONSTRUCTION OR DRAINAGE REMOVALS AND CONSTRUCTION.
3	THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY WORK AREAS NEAR TRAFFIC IN ACCORDANCE WITH THE MN MUTCD.
4	ALL TRAFFIC CONTROL DEVICES NEEDED TO ERECT THE ROAD CLOSURE AND TO MEET PROJECT STAGING AND MN MUTCD REQUIREMENTS SHALL BE INCLUDED IN THE LUMP SUM BID ITEM FOR TRAFFIC CONTROL.
5	THE DETOUR PLAN DOES NOT INCLUDE ANY TEMPORARY TRAFFIC CONTROL DEVICES REQUIRED TO CONSTRUCT THE PROJECT. CONSULT THE FIELD MANUAL FOR OTHER TEMPORARY SIGNAGE THAT MAY BE REQUIRED, SUCH AS, BUT NOT LIMITED TO, ROAD WORK AHEAD, FLAGGER SIGNAGE, BUMP AHEAD, BUMP WITH DOWN ARROW, ROUGH ROAD, LOW SHOULDER, NO CENTER STRIPE, ETC.
6	ALL DETOUR SIGNING SHOWN IN THE DETOUR PLANS SHALL BE INSTALLED THE DAY OF ROAD CLOSURE AND SHALL BE REMOVED IMMEDIATELY UPON ROAD CLOSURE COMPLETION UNLESS OTHERWISE NOTED. THE SURROUNDING GROUND SHALL BE RETURNED TO ITS ORIGINAL CONDITION.
7	THE CONTRACTOR SHALL BE REQUIRED TO COVER OR REMOVE ALL TRAFFIC CONTROL DEVICES WHICH MAY BE INCONSISTENT WITH TRAFFIC PATTERNS DURING THE TRAFFIC DETOUR.
8	ALL SIGNS INSTALLED ON TH 95 AND I-35 SHALL BE GROUND-MOUNTED AND MASH-16 COMPLIANT. USE SQUARE TUBE POSTS WITH APPROPRIATE BASES.
9	PORTABLE CHANGEABLE MESSAGE BOARDS SHALL BE USED AT THE DIRECTION OF THE ENGINEER.

STAGING AND TRAFFIC CONTROL NOTES	
10	THE CONTRACTOR WILL PROVIDE ACCESS FOR THE FIRE DEPARTMENT TO THE NORTH TO TRUNK HIGHWAY 95 OR TO THE SOUTH TO CSAH 17 ON CSAH 30 AT ALL TIMES. THE DEPARTMENT WILL PRIMARILY USE GRAND AVE AND 381ST STREET FOR ACCESS, BUT MAY GO NORTH DURING STORM SEWER CONSTRUCTION.
11	THE CONTRACTOR WILL PROVIDE ADDITIONAL DIRECTIONAL SIGNAGE FOR LOCAL ACCESS FROM ADJACENT ROADWAYS AT THE DISCRETION OF THE ENGINEER. THE PLAN INCLUDES BUSINESSES SIGNING THAT WILL BE NECESSARY DURING THE PROJECT.
12	THE CONTRACTOR WILL BE ALLOWED FULL ROAD CLOSURES AS DETAILED IN THE PLANS AND SPECIFICATIONS AND WILL BE RESONSIBLE FOR NOTIFYING ALL EMERGENCY RESPONSE PARTIES LISTED IN THE 1404 SPECIFICATION, AS WELL AS THE LOCAL SCHOOL DISTRICT(S). THE CONTRACTOR WILL SUBMIT FOR AND RECEIVE WRITTEN APPROVAL FOR ANY OTHER FULL CLOSURE AREA.
13	MAINTAIN LOCAL ACCESS AT ALL TIMES FROM TH 95 TO 384TH STREET AND FROM 381ST STREET TO 379TH STREET AND SOUTH OF 376TH STREET.

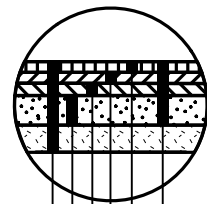
NO.	DATE	BY	CHK	REVISIONS	Design By:	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA  NICHOLAS E. HENTGES, PE DATE: 9/12/2024 LICENSE NO. 44620
					NEH	
					Plan By: MKV	
					Checked By: MAN	
					Approved By: NEH	



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA		SHEET 17 OF 216 SHEETS
SOILS AND CONSTRUCTION NOTES SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		

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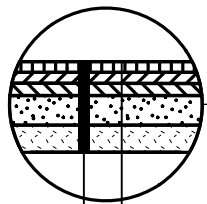


INSET A

RECONDITIONING - 1
CSAH 30 - MAINLINE

- REMOVE BITUMINOUS PAVEMENT*
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5" NON-WEAR COURSE MIXTURE (SPNWB330B) MNDOT SPEC 2360
- 6" AGGREGATE BASE (CV) CLASS 5
- INPLACE PAVEMENT AND BASE

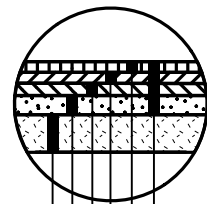
*REMOVE BITUMINOUS PAVEMENT DEPTH SHALL NOT IMPACT THE INPLACE CONCRETE PAVEMENT, ONLY ENOUGH TO PLACE PROPOSED NEW MATERIAL.



INSET B

FOG SEAL
CSAH 30 - SHOULDERS

- FOG SEAL
- INPLACE SHOULDER PAVEMENT

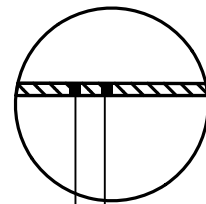


INSET C

RECONDITIONING - 2
CSAH 30 - MAINLINE

- REMOVE BITUMINOUS PAVEMENT*
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5" NON-WEAR COURSE MIXTURE (SPNWB330B) MNDOT SPEC 2360
- VARIABLE DEPTH AGGREGATE BASE (CV) CLASS 5 - 6" AVERAGE
- INPLACE CONCRETE PAVEMENT

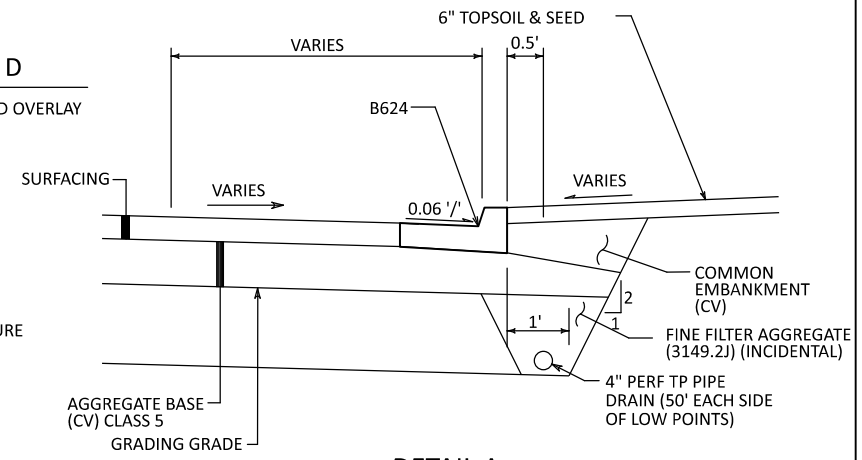
*REMOVE BITUMINOUS PAVEMENT DOWN TO INPLACE CONCRETE PAVEMENT



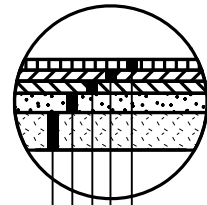
INSET D

CSAH 30 MILL AND OVERLAY

- MILL BITUMINOUS SURFACE (2.0")
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360



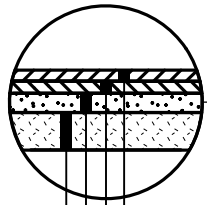
DETAIL A
CONCRETE CURB & GUTTER



INSET E

RECONSTRUCTION / WIDENING
CSAH 30
MAINLINE, BYPASS LANES, TURN LANES

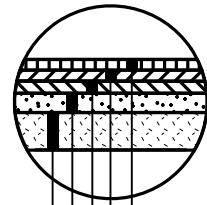
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5" NON-WEAR COURSE MIXTURE (SPNWB330B) MNDOT SPEC 2360
- 6" AGGREGATE BASE (CV) CLASS 5
- 18" SELECT GRANULAR EMBANKMENT



INSET F

RECONSTRUCTION / WIDENING
CSAH 30 - SHOULDERS

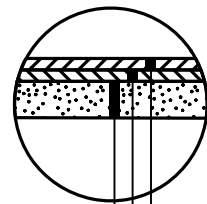
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 8" AGGREGATE BASE (CV) CLASS 5
- 18" SELECT GRANULAR EMBANKMENT



INSET G

CSAH 30 - ROUNDABOUT

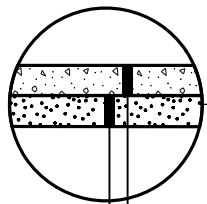
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB440F) MNDOT SPEC 2360
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB440F) MNDOT SPEC 2360
- 2" TYPE SP 12.5" NON-WEAR COURSE MIXTURE (SPNWB430F) MNDOT SPEC 2360
- 6" AGGREGATE BASE (CV) CLASS 5
- 18" SELECT GRANULAR EMBANKMENT



INSET H

BITUMINOUS RESIDENTIAL DRIVEWAY

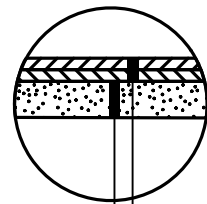
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 6" AGGREGATE BASE (CV) CLASS 5



INSET I

CONCRETE DRIVEWAY

- 6" CONCRETE DRIVEWAY PAVEMENT (RESIDENTIAL)
8" CONCRETE DRIVEWAY PAVEMENT (COMMERCIAL)
- 6" AGGREGATE BASE (CV) CLASS 5

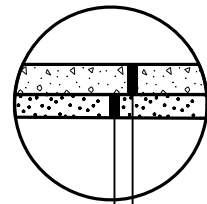


INSET J

BITUMINOUS TRAIL

- 3" TYPE SP 9.5 WEAR COURSE MIXTURE** (SPWEA230C) MNDOT SPEC 2360 - 1 LIFTS
- 6" AGGREGATE BASE (CV) CLASS 5

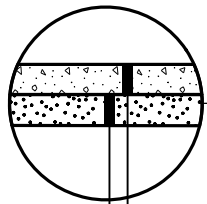
** TO BE PAID AS 3" BUTMINOUS WALK BY THE SQ FT



INSET K

6" CONCRETE WALK
(PED RAMPS & LANDINGS)

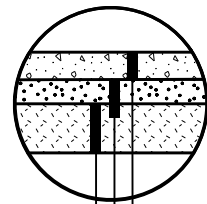
- 6" CONCRETE CURB RAMP WALK
- 4" AGGREGATE BASE (CV) CLASS 5



INSET L

4" CONCRETE WALK
(SIDEWALKS & MEDIANS)

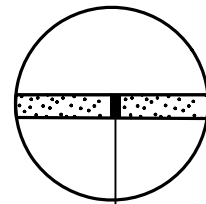
- 4" CONCRETE WALK
- 6" AGGREGATE BASE (CV) CLASS 5



INSET M

ROUNDABOUT TRUCK APRON

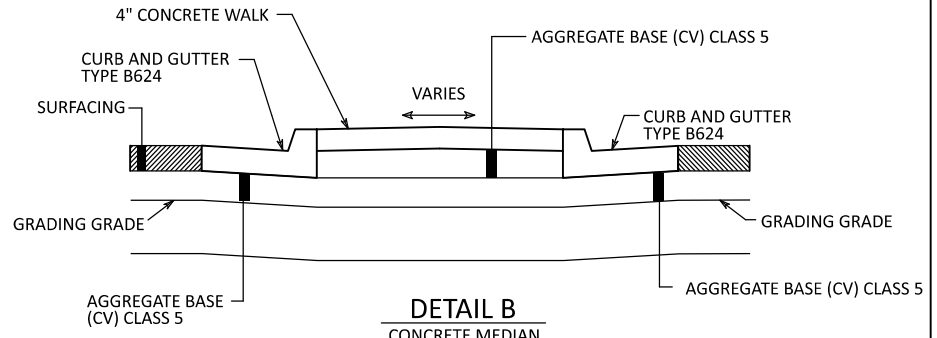
- 7" CONCRETE WALK
- 6" AGGREGATE BASE (CV) CLASS 5
- 12" SELECT GRANULAR EMBANKMENT (CV)



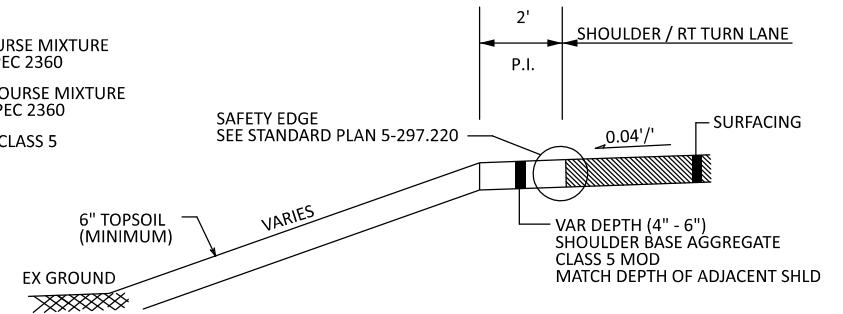
INSET N

AGGREGATE DRIVEWAYS

- 6" SHOULDER BASE AGGREGATE CLASS 5 MOD



DETAIL B
CONCRETE MEDIAN



DETAIL C
RURAL SHOULDER PI

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTGES, PE
DATE: 9/12/2024
LICENSE NO. 44620

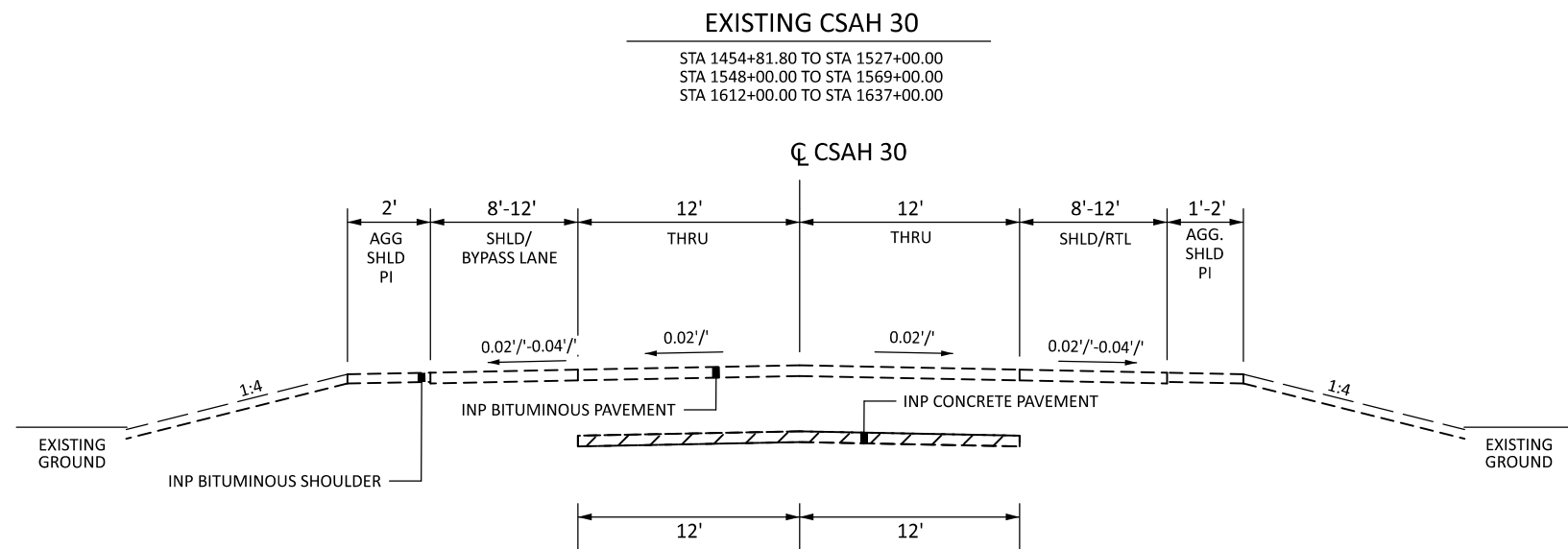
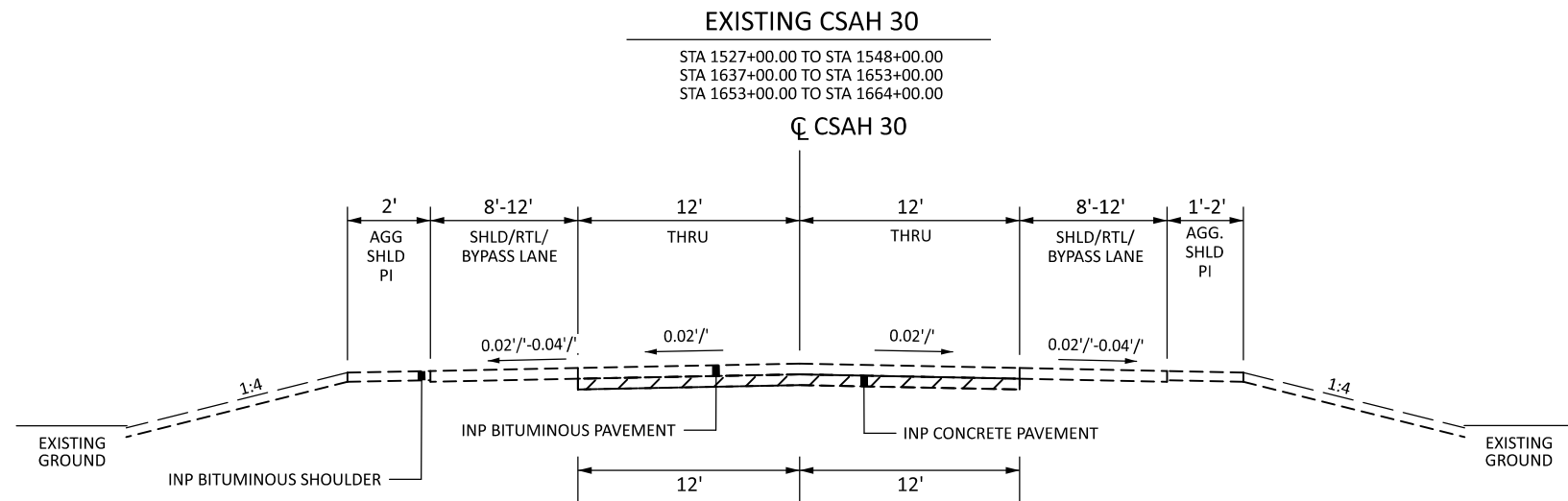
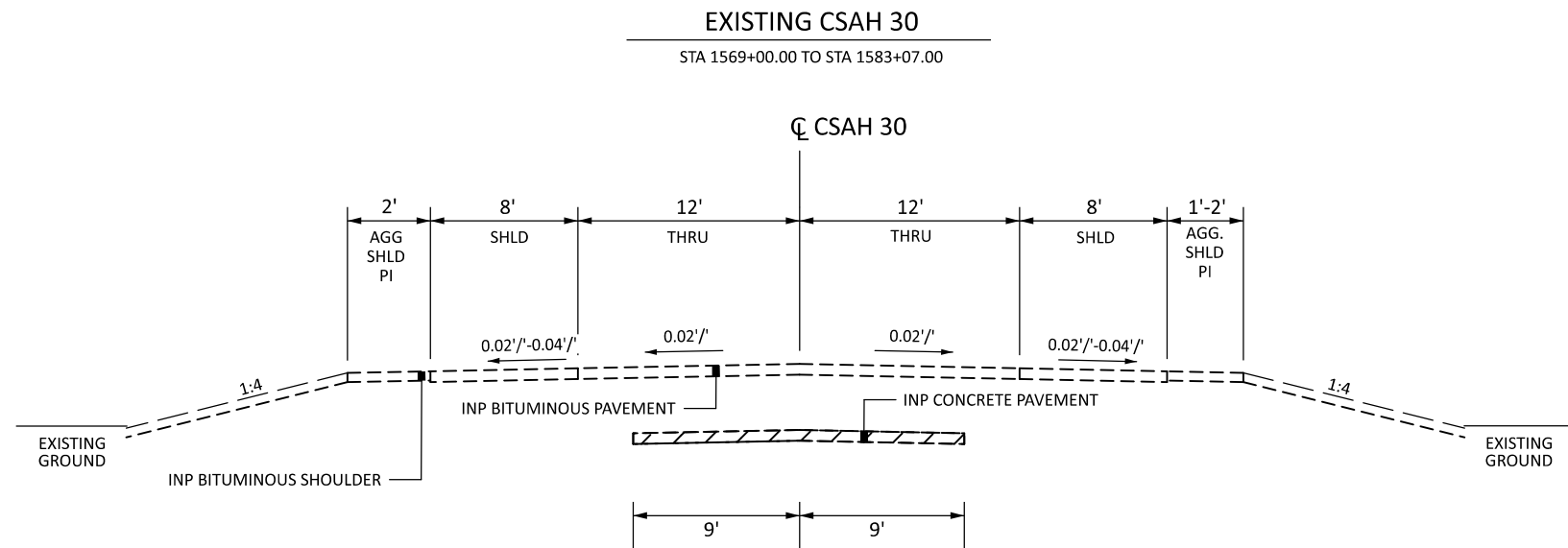


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
TYPICAL SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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GENERAL NOTES:

- SEE REMOVAL PLANS FOR THE LIMITS OF REMOVAL OF THE INPLACE CONCRETE PAVEMENT BENEATH THE INPLACE BITUMINOUS PAVEMENT.
- SEE CONSTRUCTION PLAN & PROFILE SHEETS FOR THE ELEVATION DEPICTION OF THE INPLACE CONCRETE PAVEMENT.

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Plan By: MKV
Checked By: MAN
Approved By: NEH

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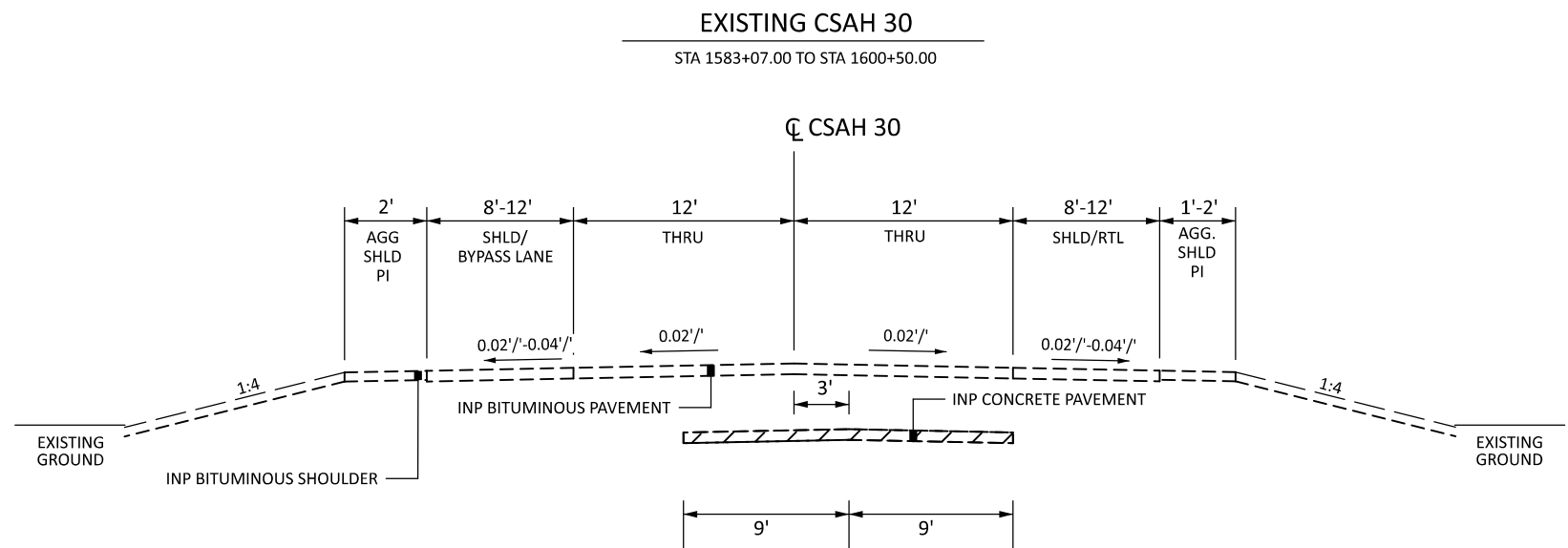
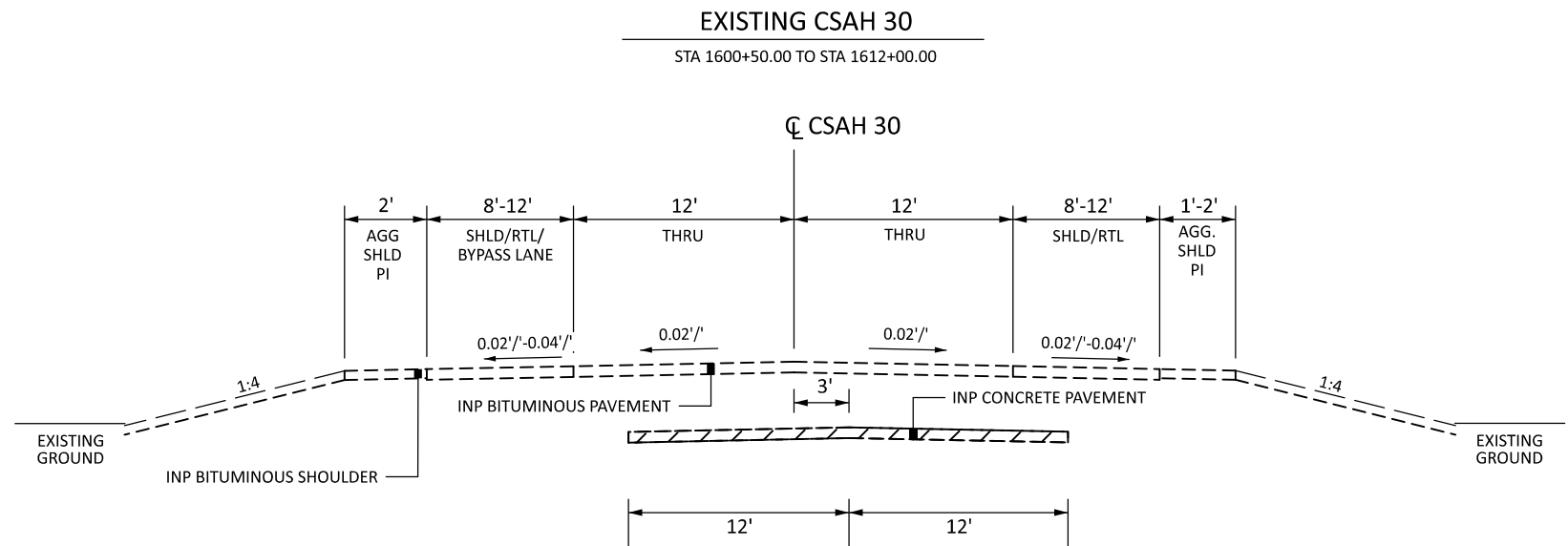
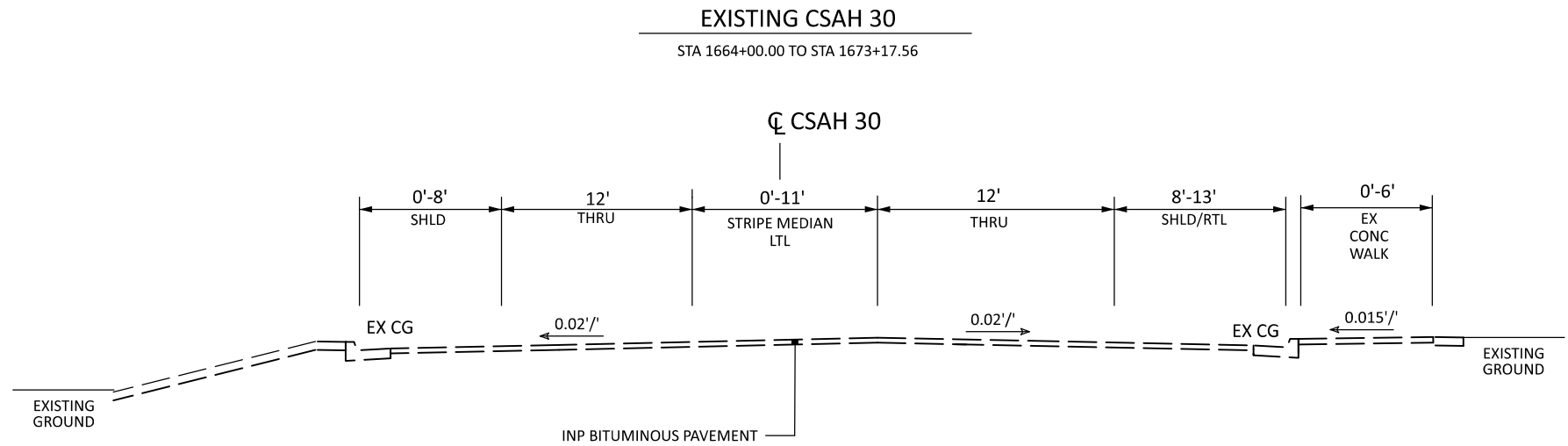


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
EXISTING TYPICALS
TYPICAL SECTIONS
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Nicholas E. Hentges
NICHOLAS E. HENTGES, PE
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

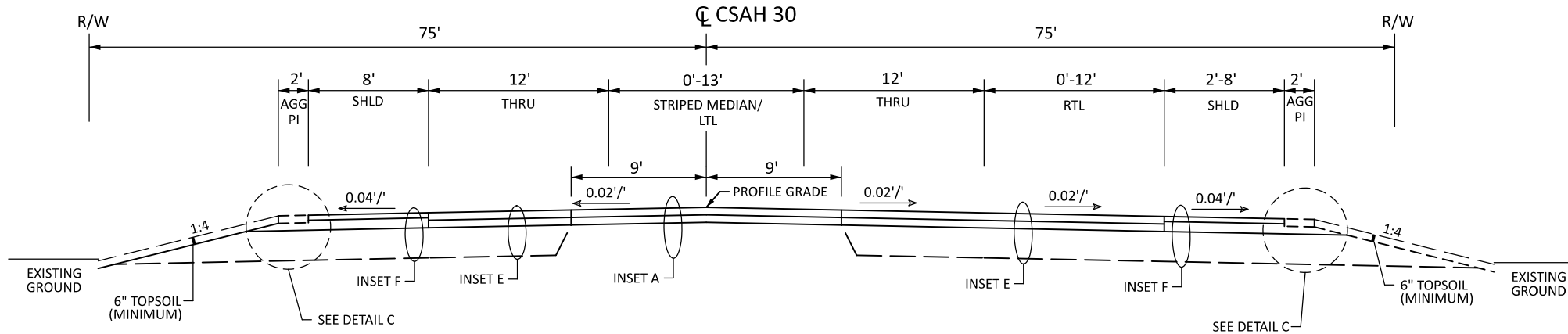
CHISAGO COUNTY, MINNESOTA
EXISTING TYPICALS
TYPICAL SECTIONS
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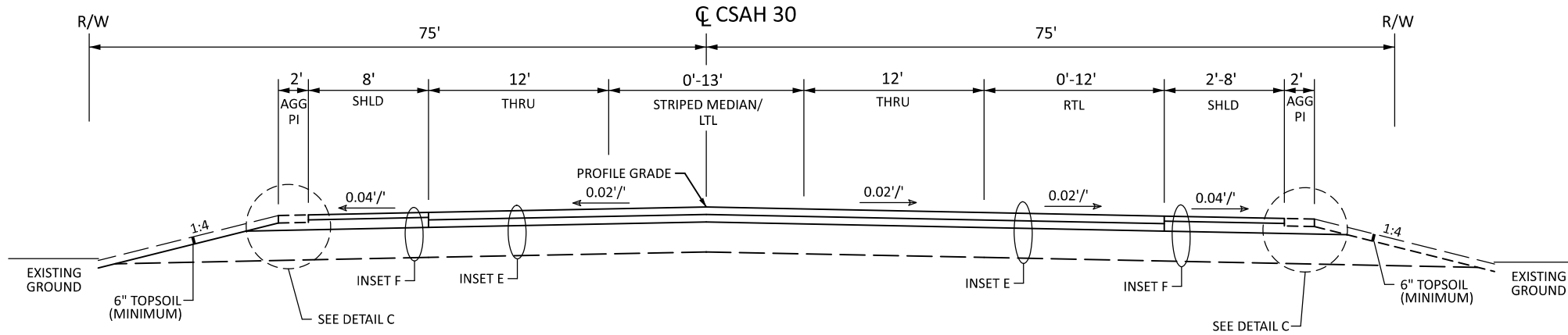
PROPOSED TYPICAL SECTION 3 - CSAH 30

STA 1582+81 TO STA 1586+00
STA 1597+00 TO STA 1598+61
STA 1599+01 TO STA 1600+50



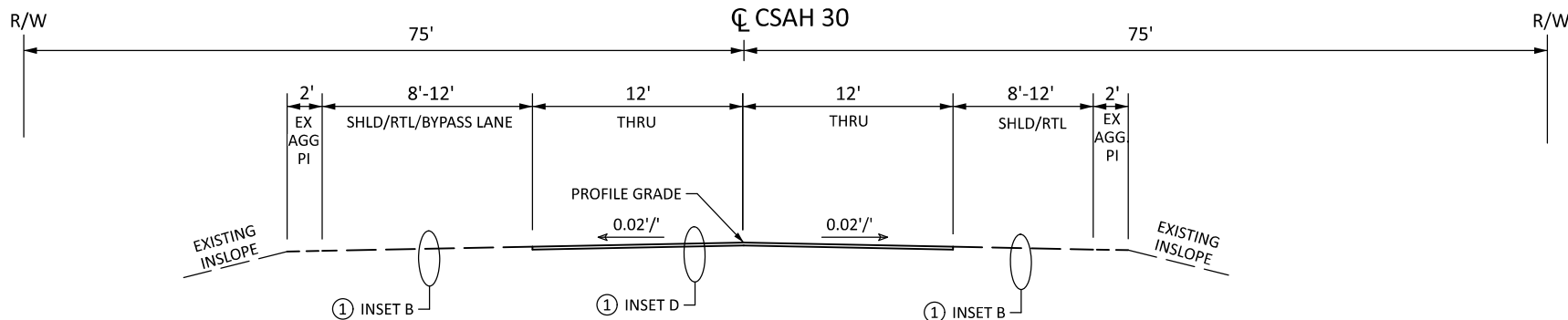
PROPOSED TYPICAL SECTION 2 - CSAH 30

STA 1582+20 TO STA 1582+81
STA 1586+00 TO STA 1597+00
STA 1598+61 TO STA 1599+01



PROPOSED TYPICAL SECTION 1 - CSAH 30

STA 1454+81.80 TO STA 1582+20



SPECIFIC NOTES:

- ① INSET D ALSO APPLIES TO RIGHT TURN LANES AND BYPASS LANES

GENERAL NOTES:

- IN AREAS WHERE NEW ROADWAY CONSTRUCTION IS OUTSIDE OF THE EXISTING ROADWAY, STRIP THE INPLACE TOPSOIL AND PLACE GRANULAR MATERIAL UP TO THE BOTTOM OF THE SELECT GRANULAR SUBGRADE OF THE NEW ROADWAY CONSTRUCTION.
- SHOULDER CROSS SLOPES TO BE 4% AND TURN LANE CROSS SLOPES TO BE 2%.
- SEE CONSTRUCTION PLAN & PROFILE SHEETS FOR EXACT LIMITS OF TURN LANES.
- SEE REMOVALS PLANS FOR AREAS OF EXPECTED BURIED CONCRETE PAVEMENT REMOVAL

NO.	DATE	BY	CHK	REVISIONS

Design By:
Plan By:
Checked By:
Approved By:

NEH
MKV
MAN
NEH

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

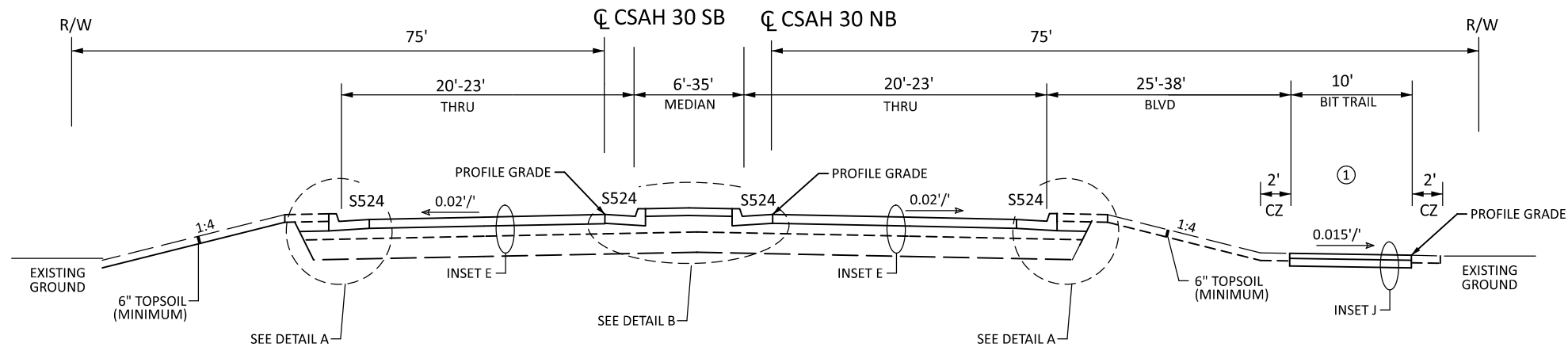
CHISAGO COUNTY, MINNESOTA

TYPICAL SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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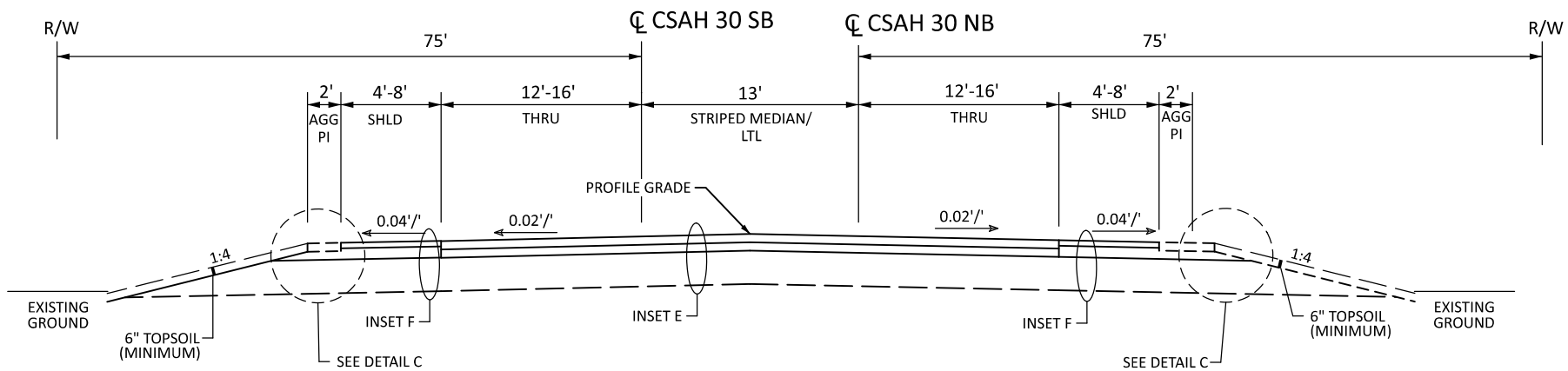
PROPOSED TYPICAL SECTION 6 - CSAH 30

STA 1613+73 TO STA 1616+80
STA 1618+43 TO STA 1619+71



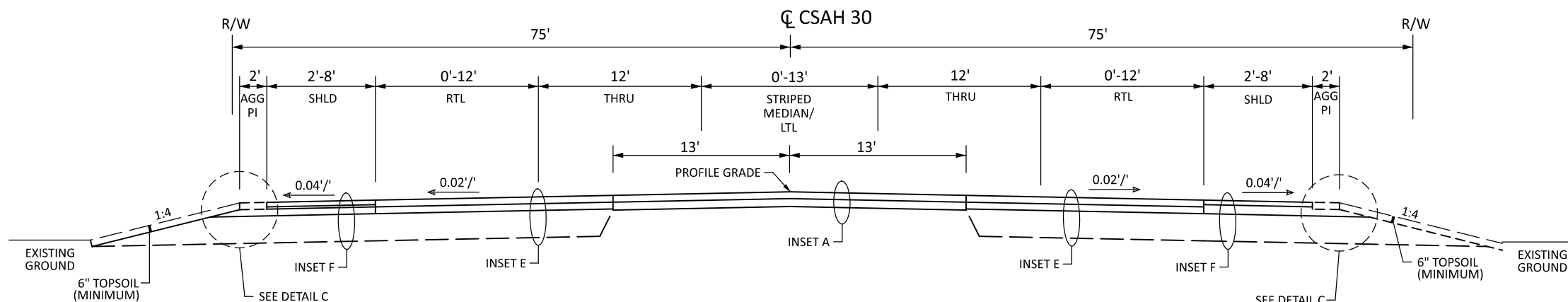
PROPOSED TYPICAL SECTION 5 - CSAH 30

STA 1611+00 TO STA 1613+73



PROPOSED TYPICAL SECTION 4 - CSAH 30

STA 1600+50 TO STA 1611+00



SPECIFIC NOTES:
① SEE CONSTRUCTION PLANS FOR BEGINNING AND END OF TRAIL CONSTRUCTION

GENERAL NOTES:
- IN AREAS WHERE NEW ROADWAY CONSTRUCTION IS OUTSIDE OF THE EXISTING ROADWAY, STRIP THE INPLACE TOPSOIL AND PLACE GRANULAR MATERIAL UP TO THE BOTTOM OF THE SELECT GRANULAR SUBGRADE OF THE NEW ROADWAY CONSTRUCTION.
- SHOULDER CROSS SLOPES TO BE 4% AND TURN LANE CROSS SLOPES TO BE 2%.
- SEE CONSTRUCTION PLAN & PROFILE SHEETS FOR EXACT LIMITS OF TURN LANES.
- SEE REMOVAL PLANS FOR AREAS OF EXPECTED BURIED CONCRETE PAVEMENT REMOVAL

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

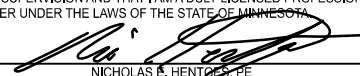
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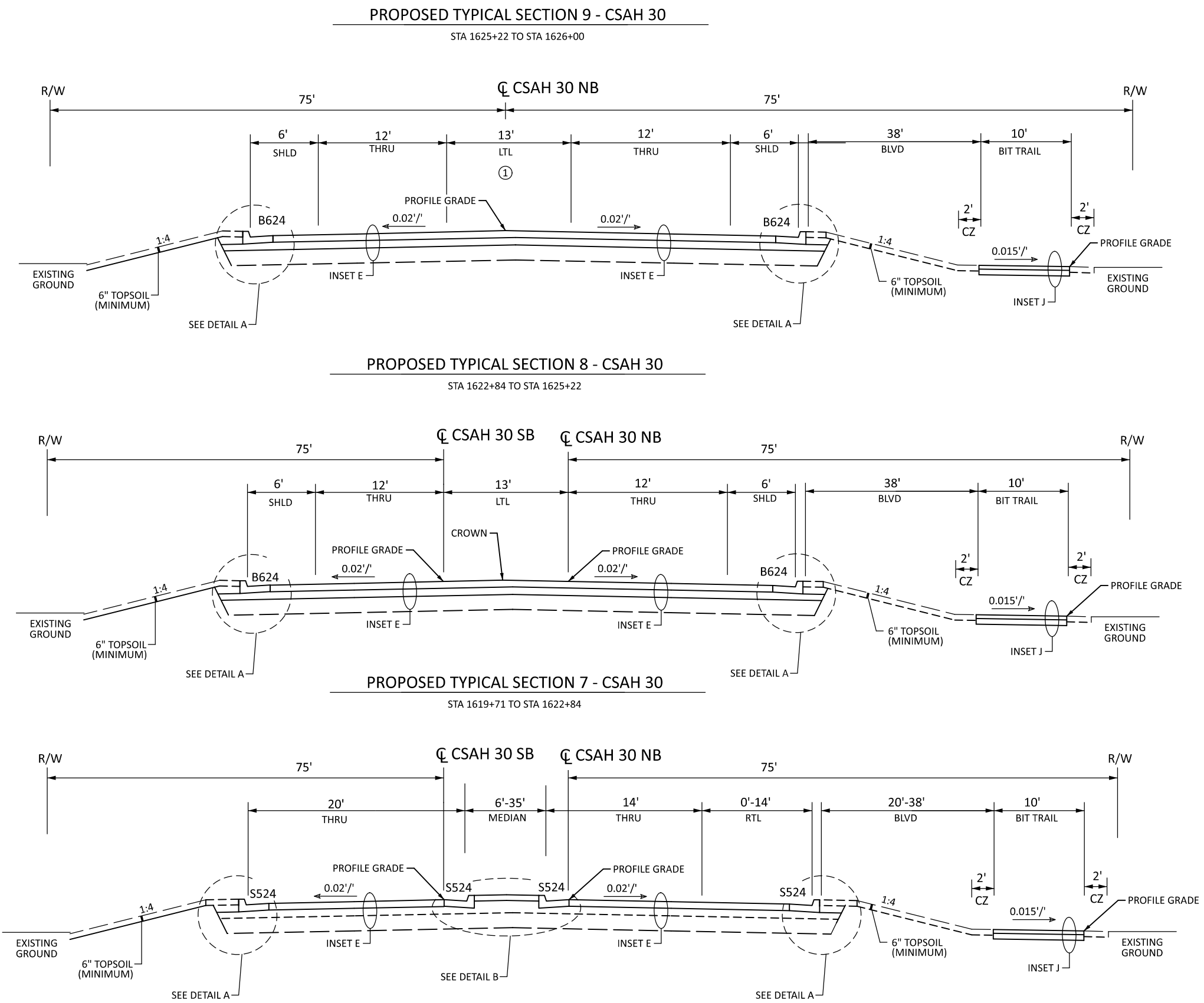
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
TYPICAL SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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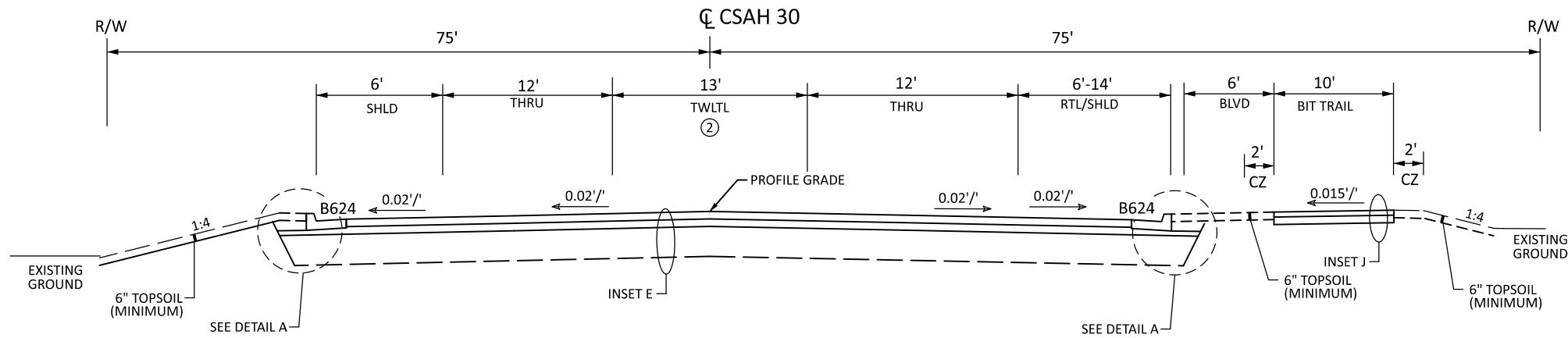


- SPECIFIC NOTES:**
- ① SEE CONSTRUCTION PLANS FOR LOCATIONS OF DEDICATED LEFT TURN LANES
- GENERAL NOTES:**
- IN AREAS WHERE NEW ROADWAY CONSTRUCTION IS OUTSIDE OF THE EXISTING ROADWAY, STRIP THE INPLACE TOPSOIL AND PLACE GRANULAR MATERIAL UP TO THE BOTTOM OF THE SELECT GRANULAR SUBGRADE OF THE NEW ROADWAY CONSTRUCTION.
 - SHOULDER CROSS SLOPES TO BE 4% AND TURN LANE CROSS SLOPES TO BE 2%.
 - SEE CONSTRUCTION PLAN & PROFILE SHEETS FOR EXACT LIMITS OF TURN LANES.
 - SEE REMOVAL PLANS FOR AREAS OF EXPECTED BURIED CONCRETE PAVEMENT REMOVAL

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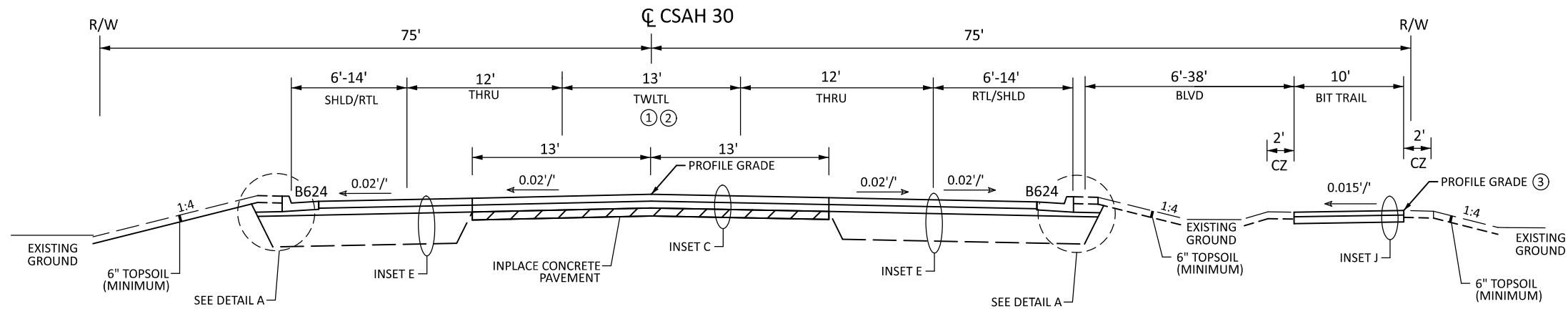
PROPOSED TYPICAL SECTION 12 - CSAH 30

STA 1653+00 TO STA 1665+59



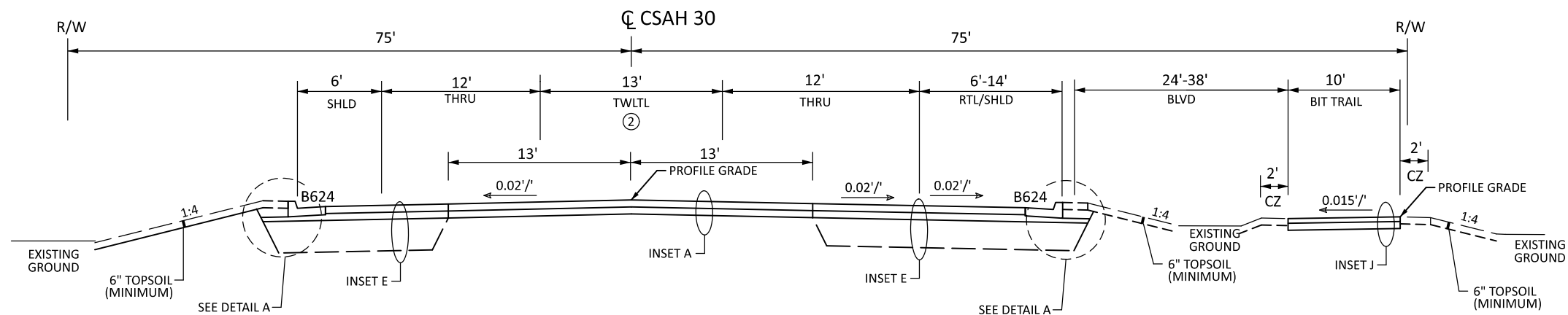
PROPOSED TYPICAL SECTION 11 - CSAH 30

STA 1637+00 TO STA 1653+00



PROPOSED TYPICAL SECTION 10 - CSAH 30

STA 1626+00 TO STA 1637+00



SPECIFIC NOTES:

- SEE CONSTRUCTION PLANS FOR LOCATION OF PEDESTRIAN REFUGE MEDIAN
- SEE CONSTRUCTION PLANS FOR LOCATIONS OF DEDICATED LEFT TURN LANES
- TRAIL PROFILE ENDS AT CSAH 30 STA 1639+00

GENERAL NOTES:

- IN AREAS WHERE NEW ROADWAY CONSTRUCTION IS OUTSIDE OF THE EXISTING ROADWAY, STRIP THE INPLACE TOPSOIL AND PLACE GRANULAR MATERIAL UP TO THE BOTTOM OF THE SELECT GRANULAR SUBGRADE OF THE NEW ROADWAY CONSTRUCTION.
- SHOULDER CROSS SLOPES TO BE 4% AND TURN LANE CROSS SLOPES TO BE 2%.
- SEE CONSTRUCTION PLAN & PROFILE SHEETS FOR EXACT LIMITS OF TURN LANES.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

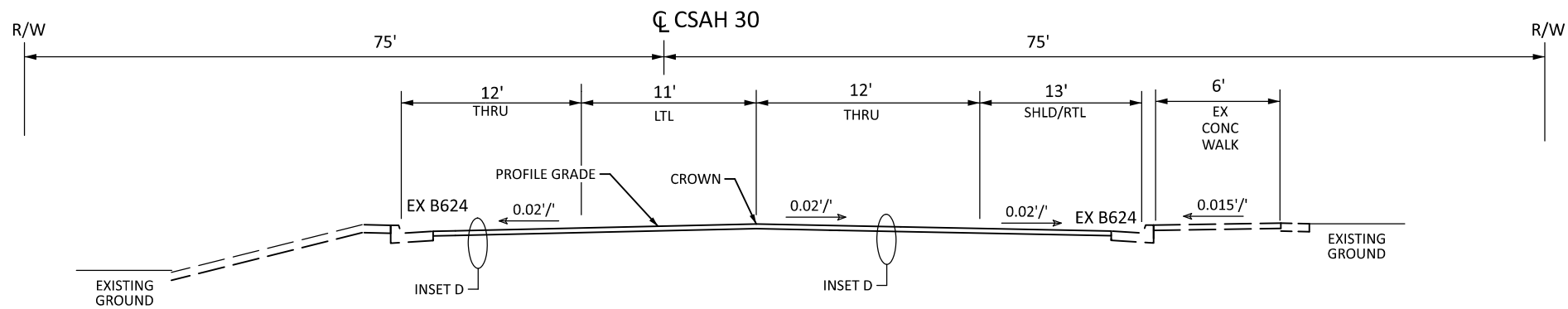
TYPICAL SECTIONS
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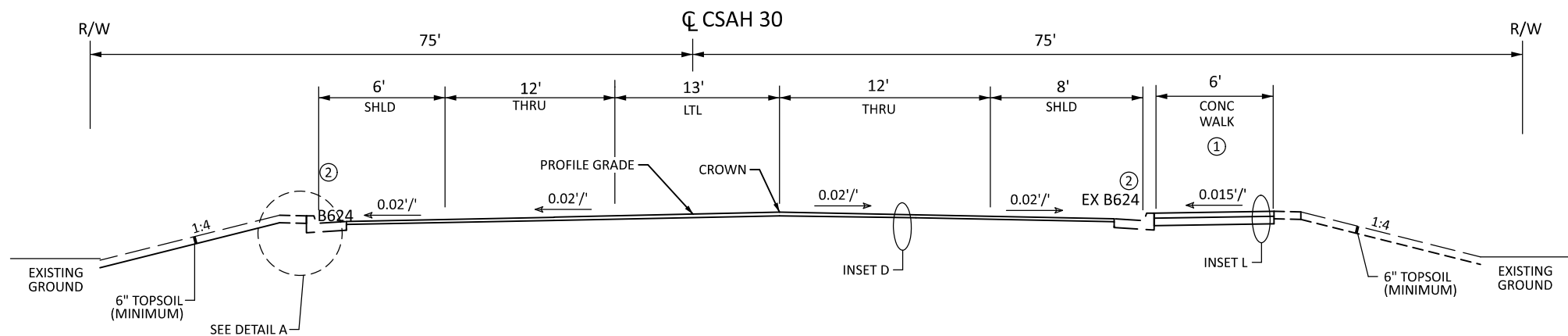
PROPOSED TYPICAL SECTION 15 - CSAH 30

STA 1669+43 TO STA 1673+17.56



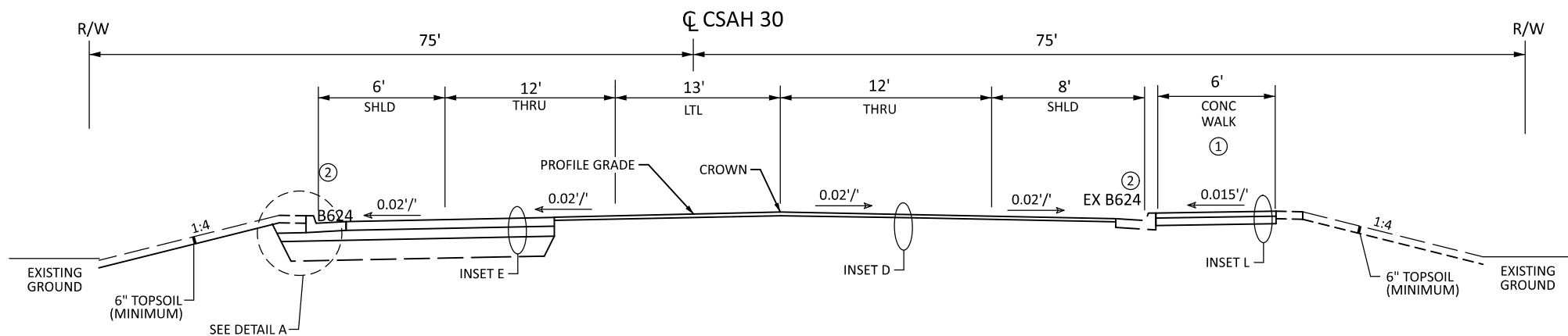
PROPOSED TYPICAL SECTION 14 - CSAH 30

STA 1666+76 TO STA 1669+43



PROPOSED TYPICAL SECTION 13 - CSAH 30

STA 1665+59 TO STA 1666+76



SPECIFIC NOTES:

- SEE CONSTRUCTION PLANS FOR BEGINNING AND END OF CONCRETE WALK AND CURB AND GUTTER CONSTRUCTION
- SEE CONSTRUCTION PLANS FOR BEGINNING AND END OF CURB TRANSITION

GENERAL NOTES:

- IN AREAS WHERE NEW ROADWAY CONSTRUCTION IS OUTSIDE OF THE EXISTING ROADWAY, STRIP THE INPLACE TOPSOIL AND PLACE GRANULAR MATERIAL UP TO THE BOTTOM OF THE SELECT GRANULAR SUBGRADE OF THE NEW ROADWAY CONSTRUCTION.
- SHOULDER CROSS SLOPES TO BE 4% AND TURN LANE CROSS SLOPES TO BE 2%.
- SEE CONSTRUCTION PLAN & PROFILE SHEETS FOR EXACT LIMITS OF TURN LANES.

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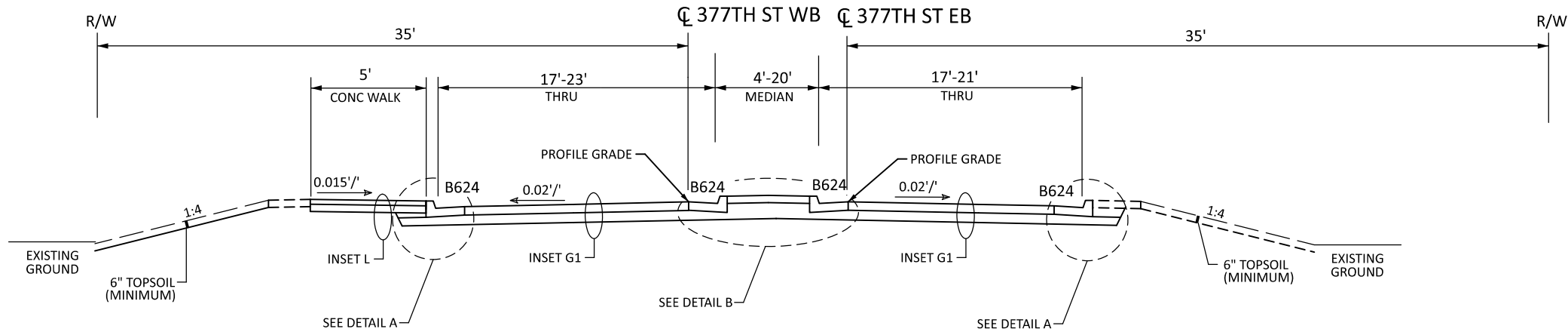
CHISAGO COUNTY, MINNESOTA

TYPICAL SECTIONS
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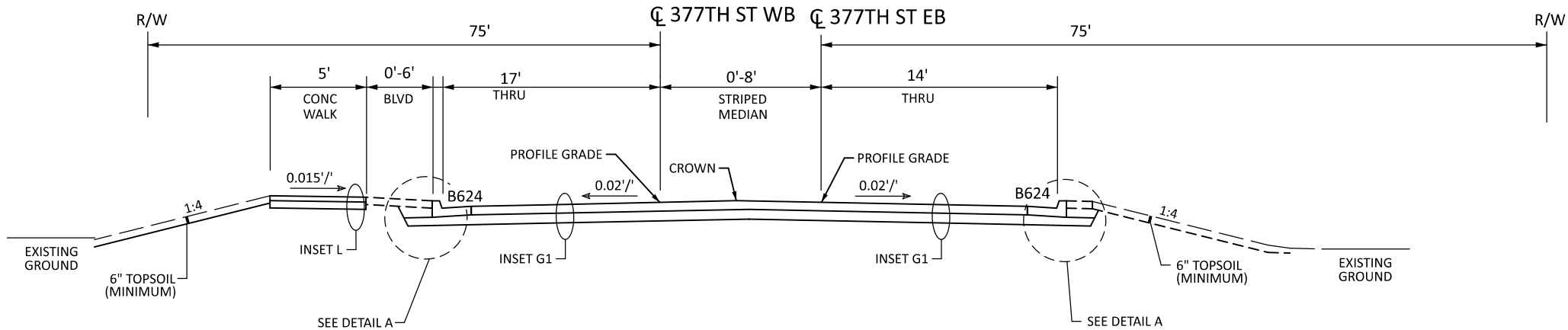
PROPOSED TYPICAL SECTION 18 - 377TH ST

STA 104+42.79 TO STA 104+91.47



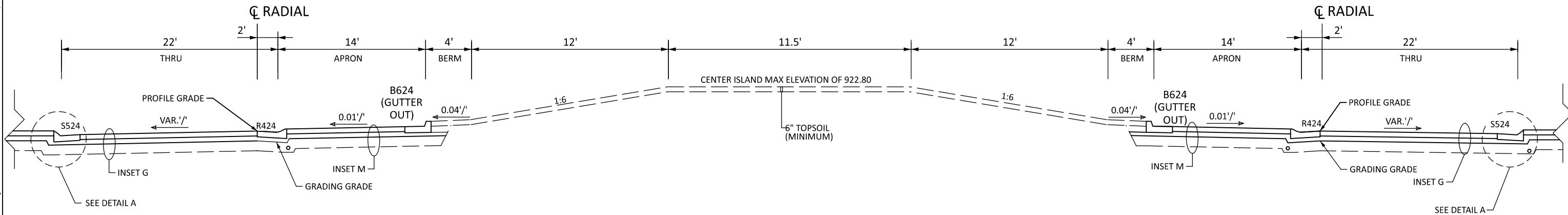
PROPOSED TYPICAL SECTION 17 - 377TH ST

STA 104+91.47 TO STA 106+20.00



PROPOSED TYPICAL SECTION 16 - CSAH 30

377TH ST ROUNDABOUT



GENERAL NOTES:

- IN AREAS WHERE NEW ROADWAY CONSTRUCTION IS OUTSIDE OF THE EXISTING ROADWAY, STRIP THE INPLACE TOPSOIL AND PLACE GRANULAR MATERIAL UP TO THE BOTTOM OF THE SELECT GRANULAR SUBGRADE OF THE NEW ROADWAY CONSTRUCTION.
- RURAL SHOULDER CROSS SLOPES TO BE 4% AND TURN LANE CROSS SLOPES TO BE 2%.
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- SEE REMOVAL PLANS FOR AREAS OF EXPECTED BURIED CONCRETE PAVEMENT REMOVAL

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

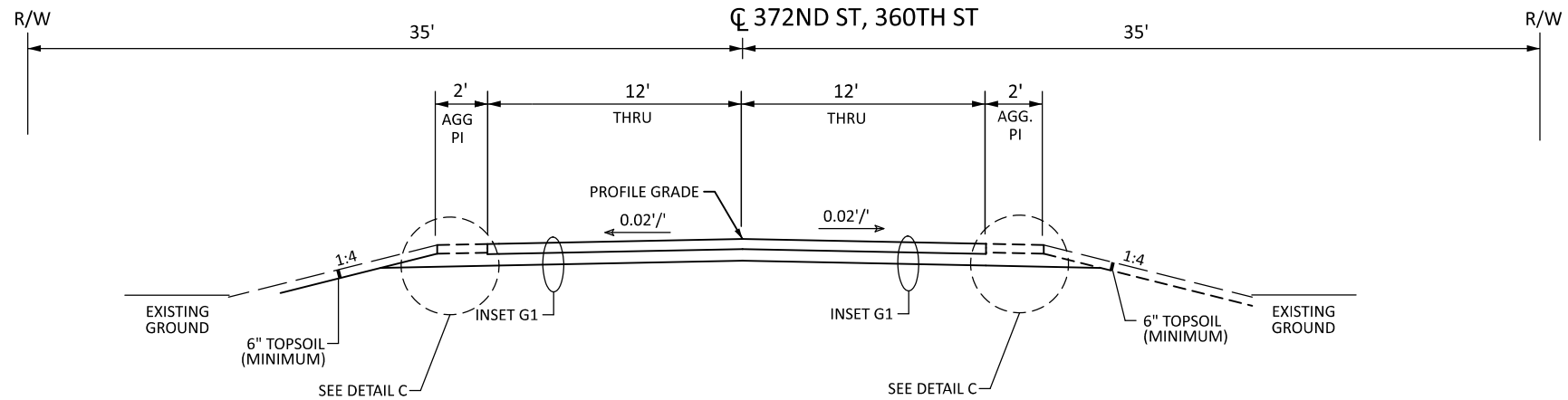
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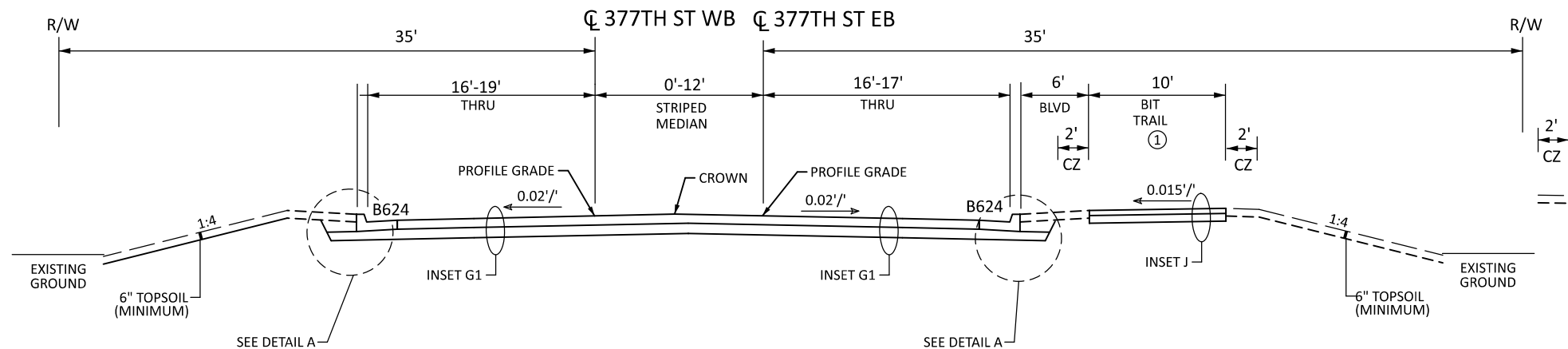
PROPOSED TYPICAL SECTION 21 - 372ND ST

STA 299+40 TO STA 300+23.68



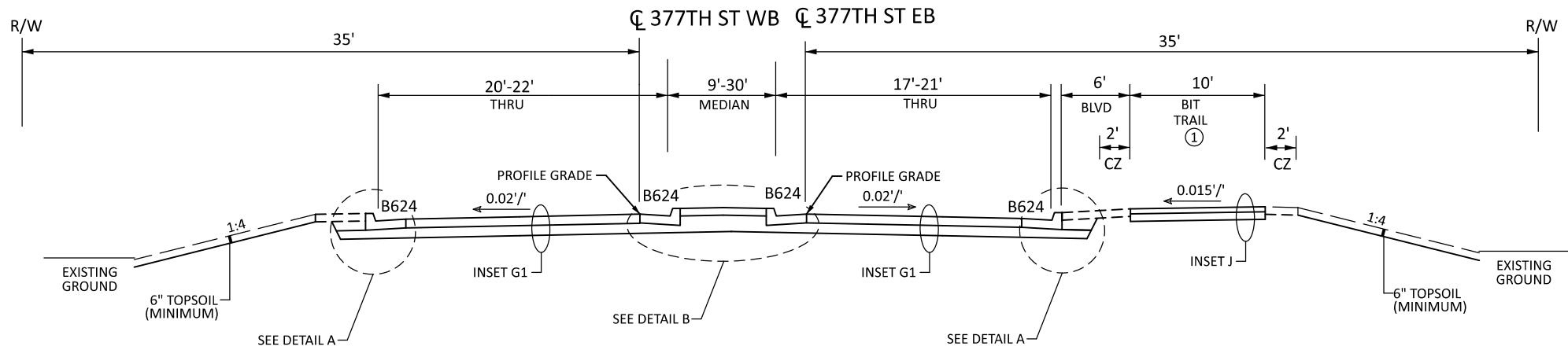
PROPOSED TYPICAL SECTION 20 - 377TH ST

STA 100+14.67 TO STA 102+05.78



PROPOSED TYPICAL SECTION 19 - 377TH ST

STA 102+05.78 TO STA 102+53.72

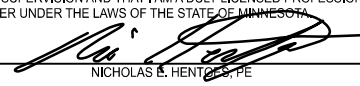


SPECIFIC NOTES:
① SEE CONSTRUCTION PLANS FOR BEGINNING AND END OF TRAIL CONSTRUCTION

GENERAL NOTES:
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- RURAL SHOULDER CROSS SLOPES TO BE 4% AND TURN LANE CROSS SLOPES TO BE 2%.
- SEE CONSTRUCTION PLAN & PROFILE SHEETS FOR EXACT LIMITS OF TURN LANES.
- SEE REMOVAL PLANS FOR AREAS OF EXPECTED BURIED CONCRETE PAVEMENT REMOVAL

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Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024
LICENSE NO. 44620

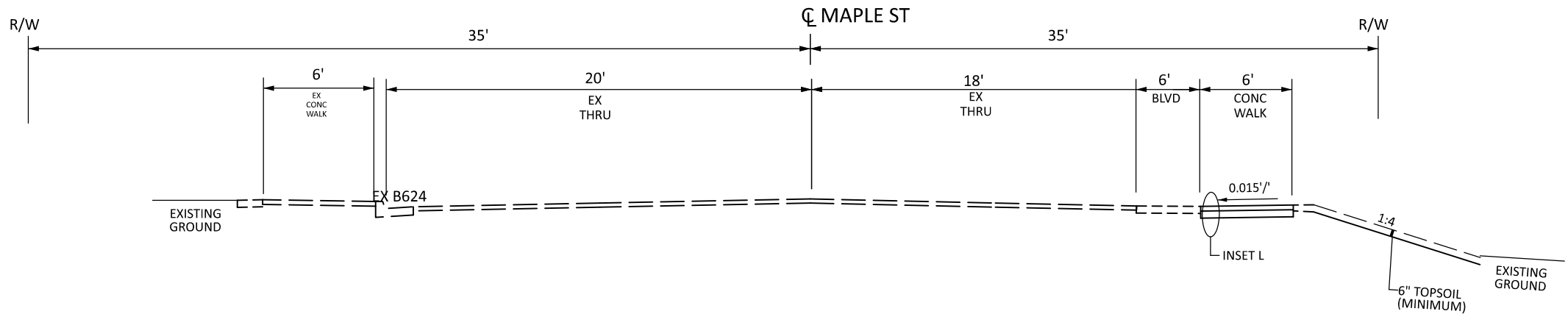


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
TYPICAL SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

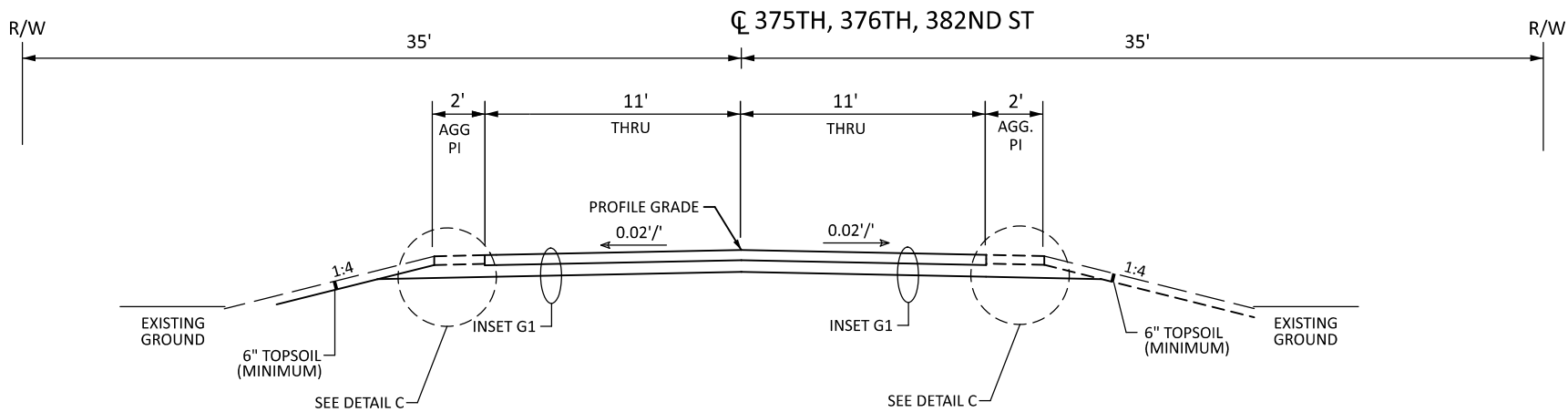
SHEET
27
OF
216
SHEETS

PROPOSED TYPICAL SECTION 23 - MAPLE ST



PROPOSED TYPICAL SECTION 22 - 375TH ST, 376TH ST, 382ND ST

STA 399+40 TO STA 401+25.04
STA 499+40 TO STA 501+30.52
STA 599+30 TO STA 601+30.70



GENERAL NOTES:

- IN AREAS WHERE NEW ROADWAY CONSTRUCTION IS OUTSIDE OF THE EXISTING ROADWAY, STRIP THE INPLACE TOPSOIL AND PLACE GRANULAR MATERIAL UP TO THE BOTTOM OF THE SELECT GRANULAR SUBGRADE OF THE NEW ROADWAY CONSTRUCTION.
- RURAL SHOULDER CROSS SLOPES TO BE 4% AND TURN LANE CROSS SLOPES TO BE 2%.
- SEE CONSTRUCTION PLAN & PROFILE SHEETS FOR EXACT LIMITS OF TURN LANES.
- SEE REMOVAL PLANS FOR AREAS OF EXPECTED BURIED CONCRETE PAVEMENT REMOVAL

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024
LICENSE NO. 44620



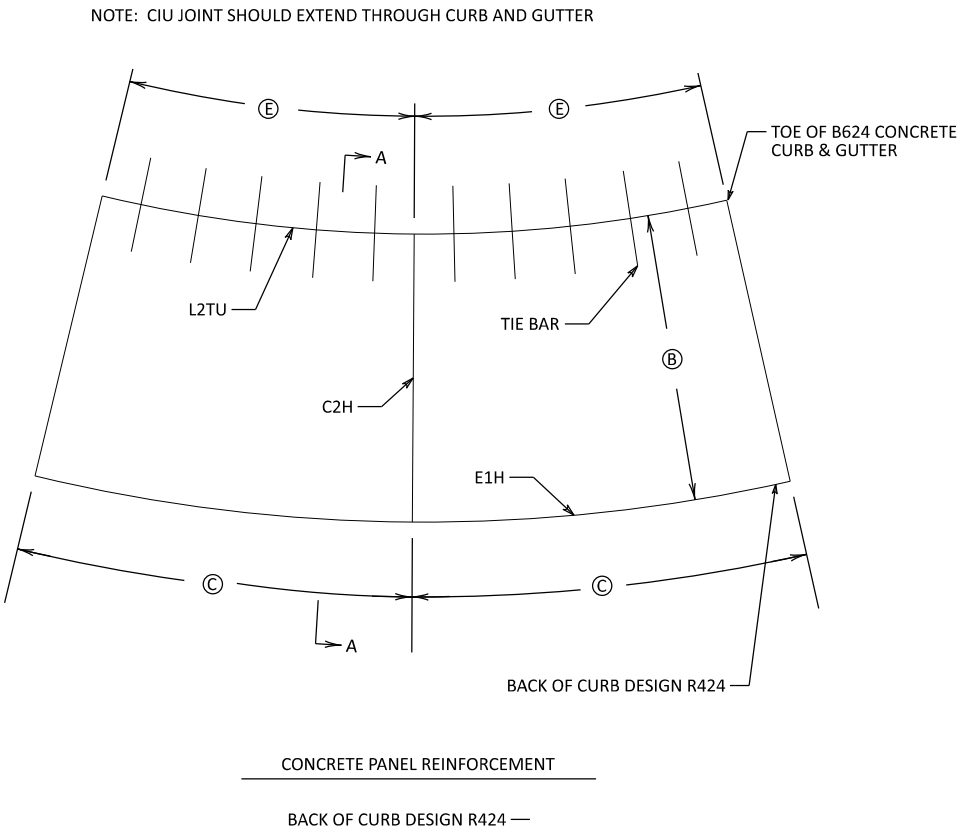
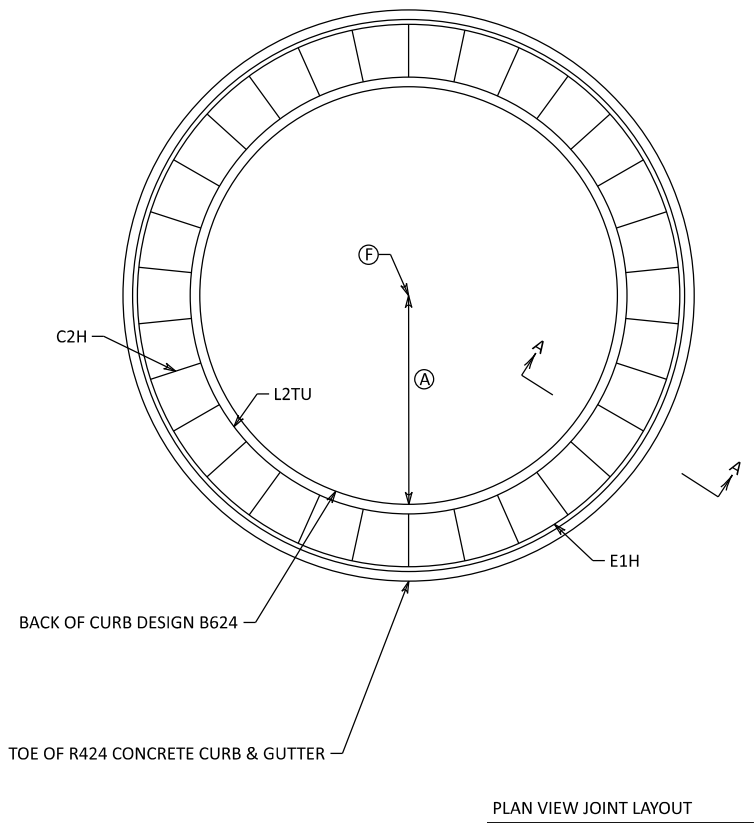
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

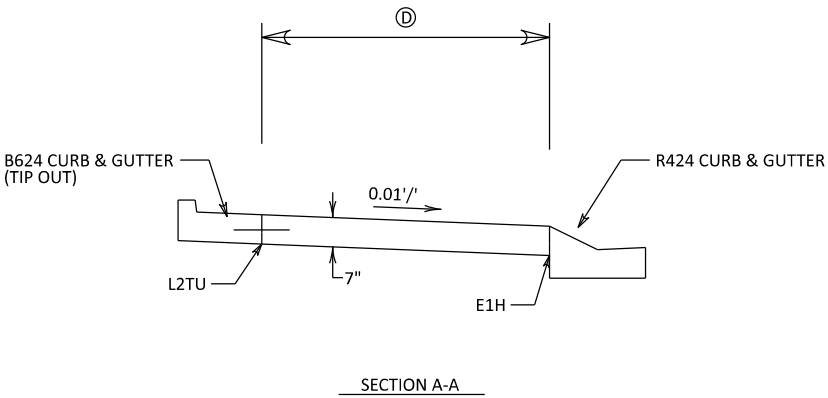
TYPICAL SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
28
OF
216
SHEETS

Truck Apron Details
NOT TO SCALE



CONCRETE PANEL REINFORCEMENT
BACK OF CURB DESIGN R424



ROUNDABOUT	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ
CSAH 30 & 377TH ST	43.5'R	11'	11.83'	11'	9.53'	X: 526239.3770 , Y: 172870.6953

- GENERAL NOTES:
- SEE TYPICAL SECTIONS AND PLAN SHEETS FOR CURB AND GUTTER DETAILS
 - ALL TIE BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301 AND STANDARD PLAN 5-297.221. (INCIDENTAL)

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

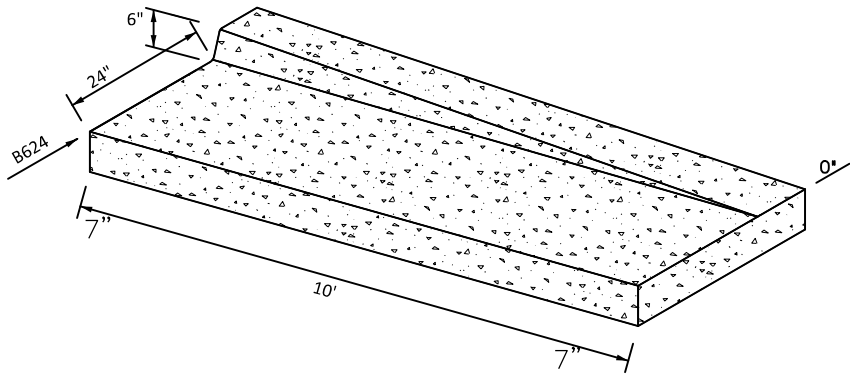
Nicholas E. Hentges
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
TRUCK APRON DETAIL
MISCELLANEOUS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
29
OF
216
SHEETS



FOR OTHER DIMENSIONS SEE STANDARD PLATE NO. 7100
TO BE USED AT CURB AND GUTTER TERMINI
PAYMENT SHALL BE MADE AS CONCRETE CURB & GUTTER DESIGN B624 BY THE LINEAR FOOT

B624 TO 0" HEIGHT CURB & GUTTER TRANSITION

NOT TO SCALE

DATE: 9/12/2024 1:59:44 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_det

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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.	
	
NICHOLAS E. HENTGES, PE	
DATE: 9/12/2024	LICENSE NO. 44620





CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
MISCELLANEOUS DETAILS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
30
OF
216
SHEETS

DATE: 9/12/2024 1:59:57 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sd1

INTERNAL DIAMETER OF PIPE (INCHES)	WEIGHT PER LINEAR FOOT OF PIPE	WALL THICKNESS	CLASS I		CLASS II		CLASS III		CLASS IV		CLASS V	
			D - LOAD TO PRODUCE A 0.01" CRACK (LBS./LIN.FT. OF DIA.)		1000		1350		2000		3000	
			D - LOAD TO PRODUCE ULTIMATE LOAD (LBS./LIN.FT. OF DIA.)		1200		1500		2000		3000	
			CONCRETE 4000 PSI (4)		CONCRETE 4000 PSI (4)		CONCRETE 4000 PSI (4)		CONCRETE 4000 PSI (4)		CONCRETE 6000 PSI	
			T		MINIMUM REINFORCEMENT SQUARE INCHES PER LINEAR FOOT OF BARREL							
D	POUNDS	INCHES	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE
12	92	2	---	(5)	---	0.07 (2)	---	0.07 (2)	---	0.07	---	---
15	127	2 1/4	---	(5)	---	0.07 (2)	---	0.07 (2)	---	0.10	---	---
18	168	2 1/2	---	(5)	---	0.07 (2)	---	0.07 (2)	---	0.14	---	---
21	214	2 3/4	---	(5)	---	0.07 (2)	---	0.07 (2)	---	0.20	---	---
24	265	3	---	(5)	---	0.07 (2)	---	0.07 (2)	---	0.27	---	---
27	322	3 1/4	---	(5)	---	0.13	---	0.16	---	0.31	---	0.23
30	384	3 1/2	---	(5)	---	0.14	---	0.18	---	0.35	---	0.25
33	452	3 3/4	---	(5)	---	0.15	---	0.20	---	0.27	0.16	0.46
36	524	4	---	(5)	---	0.12 (3)	0.07	0.17 (3)	0.10	0.30	0.18	0.50
42	685	4 1/2	---	(5)	---	0.15	0.09	0.21	0.13	0.35	0.21	0.60
48	867	5	---	(5)	---	0.18	0.11	0.24	0.14	0.42 (5)	0.25	0.73 (5)
54	1070	5 1/2	---	(5)	---	0.22	0.13	0.29	0.17	0.50 (5)	0.30	0.87 (5)
60	1296	6	0.21	0.13	0.25	0.15	0.34	0.20	0.59 (5)	0.35	(7)	(7)
66	1542	6 1/4	0.25	0.15	0.31	0.19	0.41 (5)	0.25	0.69 (5)	0.41 (5)	(7)	(7)
72	1810	7	0.29	0.17	0.35	0.21	0.49 (5)	0.29	0.79 (5)	0.47 (5)	0.96 (7.5)	0.58 (5)
78	2098	7 1/2	0.32	0.19	0.40 (5)	0.24	0.57 (5)	0.34	0.71 (7.5)	0.43 (5)	1.05 (7.5)	0.63 (5)
84	2410	8	0.37	0.22	0.46 (5)	0.28	0.64 (5)	0.38	0.76 (7.5)	0.46 (5)	1.14 (7.5)	0.68 (5)
90	2740	8 1/2	0.41 (5)	0.25	0.51 (5)	0.31	0.69 (5)	0.41 (5)	0.82 (7.5)	0.49 (5)	1.23 (7.5)	0.74 (5)
96	3090	9	0.46 (5)	0.28	0.57 (5)	0.34	0.76 (5)	0.46 (5)	0.87 (7.5)	0.52 (5)	1.32 (7.5)	0.79 (5)
108	3860	10	0.51 (5)	0.37	0.76 (5)	0.46 (5)	1.08 (5)	0.65 (5)	0.98 (7.5)	0.59 (5)	1.50 (7.5)	0.90 (5)

NOTES:

SEE SHEETS 3 THROUGH 6 FOR ADDITIONAL INFORMATION ON PIPE SECTIONS AND GENERAL NOTES.

STANDARD PLATE 3006, GASKET JOINT FOR R.C. PIPE, MAY BE FURNISHED IN LIEU OF 3000 PIPE. THE GASKET IS REQUIRED.

WHEN CONNECTING 3000 TO 3006 STANDARD PLATE PIPES, USE A TRANSITION SECTION OF NOMINAL LAYING LENGTH WITH A 3000 JOINT ON ONE END AND A 3006 GASKET JOINT ON THE OTHER END AND HAVING THE TONGUE AND GROOVE CONFIGURATION NECESSARY TO CONNECT THE PIPES. 3000 JOINTS ARE NOT ALLOWED ON CHISAGO COUNTY PROJECTS

- CLASS IV PIPE 78" OR MORE IN DIAMETER AND CLASS V PIPE 72" OR MORE IN DIAMETER ARE SPECIAL DESIGNS IN ACCORDANCE WITH 3236 AND REQUIRE SHEAR REINFORCEMENT. FOR SHEAR REINFORCEMENT, SEE SHEET 5 OF 6.
- FOR THESE CLASSES AND SIZES, THE MINIMUM PRACTICAL STEEL REINFORCEMENT IS SPECIFIED.
- AS AN ALTERNATIVE, SINGLE-CAGE REINFORCEMENT MAY BE USED. THE REINFORCEMENT AREA IN SQUARE INCHES PER LINEAR FOOT IS 0.20 IN²/LIN.FT. FOR CLASS 2, AND 0.30 IN²/LIN.FT. FOR CLASS 3.
- THE REQUIRED STRENGTH INCREASES TO 5000 PSI FOR LARGER SIZE PIPE. SEE BELOW.
- FOR PIPES 48" AND LARGER, AS AN ALTERNATIVE FOR DESIGNS REQUIRING BOTH INNER AND OUTER CAGES, IF THE REQUIRED REINFORCEMENT FOR EITHER CAGE MEETS OR EXCEEDS 0.40 IN²/LIN.FT., QUADRANT REINFORCEMENT MAY BE USED AS SHOWN ON SHEET 4 OF 6. THESE ARE SPECIAL DESIGNS IN ACCORDANCE WITH 3236.
- USE CLASS 2 AS THE MINIMUM CLASS OF PIPE.
- USE "C" WALL PIPE.

APPROVED MARCH 5, 2020

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE PIPE
B WALL

SPECIFICATION
REFERENCE
2501
2503

STANDARD
PLATE
NO.
3000M

1 OF 6

INTERNAL DIA. OF PIPE (INCHES)	WEIGHT PER LINEAR FOOT OF PIPE	WALL THICKNESS	CLASS II		CLASS III		CLASS IV		CLASS V	
			D - LOAD TO PRODUCE A 0.01 INCH CRACK (LBS./LIN.FT. OF DIA.)		1000		1350		2000	
			D - LOAD TO PRODUCE ULTIMATE LOAD (LBS./LIN.FT. OF DIA.)		1500		2000		3000	
			CONCRETE 4000 PSI (4)		CONCRETE 4000 PSI (4)		CONCRETE 4000 PSI (4)		CONCRETE 6000 PSI	
			MINIMUM REINFORCEMENT SQUARE INCHES PER LINEAR FOOT OF BARREL							
		T	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE
0	POUNDS	INCHES								
12	140	2 1/4	0.07 (2)	---	0.07 (2)	---	0.07 (2)	---	0.07 (2)	---
15	180	3	0.07 (2)	---	0.07 (2)	---	0.07 (2)	---	0.07 (2)	---
18	230	3 1/4	0.07 (2)	---	0.07 (2)	---	0.07 (2)	---	0.10	---
21	280	3 1/2	0.07 (2)	---	0.07 (2)	---	0.07 (2)	---	0.10	---
24	340	3 3/4	0.07 (2)	---	0.07	---	0.07	0.07	0.12	0.07
27	410	4	0.07 (2)	---	0.08	---	0.08	0.07	0.14	0.08
30	480	4 1/4	0.07 (2)	---	0.10	---	0.09	0.07	0.18	0.11
33	510	4 1/2	0.07 (2)	---	0.12	---	0.11	0.07	0.23	0.14
36	630	4 3/4	0.07 (3)	0.07	0.08 (5)	0.07	0.14	0.08	0.27	0.16
42	810	5 1/4	0.10	0.07	0.12	0.07	0.20	0.12	0.36	0.22
48	1010	5 3/4	0.14	0.08	0.16	0.10	0.26	0.16	0.47 (5)	0.28
54	1230	6 1/4	0.17	0.10	0.21	0.13	0.34	0.20	0.58 (5)	0.35
60	1470	6 3/4	0.22	0.13	0.25	0.15	0.41 (5)	0.25	0.70 (5)	0.42 (5)
66	1740	7 1/4	0.25	0.15	0.31	0.19	0.51 (5)	0.31	0.84 (5)	0.50 (5)
			CONCRETE 5000 PSI							
72	2010	7 3/4	0.30	0.18	0.36	0.22	0.61 (5)	0.37	0.99 (5)	0.59 (5)
78	2330	8 1/4	0.35	0.21	0.42 (5)	0.25	0.71 (5)	0.43 (5)	0.85 (7.5)	0.51 (5)
84	2640	8 3/4	0.41 (5)	0.25	0.50 (5)	0.30	0.85 (5)	0.51 (5)	0.94 (7.5)	0.56 (5)
			CONCRETE 5000 PSI							
90	3000	9 1/4	0.48 (5)	0.29	0.59 (5)	0.35	0.74 (7.5)	0.44 (5)	1.03 (7.5)	0.62 (5)
96	3370	9 3/4	0.55 (5)	0.33	0.70 (5)	0.42 (5)	0.79 (7.5)	0.47 (5)	1.12 (7.5)	0.67 (5)
			CONCRETE 5000 PSI							
108	4170	10 3/4	0.70 (5)	0.42 (5)	0.99 (5)	0.59 (5)	0.90 (7.5)	0.54 (5)	1.30 (7.5)	0.78 (5)

NOTES:

SEE SHEET 3 THROUGH 6 FOR ADDITIONAL INFORMATION ON C WALL PIPE SECTIONS AND GENERAL NOTES.

STANDARD PLATE 3006, GASKET JOINT FOR R.C. PIPE, MAY BE FURNISHED IN LIEU OF 3000 PIPE. THE GASKET IS REQUIRED.

WHEN CONNECTING 3000 TO 3006 STANDARD PLATE PIPES, USE A TRANSITION SECTION OF NOMINAL LAYING LENGTH WITH A 3000 JOINT ON ONE END AND A 3006 GASKET JOINT ON THE OTHER END AND HAVING THE TONGUE AND GROOVE CONFIGURATION NECESSARY TO CONNECT THE PIPES.

3000 JOINTS ARE NOT ALLOWED ON CHISAGO COUNTY PROJECTS

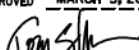
① CLASS IV PIPE 90" OR MORE IN DIAMETER AND CLASS V PIPE 78" OR MORE IN DIAMETER ARE SPECIAL DESIGNS IN ACCORDANCE WITH 3236 AND REQUIRE SHEAR REINFORCEMENT. FOR SHEAR REINFORCEMENT, SEE SHEET 5 OF 6.

② FOR THESE CLASSES AND SIZES, THE MINIMUM PRACTICAL STEEL REINFORCEMENT IS SPECIFIED.

③ AS AN ALTERNATIVE, FOR CLASS II AND III, A SINGLE CAGE REINFORCEMENT MAY BE USED. THE REQUIRED REINFORCEMENT IS 0.16 IN²/LIN.FT. FOR CLASS II AND 0.20 IN²/LIN.FT. FOR CLASS III.

④ THE REQUIRED STRENGTH INCREASES TO 5000 PSI FOR LARGER SIZE PIPE. SEE BELOW.

⑤ FOR PIPES 48" AND LARGER, AS AN ALTERNATIVE FOR DESIGNS REQUIRING BOTH INNER AND OUTER CAGES, IF THE REQUIRED REINFORCEMENT FOR EITHER CAGE EXCEEDS 0.40 IN²/LIN.FT., QUADRANT REINFORCEMENT MAY BE USED AS SHOWN ON SHEET 4 OF 6. THESE ARE SPECIAL DESIGNS IN ACCORDANCE WITH 3236.

APPROVED MARCH 5, 2020

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE PIPE
C WALL

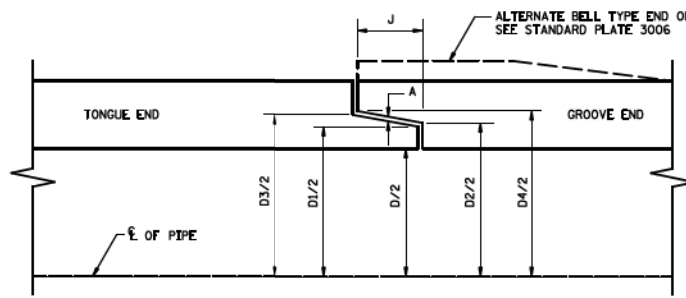
SPECIFICATION REFERENCE
2501
2503

STANDARD PLATE NO.
3000M
2 OF 6

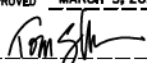
INTERNAL DIAMETER OF PIPE IN INCHES	CROSS SECTION WATER AREA	J (LENGTH OF JOINT)	A (NOMINAL)	D1	D2	D3	D4	TOLERANCES IN DIMENSIONS (PLUS OR MINUS)				
								INTERNAL DIAMETER	WALL THICKNESS		J	
									D1, D2, D3, & D4	B WALL		C WALL
D	SQ. FT.	INCHES										
12	0.79	1 3/4	3/8	13 1/4	13 1/2	13 1/2	14 1/4	1/4	3/8	3/8	3/8	1/4
15	1.23	2	3/8	16 1/2	16 1/2	16 1/2	17 1/4	17 1/2	3/8	3/8	3/8	1/4
18	1.77	2 1/4	3/8	19 1/2	20	20 1/2	20 3/4	3/8	3/8	3/8	3/8	1/4
21	2.40	2 1/2	3/8	22 3/8	23 1/4	23 3/4	24 1/8	3/8	3/8	3/8	3/8	1/4
24	3.14	2 3/4	3/8	26	26 3/8	27	27 1/2	3/8	3/8	3/8	3/8	1/4
27	3.98	3	3/8	29 1/4	29 1/2	30 1/4	30 3/4	3/8	3/8	3/8	3/8	1/4
30	4.91	3 1/4	3/8	32 3/4	32 3/4	33 1/2	33 3/4	3/8	3/8	3/8	3/8	1/4
33	5.94	3 1/2	1/4	35 1/2	36	36 3/4	37 1/4	3/8	1/4	3/8	3/8	1/4
36	7.07	3 3/4	1/4	38 3/4	39 1/4	40	40 1/2	3/8	1/4	3/8	3/8	1/4
42	9.62	4	1/4	45 1/8	45 1/2	46 1/2	47	3/8	1/4	3/8	3/8	1/4
48	12.57	4 1/4	1/4	51 1/2	52	53	53 1/2	1/2	1/4	1/4	3/8	1/4
54	15.90	4 1/2	1/4	57 1/2	58 1/2	59 1/2	59 3/4	3/8	1/4	1/4	3/8	1/4
60	19.63	5	1/4	64 1/4	64 3/4	66	66 1/2	3/8	1/4	3/8	3/8	1/4
66	23.76	5 1/2	1/4	70 1/2	71 1/8	72 1/2	73	3/8	1/4	3/8	3/8	1/4
72	28.27	6	1/4	77	77 1/2	79	79 1/2	3/8	1/4	3/8	3/8	1/4
78	33.18	6 1/2	1/4	83 3/8	83 3/8	85 1/2	86 1/8	3/8	1/4	3/8	3/8	1/4
84	38.48	7	1/4	89 3/4	90 1/4	92 1/2	92 3/4	3/8	1/4	3/8	3/8	1/4
90	44.18	7 1/4	1/4	95 3/4	96 1/4	98 1/8	98 3/8	3/8	1/4	3/8	3/8	1/4
96	50.27	7 1/2	1/4	102 1/8	102 1/2	104 1/2	105	1	1/4	3/8	3/8	1/4
108	63.62	7 3/4	1/4	115 1/2	116	118	118 1/2	1 1/8	1/4	1/2	3/8	1/4

NOTE:

LAYING LENGTH: DO NOT UNDERRUN THE LAYING LENGTH BY MORE THAN 1/2".



SECTION AT PIPE JOINT

APPROVED MARCH 5, 2020

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE PIPE
JOINT DIMENSIONS FOR B-WALL AND C-WALL

SPECIFICATION REFERENCE
2501
2503

STANDARD PLATE NO.
3000M
3 OF 6

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.
NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 31 OF 216 SHEETS

DATE: 9/12/2024 1:59:58 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sd1

CROSS SECTION FOR QUADRANT REINFORCEMENT

INTERNAL DIAMETER OF PIPE	B WALL		C WALL	
	QUADRANT REINFORCEMENT LENGTH		QUADRANT REINFORCEMENT LENGTH	
	LENGTH OF 90° ARC	LENGTH OF 90° ARC	LENGTH OF 90° ARC	LENGTH OF 90° ARC
48"	40"	44"	40"	46"
54"	44"	50"	44"	51"
60"	49"	55"	49"	57"
66"	54"	61"	54"	62"
72"	59"	66"	59"	68"
78"	63"	72"	63"	73"
84"	68"	77"	68"	78"
90"	73"	83"	73"	84"
96"	77"	88"	77"	90"
108"	87"	99"	87"	101"

QUADRANT REINFORCEMENT NOTES:
SEE SHEET 1 OR 2 FOR INNER AND OUTER CAGE REINFORCEMENT.
FOR PIPE 48" AND LARGER, AS AN ALTERNATIVE FOR DESIGNS REQUIRING BOTH INNER AND OUTER CAGES, IF THE REQUIRED REINFORCEMENT FOR EITHER CAGE MEETS OR EXCEEDS Q40 IN $\frac{1}{2}$ " L, QUADRANT REINFORCEMENT MAY BE USED.
A1 + A2 = TOTAL INNER CAGE REINFORCEMENT.
A3 + A4 = TOTAL OUTER CAGE REINFORCEMENT.
A1 = REINFORCING OF FULL CIRCULAR INNER CAGE.
A2 = REINFORCING OF INNER LAP SECTION, 90° MINIMUM ARC.
A3 = REINFORCING OF FULL CIRCULAR OUTER CAGE.
A4 = REINFORCING OF OUTER LAP SECTION, 90° MINIMUM ARC.
PROVIDE FULL CIRCULAR CAGES WITH AN AREA EQUAL TO AT LEAST 50% OF THE REQUIRED TOTAL AREA.

GENERAL NOTES:
USE OF QUADRANT REINFORCEMENT REQUIRES ADDITIONAL FABRICATION CONTROLS. SEE SPEC 3236 AND PROJECT SPECIAL PROVISIONS.
POINT OR INDENT LEGIBLE MARKS AT ONE END OF EACH SECTION ON THE INSIDE AND OUTSIDE OF OPPOSITE WALLS DESIGNATING THE CENTER OF THE QUADRANT REINFORCEMENT.
MARK OR STENCIL THE TOP OF THE PIPE ON BOTH THE INSIDE AND OUTSIDE SURFACES.

APPROVED MARCH 5, 2020

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE PIPE
QUADRANT REINFORCEMENT
SPECIAL DESIGN

SPECIFICATION REFERENCE
2501
2503

STANDARD PLATE NO.
3000M
4 OF 6

CROSS SECTION FOR SHEAR REINFORCEMENT

SHEAR REINFORCEMENT NOTES:
SHEAR LOCK MATS MUST BE INSTALLED FROM INSIDE OF PIPE AS SHOWN ON THIS SHEET.
AMP = STIRRUP AMPLITUDE MEASURED FROM FACE OF ELEMENT WIRE TO TIP OF LOOP WIRE (INCHES).
A_r = MINIMUM RADIAL REINFORCING REQUIRED IN SQUARE INCHES PER SQUARE FOOT OF PIPE OVER A MINIMUM ARC LENGTH L, AT TOP AND BOTTOM OF PIPE.
L = MINIMUM ARC LENGTH OF STIRRUPS MEASURED AT INNER CAGE CENTERED ON CENTERLINE OF PIPE (INCHES).
S = MAXIMUM SPACING OF ROWS OR RADIAL REINFORCING AT INNER CAGE (INCHES).
S IS BASED ON SECTION 12.10.4.2.6 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, WHERE S IS NOT TO EXCEED $0.75 \sqrt{f_c}$ WHERE f_c IS 0.3 IN ACCORDANCE WITH AASHTO SECTION 12.5.5.2. THE MAXIMUM STIRRUP SPACING HAS BEEN ROUNDED UP FROM THE CALCULATED VALUE TO THE NEAREST $\frac{1}{2}$ ".
PIN ALL SHEAR REINFORCEMENT, PROVIDE ELEMENT BAR WITH A MINIMUM DIAMETER OF 0.15" AND A LOCK ROD OF THE SAME DIAMETER.
SECURE LOCK RODS PLACED ON THE INSIDE OF THE OUTER CAGE NO MORE THAN 6" FROM END OF EACH LOCK ROD AT 12" MAXIMUM SPACING.
SET INSIDE CIRCUMFERENTIAL REINFORCEMENT COVER BY USING A 1" CHAIR FOR THE CIRCUMFERENTIAL REINFORCEMENT.
POINT OR INDENT LEGIBLE MARKS AT ONE END OF EACH SECTION ON THE INSIDE AND OUTSIDE OF OPPOSITE WALLS DESIGNATING THE CENTER OF SHEAR REINFORCEMENT.
MARK OR STENCIL THE TOP OF THE PIPE ON BOTH THE INSIDE AND OUTSIDE SURFACES.
SEE STANDARD PLATE 3007 FOR ADDITIONAL DETAILS.
① WHEN SHEAR LOCK MAT ALTERNATE IS USED, LOCATE THE LONGITUDINALS ON THE INNER CAGE AS SHOWN.

INTERNAL DIAMETER OF PIPE	WALL THICKNESS	AMPLITUDE	SHEAR REINFORCEMENT					
			CLASS IV			CLASS V		
			A _r	L	S	A _r	L	S
48"	7"	5"	—	—	—	0.47	58	3.5
78"	7 1/2"	5 1/2"	0.40	49	4.0	0.48	63	4.0
84"	8"	6"	0.41	53	4.5	0.49	67	4.5
90"	8 1/2"	6 1/2"	0.42	58	4.5	0.50	74	4.5
96"	9"	7"	0.42	62	5.0	0.51	78	5.0
108"	10"	8"	0.43	71	5.5	0.52	89	5.5

SHEAR LOCK MAT DETAIL (PINNED ON INSIDE)

INTERNAL DIAMETER OF PIPE	WALL THICKNESS	AMPLITUDE	SHEAR REINFORCEMENT					
			CLASS IV			CLASS V		
			A _r	L	S	A _r	L	S
78"	8 1/2"	6 1/2"	—	—	—	0.48	51	4.5
84"	8 1/2"	6 1/2"	—	—	—	0.47	57	4.5
90"	9 1/2"	7 1/2"	0.39	42	5.0	0.48	62	5.0
96"	9 1/2"	7 1/2"	0.40	46	5.5	0.49	68	5.5
108"	10 1/2"	8 1/2"	0.41	57	6.0	0.50	79	6.0

APPROVED MARCH 5, 2020

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE PIPE
SPECIAL DESIGN
SHEAR REINFORCEMENT - INSTALLED FROM INSIDE

SPECIFICATION REFERENCE
2501
2503

STANDARD PLATE NO.
3000M
5 OF 6

REINFORCEMENT:
USE REINFORCEMENT STEEL CONFORMING TO AASHTO M10, EXCEPT AS SHOWN.
LAP CIRCUMFERENTIAL REINFORCEMENT AT LEAST 20 DIAMETERS FOR DEFORMED COLD-WORKED WIRE, AND AT LEAST 40 DIAMETERS FOR PLAIN BARS AND COLD-DRAWN WIRE. ADDITIONALLY, USE A LAP WITH LONGITUDINAL WIRE INCLUDED ON EACH SIDE OF THE LAP. ASSEMBLE ALL CIRCULAR AND LONGITUDINAL REINFORCEMENT AND SECURELY FASTEN SO AS TO MAINTAIN REINFORCEMENT IN EXACT SHAPE AND CORRECT POSITION WITHIN THE FORM.
REINFORCEMENT WILL BE CONSIDERED AS MEETING THE DESIGN REQUIREMENTS IF THE AREA COMPUTED ON THE BASIS OF NOMINAL AREA OF THE WIRE OR BARS USED, EQUALS OR EXCEEDS THE ABOVE REQUIREMENT. ACTUAL AREA OF THE REINFORCING USED MAY VARY FROM THE NOMINAL AREA ACCORDING TO PERMISSIBLE VARIATIONS OF THE STANDARD SPECIFICATIONS FOR THE REINFORCING. IF REBAR IS USED INSTEAD OF WELDED WIRE REINFORCING, INCREASE THE STEEL AREAS SHOWN BY 8%.
PROVIDE COVER OVER THE CIRCUMFERENTIAL STEEL AS SHOWN ON THIS PLATE, BUT IN NO CASE LESS THAN $\frac{3}{4}$ " AS MEASURED TO THE INSIDE WALL SURFACE OR THE OUTSIDE WALL SURFACE, EXCEPT IN THE TONGUE AND GROOVE. REINFORCING STEEL MAY BE OMITTED FROM EITHER THE TONGUE OR GROOVE ENDS OF PIPE WITH A SINGLE CAGE, PROVIDE REINFORCEMENT IN BELL ENDS WHEN STANDARD PLATE 3006 JOINTS ARE USED.
DO NOT EXCEED 4" CENTER-TO-CENTER SPACING OF ADJACENT RINGS OF CIRCUMFERENTIAL REINFORCEMENT IN A CAGE UP TO AND INCLUDING PIPE HAVING A 4" WALL THICKNESS, NOR EXCEED THE WALL THICKNESS FOR LARGE PIPE, AND IN NO CASE EXCEED 6". MAINTAIN CONTINUITY OF THE CIRCUMFERENTIAL REINFORCING STEEL DURING THE MANUFACTURE OF THE PIPE. ANY CIRCUMFERENTIAL REINFORCING THAT IS CUT MUST BE REPLACED WITH AT LEAST ONE-HALF OF THE STEEL AREA ON EACH SIDE OF THE CUT WIRE.
CIRCUMFERENTIAL REINFORCEMENT: A LINE OF CIRCUMFERENTIAL REINFORCEMENT FOR ANY GIVEN TOTAL AREA MAY BE COMPOSED OF TWO LAYERS FOR PIPE WITH WALL THICKNESSES OF LESS THAN 7" OR THREE LAYERS FOR PIPE WITH WALL THICKNESSES OF 7" OR GREATER, DO NOT SEPARATE THE LAYERS BY MORE THAN THE THICKNESS OF ONE LONGITUDINAL BAR PLUS $\frac{1}{8}$ ". FASTEN MULTIPLE LAYERS TOGETHER TO FORM A SINGLE CAGE. ALL OTHER SPECIFICATION REQUIREMENTS SUCH AS LAPS, WELDS, AND TOLERANCES OF PLACEMENT IN THE WALL OF THE PIPE, ETC., APPLY TO THIS METHOD OF FABRICATION OF A LINE OF REINFORCEMENT.

GENERAL NOTES:
COMPUTE THE STRENGTH TEST REQUIREMENTS IN POUNDS-FORCE PER LINEAL FOOT OF PIPE UNDER THE THREE-EDGE-BEARING METHOD BY MULTIPLYING THE INTERNAL DIAMETER OF THE PIPE IN FEET BY THE D-LOADS EXPRESSED IN POUND-FORCE PER LINEAL FOOT OF DIAMETER TO PRODUCE THE 0.01" CRACK AND THE ULTIMATE LOAD SPECIFIED ON SHEETS 1 AND 2 OF THIS STANDARD PLATE.
SEE STANDARD PLATE 3145 FOR PIPE TIE REQUIREMENTS.
NO MORE THAN TWO LIFT HOLES ARE PERMITTED IN ANY SECTION OF PIPE. FURNISH AND INSTALL TAPERED CONCRETE PLUGS TO CLOSE LIFT HOLES.
PERFORM GASKET LUBRICATION PER MANUFACTURER'S RECOMMENDATIONS.
REFER TO MDDOT DRAINAGE MANUAL FOR ALLOWABLE FILL HEIGHTS.
LAYING LENGTH:
LAYING LENGTH IS DEFINED AS THE TOTAL PIPE SECTION LENGTH MINUS THE TONGUE LENGTH & THE MINIMUM LAYING LENGTH IS 6' FOR DIAMETERS 100" OR LESS, EXCEPT THAT TWO 4'-LENGTHS ARE PERMITTED IN A LINE OF PIPE TO MAKE A REQUIRED LENGTH. THE MINIMUM LAYING LENGTH IS 4' FOR DIAMETERS GREATER THAN 100". FOR ALL DIAMETERS OF PIPE, ONE SECTION OF ANY ODD LENGTH GREATER THAN 4 FEET IS PERMITTED IN EACH LINE OR REACH OF PIPE TO MAKE THE REQUIRED LENGTH. PLACE PIPE SECTIONS SHORTER THAN THE NOMINAL LENGTH NEAR THE MIDDLE OF THE LINE OR AS REQUIRED BY THE ENGINEER.
BASIS OF DESIGN:
CONCRETE STRENGTHS AND REINFORCEMENT REQUIREMENTS ARE IN ACCORDANCE WITH AASHTO M10, FOR PIPE SIZES AND CLASSES THAT ARE NOT INCLUDED IN M10, A CUSTOM DESIGN FOR THE 3 EDGE BEARING TEST WAS PERFORMED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, SECTION 12.10.4.2, WITH HL-93 LIVE LOAD EXCLUDING LANE LOAD, ASSUMED SOIL UNIT WEIGHT OF 120 PCF.
① 35 TO 50 PERCENT OF T, EXCEPT WHEN WALL THICKNESS IS LESS THAN $2\frac{1}{2}$ ", THEN $\frac{3}{8}$ " OF COVER IS REQUIRED.
② MAXIMUM END COVER ON LAST CIRCUMFERENTIAL IS LESSER OF $\frac{1}{2}$ " THE LENGTH OF THE JOINT OR 3". MINIMUM END COVER TO THE LAST CIRCUMFERENTIAL IS $\frac{1}{8}$ " IN THE GROOVE END AND $\frac{1}{8}$ " IN THE TONGUE END.

SECTIONS

APPROVED MARCH 5, 2020

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE PIPE
GENERAL NOTES

SPECIFICATION REFERENCE
2501
2503

STANDARD PLATE NO.
3000M
6 OF 6

NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH
Plan By:
MKV
Checked By:
MAN
Approved By:
NEH

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.

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024
LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
32
OF
216
SHEETS

DATE: 9/12/2024 2:00:00 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sd1

DIAMETER D	LENGTH OF JOINT J	D ₁	D ₂	MINIMUM L ₂	B-WALL L ₁	C-WALL L ₁	X ₁	X ₂	Y ₁	Y ₂	Y ₃
12	3/4	15.223	15.331	5	2	1/4	1	1/4	0.062	0.090	0.313
15	3/4	18.723	18.831	4 1/4	2 1/4	1 1/4	1	1/4	0.062	0.090	0.313
18	3/4	22.098	22.206	5	2 1/4	1 1/4	1	1/4	0.062	0.090	0.313
21	3/4	25.600	25.724	5 1/4	2 1/4	1 1/4	1	1/4	0.062	0.090	0.313
24	3/4	28.975	29.099	5 1/4	2 1/4	2	1	1/4	0.062	0.090	0.313
27	4	32.476	32.608	5 1/4	2 1/4	2	1	1/4	0.062	0.090	0.313
30	4	35.976	36.108	5 1/4	2 1/4	2	1	1/4	0.062	0.090	0.313
33	4 1/4	39.476	39.616	5 1/4	2 1/4	2 1/4	1	1/4	0.062	0.090	0.313
36	4 1/4	42.976	43.116	6	3 1/4	2 1/4	1	1/4	0.062	0.090	0.313
42	4 1/4	50.021	50.183	6 1/4	3 1/4	3	1 1/4	1	0.067	0.129	0.376
48	4 1/4	57.023	57.193	7 1/4	4 1/4	3 1/4	1 1/4	1	0.067	0.129	0.376
54	5	63.007	63.192	7 1/4	3 1/4	2 1/4	1 1/4	1	0.067	0.129	0.376
60	5	69.007	69.192	7 1/4	3 1/4	2 1/4	1 1/4	1	0.067	0.129	0.376
66	5	75.007	75.192	7 1/4	2 1/4	2	1 1/4	1	0.067	0.129	0.376
72	5 1/4	79.250	79.400	---	---	---	1 1/4	1 1/4	0.093	0.190	0.376
78	5 1/4	86.250	86.400	---	---	---	1 1/4	1 1/4	0.093	0.190	0.376
84	5 1/4	91.500	91.650	---	---	---	1 1/4	1 1/4	0.093	0.190	0.376
90	5 1/4	97.750	97.900	---	---	---	1 1/4	1 1/4	0.093	0.190	0.376
96	5 1/4	104.250	104.400	---	---	---	1 1/4	1 1/4	0.093	0.190	0.376
108	6 1/4	117.250	117.400	---	---	---	1 1/4	1 1/4	0.130	0.190	0.376

66" PIPE AND SMALLER ①
REINFORCEMENT NOT SHOWN

72" PIPE AND LARGER
REINFORCEMENT NOT SHOWN

NOTES:
SEE STANDARD PLATE 3000 FOR PIPE DESIGN.
THE ENGINEER MAY APPROVE A CHANGE IN THE SIZE OF THE NOTCH AND GASKET. A WRITTEN REQUEST FOR APPROVAL OF SUCH CHANGE IS REQUIRED.

TOLERANCES IN DIMENSIONS:
JOINT DIMENSIONS ARE NOMINAL AND SUBJECT TO REASONABLE MANUFACTURING TOLERANCES. FABRICATE THE TONGUE AND GROOVE SUCH THAT WHEN THE PIPE IS JOINTED WITH THE GASKET IN PLACE A PROPER FIT IS OBTAINED. FINAL ACCEPTANCE OF THE PIPE WILL BE AT THE JOB SITE AFTER EFFECTIVE JOINTING HAS BEEN OBTAINED.
DIMENSIONS SHOWN ARE DESIGN DIMENSIONS. INSPECTION MEASUREMENTS WILL BE MADE TO THE NEAREST 1/8".
FURNISH GASKETS IN ACCORDANCE WITH ASTM C1619 CLASS C.
① SEE SHEET 2 OF 2 FOR OPTIONAL BELL REINFORCEMENT, CLEARANCES, AND NOTES.

APPROVED MARCH 5, 2020

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
GASKET JOINT FOR R.C. PIPE

SPECIFICATION
REFERENCE
2501
2503

STANDARD
PLATE
NO.
3006H
1 OF 2

CYLINDRICAL CAGE DETAIL

EXPANDED BELL DETAIL

BELL REINFORCEMENT OPTIONS
66" PIPE AND SMALLER

OPTIONAL TONGUE DETAIL
REINFORCEMENT NOT SHOWN

NOTES:
PROVIDE A BELL CAGE AT LEAST AS WIDE AS DIMENSION B.
FOR DOUBLE CAGE PIPE, PROVIDE REINFORCEMENT AT LEAST EQUAL IN AREA TO THAT OF THE OUTSIDE CAGE OR LINE FOR BELLS, AND THE INSIDE CAGE OR LINE FOR SPIGOTS. FOR SINGLE CAGE PIPE, PROVIDE REINFORCEMENT IN THE BELL AT LEAST EQUAL IN AREA TO THAT OF THE CAGE.
SEE SHEET 1 FOR ALL DIMENSIONS OTHER THAN BELL REINFORCEMENT.
① LOCATE REINFORCING IN BELL FROM 3/4" TO 1 1/4" FROM INNER FACE OF BELL.
② USE A MINIMUM OF THREE NO. 3 HOOK TIES EQUALLY SPACED WITH A MAXIMUM SPACING OF 24".

OPTIONAL TRANSITION PIPE
CONNECT TONGUE END TO TONGUE END

INTERNAL DIAMETER	12"	15"	18"	21"	24"	27"	30"
WALL	4"	4 3/8"	4 3/8"	5 1/4"	5 3/4"	6"	6 1/4"
INSIDE REINFORCEMENT (IN ² / LIN. FT.)	0.08	0.08	0.10	0.12	0.12	0.14	0.18
OUTSIDE REINFORCEMENT (IN ² / LIN. FT.)	---	---	---	0.08	0.08	0.08	0.11

APPROVED MARCH 5, 2020

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
**GASKET JOINT FOR R.C. PIPE
OPTIONS**

SPECIFICATION
REFERENCE
2501
2503

STANDARD
PLATE
NO.
3006H
2 OF 2

SHEAR LOCK ALTERNATE - PIPE ①

SHEAR LOCK ALTERNATE - BOX CULVERTS ①

J-BAR ALTERNATE ①

V-BAR ALTERNATE

V-BAR DETAIL

NOTES:
S = MAXIMUM SPACING OF ROWS OR RADIAL REINFORCING AT INNER CAGE. REFER TO STANDARD PLATES 3000, 3014, OR THE PRECAST BOX CULVERT STANDARDS FOR REINFORCEMENT CLEARANCES, SHEAR REINFORCEMENT AREAS, AMPLITUDE, AND SPACING.
USE SHEAR REINFORCEMENT IN CONFORMANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M32. USE GRADE 60 REINFORCING BARS IN CONFORMANCE WITH SPEC 330L.
ANCHOR SHEAR REINFORCEMENT IN CONFORMANCE WITH SECTION 12 OF THE AASHTO LRPD BRIDGE DESIGN SPECIFICATIONS.
PIN ALL SHEAR REINFORCEMENT. FOR SHEAR LOCK MAT AND J-BAR ALTERNATES, PROVIDE ELEMENT WIRE WITH A MINIMUM DIAMETER OF 0.419" AND A LOCK ROD OF THE SAME DIAMETER. FOR THE V-BAR ALTERNATE USE ROD WITH A MINIMUM DIAMETER OF 0.25".
OTHER FORMS OF SHEAR REINFORCEMENT WILL BE CONSIDERED FOR APPROVAL UPON WRITTEN REQUEST.

① STIRRUPS MAY BE SPICED A MINIMUM OF ONE OVERLAP AT OR NEAR E OF PIPE.
② THE J BAR ALTERNATE CAN BE FABRICATED FROM WELDED WIRE REINFORCEMENT OR AS APPROVED BY THE ENGINEER. BEND THE WIRE TO FORM A 140 DEGREE OR GREATER HOOK.
③ AS MEASURED ALONG THE INNER CAGE.
④ FOR BOX CULVERTS, SHEAR LOCK MATS MAY BE INSTALLED FROM THE INSIDE OR OUTSIDE AT FABRICATORS OPTION.

APPROVED MARCH 5, 2020

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
**SHEAR REINFORCEMENT FOR
PRECAST DRAINAGE STRUCTURES**

SPECIFICATION
REFERENCE
2501
2503

STANDARD
PLATE
NO.
3007F

NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH
Plan By:
MKV
Checked By:
MAN
Approved By:
NEH

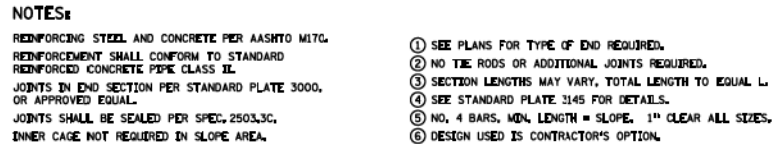
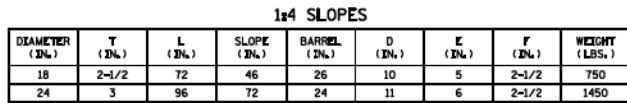
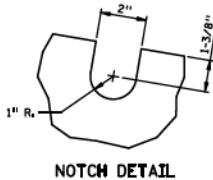
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024
LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004



Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STANDARD PLATES

SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

DATE: 9/12/2024 2:00:01 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sd1

GAGE	THICKNESS - EQUIVALENT	
	GALV. STEEL (IN.)	ALUM. ALLOY (IN.)
18	.0516	.048
16	.0635	.060
14	.0785	.075
12	.1084	.105
10	.1382	.135
8	.1681	.164

ROUND PIPE			PIPE-ARCH			
PIPE DIA. (IN.)	END AREA SQ. FT.	GAGE (MIN.)	SPAN ① (IN.)	RISE ① (IN.)	END AREA SQ. FT.	GAGE (MIN.)
6	0.2	18				
8	0.4	16				
10	0.6	16				
12	0.8	16				
15	1.2	16	17	13	1.1	16
18	1.8	16	21	15	1.5	16
21	2.4	16	24	18	2.2	16
24	3.1	16	28	20	2.8	16
30	4.9	14	35	24	4.4	14
36	7.1	14	42	29	6.4	14
42	9.6	12	49	33	8.7	12
48	12.6	12	57	38	11.4	12
54	15.9	12	64	43	14.3	12
60	19.6	10	71	47	17.6	10
66	23.8	10	77	52	21.3	8
72	28.3	10	83	57	25.3	8
78	33.2	8				
84	38.5	8				

ROUND PIPE SHALL HAVE THE VERTICAL AXIS ELONGATED 5% MORE THAN THE NORMAL DIAMETER WHEN CALLED FOR IN THE PLANS.

THE AVERAGE INSIDE DIAMETER OF CIRCULAR PIPE AND PIPE TO BE REFORMED INTO PIPE ARCHES SHALL NOT VARY MORE THAN ONE PERCENT OR ONE-HALF INCH, WHICHEVER IS GREATER, FROM THE NOMINAL DIAMETER WHEN MEASURED ON THE INSIDE CREST OF THE CORRUGATIONS.

FOR PIPE-ARCH A TOLERANCE OF PLUS OR MINUS ONE INCH OR TWO PERCENT OF THE EQUIVALENT CIRCULAR DIAMETER, WHICHEVER IS GREATER, WILL BE PERMISSIBLE IN SPAN AND RISE. ALL DIMENSIONS ARE MEASURED FROM THE INSIDE CRESTS OF THE CORRUGATIONS.

① SEE AASHTO M196M FOR ALUMINUM PIPE-ARCH VALUES.

APPROVED Jan. 29, 1979

Construction and Engineering Development

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
CORRUGATED METAL PIPE CULVERT
STANDARD 2-2/3" x 1/2" CORRUGATION

SPECIFICATION REFERENCE 2501, 2502 2503
REVISED 8-22-96

STANDARD PLATE NO. 3040F

NOTE: REINFORCEMENT AND DESIGN OF END SECTION "C" SHALL CONFORM TO STANDARD REINFORCED CONCRETE PIPE CLASS II, "B" WALL.

ROUNDED EDGE PERMITTED ON SLOPED END "B".

HANDLING HOLES SHALL BE PROVIDED AS NECESSARY FOR HANDLING OF APRONS.

SLOPE = Y TO X

SEE STD. PLATE 3000 FOR ADDITIONAL REQUIREMENTS

DIAM.	WEIGHT PER SECTION (LBS.)	APPROX. SLOPE Y TO X	T	A	B	C	D	E	G	R	⑤
12"	530	1 TO 2.4	2"	4"	24"	48-7/8"	72-7/8"	24"	2"	1-1/2"	0.07
15"	740	1 TO 2.4	2-1/4"	6"	27"	46"	73"	30"	2-1/4"	1-1/2"	0.07
18"	990	1 TO 2.3	2-1/2"	9"	27"	46"	73"	36"	2-1/2"	1-1/2"	0.07
21"	1280	1 TO 2.4	2-3/4"	9"	36"	37-1/2"	73-1/2"	42"	2-3/4"	1-1/2"	0.07
24"	1520	1 TO 2.5	3"	9-1/2"	43-1/2"	30"	73-1/2"	48"	3"	1-1/2"	0.07
27"	1930	1 TO 2.5	3-1/4"	10-1/2"	49-1/2"	24"	73-1/2"	54"	3-1/4"	1-1/2"	0.13
30"	2190	1 TO 2.5	3-1/2"	12"	54"	19-3/4"	73-3/4"	60"	3-1/2"	1-1/2"	0.14
36"	4100	1 TO 2.5	4"	15"	63"	34-3/4"	97-3/4"	72"	4"	1-1/2"	0.12
42"	5380	1 TO 2.5	4-1/2"	21"	63"	35"	98"	78"	4-1/2"	1-1/2"	0.15
48"	6550	1 TO 2.5	5"	24"	72"	26"	98"	84"	5"	1-1/2"	0.18
54"	8240	1 TO 2.0	5-1/2"	27"	65"	33-1/4"	98-1/4"	90"	5-1/2"	1-1/2"	0.22
60"	8730	1 TO 1.9	6"	35"	60"	39"	99"	96"	5"	1-1/2"	0.25
66"	10710	1 TO 1.7	6-1/2"	30"	72"	27"	99"	102"	5-1/2"	1-1/2"	0.31
72"	12520	1 TO 1.8	7"	36"	78"	21"	99"	108"	6"	1-1/2"	0.35
78"	14770	1 TO 1.8	7-1/2"	36"	90"	21"	111"	114"	6-1/2"	1-1/2"	0.40
84"	18160	1 TO 1.6	8"	36"	90-1/2"	21"	111-1/2"	120"	6-1/2"	1-1/2"	0.46
90"	20900	1 TO 1.5	8-1/2"	41"	87-1/2"	24"	111-1/2"	132"	6-1/2"	6"	0.51

⑤ CONTINUOUS BASIC REINFORCEMENT IN SQ. IN. PER LINEAL FT. FOR SLOPED END "B" (LARGER OF INNER OR OUTER GAGE ON STD. PLATE 3000). FOR WALL THICKNESSES LESS THAN 4", LOCATE REINFORCEMENT AT THE CENTER OF WALL. FOR WALL THICKNESSES 4" AND GREATER, LOCATE REINFORCEMENT WITH A MIN. OF 2" OF COVER MEASURED FROM THE OUTSIDE OF THE WALL.

NOTE: UNLESS SPECIFIED OTHERWISE IN THE PLANS, WHEN AN APRON IS REQUIRED FOR A RUN OF GASKET PIPE (STD. PLATE 3006), THE PRODUCER MAY FURNISH EITHER:

1. AN APRON WITH A STD. PLATE 3006 JOINT, OR
2. AN APRON WITH A STD. PLATE 3000 JOINT AND THE END OF THE STD. PLATE 3006 PIPE CONNECTING TO THE APRON PROVIDED WITH A STD. PLATE 3000 JOINT. THIS JOINT IS TO BE SEALED WITH A PREFORMED MASTIC SEALER.

APPROVED May 8, 1985

Assistant Division Director Technical Services

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
CONCRETE APRON FOR REINFORCED CONCRETE PIPE

SPECIFICATION REFERENCE 2501, 2503
REVISED 10-16-2000 A.K.J.

STANDARD PLATE NO. 3100G

ALTERNATE ROD CONNECTIONS

STANDARD COUPLING BAND

NOTES:

FOR OTHER APPROVED CONNECTIONS, SEE STANDARD PLATE 3124.

MULTIPLE PANEL BODIES SHALL HAVE 2" MIN. LAP SEAMS WHICH ARE TO BE JOINED BY 3/8" DIA. RIVETS OR BOLTS (GALVANIZED) SPACED AT 6" MAX. C. TO C. NUTS SHALL BE TIGHTENED TO 25 LB. + TORQUE.

WHERE METAL APRONS ARE TO BE FASTENED TO HELICALLY CORRUGATED PIPE, AN APPROVED CONNECTION SHALL BE USED.

THE TOP EDGE OF ALL APRONS SHALL HAVE TUBING REINFORCING (SEE SECTION A-A). THE TUBING SHALL BE SUPPLEMENTED WITH 2" X 2" X 1/4" GALV. ANGLE FOR 60" THRU 72" DIA. AND 2-1/2" X 2-1/2" X 1/4" GALV. ANGLE FOR 78" AND 84" DIA. ALTERNATE ROLLED TOP EDGE DESIGNS APPROVED BY THE MN/DOT MATERIALS SECTION MAY BE USED.

PIPE DIA. (IN.)	GAGE	DIMENSIONS					REMARKS
		A 1" ± (IN.)	B MAX. (IN.)	H 1" ± (IN.)	L 1-1/2" ± (IN.)	W 2" ± (IN.)	
12	16	6	6	6	21	24	1 PIECE
15	16	7	8	6	26	30	"
18	16	8	10	6	31	36	"
21	16	9	12	6	36	42	"
24	16	10	13	6	41	48	"
30	14	12	16	8	51	60	"
36	14	14	19	9	60	72	2 PIECES, & SPLICE
42	12	16	22	11	69	84	"
48	12	18	27	12	78	90	"
54	12	18	30	12	84	102	"
60	12	18	33	12	87	114	3 PIECES, 2 SPLICES
66	12	18	36	12	87	120	"
72	12	18	39	12	87	126	"
78	12	18	42	12	87	132	"
84	12	18	45	12	87	138	"

① A 2 PIECE APRON WITH & SPLICE MAY BE USED IN LIEU OF A 1 PIECE APRON.

② A 3 PIECE APRON WITH 2 SPLICES MAY BE USED IN LIEU OF A 2 PIECE APRON. THE 3 PIECE BODIES SHALL BE MADE OF 3 EQUAL SECTIONS OF 12 GA. MATERIAL.

③ 3 PIECE BODIES SHALL HAVE 12 GA. SIDES AND 10 GA. CENTER PANELS. WIDTH OF CENTER PANEL SHALL EXCEED 20% OF PIPES PERIPHERY.

④ FOR 12" THRU 24" DIA. PIPE, A FLAT STRAP CONNECTOR MAY BE USED IN PLACE OF THE ROD CONNECTION. STRAP CONNECTOR SHALL BE 1" WIDE, 12 GA. STRAP WITH STANDARD 6" LONG X 1/2" DIA. BAND BOLT AND NUT.

⑤ THE PIPE DIAMETER IS EQUAL TO DIMENSION D OF APRON.

APPROVED Nov. 13, 1985

Director Materials, Research and Standards

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
METAL APRON FOR C.S. PIPE

SPECIFICATION REFERENCE 2501
REVISED 5-3-99 A.K.J.

STANDARD PLATE NO. 3123J

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620

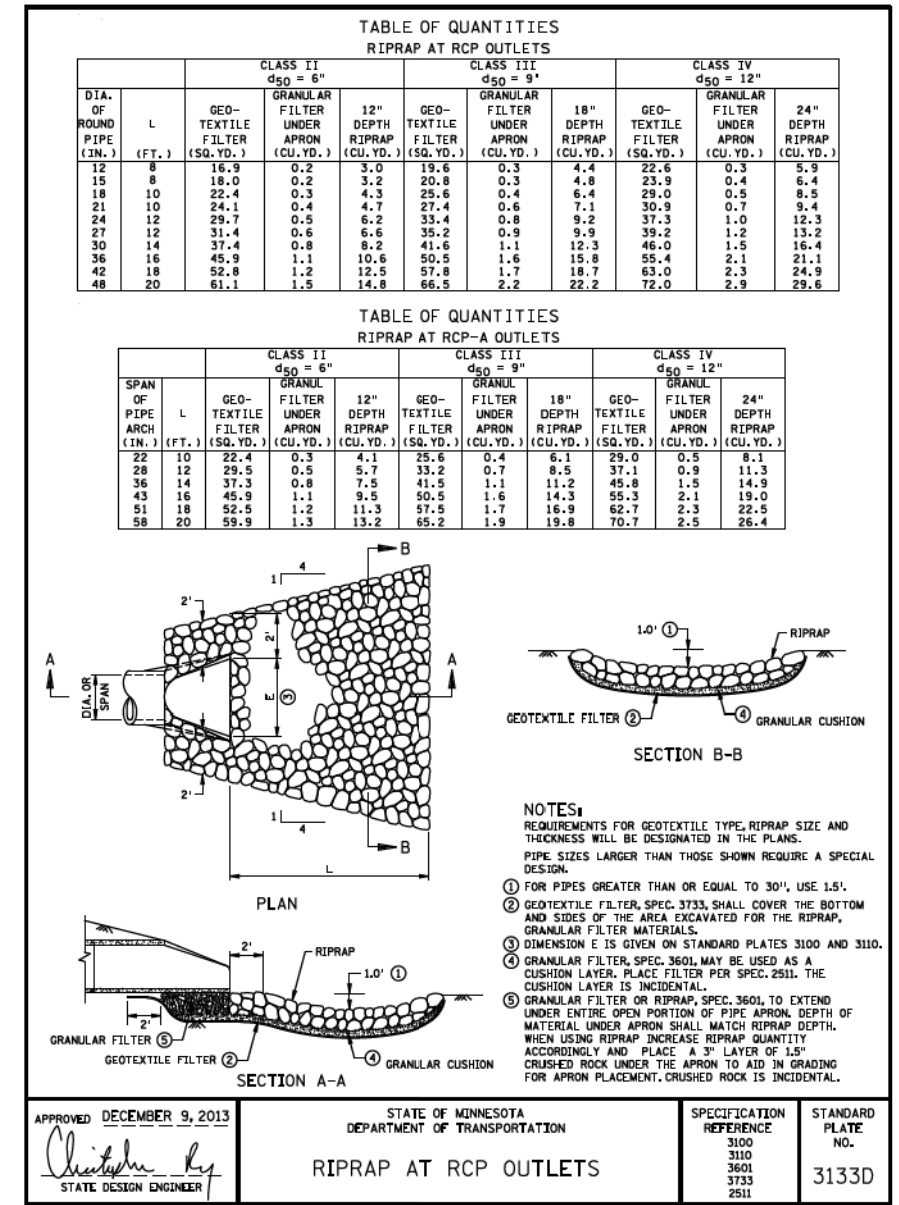
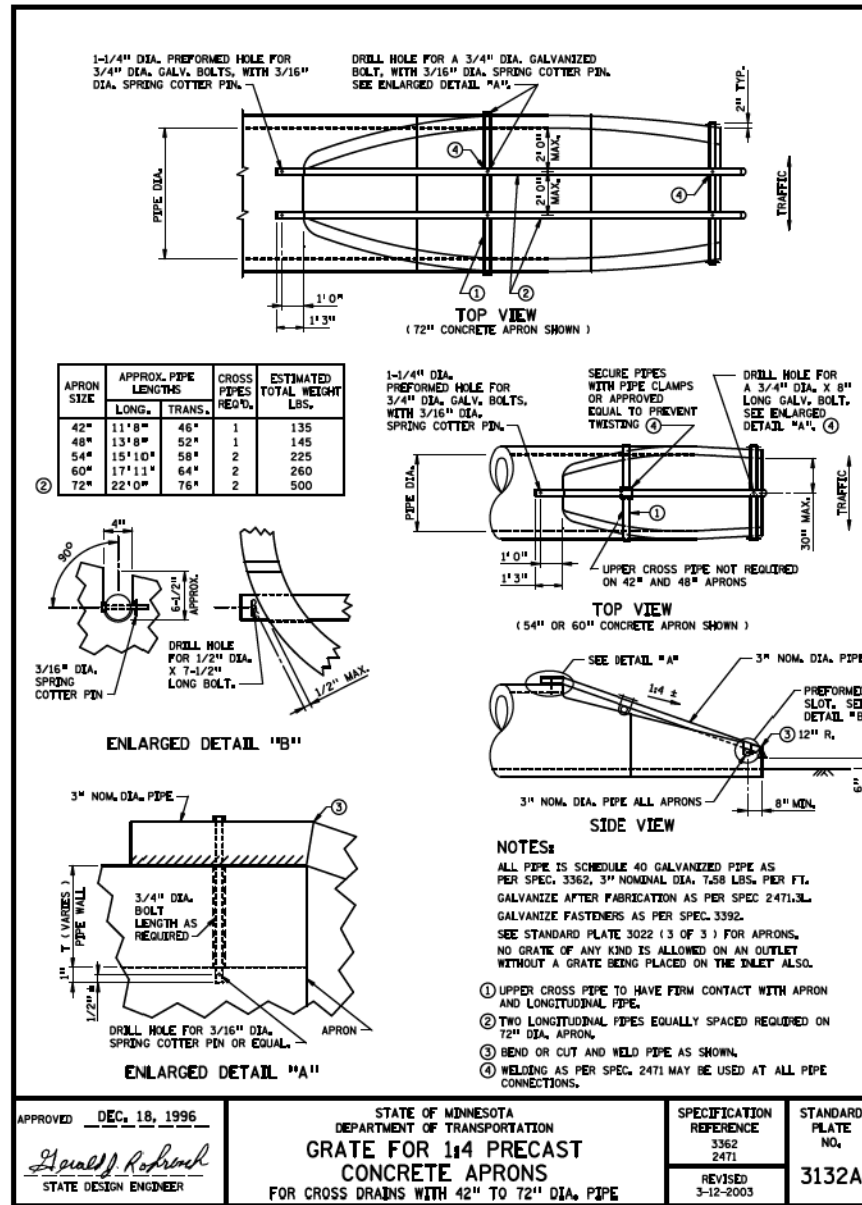
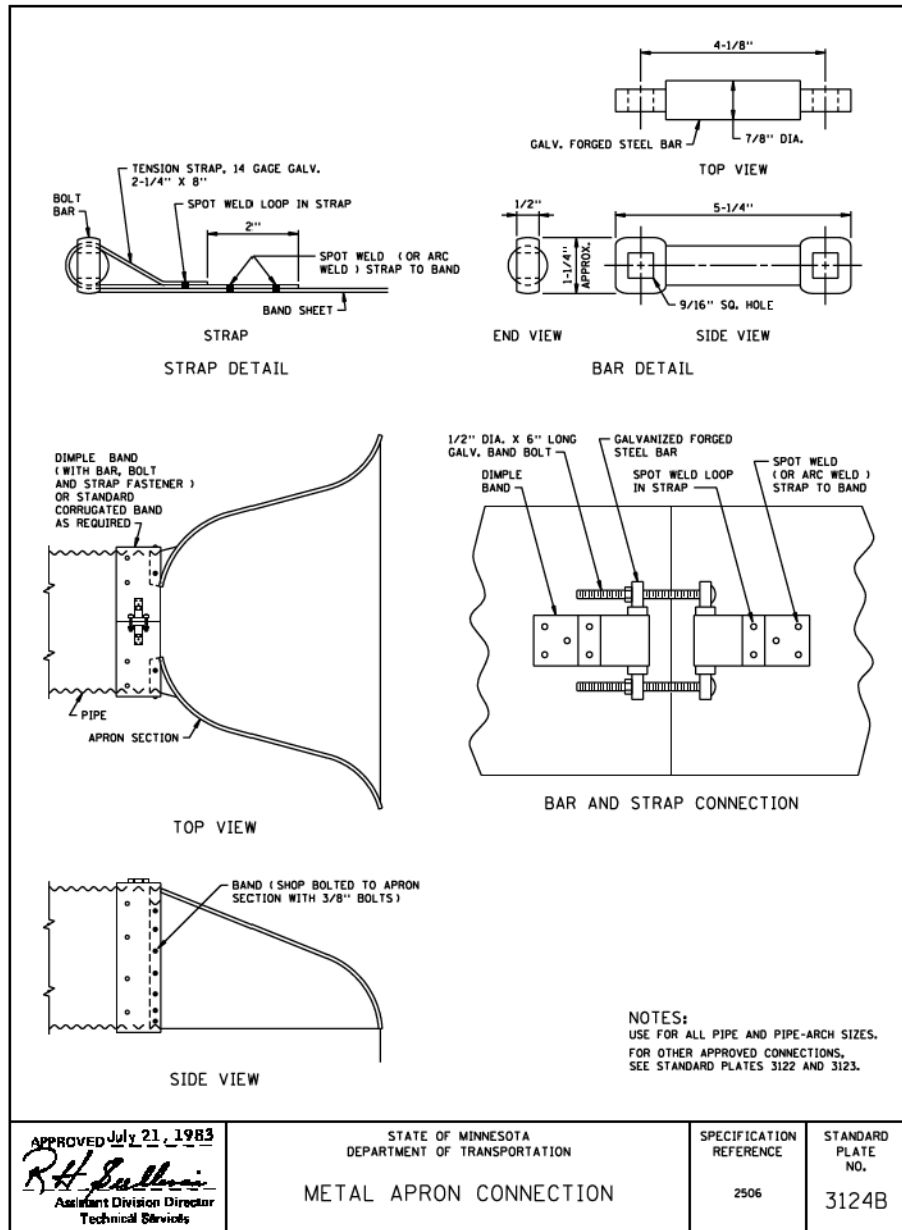


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 35 OF 216 SHEETS

DATE: 9/12/2024 2:00:02 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-SP1



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

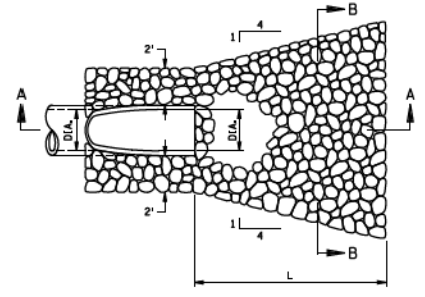
CHISAGO COUNTY, MINNESOTA
STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
36
OF
216
SHEETS

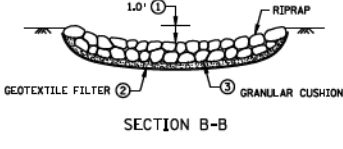
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TABLE OF QUANTITIES											
1:4 SLOPE											
DIA. OF ROUND PIPE (IN.)	L (FT.)	CLASS II d ₅₀ = 6"		CLASS III d ₅₀ = 9"		CLASS IV d ₅₀ = 12"		GEO-TEXTILE FILTER (SQ. YD.)	18" DEPTH RIPRAP (CU. YD.)	GEO-TEXTILE FILTER (SQ. YD.)	24" DEPTH RIPRAP (CU. YD.)
		GRANUL. FILTER UNDER APRON (CU. YD.)	12" DEPTH RIPRAP (CU. YD.)	GRANUL. FILTER UNDER APRON (CU. YD.)	18" DEPTH RIPRAP (CU. YD.)	GRANUL. FILTER UNDER APRON (CU. YD.)	24" DEPTH RIPRAP (CU. YD.)				
18	10	39.4	0.3	3.7	43.4	0.5	5.5	47.8	0.6	7.4	
24	12	46.6	0.6	5.1	51.3	0.9	7.7	56.2	1.2	10.2	
30	14	44.1	0.7	6.4	49.1	1.1	9.6	54.4	1.4	12.8	
36	16	62.4	1.0	8.0	67.9	1.5	12.0	73.8	2.0	16.0	
42	18	64.5	1.5	9.9	70.6	2.2	14.8	77.1	2.9	19.7	
48	20	92.8	2.1	11.9	99.5	3.1	17.9	106.6	4.1	23.8	

TABLE OF QUANTITIES											
1:6 SLOPE											
DIA. OF ROUND PIPE (IN.)	L (FT.)	CLASS II d ₅₀ = 6"		CLASS III d ₅₀ = 9"		CLASS IV d ₅₀ = 12"		GEO-TEXTILE FILTER (SQ. YD.)	18" DEPTH RIPRAP (CU. YD.)	GEO-TEXTILE FILTER (SQ. YD.)	24" DEPTH RIPRAP (CU. YD.)
		GRANUL. FILTER UNDER APRON (CU. YD.)	12" DEPTH RIPRAP (CU. YD.)	GRANUL. FILTER UNDER APRON (CU. YD.)	18" DEPTH RIPRAP (CU. YD.)	GRANUL. FILTER UNDER APRON (CU. YD.)	24" DEPTH RIPRAP (CU. YD.)				
12	8	15.9	0.2	2.7	18.4	0.3	4.1	21.1	0.4	5.4	
15	8	26.7	0.5	5.4	29.6	0.7	8.0	32.8	0.9	10.7	
18	10	32.3	0.6	6.7	35.5	0.9	10.1	39.9	1.2	13.4	
24	12	40.4	1.0	8.7	44.0	1.5	13.0	47.8	2.0	17.3	



PLAN



SECTION B-B

NOTES:

- REQUIREMENTS FOR GEOTEXTILE TYPE, RIPRAP SIZE AND THICKNESS WILL BE DESIGNATED IN THE PLANS. PIPE SIZES LARGER THAN THOSE SHOWN REQUIRE A SPECIAL DESIGN.
- FOR PIPES GREATER THAN OR EQUAL TO 30", USE 1.5'.
- GEOTEXTILE FILTER, SPEC. 3733, SHALL COVER THE BOTTOM AND SIDES OF THE AREA EXCAVATED FOR THE RIPRAP, GRANULAR FILTER MATERIALS.
- GRANULAR FILTER, SPEC. 3601, MAY BE USED AS A CUSHION LAYER. PLACE FILTER PER SPEC. 2511. THE CUSHION LAYER IS INCIDENTAL.
- GRANULAR FILTER OR RIPRAP, SPEC. 3601, TO EXTEND UNDER ENTIRE OPEN PORTION OF PIPE APRON. DEPTH OF MATERIAL UNDER APRON SHALL MATCH RIPRAP DEPTH. WHEN USING RIPRAP INCREASE RIPRAP QUANTITY ACCORDINGLY AND PLACE A 3" LAYER OF 1.5" CRUSHED ROCK UNDER THE APRON TO AID IN GRADING FOR APRON PLACEMENT. CRUSHED ROCK IS INCIDENTAL.

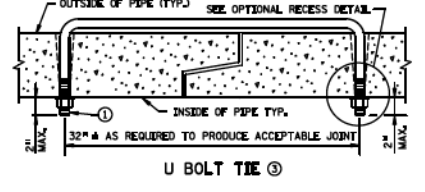
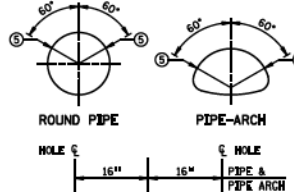
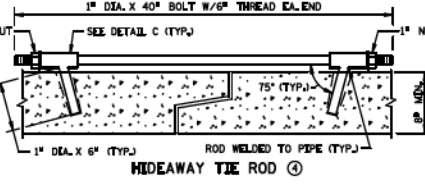
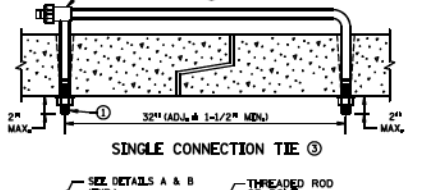
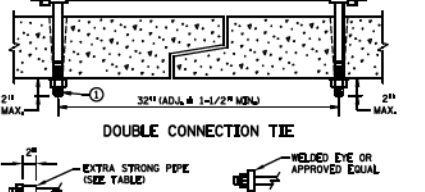
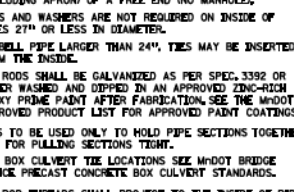
APPROVED DECEMBER 9, 2013

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
RIPRAP AT
PRECAST CONCRETE END SECTIONS
(1:4 AND 1:6 SLOPES)

SPECIFICATION REFERENCE
2501
3601
3733

STANDARD PLATE NO.
3139B

 U BOLT TIE ③	 PIPE-ARCH
 HIDEAWAY TIE ROD ④	 SINGLE CONNECTION TIE ⑤
 DOUBLE CONNECTION TIE	 OPTIONAL RECESS DETAIL ②

THE ROD DIAMETER

PIPE SIZE (INCHES)	ROD THREAD DIA.	EXTRA STRONG PIPE INSIDE DIA. (SEE DETAIL A)
12 - 27	5/8"	3/4"
30 - 66	3/4"	1"
72 - 144	1"	1-1/4"
ALL PRECAST BOX CULVERTS	1"	1-1/4"

PIPE SIZE LISTED IS INSIDE DIA. OF ROUND PIPE OR EQUIVALENT DIA. OF PIPE ARCH.

NOTES:

- STEEL SHALL CONFORM TO SPEC. 3306 OR EQUAL. FOR CONC. CULVERTS, PIPE TIES SHALL BE REQUIRED FOR ALL JOINTS UNLESS OTHERWISE SPECIFIED IN THE PLANS OR IN THE SPECIAL PROVISIONS.
- FOR CONCRETE SEWERS, THE TIE THREE END SECTIONS (INCLUDING APRON) OF A FREE END (NO MANHOLES), NUTS AND WASHERS ARE NOT REQUIRED ON INSIDE OF PIPES 27" OR LESS IN DIAMETER.
- ON BELL PIPE LARGER THAN 24", TIES MAY BE INSERTED FROM THE INSIDE.
- THE RODS SHALL BE GALVANIZED AS PER SPEC. 3392 OR POWER WASHED AND DIPPED IN AN APPROVED ZINC-RICH EPOXY PRIME PAINT AFTER FABRICATION. SEE THE WHDOT APPROVED PRODUCT LIST FOR APPROVED PAINT COATINGS.
- TIES TO BE USED ONLY TO HOLD PIPE SECTIONS TOGETHER, NOT FOR PULLING SECTIONS TIGHT.
- FOR BOX CULVERT TIE LOCATIONS SEE WHDOT BRIDGE OFFICE PRECAST CONCRETE BOX CULVERT STANDARDS.
- THE ROD THREADS SHALL PROJECT TO THE INSIDE OF PIPE OR CULVERT EXCEPT AS NOTED IN PLANS.
- THE ROD THREADS SHALL BE RECESSED WHEN PIPE OR CULVERT IS USED AS CATTLE PASS OR PEDESTRIAN TRAIL.
- THE ROD THREADS MAY PROJECT TO OUTSIDE OF BOX CULVERT PIPE IN MULTIPLE PIPELINE INSTALLATIONS, FACE CONNECTION DOWN STREAM.
- HIDEAWAY TIE ROD SHALL ONLY BE USED FOR PEDESTRIAN CULVERT APPLICATIONS OR AS SPECIFIED IN PLAN OR SPECIAL PROVISION.
- TIE LOCATION
- HOLES SHALL BE CAST OR DRILLED 16" FROM CENTERLINE OF JOINTS FOR BOX CULVERTS, AS SHOWN, UNLESS FORMS ARE SET UP FOR 16" SPACING FROM OUTSIDE OF JOINT.

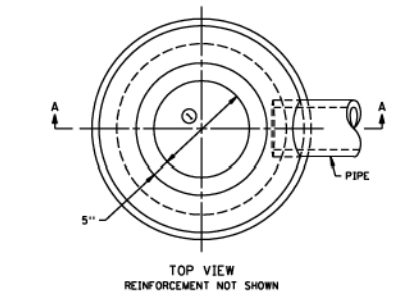
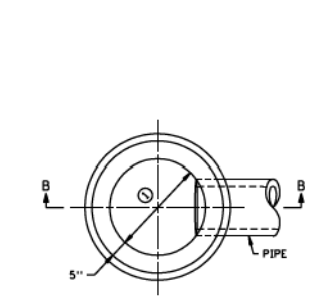
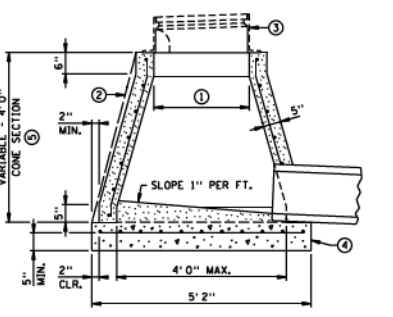
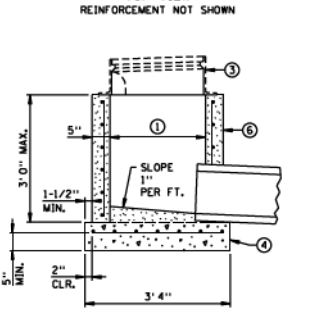
APPROVED SEPT. 14, 2012

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
CONCRETE PIPE OR
PRECAST BOX CULVERT TIES

SPECIFICATION REFERENCE
2501
2503

STANDARD PLATE NO.
3145G

 TOP VIEW REINFORCEMENT NOT SHOWN	 TOP VIEW REINFORCEMENT NOT SHOWN
 SECTION A-A DESIGN G	 SECTION B-B DESIGN H

NOTES:

- REINFORCING: SINGLE LINE STEEL WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.12 SQ. IN. PER FOOT OF HEIGHT.
- 2" 3" NOM. OPENING, WHEN GRATE FRAME CASTING NO. 802A OR NO. 805 IS USED, SEE STANDARD PLATES CASTING LIST.
- A STRAIGHT TAPERED WALL IS ACCEPTABLE.
- REFER TO PLAN FOR CASTINGS REQUIRED. USE ADJUSTING RINGS WHERE NECESSARY. SEE STANDARD PLATES INDEX. CASTING AND PRECAST CONC. ADJUSTING RINGS SHALL BE SET ON FULL MORTAR BEDS.
- 8 IN. POURED CONCRETE BASE. BASE REINFORCEMENT: 0.12 SQ. IN. PER FT. IN EACH DIRECTION. AN APPROVED ALTERNATE PRECAST CONCRETE BASE MAY BE USED.
- HEIGHT OF STRUCTURE MAY BE INCREASED UP TO 1 FT. BY THE USE OF A PRECAST SECTION OR CONCRETE BLOCK CONSTRUCTION ABOVE THE CONE SECTION. SEE STANDARD PLATE 4002 FOR BLOCK CONSTRUCTION.
- AS AN ALTERNATE, BRICK OR CONCRETE BLOCK MASONRY MAY BE USED. FOR MATERIALS & CONSTRUCTION METHODS, SEE STANDARD PLATE 4002. CONE SECTION DETAILS OF 4002 DO NOT APPLY.

APPROVED JULY 31, 1995

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
MANHOLE OR CATCH BASIN
PRECAST

SPECIFICATION REFERENCE
2506
REVISED 8-22-96

STANDARD PLATE NO.
4006L

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH	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.  NICHOLAS E. HENTGES, PE DATE: 9/12/2024 LICENSE NO. 44620
Plan By: MKV	
Checked By: MAN	
Approved By: NEH	

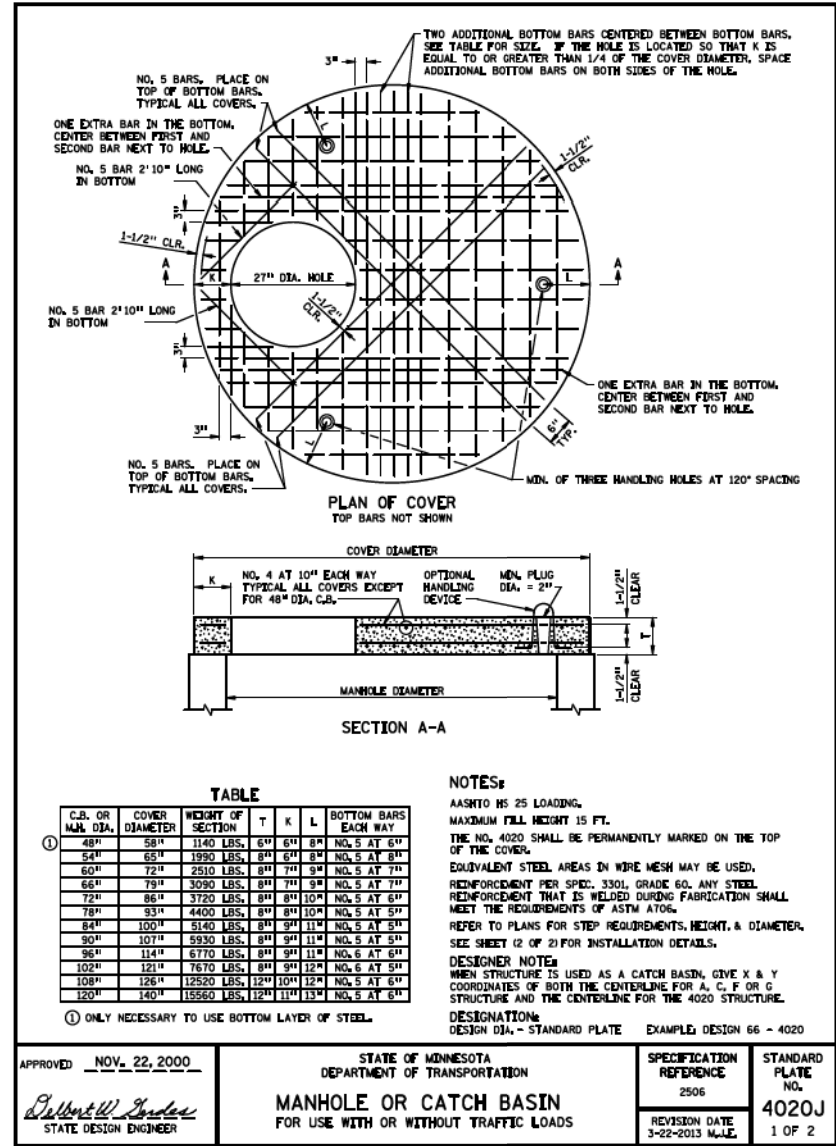
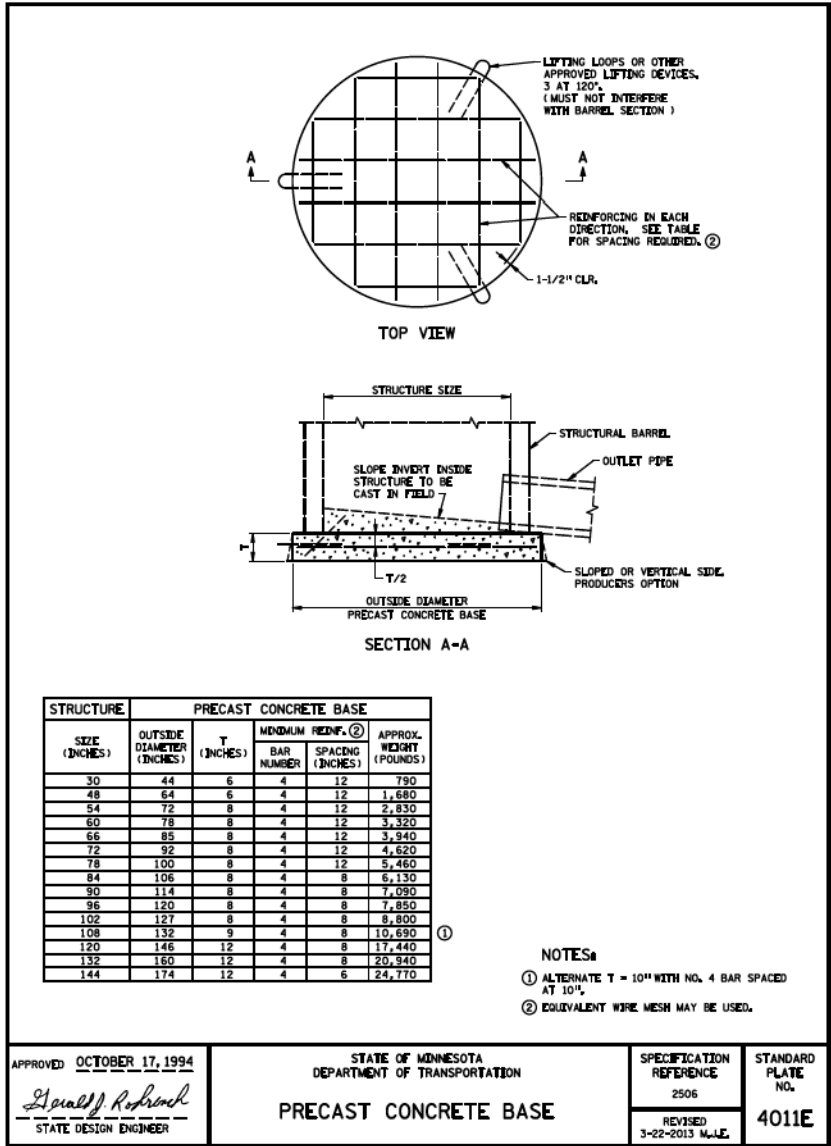
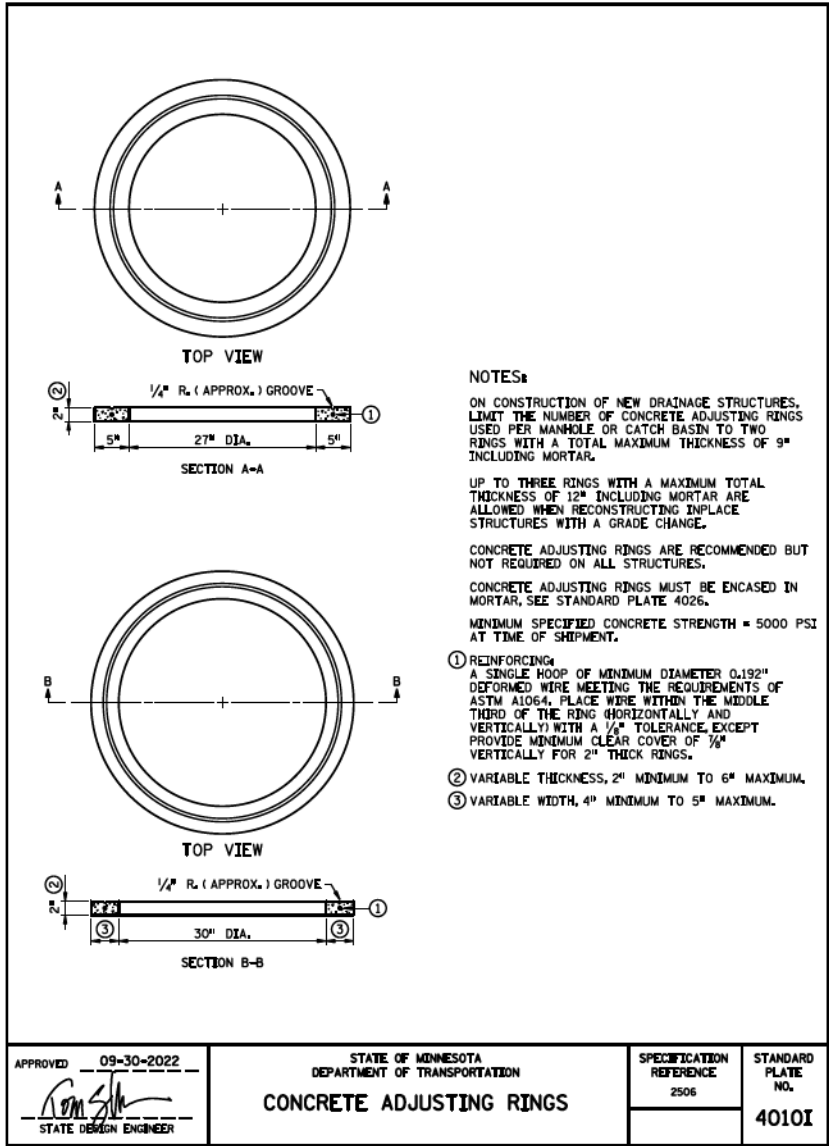


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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OF
216
SHEETS

DATE: 9/12/2024 2:00:04 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH

Plan By: MKV

Checked By: MAN

Approved By: NEH

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NICHOLAS E. HENTZ, P.E.

DATE: 9/12/2024

LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

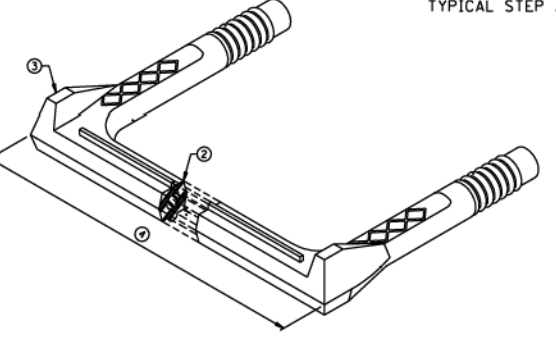
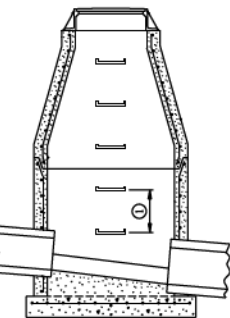
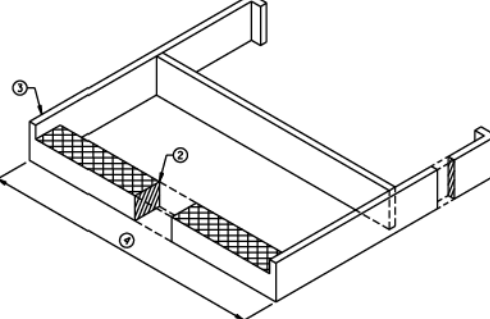
CHISAGO COUNTY, MINNESOTA

STANDARD PLATES

SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 38 OF 216 SHEETS

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TYPICAL METAL STEP

TYPICAL STEP ALIGNMENT

TYPICAL REINFORCED PLASTIC STEP

NOTES:
STEPS SHOWN ARE BASIC DESIGNS ONLY. FINAL CONFIGURATIONS MAY VARY FROM THESE DRAWINGS. VARIATIONS IN THE ABOVE DESIGNS WHICH WILL NOT DECREASE STRENGTH WILL BE PERMITTED.
THE OFFICE OF MATERIALS, RESEARCH AND ENGINEERING WILL MAINTAIN A LISTING OF APPROVED MANHOLE STEPS. CURRENTLY APPROVED STEPS ARE ALUMINUM, CAST IRON AND STEEL REINFORCED PLASTIC. SELECTION OF APPROVED STEP DESIGN IS THE OPTION OF THE CONTRACTOR OR SUPPLIER.
ALUMINUM STEPS SHALL CONFORM TO ASTM B26-64A, ALLOY AA 514.0. EMBEDDED LEG SECTIONS SHALL BE GIVEN A NEOPRENE PROTECTIVE COATING OR EQUIVALENT FOR CORROSION PROTECTION. COATINGS SHALL BE APPROVED BY MATERIALS ENGINEERING.
EXCEPT AS OTHERWISE NOTED ON THIS PLATE, STEPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C478.

STEPS SHALL BE EMBEDDED IN THE RISER OR CONICAL TOP SECTION WALL A MINIMUM DISTANCE OF 3 IN.
THE RUNG OR CLEAT SHALL PROJECT A MINIMUM CLEAR DISTANCE OF 4 IN. FROM THE WALL OF THE RISER OR CONE SECTION MEASURED FROM THE POINT OF EMBEDMENT.
THE MIN. CLEAR DISTANCE BETWEEN THE RUNG OR CLEAT AND THE OPPOSITE WALL OF THE MANHOLE RISER OR CONE SHALL BE 18 IN. MEASURED AT THE CENTER FACE OF THE STEP.
① STEPS SHALL BE SPACED AT A MAXIMUM DESIGN DISTANCE OF 16 IN. APART.
② STEPS SHALL HAVE A MINIMUM CROSS SECTION DIMENSION OF 1 IN.
③ MINIMUM VERTICAL SIDE DIMENSION TO PREVENT FOOT FROM SLIPPING OFF IS 1 1/2".
④ THE MINIMUM WIDTH OF RUNGS OR CLEATS SHALL BE 10 IN.

APPROVED DEC. 30, 1996

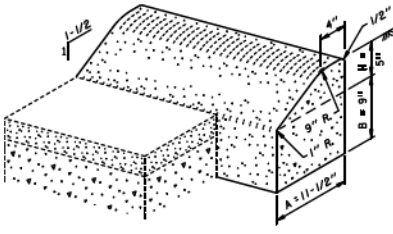
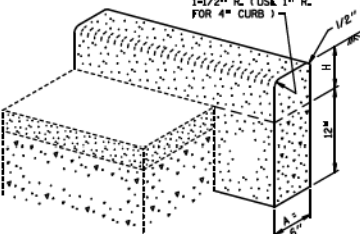
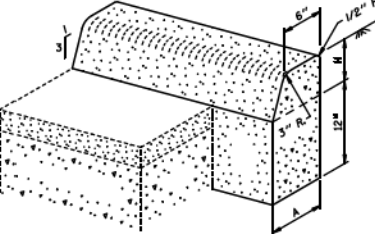
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

MANHOLE OR CATCH BASIN STEP

SPECIFICATION
REFERENCE
2506

STANDARD
PLATE
NO.
4180J



DESIGN B

DESIGN V

DESIGN S

DESIGN NO.	CURB WIDTH A	CURB HEIGHT H	CONCRETE	
			CU. YDS. PER LIN. FT.	LN. FT. PER CU. YD.
B4	7-3/8"	4"	0.0294	34.0
B6	8"	6"	0.0352	28.4
B8	8-5/8"	8"	0.0414	24.2
B9	9"	9"	0.0449	22.3
B10	9-3/8"	10"	0.0485	20.6

DESIGN NO.	CURB HEIGHT H	CONCRETE	
		CU. YDS. PER LIN. FT.	LN. FT. PER CU. YD.
V4	4"	0.0247	40.5
V6	6"	0.0277	36.1
V8	8"	0.0308	32.5
V9	9"	0.0323	31.0
V10	10"	0.0338	29.6

DESIGN NO.	CONCRETE	
	CU. YDS. PER LIN. FT.	LN. FT. PER CU. YD.
S5	0.0364	27.5

NOTE:
ALL CURB SLOPE MEASUREMENTS ARE IN RELATION TO ADJACENT PAVEMENT SLOPE.

APPROVED JULY 25, 2011

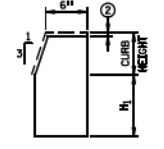
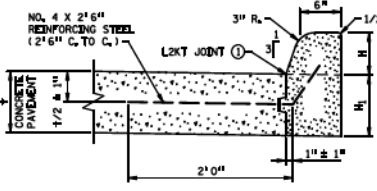
(STATE DESIGN ENGINEER)

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCRETE CURB
DESIGN B, DESIGN V, DESIGN S, DESIGN DR AND DESIGN BR

SPECIFICATION
REFERENCE
2531

STANDARD
PLATE
NO.
7020K
1 OF 2

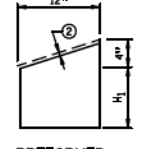
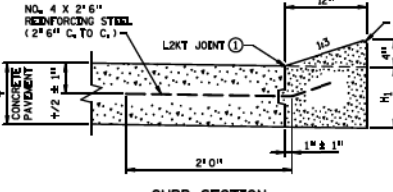


CURB SECTION

PREFORMED EXPANSION JOINT MATERIAL

DIMENSION H ₁	DIMENSION H					
	4"	6"	7"	8"	9"	10"
8"	0.0222	0.0275	0.0303	0.0332	0.0361	0.0392
9"	0.0240	0.0295	0.0324	0.0354	0.0384	0.0415
10"	0.0259	0.0315	0.0345	0.0375	0.0407	0.0439
11"	0.0277	0.0335	0.0366	0.0397	0.0429	0.0462
12"	0.0295	0.0355	0.0387	0.0419	0.0452	0.0485

DESIGN BRH-H₁
(EXAMPLE: DESIGN BR6-9)



CURB SECTION

PREFORMED EXPANSION JOINT MATERIAL

DESIGN DR4-H₁
(EXAMPLE: DESIGN DR4-9)



ALTERNATE KEYWAY DETAIL

NOTES:
ALL CURB SLOPE MEASUREMENTS ARE IN RELATION TO ADJACENT PAVEMENT SLOPE.
SEE STANDARD PLAN 5-297.221 FOR STANDARD PAVEMENT KEYWAY DETAIL.
JOINT MATERIAL SHALL BE OF 1/2" THICKNESS.
1 THICKNESS REQUIRED AT 1/2" EXPANSION JOINTS AND 3 THICKNESSES REQUIRED AT 1" EXPANSION JOINTS.
① SEE PLANS FOR SEALING REQUIREMENTS.
② 1/2" LESS THAN CURB DIMENSIONS FOR APPLICATION OF SEALER.
③ BASED ON A 2% PAVEMENT CROSS SLOPE AND STANDARD KEYWAY DESIGN.

APPROVED JULY 25, 2011

(STATE DESIGN ENGINEER)

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCRETE CURB
DESIGN B, DESIGN V, DESIGN S, DESIGN DR AND DESIGN BR

SPECIFICATION
REFERENCE
2531

STANDARD
PLATE
NO.
7020K
2 OF 2

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH

Plan By: MKV

Checked By: MAN

Approved By: NEH

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.


NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

DATE: 9/12/2024 2:00:08 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sd1

RECTANGULAR PLATES

RADIAL PLATES

SECTION A-A
TRUNCATED DOME

TYPICAL RADIAL TRUNCATED DOME PLATES			
RADIUS (FEET)	LONG CHORD WIDTH (INCHES)	SQUARE FEET PER PLATE	PLATES REQUIRED FOR 90 DEGREE TURN
10	23 1/2	3.53	8
15	18 1/4	2.93	15
15	23 1/2	3.67	12
20	18 1/4	3.00	20
20	18 1/2	2.98	20
25	20 1/2	3.28	23
25	23 1/4	3.77	20
30	22 1/2	3.65	25
35	22	3.56	30

NOTES:

DETECTABLE WARNING SURFACES SHALL FOLLOW THE PUBLIC RIGHTS-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG).

DETECTABLE WARNINGS CONSIST OF TRUNCATED DOMES ALIGNED IN A SQUARE OR RADIAL GRID PATTERN.

DETECTABLE WARNINGS ARE REQUIRED:

- WHERE RAMPS, LANDINGS, OR BLENDED TRANSITIONS PROVIDE A FLUSH PEDESTRIAN CONNECTION TO THE ROADWAY.
- WHERE PEDESTRIAN ACCESS ROUTES CROSS COMMERCIAL DRIVEWAYS THAT ARE PROVIDED WITH TRAFFIC CONTROL DEVICES OR OTHERWISE PERMITTED TO OPERATE LIKE A PUBLIC ROADWAY.
- AT PEDESTRIAN RAILWAY CROSSINGS.
- ON RAIL PLATFORMS WHERE BOARDING EDGES ARE NOT PROTECTED.

DETECTABLE WARNINGS SHALL EXTEND:

- A MINIMUM OF 24" IN THE DIRECTION OF TRAVEL.
- THE FULL WIDTH OF THE RAMP, LANDING, OR BLENDED TRANSITION, WITHIN 3' OF FULL WIDTH ON EITHER END.
- THE FULL LENGTH OF THE PUBLIC USE AREA OF A RAIL PLATFORM.

DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT GUTTER, ROADWAY, OR WALKWAY, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. CONTRAST MAY BE PROVIDED ON THE FULL RAMP SURFACE, EXCLUDING THE FLARED SIDES.

FOR MNDOT PROJECTS, SEE MNDOT'S APPROVED/QUALIFIED PRODUCT LISTS.

ALL TRUNCATED DOME SYSTEMS SHALL BE PLACED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER.

- CENTER-TO-CENTER DOME SPACING: 16" MINIMUM, 24" MAXIMUM.
- BASE-TO-BASE DOME SPACING: 0.65" MINIMUM.
- DOME BASE TO PLATE EDGE SPACING: 0.35" MINIMUM, 0.75" MAXIMUM.
- SPACING VARIES ON RADIAL PLATES.
- TYPICAL WIDTHS AVAILABLE: 12", 18", 24", 30", 36". CHECK WITH MANUFACTURERS FOR AVAILABLE WIDTHS.
- ON RADIAL PLATE, RADIUS DEFINED AT BACK OF CURB.
- TYPICAL RADIAL CHECK WITH MANUFACTURERS FOR AVAILABLE RADII.

APPROVED AUGUST 23, 2010

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

DETECTABLE WARNING SURFACE
TRUNCATED DOMES

SPECIFICATION
REFERENCE
2531
2563
REVISED
01-09-2020 M.A.E.

STANDARD
PLATE
NO.
7038A

DESIGN B

DESIGN V

NOTES:

- LONGITUDINAL JOINT WHEN ADJACENT TO RIGID PAVEMENT OR BASE. SEE STANDARD PLANS MANUAL FOR JOINT INFORMATION.
- SLOPE 0.06 FT/FT NORMAL, UNLESS OTHERWISE SPECIFIED. IF A DIFFERENT GUTTER SLOPE IS PERMITTED, THE FORM MAY BE TILTED.

DESIGN B		W = 12"		W = 18"		W = 24"		W = 30"		W = 36"	
CONCRETE		CONCRETE		CONCRETE		CONCRETE		CONCRETE		CONCRETE	
DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.
4 7-3/8"	0.0421	23.8	B412	0.0529	18.9	B418	0.0637	15.7	B430	0.0745	13.4
6 8"	0.0474	21.1	B612	0.0582	17.2	B624	0.0690	14.5	B630	0.0798	12.5
8 8-5/8"	0.0529	18.9	B812	0.0637	15.7	B824	0.0745	13.4	B830	0.0853	11.7
9 9"	0.0559	17.9	B912	0.0667	15.0	B924	0.0775	12.9	B930	0.0883	11.3
10 9-3/8"	0.0589	17.0	B1012	0.0697	14.4	B1024	0.0805	12.4	B1030	0.0913	11.0

DESIGN V		W = 12"		W = 18"		W = 24"		W = 30"		W = 36"	
CONCRETE		CONCRETE		CONCRETE		CONCRETE		CONCRETE		CONCRETE	
DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.
4 6"	0.0396	25.3	V412	0.0504	19.9	V424	0.0612	16.4	V430	0.0720	13.9
6 6"	0.0426	23.5	V612	0.0534	18.7	V624	0.0642	15.6	V630	0.0750	13.4
8 6"	0.0457	21.9	V812	0.0565	17.7	V824	0.0673	14.9	V830	0.0781	12.8
9 6"	0.0472	21.2	V912	0.0580	17.2	V924	0.0688	14.5	V930	0.0796	12.6
10 6"	0.0487	20.5	V1012	0.0595	16.8	V1024	0.0703	14.2	V1030	0.0811	12.4

APPROVED MARCH 11, 1994

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCRETE CURB AND GUTTER
DESIGN B AND DESIGN V

SPECIFICATION
REFERENCE
2531
REVISION DATE
2-28-05

STANDARD
PLATE
NO.
7100H

DESIGN D

DESIGN S

DESIGN R

DESIGN D		CONCRETE	
DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.
D412	12"	0.0505	19.8
D418	18"	0.0613	16.3
D424	24"	0.0721	13.9
D436	36"	0.0937	10.7

DESIGN S		CONCRETE	
DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.
S512	12-1/2"	0.0541	18.5
S518	18-1/2"	0.0649	15.4
S524	24-1/2"	0.0757	13.2
S530	30-1/2"	0.0865	11.6
S536	36-1/2"	0.0973	10.3

DESIGN R		CONCRETE	
DESIGN NO.	CUL. YDS. PER LIN. FT.	DESIGN NO.	CUL. YDS. PER LIN. FT.
R412	12"	0.0492	20.3
R418	18"	0.0600	16.7
R424	24"	0.0708	14.1
R436	36"	0.0924	10.8

NOTES:

- SLOPE 3/4" PER FOOT NORMAL UNLESS OTHERWISE SPECIFIED. IF A DIFFERENT GUTTER SLOPE IS SPECIFIED, THE FORM MAY BE TILTED.
- LONGITUDINAL JOINT WHEN ADJACENT TO RIGID PAVEMENT OR BASE. SEE STANDARD PLANS MANUAL FOR JOINT INFORMATION.

APPROVED AUGUST 28, 2017

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

CONCRETE CURB AND GUTTER
DESIGN D, DESIGN S AND DESIGN R

SPECIFICATION
REFERENCE
2531

STANDARD
PLATE
NO.
7102K

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH

Plan By: MKV

Checked By: MAN

Approved By: NEH

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.

NICHOLAS E. HENTZ, P.E.

DATE: 9/12/2024

LICENSE NO. 44620

CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

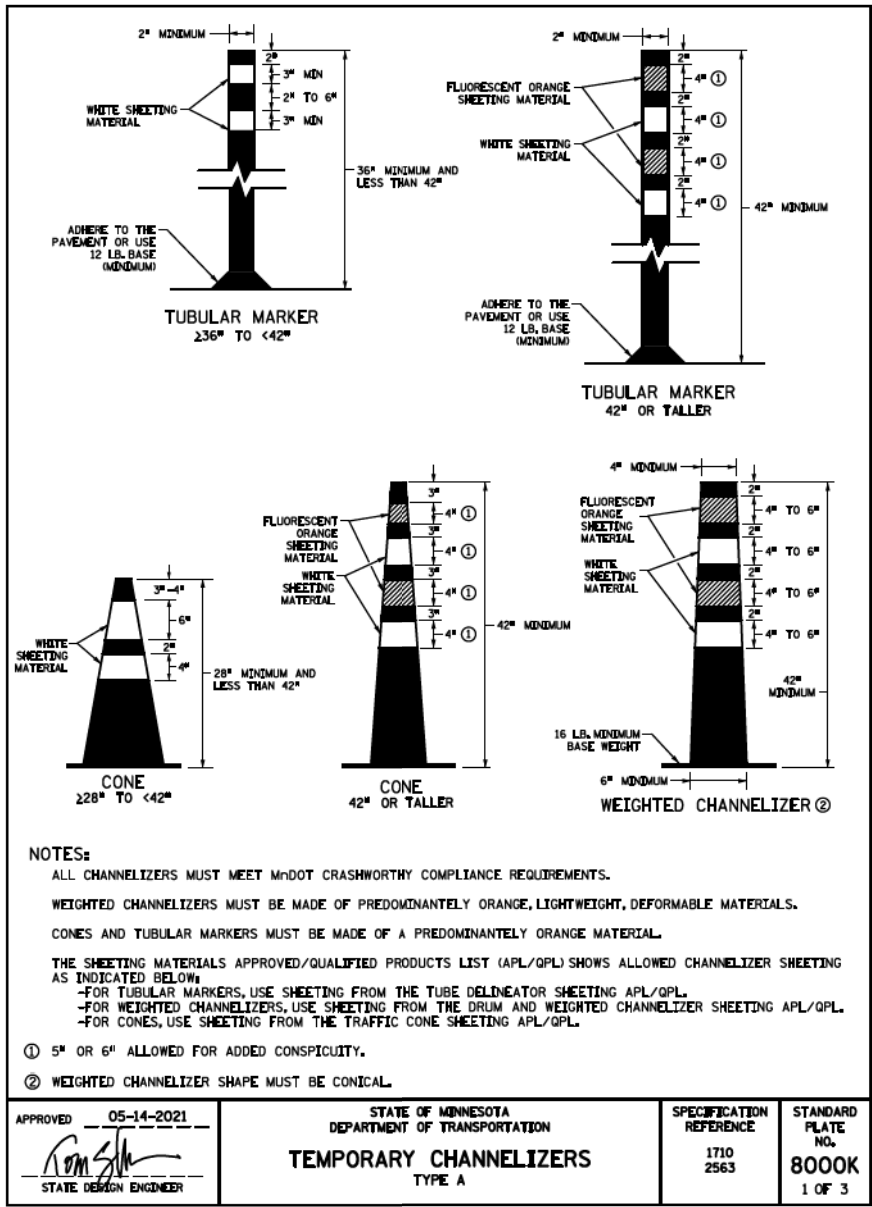
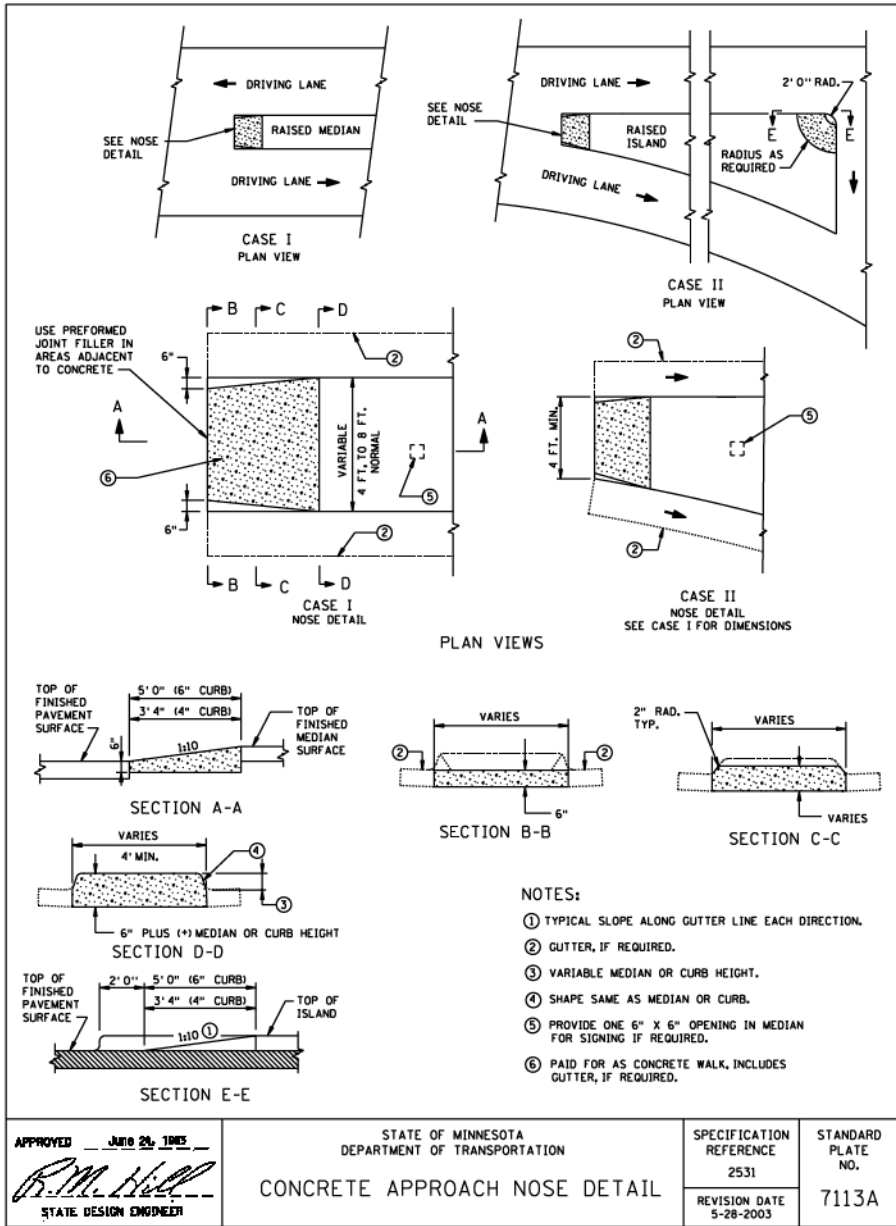
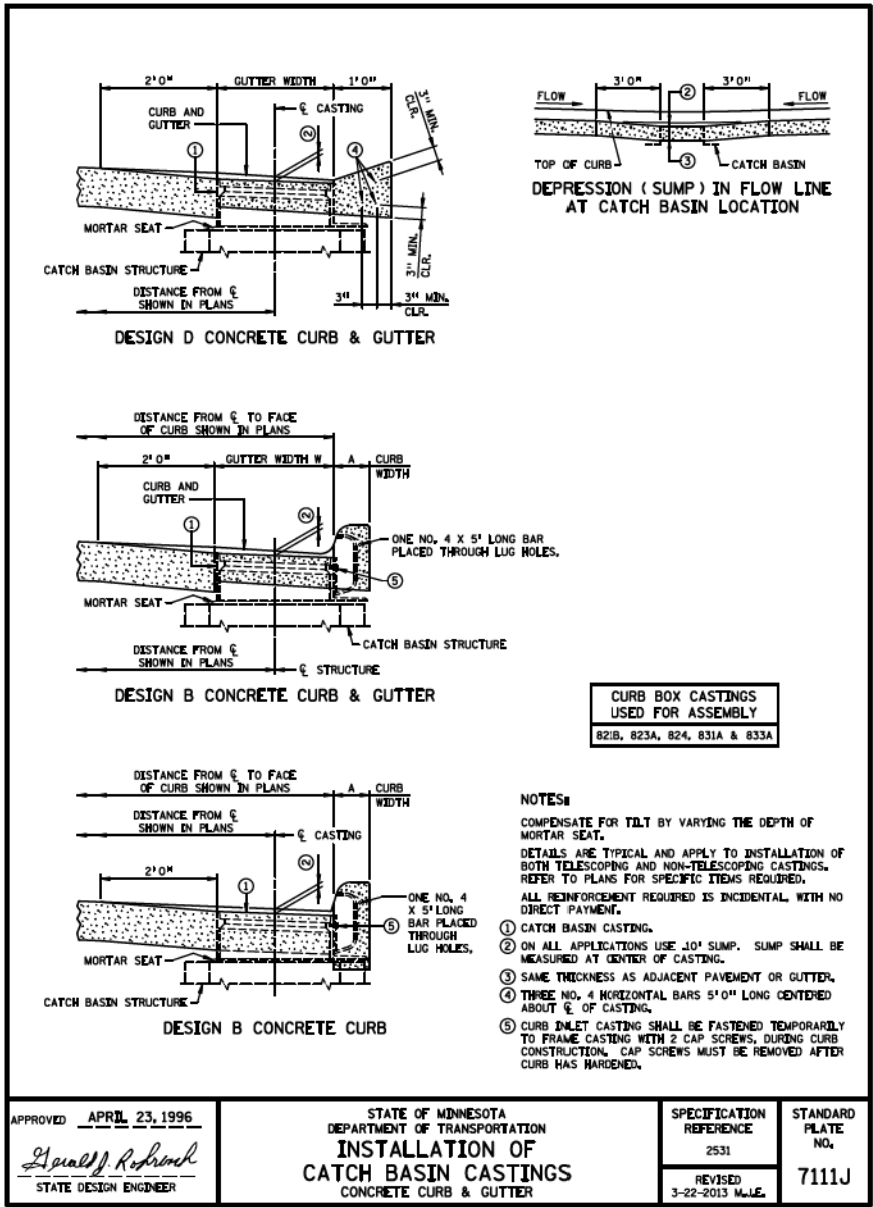
CHISAGO COUNTY, MINNESOTA

STANDARD PLATES

SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 42 OF 216 SHEETS

DATE: 9/12/2024 2:00:08 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sd1



NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH
Plan By:
MKV
Checked By:
MAN
Approved By:
NEH

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Nicholas E. Hentrich, PE
NICHOLAS E. HENTRICH, PE
DATE: 9/12/2024 LICENSE NO. 44620



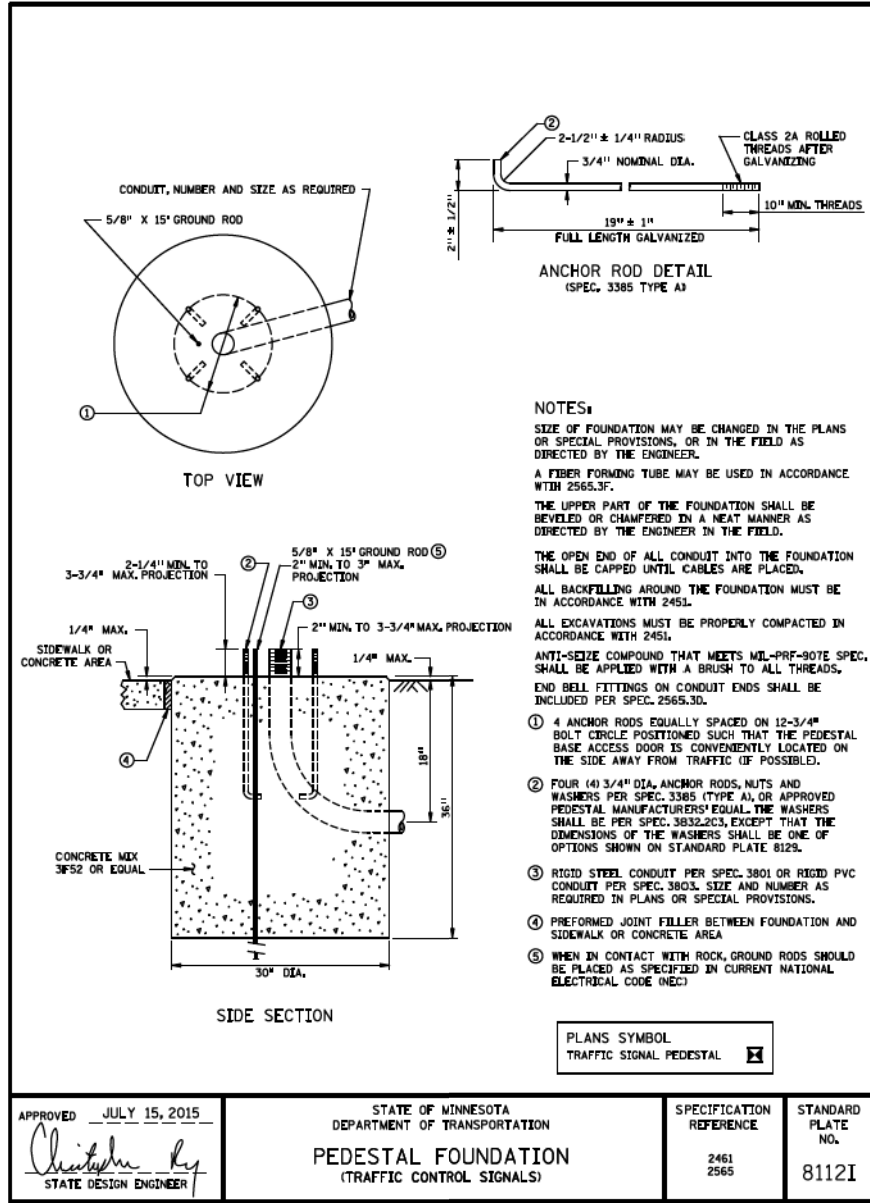
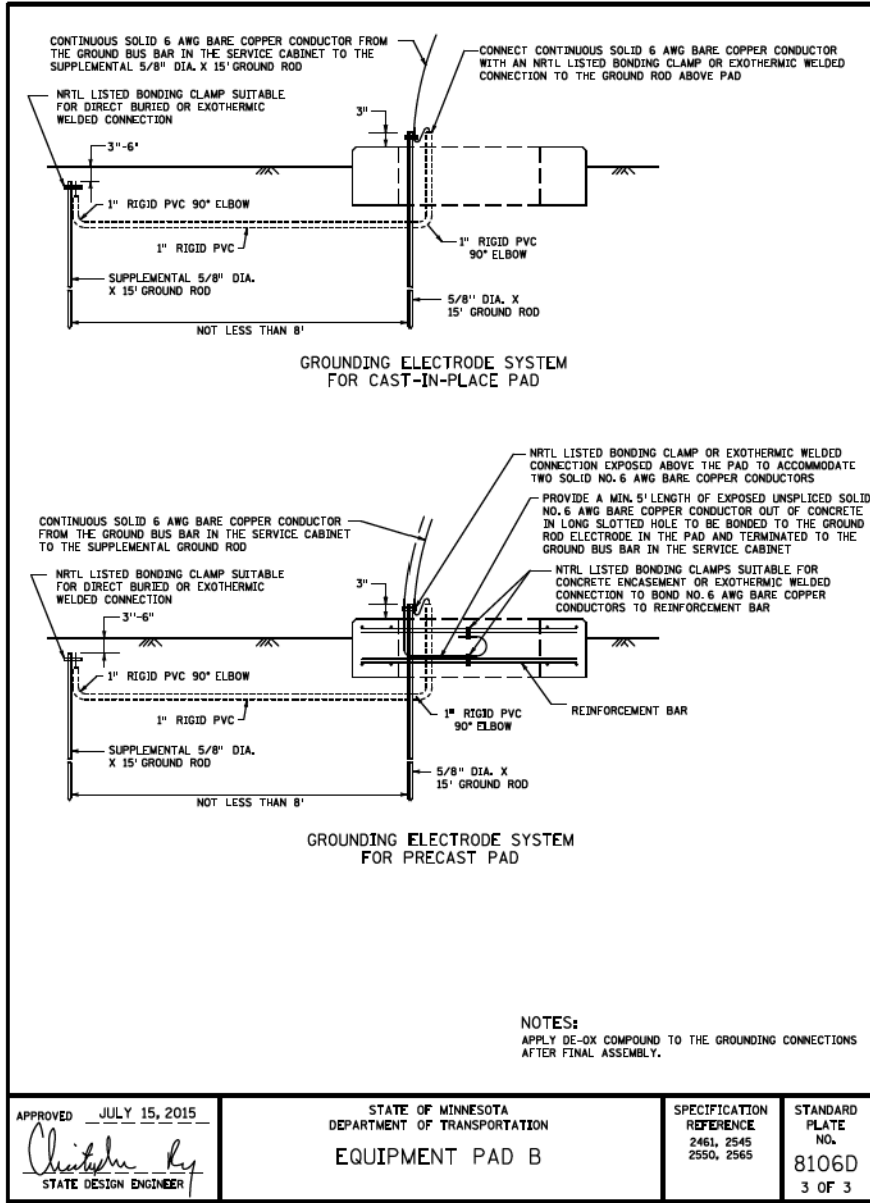
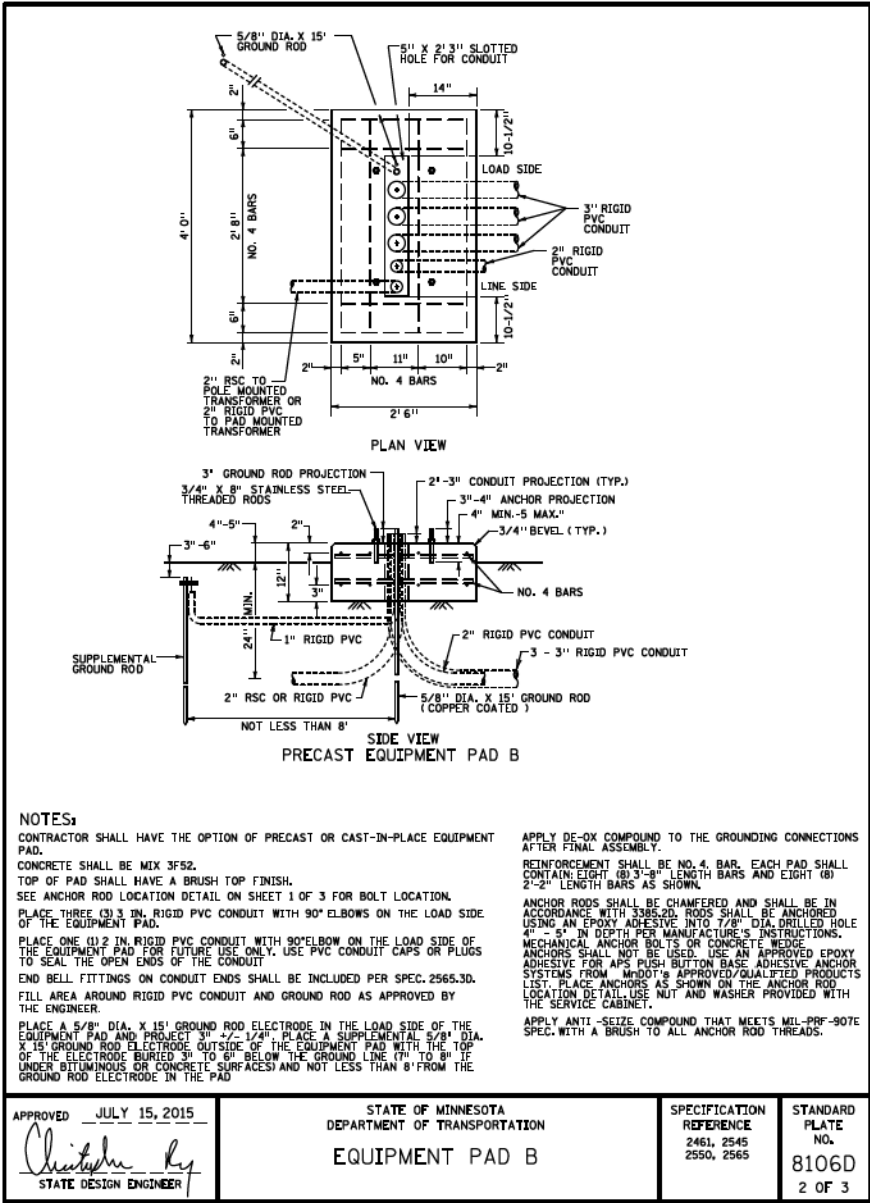
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
43
OF
216
SHEETS

DATE: 9/12/2024 2:00:10 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sd1



NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH

Plan By:
MKV

Checked By:
MAN

Approved By:
NEH

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NICHOLAS E. HENTZ, P.E.

DATE: 9/12/2024 LICENSE NO. 44620



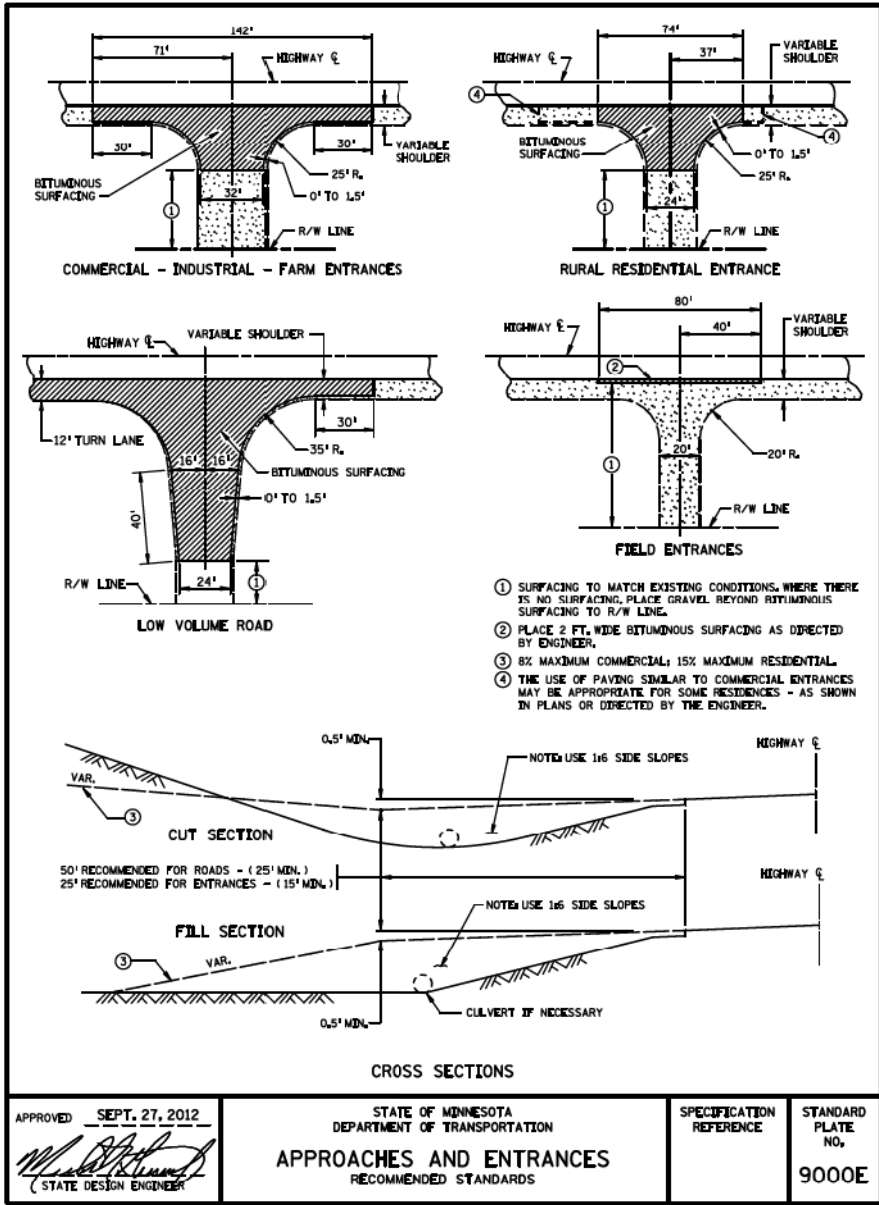
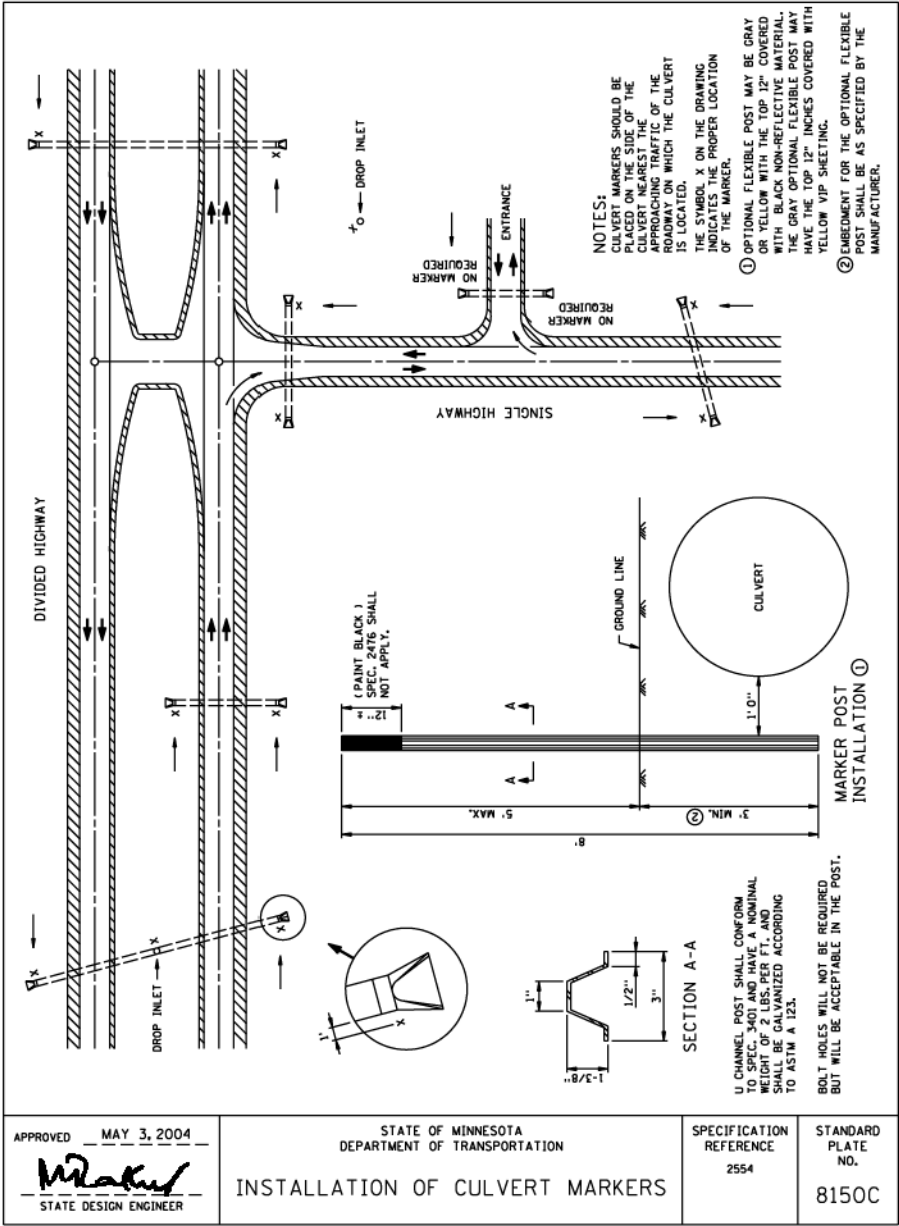
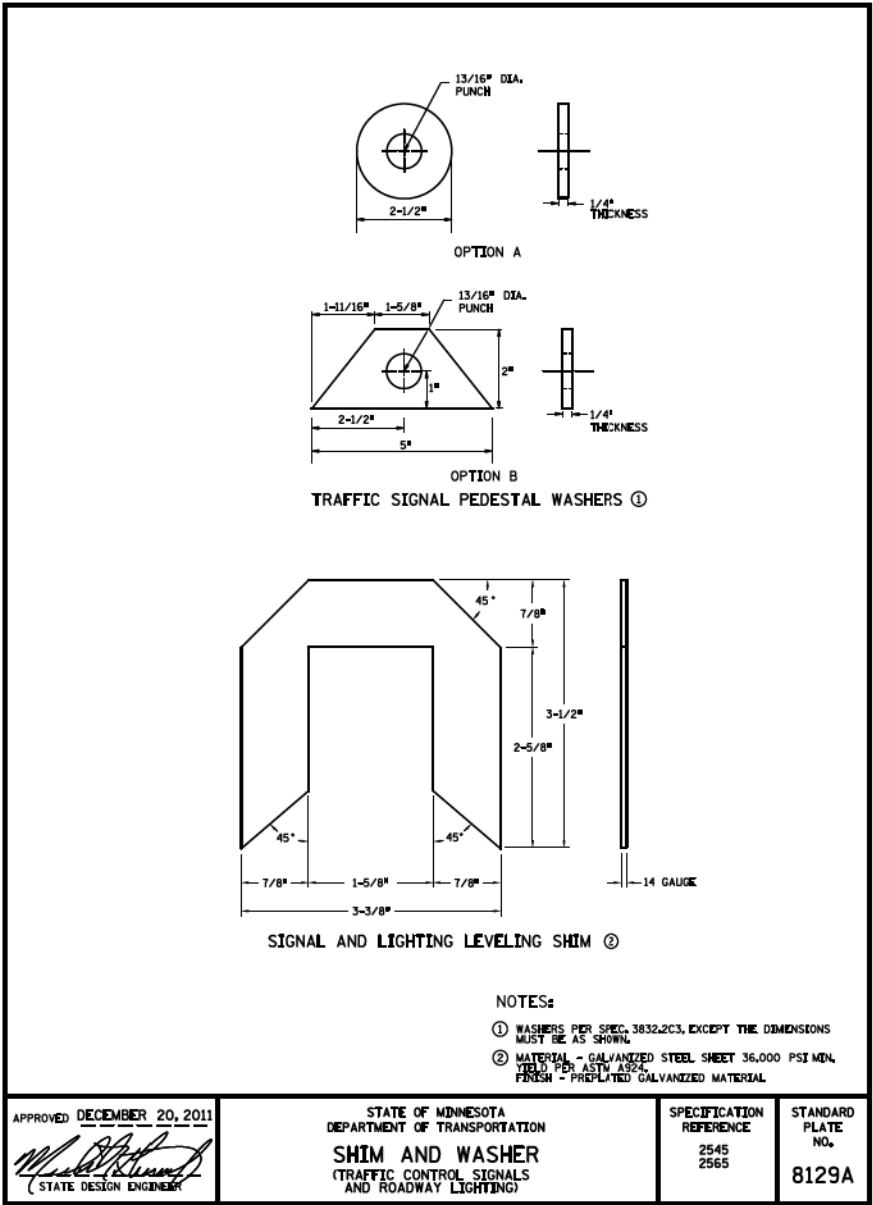
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
45
OF
216
SHEETS

DATE: 9/12/2024 2:00:11 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH

Plan By:
MKV

Checked By:
MAN

Approved By:
NEH

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.

NICHOLAS E. HENTZ, P.E.

NICHOLAS E. HENTZ, P.E.

DATE: 9/12/2024 LICENSE NO. 44620



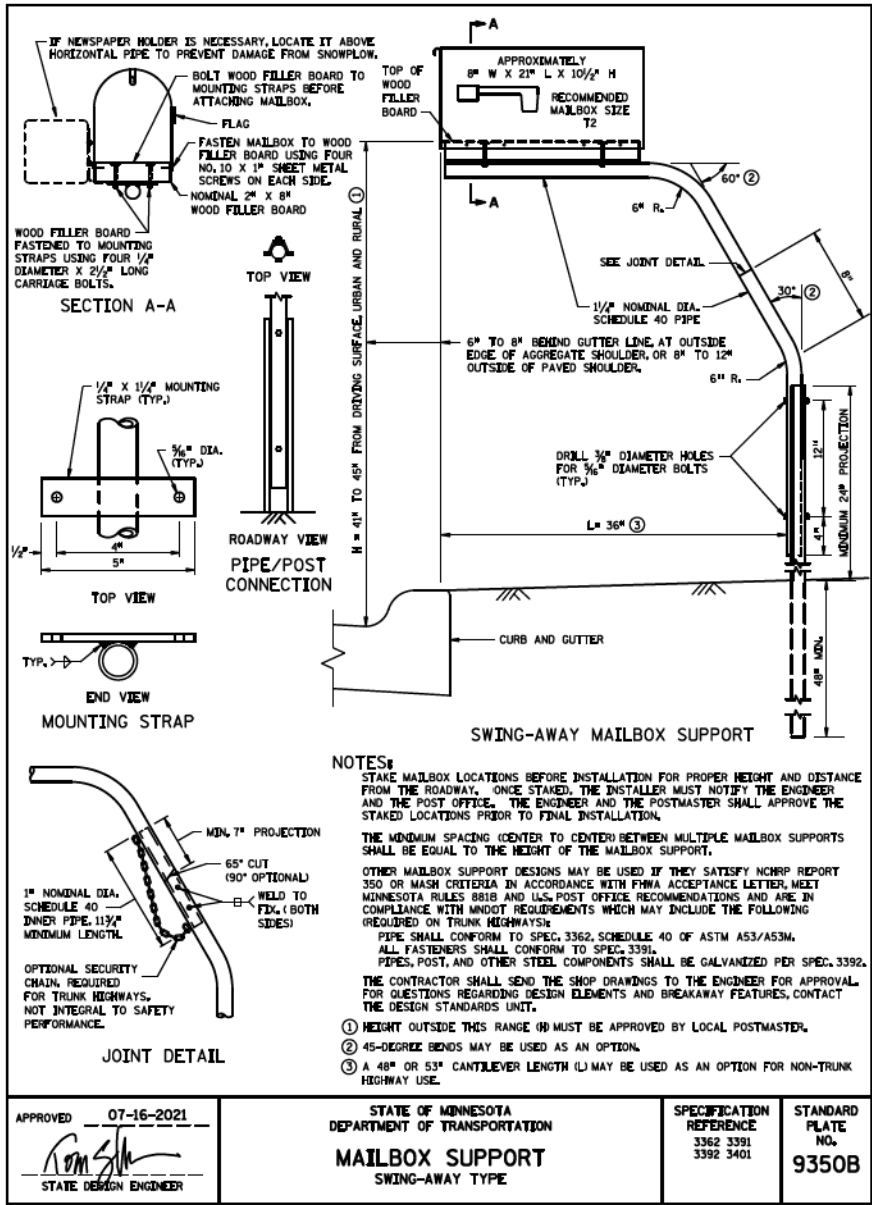
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
46
OF
216
SHEETS

DATE: 9/12/2024 2:00:12 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sd1



NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH

Plan By:
MKV

Checked By:
MAN

Approved By:
NEH

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NICHOLAS E. HENTZ, P.E.

DATE: 9/12/2024 LICENSE NO. 44620



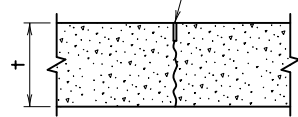
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

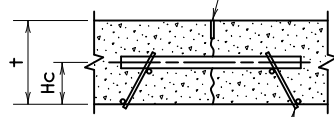
SHEET
47
OF
216
SHEETS

SEE JOINT DETAIL A OR B



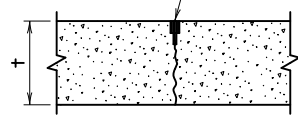
C1U & C2H

SEE JOINT DETAIL A OR B



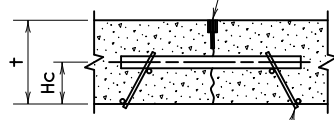
DOWEL BAR ASSEMBLY
C1U-D & C2H-D ⑧

SEE JOINT DETAIL C

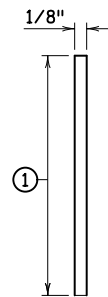


C3P

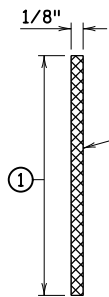
SEE JOINT DETAIL C



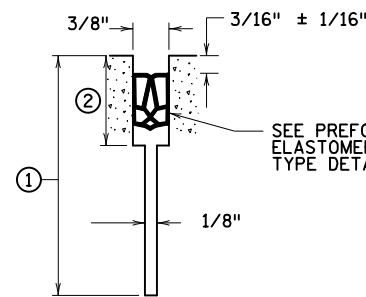
DOWEL BAR ASSEMBLY
C3P-D ⑧



JOINT DETAIL A ③⑤
SAWED & UNSEALED



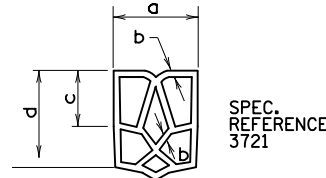
JOINT DETAIL B ④⑤
SAWED & SEALED



JOINT DETAIL C ④⑤
SAWED AND SEALED

SEE PREFORMED
ELASTOMERIC
TYPE DETAIL

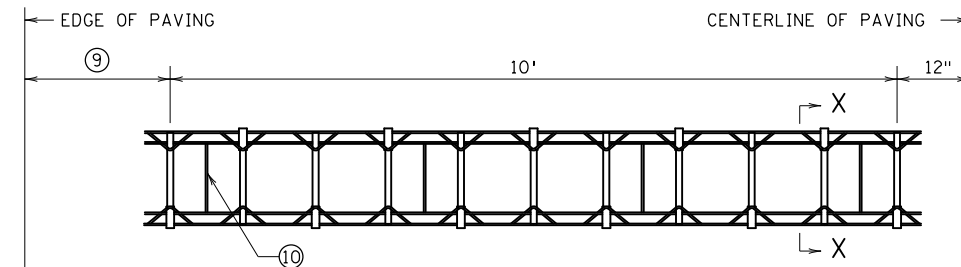
REQUIRED DIMENSIONS ②	
JOINT TYPE	TRANSVERSE
NOMINAL SEALER SIZE	11/16" USE IN ALL 3/8" JOINTS
a	0.69" + 0.13" - 0.05"
b	0.08" ± 0.02"
c	0.25" MIN.
d	0.63" MIN.



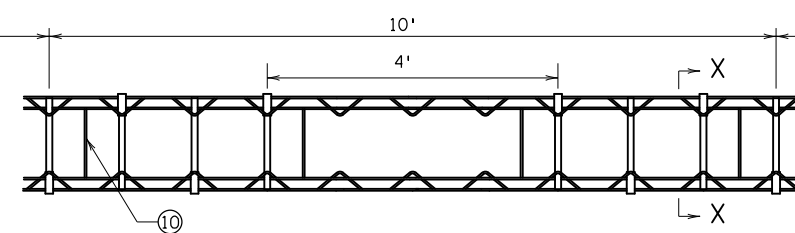
TYPICAL SHAPE FOR
SATISFACTORY INSTALLATION
IN JOINT (5 CELL MIN.)

PREFORMED ELASTOMERIC TYPE DETAIL ②

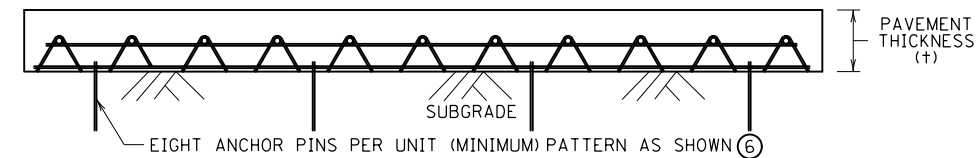
CONTRACTION JOINT REFERENCE, DETAIL & SEALER SPEC. TABLE				
JOINT REFERENCE		JOINT DETAIL	JOINT SEALER SPEC.	JOINT WIDTH
WITHOUT DOWELS	WITH DOWELS			
C1U	C1U-D	A	UNSEALED	1/8"
C2H	C2H-D	B	3725	1/8"
C3P	C3P-D	C	3721	3/8"
LEGEND C = CONTRACTION JOINT NO. = JOINT REFERENCE U = UNSEALED H = HOT POURED P = PREFORMED -D = DOWEL BARS				
EXAMPLE C2H-D				



PLAN VIEW
ELEVEN DOWEL BASKET (SPACED AT 12")

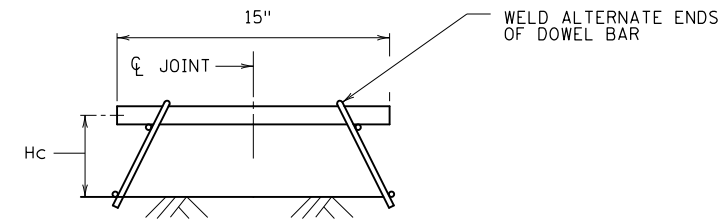


PLAN VIEW
EIGHT DOWEL BASKET (WHEEL PATH DOWELS SPACED AT 12")

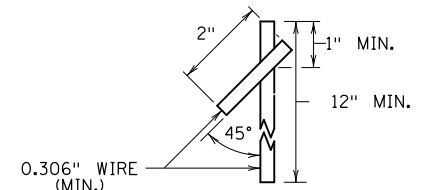


CONTRACTION JOINT DOWEL BAR ASSEMBLIES

DOWEL BAR TABLE		
± PAVEMENT THICKNESS (IN.)	DOWEL BAR DIAMETER (IN.)	HC HEIGHT TO CENTER OF DOWEL BAR (IN.)
7 - 7 1/2	1	3
8 - 10	1 1/4	4
≥ 10 1/2	1 1/2	5



SECTION X-X ⑧



ANCHOR PIN ⑦

NOTES:

SEE STANDARD PLATE 1103 FOR DOWEL BAR ASSEMBLY.

FURNISH AND INSTALL ALL JOINT SEALER IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

SEE STANDARD PLANS 5-297.217 AND 5-297.219 FOR CONCRETE MAINLINE/RAMP PAVEMENT.

SEE PAVING LAYOUTS IN THE PLANS FOR JOINT CLASS DESIGNATION TO BE USED AND SPECIAL REINFORCEMENT REQUIRED.

① JOINT DEPTH AND TOLERANCE: ±3 ± 1/4".

② JOINT DEPTH 1/4" MORE THAN THE PREFORMED SEALER WHEN COMPRESSED TO FIT THE JOINT DESIGN WIDTH. "a" DIMENSION APPLIES AT ANY POINT THROUGHOUT "c" DEPTH. SHARP CORNERS NOT PERMITTED. PROVIDE CORNERS WITH SUITABLE FILLET.

③ CLEAN JOINT FACES WITH WATER DURING THE SAW CUTTING OPERATION OR BY WATER BLASTING AFTER SAWING.

④ CLEAN AND DRY JOINT FACES BY SANDBLASTING AND AIR BLASTING, WHEN SEALING IS REQUIRED.

⑤ JOINT WIDTH TOLERANCE IS +1/16" TO -1/32".

⑥ EVENLY SPACE A MINIMUM OF (8) ANCHOR PINS (4 PER SIDE) PER DOWEL ASSEMBLY. PROVIDE QUALITY CONTROL PLAN FOR ANCHORING THE DOWEL BAR ASSEMBLIES TO THE ENGINEER FOR ACCEPTANCE PER SPEC. 2301.

⑦ ANCHOR PIN REQUIREMENTS FOR CONCRETE PAVEMENT ON GRADE CONSTRUCTION. FOR CONCRETE OVERLAYS, ANCHOR PIN REQUIREMENT AS APPROVED BY THE ENGINEER.

⑧ TOLERANCES:
- PLACE DOWEL BARS PARALLEL TO THE SUBSTRATE SURFACE ±1/8" IN 15".
- PLACE DOWEL BARS PARALLEL TO THE CENTERLINE OF THE PAVEMENT ±1/4" IN 15"
- SAW CONTRACTION JOINTS PERPENDICULAR TO THE CENTERLINE OF THE PAVEMENT AND CENTERED ON THE DOWEL BAR ±3".
- HEIGHT (hc) TO CENTER OF DOWEL BAR ± 1/2".

⑨ DISTANCE TO EDGE OF PAVEMENT FROM OUTSIDE DOWEL:
- 3' 0" FOR 14' 0" LANE.
- 2' 6" FOR 13' 6" LANE.
- 2' 0" FOR 13' 0" LANE.
- 1' 0" FOR 12' 0" LANE.

⑩ CONTRACTOR OPTION TO CUT AND BEND SPACER WIRES AFTER STAKING.

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STANDARD PLAN 5-297.221

1 OF 4

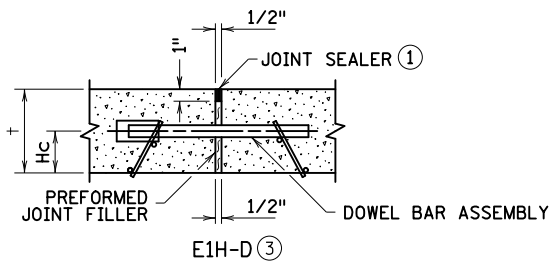
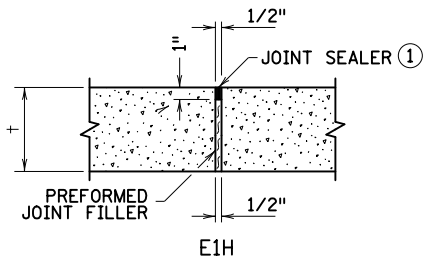
THOMAS STYRBICKI
STATE DESIGN ENGINEER

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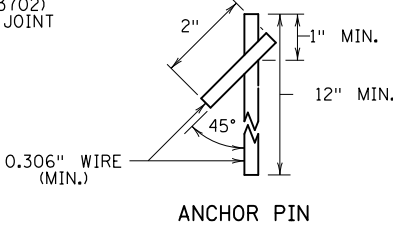
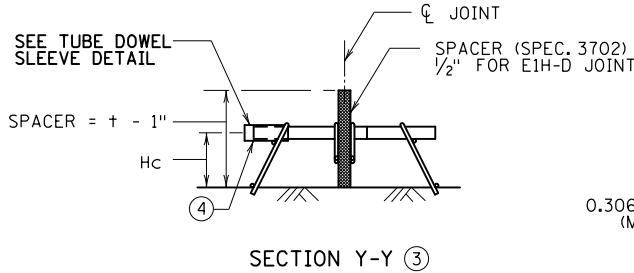
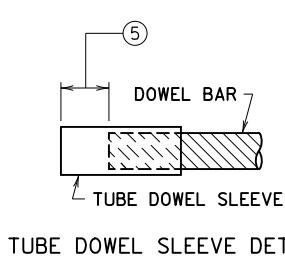
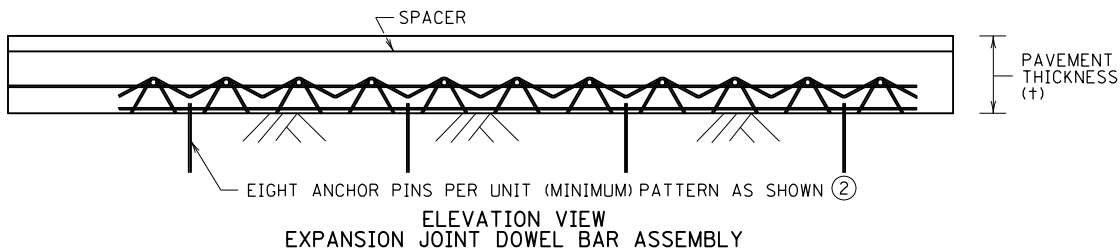
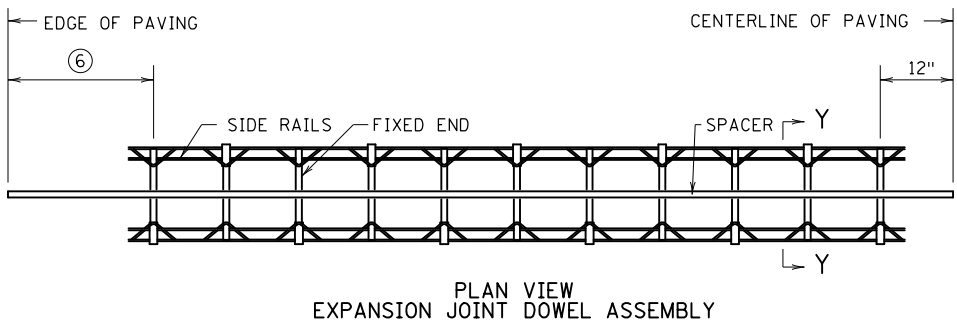
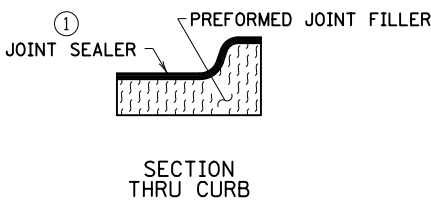
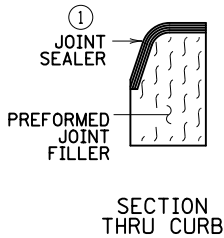
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PAVEMENT JOINTS
CONTRACTION (DESIGN C)

SHEET NO. 48 OF 216



EXPANSION JOINT REFERENCE, DETAIL & SEALER SPEC. TABLE				
JOINT REFERENCE		PREFORMED JOINT FILLER SPEC.	JOINT SEALER SPEC.	JOINT WIDTH
WITHOUT DOWELS	WITH DOWELS			
E1H	E1H-D	3702	3725	1/2"
LEGEND E = EXPANSION JOINT NO. = JOINT REFERENCE H = HOT POURED -D = DOWEL BARS EXAMPLE E1H-D				



DOWEL BAR TABLE		
+ PAVEMENT THICKNESS (IN.)	DOWEL BAR DIAMETER (IN.)	Hc HEIGHT TO CENTER OF DOWEL BAR (IN.)
7 - 7 1/2	1	3
8 - 10	1 1/4	4
≥ 10 1/2	1 1/2	5

NOTES:

WHEN USING THE EXPANSION JOINT DOWEL ASSEMBLY, CONTACT THE CONCRETE OFFICE.

SEE STANDARD PLATE 1103 FOR DOWEL BAR ASSEMBLY.

PROVIDE PREFORMED JOINT FILLER MATERIAL IN ACCORDANCE WITH SPEC. 3702.

FURNISH AND INSTALL ALL JOINT SEALER IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

- JOINT SEALER SPEC. 3725. CLEAN AND DRY JOINT FACES BY SANDBLASTING AND AIR BLASTING. TOP OF SEALER FLUSH TO 1/8" BELOW TOP OF PAVEMENT SURFACE.
- EVENLY SPACE A MINIMUM OF (8) ANCHOR PINS (4 PER SIDE) PER DOWEL ASSEMBLY. PROVIDE QUALITY CONTROL PLAN FOR ANCHORING THE DOWEL BAR ASSEMBLIES TO THE ENGINEER FOR ACCEPTANCE PER SPEC. 2301.

- TOLERANCES:
 - PLACE DOWEL BARS PARALLEL TO THE SUBSTRATE SURFACE ±1/8" IN 15".
 - PLACE DOWEL BARS PARALLEL TO THE CENTERLINE OF THE PAVEMENT ±1/4" IN 15"
 - HEIGHT (Hc) TO CENTER OF DOWEL BAR ± 1/2".
- PLACE METAL INSTALLATION SHIELDS FOR EXPANSION JOINTS PARALLEL TO THE PAVEMENT SURFACE AND THE PAVEMENT CENTERLINE WITHIN A TOLERANCE OF 1/4" WITHIN THE LENGTH OF BAR.
- SPACE FROM END OF DOWEL BAR TO END OF SLEEVE IS 1" MINIMUM.
- DISTANCE TO EDGE OF PAVEMENT FROM OUTSIDE DOWEL:
 - 3' 0" FOR 14' 0" LANE.
 - 2' 6" FOR 13' 6" LANE.
 - 2' 0" FOR 13' 0" LANE.
 - 1' 0" FOR 12' 0" LANE.

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STANDARD PLAN 5-297.221

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THOMAS STYRBICKI
STATE DESIGN ENGINEER

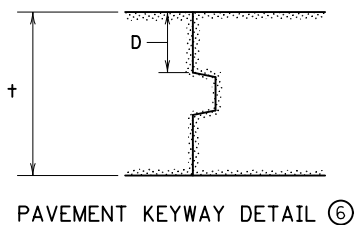
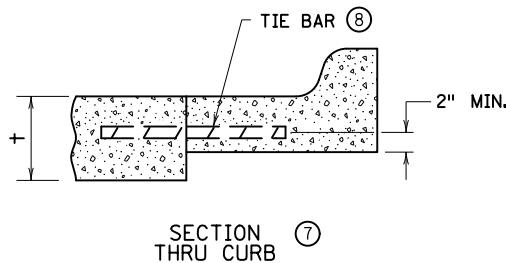
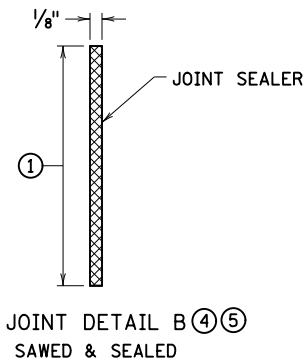
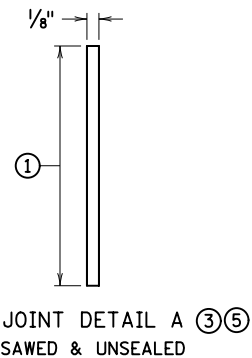
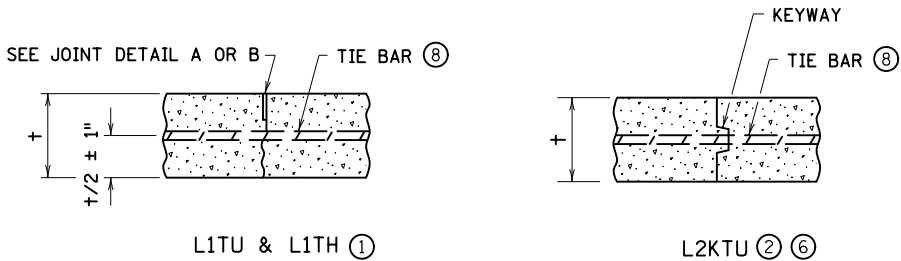
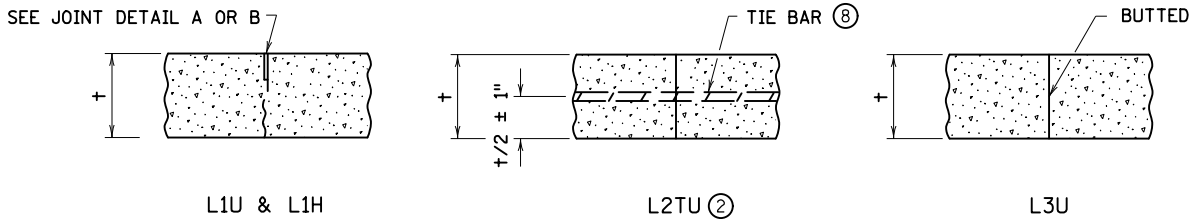
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PAVEMENT JOINTS
EXPANSION (DESIGN E)

SHEET NO. 49 OF 216

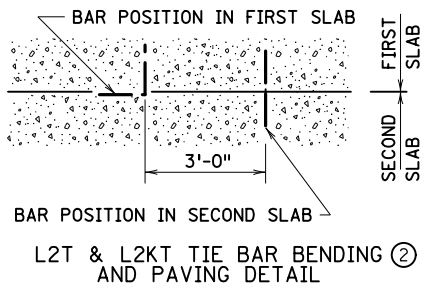
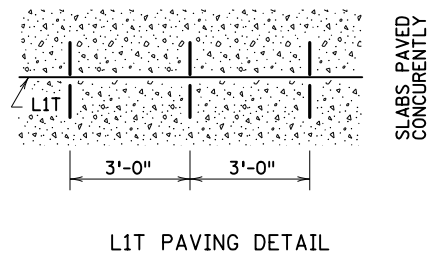
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FIXED FORM KEYWAY TABLE ⑥	
+	D
PAVEMENT THICKNESS	(MIN. DEPTH)
< 7"	2-1/2"
7" TO 7-1/2"	3"
8" TO 9-1/2"	4"
≥ 10"	5"

SLIPFORM KEYWAY TABLE ⑥	
+	D
PAVEMENT THICKNESS	(MIN. DEPTH)
< 10"	NO KEYWAY
≥ 10"	5"

LONGITUDINAL JOINT REFERENCE, DETAIL & SEALER SPECIFICATION TABLE					
JOINT REFERENCE			JOINT DETAIL	JOINT SEALER SPEC	JOINT WIDTH
WITHOUT TIE BARS	WITH TIE BARS	WITH KEYWAY & TIE BARS			
L1U	L1TU		A	UNSEALED	1/8"
L1H	L1TH		B	3725	1/8"
	L2TU	L2KTU	NONE	UNSEALED	
L3U			NONE	UNSEALED	
LEGEND L = LONGITUDINAL JOINT NO. = JOINT REFERENCE 1 = PAVED CONSTRUCTION JOINT 2 = TIED CONSTRUCTION JOINT 3 = BUTTED CONSTRUCTION JOINT K = KEYWAY T = TIE BARS U = UNSEALED H = HOT POURED EXAMPLE L2KTU					



NOTES:

PROVIDE EPOXY-COATED TIE BARS COMPLYING WITH SPEC. 3301.

FURNISH AND INSTALL ALL JOINT SEALER IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

SEE STANDARD PLANS 5-297.217 AND 5-297.219 FOR CONCRETE MAINLINE AND RAMP PAVEMENT.

SEE PAVING LAYOUTS IN THE PLANS FOR JOINT CLASS DESIGNATION TO BE USED AND SPECIAL REINFORCEMENT REQUIRED.

LONGITUDINAL JOINTS SAWED WIDER THAN 1/8", CONTACT THE CONCRETE UNIT FOR SEALING RECOMMENDATIONS.

① JOINT DEPTH AND TOLERANCE: $\pm 3 \pm 1/4$ ".

② BEND TIE BARS 90 DEGREES WHEN INSERTED IN THE L2 JOINTS, EXCEPT WHEN NOTED OTHERWISE IN THE PLANS.

③ CLEAN JOINT FACES WITH WATER DURING THE SAW CUTTING OPERATION OR BY WATER BLASTING AFTER SAWING.

④ CLEAN AND DRY JOINT FACES BY SANDBLASTING AND AIR BLASTING, WHEN SEALING IS REQUIRED.

⑤ JOINT WIDTH TOLERANCE IS $\pm 1/16$ " TO $-1/32$ ".

⑥ CONTRACTOR'S OPTION TO USE KEYWAY WHEN:
- PLACING FIXED FORM CONSTRUCTION.
- PLACING SLIPFORM CONSTRUCTION WHEN $\pm \geq 10$ ".

USE OF KEYWAY FOR ANY OTHER APPLICATION REQUIRES APPROVAL BY THE ENGINEER. OTHER KEYWAY SHAPES MAY BE USED WITH THE APPROVAL OF THE CONCRETE ENGINEER.

⑦ WHEN CURB AND GUTTER IS NOT CONSTRUCTED AT THE SAME DEPTH AS ADJACENT CONCRETE, PLACE TIE BAR MINIMUM OF 2" ABOVE THE CURB AND GUTTER GRADE.

⑧ PROVIDE NO. 4 TIE BAR, 30" LONG, SPACED AT 3' ON CENTER.

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STANDARD PLAN 5-297.221

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THOMAS STYRBICKI
STATE DESIGN ENGINEER

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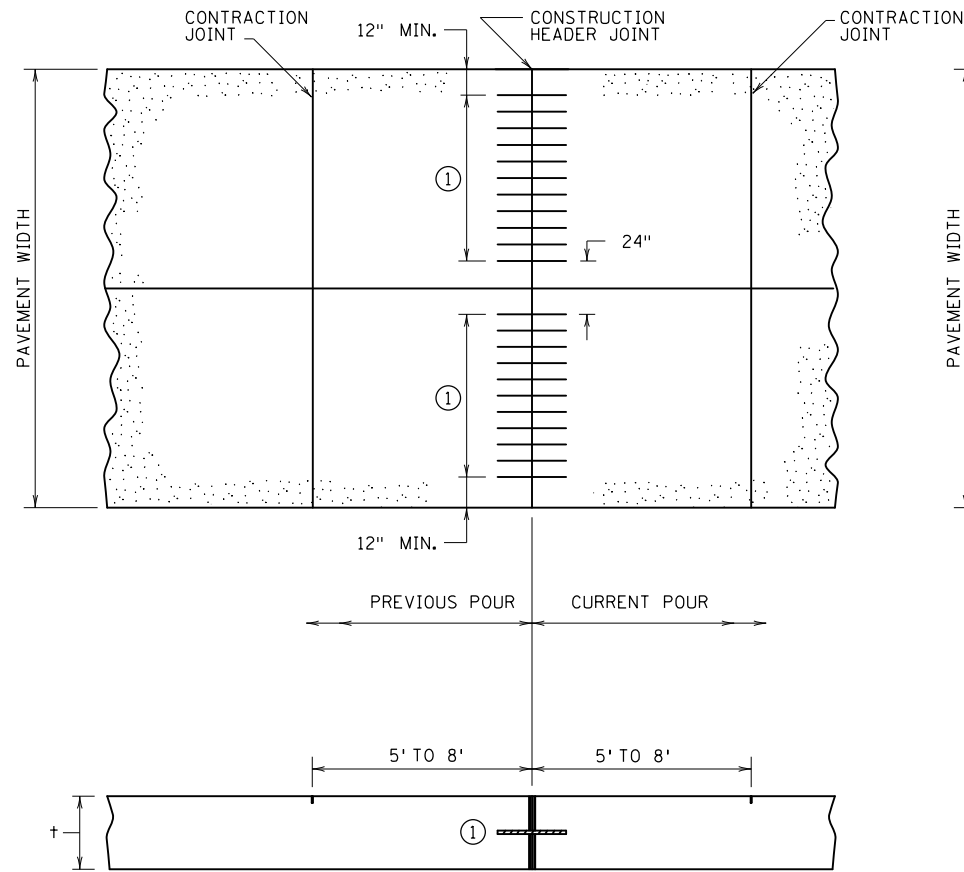
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PAVEMENT JOINTS

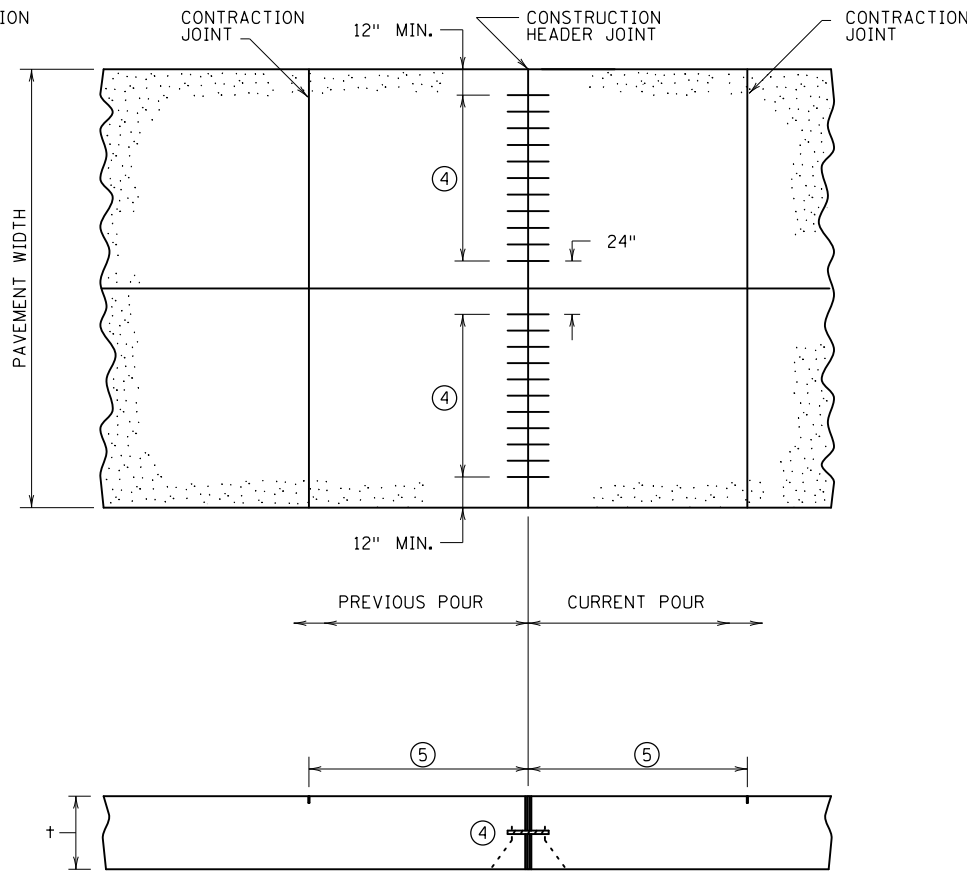
LONGITUDINAL (DESIGN L)

SHEET NO. 50 OF 216

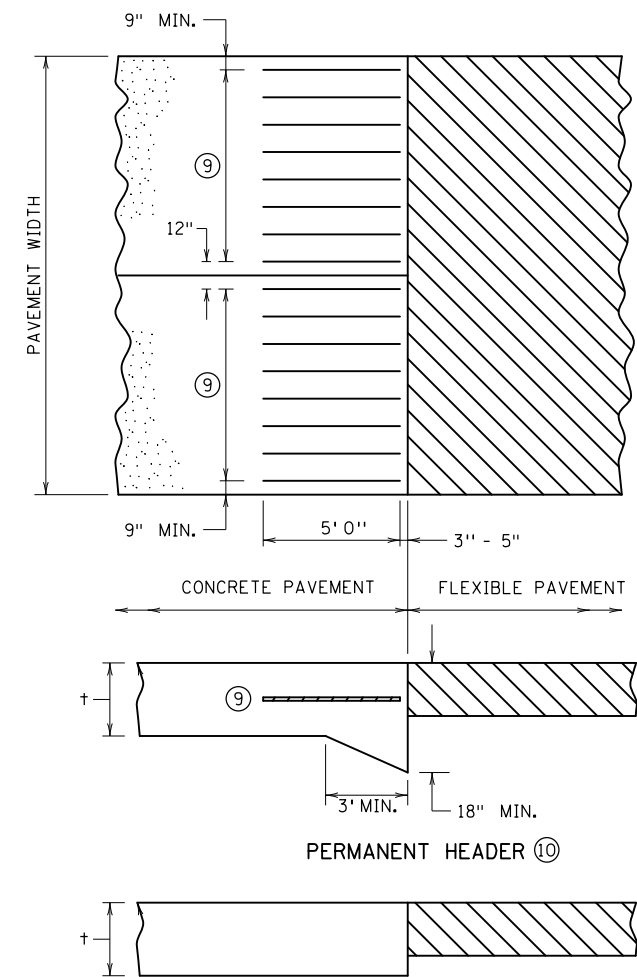
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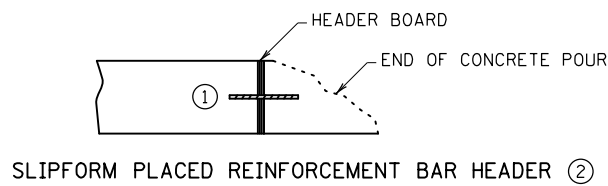
REINFORCEMENT BAR CONSTRUCTION HEADERS



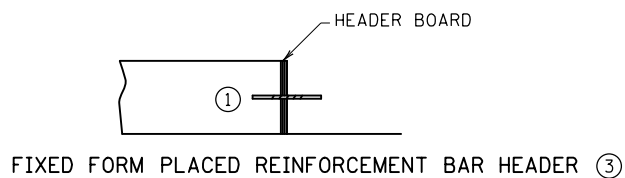
DOWEL BAR CONSTRUCTION HEADERS



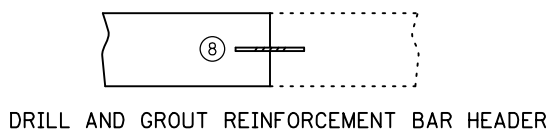
TERMINAL HEADER 11



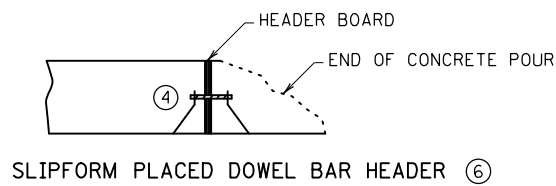
SLIPFORM PLACED REINFORCEMENT BAR HEADER 2



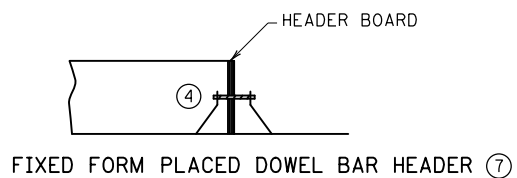
FIXED FORM PLACED REINFORCEMENT BAR HEADER 3



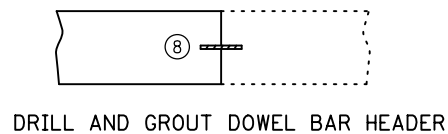
DRILL AND GROUT REINFORCEMENT BAR HEADER



SLIPFORM PLACED DOWEL BAR HEADER 6



FIXED FORM PLACED DOWEL BAR HEADER 7



DRILL AND GROUT DOWEL BAR HEADER

NOTES:

PROVIDE EPOXY-COATED REINFORCEMENT BARS IN ACCORDANCE WITH SPEC. 3301.

- 1 PROVIDE NO. 4 REINFORCEMENT BARS, 30" LONG, SPREAD 12" ON CENTER AT DEPTH OF $T/2 \pm 1"$.
- 2 PAVE PAST THE HEADER LOCATION. REMOVE END OF CONCRETE POUR. SET HEADER BOARD SHAPED TO PAVEMENT CROSS SECTION AND SLOTTED OR DRILLED FOR REINFORCEMENT BARS. PLACE THE CONCRETE BEHIND THE BOARD AND INSERT THE REINFORCEMENT BARS. CONSOLIDATE AND FINISH THE CONCRETE BEHIND THE HEADER BOARD.
- 3 SET HEADER BOARD SHAPED TO PAVEMENT CROSS SECTION AND SLOTTED OR DRILLED FOR REINFORCEMENT BARS. PLACE THE CONCRETE BEHIND THE BOARD AND INSERT THE REINFORCEMENT BARS. CONSOLIDATE AND FINISH THE CONCRETE BEHIND THE HEADER BOARD.
- 4 PROVIDE DOWEL BARS IN ACCORDANCE WITH SPEC. 3302 AND THE CONTRACT.
- 5 DISTANCE EQUAL TO OR LESS THAN THE DESIGNED CONTRACTION JOINT SPACING IN ACCORDANCE WITH THE CONTRACT.
- 6 PLACE DOWEL BAR BASKET AT DESIRED HEADER LOCATION. SET HEADER BOARD SHAPED TO PAVEMENT CROSS SECTION ABOVE AND BELOW THE DOWELS. PAVE PAST THE HEADER LOCATION AND FINISH CONCRETE BEHIND THE HEADER BOARD. THOROUGHLY REMOVE ALL CONCRETE FROM THE EXPOSED DOWELS.
- 7 PLACE DOWEL BAR BASKET AT DESIRED HEADER LOCATION. SET HEADER BOARD SHAPED TO PAVEMENT CROSS SECTION ABOVE AND BELOW THE DOWELS. PLACE, CONSOLIDATE AND FINISH THE CONCRETE BEHIND THE HEADER BOARD.
- 8 DRILL AND GROUT 18" LONG DOWEL OR REINFORCEMENT BARS SPACED AT 12" ON CENTER AT A DEPTH OF $T/2 \pm 1"$. DRILL THE HOLE $1/8"$ GREATER THAN THE NOMINAL OUTSIDE DIAMETER OF THE BAR BEING PLACED TO A DEPTH OF 9". INJECT A MnDOT-APPROVED EPOXY OR NON-SHRINK GROUT IN THE BACK OF THE DRILL HOLE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 - FOR DOWEL BAR HEADERS, USE DOWEL BARS HAVING A DIAMETER IN ACCORDANCE WITH SPEC. 3302 AND THE CONTRACT.
 - FOR REINFORCEMENT BAR HEADERS, USE NO. 4 REINFORCEMENT BARS.
- 9 PROVIDE NO. 7 REINFORCEMENT BARS, 5' LONG, SPACED 18" ON CENTER AT DEPTH OF $T/2 \pm 1"$.
- 10 USE PERMANENT HEADER WHEN LONG SECTIONS OF CONCRETE (400' OR GREATER) ABUT BITUMINOUS. CONTACT THE CONCRETE UNIT WHEN FUTURE CONCRETE IS BEING CONSTRUCTED ADJACENT TO AN EXISTING PERMANENT HEADER.
- 11 USE TERMINAL HEADER WHEN SHORT SECTIONS OF CONCRETE (LESS THAN 400') ABUT BITUMINOUS (ON SIDE STREETS, FOR EXAMPLE).

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STANDARD PLAN 5-297.221

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THOMAS STYRBICKI
STATE DESIGN ENGINEER

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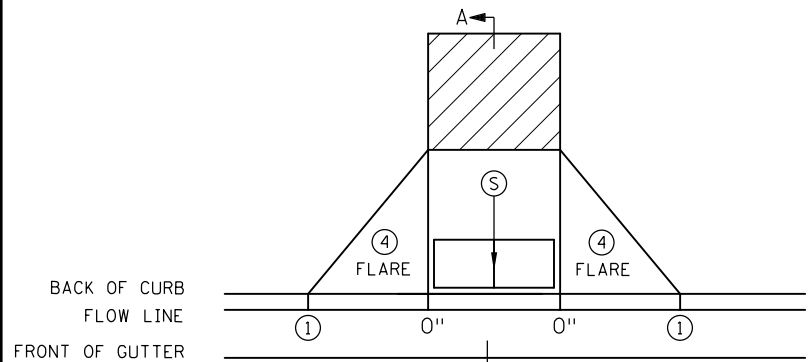
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PAVEMENT JOINTS

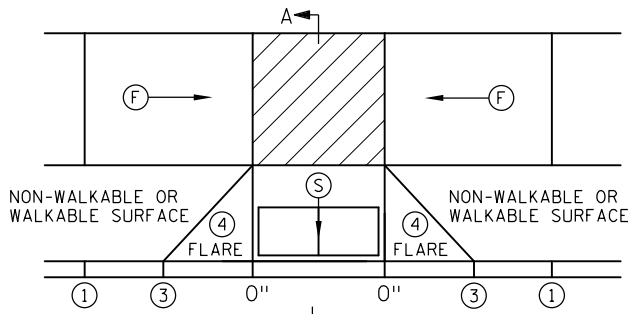
CONSTRUCTION AND TERMINAL HEADERS

SHEET NO. 51 OF 216

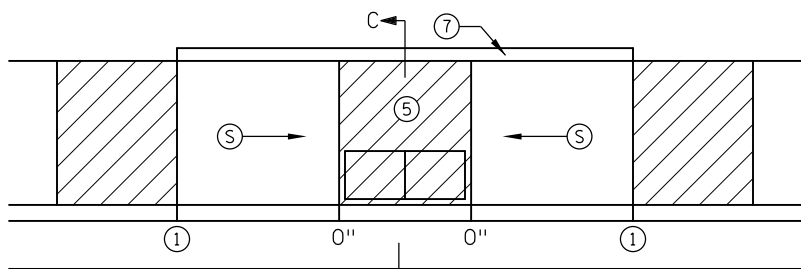
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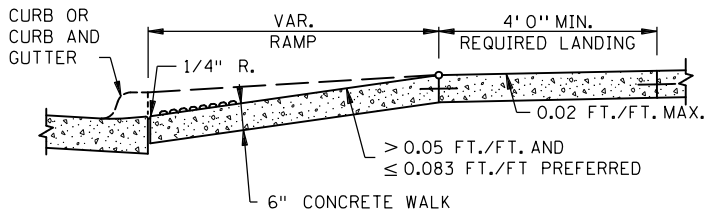
PERPENDICULAR



TIERED PERPENDICULAR

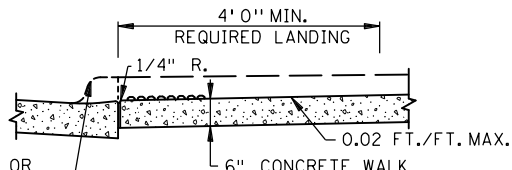


PARALLEL



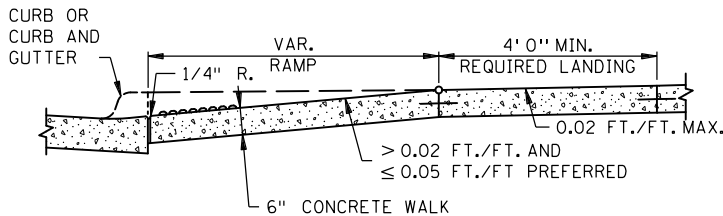
SECTION A-A

PERPENDICULAR/TIERED/DIAGONAL



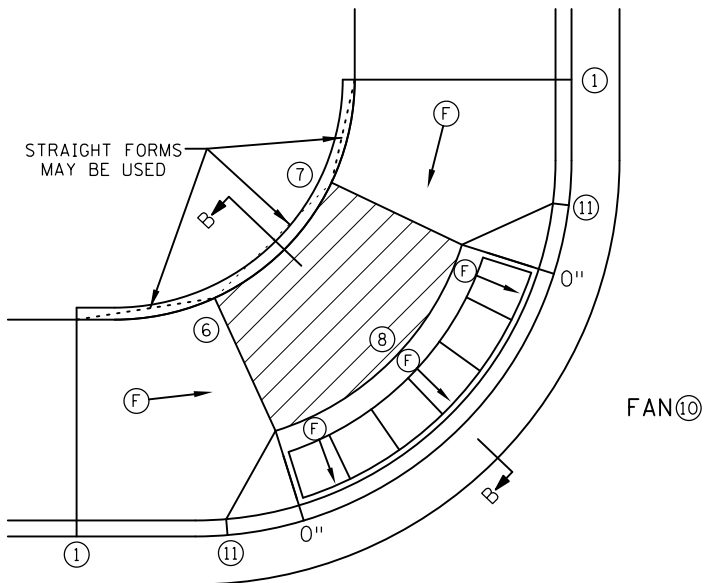
SECTION C-C

PARALLEL/DEPRESSED CORNER

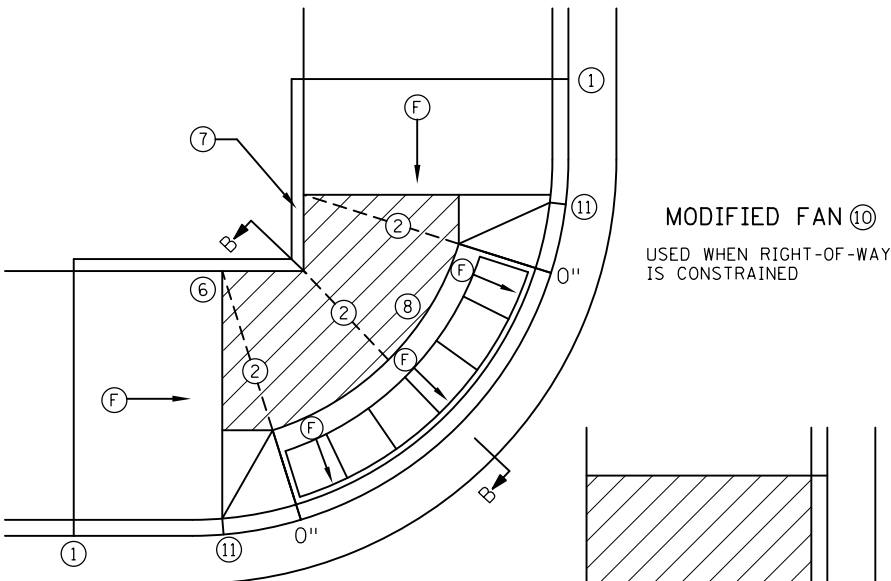


SECTION B-B

FAN

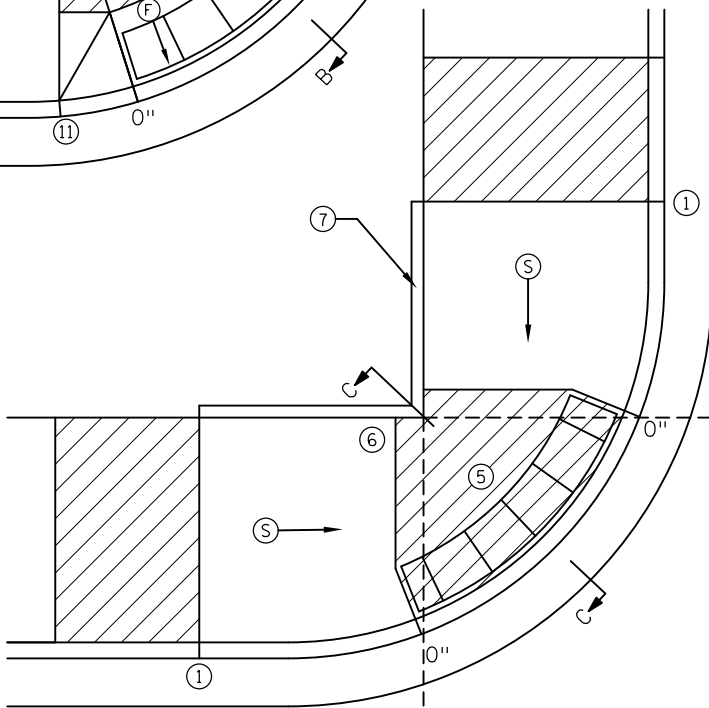


FAN ⑩

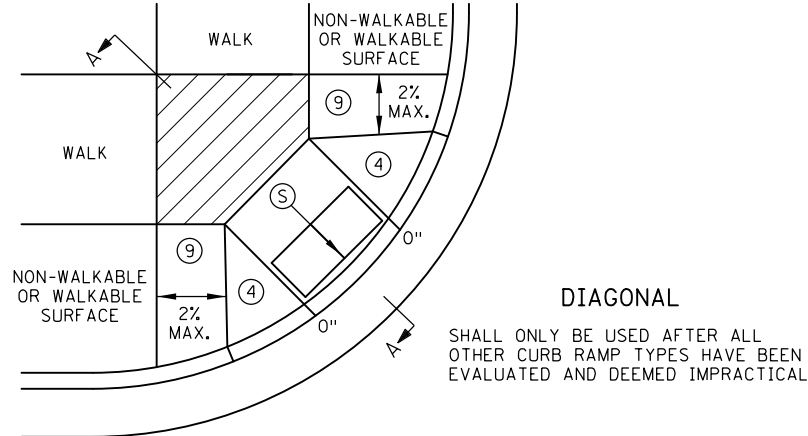


MODIFIED FAN ⑩

USED WHEN RIGHT-OF-WAY IS CONSTRAINED



DEPRESSED CORNER



DIAGONAL

SHALL ONLY BE USED AFTER ALL OTHER CURB RAMP TYPES HAVE BEEN EVALUATED AND DEEMED IMPRACTICAL

NOTES:

LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE (PAR) CHANGES DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%, AND IF THE APPROACHING WALK IS INVERSE GRADE GREATER THAN 2%.

INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE, ONLY APPLICABLE WHEN THE INITIAL RAMP RUNNING SLOPE IS OVER 5.0%.

SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE WHEN THE LONGITUDINAL RUNNING SLOPE IS GREATER THAN 5.0%.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PAR, 1/4" DEEP. VISUAL JOINTS SHALL BE USED AT THE TOPS OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.

ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL, THUS BOTH SIDES OF A SLOPED WALKING SURFACE MUST BE EQUAL LENGTH, EXCEPT AS STATED IN ⑥ BELOW.

TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONSTRUCTED, ALL INITIAL LANDINGS AT A TOP OF A RAMPED SURFACE (RUNNING SLOPE GREATER THAN 2%) SHALL BE FORMED AND PLACED SEPARATELY IN AN INDEPENDENT CONCRETE POUR, FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 6 OF 6 FOR ALL SEPARATELY POURED INITIAL LANDINGS.

WHEN SIDEWALK IS AT BACK OF CURB, TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE. MAINTAIN POSITIVE BOULEVARD DRAINAGE TO TOP OF CURB.

ALL RAMP TYPES SHOULD HAVE A MINIMUM 3' LONG RAMP LENGTH.

4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MIN. OF 24" IN THE PATH OF TRAVEL. DETECTABLE WARNING TO COVER THE ENTIRE PAR WIDTH OF SHARED-USE PATHS AND THE ENTIRE PAR WIDTH OF THE WALK WITH THE EXCEPTION OF 3" MAXIMUM ON EACH OUTSIDE EDGE WHICH ENSURES THE DETECTABLE WARNINGS ARE ENCASED IN CONCRETE WHEN ADJACENT TO TURF, WHEN ADJACENT TO CONCRETE FLARES 0" - 3" OFFSET IS ALLOWED.

WHEN DESIGNING OR ORDERING RECTANGULAR DETECTABLE WARNING SURFACES SHOULD BE 6" LESS THAN THE INCOMING PAR, ARC LENGTH OF THE RADIAL DETECTABLE WARNINGS SHOULD NOT BE GREATER THAN 20 FEET.

RECTANGULAR DETECTABLE WARNINGS SHALL BE SETBACK 3" FROM THE BACK OF CURB, RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB.

- ① MATCH FULL HEIGHT CURB.
- ② 4' MINIMUM DEPTH LANDING REQUIRED ACROSS TOP OF RAMP.
- ③ 3" HIGH CURB WHEN USING A 3' LONG RAMP, 4" HIGH CURB WHEN USING A 4' LONG RAMP.
- ④ SEE SHEET 4 OF 6, TYPICAL SIDE TREATMENT OPTIONS, FOR DETAILS ON FLARES AND RETURNED CURBS.
- ⑤ DETECTABLE WARNINGS MAY BE PART OF THE 4' X 4' MIN. LANDING AREA IF IT IS NOT FEASIBLE TO CONSTRUCT THE LANDING OUTSIDE OF THE DETECTABLE WARNING AREA.
- ⑥ THE GRADE BREAK SHALL BE PERPENDICULAR TO THE BACK OF WALK, THIS WILL ENSURE THAT THE GRADE BREAK IS PERPENDICULAR TO THE DIRECTION OF TRAVEL. (TYPICAL FOR ALL)
- ⑦ WHEN ADJACENT TO GRASS, GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS LESS THAN 5% RUNNING SLOPE SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.
- ⑧ A 7' MIN TOP RADIUS GRADE BREAK IS REQUIRED TO BE CONSTRUCTIBLE.
- ⑨ PAVE FULL WALK WIDTH.
- ⑩ "S" SLOPES ON FANS SHALL ONLY BE USED WHEN ALL OTHER FEASIBLE OPTIONS HAVE BEEN EVALUATED AND DEEMED IMPRACTICAL.
- ⑪ INTERMEDIATE CURB HEIGHTS TAPER SHALL RISE AT 8-10% TO A MINIMUM 3" CURB HEIGHT. REDUCE INTERMEDIATE CURB HEIGHT TO 2+ INCHES IF NECESSARY TO MATCH ADJACENT BOULEVARD OR SIDEWALK GRADES.

LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

⑤ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.

⑥ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

⑦ LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PAR.

X" CURB HEIGHT

REVISION:

APPROVED: 11-04-2021

Jeffrey J. Perkins
JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA
DEPARTMENT
OF
TRANSPORTATION

STANDARD PLAN 5-297.250

1 OF 6

Tom Styrbicki
THOMAS STYRBICKI
STATE DESIGN ENGINEER

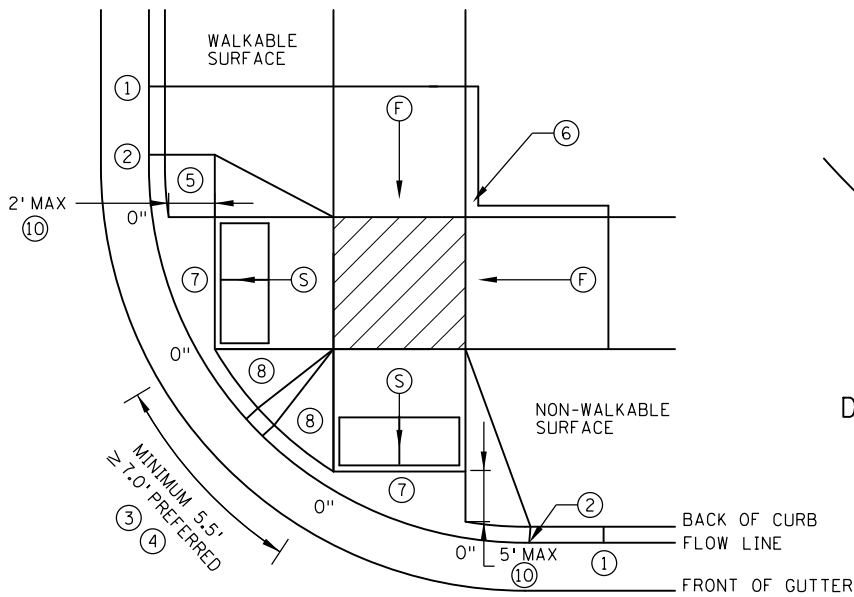
APPROVED: 11-04-2021
REVISED:

SAP 013-630-021 / SAP 225-591-007

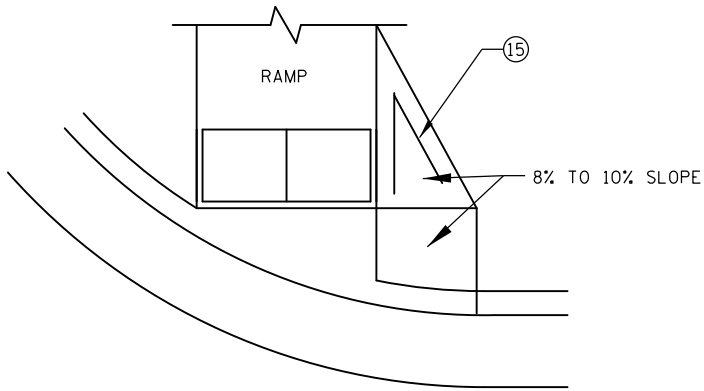
PEDESTRIAN CURB RAMP DETAILS

SHEET NO. 52 OF 216

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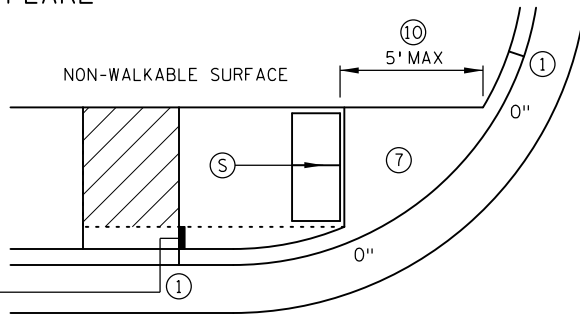


COMBINED DIRECTIONAL

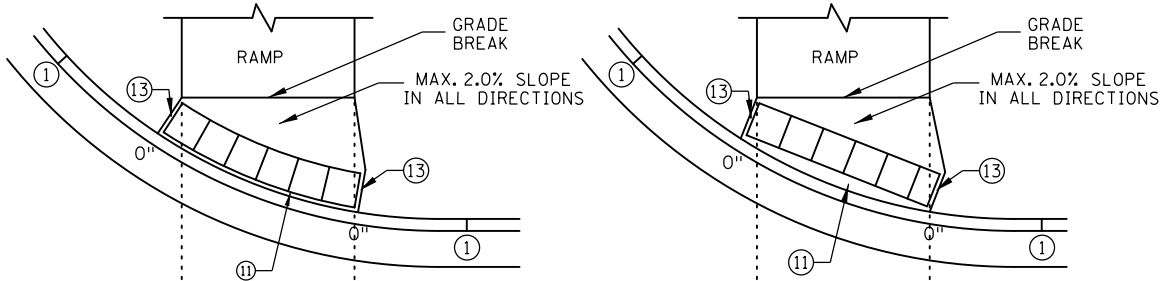


DIRECTIONAL RAMP WALKABLE FLARE

IF NON-CONCRETE BLVD. IS
CONSTRUCTED AND IS LESS THAN 2'
IN WIDTH AT TOP OF CURB
TRANSITION, PAVE CONCRETE RAMP
WIDTH TO ADJACENT BACK OF CURB.

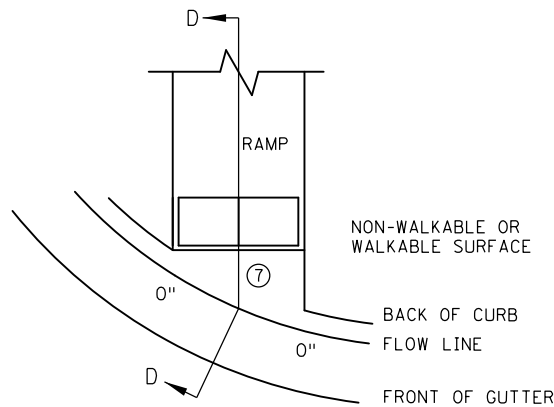


STANDARD ONE-WAY DIRECTIONAL ⑨

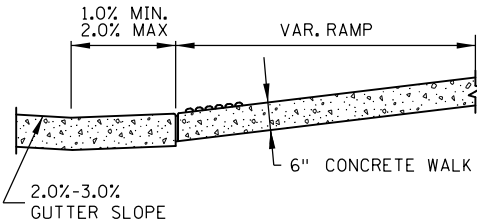


DETECTABLE WARNING PLACEMENT WHEN
SETBACK CRITERIA IS EXCEEDED ⑫

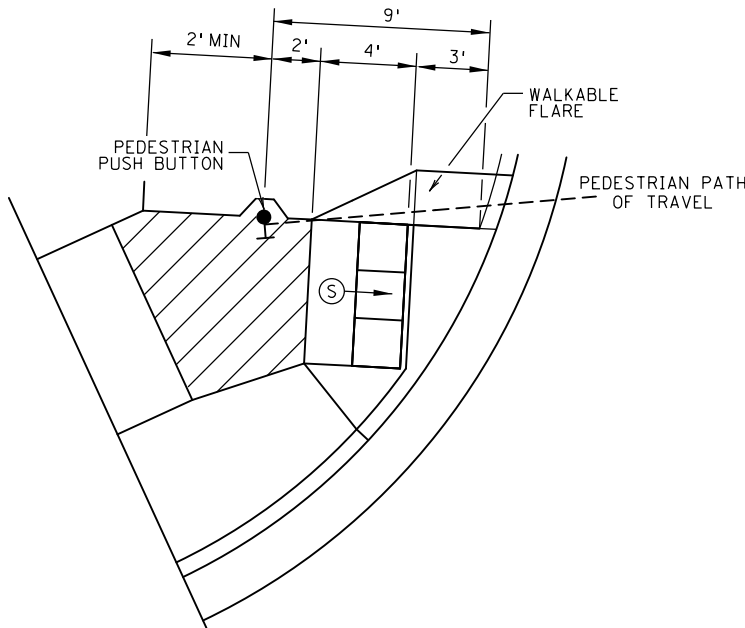
ONE-WAY DIRECTIONAL WITH DETECTABLE
WARNING AT BACK OF CURB



CURB FOR DIRECTIONAL RAMPS ⑭



SECTION D-D



SEMI-DIRECTIONAL RAMP ③④⑨

3' DOME SETBACK, 4' LONG RAMP AND
PUSH BUTTON 9' FROM THE BACK OF CURB
PRIMARYLY USED FOR APS APPLICATIONS
WHERE THE PAR DOES NOT CONTINUE PAST
THE PUSH BUTTON (DEAD-END SIDEWALK)

NOTES:

LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE (PAR) CHANGES
DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%,
AND IF THE APPROACHING WALK IS INVERSE GRADE.

INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK
OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE, ONLY
APPLICABLE WHEN THE INITIAL RAMP RUNNING SLOPE IS OVER 5.0%.

SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE
WHEN THE LONGITUDINAL SLOPE IS GREATER THAN 5.0%.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PAR. 1/4" DEEP VISUAL
JOINTS SHALL BE USED AT THE TOP GRADE BREAK OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.

ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL.
THUS BOTH SIDES OF A SLOPED WALKING SURFACE MUST BE EQUAL LENGTH.

TO ENSURE INITIAL RAMPS AND INITIAL LANDINGS ARE PROPERLY CONSTRUCTED, LANDINGS
SHALL BE CAST SEPARATELY, FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 6 AND
THE ADA SPECIAL PROVISION (PROSECUTION OF WORK).

TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

WHEN THE BOULEVARD IS 4' WIDE OR LESS, THE TOP OF CURB TAPER SHALL MATCH THE RAMP
SLOPES TO REDUCE NEGATIVE BOULEVARD SLOPES FROM THE TOP BACK OF CURB TO THE PAR.

ALL RAMP TYPES SHOULD HAVE A MINIMUM 3' LONG RAMP LENGTH.

4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL
CONTINUOUSLY EXTEND FOR A MIN. OF 24" IN THE PATH OF TRAVEL. DETECTABLE WARNING TO COVER
THE ENTIRE PAR WIDTH OF SHARED-USE PATHS AND THE ENTIRE PAR WIDTH OF THE WALK WITH THE
EXCEPTION OF 3" MAXIMUM ON EACH OUTSIDE EDGE WHICH ENSURES THE DETECTABLE WARNINGS ARE
ENCASED IN CONCRETE WHEN ADJACENT TO TURF. WHEN ADJACENT TO CONCRETE FLARES 0" - 3" OFFSET
IS ALLOWED.

WHEN DESIGNING OR ORDERING RECTANGULAR DETECTABLE WARNING SURFACES SHOULD BE 6" LESS THAN
THE INCOMING PAR. ARC LENGTH OF THE RADIAL DETECTABLE WARNINGS SHOULD NOT BE GREATER THAN
20 FEET.

RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB.
SEE NOTES ⑩ & ⑪ FOR INFORMATION REGARDING RECTANGULAR DETECTABLE WARNING PLACEMENT.

① MATCH FULL CURB HEIGHT.

② 3" HIGH CURB WHEN USING A 3' LONG RAMP
4" HIGH CURB WHEN USING A 4' LONG RAMP.

③ 3" MINIMUM CURB HEIGHT (5.5' MIN. DISTANCE REQUIRED BETWEEN DOMES)
4" PREFERRED (7' MIN. DISTANCE REQUIRED BETWEEN DOMES).

④ THE "BUMP" IN BETWEEN THE RAMPS SHOULD NOT BE IN THE PATH OF TRAVEL FOR COMBINED DIRECTIONAL
RAMPS. IF THIS OCCURS MODIFY THE RAMP LOCATION OR SWITCH RAMP TO A FAN/DEPRESSED CORNER.

⑤ WHEN USING CONCRETE PAVED FLARES ON THE OUTSIDE OF DIRECTIONAL RAMPS, AND ADJACENT TO A
WALKABLE SURFACE, DIRECTIONAL RAMP FLARES SHALL BE USED. SEE THE DETAIL ON THIS SHEET.

⑥ GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK
LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS
SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.

⑦ MAX. 2.0% SLOPE IN ALL DIRECTIONS IN FRONT OF GRADE BREAK AND DRAIN TO FLOW LINE. SHALL BE
CONSTRUCTED INTEGRAL WITH CURB AND GUTTER.

⑧ 8% TO 10% WALKABLE FLARE.

⑨ PLACE DOMES AT THE BACK OF CURB WHEN ALLOWABLE SETBACK CRITERIA IS EXCEEDED.

⑩ FRONT EDGE OF DETECTABLE WARNING SHALL BE SET BACK 2' MAXIMUM WHEN ADJACENT TO WALKABLE
SURFACE, AND 5' MAXIMUM WHEN ADJACENT TO NON-WALKABLE SURFACE WITH ONE CORNER SET 3" FROM
BACK OF CURB. A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP
WITHOUT RAISED OBSTACLES THAT COULD MISTAKENLY BE TRAVERSED BY A USER WHO IS VISUALLY
IMPAIRED.

⑪ RECTANGULAR DETECTABLE WARNINGS MAY BE SETBACK UP TO 9" FROM THE BACK OF CURB WITH CORNERS
SET 3" FROM BACK OF CURB. IF 9" SETBACK IS EXCEEDED USE RADIAL DETECTABLE WARNINGS.

⑫ FOR DIRECTIONAL RAMPS WITH THE DETECTABLE WARNINGS PLACED AT THE BACK OF CURB, THE DETECTABLE
WARNINGS SHALL COVER THE ENTIRE WIDTH OF THE WALK/PATH. THIS ENSURES A DETECTABLE EDGE
AND HELPS ELIMINATE THE CURB TAPER OBSTRUCTING THE PATH OF PEDESTRIAN TRAVEL.

⑬ THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE BACK OF CURB.
MAINTAIN 3" BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.

⑭ TO BE USED FOR ALL DIRECTIONAL RAMPS, EXCEPT WHERE DOMES ARE PLACED ALONG THE BACK OF CURB.

⑮ PLACE 2 NO. 4 BARS 4 INCHES FROM SIDE OF FORMS WITH A MINIMUM 2 INCHES
OF CONCRETE COVER ALONG EACH SIDE OF FLARE (INCIDENTAL).

LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE
CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

⑤ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN
5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN
AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.

⑥ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER
THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN
AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

⑦ LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX
2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PAR.

X" CURB HEIGHT

REVISION:
APPROVED: 11-04-2021 Jeffrey Perkins OPERATIONS DIVISION



STANDARD PLAN 5-297.250

2 OF 6

THOMAS STYRBICKI
STATE DESIGN ENGINEER

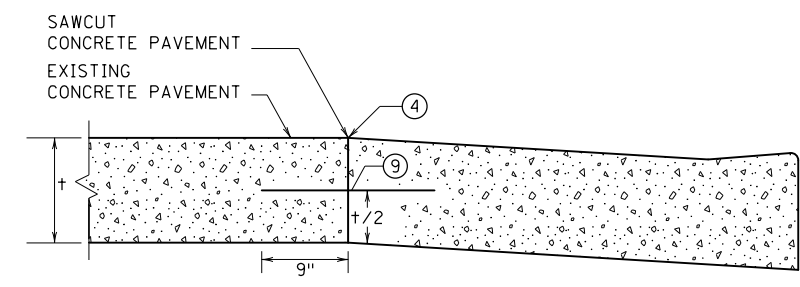
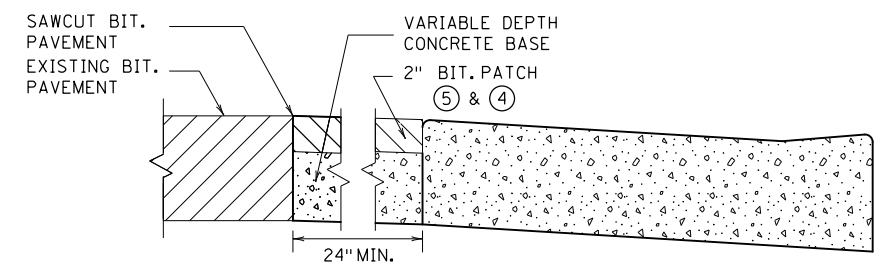
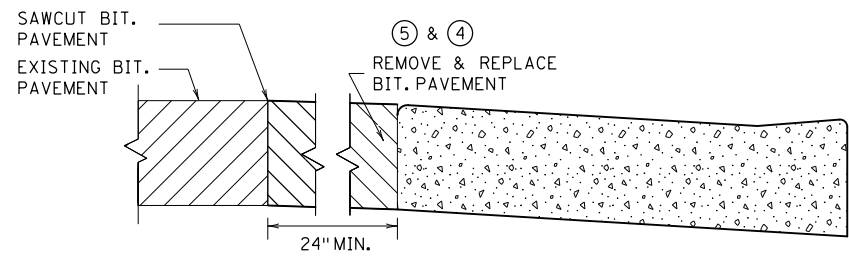
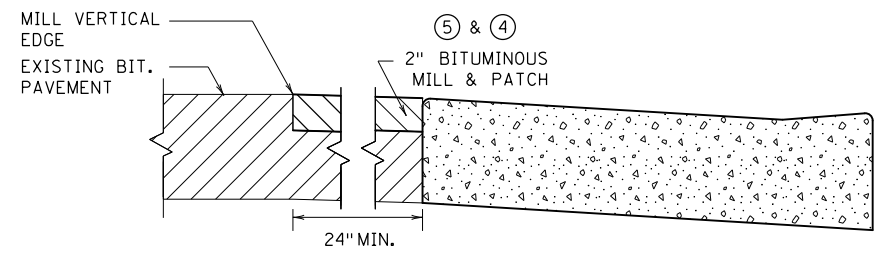
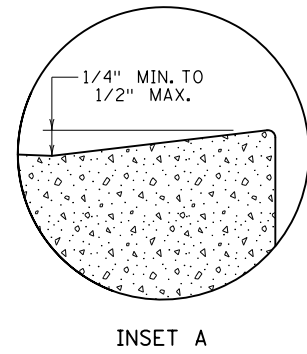
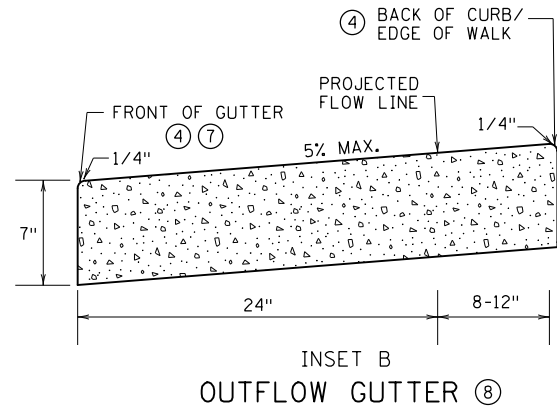
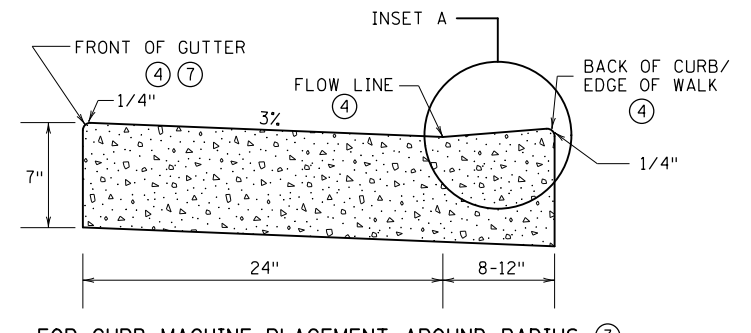
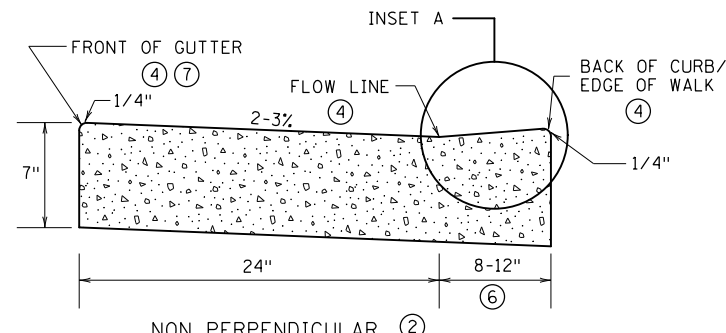
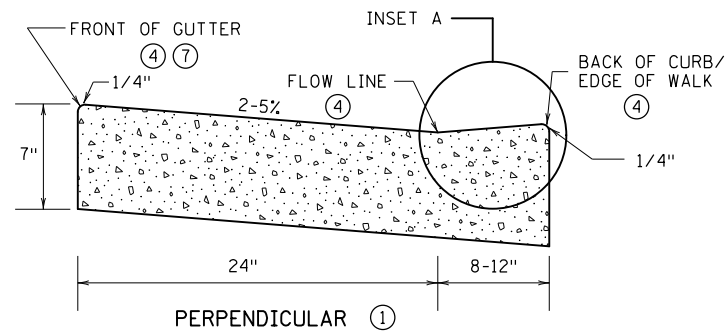
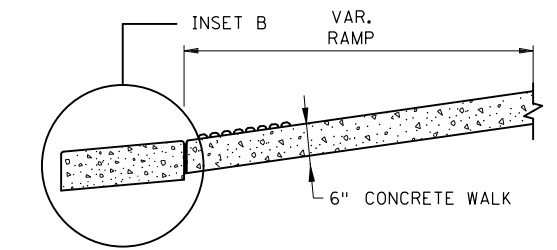
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REVISED:

SAP 013-630-021 / SAP 225-591-007

PEDESTRIAN CURB RAMP DETAILS

SHEET NO. 53 OF 216

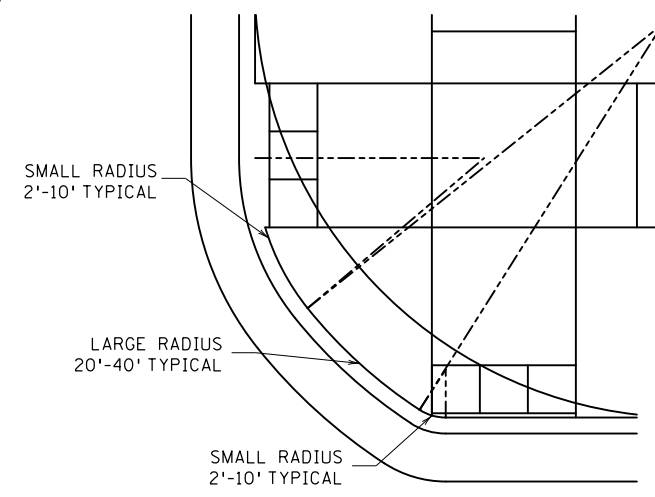
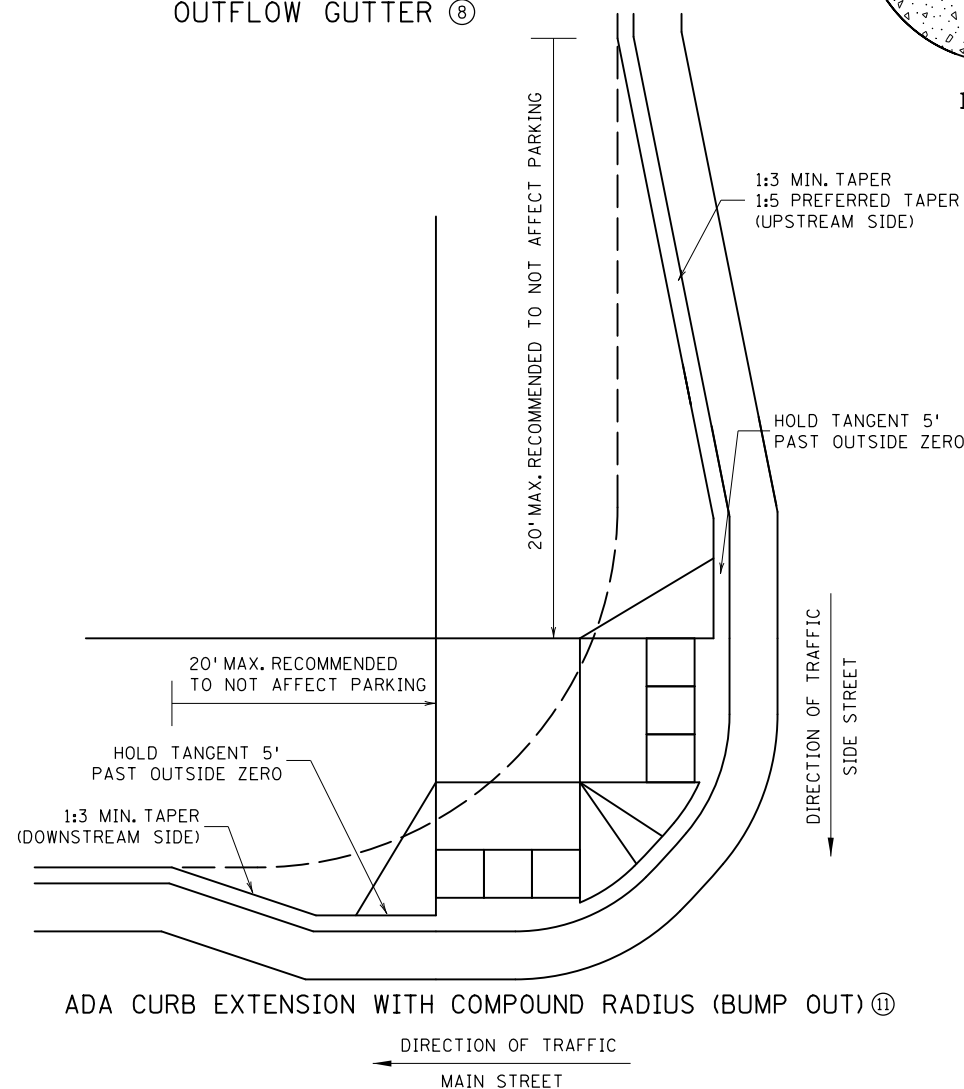
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ONLY ALLOWED PER ENGINEER'S APPROVAL

PAVEMENT TREATMENT OPTIONS IN FRONT OF CURB & GUTTER
FOR USE ON CURB RAMP RETROFITS

- NOTES:
- POSITIVE FLOW LINE DRAINAGE SHALL BE MAINTAINED THROUGH THE PEDESTRIAN ACCESS ROUTE (PAR) AT A 2% MAXIMUM. NO PONDING SHALL BE PRESENT IN THE PAR.
- ANY VERTICAL LIP THAT OCCURS AT THE FLOW LINE SHALL NOT BE GREATER THAN 1/4 INCH.
- ① FOR USE AT CURB CUTS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: PERPENDICULAR, TIERED PERPENDICULAR, PARALLEL, AND DIAGONAL RAMPS.
- ② FOR USE AT CURB RAMPS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED NON PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: FANS & DEPRESSED CORNERS.
- ③ BEGIN GUTTER SLOPE TRANSITION 10' OUTSIDE OF ALL CURB RAMPS.
- ④ THERE SHALL BE NO VERTICAL DISCONTINUITIES GREATER THAN 1/4\".
- ⑤ ELEVATION CHANGE TAKES PLACE FROM THE EXISTING TO NEW FRONT OF GUTTER. PATCH IS USED TO MATCH THE NEW GUTTER FACE INTO THE EXISTING ROADWAY.
- ⑥ VARIABLE WIDTH FOR DIRECTIONAL CURB APPLICATIONS. SEE SHEET 2 FOR DIRECTIONAL CURB SLOPE REQUIREMENTS.
- ⑦ TOP FRONT OF GUTTER SHALL BE CONSTRUCTED FLUSH WITH PROPOSED ADJACENT PAVEMENT ELEVATION. TOP 1.5\" OF THE GUTTER FACE MUST BE A FORMED EDGE. PAR GUTTER SHALL NOT BE OVERLAID.
- ⑧ SHOULD BE USED AT VERTICALLY CONSTRAINED AREAS WHEN AT A DRAINAGE HIGH POINT OR SUPER ELEVATED ROADWAY SEGMENTS.
- ⑨ DRILL AND GROUT NO. 4 EPOXY-COATED 18\" LONG TIE BARS AT 30\" CENTER TO CENTER INTO EXISTING CONCRETE PAVEMENT 1' MINIMUM FROM ALL JOINTS.
- ⑩ HELPS PROVIDE TWO SEPARATE RAMPS, REDUCES THE DOME SETBACK LENGTH AND MINIMIZES DIRECTIONAL CURB. THIS RADIUS DESIGN CLOSELY FOLLOWS THE TURNING VEHICLE PATH WHILE OPTIMIZING CURB RAMP LENGTH.
- ⑪ CURB EXTENSIONS SHOULD BE USED IN VERTICALLY CONSTRAINED AREAS, USUALLY IN DOWNTOWN ROADWAY SEGMENTS WHERE ON-STREET PARKING IS AVAILABLE. CURB EXTENSIONS SHOULD BE CONSIDERED FOR APS INTERSECTIONS WHERE SPACE IS LIMITED. PUSH BUTTONS MUST MEET APS CRITERIA AS DESCRIBED IN THE PUSH BUTTON LOCATION DETAIL SHEET.

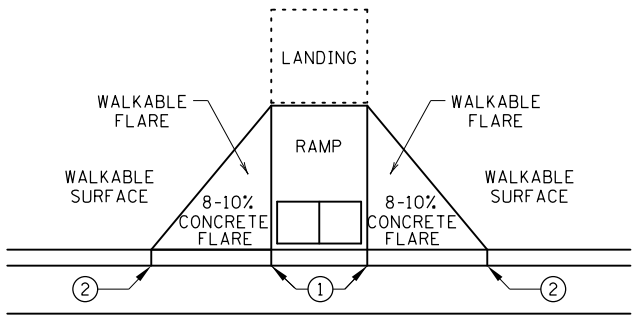


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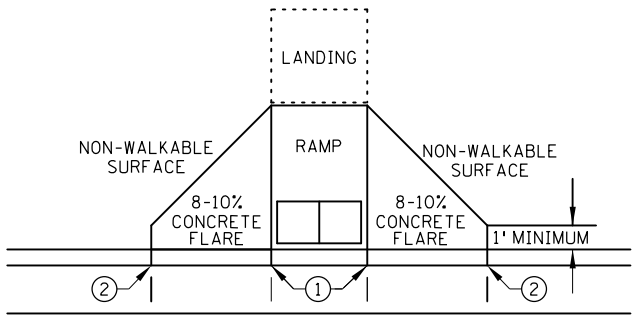
APPROVED: 11-04-2021

Jeffrey J. Perkins
JEFFREY PERKINS
OPERATIONS DIVISION

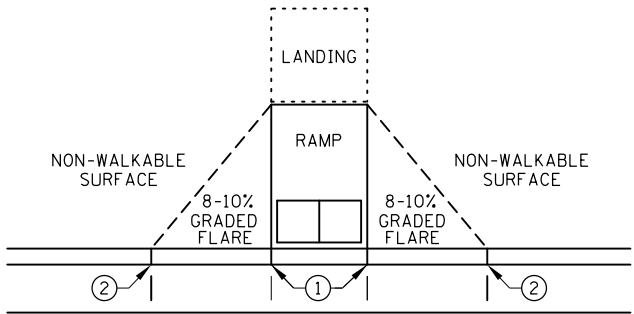
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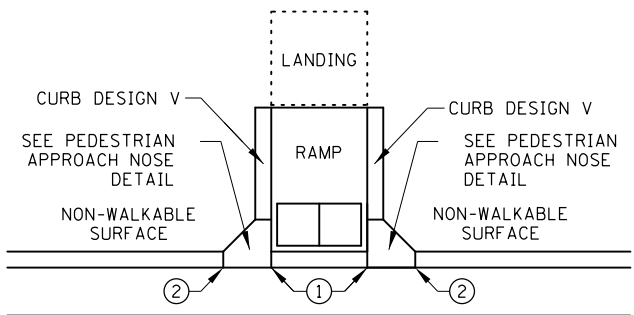
PAVED FLARES
ADJACENT TO WALKABLE SURFACE



PAVED FLARES
ADJACENT TO NON-WALKABLE SURFACE

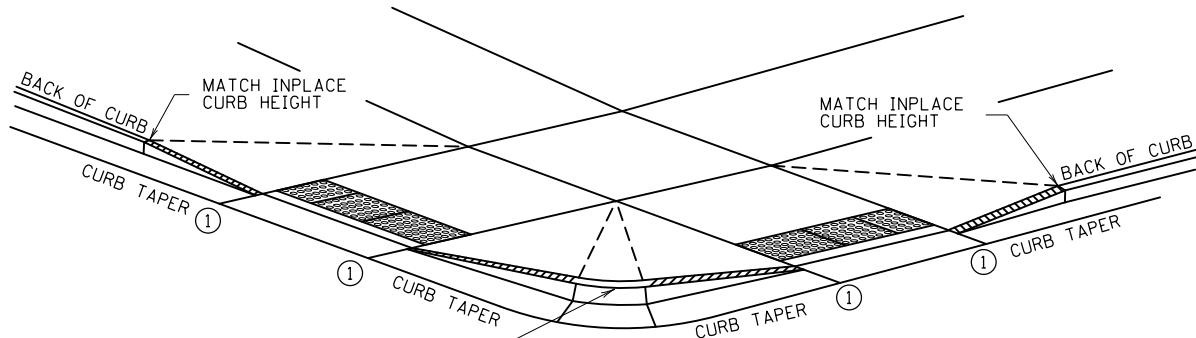


GRADED FLARES



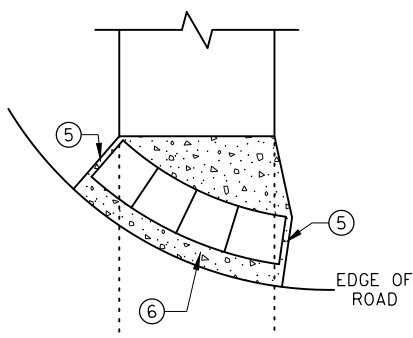
RETURNED CURB ④

TYPICAL SIDE TREATMENT OPTIONS ③ ⑩

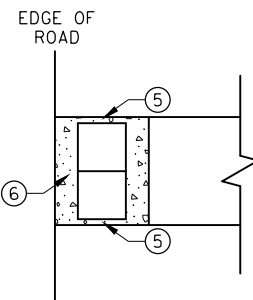


3" MINIMUM CURB HEIGHT, 4" PREFERRED
(MEASURED AT FRONT FACE OF CURB)
FOR A MIN. 6" LENGTH (MEASURED ALONG FLOW LINE)

DETECTABLE EDGE WITH
CURB AND GUTTER ⑦

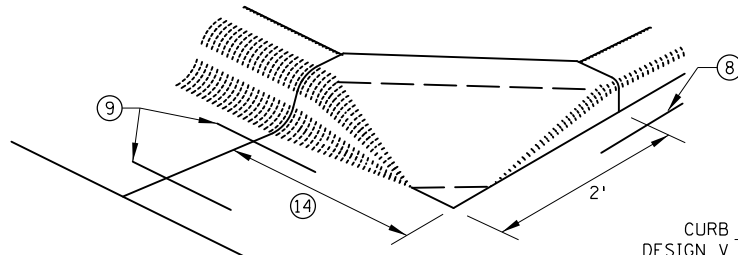


RADIAL DETECTABLE WARNING

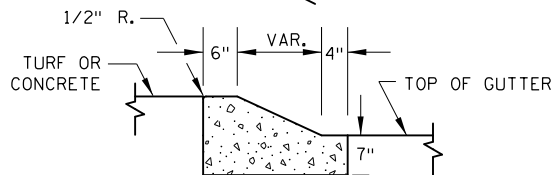


RECTANGULAR DETECTABLE WARNING

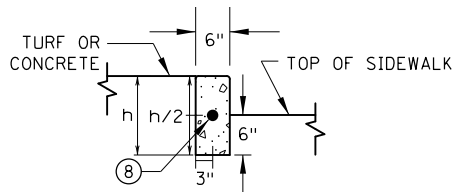
DETECTABLE EDGE WITHOUT CURB AND GUTTER



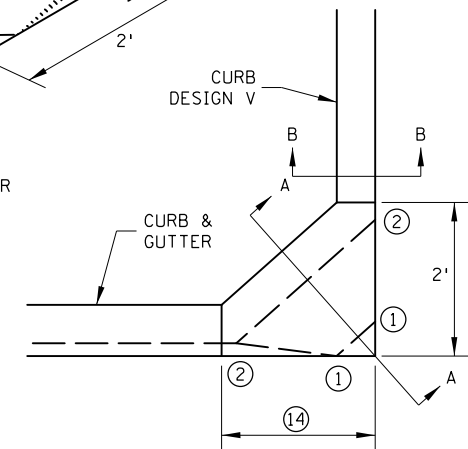
SECTION A-A



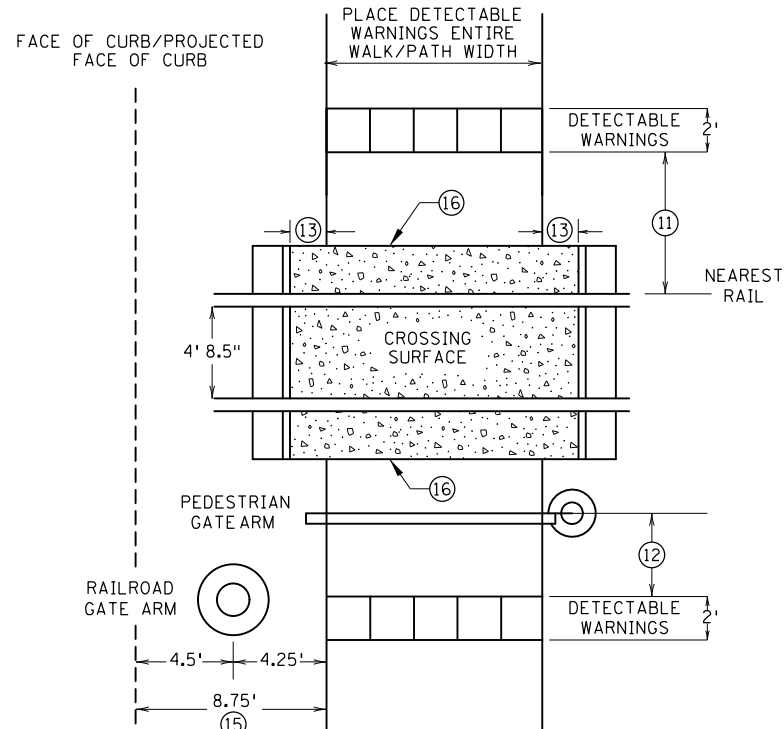
SECTION A-A



SECTION B-B



PEDESTRIAN APPROACH
NOSE DETAIL
(FOR RETURNED CURB
SIDE TREATMENT)



RAILROAD CROSSING
PLAN VIEW

NOTES:

INTERMEDIATE CURB HEIGHTS TAPER SHALL RISE AT 8-10% TO A MINIMUM 3 INCH CURB HEIGHT. INCREASE CURB TAPER LENGTH AT LESS THAN 8% OR REDUCE INTERMEDIATE CURB HEIGHT TO 2+ INCHES IF NECESSARY TO MATCH ADJACENT BOULEVARD OR SIDEWALK GRADES.

SEE STANDARD PATE 7038 AND THIS SHEET FOR ADDITIONAL DETAILS ON DETECTABLE WARNING.

A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP WITHOUT RAISED OBSTACLES THAT COULD MISTAKENLY BE TRAVERSED BY A USER WHO IS VISUALLY IMPAIRED.

CONCRETE FLARE LENGTHS ADJACENT TO NON-WALKABLE SURFACES SHOULD BE LESS THAN 8' LONG MEASURED ALONG THE RAMPS FROM THE BACK OF CURB.

① 0" CURB HEIGHT. SEE INSET A ON SHEET 3 OF 6.

② FULL CURB HEIGHT.

③ SIDE TREATMENTS ARE APPLICABLE TO ALL RAMP TYPES AND SHOULD BE IMPLEMENTED AS NEEDED AS FIELD CONDITIONS DICTATE. THE ENGINEER SHALL DETERMINE THE RAMP SIDE TREATMENTS BASED ON MAINTENANCE OF BOTH ROADWAY AND SIDEWALK, ADJACENT PROPERTY CONSIDERATIONS, AND MITIGATING CONSTRUCTION IMPACTS.

④ TYPICALLY USED FOR MEDIANS AND ISLANDS.

⑤ WHEN NO CONCRETE FLARES ARE PROPOSED, THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE EDGE OF ROADWAY. MAINTAIN 3" MAX. BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.

⑥ IF NO CURB AND GUTTER IS PLACED IN RURAL SECTIONS, DETECTABLE WARNINGS SHALL BE PLACED 1' FROM THE EDGE OF BITUMINOUS ROADWAY AND/OR BITUMINOUS SHARED-USE PATH TO PROVIDE VISUAL CONTRAST.

⑦ ALL CONSTRUCTED CURBS MUST HAVE A CONTINUOUS DETECTABLE EDGE FOR THE VISUALLY IMPAIRED. THIS DETECTABLE EDGE REQUIRES DETECTABLE WARNINGS WHEREVER THERE IS ZERO-INCH HIGH CURB. CURB TAPERS ARE CONSIDERED A DETECTABLE EDGE WHEN THE TAPER STARTS WITHIN 3" OF THE EDGE OF THE DETECTABLE WARNINGS. AND UNIFORMLY RISES TO A 3-INCH MINIMUM CURB HEIGHT. ANY CURB NOT PART OF A CURB TAPER AND LESS THAN 3 INCHES IN HEIGHT IS NOT CONSIDERED A DETECTABLE EDGE AND THEREFORE IS NOT COMPLIANT WITH ACCESSIBILITY STANDARDS.

⑧ DRILL AND GROUT 1 - NO. 4 12" LONG REINFORCEMENT BAR (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE V CURB.

⑨ DRILL AND GROUT 2 - NO. 4 12" LONG REINFORCEMENT BARS (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE CURB AND GUTTER.

⑩ SIDE TREATMENT EXAMPLES SHOWN ARE WHEN THE INITIAL LANDING IS APPROXIMATELY LEVEL WITH THE FULL HEIGHT CURB (I.E. 6" LONG RAMP FOR 6" HIGH CURB). WHEN THE INITIAL LANDING IS MORE THAN 1" BELOW FULL HEIGHT CURB REFER TO SHEETS 1 & 2 TO MODIFY THE CURB HEIGHT TAPERS AND MAINTAIN POSITIVE BOULEVARD DRAINAGE. CONSTRUCT THESE TAPERS AT 0" - 3" AT 8-10%, THEN LESS THAN 5% FROM 3" CURB TO FULL CURB HEIGHT.

⑪ NEAREST EDGE OF DETECTABLE WARNING SURFACES SHALL BE PLACED 12' MINIMUM TO 15' MAXIMUM FROM THE NEAREST RAIL. FOR SKEWED RAILWAYS IN NO INSTANCE SHALL THE DETECTABLE WARNING BE CLOSER THAN 12' MEASURED PERPENDICULAR TO THE NEAREST RAIL.

⑫ WHEN PEDESTRIAN GATES ARE PROVIDED, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE SIDE OF THE GATES OPPOSITE THE RAIL, 2' FROM THE APPROACHING SIDE OF THE GATE ARM. THIS CRITERIA GOVERNS OVER NOTE ⑪.

⑬ CROSSING SURFACE SHALL EXTEND 2' MINIMUM PAST THE OUTSIDE EDGE OF WALK OR SHARED-USE PATH.

⑭ 3' FOR MEDIANS AND SPLITTER ISLANDS. NOSE CAN BE REDUCED TO 2' ON FREE RIGHT ISLANDS.

⑮ SIDEWALK TO BE PLACED 8.75' MIN. FROM THE FACE OF CURB/PROJECTED FACE OF CURB. THIS ENSURES MIN. CLEARANCE BETWEEN THE SIDEWALK AND GATE ARM COUNTERWEIGHT SUPPORTS.

⑯ CONSTRUCT WITH EXPANSION MATERIAL PER MNDOT SPECIFICATION 3702 TYPES A-E. EXPANSION MATERIAL SHALL MATCH FULL HEIGHT OF ADJACENT CONCRETE.

REVISION:
APPROVED: 11-04-2021
Jeffrey J. Perkins
JEFFREY PERKINS
OPERATIONS DIVISION



STANDARD PLAN 5-297.250

4 OF 6

THOMAS STYRBICKI
STATE DESIGN ENGINEER

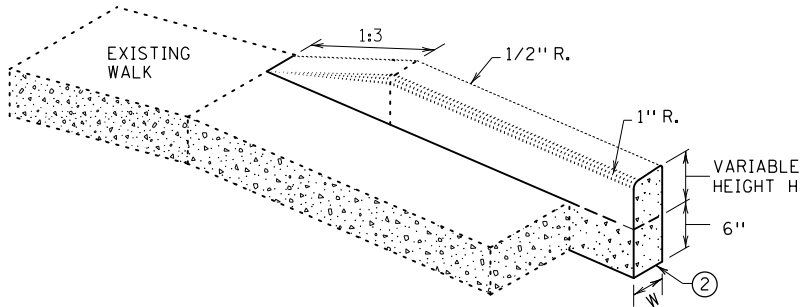
APPROVED: 11-04-2021
REVISED:

SAP 013-630-021 / SAP 225-591-007

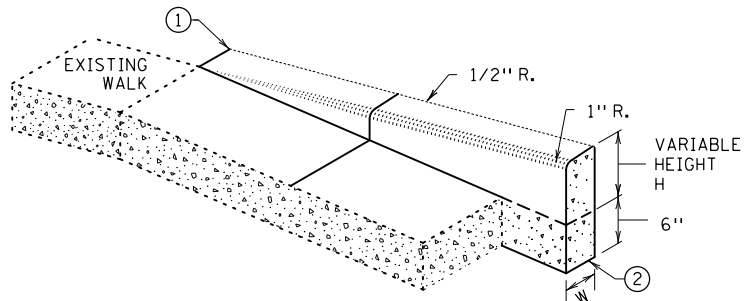
PEDESTRIAN CURB RAMP DETAILS

SHEET NO. 55 OF 216

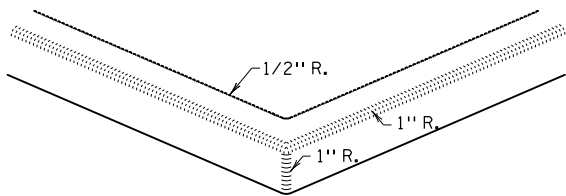
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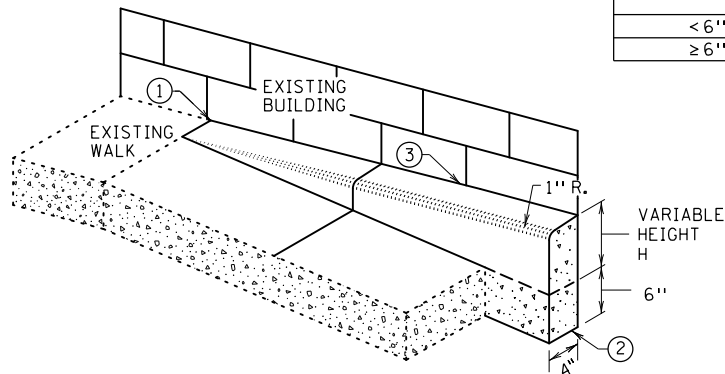
V CURB ADJACENT TO LANDSCAPE
CURB WITHIN SIDEWALK LIMITS



V CURB ADJACENT TO LANDSCAPE
CURB OUTSIDE SIDEWALK LIMITS

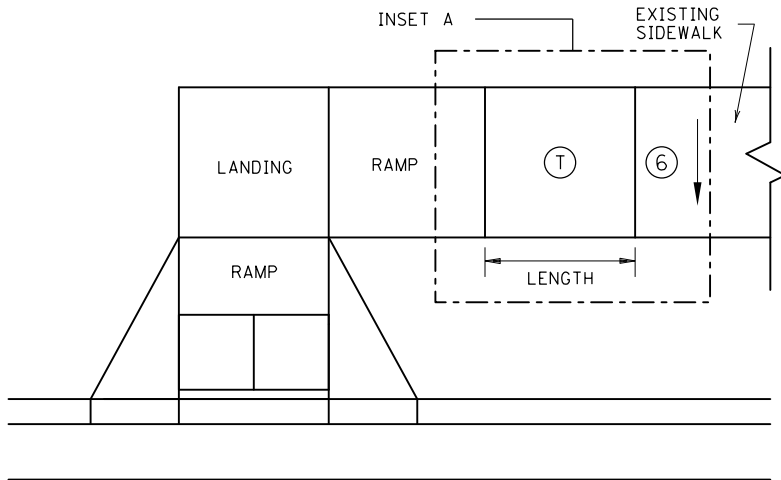


V CURB INTERSECTION

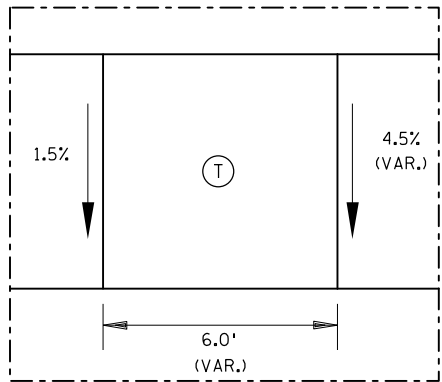


V CURB ADJACENT TO BUILDING
OR BARRIER

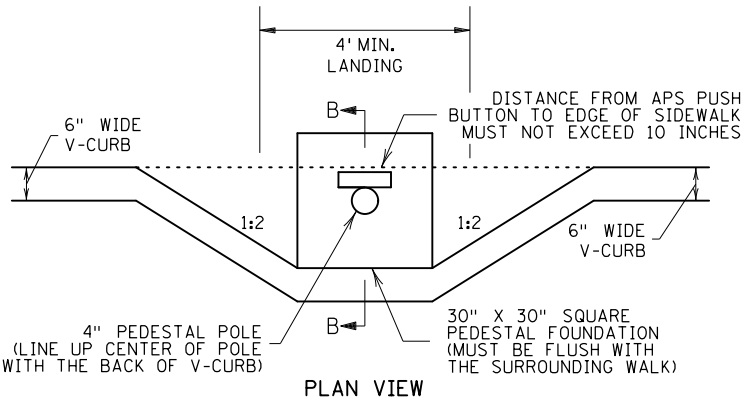
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
< 6"	4"
≥ 6"	6"



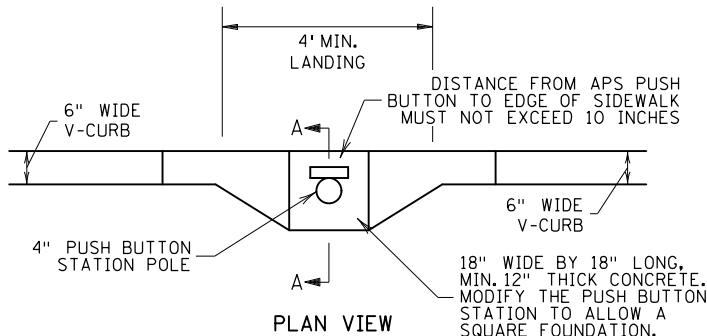
TRANSITION PANEL ④ ⑤



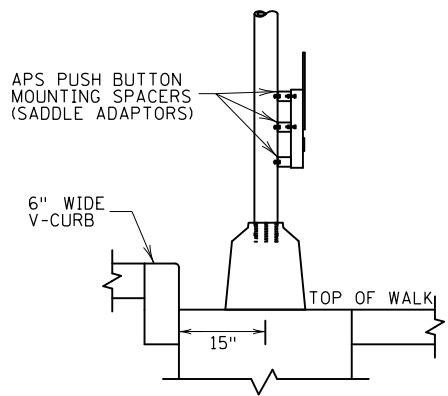
INSET A



PLAN VIEW

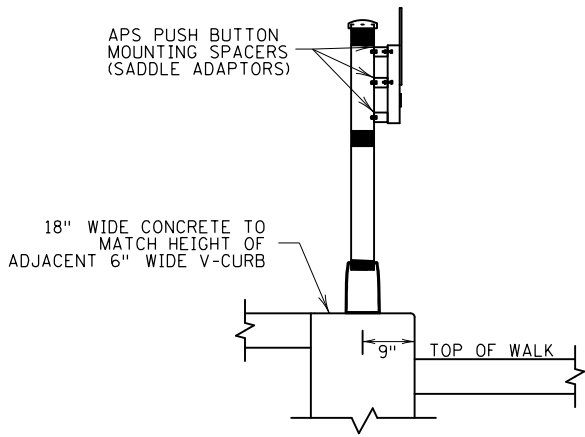


PLAN VIEW



SECTION B-B

SIGNAL PEDESTAL & PUSH BUTTON (V-CURB)



SECTION A-A

PUSH BUTTON STATION (V-CURB)

NOTES:

A WALKABLE FLARE IS AN 8-10% CONCRETE FLARE THAT IS REQUIRED WHEN THE FLARE IS ADJACENT TO A WALKABLE SURFACE, OR WHEN THE PEDESTRIAN PATH OF TRAVEL OF A PUSH BUTTON TRAVERSES THE FLARE.

ALL V CURB CONTRACTION JOINTS SHALL MATCH CONCRETE WALK JOINTS.

WHERE RIGHT-OF-WAY ALLOWS, USE OF V CURB SHOULD BE MINIMIZED. GRADING ADJACENT TURF OR SLOPING ADJACENT PAVEMENT IS PREFERRED.

V CURB SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS.

V CURB NEXT TO BUILDING SHALL BE A 4" WIDTH AND SHALL MATCH PREVIOUS TOP OF SIDEWALK ELEVATIONS.

- ① END TAPERS AT TRANSITION SECTION SHALL MATCH INPLACE SIDEWALK GRADES.
- ② ALL V CURB SHALL MATCH BOTTOM OF ADJACENT WALK.
- ③ CONSTRUCT USING APPROVED EXPANSION MATERIAL PER MNDOT TYPE A-E EXPANSION. LEAVE A MINIMUM 1/2" TOP GAP AND SEAL WITH MNDOT APPROVED SILICONE PER MNDOT SPEC 3722.
- ④ THE MAX. RATE OF CROSS SLOPE TRANSITIONING IS 1' LINEAR FOOT OF SIDEWALK PER HALF PERCENT CROSS SLOPE. WHEN PAR WIDTH IS GREATER THAN 6' OR THE RUNNING SLOPE IS GREATER THAN 5%, DOUBLE THE CALCULATED TRANSITION LENGTH.
- ⑤ TRANSITION PANELS ARE TO ONLY BE USED AFTER THE RAMP, OR IF NEEDED, LANDING ARE AT THE FULL CURB HEIGHT (TYPICAL SECTION).
- ⑥ EXISTING CROSS SLOPE GREATER THAN 2.0%.

LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

- ⑤ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.
- LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PAR.
- ① TRANSITION PANEL(S) - TO BE USED FOR TRANSITIONING THE CROSS-SLOPE OF A RAMP TO THE EXISTING WALK CROSS-SLOPE. RATE OF TRANSITION SHOULD BE 0.5% PER 1 LINEAR FOOT OF WALK. SEE THIS SHEET FOR ADDITIONAL INFORMATION.

REVISION:
APPROVED: 11-04-2021 <i>Jeffrey J. Perkins</i> JEFFREY PERKINS OPERATIONS DIVISION



STANDARD PLAN 5-297.250

5 OF 6

Tom Styrbicki
THOMAS STYRBICKI
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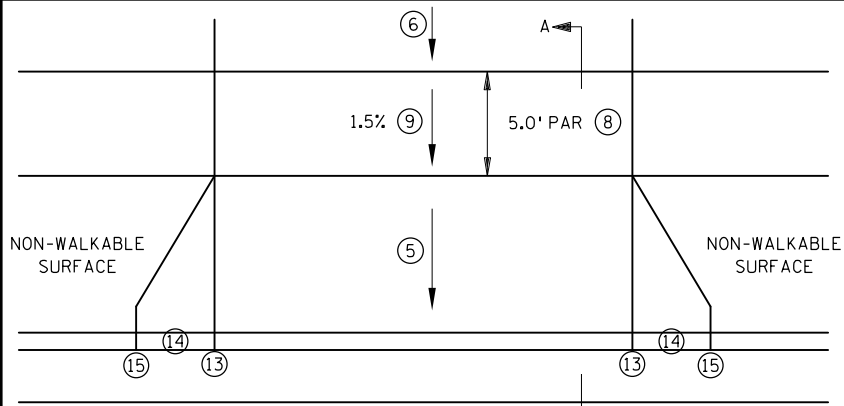
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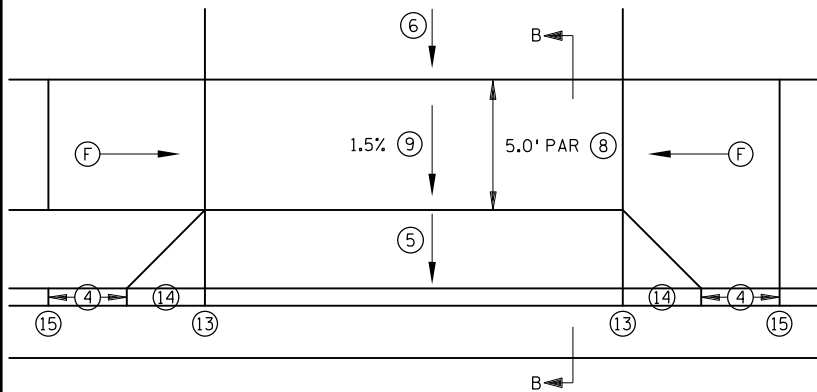
PEDESTRIAN CURB RAMP DETAILS

SHEET NO. 56 OF 216

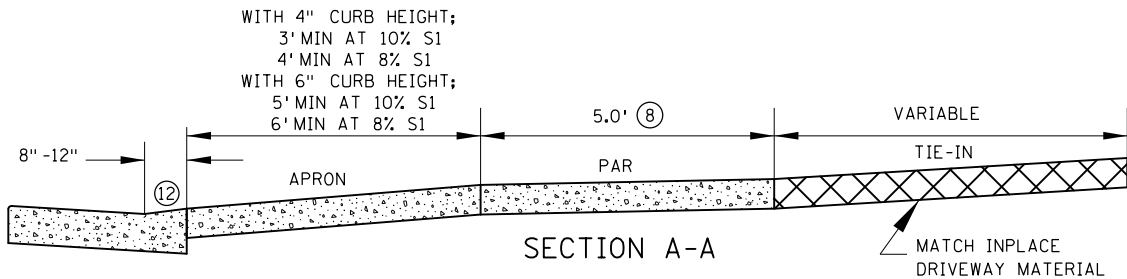
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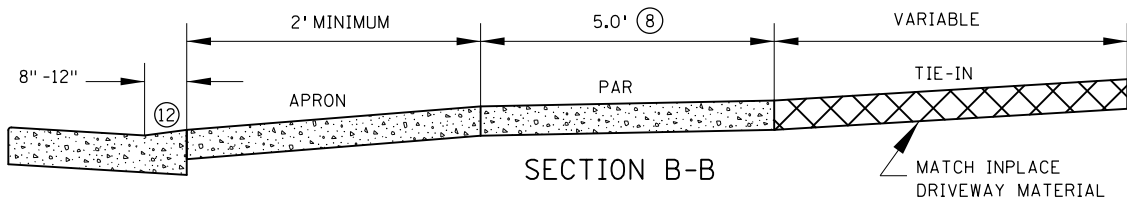
PERPENDICULAR DRIVEWAY ①



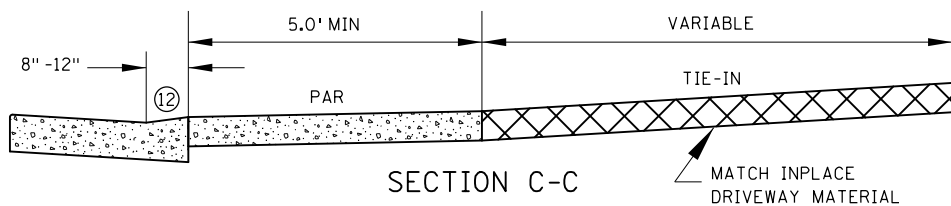
TIERED PERPENDICULAR DRIVEWAY ②



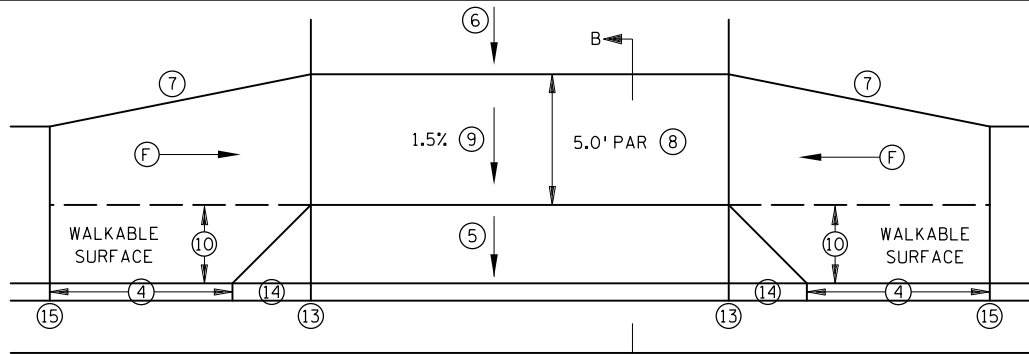
SECTION A-A



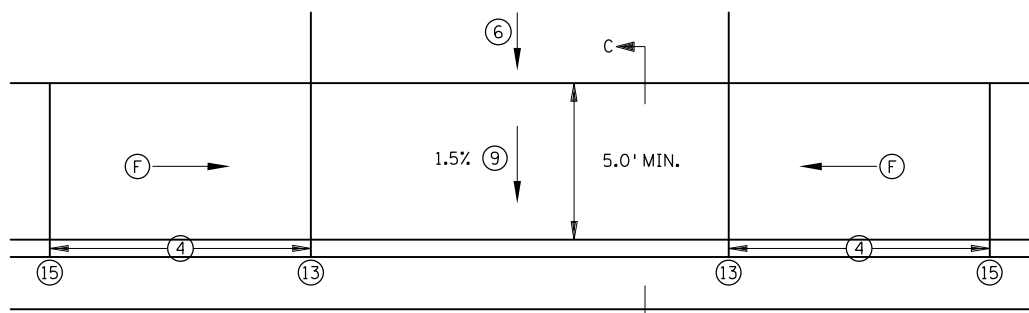
SECTION B-B



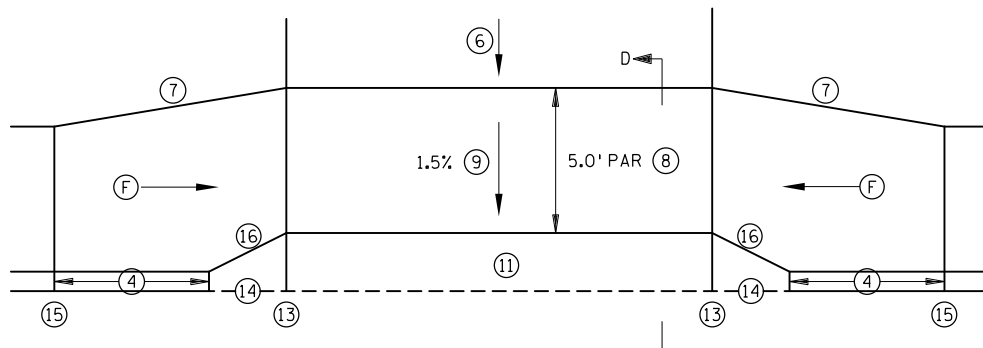
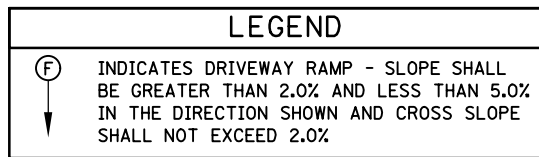
SECTION C-C



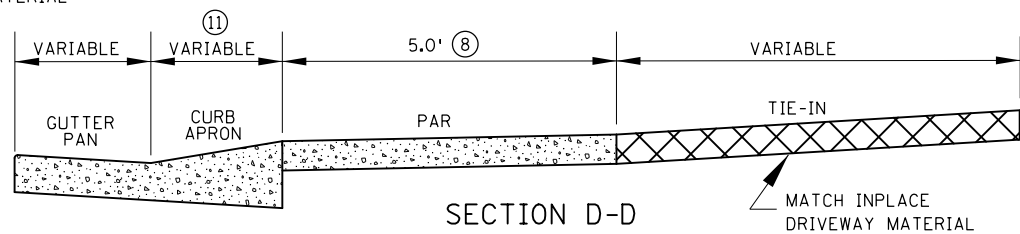
TIERED PERPENDICULAR OFFSET DRIVEWAY ②



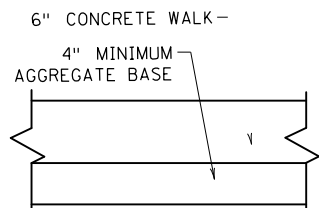
PARALLEL DRIVEWAY ③



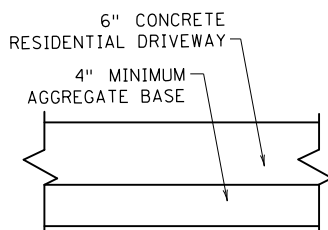
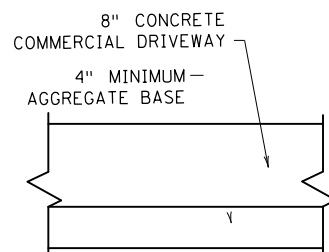
INTEGRAL DRIVEWAY APRON



SECTION D-D



TYPICAL SIDEWALK SECTION ⑪



TYPICAL DRIVEWAY SECTIONS

NOTES:

ALL SIDEWALK AND BOULEVARD WIDTHS SHALL BE MEASURED FROM BACK OF CURB.

IN URBAN ROADWAY SECTIONS, 6" CURB HEIGHT SHOULD BE USED WHEN 6' OR GREATER BOULEVARD WIDTH IS PROPOSED. WHEN BOULEVARD IS LESS THAN 6' WIDE, 4" CURB HEIGHT SHOULD BE USED.

MAINTAIN EXISTING DRAINAGE PATTERNS FLOWING TO PUBLIC RIGHT OF WAY.

ACQUIRE ADEQUATE L3 TO ALLOW FOR A CONTINUOUS PAR PROFILE (UNIFORM TYPICAL SIDEWALK SECTION) THROUGH THE DRIVEWAY APRON.

IN NO CASE SHALL SIDEWALK PROFILES EXCEED 5.0%, EXCEPT SIDEWALK PROFILES CAN MATCH ROADWAY GRADE IF ROADWAY GRADE IS GREATER THAN 5.0%. RAMP FOR DRIVEWAYS ARE REQUIRED TO FOLLOW THE ABOVE SIDEWALK CRITERIA.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PEDESTRIAN ACCESS ROUTE (PAR). 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOPS OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.

DRIVEWAY TYPES FROM MOST PREFERRED TO LEAST PREFERRED ARE AS FOLLOWS: PERPENDICULAR, TIERED PERPENDICULAR, TIERED PERPENDICULAR OFFSET & PARALLEL.

- ① PERPENDICULAR DRIVEWAYS ARE THE STANDARD AND STARTING POINT FOR ALL DRIVEWAY DESIGN AND CONSTRUCTION. SHOULD BE USED TO ACHIEVE CONTINUOUS PAR PROFILE THROUGH THE DRIVEWAY. OBTAINING A PERPENDICULAR DRIVEWAY DESIGN BECOMES MORE CRITICAL WITH STEEP ROADWAY PROFILES.
- ② TO BE USED WHEN PERPENDICULAR DRIVEWAY DESIGN CANNOT BE ACHIEVED, THE DRIVEWAY PAR IS BELOW ROADWAY CURB HEIGHT. THIS DRIVEWAY TYPE CAN BE USED FOR BOTH PAVED (AS SHOWN) AND GRASS BOULEVARDS.
- ③ TO BE USED WHEN PERPENDICULAR AND TIERED PERPENDICULAR DRIVEWAY DESIGN CANNOT BE ACHIEVED. CAN BE USED FOR STEEP NEGATIVE SLOPED DRIVEWAYS. DW CURB TYPE 2 SHOULD BE USED TO RAISE PAR ABOVE GUTTER AND REDUCE "ROLLER COASTER" EFFECT. 4" HIGH ROADWAY CURB SHOULD BE USED TO REDUCE "ROLLER COASTER" EFFECT ESPECIALLY WHEN MULTIPLE DRIVEWAYS ARE PRESENT.
- ④ TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.
- ⑤ 8% STANDARD, 10% MAX. FOR COMMERCIAL AND 12% MAX. FOR RESIDENTIAL. SEE GENERAL NOTES ON SHEET 2 FOR MORE INFORMATION.
- ⑥ S3 8% MAXIMUM, IF THE SLOPE IS EXCEEDED OR CONTINUED FOR MORE THAN 5', ANALYZE VEHICLE TEMPLATES FOR VERTICAL CLEARANCE. IF EXISTING DRIVEWAY IS NEGATIVELY DRAINING, S3 CAN BECOME SLIGHTLY MORE NEGATIVE TO ACHIEVE PERPENDICULAR DRIVEWAY DESIGN IF THE VERTICAL CLEARANCE IS ACHIEVED IN VEHICLE TEMPLATES.
- ⑦ 1:3 MIN. 1:5 PREFERRED FOR DRIVEWAY RETROFIT PROJECTS. 1:10 PREFERRED FOR SIDEWALK REPLACEMENT PROJECTS.
- ⑧ 5.0' MIN. PAR WIDTH IS THE STANDARD THROUGH DRIVEWAYS. IF FEASIBLE WIDEN DRIVEWAY PAR WIDTH TO MATCH APPROACHING SIDEWALK PAR WIDTHS. IN VERTICALLY CONSTRAINED AREAS PAR WIDTHS CAN INCREMENTALLY BE REDUCED TO 4.5' OR 4' MIN AFTER ALL OTHER OPTIONS HAVE BEEN APPLIED.
- ⑨ THE PEDESTRIAN ACCESS ROUTE, MAY NOT EXCEED 0.02 FT./FT. AS CONSTRUCTED.
- ⑩ SIDEWALK OFFSET TO BE LESS THAN OR EQUAL TO HALF THE APPROACHING SIDEWALK WIDTH.
- ⑪ INTEGRAL DRIVEWAY APRON TO BE POURED MONOLITHICALLY/INTEGRAL WITH THE CURB AND GUTTER. SEE SHEET 2 FOR MORE INFORMATION.
- ⑫ SEE SHEET 2 FOR CURB TYPE INFORMATION.
- ⑬ 0" CURB IS AT FLOW LINE. SEE DRIVEWAY TABLE FOR BACK OF CURB HEIGHTS.
- ⑭ 3' LONG AT 8-10% PREFERRED FOR INITIAL CURB TAPER. REDUCE CURB TAPER SLOPE IF NECESSARY TO MATCH ADJACENT SIDEWALK GRADES.
- ⑮ MATCH FULL CURB HEIGHT.
- ⑯ 1:2 TAPER RATE ON INTEGRAL DRIVEWAY APRONS.
- ⑰ SEE SHEET 4 FOR WHEN 6" WALK IS REQUIRED.

REVISION:
APPROVED: 11-04-2021 <i>Jeff J. Perkins</i> JEFFREY PERKINS OPERATIONS DIVISION



STANDARD PLAN 5-297.254

1 OF 4

Tom Styrbicki
THOMAS STYRBICKI
STATE DESIGN ENGINEER

APPROVED: 11-04-2021
REVISED:

SAP 013-630-021 / SAP 225-591-007

DRIVEWAY AND SIDEWALK DETAILS

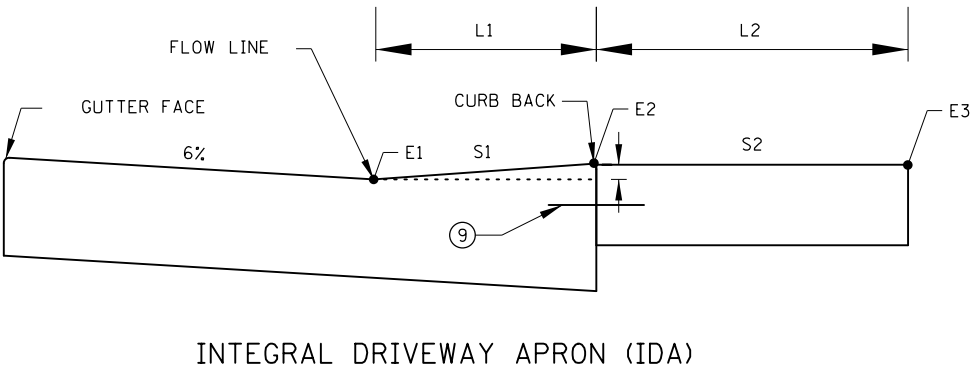
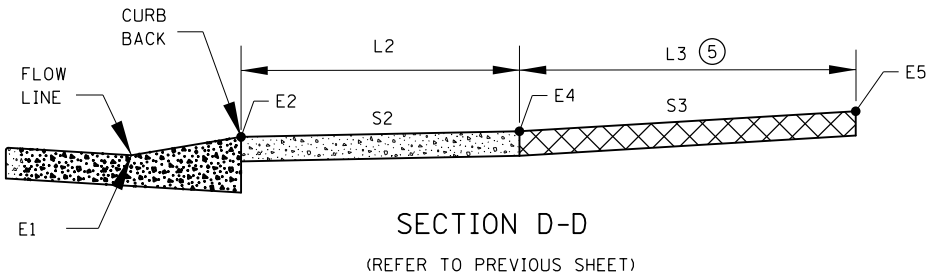
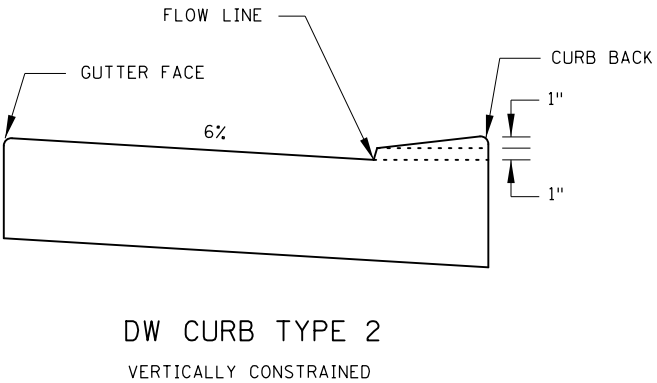
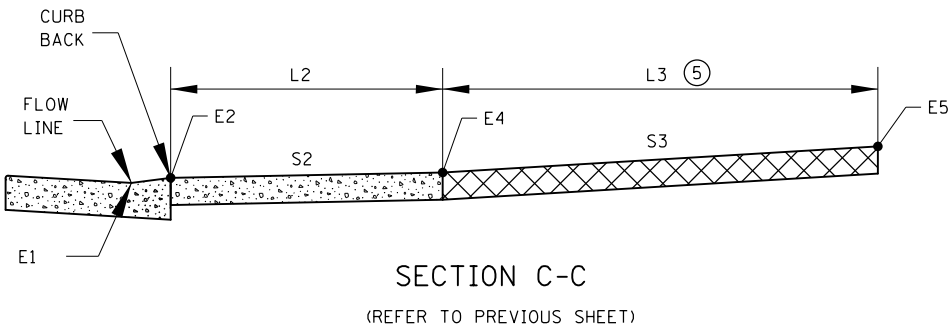
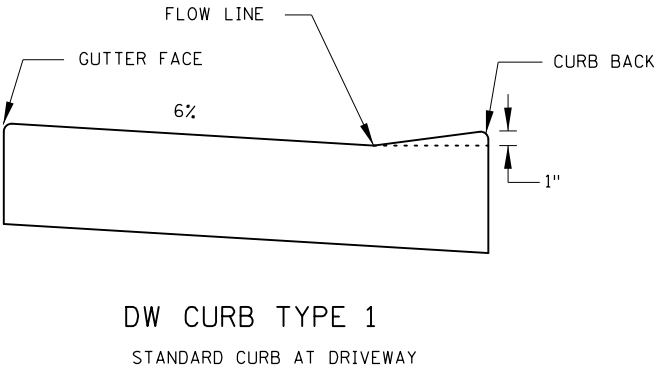
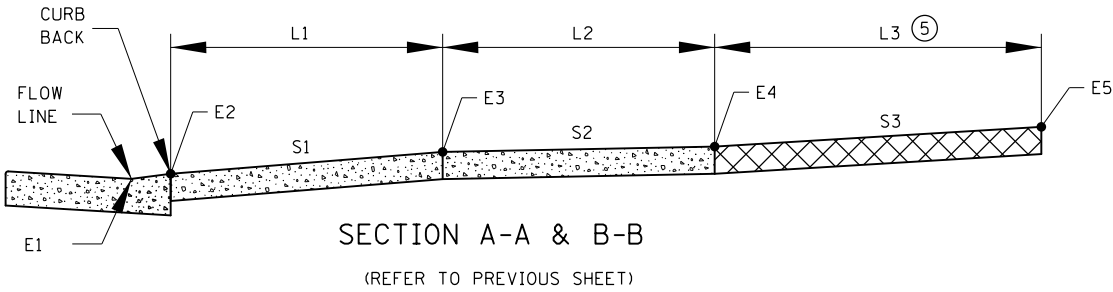
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DRIVEWAY TABLE ①																
STATION	SIDE	DRIVEWAY TYPE ②	CURB TYPE ③	E1	E2	L1	S1	E3	L2	S2 ④	E4	L3 ⑤	S3	EXISTING ⑥	E5	COMMENTS
						FT	%		FT	%		FT	%	%		

NOTES:

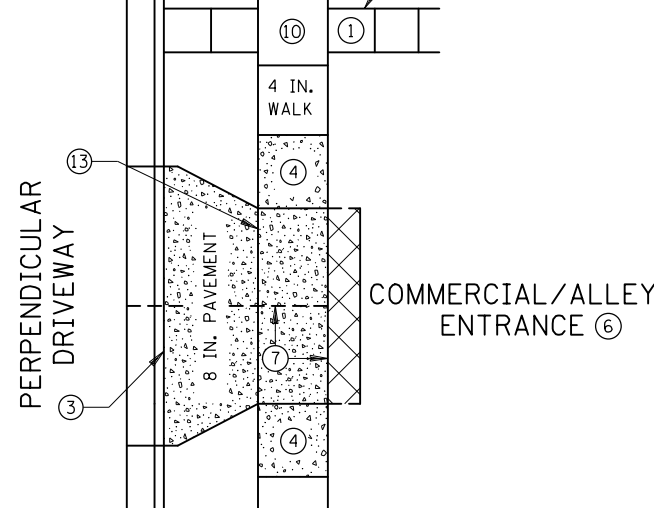
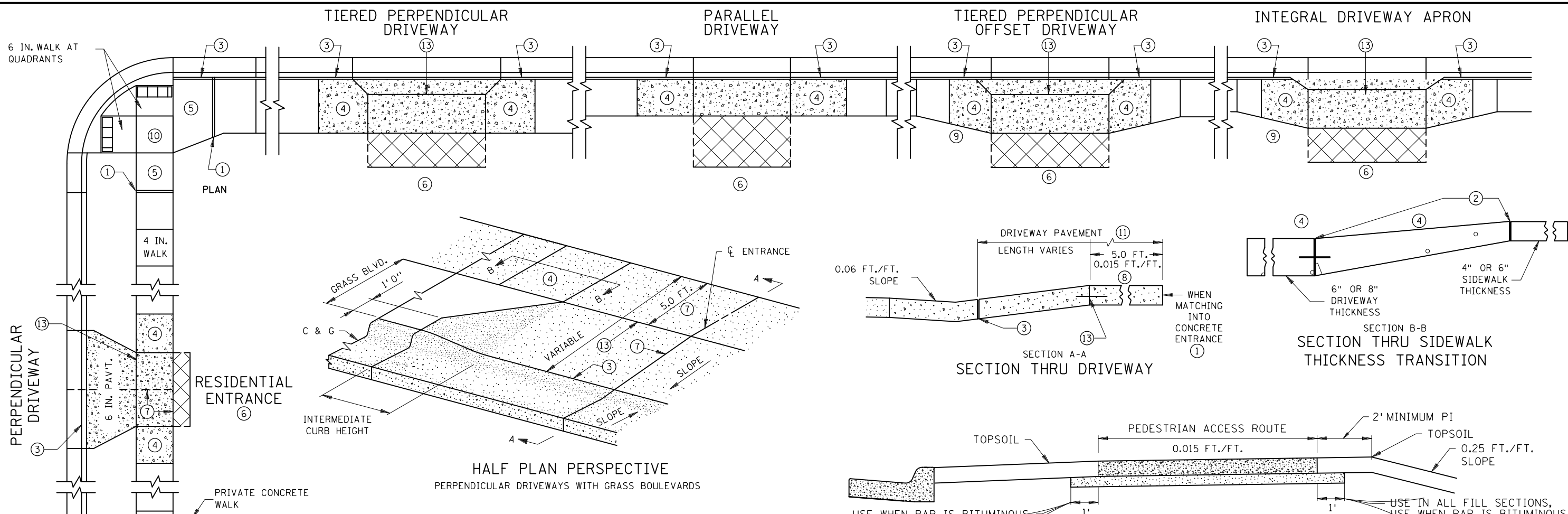
- ALL SIDEWALK AND BOULEVARD WIDTHS SHALL BE MEASURED FROM BACK OF CURB.
- DW CURB TYPE 1 SHALL BE USED WHEN THE DRIVEWAY ACTS AS A PEDESTRIAN RAMP. THE MAX. APRON SLOPE MUST ADHERE TO ADA CRITERIA AS WELL. DW CURB TYPE 1 SHOULD BE USED IF THERE IS ON STREET PARKING.
- WHERE ROADWAY DRAINAGE IS A CONCERN (NEGATIVE SLOPED APRON) DW CURB TYPE 2 CAN BE USED TO HELP KEEP THE WATER ON PUBLIC RIGHT OF WAY.
- S1 8% STANDARD, 10% MAX. COMMERCIAL AND 12% MAX. RESIDENTIAL. IF EXISTING GRADES ARE STEEPER DO NOT MAKE GRADES APPRECIABLY WORSE BY USING BEST PRACTICES SUCH AS DRIVEWAY CURB HEIGHTS, EXTENDING L3 AND/OR STEEPEN S3.
- S3 8% MAXIMUM, IF THIS SLOPE IS EXCEEDED OR CONTINUED FOR MORE THAN 5', ANALYZE VEHICLE TEMPLATES FOR VERTICAL CLEARANCE. SEE FACILITY DESIGN GUIDE, CHAPTER 6, FOR GEOMETRIC DESIGNS OF DRIVEWAYS.
- ① EXAMPLE SHOWN TO BE INCLUDED IN PLAN FOR EACH DRIVEWAY THAT HAS PAR THROUGH IT.
- ② REFERS TO THE FOLLOWING TYPES; PERPENDICULAR DRIVEWAY, TIERED PERPENDICULAR OFFSET DRIVEWAY, TIERED PERPENDICULAR DRIVEWAY, PARALLEL DRIVEWAY, AND INTEGRAL DRIVEWAY APRON.
- ③ DW CURB TYPE 1 IS THE STANDARD AND SHALL BE THE STARTING POINT FOR ALL PERPENDICULAR AND TIERED DRIVEWAYS. DW CURB TYPE 2 SHALL ONLY BE USED AFTER UTILIZING BEST PRACTICES SUCH AS MAXIMIZING S1, S3, AND L3.
- ④ SHOULD BE DESIGNED AT 1.5%.
- ⑤ ACQUIRE ADEQUATE L3 TO ALLOW FOR CONTINUOUS PAR PROFILE (UNIFORM SIDEWALK SECTION) THROUGH THE DRIVEWAY APRON.
- ⑥ PROVIDE INPLACE TIE-IN SLOPE INFORMATION AT BACK OF PROPOSED WALK (S3 AREA).
- ⑦ INFORMATION TO BE INCORPORATED INTO DRIVEWAY TABLE WHEN INTEGRAL DRIVEWAY APRON IS USED. OTHER CURB HEIGHTS & CURB APRON LENGTHS CAN BE USED.
- ⑧ L1 & S1 FOR INTEGRAL DRIVEWAY APRON IS TO FLOWLINE. 12.5% IS MAXIMUM PREFERRED SLOPE.
- ⑨ TIE ADJACENT SECTIONS. CONCRETE DRIVEWAY APRON AND CONCRETE DRIVEWAY SIDEWALK SHALL BE CONSTRUCTED SEPARATELY IN AN INDEPENDENT CONCRETE POUR. DRILL AND GROUT OR CAST IN-PLACE THROUGH HOLES IN THE FORMS NO. 4 X 12" LONG TIE BARS (EPOXY COATED). 36" MAXIMUM SPACING WITH 2" MINIMUM CONCRETE COVER PLACED 1' MINIMUM FROM ADJACENT CONSTRUCTION JOINT.



TYPICAL INTEGRAL DRIVEWAY APRON ⑦			
CURB TYPE	L1	E2	S1 ⑧
	FT		%
IDA 216	1.33	+0.16	12.5
IDA 220	1.67	+0.16	10
IDA 324	2	+0.24	12.5
IDA 432	2.67	+0.33	12.5

REVISION:
APPROVED: 11-04-2021 <i>Jeffrey J. Perkins</i> JEFFREY PERKINS OPERATIONS DIVISION

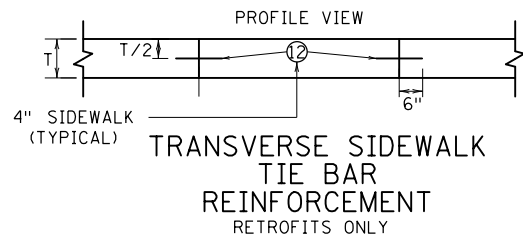
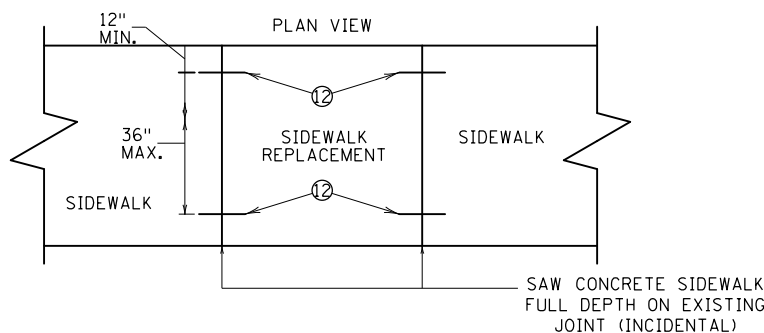
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	 THOMAS STYRBICKI STATE DESIGN ENGINEER	APPROVED: 11-04-2021 REVISED:	
SAP 013-630-021 / SAP 225-591-007			SHEET NO. 59 OF 216



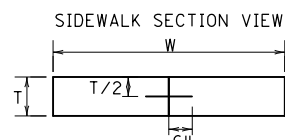
SIDEWALK LONGITUDINAL JOINT TIE BAR TABLE				
SIDEWALK WIDTH, W	SIDEWALK THICKNESS, T	TIE BAR SIZE	LENGTH	SPACING
> 7'	4"	No. 4	12"	24"
>10'	6"	No. 4	12"	36"

FOR 4" CONCRETE ONLY: CAST IN PLACE BARS MUST BE SUPPORTED WITH P-STAKES OR REINFORCEMENT BASKETS FOR FULL WIDTH CONCRETE PLACEMENTS.

FOR 6" CONCRETE ONLY: DRILL AND GROUT OR CAST IN PLACE THROUGH HOLES IN THE FORMS REQUIRED FOR STAGED ADJACENT CONCRETE PLACEMENTS.



TRANSVERSE SIDEWALK TIE BAR REINFORCEMENT RETROFITS ONLY



LONGITUDINAL SIDEWALK REINFORCEMENT JOINTS

NOTES:

- ALL SIDEWALK AND BOULEVARD WIDTHS SHALL BE MEASURED FROM BACK OF CURB.
- TO MINIMIZE SIDEWALK "ROLLER COASTER" EFFECT IT IS DESIRABLE TO KEEP THE PAR ELEVATION CONTINUOUS OR AT LEAST IN THE UPPER HALF OF CURB HEIGHT. 4" HIGH CURB SHOULD BE USED INSTEAD OF 6" HIGH CURB TO HELP THIS PROBLEM WHEN APPLICABLE.
- 4" HIGH ADJACENT CURB IS PREFERRED WHEN BOULEVARDS 4' OR LESS ARE PRESENT MEASURED FROM THE BACK OF CURB. WHEN THE DRIVEWAY IS SLOPING DOWN FROM THE ROADWAY (NEGATIVE) 4" HIGH ADJACENT CURB SHOULD ALSO BE USED.
- SEE FACILITY DESIGN GUIDE, CHAPTER 6, FOR GEOMETRIC DESIGN OF DRIVEWAYS.
- ① CONSTRUCT WITH EXPANSION MATERIAL PER MNDOT SPECIFICATION 3702 TYPES A-E. EXPANSION MATERIAL SHALL MATCH FULL HEIGHT OF ADJACENT CONCRETE. DRIVEWAY EXPANSION SHALL BE PLACED AT TOP OR BOTTOM OF TRANSITION PANEL.
- ② CONSTRUCT WITH EXPANSION MATERIAL MNDOT PER SPEC. 3702 TYPES A-E. EXPANSION MATERIAL SHALL MATCH FULL HEIGHT OF ADJACENT CONCRETE. MAXIMUM ONE EXPANSION PER DRIVEWAY PLACED AT EITHER TOP OR BOTTOM OF CONCRETE THICKNESS TRANSITION. IF MULTIPLE DRIVEWAYS EXIST PLACE ONE EXPANSION BETWEEN EACH DRIVEWAY. IF NO DRIVEWAY EXIST PLACE A MAXIMUM OF ONE EXPANSION PER 150' OF SIDEWALK RUN.
- ③ USE AN APPROVED TYPE F (1/4 INCH THICK) SEPARATION MATERIAL. SEPARATION MATERIAL SHALL MATCH FULL HEIGHT DIMENSION OF ADJACENT CONCRETE.
- ④ TRANSITION DRIVEWAY THICKNESS TO WALK THICKNESS. IF THERE IS A CONSTRUCTION JOINT AND NO EXPANSION IS USED, INSTALL TIE BARS.
- ⑤ TRANSITION CURB RAMP THICKNESS TO WALK THICKNESS.
- ⑥ MATCH INPLACE DRIVEWAY WIDTH, MATERIAL TYPE AND THICKNESS.
- ⑦ FORM CONTRACTION JOINT AS NEEDED TO PRODUCE APPROXIMATELY SQUARE PANELS. CONCRETE PANEL SIZE SHOULD NOT EXCEED 1 1/2 : 1 LENGTH X WIDTH. 81 SF FOR 6" CONCRETE DRIVEWAY WITH 9'X9' MAXIMUM PANEL SIZE. 144 SF FOR 8" CONCRETE DRIVEWAY WITH 12'X12' MAXIMUM PANEL SIZE. MATCH DRIVEWAY APRON AND SIDEWALK JOINTS.
- ⑧ THE PEDESTRIAN ACCESS ROUTE CROSS-SLOPE, SHALL NOT EXCEED 0.02 FT./FT. AS CONSTRUCTED.
- ⑨ 1:10 MIN. SIDEWALK OFFSET TAPER REQUIRED FOR SIDEWALK REPLACEMENT PROJECTS. 1:3 MIN. AND 1:5 MIN. PREFERRED SIDEWALK OFFSET TAPER FOR DRIVEWAY REPLACEMENT.
- ⑩ LANDING REQUIRED, SEE NEXT SHEET FOR MORE INFORMATION.
- ⑪ CONCRETE DRIVEWAY APRON AND CONCRETE DRIVEWAY SIDEWALK SECTIONS SHALL BE CONSTRUCTED SEPARATELY IN AN INDEPENDENT CONCRETE POUR. ENGINEER'S APPROVAL REQUIRED FOR MONOLITHIC PLACEMENTS.
- ⑫ DRILL AND GROUT NO. 4 X 12" LONG TIE BARS (EPOXY COATED). 36" MAXIMUM SPACING BETWEEN BARS COVER PLACED 1' MINIMUM FROM ADJACENT CONSTRUCTION JOINTS. 1' MINIMUM FROM ADJACENT CONCRETE JOINTS. BARS TO BE ADJUSTED TO MATCH SIDEWALK GRADES. TO BE PAID BY EACH.
- ⑬ DRILL AND GROUT OR CAST IN-PLACE THROUGH HOLES IN THE FORMS NO. 4 X 12" LONG TIE BARS (EPOXY COATED). 36" MAXIMUM SPACING BETWEEN BARS WITH 2" MINIMUM CONCRETE COVER PLACED 1' MINIMUM FROM ADJACENT CONSTRUCTION JOINTS. 1' MINIMUM FROM ADJACENT CONCRETE JOINTS.

REVISION: 12-23-2021

APPROVED: 11-04-2021



STANDARD PLAN 5-297.254

3 OF 4

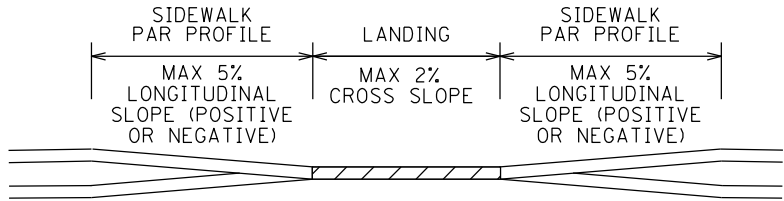
DRIVEWAY AND SIDEWALK DETAILS

APPROVED: 11-04-2021
REVISED: 12-23-2021

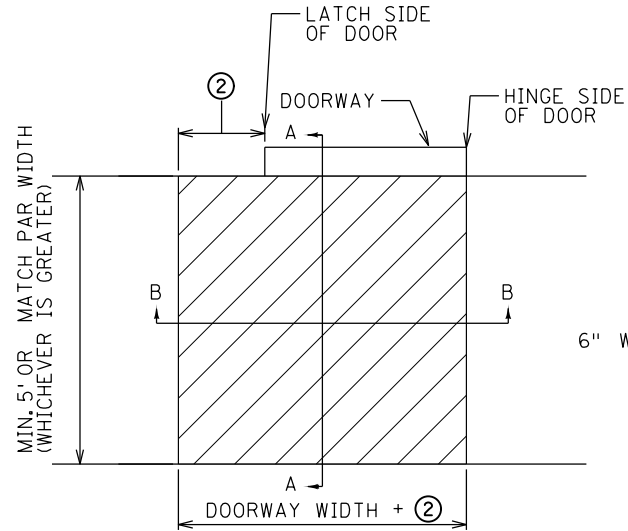
SAP 013-630-021 / SAP 225-591-007

SHEET NO. 60 OF 216

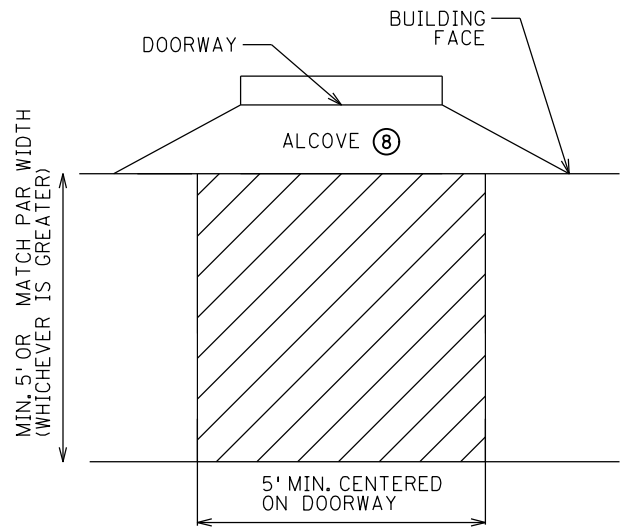
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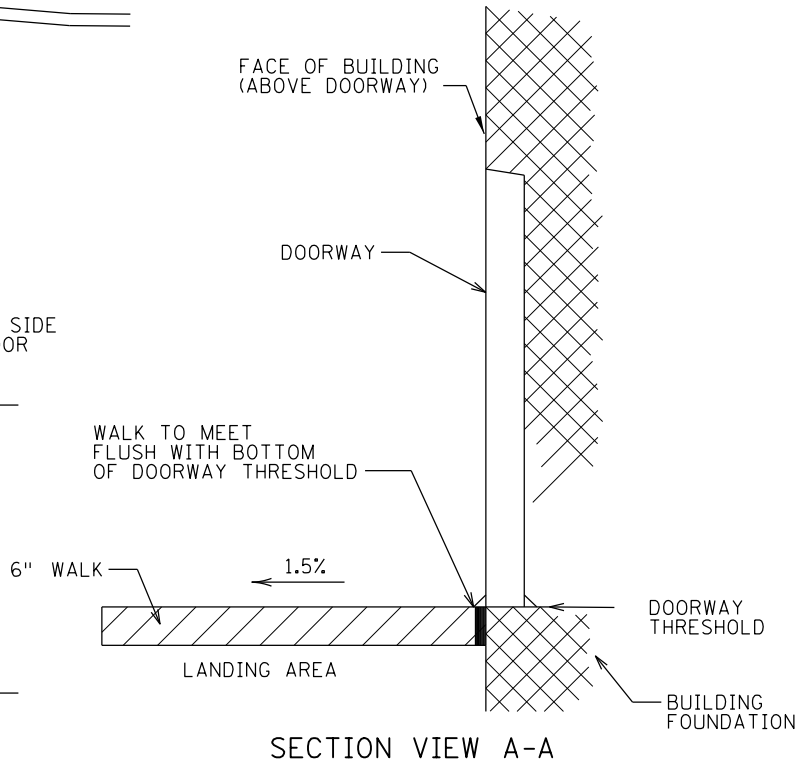
SECTION VIEW B-B



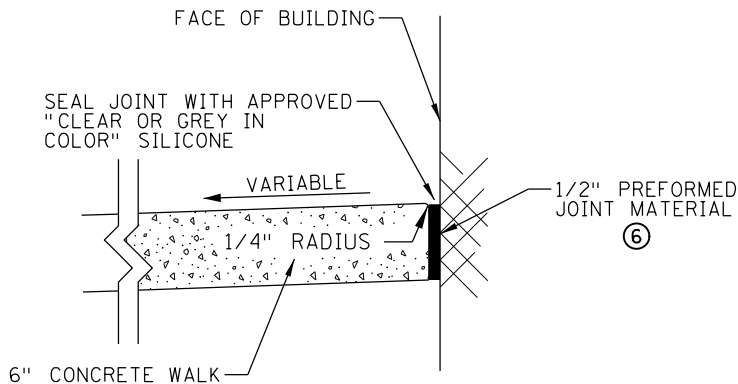
PLAN VIEW DOORWAY



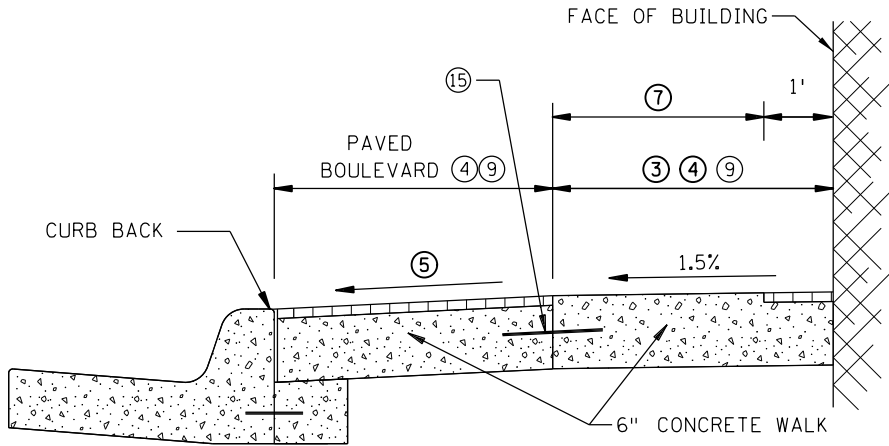
PLAN VIEW DOORWAY WITH ALCOVE
SIDEWALK LANDING REQUIREMENTS ①



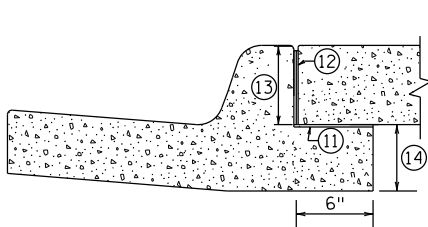
SECTION VIEW A-A



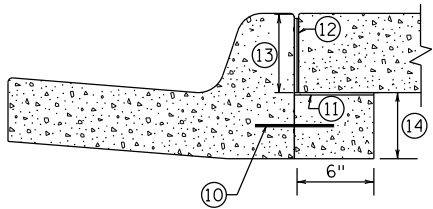
BUILDING JOINT SEAL (INCIDENTAL)



DOWNTOWN SIDEWALK TYPICAL SECTION



SLIP FORM SILL



FIXED FORM SILL

SILL CURB SHOULD BE USED AT ALL LOCATIONS WHEN CONCRETE WALK IS AT BACK OF CURB, INCLUDING PAVED BOULEVARD.
SILL CURB SHALL NOT BE USED IN CURB RAMP AND DRIVEWAY AREAS, INCLUDING CONCRETE FLARES.
SILL CURB WITH 4" WALK CAN USE FIXED OR SLIP FORM OPTIONS.

NOTES:

- 6" WALK IS REQUIRED:
1) IN ALL SIDEWALK LOCATIONS WHERE VARIABLE SLOPED CONCRETE BOULEVARDS ARE PAVED, SUCH AS COMMERCIAL (STORE FRONT, DOWNTOWN) AREAS.
2) ANYTIME DRILL AND REINFORCEMENT IS USED TO TIE LONGITUDINAL JOINTS TOGETHER.
3) TO ELIMINATE LONGITUDINAL JOINT WHEN INCREASING PANEL SIZE OVER 36SF.
4) AT LOCATIONS WHERE MAINTENANCE EQUIPMENT WILL SUBJECT CONCRETE TO HEAVY LOADS.

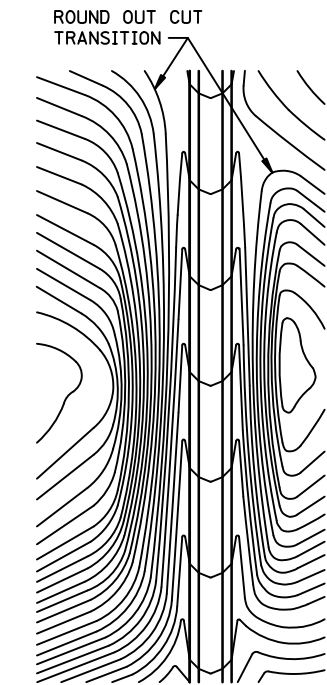
ALL SIDEWALK AND BOULEVARD WIDTHS SHALL BE MEASURED FROM BACK OF CURB.
FIELD ADJUST SIDEWALK PROFILES TO MEET ALL DOORWAY THRESHOLDS.
SIDEWALK MUST MAINTAIN POSITIVE DRAINAGE AWAY FROM THE BUILDING TO THE ROADWAY.

- SEE SPECIAL PROVISIONS FOR SILICONE SPECIFICATIONS.
- ① LANDING CRITERIA IS REQUIRED FOR ALL DOORS, STEPS, AND PRIVATE WALKS. FEASIBILITY DECREASES WITH NARROWER BOULEVARDS AND STEEPER SIDEWALK PROFILES.
- ② 18" MIN. WHEN DOOR SWINGS OUTWARD FROM BUILDING. 12" MIN WHEN DOOR SWINGS INWARD FROM BUILDING.
- ③ 6' MIN. PAR REQUIRED WHEN ADJACENT TO BUILDINGS.
- ④ 2/3 PAR TO 1/3 BOULEVARD SHOULD BE USED WHEN FEASIBLE. HOLD UNIFORM BOULEVARD WIDTH. 4' PREFERRED MINIMUM BOULEVARD.
- ⑤ 1%-5% FOR THE MAJORITY OF THE BLOCK, WITH EXCEPTIONS UP TO 8% IN CONSTRAINED AREAS.
- ⑥ CONSTRUCT USING APPROVED EXPANSION MATERIAL PER MNDOT TYPE A-E EXPANSION. LEAVE A MINIMUM 1/2" TOP GAP AND SEAL WITH MNDOT APPROVED SILICONE PER MNDOT SPEC 3722.
- ⑦ TO MINIMIZE VIBRATION AND ROLLING RESISTANCE, AREA SHALL BE FREE OF PAVERS, STAMPED CONCRETE, AND/OR EXCESSIVE JOINTING.
- ⑧ 2% MAX. PER BUILDING CODE. IF GREATER THAN 2%, FLATTEN AS FEASIBLE.
- ⑨ FORM CONTRACTION JOINTS AS NEEDED TO PRODUCE APPROXIMATELY SQUARE PANEL SIZE. CONCRETE PANEL SIZE SHOULD NOT EXCEED 1 1/2' : 1' LENGTH X WIDTH.
- ⑩ DRILL AND GROUT NO. 4 X 8" LONG TIE BARS (EPOXY COATED). 36" MAXIMUM SPACING BETWEEN BARS WITH 2" MINIMUM CONCRETE COVER PLACED 1' MINIMUM FROM ADJACENT CONSTRUCTION JOINTS. 1' MINIMUM FROM ADJACENT CONCRETE JOINTS. TIE BARS SHALL BE EMBEDDED 4" WITH 2" MINIMUM CONCRETE COVER AND ARE INCIDENTAL TO SILL PLACEMENT.
- ⑪ FURNISH AND INSTALL THE FULL WIDTH OF THE TOP OF SILL A MINIMUM 2ML THICK POLYTHENE SHEETING.
- ⑫ USE AN APPROVED TYPE F (1/4" INCH THICK) SEPARATION MATERIAL. SEPARATION MATERIAL SHALL MATCH FULL HEIGHT DIMENSION OF ADJACENT CONCRETE.
- ⑬ DIMENSION TO BE SAME AS SIDEWALK THICKNESS, 4" MIN.
- ⑭ 6" WALK: 5" MIN. FOR B424; 7" MIN. FOR B624
4" WALK: 7" MIN. FOR B424; 9" MIN. FOR B624
- ⑮ DRILL AND GROUT NO. 4 X 12" LONG TIE BARS (EPOXY COATED). 36" MAXIMUM SPACING BETWEEN BARS WITH 2" MINIMUM CONCRETE COVER PLACED 1' MINIMUM FROM ADJACENT CONCRETE JOINTS.

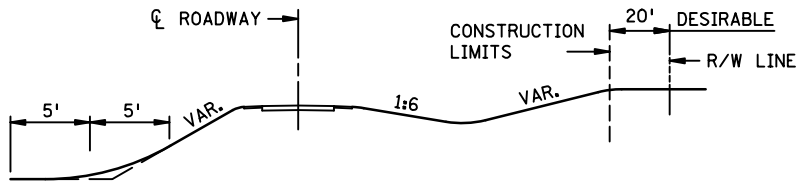
REVISION:
APPROVED: 11-04-2021
<i>Jeff J. Perkins</i>
JEFF PERKINS OPERATIONS DIVISION

m MINNESOTA DEPARTMENT OF TRANSPORTATION	STANDARD PLAN 5-297.254	4 OF 4	DRIVEWAY AND SIDEWALK DETAILS
<i>Tom Styrbicki</i> THOMAS STYRBICKI STATE DESIGN ENGINEER	APPROVED: 11-04-2021 REVISED:	SAP 013-630-021 / SAP 225-591-007	SHEET NO. 61 OF 216

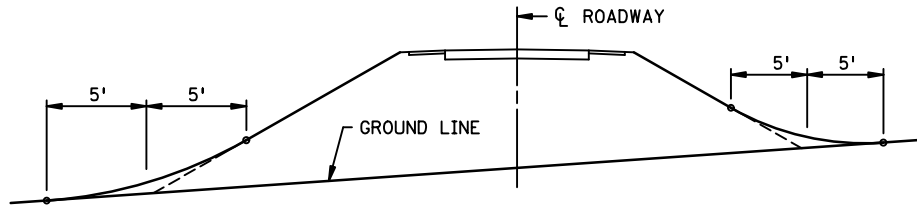
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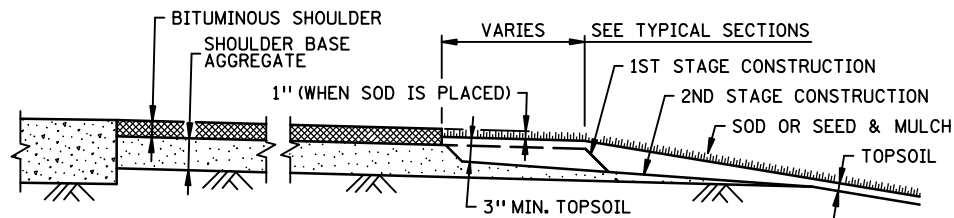
CONTOURING ROAD CUTS



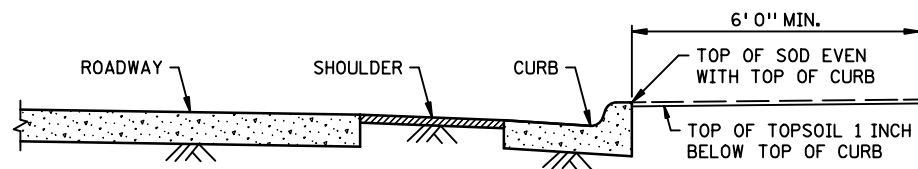
ROUNDING SHOULDERS AND BACKSLOPES



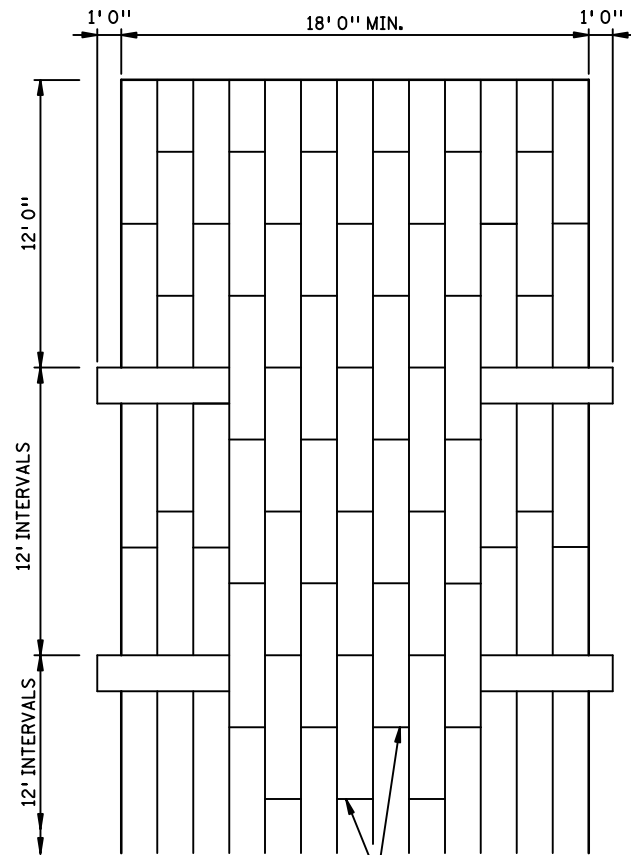
SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES



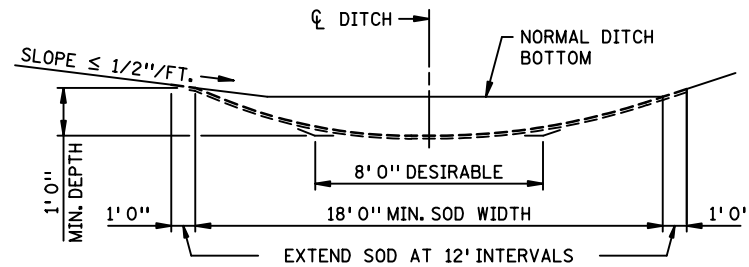
SHAPING AND TOPSOILING INSLOPES



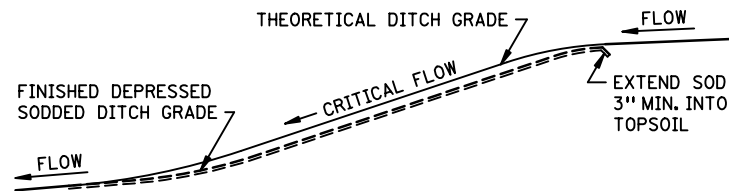
SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED



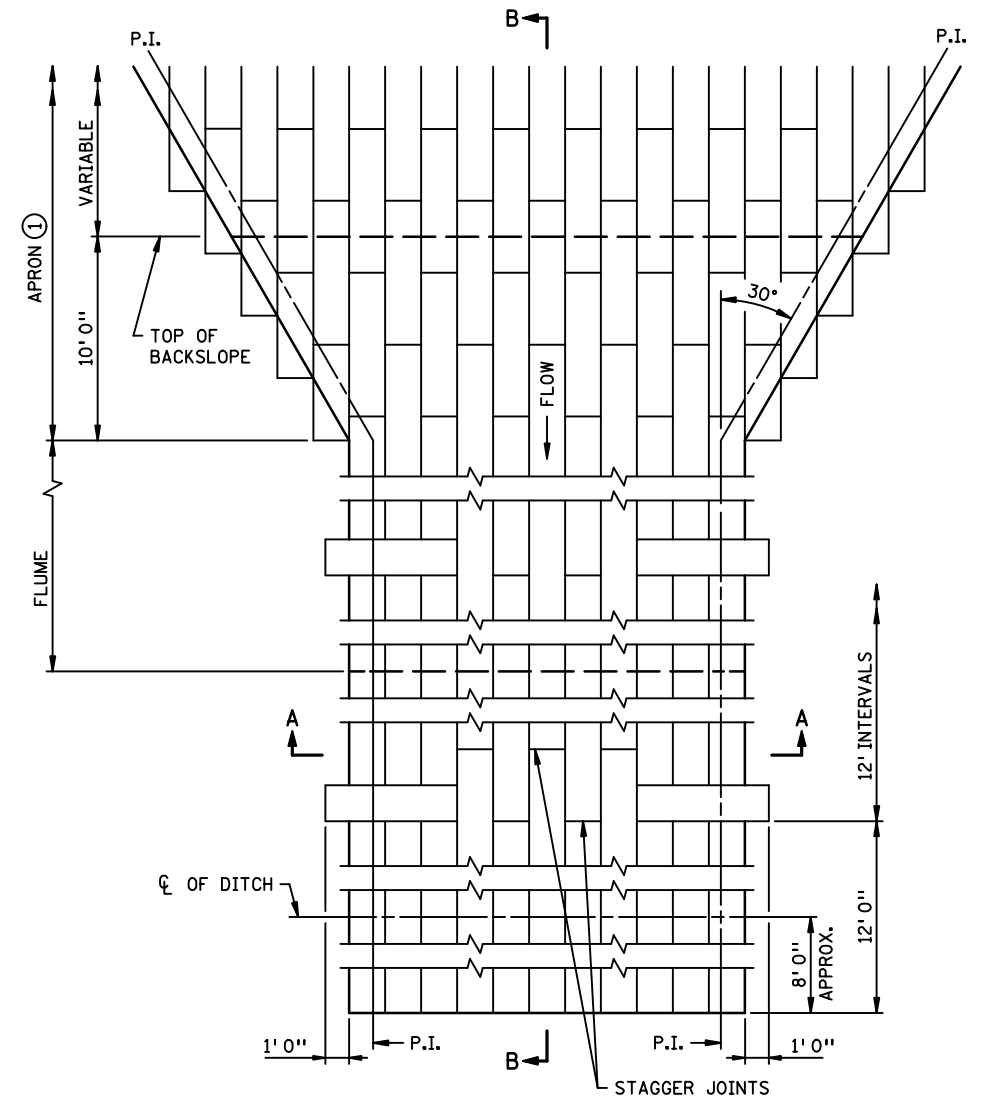
PLAN VIEW



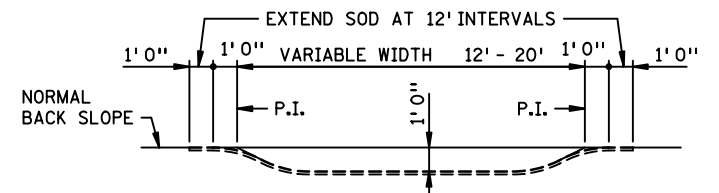
SODDED DITCH CROSS SECTION
WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.),
FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.



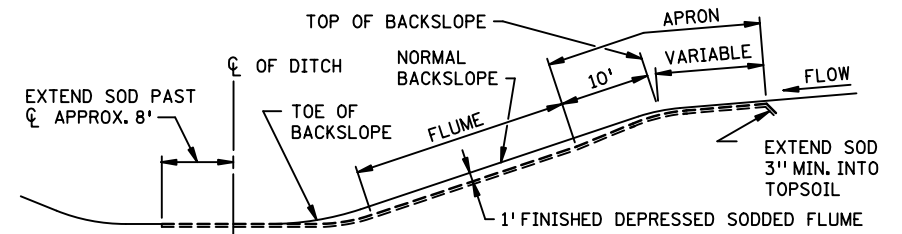
DITCH PROFILE
SODDED DITCH DETAILS



PLAN VIEW



SECTION A-A



SECTION B-B

SODDED FLUME DETAILS

NOTES:
SEE SPEC. 2575.3 FOR ADDITIONAL INFORMATION.
① CONSTRUCT TAPER AS DIRECTED BY THE ENGINEER.

REVISION:
APPROVED: 2-28-2017

CHIEF ENVIRONMENTAL OFFICER

MINNESOTA
DEPARTMENT
OF
TRANSPORTATION

STANDARD PLAN 5-297.404

1 OF 3

STATE DESIGN ENGINEER

APPROVED: 2-28-2017
REVISED:

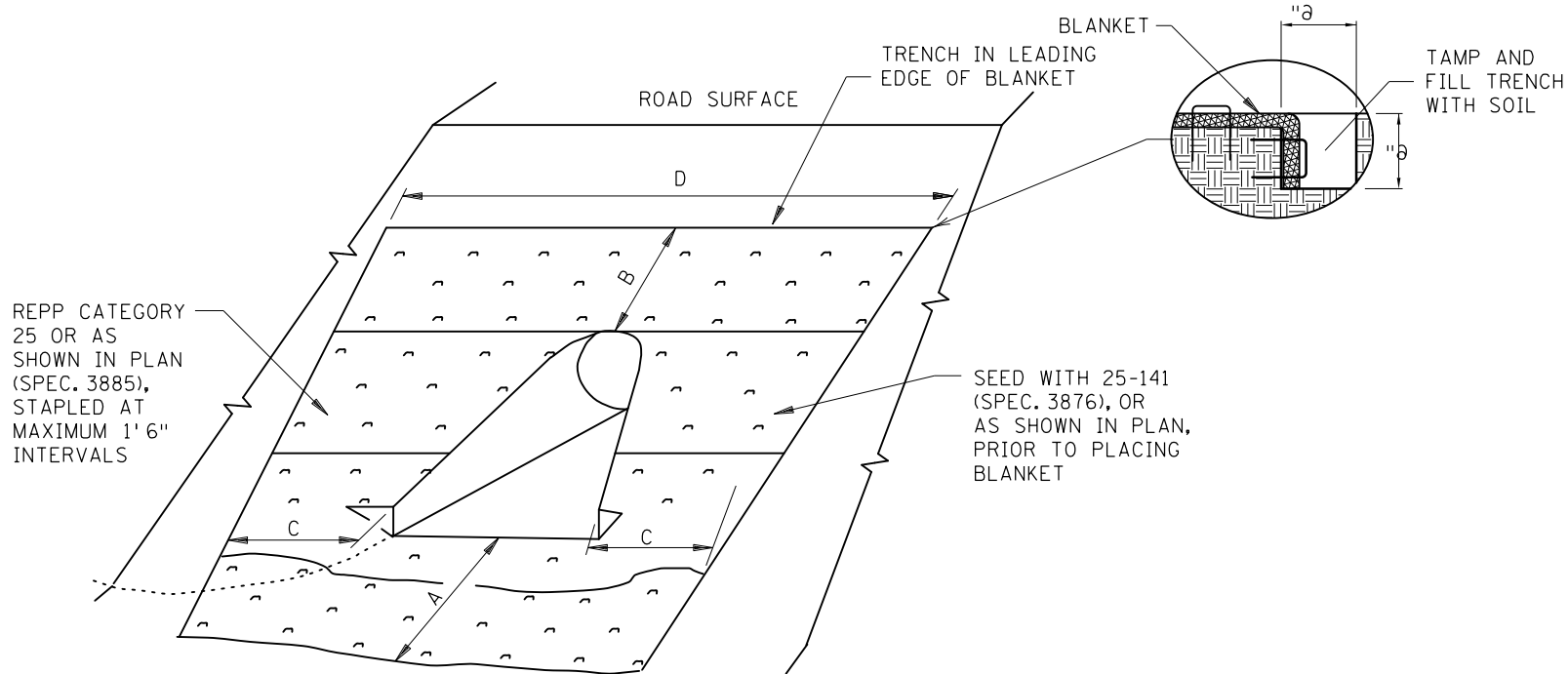
SAP 013-630-021 / SAP 225-591-007

PERMANENT EROSION CONTROL
ALONG ROADWAYS, DITCHES AND FLUMES

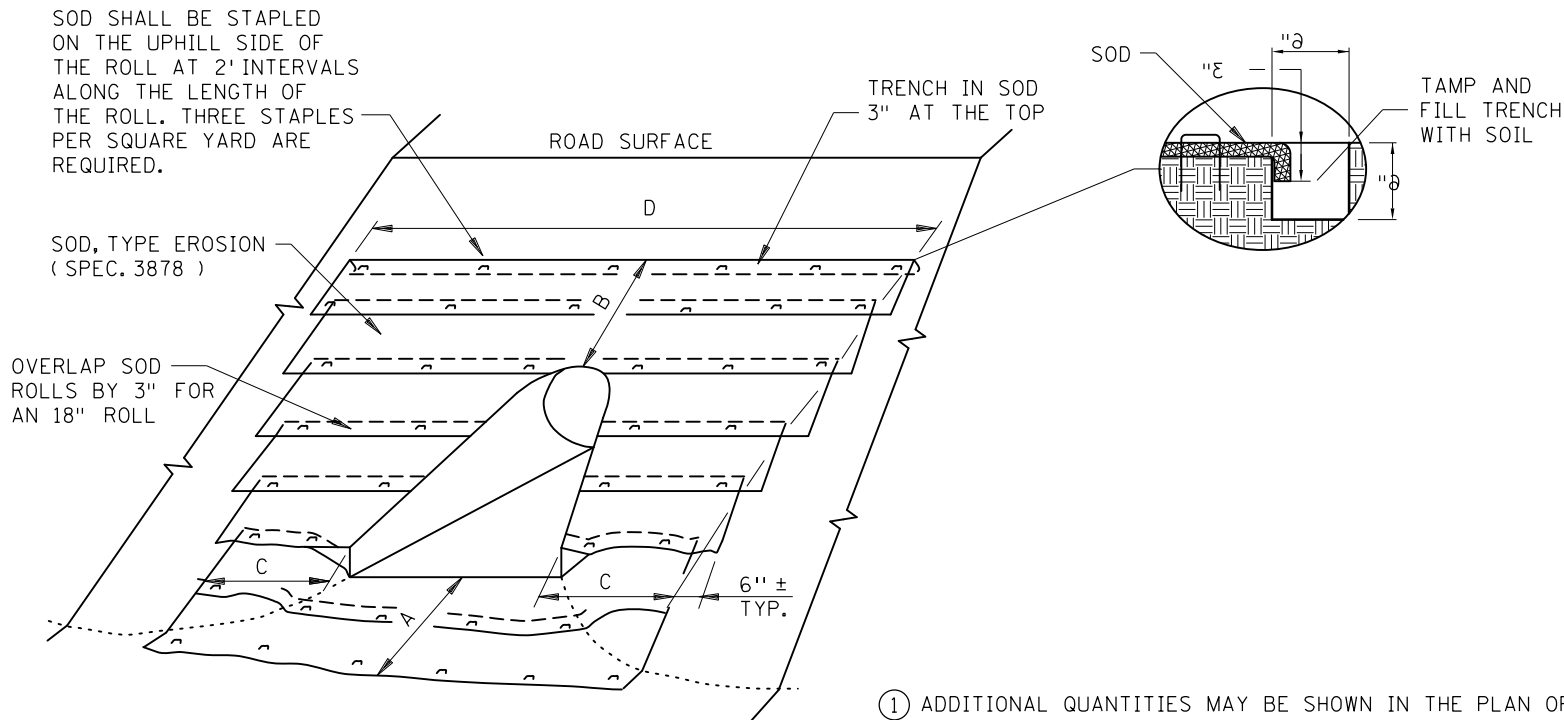
SHEET NO. 62 OF 216

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DATE: 9/12/2024
TIME: 2:00:45 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700



ROLLED EROSION PREVENTION PRODUCT (BLANKET) & SEED DETAIL



SODDING DETAIL

- ① ADDITIONAL QUANTITIES MAY BE SHOWN IN THE PLAN OR REQUIRED BY THE ENGINEER.
② FOR ARCH PIPE USE CLOSEST CIRCULAR PIPE DIAMETER AND APRON SLOPE. DIAMETERS LARGER THAN 72" REQUIRE SPECIAL DESIGNS.

CULVERT INLET APRON ①								
CULVERT DIAMETER ②	SOD OR REPP (SQ. YDS.)						"A"	"B"
	CIRCULAR AND ARCH PIPE METAL APRON (PLATE 3123, PLATE 3122)	CIRCULAR AND ARCH PIPE CONCRETE APRON (PLATE 3100, PLATE 3110)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:4 SLOPE (PLATE 3148)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:6 SLOPE (PLATE 3148)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:6 SLOPE (PLATE 3128)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:4 SLOPE (PLATE 3128)		
15"	9	9	8	8	N/A	N/A	3'	1.5'
18"	13	12	12	14	16	N/A	3'	3'
21"	14	14	14	16	18	14	3'	3'
24"	16	15	16	19	21	17	3'	3'
27"	N/A	20	N/A	N/A	N/A	N/A	3'	4.5'
30"	23	22	25	30	32	N/A	3'	4.5'
36"	34	34	39	48	51	37	4.5'	4.5'
42"	43	40	51	64	N/A	N/A	4.5'	6'
48"	54	50	66	82	N/A	N/A	4.5'	7.5'
54"	65	58	81	102	N/A	N/A	4.5'	9'
60"	69	59	91	115	N/A	N/A	4.5'	9'
66"	69	63	N/A	N/A	N/A	N/A	4.5'	9'
72"	78	72	99	122	N/A	N/A	4.5'	10.5'

CULVERT OUTLET APRON ①								
CULVERT DIAMETER ②	SOD OR REPP (SQ. YDS.)						"A"	"B"
	CIRCULAR AND ARCH PIPE METAL APRON (PLATE 3123, PLATE 3122)	CIRCULAR AND ARCH PIPE CONCRETE APRON (PLATE 3100, PLATE 3110)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:4 SLOPE (PLATE 3148)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:6 SLOPE (PLATE 3148)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:6 SLOPE (PLATE 3128)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:4 SLOPE (PLATE 3128)		
15"	10	10	9	10	N/A	N/A	4.5'	1.5'
18"	13	13	12	14	15	N/A	6'	1.5'
21"	16	14	16	18	19	15	6'	1.5'
24"	18	18	18	21	22	18	7.5'	1.5'
27"	N/A	19	N/A	N/A	N/A	N/A	7.5'	1.5'
30"	23	23	24	28	29	N/A	9'	1.5'
36"	36	35	38	47	48	37	10.5'	1.5'
42"	43	40	47	58	N/A	N/A	12'	1.5'
48"	50	46	57	70	N/A	N/A	13.5'	1.5'
54"	57	50	67	84	N/A	N/A	15'	1.5'
60"	74	63	90	113	N/A	N/A	16.5'	1.5'
66"	75	67	N/A	N/A	N/A	N/A	16.5'	1.5'
72"	77	70	92	114	N/A	N/A	16.5'	1.5'

NOTES:

REPP = ROLLED EROSION PREVENTION PRODUCT.

AREA SHOWN IN SQUARE YARDS IS FOR ONE CULVERT END.

QUANTITIES ARE CALCULATED TO INCLUDE SOD REQUIRED TO PROVIDE A 3" OVERLAP ON ALL 18" WIDE ROLLS. THIS ALLOWS FOR SHRINKAGE OF THE SOD.

FOR PIPE ARCHES USE EQUIVALENT PIPE DIAMETER TO APPROXIMATE AREA.

FOR CORRUGATED POLYETHYLENE PIPE METAL APRON (PLATE 3129), USE THE METAL APRON COLUMN (PLATE 3123).

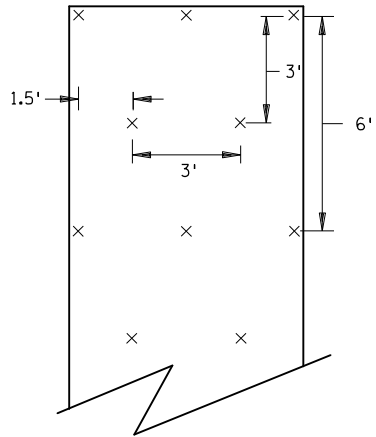
AREAS AND DIMENSIONS ARE APPROXIMATE AND ARE BASED ON APRON SIDE SLOPES OF NO STEEPER THAN 1:2, UNLESS INDICATED AS FOR SAFETY APRONS.

CARE SHOULD BE TAKEN IN SELECTING SOD TO STABILIZE THE APRON. RIP-RAP SHOULD BE USED FOR FLOW VELOCITIES GREATER THAN 6 FPS.

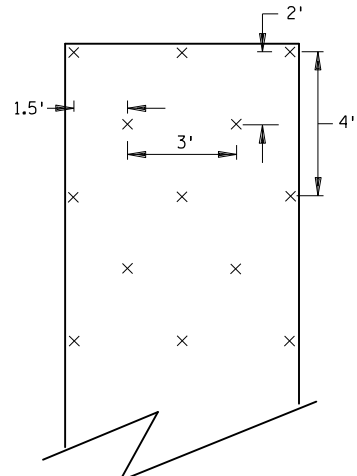
REVISION:
APPROVED: JANUARY 8, 2020 <i>Marni Karnowski</i> MARNI KARNOWSKI CHIEF ENVIRONMENTAL OFFICER

	STANDARD PLAN 5-297.404	2 OF 3	PERMANENT EROSION CONTROL TURF ESTABLISHMENT DETAIL AT CULVERT ENDS	
	 THOMAS STYRBICKI STATE DESIGN ENGINEER	APPROVED: 1-8-2020 REVISED:		
SAP 013-630-021 / SAP 225-591-007			SHEET NO. 63 OF 216	

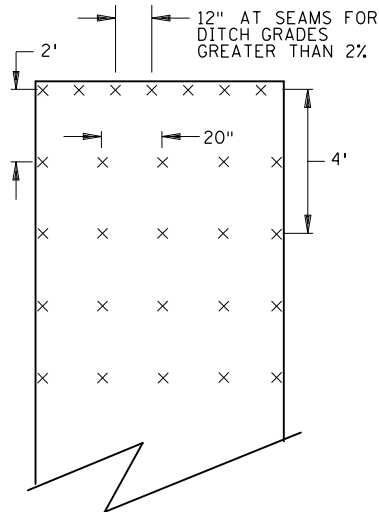
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SLOPES FLATTER THAN 1:2
120 STAPLES PER 100 SQ YD

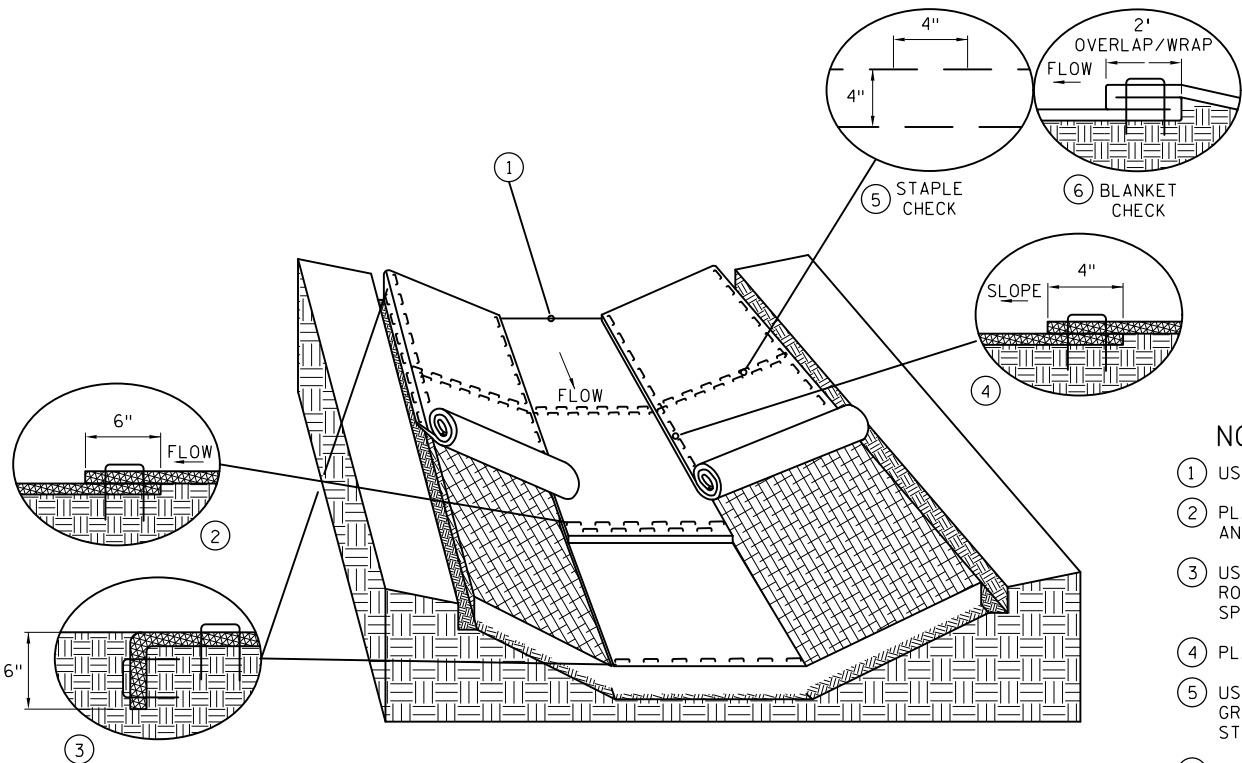


SLOPES 1:2 TO 1:1
170 STAPLES PER 100 SQ YD

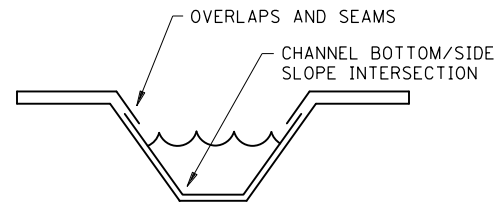


CHANNEL AND DITCH APPLICATIONS
350 STAPLES PER 100 SQ YD

BLANKET STAPLE PATTERN



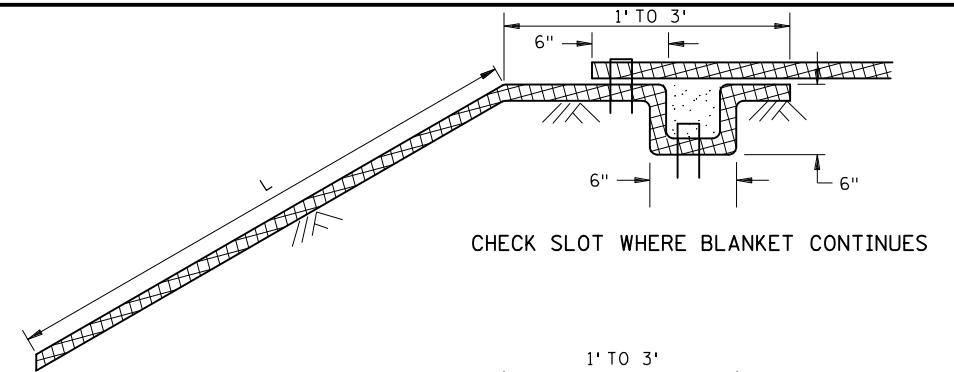
DITCH BLANKET STAPLE DETAIL



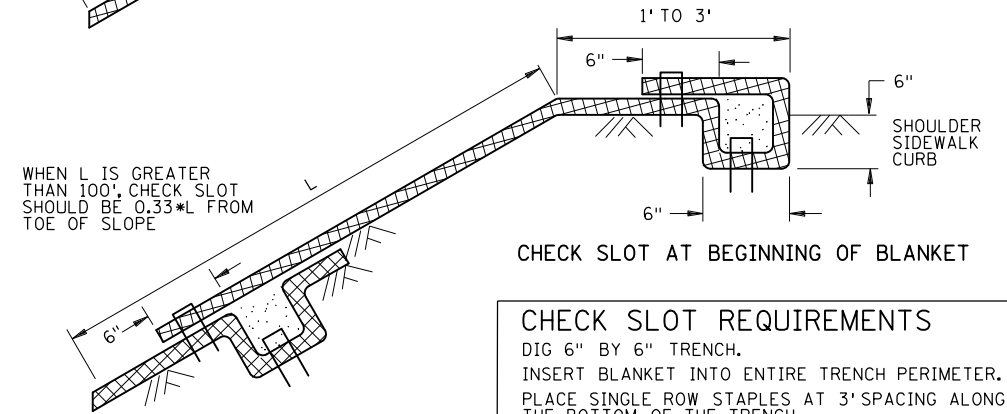
DITCH BLANKET CRITICAL POINTS ⑦

NOTES:

- ① USE CHECK SLOT DETAIL (NO ALTERNATES).
- ② PLACE DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER.
- ③ USE 6" X 6" TRENCH TO PLACE BLANKET. PLACE SINGLE ROW OF STAPLES ON TOP AND TRENCH SIDES AT 12" SPACING. BACKFILL TRENCH WITH SOIL AND TAMP.
- ④ PLACE SINGLE ROW OF STAPLES AT 12" SPACING.
- ⑤ USE STAPLE CHECK FOR CHANNEL SLOPES LESS THAN 2.5%. GRADE AT 100' INTERVALS. PLACE DOUBLE ROW OF STAPLES STAGGERED 4" APART AND AT 4" SPACING.
- ⑥ USE BLANKET CHECKS FOR THE FOLLOWING SLOPES:
2.5%-3% 100' INTERVALS
3%-5% 50' INTERVALS
5%-7% 25' INTERVALS
- ⑦ CRITICAL POINTS SHALL BE SECURED WITH PROPER STAPLE PATTERNS.

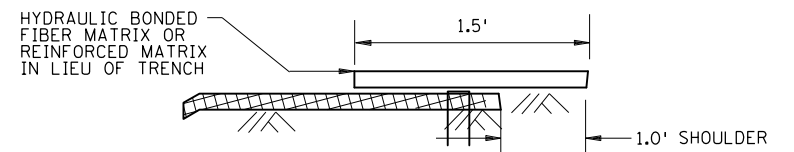


CHECK SLOT WHERE BLANKET CONTINUES



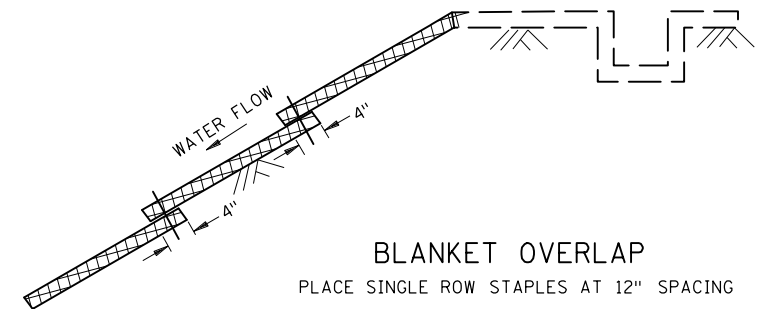
CHECK SLOT AT BEGINNING OF BLANKET

CHECK SLOT REQUIREMENTS
DIG 6" BY 6" TRENCH.
INSERT BLANKET INTO ENTIRE TRENCH PERIMETER.
PLACE SINGLE ROW STAPLES AT 3' SPACING ALONG THE BOTTOM OF THE TRENCH.
BACKFILL TRENCH WITH SOIL AND TAMP.
PLACE SINGLE ROW STAPLES AT 3' SPACING ON OVERLAP.



CHECK SLOT ALTERNATIVE
PLACE SINGLE ROW STAPLES AT 12" SPACING

CHECK SLOT DETAILS



BLANKET OVERLAP
PLACE SINGLE ROW STAPLES AT 12" SPACING

GENERAL BLANKET INSTALLATION REQUIREMENTS
REPP = ROLLED EROSION PREVENTION PRODUCT.
PREPARE SOIL AS PER SPECIFICATION 2574.
LAY PARALLEL OR PERPENDICULAR TO THE DIRECTION OF WATER FLOW.
OVERLAP ADJACENT STRIP EDGES A MINIMUM OF 4".
OVERLAP BLANKET 6" (MINIMUM) AT EACH END. OVERLAP BOTTOM END OF UPPER BLANKET OVER TOP END OF LOWER BLANKET. STAPLE ALONG OVERLAP EVERY 1.5'.
THE UPPERMOST BLANKET OF ALL SLOPE APPLICATIONS MUST START IN A CHECK SLOT. IF SLOPE LENGTH (L) IS 100' OR GREATER, INSERT BLANKET INTO A CHECK SLOT 1/2 FROM THE BOTTOM OF THE SLOPE.

REVISION:
APPROVED: JANUARY 8, 2020 <i>Marni Karnowski</i> MARNI KARNOWSKI CHIEF ENVIRONMENTAL OFFICER



STANDARD PLAN 5-297.404

3 OF 3

Tom Styrbicki
THOMAS STYRBICKI
STATE DESIGN ENGINEER

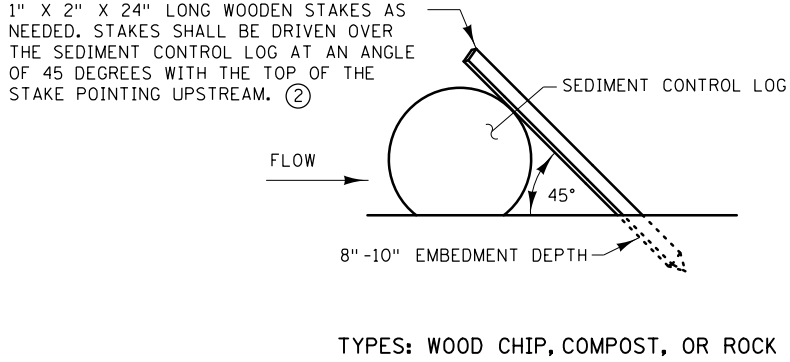
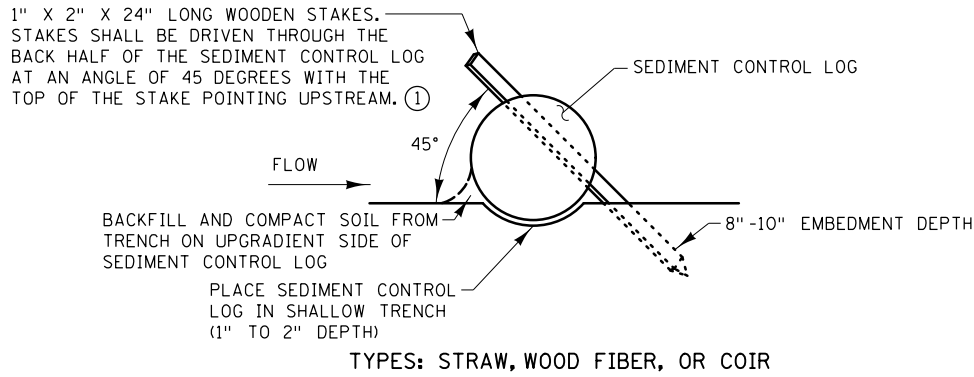
APPROVED: 1-8-2020
REVISED:

SAP 013-630-021 / SAP 225-591-007

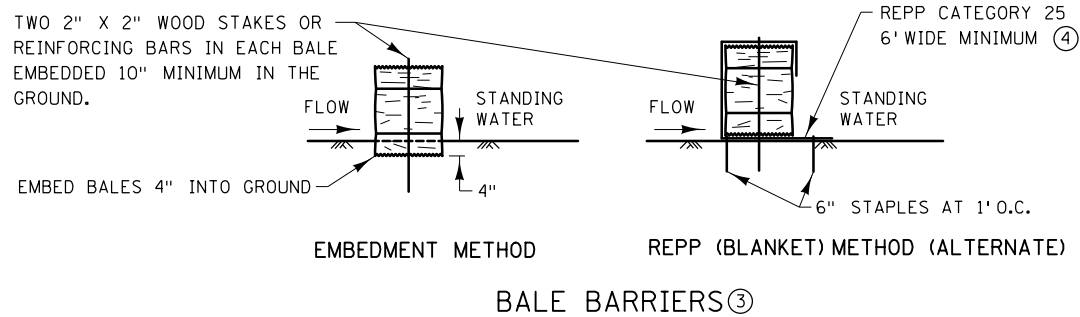
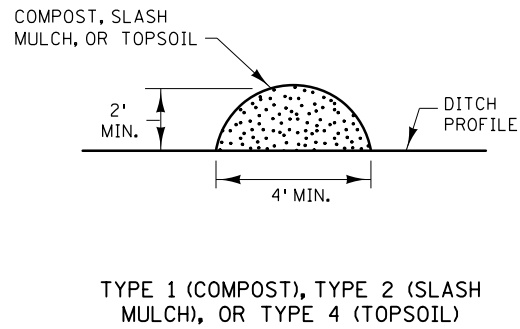
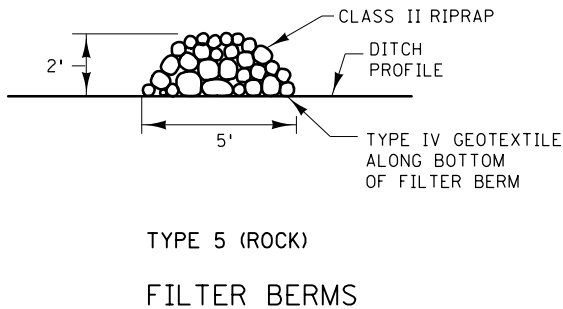
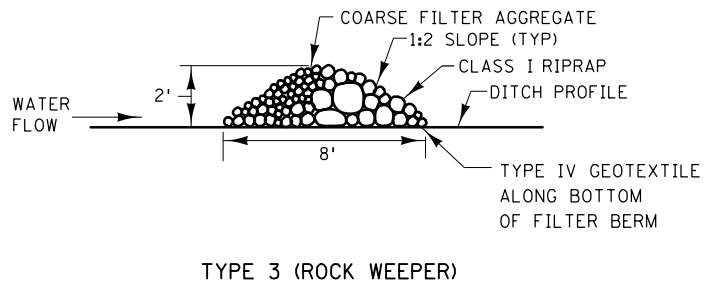
PERMANENT EROSION CONTROL
REPP (BLANKET) STAPLE PATTERN FOR SLOPES

SHEET NO. 64 OF 216

DATE: 9/12/2024 TIME: 2:00:47 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700



SEDIMENT CONTROL LOGS



NOTES:

REPP = ROLLED EROSION PREVENTION PRODUCT.

SEE SPECS. 2573, 3149, 3874, 3882, 3885, 3886, AND 3897.

- ① SPACE BETWEEN STAKES SHALL BE A MAXIMUM OF 1' FOR DITCH CHECKS OR 2' FOR OTHER APPLICATIONS.
- ② PLACE STAKES AS NEEDED TO PREVENT MOVEMENT OF SEDIMENT CONTROL LOGS PLACED ON SLOPES OR AS NEEDED DUE TO OTHER FACTORS. STAKES SHALL BE INCIDENTAL.
- ③ TO BE USED FOR CRITICAL PERIMETER CONTROL AREAS WHERE STANDING WATER OCCURS (6" MAXIMUM DEPTH). BALES SHALL CONSIST OF TYPE 1 MULCH OF APPROXIMATELY 14" X 18" X 36" LONG. BALES SHALL BE PLACED ON EDGE AND BUTTED TIGHT TO ADJACENT BALES.
- ④ INSTEAD OF TRENCHING, PLACE BALE ON THE REPP (BLANKET) AND WRAP BLANKET AROUND THE BALE. PLACE STAKE THROUGH BALE AND BLANKET.

REVISION:

APPROVED: JANUARY 8, 2020

Marni Karnowski

MARNI KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER



STANDARD PLAN 5-297.405

2 OF 8

Thomas Styrbicki
THOMAS STYRBICKI
STATE DESIGN ENGINEER

APPROVED: 1-8-2020
REVISED:

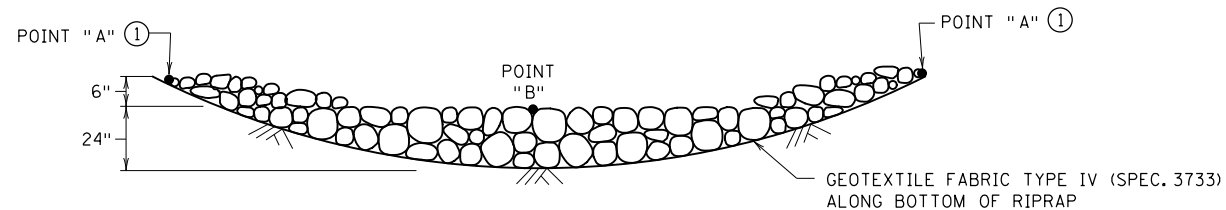
SAP 013-630-021 / SAP 225-591-007

TEMPORARY SEDIMENT CONTROL

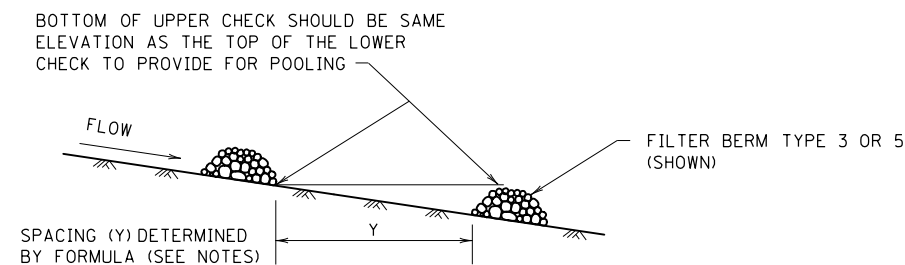
FILTER BERMS, SEDIMENT CONTROL LOGS, AND BALE BARRIERS

SHEET NO. 65 OF 216

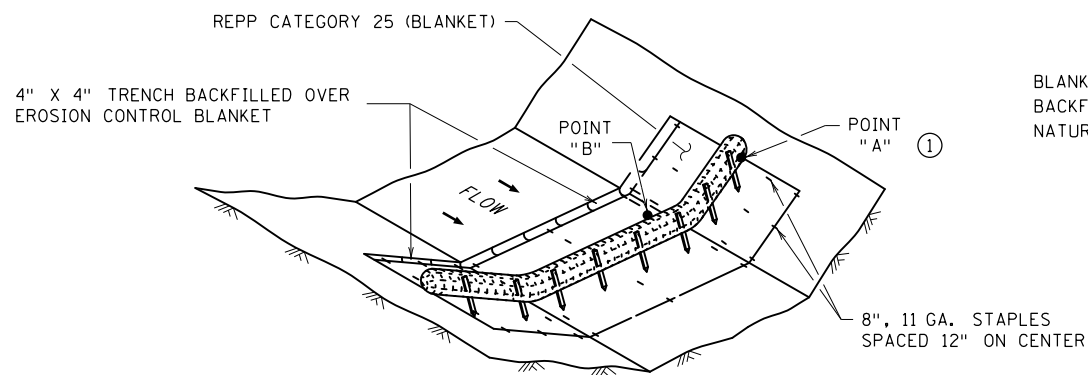
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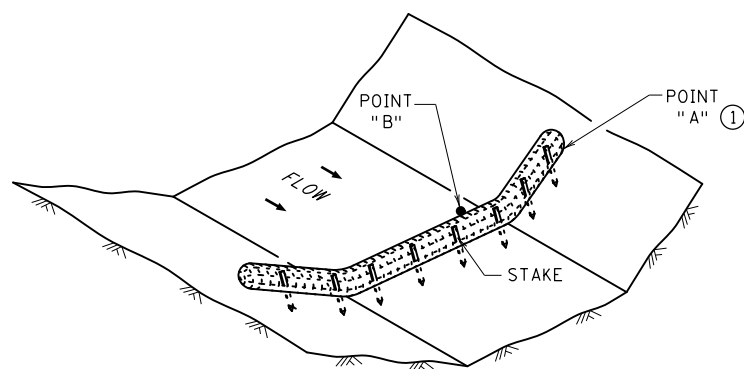
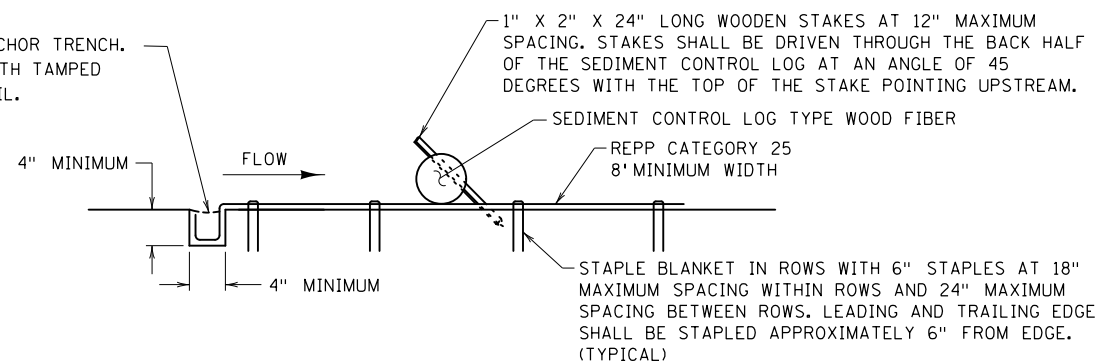
ROCK DITCH CHECKS
 FILTER BERMS TYPE 3 (ROCK WEEPER) OR FILTER TYPE 5 (ROCK) ③
 FOR USE ON ROUGH-GRADED AREAS
 ONLY FOR USE OUTSIDE CLEAR ZONE ②



DITCH CHECK SPACING
 FOR ALL FILTER BERM TYPES



SEDIMENT CONTROL LOG TYPE REPP (BLANKET) SYSTEM ④



SEDIMENT CONTROL LOG TYPE WOOD FIBER, OR TYPE COMPOST ⑤
 FOR USE ON ROUGH GRADED AREAS

NOTES:

REPP = ROLLED EROSION PREVENTION PRODUCT.

SEE SPECS. 2573, 3601, 3733, 3885, 3886 & 3889.

FOR DITCH CHECKS, PLACE SEDIMENT CONTROL LOG PERPENDICULAR TO FLOW AND IN A CRESCENT SHAPE WITH THE ENDS FACING UPSTREAM.

APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{DITCH CHECK HEIGHT (FT.)}}{\% \text{ CHANNEL SLOPE}} \times 100$$

- ① POINT "A" MUST BE A MINIMUM OF 6" HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.
- ② ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE ARE TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.
- ③ DITCH GRADE 3% - 5%, MAX. FLOW VELOCITY 12 FT./SEC.
- ④ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 4.5 FT./SEC.
- ⑤ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 1.5 FT./SEC.

DATE: 9/12/2024 TIME: 2:00:47 PM
 FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700

REVISION:
 APPROVED: JANUARY 8, 2020
 Marni Karnowski
 MARNI KARNOWSKI
 CHIEF ENVIRONMENTAL OFFICER

m
 MINNESOTA
 DEPARTMENT
 OF
 TRANSPORTATION

STANDARD PLAN 5-297.405

3 OF 8

THOMAS STYRBICKI
 STATE DESIGN ENGINEER

APPROVED: 1-8-2020
 REVISED:

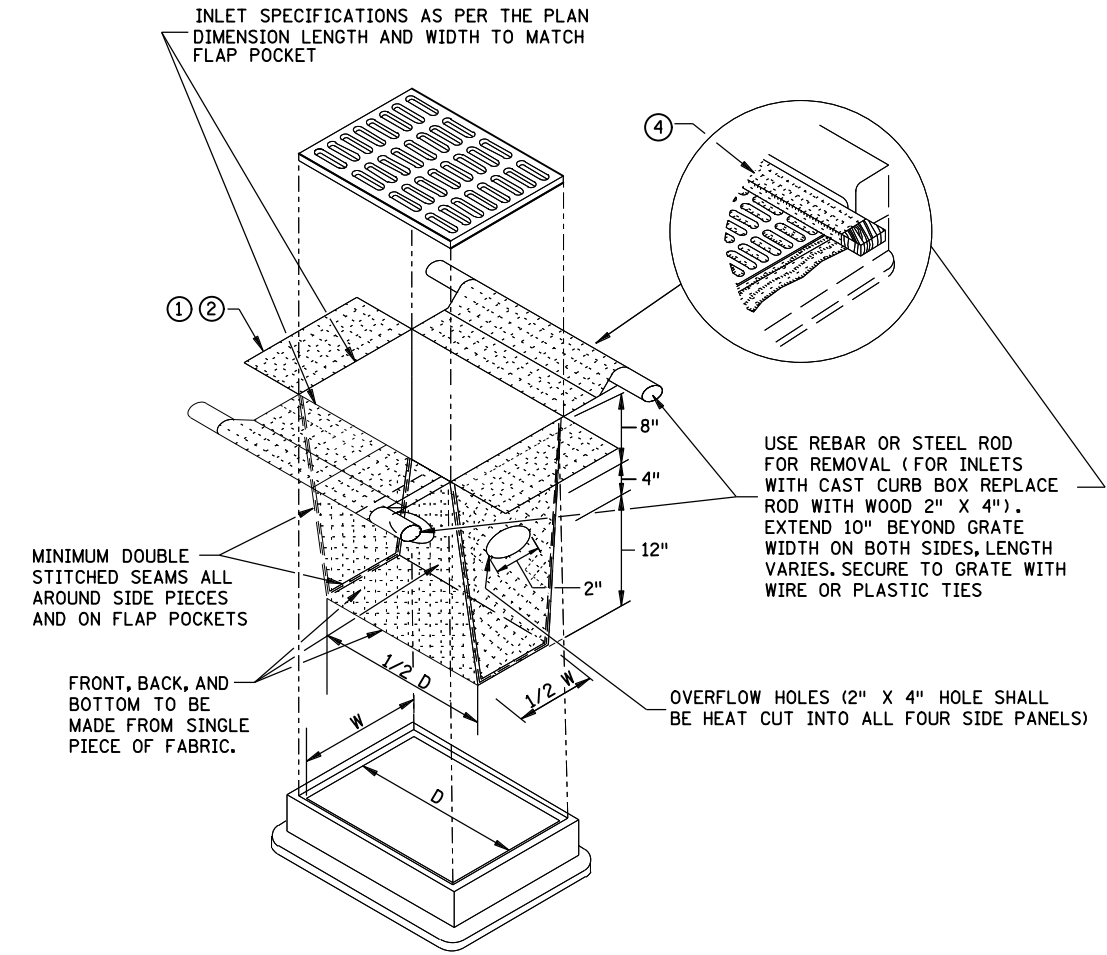
SAP 013-630-021 / SAP 225-591-007

TEMPORARY SEDIMENT CONTROL
 DITCH CHECK

SHEET NO. 66 OF 216

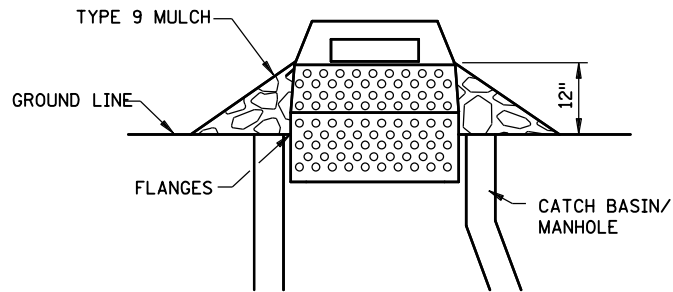
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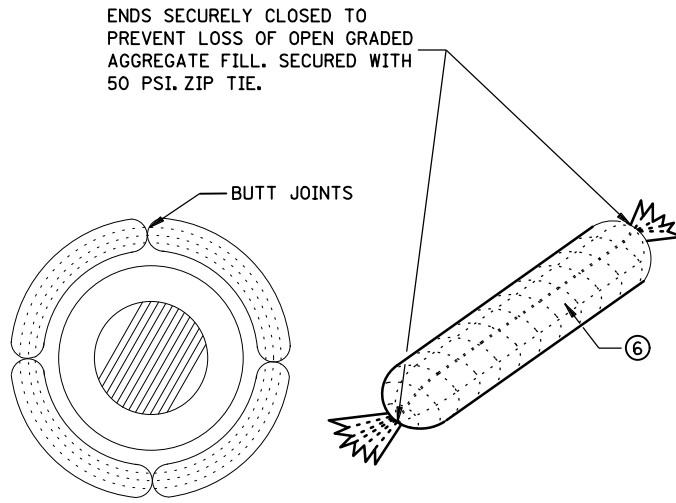
FILTER BAG INSERT ③

(CAN BE INSTALLED IN ANY INLET TYPE
WITH OR WITHOUT A CURB BOX)

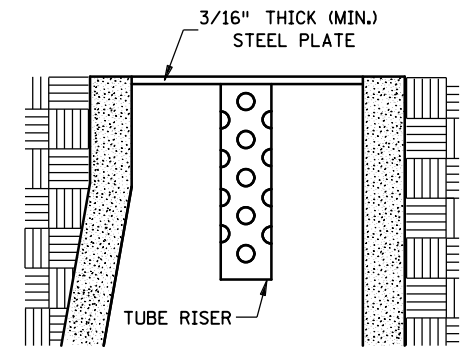
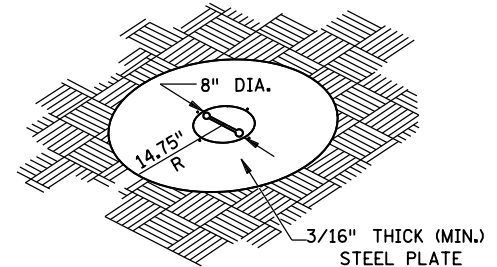
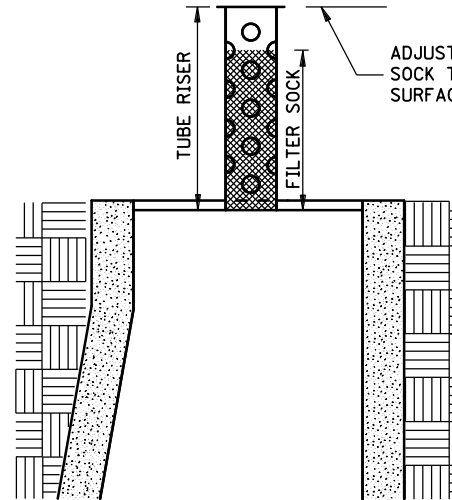
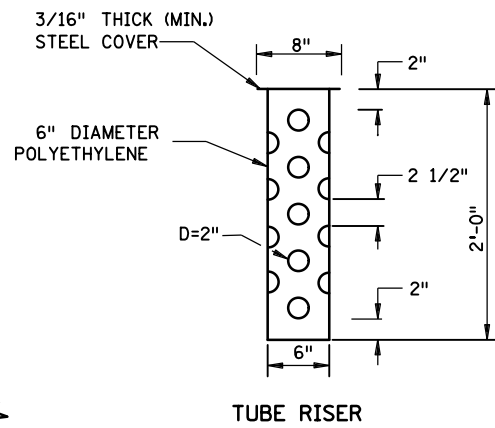


SEDIMENT CONTROL INLET HAT

NOTE:
THE SEDIMENT CONTROL BARRIER SHALL BE A METAL
OR PLASTIC/POLYETHYLENE RISER SIZED TO FIT INSIDE
THE CATCH BASIN/MANHOLE; HAVE PERFORATIONS TO ALLOW
FOR WATER INFILTRATION; HAVE AN OVERFLOW OPENING,
FLANGES AND A LID/COVER.



ROCK LOG/COMPOST LOG



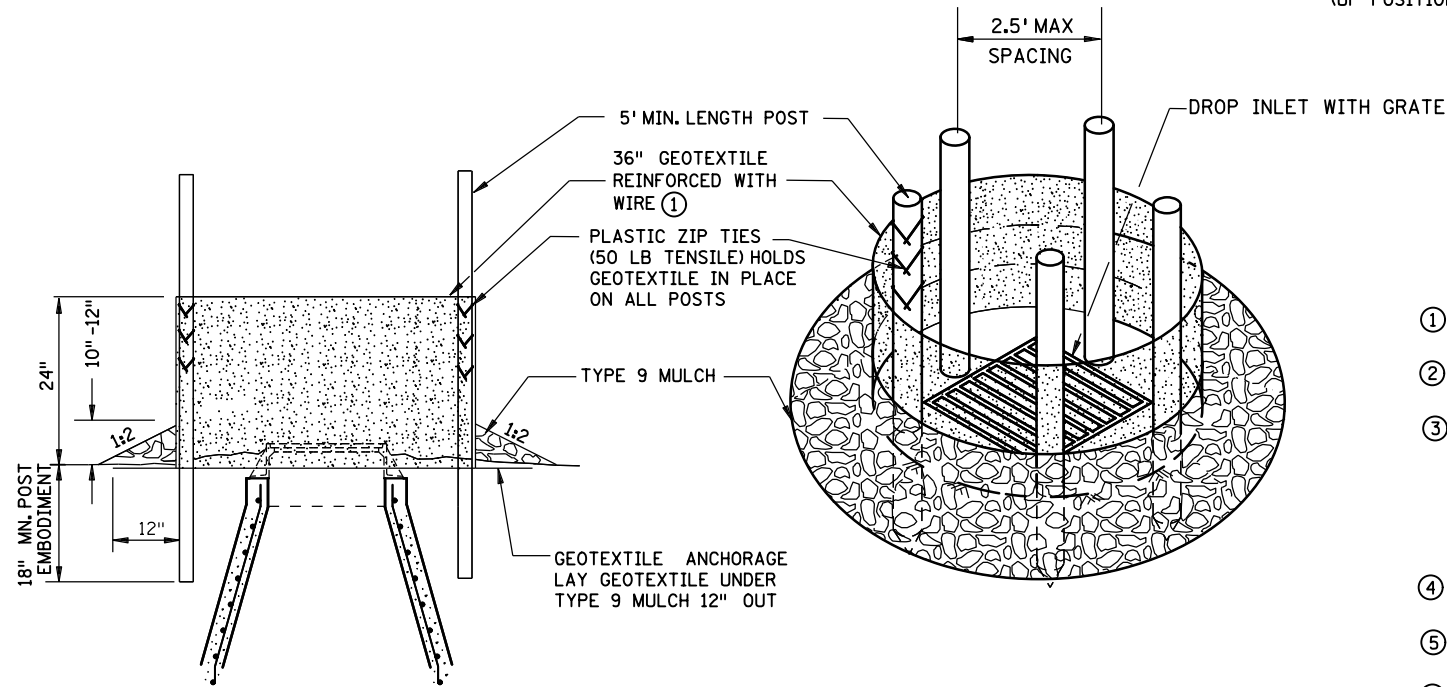
POP-UP HEAD

NOTES:

SEE SPECS. 2573, 3137, & 3886.

DEVICES MUST BE ADJUSTED ACCORDINGLY AS TO NOT CAUSE FLOODING ON ROADWAY
THAT WOULD IMPEDE TRAFFIC FLOW.

- ① ALL GEOTEXTILE USED FOR INLET PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886.
- ② FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED SHALL EXTEND A MINIMUM OF 10 INCHES AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- ③ INSTALLATION NOTES:
DO NOT PLACE FILTER BAG INSERT IN INLETS SHALLOWER THAN 30 INCHES, MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. THE PLACED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE OF 3 INCHES BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES. WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3 INCH SIDE CLEARANCE.
- ④ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2 INCH X 4 INCH OR USE A ROCK SOCK OR SAND BAGS IN PLACE OF THE FLAP POCKETS.
- ⑤ SOCK HEIGHT MUST NOT BE SO HIGH AS TO SLOW DOWN WATER FILTRATION TO CAUSE FLOODING OF THE ROADWAY.
- ⑥ GEOTEXTILE SOCK BETWEEN 4-10 FEET LONG AND 4-6 INCH DIAMETER. SEAM TO BE JOINED BY TWO ROWS OF STITCHING WITH A PLASTIC MESH BACKING OR PROVIDE A HEAT BONDED SEAM (OR APPROVED EQUIVALENT). FILL ROCK LOG WITH OPEN GRADED AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF COARSE AGGREGATE CONFORMING TO SPEC. 3137 TABLE 3137-1; CA-3 GRADATION.



SILT FENCE RING AND ROCK FILTER BERM

USE WHERE INLET DRAINS IN AN AREA WITH SLOPES AT 1:3 OR LESS

REVISIONS:

APPROVED: 2-28-2017

Chief Environmental Officer



STANDARD PLAN 5-297.405

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APPROVED: 2-28-2017
REVISED:

STATE DESIGN ENGINEER

SAP 013-630-021 / SAP 225-591-007

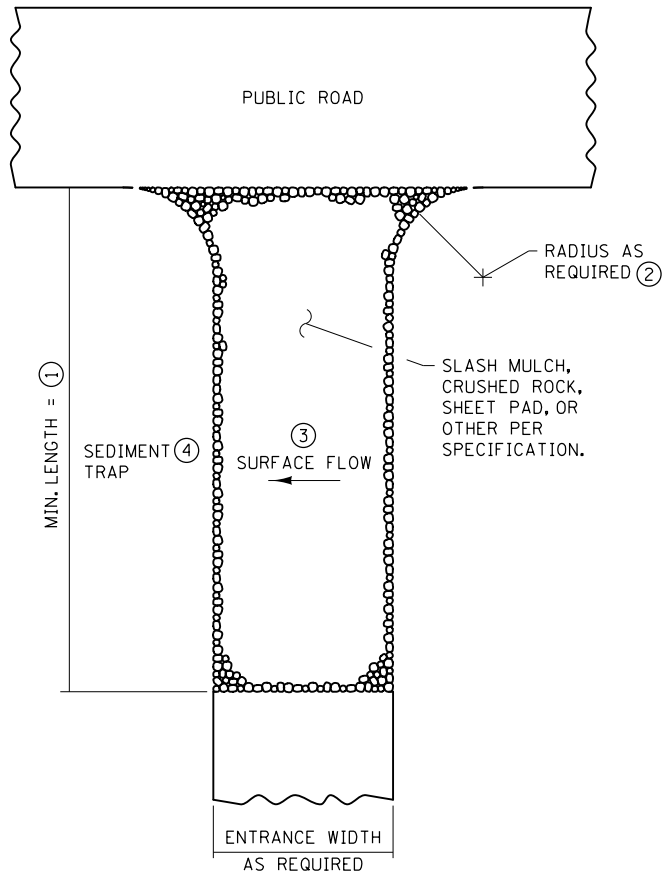
TEMPORARY SEDIMENT CONTROL

STORM DRAIN INLET PROTECTION

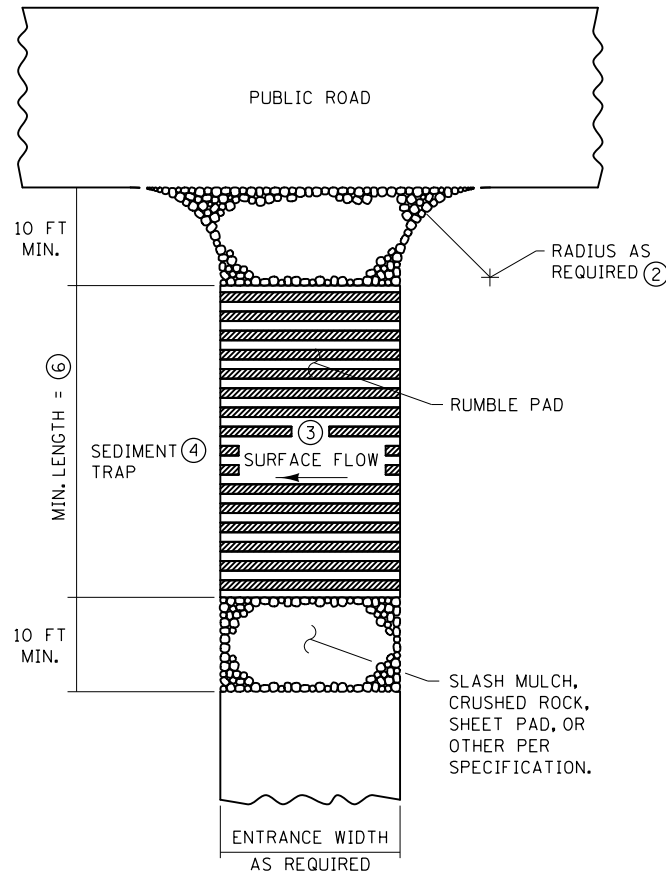
SHEET NO. 67 OF 216

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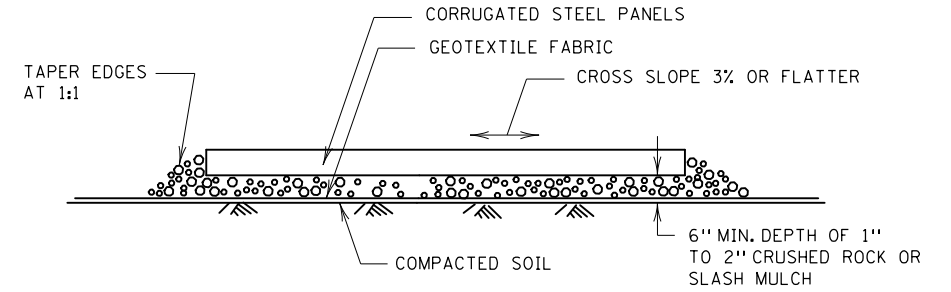
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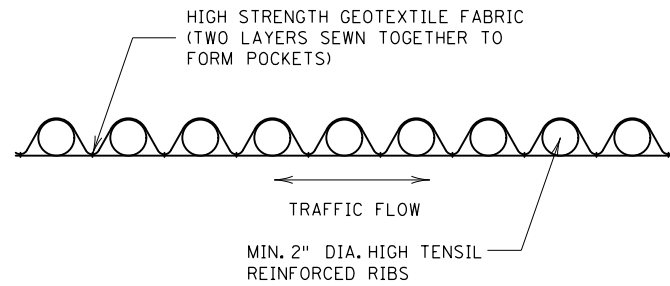
SLASH MULCH, CRUSHED ROCK, OR SHEET
PAD CONSTRUCTION EXIT 5 7



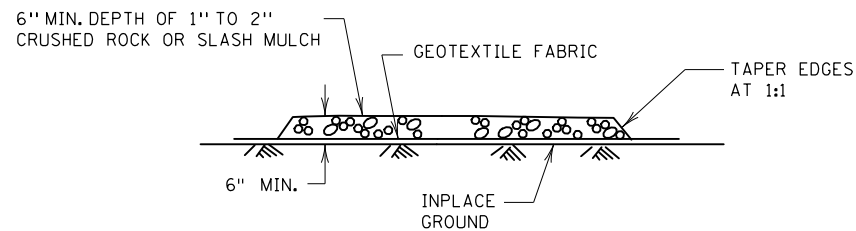
RUMBLE PAD
CONSTRUCTION EXIT 5 7



RUMBLE PAD



SHEET PAD



SLASH MULCH OR CRUSHED ROCK

NOTES:

SEE SPECS. 2573 & 3882.

- 1 MINIMUM LENGTH SHALL BE THE GREATER OF 50 FEET OR A LENGTH SUFFICIENT TO ALLOW A MINIMUM OF 5 TIRE ROTATIONS ON THE PROVIDED PAD. MINIMUM LENGTH SHALL BE CALCULATED USING THE LARGEST TIRE WHICH WILL BE USED IN TYPICAL OPERATIONS.
- 2 PROVIDE RADIUS OR WIDEN PAD SUFFICIENTLY TO PREVENT VEHICLE TIRES FROM TRACKING OFF OF PAD WHEN LEAVING SITE.
- 3 IF RUNOFF FROM DISTURBED AREAS FLOWS TOWARD CONSTRUCTION EXITS, PREVENT RUNOFF FROM DRAINING DIRECTLY TO PUBLIC ROAD OVER CONSTRUCTION EXIT BY CROWNING THE EXIT OR SLOPING TO ONE SIDE. IF SURFACE GRADING IS INSUFFICIENT, PROVIDE OTHER MEANS OF INTERCEPTING RUNOFF.
- 4 IF RUNOFF FROM CONSTRUCTION EXITS WILL DRAIN OFF OF PROJECT SITE, PROVIDE SEDIMENT TRAP WITH STABILIZED OVERFLOW.
- 5 IF A TIRE WASH OFF IS REQUIRED THE CONSTRUCTION EXITS SHALL BE GRADED TO DRAIN THE WASH WATER TO A SEDIMENT TRAP.
- 6 MINIMUM LENGTH OF RUMBLE PAD SHALL BE 20 FEET, OR AS REQUIRED TO REMOVE SEDIMENT FROM TIRES. IF SIGNIFICANT SEDIMENT IS TRACKED FROM THE SITE, THE RUMBLE PAD SHALL BE LENGTHENED OR THE DESIGN MODIFIED TO PROVIDE ADDITIONAL VIBRATION. WASH-OFF LENGTH SHALL BE AS REQUIRED TO EFFECTIVELY REMOVE CONSTRUCTION SEDIMENT FROM VEHICLE TIRES.
- 7 MAINTENANCE OF CONSTRUCTION EXITS SHALL OCCUR WHEN THE EFFECTIVENESS OF SEDIMENT REMOVAL HAS BEEN REDUCED. MAINTENANCE SHALL CONSIST OF REMOVING SEDIMENT AND CLEANING THE MATERIALS OR PLACING ADDITIONAL MATERIAL (SLASH MULCH OR CRUSHED ROCK) OVER SEDIMENT FILLED MATERIAL TO RESTORE EFFECTIVENESS.



STANDARD PLAN 5-297.405

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APPROVED: 2-28-2017
REVISED:

Tom S. [Signature]
STATE DESIGN ENGINEER

SAP 013-630-021 / SAP 225-591-007

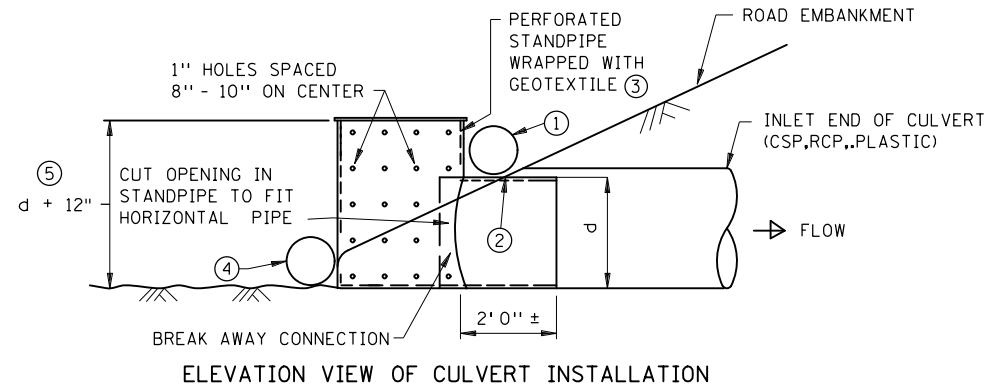
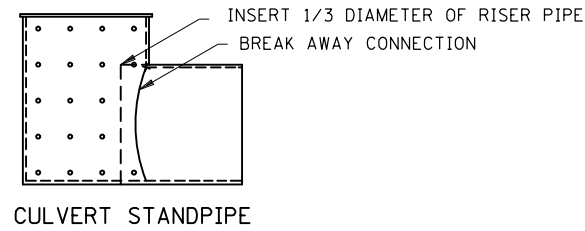
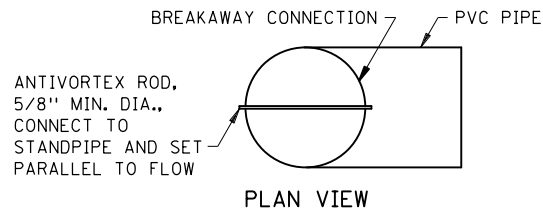
TEMPORARY SEDIMENT CONTROL
STABILIZED CONSTRUCTION EXIT

SHEET NO. 68 OF 216

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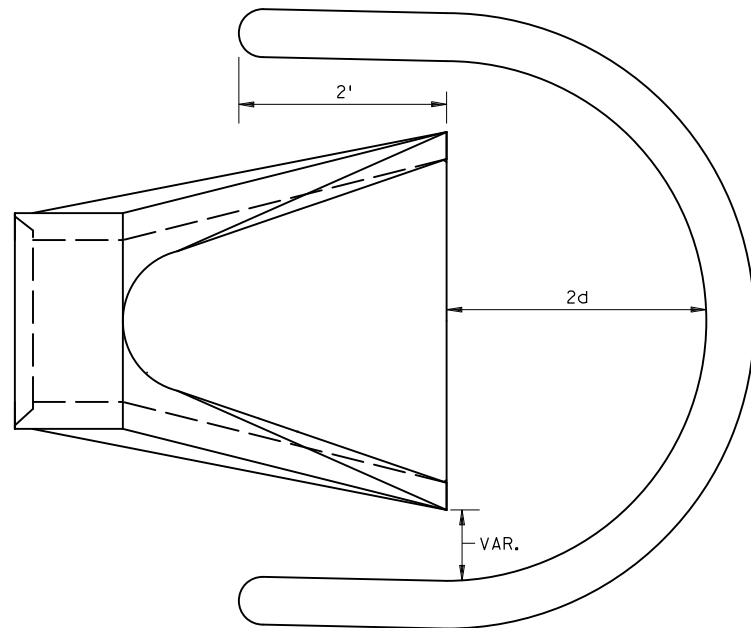
REVISIONS:
APPROVED: 2-28-2017
[Signature]
CHIEF ENVIRONMENTAL OFFICER

DATE: 9/12/2024 TIME: 2:00:50 PM
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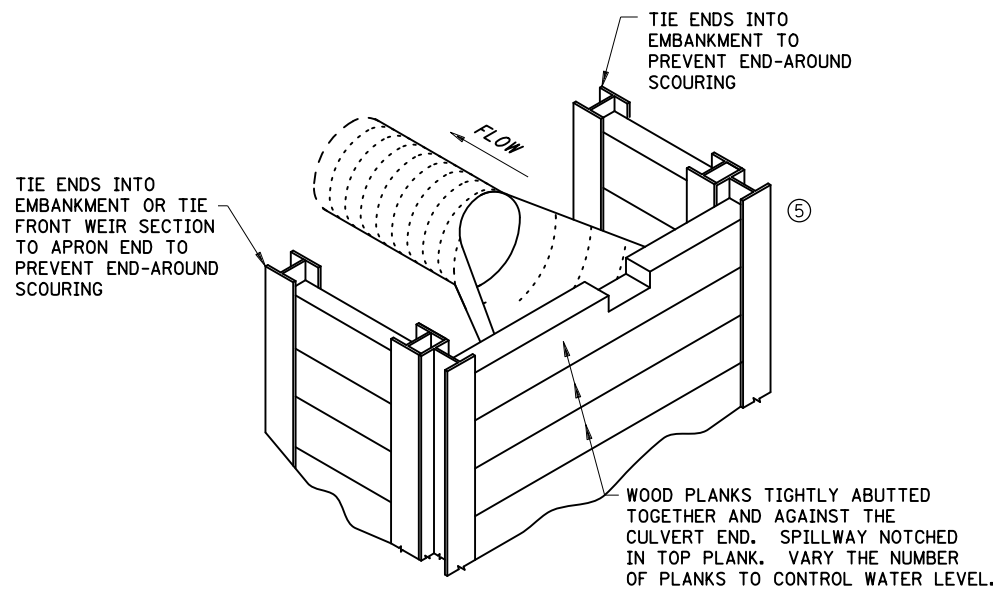
CULVERT STANDPIPE INSERT (D-RISER)

d = CULVERT SIZE: 12" - 36"

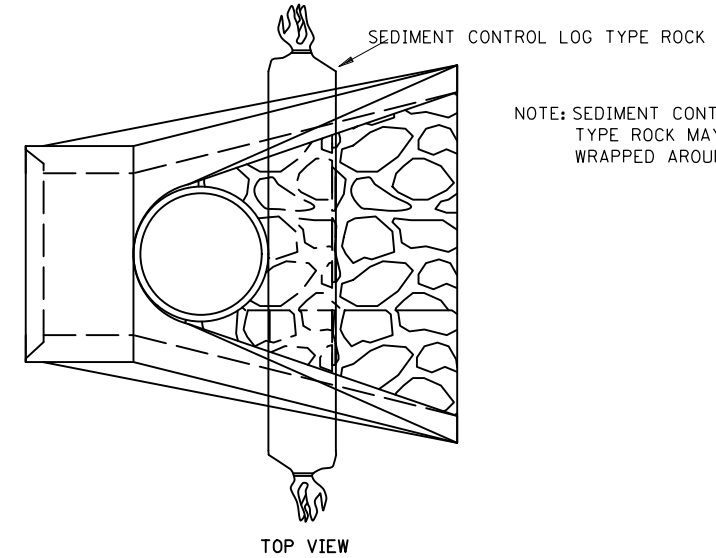
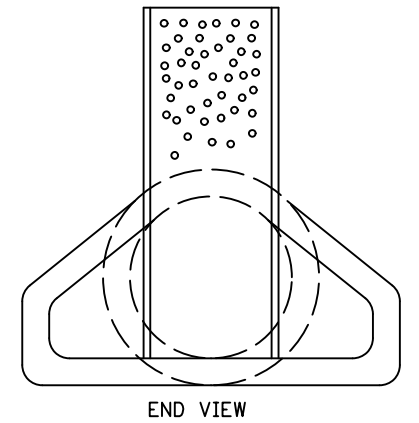
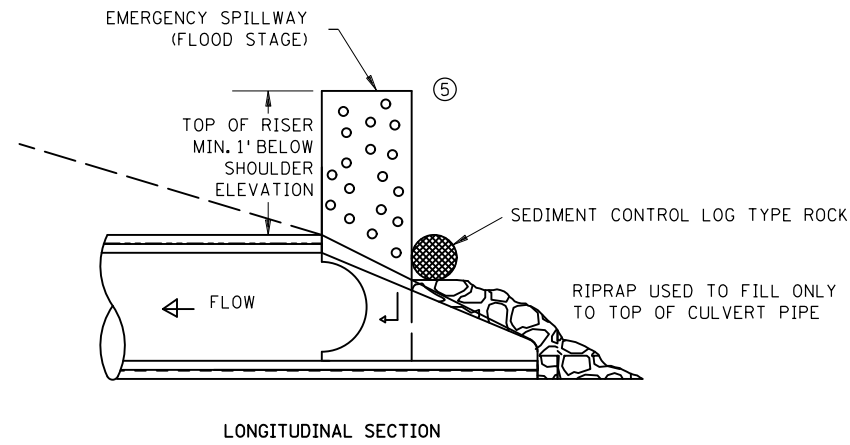


SEDIMENT CONTROL LOG WEIR (COMPOST, WOOD CHIP, OR ROCK)

d = CULVERT SIZE: 12" - 36"



WOOD PLANK WEIR



CULVERT STANDPIPE INSERT (D-RISER)

NOTE: SEDIMENT CONTROL LOG
TYPE ROCK MAY BE
WRAPPED AROUND RISER

NOTES:

SEE SPECS. 2573, 3891 & 3893.

FOR USE WHEN TEMPORARY PONDING IS NEEDED IN DITCH
SECTIONS FOR SEDIMENT CONTROL.

MANUFACTURED ALTERNATIVES LISTED ON MnDOT'S
APPROVED PRODUCTS LIST MAY BE SUBSTITUTED AT
NO ADDITIONAL COST.

- ① ROCK LOG OR SANDBAG TO HOLD STANDPIPE AND ACT
AS A SEAL BETWEEN RISER PIPE AND CULVERT.
- ② PLACE CULVERT APRON AND SLIDE TEMPORARY STANDPIPE
INTO CSP OR RCP CULVERT.
- ③ ALL GEOTEXTILE USED FOR CULVERT PROTECTION SHALL BE
MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886
FOR MACHINE SLICED.
- ④ ROCK LOG OR RIP RAP TO HOLD STANDPIPE AND ACT
AS A FILTER BETWEEN RISER PIPE AND CULVERT.
- ⑤ HEIGHT OVERFLOW NOT TO CAUSE FLOODING OF ROAD OR
ADJACENT PROPERTIES.

REVISION:

APPROVED: 2-28-2017

[Signature]
CHIEF ENVIRONMENTAL OFFICER



STANDARD PLAN 5-297.405

8 OF 8

[Signature]
STATE DESIGN ENGINEER

APPROVED: 2-28-2017
REVISED:

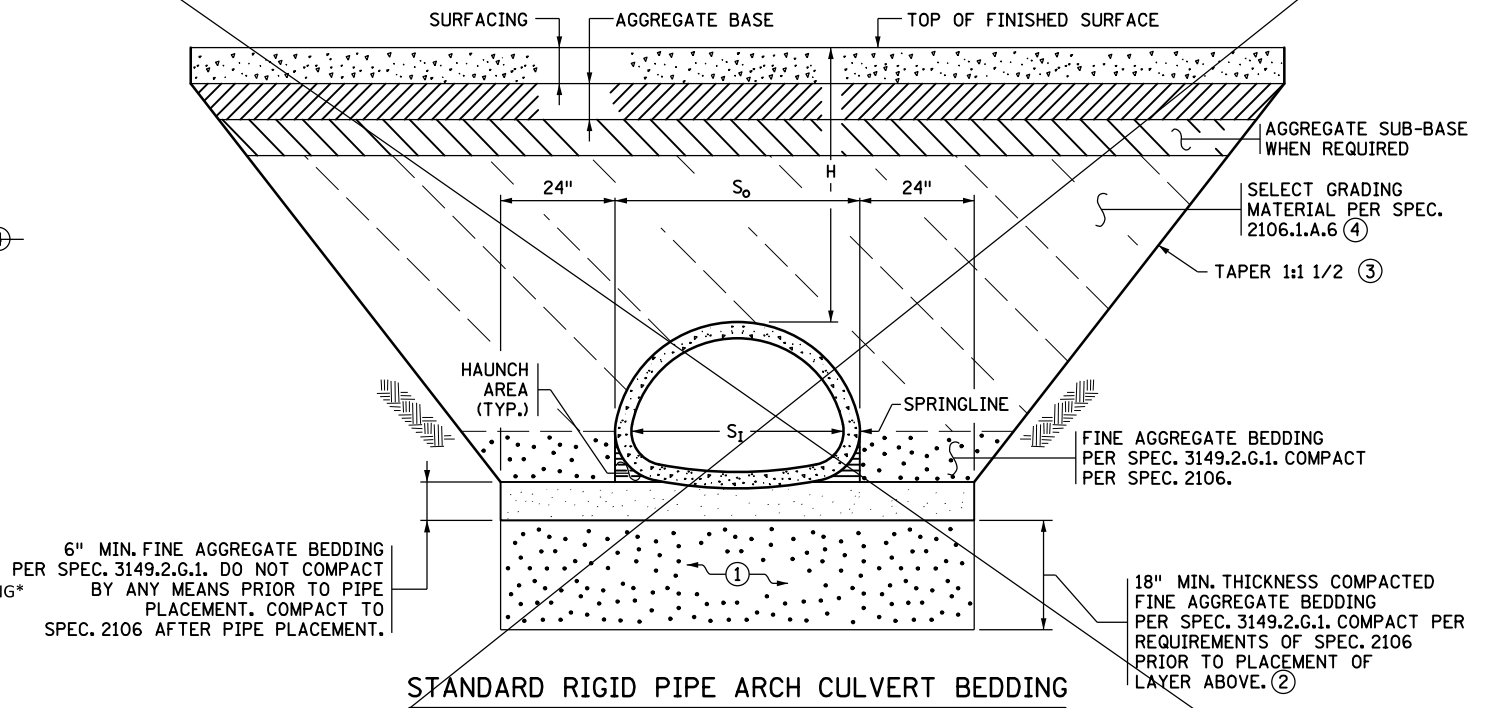
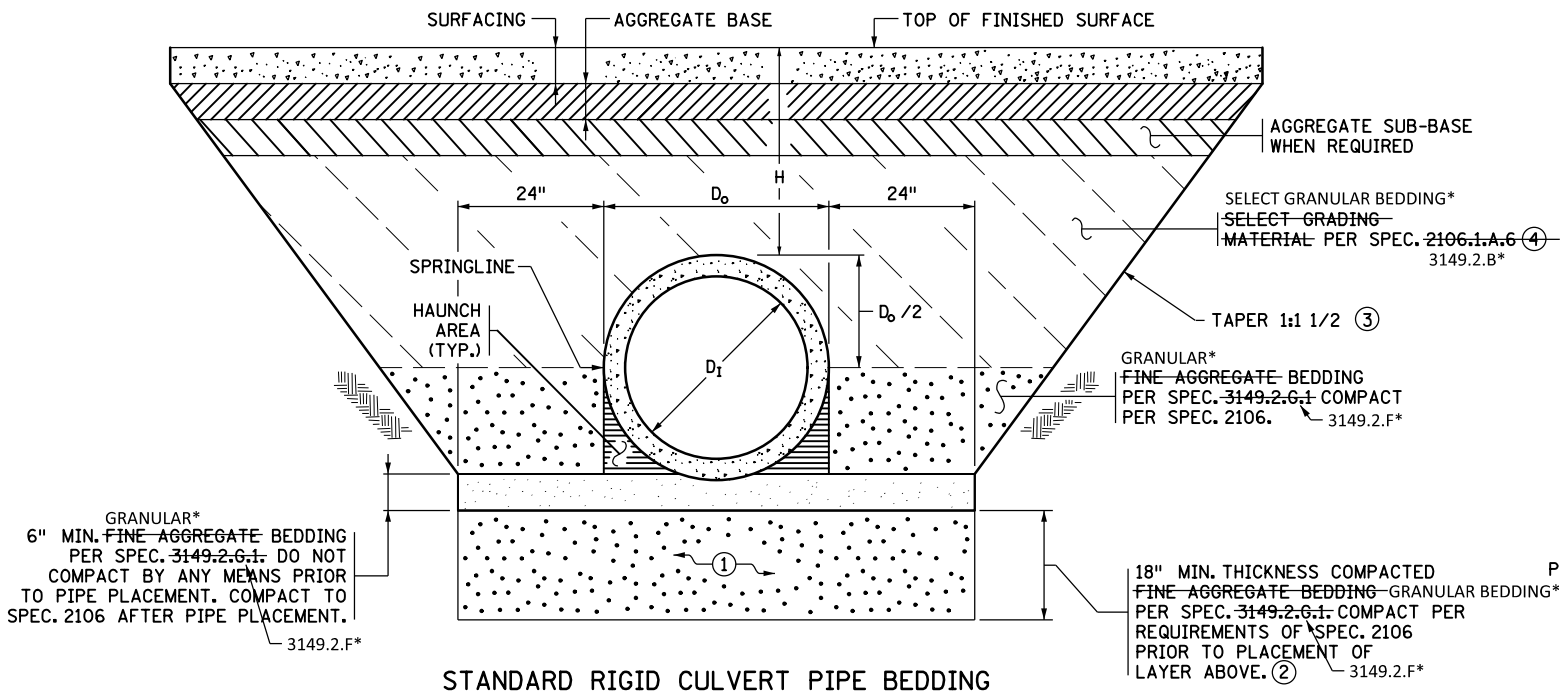
SAP 013-630-021 / SAP 225-591-007

TEMPORARY SEDIMENT CONTROL CULVERT END CONTROLS

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DATE: 9/12/2024 TIME: 2:00:51 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700



-LEGEND-

- D_i = INSIDE DIAMETER OF ROUND PIPE (INCHES).
D_o = OUTSIDE DIAMETER OF ROUND PIPE (INCHES).
S_i = INSIDE SPAN OF PIPE-ARCH (INCHES).
S_o = OUTSIDE SPAN OF PIPE-ARCH (INCHES).
H = FILL COVER HEIGHT OVER PIPE (FEET).
= UNDISTURBED SOIL
= COMPACTED BEDDING
= LOOSE BEDDING, COMPACTED AFTER PIPE PLACEMENT

NOTES

- STANDARD BEDDING FOR RIGID PIPE CULVERTS WITHOUT TREATMENTS.
RIGID PIPE INCLUDES CONCRETE.
ENTRANCE CULVERTS (FIELD AND DRIVEWAY CULVERTS) DO NOT NEED BEDDING UNLESS SPECIFIED IN THE PLANS OR SPECIAL PROVISIONS.
UNLESS OTHERWISE NOTED IN THE PLAN, BEDDING QUANTITIES ARE COMPUTED FOR THE FULL LENGTH OF THE PIPE AND APRON, AND WILL NOT BE ADJUSTED FOR CHANGES TO MEET OSHA REQUIREMENTS.
WHEN RIPRAP IS REQUIRED AT THE APRON END, SEE STANDARD PLATE OR PLAN FOR RIPRAP INSTALLATION AND QUANTITIES. FOR APRONS WITHOUT RIPRAP PLACE 6" MIN. FINE AGGREGATE BEDDING UNDER APRONS. USE A TRENCH WIDTH EQUAL TO THE PIPE TRENCH WIDTH.
CONTRACT PAY ITEM FOR FINE AGGREGATE BEDDING INCLUDES THE COST OF EXCAVATION, PLACEMENT AND COMPACTION.
EXCAVATION AND BACKFILL WITH SELECT GRADING MATERIAL ARE NOT TABULATED SEPARATELY BUT ARE INCLUDED IN THE CONTRACT UNIT PRICE OF THE RELEVANT CULVERT PAY ITEM.
EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.
ALL SLOPES SHOWN AS (V):(H).
PIPE SIZE IS BASED ON THE NOMINAL INSIDE DIAMETER OR SPAN.
PROTECT ALL PIPE DURING CONSTRUCTION PER SPEC. 2501.
PLACE MULTIPLE PIPE CULVERTS WITH A CLEARANCE OF 24 INCHES OR GREATER BETWEEN STRINGS OF PIPE.
① IF APPROVED BY THE ENGINEER, IN WET CONDITIONS THE CONTRACTOR MAY SUBSTITUTE 18" OF COARSE FILTER AGGREGATE PER SPEC. 3149.2.H COMPACTED TO THE QUALITY COMPACTION REQUIREMENTS OF SPEC. 2106. WRAP WITH GEOTEXTILE FABRIC TYPE IV PER SPEC. 3733. SEAM ALL FABRIC SIDES AND ENDS PER SPEC. TABLE 3733-1 INCLUDING FOOTNOTE (e) OR OVERLAP A MINIMUM OF 3 FT., ALL AT NO ADDITIONAL COST. ALL WORK AND MATERIAL SHALL BE INCLUDED PER PAY ITEM "COARSE AGGREGATE BEDDING (CY)".*
② FOR INSTALLATIONS ON INTACT BEDROCK, OMIT THIS LAYER.
③ OVER-EXCAVATION BENEATH TAPERS IS NOT PERMITTED UNLESS REQUIRED BY OSHA. (TYP.)
④ MAXIMUM EMBANKMENT PARTICLE SIZE WITHIN 2 FT. OF RIGID PIPE IS 3".

CONSTRUCTION SEQUENCE

1. PLACE AND COMPACT 18" OF ~~FINE AGGREGATE BEDDING~~ ^{GRANULAR*} TO THE REQUIREMENTS OF SPEC. 2106. 3149.2.F*
2. LOOSELY PLACE 6" OF ~~FINE AGGREGATE BEDDING MATERIAL~~ ^{GRANULAR*} (SPEC. 3149.2.G.1) TO GRADE. DO NOT COMPACT PRIOR TO PIPE PLACEMENT.
3. FOR PIPES WITH BELL, REMOVE MATERIAL IN BELL AREA PRIOR TO PLACEMENT.
4. FURNISH AND INSTALL PIPE TO GRADE.
5. AFTER PLACEMENT OF THE PIPE, PLACE ADDITIONAL BEDDING AND COMPACT THE FULL LENGTH ON BOTH SIDES OF THE PIPE UNDERNEATH THE HAUNCH AREA BY FIRST SHOVEL SLICING (MANUALLY SHOVE THE BLADE END OF A SHOVEL AT AN ANGLE DOWN THE ENTIRE LENGTH OF THE PIPE IN THE HAUNCH AREA) THEN COMPACT THE HAUNCH AT AN ANGLE USING A POWERED MECHANICAL OR PNEUMATIC DEVICE (I.E. POLE TAMPER, JUMPING JACK, OR SIMILAR).
6. COMPACT THE REMAINING MATERIAL OUTSIDE THE HAUNCH AREA TO THE REQUIREMENTS OF SPEC. 2106 ENSURING THAT THE ENTIRE LENGTH OF PIPE IS SUPPORTED UNIFORMLY BY BEDDING.
7. PLACE AND COMPACT BACKFILL EVENLY AND SIMULTANEOUSLY IN 6" LIFTS ON EACH SIDE OF THE PIPE UP TO THE SPRINGLINE WHEN COMPACTED.
8. COMPLETE REMAINING BACKFILL.

REVISION:
APPROVED: JANUARY 18, 2019
Kevin Weston
STATE BRIDGE ENGINEER

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.

SIGNED *Nicholas E. Hentges*
LICENSED PROFESSIONAL ENGINEER
NAME: NICHOLAS E. HENTGES, PE

DATE 9/12/2024
LIC NO. 44620



STANDARD PLAN 5-297.441

1 OF 1

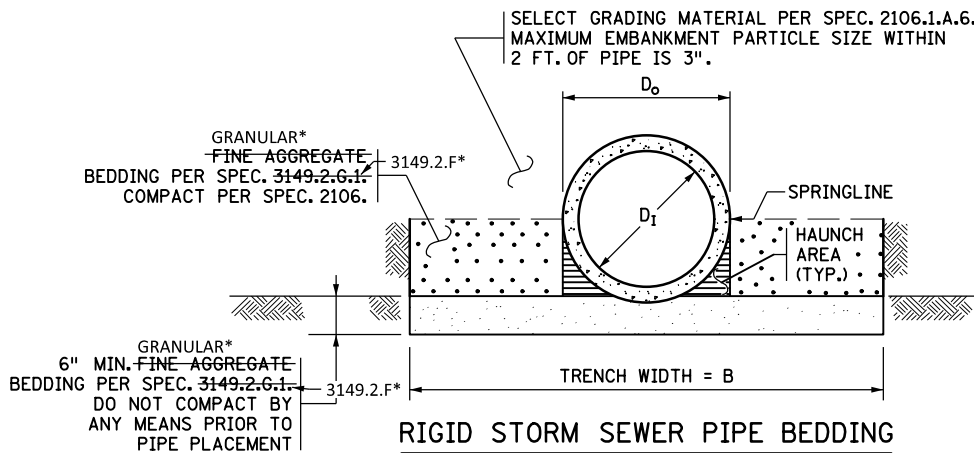
APPROVED: 01-18-2019
REVISED:

SAP 013-630-021 / SAP 225-591-007

STANDARD CULVERT BEDDING FOR RIGID PIPE
(WITHOUT TREATMENTS)

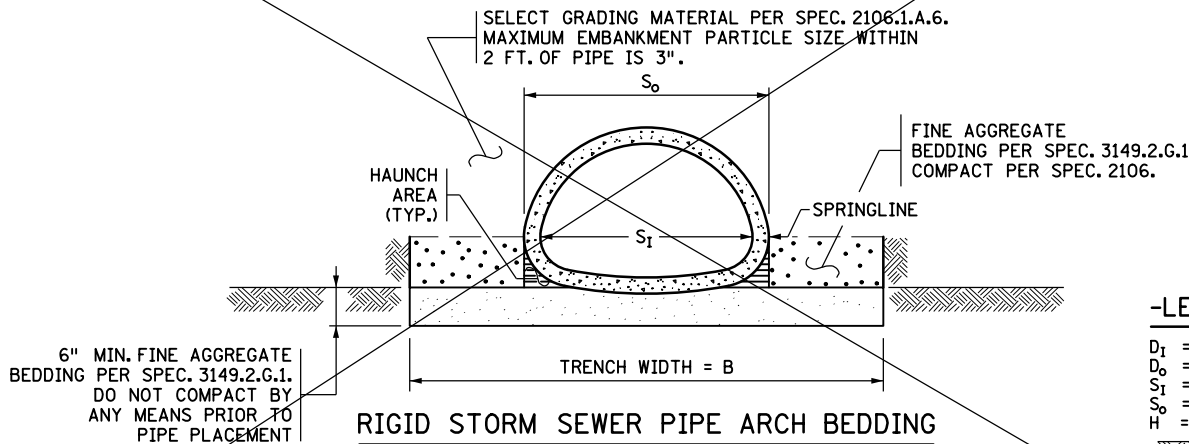
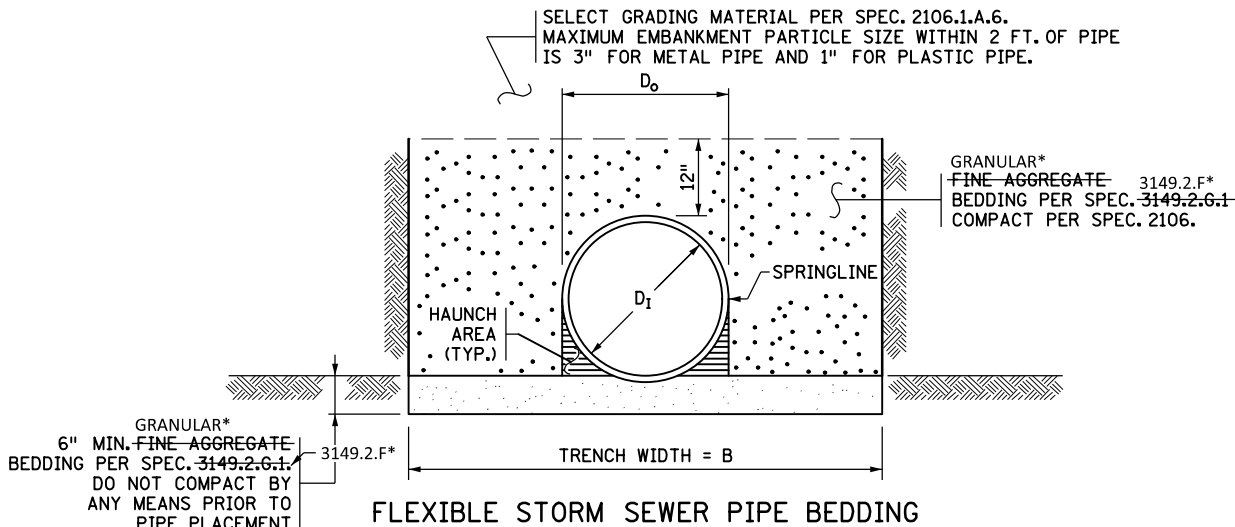
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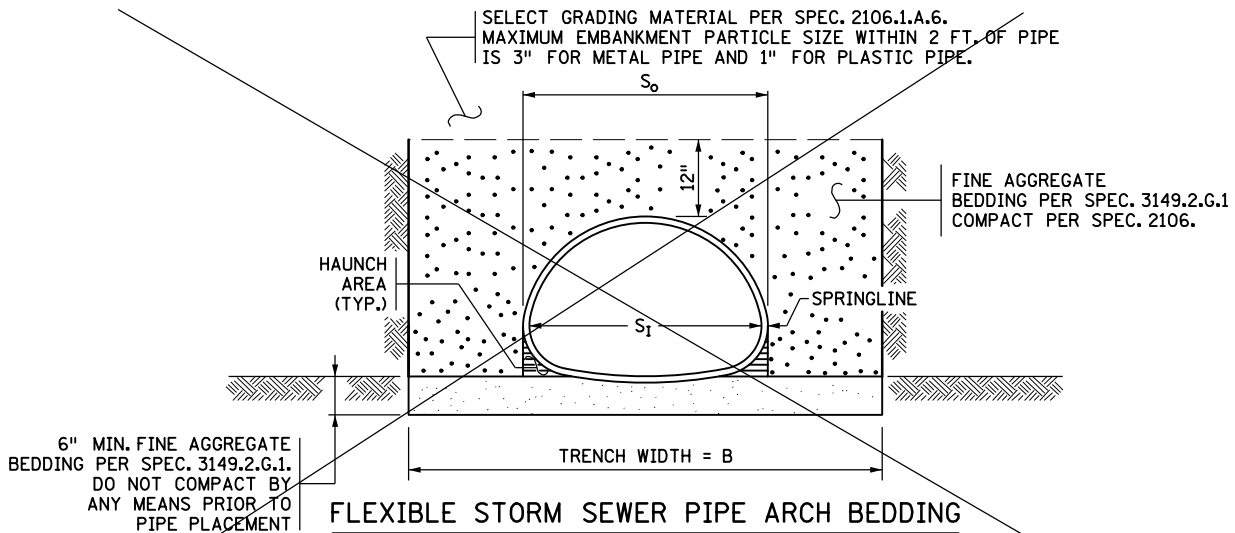
TRENCH BASE WIDTH ①②	
PIPE DIA. D_1 OR S_1	TRENCH WIDTH B
< 42"	$D_0 + 24"$
42" TO 54"	$1.5 \times D_0$
> 54"	$D_0 + 36"$

PLASTIC PIPE WITH H > 10 FT. ①②	
PIPE DIA.	TRENCH WIDTH (FEET)
12"	5'-2"
15"	5'-6"
18"	5'-9"
24"	6'-6"
30"	8'-0"
36"	9'-6"
42"	11'-0"
48"	12'-6"



-LEGEND-

- D_1 = INSIDE DIAMETER OF ROUND PIPE (INCHES).
 D_0 = OUTSIDE DIAMETER OF ROUND PIPE (INCHES).
 S_1 = INSIDE SPAN OF PIPE-ARCH (INCHES).
 S_0 = OUTSIDE SPAN OF PIPE-ARCH (INCHES).
 H = FILL COVER HEIGHT OVER PIPE (FEET).
- = UNDISTURBED SOIL
 = COMPACTED BEDDING
 = LOOSE BEDDING, COMPACTED AFTER PIPE PLACEMENT



CONSTRUCTION SEQUENCE

1. LOOSELY PLACE 6" OF ~~FINE AGGREGATE~~ BEDDING MATERIAL TO GRADE. DO NOT COMPACT PRIOR TO PIPE PLACEMENT.
2. FOR PIPES WITH BELL, REMOVE MATERIAL IN BELL AREA PRIOR TO PLACEMENT.
3. FURNISH AND INSTALL PIPE TO GRADE.
4. AFTER PLACEMENT OF THE PIPE, PLACE ADDITIONAL ~~FINE AGGREGATE~~ BEDDING AND COMPACT THE FULL LENGTH ON BOTH SIDES OF THE PIPE UNDERNEATH THE HAUNCH AREA BY FIRST SHOVEL SLICING (MANUALLY SHOVE THE BLADE END OF SHOVEL AT AN ANGLE DOWN THE ENTIRE LENGTH OF HAUNCH UNDER THE PIPE). THEN COMPACT THE HAUNCH AT AN ANGLE USING A POWERED MECHANICAL OR PNEUMATIC DEVICE (I.E. POLE TAMPER, JUMPING JACK, OR SIMILAR).
5. COMPACT THE REMAINING MATERIAL OUTSIDE THE HAUNCH AREA TO THE REQUIREMENTS OF SPEC. 2106 ENSURING THAT THE ENTIRE LENGTH OF PIPE IS SUPPORTED UNIFORMLY BY BEDDING.
6. PLACE AND COMPACT BACKFILL EVENLY AND SIMULTANEOUSLY IN 6" LIFTS ON EACH SIDE OF THE PIPE UP TO THE SPRINGLINE FOR RIGID PIPE AND 12" ABOVE THE TOP OF THE PIPE FOR FLEXIBLE PIPE WHEN COMPACTED.
7. COMPLETE REMAINING BACKFILL.

NOTES

EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.

PIPE SIZE IS BASED ON THE NOMINAL INSIDE DIAMETER OR SPAN.

PROTECT ALL PIPE DURING CONSTRUCTION PER SPEC. 2503.

WHEN RIPRAP IS REQUIRED AT THE APRON END, SEE STANDARD PLATE OR PLAN FOR RIPRAP INSTALLATION AND QUANTITIES. FOR APRONS WITHOUT RIPRAP PLACE 6" MIN. FINE AGGREGATE BEDDING UNDER APRONS. USE A TRENCH WIDTH EQUAL TO THE PIPE TRENCH WIDTH.

GRANULAR* ~~FINE AGGREGATE~~ BEDDING INCLUDING THE COST OF EXCAVATION, PLACEMENT AND COMPACTION IS INCLUDED IN THE CONTRACT UNIT PRICE OF THE RELEVANT STORM SEWER PAY ITEM.

EXCAVATION AND BACKFILL WITH SELECT GRADING MATERIAL ARE NOT TABULATED SEPARATELY BUT ARE INCLUDED IN THE CONTRACT UNIT PRICE OF THE RELEVANT STORM SEWER PAY ITEM.

RIGID PIPE INCLUDES CONCRETE. FLEXIBLE PIPE INCLUDES METAL, AND PLASTIC MATERIALS SUCH AS CORRUGATED POLYPROPYLENE (PP), CORRUGATED POLYETHYLENE (CP) AND POLYVINYL CHLORIDE (PVC).

① MODIFY TRENCH WIDTH & SLOPE AS NECESSARY TO COMPLY WITH OSHA REQUIREMENTS.

② USE PLASTIC PIPE TABLE FOR TRENCH WIDTHS WHEN FILL HEIGHT IS GREATER THAN 10 FT.

DATE: 9/12/2024

FILENAME: Projects\Minneapolis\Standard Storm Sewer Bedding\Standard Storm Sewer Bedding.dwg

REVISION:
 APPROVED: JANUARY 18, 2019

 STATE BRIDGE ENGINEER

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.

SIGNED
 LICENSED PROFESSIONAL ENGINEER
 NAME: NICHOLAS E. HENTGES, PE

DATE 9/12/2024
 LIC NO. 44620

MINNESOTA
 DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.442
 1 OF 1
 APPROVED: 01-18-2019
 REVISED:

 STATE DESIGN ENGINEER

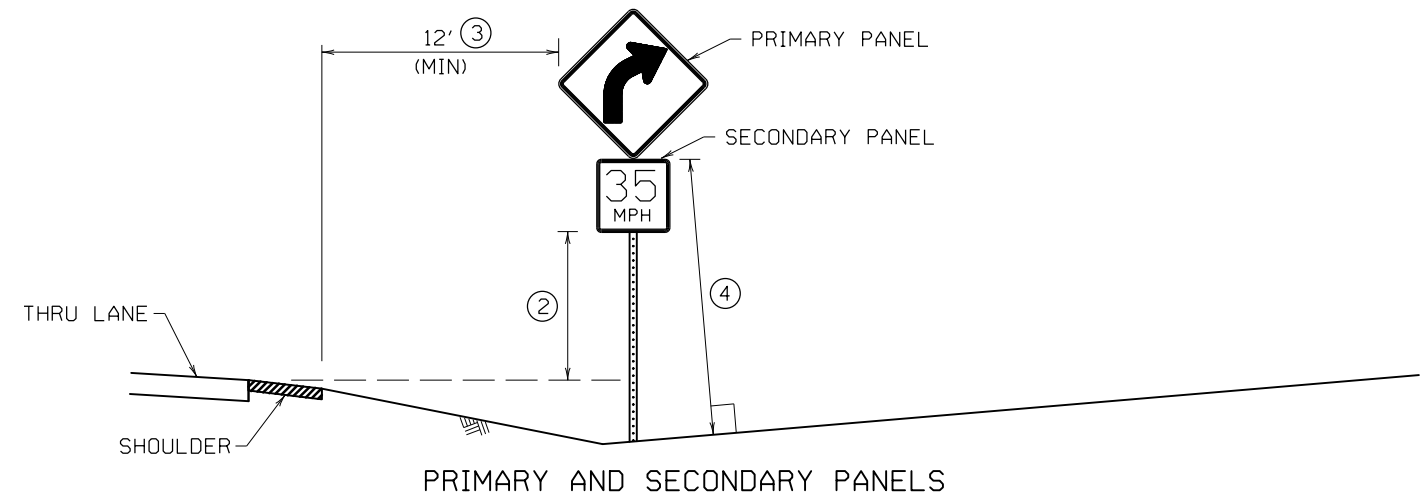
SAP 013-630-021 / SAP 225-591-007

STANDARD STORM SEWER BEDDING
 FOR RIGID AND FLEXIBLE PIPE

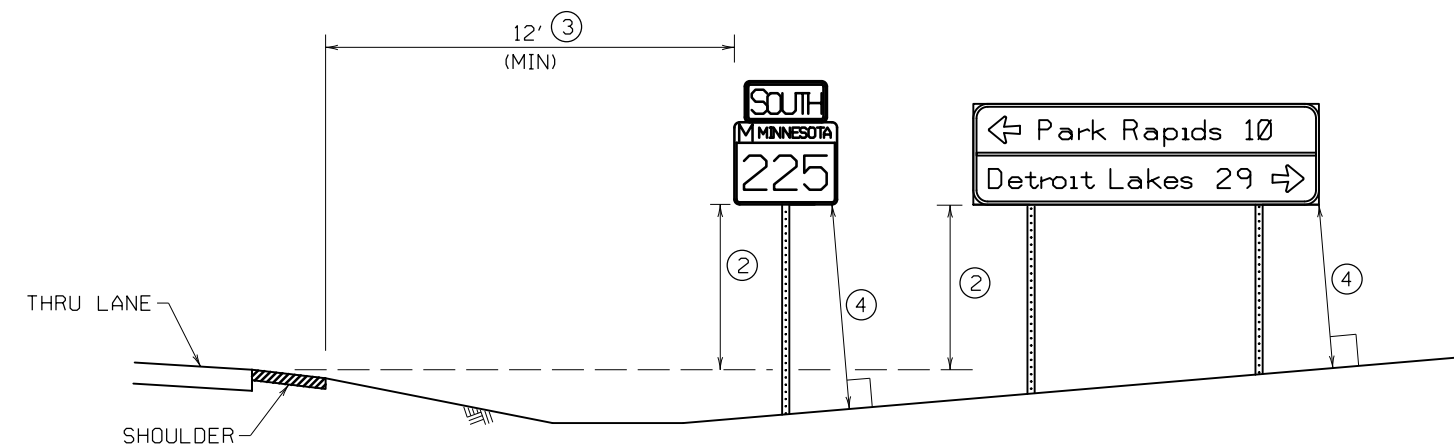
SHEET NO. 72 OF 216

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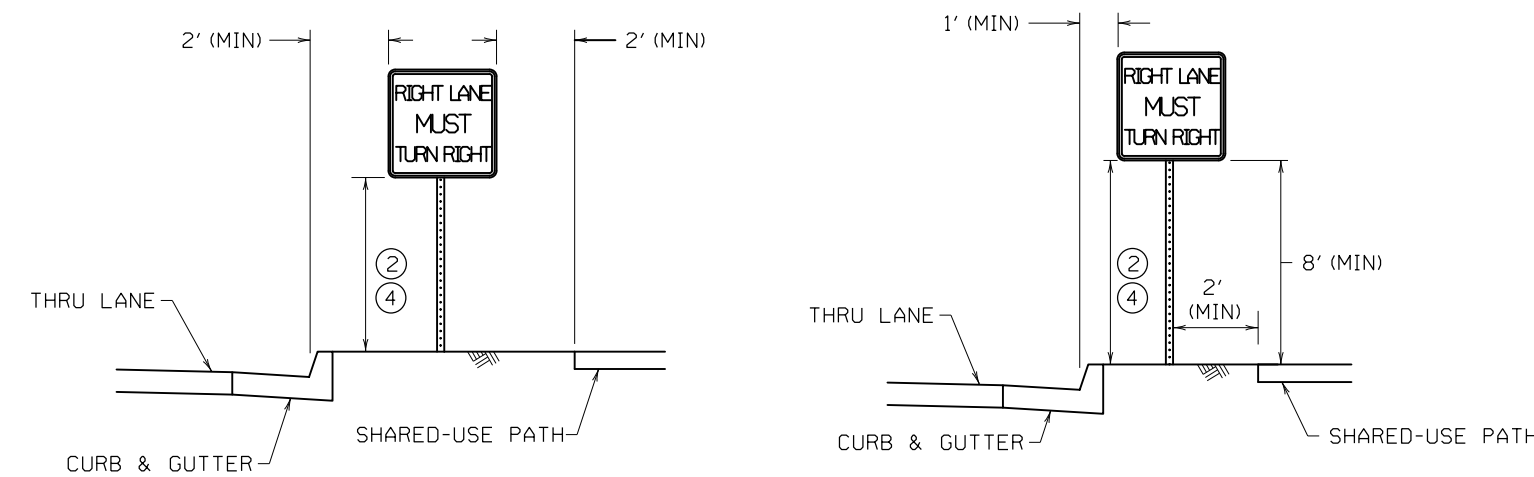
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PRIMARY AND SECONDARY PANELS

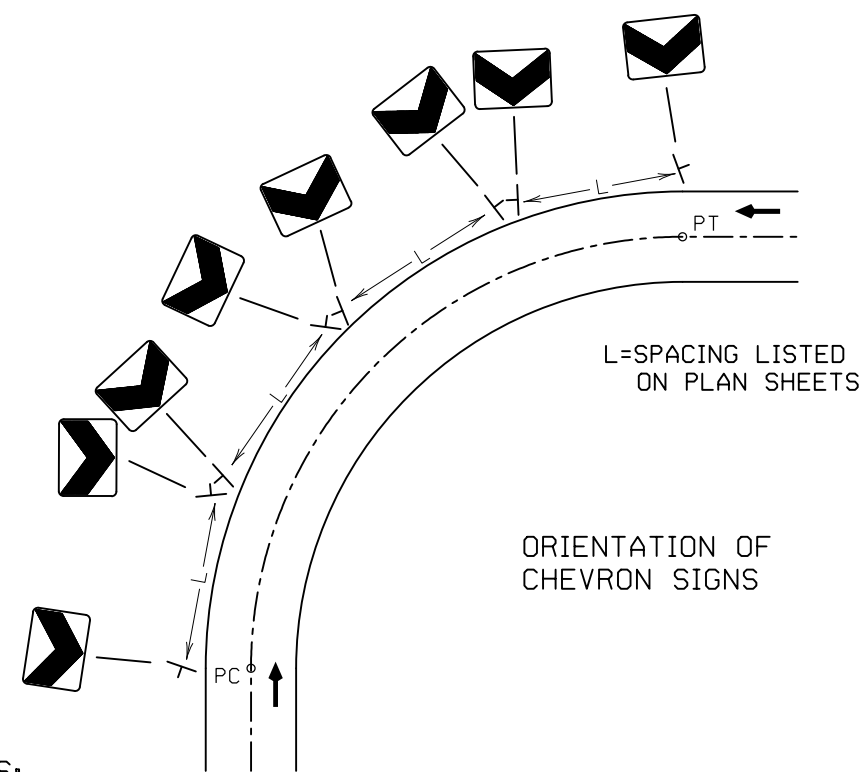


STANDARD LOCATIONS



BOULEVARD LOCATIONS
6' TO 12' WIDE

BOULEVARD LOCATIONS ①
LESS THAN 6' WIDE



ORIENTATION OF
CHEVRON SIGNS

NOTES:

PLACE SIGNS AND ORIENT THEM APPROXIMATELY AS SHOWN IN THE PLAN, AT RIGHT ANGLES TO THE DIRECTION OF, AND FACING THE TRAFFIC THEY ARE INTENDED TO SERVE, UNLESS OTHERWISE SPECIFIED. TO AVOID SPECULAR GLARE, TURN SIGNS APPROXIMATELY THREE DEGREES AWAY FROM APPROACHING TRAFFIC.

IF A SIGN NEEDS TO BE REPOSITIONED FROM THE PROPOSED PLAN LOCATION IN ORDER TO AVOID CONFLICTS WITH UTILITIES OR OBSTACLES, CONTACT THE PROJECT ENGINEER.

MOUNT SIGN FACES PLUMB.

LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND/OR LEFT SIDE INSTALLATION.

ERECT OR CONSTRUCT SIGN SUPPORT SO THAT NO PORTION OF THE SIGN PANEL IS WITHIN 15' OF THE RAIL OF A RAILROAD TRACK.

PLACE SIGNS SUCH THAT OBSTACLES DO NOT BLOCK THEM FROM BEING VIEWED BY THE APPROACHING TRAFFIC.

PLACE SIGNS A MINIMUM OF 10' FROM THE NEAREST OBSTACLE. OBSTACLES MAY INCLUDE, BUT ARE NOT LIMITED TO, LIGHT POLES, TREES, SIGNS, AND BUILDINGS. SIGNS MAY BE PLACED CLOSER TO SIGNS IN TIGHT AREAS, BUT NO MORE THAN TWO POSTS IN A 7' DIAMETER CIRCLE.

AVOID PLACING SIGNS IN DITCH BOTTOMS.

- ① ONLY USE WHEN BOULEVARD IS TOO NARROW TO OBTAIN ADEQUATE CURBED LOCATION SIGN OFFSETS.
- ② ALL SIGN MOUNTING HEIGHTS ARE MEASURED VERTICALLY FROM THE BOTTOM OF THE LOWEST SIGN PANEL TO THE TOP OF THE CURB, OR IN ABSENCE OF CURB, TO THE NEAR EDGE OF THE THRU-LANE PAVEMENT. SEE SIGN TABULATIONS.
- ③ MINIMUM OFFSET MAY BE REDUCED TO AT LEAST 6' FROM SHOULDER AND AT LEAST 12' FROM THRU LANE IF SITE CONDITIONS PROHIBIT A 12' OFFSET FROM SHOULDER.
- ④ CRASHWORTHY HEIGHT IS AT LEAST 7' FOR BREAKAWAY STRUCTURES AND AT LEAST 4' FOR BENDABLE STRUCTURES. SEE SPECIFIC SQUARE TUBE BASE STRUCTURE PLAN FOR CRASH RESPONSE TYPE. THE CRASHWORTHY HEIGHT IS MEASURED TO THE BOTTOM OF THE PRIMARY SIGN PANEL EXCLUDING ANY SECONDARY SIGN PANELS, MARKERS, DELINEATORS, AND REFERENCE LOCATION SIGN PANELS. ANY SECONDARY SIGN PANELS MOUNTED TO MORE THAN ONE POST ARE CONSIDERED PRIMARY SIGN PANELS FOR CRASHWORTHY PURPOSES.

LEAD
EXPERT
OFFICE

BRIAN SORENSON
STATE TRAFFIC ENGINEER
OFFICE OF TRAFFIC ENGINEERING

STANDARD SIGN PLACEMENT

APPROVED: 08-09-2023
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD
PLAN
5-297.701

1 OF 1

SAP 013-630-021 / SAP 225-591-007

SHEET NO. 73 OF 216

DATE: 9/12/2024 TIME: 2:01:23 PM
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LEAD
EXPERT
OFFICE

BRIAN SORENSON
STATE TRAFFIC ENGINEER
OFFICE OF TRAFFIC ENGINEERING

DELINEATOR AND MARKER PLACEMENT

APPROVED: 06-04-2024
REVISED:

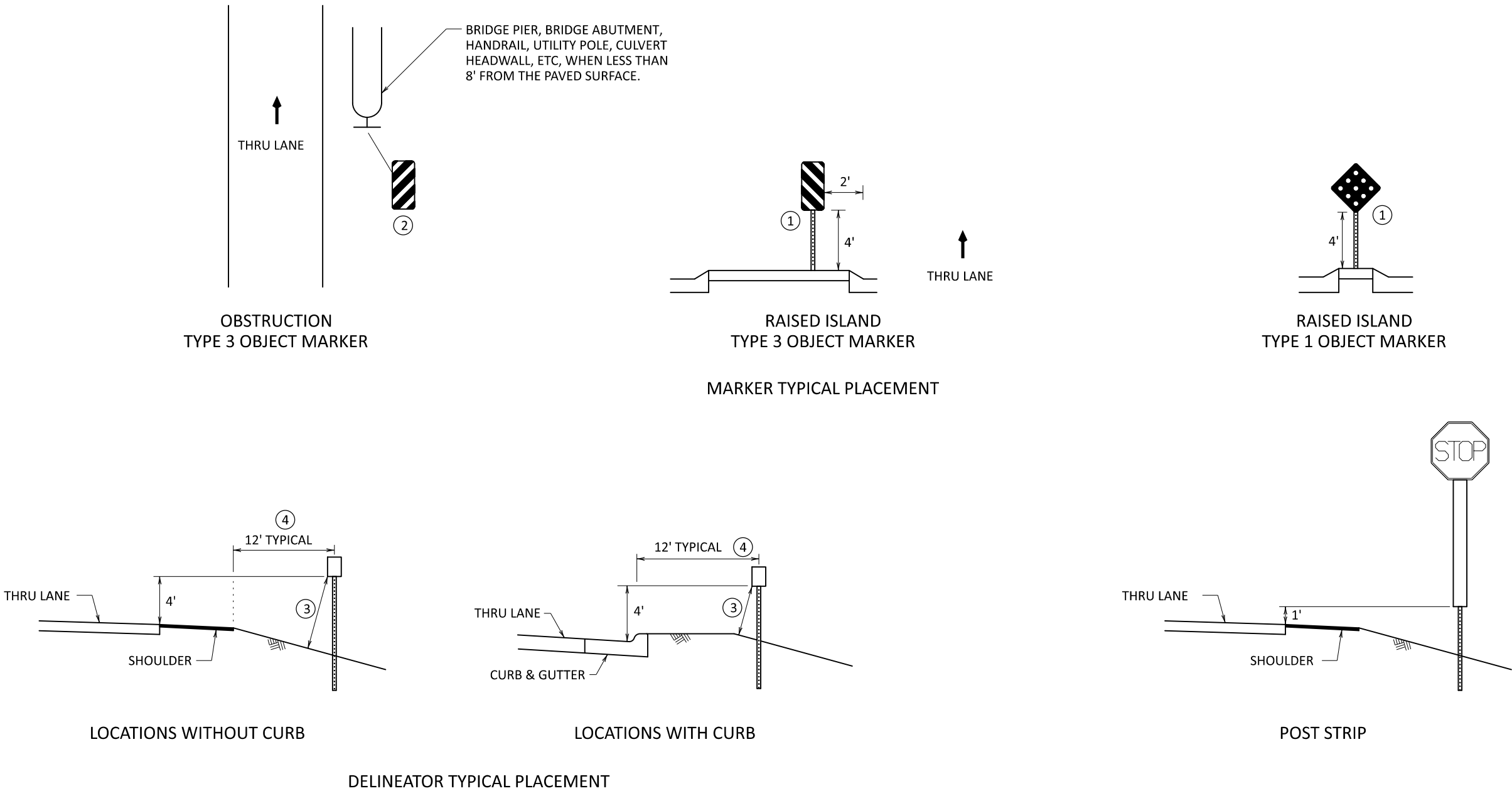

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD
PLAN
5-297.702

1 OF 1

SAP 013-630-021 / SAP 225-591-007

SHEET NO. 74 OF 216



- NOTES:
- FOR DELINEATOR OFFSETS AT RAMP GORES, SEE STANDARD PLAN 5-297.703.
- ① PLACE MARKER AS CLOSE TO THE BEGINNING OF MEDIAN AS POSSIBLE.
- ② PLACE THE EDGE OF THE OBJECT MARKER THAT IS CLOSEST TO THE ROAD USER IN LINE WITH THE CLOSEST EDGE OF THE OBSTRUCTION. ANGLE THE STRIPES DOWNWARD TOWARDS THE SIDE TRAFFIC IS TO PASS THE OBSTRUCTION.
- ③ THE CRASHWORTHY HEIGHT FROM THE GROUND TO ANY PORTION OF THE SIGN PANEL IS AT LEAST 7' FOR BREAKAWAY STRUCTURES AND AT LEAST 4' FOR BENDABLE STRUCTURES. SEE SPECIFIC SQUARE TUBE BASE STRUCTURE PLAN FOR CRASH RESPONSE TYPE.
- ④ ADJUST OFFSET TO MATCH OTHER SIGN OFFSETS ALONG ROADWAY CORRIDOR, BUT NOT MORE THAN 12' NOR LESS THAN 2'.

DATE: 9/12/2024
TIME: 2:01:24 PM
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LEAD
EXPERT
OFFICE

BRIAN SORENSON
STATE TRAFFIC ENGINEER
OFFICE OF TRAFFIC ENGINEERING

SQUARE-TUBE SIGN MOUNTING DETAILS

APPROVED: 08-09-2023
REVISED:

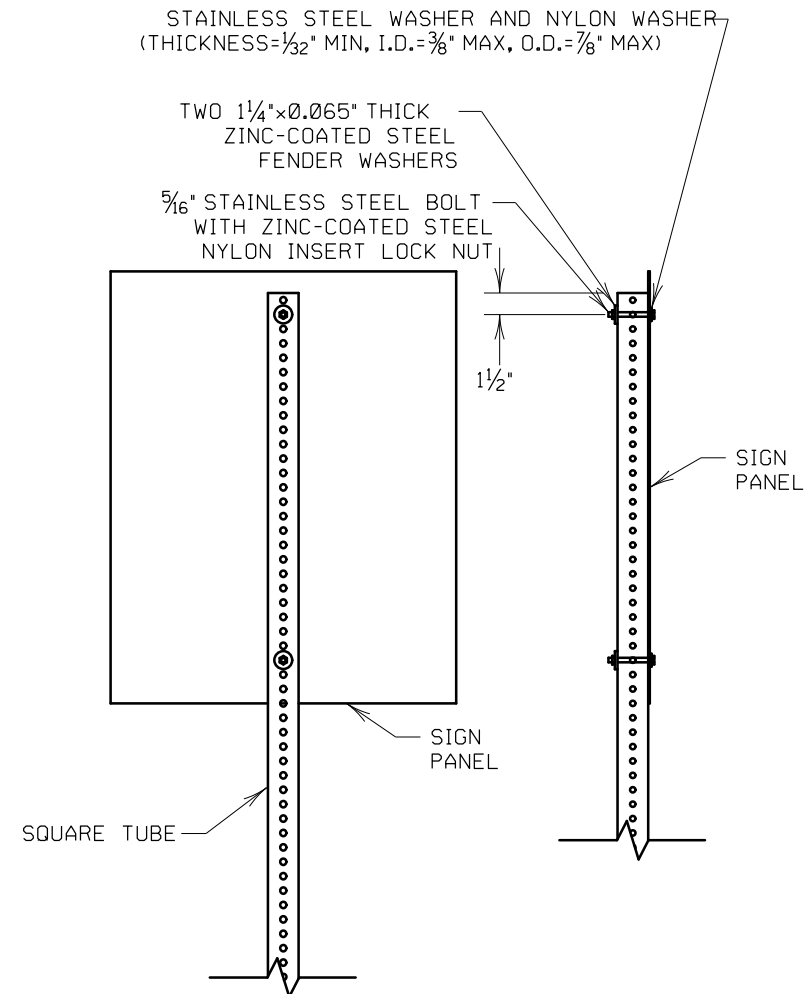
THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD
PLAN
5-297.718

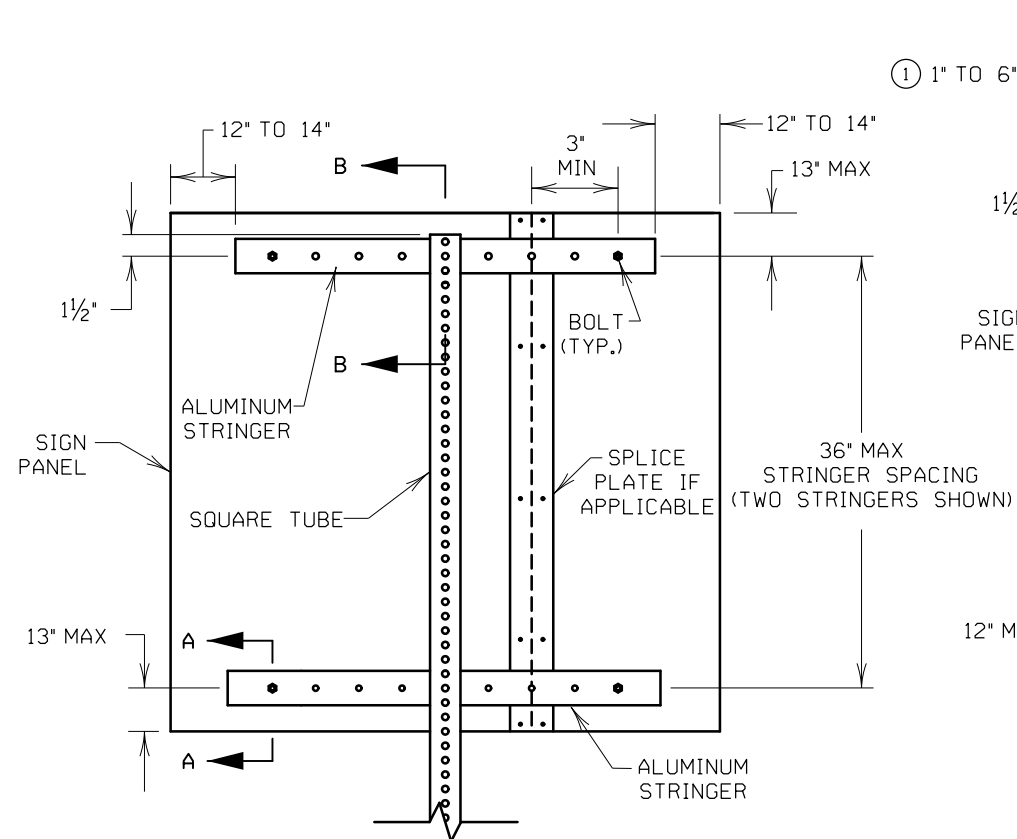
1 OF 3

SAP 013-630-021 / SAP 225-591-007

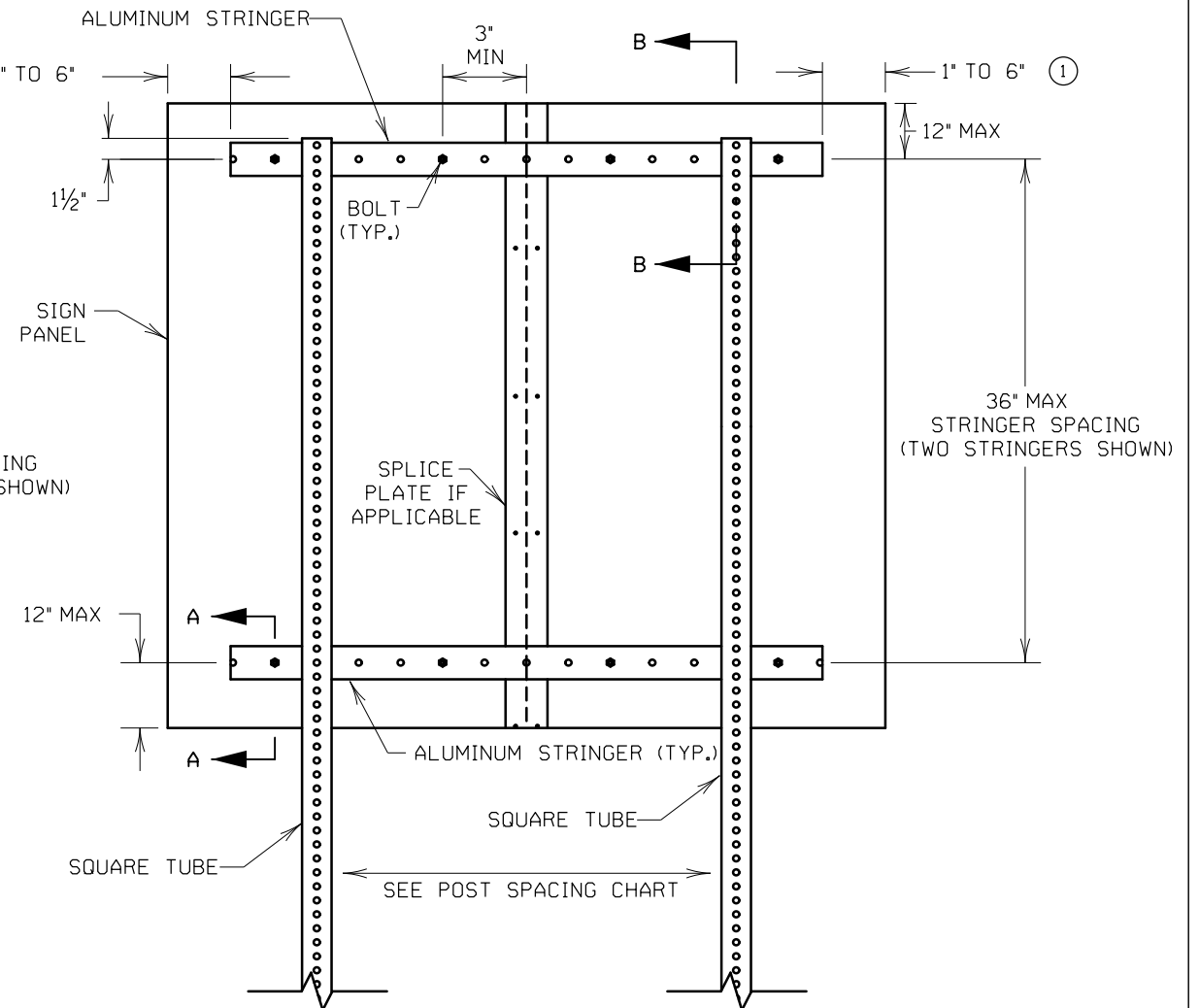
SHEET NO. 75 OF 216



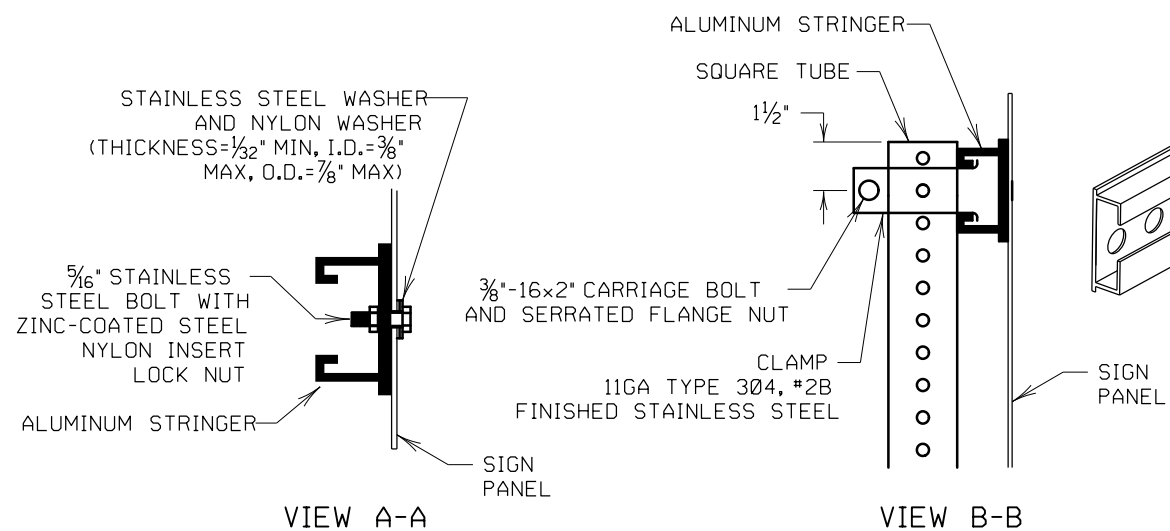
FOR SIGN PANELS UP TO 30" WIDE



FOR SIGN PANELS 36" WIDE
OR GREATER ON ONE POST

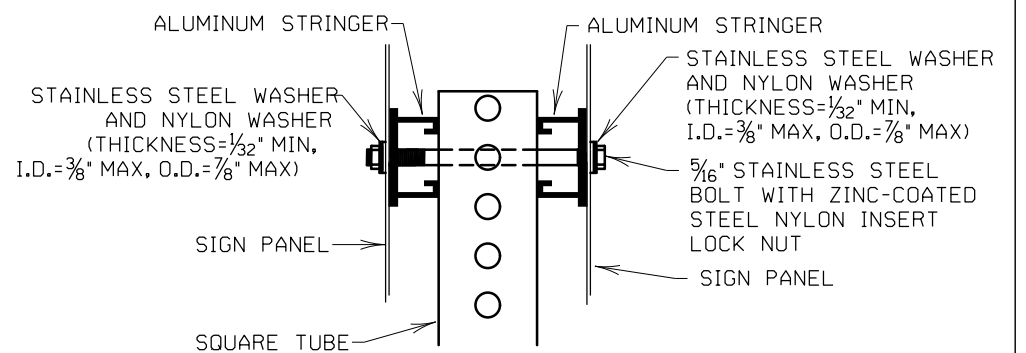


FOR SIGN PANELS ON TWO OR MORE POSTS



CLAMP DETAIL
4" SQUARE TUBE

CLAMP DETAIL
2" AND 2 $\frac{1}{2}$ " SQUARE TUBE



BACK-TO-BACK SIGN MOUNTING
WITH STRINGERS

NOTES:

BOLT SIGN PANELS TO STRINGERS OR RISER POSTS AT NO GREATER THAN 24" SPACING OR ACCORDING TO THE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR MOUNTING HOLES (PUNCH CODES) INFORMATION.

CENTER STRINGERS ON SIGN PANEL.

① IF POST SPACING REQUIRES PLACEMENT OF A POST WITHIN THIS AREA, EXTEND STRINGERS AS NEEDED TO ACCOMMODATE THE STRINGER TO POST CLAMP.

DATE: 9/12/2024 TIME: 2:01:25 PM
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SQUARE-TUBE SIGN MOUNTING DETAILS

APPROVED: 08-09-2023
REVISED:

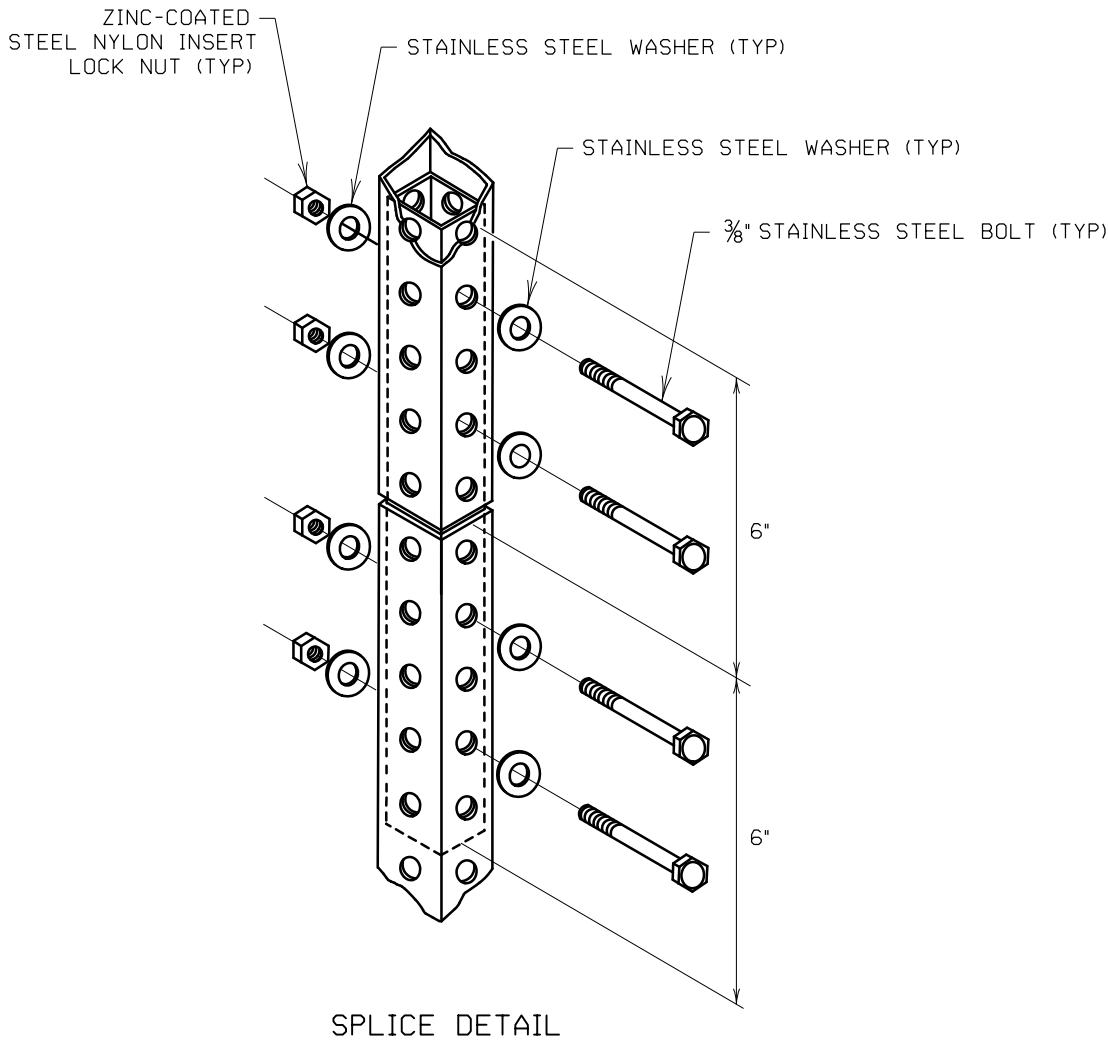

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD
PLAN
5-297.718

2 OF 3

SAP 013-630-021 / SAP 225-591-007

SHEET NO. 76 OF 216



PANEL WIDTH	SQUARE TUBE POST SPACING						
	2 POSTS	3 POSTS	4 POSTS	5 POSTS	6 POSTS	7 POSTS	8 POSTS
(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)
42	15						
48	21						
54	30						
60	36						
66	36						
72	42						
78	42						
84	48						
90	48	42					
96	48	42					
102	54	42					
108	54	42					
114	60	42					
120	60	48					
126	66	48					
132	66	48	42				
138	72	48	42				
144	72	48	42				
150	78	54	42				
156	78	54	42				
162	84	54	42				
168	84	60	48				
174	90	60	48	42			
180	90	60	48	42			
186	96	66	48	42			
192	96	66	48	42			
198	102	66	54	42			
204	102	72	54	42			
210	108	72	54	42			
216	108	72	54	48	42		
222	114	78	60	48	42		
228	114	78	60	48	42		
234	120	78	60	48	42		
240	120	84	60	48	42		
246		84	66	54	42		
252		84	66	54	42		
258		90	66	54	42	42	
264		90	66	54	48	42	
270		90	72	54	48	42	
276		96	72	60	48	42	
282		96	72	60	48	42	
288		96	72	60	48	42	
294		102	78	60	54	42	
300		102	78	60	54	42	42
306		102	78	66	54	42	42
312		108	78	66	54	48	42
318		108	84	66	54	48	42
324		108	84	66	54	48	42
330		114	84	66	60	48	42
336		114	84	72	60	48	42

DISTANCES ARE CENTER-TO-CENTER OF POSTS

NOTES:

NO MORE THAN ONE SPLICE PER POST.

WHEN USED, THE SPLICE MUST BE PLACED AT LEAST 8'
ABOVE GROUND. THE PREFERRED PLACEMENT LOCATION IS
BEHIND THE SIGN PANEL.

INTERIOR POST STUD SHALL BE ONE SIZE SMALLER
FOR TIGHT FIT. IF RISER POST IS 2½", INTERIOR POST
IS 2¾". IF RISER POST IS 2", INTERIOR POST IS 1¾".

[illegible][illegible]

**LEAD
EXPERT
OFFICE**

BRIAN SORENSON
STATE TRAFFIC ENGINEER
OFFICE OF TRAFFIC ENGINEERING

3 OF 3

SHEET NO. 77 OF 216

DATE: 9/12/2024 TIME: 2:01:26 PM
FILENAME: Invalid expression

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OFFICE OF TRAFFIC ENGINEERING

SQUARE TUBE SIDE-BY-SIDE SIGN MOUNTING DETAILS

APPROVED: 08-09-2023
REVISED:

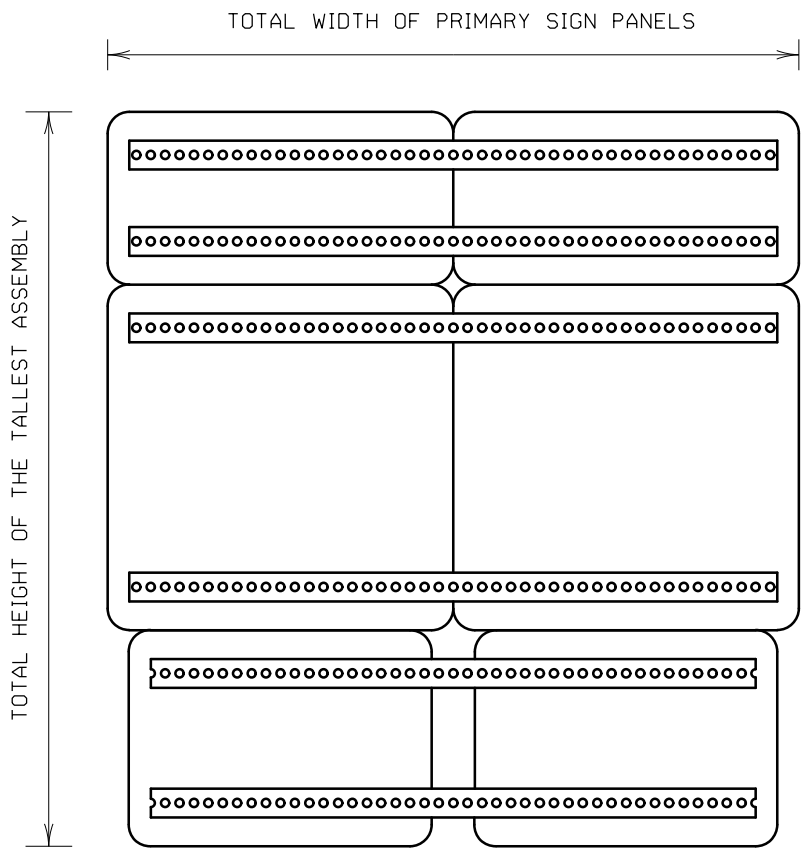

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD
PLAN
5-297.719

1 OF 1

SAP 013-630-021 / SAP 225-591-007

SHEET NO. 78 OF 216

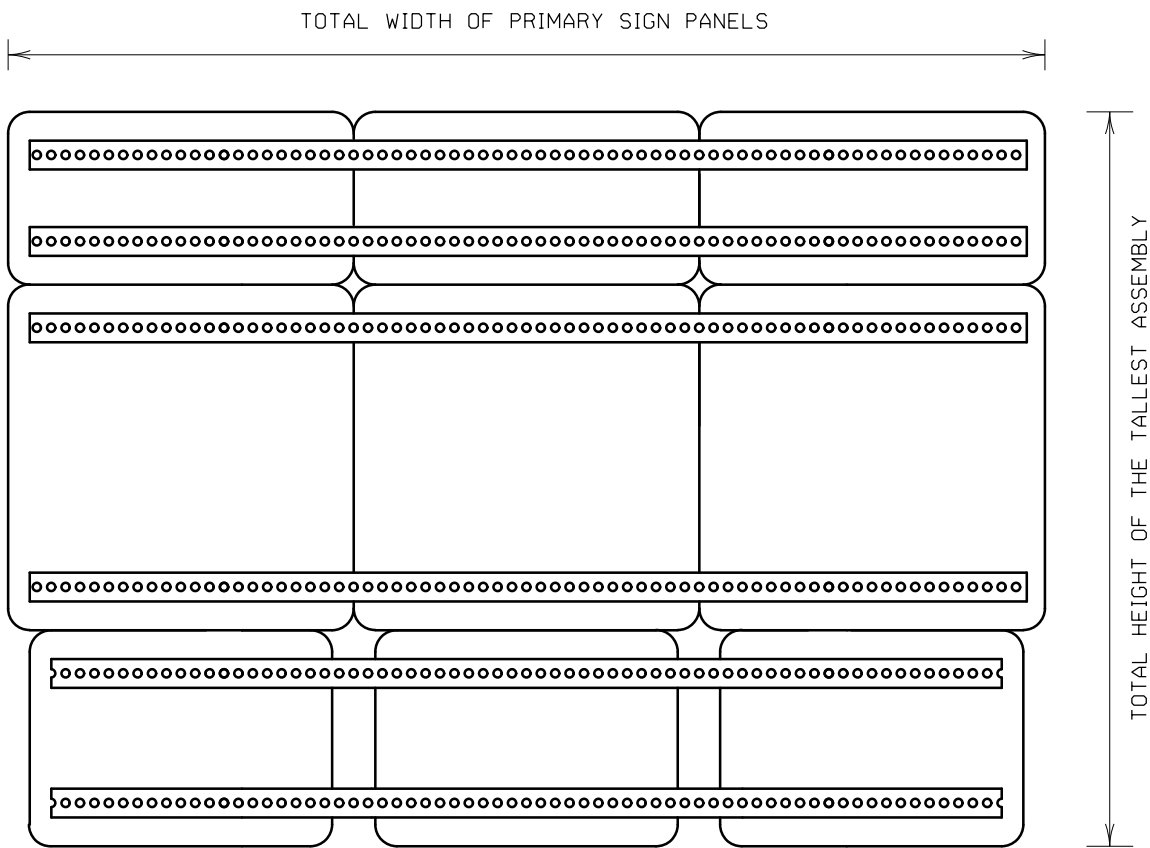


TWO SIDE-BY-SIDE ASSEMBLIES

SECONDARY SIGN PANELS

PRIMARY SIGN PANELS

SECONDARY SIGN PANELS



THREE SIDE-BY-SIDE ASSEMBLIES

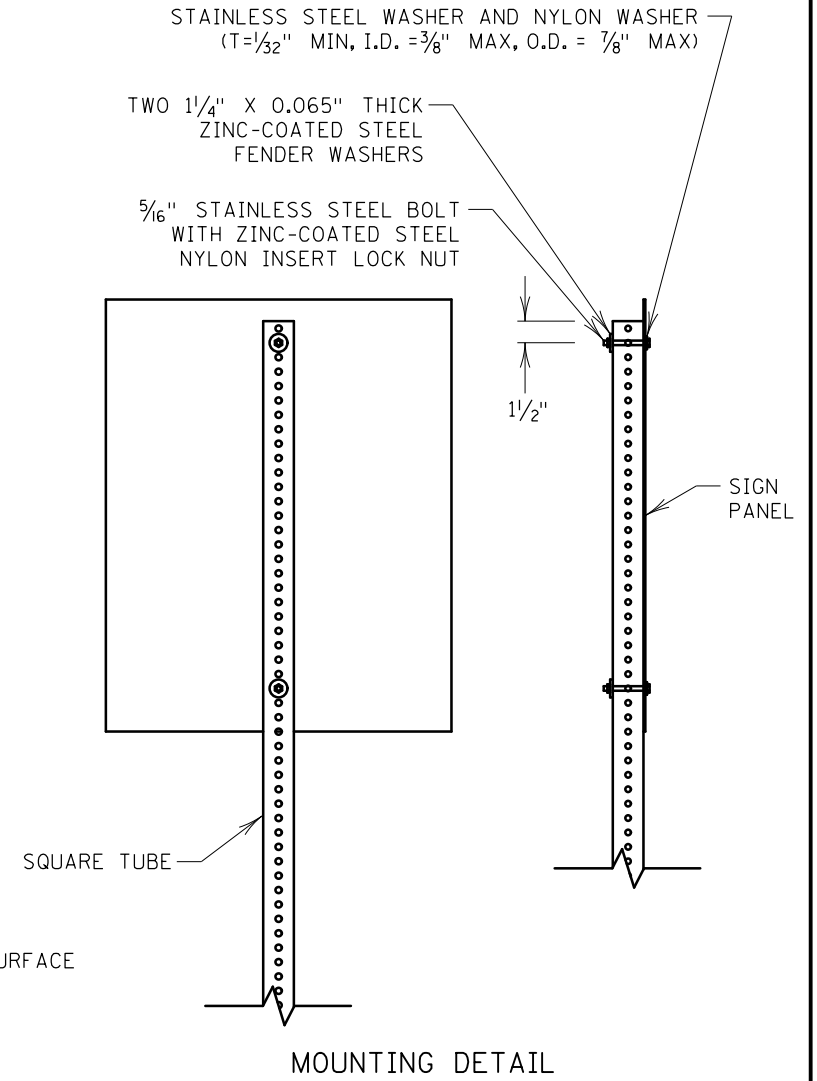
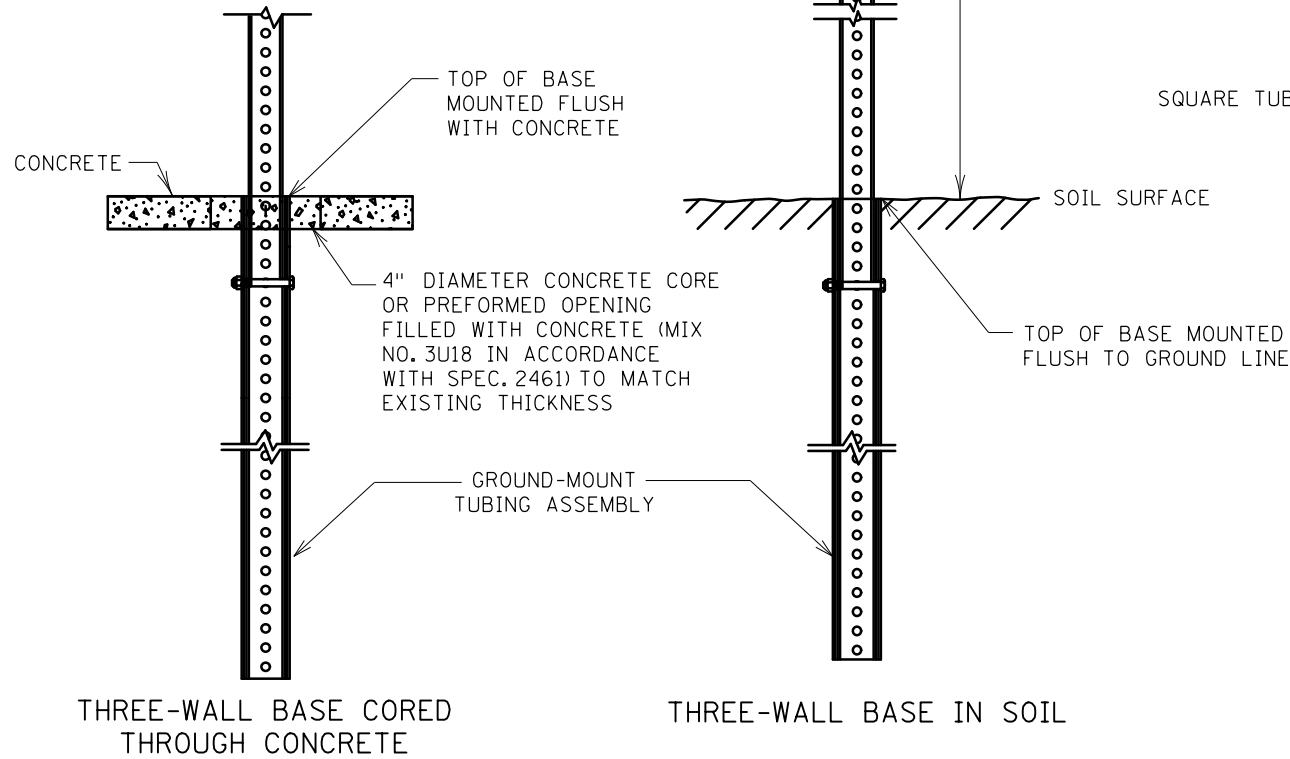
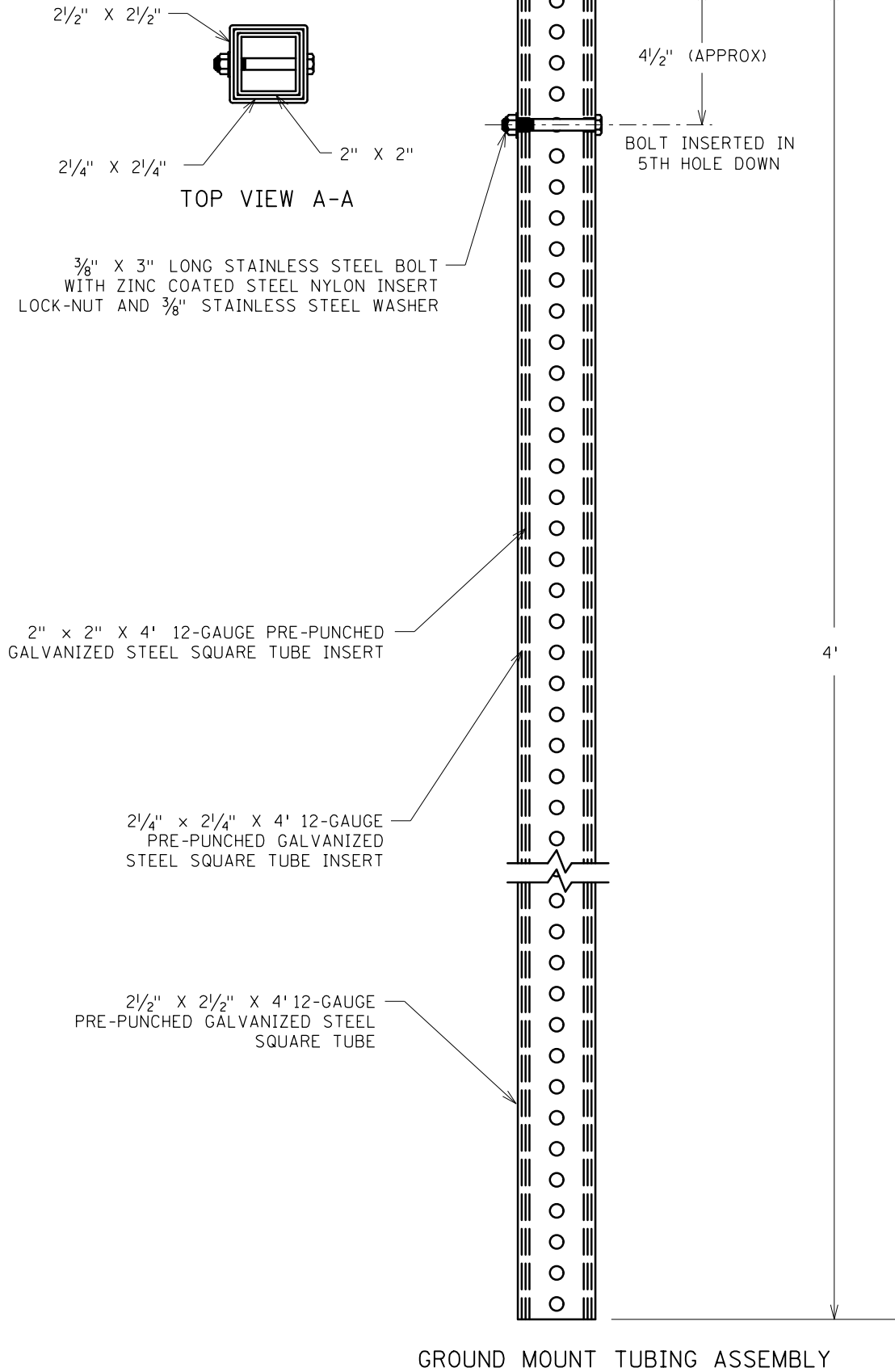
NOTES:

- CENTER SECONDARY SIGN PANELS BELOW OR ABOVE PRIMARY SIGN PANELS.
- STRINGER SPACING TO MATCH VERTICAL PUNCHING SPACING FOR SIGN PANELS.
- FOR SINGLE-POST INSTALLATIONS, THE STRINGERS MUST EXTEND 1" BEYOND THE BOLT HOLES.
- FOR MULTI-POST INSTALLATIONS, THE STRINGERS MUST EXTEND EITHER 1" BEYOND THE BOLT HOLES OR 3" BEYOND THE OUTER POST CENTERLINE, WHICHEVER IS GREATER.
- DETERMINE THE NUMBER OF POSTS AND THE POST SPACING BY THE TOTAL WIDTH AND HEIGHT OF THE ASSEMBLIES.
- SEE STANDARD PLAN 5-297.718 FOR ADDITIONAL MOUNTING DETAILS.

DATE: 9/12/2024
TIME: 2:02:06 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn7-800

LEAD EXPERT OFFICE

BRIAN SORENSON
STATE TRAFFIC ENGINEER
OFFICE OF TRAFFIC ENGINEERING



NOTES:

THE CRASH RESPONSE FOR THIS STRUCTURE IS BENDABLE.

TO MEET CRASHWORTHY REQUIREMENTS THE DISTANCE BETWEEN THE BOTTOM OF THE SIGN PANEL AND THE GROUND SURFACE BELOW ANY PORTION OF THE SIGN PANEL SHALL BE A MINIMUM OF 4'. SEE TABULATIONS FOR MOUNTING HEIGHT.

SQUARE TUBE SIGN POSTS PER MnDOT SPEC. 3402.



STANDARD PLAN 5-297.721

1 OF 1

THOMAS STYRBICKI
STATE DESIGN ENGINEER

APPROVED: 11-29-2022
REVISED:

SAP 013-630-021 / SAP 225-591-007

THREE-WALL BASE
FOR 1 3/4" SQUARE-TUBE RISER POST

SHEET NO. 79 OF 216

Page 178 of 739

DATE: 9/12/2024 TIME: 2:02:38 PM
FILENAME: Invalid expression

LEAD EXPERT OFFICE
BRIAN SORENSON
STATE TRAFFIC ENGINEER
OFFICE OF TRAFFIC ENGINEERING

FIN BASE
FOR 2" SQUARE-TUBE RISER POST IN SOIL

APPROVED: 08-09-2023
REVISED:

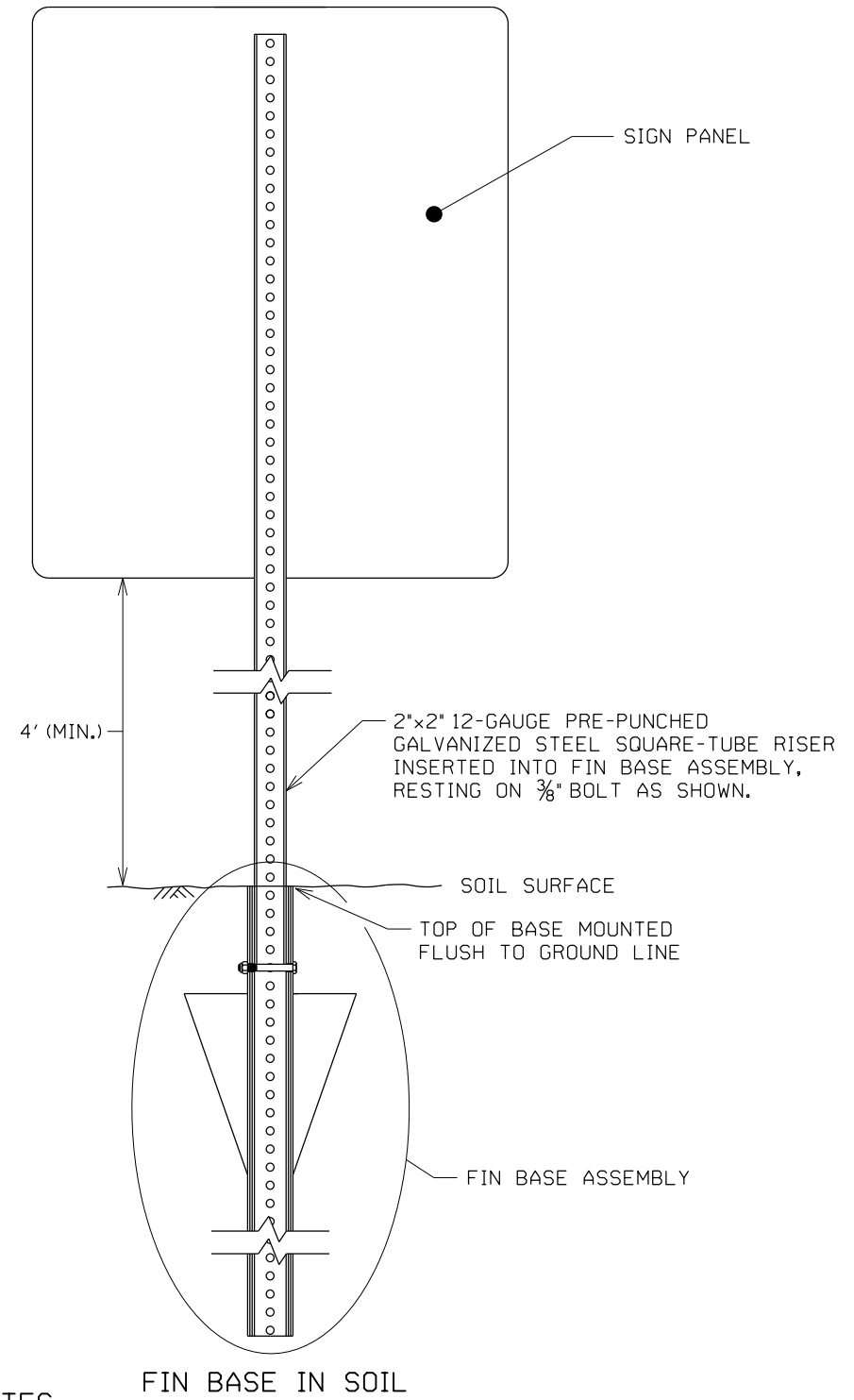
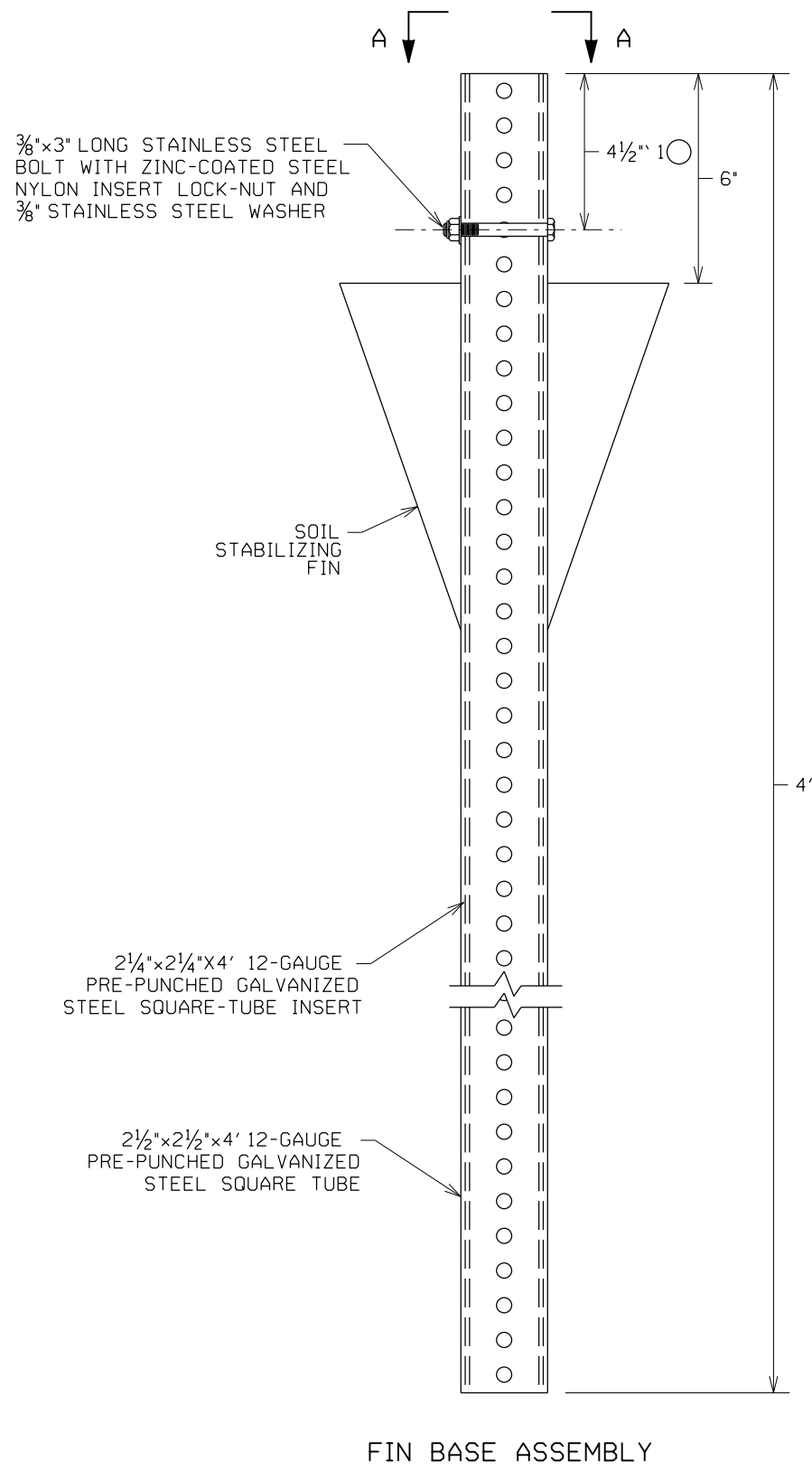
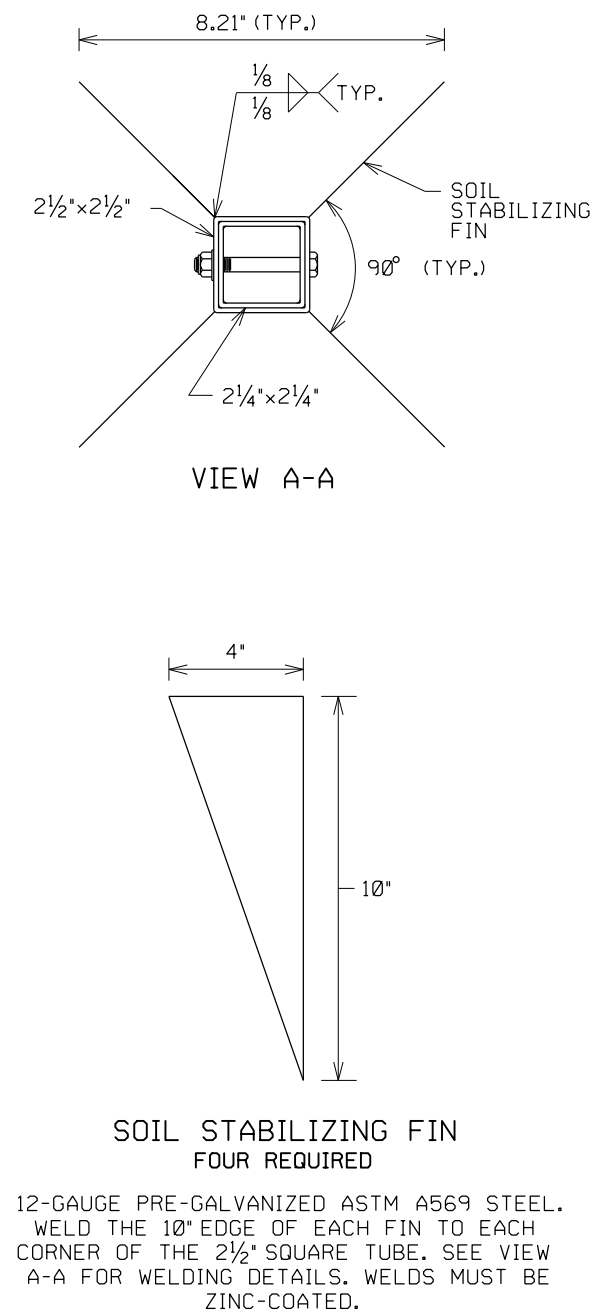
THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD PLAN
5-297.722

1 OF 1

SAP 013-630-021 / SAP 225-591-007

SHEET NO. 80 OF 216



NOTES:

THE CRASH RESPONSE TYPE FOR THIS STRUCTURE IS BENDABLE.

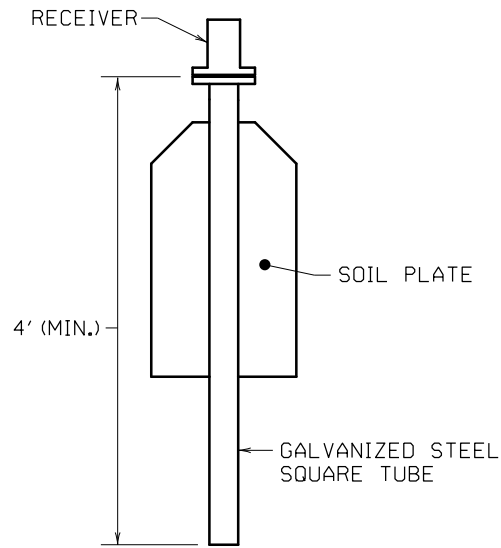
TO MEET CRASHWORTHY REQUIREMENTS, THE DISTANCE BETWEEN THE BOTTOM OF THE SIGN PANEL AND THE GROUND SURFACE BELOW ANY PORTION OF THE SIGN PANEL MUST BE A MINIMUM OF 4'. SEE TABULATIONS FOR MOUNTING HEIGHT.

SEE STANDARD PLAN 5-297.718 FOR ADDITIONAL MOUNTING DETAILS.

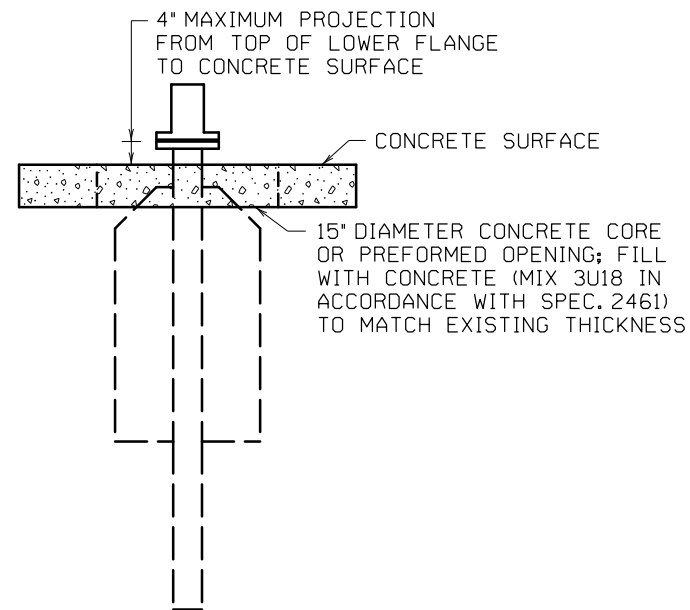
SQUARE-TUBE SIGN POSTS IN ACCORDANCE WITH SPEC. 3402.

① INSERT BOLT IN 5TH HOLE DOWN.

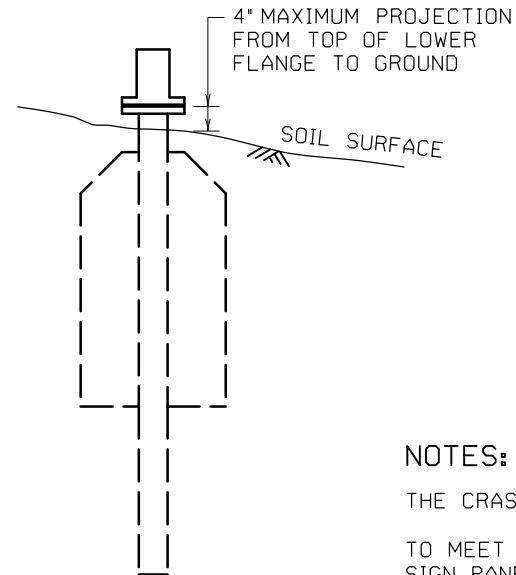
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TIME: 2:02:39 PM
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PROPRIETARY SLIP BASE ASSEMBLY①



SLIP BASE ASSEMBLY IN CONCRETE



SLIP BASE ASSEMBLY IN SOIL

$\frac{5}{16}$ " STAINLESS STEEL BOLT WITH ZINC-COATED STEEL NYLON INSERT LOCK NUT; PLACE THROUGH RISER AND INSERT

$2\frac{1}{2}$ "x $2\frac{1}{2}$ " 10-GAUGE PRE-PUNCHED GALVANIZED STEEL SQUARE-TUBE RISER. PLACE $2\frac{3}{16}$ "x $2\frac{3}{16}$ "x8' LONG 10-GAUGE PRE-PUNCHED GALVANIZED STEEL SQUARE-TUBE INSERT INSIDE BOTTOM 8' OF RISER.

SLIP BASE MUST BE DRIVEN INTO GROUND TO COMPLETELY BURY THE SOIL PLATE

SOIL SURFACE

SIGN PANEL

7' (MIN.)

SLIP BASE ASSEMBLY WITH SINGLE-POST SIGN
TYPICAL PLACEMENT IN SOIL

NOTES:

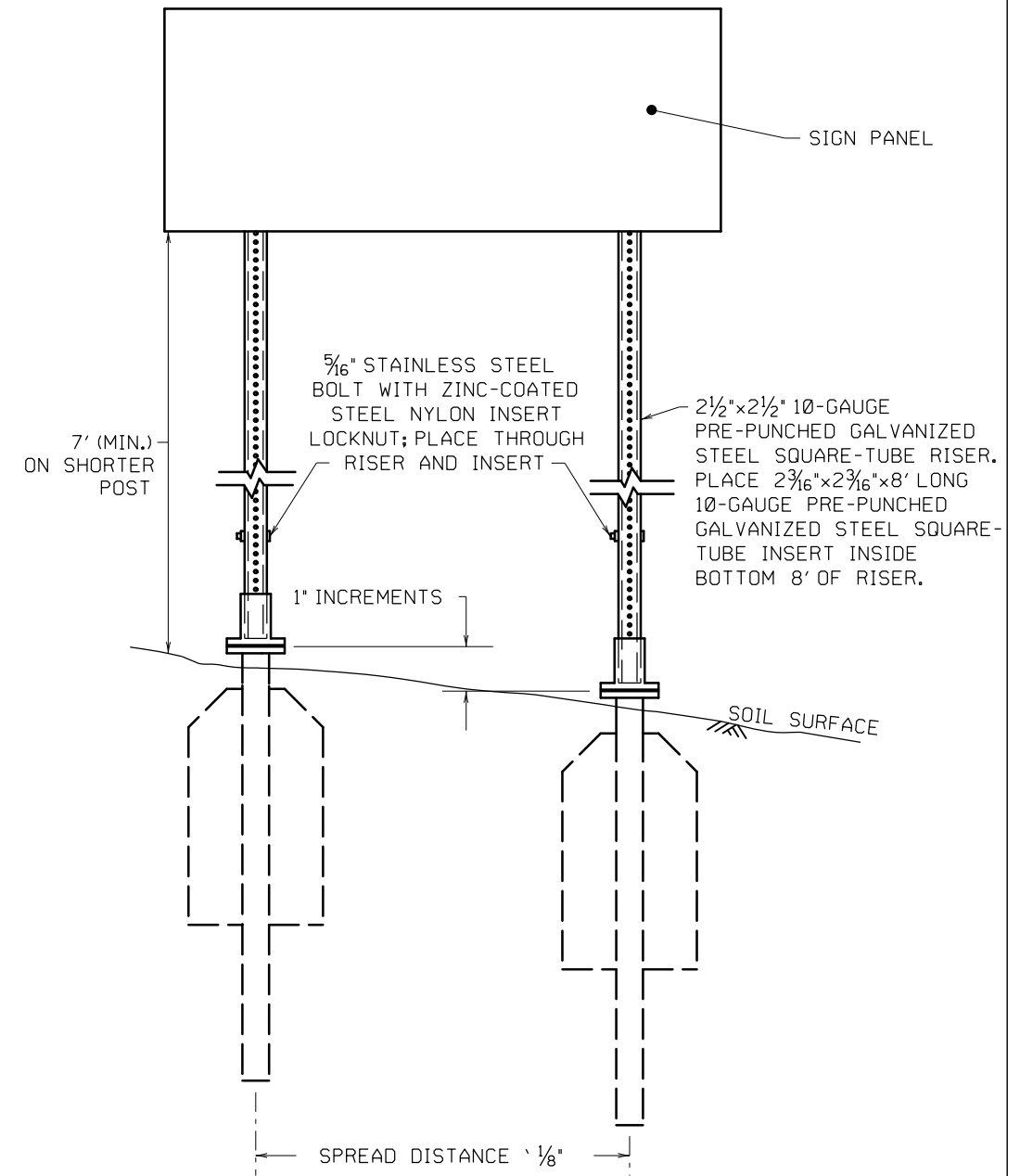
THE CRASH RESPONSE TYPE FOR THIS STRUCTURE IS BREAKAWAY.

TO MEET CRASHWORTHY REQUIREMENTS, THE DISTANCE BETWEEN THE BOTTOM OF THE PRIMARY SIGN PANEL AND THE GROUND SURFACE BELOW ANY PORTION OF THE PRIMARY SIGN PANEL MUST BE A MINIMUM OF 7'. SEE SIGNING PLAN TABULATIONS FOR MOUNTING HEIGHT.

$\frac{1}{16}$ "-THICK LEVELING SHIMS MAY BE USED TO PLUMB TOP HALF. PLACE SHIMS UNDER TEFLON-COATED SLIP WASHER. MAXIMUM OF TWO SHIMS PER NOTCH POINT.

FOR SIGN PANEL MOUNTING DETAILS, SEE STANDARD PLAN 5-297.718.

SQUARE TUBE SIGN POST IN ACCORDANCE WITH MDOT SPEC. 3402.



SLIP BASE ASSEMBLY WITH MULTIPLE-POST SIGN②
TYPICAL PLACEMENT IN SOIL

① USE APPROVED PRODUCT FROM THE SIGN STRUCTURES PAGE OF THE SIGNING SECTION OF THE APPROVED PRODUCTS LIST.

② FOR MULTIPLE-POST APPLICATIONS, ENSURE SOIL PLATES ARE COMPLETELY BURIED. IF SOIL SURFACE IS NOT LEVEL, DRIVE THE BASES UNTIL THEY ARE OFFSET IN 1" INCREMENTS. THE BASES MUST BE TRUE AND SQUARE WITH ONE ANOTHER TO ENSURE PROPER UNRESTRICTED INSERTION OF STEEL TUBE RISERS. MOUNT SIGN PANELS LEVEL.

LEAD
EXPERT
OFFICE

BRIAN SORENSON
STATE TRAFFIC ENGINEER
OFFICE OF TRAFFIC ENGINEERING

SLIP BASE ASSEMBLY
FOR $2\frac{1}{2}$ " SQUARE-TUBE RISER POST

APPROVED: 08-09-2023
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD
PLAN
5-297.724

1 OF 1

SAP 013-630-021 / SAP 225-591-007

SHEET NO. 81 OF 216

NOTES & GUIDELINES

GENERAL INFORMATION:

1. ALL DISTANCES ARE APPROXIMATE.
- SIGNING:
1. ALL TEMPORARY SIGNS ARE REQUIRED TO BE CRASHWORTHY PER THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE 2016 (MASH-2016). TEMPORARY SIGN STRUCTURES THAT ARE CRASHWORTHY UNDER THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 (NCHRP-350) MAY BE USED PROVIDED THE DEVICES WERE ACQUIRED BY THE CONTRACTOR PRIOR TO DECEMBER 31ST, 2019. THE MINNESOTA TYPE "C" AND "D" BRACED LEG U-CHANNEL (KNEE BRACE) SIGN SUPPORT IS NOT ALLOWED.

2. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE FINAL SIGNS TO ASSURE THAT THE FINAL SIGNS ARE PLACED AS NEEDED, OR PROVIDE TEMPORARY SIGNING UNTIL THE FINAL SIGNING IS PLACED.

3 WHEN MULTIPLE GROUND MOUNTED SIGN STRUCTURES ARE PLACED ADJACENT TO EACH OTHER THERE SHOULD BE NO MORE THAN 2 POSTS WITHIN 84" OF EACH OTHER. WHEN THIS SPACING CAN NOT BE MAINTAINED, THEN SIGN STRUCTURES SHALL BE OFFSET, AND STAGGERED WITH A MINIMUM OF 4' BETWEEN SIGN STRUCTURES BOTH Laterally and Longitudinally. EXAMPLE SHOWS DETOUR SIGNAGE, BUT THIS REQUIREMENT APPLIES TO ALL SIGNAGE.

4. WHEN A SIGN OR BARRICADE IS ORIENTED SUCH THAT VISIBILITY TO ROAD USERS INCLUDING BIKES AND PEDESTRIANS IS REDUCED ENOUGH TO CAUSE A HAZARD, DELINEATE THE SIGN/BARRICADE WITH APPROPRIATE DEVICES.

5. TEMPORARY SIGNS SHALL BE PLACED SUCH THAT OBSTACLES DO NOT BLOCK THEM FROM BEING VIEWED BY APPROACHING ROAD USERS. OBSTACLES MAY INCLUDE, BUT ARE NOT LIMITED TO, LIGHT POLES, TREES, SIGNS, AND BUILDINGS.

6. TEMPORARY SIGNS SHALL BE PLACED AND ORIENTED APPROXIMATELY AS SHOWN IN THE PLAN, AT RIGHT ANGLES TO DIRECTION OF TRAVEL AND FACING THE TRAFFIC THEY ARE INTENDED TO SERVE, UNLESS OTHERWISE SPECIFIED.

7. LONGITUDINAL DROPOFFS SHALL BE SIGNED AS SHOWN IN THE "MINNESOTA TEMPORARY TRAFFIC CONTROL FIELD MANUAL" PAGES (6K-aJ) THRU (6K-al) UNLESS OTHERWISE SPECIFIED IN THESE PLANS.

8. AFTER REMOVAL OF SIGN AND/OR SIGN BASE, BACK FILL, COMPACT, AND LEVEL SOIL TO MATCH SURROUNDING SOIL.

CONSTRUCTION INFORMATION SIGNING:

1. THE CONTRACTOR SHALL USE CONSTRUCTION INFORMATION SIGNING AS SHOWN IN THE PLAN WHICH ARE TO BE USED AS FOLLOWS:
- PLACE G20-X2 ADVANCE NOTICE SIGNS 7 DAYS PRIOR TO THE WORK STARTING DATE. ONCE WORK BEGINS, COVER THE START DATE LEGEND WITH SUGGESTED PLAQUE CONTAINED IN THIS PLAN. IF NO ALTERNATE MESSAGE IS SHOWN IN THE PLAN OR APPROVED BY THE ENGINEER, DISPLAY THE CORRECT ESTIMATED FINISH DATE, MONTH, OR SEASON.
- IF CONSTRUCTION INFORMATION SIGNING IS NO LONGER VISIBLE TO THE MOTORING PUBLIC ONCE WORK BEGINS, MOVE SAID SIGNING TO A SITE IN ADVANCE OF THE WORK ZONE OR CLOSURE AS SHOWN IN THE PLAN OR APPROVED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES & SYMBOLS LEGEND

SYMBOL DESCRIPTION

- 

AREA CLOSED TO TRAFFIC / WORK AREA
- 

TRAFFIC CONTROL SIGN
- 

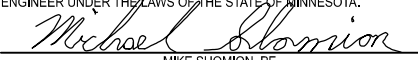
TYPE III BARRICADE = 
- 

TYPE A FLASHING WARNING LIGHT

INDEX

TRAFFIC CONTROL SHEET NO. DESCRIPTIONS

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90	-	91 TRAFFIC CONTROL

NO.	DATE	BY	CHK	REVISIONS	Design By:	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.  MIKE SHOMION, PE DATE: 9/12/2024 LICENSE NO. 50488
					MJS	
					Plan By: GAD	
					Checked By: MKV	
					Approved By: MJS	



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
TEMPORARY TRAFFIC CONTROL TITLE SHEET
CONSTRUCTION STAGING & TRAFFIC CONTROL
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 83 OF 216 SHEETS

DATE: 9/12/2024 2:03:33 PM
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"M" SERIES					
SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (WxH)	ASSEMBLY (IN. X IN.) (WxH)	NUMBER OF POST
          	M4-8	BLACK ON ORANGE	24 x 12 36 x 18	24 x 63 36 x 93 [Ⓒ]	1
	M3-4 M3-4	WHITE ON BLUE	24 x 12 36 x 18		
	M1-6M	WHITE AND YELLOW BLUE	24 x 24 36 x 36		
	M6-1	WHITE ON BLUE	21 x 15 30 x 21 [Ⓒ]		
	M6-3				
	M5-1				
	M6-2				
	M5-2				
M4-8a	BLACK ON ORANGE	24 x 18 36 x 24	24 x 69 36 x 99 [Ⓒ]	1	
M3-4 M3-4	WHITE ON BLUE	24 x 12 36 x 18			
M1-6M	WHITE AND YELLOW BLUE	24 x 24 36 x 36			
M6-1 (R/L)	WHITE ON BLUE	21 x 15 30 x 21			

SPECIFIC NOTES:

- Ⓐ MAY USE 2" SQUARE TUBE POST WITH FIN BASE.
- Ⓑ SEE SPECIAL SIGN DETAILS SHEET FOR SIGN DETAILS.
- Ⓒ LOWER SIZES ARE FOR SIGNS ON MNDOT R/W.

GENERAL NOTES:

1. SIGN STRUCTURE TABULATIONS INDICATE SQUARE TUBE GROUND MOUNTED SIGN STRUCTURES THAT ARE MASH-16 COMPLIANT.
2. USE PRODUCTS FROM THE BASES FOR SQUARE TUBE SIGN STRUCTURES APPROVED/QUALIFIED PRODUCTS LIST FOR THE INDICATED SQUARE TUBE RISER POST SIZE. PLACE PER THE MANUFACTURER'S SPECIFICATIONS.
3. ALUMINUM STRINGERS SHALL BE USED FOR SIGNS 36 INCHES AND WIDER. SEE MANUFACTURER'S SPECIFICATIONS FOR SQUARE TUBE MOUNTING DETAILS. STRINGERS ON SINGLE POST ASSEMBLIES ARE REQUIRED TO BE AT LEAST 9 INCHES IN FROM THE EDGE OF THE SIGN.
4. UNLESS OTHERWISE INDICATED, USE 2-1/2 INCH RISER POSTS FOR GROUND MOUNTED SIGN STRUCTURES.

"W" SERIES					
SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (WxH)	ASSEMBLY (IN. X IN.) (WxH)	NUMBER OF POST
	W20-1	WHITE ON BLUE	24 x 12	48 x 84	1
	W20-1	WHITE AND YELLOW ON BLUE	24 x 24		
	W20-1	BLACK ON ORANGE	48 x 48		
	W20-1	WHITE ON BLUE	24 x 12	48 x 84	1
	W20-1	WHITE AND YELLOW ON BLUE	24 x 24		
	W20-2	BLACK ON ORANGE	48 x 48		
	W20-1	BLACK ON ORANGE	48 x 48	48 x 72	1
	W16-2P	BLACK ON ORANGE	36 x 24		
	W20-2	BLACK ON ORANGE	48 x 48	48 x 48	1
	W20-3M	BLACK ON ORANGE	18 x 18	18 x 18	1

NO.	DATE	BY	CHK	REVISIONS

Design By:
MJS
Plan By:
GAD
Checked By:
MKV
Approved By:
MJS

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.

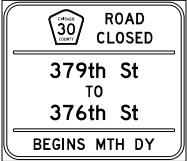
Michael Shomion
MIKE SHOMION, PE
DATE: 9/12/2024 LICENSE NO. 50488



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
TEMPORARY SIGN TABULATION
CONSTRUCTION STAGING & TRAFFIC CONTROL
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
84
OF
216
SHEETS

"G" SERIES						
SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (W×H)	ASSEMBLY (IN. X IN.) (W×H)	NUMBER OF POST	POST SPACING INCHES
 379th St TO 376th St BEGINS MTH DY SAMPLE	G20-X2 ®	BLACK ON ORANGE	96 x 84	96 x 84	2	48
	G20-X6 (R/L/THRU)	BLACK ON ORANGE	36 x 24	36 x 24	1	
 	G20-X4 (R/L/THRU)	BLACK ON ORANGE	72 x 18	72 x 18	2	42

BARRICADE MOUNTED SIGNS			
SIGN	SIGN NO.	COLOR	SIZE (IN. X IN. (W×H)
	R9-9	BLACK ON WHITE	30 x 18
	R11-2M	BLACK ON WHITE	48 x 30
	R11-4	BLACK ON WHITE	60 x 30
	R11-3a	BLACK ON WHITE	60 x 30
	M4-10 (R/L)	BLACK ON ORANGE	48 x 18

SPECIFIC NOTES:

- ① MAY USE 2" SQUARE TUBE POST WITH FIN BASE.
② SEE SPECIAL SIGN DETAILS SHEET FOR SIGN DETAILS.

GENERAL NOTES;

1. SIGN STRUCTURE TABULATIONS INDICATE SQUARE TUBE GROUND MOUNTED SIGN STRUCTURES THAT ARE MASH-16 COMPLIANT.
2. USE PRODUCTS FROM THE BASES FOR SQUARE TUBE SIGN STRUCTURES APPROVED/QUALIFIED PRODUCTS LIST FOR THE INDICATED SQUARE TUBE RISER POST SIZE. PLACE PER THE MANUFACTURER'S SPECIFICATIONS.
3. ALUMINUM STRINGERS SHALL BE USED FOR SIGNS 36 INCHES AND WIDER. SEE MANUFACTURER'S SPECIFICATIONS FOR SQUARE TUBE MOUNTING DETAILS. STRINGERS ON SINGLE POST ASSEMBLIES ARE REQUIRED TO BE AT LEAST 9 INCHES IN FROM THE EDGE OF THE SIGN.
4. UNLESS OTHERWISE INDICATED, USE 2-1/2 INCH RISER POSTS FOR GROUND MOUNTED SIGN STRUCTURES.

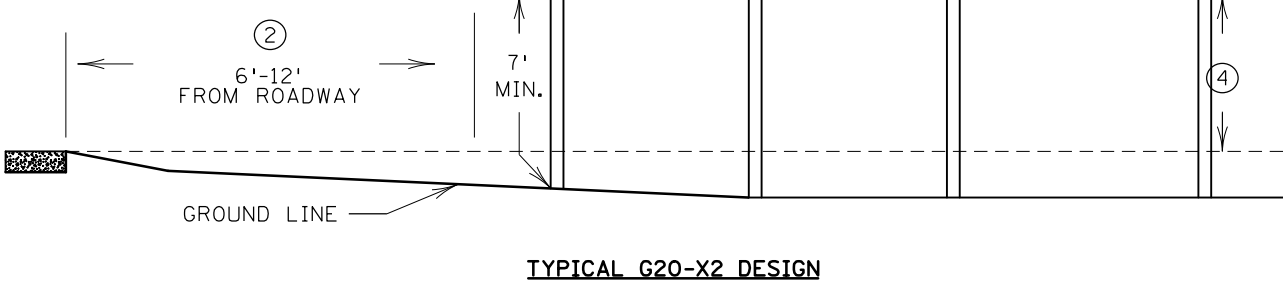
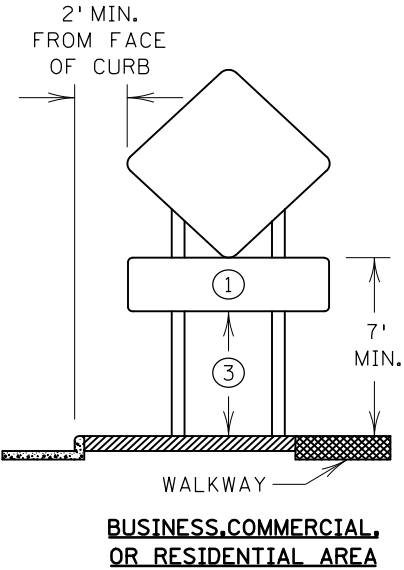
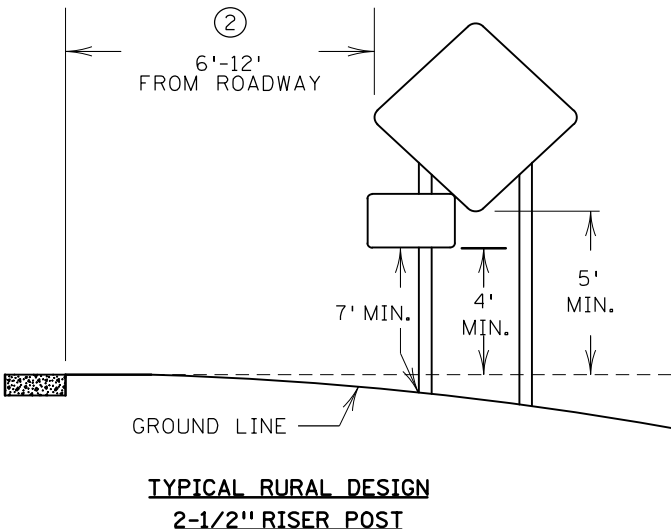
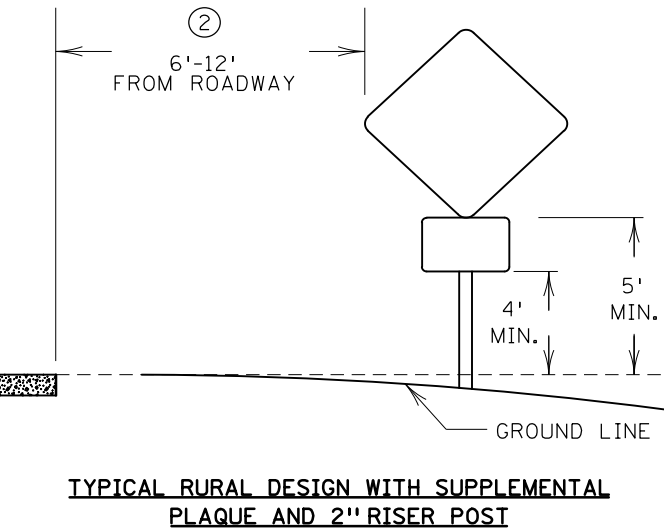
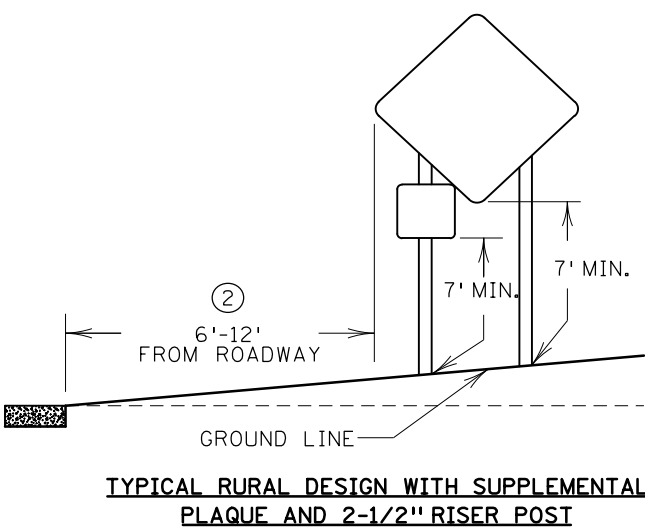
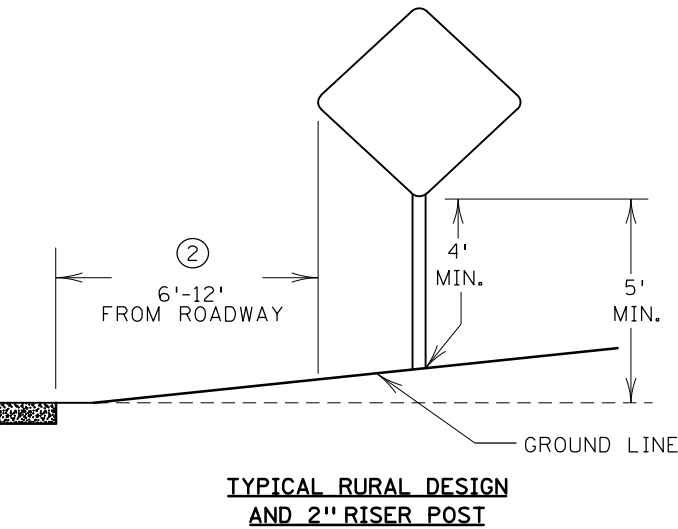
NO.	DATE	BY	CHK	REVISIONS	Design By: MJS	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  MIKE SHOMION, PE DATE: 9/12/2024 LICENSE NO. 50488	  CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota		CHISAGO COUNTY, MINNESOTA	SHEET
				Plan By: GAD	TEMPORARY SIGN TABULATION				85	
				Checked By: MKV	CONSTRUCTION STAGING & TRAFFIC CONTROL				OF	
				Approved By: MJS	SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004				216	
										SHEETS

GENERAL NOTES;

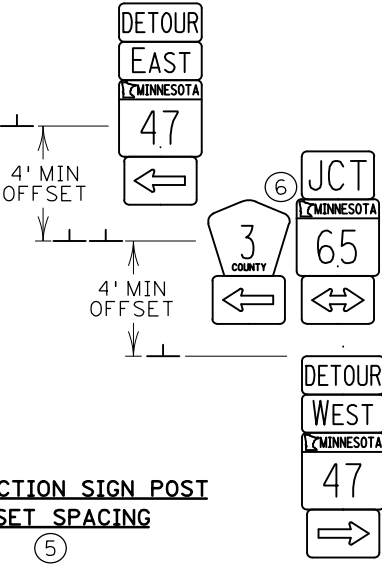
1. GROUND MOUNTED SQUARE TUBE SIGN STRUCTURES PLACED WITHIN 50' OF THE RADIUS END OF AN INTERSECTION SHALL BE PLACED ON ONE 2" OR 2-1/2" POST.
2. FOR 2" SQUARE TUBE RISER POST IN SOIL, USE FIN BASE PLACED PER MANUFACTURER'S SPECIFICATIONS. USE A 2" X 2" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST. PLACE 3/8" STAINLESS STEEL BOLT THROUGH THE 5TH HOLE DOWN FROM THE TOP OF THE BASE. RISER POST SHALL REST ON THE BOLT.
3. FOR 2-1/2" SQUARE TUBE RISER POST IN SOIL, USE SLIP BASE PLACED PER MANUFACTURER'S SPECIFICATIONS USING A 10 GAUGE, 2-1/2" X 2-1/2" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST WITH A 10 GAUGE 2-3/16" X 2-3/16" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE INTERNAL INSERT.

SPECIFIC NOTES;

- ① IF ANY PART OF A SIGN OR SIGN ASSEMBLY EXTENDS MORE THAN 4" INTO THE PEDESTRIAN FACILITY, THE MINIMUM HEIGHT TO BOTTOM OF THE SIGN OR SIGN ASSEMBLY SHALL BE 7'.
- ② 6' - 12' FROM EDGE OF ROADWAY, MUST BE A MINIMUM OF 6' FROM EDGE OF PAVED SHOULDER (WHEN PRESENT).
- ③ IF GROUND MOUNTED TEMPORARY SIGN OR SIGN ASSEMBLY IS PLACED ON 2-1/2" SQUARE TUBE RISER POST(S), THE MINIMUM CLEARANCE FROM THE GROUND LINE TO THE BOTTOM OF THE LOWEST SIGN ON THE ASSEMBLY SHALL BE 7', OR AS SHOWN IN DETAIL, WHICHEVER IS GREATER.
- ④ 5' MINIMUM IN RURAL, 7' MINIMUM IN BUSINESS, COMMERCIAL, OR RESIDENTIAL AREAS.
- ⑤ WHEN MULTIPLE GROUND MOUNTED SIGN STRUCTURES ARE PLACED ADJACENT TO EACH OTHER THERE SHOULD BE NO MORE THAN 2 POSTS WITHIN 84" OF EACH OTHER. WHEN THIS SPACING CAN NOT BE MAINTAINED, THEN SIGN STRUCTURES SHALL BE OFFSET, AND STAGGERED WITH A MINIMUM OF 4' BETWEEN SIGN STRUCTURES BOTH Laterally AND LONGITUDINALLY. EXAMPLE SHOWS DETOUR SIGNAGE, BUT THIS REQUIREMENT APPLIES TO ALL SIGNAGE.
- ⑥ INPLACE AND/OR OTHER CONSTRUCTION SIGNING.



**CONSTRUCTION SIGN POST
OFFSET SPACING**
⑤



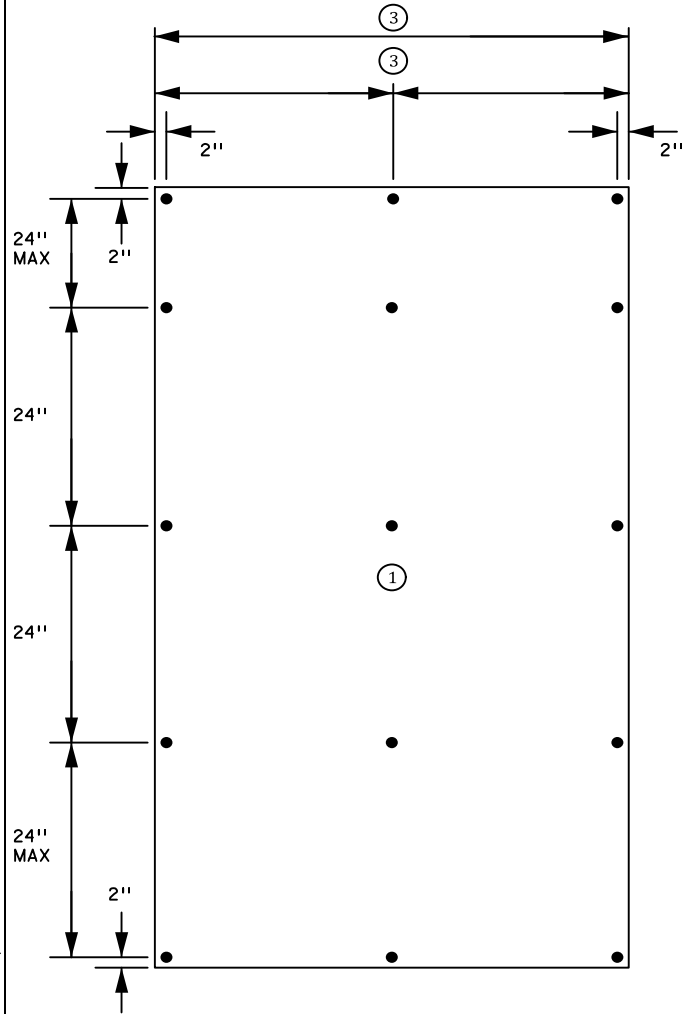
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PUBLISHED BY OTE 03/15/2021					TEMPORARY SQUARE TUBE GROUND MOUNTED SIGN PLACEMENT							
NO.	DATE	BY	CHK	REVISIONS	Design By:	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  MIKE SHOMION, PE DATE: 9/12/2024 LICENSE NO. 50488			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA		SHEET 86 OF 216 SHEETS
										TEMPORARY SQUARE TUBE GROUND MOUNTED SIGN PLACEMENT		
										CONSTRUCTION STAGING & TRAFFIC CONTROL		
										SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		
					Plan By:							
					Checked By:							
					Approved By:							

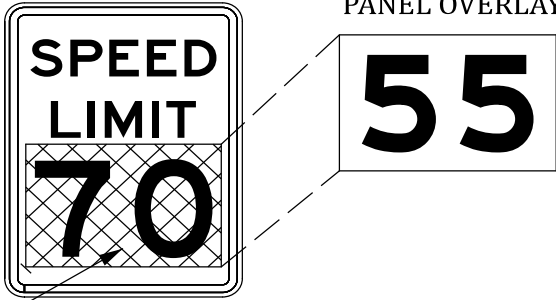
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FASTENER SPACING DETAIL
HORIZONTAL PLACEMENT

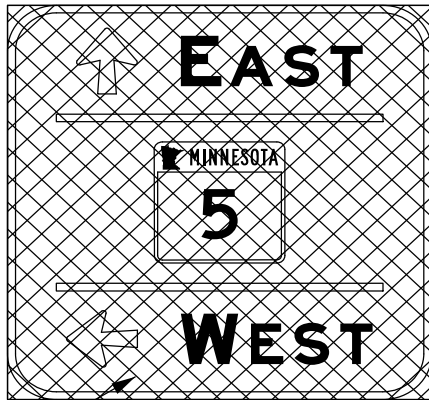


R2-1

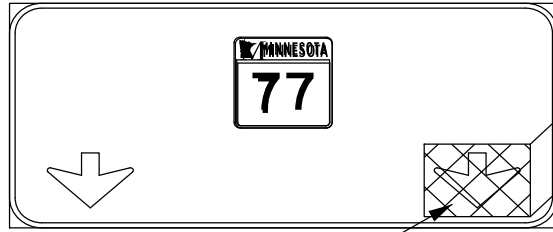
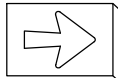
BLACK ON WHITE
PANEL OVERLAY



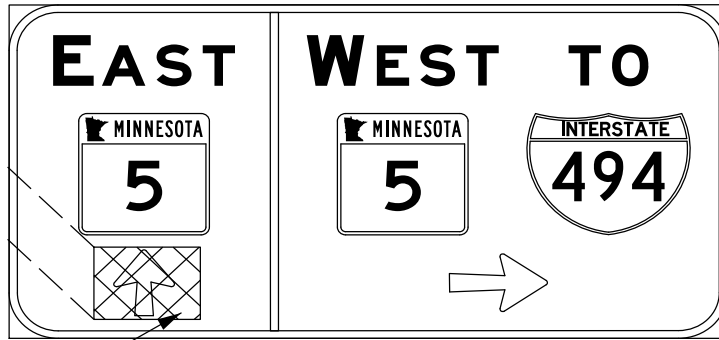
BLANK
NON-REFLECTIVE
GREEN
COVER



BLACK ON
ORANGE
PANEL
OVERLAY



BLANK
ORANGE
PANEL
OVERLAY

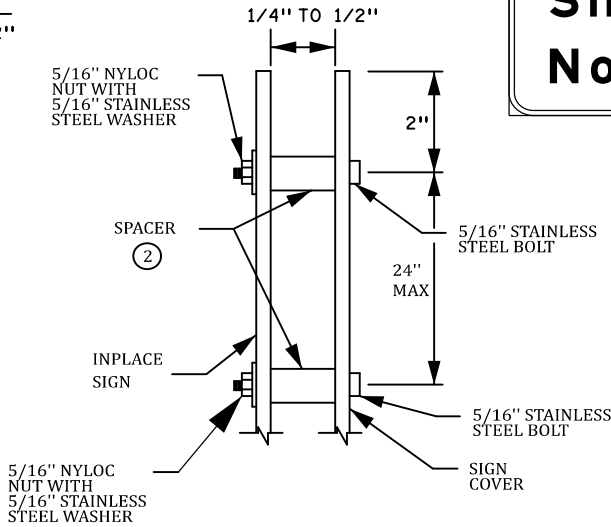


BLACK ON
ORANGE
PANEL
OVERLAY

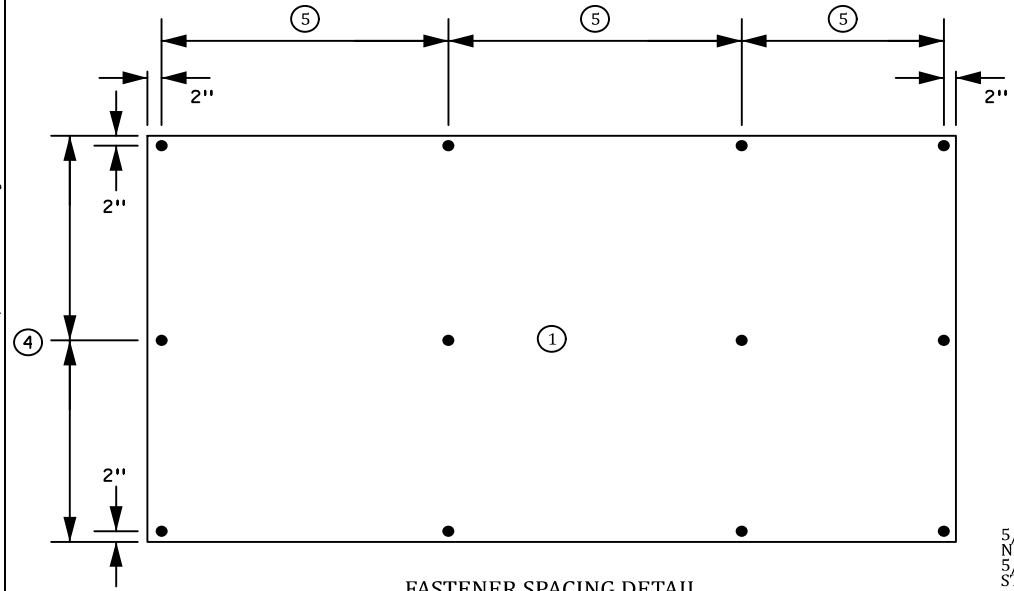


EXIT
CLOSED

SPACER DETAIL



FASTENER SPACING DETAIL
VERTICAL PLACEMENT



GENERAL NOTES:

- SIGN COVERS ARE USED TO COVER THE ENTIRE PANEL OF A INPLACE SIGN. THE COVER SHALL BE BLANK, GREEN IN COLOR, AND MADE OF A RIGID NON-REFLECTIVE MATERIAL (SHEET ALUMINUM, PLYWOOD, CORRUGATED PLASTIC). OTHER MATERIALS MAY BE USED AS APPROVED BY THE ENGINEER.
- SIGN PANEL OVERLAYS ARE USED TO MODIFY THE MESSAGE OF AN INPLACE SIGN PANEL. THE PANEL OVERLAY SHALL BE MADE OF SHEET ALUMINUM WITH THE APPROPRIATE SHEETING MATERIAL AS SPECIFIED ON THE MNDOT SHEETING FOR RIGID TEMPORARY WORK ZONE SIGNS APL. THE MESSAGE SHALL FOLLOW THE REQUIREMENTS OF THE "MNDOT STANDARD SIGNS AND MARKINGS MANUAL" OR THE "FHWA STANDARD HIGHWAY SIGNS MANUAL" (AND SUPPLEMENTS). THE SIGN PANEL OVERLAY SHALL BE RECTANGULAR IN SHAPE AND FULLY COVER THE MESSAGE ELEMENT(S) BEING MODIFIED.
- SIGN PANEL OVERLAY WITH A MESSAGE SHALL BE BLACK ON FLUORESCENT ORANGE ON ALL SIGNS EXCEPT FOR REGULATORY SIGNS WHICH SHALL BE THE PROPER COLOR ON A WHITE BACKGROUND.
- BLANK SIGN PANEL OVERLAYS SHALL BE FLUORESCENT ORANGE ON ALL SIGNS.
- DO NOT COVER OR MODIFY THE "STOP" (R1-1), "YIELD" (R1-2), OR THE (W14-3) NO PASSING ZONE SIGNS, THESE SIGNS SHALL BE REMOVED IF THEY NO LONGER APPLY OR CONFLICT WITH WORK ZONE SIGNING.
- MINIMIZE DAMAGE TO THE INPLACE SIGN PANEL. DO NOT APPLY TAPE TO THE INPLACE SIGN SHEETING.
- SPACERS (SUCH AS PLASTIC OR RUBBER) SHALL BE A MATERIAL THAT WILL NOT HARM THE INPLACE SIGN SHEETING FACE.
- ATTACH SIGN COVER PANEL OR PANEL OVERLAY USING HARDWARE SHOWN IN THE SPACER DETAIL.
- IF SHEET METAL SCREWS ARE USED TO PLACE CORRUGATED PLASTIC AS A SIGN COVER PANEL, PLACE FENDER WASHERS BETWEEN THE SCREW HEADS AND THE CORRUGATED PLASTIC.
- REMOVE ALL COVERING MATERIAL, MOUNTING HARDWARE, AND FASTENERS WHEN SIGN COVER PANEL OR PANEL OVERLAY IS REMOVED.
- NO HANDLE OR OTHER LIFTING DEVICE SHALL BE LEFT ATTACHED TO ANY SIGN COVER PANEL AFTER PLACEMENT.

SPECIFIC NOTES:

- THE SIGN COVER OR PANEL OVERLY SHALL FULLY COVER THE MESSAGE BEING COVERED OR MODIFIED.
- PLACE SIGN COVER AND PANEL OVERLAYS WITH SPACERS THAT PROVIDE A SPACING OF 1/4 IN TO 1/2 IN BETWEEN THE COVER MATERIAL AND THE INPLACE SIGN. THE SPACERS SHALL HAVE AN OUTSIDE DIAMETER BETWEEN 3/8 IN TO 7/8 IN. EACH FASTENER REQUIRES A SPACER.
- IF THE SIGN COVER OR PANEL OVERLAY IS GREATER THAN 48 IN WIDE, THE FASTENER SPACING SHALL BE NO GREATER THAN 24 IN. IF THE SIGN COVER OR PANEL OVERLAY IS LESS THAN 24 IN WIDE, DO NOT PLACE A CENTER FASTENER (UNLESS REQUIRED BY SPECIFIC NOTE ④).
- VERTICAL SPACING FOR FASTENERS IS 50% OF THE SIGN COVER OR PANEL OVERLAY. IF THE SIGN COVER OR PANEL OVERLAY IS LESS THAN 24 IN HIGH, DO NOT PLACE A CENTER FASTENER (UNLESS REQUIRED PER SPECIFIC NOTE ⑤).
- HORIZONTAL SPACING FOR FASTENERS SHALL NOT BE LESS THAN 15 IN OR MORE THAN 24 IN.

ASSEMBLY NOTES:

- DRILL 11/32 IN HOLES ON THE SIGN COVER OR PANEL OVERLAY IN ACCORDANCE WITHHELD FASTENER SPACING DETAILS.
- ATTACH PLASTIC SPACERS TO SIGN COVER OR PANEL OVERLAY WITH DOUBLE FACED TAPE. CENTERED BEHIND EACH DRILLED HOLE.
- POSITION THE COVER OR OVERLAY MATERIAL OVER THE SIGN OR MESSAGE TO BE MODIFIED.
- DRILL ALL THE OUTSIDE HOLES THROUGH THE INPLACE SIGN PANEL AND ATTACH THE COVER OR OVERLAY MATERIAL WITH APPROPRIATE FASTENERS.
- DRILL ALL THE INNER HOLES THROUGH THE INPLACE SIGN PANEL AND ATTACH WITH APPROPRIATE FASTENERS.

PUBLISHED BY OTE 08/17/2023

TEMPORARY SIGN COVERING AND MODIFICATION DETAIL

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS
Plan By: GAD
Checked By: MKV
Approved By: MJS

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.

Michael Shomon
MIKE SHOMON, PE

DATE: 9/12/2024 LICENSE NO. 50488

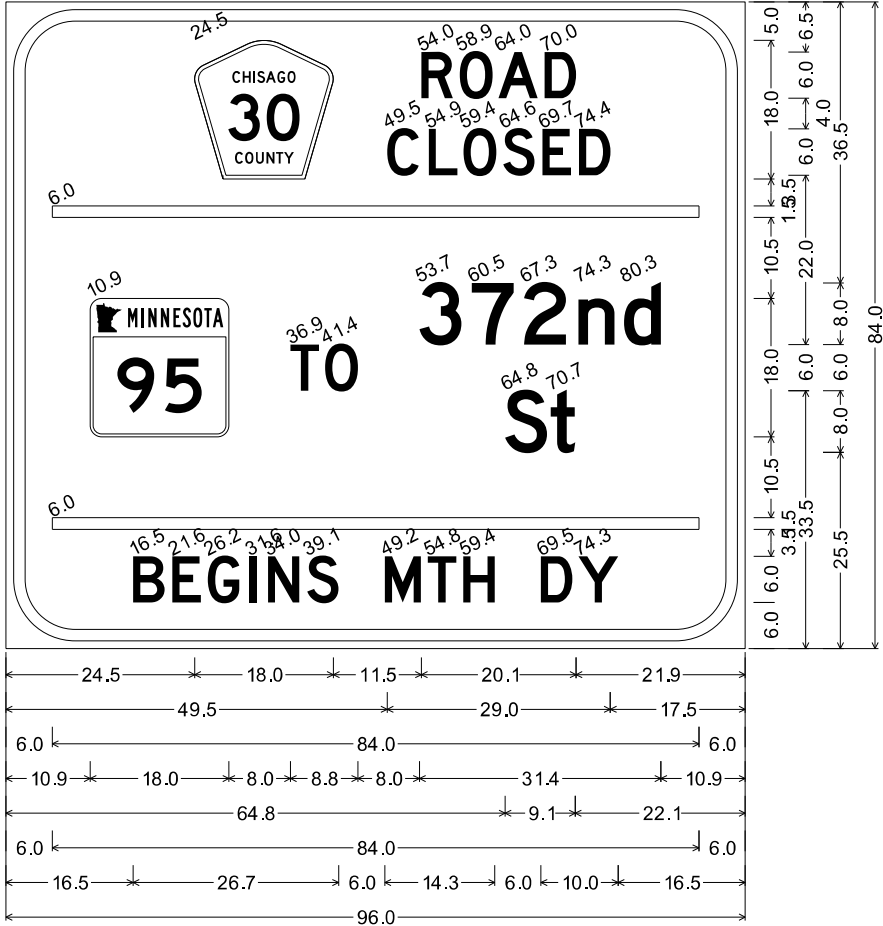


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

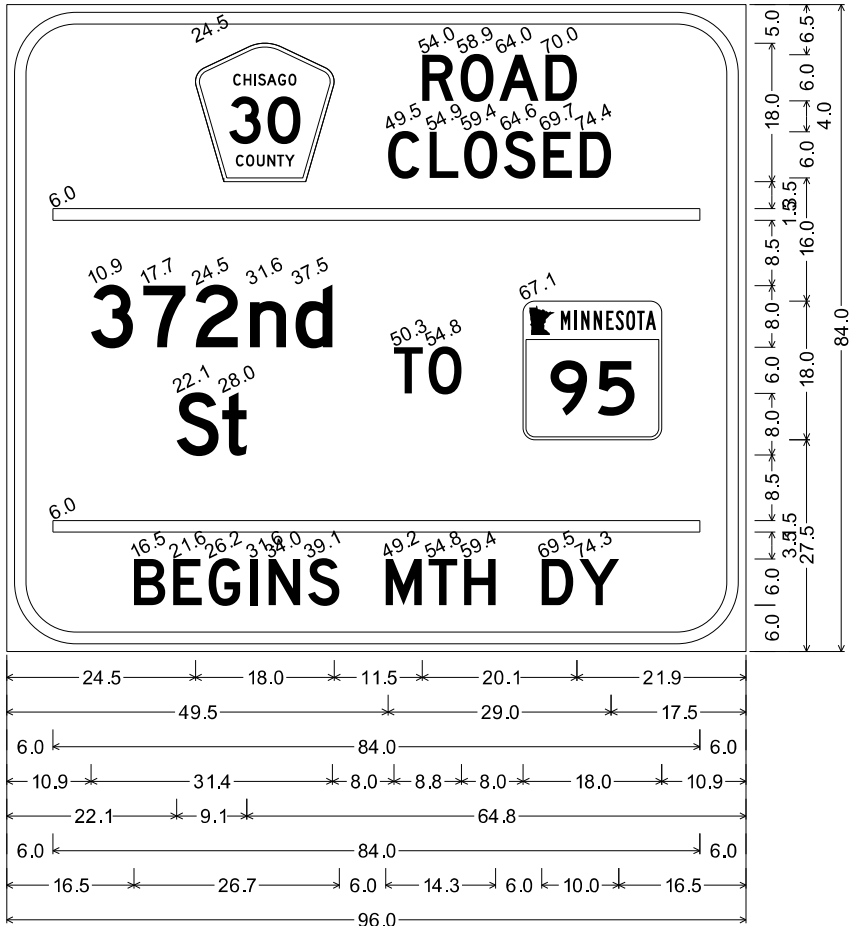
CHISAGO COUNTY, MINNESOTA
TEMPORARY SIGN COVERING AND MODIFICATION DETAIL
CONSTRUCTION STAGING & TRAFFIC CONTROL
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
87
OF
216
SHEETS

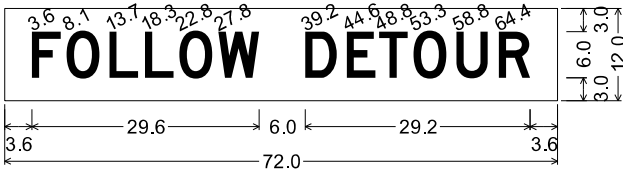
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9.0" Radius, 1.5" Border, 1.0" Indent, Black on Orange;
"ROAD", D 2K; "CLOSED", D 2K; State Highway 95 M1-5M; "TO", D 2K;
"372nd", D 2K; "St", D 2K; "BEGINS MTH DY", D 2K;



9.0" Radius, 1.5" Border, 1.0" Indent, Black on Orange;
"ROAD", D 2K; "CLOSED", D 2K; "372nd", D 2K; "St", D 2K;
"TO", D 2K; State Highway 95 M1-5M; "BEGINS MTH DY", D 2K;



No border, White on Orange;
"FOLLOW DETOUR" Black, D 2K;

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS
Plan By: GAD
Checked By: MKV
Approved By: MJS

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Michael Shomion
MIKE SHOMION, PE
DATE: 9/12/2024 LICENSE NO. 50488

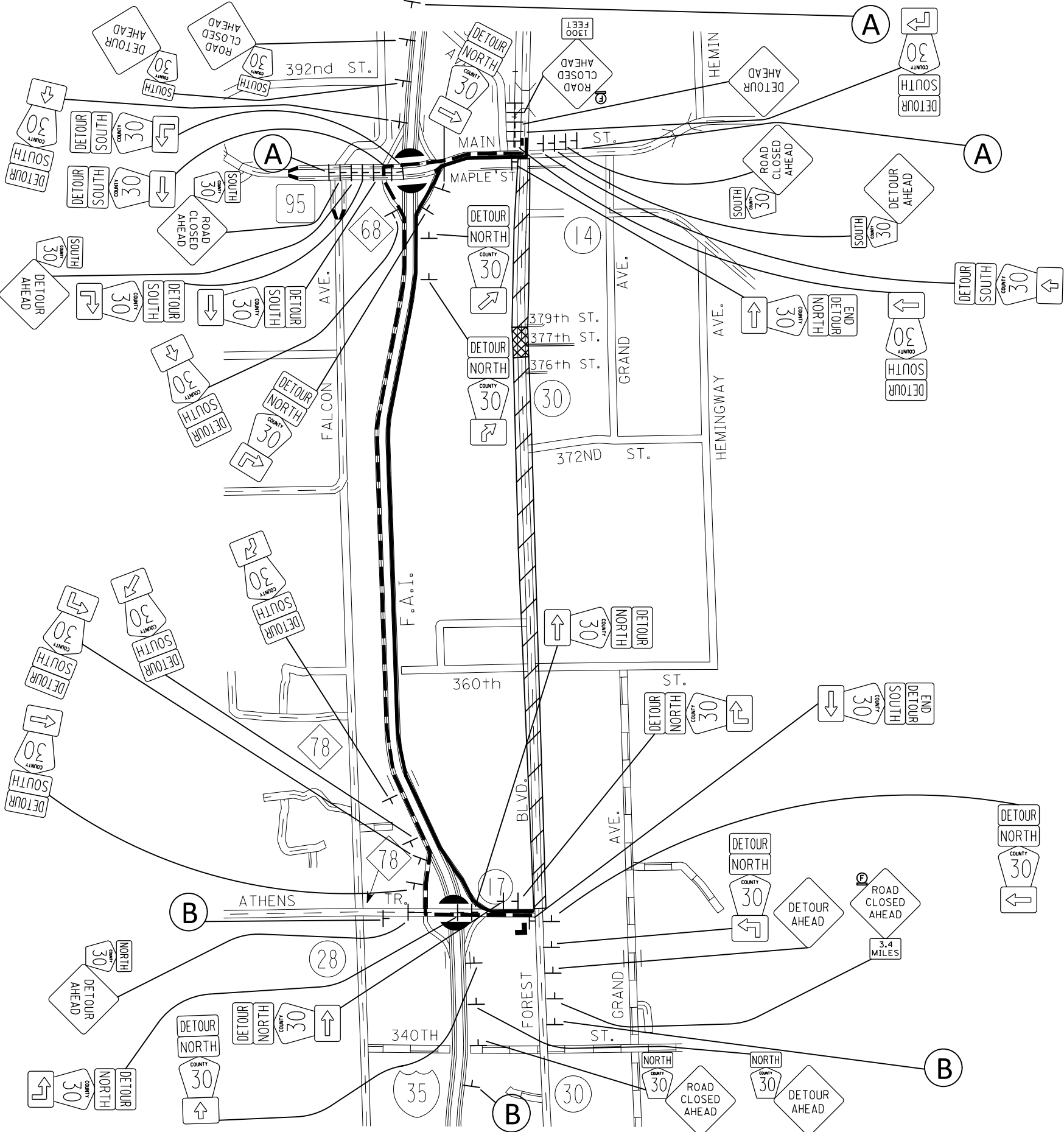


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
SPECIAL SIGN DETAILS
CONSTRUCTION STAGING & TRAFFIC CONTROL
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 88 OF 216 SHEETS

DATE: 9/12/2024 2:03:45 PM
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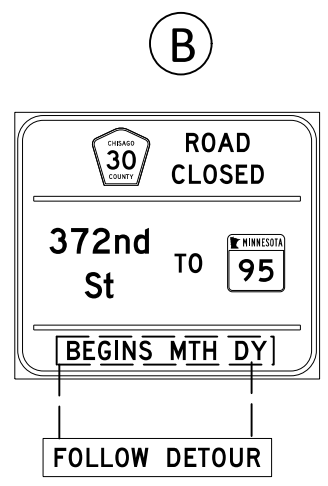
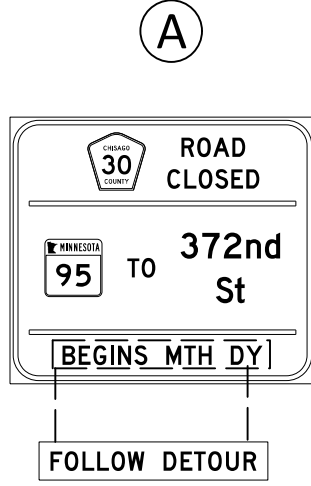


NOTES:

1. MAINTAIN ACCESS TO RESIDENTIAL AREAS AT ALL TIMES

CSAH 30 NORTH DETOUR ROUTE —————

CSAH 30 SOUTH DETOUR ROUTE - - - - -



NO.	DATE	BY	CHK	REVISIONS

Design By: MJS
Plan By: GAD
Checked By: MKV
Approved By: MJS

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.

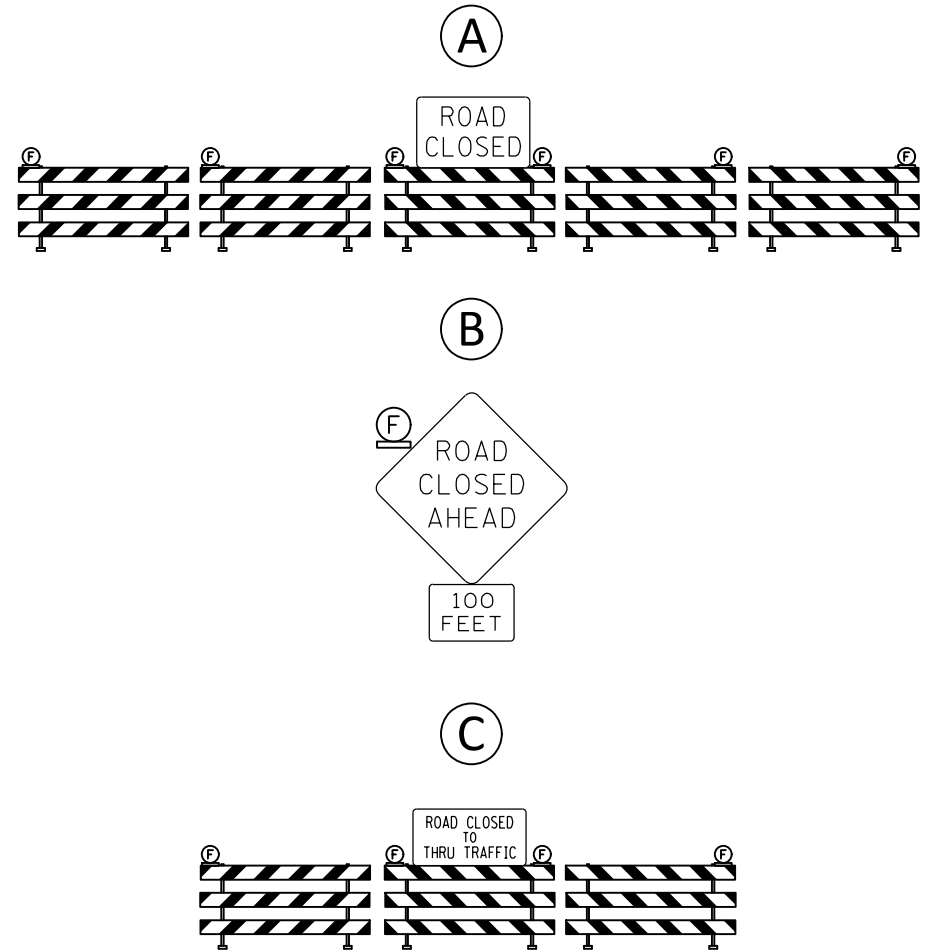
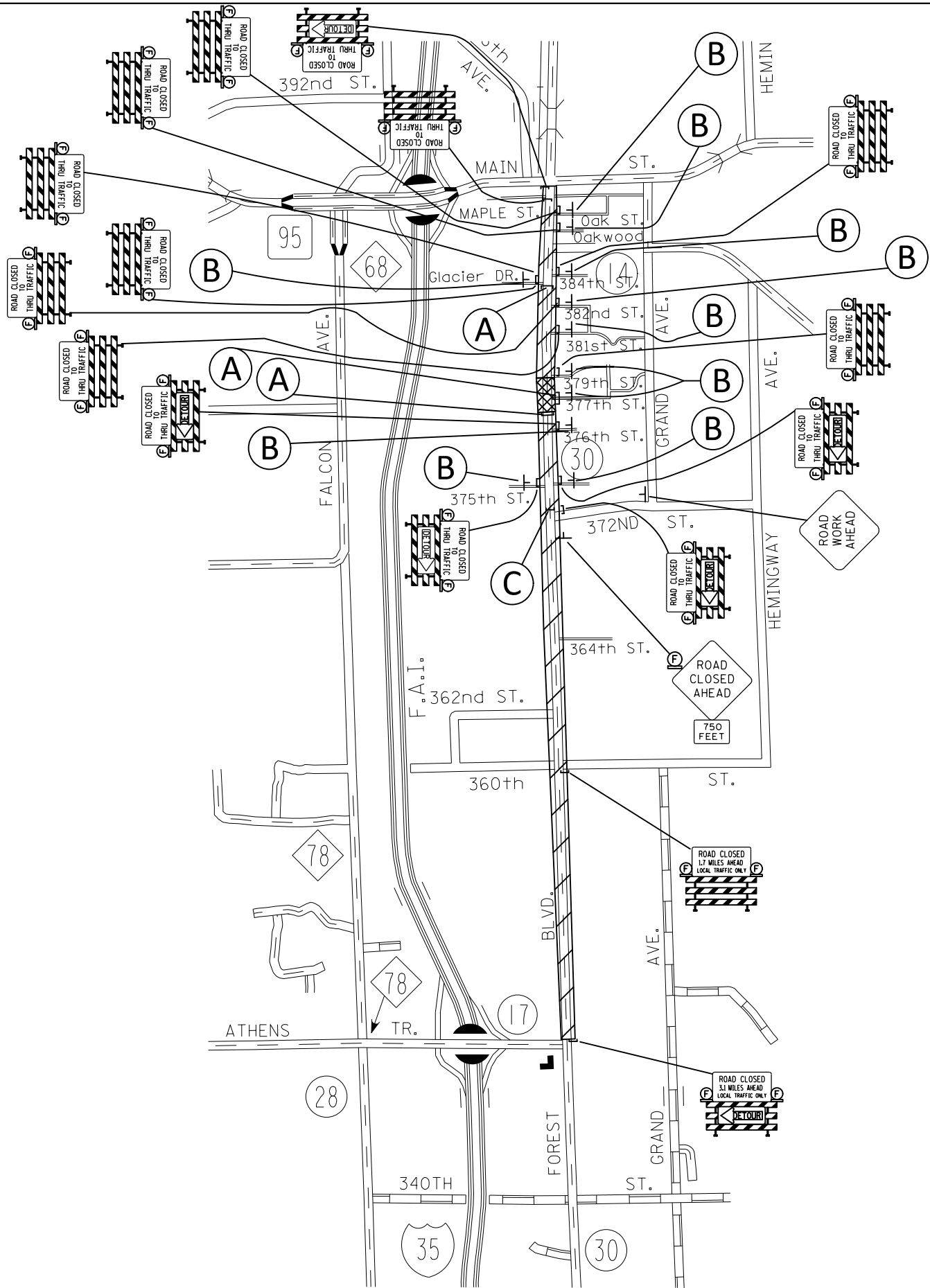
Michael Shomon
MIKE SHOMON, PE
DATE: 9/12/2024 LICENSE NO. 50488

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
DETOUR
CONSTRUCTION STAGING & TRAFFIC CONTROL
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 89 OF 216 SHEETS
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DATE: 9/12/2024 2:03:46 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-tcp-DETOUTP-001



NO.	DATE	BY	CHK	REVISIONS

Design By: MJS
Plan By: GAD
Checked By: MKV
Approved By: MJS

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Michael Shomon
MIKE SHOMON, PE
DATE: 9/12/2024 LICENSE NO. 50488

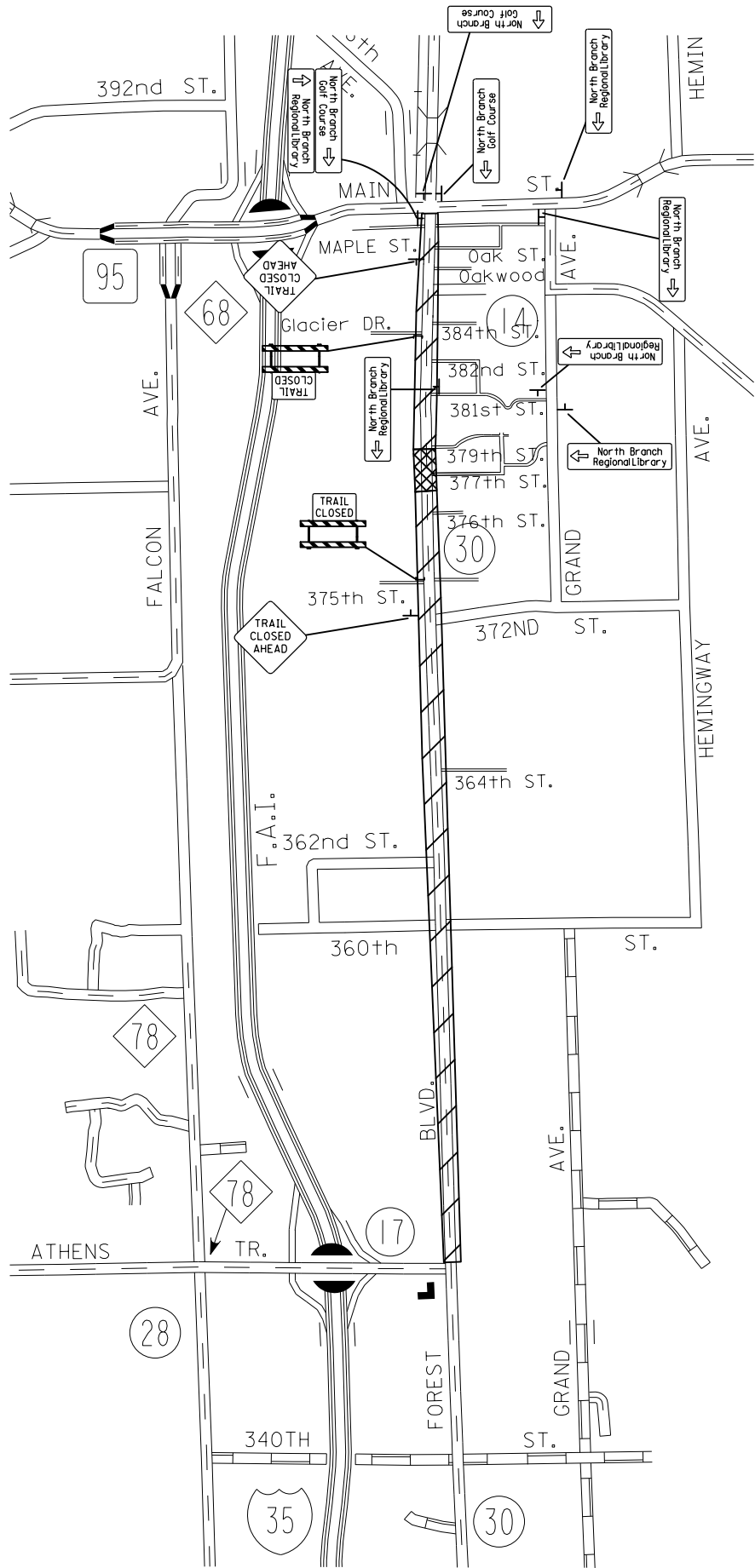


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
TRAFFIC CONTROL
CONSTRUCTION STAGING & TRAFFIC CONTROL
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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DATE: 9/12/2024 2:03:47 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-tcp-DET01P-001



NO.	DATE	BY	CHK	REVISIONS

Design By: MJS
Plan By: GAD
Checked By: MKV
Approved By: MJS

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Michael Shomon
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DATE: 9/12/2024 LICENSE NO. 50488

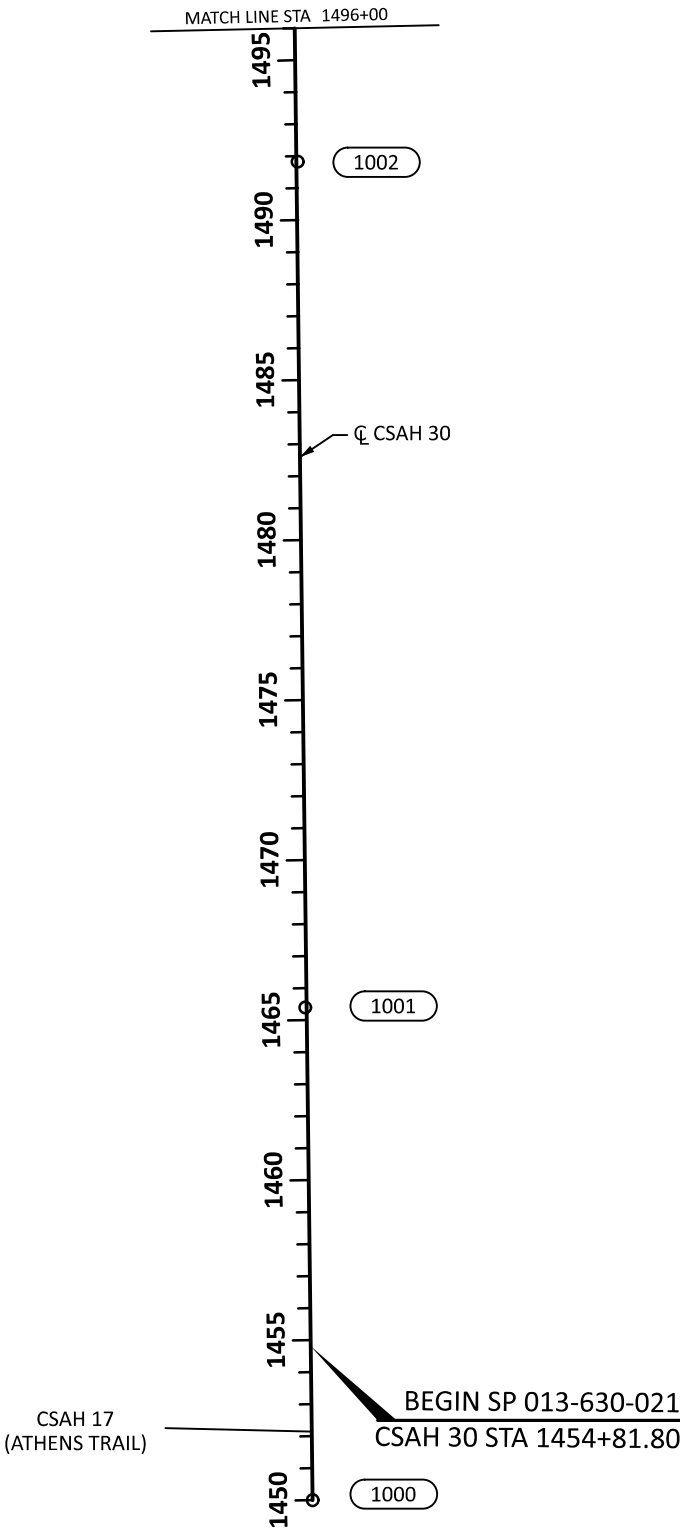


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

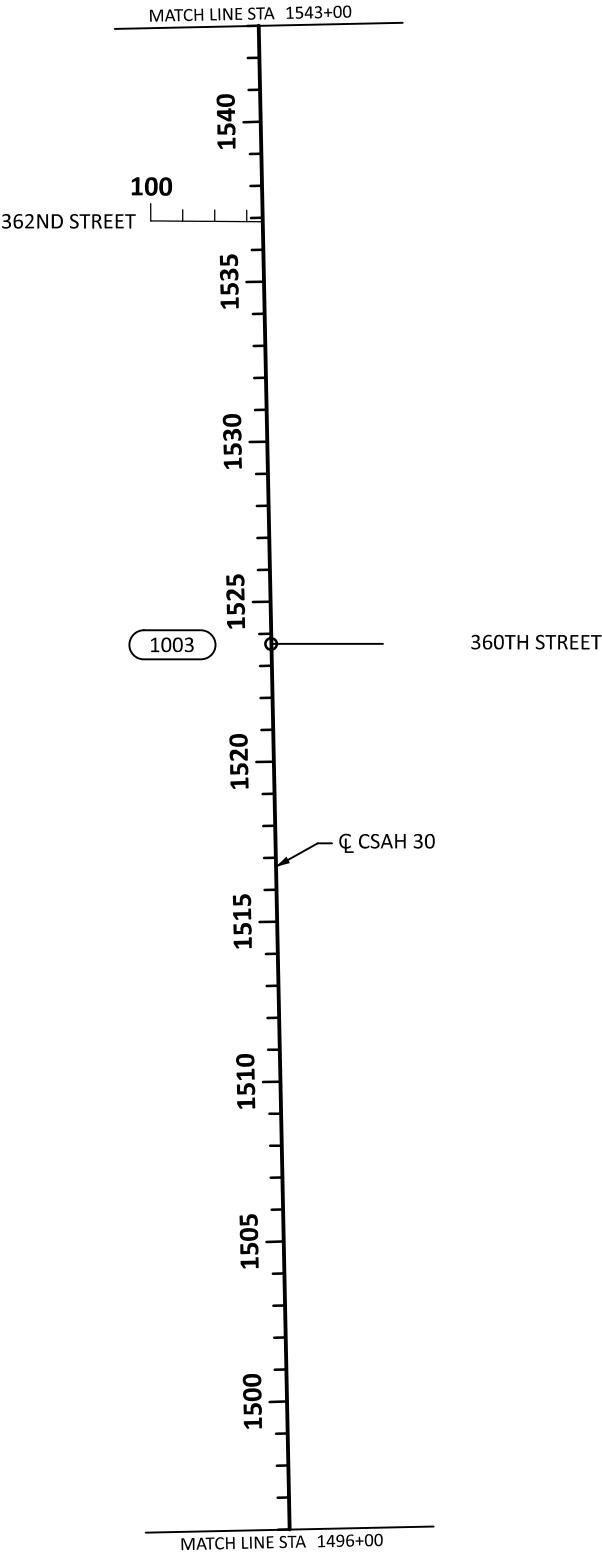
CHISAGO COUNTY, MINNESOTA
TRAFFIC CONTROL
CONSTRUCTION STAGING & TRAFFIC CONTROL
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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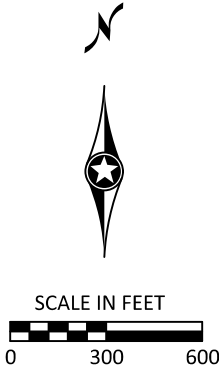
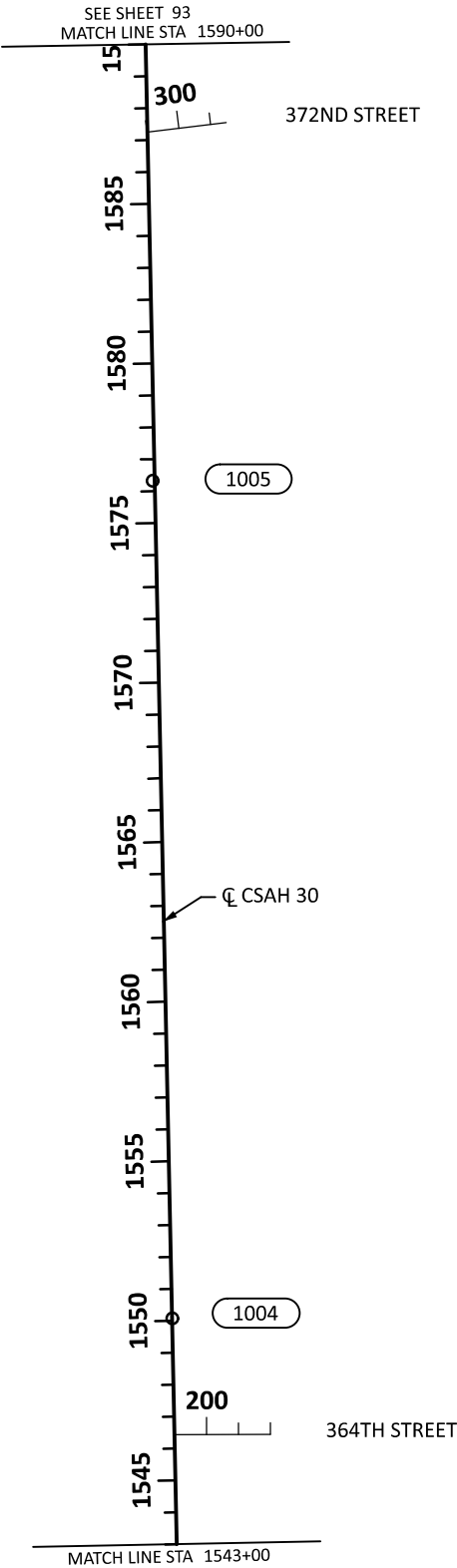
CSAH 30 (Forest Blvd)



CSAH 30 (Forest Blvd)



CSAH 30 (Forest Blvd)



THE HORIZONTAL CONTROL FOR THIS PLAN IS CHISAGO COUNTY COORDINATES NAD 83 (1996 ADJUSTMENT).

THE VERTICAL CONTROL FOR THIS PLAN IS NAVD 88.

LEGEND

XXXX POINT NUMBER (POINT DETAILS FOUND ON ALIGNMENT TABULATION SHEET)

DATE: 9/12/2024 2:03:56 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_al

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.


NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



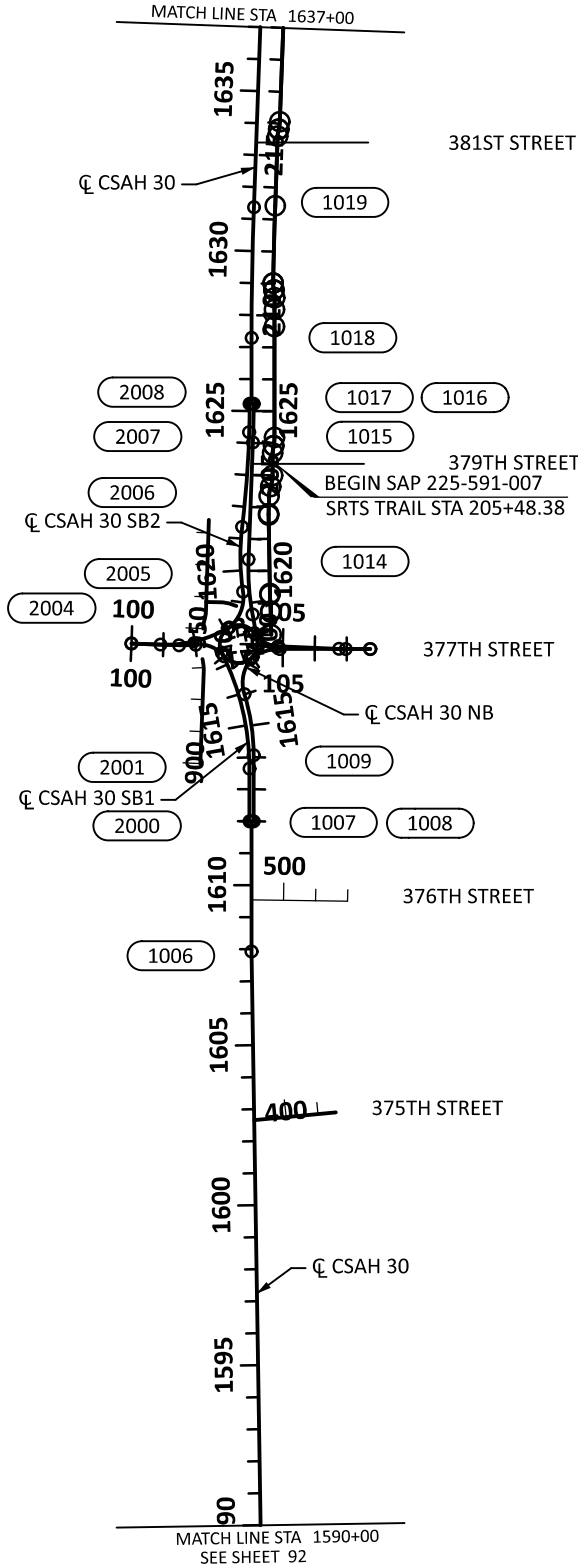
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

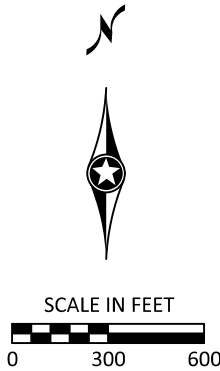
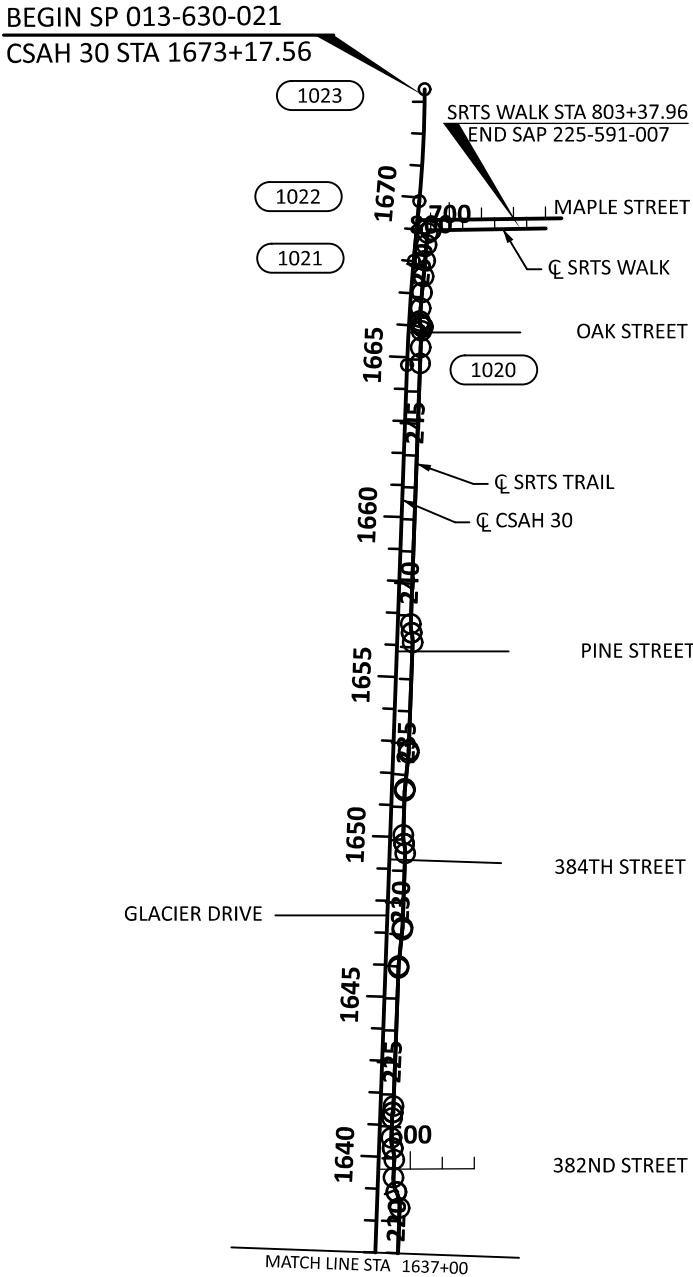
ALIGNMENT PLAN AND TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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SHEETS

CSAH 30 (Forest Blvd)



CSAH 30 (Forest Blvd)



THE HORIZONTAL CONTROL FOR THIS PLAN IS CHISAGO COUNTY COORDINATES NAD 83 (1996 ADJUSTMENT).
THE VERTICAL CONTROL FOR THIS PLAN IS NAVD 88.

LEGEND	
XXXX	POINT NUMBER (POINT DETAILS FOUND ON ALIGNMENT TABULATION SHEET)

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
ALIGNMENT PLAN AND TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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DATE: 9/12/2024 2:03:59 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_al

ALIGNMENT TABULATION										
POINT NUMBER	POINT TYPE	STATION	CIRCULAR CURVE DATA					COORDINATES		DIRECTION AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH			
			SPIRAL CURVE DATA					EASTING (X)	NORTHING (Y)	
			THETA	DEGREE	ST	LT	LS			
ALIGNMENT: CSAH 30-1										
1000	START	1450+00.000 R1						526557.630	156119.240	
1001	HPI	1465+39.786 R1						526534.352	157658.850	359.134°
1002	HPI	1491+83.063 R1						526510.705	160302.021	359.487°
1003	HPI	1523+68.041 R1						526443.513	163486.290	358.791°
1004	HPI	1550+07.649 R1						526391.254	166125.381	358.866°
1005	HPI	1576+32.498 R1						526329.603	168749.506	358.654°
1006	HPI	1607+93.311 R1						526279.464	171909.921	359.091°
1007	END	1612+00.000 R1						526279.523	172316.610	0.008°
ALIGNMENT: CSAH 30 NB										
1008	START	1612+00.000 R1						526286.023	172316.609	
1009	PC	1614+06.512 R1						526286.053	172523.122	0.008°
	HPI	1615+04.325 R1	17.115° LT	8.815°	650	97.813	194.169	526286.067	172620.934	PI
	CC							525636.053	172523.216	
1010	PRC	1616+00.681 R1						526257.294	172714.42	342.893°
	HPI	1616+69.240 R1	59.481° RT	47.746°	120	68.559	124.577	526237.127	172779.945	PI
	CC							526371.985	172749.719	
1011	PRC	1617+25.258 R1						526283.334	172830.594	42.374°
	HPI	1617+54.860 R1	52.902° LT	96.295°	59.5	29.602	54.937	526303.284	172852.463	PI
	CC							526239.377	172870.695	
1012	PT	1617+80.195 R1						526297.875	172881.567	349.472°
1013	PC	1618+63.228 R1						526282.704	172963.202	349.472°
	HPI	1619+49.972 R1	12.692° RT	7.346°	780	86.744	172.777	526266.854	173048.486	PI
	CC							527049.572	173105.724	
1014	PT	1620+36.005 R1						526270.128	173135.168	2.163°
1015	PC	1624+01.546 R1						526283.927	173500.448	2.163°
	HPI	1624+61.987 R1	2.155° LT	1.783°	3213.5	60.441	120.868	526286.208	173560.846	PI
	CC							523072.717	173621.752	
1016	PT	1625+22.414 R1						526286.217	173621.287	0.008°
ALIGNMENT: CSAH 30-2										
1017	START	1625+22.410 R1						526279.717	173621.288	
1018	PC	1627+28.230 R1						526279.747	173827.108	0.008°
	HPI	1629+32.574 R1	2.043° RT	0.500°	11459.16	204.345	408.646	526279.776	174031.452	PI
	CC							537738.903	173825.45	
1019	PT	1631+36.876 R1						526287.091	174235.666	2.052°
1020	PC	1664+75.217 R1						526406.597	177571.867	2.052°
	HPI	1666+38.482 R1	3.264° RT	1.000°	5729.58	163.266	326.443	526412.442	177735.028	PI
	CC							532132.505	177366.759	
1021	PT	1668+01.660 R1						526427.568	177897.592	5.316°
1022	PC	1669+89.355 R1						526444.958	178084.479	5.316°
	HPI	1671+64.415 R1	5.257° LT	1.503°	3813.22	175.06	349.875	526461.177	178258.787	PI
	CC							522648.139	178437.765	
1023	PT	1673+39.229 R1						526461.357	178433.847	0.059°
ALIGNMENT: CSAH 30 SB1										
2000	START	1612+00.000 R1						526273.023	172316.611	
2001	PC	1613+64.766 R1						526273.047	172481.377	0.008°
	HPI	1615+56.337 R1	26.933° LT	7.162°	800	191.571	376.06	526273.075	172672.948	PI
	CC							525473.047	172481.493	
2002	PT	1617+40.826 R1						526186.327	172843.752	333.075°

ALIGNMENT TABULATION										
POINT NUMBER	POINT TYPE	STATION	CIRCULAR CURVE DATA					COORDINATES		DIRECTION AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH			
			SPIRAL CURVE DATA					EASTING (X)	NORTHING (Y)	
			THETA	DEGREE	ST	LT	LS			
ALIGNMENT: CSAH 30 SB2										
2003	PC	1618+02.242 R1						526204.563	172918.947	54.190°
	HPI	1618+75.503 R1	62.809° LT	47.746°	120	73.261	131.546	526263.975	172961.813	PI
	CC							526134.351	173016.262	
2004	PRC	1619+33.789 R1						526252.995	173034.246	351.381°
	HPI	1620+35.981 R1	15.529° RT	7.645°	749.5	102.192	203.132	526237.68	173135.284	PI
	CC							526994.031	173146.571	
2005	PRC	1621+36.921 R1						526249.974	173236.735	6.909°
	HPI	1622+85.464 R1	5.315° LT	1.790°	3200.5	148.543	296.873	526267.844	173384.199	PI
	CC							523072.717	173621.752	
2006	PCC	1624+33.795 R1						526271.977	173532.685	1.595°
	HPI	1624+78.105 R1	1.586° LT	1.790°	3200.5	44.311	88.615	526273.21	173576.978	PI
	CC							523072.717	173621.752	
2007	PT	1625+22.410 R1						526273.217	173621.289	0.008°
ALIGNMENT: 362ND ST										
	START	100+00.000 R1						526067.401	164808.013	
	END	103+50.000 R1						526417.391	164805.452	90.419°
ALIGNMENT: 364TH ST										
	START	199+00.000 R1						526398.477	165760.647	
	END	202+00.000 R1						526698.473	165762.117	89.719°
ALIGNMENT: 372ND ST										
	START	299+00.000 R1						526312.275	169841.728	
	END	301+50.000 R1						526560.413	169872.184	83.003°
ALIGNMENT: 375TH ST										
	START	399+00.000 R1						526287.820	171383.209	
	END	401+56.101 R1						526542.781	171407.341	84.593°
ALIGNMENT: 376TH ST										
	START	499+00.000 R1						526279.488	172070.863	
	END	502+00.000 R1						526579.461	172066.848	90.767°
ALIGNMENT: 382ND ST										
	START	599+00.000 R1						526316.582	175058.95	
	END	602+00.000 R1						526616.577	175060.65	89.675°
ALIGNMENT: SOUTH SUNRISE PRAIRIE TRAIL										
	START	900+00.000 R1						526119.321	172497.169	
	PC	902+92.064 R1						526130.208	172789.03	2.136°
	HPI	903+04.484 R1	14.160° LT	57.296°	100	12.42	24.714	526130.671	172801.442	PI
	CC							526030.277	172792.758	
	PRC	903+16.778 R1						526128.084	172813.589	347.976°
	HPI	903+21.775 R1	5.202° RT	52.087°	110	4.997	9.988	526127.043	172818.477	PI
	CC							526235.67	172836.504	
	PT	903+26.765 R1						526126.449	172823.438	353.179°
ALIGNMENT: NORTH SUNRISE PRAIRIE TRAIL										
	START	950+00.000 R1						526128.542	172919.008	
	PC	950+01.689 R1						526128.602	172920.697	2.042°
	HPI	950+15.259 R1	14.065° RT	52.087°	110	13.57	27.003	526129.085	172934.258	PI
	CC							526238.532	172916.778	
	PRC	950+28.692 R1						526132.85	172947.295	16.107°
	HPI	950+41.240 R1	14.304° LT	57.296°	100	12.548	24.965	526136.331	172959.35	PI
	CC							526036.775	172975.037	
	PT	950+53.658 R1						526136.725	172971.892	1.802°
	END	953+40.838 R1						526145.758	173258.93	1.802°

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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.	
	NICHOLAS E. HENTGES, PE
DATE: 9/12/2024	LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

ALIGNMENT PLAN AND TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

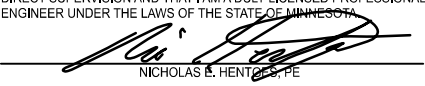
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DATE: 9/12/2024 2:04:00 PM
PATH & FILENAME: Projects\Minnesota\Roadway\Sheets\023661-000.dwg

ALIGNMENT TABULATION										
POINT NUMBER	POINT TYPE	STATION	CIRCULAR CURVE DATA					COORDINATES		DIRECTION AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH			
			SPIRAL CURVE DATA							
			THETA	DEGREE	ST	LT	LS	EASTING (X)	NORTHING (Y)	
ALIGNMENT: SRTS TRAIL										
	START	200+00.000 R1						526341.312	172899.403	
	PC	200+70.755 R1						526339.799	172970.142	358.775°
	HPI	200+72.696 R1	2.022° LT	52.087°	110	1.941	3.881	526339.757	172972.082	PI
	CC							526229.824	172967.789	
	PT	200+74.636 R1						526339.647	172974.02	356.753°
	PC	201+25.635 R1						526336.759	173024.936	356.753°
	HPI	201+27.658 R1	2.318° RT	57.296°	100	2.023	4.046	526336.644	173026.956	PI
	CC							526436.598	173030.6	
	PT	201+29.681 R1						526336.611	173028.979	359.071°
	PC	203+74.173 R1						526332.649	173273.439	359.071°
	HPI	203+76.248 R1	2.378° RT	57.296°	100	2.075	4.15	526332.615	173275.514	PI
	CC							526432.636	173275.06	
	PT	203+78.323 R1						526332.668	173277.589	1.449°
	PC	204+34.165 R1						526334.08	173333.413	1.449°
	HPI	204+49.383 R1	17.307° RT	57.299°	99.995	15.218	30.204	526334.465	173348.626	PI
	CC							526434.043	173330.884	
	PRC	204+64.369 R1						526339.358	173363.036	18.756°
	HPI	204+82.184 R1	18.399° LT	52.089°	109.995	17.814	35.321	526345.087	173379.906	PI
	CC							526235.205	173398.405	
	PT	204+99.691 R1						526345.198	173397.72	0.357°
	PC	205+69.724 R1						526345.634	173467.751	0.357°
	HPI	205+81.266 R1	13.169° RT	57.299°	99.995	11.542	22.983	526345.706	173479.293	PI
	CC							526445.627	173467.128	
	PC	205+92.708 R1						526348.406	173490.516	13.526°
	HPI	206+05.807 R1	13.582° LT	52.089°	109.995	13.099	26.075	526351.47	173503.252	PI
	CC							526241.462	173516.243	
	PT	206+18.783 R1						526351.457	173516.351	359.944°
	PC	209+65.397 R1						526351.115	173862.965	359.944°
	HPI	209+91.993 R1	0.647° RT	1.217°	4708.914	26.596	53.191	526351.089	173889.561	PI
	CC							531060.027	173867.607	
	PT	210+18.588 R1						526351.363	173916.155	0.591°
	PC	210+55.521 R1						526351.744	173953.087	0.591°
	HPI	210+67.483 R1	12.412° LT	52.089°	109.995	11.961	23.829	526351.867	173965.047	PI
	CC							526241.755	173954.221	
	PC	210+79.352 R1						526349.416	173976.756	348.178°
	HPI	210+90.431 R1	12.644° RT	57.299°	99.995	11.079	22.068	526347.147	173987.6	PI
	CC							526447.29	173997.242	
	PC	211+01.420 R1						526347.306	173998.678	0.823°
	HPI	212+22.276 R1	1.231° RT	0.509°	11253	120.856	241.703	526349.041	174119.522	PI
	CC							537599.146	173837.121	
	PT	213+43.123 R1						526353.371	174240.301	2.053°
	PC	215+60.813 R1						526361.17	174457.851	2.053°
	HPI	215+71.789 R1	12.528° RT	57.299°	99.995	10.976	21.864	526361.564	174468.82	PI
	CC							526461.101	174454.268	
	PC	215+82.678 R1						526364.327	174479.443	14.581°
	HPI	215+94.752 R1	12.528° LT	52.089°	109.995	12.074	24.051	526367.367	174491.128	PI
	CC							526257.875	174507.134	
	PT	216+06.729 R1						526367.799	174503.193	2.053°
	PC	220+41.629 R1						526383.381	174937.814	2.053°
	HPI	220+67.857 R1	26.823° LT	52.089°	109.995	26.228	51.495	526384.321	174964.025	PI
	CC							526273.457	174941.755	
	PC	220+93.126 R1						526373.331	174987.842	335.230°
	HPI	221+16.968 R1	26.822° RT	57.299°	99.995	23.842	46.81	526363.342	175009.491	PI
	CC							526464.126	175029.738	
	PT	221+39.936 R1						526364.195	175033.317	2.052°
	PC	221+95.230 R1						526366.175	175088.576	2.052°
	HPI	222+13.544 R1	18.907° LT	52.089°	109.995	18.315	36.297	526366.83	175106.879	PI
	CC							526256.25	175092.514	
	PC	222+31.528 R1						526361.519	175124.409	343.145°
	HPI	222+48.178 R1	18.907° RT	57.299°	99.995	16.65	32.997	526356.692	175140.343	PI
	CC							526457.219	175153.403	
	PT	222+64.525 R1						526357.288	175156.982	2.052°

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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.	
	NICHOLAS E. HENTRICH, P.E.
DATE: 9/12/2024	LICENSE NO. 44620





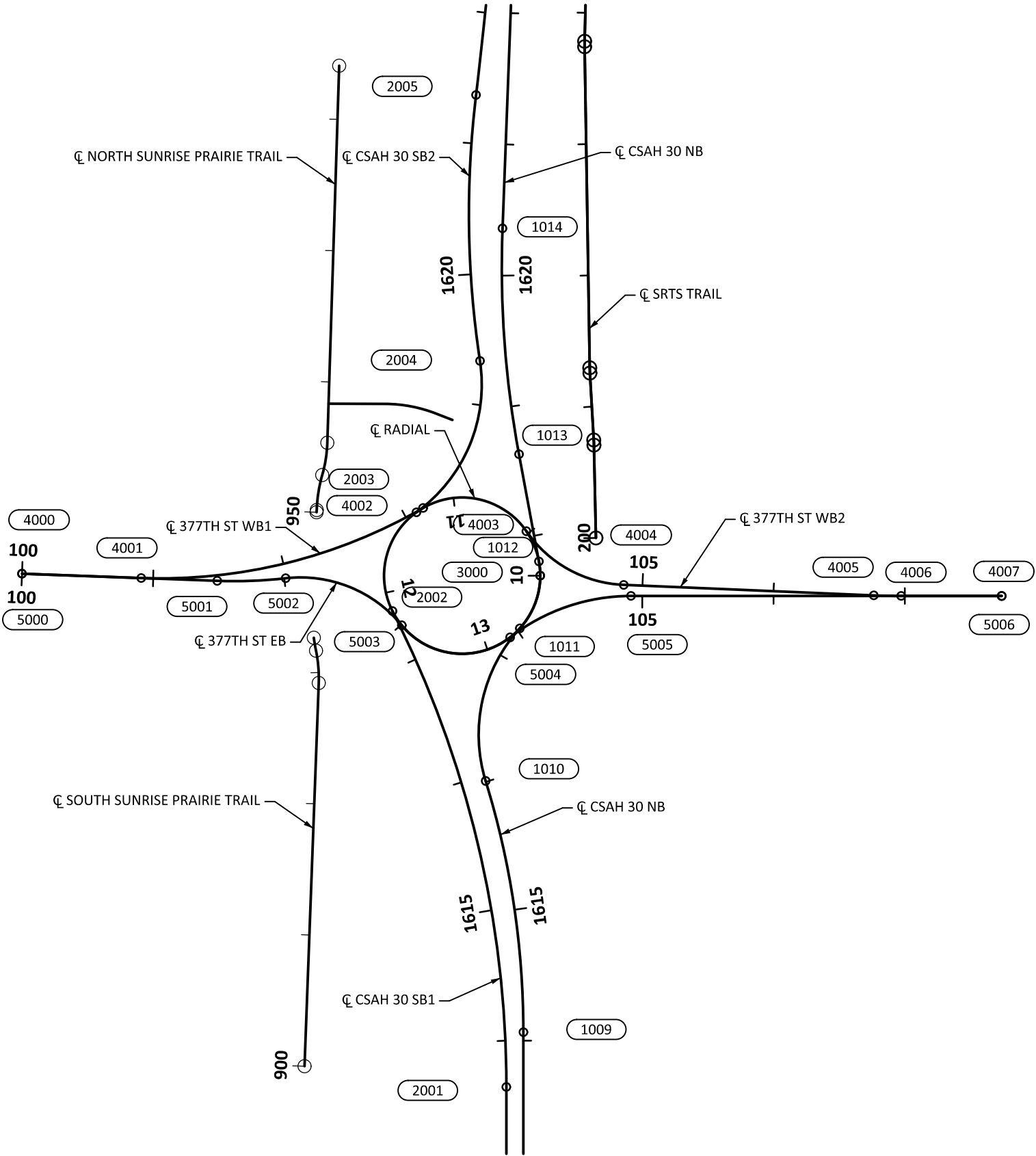
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	
ALIGNMENT PLAN AND TABULATIONS	
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

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ALIGNMENT TABULATION										
POINT NUMBER	POINT TYPE	STATION	CIRCULAR CURVE DATA					COORDINATES		DIRECTION AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH			
			SPIRAL CURVE DATA					EASTING (X)	NORTHING (Y)	
THETA	DEGREE	ST	LT	LS						
ALIGNMENT: SRTS TRAIL										
	PC	223+26.560 R1						526359.508	175218.977	2.052°
	HPI	223+35.499 R1	10.217° RT	57.299°	99.995	8.939	17.831	526359.828	175227.911	PI
	CC							526459.439	175215.398	
	PC	223+44.392 R1						526361.728	175236.647	12.269°
	HPI	223+54.225 R1	10.217° LT	52.089°	109.995	9.833	19.614	526363.818	175246.256	PI
	CC							526254.245	175260.02	
	PT	223+64.006 R1						526364.17	175256.083	2.052°
	PC	227+95.744 R1						526379.625	175687.543	2.052°
	HPI	227+99.073 R1	3.814° RT	57.296°	100	3.33	6.657	526379.744	175690.871	PI
	CC							526479.561	175683.964	
	PT	228+02.400 R1						526380.085	175694.183	5.866°
	PC	229+15.675 R1						526391.661	175806.864	5.866°
	HPI	229+19.337 R1	3.814° LT	52.087°	110	3.663	7.322	526392.035	175810.508	PI
	CC							526282.236	175818.106	
	PT	229+22.997 R1						526392.166	175814.168	2.052°
	PC	231+55.412 R1						526400.486	176046.434	2.052°
	HPI	231+70.739 R1	15.866° LT	52.089°	109.995	15.327	30.459	526401.035	176061.751	PI
	CC							526290.561	176050.371	
	PC	231+85.872 R1						526397.375	176076.637	346.186°
	HPI	231+99.806 R1	15.866° RT	57.298°	99.996	13.934	27.69	526394.047	176090.168	PI
	CC							526494.478	176100.513	
	PT	232+13.562 R1						526394.546	176104.093	2.052°
	PC	233+50.522 R1						526399.449	176240.965	2.052°
	HPI	233+53.852 R1	3.814° RT	57.296°	100	3.33	6.657	526399.568	176244.293	PI
	CC							526499.385	176237.386	
	PT	233+57.179 R1						526399.909	176247.605	5.866°
	PC	234+70.453 R1						526411.485	176360.286	5.866°
	HPI	234+74.116 R1	3.814° LT	52.087°	110	3.663	7.322	526411.859	176363.93	PI
	CC							526302.061	176371.528	
	PT	234+77.775 R1						526411.99	176367.59	2.052°
	PC	238+16.042 R1						526424.099	176705.64	2.052°
	HPI	238+31.370 R1	15.866° LT	52.089°	109.995	15.327	30.459	526424.648	176720.958	PI
	CC							526314.175	176709.578	
	PC	238+46.503 R1						526420.988	176735.843	346.186°
	HPI	238+60.436 R1	15.866° RT	57.299°	99.995	13.934	27.69	526417.661	176749.374	PI
	CC							526518.091	176759.719	
	PT	238+74.192 R1						526418.16	176763.299	2.052°
	PC	246+88.640 R1						526447.315	177577.225	2.052°
	HPI	247+13.626 R1	0.640° RT	1.282°	4470.339	24.986	49.971	526448.21	177602.195	PI
	CC							530914.789	177417.195	
	PT	247+38.611 R1						526449.383	177627.153	2.692°
	HPI	247+90.678 R1						526451.829	177679.162	
	HPI	248+03.540 R1						526455.818	177691.391	18.066°
	PC	248+03.873 R1						526455.501	177691.494	288.066°
	HPI	248+07.239 R1	37.201° RT	212.958°	10	3.365	6.493	526452.301	177692.537	PI
	CC							526458.602	177701.001	
	PT	248+10.366 R1						526450.384	177695.303	325.267°
	HPI	248+18.039 R1						526446.013	177701.609	
	HPI	248+26.080 R1						526446.236	177709.646	1.595°
	HPI	248+65.911 R1						526449.301	177749.36	
	HPI	249+15.516 R1						526453.61	177798.777	4.984°
	HPI	249+65.546 R1						526458.226	177848.593	5.294°
	HPI	250+15.430 R1						526462.906	177898.257	5.383°
	HPI	250+65.261 R1						526467.515	177947.875	5.306°
	PC	251+01.805 R1						526471.003	177984.252	5.477°
	HPI	251+10.742 R1	83.606° RT	213.244°	9.995	8.937	14.585	526471.856	177993.149	PI
	CC							526480.952	177983.298	
	PT	251+16.389 R1						526480.792	177993.292	89.083°
	END	251+16.394 R1						526480.797	177993.292	89.083°
ALIGNMENT: SRTS WALK										
SRTS TRAIL STA 251+16.39 = SRTS WALK STA 800+00.00										
	START	800+00.000 R1						526480.797	177993.292	
	END	803+59.085 R1						526839.836	177999.036	89.083°

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ALIGNMENT TABULATION										
POINT NUMBER	POINT TYPE	STATION	CIRCULAR CURVE DATA					COORDINATES		DIRECTION AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH			
			SPIRAL CURVE DATA					EASTING (X)	NORTHING (Y)	
			THETA	DEGREE	ST	LT	LS			
ALIGNMENT: RADIAL										
3000	PC	10+00.000						526298.877	172870.695	
	PI									
	CC							526239.377	172870.695	
3000	PT	13+73.847						526298.877	172870.693	
ALIGNMENT: 377TH ST EB										
5000	START	100+00.000 R1						525904.168	172872.233	
5001	PC	101+48.795 R1						526052.864	172866.778	92.101°
	HPI	101+74.937 R1	8.543° LT	16.370°	350	26.142	52.187	526078.988	172865.82	PI
	CC							526065.695	173216.543	
5002	PRC	102+00.982 R1						526104.965	172868.753	83.558°
	HPI	102+55.288 R1	57.009° RT	57.296°	100	54.306	99.499	526158.928	172874.846	PI
	CC							526116.185	172769.384	
5003	PRC	103+00.481 R1						526193.421	172832.902	140.567°
	HPI	103+58.373 R1	88.430° LT	96.295°	59.5	57.892	91.832	526230.193	172788.188	PI
	CC							526239.377	172870.695	
5004	PRC	103+92.314 R1						526275.897	172823.722	52.136°
	HPI	104+43.781 R1	37.876° RT	38.197°	150	51.467	99.158	526316.529	172855.311	PI
	CC							526367.965	172705.3	
5005	PT	104+91.472 R1						526367.996	172855.3	90.012°
5006	END	107+73.796 R1						526650.32	172855.241	90.012°
ALIGNMENT: 377TH ST WB1										
4000	START	100+00.000 R1						525904.168	172872.233	
4001	PC	100+90.855 R1						525994.962	172868.903	92.101°
	HPI	102+05.935 R1	32.101° LT	14.324°	400	115.08	224.108	526109.965	172864.684	PI
	CC							526009.627	173268.634	
4002	PT	103+14.962 R1						526209.627	172922.224	60.000°
ALIGNMENT: 377TH ST WB2										
4003	PC	103+98.008 R1						526288.311	172904.543	145.329°
	HPI	104+45.302 R1	52.931° LT	60.311°	95	47.294	87.763	526315.216	172865.647	PI
	CC							526366.442	172958.586	
4004	PT	104+85.771 R1						526362.468	172863.669	92.397°
4005	PC	106+76.405 R1						526552.935	172855.694	92.397°
	HPI	106+86.814 R1	2.385° LT	11.459°	500	10.409	20.816	526563.336	172855.259	PI
	CC							526573.851	173355.257	
4006	PT	106+97.221 R1						526573.745	172855.257	90.012°
4007	END	107+73.796 R1						526650.32	172855.241	90.012°

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620

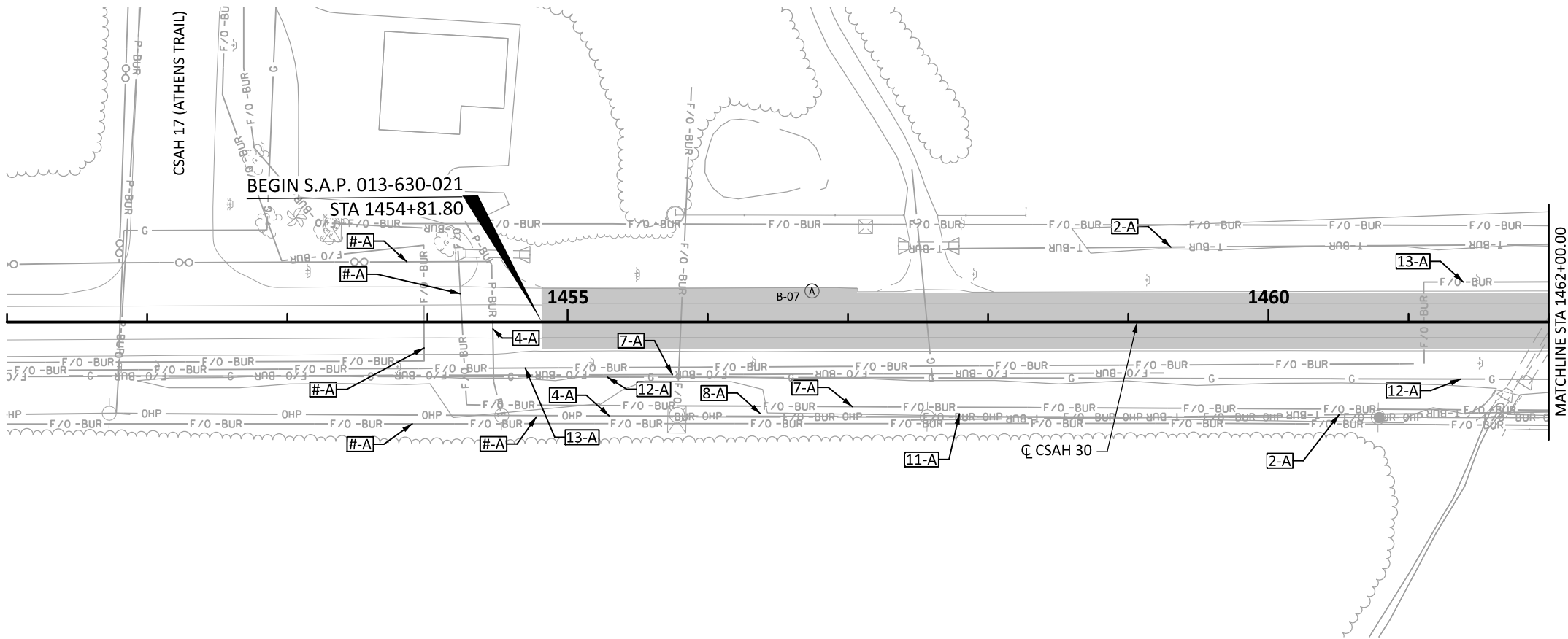


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

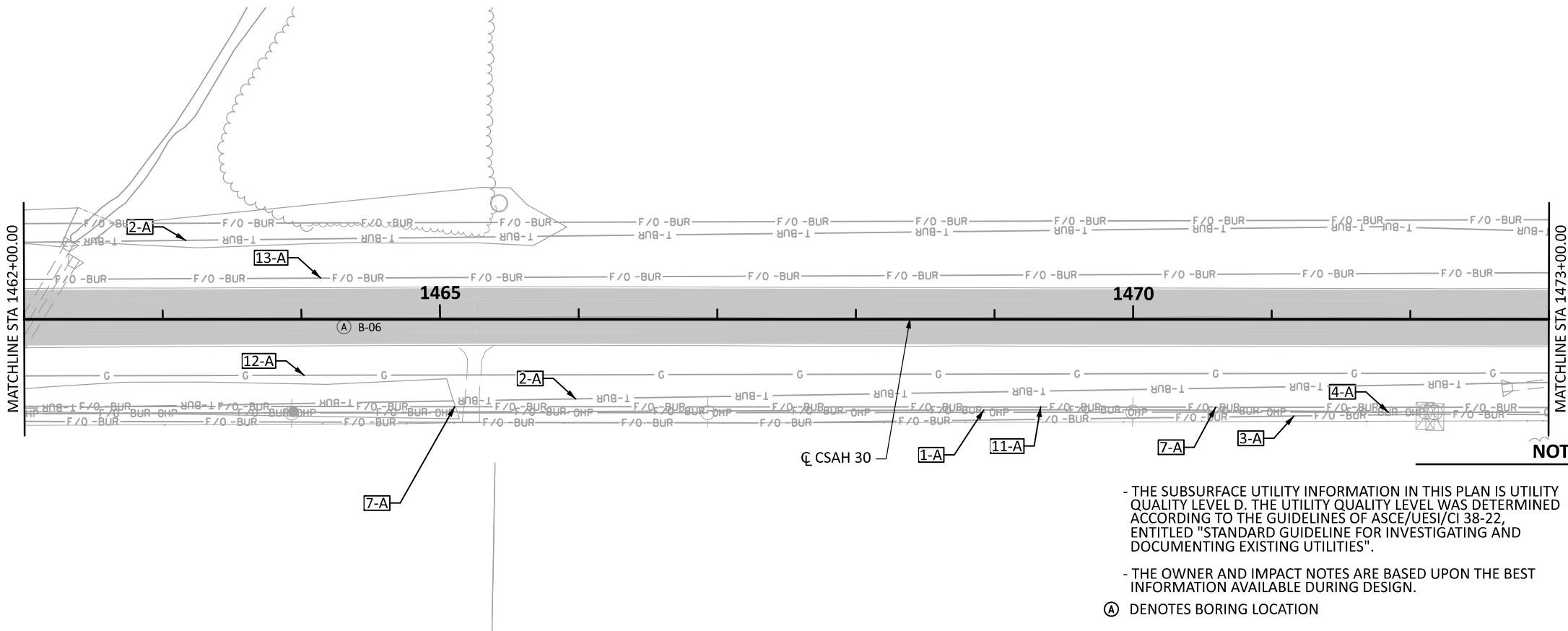
ALIGNMENT PLAN AND TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 96 OF 216 SHEETS



LEGEND

- CONSTRUCTION LIMITS
- - - EXISTING R/W
- - - EXISTING RR R/W
- T-BUR - BURIED TELEPHONE
- G - GAS
- TV-BUR - BURIED CABLE TELEVISION
- F/O - BUR - BURIED FIBER OPTIC
- OHP - OVERHEAD POWER
- P-BUR - BURIED ELECTRIC
- OO - BURIED COMM.
- PROPOSED ROADWAY
- U - UTILITY PEDESTAL
- M - MANHOLE
- - POWER/UTILITY POLE
- - LIGHT POLE
- - UTILITY POLE ANCHOR
- ✱ - VEGETATION
- ✱ - VEGETATION
- ⊕ - INPLACE STRUCTURE
- ▨ - CATCH BASIN
- ▨ - APRON
- - - WETLAND DELINEATION



LEGEND CONT.

- 1-W - UTILITY CONFLICT (OWNER - IMPACT)
- OWNERSHIP:
(1) ARVIG, (2) CENTURY LINK/LUMEN,
(3) CONSOLIDATED COMM., (4) EAST
CENTRAL ENERGY, (5) FRONTIER COMM.,
(6) GREAT RIVER ENERGY, (7) MIDCO,
(8) MINNESOTA ENERGY RESOURCES,
(10) VIKING GAS, (11) WINDSTREAM
COMM., (12) XCEL ENERGY,
(13) ZAYO GROUP, LLC.
(14) SMMPA
- IMPACT NOTES ON PLAN SHEETS:
(A) LEAVE AS IS,
(B) ADJUST,
(C) RELOCATE,
(D) REMOVE

- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THE UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/UESI/CI 38-22, ENTITLED "STANDARD GUIDELINE FOR INVESTIGATING AND DOCUMENTING EXISTING UTILITIES".
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- Ⓐ DENOTES BORING LOCATION
- ALL UTILITY WORK SHOWN SHALL BE DONE BY OTHERS UNLESS SHOWN IN THE PLAN AS WORK TO BE PERFORMED BY THE CONTRACTOR. SEE DRAINAGE, SIGNAL, AND LIGHTING PLANS FOR MORE INFORMATION.
- SOME UTILITIES MAY BE RELOCATED PRIOR TO CONSTRUCTION. SOME UTILITIES MAY BE RELOCATED OR ADJUSTED WITH THE CONTRACTOR'S OPERATION. THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH UTILITY COMPANIES AND SHOULD EXPECT IMPACTS TO THE CONTRACTOR'S OPERATIONS AND SCHEDULE (INCIDENTAL).
- ALL ELECTRICAL FACILITIES ARE DISTRIBUTION UNLESS OTHERWISE NOTED.

NOTES

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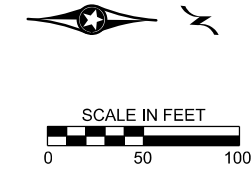
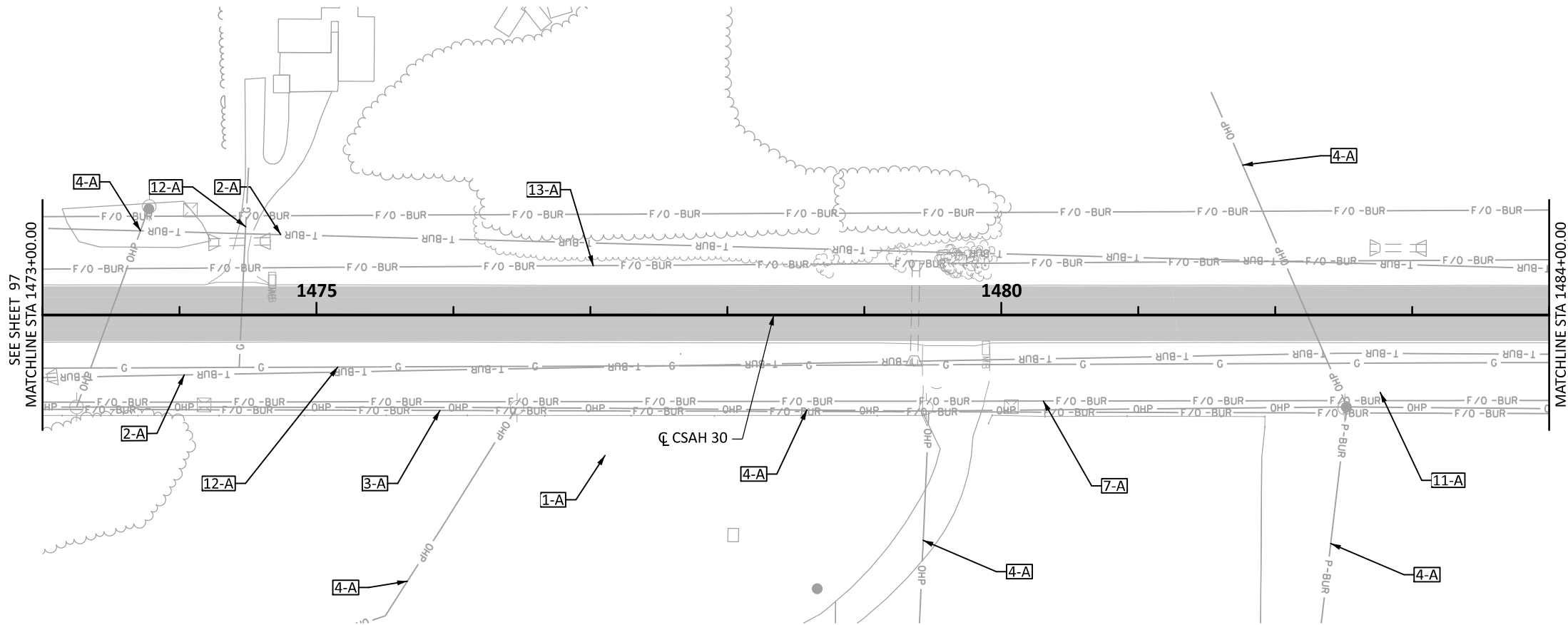
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

INPLACE TOPOGRAPHY & UTILITIES PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

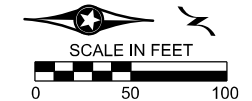
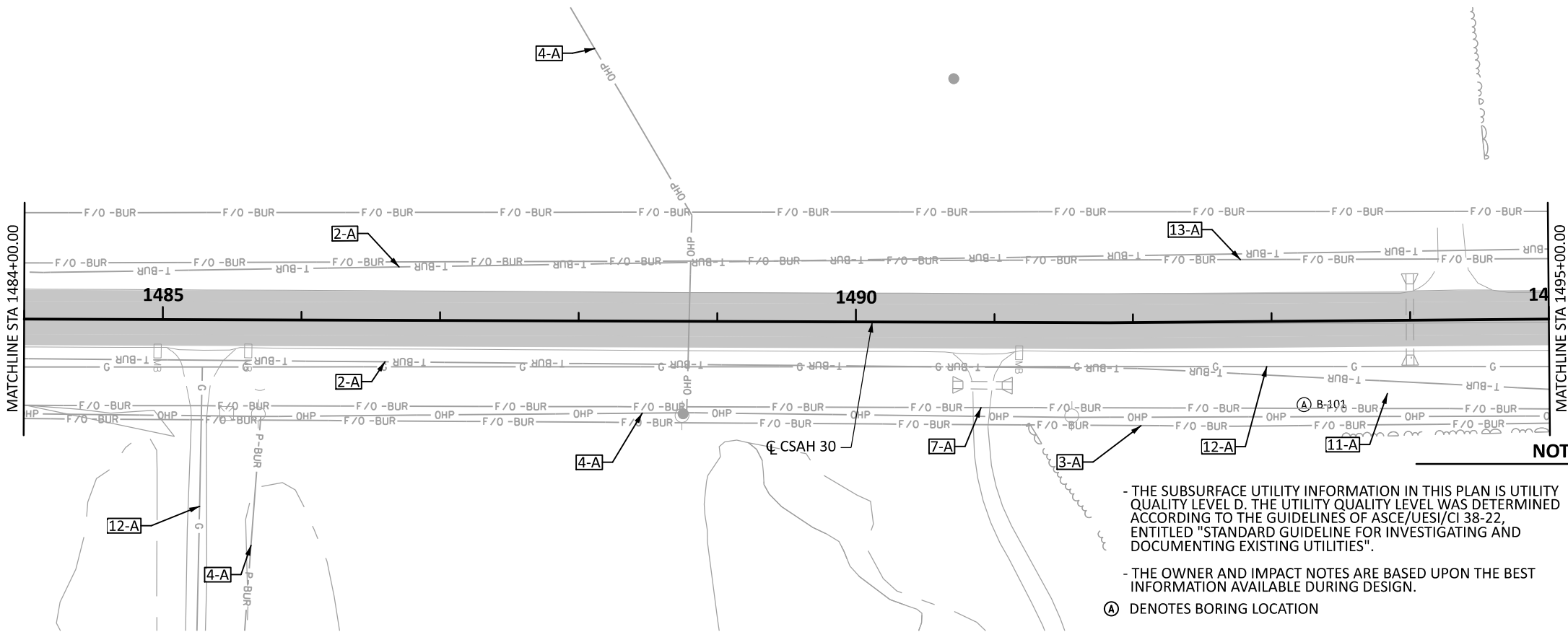
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LEGEND

- CONSTRUCTION LIMITS
- - - EXISTING R/W
- - - EXISTING RR R/W
- T-BUR BURIED TELEPHONE
- G GAS
- TV-BUR BURIED CABLE TELEVISION
- F/O -BUR BURIED FIBER OPTIC
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- ✱ VEGETATION
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- ▨ CATCH BASIN
- ▨ APRON
- WETLAND DELINEATION



LEGEND CONT.

- 1-W UTILITY CONFLICT (OWNER - IMPACT)
- OWNERSHIP:
(1) ARVIG, (2) CENTURY LINK/LUMEN,
(3) CONSOLIDATED COMM., (4) EAST
CENTRAL ENERGY, (5) FRONTIER COMM.,
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(8) MINNESOTA ENERGY RESOURCES,
(10) VIKING GAS, (11) WINDSTREAM
COMM., (12) XCEL ENERGY,
(13) ZAYO GROUP, LLC.
(14) SMMPA

- IMPACT NOTES ON PLAN SHEETS:
- (A) LEAVE AS IS,
 - (B) ADJUST,
 - (C) RELOCATE,
 - (D) REMOVE

NOTES

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Plan By:
Checked By:
Approved By:

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MAN
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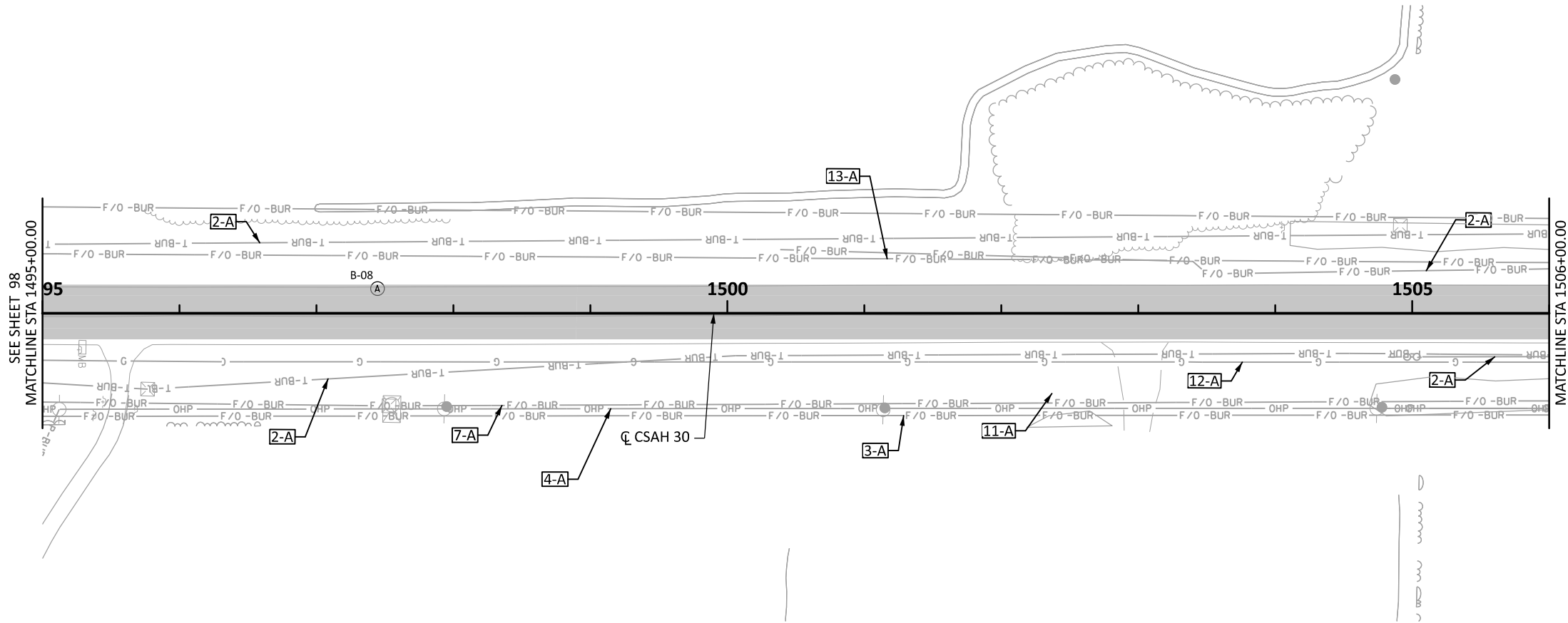
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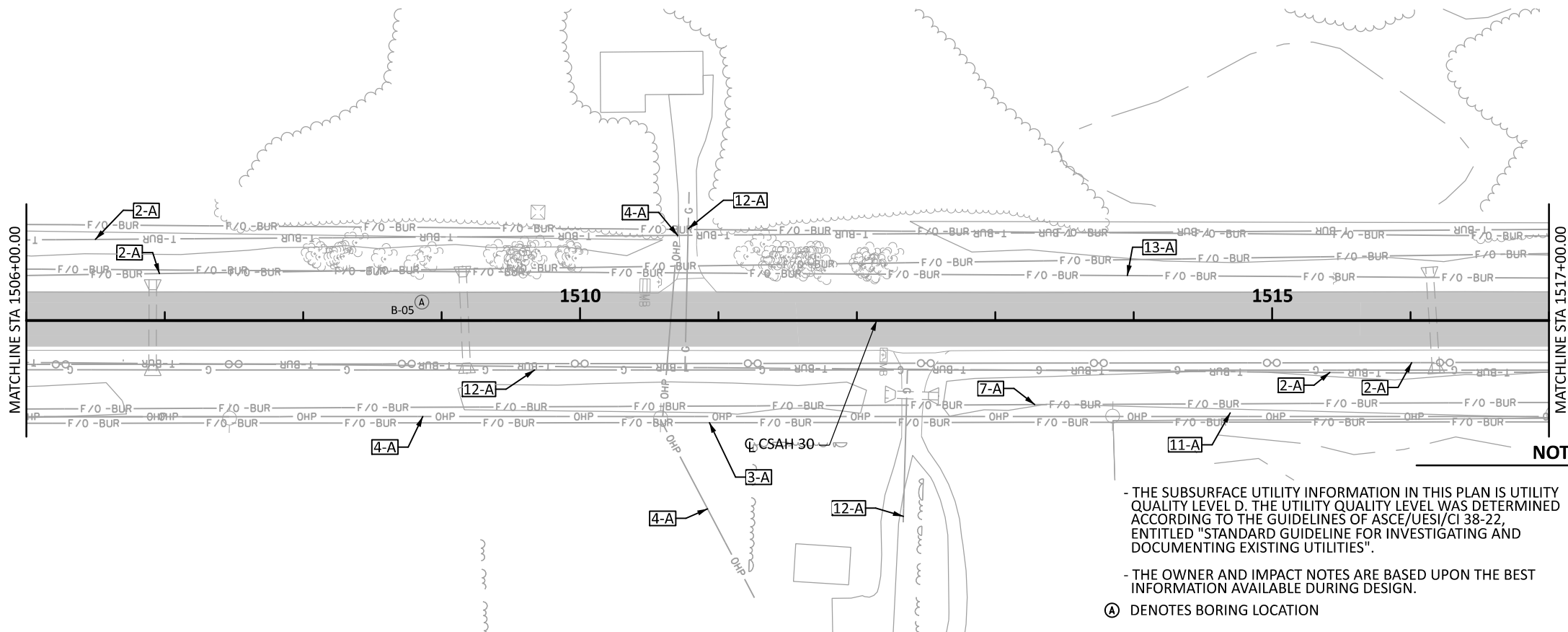
INPLACE TOPOGRAPHY & UTILITIES PLAN
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SHEETS

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- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
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 - Utility Pedestal
 - Handhole
 - Manhole
 - Power/Utility Pole
 - Light Pole
 - Utility Pole Anchor
 - Vegetation
 - Vegetation
 - Inplace Structure
 - Catch Basin
 - Apron
 - Wetland Delineation



- LEGEND CONT.**
- 1-W UTILITY CONFLICT (OWNER - IMPACT)
 - OWNERSHIP:
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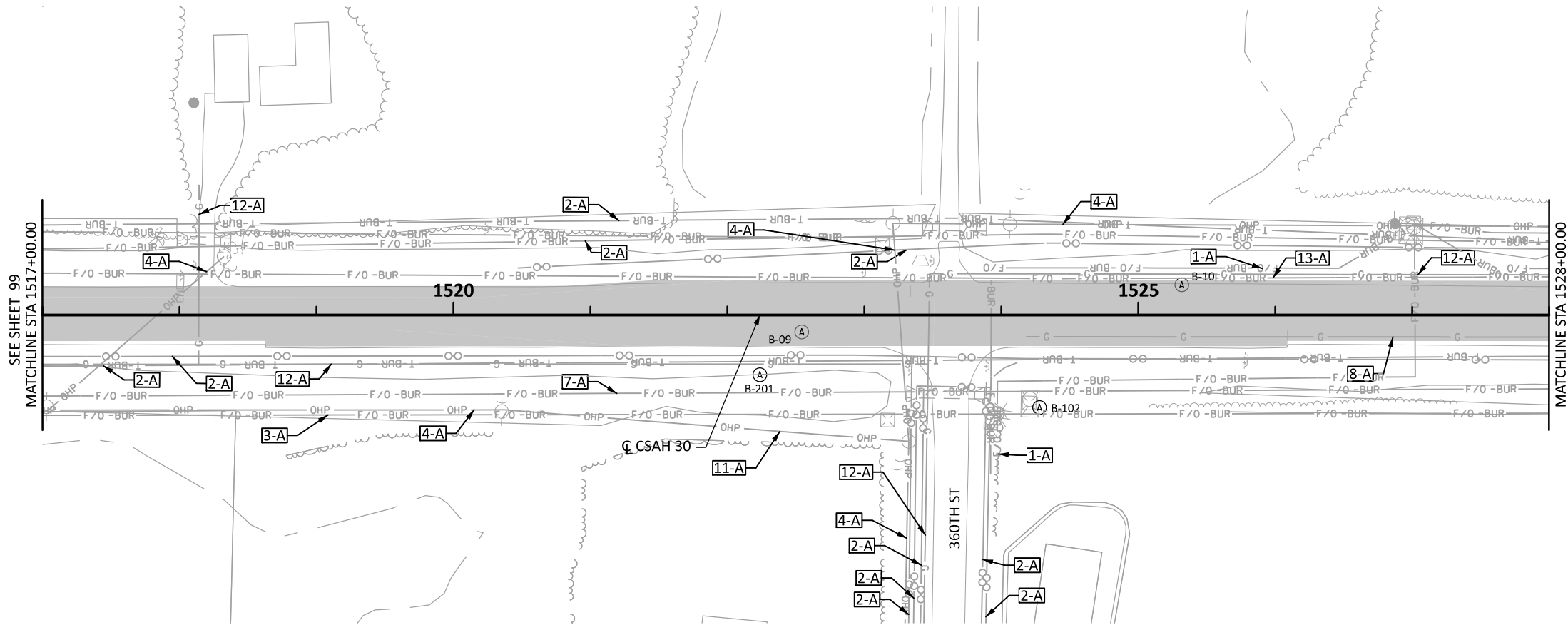
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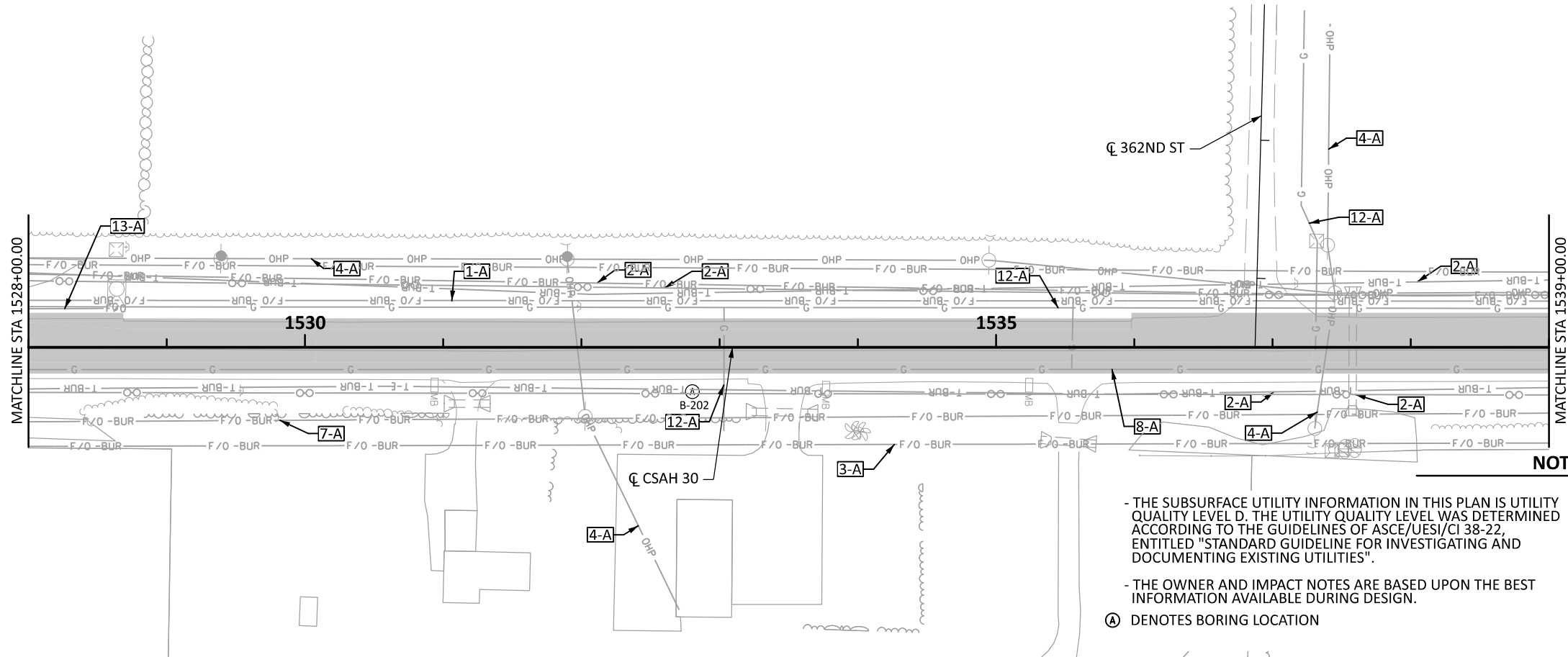
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- LEGEND**
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 - ✱ VEGETATION
 - ✱ VEGETATION
 - ✱ INPLACE STRUCTURE
 - ✱ CATCH BASIN
 - ✱ APRON
 - WETLAND DELINEATION



- LEGEND CONT.**
- 1-W UTILITY CONFLICT (OWNER - IMPACT)
 - OWNERSHIP:
(1) ARVIG, (2) CENTURY LINK/LUMEN,
(3) CONSOLIDATED COMM., (4) EAST
CENTRAL ENERGY, (5) FRONTIER COMM.,
(6) GREAT RIVER ENERGY, (7) MIDCO,
(8) MINNESOTA ENERGY RESOURCES,
(10) VIKING GAS, (11) WINDSTREAM
COMM., (12) XCEL ENERGY,
(13) ZAYO GROUP, LLC.
(14) SMMPA

IMPACT NOTES ON PLAN SHEETS:
(A) LEAVE AS IS,
(B) ADJUST,
(C) RELOCATE,
(D) REMOVE

NOTES

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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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Nicholas E. Hentges, PE
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



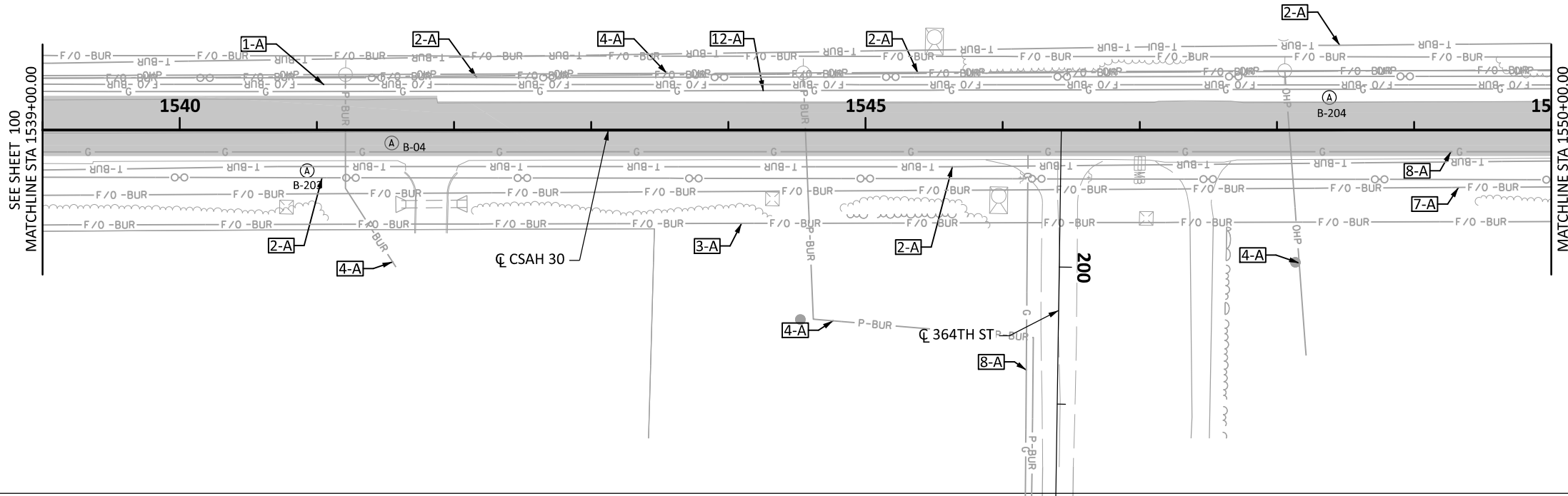
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

INPLACE TOPOGRAPHY & UTILITIES PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
100
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216
SHEETS

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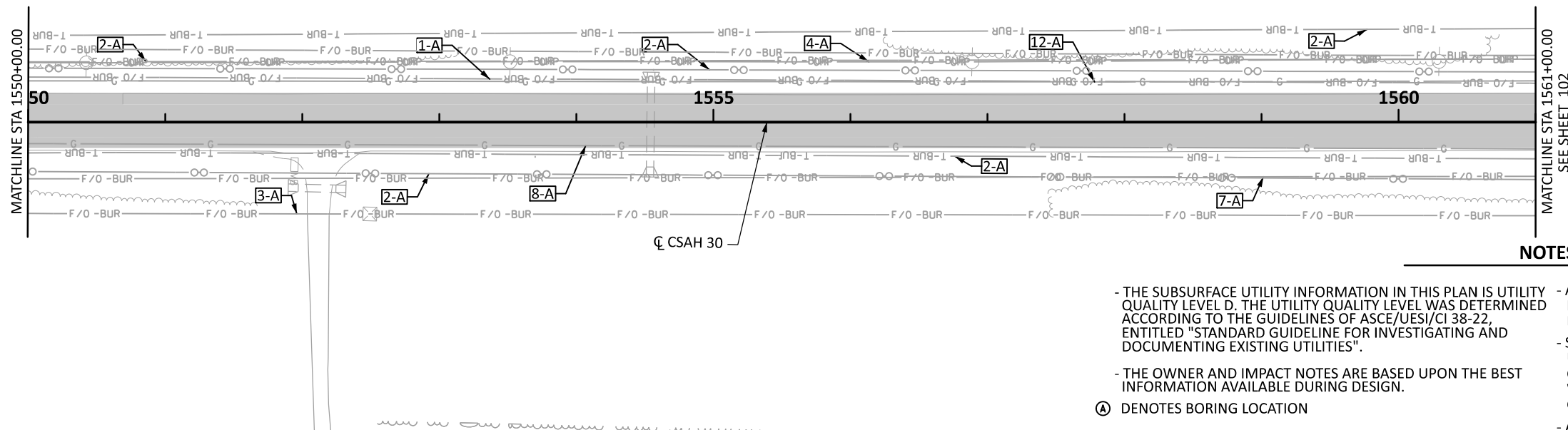
LEGEND	
---	CONSTRUCTION LIMITS
---	EXISTING R/W
---	EXISTING RR R/W
-T-BUR-	BURIED TELEPHONE
-G-	GAS
-TV-BUR-	BURIED CABLE TELEVISION
-F/O-BUR-	BURIED FIBER OPTIC
-OHP-	OVERHEAD POWER
-P-BUR-	BURIED ELECTRIC
-OO-	BURIED COMM.
[Shaded Area]	PROPOSED ROADWAY
[Symbol]	UTILITY PEDESTAL
[Symbol]	HANDHOLE
[Symbol]	MANHOLE
[Symbol]	POWER/UTILITY POLE
[Symbol]	LIGHT POLE
[Symbol]	UTILITY POLE ANCHOR
[Symbol]	VEGETATION
[Symbol]	VEGETATION
[Symbol]	INPLACE STRUCTURE
[Symbol]	CATCH BASIN
[Symbol]	APRON
[Symbol]	WETLAND DELINEATION



LEGEND CONT.

- 1-W** UTILITY CONFLICT (OWNER - IMPACT)
- OWNERSHIP:**
(1) ARVIG, (2) CENTURY LINK/LUMEN,
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CENTRAL ENERGY, (5) FRONTIER COMM.,
(6) GREAT RIVER ENERGY, (7) MIDCO,
(8) MINNESOTA ENERGY RESOURCES,
(10) VIKING GAS, (11) WINDSTREAM
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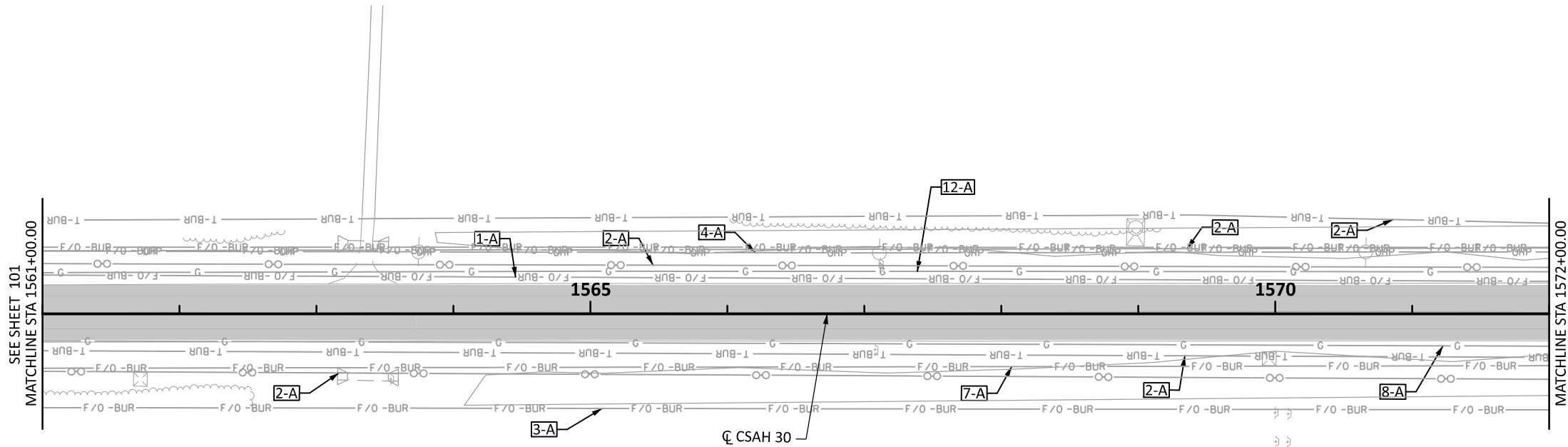
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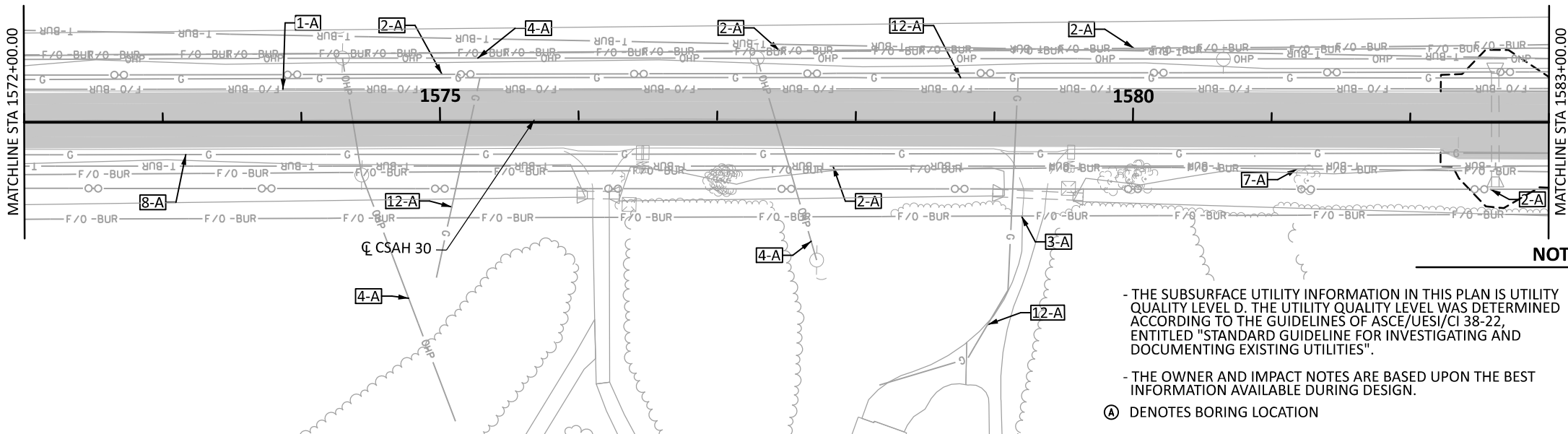


LEGEND	
---	CONSTRUCTION LIMITS
---	EXISTING R/W
---	EXISTING RR R/W
-T-BUR	BURIED TELEPHONE
-G	GAS
-TV-BUR	BURIED CABLE TELEVISION
-F/O-BUR	BURIED FIBER OPTIC
-OHP	OVERHEAD POWER
-P-BUR	BURIED ELECTRIC
-OO	BURIED COMM.
[Shaded Area]	PROPOSED ROADWAY
[Box with U]	UTILITY PEDESTAL
[Circle with U]	HANDHOLE
[Circle with OM]	MANHOLE
[Circle with dot]	POWER/UTILITY POLE
[Circle with cross]	LIGHT POLE
[Circle with X]	UTILITY POLE ANCHOR
[Star]	VEGETATION
[Wavy Line]	VEGETATION
[Cross-hatch]	INPLACE STRUCTURE
[Hatched Box]	CATCH BASIN
[Triangle]	APRON
[Dashed Line]	WETLAND DELINEATION



LEGEND CONT.	
[Line with W]	UTILITY CONFLICT (OWNER - IMPACT)
OWNERSHIP:	
(1) ARVIG, (2) CENTURY LINK/LUMEN,	
(3) CONSOLIDATED COMM., (4) EAST	
CENTRAL ENERGY, (5) FRONTIER COMM.,	
(6) GREAT RIVER ENERGY, (7) MIDCO,	
(8) MINNESOTA ENERGY RESOURCES,	
(10) VIKING GAS, (11) WINDSTREAM	
COMM., (12) XCEL ENERGY,	
(13) ZAYO GROUP, LLC.	
(14) SMMPA	

IMPACT NOTES ON PLAN SHEETS:
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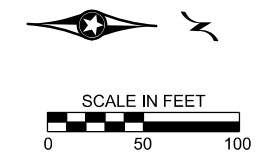
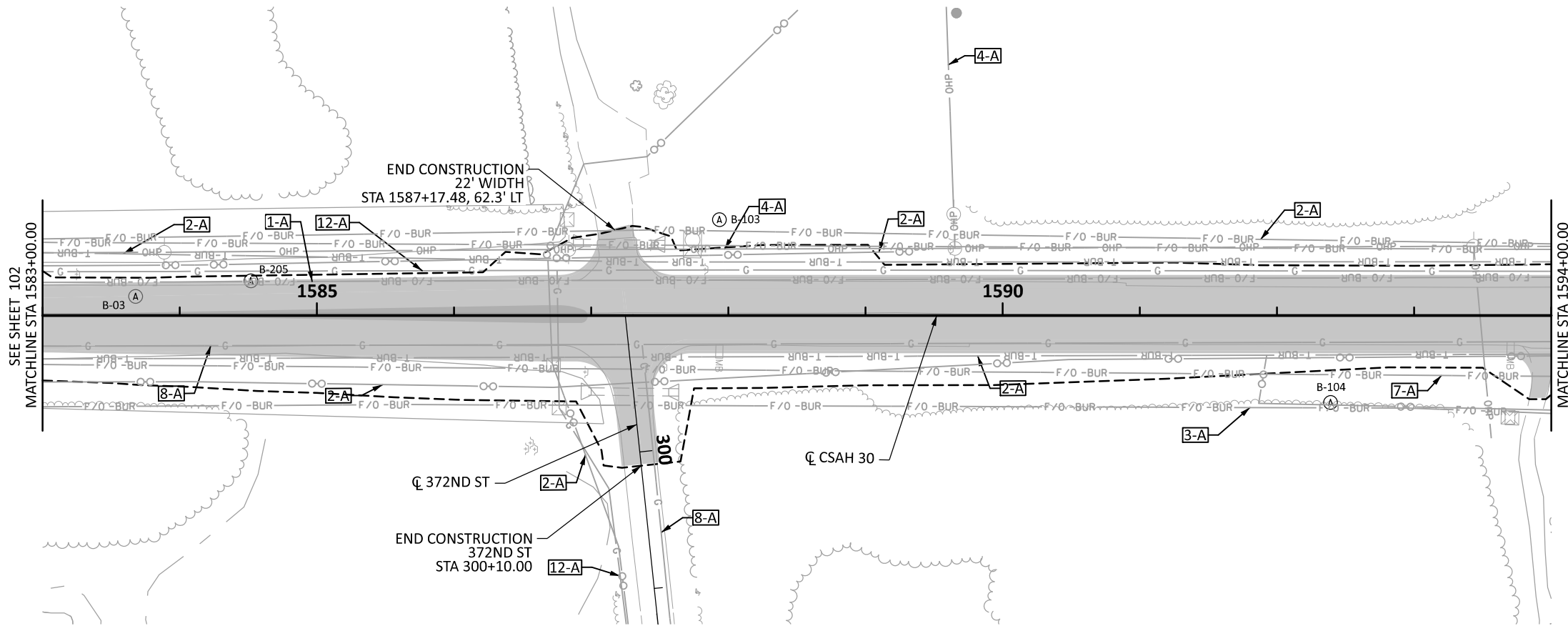


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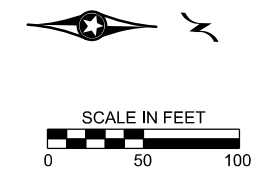
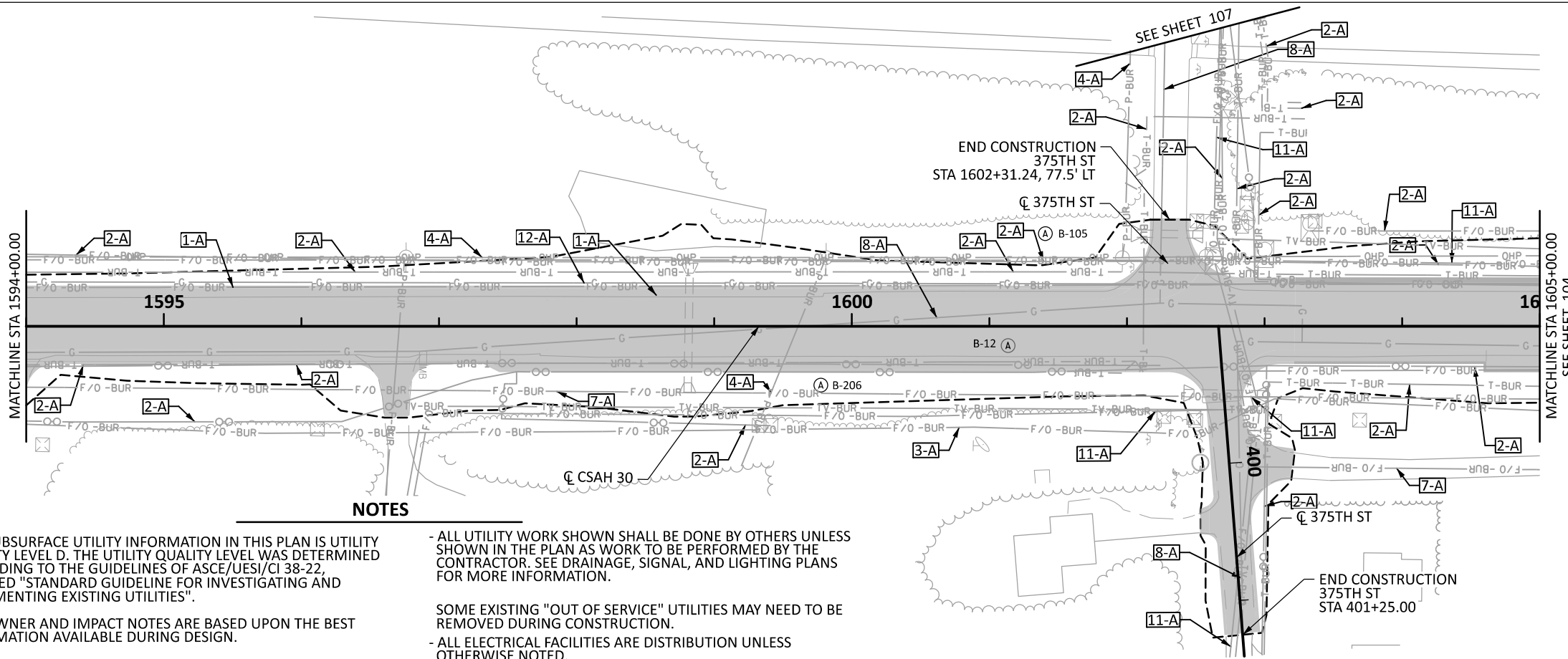
CHISAGO COUNTY, MINNESOTA	
INPLACE TOPOGRAPHY & UTILITIES PLAN	
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

SHEET
102
OF
216
SHEETS

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- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
 - - - EXISTING RR R/W
 - T-BUR BURIED TELEPHONE
 - G GAS
 - TV-BUR BURIED CABLE TELEVISION
 - F/O -BUR BURIED FIBER OPTIC
 - OHP OVERHEAD POWER
 - P-BUR BURIED ELECTRIC
 - OO BURIED COMM.
 - PROPOSED ROADWAY
 - UTILITY PEDESTAL
 - HANDHOLE
 - MANHOLE
 - POWER/UTILITY POLE
 - LIGHT POLE
 - UTILITY POLE ANCHOR
 - VEGETATION
 - VEGETATION
 - INPLACE STRUCTURE
 - CATCH BASIN
 - APRON
 - WETLAND DELINEATION



- LEGEND CONT.**
- 1-W UTILITY CONFLICT (OWNER - IMPACT)
- OWNERSHIP:
(1) ARVIG, (2) CENTURY LINK/LUMEN,
(3) CONSOLIDATED COMM., (4) EAST
CENTRAL ENERGY, (5) FRONTIER COMM.,
(6) GREAT RIVER ENERGY, (7) MIDCO,
(8) MINNESOTA ENERGY RESOURCES,
(10) VIKING GAS, (11) WINDSTREAM
COMM., (12) XCEL ENERGY,
(13) ZAYO GROUP, LLC.
- IMPACT NOTES ON PLAN SHEETS:
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- SOME EXISTING "OUT OF SERVICE" UTILITIES MAY NEED TO BE REMOVED DURING CONSTRUCTION.
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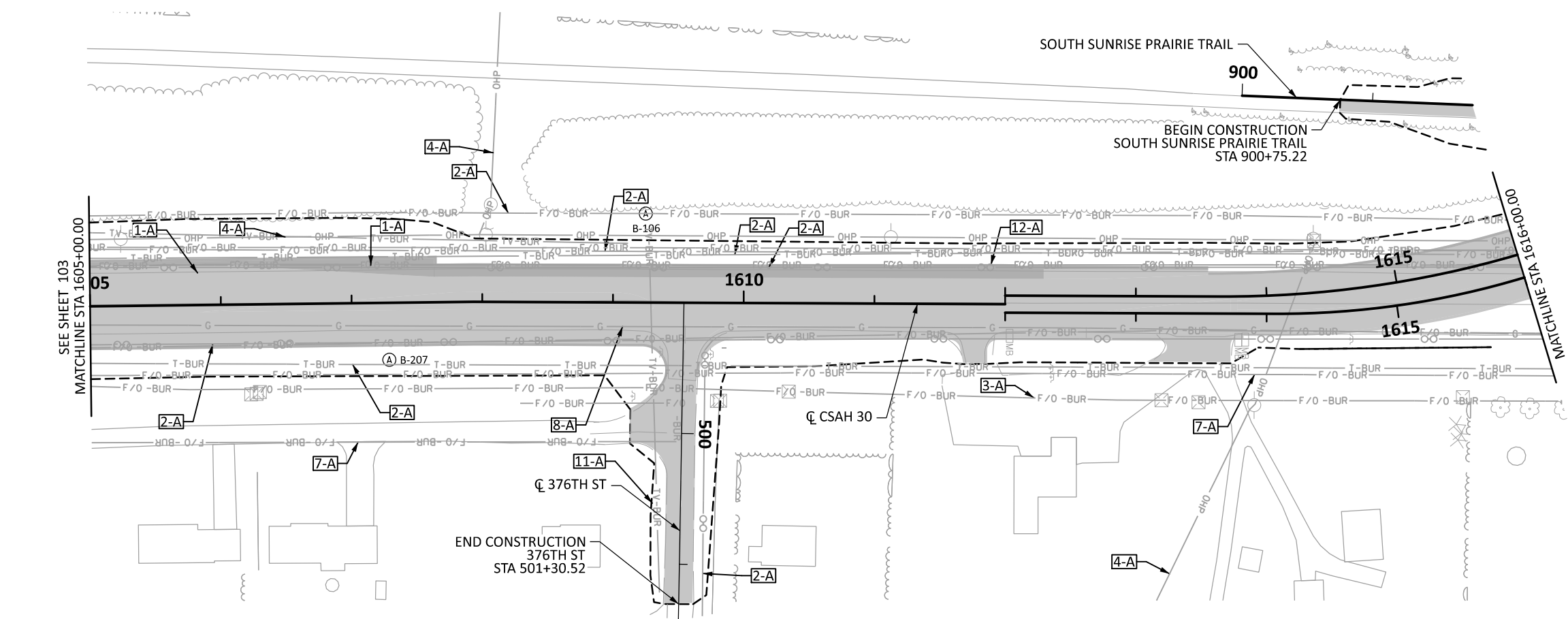
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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INPLACE TOPOGRAPHY & UTILITIES PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

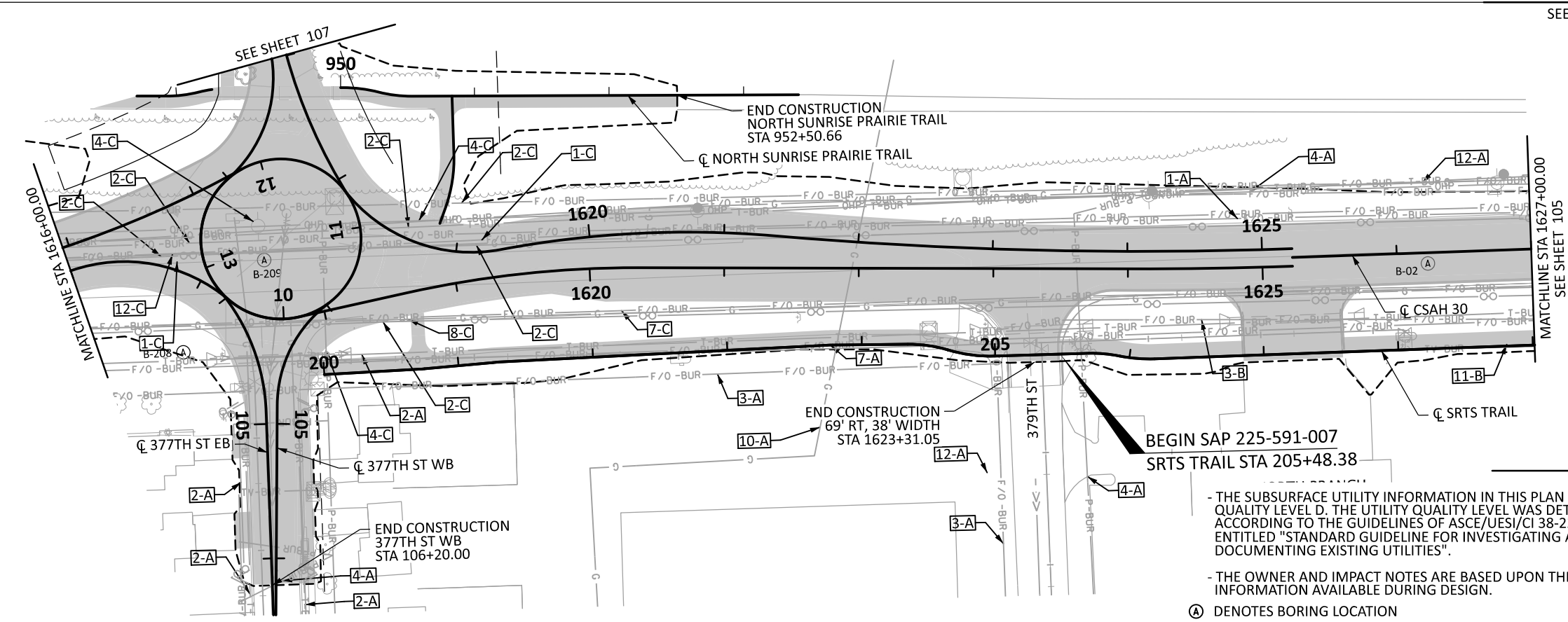
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LEGEND

- CONSTRUCTION LIMITS
- - - EXISTING R/W
- - - EXISTING RR R/W
- T-BUR BURIED TELEPHONE
- G GAS
- TV-BUR BURIED CABLE TELEVISION
- F/O-BUR BURIED FIBER OPTIC
- OHP OVERHEAD POWER
- P-BUR BURIED ELECTRIC
- O BURIED COMM.
- PROPOSED ROADWAY
- U UTILITY PEDESTAL
- M HANDHOLE
- OM MANHOLE
- POWER/UTILITY POLE
- LIGHT POLE
- UTILITY POLE ANCHOR
- ✱ VEGETATION
- ✱ VEGETATION
- ⊕ INPLACE STRUCTURE
- ⊕ CATCH BASIN
- ⊕ APRON
- WETLAND DELINEATION



LEGEND CONT.

- 1-W UTILITY CONFLICT (OWNER - IMPACT)

OWNERSHIP:
(1) ARVIG, (2) CENTURY LINK/LUMEN,
(3) CONSOLIDATED COMM., (4) EAST
CENTRAL ENERGY, (5) FRONTIER COMM.,
(6) GREAT RIVER ENERGY, (7) MIDCO,
(8) MINNESOTA ENERGY RESOURCES,
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COMM., (12) XCEL ENERGY,
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(14) SMMPA

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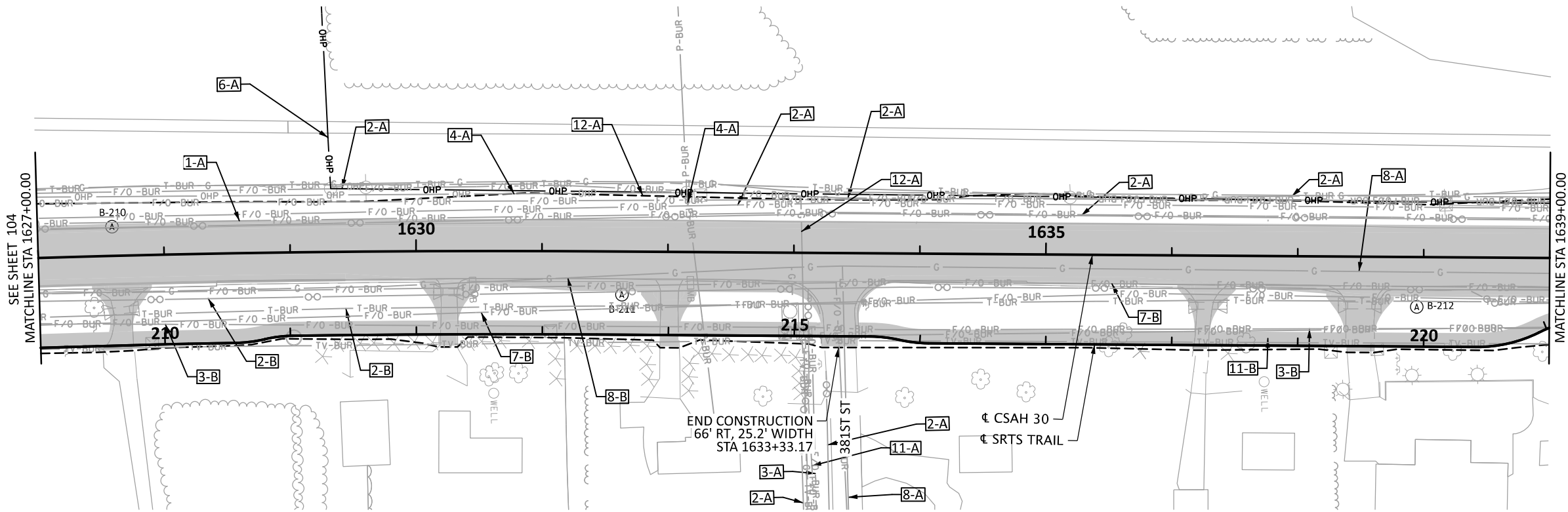
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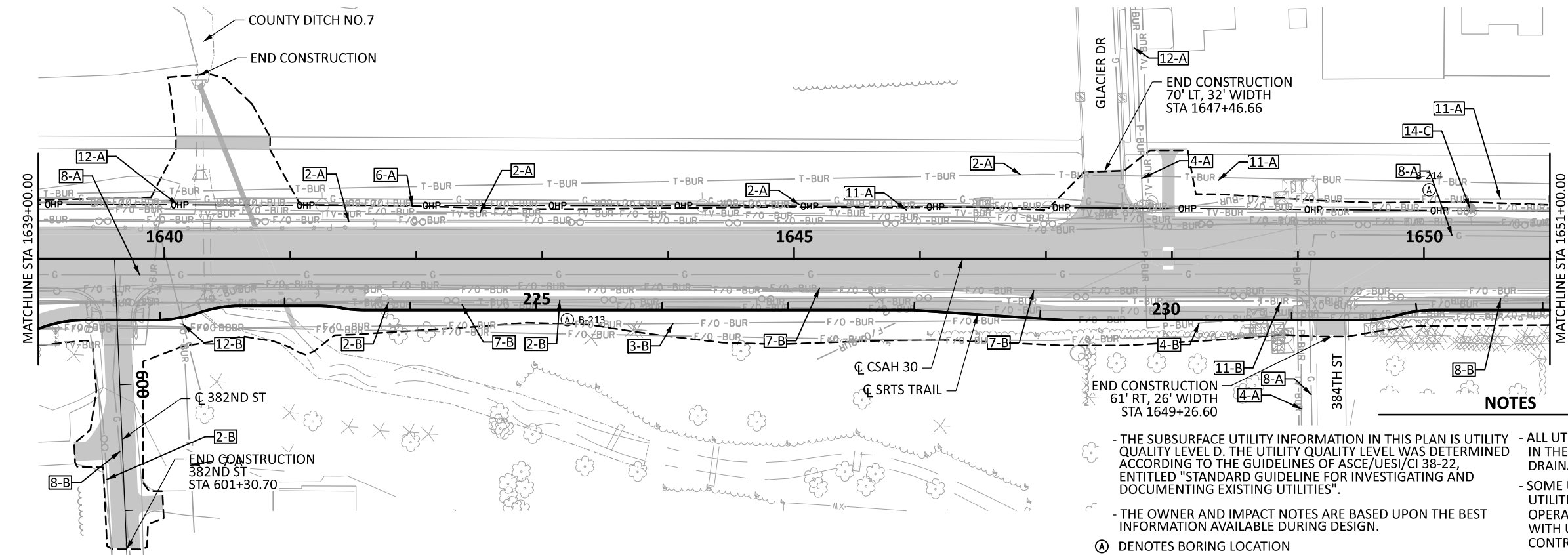
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- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
 - - - EXISTING RR R/W
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 - P-BUR BURIED ELECTRIC
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 - UTILITY POLE ANCHOR
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 - VEGETATION
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 - WETLAND DELINEATION



- LEGEND CONT.**
- 1-W UTILITY CONFLICT (OWNER - IMPACT)
 - OWNERSHIP:
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 - (3) CONSOLIDATED COMM., (4) EAST CENTRAL ENERGY, (5) FRONTIER COMM.,
 - (6) GREAT RIVER ENERGY, (7) MIDCO, (8) MINNESOTA ENERGY RESOURCES,
 - (10) VIKING GAS, (11) WINDSTREAM COMM., (12) XCEL ENERGY,
 - (13) ZAYO GROUP, LLC, (14) SMMPA
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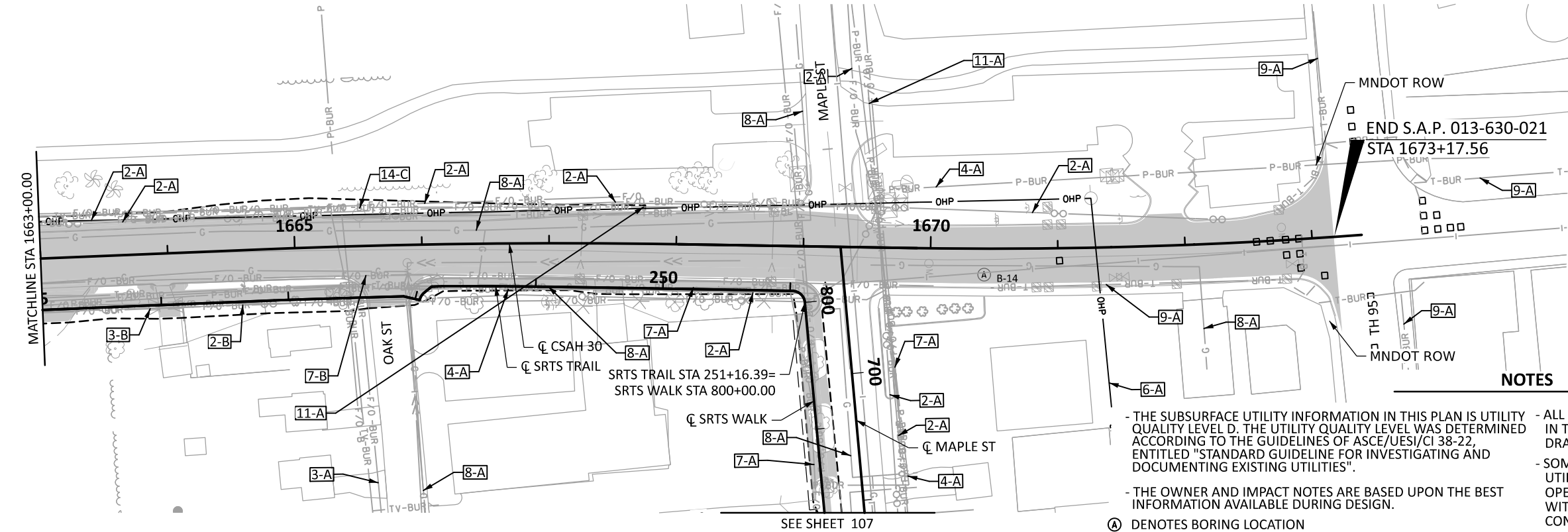
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LEGEND CONT. SCALE IN FEET

1-W UTILITY CONFLICT (OWNER - IMPACT)

OWNERSHIP:
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(3) CONSOLIDATED COMM., (4) EAST
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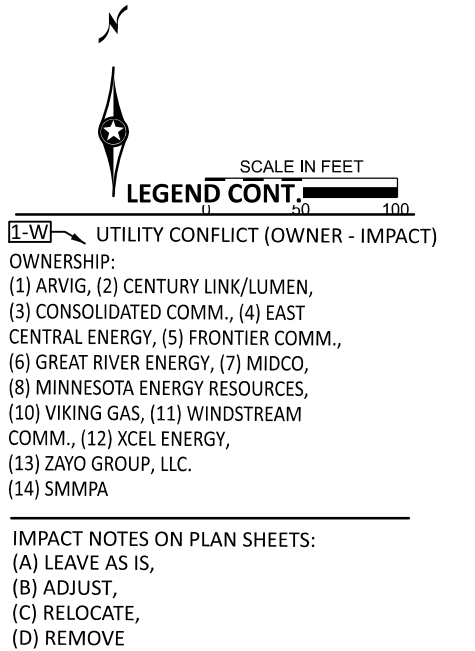
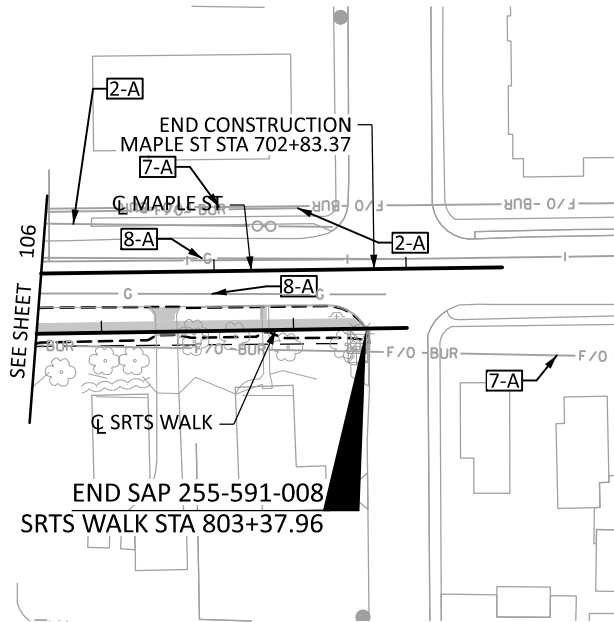
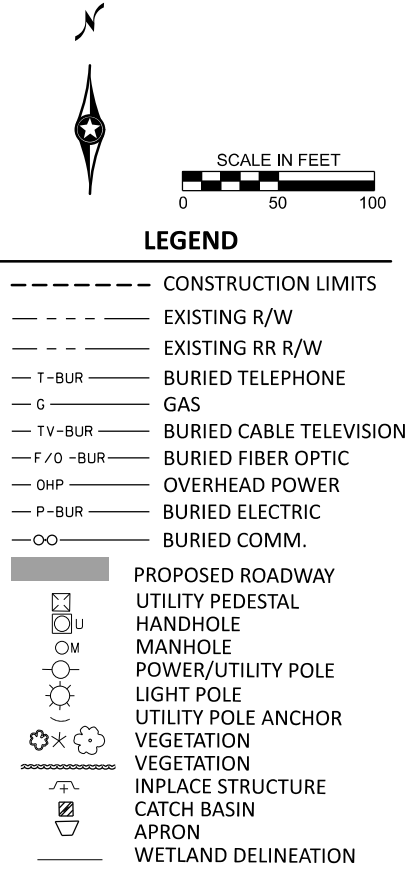
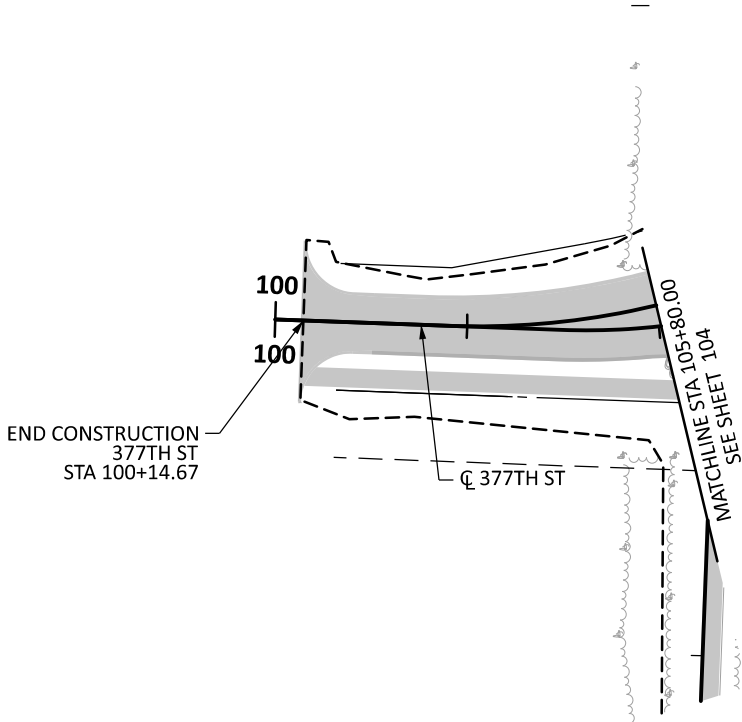
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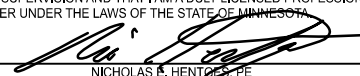


NOTES

- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THE UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF ASCE/UES/CI 38-22, ENTITLED "STANDARD GUIDELINE FOR INVESTIGATING AND DOCUMENTING EXISTING UTILITIES".
- THE OWNER AND IMPACT NOTES ARE BASED UPON THE BEST INFORMATION AVAILABLE DURING DESIGN.
- Ⓐ DENOTES BORING LOCATION
- ALL UTILITY WORK SHOWN SHALL BE DONE BY OTHERS UNLESS SHOWN IN THE PLAN AS WORK TO BE PERFORMED BY THE CONTRACTOR. SEE DRAINAGE, SIGNAL, AND LIGHTING PLANS FOR MORE INFORMATION.
- SOME UTILITIES MAY BE RELOCATED PRIOR TO CONSTRUCTION. SOME UTILITIES MAY BE RELOCATED OR ADJUSTED WITH THE CONTRACTOR'S OPERATION. THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH UTILITY COMPANIES AND SHOULD EXPECT IMPACTS TO THE CONTRACTOR'S OPERATIONS AND SCHEDULE (INCIDENTAL).
- ALL ELECTRICAL FACILITIES ARE DISTRIBUTION UNLESS OTHERWISE NOTED.

NO.	DATE	BY	CHK	REVISIONS

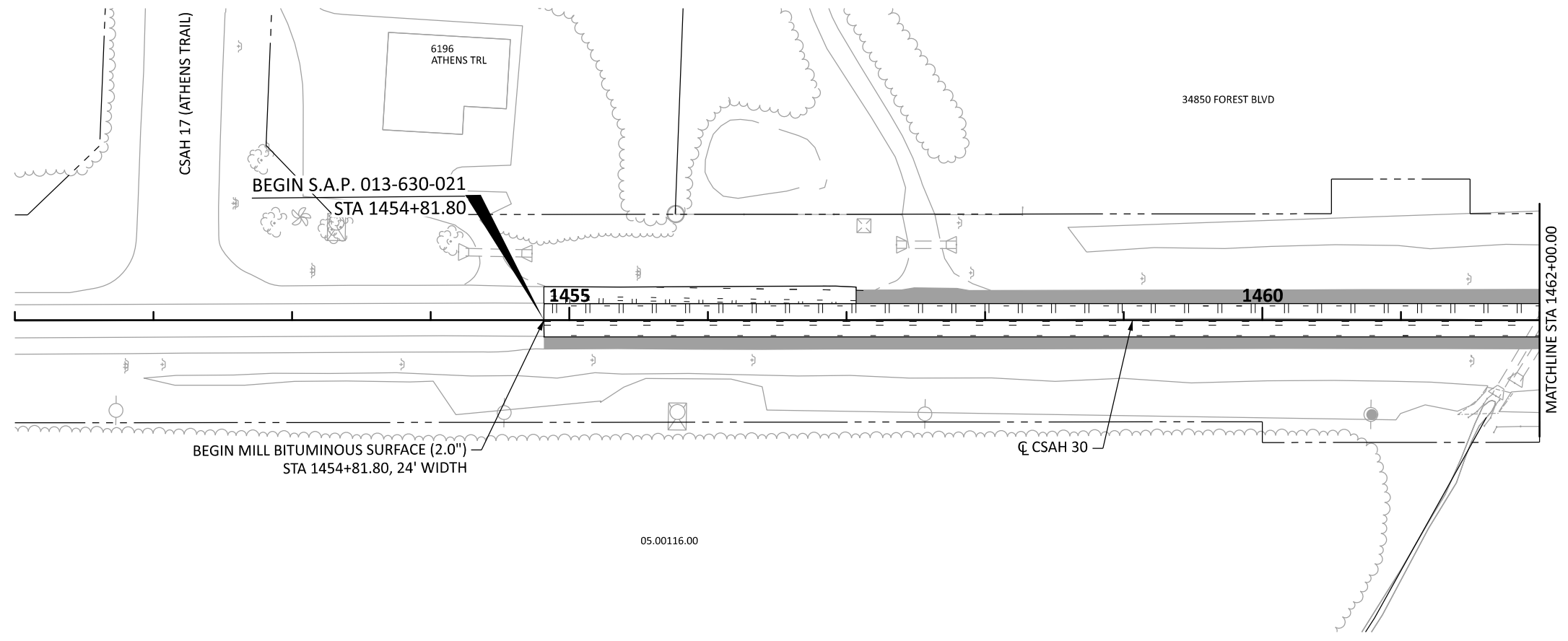
Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024
LICENSE NO. 44620

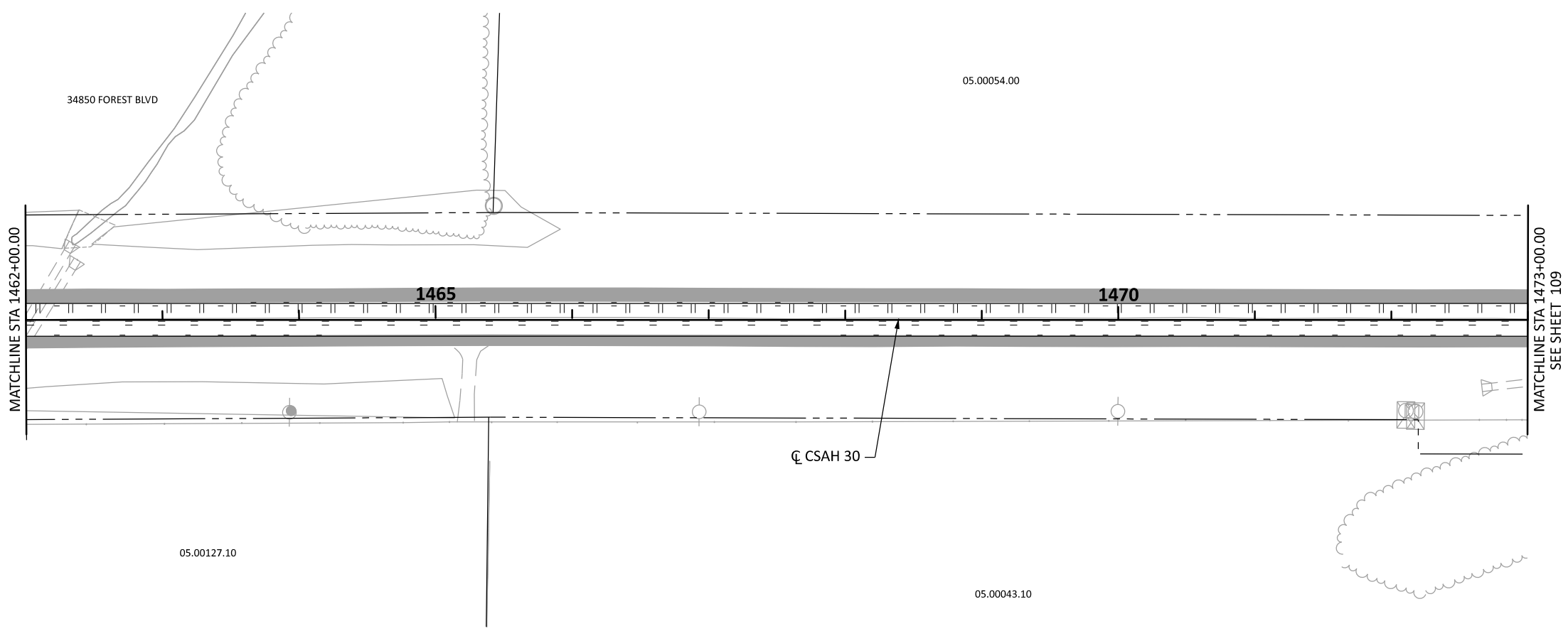


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	SHEET 107 OF 216 SHEETS
INPLACE TOPOGRAPHY & UTILITIES PLAN SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

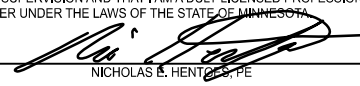
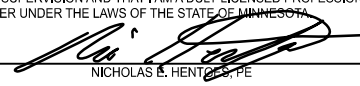
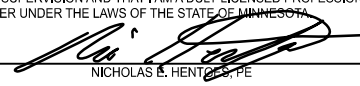


- LEGEND**
- MILL BITUMINOUS SURFACE (2.0")
 - FOG SEAL (EXISTING RURAL SHOULDERS)
 - REMOVE BITUMINOUS PAVEMENT
 - REMOVE PAVEMENT
 - REMOVE CONCRETE DRIVEWAY PAVEMENT
 - REMOVE BITUMINOUS DRIVEWAY PAVEMENT
 - CLEAR & GRUB TREE (ACRES)
 - REMOVE BITUMINOUS WALK
 - REMOVE CONCRETE WALK
 - REMOVE CURB & GUTTER
 - REMOVE SEWER PIPE (STORM)
 - REMOVE PIPE CULVERTS
 - CLEAR & GRUB TREE (EACH)
 - RELOCATE MAILBOX SUPPORT
 - CONSTRUCTION LIMITS
 - EXISTING R/W
 - PROPOSED R/W
 - TEMPORARY EASEMENT
 - PERMANENT EASEMENT
 - REMOVE GUARDRAIL- PLATE BEAM
 - REMOVE GUARDRAIL- TENSION

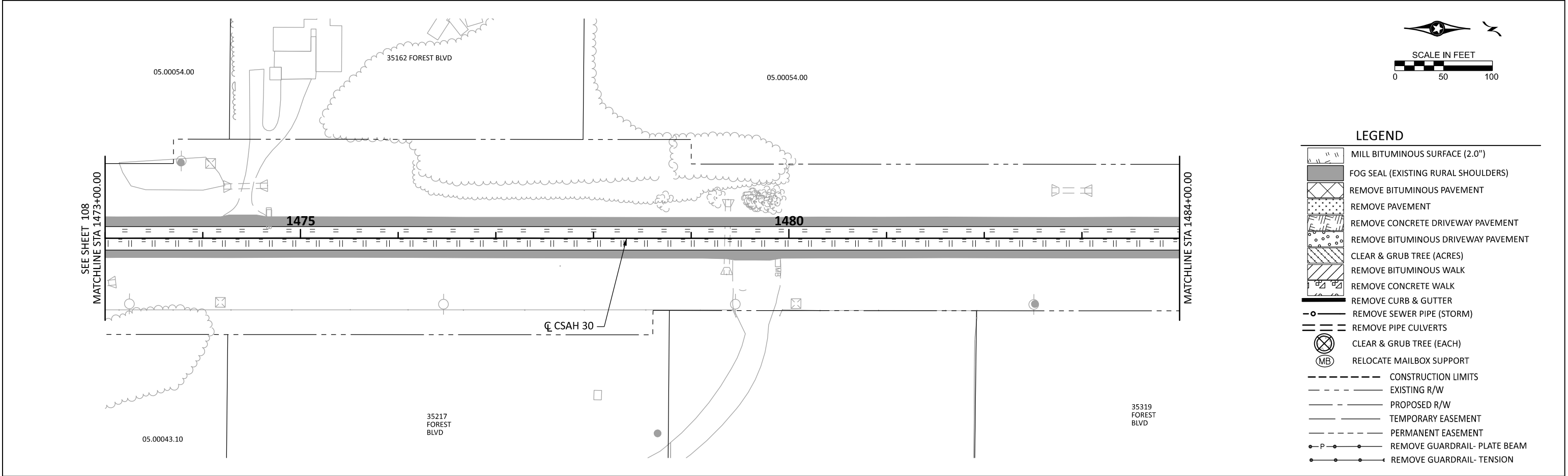


- LEGEND**
- ① SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
 - ② SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
 - ③ REMOVE LIGHT FOUNDATION
 - ④ ADJUST FRAME & RING CASTING
 - ⑤ ADJUST FRAME & RING CASTING (SPECIAL)
 - ⑥ SALVAGE LIGHTING UNIT
 - ⑦ ADJUST GATE VALVE & BOX
 - ⑧ REMOVE HYDRANT REMOVE GATE VALVE & BOX
- NOTES**
- EXACT LIMITS OF CLEARING AND GRUBBING WILL BE ESTABLISHED IN THE FIELD.
 - REMOVAL OF ALL AGGREGATE SURFACING REGARDLESS OF THICKNESS SHALL BE INCLUDED IN EXCAVATION - COMMON.
 - SAWCUTTING FOR CONCRETE CURB AND GUTTER SHALL BE INCIDENTAL.
 - SEE SIGNING PLANS FOR ADDITIONAL REMOVALS.
 - SEE SANITARY AND WATERMAIN PLANS FOR MORE DETAILS.

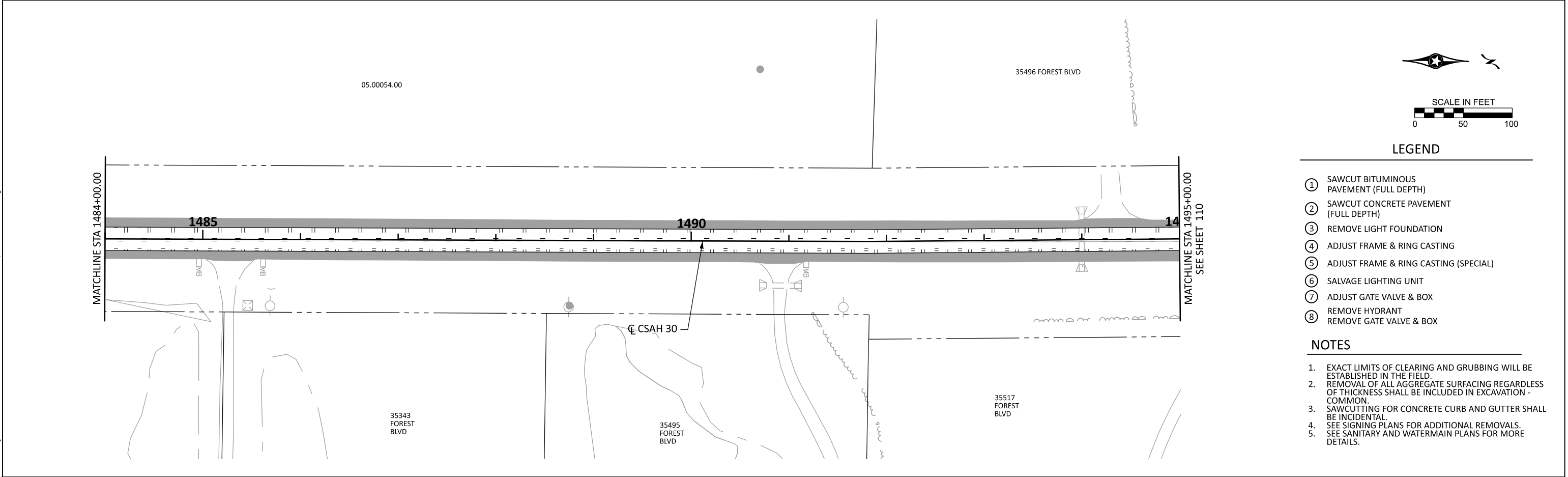
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LEGEND	
	MILL BITUMINOUS SURFACE (2.0")
	FOG SEAL (EXISTING RURAL SHOULDERS)
	REMOVE BITUMINOUS PAVEMENT
	REMOVE PAVEMENT
	REMOVE CONCRETE DRIVEWAY PAVEMENT
	REMOVE BITUMINOUS DRIVEWAY PAVEMENT
	CLEAR & GRUB TREE (ACRES)
	REMOVE BITUMINOUS WALK
	REMOVE CONCRETE WALK
	REMOVE CURB & GUTTER
	REMOVE SEWER PIPE (STORM)
	REMOVE PIPE CULVERTS
	CLEAR & GRUB TREE (EACH)
	RELOCATE MAILBOX SUPPORT
	CONSTRUCTION LIMITS
	EXISTING R/W
	PROPOSED R/W
	TEMPORARY EASEMENT
	PERMANENT EASEMENT
	REMOVE GUARDRAIL- PLATE BEAM
	REMOVE GUARDRAIL- TENSION



LEGEND	
①	SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
②	SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
③	REMOVE LIGHT FOUNDATION
④	ADJUST FRAME & RING CASTING
⑤	ADJUST FRAME & RING CASTING (SPECIAL)
⑥	SALVAGE LIGHTING UNIT
⑦	ADJUST GATE VALVE & BOX
⑧	REMOVE HYDRANT REMOVE GATE VALVE & BOX

- NOTES**
- EXACT LIMITS OF CLEARING AND GRUBBING WILL BE ESTABLISHED IN THE FIELD.
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 - SEE SIGNING PLANS FOR ADDITIONAL REMOVALS.
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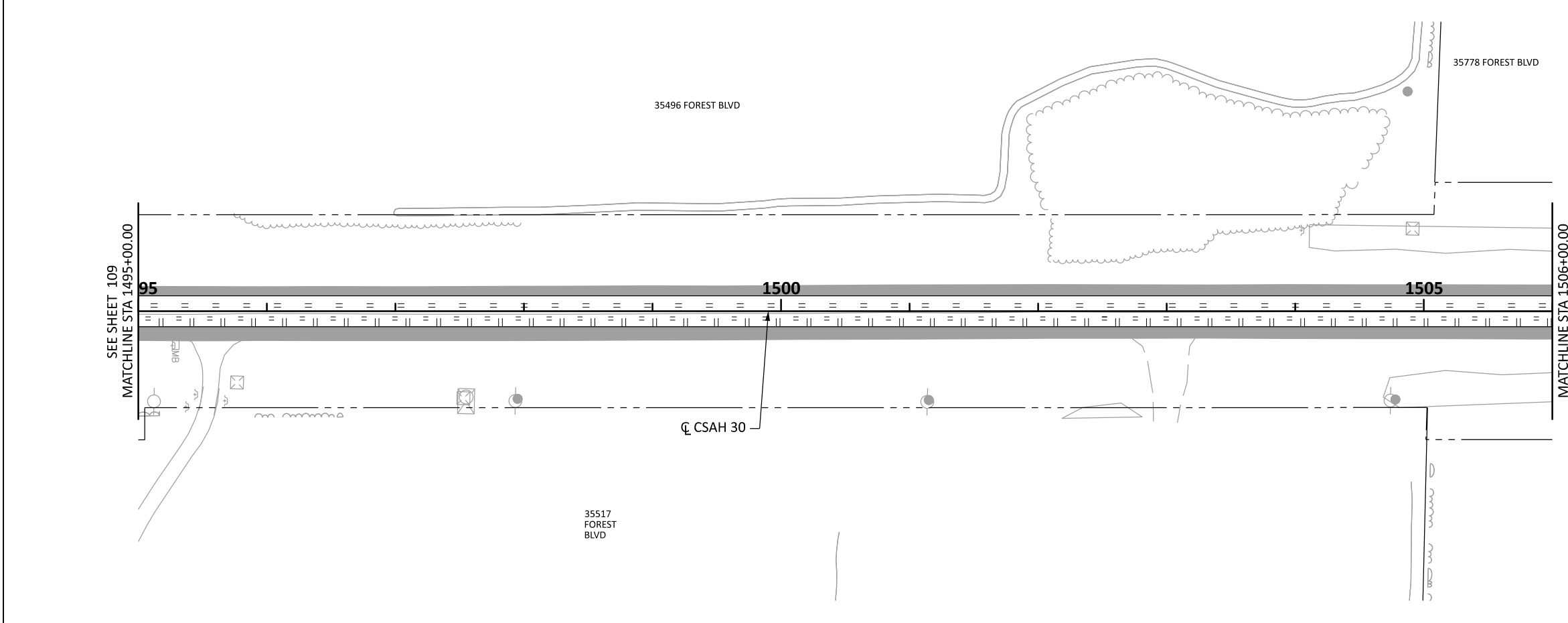
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

REMOVAL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

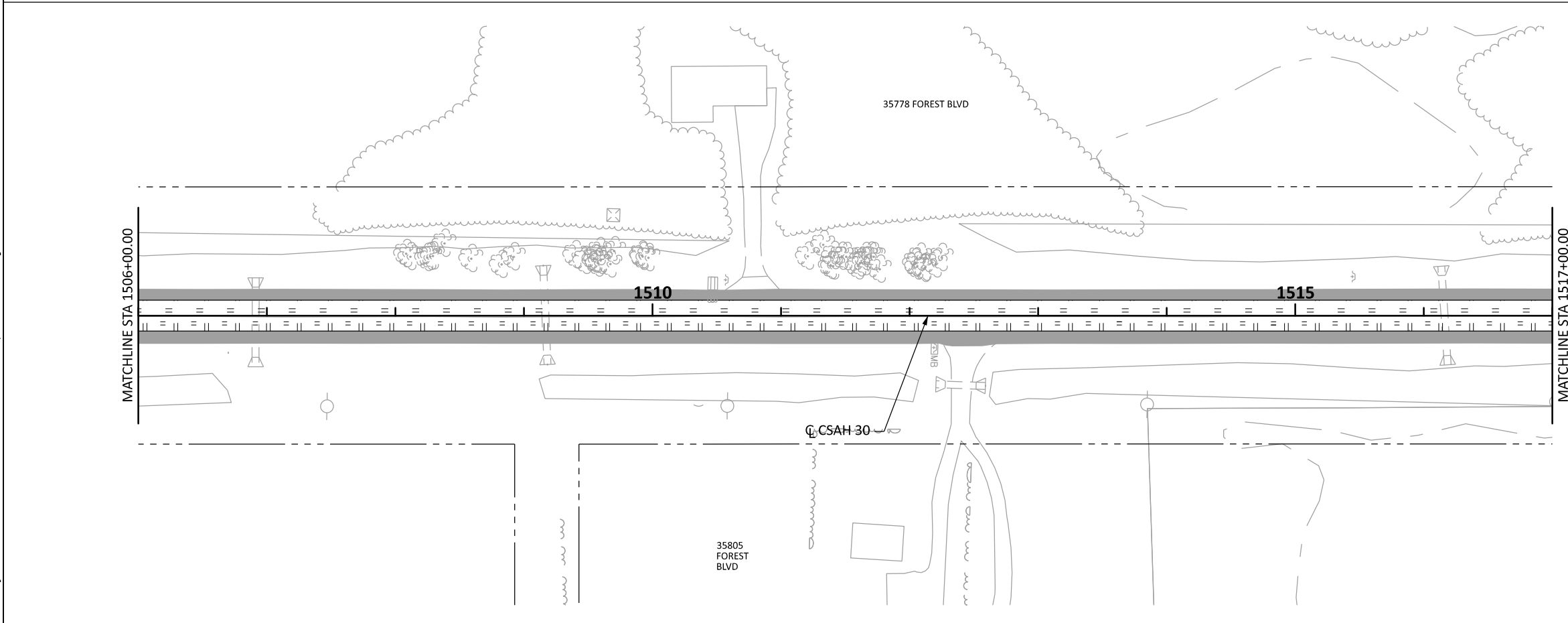
SHEET 109 OF 216 SHEETS

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LEGEND

- MILL BITUMINOUS SURFACE (2.0")
- FOG SEAL (EXISTING RURAL SHOULDERS)
- REMOVE BITUMINOUS PAVEMENT
- REMOVE PAVEMENT
- REMOVE CONCRETE DRIVEWAY PAVEMENT
- REMOVE BITUMINOUS DRIVEWAY PAVEMENT
- CLEAR & GRUB TREE (ACRES)
- REMOVE BITUMINOUS WALK
- REMOVE CONCRETE WALK
- REMOVE CURB & GUTTER
- REMOVE SEWER PIPE (STORM)
- REMOVE PIPE CULVERTS
- CLEAR & GRUB TREE (EACH)
- RELOCATE MAILBOX SUPPORT
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION



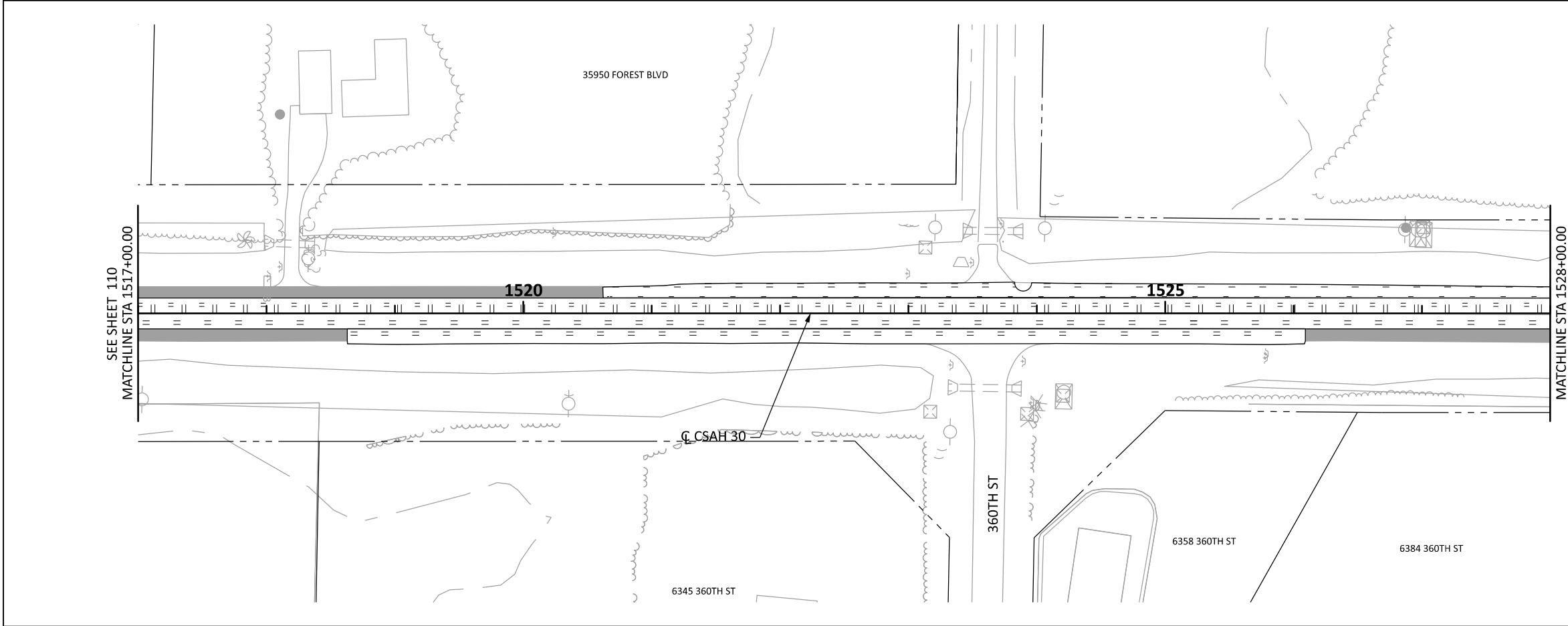
LEGEND

- SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
- SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
- REMOVE LIGHT FOUNDATION
- ADJUST FRAME & RING CASTING
- ADJUST FRAME & RING CASTING (SPECIAL)
- SALVAGE LIGHTING UNIT
- ADJUST GATE VALVE & BOX
- REMOVE HYDRANT
- REMOVE GATE VALVE & BOX

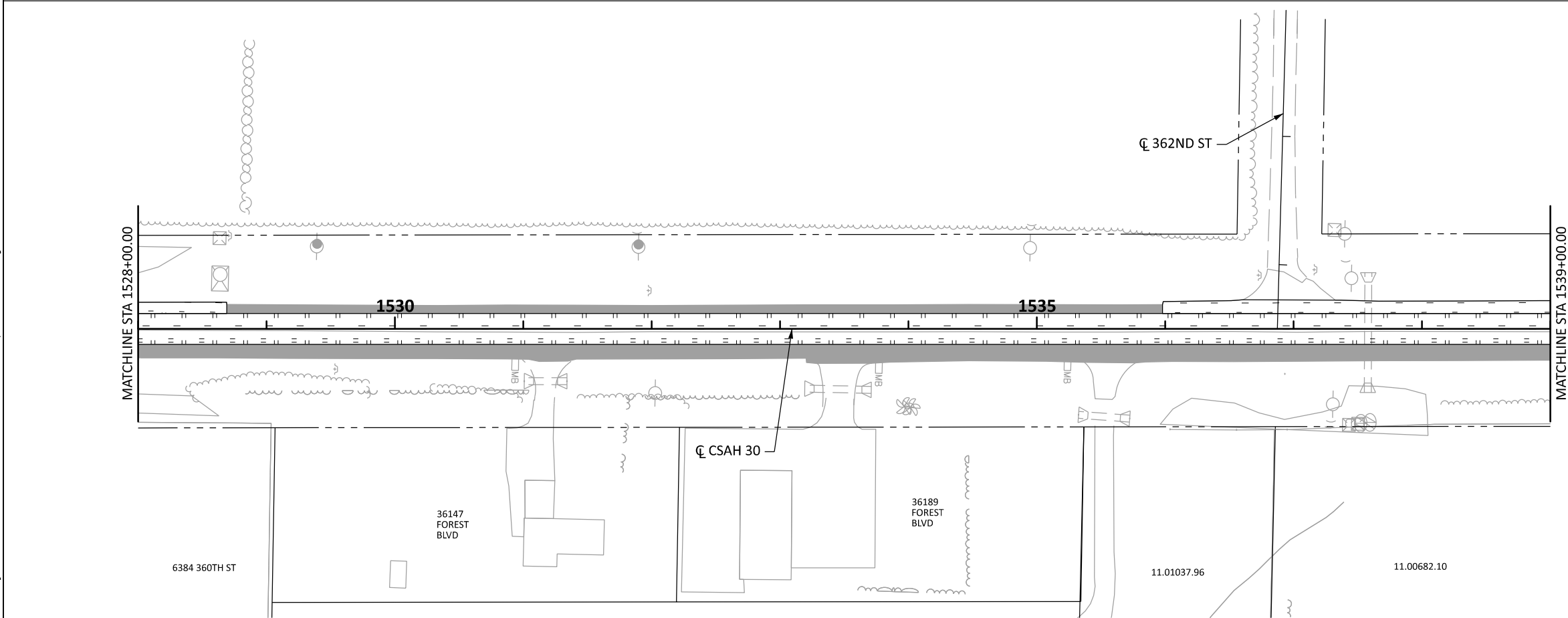
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- LEGEND**
- MILL BITUMINOUS SURFACE (2.0")
 - FOG SEAL (EXISTING RURAL SHOULDERS)
 - REMOVE BITUMINOUS PAVEMENT
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- LEGEND**
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NICHOLAS E. HENTGES, PE
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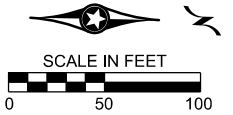


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

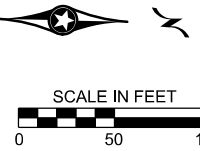
REMOVAL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
111
OF
216
SHEETS



LEGEND

- MILL BITUMINOUS SURFACE (2.0")
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- REMOVE BITUMINOUS PAVEMENT
- REMOVE PAVEMENT
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- REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION

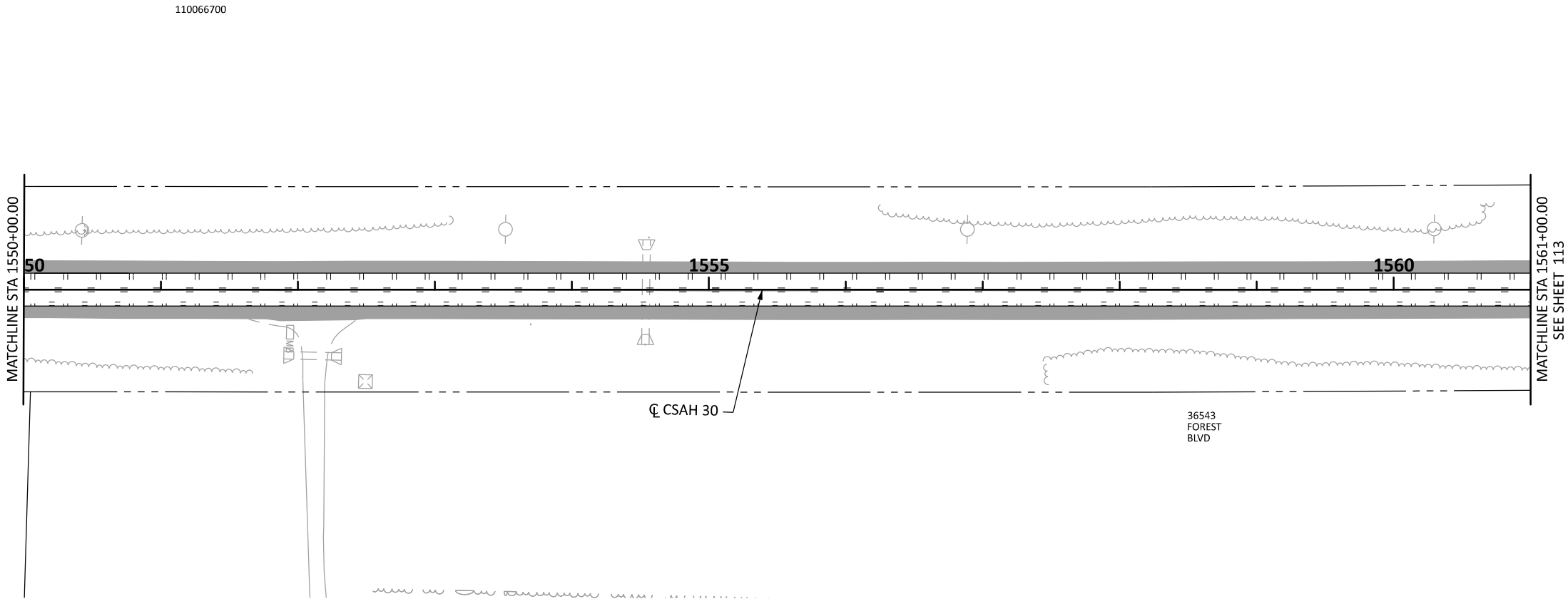
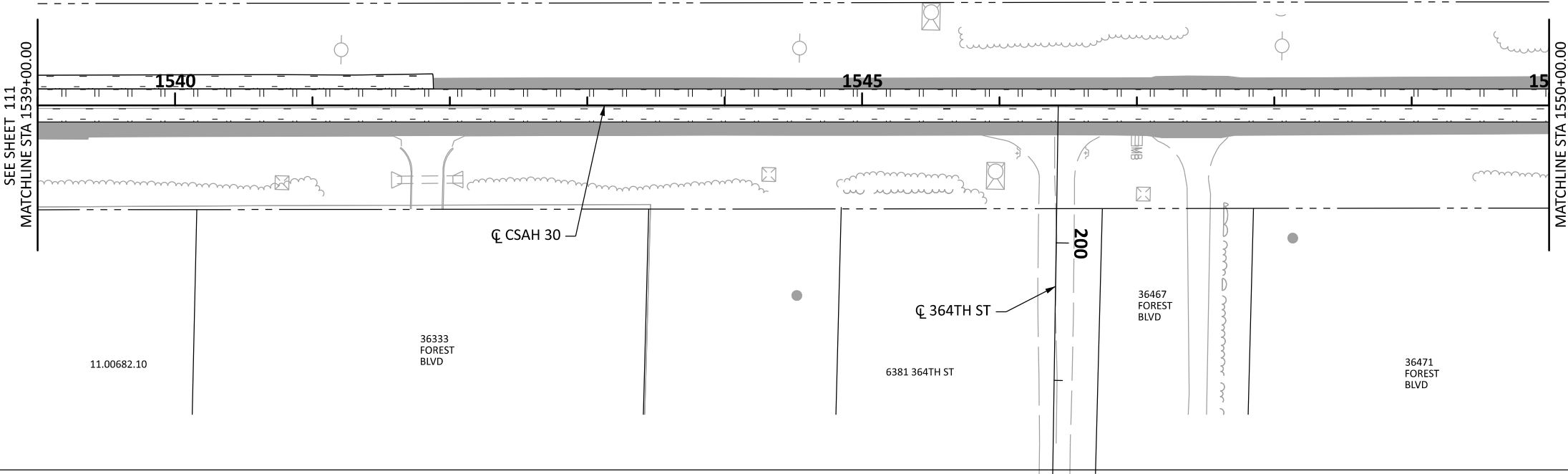


LEGEND

- ① SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
- ② SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
- ③ REMOVE LIGHT FOUNDATION
- ④ ADJUST FRAME & RING CASTING
- ⑤ ADJUST FRAME & RING CASTING (SPECIAL)
- ⑥ SALVAGE LIGHTING UNIT
- ⑦ ADJUST GATE VALVE & BOX
- ⑧ REMOVE HYDRANT
REMOVE GATE VALVE & BOX

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Chisago County, Minnesota

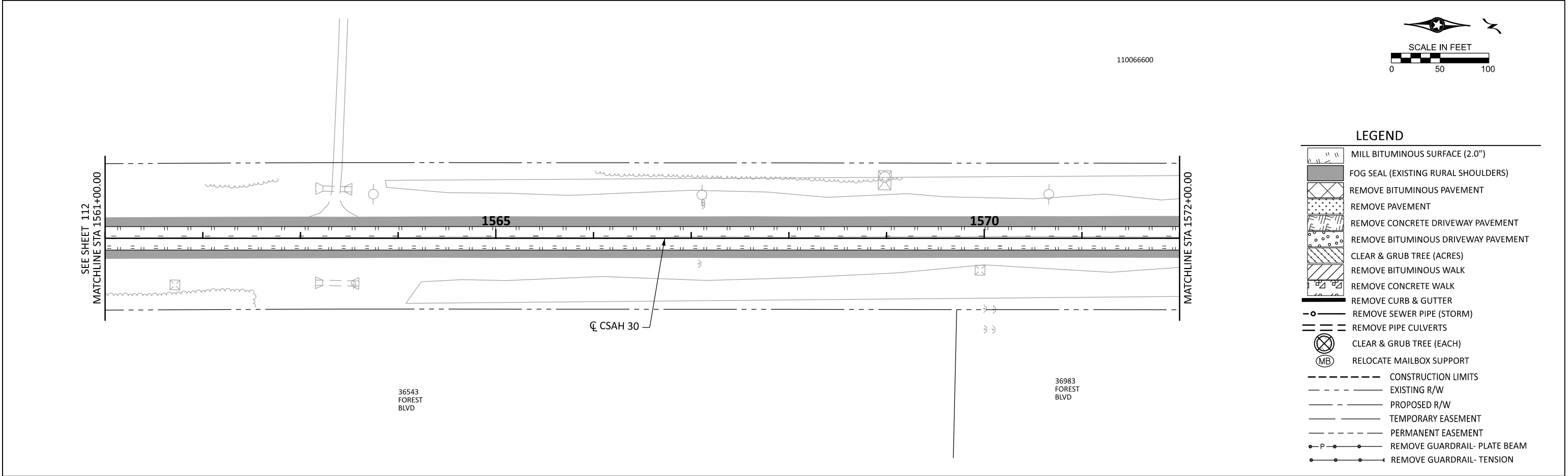
CHISAGO COUNTY, MINNESOTA

REMOVAL PLAN
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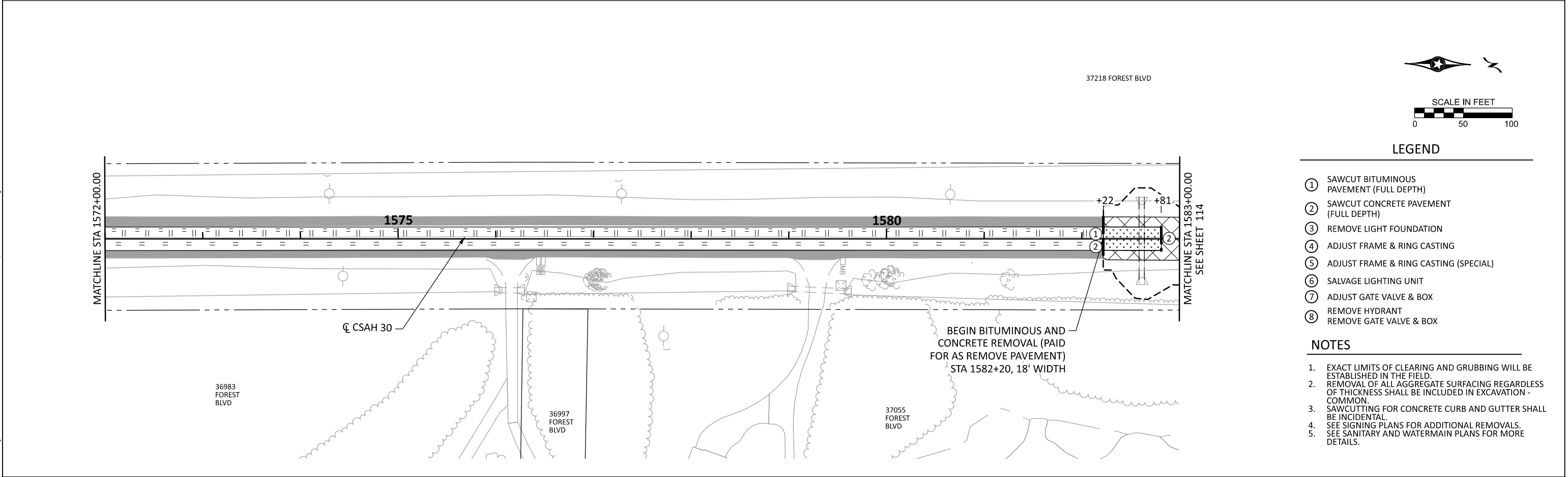
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OF
216
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	REMOVE GUARDRAIL- PLATE BEAM
	REMOVE GUARDRAIL- TENSION

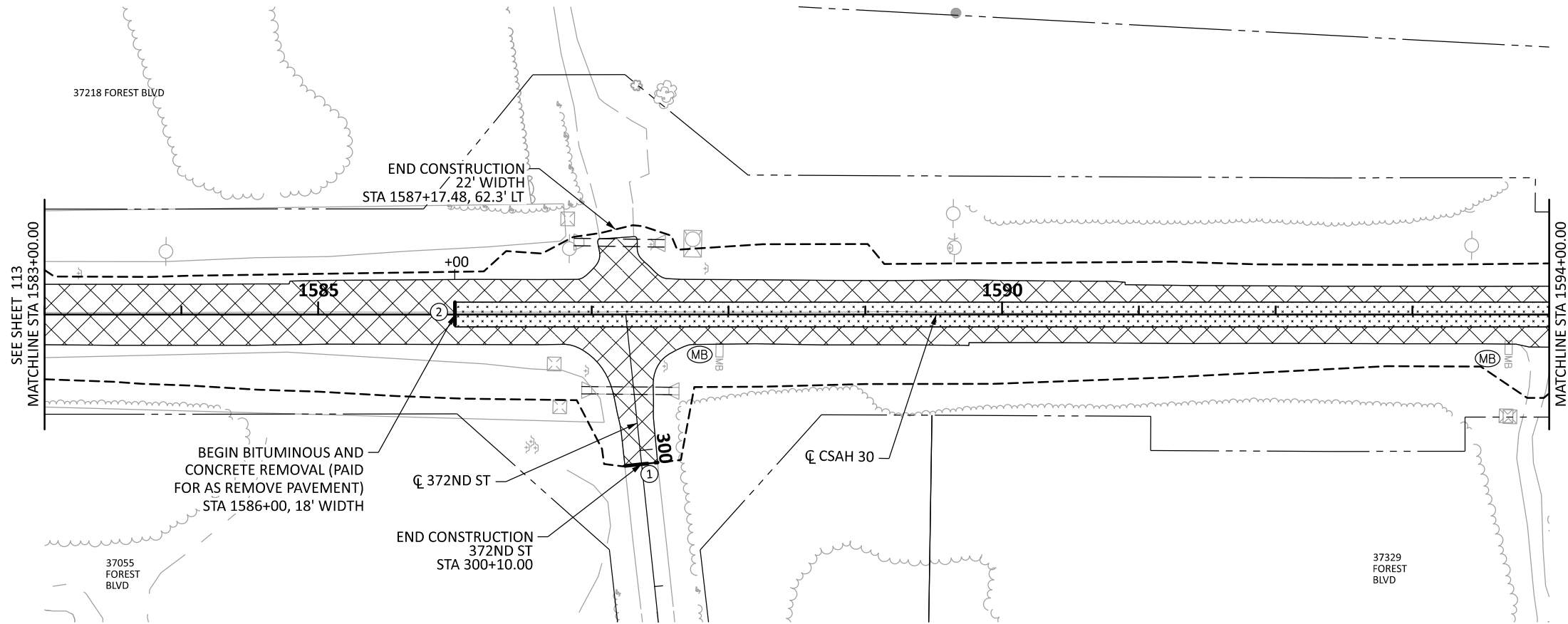


LEGEND	
①	SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
②	SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
③	REMOVE LIGHT FOUNDATION
④	ADJUST FRAME & RING CASTING
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⑥	SALVAGE LIGHTING UNIT
⑦	ADJUST GATE VALVE & BOX
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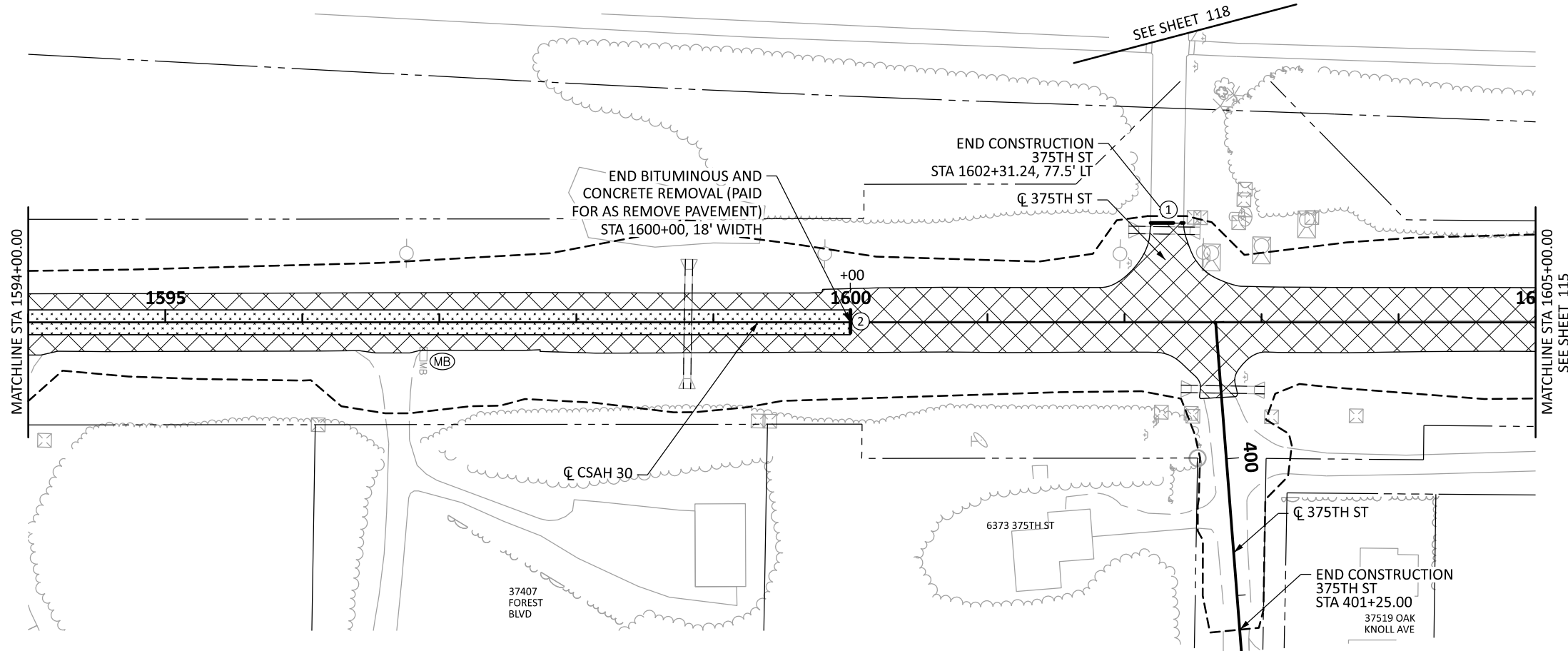
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LEGEND	
	MILL BITUMINOUS SURFACE (2.0")
	FOG SEAL (EXISTING RURAL SHOULDERS)
	REMOVE BITUMINOUS PAVEMENT
	REMOVE PAVEMENT
	REMOVE CONCRETE DRIVEWAY PAVEMENT
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	CLEAR & GRUB TREE (ACRES)
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LEGEND	
①	SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
②	SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
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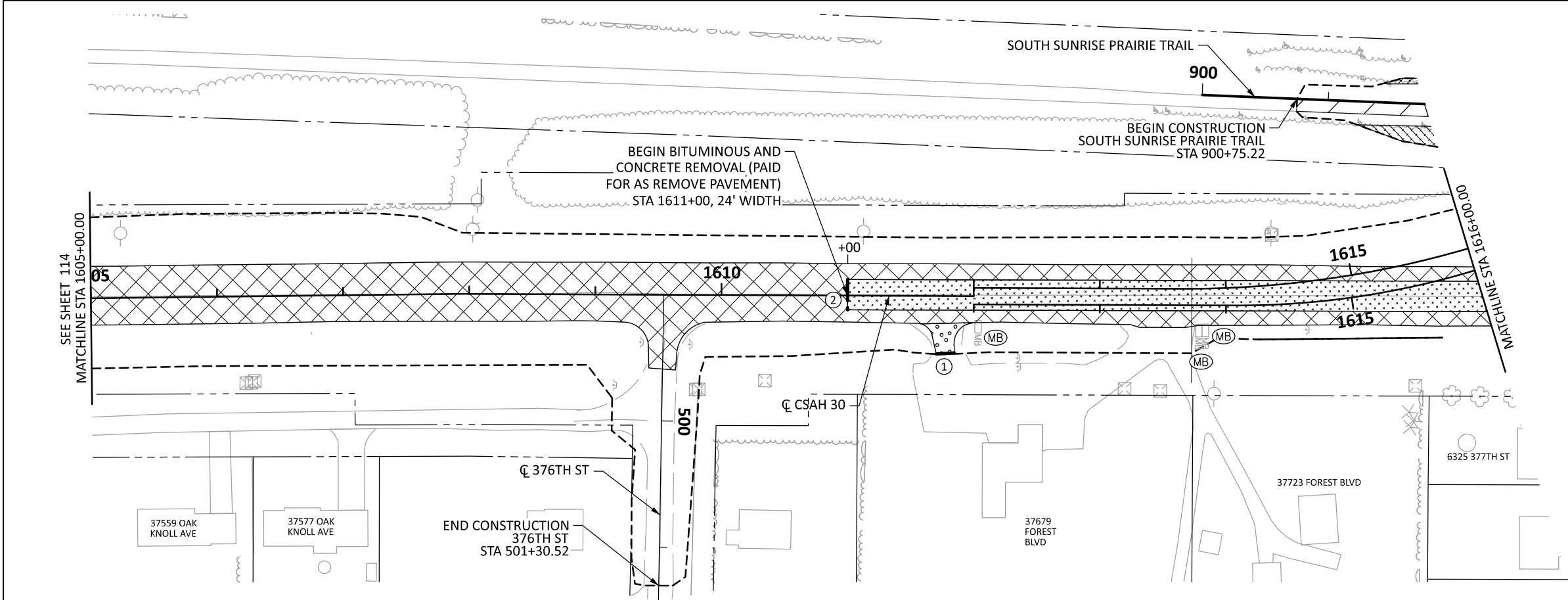
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

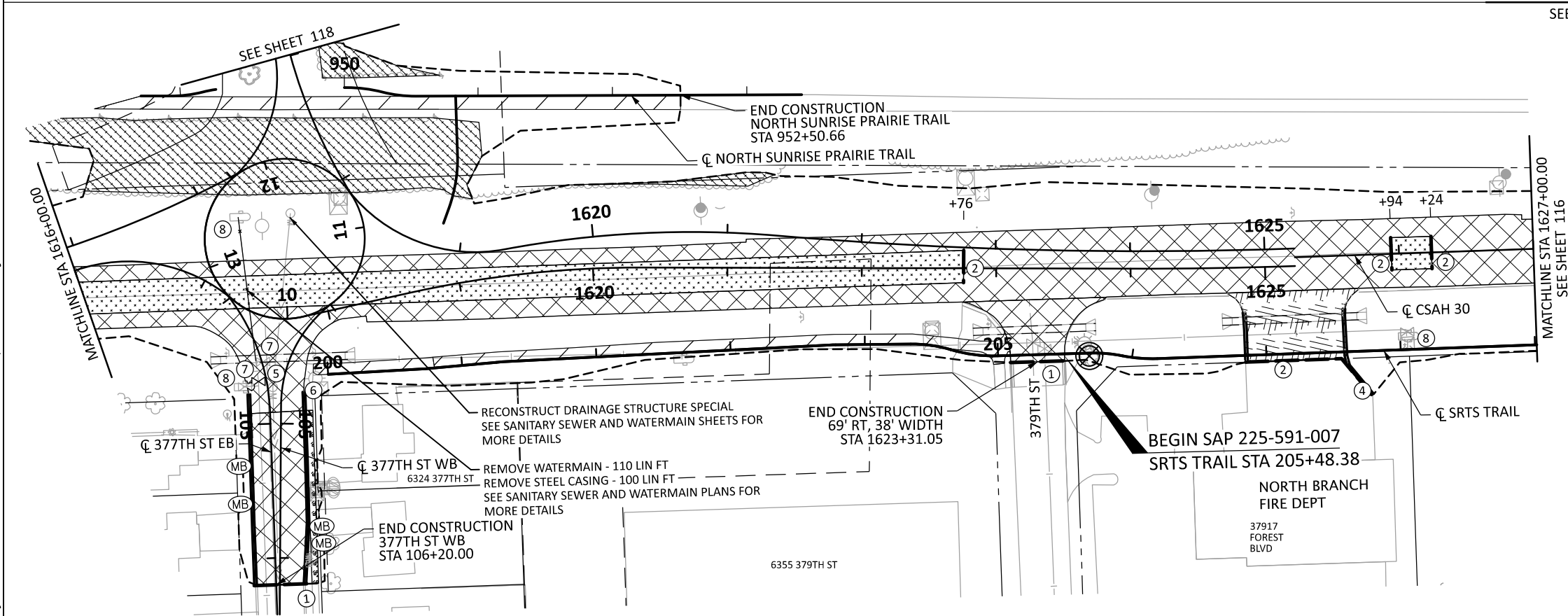
REMOVAL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
114
OF
216
SHEETS

DATE: 9/12/2024 2:04:59 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_Rem



LEGEND	
	MILL BITUMINOUS SURFACE (2.0")
	FOG SEAL (EXISTING RURAL SHOULDERS)
	REMOVE BITUMINOUS PAVEMENT
	REMOVE PAVEMENT
	REMOVE CONCRETE DRIVEWAY PAVEMENT
	REMOVE BITUMINOUS DRIVEWAY PAVEMENT
	CLEAR & GRUB TREE (ACRES)
	REMOVE BITUMINOUS WALK
	REMOVE CONCRETE WALK
	REMOVE CURB & GUTTER
	REMOVE SEWER PIPE (STORM)
	REMOVE PIPE CULVERTS
	CLEAR & GRUB TREE (EACH)
	RELOCATE MAILBOX SUPPORT
	CONSTRUCTION LIMITS
	EXISTING R/W
	PROPOSED R/W
	TEMPORARY EASEMENT
	PERMANENT EASEMENT
	REMOVE GUARDRAIL- PLATE BEAM
	REMOVE GUARDRAIL- TENSION



LEGEND	
①	SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
②	SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
③	REMOVE LIGHT FOUNDATION
④	ADJUST FRAME & RING CASTING
⑤	ADJUST FRAME & RING CASTING (SPECIAL)
⑥	SALVAGE LIGHTING UNIT
⑦	ADJUST GATE VALVE & BOX
⑧	REMOVE HYDRANT REMOVE GATE VALVE & BOX

NOTES

- EXACT LIMITS OF CLEARING AND GRUBBING WILL BE ESTABLISHED IN THE FIELD.
- REMOVAL OF ALL AGGREGATE SURFACING REGARDLESS OF THICKNESS SHALL BE INCLUDED IN EXCAVATION - COMMON.
- SAWCUTTING FOR CONCRETE CURB AND GUTTER SHALL BE INCIDENTAL.
- SEE SIGNING PLANS FOR ADDITIONAL REMOVALS.
- SEE SANITARY AND WATERMAIN PLANS FOR MORE DETAILS.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTGES, P.E.
DATE: 9/12/2024 LICENSE NO. 44620

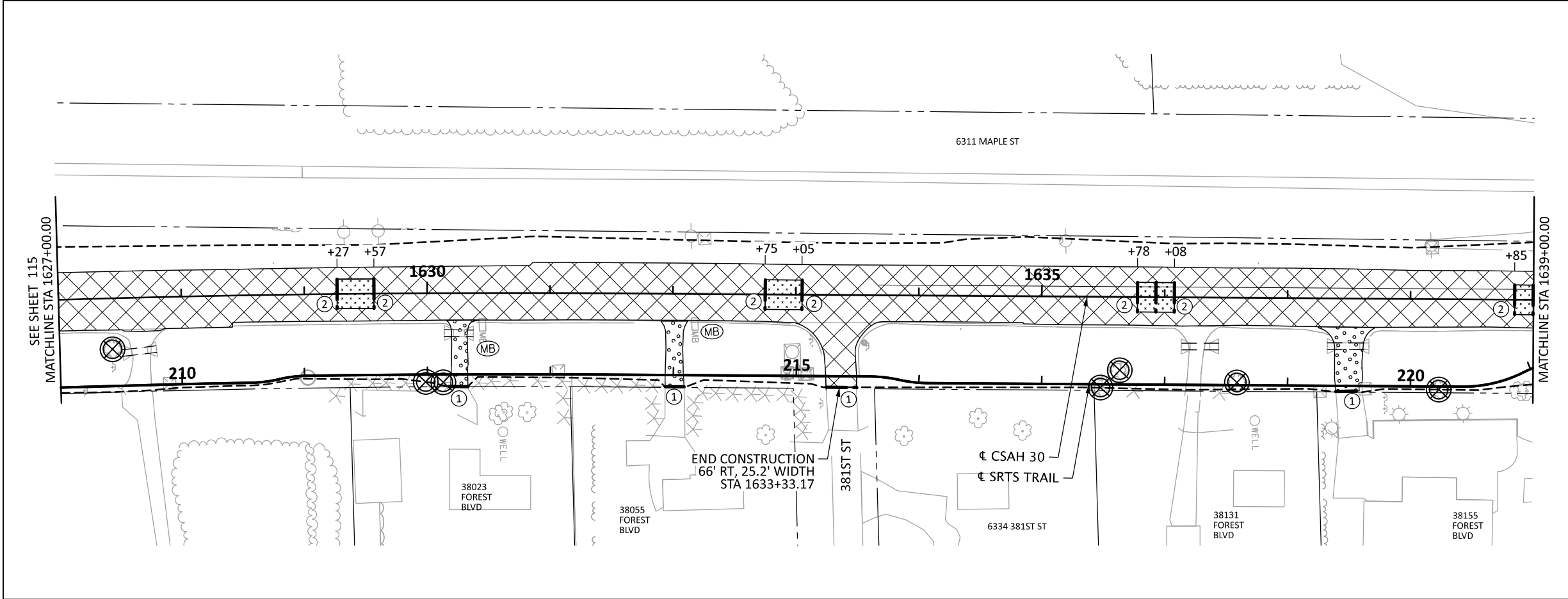
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

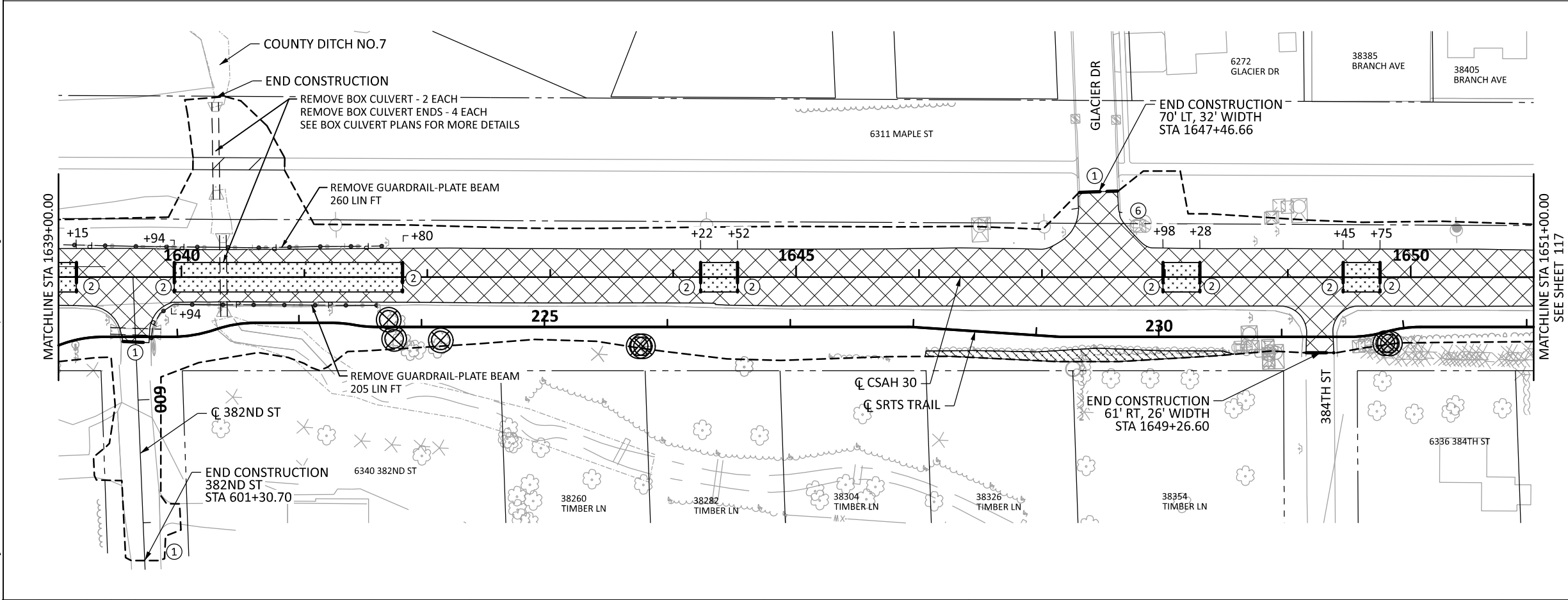
REMOVAL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 115 OF 216 SHEETS

DATE: 9/12/2024 2:05:00 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_Rem



- LEGEND**
- MILL BITUMINOUS SURFACE (2.0")
 - FOG SEAL (EXISTING RURAL SHOULDERS)
 - REMOVE BITUMINOUS PAVEMENT
 - REMOVE PAVEMENT
 - REMOVE CONCRETE DRIVEWAY PAVEMENT
 - REMOVE BITUMINOUS DRIVEWAY PAVEMENT
 - CLEAR & GRUB TREE (ACRES)
 - REMOVE BITUMINOUS WALK
 - REMOVE CONCRETE WALK
 - REMOVE CURB & GUTTER
 - REMOVE SEWER PIPE (STORM)
 - REMOVE PIPE CULVERTS
 - CLEAR & GRUB TREE (EACH)
 - RELOCATE MAILBOX SUPPORT
 - CONSTRUCTION LIMITS
 - EXISTING R/W
 - PROPOSED R/W
 - TEMPORARY EASEMENT
 - PERMANENT EASEMENT
 - REMOVE GUARDRAIL- PLATE BEAM
 - REMOVE GUARDRAIL- TENSION



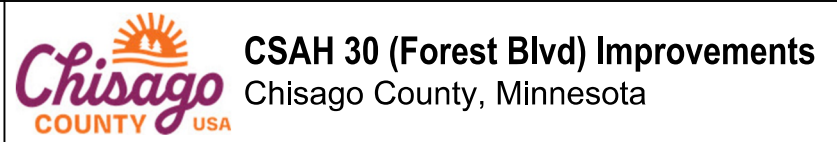
- LEGEND**
- 1 SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
 - 2 SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
 - 3 REMOVE LIGHT FOUNDATION
 - 4 ADJUST FRAME & RING CASTING
 - 5 ADJUST FRAME & RING CASTING (SPECIAL)
 - 6 SALVAGE LIGHTING UNIT
 - 7 ADJUST GATE VALVE & BOX
 - 8 REMOVE HYDRANT REMOVE GATE VALVE & BOX
- NOTES**
- EXACT LIMITS OF CLEARING AND GRUBBING WILL BE ESTABLISHED IN THE FIELD.
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 - SEE SIGNING PLANS FOR ADDITIONAL REMOVALS.
 - SEE SANITARY AND WATERMAIN PLANS FOR MORE DETAILS.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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Nicholas E. Hentges, PE
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



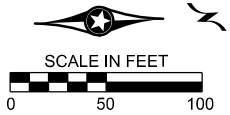
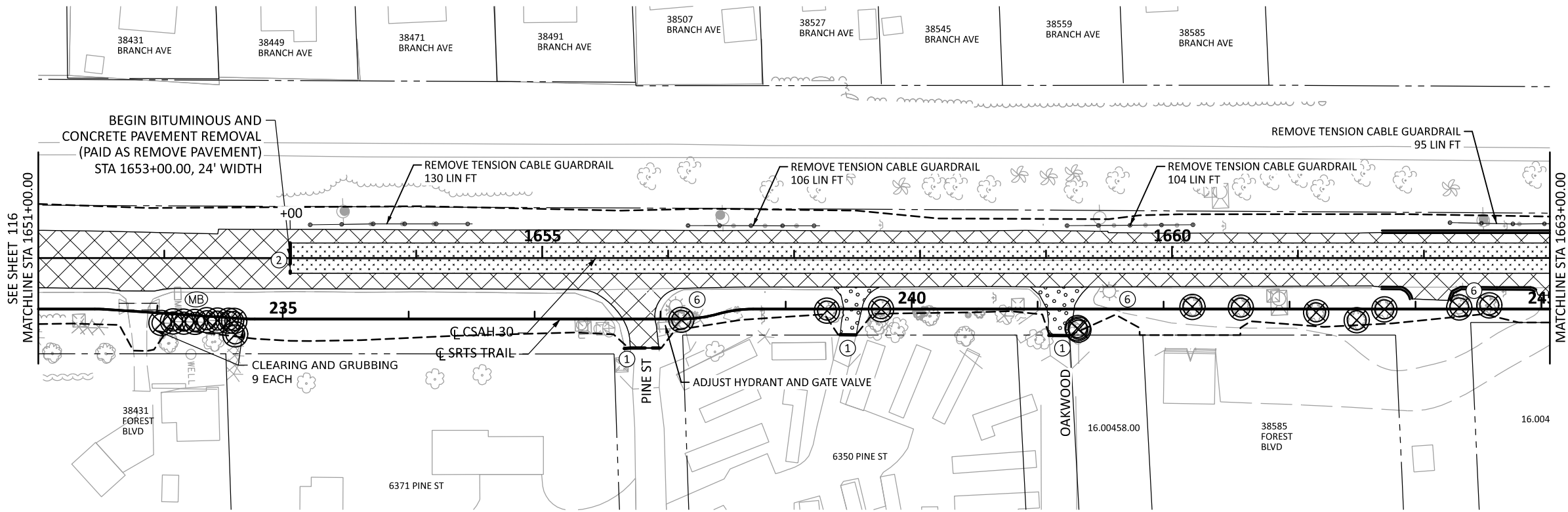
CHISAGO COUNTY, MINNESOTA

REMOVAL PLAN

SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

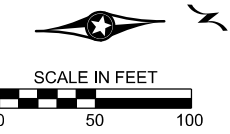
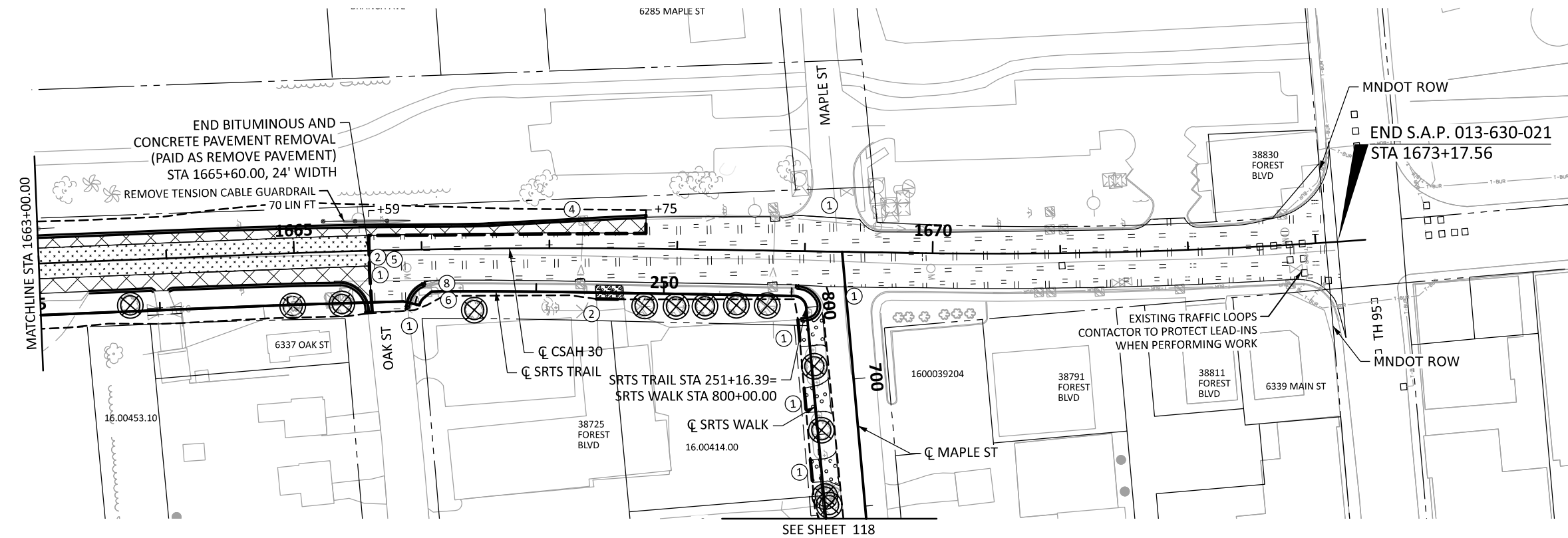
SHEET 116 OF 216 SHEETS

DATE: 9/12/2024 2:05:00 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_Rem



LEGEND

- MILL BITUMINOUS SURFACE (2.0")
- FOG SEAL (EXISTING RURAL SHOULDERS)
- REMOVE BITUMINOUS PAVEMENT
- REMOVE PAVEMENT
- REMOVE CONCRETE DRIVEWAY PAVEMENT
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- CLEAR & GRUB TREE (ACRES)
- REMOVE BITUMINOUS WALK
- REMOVE CONCRETE WALK
- REMOVE CURB & GUTTER
- REMOVE SEWER PIPE (STORM)
- REMOVE PIPE CULVERTS
- CLEAR & GRUB TREE (EACH)
- RELOCATE MAILBOX SUPPORT
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION



LEGEND

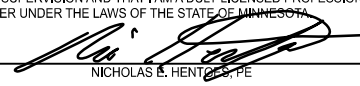
- 1 SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
- 2 SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
- 3 REMOVE LIGHT FOUNDATION
- 4 ADJUST FRAME & RING CASTING
- 5 ADJUST FRAME & RING CASTING (SPECIAL)
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- 7 ADJUST GATE VALVE & BOX
- 8 REMOVE HYDRANT REMOVE GATE VALVE & BOX

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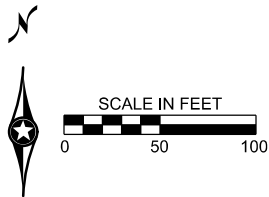
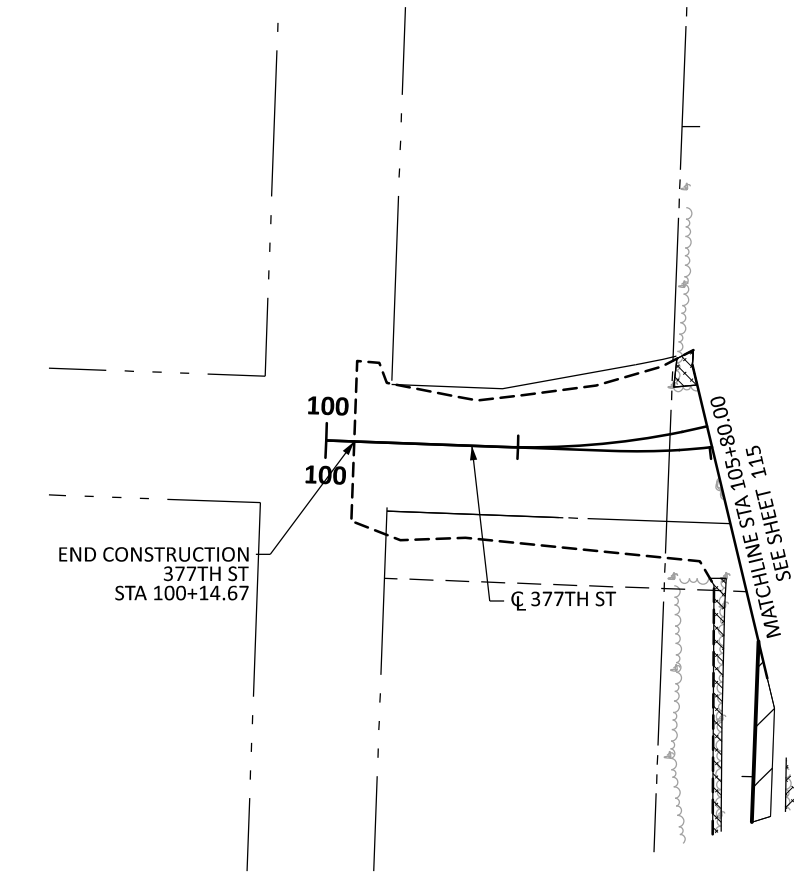
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

REMOVAL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

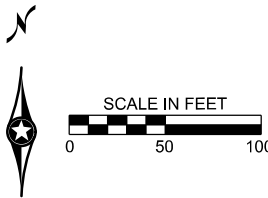
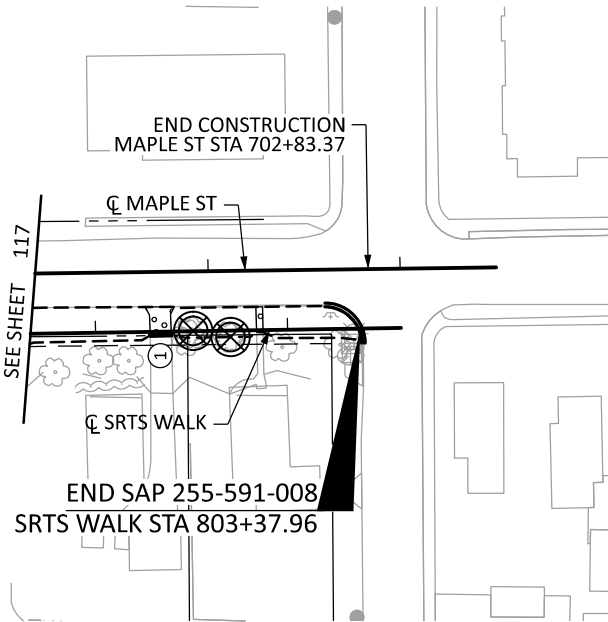
SHEET
117
OF
216
SHEETS

DATE: 9/12/2024 2:05:01 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_rem



LEGEND

- MILL BITUMINOUS SURFACE (2.0")
- FOG SEAL (EXISTING RURAL SHOULDERS)
- REMOVE BITUMINOUS PAVEMENT
- REMOVE PAVEMENT
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- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION



LEGEND

- ① SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
- ② SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
- ③ REMOVE LIGHT FOUNDATION
- ④ ADJUST FRAME & RING CASTING
- ⑤ ADJUST FRAME & RING CASTING (SPECIAL)
- ⑥ SALVAGE LIGHTING UNIT
- ⑦ ADJUST GATE VALVE & BOX
- ⑧ REMOVE HYDRANT
REMOVE GATE VALVE & BOX

NOTES

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NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



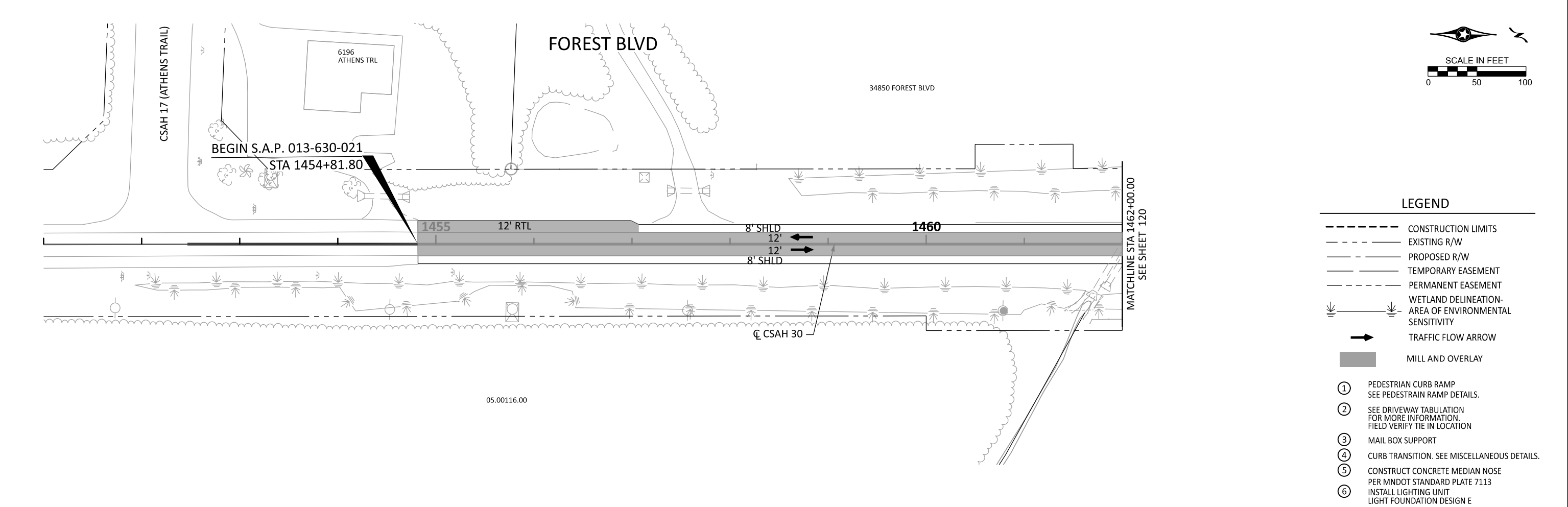
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

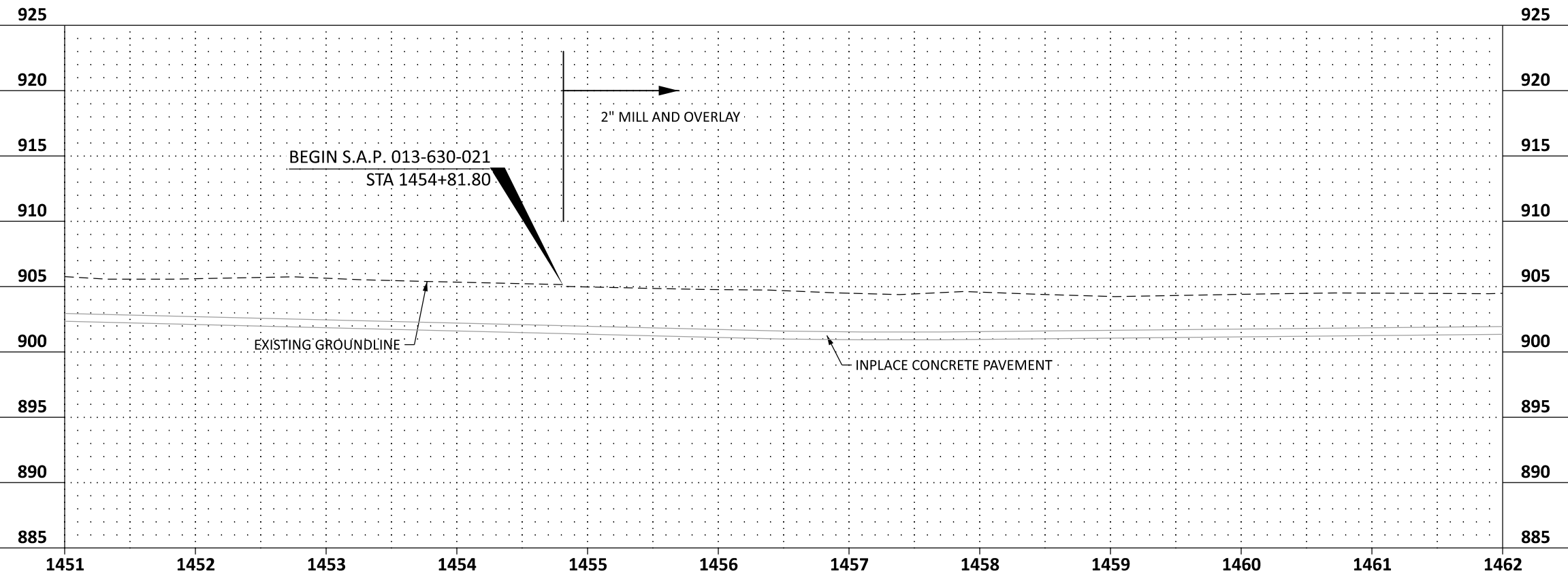
REMOVAL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
118
OF
216
SHEETS

DATE: 9/12/2024 2:05:17 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_cp



- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
 - - - PROPOSED R/W
 - - - TEMPORARY EASEMENT
 - - - PERMANENT EASEMENT
 - WETLAND DELINEATION- AREA OF ENVIRONMENTAL SENSITIVITY
 - TRAFFIC FLOW ARROW
 - MILL AND OVERLAY
- ① PEDESTRIAN CURB RAMP
SEE PEDESTRAIN RAMP DETAILS.
- ② SEE DRIVEWAY TABULATION
FOR MORE INFORMATION.
FIELD VERIFY TIE IN LOCATION
- ③ MAIL BOX SUPPORT
- ④ CURB TRANSITION. SEE MISCELLANEOUS DETAILS.
- ⑤ CONSTRUCT CONCRETE MEDIAN NOSE
PER MNDOT STANDARD PLATE 7113
- ⑥ INSTALL LIGHTING UNIT
LIGHT FOUNDATION DESIGN E



- GENERAL NOTES**
- ALL DIMENSIONS ARE TO FACE OF CURB OR EDGE OF BITUMINOUS UNLESS OTHERWISE NOTED.
 - SEE INTERSECTION DETAILS FOR ADDITIONAL INFORMATION AT INTERSECTIONS.
 - SEE DRIVEWAY DETAIL SHEETS FOR DETAILED DRIVEWAY INFORMATION.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH	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. <i>Nicholas E. Hentges</i> NICHOLAS E. HENTGES, PE DATE: 9/12/2024 LICENSE NO. 44620
Plan By: MKV	
Checked By: MAN	
Approved By: NEH	

wsb

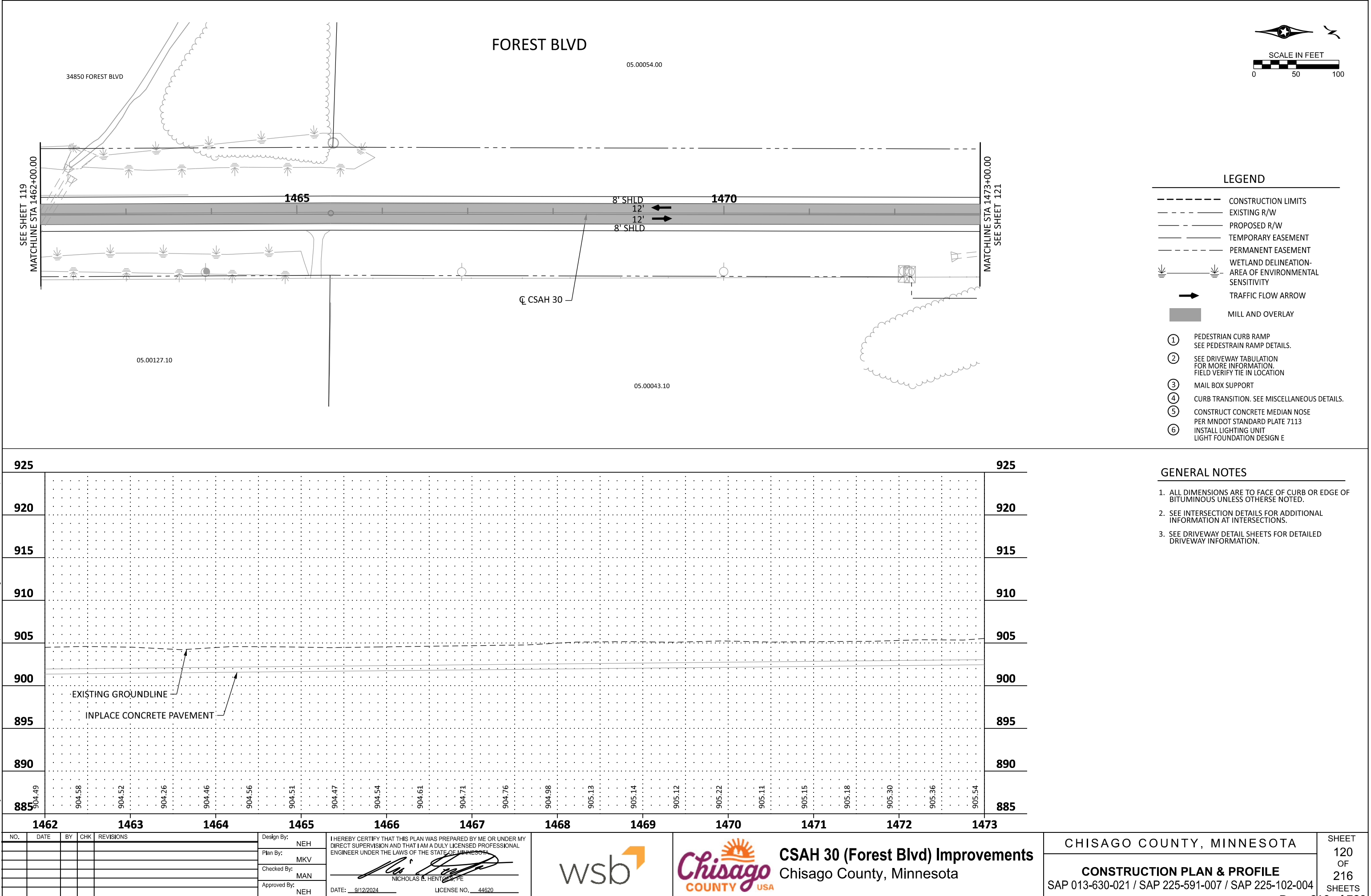
Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

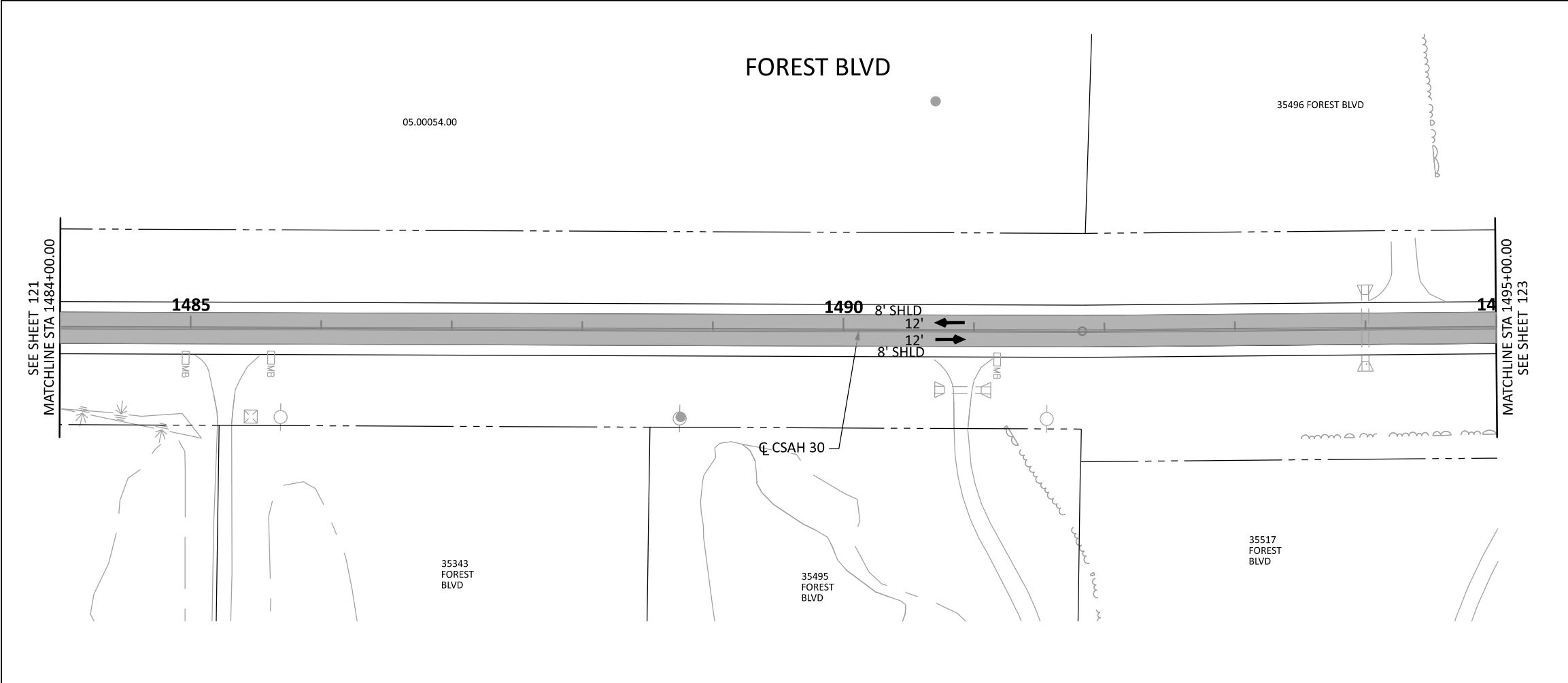
CHISAGO COUNTY, MINNESOTA	
CONSTRUCTION PLAN & PROFILE	
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

SHEET 119 OF 216 SHEETS

DATE: 9/12/2024 2:05:21 PM
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DATE: 9/12/2024 2:05:23 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_cp



LEGEND

CONSTRUCTION LIMITS

EXISTING R/W

PROPOSED R/W

TEMPORARY EASEMENT

PERMANENT EASEMENT

WETLAND DELINEATION-
AREA OF ENVIRONMENTAL
SENSITIVITY

TRAFFIC FLOW ARROW

MILL AND OVERLAY

①

PEDESTRIAN CURB RAMP
SEE PEDESTRAIN RAMP DETAILS.

②

SEE DRIVEWAY TABULATION
FOR MORE INFORMATION.
FIELD VERIFY TIE IN LOCATION

③

MAIL BOX SUPPORT

④

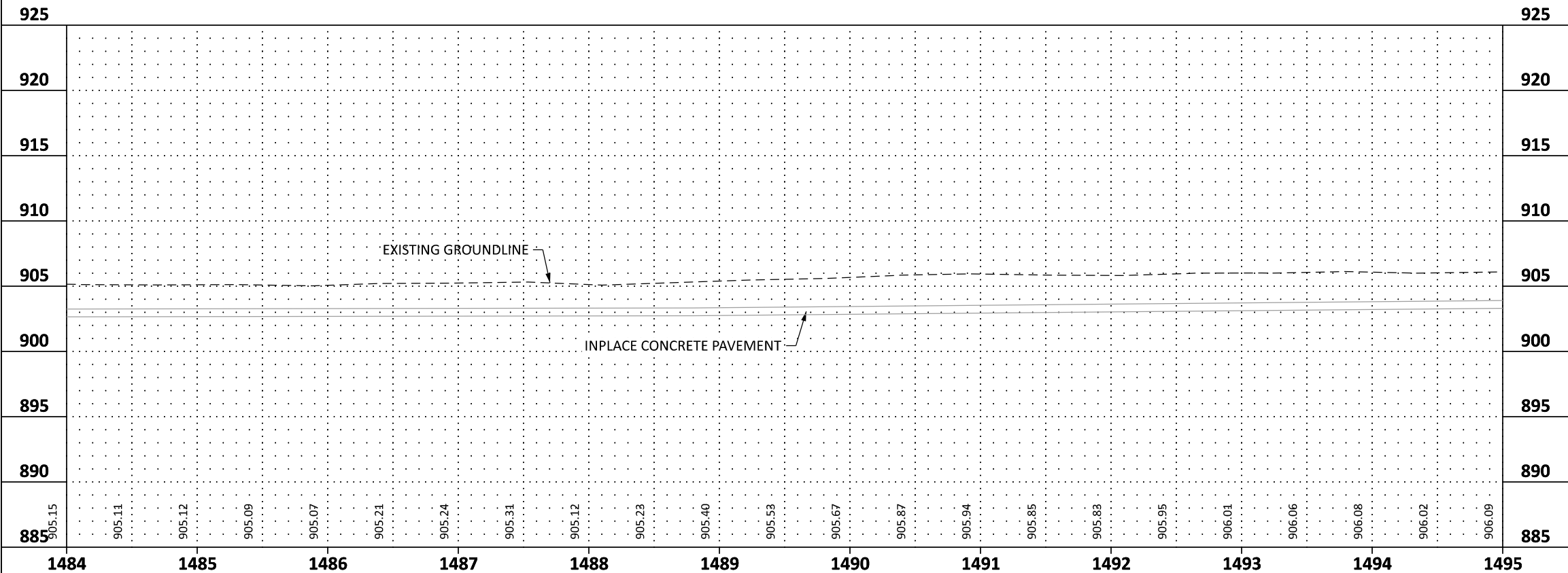
CURB TRANSITION. SEE MISCELLANEOUS DETAILS.

⑤

CONSTRUCT CONCRETE MEDIAN NOSE
PER MNDOT STANDARD PLATE 7113

⑥

INSTALL LIGHTING UNIT
LIGHT FOUNDATION DESIGN E



GENERAL NOTES

- ALL DIMENSIONS ARE TO FACE OF CURB OR EDGE OF BITUMINOUS UNLESS OTHERWISE NOTED.
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- SEE DRIVEWAY DETAIL SHEETS FOR DETAILED DRIVEWAY INFORMATION.

NO.	DATE	BY	CHK	REVISIONS

Design By:
Plan By:
Checked By:
Approved By:

NEH
MKV
MAN
NEH

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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024

LICENSE NO. 44620



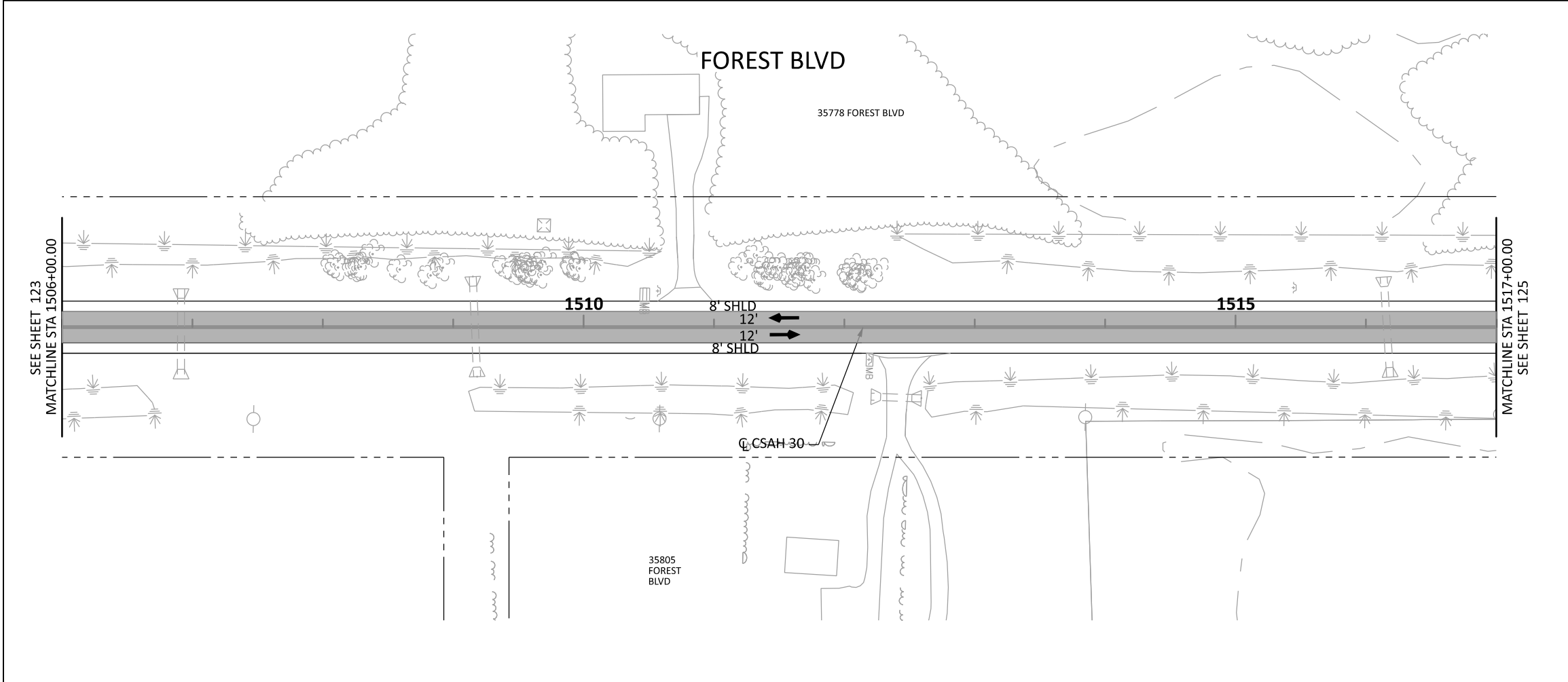
CSAH 30 (Forest Blvd) Improvements
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CONSTRUCTION PLAN & PROFILE
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

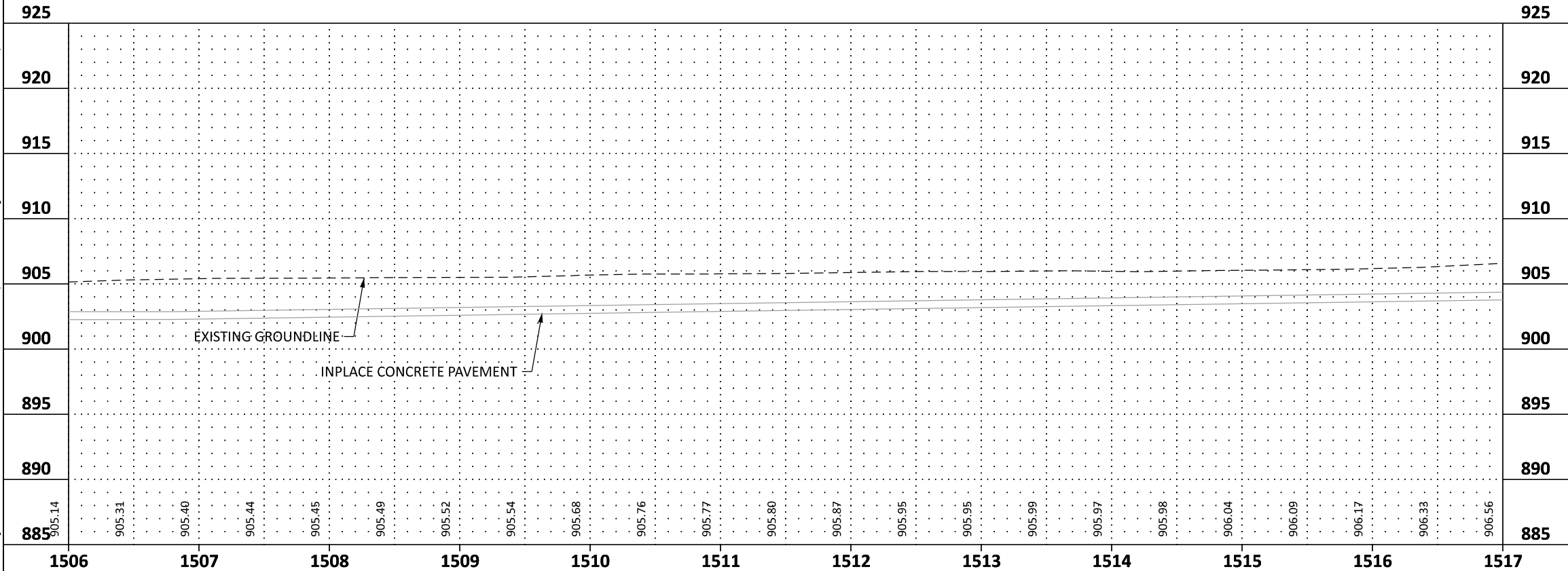
SHEET
122
OF
216
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DATE: 9/12/2024 2:05:24 PM
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LEGEND

- CONSTRUCTION LIMITS
- - - EXISTING R/W
- - - PROPOSED R/W
- - - TEMPORARY EASEMENT
- - - PERMANENT EASEMENT
- WETLAND DELINEATION-
AREA OF ENVIRONMENTAL
SENSITIVITY
- TRAFFIC FLOW ARROW
- MILL AND OVERLAY
- ① PEDESTRIAN CURB RAMP
SEE PEDESTRAIN RAMP DETAILS.
- ② SEE DRIVEWAY TABULATION
FOR MORE INFORMATION.
FIELD VERIFY TIE IN LOCATION
- ③ MAIL BOX SUPPORT
- ④ CURB TRANSITION. SEE MISCELLANEOUS DETAILS.
- ⑤ CONSTRUCT CONCRETE MEDIAN NOSE
PER MNDOT STANDARD PLATE 7113
- ⑥ INSTALL LIGHTING UNIT
LIGHT FOUNDATION DESIGN E



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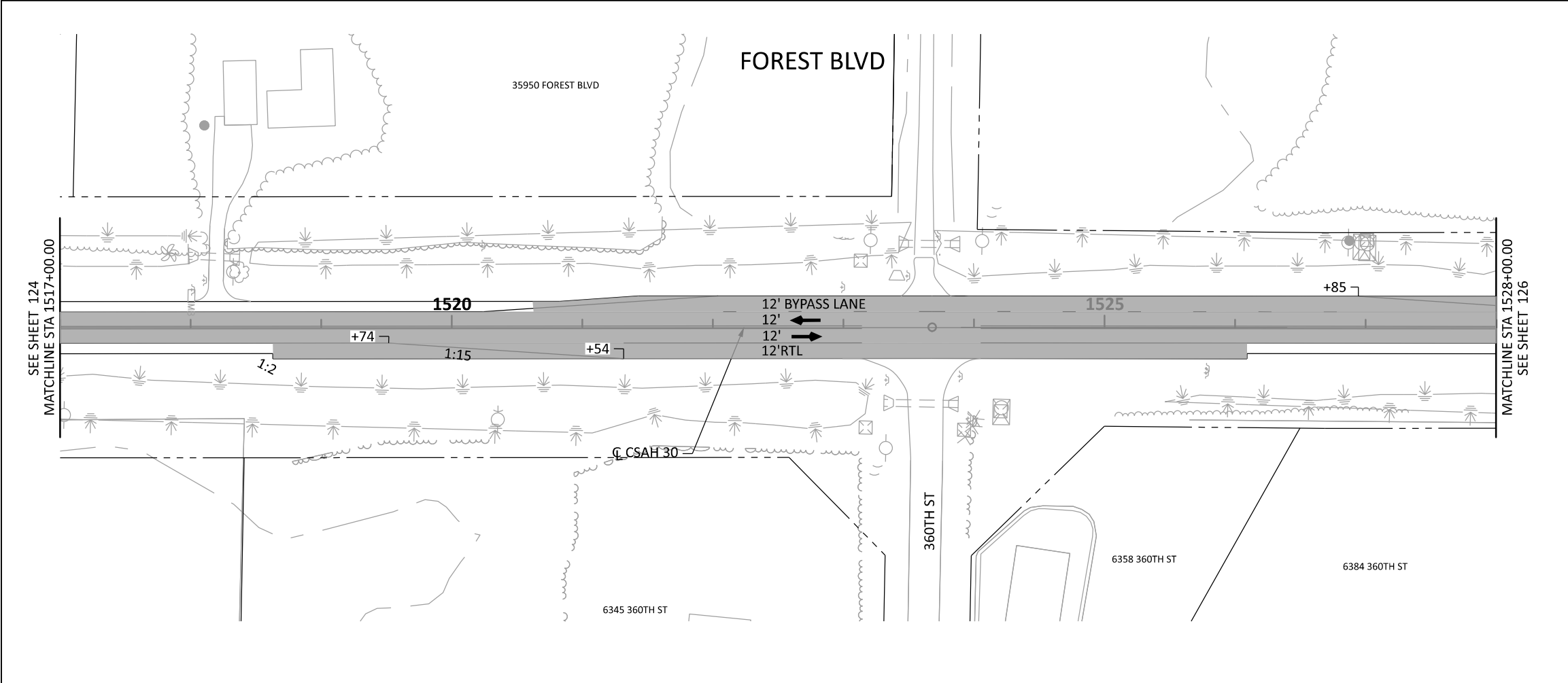
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

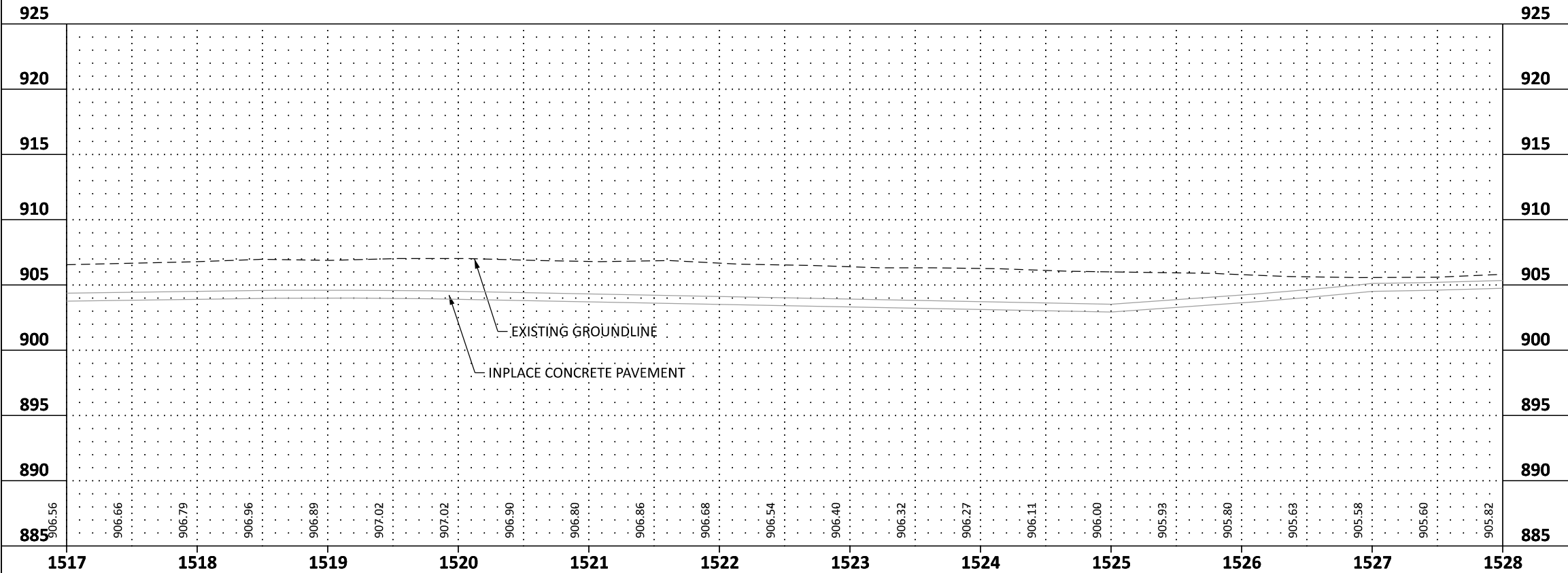
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SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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OF
216
SHEETS

DATE: 9/12/2024 2:05:25 PM
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- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
 - - - PROPOSED R/W
 - - - TEMPORARY EASEMENT
 - - - PERMANENT EASEMENT
 - WETLAND DELINEATION-
AREA OF ENVIRONMENTAL
SENSITIVITY
 - TRAFFIC FLOW ARROW
 - MILL AND OVERLAY
- ① PEDESTRIAN CURB RAMP
SEE PEDESTRAIN RAMP DETAILS.
- ② SEE DRIVEWAY TABULATION
FOR MORE INFORMATION.
FIELD VERIFY TIE IN LOCATION
- ③ MAIL BOX SUPPORT
- ④ CURB TRANSITION. SEE MISCELLANEOUS DETAILS.
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PER MNDOT STANDARD PLATE 7113
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LIGHT FOUNDATION DESIGN E



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Plan By:
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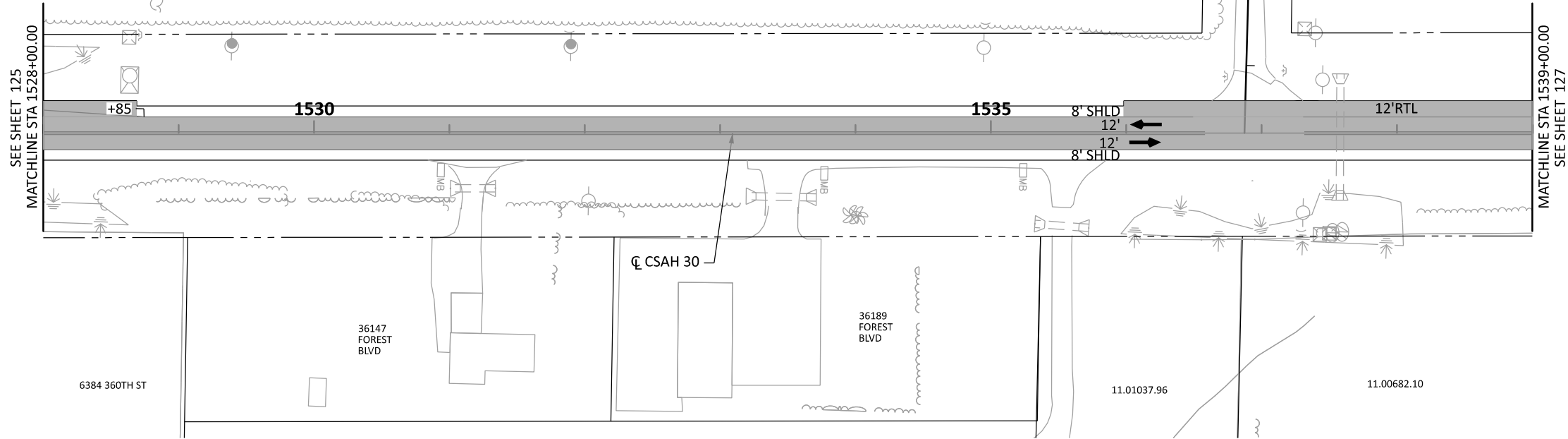
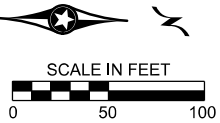
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CONSTRUCTION PLAN & PROFILE
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
125
OF
216
SHEETS

FOREST BLVD



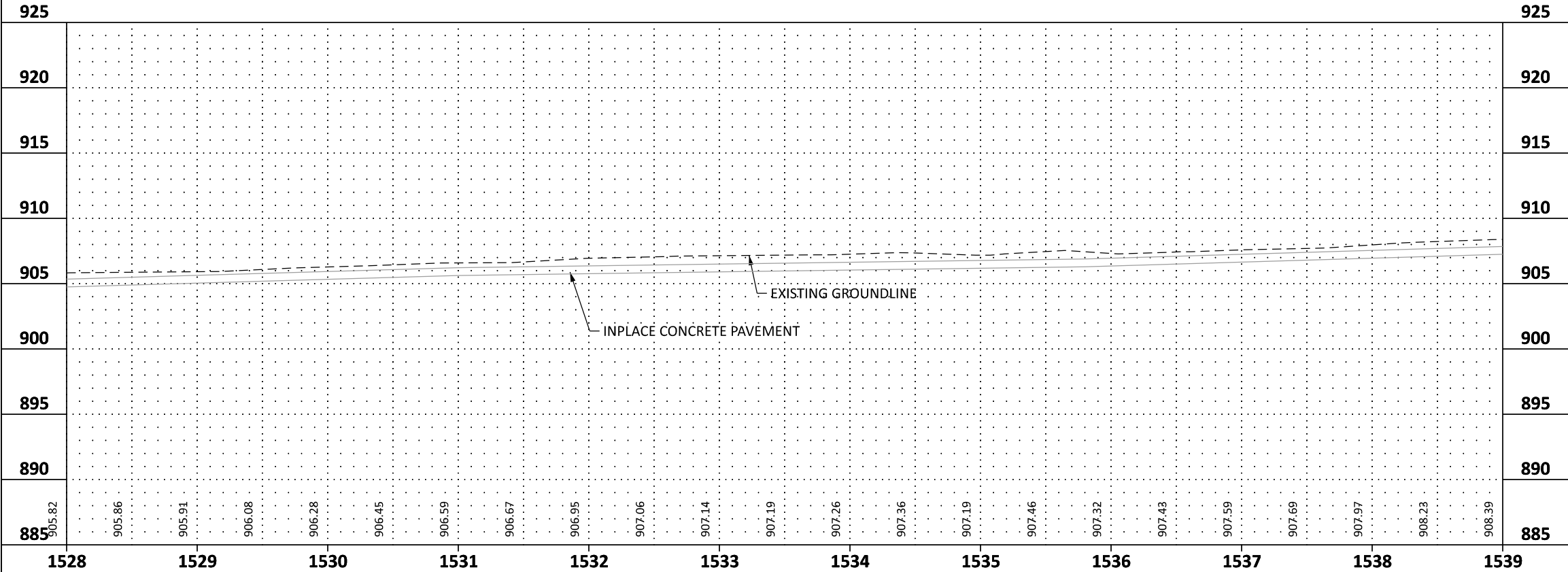
LEGEND

- CONSTRUCTION LIMITS
- - - EXISTING R/W
- - - PROPOSED R/W
- - - TEMPORARY EASEMENT
- - - PERMANENT EASEMENT
- WETLAND DELINEATION- AREA OF ENVIRONMENTAL SENSITIVITY
- TRAFFIC FLOW ARROW
- MILL AND OVERLAY
- ① PEDESTRIAN CURB RAMP
SEE PEDESTRAIN RAMP DETAILS.
- ② SEE DRIVEWAY TABULATION
FOR MORE INFORMATION.
FIELD VERIFY TIE IN LOCATION
- ③ MAIL BOX SUPPORT
- ④ CURB TRANSITION. SEE MISCELLANEOUS DETAILS.
- ⑤ CONSTRUCT CONCRETE MEDIAN NOSE
PER MNDOT STANDARD PLATE 7113
- ⑥ INSTALL LIGHTING UNIT
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DATE: 9/12/2024 2:05:26 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620



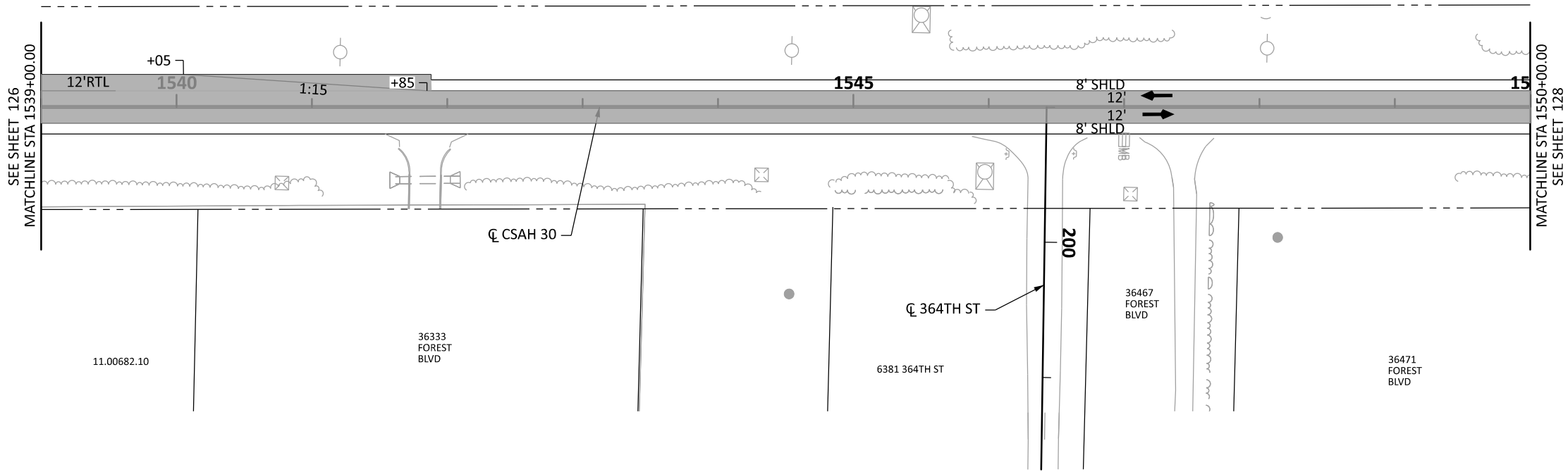
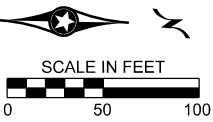
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CONSTRUCTION PLAN & PROFILE
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
126
OF
216
SHEETS

FOREST BLVD

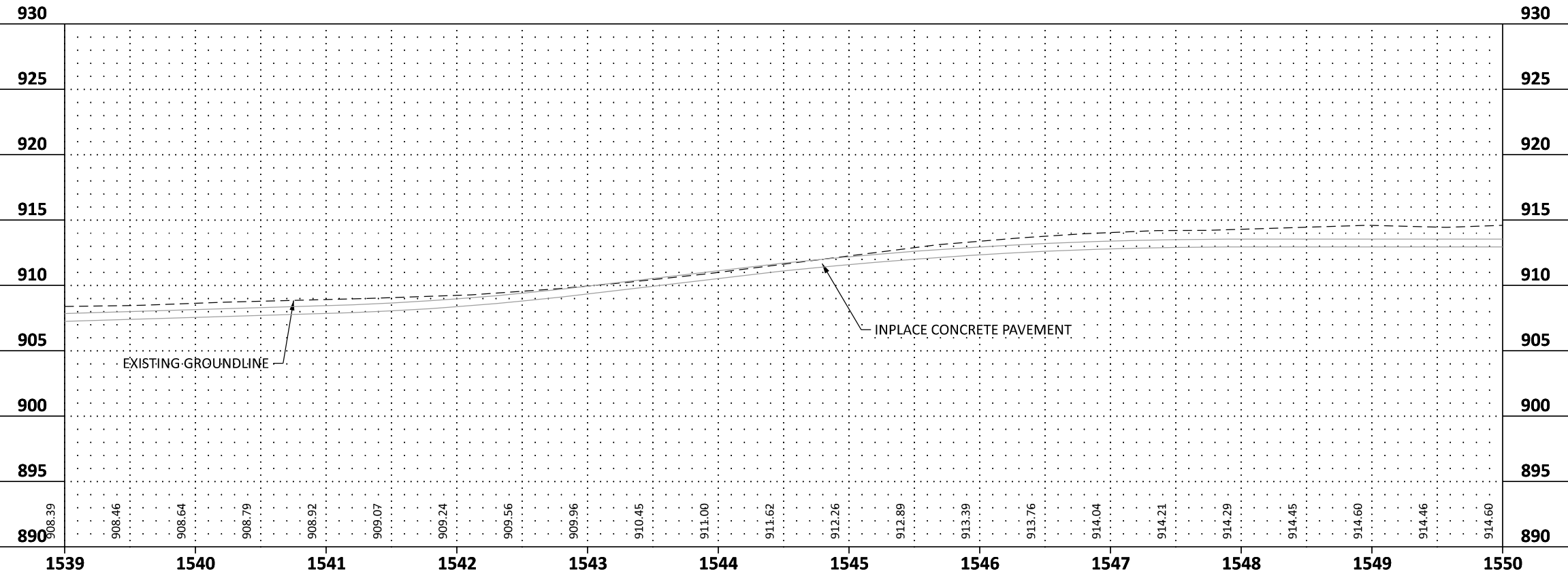


- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
 - - - PROPOSED R/W
 - - - TEMPORARY EASEMENT
 - - - PERMANENT EASEMENT
 - WETLAND DELINEATION-AREA OF ENVIRONMENTAL SENSITIVITY
 - TRAFFIC FLOW ARROW
 - MILL AND OVERLAY
 - ① PEDESTRIAN CURB RAMP
SEE PEDESTRAIN RAMP DETAILS.
 - ② SEE DRIVEWAY TABULATION
FOR MORE INFORMATION.
FIELD VERIFY TIE IN LOCATION
 - ③ MAIL BOX SUPPORT
 - ④ CURB TRANSITION. SEE MISCELLANEOUS DETAILS.
 - ⑤ CONSTRUCT CONCRETE MEDIAN NOSE
PER MNDOT STANDARD PLATE 7113
 - ⑥ INSTALL LIGHTING UNIT
LIGHT FOUNDATION DESIGN E

GENERAL NOTES

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DATE: 9/12/2024 2:05:27 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
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NICHOLAS E. HENTGES, PE
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

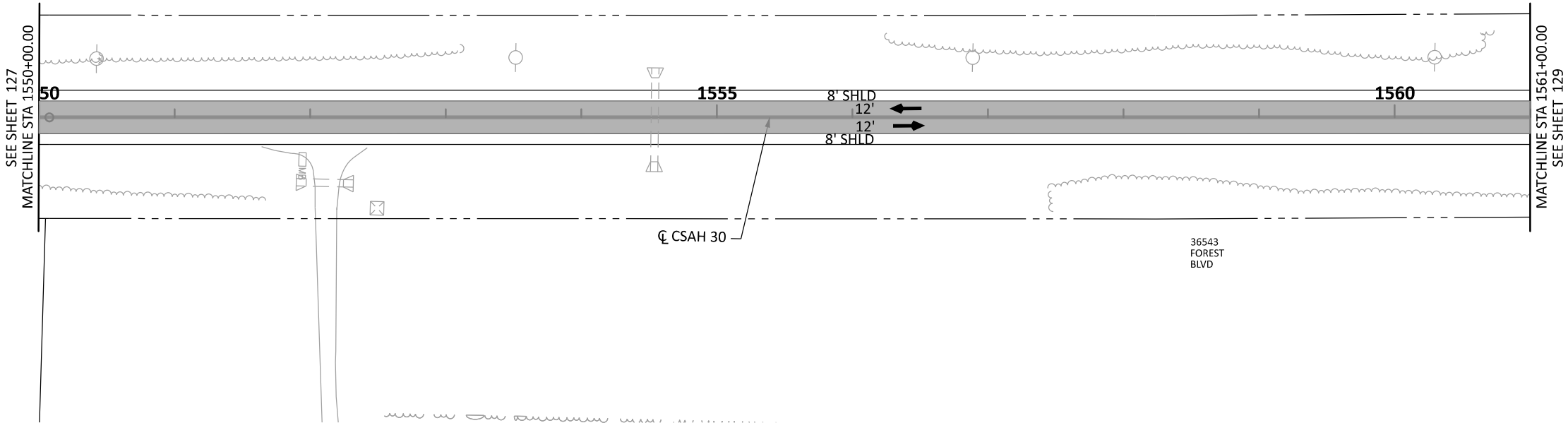
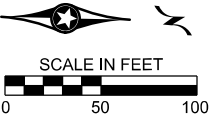
CHISAGO COUNTY, MINNESOTA

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SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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SHEETS

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FOREST BLVD



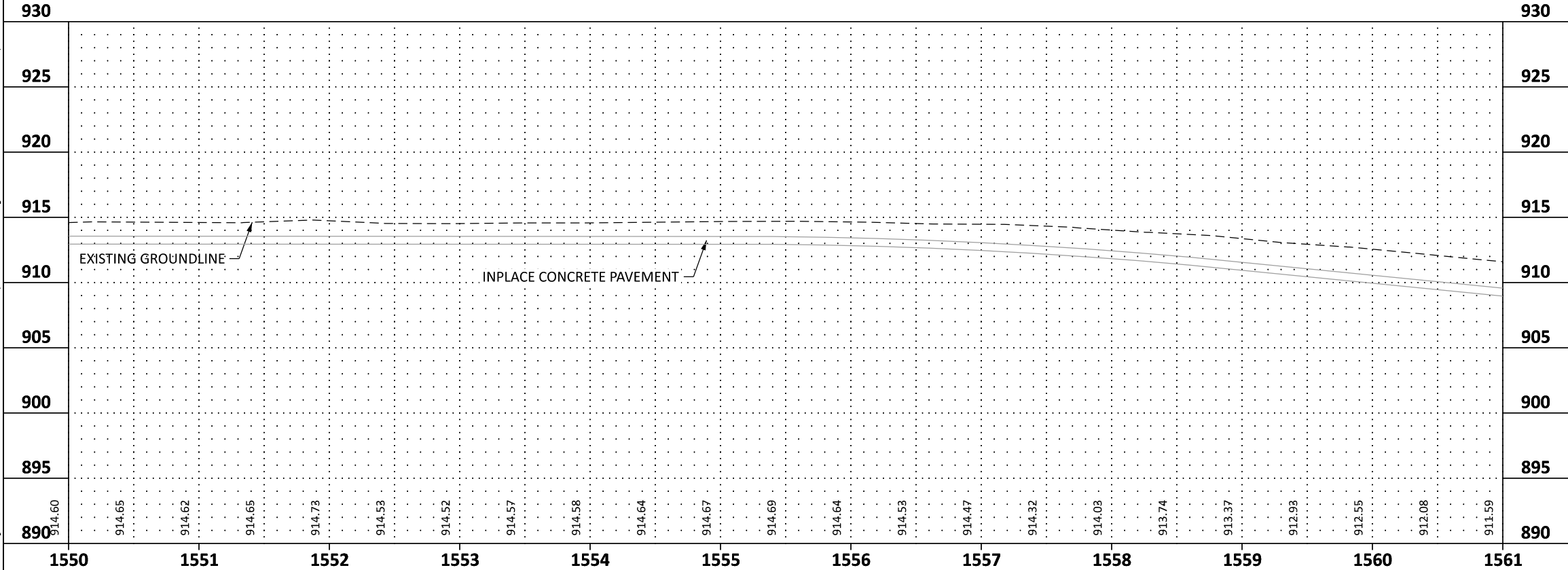
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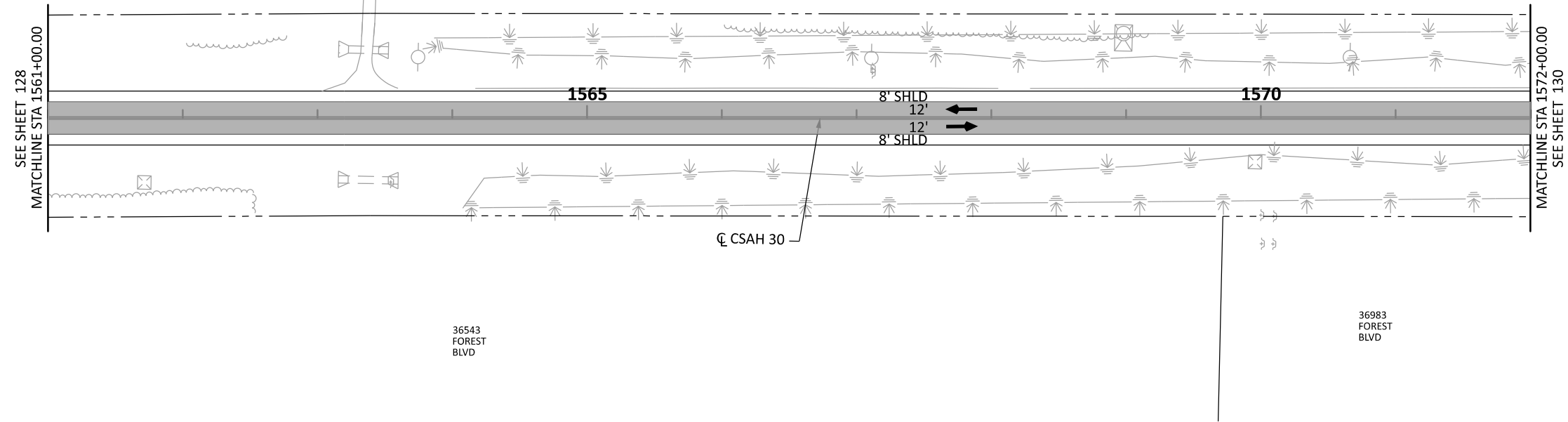
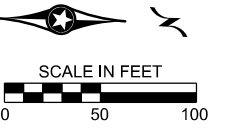


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

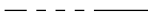
CHISAGO COUNTY, MINNESOTA

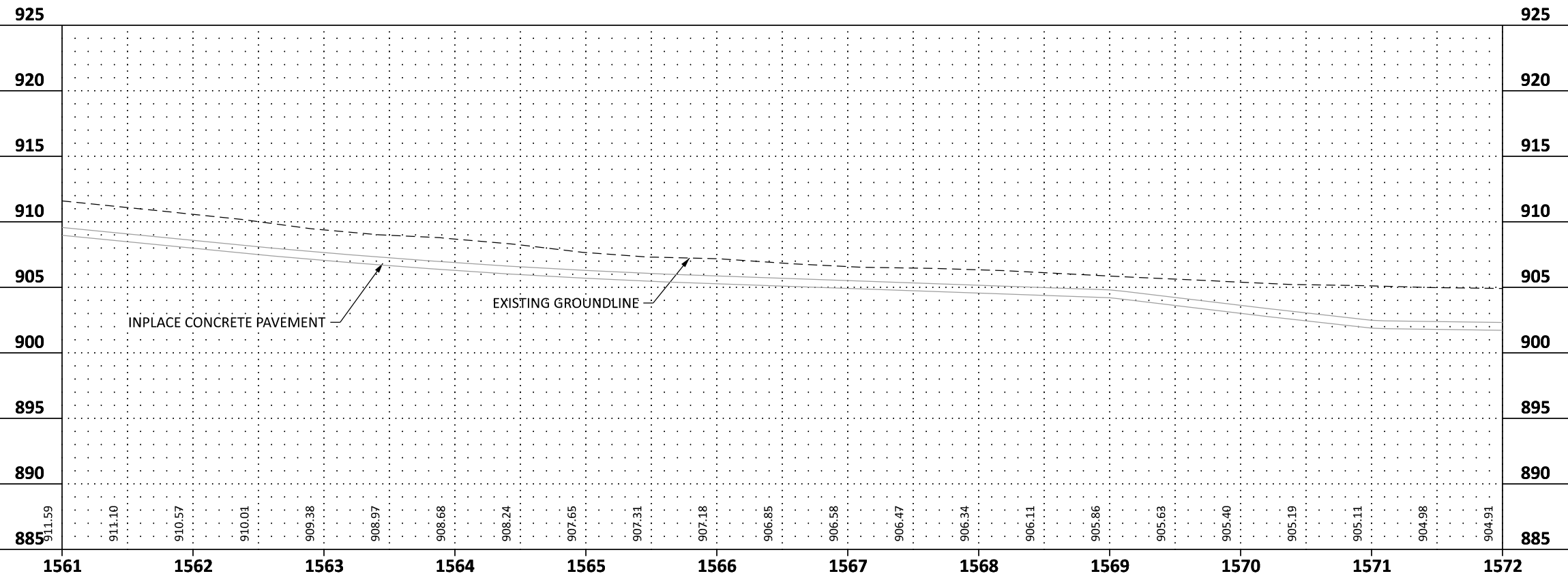
CONSTRUCTION PLAN & PROFILE
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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SHEETS



LEGEND

- | | |
|---|--|
|  | CONSTRUCTION LIMITS |
|  | EXISTING R/W |
|  | PROPOSED R/W |
|  | TEMPORARY EASEMENT |
|  | PERMANENT EASEMENT |
|  | WETLAND DELINEATION-
AREA OF ENVIRONMENTAL
SENSITIVITY |
|  | TRAFFIC FLOW ARROW |
|  | MILL AND OVERLAY |
-
- | | |
|---|--|
|  | PEDESTRIAN CURB RAMP
SEE PEDESTRAIN RAMP DETAILS. |
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LIGHT FOUNDATION DESIGN E |



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Plan By:	MKV
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Approved By:	NEH

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CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

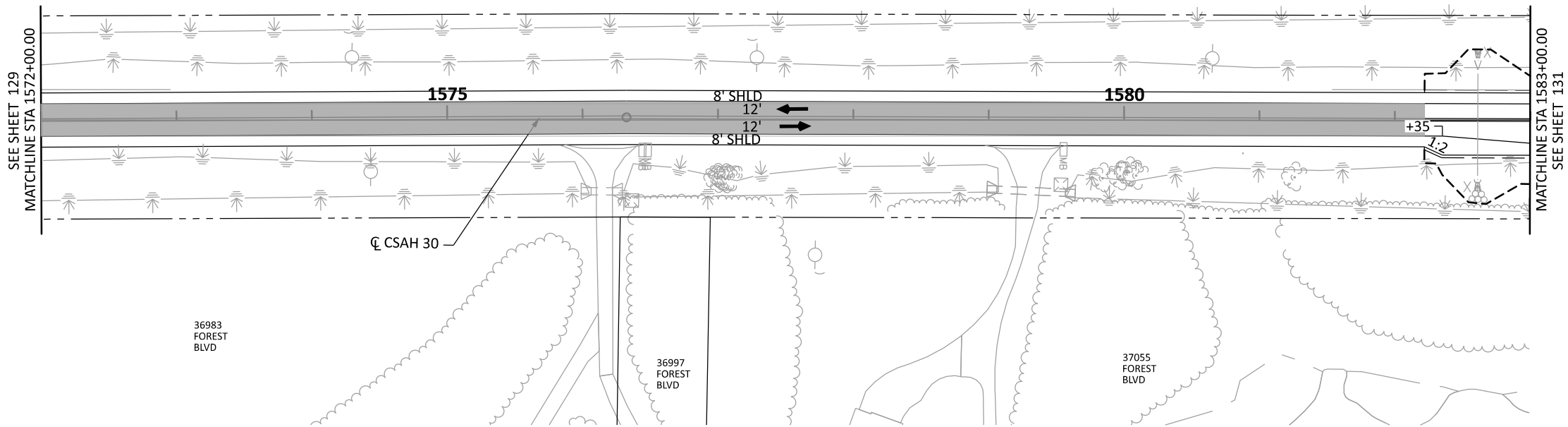
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CONSTRUCTION PLAN & PROFILE
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

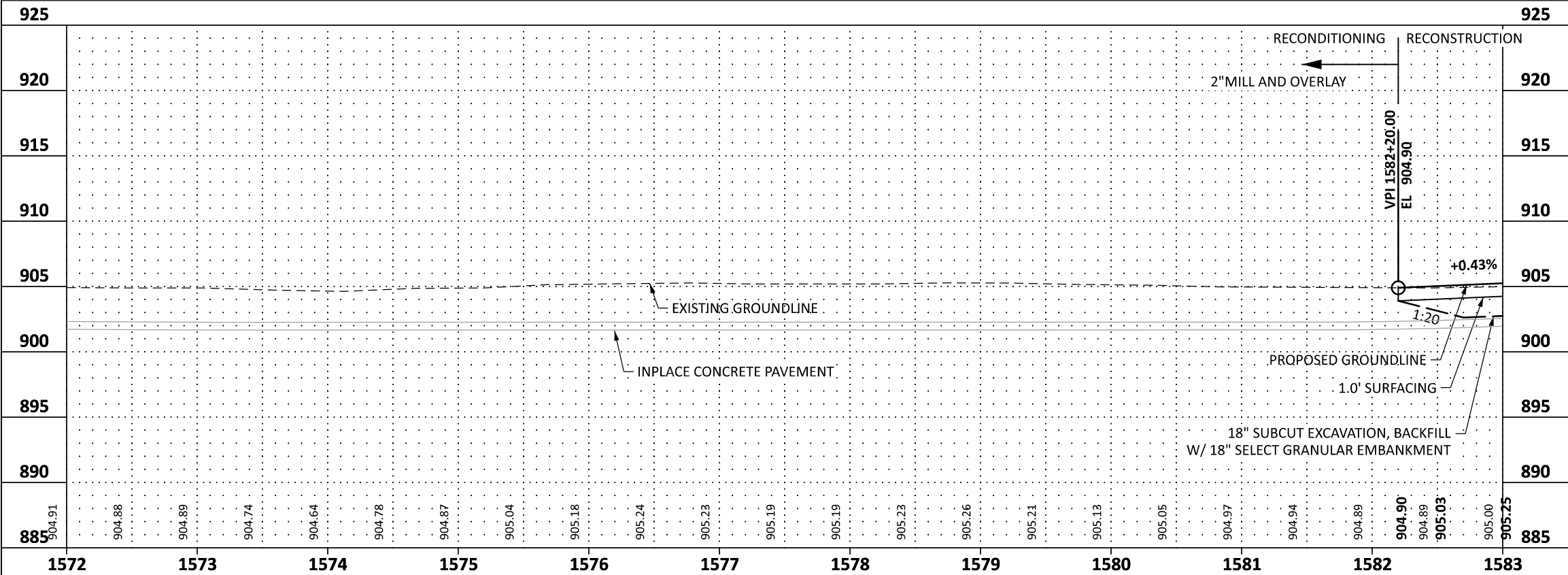
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SHEETS

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FOREST BLVD



- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
 - - - PROPOSED R/W
 - - - TEMPORARY EASEMENT
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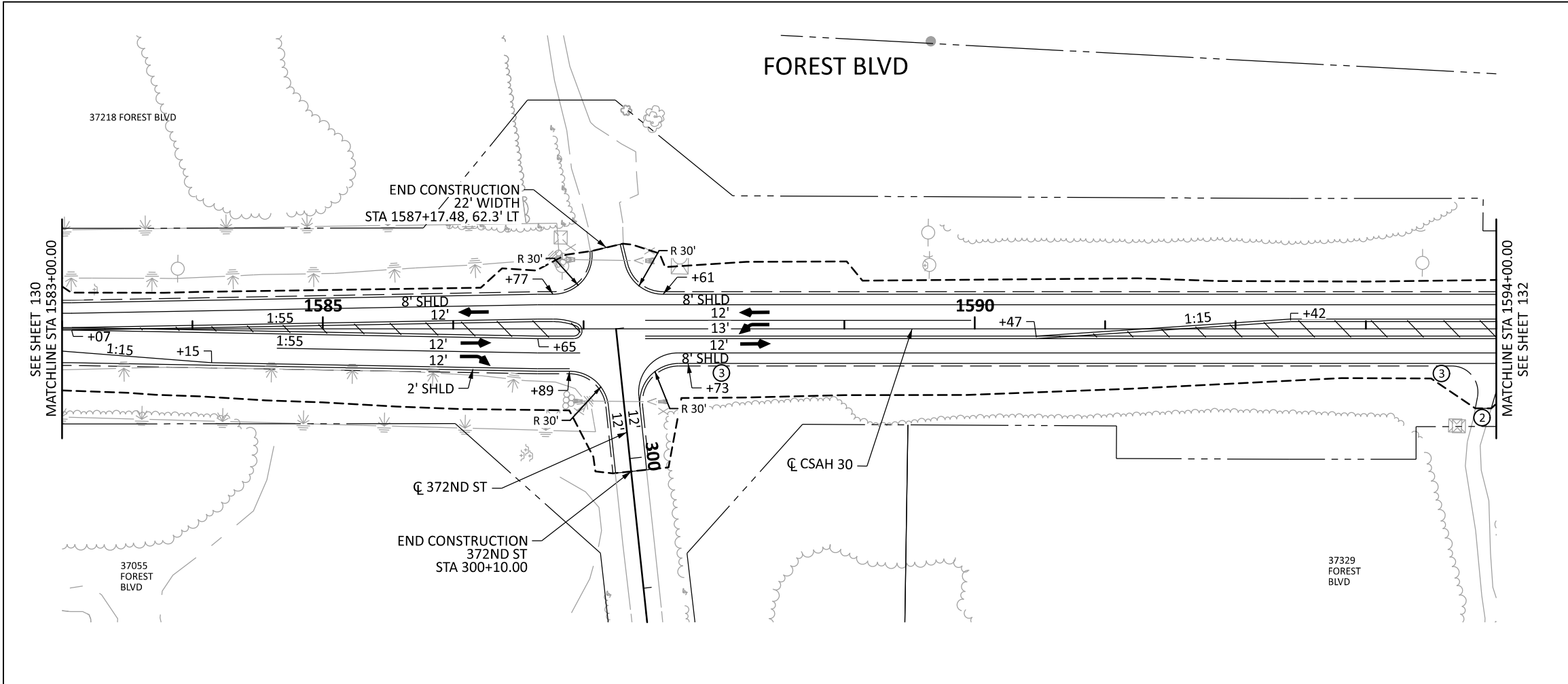
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

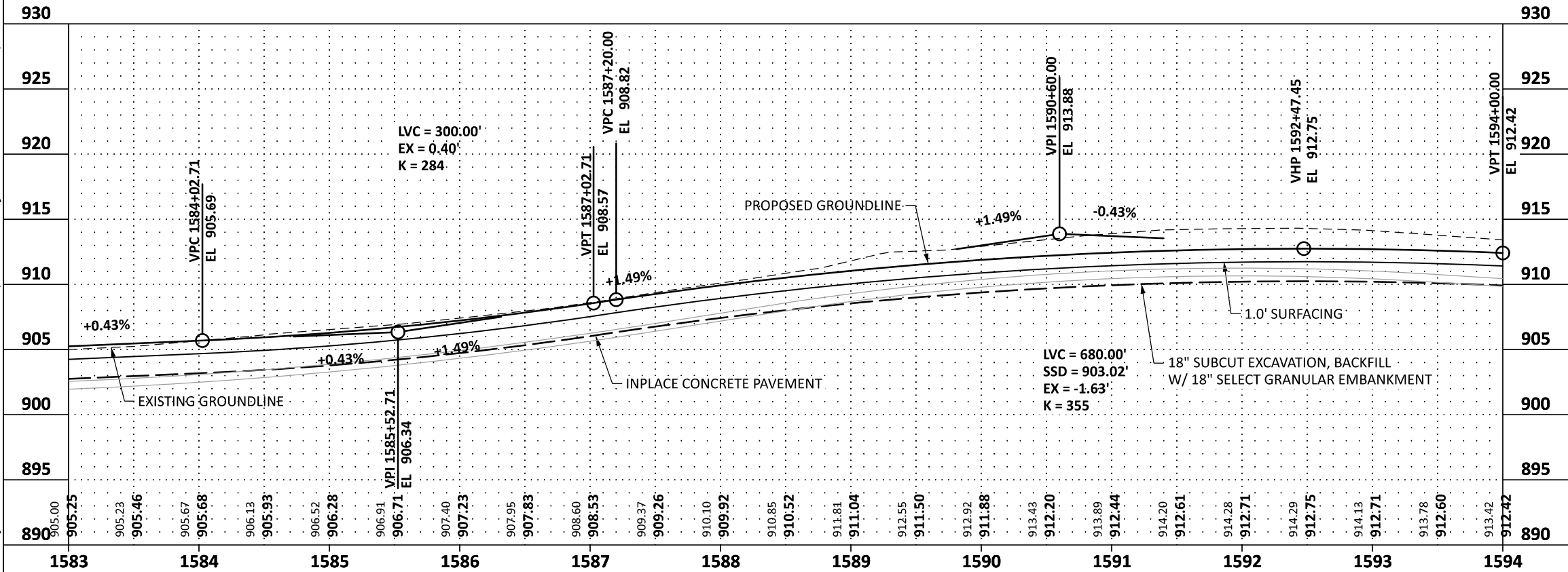
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- LEGEND**
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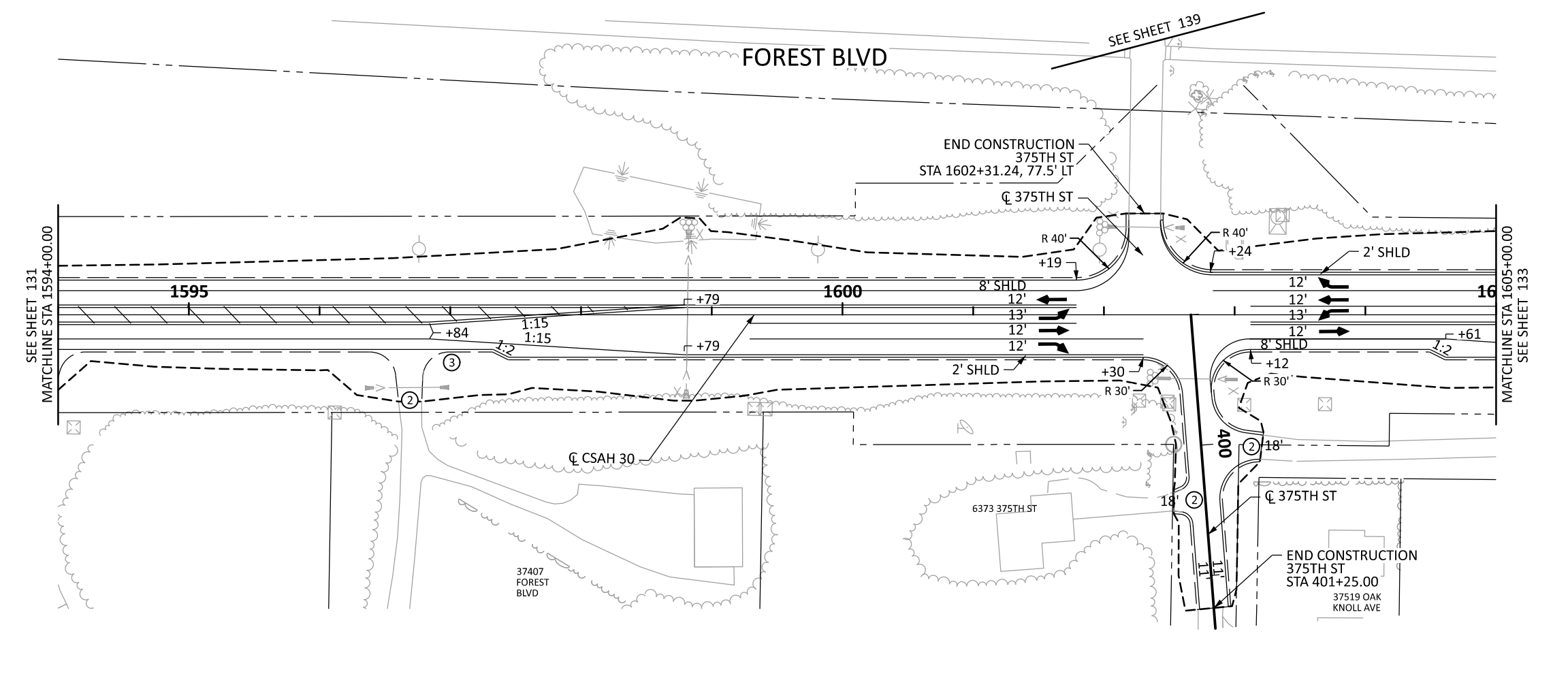
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CONSTRUCTION PLAN & PROFILE
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SHEET
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OF
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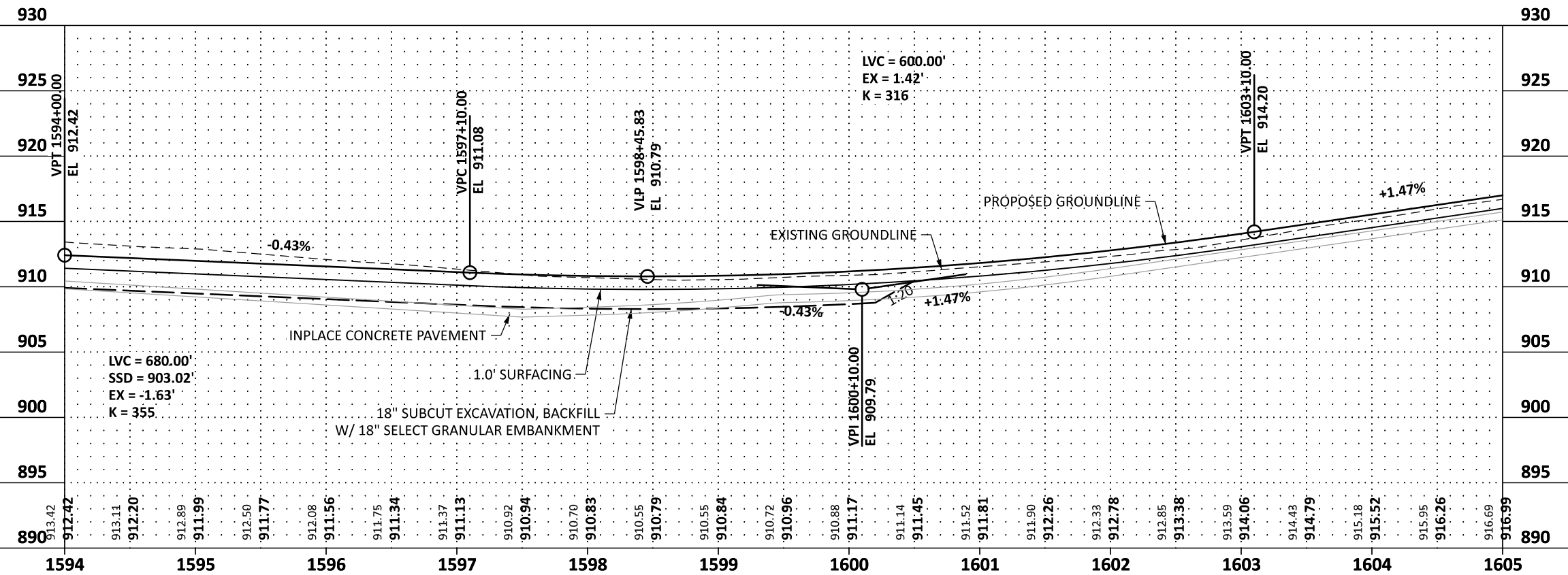
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LEGEND

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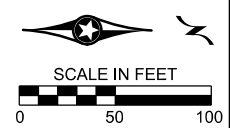
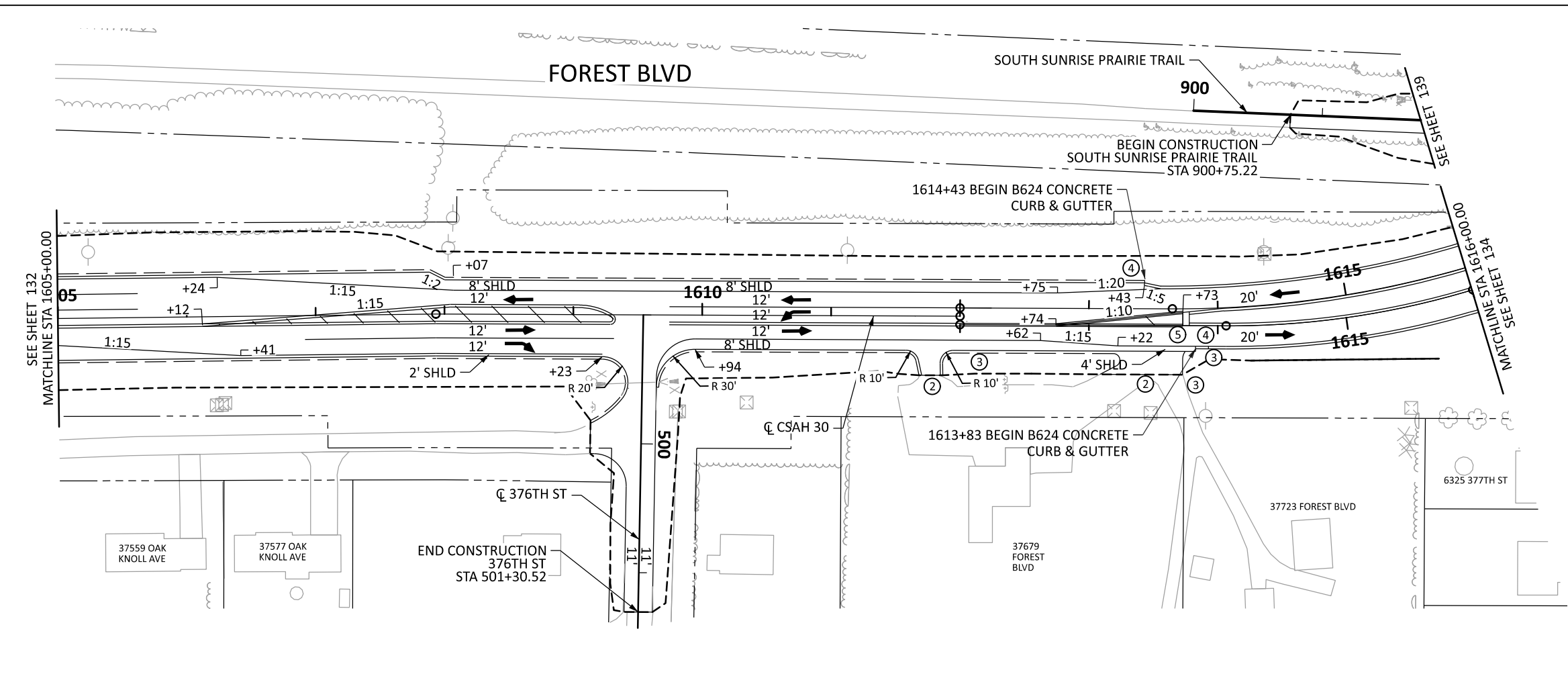


GENERAL NOTES

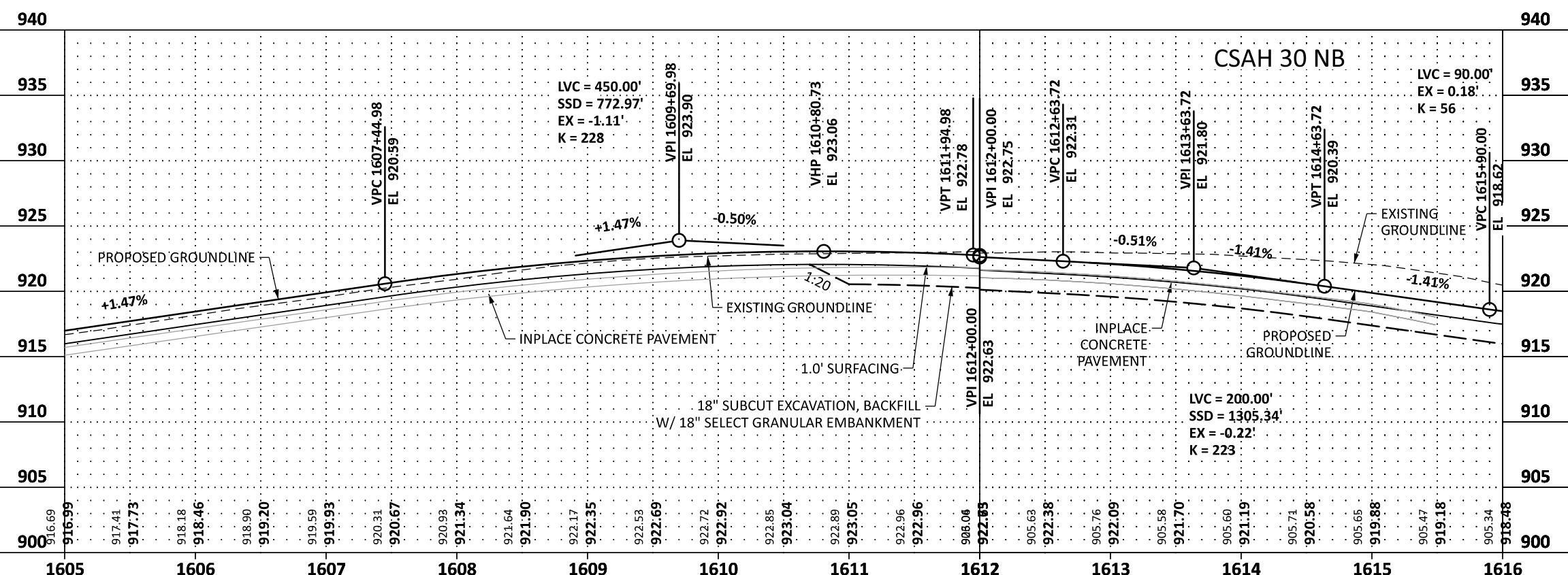
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										CONSTRUCTION PLAN & PROFILE		
										SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		

DATE: 9/12/2024 2:05:33 PM
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- LEGEND**
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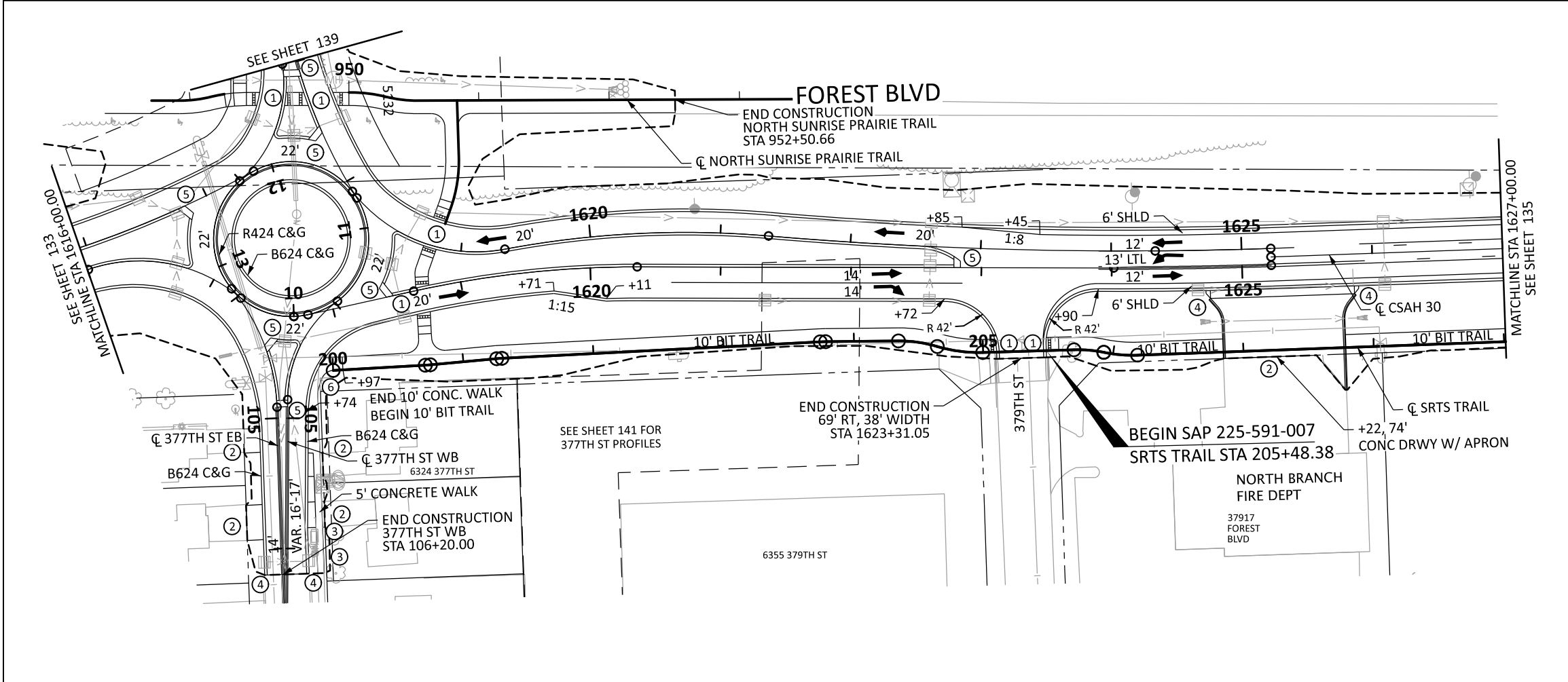
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

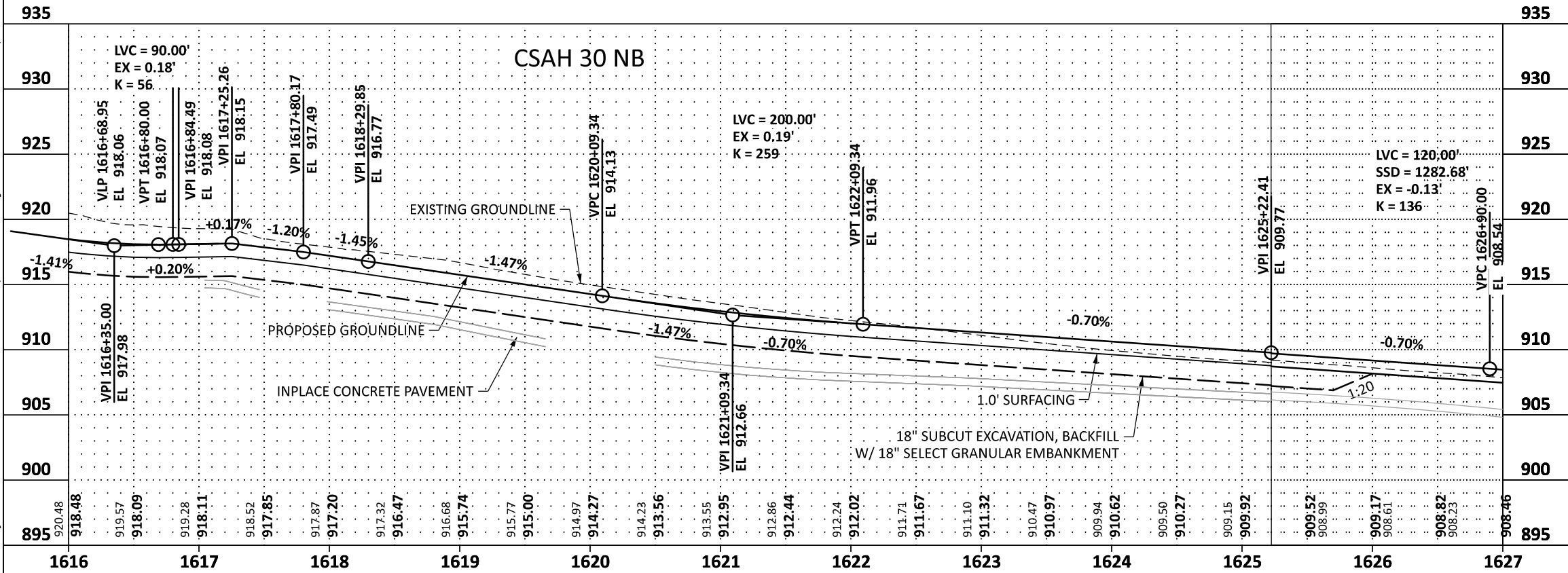
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- LEGEND**
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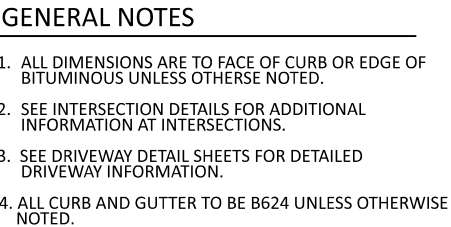
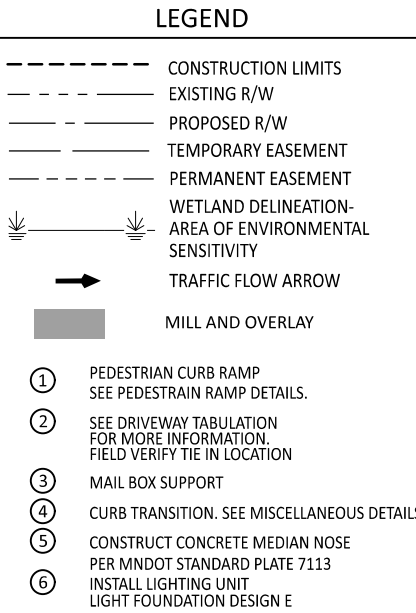


CSAH 30 (Forest Blvd) Improvements
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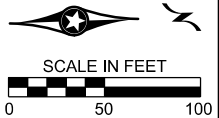
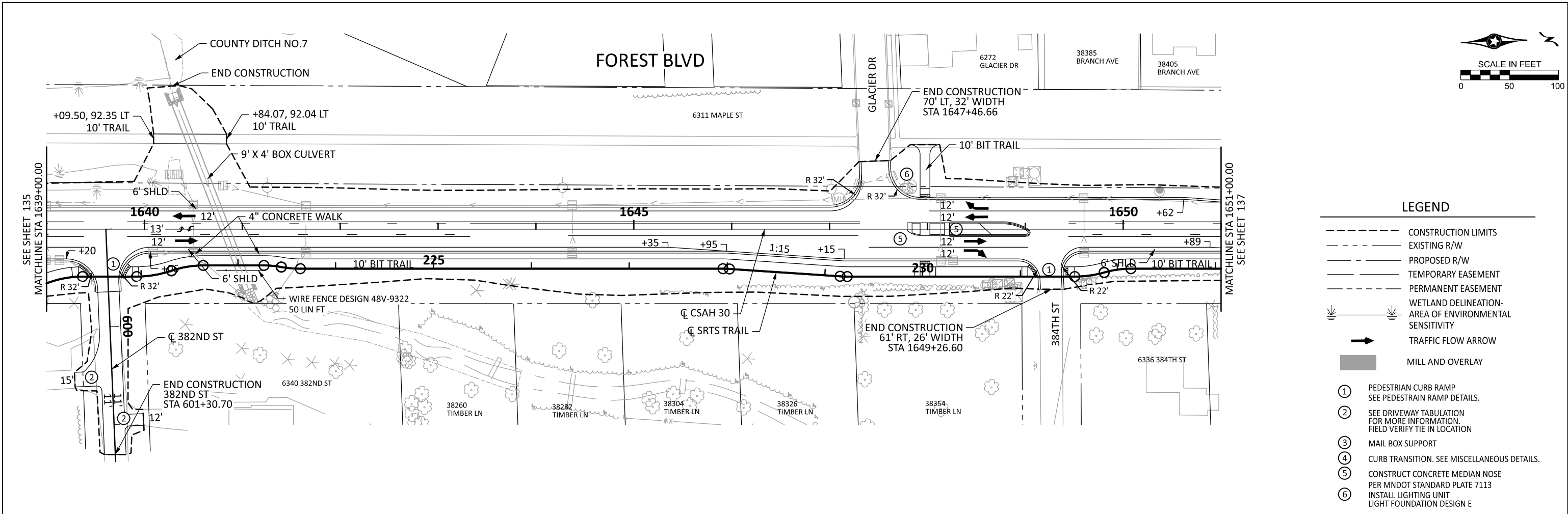
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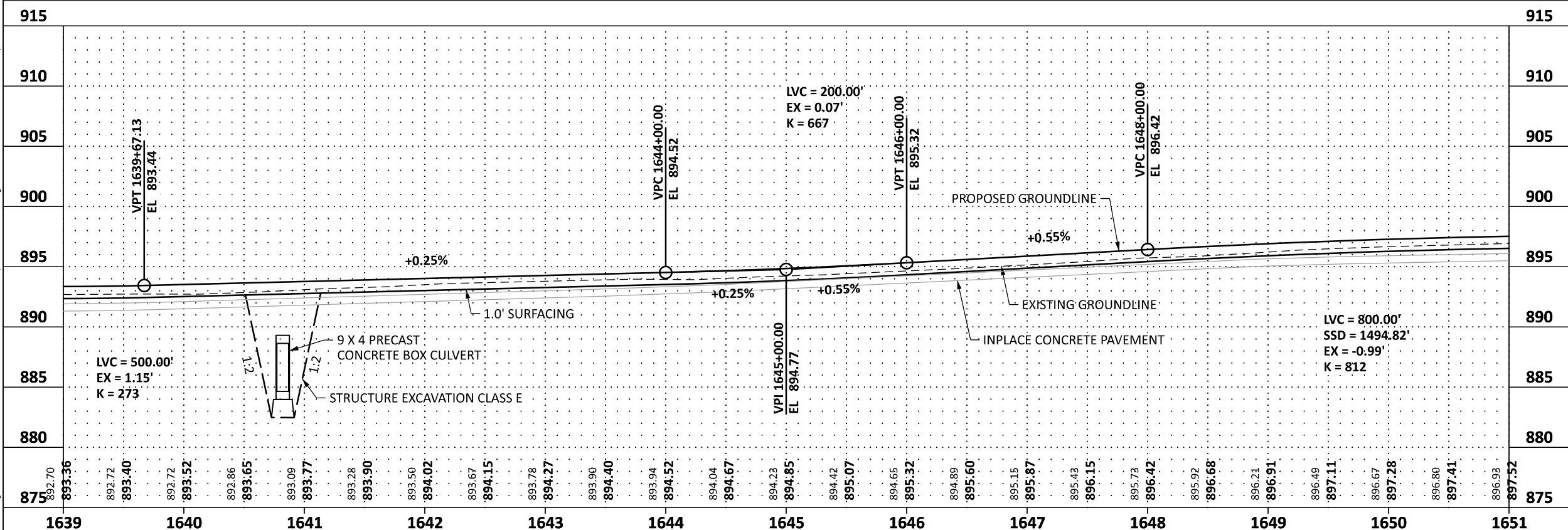


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- LEGEND**
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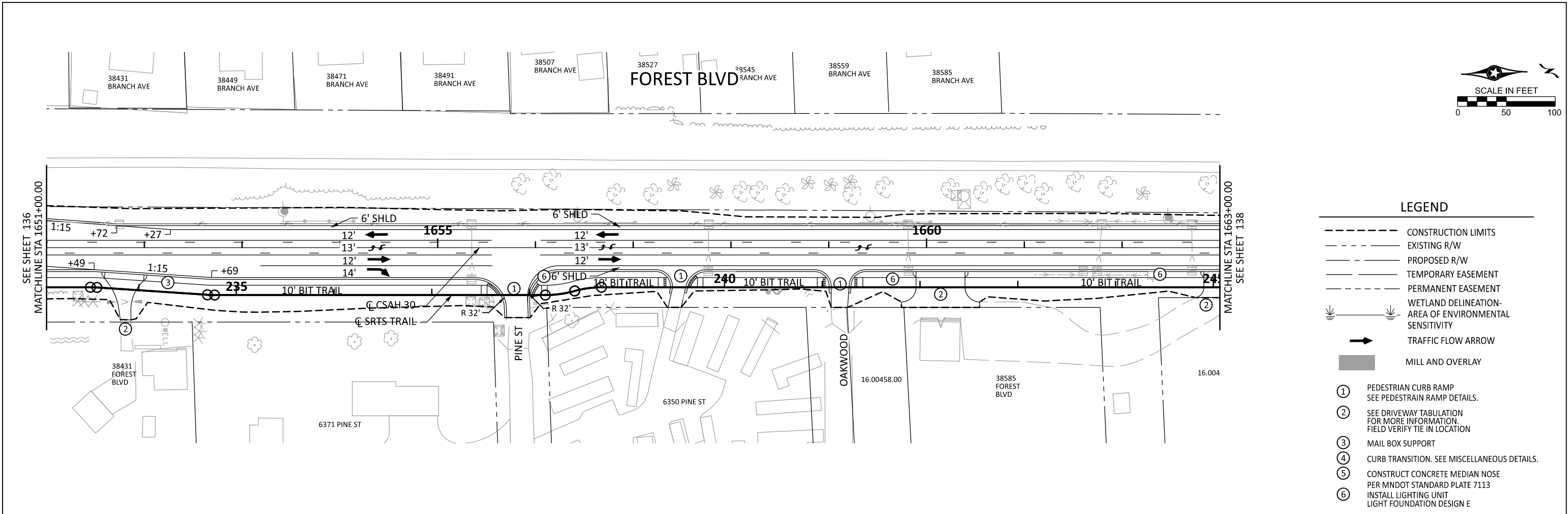
CHISAGO COUNTY, MINNESOTA

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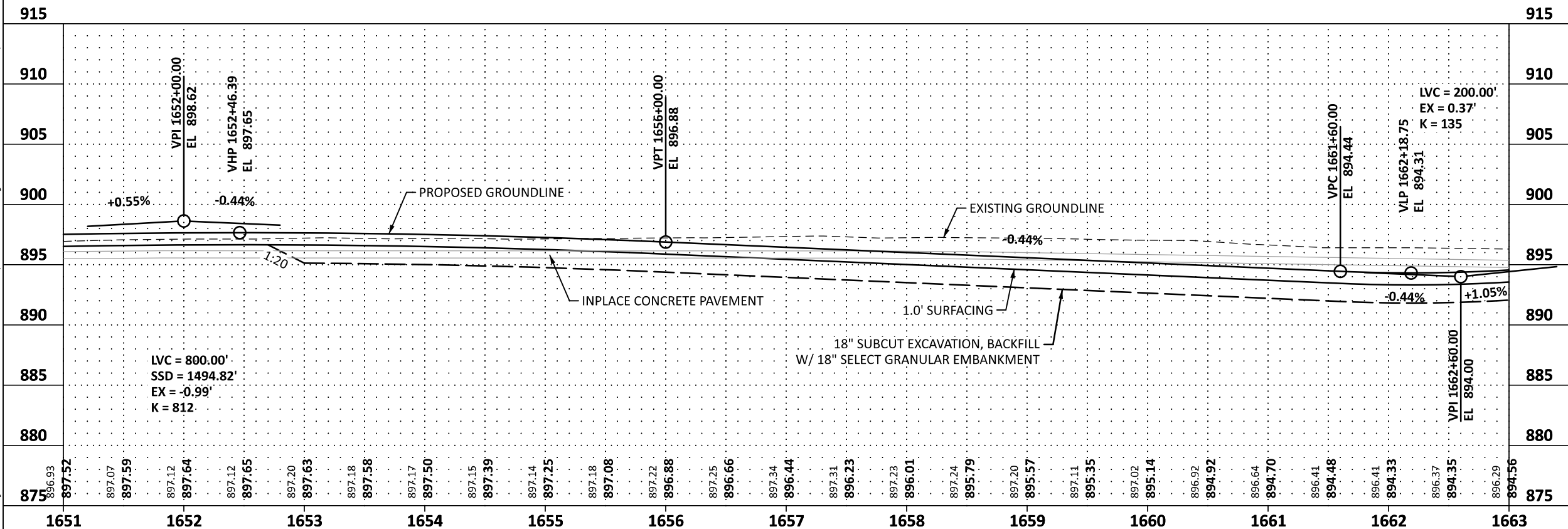
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- ② SEE DRIVEWAY TABULATION
FOR MORE INFORMATION.
FIELD VERIFY TIE IN LOCATION
- ③ MAIL BOX SUPPORT
- ④ CURB TRANSITION. SEE MISCELLANEOUS DETAILS.
- ⑤ CONSTRUCT CONCRETE MEDIAN NOSE
PER MNDOT STANDARD PLATE 7113
- ⑥ INSTALL LIGHTING UNIT
LIGHT FOUNDATION DESIGN E



- GENERAL NOTES**
- ALL DIMENSIONS ARE TO FACE OF CURB OR EDGE OF BITUMINOUS UNLESS OTHERWISE NOTED.
 - SEE INTERSECTION DETAILS FOR ADDITIONAL INFORMATION AT INTERSECTIONS.
 - SEE DRIVEWAY DETAIL SHEETS FOR DETAILED DRIVEWAY INFORMATION.
 - ALL CURB AND GUTTER TO BE B624 UNLESS OTHERWISE NOTED.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620



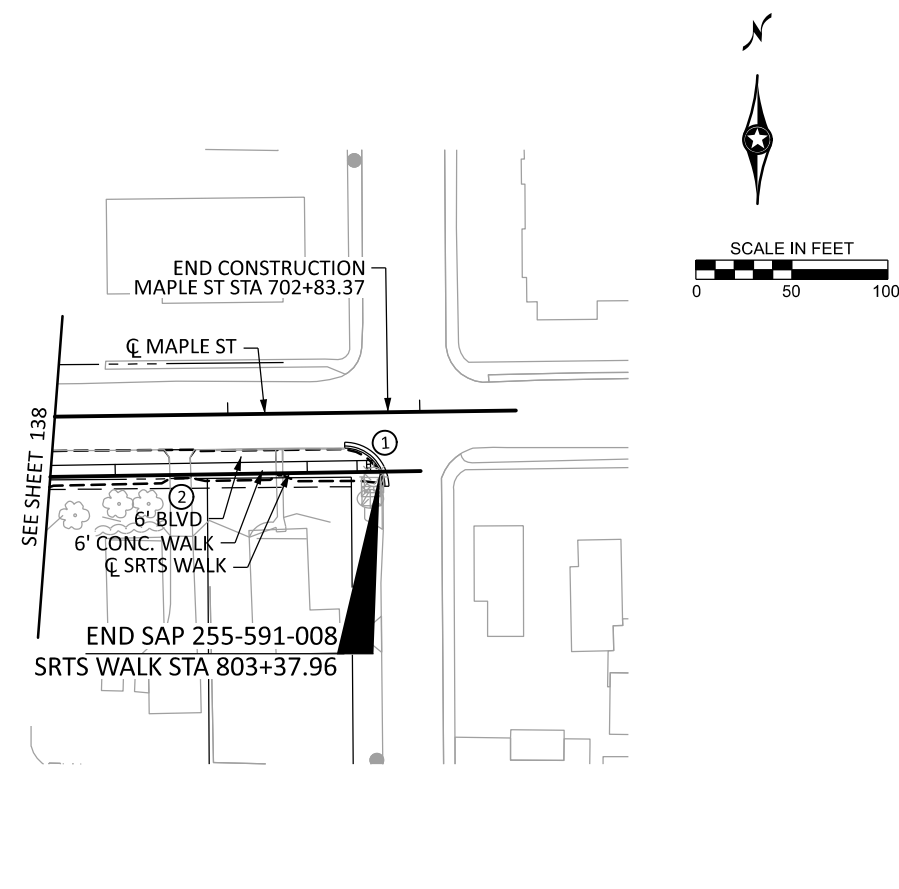
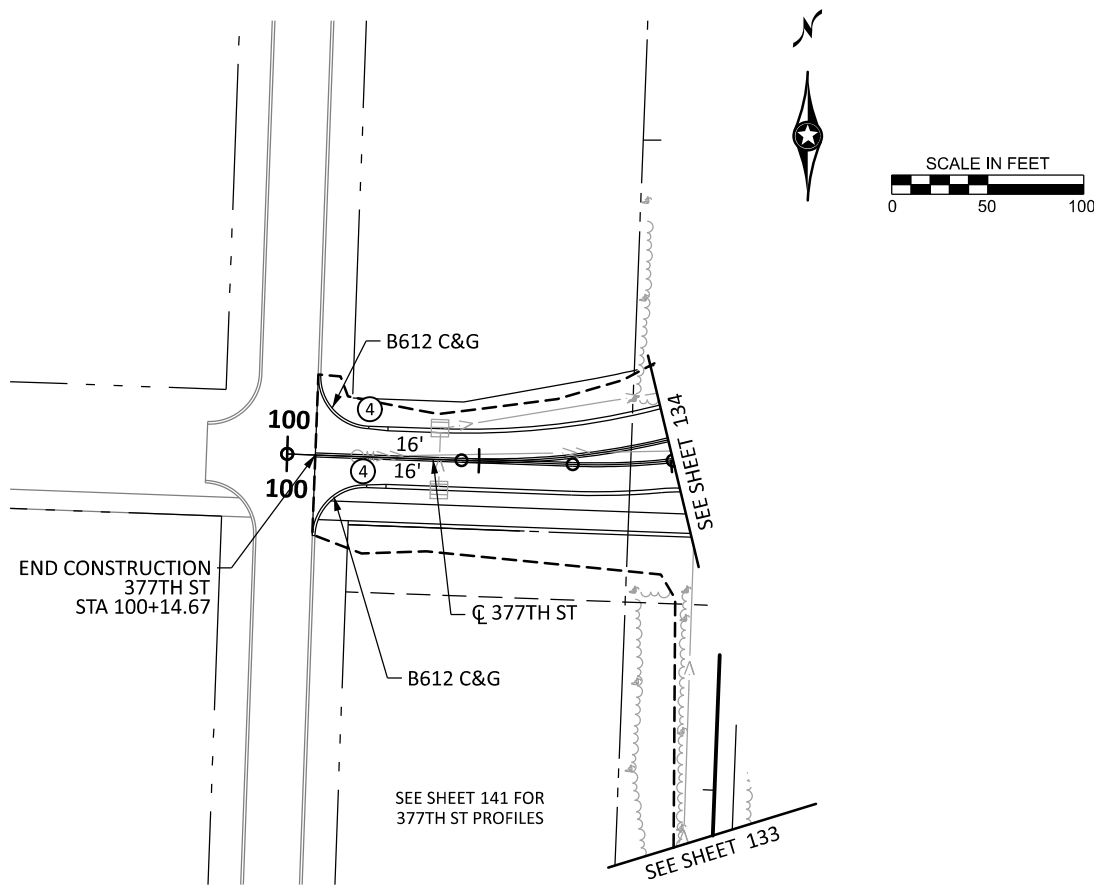
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

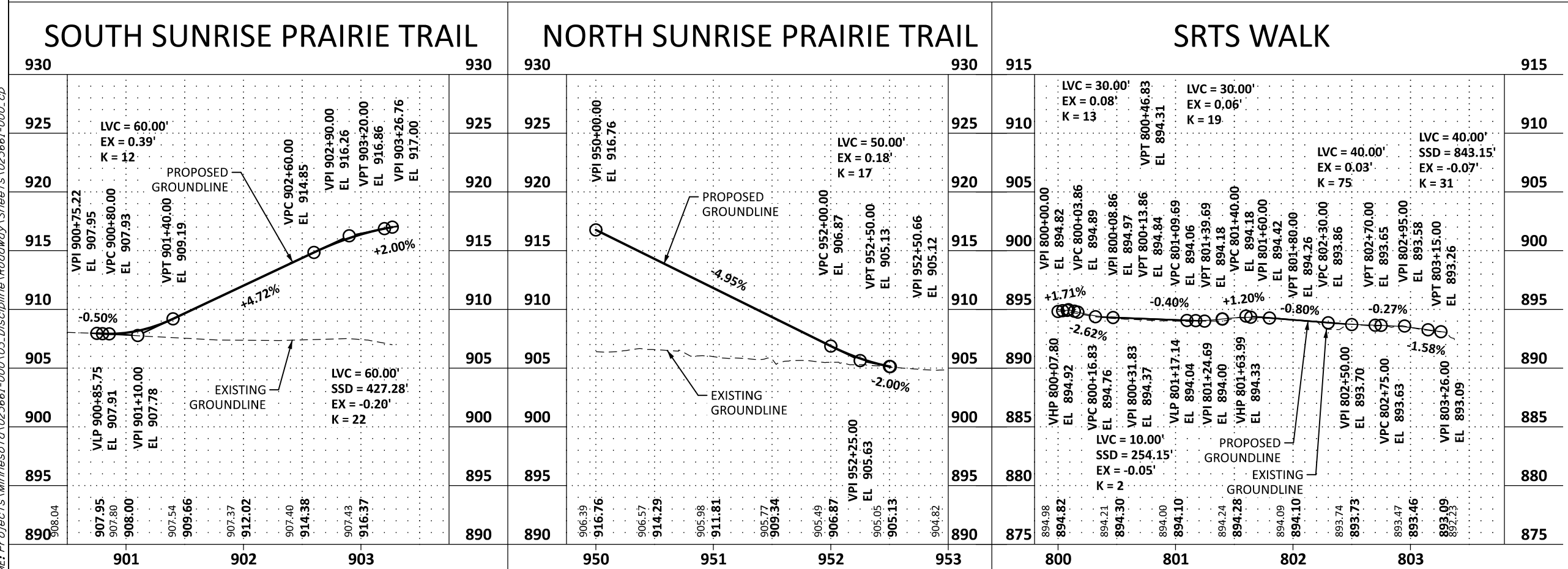
CONSTRUCTION PLAN & PROFILE
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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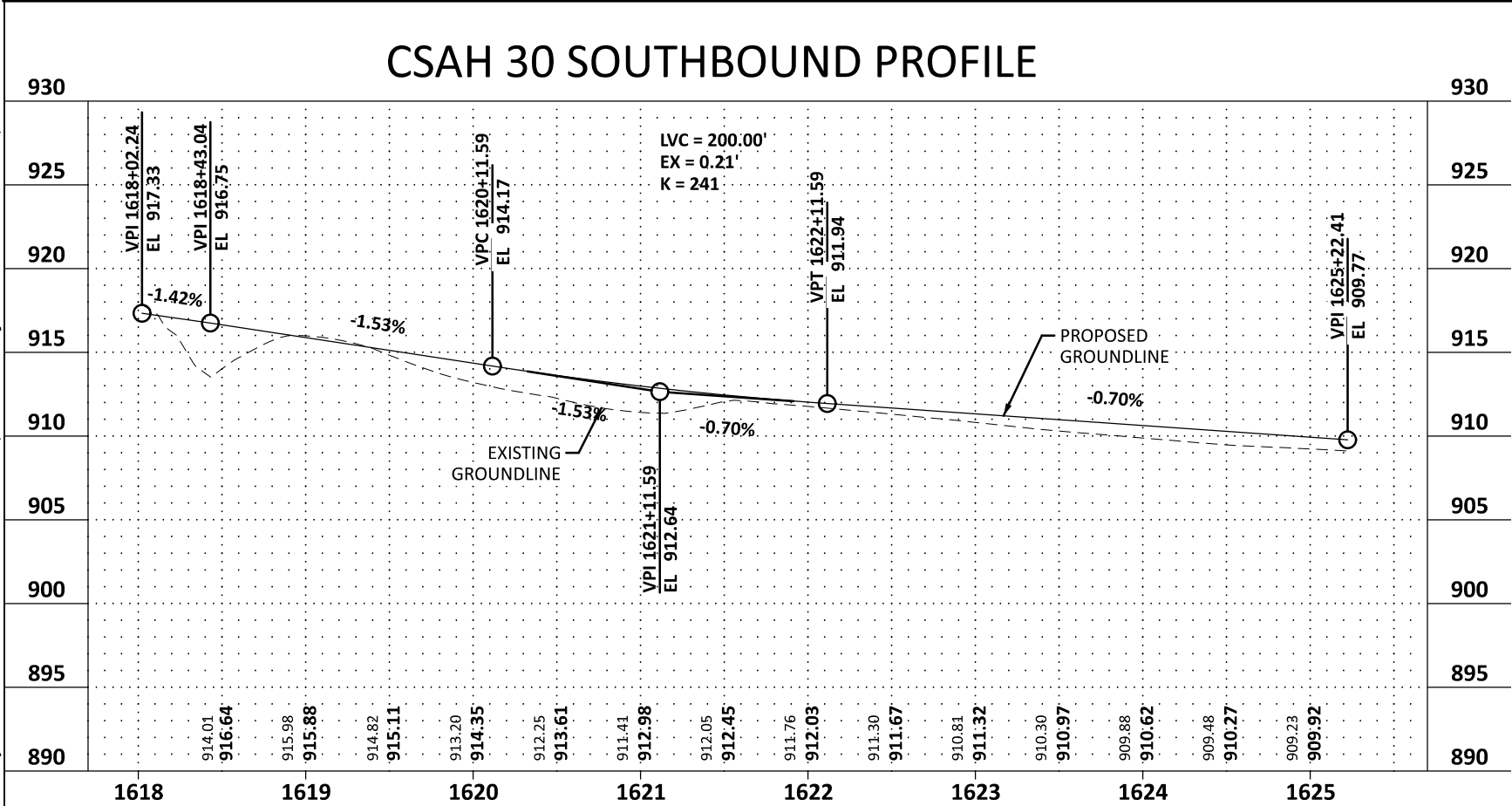
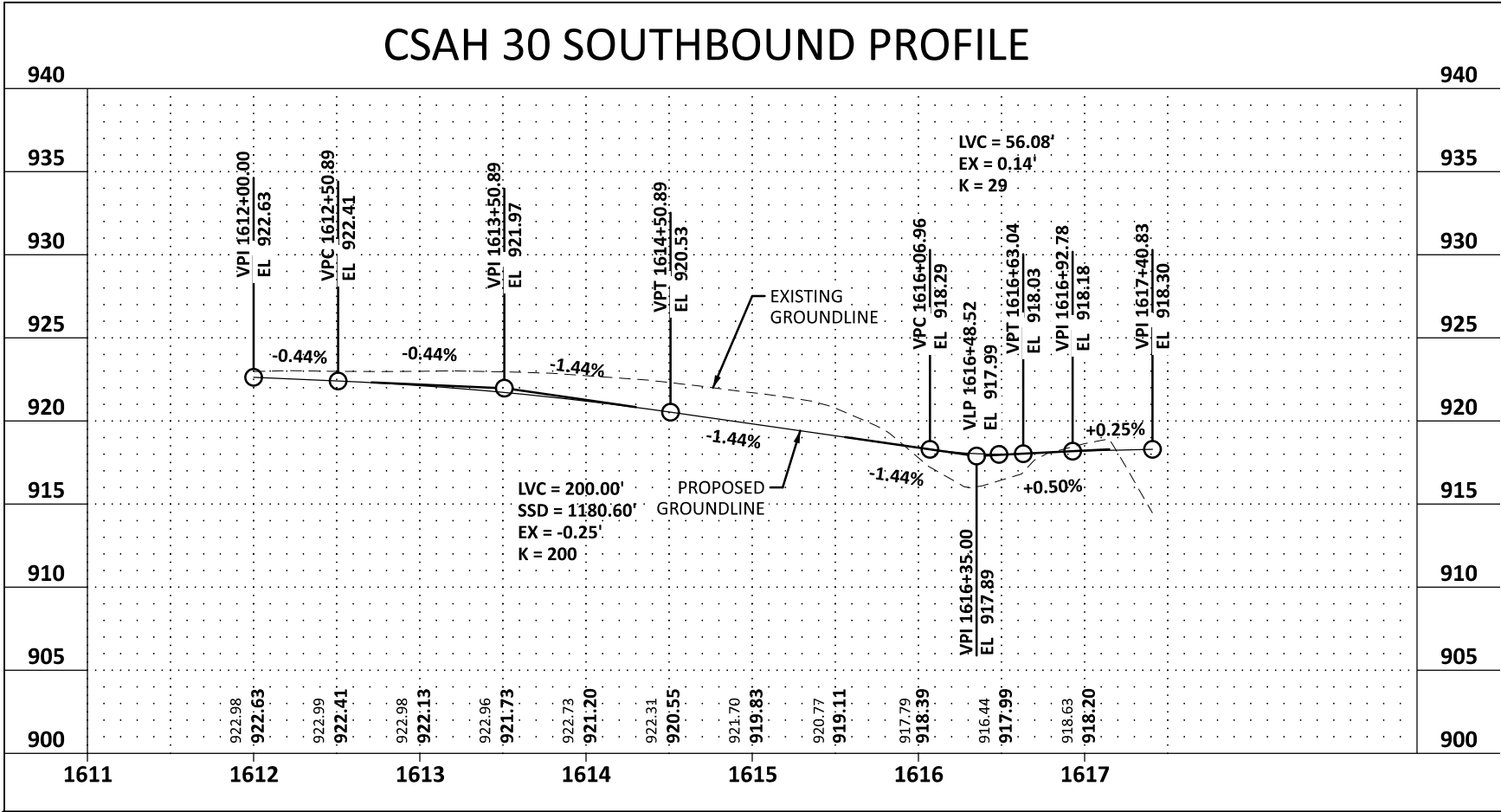


- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
 - - - PROPOSED R/W
 - - - TEMPORARY EASEMENT
 - - - PERMANENT EASEMENT
 - WETLAND DELINEATION- AREA OF ENVIRONMENTAL SENSITIVITY
 - TRAFFIC FLOW ARROW
 - MILL AND OVERLAY
- ① PEDESTRIAN CURB RAMP
SEE PEDESTRAIN RAMP DETAILS.
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Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH
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NICHOLAS E. HENTGES, PE	
DATE: 9/12/2024	LICENSE NO. 44620

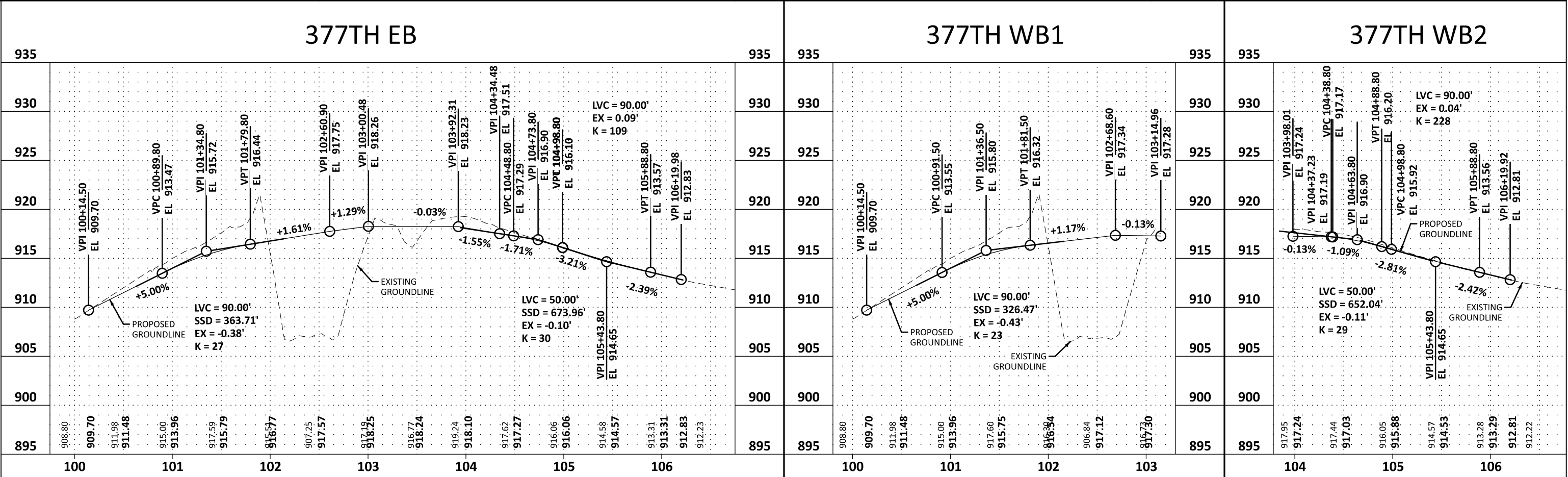
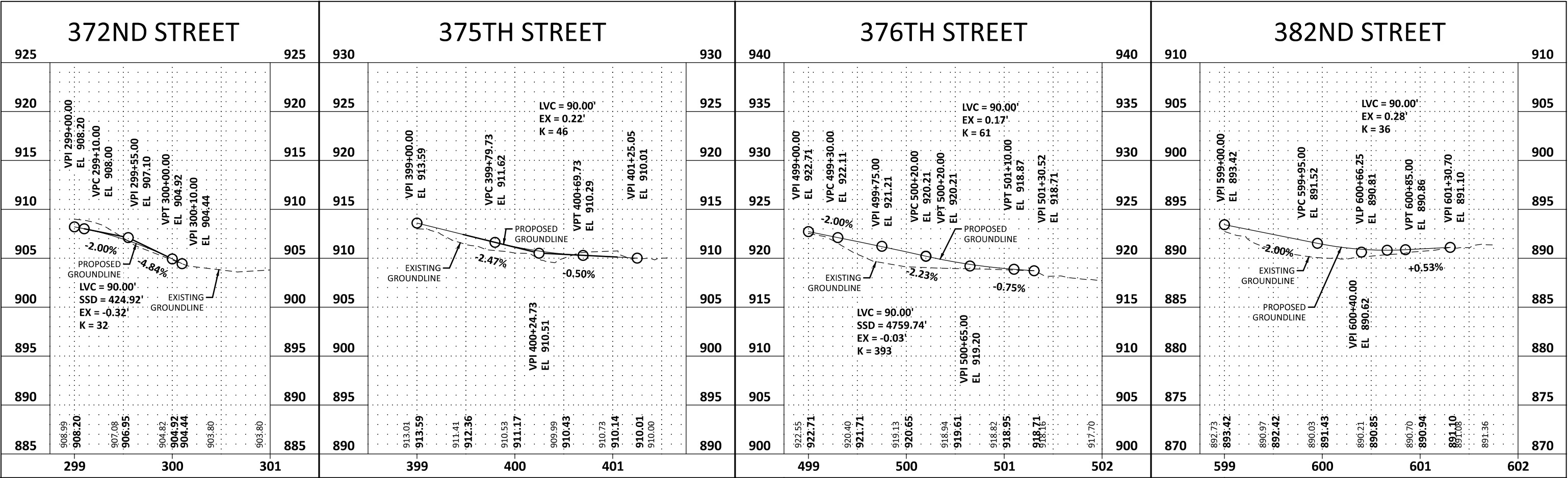


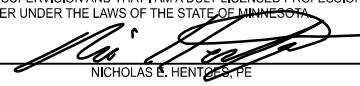
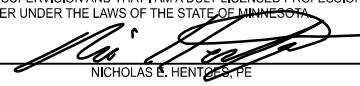
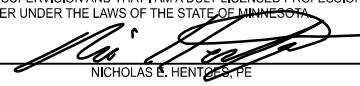
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
PROFILES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

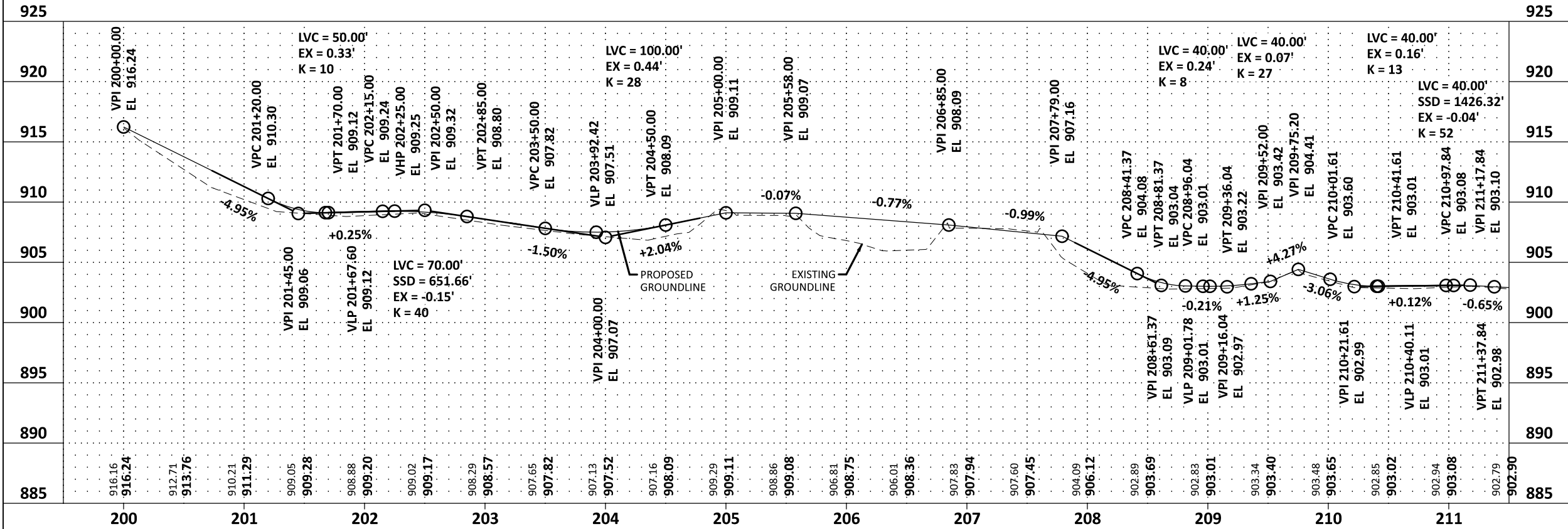
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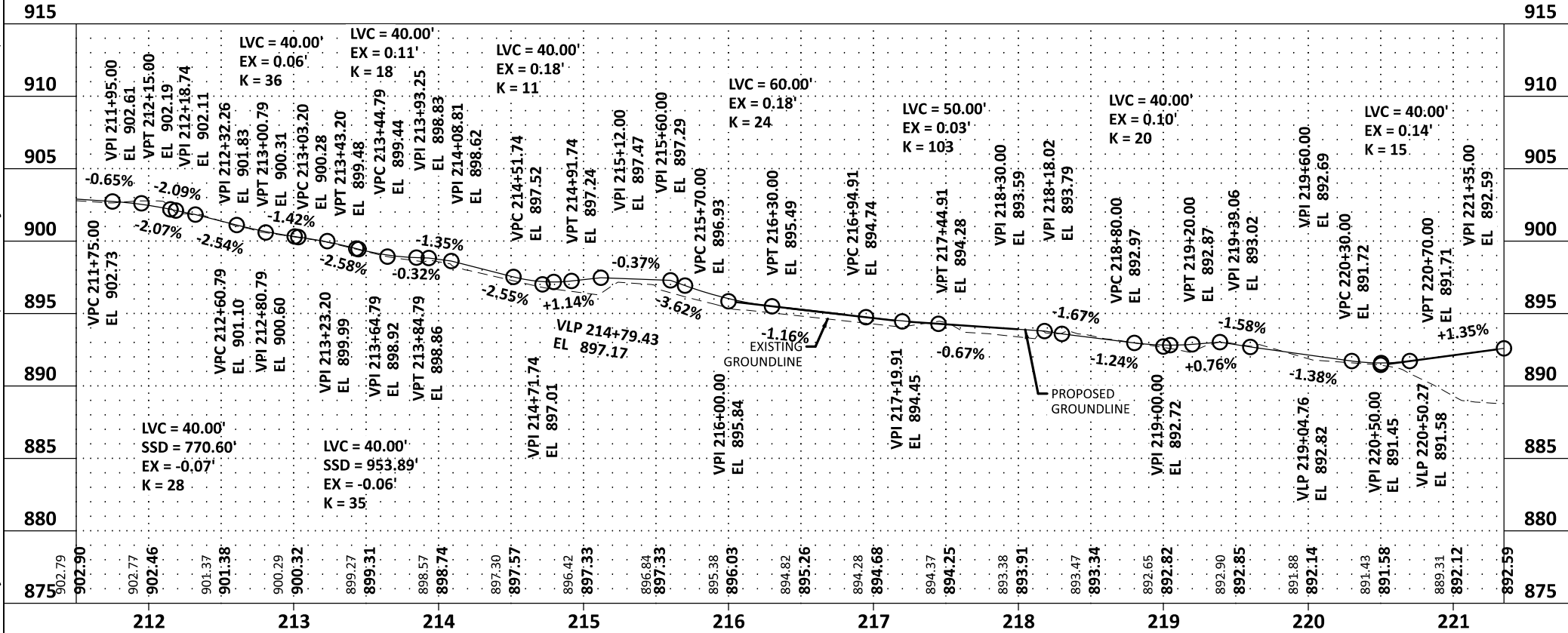


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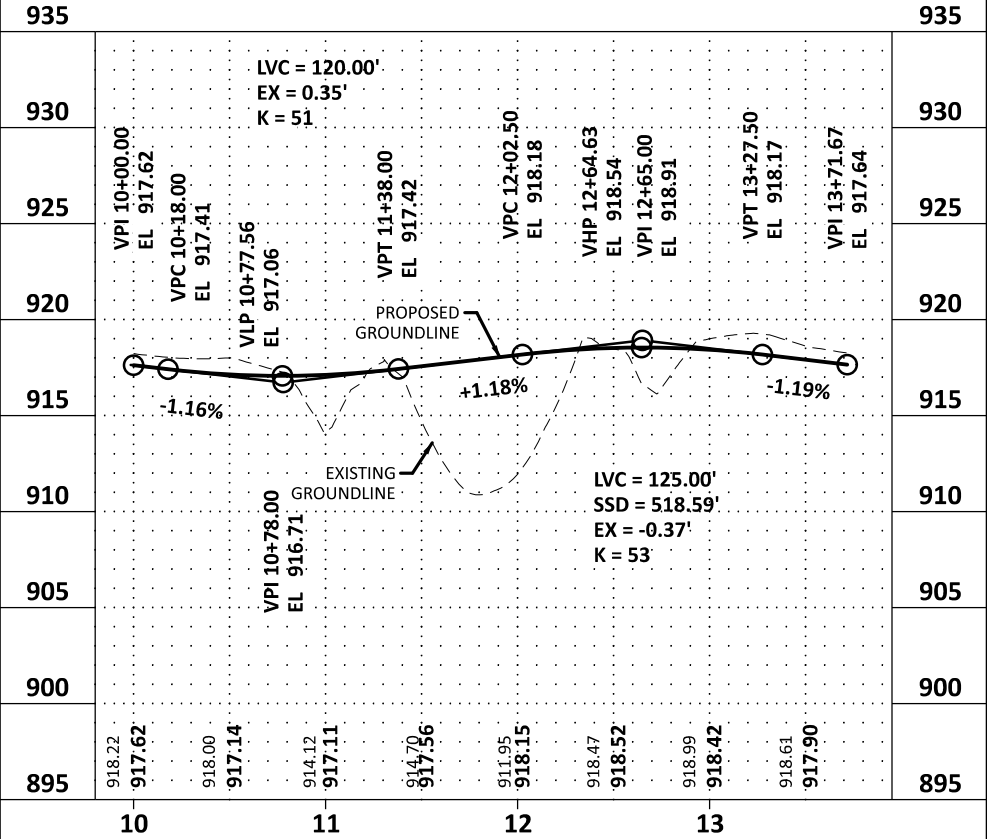
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SRTS TRAIL



RADIAL



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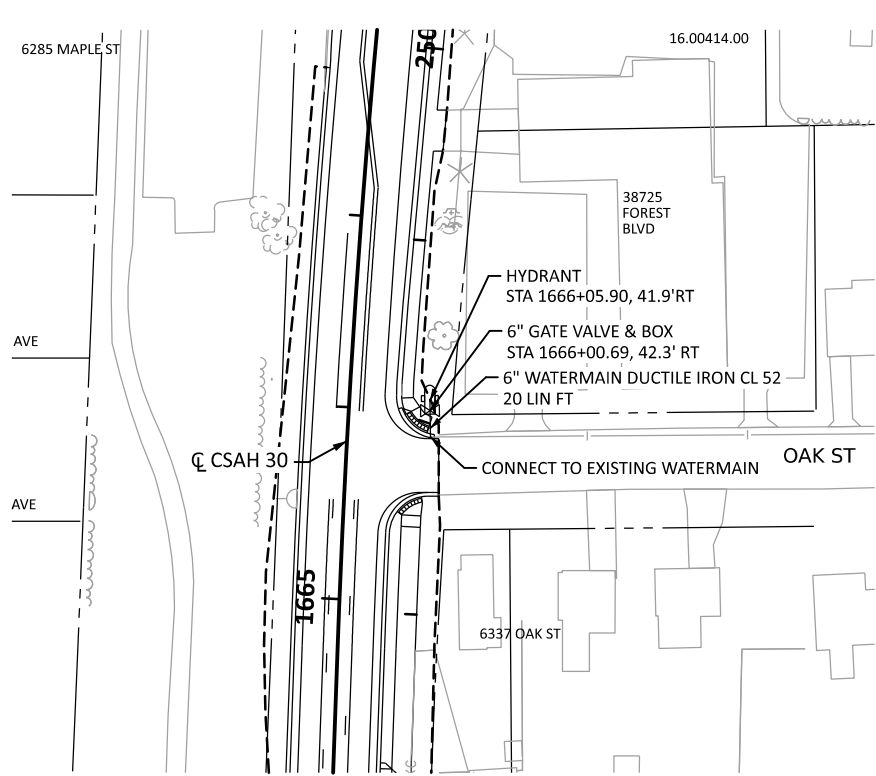
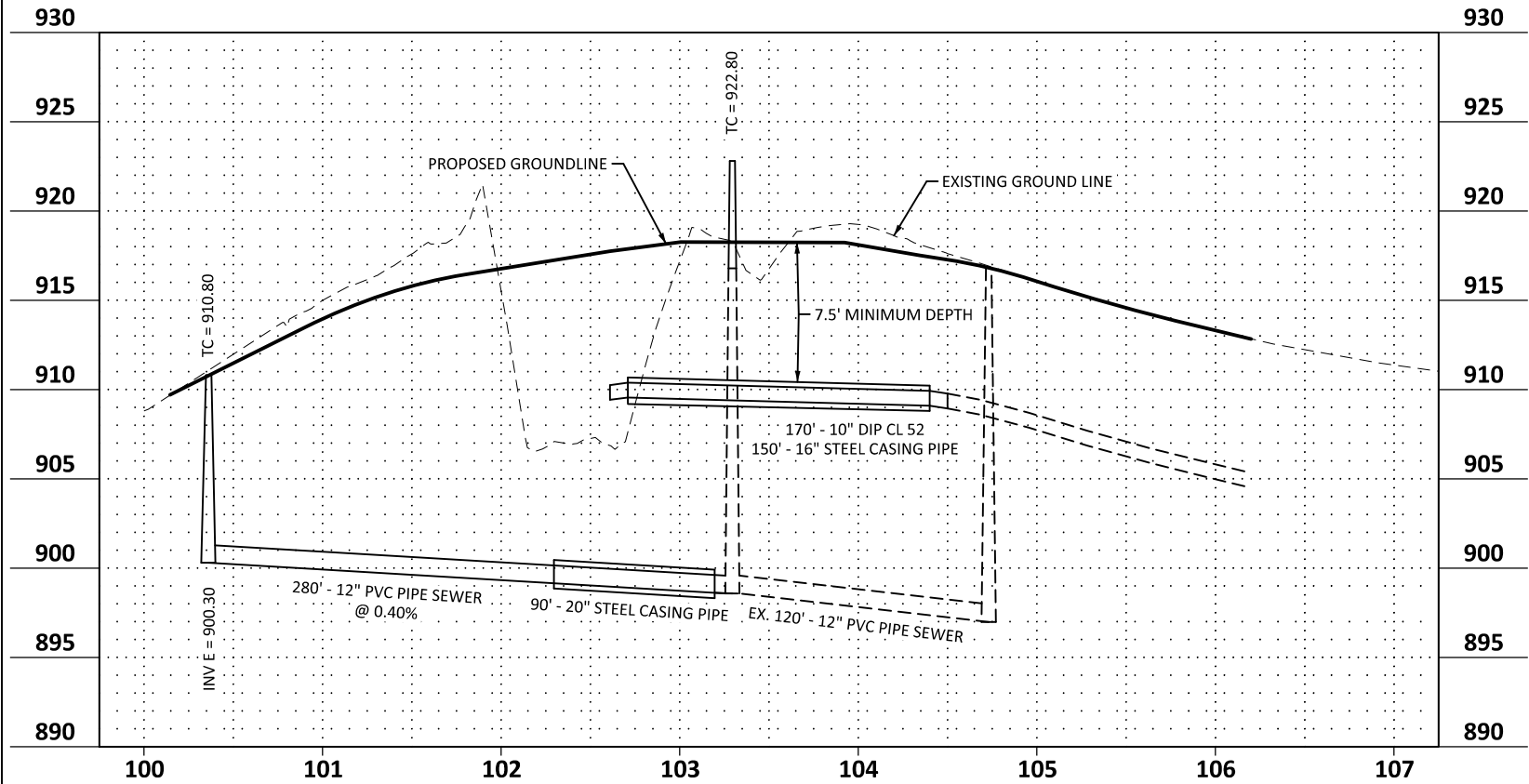
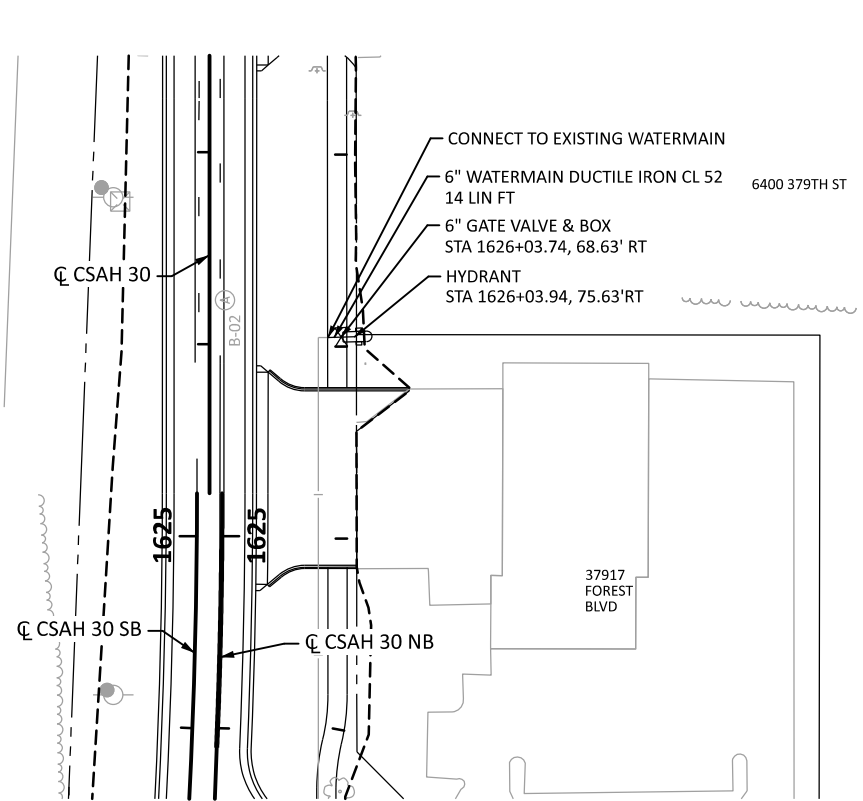
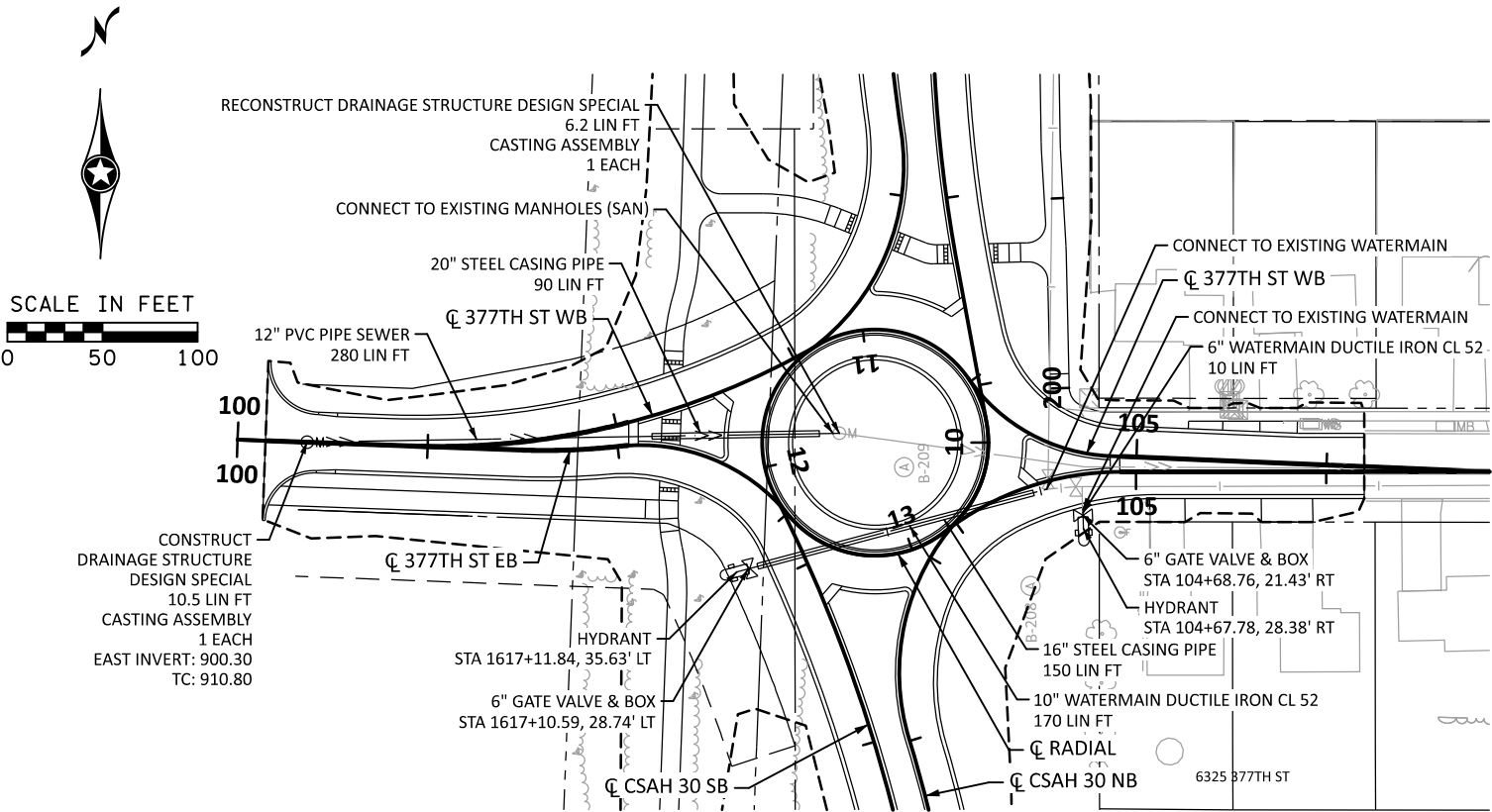
Nicholas E. Hentz, P.E.
NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
PROFILES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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Nicholas E. Hentges
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



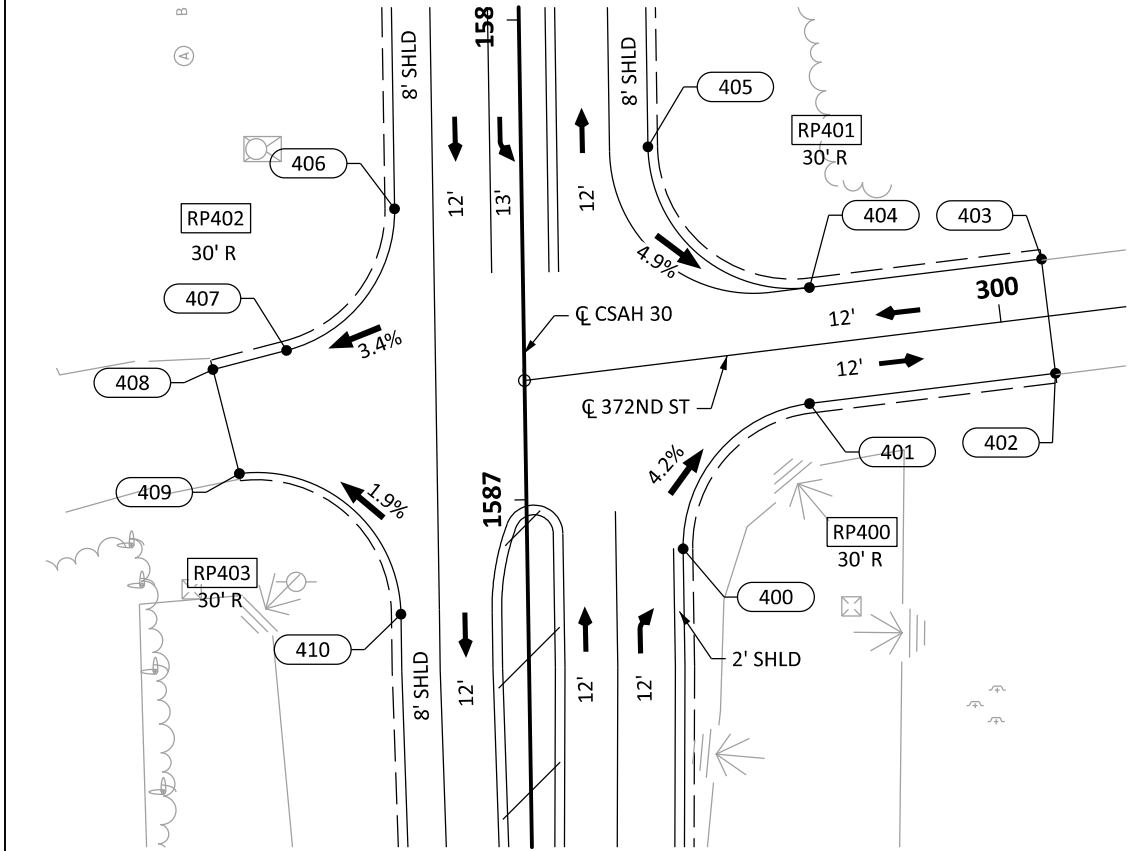
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

SANITARY AND WATERMAIN PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

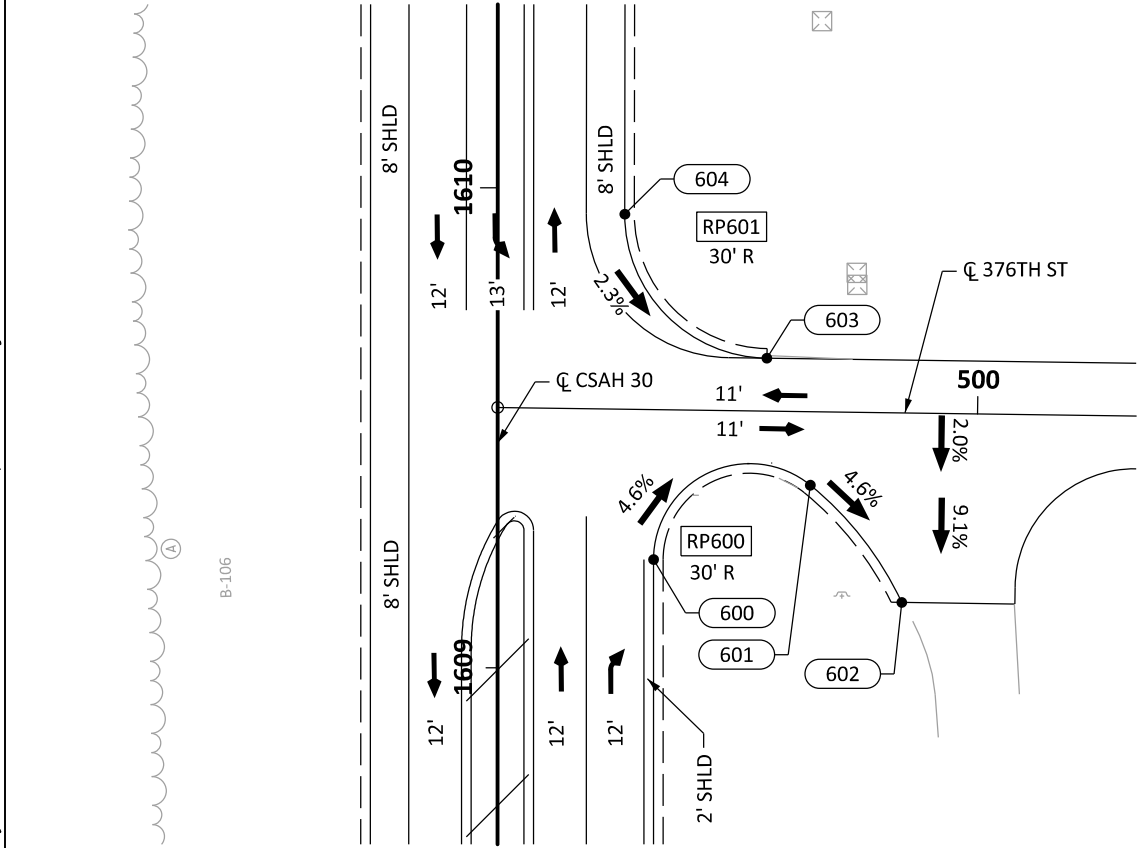
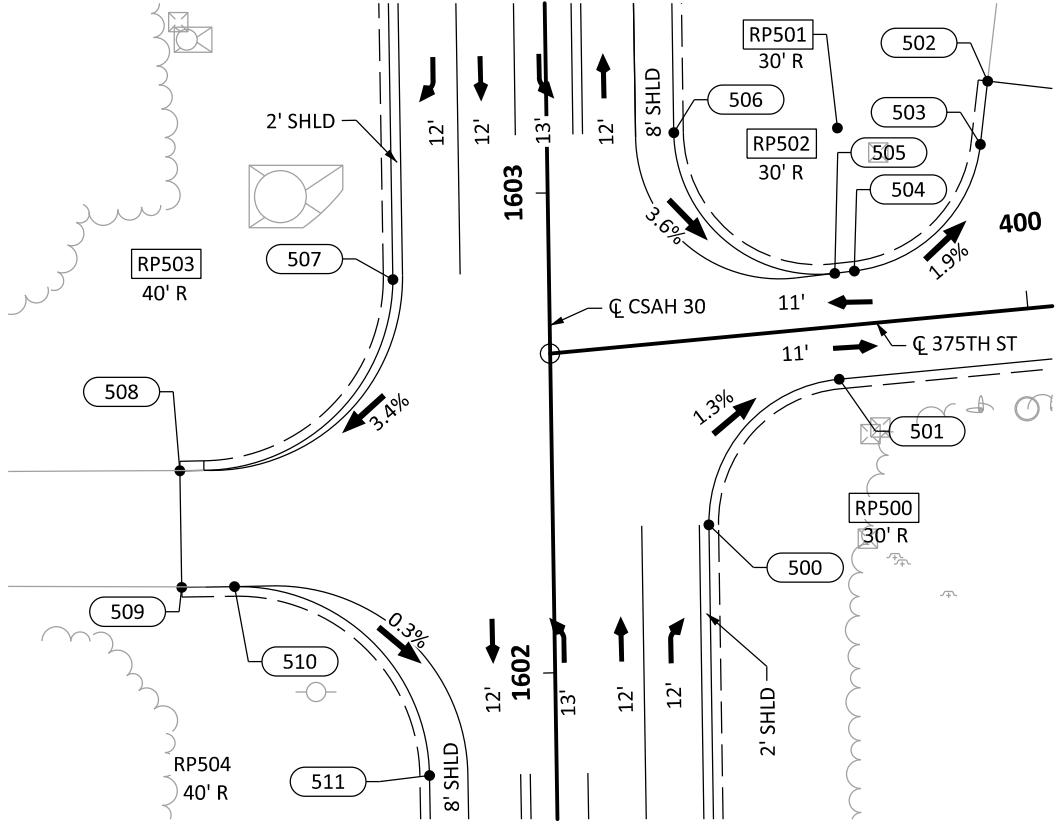
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GUTTER CONTROL POINTS			
POINT NO.	X	Y	ELEV
400	526345.335	169806.676	907.722
401	526371.677	169836.929	905.885
402	526436.491	169844.884	903.727
403	526433.567	169868.705	904.104
404	526371.657	169861.106	906.533
405	526338.006	169890.407	909.044
406	526285.204	169877.514	908.881
407	526262.712	169847.992	907.511
408	526247.370	169844.028	906.968
409	526252.893	169822.349	906.752
410	526286.544	169793.048	907.664

RADIUS POINTS		
POINT NO.	X	Y
RP400	526375.331	169807.152
RP401	526368.002	169890.883
RP402	526255.208	169877.038
RP403	526256.548	169792.572

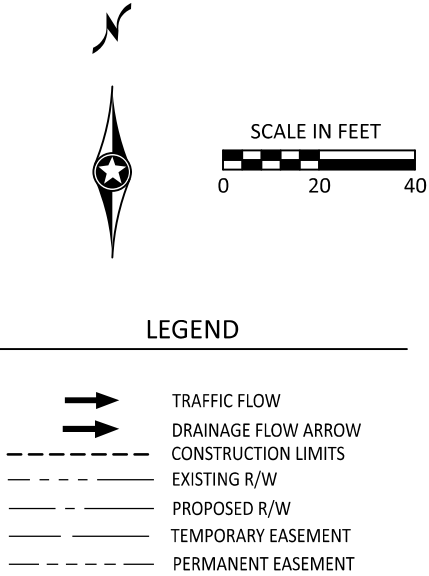


GUTTER CONTROL POINTS			
POINT NO.	X	Y	ELEV
600	526311.983	172039.160	921.863
601	526344.634	172054.648	919.780
602	526350.855	172048.905	918.336
603	526335.591	172081.113	921.319
604	526305.993	172111.114	922.368

RADIUS POINTS		
POINT NO.	X	Y
RP600	526331.983	172039.157
RP601	526335.993	172111.110

GUTTER CONTROL POINTS			
POINT NO.	X	Y	ELEV
500	526320.890	171347.518	912.482
501	526348.060	171377.861	911.904
502	526378.985	171439.965	910.778
503	526377.481	171426.786	911.025
504	526351.206	171400.396	911.771
505	526347.120	171399.912	911.875
506	526313.593	171429.227	913.703
507	526255.058	171399.489	913.159
508	526210.697	171358.833	912.180
509	526211.094	171334.580	912.280
510	526222.082	171334.660	912.211
511	526262.711	171295.300	912.019

RADIUS POINTS		
POINT NO.	X	Y
RP500	526350.886	171347.994
RP501	526347.675	171430.188
RP502	526343.589	171429.703
RP503	526215.063	171398.855
RP504	526222.716	171294.665



NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
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Approved By:	NEH

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Nicholas E. Hentges, PE
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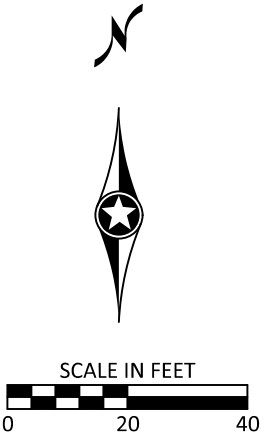
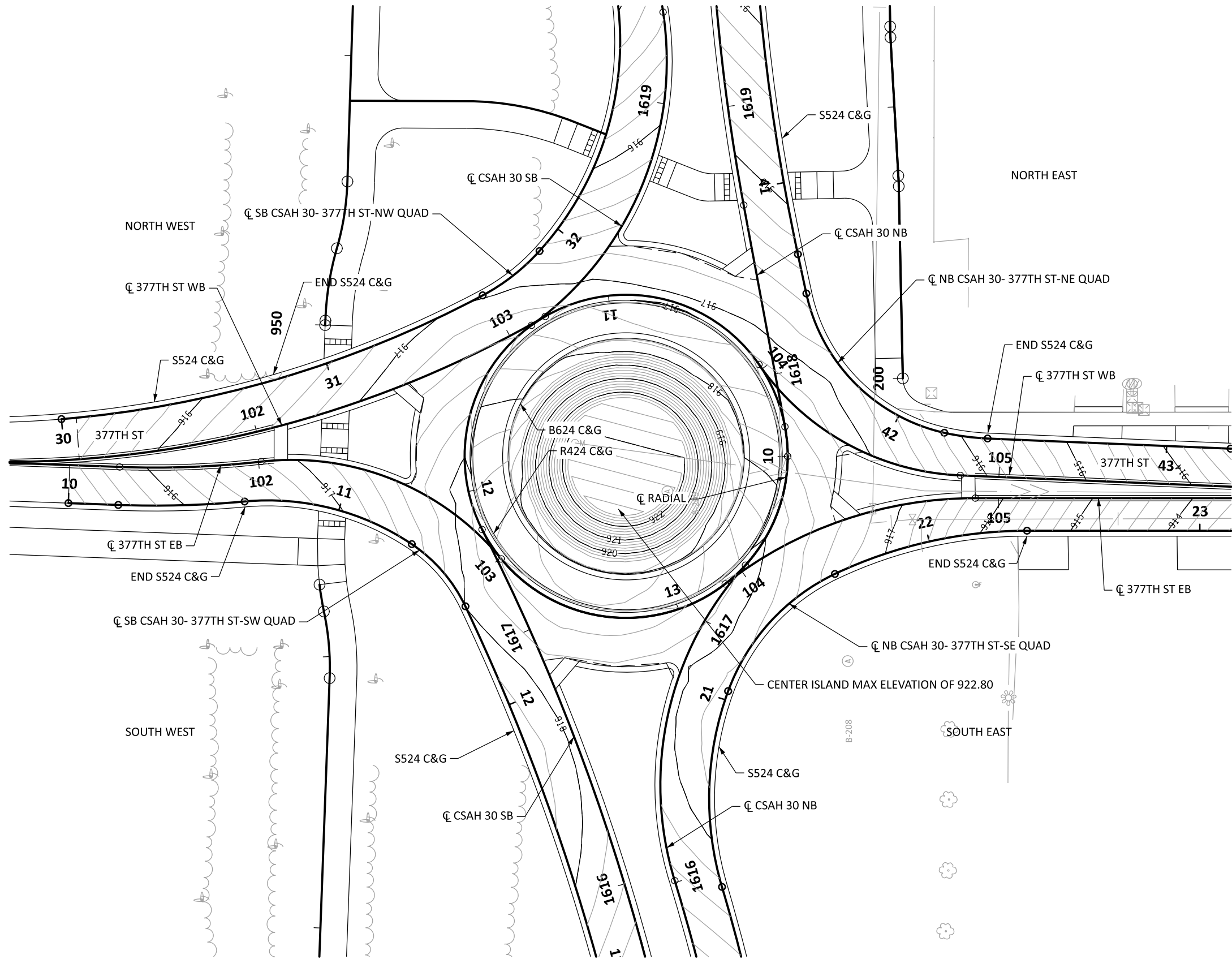
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_Int



LEGEND	
	TRAFFIC FLOW
	DRAINAGE FLOW ARROW
	CONSTRUCTION LIMITS
	EXISTING R/W
	PROPOSED R/W
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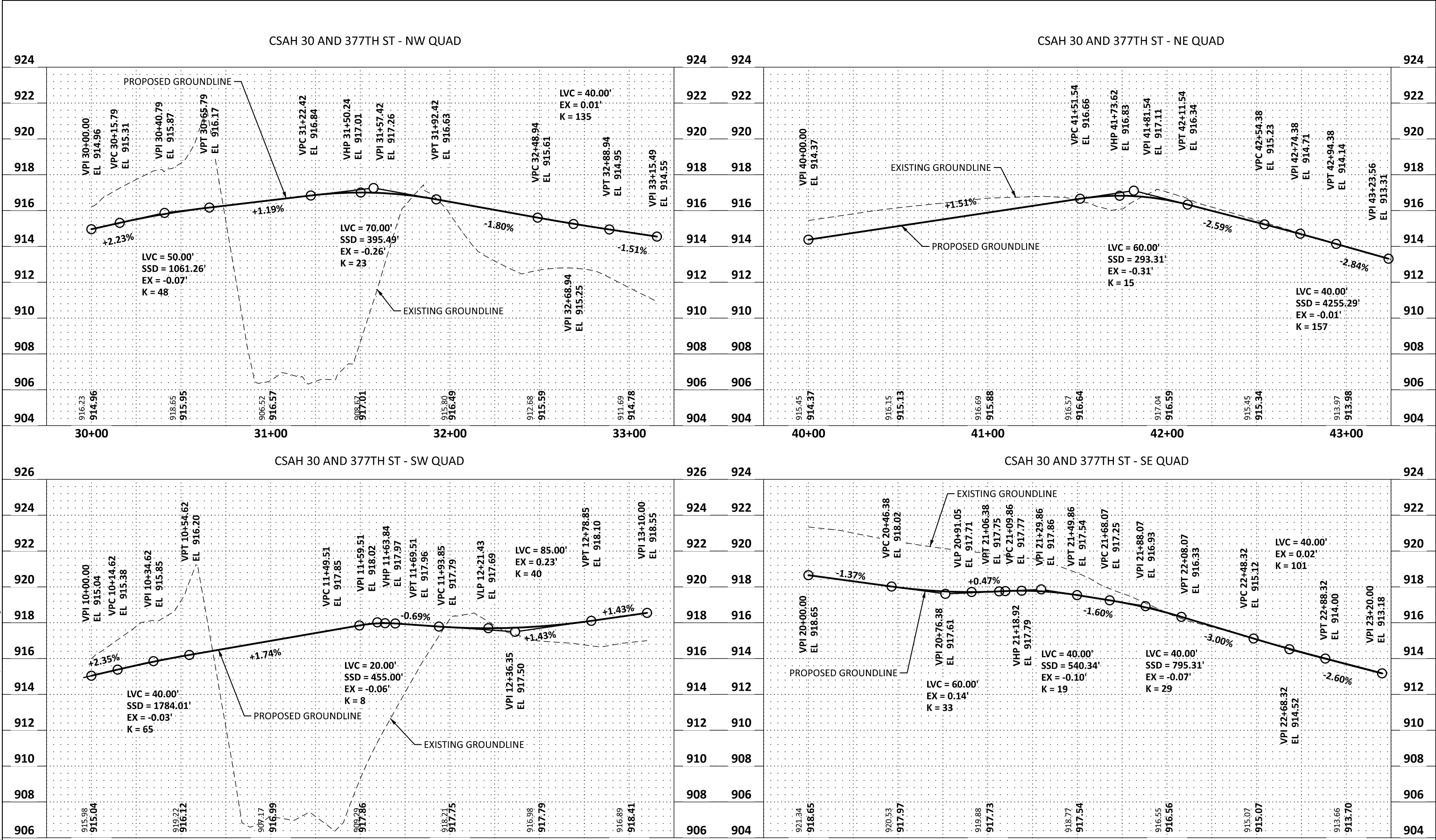


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
ROUNDABOUT DETAIL
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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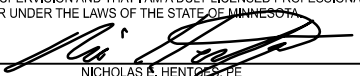
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ALIGNMENT TABULATION										
POINT NUMBER	POINT TYPE	STATION	CIRCULAR CURVE DATA					COORDINATES		DIRECTION AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	EASTING (X)	NORTHING (Y)	
			SPIRAL CURVE DATA							
			THETA	DEGREE	ST	LT	LS			
ALIGNMENT: RA-QUAD NW										
	PC	30+00.00 R1						526031.419	172884.396	85°17'39.234"
	HPI	30+82.54 R1	23°19'10.511" LT	14°19'26.202"	400	82.543	162.801	526113.684	172891.168	PI
	CC							525998.603	173283.047	
	PCC	31+62.80 R1						526186.548	172929.952	61°58'28.724"
	HPI	31+76.27 R1	19°50'45.467" LT	74°24'36.372"	77	13.47	26.671	526198.439	172936.281	PI
	CC							526150.369	172997.923	
	PCC	31+89.47 R1						526207.475	172946.271	42°07'43.257"
	HPI	32+43.30 R1	50°10'08.973" LT	49°49'20.701"	115	53.832	100.696	526243.586	172986.195	PI
	CC							526122.187	173023.413	
	PRC	32+90.17 R1						526236.056	173039.498	351°57'34.284"
	HPI	33+02.83 R1	01°53'42.725" RT	07°29'05.109"	765.5	12.662	25.321	526234.285	173052.035	PI
	CC							526994.031	173146.571	
	PT	33+15.49 R1						526232.930	173064.624	353°51'17.009"
ALIGNMENT: RA-QUAD SW										
	START	10+00.00 R1						526033.965	172853.462	
	PC	10+18.40 R1						526052.351	172852.788	92°06'03.605"
	HPI	10+41.72 R1	07°19'52.734" LT	15°44'26.156"	364	23.32	46.576	526075.655	172851.933	PI
	CC							526065.695	173216.543	
	PRC	10+64.97 R1						526098.877	172854.059	84°46'10.871"
	HPI	10+98.68 R1	39°04'19.337" RT	60°18'40.849"	95	33.708	64.784	526132.445	172857.132	PI
	CC							526107.537	172759.454	
	PCC	11+29.76 R1						526160.443	172838.359	123°50'30.208"
	HPI	11+45.43 R1	30°45'10.920" RT	100°31'08.081"	57	15.675	30.594	526173.463	172829.630	PI
	CC							526128.700	172791.016	
	PCC	11+60.35 R1						526180.188	172815.470	154°35'41.129"
	HPI	12+35.39 R1	10°43'03.969" RT	07°09'43.101"	800	75.043	149.648	526212.382	172747.684	PI
	CC							525457.551	172472.256	
	PT	13+10.00 R1						526231.409	172675.093	165°18'45.098"

ALIGNMENT TABULATION										
POINT NUMBER	POINT TYPE	STATION	CIRCULAR CURVE DATA					COORDINATES		DIRECTION AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH			
			SPIRAL CURVE DATA					EASTING (X)	NORTHING (Y)	
			THETA	DEGREE	ST	LT	LS			
ALIGNMENT: RA-QUAD NE										
	PC	40+00.00 R1						526286.372	173070.772	177°22'40.327"
	HPI	40+63.58 R1	09°30'52.803" LT	07°29'58.011"	764	63.582	126.872	526289.281	173007.257	PI
	CC							527049.572	173105.724	
	PT	41+26.87 R1						526302.649	172945.096	167°51'47.524"
	PC	41+41.64 R1						526305.755	172930.653	167°51'47.524"
	HPI	41+84.50 R1	65°12'31.505" LT	85°30'57.920"	67	42.855	76.253	526314.765	172888.756	PI
	CC							526371.257	172944.740	
	PCC	42+17.90 R1						526356.579	172879.367	102°39'16.019"
	HPI	42+25.97 R1	10°15'25.224" LT	63°39'43.118"	90	8.077	16.112	526364.461	172877.598	PI
	CC							526376.296	172967.181	
	PT	42+34.01 R1						526372.531	172877.260	92°23'50.795"
	HPI	43+23.56 R1						526462.008	172873.514	92°23'50.795"
	END	43+33.56 R1						526472.007	172873.514	90°00'00.000"
ALIGNMENT: RA-QUAD SE										
	PC	20+00.00 R1						526282.554	172683.192	346°06'05.018"
	HPI	20+15.00 R1	02°34'51.212" LT	08°36'10.692"	666	15.003	30	526278.950	172697.755	PI
	CC							525636.053	172523.216	
	PRC	20+30.00 R1						526274.695	172712.141	343°31'13.806"
	HPI	20+67.98 R1	36°33'21.115" RT	49°49'20.701"	115	37.983	73.372	526263.920	172748.564	PI
	CC							526384.971	172744.764	
	PCC	21+03.37 R1						526276.958	172784.240	20°04'34.921"
	HPI	21+34.91 R1	44°33'04.288" RT	74°24'36.372"	77	31.542	59.873	526287.786	172813.865	PI
	CC							526349.280	172757.808	
	PCC	21+63.24 R1						526316.285	172827.381	64°37'39.208"
	HPI	22+00.41 R1	25°23'04.417" RT	34°43'28.973"	165	37.161	73.102	526349.861	172843.304	PI
	CC							526386.988	172678.296	
	PT	22+36.35 R1						526387.022	172843.296	90°00'43.625"
	END	23+20.73 R1						526471.401	172843.278	90°00'43.625"

NO.	DATE	BY	CHK	REVISIONS

Design By:
NEH
Plan By:
MKV
Checked By:
MAN
Approved By:
NEH

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.

NICHOLAS E. HENTGES, PE
DATE: 9/12/2024
LICENSE NO. 44620



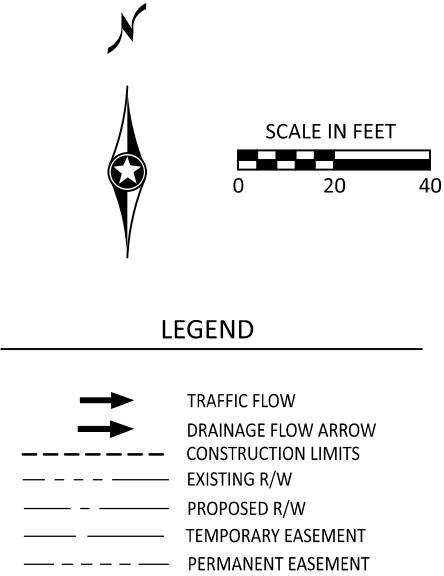
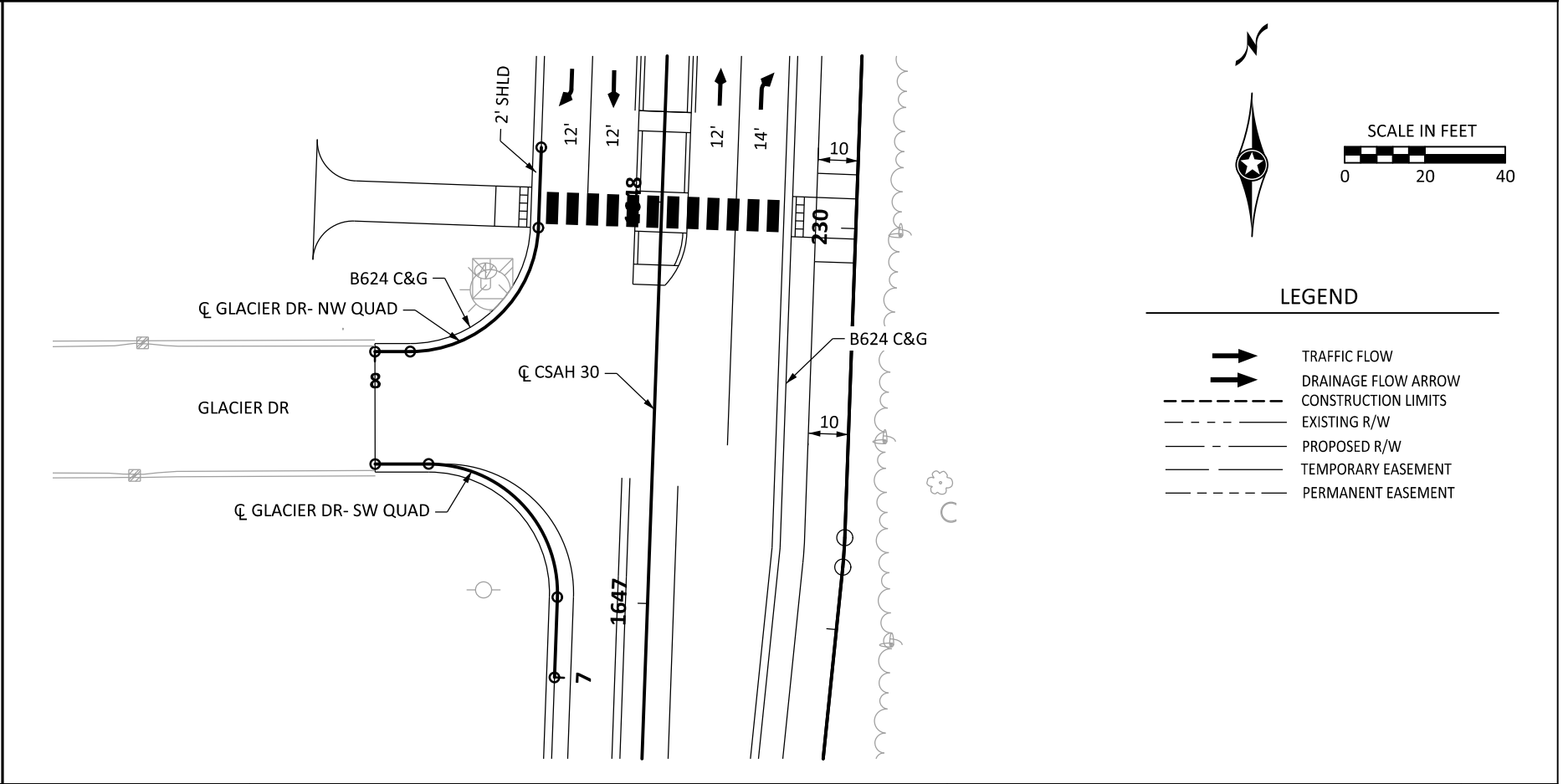
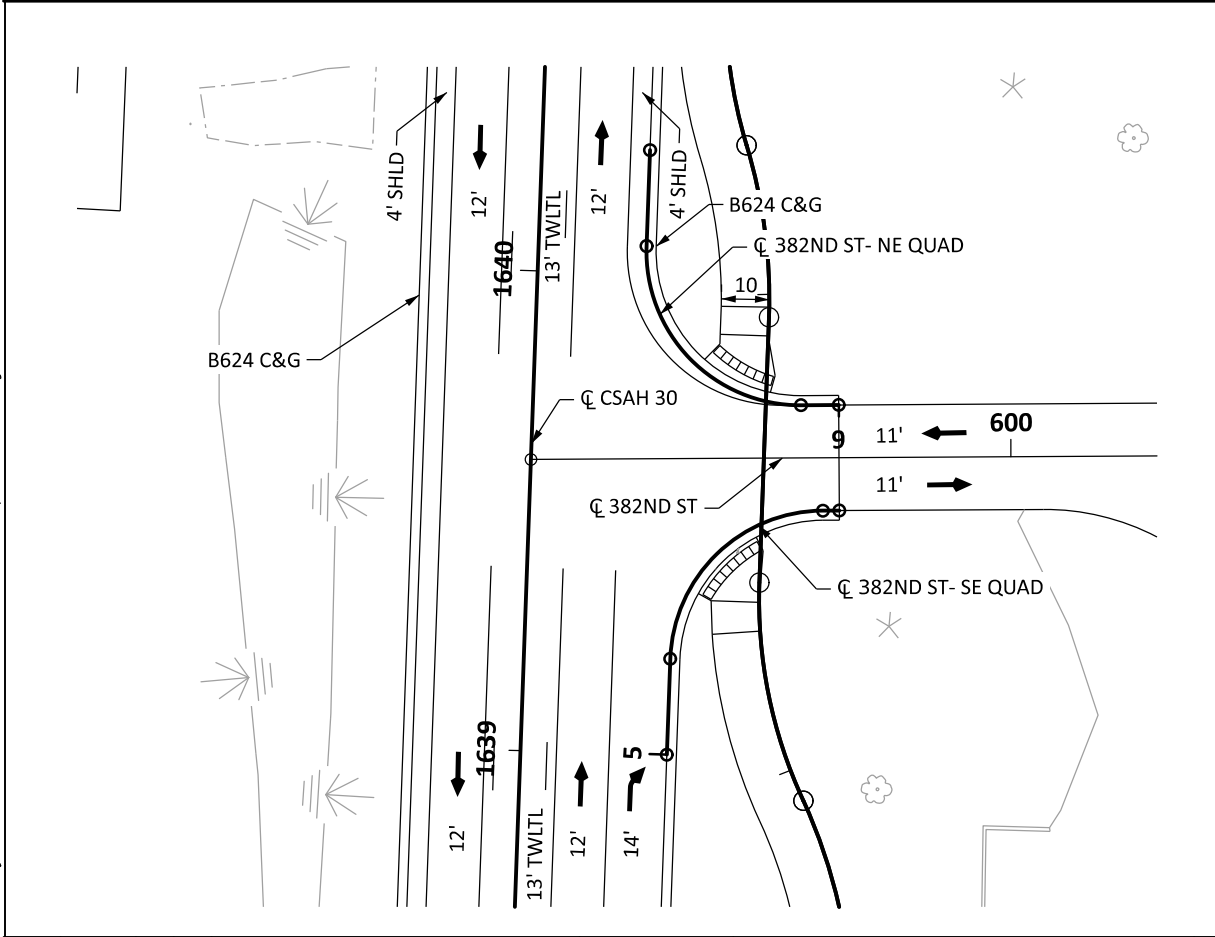
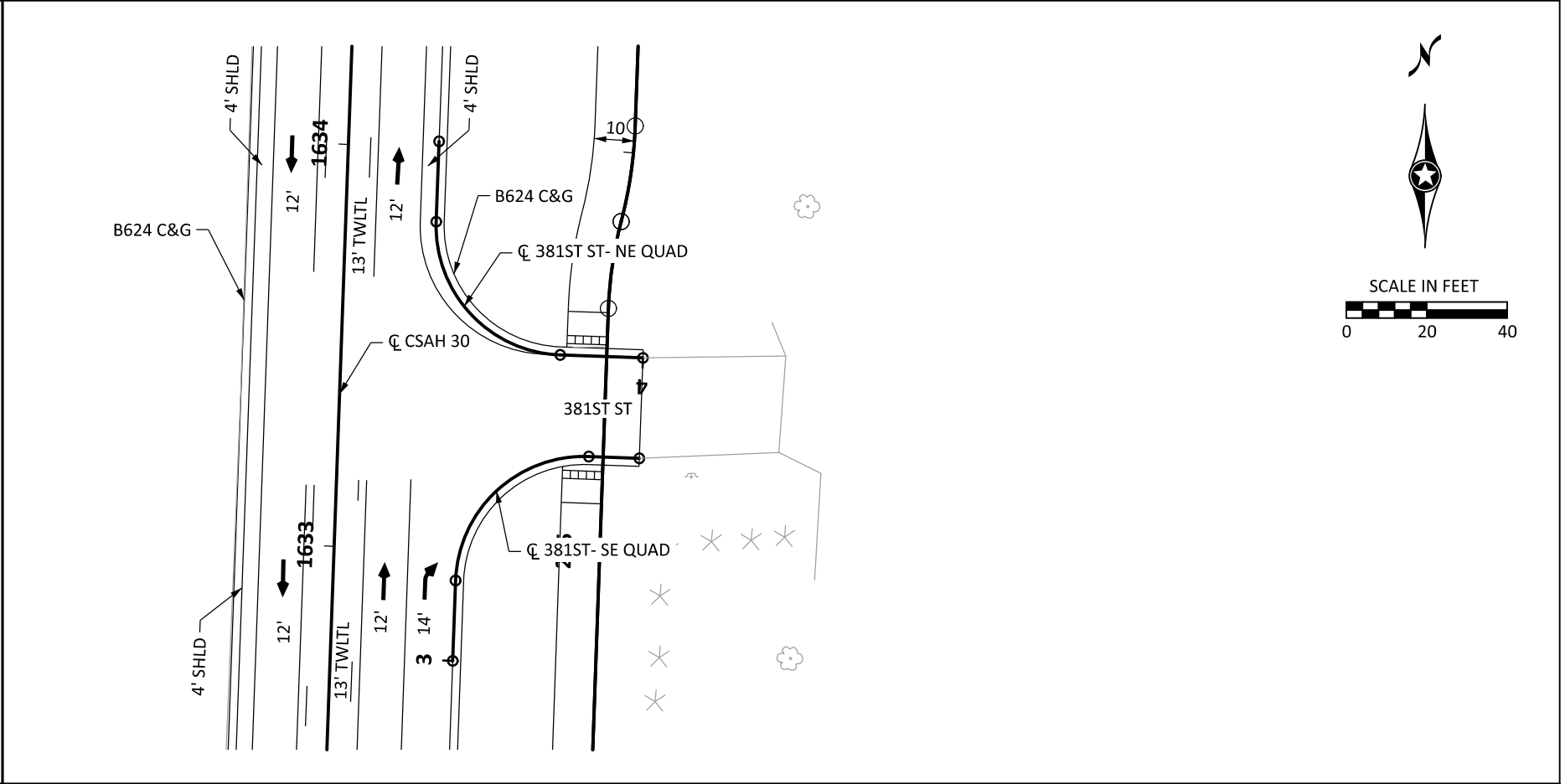
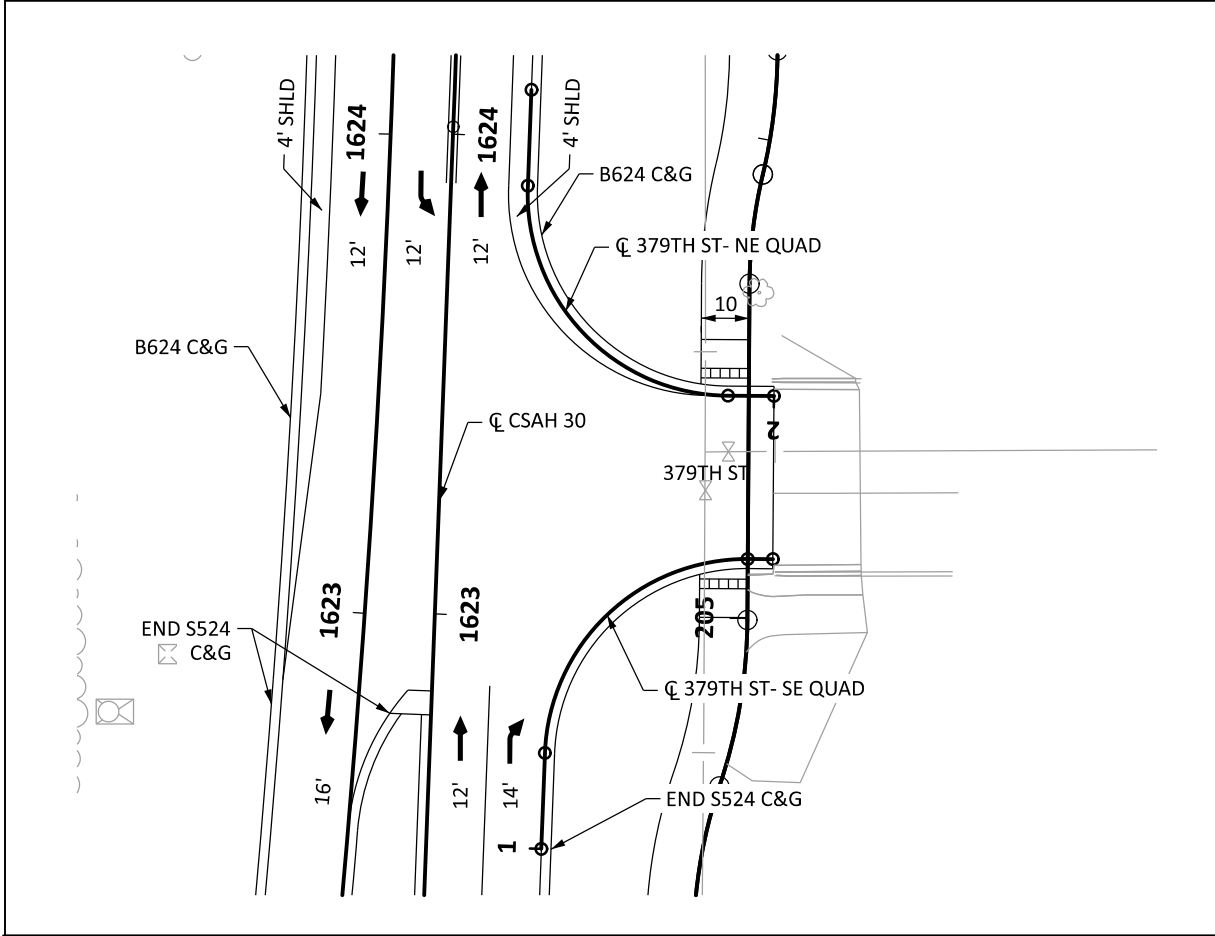
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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OF
216
SHEETS

DATE: 9/12/2024 2:06:21 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_Int



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTGES, PE
DATE: 9/12/2024
LICENSE NO. 44620



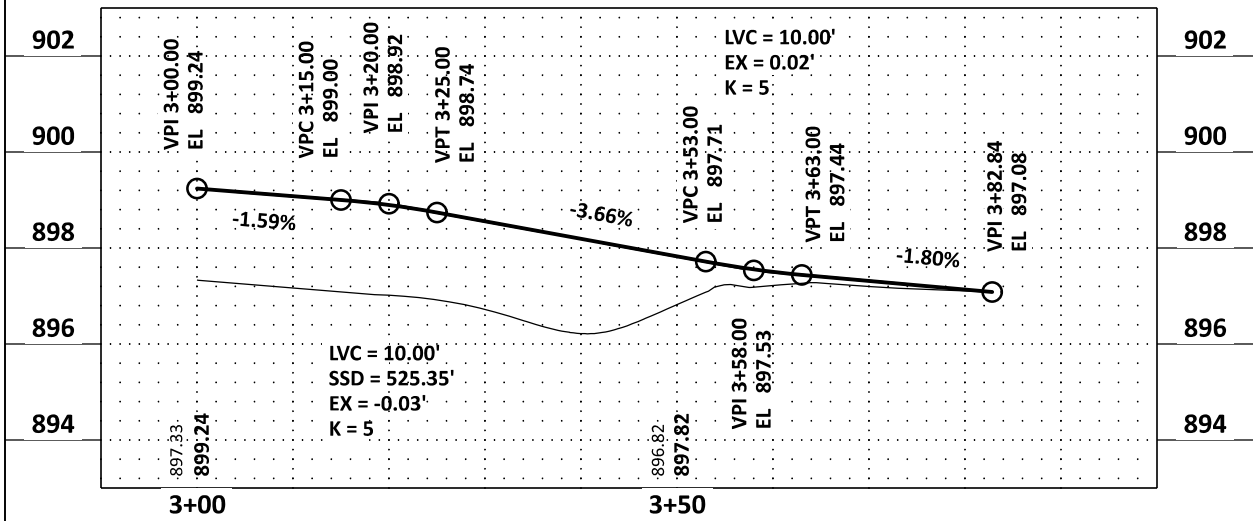
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

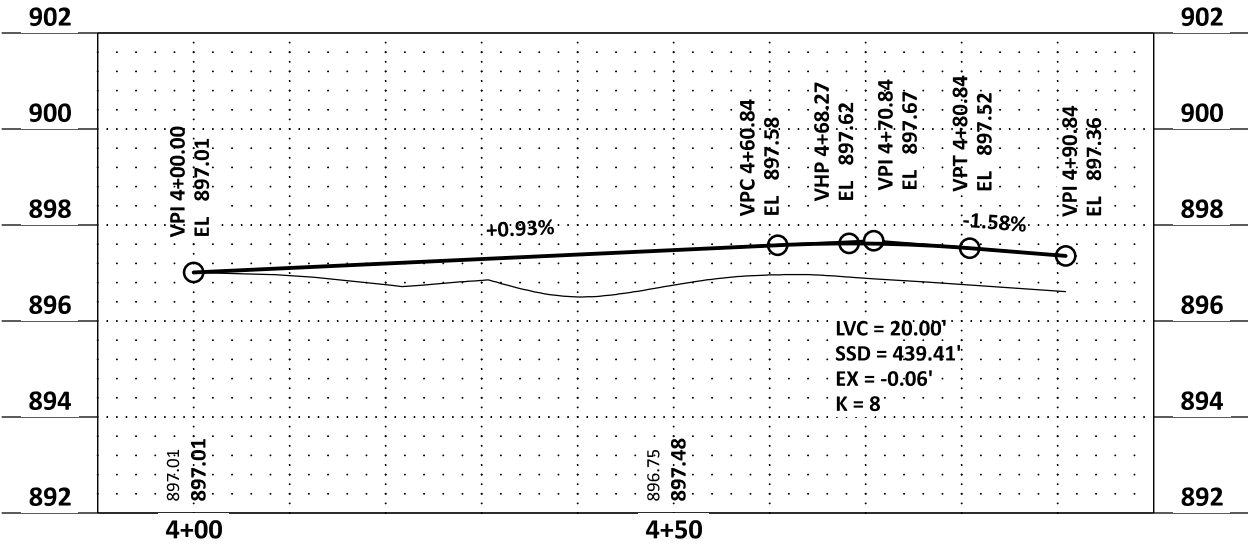
SHEET
148
OF
216
SHEETS

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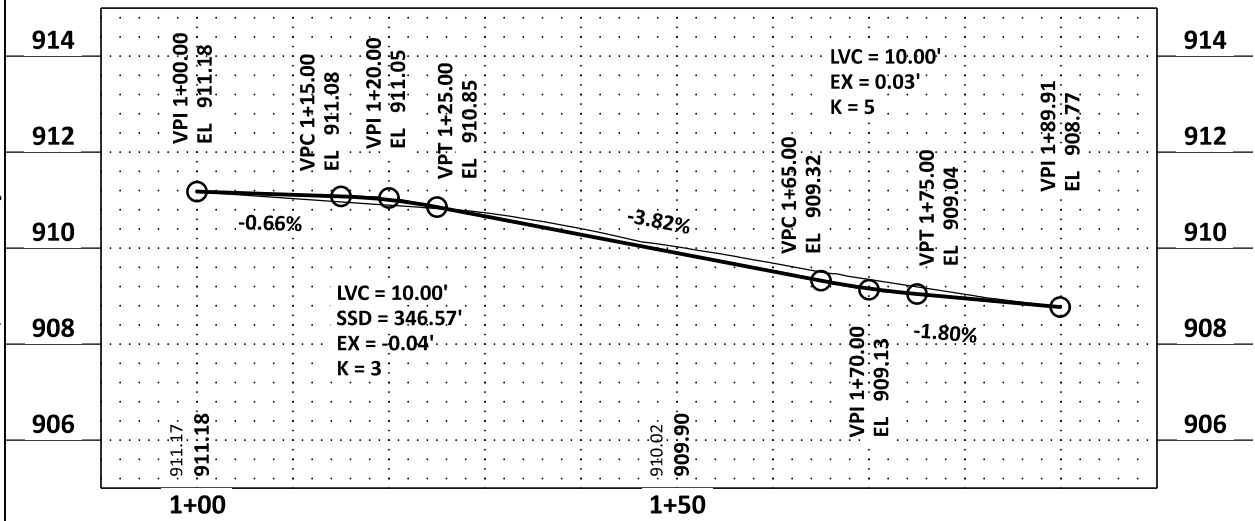
381ST ST - SOUTHEAST QUAD PROFILE



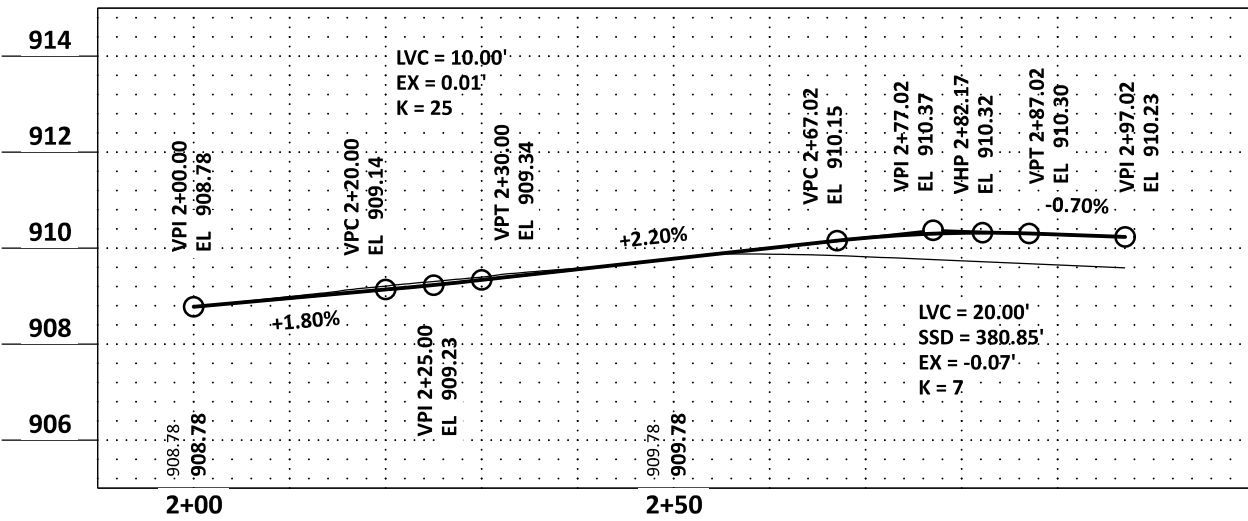
381ST ST - NORTHEAST QUAD PROFILE



379TH ST - SOUTHEAST QUAD PROFILE



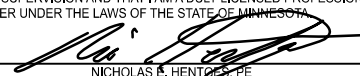
379TH ST - NORTHEAST QUAD PROFILE



NO.	DATE	BY	CHK	REVISIONS

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NICHOLAS E. HENTGES, PE
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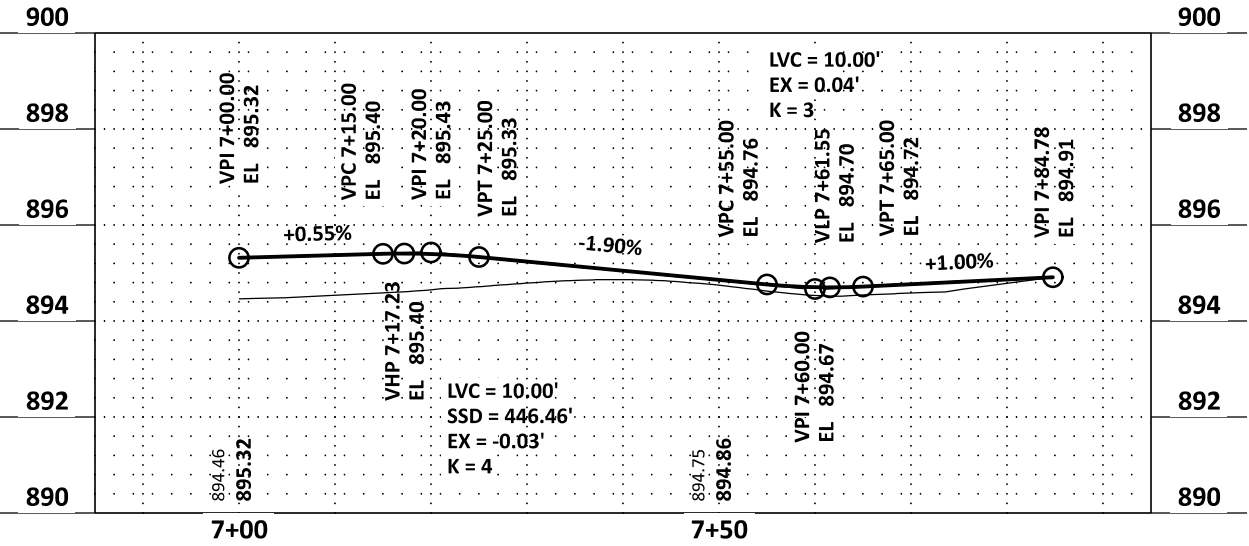
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

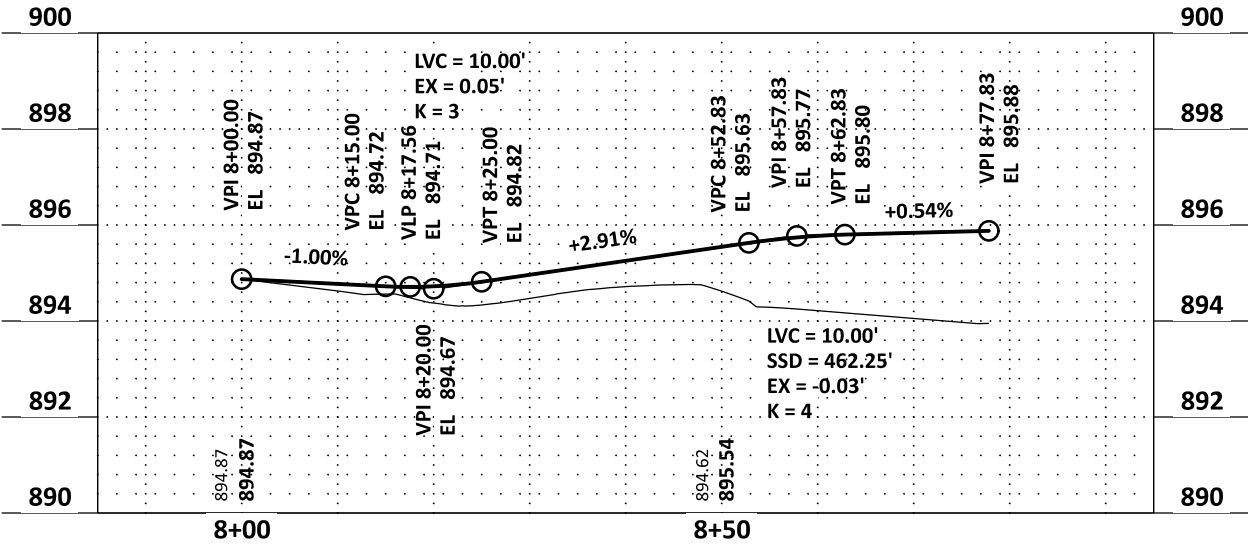
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216
SHEETS

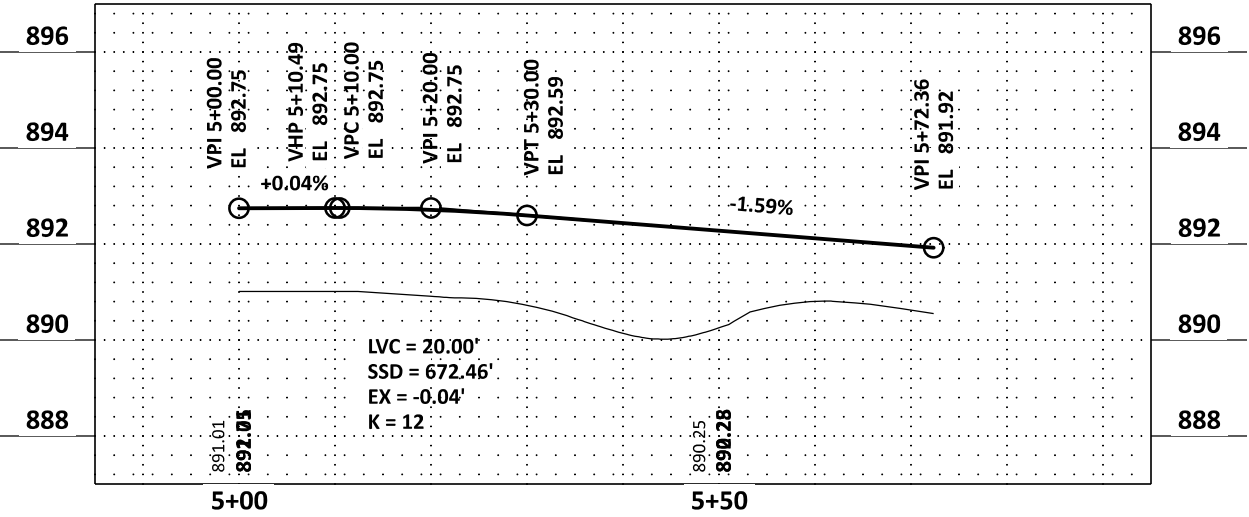
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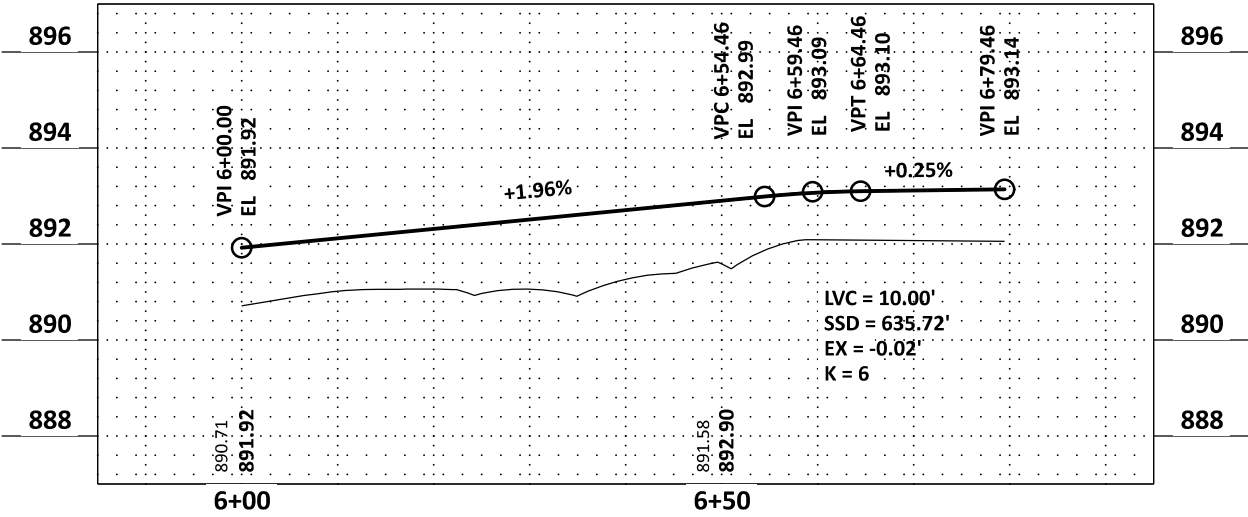
GLACIER DR - NORTHWEST QUAD PROFILE



382ND ST - SOUTHEAST QUAD PROFILE



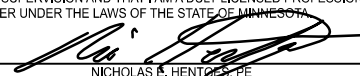
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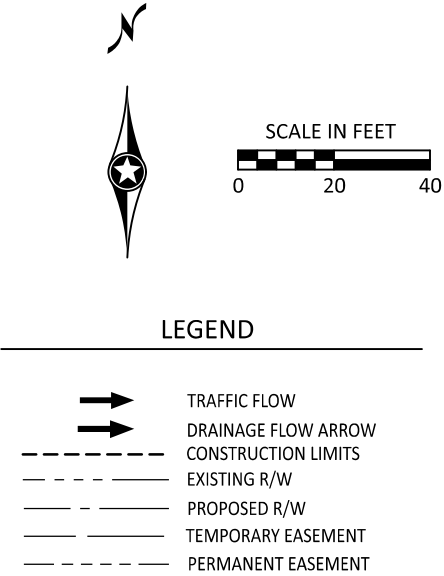
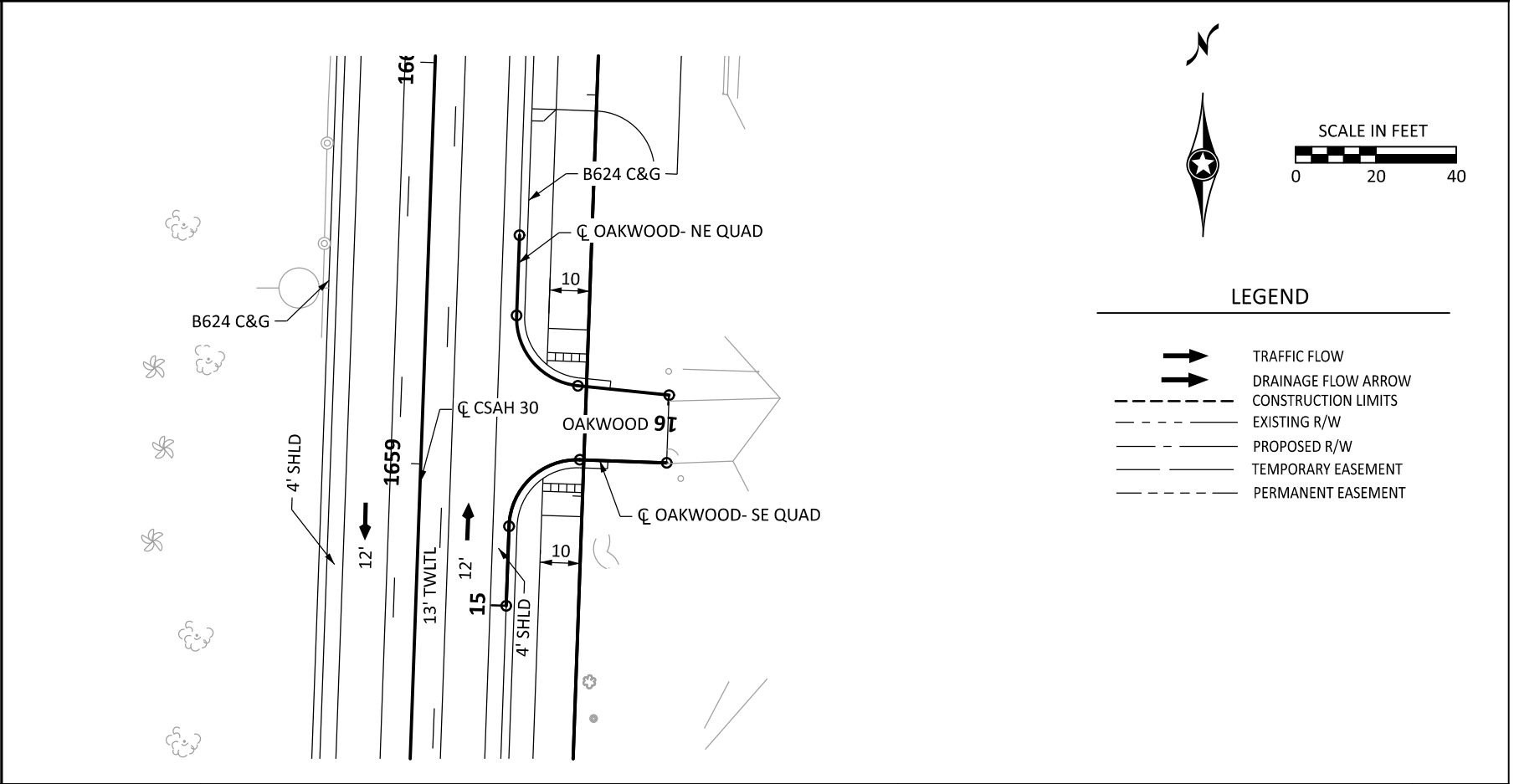
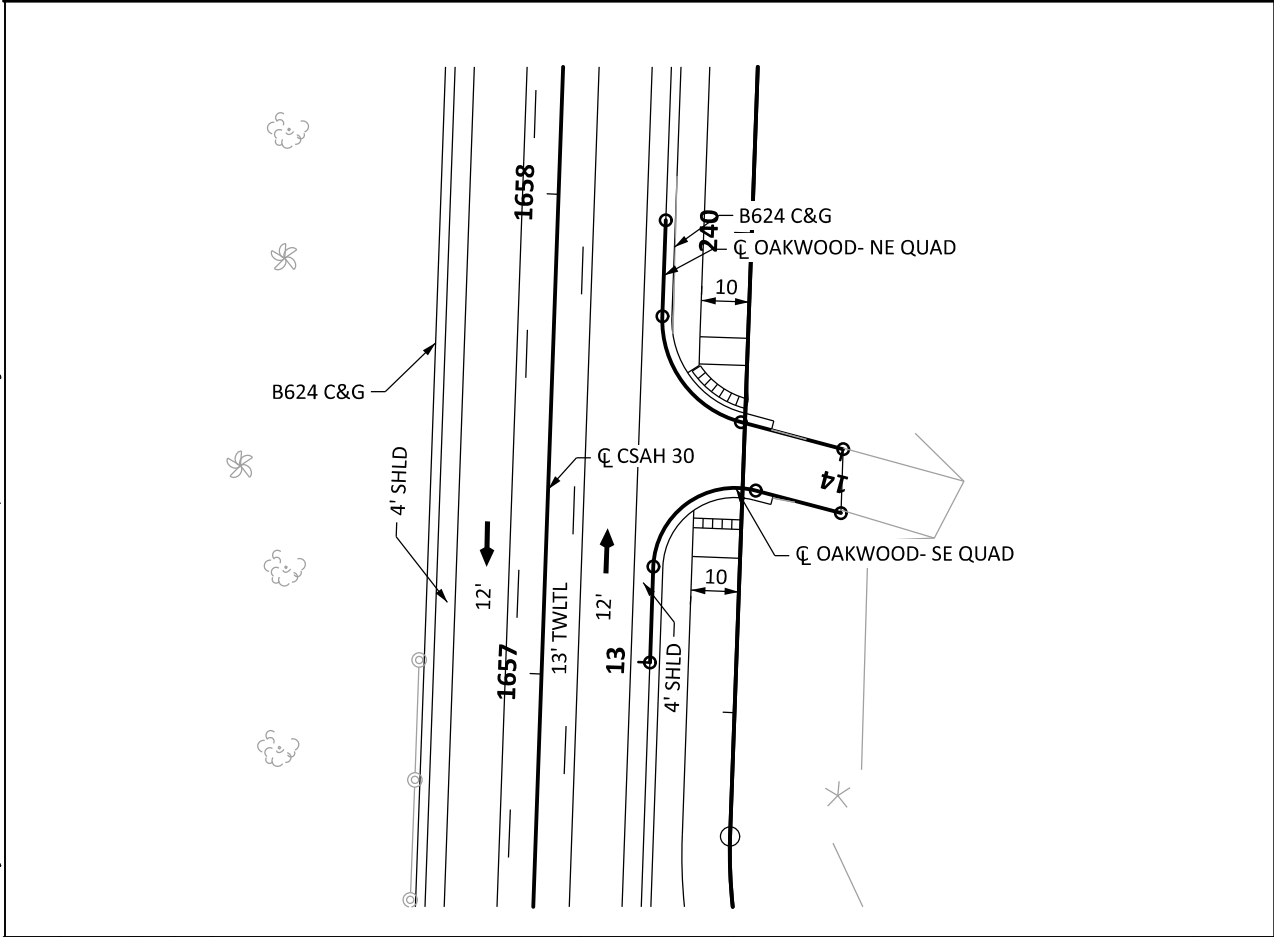
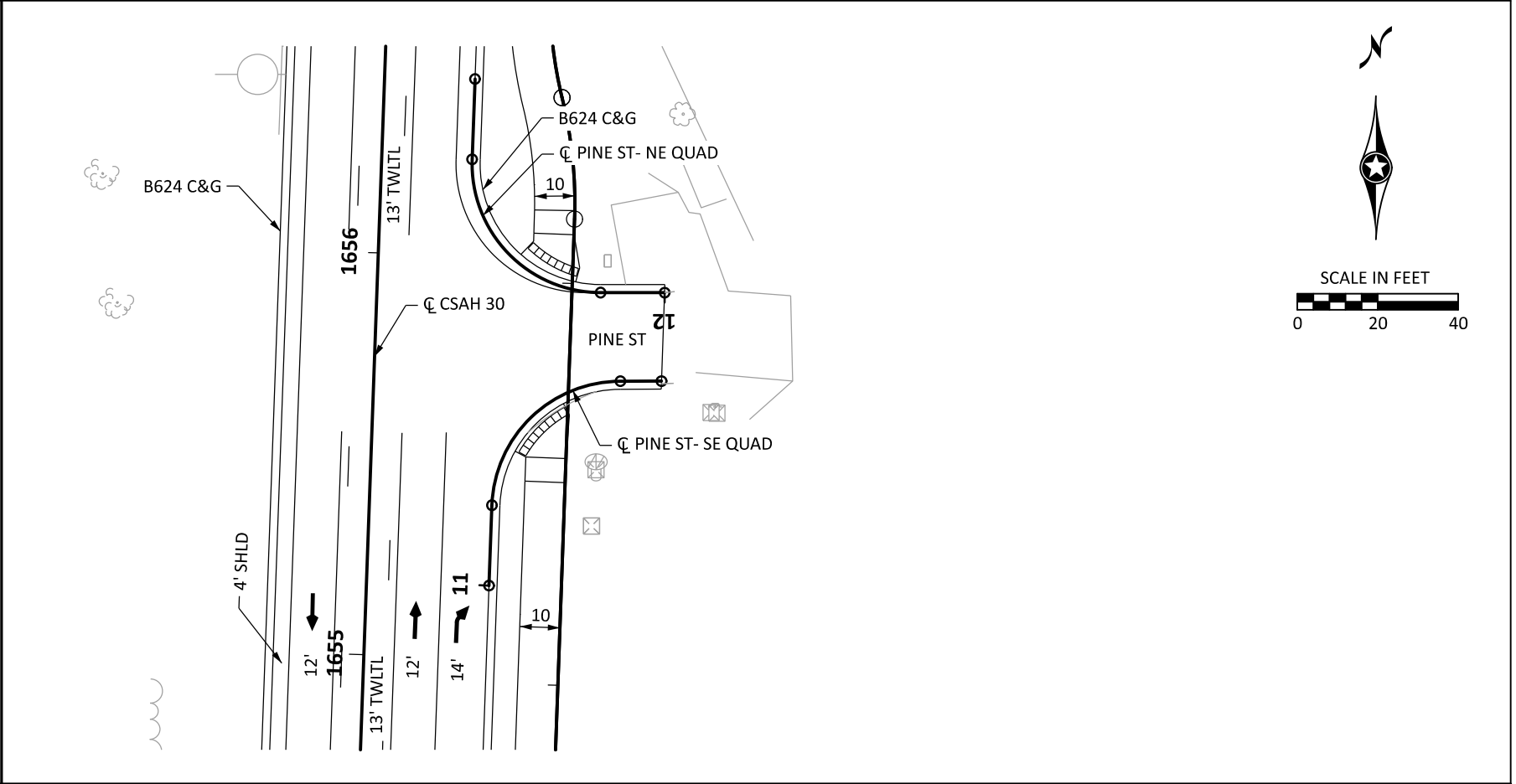
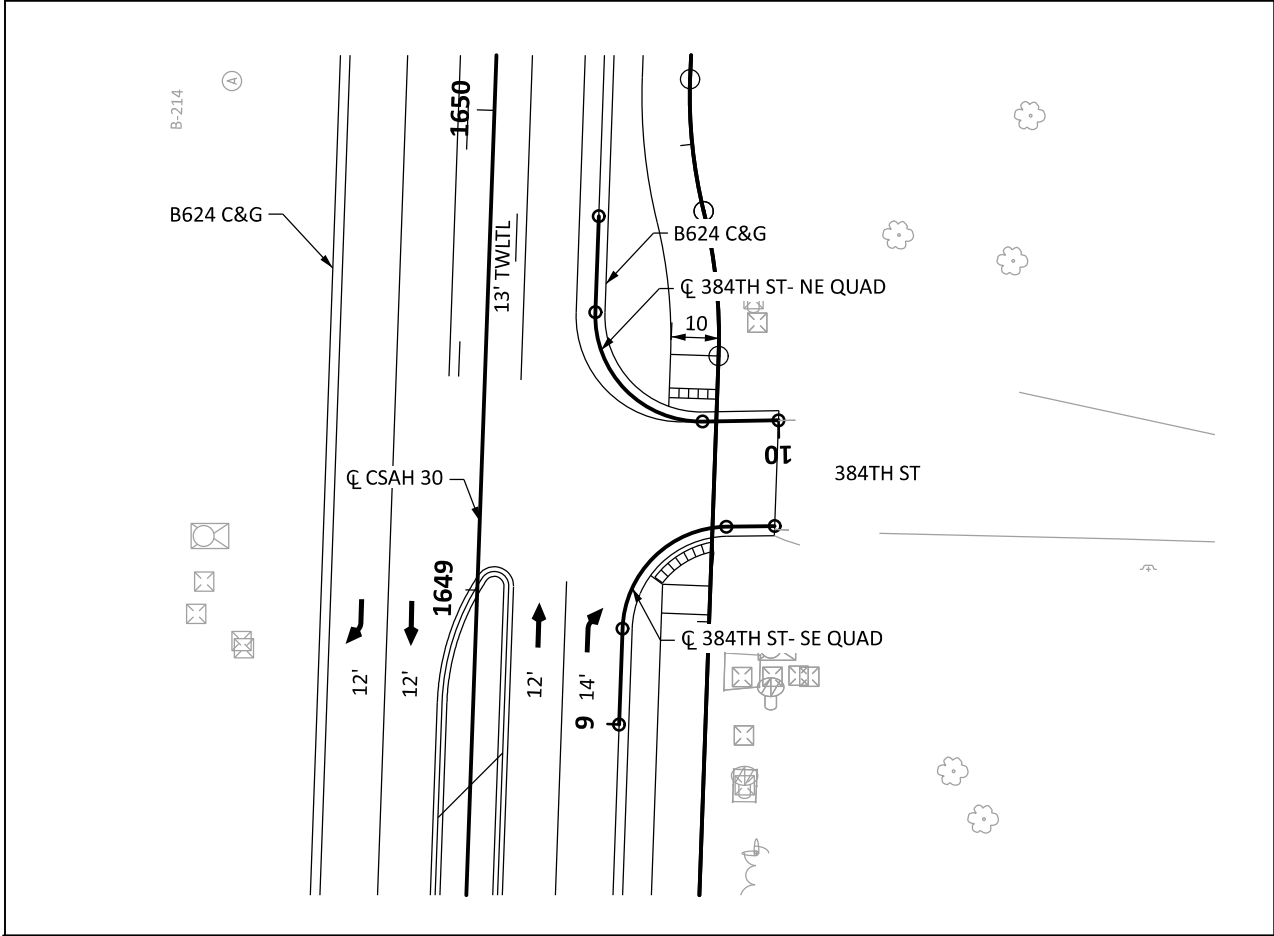
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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NO.	DATE	BY	CHK	REVISIONS

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Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTGES, PE
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LICENSE NO. 44620



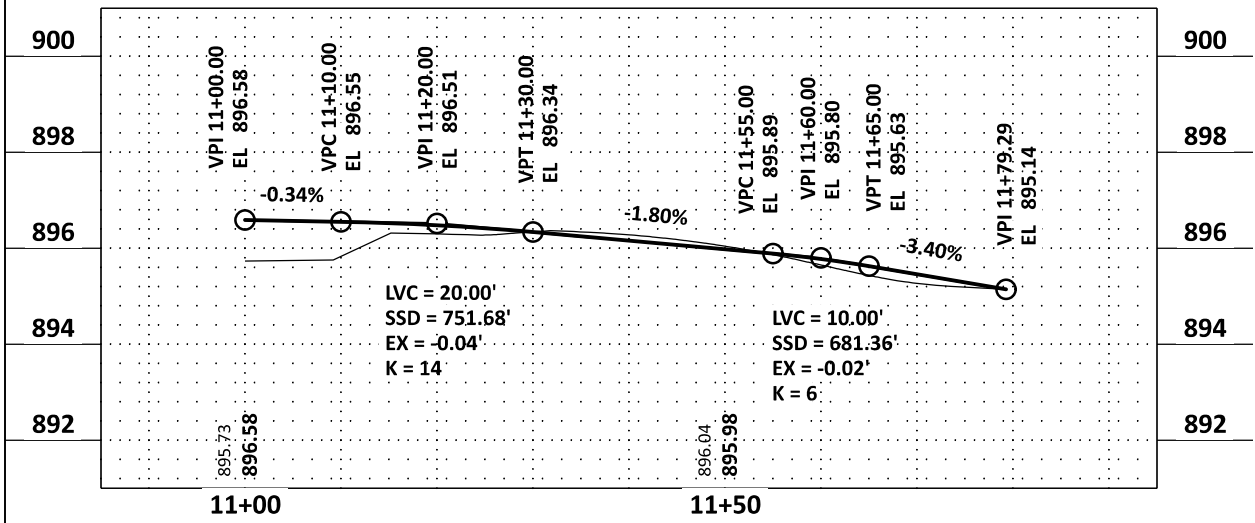
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

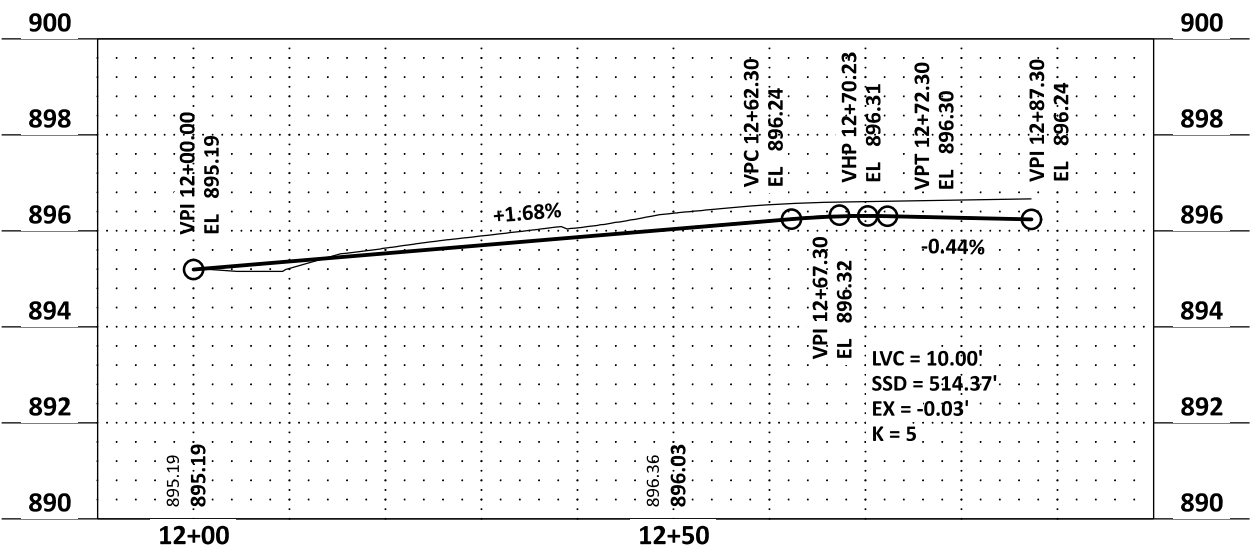
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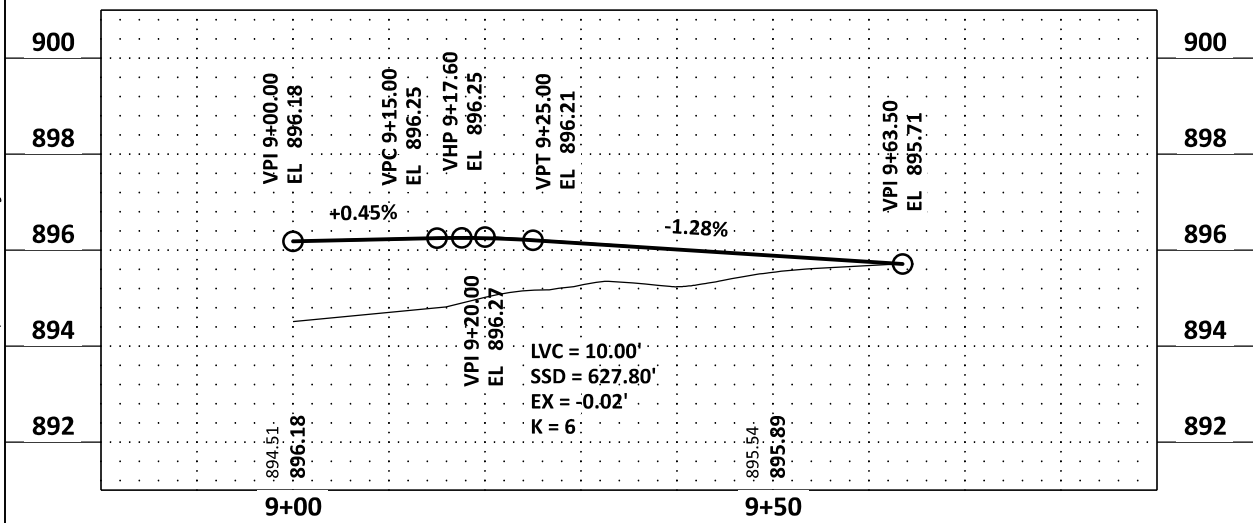
PINE ST - SOUTHEAST QUAD PROFILE



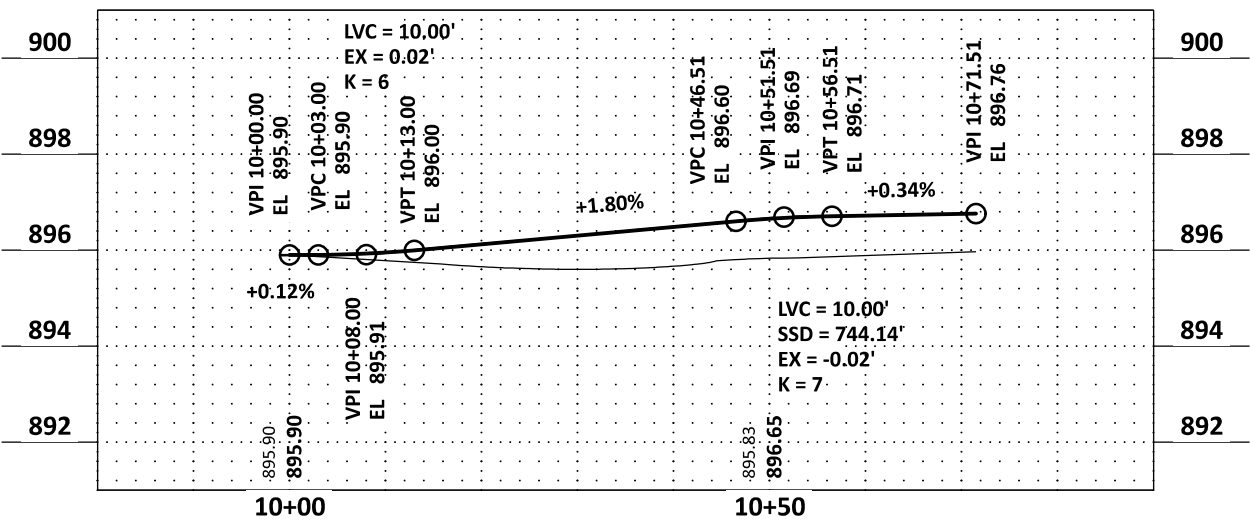
PINE ST - NORTHEAST QUAD PROFILE



384TH ST - SOUTHEAST QUAD PROFILE



384TH ST - NORTHEAST QUAD PROFILE



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Plan By: MKV
Checked By: MAN
Approved By: NEH

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Nicholas E. Hentges
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

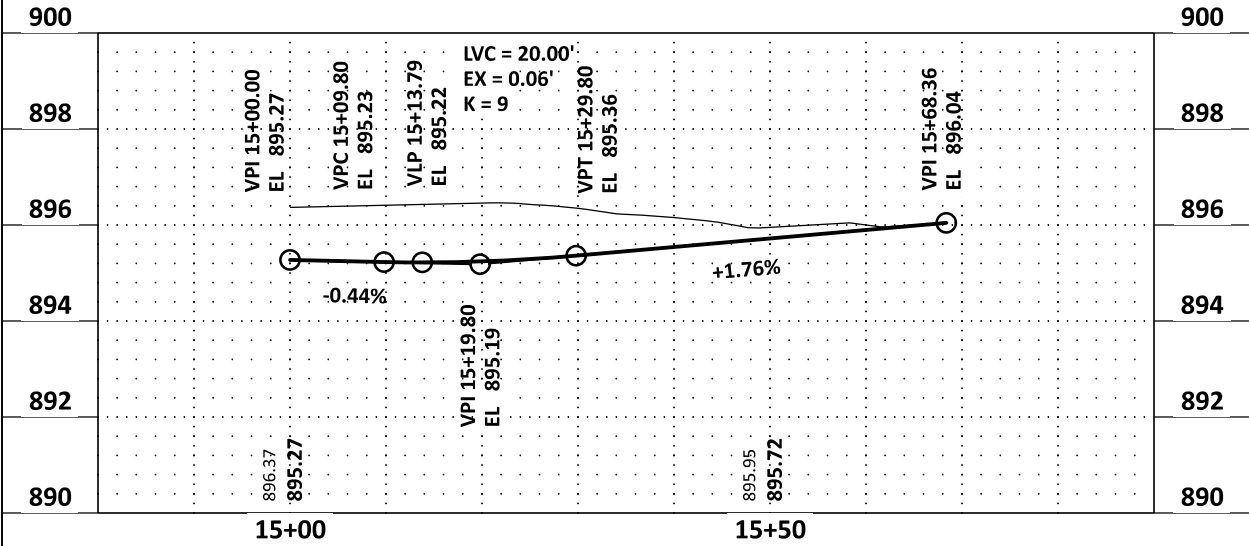
CHISAGO COUNTY, MINNESOTA

INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

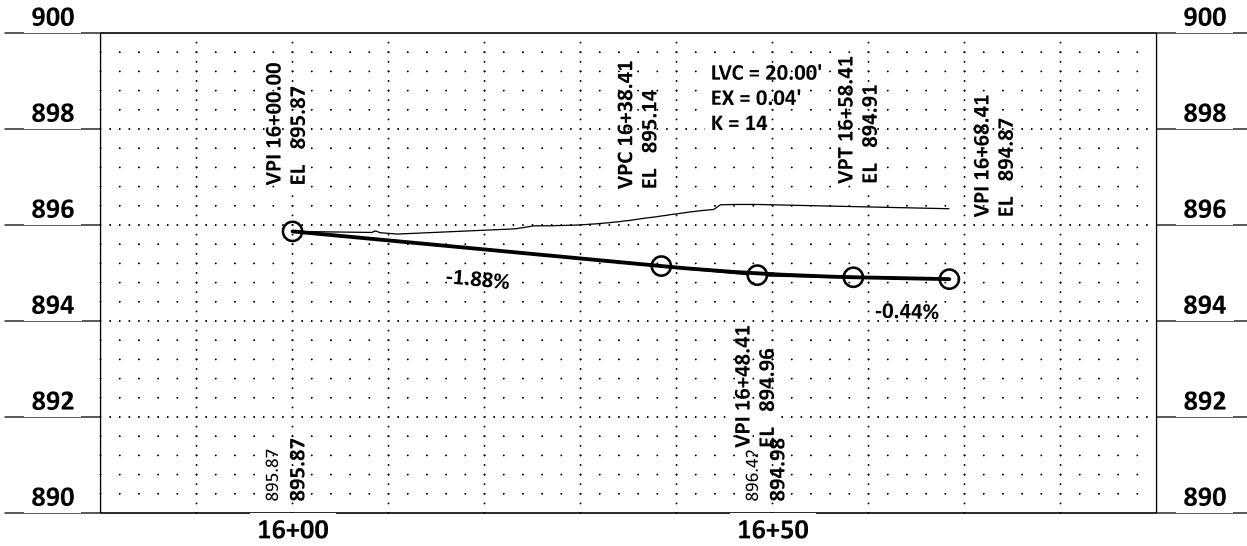
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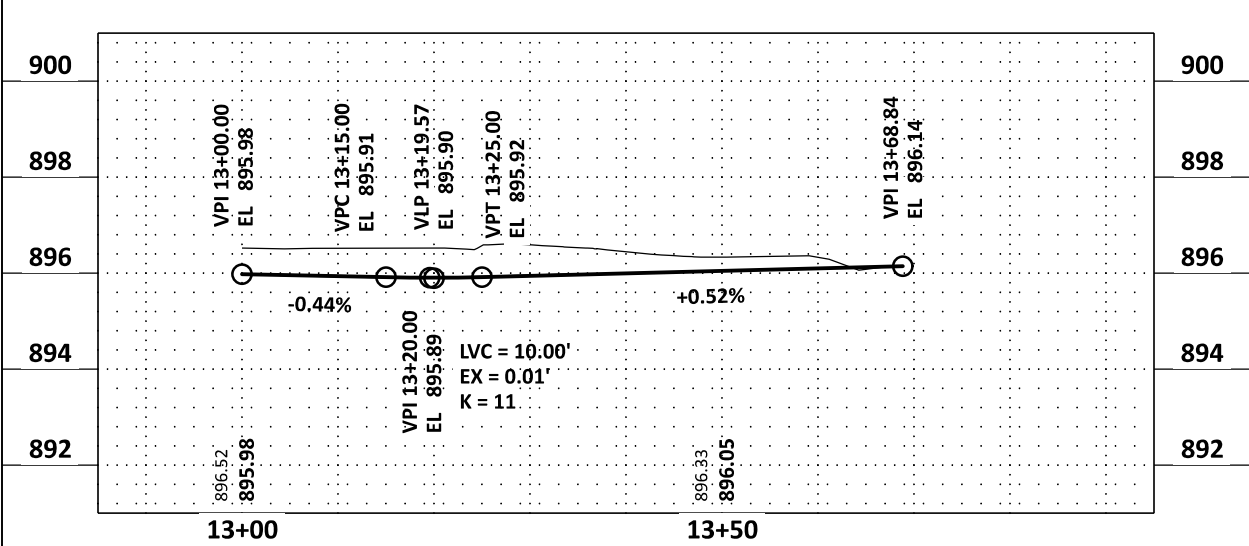
OAKWOOD ST N - SOUTHEAST QUAD PROFILE



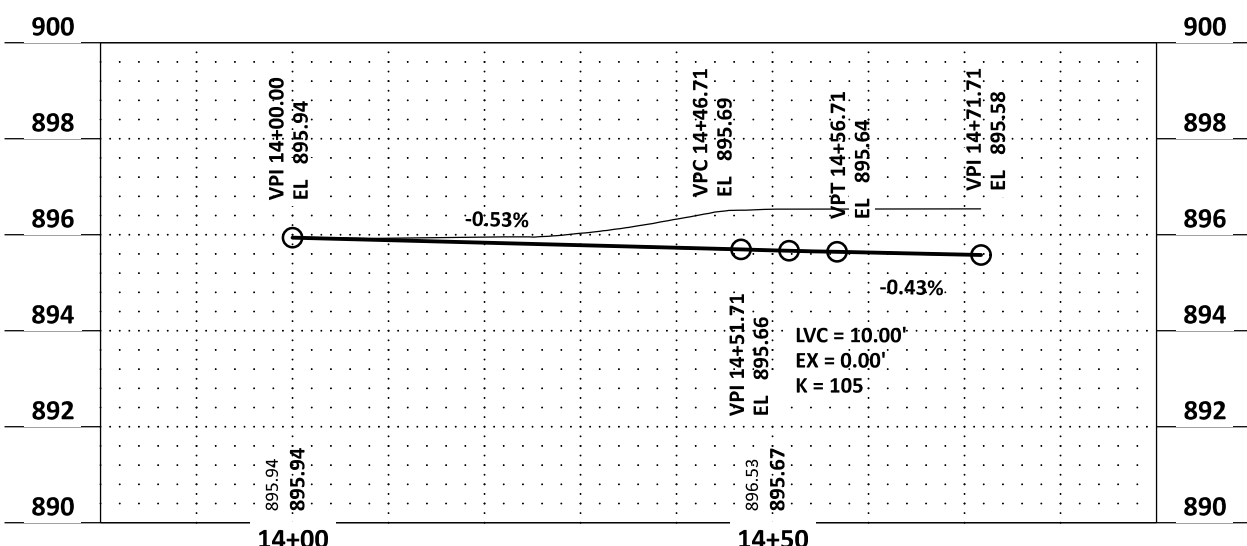
OAKWOOD ST N - NORTHEAST QUAD PROFILE



OAKWOOD ST S - SOUTHEAST QUAD PROFILE



OAKWOOD ST S - NORTHEAST QUAD PROFILE



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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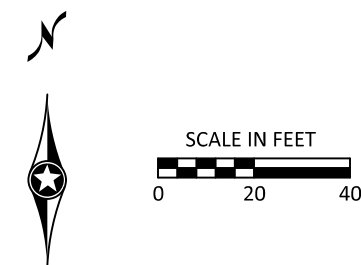
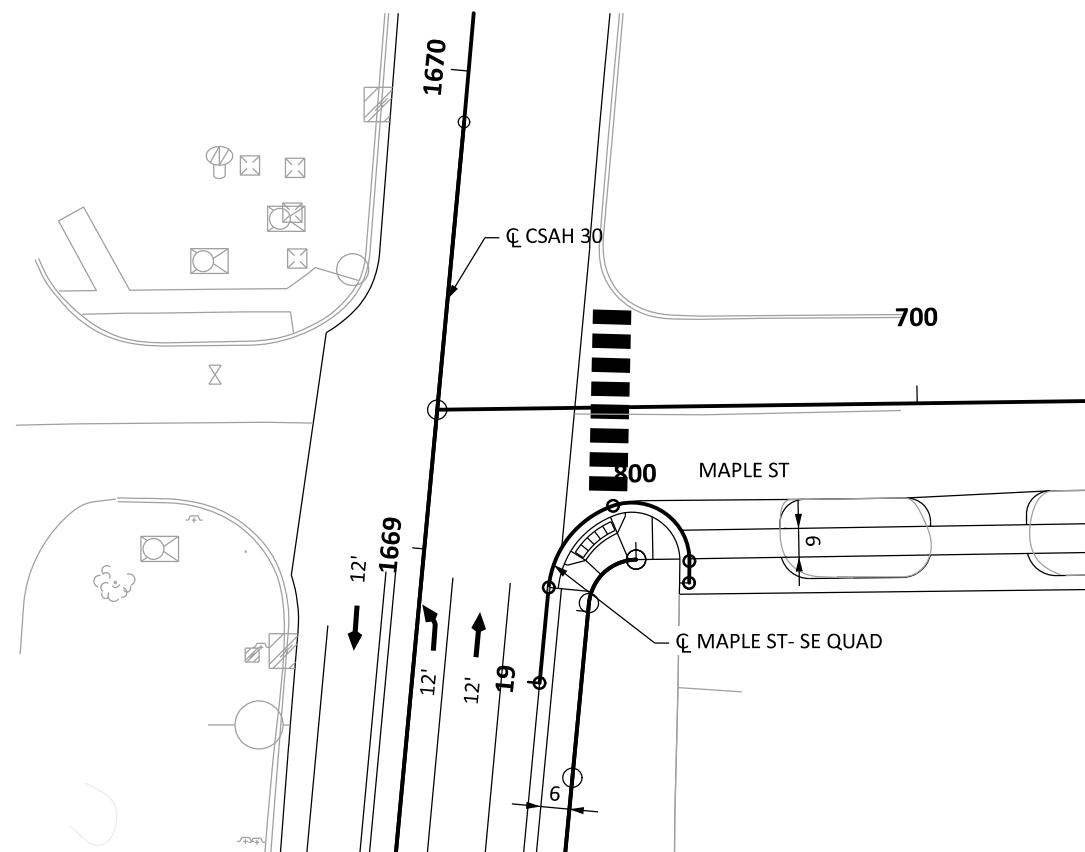
NICHOLAS E. HENTGES, PE
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 153 OF 216 SHEETS



	TRAFFIC FLOW
	DRAINAGE FLOW ARROW
	CONSTRUCTION LIMITS
	EXISTING R/W
	PROPOSED R/W
	TEMPORARY EASEMENT
	PERMANENT EASEMENT

[illegible]

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
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CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

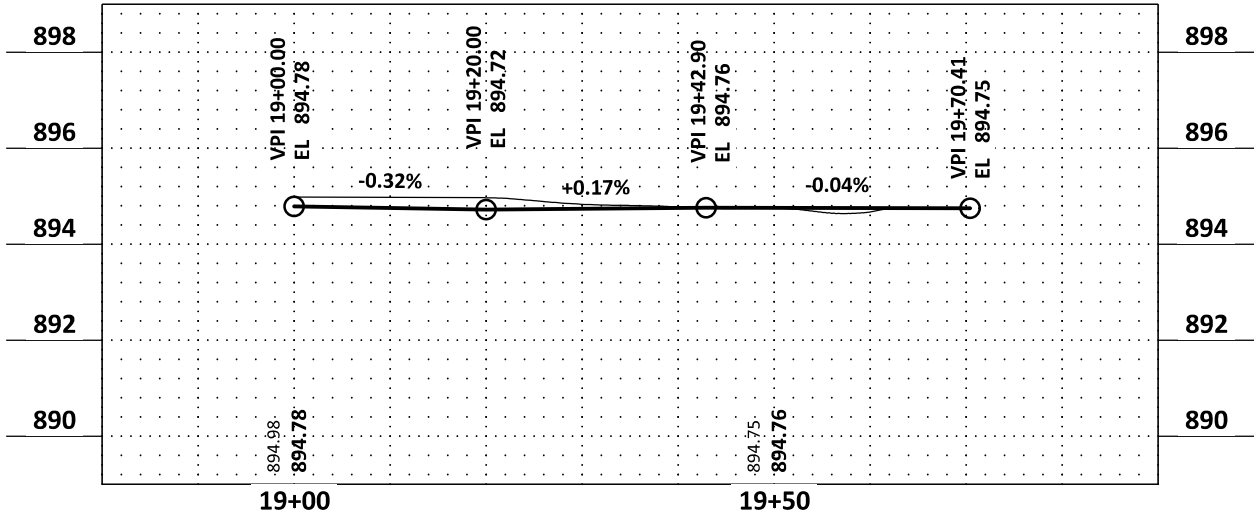
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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OF
216
SHEETS

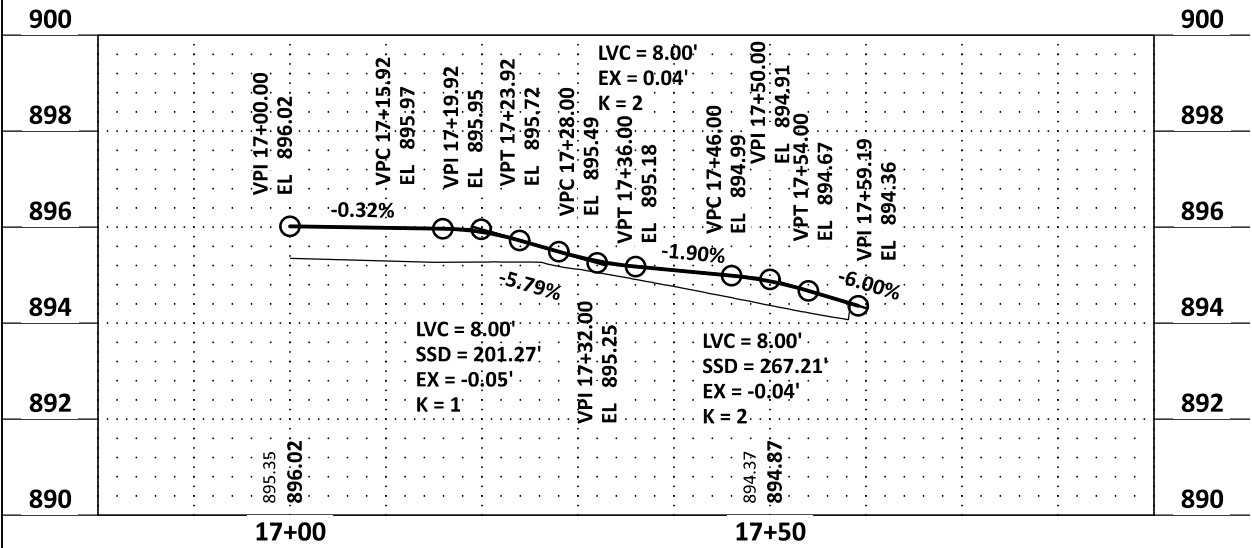
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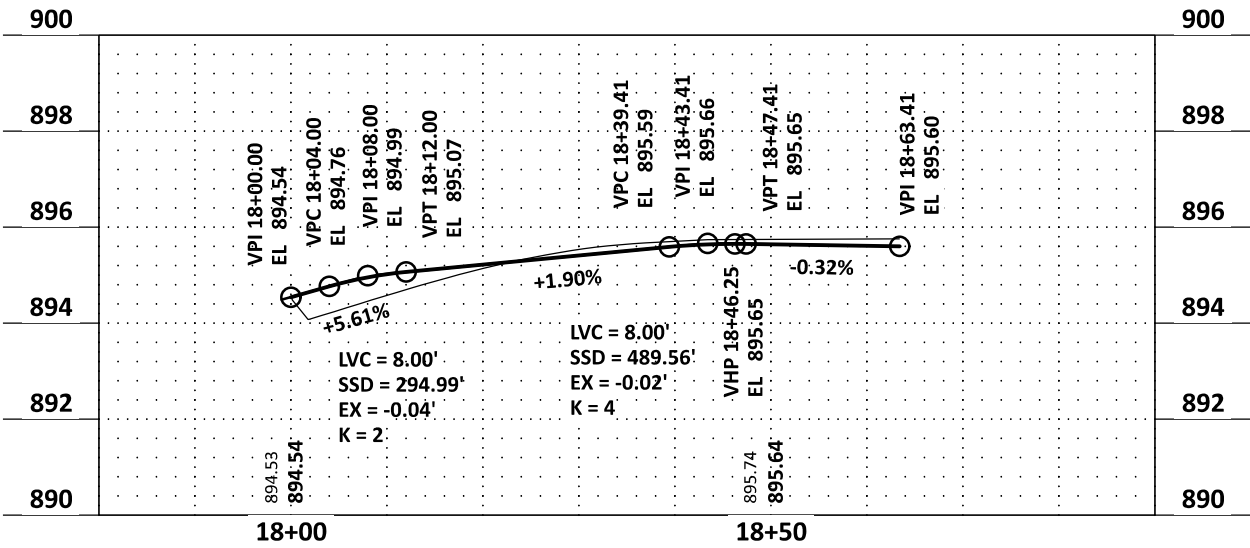
MAPLE ST - SOUTHEAST QUAD PROFILE



OAK ST - SOUTHEAST QUAD PROFILE



OAK ST - NORTHEAST QUAD PROFILE



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
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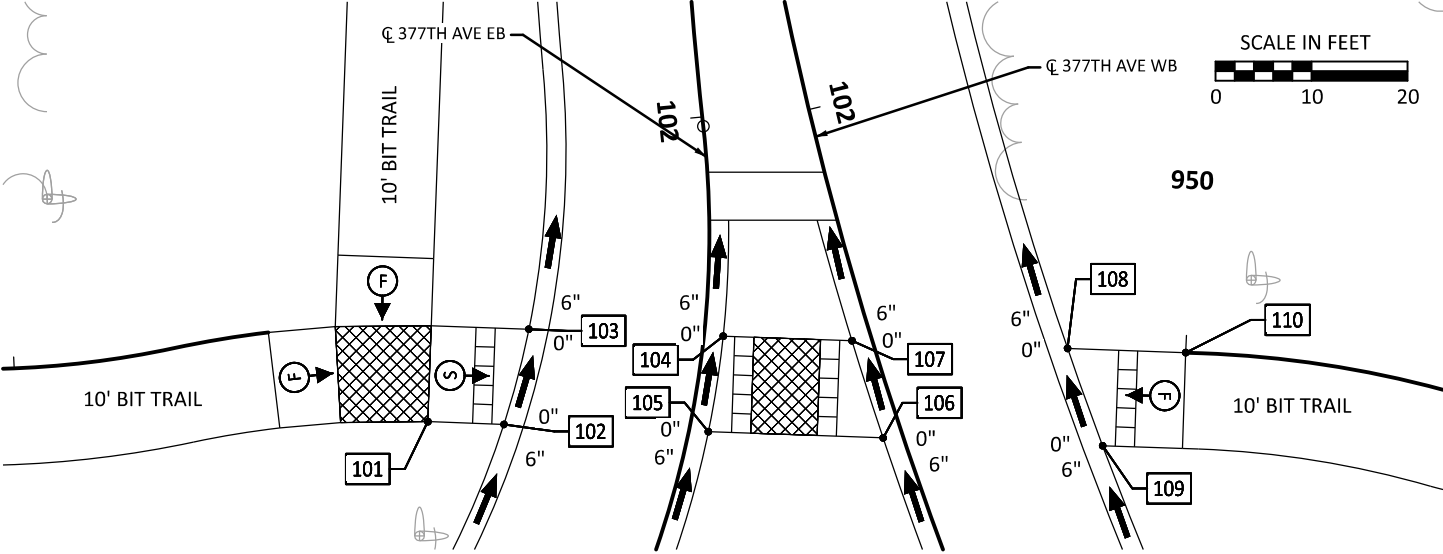
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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OF
216
SHEETS

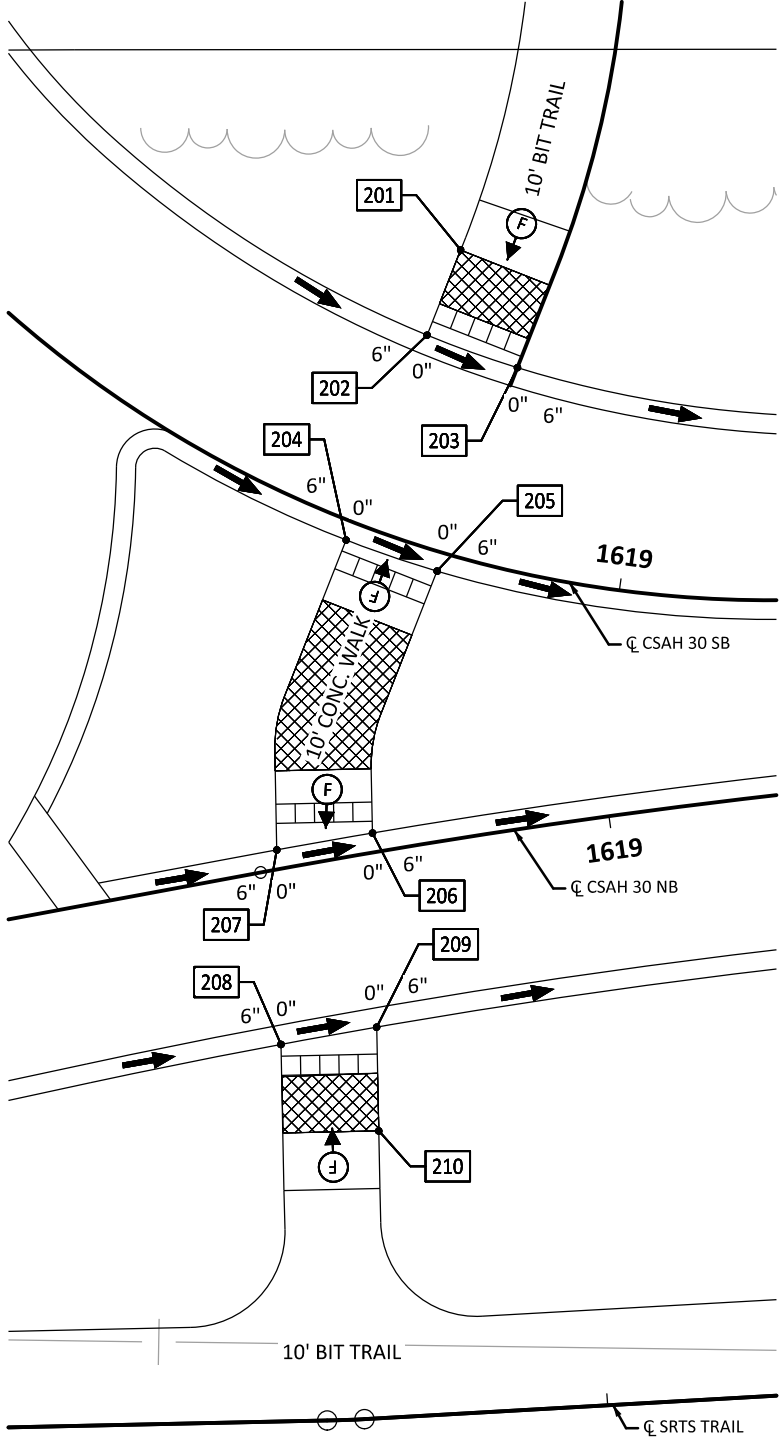
CSAH 30 AT 377TH ST WEST LEG



POINT NO.	X	Y	ELEV
101	526135.73	172840.07	917.12
102	526136.02	172847.99	916.64
103	526126.10	172850.58	916.49
104	526126.82	172870.83	916.78
105	526136.78	172869.28	917.03

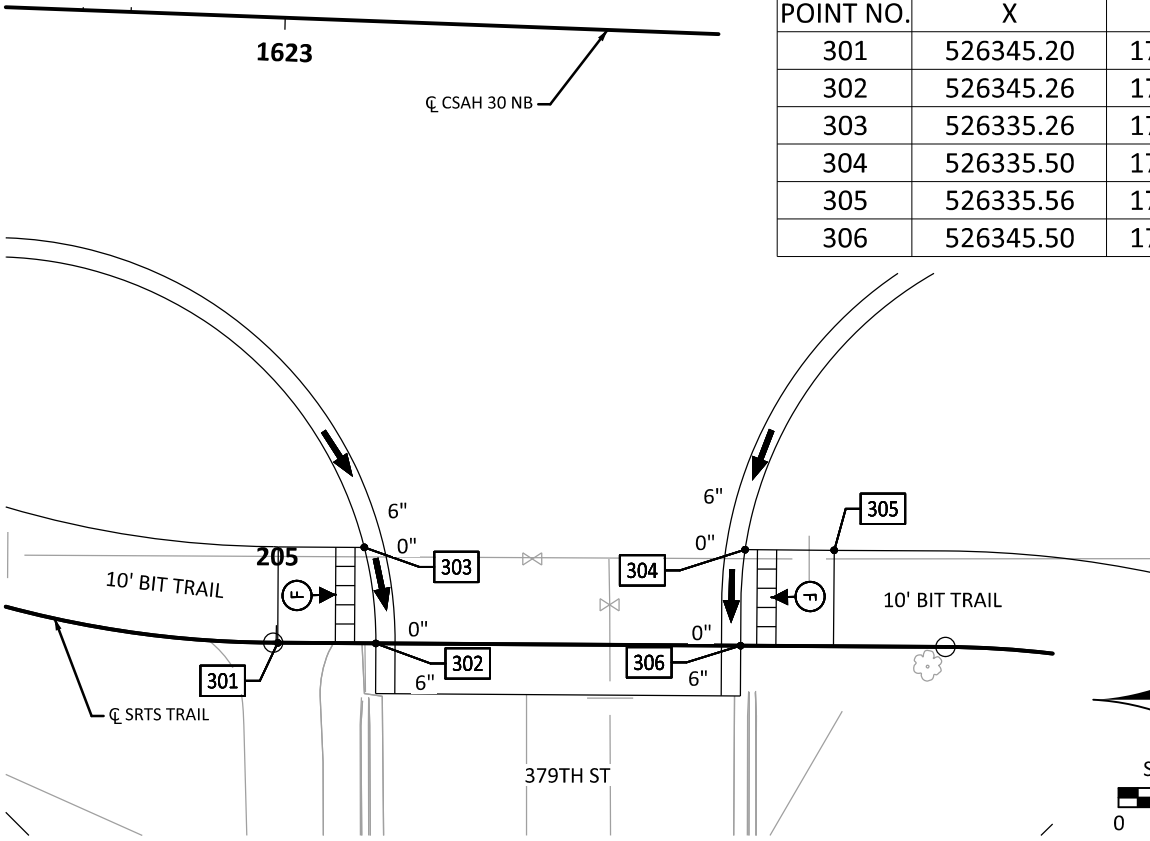
106	526137.42	172887.49	916.82
107	526127.30	172884.24	916.70
108	526128.13	172906.70	916.45
109	526138.24	172910.35	916.57
110	526128.54	172919.01	916.76

CSAH 30 AT 377TH ST NORTH LEG



POINT NO.	X	Y	ELEV
201	526217.88	172984.03	916.14
202	526226.74	172980.54	915.81
203	526230.12	172989.95	915.63
204	526248.08	172972.11	916.20
205	526251.32	172981.59	916.05
206	526278.60	172974.86	915.98
207	526280.36	172964.89	916.13
208	526300.62	172965.32	915.86
209	526298.82	172975.28	915.70
210	526315.63	172975.64	916.08

CSAH 30 AT 379TH ST



POINT NO.	X	Y	ELEV
301	526345.20	173398.20	909.11
302	526345.26	173408.41	908.75
303	526335.26	173407.21	908.94
304	526335.50	173446.88	908.94
305	526335.56	173456.16	909.26
306	526345.50	173446.41	908.75

LEGEND

XXX

CONTROL POINTS AT PED. RAMP AND GUTTER FLOW LINE

DRAINAGE FLOW ARROW

CATCH BASIN

TRUNCATED DOMES

X"

CURB HEIGHT

LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS

INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

MAX. 2.0% SLOPE IN ALL DIRECTIONS

GENERAL NOTES

- MAINTAIN A MINIMUM 4' WIDE PEDESTRIAN ACCESS ROUTE OBSTRUCTION TO OBSTRUCTION AND/OR OBSTRUCTION TO FAR EDGE OF WALK.

- THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL NOT EXCEED 0.020 FT/FT

- PROVIDE A SAWCUT (INCIDENTAL) AT ALL CONCRETE WALK AND BITUMINOUS TRAIL REMOVAL LIMITS.

- ALL CURB RAMPS AND LANDING AREAS SHALL BE 6" CONCRETE WALK ON 6" AGGREGATE BASE (CV) CLASS 5 AND 12" SELECT GRANULAR EMBANKMENT.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH

Plan By: MKV

Checked By: MAN

Approved By: NEH

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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024

LICENSE NO. 44620

wsb

CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

PEDESTRIAN RAMP DETAILS

SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 156 OF 216 SHEETS

POINT NO.	X	Y	ELEV
401	526359.43	174409.24	897.47
402	526359.77	174418.88	897.13
403	526349.75	174418.54	897.32
404	526350.89	174448.21	897.07
405	526351.14	174457.13	897.38
406	526360.81	174447.86	896.98

1634

☐ CSAH 30 NB

215

10' BIT TRAIL

☐ 401

☐ 402

☐ 403

☐ 404

☐ 405

☐ 406

10' BIT TRAIL

☐ SRTS TRAIL

381ST ST

SCALE IN FEET

0 10 20

POINT NO.	X	Y	ELEV
501	526354.13	175029.55	892.44
502	526351.47	175031.05	892.39
503	526363.50	175042.78	892.10
504	526366.45	175072.92	892.09
505	526352.80	175079.79	892.41
506	526356.23	175090.86	892.53

1640

CSAH 30 NB

10' BIT TRAIL

6"

0"

501

502

503

6"

0"

504

505

506

10' BIT TRAIL

6"

0"

0"

6"

SRTS TRAIL

382ND ST

SCALE IN FEET

0 10 20

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

wsb



CSAH 30 (Forest Blvd) Improvements

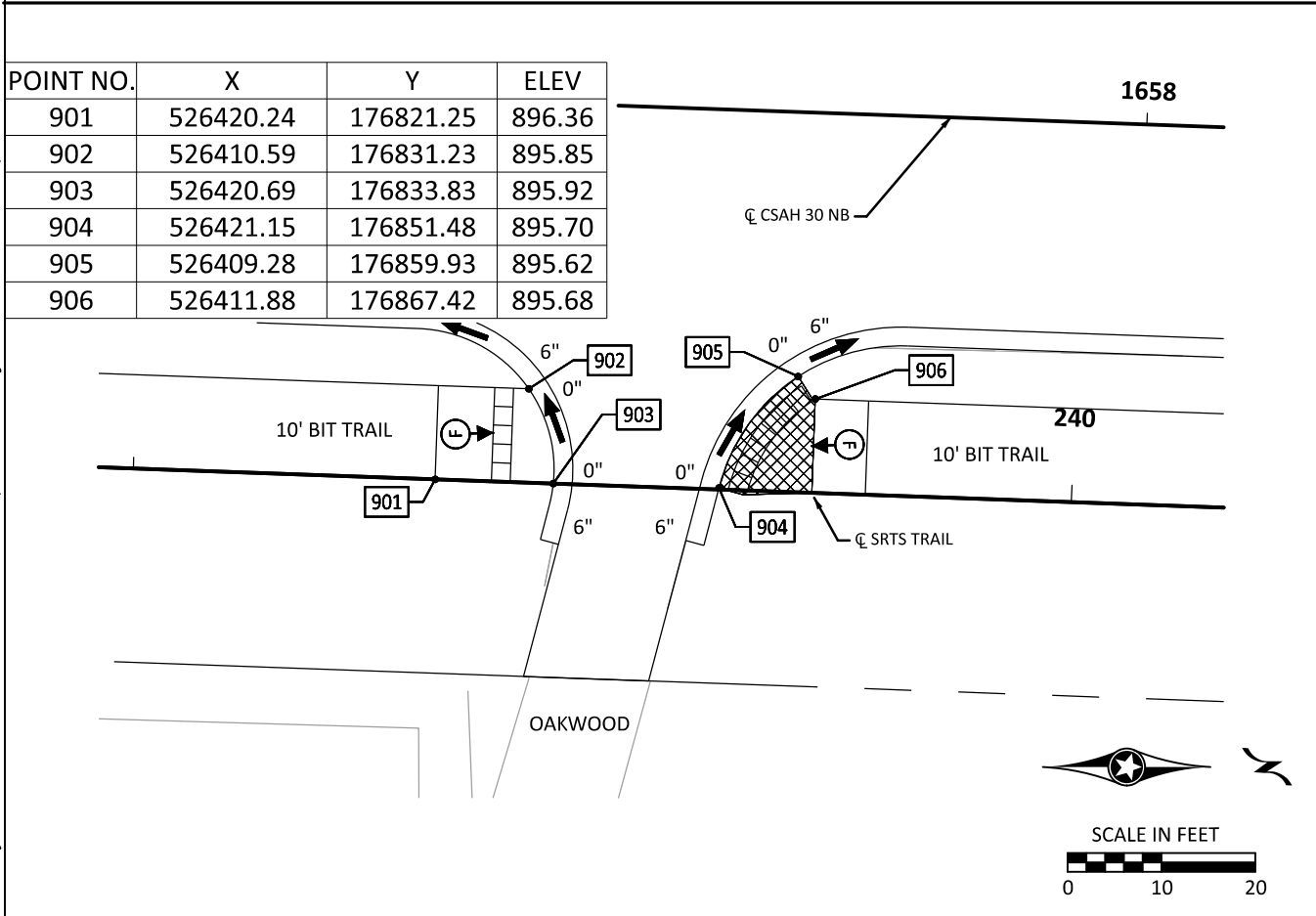
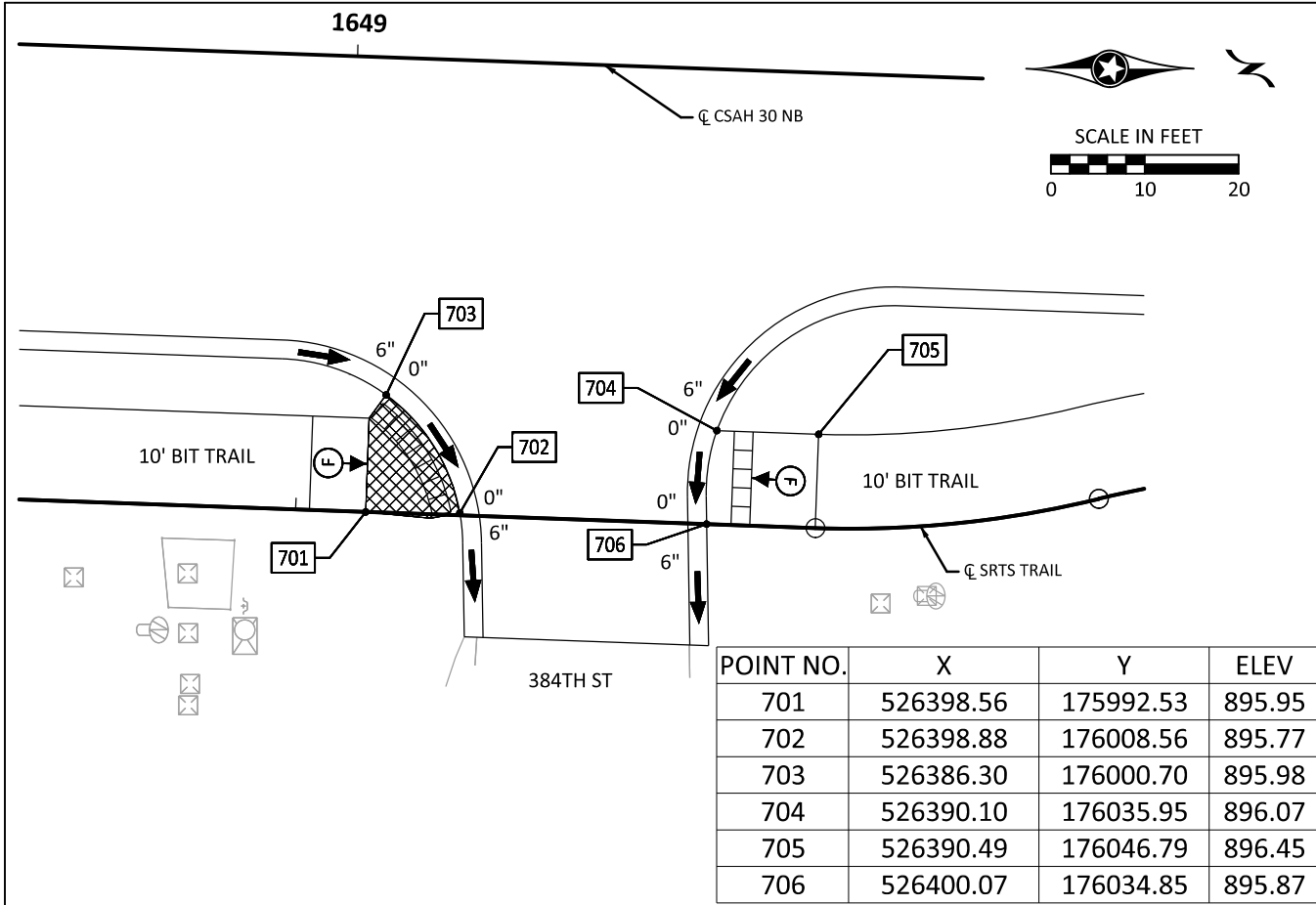
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

PEDESTRIAN RAMP DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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OF
216
SHEETS

DATE: 9/12/2024 2:06:42 PM
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NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620

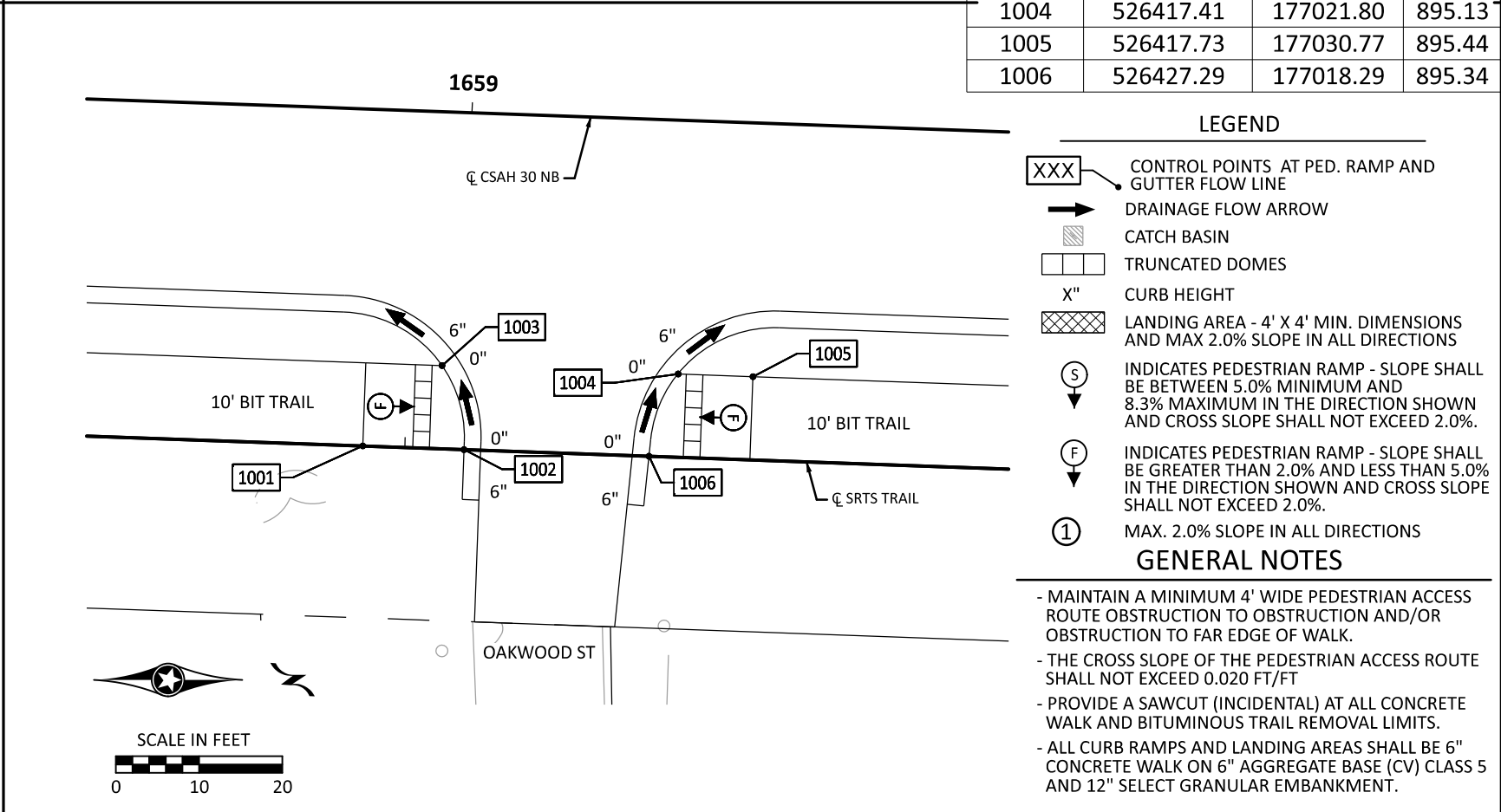
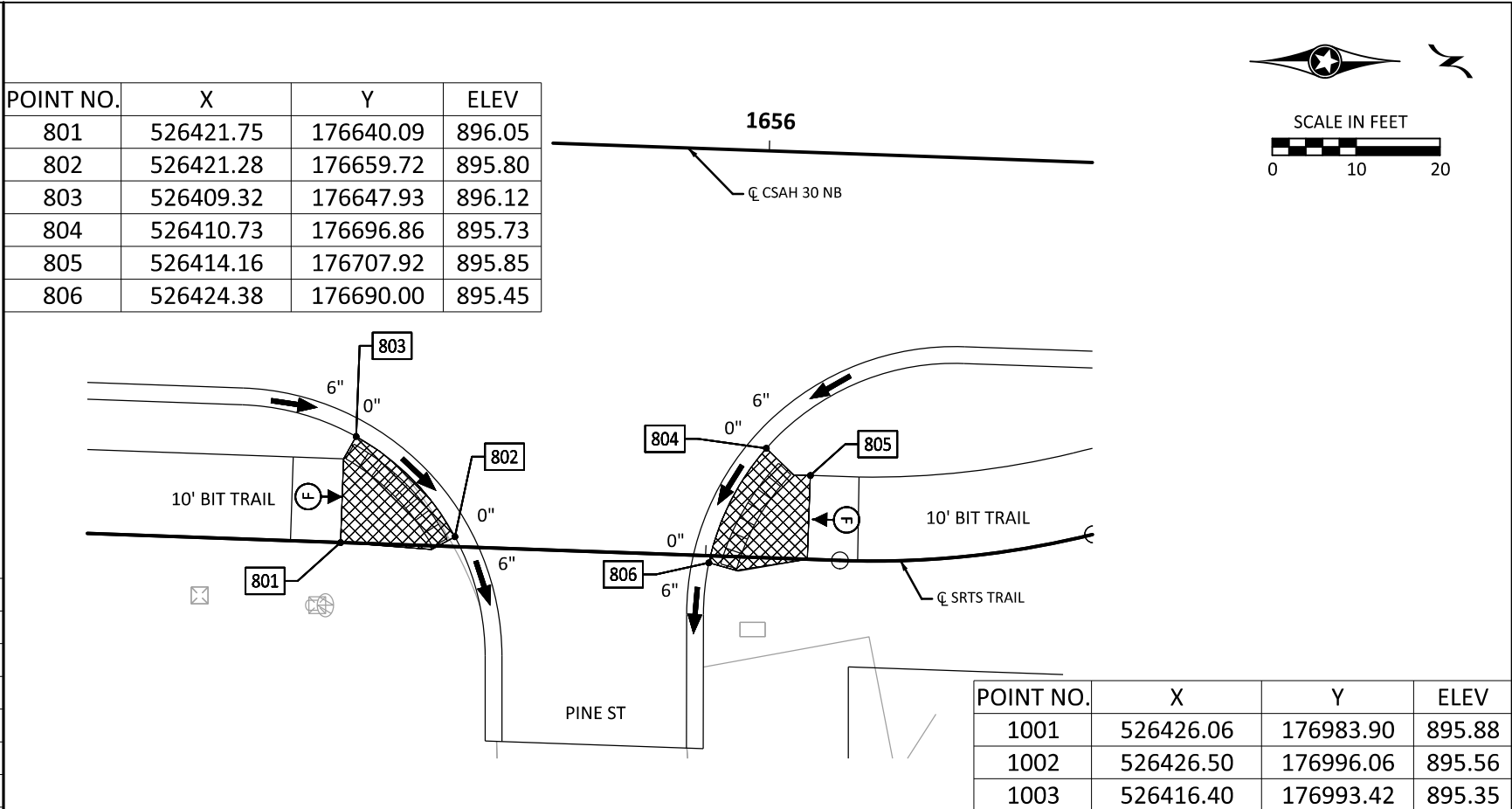


CSAH 30 (Forest Blvd) Improvements
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CHISAGO COUNTY, MINNESOTA

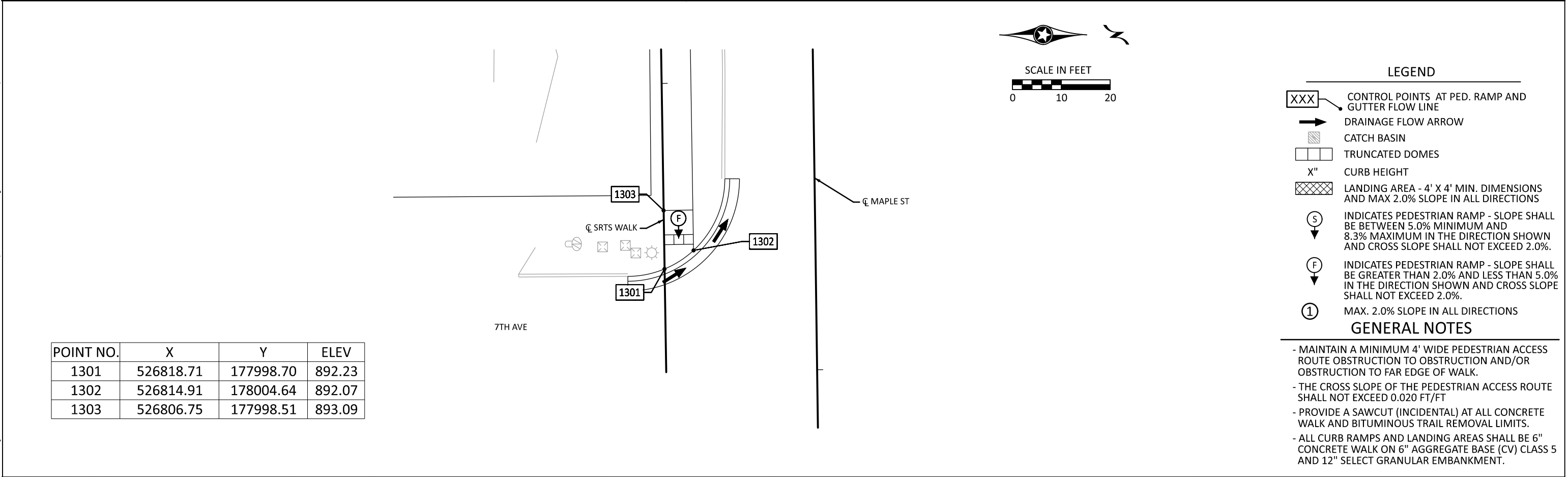
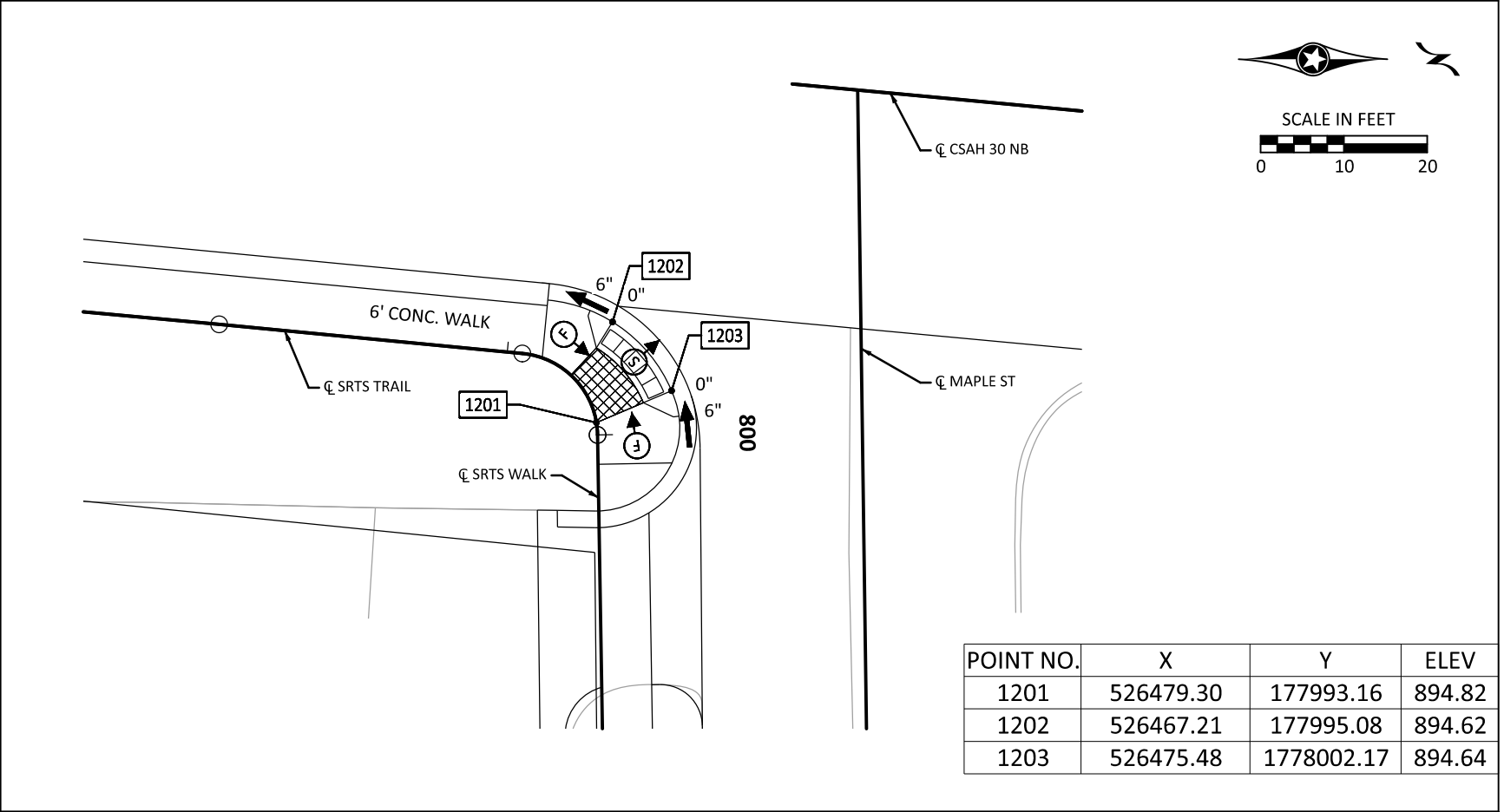
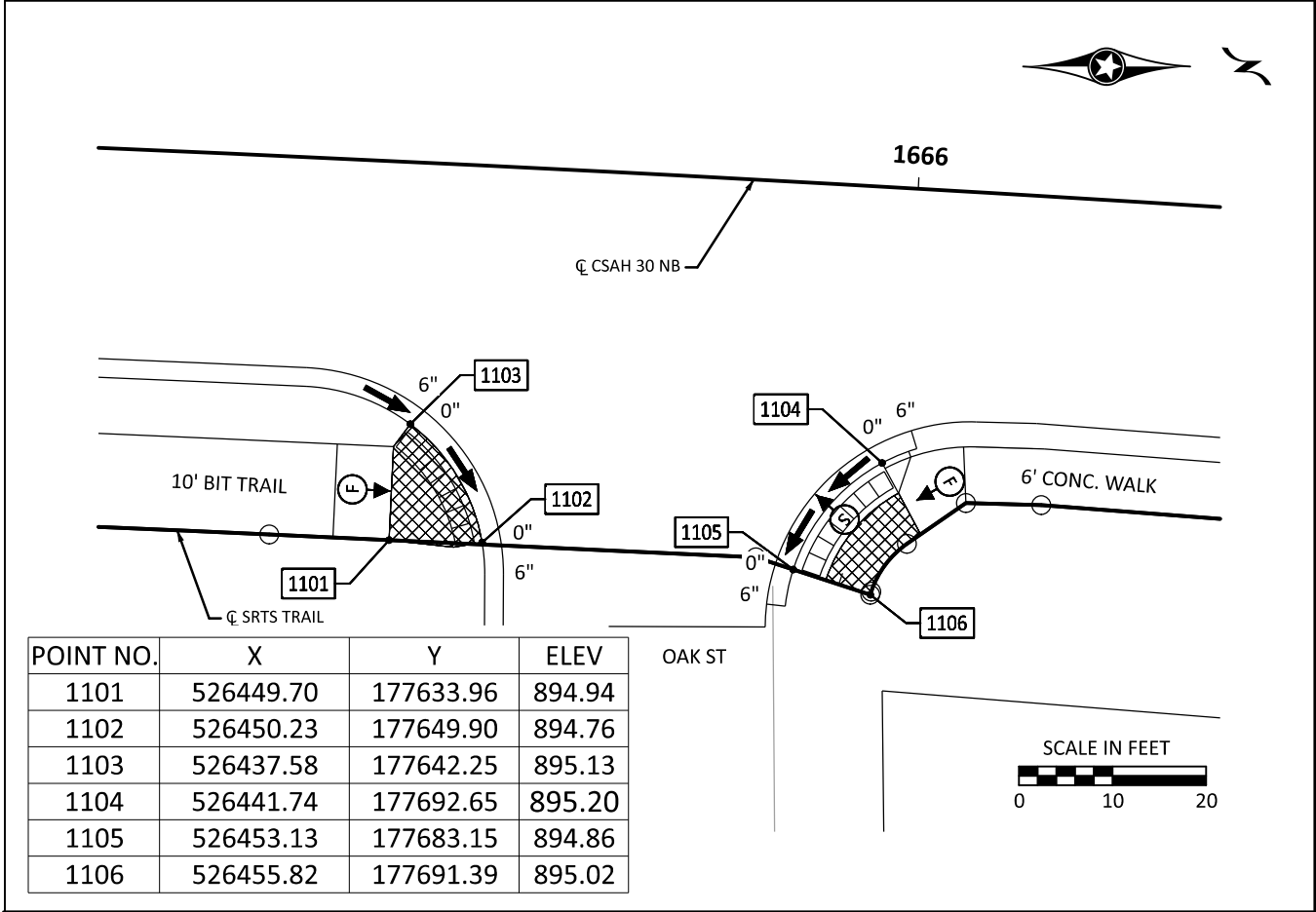
PEDESTRIAN RAMP DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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OF
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SHEETS



- LEGEND
- XXX CONTROL POINTS AT PED. RAMP AND GUTTER FLOW LINE
 - DRAINAGE FLOW ARROW
 - CATCH BASIN
 - TRUNCATED DOMES
 - X" CURB HEIGHT
 - LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
 - INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.
 - INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.
 - ① MAX. 2.0% SLOPE IN ALL DIRECTIONS
- GENERAL NOTES
- MAINTAIN A MINIMUM 4' WIDE PEDESTRIAN ACCESS ROUTE OBSTRUCTION TO OBSTRUCTION AND/OR OBSTRUCTION TO FAR EDGE OF WALK.
 - THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL NOT EXCEED 0.020 FT/FT
 - PROVIDE A SAWCUT (INCIDENTAL) AT ALL CONCRETE WALK AND BITUMINOUS TRAIL REMOVAL LIMITS.
 - ALL CURB RAMPS AND LANDING AREAS SHALL BE 6" CONCRETE WALK ON 6" AGGREGATE BASE (CV) CLASS 5 AND 12" SELECT GRANULAR EMBANKMENT.

DATE: 9/12/2024 2:06:43 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ped



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024
LICENSE NO. 44620

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

PEDESTRIAN RAMP DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 159 OF 216 SHEETS

DATE: 9/12/2024 2:06:55 PM
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POINT NO.	X	Y	ELEV
2200	526328.21	170507.86	911.93
2201	526362.80	170501.71	909.78
2202	526362.60	170513.90	909.95
2203	526327.96	170523.49	911.86

POINT NO.	X	Y
RP2200	526350.60	170483.56
RP2201	526349.73	170538.21

POINT NO.	X	Y	ELEV
2300	526324.00	170773.25	910.79
2301	526353.85	170777.11	907.94
2302	526353.55	170796.48	907.86
2303	526323.63	170796.57	910.69

POINT NO.	X	Y
RP2300	526346.28	170755.96
RP2301	526345.32	170816.51

POINT NO.	X	Y	ELEV
2400	526351.21	171400.40	911.77
2401	526377.48	171426.79	910.99
2402	526378.99	171439.97	910.74
2403	526397.51	171437.85	910.68
2404	526430.34	171407.75	910.27
2405	526447.60	171387.28	910.12
2406	526438.23	171372.56	907.68
2407	526424.02	171372.41	908.34
2408	526411.52	171383.87	910.54

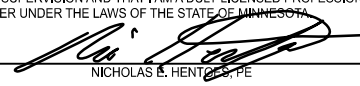
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RP2400	526347.68	171430.19
RP2401	526427.51	171437.61
RP2402	526448.55	171377.33
RP2403	526412.47	171373.91

POINT NO.	X	Y	ELEV
2500	526344.63	172054.65	921.00
2501	526350.86	172048.91	918.31
2502	526392.48	172048.35	918.23
2503	526412.61	172058.08	919.35

POINT NO.	X	Y
RP2500	526300.36	172000.43
RP2501	526412.28	172033.08

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



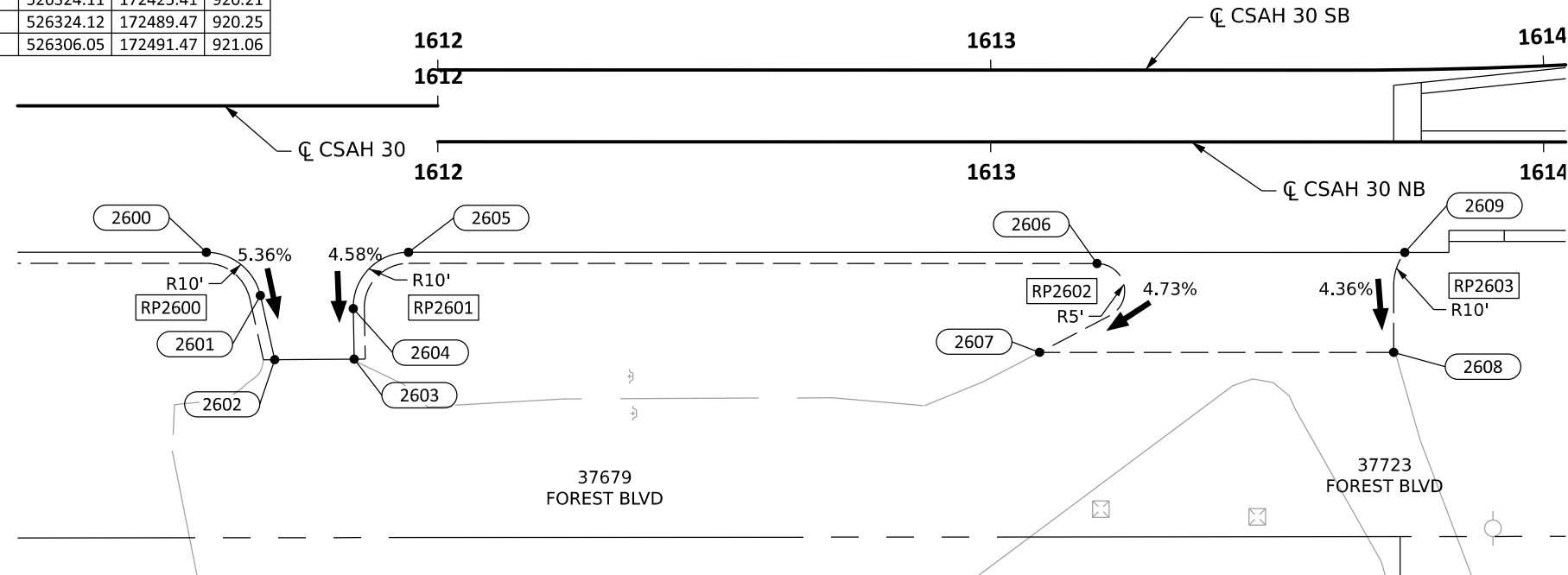
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
DRIVEWAY DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

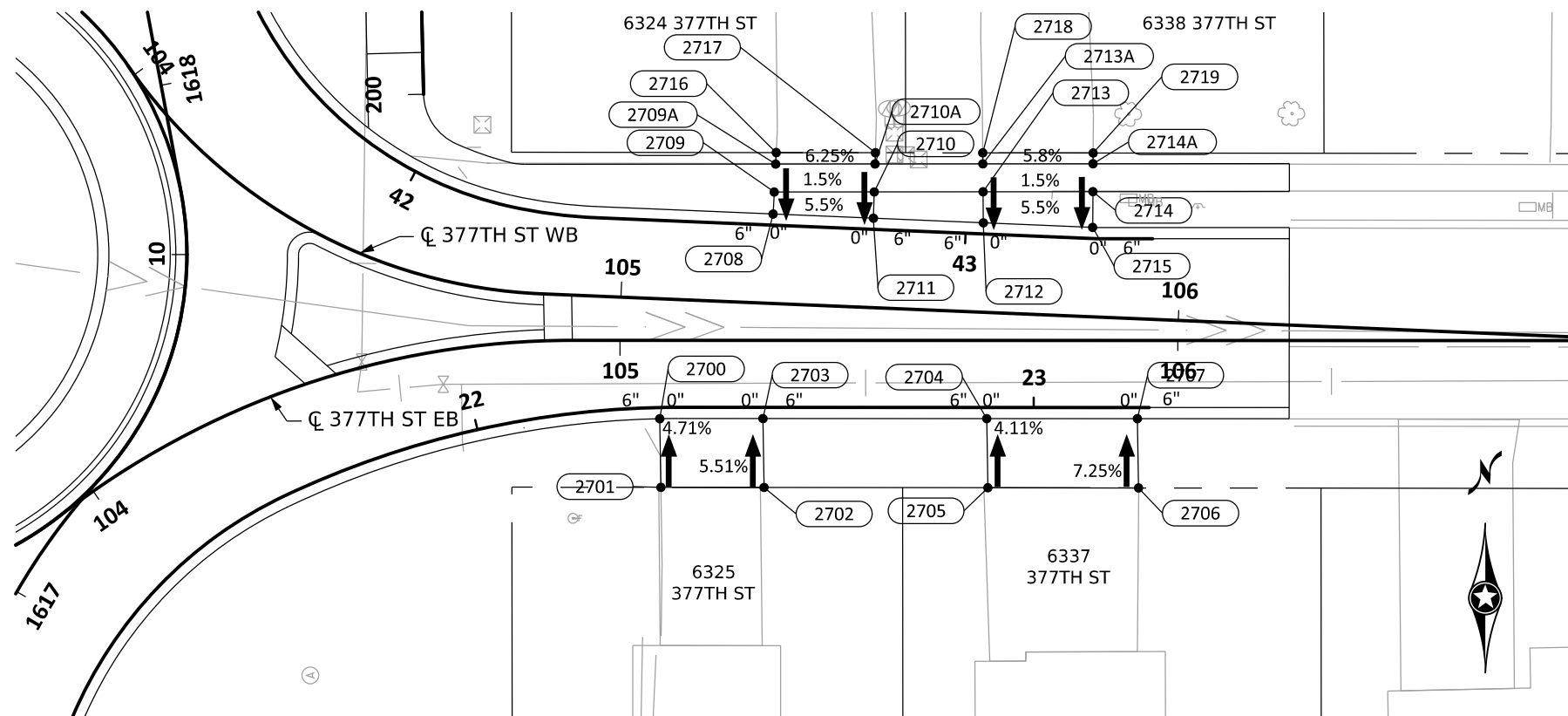
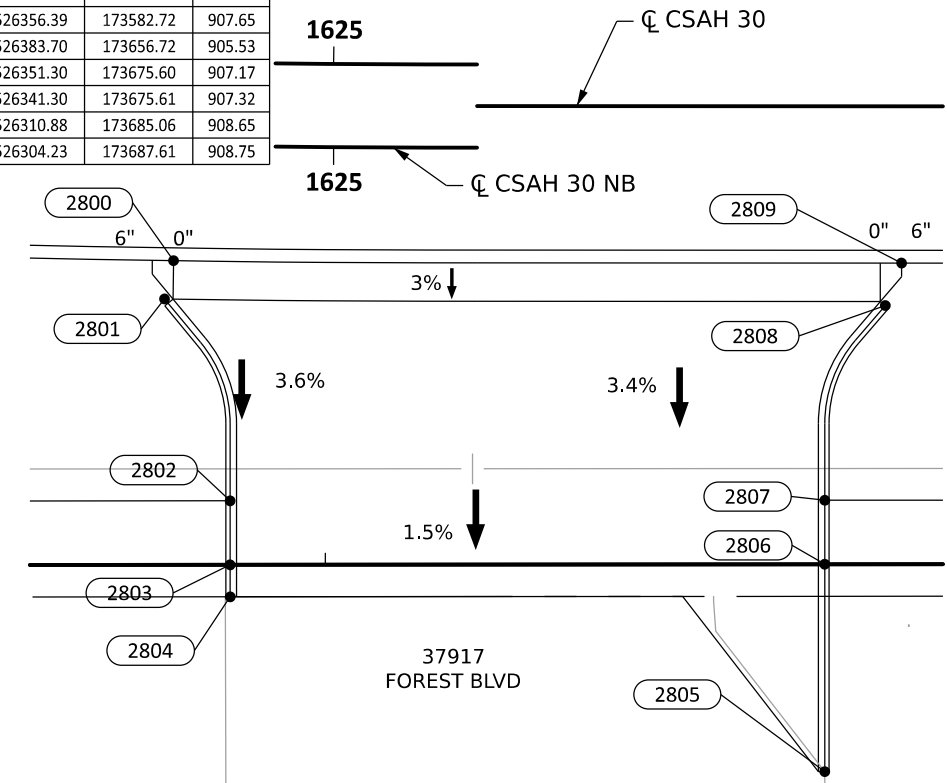
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OF
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SHEETS

POINT NO.	X	Y	ELEV.
2600	526306.02	172274.73	922.40
2601	526313.84	172284.49	921.68
2602	526325.46	172287.08	921.04
2603	526325.35	172301.46	921.10
2604	526316.21	172301.29	921.52
2605	526306.02	172311.29	922.25
2606	526308.04	172435.82	921.51
2607	526324.11	172425.41	920.21
2608	526324.12	172489.47	920.25
2609	526306.05	172491.47	921.06

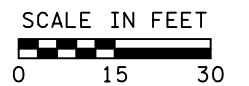
POINT NO.	X	Y
RP2600	526316.02	172274.73
RP2601	526316.02	172311.29
RP2602	526313.04	172435.82
RP2603	526312.05	172499.47



POINT NO.	X	Y	ELEV
2800	526303.84	173572.54	909.66
2801	526309.84	173572.45	909.48
2802	526341.39	173582.70	908.24
2803	526351.39	173582.71	908.09
2804	526356.39	173582.72	907.65
2805	526383.70	173656.72	905.53
2806	526351.30	173675.60	907.17
2807	526341.30	173675.61	907.32
2808	526310.88	173685.06	908.65
2809	526304.23	173687.61	908.75



POINT NO.	X	Y	ELEV
2700	526383.65	172841.26	915.47
2701	526383.85	172828.98	916.05
2702	526402.35	172828.96	915.59
2703	526402.15	172841.29	914.97
2704	526442.27	172841.28	913.97
2705	526442.47	172828.91	914.42
2706	526469.48	175828.88	914.07
2707	526469.28	172841.28	913.12
2708	526403.97	172877.95	914.87
2709	526404.17	172881.89	915.02
2709A	526404.42	172886.89	915.09
2710	526422.09	172881.91	914.59
2710A	526422.24	172886.91	914.66
2711	526421.95	172877.19	914.33
2712	526441.66	172876.37	913.77
2713	526441.61	172881.93	914.08
2713A	526441.57	172886.93	914.15
2714	526461.29	172881.96	913.57
2714A	526461.32	172886.96	913.64
2715	526461.25	172875.55	913.27
2716	526404.53	172888.95	915.23
2717	526422.30	172888.93	914.79
2718	526441.55	172888.91	914.27
2719	526461.33	172888.89	913.76



LEGEND

-  CONTROL POINTS
 RADIUS CALLOUT
 PROPOSED CATCH BASIN
 CONSTRUCT CONCRETE CURB AND GUTTER
 DRAINAGE FLOW ARROW
 CONSTRUCTION LIMITS
 EX RIGHT OF WAY
 RIGHT OF WAY
 TEMPORARY EASEMENT
 PERMANENT EASEMENT DRAINAGE/ UTIL
 INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.
 SEE CITY OF NORTH BRANCH STD PLATE RDW-005 (RESIDENTIAL CONCRETE DRIVEWAY ENTRANCES)
 SEE CITY OF NORTH BRANCH STD PLATE RDW-008 (RESIDENTIAL BITUMINOUS DRIVEWAY ENTRANCE)

NOTES:

1. SEE MISCELLANEOUS DETAILS FOR DRIVEWAY DETAILS.
2. SEE DRIVEWAY TAB FOR QUANTITY INFORMATION.

[illegible]

Design By:
Plan By:
Checked By:
Approved By:

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DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL
ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA


NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

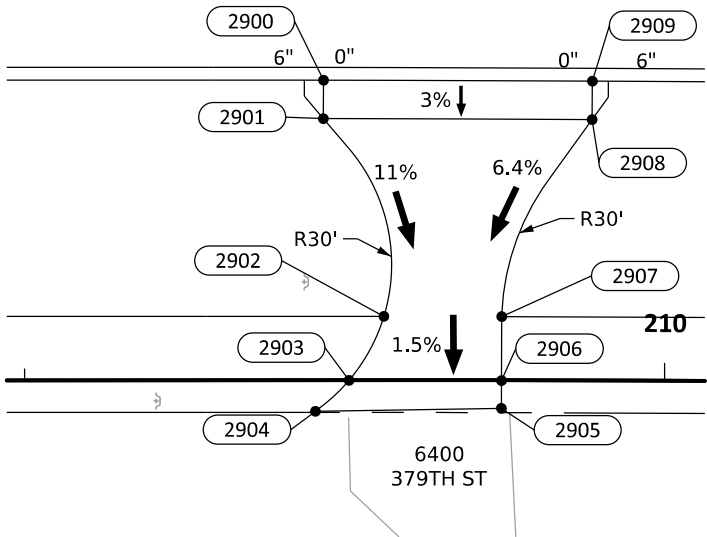
CHISAGO COUNTY, MINNESOTA

DRIVEWAY DETAILS

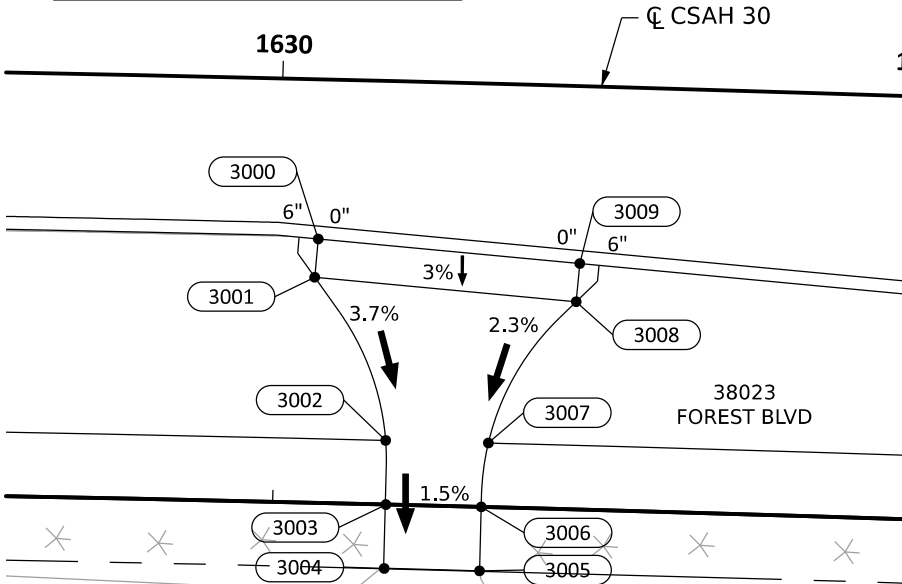
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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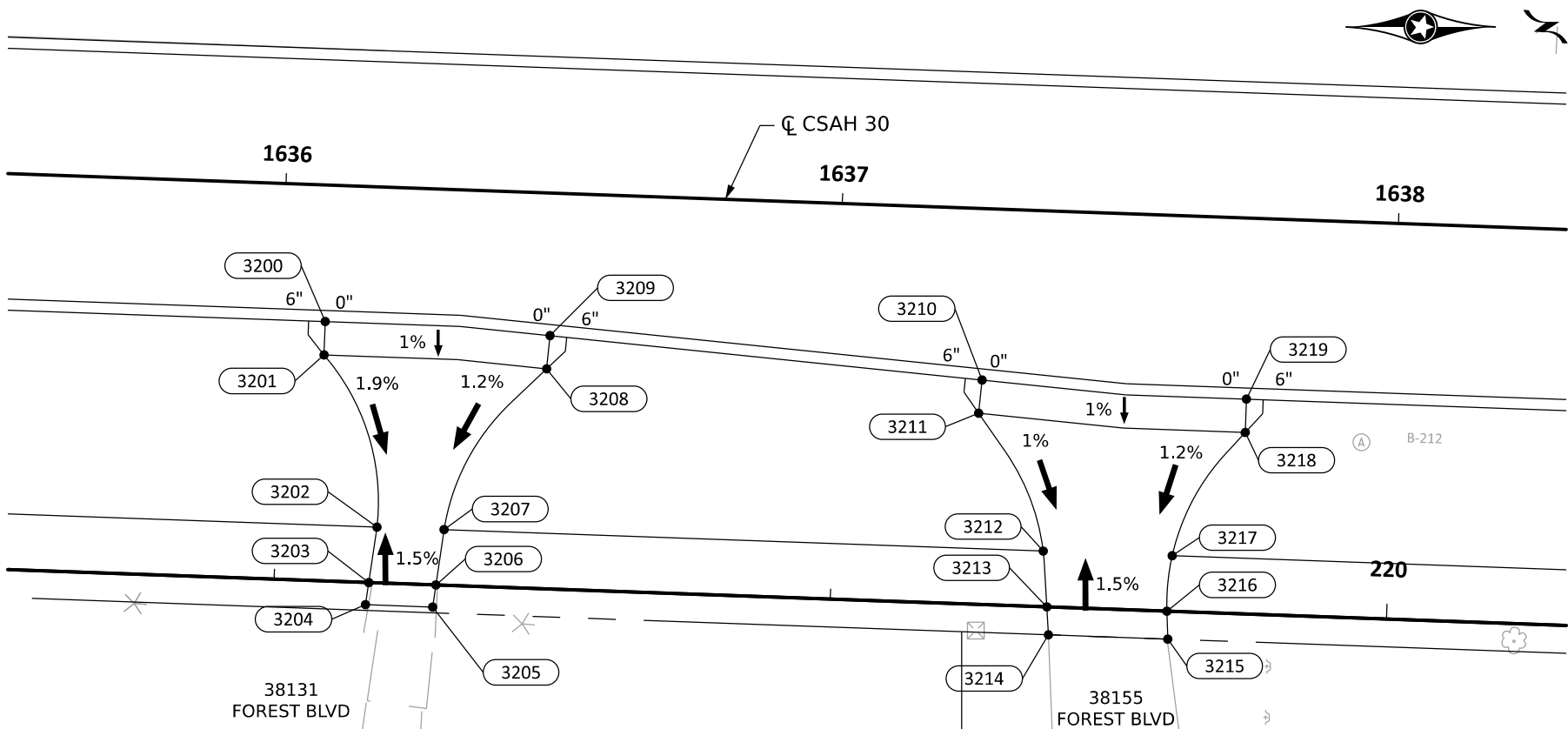
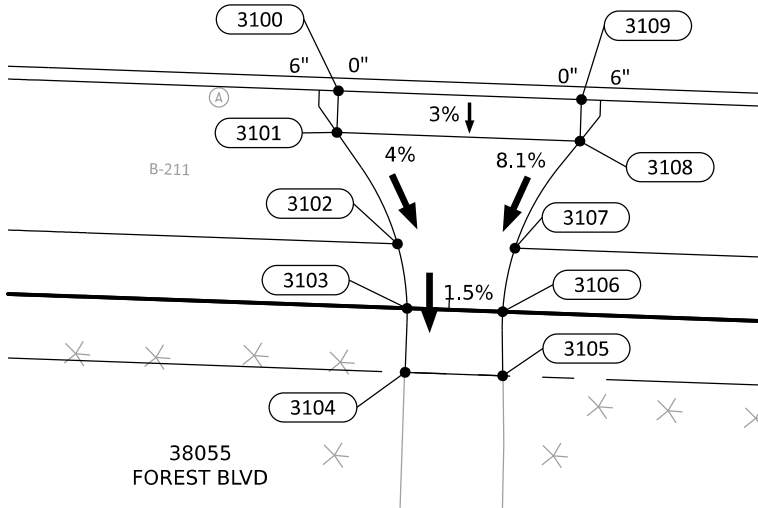
POINT NO.	X	Y	ELEV
2900	526304.26	173844.27	907.47
2901	526310.26	173844.26	907.29
2902	526341.16	173853.71	903.57
2903	526351.15	173848.28	903.42
2904	526356.00	173842.96	903.06
2905	526355.52	173872.07	904.34
2906	526351.20	173872.09	904.41
2907	526341.20	173872.14	904.55
2908	526310.41	173886.26	906.76
2909	526304.41	173886.29	906.94



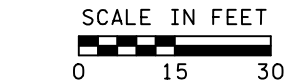
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3000	526308.10	174104.38	903.48
3001	526314.07	174103.82	903.30
3002	526339.57	174114.90	902.26
3003	526349.64	174114.85	902.11
3004	826359.55	174114.58	901.96
3005	526359.95	174129.58	901.68
3006	526349.95	174129.85	901.83
3007	526339.96	174130.96	901.98
3008	526317.90	174144.68	902.60
3009	526311.93	174145.24	902.78



POINT NO.	X	Y	ELEV
3100	526321.20	174279.87	899.95
3101	526327.69	174279.63	899.77
3102	526345.11	174289.09	898.98
3103	526355.17	174290.59	898.83
3104	526365.17	174290.30	898.68
3105	526365.72	174305.57	898.47
3106	526355.71	174305.53	898.62
3107	526345.77	174307.45	898.70
3108	526329.05	174317.61	900.37
3109	526322.56	174317.84	900.55



POINT NO.	X	Y	ELEV
3200	526328.44	174705.53	894.34
3201	526334.43	174705.32	894.28
3202	526365.38	174714.81	893.64
3203	526375.33	174713.35	893.79
3204	526379.29	174712.77	893.85
3205	526379.72	174724.83	893.65
3206	526375.77	174725.42	893.59
3207	526365.81	174726.89	893.44
3208	526336.94	174745.31	893.86
3209	526330.97	174745.92	893.92
3210	526338.94	174823.55	893.21
3211	826344.91	174822.94	893.15
3212	526369.67	174834.54	892.87
3213	526379.70	174835.18	893.02
3214	526384.71	174835.46	893.10
3215	526385.48	174856.91	892.76
3216	526380.57	174856.76	892.69
3217	526370.50	174857.71	892.54
3218	526348.37	174870.82	892.85
3219	526342.37	174871.04	892.91



- LEGEND**
- XXX • CONTROL POINTS
 - RXX' → RADIUS CALLOUT
 - PROPOSED CATCH BASIN
 - CONSTRUCT CONCRETE CURB AND GUTTER
 - DRAINAGE FLOW ARROW
 - CONSTRUCTION LIMITS
 - EX RIGHT OF WAY
 - RIGHT OF WAY
 - TEMPORARY EASEMENT
 - PERMANENT EASEMENT DRAINAGE/ UTIL
- Ⓢ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.
- ① SEE CITY OF NORTH BRANCH STD PLATE RDW-005 (RESIDENTIAL CONCRETE DRIVEWAY ENTRANCES)
- ② SEE CITY OF NORTH BRANCH STD PLATE RDW-008 (RESIDENTIAL BITUMINOUS DRIVEWAY ENTRANCE)
- NOTES:
- SEE MISCELLANEOUS DETAILS FOR DRIVEWAY DETAILS.
 - SEE DRIVEWAY TAB FOR QUANTITY INFORMATION.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

Nicholas E. Hentges, PE
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

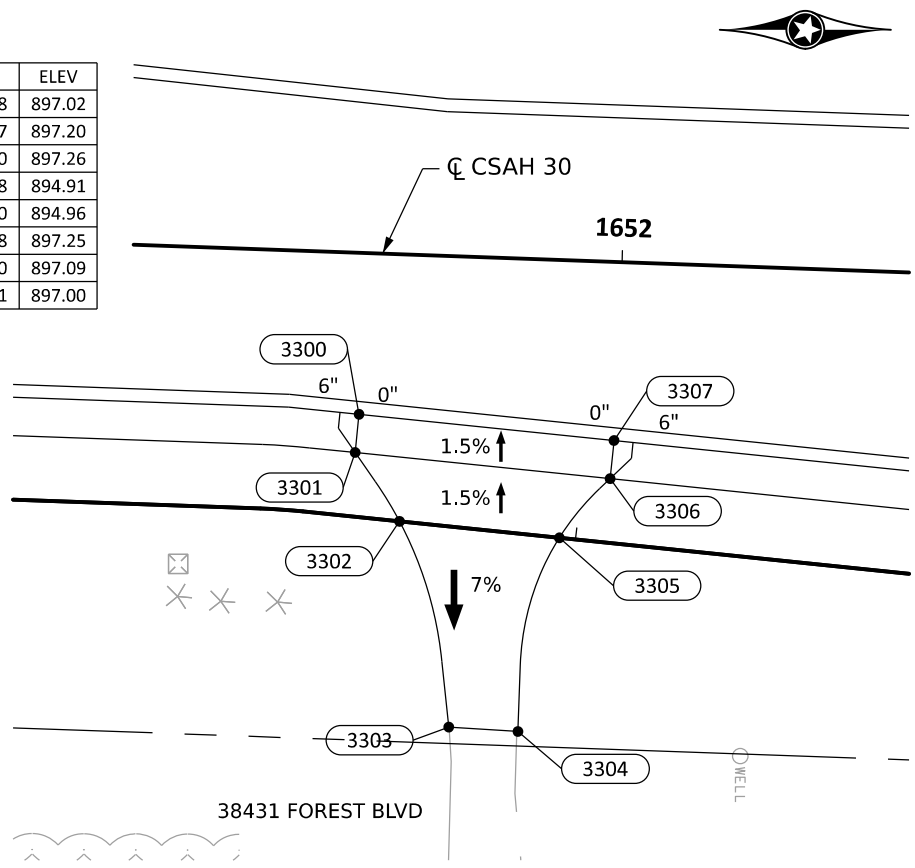
CHISAGO COUNTY, MINNESOTA

DRIVEWAY DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

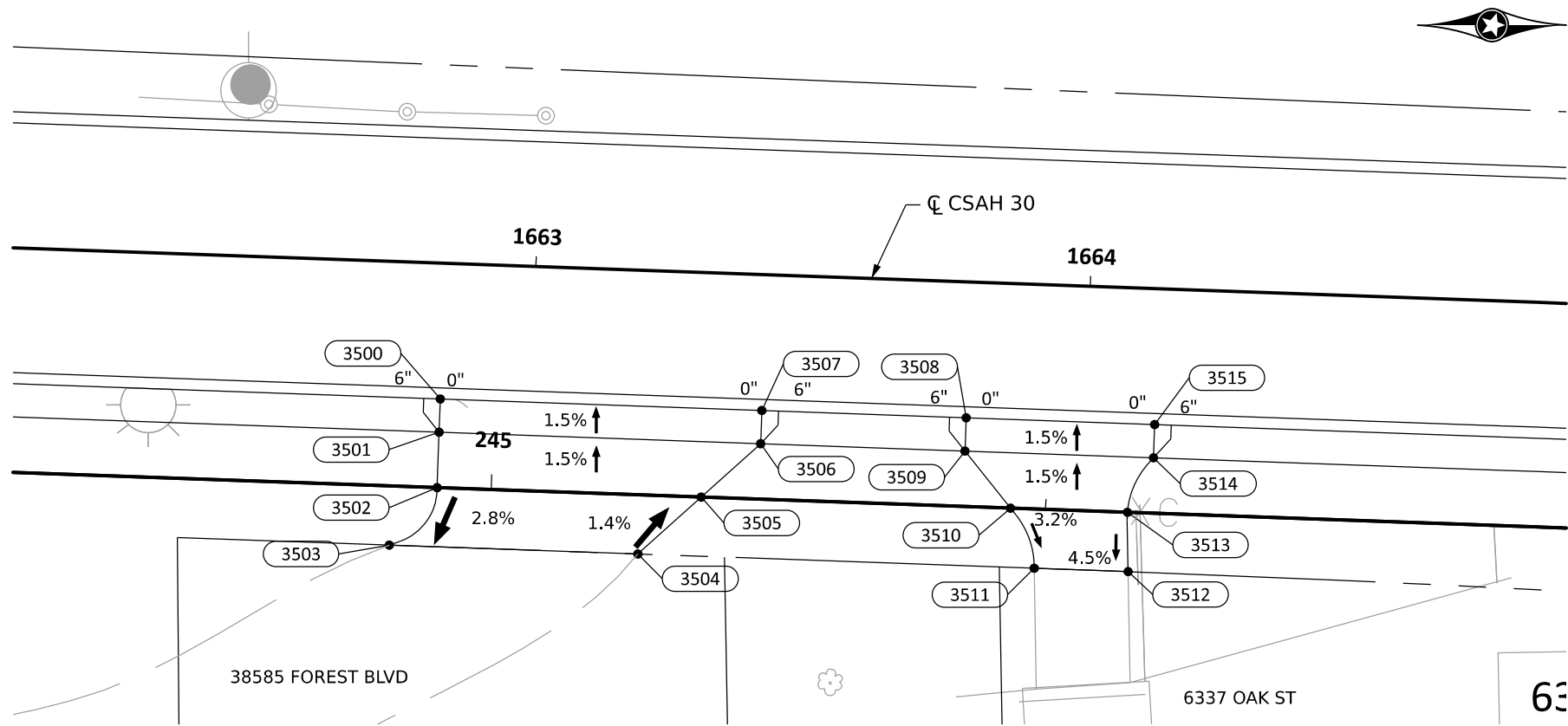
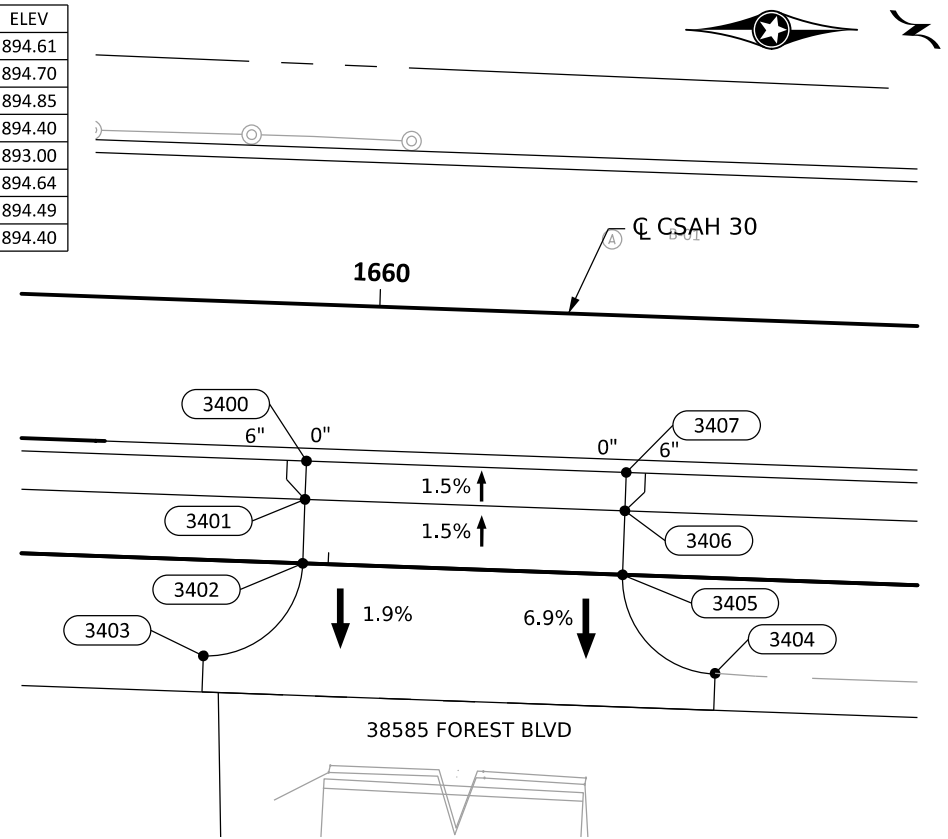
SHEET
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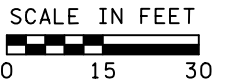
POINT NO.	X	Y	ELEV
3300	526384.73	174256.38	897.02
3301	526390.69	174255.77	897.20
3302	526401.46	174262.70	897.26
3303	526433.60	176270.38	894.91
3304	526434.28	176281.20	894.96
3305	526404.03	176287.68	897.25
3306	526394.79	176295.60	897.09
3307	526388.82	176296.21	897.00



POINT NO.	X	Y	ELEV
3400	526413.69	177085.49	894.61
3401	526419.69	177085.27	894.70
3402	526429.68	177084.92	894.85
3403	526444.13	177069.39	894.40
3404	526446.87	177149.34	893.00
3405	526431.47	177134.88	894.64
3406	526421.48	177135.24	894.49
3407	526415.48	177135.46	894.40



POINT NO.	X	Y	ELEV
3500	526424.22	177379.53	893.90
3501	526430.22	177379.32	893.99
3502	526440.21	177378.96	894.14
3503	526450.58	177370.34	893.75
3504	526452.18	177415.15	894.67
3505	526441.92	177426.57	894.45
3506	526432.30	177437.28	894.39
3507	526426.30	177437.50	894.30
3508	526427.62	177474.33	894.68
3509	526433.62	177474.12	894.76
3510	526443.92	177482.32	895.01
3511	526454.75	177486.61	894.64
3512	526455.36	177503.52	894.74
3513	526444.67	177503.40	895.23
3514	526434.83	177508.09	895.12
3515	526428.84	177508.31	895.03



LEGEND

- XXX • CONTROL POINTS
- RXX' → RADIUS CALLOUT
- PROPOSED CATCH BASIN
- CONSTRUCT CONCRETE CURB AND GUTTER
- DRAINAGE FLOW ARROW
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INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

SEE CITY OF NORTH BRANCH STD PLATE RDW-005 (RESIDENTIAL CONCRETE DRIVEWAY ENTRANCES)

SEE CITY OF NORTH BRANCH STD PLATE RDW-008 (RESIDENTIAL BITUMINOUS DRIVEWAY ENTRANCE)

NOTES:
1. SEE MISCELLANEOUS DETAILS FOR DRIVEWAY DETAILS.
2. SEE DRIVEWAY TAB FOR QUANTITY INFORMATION.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTZ, P.E.
DATE: 9/12/2024 LICENSE NO. 44620

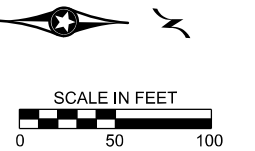
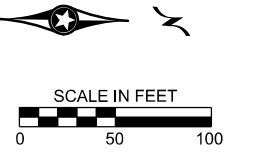


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

DRIVEWAY DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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NOTES

1. SEE TYPICAL SECTION FOR PAVEMENT CROSS SLOPE.
2. SEE DRAINAGE PROFILES AND TABULATIONS FOR STRUCTURE & PIPE DATA.

wsb

CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

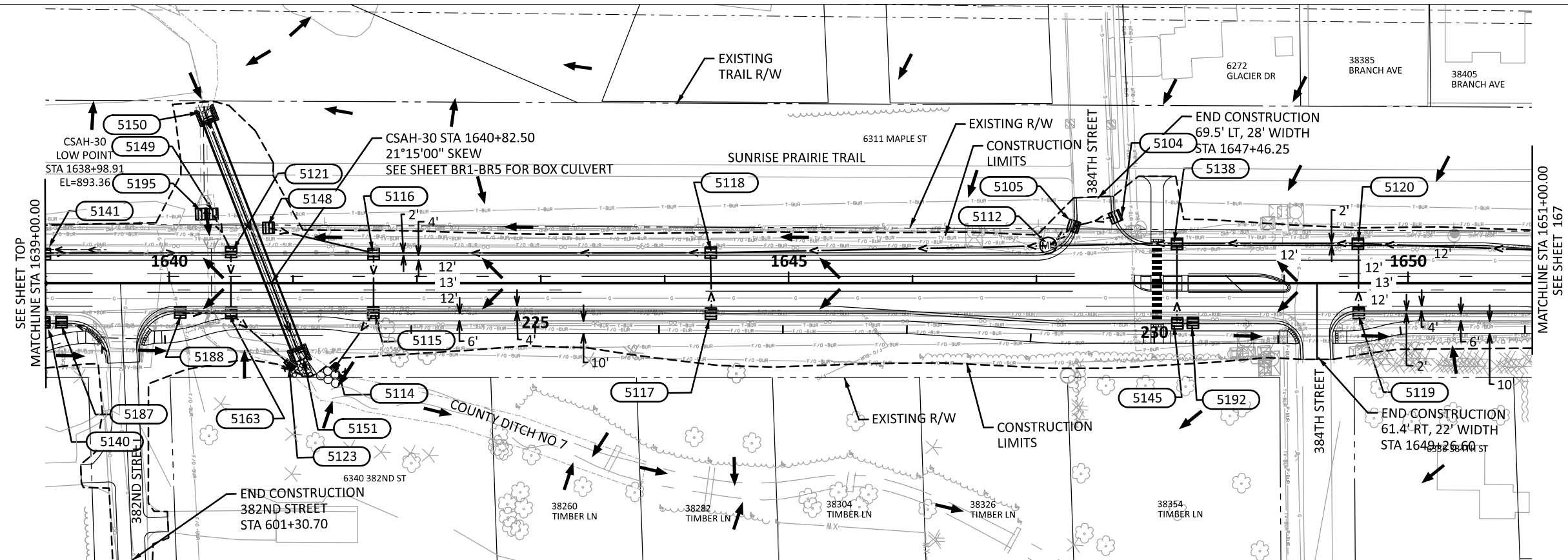
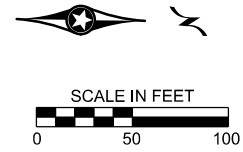
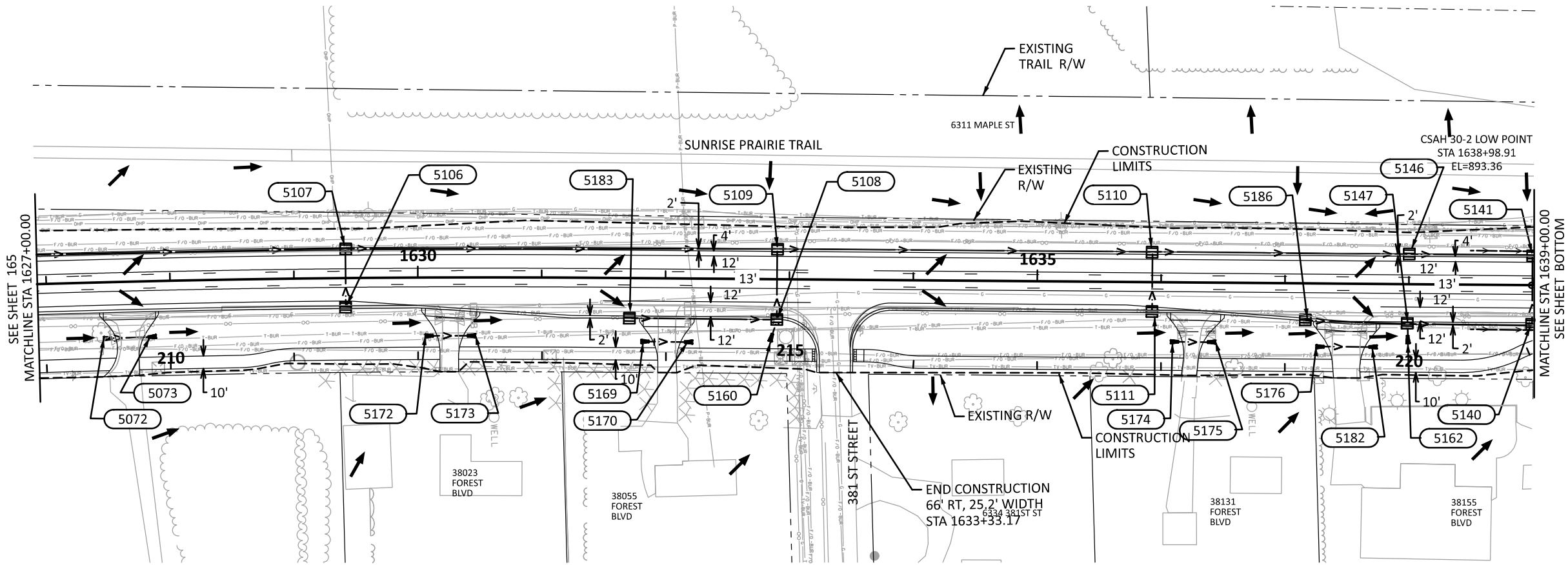
CHISAGO COUNTY, MINNESOTA

DRAINAGE PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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- LEGEND**
- 0000 STRUCTURE NUMBER
 - CATCH BASIN
 - MANHOLE
 - APRON
 - EXISTING CULVERT PIPE
 - CULVERT PIPE
 - STORM SEWER PIPE
 - 4\"/>

- NOTES**
- SEE TYPICAL SECTION FOR PAVEMENT CROSS SLOPE.
 - SEE DRAINAGE PROFILES AND TABULATIONS FOR STRUCTURE & PIPE DATA.

NO.	DATE	BY	CHK	REVISIONS

Design By: WAR
Plan By: WAR
Checked By: EAE
Approved By: EAE

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.

EMILY A. EVANS, PE
DATE: 9/12/2024 LICENSE NO. 44235



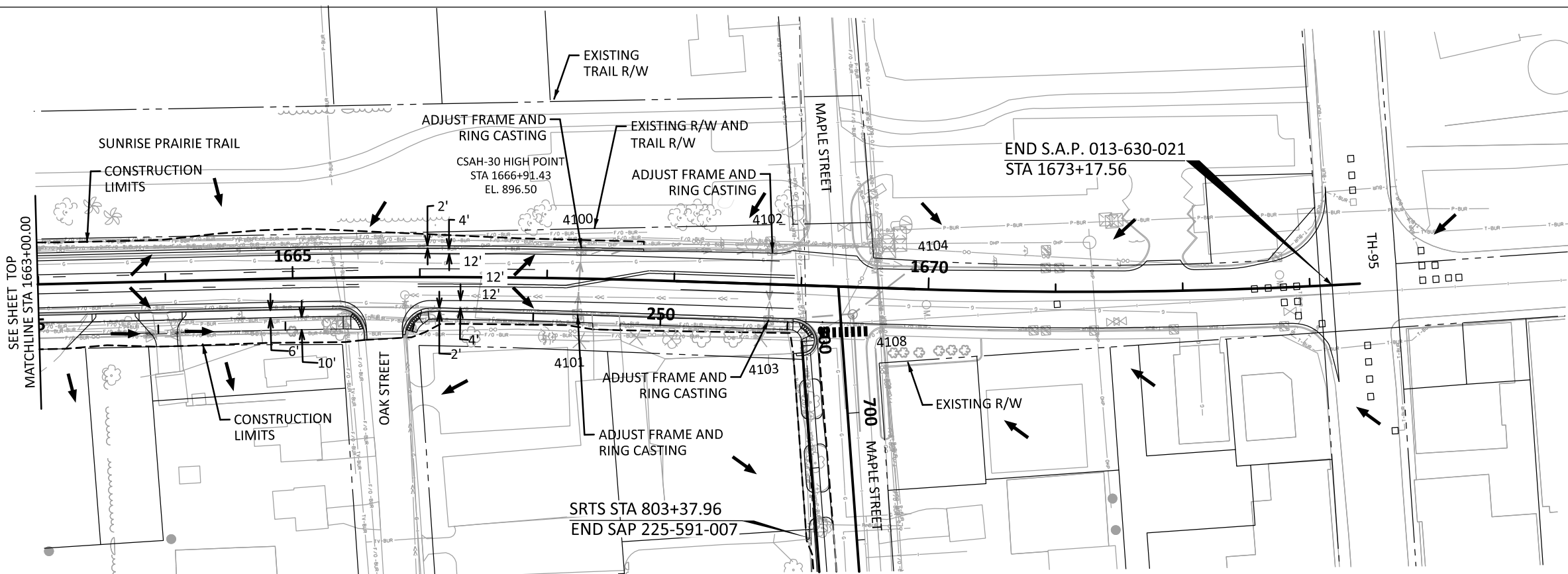
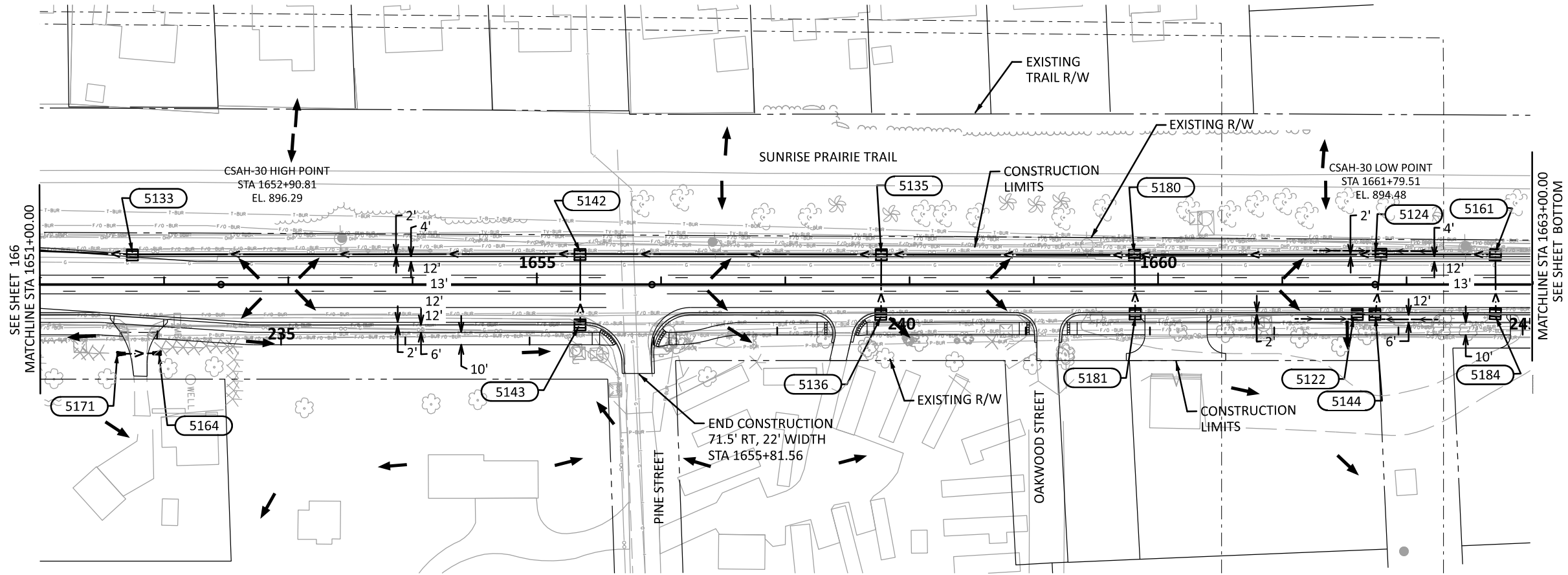
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

DRAINAGE PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
166
OF
216
SHEETS

DATE: 9/12/2024 2:07:41 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Drainage\Sheets\023661-000-301drp-plan-001



LEGEND

- 0000 STRUCTURE NUMBER
- CATCH BASIN
- MANHOLE
- APRON
- EXISTING CULVERT PIPE
- CULVERT PIPE
- STORM SEWER PIPE
- 4" PERF PE PIPE DRAIN
- RANDOM RIPRAP
- GUIDE POST TYPE B WITH X4-3
- SURFACE FLOW DIRECTION
- WETLAND DELINEATION - AREA OF ENVIRONMENTAL SENSITIVITY

NOTES

- SEE TYPICAL SECTION FOR PAVEMENT CROSS SLOPE.
- SEE DRAINAGE PROFILES AND TABULATIONS FOR STRUCTURE & PIPE DATA.

NO.	DATE	BY	CHK	REVISIONS

Design By: WAR
Plan By: WAR
Checked By: EAE
Approved By: EAE

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.

EMILY A. EVANS, PE
DATE: 9/12/2024 LICENSE NO. 44235



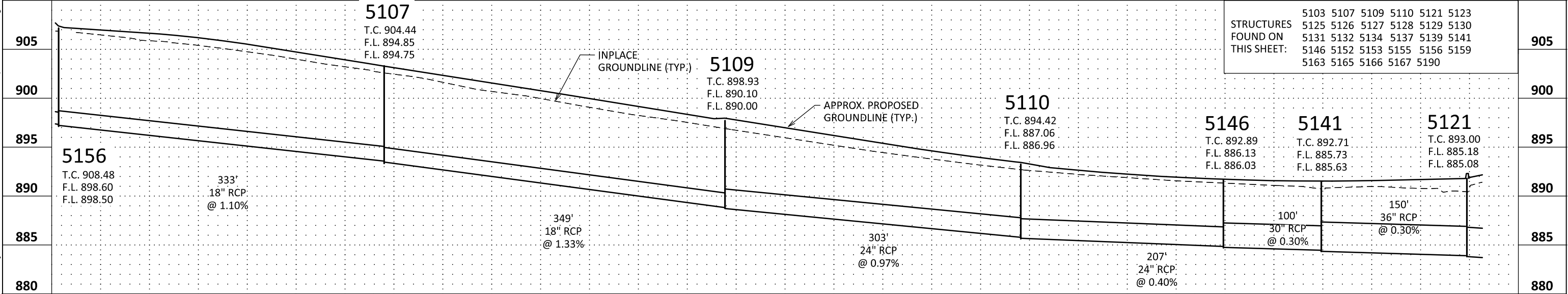
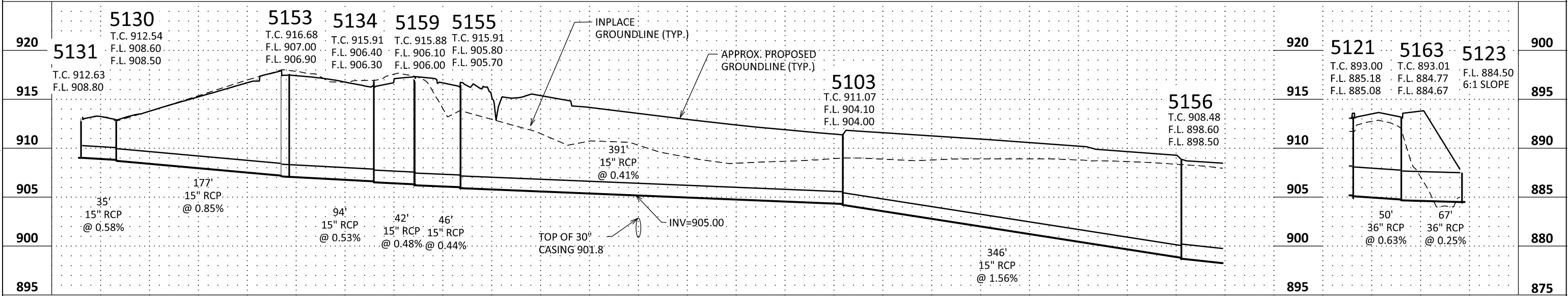
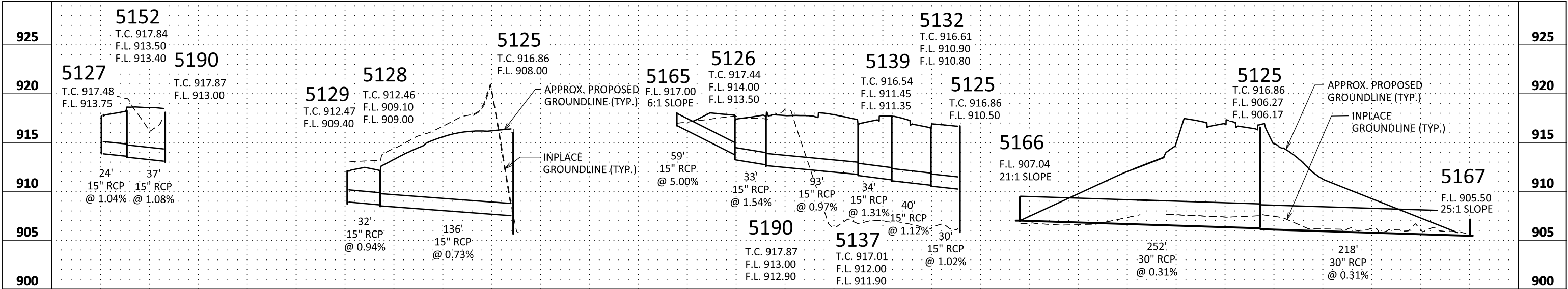
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

DRAINAGE PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
167
OF
216
SHEETS

DATE: 9/12/2024 5:19:25 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Drainage\Sheets\023661-000-302dr1-CSAH-30-prof-001



STRUCTURES FOUND ON THIS SHEET:	5103	5107	5109	5110	5121	5123
	5125	5126	5127	5128	5129	5130
	5131	5132	5134	5137	5139	5141
	5146	5152	5153	5155	5156	5159
	5163	5165	5166	5167	5190	

NO.	DATE	BY	CHK	REVISIONS

Design By:	WAR
Plan By:	WAR
Checked By:	EAE
Approved By:	EAE

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[Signature]
EMILY A. EVANS, PE
DATE: 9/12/2024 LICENSE NO. 44235



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	
DRAINAGE PROFILES	
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

SHEET
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OF
216
SHEETS

DATE: 9/12/2024 2:08:08 PM
PATH & FILENAME: Projects\Minnesota\Drainage\Sheets\023661-000\03_Discipline\Drainage\023661-000-130tab-CSAH-30-plan-001

CULVERT TABULATION														G
STRUCTURE NO.		STRUCTURE LOCATION			APRON ELEV	FLOWS TO PIPE INLET ELEV. / CULVERT GRADE	18" RC PIPE CULVERT DES 3006 CL III	18" CAS PIPE CULVERT	24" RC PIPE CULVERT DES 3006 CL III	APRON	APRON TYPE	RIPRAP CLASS II	GUIDE POSTS TYPE B WITH X 4-3 (INCIDENTAL)	REMARKS
		ALIGN.	STATION	OFFSET			LIN FT	LIN FT	LIN FT			EACH	CU YD	
5054	5055	CSAH 30-1	1582+62	51.9' LT	900.77	900.27			104	1	24" RC PIPE APRON		1	
5055		CSAH 30-1	1582+62	52.2' RT	900.27	0.48%				1	24" RC PIPE APRON	6.2	1	
5057	5056	CSAH 30-1	1587+54	52.1' LT	903.89	903.41			68	1	24" RC PIPE APRON		1	
5056		CSAH 30-1	1586+87	53' LT	903.41	0.70%				1	24" RC PIPE APRON	6.2	1	
5059	5058	CSAH 30-1	1587+64	55.9' RT	902.88	901.91	72			1	18" RC PIPE APRON		1	
5058		CSAH 30-1	1586+93	55.4' RT	901.91	1.34%				1	18" RC PIPE APRON	4.3	1	
5060	5061	CSAH 30-1	1598+81	63.7' RT	905.02	904.52			128	1	24" RC PIPE APRON		1	
5061		CSAH 30-1	1598+83	64.6' LT	904.52	0.39%				1	24" RC PIPE APRON	6.2	1	
5063	5062	CSAH 30-1	1602+62	66.5' LT	911.03	909.47	60			1	18" RC PIPE APRON		1	
5062		CSAH 30-1	1602+04	67.4' LT	909.47	2.60%				1	18" RC PIPE APRON	4.3	1	
5065	5064	CSAH 30-1	1603+02	49.6' RT	909.40	908.95	64			1	18" RC PIPE SAFETY APRON②		1	
5064		CSAH 30-1	1602+42	48.6' RT	908.95	0.70%				1	18" RC PIPE SAFETY APRON②	4.3	1	
5068	5069	CSAH 30-1	1596+35	56.1' RT	906.00	905.65		65		1	18" GS PIPE APRON			
5069		CSAH 30-1	1596+99	55.6' RT	905.65	0.54%				1	18" GS PIPE APRON			
5070	5071	CSAH 30 NB	1624+67	42' RT	905.00	904.40	116 ①			1	18" RC PIPE APRON			
5071		CSAH 30-2	1625+94	49.2' RT	904.40	0.52%				1	18" RC PIPE APRON			
5072	5073	CSAH 30-2	1627+46	45.3' RT	903.08	902.86		45		1	18" GS PIPE APRON			
5073		CSAH 30-2	1627+88	44.7' RT	902.86	0.49%				1	18" GS PIPE APRON			
5091	5090	CSAH 30-1	1609+82	51.3' RT	917.50	917.00	64			1	18" RC PIPE APRON			
5090		CSAH 30-1	1609+19	54' RT	917.00	0.78%				1	18" RC PIPE APRON	4.3	1	
5171	5164	CSAH 30-2	1651+63	55.8' RT	895.36	895.07		35		1	18" GS PIPE APRON			
5164		CSAH 30-2	1651+98	55.2' RT	895.07	0.81%				1	18" GS PIPE APRON			
5169	5170	CSAH 30-2	1631+81	51.0' RT	898.05	896.94		45		1	18" GS PIPE APRON			
5170		CSAH 30-2	1632+22	51.2' RT	896.94	2.47%				1	18" GS PIPE APRON			
5172	5173	CSAH 30-2	1630+06	47.2' RT	904.07	903.43		40		1	18" GS PIPE APRON			
5173		CSAH 30-2	1630+47	47' RT	903.43	1.61%				1	18" GS PIPE APRON			
5174	5175	CSAH 30-2	1636+08	48' RT	894.91	894.54		40		1	18" GS PIPE APRON			
5175		CSAH 30-2	1636+45	47.9' RT	894.54	0.91%				1	18" GS PIPE APRON			
5176	5182	CSAH 30-2	1637+26	51.1' RT	893.91	893.64		50		1	18" GS PIPE APRON			
5182		CSAH 30-2	1637+75	50.9' RT	893.64	0.53%				1	18" GS PIPE APRON			
							260	320	300	30		35.8	13	

GENERAL NOTES:

THE OUTLET ELEVATION IS THE INVERT ELEVATION OF THE PIPE AT THE INSIDE EDGE OF THE FLOWS FROM STRUCTURE.
INLET ELEVATION IS THE INVERT ELEVATION OF THE PIPE AT THE INSIDE EDGE OF THE FLOWS TO STRUCTURE.
THE CASTING ELEVATION AND LOCATION ARE AT THE CENTER OF THE GRATE/COVER.
FOR CONCRETE PIPES WITH APRONS: THE LOCATION OF THE APRON IS THE OUTLET, INVERT END OF THE APRON.
STATIONS, OFFSETS, AND ELEVATIONS ARE GIVEN TO:
-END OF ALL CONCRETE APRONS.
-END OF BARREL FOR ALL METAL APRONS.
-CENTER OF CASTING FOR ALL STORM STRUCTURES.
-FOR 4020 STRUCTURES, THE SECOND LINE LISTS STA. AND OFFSET TO CENTER OF STRUCTURE.
ALL PIPE LENGTHS EXCLUDE APRONS.
PAY HEIGHTS ARE FROM BOTTOM OF CASTING TO INVERT, PLUS 0.7'
RC PIPE IS DES 3006 GACKET JOINT PIPE, PIPE CLASS BASED ON BEDDING DETAILS ON SHEET 62.
ALL RC PIPE IS CL III UNLESS OTHERWISE NOTED.
STEPS REQUIRED WHEN DEPTH FROM TOP OF CASTING TO STRUCTURE INVERT IS GREATER THAN 4.5'.
GEOTEXTILE FILTER TYPE 4 REQUIRED FOR DETAIL 3133D AND X 4-3 DELINEATOR IS INCIDENTAL

SPECIFIC NOTES:

- ① 9 LIN FT OF 18" RC PIPE CULVERT CL III FUNDED WITH LOCAL FUNDS
② FURNISH AND INSTALL SAFETY APRON AT CULVERT END. UTILIZE 1:X CROSS SLOPE OPTION PER STD PLATE 3022.

NO.	DATE	BY	CHK	REVISIONS

Design By:
WAR
Plan By:
WAR
Checked By:
EAE
Approved By:
EAE

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EMILY H. EVANS, PE
DATE: 9/12/2024 LICENSE NO. 44235



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

DRAINAGE TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 171 OF 216 SHEETS

DATE: 9/12/2024 3:08:14 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Drainage\Sheets\023661-000-130tab-CSAH-30-plan-001

STORM SEWER TABULATION																					H	
STRUCTURE NO. FLOWS FROM FLOWS TO		STRUCTURE LOCATION ALIGN. STATION OFFSET			DRAINAGE STRUCTURES					TOP OF CASTING ELEV	FLOWS FROM PIPE OUTLET ELEV	FLOWS TO PIPE INLET ELEV	15" RC PIPE SEWER DES 3006 CL V LIN FT	18" RC PIPE SEWER DES 3006 CL III LIN FT	24" RC PIPE SEWER DES 3006 CL III LIN FT	30" RC PIPE SEWER DES 3006 CL III LIN FT	36" RC PIPE SEWER DES 3006 CL III LIN FT	APRON EACH	APRON TYPE	RIPRAP CLASS II CU YD	GUIDE POSTS TYPE B WITH X 4-3 (INCIDENTAL) EACH	REMARKS
					PAY HEIGHT			CASTING ASSEMBLY TYPE	STEPS REQ'D													
					G	48-4020 LIN FT	60-4020 LIN FT															
SAP 013-630-021																						
5129	5128	377TH ST WB1	100+79	14.94' RT	3.4			B - 5		912.47	909.40	909.10	32									
5128	5125	377TH ST WB1	100+79	14.98' LT		4.5		B - 5	YES	912.46	909.00	908.00	136									
5131	5130	377th ST EB1	106+10	13' LT	4			B - 5		912.63	908.80	908.60	35									
5121	5163	CSAH 30-2	1640+50	23.43' LT			8.1	B - 5	YES	893.00	885.08	884.77					50					
5163	5123	CSAH 30-2	1640+50	22.87' RT			8.4	B - 5	YES	893.01	884.67	884.50					67					
5123		CSAH 30-2	1641+00	68.32' RT							884.50							1	36" RC PIPE APRON	10.6	1	
5156	5107	CSAH 30-2	1626+10	23.47' LT		13.7		B - 5	YES	908.48	898.50	894.85		333								
5107	5109	CSAH 30-2	1629+42	22.73' LT		14.4		B - 5	YES	904.44	894.75	890.10		349								
5109	5110	CSAH 30-2	1632+90	23.5' LT		12		B - 5	YES	898.93	890.00	887.06			303							
5110	5146	CSAH 30-2	1635+93	23.49' LT		8.3		B - 5	YES	894.42	886.96	886.13			207							
5146	5141	CSAH 30-2	1638+00	23.01' LT		7.2		B - 5	YES	892.89	886.03	885.73				100						
5141	5121	CSAH 30-2	1639+00	23.09' LT		7.6		B - 5	YES	892.71	885.63	885.18					150					
5103	5156	CSAH 30 SB2	1622+19	16.52' LT		12.5		B - 9	YES	911.07	904.00	898.60	346									
5113	5157	CSAH 30 NB	1624+66	16.54' RT		6.6		B - 5	YES	909.64	905.60	903.10	144									
5157	5156	CSAH 30-2	1626+09	23.19' RT		7.0		B - 5	YES	908.48	903.00	901.50	49									
5111	5110	CSAH 30-2	1635+93	23.18' RT	5			B - 5	YES	894.42	890.60	889.56	49									
5106	5107	CSAH 30-2	1629+42	23.47' RT	5			B - 5	YES	904.43	900.10	899.60	49									
5160	5108	CSAH 30-2	1632+85	50.05' RT							896.10	894.20	18					1	15" RC PIPE APRON		1	
5108	5109	CSAH 30-2	1632+90	31.5' RT		5.2		B - 5	YES	898.77	894.10	893.60	57									
5183	5108	CSAH 30-2	1631+71	31.18' RT	4			B - 5	YES	900.65	897.80	896.50	119									
5186	5147	CSAH 30-2	1637+16	28.78' RT	4			B - 5	YES	893.21	890.65	889.00	84									
5162	5147	CSAH 30-2	1638+00	47.8' RT							889.00	888.75	16					1	15" RC PIPE APRON		1	
5147	5140	CSAH 30-2	1637+99	31.06' RT		6.2		B - 5	YES	892.73	887.50	886.60	101									
5187	5140	CSAH 30-2	1639+13	31.44' RT	4			B - 5	YES	892.55	888.90	888.76	14									
5140	5141	CSAH 30-2	1639+00	31.43' RT		6.5		B - 5	YES	892.54	886.50	886.10		57								
5188	5163	CSAH 30-2	1640+10	23.33' RT	5			B - 5	YES	892.90	888.55	888.07		41								
5195	5149	CSAH 30-2	1640+26	55.58' LT	4.4			B - 5		890.00	885.75	885.67	9									
5149	5121	CSAH 30-2	1640+35	55.79' LT		5.2		M - 11	YES	889.80	885.57	884.78		34								
5184	5161	CSAH 30-2	1662+72	23.03' RT	3.6			B - 5	YES	893.77	890.95	890.20	48									
5161	5124	CSAH 30-2	1662+72	23.06' LT		3.9		B - 5	YES	893.77	890.10	889.89	92									
5124	5180	CSAH 30-2	1661+79	23.04' LT		4.4		B - 5		893.72	889.79	889.41		198								
5180	5135	CSAH 30-2	1659+81	22.61' LT		5.7		B - 5	YES	894.56	889.31	888.90			204							
5135	5142	CSAH 30-2	1657+78	23.02' LT		7.2		B - 5	YES	895.45	888.80	888.31			242							
5142	5133	CSAH 30-2	1655+35	23.5' LT		9.0		B - 5	YES	896.48	888.21	887.49			360							
5133	5120	CSAH 30-2	1651+75	23.05' LT		10.1		B - 5	YES	896.97	887.39	886.94			215							
5120	5138	CSAH 30-2	1649+60	30.91' LT		9.9		B - 5	YES	896.34	886.84	886.53			146							
5138	5112	CSAH 30-2	1648+14	31.11' LT		9.5		B - 5	YES	895.69	886.43	886.21			104							
5112	5118	CSAH 30-2	1647+10	29.39' LT		10.4		A - 7D	YES	895.93	886.11	885.54			273							
5118	5116	CSAH 30-2	1644+37	23.45' LT		9.1		B - 5	YES	893.97	885.44	884.87				272						
5116	5115	CSAH 30-2	1641+65	23.06' LT		8.7		B - 5	YES	893.29	884.77	884.67				49						
5115	5114	CSAH 30-2	1641+65	23.43' RT		9		B - 5	YES	893.29	884.57	884.40				56						
5114		CSAH 30-2	1641+33	70.13' RT							884.40							1	30" RC PIPE APRON	8.2	1	
5122	5144	CSAH 30-2	1661+60	23.03' RT	3.4			B - 5		893.79	890.60	890.45	15									
5144	5124	CSAH 30-2	1661+75	23.03' RT	4			B - 5		893.74	890.35	889.89	48									
5119	5120	CSAH 30-2	1649+60	23.04' RT	4			B - 5	YES	896.50	893.65	892.65	56									
5104	5105	CSAH 30-2	1647+63	53.9' LT	4			B - 5		894.96	891.26	890.75	35									
5105	5112	CSAH 30-2	1647+31	45.28' LT		4.6		B - 5		894.95	890.65	890.25	26									
5136	5135	CSAH 30-2	1657+77	23.06' RT	5.1			B - 5	YES	895.45	891.40	890.40	48									
5143	5142	CSAH 30-2	1655+35	31.5' RT	5			B - 5	YES	896.32	892.40	891.50	57									
5148	5116	CSAH 30-2	1640+81	44.91' LT	5			M - 11	YES	889.88	886.40	884.97	87									
5181	5180	CSAH 30-2	1659+82	22.67' RT	5			B - 5	YES	894.56	890.35	889.71	47									
5192	5145	CSAH 30-2	1648+27	31.41' RT	4			B - 5	YES	895.75	893.00	891.60	13									
5145	5138	CSAH 30-2	1648+14	31.4' RT		5.0		B - 5	YES	895.68	891.50	890.75	65									
5117	5118	CSAH 30-2	1644+38	23.42' RT	4.9			B - 5	YES	893.98	889.60	889.10	49									
SAP 013-630-021 SUBTOTALS					87	223	17						1944	1012	2054	477	267	4		18.8	4	

NO.	DATE	BY	CHK	REVISIONS	Design By:	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.  ELIZABETH A. EVANS, PE DATE: <u>9/12/2024</u> LICENSE NO. <u>44235</u>			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA		SHEET 172 OF 216 SHEETS
				Plan By: WAR	DRAINAGE TABULATIONS							
				Checked By: EAE	SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004							
				Approved By: EAE								

DATE: 9/12/2024 5:20:00 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Drainage\Sheets\023661-000-130tab-CSAH-30-plan-001

STORM SEWER TABULATION																				H			
STRUCTURE NO. FLOWS FROM FLOWS TO		STRUCTURE LOCATION ALIGN. STATION OFFSET			DRAINAGE STRUCTURES					TOP OF CASTING ELEV	FLOWS FROM PIPE OUTLET ELEV	FLOWS TO PIPE INLET ELEV	15" RC PIPE SEWER DES 3006 CL V LIN FT	18" RC PIPE SEWER DES 3006 CL III LIN FT	24" RC PIPE SEWER DES 3006 CL III LIN FT	30" RC PIPE SEWER DES 3006 CL III LIN FT	36" RC PIPE SEWER DES 3006 CL III LIN FT	APRON EACH	APRON TYPE	RIPRAP CLASS II CU YD	GUIDE POSTS TYPE B WITH X 4-3 (INCIDENTAL) EACH	REMARKS	
					PAY HEIGHT			CASTING ASSEMBLY TYPE	STEPS REQ'D														
					G	48-4020	60-4020																
																							LIN FT
SAP 013-630-021 & SAP 225-102-004																							
5127	5152	CSAH 30 NB	1616+75	19.86' RT	4.0			B - 9		917.48	913.75	913.50	24										
5152	5190	CSAH 30 SB1	1616+79	14.89' RT		4.9		B - 9	YES	917.84	913.40	913.00	37										
5165	5126	CSAH 30 SB1	1615+90	33.80' LT							917.00	914.00	59					1	15" RC PIPE SAFETY APRON		1		
5126	5190	CSAH 30 SB1	1616+50	18.74' LT		4.5		B - 9	YES	917.44	913.50	913.00	33										
5190	5137	CSAH 30 SB1	1616+74	1.56' RT		6		B - 9	YES	917.87	912.90	912.00	93										
5137	5139	377TH ST EB	102+50	18.39' RT		5.6		B - 9	YES	917.01	911.90	911.45	34										
5139	5132	377TH ST WB1	102+53	21.2' RT		5.7		B - 9	YES	916.54	911.35	910.90	40										
5132	5125	377TH ST WB1	102+54	18.46' LT		6.2		B - 9	YES	916.61	910.80	910.50	30										
5166	5125	CSAH 30 SB1	1615+78	139.73' LT							907.04	906.27				252	1	30" RC PIPE APRON		1			
5125	5167	377TH ST WB1	102+24	22.36' LT			11.6	A - 7D	YES	916.86	906.17	905.50				218							
5167		CSAH 30 SB1	1617+41	285.48' RT							905.50						1	30" RC PIPE APRON	8.2	1			
5130	5153	377th ST WB	106+10	16.5' RT		5.6		B - 5	YES	912.54	908.50	907.00	177										
5153	5134	377th ST EB1	104+44	12.43' RT		10.3		B - 9	YES	916.68	906.90	906.40	94										
5134	5159	CSAH 30 NB	1618+53	17.09' RT		9.9		B - 9	YES	915.91	906.30	906.10	42										
5159	5155	CSAH 30 SB2	1618+55	24.66' RT		10.1		B - 9	YES	915.88	906.00	905.80	46										
5155	5103	CSAH 30 SB2	1618+60	20.09' LT		12		B - 9	YES	915.91	905.70	904.10	391										
5191	5159	RADIAL	10+81	1.00' LT	5			B - 9	YES	916.86	912.51	912.00	24										
5168	5153	377TH ST EB	104+38	35.51' RT							914.40	913.00	52				1	15" RC PIPE SAFETY APRON		1			
5189	5102	CSAH 30 NB	1621+34	24.73' RT		5		B - 9	YES	911.92	908.67	906.67	126										
5102	5193	CSAH 30 NB	1622+21	24.54' RT		4.6		B - 9	YES	910.92	906.57	906.40	29										
5193	5194	CSAH 30 NB	1622+61	1.53' LT		5.2		B - 9	YES	911.38	906.30	906.20	11										
5194	5103	CSAH 30 NB	1622+62	1.53' RT		5.6		B - 9	YES	911.37	906.10	905.85	21										
SAP 013-630-021 & SAP 225-102-004 SUBTOTAL					9	101	12						1363			470	4		8.2	4			
PROJECT TOTAL					96	324	29						3307	1012	2054	947	267	8		27	8		

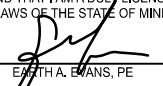
- General Notes:
- * INDICATES LENGTH OF PIPE WITHIN SAP #
 - STRUCTURE NUMBERS ARRANGED IN ORDER THEY APPEAR IN PROFILE SHEETS.
 - THE OUTLET ELEVATION IS THE INVERT ELEVATION OF THE PIPE AT THE INSIDE EDGE OF THE FLOWS FROM STRUCTURE.
 - INLET ELEVATION IS THE INVERT ELEVATION OF THE PIPE AT THE INSIDE EDGE OF THE FLOWS TO STRUCTURE.
 - THE CASTING ELEVATION AND LOCATION ARE AT THE CENTER OF THE GRATE/COVER.
 - FOR OFFSET STRUCTURES, THE STRUCTURE LOCATION IS AT THE CENTER OF THE STRUCTURE.
 - FOR CONCRETE PIPES WITH APRONS: THE LOCATION OF THE APRON IS THE OUTLET, INVERT END OF THE APRON.
 - STATIONS, OFFSETS, AND ELEVATIONS ARE GIVEN TO:
 - END OF ALL CONCRETE APRONS.
 - END OF BARREL FOR ALL METAL APRONS.
 - CENTER OF CASTING FOR ALL STORM STRUCTURES.
 - FOR 4020 STRUCTURES, THE SECOND LINE LISTS STA. AND OFFSET TO CENTER OF STRUCTURE.
 - ALL PIPE LENGTHS EXCLUDE APRONS.
 - PAY HEIGHTS ARE FROM BOTTOM OF CASTING TO INVERT, PLUS 0.7'
 - RC PIPE IS DES 3006 GACKET JOINT PIPE, PIPE CLASS BASED ON BEDDING DETAILS ON SHEET 62.
 - 15" RC PIPE IS CL V. ALL OTHER RC PIPE IS CL III UNLESS OTHERWISE NOTED.
 - STEPS REQUIRED WHEN DEPTH FROM TOP OF CASTING TO STRUCTURE INVERT IS GREATER THAN 4.5'.
 - TIE ALL JOINTS FROM STRUCTURES TO APRON, INCIDENTAL.
 - GEOTEXTILE FILTER TYPE 4 REQUIRED FOR DETAIL 3133D AND X 4-3 DELINEATOR IS INCIDENTAL.
 - ALL SAFETY APRON UTILIZING 1:X CROSS SLOPE OPTION PER STD PLATE 3022.

CASTING ASSEMBLY SUMMARY							
ASSEMBLY	RING OR FRAME	COVER OR GRATE	CURB BOX	STANDARD PLATE NUMBER	USE	SAP 013-630-021 & 225-102-004	SAP 013-630-021
B-5	SQUARE CONC.	816 (4154)	823A (4160)	4129	CATCH BASIN	1	46
M-11	ROUND CONC.	731 (4143)		4143	CATCH BASIN	0	2
A-7D	ROUND CONC.	700-7		4101	MAN HOLE	1	1
B-9	SQUARE CONC. (4132)	816 (4154)			CATCH BASIN	16	1
TOTAL						18	50

NO.	DATE	BY	CHK	REVISIONS

Design By: WAR
Plan By: WAR
Checked By: EAE
Approved By: EAE

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.


EARTH A. EVANS, PE
DATE: 9/12/2024 LICENSE NO. 44235



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

DRAINAGE TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
173
OF
216
SHEETS

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE

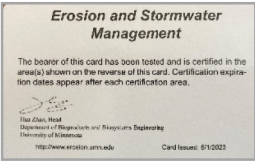
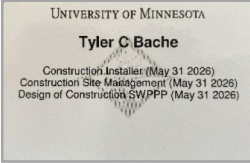
PROJECT NAME: CHISAGO COUNTY CSAH 30 CORRIDOR IMPROVEMENTS **PROJECT NUMBER:** SAP 013-630-021; WSB 023661-000
PROJECT LOCATION: STREET: 379th STREET CITY: NORTH BRANCH COUNTY: CHISAGO COUNTY
STATE: MINNESOTA ZIP: 55056 LATITUDE/LONGITUDE: 45.4977/-92.9807

THE PLANNED SCOPE OF THE PROJECT INCLUDES:
CHISAGO COUNTY IS PROPOSING THE RECONDITIONING AND RECONSTRUCTION OF FOREST BOULEVARD FROM ATHENS TRAIL TO SAINT CROIX TRAIL. CONSTRUCTION ACTIVITIES INCLUDE ROADWAY RECONDITIONS AND RECONSTRUCTION FROM CSAH 17 (ATHENS TRAIL) IN STACY TO TRUNK HIGHWAY 95 IN NORTH BRANCH, ADDITION OF A MULTI-USE TRAIL ALONG THE EAST SIDE OF CSAH 30 FROM 377TH ST TO MAPLE STREET, ADDITION OF A SIDEWALK ALONG THE SOUTH SIDE OF MAPLE STREET FROM CSAH 30 TO 7TH AVE, ROUNDABOUT ADDITION AT THE INTERSECTION OF CSAH 30 AND 377TH ST, NEW STORM SEWER SYSTEM FROM 377TH ST TO MAPLE ST, AND MILL AND OVERLAY FROM MAPLE ST TO TRUNK HIGHWAY 95.

TENTATIVE CONSTRUCTION SCHEDULE (OPERATOR SHOULD PROVIDE ESTIMATED CONSTRUCTION SCHEDULE TO THE ENGINEER)	
CONSTRUCTION ACTIVITIES:	ESTIMATED DATES OF SOIL DISTURBANCE ACTIVITIES:
TEMPORARY SEDIMENT CONTROL BMPS & REMOVALS	APRIL 2025
GRADING & UTILITY WORK	APRIL - JULY 2025
CURB & PAVEMENT	JUNE - OCTOBER 2025
FINAL STABILIZATION	NOVEMBER 2025

PROJECT PERSONNEL AND TRAINING

SWPPP DEVELOPER:
WSB TYLER C. BACHE
701 XENIA AVE S, SUITE 300
GOLDEN VALLEY, MN 55416
303-870-7436/TBACHE@WSBENG.COM



CONTRACTOR TO PROVIDE CERTIFICATION OF EROSION CONTROL OFFICER AND ANY OTHER CREW MEMBERS WHO WILL WORK ON THE IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING, AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA. PROVIDE PROOF OF CERTIFICATION AT THE PRECONSTRUCTION MEETING. WORK WILL NOT BE ALLOWED TO COMMENCE UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT ENGINEER.

CHAIN OF RESPONSIBILITY

CHISAGO COUNTY AND THE CONTRACTOR ARE CO-PERMITTEES FOR THE NPDES CONSTRUCTION GENERAL PERMIT. THE CONTRACTOR IS RESPONSIBLE TO COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION PERMIT AT ALL TIMES UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA.

NAME	COMPANY	TITLE	PHONE
BEN HOBERT	CHISAGO COUNTY	OWNER CONTACT	651-213-8723
NIC HENTGES	WSB	PROJECT MANAGER	612-360-1286

AGENCY CONTACTS

ORGANIZATION	CONTACT NAME	PHONE
MPCA (EMERGENCY) 24 HOUR	STATE DUTY OFFICER	1-800-422-0798
MPCA	JIM DEXTER	218-302-6632
COMFORT LAKE & FOREST LAKE WD	MIKE KINNEY	651-209-9753
ACOE	DULUTH FIELD OFFICE	218-788-6408
MNDNR	CRAIG WILLS	763-284-7221

LOCATION OF SWPPP REQUIREMENTS

THE REQUIRED SWPPP ELEMENTS MAY BE LOCATED IN MANY PLACES WITHIN THE PLAN SET AS WELL AS IN THE SPECIAL PROVISIONS, PROJECT MANUAL, MNDOT SPEC BOOK, OR ON FILE WITH THE PROJECT OWNER.

DESCRIPTION	LOCATION
TEMPORARY/PERMANENT EROSION CONTROL MEASURES	178 - 189
DIRECTION OF FLOW	164 - 167
CONSTRUCTION NOTES & STANDARD PLATES	16 , 31 - 47
DRAINAGE PLAN & CONSTRUCTION PLAN	164 - 167 , 119 - 142
BMP TABULATION	178 - 189
STORMWATER CALCULATIONS	DRAINAGE REPORT & HYDRAULIC REPORT. AVAILABLE UPON REQUEST

RECEIVING WATERS

A SPECIAL AND IMPAIRED WATERS SEARCH WAS COMPLETED USING THE MPCA SEARCH ENGINE ON 03/20/24. BASED ON THIS REVIEW, THE FOLLOWING SPECIAL/IMPAIRED WATERS (WITH CONSTRUCTION RELATED IMPAIRMENTS) ARE LOCATED WITHIN ONE MILE OF, AND DOWNSTREAM OF, ANY PROJECT DISCHARGE POINTS. PARTS 23.9 & 23.10 OF THE NPDES PERMIT APPLY.

WATERBODY	IMPAIRMENT (S)
SUNRISE RIVER, NORTH BRANCH	FECAL COLIFORM; FISH BIOASSESSMENTS; MERCURY IN FISH TISSUE
COUNTY DITCH 5 (WETLAND 1)	N/A
COUNTY DITCH 7	N/A
UNNAMED STREAM	N/A
WET DITCH 1	N/A

AREAS OF ENVIRONMENTAL SENSITIVITY (AES) AND INFESTED WATERS

IN ADDITION TO THE LIST OF SPECIAL AND IMPAIRED WATERS, THE CONTRACTOR SHALL BE AWARE THAT THERE ARE WETLANDS AND EXISTING STORMWATER FACILITIES WITHIN AND NEAR THE PROJECT BOUNDARY. THERE IS A MAP OF KNOWN NATURAL RESOURCES ON THE LAST PAGE OF THE SWPPP NARRATIVE. AREAS OF ENVIRONMENTAL SENSITIVITY ARE ALSO CALLED OUT ON THE PLAN SHEETS.

SOIL TYPES

A PROJECT WIDE GEOTECHNICAL REPORT WAS COMPLETED DURING THE DESIGN PHASE BY AMERICA TESTING AND ENGINEERING INC. THIS REPORT FOUND THE SUBSURFACE SOIL CONDITIONS CONSISTED OF A MIX OF SHALLOW TOPSOIL, ADDITIONAL FILL AND POSSIBLE FILL SOILS EXTENDING TO DEPTHS RANGING FROM ABOUT 2 INCHES TO 2 FEET. THE FILL WAS GENERALLY UNDERLAIN BY SOILS IDENTIFIED AS COARSE ALLUVIUM THAT EXTENDED TO THE BORING TERMINATION DEPTHS OF 14 1/2 FEET. THESE MOSTLY CONSISTED OF SAND AND SAND WITH SILT, PLUS SOME SILTY SAND. THE TILL CONSISTS OF A BLEND OF SAND AND CLAY WHILE THE OUTWASH IS GENERALLY SANDY. ADDITIONAL SOIL INFORMATION CAN BE FOUND IN THE GEOTECHNICAL REPORT, LOCATED WITHIN THE PROJECT SPECIFICATIONS. SOIL CLASSIFICATIONS FOR HIGHLY ERODIBLE LAND (HEL), POTENTIALLY HIGHLY ERODIBLE LAND (PHEL), AND NOT HIGHLY ERODIBLE LAND (NHEL) SOILS CAN BE FOUND ON FIGURE 1. SWPPP RESOURCE MAP.

NATIVE TOPSOIL WILL BE STRIPPED; IF MATERIAL NEEDS TO BE STOCKPILED, APPROPRIATE ACTION WILL TAKE PLACE TO ENSURE THE STOCKPILES HAVE ALL PROPER BMPS IN PLACE ACCORDING TO THIS SWPPP AND THE NPDES PERMIT.

ENVIRONMENTAL REVIEW

NO FORMAL ENVIRONMENTAL REVIEW WAS REQUIRED FOR THIS PROJECT.

WETLANDS: MITIGATION MEASURES ARE REQUIRED AS A RESULT OF WETLAND IMPACTS FROM THE PROJECT. A PROJECT WIDE WETLAND DELINEATION REPORT SHOWS 23 WETLANDS WITHIN THE PROJECT AREA USING THE LEVEL 2 METHOD. MITIGATION MEASURES HAVE BEEN ADDRESSED VIA WETLAND BANKING. ALL WETLAND AREAS WILL BE PROTECTED WITH PERIMETER CONTROL AND A 50' NATURAL BUFFER (IF INFEEASIBLE, REDUNDANT PERIMETER CONTROL MEASURES), INCLUDED AREAS THAT ARE PERMITTED TO BE FILLED AND/OR EXCAVATED UNTIL WORK IN THE PERMITTED AREAS ARE NECESSARY. REDUNDANT BMP MEASURES MUST BE PLACED 5' FROM THE INITIAL PERIMETER CONTROL MEASURE WITH A STABILIZED BUFFER STRIP BETWEEN THE BMPS. A LIST OF THESE DELINATED WETLANDS IS PROVIDED IN THE TABLE BELOW.

WETAND ID	CLASSIFICATION	DESCRIPTION	WETLAND SIZE (ACRES)
1	PEMB	WET MEADOW	0.02
2	PEMB	WET MEADOW	0.4
3	PEMB	WET MEADOW	0.17
4	PEMB	WET MEADOW	0.17
5	PEMB	WET MEADOW	0.21
6	PEMB	WET MEADOW	0.07
7	PSSIAd	SHRUB SWAMP	0.02
8	PSSIAd	SHRUB SWAMP	0.01
9	PEMB	WET MEADOW	0.11
10	PEMB	WET MEADOW	0.19
11	PEMB	WET MEADOW	0.13
12	PEMB	WET MEADOW	0.7
13	PEMB	WET MEADOW	0.31
14	PEMB	WET MEADOW	0.28
15	PEMB	WET MEADOW	0.25
16	PEMB	WET MEADOW	0.07
17	PEMB	WET MEADOW	0.1
18	PEMC	SHALLOW MARSH	0.71
19	PEMC	SHALLOW MARSH	1.33
20	PEMC	SHALLOW MARSH	0.12
21	PEMC	SHALLOW MARSH	0.13
22	PEMB	WET MEADOW	0.13
23	PEMB	WET MEADOW	1.43

THREATENED/ENDANGERED SPECIES: THE U.S. FISH & WILDLIFE SERVICE LISTS THE NORTHERN LONG-EARED BAT, TRI-COLORED BAT, WHOOPING CRANE, SALAMANDER MUSSEL, AND MONARCH BUTTERFLY AS THREATENED/ENDANGERED SPECIES WITHIN THE COUNTY. TREE REMOVAL SHOULD OCCUR OUTSIDE OF THE NORTHERN LONG-EARED BAT ACTIVE SEASON (APRIL 1 TO OCTOBER 31). BASED ON THE CONSTRUCTION ACTIVITIES, IT IS DETERMINED THAT THE PROJECT WILL HAVE NO EFFECT ON THESE SPECIES OR THEIR HABITATS. HOWEVER, IF THESE SPECIES ARE FOUND, CONTRACTOR TO STOP WORK IMMEDIATELY FOR FURTHER INVESTIGATION.

DRINKING WATER/WELLS: ACCORDING TO THE MDH, THE PROJECT IS LOCATED WITHIN THE NORTH BRANCH DRINKING WATER SUPPLY MANAGEMENT AREA (DWSMA) AND WELLHEAD PROTECTION AREA.

CONTAMINATED PROPERTIES: THE MPCA'S "WHAT'S IN MY NEIGHBORHOOD" DATABASE WAS REVIEWED ON 03/20/2024. THE RESULTS OF THIS REVIEW SHOW THE DEPTH OF THE FULL RECLAMATION IS NOT PROPOSED TO UNEARTH ANY CONTAMINATED SOIL, CONTAMINATED WATER, AND/OR REGULATED WASTE. REFER TO MNDOT SPEC 1717.1.A. FOR POTENTIAL INDICATORS OF CONTAMINATED MATERIALS AND REGULATED WASTE. IF CONTAMINATED MATERIAL, CONTAMINATED WATER, AND/OR REGULATED MATERIALS ARE FOUND, CREWS ARE TO STOP WORK IMMEDIATELY FOR FURTHER INVESTIGATION/TESTING.

SITE ID	NAME	ADDRESS	ACTIVITIES
26226	POLETECH INC	36375 FOREST BLVD	HAZARDOUS WASTE; PETROLEUM REMEDIATION, LEAK SITE
62502	RALPH D ELLEFSON FARM	6093 362ND ST	FEEDLOTS
88716	NORTH BRANCH COLLISION LLC	36401 FOREST BLVD STE 2	HAZARDOUS WASTE
10809	SNOWBALL EXPRESS INC	6360 375TH ST	HAZARDOUS WASTE

NO.	DATE	BY	CHK	REVISIONS	Design By:	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. NICHOLAS E. HENTGES, PE DATE: 9/12/2024 LICENSE NO. 44620
					NEH	
					MKV	
					MAN	
					NEH	



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STORM WATER POLLUTION PREVENTION PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
174
OF
216
SHEETS

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55553	ROLAND CLEVELAND FARM	6160 375TH ST	FEEDLOTS
11566	O'BRIENS	38171 FOREST LAKE BLVD	HAZARDOUS WASTE
13697	BRANCH MANUFACTURING CO	6420 PINE ST	HAZARDOUS WASTE
1982	NORTH BRANCH MUNICIPAL WATER AND LIGHT	6388 MAPLE ST	ABOVEGROUND TANKS; AIR QUALITY; HAZARDOUS WASTE, MINIMAL QUANTITY GENERATOR; UNDERGROUND TANKS
187113	FORMER GAS STATION	911 FOREST BLVD	PETROLEUM REMEDIATION, LEAK SITE

FLOOD CONTINGENCY PLAN: PROJECT ACTIVITIES ARE NOT LOCATED WITHIN THE 100-YEAR FLOODPLAIN OR FLOODWAY; HOWEVER, THE PROJECT ENGINEER (AT THEIR DISCRETION) MAY REQUIRE A PREVENTATIVE FLOOD CONTINGENCY PLAN FOR SPECIFIC PROJECT ACTIVITIES AND AREAS IF SEASONAL PRECIPITATION POSSES A POTENTIAL RISK OF FLOODING WORK AREAS WITHIN THE PROJECT LIMITS. THIS PLAN SHALL BE SUBMITTED BY THE OPERATOR TO THE PROJECT ENGINEER FOR APPROVAL A MINIMUM OF 72 HOURS PRIOR TO THE SCHEDULED WORK AND/OR DURING ACTIVE WORK WITHIN THE AREA OF POTENTIAL RISK OF FLOODING. NO WORK CAN COMMENCE IN THE AREA UNTIL WRITTEN APPROVAL HAS BEEN GRANTED BY THE PROJECT ENGINEER.

LAND FEATURE CHANGES

TOTAL AREA TO BE DISTURBED = 22.79 ACRES
IMPERVIOUS AREA: PRE-CONSTRUCTION = 10.38 ACRES/POST-CONSTRUCTION = 15.33 ACRES
NET INCREASE OF IMPERVIOUS AREA = 4.95 ACRES

LONG TERM MAINTENANCE AND OPERATION:

THE NPDES PERMANENT STORMWATER TREATMENT SYSTEM (PART 15.1) FROM THE NET NEW IMPERVIOUS SURFACES OF THE PROJECT IS PROVIDED IN THE EXISTING DITCHES ALONG THE ROADWAY. EXISTING SOILS ARE GENERALLY CHARACTERIZED AS HSG A AND B SOILS AND CONDUCIVE TO INFILTRATION. CHISAGO COUNTY STAFF IS RESPONSIBLE FOR THE LONG-TERM MAINTENANCE AND OPERATION OF THE PERMANENT STORMWATER SYSTEM. THE STORMWATER REPORT CAN BE MADE AVAILIABLE BY REQUEST.

STABILIZATION TIME FRAMES

AREA	TIME FRAME	NOTES
EXPOSED AREAS	IMMEDIATELY AND NO LATER THAN 7 DAYS OF BEING UNWORKED	1, 4, 5
LAST 200 LINEAL FEET OF DRAINAGE DITCH/SWALE	WITHIN 24 HOURS OF CONNECTION TO SURFACE WATER/PROPERTY EDGE	1, 2, 3
REMAINING PORTIONS OF DRAINAGE DITCH OR SWALE	7 DAYS	1, 3
PIPE AND CULVERT OUTLETS	24 HOURS	
STOCKPILES	7 DAYS	1

1. INITIATE STABILIZATION IMMEDIATELY WHEN CONSTRUCTION HAS TEMPORARILY OR PERMANENTLY CEASED ON ANY PORTION OF THE SITE. COMPLETE STABILIZATION WITHIN THE TIME FRAME LISTED. IN MANY INSTANCES THIS WILL REQUIRE STABILIZATION TO OCCUR MORE THAN ONCE DURING THE COURSE OF THE PROJECT. TEMPORARY SOIL STOCKPILES WITHOUT SIGNIFICANT CLAY OR SILT AND STOCKPILED AND CONSTRUCTED ROAD BASE ARE EXEMPT FROM THE STABILIZATION REQUIREMENT.
2. STABILIZE WETTED PERIMETER OF DITCH (I.E. WHERE THE DITCH GETS WET).
3. APPLICATION OF MULCH, HYDROMULCH, TACKIFIER AND POLYACRYLAMIDE ARE NOT ACCEPTABLE STABILIZATION METHODS IN THESE AREAS.
4. STABILIZE ALL AREAS OF THE SITE PRIOR TO THE ONSET OF WINTER. ANY WORK STILL BEING PERFORMED WILL BE MULCHED OR BLANKETED WITHIN THE TIME FRAMES IN THE NPDES PERMIT.
5. TOPSOIL BERMS MUST BE STABILIZED TO BE CONSIDERED PERIMETER CONTROL BMPS. USE RAPID STABILIZATION METHOD 3. THE SEED MIX USED IN THE RAPID STABILIZATION MAY BE SUBSTITUTED AS FOLLOWS:
 - A. SINGLE YEAR CONSTRUCTION BETWEEN MAY 1 - AUGUST 1, SEED WITH SEED MIX 21-111
 - B. SINGLE YEAR CONSTRUCTION BETWEEN AUGUST 1 - OCTOBER 31, SEED WITH SEED MIX 21-112
 - C. MULTI YEAR TEMPORARY STABILIZATION 22-111
6. KEEP DITCHES AND EXPOSED SOILS IN AN EVEN ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES, HYDROMULCHES, AND BLANKETS.

SITE INSPECTION AND MAINTENANCE

THE EROSION CONTROL OFFICER IS TO INSPECT THE ENTIRE CONSTRUCTION SITE AT LEAST ONCE EVERY SEVEN (7) DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. THE OPERATOR SHALL PROVIDE A RAINFALL GAUGE ON-SITE AT VARIOUS MILE INTERVALS ALONG THE ALIGNMENT. INSPECT ALL TEMPORARY AND PERMANENT PROJECT BMPS UNTIL THE SITE HAS UNDERGONE FINAL STABILIZATION AND THE NOT HAS BEEN SUBMITTED. INSPECT SURFACE WATER INCLUDING DRAINAGE DITCHES FOR SIGNS OF EROSION AND SEDIMENT DEPOSITION. INSPECT CONSTRUCTION SITE VEHICLE EXIT LOCATIONS FOR EVIDENCE OF TRACKING ONTO PAVED SURFACES. INSPECT SURROUNDING PROPERTIES FOR EVIDENCE OF OFF-SITE SEDIMENT ACCUMULATION. ALL INSPECTIONS AND MAINTENANCE CONDUCTED MUST BE RECORDED IN WRITING BY THE OPERATOR AND RETAINED WITH THE SWPPP. SUBMIT INSPECTION REPORTS IN A FORMAT THAT IS ACCEPTABLE TO THE PROJECT ENGINEER. RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY SHALL INCLUDE:

- A. DATE, TIME, AND NAME OF PERSON(S) CONDUCTING INSPECTIONS;
- B. FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS;
- C. CORRECTIVE ACTIONS TAKEN (INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES); INCLUDING DOCUMENTATION/PHOTOS OF IMPLEMENTED BMPS INTENDED TO CORRECT A PROBLEM BUT FAILED.
- D. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCHES IN 24 HOURS;
- E. DOCUMENTATION OF CHANGES MADE TO THE SWPPP.

REPLACE, REPAIR OR SUPPLEMENT ALL NONFUNCTIONAL BMPS BY THE END OF THE NEXT BUSINESS DAY FOLLOWING DISCOVERY UNLESS LISTED DIFFERENTLY BELOW:

- A. REPAIR, REPLACE, OR SUPPLEMENT PERIMETER CONTROL DEVICES WHEN THEY BECOME NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT OF THE DEVICE. COMPLETE REPAIRS BY THE END OF THE NEXT BUSINESS DAY FOLLOWING DISCOVERY.
- B. REPAIR OR REPLACE INLET PROTECTION DEVICES WHEN THEY BECOME NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT AND/OR DEPTH OF THE DEVICE.
- C. REMOVE ALL DELTAS AND SEDIMENT DEPOSITED IN SURFACE WATERS INCLUDING DRAINAGE WAYS, CATCH BASINS, AND OTHER DRAINAGE SYSTEMS. STABILIZE ANY AREAS THAT ARE DISTURBED BY SEDIMENT REMOVAL OPERATIONS. SEDIMENT REMOVAL AND STABILIZATION MUST BE COMPLETED WITHIN 7 DAYS OF DISCOVERY.

- D. REMOVE TRACKED SEDIMENT FROM PAVED SURFACES BOTH ON AND OFF SITE WITHIN ONE (1) CALENDAR DAY OF DISCOVERY. STREET SWEEPING MAY HAVE TO OCCUR MORE OFTEN TO MINIMIZE OFF SITE IMPACTS. LIGHTLY WET THE PAVEMENT PRIOR TO SWEEPING.
- E. MAINTAIN ALL BMPS UNTIL WORK HAS BEEN COMPLETED, SITE HAS GONE UNDER FINAL STABILIZATION, AND THE NOT HAS BEEN SUBMITTED TO THE MPCA.

CONSTRUCTION ACTIVITY REQUIREMENTS: EROSION/SEDIMENT CONTROL, PROCEDURES, & MAINTENANCE STANDARDS

1. AMEND THE SWPPP AND DOCUMENT ALL CHANGES TO THE SWPPP AND ASSOCIATED PLAN SHEETS IN A TIMELY MANNER. SWPPP AMENDMENTS AND SITE PLANS WILL BE PREPARED BY THE OPERATOR AND SUBMITTED TO THE OWNER FOR REVIEW AND WRITTEN APPROVAL BY THE PROJECT OWNER (OR DESIGNATED REPRESENTATIVE). STORE THE SWPPP AND ALL AMENDMENTS ON SITE AT ALL TIMES.
2. PREPARE AND SUBMIT A SITE MANAGEMENT PLAN FOR THE ENGINEER’S ACCEPTANCE FOR STAGING/STOCKPILE MANAGEMENT AREAS, CONCRETE MANAGEMENT, CONCRETE SLURRY APPLICATION AREAS, FUGITIVE DUST CONTROL PLAN, SPILL CONTAINMENT PLAN, HAZARDOUS MATERIAL MANIFEST & MANAGEMENT PLAN, WETLAND MANAGEMENT PLAN, VEGETATION PRESERVATION & MAINTENANCE PLAN, WORK IN AND NEAR AREAS OF ENVIRONMENTAL SENSITIVITY, AREAS IDENTIFIED IN THE PLANS AS “SITE MANAGEMENT PLAN AREA”, ANY WORK THAT WILL REQUIRE DEWATERING, ANY ADDITIONAL PLANS LISTED IN THE PROJECT SPECIFICATIONS, AND AS REQUIRED BY THE ENGINEER. SUBMIT ALL SITE MANAGEMENT PLANS TO THE ENGINEER IN WRITING. ALLOW A MINIMUM OF 7 DAYS FOR PROJECT ENGINEER TO REVIEW AND ACCEPT SITE MANAGEMENT PLAN SUBMITTALS. WORK WILL NOT BE ALLOWED TO COMMENCE IF A SITE MANAGEMENT PLAN IS REQUIRED UNTIL ACCEPTANCE HAS BEEN GRANTED BY THE ENGINEER. THERE WILL BE NO EXTRA TIME ADDED TO THE CONTRACT DUE TO THE UNTIMELY SUBMITTAL.
3. THE PROJECT’S CONSTRUCTION PHASING AND STAGING IS DEFINED BY THE “CONSTRUCTION STAGING & TRAFFIC CONTROL PLAN” AND PROJECT SPECIFICATIONS.
4. BURNING OF ANY MATERIAL IS NOT ALLOWED WITHIN PROJECT BOUNDARY.
5. DO NOT DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS. DELINEATE AREAS NOT TO BE DISTURBED AND WETLANDS (EVEN AREAS THAT ARE PERMITTED FOR CONSTRUCTION) PRIOR TO STARTING GROUND DISTURBING ACTIVITIES. IF IT BECOMES NECESSARY TO DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS, OBTAIN WRITTEN PERMISSION FROM THE PROJECT ENGINEER PRIOR TO PROCEEDING. PRESERVE ALL NATURAL BUFFERS SHOWN ON THE PLANS.
6. ROUTE STORMWATER AROUND UNSTABILIZED AREAS OF THE SITE WHENEVER FEASIBLE. PROVIDE EROSION CONTROL AND VELOCITY DISSIPATION DEVICES AS NEEDED TO KEEP CHANNELS FROM ERODING AND TO PREVENT NUISANCE CONDITIONS AT THE OUTLET.
7. DIRECT DISCHARGE FROM BMPS TO VEGETATED AREAS WHENEVER FEASIBLE. PROVIDE VELOCITY DISSIPATION DEVICES AS NEEDED TO PREVENT EROSION.
8. LOCATE PERIMETER CONTROL ON THE CONTOUR TO CAPTURE OVERLAND, LOW-VELOCITY SHEET FLOWS DOWN GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS. PLACE J-HOOKS AT A MAXIMUM OF 100-FOOT INTERVALS.
9. ALL STOCKPILES MUST HAVE PERIMETER SEDIMENT CONTROLS IMPLEMENTED AND MAINTAINED AT ALL TIMES AND SHOULD BE INSTALLED PRIOR TO INITIATION OF STOCKPILING. PILES CANNOT BE PLACED IN BUFFER AREAS OR SURFACE WATERS, INCLUDING STORMWATER CONVEYANCES SUCH AS CURB AND GUTTER SYSTEMS, OR CONDUITS AND DITCHES UNLESS THERE IS A BYPASS IN PLACE TO PREVENT STORMWATER RUN-ON INTO THE STOCKPILE.
10. STEEP SLOPES MAY BE TEMPORARILY CREATED DURING GRADING OPERATIONS. STABILIZATION OF STEEP SLOPES (3:1 OR GREATER) SHALL BE PROPERLY CAT-TRACKED AND STABILIZED PER THE EROSION CONTROL PLAN. LONG SLOPES CAN BE BROKEN UP WITH SEDIMENT CONTROL LOGS IF EROSION IS EVIDENT.
11. DITCH CHECKS WILL BE PLACED AS INDICATED ON THE PLANS DURING ALL PHASES OF CONSTRUCTION.
12. ALL STORM DRAIN INLETS, THAT RECEIVE PROJECT STORMWATER, MUST BE PROTECTED BY APPROPRIATE BMPS DURING CONSTRUCTION UNTIL ALL SOURCES WITH POTENTIAL FOR DISCHARGING TO THE INLET HAVE BEEN STABILIZED. INLET PROTECTION MAY BE REMOVED FOR A PARTICULAR INLET IF A SPECIFIC SAFETY CONCERN (STREET FLOODING/FREEZING) HAS BEEN IDENTIFIED AND THE PERMITTEE(S) HAS RECEIVED WRITTEN CORRESPONDENCE FROM THE JURISDICTIONAL AUTHORITY VERIFYING THE NEED FOR REMOVAL. WRITTEN CORRESPONDENCE MUST BE DOCUMENTED IN THE SWPPP.
13. SILT FENCE IS NOT AN ACCEPTABLE CATCH BASIN INLET PROTECTION BMP. CONTACTOR SHALL CLEAN, REMOVE AND DISPOSE OF SEDIMENT, AND/OR REPLACE STORM DRAIN INLET PROTECTION ON A ROUTINE BASIS TO ENSURE THE DEVICE IS FULLY FUNCTIONAL PRIOR TO THE NEXT FORECASTED PRECIPITATION EVENT (30% OR GREATER).
14. DISCHARGE TURBID OR SEDIMENT LADEN WATER TO TEMPORARY SEDIMENT BASINS WHENEVER FEASIBLE. IN THE EVENT THAT IT IS NOT FEASIBLE TO DISCHARGE THE SEDIMENT LADEN WATER TO A TEMPORARY SEDIMENT BASIN, THE WATER MUST BE TREATED SO THAT IT DOES NOT CAUSE A NUISANCE CONDITION IN THE RECEIVING WATERS OR TO DOWNSTREAM LANDOWNERS. CLEAN OUT ALL PERMANENT STORMWATER BASINS REGARDLESS OF WHETHER USED AS TEMPORARY SEDIMENT BASINS/TRAPS TO THE DESIGN CAPACITY AFTER COMPLETING ALL UP-GRADIENT LAND DISTURBING ACTIVITY. USE A SKIMMER DEVICE FOR BASIN DRAINING.
15. PROVIDE STABILIZATION IN ANY TRENCHES CUT FOR DEWATERING OR SITE DRAINING PURPOSES.
16. THE CONTRACTOR SHALL SUBMIT A DEWATERING PLAN AND NARRATIVE TO THE PROJECT ENGINEER FOR APPROVAL 7 DAYS PRIOR TO UNDERTAKING THESE ACTIVITIES. DEWATERING PLAN MUST INCLUDE BMP’S TO PREVENT SEDIMENT TRANSPORT, EROSION, AND ADVERSE IMPACTS TO DOWNSTREAM RECEIVING WATERS. THE DEWATERING PLAN MUST ALSO INCLUDE ANY SPECIFIC CHEMICAL TREATMENTS (FLOC, POLYMERS, ETC.) THAT WILL BE USED. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ANY PERMIT NECESSARY FOR THESE ACTIVITIES; THE DEWATERING PLAN AND DNR APPROPRIATIONS PERMIT WILL BECOME PART OF THE SWPPP. THE CONTRACTOR SHALL VISUALLY CHECK AND PHOTOGRAPH THE DISCHARGE AT THE BEGINNING AND AT LEAST ONCE EVERY 24 HOURS OF OPERATION TO ENSURE ADEQUATE TREATMENT HAS BEEN OBTAINED AND NUISANCE CONDITIONS WILL NOT RESULT FROM THE DISCHARGE.

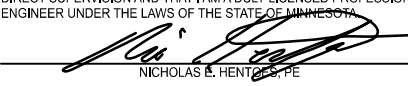
TEMPORARY & PERMANENT EROSION CONTROL BMPS

SEED MIX: SEED MIX SHALL BE USED IN CONSTRUCTION AND REVEGETATION PROJECTS IN ORDER TO ENHANCE SOIL NUTRIENT AVAILABILITY AND BIOLOGICAL SOIL STRUCTURE, ENCOURAGE NATIVE PLAN SUCCESSION, REDUCE EROSION, AND DISCOURAGE INVASIVE PLANT SPECIES. INOCULATION OF SOILS WITH MYCORRHIZAL FUNGI OR THE PRESENCE OF PRE-EXISTING SOIL MICROBES IS ESSENTIAL FOR THE STABILIZATION OF ADVERSE SOILS, ESTABLISHMENT OF NATIVE GRASSES, AND THE EXCLUSION OF NON-NATIVE “ANNUALS” AND NOXIOUS WEEDS.

EROSION CONTROL BLANKET: EROSION CONTROL BLANKETS (ECBS) ARE A SOIL STABILIZATION (EROSION CONTROL) BMP, INTENDED TO PROTECT DISTURBED SOIL SURFACES FROM RAINDROP IMPACT EROSION. ECBS ARE CARPET-LIKE MATS, INSTALLED OVER AND ANCHORED TO THE PROPERLY PREPARED SOIL SURFACES. PROPERLY SELECTED AND INSTALLED, ECBS CAN MIMIC THE BENEFICIAL EFFECTS OF VEGETATIVE COVER THEREBY REDUCING EROSION RATES BY OVER 90%. ECBS ALSO PROTECT SEEDS AND PROVIDE A BENEFICIAL ENVIRONMENT FOR VEGETATION TO BECOME ESTABLISHED. CONTRACTOR SHALL VERIFY DURING REGULAR INSPECTIONS THAT NO GULLIES, RILLS, OR SCOUR HOLES HAVE FORMED UNDER EROSION CONTROL BLANKETS AND MATS AND CORRECT ALL ERODED AREAS WITHIN 7 DAYS. ALL REPAIRS MUST BE COMPLETED WITHIN 24 HOURS OF DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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	
	NICHOLAS E. HENTGES, PE
DATE: 9/12/2024	LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
STORM WATER POLLUTION PREVENTION PLAN SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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STRAW MULCHING: DISTURBED SOIL AREAS SHALL BE PROTECTED WITH STRAW MULCH. MULCHING IS THE APPLICATION OF A PROTECTIVE LAYER OF STRAW OR OTHER SUITABLE MATERIAL TO THE SOIL SURFACE. STRAW MULCH SHALL BE USED IN CONJUNCTION WITH SEEDING AND HYDRO-SEEDING FOR ESTABLISHMENT OF VEGETATION. STRAW MULCH MUST BE SECURED TO THE GROUND USING DISKING OR AN OVERSPRAY OF AN HECF. MULCHING IS COMMONLY USED AS A TEMPORARY MEASURE TO PROTECT BARE OR DISTURBED SOIL AREAS THAT HAVE NOT BEEN SEEDED, UNTIL NATIVE VEGETATION RE-GROWS. CERTIFIED WEED-FREE MULCH MUST BE USED WHEN USING NATIVE SEED MIXES OR WHEN WORKING NEAR ENVIRONMENTALLY SENSITIVE AREAS.

HYDRAULIC MATRICES: HYDRAULIC MATRICES ARE EROSION CONTROL PRODUCTS THAT ARE USED TO STABILIZE EXPOSED SOILS. THESE MATRICES ARE APPLIED IN A SLURRY, PRODUCED BY MIXING FIBER, WATER AND A BINDING AGENT TOGETHER IN A MECHANICAL HYDRO-SEEDER. WOOD FIBER IS WIDELY USED BUT OTHER FIBERS CAN INCLUDE PAPER, STRAW, COIR, CORN, ETC. THE EFFECTIVENESS OF THESE HYDRAULIC MATRICES ARE DEPENDENT ON:

- PROPER SOIL PREPARATION
- APPLICATION RATES (DEPENDENT ON THE MANUFACTURERS RECOMMENDATIONS)
- THE TYPE OF FIBERS USED
- THE TYPE OF BOND AGENT(S) ADDED

THESE HYDRAULIC MATRICES ARE CLASSIFIED IN THE MNDOT SPEC BOOK AND APPROVED PRODUCTS LIST, DEPENDING ON THE PRODUCT CHARACTERISTICS, STRENGTH, AND LONGGEVITY. HYDRAULIC MATRICES USED INCLUDE: ORGANIC FIBER MATRIX, HYDRAULIC MULCH MATRIX, STABILIZED FIBER MATRIX, BONDED FIBER MATRIX, AND FIBER REINFORCED MATRIX.

SOD TYPE LAWN: SOD IS A PERMANENT EROSION PREVENTION BMP THAT PROVIDES INSTANTANEOUS SOIL STABILIZATION. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF SOD AS OUTLINED IN THE PROJECT SPECIFICATIONS.

ENERGY DISSIPATER: AN ENERGY DISSIPATER IS A STRUCTURE DESIGNED TO CONTROL EROSION AT THE OUTLET OF A CHANNEL OR CONDUIT.

RAPID STABILIZATION METHOD #1: THIS METHOD SHALL CONSIST OF TYPE 1 MULCH (2 TON PER ACRE) WITH DISC ANCHORING BE SPREAD IN AREAS THAT HAVE BEEN UNWORKED FOR 7 DAYS. THIS METHOD SHALL BE USED ON SLOPES OF 3:1 AND LESS. OPERATOR MUST APPLY MULCH IN A UNIFORM PATTERN OVER THE DISTURBED SOILS TO ACHIEVE A MINIMUM OF 90% GROUND COVER.

RAPID STABILIZATION METHOD #2: THIS METHOD SHALL CONSIST OF TYPE 3 MULCH (1.5 TON PER ACRE) OR 3884 TYPE STABILIZED FIBER MATRIX (750 LBS PER ACRE) BE SPREAD IN AREAS THAT HAVE BEEN UNWORKED FOR 7 DAYS. THIS METHOD SHALL BE USED ON SLOPES LESS THAN 3:1.

RAPID STABILIZATION METHOD #3: THIS WORK SHALL CONSIST OF OPERATIONS NECESSARY TO RAPIDLY STABILIZE SMALL CRITICAL AREAS WITHIN 200 FEET OF SURFACE WATERS, TO PREVENT OFF SITE SEDIMENTATION AND OR TO COMPLY WITH PERMIT REQUIREMENTS. THIS FORM OF RAPID STABILIZATION EMPLOYS SFM, SEED MIX 22-111, AND FERTILIZER TYPE 3. THIS METHOD SHALL BE USED ON SLOPES LESS THAN 3:1. INSTALL PER MNDOT SPECIFICATION 2575.3.M.1.C.

RAPID STABILIZATION METHOD #4: THIS METHOD SHALL CONSIST OF CATEGORY 20/25 EROSION CONTROL BLANKET (NATURAL NET ONLY) IN COMBINATION WITH MNDOT SEED MIX 22-111 (2 LBS PER 100 SQ. YD.) AND TYPE 3 SLOW RELEASE FERTILIZER (8 LBS PER 100 SQ. YD.). THIS IS AN ACCEPTABLE BMP FOR DISTURBED AREAS ADJACENT TO ENVIRONMENTALLY SENSITIVE AREAS, SURFACE WATERS, AND WITHIN THE LAST 200 FEET OF DITCH BOTTOMS.

TEMPORARY & PERMANENT SEDIMENT CONTROL BMPS

SEDIMENT CONTROL LOGS: SEDIMENT CONTROL LOGS ARE MANUFACTURED FROM STRAW, WOOD EXCELSIOR, COCONUT FIBERS, AND/OR OTHER MATERIALS THAT ARE BOUND WITH POLYPROPYLENE OR BIODEGRADABLE NETTING INTO TIGHT TUBULAR ROLLS. FIBER ROLLS CONTROL THREE TYPES OF EROSIONAL PROCESSES; EROSION CONTROL, RUN OFF CONTROL, AND SEDIMENT CONTROL. SEDIMENT CONTROL LOGS CAN BE USED FOR THE FOLLOWING:

- SLOPE INTERRUPTERS TO REDUCE EROSION ON NEWLY CONSTRUCTED SLOPES
- TEMPORARY DITCH CHECKS TO REDUCE RUNOFF VELOCITIES IN DRAINAGE CHANNELS
- SEDIMENT CONTROL BARRIERS FOR SMALL DISTURBED SOIL AREAS SUCH AS STOCKPILES, DISCRETE SLOPES, OR INDIVIDUAL LOTS

MACHINE SLICED SILT FENCE: A SILT FENCE IS A TEMPORARY SEDIMENT BARRIER CONSISTING OF FILTER FABRIC ENTRENCHED INTO THE SOIL AND ATTACHED TO SUPPORTING POSTS. SILT FENCE IS INTENDED TO BE INSTALLED WHERE SEDIMENT-LADEN WATER CAN POND, THUS ALLOWING THE SEDIMENT TO FALL OUT OF SUSPENSION AND SEPARATE FROM THE RUNOFF. SILT FENCE INSTALLED WITH A TRENCHER OR BY SLICING IS THE MOST EFFECTIVE INSTALLATION METHOD TO ENSURE AGAINST COMMON SILT FENCE FAILURES. THE BMP WILL BE CLEANED OUT OR REPLACED WHEN THE SEDIMENT REACHES 1/2 THE HEIGHT OF THE FENCE.

STABILIZED CONSTRUCTION EXIT: TEMPORARY CONSTRUCTION EXITS ARE CONSTRUCTED AT THE EGRESS POINT FROM THE CONSTRUCTION AREA ONTO A PAVED ROAD. A STABILIZED CONSTRUCTION EXIT IS A TRACKING CONTROL BMP INTENDED TO PREVENT TRACKING OF SOIL FROM THE CONSTRUCTION SITE BY EQUIPMENT AND VEHICLES. THE EXITS ARE CONSTRUCTED OF LARGE ANGULAR ROCK, STEEL RIBS (RUMBLE STRIPS), OR TRACK PADS INTENDED TO KNOCK THE MUD OFF THE TIRES BEFORE TRAVELING ONTO THE ROADWAY.

CHEMICAL TREATMENTS: OPERATOR MUST AMEND THE SWPPP TO INCLUDE THE INTENDED USES AND LOCATIONS OF FLOCCULANTS, POLYMERS, AND OTHER SEDIMENTATION TREATMENT CHEMICALS. CHEMICAL TREATMENTS MUST BE IN COMPLIANCE WITH PART 9.18.

BIORETENTION & BIOSWALES: BIORETENTION BASINS AND BIOSWALES DIRECT SHEET FLOW ACROSS A GRASS BUFFER STRIP TO A PONDING AREA FOR INFILTRATION. THEY UTILIZE SOILS AND BOTH WOODY AND HERBACEOUS PLANTS TO REMOVE POLLUTANTS FROM STORMWATER RUNOFF. THE PONDING AREA GENERALLY CONSISTS OF A SURFACE LAYER CONTAINING ORGANICS SUCH AS MULCH, TREES, NATIVE GRASSES AND SHRUBS, A SUBSURFACE LAYER OF PLANTING SOIL, AND A SAND BED.

DUST CONTROL: OPERATOR WILL COMPLY WITH STATE RULE 7011.0150 ON DUST PREVENTION REQUIREMENTS. DUST FROM THE SITE WILL BE CONTROLLED BY INCREASED STREET SWEEPING AND/OR USING A MOBILE PRESSURE-TYPE DISTRIBUTOR TRUCK TO APPLY POTABLE WATER TO DISTURBED AREAS. THE MOBILE UNIT WILL APPLY WATER AT A RATE NECESSARY TO PREVENT RUNOFF AND PONDING.

POLLUTION PREVENTION MANAGEMENT

POTENTIAL SOURCES OF POLLUTANTS FROM CONSTRUCTION ACTIVITIES INCLUDE, BUT NOT LIMITED TO:

1. SEDIMENT AND FUGITIVE DUST GENERATED FROM CLEARING AND GRUBBING, IMPORT/EXPORT OPERATIONS, REMOVALS/COMPACTION, MASS/FINE GRADING, EXCAVATIONS, TRENCHING, TOPSOIL STRIPING STOCKPILING, WET/DRY PAVEMENT CUTTING, STREET CONSTRUCTION.
2. BASIC/ACIDIC PH LEVELS FROM CURB AND GUTTER, MANHOLE STRUCTURES, SIDEWALKS, DRIVEWAY APRONS, FOUNDATIONS, BRIDGE ABUTMENTS, WET/DRY PAVEMENT CUTTING, MASONRY WASHOUT/CLEANOUT.
3. EXCESS NUTRIENTS FROM LANDSCAPING INSTALLATIONS, SOIL ADDITIVES, FERTILIZATION, MULCHING.
4. HYDROCARBONS FROM STREET CONSTRUCTION, DEMOLITION/REMOVALS, WET/DRY PAVEMENT CUTTING.

OPERATOR WILL COMPLY WITH ALL OF THE POLLUTION PREVENTION AND MANAGEMENT MEASURES IDENTIFIED IN THE NPDES-CSW PERMIT, PART 12.1. STORAGE AND DISPOSAL OF CONSTRUCTION AND HAZARDOUS WASTES MUST BE IN COMPLIANCE WITH MPCA REGULATIONS.

- A. POSITION AND STAKE DOWN ALL PORTABLE TOILETS SO THEY CANNOT BE TIPPED OR KNOCKED OVER. SUPPLY ADEQUATE SECONDARY CONTAINMENT.
- B. SECONDARY CONTAINMENT IS NEEDED AROUND ALL STATIONARY EQUIPMENT (GENERATORS, PUMPS, LIGHT PLANTS, ETC.) PROVIDE CONTAINMENT FOR ALL HAZARDOUS MATERIALS AND TOXIC WASTE.
- C. NO ENGINE DEGREASING IS ALLOWED ON SITE.
- D. VEHICLE AND EQUIPMENT WASHING TO OCCUR IN DESIGNATED AREA AS DETERMINED BY THE CONTRACTOR SUBMITTAL OF A MANAGEMENT PLAN FOR THESE ACTIVITIES.
- E. PROPERLY CLEAN UP AND REPORT ALL SPILLS AS REQUIRED BY THE MPCA AND MNDOT SPECIFICATIONS.
- F. PROVIDE A SPILL KIT AT EACH WORK LOCATION ON THE SITE.
- G. PROVIDE A SECURE STORAGE AREA WITH RESTRICTED ACCESS FOR ALL HAZARDOUS MATERIALS AND TOXIC WASTE. RETURN ALL HAZARDOUS MATERIALS AND TOXIC WASTE TO THE DESIGNATED STORAGE AREA AT THE END OF THE BUSINESS DAY UNLESS INFEASIBLE. STORE ALL HAZARDOUS MATERIALS AND TOXIC WASTE (INCLUDING BUT NOT LIMITED TO OIL, DIESEL FUEL, GASOLINE, HYDRAULIC FLUIDS, PAINT, PETROLEUM BASED PRODUCTS, WOOD PRESERVATIVES, ADDITIVES, CURING COMPOUNDS, AND ACIDS) IN SEALED CONTAINERS WITH SECONDARY CONTAINMENT. CLEAN UP SPILLS IMMEDIATELY. STORE, COLLECT AND DISPOSE OF ALL SOLID WASTE.
- H. SLURRY FROM CONCRETE OPERATIONS MUST BE VACUUMED UP IMMEDIATELY. NO CONCRETE WASHOUT SHALL COME IN CONTACT WITH THE GROUND AND MUST BE PROPERLY DISPOSED OF.
- I. A SIGN MUST BE INSTALLED ADJACENT TO EACH CONCRETE WASHOUT FACILITY.
- J. CREATE AND FOLLOW A WRITTEN DISPOSAL PLAN FOR ALL WASTE MATERIALS. INCLUDE IN THE PLAN HOW THE MATERIAL WILL BE DISPOSED OF AND THE LOCATION OF THE DISPOSAL SITE. SUBMIT PLAN TO THE ENGINEER PRIOR TO CONSTRUCTION.
- K. USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT DISCHARGE OR PLACEMENT OF BITUMINOUS GRINDINGS, CUTTINGS, MILLINGS, AND OTHER BITUMINOUS WASTES FROM AREAS OF EXISTING OR FUTURE VEGETATED SOILS AND FROM ALL WATER CONVEYANCE SYSTEMS, INCLUDING INLETS, DITCHES AND CURB FLOW LINES.

FINAL STABILIZATION

FINAL STABILIZATION IS ACHIEVED WHEN NPDES CGP PARTS 13.1-13.7 (AS APPLICABLE) ARE COMPLETED PRIOR TO SUBMISSION OF THE NOTICE OF TERMINATION (NOT) TO MPCA.

1. ALL AREAS MUST BE STABILIZED WITH A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70%.
2. ALL TEMPORARY SEDIMENT CONTROL BMP MEASURES MUST BE REMOVED PRIOR TO SUBMITTING PERMIT NOT.
3. THE NOT SUBMITTAL MUST INCLUDE EITHER GROUND OR AERIAL PHOTOGRAPHS SHOWING THE AFOREMENTIONED REQUIREMENTS OF HAVE BEEN MET.

NO.	DATE	BY	CHK	REVISIONS

Design By:
Plan By:
Checked By:
Approved By:

NEH
MKV
MAN
NEH

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


NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

STORM WATER POLLUTION PREVENTION PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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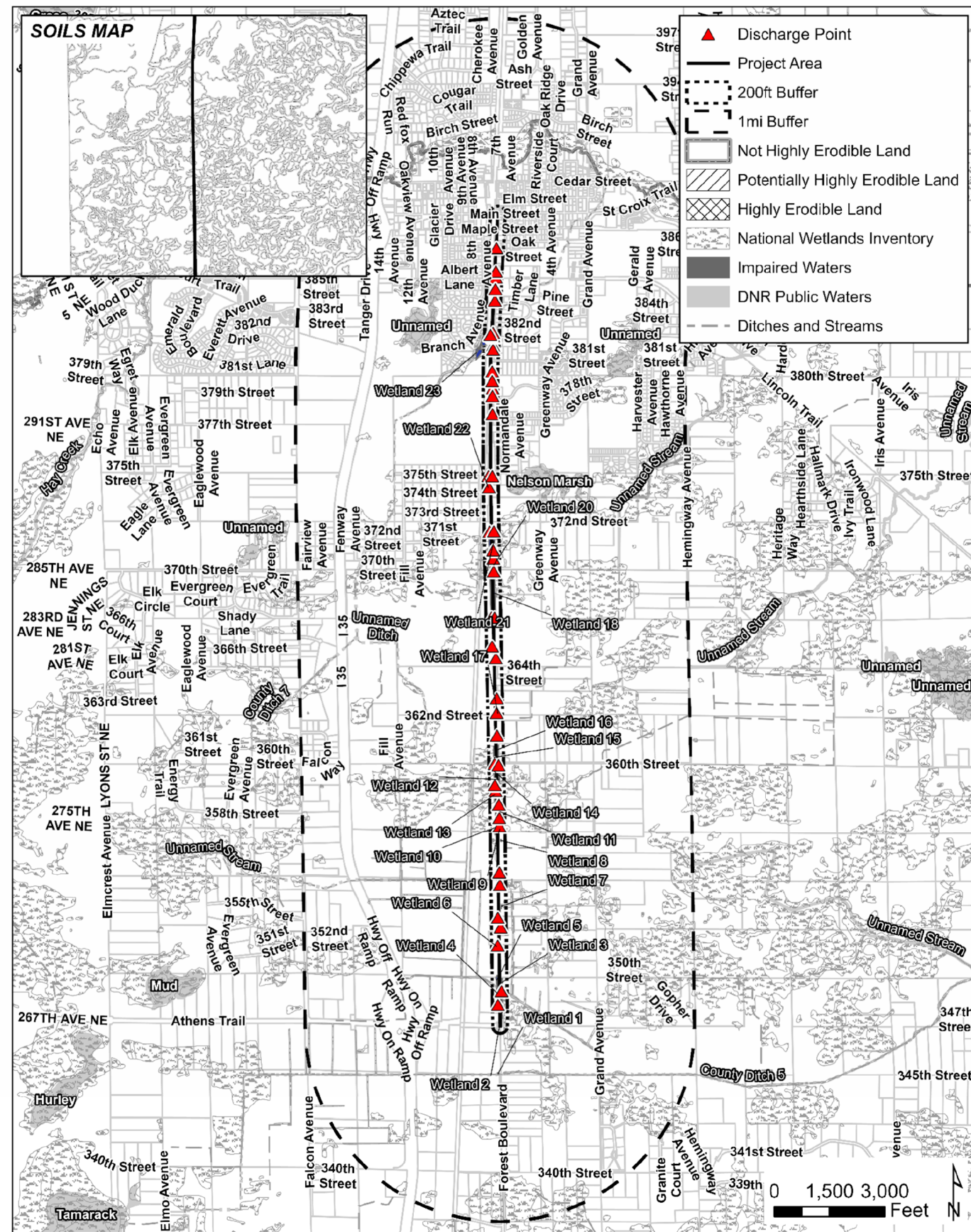


Figure 1. SWPPP Resource Map

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Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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CSAH 30 (Forest Blvd) Improvements

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EROSION/SEDIMENT CONTROL NOTES:

SEDIMENT CONTROL PRACTICES:

1. SEDIMENT CONTROL MUST BE IN PLACE AND APPROVED BY THE ENGINEER BEFORE ANY PHASE OF CONSTRUCTION CAN BEGIN.
2. IF A 50' NATURAL BUFFER AROUND A SURFACE WATER IS INFEASIBLE, REDUNDANT PERIMETER CONTROLS MUST BE PROVIDED. REDUNDANT MEASURE TO BE INSTALLED 5' FROM THE PRIMARY MEASURE WITH STABILIZED AREAS IN BETWEEN THE TWO BMPS.
3. INLET PROTECTION WILL BE INSTALLED AT ALL CATCH INLETS WITHIN AND IMMEDIATELY DOWNSTREAM OF THE PROJECT AREA PER STANDARD DETAILS.
4. TEMPORARY STABILIZATION MEASURES SHALL BE EMPLOYED WITHIN 200 FEET OF THE NWP OF ALL DISCHARGE POINTS WITHIN 24 HOURS. MULCH IS NOT AN APPROVED MEASURE.
5. IN THE EVENT THAT PERMANENT STABILIZATION CANNOT BE IMPLEMENTED WITHIN 7 DAYS AFTER CONSTRUCTION ACTIVITY IN THE DISTURBED AREA HAS CEASED, TEMPORARY STABILIZATION BMPS MUST BE SCHEDULED TO OCCUR WITHIN THAT 7 DAY TIME FRAME (EXCEPT WHERE CALLED OUT BY NOTE BELOW)
6. RAPID STABILIZATION METHOD 4 SHALL BE EMPLOYED WITHIN 200 FEET OF THE NORMAL WETTED PERIMETER OF ALL DISCHARGE POINTS WITHIN 24 HOURS.
7. ALL STOCKPILES MUST HAVE DOWN GRADIENT PERIMETER SEDIMENT CONTROL IMPLEMENTED AND MAINTAINED AT ALL TIMES. STOCKPILES TO RECEIVE TEMPORARY STABILIZATION IF UNWORKED FOR 7 DAYS.
8. STOCKPILES MAY NOT BE PLACED WITHIN ANY DRAINAGE OR CURB LINE UNLESS PROPER BYPASS IS INSTALLED PRIOR TO STOCKPILE PLACEMENT.
9. CONTRACTOR TO INSTALL SEDIMENT CONTROL LOGS DOWN GRADIENT FROM ANY EXPOSED AREAS

EROSION PREVENTION PRACTICES:

1. STABILIZATION OF DISTURBED AREAS SHALL BE DONE BY PERMANENT TURF ESTABLISHMENT WHENEVER POSSIBLE.

POLLUTION PREVENTION MANAGEMENT MEASURES:

1. A ROCK CONSTRUCTION ENTRANCE WILL BE PLACED AT ALL ENTRANCES THAT LEAD TO THE PROJECT SITE IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN AND THE APPROVED STANDARD DETAILS. ENTRANCE MUST BE A MINIMUM OF 50 FEET PER THE CONSTRUCTION PERMIT REQUIREMENT.
2. ALL STREETS IN AND ADJACENT TO THE PROJECT SHALL REMAIN CLEAN AND PASSABLE AT ALL TIMES. ADJACENT STREET AND CURB LINE TO BE SWEEPED FREE OF DEBRIS AT THE END OF EACH WORK DAY, OR AS OFTEN AS NEEDED TO ENSURE PUBLIC SAFETY.
3. SLURRY FROM CONCRETE OPERATIONS MUST BE VACUUMED UP IMMEDIATELY. NO CONCRETE WASHOUT SHALL COME IN CONTACT WITH THE GROUND AND MUST BE PROPERLY DISPOSED OF. ALL HAZARDOUS MATERIALS MUST BE KEPT UNDER COVER AND WITHIN PROPER CONTAINMENT WHEN NOT IN USE.

MISCELLANEOUS:

1. ADDITIONAL EROSION AND SEDIMENT CONTROL MAY BE ADDED DURING ANY PHASE OF CONSTRUCTION AS DIRECTED BY THE ENGINEER.
2. IF PROJECT CONSISTS OF MILL & OVERLAY OF SECTIONS, ENSURE MILLINGS ARE NOT A THREAT FROM WASHING OFF THE PROJECT ROW.
3. CONTRACTOR TO PROTECT ALL WETLAND AREAS WITH PERIMETER CONTROL (AND REDUNDANT MEASURES) UNTIL WORK IN THE PERMITTED AREAS IS NEEDED. REDUNDANT MEASURES MUST BE A MINIMUM OF 5 FEET APART, WHERE FEASIBLE.
4. THE CONTRACTOR SHALL AMEND THE SWPPP AND THIS PLAN SHEET TO SHOW THE LOCATIONS OF STAGING AREAS, STOCKPILE LOCATIONS (AND APPROPRIATE ESC BMPS), AND LOCATIONS OF POTENTIAL POLLUTANT GENERATING ACTIVITIES (I.E. DESIGNATED CONCRETE WASHOUT AREAS, FUELING LOCATIONS, ETC.).

TURF ESTABLISHMENT AND EROSION CONTROL LEGEND



PERMANENT: RESDENTIAL AREAS
SEED TURFGRASS (200 LBS/ACRE)
SEED MESIC INSLOPE (65 LBS/ACRE)
FERTILIZER TYPE 3 (350 LBS/ACRE, 22-5-10)
HYDRAULIC STABILIZED FIBER MATRIX (3000 LBS/ACRE)

TEMPORARY:
RAPID STAB METHOD 3

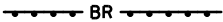


PERMANENT: RURAL INSLOPE
SEED MESIC INSLOPE (65 LBS/ACRE)
FERTILIZER TYPE 1 (350 LBS/ACRE, 20-10-20)
MULCH MATERIAL TYPE 3 (2 TONS/ACRE)
DISK ANCHORING

TEMPORARY:
RAPID STAB METHOD 4



SILT FENCE, TYPE MS



SEDIMENT CONTROL LOG, TYPE STRAW



CULVERT END CONTROLS



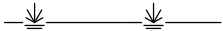
STORM DRAIN INLET PROTECTION



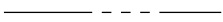
SURFACE DRAINAGE DIRECTION



PROPOSED DRAINAGE STRUCTURES



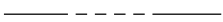
AREA OF ENVIRONMENTAL SENSITIVITY



RIGHT OF WAY



TEMPORARY EASEMENT



PERMANENT DRAINAGE EASEMENT

NO.	DATE	BY	CHK	REVISIONS

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Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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.	
NICHOLAS E. HENTGES, PE	
DATE: 9/12/2024	LICENSE NO. 44620

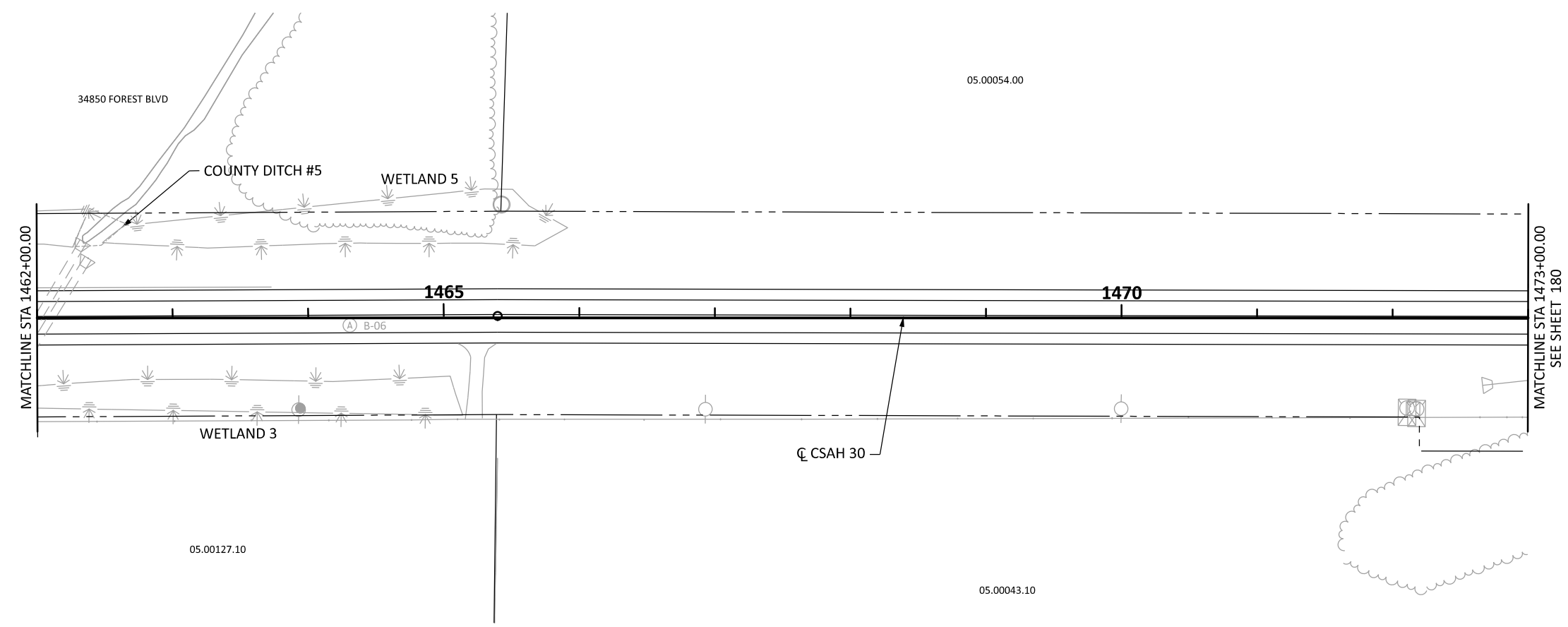
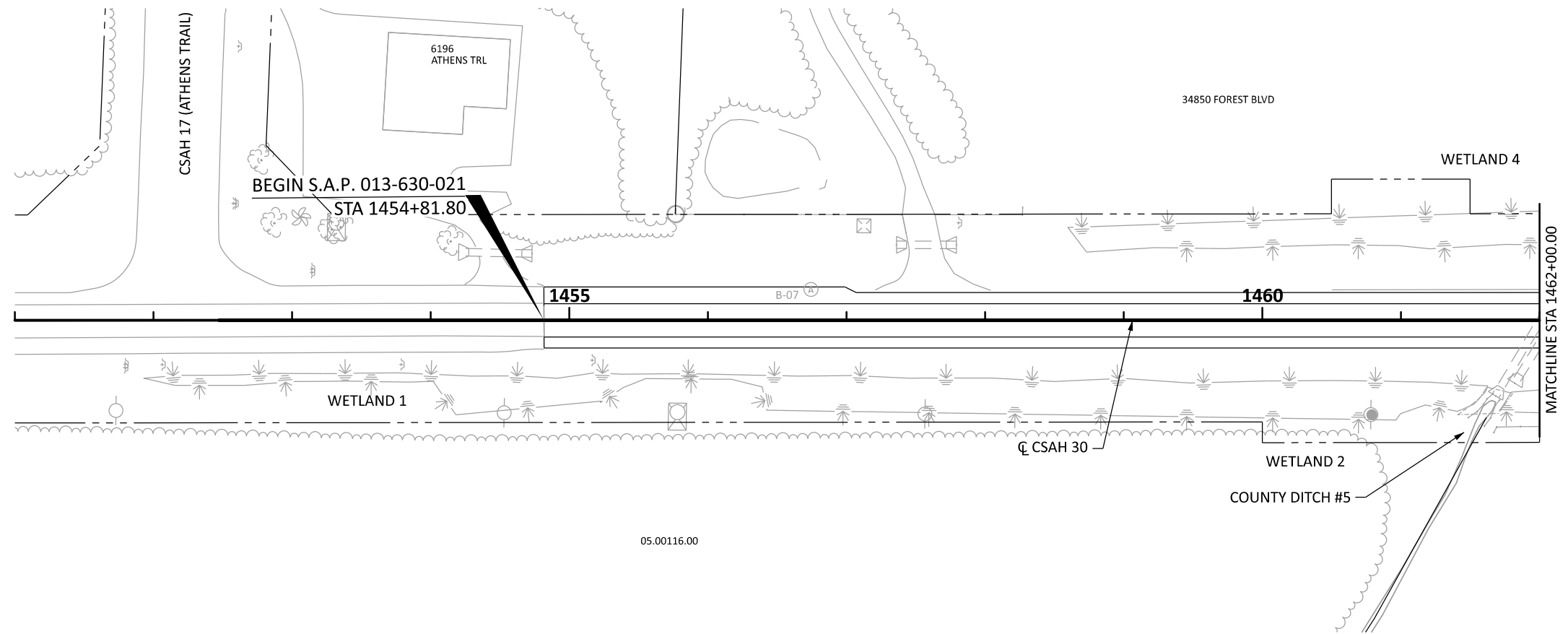


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

EROSION CONTROL & TURF ESTABLISHMENT PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
178
OF
216
SHEETS



DATE: 9/12/2024 2:09:04 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_1e

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

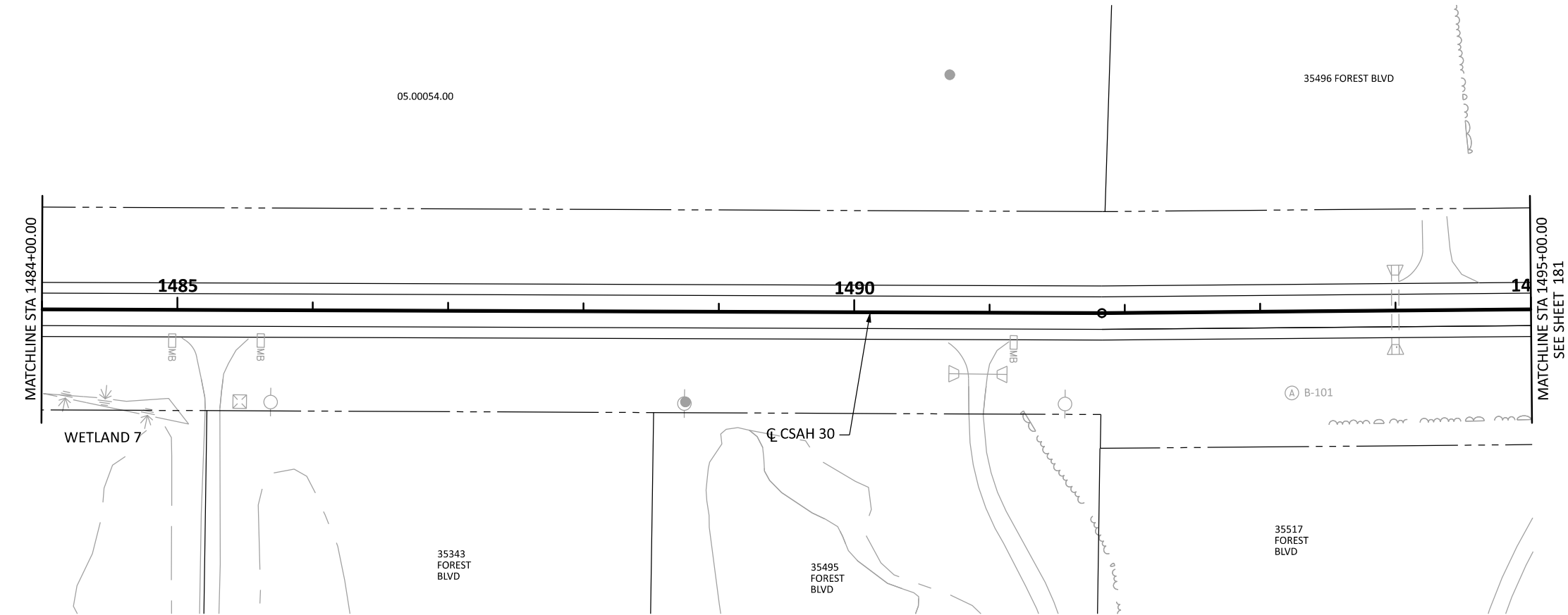
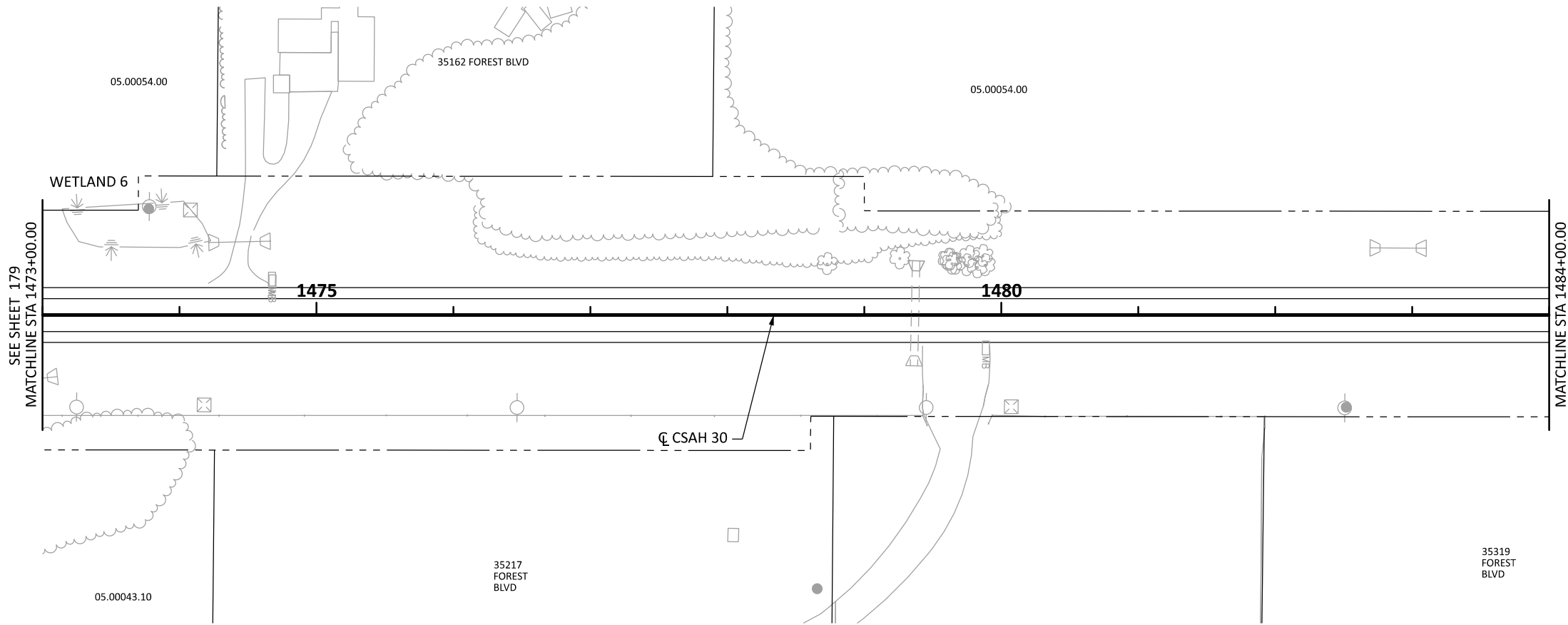
Nicholas E. Hentges
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 179 OF 216 SHEETS



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



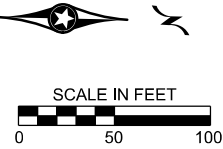
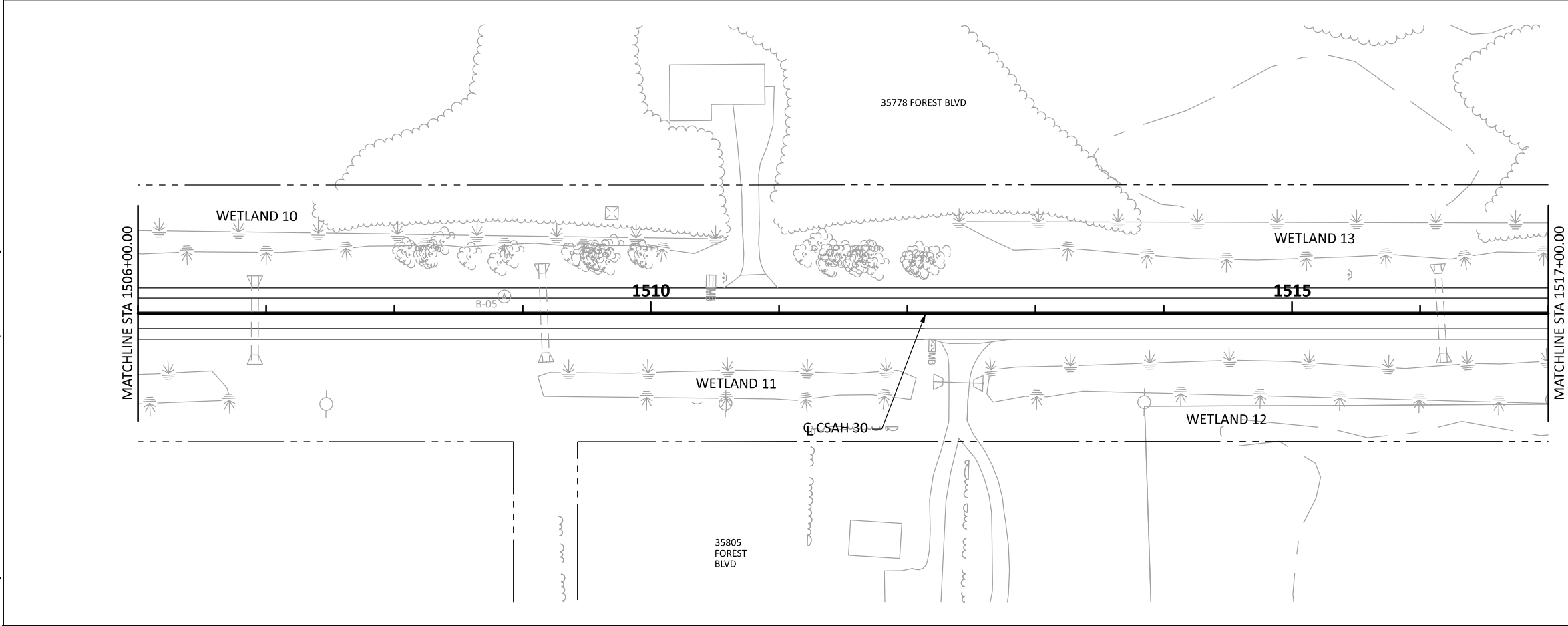
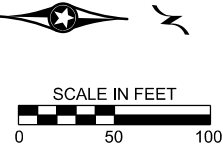
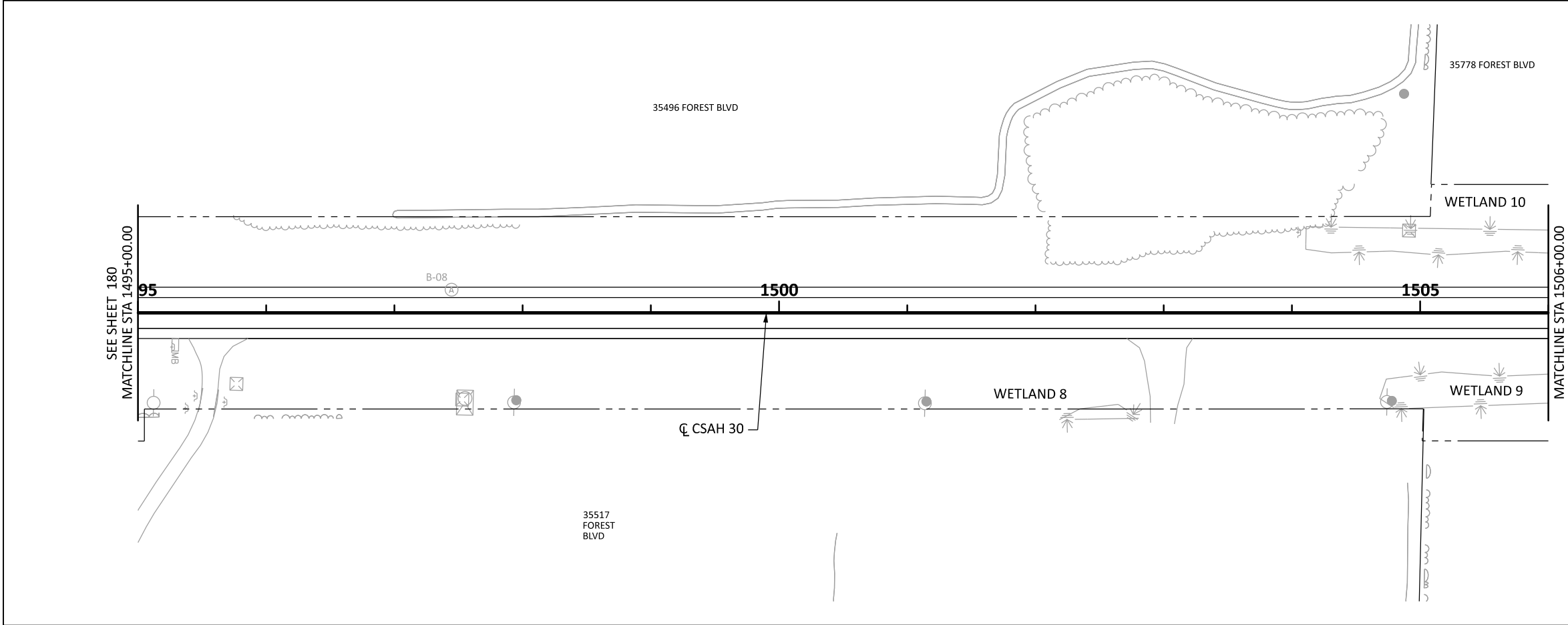
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
180
OF
216
SHEETS

DATE: 9/12/2024 2:09:07 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_1e



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620

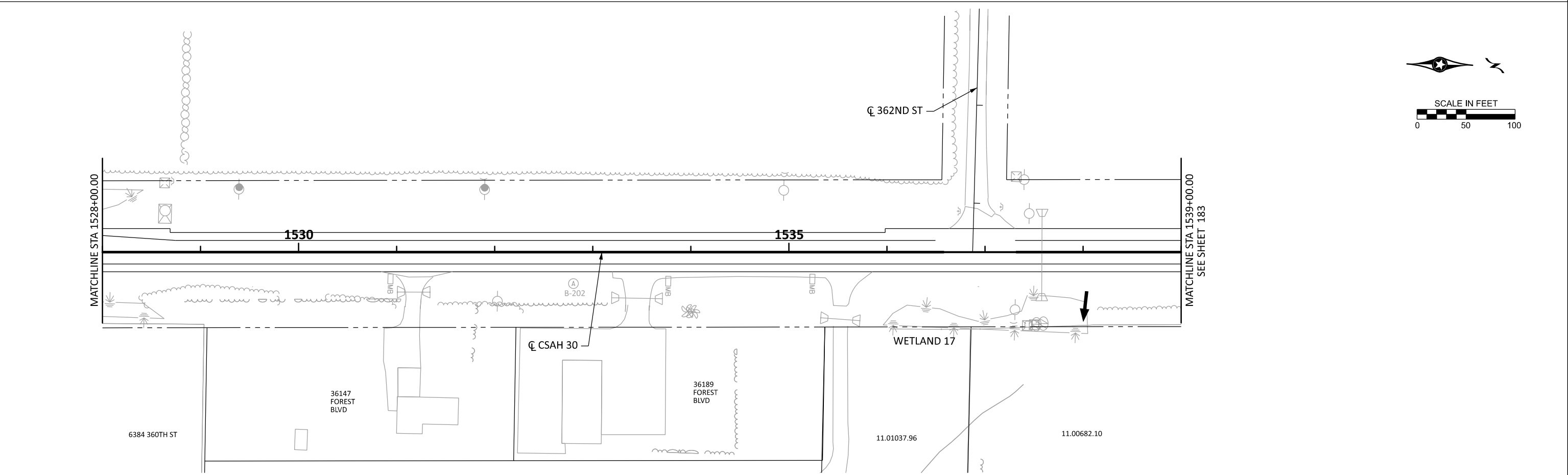
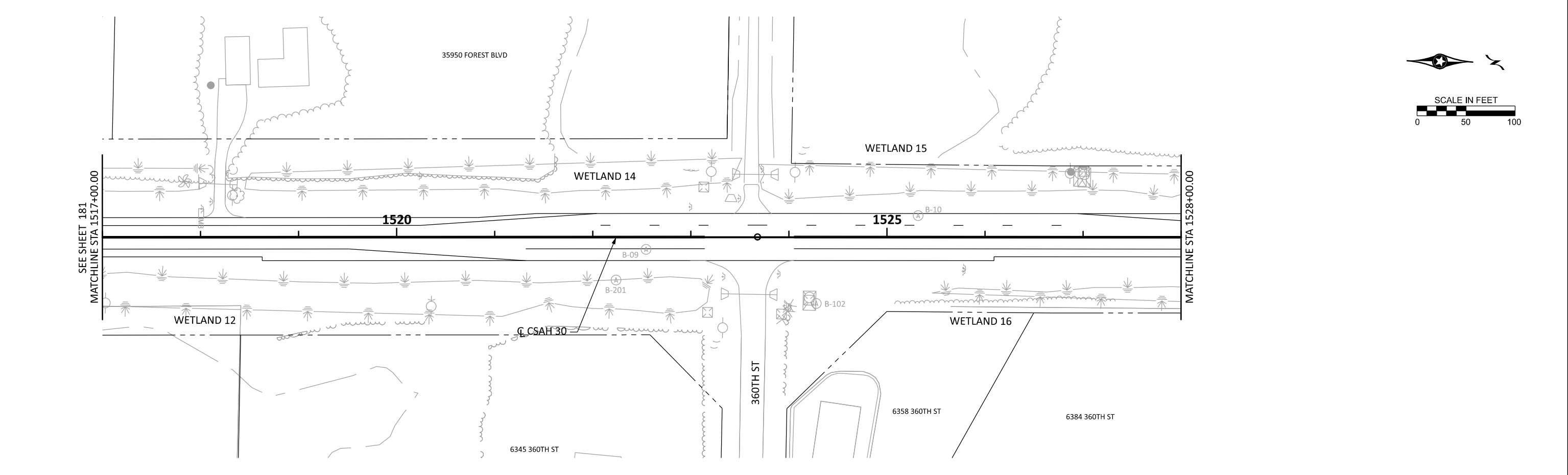


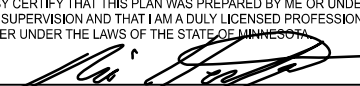


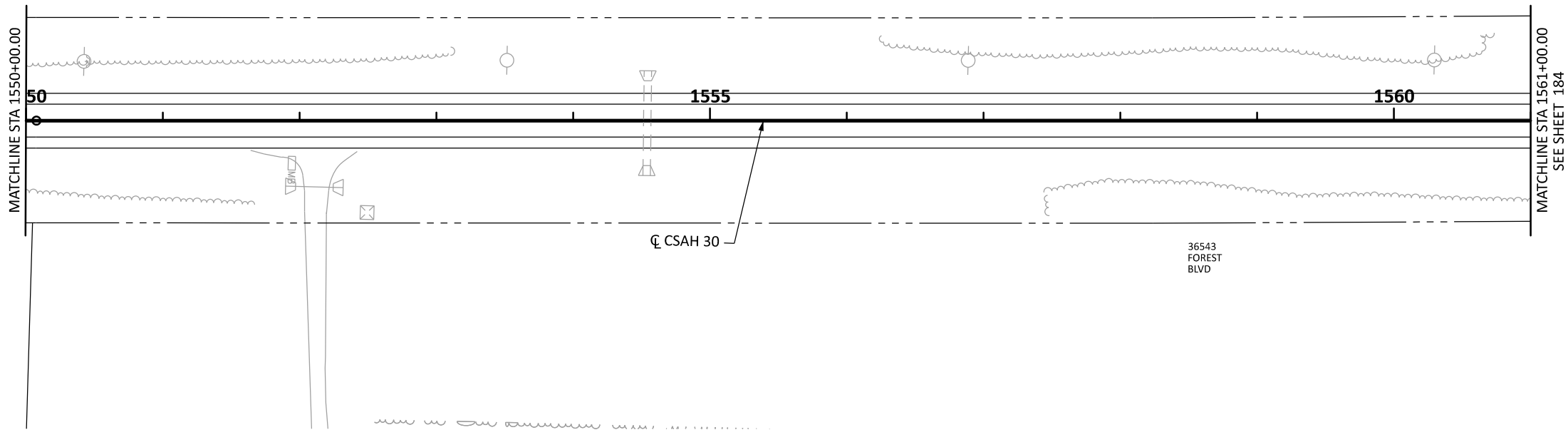
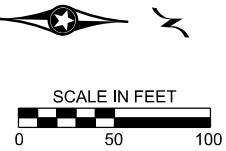
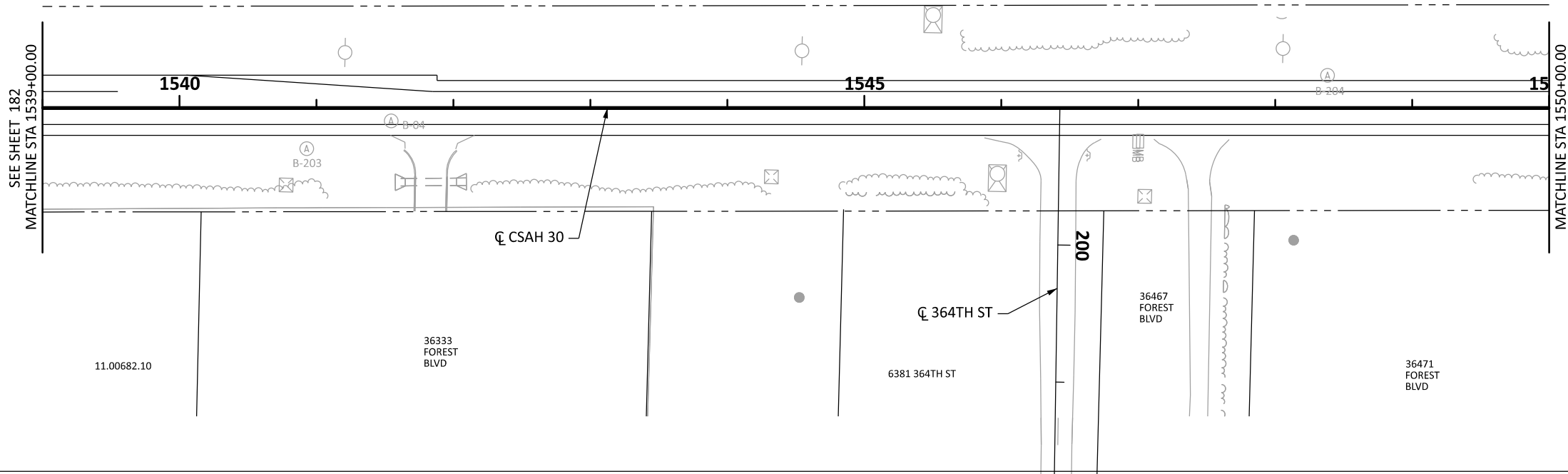
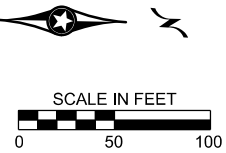
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	SHEET 181 OF 216 SHEETS
TURF ESTABLISHMENT & EROSION CONTROL PLAN SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

DATE: 9/12/2024 2:09:08 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_1e



NO.					DATE	BY	CHK	REVISIONS	Design By:		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.  NICHOLAS E. HENTGES, PE DATE: 9/12/2024 LICENSE NO. 44620				CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota		CHISAGO COUNTY, MINNESOTA TURF ESTABLISHMENT & EROSION CONTROL PLAN SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		SHEET 182 OF 216 SHEETS
									Plan By:	NEH									
									Checked By:	MKV									
									Approved By:	MAN									



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

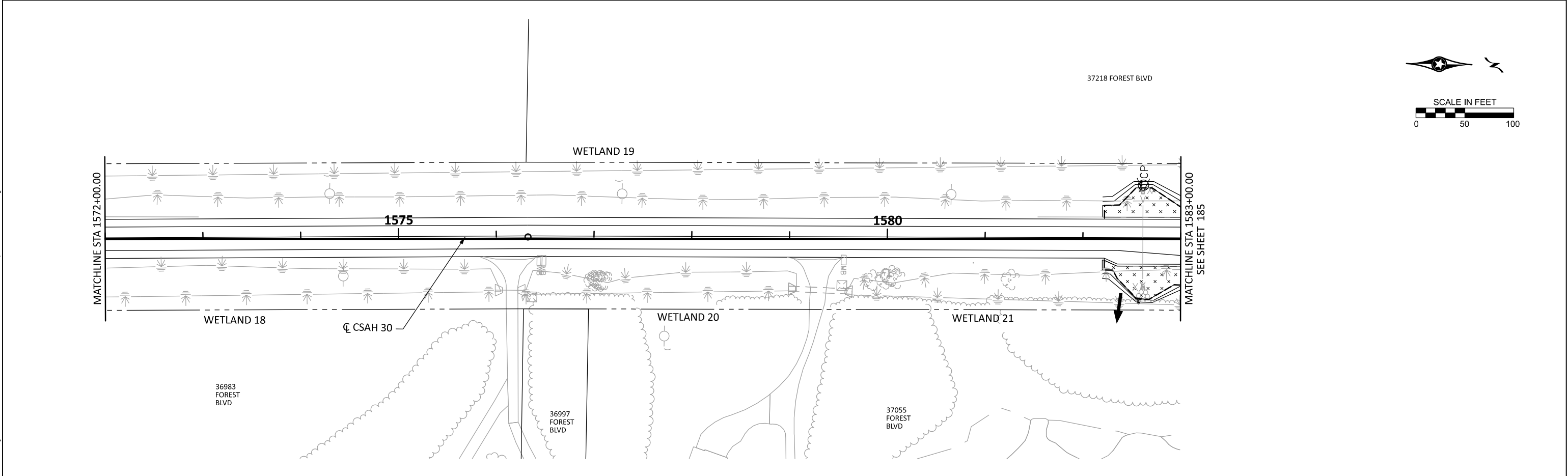
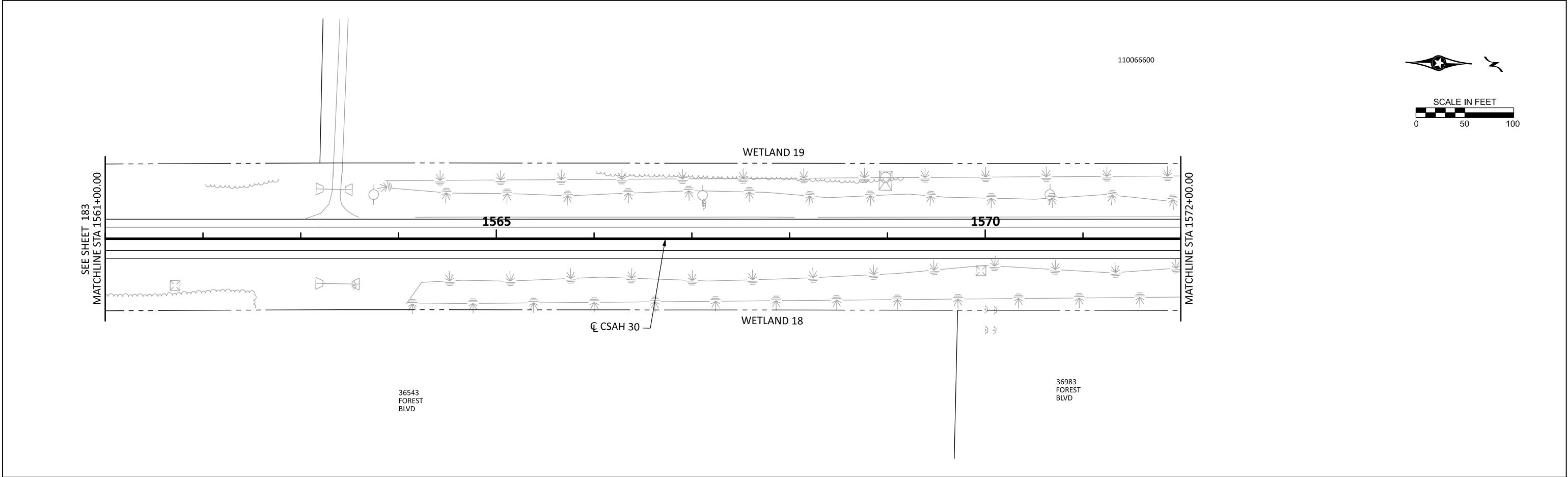
CHISAGO COUNTY, MINNESOTA

TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

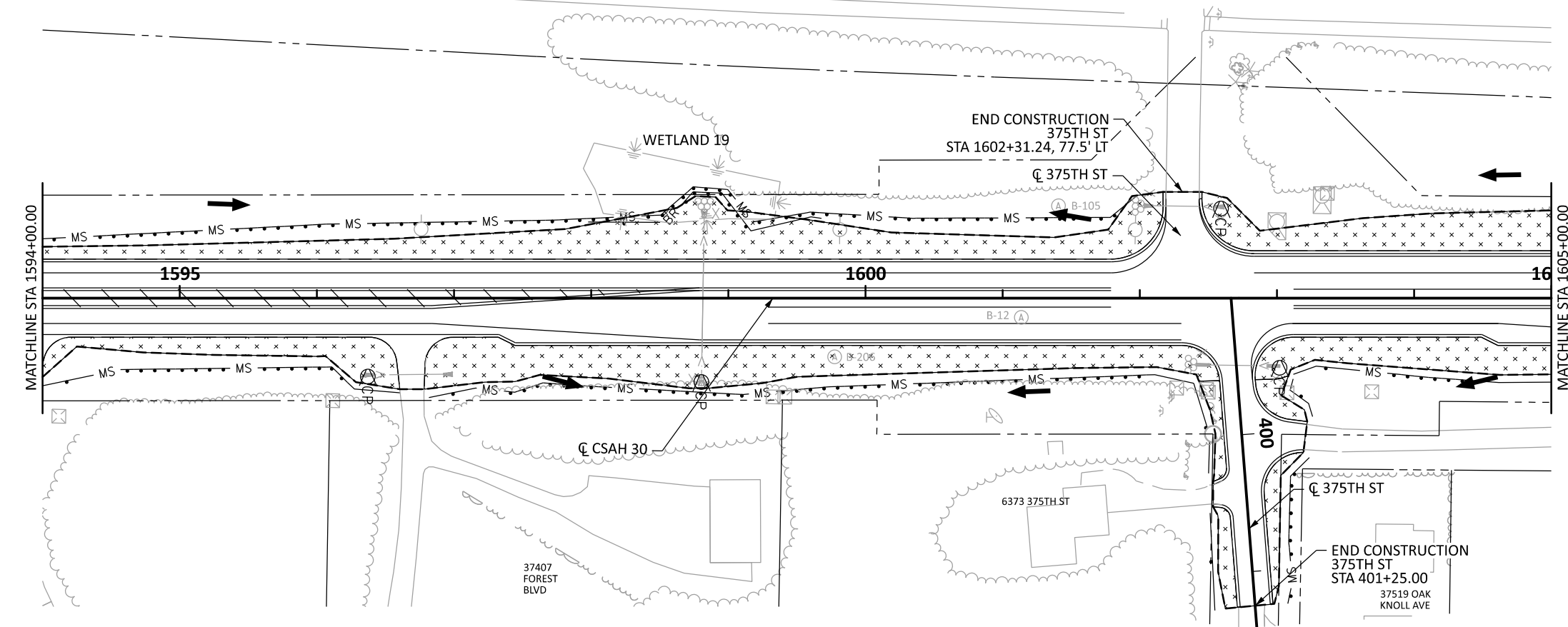
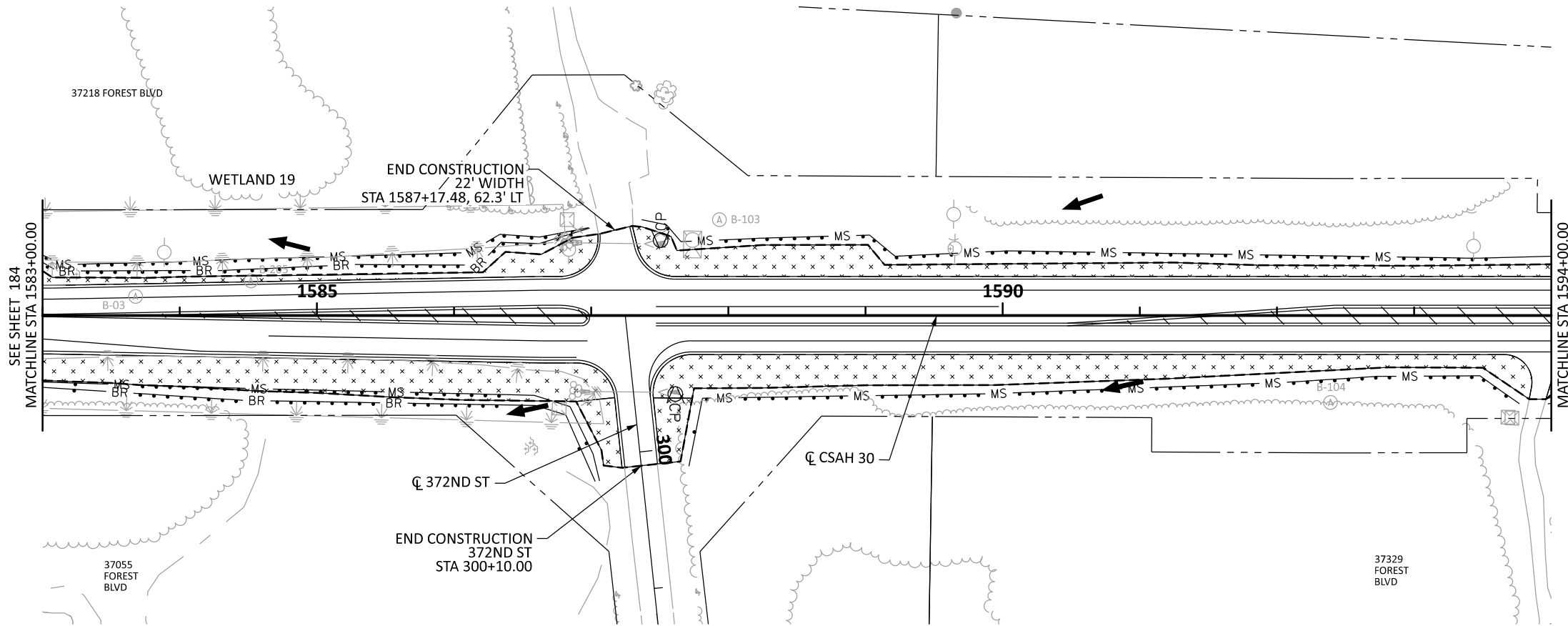
SHEET
183
OF
216
SHEETS

DATE: 9/12/2024 2:09:09 PM
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PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_1e



NO.	DATE	BY	CHK	REVISIONS	Design By: NEH	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.  NICHOLAS E. HENTGES, PE DATE: <u>9/12/2024</u> LICENSE NO. <u>44620</u>			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA	SHEET 184 OF 216 SHEETS
				Plan By: MKV	TURF ESTABLISHMENT & EROSION CONTROL PLAN						
				Checked By: MAN	SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004						
				Approved By: NEH							



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
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Nicholas E. Hentges, PE
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



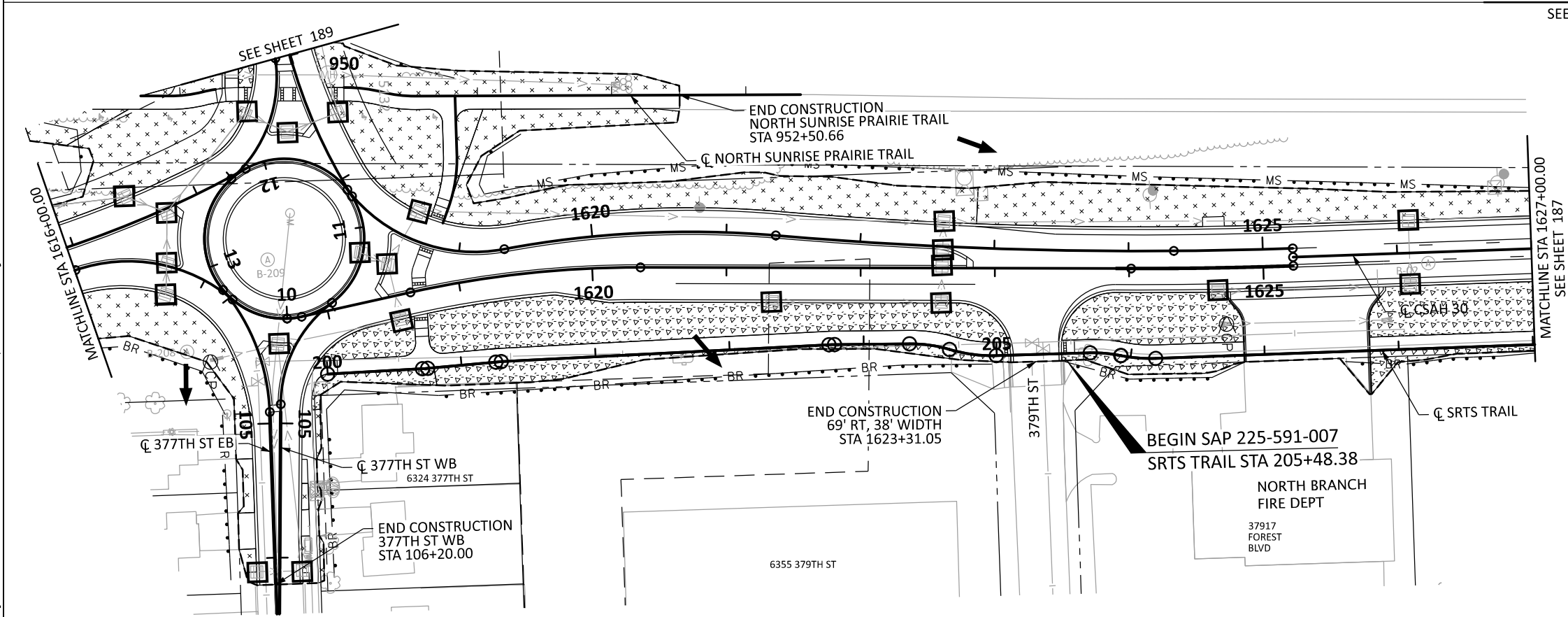
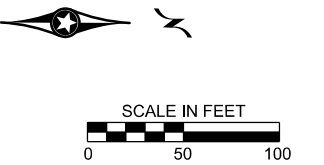
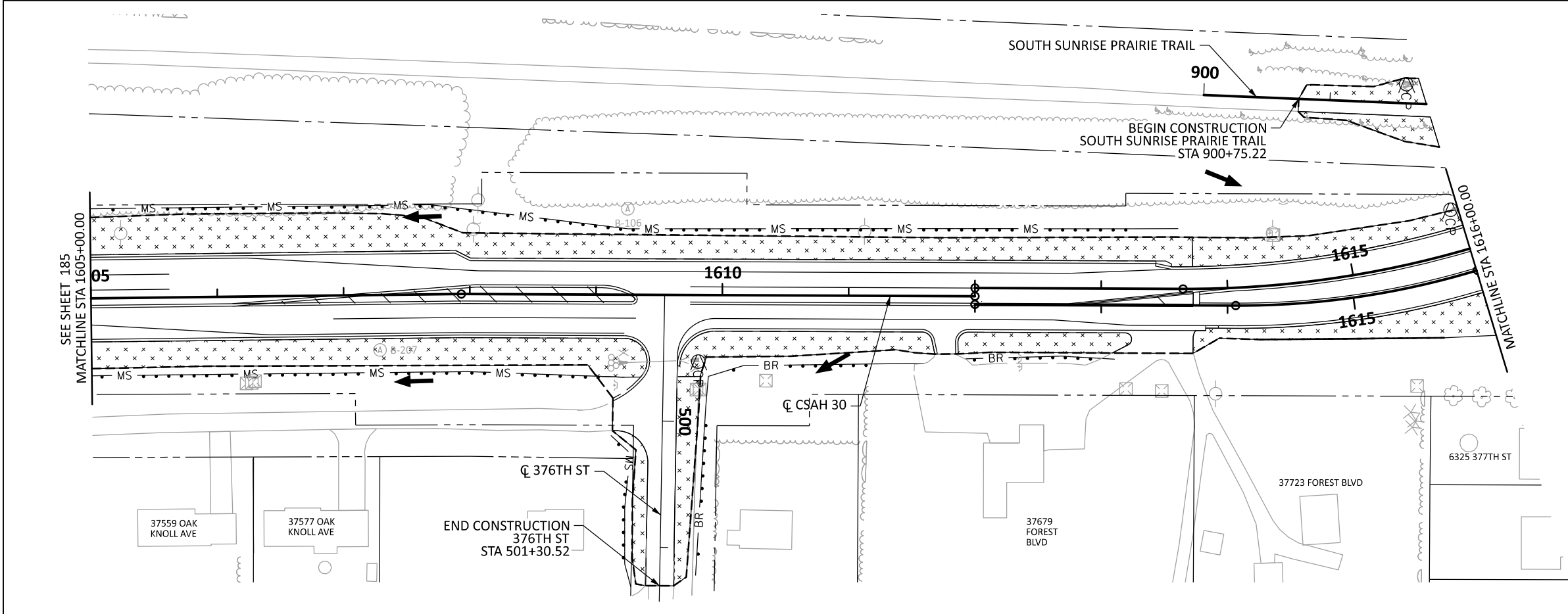
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
185
OF
216
SHEETS

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PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_1e



NO.	DATE	BY	CHK	REVISIONS

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Nicholas E. Hentges, PE
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



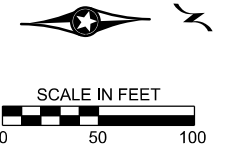
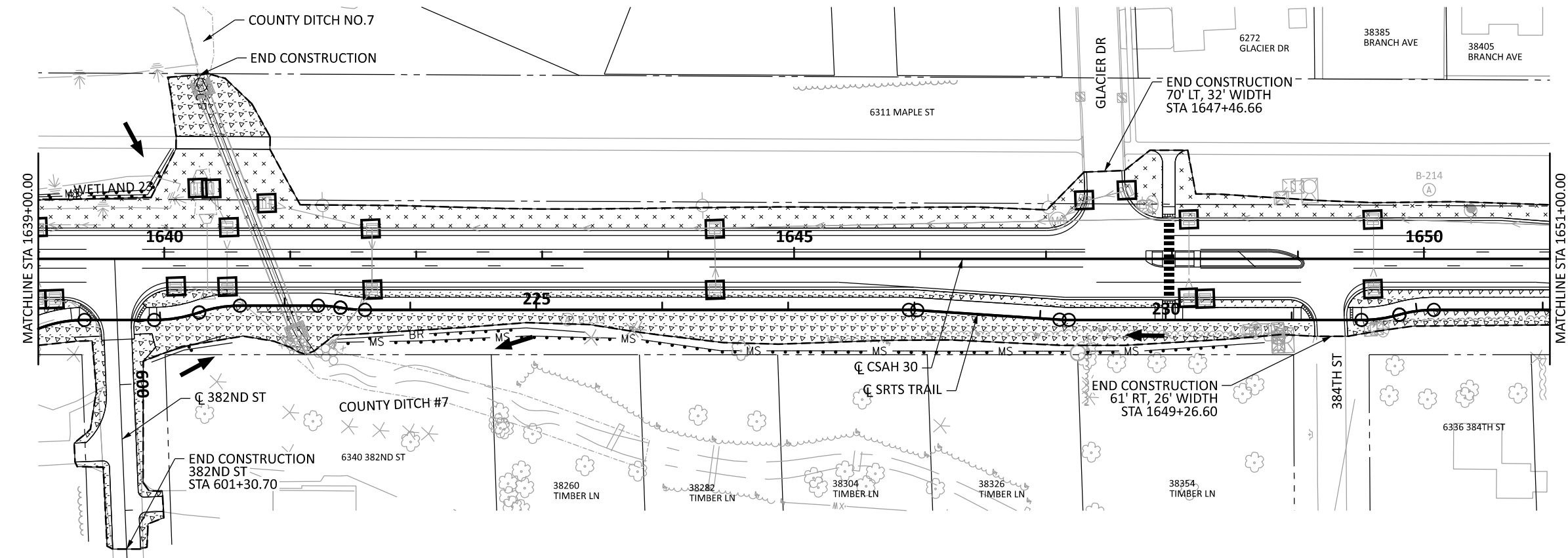
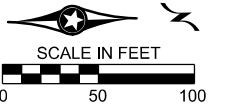
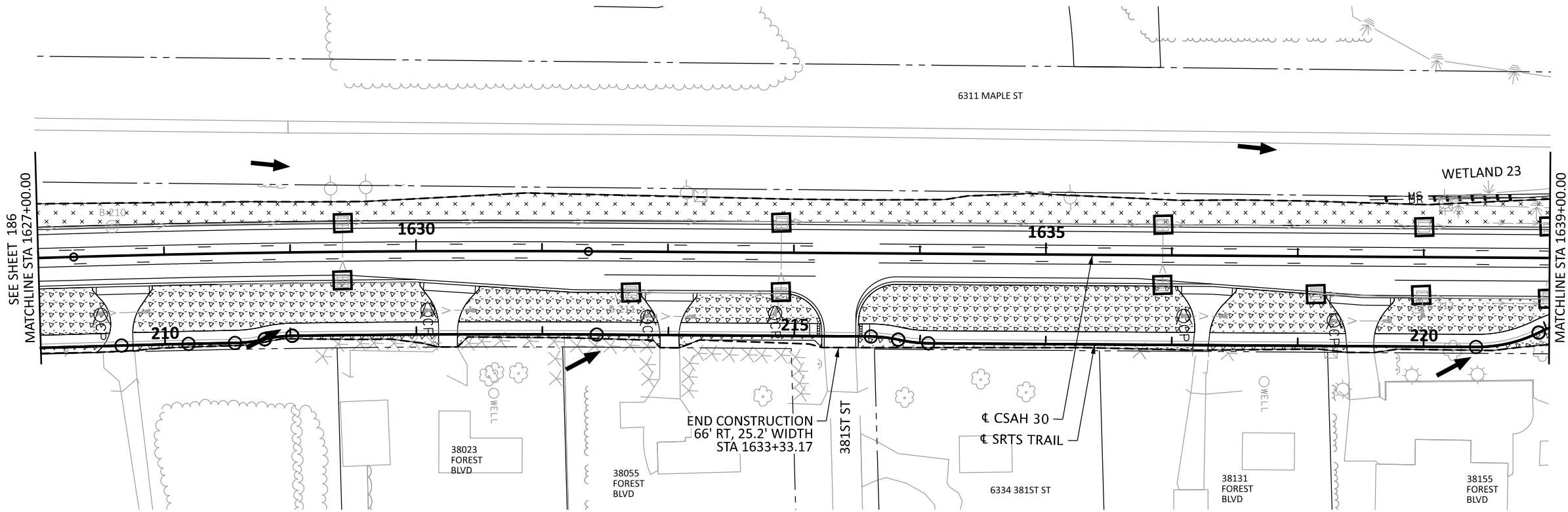
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
186
OF
216
SHEETS

DATE: 9/12/2024 2:09:17 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_1e



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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Nicholas E. Hentges
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620

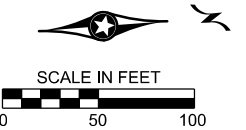
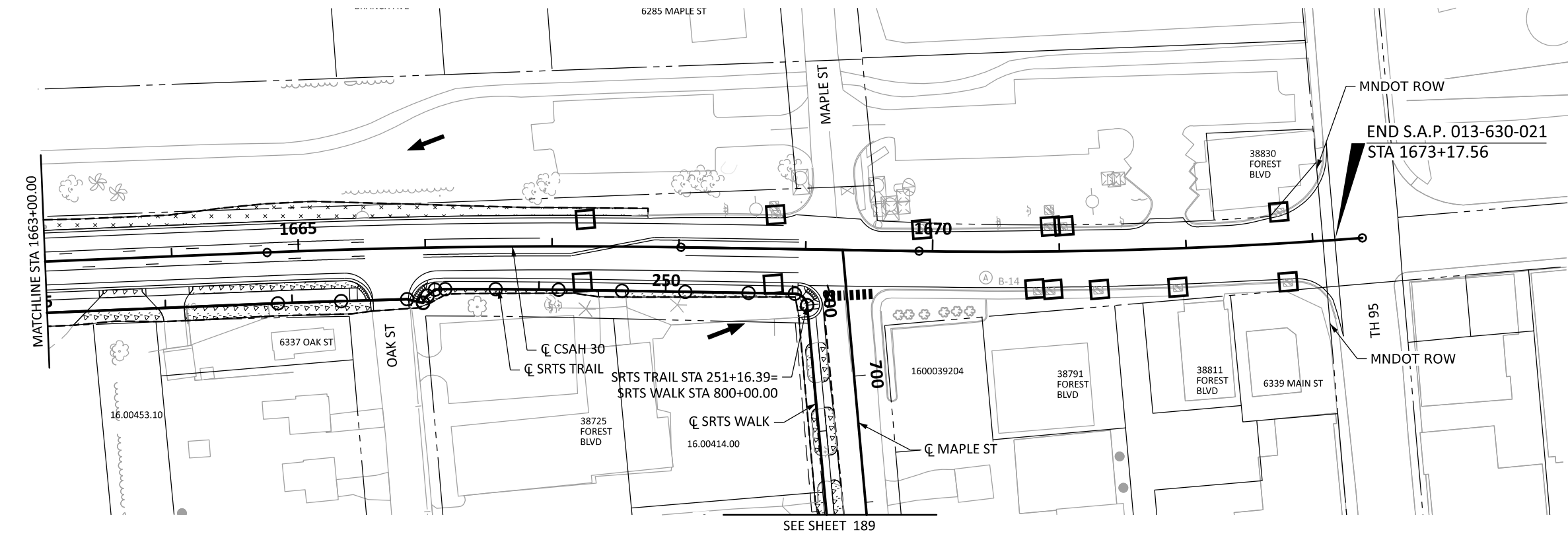
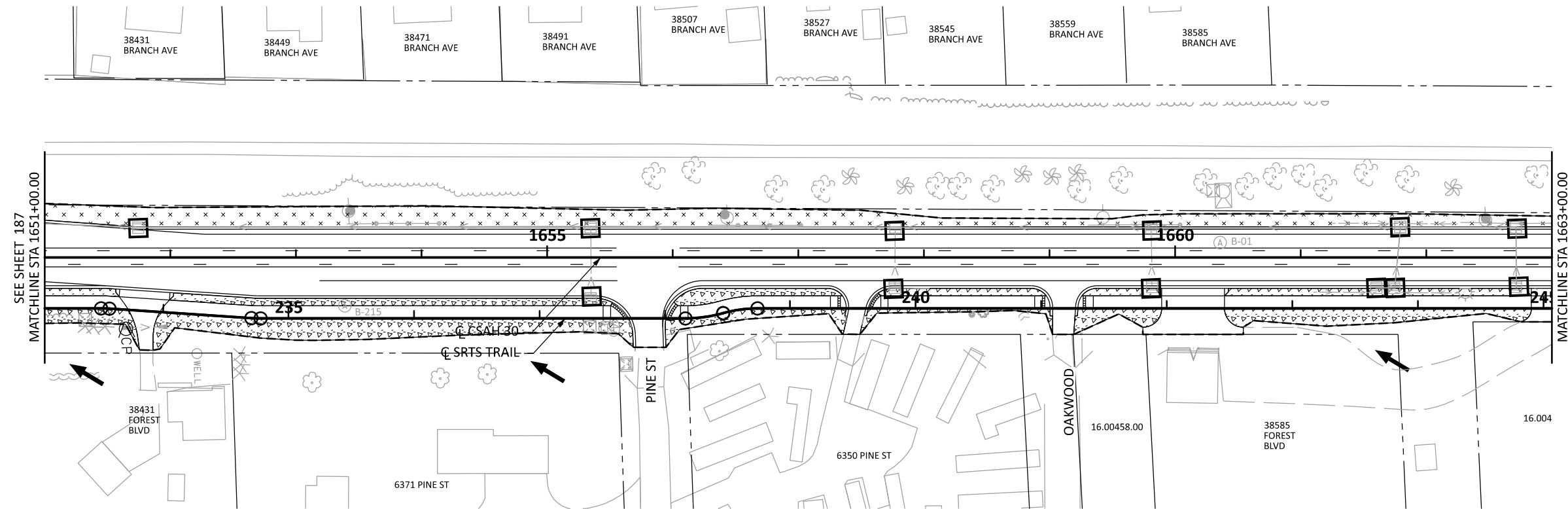


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
187
OF
216
SHEETS

[illegible]

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY
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ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA



NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620



CSAH 30 (Forest Blvd) Improvements

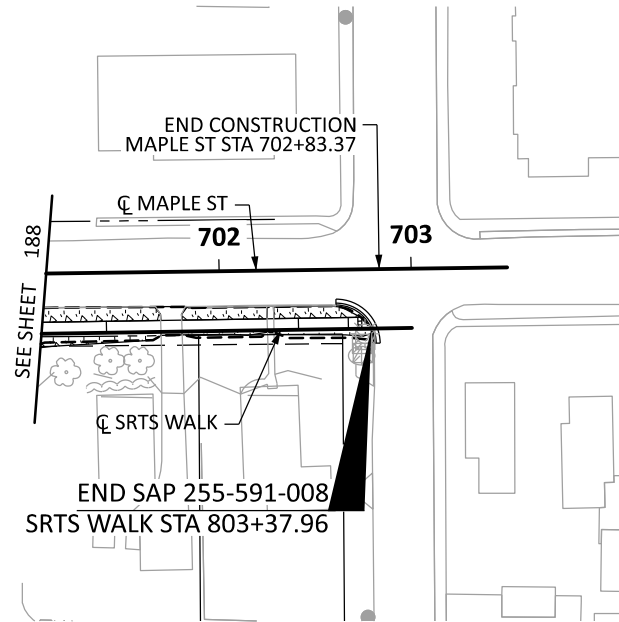
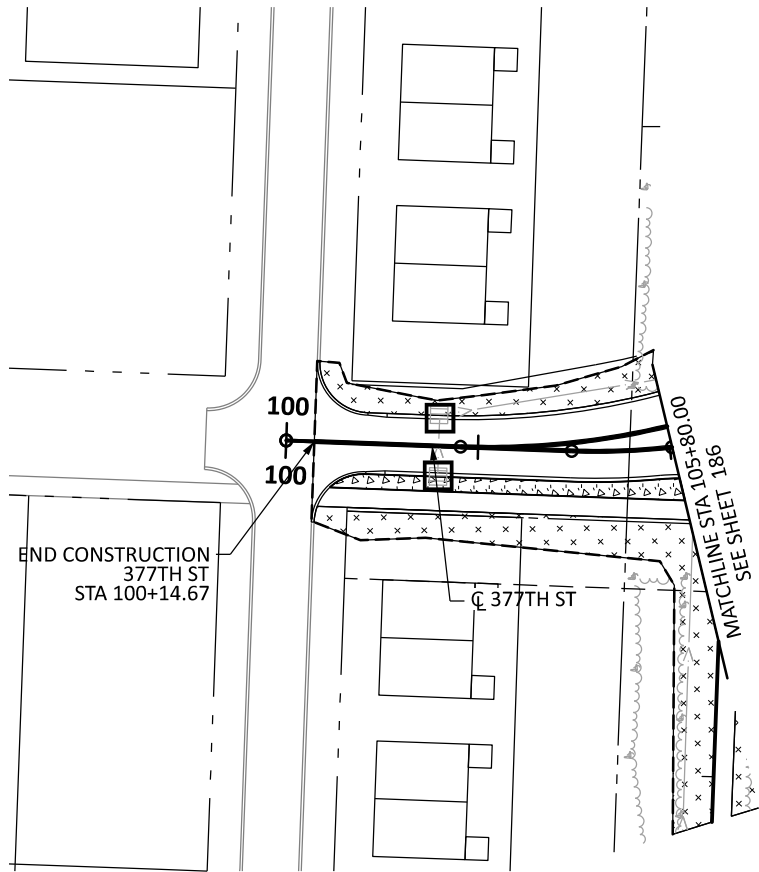
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
 188
 OF
 216
 SHEETS

DATE: 9/12/2024 2:09:24 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_te



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

EROSION CONTROL & TURF ESTABLISHMENT PLAN
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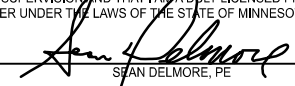
SHEET
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OF
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SHEETS

DATE: 9/12/2024 2:09:50 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss

SIGN AND DELINEATOR / MARKER																						I			
SIGN NUMBER	PANEL				SUPPORT			REMOVE SIGN			SIGN			SALVAGE SIGN	INSTALL SIGN	REMOVE DELINEATOR /MARKER	DELINEATOR /MARKER			DELINEATOR /MARKER PANEL					
	PANEL CODE	LEGEND	SIZE (W x H)	MOUNTING HEIGHT	TYPE	RISER POST SIZE	NUMBER OF POSTS	(A)	(B)	(C)	(A)	(B)	(C)				(A)	(A)	(A)	(A)	(B)	(C)	(A)	(B)	(C)
								INCHES	FEET	INCHES	EACH	EACH	SQ FT				SQ FT	SQ FT	SQ FT	EACH	EACH	EACH	EACH	EACH	EACH
S-1																									
S-2																									
S-3																									
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S-23																									
S-24																									
S-25	W14-3	NO PASSING ZONE	48 x 48 x 36	7	SQ-SOIL	2-1/2	1	1			5.60				1	1									
S-26	R9-X6L	BRANCH LANDSCAPE NURSERY	72 x 18	7	SQ-SOIL	2-1/2	1																		
S-27	R3-8AC	L-T	36 x 30	7	SQ-SOIL	2	1				7.50														
S-28	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00														
S-29	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1					
S-29	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1				6.25														
S-30	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00														
S-30	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1					
S-31																									
S-32																									
S-33																									
S-34	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00														
S-34	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1					
S-35	R3-8ACA	L-T-R	54 x 30	7	SQ-SOIL	2-1/2	1				11.25														
S-36	R3-8ACA	L-T-R	54 x 30	7	SQ-SOIL	2-1/2	1				11.25														
S-37	R2-1	SPEED LIMIT 55	24 x 30	7	SQ-SOIL	2	1				5.00														
S-38	R3-8AC	L-T	36 x 30	7	SQ-SOIL	2	1				7.50														
S-39	X36	SNOWPLOW MARKER LOWER BLADE	6 x 12	4	SQ-SOIL	1-3/4	1												1						
S-40	R4-7	KEEP RIGHT	24 x 30	7							5.00														
S-40	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4	SQ-CONC	2-1/2	1														1				
S-41	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1				6.25														
S-42	X36	SNOWPLOW MARKER RAISE BLADE	6 x 12	4	SQ-SOIL	1-3/4	1												1						
S-43	W16-17P	ROUNDAABOUT PLAQUE	36 x 12								3.00														
S-43	W2-6	ROUNDAABOUT	30 x 30	7	SQ-SOIL	2-1/2	1				6.25														
S-43	W13-1P	20 MPH PLAQUE	18 x 18								2.25														
S-44	W3-2	YIELD AHEAD	30 x 30	7	SQ-SOIL	2	1				6.25														
S-45	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00														
S-45	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1					
S-46	DESIGN	ROUNDAABOUT DIAGRAMATIC	150 x 84	7	SQ-SOIL	2-1/2	4				87.50														
S-47	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1				6.25														
S-48	W16-17P	ROUNDAABOUT PLAQUE	36 x 12								3.00														
S-48	W2-6	ROUNDAABOUT	30 x 30	7	SQ-SOIL	2-1/2	1				6.25														
S-48	W13-1P	20 MPH PLAQUE	18 x 18								2.25														
S-48	R4-7	KEEP RIGHT	24 x 30	7							5.00														
S-49	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4	SQ-CONC	2-1/2	1														1				
S-50	W3-2	YIELD AHEAD	30 x 30	7	SQ-SOIL	2	1				6.25														
S-51	I-8	LIBRARY	24 x 24	7	SQ-SOIL	2	1	1			4.00														
S-52	M6-1L	ARROW LEFT (GREEN)	21 x 15								2.19														
S-52	R3-8AC	L-T	36 x 30	7	SQ-SOIL	2	1				7.50														
S-53	R3-9cP	BEGIN PLAQUE	30 x 12	7	SQ-SOIL	2-1/2	1				2.50														
S-53	R3-9B	TWO WAY LEFT TURN LANE	24 x 36								6.00														
S-54	R2-1	SPEED LIMIT 40	24 x 30	7	SQ-SOIL	2	1				5.00														
S-55	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00														
S-55	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1					
S-56	W11-2	PEDESTRIAN CROSSING (FL YEL-GR)	30 x 30								6.25														
S-56	W16-7PL	DOWN ARROW LEFT PLAQUE (FL YEL-GR)	24 x 12	7	SQ-SOIL	2-1/2	1				2.00														
S-57	I-8																								

NO.	DATE	BY	CHK	REVISIONS

Design By: MF
Plan By: MF
Checked By: ES
Approved By: SD

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.

SEAN DELMORE, PE
DATE: 9/12/2024 LICENSE NO. 40945



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

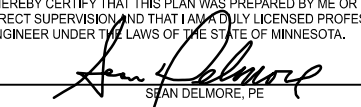
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PATH & FILENAME: Projects\Minnesota\Roadway\Sheets\023661-000_ss

SIGN AND DELINEATOR / MARKER																						I
SIGN NUMBER	PANEL CODE	PANEL			SUPPORT			REMOVE SIGN			SIGN			SALVAGE SIGN	INSTALL SIGN	REMOVE DELINEATOR / MARKER	DEL INEATOR / MARKER			DEL INEATOR / MARKER PANEL		
		LEGEND	SIZE (W x H)	MOUNTING HEIGHT	TYPE	RISER POST SIZE	NUMBER OF POSTS	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(A)	(A)	(A)	(B)	(C)	(A)	(B)	(C)
								INCHES	FEET	INCHES	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET
S-73	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1															
S-74	R3-9B	TWO WAY LEFT TURN LANE	24 x 36	7	SQ-SOIL	2	1															
S-75	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1														
S-76	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1		
S-77	R2-1	SPEED LIMIT 40	x					1														
S-78	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4	SQ-CONC	1-3/4	1										1					
S-79	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1															
S-80	R3-8AC	L-T	36 x 30	7	SQ-SOIL	2	1															
S-81	W11-2	PEDESTRIAN CROSSING (FL YEL-GR)	30 x 30	7	SQ-SOIL	2	1															
S-82	X36	SNOWPLOW MARKER BLADE DOWN	x													1						
S-83	X36	SNOWPLOW MARKER BLADE UP	x					NOT USED														
S-84	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1								1						
S-85	W11-2	PEDESTRIAN CROSSING (FL YEL-GR)	30 x 30	7	SQ-SOIL	2	1															
S-86	DESIGN	NO PARKING ON ANY NORTH BRANCH CITY STREET..	x	7	SQ-SOIL	2	1							1	1							
S-87	R2-1	SPEED LIMIT 40	x					1														
S-88	DESIGN	NORTH BRANCH GOLF COURSE RIGHT	x	7	SQ-SOIL	2	1							1	1							
S-89	DESIGN	NORTH BRANCH GOLF COURSE LEFT	x																			
S-89	M4-X1	OLD (WHITE)	24 x 12	7	SQ-SOIL	2	1							1	1							
S-90	M1-4	US 61	24 x 24																			
S-90	M4-X1	OLD (WHITE)	24 x 12	7	SQ-SOIL	2	1							1	1							
S-91	M1-4	US 61	24 x 24																			
S-92	R2-1	SPEED LIMIT 40	x					1														
S-93	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1														
S-94	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1															
S-95	R2-1	SPEED LIMIT 40	24 x 30	7	SQ-SOIL	2	1	1														
S-96	R3-9cP	BEGIN PLAQUE	30 x 12	7	SQ-SOIL	2-1/2	1															
S-97	R3-9B	TWO WAY LEFT TURN LANE	24 x 36																			
S-98	X36	SNOWPLOW MARKER RAISE BLADE	x													1						
S-99	R3-8AC	L-T	36 x 30	7	SQ-SOIL	2	1															
S-99	M2-1	JCT (BLUE)	21 x 15	7	SQ-SOIL	2	1	1														
S-100	M1-5M	MINNESOTA HWY 95	24 x 24																			
S-101	R3-8AD	L-TR	36 x 30	7	SQ-SOIL	2	1	1														
S-102	W3-3	SIGNAL AHEAD	30 x 30	7	SQ-SOIL	2	1	1														
S-103	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1														
S-104	R2-1	SPEED LIMIT 30	24 x 30	7	SQ-SOIL	2	1	1														
S-105	R3-9dP	END PLAQUE	30 x 12	7	SQ-SOIL	2-1/2	1															
S-106	R3-9B	TWO WAY LEFT TURN LANE	24 x 36																			
S-107	DESIGN	377TH ST ARROW	42 x 24	7									7.00									
S-108	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4	SQ-CONC	2-1/2	1															1
S-109	R6-1R	ONE WAY RIGHT	36 x 12	4	SQ-CONC	2-1/2	1						3.00									
S-110	R6-4B	ROUNDAABOUT DIRECTIONAL (4 ARROWS)	60 x 24	7	SQ-SOIL	2-1/2	1						10.00									
S-111	R1-2	YIELD	30 x 30	7	SQ-SOIL	2-1/2	1						6.25									
S-112	R6-2R	ONE WAY RIGHT	24 x 30	7	SQ-CONC	2-1/2	1						6.25									
S-113	W14-3	NO PASSING ZONE	x					1					5.00									
S-114	R1-2	YIELD	30 x 30	7	SQ-SOIL	2-1/2	1															
S-115	DESIGN	FOREST BLVD ARROW	48 x 24	7	SQ-CONC	2-1/2	1						8.00									
S-116	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4																1		
S-117	R1-1	STOP	x							1												
S-118	R1-2	YIELD	30 x 30	7	SQ-CONC	2-1/2	1						6.25									
S-119	R6-2R	ONE WAY RIGHT	24 x 30	7	SQ-CONC	2-1/2	1						5.00									
S-120	W16-17P	ROUNDAABOUT PLAQUE	36 x 12	7	SQ-SOIL	2-1/2	1						5.00									
S-121	W2-6	ROUNDAABOUT	30 x 30	7	SQ-SOIL	2-1/2	1						3.00									
S-122	R4-7	KEEP RIGHT	24 x 30	7									6.25									
S-123	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4	SQ-CONC	2-1/2	1						5.00									1
S-124	R2-1	SPEED LIMIT 30	24 x 30	7	SQ-SOIL	2	1			1												
S-125	R6-1R	ONE WAY RIGHT	36 x 12	4	SQ-CONC	2-1/2	1						3.00									
S-126	R6-4A	ROUNDAABOUT DIRECTIONAL (3 ARROWS)	48 x 24	7	SQ-CONC	2-1/2	1						8.00									
S-127	DESIGN	377TH ST ARROW	42 x 24	7	SQ-CONC	2-1/2	1						7.00									
S-128	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4																		1
S-129	R1-2	YIELD	30 x 30	7	SQ-SOIL	2-1/2	1						6.25									
S-130	R1-2	YIELD	30 x 30	7	SQ-CONC	2-1/2	1						6.25									
S-131	R6-2R	ONE WAY RIGHT	24 x 30	7	SQ-CONC	2-1/2	1						5.00									
S-132	R3-8AD	L-TR	36 x 36	7	SQ-SOIL	2-1/2	1	1					9.00									
S-133	R8-3	NO PARKING	24 x 24										4.00									
S-134	M3-3	SOUTH (BLUE)	24 x 12	7	SQ-SOIL	2	1	1					2.00									
S-135	M1-6M	CHISAGO COUNTY 30	24 x 24										4.00									
S-136	R3-8ACA	L-T-R	54 x 30	7	SQ-SOIL	2-1/2	1	1					11.25									
S-137	R8-3	NO PARKING	24 x 24										4.00									
GROUP SUBTOTAL								22	1	2				5	5	5	1	2	0	6	4	3
PROJECT TOTAL									25					5	5	5		3				

FUNDING NOTE(S):
(A) SAP 013-630-021
(B) SAP 013-630-021 / SAP 225-102-004 (50/50)
(C) CITY LOCAL FUNDS

NO.	DATE	BY	CHK	REVISIONS

Design By: MF
Plan By: MF
Checked By: ES
Approved By: SD

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

SEAN DELMORE, PE
DATE: 9/12/2024 LICENSE NO. 40945



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
191
OF
216
SHEETS

DATE: 9/12/2024 2:09:51 PM
PATH & FILENAME: Projects\Minnesota\Roadway\Sheets\023661-000_ss

SIGN SPECIAL											J
SIGN NUMBER	PANEL			SUPPORT			REMOVE SIGN SPECIAL	SALVAGE SIGN SPECIAL	INSTALL SIGN SPECIAL	SALVAGE SIGN PANEL SPECIAL	INSTALL SIGN PANEL SPECIAL
	LEGEND	SIZE (W X H)	MOUNTING HEIGHT	TYPE	RISER POST SIZE	NUMBER OF POSTS					
		INCH	FEET		INCHES		(B) EACH	(A) EACH	(A) EACH	(A) EACH	(A) EACH
S-501	NOT USED										
S-502	NOT USED										
S-503	372ND ST	X	7	SQ-SOIL	2	1		1	1		
	FOREST BLVD	X									
S-504	375TH ST	X	7	SQ-SOIL	2	1		1	1		
	FOREST BLVD	X									
S-505	376TH ST	X	7	SQ-SOIL	2	1		1	1		
	FOREST BLVD	X									
S-506	379TH ST	X	7	SQ-SOIL	2	1		1	1		
	OAK KNOLL AVE	X									
S-507	381ST ST	X	7	SQ-SOIL	2	1		1	1		
	FOREST BLVD	X									
S-508	382ND ST	X	7	SQ-SOIL	2	1		1	1		
	FOREST BLVD	X									
S-509	GLACIER DR	X	7	SQ-SOIL	2	1				1	1
	FOREST BLVD	X									
S-510	384TH ST	X	7	SQ-SOIL	2	1		1	1		
	FOREST BLVD	X									
S-511	PINE ST	X	7	SQ-SOIL	2	1				1	1
	FOREST BLVD	X									
S-512	OAK ST	X	7	SQ-SOIL	2	1				1	1
	FOREST BLVD	X									
S-513	377TH ST	X	7	SQ-SOIL	2	1	1				
	FOREST BLVD	X									
GROUP SUBTOTAL							1	7	7	3	3
PROJECT TOTAL							1	7	7	3	3

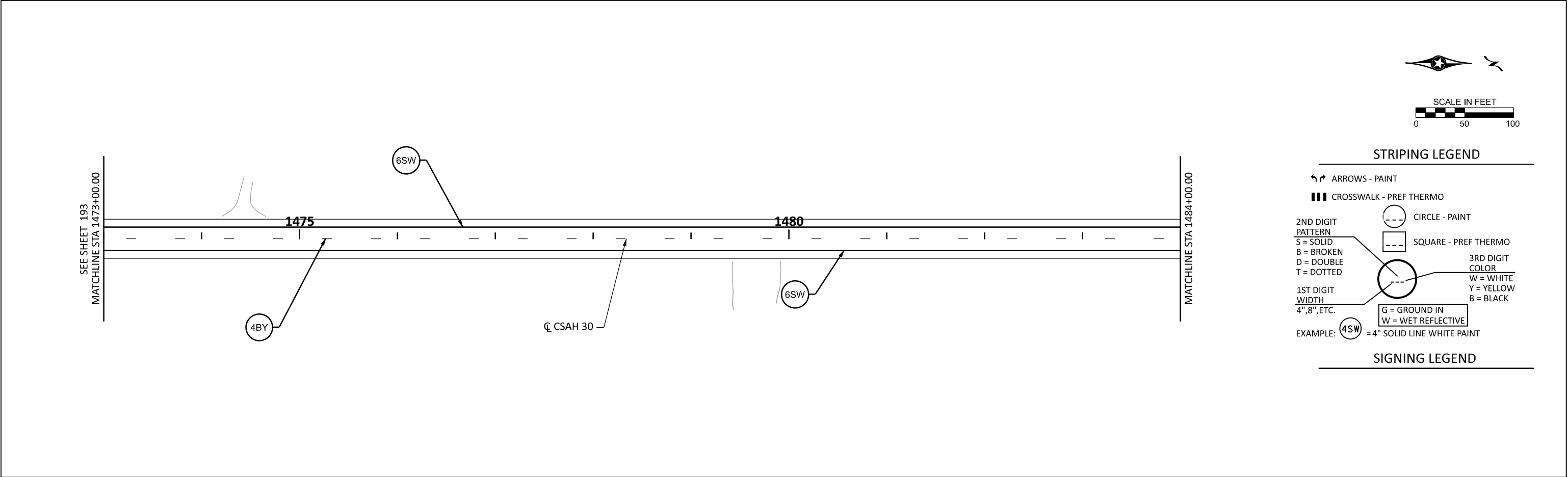
FUNDING NOTE(S):
(A) SAP 013-630-021
(B) SAP 013-630-021 / SAP 225-102-004 (50/50)

PAVEMENT MARKING TABULATION															K	
LOCATION	PAINT GR IN (WR)			PAINT									PREFORM THERMOPLASTIC	PREFORM THERMOPLASTIC GR IN		
	4" SOLID LINE	6" SOLID LINE	6" DOTTED LINE (2)	4" SOLID LINE	4" BROKEN LINE (1)	4" DOUBLE SOLID LINE	6" SOLID LINE	6" DOTTED LINE (2)	10" DOTTED LINE (3)	24" SOLID LINE	PAVEMENT MESSAGE		CROSSWALK (5)	12" DOTTED LINE (4)	CROSSWALK (5)	
	YELLOW	WHITE	WHITE	YELLOW	YELLOW	YELLOW	WHITE	WHITE	WHITE	YELLOW	LEFT ARROW	RIGHT ARROW		WHITE		
	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	SQ FT	SQ FT		SQ FT	LIN FT	SQ FT
SAP 013-630-021																
CSAH 30																
STA 1454+81.73 TO STA 1462+00				857	190		1513					16				
STA 1462+00 TO STA 1473+00					220		2200									
STA 1473+00 TO STA 1484+00					220		2200									
STA 1484+00 TO STA 1495+00					220		2200									
STA 1495+00 TO STA 1506+00					220		2200									
STA 1506+00 TO STA 1517+00					220		2200									
STA 1517+00 TO STA 1528+00				158	220		2200									
STA 1528+00 TO STA 1539+00				1009	230		2270		88			31				
STA 1539+00 TO STA 1550+00				621	220		2288					16				
STA 1550+00 TO STA 1561+00					220		2187					16				
STA 1561+00 TO STA 1572+00					220		2200									
STA 1572+00 TO STA 1582+20					220		2200									
TOTAL RECONDITIONING SAP 013-630-021				420	210		2040									
				3065	2610		25698		88			79				
STA 1582+20 TO STA 1594+00				80	20	1793	2768			192	31	31				
STA 1594+00 TO STA 1605+00						1447	3023			151	47	47				
STA 1605+00 TO STA 1613+73						1254	2271	37		121	47	47				
STA 1622+85 TO STA 1627+00				1089	1815	23	220	50	200	834	62		180			
STA 1627+00 TO STA 1639+00					2336	470	2335				155	31	150			
STA 1639+00 TO STA 1651+00					1090	220	566			39	124	47				
STA 1651+00 TO STA 1663+00					2301	470	2481				155	31				
STA 1663+00 TO STA 1673+00					505	110	644	2353			109	31	144			
TOTAL RECONSTRUCTION SAP 013-630-021				1089	1815	23	6532	1340	5904	18911	37	503	730	265	474	
SAP 013-630-021 / SAP 225-102-004 (50/50)																
STA 1613+73 TO STA 1616+00				454	454											
STA 1616+00 TO STA 1618+75				252	548									43		
STA 1618+75 TO STA 1622+85				837	1039	23						31			180	
SAP 013-630-021 / SAP 225-102-004 (50/50)				1543	2041	23						31		43	180	
CITY LOCAL FUNDS																
377TH STREET																
STA 101+53.82 TO STA 102+82				122		468				25				20		
STA 105+78 TO STA 107+64.69				115		308				17				23	180	
TOTAL CITY LOCAL				237		776				42				43	180	
PROJECT TOTAL				2869	3856	46	9597	3950	6680	44609	37	88	545	1105	474	360

NOTES:
(1) 10' LINE, 40' GAP.
(2) 2' LINE, 6' GAP.
(3) 3' LINE, 12' GAP.
(4) 3' LINE, 3' GAP.
(5) 10' X 3' BLOCK.

NO.	DATE	BY	CHK	REVISIONS	Design By:	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  SEAN DELMORE, PE DATE: <u>9/12/2024</u> LICENSE NO. <u>40945</u>			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA		SHEET 192 OF 216 SHEETS
					MF							
					MF							
					ES							
					SD							
											SIGNING & PAVEMENT MARKING PLAN SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

DATE: 9/12/2024 2:09:56 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss



STRIPING LEGEND

↔ ARROWS - PAINT

▬ CROSSWALK - PREF THERMO

2ND DIGIT PATTERN
S = SOLID
B = BROKEN
D = DOUBLE
T = DOTTED

1ST DIGIT WIDTH
4", 8", ETC.

EXAMPLE: **4SW** = 4" SOLID LINE WHITE PAINT

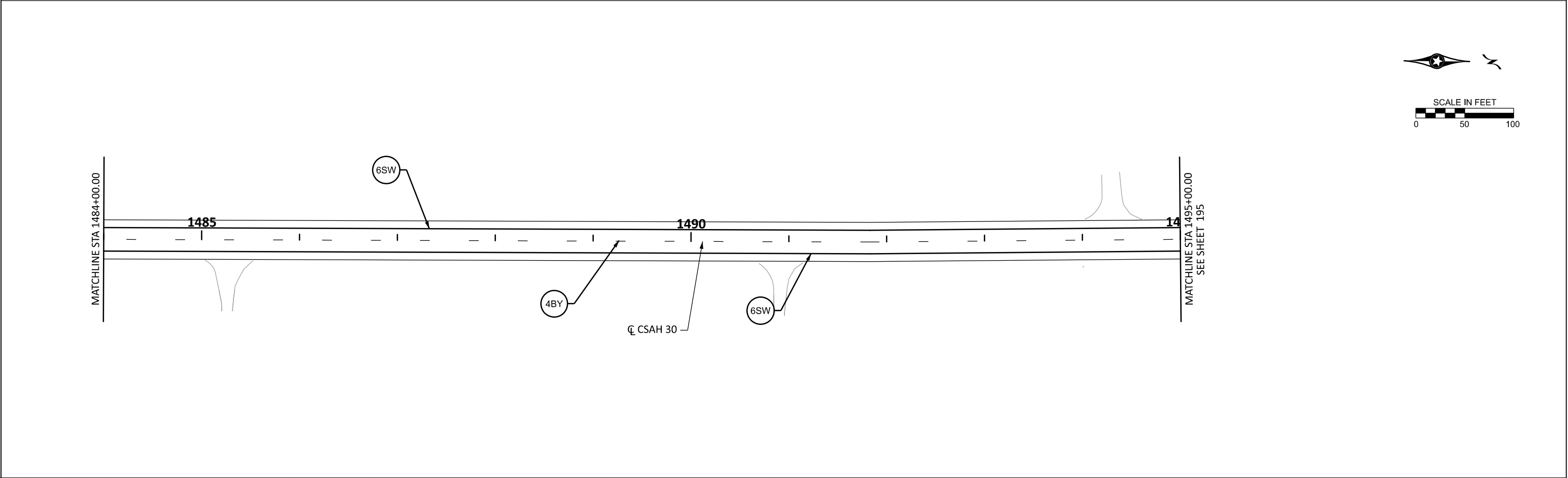
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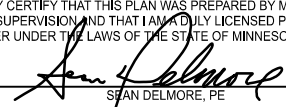
SQUARE - PREF THERMO

3RD DIGIT COLOR
W = WHITE
Y = YELLOW
B = BLACK

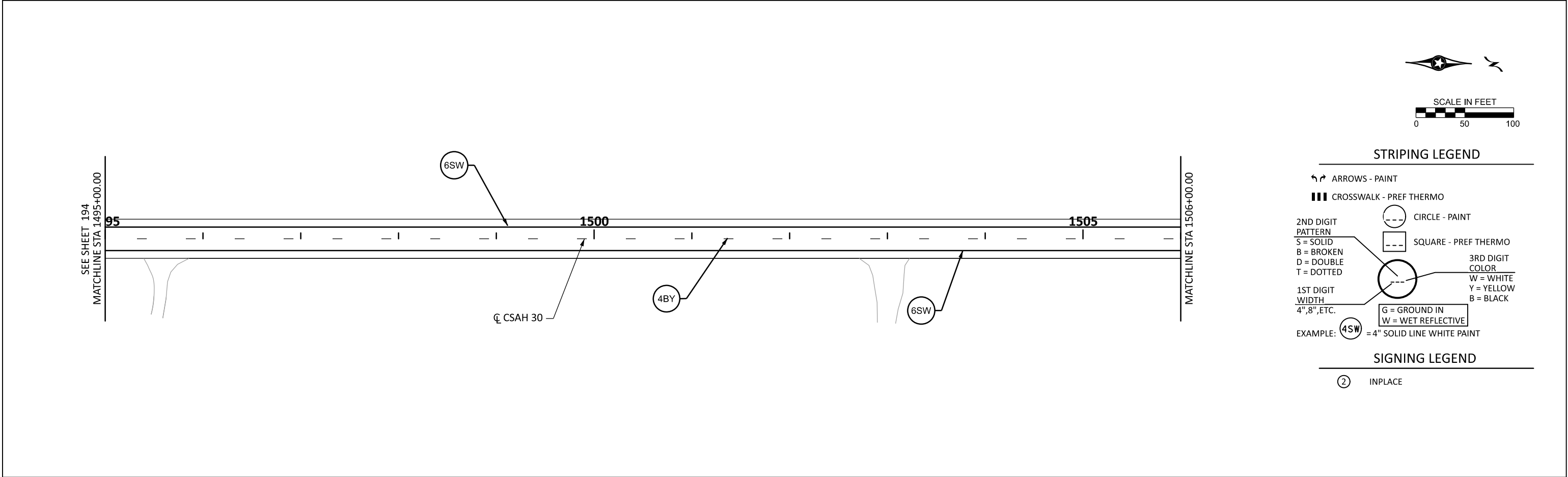
G = GROUND IN
W = WET REFLECTIVE

SIGNING LEGEND



NO.	DATE	BY	CHK	REVISIONS	Design By: MF	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A JULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  SEAN DELMORE, PE DATE: <u>9/12/2024</u> LICENSE NO. <u>40945</u>			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA		SHEET 194 OF 216 SHEETS
SIGNING & PAVEMENT MARKING PLAN												
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004												

DATE: 9/12/2024 2:09:56 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss



STRIPING LEGEND

↔ ARROWS - PAINT

▬ CROSSWALK - PREF THERMO

2ND DIGIT PATTERN
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B = BROKEN
D = DOUBLE
T = DOTTED

1ST DIGIT WIDTH
4", 8", ETC.

○ CIRCLE - PAINT

□ SQUARE - PREF THERMO

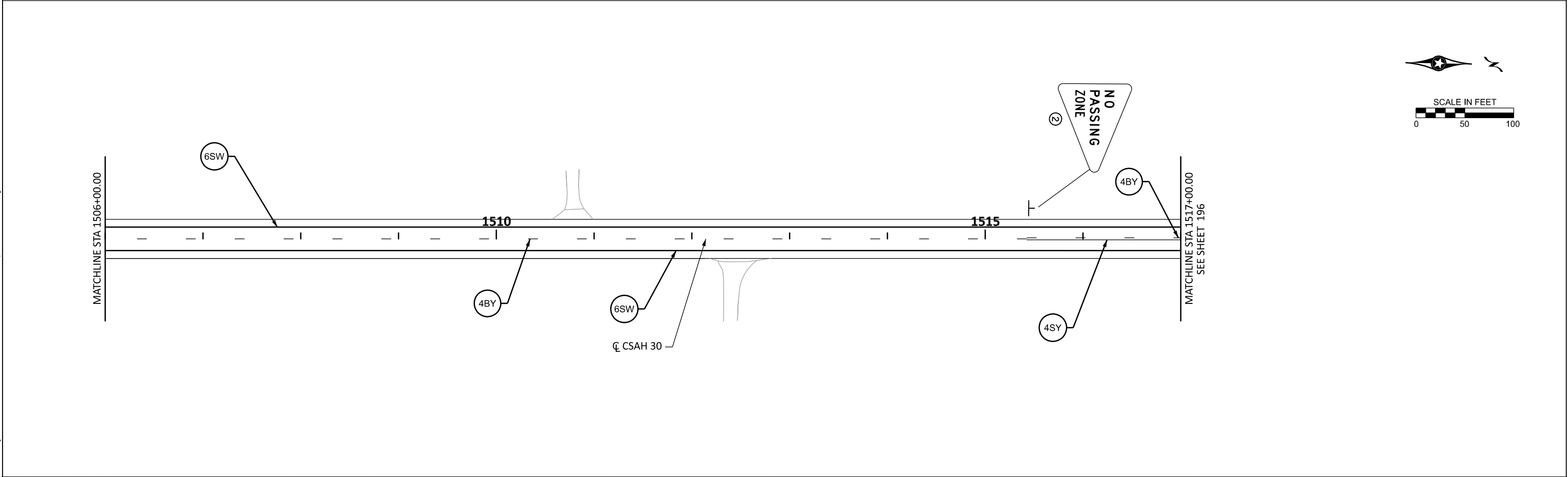
3RD DIGIT COLOR
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Y = YELLOW
B = BLACK

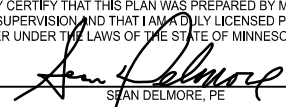
G = GROUND IN
W = WET REFLECTIVE

EXAMPLE: (4SW) = 4" SOLID LINE WHITE PAINT

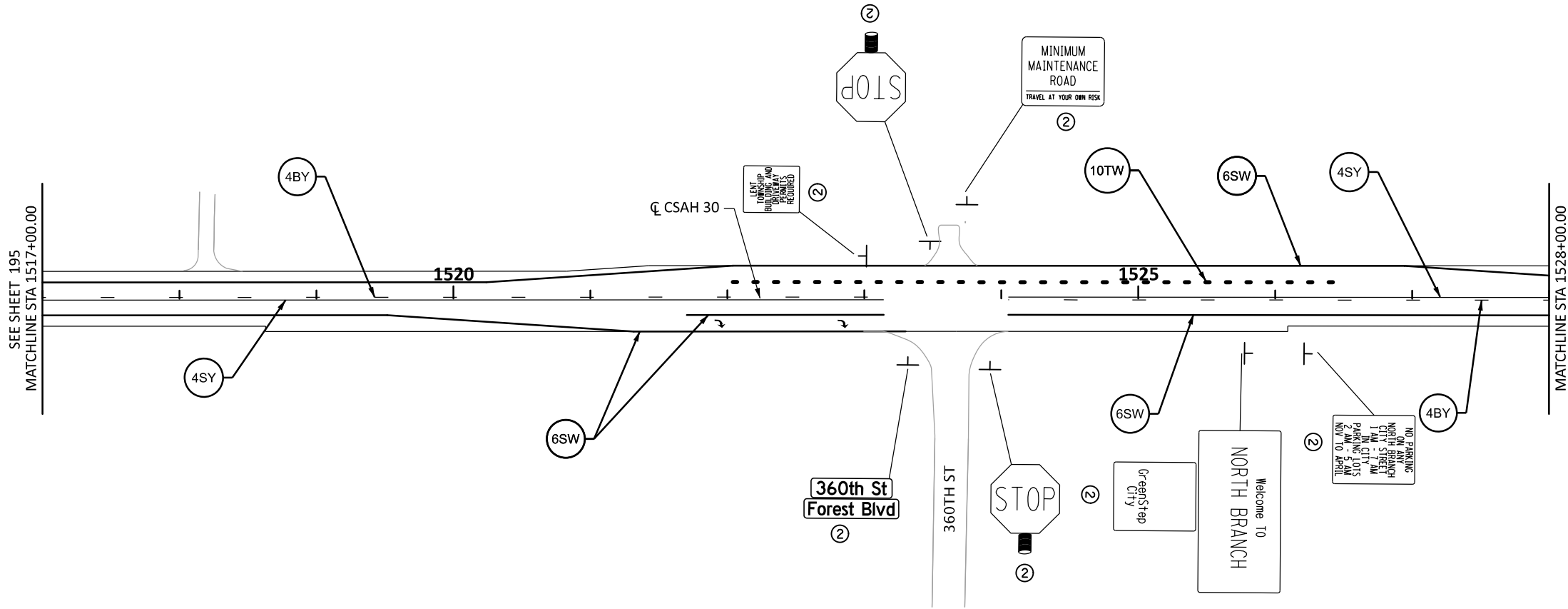
SIGNING LEGEND

(2) INPLACE



NO.	DATE	BY	CHK	REVISIONS	Design By: MF	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.  SEAN DELMORE, PE DATE: <u>9/12/2024</u> LICENSE NO. <u>40945</u>			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA		SHEET
										195		
										OF		
										216		
										SHEETS		
					Approved By: SD					SIGNING & PAVEMENT MARKING PLAN SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		

DATE: 9/12/2024 2:09:57 PM
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STRIPING LEGEND

↔ ARROWS - PAINT

▬ CROSSWALK - PREF THERMO

2ND DIGIT PATTERN
S = SOLID
B = BROKEN
D = DOUBLE
T = DOTTED

1ST DIGIT WIDTH
4", 8", ETC.

EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

CIRCLE - PAINT

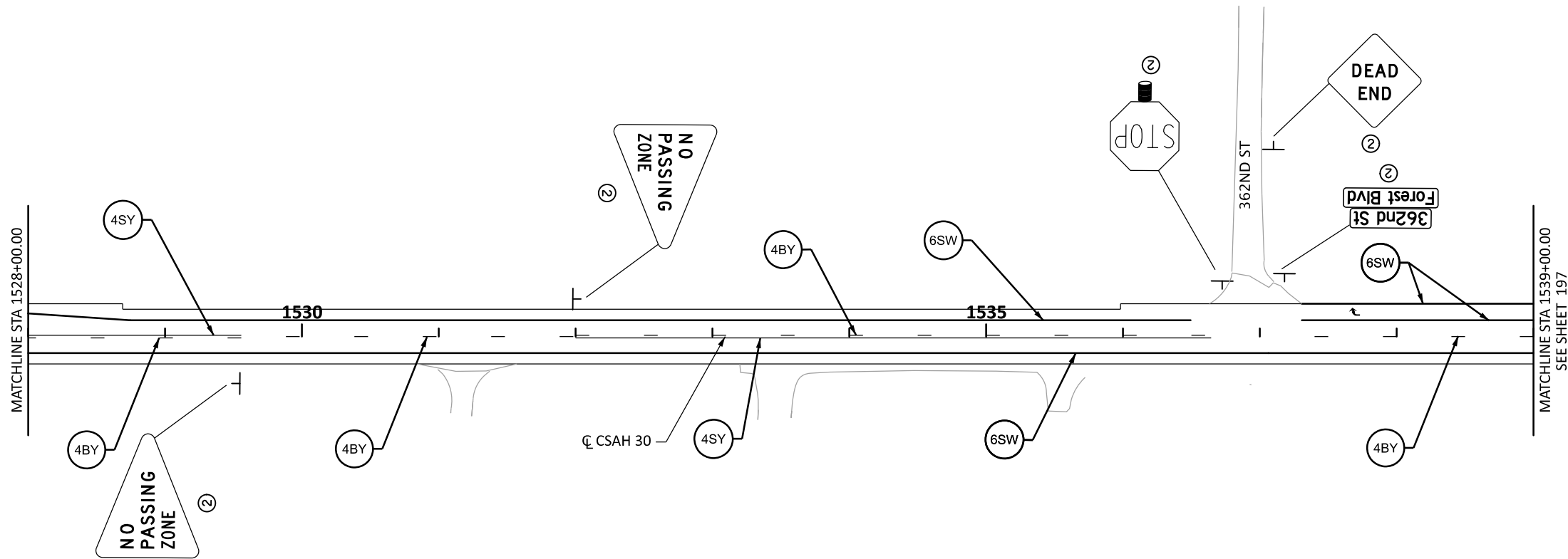
SQUARE - PREF THERMO

3RD DIGIT COLOR
W = WHITE
Y = YELLOW
B = BLACK

G = GROUND IN
W = WET REFLECTIVE

SIGNING LEGEND

② INPLACE



NO.	DATE	BY	CHK	REVISIONS

Design By: MF
Plan By: MF
Checked By: ES
Approved By: SD

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SEAN DELMORE, PE
DATE: 9/12/2024 LICENSE NO. 40945

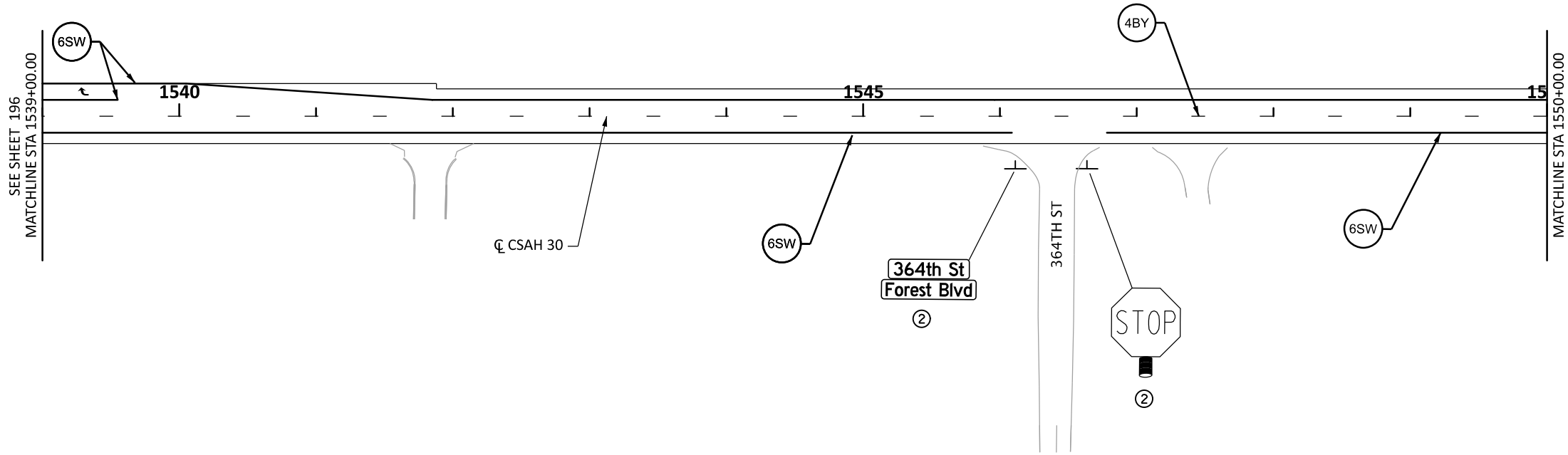


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
196
OF
216
SHEETS



SCALE IN FEET
0 50 100

STRIPING LEGEND

↔ ARROWS - PAINT

▬ CROSSWALK - PREF THERMO

2ND DIGIT PATTERN
S = SOLID
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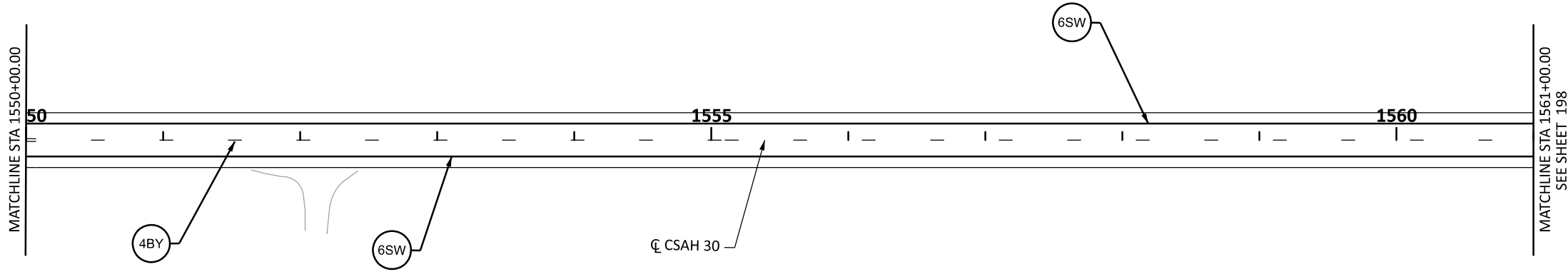
1ST DIGIT WIDTH
4", 8", ETC.

3RD DIGIT COLOR
W = WHITE
Y = YELLOW
B = BLACK

EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

STRIPING LEGEND

② INPLACE

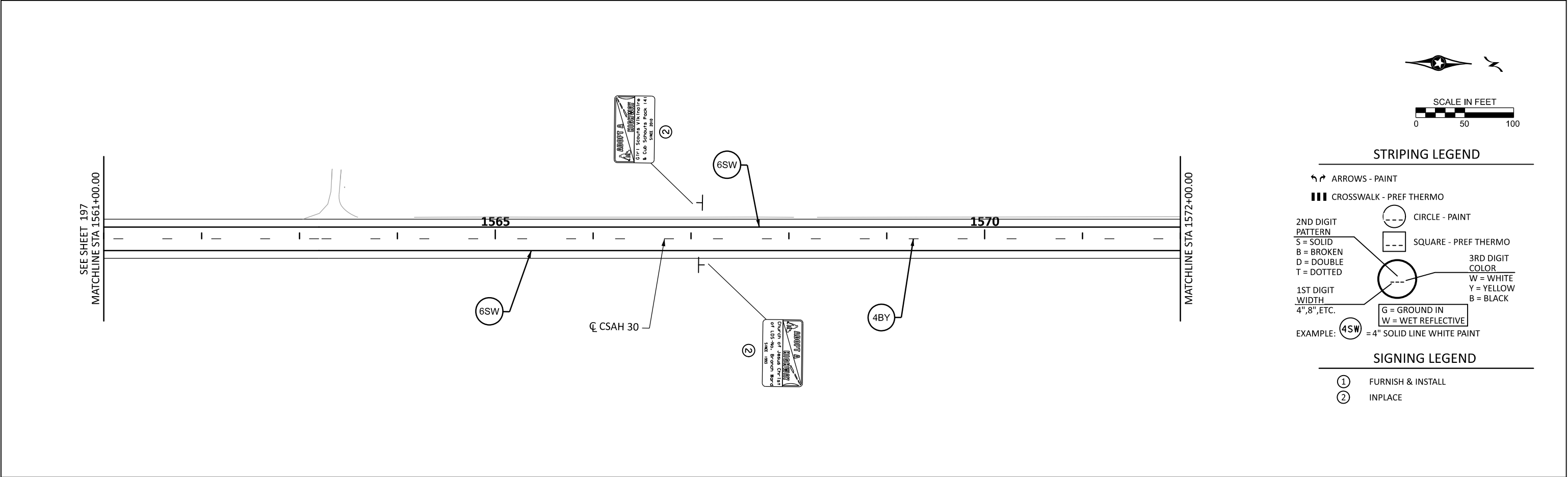


SCALE IN FEET
0 50 100

DATE: 9/12/2024 2:09:57 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss

NO.	DATE	BY	CHK	REVISIONS	Design By: MF	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A JULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  SEAN DELMORE, PE DATE: 9/12/2024 LICENSE NO. 40945			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA	SHEET 197 OF 216 SHEETS
				Plan By: MF							
				Checked By: ES							
				Approved By: SD							
										SIGNING & PAVEMENT MARKING PLAN SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

DATE: 9/12/2024 2:09:58 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss



STRIPING LEGEND

↔ ARROWS - PAINT

▬ CROSSWALK - PREF THERMO

2ND DIGIT PATTERN

S = SOLID

B = BROKEN

D = DOUBLE

T = DOTTED

1ST DIGIT WIDTH

4", 8", ETC.

CIRCLE - PAINT

SQUARE - PREF THERMO

3RD DIGIT COLOR

W = WHITE

Y = YELLOW

B = BLACK

G = GROUND IN

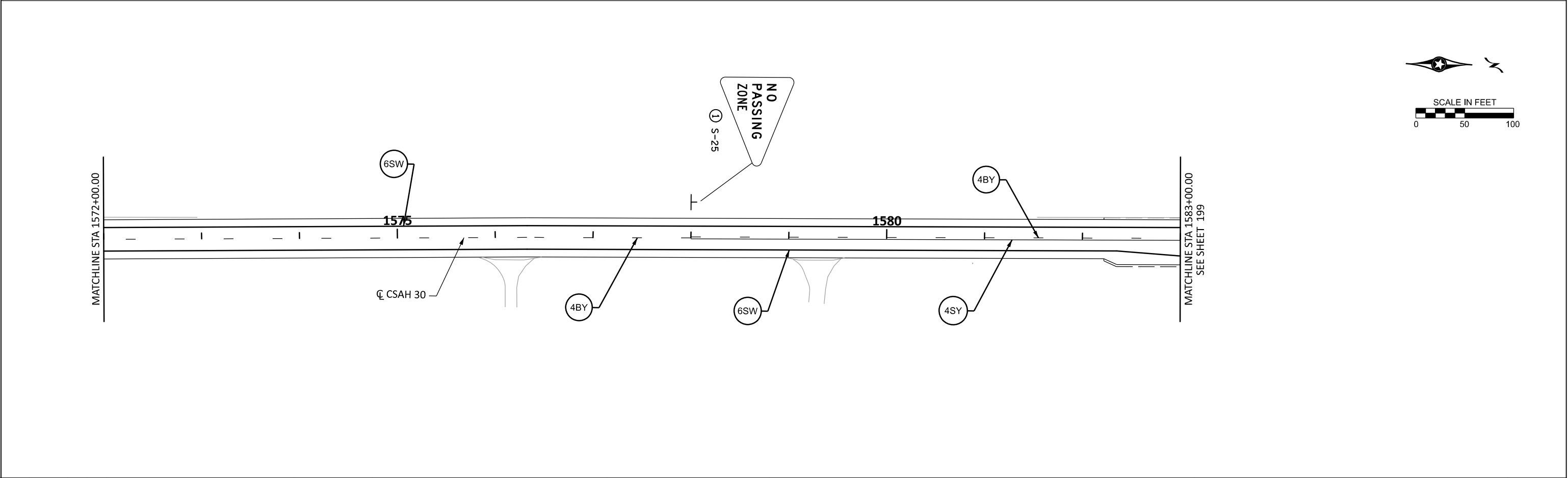
W = WET REFLECTIVE

EXAMPLE: **4SW** = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

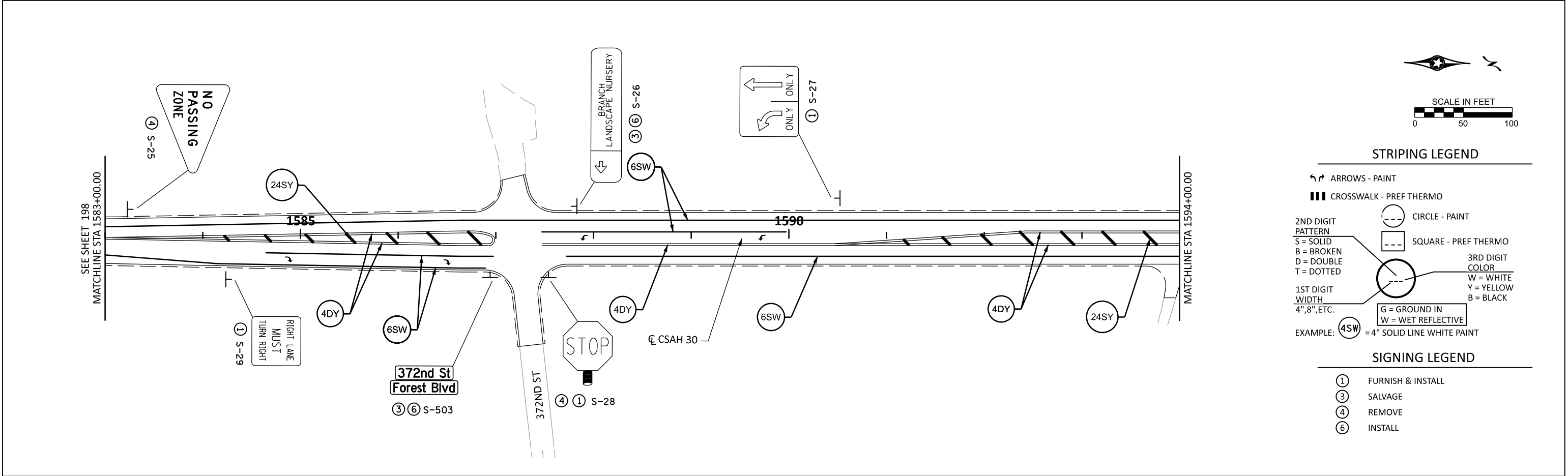
① FURNISH & INSTALL

② INPLACE



NO.	DATE	BY	CHK	REVISIONS	Design By: MF	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.  SEAN DELMORE, PE DATE: <u>9/12/2024</u> LICENSE NO. <u>40945</u>			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA		SHEET
										198		
										OF		
										216		
										SHEETS		
					Approved By: SD					SIGNING & PAVEMENT MARKING PLAN SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		

DATE: 9/12/2024 2:09:58 PM
PATH & FILENAME: Projects\Minnesota\Roadway\Sheets\023661-000_ss



STRIPING LEGEND

ARROWS - PAINT

CROSSWALK - PREF THERMO

2ND DIGIT PATTERN
S = SOLID
B = BROKEN
D = DOUBLE
T = DOTTED

1ST DIGIT WIDTH
4", 8", ETC.

CIRCLE - PAINT

SQUARE - PREF THERMO

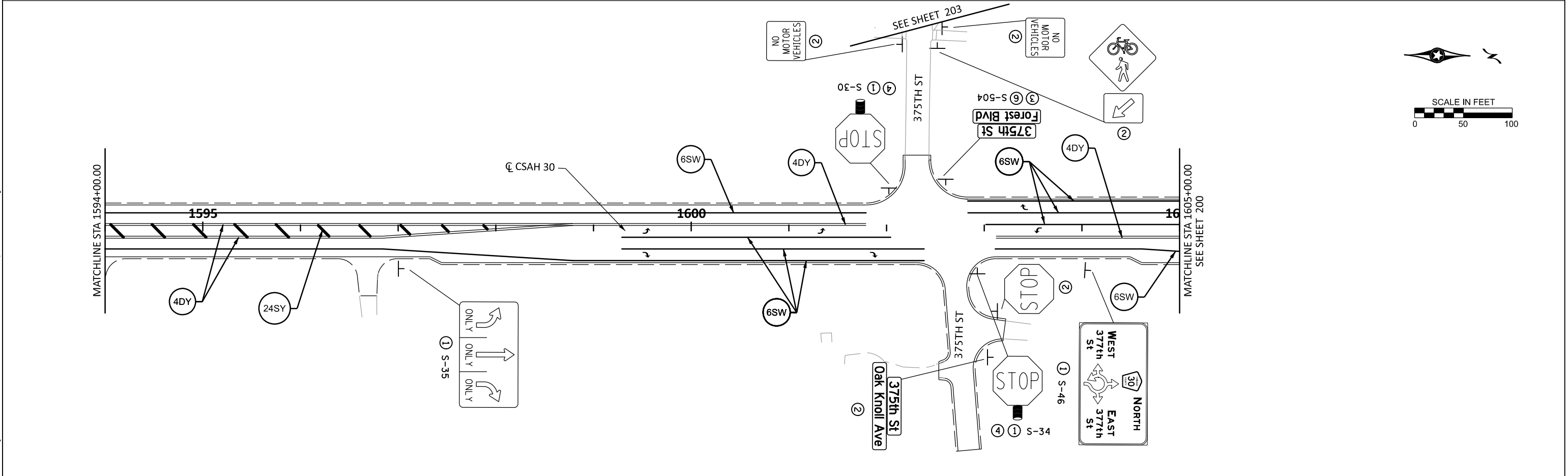
3RD DIGIT COLOR
W = WHITE
Y = YELLOW
B = BLACK

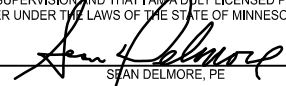
G = GROUND IN
W = WET REFLECTIVE

EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

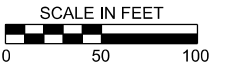
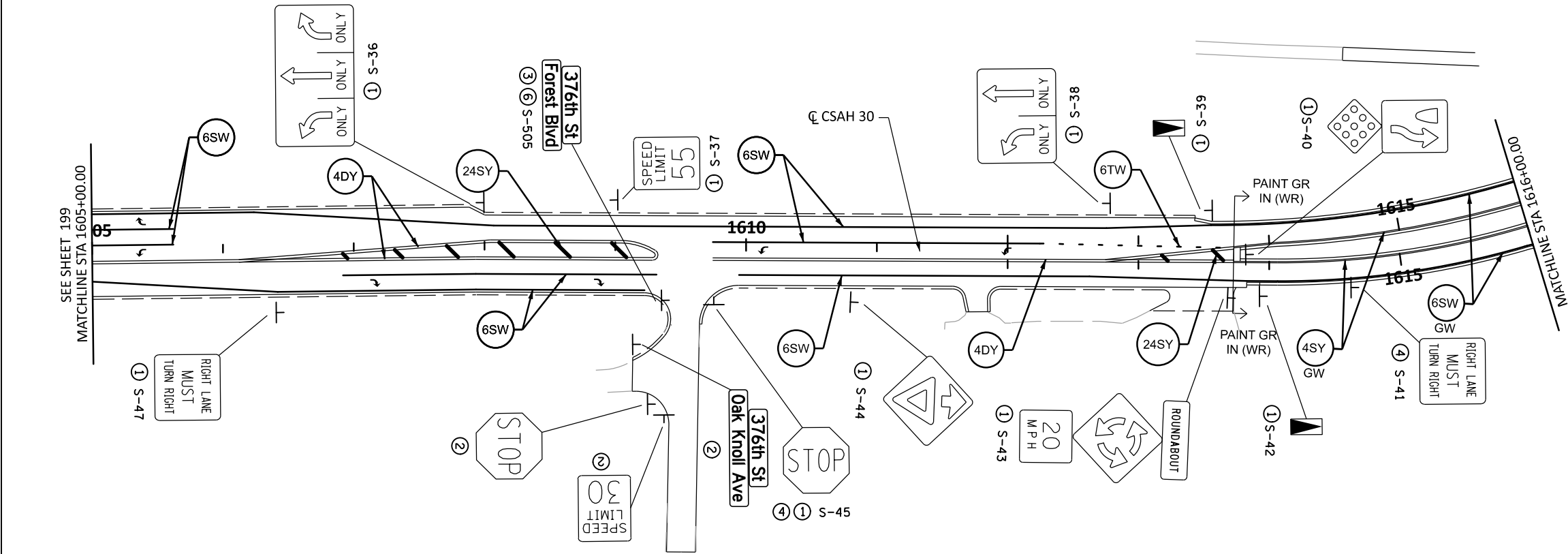
SIGNING LEGEND

1 FURNISH & INSTALL
3 SALVAGE
4 REMOVE
6 INSTALL



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				Plan By: MF	SIGNING & PAVEMENT MARKING PLAN				
				Checked By: ES	SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004				
				Approved By: SD					

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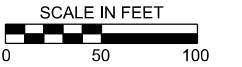
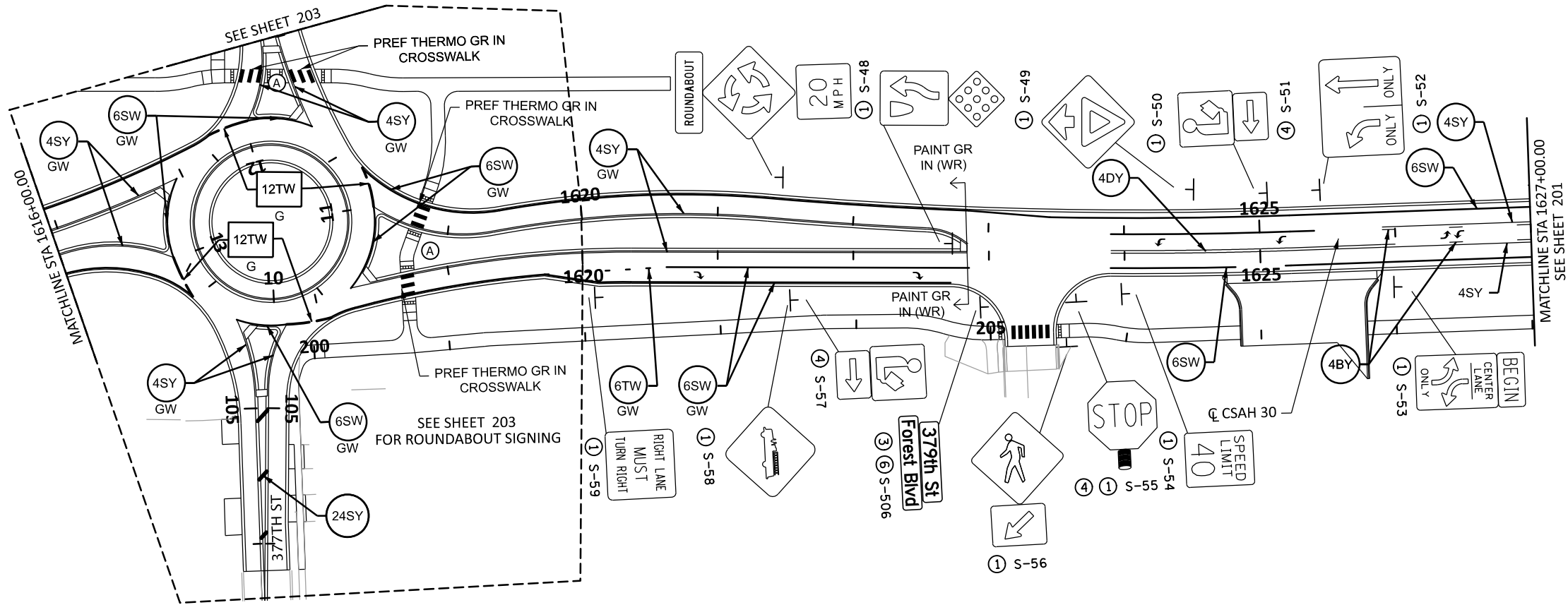


STRIPING LEGEND

- ARROWS - PAINT
- CROSSWALK - PREF THERMO
- 2ND DIGIT PATTERN:
S = SOLID
B = BROKEN
D = DOUBLE
T = DOTTED
- 1ST DIGIT WIDTH:
4", 8", ETC.
- CIRCLE - PAINT
- SQUARE - PREF THERMO
- 3RD DIGIT COLOR:
W = WHITE
Y = YELLOW
B = BLACK
- G = GROUND IN
W = WET REFLECTIVE
- EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

- 1 FURNISH & INSTALL
- 3 SALVAGE
- 4 REMOVE
- 6 INSTALL



(A) SEE SHEETS 214 - 216 FOR RRFB PLAN.

NO.	DATE	BY	CHK	REVISIONS

Design By: MF
Plan By: MF
Checked By: ES
Approved By: SD

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SEAN DELMORE, PE
DATE: 9/12/2024 LICENSE NO. 40945

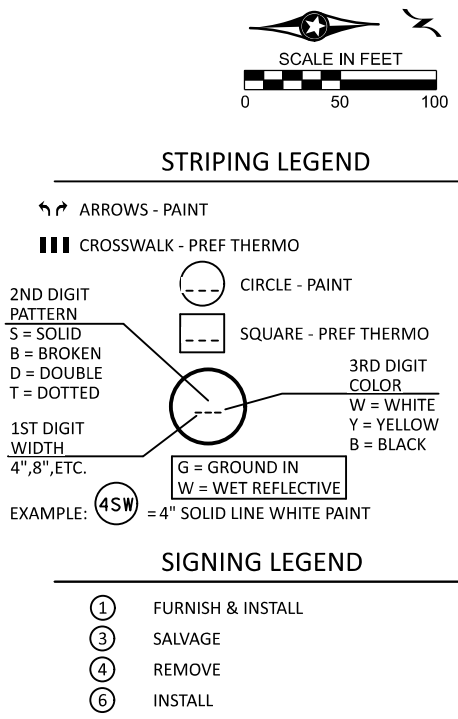


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

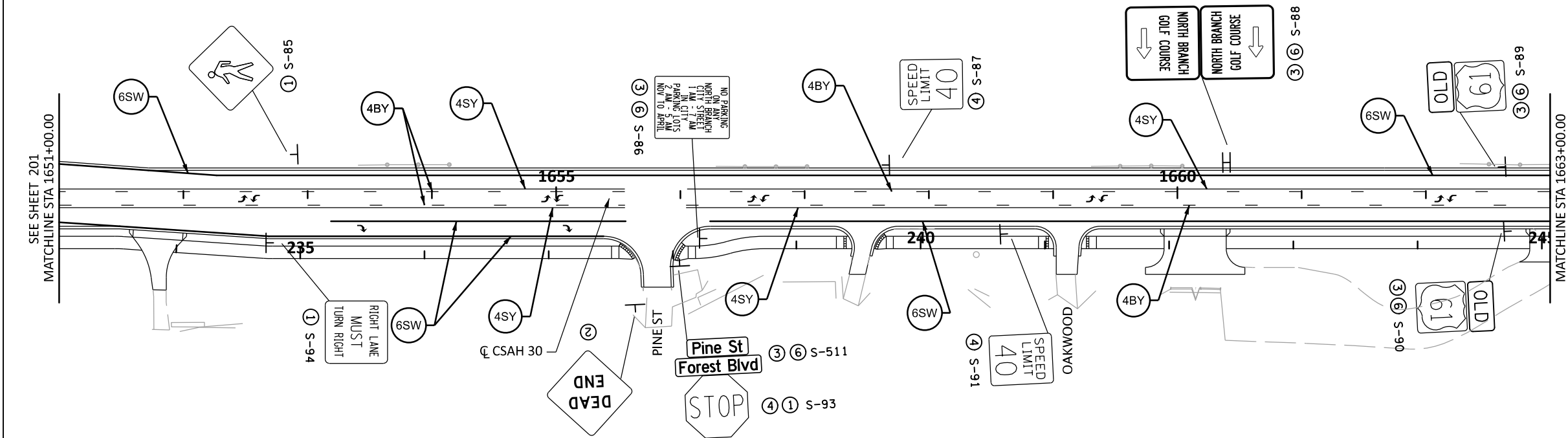
SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
200
OF
216
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SHEET
201
OF
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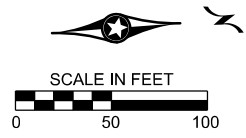
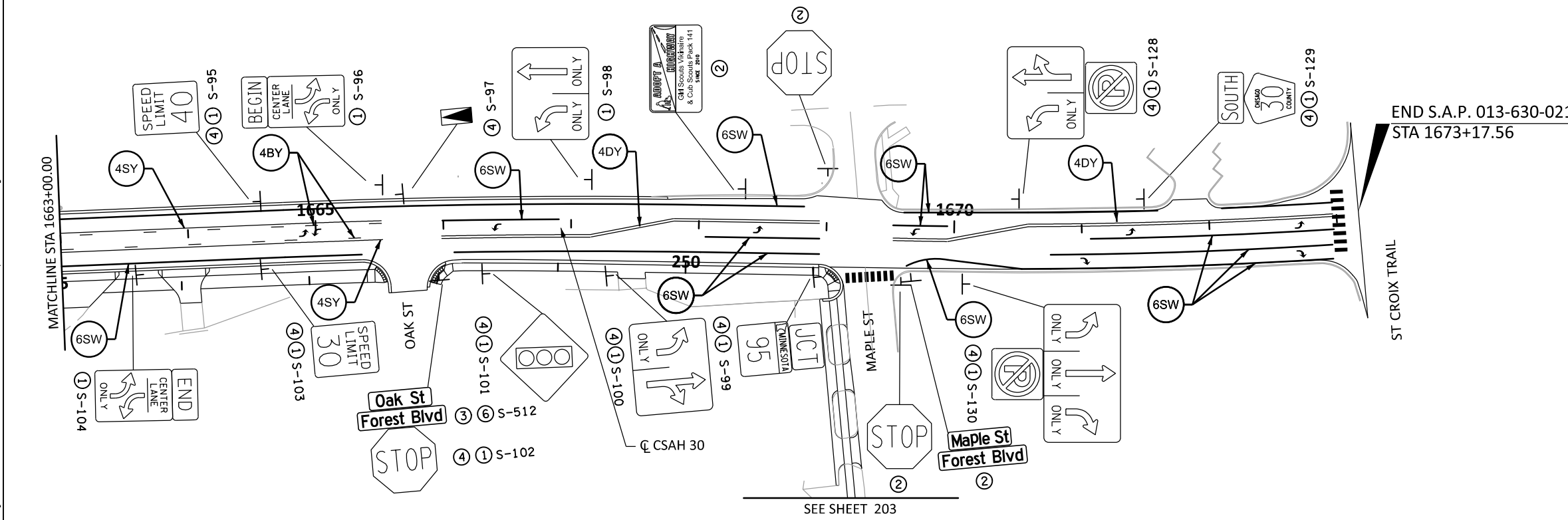


STRIPING LEGEND

- ARROWS - PAINT
- CROSSWALK - PREF THERMO
- CIRCLE - PAINT
- SQUARE - PREF THERMO
- 2ND DIGIT PATTERN:
 - S = SOLID
 - B = BROKEN
 - D = DOUBLE
 - T = DOTTED
- 3RD DIGIT COLOR:
 - W = WHITE
 - Y = YELLOW
 - B = BLACK
- 1ST DIGIT WIDTH:
 - 4", 8", ETC.
- EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

- 1 FURNISH & INSTALL
- 2 INPLACE
- 3 SALVAGE
- 4 REMOVE
- 6 INSTALL



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LICENSE NO. 40945



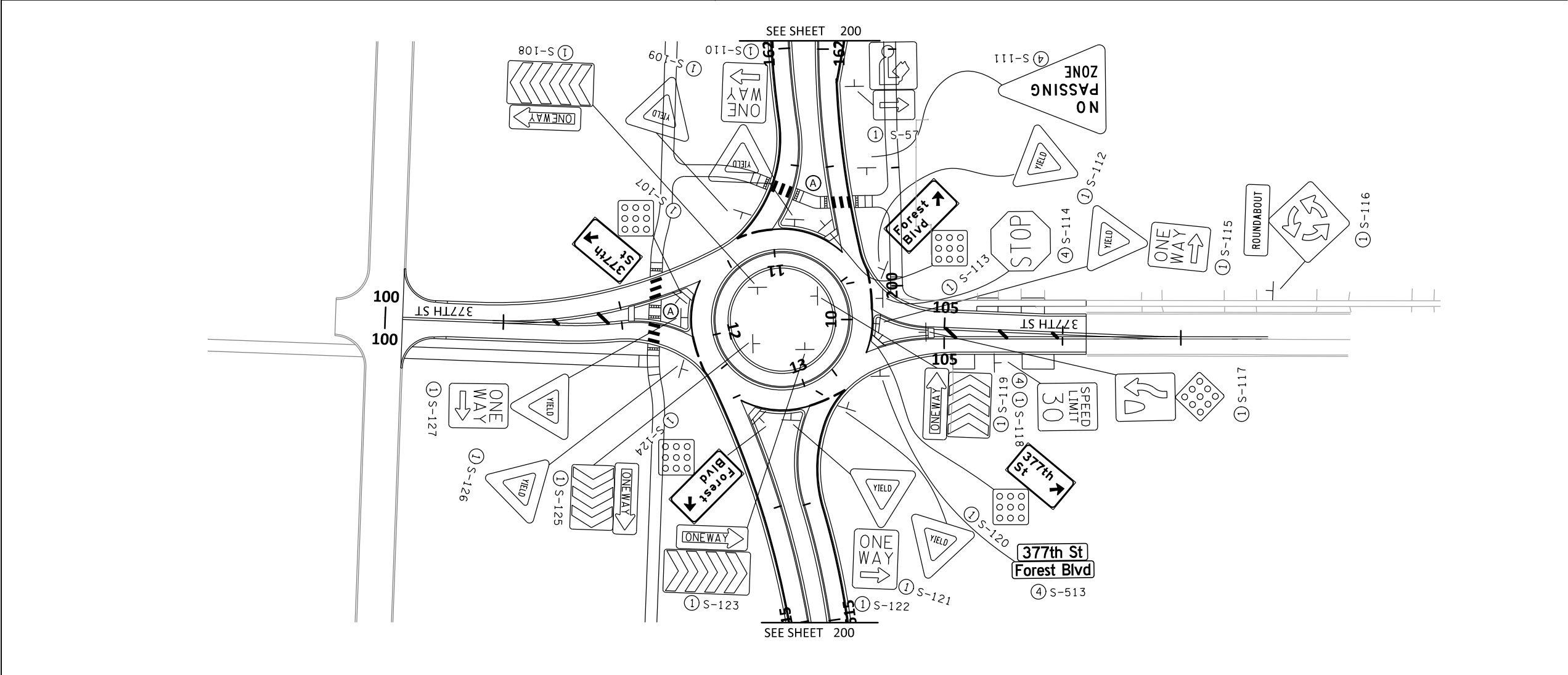
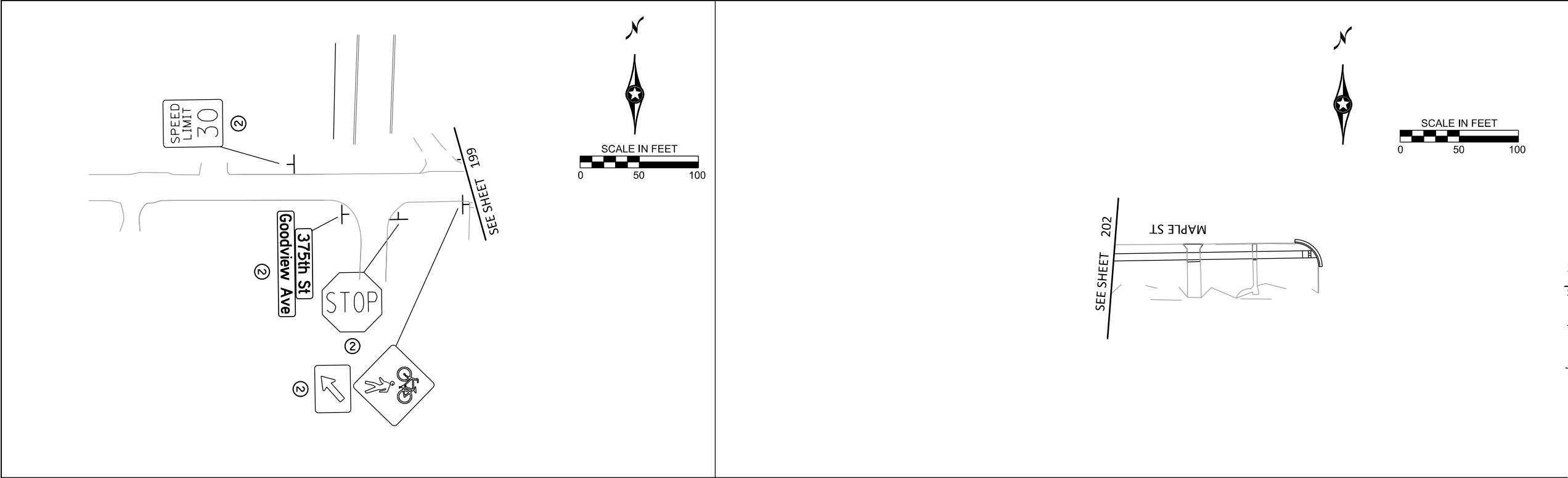
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
202
OF
216
SHEETS

DATE: 9/12/2024 2:10:01 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss



STRIPING LEGEND

ARROWS - PAINT

CROSSWALK - PREF THERMO GR IN

2ND DIGIT PATTERN
S = SOLID
B = BROKEN
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T = DOTTED

1ST DIGIT WIDTH
4", 8", ETC.

CIRCLE - PAINT

SQUARE - PREF THERMO

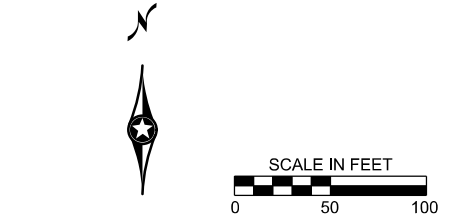
3RD DIGIT COLOR
W = WHITE
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EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

1 FURNISH & INSTALL
2 INPLACE
3 SALVAGE
4 REMOVE
6 INSTALL



NOTES

A SEE SHEETS 214 - 216 FOR RRFB PLAN.

NO.	DATE	BY	CHK	REVISIONS

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Plan By: MF
Checked By: ES
Approved By: SD

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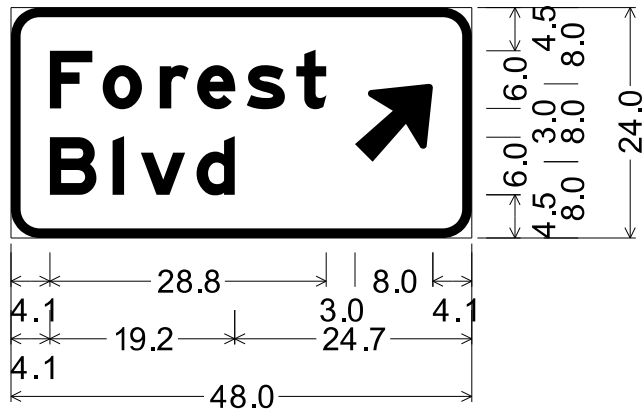
Sean Delmore
SEAN DELMORE, PE
DATE: 9/12/2024 LICENSE NO. 40945

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

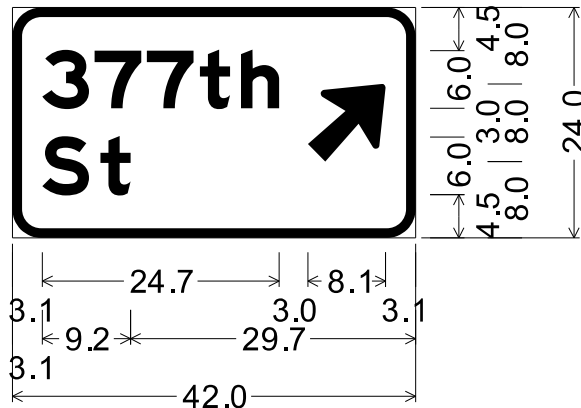
CHISAGO COUNTY, MINNESOTA

SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

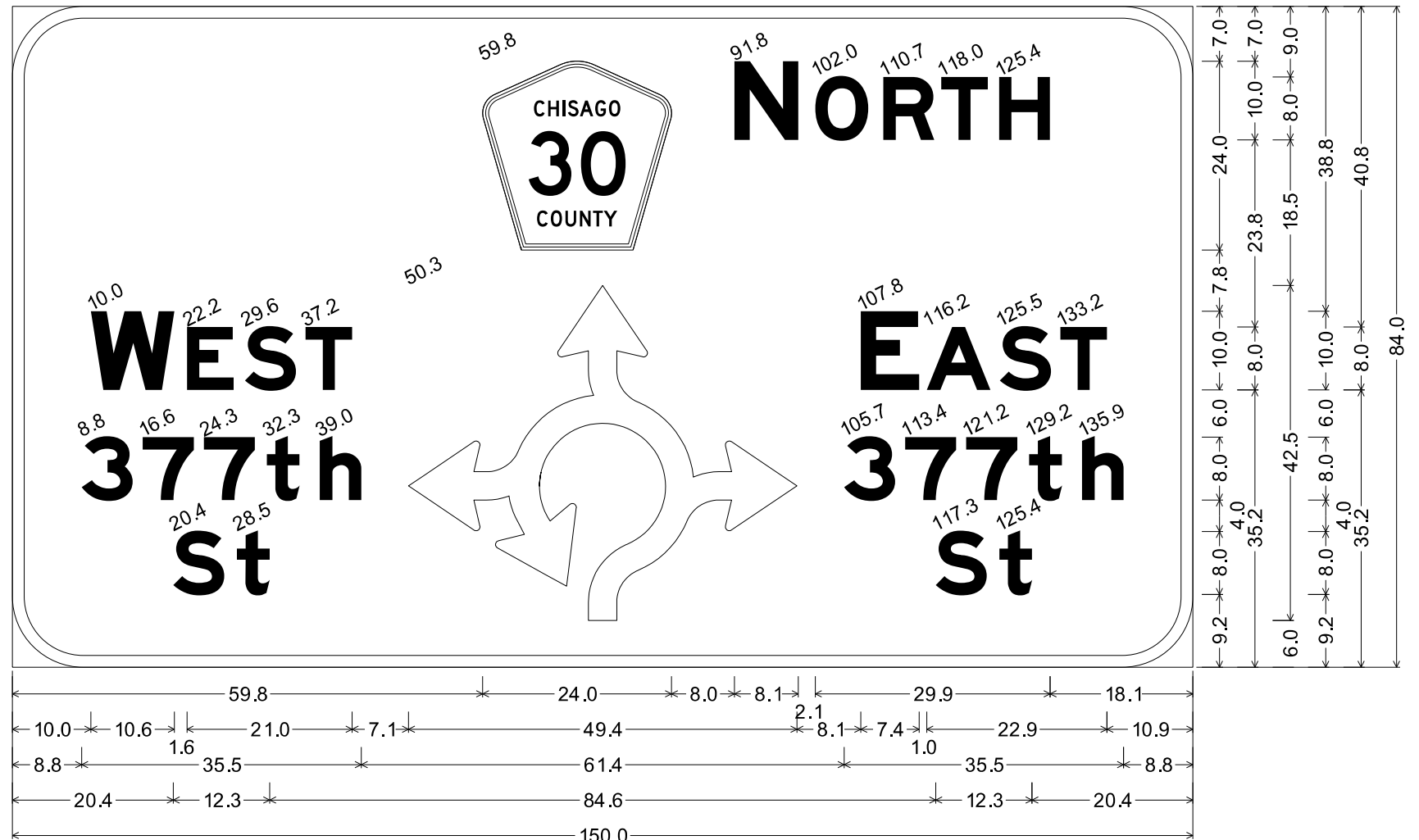
SHEET 203 OF 216 SHEETS



3.0" Radius, 1.0" Border, White on Green;
"Forest", E Mod 2K;
"Blvd", E Mod 2K;
Arrow 3 - 10.0" 45°;



3.0" Radius, 1.0" Border, White on Green;
"377th", E Mod 2K 60% spacing;
"St", E Mod 2K;
Arrow 3 - 10.0" 45°;

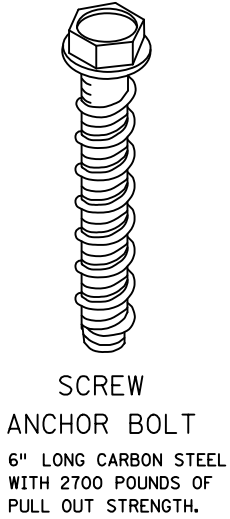
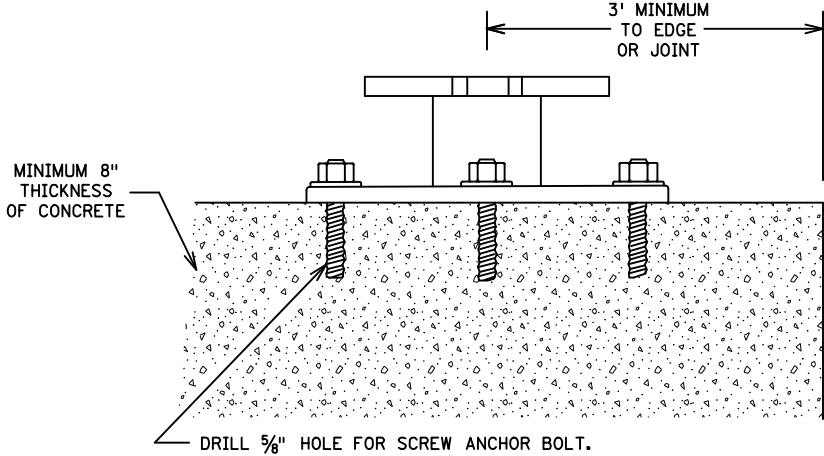


Roundabout Diagrammatic;
9.0" Radius, 1.5" Border, White on Green;
"NORTH", E Mod 2K; "WEST", E Mod 2K; "377th", E Mod 2K; "St", E Mod 2K; RA Arrow-4hd; "EAST", E Mod 2K;
"377th", E Mod 2K; "St", E Mod 2K;

DIMENSIONS ARE IN INCHES.

DATE: 9/12/2024 2:10:02 PM
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					SIGNING & PAVEMENT MARKING PLAN							
					SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004							



THE MINIMUM CONCRETE SURFACE REQUIRED FOR MOUNTING THE SLIP BASE IS 6 FEET BY 6 FEET.

SLIP BASE MOUNTED TO CONCRETE SURFACE DETAIL

RISER POSTS TO BE MOUNTED CLOSE TO PLUMB. UP TO A MAXIMUM OF 1/2" OF SHIM WASHERS MAY BE USED BETWEEN SHEAR BOLT BASE AND CONCRETE FOR LEVELING. IF MORE THAN 1/2" OF SHIMS ARE REQUIRED, THEN CORE THROUGH THE CONCRETE. IF CONCRETE IS LESS THAN 8" THICK, THEN CORE THROUGH THE CONCRETE.

REV 5/04/21

NO.	DATE	BY	CHK	REVISIONS

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

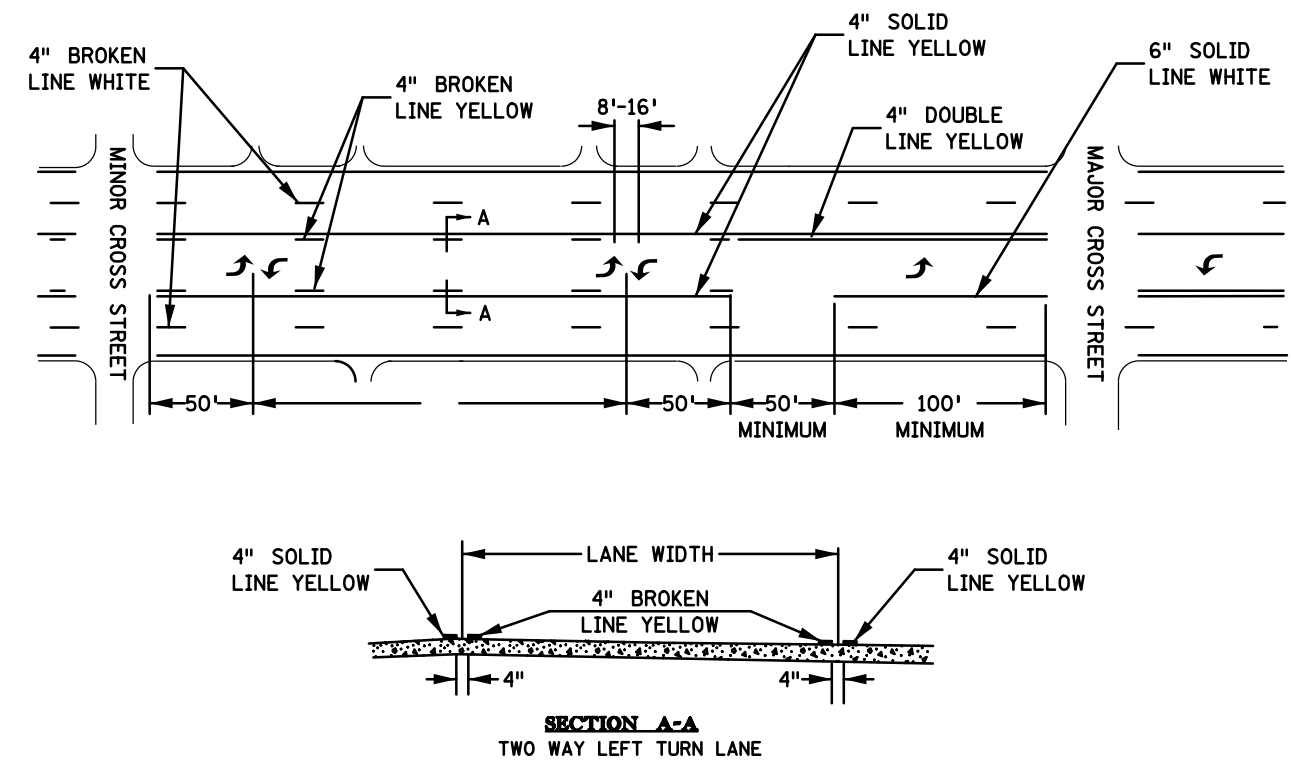
CHISAGO COUNTY, MINNESOTA

SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 205 OF 216 SHEETS

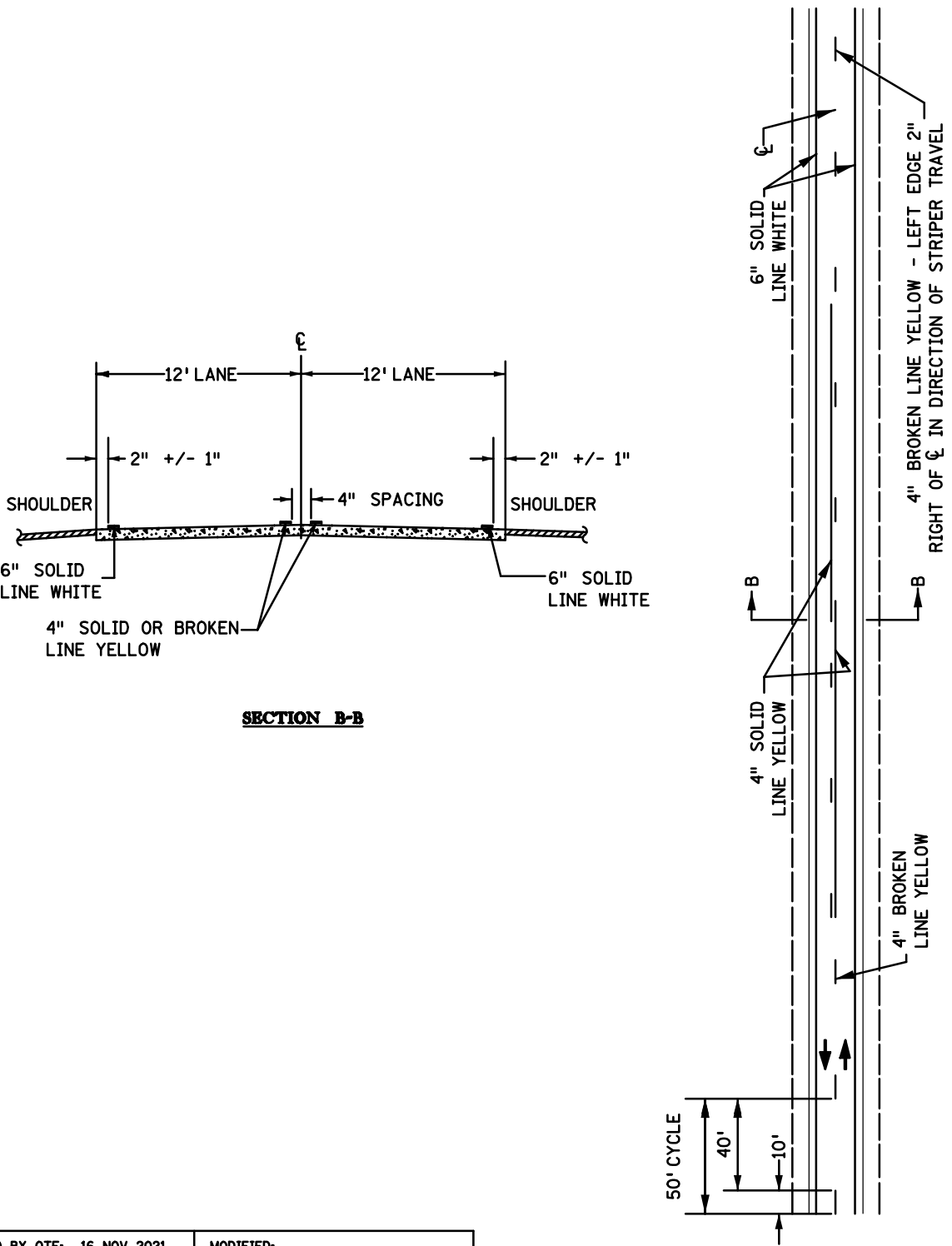
DATE: 9/12/2024 2:10:03 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss

TWO-WAY LEFT-TURN LANE



PUBLISHED BY OTE: 16 NOV 2021
MODIFIED:

TWO-LANE, TWO-WAY



PUBLISHED BY OTE: 16 NOV 2021
MODIFIED:

NO.	DATE	BY	CHK	REVISIONS

Design By: MF
Plan By: MF
Checked By: ES
Approved By: SD

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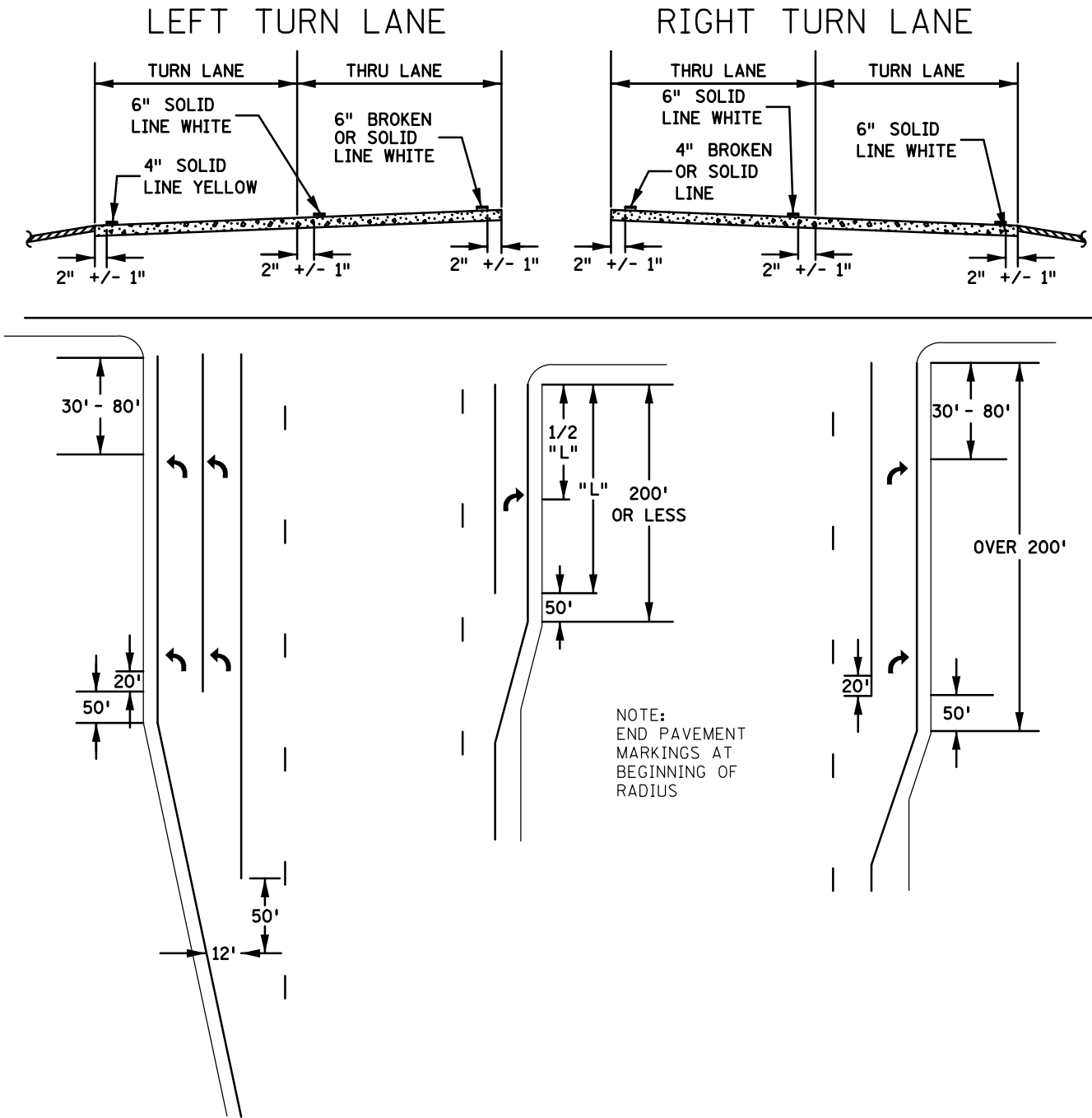
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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OF
216
SHEETS

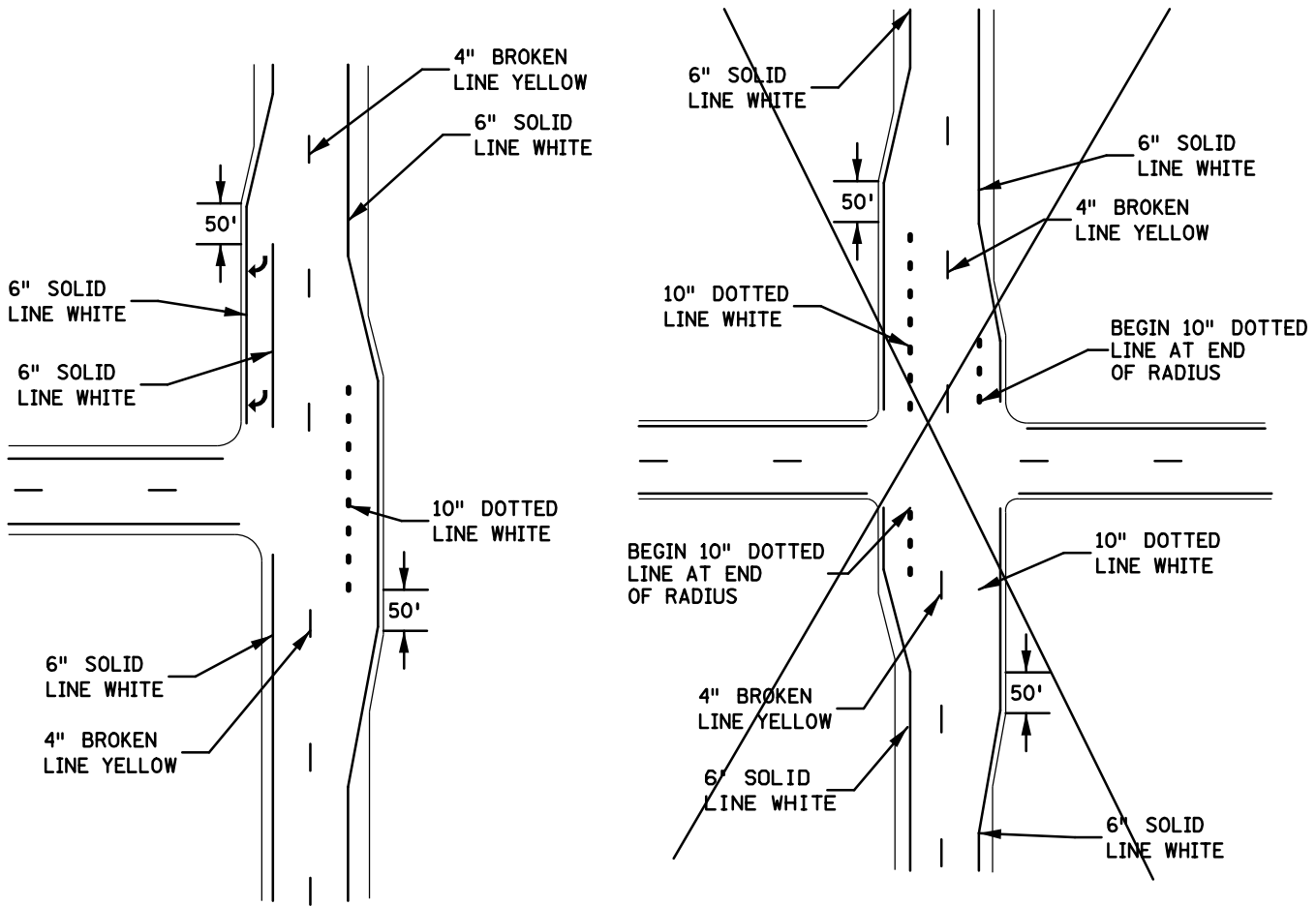
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TURN LANE WITH ARROW MESSAGE



PUBLISHED BY OTE: 16 NOV 2021 MODIFIED:

BYPASS LANE



PUBLISHED BY OTE: 16 NOV 2021 MODIFIED:

NO.	DATE	BY	CHK	REVISIONS

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Plan By: MF
Checked By: ES
Approved By: SD

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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OF
216
SHEETS

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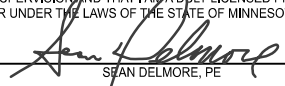
STANDARD PLATES - SIGNAL SYSTEMS	
THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT	
PLATE NO.	DESCRIPTION
► 8132 B	PREFORMED RIGID PVC CONDUIT LOOP DETECTOR
► STANDARD PLATES APPLICABLE TO THIS PROJECT	

ABBREVIATIONS	
APS	ACCESSIBLE PEDESTRIAN SIGNAL
AWF	ADVANCE WARNING FLASHER
C.D.	COUNT DOWN
D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
DEG	DEGREES
DWK	DON'T WALK
EQ.G	EQUIPMENT GROUND
EVP	EMERGENCY VEHICLE PRE-EMPTION
F&I	FURNISH AND INSTALL
FL	FLASH/FLASHING
FYA	FLASHING YELLOW ARROW
GLA	GREEN LEFT ARROW
GRN	GREEN INDICATION
GR. RD.	GROUND ROD
GRA	GREEN RIGHT ARROW
GTHA	GREEN THRU ARROW
HH	HANDHOLE
HPS	HIGH PRESSURE SODIUM
IND	INDICATION
IMC	INTERMEDIATE METAL CONDUIT
INP	INPLACE
INS. GR.	INSULATED GROUND
JB	JUNCTION BOX
LED	LIGHT EMITTING DIODE
LHT	LIGHT
LUM	LUMINAIRE
NEU	NEUTRAL
NMC	NONMETALLIC CONDUIT
P1-1 (e.g.)	PEDESTRIAN INDICATION (PHASE 1, NO. 1)
PB	PUSH BUTTON
PB2-1 (e.g.)	PUSH BUTTON (PHASE 2, NO. 1)
PEC	PHOTOELECTRIC CELL
PED	PEDESTRIAN
PV	PULL VAULT
RED	RED INDICATION
R&S	REMOVE AND SALVAGE
RLA	RED LEFT ARROW
RSC	RIGID STEEL CONDUIT
S&I	SALVAGE AND INSTALL
SOP	SOURCE OF POWER
SPR	SPARE
ST LHT	STREET LIGHT
STA	STATION
TDW	TELEPHONE DROP WIRE
WLK	WALK
YEL	YELLOW INDICATION
YLA	YELLOW LEFT ARROW
YRA	YELLOW RIGHT ARROW

SYMBOLS	
■	HANDHOLE
—○—	EQ.G CONNECTION
—◄	EVP CONFIRMATORY LIGHT
—//→	EVP DETECTOR
—◄//→	EVP DETECTOR AND CONFIRMATORY LIGHT
—●—	SPLICE
◊F◊	FIBER OPTIC SPLICE VAULT
◻PV	PULL VAULT
△2	LUMINAIRE NO.
◊3	SIGNAL BASE NO.
3-2	SIGNAL HEAD NO./FLASHER HEAD NO.
BM4	BARREL MOUNT BASE NO.
WP1	WOOD POLE NO.
TV	TELEVISION CAMERA (CCTV)
—V◄	VIDEO DETECTION
FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL	

NO.	DATE	BY	CHK	REVISIONS

Design By:	MF
Plan By:	MF
Checked By:	ES
Approved By:	SD

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	SEAN DELMORE, PE
DATE: 9/12/2024	LICENSE NO. 40945



CSAH 30 (Forest Blvd) Improvements

Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

ABBREVIATIONS

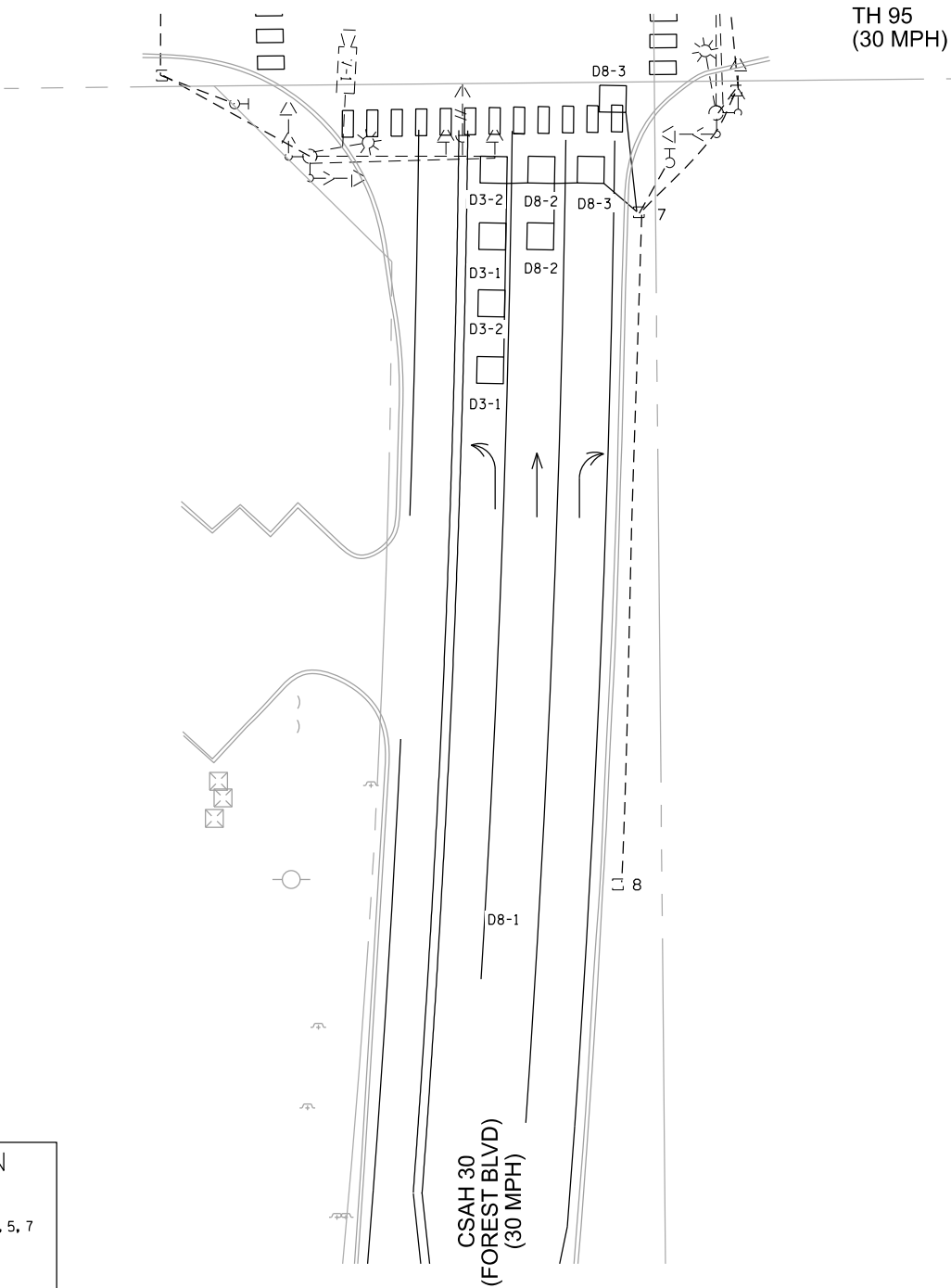
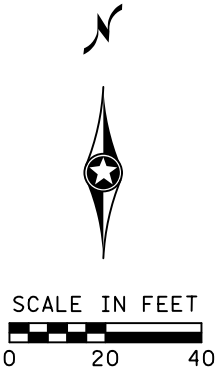
TRAFFIC CONTROL SIGNAL SYSTEM

SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 208 OF 216 SHEETS

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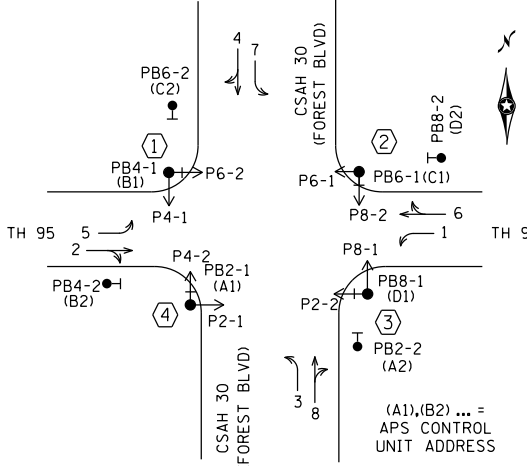
- NOTES:
- 1. CONTRACTOR SHALL TEST LOOP DETECTORS D3-1, D3-2, D8-1, D8-2 AND D8-3 PRIOR TO THE MILLING AND AFTER THE MILLING IS COMPLETED. IF ANY LOOP DETECTOR FAILS, THE CONTRACTOR SHALL FURNISH AND INSTALL NEW.
 - 2. CONTRACTOR SHALL CONTACT PETE ELLWANGER, METRO SIGNAL CONSTRUCTION COORDINATOR (651-775-1279) PRIOR TO ANY TRAFFIC CONTROL CHANGE OR REMOVAL OF EXISTING LOOP DETECTORS.



LOOP DETECTOR CHART		
NUMBER	SIZE	LOCATION
D1-1, D5-1, D7-1	6 X 6	INP
D1-2, D5-2, D7-2	6 X 6	INP
D2-1, D6-1	6 X 6	INP
* D3-1	6 X 6	20 & 50
* D3-2	6 X 6	5 & 35
D4-1	6 X 6	INP
D4-2	6 X 6	INP
D4-3	6 X 6	INP
* D8-1	6 X 6	165
* D8-2	6 X 6	5 & 20
* D8-3	6 X 6	5 & -5

➔ * CONTRACTOR SHALL TEST LOOPS DETECTORS D3-1, D3-2, D8-1, D8-2 AND D8-3 PRIOR TO MILL AND OVERLAY AND AFTER. ANY LOOP THAT IS DAMAGED SHALL BE REPLACED.

CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



SIGNAL SYSTEM OPERATION

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE, WITH PHASE 1, 3, 5, 7 BEING FYA TURN PHASES, BY TIME OF DAY.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

PEDESTRIAN PUSH BUTTONS SHALL BE LOCATED AS SHOWN ABOVE

NO.	DATE	BY	CHK	REVISIONS

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Plan By: MF
Checked By: ES
Approved By: SD

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Sean Delmore
SEAN DELMORE, PE
DATE: 9/12/2024 LICENSE NO. 40945



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

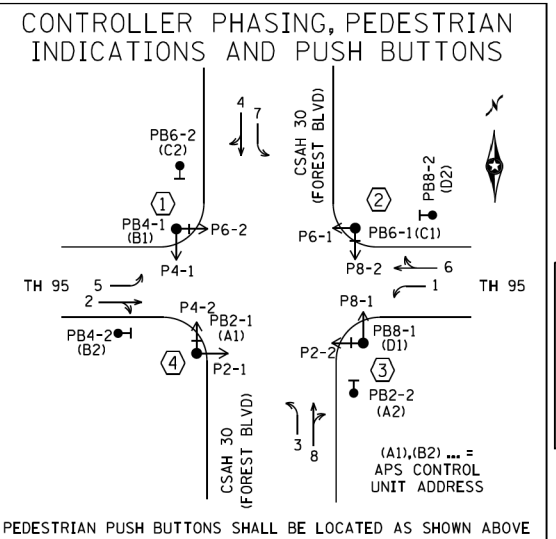
CHISAGO COUNTY, MINNESOTA
LOOP REPLACEMENT
TRAFFIC CONTROL SIGNAL SYSTEM
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
209
OF
216
SHEETS

DATE: 9/12/2024 2:10:37 PM
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- NOTES:
- SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
 - THE EXACT LOCATION OF HANDHOLES, POLES, LOOP DETECTORS, EQUIPMENT PAD AND PUSH BUTTON STATIONS, SHALL BE VERIFIED IN THE FIELD BY MNDOT TRAFFIC OFFICE PERSONNEL.
 - THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE TRAFFIC SIGNAL.
 - FOR TYPE D SIGNS SEE DETAIL SHEET. ALL SIGNS REQUIRED ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL SIGNAL SYSTEM PAY ITEM.
 - PAVEMENT MARKINGS ARE INCLUDED IN PAVEMENT MARKING PLAN.
 - CONSTRUCTION OF PEDESTRIAN CURB RAMPS ARE PART OF THE CONSTRUCTION PLAN AND ARE NOT INCLUDED IN PAYMENT FOR THE SIGNAL SYSTEM.
 - THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER THE ROADWAYS MAY REQUIRE BORING.
 - ALL NEW CONDUIT SHALL BE PVC - SCHEDULE 80 OR HDPE SCHEDULE 80 AND SHALL CARRY 1/C#6 GREEN INSULATED GROUNDING CONDUCTOR AS SHOWN IN THE PLAN.
 - ITEMS DENOTED WITH AN * ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
 - TEMPORARY SIGNAL SYSTEM WORK (SEE SPECIAL PROVISIONS)

- (A) EQUIPMENT PAD - SEE DETAIL
SERVICE CABINET
CONTROLLER AND CABINET
4" CONDUIT TO HH 1:
2-12/C#14
2-4/C#14
*1-3/C#14
*1-3/C#20
18-2/C#14
1-1/C#6 INS. GR.
4" CONDUIT TO HH 11:
2-12/C#14
2-4/C#14
*1-3/C#14
*1-3/C#20
1-2/C#14
3" CONDUIT STUBBED OUT - CAPPED BOTH ENDS
3/4" CONDUIT STUBBED OUT CAPPED FOR TELEPHONE LINE
2" CONDUIT TO SERVICE CABINET
2-1/C#6
1-1/C#6 INS. GR.
2-2" CONDUIT STUBBED OUT AND CAPPED BOTH ENDS (ONE FROM CONTROLLER CABINET, ONE FROM SERVICE CABINET)
2" CONDUIT TO SERVICE CABINET (COMMS)
SERVICE CABINET TO HH 12:
2" CONDUIT
3-1/C #2
SERVICE CABINET TO HH 11:
2" CONDUIT
4-3/C #14 (LUM)
HH 11 TO HH 1:
2" CONDUIT
2-3/C#14 (LUM)
- (B) POLE MOUNTED TRANSFORMER
(TO BE RELOCATED BY POWER COMPANY)
APPROXIMATE LOCATION
EXTEND 2" CONDUIT INTO HH 12:
3-1/C#2



- 1 EB STA 739+67 48' LT
PA100 POLE FOUNDATION
PA100 SWING AWAY HINGES
TYPE PA100-A-40-D40-9 (DAVIT AT 350 DEG)
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
1-STRAIGHT MOUNT SIGNAL OVERHEAD AT 11'
2-ANGLE MOUNT SIGNALS
AT 90 AND 180 DEG
2-ANGLE MOUNT C.D. PED IND
AT 90 AND 180 DEG
*1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 1 & 6)
LUMINAIRE-250W HPS
1-APS PB AND SIGN (LT ARROW PB4-1)
1-SIGN D-1
1-SIGN R10-X12 MOUNTED ADJACENT TO HEAD 1-1
3" CONDUIT TO HH 11:
2-12/C#14
2-4/C#14
1-3/C#14 (LUM)
*1-3/C#14
*1-3/C#20
1-2/C#14
1-1/C#6 INS. GR.
- 2 EB STA 740+58 38' LT
PA90 POLE FOUNDATION
TYPE PA90-A-30-D40-9 (DAVIT AT 350 DEG)
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
1-STRAIGHT MOUNT SIGNAL OVERHEAD AT 11'
2-ANGLE MOUNT SIGNALS
AT 90 AND 180 DEG
2-ANGLE MOUNT C.D. PED IND
AT 90 AND 180 DEG
*1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 3 & 8)
LUMINAIRE-250W HPS
1-APS PB AND SIGN (LT ARROW PB6-1)
1-SIGN D-2
1-SIGN R10-X12 MOUNTED ADJACENT TO HEAD 3-1
3" CONDUIT TO HH 3:
2-12/C#14
2-4/C#14
1-3/C#14 (LUM)
*1-3/C#14
*1-3/C#20
1-2/C#14
1-1/C#6 INS. GR.
- 3 EB STA 740+78 43' RT
PA90 POLE FOUNDATION
TYPE PA90-A-35-D40-9 (DAVIT AT 350 DEG)
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
1-STRAIGHT MOUNT SIGNAL OVERHEAD AT 11'
2-ANGLE MOUNT SIGNALS
AT 90 AND 180 DEG
2-ANGLE MOUNT C.D. PED IND
AT 90 AND 180 DEG
*1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 2 & 5)
LUMINAIRE-250W HPS
1-APS PB AND SIGN (LT ARROW PB8-1)
1-SIGN D-1
1-SIGN R10-X12 MOUNTED ADJACENT TO HEAD 5-1
3" CONDUIT TO HH 6:
2-12/C#14
2-4/C#14
1-3/C#14 (LUM)
*1-3/C#14
*1-3/C#20
1-2/C#14
1-1/C#6 INS. GR.
- 4 EB STA 739+86 46' RT
PA100 POLE FOUNDATION
TYPE PA100-A-40-D40-9 (DAVIT AT 350 DEG)
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
1-STRAIGHT MOUNT SIGNAL OVERHEAD AT 11'
2-ANGLE MOUNT SIGNALS
AT 90 AND 180 DEG
2-ANGLE MOUNT C.D. PED IND
AT 90 AND 180 DEG
*1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 4 & 7)
LUMINAIRE 250W HPS
1-APS PB AND SIGN (LT ARROW PB2-1)
1-SIGN D-2
1-SIGN R10-X12 MOUNTED ADJACENT TO HEAD 7-1
3" CONDUIT TO HH 9:
2-12/C#14
2-4/C#14
1-3/C#14 (LUM)
*1-3/C#14
*1-3/C#20
1-2/C#14
1-1/C#6 INS. GR.

- SIGNAL SYSTEM OPERATION
- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
 - NORMAL OPERATION IS 8 PHASE, WITH PHASE 1, 3, 5, 7 BEING FYA TURN PHASES, BY TIME OF DAY.
 - PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

SIGNAL FACE CHART

FACE	R	Y	G	RLA	YLA	FYA	GLA
1-1, 1-2				←	←	←	←
2-1, 2-2	●	●	●				
3-1, 3-2				←	←	←	←
4-1, 4-2	●	●	●				
5-1, 5-2				←	←	←	←
6-1, 6-2	●	●	●				
7-1, 7-2				←	←	←	←
8-1, 8-2	●	●	●				

-ALL SIGNAL INDICATIONS SHALL BE 12" LED
-ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BACKGROUND SHIELDS

LOOP DETECTOR CHART

NUMBER	SIZE (FT)	LOCATION
D1-1, 5-1	6x6	20 & 50
D1-2, D5-2	6x6	5 & 35
D2-1, D6-1	6x6	120
D3-1, 7-1	6x6	20 & 50
D3-2, 7-2	6x6	5 & 35
D4-1	6x6	170
D4-2	6x6	5 & 20
D4-3	6x6	5 & -5
D8-1	6x6	165
D8-2	6x6	5 & 20
D8-3	6x6	5 & -5

-ALL LOOP DETECTORS SHALL BE PVC
-LOCATION: DISTANCE FROM CROSSWALK/STOP BAR IN FEET

FOR INFORMATION ONLY

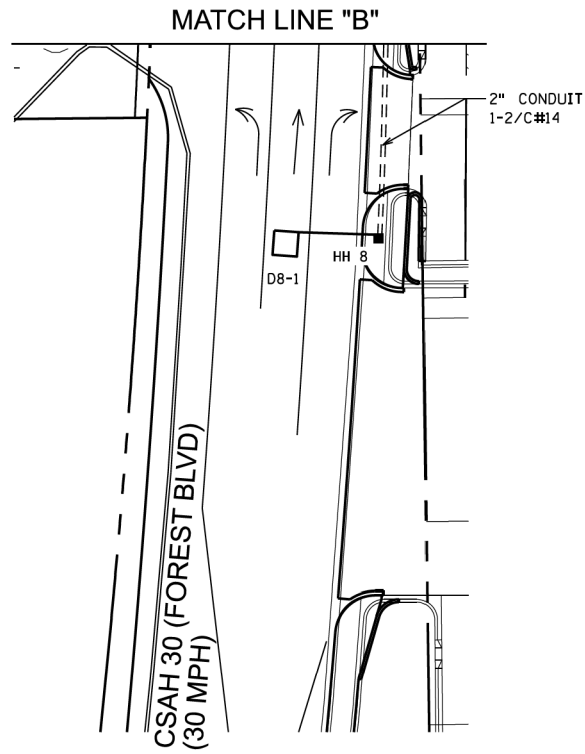
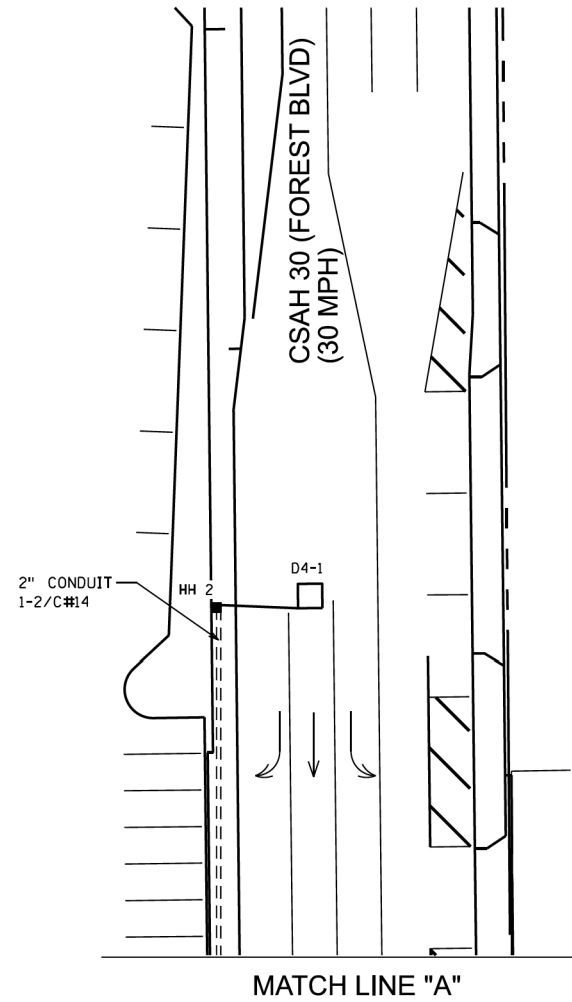
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
FOR INFORMATION ONLY
TRAFFIC CONTROL SIGNAL SYSTEM
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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OF
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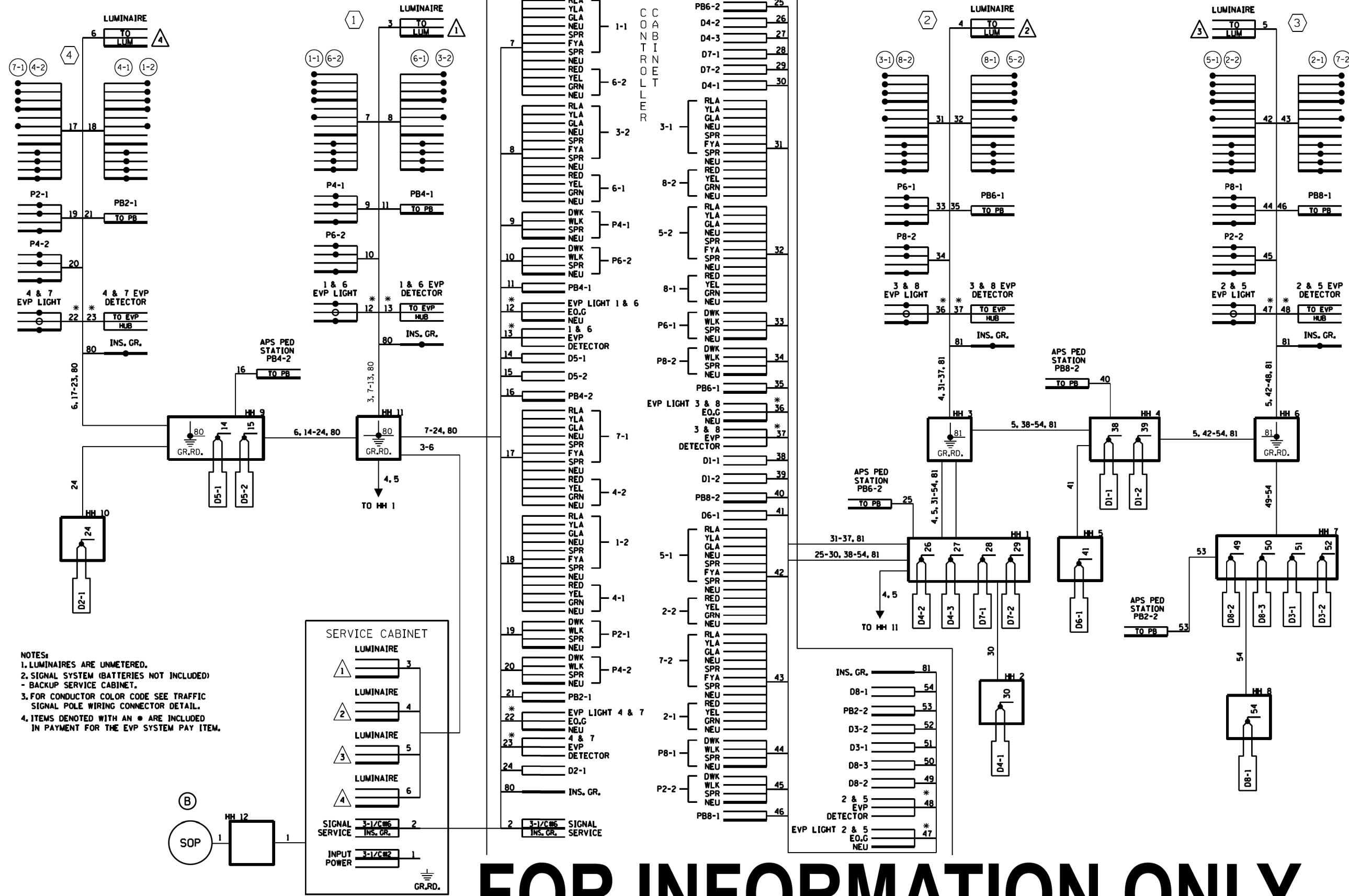


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
FOR INFORMATION ONLY
TRAFFIC CONTROL SIGNAL SYSTEM
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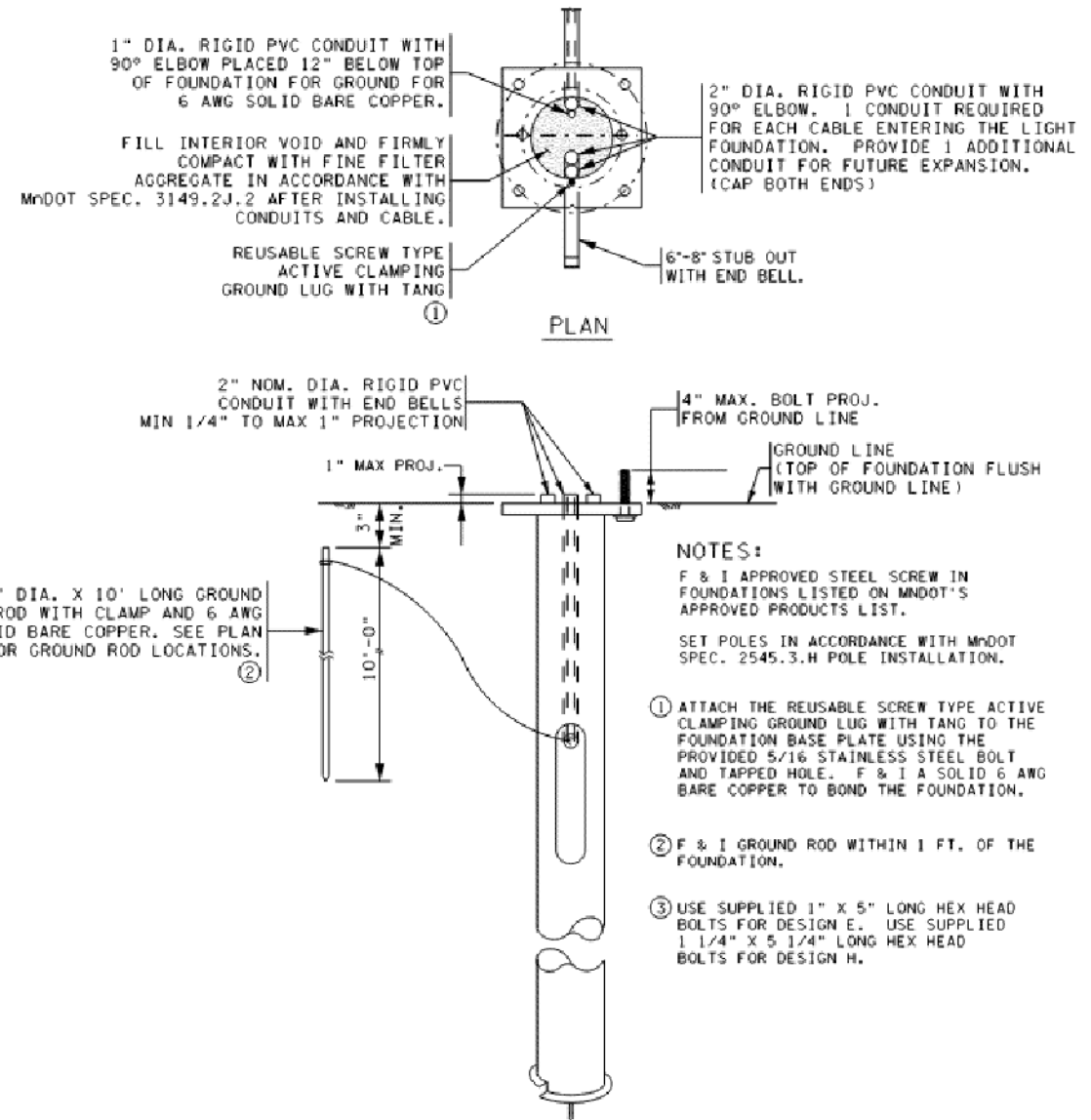


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
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TRAFFIC CONTROL SIGNAL SYSTEM
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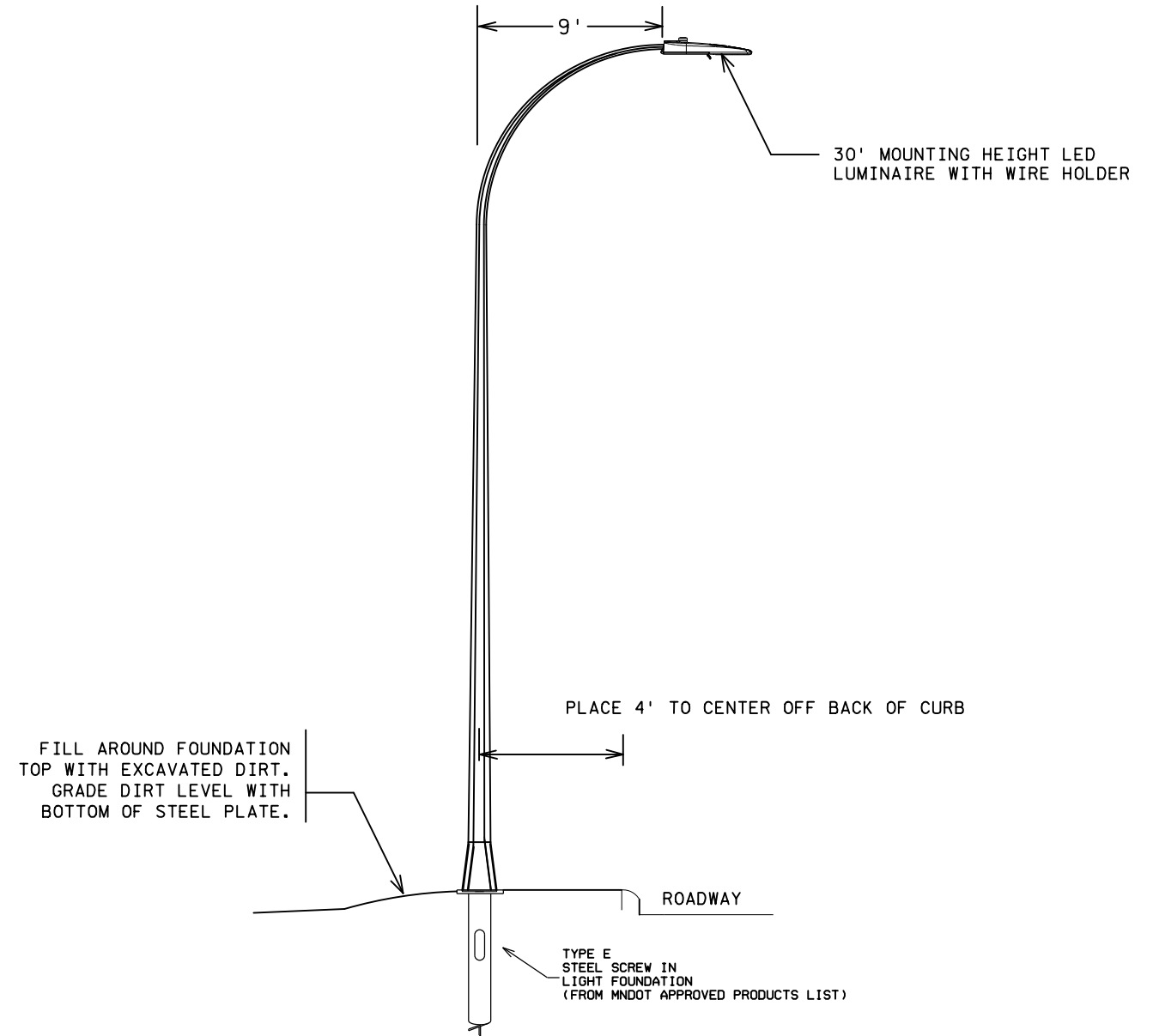
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STEEL SCREW IN LIGHT FOUNDATION DESIGN E

STREET LIGHTING TABULATION		L
ITEM DESCRIPTION	UNIT	TOTAL
LIGHTING UNIT TYPE 9-30	EACH	11
LIGHT FOUNDATION DESIGN STEEL E	EACH	11
SERVICE CABINET TYPE-L1	EACH	1
EQUIPMENT PAD B	EACH	1
SERVICE EQUIPMENT	EACH	1
2" NON-METALLIC CONDUIT	LIN FT	1500
UNDERGROUND WIRE 1/C 8 AWG	LIN FT	6500



TYPICAL PLACEMENT OF LIGHTING UNIT TYPE 9-30

NOTE:

WHEN SIDEWALK IS PRESENT PLACE 3' TO CENTER OFF BACK EDGE OF SIDEWALK.

NO.	DATE	BY	CHK	REVISIONS

Design By: DS
Plan By: DS
Checked By: ES
Approved By: SD

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

Sean Delmore
SEAN DELMORE, PE
DATE: 9/12/2024 LICENSE NO. 40945

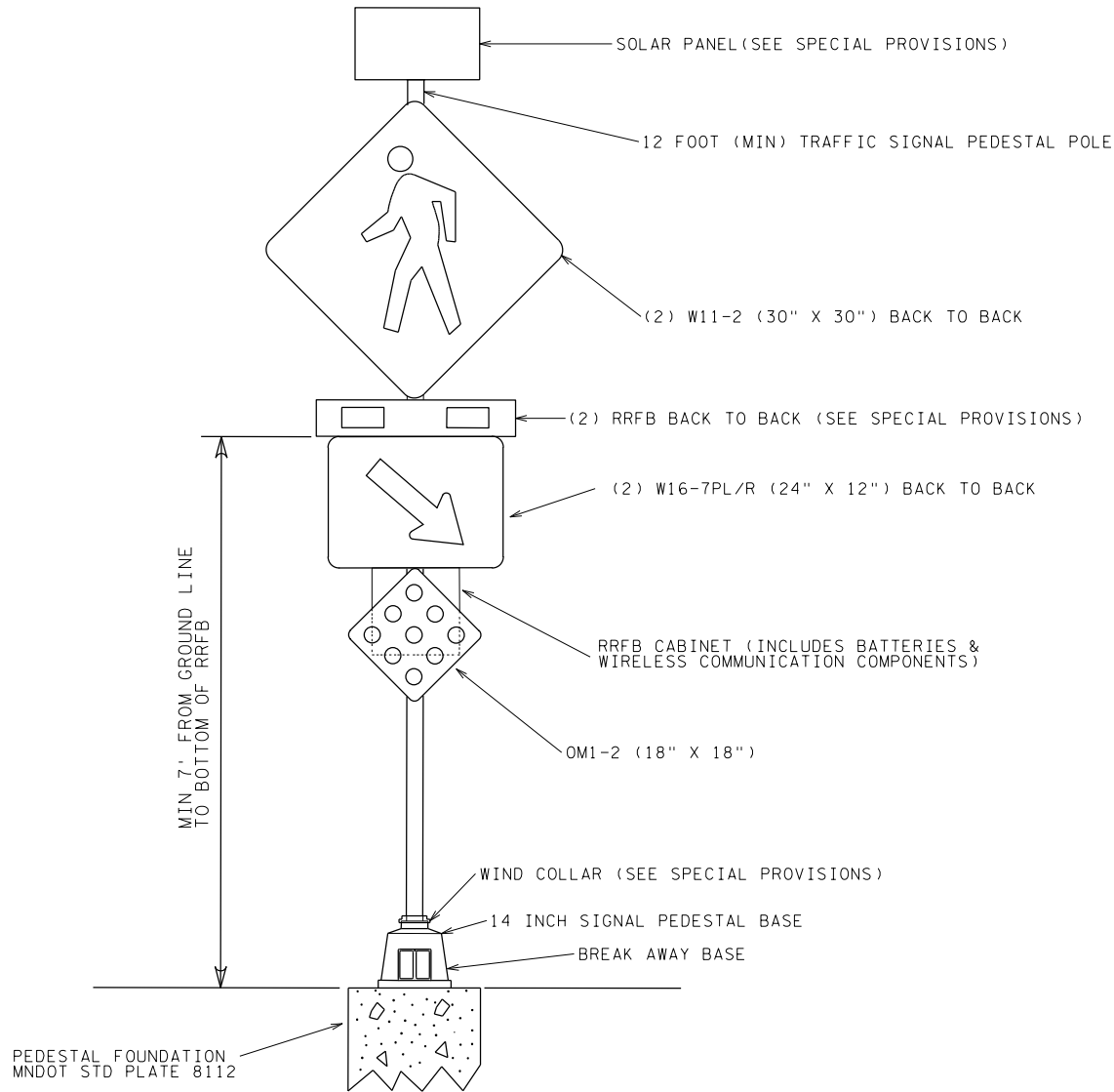


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

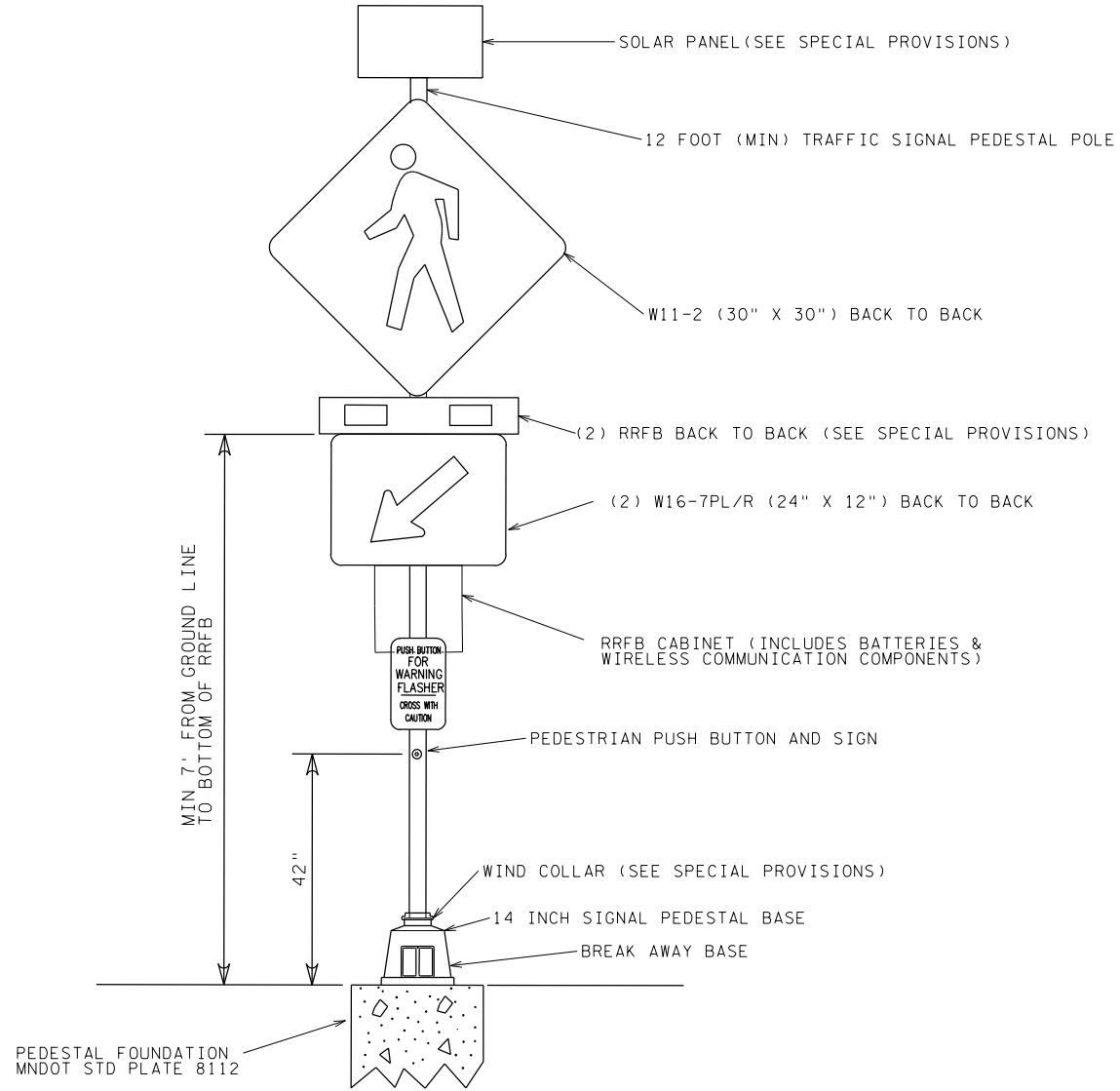
CHISAGO COUNTY, MINNESOTA

LIGHTING & RRFB PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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WARNING FLASHER DETAIL
SYSTEM (2)
NOT TO SCALE



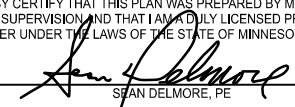
WARNING FLASHER / PUSH BUTTON DETAIL
SYSTEM (1) AND (3)
NOT TO SCALE

PEDESTRIAN CROSSWALK FLASHER SYSTEM (SIGNS) (A) (C)					
CODE NO.	POSTS	MOUNTING HEIGHT	PANEL	QTY	PANEL LEGEND
	NO. & TYPE		SIZE (W x H)		
			INCH	EACH	
R10-25	(B)	3.5	6 x 12	6	PUSH BUTTON TO ACTIVATE FLASHER
W11-2	(B)	9.5	30 x 30	18	PEDESTRIAN CROSSING
W16-7PL	(B)	7	24 x 12	6	DOWN ARROW (LEFT)
W16-7PR	(B)	7	24 x 12	12	DOWN ARROW (RIGHT)
OM1-2	(B)	4	18 x 18	2	HAZARD MARKER

(A) ALL SIGN PANELS MOUNTED TO PEDESTAL POLES
(B) ALL SIGN PANELS PAID UNDER ITEM - (2565) PEDESTRIAN CROSSWALK FLASHER SYSTEM
(C) PEDESTRIAN CROSSWALK FLASHER SYSTEM TO BE TRAFFICLARM BRAND.

NO.	DATE	BY	CHK	REVISIONS

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Plan By: DS
Checked By: ES
Approved By: SD

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
LIGHTING & RRFB PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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FEEDPOINT G

LIGHTING STANDARDS AND FOUNDATIONS

NO.	STATION	LT	RT	LOCATION	TYPE	MH
G1	105+00	X		377th St (WB)	Type 9-30	30'
G2	104+40		X	377th St (EB)	Type 9-30	30'
G3	1616+35		X	CSAH 30 (NB)	Type 9-30	30'
G4	1617+00	X		CSAH 30 (SB)	Type 9-30	30'
G5	101+90		X	377th St (EB)	Type 9-30	30'
G6	1614+00		X	CSAH 30 (NB)	Type 9-30	30'
G7	1618+40		X	CSAH 30 (NB)	Type 9-30	30'
G8	1619+20	X		CSAH 30 (SB)	Type 9-30	30'
G9	1621+00	X		CSAH 30 (SB)	Type 9-30	30'
G10	1622+95	X		CSAH 30 (SB)	Type 9-30	30'
G11	103+80	X		377th St (WB)	Type 9-30	30'

LEGEND

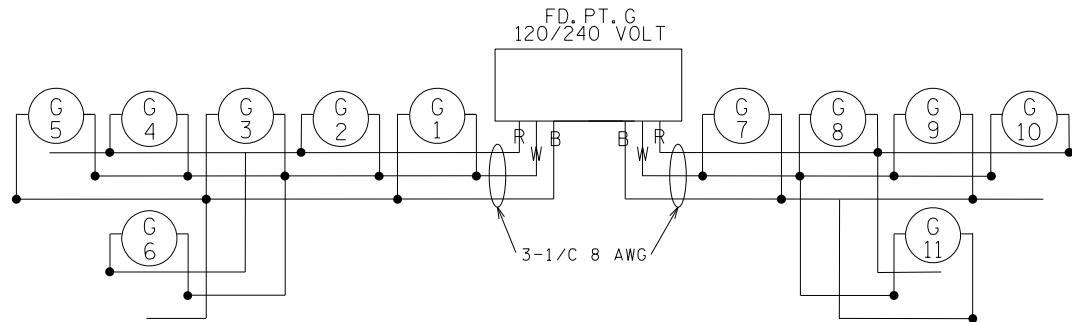
-  LIGHTING UNIT TYPE 9-30
-  2" NON-METALLIC CONDUIT
-  SERVICE CABINET TYPE L1
-  LIGHTING SYSTEM ID
LIGHTING UNIT #



SCALE IN FEET
0 50 100

LIGHTING SYSTEM G WIRING DIAGRAM

B AND R DENOTE CURRENT CARRYING CONDUCTORS
W DENOTES NEUTRAL CONDUCTOR
GROUND NOT SHOWN



- NOTE:
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES PRIOR TO WORK.
 2. THE CONTRACTOR SHALL COORDINATE THE PLACEMENT OF CONDUIT AND FOUNDATIONS WITH OTHER CONSTRUCTION ACTIVITIES IN THE AREA.
 3. THE CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS AND UTILITY COORDINATION.
 4. ALL MATERIALS AND WORK SHALL BE IN ACCORDANCE WITH THE N.E.C.
 5. EXACT LOCATIONS OF LIGHT, PEDESTALS AND SERVICE CABINET FOUNDATIONS SHALL BE STAKED IN THE FIELD FOR ENGINEER APPROVAL.

NO.	DATE	BY	CHK	REVISIONS

Design By:
DS
Plan By:
DS
Checked By:
ES
Approved By:
SD

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

LIGHTING & RRFB PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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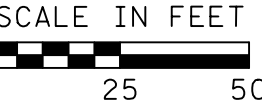
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230

CSAH 30

384TH ST



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Design By: DS
Plan By: DS
Checked By: ES
Approved By: SD

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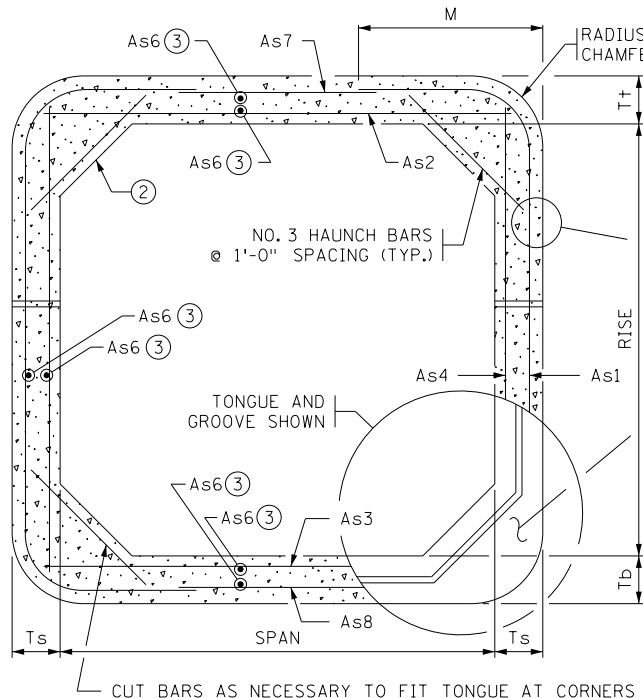
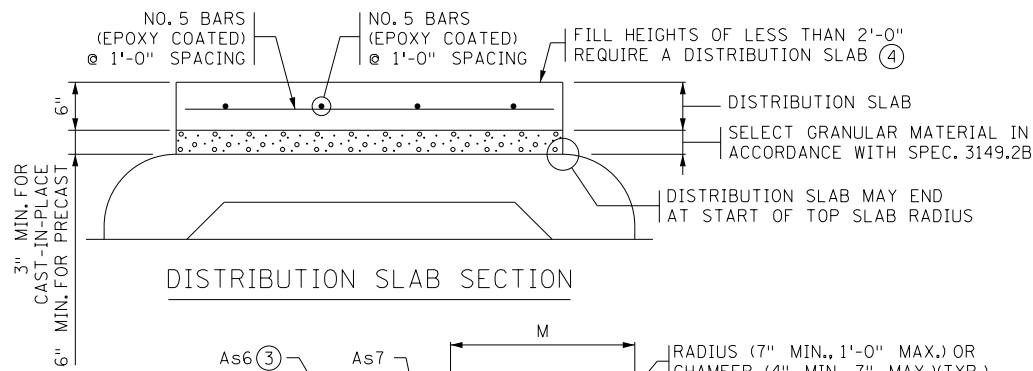
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

LIGHTING & RRFB PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

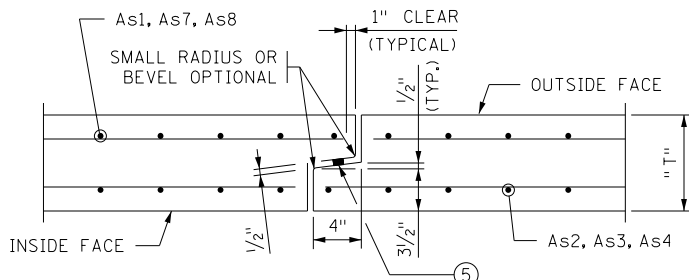
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TRANSVERSE BARREL SECTION

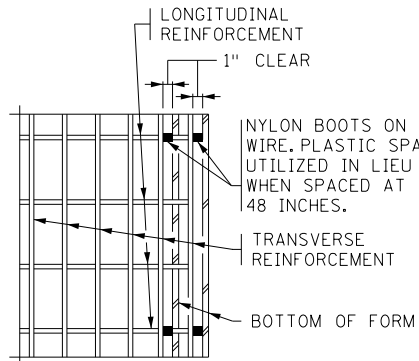
BAR REINFORCEMENT OPTION SHOWN



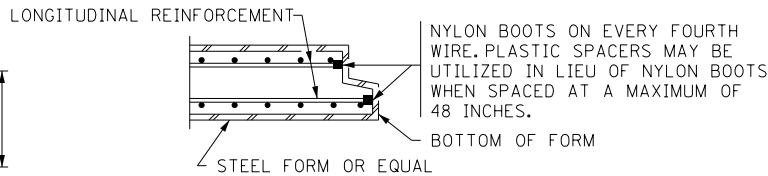
TONGUE AND GROOVE JOINT DETAIL

HAUNCH BAR LENGTH:
31" FOR 8" WALL THICKNESS
34" FOR 9" WALL THICKNESS
34" FOR 10" WALL AND 10" SLAB
36" FOR 10" WALL AND 11" SLAB
38" FOR 10" WALL AND 12" SLAB
38" FOR 11" WALL THICKNESS

REINFORCEMENT NOT SHOWN FOR CLARITY

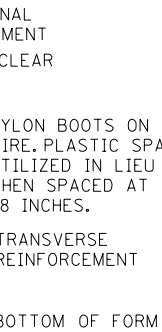


PLAN

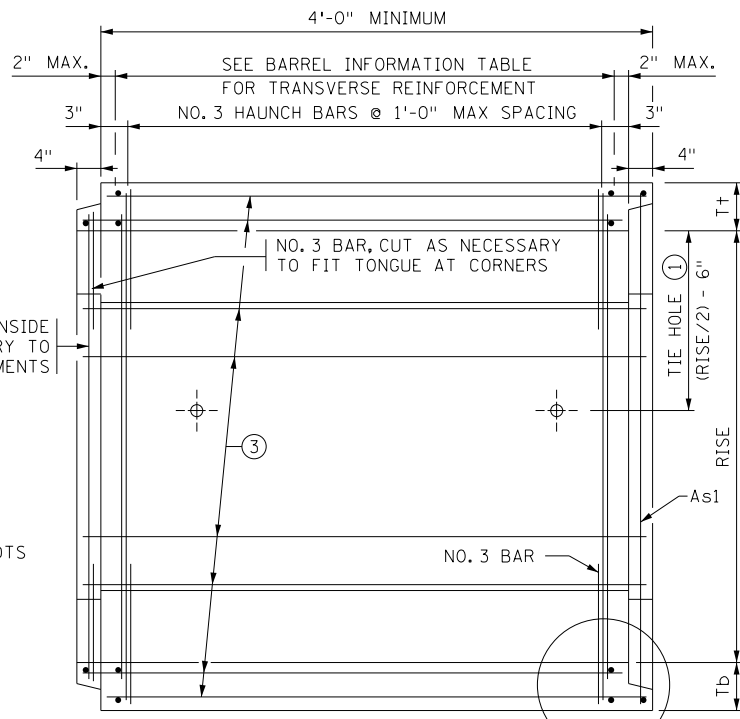


SECTION
FORMING DETAIL

CUT OR BEND INSIDE REINFORCEMENT AS NECESSARY TO ACHIEVE COVER REQUIREMENTS

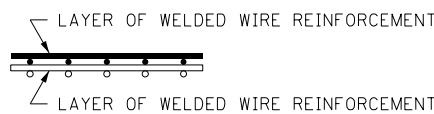


DISTRIBUTION SLAB - LONGITUDINAL SECTION



LONGITUDINAL BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN



REINFORCEMENT LAYER DETAIL

WHEN MORE THAN ONE LAYER OF WELDED WIRE REINFORCEMENT IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, PLACE THE WIRES OF THE WELDED WIRE REINFORCEMENT AS SHOWN

CONSTRUCTION NOTES

CONSTRUCT CULVERTS IN ACCORDANCE WITH SPEC. 2412 EXCEPT AS NOTED.

REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5-395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.

PROVIDE WELDED WIRE REINFORCEMENT, SHEAR REINFORCEMENT AND REINFORCEMENT BARS IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M259.

1 1/2" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:
(a) 1 OR 2 LAYERS OF WELDED WIRE REINFORCEMENT OR
(b) 1 LAYER OF WELDED WIRE REINFORCEMENT AND 1 LAYER OF REINFORCEMENT BARS OR
(c) 1 LAYER OF REINFORCEMENT BARS.

DEVELOP REINFORCEMENT IN ACCORDANCE WITH AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WELDED WIRE REINFORCEMENT, INCREASE THE AREA OF REINFORCEMENT BY 8%, AND SUBMIT DESIGN CALCULATIONS VERIFYING COMPLIANCE WITH AASHTO 5.7.3.4. "CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT".

MAXIMUM SIZE OF REINFORCEMENT BARS IS NO. 6. THE MAXIMUM WELDED WIRE REINFORCEMENT SIZE IS W23 PER LAYER (MAXIMUM OF 2 LAYERS).

SPACE CENTER TO CENTER OF TRANSVERSE WIRES NOT LESS THAN 2" NOR MORE THAN 4". SPACE CENTER TO CENTER OF LONGITUDINAL WIRES NOT MORE THAN 8".

WHEN USING As1, As7, AND As8 REINFORCEMENT AS ONE CONTINUOUS CAGE WITH SPLICES OCCURRING IN THE CENTER OF THE TOP AND BOTTOM OF THE BOX SECTION, THE MIN. LAP LENGTH FOR THE As7 AND As8 IS 15".

WELDING IS NOT PERMITTED ON REINFORCEMENT BARS OR WELDED WIRE REINFORCEMENT, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE REINFORCEMENT IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, PLACE ADDITIONAL REINFORCEMENT ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

USE CONCRETE MIX NO. 3W82 WITH NO CALCIUM CHLORIDE ALLOWED.

SHOP DRAWING APPROVAL IN ACCORDANCE WITH SPEC. 3238.2A IS NOT REQUIRED UNLESS OPENINGS OR ATTACHMENTS ARE PLACED ON A BARREL SEGMENT.

COMPACT THE FIRST 1.5' (LOOSE) OF FILL ABOVE THE BOX WITH LIGHT COMPACTION EQUIPMENT SUCH AS PLATE COMPACTORS OR WALK BEHIND ROLLERS.

TRANSVERSE REINFORCEMENT IS PARALLEL TO THE CULVERT SPAN. LONGITUDINAL REINFORCEMENT IS PERPENDICULAR TO THE CULVERT SPAN.

- USE 1" DIAMETER CULVERT TIES. SEE STANDARD PLATE NO. 3145 FOR DETAILS.
- USE 12" VERTICAL, 12" HORIZONTAL HAUNCHES ON ALL BOX SIZES.
- PLACE LONGITUDINAL REINFORCEMENT DENOTED AS As6 IN ALL SLABS AND WALLS WITH A MINIMUM OF 0.06 SQ. IN./FT.
- ROADWAY OR SHOULDER FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A 6" THICK DISTRIBUTION SLAB WITH CONCRETE MIX 3S52.

PLACE CAST-IN-PLACE DISTRIBUTION SLABS WITH 3" MIN. SELECT GRANULAR MATERIAL IN ACCORDANCE WITH SPEC. 3149.2B BETWEEN BARREL AND DISTRIBUTION SLAB.

PRECAST DISTRIBUTION SLABS MAY BE USED FOR FILL HEIGHTS OVER 1'-0". PROVIDE 6" MINIMUM SELECT GRANULAR MATERIAL IN ACCORDANCE WITH SPEC. 3149.2B BETWEEN BARREL AND SLAB.

EXTEND THE WIDTH OF THE DISTRIBUTION SLAB TO THE OUTSIDE EDGES OF THE ROADWAY SHOULDERS UNLESS DIRECTED BY THE ENGINEER.

REDESIGN THE DISTRIBUTION SLAB PER THE MnDOT PAVEMENT DESIGN MANUAL IF IT IS USED AS PAVEMENT SURFACE.

PAYMENT FOR THE DISTRIBUTION SLAB AND SELECT GRANULAR MATERIAL BENEATH THE SLAB IS INCLUDED IN THE PRECAST CONCRETE BOX CULVERT PAY ITEM.

- REFER TO SPEC. 2412 FOR SEALANT REQUIREMENTS.
- BOX CULVERT IS A NON-STANDARD SIZE. BARREL INFORMATION PROVIDED IN THE TABLE MATCHES THAT OF A STANDARD 10' X 4' BOX CULVERT.

BARREL INFORMATION TABLE ***

BARREL INFORMATION TABLE ***																									
LOCATION ⑥	SIZE	CLASS	f'c (P.S.I.)	FILL HEIGHT RANGE (FT.)	DISTRIBUTION SLAB REQUIRED *	RECESSED TIE RODS REQUIRED **	DIMENSIONS					WEIGHT (LBS./FT.)	WELDED WIRE REINFORCEMENT												
							SPAN (FT.)	RISE (FT.)	T+ (IN.)	Tb (IN.)	Ts (IN.)		As1			As2		As3		As4		As7		As8	
													AREA (IN. ² /FT.)	LENGTH (FT.)	M (FT.)	AREA (IN. ² /FT.)	LENGTH (FT.)	AREA (IN. ² /FT.)	LENGTH (FT.)	AREA (IN. ² /FT.)	LENGTH (FT.)	AREA (IN. ² /FT.)	LENGTH (FT.)	AREA (IN. ² /FT.)	LENGTH (FT.)
1640+82.50	9x4	1	5000	3	NO	NO	9	4	9	10	8	3800	0.66	10'-8"	2'-10"	0.50	10'-6"	0.48	10'-6"	0.20	4'-6"	0.24	8'-3"	0.24	8'-3"

REVISION: DECEMBER 21, 2022

APPROVED: MARCH 24, 2011

Nancy Dubenberger
STATE BRIDGE ENGINEER

* ALL CLASS 1 CULVERTS WITH FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. IF A DISTRIBUTION SLAB IS NOT REQUIRED, INDICATE "NO" IN THIS BOX.

** FOR PEDESTRIAN CULVERT APPLICATIONS HIDE-AWAY OR RECESSED TIE CONNECTIONS ARE REQUIRED. SEE STANDARD PLATE 3145. IF REQUIRED, INDICATE "YES" IN THIS BOX.

*** BOX CULVERTS WITH SPANS FROM 6 TO 14 FT. ARE DESIGNED FOR HL-93 LIVE LOADS (AASHTO LRFD 3.6.2.1) NOT INCLUDING THE DESIGN LANE LOAD. BOXES WITH SPANS OF 16 FT. ARE DESIGNED FOR HL-93 LIVE LOADS INCLUDING THE DESIGN LANE LOAD.



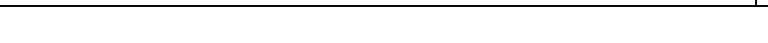
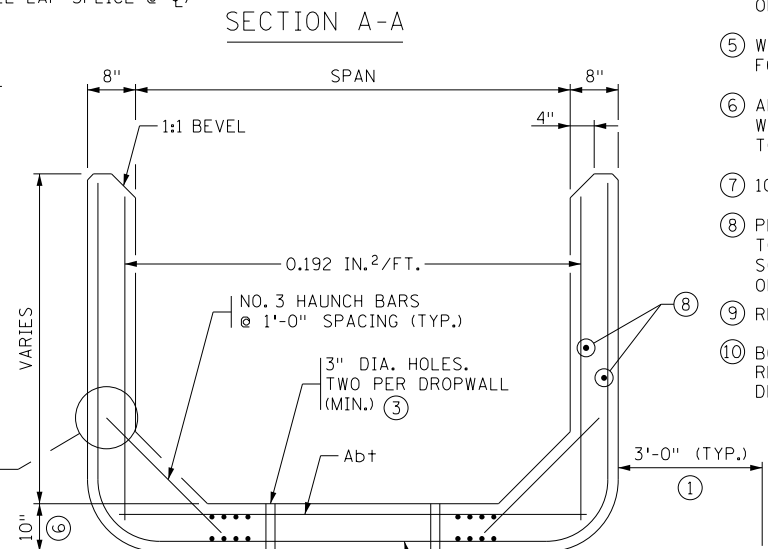
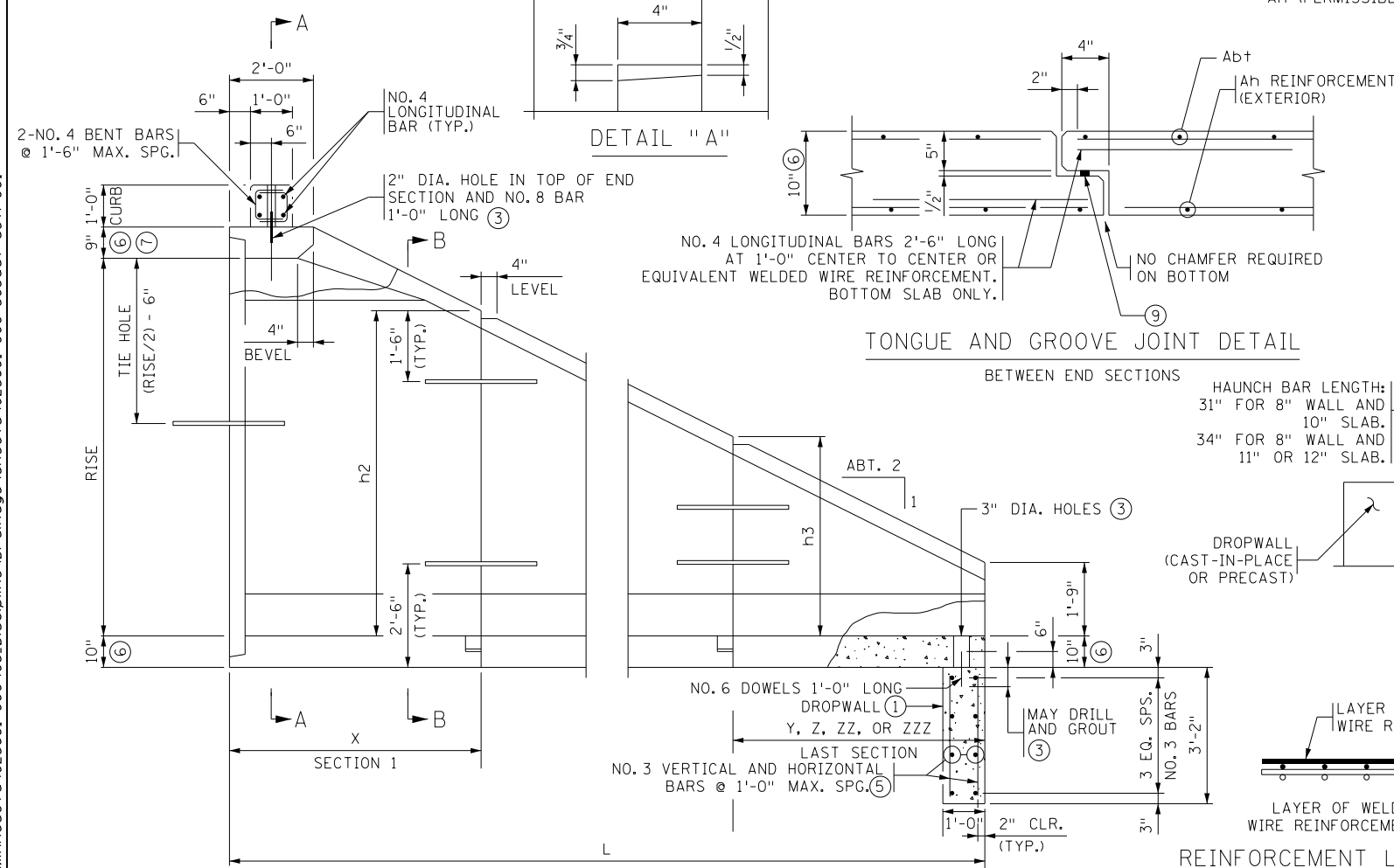
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

PRECAST CONCRETE BARREL DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

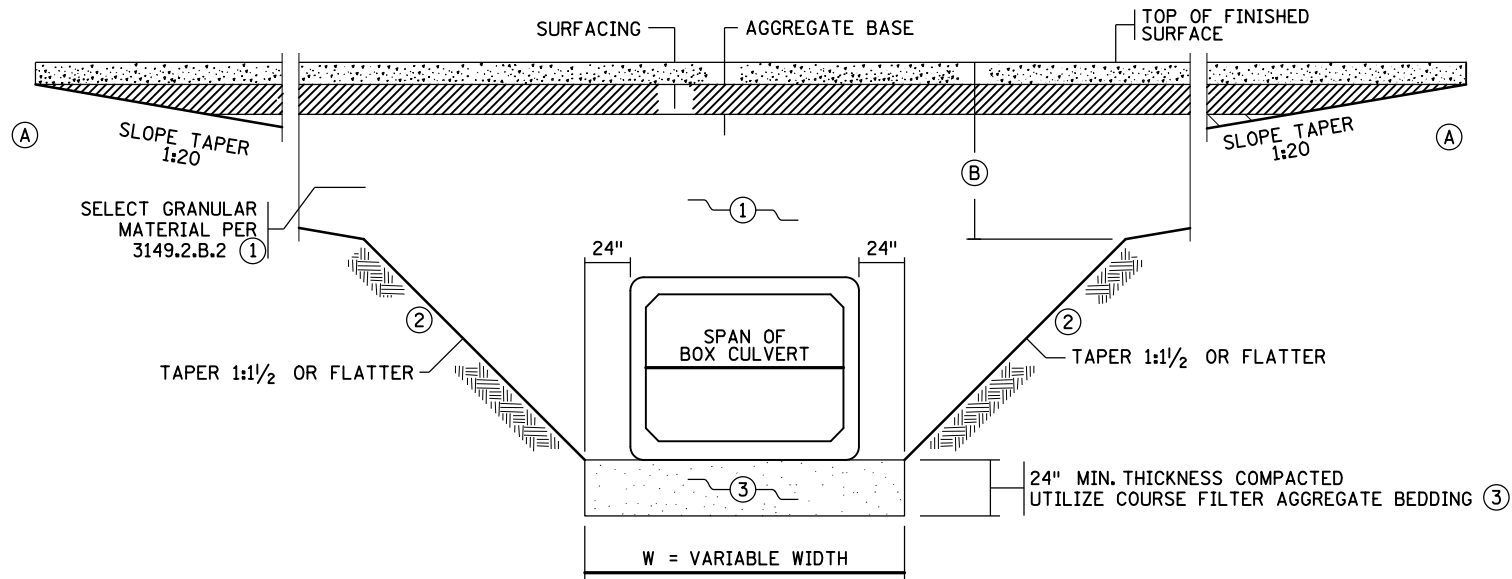
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BR5
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FIG. 5-395.101(A)



A++ , A+b REINFORCEMENT			Ab+ REINFORCEMENT		
SPAN (FT.)	A++ (IN ² /FT.)	A+b (IN ² /FT.)	SPAN (FT.)	Ab+ (IN ² /FT.)	
6	0.27	0.44	6-10	0.20	
8	0.47	0.60	12	0.30	
10	0.62	0.74	14	0.39	
12	0.88	1.06	16	0.39	
14	1.20	1.58			
16	1.52	2.09			

LENGTH (IN./FT.) WITH SPANS OF		FIG. 5-395.102
CHICAGO COUNTY, MINNESOTA		SHEET BR3 OF BR5 SHEETS
SINGLE OR MULTIPLE BARREL FOR SKEWS UP TO 7.5" PRECAST CONCRETE END SECTION TYPE 1 SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		



CONCRETE BOX CULVERT BEDDING

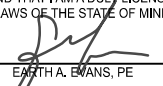
NOTES

- EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.
ALL SLOPES SHOWN AS (V) : (H)
- ① MAXIMUM EMBANKMENT PARTICLE SIZE WITHIN 2 FT. OF CULVERT IS 3" PER SPEC. TABLE 2106-4.
 - ② OVER EXCAVATION BENEATH TAPERS IS NOT PERMITTED UNLESS REQUIRED BY OSHA. (TYP.)
 - ③ IF APPROVED BY THE ENGINEER IN WET CONDITIONS THE CONTRACTOR MAY SUBSTITUTE 24" OF COARSE FILTER AGGREGATE PER 3149.2.H COMPACTED TO THE QUALITY COMPACTION REQUIREMENTS OF SPEC. 2211.3.D.2.b. WRAP WITH GEOTEXTILE FABRIC TYPE IV PER SPEC 3733. SEAM ALL FABRIC SIDES AND ENDS PER SPEC TABLE 3733-1 INCLUDING FOOTNOTE (e) OR OVERLAP A MINIMUM OF 3 FT. ALL AT NO ADDITIONAL COST.
- DESIGNER NOTE:
SLOPING AND BENCHING FOR EXCAVATIONS GREATER THAN 20 FT. DEEP SHALL BE DESIGNED BY A REGISTERED ENGINEER.

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NO.	DATE	BY	CHK	REVISIONS

Design By:	WAR
Plan By:	WAR
Checked By:	EAE
Approved By:	EAE

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.	
	
EARTHA A. EVANS, PE	
DATE: 9/12/2024	LICENSE NO. 44235



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
BOX CULVERT BEDDING
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET BR4 OF BR5 SHEETS

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REVISION: DECEMBER 21, 2022

APPROVED: SEPTEMBER 11, 2014
Nancy Swenberger
STATE BRIDGE ENGINEER

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Design By: WAR
Plan By: WAR
Checked By: EAE
Approved By: EAE

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.

EARTH A. EVANS, PE
EARTH A. EVANS, PE
DATE: 9/12/2024
LICENSE NO. 44235



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

EMBANKMENT PROTECTION FOR BOX CULVERTS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
BR5
OF
BR5
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CONSTRUCTION NOTES

THIS PLAN SHEET IS FOR CULVERT EMBANKMENT PROTECTION ONLY. REFER TO THE GRADING PLANS FOR ADDITIONAL RIPRAP OR OTHER SCOUR PROTECTION MEASURES.

PROVIDE RIPRAP IN ACCORDANCE WITH SPECS. 2511 AND 3601.

EMBANKMENT PROTECTION, INCLUDING MATERIAL PLACED BETWEEN BARRELS THAT ARE LESS THAN 2'-0" APART, IS INCLUDED IN THE PRECAST CONCRETE BOX CULVERT PAY ITEMS.

- ① PROVIDE TYPE 7 GEOTEXTILE IN ACCORDANCE WITH SPEC. 3733. PROVIDE GEOTEXTILE STRIPS CONTINUOUS WITHOUT OVERLAPS, EXCEPT FOR THE TOP STRIP, WHICH SHOULD SHINGLE VERTICAL STRIPS. BURY THE TOP EDGE TO PREVENT UNDERMINING.

RIPRAP CLASS

RIPRAP CLASS	RIPRAP CLASS	T	W
☒	III	1'-6"	3'-0"
☐	IV	2'-0"	4'-0"

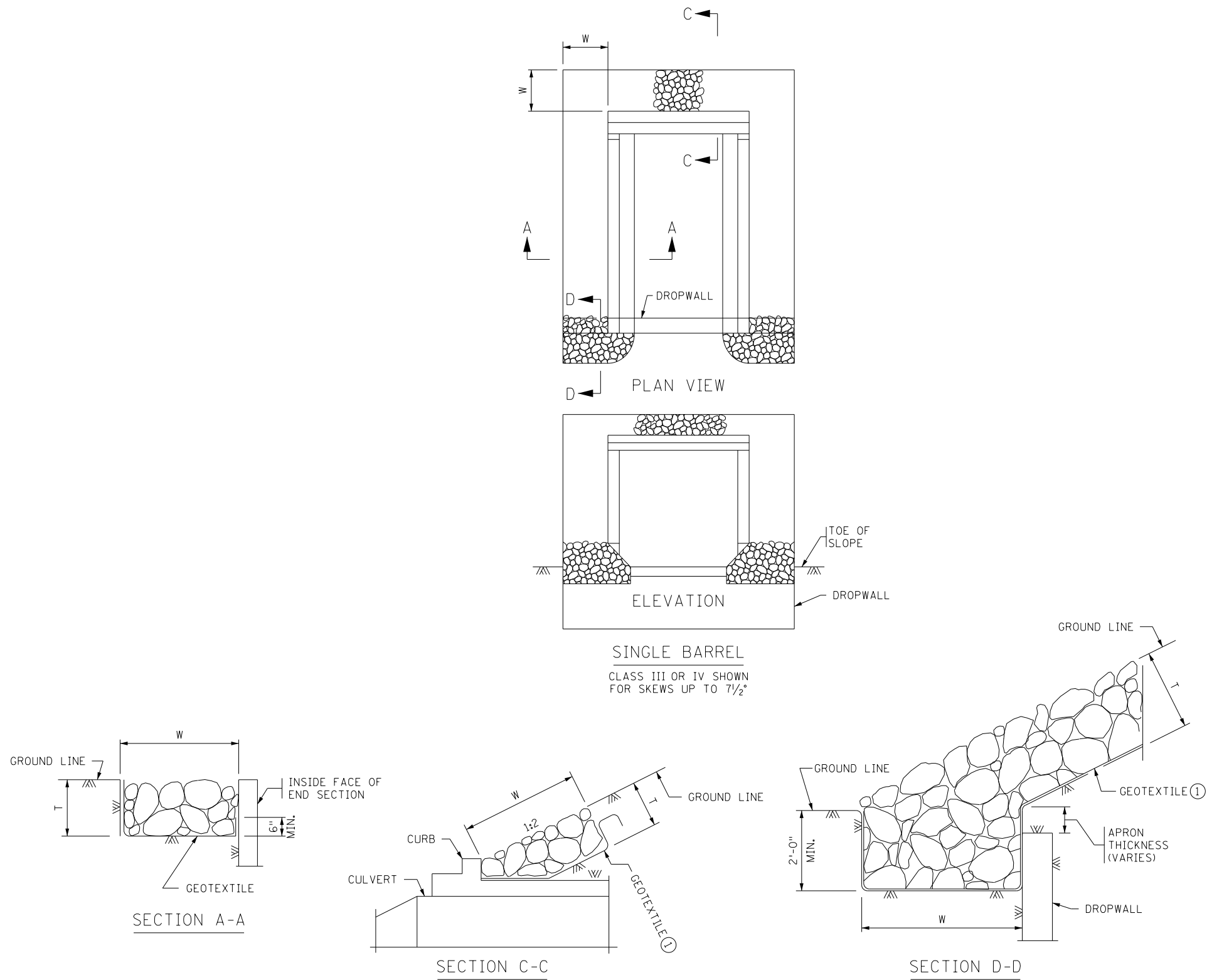
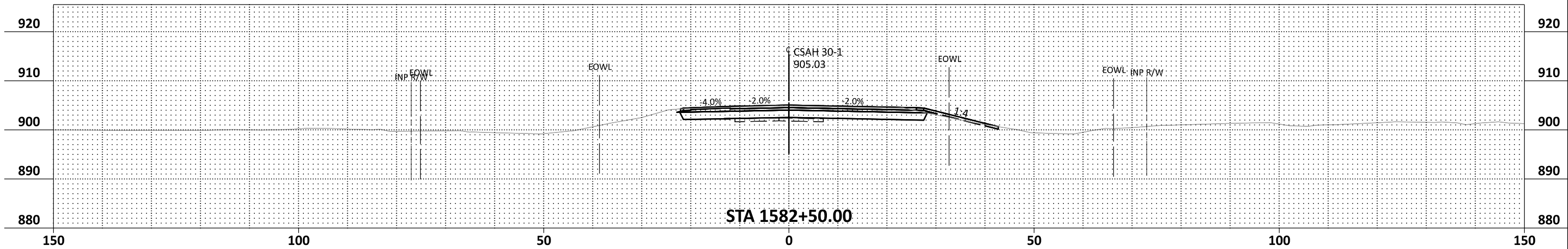
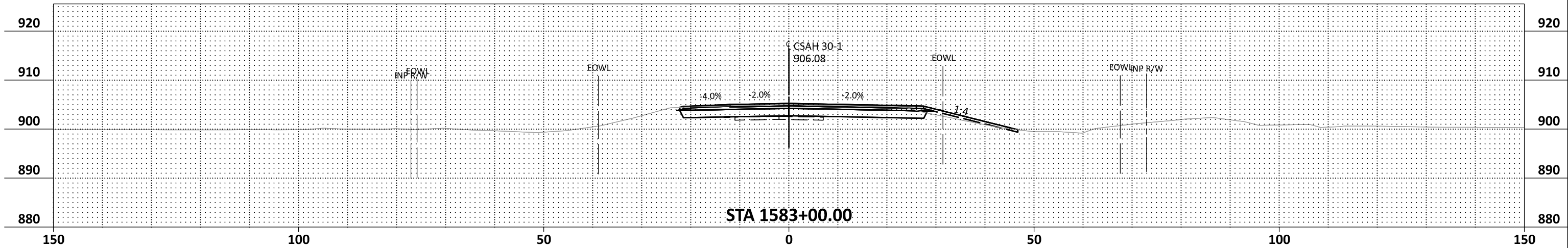
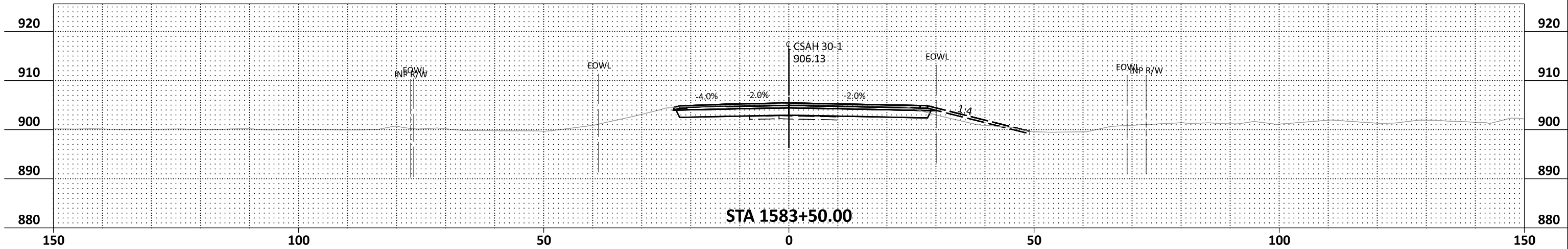


FIG. 5-395.115

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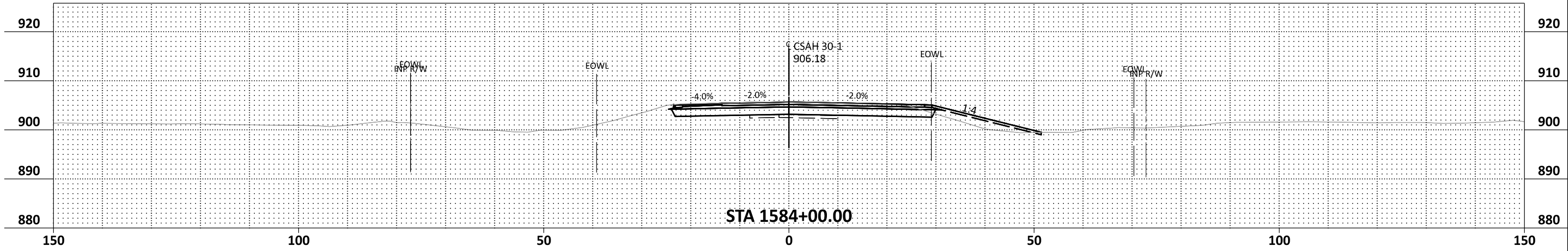
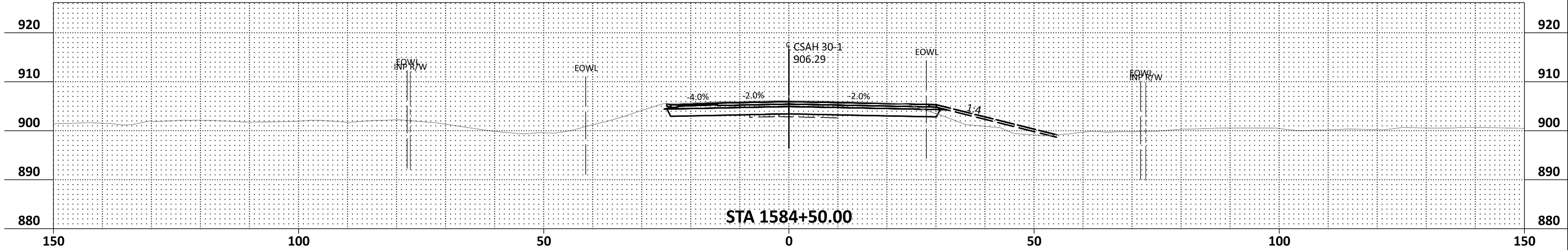
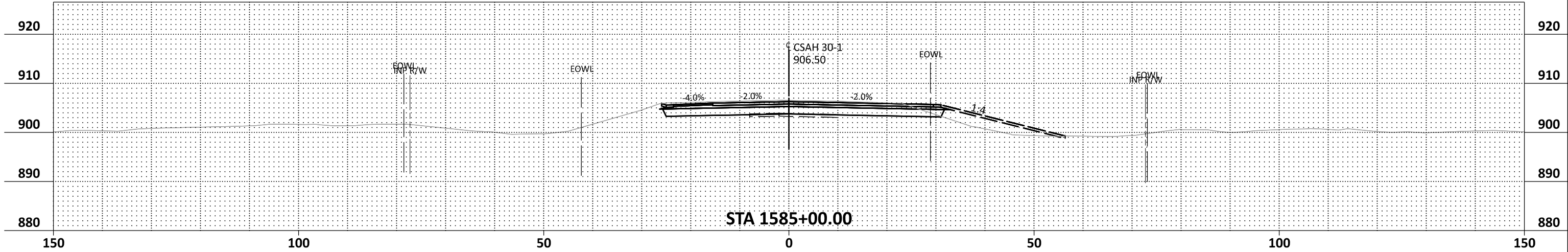
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Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



CSAH 30 (Forest Blvd) Improvements
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CHISAGO COUNTY, MINNESOTA	SHEET X1 OF X65 SHEETS
CROSS SECTIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

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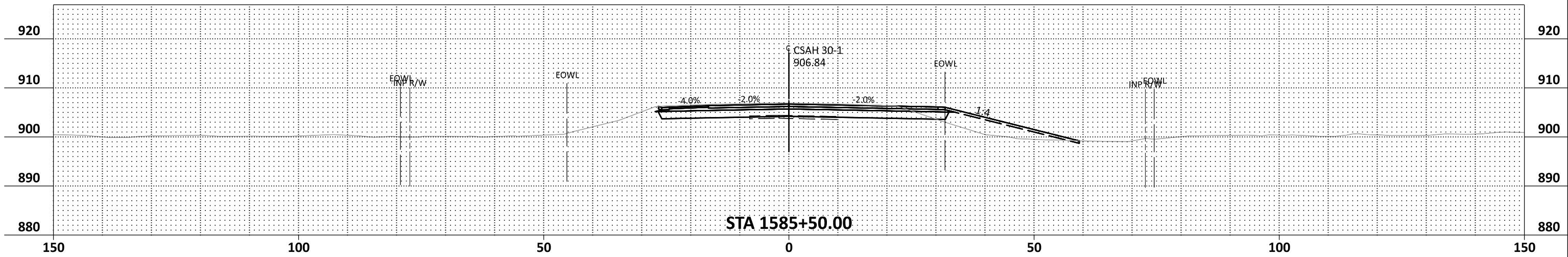
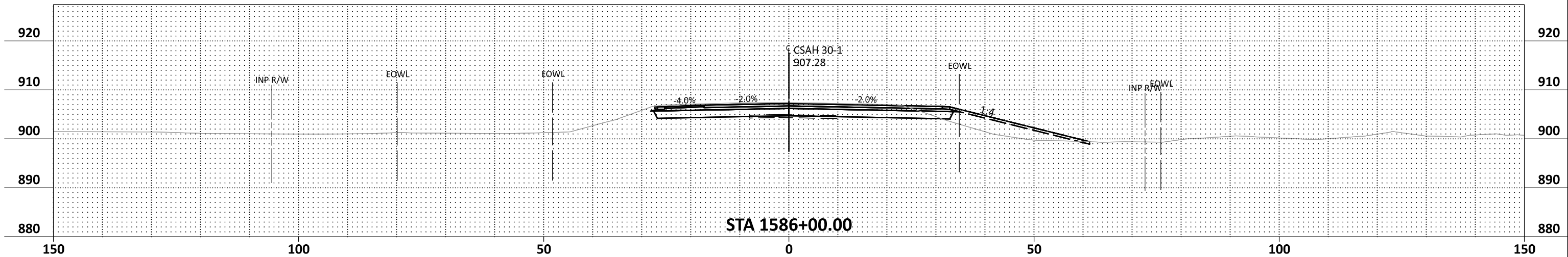
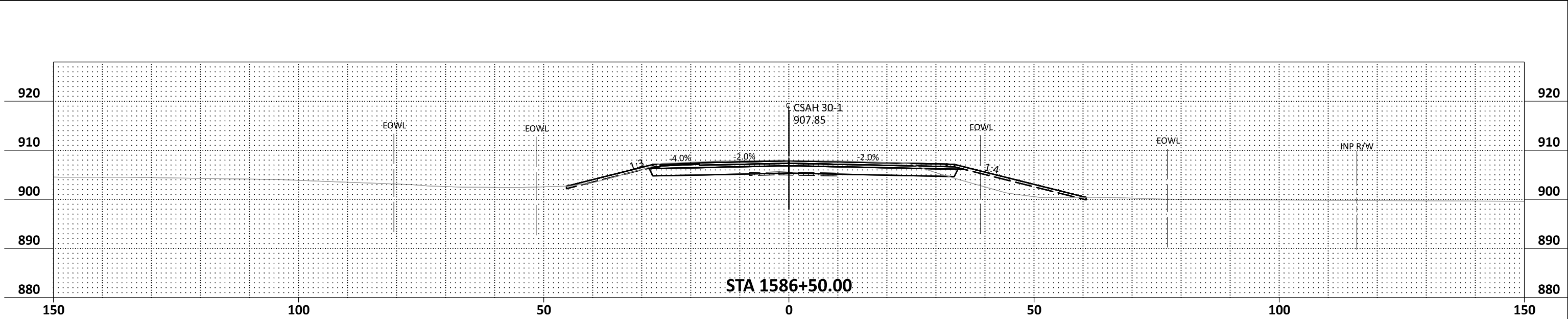
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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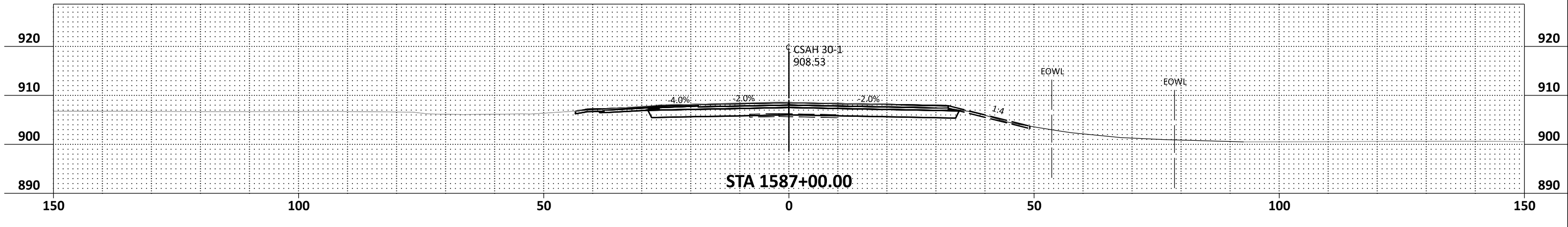
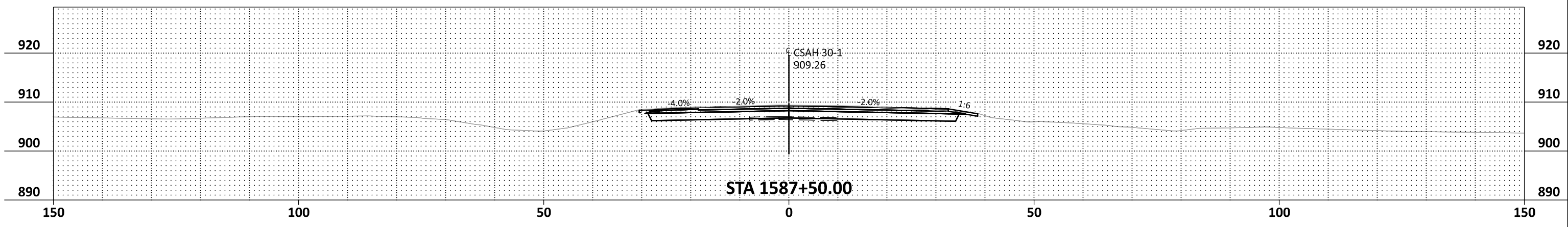
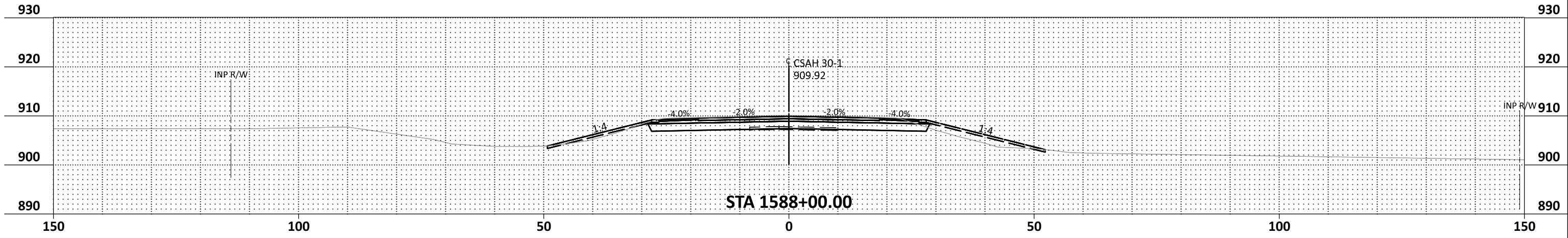
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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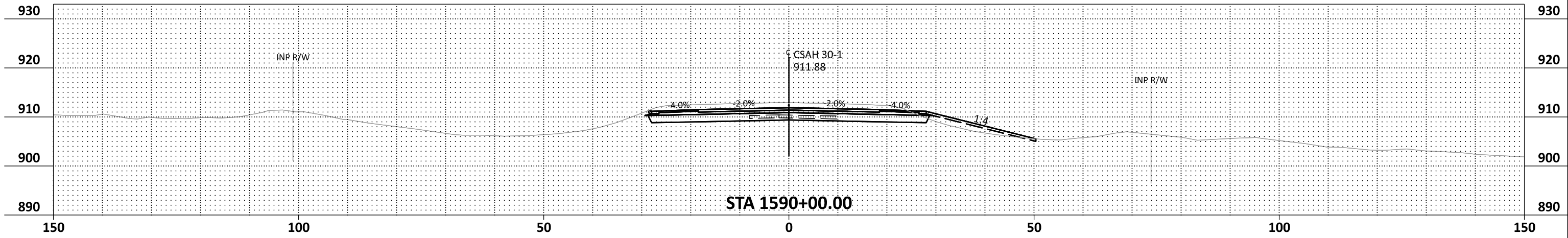
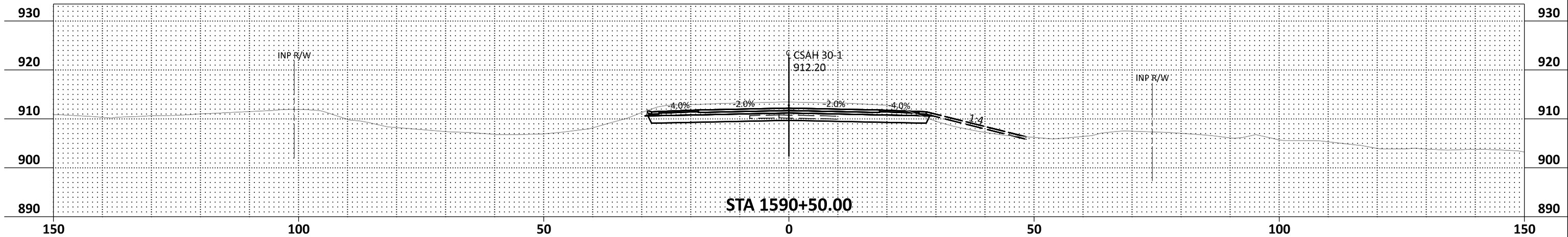
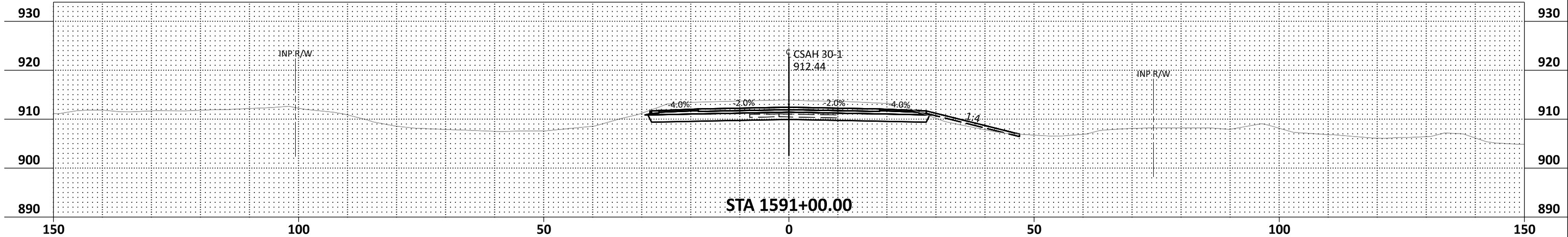
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					Approved By: MKV					
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									SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

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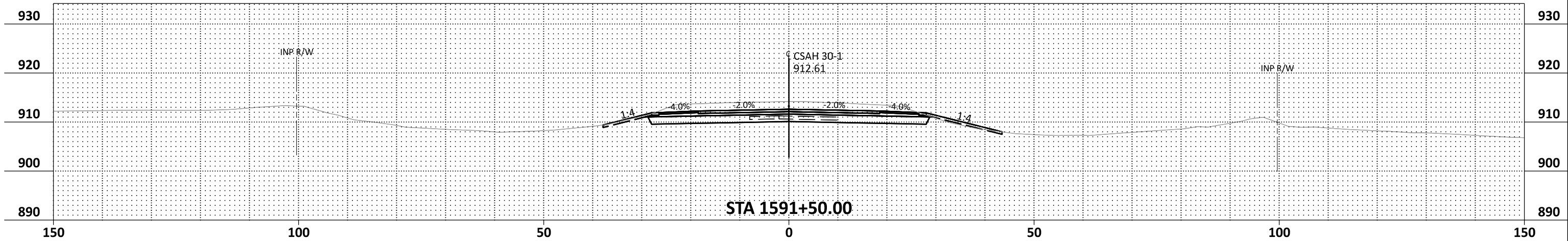
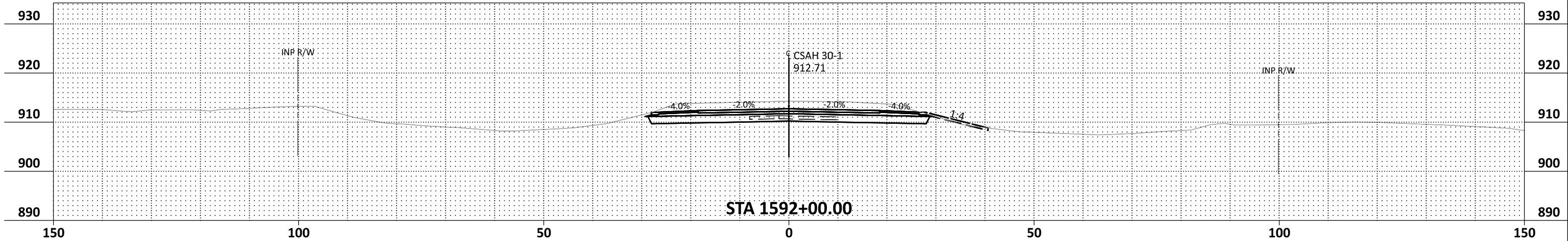
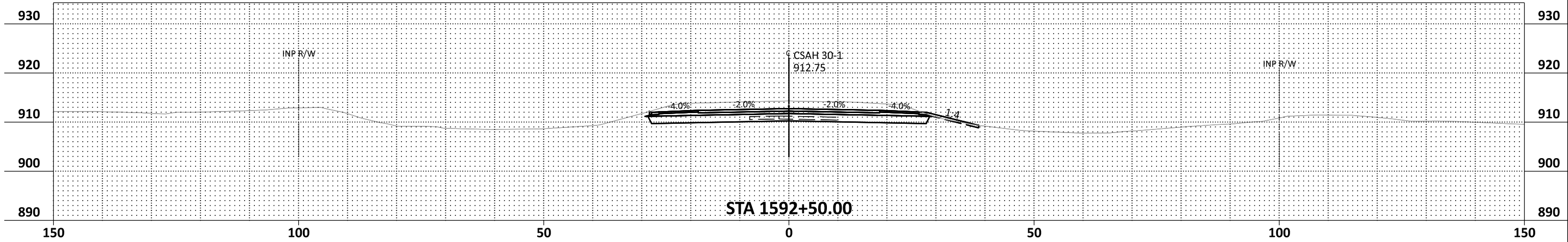
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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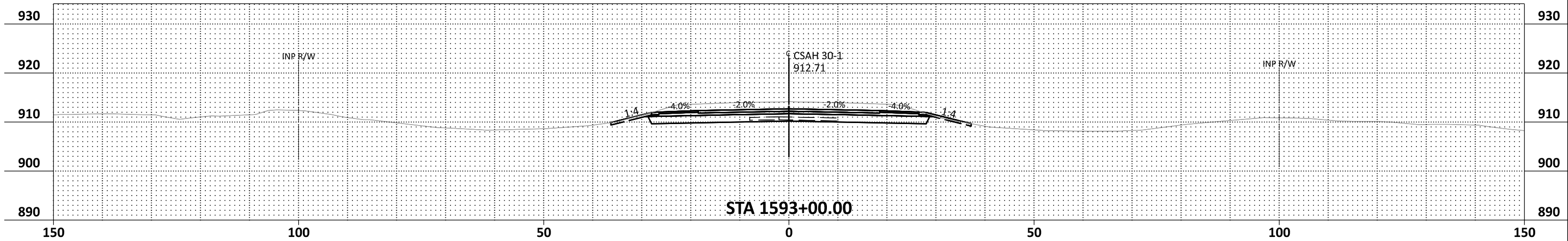
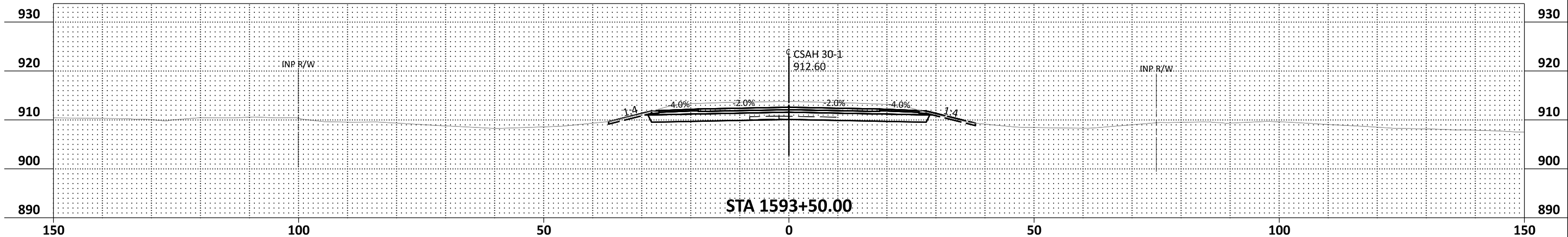
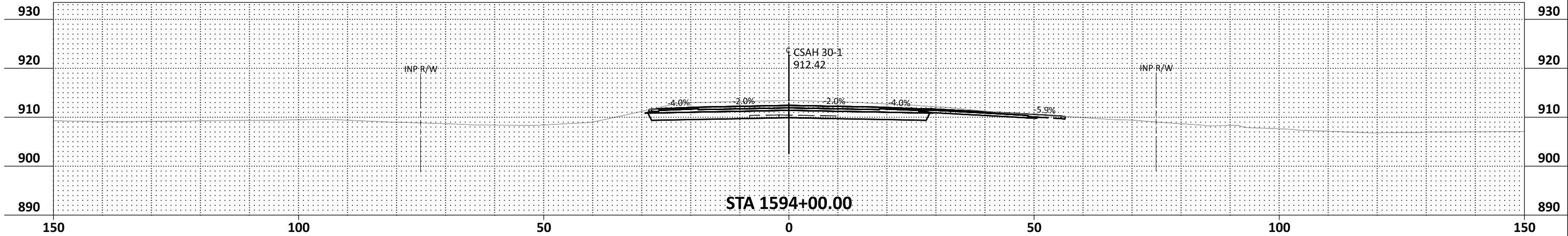
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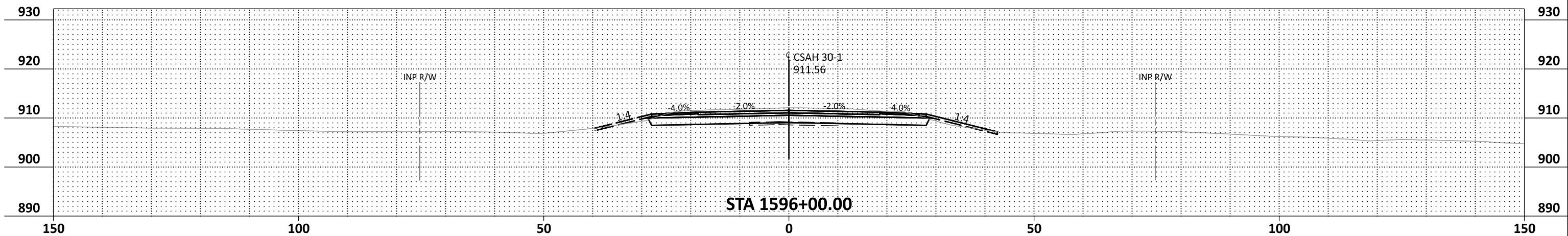
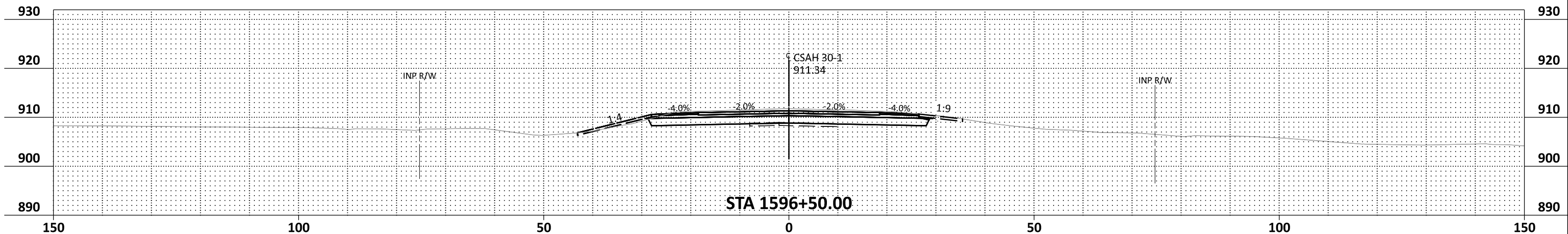
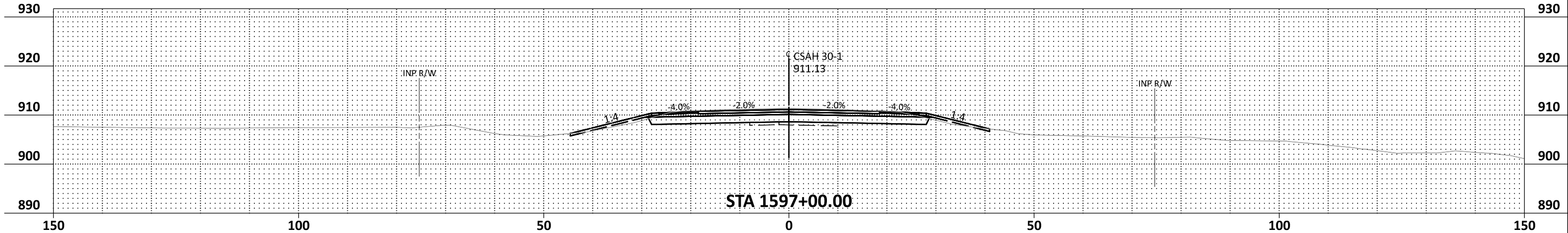
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Chisago County, Minnesota

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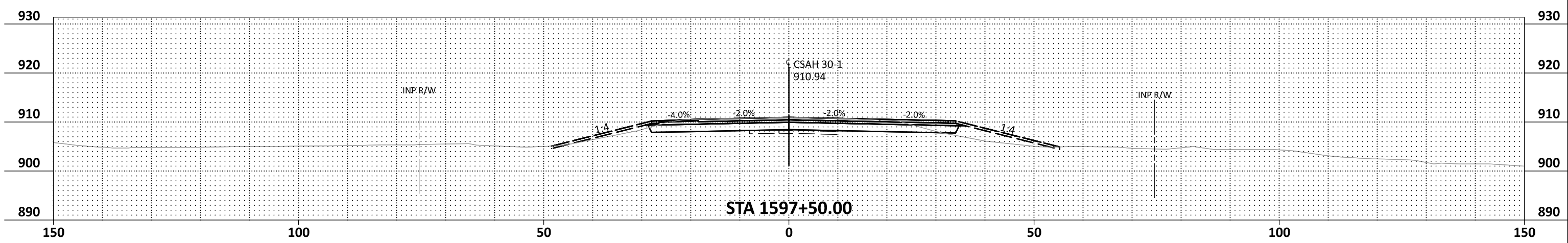
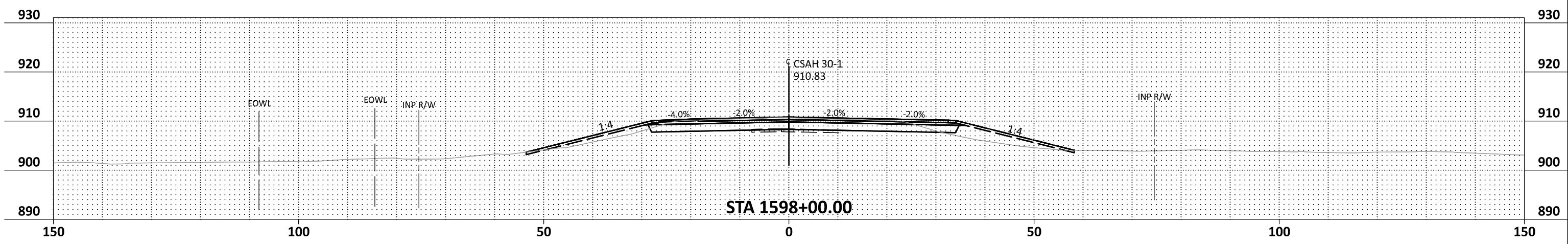
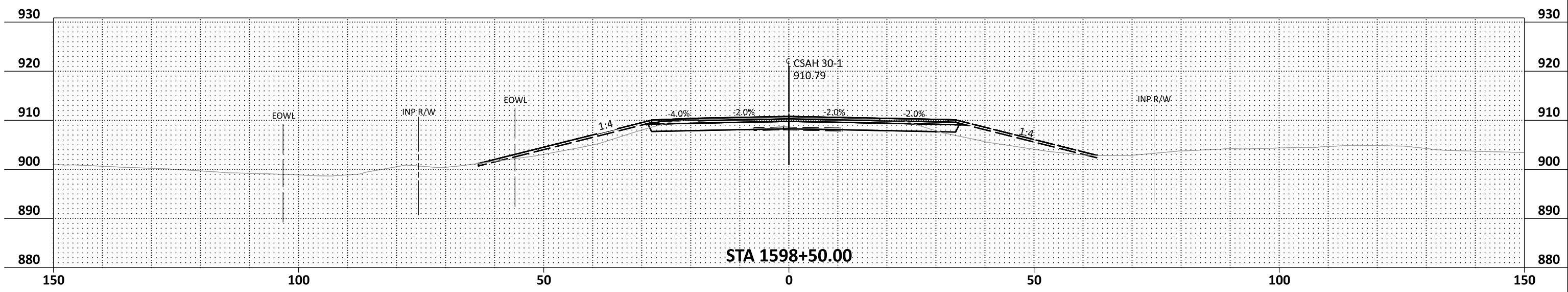
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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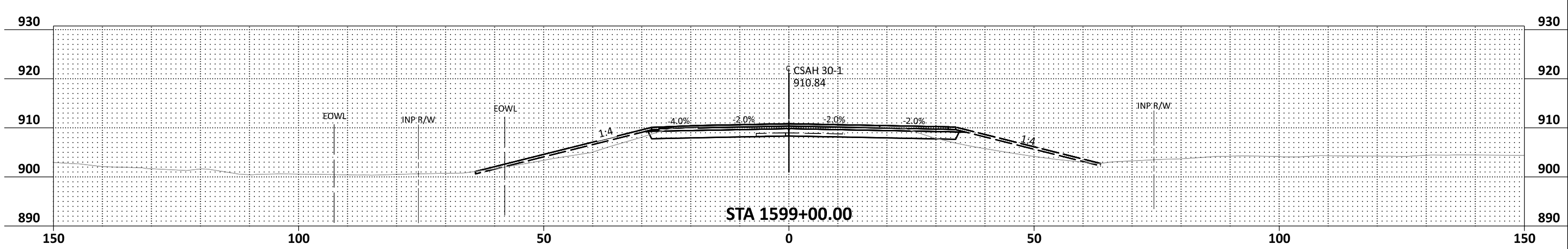
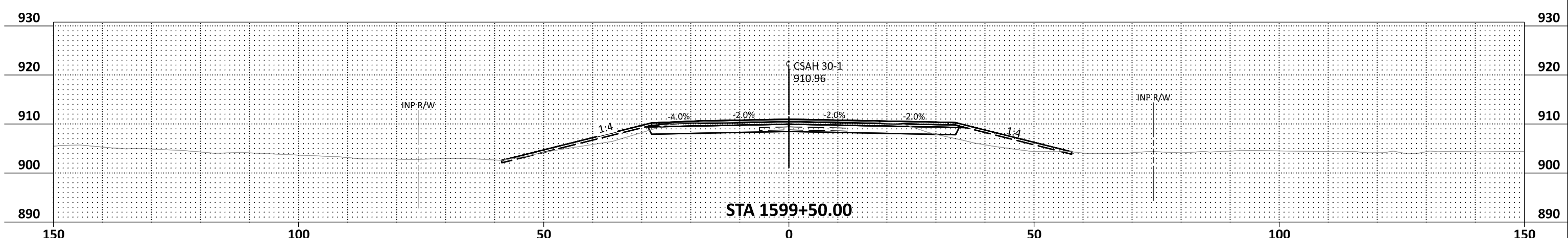
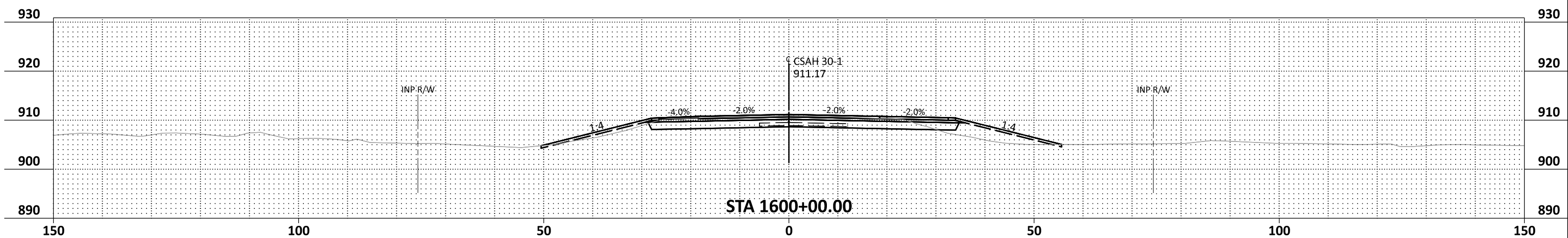


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
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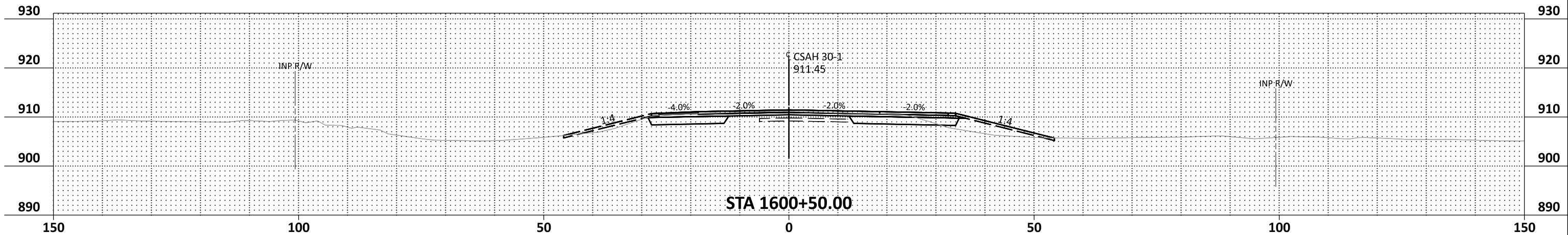
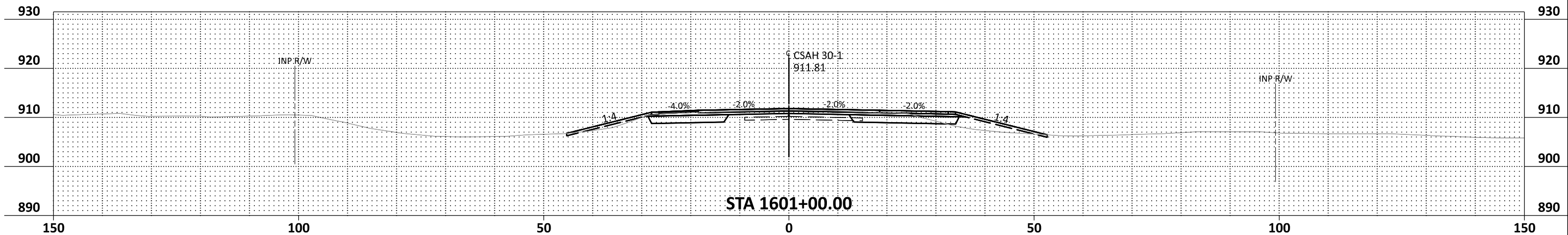
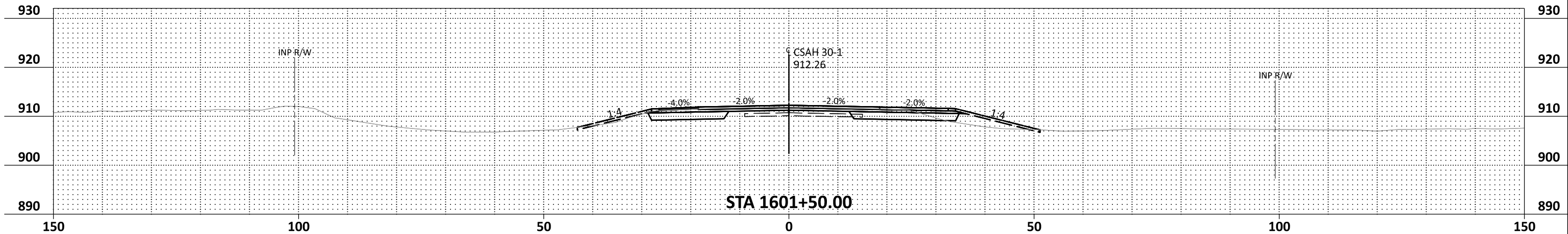
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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Approved By:	MKV

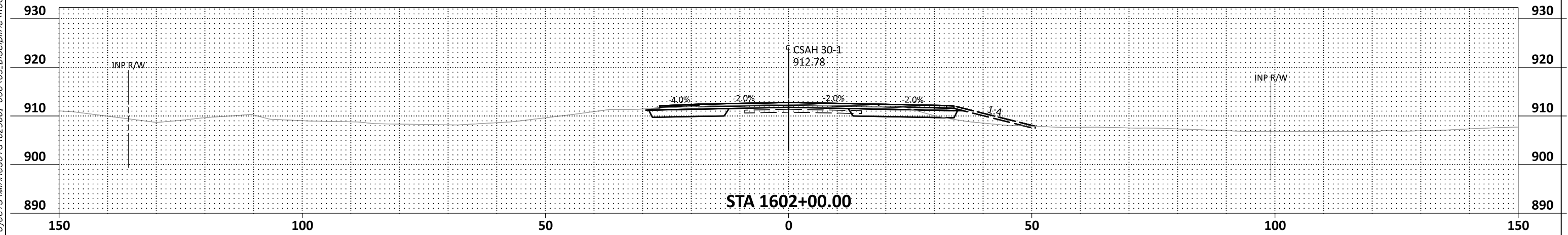
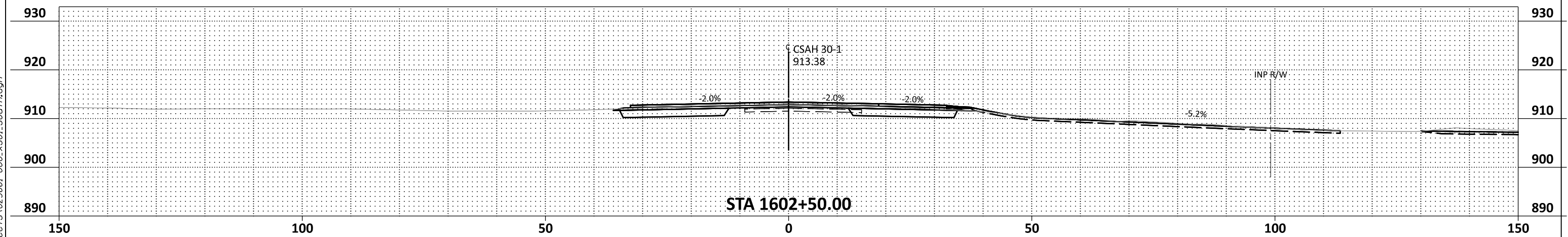
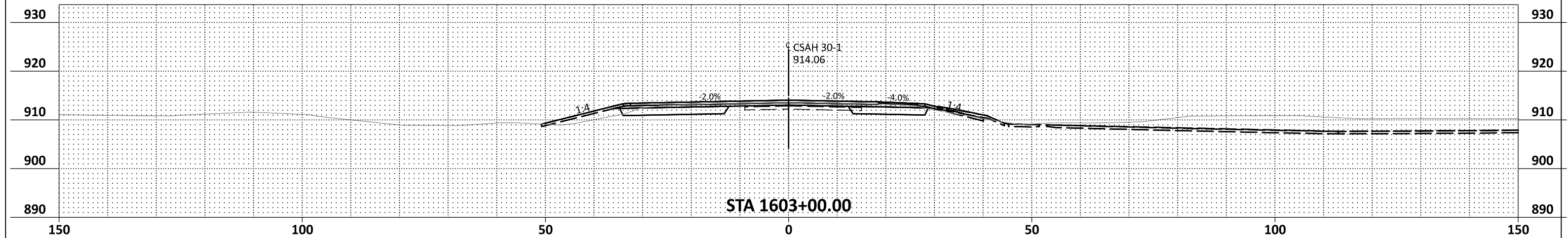


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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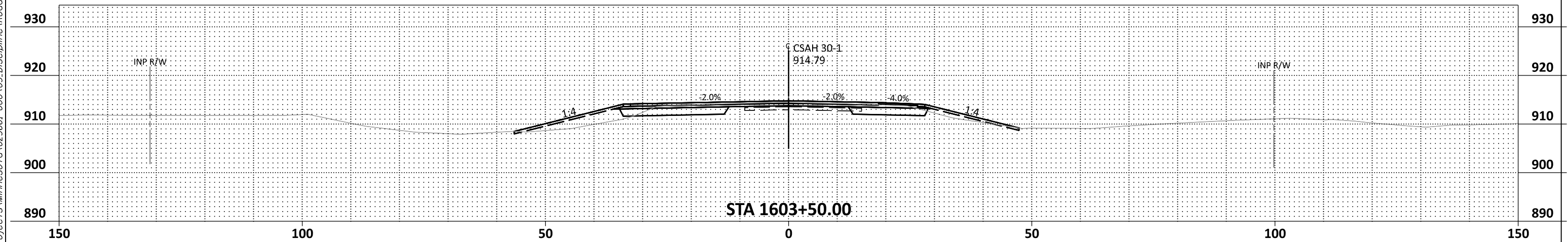
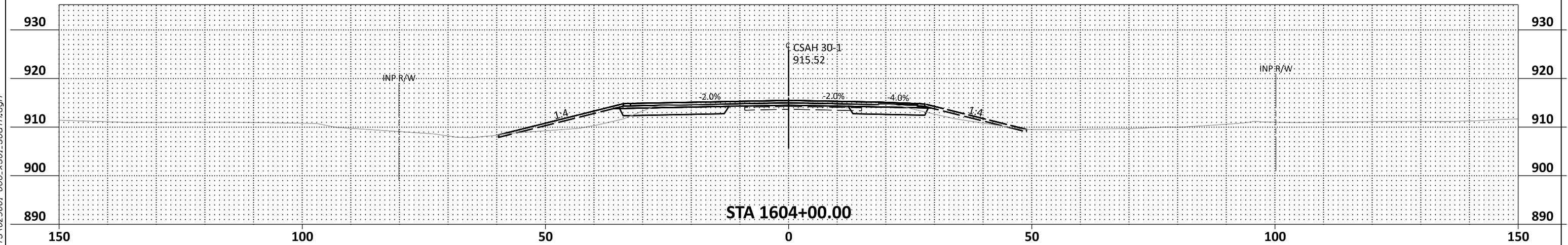
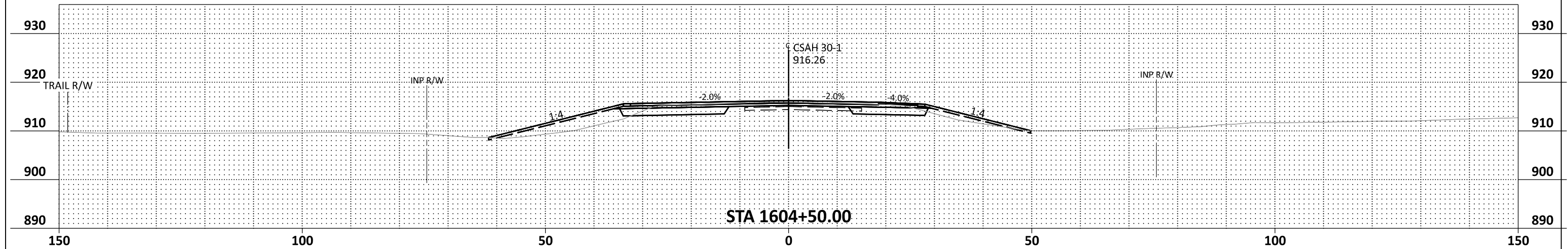
CSAH 30 (Forest Blvd) Improvements

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NO.	DATE	BY	CHK	REVISIONS	Design By:	MKV
					Plan By:	GAD
					Checked By:	AJP
					Approved By:	MKV

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



CSAH 30 (Forest Blvd) Improvements

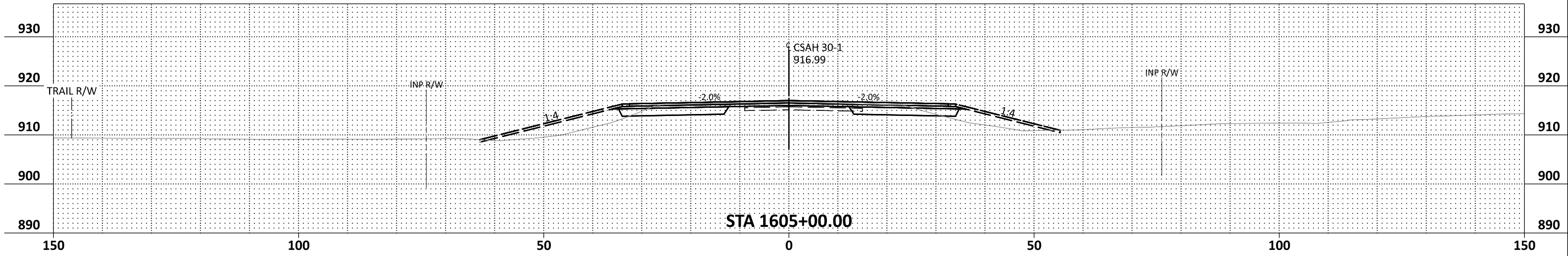
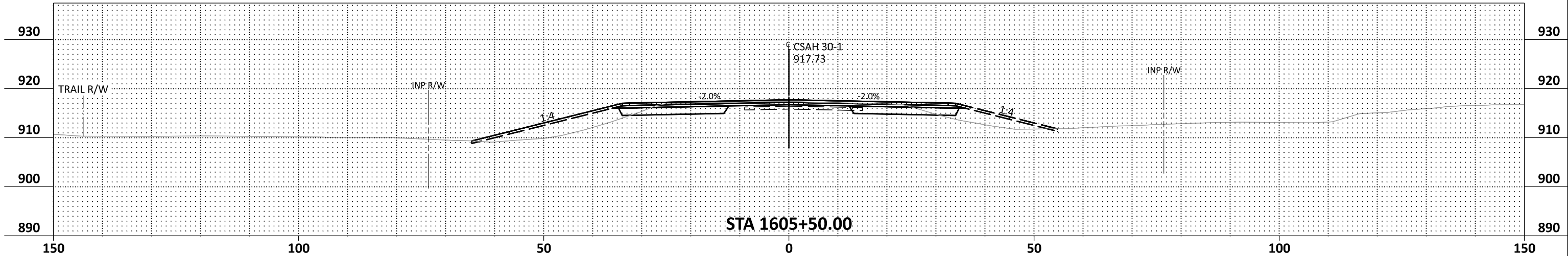
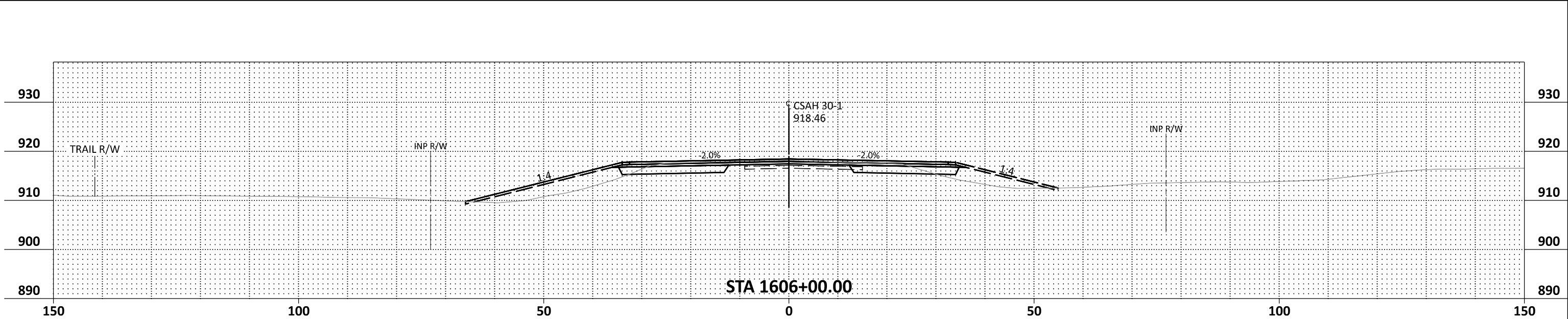
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

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Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



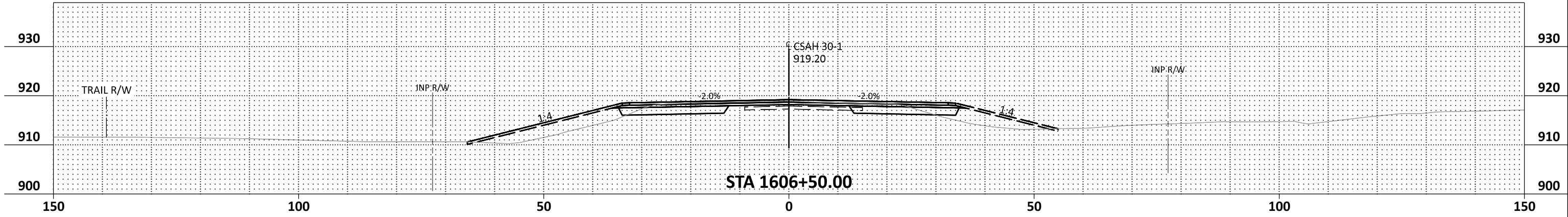
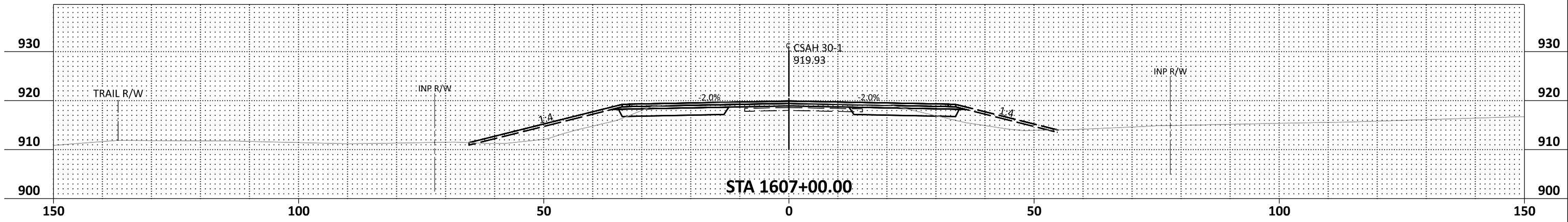
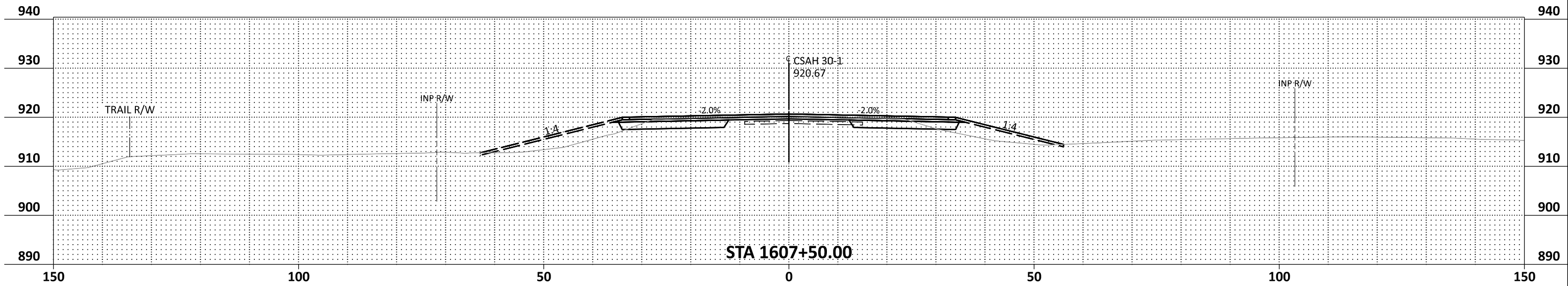
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

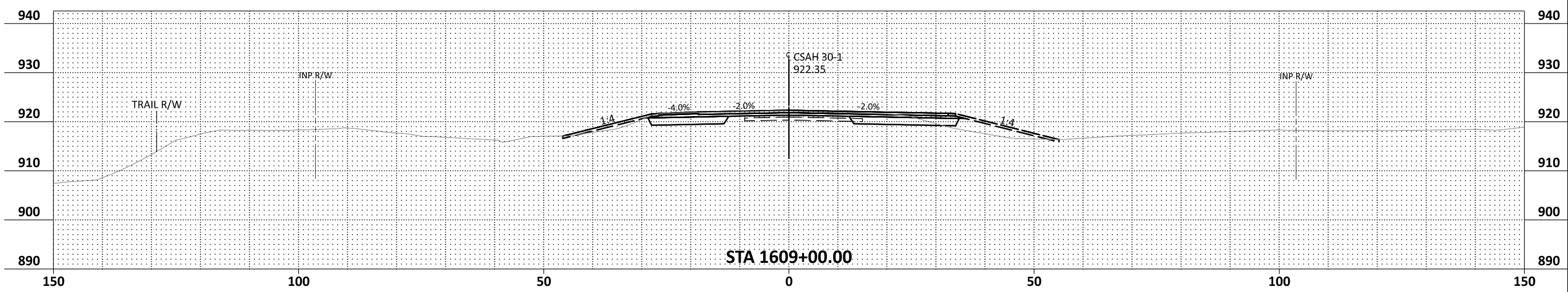
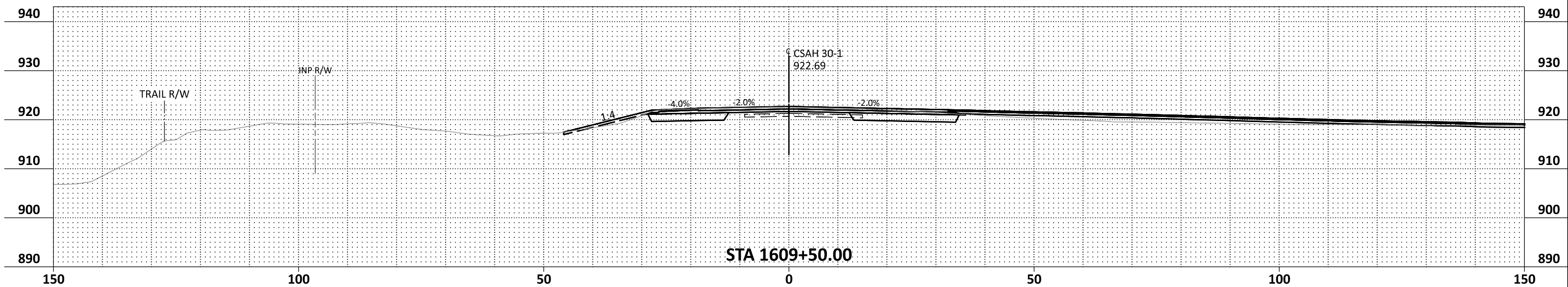
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NO.	DATE	BY	CHK	REVISIONS	Design By: MKV			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA	SHEET X17 OF X65 SHEETS
					Plan By: GAD				CROSS SECTIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	
					Checked By: AJP					
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Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

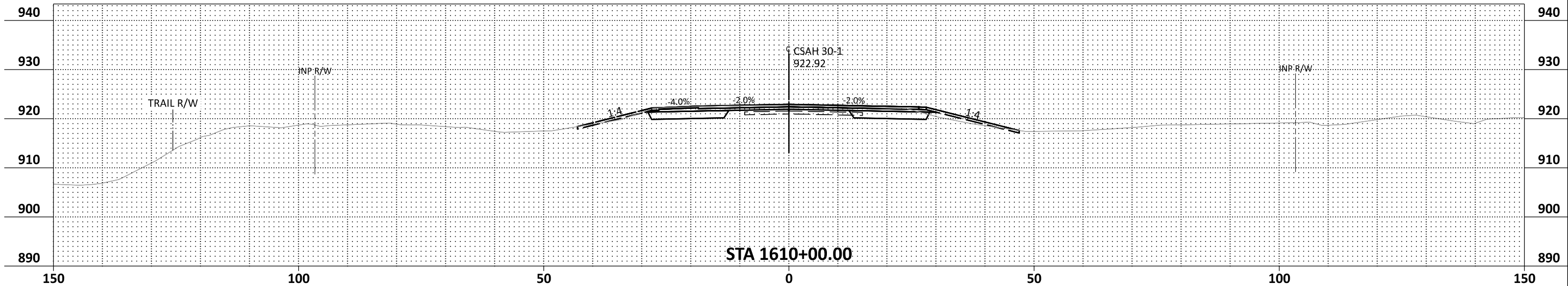
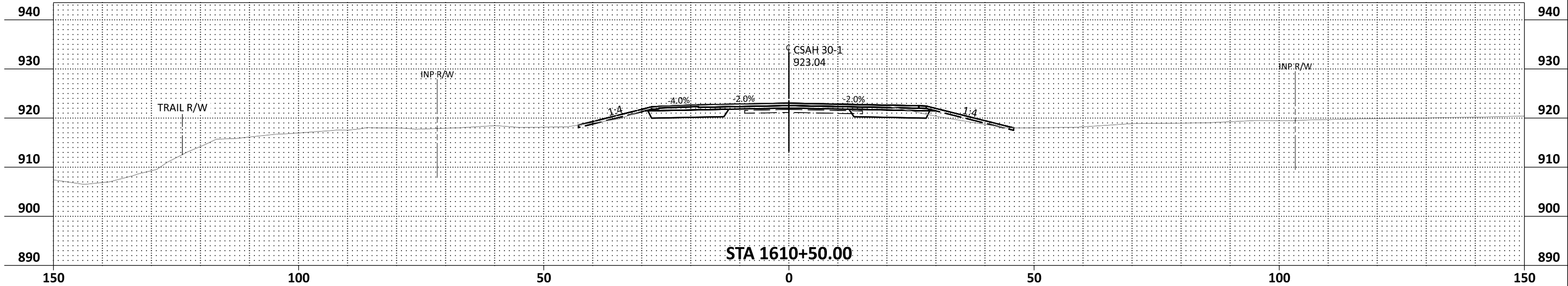


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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CROSS SECTIONS
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Plan By: GAD
Checked By: AJP
Approved By: MKV

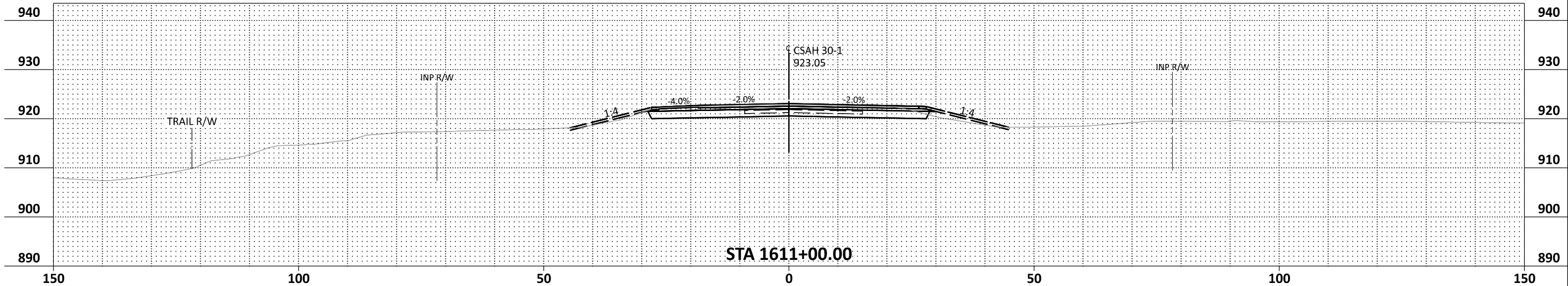
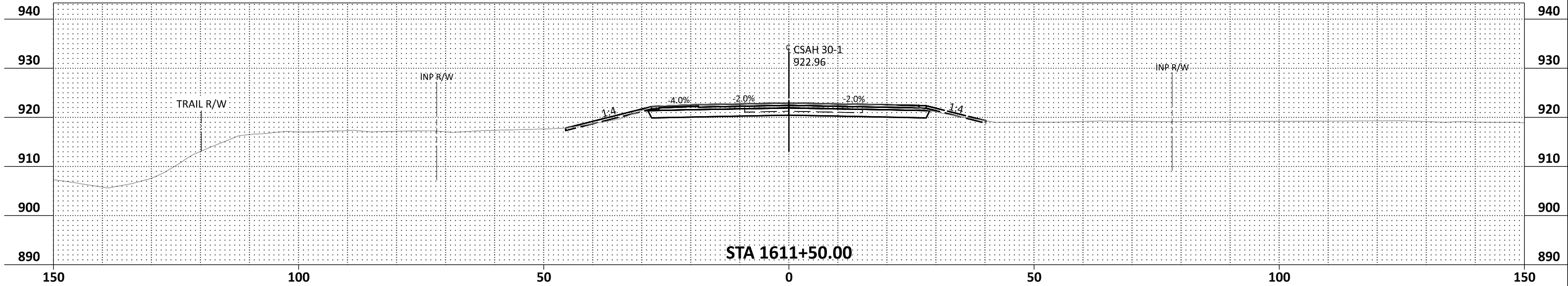


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
CROSS SECTIONS
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Plan By: GAD
Checked By: AJP
Approved By: MKV



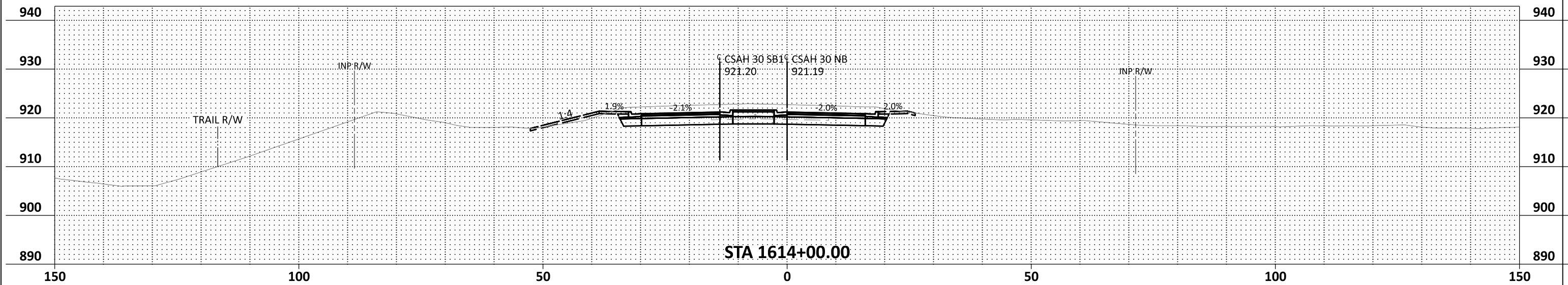
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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Profile view of the proposed bridge deck and approach roadway. The vertical axis shows elevation from 890 to 940 feet. The horizontal axis shows stationing from 150 to 0 to 150. The profile includes the existing ground line, the proposed bridge deck, and the approach roadway. Key features include the TRAIL R/W, INP R/W, and the bridge deck with a 2.1% grade. The bridge deck is shown with a 2.1% grade, and the approach roadway has a 1.4% grade. The bridge deck is shown with a 2.1% grade, and the approach roadway has a 1.4% grade. The bridge deck is shown with a 2.1% grade, and the approach roadway has a 1.4% grade.



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					MKV
					Plan By: GAD
					Checked By: AJP
					Approved By: MKV



CSAH 30 (Forest Blvd) Improvements

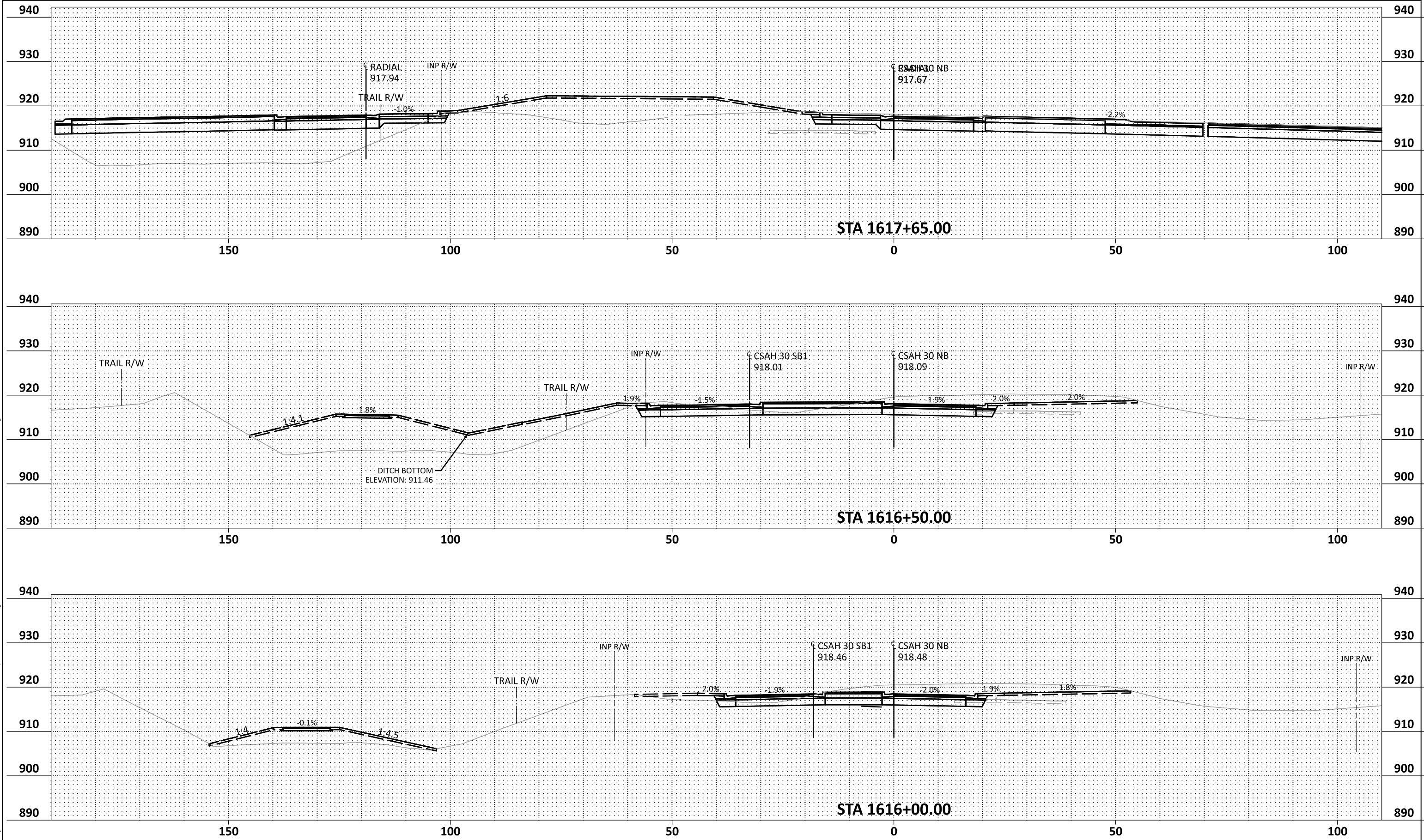
Chisago County, Minnesota

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Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



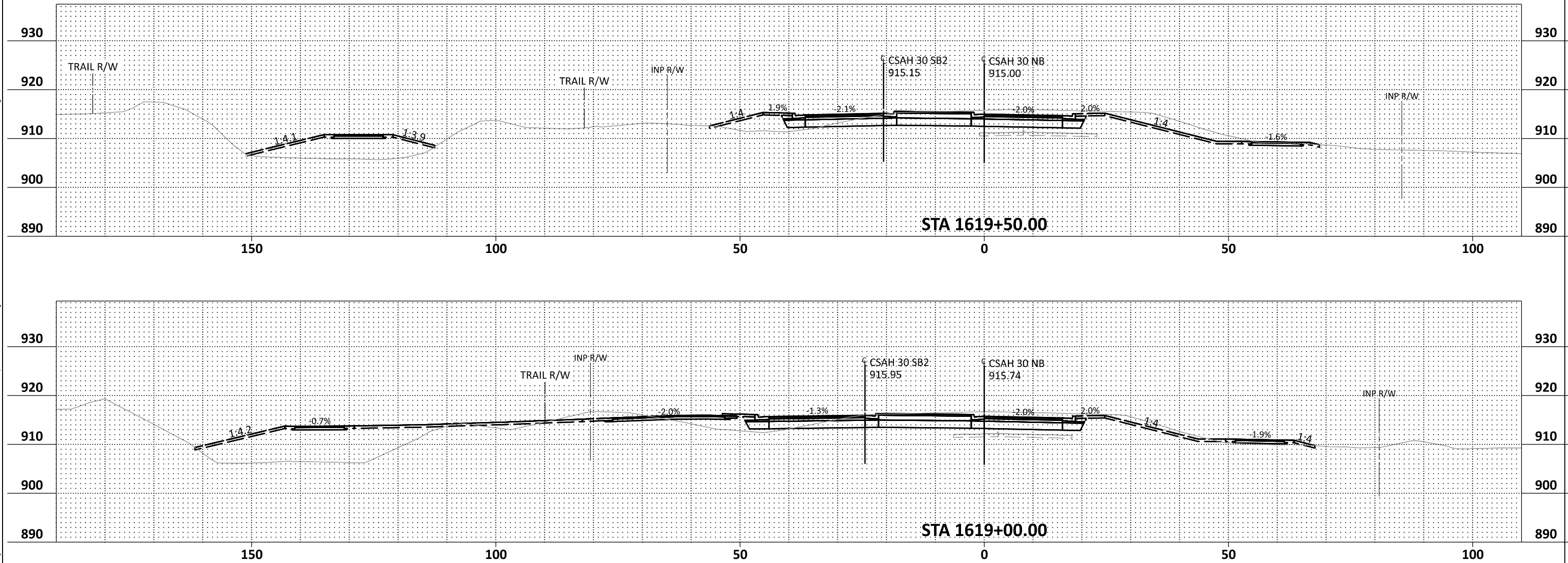
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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Plan By:	GAD
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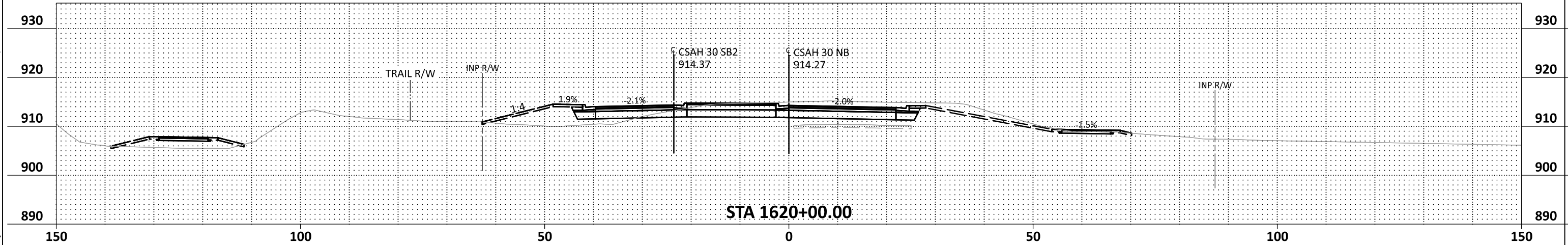
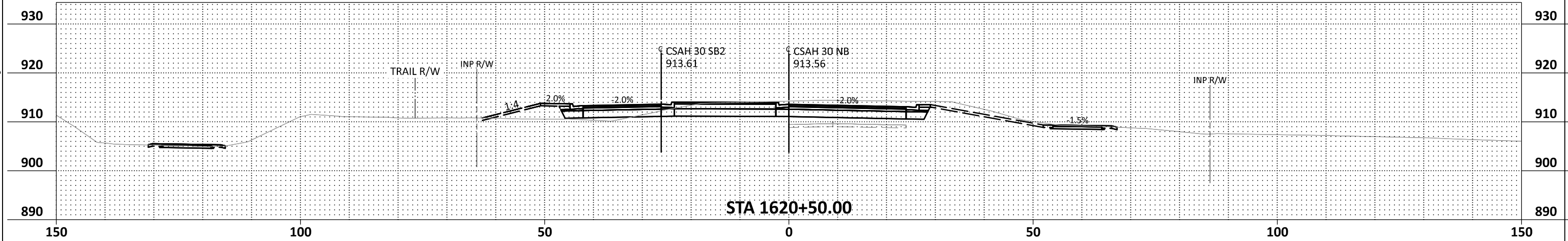
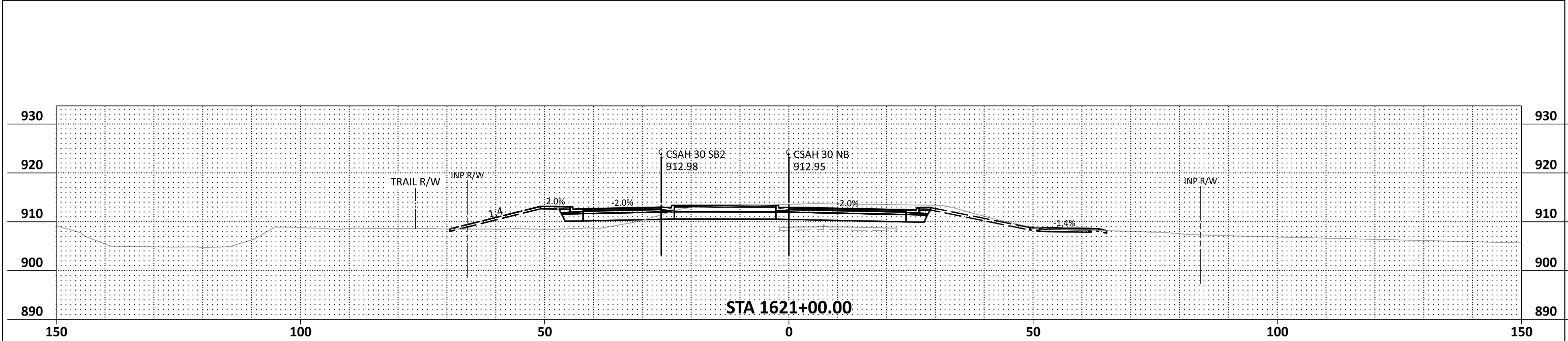
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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Plan By:	GAD
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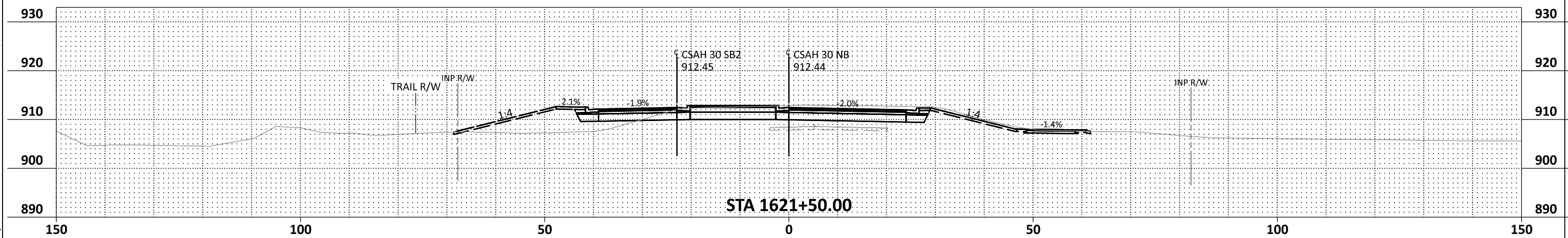
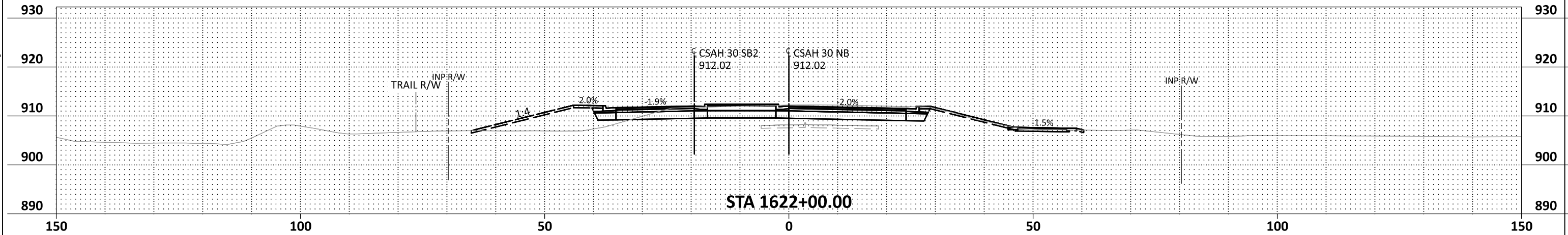
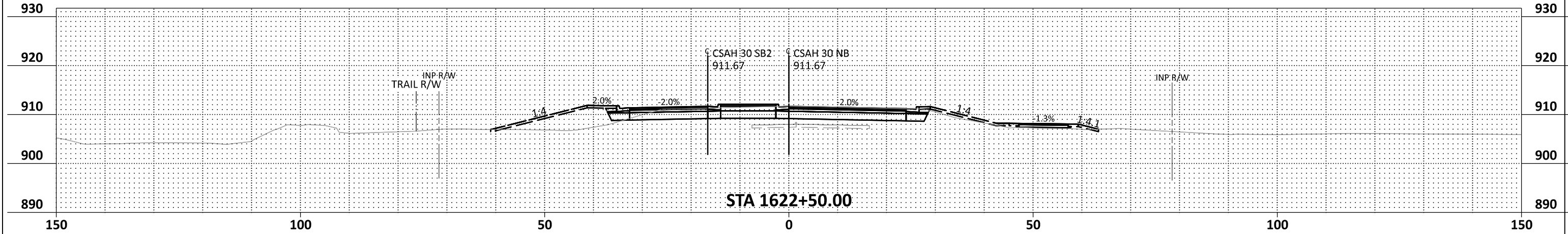
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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CROSS SECTIONS
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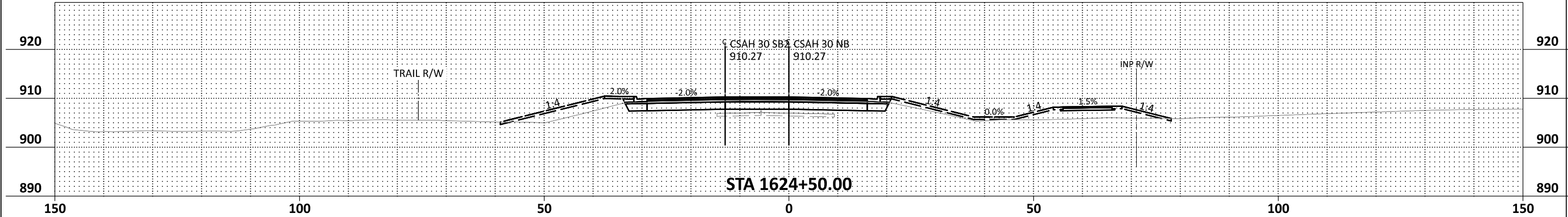
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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Plan By:	GAD
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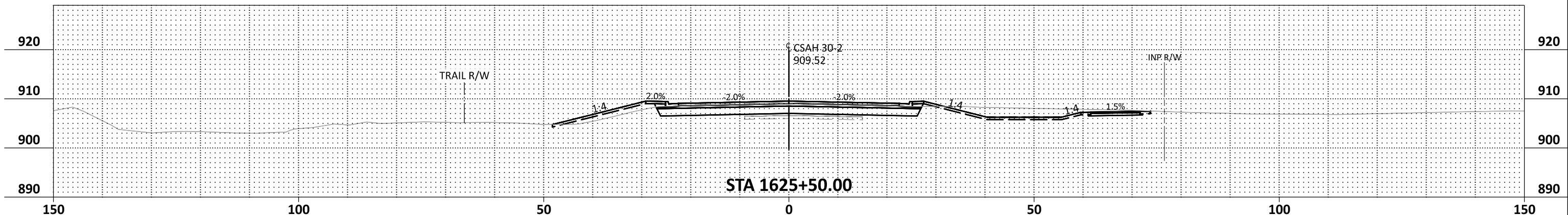
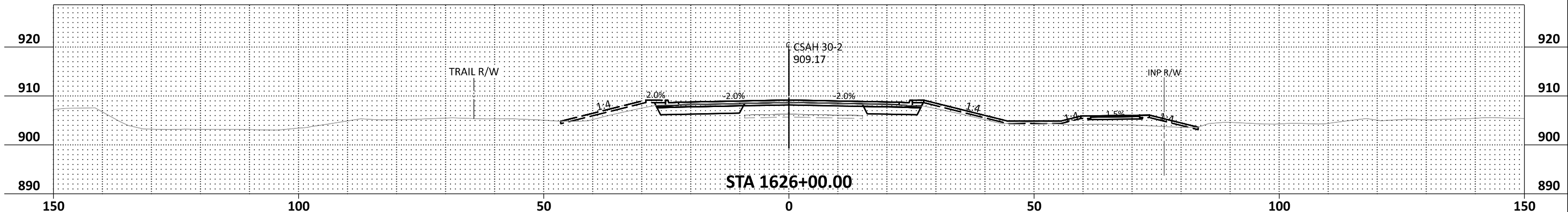
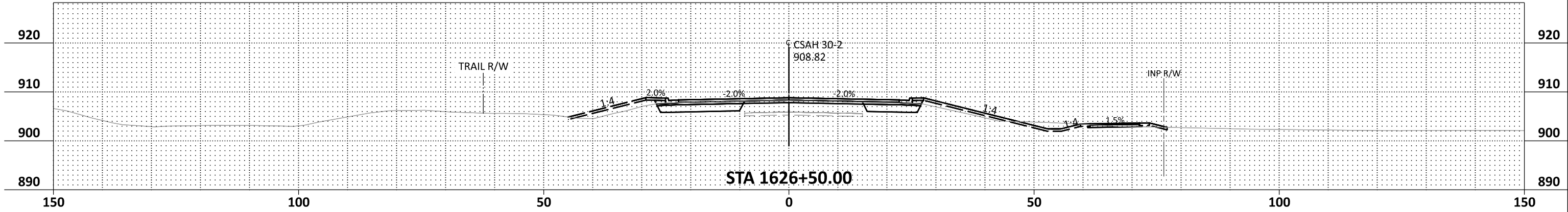
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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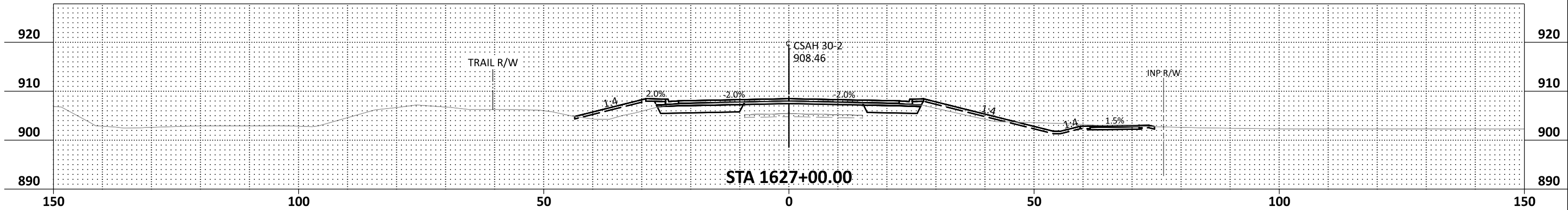
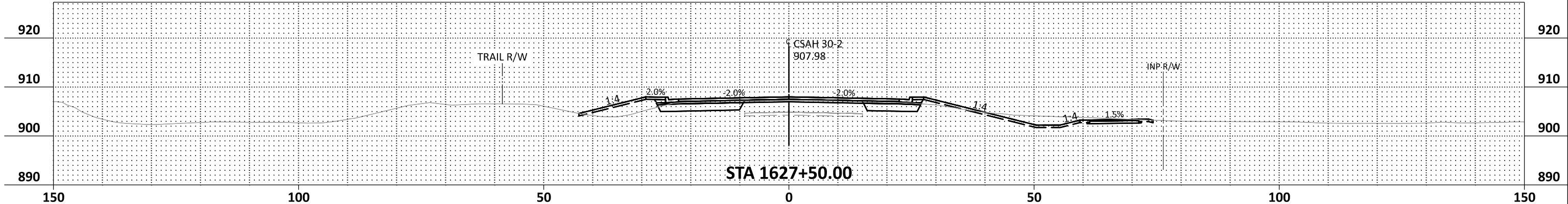
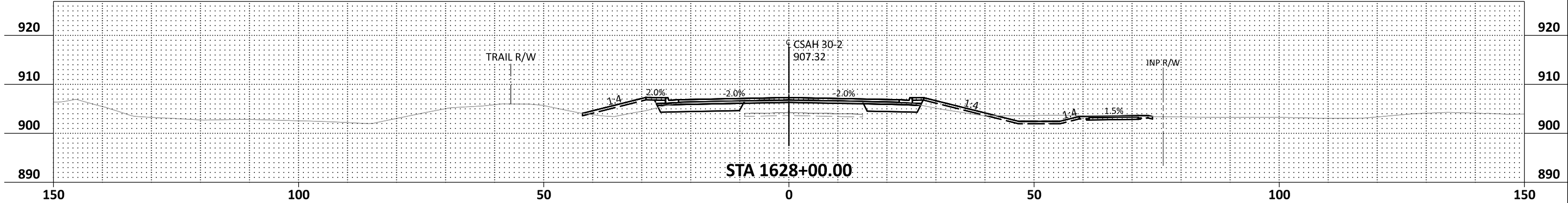
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	SHEET X32 OF X65 SHEETS
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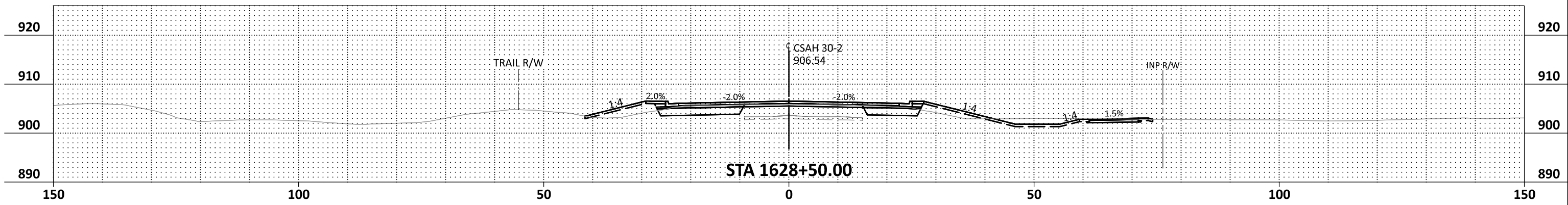
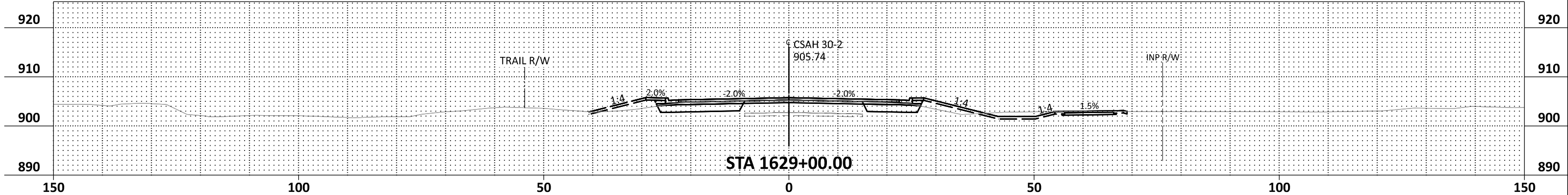
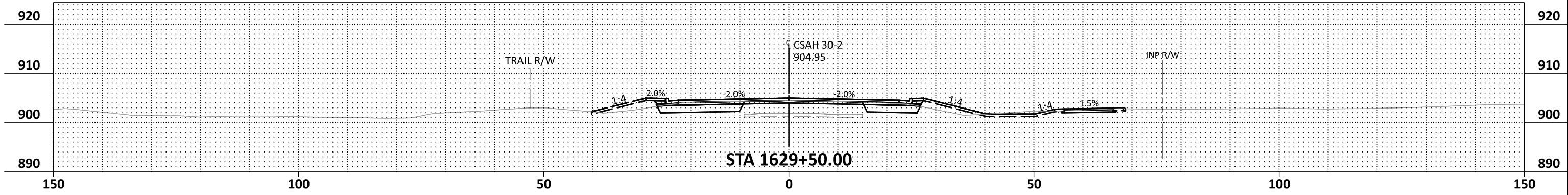
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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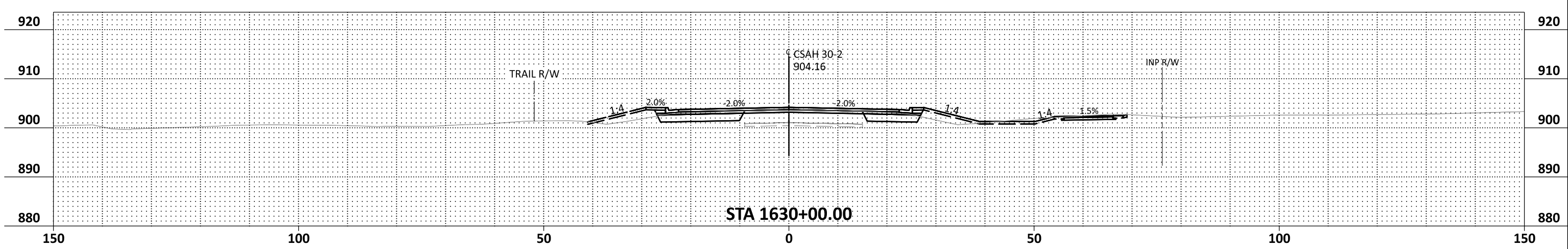
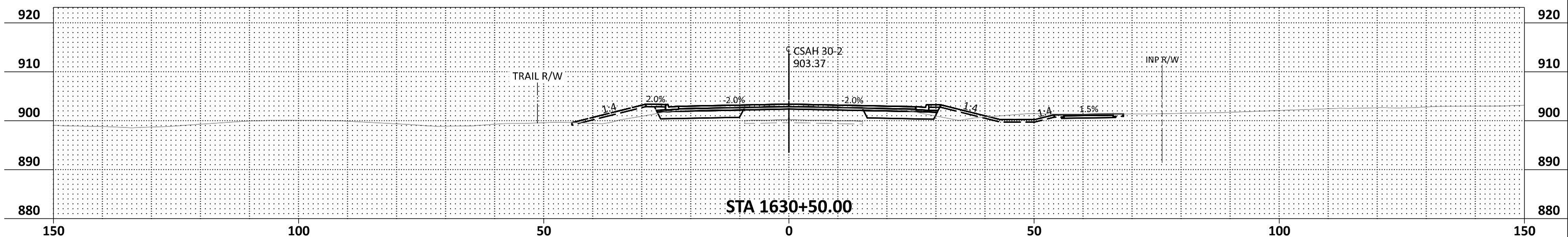
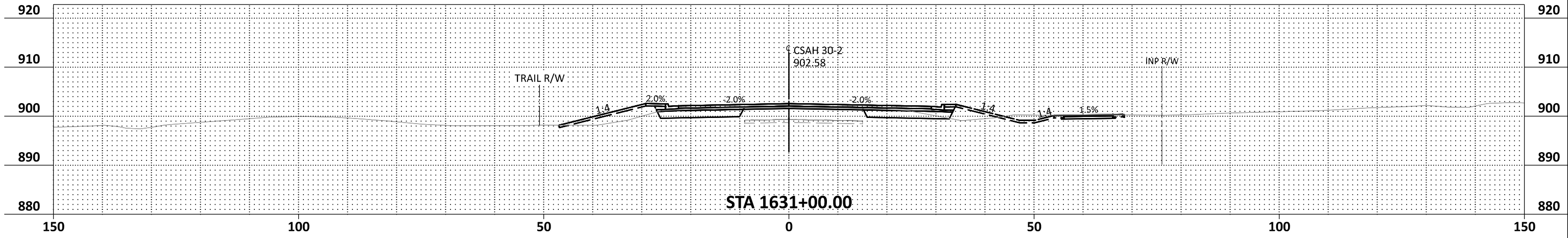
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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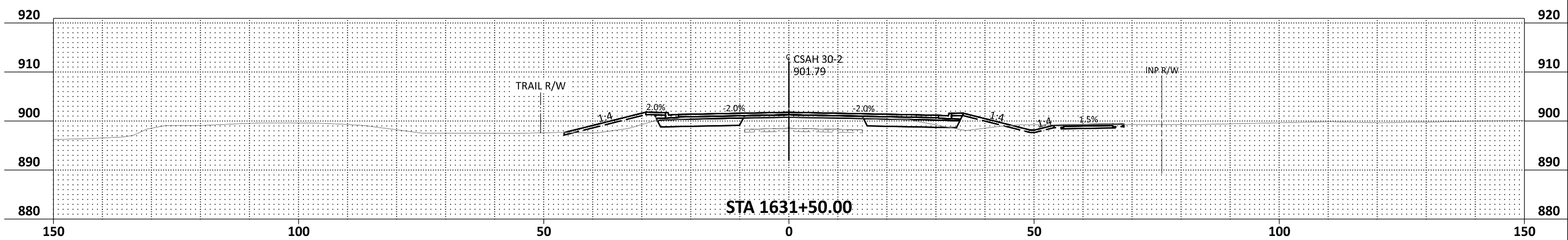
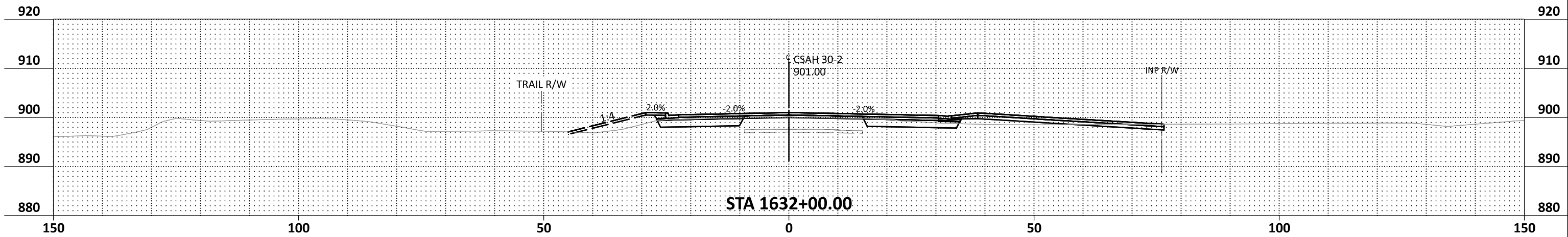
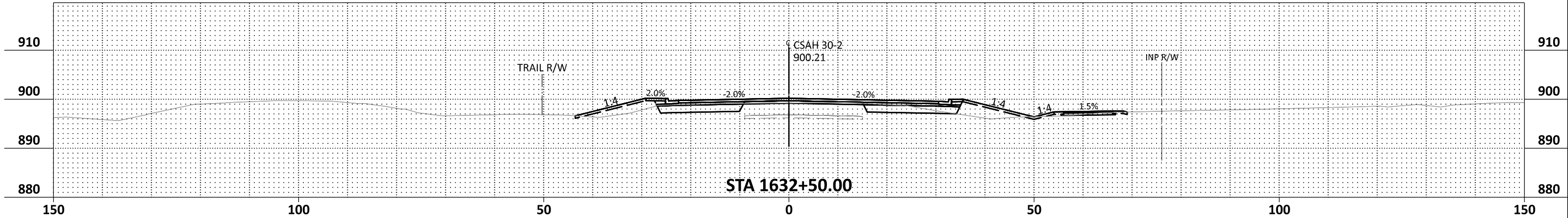
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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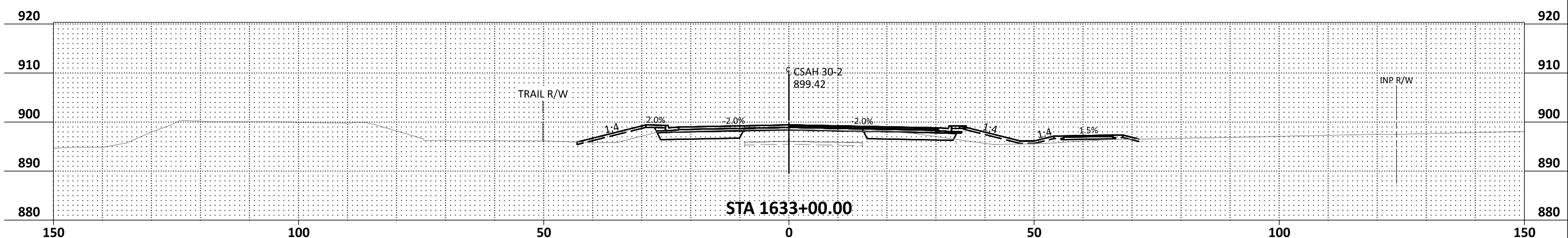
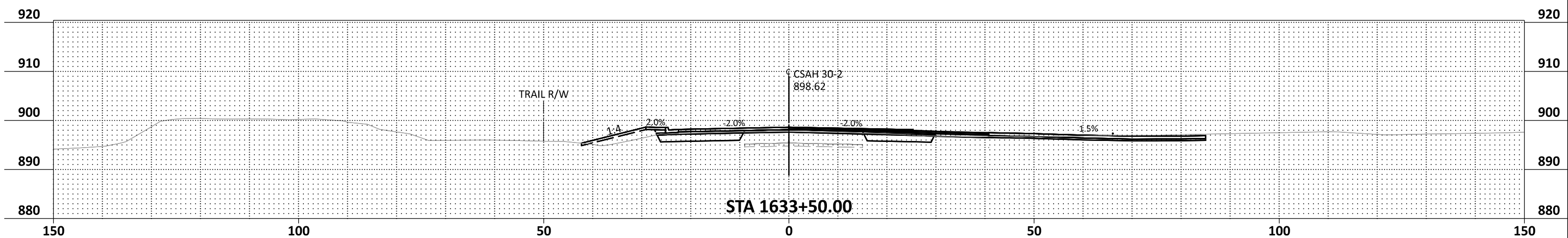
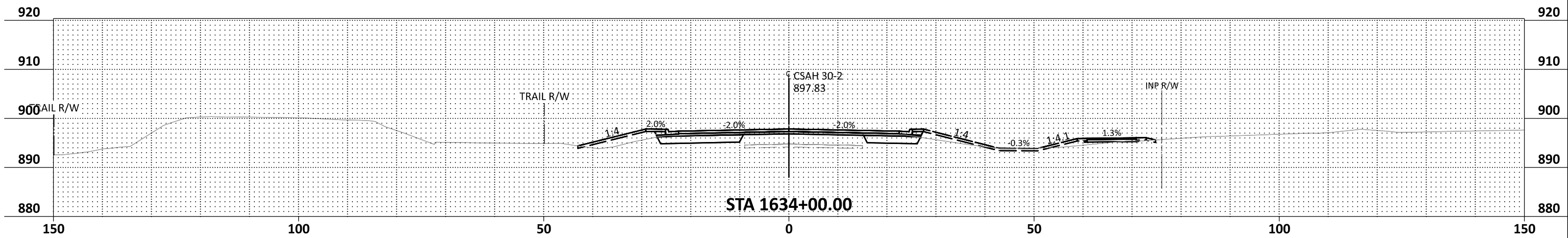
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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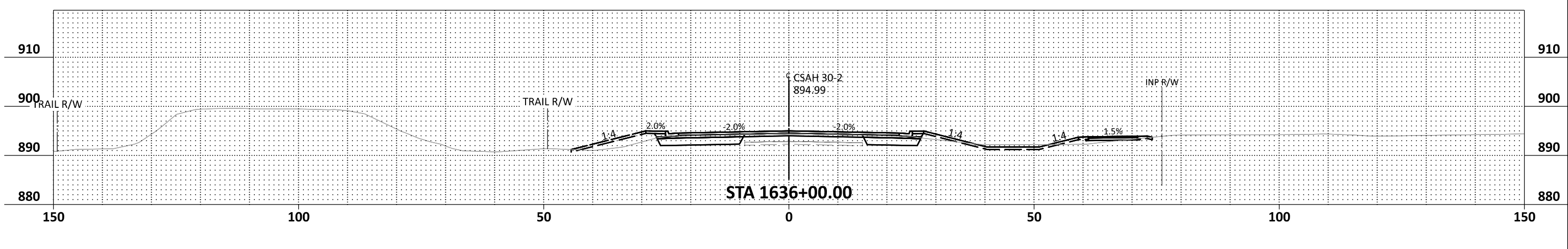
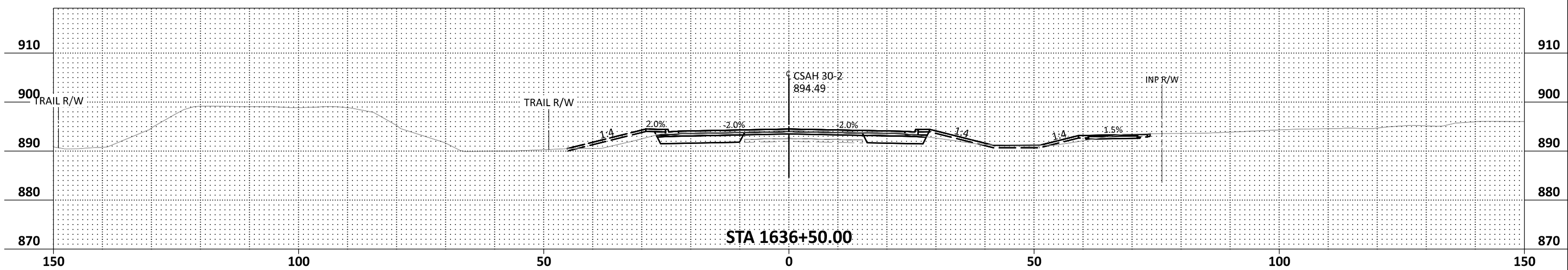
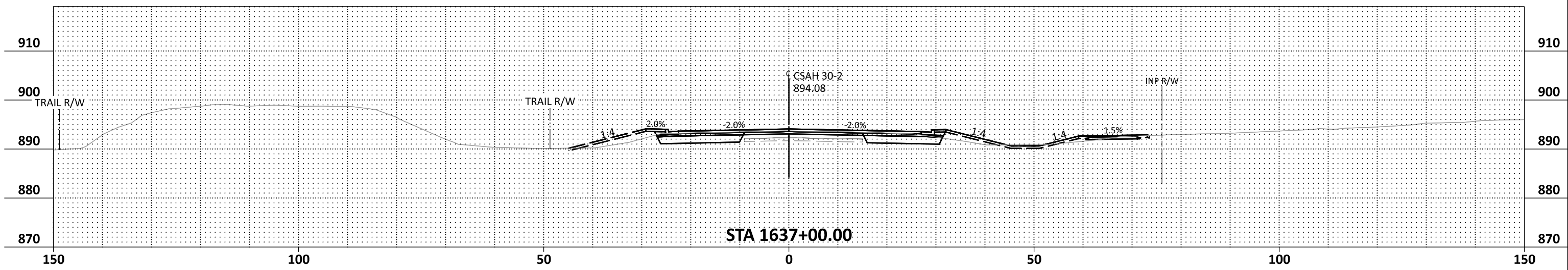
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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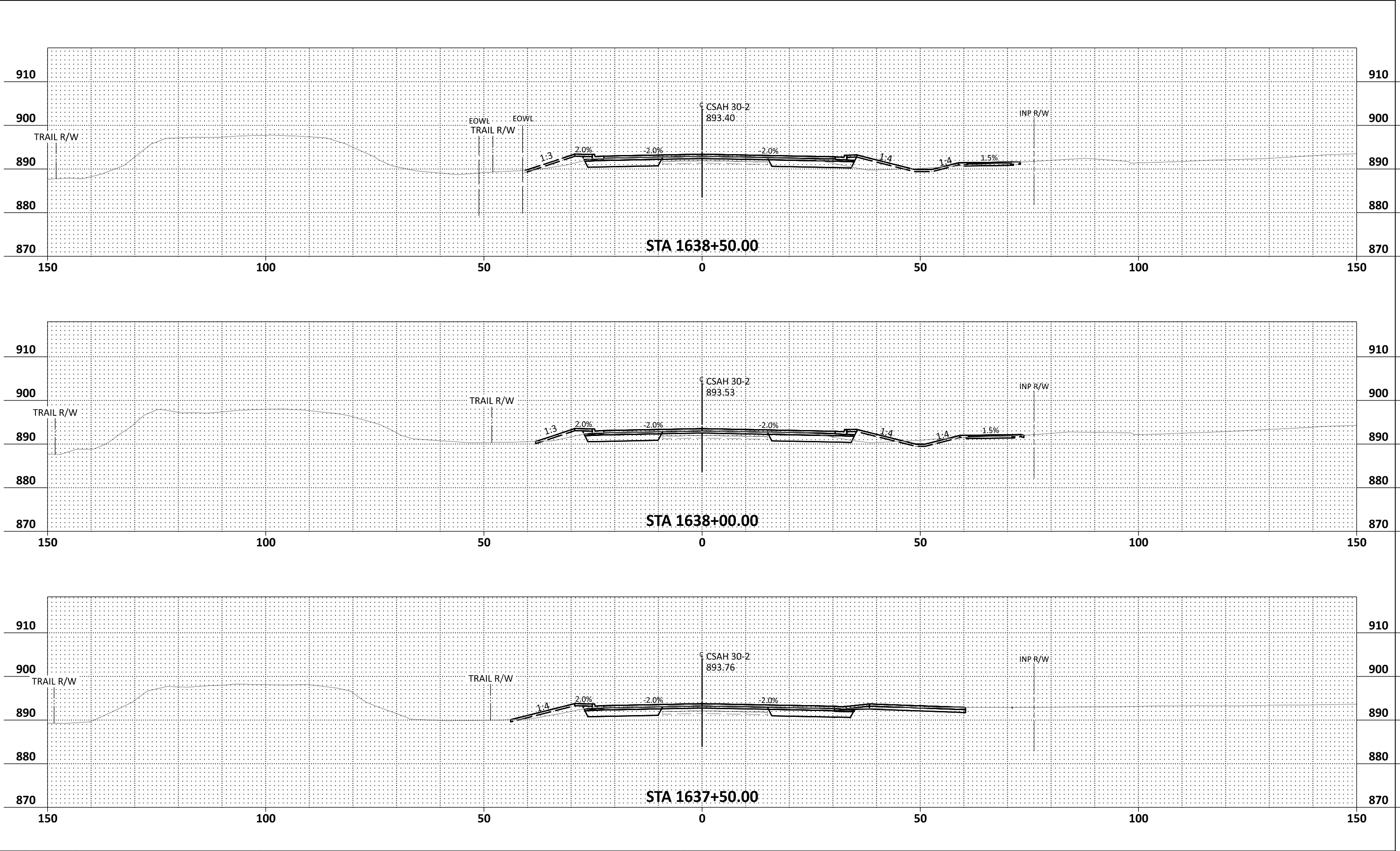
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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CROSS SECTIONS
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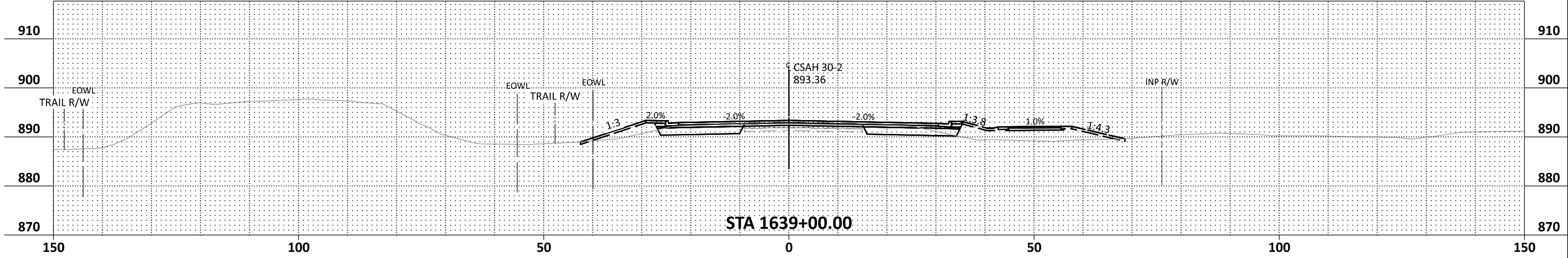
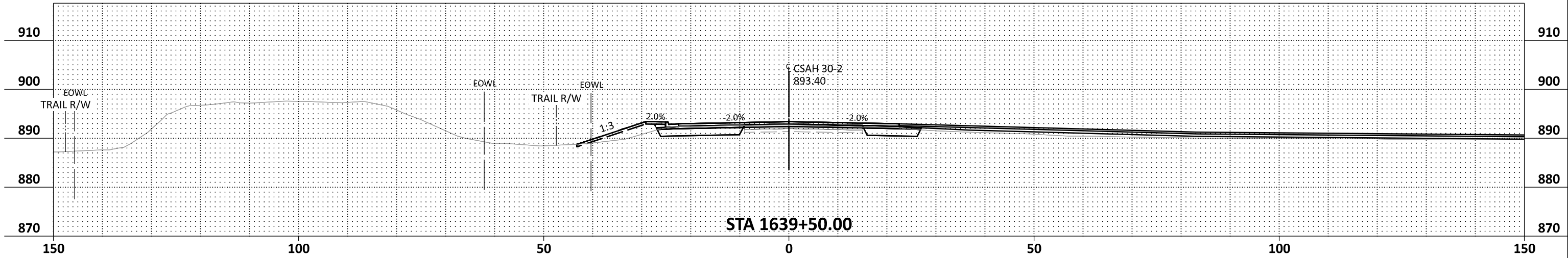
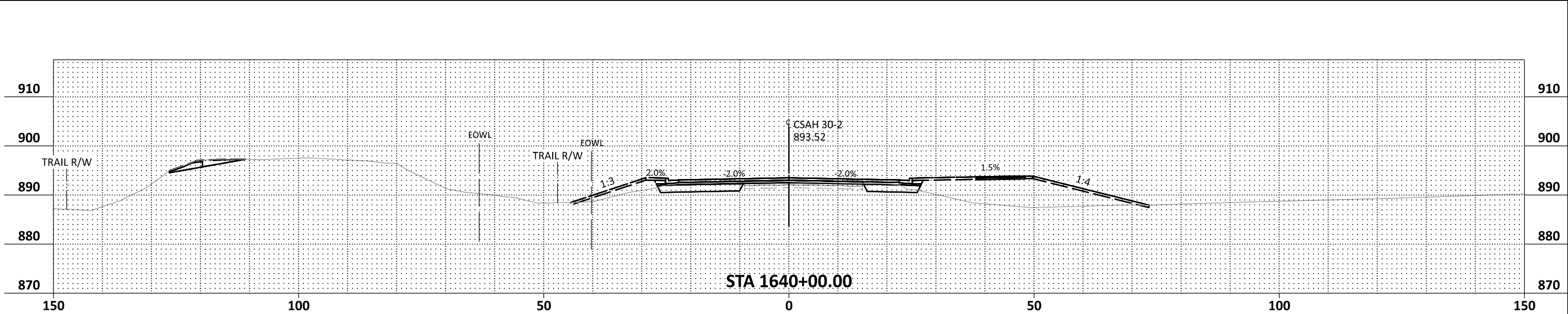
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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CROSS SECTIONS
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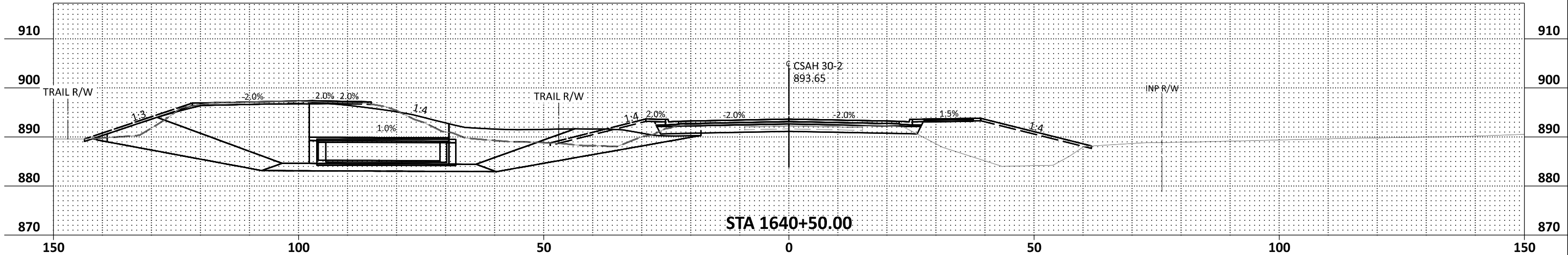
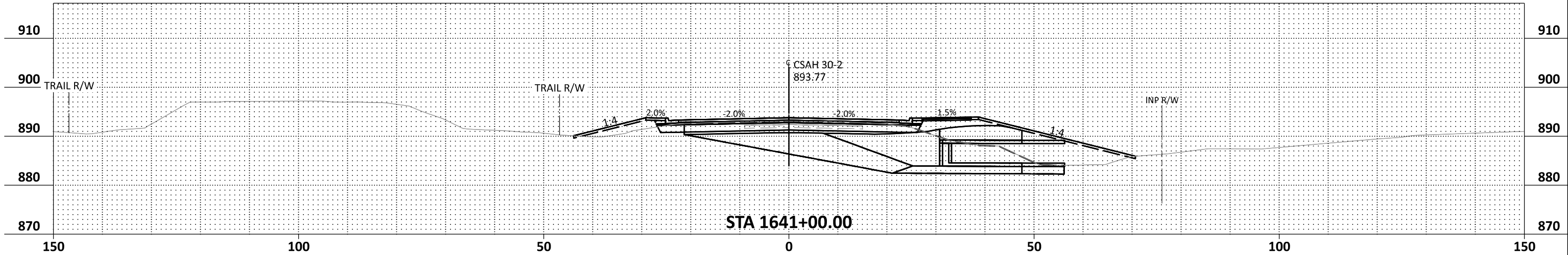
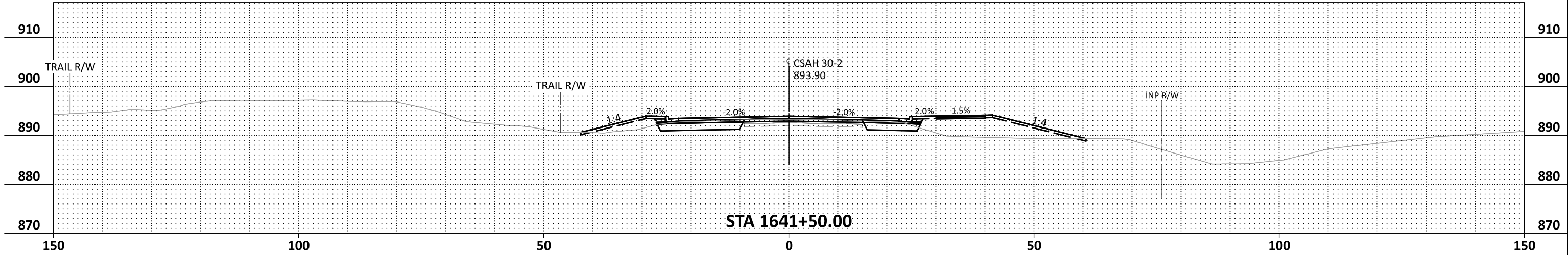


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

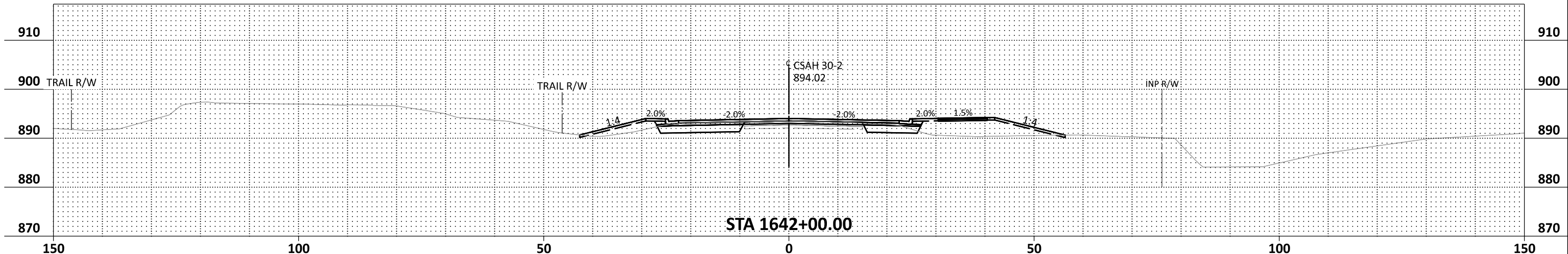
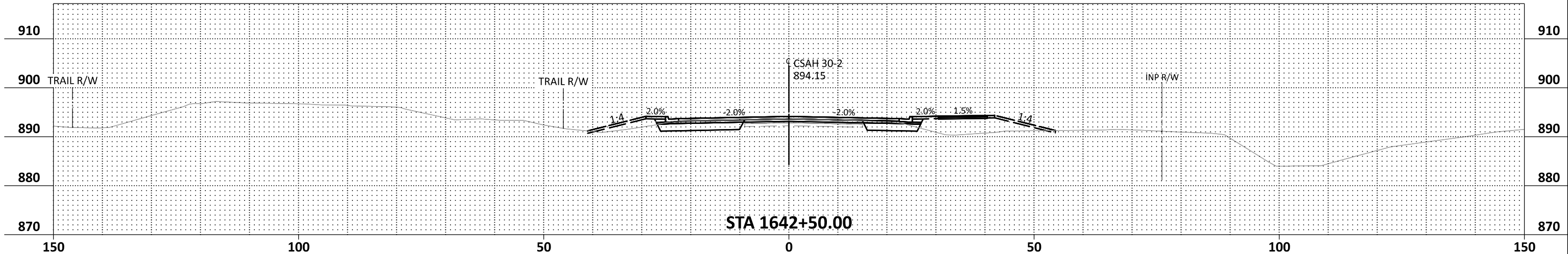
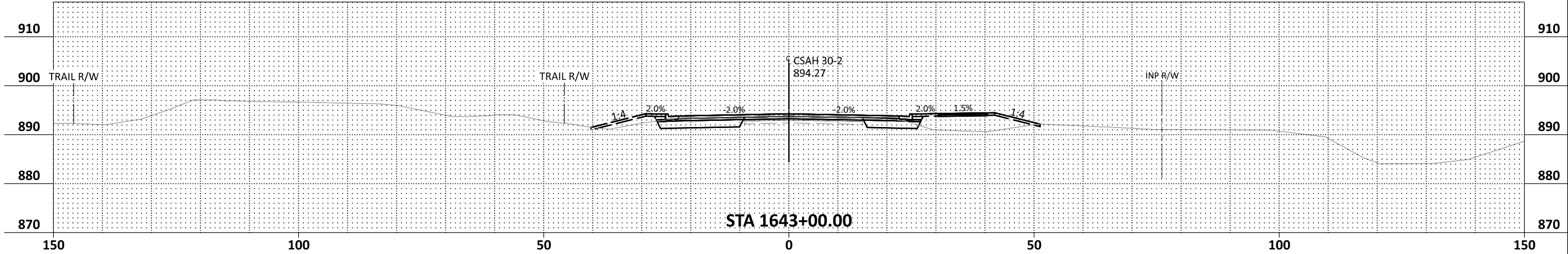


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
X42
OF
X65
SHEETS

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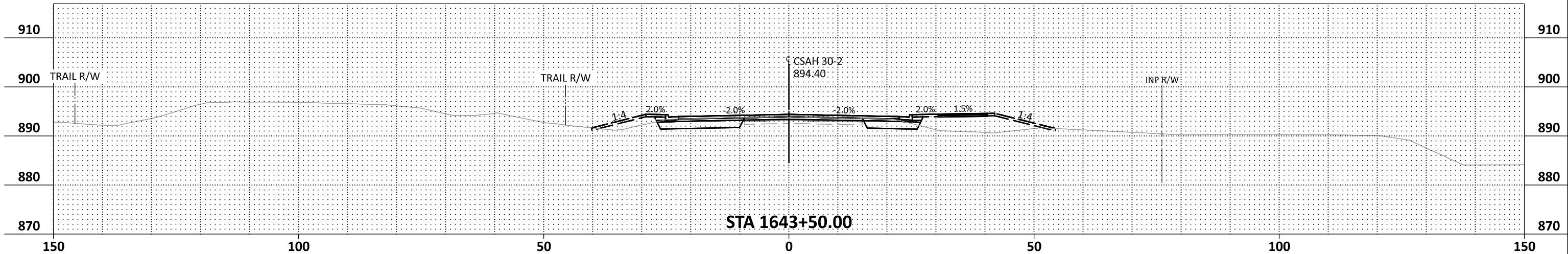
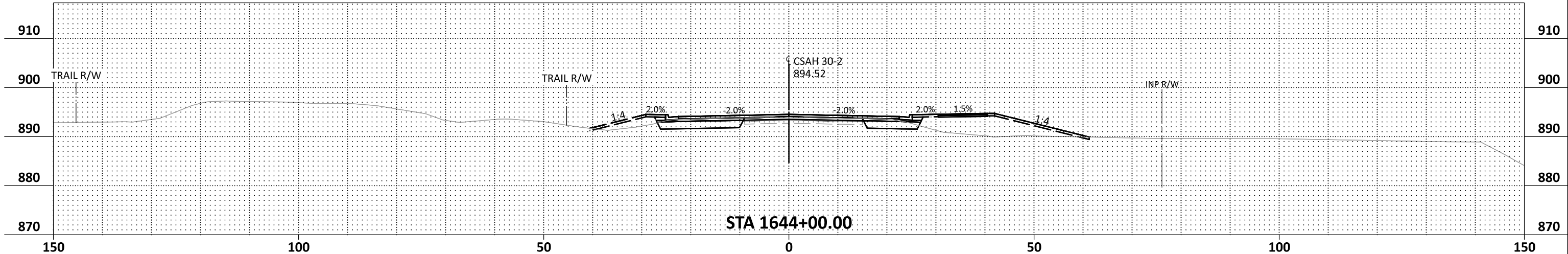
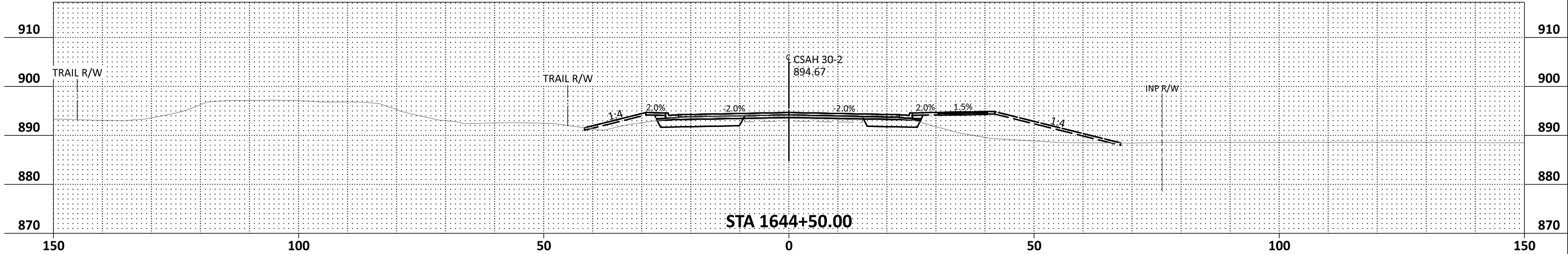
Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	SHEET X43
CROSS SECTIONS	OF
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	X65
	SHEETS

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Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



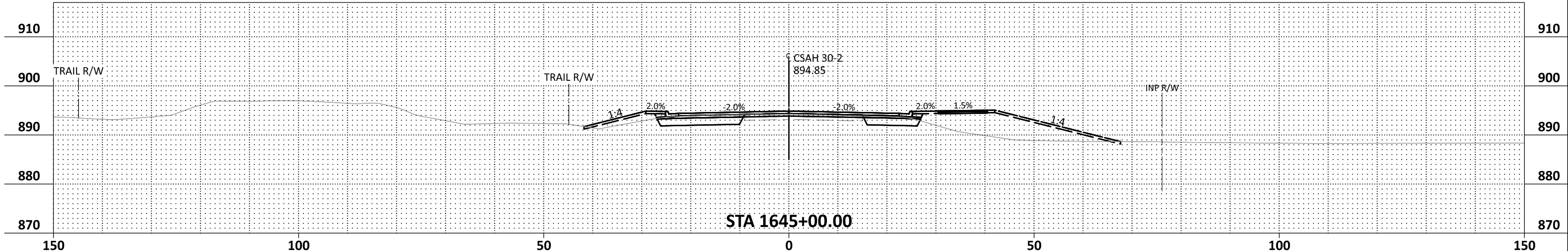
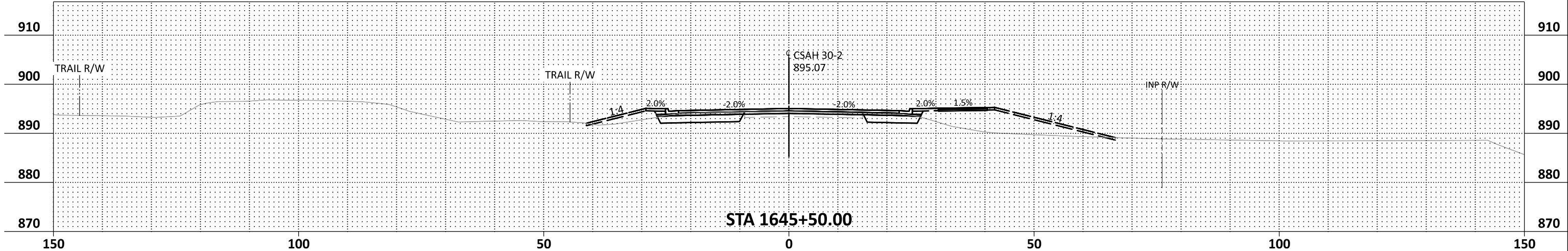
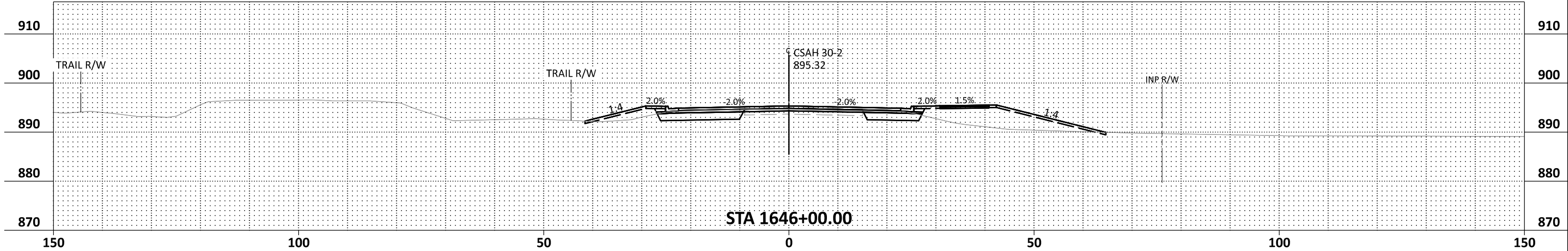
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
X44
OF
X65
SHEETS

DATE: 9/12/2024 2:14:11 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

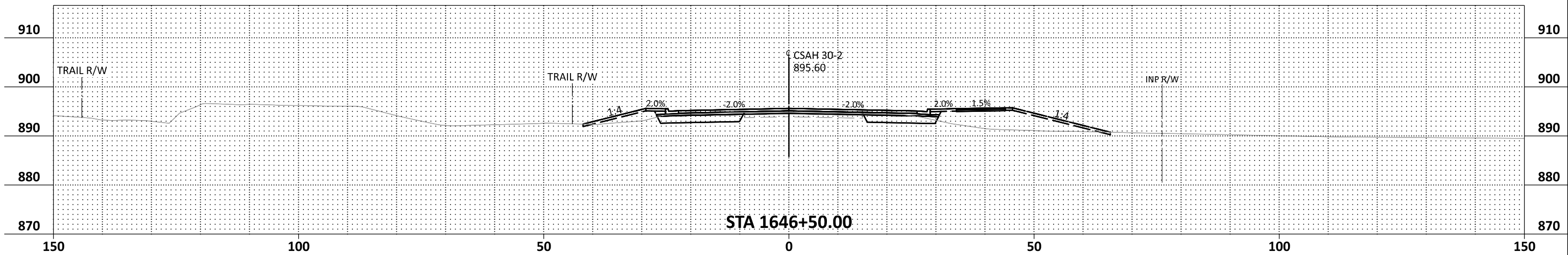
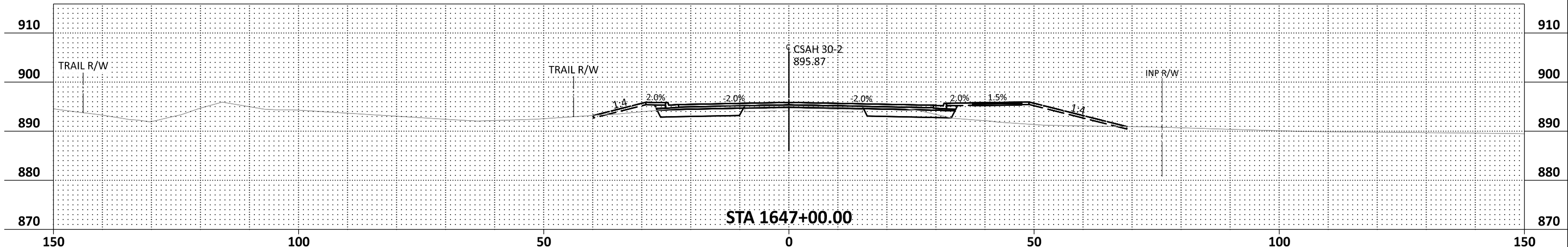
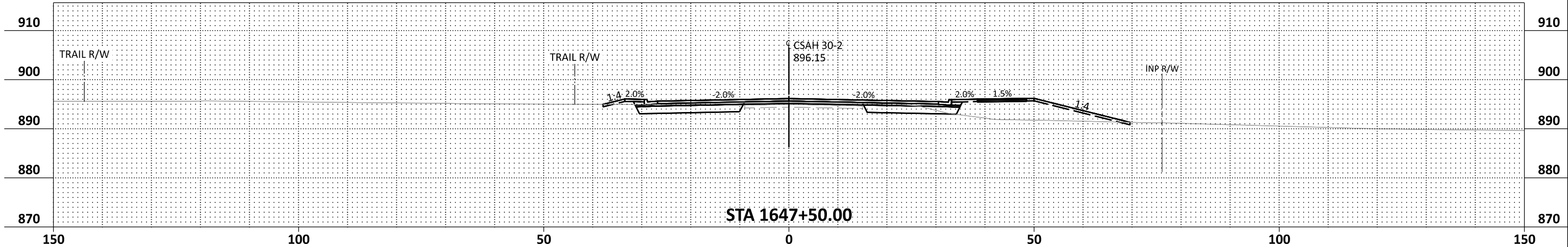


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
X45
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X65
SHEETS

DATE: 9/12/2024 2:14:13 PM
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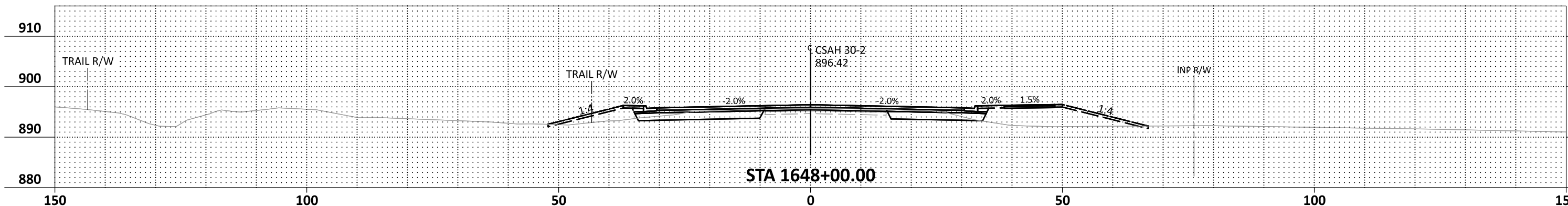
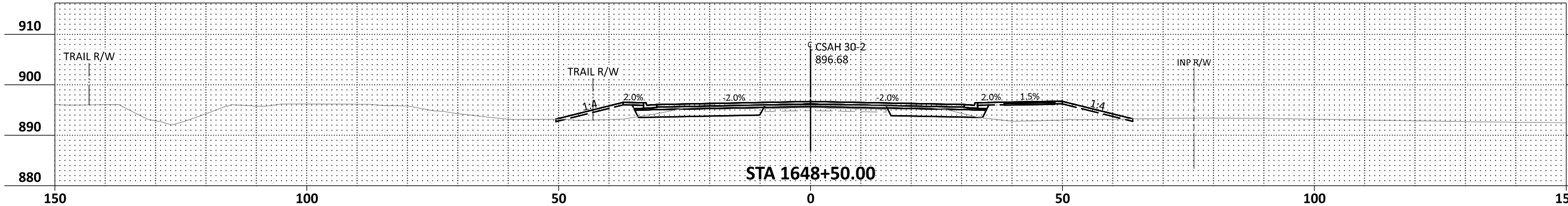
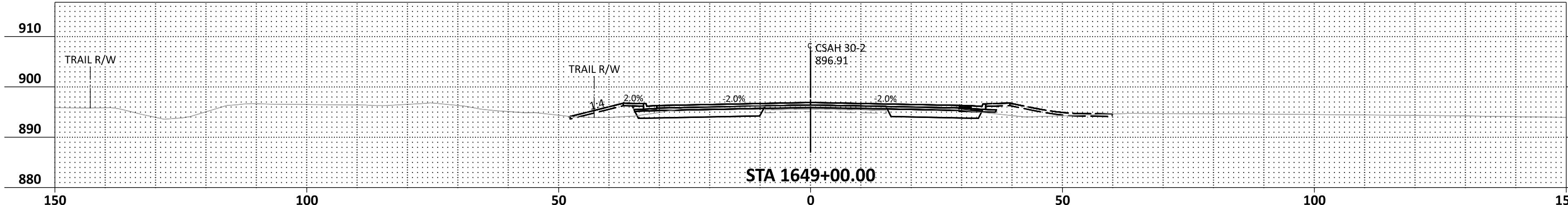
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Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	SHEET X46 OF X65 SHEETS
CROSS SECTIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

DATE: 9/12/2024 2:14:15 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_xs03_nor.th.dgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

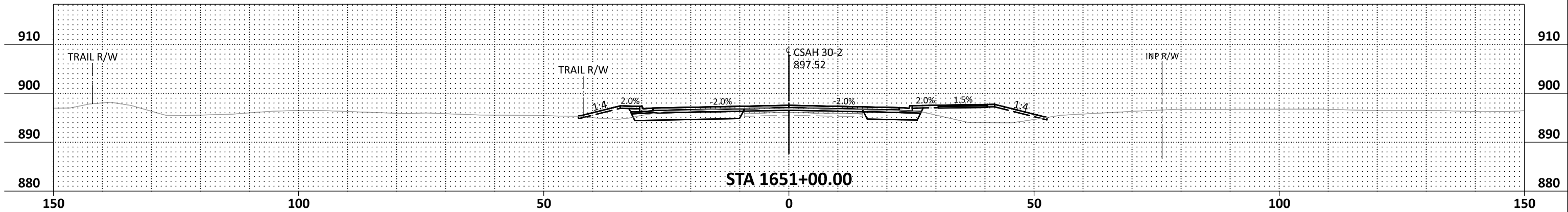
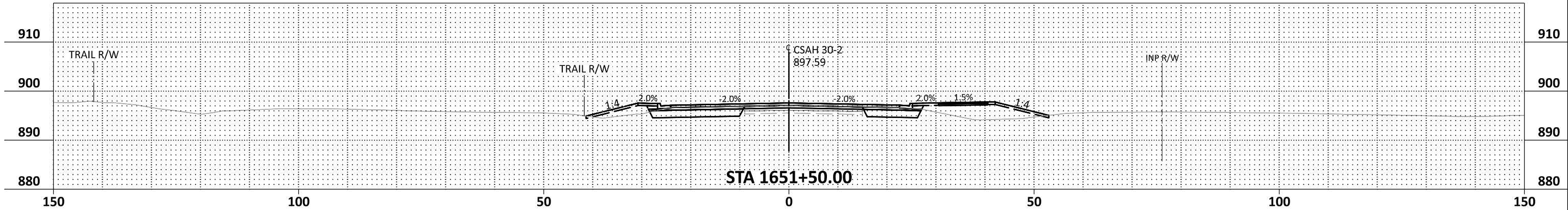
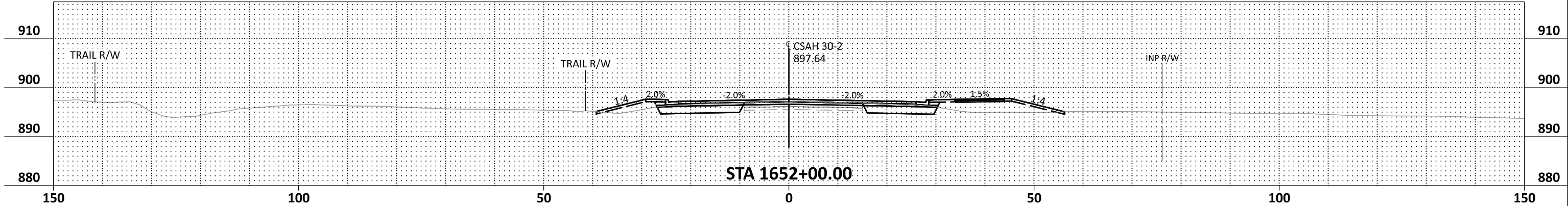
CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS

SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
X47
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SHEETS

DATE: 9/12/2024 2:14:19 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



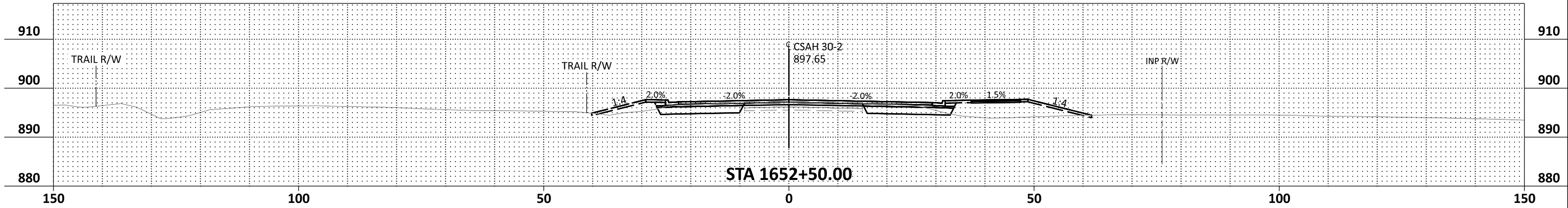
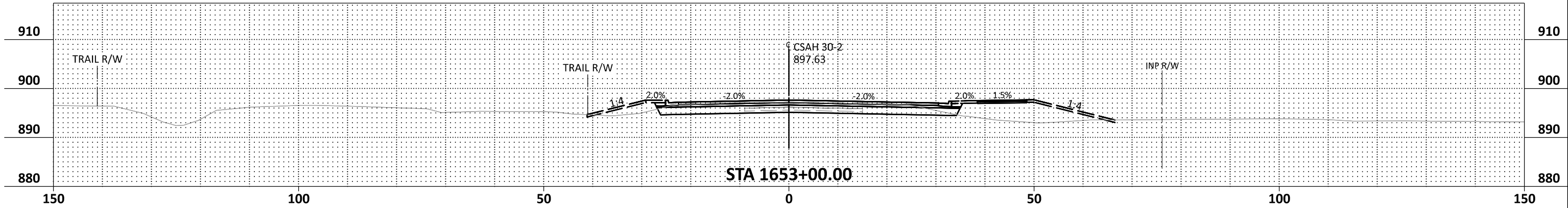
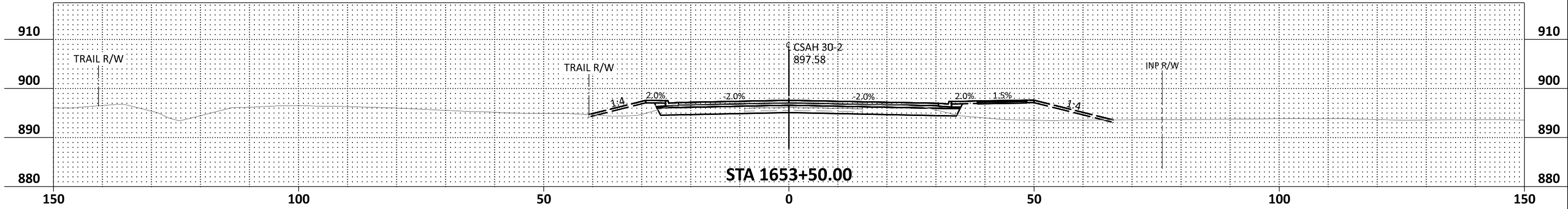
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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OF
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SHEETS

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PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_xs03_north.dgn



NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



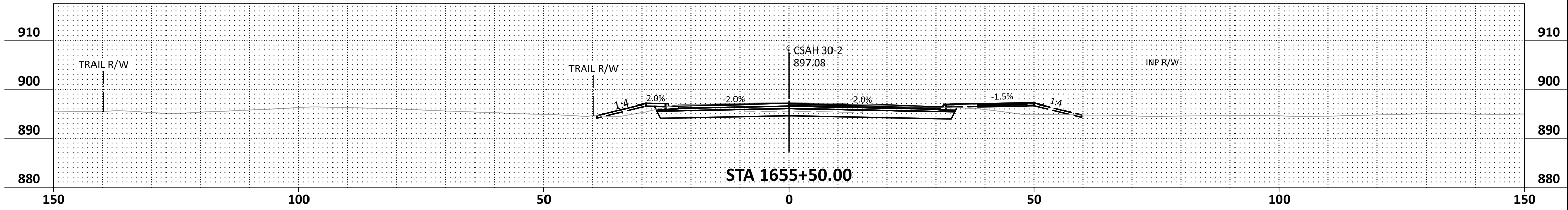
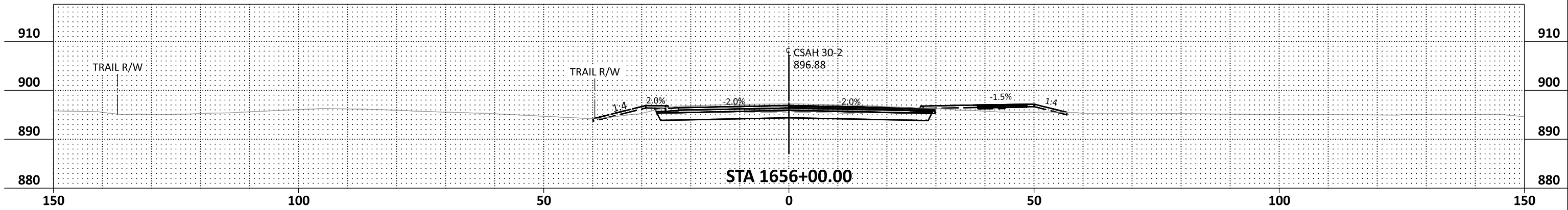
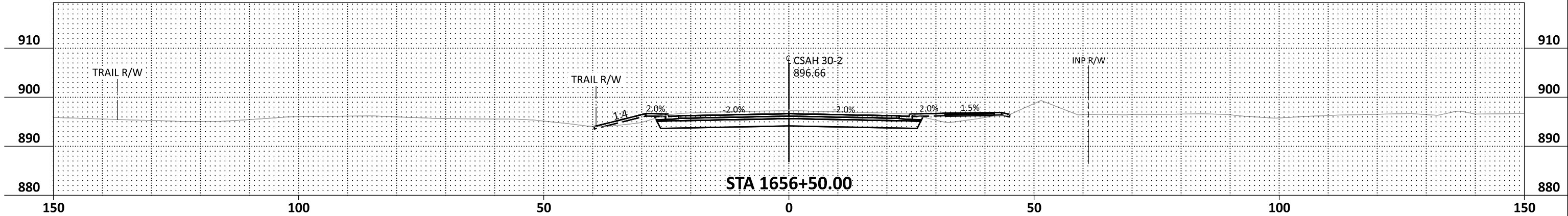
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

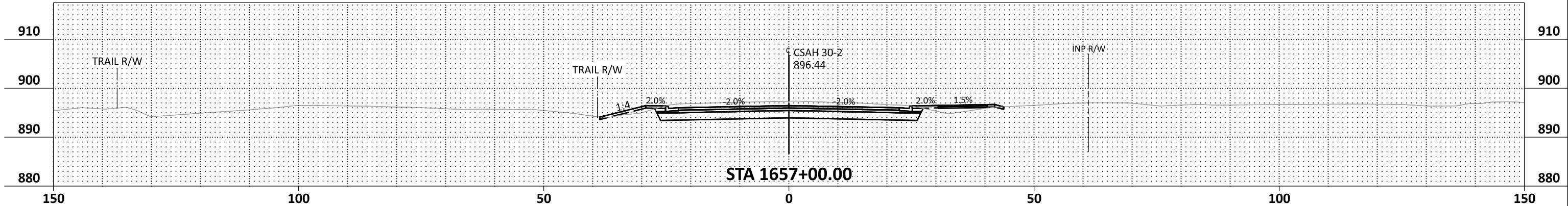
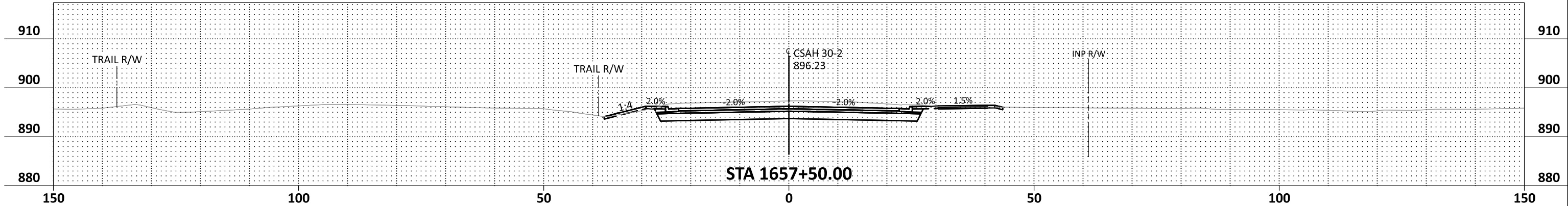
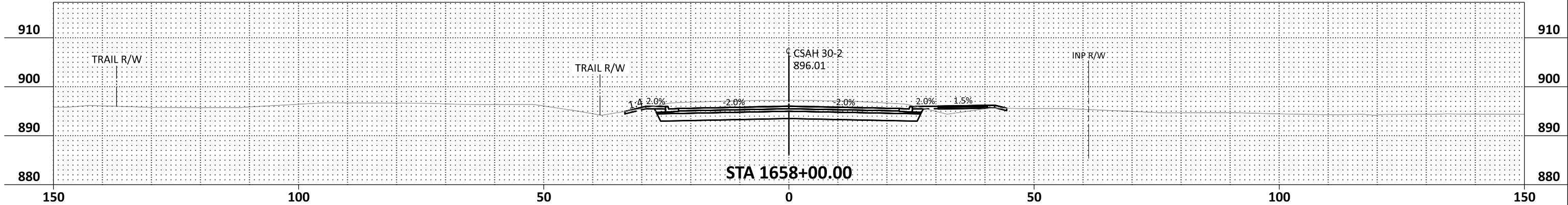
SHEET
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NO.	DATE	BY	CHK	REVISIONS	Design By: MKV			CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CHISAGO COUNTY, MINNESOTA	SHEET X52 OF X65 SHEETS
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					Checked By: AJP					
					Approved By: MKV					
					CROSS SECTIONS					
					SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004					

DATE: 9/12/2024 2:14:26 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



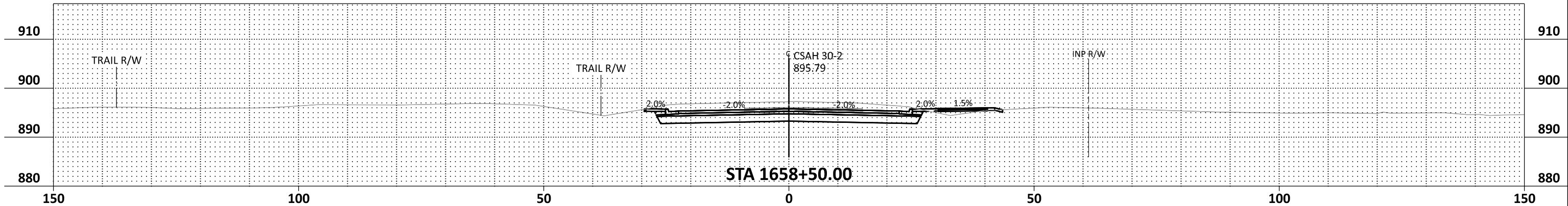
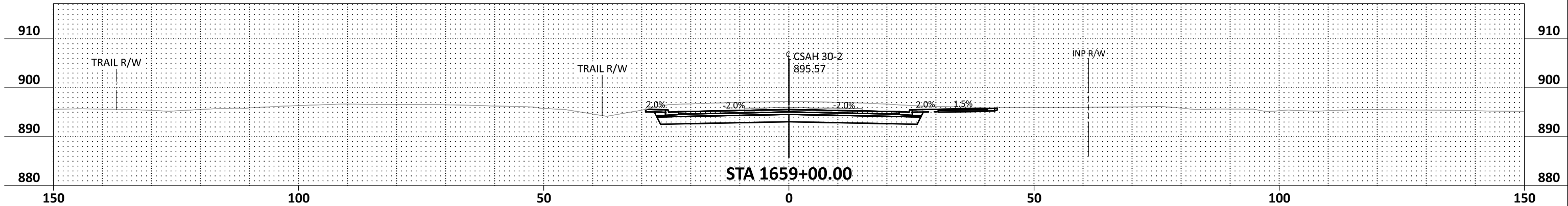
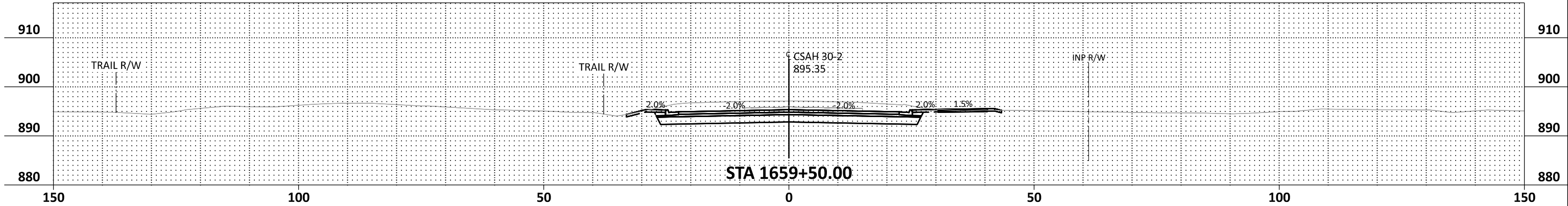
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
X53
OF
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SHEETS

DATE: 9/12/2024 2:14:28 PM
PATH & FILENAME: Projects\Minnesota\Roadway\Sheets\023661-000\03_Discipline\Roadway\Sheets\023661-000_xs03_north.dgn



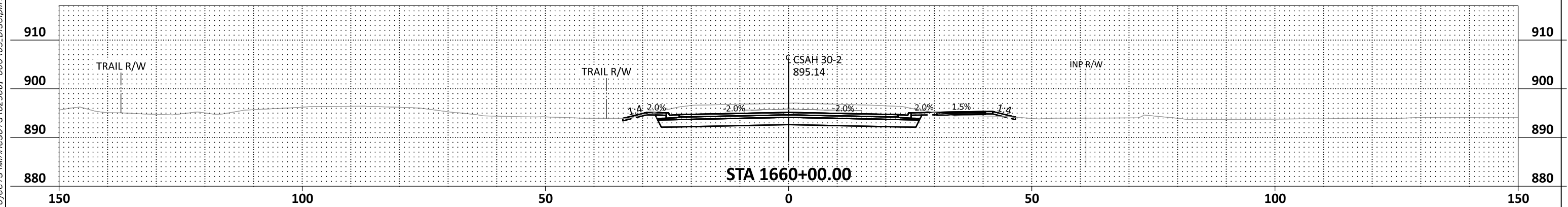
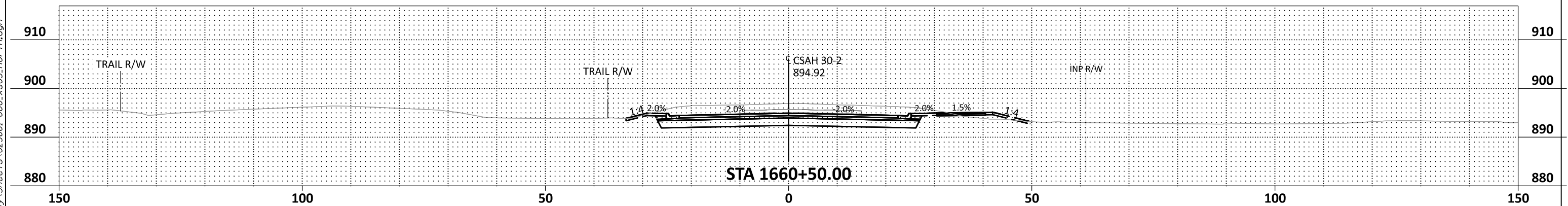
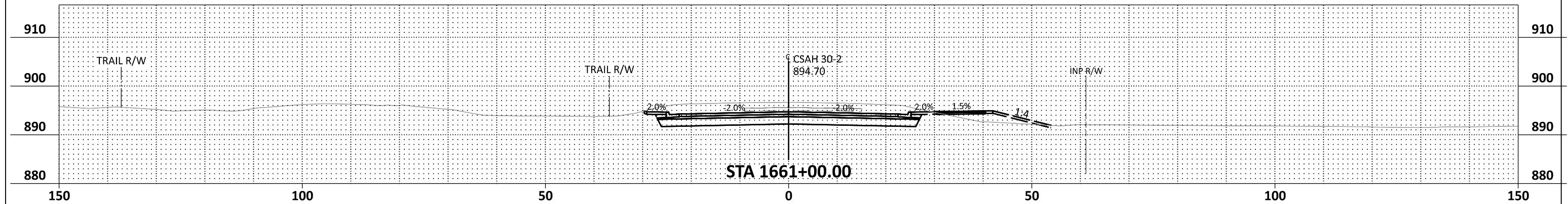
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Design By:	MKV
Plan By:	GAD
Checked By:	AJP
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	SHEET X54 OF X65 SHEETS
CROSS SECTIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	



NO.	DATE	BY	CHK	REVISIONS	Design By: MKV
					Plan By: GAD
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Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



CSAH 30 (Forest Blvd) Improvements

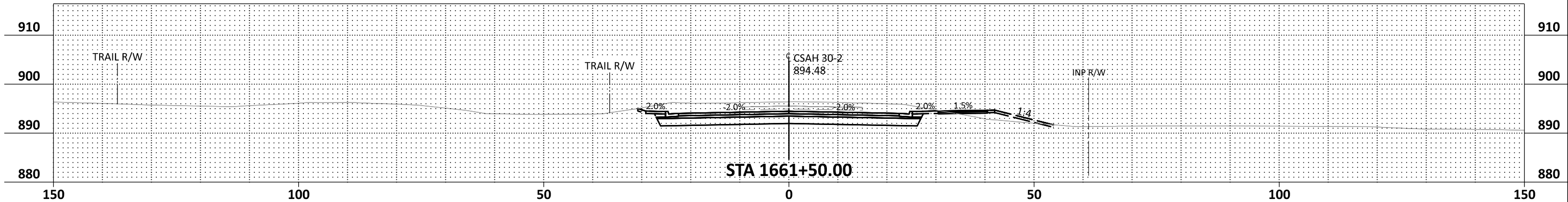
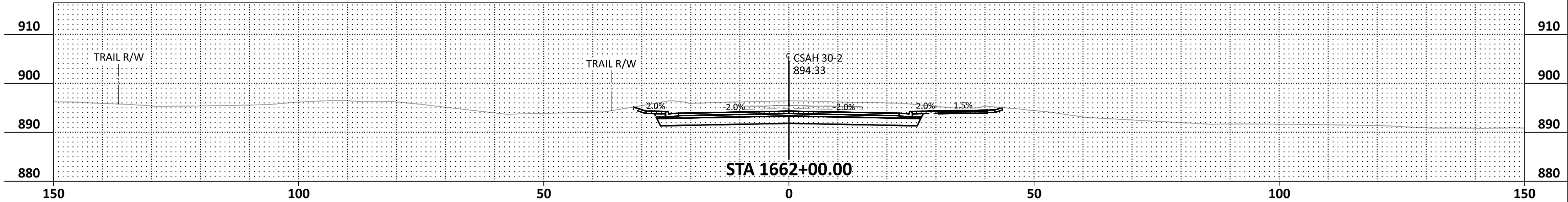
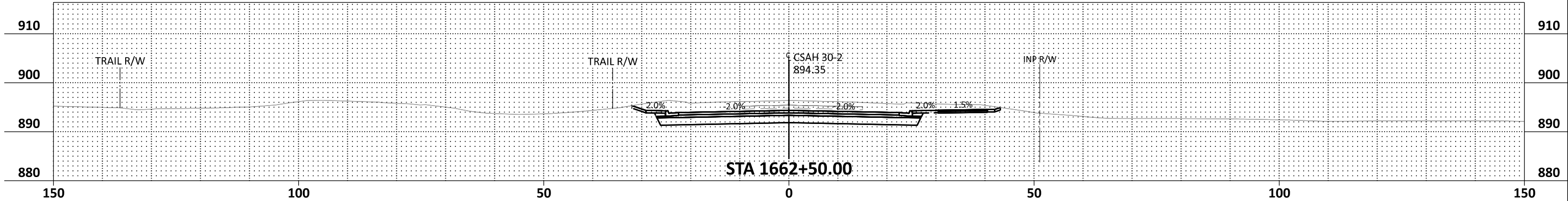
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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DATE: 9/12/2024 2:14:32 PM
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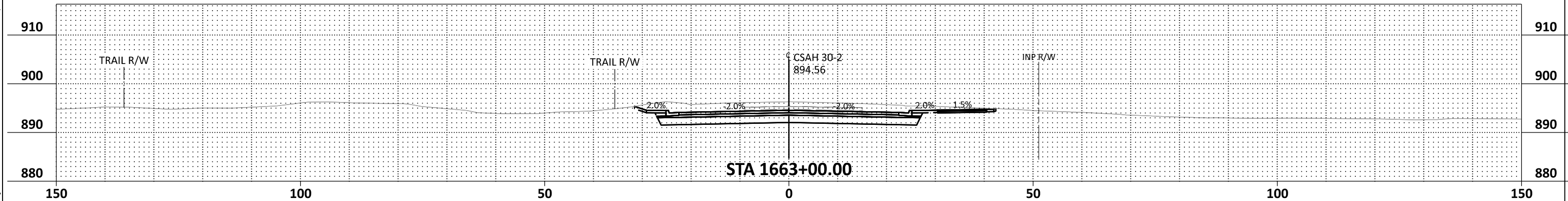
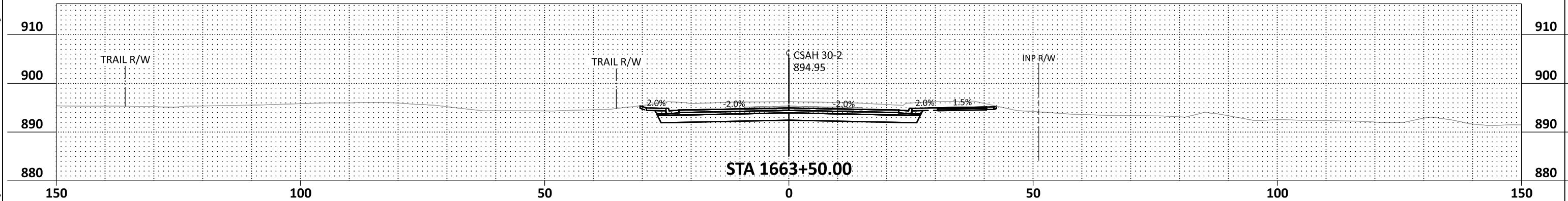
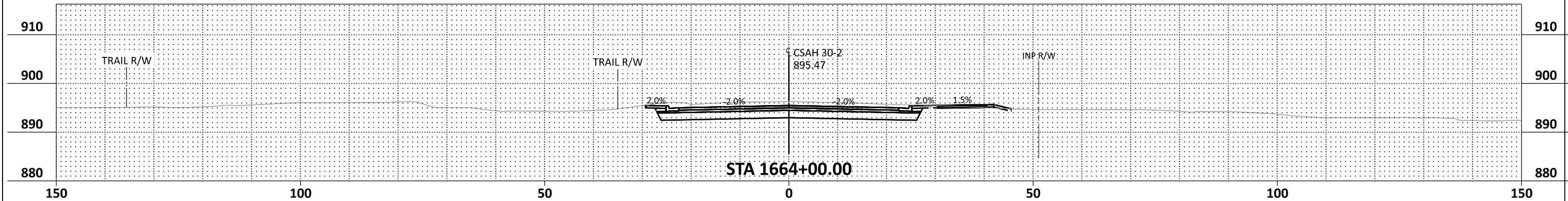
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Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA	SHEET X56 OF X65 SHEETS
CROSS SECTIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004	

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Design By:	MKV
Plan By:	GAD
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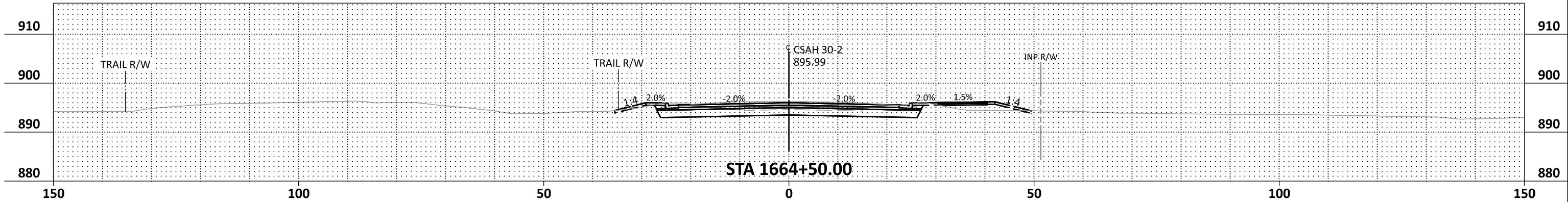
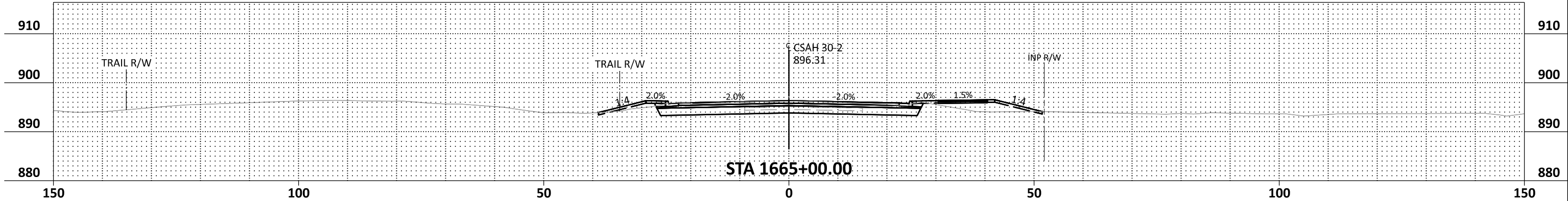
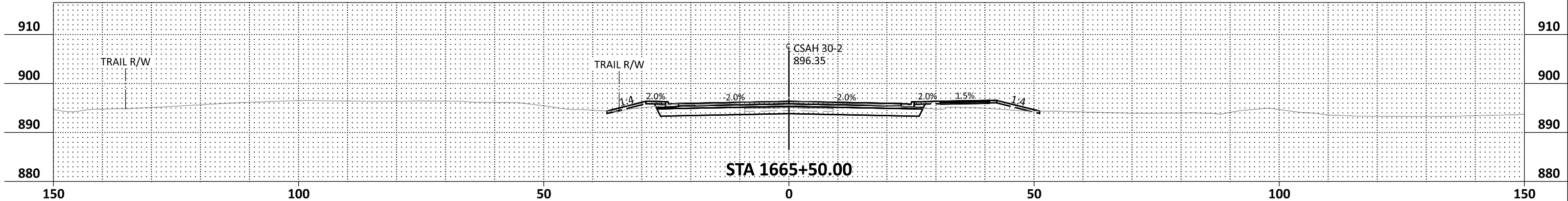
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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DATE: 9/12/2024 2:14:36 PM
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Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



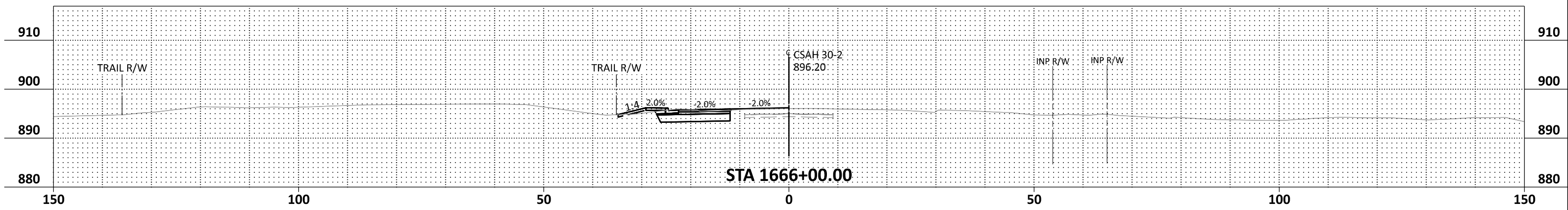
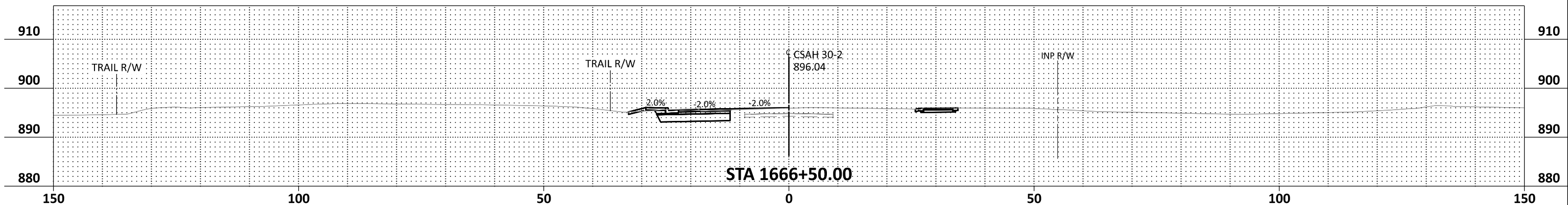
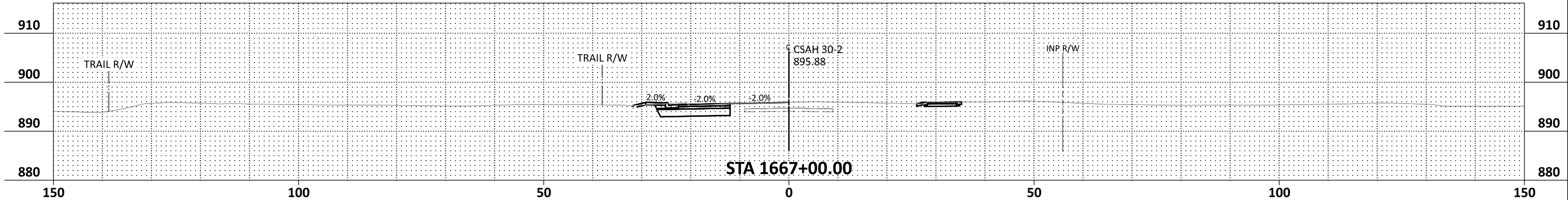
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
X58
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DATE: 9/12/2024 2:14:38 PM
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NO.	DATE	BY	CHK	REVISIONS

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Plan By:	GAD
Checked By:	AJP
Approved By:	MKV



CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

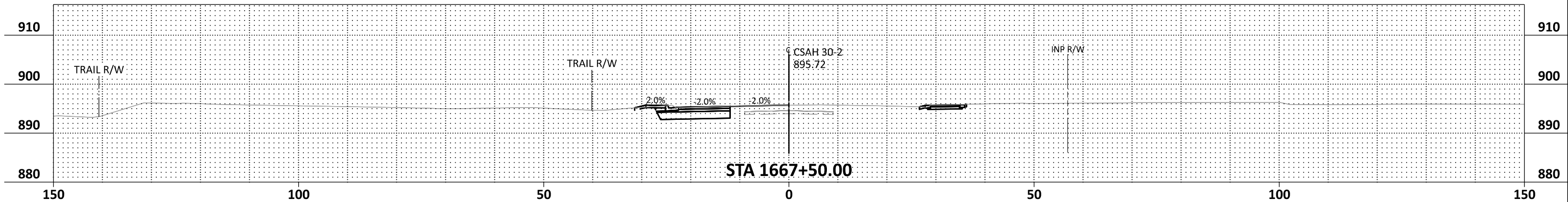
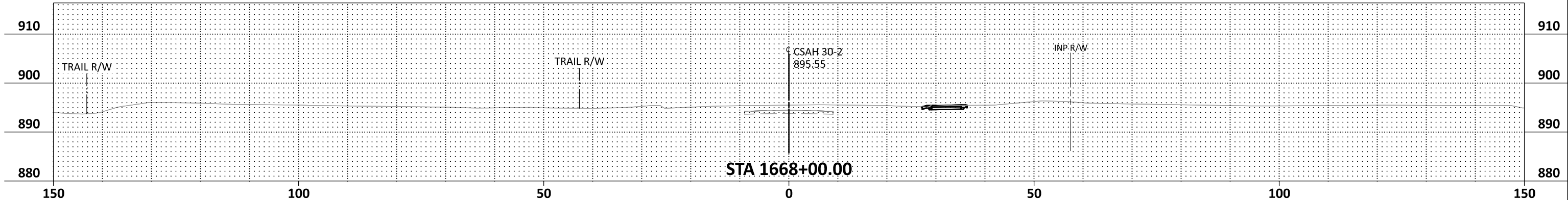
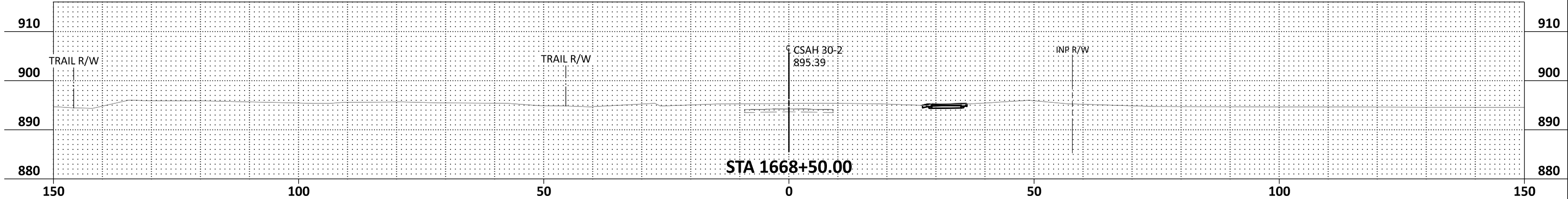
CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS

SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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DATE: 9/12/2024 2:14:39 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
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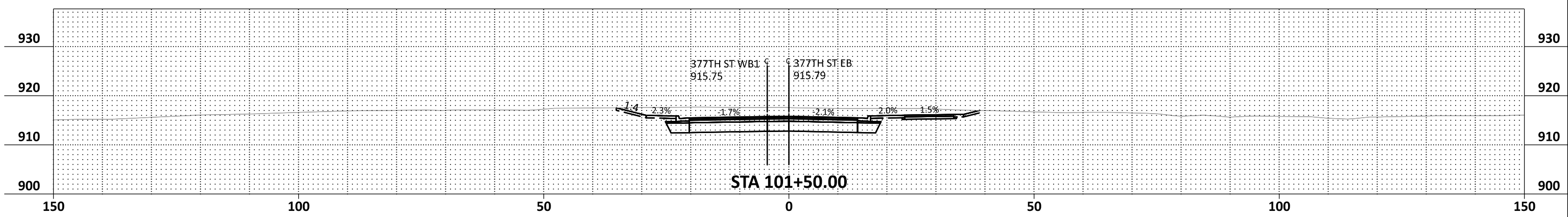
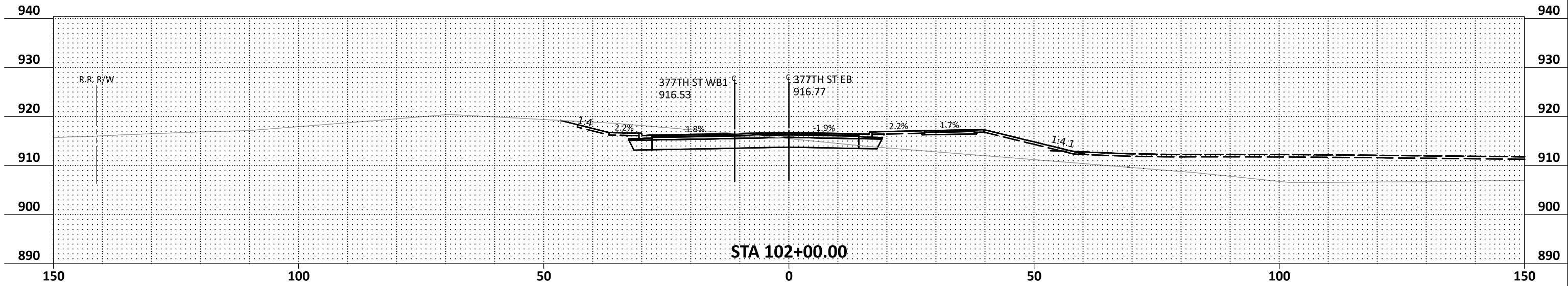
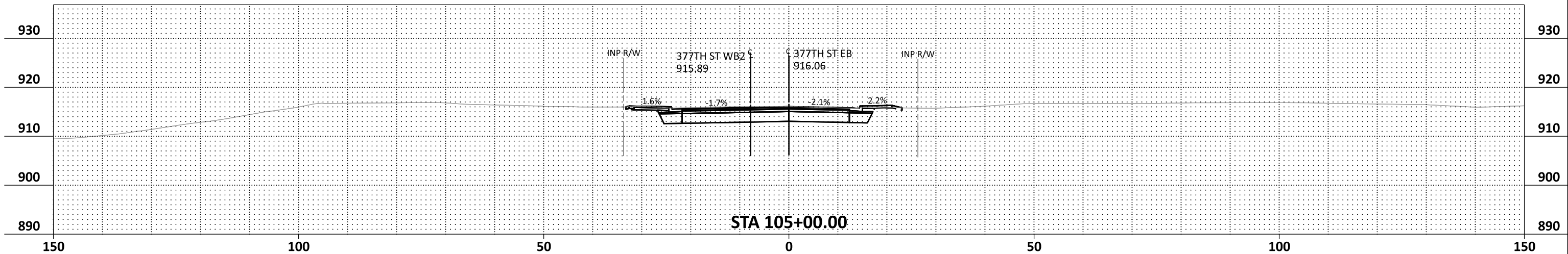
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
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DATE: 9/12/2024 2:15:02 PM
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NO.	DATE	BY	CHK	REVISIONS

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Plan By:	GAD
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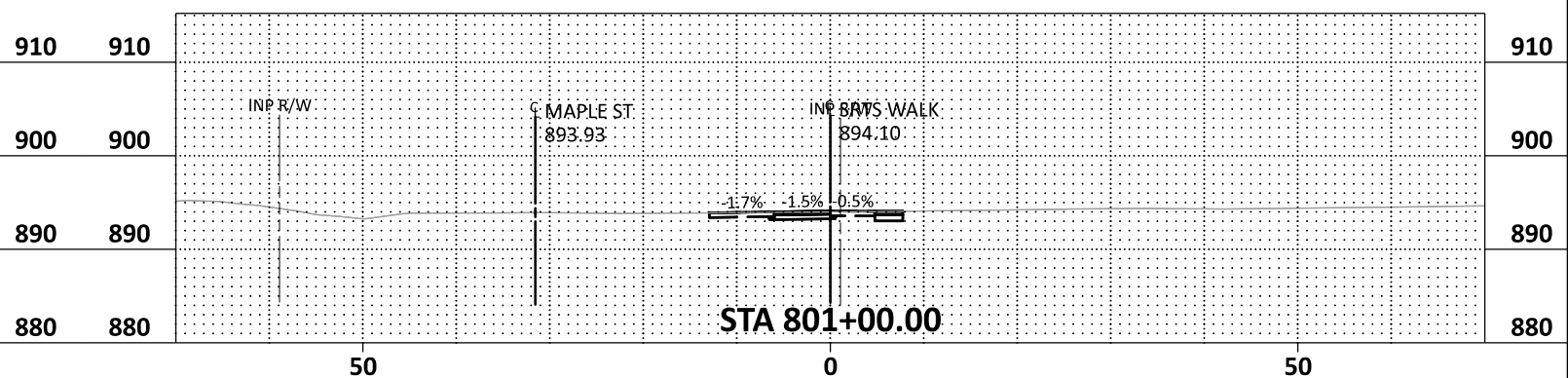
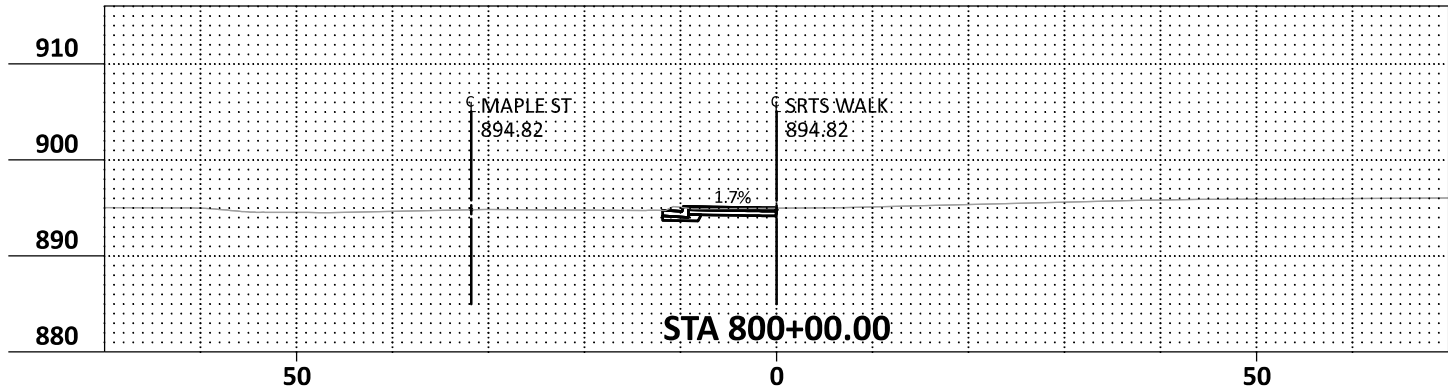
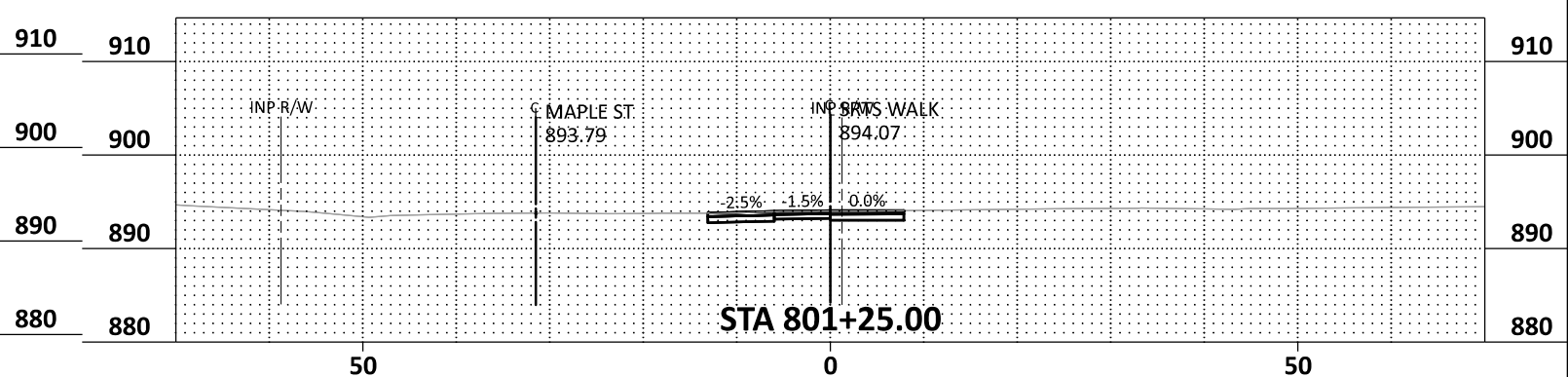
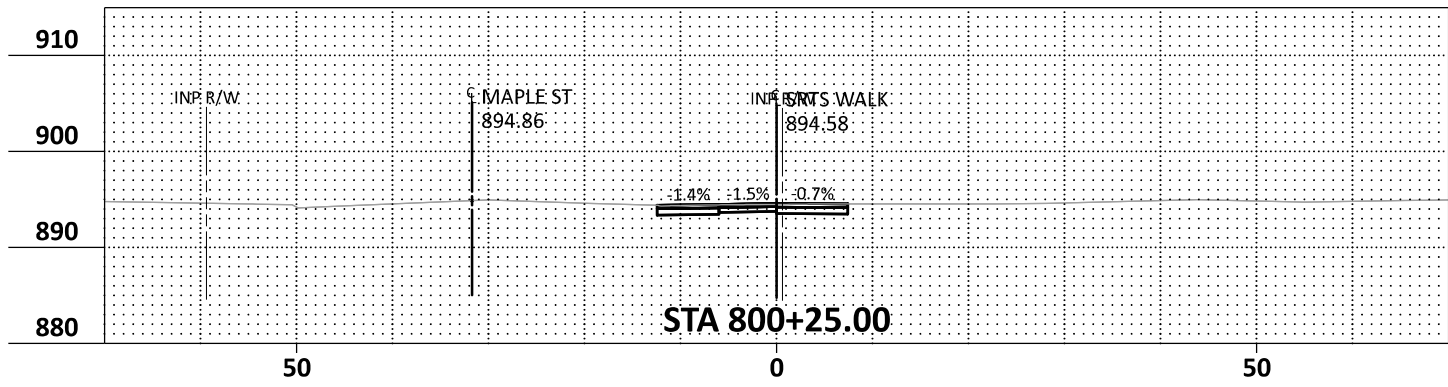
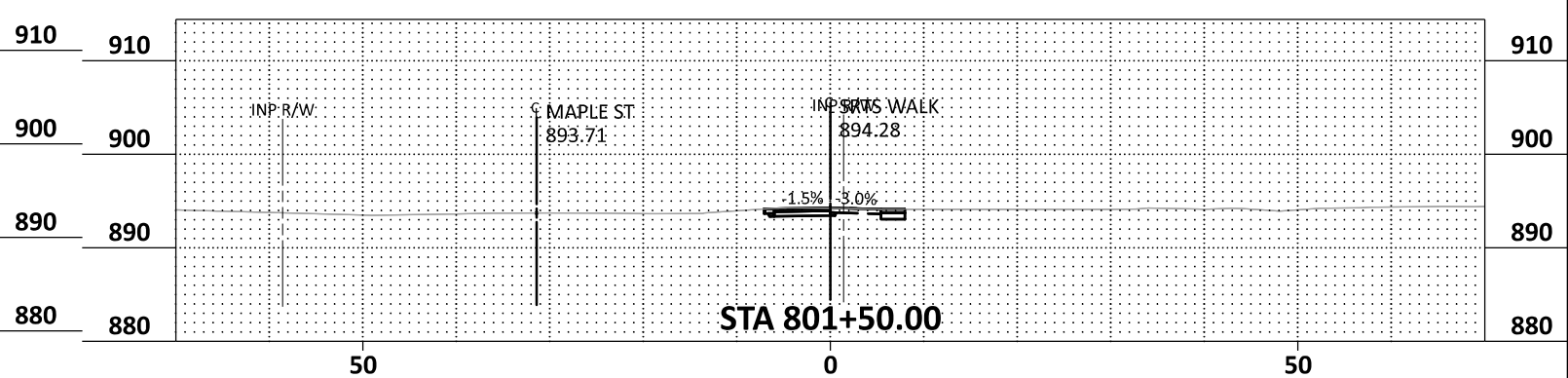
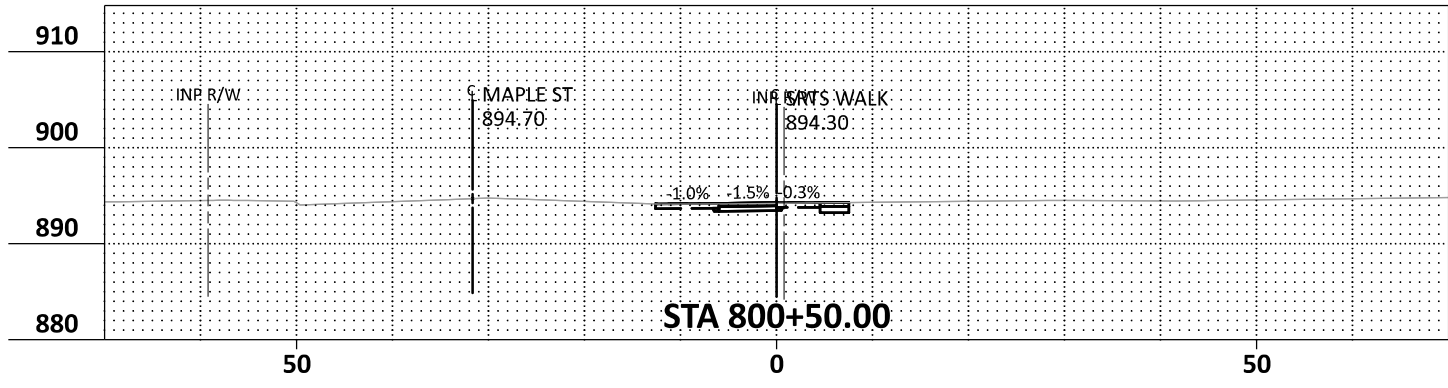
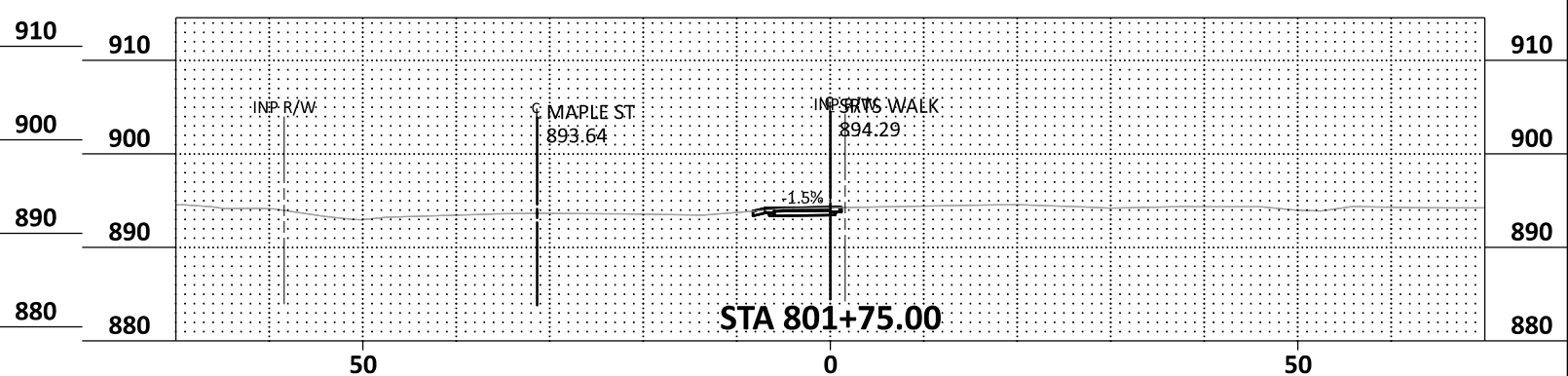
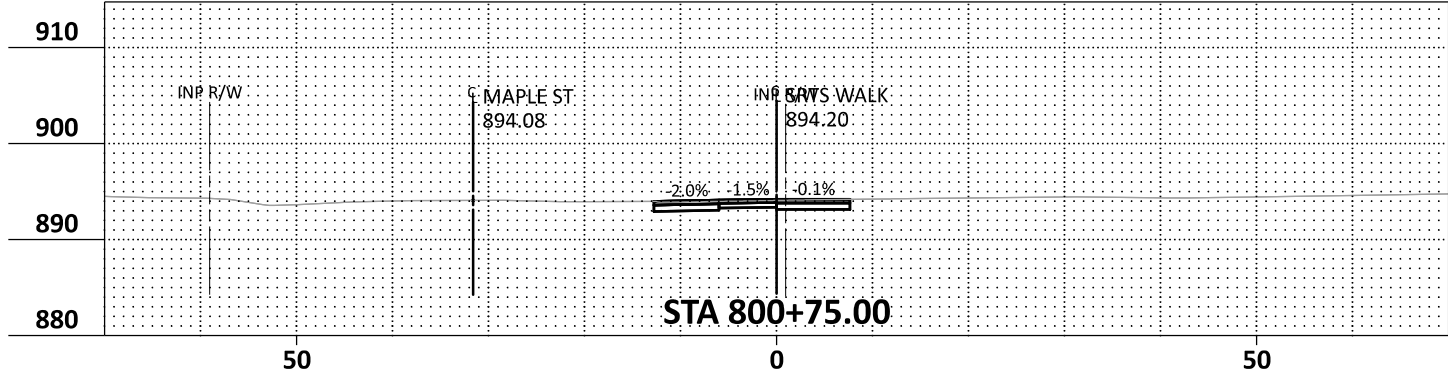
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

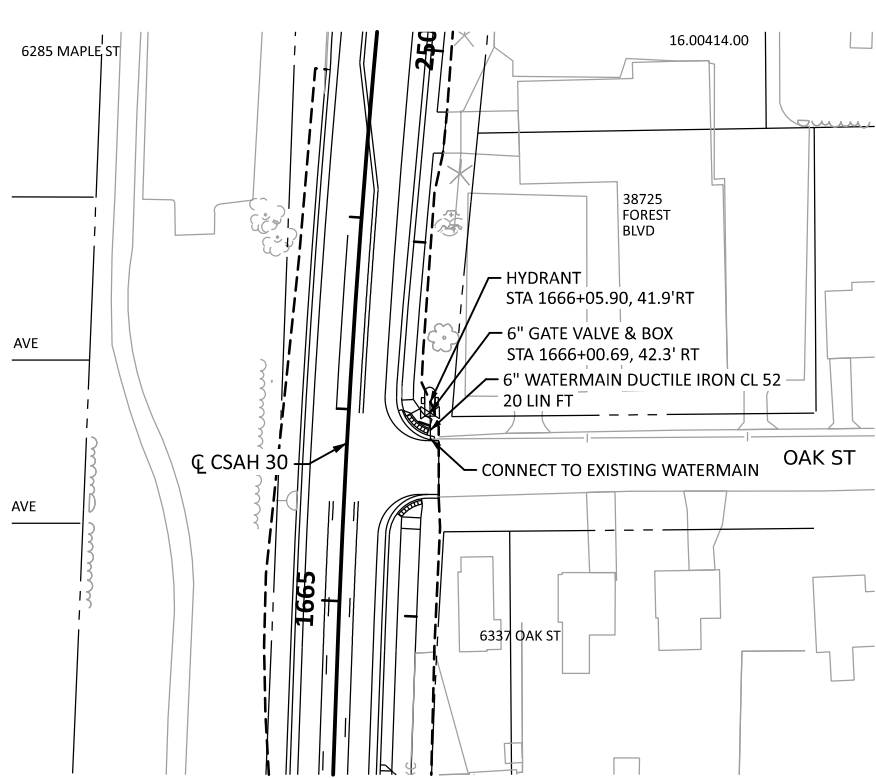
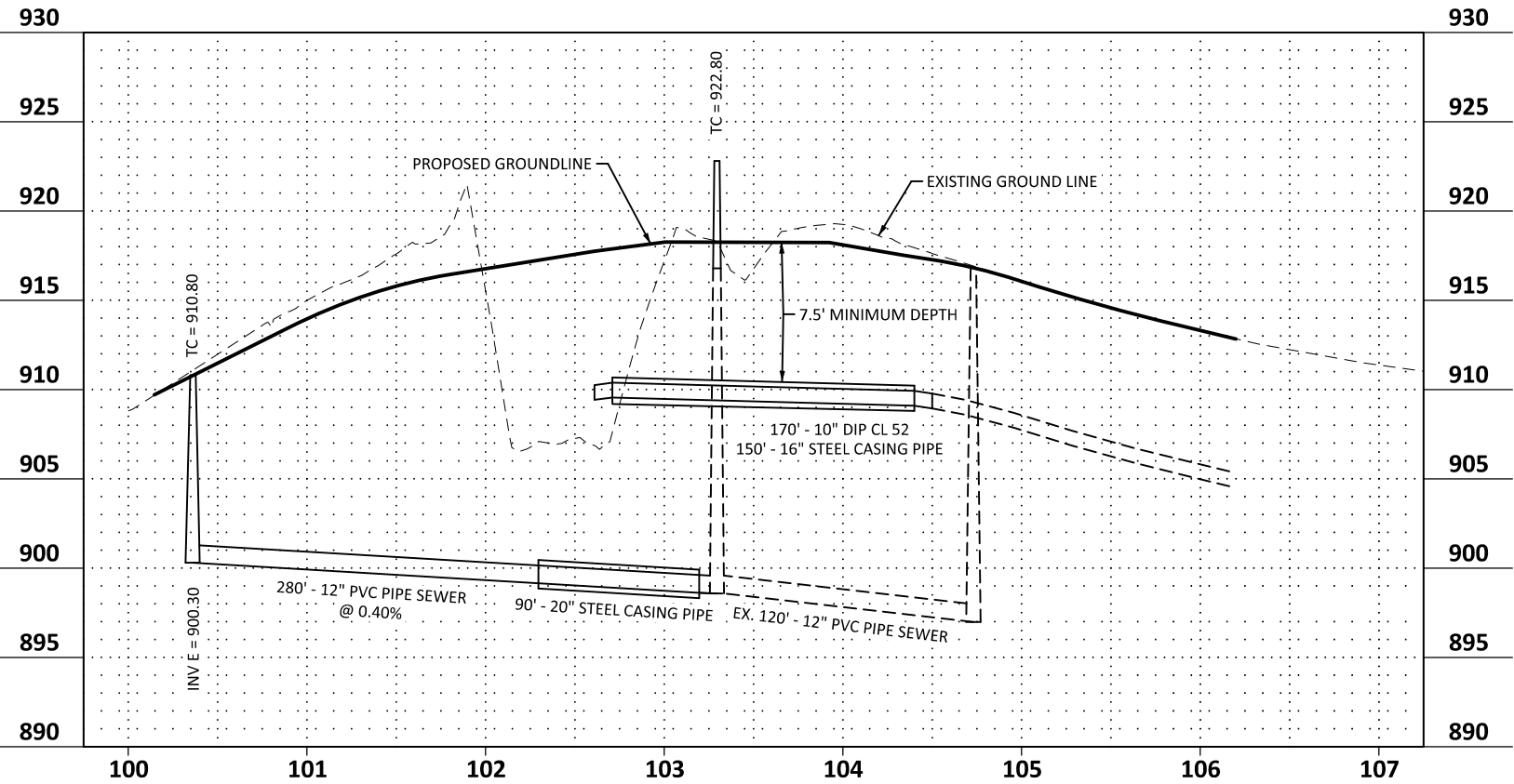
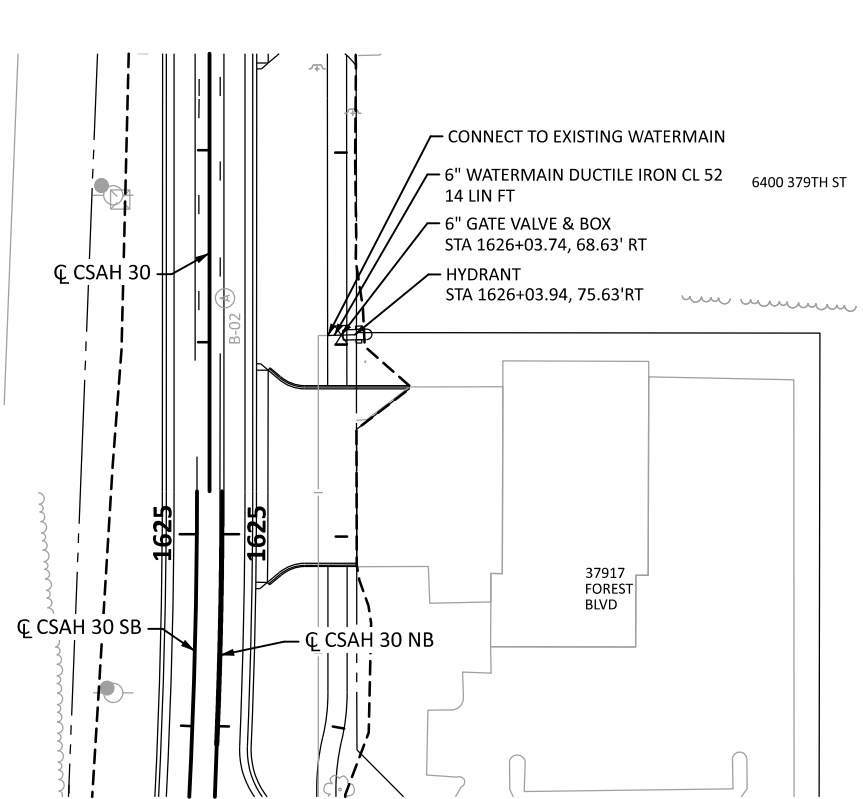
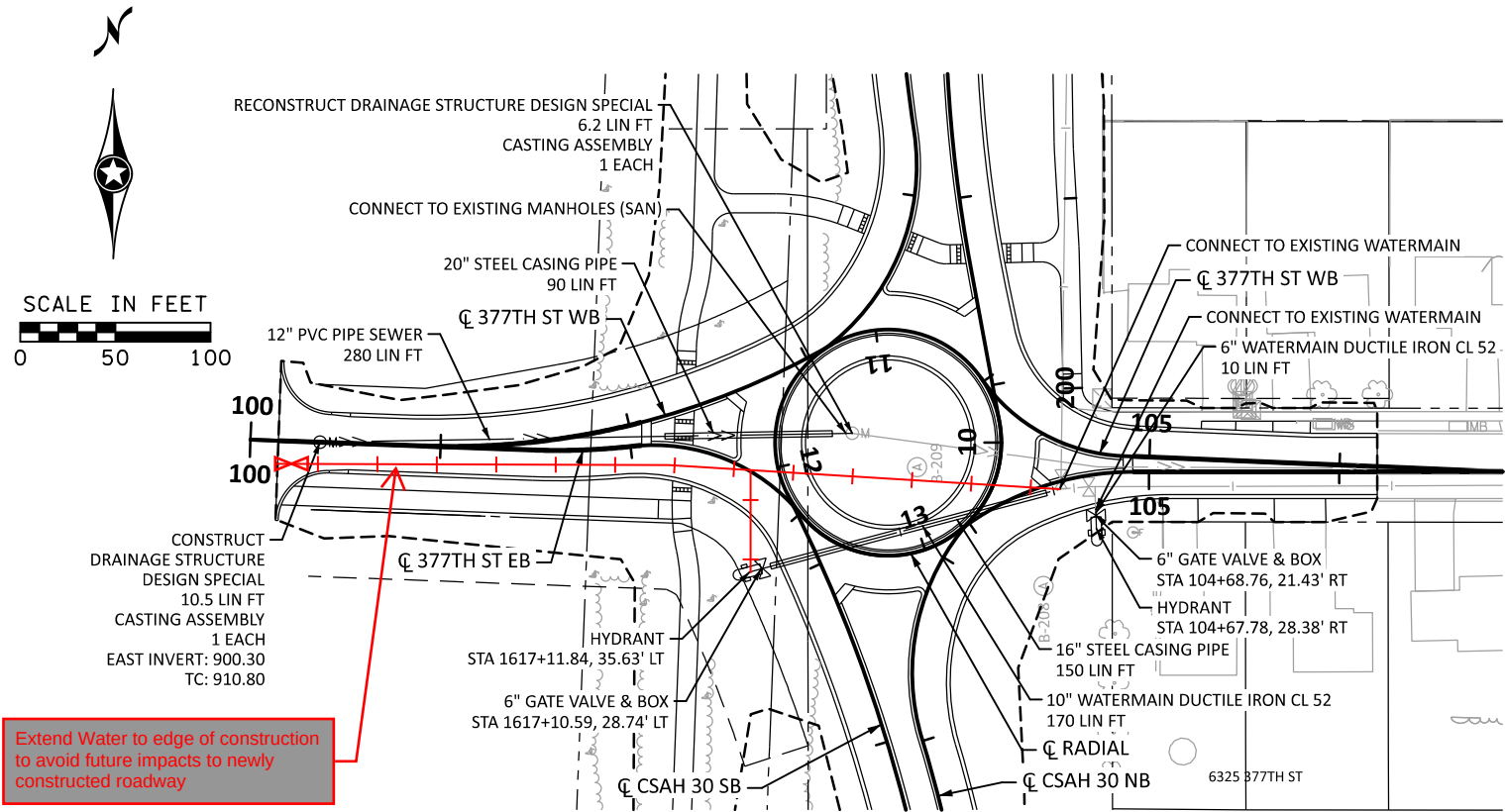
CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
X62
OF
X65
SHEETS

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NO.	DATE	BY	CHK	REVISIONS	Design By: MKV	CHISAGO COUNTY, MINNESOTA	SHEET X64 OF X65 SHEETS
					Plan By: GAD		
					Checked By: AJP		
					Approved By: MKV		
						CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota	CROSS SECTIONS SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
Checked By: MAN
Approved By: NEH

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.

Nicholas E. Hentges, PE
NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620



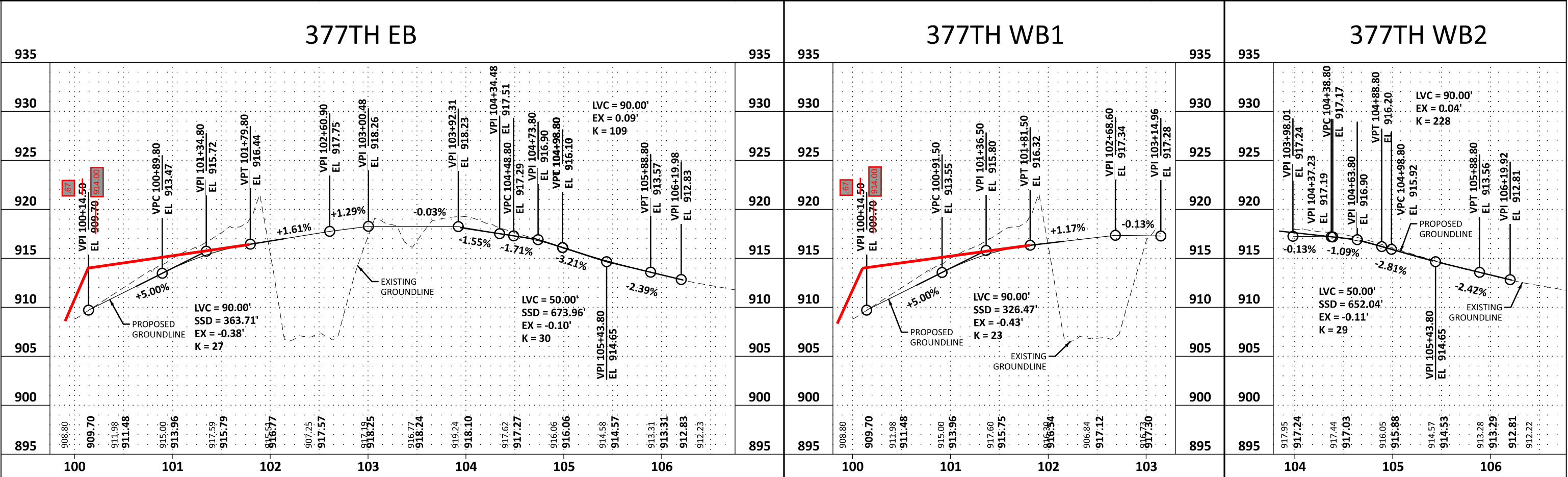
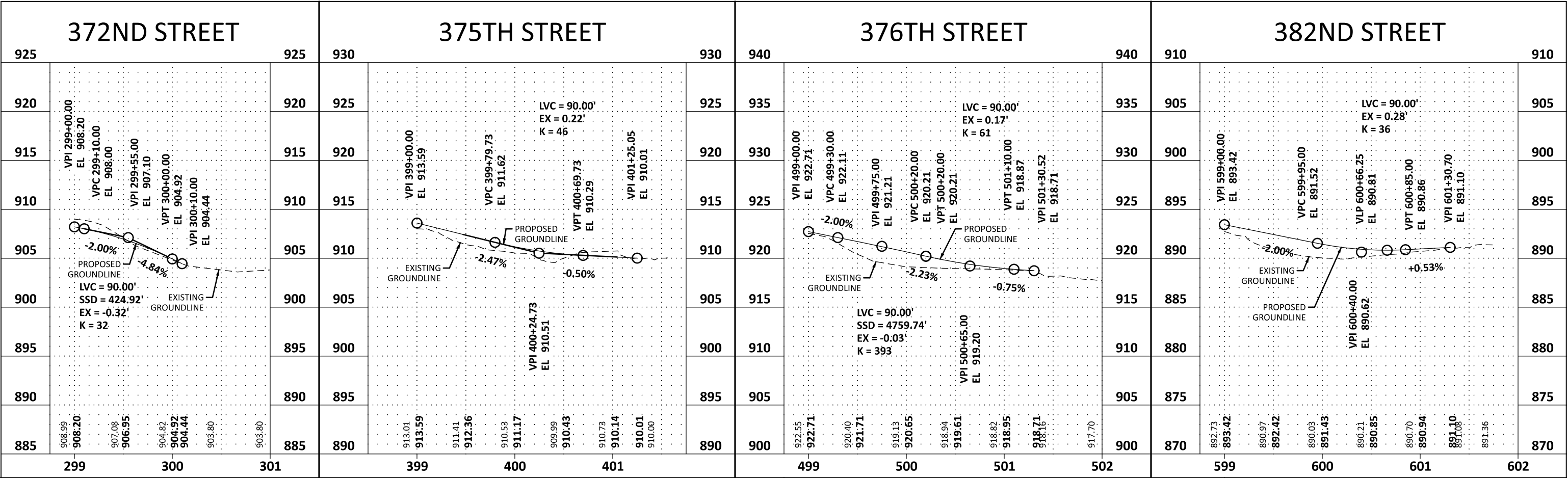
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

SANITARY AND WATERMAIN PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
143
OF
216
SHEETS

DATE: 9/12/2024 2:05:51 PM
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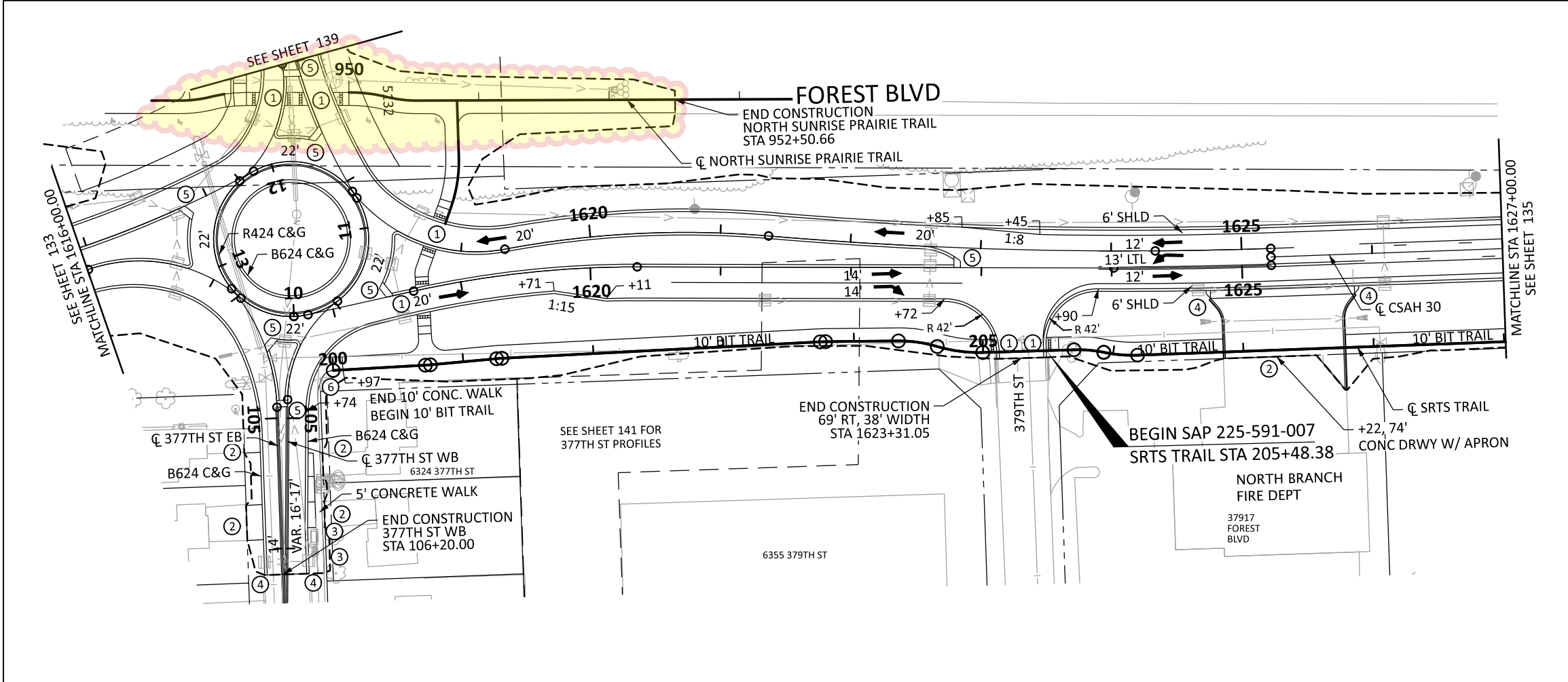


NO. DATE BY CHK REVISIONS				Design By: NEH		I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. NICHOLAS E. HENTZ, P.E. DATE: 9/12/2024 LICENSE NO. 44620				CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota				CHISAGO COUNTY, MINNESOTA				SHEET 141 OF 216 SHEETS			
				Plan By: MKV										PROFILES							
				Checked By: MAN														SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004			
				Approved By: NEH																	

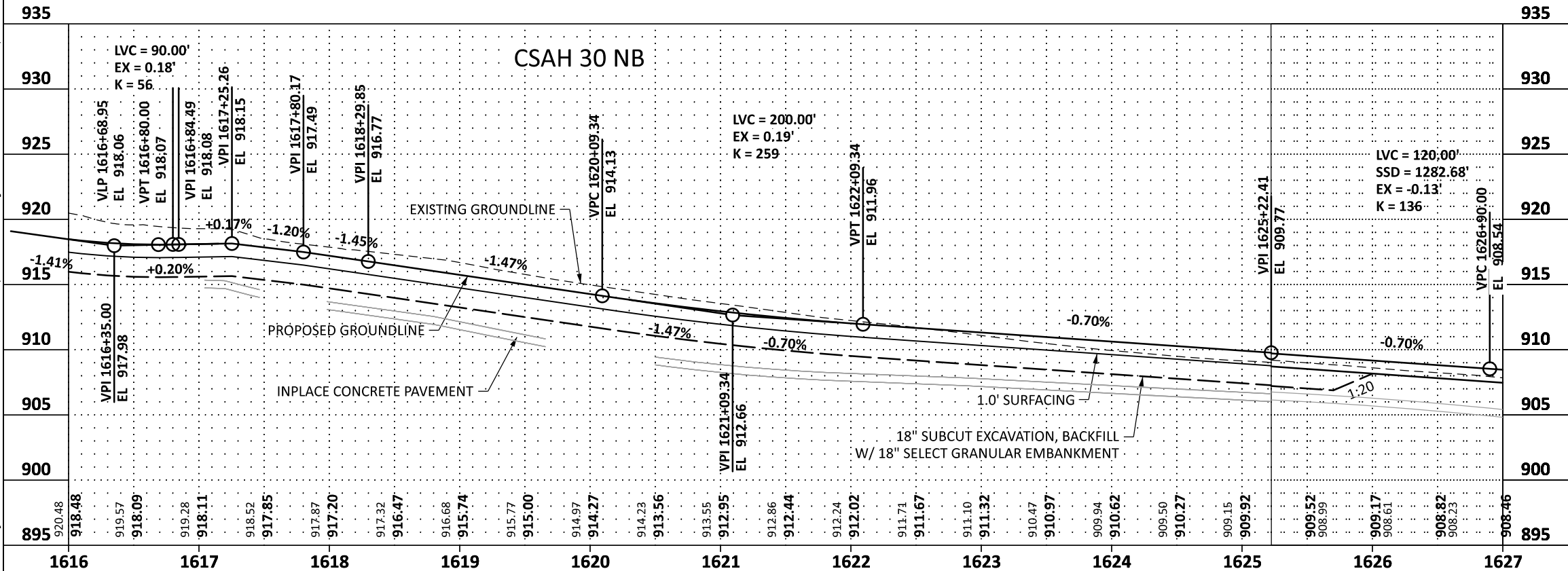
TOWNS EDGE TURN LANE - ROUNDABOUT PROPOSED					
MN/DOT SPECIFICATION NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	ESTIMATED TOTAL
2021.501	MOBILIZATION	LS	1	\$21,029.00	\$21,029.00
2105.607	EXCAVATION - COMMON	C Y	1200	\$6.00	\$7,200.00
2112.519	SUBGRADE PREPARATION	RDST	3	\$200.00	\$600.00
2123.610	STREET SWEEPER (WITH PICKUP BROOM)	HOURL	10	\$175.00	\$1,750.00
2130.523	WATER	MGAL	10	\$50.00	\$500.00
2211.509	AGGREGATE BASE CLASS 5	TON	500	\$42.00	\$21,000.00
2331.603	JOINT ADHESIVE	L F	500	\$1.00	\$500.00
2357.506	BITUMINOUS MATERIAL FOR TACK COAT	GAL	130	\$2.50	\$325.00
2360.509	TYPE SP 9.5 WEARING COURSE MIX (4,F)	TON	140	\$114.00	\$15,960.00
2360.509	TYPE SP 12.5 NON WEARING COURSE MIX (4,F)	TON	140	\$110.00	\$15,400.00
2501.502	30" RC PIPE APRON	EACH	2	\$3,400.00	\$6,800.00
2503.503	12" PVC PIPE SEWER	LIN FT	280	\$54.00	\$15,120.00
2503.503	15" RC PIPE SEWER DESIGN 3006 CLASS V	LIN FT	272	\$38.10	\$10,363.20
2503.503	30" RC PIPE SEWER DESIGN 3006 CLASS III	LIN FT	470	\$73.00	\$34,310.00
2503.603	20" STEEL CASING PIPE	LIN FT	90	\$140.00	\$12,600.00
2504.602	CONNECT TO EXISTING WATER MAIN	EACH	1	\$4,000.00	\$4,000.00
2504.602	HYDRANT	EACH	1	\$7,600.00	\$7,600.00
2504.602	6" GATE VALVE AND BOX	EACH	1	\$2,884.00	\$2,884.00
2504.603	6" WATERMAIN DUCTILE IRON CL 52	LIN FT	20	\$54.00	\$1,080.00
2504.603	10" WATERMAIN DUCTILE IRON CL 52	LIN FT	420	\$84.00	\$35,280.00
2504.603	16" STEEL CASING PIPE	LIN FT	150	\$100.00	\$15,000.00
2506.502	CASTING ASSEMBLY	EACH	1	\$1,000.00	\$1,000.00
2506.502	ADJUST FRAME & RING CASTING	EACH	8	\$950.00	\$7,600.00
2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN G	LIN FT	3.4	\$960.00	\$3,264.00
2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48-4020	LIN FT	22	\$705.00	\$15,510.00
2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60-4020	LIN FT	11.6	\$600.00	\$6,960.00
2506.603	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL	LIN FT	10.5	\$600.00	\$6,300.00
2506.603	RECONSTRUCT DRAINAGE STRUCTURE SPECIAL	LIN FT	6.2	\$516.00	\$3,199.20
2521.518	6" CONCRETE WALK	S F	1160	\$9.50	\$11,020.00
2521.518	3" BITUMINOUS WALK	S F	2430	\$3.80	\$9,234.00
2531.503	CONCRETE CURB & GUTTER DESIGN	L F	400	\$24.50	\$9,800.00
2531.618	TRUNCATED DOMES	S F	48	\$50.00	\$2,400.00
2563.601	TRAFFIC CONTROL	LS	1	\$1,500.00	\$1,500.00
2563.610	FLAGGER	HOURL	10	\$85.00	\$850.00
2564.502	SIGN	S F	23	\$73.50	\$1,690.50
2573.502	STORM DRAIN INLET PROTECTION	EACH	2	\$200.00	\$400.00
2574.507	COMMON TOPSOIL BORROW	C Y	150	\$38.00	\$5,700.00
2575.604	SITE RESTORATION	S Y	1280	\$5.00	\$6,400.00

construction total \$322,128.90
 +25% engineering, admin, construction \$80,532.23
 subtotal \$402,661.13

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- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
 - - - PROPOSED R/W
 - - - TEMPORARY EASEMENT
 - - - PERMANENT EASEMENT
 - WETLAND DELINEATION- AREA OF ENVIRONMENTAL SENSITIVITY
 - TRAFFIC FLOW ARROW
 - MILL AND OVERLAY
- ① PEDESTRIAN CURB RAMP
SEE PEDESTRAIN RAMP DETAILS.
- ② SEE DRIVEWAY TABULATION
FOR MORE INFORMATION.
FIELD VERIFY TIE IN LOCATION
- ③ MAIL BOX SUPPORT
- ④ CURB TRANSITION. SEE MISCELLANEOUS DETAILS.
- ⑤ CONSTRUCT CONCRETE MEDIAN NOSE
PER MNDOT STANDARD PLATE 7113
- ⑥ INSTALL LIGHTING UNIT
LIGHT FOUNDATION DESIGN E



- GENERAL NOTES**
- ALL DIMENSIONS ARE TO FACE OF CURB OR EDGE OF BITUMINOUS UNLESS OTHERWISE NOTED.
 - SEE INTERSECTION DETAILS FOR ADDITIONAL INFORMATION AT INTERSECTIONS.
 - SEE DRIVEWAY DETAIL SHEETS FOR DETAILED DRIVEWAY INFORMATION.
 - ALL CURB AND GUTTER TO BE B624 UNLESS OTHERWISE NOTED.

NO.	DATE	BY	CHK	REVISIONS

Design By:	NEH
Plan By:	MKV
Checked By:	MAN
Approved By:	NEH

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.

NICHOLAS E. HENTZ, P.E.

DATE: 9/12/2024 LICENSE NO. 44620

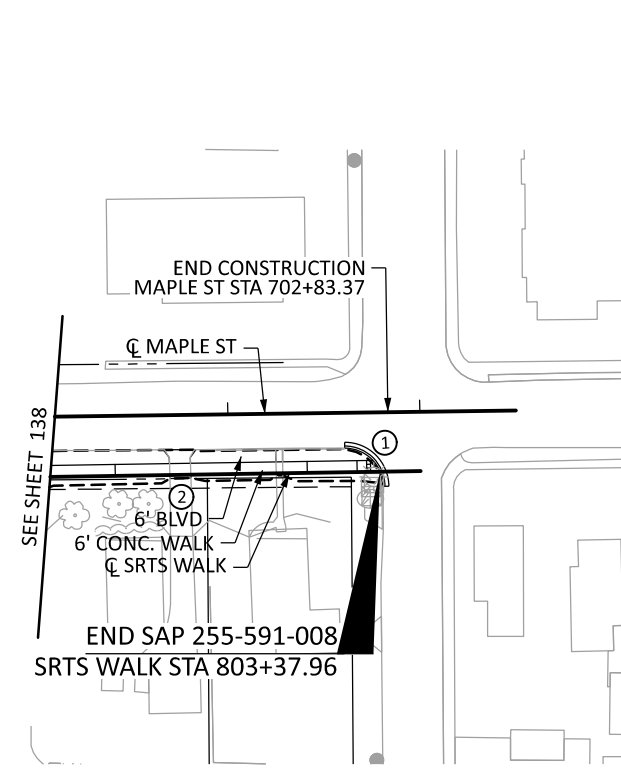
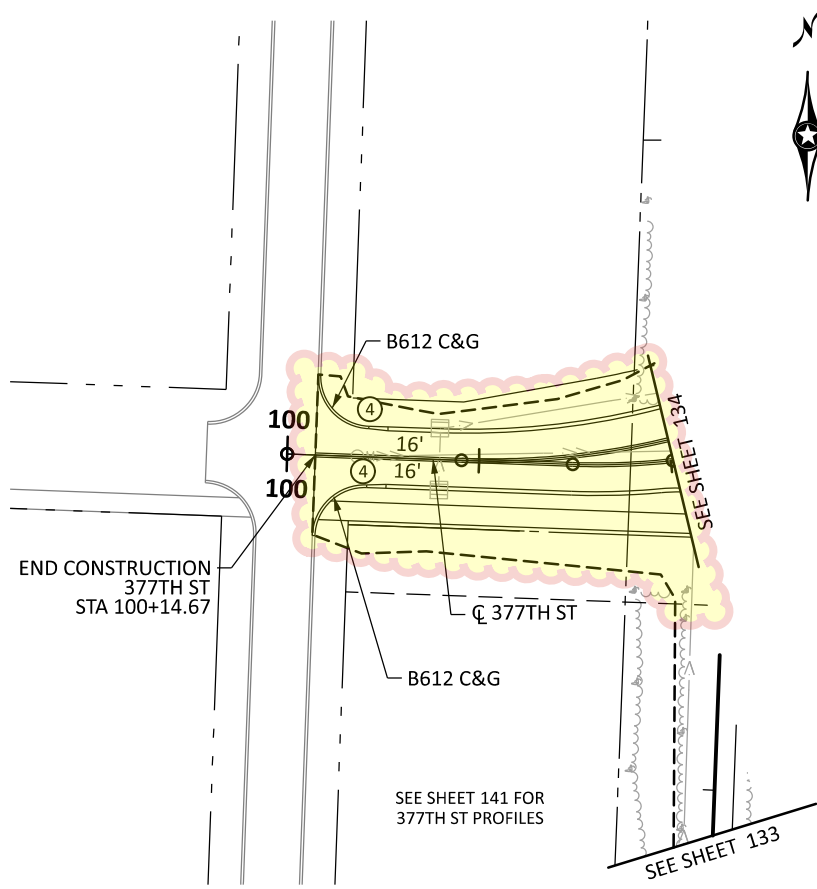


CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

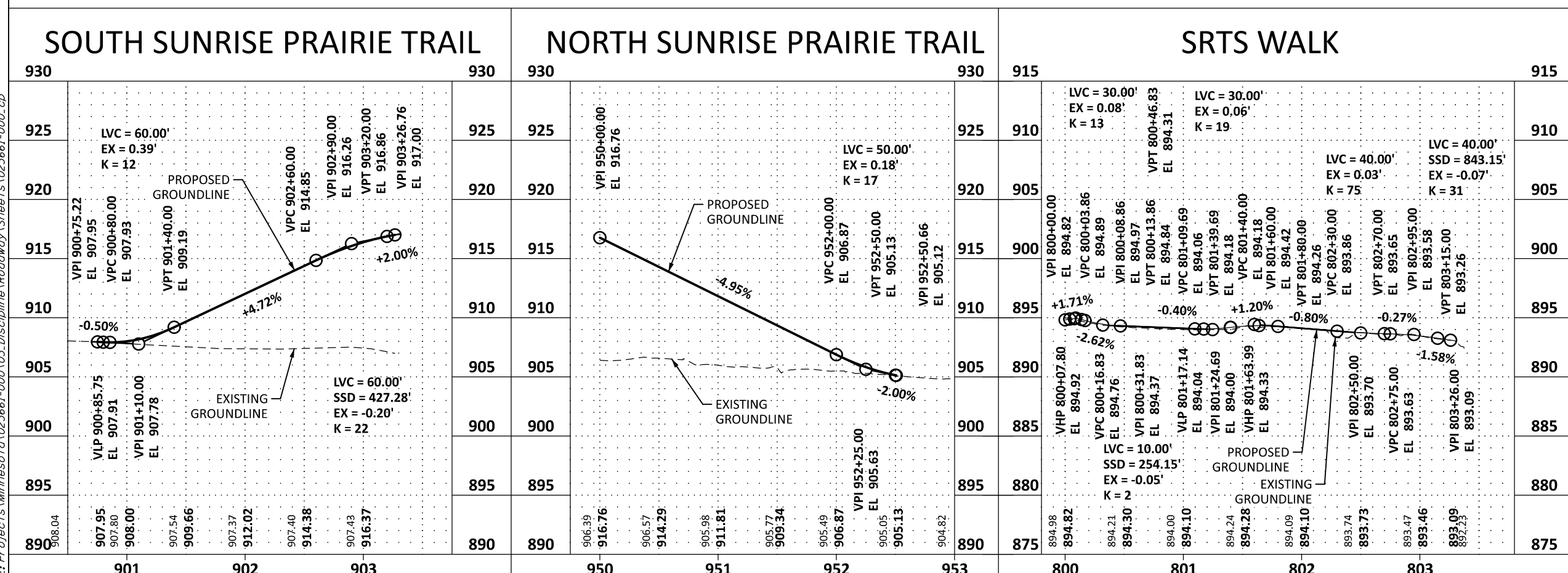
CHISAGO COUNTY, MINNESOTA

CONSTRUCTION PLAN & PROFILE
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET
134
OF
216
SHEETS



- LEGEND**
- CONSTRUCTION LIMITS
 - - - EXISTING R/W
 - - - PROPOSED R/W
 - - - TEMPORARY EASEMENT
 - - - PERMANENT EASEMENT
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<table border="1"><thead><tr><th>NO.</th><th>DATE</th><th>BY</th><th>CHK</th><th>REVISIONS</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr></tbody></table>					NO.	DATE	BY	CHK	REVISIONS																					<table border="1"><tr><td>Design By:</td><td>NEH</td></tr><tr><td>Plan By:</td><td>MKV</td></tr><tr><td>Checked By:</td><td>MAN</td></tr><tr><td>Approved By:</td><td>NEH</td></tr></table>		Design By:	NEH	Plan By:	MKV	Checked By:	MAN	Approved By:	NEH	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. <i>Nicholas E. Hentz, PE</i> NICHOLAS E. HENTZ, PE DATE: 9/12/2024 LICENSE NO. 44620		wsb Chisago COUNTY USA CSAH 30 (Forest Blvd) Improvements Chisago County, Minnesota		CHISAGO COUNTY, MINNESOTA CONSTRUCTION PLAN & PROFILE SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004		SHEET 139 OF 216 SHEETS Page 390 of 739	
NO.	DATE	BY	CHK	REVISIONS																																											
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CSAH 30 Improvements - Low Bid Schedule I																				
Project: CSAH 30 (Forest Blvd) Improvements Project Location: North Branch, Chisago County, MN Project No.: SAP 013-630-021, SAP 225-102-004, SAP 225-591-007 Letting Date: 10/29/2024 10/30/2024																				
STATEMENT OF ESTIMATED QUANTITIES																				
Item No.	Description	Notes	Unit	Unit Price	PROJECT TOTAL		CHISAGO COUNTY SAP 013-630-021						50% CHISAGO COUNTY SAP 013-630-021 50% CITY OF NORTH BRANCH SAP 225-102-004				SAP 225-591-007 CITY OF NORTH BRANCH		CITY OF NORTH BRANCH	
							ROADWAY				STORM SEWER		ROADWAY		STORM SEWER		SAFE ROUTES TO SCHOOL			
							Estimated Quantity	Estimated Cost	Estimated Quantity	Estimated Cost										
2021.501	MOBILIZATION		LUMP SUM	\$460,000.00	1	\$460,000.00	0.08	\$36,800.00	0.49	\$225,400.00	0.17	\$78,200.00	0.13	\$59,800.00	0.03	\$13,800.00	0.05	\$23,000.00	0.05	\$23,000.00
2051.501	MAINT AND RESTORATION OF HAUL ROADS		LUMP SUM	\$10,500.00	1	\$10,500.00			1	\$10,500.00										
2101.502	CLEARING		EACH	\$199.00	51	\$10,149.00							1	\$199.00			50	\$9,950.00		
2101.502	GRUBBING		EACH	\$199.00	51	\$10,149.00							1	\$199.00			50	\$9,950.00		
2101.505	CLEARING		ACRE	\$2,501.00	0.7	\$1,750.70			0.1	\$250.10			0.5	\$1,250.50			0.1	\$250.10		
2101.505	GRUBBING		ACRE	\$2,501.00	0.7	\$1,750.70			0.1	\$250.10			0.5	\$1,250.50			0.1	\$250.10		
2104.502	REMOVE BOX CULVERT		EACH	\$3,700.00	2	\$7,400.00					2	\$7,400.00								
2104.502	REMOVE BOX CULVERT END		EACH	\$3,700.00	4	\$14,800.00					4	\$14,800.00								
2104.502	REMOVE GATE VALVE AND BOX		EACH	\$1,800.00	4	\$7,200.00							2	\$3,600.00			2	\$3,600.00		
2104.502	REMOVE HYDRANT		EACH	\$1,500.00	4	\$6,000.00							2	\$3,000.00			2	\$3,000.00		
2104.502	REMOVE DELINEATOR / MARKER		EACH	\$175.00	5	\$875.00			5	\$875.00										
2104.502	REMOVE SIGN		EACH	\$25.00	25	\$625.00			22	\$550.00			1	\$25.00					2	\$50.00
2104.502	REMOVE LIGHT FOUNDATION		EACH	\$150.00	6	\$900.00			5	\$750.00			1	\$150.00						
2104.502	SALVAGE LIGHTING UNIT		EACH	\$635.32	6	\$3,811.92			5	\$3,176.60			1	\$635.32						
2104.502	SALVAGE SIGN		EACH	\$25.00	5	\$125.00			5	\$125.00										
2104.502	SALVAGE MAIL BOX SUPPORT		EACH	\$200.00	14	\$2,800.00			8	\$1,600.00			2	\$400.00					4	\$800.00
2104.503	SAWING CONCRETE PAVEMENT (FULL DEPTH)		LIN FT	\$6.00	695	\$4,170.00			671	\$4,026.00			24	\$144.00						
2104.503	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)		LIN FT	\$1.90	758	\$1,440.20			648	\$1,231.20							70	\$133.00	40	\$76.00
2104.503	REMOVE PIPE CULVERTS		LIN FT	\$17.00	914	\$15,538.00			806	\$13,702.00			108	\$1,836.00						
2104.503	REMOVE WATER MAIN		LIN FT	\$15.00	110	\$1,650.00													110	\$1,650.00
2104.503	REMOVE CURB AND GUTTER		LIN FT	\$4.50	1120	\$5,040.00			1002	\$4,509.00							78	\$351.00	40	\$180.00
2104.503	REMOVE GUARDRAIL-PLATE BEAM		LIN FT	\$18.00	465	\$8,370.00			465	\$8,370.00										
2104.503	REMOVE STEEL CASING		LIN FT	\$10.00	100	\$1,000.00													100	\$1,000.00
2104.503	REMOVE TENSION CABLE GUARDRAIL		LIN FT	\$20.00	505	\$10,100.00			505	\$10,100.00										
2104.504	REMOVE PAVEMENT	(3) (4)	SQ YD	\$2.00	10531	\$21,062.00			8185	\$16,370.00			2346	\$4,692.00						
2104.504	REMOVE CONCRETE DRIVEWAY PAVEMENT		SQ YD	\$2.75	431	\$1,185.25			431	\$1,185.25										
2104.504	REMOVE BITUMINOUS DRIVEWAY PAVEMENT		SQ YD	\$2.00	710	\$1,420.00			540	\$1,080.00							161	\$322.00	9	\$18.00
2104.504	REMOVE BITUMINOUS PAVEMENT	(4)	SQ YD	\$2.00	35469	\$70,938.00			32033	\$64,066.00			2861	\$5,722.00					575	\$1,150.00
2104.518	REMOVE BITUMINOUS WALK		SQ FT	\$2.00	10035	\$20,070.00							10035	\$20,070.00						
2104.518	REMOVE CONCRETE WALK		SQ FT	\$2.00	970	\$1,940.00			237	\$474.00									733	\$1,466.00
2104.602	REMOVE SIGN SPECIAL		EACH	\$25.00	1	\$25.00							1	\$25.00						
2104.602	SALVAGE SIGN SPECIAL		EACH	\$25.00	7	\$175.00			7	\$175.00										
2104.602	SALVAGE SIGN PANEL SPECIAL		EACH	\$25.00	3	\$75.00			3	\$75.00										
2106.507	EXCAVATION - COMMON	(P)	CU YD	\$6.00	22005	\$132,030.00			13093	\$78,558.00			4649	\$27,894.00			3103	\$18,618.00	1160	\$6,960.00
2106.507	EXCAVATION - SUBGRADE	(P)	CU YD	\$8.50	20871	\$177,403.50			16511	\$140,343.50			3510	\$29,835.00					850	\$7,225.00
2106.507	SELECT GRANULAR EMBANKMENT (CV)	(P)	CU YD	\$11.50	24404	\$280,646.00			18751	\$215,636.50			4794	\$55,131.00					859	\$9,878.50
2106.507	SELECT GRANULAR EMBANKMENT MOD 10% (CV)	(P)	CU YD	\$11.50	1022	\$11,753.00					1022	\$11,753.00								
2106.507	COMMON EMBANKMENT (CV)	(P)	CU YD	\$8.00	13075	\$104,600.00			4181	\$33,448.00			1278	\$10,224.00			7277	\$58,216.00	339	\$2,712.00
2106.601	DEWATERING	(2)	LUMP SUM	\$42,000.00	1	\$42,000.00			1	\$42,000.00										
2130.523	WATER	(6)	M GALLON	\$50.00	400	\$20,000.00			400	\$20,000.00										
2211.507	AGGREGATE BASE (CV) CLASS 5	(P)	CU YD	\$42.00	12188	\$511,896.00			9420	\$395,640.00			1630	\$68,460.00			801	\$33,642.00	337	\$14,154.00
2221.509	SHOULDER BASE AGGREGATE CLASS 5 MOD		TON	\$44.50	494	\$21,983.00			494	\$21,983.00										
2232.504	MILL BITUMINOUS SURFACE (2.0")		SQ YD	\$1.80	40837	\$73,506.60	36863	\$66,353.40	3974	\$7,153.20										
2355.506	BITUMINOUS MATERIAL FOR FOG SEAL		GALLON	\$6.00	2163	\$12,978.00	2163	\$12,978.00												
2357.506	BITUMINOUS MATERIAL FOR TACK COAT		GALLON	\$2.50	11170	\$27,925.00	3326	\$8,315.00	7319	\$18,297.50			403	\$1,007.50					122	\$305.00
2360.509	TYPE SP 12.5 NON WEARING COURSE MIXTURE (3,B)		TON	\$67.00	5102	\$341,834.00			4799	\$321,533.00			303	\$20,301.00						
2360.509	TYPE SP 12.5 WEARING COURSE MIXTURE (3,C)		TON	\$82.00	17081	\$1,400,642.00	4413	\$361,866.00	11693	\$958,826.00			605	\$49,610.00			36	\$2,952.00	334	\$27,388.00
2360.509	TYPE SP 12.5 WEARING COURSE MIXTURE (4,F)		TON	\$114.00	477	\$54,378.00							477	\$54,378.00						
2360.509	TYPE SP 12.5 NON WEARING COURSE MIXTURE (4,F)		TON	\$106.00	239	\$25,334.00							239	\$25,334.00						
2411.507	STRUCTURE EXCAVATION CLASS E		CU YD	\$10.00	2743	\$27,430.00					2743	\$27,430.00								
2412.502	9X4 PRECAST CONCRETE BOX CULVERT END SECTION	(9)	EACH	\$12,000.00	2	\$24,000.00					2	\$24,000.00								
2412.503	9X4 PRECAST CONCRETE BOX CULVERT	(9)	LIN FT	\$1,650.00	200	\$330,000.00					200	\$330,000.00								
2451.507	GRANULAR BEDDING (CV)		CU YD	\$11.50	183	\$2,104.50					183	\$2,104.50								

CSAH 30 Improvements - Low Bid Schedule I																					
Project: CSAH 30 (Forest Blvd) Improvements Project Location: North Branch, Chisago County, MN Project No.: SAP 013-630-021, SAP 225-102-004, SAP 225-591-007 Letting Date: 10/29/2024 10/30/2024																					
STATEMENT OF ESTIMATED QUANTITIES																					
Item No.	Description	Notes	Unit	Unit Price	PROJECT TOTAL		CHISAGO COUNTY SAP 013-630-021						50% CHISAGO COUNTY SAP 013-630-021 50% CITY OF NORTH BRANCH SAP 225-102-004				SAP 225-591-007 CITY OF NORTH BRANCH		CITY OF NORTH BRANCH		
							ROADWAY				STORM SEWER		ROADWAY		STORM SEWER		SAFE ROUTES TO SCHOOL				
							Estimated Quantity	Estimated Cost	Estimated Quantity	Estimated Cost											Estimated Quantity
2501.502	18" GS PIPE APRON		EACH	\$300.00	14	\$4,200.00			14	\$4,200.00											
2501.502	15" RC PIPE APRON		EACH	\$2,700.00	2	\$5,400.00					2	\$5,400.00									
2501.502	18" RC PIPE APRON		EACH	\$2,900.00	8	\$23,200.00			8	\$23,200.00											
2501.502	24" RC PIPE APRON		EACH	\$3,200.00	6	\$19,200.00			6	\$19,200.00											
2501.502	30" RC PIPE APRON		EACH	\$3,400.00	3	\$10,200.00					1	\$3,400.00			2	\$6,800.00					
2501.502	36" RC PIPE APRON		EACH	\$3,800.00	1	\$3,800.00					1	\$3,800.00									
2501.502	15" RC SAFETY APRON		EACH	\$2,775.00	2	\$5,550.00									2	\$5,550.00					
2501.502	18" RC SAFETY APRON		EACH	\$2,950.00	2	\$5,900.00			2	\$5,900.00											
2501.503	18" CAS PIPE CULVERT		LIN FT	\$38.00	320	\$12,160.00			320	\$12,160.00											
2501.503	18" RC PIPE CULVERT DESIGN 3006 CLASS III		LIN FT	\$46.00	376	\$17,296.00			367	\$16,882.00									9	\$414.00	
2501.503	24" RC PIPE CULVERT DESIGN 3006 CLASS III		LIN FT	\$57.50	300	\$17,250.00			300	\$17,250.00											
2502.503	4" PERF TP PIPE DRAIN		LIN FT	\$18.00	600	\$10,800.00			400	\$7,200.00			200	\$3,600.00							
2503.503	12" PVC PIPE SEWER		LIN FT	\$54.00	280	\$15,120.00													280	\$15,120.00	
2503.503	15" RC PIPE SEWER DESIGN 3006 CLASS V		LIN FT	\$38.10	3307	\$125,996.70					1944	\$74,066.40			1363	\$51,930.30					
2503.503	18" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	\$42.40	1012	\$42,908.80					1012	\$42,908.80									
2503.503	24" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	\$52.50	2054	\$107,835.00					2054	\$107,835.00									
2503.503	30" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	\$73.00	947	\$69,131.00					477	\$34,821.00			470	\$34,310.00					
2503.503	36" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	\$101.40	267	\$27,073.80					267	\$27,073.80									
2503.602	CONNECT TO EXISTING MANHOLES (SAN)		EACH	\$4,500.00	1	\$4,500.00													1	\$4,500.00	
2503.603	20" STEEL CASING PIPE		LIN FT	\$140.00	90	\$12,600.00													90	\$12,600.00	
2504.602	CONNECT TO EXISTING WATER MAIN		EACH	\$4,000.00	4	\$16,000.00													4	\$16,000.00	
2504.602	HYDRANT		EACH	\$7,600.00	4	\$30,400.00													4	\$30,400.00	
2504.602	ADJUST HYDRANT AND GATE VALVE		EACH	\$1,500.00	1	\$1,500.00											1	\$1,500.00			
2504.602	ADJUST GATE VALVE AND BOX		EACH	\$500.00	2	\$1,000.00							2	\$1,000.00							
2504.602	6" GATE VALVE AND BOX		EACH	\$2,884.00	4	\$11,536.00													4	\$11,536.00	
2504.603	6" WATERMAIN DUCTILE IRON CL 52		LIN FT	\$54.00	44	\$2,376.00													44	\$2,376.00	
2504.603	10" WATERMAIN DUCTILE IRON CL 52		LIN FT	\$84.00	170	\$14,280.00													170	\$14,280.00	
2504.603	16" STEEL CASING PIPE		LIN FT	\$100.00	150	\$15,000.00													150	\$15,000.00	
2506.502	CASTING ASSEMBLY	(13)	EACH	\$1,000.00	70	\$70,000.00					50	\$50,000.00			18	\$18,000.00			2	\$2,000.00	
2506.502	ADJUST FRAME AND RING CASTING		EACH	\$950.00	2	\$1,900.00			1	\$950.00									1	\$950.00	
2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN G		LIN FT	\$960.00	94.2	\$90,432.00					82	\$78,720.00			12.2	\$11,712.00					
2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48-4020		LIN FT	\$705.00	276.7	\$195,073.50					188.3	\$132,751.50			88.4	\$62,322.00					
2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60-4020		LIN FT	\$600.00	26.9	\$16,140.00					16	\$9,600.00			10.9	\$6,540.00					
2506.602	ADJUST FRAME AND RING CASTING (SPECIAL)		EACH	\$650.00	2	\$1,300.00			1	\$650.00			1	\$650.00							
2506.603	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL	(10)	LIN FT	\$600.00	10.5	\$6,300.00													10.5	\$6,300.00	
2506.603	RECONSTRUCT DRAINAGE STRUCTURE SPECIAL		LIN FT	\$516.00	6.2	\$3,199.20													6.2	\$3,199.20	
2511.504	GEOTEXTILE FILTER TYPE 7		SQ YD	\$3.80	398	\$1,512.40					398	\$1,512.40									
2511.507	RANDOM RIPRAP CLASS I		CU YD	\$125.00	7	\$875.00					7	\$875.00									
2511.507	RANDOM RIPRAP CLASS II	(1)	CU YD	\$125.00	62.8	\$7,850.00			35.8	\$4,475.00	18.8	\$2,350.00			8.2	\$1,025.00					
2511.507	RANDOM RIPRAP CLASS III		CU YD	\$120.00	400	\$48,000.00					400	\$48,000.00									
2521.518	4" CONCRETE WALK		SQ FT	\$5.79	19101	\$110,594.79			485	\$2,808.15			14310	\$82,854.90			3546	\$20,531.34	760	\$4,400.40	
2521.518	7" CONCRETE WALK	(8)	SQ FT	\$13.35	3525	\$47,058.75							3525	\$47,058.75							
2521.518	3" BITUMINOUS WALK		SQ FT	\$1.75	49336	\$86,338.00							11408	\$19,964.00			37928	\$66,374.00			
2521.602	DRILL AND GROUT REINF BAR (EPOXY COATED)	(7)	EACH	\$8.50	93	\$790.50							33	\$280.50			60	\$510.00			
2521.618	CONCRETE CURB RAMP WALK		SQ FT	\$9.50	4449	\$42,265.50			528	\$5,016.00			1619	\$15,380.50			2302	\$21,869.00			

CSAH 30 Improvements - Low Bid Schedule I																				
Project: CSAH 30 (Forest Blvd) Improvements Project Location: North Branch, Chisago County, MN Project No.: SAP 013-630-021, SAP 225-102-004, SAP 225-591-007 Letting Date: 10/29/2024 10/30/2024																				
STATEMENT OF ESTIMATED QUANTITIES																				
Item No.	Description	Notes	Unit	Unit Price	PROJECT TOTAL		CHISAGO COUNTY SAP 013-630-021						50% CHISAGO COUNTY SAP 013-630-021 50% CITY OF NORTH BRANCH SAP 225-102-004				SAP 225-591-007 CITY OF NORTH BRANCH		CITY OF NORTH BRANCH	
							ROADWAY				STORM SEWER		ROADWAY		STORM SEWER		SAFE ROUTES TO SCHOOL			
					Estimated Quantity	Estimated Cost	Estimated Quantity	Estimated Cost	Estimated Quantity	Estimated Cost									Estimated Quantity	Estimated Cost
2545.502	LIGHT FOUNDATION DESIGN STEEL E		EACH	\$1,440.28	11	\$15,843.08							11	\$15,843.08						
2545.502	SERVICE CABINET -TYPE L1		EACH	\$9,718.81	1	\$9,718.81							1	\$9,718.81						
2545.502	SERVICE EQUIPMENT		EACH	\$1,326.23	1	\$1,326.23							1	\$1,326.23						
2545.502	EQUIPMENT PAD B		EACH	\$1,140.75	1	\$1,140.75							1	\$1,140.75						
2545.503	2" NON-METALLIC CONDUIT		LIN FT	\$4.79	1500	\$7,185.00							1500	\$7,185.00						
2545.503	UNDERGROUND WIRE 1/C 8 AWG		LIN FT	\$1.14	6500	\$7,410.00							6500	\$7,410.00						
2545.602	INSTALL LIGHTING UNIT		EACH	\$1,123.50	6	\$6,741.00			5	\$5,617.50			1	\$1,123.50						
2554.502	GUIDE POST TYPE B	(11)	EACH	\$85.00	21	\$1,785.00			13	\$1,105.00	4	\$340.00			4	\$340.00				
2557.503	WIRE FENCE DESIGN 48V-9322		LIN FT	\$80.00	50	\$4,000.00			50	\$4,000.00										
2563.601	TRAFFIC CONTROL	(12)	LUMP SUM	\$34,000.00	1	\$34,000.00	0.08	\$2,720.00	0.49	\$16,660.00	0.17	\$5,780.00	0.13	\$4,420.00	0.03	\$1,020.00	0.05	\$1,700.00	0.05	\$1,700.00
2563.613	PORTABLE CHANGEABLE MESSAGE SIGN		UNIT DAY	\$75.00	100	\$7,500.00			100	\$7,500.00										
2563.618	CONSTRUCTION SIGN SPECIAL	(14)	SQ FT	\$200.00	7	\$1,400.00			7	\$1,400.00										
2564.602	INSTALL SIGN		EACH	\$450.00	5	\$2,250.00			5	\$2,250.00										
2564.602	INSTALL SIGN SPECIAL		EACH	\$250.00	7	\$1,750.00			7	\$1,750.00										
2564.602	INSTALL SIGN PANEL SPECIAL		EACH	\$250.00	3	\$750.00			3	\$750.00										
2564.602	DELINEATOR / MARKER		EACH	\$350.00	3	\$1,050.00			1	\$350.00			2	\$700.00						
2564.602	DELINEATOR / MARKER PANEL		EACH	\$95.00	13	\$1,235.00			6	\$570.00			4	\$380.00					3	\$285.00
2564.618	SIGN		SQ FT	\$73.50	682	\$50,127.00			441	\$32,413.50			173	\$12,715.50					68	\$4,998.00
2565.602	RIGID PVC LOOP DETECTOR 6'X6'	(15)	EACH	\$1,097.52	9	\$9,877.68			9	\$9,877.68										
2565.616	PEDESTRIAN CROSSWALK FLASHER SYSTEM		SYSTEM	\$26,666.16	3	\$79,998.48			1	\$26,666.16			1	\$26,666.16					1	\$26,666.16
2573.501	STABILIZED CONSTRUCTION EXIT		LUMP SUM	\$1,500.00	1	\$1,500.00			1	\$1,500.00										
2573.501	EROSION CONTROL SUPERVISOR		LUMP SUM	\$765.34	1	\$765.34			1	\$765.34										
2573.502	STORM DRAIN INLET PROTECTION		EACH	\$200.00	78	\$15,600.00			58	\$11,600.00			16	\$3,200.00					4	\$800.00
2573.502	CULVERT END CONTROLS		EACH	\$220.00	17	\$3,740.00			9	\$1,980.00							8	\$1,760.00		
2573.503	SILT FENCE, TYPE MS		LIN FT	\$1.95	8278	\$16,142.10			6915	\$13,484.25			474	\$924.30			889	\$1,733.55		
2573.503	SEDIMENT CONTROL LOG TYPE STRAW		LIN FT	\$2.35	3678	\$8,643.30			2078	\$4,883.30			729	\$1,713.15			597	\$1,402.95	274	\$643.90
2573.602	TEMPORARY STREAM DIVERSION SYSTEM		EACH	\$10,000.00	1	\$10,000.00					1	\$10,000.00								
2574.508	FERTILIZER TYPE 3		POUND	\$0.74	3378	\$2,499.72			2320	\$1,716.80			549	\$406.26			404	\$298.96	105	\$77.70
2575.504	RAPID STABILIZATION METHOD 4		SQ YD	\$1.70	31170	\$52,989.00			24484	\$41,622.80							5450	\$9,265.00	1236	\$2,101.20
2575.505	SEEDING		ACRE	\$525.00	12.3	\$6,457.50			8	\$4,200.00			1.9	\$997.50			1.8	\$945.00	0.6	\$315.00
2575.505	DISK ANCHORING		ACRE	\$175.00	8.4	\$1,470.00			6.4	\$1,120.00			1.5	\$262.50					0.5	\$87.50
2575.508	HYDRAULIC STABILIZED FIBER MATRIX		POUND	\$0.91	9445	\$8,594.95			4609	\$4,194.19			1306	\$1,188.46			3420	\$3,112.20	110	\$100.10
2575.509	MULCH MATERIAL TYPE 3		TON	\$650.00	12.4	\$8,060.00			9.7	\$6,305.00			2.2	\$1,430.00					0.5	\$325.00
2575.523	RAPID STABILIZATION METHOD 3		M GALLON	\$495.00	22	\$10,890.00			10.5	\$5,197.50			3	\$1,485.00			8	\$3,960.00	0.5	\$247.50
2575.608	SEED TURFGRASS		POUND	\$3.45	645	\$2,225.25			314	\$1,083.30			89	\$307.05			234	\$807.30	8	\$27.60
2575.608	SEED MESIC INSLOPE		POUND	\$10.30	648	\$6,674.40			441	\$4,542.30			105	\$1,081.50			80	\$824.00	22	\$226.60
2582.503	4" SOLID LINE PAINT		LIN FT	\$0.13	9597	\$1,247.61	3065	\$398.45	6532	\$849.16										
2582.503	6" SOLID LINE PAINT		LIN FT	\$0.17	44609	\$7,583.53	25698	\$4,368.66	18911	\$3,214.87										
2582.503	24" SOLID LINE PAINT		LIN FT	\$3.70	545	\$2,016.50			503	\$1,861.10									42	\$155.40
2582.503	4" BROKEN LINE PAINT		LIN FT	\$0.13	3950	\$513.50	2610	\$339.30	1340	\$174.20										
2582.503	6" DOTTED LINE PAINT		LIN FT	\$0.17	37	\$6.29			37	\$6.29										
2582.503	10" DOTTED LINE PAINT		LIN FT	\$0.40	88	\$35.20	88	\$35.20												
2582.503	4" DOUBLE SOLID LINE PAINT		LIN FT	\$0.26	6680	\$1,736.80			5904	\$1,535.04									776	\$201.76
2582.503	4" SOLID LINE PAINT GROUND IN (WR)		LIN FT	\$1.10	2869	\$3,155.90			1089	\$1,197.90			1543	\$1,697.30					237	\$260.70
2582.503	6" SOLID LINE PAINT GROUND IN (WR)		LIN FT	\$1.30	3856	\$5,012.80			1815	\$2,359.50			2041	\$2,653.30						
2582.503	6" DOTTED LINE PAINT GROUND IN (WR)		LIN FT	\$1.30	46	\$59.80			23	\$29.90			23	\$29.90						
2582.503	12" DOTTED LINE PREFORM THERMO GROUND IN		LIN FT	\$20.00	86	\$1,720.00							43	\$860.00					43	\$860.00
2582.518	PAVEMENT MESSAGE PAINT		SQ FT	\$4.00	1105	\$4,420.00	79	\$316.00	995	\$3,980.00			31	\$124.00						
2582.518	CROSSWALK PREFORM THERMOPLASTIC		SQ FT	\$13.00	474	\$6,162.00			474	\$6,162.00										
2582.518	CROSSWALK PREFORM THERMOPLASTIC GROUND IN		SQ FT	\$15.00	360	\$5,400.00							180	\$2,700.00					180	\$2,700.00
TOTAL						\$6,586,316.60		\$494,490.01		\$3,238,801.63		\$1,134,921.40		\$876,647.54		\$213,349.30		\$322,475.50		\$305,631.22



Prepared By: Shawn Williams, Public Works Director

Presenter: Shawn Williams, Public Works Director

Date: 02/06/2025

Board & Commission: City Council

Subject: Bulk Water Meter Purchase

One of the many duties of the water utility is supplying water meters and replacement of them at the end of its 20-year life cycle. As the meters approach the end of life, the accuracy also diminishes, which means less revenue for the utility. We have 3,300 water meters currently and with new home construction, we have been averaging about 105 new homes per year on municipal services. Each new home requires two meters, service water and an irrigation meter. Both are paid for with the building permit, and after this the utility owns and maintains the meters, including replacement at the end of its life cycle. Our replacement program is going well too, Since 2022 we have replaced 1,200 meters, we have about 250 to go in this next phase of replacement, then we will have a 3-year break before we start the next cycle of 300 to replace. There can be delays in receiving meters, so I have been keeping ahead of our stock to allow for such delays. With that said, I am asking the council to consider approving, in the form of a motion, a "pallet" of meters and radios, which is 240 each, for a total cost of \$73,000.00.

Voting Requirements:

Voting Options Simple Majority

11:16:16 JAN 24 2025

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FERGUSON WATERWORKS #2518

Price Quotation

Phone: 763-560-5200
Fax: 763-560-1799

Bid No: B171128

Bid Date: 01/24/25

Quoted By: BRR

Cust Phone: 651-674-7100

Terms: NET 10TH PROX

Customer: NORTH BRANCH WATER & LIGHT

METER ACCOUNT

PO BOX 339

6408 ELM STREET NORTH

NORTH BRANCH, MN 55056-0176

Ship To:

NORTH BRANCH WATER & LIGHT
METER ACCOUNT
PO BOX 339
6408 ELM STREET NORTH
NORTH BRANCH, MN 55056-0176

Cust PO#: METERS AND RADIOS

Job Name: METER ACCOUNT

Item	Description	Quantity	Net Price	UM	Total
NED2B11RREG21	LF 5/8X3/4 T10 MTR P/C W/O REC G*X	200	171.000	EA	34200.00
M13341200	R900 V4 WALL MIU	200	134.000	EA	26800.00
Net Total:					\$61000.00
Tax:					\$0.00
Freight:					\$0.00
Total:					\$61000.00

Quoted prices are based upon receipt of the total quantity for immediate shipment (48 hours). SHIPMENTS BEYOND 48 HOURS SHALL BE AT THE PRICE IN EFFECT AT TIME OF SHIPMENT UNLESS NOTED OTHERWISE. QUOTES FOR PRODUCTS SHIPPED FOR RESALE ARE NOT FIRM UNLESS NOTED OTHERWISE.

CONTRACTOR CUSTOMERS: IF YOU HAVE DBE/MBE/WBE/DBE/SBE GOOD FAITH EFFORTS DIVERSITY GOALS/ REQUIREMENTS ON A FEDERAL, STATE, LOCAL GOVERNMENT, PRIVATE SECTOR PROJECT, PLEASE CONTACT YOUR BRANCH SALES REPRESENTATIVE IMMEDIATELY PRIOR TO RECEIVING A QUOTE/ORDER.

Seller not responsible for delays, lack of product or increase of pricing due to causes beyond our control, and/or based upon Local, State and Federal laws governing type of products that can be sold or put into commerce. This Quote is offered contingent upon the Buyer's acceptance of Seller's terms and conditions, which are incorporated by reference and found either following this document, or on the web at <https://www.ferguson.com/content/website-info/terms-of-sale>
Govt Buyers: All items are open market unless noted otherwise.

LEAD LAW WARNING: It is illegal to install products that are not "lead free" in accordance with US Federal or other applicable law in potable water systems anticipated for human consumption. Products with "NP" in the description are NOT lead free and can only be installed in non-potable applications. Buyer is solely responsible for product selection.



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Scan the QR code or use the link below to
complete a survey about your bids:

<https://survey.medallia.com/?bidorder&fc=2518&on=23083>



Prepared By: Shawn Williams, Public Works Director

Presenter: Shawn Williams, Public Works Director

Date: 02/06/2025

Board & Commission: City Council

Subject: Adopt the 2025 General Specifications and Detail Plates for Street and Utility Construction

The City of North Branch’s “General Specifications and Detail Plates for Street and Utility Construction” were last updated in April 2007, then again in 2018, then again in September of 2022, in April of 2024 and now in February of 2025. This specification book is the city's standard for protecting the city's largest and most expensive assets; i.e. water, storm sewer, sanitary sewer and importantly, the streets we all drive on. The following is a high-level summary of the changes that have been made to the General Specifications and Detail Plates for Street and Utility Construction.

- Updated to reflect the most current standard general conditions of the Engineers Joint Contract Documents Committee
- Updated to reflect the most current MnDOT specifications
 - Consistent with standard plates
 - Consistent with most current testing procedures and rates
- Updated watermain details and testing requirements
 - Added more information regarding developer requirements (i.e. service termination points and curb stop locations, televising and testing requirements now done by the city and billed back to the developer. The developer has always paid for this. The reason for the change was that it was not getting done correctly.
- Updated to reflect the most current MN City Engineers Association (CEAM) manual
- Updated standard plates to reflect public works comments, such as better reflective hydrant markers, and adding the STORZ connection for the fire department, cul-de-sac design with mail box placement, asphalt pacer requirements.

If approved by council, the book will be dated February 2025 to coincide with Council’s approval. It will be available on the city’s website immediately.

Voting Requirements:

Voting Options **Simple Majority**



NORTH BRANCH

City of North Branch
6408 Elm Street
North Branch, MN 55056

General Specifications and Standard Detail Plates for Street and Utility Construction



FEBRUARY 2025



City of North Branch

**General Specifications and
Standard Detail Plates
for
Street and Utility Construction**

February 2025

**City of North Branch
6408 Elm Street, PO Box 910
North Branch, Minnesota 55056
Phone: 651.674.8113
Fax: 651.674.8262**

CERTIFICATION

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.

A handwritten signature in black ink, appearing to read 'Justin Messner', is written over a horizontal line.

Justin Messner, PE

Date: February 2025

Lic. No. 45857

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
- 11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
 - 12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
 - 13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
 - 14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
 - 15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
 - 16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
 - 17. *Cost of the Work*—See Paragraph 13.01 for definition.
 - 18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
 - 19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
 - 20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
 - 21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers’ instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - 1. does not conform to the Contract Documents;
 - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
 - 1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 - 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 - 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 - 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
 - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
 - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
 3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
 4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions:* Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;
 3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition

and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the

required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

- C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.
- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.
- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed

by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);
 4. not seek contribution from insurance maintained by the additional insured; and
 5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will

provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

- E. *Insurance of Other Property; Additional Insurance:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.
 - 1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 - 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
 - 1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.
- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or

description contains or is followed by words reading that no like, equivalent, or “or equal” item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an “or equal” item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
 - b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor’s Expense*: Contractor shall provide all data in support of any proposed “or equal” item at Contractor’s expense.
- C. *Engineer’s Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each “or-equal” request. Engineer may require Contractor to furnish additional data about the proposed “or-equal” item. Engineer will be the sole judge of acceptability. No “or-equal” item will be ordered, furnished, installed, or utilized until Engineer’s review is complete and Engineer determines that the proposed item is an “or-equal,” which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer’s Determination*: Neither approval nor denial of an “or-equal” request will result in any change in Contract Price. The Engineer’s denial of an “or-equal” request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an “or-equal” item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor’s Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that

Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a

Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation.

Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as

being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such

changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when

Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

- 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.
 3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.
5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.
 - d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is

not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

1. Observations by Engineer;
 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. Use or occupancy of the Work or any part thereof by Owner;
 5. Any review and approval of a Shop Drawing or Sample submittal;
 6. The issuance of a notice of acceptability by Engineer;
 7. The end of the correction period established in Paragraph 15.08;
 8. Any inspection, test, or approval by others; or
 9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.
- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER’S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer’s status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner’s duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner’s duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner’s identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner’s responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner’s responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner’s responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner’s Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor’s failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the

responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.

- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.
- E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of

inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

- E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.
- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
 - 1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 - 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 - 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will be determined as follows:
 - 1. A mutually acceptable fixed fee; or
 - 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;

- d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
- e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
- f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

- A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.
- B. *Change Proposal Procedures*
 - 1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
 - 2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
 4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
 5. *Binding Decision:* Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion:* Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval:* If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim:* If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 Cost of the Work

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors

acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.
 - c. *Construction Equipment Rental*
 - 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
 - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded:* The term Cost of the Work does not include any of the following items:
- 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
 - 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 6. Expenses incurred in preparing and advancing Claims.
 - 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *Allowances*

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances*: Contractor agrees that:
 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.
- E. *Adjustments in Unit Price*
 - 1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
 - 2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
 - 3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.

- C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
 3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
 4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;

- b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
- 3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
- 4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
- 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
- 6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining

after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work,

property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
 - 2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is

acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

- D. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced.

Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.

- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in

connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 Contractor May Stop Work or Terminate

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 Methods and Procedures

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 2. agree with the other party to submit the dispute to another dispute resolution process; or
 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SUPPLEMENTARY CONDITIONS

INTRODUCTION

These Supplementary Conditions amend or supplement EJCDC® C 700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix “SC” added—for example, “Paragraph SC 4.05.”

ARTICLE 1 DEFINITIONS AND TERMINOLOGY

SC 1.01 Defined Terms

Modify the definition of *Technical Data*, Paragraph 1.01.A.46 by amending the first sentence of Paragraph 1.01.A.46.b to read as follows:

If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.

Add to the list of definitions in Paragraph 1.01.A by inserting the following as numbered items in their proper alphabetical positions:

Observer – The individual or entity by with whom the Owner and Engineer is represented in the observation and construction of the Project.

Project Manual – The written documents prepared for, or made available for, procuring and construction the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing condition information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

ARTICLE 2 PRELIMINARY MATTERS

SC 2.02 Copies of Documents

Delete Paragraph 2.02.A in its entirety and replace with the following:

- A. Owner shall furnish to Contractor one printed copy of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

SC 2.03 Before Starting Construction

Modify the beginning of the first sentence of Paragraph 2.03.A to read as follows:

Preliminary Schedules: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents) and prior to the preconstruction conference, Contractor shall submit to Engineer for timely review:

Delete Paragraph 2.03.A.3 in its entirety.

SC 2.04 Preconstruction Conference; Designation of Authorized Representative

Delete Paragraph 2.04.A in its entirety and replace with the following:

- A. Before any work at the Site is started, Engineer will arrange a preconstruction conference attended by Owner, Contractor, Engineer, private utility owners, and others as appropriate to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

SC 2.05 Acceptance of Schedules

Delete the first sentence of Paragraph 2.05.A.

Delete Paragraph 2.05.A.3 in its entirety.

SC 2.06 Electronic Transmittals

Add the following new paragraphs to Paragraph 2.06:

- D. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.
- E. Electronic Documents that are exchanged may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitation, and restrictions, set forth in the Contract Documents.
- F. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for project purposes.

ARTICLE 3 CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC 3.02 Reference Standards

Add the following new paragraph immediately after Paragraph 3.02.A:

- B. The Work shall be performed in accordance with:
 - 1. the Project Manual;
 - 2. the Project Plans;
 - 3. the City of North Branch General Specification and Standard Detail Plates for Street and Utility Construction, dated February 2025;
 - 4. the 2020 Edition of the Minnesota Department of Transportation (MnDOT) Standard Specifications for Construction; and
 - 5. the 2023 Edition of the City Engineers Association of Minnesota (CEAM) Standard Specifications.

ARTICLE 4 COMMENCEMENT AND PROGRESS OF THE WORK

SC 4.04 Progress Schedule

Amend the first sentence of Paragraph 4.04.A to read as follows:

Contractor shall adhere to the Progress Schedule submitted in accordance with Paragraph 2.03 as it may be adjusted from time to time as provided below.

Amend the first sentence of Paragraph 4.04.A.1 to read as follows:

1. Contractor shall submit to Engineer for acceptance proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

ARTICLE 5 AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC 5.01 Availability of Lands

Add the following language at the end of Paragraph 5.01.A:

If the Contractor believes that there has been delay by Owner in furnishing land, right-of-way, or easements, Contractor's sole remedy shall be an extension of Contract Time, for which the Contractor may make a claim therefore as provided in Article 12.

SC 5.03 Subsurface and Physical Conditions

Add the following new paragraphs immediately after Paragraph 5.03.D:

- E. The following table lists the reports of explorations and tests of subsurface conditions, and the drawings of existing physical conditions, at or adjacent to the Site that contain Technical Data.

Technical Data upon which Contractor may rely is specifically identified.

Report/Drawing Title	Date of Report/Drawing	Technical Data

- F. Copies of reports and drawings identified in SC 5.03.E are included with the Bidding Documents only for reference, and are not part of the Contract Documents.
- G. Under no circumstances may Contractor rely upon the data contained in reports of explorations or tests, regarding the amounts, elevations, or locations of subsurface groundwater.

SC 5.06 Hazardous Environmental Conditions at Site

Delete Paragraph 5.06.A in its entirety and replace with the following:

- A. *Reports and Drawings:* There are no reports or drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site.

ARTICLE 6 BONDS AND INSURANCE

SC 6.01 Performance, Payment and Other Bonds

Add the following new paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C 610, Performance Bond, or as acceptable to the Owner.
2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C 615, Payment Bond, or as acceptable to the Owner.

Add the following paragraphs immediately after Paragraph 6.01.B:

1. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be two years after the date of Notice of Acceptability of Work.
2. After the Owner formally accepts the project and the Notice of Acceptability of Work is issued, Contractor shall furnish a maintenance bond in a bond amount of **100** percent of the final Contract Price. The maintenance bond period will extend to a date two years after the date of Notice of Acceptability of Work. Contractor shall deliver the fully executed maintenance bond no later than 10 days after the date of Notice of Acceptability of Work.
3. The maintenance bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

SC 6.03 Contractor's Insurance

Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- D. *Other Additional Insureds:* As a supplement to the provision of Paragraph 6.03.C of the General Conditions, the required policies, including but not limited to the commercial general liability, automobile liability, umbrella or excess policies, must include as additional insureds the following:
 1. City of North Branch (Owner)
 2. WSB & Associates, Inc. d/b/a WSB (Engineer)
- E. *Workers' Compensation and Employer's Liability:* Contractor must purchase and maintain workers' compensation and employer's liability insurance in accordance with the Minnesota statutory requirements and must include the following:
 1. Part 2, Employer's Liability including Stop Gap Liability for monopolistic states;
 2. Coverage C: All States Coverage;
 3. Waiver of subrogation in favor of the Owner; and
 4. If applicable, USL&H, Maritime, Voluntary, and Foreign Coverage.

The Contractor must also require Subcontractors to provide workers' compensation insurance in accordance with the requirements above.

If the Contractor is self-insured for its obligation under the Worker's Compensation Statute in the jurisdiction where the Project is located, the Contractor must provide the Owner with a Certification of the Authority to Self-Insure.

Worker's Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Employer's Liability	
Each accident	\$2,000,000
Each employee	\$2,000,000
Policy limit	\$2,000,000

- F. *Commercial General Liability – Claims Covered:* Contractor must provide and maintain commercial general liability insurance to cover claims arising from operations under the Contract, whether such operations are by the Contractor, subcontractor, lower-tier subcontractor or by anyone directly or indirectly employed under the Contract.
- G. *Commercial General Liability – Form and Content:* Contractor's commercial liability policy must include the following types of coverage:
1. Premises and Operations Bodily Injury and Property Damage
 2. Personal and Advertising Injury
 3. Products and Completed Operations Liability
 - a. Such insurance must be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 4. Contractual Liability as provided in ISO form CG 00 01 12 04 13 or its equivalent
 5. Pollution exclusion with standard exception as per ISO Commercial General Liability Coverage Form – CG 00 01 12 04 13 or equivalent
 6. Independent Contractors – Let or Sublet Work
 7. Waiver of subrogation in favor of the Owner
 8. Owner names as an Additional Insured, to the extent permitted by law, for claims arising out of the Contractor's negligence or the negligence of those for whom the Contractor is responsible, for both ongoing and completed operations
 9. Coverage under the General Liability Policy(ies) of the Contractor will be as broadly construed for the Owner as is available to the Contractor.

Contractor agrees its coverage will not contain any restrictive endorsement(s) excluding or limiting Broad Form Property Damage (BFPD) or Explosion, Collapse, Underground (XCU).

- H. *Commercial General Liability – Excluded Content:* The commercial general liability insurance policy, including its coverages, will not contain any restrictive endorsement(s) excluding or limiting Broad Form Property Damage (BFPD) or Explosion, Collapse, Underground (XCU).
- I. *Commercial General Liability – Minimum Policy Limits:* The liability limits specified below are the minimum limits required, and any and all additional limits provided to the Contractor will be available on an excess, umbrella, or other basis to the additional insured for any and all covered claims.

Commercial General Liability	Policy limits of not less than:
Per Occurrence	\$2,000,000
Annual aggregate applying per Project or location	\$2,000,000
Annual aggregate applying to Products and Completed Operations	\$2,000,000
Fire damage (any one fire)	\$50,000
Medical expense (any one person per occurrence)	\$5,000

- J. *Automobile Liability*: Contractor must provide and maintain insurance to cover liability arising out of the operations, use, or maintenance of all owned, non-owned, and hired motor vehicles. A waiver of subrogation in favor of the Owner must also be included.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	\$2,000,000
Each Accident	\$2,000,000
Property Damage	
Each Accident	\$2,000,000
Or	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage) per occurrence	\$2,000,000

- K. *Aircraft Liability Insurance*: If the Contractor uses aircraft (including "Unmanned Aerial Vehicles") to perform the Work, then the Contractor must provide Aviation (aircraft) insurance protecting it from claims for bodily injury and property damage whether the operations are by Contractor or by a subcontractor or by anyone directly or indirectly employed under the Contract. The insurance must cover the Contractor and its employees as well as the Owner and the Owner's employees as additional insured.

Aircraft Liability	Policy limits of not less than:
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage) per occurrence	\$2,000,000

- L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements*: Contractor may meet the policy limits specified for employer's liability, commercial general liability, automobile liability, and aircraft liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein.
- M. *Contractor's Pollution Liability Insurance*: Contractor is not required to provide Pollution Liability Insurance under this Contract.
- N. *Contractor's Professional Liability Insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	N/A
Annual Aggregate	N/A

SC 6.04 Builder's Risk and Other Property Insurance

Delete Paragraph 6.04.A and insert the following in its place:

- A. *Builder's Risk:* Contractor is not required to purchase and maintain builder's risk insurance under this Contract. However, any damage or loss to property shall be the sole responsibility of the Contractor until final acceptance of the Work.

Supplement Paragraph 6.04 of the General Conditions with the following provision:

- F. *Builder's Risk and Other Property Insurance Deductibles:* The purchaser of any required builder's risk, installation floater, or other property insurance will be responsible for costs not covered because of the application of a policy deductible.

ARTICLE 7 CONTRACTOR'S RESPONSIBILITIES

SC 7.07 Concerning Subcontractors and Suppliers

Add the following new paragraph to Paragraph 7.07:

- N. In accordance with MINN. STAT. 471.425, Contractor shall pay any subcontractor within 10 days of the Contractor's receipt of payment from the Owner.

SC 7.16 Submittals

Amend Paragraph 7.16.B.1.a to read as follows:

Contractor shall submit as a minimum, one electronic copy or as required in the Specifications.

Add the following new paragraph immediately after Paragraph 7.16.B.1.b:

- a. Detailed, dimensioned manufacturer's drawings shall be submitted for all materials, apparatus and machinery, and for such fittings and devices as the Engineer may direct, including but not limited to: manhole/catch basin structures, castings, sewer pipe, watermain, lift stations, and waterworks brass.

Amend Paragraph 7.16.B.3 by striking out the following words:

and approval

Amend the second sentence of Paragraph 7.16.C.1 by striking out the following words:

and approval

Amend Paragraph 7.16.C.2 by striking out the following words:

and approval

Amend Paragraph 7.16.C.3 to read as follows:

Engineer's review of a separate item as such will not indicate acceptance of the assembly in which the item functions.

Amend the first sentence of Paragraph 7.16.C.4 by striking out the following words:

and approval

Amend Paragraph 7.16.C.5 by striking out the following words:

and approval

Amend Paragraph 7.16.C.6 by striking out the following words:

and approval

Amend Paragraph 7.16.C.7 to read as follows:

Neither Engineer's receipt, review or acceptance of a Shop Drawing or Sample will result in such item becoming a Contract Document.

Amend Paragraph 7.16.C.8 to read as follows:

Contractor shall perform the Work in compliance with the requirements and commitments set forth in accepted Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

Amend the first sentence of Paragraph 7.16.D.1 by striking out the following words:

and approval

Amend the first sentence of Paragraph 7.16.D.2 to read as follows:

Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required acceptance of an item with no more than two resubmittals.

Amend Paragraph 7.16.D.3 to read as follows:

If Contractor requests a change of a previously accepted Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

SC 7.17 Contractor's General Warranty and Guarantee

Amend Paragraph 7.17.D.5 by striking out the following words:

and approval

ARTICLE 8 OTHER WORK AT THE SITE

SC 8.01 Other Work

Add the following language at the end of Paragraph 8.01.C:

Contractor shall cooperate with all parties to facilitate the prompt completion of all contracts for work at or adjacent to the Site.

SC 8.02 Coordination

Add the following new paragraphs immediately following paragraph 8.02.B:

- C. Contractor is hereby advised that the following work may be performed at or adjacent to the Site by others during the Contract Time:
 - 1. The individual lot owners or their agents may be site grading and/or constructing buildings on the lots adjacent to the proposed streets.
 - 2. Private utility companies may be installing and/or relocating underground facilities.

SC 8.03 Legal Relationships

Add the following sub-paragraph to Paragraph 8.03.B:

3. If Owner performs work for the Contractor, the Contractor must pay Owner for such work with no deduction in Contract amount.

ARTICLE 10 ENGINEER'S STATUS DURING CONSTRUCTION

SC 10.02 Visits to Site

Add the following new paragraph immediately following paragraph 10.02.B:

- C. Throughout the construction phase, regular weekly meetings will be held by the Engineer on site to review progress and to discuss items necessary for an orderly completion of the project. This weekly construction meeting shall include the Owner, Engineer, and Contractor. Contractor's representative must be able to make decisions for the Contractor pertaining to the project. All project conflicts shall be brought to these meetings, including requests for additional payment. Meeting minutes will be provided to all participants as a record of the meeting.

SC 10.03 Resident Project Representative

Add the following new subparagraph immediately after Paragraph 10.03.A:

1. On this Project, by agreement with the Owner, the Engineer will not furnish a Resident Project Representative. Rather, the Engineer will furnish an Observer to represent both the Owner and the Engineer at the Site and to assist Engineer in observing the progress and quality of the Work.

Add the following new paragraphs immediately after Paragraph 10.03.B:

- C. The Observer's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. Observer's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The Observer will:
 1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
 2. *Safety Compliance:* Comply with Site safety programs, as they apply to Observer, and if required to do so by such safety programs, receive safety training specifically related to Observer's own personal safety while at the Site.
 3. *Liaison*
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.
 4. *Review of Work; Defective Work*
 - a. Conduct on-site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Observe whether any Work in place appears to be defective.

- c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
- 5. *Inspections and Tests*
 - a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
 - b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
- 6. *Payment Requests*: Review Applications for Payment with Contractor.
- 7. *Completion*
 - a. Participate in Engineer's visits regarding Substantial Completion.
 - b. Assist in the preparation of a punch list of items to be completed or corrected.
 - c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
 - d. Observe whether items on the final punch list have been completed or corrected.
- D. The Observer will not:
 - 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
 - 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
 - 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
 - 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
 - 5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
 - 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
 - 7. Authorize Owner to occupy the Project in whole or in part.

SC 10.07 Limitations on Engineer's Authority and Responsibilities

Add the following new sub-paragraph to paragraph 10.07.A:

- 1. Insofar as the subject matter of any pertinent claim, dispute, or other matter falls within the realm of the technical expertise of Engineer, Engineer shall not render any decision on any claims, disputes, or other matters the subject matter of which, at Engineer's sole discretion, requires legal, rather than technical interpretation.

Add the following new paragraph immediately following paragraph 10.07.E:

- F. Paragraph 10.07 pertains to the Engineer's responsibilities to the Contractor and its subcontractors, suppliers, and other agents. Nothing in this paragraph shall be construed to limit the Engineer's responsibilities to the Owner, if any, under the Engineer's contract with the Owner.

ARTICLE 11 CHANGES TO THE CONTRACT

SC 11.06 Unauthorized Changes in the Work

Add the following new paragraphs immediately following paragraph 11.06.A:

- B. Except as specifically authorized in writing by the Engineer at the time additional work is done beyond the original scope of the Contract Documents, the Contractor shall make no claims for additional compensation. The Contractor's plea of ignorance of foreseeable conditions which will create difficulties or hindrances in the execution of the Work will not be acceptable

to the Owner as an excuse for any failure of the Contractor to fulfill the requirements of the Contract Documents, and shall not be a basis for the Contractor's claim for additional compensation.

- C. Any discrepancies in or conflicts between the items described in these Contract Documents must be submitted in writing to the Engineer for adjustment prior to proceeding with the Work as any claims for additional compensation to achieve compliance with the requirements of those items will not be allowed or considered.

SC 11.09 Change Proposals

Delete paragraph 11.09.B in its entirety, and replace with the following:

- B. *Change Proposal Procedures:* All Change Proposal procedures shall follow the requirements of MnDOT 1403, Notification for Contract Revisions.

ARTICLE 12 CLAIMS

SC 12.01 Claims

Amend the first sentence of paragraph 12.01.B to read as follows:

The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 10 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 10 days of the decision under appeal.

ARTICLE 13 COST OF WORK; ALLOWANCES, UNIT PRICE WORK

SC 13.03 Unit Price Work

Delete Paragraph 13.03.E in its entirety.

ARTICLE 14 TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

SC 14.02 Tests, Inspections, and Approvals

Add the following sub-paragraphs to paragraph 14.02.A:

1. The Contractor shall provide a minimum 48-hour notice to the Observer for any testing that must be observed or accomplished by someone other than the Contractor's personnel. All final tests and inspections shall be performed in the presence of the Observer.
2. Signed copies of all reports on tests shall be sent at once to the Owner, Engineer, and Contractor.
3. Inspection and testing shall in no way relieve the Contractor or supplier from the responsibility of furnishing materials and workmanship in accordance with the Contract Documents.

ARTICLE 15 PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

SC 15.01 Progress Payments

Amend paragraph 15.01.A to read as follows:

Basis for Progress Payments: The Contractor's Bid Unit Prices will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to

Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03.

Delete paragraph 15.01.D and insert the following:

D. *Payment Becomes Due*

1. Thirty days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor, unless extenuating circumstances exist which would preclude such payment by Owner to Contractor. If such extenuating circumstances exist, then payment shall be made within 45 days after Owner received the Application for Payment.
2. Contractor's acceptance of partial payment constitutes a certification by the Contractor that the Work covered by the partial payment meets the Contract requirements.
3. Contractor must promptly notify the Owner if the Contractor receives an underpayment or overpayment for the Work. The Contractor must refund the Owner any overpayment in response to a request for refund of overpayment within 30 days of the Owner's request. If the Contractor fails to refund overpayment, the Owner may deduct the amount of overpayment from any moneys due or becoming due to the Contractor.

SC 15.03 Substantial Completion

Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

SC 15.05 Final Inspection

Add the following language at the end of the second sentence of Paragraph 15.05.A:

If, after such measures are taken, subsequent inspections by the Engineer reveal that any of the previously identified construction items remain incomplete or defective, the Engineer will again notify the Contractor in writing of the remaining construction items. All costs associated with any subsequent inspections in which said remaining particulars are revealed, will be documented by the Engineer and paid by the Contractor to the Owner.

SC 15.06 Final Payment

Add the following new sub-paragraphs to Paragraph 15.06.A:

4. Before final application for payment is made for the Work, the Contractor must make satisfactory showing of compliance with MINN. STAT. 290.92, which requires the withholding of state income taxes for wages paid to employees on this project. Receipt by the Engineer of a certificate of Compliance from the Commissioner of Taxation to the Owner will satisfy this requirement. The Contractor is advised that before such certificate can be issued, the Contractor must first place on file with the Commissioner of Taxation an affidavit that the Contractor has complied with the provisions of MINN. STAT. 290.92. The required affidavit form will be supplied by the Commissioner of Taxation, Centennial Building, St. Paul, Minnesota, on request.
5. Final payment will not be made until the Contractor has filed with the Engineer evidence in the form of an affidavit or such other evidence as may be required that all claims against the Contractor by reason of the Contract have been fully paid or satisfactorily secured. This shall

be in the form of IC134 forms, paid-in-full final lien waivers from the Contractor, subcontractors, and major suppliers, and a Consent of Surety. Such evidence shall precede or accompany the final application for payment. If evidence is not furnished, the Owner may retain out of any monies due said Contractor sums sufficient to cover all lienable claims unpaid.

SC 15.08 Correction Period

Add the following new paragraphs to Paragraph 15.08:

- G. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be the number of years set forth in SC 6.01.B.1.
- H. With regard to any surface concrete work, including but not limited to sidewalks, curb, gutter, and driveway aprons within the project area, the Contractor shall assume full responsibility for any warranty work unless written approval is provided by the Owner releasing the Contractor for the responsibility for damages. The intent of this provision is to release the Contractor from accepting monetary losses for destruction of surface concrete work due to damages and circumstances beyond control of the Contractor. At no point during the two-year correction period shall this relieve the Contractor's responsibility for correction of the defective work as states above, or as caused by poor construction and defective materials on surface concrete work within the project area. The Owner or engineer shall make the final determination of what work is defective within the project area at any point within the two-year correction period.

ARTICLE 17 FINAL RESOLUTION OF DISPUTES

SC 17.02 Mediation

Add the following new paragraph to Article 17:

17.02 *Mediation*

- A. To resolve any conflicts that arise during the design or construction of the project or following the completion of the project, the Contractor and the Engineer agree that all disputes between them arising out of or relating to this agreement shall be resolved, if possible, at the lowest possible staff level. If the individuals with full settlement authority for the Contractor and the Engineer are unable to achieve a resolution, the dispute shall be submitted to non-binding mediation.
- B. The rights and remedies available to the Contractor shall be limited to breach of Contract, and no other cause of action, including, without limitation, negligence, misrepresentation or other tort theory. The Owner or Contractor may assert any such breach of contract claim in any court of competent jurisdiction. Neither the Owner nor the Contractor shall be entitled to a jury trial in any such action.
- C. The rights and remedies to the Owner hereunder shall be in addition to and shall not be constructed in any way as a limitation of any rights and remedies available to the Owner, which is otherwise available by law or contract, by special warranty or guarantee, or by other provision of the Contract Documents.
- D. The provision of Paragraph 17.02 shall be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which it may apply. All representations, warranties and guarantees made in the Contract Documents shall survive final payment, termination, or completion of this agreement.

- E. No waiver or failure to enforce any part of provision of the Contract Documents, including but not limited to the change order process, shall be deemed to be waiver by the Owner of any subsequent default or breach of the same or any other part of provision contained herein, or right to enforce the same or any other part or provision contained herein.

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DIVISION 1

GENERAL REQUIREMENTS

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DIVISION 1

GENERAL REQUIREMENTS

INTRODUCTION

These General Requirements amend or supplement Division I of the Minnesota Department of Transportation (MnDOT) Standard Specifications for Construction (2020 Edition). With the exclusion of *Definitions and Terms, Bidding Requirements and Conditions, and Bidding Requirements and Covenants*, unless specifically stated, provisions of MnDOT Division I which are not amended or supplemented **shall not apply** to this Contract.

Where the MnDOT specifications are referred to herein and where a reference to the word "State" is mentioned, it is understood that the word "Owner" is substituted. All reference to the word "Engineer" shall be interpreted as the Engineer for the Owner.

GR - 1 SUMMARY OF WORK

The work to be done under this Contract shall include the furnishing of all labor, materials, tools, and equipment necessary to complete the street construction, watermain, sanitary sewer, storm sewer, grading, and appurtenant work as shown on the Plans and specified herein.

Based on personal examination of the site, the Contractor must satisfy himself as to all local conditions affecting the performance of the contract. The Contractor is considered to accept such conditions as found to exist.

The Contractor shall observe that the Owner reserves the right to do other work in connection with the project or adjacent to the project, by contract or otherwise. Contractor shall conduct his work to impose no hardship on the Owner or others engaged in other work.

The Contractor shall confine his operations to the limits of the construction area as shown on the plans. The City will endeavor to have obtained necessary rights-of-entry, rights-of-way, and easements prior to the Contractor commencing work. Failure to acquire all rights-of-entry, rights-of-way, and easements prior to the start of construction shall not be cause for a request of time extension or additional monies by the Contractor.

The Contractor shall provide for protection, temporary removal and replacement, or relocation of identified obstructions as required for the performance of the work required in these contract documents. No extra payment will be made for this work unless specified in the proposal or special provisions.

Obstructions not shown on the drawings or indicated in the specifications, and requiring relocation, shall be exposed by the Contractor without injury, or if injured, shall be repaired by Contractor at his expense. Removal of such obstruction or its relocation shall be made by the Contractor according to the provisions of the General Conditions.

Should special and/or extraordinary construction methods need to be employed by the Contractor for the completion of the project such as, but not limited to, trench box construction, any special and/or extraordinary construction methods used shall be considered incidental to the project.

GR - 2 WORK SEQUENCE

The Contractor shall:

1. Perform its work in such a manner as to cause the least interference with adjoining property owners and the general public.

2. For each phase of the project, construct work in a sequence that will allow the utility work to follow immediately upon the removal of the bituminous pavement and concrete curb and gutter. Subgrade excavation, subgrade preparation, and placement of aggregate base shall be completed within two weeks of the completion of any utility work. Curb and gutter placement, final aggregate base placement, and the first lift of bituminous pavement shall be placed within two weeks of initial aggregate base placement. All restoration work within the boulevard area shall be completed within two weeks of paving the bituminous base course.
3. Limit the area under construction at any given time to minimize the impacts to adjoining properties and limit the duration that activities will disturb residents on each street.
4. Limit the area under construction to the area(s) indicated on the staging plan, unless approved by the Engineer. Under construction is defined as the time period from bituminous removal to placement of aggregate base.
5. All proposed haul roads must be approved by the Engineer. The Contractor cannot utilize newly paved streets as haul roads. Any damage to existing streets due to unapproved construction use will be repaired at the Contractor's expense.
6. Concrete curb and gutter and bituminous paving crews shall be mobilized to the project whenever a minimum of one working day, but not more than two working days, are satisfactorily prepared for their respective work.

GR - 3 (1401) INTENT OF CONTRACT

The provision of MnDOT 1401 shall apply.

GR - 4 (1402) CONTRACT REVISIONS

The provision of MnDOT 1402 are modified and/or supplemented with the following:

Delete Paragraph 1402.6 in its entirety.

GR - 5 (1403) NOTIFICATION FOR CONTRACT REVISIONS

The provision of MnDOT 1403 are modified and/or supplemented with the following:

Modify the first sentence of MnDOT 1403.6 to read as follows:

If the Contractor disagrees with the Engineer's final written response or the Engineer's response is untimely, the Contractor may pursue a claim in accordance with the General Conditions, Article 12.

GR - 6 (1404) MAINTENANCE OF TRAFFIC

The provisions of MnDOT 1404 are modified and/or supplemented with the following:

Add the following new paragraph to MnDOT 1404.1:

A. Access to Properties

The Contractor shall maintain driveway access to the residents at the end of each day. Each resident must be able to drive their vehicle into the driveway. The only exceptions are:

- During utility installation directly in front of said driveway
- The time after the curb and gutter is poured
- During and immediately after the driveway is restored.

If a driveway access must be closed, the Contractor shall notify the residents a minimum of twenty four (24) hours in advance of the time the access will not be available. The Contractor shall install the proper traffic control to barricade the access at no additional cost to the Owner.

The Contractor shall salvage aggregate or recycled bituminous from the project, or haul approved granular material to the project site, at no additional cost to the Owner for use in ramping the driveways to maintain access.

The Contractor shall accommodate special access needs of the residents (medical needs, working the night shift, etc.) and provide access to driveways and roadways as required.

If access is determined to be unsuitable for individual residences by the Engineer, the Contractor shall make the necessary improvements to reestablish an acceptable access to the property.

The Contractor shall notify the Owner at least one week in advance of any daytime road closures or access restrictions.

GR - 7 (1405) USE OF MATERIALS FOUND ON THE PROJECT

The provisions of MnDOT 1405 shall apply.

GR - 8 (1406) PRESERVATION OF HISTORICAL OBJECTS

The provisions of MnDOT 1406 shall apply.

GR - 9 (1407) FINAL CLEANUP

The provisions of MnDOT 1407 are modified and/or supplemented with the following:

During the progress of the work, the area affected shall be kept clean and free of all rubbish and surplus materials. All unnecessary construction equipment shall be removed from the site and all damage repaired so that the public and adjacent property owners are inconvenienced as little as possible.

Where materials or debris have washed, flowed into, or have been placed in water courses, ditches, gutters, drains, catch basins, or elsewhere as a result of the Contractor's operations, such material or debris shall be removed and satisfactorily disposed of during progress of work. All ditches, channels, drains, etc. shall be kept in a clean and neat condition.

On or before the completion of work, the Contractor shall, unless otherwise directed in writing, remove all temporary works, tools and machinery, other construction equipment, or stockpiles placed by the Contractor. The Contractor shall remove all rubbish from any grounds which the Contractor occupied and shall leave all the premises and adjacent properties affected by the operation in a neat and restored condition satisfactory to the Engineer.

Street sweeping (with a pickup broom) will be required periodically. Any material deposited on streets adjacent to the project from construction or hauling operations shall be cleaned as directed by the Engineer. If the Contractor fails to clear adjacent roadways within 24 hours of notification, the Engineer shall arrange to have the roadways cleaned by the Owner and bill the Contractor \$500 per occurrence. The \$500 fee for street sweeping will be deducted from project retainage for each occurrence.

GR - 10 (1408) VALUE ENGINEERING INCENTIVE

The provision of MnDOT 1408 are modified and/or supplemented with the following:

MnDOT 1408 is deleted in its entirety and replaced with the following:

1408 VALUE ENGINEERING INCENTIVE

Value engineering provisions allow the Contractor to initiate, develop, and present cost reduction Proposals involving changes in the Contract requirements to the Owner for consideration.

Value engineering provisions only apply if the Contractor specifically submits a Proposal for consideration as a value engineering Proposal.

The cost reduction Proposals shall produce a net savings to the Contract by providing less costly items or methods than those specified in the Contract without impairing essential functions and characteristics.

The Contractor shall submit value engineering Proposals to the Engineer with the following information:

- (1) A statement that the Contractor is submitting a value engineering Proposal
- (2) A description of the Proposal
- (3) An itemization of the proposed changes to the Contract requirements and a recommendation of how to make each change
- (4) An estimate of the reduction in performance costs that will result from adoption of the Proposal
- (5) A prediction of any effect the proposed changes would have on other costs incurred by the Owner
- (6) A statement of the time by which an agreement for adoption of the Proposal must be executed to obtain the maximum cost reduction during the remainder of the Contract, and the reasoning for this time schedule
- (7) The dates of any previous submissions of the Proposal, including project Owner's name, contact information, and actions taken
- (8) A statement as to the effect the Proposal would have on the time for completion of the Contract

The Owner will not assume any liability for not meeting the statement of the time described in the Contractor's value engineering Proposal. The Contractor may withdraw, in whole or in part, any value engineering Proposal not accepted by the Owner within the period identified in the proposal.

The Owner's acceptance or rejection decision on a value engineering Proposal shall be final and the provisions of the General Conditions, Article 12 will not apply.

The Owner will notify the Contractor in writing of its decision regarding each value engineering Proposal. Until the Owner accepts the Proposal, the Contractor shall continue to perform Work in accordance with the requirements of the Contract. If the Owner accepts the Proposal, the Owner will execute a Change Order setting forth the terms, conditions, and costs of the Proposal. If the Contractor performs any Work performed in accordance with the value engineering Proposal before the execution of the Change Order, the Department will consider that "unauthorized Work" as specified in MnDOT 1512 as modified herein.

The Owner reserves the right to reject any value engineering Proposal.

The Owner will not provide an incentive payment to the Contractor as a result of any net savings from the value engineering Proposal. The Owner may include conditions for consideration, approval, and implementation of the cost reduction Proposal in the Change Order.

The Contractor shall design and develop the Proposal at no additional cost to the Owner.

After the Owner accepts the cost reduction Proposal, any restrictions imposed by the Contractor on its use or disclosure of the information submitted shall be void, and the Owner will have the right to use, duplicate, and disclose any data necessary to use the Proposal.

GR - 11 (1502) PLANS AND WORKING DRAWINGS

The provisions of MnDOT 1502 are modified and/or supplemented with the following:

Drawings provided by the Owner will include the information, as applicable to the project, in accordance with MnDOT 1502. The Owner's Standard Plates, MnDOT's Standard Plates, and MnDOT's Standard Plans may provide supplemental information.

GR - 12 (1504) COORDINATION OF CONTRACT DOCUMENTS

The provisions of MnDOT 1504 are modified and/or supplemented with the following:

Delete the second sentence of the first paragraph of MnDOT 1504 and replace with the following:

If discrepancies exist between the Contract documents, the following order of precedence applies:

1. Addenda,
2. Project Manual,
3. Project Plans,
4. Owner's General Specifications and Standard Plates (if applicable),
5. MnDOT Standard Specifications for Construction, and
6. CEAM Standard Specifications.

GR - 13 (1506) SUPERVISION BY CONTRACTOR

The provisions of MnDOT 1506 shall apply.

GR - 14 (1507) UTILITY PROPERTY AND SERVICE

The provisions of MnDOT 1507 are modified and/or supplemented with the following:

The plans show only known underground utilities, public and private, and the locations are approximate. No assurance is given that additional underground facilities do not exist. The utilities are classified as "Level D" unless the plans specifically state otherwise. This utility quality level was determined according to the guidelines of CI/ASCE 38-02, entitled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Data".

State law requires the Contractor to contact Gopher State One Call (811) for utility locations before doing any underground excavation. The Contractor is responsible for ascertaining the actual location of underground utilities.

All bidders are encouraged to contact the affected utilities prior to submitting a bid to determine the extent of their facilities within the project area and the scope and anticipated schedule of any facility relocation, removal, or adjustment.

Prior to commencing construction, the Contractor shall check all existing manholes, catch basins, gate valve boxes, stop boxes, culverts, and storm sewer lines in the construction zones to determine their condition. Failure to report deficiencies in writing, and have such deficiencies acknowledged in writing by the Engineer, will be cause for any required repairs and/or cleaning to be charged to this Contractor.

The Contractor shall coordinate schedules with the work schedules of the utility owners present within the project limits to avoid delays. This includes delays associated with scheduling conflicts, fees charges by utility owners for construction services, and all time necessary to communicate and work with utility owners within the project limits.

The location, protection, maintenance and/or repair, if damaged, of all in-place utilities shall be the responsibility of the Contractor.

The Contractor must provide a safe Work place for personnel and the utilities, including the payment of any fee charged by the utility for preparing a safe Work area for the Contractor.

Where construction operations require the interruption of service of a utility, the Contractor shall notify the utility at least 48 hours before the interruption and shall advise the utility of the probable time when the service will be restored.

GR - 15 (1508) CONSTRUCTION STAKES, LINE, AND GRADES

MnDOT 1508 is deleted in its entirety and replaced with the following:

1508 CONSTRUCTION STAKES, LINE AND GRADES

The Contractor shall furnish all staking materials of adequate quality for the purpose intended, including all stakes necessary to properly perform the required work. Stakes will consist of wooden hubs and lathe with smooth faces for clear marking, suitable for general field construction staking and shall be durable enough to last the duration of the project without undue weathering so as to make the stake illegible or difficult to read or use. Stakes that become illegible shall be remarked or reset at the Contractor's expense. Staking materials shall be provided by the Contractor prior to the start of construction and shall be stored in a protected, dry location on the project site. Contractor supply of construction survey stakes (hubs and lathe) is incidental, with no direct compensation made.

The Engineer will provide horizontal and vertical control construction staking as follows:

1. Offset stakes placed at 25-foot intervals for the first 100 feet out of each manhole, then 100-foot intervals thereafter for sanitary or storm sewer, with a cut sheet indicating horizontal and vertical distances from the stake to the pipe invert.
2. Offset stakes placed at 50-foot intervals, including changes in direction and appurtenances for watermain construction.
3. Curb and Gutter: 3-foot offset stakes placed at 25-foot intervals with a cut sheet indicating a cut/fill to the proposed top of curb.
4. Reference hubs (blue tops) at approximately 100-foot intervals at a measured distance either side of centerline, including cut or fill instructions for subgrade and/or gravel base.

Construction stakes will not be placed by the Owner until a written request is received from the Contractor giving the Engineer 48 hours' notice, describing where and when the Contractor wants the construction stakes placed for the next week's construction.

The Contractor shall preserve all stakes and marks. If the Contractor carelessly or willfully destroys or disturbs any of the field control states or marks, the Engineer will deduct the Owner's cost for replacing the damaged stakes or marks from the payment for the Work.

The Engineer shall have the right to order the Contractor to have construction stakes replaced if the Engineer determines that a significant number of stakes have been destroyed. The stakes will be set only one (1) time and it will be the responsibility of the Contractor to preserve the stakes. Private utility owners are responsible for staking their own improvements.

The Contractor shall not rely solely upon the construction stakes, and shall fully review the Contract Documents along with the construction stakes. The Contractor shall notify the Engineer of any discrepancies between the Contract Documents and the construction stakes. The Contractor shall not knowingly take advantage of any such discrepancies.

The Contractor is fully responsible for all measurements made from any offset construction stake or measurements made from any stakes and marks established by the Engineer.

No additional compensation shall be allowed the Contractor for any claims of crews being held up because of lack of line and grade stakes.

GR - 16 (1511) INSPECTION OF WORK

The provisions of MnDOT 1511 are modified and/or supplemented with the following:

Any person representing Federal or State agencies, the Engineer, or Owner shall have the right of entry to inspect the Work being performed by the Contractor. If the case warrants, the Contractor shall provide proper facilities for such access and inspection.

The Contractor shall notify the Engineer anytime they anticipate working on this project. No work will be allowed without notifying the Engineer a minimum of 24 hours beforehand.

GR - 17 (1512) UNACCEPTABLE AND UNAUTHORIZED WORK

The provisions of MnDOT 1512 are modified and/or supplemented with the following:

MnDOT 1512.1 is deleted in its entirety and replaced with the following:

1512.1 UNACCEPTABLE WORK

The Owner will consider all Work and Materials that do not meet the Contract requirements, or do not meet generally accepted industry standards if the Contract does not provide specific standards, to be unacceptable.

Unacceptable Work resulting from poor workmanship, use of nonconforming Materials, damage through carelessness, or any other cause existing before final acceptance of the Work shall be handled in the same manner as Defective Work, in accordance with Article 14 of the General Conditions.

GR - 18 (1513) RESTRICTIONS ON MOVEMENT AND STORAGE OF HEAVY LOADS AND EQUIPMENT

The provisions of MnDOT 1513 are modified and/or supplemented with the following:

The Contractor shall limit the roadways utilized for delivery of equipment and for hauling operations. ***Hauling operations will not be permitted to take place on residential roadways except for the roadway segment under construction.***

The Contractor shall provide and use only rubber tire dozers, front end loaders, and other necessary equipment on all work where street pavements or portions of pavements are undisturbed for the protection of the pavements or in such locations as the Engineer may direct.

No compensation will be allowed to the Contractor for replacement of damaged utilities and resurfacing or replacing damaged pavements.

GR - 19 (1514) MAINTENANCE DURING CONSTRUCTION

The provisions of MnDOT 1514 shall apply.

GR - 20 (1515) CONTROL OF HAUL ROADS

The provisions of MnDOT 1515 shall apply.

GR - 21 (1601) SOURCE OF SUPPLY AND QUALITY

The provisions of MnDOT 1601 shall apply.

GR - 22 (1603) MATERIALS: SPECIFICATIONS, SAMPLES, TESTS, AND ACCEPTANCE

The provisions of MnDOT 1603 are modified and/or supplemented with the following:

Delete the first paragraph of MnDOT 1603.2 and replace with the following:

Testing of materials and/or densities shall be completed to assure quality of materials and/or workmanship. The Observer will coordinate and order the tests to be performed. Initial testing of materials and/or densities, in accordance with the requirements below, will be paid for by the Owner. Any retesting due to failures shall be at the expense of the Contractor.

Schedule of Materials Control

TRENCH BACKFILL AND SUBGRADE DENSITY TESTING			
Location	Depth Below Aggregate Base	Minimum Required Compaction	Density Requirements
Green Areas	All Depths	95%	1/1,000 LF at various depths
Longitudinal Trench	0-3 FT	100%	1/500 LF at various depths
	3+ FT	95%	
Transverse Trench	0-3 FT	100%	1/250 LF every 2 ft vertical
	3+ FT	95%	
Subgrade	0-3 FT	100%	1/500 LF
	3+ FT	95%	

AGGREGATE BASE AND SELECT GRANULAR TESTING		
Test Type	Frequency	Test Requirements
Gradation: Aggregate Base	1/4,000 tons	2 tests minimum per source
Gradation: Select Granular	1/10,000 tons	1 test minimum per source
Density Testing	1/500 LF	100% Density of Standard Proctor or Penetration Index Method
Proof Roll	All	Top of Subgrade and Aggregate Base

CONCRETE TESTING						
Structure	Mix Designation	Testing Frequency	# of 28 Day Cylinders	Required 28 Day Compressive Strength (PSI)	Slump Range	Air Content
Hand-Formed Curb & Gutter and Flatwork	3F52	1/100 CY	3	4,500	2 - 5"	5 - 8.5%
Slip-Formed Curb & Gutter and Flatwork	3F32	1/100 CY	3	4,500	1/2 - 3"	5 - 8.5%

BITUMINOUS TESTING				
PLEASE SEE DIVISION 2 OF PROJECT MANUAL FOR REQUIRED TESTING METHOD				
Density Testing Method	Density Test	Test Rate	Mix Tests	Mix Test Rate
Maximum Density	Nuclear Density	1 per 500 LF	MnDOT Gyratory Mix Properties	1 / mix type / day
	Density Cores	1 Companion Per Lot	MnDOT Gyratory Mix Properties	
Quality Compaction	Roll Pattern	1 / mix type / project	Extraction & Gradation	

The rates of testing to be completed may be adjusted as determined by the Engineer.

The Contractor shall make an earnest effort to dry soils that exceed the optimum moisture content requirements as specified in MnDOT 2106.3F1. This work is incidental to the project bid and shall include, but is not limited to, "farming" the soils with a disc or blade to allow natural drying, and/or mixing or replacement of the wet soil with dry soil from another area of the site.

The location of the subgrade testing will be at the direction of the Engineer. The Owner shall bear the initial cost of the testing. If, however, sections of the roadway fail and retesting is required, the cost of this additional testing shall be at the Contractor's expense.

Subject to prior approval by the Engineer, the Contractor may exceed the maximum slump requirements only with the addition of a water reducing agent (super plasticizer). The use of water to exceed the maximum slump requirements is not allowed. The use of plasticizers and/or water reducers shall be at the Contractor's expense.

Bacteria tests on watermain will be the responsibility of the Contractor and shall be considered incidental. Bacteria testing of watermain field samples shall be completed by an independent testing company.

Add the following new paragraph to MnDOT 1603.2:

Copies of all test results, either passing or failing, shall be provided to the Observer, Owner, and Engineer. Failing test results shall be retested to confirm compliance with the project specifications.

GR - 23 (1606) STORAGE OF MATERIALS

The provisions of MnDOT 1606 are modified and/or supplemented with the following:

The Contractor shall be responsible for identifying and providing a project storage area.

Any disturbed area shall be cleaned up and fully restored to the pre-existing condition prior to closing out this project. The Contractor shall be required to install protective fencing and silt fence around the storage area. The protection, cleanup, and restoration of the project storage area shall be the Contractor's responsibility; no compensation will be made for this work. It is anticipated that all work, including stockpiling of materials, will be completed within the roadway right-of-way.

The Contractor is hereby advised that the only materials that will be allowed to be stockpiled within project limits are materials which will be incorporated into the project and then only in the quantity needed. Materials cannot be stockpiled which are for use on other projects. This specification applies to manufactured and natural materials.

GR - 24 (1607) HANDLING MATERIALS

The provisions of MnDOT 1607 shall apply.

GR - 25 (1608) UNACCEPTABLE MATERIALS

The provisions of MnDOT 1608 shall apply.

GR - 26 (1609) DEPARTMENT PROVIDED MATERIAL

The provisions of MnDOT 1609 shall apply.

GR - 27 (1701) LAWS TO BE OBSERVED

The provisions of MnDOT 1701 are modified and/or supplemented with the following:

The Contractor shall not discriminate against prospective employees because of age, race, color, sex, creed, religion, nationality, or disability.

Delete MnDOT 1701.2 in its entirety and replace with the following:

1701.2 WORKER CONDUCT

The Owner intends to provide a workplace free of violence, threats of violence, harassment, and discrimination. The Owner has zero tolerance for violence in the workplace. Contractors shall maintain a workplace free of violence, harassment, and discrimination. The Contractor must immediately remove from the Project any employee of the Contractor or a Subcontractor in violation of these requirements.

Delete MnDOT 1701.3 in its entirety.

Delete MnDOT 1701.5 in its entirety and replace with the following:

1701.5 PROMPT PAYMENT AND RETAINAGE

A. Prompt payment of Subcontractors is required by MINN. STAT. 471.425.

The Contractor must pay a Subcontractor no later than ten days after receiving payment from the Owner for undisputed Work provided by that Subcontractor. If the Contractor fails to pay a Subcontractor on time, then the Contractor must pay interest, at the rate of 1.5 percent per month or any part of a month, to the Subcontractor on the undisputed amount not paid on time. For an unpaid amount under \$100, the Contractor must pay the actual interest penalty (calculated at 1.5 percent per month) or \$10, whichever is greater.

MINN. STAT. 471.425, subdivision 4a. also provides that a Subcontractor who prevails in a civil action to collect interest penalties from a prime Contractor must be awarded its costs and disbursements, including attorney's fees, incurred in bringing the action.

A. Payment of retainage is governed by MINN. STAT. 337.10, and 15.72.

The Contractor may not withhold more than 5 percent in retainage from a Subcontractor, as provided by MINN. STAT. 337.10 subdivision 4(b). The Contractor must pay any retainage no later than 10 Calendar Days after the Contractor receives payment of retainage from the Owner, unless there is a dispute about the Work under a subcontract. If there is a dispute about the Work under a subcontract, the Contractor must pay out retainage to any Subcontractor whose Work is not involved in the dispute, and must provide a written statement detailing the amount and reason for the withholding to the affected Subcontractor.

GR - 28 (1702) PERMITS, LICENSES, AND TAXES

The provisions of MnDOT 1702 are modified and/or supplemented with the following:

The following permits will be acquired by the Owner (except as noted). The Contractor is required to follow the provisions of all permits:

Minnesota Pollution Control Agency (MPCA):

This Contract requires a Construction Stormwater General Permit (CSG Permit) administered by the MPCA. The Contractor shall become a co-permittee with the Owner to ensure compliance with the State of Minnesota Construction Stormwater General Permit (MNR100001), which is part of the National Pollutant Discharge Elimination System (NPDES) and the State Disposal System (SDS) Program. This permit establishes conditions for discharging storm water to waters of the State from construction activity disturbing one or more acres of total land area.

By completing the online CSG Permit application, the Contractor must ensure compliance with the terms and conditions of the permit that reference the "operator."

The Contractor shall cooperate with the Owner to implement a fully-documented inspection and maintenance program for all temporary erosion and sediment control measures as required by the Permit.

Minnesota Pollution Control Agency (MPCA):

The Owner has submitted a completed application to the MPCA for a Sanitary Sewer Extension Permit.

Minnesota Department of Health:

The Owner has submitted plans and specifications to the Minnesota Department of Health as required for Watermain Plan Review.

Chisago County:

The Contractor is responsible for registering with Chisago County and MnDOT and obtaining the necessary permits for hauling along County and State Roadways.

Minnesota Department of Natural Resources (DNR):

The Contractor shall acquire a DNR Water Appropriations permit if any dewatering becomes necessary.

In the event the Owner is fined by the Minnesota Pollution Control Agency, Environmental Protection Agency or Minnesota Department of Health as a result of the Contractor's actions or lack of actions, the Owner will deduct from payment due the Contractor corresponding amounts to cover the cost of such fines, including the costs of related engineering and legal fees.

GR - 29 (1706) EMPLOYEE HEALTH AND WELFARE

The provisions of MnDOT 1706 are modified and/or supplemented with the following:

The Contractor, at their own expense, shall provide and maintain temporary toilet facilities at the site during the construction period sufficient for the scheduled workforce. The Contractor and Engineer shall agree to the location of the temporary toilet facilities.

The Contractor must not use motor vehicle Equipment that has an obstructed rear view unless the vehicle has a reverse alarm that is audible above the surrounding noise level; or an observer signals to the operator that it is safe to reverse.

Areas of special concern include, but are not limited to, excavation stability protection, fall protection, protection from overhead hazards, vehicle backup protection, confined space safety, blasting operations, and personal safety devices.

GR - 30 (1707) PUBLIC CONVENIENCE AND SAFETY

The provisions of MnDOT 1707 are modified and/or supplemented with the following:

Regular working hours will be from 7:00 a.m. to 7:00 p.m., Monday through Friday; and 8:00 a.m. to 5:00 p.m. on Saturday. The Contractor shall not be permitted to work on Sundays or holidays, except in the case of emergencies. Requests for modification of working hours must be approved by the Owner. The Contractor shall submit all requests in writing to the Engineer. The Contractor shall structure the proposed project schedule based on the stated working hours.

The Contractor shall comply with local and state ordinances on noise abatement. All equipment shall have effective mufflers on engine exhaust systems.

The Contractor shall be required to accommodate garbage collection while the project is under construction. Coordination shall include contact with the garbage companies service the area and maintaining access to the individual residences. If the Contractor fails to accommodate garbage collection, the Contractor shall contract independently to have the garbage removed at no cost to the Owner.

The Contractor shall provide any barricades, fences or other means of protection necessary to properly execute the work and adequately protect its employees, employees of the Owner, employees of the

Engineer, and members of the public according to federal, state, and local regulators. All utility trenches shall be backfilled at the end of each working day to the satisfaction of the Engineer. All labor and materials necessary to comply with these provisions are incidental, and no payment shall be made.

All labor and materials necessary to comply with these provisions are incidental, and no payment shall be made.

The Contractor shall ensure that employees and Subcontractors do not display items such as, but not limited to, flags, banners, and symbols on the Project Site, that may disrupt the proper prosecution of the Work, impede public safety, or create a distraction for the traveling public.

GR - 31 (1710) TRAFFIC CONTROL DEVICES

The provisions of MnDOT 1710 shall apply.

GR - 32 (1712) PROTECTION AND RESTORATION OF PROPERTY

The provisions of MnDOT 1712 are modified and/or supplemented with the following:

The Contractor shall protect, and/or remove and reinstall all fences, street signs, retaining walls, and other items required to construct the proposed improvements. Work associated with protecting, and/or removing and reinstalling fences, street signs, lawn irrigation systems, and other items shall be considered incidental to the project unless specific bid items are included.

The Contractor shall take whatever steps necessary to protect adjoining properties and structures from hazards due to performance of the work. The Contractor is responsible for any and all damage to properties and structures that occur as a result of the Contractor's operations.

The street and utility construction may occur in close proximity to a number of existing structures. The Contractor shall use shoring or other means as necessary to ensure that those structures are protected during construction.

Existing residences may not be of modern construction and are thus sensitive to vibrating equipment. The Contractor shall take care when utilizing vibratory equipment to avoid damage to adjoining structures. Damage to structures resulting from the use of vibratory equipment are the responsibility of the Contractor. In the event of a complaint or perceived problem, a seismograph will be required to be provided at the Contractor's expense.

All labor and materials necessary to comply with the provisions of this section are incidental, and no payment shall be made.

Delete Paragraph MnDOT 1712.1.A in its entirety and replace with the following:

A. Monuments

The Contractor shall preserve all land and property corner monuments, Right-of-way monuments, and vertical and horizontal control point monuments in the vicinity of the Work. The Owner will mark all such monuments the Owner is aware of prior to construction. The Contractor shall notify the Engineer of any monument, whether the Owner has marked them or not, which the Contractor may disturb, in sufficient time to allow the Engineer to establish ties to the corner. The replacement of monuments removed by the Contractor shall be completed by the Owner at the Contractor's expense.

GR - 33 (1716) CONTRACTOR'S RESPONSIBILITY FOR WORK

The provisions of MnDOT 1716 are modified and/or supplemented with the following:

The Contractor shall guarantee and maintain the stability of all work, equipment and materials for a period of two years from the date of Notice of Acceptability of Work. The Contractor shall provide as part of the contract security a separate two-year maintenance bond to be dated to begin the date of Notice of Acceptability of Work. The provisions of this paragraph shall not be construed as restricting Contractor's liability for breach of contract by reason of non-conformance with the specification for defects or faulty workmanship.

GR - 34 (1717) AIR, LAND, AND WATER POLLUTION

The provisions of MnDOT 1717 are modified and/or supplemented with the following:

Pollution of natural resources of air, land, and water by operations under this Contract shall be prevented, controlled, and abated in accordance with the rules, regulations, and standards adopted and established by the Minnesota Pollution Control Agency (MPCA) and MnDOT 1717, 2573 and 2575.

Add the following requirements to MnDOT 1717.1.D:

The Contractor shall be responsible for dust control.

Water for construction purposes may be obtained from the City of North Branch. The Contractor shall make suitable arrangements with the Public Works Department for the location where water may be obtained. The City will not charge for reasonable amounts of water for dust control, filling mains, and flushing mains. Water for all other uses will be charged. Contact the Public Works Supervisor for current water rates. The City must be notified twenty four (24) hours in advance of any water usage.

The Contractor will be responsible for developing a dust control plan that shall include, but not be limited to, the following dust control measures:

1. Minimize period of exposed or graded areas.
2. Spraying construction areas and haul roads with water or calcium chloride.
3. Minimize use of vehicles on unpaved surfaces.
4. Covering or spraying material piles and trucks.
5. Street sweeping.
6. Using natural or artificial wind breaks.

The Owner has the right to perform this work out at the Contractor's expense if the work is not completed in a timely manner according to the Engineer. The Owner will deduct from payment due to the Contractor for all corresponding amounts to cover the cost for dust control measures.

Add the following requirements to MnDOT 1717.2:

D. MPCA Construction Storm Water Permit

By signing the Proposal and completing the electronic online NPDES CSW permit, the Contractor is a co-permittee with the Owner and must ensure compliance with the terms and conditions of the Construction General Storm Water Permit (MN R100001). The Contractor is responsible for those portions of the permit referencing the "operator". This permit establishes conditions for discharging storm water to waters of the State from construction activities that disturb one acre or more of total land area. A copy of the permit is available at <https://www.pca.state.mn.us/water/construction-stormwater>, or by calling (651) 296-3890. The Owner will apply and pay for the NPDES Permit on this Project.

The Contractor is not authorized to perform any Project Work which disturbs soil or which involves Work in waters of the State until the Permit is in effect and the Owner has received the required documentation.

Contractor must provide an Erosion Control Supervisor as per MnDOT 2573.3. The Contractor is solely responsible for all inspections, maintenance, and records required in Section 11 of the General

Permit. Immediately notify the Engineer of site visits by Local Permitting Authorities performed in accordance with Section 24.10 of the Permit. The Contractor must obtain the Engineer's approval before starting any Work required by regulatory authorities which (1) the Contractor believes will result in additional compensation from the Owner; or (2) will impact the design or requirements of the Contract documents or impact traffic.

The Contractor must use Best Management Practices to help minimize turbidity of surface waters and relieve runoff from extreme weather events. The Contractor must report a stormwater sediment release from the Project Site to the Minnesota Duty Office (1-800-422-0798) at the time the Contractor or Owner discovers the release. The Contractor must also immediately contact the Minnesota Duty Officer during any emergency situation involving an uncontrolled stormwater release.

Erosion control shall be placed and maintained by the Contractor as directed by the Engineer. The Contractor shall use the appropriate means of control for individual situations. The erosion control types may include but are not limited to silt fence, fiber blanket, rock construction entrances, diversion ditches, and catch basin inlet protection, all of which will be considered incidental to the project cost unless a bid item is provided in the Bid Form. Failure to maintain the erosion control will be sufficient cause to withhold further payments on the project until the maintenance is complete.

The erosion control measures for the project have been identified in the plan set and the NPDES Stormwater Pollution Prevention Plan (SWPPP); however, modifications can be made depending on actual site conditions.

Emergency Best Management Practices must be enacted to help minimize turbidity of surface waters and relieve runoff from extreme weather events.

All manholes shall be protected from surface water drainage. All storm sewer systems shall be protected from sedimentation, along with downstream ponding areas. All catch basins shall be protected with approved means of protection, immediately following construction. Areas of pervious pavement adjacent to the project area shall be protected from sedimentation.

Prior to final acceptance of the project or the end of the warranty period, as applicable, the Contractor shall remove all erosion control items.

GR - 35 (1801) SUBLETTING OF CONTRACT

The provisions of MnDOT 1801 are modified and/or supplemented with the following:

Modify the first sentence of the second to the last paragraph of MnDOT 1801 to read as follows:

The Contractor must ensure that the subcontracts at least contain the following (if required by the Contract):

GR - 36 (1802) QUALIFICATIONS OF WORKERS

The provisions of MnDOT 1802 shall apply.

GR - 37 (1804) PROSECUTION OF WORK

The provisions of MnDOT 1804 are modified and/or supplemented with the following:

Delete the first sentence of the first paragraph of MnDOT 1804.1.

Delete the third and fourth paragraphs of MnDOT 1804.1 and replace with the following:

Should the Contractor fail to maintain satisfactory progress, the Engineer will require that the Contractor provide additional resources (e.g., labor, Materials, Equipment) as necessary to bring the Work up to the level of progress required in the current accepted Progress Schedule to ensure completion of the Work within the time(s) specified in the Contract.

GR - 38 (1805) METHODS AND EQUIPMENT

The provisions of MnDOT 1805 shall apply.

GR - 39 (1806) DETERMINATION AND EXTENSION OF CONTRACT TIME

The provisions of MnDOT 1806.1 are deleted in their entirety and replaced with the following:

1806.1 GENERAL

The Contractor shall prosecute the Work continuously and effectively, with the least possible delay, to the end that all Work is completed within the Contract Time.

If the Owner grants an extension of the Contract Time, the extended time for completion will be in full force and effect as though it was originally specified.

The project schedule has been set to accommodate sufficient time for private utility relocation and weather delays. It is the Contractor's responsibility to complete the project within the assigned schedule. No extension of time will be granted for weather conditions typical to the time of year the work is undertaken.

Provide 48-hour notice prior to installing traffic control signs. The Contractor shall schedule work to occur continuously to avoid delays. The Contractor shall coordinate schedules with all utility owners within the project limits.

Delete MnDOT 1806.2 in its entirety.

GR - 40 (1807) FAILURE TO COMPLETE THE WORK ON TIME

The provisions of MnDOT 1807 are modified and/or supplemented with the following:

Contractor and Owner recognize that time is of the essence and that the Owner will suffer financial loss and other losses if the work is not completed within the times specified by the Owner, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay the Owner as follows:

- The liquidated damages shall be in accordance with Table 1807-1 Schedule of Liquidated Damages for all stated completion dates, as well as any intermediate completion dates.

The monetary deductions as set forth above may apply equally, separately and may be assessed concurrently with other damages as described in these special provisions and the MnDOT Standard Specifications for Construction.

The Contractor will be subject to an hourly charge for failure to maintain the traffic control devices as set forth in these Special Provisions. Non-compliance charges, for each incident, will be assessed at a rate of \$250.00 per hour for each hour or any portion thereof with which the Engineer determines that the Contractor has not complied.

The Contractor will be subject to an hourly charge for failure to (1) install and/or maintain the erosion control devices and (2) correct adverse erosion impacts; all as set forth in the Minnesota Department of Transportation Standard Specifications for Construction, these Special Provisions, appropriate permits incorporated herein by reference and/or attachment, and the direction of the Engineer. Non-compliance charges, for each separate incident, will be assessed at a rate of \$200.00 per day that the Contractor has not installed or repaired erosion control devices (including turf establishment) with twenty-four (24) hours after receiving notice.

Assessment of the aforesaid non-compliance charge for failure to install and/or maintain the erosion control devices required is not intended to nor shall it be construed to be in lieu of applicable civil or criminal non-compliance penalties assessed against the Contractor as co-permittee by other governmental or regulatory agencies.

Failure to install erosion or sediment control measures when ordered by the Project Engineer will result in withholding of partial estimates from related work and/or a penalty of \$1,000.00 per calendar day will be deducted from any monies due or coming due to the Contractor for failure to complete this work.

GR - 41 (1901) MEASUREMENT OF QUANTITIES

The provisions of MnDOT 1901 shall apply.

GR - 42 (1902) SCOPE OF PAYMENT

The provisions of MnDOT 1902 are modified and/or supplemented with the following:

Modify the second sentence of MnDOT 1902 to read as follows:

This includes compensation for all risk, loss, damage, and expense incurred by the Contractor for performing the Work required by the Contract subject to the General Conditions.

GR - 43 (1903) COMPENSATION FOR ALTERED QUANTITIES

The provisions of MnDOT 1903 are modified and/or supplemented with the following:

The Owner reserves the right to reduce certain quantities or delete certain items from each section of the bids as the Owner sees fit, either before or after the Award of Contract.

There will be no additional compensation due to remobilization of equipment as necessary to complete punch list items or other items not completed by the Contractor.

There will be no additional compensation due to restocking charges for materials not used on the project.

All payments will be by the unit price bid times the actual number of units installed and accepted.

GR - 44 (1908) FINAL ESTIMATE AND PAYMENT – CONDITIONS AND PROCESS

MnDOT 1908 is deleted in its entirety and replaced with the following:

1908 FINAL ESTIMATE AND PAYMENT – CONDITIONS AND PROCESS

Absent complete and legally effective releases or waivers of all Lien rights arising out of the Work, and of Liens filed in connection with the Work, the Owner may retain out of any monies due said Contractor sums sufficient to cover all unpaid liens/claims.

The Owner cannot make final payment to the Contractor until the Contractor demonstrates that it and all its Subcontractors have complied with the Income Tax withholding requirements of Minnesota

Statutes, section 290.92 for wages paid for Work performed under the Contract. To establish compliance, the Contractor must submit a "Contractor Affidavit" either online or in paper form (IC134) to the Minnesota Department of Revenue. The Contractor will receive written certification of compliance when the Department of Revenue determines that all withholding tax returns have been filed and all withholding taxes attributable to the Work performed on the Contract have been paid. The Contractor must then provide this written certification to the Owner to receive final payment.

Every Subcontractor working on the Project must submit an approved "Contractor Affidavit" from the Minnesota Department of Revenue to the Contractor before the Contractor can file its own Contractor Affidavit. The Contractor is advised to obtain the certification from each Subcontractor as soon as the Subcontractor completes Work on the Project. Experience has shown that waiting until the Project is complete to obtain the forms from all Subcontractors is likely to result in significant additional Work for the Contractor as it will be difficult or impossible to collect all forms.

The Department of Revenue, in association with the Department of Employment and Economic Development, offers a free seminar to help contractors understand tax law requirements. The Department strongly urges the Contractor and all Subcontractors to attend the "Employment Taxes & Employer Responsibilities Seminar" or similarly offered classes. You can find a schedule and more information on the Department's website at: <https://www.revenue.state.mn.us/sites/default/files/2019-05/Employment%20Taxes%20Seminar%20Flyer.pdf>.

Complying with this requirement is considered part of the Work under this Contract. The Department will enforce this requirement equally with all other Contract requirements. Contractor delay in complying with this requirement will cause the Department to delay final payment and Contract Acceptance. The Department may also report non-compliance to the Department of Revenue, which may result in enforcement action by the Department of Revenue.

Contractor Affidavit requirements and Form IC134 can be found here:
<https://www.revenue.state.mn.us/contractor-affidavit-requirements>.

GR - 45 (1910) COST ESCALATION

The provisions of MnDOT 1910 shall apply.

This contract requires strict adherence to the (1910) Fuel Escalation Clause. It is the contractor's responsibility to make himself/herself familiar with it. The (1910) Fuel Escalation Clause is available via the internet at: <http://www.dot.state.mn.us/pre-letting/prov/order/fuel-esc.pdf>.

DIVISION 2

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DIVISION 2

SPECIFICATIONS

2021 MOBILIZATION

The provisions of MnDOT 2021 are modified and/or supplemented as follows:

2021.5 BASIS OF PAYMENT

The Contractor shall assume multiple mobilizations (incidental) for clearing and grubbing operations.

Payment will be made based on the following schedule, with partial payments in accordance with MnDOT Table 2021.5-1:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2021.501	MOBILIZATION	LS

2101 CLEARING AND GRUBBING

The provisions of MnDOT 2101 are modified and/or supplemented as follows:

Delete Paragraph 2101.1 in its entirety and replace with the following:

2101.1 DESCRIPTION

This work consists of removing and disposing of the trees, brush, stumps, roots, and other plant life, including dead and decayed matter, within the construction area designated for removal by the Contract or as directed by the Engineer. No trees shall be removed unless approved by the Engineer.

2101.3 CONSTRUCTION REQUIREMENTS

The Contractor shall assume multiple mobilizations for this Work.

B. Clearing Operations

All trees, stumps, brush, etc. shall be cleared within two (2) feet of the edges of proposed sidewalks and trails. The only exception will be for hardwood specimen trees or other exceptional items of high significant value, as determined by the Engineer.

C. Grubbing Operations

All depressions resulting from grubbing operations shall be filled and compacted within seven (7) days (incidental). The top four (4) inches shall be topsoil borrow material and the disturbed areas shall be temporarily seeded until such time as sod or final seed is placed.

D. Disposal Limitations

No disposal of debris shall be allowed on-site unless authorized by the Engineer.

2101.4 METHOD OF MEASUREMENT

B. Area Basis

Modify the first sentence of MnDOT 2101.4.B to read as follows:

If the contract specifies the unit as an acre, the Engineer will determine quantities by measuring, to the nearest 0.05 acre, all areas cleared and all areas grubbed within the limits as shown on the plans or staked by the Engineer.

2101.5 BASIS OF PAYMENT

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2101.502	CLEARING	EACH
2101.502	GRUBBING	EACH
2101.505	CLEARING	ACRE
2101.505	GRUBBING	ACRE

2104 REMOVING PAVEMENT AND MISCELLANEOUS STRUCTURES

The provisions of MnDOT 2104 are modified and/or supplemented as follows:

2104.3 CONSTRUCTION REQUIREMENTS

B.1 Haul Salvaged Materials

Salvaged Materials, not required for installation elsewhere under this Contract, shall be loaded and hauled to the designated storage area(s) where they shall be unloaded and deposited in a manner satisfactory to the Engineer.

B. Removal Operations

Removals made by sawing, shall result in a neat, straight line, or a square edge. The use of wedges driven into the saw cut to break off the portion to be removed will not be permitted.

C.6 Miscellaneous Items

Driveways and walks disturbed by construction shall be replaced as directed by the Engineer. The Contractor will be required to remove the existing driveway pavement and walk to the limits marked by the Engineer. The Contractor shall then excavate and dispose of the amount of material required to allow for the new driveway and walk section.

Sign removals shall include removal of signs on existing sign posts and signs that are connected to utility poles.

To accommodate matching of bituminous wear course following the freeze-thaw cycle, bituminous pavement milling shall be considered incidental to the new pavement. No separate payment will be made for this work. Disposal of the millings shall be the responsibility of the Contractor.

Add the following new paragraphs to MnDOT 2104.3.C:

C.7 Concrete Curb and Gutter

All concrete curb and gutter scheduled for removal and marked by the Engineer in the field shall first be saw cut, using a wet saw, and then removed.

The Contractor shall be responsible for protecting curb and gutter within the project that is to remain in place. Any damage to existing curb and gutter shall be the responsibility of the

Contractor, and shall be repaired or replaced as directed by the Engineer with no additional compensation thereto.

C.8 Pipe Removal

Removal of storm sewer pipe and culvert, as noted in the plans, shall be in manner and at the stage of construction so that drainage will be maintained.

Add the following new paragraph to MnDOT 2104.3:

F. Abandon Operations

Sanitary sewer, storm sewer, and/or watermain pipe that is to be abandoned shall be filled with a granular or other approved material and capped watertight. Filling and capping of the abandoned pipe shall be included in the unit price for abandonment.

Manhole structures that are to be abandoned shall first have the cone section removed (to a depth specified by the Engineer) (incidental) and then filled with granular or other approved material to the top of the barrel section. The remainder of the backfilling shall consist of the native soils. Abandoning a manhole is not allowed unless specifically called for in the plans.

2104.4 METHOD OF MEASUREMENT

B. Length

The Engineer will measure abandonment of pipe by length of pipe sealed and abandoned as specified.

2104.5 BASIS OF PAYMENT

Measurement and payment for the removal and disposal of materials will be made only for those items of removal work specifically included for payment as such in the Bid Form and as listed in the Plans.

All costs of hauling salvaged materials shall be included in the cost of salvaging the material.

Payment at the Contract bid price per linear foot of abandoned pipe shall be payment in full for all costs involved.

Saw cutting necessary for the removal of sidewalks, trails and concrete curb and gutter shall be considered incidental with no direct compensation made.

Payment for the removal of concrete curb and gutter shall include the concrete removal, sawcutting at any match points with existing curb and gutter, salvaging/stockpiling of topsoil and backfill material, and the disposal of removal materials. Reinstallation of topsoil and back fill material shall be included with the new concrete curb and gutter bid items. Payment for removal of integral curb shall be included in contract price bid for pavement removal.

Payment for removal and salvaging of existing signs shall be made per post removed/salvaged. No additional payment will be made for multiple signs on a single post. No additional payment will be made for signs mounted on multiple posts.

Removal of hydrant shall include the removal of the hydrant assembly from the hydrant gate valve to the hydrant including the watermain lead and existing hydrant gate valve. Removal of the gate valve, if any, will not be paid separately.

Payment for the removal of manholes and drainage structures shall include the entire manhole from (and including) the base slab to (and including) the frame and ring casting. The Contractor shall first offer the

existing casting to the Owner prior to removal and disposal. Salvaging of the casting shall be considered incidental to the manhole and drainage structure removal items.

Removal of hydrant shall include the removal of the hydrant assembly from the hydrant gate valve to the hydrant

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2104.502	REMOVE MANHOLE	EACH
2104.502	REMOVE GATE VALVE & BOX	EACH
2104.502	REMOVE HYDRANT	EACH
2104.502	REMOVE DRAINAGE STRUCTURE	EACH
2104.502	REMOVE SIGN	EACH
2104.502	SALVAGE SIGN	EACH
2104.503	SAWING CONCRETE PAVEMENT (FULL DEPTH)	L F
2104.503	SAWING BIT PAVEMENT (FULL DEPTH)	L F
2104.503	REMOVE WATER MAIN	L F
2104.503	REMOVE SEWER PIPE (STORM)	L F
2104.503	REMOVE SEWER PIPE (SANITARY)	L F
2104.503	REMOVE CURB & GUTTER	L F
2104.504	REMOVE CONCRETE DRIVEWAY PAVEMENT	S Y
2104.504	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	S Y
2104.504	REMOVE BITUMINOUS PAVEMENT	S Y
2104.518	REMOVE CONCRETE WALK	S F
2104.603	ABANDON STORM SEWER	L F
2104.603	ABANDON SANITARY SEWER	L F
2104.603	ABANDON WATER MAIN	L F

2106 EXCAVATION AND EMBANKMENT – COMPACTED VOLUME METHOD

The provisions of MnDOT 2106 are modified and/or supplemented as follows:

2106.1 DESCRIPTION

Add the following new paragraph to MnDOT 2106.1:

A. Dewatering

The Contractor shall provide groundwater excavation dewatering as necessary to allow for construction on a stable foundation. The work potentially involves the drawdown of the water table (using wells or other means), placement of temporary barriers, or other satisfactory types of water control to allow for construction and to protect the improvements. Dewatering operations are controlled by permit from the DNR or other agencies. Dewatering operations must be in accordance with the MnDOT 2573. Rerouting surface water is not considered dewatering and is incidental.

The Contractor is responsible for application for any necessary permits and compliance with all conditions of permits. The Contractor shall also be responsible for noise control during dewatering as directed by the Engineer.

The Contractor shall make their own determination as to the extent of the groundwater on the project prior to bidding. No additional compensation will be made for a higher-than-expected groundwater table or any compliance requirements from regulatory agencies.

Dewatering systems and excavations must remain inside construction limits.

2106.2 MATERIALS

A.4 Excavation – Muck

Includes material at the top of the subgrade (as defined as the bottom of the granular material by MnDOT 2106.1.A.3) deemed unsuitable by the Engineer. Removal of unsuitable material must be directed by the Engineer prior to the start of excavation. This item does not include the removal of unsuitable soil encountered during the utility installation.

A.5 Excavation – Channel and Pond

Excavation – channel and pond includes topsoil excavation.

B.1 Common Embankment

Delete the second paragraph of MnDOT 2106.2.B.1 and replace with the following:

Select Grading Material used for Common Embankment may contain up to 100 percent recycled Materials composed of recycled concrete (maximum of 75 percent), recycled asphalt, or glass (maximum of 10 percent). The bitumen content must be 3.5 percent or less.

B.3 Select Granular Embankment

Select Granular Material in accordance with MnDOT Table 3149.2-1 for use as Select Granular Embankment shall also be free-draining, non-recycled (virgin) sand with 100% passing the 3/8 inch sieve.

2106.3 CONSTRUCTION REQUIREMENTS

A. General

Where connection to an in-place roadway is made: at the termini of new road construction, cut vertically to the bottom of in place surfacing. Then, cut back within the construction limits at a 1:20 (Vertical:Horizontal) taper to the bottom of the recommended subgrade excavation.

Mining of materials for removal from the project area and replacement with less desirable materials by the Contractor shall not be permitted.

Management of the excavated materials on the site is the Contractor's responsibility. All suitable material shall be utilized for roadway construction. Excess material shall remain onsite for use as backfill for unsuitable material excavation. Remaining excess material shall become property of the Contractor. The Contractor is responsible to determine how much excess material shall remain onsite during grading operations.

B. Contractor Quality Control (QC) Testing and Aggregate Certification

Correct areas represented by failing QC or Quality Assurance (QA) tests. Submit test results to the Engineer within one business day.

C. Moisture Control

Note that optimum moisture content determination tests and moisture tests during compaction are required for all compaction requirements, including quality compaction, LWD, penetration index, and specified density.

The Owner's proctor test results are used to determine optimum moisture determination.

E. Excavating Operations

Muck excavations shall be performed for the removal of any unstable or unsuitable materials which may be encountered. Such excavations shall be backfilled with suitable excess material generated from the common excavation, or granular embankment material as directed by the Engineer. If the Contractor proceeds without the approval of the Engineer, all work and material required for restoration of the roadbed to the proposed grade shall be at the Contractor's expense.

I. Finishing Operations

Common Topsoil Borrow meeting the requirements of MnDOT 3877.2.A shall be used only when specifically authorized by the Engineer. It shall only be used when there is not sufficient in place topsoil to restore the disturbed area. This work shall not be substituted for the work required of the Contractor to salvage and replace existing topsoil.

All topsoil (salvaged and borrow) shall be free of all sticks, rocks/stones, and debris. Topsoil shall be of a consistency acceptable to the Engineer.

Excess topsoil may be disposed of outside the road core as directed by the Engineer.

2106.4 METHOD OF MEASUREMENT

B. Embankment Material

Granular embankment shall be used only as directed by the Engineer.

Add the following new paragraph to MnDOT 2106.4:

D. Dewatering

The Engineer will measure dewatering by the lump sum. No additional compensation will be paid for multiple dewatering operations at multiple locations throughout the project. Payment for dewatering shall require proof that a DNR permit was obtained for dewatering completed in conjunction with the project.

2106.5 BASIS OF PAYMENT

The Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required as Quality Control (QC). The Owner shall be responsible for all inspections and tests required as Quality Assurance (QA).

Payment for Dewatering will be made at the unit price bid on a lump sum basis and shall be compensation in full for materials, labor, and equipment necessary to complete the work as specified. Permits necessary for this work shall be considered incidental. Rock or other materials used for dewatering purposes shall be incidental to this pay item.

Payment for Excavation – Common will be at the unit price bid per cubic yard as an excavated volume, and shall be compensation in full for excavation (including salvaging and stockpiling topsoil), preparing the excavation and embankment areas, loading, hauling, placing and compacting fill, stockpiling materials, spreading topsoil, and disposal of material as required. Payment for Excavation-Common shall not include the volume of items paid for separately as removals (e.g. curb, bituminous pavement, concrete pavement, reclaimed material).

Payment for Excavation – Subgrade will be made at the unit price bid per cubic yard as an excavated volume, and shall be compensation in full for excavation, hauling, stockpiling, and embankment, and the disposal of unsuitable materials.

Payment for Excavation – Muck will be made at the unit price bid per cubic yard as an excavated volume, and shall be compensation in full for excavation, hauling, stockpiling, and embankment, and the disposal of unsuitable materials. This work shall also include the replacement and compaction of suitable excess material generated from the common excavation within the excavated area unless it is directed by the ENGINEER that embankment material be used to replace the excavated material volume.

Potholing to locate existing utilities may be required. All labor and materials used for potholing will be incidental.

All final grading is considered incidental to earthwork quantities: including grading ditches to drain around storm sewer, pond work and embankments.

Delete MnDOT 2106.5.A in its entirety.

B. Schedule

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2106.507	EXCAVATION – COMMON	C Y
2106.507	EXCAVATION – MUCK	C Y
2106.507	EXCAVATION – SUBGRADE	C Y
2106.507	EXCAVATION – CHANNEL AND POND	C Y
2106.507	GRANULAR EMBANKMENT (CV)	C Y
2106.507	SELECT GRANULAR EMBANKMENT (CV)	C Y
2106.507	COMMON EMBANKMENT (CV)	C Y
2106.601	DEWATERING	LS

2108 GEOSYNTHETIC CONSTRUCTION MATERIALS

The provisions of MnDOT 2108 are modified and/or supplemented as follows:

2108.1 DESCRIPTION

Delete note (5) in MnDOT 2108.1 and replace with the followings:

- (5) Provide confinement of granular materials.

2108.2 MATERIALS

A. Geotextiles

Geotextiles for stabilization shall conform to the requirements of MnDOT 3733, Type 5.

2108.3 CONSTRUCTION REQUIREMENTS

Delete and replace MnDOT 2108.3.B with the following:

B. Geotextile

If multiple pieces of geotextile are required, overlap geotextiles a minimum of 36 inches.

Sewing geotextiles may be used in lieu of overlapping if there is a Quality Assurance sewing test result provided prior to installation. Use a “double spool” machine capable of sewing a Federal Type 401 locking stitch (ASTM D6193-16) or approved better stitch. Sew a flat “J,” or butterfly seam type (ASTM D6193-16) using thread with a minimum strength of 25 pounds, with 1-2 rows of stitching and 5-7 stitches per inch. Meet the required seam strength for the specified geotextile

type. Provide geotextiles manufactured by the same operator, thread, and sewing machine used for the sewing sample.

Adhesives listed on the Approved Products List may be used in lieu of overlapping or sewing for Types 3, 4, and 5 geotextiles. The approved list for adhesives is found under the geosynthetics sub-heading on the Approved Products List. Apply adhesive per the Adhesive Seams Guidelines found on the geosynthetic/adhesive seams links on the Approved Products List.

2108.5 BASIS OF PAYMENT

Delete the first paragraph of MnDOT 2108.5 and replace with the following:

The Contract Unit Price for geosynthetics includes the cost of providing, placing, overlapping or sewing.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2108.504	GEOTEXTILE FABRIC TYPE 5	S Y

2111 TEST ROLLING

The provisions of MnDOT 2111 are modified and/or supplemented as follows:

2111.1 DESCRIPTION

This work shall consist of test rolling the top of subgrade prior to placement of geotextile fabric (if applicable) and select granular embankment (if the project does not include a select granular embankment section, test rolling shall be completed prior to the placement of the aggregate base material). In the event of failure, the Contractor shall repair the area(s) without compensation. Additional test rolling shall be required following the repair of the failed area(s). Approval of the test roll does not constitute acceptance of the street and does not relieve the Contractor of warranty issues.

2111.3 CONSTRUCTION REQUIREMENTS

A representative of the Owner and Contractor shall be present during test rolling.

In addition, the roadway shall be considered unstable if, at any time throughout the construction, the surface shows rutting, pumping, cracking, or rolls under the weight of a vehicle.

For full depth reclamation, the reclaimed material shall be test rolled prior to placement of the bituminous base course.

If it rains after a test roll has been performed and the test roll has been accepted, the Contractor, at the discretion of the Owner and Engineer, will be required to perform an additional test roll prior to commencing with construction at no additional compensation.

2112 SUBGRADE PREPARATION

The provisions of MnDOT 2112 are modified and/or supplemented as follows:

2112.3 CONSTRUCTION REQUIREMENTS

A. General

Maintain drainage of surface water to avoid unnecessary saturation of the subgrade.

The Contractor shall take the necessary measures to prevent the subgrade material from exposure to moisture. The Contractor shall grade and compact with a smooth drum roller at the end of each workday to seal the subgrade material and prevent standing water on surface. Under no circumstances shall reimbursement or delay claims be made for additional work required to dry subgrade materials as a result of failure to protect subgrade material from moisture.

2112.5 BASIS OF PAYMENT

The Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required as Quality Control (QC). The Owner shall be responsible for all inspections and tests required as Quality Assurance (QA).

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2112.519	SUBGRADE PREPARATION	RDST

2123 EQUIPMENT RENTAL

The provisions of MnDOT 2123 are modified and/or supplemented as follows:

2123.3 SPECIFIC REQUIREMENTS

Add the following item to the list in MnDOT 2123.3:

- (14) Street Sweeper with Pickup Broom: Provide self-propelled street sweeping equipment with a pick-up broom.

Throughout construction, constructed streets and roadways adjacent to the project shall be swept and cleaned as directed by the Engineer, and shall be in conformance with the NPDES permit. The Engineer may require additional sweeping of roads to ensure safety for the general public, protect the environment, uphold local requirements, or as otherwise directed. Material that is tracked off the project site shall be swept within 24 hours.

Removal of dirt and debris shall be accomplished to the satisfaction of the Engineer. All materials shall be collected and retained within the sweeping equipment as they are swept. Disposal of the swept material shall be in accordance with MnDOT 2104.3.D.

2123.5 BASIS OF PAYMENT

Payment for a Utility Crew at the bid unit price per hour shall include all labor and equipment for work associated with additional utility work which has not been previously indicated or accurately shown in the plans, or as directed by the Engineer. This item is not for a Contractor to fulfill their obligation to locate private utilities prior to excavation as required by the Contract Documents.

Add the following new paragraph to MnDOT 2123.5:

A. Street Sweeper with Pickup Broom

Payment for street sweeping will only be made for hours of time required to maintain cleaned roadways for the traveling public, as approved by the Engineer. No payment shall be made for sweeping that is normally required to construct the project, including, but not limited to, removal of bituminous millings, sweeping between bituminous lifts, and sweeping prior to placement of pavement markings. No payment will be made for sweeping done by "kickoff brooms."

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2123.610	STREET SWEEPER (WITH PICKUP BROOM)	HOUR
2123.610	UTILITY CREW	HOUR

2130 APPLICATION OF WATER FOR DUST CONTROL

The provisions of MnDOT 2130 are modified and/or supplemented as follows:

2130.5 BASIS OF PAYMENT

Delete the third paragraph of MnDOT 2130.5 in its entirety.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2130.523	WATER	MGAL

2211 AGGREGATE BASE

The provisions of MnDOT 2211 are modified and/or supplemented as follows:

2211.2 MATERIALS

Aggregate base shall be Class 5 in accordance with MnDOT 3138.

Aggregate base shall be 100 percent crushed quarry rock (limestone) Class 5 in accordance with MnDOT 3138.2.B or salvaged/recycled aggregate mixtures in accordance with MnDOT 3138.2C.

Before any aggregate base is placed, the Contractor shall submit an aggregate gradation from an approved testing laboratory certifying that the materials to be incorporated into the work meet these specifications with no exceptions. All costs associated with testing and certification shall be borne by the Contractor and considered incidental to the project with no additional compensation allowed therefore.

Full Depth Reclamation (FDR) used for aggregate base will not be allowed unless specified or approved by the Engineer.

2211.3 CONSTRUCTION REQUIREMENTS

B. Contractor Quality Control (QC) Testing

If required by the Schedule of Materials Control, perform Contractor QC testing and submit results and all required forms to the Engineer within one business day.

Correct base, which fails either QC or Quality Assurance (QA) testing Correct failing material before placing the next lift.

C. Placing and Compacting

Compaction shall be obtained by the Specified Density Method.

The Contractor shall install the aggregate base immediately, no more than 24 hours after completion and approval of the Grading Grade. If placement of the aggregate base is done more than 24 hours after the initial test roll, a second test roll shall be required and paid for by the Contractor.

If aggregate base material is being wasted or placed excessively thick, the Engineer reserves the right to deduct quantities that are in excess of plan thickness. Said quantities shall be based on aggregate material weighing one hundred five (105) pounds per square yard of area per inch of thickness.

Upon completion of the aggregate base installation and test rolling, the resident project representative will review the grades with the Contractor's representative by the string line method. The Contractor shall furnish the string line and perform the string line grade check. The Contractor shall certify that the aggregate base is to proper grade prior to the placement of the bituminous base.

The Contractor shall remove, replace and test roll any portion of the aggregate base that becomes contaminated after placement.

The Contractor shall be responsible to maintain the aggregate base until completion of bituminous surfacing with no direct payment therefore. Additional aggregate base required due to erosion, washouts, trench settlements or other similar causes shall be replaced by the Contractor without additional compensation therefore.

D.4 Moisture Testing

Note that moisture tests during compaction are required for all compaction requirements, including quality compaction, LWD, penetration index, and specified density.

2211.5 BASIS OF PAYMENT

The Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required as Quality Control (QC). The Owner shall be responsible for all inspections and tests required as Quality Assurance (QA).

No claim may be made for aggregate not finished or placed. This shall be payment in full for all costs incidental to construction including water added and compaction. **Original load tickets from a certified scale shall be provided to the construction Observer by the end of a day's haul. Failure to provide certified scale tickets will result in non-payment.**

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2211.507	AGGREGATE BASE (CV) CLASS 5	C Y
2211.509	AGGREGATE BASE CLASS 5	TON

2215 RECLAMATION

The provisions of MnDOT 2215 are modified and/or supplemented as follows:

2215.1 DESCRIPTION

Pulverizing and blending shall be accomplished in a single operation for FDR.

2215.3 CONSTRUCTION REQUIREMENTS

A. General

Provide traffic control in accordance with the current MN MUTCD for reclaiming operations. If flaggers are needed, the Contractor shall provide them and the cost associated with flaggers shall be included in the bid price for full depth reclamation.

E.1 Pulverizing Operation

Perform a test strip to ensure that the reclamation material meets the correct specifications. Aggregate materials shall have uniform: appearance, texture, moisture content, and performance characteristics.

When reclaiming operations are not feasible as determined by the Engineer due to a lack of existing gravel base or other suitable subgrade material, the Contractor shall suspend reclaiming operations and remove and salvage the existing pavement by milling.

E3. Placing and Compacting

Where subsurface utility installation work is to occur, remove and stockpile the reclaimed material prior to performing the utility work. Any contaminated reclaimed material shall be removed and replaced as directed by the Engineer with no additional compensation provided to the Contractor.

Excess reclamation material not incorporated into the Work shall become property of the Contractor and shall be removed and disposed of at no cost to the Owner.

2215.5 BASIS OF PAYMENT

The Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required as Quality Control (QC). The Owner shall be responsible for all inspections and tests required as Quality Assurance (QA).

Test strips shall be included in the cost of Full Depth Reclamation, with no additional compensation provided.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2215.504	FULL DEPTH RECLAMATION	S Y

2232 MILL PAVEMENT SURFACE

The provisions of MnDOT 2232 are modified and/or supplemented as follows:

2232.3 CONSTRUCTION REQUIREMENTS

B. Operations

Provide traffic control in accordance with the current MN MUTCD for milling operations. If flaggers are needed, the Contractor shall provide them and the cost associated with flaggers shall be included in the bid price for milling.

The Contractor shall be responsible for marking and verifying the condition of existing structures within the roadway prior to beginning pavement milling.

2232.5 BASIS OF PAYMENT

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2232.504	MILL BITUMINOUS SURFACE (____")	S Y

2331 PAVEMENT JOINT ADHESIVE

2331.1 DESCRIPTION

This work consists of applying pavement joint adhesive to the face of the longitudinal construction joint formed between the concrete curb and gutter and the bituminous pavement. Joint adhesive is to be applied to the exposed face of the concrete gutter pan immediately prior to paving the bituminous wear course.

2331.2 MATERIALS

Provide joint adhesive meeting requirements as specified in Table 2331.2-1.

Table 2331.2-1 Joint Adhesive Requirements			
Test	Temperature	ASTM	Specification
Brookfield Viscosity	400°F	D3236	4,000 – 10,000 cp
Cone Penetration	77°F	D5329	60 – 100 dmm
Resilience	77°F	D5329	30% minimum
Ductility	77°F	D113	30 cm minimum
Ductility	39.2°F	D113	30 cm minimum
Tensile Adhesion	77°F	D5329	500% minimum
Softening Point	---	D36	170°F minimum
Asphalt Compatibility	---	D5329	Pass

2331.3 CONSTRUCTION REQUIREMENTS

A. Equipment Requirements

Use a jacketed double boiler type melting unit, with both agitation and recirculation systems. Provide a pressure feed wand application system.

B. Material Handling

Submit a copy of the manufacturer's recommendations for heating, re-heating, and applying the joint adhesive material.

Remove the joint adhesive material from the packaging immediately before it is placed in the melter. Joint adhesive packaging must be clearly marked with the name of the manufacturer, the trade name of the adhesive, the manufacturer's batch and lot number, the application/pour temperature, and the safe heating temperature.

Feed additional material into the melter at a rate equal to the rate of material used.

Verify the pouring temperature of the joint adhesive at least twice per day at the point of discharge. Stop production if the adhesive falls below the recommended application/pour temperature. When the temperature of the adhesive exceeds the maximum safe heating temperature, stop production, empty the melter, and dispose of that adhesive in an environmentally safe method.

Do not blend or mix different manufacturer's brands or different types of adhesives.

C. Joint Adhesive Application

Clean and dry the face of the longitudinal joint before applying joint adhesive. Apply the joint adhesive material to the entire exposed face of the concrete gutter pan where an adjacent HMA pavement will be constructed. Recommended band thickness is approximately 1/8 inch. An application shoe attached to the end of application wand is recommended. Do not overlap the joint by greater than 1/2 inch at the top of the joint or 2 inches at the bottom of the joint. Apply the joint adhesive immediately in front of the HMA

paving operation. If the adhesive is tracked by construction vehicles, repair the damaged area and restrict traffic from driving on the adhesive.

D. Quality Control

Acceptance of the joint adhesive material is based on the certification by the manufacturer that the sealant meets the requirements listed in Table 2331.2-1. Field sampling shall be used to verify that the delivered joint adhesive meets the requirements of the Specification. The Contractor shall take a sample from the application wand during the first 20 minutes of placing sealant from each melter on the Project in the presence of the Engineer.

Each sample shall consist of two aluminum or steel sample containers with the capacity to hold 5 pounds of sealant each. The two sampling containers shall be labeled with the project number, date, time, location, manufacturer and lot number of the sealant. Each container shall be numbered one of two, or two of two. The Engineer reserves the right to conduct supplementary sampling and testing of the sealant material.

The Contractor shall document the locations where the material from each lot number of sealant is placed.

2331.4 METHOD OF MEASUREMENT

The Engineer will measure the length of joint adhesive applied.

2331.5 BASIS OF PAYMENT

The Contract Unit Price for Joint Adhesive is compensation in full for equipment, Materials and labor required to complete the Work.

No payment will be made for adhesive material that exceeds the maximum safe heating temperature or its disposal.

If a field sample fails to meet any of the requirements in Table 2331.2-1, the Work completed with the material from the lot that the field sample represents, shall be subject to a two percent reduction in the Contract Unit Price of the final Lift of the plant mixed asphalt pavement.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2331.603	JOINT ADHESIVE	L F

2357 BITUMINOUS TACK COAT

The provisions of MnDOT 2357 are modified and/or supplemented as follows:

2357.5 BASIS OF PAYMENT

Delete paragraph 2357.5.A in its entirety.

Tacking of concrete curbing or concrete edge shall be considered incidental to the installation of the bituminous base course and no direct compensation shall be paid therefore.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2357.506	BITUMINOUS MATERIAL FOR TACK COAT	GAL

2360 PLANT MIXED ASPHALT PAVEMENT (LOCAL AGENCY)

The provisions of MnDOT 2360 are modified and/or supplemented as follows:

2360.1 DESCRIPTION

Bituminous pavement payment incentives shall not apply to this Project.

2360.2 MATERIALS

Aggregate for wearing courses shall be virgin aggregates as specified in MnDOT 3138.2B. Recycled asphaltic pavement within the wear course layer will not be allowed.

G. Mixture Quality Management

Delete and replace the third through sixth sentences of the first paragraph of MnDOT 2360.2.G.4.b with the following:

Sample mixture from behind the paver. Sampling from the truck box at the plant site is not allowed unless approved by the Engineer. In addition to the QC sample, the Contractor will also bring an additional split of the mixture sample to the plant site and store for the Owner for 10 calendar days.

2360.3 CONSTRUCTION REQUIREMENTS

B.2.a Paver

Provide a paver with an operating weight of at least 31,500 pounds with a maximum throughput capacity of at least 850 tons per hour.

D. Compaction

Perform ordinary compaction for all bituminous paving on the Project, as directed by the Engineer.

Delete the first paragraph of MnDOT 2360.3.D.1 and replace with the following:

Compact the pavement to at least the minimum required Maximum Density values in accordance with Table 2360.3-1. Density evaluation will not include longitudinal joint density.

Delete MnDOT Table 2360.3-2 in its entirety.

Delete MnDOT 2360.3.D.1.j and replace with the following:

D.1.j Companion Core Testing

The Department will select at least one of the two companion cores per lot to test for verification.

Delete MnDOT 2360.3.D.1.n in its entirety.

Delete MnDOT 2360.3.D.1.p in its entirety.

Add the following new paragraph to MnDOT 2360.3:

H. Bituminous Driveways

Driveways disturbed by construction shall be replaced as directed by the Engineer. The Contractor will be required to remove the existing driveway pavement to the limits marked by the Engineer. The Contractor shall then excavate and dispose of the amount of material required to allow for the new driveway section.

Bituminous driveways shall be replaced with six inches (6") of Class 5, aggregate base and three inches (3") of paver-laid bituminous wear course as shown in the details on the plans. Existing bituminous edges shall be saw-cut clean and true and coated with bituminous tack coat material prior to placement of pavement. All joints shall be flush with the abutting surface. Completed bituminous driveways shall have a smooth "tight" appearing finish and not show open aggregate. If in the opinion of the Engineer, the appearance is unacceptable, the Contractor shall either replace or seal coat the driveway at his expense.

2360.4 METHOD OF MEASUREMENT

When paying for Material by Square Yard the Engineer will measure the Plan dimensions for standard width and/or irregular width paving at the dimensions and thickness specified. There will be no additional payment for asphalt pavement constructed with a greater thickness or width than required by the Plan.

The Engineer may direct the Contractor to construct asphalt pavement in thicknesses different than that shown on the plan for small quantities. The Method of Measurement will be a direct proration from the original thickness to the changed thickness, with payment to be made at Contract Unit Prices.

2360.5 BASIS OF PAYMENT

The Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required as Quality Control (QC). The Owner shall be responsible for all inspections and tests required as Quality Assurance (QA).

Where bituminous driveway pavement is measured by the square yard, aggregate base material and excavation required beneath the driveway pavement shall be considered included in the cost of the bituminous driveway pavement. Existing bituminous edges shall be saw cut clean and true and coated with bituminous tack coat material prior to placement of pavement. Completed bituminous driveways shall have a smooth "tight" appearing finish and not show open aggregate. If in the opinion of the Engineer, the appearance is unacceptable, the Contractor shall replace the driveway at his expense.

B.13 Compaction – Maximum Density

Use a maximum pay factor of 1.00 for pay factor A – payment incentives shall not apply to this Project.

Delete MnDOT Table 2360.5-6 Incentive and Disincentive Schedule for Longitudinal Joint Density, 4 percent Design Void in its entirety.

Delete MnDOT Table 2360.5-7 Incentive and Disincentive Schedule for Longitudinal Joint Density, 3 percent Design Void in its entirety.

Delete the last sentence of Paragraph 2360.5.B.13.b and replace with the following:

Use a pay factor of 1.00 for both pay factor B and pay factor C – no cores are taken at the longitudinal joint.

C. Schedule

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2360.504	TYPE SP __ WEAR CRS MIX (__ , __) (X.X)" THICK	S Y

2360.509	TYPE SP ___ WEARING COURSE MIX (__, __)	TON
2360.509	TYPE SP ___ NON WEAR COURSE MIX (__, __)	TON

2451 (CEAM 2600) STRUCTURE EXCAVATIONS AND BACKFILLS

The provisions of MnDOT 2451 shall apply, in addition to the provisions of CEAM 2600, Trench Excavation and Backfill/Surface Restoration, which are modified and/or supplemented as follows:

2451.2 (CEAM 2600.2) MATERIALS

The provisions of CEAM 2600.2 are modified and/or supplemented as follows:

A.1 Granular Material Gradation Classifications

Delete the third paragraph of CEAM 2600.2.A.1 and replace with the following:

Bedding and encasement materials for pipe, unless noted otherwise, shall be Granular Material meeting the requirements of MnDOT 3149.2.B.1 Granular Material, except that 100 percent by weight shall pass the one inch sieve.

Add the following new paragraph to CEAM 2600.2:

D. Tracer Wire for Non-Conductive Pipe

Tracer wire for use with all thermoplastic pipe types shall be in accordance with CEAM 2611.2.I.

2451.3 (CEAM 2600.3) CONSTRUCTION REQUIREMENTS

The provisions of CEAM 2600.3 are modified and/or supplemented as follows:

A2. Establishing Line and Grade

All trenches shall be excavated so that the pipe may be laid accurately to grade with a minimum of seven and one-half feet (7½') of cover over the water main from finished grade, unless otherwise noted on the plans. Installation of water main or services to a deeper depth than specified shall be considered incidental with no additional compensation allowed therefore.

A4. Establishing Line and Grade

No existing valves may be operated by individuals other than personnel from the Owner's Public Works Department. Only under emergency conditions or after specific authorization is given by the Owner's Public Works Department shall the Contractor operate valves.

Add the following new paragraph to CEAM 2600.3.A:

A7. Tracer Wire for Non-Conductive Pipe

Tracer wire for use with all thermoplastic pipe types shall be installed in accordance with CEAM 2611.3.B.4.

B3. Excavation Limits and Requirements

It shall be the Contractor's responsibility to notify the Engineer of changing soil conditions which may be of poor bearing capacity and when organic soils are encountered. Where utilities are placed on unstable soils without notification of the Engineer, the Contractor shall be responsible for all repairs and correction of the installation without further compensation.

C1. Jacking/Boring

Casing pipe shall be welded steel pipe (new material) conforming to ASTM Designation A252, Grade 2 or ASTM Designation A139, Grade B. No recycled steel casing pipe shall be allowed. The carrier pipe shall be installed using joint restraints to facilitate removal if needed.

The carrier pipe shall be installed within the casing pipe using casing spacers to center the carrier pipe within the casing pipe. Casing spacers shall be stainless steel as manufactured by Cascade Waterworks Manufacturing or approved equal. Upon completion of the carrier pipe installation, the annular space between the carrier pipe and the casing shall be densely filled with sand and the ends sealed with cement. A simultaneous grouting and jacking procedure shall be used.

The carrier pipe shall be installed using joint restraints or locking gaskets to facilitate removal if needed.

D. Placement of Insulation

Place insulation boards on a smooth, level foundation with the edges trim and square. Provide joint overlaps of a minimum of 6 inches on the underlying sheets. Install at least two wood skewers per board in each Layer driven flush with the surface of the material.

E. Pipeline Backfilling Operations

If insufficient suitable materials are available to complete backfilling, excess suitable materials from other areas of the project may be used to complete the work, as directed by the Engineer.

Granular foundation, bedding, and encasement materials shall be placed around all pipe within areas of rock excavation.

Bedding as specified within the CEAM Standard Specifications and shall be used for all ductile iron pipe (DIP) and reinforced concrete pipe (RCP) installations unless otherwise called for in the drawings or directed by the Engineer.

Delete the ninth paragraph of CEAM 2600.3.E in its entirety.

Backfilling above the encasement zone shall comply with the general requirements specified in 2600.3.E and the following:

1. Backfill within the roadbed or building pad areas shall be placed in accordance with MnDOT 2106.3.F and shall be compacted to Specified Density requirements in accordance with MnDOT 2106.3.G.1.
2. Backfill not within the roadbed or building pad areas shall be compacted to 95 percent of maximum density (MnDOT Standard Proctor).
3. Maximum backfill lift thicknesses may be increased or decreased by authority and at the discretion of the Engineer in consideration of material type, material disposition, or the demonstrated capability of compaction equipment.
4. The Engineer shall have full authority to suspend backfill operations until the preceding lift of backfill has been determined by the Engineer to be fully compacted and a passing compaction test has been taken. No additional compensation for lost time shall be made if backfill operations are suspended by the Engineer for the purposes of determining adequate trench backfill compaction.

2451.5 (CEAM 2600.5) BASIS OF PAYMENT

The provisions of CEAM 2600.5 are modified and/or supplemented with the following;

Delete the third paragraph of CEAM 2600.5 and replace with the following:

Furnishing and placing of granular materials for foundation, bedding, cover or backfill placement as specified in connection with pipe or structure items shall be incidental to the pipe or structure item without any direct compensation being made.

No additional compensation will be made for sewer and water service lines not constructed in a common trench.

For all utility work, granular foundation material (including 1 ½-inch clear rock) may be used in conjunction with or in lieu of dewatering. Any use of granular foundation material or other material to maintain a dry trench or improve the pipe foundation shall be considered incidental with no additional compensation.

2461 STRUCTURAL CONCRETE

2461.2 MATERIALS

E. Concrete Mix Designs

Modify MnDOT Table 2461.2-6 as follows:

For Concrete Grade P, Piling, Mix Number 1P62, the Maximum W/C Ratio shall be 0.63.

Modify MnDOT Table 2461.2-11 as follows:

For Level 2 mixes, when there is a change of more than 5% Total Cementitious, resubmittal of the mix design is required in accordance with MnDOT 2461.2.E.3.a, "Preliminary Test Data Requirements for Level 2 Mixes."

2461.3 CONSTRUCTION REQUIREMENTS

F.2 Certificate of Compliance

Add the following items to the list in MnDOT 2461.3.F.2:

- (22) Fibers, brand and dosage per cubic yard.
- (23) Approved Ready-Mix (RMX) Sheet Number (XXX-XXX)

G.6 Estimating Concrete Strength by the Maturity Method

Modify MnDOT Table 2461.3-3 as follows:

For Normal Strength Concrete, Testing Ages shall be 1,3, 7, 14 and 28 Calendar Days.

2462 PRECAST CONCRETE

2462.3 CONSTRUCTION REQUIREMENTS

G.4 Test Methods and Specimens

Delete and replace the first paragraph of MnDOT 2462.3.G.4 with the following:

Take samples randomly in accordance with ASTM D3665, "Standard Practice for Random Sampling of Construction," Section 5, at a rate defined in accordance with the Schedule of Materials Control. Perform sampling and testing in accordance with the Concrete Manual.

Delete and replace the fourth paragraph of MnDOT 2462.3.G.4 with the following:

Furnish 4 inch by 8 inch cylinder molds, unless the maximum Aggregate size is greater than 1 ¼ inches, then furnish 6 inch by 12 inch cylinder molds.

2501 PIPE CULVERTS

The provisions of MnDOT 2501 are modified and/or supplemented as follows:

2501.3 CONSTRUCTION REQUIREMENTS

Add the following new paragraph to MnDOT 2501.3:

H. Geotextile

Use Geotextile 3733 Type 1 to wrap concrete pipe joints or for other drainage applications.

2501.5 BASIS OF PAYMENT

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2501.502	___" RC PIPE APRON	EACH
2501.502	___" SPAN RC PIPE-ARCH APRON	EACH
2501.602	TRASH GUARD FOR ___" PIPE APRON	EACH
2501.602	TRASH GUARD FOR ___" SPAN PIPE APRON	EACH

2502 SUBSURFACE DRAINS

The provisions of MnDOT 2502 are modified and/or supplemented as follows:

2502.1 DESCRIPTION

The location and alignment of the subsurface drains and outlets are shown in a general manner on the Plans. Modifications to the proposed alignment may be made by the Engineer in the field to ensure that the drain properly collects groundwater and infiltration water that may accumulate in the bottom of granular base material. Subsurface drains will be installed at low point catch basin as directed by the Engineer.

Perforated thermoplastic (TP) pipe shall be installed in accordance with the requirements for subcut drains, (MnDOT 2502.3.B) **except that perforated pipe drains shall be bedded on coarse filter aggregate (MnDOT 3149.2.H). Trenches shall also be backfilled with coarse filter aggregate.**

Tracer wire shall be installed with all subsurface drains in accordance with CEAM 2611 and CEAM 2621.

This work shall also include the connection to sump pump drains in the adjacent yards as shown on the plans and as directed by the Engineer in the field.

2502.2 MATERIALS

C.1 Thermoplastic (TP)

Pipe shall be wrapped with factory installed snug fitting geotextile, MnDOT 3733, Type I (knit sock). Pipe shall be backfilled with one-quarter inch (¼") washed pea gravel. Pea gravel shall be wrapped with geotextile, MnDOT 3733, Type I (fabric). Pea gravel shall be clean naturally rounded aggregate meeting the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Passing</u>
19.0 mm (¾ inch)	100%

9.5 mm (# 4)	90 - 100%
4.75 mm (# 10)	0 - 10%
2.00 mm (# 40)	0 - 1%

If pipe is not specified in the Contract, use pipe meeting MnDOT 3245.

The provisions of MnDOT 3245.2 are modified and/or supplemented as follows:

- (5) ASTM D1785, PVC Schedule 40 pipe (perforated & unperforated as applicable) with one of the following:
 - a. Perforated: Slotted with maximum slot width of 1/16 in and minimum slot area of 1½ sq. in/linear ft for 4 in diameter pipe and greater than 1 sq. in/linear ft for pipe having a diameter less than 4 in.
 - b. Perforated: Circular holes with two to four rows of holes. Hole diameter equal to 3/16 in to 3/8 in, and minimum area of holes 1½ sq. in/linear ft for 4 in diameter pipe and greater and 1 sq.in/linear ft for pipe having a diameter less than 4 in.
 - c. Unperforated.

Create all perforations at manufacturer's plant; no field perforations are allowed. Unless otherwise specified in the applicable specifications, plans, or special provisions, the Contractor may choose the joint type.

Submit to the Engineer a manufacturer's Certificate of Compliance with each pipe shipment.

2502.5 BASIS OF PAYMENT

The connection of the subsurface drain to a drainage structure shall be considered incidental unless the subsurface drain is connected to an existing drainage structure.

Payment for Perforated (TP) Pipe Drain at the contract unit price per linear foot shall be full compensation for fabric wrapped pipe, furnished and installed as specified, filter aggregate backfill and compaction, end caps, connecting the pipe drains into the drainage structures, and all other associated work required to install the perforated pipe drains as detailed, specified, and as directed by the Engineer.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2502.503	4" PERF TP PIPE DRAIN	L F
2502.602	4" PVC PIPE DRAIN CLEANOUT	EACH

2503 (CEAM 2621) PIPE SEWERS

The provisions of MnDOT 2503 shall apply, in addition to the provisions of CEAM 2621, Sanitary Sewer and Storm Sewer Installation, which are modified and/or supplemented as follows:

2503.2 (CEAM 2621.2) MATERIALS

The provisions of CEAM 2621.2 are modified and/or supplemented with the following:

A3. Reinforced Concrete Pipe and Fittings

Reinforced concrete pipe and fittings shall conform with the requirements of MnDOT Specification 3236 for the type, size and strength class specified.

Reinforced concrete aprons shall be of the same strength class as the pipe. Trash guards and "U" bolt fasteners shall be hot dipped galvanized after fabrication as per MnDOT Standard

Specifications 3392 and 3394. Aprons that are thirty-six (36) inch (pipe size) and larger require steel sheet piling (see detail SD-6).

A5. Polyvinyl Chloride Pipe and Fittings

Sanitary sewer polyvinyl chloride (PVC) pipe and fittings shall conform to the CEAM requirements.

PVC pipe used for storm sewer installations shall conform to the requirements of MnDOT 2503.

PVC pipe and fittings for pressure sewer and forcemains shall meet the requirements of CEAM 2611.2.A2 for watermain class pipe.

Submit a manufacturer's Certificate of Compliance with each pipe shipment including date manufactured, nominal and actual inside pipe diameters.

Joints shall be either O-ring rubber gasket or solvent-cemented according to the manufacturer's specifications and with the approval of the Engineer. All service wyes and service pipe shall be Schedule 40.

The Contractor shall furnish and place the necessary pipe bedding material as specified in 3149.2.F, "Recommended Practice for Underground Installation of Flexible Thermo-Plastic Sewer Pipe".

A11. Tracer Wire for Non-conductive Pipe

Tracer wire shall be PRO-TRACE HF-CCS PE45 as manufactured by Pro-Line Safety Products or approved equal.

Tracer wire for laterals to use Copperhead SRK-01 service locating kit or approved equal. Contractor to use kit with appropriate color-coding in accordance with APWA Uniform Color Code.

Non-roadway tracer wire access box (BoaBox) shall be Copperhead grade level adjustable, light duty, product BOABOX SWR or approved equal.

Add the following new paragraph to CEAM 2621.2:

F. Steel Casing Pipe

The casing pipe shall be welded steel pipe (new material) with a minimum yield strength of 35,000 psi. The wall thickness shall be a minimum of 0.5 inch.

2503.3 (CEAM 2621.3) CONSTRUCTION REQUIREMENTS

The provisions of CEAM 2621.3 are modified and/or supplemented with the following:

A. Installation of Pipe and Fittings

The Engineer shall receive notice 24 hours in advance for testing of sewers including leakage testing, deflection testing, and televising.

When the Contractor uses laser beam control for grade and alignment, the Contractor shall check into the grade stakes provided. Any discrepancies found between the laser beam elevation and grade stake elevation, or the line and grade shown on the plans, shall be immediately brought to the Engineer's attention before continuing pipe installation. Failure to check into grade stakes provided or to notify the Engineer of discrepancies shall put the full responsibility on the Contractor for any removal and reinstallation of pipe necessary to conform to the line and grade as shown in the Drawings.

Installation of HDPE pipe for pressure sewer and forcemains shall meet the requirements of CEAM 2611.3 for watermain class pipe.

A2. Pipe Laying Operations

Dewatering to maintain pipe trenches free of water shall be considered incidental, unless a bid item has been included for Dewatering.

Install pipe to the alignment, grade, and location as shown in the drawings and/or staked in the field. No deviation from the drawings and/or staked alignment, grade, or location is allowed.

Deviation from the pipe grade, as provided by the Engineer, in excess of 0.05 percent may be cause for removal and relaying of the pipe by the Contractor with no additional compensation allowed therefore. No re-rounding of pipe will be allowed. Bedding shall be per MnDOT 3149.2.F for ductile iron and concrete pipe unless stated in the plans. PVC plastic sewer pipe shall be bedded and installed in accordance with the requirements of ASTM-D-2321, "Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe". Density tests will be performed by the Owner at all points designed by the Engineer to assure compliance with the minimum density requirement. If required density is not achieved, the Contractor will be ordered to bed the pipe with compacted sand four inches (4") below the pipe and alongside the top of the pipe. The Contractor shall furnish and place this sand bedding as an incidental item with no direct compensation therefore.

The trench shall be dug only so far in advance of the work. Advance excavation shall be the minimum consistent with the Contractor's methods and scheduling, shall be subject to the approval of the Engineer and consistent with other sections of these specifications. The sides of the trench shall be sloped and/or braced, and the trench drained to provide a stable excavation, protect adjacent structures, and permit pipe to be laid in a dry trench.

Trench excavation must conform to all local, state and federal requirements. All work must be confined to the limits of the construction and to easements or rights-of-way as indicated on the plans.

Temporary shoring, bracing, or other means to ensure a safe trench shall be incidental to utility installation and no additional payment shall be made.

Backfilling shall be done in uniform lifts completely compacted over the full width of the excavated area. The material shall be compacted to ninety five percent (95%) Standard Proctor Density, except that the top three feet (3') of the trench shall be compacted to one hundred percent (100%) standard proctor density. Backfill shall be placed such that the final moisture content of the soil is in an acceptable range as determined by the Owner's testing laboratory.

Trench backfill shall be by use of suitable material from the excavation. The Contractor is responsible for excavating, stockpiling and handling materials in such a way as to not degrade suitability of materials for backfill. Backfill material shall be tested by the Contractor for optimum moisture content with the Contractor responsible for adding moisture or for reasonable soil drying measures to allow for material placement at a moisture content that will allow compaction to the required Standard Proctor Density.

All pipe backfill material, placement, and compaction shall be incidental to pipe sewer price per linear foot for each size and type of pipe and all bedding requirements.

Should material be encountered in any trench that is in the judgment of the Engineer unsuitable, replacement materials may be ordered at the unit price stipulated in the contract. Excavation and disposal of material shall be incidental. Replacement material shall be aggregate backfill.

Piping shall be installed in accordance with MnDOT provisions 2451.3D and/or 3149.2F according to the details for each type of pipe. In areas with poor foundation soils, the trench shall be over-excavated and backfilled with Aggregate Bedding material as directed by the Engineer.

Aggregate Bedding shall be utilized as directed by the Engineer as fill material below the foundation grade in utility trenches if unsuitable soils are encountered.

Service must be maintained during construction of the new sanitary sewer and storm sewer mains. Service can be maintained by pumping around sections of mains being replaced. It shall be the Contractor's responsibility to determine a method to maintain service. The Engineer shall approve all service maintenance methods prior to the start of such operations.

Add the following new paragraphs to CEAM 2621.3.A2:

When connecting to existing pipe, neatly cut the existing pipe off and trim flush with the proposed pipe or inside wall of proposed Structure. Assure the patch for the proposed pipe connection to the existing pipe is secure and waterproof. Repair unplanned damage to the existing sewer.

When connecting into an existing structure, field verify the location and top of casting elevation, and the location, invert elevation, size and type of existing pipes connected to the structure. Core drill (or saw) openings in the existing Structures. Provide a clean, water-tight fit seal to the proposed pipe. Repair unplanned damage to the existing Structure.

A3. Connection and Assembly of Joints

Use Geotextile 3733 Type 1 to wrap concrete pipe joints or for other drainage applications.

A4. Bulkheading Open Pipe Ends

Mark end of sewer stubs with a wooden 4 in x 4 in marker. The marker shall extend adjacent to the plug and to a depth 6 in below, and shall extend 2 ft above the ground line. The marker shall be continuous without any breaks, and shall be vertical or plumb.

A.5 Tracer Wire

A single continuous wire shall be installed with all new off-road sanitary sewer pipe and all new sanitary sewer services. Wire for main line pipe shall terminate outside each off-road manhole at an approved tracer wire access box ("snake pit") located adjacent to manhole and structure marker, and shall terminate inside each roadway manhole through the adjusting rings. Wire for service pipe shall terminate at both ends of the stub, furnished with specified connections.

Tracer wire shall be installed with PVC sanitary sewer located in pervious surfaces and with all sanitary sewer services from the mainline to the end of the service stub. Wire connectors shall be lockable and specifically manufactured for use in underground tracer wire installation. Connectors shall be dielectric silicon filled to seal out moisture and corrosion, and shall be installed in a manner so as to prevent any uninsulated wire exposure. Non-locking friction fit, twist on or taped connectors are prohibited.

Prior to approval to build the street section, the Contractor shall furnish a locator and using a low voltage circuit, test the entire trace wire system in the presence of the Engineer. The test shall consist of a continuous above ground trace of the piping and appurtenances installed to within 2 feet of installed locations. All areas failing the location test shall be corrected at the Contractor's expense.

E. Sanitary Sewer Leakage Testing

The Observer shall receive twenty-four (24) hours' advance notice for testing. All leaks shall be sealed by the Contractor before final acceptance by the Owner.

E.1 Air Test Method

The pressure gauge shall be marked in one tenth (0.1) psi increments and to be a standard calibrated gauge.

F. Deflection Test

The Owner reserves the right to have the Contractor measure the deflection of PVC pipe at any time, including during a two (2) year guarantee period following the final acceptance of the sewer pipe.

G. Televising

Televising of the sanitary and storm sewers for all projects shall be coordinated with the Owner. For projects completed as part of a private development, the televising costs shall be reimbursed by the project developer. All sanitary sewer shall be jetted clean and televised after the services are installed and within fifteen (15) days after the manholes are raised as directed by the Engineer. The televising contractor shall supply the Owner, and developer if applicable, with video and a detailed report within seven (7) days of the televising being completed. The televising video shall be of high-quality color picture (high resolution definition 1080p or greater) and sound meeting the Owner's formatting requirements. The camera lighting shall be illuminated to see a minimum of 20 feet in front of the camera. The operator must stop at all joint connections, potential defects and services, and move the camera (pan and tilt) so the joint connection condition and interior of connecting pipe are clearly visible. The camera will be operative in 100% humidity conditions and the focal distance will be adjustable through a range of from 6" to infinity. Prior to placement of wear course paving, the Engineer must review all sewer televising reports and conclude there are no subsurface deficiencies requiring excavation to correct.

The Contractor will be responsible for television inspection of the sanitary sewer and storm sewer after it has been constructed. The Owner reserves the right to view these television inspection records prior to final project acceptance and at any time within the warranty period.

Add the following new paragraph to CEAM 2621.3:

H. Sanitary Sewer By-Pass Pumping

The Contractor shall furnish, install, maintain, and remove temporary pumps, pipes, automatic controls, and related appurtenances to allow continuous operation of sanitary sewer facilities whenever necessary to ensure service will be maintained during construction. Sanitary sewer facilities shall include, but are not limited to gravity sanitary sewer main, sanitary sewer force mains, sanitary sewer services, sanitary sewer lift stations, and/or sanitary sewer grinder pumps.

Sanitary sewer pipe sizes are shown on the Plans. The Contractor shall be responsible for verifying all sanitary sewer pipe sizes and locations within the project limits to determine the most appropriate manner to provide sanitary sewer bypass pumping.

The Contractor shall submit copies of the proposed pumping, piping, and control systems for sanitary sewer bypass pumping to the Engineer a minimum of seven days in advance of installing the sanitary sewer bypass pumping system.

The Contractor shall have one standby pump available on-site for each pumping location to use in the event of a pump failure. The standby pump shall be adequately sized to handle the rates of sanitary sewer flow being bypasses.

During the duration of the bypassing the Contractor shall be required to routinely check the bypass piping and clean it as necessary to avoid clogging of the bypass piping and subsequent surcharging of the existing sewer.

2503.5 (CEAM 2621.5) BASIS OF PAYMENT

The provisions of CEAM 2621.5 are modified and/or supplemented with the following:

Sewer connections shall be paid per each connection of new sewer to existing sewer. All necessary labor, materials, and work required to make the connection shall be included in the price per each as provided in the Bid Form.

Payment for sewer pipe shall be made at the unit price bid per liner foot. Riser service at the right-of-way end of the service pipe installation will be paid for as liner foot of service pipe. Sewer pipe payment shall be limited to eighty percent (80%) of the actual amount installed until all sewer has been tested, accepted and backfilled to subgrade elevations. No additional compensation will be made for sewer and water service lines not constructed in a common trench.

Payment for connection to existing sanitary sewer shall be made for each connection to the existing sanitary sewer including locations where manholes will be constructed over existing sewer lines. The Contractor shall verify locations, alignment, and elevation prior to connecting. MaxAdaptor or approved equal adaptors, if necessary, shall be incidental.

Payment for sanitary sewer and storm sewer televising inspection shall be at the contract unit price per linear foot for televising of all sanitary sewer and storm sewer as specified. All pipe shall be clean and free of dirt and debris prior to final payment. The cost to verify the pipe is clean shall be at the Contractor's expense.

Replacement of the existing storm sewer line may require temporary bulk heading of the upstream manhole during replacement of the storm system. The duration of temporary bulkhead operations should be limited to prevent excessive backup and must be removed at the end of each construction day. This work shall be incidental to pipe installation and no payment shall be made.

Payment for aggregate bedding shall be made by the cubic yard, loose volume, at the unit price in the proposal and shall include excavation and disposal of unsuitable materials. Payment for Aggregate Bedding MUST be pre-approved by the Engineer prior to the start of placement.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2503.503	___" SPAN RC PIPE-ARCH SEWER CL IIA	L F
2503.503	___" RC PIPE SEWER DES 3006 CL III	L F
2503.503	___" RC PIPE SEWER DES 3006 CL V	L F
2503.601	SANITARY SEWER BYPASS PUMPING	LS
2503.602	CONNECT TO EXISTING SANITARY SEWER	EACH
2503.602	CONNECT TO EXISTING STORM SEWER	EACH
2503.602	CONNECT INTO EXISTING DRAINAGE STRUCTURE	EACH
2503.602	CONNECT INTO EXISTING MANHOLE (SAN)	EACH
2603.602	CONNECT TO EXISTING SANITARY SEWER SER	EACH
2503.602	8"X4" PVC WYE	EACH
2503.603	TELEWISE SANITARY SEWER	L F
2503.603	TELEWISE STORM SEWER	L F
2503.603	4" PVC PIPE SEWER	L F
2503.603	8" PVC PIPE SEWER	L F
2503.603	___" PVC PIPE SEWER SDR 26	L F
2503.603	___" PVC PIPE SEWER SDR 35	L F
2503.603	___" DUCTILE IRON PIPE SEWER	L F
2503.603	___" STEEL CASING PIPE	L F

2504 (CEAM 2611) WATERMAIN

The provisions of CEAM 2611, Standard Specifications for Watermain and Service Line Installation are modified and/or supplemented as follows:

2504.2 (CEAM 2611.2) MATERIALS

The provisions of CEAM 2611.2 are modified and/or supplemented as follows:

All watermain materials, including but not limited to ductile iron pipe and fittings, hydrants, valve boxes, gate valves, and retainer glands and bolts shall be manufactured and produced in the United States.

A1. Ductile Iron Pipe and Ductile Iron and Gray Iron Fittings

Ductile iron pipe shall be mechanical joint, Class 50 for 16 in and larger diameter, and Class 52 for 12 in and smaller diameter. Ductile iron pipe, gray iron pipe fittings and accessories shall be manufactured by American Cast Iron Pipe Company, McWane Ductile Iron Pipe Company, Tyler Pipe Company, U.S. Pipe, Tyler Union Company or Engineer approved equal. All DIP water mains including valves, fittings, hydrants, and appurtenances shall be fully encased in polyethylene film of 8 mil minimum nominal thickness or 4 mil high-density cross-laminated per AWWA C105.

All fittings for watermain shall be mechanical joint, Class 350, Ductile Iron Compact Fittings in accordance with AWWA C153. Fittings shall be furnished with fusion bonded epoxy external coating and/or interior lining in accordance with AWWA C550 and C116, 6 mil to 8 mil nominal thickness.

All restraints shall be fusion bonded epoxy coated on the inside and outside according to ANSI/AWWA C550 and C116/A21.16. The thickness of the coating shall be 6-8 mils. All bolts and fasteners are to be stainless steel.

All mechanical and push-on joints shall have rubber gaskets conforming to ANSI/AWWA C111/A21.11.

All nuts and bolts shall be stainless steel or Cor-Blue t-head bolts as manufactured by Birmingham Fastener Inc. or Engineer approved equal. The raw materials analysis shall meet the chemical and physical requirements of AWWA C111/A21.11-00, current revision. All tie rod restraints and corresponding nuts shall be coated with an approved rust-proofing material.

A2. Polyvinyl Chloride (PVC) Pressure Pipe and Fittings

All PVC watermain pipe shall conform to AWWA C900 (DR 18). Tracer wire shall be laid with all PVC watermain.

All fittings for watermain shall be mechanical joint, Class 350, Ductile Iron Compact Fittings in accordance with AWWA C153. Fittings shall be furnished with fusion bonded epoxy external coating and/or interior lining in accordance with AWWA C550 and C116, 6 mil to 8 mil nominal thickness.

B. Fire Hydrants

Hydrants shall be Waterous Pacer (model WB-67-250), traffic type, **eight and one-half feet (8-1/2')** of bury. The nozzle shall be a minimum of **twenty-four inches (24")** above grade while still maintaining the appropriate break-off elevation. Hydrants shall have National Standard Thread connections. Nozzle caps shall be nut type with chain. **Each hydrant shall be equipped with a High-Visibility Utility Marker as manufactured by Vait Projects, Model LRSH-5000, or approved equal. The Contractor**

shall provide spare markers for each hydrant to the North Branch Public Works Department. All hydrant valves shall be installed with mega-lugs or be rodded to the tee on the main line.

The Contractor shall install one yellow "Out of Order" tag on pumper connection after backfilling of the hydrant has been completed. The tag can be removed once the results of the bacteria test have been received by North Branch Public Works and the City of North Branch, and the system is put online.

C1. Valve Housings

Shall be cast iron, three-piece screw type boxes with 5 ¼" diameter shaft suitable for 7 1/2' of cover over water main, and a drop lid with the word "WATER" on the lid. Valve boxes shall be Tyler 6860 series or approved equal.

C2. Gate Valves

Shall be American made, resilient wedge gate valve Waterous Series 2500 or Engineer approved equal and be compression resilient seated gate valves in accordance with the AWWA C509 (latest revision) and all applicable ASTM standards. Valves shall be Waterous Series 2500 or approved equal, including adaptors (incidental). Gate valves meeting AWWA C500 Specification will not be allowed. Bonnet adaptors are required on all gate valves and will be considered incidental. Gate valve extensions are required where accessibility exceeds seven and one-half feet (7 1/2') (installed prior to backfill).

C3. Butterfly Valves

All valves larger than twelve-inch (12") shall be butterfly valves and shall conform to the requirements of AWWA C504 and the following requirements:

- (1) Working pressure rating of 150 psi minimum.
- (2) Two-inch square operating nut opening counterclockwise.
- (3) Double "O" ring or split V type stem seal.
- (4) Traveling must type greater permanently sealed and lubricated.
- (5) Manufacturers: Dresser, Pratt, or equal.

D. Water Service Pipe and Fittings

Water Services Pipe shall be HDPE SDR-9 CTS conforming to the requirements of AWWA C901, ASTM D-2737 and the following:

- (1) Meets NFS Standard 14, 61, and 372.
- (2) Made from PE4710 material.
- (3) 250psi pressure rating.
- (4) Blue Ultra as manufactured by Polyethylene Technology, Inc. or approved equal.
- (5) Stainless steel insert stiffeners on all compression fittings.
- (6) Provide and install magnesium grounding anode rod and tracer wire.

Drive in magnesium grounding anode rod 6-inches perpendicular from the water main and 6-inches perpendicular to the side of the water service line. Connect tracer wire adjacent to the HDPE by fastening to pipe every 5-feet with plastic ties. At the side of curb stop, wrap 75 feet of tracer wire around a 3-foot long, 6-inch diameter section of perforated flexible polyethylene sleeve before cutting. No splices are allowed except at locations identified in the details. All tracer wire damage must be replaced prior to backfilling

Corporation Stops shall be Mueller B25000, Ford F600, A.Y. McDonald 4701, or Engineer approved equal ball valve design with threaded inlet and flare type joint.

Curb stops shall be Mueller H-15154 Mark II, Ford B22 Series, A.Y. McDonald 6104, or Engineer approved equal ball valve design for use with Minneapolis Pattern Curb boxes with stationary rods.

Curb boxes and lids shall be Mueller, Ford, McDonald or Engineer approved equal. Curb boxes shall be adjustable up and down for seven and one-half feet (7 ½") of cover. Adjustments shall be at mid-range at installation. No additional compensation will be paid for any adjustments required to match final grade elevations.

Curb boxes located in a driveway or parking lot shall be covered with a Ford A-1 Meter Box Cover or Engineer approved equal.

Service saddle on six-inch (6") mains shall have an epoxy coated ductile iron body with double stainless-steel straps and neoprene gasket, Smith-Blair 317 or Engineer approved equal.

F. Mechanical Joint Restraints

All restraints shall be fusion bonded epoxy coated on the inside and outside according to ANSI/AWWA C550 and C116/A21.16. All bolts and fasteners are to be stainless steel or Cor-Blue t-head bolts.

Retainer glands shall be ductile iron designed to withstand the same pressures as the watermain pipe and fittings. Retainer glands shall be by American, US Pipe or Mega-Lug and shall be used at all changes in direction and at all fittings and valves. This shall be considered included in the cost of the water main pipe.

I. Tracer Wire

All watermain, hydrants, and service lines shall be installed with tracer wire, grounding anodes and access boxes as defined on the standard detail plates. Connectors shall be dielectric silicon filled to seal out moisture. Non-locking friction fit, twist on or taped connectors are prohibited. Tracer wire shall be connected to hydrants with Copperhead T2R-FLPKG-5/8 or approved equal.

Tracer wire shall be PRO-TRACE HF-CCSPE45 as manufactured by Pro-Line Safety Products, or approved equal.

Tracer wire for service laterals to use Copperhead SRK-01 service locating kit or approved equal. Contractor to use kit with appropriate color-coding in accordance with APWA Uniform Color Code.

Add the following new paragraphs to CEAM 2611.2:

J. Grounding Rod

All HDPE service lines shall be installed with a magnesium grounding anode. Grounding anodes shall be 18-inch minimum length, 1.5 pound drive-in magnesium ground rod with HDPE cap and 20 feet of 12-AWG CCS wire.

K. Polystyrene Insulation

Insulation board shall be rigid expanded polystyrene, conforming to the material requirements of CEAM 2600.2B. Placement of insulation shall be in accordance with the requirements of CEAM 2600.3.D.

L. Temporary Water Distribution System

A temporary water distribution system shall be required when existing users will be out of water service for a period exceeding eight hours, or as required at the discretion of the Engineer. All piping including hoses used for water service shall be ANSI/AWWA rated. All piping and fittings shall meet current NSF standards and shall be rated for residential or commercial use. The minimum pipe size shall be 2 in for mainlines and ¾ in for individual service connections. Larger pipe sizes may be required based on zoning

or Contractor's phasing plans. No additional compensation will be granted for pipe sizes larger than the specified minimum.

L. Steel Casing Pipe

The casing pipe shall be welded steel pipe (new material) with a minimum yield strength of 35,000 psi. The wall thickness shall be a minimum of 0.5 in.

2504.3 (CEAM 2611.3) CONSTRUCTION REQUIREMENTS

The provisions of CEAM 2611.3 are modified and/or supplemented with the following:

Dewatering to maintain pipe trenches free of water shall be considered incidental.

Notify the Engineer and the Owner at least 72 hours prior to connecting to existing watermain. All residents who will be affected by shutting off water service shall be given a minimum of 24 hours' notice in writing as to when, and for how long, service will be interrupted. Temporary water shutoffs shall not exceed four hours in duration, and shall only occur between the hours of 9:00 a.m. and 3:00 p.m. Monday through Friday, unless otherwise specified in the Contract. The Contractor shall at all times coordinate work with the Engineer and the Owner.

During the installation of the new watermain, service shall be maintained to all properties. It may be necessary to maintain temporary pipes on the surface with connections to outside hose bibs. The temporary connections must be made according to Department of Health standards and approved by the Engineer. New watermain installations shall be coordinated so that no home or business is on temporary water service for more than 14 days unless prior arrangements have been made. The Contractor shall be responsible for any improvements to homes or businesses necessary to facilitate the temporary water connections.

D. Setting Valves, Hydrants, Fittings, and Specials

Hydrants, gate valves and valve boxes shall be set plumb with valve boxes placed directly over valves. Top of valve boxes shall be set one-half inch (1/2") below finished grade unless otherwise noted on the plans. Top of valve boxes shall be adjusted by turning the threaded screw sections to achieve proper final elevations. Internal top sections shall not be used to accomplish the adjustment.

Valves shall be installed over one-fourth (1/4) cubic yard of crushed stone or coarse gravel to ensure drainage. These items shall be incidental to the valve installation.

All hydrants shall be given one (1) additional coat of paint after installation. All abraded surfaces shall be cleaned prior to application of the final field coat.

Hydrants shall be set at such elevations that the connecting pipe will have a minimum of eight feet (8') cover or as shown in the plans. Each hydrant shall be placed upon a brick or concrete not less than four inches (4") thick and fifteen inches (15") square. The back side of the hydrant opposite the pipe connection shall be firmly wedged against the vertical face of the trench with concrete blocking to prevent the hydrant from blowing off the line. Around the base of each hydrant shall be placed not less than three (3) cubic yard of crushed stone or coarse gravel with tar paper covering to ensure complete drainage of the hydrant when closed. Any hydrants placed where the ground water table is less than eight feet (8') below the ground surface shall have the drain hole plugged. The hydrant shall be equipped with a tag stating the need for pumping after use. These items shall be incidental to the hydrant installation.

Add the following new paragraphs to CEAM 2611.3.D:

D1. Adjust Gate Valve & Box

During gate valve box adjustment activities, the Contractor shall place traffic cones or other traffic control devices to direct traffic around the castings being adjusted.

The final surface elevation of the gate valve box shall be one-half inch ($\frac{1}{2}$ ") below the adjacent pavement surface elevation.

E. Disinfection of Watermains

Chlorine Residual or Bacteriological Tests shall be conducted at all hydrant locations, unless directed otherwise by the Engineer. The tests shall be witnessed and approved by an authorized representative of the Owner. Disinfection shall be incidental to the cost of the pipe.

The Owner shall bear the initial cost of the testing. If retesting is required, the cost of this additional testing shall be at the Contractor's expense.

F. Electrical Conductivity Test

The Engineer shall receive at least 24 hours' notice for all testing. The Contractor shall perform all testing in the presence of the Engineer in the field.

A low voltage circuit shall be completed with the use of a suitable voltage source and meter to ensure continuity. If a close clamp circuit cannot be completed, the cause shall be isolated and corrected. Thereafter, the section in which the defective test occurred shall be retested as a unit and shall meet the requirements.

In order to provide joint conductivity, copper jumpers shall be installed between the mechanical joint fittings. The copper jumper shall consist of a minimum of one and one-half inch by ten inch (1-1/2" x 10") wide flat copper strip with holes on either end to accommodate the bolts on the mechanical joints. The nuts and bolts used to affix more than one copper strap shall consist of Silicon Bronze meeting all ANSI/AWWA specifications. No grinding or chipping of the epoxy coatings shall be allowed.

Complete the pressure test as per Section 2611.3G. If this fails, the Contractor shall attempt to locate and repair the leak. As a final option, the leakage test shall be performed with approval from the Engineer.

The Owner does not guarantee that the existing gate valves will maintain the leakage test requirement and as an alternate, the Contractor will be required to plug the newly-installed line and test separately each segment of line installed. All wet taps and/or cut-ins shall be tested separately and immediately prior to backfilling. See Typical Air Bleed and Testing Detail.

G. Hydrostatic Testing of Watermains

The Engineer shall receive at least 24 hours' notice for all testing. The Contractor shall perform all testing in the presence of the Engineer in the field.

Service pipes may be tested at the time of the foregoing test, if installed, at the Contractor's option; however, testing of service pipes may be completed as a separate operation from main testing. Service pipe testing, if done separately, shall be done with the corporation stop open.

Add the following new paragraph to CEAM 2611.3:

I. Temporary Water Distribution System

The temporary water distribution system shall be designed to meet a pressure requirement of 30 psi to 60 psi when in operation.

Prior to installing the temporary water distribution system, a detailed plan of the temporary water distribution shall be provided by the Contractor and approved by the Engineer. The Contractor shall allow one week for review and acceptance by the Engineer. The plan shall detail connection points, valves, redundancy measures, back feed ports, materials, mainline and service sizes, sampling points, emergency procedures, and other related information about the temporary water system including installation methods at all street crossings and driveways. The Contractor shall demonstrate that the level of service to the water users will not be significantly impacted and that the temporary system will supply water demands at pressures normal to the existing system. The Contractor shall identify large or exceptional water users and incorporate their needs into the temporary water distribution system.

I1. Location

All above ground piping shall be installed with appropriate ramping or burial such that the piping will:

- Not be endangered by equipment or vehicular traffic;
- Not pose a hazard for pedestrians (tripping, etc.);
- Provide a barrier-free access; and
- Be constructed to safeguard against vandalism and tampering.

All driveway and street crossings must be buried.

The proposed phasing for the temporary water distribution system shall be planned such that no sleeves will be required to construct the new permanent water distribution system.

I2. Source Water Connection

Source water connections to fire hydrants are discouraged unless the Contractor can demonstrate that the hydrant has been disinfected and thoroughly flushed. The Owner and Engineer assume no responsibility for the quality of water obtained from a hydrant. After disinfection, the hydrant shall be pressurized at all times in which it serves as a source of potable water. Isolation valves are required at the source water connection, branches (two on 3-way, three on 4-way) and at every service.

I3. Reduced Pressure Zone (RPZ)

The Minnesota State Plumbing Code required protection of potable water. A Reduced Pressure Zone (RPZ) backflow preventer must be installed at each point of connection. That RPZ must be tested annually and rebuilt on a five-year operating cycle, in accordance with the State Plumbing Code. The Contractor shall provide certification of such for each RPZ utilized with the project. Installation of RPZs shall be included with the cost of the temporary water distribution system.

I4. Pressure Testing and Leakage

All above ground piping shall be regularly inspected to ensure leak tight connections at the beginning and during the period that the temporary water distribution system is in use. At the discretion of the Engineer, buried temporary water distribution piping shall satisfy hydrostatic pressure testing.

The Contractor shall make its own determination about water pressure maintained by the temporary water distribution system and shall determine if a pressure reduction valve(s) (PRV) is necessary. If so, the PRV shall be include with the cost of the temporary water distribution system.

I5. Chlorine Residual and Bacteriological Testing

After the temporary water distribution system is installed (both mainlines and services) in its final location, but before service piping is connected to the water users, the temporary water

distribution system shall satisfy the chlorine residual and bacteriological testing standards and protocols for the commissioning of new watermain. Disinfection materials and procedures, and the collection and testing of water samples, shall be in accordance with the provisions of AWWA C-651.

16. Service Connections

The service connection piping shall be installed and disinfected at the same time as the main line in order that disinfection is accomplished on the service piping. The final connection to the water user shall not be made until the chlorine residual and bacteriological testing requirements have been satisfied. A check valve shall be installed on the service connection between the mainline and the connection to the water user. Prior to connection to water users, individual service lines shall be thoroughly flushed. The final connectors shall be spray-disinfected and swabbed with a minimum 1 percent and maximum 5 percent sodium hypochlorite (bleach) solution to disinfect the fittings. The Contractor shall arrange for the plumbing system to be flushed to remove any elevated chlorine residuals. A typical service connection to a private building shall be at an outside hose bib, requiring the water valve at the meter to be shut-off. It is the responsibility of the Contractor to determine how to provide temporary water service to the satisfaction of the property Owner and the Engineer. The Contractor is responsible to provide an appropriate connection to the water user. The property Owner is under no obligation to allow the temporary water system to be connected to their internal system at any location other than on the public side of the curb stop. If a property Owner will not permit an above ground connection as typical, it shall be the Contractor's responsibility to make alternate arrangements to service the property. In lieu of making aboveground temporary servicing, the Contractor has the option to connect the temporary distribution system to the public side of the existing curb stop.

17. Operation

The temporary water distribution system shall be continually pressurized after the bacteriological testing is completed and be capable of supplying normal water demands throughout its installation. In the event of a main or service break, the Contractor shall take immediate steps to minimize water loss and to avoid system contamination. Each end of the broken pipe shall be elevated in a manner to avoid backflow into the pipe. All fittings used in the repair and the pipe ends shall be spray-disinfected and swabbed with a minimum 1 percent and maximum 5 percent sodium hypochlorite (bleach) solution to disinfect the connection. At the discretion of the Engineer, a round of chlorine and bacterial samples may be taken to ensure the integrity of the system.

18. Off-Hours Corrective Action

If corrective action is needed to the temporary water distribution system outside of normal working hours, the Engineer or Owner will attempt to contact the Contractor to take corrective actions. At the preconstruction meeting for the project, the Contractor shall provide the name and 24-hour contact information for the person(s) responsible for repairs. If, in the sole opinion of the Owner, the Contractor is unable to make the corrections in a timely manner, the Owner may direct their own forces to take corrective steps. The Contractor will be responsible for any costs incurred by the Owner.

19. Relocation of the Temporary Water Distribution System

The relocation of the temporary water distribution system either in whole or in parts by any means without conducting and passing the chlorine residual and bacteriological requirements shall not be permitted. Relocation is defined as depressurizing and moving the pipe work to service other water users.

Add the following new paragraph to CEAM 2611.3:

J. Irrigation System Repair

The Engineer shall attempt to field verify any existing irrigation systems in the project area prior to construction. The Engineer shall notify the Contractor of such known systems. The Contractor shall avoid or minimize disturbance to existing irrigation systems during construction. Homeowners must be notified by the Contractor a minimum of 24 hours prior to any disturbances or disruptions of existing irrigation systems.

Temporary repairs (i.e. plugging, pinching off impacted lines, etc.) shall be required where feasible, allowing for partial use of the irrigation system by the homeowner during construction. Temporary repairs shall be incidental to the irrigation system repair.

Existing private irrigation systems (of all types and designs) impacted by construction are to be repaired and/or replaced. New components used in the repair/replacement shall be consistent with existing system components. The existing system and its components shall be salvaged and reinstalled where possible.

2504.4 (CEAM 2611.4) METHOD OF MEASUREMENT

The provisions of CEAM 2611.4 are modified and/or supplemented with the following:

H. Ductile and Gray Iron Fittings

Ductile Iron compact fittings (AWWA C153) shall be measured by the pound. (See Appendix for Fitting Weights table.)

Add the following new paragraph to CEAM 2611.4:

K. Insulation

Insulation shall be measured on a square yard basis installed to the specified thickness, and shall include all materials, equipment, and labor required for placement.

2504.5 (CEAM 2611.5) BASIS OF PAYMENT

Payment shall be made for each installed at the unit price in the proposal and shall be compensation in full for all time, materials, equipment, and labor to adjust each valve box as directed by the Engineer, including multiple adjustments to suit blacktop lifts. Payment for new gate valves and boxes includes adjustments for asphalt placement. No additional compensation will be made for sewer and water service lines not constructed in a common trench.

Payment at the lump sum unit price for Temporary Water Service shall include all costs of furnishing, installing, and removing the temporary water distribution system as required by the plans and specifications.

Irrigation System Repair: Payment at the bid unit price per each sprinkler system repair shall include all labor and materials required to satisfactorily repair each existing irrigation system impacted by construction, including but not limited to salvaging, repairing, or replacing the system and/or its components. If the Contractor damages an existing system unnecessarily or is otherwise negligent, the Owner reserves the right to require payment of the resulting excessive repair costs by the Contractor.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2504.601	TEMPORARY WATER SERVICE	LS
2504.602	CONNECT TO EXISTING WATER MAIN	EACH
2504.602	CONNECT TO EXISTING WATER SERVICE	EACH
2504.602	HYDRANT	EACH

2504.602	ADJUST HYDRANT	EACH
2504.602	ADJUST GATE VALVE & BOX	EACH
2504.602	— " CORPORATION STOP	EACH
2504.602	— " GATE VALVE & BOX	EACH
2504.602	— " CURB STOP & BOX	EACH
2504.602	IRRIGATION SYSTEM REPAIR	EACH
2504.603	— " TYPE PE PIPE	L F
2504.603	— " WATERMAIN DUCTILE IRON CL 52	L F
2504.603	— " PVC WATERMAIN	L F
2504.603	— " STEEL CASING PIPE	L F
2504.604	4" POLYSTYRENE INSULATION	S Y
2504.608	DUCTILE IRON FITTINGS	LB

2506 (CEAM 2621) MANHOLES AND CATCH BASINS

The provisions of MnDOT 2506 shall apply, in addition to the provisions of CEAM 2621, Sanitary Sewer and Storm Sewer Installation, which are modified and/or supplemented as follows:

2506.2 (CEAM 2621.2) MATERIALS

The provisions of CEAM 2621.2 are modified and/or supplemented with the following:

B. Metal Sewer Castings

Metal Sewer Castings shall conform to the Standard Detail Plates. All castings shall be Class 35B or better, in accordance with MnDOT 3321. The words "SANITARY SEWER" or "STORM SEWER" shall be cast on top of each manhole cover in 2 inch letters as applicable.

Except as directed on the plans, all castings shall be used for the following situations:

1. Type B618 curb storm sewer casting shall be Neenah R-3067-V or Engineer approved equal.
2. In roads, concrete walks, and bituminous paths, storm and sanitary sewer casting shall be Neenah R-1642 with two (2) pick holes or Engineer approved equal.
3. In backyards or "green areas", the storm sewer casting shall be Neenah R-4342 or Engineer approved equal.
4. When drive over castings are approved by the Engineer, the storm sewer casting shall be Neenah R-3501-TB.

C. Precast Concrete Manhole and Catch Basin Sections

Precast concrete drainage structures shall be utilized in all locations. For shallow structures, the Contractor shall furnish precast structures with additional depth as necessary for pre-casting, not to exceed a maximum of two feet (2') deeper than the plan design build. The additional depth of manhole shall be filled with grout to match elevations of proposed pipe inverts.

Delete CEAM 2621.2.C, Item 3 and replace with the following:

- (3) Sanitary sewer inlet and outlet pipes shall be joined to the manhole with a watertight joint consisting of a rubber boot with a non-magnetic, corrosion resistant steel coupling band or equal.

Add the following new item to CEAM 2621.2.C:

- (7) The base of sanitary manholes shall be cast integral with the bottom section of the manhole unless noted otherwise.

Add the following new paragraph to CEAM 2621.2:

F. Chimney Seal and Joint Wrap

The adjusting rings and castings of each sanitary sewer and storm sewer manhole located within the project area shall be sealed with external chimney seal, Infi-Shield or approved equal, meeting the material and installation requirements of the manufacturer.

The Contractor shall furnish and install Infi-Shield Gator Joint Wrap (12-inch) or approved equal at all manhole joints, per manufacturer's recommendations and/or other approved methods to prevent leakage into the manhole. If leakage occurs, the Contractor will be responsible for providing a watertight manhole.

2506.3 (CEAM 2621.3) CONSTRUCTION REQUIREMENTS

The provisions of CEAM 2621.3 are modified and/or supplemented with the following:

B. Appurtenance Installations

It is the Contractor's responsibility to verify the type and quantity of casting assemblies prior to ordering materials.

The final surface elevation of the frame or ring casting shall be 1/2 in below the adjacent pavement surface elevation and at-grade in turf areas unless noted otherwise.

Frame and ring castings within curbs shall be encased in a minimum of 6 in thick concrete around the outside of the adjustment rings. Rim elevations shall be set to correspond with the depressed curb as detailed in the Plans.

Add the following new paragraph to CEAM 2621.3.B:

B1. Chimney Seal

All chimney seal installation shall be performed in accordance with the manufacturer's recommendations. The Contractor shall be required to perform the installation of the first chimney seal in the presence of the Engineer to verify that the installation is acceptable and in accordance with the manufacturer's recommendations.

D. Manhole and Catch Basin Structures

For shallow structures, the Contractor may furnish precast structures with additional depth as necessary for pre casting, not to exceed a maximum of 2 ft deeper than the plan design build. The additional depth of manhole shall be filled with grout to match elevations of proposed pipe inverts.

Steps shall be aligned over the downstream side of the manhole and be:

- 1 in plus or minus horizontal alignment
- 1 in plus or minus vertical alignment with 16 in spacing

Catch basins under curb and gutter shall be installed to an alignment deviation of less than 0.20 ft with the top slab centered over the base. Deviations greater than 0.2 ft shall be corrected by the Contractor by moving the base to its proper location. All grade stakes involved must be saved by the Contractor. If a catch basin location must be adjusted and the grade stake shows the Contractor to be in error or the grade stake has been destroyed, the Contractor must make the correction at their expense.

All manholes must be protected or covered with plates, castings, or other approved materials at all times during construction to prevent sediment from entering the system. Sanitary manholes shall be covered to also prevent rainwater from entering the sanitary sewer system. This is included in the construction of the structure.

When installing a new structure within an existing pipe network, the Contractor shall verify the structure location, invert elevation and line of any existing opening to ensure the installation of the proposed sewer facility can be constructed according to the plan requirements. The Contractor shall immediately inform the Engineer of any deviation from the plan requirements necessitated by existing conditions. The Contractor shall ensure that upon completion of the connection that the area of the connection be watertight. The Contractor shall ensure smooth even flow from the newly connected pipe to the invert of the existing structure.

New connections to any existing sanitary sewer manhole shall be core drilled with an approved type of coring machine. The coring shall produce uniform, smooth circular cutouts as required for proper fit. The cutout discs shall be retrieved and disposed of properly. The connection with the newly installed pipe shall be sealed watertight with a KOR-N-SEAL boot or approved equal.

New connections to any existing drainage structure shall be sawcut out where the storm is to be inserted. The joints at the connection shall be filled with mortar or an approved joint compound material as required to make a watertight connection.

2506.4 (CEAM 2621.4) METHOD OF MEASUREMENT

The provisions of CEAM 2621.4 are modified and/or supplemented with the following:

Delete CEAM Paragraph 2621.4.B and replace with the following:

B. Manholes

Manholes will be measured by length in accordance with MnDOT 2506.4.A unless noted otherwise.

Where manholes are measured by length, the casting assembly will be measured separately by each, in accordance with MnDOT 2506.4.C

Payment for connection to existing sanitary sewer manhole shall be made for each connection to existing sanitary sewer manholes. The Contractor shall verify locations, alignment, and elevation prior to connecting. KOR-N-SEAL or approved equals shall be incidental. Joint Wrap shall be incidental.

Delete CEAM Paragraph 2621.4.C and replace with the following:

C. Catch Basins

Drainage structures of each design designation will be measured in accordance with MnDOT 2506.4.A unless noted otherwise.

In accordance with MnDOT 2506.4.C, where drainage structures are measured by length, the casting assembly will be measured separately by each. No separate measurement for casting assemblies will be made where drainage structures are measured as a unit.

H. Appurtenant Items

Chimney seals shall be measured by the number of each chimney seal provided and installed.

Add the following new paragraph to CEAM 2621.4:

I. Adjust Frame and Ring Casting

Measurement for adjustment of frame and ring castings shall be for existing castings that are adjusted in preparation for bituminous wear course placement or curb and gutter placement. Initial casting placement after base course construction, installation of new castings on catch basins or structures, or installation of

any castings in areas outside of the bituminous roadway surface shall be considered included with the casting and/or manhole structure pay item.

2506.5 (CEAM 2621.5) BASIS OF PAYMENT

The provisions of CEAM 2621.5 are modified and/or supplemented with the following:

Add the following new paragraphs to CEAM 2621.5:

A. Casting Assembly

Payment for both sanitary sewer and storm sewer castings shall be made under the casting assembly pay item. This item shall include furnishing, installing, and adjusting each new casting assembly and be compensation in full for all materials, labor, and equipment required to set the furnished and install castings on new or existing structures to the required elevation for new pavement surface, including multiple adjustments to suit pavement lifts.

B. Chimney Seal

The bid unit price for chimney seal by the each shall be compensation in full for all materials, labor and equipment necessary to perform the work.

C. Construct Sanitary Manhole

The bid unit price for construct sanitary manhole by linear foot, shall be compensation in full for all materials, labor, equipment, casting adjustments, excavation, and backfilling necessary to install the manhole. A separate bid item shall be provided for the casting assembly.

D. Construct Drainage Structure

The bid unit price for construct drainage structure design special (2 ft x 3 ft) by each, shall be compensation in full for all materials, labor, equipment, casting, casting adjustments, base slab, excavation, and backfilling to install the catch basin. The casting assembly shall be considered included with the drainage structure.

The bid unit price for construct drainage structure by linear foot of each structure design and size, shall be compensation in full for all materials, labor, equipment, casting adjustments, base slab, excavation, and backfilling to install the drainage structure. A separate bid item shall be provided for the casting assembly.

No separate payment shall be made for connecting to a new drainage structure.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2506.502	CASTING ASSEMBLY	EACH
2506.502	ADJUST FRAME & RING CASTING	EACH
2506.503	CONST DRAINAGE STRUCTURE DESIGN SD-48	L F
2506.503	CONST DRAINAGE STRUCTURE DES 48-4020	L F
2506.602	CONST DRAINAGE STRUCTURE DESIGN SPEC (2'X3')	EACH
2506.602	CHIMNEY SEAL	EACH
2506.602	CASTING ASSEMBLY (SANITARY)	EACH
2506.602	RECONSTRUCT DRAINAGE STRUCTURE	EACH
2506.602	RECONSTRUCT MANHOLE (SANITARY)	EACH
2506.603	CONSTRUCT 48" DIA SANITARY MANHOLE	L F
2506.603	CONSTRUCT 8" OUTSIDE DROP	L F

2511 RIPRAP

The provisions of MnDOT 2511 are modified and/or supplemented with the following:

2511.2 MATERIALS

Add the following new paragraph to MnDOT 2511.3:

D. Geotextile Filter Material

Provide geotextile filter material, meeting the requirements of MnDOT 3733 and the following:

- (1) Type 3 for use under Class I and Class II random riprap;
- (2) Type 4 for use under Class III and Class IV random riprap and hand-placed riprap on slopes no steeper than 3:1, horizontal to vertical;
- (3) Type 7 for use under Class III and Class IV random riprap on slopes steeper than 3:1, horizontal to vertical, and under Class V random riprap.

2511.3 CONSTRUCTION REQUIREMENTS

Delete MnDOT 2511.3.F and replace with the following:

F. Quality Control (QC)

Refer to the requirements in the Schedule of Materials Control for Project specific requirements.

F.1 Gradation and Certification Requirements

For riprap meeting 3601.2.A and 3601.2.B test one gradation per year for each product using either:

- (1) FHWA Hydraulic Toolbox, Test method 5-692.212 in the Grading and Base Manual. Record and submit results using form G&B-108a, found on the MnDOT Grading and Base website,
- (2) WipFrag or an alternative image analysis software, approved by the Engineer. Record and submit test results using form G&B-108a, found on the MnDOT Grading and Base website, or
- (3) Wolman Count Method. Test method 5-692.211 in the Grading and Base Manual. Record and submit results using form G&B-108b, found on the MnDOT Grading and Base website.

Provide certification for each product, using Form G&B-104bb, and attach required test(s).

F.2 Carbonate Quarried Riprap

For riprap meeting MnDOT 3601.2.A and MnDOT 3601.2.B the supplier is required to have an approved QC Plan, prior to delivery of stone, when either of the following apply:

- (1) Quantities are greater than 100 cu. yds
- (2) Riprap is used for Bridge protection, as shown in the Plan

The Carbonate riprap QC Plan requirements are found on the MnDOT Geology Web page. Contact the MnDOT Geology Unit a minimum of 60 days prior to supplying riprap.

Provide certification, for each product, using Form G&B-104b, and attach required test(s).

F.3 Riprap meeting MnDOT 3601.2.C or 3601.2D, and 3601.2.E

Provide certification using Form G&B-104b, found on the MnDOT Grading and Base website.

Delete MnDOT 2511.3.G.1 and replace with the following:

G.1 Riprap meeting MnDOT 3601.2.A or 3601.2B

For gradation compliance the Engineer will visually inspect the riprap and perform the D85 test, test method 5-692.210, listed in the Grading and Base Manual and complete Form G&B-108a, found on the MnDOT Grading and Base website.

If the material fails to meet requirements based on the visual check or the D85 results, the Engineer will test the gradation using one of the following methods:

- (1) FHWA Hydraulic Toolbox, 5-692.212 test method, listed in the Grading and Base Manual and Form G&B-108a,
- (2) WipFrag or a similar image analysis software, as approved by the Engineer, and Form G&B-108a, or
- (3) The Wolman Count, 5-692.211 test method, listed in the Grading and Base Manual and Form G&B-108b.

2511.4 METHOD OF MEASUREMENT

Delete MnDOT 2511.4.B and replace with the following:

B. Filter Materials

No separate measurement shall be made for filter Materials or geotextile filter Material. Filter Materials shall be considered included with the installation of the riprap.

2511.5 BASIS OF PAYMENT

The bid unit price for riprap of each type and class includes the cost of providing the Materials, excavating, and preparing the foundations, placing the riprap stone, and providing and placing the filter Materials as required by the contract.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2511.507	RANDOM RIPRAP CLASS III	C Y

2521 WALKS

The provisions of MnDOT 2521 are modified and/or supplemented with the following:

2521.2 MATERIALS

A. Concrete

All concrete shall be Type 3 air-entrained concrete as specified in MnDOT 2461.

When the compressive strength of the concrete test cylinders is less than 4,500 PSI at the twenty-eight (28) day test break, the Owner will decide whether or not the defective concrete must be removed and replaced on a case by case basis. The removal and replacement costs shall be the responsibility of the Contractor. If the Owner decides to allow the concrete to be left in place, the Contractor shall receive no compensation for that section that is determined to be of deficient strength.

E. Granular Materials

Subgrade shall meet requirements of Section 2211 Class 5 aggregate base. Crushed concrete shall meet the requirements of MnDOT 3149 and be used at the direction of the Engineer.

2521.3 CONSTRUCTION REQUIREMENTS

All concrete sidewalk placed between October 1 and October 15 must be high early strength concrete. No concrete sidewalk shall be placed on any project after October 15 or before April 15 without approval from the Engineer. No walk installed on frozen ground will be allowed.

Signing for "Walk Closed" signs, during reconstruction or repair of concrete walks shall be considered incidental. Placement shall be at the beginning and end of each block segment or as directed by the Engineer.

Where private utilities are to be installed within the public right-of-way and drainage and utility easements, and are on the same side as the walk, the private utility work shall be coordinated with all applicable private utility companies such that all construction of private utilities will be completed prior to construction of the walk. The Contractor shall be responsible for coordination with the private utilities, Engineer, and Owner to ensure that the private utilities are constructed prior to the walk. The Contractor shall give a minimum of two weeks notification to private utilities for the estimated completion date of curb, gutter, grading, and erosion control stabilization. No additional compensation from the Owner shall be provided to the Contractor for any claims of crews being delayed because of scheduling issues with private utility companies resulting from inadequate notification of curb, gutter, grading, and erosion control completion dates.

D. Placing and Finishing Concrete

Each concrete batch shall be tested for air content prior to placement as specified in Division 1. Any batch not meeting these requirements shall be rejected.

Slip form machine placement will be allowed and shall conform to MnDOT 2531.3D requirements.

D.2 Joint Construction

Expansion joints shall be placed at locations where a fixed object or structures extend through the walk, at pedestrian ramps and where thicknesses may vary. Spacing of contraction joints shall equal the width of the walk or not to exceed the maximum of sixty feet (60') apart.

Joint widths shall be as specified in MnDOT 2521. Larger joint widths may be allowed with prior approval from the Engineer and shall require the Contractor to construct a mock-up sidewalk containing the desired joint width. Construction of a mock-up sidewalk shall be considered incidental to the construction of the concrete walk.

Joints abutting existing sidewalks in excess of one eighth of an inch (1/8") in elevation measured with a straightedge from the existing pavement will be considered unacceptable.

Joint Sealing shall not be required unless specified for concrete paving.

Delete MnDOT 2521.3.D.3 and replace with the following:

D.3 Workmanship and Quality

Any deviation in the design curvature of concrete edges in excess of three eighths of an inch (3/8"), measured with a ten-foot (10') straightedge, will be considered unacceptable. Any surface area allowing the entrapment of water at a depth of one eighth inch (1/8") or greater will be considered unacceptable.

E. Concrete Curing and Protection

When temperatures are projected to fall below 36 degrees F within the next twenty-four (24) hours, insulated blankets shall be used for curing. All costs associated with blanket curing shall be incurred by the Contractor. Failure to comply with these provisions will be considered unacceptable.

Add the following new paragraph to MnDOT 2521.3:

H. ADA Requirements (MnDOT Standard Plan Sheet No. 5-297-250)

H.1 Concrete Walk

The minimum continuous and unobstructed clear width of a Pedestrian Access Route (PAR) shall be 4.0 feet. All new or reconstructed sidewalk widths shall match or exceed in place sidewalk and in no case shall it be less than 5.0 feet in width except at locations where obstructions cannot be moved or at driveways where slopes exceed the maximum allowable grades. The cross slope of the sidewalk shall not exceed 2% and shall be measured across the entire surface width of the sidewalk. Curb ramps shall meet or exceed existing sidewalk widths and curb openings. Maintain a consistent flat smooth surface within the PAR.

Where sidewalk grade changes adjacent to fixed structures, the sidewalk shall be finished around these structures to the satisfaction of the Engineer.

Sawcut concrete curb ramp, sidewalk, and driveway contraction joints. Exceptions for tooling relief joints are allowed for large driveway placements, long sidewalk placements to prevent random cracks, and minor repairs. Obtain approval from the Engineer where tooling of contraction relief joints will occur.

Sawcut curb and gutter contraction joints within the PAR including contraction joints at zero-inch height curb locations.

Sawcut a visual joint at the top grade break of walkable flares to indicate a change in grade meeting MnDOT 2521.3.D, except the depth requirement is reduced to 1/4 inch.

To avoid corner breaks, all walk edges shall be formed and constructed perpendicular to the back of curb and gutter sections and concrete structures for a one foot minimum distance.

H.2 Grading

Fill sections shall be graded flush with the top of walk for a minimum 18 inches from the edge of walk at 2% slope and then down at a maximum 1:3 slope to existing terrain unless otherwise detailed in the Plan. Blend in the toe of fill slope and adjacent areas so as not to adversely affect drainage.

H.3 Landings

An initial landing is the first required landing of a pedestrian ramp. Form and place initial landings at the top of a ramped sloped surface (>2% longitudinal slope), with an independent concrete pour unless the initial landing is located at roadway grade such as depressed corners, parallel ramps, rural flat landings, or flat cut-throughs. Secondary landings consist of all landings beyond the initial landing. These secondary landings do not require a separate landing pour.

Construct initial landings in a single concrete placement, whenever possible, as a single plane surface having no grade breaks. If single concrete placement is not possible, follow the requirements for tie bar placement in accordance with the details shown in Standard Plan 5-297.250 Sheet 6 of 6 and tie adjacent landings together. Keep architectural elements such as brick pavers or concrete stamping outside the curb ramps and curb ramp landings.

Cast in-place or drill and grout tie bars will be required in accordance with the details shown in Standard Plan 5-297.250 Sheet 6 of 6. If cast in place, install tie bars through holes in the forms, with a form height at least equal to the walk thickness of the formed concrete shown in the Plans. These bars shall be deformed and shall be installed with 2" minimum concrete cover.

All necessary subgrade preparation and aggregate base placement for the entire ramp construction limit shall be done before the initial landing is constructed.

2521.5 BASIS OF PAYMENT

Delete Mn2521.5.A in its entirety.

The bid unit price for walk of each type includes the cost excavation, grading, aggregate base, material, and placement of concrete as detailed.

Maximum of 10 pop outs per square yard. Where maximum pop out limit matched or exceeded, the Contractor shall replace the concrete pavement at no additional cost. Replacement will be by the whole panel only to the nearest tooled joint.

Reinforcement bars for pedestrian curb ramps shall be included in the Bid Unit Price for the Concrete Walk.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2521.518	4" CONCRETE WALK	S F
2521.518	6" CONCRETE WALK	S F

2531 CONCRETE CURBING

The provisions of MnDOT 2531 are modified and/or supplemented with the following:

2531.1 DESCRIPTION

This work also consists of furnishing and installing Truncated Dome Systems at pedestrian curb ramps in compliance with the Public Rights-of-Way Accessibility Guidelines (PROWAG). Truncated domes shall provide a visual contrast to the concrete ramp of either dark on light or light on dark. This work shall be performed in accordance with the applicable MnDOT Standard Specifications, Special Provisions, and the details in the Plan.

2531.2 MATERIALS

Add the following new paragraph to MnDOT 2531.2:

G. Truncated Domes

The Contractor, with approval of the Engineer, shall select a truncated dome product from the Approved/Qualified Products List.

2531.3 CONSTRUCTION REQUIREMENTS

All concrete pavement placed between October 1 and October 15 must be high early strength concrete. No concrete pavement shall be placed on any project after October 15 or before April 15 without approval from the Engineer. No walk installed on frozen ground will be allowed.

Prior to curb installation, the Contractor shall expose all catch basin structures and manholes as directed by the Engineer and verify proper opening alignment with the curb and proper structure build heights. All necessary corrections to alignment and build shall be made by the Contractor in a timely manner. This work shall be incidental to the Contract.

All valley gutters shall be constructed with staged pours, in which half the width of the valley gutter is constructed at a time using a keyway to connect the two halves. This shall be done to maintain access to adjacent properties, with no additional compensation.

C. Placing and Finishing Concrete

For concrete curb and gutter, including curb fill-ins, mechanical vibration of the concrete will be required to produce a smooth curb face.

For concrete driveway pavement, a power concrete screed shall be used on all concrete driveway pavement. Roller screeds will not be allowed.

D. Slipform Machine Placement

Where existing driveways are being protected, or do not need to be removed, the Contractor shall hand pour the concrete curb along these driveways. No additional compensation will be granted the Contractor for this work.

E. Joint Construction

Expansion joints shall be placed at locations where a fixed object or structures extend through the walk, at pedestrian ramps and where thicknesses may vary. Spacing of contraction joints shall equal the width of the walk or not to exceed the maximum of sixty feet (60') apart.

Joint widths shall be as specified in MnDOT 2521. Larger joint widths may be allowed with prior approval from the Engineer and shall require the Contractor to construct a mock-up sidewalk containing the desired joint width. Construction of a mock-up sidewalk shall be considered incidental to the construction of the concrete walk.

Joints abutting existing sidewalks in excess of one eighth of an inch (1/8") in elevation measured with a straightedge from the existing pavement will be considered unacceptable.

Joint Sealing shall not be required unless specified for concrete paving.

G.1.a Membrane Curing Method

When temperatures are projected to fall below 36 degrees F within the next twenty-four (24) hours, insulated blankets shall be used for curing. All costs associated with blanket curing shall be incurred by the Contractor. Failure to comply with these provisions will be considered unacceptable.

L. Backfill Construction

Backfilling of the curb and gutter shall be completed prior to bituminous surfacing of the roadway.

M. Workmanship and Finish

Any deviation in the design curvature of concrete edges in excess of three eighths of an inch (3/8"), measured with a ten-foot (10') straightedge, will be considered unacceptable. Any surface area allowing the entrapment of water at a depth of one eighth inch (1/8") or greater will be considered unacceptable.

The complete concrete work shall give the appearance of uniformity in surface contour and texture and shall be accurately constructed to line and grade. The freshly finished surface shall be protected, surfaces pitted by rain will be considered unacceptable. Unacceptable work shall be removed and replaced with acceptable work as ordered by the Engineer.

Prior to placement of the bituminous wear course, all unacceptable, cracked, or broken concrete curb and pavements shall be replaced at no additional cost to the Owner. Saw and seal of cracked concrete will not be allowed. Replacement will be by the whole panel only to the nearest tooled joint.

Add the following new paragraph to MnDOT 2531.3:

N. Truncated Domes

Firmly press truncated domes into concrete filling the vent holes on the truncated dome plates.

Obtain Engineer's approval prior to cutting truncated domes. Minimum cut section surface area is two square feet. Grind cut edges smooth. A maximum of one cut section is allowed per pedestrian ramp. Coated colored truncated domes shall not be cut.

Screed the surrounding concrete finishing flush with the truncated dome plate edge. The maximum surface deviation is 3/16 inches. Provide a 3 inch minimum concrete border around the edges of the truncated domes.

Contractor shall modify the curb line radius in accordance with MnDOT Standard Plan 5-297-250 and may adjust the zero-length height curb locations up to 6 inches laterally if radial dome sections are used.

Add the following new paragraph to MnDOT 2531.3:

K. ADA Requirements (MnDOT Standard Plan Sheet No. 5-297-250)

K1. Concrete Curb and Gutter

Construct curb and gutter to meet the details in the Plan. When machine placed, the gutter inslope shall be poured at 3% inflow around the radius or at a minimum distance of 10 feet from any zero-height curb section. Construct the gutter inslope and transitions as detailed in the Plans. Modify the proposed gutter width to not protrude into the adjacent travel.

Leave a minimum 3 feet of in place curb and gutter between an existing joint and the saw cut. If the 3 foot minimum cannot be maintained, place the saw cut over the existing joint. Install epoxy coated reinforcement bars per Standard Plans 5-297.250 (Sheet 6 of 6) if construction joints are utilized within a quadrant radius.

Form, at a minimum, the top 1.5 inches of the gutter face (front of gutter). The existing roadway edge is not to be used as a form for the top 1.5 inches of the gutter face unless approved by the Engineer.

If the gutter flow line in front of the proposed curb ramp exceeds 2.0% slope, adjust the flow line to 2% or less if feasible while following the roadway criteria as per Standard Plans 5-297.250 (Sheet 6 of 6). The bituminous patch in front of the truncated domes should be 1% minimum to 5% maximum slope measured perpendicular to the flow line. In no case shall a newly constructed curb and gutter flow line exceed 8% unless the roadway profile exceeds 8%.

Drainage patterns shall not be altered unless called for in the Plans or approved by the Engineer.

Construct a contraction joint through the curb and gutter section where the curb height equals zero inches. If any curb and gutter joints fall within the Pedestrian Access Route (PAR), meet the requirements of MnDOT 2521.3.C.

When constructing directional curb where truncated domes are perpendicular to the path of travel, the triangular concrete area between the grade break/edge of truncated domes and the gutter face (front face of gutter) shall be constructed integral.

2531.4 METHOD OF MEASUREMENT

A. Length

Concrete valley gutter shall be measured per linear foot installed as measured through the flow line. No separate measurement shall be taken for any apron space necessary to connect the valley gutter to the adjacent curb and gutter.

B. Area

The Engineer will measure the area of square or rectangular truncated dome areas along the edge and radial truncated domes along the long chord multiplied by two.

2531.5 BASIS OF PAYMENT

Delete MnDOT 2531.5.A in its entirety.

Payment for concrete curb and gutter shall be limited to 80 percent of the actual footage installed until all curbing has been backfilled and topsoil placed.

Aggregate base material and excavation required beneath concrete driveway pavement shall be considered included in the cost of the concrete driveway pavement.

The Contract unit prices for Truncated Domes shall be compensation in full for equipment, labor and materials required to complete the Work.

The Contractor shall designate a responsible person (ADA Compliance Supervisor) in accordance with the requirements of Division 1 (1804) Prosecution of Work. No measurement will be made of the various duties of the ADA Compliance Supervisor.

Maximum of 10 pop outs per square yard. Where maximum pop out limit matched or exceeded, the Contractor shall replace the concrete pavement at no additional cost. Replacement will be by the whole panel only to the nearest tooled joint.

B. Schedule

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2531.503	CONCRETE CURB & GUTTER DESIGN _____	L F
2531.504	6" CONCRETE DRIVEWAY PAVEMENT	S Y
2531.603	CONCRETE CURB & GUTTER DES SURMOUNTABLE	L F
2531.603	CONCRETE RIBBON CURB	L F
2531.603	7" CONCRETE VALLEY GUTTER	L F
2531.618	TRUNCATED DOMES	S F

2540 MAILBOX

2540.1 DESCRIPTION

The provisions herein shall be applicable to all labor, materials, and equipment associated with managing and maintaining mail service for the duration of the project as herein.

2540.2 MATERIALS

When new mailboxes or standards are required, the design (size, color, material, etc.) of the mail box and standard shall be approved by the Owner prior to installation.

2540.3 CONSTRUCTION REQUIREMENTS

The Contractor shall be required to carefully remove each existing mailbox and standard as necessary for construction (including any attached distribution box and/or sign). The mailbox and standard shall be delivered to the homeowner for storage during construction. During construction, the Contractor shall furnish temporary mailboxes for all residents at an accessible location for interim mail delivery as approved by the Postmaster. Each box shall be clearly labeled and mounted on a stable standard. Upon completion of construction, the Contractor shall be required to reinstall the original box and standard as directed by the Engineer. There shall be no interruption of mail delivery.

Temporarily relocate the mailboxes in collaboration with the Engineer and the Post Office.

If the existing mailbox or standard is in such a condition that removal and reinstallation is not feasible, the homeowner shall be provided a new mailbox or standard for installation by the Contractor as directed by the Engineer. The Contractor may request to be relieved of their responsibility for reinstallation by the Engineer, and notification of such relief of responsibility shall only be granted in writing from the Engineer.

In rural areas when addresses are removed with mailboxes, or in any situation when temporary addresses are required, the Contractor shall provide reflective address labels visible for emergency vehicles.

If a concrete base existed prior to construction, a new concrete base shall be installed for the mailbox support. The bid item for new mailbox support shall include the placement of concrete at the support base.

2540.4 METHOD OF MEASUREMENT

A. Temporary Mailbox

Measurement for temporary mailbox shall be per each temporary mailbox furnished and installed.

B. Mailbox

There will be no direct payment made for installation of a new mailbox (provided by the homeowner) to either the existing post or new post. This work shall be considered incidental to either the Mailbox Support or Temporary Mailbox items.

C. Mailbox Support

Measurement for mailbox support shall be per each new mailbox support furnished and installed, as directed by the Engineer.

2540.5 BASIS OF PAYMENT

Payment shall be at the bid unit price per each temporary mailbox. This shall include the salvage of existing mailbox and standard, coordination of temporary mail delivery with the Postmaster, reinstallation of salvaged mailbox and standard, and removal of temporary mailboxes as specified.

Payment shall be at the bid unit price per each mailbox. This shall include furnishing and installing a new mailbox, as directed by the Engineer. Disposal of the existing mailbox which was unsuitable for reinstallation shall be at the Contractor's expense.

Payment shall be at the bid unit price per each mailbox support. This shall include furnishing and installing a new mailbox support, as directed by the Engineer. Disposal of the existing mailbox support which was unsuitable for reinstallation shall be at the Contractor's expense.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2540.602	TEMPORARY MAILBOX	EACH
2540.602	MAILBOX	EACH
2540.602	MAILBOX SUPPORT	EACH

2557 FENCING

The provisions of MnDOT 2557 are modified and/or supplemented with the following:

2557.4 METHOD OF MEASUREMENT

Add the following new paragraph to MnDOT 2557.4:

A. Repair Dog Fence

Measurement will be made of each underground fencing system (per parcel, lot or address) that is to be repaired. Additional compensation shall not be made for repairing the same underground fencing system on multiple occasions or at multiple locations on the same parcel, lot or address. If an underground fencing system is damaged causing the need for repair, repairs beyond the initial repair to that same system will be incidental. Use only an approved epoxy splice kit for underground wire repair. If damage occurs more than once along the property's street frontage, the entire front footage adjacent to the curb shall be replaced.

Compensation will not be made for damage to underground fencing systems that have been identified on the plans or in the field by the Engineer. It is the Contractor's responsibility to protect fencing systems previously identified at no additional compensation.

2557.5 BASIS OF PAYMENT

Add the following new paragraphs to MnDOT 2557.5:

A. Repair Dog Fence

Payment for Repair Dog Fence shall be compensation in full for all labor, materials, and equipment necessary to complete the specified work for the identified parcel, regardless of the number of locations or occasions that the identified system requires repair.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2557.602	REPAIR DOG FENCE	EACH

2563 TEMPORARY TRAFFIC MANAGEMENT

2563.1 DESCRIPTION

Furnish, install, maintain, and remove all traffic control devices required to provide safe movement of traffic and pedestrians through the Project at all times from commencement of the Work until project acceptance. Do not close streets or pedestrian facilities, except as authorized. The Engineer may modify the requirements for traffic control as deemed necessary.

All temporary traffic management must conform to and be installed in accordance with:

- the “Minnesota Manual on Uniform Traffic Control Devices” (MN MUTCD);
- the “Minnesota Temporary Traffic Control Field Manual” (Field Manual);
- the “Speed Limits in Work Zone Guidelines”;
- the “Minnesota Flagging Handbook”;
- the “MnDOT Standard Signs and Markings Manual”;
- the Plan; and
- all applicable standard Specifications and Special Provisions.

Manuals listed above may be found at: <http://www.dot.state.mn.us/trafficeng/publ/index.html>.

2563.2 MATERIALS

A. Temporary Signs and Devices

Reflectorize all signs, paddles, and other traffic control devices including those used for daytime operations. Fabricate temporary rigid signs and devices with retroreflective sheeting material of the appropriate color listed on the Approved Products List (APL) for either “Sheeting for Rigid Temporary Work Zone Signs, Delineators, and Markers (Type IX and XI)” or “Sheeting for Rigid Permanent Signs, Delineators, and Markers (Type IX and XI)”. The sheeting Materials APL is located at the following link: <http://www.dot.state.mn.us/products/signing/sheeting.html>.

Inplace signs that still apply during temporary operations need no change in sign sheeting.

B. Vehicle Conspicuity Tape

The Approved Products List for “Conspicuity Vehicle Sheeting (Type VII)” is found at <http://www.dot.state.mn.us/products/signing/sheeting.html>.

C. Truck/Trailer Mounted Attenuators

The Approved Products List for “Mobile Crash Attenuators” is found at: <http://www.dot.state.mn.us/products/temporarytrafficcontrol/mobilecrashattenuators.html>.

D. Drum Sheeting

On Projects requiring drums per MnDOT Standard Plate 8000 (Channelizers – Type B), provide all drums with six inch fluorescent orange and white sheeting material with no gap between sheeting layers.

E. Crashworthy Signs, Traffic Control Devices, and Ballast

Signs and traffic control devices must meet the crash testing requirements of the AASHTO Manual for Assessing Safety Hardware 2016 (MASH-16). The Owner may require a letter of compliance stating that all signs and traffic control devices comply with MASH-16 requirements. The Letter of Compliance must

include drawings of the different signs and devices along with a copy of the FHWA issued Letter of Eligibility or MnDOT MASH Crashworthy Evaluation.

See MnDOT Technical Memorandum No. 19-03-T-01 for information and timelines on the allowable use of crashworthy devices tested under NCHRP-350. <https://techmemos.dot.state.mn.us/techmemo.aspx>.

The approved ballast system for signs and devices mounted on temporary portable supports is sandbags, unless it is designed, crash tested, and approved for the specific device. Add a deicer during freezing conditions to prevent the sand from freezing. Place sandbags at the base of the sign or traffic control device. Do not use any ballast that causes a sign or traffic control device to become hazardous to motorists or workers.

2563.3 CONSTRUCTION REQUIREMENTS

Road Work Begins Notice Signs (G20-X1) shall be installed seven calendar days prior to the anticipated start of Work for all roads that will be impacted by construction longer than seven days.

A. Traffic Control Plan, Maintenance, and Inspection

Submit a proposed traffic control plan to the Engineer for acceptance, at least seven days before implementation. If Field Manual layouts are used, specify layout number(s) but do not submit the layouts from the Field Manual. Do not implement the proposed traffic control until accepted by the Engineer.

Immediately repair or replace all traffic control devices that become damaged, moved, or destroyed, and all ballasts that are damaged, destroyed, or otherwise fail to stabilize the device.

Meet the traffic control device quality standards as required in the Field Manual. Immediately replace unacceptable traffic control devices. Signs that are dirty and result in a noticeable loss of reflectivity at night are considered unacceptable and must be cleaned or replaced. Respond promptly to any call from the Engineer concerning the notification of unacceptable traffic control devices.

Provide the names, address, and phone numbers of at least two individuals responsible for placing and maintaining traffic control devices to the Engineer at the Pre-construction Conference. These individuals will be "on call" 24 hours per day, seven days per week during the times any temporary traffic control devices are in place.

Inspect all traffic control devices daily, including one nighttime inspection per week. Verify that the devices are placed in accordance with the Traffic Control Plan, these Special Provisions, and the MN MUTCD. Immediately correct discrepancies between the actual placement and the required placement. Respond immediately to any call from the Engineer concerning any request for improving or corrective traffic control devices.

B. Traffic Control Signs and Devices

The Engineer may require extra traffic control devices in addition to the traffic control devices shown on the Plan or in the Field Manual.

The Contractor shall store on-site a minimum of ten reflectorized drums (Type B channelizers) and five Type III barricades. These additional traffic control signs/devices are to be utilized on the project as directed by the Engineer, with all associated costs included in the lump sum payment for Traffic Control.

Roll-up signs are not allowed unless authorized by the Engineer.

Cover, modify, or remove all signs that are not consistent with traffic operations. Cover the entire sign or that part of the legend that is inappropriate. Sign covers must conform to the Typical Temporary Sign Covering Detail Sheet found in the Plan or at the following link:

<http://www.dot.state.mn.us/trafficeng/workzone/wz-templates/pdf/layout%2020A.pdf>

Maintain street identification signage at all times. Signs may be installed on temporary supports if the permanent sign Structures are affected by operations. This is necessary to maintain the 911 emergency system.

Post mount all signs that will remain in the same location for more than 30 consecutive days. This does not include portable signs which are set up and taken down at the beginning and end of each Work shift.

When the proper location of a sign is on pavement, do not core through the surface. If there is a conflict with underground utilities, attempt to move the sign while maintaining its visibility to traffic. If it is not possible to drive posts into the ground, mount signs on portable supports as approved by the Engineer.

When signs are removed, the sign posts and stub posts must also be removed from the Right-of-way. Posts left in place for future use or removal at a later date must be properly delineated with tubular markers, flags, or other delineation as approved by the Engineer at no additional cost.

All in place signs and delineators that interfere with the Contractor's normal operation may be temporarily relocated by the Contractor at the direction of the Engineer. Store salvaged signs in such a manner as to protect the sign from scratching, fading, or other harmful effects until the signs are reinstalled. After completing work at each sign location, or at the direction of the Engineer, replace the signs as near to their original location as possible or to a location designated by the Engineer. Reinstall sign Structures according to the Type C & D Sign Structural Details Sheet located at the following link:
<http://www.dot.state.mn.us/trafficeng/signing/plansheets/groundmounted.pdf>

Signs and structures damaged by the Contractor shall be replaced at the Contractor's Expense.

C. Traffic Safety

Do not suspend material, equipment, tools or personnel over lanes or pedestrian facilities open to traffic.

Protect traffic and pedestrians from excavations, drop-offs, falling objects, splatter or other potential construction hazards.

Do not store Materials or Equipment in the Work zone clear zone unless approved by the Engineer. If Materials or Equipment must be stored within the Work zone clear zone, protect with temporary barrier. If the Engineer agrees that temporary barrier is not practical, delineate with Type B channelizers.

Do not park vehicles or construction Equipment in the clear zone or any location that obstructs traffic control devices. Workers are not allowed to park their private vehicles within the Project limits unless approved by the Engineer.

D. High Visibility Apparel

During night work or low light conditions, all workers must wear high visibility Class E long pants and retro-reflective headgear in addition to the ANSI Class 2 or 3 vest, shirt, or jacket.

All high visibility apparel must be worn in the manner for which it was designed. All apparel worn on the torso must be closed in the front to provide 360-degree visibility. A worker's high visibility apparel must be removed from service and replaced if it becomes faded, worn, torn, dirty, or defaced, reducing the conspicuity of the apparel.

E. Night Work

Night work is not permitted on this project without prior approval of the Engineer.

F. Vehicle Warning Light Specification

All vehicles and Equipment operating in the Right-of-way must have operable warning lights that are amber in color and meet the appropriate SAE specification. The SAE specification requirements are as follows:

- Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles – SAE Specification J845.
- Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles – SAE Specification J595.

Details on SAE Specification can be found at: <http://www.dot.state.mn.us/const/wzs/lighting.html>.

G. Lane Closure Requirements

Temporary lane closures or other traffic restrictions by the Contractor, during work hours and consistent with any time restrictions, will be permitted only during those hours and at those locations approved by the Engineer. Request temporary lane closures at least two Business Days prior to the closure.

Temporary lane closures will be permitted in accordance with the hours and number of lanes allowed as indicated in the Metro Lane Closure Manual; <http://www.dot.state.mn.us/metro/trafficeng/laneclosure/index.html>. Lane closures that cross segments as defined in the Manual shall follow the more restrictive limits.

Place traffic control devices in any temporary lane closure that is adjacent to traffic and extends beyond 1000 feet as shown on Layout 61 of the Field Manual. When the lane closure is in place three days or longer, use only Type III barricades.

Use Drum Channelizers in all lane closure tapers and in any shifts in traffic alignment.

Maintain a minimum of two miles between temporary lane closures.

Temporary lane closures will not be permitted during inclement weather, nor any other time when, in the opinion of the Engineer, the lane closure will be a greater than normal hazard to traffic.

H. Truck/Trailer Mounted Attenuators (TMAs) for Mobile/Short Duration Operations

Truck/Trailer Mounted Attenuators (TMAs) must be used on all shadow and protection vehicles operating totally or partially in a traffic lane if any temporary traffic control zone is defined as “Mobile/Short Duration” by the Field Manual. All references to “should” in the Field Manual in regards to TMA use for Mobile/Short Duration layouts are hereby changed to “shall.” This requirement applies to all operations utilizing Field Manual layouts 9, 12, 13, 36, 41, 49, 50, 51, 54, 55, 63, 76, 77, 78, and 79. Providing TMAs for “Mobile/Short Duration” work zones is incidental.

I. Flagging Operations

Flaggers must attend a training session taught by a MnDOT-Qualified Flagger Trainer. The trainer must have completed a “MnDOT Flagger Train the Trainer Session” within the last five years and be on file as a qualified Trainer with MnDOT. Provide all flaggers with the MnDOT Flagging Handbook. Flaggers must be in possession of the handbook while flagging on the Project. Furnish the signed “Checklist for Flagger Training” or “Flagger Qualification Card” to the Engineer any time a new flagger reports to work on the Project. The “Checklist for Flagger Training” and other forms and information is found at: <http://www.dot.state.mn.us/const/wzs/flagger.html>.

All signs associated with the flagging operation must be removed or covered when flagging operations are not present.

Coordinate the flagging operations in a manner that causes minimum delay to the traveling public.

The maximum delay time is 10 minutes. If the operation exceeds the maximum delay time, the operation must be discontinued until a new traffic control plan is developed which meets the maximum delay requirement.

J. Milling, Sealcoating, and Paving Operations

Traffic will be allowed on the milled surface.

When traffic is allowed to drive on the milled and newly paved surfaces, install interim striping and provide appropriate warning signs such as "GROOVED PAVEMENT" and "BUMP" with "Advisory Speed" plaques as shown on Layouts 35 and 66 of the Field Manual.

Taper and/or chamfer any drop-off where traffic will cross from or to the in-place surface, or from or to the milled surface, so as to provide the safe passage of traffic.

Schedule construction operations to minimize traffic exposure to uneven lanes, milled edges, and edge drop-offs. If these conditions cannot be avoided, provide and maintain the appropriate traffic control in accordance with the "LONGITUDINAL DROP OFF GUIDELINES" in the Field Manual.

Do not mill any notches for surfacing tapers until immediately prior to paving. The Engineer may allow notches if temporary bituminous is installed and maintained to provide for the safe passage of traffic until the surfacing is completed. Constructing and milling tapers and/or chamfers is incidental.

Maintain traffic with a minimum of delay during milling and paving operations at intersections controlled by signals or by all-way stop signs.

Intersecting Streets, other than Intersections controlled by signals or all-way stop signs, may be closed during milling and paving operations in the Intersection if there are adequate alternate routes for the intersecting Street traffic. Do not close adjacent intersecting Streets to traffic concurrently. Notify the local Road authorities of the schedule to close intersecting Streets 48 hours in advance of the closure.

When traffic is allowed to drive on the sealed surface, provide and install "LOOSE GRAVEL" and "FRESH OIL" signs with "Advisory Speed" plaques as shown on Layouts 35 and 66 of the Field Manual.

K. Maintenance and Staging of Traffic Control

Pedestrian traffic must be maintained and guided through, or around, the Project at all times.

2563.4 METHOD OF MEASUREMENT

All traffic control required to complete the project as shown in the Plans and as specified will be made as a lump sum payment under item 2563.601 (Traffic Control). Payment includes all costs associated with furnishing, installing, maintaining, relocating and subsequently removing traffic control devices (including flaggers) as required. No additional measurement for payment will be made for individual activities and devices that constitute Traffic Control, except for other traffic control Bid items specifically listed on the Bid Form.

If the Contractor fails to properly provide, install, maintain, or remove any of the required traffic control devices, the Owner may correct the deficiency and deduct the costs from any moneys due or becoming due to the Contractor in accordance with the General Conditions.

2563.5 BASIS OF PAYMENT

Partial payments for lump sum item 2563.601 (Traffic Control) will be made as follows:

Table 2563.5-1 Traffic Control Partial Payments	
Percent of Original Contract Completed	Pay this Percentage of Traffic Control
5	50
10	75
50	95
All work completed and all traffic control removed	100

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2563.601	TRAFFIC CONTROL	LS

2564 TRAFFIC SIGNS AND DEVICES

The provisions of MnDOT 2564 are modified and/or supplemented with the following:

2564.3 CONSTRUCTION REQUIREMENTS

A. General

Unless designated otherwise, or directed by the Engineer, all existing sign panels removed shall be salvaged and delivered to the Owner.

2564.5 BASIS OF PAYMENT

Add the following new paragraphs to MnDOT 2564.5:

A. Sign Panel Type C

The bid unit price for each Sign Panel Type C shall include the cost of providing and installing the sign panels, the sign post, brackets, and all mounting hardware necessary for sign panel attachment. Regardless of measurement type, the cost for the signs shall be for the complete unit (sign and post(s)) furnished and installed.

B. Sign Panel Type Special

The bid unit price for each Sign Panel Type Special (street name sign) shall include the cost of providing and installing the sign panels, the sign post, brackets, and all mounting hardware necessary for sign panel attachment. Each installation of Sign Panel Type Special shall include two blades of each street name (four blades total.) Multiple sign panels may be installed on the same sign post as directed by the Engineer.

C. Install Salvaged Sign

The bid unit price for each salvaged sign to be reinstalled shall include the cost of re-installing the salvaged sign panels on a new sign post, using new brackets and mounting hardware. Multiple sign panels may be installed on the same sign post as directed by the Engineer.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2564.518	SIGN PANELS TYPE C	S F
2564.602	SIGN PANELS TYPE SPECIAL	EACH
2564.602	INSTALL SALVAGED SIGN	EACH

2571 PLANT INSTALLATION AND ESTABLISHMENT

The provisions of MnDOT 2571 are modified and/or supplemented with the following:

2571.1 DESCRIPTION

Trees which are removed for construction of this Project are to be replaced as directed by the Engineer.

Only where trees are removed in conjunction with water service replacement work, the City will offer the property owner a replacement tree to be installed elsewhere within their property that is accessible with tree planting equipment.

2571.2 MATERIALS

The Contractor will be provided the list of trees to be installed from the Owner.

The Contractor shall supply the Engineer with a list of available trees from which the homeowners will be allowed to choose.

A. Nursery Plant Stock

Provide the following plants: Coniferous Tree 8' Ht. B & B
 Deciduous Tree 2.5" Cal. B & B

2571.3 CONSTRUCTION REQUIREMENTS

K. Plant Establishment Period

Delete Paragraph 2571.3.K.1 and replace with the following:

K.1 Establishment Period

The Contractor shall guarantee replacement of any tree failing to survive and thrive for a period of one (1) year from the date of installation or substantial completion, whichever is later. This guarantee shall extend to two (2) years for shade trees over five (5) inches in diameter at the trunk and evergreen trees over 15 feet in height. Any tree, plant material, or shrub replaced will be subject to a new one (1) year warranty period from the date of replacement.

Delete the third paragraph of 2571.3.K.2.b in its entirety.

2571.4 METHOD OF MEASUREMENT

Landscaping items have been included in the Contract to be utilized as determined by the Engineer in the field. The Engineer reserves the right to use as much or as little of individual items necessary. No adjustment to the unit prices will be allowed for increased or decreased quantities of landscaping items.

Tree replacement shall be with a tree type as requested by the property owner and must be approved by the City prior to installation.

2571.5 BASIS OF PAYMENT

Payment shall be made for each type and size of tree installed at the Bid unit price. Payment shall include all work and materials, delivery, planting, planting soils, fertilizer, maintenance, and guarantee.

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2571.502	CONIFEROUS TREE 8' HT B&B	EACH
2571.502	DECIDUOUS TREET 2.5" CAL B&B	EACH

2572 PROTECTION AND RESTORATION OF VEGETATION

The provisions of MnDOT 2572 are modified and/or supplemented with the following:

2572.3 CONSTRUCTION REQUIREMENTS

A. Protecting and Preserving

Any trees or shrubs not designated for removal shall be fully protected by the Contractor during construction. Any trees or shrubs removed or damaged by the Contractor, which were not designated for removal, will be replaced at the Contractor's expense.

A.6 Pruning

All pruning of trees has to be approved by the Engineer. All trees damaged during construction shall be pruned and repaired. All wounds on trees shall be treated with an asphalt varnish containing an antiseptic. If an antiseptic asphalt varnish is not available, a plain asphalt varnish can be used if the wound is swabbed with alcohol or coated with shellac. Wounds shall be painted as soon as possible after the area is dry.

2572.5 BASIS OF PAYMENT

All work under this section shall be considered incidental to the contract with no additional compensation allowed unless provided for in the Bid Form.

2573 STORM WATER MANAGEMENT

The provisions of MnDOT 2573 are modified and/or supplemented with the following:

2573.1 DESCRIPTION

The Contractor will be required to comply with NPDES General Storm Water Permit regulations to prevent erodible materials from leaving the site, even if such permit is not required due to the project scope, size, or location. A copy of the permit is available at <https://www.pca.state.mn.us/water/construction-stormwater>

2573.2 MATERIALS

BMP devices shall be a MnDOT approved product. The Contractor shall verify with the Engineer prior to installation that the proposed BMP device is suitable for prevention of soil and sediment erosion in the field.

2573.3 CONSTRUCTION REQUIREMENTS

A.5 Temporary Sediment Control Measures

All manholes shall be protected from surface water drainage. All storm sewer systems shall be protected from sedimentation, along with downstream ponding areas. All catch basins shall be protected with approved means of protection, immediately following construction.

M. Maintenance

The Contractor shall be responsible for the maintenance of all-temporary erosion and sediment control measures. These measures shall be repaired, replaced, or supplemented as set forth in the NPDES General Storm Water Permit.

If the Contractor fails to provide maintenance of the temporary erosion and sediment control measures as set forth in the NPDES permit requirements, the Engineer shall have the authority under the terms of this contract to hire the work done and deduct the costs incurred from the amounts due to the Contractor.

The Contractor shall be assessed liquidated damages for each specified area for which the Contractor has not installed or repaired erosion and sediment control devices (including sod) within 48 hours after receiving written notice.

2573.5 BASIS OF PAYMENT

H. Schedule

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2573.501	STABILIZED CONSTRUCTION EXIT	LS
2573.501	EROSION CONTROL SUPERVISOR	LS
2573.502	STORM DRAIN INLET PROTECTION	EACH
2573.502	CULVERT END CONTROLS	EACH
2573.503	SILT FENCE, TYPE _____	L F
2573.503	FLOTATION SILT CURTAIN TYPE _____ WATER	L F
2573.503	SEDIMENT CONTROL LOG TYPE _____	L F
2573.603	LINEAR SEDIMENT TRAP	L F

2574 SOIL PREPARATION

The provisions of MnDOT 2574 are modified and/or supplemented with the following:

2574.3 CONSTRUCTION REQUIREMENTS

C. Topsoil

The topsoil shall be free from roots, stick, chunks of miscellaneous debris, rocks larger than 1 in, and garbage. Topsoil placement shall be approved by the Engineer prior to installation.

2574.4 METHOD OF MEASUREMENT

E. Topsoil Borrow

Topsoil borrow shall be imported only at the direction of the Engineer. Load tickets will be required for payment.

2574.5 BASIS OF PAYMENT

B. Schedule

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2574.507	COMMON TOPSOIL BORROW	C Y
2574.508	FERTILIZER TYPE _____	LB

2575 ESTABLISHING TURF AND CONTROLLING EROSION

The provisions of MnDOT 2575 are modified and/or supplemented with the following:

2575.1 DESCRIPTION

All disturbed areas within the project shall be either seeded or sodded to an equal or better condition to that which was in place prior to construction and as directed by the Engineer. All exposed areas of the site shall receive seed and mulch, sod or rolled erosion prevention product within two weeks after final grade on slopes flatter than 1(V):3(H) and one week on slopes steeper than 1(V):3(H). Restoration may include areas outside of the construction limits as determined by the Engineer.

If bituminous base is placed, the final turf establishment shall be installed within two weeks of bituminous placement. Failure to install final turf establishment within two weeks of the bituminous base being placed will result in penalty of \$100 per calendar day to be deducted from any monies due or coming due to the Contractor.

All pond and stormwater management basin slopes shall receive seed and rolled erosion prevention blankets as specified in section 2575.2.f and as detailed on plates ERO-011 and ERO-012.

All ditch areas shall receive sod or seed w/ rolled erosion prevention blankets as specified in section 2575.2.f and as detailed on plates ERO-006.

All areas adjacent to the roadway disturbed by construction shall be excavated to a depth as specified to allow for placement of topsoil. The Contractor shall import topsoil as necessary to provide for a minimum depth of topsoil specified. All rock, Class 5, debris, and excess concrete shall be removed from the area behind the curb to the satisfaction of the Engineer prior to the placement of topsoil. The Contractor shall cut a clean, square edge and install sod or seed in areas as directed by the Engineer.

Where boulevard sodding is identified by the plans, sod shall be placed in the boulevard area adjacent to curb and gutter installation/replacement. A minimum of 4 ft and maximum of 6 ft of sod shall be placed along curb unless the extended area is directed by the Engineer.

2575.2 MATERIALS

C. Sod

Sod shall meet the requirements of either MnDOT 3878.2.A or MnDOT 3878.2.C. The sod type shall be a commercially produced Kentucky bluegrass blend, densely rooted and locally grown.

F. Rolled Erosion Prevention Products

The Machine Direction (MD) Tensile Strength and TD Tensile Strength requirements of MnDOT Table 3885.2-1 and Table 3885.2-2 are modified as follows:

Machine Direction (MD) Tensile Strength, minimum (pounds per foot):

Category 10	Category 20	Category 30	Category 25	Category 35	Category 45
70	160	160	160	160	160

TD Tensile Strength, minimum (pounds per foot):

Category 10	Category 20	Category 30	Category 25	Category 35	Category 45
50	110	150	110	110	110

2575.3 CONSTRUCTION REQUIREMENTS

A. General

Permanent turf establishment shall commence within seven days after finish grading has been completed, unless the NPDES permit requirements specify a more stringent timeline.

Delete MnDOT 2575.3.A.4 and replace with the following:

A.4 Substitutions

The Engineer may allow substitutions for the following Materials: plastic, geotextile, mulch, Rolled erosion prevention, and hydraulic erosion control products. The Engineer may authorize requested substitutions for specific locations shown in the Plan. Provide substitutions equal to or better than initially specified Material.

F. Placing Sod

In areas where there will be sidewalk construction, a bio-roll may be placed behind the back of curb until the sidewalk work is completed. The entire boulevard area must receive sod within two weeks following sidewalk construction. No additional compensation will be allowed for the additional mobilization required to complete the work as specified.

While laying or immediately after completing the sod placement on each area, the sod shall be watered and compressed into the underlying soil by rolling or tamping in the presence of the Engineer. If, after rolling, the surface of the sod is not free of bumps or depressions, the Contractor shall make suitable corrections to the topsoil and/or subgrade, replace the sod and roll the sod at no additional cost to the Owner. New sod shall be level with existing adjacent sod and the thatch or base soil shall be approximately one inch below the top of adjacent curb, gravel shoulder, or sidewalk. The Engineer reserves the right to have sod re-laid in areas where this specification is not met without any cost to the Owner.

Leftover sod and topsoil material shall be removed from the street immediately after installation.

K.3 Seed

The Contractor shall be responsible for maintaining seeded areas until accepted by the Owner and the requirements of MnDOT 2575.3.L are met. The Contractor shall be solely responsible for replacement and/or repair of any seeded areas that may wash out, erode, or fail to grow prior to acceptance with no additional compensation therefore.

Add the following new paragraph to MnDOT 2575.3:

R. Water (Turf Establishment)

Watering will become the responsibility of the homeowner only after the maintenance period has expired AND final acceptance of the turf has been obtained.

R.1 Sodded Areas

For sodded areas, the maintenance period, in accordance with MnDOT 2575.3.K.1 is 30 days. Sod shall be placed in accordance with MnDOT 2575.3.F and maintained in accordance with MnDOT 2575.3.K. The Engineer will accept sod in accordance with MnDOT 2575.3.N.

R.2 Seeded Areas

For seeded areas, the Engineer will accept the area after the perennial seed germinates, vegetation is at least 4 inches in height, and cover is uniform.

The Engineer may direct the Contractor to water portions of the project after final acceptance of the turf at the bid unit price. When so directed, the Contractor shall be responsible for notifying the Engineer, and keeping a log of watering hours and meter readings when they are on the project watering the turf establishment area.

For sod placed late enough in the season such that watering cannot be completed in the Phase year, the Engineering and the Contractor shall agree on a date as to when watering operations will cease in a specific Phase year, and again when they will resume in year following the Phase year, such that all sod placed in conjunction with the project will be watered for the required maintenance period.

2575.5 BASIS OF PAYMENT

K. Schedule

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2575.504	SODDING TYPE LAWN	S Y
2574.504	ROLLED EROSION PREVENTION CATEGORY	S Y
2575.504	RAPID STABILIZATION METHOD 4	S Y
2575.505	DISK ANCHORING	ACRE
2575.505	SEEDING	ACRE
2575.508	SEED MIXTURE XX-XXX	LB
2575.509	MULCH MATERIAL TYPE 1	TON
2575.523	WATER	MGAL
2575.523	RAPID STABILIZATION METHOD 3	MGAL

2582 PAVEMENT MARKINGS

The provisions of MnDOT 2582 are modified and/or supplemented with the following:

2582.1 DESCRIPTION

The Contractor shall be responsible for the layout of all temporary and permanent pavement markings (striping). The Owner will check and approve layout before application of pavement markings is allowed.

All striping shall be completed as soon as possible and within 48 hours after placement of the final lift (in accordance with manufacturers' requirements).

2582.2 MATERIALS

For pavement marking installations between the dates of October 15 and April 1, provide and use pavement marking materials listed on the Late Season pavement marking Materials Approved Products List.

2582.3 CONSTRUCTION REQUIREMENTS

B. Application

The Engineer's involvement in the application of the material shall be limited to field consultation and inspection. The Contractor will place necessary 'spotting' at appropriate points to provide horizontal control for striping and to determine necessary starting and cutoff points. Longitudinal joints, pavement edges and existing marking may serve as horizontal control when so directed.

2582.5 BASIS OF PAYMENT

Layout is incidental with no additional compensation allowed therefore.

Delete MnDOT 2582.5.A in its entirety.

B. Schedule

Payment will be made based on the following schedule:

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
2582.503	—" SOLID LINE PAINT	L F
2582.503	4" BROKEN LINE PAINT	L F
2582.503	4" DBLE SOLID LINE PAINT	L F
2582.518	PAVT MSSG PAINT	S F
2582.518	CROSSWALK PAINT	S F

APPENDIX A

CEAM STANDARD SPECIFICATIONS (2023)



CITY ENGINEERS ASSOCIATION OF MINNESOTA
Engineering Our Cities' Futures

STANDARD SPECIFICATIONS

2023 Edition

2600 Trench Excavation and Backfill/Surface Restoration

2611 Watermain and Service Line Installation

2621 Sanitary Sewer and Storm Sewer Installation

2631-CIPPS Sewer Pipe Rehabilitation - Cured In Place Pipe Systems

2641 – Pipeline Rehabilitation - Pipe Bursting Method

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SECTION 2600 – STANDARD SPECIFICATIONS FOR TRENCH EXCAVATION & BACKFILL/SURFACE RESTORATION

2600.1 DESCRIPTION

This work shall consist of excavation, trenching, backfilling, and restoration of existing surfaces for the construction of underground utilities.

The use of the term "Plans, Specifications and Special Provisions" within this specification shall be construed to mean those documents which compliment, modify, or clarify these specifications and are an enforceable component of the Contract Documents.

All references to MnDOT Specifications shall mean the latest published edition of the Minnesota Department of Transportation "Standard Specifications for Construction", and all supplements and amendments thereto, published prior to the date of advertisement for bids.

All reference to other Specifications of AASHTO, ASTM, ANSI, AWWA, etc. shall mean the latest published edition available on the date of advertisement for bids.

2600.2 MATERIALS

A Granular Materials

Granular materials furnished for foundation, bedding, encasement, backfill, or other purposes as may be specified shall consist of any natural or synthetic mineral aggregate such as sand, gravel, crushed rock, crushed stone, or slag that shall be so graded as to meet the gradation requirements specified herein for each particular use by the material manufacturer or as indicated in the Plans, Specifications, or Special Provisions.

A1 Granular Material Gradation Classifications

Granular materials furnished for use in Foundation, Bedding, Encasement, or Backfill construction shall conform to the following requirements:

Foundation materials shall have one hundred percent (100%) by weight passing the one and one-half inch (1 1/2") sieve and a maximum of ten percent (10%) by weight passing the No. 4 sieve. Not less than fifty percent (50%) of the material by weight that is retained on the No. 4 sieve shall have one (1) or more crushed faces. Hard, durable crushed carbonate quarry rock may be used for Foundation materials.

Bedding and encasement materials for flexible pipe shall meet the requirements of MnDOT Specification 3149.2 B, Granular Material, except that one hundred percent (100%) by weight shall pass the one-inch (1") sieve.

Backfill materials shall consist of suitable existing trench materials, except as otherwise specified in the Special Provisions. Suitable material shall be defined as a mineral soil free of foreign materials (rubbish, organics, and debris), frozen clumps, oversize stone, rock, concrete or bituminous chunks, and other unsuitable materials that may damage the pipe, prevent thorough compaction, or increase the risks of settlement.

A gradation report, certified by an approved independent testing laboratory, of the proposed granular materials shall be furnished to the Engineer before any of the granular materials are delivered to the project.

A2 Granular Material Use Designations

Granular materials provided for Foundation, Bedding, Encasement, or Backfill use as required by the Plans, Specifications, and Special Provisions, either as part of the pipe item work unit or as a separate contract item, shall be classified as to use in accordance with the following:

<u>Material Use</u>	<u>Zone Designation</u>
Granular Foundation	Placed below the bottom of pipe grade as replacement for unsuitable or unstable soils, to achieve improved foundation support.
Granular Bedding	Placed below the pipe midpoint, prior to pipe installation, to facilitate proper shaping and to achieve uniform pipe support. For flexible pipe installation, placed below the pipe midpoint to a point six inches (6") below the bottom of pipe or twenty five percent (25%) of the diameter below the pipe, whichever is greater.
Granular Encasement	Placed below an elevation one foot above the top of pipe, after pipe installation, for protection of the pipe and to assure proper filling of voids or thorough consolidation of backfill.
Granular Backfill	Placed below the surface base course, if any, as the second stage of backfill, to minimize trench settlement and provide support for surface improvements.

In each case above, unless otherwise indicated, the lower limits of any particular zone shall be the top surface of the next lower course as constructed. The upper limits of each zone are established to define variable needs for material gradation and compaction or void content, taking into consideration the sequence of construction and other conditions. The material use and zone designations described above shall only serve to fulfill the objectives and shall not be construed to restrict the use of any particular material in other zones where the gradation requirements are met.

B Insulation

Insulation shall be extruded rigid board material having a thermal conductivity of 0.23 BTU/hour/square foot/degree Fahrenheit/per inch thickness, maximum, at 40°F mean, a comprehensive strength of thirty-five (35) psi minimum, and water absorption of one quarter percent (0.25%) by volume maximum. Unless otherwise specified in the Plans, Specifications, or Special Provisions, board dimensions shall measure eight feet (8') long, two or four feet (2' or 4') wide, and one (1), one and one half (1-1/2), two (2), or three (3) inches thick.

C Geotextile Fabric

Geotextile fabric shall meet the requirements of MnDOT Specification 3733 and be used as required by the Plans, Specifications, and Special Provisions.

2600.3 CONSTRUCTION REQUIREMENTS

A General Provisions

A1 Maintenance of Traffic

Whenever work interferes with the flow of traffic along a roadway, the Contractor shall provide traffic control signing and public safety in accordance with the provisions Minnesota Manual on Uniform Traffic Control Devices (current edition and all amendments), MnDOT Specifications 1404 and 1710, and the Special Provisions. Neither road closures nor detours shall be permitted unless specified in the Special Provisions or authorized by the Engineer. Where road closures or detours are permitted by the Engineer, the Engineer shall determine the appropriate agencies, boards, or departments the Contractor must notify prior to taking the action and the proper advance notice to be provided to each body.

Compliance with this requirement shall not be construed to relieve the Contractor from the responsibility of notifying agencies or institutions whose services may be predicated upon a roadway being opened to traffic or whose services would be hindered if a roadway is closed to traffic. Such agencies or institutions shall include, but not be limited to, the police department, the fire department, municipal bus service, school bus service, and ambulance service, mail delivery, and waste hauler services. The Contractor shall keep the required agencies informed of changing traffic patterns and detour situations.

A2 Establishing Line and Grade

The primary line and grade will be established by the Engineer. For trench installation, line and grade stakes will be set parallel to the proposed pipeline at an appropriate offset therefrom as will best serve the Contractor's operations wherever practical. For tunnel installation, line and grade stakes will be set directly above the proposed pipeline setting.

The Contractor shall arrange operations to avoid unnecessary interference with the establishment of the primary line and grade stakes and shall render whatever assistance may be required by the Engineer in accomplishing the staking. The Contractor shall be responsible for preservation of the primary stakes and, if negligent in providing necessary protection, shall bear the full cost of any re-staking.

The Contractor shall be solely responsible for the correct transfer of the primary line and grade to all working points and for construction of the work to the prescribed lines and grades as established by the Engineer.

Unless otherwise specified in the Plans, Specifications, and Special Provisions the watermain shall generally be placed with the minimum specified cover. However, a greater depth may be required to avoid conflicts with other utilities and obstructions. Installation of watermain and services to a depth deeper than specified shall be considered incidental with no additional compensation allowed therefore.

The existing grade shown on the plans is approximate. Modification of the pipe location or differences in existing elevation shall not be cause for additional compensation.

In areas where direct conflicts arise between watermain and water services, with storm sewer, sanitary sewer, sanitary sewer services, sewer forcemains, septic tanks, or subsoil treatment systems, the following shall apply:

Watermain and services located near sewer forcemains:

A minimum of ten feet (10') of separation, measured horizontally between the outer surfaces of the pipes is required.

If ten feet (10') of separation cannot be provided, an approved additional measure of containment must be provided for either the watermain or the sewer forcemain.

Watermain and services located near septic tanks, or subsoil treatment systems:

A minimum of ten feet (10') measured horizontally between the outer surfaces of the watermain, tank and subsoil treatment system is required.

Watermain and services located near gravity sanitary and storm sewers:

A minimum of ten feet (10') measured horizontally between the outer surfaces of the pipes is required.

In locations where local conditions prevent the required separation indicated above (due to the presence of rock, buildings, other significant obstructions), the watermain may be laid closer to gravity sewer if **one** (1) of the following conditions is met:

The bottom of the watermain is laid at least eighteen inches (18") above the top of the sewer on a separate shelf; or

The sewer is constructed of materials and with joints that are equivalent to watermain standards of construction and is pressure tested to assure water tightness prior to backfilling.

Watermain and services crossing gravity sanitary and storm sewers:

A minimum vertical separation of eighteen inches (18") must be provided between the outer surfaces of the pipes, with preference that the watermain cross above the sewer, wherever possible.

One full length of water pipe shall be located so both joints will be as far from the sewer as possible.

Watermain above-water crossings:

The pipe shall be adequately supported and anchored, protected from vandalism, damage and freezing, and accessible for repair or replacement.

Watermain underwater crossings:

A minimum cover of five feet (5') shall be provided over the pipe unless otherwise approved by the Department of Health. When crossing water courses which are greater than fifteen feet (15') in width, the following shall be provided:

1. The pipe shall be of special construction, having flexible, restrained or welded watertight joints
2. Valves shall be provided at both ends of water crossings so that the section can be isolated for testing or repair; the valves shall be easily accessible, and not subject to flooding
3. Permanent taps or other provisions to allow insertion of a small meter to determine leakage and obtain water samples on each side of the valve closest to the supply source.

A3 Protection of Surface Structures

All surface structures and features located outside the permissible excavation limits for underground installations, together with those within the construction areas which are indicated in the Plans as being saved, shall be properly protected against damage and shall not be disturbed or removed without approval of the Engineer. Within the construction limits, as indicated on the plans or as directed by the Engineer, the removal of improvements such as pavement, curb, curb & gutter, walks, turf, etc., shall be subject to equivalent acceptable replacement after completion of underground work, with all expense of removal and replacement being borne by the Contractor to the extent that separate compensation is not specifically provided for in the Contract.

Obstructions such as street signs, guard posts, small culverts, mailboxes, and other items of prefabricated construction may be temporarily removed during construction provided that essential service is maintained in a relocated setting as approved by the Engineer and that nonessential items are properly stored for the duration of construction. Upon completion of the underground work, all such items shall be replaced in their proper setting at the sole expense of the Contractor to the extent that separate compensation is not specifically provided for in the Contract.

The Contractor shall be responsible for protection of existing overhead utilities and poles. This shall include arranging with the utility owner and arrange paying the utility for holding poles that will be close to the edge of any trench. Holding of poles and repair of any damage to these facilities shall be considered incidental to the project with no additional compensation allowed. If relocation or removal of these facilities is required, the Owner will contact the concerned utility owner and arrange and pay for the relocation or removal at no additional expense to the Contractor.

In the event of damage to any surface improvements, either privately or publicly owned, in the absence of construction necessity, the Contractor will be required to replace or repair the damaged property to the satisfaction of the Engineer and without cost to the Owner.

A4 Interference of Underground Structures

When any underground structure interferes with the planned placement of the pipeline or appurtenances to such an extent that alterations in the work are necessary to eliminate the conflict or avoid endangering effects on either the existing or proposed facilities, the Contractor shall immediately notify the Engineer and the Owner of the affected structure. When any existing facilities are endangered by the Contractor's operations, the Contractor shall cease work at the site and take such precautions as may be necessary to protect the in-place structures until a decision is made as to how the conflict will be resolved.

Without specific authorization from the Engineer, no utility service shall be disrupted, nor shall any change be made in either the existing structures or the planned installations to overcome the interference. Alterations in existing facilities will be allowed only to the extent that service will not be curtailed and then only when the encroachment or relocation will satisfy all applicable regulations and conditions.

Wherever alterations are required as a result of unforeseen underground interferences not due to any fault or negligence of the Contractor, the Engineer will issue a written order covering any additional or extra work involved and specifying the revised basis of payment, if any. Any alterations made strictly for the convenience of the Contractor, shall be subject to prior approval and shall be at the Contractor's expense. No extra compensation will be allowed for delays caused by the interference of underground structures.

A5 Removal of Surface Improvements

Removal of surface improvements in connection with trench excavation shall be limited to actual needs for installation of the pipeline and appurtenances, based on the allowable trench widths and any other controls imposed in connection with the work. Removal operations shall be coordinated effectively with the excavation and installation operations as will cause the least practical disruption of traffic or inconvenience to the public. The debris resulting from removals shall become the property of the Contractor and shall be disposed of by the Contractor in accordance with MnDOT Specification 2104 and the Special Provisions. Removal debris shall not be deposited at locations that will block access to fire hydrants, private driveways, or other essential service areas, nor obstruct surface drainage. Removal and final disposal of debris shall be accomplished as a single operation wherever possible and, in any event, the debris shall be removed from the site before starting the excavating operations.

Removal of concrete or bituminous structures shall be by methods producing clean-cut breakage to pre-scored lines as will preserve the remaining structure without damage. Removal equipment shall not be operated in a manner that will cause damage to the remaining structure or adjoining property. Where not removed to an existing joint, concrete structures shall be sawed along the break lines to a minimum depth of one-third (1/3) of the structure depth.

Any reusable materials generated during the work, such as aggregate, sod, topsoil, shall be segregated from other waste materials and be stockpiled so as to maintain suitability and permit proper reuse.

The use of drop weight equipment for breaking pavement will be allowed to the extent that the Contractor shall assume full responsibility for any damages caused thereby. The pavement breaking operation shall not be allowed to become a nuisance to the public or a source of damage to underground or adjacent structures. The Engineer reserves the right to order discontinuance of drop weight breaking operations at any time.

A6 Temporary Service Measures

While any open excavations are maintained, the Contractor shall have available a supply of steel plates suitable for temporary bridging of open trench sections where either vehicular or pedestrian traffic must be maintained. Use of the plates shall be as directed or approved by the Engineer and where installed they shall be secured against possible displacement and be replaced with the permanent structure as soon as possible.

B Excavation and Preparation of Trench

B1 Operational Limitations and Requirements

Trench excavation must conform to all local, state and federal requirements. All work must be confined to the limits of the construction and to easements and right of way as indicated on the plans. The Contractor shall install at his expense the necessary trench support to meet the varying soil conditions and to protect existing structures and property. The trench shall be drained to provide stable excavation and permit the pipe to be laid in a dry trench.

Excavating operations shall proceed only so far in advance of pipe laying as will satisfy the needs for coordination of work and permit advance verification of unobstructed line and grade as planned, consistent with the Contractors methods and scheduling. Where interference with existing structures is possible or in any way indicated, and where necessary to establish elevation or direction for connections to in-place structures, the excavating shall be done at those locations in advance of the main operation so actual conditions will be exposed in sufficient time to make adjustments without resorting to extra work or unnecessary delay.

Wherever possible, excavated materials shall be placed in areas that will not block existing vehicle and pedestrian traffic and drainage ways. The Contractor shall review proposed methods of operation with the Engineer prior to beginning the work.

The Contractor shall backfill all trenches at the end of each work day, or upon written authorization of the Engineer, shall provide another approved method of protecting the trench area while work is not being performed.

All installations shall be accomplished by open trench with the exception that boring, jacking and tunnel construction methods shall be employed where specifically required by the Plans, Specifications, or Special Provisions.

The excavating operations shall be conducted so as to carefully expose all existing underground structures without damage. Wherever the excavation extends under or approaches so close to an existing structure as to endanger it in any way, precautions and protective measures shall be taken as necessary to preserve the structure and provide temporary support. Hand methods of excavating shall be utilized to probe for and expose such critical or hazardous installations as gas pipe, power and communication cables, watermain, gravity and pressure sewers, and respective service pipes.

The Engineer shall be notified of any need for blasting to remove materials which cannot be broken up mechanically, and there shall be no blasting operations conducted until the Engineer's approval has been secured. Blasting will be allowed only when proper precautions are taken to protect life and property, and then shall be restricted as the Engineer directs. The hours of blasting operations shall be set by the Owner. The Contractor shall assume full responsibility for any damages caused by blasting, regardless of the requirements for notification and approval. The Contractor shall secure any required permits for blasting and shall conduct blasting operations in conformance with all applicable local, state and federal laws, regulations, and ordinances.

B2 Classification and Disposition of Materials

Excavated materials will be classified for payment only when specifically provided in the Special Provisions, or the Proposal. All other materials encountered in the excavations will be considered incidental to utility construction, with no additional compensation provided thereto.

Miscellaneous excavated materials that are not specifically identified for payment in the Special Provisions or Proposal, exceed one (1) cubic yard in volume, cannot be re-used within the project limits, and in the opinion of the Engineer requires special means for handling and disposal, may be considered for payment through supplemental agreement as extra work. Miscellaneous excavated materials include but are not limited to organic soils, rubble, wood debris, boulder stone, masonry, concrete fragments, and metals.

Rock excavation shall be defined to include all hard, solid rock in ledge formation, bedded deposits and unstratified masses; all natural conglomerate deposits so firmly cemented as to present all the characteristics of solid rock; and any boulder stone, masonry or concrete fragments exceeding one (1) cubic yard in volume. Materials such as shale, hard pan, soft or disintegrated rock which can be dislodged with a hand pick or removed with a power operated excavator will not be classified as Rock Excavation.

Excavated materials will be classified for reuse as being either Suitable or Unsuitable for backfill or other specified use, subject to selective controls. All suitable materials shall be reserved for backfill to the extent needed, and any surplus remaining shall be utilized for other construction on the project as may be specified or ordered by the Engineer. To the extent practicable, granular materials and topsoil shall be segregated from other materials during the excavating and stockpiling operations so as to permit best use of the available materials at the time of backfilling. Unless otherwise specified in the Plans, Specifications, and Special Provisions, material handling as described above shall be considered incidental with no additional compensation provided.

All excavated materials reserved for backfill or other use on the project shall be stored at locations approved by the Engineer that will cause a minimum of inconvenience to public travel, adjacent properties, and other special interests. The material shall not be deposited so close to the edges of the excavations in a manner that could create hazardous conditions, nor shall any material be placed so as to block the access to emergency services. All materials considered unsuitable by the Engineer, for any use on the project, shall be immediately removed from the project and be disposed of as arranged for by the Contractor with no additional compensation.

B3 Excavation Limitations and Requirements

Trench excavating shall be to a depth that will permit preparation of the foundation as specified and installation of the pipeline and appurtenances at the prescribed line and grade, except where alterations are specifically authorized. Trench widths shall be sufficient to permit the pipe to be laid and joined properly and the backfill to be placed and compacted as specified. Extra width shall be provided as necessary to permit convenient placement of sheeting and shoring and to accommodate placement of appurtenances.

Excavations shall be extended below the bottom of structures as necessary to accommodate any required Granular Foundation material. When rock or unstable foundation materials are encountered at the established grade, additional materials shall be removed as specified or directed by the Engineer to produce an acceptable foundation. Unless otherwise indicated or directed, rock shall be removed to an elevation at least six inches (6") below the bottom surface of the pipe barrel and below the lowest projection of flange and bell/spigot joint. All excavations below grade shall be to a minimum width equal to the outside pipe diameter plus two feet (2'). Rock shall be removed to such additional horizontal dimensions as will provide a minimum clearance of six inches (6") on all sides of appurtenant structures such as valves, housings, access structures, etc.

Where no other grade controls are indicated or established for the pipeline, the excavating and foundation preparations shall be such as to provide a minimum cover over the top of the pipe as specified. Trench widths shall allow for at least six inches (6") of clearance on each side of the flange and bell/spigot joint. The maximum allowable width of the trench at the top of pipe level shall be the outside diameter of the pipe plus two feet (2'), subject to the considerations for alternate pipe loading set forth below. The width of the trench at the ground surface shall be held to a minimum to prevent unnecessary destruction of the surface structures.

The maximum allowable trench width at the top of pipe level may be exceeded only by approval of the Engineer, after consideration of pipe strength and loading relationships. Any alternate proposals made by the Contractor shall be in writing, giving the pertinent soil weight data and proposed pipe strength alternate, at least seven (7) days prior to the desired date of decision. Approval of alternate pipe designs shall be with the understanding that there will be no extra compensation allowed for any increase in material or construction costs.

If the trench is excavated to a greater width than that authorized, the Engineer may direct the Contractor to provide a higher class of bedding and/or a higher strength pipe than that required by the Plans, Specifications, and Special Provisions in order to satisfy design requirements, without additional compensation.

Excess excavated materials generated by utility construction without a specified use on the project site, shall become the property of the Contractor and disposed of offsite. Offsite disposal of excess excavated materials is considered incidental to the construction with no additional compensation allowed thereto.

The use of granular foundation materials shall not be used as an aid to facilitate installation of pipe in wet soil conditions. Use of these materials in this manner in lieu of providing adequate dewatering measures shall be considered incidental to the construction with no additional compensation allowed thereto.

B4 Sheeting and Bracing Excavations

All trench excavations that require slope support shall be sheeted, shored, and braced in a manner that will meet all requirements of the applicable safety codes and regulations; comply with any specific requirements of the Contract; and prevent disturbance or settlement of adjacent surfaces, foundations, structures, utilities, and other properties. Any damage to the work under contract, to adjacent structures, or other property, caused by settlement, water or earth pressures, slides, cave-ins, or other causes due to the failure or lack of sheeting, shoring, or bracing, through negligence or fault of the Contractor in any manner shall be repaired at the Contractor's expense and without delay.

The Plans, Specifications, and Special Provisions may require special precautions to protect life and property. The Engineer may order other precautions when excavation conditions appear to warrant additional measures. Failure of the Engineer to order correction of improper or inadequate sheeting, shoring, or bracing shall not relieve the Contractor's responsibilities for protection of life, property, and the work.

The Contractor shall assume full responsibility for proper and adequate placement of sheeting, shoring, and bracing, to prevent displacement. Bracing shall be so arranged as to provide ample working space and without increase of stress or strain on the in-place structures to any extent that may cause damage.

Sheeting, shoring and bracing materials shall be removed only when and, in such manner, as will assure adequate protection of the in-place structures and prevent displacement of supported grounds. Sheeting and bracing shall be left in place only as required by the Plans, Specifications, and Special Provisions or ordered by the Engineer. Otherwise, sheeting and bracing may be removed as the backfilling reaches the level of respective support. Wherever sheeting and bracing is left in place, the upper portions shall be cut and removed to an elevation of three feet (3') or more below the established surface grade or as the Engineer may direct.

All costs of furnishing, placing and removing sheeting, shoring, and bracing materials, including the value of materials left in place as required by the Contract, shall be included in the prices bid for pipe installation and will not be compensated for separately. When sheeting, shoring, or bracing materials are left in place by written order of the Engineer, in the absence of specific requirements of the Contract, payment will be made for those materials by supplemental agreement.

B5 Preparation and Maintenance of Foundations

Foundation preparations shall be conducted as necessary to produce a stable foundation and provide continuous and uniform pipe bearing between bell holes. The initial excavating or backfilling operations shall produce a subgrade level slightly above finished grade as will permit hand shaping to finished grade by trimming of high spots and without the need for filling of low spots to grade. Final subgrade preparations shall be such as to produce a finished grade at the centerline of the pipe that is within three hundredths of a foot (0.03') of a straight line between pipe joints and to provide bell excavation at each joint as will permit proper joining of pipe and fittings.

In excavations made below grade to remove rock or unstable materials, the backfilling to grade shall be made with available suitable materials unless placement of Granular Foundation or Bedding material is specified or is ordered by the Engineer. Placement of the backfill shall be in relatively uniform layers not exceeding eight inches (8") in loose thickness. Each layer of backfill shall be compacted thoroughly, by means of approved mechanical compaction equipment, as will produce uniform pipe support throughout the full pipe length and facilitate proper shaping of the pipe bed.

It shall be the Contractor's responsibility to notify the Engineer of changing soil conditions which may be of poor bearing capacity and when organic soils are encountered. Where utilities are placed on unstable soils without notification of the Engineer, the Contractor shall be responsible for all repairs and correction of the installation without further compensation.

Care shall be taken during final subgrade shaping to prevent any over-excavation. Should any low spots develop, they shall only be filled with approved material, which shall have optimum moisture content and be compacted thoroughly without additional compensation to the Contractor. The finished subgrade shall be maintained free of water and shall not be disturbed during pipe lowering operations except as necessary to remove pipe slings. The discharge of trench dewatering pumps shall be directed to natural drainage channels or storm water drains. Draining trench water into sanitary sewers or combined sewers will not be permitted.

The Contractor shall install and operate a dewatering system of wells or points to maintain pipe trenches free of water whenever necessary or as directed by the Engineer. Unless otherwise specified in the Plans, Specifications, and Special Provisions such work shall be considered incidental.

All costs of excavating below grade and placing foundation or bedding aggregates as required shall be included in the bid prices for pipe items to the extent that the need for such work is indicated in the Contract provisions and the Proposal does not provide for payment under separate Contract Items. Any excavation below grade and any foundation or bedding aggregates required by order of the Engineer in the absence of Contract requirements will be compensated for separately.

If examination by the Engineer reveals that the need for placement of foundation aggregate was caused by the Contractor's manipulation of the soils in the presence of excessive moisture or lack of proper dewatering, the cost of the corrective measures shall be borne by the Contractor.

B6 Contaminated Materials and Regulated Wastes

If during the course of the Project, the Contractor unexpectedly encounters any of the following conditions indicating the possible presence of contaminated soil, contaminated water, or regulated waste, the Contractor shall immediately stop work in the vicinity, and notify the Engineer.

At the direction of the Engineer, a documented inspection and evaluation will be conducted prior to the resumption of work. The Contractor shall not resume work in the suspected area without authorization by the Engineer.

Indicators of contaminated soil, groundwater or surface water include, but are not limited to the following:

- (1) Odor including gasoline, diesel, creosote (odor of railroad ties), mothballs, or another chemical odor.
- (2) Soil stained green or black (but not because of organic content), or with a dark, oily appearance, or any unusual soil color or texture.
- (3) A rainbow color (sheen) on surface water or soil.

Indicators of regulated wastes include, but are not limited to the following:

- (1) Cans, bottles, glass, scrap metal, wood (indicators of solid waste and a potential dump site).
- (2) Concrete and asphalt rubble (indicators of demolition waste).
- (3) Roofing materials, shingles, siding, vermiculite, floor tiles, transite or any fibrous material (indicators of demolition waste that could contain asbestos, lead or other chemicals).
- (4) Culverts or other pipes with tar-like coating, insulation or transite (indicators of asbestos).
- (5) Ash (ash from burning of regulated materials may contain lead, asbestos or other chemicals).
- (6) Sandblast residue (could contain lead).
- (7) Treated wood including, but not limited to products referred to as green treat, brown treat and creosote (treated wood disposal is regulated).
- (8) Chemical containers such as storage tanks, drums, filters and other containers (possible sources of chemical contaminants).
- (9) Old basements with intact floor tiles or insulation (could contain asbestos), sumps (could contain chemical waste), waste traps (could contain oily wastes) and cesspools (could contain chemical or oily wastes).

Discovery of contaminated soil, contaminated water, or regulated waste on State right of way, State property, and State funded projects shall be handled in accordance with guidance procedures of the MNDOT Office of Environmental Stewardship (OES) and the MPCA requirements for materials handling, disposal, re-use and remediation.

Discovery of contaminated soil, contaminated water, or regulated waste on projects or properties that are not under the ownership or financed by the State shall be handled in accordance with guidance procedures of the MPCA requirements for materials handling, disposal, re-use and remediation.

C Trenchless Pipe Installation

The Contractor shall inspect and verify soil conditions as necessary in order to determine the type of construction to employ. Natural and/or manmade obstructions may be encountered in the soil. These contract documents do not warrant the nature or condition of the soils, and do not warrant that natural or manmade obstructions will not be encountered, nor guarantee the extent to which rocks, boulders, or other obstructions, regardless of size, may be encountered during boring operations. The Contractor shall not be entitled to additional compensation for any natural or manmade obstructions encountered during trenchless construction.

The Contractor shall be responsible for protecting all existing utilities within the construction limits.

C1 Jacking/Boring

The terms "auger", "boring", "jack", "jacking", and "tunneling" in the proposal, specifications, and plans refers only to trenchless construction.

The minimum diameter of the casing pipe shall be four inches (4") greater than the outside diameter of the bell of the carrier pipe.

The Contractor shall prevent excavated materials from flowing back into the excavation during the trenchless construction. This shall include the use of a shield conforming to the size and shape of the casing that will prevent materials from flowing into the leading edge of the casing. The machine used shall be capable of controlling line and grade and shall conform to the size and shape of the casing pipe.

No jacking/augering of pipe will be allowed below the water table unless the water table has been lowered sufficiently to keep the water below the pipe being installed. The use of water under pressure (jetting) or puddling will not be permitted to facilitate jacking/augering operations.

If any installation is augered, the head shall be approved by the Engineer and the auger shall be located six inches (6") behind the lead edge of the casing or carrier pipe.

The jacking system shall be provided with an integral grout pipe and casing pipe. A one-inch (1") grout pipe shall be tack welded to the front edge of the first length of casing pipe. The grout pipe shall be extended with the casing pipe, but not fastened to the casing pipe during the remaining jacking operations. After the pipes are through to the receiving pit, the grout pipe shall be cut free from the casing pipe. The grout pipe shall be pulled back through the embankment applying positive piston pressure on the grout along the outside of the casing pipe throughout the pulling operation. A cement slurry grout mix with as little water as possible shall be used. Bentonite shall not be used to fill voids. The Engineer shall approve grout and backfill material prior to placement of any material.

Deviation from the pipe grade, as provided by the Engineer, in excess of five tenths of a percent (0.50%) may be cause for removal and relaying of the pipe by the Contractor with no additional compensation allowed therefore.

If a void develops, the jacking or boring operation shall be stopped immediately and the void shall be filled by an approved method.

The Contractor shall take the following precautions when boring:

Extend casing through entire distance bored.

Check grade and alignment after each casing section is installed.

Coordinate operations to provide continuous support to surrounding earth materials.

Excavation shall be carried on in such a manner as to provide adequate support to surface structures and roads above and adjacent to the boring and not create any hazards to overhead traffic and other activities.

These contract documents do not guarantee the extent to which rocks, boulders, or other obstructions, regardless of size, may be encountered during boring operations. No extra compensation will be made for removal of rocks, boulders or other natural or manmade obstructions encountered during trenchless construction or excavation.

All voids caused by boring shall be filled by pressure grouting. The grout material shall consist of sand cement slurry of at least two (2) sacks of cement per cubic yard and a minimum of water to assure satisfactory placement. All slurry shall be pre-approved by the Engineer prior to use by the Contractor.

The Contractor shall take the following precautions when jacking:

The jacking machine shall be capable of controlling line and grade.

Progressively push carrier pipe through completed casing.

Strap two (2) wooden saddle blocks to each pipe length to provide support at regular intervals.

Center carrier pipe in casing at all times.

Seal each end of the casing with a concrete block and mortar bulkhead with PVC filler and vent pipes at opposite ends.

Fill the annular space between casing and carrier pipe with dry blown sand. Space shall be considered filled when dry sand blows out of the vent pipe at the opposite end of casing pipe.

Seal the filler and vent pipes after the sand has been deposited.

The location, size, and configuration of all jacking pits shall be subject to approval of the Engineer.

C2 Directional Boring

Direction boring/drilling installation shall be accomplished where required on the Plans or in the Special Provisions to minimize disturbance of existing surface improvements. The installer shall have a minimum of five (5) years of experience in this method of construction and have successfully installed at least ten thousand feet (10,000') of eight inch (8") or larger diameter pipe to specified grades. The field supervisor employed by the Contractor shall have at least five (5) years of experience and shall be at the site at all times during the boring/drilling installation.

The Contractor shall submit boring/drilling pit locations to the Engineer before beginning construction. Boring pits may be located within roadway right-of-way and easements. Any other boring pit locations that may be desired by the Contractor for boring or other uses shall be the responsibility of the Contractor to attain authorization, including use of private property.

Unless otherwise provided in the Special Provisions, the Contractor shall be compensated for the restoration work only within the areas at the connection points, or other locations as may be approved by the Engineer. The Contractor shall be responsible for repairs, without compensation, for any other repair areas, including pit/boring points and areas above the drilled pipe where drilling fluid pressure may have caused heaving or damage to pavement and other surfaces.

The drilling equipment shall be capable of placing the pipe as shown on the plans. The installation shall be by a steerable drilling tool capable of installing continuous runs of pipe between appurtenances such as valves, manholes, etc., without intermediate pits. The guidance system shall be capable of installing pipe within one and one-half inch (1 ½") of the plan vertical dimensions and two inches (2") of the plan horizontal dimensions. The Contractor shall remove and reinstall pipes which vary in depth and alignment from these tolerances.

Pull back forces shall not exceed the allowable pulling forces for the pipe being installed. Drilling fluid shall be a mixture of water and bentonite clay and shall be suitable for existing soil conditions. Disposal of excess fluid and spoils shall be the responsibility of the Contractor.

D Placement of Insulation

Rigid insulation board shall be placed within the pipe encasement zone, six inches (6") above the pipe.

Insulation boards shall be placed with the long dimension parallel to the centerline of the pipe. Boards shall be placed in a single layer with tight joints. No continuous joints or seams shall be placed directly over the pipe. If two (2) or more layers of insulation boards are used, each layer shall be placed to cover the joints of the layer immediately below.

The Contractor shall exercise caution to ensure that all joints between boards are tight during placement and backfilling with only extruded ends placed end to end or edge to edge.

Backfill material shall be placed in such a manner that construction equipment does not operate directly on the insulation and compacted with equipment which exerts a contact pressure of less than eighty (80) psi.

E Pipeline Backfilling Operations

All pipeline excavations shall be backfilled to restore preexisting conditions as the minimum requirement, and fulfill all supplementary requirements indicated in the Plans, Specifications, and Special Provisions. The backfilling operations shall be started as soon as conditions will permit on each section of pipeline, so as to provide continuity in subsequent operations and restore normal public service as soon as practicable. All operations shall be pursued diligently, with proper and adequate equipment, to assure acceptable results.

The backfilling shall be accomplished with the use of Suitable Materials selected from the excavated materials to the extent available and practical. Should the materials available within the trench section be unsuitable or insufficient, the required additional materials shall be furnished from outside sources as provided in the Special Provisions, or as arranged otherwise through supplemental agreement.

Backfill material selection shall be such as to make the best and fullest utilization of what is available, taking into consideration particular needs of different backfill zones. Material containing stone, rock, or chunks of any sort shall only be utilized where and to the extent there will be no detrimental effects. Placement of backfill material containing stones, boulders, chunks, greater than eight inches (8") in any dimension shall not be allowed.

All flexible pipe shall be bedded in accordance with ASTM Specification D2321, "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications". Where existing soils do not meet the requirements of bedding and encasement materials, the Contractor shall furnish the required granular materials. Placement and compaction of bedding and encasement materials around the pipe shall be considered incidental to the installation of the pipe.

Compaction of materials placed within the pipe bedding and encasement zones shall be accomplished with portable or hand equipment methods, so as to achieve thorough consolidation under and around the pipe and avoid damage to the pipe. Above the cover zone material, the use of heavy roller type compaction equipment shall be limited to safe pipe loading.

Backfill materials shall be carefully placed in uniform loose thickness layers up to twelve inches (12") thick spread over the full width and length of the trench section to provide simultaneous support on both sides of the pipeline. Granular backfill may be placed in layers up to twelve inches (12") above an elevation one foot (1') above the top of the pipe.

Each layer of backfill material shall be compacted effectively, by approved mechanical or hand methods, until there is no further visual evidence of increased consolidation or the density of the compacted layer conforms to the density requirements specified in the Special Provisions. Compaction of each layer shall be completed acceptably before placing material for a succeeding layer thereon. The manner of placement, compaction equipment, or procedure effectiveness shall be subject to approval of the Engineer.

All surplus or waste materials remaining after completion of the backfilling operations shall be disposed of in an acceptable manner within twenty-four (24) hours after completing the backfill work on each particular pipeline section. Disposal at locations within the project limits shall be as specified, or as approved by the Engineer; otherwise, disposal shall be accomplished outside the project limits at the Contractor's discretion. The backfilling and surplus or waste disposal operations shall be a part of the work required under the pipeline installation items, without delay.

Compaction of backfill within Roadbed areas shall meet the density requirements of MnDOT Specification 2106.3.G1. Compaction of backfill in all other areas shall be as required in the Special Provisions.

Until expiration of the guarantee period, the Contractor shall assume full responsibility and expense for all backfill settlement and shall refill and restore the work as directed to maintain an acceptable surface condition, regardless of location. All additional materials required shall be furnished without cost to the Owner.

Any settlement of road surfaces placed under this Contract and that are within the guarantee period that are in excess of one inch (1"), as measured by a ten foot (10') straight edge-shall be considered failure of the mechanical compaction. The Contractor shall be required to repair such settlement without cost to the Owner.

F Restoration of Surface Improvements

Wherever any surface improvements such as pavement, curbing, pedestrian walks, fencing, or turf have been removed, damaged or otherwise disturbed by the Contractor's operations, they shall be repaired or replaced to the Engineer's satisfaction, as will restore the improvement in kind and structure to the preexisting condition. Each item of restoration work shall be done as soon as practicable after completion of installation and backfilling operations on each section of pipeline.

In the absence of specific payment provisions, as separate Contract Items, the restoration work shall be compensated for as part of the work required under those Contract Items which necessitated the destruction and replacement or repair, and there will be no separate payment. If separate pay items are provided for restoration work, only that portion of the repair or reconstruction which was necessitated by the Contract work will be measured for payment. Any improvements removed or damaged unnecessarily or undermined shall be replaced or repaired at the Contractor's expense.

G Maintenance and Final Cleanup

All subgrade surfaces shall be maintained acceptably until the start of surfacing construction or restoration work, and until the work has been finally accepted. Additional materials shall be provided and placed as needed to compensate for trench settlement and to serve as temporary construction pending completion of the final surface improvements.

Final disposal of debris, waste materials, and other remains or consequences of construction, shall be accomplished intermittently as new construction items are completed and shall not be left to await final completion of all work. Cleanup operations shall be considered an incidental part of the work covered under the Contract Items.

If disposal operations and other cleanup work are not conducted properly as the construction progresses, the Engineer may withhold partial payments until such work is satisfactorily performed or the Engineer may deduct the estimated cost of its performance from the partial estimate value.

2600.4 METHOD OF MEASUREMENT

All items will be measured separately according to design designation as indicated in the Pay Item name and as may be detailed and defined in the Plans, Specifications, or Special Provisions. Complete-in-Place items shall include all component parts thereof as described or required to complete the unit, but excluding any excesses covered by separate Pay Items.

A Rock Excavation

Rock Excavation shall be measured by volume in cubic yards. Depth shall be measured from the top of the rock to a point six inches below the outside barrel of the pipe and width shall be the inside diameter of the pipe plus twenty-four inches (24") (12" from each side). The minimum width of measurement shall be four feet (4').

B Granular Materials

Granular materials furnished and placed as special foundation, bedding, encasement, or backfill construction will be measured by weight or volume of material furnished by the Contractor from outside sources and placed within the limits defined. Unless otherwise specified, volume will be determined by vehicular measure (loose volume) at the point of delivery. Measurements will not include any materials required to be placed as a component part of other Contract Items as may be specified.

C Geotextile Fabric

Where geotextile fabric is used for improving pipe foundation, it shall be measured by the square yard of material installed.

D Insulation

Rigid board insulation shall be measured on a square yard basis installed to the specified thickness noted on the Plans, Specifications, and Special Provisions and shall include all materials, equipment, and labor required for placement.

2600.5 BASIS OF PAYMENT

All costs of excavating to foundation grade, preparing the foundation, placing and compacting backfill materials, restoring surface improvements, and other work necessary for prosecution and completion of the work as specified, shall be included for payment as part of the pipe and pipe appurtenance items without any direct compensation being made.

In the absence of special payment provisions, all costs of restoring surface improvements as required, disposal of surplus or waste materials, maintenance and repair of completed work, and final cleanup operations shall be incidental to the Contract Items under which the costs are incurred.

Granular materials furnished for foundation, bedding, cover, or backfill placement as specified in connection with pipe or structure items will only be paid for as separate Contract Items to the extent that the Proposal contains specific Pay Items. Otherwise the furnishing and placing of granular materials as specified shall be incidental to the pipe or structure item without any direct compensation being made.

Materials utilized for filling annular spaces due to jacking/boring and drilling fluids for directional boring shall be incidental to the installation of the casing and pipe installed.

Contaminated Materials and Regulated Wastes not anticipated in the plans, specifications and special provisions and unexpectedly discovered during construction shall be compensated for as negotiated by supplemental agreement.

Contaminated Materials and Regulated Wastes specifically identified for payment in the plans, specifications, and special provisions, will be paid for under separate Contract Items provided in the Proposal.

SECTION 2611 – STANDARD SPECIFICATIONS FOR WATERMAIN AND SERVICE LINE INSTALLATION

2611.1 DESCRIPTION

This work shall consist of the construction of watermain and building service pipelines utilizing plant fabricated pipe and other appurtenant materials, installed for conveyance of potable water. The work includes the relocation or adjustment of existing facilities as may be specified in the Plans, Specifications and Special Provisions.

The use of the term "Plans, Specifications, and Special Provisions" within this specification shall be construed to mean those documents which compliment, modify, or clarify these specifications and are an enforceable component of the Contract Documents.

All references to MnDOT Specifications shall mean the latest published edition of the Minnesota Department of Transportation "Standard Specifications for Construction", and all supplements and amendments thereto, published prior to the date of advertisement for bids.

All reference to other Specifications of AASHTO, ASTM, ANSI, AWWA, etc. shall mean the latest published edition available on the date of advertisement for bids.

The following American Water Works Association (AWWA) Specifications and American Society for Testing and Materials (ASTM) Standards have been referenced in this Specification:

AWWA C104 Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
AWWA C105 Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C110 Standard for Ductile-Iron and Gray-Iron Fittings
AWWA C111 Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C115 Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges
AWWA C116 Standard for Protective Fusion-Bonded Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings
AWWA C150 Standard for Thickness Design of Ductile-Iron Pipe
AWWA C151 Standard for Ductile-Iron Pipe, Centrifugally Cast
AWWA C153 Standard for Ductile-Iron Compact Fittings
AWWA C301 Standard for Prestressed Concrete Pressure Pipe, Steel-Cylinder Type
AWWA C304 Standard for Design of Prestressed Concrete Cylinder Pipe
AWWA C500 Standard for Metal-Seated Gate Valves for Water Supply Service
AWWA C502 Standard for Dry-Barrel Fire Hydrants
AWWA C504 Standard for Rubber-Seated Butterfly Valves
AWWA C509 Standard for Resilient-Seated Gate Valves for Water Supply Service
AWWA C515 Standard for Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
AWWA C550 Standard for Protective Interior Coatings for Valves and Hydrants
AWWA C600 Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances
AWWA C605 Standard for Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings
AWWA C651 Standard for Disinfecting Water Mains
AWWA C800 Standard for Underground Service Line Valves and Fittings
AWWA C900 Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1,500 mm)

AWWA C901 Standard for Polyethylene (PE) Pressure Pipe and Tubing, 3/4 In. (19 mm) Through 3 In. (76 mm), for Water Service
 AWWA C904 Standard for Crosslinked Polyethylene (PEX) Pressure Tubing, 1/2 In. (13 mm) Through 3 In. (76 mm) for Water Service
 AWWA C906 Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks
 AWWA C907 Standard for Injection-Molded Polyvinyl Chloride (PVC) Pressure Fittings, 4 In. Through 12 In. (100mm Through 300 mm) for Water, Wastewater, and Reclaimed Water Services
 AWWA M23 Manual for P.V.C Pipe Design and Installation
 AWWA M55 Manual for P.E. Pipe Design and Installation
 ASTM A48 Standard Specification for Gray Iron Castings
 ASTM A536 Standard Specification for Ductile Iron Castings
 ASTM B88 Standard Specification for Seamless Copper Water Tube
 ASTM C270 Standard Specification for Mortar for Unit Masonry
 ASTM C478 Standard Specification for Circular Precast Reinforced Concrete Manhole Sections
 ASTM D543 Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents
 ASTM D1248 Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
 ASTM D1784 Standard Classification System and Basis for Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
 ASTM D1785 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
 ASTM D2241 Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series)
 ASTM D2466 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
 ASTM D2467 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
 ASTM D3035 Standard Specification for Polyethylene (PE) Plastic Pipe (DR PR) Based on Controlled Outside Diameter
 ASTM D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
 ASTM D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
 ASTM F593 Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
 ASTM F594 Standard Specification for Stainless Steel Nuts
 ASTM F714 Standard Specification for Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter
 ASTM F876 Standard Specification for Crosslinked Polyethylene (PEX) Tubing
 ASTM F877 Standard Specification for Crosslinked Polyethylene (PEX) Hot and Cold-Water Distribution Systems

Service installations shall include either Branch Service Lines or Tapped Service Lines in accordance with the standards set forth herein.

Tapped Service installations shall include all water service lines less than three inches (3") nominal inside diameter pipe. The component parts of a tap service installation shall include a corporation stop coupling complete with watermain tap and saddle where required; a curb stop coupling complete with service box; and service piping extending from the corporation stop to the curb stop coupling and beyond to the property line or to the limits as established by the Engineer.

Branch Service installations shall include all water service lines of three inches (3") nominal inside diameter pipe and larger. The component parts of a branch service installation shall include a tapping sleeve and valve or a tee connection and valve complete with valve box, and piping extending from the watermain connection, to the property line or to the limits as specified by the Engineer.

All references to "structure" shall include any man-made object that is not otherwise exempted by special terminology or definition.

2611.2 MATERIALS

All materials required for this work shall be new material conforming to requirements of the reference specifications for the class, kind, type, size, grade, and other details indicated in the Contract. Unless otherwise indicated, all required materials shall be furnished by the Contractor. If any options are provided for, as to type, grade, or design of the material, the choice shall be limited as may be stipulated in the Plans, Specifications, or Special Provisions.

All manufactured products shall conform in detail to such standard design drawings as may be referenced or furnished in the Plans. Otherwise, the Owner may require advance approval of material suppliers, product design, or other unspecified details as it deems desirable for maintaining adopted standards.

At the request of the Engineer, the Contractor shall submit, in writing, a list of materials and suppliers for approval.

A Certificate of Compliance shall be furnished stating that the materials furnished have been tested and are in compliance with the specification requirements.

A Water Pipe Materials

All pipe furnished for watermain and branch line installations shall be of the type, kind, size, and class indicated for each particular line segment as shown in the Plan and designated in the Contract Items. Wherever connection of dissimilar materials or designs is required, the method of joining and any special fittings employed shall be subject to approval of the Engineer.

A1 Ductile Iron Pipe and Ductile Iron and Gray Iron Fittings

The pipe furnished shall be Ductile Iron pipe and pipe fittings furnished shall be of the Ductile Iron or Gray Iron type as specified for each particular use of installation. When Gray Iron is specified, either type may be furnished. Gray Iron may not be substituted for Ductile Iron unless specifically authorized in the Special Provisions.

Ductile iron pipe shall conform to the requirements of AWWA C115 or C151 for potable water, and thickness design shall conform to AWWA C150. In addition, the pipe shall comply with the following supplementary provisions:

- (1) Fittings shall conform to the requirements of AWWA C110 (Gray Iron and Ductile Iron Fittings) or AWWA C153 (Ductile Iron Compact Fittings) for the joint type specified.
- (2) Unless otherwise specified all pipe and fittings shall be furnished with cement mortar lining meeting the requirements of AWWA C104 for standard thickness lining. All exterior surfaces of the pipe and fittings shall have an asphaltic coating at least one mil thick. Spotty or thin seal coating, or poor coating adhesion, shall be cause for rejection.

Fittings specified to be furnished with fusion bonded epoxy external coating and/or interior lining shall conform to the requirements of AWWA C550 and C116/A21.16, with 6-8 mil nominal thickness.

Fittings and pipe specified to be furnished with zinc coating shall meet the requirements of ISO 8179-1 or ISO 8179-2. Pipe and fittings shall be coated with the manufacturer compatible asphaltic coating

- (3) Rubber gasket joints for Ductile Iron Pressure Pipe and fittings shall conform to AWWA C111.
- (4) The nuts and bolts shall be constructed of corrosion resistant, high-strength, low-alloy steel with a ceramic filled, baked on fluorocarbon resin. The nuts and bolts shall be in compliance with ANSI/AWWA C111/A21.11.
- (5) Conductivity shall be maintained through pipe and fittings with an external copper jumper wire or specialty gaskets which are capable of meeting conductive requirements. Wedge type connectors will not be allowed.

A2 Polyvinyl Chloride (PVC) Pressure Pipe and Fittings

Polyvinyl chloride (PVC) pressure pipe shall be manufactured with compounds that meet or exceed cell classification 12454 as defined in ASTM D1784 and shall conform to the requirements of AWWA C900 and Fusible C900, for the nominal size, grade, and pressure class indicated on the Plans, Specifications, and Special Provisions. Fittings shall be the same pressure class as the pipe and injection molded PVC fittings shall conform to AWWA C907. PVC pressure pipe and fittings shall have a pressure class of two hundred (200) psi or greater, unless otherwise provided in the special provisions. The pipe shall be resistant to aggressive soils or corrosive substances in accordance with the requirements of ASTM D543. Unless otherwise specified, the dimensions and tolerances of the pipe barrel should conform to ductile iron or cast-iron pipe equivalent outside diameters.

A3 Polyethylene (PE) Pressure Pipe and Fittings

Polyethylene pressure pipe and fittings shall be manufactured with compounds that meet or exceed cell classification 44557C/E as defined in ASTM D3350 and shall conform to the requirements of AWWA C-901(for 0.75" to 3" diameters) and AWWA C906 (for 4" to 65"

diameters) for the size, grade and pressure class indicated on the plans, specifications and special provisions. Polyethylene pipe and fittings shall be PE 4710 and pressure class of two hundred (200) psi or greater, unless otherwise provided in the special provisions. Polyethylene compounds used in potable water applications shall also be classified as CC3 per ASTM D3350. The pipe and fittings shall be manufactured from the same resin type, grade, and cell classification. Unless otherwise specified, the dimensions and tolerances of the pipe barrel shall conform to Ductile Iron Pipe equivalent outside diameters (DIPS) for pipe diameters greater than three inches (3"). The method of joining material shall be by the Thermal Butt Heat Fusion Method in accordance with ASTM D3261.

The minimum "quick-burst" strength of the fittings shall not be less than that of the pipe with which the fitting is to be used.

B Fire Hydrants

Fire hydrants shall be of the type, size, and construction specified in the Plans and shall conform to the applicable requirements of AWWA C502.

Unless otherwise specified in the Plans, Specifications, and Special Provisions, hydrants shall be furnished in conformance with the following supplementary requirements:

- (1) Hydrants shall have a five inch (5") (nominal diameter) main valve opening of the type that opens against water pressure.
- (2) Hydrant barrels shall be two (2) piece, non-jacket type, with flanged joint above finished grade line and with mechanical joint connection at the hub end for joining a six inch (6") ductile iron branch pipe.
- (3) Hydrant operating rod shall be equipped with a breakable joint coinciding with the flange joint above the grade line.
- (4) Hydrant bury length shall be measured from the bottom of the branch pipe connection to the finished ground line at the hydrant.
- (5) Hydrants shall have two (2) outlet nozzles for two and one-half inch (2-1/2") (I.D.) hose connection and one outlet nozzle for four-inch (4") (I.D.) steamer connection. All outlet nozzle threads shall be National Standard Fire-Hose Coupling Screw Threads (NFPA 1963).
- (6) Hydrant operating mechanisms shall be provided with "O" ring seals preventing entrance of moisture and shall be lubricated through an opening in the operating nut or bonnet.
- (7) Hydrants shall be provided with outlets for drainage in the base or barrel, or between the base and barrel, unless the Special Provisions require that drain outlets be omitted or plugged.
- (8) The hydrant operating nut shall be rotated counterclockwise to open.
- (9) Detailed drawings, catalog information, and maintenance data shall be furnished as requested by the Engineer.

- (10) Hydrant body bolts shall be corrosion resistant, stainless steel conforming to the requirements of ASTM F593 and F594, alloy group 1, 2, 3, suitable for exterior use above and below ground. Bolts shall conform to manufacturer recommendation for tensile strength and torque.

C Valves and Valve Housing

C1 Valve Housings

Valve housings shall be of ductile or cast iron, High Density Polyethylene or masonry construction as specified in the Plans, Specifications, and Special Provisions for the particular valve size or installation. Masonry manhole or vault type units shall be constructed in accordance with the provisions of MnDOT Specification 2506. Precast Concrete Manholes shall conform to ASTM C478 suitable for HS 20 traffic loading for all units located in driving areas. Ductile or cast-iron valve boxes and all castings for manhole or vault type units shall conform to the requirements of MnDOT Specification 3321.

C2 Gate Valves

Gate Valves shall conform to all applicable requirements of AWWA C500 or AWWA C509 or AWWA C515, together with such supplementary requirements as may be covered in the Plans, Specifications, and Special Provisions. Unless otherwise specified gate valves shall comply with the following supplementary requirements:

- (1) Gate valves meeting the requirements of AWWA C500 shall be two-faced, double disc type, with parallel seats. Gate valves meeting the requirements of AWWA C509 and C515 shall be single disc type with resilient seat bonded or mechanically attached to either the gate or valve body, and the wedge shall be ductile iron fully encapsulated with EPDM rubber, shall be symmetrical and seal equally well with flow in either direction without misalignment. All valves shall be provided with a two-inch square operating nut opening counterclockwise and mechanical joint ends.
- (2) All gate valves shall be non-rising stem (NRS) type furnished with O-Ring stem seals.
- (3) All gate valves sixteen inches (16") or larger in size shall be arranged for operation in the horizontal position and shall be equipped with bypass valves.
- (4) All gears on gate valves shall be cut tooth steel gears, housed in heavy ductile or cast iron extended type grease cases of approved design.
- (5) All gate valves shall have an open indicating arrow, the manufacturer's name, pressure rating and year of manufacture cast on the valve bodies.
- (6) All internal and external surfaces of the valve body and bonnet shall have an epoxy coating, complying with ANSI/AWWA C550.
- (7) All gate valves shall have stainless steel body bolts unless otherwise specified.

C3 Butterfly Valves

Butterfly valves shall be manufactured in conformance with all applicable requirements of AWWA C504 for 150 p.s.i. working pressure minimum, together with such supplementary requirements as may be covered in the Plans, Specifications, and Special Provisions. Unless otherwise specified, the butterfly valves furnished shall comply with the following supplementary requirements.

- (1) The butterfly valves shall be short body of ductile or cast iron with mechanical joint ends.
- (2) The butterfly valves shall be rubber seated with ductile or cast disc, non-rising stem type furnished with O-ring stem seals.
- (3) The butterfly valves shall be equipped with a two-inch square operating nut opening counterclockwise.
- (4) The butterfly valves shall be designed for direct burial installation.
- (5) All butterfly valves shall have an open indicating arrow, the manufacturer's name, pressure rating and year of manufacture on the valve bodies.
- (6) All internal and external surfaces of the valve body and bonnet shall have an epoxy coating, complying with ANSI/AWWA C550.
- (7) All butterfly valves shall have stainless steel body bolts unless otherwise specified.

D Water Service Pipe and Fittings

Water service pipe of 3 inches or larger inside diameter shall conform to the requirements as set forth under the provisions of 2611.2.

Water service pipe of less than three inch (3") inside diameter shall conform to the requirements of ASTM B88 for Seamless Copper Water Tube, Type K, Soft Annealed temper; Polyethylene Pipe as per AWWA C901 and ASTM D3350, or Polyvinyl Chloride Pipe and fittings as per a ASTM D1785, D2241, D2466, D2467 and D2740, or Cross-linked Polyethylene (PEX) pipe as per ASTM F876, ASTM F877, and AWWA C904, NSF/ANSI Standard 61 for potable water distribution, as specified on the Proposal or in the Special Provisions. Water service piping supplied shall include markings indicating the type, pressure class, testing certification, and use for potable water systems.

Corporation stops, saddles, curb stops, and curb stop service boxes shall conform to the requirements of AWWA C800 and as detailed in the Plans, Specifications, and Special Provisions or approved designations.

Saddles for Polyethylene Pipe shall conform to the requirements of AWWA C800 and shall be thermal fusion polyethylene type; ductile iron with dual stainless steel straps, spring washers, bolts and washers; or stainless steel sleeve type, with stainless steel bolts, nuts, and spring washers. Stainless steel bolts, nuts, and washers. Spring washers shall be manufactured from type 304 stainless steel, special "spring grade". Saddles shall include threaded outlet tapping sleeves and Nitrile Butadiene Rubber (NBR) gaskets.

All fittings for copper tubing shall be cast brass, having uniformity in wall thickness and strength, and shall be free of defects affecting serviceability. All copper pipe fittings shall be flared or compression type. All threads for underground service line fittings shall conform to the requirements of AWWA C800. Each fitting shall be permanently and plainly marked with the name or trademark of the manufacturer. Fittings for thermoplastic pipe types shall be of the same material and pressure class as the piping.

Curb stop service boxes shall be gray iron conforming to the requirements of ASTM A 48 for Class 20 or higher tensile strength and shall have at least twelve inches (12") of vertical adjustment for the cover depth specified in the Plans, Specifications, and Special Provisions.

E Polyethylene Encasement Material

Polyethylene encasement material shall conform to the requirements of AWWA C105 for tube type installation and 8 mil nominal film thickness.

F Mechanical Joint Restraints

Mechanical joint restraints shall be ductile iron conforming to the requirements of ASTM A536 and AWWA C600. Joint restraints shall be Lug or Grip Ring type, and be designed to withstand the design pressures indicated in the Plans, Specifications, and Special Provisions.

Mechanical joint restraints shall be fusion bonded epoxy coated meeting the requirements of AWWA C116.

All nuts, bolts, and tie rod type restraints shall be stainless steel, corrosion-resistant coating, or coated with an owner approved rustproofing material.

G Mortar

Mortar for use in masonry construction shall meet the requirements of MNDOT 2506.2 B.2 and ASTM C270.

H Concrete

Concrete used for cast-in-place masonry construction shall be produced and furnished in accordance with the provisions of MnDOT Specification 2461 for the mix design indicated in the Plans, Specifications, or Special Provisions. The requirements for Grade B concrete shall be met where a higher grade is not specified. Type 3, air-entrained, concrete shall be furnished and used in all structures having weather exposure.

I Tracer Wire for Non-Conductive Pipe

Tracer wire for use with all thermoplastic pipe types shall be Underwriters Laboratories (UL) listed for use in direct burial applications, color coated per APWA uniform color code for the specific utility being marked. Tracer wire shall be a minimum 12 AWG copper clad steel rated to 30 volts, insulation shall be High Molecular Weight Polyethylene (HMWPE) meeting ASTM D1248, with designation identified on the outside of the wire casing.

Tracer wire shall meet the following additional criteria for the construction method specified:

Open Trench - Trace wire shall be High Strength with minimum 450 lb. break load, with minimum 30 mil HDPE insulation thickness.

Directional Drilling/Boring - Trace wire shall be Extra High Strength with minimum 1,150 lb. break load, with minimum 30 mil HDPE insulation thickness.

Pipe Bursting/Slip Lining - Trace wire shall be 7 x 7 Stranded Copper Clad Steel, Extreme Strength with 4,700 lb. break load, with minimum 50 mil HDPE insulation thickness.

Connectors for tracer wire shall meet the following:

All mainline trace wires must be interconnected at tees and crosses, joined using a single 3-way or 4-way lockable connector for tees and crosses, respectively.

Lockable connectors shall be for direct bury application and shall be dielectric silicon filled to seal out moisture and corrosion.

2611.3 CONSTRUCTION REQUIREMENTS

A Installation of Pipe and Fittings

Installation of ductile iron watermain and their appurtenances shall conform to the requirements of AWWA C600, the Plans, Specifications and Special Provisions.

Installation of Polyvinyl Chloride (PVC) pipe and their appurtenances shall conform to the requirements of AWWA C605, and the bedding and backfill conditions specified by the Manufacturer, Plans, Specifications, and Special Provisions.

Installation of Polyethylene Pipe and their appurtenances shall conform to the requirements of AWWA M55 and to the bedding and backfill conditions specified by the Manufacturer, Plans, Specifications, and Special Provisions.

No existing valves or hydrants shall be operated by individuals other than personnel from the City Public Works Department. Only under emergency conditions or after specific authorization is given by the City Public Works Department shall the Contractor operate valves or hydrants.

Installation of pipe and fittings shall also conform to the following general guidelines:

A1 Inspection and Handling

Proper and adequate implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work.

During the process of unloading delivered materials, all pipe and accessories shall be inspected by the Contractor for damage. The Contractor shall notify the Engineer of all material found to have cracks, flaws or other defects. The Engineer shall inspect the damaged material and have the right to reject any materials found to be unsatisfactory. The Contractor shall promptly remove all rejected material from the site.

All materials shall be handled carefully, as will prevent damage to protective coatings, linings, and joint fittings; preclude contamination of interior areas; and avoid jolting contact, dropping, or dumping.

During pipe laying operations, each pipe section and shall be inspected by the Contractor. The Contractor shall inform the Engineer of any defects discovered and the Engineer will prescribe the required corrective actions or order rejection.

Immediately before placement, the joint surfaces of each pipe section and fitting shall be inspected for the presence of foreign matter, coating blisters, rough edges or projections, and any imperfections so detected shall be corrected by cleaning, trimming, or repair.

A2 Pipe Laying Operations

Trench excavation and bedding preparations shall proceed ahead of pipe placement as will permit proper placement and joining of the pipe and fittings at the prescribed grade and alignment without unnecessary hindrance. All foreign matter or dirt shall be removed from the inside of the pipe and fittings before they are lowered into position in the trench, and they shall be kept clean. The watermain materials shall be carefully lowered into laying position by the use of suitable restraining devices. Under no circumstances shall the pipe be dropped or dumped into the trench.

As each length of bell and spigot pipe is placed in laying position, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved encasement and backfill materials.

When pipe laying is not in progress, all open ends of the pipe line shall be closed by watertight plugs or other means approved by the Engineer. If water is present in the trench, the plugs shall remain in-place until the trench is pumped completely dry.

When connecting to existing stubs, the Contractor shall prevent dirt or debris from entering the existing pipe.

A3 Aligning and Fitting of Pipe

The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe and so as to leave a smooth square-cut end. Pipe shall be cut with approved mechanical tools. Flame cutting will not be allowed under any conditions. All rough edges shall be removed from the cut ends of pipe and, where rubber gasket joints are used, the outer edge shall be rounded or beveled by grinding or filing to produce a smooth fit.

When necessary to deflect pipe from a straight line either in the vertical or horizontal plane to avoid obstructions, plumb stems, or produce a long radius curve when permitted, the amount of deflection allowed at each joint shall not exceed the limits to maintain a satisfactory joint seal in conformance with AWWA C600 for ductile iron pipe mechanical and push-on joints, AWWA C605 for PVC pipe and AWWA M55 for PE pipe. The maximum angular deflection at any joint for other pipe materials and joints shall not exceed the manufacturer's recommendations. If the specified alignment requires angular deflections greater than recommended or allowed, the Contractor shall provide appropriate bends or shorter pipes such that the maximum angular deflection is not exceeded.

A4 Blocking and Anchoring of Pipe

All plugs, caps, tees, bends, and other thrust points shall be provided with reaction backing, or movement shall be prevented by attachment of suitable restraining devices or tie rods, in accordance with the requirements of the Plans, Specifications, and Special Provisions.

In the absence of other specified requirements for reaction backing or restraining devices, the following provisions shall apply:

- (1) All horizontal bends exceeding twenty (20) degrees deflection, and all caps, plugs, and branch tees shall be provided with concrete buttress blocking.
- (2) All vertical bends exceeding twenty (20) degrees deflection shall be provided with concrete buttress blocking at the low points and with metal tie rod or strapping restraints at the high points.
- (3) Offset bends made with standard offset fittings need not be strapped or buttressed.
- (4) Hardwood blocking shall not be used.

Concrete buttresses shall be poured against firm, undisturbed ground and shall be formed in such a way that the joints will be kept free of concrete and remain accessible for repairs. The concrete mix used in buttress construction shall meet the requirements for Grade B concrete in conformance with MnDOT Specification Section 2461. Buttress dimensions shall be a minimum of twelve inches (12") in thickness, and the minimum area, in square feet shall be as follows:

PIPE SIZE	TEE OR PLUG	1/4 BEND	1/8 BEND	1/32 BEND 1/16 BEND
6"	2.9	3.1	1.6	0.8
8"	3.7	5.3	2.9	1.4
10"	5.7	8.1	4.4	2.2
12"	8.1	13.4	6.6	3.2
16"	15.1	21.4	11.6	5.9
20"	23.2	30.2	18.1	9.3
24"	33.6	48.5	26.1	13.3

Contractors are instructed to size concrete buttress blocking on fittings and dead ends where the blocking must withstand the pressure of larger main line fittings equipped with reducers, for the larger sized main line thrust and not for smaller fitting size only. This is of particular importance on tees and crosses where the main size is reduced on the run from large to small size by use of reducers.

All metal parts of tie rod or strap type restraints shall be galvanized or coated with other approved asphaltic type rustproofing.

All necessary fittings, bands, tie rods, nuts, and washers, and all labor and excavation required for installation of reaction restraints shall be incidental to the installation of the pipe, unless a specific payment item is provided in the bid proposal.

A5 Polyethylene Encasement of Pipeline

Wherever so required by the Plans, Specifications, or Special Provisions the pipeline, including valves, fittings, and appurtenances, shall be fully encased in polyethylene film meeting the requirements of these Specifications. The film shall be furnished in tube form for installation on pipe and all pipe-shaped appurtenances such as bends, reducers, off-sets, etc. Sheet film shall be provided and used for encasing all odd-shaped appurtenances such as valves, tees, crosses, etc.

The polyethylene tubing shall be installed on the pipe prior to being lowered into the trench. Tubing length shall be sufficient to provide a minimum overlap at all joints of one foot or more. Overlap may be accomplished with a separate sleeve tube placed over one end of the pipe prior to connecting another section of pipe, or by bunching extra overlap material at the pipe ends in accordion fashion. After completing the pipe jointing and positioning the overlap material, the overlap shall be secured in place with plastic adhesive tape wrapped circumferentially around the pipe not less than three (3) turns.

After encasement, the circumferential slack in the tubing film shall be folded over at the top of the pipe to provide a snug fit along the barrel of the pipe. The fold shall be held in place with plastic adhesive tape applied at intervals of approximately three feet (3') along the pipe length. Also, any rips, punctures, or other damage to the tubing shall be repaired as they are detected. These repairs shall be made with adhesive tape and overlapping patches cut from sheet or tubing material.

At odd-shaped appurtenances such as gate valves, the tubing shall overlap the joint and be secured with tape, after which the appurtenant piece shall be wrapped with a flat film sheet or split length of tubing by passing the sheet under the appurtenance and bringing it up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Wherever encasement is terminated, it shall extend for at least two feet (2') beyond the joint area.

Openings in the tubing for branches, service taps, air valves and similar appurtenances shall be made by cutting an X-shaped slit and temporarily folding back the film. After installing the appurtenance, the cut tabs shall be secured with tape and the encasement shall be completed as necessary for an odd-shaped appurtenance.

Unless otherwise specified in the Plans, Specifications, and Special Provisions, hydrants encased in polyethylene tubing shall have plugged drain outlets.

B Connection and Assembly of Joints

Where rubber gasket joints are specified, care shall be taken during the laying and setting of piping materials to ensure that the units being joined have the same nominal dimension of the spigot outside diameter and the socket inside diameter. A special adaptor shall be provided to make the connection when variations in nominal dimension might cause unsatisfactory joint sealing.

Immediately before making the connection, the inside of the bell or socket and the outer surface of the spigot ends shall be thoroughly cleaned to remove oil, grit, excess coating, and other foreign matter. Insertion of spigot ends into the socket or bell ends shall be accomplished in a manner that will assure proper centering and insertion to full depth. The joint seal and securing requirements shall be as prescribed below for the applicable pipe and joint type.

B1 Ductile Iron Pressure Pipe and Fitting Joints

B1a Push-On Joints

The circular rubber gasket shall be kept in a warm, flexible condition at all times, and for purposes of placement shall be flexed inward and inserted in the gasket recess of the bell socket. A thin film of approved gasket lubricant shall be applied to either the inside surface of the gasket or the outside surface of the spigot end, or to both. Care shall be taken while inserting the spigot end to prevent introduction of contaminants. The joint shall be completed by forcing the spigot end to the bottom of the socket using suitable pry-bar or jack type equipment. Spigot ends which do not have depth marks shall be marked before assembly to ensure full insertion. The use of the bucket on the excavation equipment to force the pipe into the socket shall not be permitted.

B1b Mechanical Joints

The last eight inches (8") of the outside spigot surface and the inside bell surface of each pipe and appurtenance joint shall be painted with a thin film of approved gasket lubricant after being thoroughly cleaned. The gland shall then be slipped on the spigot end with the lip extension toward the socket or bell end. The rubber gasket shall be kept in a warm, flexible condition at all times, and for purposes of placement shall be painted with a thin film of approved gasket lubricant and be placed on the spigot end with the thick edge toward the gland

After the spigot end is inserted into the socket to full depth and centered, the gasket shall be pressed into place within the bell evenly around the entire joint. After the gland is positioned behind the gasket, all bolts shall be installed and the nuts tightened alternately to the specified torque, such as to produce equal pressure on all parts of the gland.

Unless otherwise specified, the bolts shall be tightened by means of a suitable torque-limiting wrench to within a foot-pound range of: 45 to 60 for 5/8 inch bolts; 75 to 90 for 3/4 inch bolts; 100 to 120 for 1 inch bolts; and 120 to 150 for 1-1/4 inch bolts. After tightening, all exposed parts of the bolts and nuts shall be completely coated with an approved asphaltic type rust preventive material.

B1c Flanged Joints

Flanged joints shall be installed only in above grade or exposed locations and shall conform to the requirements of AWWA C115, the Plans, Specifications and Special Provisions. Flanged joints shall have full face gaskets.

B2 Polyvinyl Chloride Pipe Joints

B2a Push-On Joints

The circular rubber gasket shall be bonded to the inner wall of the gasket recess of the bell socket. Insertion of pipe spigot into the bell socket shall conform to manufacturer recommended insertion depth.

B2b Fusion Joints

The method of joining shall be specified and conform with AWWA C605. Joining by pipe fusion shall be performed by "qualified" fusion technicians, as documented by the manufacturer. Each joint fusion shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. Appropriately sized and outfitted fusion machines that have been approved by the manufacturer shall be used for the fusion process.

B3 Polyethylene Pipe Joints

The joining of polyethylene pipe joints shall conform to the requirements of AWWA M55, shall be made by the Thermal Butt Heat Fusion Method, Mechanical Flange Adaptor Method, Mechanical Joint Adaptor Method and Mechanical Transition Fittings. Mechanical joints shall include stainless steel pipe stiffeners. Compression fittings are not allowed for pipe diameters greater than two inches (2") in diameter.

B4 Tracer Wire for Non-conductive Pipe

Tracer wire shall be installed along the length of all non-conductive mainline pipes, laterals, and services with vertical riser to the surface, at gate valve boxes, hydrants, curb boxes, and/or utility location boxes as required by the Special Provisions. Tracer wire shall be taped, clamped or affixed to the pipe in another manner as approved by the Engineer. Splicing tracer wire shall be in a manner to prevent any uninsulated wire exposure.

A twelve-inch (12") tracer wire loop shall be provided on each side of a spliced connection.

Tracer wire lengths greater than 500 linear feet without service laterals or hydrants are to include an approved grade level/in-ground access box, located at the edge of the road right-of-way and outside of the roadway.

Tracer wire shall be grounded at all terminal ends (stubs, plugs).

C Water Service Installations

Water service facilities consisting of Tap Service Lines and Branch Service Lines, complete with all required appurtenances, shall be installed as required by in the Plans, Specifications, and Special Provisions, in accordance with all pertinent requirements for main line installations together with the provisions hereof.

It shall be the responsibility of the Contractor to keep an accurate record of the location, depth and size of each service connection and other pertinent data such as the location of curb stops and pipe endings. Tap locations shall be recorded in reference to survey line stationing. Curb stops shall be tied to definable land marks such as building corners, lot corner markers, hydrants, gate valves, etc. Pipe terminals at the property line shall be marked to the ground surface with a suitable wood timber four by four inch (4"x4"), eight feet (8') long set vertically into the ground with the top two feet (2') painted blue. Approved record keeping forms will be furnished by the Engineer and the completed records shall be submitted by the Contractor upon completion of the work.

Water service lines shall be subject to the same requirements as prescribed for the main pipeline installation.

Water service lines shall be installed to provide a minimum of six inches (6") of clearance shall be maintained in crossing over or under other structures. Where the service pipe may be exposed to freezing due to insufficient cover or exposure from other underground structures, the water pipe shall be insulated as directed by the Engineer.

C1 Tee Branch Service Lines

Tee branch service piping shall be of the type, size, and wall thickness specified. The pipe and appurtenances shall have rubber gasketed push-on or mechanical joints. Tee branch service lines shall be provided as required by the Plans.

Installation of tee branch service facilities shall be in accordance with all applicable requirements of these specifications as pertain to the mainline installations.

C2 Tapped Service Lines

Service piping shall be of the size and type specified. Unless otherwise specified, minimum pipe size for tap service installations shall be one inch (1") nominal inside diameter. Larger size pipe may be specified for commercial and industrial uses or for some domestic service as specifically identified.

Installation of service facilities shall be in accordance with all applicable requirements of these specifications as pertain to the mainline installations, subject to the exceptions and supplementary provisions set forth hereinafter.

Installation of tapped service lines shall be performed while the mainline watermain is at system operating pressure. Dry tapping watermain pipe will not be allowed.

Unless otherwise indicated, service piping may be laid directly on any solid foundation soil that is free of stones and hard lumps. However, when specified or ordered, aggregate materials shall be furnished and placed as necessary to secure proper foundation drainage, pipe covering, or backfill support.

Tapped service piping of three quarters inch (3/4") to and including one and one quarter inches (1-1/4") in diameter shall be installed in one piece without intermediate joint couplings between the corporation stop and the curb stop. Service pipe of one and one half inches (1-1/2") in diameter and larger shall be furnished in standard roll lengths to eliminate any intermediate joints. When full roll lengths are less than the service length the rolls may be joined with approved couplings.

Unless otherwise specified, connection of tapped service lines to the watermain shall be made at an angle of not more than twenty-two (22) degrees from the horizontal. A double wrap of Teflon tape shall be placed on the corporation stop threads prior to installation in the main.

Unless otherwise indicated, tap service lines shall be installed on a straight line at right angles to the watermain or property line as directed by the Engineer. In the absence of specific requirements, the service line shall be terminated at the property line, where it shall be connected to an existing line or, in the case of undeveloped property, it shall be capped, plugged, or peened as approved by the Engineer.

The flaring of new copper tubing ends shall be accomplished only with the use of the proper size and type of tools as designed for the purpose. Tubing shall be cut squarely and all edge roughness shall be removed prior to flaring. All couplings shall be tightened securely, so the flared end fits snugly against the bevel of the fitting without leakage. The flared joint couplings shall be made up without the use of jointing compounds.

The service pipe and curb stop coupling depth shall be such as to maintain not less than the specified minimum cover. The service box shall be connected to or centered over the curb stop and be firmly supported on concrete blocking as required by the Plans, Specifications, and Special Provisions. Clearance shall be provided so the service box does not rest on the water pipe. Service boxes shall be installed plumb.

The service boxes shall be brought to proper surface grade when the final ground surface has been established.

D Setting Valves, Hydrants, Fittings and Specials

Valves, hydrants, fittings, and specials shall be provided and installed as required by the Plans, Specifications, and Special Provisions with the exact locations and setting as directed by the Engineer, and with each installation accomplished in accordance with the requirements for installation of mainline pipe to the extent applicable. Support blocking, reaction backing, and anchorage devices shall be provided as required by the Plans, Specifications, and Special Provisions or as otherwise ordered by the Engineer.

Hydrants shall be installed plumb, with the height and orientation of nozzles as shown in the Plans or as directed by the Engineer. Unless otherwise specified, the hydrants shall be connected to the mainline pipe with six-inch (6") diameter pipe, controlled by an independent valve.

When a hydrant with an open drain outlet is set in clay or other impervious soil, a drainage pit of at least one cubic yard shall be excavated below and around the hydrant base and the pit shall be filled with Foundation Material to a level six inches (6") above the drain outlet. MnDOT 3733 geotextile Type 5, or other material approved by the Engineer, shall be carefully placed over the rock to prevent backfill material from entering voids in the rock drain. Hydrants located where the groundwater table is above the drain outlet shall have the outlet drain hole plugged or the drain tube cut off to prevent draining, and shall be equipped with a tag stating, "Pump After Use".

Valve boxes shall be centered over the valve wrench nut and be installed plumb, with the box cover flush with the surface of the finished pavement or at such other level as may be directed.

Valve box adaptors for use to stabilize the valve box in a centered position over the valve wrench nut shall include a rubber gasket between the adaptor plate and valve body. The adaptor shall be epoxy coated conforming to the requirements for fittings in section 2611.2A1, or as otherwise allowed by the plans, specifications and special provisions. Gate valve box adaptors shall be incidental to the valve box unless otherwise provided in the bid proposal.

Masonry valve pit structures, for valves with exposed gearing or operating mechanisms, shall be constructed in accordance with the details shown in the Plans and with the applicable provisions of these Specifications.

Drainage blow-offs, air vents, and other special appurtenances shall be provided and installed as required by the Plans, Specifications, and Special Provisions.

All dead ends shall be closed with approved plugs or caps and shall be equipped with suitable blow-off facilities.

E Disinfection of Watermains

Before being placed in service, the completed water main shall be disinfected. Disinfection materials and procedures, and the collection and testing of water samples, shall be in accordance with the provisions of AWWA C651. After the final flushing of watermain, the water shall be tested for bacteriologic quality and found to meet the standards prescribed by the Minnesota Department of Health.

Where an existing watermain is cut for the installation of any fitting, the pipe and fittings proposed to be installed shall be disinfected prior to installation as follows:

- (1) The interior of the pipe and fittings shall be cleaned of all dirt and foreign material.
- (2) The interior of the pipe and fittings shall be thoroughly swabbed or sprayed with a one percent (1%) minimum hypochlorite solution.

Unless otherwise indicated in the Plans, Specifications, and Special Provisions, the Contractor shall furnish all materials and perform the disinfecting, flushing, and testing as necessary for meeting the water quality requirements.

The flushing operations and the form of chlorine and method of application to be used shall be subject to approval by the Engineer.

F Electrical Conductivity Test

The Contractor shall perform a conductivity test within one week after completion of pressure testing of the main on all watermain to ensure continuous conductivity for locating watermain. Sufficient conductivity shall be provided to allow for the location of watermain, services, hydrant leads, and laterals for mainline segments at least one thousand two hundred (1,200) linear feet in length

G Hydrostatic Testing of Watermains

After the pipe has been laid, including fittings and valves and blocking, all newly-laid pipe or any section between valves thereof, unless directed otherwise by the Engineer, shall be subject to hydrostatic pressure of one hundred fifty (150) pounds per square inch. The duration of each such test shall be at least two (2) hours.

Each section of pipe to be tested shall be filled with water and all air expelled at the highest point. The required taps to expel air or to fill the watermain shall be supplied and installed by the Contractor, shall be three quarters inch (3/4") and shall include an approved service saddle when required.

The test apparatus shall be applied at the lowest elevation on the section to be tested. The apparatus shall be connected to the main at a service tap or special tap location.

The pressure gauge shall be a standard pressure gauge. The dial shall register from 0 - 200 psi and have a dial size of four and one half inches (4-1/2") with one (1) psi increments.

The hydrostatic test pressure requirement for an acceptable test shall be a maximum pressure drop of two (2) psi during the last hour of the two (2) hour pressure test. The test pressure shall not drop more than five (5) psi for the duration of the test.

If this test requirement cannot be met, the Contractor shall investigate the cause, make corrections, and retest until the pressure drop requirement can be met.

Only if several consecutive tests indicate a consistent pressure drop and only after the Contractor has made numerous attempts to resolve the problem, acceptable to the Engineer, may the Contractor request in writing and the Engineer consider the use of the leakage test. The leakage test may be performed by the Contractor to determine the magnitude of the leak, however, meeting the leakage allowance shall not automatically be considered acceptance, in lieu of the pressure test, for the section being tested. Final acceptance shall be at the discretion of the Engineer.

When allowed, the leakage test shall be performed in accordance with AWWA C600.

H Operational Inspection

At the completion of the project and in the presence of the Engineer and the Contractor, representatives of the Owner shall operate all valves, hydrants, and water services to ascertain that the entire facility is in good working order; that all valve boxes are centered and valves are opened; that all hydrants operate and drain properly; that all curb boxes are plumb and centered; and that water is available at all curb stops.

2611.4 METHOD OF MEASUREMENT

All items will be measured separately according to design designation as indicated in the Pay Item name and as may be detailed and defined in the Plans, Specifications, or Special Provisions. Pipe will generally be designated by size (inside diameter or span), strength class, kind or type, and laying condition. Payment shall include all component parts thereof as described or required to complete the unit, but excluding any item covered by a separate pay item. Lineal measurement of piping will include the running length of any special fittings (tees, wyes, bends, gates, etc.) installed within the line of measure between specified terminal points.

A Water Pipe

Mainline pipe and service pipe of each kind and size will be measured separately by the overall length along the axis of the pipeline, from beginning to end of each installation and without regard to intervening valves or specials. Terminal points of measure will be the spigot or cut end, base of hub or bell end, center of valves or hydrants, intersecting centers of tee or wye branch service connections, and center of corporation stop or curb stop couplings.

B Valves

Valves of each size and type will be measured separately as complete units, including the required manhole or valve box setting.

C Corporation Stops

Corporation stops of each size and type will be measured separately by the number of units installed, including the watermain tap and saddle.

D Curb Stops

Curb stops of each size and type will be measured separately by the number of units installed, including the required curb box.

E Hydrants

Hydrants will be measured by the number of units installed.

F Air Vents

Air vents of each type and size will be measured separately by the number of complete units installed, including the required manhole or valve box setting.

G Polyethylene Encasement

Polyethylene encasement of pipe will be measured by the linear foot of pipe encased of each specified size.

H Ductile and Gray Iron Fittings

Ductile Iron and Gray Iron fittings shall be measured by the pound without joint accessories or on per each basis as specified on the Proposal or in the Special Provisions. Joint accessories including tie rods, joint restraints, nuts and bolts shall be incidental to the watermain unless otherwise provided on the Proposal or in the Special Provisions.

The standard weight of Ductile Iron and Gray Iron fittings, for payment basis, shall be as published in AWWA C153 and C110, respectively.

I Polyvinyl Chloride or Polyethylene

Polyvinyl Chloride or Polyethylene fittings shall be measured on an each basis as specified and shown on the Proposal or in the Special Provisions.

J Access Structures

Access structures, such as valve boxes, service boxes, manholes and vaults, will be measured for payment only when and to the extent that the Proposal contains specific items therefore. Otherwise, the required structures are included for payment as part of the pipe appurtenance (Gate Valve, Curb Stop, Air Vent, etc.) item which is served. When applicable, measurement will be by the number of individual units installed of each type and design.

2611.5 BASIS OF PAYMENT

Payment for construction of water distribution facilities will be made as detailed in the method of measurement and as shown on the Bid Proposal or detailed in the Special Provisions. Payment shall include all costs of furnishing and installing the complete facility as required by the Plans, Specifications, and Special Provisions.

Payment shall be made for Watermain Pipe, Service Pipe, and Tapped Service Pipe, of each size and kind at the appropriate Contract prices per linear foot installed. All costs of pipeline disinfection, leakage testing, pipe jointing materials, dead end plugs and caps, making connections to existing facilities, blocking and anchorage materials, and other work necessary for proper installation of pipe as specified shall be included for payment as part of the pipe item, without any direct compensation being made therefore unless specific pay items are included on the Proposal.

Payment shall be made for Valves, Corporation Stops, Curb Stops, Hydrants, Air Vents, Polyethylene Encasement, Insulation, and other specially identified appurtenant items, at the appropriate Contract prices per unit of measure for each size and type or kind installed.

Access structures such as Valve Boxes, Service Boxes, Manholes, and Vaults will be paid for as separate items only when separate pay items are included on the Proposal.

Payment for rearrangement of in-place facilities or vertical offset of proposed facilities shall be made under specially named items at the appropriate Contract prices per unit of measure and shall be compensation in full for all costs of performing the work as specified.

All costs of excavating to foundation grade, preparing the foundation, placing and compacting backfill materials, restoring surface improvements, and other work necessary for prosecution and completion of the work as specified, shall be included for payment as part of the pipe and pipe appurtenance items without any direct compensation being made therefore, unless specific pay items are included on the Proposal.

Watermain connections shall be paid per each connection to new watermain. All necessary labor, materials, and work required to make the connection shall be included in the price per each as provided in the bid proposal.

Installation of tracer wire for thermoplastic and other non-conductive pipe materials shall be considered incidental with no direct compensation made thereto, except where noted otherwise.

SECTION 2621 – STANDARD SPECIFICATIONS FOR SANITARY SEWER AND STORM SEWER INSTALLATION

2621.1 DESCRIPTION

This work shall consist of the construction of pipe sewers utilizing plant fabricated pipe and other appurtenant materials, installed for conveyance of sewage, industrial wastes, or storm water. The work includes construction of manhole and catch basin structures and other related items as specified.

The use of the term "Plans, Specifications and Special Provisions" within this specification shall be construed to mean those documents which compliment, modify, or clarify these specifications and are an enforceable component of the Contract Documents.

All references to MnDOT Specifications shall mean the latest published edition of the Minnesota Department of Transportation "Standard Specifications for Construction", and all supplements and amendments thereto published prior to the date of advertisement for bids.

All references to other Specifications of AASHTO, ASTM, ANSI, AWWA, etc. shall mean the latest published edition available on the date of advertisement for bids.

The following specifications have been referenced in this Specification:

AASHTO M294 Standard Specification for Corrugated Polyethylene Pipe, 300-mm to 1500-mm (12-in. to 60-in.) Diameter

ASTM A48 Standard Specification for Gray Iron Castings

ASTM A74 Standard Specification for Cast Iron Soil Pipe and Fittings

ASTM A798 Standard Practice for Installing Factory-Made Corrugated Steel Pipe for Sewers and Other Applications

ASTM C12 Standard Practice for Installing Vitrified Clay Pipe Lines

ASTM C76 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe

ASTM C270 Standard Specification for Mortar for Unit Masonry

ASTM C301 Standard Test Methods for Vitrified Clay Pipe

ASTM C361 Standard Specification for Reinforced Concrete Low Head Pressure Pipe

ASTM C425 Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings

ASTM C443 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets

ASTM C478 Standard Specification for Circular Precast Reinforced Concrete Manhole Sections

ASTM C564 Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings

ASTM C700 Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated

ASTM C969 Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines

ASTM C990 Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

ASTM C1479 Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations

ASTM D543 Standard Practice for Evaluating the Resistance of Plastics to Chemical Reagents

ASTM D2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications

ASTM D3034 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

ASTM D3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

ASTM D3262 Standard Specification for “Fiberglass” (Glass Fiber Reinforced Thermosetting Resin) Sewer Pipe

ASTM D3839 Standard Guide for Underground Installation of “Fiberglass” (Glass Fiber Reinforced Thermosetting Resin) Pipe

ASTM D4161 Standard Specification for Fiberglass (Glass Fiber Reinforced Thermosetting Resin) Pipe Joints Using Flexible Elastomeric Seals

ASTM F477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

ASTM F679 Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

ASTM F949 Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings

ASTM F1417 Standard Practice for Installation Acceptance of Plastic Non pressure Sewer Lines Using Low Pressure Air

ASTM F2764 Standard Specification for 6 to 60 in. [150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications

ASTM F3219 Standard Specification for 3 to 30 in. (75 To 750 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Fittings

AWWA C104 Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings

AWWA C110 Standard for Ductile-Iron and Gray-Iron Fittings

AWWA C111 Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

AWWA C115 Standard for Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges

AWWA C116 Standard for Protective Fusion-Bonded Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings

AWWA C150 Standard for Thickness Design of Ductile-Iron Pipe

AWWA C151 Standard for Ductile-Iron Pipe, Centrifugally Cast

AWWA C153 Standard for Ductile-Iron Compact Fittings

AWWA C550 Standard for Protective Interior Coatings for Valves and Hydrants

2621.2 MATERIALS

All materials required for this work shall be new material conforming to requirements of the referenced specifications for the class, kind, type, size, grade, and other details indicated in the Contract. Unless otherwise indicated, all required materials shall be furnished by the Contractor. If any options are provided for, as to type, grade, or design of the material, the choice shall be limited as may be stipulated in the Plans, Specifications, or Special Provisions.

All manufactured products shall conform in detail to such standard design drawings as may be referenced or furnished in the Plans. Otherwise, the Owner may require advance approval of material suppliers, product design, or other unspecified details as it deems desirable for maintaining adopted standards.

At the request of the Engineer, the Contractor shall submit in writing a list of materials and suppliers for approval. Suppliers shall submit a Certificate of Compliance that the materials furnished have been tested and are in compliance with the specifications.

A Sewer Pipe and Service Line Materials

All pipe furnished for main sewer and service line installations shall be as indicated for each particular line segment as shown in the Plans and designated in the Contract Items. Wherever connection of dissimilar materials or designs is required, the method of joining and any special fittings employed shall be products specifically manufactured for this purpose and subject to approval by the Engineer.

A1 Vitrified Clay Pipe and Fittings

Vitrified clay extra strength pipe and fittings shall conform to the requirements of ASTM C700 for the size and type and class specified, subject to the following supplementary provisions:

- (1) Unless otherwise specified, the pipe and fittings shall be non-perforated, full circular type, either glazed or unglazed.
- (2) All pipe and fittings manufactured with bell-and-spigot ends shall be furnished with factory fabricated compression joints conforming to the requirements of ASTM C425.
- (3) In lieu of the bell-and-spigot jointing requirements, the pipe and fittings may be furnished with plain ends, in which case the jointing shall be by means of compression couplings conforming to the requirements of ASTM C425, Type B.
- (4) All clay pipe fittings (wyes, tees, bends, plugs, etc.) shall be of the same pipe class and joint design as the pipe to which they are to be attached.

A2 Ductile Iron Pipe and Ductile Iron and Gray Iron and Fittings

The pipe furnished shall be Ductile Iron pipe and pipe fittings furnished shall be of the Ductile Iron or Gray Iron type as specified for each particular use of installation. When Gray Iron is specified, either type may be furnished. Gray Iron may not be substituted for Ductile Iron unless specifically authorized in the Special Provisions.

Ductile iron pipe shall conform to the requirements of AWWA C115 or C151 for water, and thickness design shall conform to AWWA C150. In addition, the pipe shall comply with the following supplementary provisions:

- (1) Fittings shall conform to the requirements of AWWA C110 (Gray Iron and Ductile Iron Fittings) or AWWA C153 (Ductile Iron Compact Fittings) for the joint type specified.
- (2) Unless otherwise specified all pipe and fittings shall be furnished with cement mortar lining meeting the requirements of AWWA C104 for standard thickness lining. All exterior surfaces of the pipe and fittings shall have an asphaltic coating at least one mil thick. Spotty or thin seal coating, or poor coating adhesion, shall be cause for rejection.

Fittings specified to be furnished with fusion bonded epoxy external coating and/or interior lining shall conform to the requirements of AWWA C550 and C116/A21.16, with 6-8 mil nominal thickness.

Fittings and pipe specified to be furnished with zinc coating shall meet the requirements of ISO 8179-1 and ISO 8179-2. Pipe and fittings shall be coated with the manufacturer compatible asphaltic coating. Zinc coatings for pipe and fittings in corrosive environments shall be wrapped with polyethylene encasement material.

- (3) Rubber gasket joints for Ductile Iron Pressure Pipe and fittings shall conform to AWWA C111.
- (4) The nuts and bolts shall be constructed of corrosion resistant, high-strength, low-alloy steel with a ceramic filled, baked on fluorocarbon resin. The nuts and bolts shall be in compliance with ANSI/AWWA C111/A21.11.
- (5) Conductivity, when required by the Special Provisions, shall be maintained through pipe and fittings with an external copper jumper wire or specialty gaskets which are capable of meeting conductive requirements. Wedge type connectors will not be allowed.

A3 Reinforced Concrete Pipe and Fittings

Reinforced concrete (RC) pipe, fittings and specials shall conform to the requirements of MnDOT 2501, 2503, 3236, 3726, and ASTM C76 (Reinforced Concrete Pipe) with rubber O-ring or profile joints for the type, size, and strength class specified, subject to the following supplementary provisions:

- (1) All branch fittings such as tees, wyes, etc. shall be cast as integral parts of the pipe. All fittings and specials shall be of the same strength class as the pipe to which they are attached.
- (2) Joints shall meet the requirements of ASTM C361, and ASTM C443.
- (3) Lift holes will not be permitted unless specifically authorized in the Plans, Specifications, and Special Provisions

A4 Corrugated Steel Pipe and Fittings

Corrugated Steel (CS) Pipe and fittings shall conform to the requirements of MnDOT 2501, 2503, and 3226 (CS) Pipe for the application, type, size and sheet thickness specified. Joints for joining CS Pipe shall be the band type, soil-tight or bell/spigot type soil-tight and watertight, and watertight, with preformed gasket seals meeting MnDOT 3726. Fittings and bands for joining pipe sections shall be of the same material and thicknesses as the mainline pipe.

Specialty coatings for the pipe shall be as indicated in the Plans, Specifications, and Special Provisions.

A5 Polyvinyl Chloride Pipe and Fittings

Smooth walled polyvinyl chloride pipe and fittings shall conform to the requirements of ASTM D3034 and ASTM F679 for the size, standard dimension ratio (SDR), and strength requirements indicated on the Plans, Specifications, and Special Provisions. The grade used shall be resistant to aggressive soils or corrosive substances in accordance with the requirements of ASTM D543.

Pipe fittings shall be of the same class and grade as specified for the pipe, unless otherwise specified in the special provisions.

Unless otherwise specified, all pipe and fittings shall be SDR 35 and connections shall be push-on with elastomeric gasket joints which are bonded to the inner wall of the gasket recess of the bell socket.

PVC pipe and fittings for pressure sewer and forcemains shall meet the requirements of 2611.2 A3 for watermain class pipe.

Corrugated polyvinyl chloride pipe and fittings with smooth interior shall conform to the requirements of ASTM F949 for the size and wall thickness indicated on the Plans, Specifications, and Special Provisions. Unless otherwise specified, all pipe and fittings shall be push-on with snug fit elastomeric joints meeting tightness requirements of ASTM D3212 and ASTM F477.

A6 Cast Iron Soil Pipe

Unless otherwise specified in the Plans, Specifications, and Special Provisions, cast iron soil pipe shall be service weight pipe meeting the requirements of ASTM A74 and the Plans, Specifications, and Special Provisions. Unless otherwise specified, pipe joints shall be push-on, sealed with elastomeric gaskets, meeting the requirements of ASTM C564.

A7 Acrylonitrile-Butadiene-Styrene Pipe

Acrylonitrile-Butadiene-Styrene (ABS) solid wall pipe and fittings shall conform to the requirements of ASTM D2751 (Withdrawn 2014) and shall be gasket seal joints, assembled as recommended by the pipe manufacturer. Unless otherwise specified, all pipe and fittings shall be push-on with snug fit elastomeric joints meeting tightness requirements of ASTM D3212 and ASTM F477. Solvent cemented joints, assembled as recommended by the pipe manufacturer, shall be provided only where specifically indicated in the Plans, Specifications, and Special Provisions.

A8 Corrugated Polyethylene Pipe

Dual-Wall and Triple-Wall Corrugated Polyethylene Pipe (PE/HDPE) for gravity sewers shall conform to the requirements of AASHTO M294 for storm sewer pipe sizes twelve inch (12") through sixty inch (60"). Joints shall be bell and spigot push-on type, soil-tight and watertight joints in accordance with ASTM D3212 and ASTM F477. Pipe manufacture, watertight joint testing, and installation shall conform to MnDOT 2501, 2503, 3247, ASTM C969, and as indicated in the Plans, Specifications, and Special Provisions.

A9 Solid Wall High Density Polyethylene Pipe

Solid wall HDPE for pressure and gravity sewer pipes shall meet the requirements of 2611.2A3.

A10 Fiberglass Reinforced Pipe

Fiberglass Reinforced Pipe (FRP/GRP) for gravity sewers shall meet requirements of ASTM D3262 for Glass-Fiber-Reinforced Thermosetting Resin pipe, such as reinforced thermosetting-resin pipe (RTRP) and reinforced polymer mortar pipe (RPMP; natural polymers not included) for use in gravity-flow systems. The pipe shall be manufactured with polyester resin systems with a proven history of performance in this application.

The reinforcing glass fibers used to manufacture the components shall be of highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.

Sand used to manufacture the pipe and fittings shall be minimum ninety eight percent (98%) silica sand with a maximum moisture content of two tenths of a percent (0.2%).

Pipe resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., when used, shall not detrimentally effect the performance of the products.

Gaskets shall be supplied by approved gasket manufacturers and be suitable for the service intended. Minimum pressure rating of gaskets shall be two hundred fifty (250) psi.

Unless otherwise specified, the pipe shall be field connected with fiberglass sleeve couplings that utilize elastomeric sealing gaskets made of EPDM rubber compound to provide watertight joints meeting the requirements of ASTM D4161. Joints at tie-ins, when needed, may utilize fiberglass, gasket-sealed closure couplings.

Fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays. Properly protected standard ductile iron, fusion-bonded epoxy-coated steel and stainless steel fittings are allowed unless otherwise stated in the Special Provisions.

The actual outside diameter (eighteen inch (18") to forty eight inch (48")) of the pipes shall be in accordance with ASTM D3262. Other pipe diameter OD's shall be per manufacturer's literature.

Pipe shall be supplied in nominal lengths of twenty feet (20') except where noted otherwise on the drawings. Actual laying length shall be nominal $\pm 1/4$ inches. At least ninety percent (90%) of the total footage of each size and class of pipe, excluding special order lengths, shall be furnished in nominal length sections.

Pipe ends shall be square to the longitudinal pipe axis with a maximum tolerance of one-eighth inch (1/8").

Pipe shall be marked identifying each pipe with the name of manufacturer, plant location, code date of manufacturer, nominal pipe size, pipe stiffness designation and ASTM D3262.

Service lateral connections (wye, tee, bend) to the sanitary sewer shall be as recommended by the main line sewer pipe manufacturer recommendation.

A11 Polypropylene Pipe

Corrugated Polypropylene Pipe (PP) for gravity sewers shall conform to ASTM F2881. Pipe joints shall be bell and spigot push-on type, soil-tight and watertight joints in accordance with ASTM D3212 and ASTM F477, and shall conform to the requirements of AASHTO M330 dual wall Type "S" pipe for storm sewer pipe sizes twelve inch (12") through sixty inch (60"). Pipe manufacture, watertight joint testing, and installation shall conform to current MnDOT requirements, ASTM F1417, and as indicated in the Plans, Specifications, and Special Provisions.

A12 Tracer Wire for Non-conductive Pipe

Tracer wire for use with all thermoplastic pipe types shall be Underwriters Laboratories (UL) listed for use in direct burial applications, color coated per APWA uniform color code for the specific utility being marked. Tracer wire shall be a minimum 12 AWG copper clad steel rated to 30 volts, insulation shall be High Molecular Weight Polyethylene (HMWPE) meeting ASTM D1248, with designation identified on the outside of the wire casing.

Tracer wire shall meet the following additional criteria for the construction method specified:

Open Trench - Trace wire shall be High Strength with minimum 450 lb. break load, with minimum 30 mil HDPE insulation thickness.

Directional Drilling/Boring - Trace wire shall be Extra High Strength with minimum 1,150 lb. break load, with minimum 30 mil HDPE insulation thickness.

Pipe Bursting/Slip Lining - Trace wire shall be 7 x 7 Stranded Copper Clad Steel, Extreme Strength with 4,700 lb. break load, with minimum 50 ml HDPE insulation thickness.

Connectors for tracer wire shall meet the following:

All mainline trace wires must be interconnected at tees and crosses, joined using a single 3-way or 4-way lockable connector for tees and crosses, respectively.

Lockable connectors shall be for direct bury application, and shall be dielectric silicon filled to seal out moisture and corrosion.

B Metal Sewer Castings

Metal castings for sewer structures such as manhole frames and covers, catch basin frames, grates and curb boxes, shall conform to the requirements of ASTM A48 (Gray Iron Castings), subject to the following supplementary provisions:

- (1) Casting assemblies or dimensions, details, weights, and class shall be as indicated in the detailed drawings for the design designation specified. Unless otherwise specified, the castings shall be Class 30 or better.
- (2) Lid-to-frame surfaces on round casting assemblies shall be machine milled to provide true bearing around the entire circumference.
- (3) Casting weight shall be not less than ninety five percent (95%) of theoretical weight for a unit cast to exact dimensions, based on four hundred forty two (442) pounds per cubic foot.
- (4) A Certificate of Compliance shall be furnished with each shipment of castings stating that the materials furnished have been tested and are in compliance with the specification requirements.
- (5) Unless otherwise specified, sanitary sewer manholes shall have self-sealing lids and concealed pick holes.

C Precast Concrete Manhole and Catch Basin Sections

Precast concrete riser sections and appurtenant units (grade rings, top and base slabs, special sections, etc.) used in the construction of manhole and catch basin structures shall conform with the requirements of ASTM C478, MnDOT 2506 and the following supplementary provisions:

- (1) The precast sections and appurtenant units shall conform to all requirements as shown on the detailed drawings.
- (2) Joints of manhole riser sections shall be tongue and groove with rubber "O" ring or profile gaskets conforming to the requirements of ASTM C443..

- (3) Sanitary sewer inlet and outlet pipes shall be joined to the manhole with a gasketed, flexible, watertight connection, watertight boot, or any watertight connection arrangement approved by the Engineer that allows differential settlement of the pipe and manhole wall to take place.
- (4) Air-entrained concrete shall be used in the production of all wet-cast units. Air content shall be maintained within the range of five (5) to eight (8) percent (%).
- (5) A Certificate of Compliance shall be furnished with each shipment of precast manhole and catch basin sections stating that the materials furnished have been tested and are in compliance with the specification requirements.
- (6) Lift holes will not be permitted in precast manholes.

D Mortar

Mortar for use in masonry construction shall meet the requirements of MNDOT 2506.B.2 and ASTM C270.

E Concrete

Concrete used for cast-in-place masonry construction shall be produced and furnished in accordance with the provisions of MnDOT Specification 2461, Table 2461-6, for the mix design indicated in the Plans, Specifications, or Special Provisions. Type 3, air-entrained, concrete shall be furnished and used in all structures having weather exposure.

2621.3 CONSTRUCTION REQUIREMENTS

A Installation of Pipe and Fittings

The Contractor shall take all necessary precautions to handle and install all pipe and appurtenances as recommended by the manufacturer, Engineer, Plans, Specifications, and the Special Provisions.

Installation of PVC pipe and fittings for pressure sewer and forcemains shall meet the requirements of 2611.3 for watermain class pipe.

A1 Inspection and Handling

Proper and adequate implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. During the process of unloading, all pipe and accessories shall be inspected by the Contractor for damage. The Contractor shall notify the Engineer of all material found to have cracks, flaws or other defects. The Engineer shall inspect the damaged materials and have the right to reject any materials found to be unsatisfactory. The Contractor shall promptly remove all rejected material from the site. All materials shall be handled carefully, as will prevent damage to protective coatings, linings, and joint fillings; preclude contamination of interior areas; and avoid jolting contact, dropping, or dumping.

All work and materials are subject to tests by the Owner at such frequency as may be determined by the Engineer.

While suspended and before being lowered into laying position, each pipe section and appurtenant unit shall be inspected by the Contractor to detect damage or unsound conditions that may need corrective action or be cause for rejection. The Contractor shall inform the Engineer of any defects discovered and the Engineer will prescribe the required corrective actions or order rejection.

Immediately before placement, the joint surfaces of each pipe section and fitting shall be inspected for the presence of foreign matter, coating blisters, rough edges or projections, and any imperfections so detected shall be corrected by cleaning, trimming, or repair as needed.

A2 Pipe Laying Operations

Trench excavation and bedding preparations shall proceed ahead of pipe placement as will permit proper laying and joining of the units at the prescribed grade and alignment without unnecessary deviation or hindrance.

All foreign matter or dirt shall be removed from the inside of the pipe and fittings before they are lowered into position in the trench and they shall be kept clean. The sewer materials shall be carefully lowered into laying position by the use of suitable restraining devices. Under no circumstances shall the pipe be dropped into the trench.

Unless otherwise permitted by the Engineer, bell and spigot pipe shall be laid with the bell ends facing upgrade and the laying shall start on the downgrade end and proceed upgrade. As each length of bell and spigot pipe is placed in laying position, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

Connection of pipe to existing lines or previously constructed manholes or catch basins shall be accomplished as shown in the Plans or as otherwise approved by the Engineer. Where necessary to make satisfactory closure or produce the required curvature, grade or alignment, deflections at joints shall not exceed that which will assure watertight joints and shall comply with the pipe manufacturer recommendations.

Entrance of foreign matter into pipeline openings shall be prevented at all times to the extent that suitable plugs or covering can be kept in place over the openings without interfering with the installation operations.

Installation of thermoplastic pipe shall conform to ASTM D2321; FRP/GRP pipe to ASTM D3839, and the manufacturers' recommendations; ASTM A798 for CS pipe, and ASTM C1479 for RC pipe.

A3 Connection and Assembly of Joints

All pipe and fitting joints shall fit tightly and be fully closed. Spigot ends shall be marked as necessary to indicate the point of complete closure. All joints shall be soil tight and watertight in all sanitary sewer and storm sewer pipe.

A4 Bulkheading Open Pipe Ends

All pipe and fitting ends left open for future connection shall be bulkheaded by approved methods prior to backfilling. Unless otherwise specified or approved, all openings of twenty four inches (24") in diameter or less shall be closed off with prefabricated plugs or caps and all openings larger than twenty four inches (24") in diameter shall be closed off with masonry bulkheads.

Prefabricated plugs and caps shall be of the same material as the pipe material, or an approved alternate material, and they shall be installed with watertight seal as required for the pipeline joints. Masonry bulkheads shall be constructed with clay or concrete brick to a wall thickness of eight inches (8").

Bulkheads installed for temporary service during construction may be constructed with two inch (2") timber planking securely fastened together and adequately braced, as an alternate to the masonry construction.

A5 Tracer Wire

Tracer wire shall be installed along the length of all non-conductive mainline pipe, laterals, and services with vertical riser to the surface, at manholes, catch basins, stubs, laterals, services, and/or utility location boxes as required by the Special Provisions. Tracer wire shall be taped, clamped or affixed to the pipe in another manner as approved by the Engineer.

Splicing tracer wire shall be by mechanical split bolt type or a crimp type compression fitting fully encased in approved electrical insulation putty. A twelve inch (12") tracer wire loop shall be provided on each side of a spliced connection.

Tracer wire lengths greater than 500 linear feet are to include an approved grade level/in-ground access box, located at the edge of the road right-of-way and outside of the roadway.

Tracer wire shall be grounded at all terminal ends (stubs, plugs).

B Appurtenance Installations

Appurtenance items such as aprons, trash guards, gates and castings shall be installed where and as required by the Plans and in accordance with such standard detail drawings or supplementary requirements as may be specified.

Casting assemblies installed on manhole or catch basin structures shall be set in a full mortar bed and be adjusted to the specified elevation without the use of shims or blocking.

Sewer aprons shall be subject to all applicable requirements for installation of pipe. All aprons and outfall end sections shall have the last three (3) sections tied. Two (2) tie bolt fasteners shall be placed in each of the last three joints, one on each side of top center at the sixty (60) degree point (from vertical). Tie bolt diameter shall be: 5/8 inch for 12" to and including 27" pipe; 3/4 inch for 30" to and including 66" pipe; 1 inch for 72" to and including 144" pipe. The tie bolts shall be of a design approved by the Engineer.

C Sewer Service Installations

Main sewer service connections and building service sewer pipe shall be installed as provided for in the Contract and as may be directed by the Engineer. The sewer service connections and pipe lines shall be installed in conformance with all applicable requirements of the main sewer installation and as more specifically provided for herein.

The Engineer, with the assistance of the Contractor, shall keep accurate records of all service installations as to type, location, elevation, point of connection and termination, etc. This service record shall be maintained jointly by the Contractor and Engineer on forms provided by the Engineer. The service installations shall not be backfilled until all required information has been obtained and recorded.

The main sewer service connection shall consist of installing a Branch Tee or Wye section in the main sewer line at designated locations or providing an insert type Saddle Tee or Wye fitting in a pipe cut-out where specified. Orientation of service connection fitting shall be as shown in the standard drawings unless otherwise directed by the Engineer.

Where the depth of cover over the main sewer invert is greater than fifteen (15) feet (or such other maximum as may be indicated), the service connection shall be extended upward by means of a Service Riser Section.

Unless otherwise specified, service pipe shall be installed at right angles to the main sewer and at a straight line grade to the property line. The standard and minimum grades shall be a uniform rise of one inch (1") in four feet (4') (two percent (2%)) for sanitary service lines and one inch (1") in eight feet (8') (one percent (1%)) for storm sewer service lines. These minimum grades may be reduced (by not more than one-half (1/2) pitch) where the Engineer so approves in the case of restrictive elevation differences.

Building service pipe lines shall generally be kept as deep as required to serve the building elevation and maintain the specified minimum pipe grades. Pipe bends shall be provided as necessary to bring the service lines to proper location and grade. Pipe bends shall not exceed twenty-two and one half (22-1/2) degrees without approval of the Engineer.

Unless otherwise indicated, service pipe installation shall terminate at property line or as designated on the Plans, with a gasketed plug placed in the end, at which point the Contractor shall furnish and set a four inch by four inch (4" x 4") wooden timber six feet (6') to eight feet (8') in length embedded four feet (4') below grade, or approved steel post to mark the exact end of pipe. The timber or post shall be set vertically, with the top two feet (2') painted green.

Wherever service line connections to the main sewer are permitted or required to be made by the open cut-out method in the absence of a built-in Tee or Wye fitting, the connection shall be made by using an approved type of Saddle Tee or Wye fitting. The pipe cut-out shall be made with an approved type coring machine or by other approved methods producing a uniform, smooth circular cut-out as required for proper fit. The cut-out discs shall be retrieved and shall not be allowed to remain within the main sewer pipe. The Saddle Tee shall be securely fastened to the main sewer pipe by means of epoxy resin or other approved adhesive. The entire connection fitting shall be encased in concrete to a minimum thickness of six inches (6") and as may be shown in the standard drawings.

Wherever service line connections to the main sewer are required to be made by means of built-in Branch Tee or Wye fittings, the Contractor shall, in the absence of such fitting, remove a section of the main sewer pipe and replace it with the required Branch Tee or Wye section connected by means of an approved sleeve coupling.

Sanitary sewer service lines shall not be connected to a manhole at an elevation more than twenty-four inches (24") above the crown of the outgoing sewer. Where the elevation difference is greater than twenty-four inches (24"), the connection shall be made by means of an Outside Drop Connection in accordance with the details shown in the standard drawings.

All pipe and fitting openings at temporary terminal points shall be fitted with suitable plugs or shall be bulkheaded as required for the main sewer pipe.

D Manhole and Catch Basin Structures

Manholes, catch basins, and other special access structures shall be constructed at designated locations as required by the Plans and in accordance with any standard detail drawings or special design requirements given therefor.

Unless otherwise specified or approved, storm sewer manholes and catch basins shall be constructed on a precast or cast-in-place concrete base and the barrel riser sections, and cone section shall all be of precast concrete. Sanitary sewer manholes shall be constructed with precast concrete integral base with pre-formed invert barrel section and with watertight boots at all pipe locations. All units shall be properly fitted and sealed to form a completely watertight structure. Manholes and catch basin structures shall be fabricated to provide a twelve-inch (12") or sixteen inch (16") barrel section immediately below the cone or top slab whenever possible. Barrel and cone height shall be such as to permit placement of at least two (2) and not more than six (6) standard two-inch (2") precast concrete or high density polyethylene adjusting immediately below the casting assembly. Sanitary manhole adjustment rings and casting flange shall be fitted with specified method/materials as indicated in the Special Provisions to reduce inflow and infiltration. Storm sewer manhole and drainage structure adjustment rings and casting flange shall be wrapped with a Type 2 Geotextile fabric meeting MnDOT 3733.

Unless otherwise specified or approved, manholes and catch basins shall have an inside barrel diameter at the bottom of forty-eight inches (48") minimum and the inside diameter at the top of the cone section and all adjusting rings shall be of the same size and shape as the casting frame. Casting assemblies shall be as specified in the Plans

Concrete cast-in-place base shall be poured on undisturbed or firmly compacted foundation material which shall be trimmed to proper elevation. The bottom riser section shall be set in fresh concrete or mortar and all other riser section joints of the tongue and groove design shall be sealed with rubber gaskets. The concrete base under an outside drop connection shall be monolithic with the manhole base.

Wherever special designs so require or permit, and as may be approved by the Engineer, a precast concrete base may be used or the structure may be constructed with solid sewer brick or block units or with cast-in-place concrete. Any combination of cast-in-place concrete and brick or block mortar construction will be allowed and may be required where it is impossible to complete the construction with standard precast manhole sections.

All storm sewer manhole and catch basin structure doghouses shall be completely filled with mortar, concrete masonry, or concrete to completely seal the pipes into the structure wall. When formed inverts are specified, the inside bottom of each manhole and catch basin shall be shaped with fresh concrete to form free flow invert troughs.

When connecting to an existing sanitary sewer manhole without an existing opening for sewer pipe, the Contractor shall be required to core-drill an opening of the correct size and elevation for the proposed sanitary sewer facility. The Contractor shall set the connecting pipe through the full thickness of the wall flush with the inner face of the wall. Connection to the structure shall be made with a watertight joint, by means of a rubberized boot. The Contractor shall ensure the flow line of the manhole is constructed in a manner to provide steady flow from the new sanitary line to the existing sanitary line. The flow line and the core-drilled hole are to be grouted smooth. The Contractor shall install a plug in the connecting pipe once the connection is complete and construction has advanced to the next manhole to prevent rainwater or sediment from entering the existing system. The plug shall be removed once all the proposed sanitary sewer mains on the project have been installed, tested, inspected, and approved.

E Sanitary Sewer Leakage Testing

All sanitary sewer lines, including service connections, shall be substantially watertight and shall be tested for excessive leakage upon completion and before connections are made to the service by Others. Each test section of the sewer shall be subjected to exfiltration testing, either by hydrostatic or air test method as described below and at the Contractor's option. The requirements set forth for maximum leakage shall be met as a condition for acceptance of the sewer section represented by the test.

If the ground water level is greater than three feet above the invert elevation of the upper manhole and the Engineer so approves, infiltration testing may be allowed in lieu of the exfiltration testing, in which case the allowable leakage shall be the same as would be allowed for the Hydrostatic Test.

All testing shall be performed by the Contractor without any direct compensation being made therefore, and the Contractor shall furnish all necessary equipment and materials, including plugs and standpipes as required.

E1 Air Test Method

E1a Gravity Sewers

All gravity sanitary sewer lines, including service connections, shall be substantially watertight and shall be tested for excessive leakage upon completion and before connections are made to the service by Others. Each test section of the sewer shall be subjected to exfiltration testing by the ASTM F1417 (low pressure air) test method regardless of pipe material.

The requirements set forth for maximum leakage shall be met as a condition for acceptance of the sewer section represented by the test. All testing shall be performed by the Contractor without any direct compensation being made therefore, and the Contractor shall furnish all necessary equipment and materials, including plugs and standpipes as required.

The sewer pipe section under test shall be clean at the time of testing but the pipe may be wetted. Pneumatic balls shall be used to plug the pipe ends at manholes. Low pressure air shall be introduced to the plugged line until the internal air pressure reaches three and one half (3.5) psi greater than the average back pressure of any ground water pressure that may submerge the pipe. At least two (2) minutes shall be allowed for the air temperature to stabilize before readings are taken and the timing started. During this time the Contractor shall check all plugs to detect plug leakage. If plugs are found to leak, air shall be bled off, the plugs shall be retightened, and the air shall be reintroduced into the line.

The sewer section under test will be accepted as having passed the air leakage test when the rate of air loss as measured by pressure drop, does not exceed a specified amount in a specified time. Pressure drop may be determined by using the table below, or calculated by use of the formulas provided below.

TABLE
Minimum Specified Time Required for a 0.5 psig Pressure Drop for Size and Length of Pipe Indicated for Q = 0.0015 CFM/SF

Pipe Diameter (Inches)	Minimum Time (Min:Sec)	Length for Min. Time (Feet)	Time for increased Length (Sec)	Specification Time for Length (L) Shown (Min:Sec)								
				100 Ft.	150 Ft.	200 Ft.	250 Ft.	300 Ft.	350 Ft.	400 Ft.	450 Ft.	
4	1:53	597	0.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	0.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12	3:12
8	3:47	298	0.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42	5:42
10	4:43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54	8:54
12	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50	12:50
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02	20:02
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51	28:51
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	28:11	30:32	34:54	39:16	39:16
24	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17	51:17
*27	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:18	50:30	57:42	64:54	64:54
*30	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:131	80:07	80:07
*33	15:35	72	12.926 L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57	96:57
*36	17:00	66	15.384 L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23	115:23

*NOTE - Consult with pipe and appurtenance manufacturer for maximum test pressure for pipe size greater than twenty four inches (24") in diameter.

FORMULA

The formula below calculates the specified minimum time required for a **1.00 psig pressure drop** from a starting pressure of 3.5 psig to a final pressure of 2.5 psig using a leakage rate of 0.0015 cubic feet/minute/square foot of internal surface.

Calculate all test times by the following formula:

$$T = 0.085 DK/Q$$

where:

T = shortest time allowed for the **air pressure to drop 1.0 psig**, sec.

K = 0.000419 DL but not less than 1.0,

Q = leak rate = 0.0015 CFM/SF,

D = measured average inside diameter of sewer pipe, in., and

L = length of test section, ft.

E2 Hydrostatic Test Method

E2a Gravity Sewers

After bulkheading the test section, the pipe shall be subjected to a hydrostatic pressure produced by a head of water at a depth of three feet (3') above the invert elevation of the sewer at the upstream manhole of the test section. In areas where ground water exists, this head of water shall be three feet (3') above the existing water table.

The water head shall be maintained for a period of one (1) hour during which time it will be presumed that full absorption of the pipe body has taken place, and thereafter for an extended period of one (1) hour the water head shall be maintained as the test period. During the test period, the measured water loss within the test section, including service stubs, shall not exceed an infiltration / exfiltration rate of thirty five (35) gallons / inch diameter / mile / day.

If measurements indicate exfiltration within a test action section is not greater than the allowable maximum, the section will be accepted as passing the test.

E2b Pressure Sewers

For sewers designated as pressure pipe sewers, the sewer shall be subjected to hydrostatic testing under 2611.3G Hydrostatic Testing of Watermains, except the hydrostatic testing pressure shall be two (2) times the maximum design operating pressure, but not less than one hundred (100) psig and the duration of the test shall be one hour.

E3 Test Failure and Remedy

In the event of test failure on any test section, testing shall be continued until all leakage has been detected and corrected to meet the requirements. All repair work shall be subject to approval of the Engineer. Introduction of sealant substances by means of the test water will not be permitted.

Unsatisfactory repairs or test results may result in an order to remove and replace pipe as the Engineer considers necessary for test conformance. All repair and replacement work shall be at the Contractor's expense.

F Deflection Test

Deflection tests shall be performed on all plastic gravity sewer pipes. The test shall be conducted after the sewer trench has been backfilled to the desired finished grade and has been in place for thirty (30) days.

The deflection test shall be performed by pulling a rigid ball or nine-point mandrel in accordance with MnDOT 2503.3 C.4. Direct measurement of the pipe diameter to determine deflection is not allowed. The ball or mandrel shall have a minimum diameter equal to ninety five percent (95%) of the actual inside diameter of the pipe. The maximum allowable deflection shall not exceed five percent (5%) of the pipe's internal diameter. The line will be considered acceptable if the mandrel can progress through the line without binding. The time of the test, method of testing, and the equipment to be used for the test shall be subject to the approval of the Engineer.

All testing shall be performed by the Contractor at his expense without any direct compensation being made therefore, and he shall furnish all necessary equipment and materials required.

F1 Test Failure and Remedy

In the event of test failure on any test section, the section shall be replaced, with all repair work subject to approval of the Engineer. The replaced section shall be retested for leakage and deflection in conformance with the specifications contained herein. All repairs, replacement, and retesting shall be at the Contractor's expense.

G Televising

Sewer line televising may be required by the Engineer, at the cost of the Contractor, if visual inspection, leakage testing, or deflection testing indicate the sewer has not been constructed in accordance with these specifications and the requirements of the Plans, Specifications, and Special Provisions.

2621.4 METHOD OF MEASUREMENT

All items will be measured separately according to design designation as indicated in the Pay Item name and as may be detailed and defined in the Plans, Specifications, or Special Provisions.

Complete-in-place items shall include all component parts thereof as described or required to complete the unit, but excluding any excesses covered by separate Pay Items. Linear measurement of piping will include the running length of any special fittings (tees, wyes, elbows, gates, etc.) installed within the line of measure between specified terminal points.

A Sewer Pipe

Sewer pipe of each design designation will be measured by length in linear feet along the line of pipe. Terminal points of measurement will be the pipe end at free outlets; the point of connection with in-place pipe; the center of manholes or catch basins; the point of centerline intersections at branch fittings; or the point of juncture with other appurtenances or units as defined.

Separation of quantities according to "depth zone classification", when so designated in the Pay Item, will be determined by depth of pipe invert below the ground surface profile.

B Manholes

Manholes of each design designation will be measured by number of each constructed complete-in-place, including the base and castings as required, but excluding any excess depth greater than eight feet (8') measured from top of manhole cover to invert elevation of lowest pipe.

Excess manhole depth of each design designation will be measured by the linear foot difference in depth between the eight feet (8') allowed as standard and the actual increased depth as constructed.

C Catch Basins

Catch basins of each design designation will be measured by number of each constructed complete-in-place, including the base and castings as required, but excluding any excess depth greater than five feet (5') measured from top of grate (low point) to invert elevation of lowest outlet pipe.

Excess catch basin depth of each design designation will be measured by the linear foot difference in depth between the five feet (5') allowed as standard and the actual increased depth as constructed.

D Outside Drop Connection

Outside drop connections of each design will be measured by linear foot constructed complete-in-place, and shall include granular encasement, fittings, any special piping required, including coring holes and watertight boots for existing manholes for the drop connection. Measurement shall be made vertically from the invert of the lower outside drop invert to the upper outside drop invert.

E Service Connection

Service Connections of each design will be measured by number of each constructed complete-in-place as specified.

F Service Pipe

Service pipe of each design will be measured separately by length in linear feet, horizontally along the line of installation, between the service end and the point of juncture with the main pipe connection fitting.

G Special Pipe Fittings

Special pipe fittings (wyes, tees, bends, etc.) of each design designation will be measured by number of each installed complete-in-place as specified, but excluding any such fittings required to be installed as a component part of any other Work Unit.

H Appurtenant Items

Appurtenant items such as aprons, trash guards, gates and other prefabricated units or assemblies as identified by Pay Item name will be measured separately by number of each installed complete-in-place as specified.

2621.5 BASIS OF PAYMENT

Payment for sewer pipe and service pipe items at the Contract prices per linear foot of pipe of each design shall be compensation in full for all costs of providing a complete-in-place pipeline, including excavation, foundation preparation, backfilling, leakage testing, restoration of surface improvements, disposal of surplus or waste materials, final cleanup, and such other work as may be specified, but excluding the construction of other structures or special sections and the placement of special fittings, appurtenances or materials specifically designated for payment under other Contract Items.

Payment for manhole, catch basin, outside drop connection, service connection, and other structures as specified, at the Contract prices per structure, shall be compensation in full for all costs of constructing each unit complete-in-place as specified, including all required castings, special fittings, base or encasement, and appurtenant materials as specified for the complete structure or section, but excluding such additional work as may be designated for payment under other Contract Items.

Where the specified standard manhole, catch basin, or outside drop connection depths are exceeded, the excess depth of each design will be paid for separately as linear footage items and payment at the Contract prices therefor shall be compensation in full for all costs of providing the extra depth.

Special pipe fittings such as wyes, tees and bends will be paid for as separate Contract Items to the extent they are required to be installed in the sewer pipe and service pipe lines and not as a component part of a complete-in-place structure (outside drop connections, service connections, etc.)

Appurtenant items such as aprons, trash guards, drainage gates, and other prefabricated units or assemblies and specials as designated will be paid for as separate Contract Items to the extent they are not included as a component part of any complete-in-place structure.

SECTION 2631 CIPPS – STANDARD SPECIFICATIONS FOR SEWER PIPE REHABILITATION WITH CURED IN-PLACE PIPE SYSTEMS (CIPPS)

2631.1 CIPPS DESCRIPTION

A General

This work shall consist of the rehabilitation of pipelines and conduits by the installation of a resin-impregnated flexible tube Cured-In-Place Pipe System (CIPPS). The rehabilitation of pipelines shall be constructed by the installation of a resin-impregnated flexible tube which, when cured, shall be continuous and tight-fitting throughout the entire length of the original pipe. The CIPP shall extend the full length of the original pipe and provide a structurally sound, joint less and watertight new pipe within the existing pipe. The Contractor is responsible for proper, accurate and complete installation of the CIPP using the system selected by the Contractor.

Neither the CIPP system, nor its installation, shall cause adverse effects to any downstream facilities. The use of the product shall not result in the formation or production of any detrimental compounds or by-products that may affect downstream structures, pumps, pipe, equipment and wastewater treatment facilities. The Contractor shall notify the Engineer and identify any by-products produced as a result of the installation operations, test and monitor the levels, and comply with any and all local waste discharge requirements. The Contractor shall cleanup, restore existing surface conditions and structures, and repair any of the CIPP system determined to be defective. The Contractor shall conduct installation operations and schedule cleanup in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, businesses, and residents.

The use of the term "Plans, Specifications, and Special Provisions" within this specification shall be construed to mean those documents which compliment, modify, or clarify these specifications and are an enforceable component of the Contract Documents.

All references to MnDOT Specifications shall mean the latest published edition of the Minnesota Department of Transportation "Standard Specifications for Construction", and all supplements and amendments thereto, published prior to the date of advertisement for bids.

All references to other Specifications of AASHTO, ASTM, ANSI, AWWA, etc. shall mean the latest published edition available on the date of advertisement for bids.

The following specifications have been referenced in this Specification:

- ASTM F1216 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
- ASTM F1743 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)
- ASTM D543 Standard Practice for Evaluating the Resistance of Plastics to Chemical Reagents
- ASTM D638 Standard Test Method for Tensile Properties of Plastics
- ASTM D790 Standard Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials
- ASTM D792 Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by displacement.
- ASTM D2122 Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

ASTM F2019 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic Cured-in- Place (GRP-CIPP) Using the UV-Light Curing Method

ASTM D2122 Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

ASTM D2990 Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics

ASTM D5813 Standard Specification for Cured-in Place Thermosetting Resin Sewer Piping Systems

B Qualifications

The Contractor shall be responsible for all aspects of the design of the liner pipe. The Contractor shall guarantee that the installed liner is capable of sustaining outside loads, resist chemical attack that normally occurs in sanitary and storm sewer systems, and will maintain hydraulic characteristics over a fifty (50) year design life.

Unless provided otherwise in the plans or Special Provisions, the existing sewer pipe shall be considered to be in a fully deteriorated condition, is not structurally sound, and cannot support soil and live loads. The cured-in-place pipe shall be designed to support hydraulic, soil, and live loads.

The sewer products are intended to have a fifty (50) year or greater design life, and in order to minimize the Owner's risk, only proven products with substantial successful long term track records will be approved.

B1 Manufactured Products and Installation

Contractors must meet all of the following criteria:

- a. For a Product to be considered acceptable, a minimum of 100,000 linear feet or two hundred fifty (250) manhole-to-manhole line sections of successful wastewater collection system installations in the U.S. must be documented to the satisfaction of the Engineer. In addition, at least 50,000 linear feet of the product shall have been in successful service within the State for a minimum of five (5) years.
- b. The Contractor's personnel must satisfy all insurance, financial, and bonding requirements of the Owner, and must have had at least 5 (five) years active experience in the commercial installation of the product bid. In addition, the Contractor's personnel must have successfully installed at least 100,000 feet of the same product bid. The Field Supervisor/Foreman shall have a minimum five (5) years as a foreman/superintendent for a cured-in-place lining crew (installing actual product included with this bid/proposal), and a minimum of 100,000 lineal feet of cured-in-place lining, diameters up to and including twenty-four inches (24") installed under his/her supervision. Such experience shall include the actual product, by trade name, Contractor proposes to install. Acceptable documentation of these minimum installations must be submitted to the Engineer.

- c. Sewer rehabilitation products submitted for approval must provide Third Party Test Results supporting the long-term performance and structural strength of the product and such data shall be satisfactory to the Engineer. Test samples shall be prepared so as to simulate installation methods and trauma of the product. No product will be approved without independent third party testing verification.

2631.2 CIPPS MATERIALS

A General

All materials required for this work shall be new material conforming to requirements of the referenced specifications for the class, kind, type, size, grade, and other details indicated in the Contract. Unless otherwise indicated, all required materials shall be furnished by the Contractor. If any options are provided for, as to type, grade, or design of the material, the choice shall be limited as may be stipulated in the Plans, Specifications, or Special Provisions.

All manufactured products shall conform in detail to such standard design drawings as may be referenced or furnished in the Plans. Otherwise, the Owner may require advance approval of material suppliers, product design, or other unspecified details as it deems desirable for maintaining adopted standards.

All materials shipped to the project site shall be accompanied by test reports certifying that the material conforms to the ASTM standards listed herein. Materials shall be shipped, stored, and handled in a manner consistent with written recommendations of the CIPP manufacturer to avoid damage. Damage includes but is not limited to, gouging, abrasion, flattening, cutting, puncturing, and ultra-violet (UV) degradation. All damaged materials shall be promptly removed from the project site at no cost to the Owner. On site material storage locations shall be approved by the Engineer.

A1 CIPPS Fabric Tube

The CIPPS fabric "Tube" shall consist of one or more layers of absorbent non-woven felt fabric, felt/fiberglass or fiberglass and meet the requirements of ASTM F 1216, ASTM F 1743, ASTM D5813 & ASTM F2019. The fabric Tube shall be capable of absorbing and carrying resins, manufactured to withstand installation pressures and curing temperatures, have sufficient strength to bridge missing pipe segments, and stretch to fit irregular pipe sections.

The fabric Tubes shall have a uniform thickness that when compressed at installation pressures will equal the specified nominal tube thickness.

The wet-out fabric tube shall have a uniform thickness and excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure.

The fabric tube shall be manufactured to a size and length that when installed will tightly fit the internal circumference and length of the original pipe. Allowance shall be made for circumferential stretching during installation. The tube shall be properly sized to the diameter of the existing pipe and the length to be rehabilitated and be able to stretch to fit irregular pipe sections and negotiate bends. The Contractor shall determine the minimum tube length necessary to effectively span the designated run between manholes. The Contractor shall verify the lengths in the field prior to ordering and prior to impregnation of the tube with resin, to ensure that the tube will have sufficient length to extend the entire length of the run. The

Contractor shall also measure the inside diameter of the existing pipelines in the field prior to ordering liner so that the liner can be installed in a tight-fitted condition. Overlapped layers of felt in longitudinal seams that cause lumps in the final product shall not be allowed.

The minimum length of the fabric tube shall be that deemed necessary by the installer to effectively span the distance from the starting manhole to the terminating manhole or access point, plus that amount required to run-in and run-out for the installation process.

The outside and/or inside layer of the fabric tube (before inversion/pull-in, as applicable) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate, if applicable, vacuum impregnation and monitoring of the resin saturation during the resin impregnation (wet-out) procedure.

No material shall be included in the fabric tube that may cause de-lamination in the cured CIPP. No dry or unsaturated layers shall be acceptable upon visual inspection as evident by color contrast between the felt fabric and the activated resin containing a colorant. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No materials shall be included in the tube that is subject to delamination in the CIPPS.

The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made. The hue of the color shall be dark enough to distinguish a contrast between the fully resin saturated felt fabric and dry or resin lean areas.

Seams in the fabric tube, if applicable, shall meet the requirements of ASTM D5813. The outside of the fabric tube shall be marked every five feet (5') with the name of the manufacturer or CIPP system, manufacturing lot and production footage.

The nominal fabric tube wall thickness shall be constructed to the nearest 0.5 mm increment, rounded up from the design thickness for that section of installed CIPP. Wall thickness transitions, in 0.5 mm increments or greater as appropriate, may be fabricated into the fabric tube between installation entrance and exit access points. The quantity of resin used in the impregnation shall be sufficient to fill all of the felt voids for the nominal felt thickness.

The resin shall be a corrosion resistant polyester or vinyl ester resin and catalyst system that when properly cured within the tube composite meets the requirements of ASTM F1216, ASTM F1743 or F2019, the physical properties herein, and those, which are to be utilized in the design of the CIPP for this application. The resin shall produce CIPP which will comply with or exceed the structural and chemical resistance requirements of this specification.

A2 CIPPS Structural Requirements

The physical properties and characteristics of the finished liner will vary considerably, depending on the types and mixing proportions of the materials used, and the degree of cure executed. It shall be the responsibility of the Contractor to control these variables and to provide a CIPP system which meets or exceeds the minimum properties specified herein:

- (1) The CIPP shall be designed as per ASTM standards. The CIPP design shall assume no bonding to the original pipe wall.
- (2) The design engineer shall set the long term (fifty (50) year extrapolated) Creep Retention Factor at thirty three percent (33%) of the initial design flexural modulus as determined by ASTM D-790 test method. This value shall be used unless the Contractor submits long term test data (ASTM D2990) to substantiate a higher retention factor.
- (3) The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two (2) layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.

Minimum Physical Properties: The cured pipe material (CIPP) shall, at a minimum, meet or exceed the structural properties, as listed in the table below.

Property	Test Method	Cured Composite Per ASTM F1216	Cured Composite Per Design
Flexural Modulus of Elasticity (Short Term)	ASTM D790	250,000 Psi	Contractor Value
Flexural Strength (Short Term)	ASTM D790	4,500 Psi	Contractor Value

The required structural CIPP wall thickness shall be based as a minimum, on the physical properties listed above and in accordance with the Design Equations in the appendix of ASTM F 1216, and the following design parameters:

Design Safety Factor	2.0 (1.5 For Pipes 36" Or Larger)
Creep Retention Factor	33%
Ovality	2% Or As Measured By Field Inspection
Constrained Soil Modulus	Per AASHTO LRFD Section 12 And AWWA Manual M45
Groundwater Depth	As Specified Or Indicated On The Plans
Soil Depth (Above The Crown)	As Specified Or Indicated On The Plans
Live Load	H20 Highway
Soil Load (Assumed)	120 Lb/Cu. Ft.
Minimum Service Life	50 Years

The Contractor shall submit, prior to installation of the lining materials, certification of compliance with these specifications and/or the requirements of the pre-approved CIPP system. Certified material test results shall be included that confirm that all materials conform to these specifications. Materials not complying with these requirements will be rejected.

CIPP Short-Liners or segmental liners shall be of the same materials and meet the structural requirements of the full CIPP Tube liner.

A3 Material Testing Requirements

- (1) Chemical Resistance - The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical testing requirements.
- (2) Hydraulic Capacity - Overall, the hydraulic profile shall be maintained as large as possible. The CIPP shall have a minimum of the full flow capacity of the original pipe before rehabilitation. Calculated capacities may be derived using a commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.
- (3) CIPP Field Samples - When requested by the Owner, the Contractor shall submit test results from field installations in the USA of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified in above have been achieved in previous field applications. Samples for this project shall be made and tested as described herein.

2631.3 CIPPS CONSTRUCTION REQUIREMENTS

The Contractor shall clean the interior of the existing host pipe prior to installation of the CIPP liner. All debris and obstructions that will affect the installation and the final CIPP product shall be removed and disposed of. The CIPP liner shall be constructed of materials and methods, that when installed, shall provide a joint less and continuous structurally sound liner able to withstand all imposed static and dynamic loads on a long-term basis.

A Installation of CIPPS

A1 Access

It will be the responsibility of the Owner to locate and designate all manhole access points open and accessible for the work, and provide rights of access to these points. If a street must be closed to traffic because of the orientation of the sewer, the Contractor shall institute the actions necessary to do this for the mutually agreed time period. Traffic Control shall be the responsibility of the Contractor and shall conform to the latest revision of the MMUTCD and other provisions of this specification herein. The Contractor shall keep the roadway open to traffic at all times unless given prior approval by the Engineer.

A2 Water Usage

Water is available from the City at designated locations for cleaning, inversion, and other work items requiring water. Use of an approved double check backflow assembly shall be required. The Contractor shall provide his own approved assembly. The Contractor may use City water but shall inform the Public Works Department of such use and obtain a meter for documenting water usage. No fees will be charged for water.

A3 Cleaning of Sewer Lines

The Contractor shall remove all internal debris from the pipe line that will interfere with the installation and the final product delivery of the CIPP as required in these specifications. Solid debris and deposits shall be removed from the system and disposed of properly by the Contractor. Moving material from manhole section to manhole section shall not be allowed. As applicable the contractor shall either plug or install a flow bypass pumping system to properly clean the pipe lines. The Contractor shall ensure that no debris is transferred downstream during cleaning operations. The Contractor shall use a vacuum vehicle or similar means to remove debris during cleaning operations. Precaution shall be taken, by the Contractor in the use of cleaning equipment to avoid damage to the existing pipe. The repair of any damage, caused by the cleaning equipment, shall be the responsibility of the Contractor. Disposal of the cleaning debris shall be in accordance with local, State and Federal Law and shall be incidental to the CIPPS.

A4 Bypassing Wastewater

The Contractor shall provide a by-pass for the flow of existing mainline and service connection effluent around the section or sections of pipe designated for CIPP installation. Installation of the liner shall not begin until the Contractor has installed a sewage by-pass system and all pumping facilities have been installed and tested under full operating conditions including the bypass of mainline and side sewer flows. Once the lining process has begun, existing sewage flows shall be maintained, until the resin/felt tube composite is fully cured, cooled down, fully televised and the CIPP ends finished. The Contractor shall coordinate sewer bypass and flow interruptions with the Engineer at least fourteen (14) days in advance and with the property owners and businesses at least three (3) business days in advance. The pump and bypass lines shall be of adequate capacity and size to handle peak flows. The Contractor shall submit a detail of the bypass plan and design to the Engineer prior to proceeding with any CIPP installation. Compensation for by-pass pumping and all associated plans and approvals shall be included in the price bid for CIPPS Installation.

A5 Inspection of Pipelines

Inspection of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television. The interior of the pipeline shall be carefully inspected to determine the location of any conditions which may prevent proper installation of the CIPPS into the pipelines and it shall be noted so that these conditions can be corrected. A video and suitable log shall be kept for later reference by the Owner. The Owner has copies of a video inspection of the sewers to be relined, and these are available for prospective bidders. However, since the deterioration of sewer is an ongoing process, and roots, solids, and deposits can accumulate over time, the Contractor shall base the design of the liner on inspections made immediately prior to installation.

A6 Line Obstructions

It shall be the responsibility of the Contractor to clear the line of obstructions such as solids and roots that will prevent the insertion of CIPP. If pre-installation inspection reveals an obstruction such as a protruding service connection, dropped joint, or a collapse that will prevent the inversion process, that was not evident on the pre-bid video and it cannot be removed by conventional sewer cleaning equipment, if directed by the Owner, the Contractor shall make a point repair excavation to uncover and remove or repair the obstruction. Such excavation shall be approved in writing by the Owner's representative prior to the commencement of the work and shall be considered as a separate pay item.

A7 Public Notification

The Contractor shall make every effort to maintain service usage throughout the duration of the project. In the event that a service will be out of service, the maximum amount of time of no service shall be eight (8) hours for any property served by the sewer. A public notification program shall be implemented, and shall as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off-line. The Contractor shall also provide the following:

- (1) Written notice to be delivered to each home or business the day prior to the beginning of work being conducted on the section, and a local telephone number of the Contractor they can call to discuss the project or any problem which could arise.
- (2) Personal contact with any home or business, which cannot be reconnected within the time stated in the written notice.
- (3) Notification shall include advisory statements to the resident that:
 - a. To minimize odor problems during the installation of CIPP, residents should be advised to ensure that their sewer traps are in a proper state of repair. In cases of damaged, dry, or non-existent traps, the areas or rooms where floor drains or access to traps are located should be ventilated, if possible, by leaving doors or windows open to the outside during the CIPP installation process.

The Contractor shall be responsible for confirming the locations of all branch service connections prior to installing and curing the CIPP.

A8 Liner Installation

CIPP installation shall be in accordance with the applicable ASTM standards with the following modifications:

- (1) The wet-out tube shall be positioned in the pipeline using the method specified by the manufacturer. Care should be exercised not to damage the tube as a result of installation. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point. If pulled into place, a power winch should be utilized, and care should be exercised not to damage the tube as a result of pull-in friction.

- (2) Prior to installation and as recommended by the manufacturer remote temperature gauges or sensors shall be placed inside the host pipe to monitor the temperatures during the cure cycle. Liner and/or host pipe interface temperature shall be monitored and logged during curing of the liner.
- (3) Curing shall be accomplished by utilizing the appropriate medium in accordance with the manufacturer's recommended cure schedule. The curing source or in and output temperatures shall be monitored and logged during the cure cycles. The manufacturer's recommended cure schedule shall be used for each line segment installed, and the liner wall thickness and the existing ground conditions with regard to temperature, moisture level, and thermal conductivity of soil, per ASTM as applicable, shall be taken into account by the Contractor.
- (4) The Contractor shall remove protruding taps to the inside wall of the pipe. In no case shall the pipe be less than ninety five percent (95%) open to flow.

A9 Resin Impregnation

The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum impregnation process shall be used. To insure a through wet-out, the point of vacuum shall be no further than twenty-five feet (25') from the point of initial resin introductions. After vacuum in the tube is established, the vacuum points shall be no further than seventy-five feet (75') from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular to the longitudinal axis of the tube as possible. A roller system shall be used to uniformly distribute tie resin throughout the tube. If the Installer proposes an alternate method of resin impregnation, the method must produce the same results and the method approved by the Engineer.

A10 Cool Down

The Contractor shall cool the CIPP in accordance with the manufacturer's recommendations. Temperatures and curing data shall be monitored and recorded, by the Contractor, throughout the installation process to ensure that each phase of the process is achieved as approved in accordance with the CIPP System manufacturer's recommendations.

Proper curing and handling of CIPP systems shall be done using the following guidelines for discharge of by-products:

Water Curing Method:

Sanitary Sewers

- (1) Release process water to the sewer after per industry standards during/after cool-down.

Storm Sewers and Culverts

- (1) Based upon receiving waterway's assimilative capacity
 - a. Discharge water when cooled to ambient air temperature
 - b. Discharge water once styrene concentration is confirmed to be at or below 25ppm; or,
 - c. Transport process water to nearest wastewater treatment facility

Steam Curing Method:

Sanitary Sewers

- (1) Release condensate water directly to receiving sewer while processing

Storm Sewers and Culverts

- (1) Based upon receiving waterway's assimilative capacity
 - a. Detain condensate in a lined holding pond until it cools to ambient
 - b. Discharge water once styrene concentration is confirmed to be less than 25ppm; or
 - c. Retrieve condensate by pumping it into the steam generation truck's reservoir; or
 - d. Transport condensate to nearest wastewater treatment facility.

A11 Finishing Operations

The installed CIPP shall be continuous over the entire length of a sewer line section and be free from visual defects such as foreign inclusions, dry spots, pinholes, major wrinkles and delamination. The lining shall be impervious and free of any leakage from the pipe to the surrounding ground or from the ground to inside the lined pipe. Any defect, which will or could affect the structural integrity or strength of the linings, shall be repaired at the Contractor's expense. The beginning and end of the CIPP shall be sealed to the existing host pipe. The sealing material shall be compatible with the pipe end and shall provide a watertight seal. If any of the service connections leak water between the host pipe and the installed liner, the connection mainline interface shall be sealed to provide a watertight connection. If the wall of the CIPP leaks, it shall be repaired or removed and replaced with a watertight pipe as recommended by the manufacture of the CIPP system.

At all points where the liner pipe has been exposed (such as service connection fittings, or other points where the old pipe must be removed), the liner pipe and fittings shall be encased in cement-stabilized sand or other high density material as specified by the Engineer to prevent deflection due to difference in subsidence. After the encasement material is in place and accepted by the Engineer, backfill is placed and compacted to require finish grade in accordance with the specifications. Particular care should be taken to ensure compaction of earth beneath the lateral/service pipe in order to reduce subsidence and resultant bending at the lateral connection at the sewer main.

A12 Manhole Connections

A seal, consisting of a resin mixture or hydrophilic seal compatible with the installed CIPP shall be applied at manhole walls in accordance with the CIPP System manufacturer's recommendations.

A13 Reconnections of Existing Services

Services shall be identified by the Contractor prior to lining work. After the pipe has been reconstructed and tested, the service connections shall be reconnected. It is the Contractor's responsibility to make sure that all service connections are reconnected, unless otherwise directed by the Engineer. A CCTV camera and remote cutting tool shall be used for internal reconnections. The machined opening shall be at least ninety five percent (95%) of the service connection opening and the bottom of both openings must match. The opening shall not be more than one hundred percent (100%) of the service connection opening.

The edges of the opening shall not have pipe fragments or liner fragments, which may obstruct flow or snag debris. In the event that service reinstatements result in openings that are greater than one hundred percent (100%) of the service connection opening, the Contractor shall install a CIPP type repair, sufficiently in size to completely cover the over-cut service connection. No additional compensation will be paid for the repair of over-cut service connections. Discs of pipe material resulting from service tap cutting shall be collected at the next manhole downstream of the pipe rehabilitation operation prior to leaving the site. Discs shall not be allowed to pass through the system.

A14 CIPP Short-Liner

The CIPP short-liner shall meet the requirements of the full length CIPP liner and the following:

- (1) The Short-Liner shall be inserted into the existing sewer line with a power winch and steel cable attached to the end of the liner by use of an appropriate pulling head. Length of the liner to be inserted at any one time shall be governed by the length of the section in need of repair or the maximum length of the installation equipment considering the size and condition of the sewer.
- (2) A mobile installation unit shall be brought to the site ready to process the liner. The installation unit shall contain heat generating equipment, CCTV facility and other auxiliary miscellaneous equipment necessary for controlling processing of the Short-Liner pipe. The equipment shall be positioned next to the point of entry with minimum obstruction to the other side activities and shall be operated by trained personnel only.
- (3) The pressure shall be increased to compensate for the heating-cooling transition and it shall be maintained until the temperature at the lowest critical point is 100° F (38° C). This shall constitute completion of the Short-Liner pipe processing. The pipe within the pipe shall be tight fitting and adapted to the existing sewer pipe.

B TESTING AND INSPECTION

B1 Testing

CIPP samples shall be prepared and tested in accordance with ASTM F1216, Section 8.1, using either method proposed. Leakage testing of the CIPP shall be accomplished during cure while under a positive head. CIPP products in which the pipe wall is cured while not in direct contact with the pressurizing fluid (e.g., a removable bladder) must be tested by an alternative method approved by the Engineer.

B2 Inspection

Visual inspection of the CIPP shall be in accordance with ASTM F1216, Section 8.4. The relined pipe shall be continuous without joints through the entire pipe length. The liner shall be free of all visible defects except those resulting from pre-lined conditions which the Contractor has noted prior to lining. There shall be no pits, pinholes, cracks, or crazing, and the surface shall be smooth and free of waviness throughout the pipe. Any defects shall be repaired by the Contractor with no expense to the Owner. Where leakage is observed through the wall of the pipe, the contractor shall institute additional testing including but not limited to air testing, localized testing and any other testing that will verify the leak proof integrity of the installed CIPP to the satisfaction of the Owner.

B3 Televising

Prior to final acceptance of any sanitary sewer relining including short-liners, the Contractor shall inspect by means of remote closed circuit television equipment the entire segment of sanitary sewer, manhole-to manhole. Sewer shall be cleaned prior to inspection. A video of the inspection shall be furnished to the City. The following conditions shall apply to the sewer acceptance TV inspection:

- (1) The video shall be in a format to be decided by the Owner, that creates high quality picture and sound and shall be recorded in color.
- (2) The TV camera shall be pulled through the sewer at a maximum rate of thirty-five feet (35') per minute.
- (3) The camera shall be pulled downstream in all cases.
- (4) The lens of the camera shall be cleaned at each manhole or when directed by the Owner.
- (5) The recording shall have an on-screen display showing the following:
 - a. Upstream and downstream manhole numbers
 - b. Footage from the upstream manhole
 - c. Inspection date
- (6) Sewers shall not be televised within forty-eight (48) hours of a rainfall event greater than one half inch ($\frac{1}{2}$ ").

2631.4 CIPPS METHOD OF MEASUREMENT

Measurement for CIPP Lining shall be on a linear foot basis, to the nearest whole foot, measured from center of manhole to center of manhole.

2631.5 CIPPS BASIS OF PAYMENT

The proposal form shall cover all work shown on the contract drawings, specifications, and Special Provisions. All costs associated with the work including furnishing of all materials, providing all construction and equipment, and performing all necessary labor, coordination, supervision, and management to fully complete the work, shall be included in the unit or lump sum prices quoted in the proposal form. This work shall include restoration of all surfaces to their original condition or better. Reconnection of all existing services shall be considered incidental to the CIPPS. All work not specifically set forth as a pay item in the proposal form shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be included in the amounts and prices submitted in the proposal form.

The following methods of measurement for payment will be used to derive the quantities installed:

(1) Site Protection and Restoration

- a. No separate payment will be made for protection and restoration of roadway surfaces, curb and gutter, landscaping, and other site features unless otherwise specified.

(2) Spot Repair to existing pipe

- a. Bid items have been provided in the proposal for removal and replacement of pipe as Spot or Point Repairs. No additional compensation will be granted for repairs.

(3) Cured-in-Place Pipe System (CIPPS)

- a. Payment shall be made at the unit price as listed on the proposal. All work related to the cleaning, installation and acceptance of the system as a whole shall be considered incidental to CIPPS installation.
- b. Payment for re-instatement of services shall be at the unit price listed on the proposal per each service, and shall be compensation in full for all materials, labor, equipment, and maintenance necessary to complete the work as required by the plans or required by the Engineer.
- c. Payment for Short-Liner installations shall be made at the unit price listed on the proposal and shall be compensation in full for all materials, labor, equipment, and maintenance necessary to complete the work as required by the plans or required by the Engineer.

SECTION 2641 – STANDARD SPECIFICATIONS FOR PIPELINE REHABILITATION BY PIPE BURSTING

2641.1 DESCRIPTION

A General

All references to MnDOT Specifications shall mean the latest published edition of the Minnesota Department of Transportation “Standard Specifications for Construction”, and all supplements and amendments thereto, published prior to the date of advertisement for bids.

This specification shall cover the rehabilitation of existing gravity and pressure utility pipelines using pipe bursting methods. Pipe bursting is a process by which the bursting unit fractures the existing pipe while simultaneously installing a new pipe of the same size or larger size pipe in the place of the existing pipe. Existing lateral and service connections are disconnected prior to mainline pipe bursting to reduce lateral pipe/service pipe damage, then reconnected after testing and disinfection of the new pipe as applicable is approved, television inspection of the new pipe is performed, and the installation is completed in accordance with the contract documents.

2641.2 QUALIFICATIONS

The Contractor shall be certified by the Pipe Bursting System Manufacturer as a fully trained installer of the pipe bursting system. The Contractor shall provide certifications of training and proficiency in the use of the equipment. Only the Contractor's employees that are trained and certified shall operate the equipment.

The Contractor shall have a minimum of five (5) years' experience using the pipe-bursting method proposed and shall have installed no less than 50,000 feet by this method.

2641.3 MATERIALS

Pipe materials meet the requirements described in Sections 2611.2 and 2621.2 of these specifications, and as provided in the Special Provisions and the following:

- (1) Sizes of the new pipe insertions shall be such to renew the pipe mainline to greater than the original flow capacity.
- (2) All pipe and fittings shall be made of virgin material. No rework except that obtained from the manufacturer's own production of the same formulation shall be used.
- (3) The pipe shall be homogenous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.
- (4) Tensile strength of the pipe shall be in accordance with manufacturer's recommendation for the specified purpose and method of installation.

- (5) Material color shall be as specified with interior of pipe having a light reflective color to allow for viewing for television inspection. The fused pipe joints shall be de-beaded to reduce collection of sediment and allow a camera to pass during inspection.
- (6) The Contractor shall consult with the selected pipe bursting equipment manufacturer regarding recommendations for the installation of pipe materials specified.

2641.4 SUBMITTALS

The Contractor shall submit the following:

- (1) Tests for compliance with this specification shall be made as specified herein and in accordance with the applicable ASTM Specification. A certificate from the manufacturer indicating the materials furnished meet the requirements of these specifications.
- (2) Shop drawings, catalog data, and manufacturer's technical data showing complete information on material composition, physical properties, and dimensions of new pipe and fittings. Include manufacturer's recommendations for handling, storage, and repair of pipe and fittings damaged.
- (3) Certification of Contractor and assigned personnel training for installing pipe.
- (4) Detailed submittal of the procedures and method proposed by the Contractor to burst the existing pipe and insert the new pipe.
- (5) Television inspection reports and video made of the existing pipe and after new pipe installation.

2641.5 DELIVERY, STORAGE, AND HANDLING

The Contractor shall transport, handle, and store pipe and fittings as recommended by the manufacturer. If new pipe and fittings become damaged before or during installation, it shall be repaired as recommended by the manufacturer or replaced as required by the Engineer at the Contractor's expense, before proceeding further. Deliver, store and handle other materials as required to prevent damage.

2641.6 LICENSE AGREEMENTS

The Contractor shall submit evidence acceptable to the Owner, such as a certified copy of a license or agreement that it has the authority to use the proposed method from the patent holder and licensed manufacturer. The Contractor agrees to defend, indemnify, and hold harmless the Owner and the Engineer against all claims, suits, and actions or other damages as a result of negligence of any person or property arising out of patent infringement by the Contractor or the Contractor's employee's, agents, the suppliers, or any tier of subcontractors involved in the work.

2641.7 CONSTRUCTION REQUIREMENTS

Before excavation is started, it will be the responsibility of the Contractor to check with the various utility companies and determine the location and depth of the existing utilities in the vicinity of the work area.

Damage to utilities and the resulting repair, temporary service cost, etc., shall be borne by the Contractor. Access pits shall be backfilled in accordance with Section 2600, Trench Excavation and Backfill.

All excavations shall be properly sheeted/shored in accordance with relevant specifications for trench safety systems. Any damage resulting from improperly shored excavations shall be corrected to the satisfaction of the Engineer with no compensation to the Contractor.

All open excavations shall be kept secure at all times by the use of barricades and fencing with appropriate lights and signs, construction tape, covering with steel plates, etc., or as directed by the Engineer.

All lateral and service connections shall be identified, located and excavated prior to the pipe insertion to expedite reconnection. The Contractor shall use excavation methods that will not create a rise or sag at the service or lateral connection for gravity sewers. A rise or sag in the sewer will be repaired by the contractor at no expense to the Owner, in a manner approved by the Engineer.

The location and number of insertion and receiving excavations shall be planned by the Contractor and submitted in writing for approval by the Engineer at least ten (10) days prior to excavation.

One (1) or more receiving pits shall be excavated at the end(s) of the pipe to be replaced or at appropriate points within the length of the existing pipe. Pit shall be centered over the existing pipe. The number of pits for machine and pipe insertion shall be the minimum necessary to most efficiently accomplish the work. The Contractor shall give consideration to the use of excavation required for other purposes such as for sanitary sewer service reconnections and manhole replacement.

Where manholes are used as machine or new pipe insertion pits, the Contractor shall identify such manholes and replace them at no additional cost to the Owner if damaged. Any manhole modification or replacement required shall be considered incidental to the installation of the new pipe. Equipment used to perform the work shall be located away from buildings so as not to create noise impact. Provide a silent engine compartment to reduce machine noise as required to meet local requirements.

The Contractor shall install all pulleys, rollers, bumpers, alignment control devices, and other equipment required to protect existing manholes and pipe components not intended for removal/replacement, and to protect the new pipe from damage during installation. Lubrication may be used as recommended by the manufacturer. If lubrication is used for insertion, the Contractor shall ensure that the lubricant does not backfill existing services. Under no circumstances will the pipe be stressed beyond eighty percent (80%) of its elastic limit as published and recommended by the manufacturer.

Pipe insertion shall be continuous and without interruption from manhole to manhole for sewers, or junction to junction for watermain, except as approved by the Engineer. Upon completion of insertion of the new pipe, and after the relaxation period, the Contractor shall expedite the reconnection of laterals and services so as to minimize any inconvenience to customers. Connection of services shall be in accordance with Sections 2611 and 2621 of these specifications and as provided in the Special Provisions.

The installed pipe shall be allowed the manufacturer's recommended amount of time, but not less than four (4) hours, for cooling and relaxation due to tensile stressing prior to any reconnection of service lines, sealing of the annulus or backfilling of the insertion pit. Sufficient excess length of new pipe, but not less than four inches (4"), shall be allowed to protrude into manholes. Restraint of pipe ends shall be achieved by means of electrofusion couplings. The electrofusion couplings shall be slipped over pipe ends against manhole wall and fused in place. Installation of electrofusion couplings shall be done in accordance with the manufacturers recommended procedures.

Following the relaxation period, the annular space at the manhole shall be sealed. Sealing shall be made with material approved by the Engineer and shall extend a minimum of eight inches (8") into the manhole wall in such a manner as to form a smooth, uniform, watertight joint.

Fused pipe joints shall be de-beaded to create a smooth flow line. There shall be no ridges or burrs from the fusion method exposed on the interior of the pipe following installation.

Tracer wire shall be installed with the pipe in accordance with 2611 and 2621.

Equipment: The pipe bursting tool shall increase the external dimensions sufficiently, causing breakage of the existing pipe at the same time expanding the surrounding ground. Simultaneously, the new pipe, directly attached to the expander, shall also move forward. See manufacturer's specifications for what size tool should be used in what diameter of pipe, as well as parameters of what size tool for percentage of upsize allowed.

The bursting head shall incorporate a shield/expander to prevent collapse of the hole ahead of the pipe insertion.

Bypass Pumping: The Contractor, when and where required for sanitary sewer replacement, shall provide diversion for the pipe bursting/replacement process. The pumps and by-pass lines shall be of adequate capacity and size to handle all flows. All costs for by-pass pumping required during installation of the pipe shall be incidental to the installation of the pipe, unless otherwise provided in the Special Provisions.

Temporary Water: The Contractor when and where required for watermain replacement, shall provide all labor, materials, and equipment associated with managing, constructing, and maintaining a temporary potable water distribution system for all existing water users which must be taken out of service for a period exceeding eight (8) hours, or as required at the discretion of the Engineer. All costs to provide temporary water required during installation of the pipe shall be incidental to the installation of the pipe, unless otherwise provided in the Special Provisions.

2641.8 TESTING AND INSPECTION

Testing: Tests for compliance with this specification shall be made as described herein and in accordance with the applicable ASTM Specification. A certificate with this specification shall be furnished, upon request, by the manufacturer for all material furnished under this specification.

Inspection: Video inspection of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit color television. Video inspection shall include the following:

- Two (2) copies of the DVD's in mpeg4 format (post) to be submitted to the Owner before final invoice.
- DVD's are to remain property of the Owner; Contractor to retain second copy.
- All flows tributary to reach of sewer being inspected are to be completely by-passed around the reach during inspection if necessary and required by the Owner.
- Pre-construction video of the existing pipe and post construction video inspection upon completion of reconstruction of each reach of pipe, with the voice description, with stationing of services indicated. Data and stationing to be on video.
- Should any portion of the video inspection be of inadequate quality or coverage, as determined by the Owner the Contractor will have the portion re-inspected and video recorded at no additional expense to the Owner.

2641.9 METHOD OF MEASUREMENT

Measurement for pipe bursting shall be on a linear foot basis, to the nearest whole foot, measured from center of manhole to center of manhole or junction point to junction point as indicated on the plans.

2641.10 BASIS OF PAYMENT

Pipe Bursting: The work performed as prescribed by this item will be paid for by the linear foot at the unit price bid for the pipe bursting/replacement at the specified pipe diameter and location which price shall be full compensation for the installation of the new pipe, furnishing and placing of all materials, labor, tools, equipment, cleaning, and preparation of the existing pipe to receive the new pipe, tracer wire, pipe bedding, backfill material, annulus sealing material and launching pits, and video inspection of final installed pipe, bypass pumping, temporary water distribution, traffic control, sealing at manholes, locating, excavating, disconnecting, testing in accordance with the Contract Documents, and all else incidental thereto for which separate payment is not provided under other Items in the Bid Form.

APPENDIX B

CITY OF NORTH BRANCH STANDARD DETAIL PLATES

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STANDARD DETAIL PLATES

Erosion Control

ERO-001	Placement and Construction of Silt Fence
ERO-002	Placement and Construction of Bale Checks
ERO-003	Storm Sewer Inlet Protection
ERO-004	Pond Outlet Skimmer
ERO-005	Outlet Screen
ERO-006	Erosion Control Blanket
ERO-007	Bioroll Ditch Check Temporary Sediment Control
ERO-008	Flotation Silt Curtain Work Area and Still Water
ERO-009	Bio-Filtration Basin
ERO-010	Rock Weeper & Rock Ditch Check
ERO-011	Erosion Control Blanket Installation at Ponds
ERO-012	Slope Tracking

Miscellaneous

MISC-001	Standard MnDOT Plates
MISC-002	Placement of Insulation
MISC-003	Conservation Signs

Roadway

RDW-001	Typical Residential Urban Street
RDW-002	Typical Residential Rural Street
RDW-003	Concrete Curb and Gutter
RDW-004	Surmountable Curb and Gutter at Catch Basin
RDW-005	Street Radius for Concrete Curb and Gutter
RDW-006	Typical Residential Concrete Driveway Apron
RDW-007	Rural Section Driveway & Culvert Installation
RDW-008	Typical Commercial Driveway Entrance
RDW-009	Residential Driveway Entrance Without Apron
RDW-010	Typical Street Sign
RDW-011	Typical Bituminous Trail
RDW-012	Typical Concrete Walk
RDW-013	Mailbox Installation Detail
RDW-014	Standard Cul-De-Sac
RDW-015	Concrete Valley Gutter Detail

Sanitary Sewer

SAN-001	Sanitary Sewer Service Detail
SAN-002	Standard Manhole for Sanitary Sewer
SAN-003	Sanitary Sewer Main to Clay Pipe Connection Detail
SAN-004	Standard Sanitary & Storm Sewer Frame & Cover for Manhole
SAN-005	Casting Adjustment for Sanitary and Storm Sewer
SAN-006	Typical Trench Compacting and Class B Bedding
SAN-007	Outside Drop Section for Sanitary Sewer
SAN-008	Sanitary Sewer Service Cleanout
SAN-009	Go, No-Go 5% Deflection Testing Mandrel for Flexible Sewer Pipe
SAN-010	Inside Drop Manhole for Sanitary Sewer

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STANDARD DETAIL PLATES

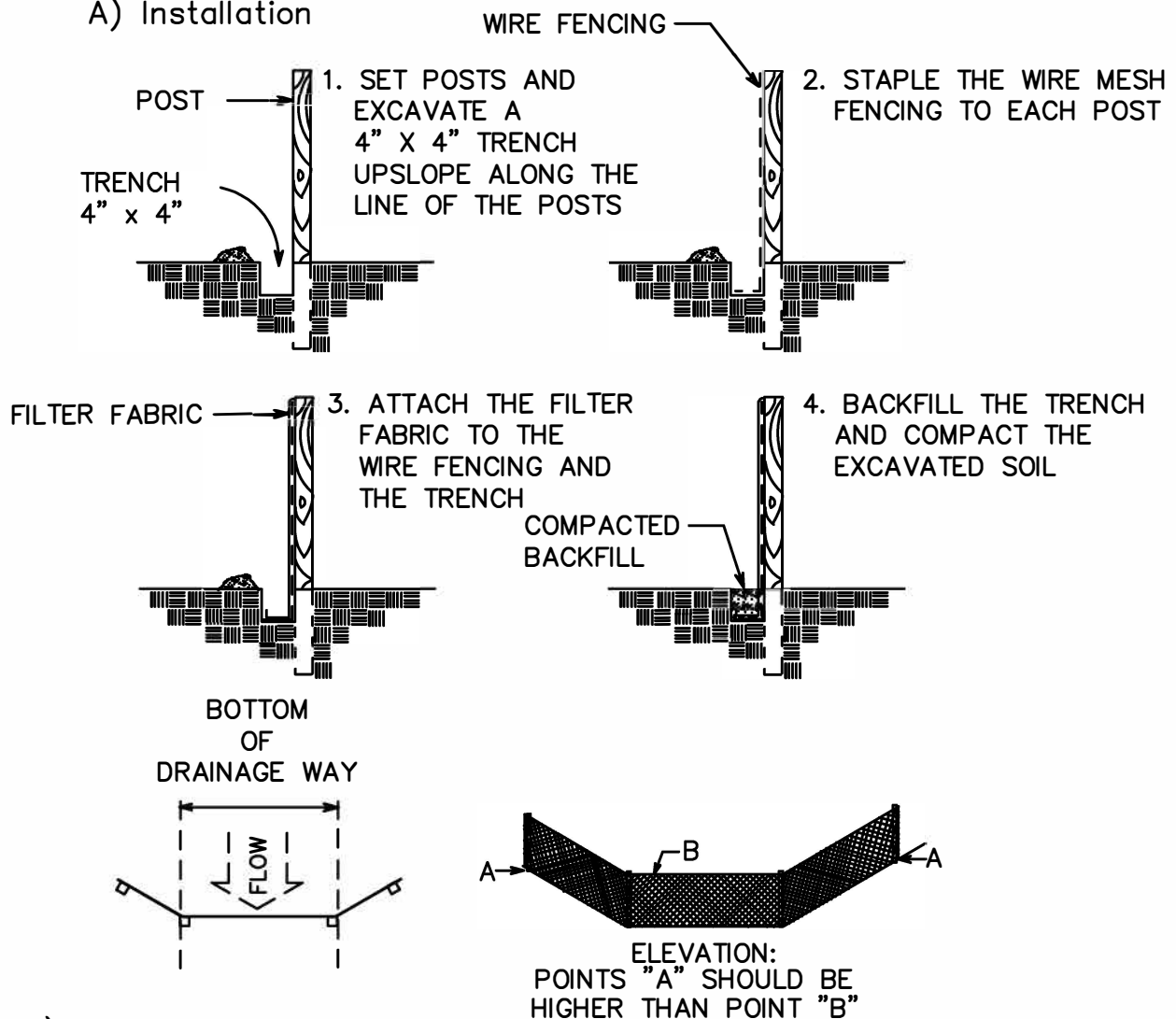
Storm Sewer

STM-001	Standard Storm Sewer Manhole, MnDOT 4020 Manhole
STM-002	Standard Storm Sewer Catch Basin Manhole
STM-003	Concrete Collar for Catch Basin Casting
STM-004	Beehive Manhole Grate
STM-005	Flared End Sections and Trash Guard Detail
STM-006	Piling for Flared End Sections – 24" Pipe and Larger
STM-007	Hand Placed Rip Rap at RCP Outlets
STM-008	Drain Tile Installation

Watermain

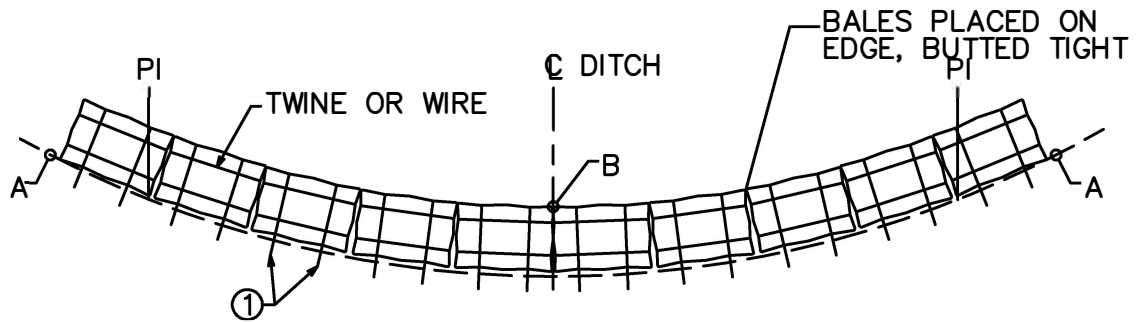
WM-001	Typical Hydrant Assembly Installation
WM-002	Typical Water Service
WM-003	Valve Box Installation
WM-004	Butterfly Valve Installation
WM-005	Thrust Blocking
WM-006	Watermain Lowering and Insulation Details
WM-007	Air Bleed Installation Detail
WM-008	Irrigation Detail

A) Installation

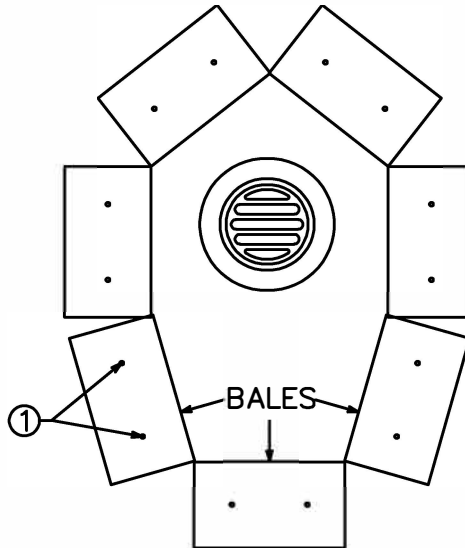


B) Maintenance

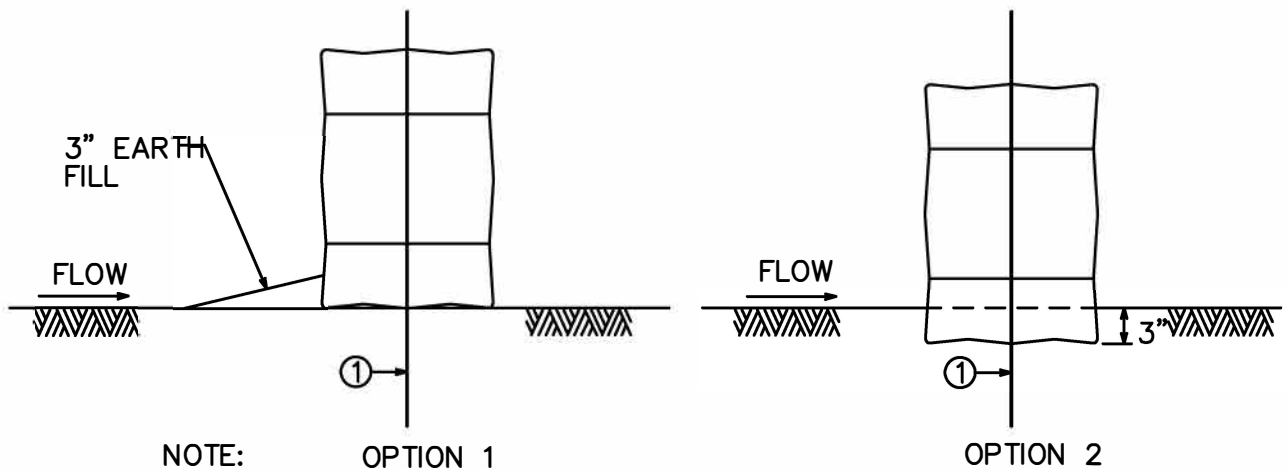
1. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USEABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY $\frac{1}{3}$ THE HEIGHT OF THE BARRIER.
4. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEED, OR REMOVED



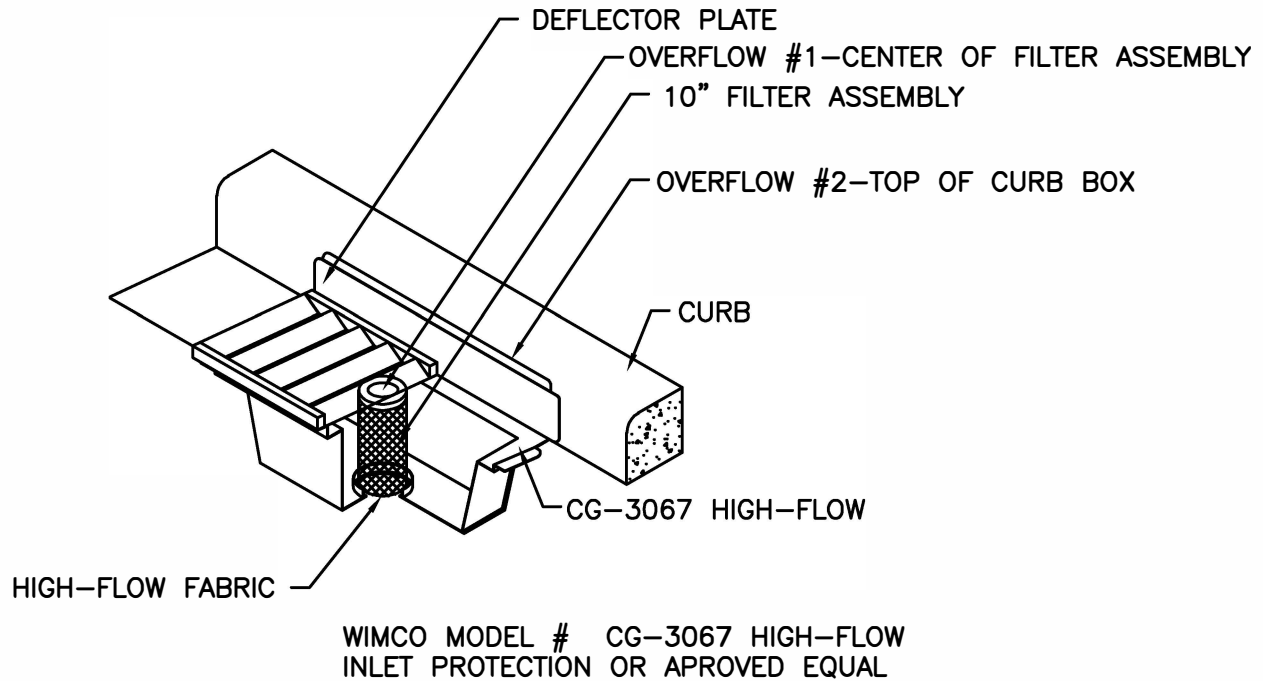
NOTE: POINT A MUST BE HIGHER, THAN POINT B
BALE DITCH CHECK



BALE CHECK
TO PROTECT STORM SEWER INLETS

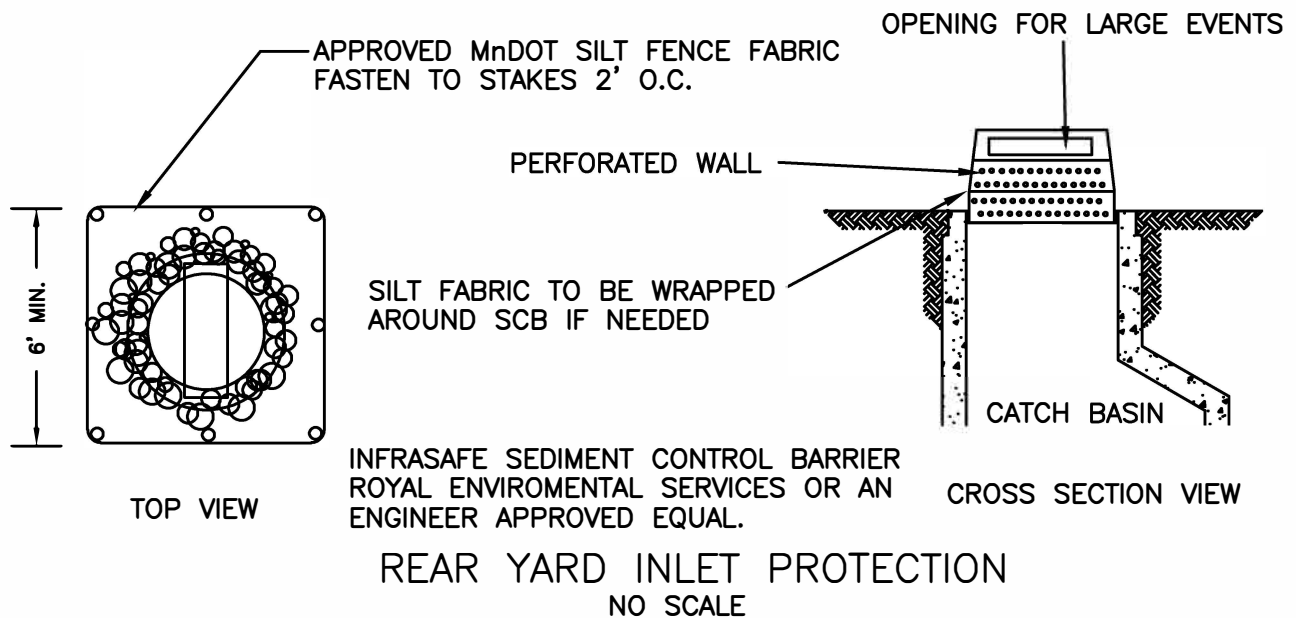


NOTE: OPTION 1
OPTION 2
① TWO 2"x 2" WOOD STAKES OR STEEL REINFORCING BARS IN EACH BALE AND EMBEDDED IN THE GROUND 10" MINIMUM.

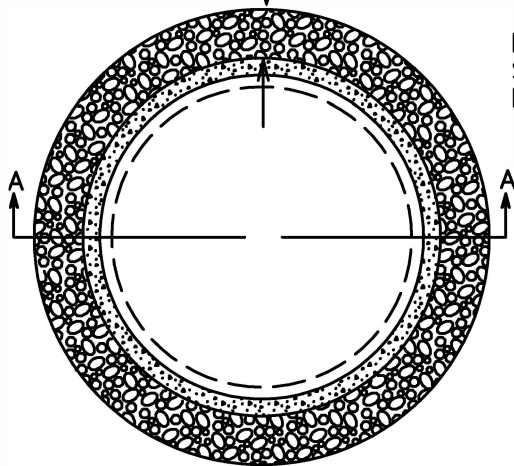


CURB AND GUTTER INLET PROTECTION

NO SCALE



4' CONCRETE COLLAR

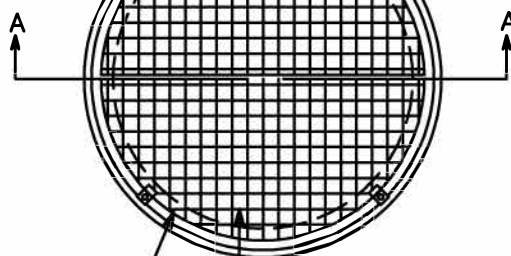


PLAN

OUTSIDE MANHOLE WALL TO FLAT BAR = 1"

PROVIDE 4-1/2" SS ANCHOR BOLTS W/CLIPS

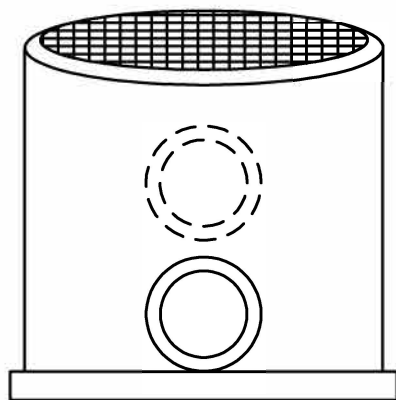
1/4" X 1" FLAT BAR (ROLLED TO PROVIDE OUTER RING)



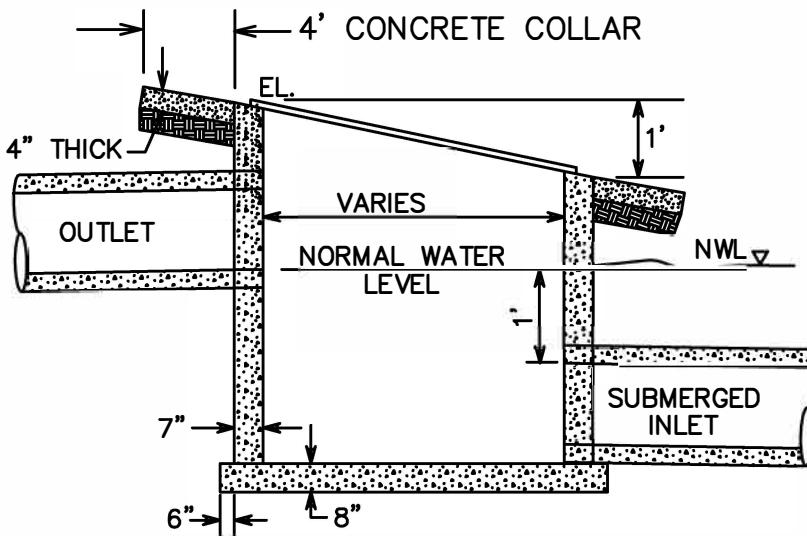
HOT DIPPED GALVANIZED GRATE IN 2 SECTIONS (SEE ERO-004 FOR SCREEN DETAIL)

#5 SMOOTH BAR @ 4" O.C. EACH WAY (PROVIDE 3-1/4" X 3-1/4" OPENING)

PLAN

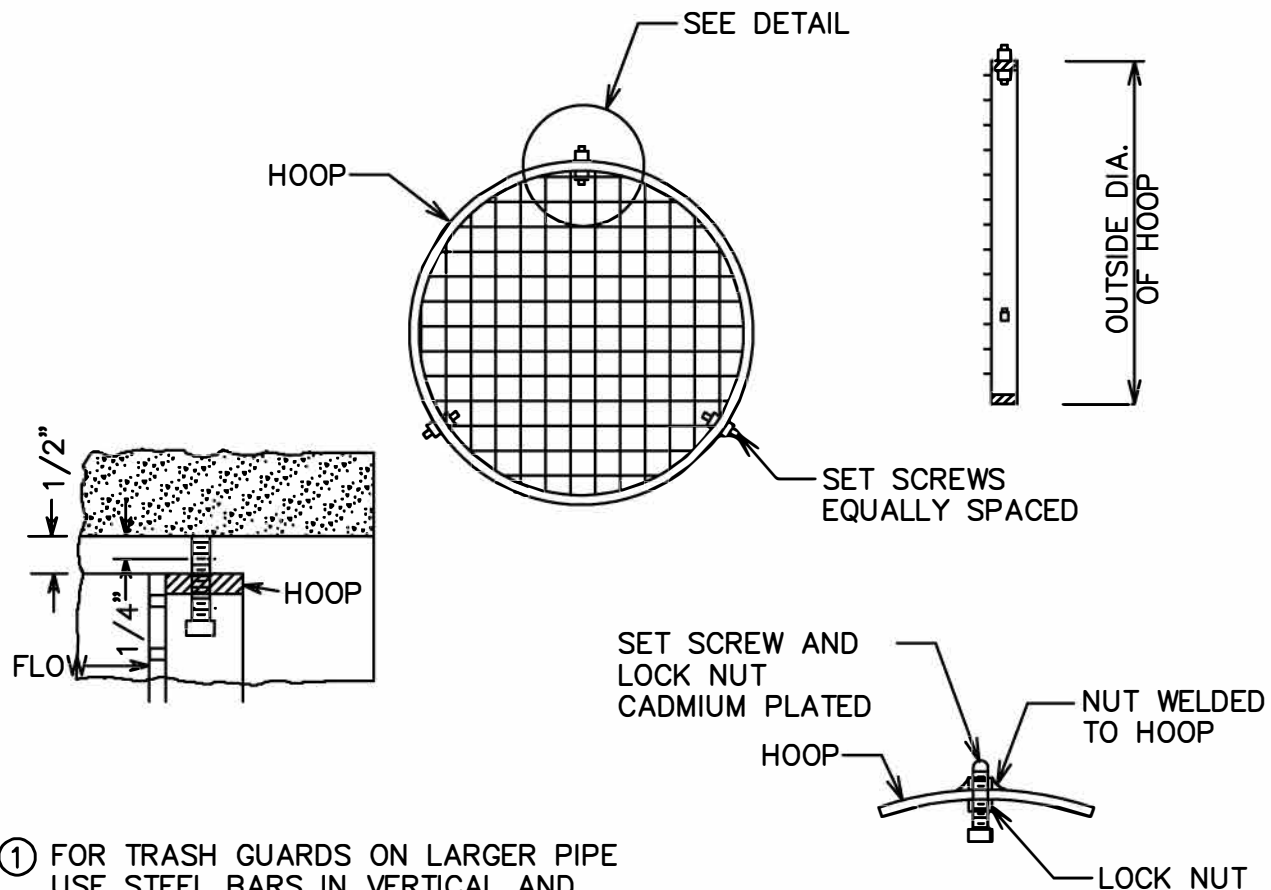


ELEVATION

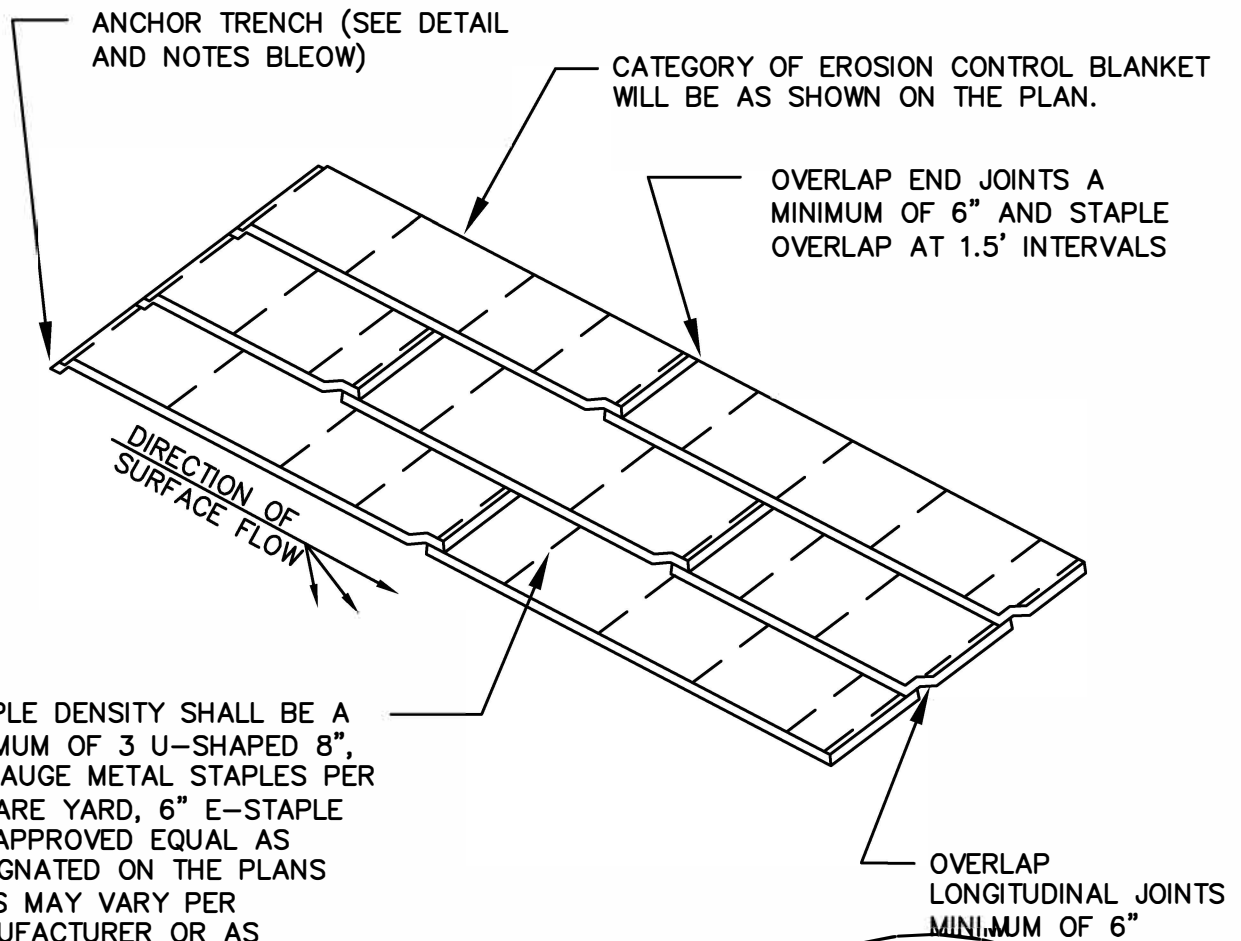


SECTION A-A

PIPE SIZE	HOOP DIMENSIONS		WIRE CLOTH		SET SCREWS	
	OUTSIDE DIAM.	STOCK SIZE	MESH	WIRE GAUGE	SIZE	NO.
6"	5"	$\frac{3}{8}" \times 1\frac{1}{2}"$	$\frac{5}{8}"$	16	$\frac{3}{8}" \times 1\frac{1}{4}"$	3
8"	7"	" "	"	16	" "	"
10"	9"	" "	"	16	" "	"
12"	11"	$\frac{1}{4}" \times 1\frac{1}{2}"$	"	14	" "	"
15"	14"	" "	"	14	" "	"
18"	17"	" "	1"	14	" "	"
24"	23"	" "	"	12	" "	"
30"	29"	" "	"	10	$\frac{1}{2}" \times 1\frac{1}{4}"$	4
36"	35"	$\frac{3}{8}" \times 1\frac{1}{2}"$	"	10	" "	4



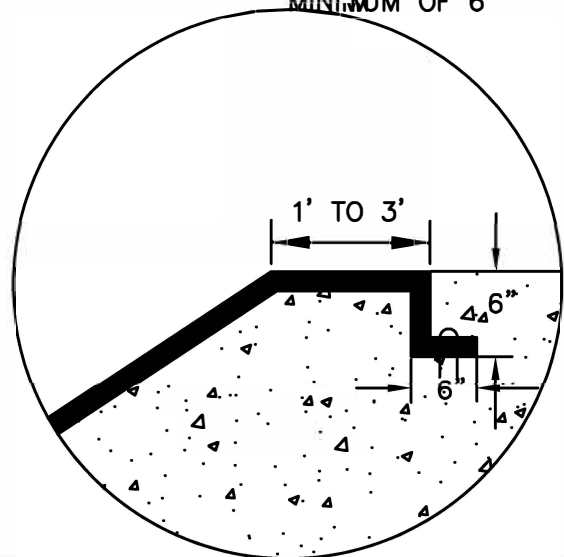
- ① FOR TRASH GUARDS ON LARGER PIPE USE STEEL BARS IN VERTICAL AND HORIZONTAL DIRECTION (BAR SIZE & SPACING AS REQUIRED.)
- ② ALL HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH MN/DOT 3392 EXCEPT AS NOTED.
- ③ ALL STRUCTURAL SHAPES, PLATES AND BARS SHALL BE GALVANIZED IN ACCORDANCE WITH MN/DOT 3394 EXCEPT AS NOTED.

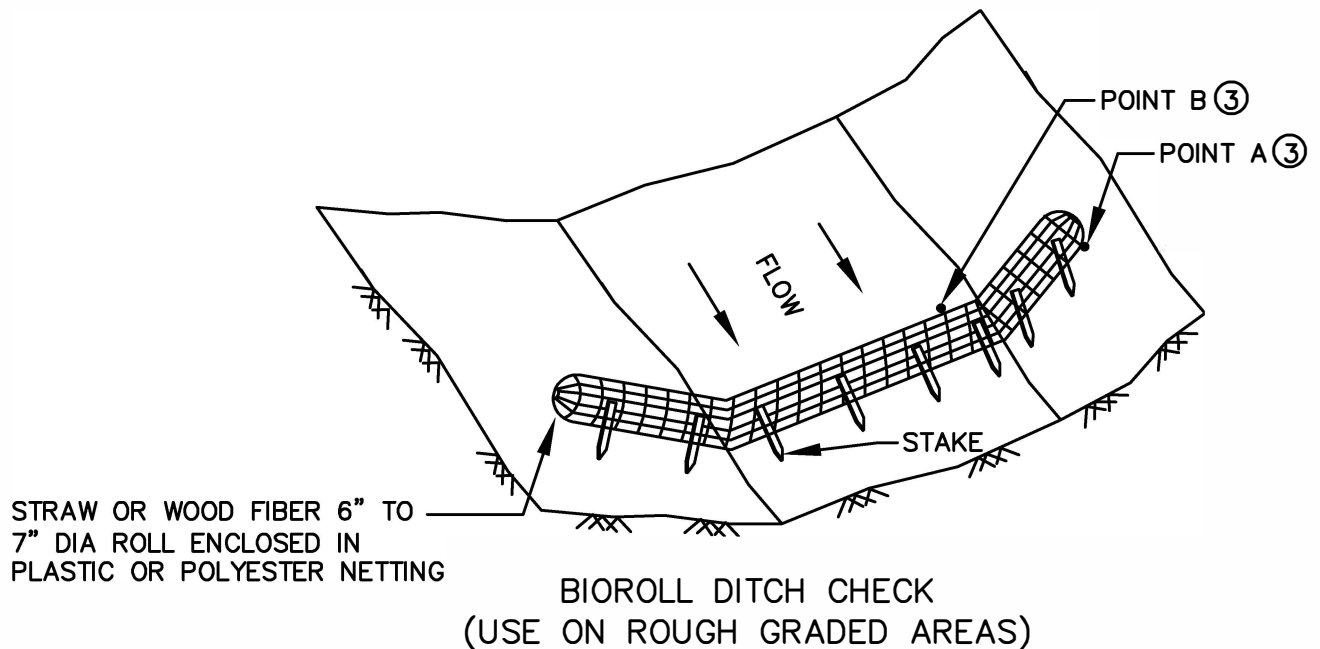
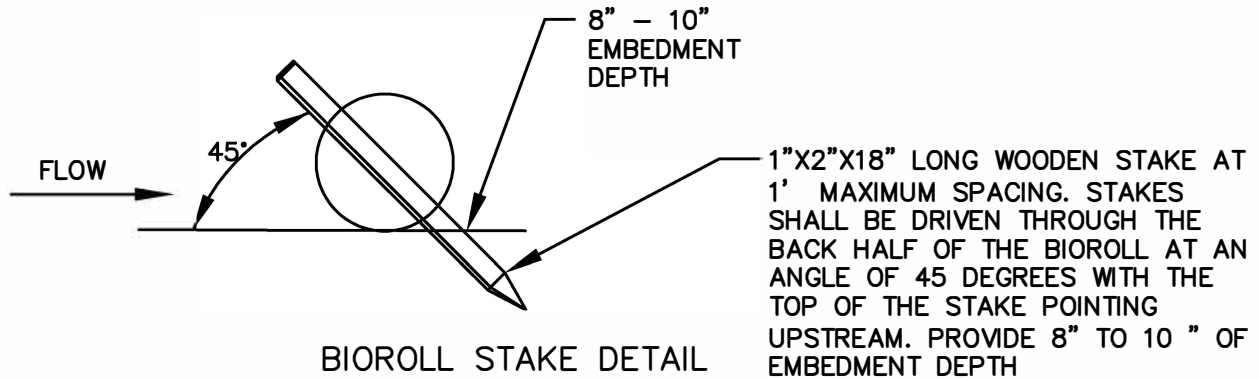


STAPLE DENSITY SHALL BE A MINIMUM OF 3 U-SHAPED 8", 11 GAUGE METAL STAPLES PER SQUARE YARD, 6" E-STAPLE OR APPROVED EQUAL AS DESIGNATED ON THE PLANS (THIS MAY VARY PER MANUFACTURER OR AS REQUIRED ON THE PLANS.)

ANCHOR TRENCH

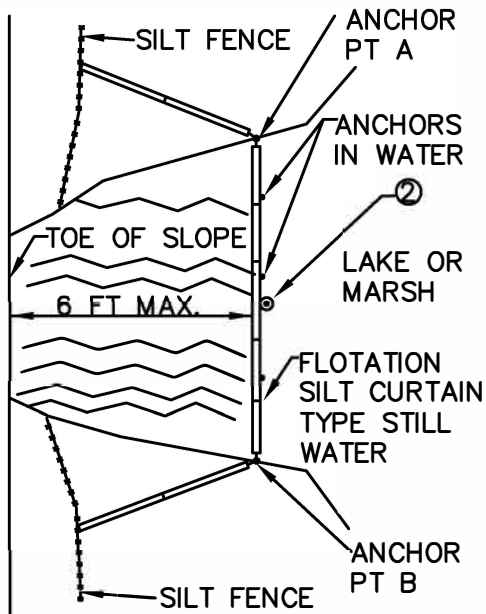
1. DIG 6" X 6" TRENCH
2. LAY BLANKET IN TRENCH
3. STAPLE AT 1.5' INTERVALS OR AS DIRECTED ON THE PLANS
4. BACKFILL WITH NATURAL SOIL AND COMPACT
5. ANCHOR TRENCHES SHALL BE PLACED AT THE TOP OF SLOPE, AND EVERY 100 LINEAR FEET OF SLOPE



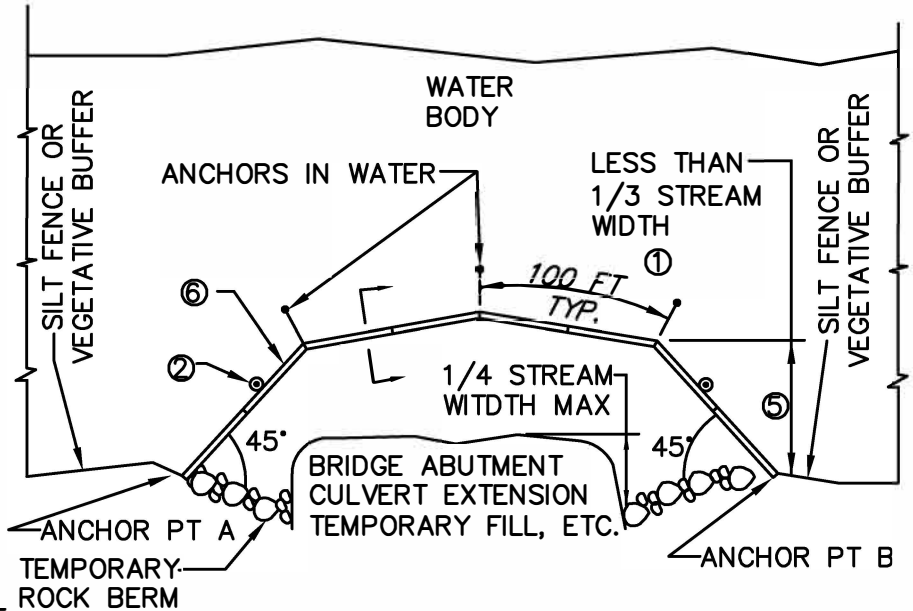


NOTES:

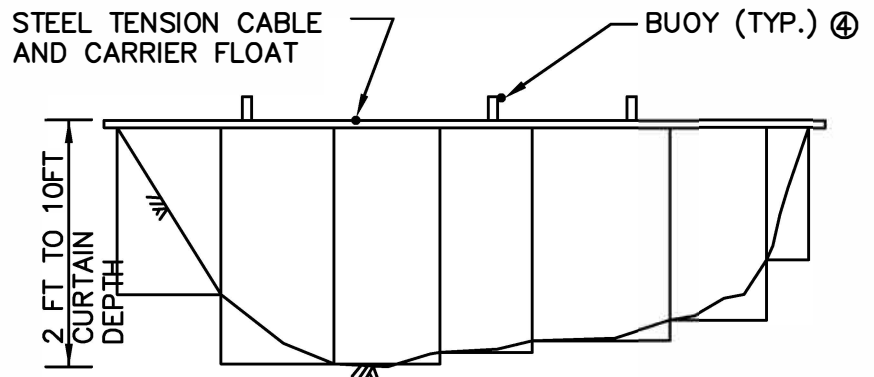
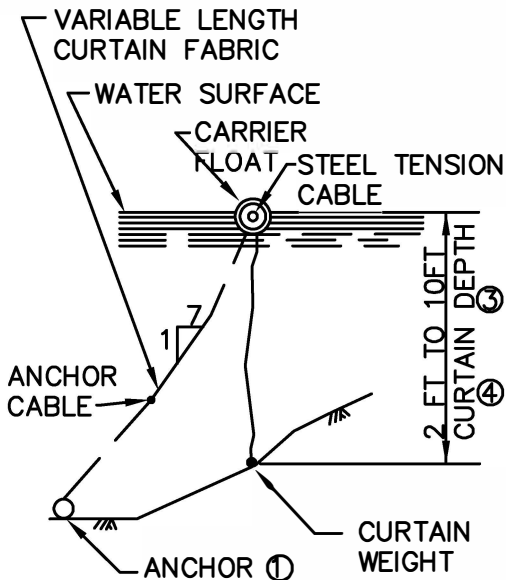
1. SEE MNDOT SPECS 2573, & 3889
2. APPROXIMATE SPACING OF DITCH CHECK (FT)= $Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\% \text{ CHANNEL SLOPE}} \times 100$
3. POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.



PLAN VIEW (TYPE: STILL WATER)



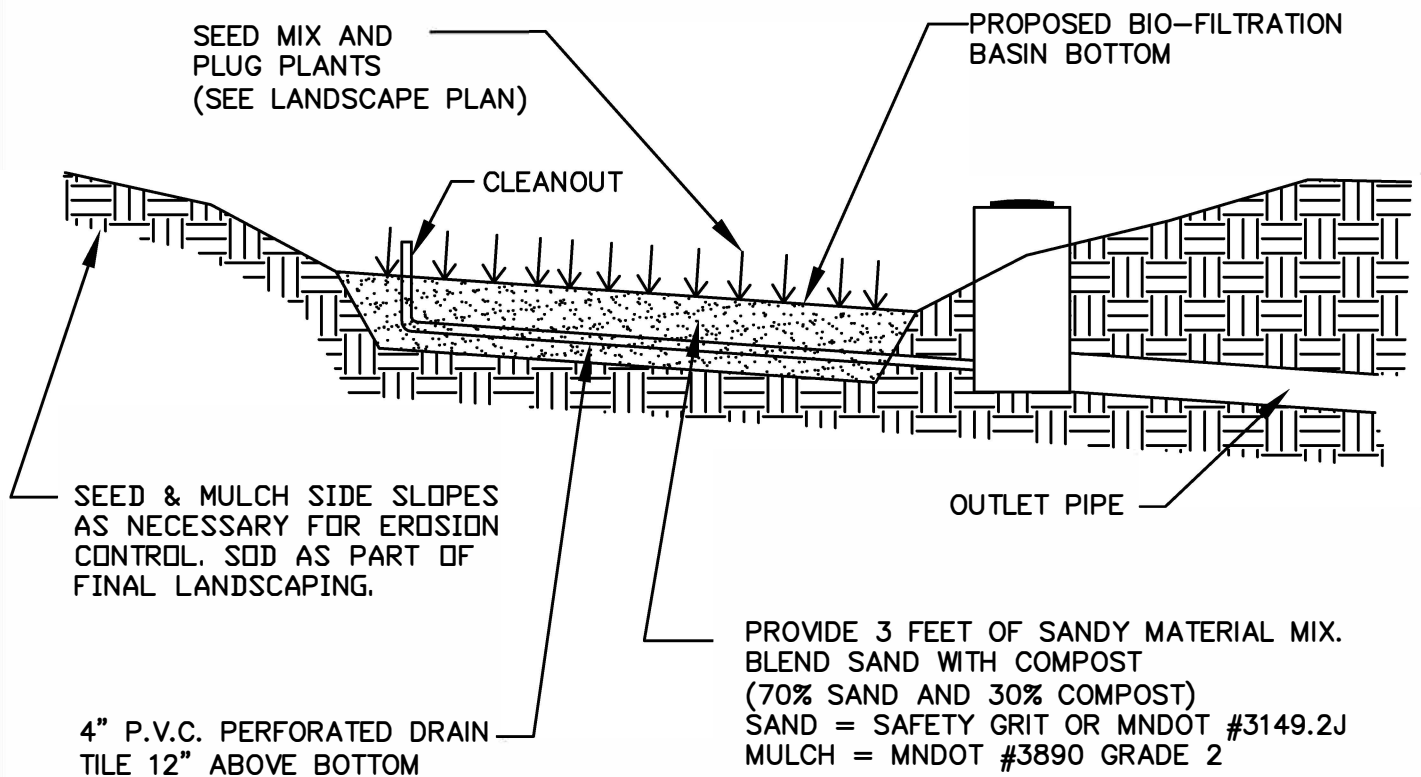
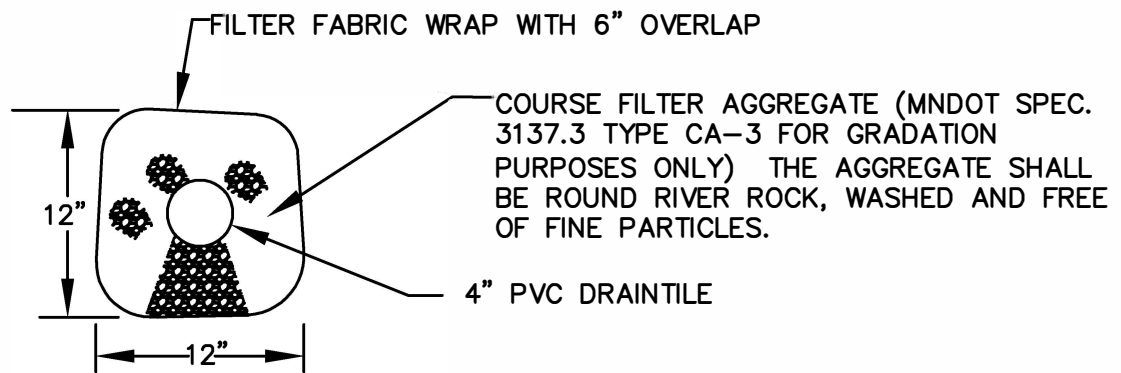
PLAN VIEW (TYPE: WORK AREA)



NOTES:

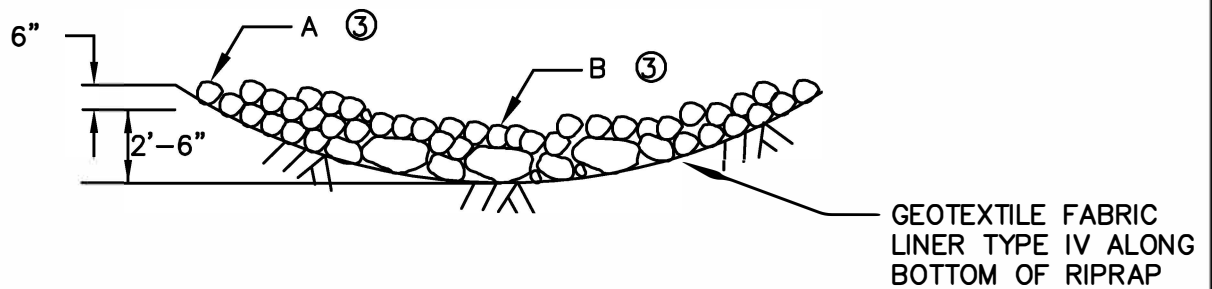
SEE MNDOT SPEC. 2573 & 3887

1. FOR ANCHOR AND WEIGHT REQUIREMENTS, SEE MNDOT SPEC 2573
2. ON MOTORIZED WATER WAYS, BUOYS ARE REQUIRED TO MARK THE ENDS AND SPECIAL AREAS FOR VISIBILITY. PLACE BUOYS AS REQUIRED FOR NAVIGATIONAL PURPOSES.
3. WATER DEPTH CAN BE TO 10 FEET.
4. SILT CURTAIN HEIGHT INCLUDES MAXIMUM WAVE HEIGHT FOR WATER BODY.
5. KEEP AS CLOSE TO WORK AREA AS POSSIBLE
6. SILT CURTAIN, ROCK BERM OR SHEET PILE AS REQUIRED TO CONTROL THE INFILTRATION OF SILT.
7. IF 6 INCHES OR LESS OF WATER, USE BALE BARRIERS

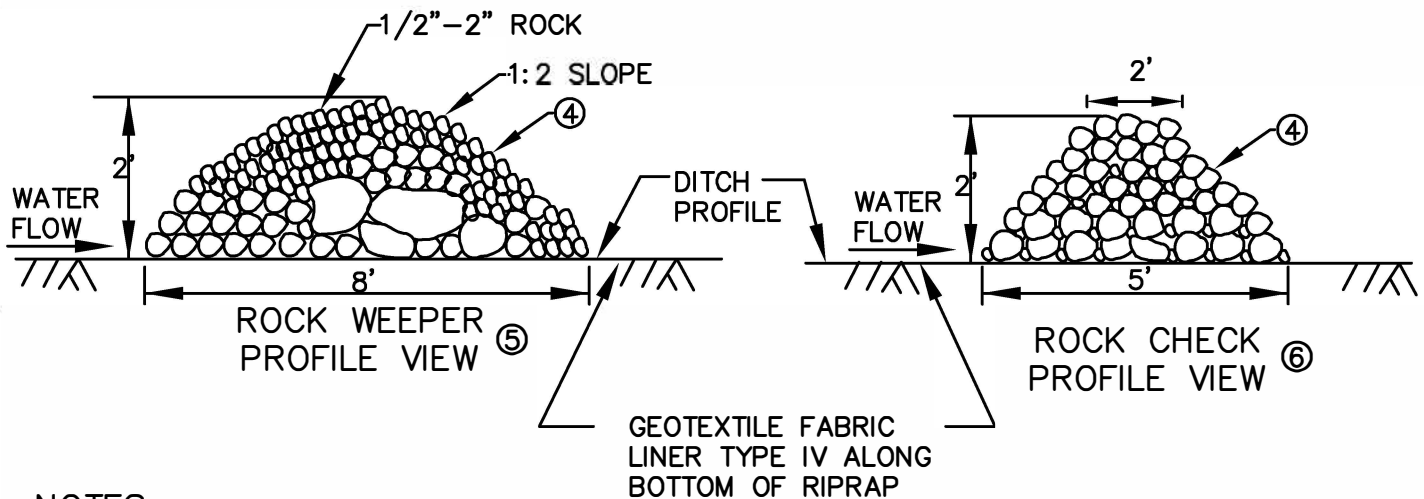


NOTE:

1. 40" EXCAVATION REQUIRED TO PROVIDE FOR A TOTAL 36" OF SAND COMPOST MIXTURE WITH 4" DOUBLE-SHREDDED HARDWOOD MULCH ON TOP.
2. THE BOTTOM OF THE EXCAVATION SHALL BE SCARIFIED TO A 2' DEPTH WITH A FROST RIPPING TOOTH OR OTHER APPROVED METHOD.



CROSS SECTION (ROCK WEEPER AND ROCK CHECK)

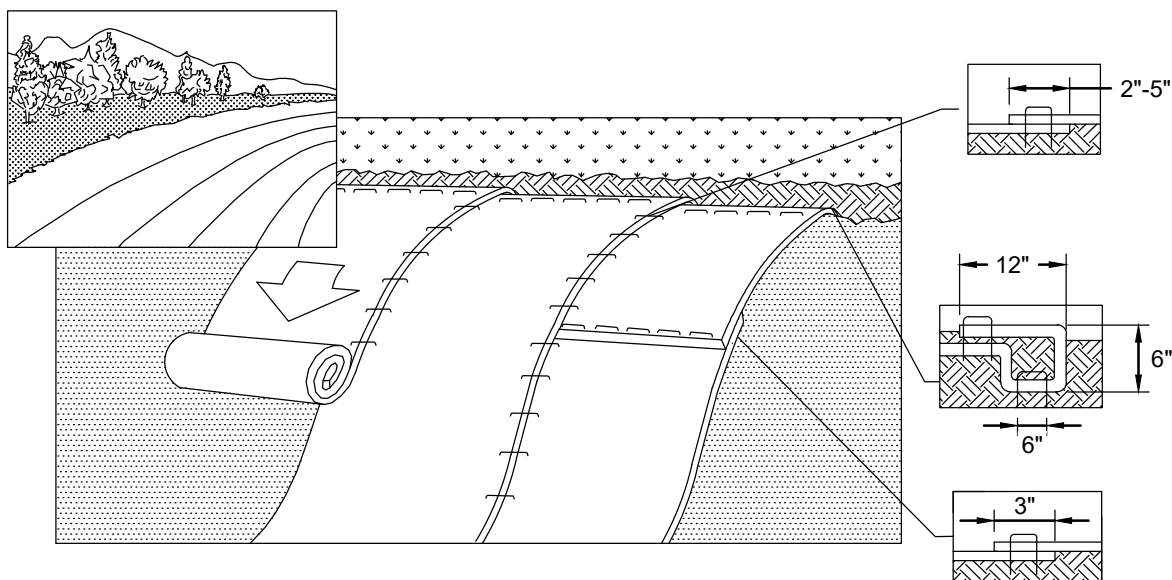
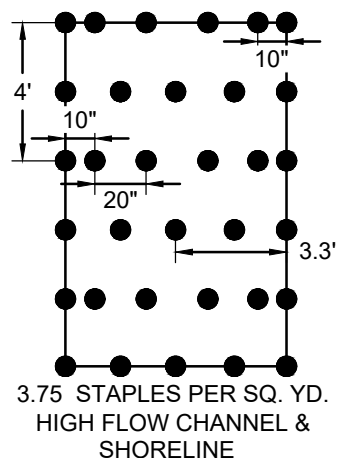
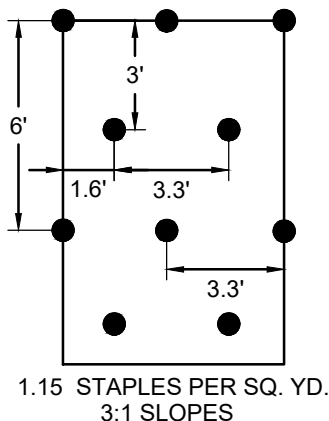
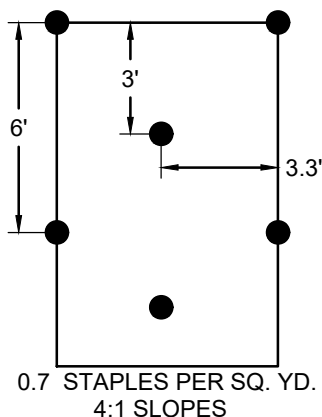


NOTES:

1. SEE MNDOT SPECS 2573, 3601, 3733 & 3889
2. APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA

$$\text{APPROXIMATE SPACING OF DITCH CHECK (FT)} = Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\% \text{ CHANNEL SLOPE}} \times 100$$

3. POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.
4. CLASS I-IV RIPRAP (SPEC. 3601) WITH GEOTEXTILE FABRIC LINER, TYPE IV (SPEC 3733)
5. THE ROCK WEEPER FILTERS SEDIMENT OUT OF THE WATER BETTER THAN THE OTHER DITCH CHECKS. THE ROCK WEEPERS COULD BE USED AS A PERMANENT WATER FILTERING FEATURE.
6. PERMANENT ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE WILL NEED TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.



NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, TO A SMOOTH GRADE SO THAT BLANKET HAS DIRECT CONTACT WITH SOILS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15cm) DEEP X 6" (15cm) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30cm) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30cm) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30cm) APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2'-5" (5cm-12.5cm) OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5cm) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30cm) APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:

*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15cm) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.



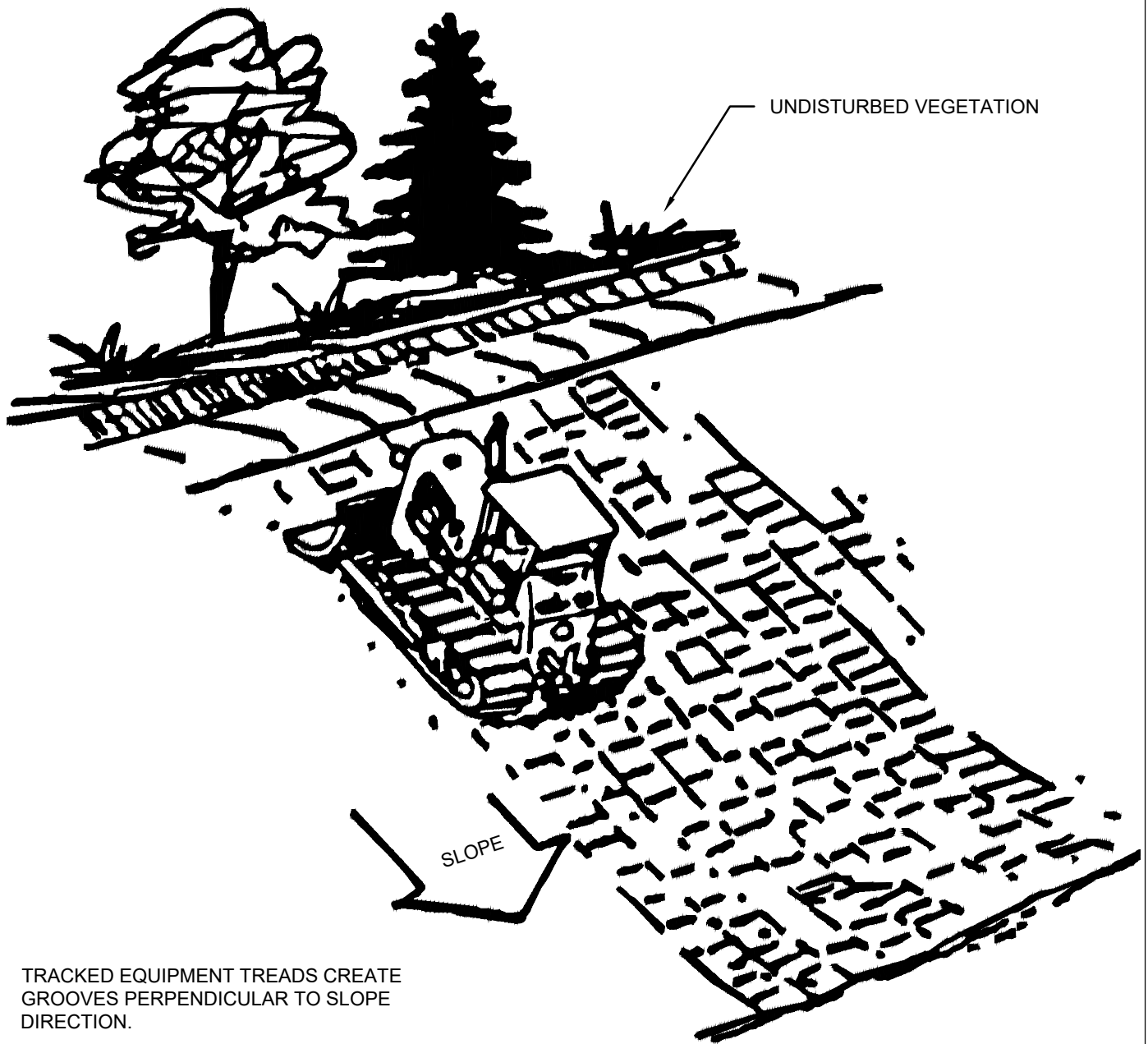
CITY OF NORTH BRANCH EROSION CONTROL BLANKET INSTALLATION AT PONDS

NO SCALE

2025 - STANDARD DETAIL

DETAIL NO.

ERO - 011



NOTE:

ALL SLOPES WITH A GRADE EQUAL TO OR STEEPER THAN 3:1 REQUIRE SLOPE TRACKING.
SLOPES WITH A GRADE MORE GRADUAL THAN 3:1 REQUIRE SLOPE TRACKING IF THE STABILIZATION METHOD IS EROSION CONTROL BLANKET.

THE FOLLOWING STANDARD PLATES SHALL APPLY ON THIS PROJECT.

PLATE NO.		MnDOT STANDARD PLATES
3000	M	REINFORCED CONCRETE PIPE
3006	H	GASKET JOINT FOR R.C. PIPE
3007	F	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES
3040	F	CORREGATED METAL PIPE CULVERT
3100	G	CONCRETE APRON FOR R.C. PIPE
3123	J	METAL APRON FOR C.S. PIPE
3124	B	METAL APRON CONNECTION
3133	D	RIP RAP AT RCP OUTLETS
3145	G	CONCRETE PIPE TIES
3221	C	CORREGATED STEEL PIPE COUPLING BAND
4006	L	MANHOLE OR CATCH BASIN (DESIGN H)
4011	E	PRECAST CONCRETE BASE
4022	A	MANHOLE OR CATCH BASIN COVER (3' x 2' OPENING)
4026	A	ENCASED CONCRETE ADJUSTING RINGS
4101	D	RING CASTING FOR MANHOLE OR CATCH BASIN (NO. 700-7)
4108	F	ADJUSTING RINGS
4110	F	COVER CASTING FOR MANHOLE
4180	J	MANHOLE OR CATCH BASIN STEP
7100	H	CONCRETE CURB AND GUTTER (DESIGN B)
7102	K	CONCRETE CURB AND GUTTER (DESIGN D, DESIGN S)
7111	J	INSTALLATION OF CATCH BASIN CASTINGS
8000	J	STANDARD BARRICADE
8002	G	PERMANENT BARRICADE



CITY OF NORTH BRANCH

STANDARD MNDOT PLATES

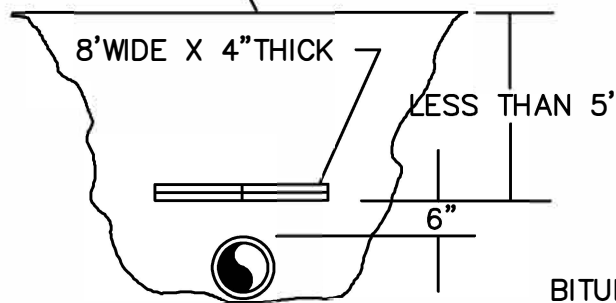
NO SCALE

2025 - STANDARD DETAIL

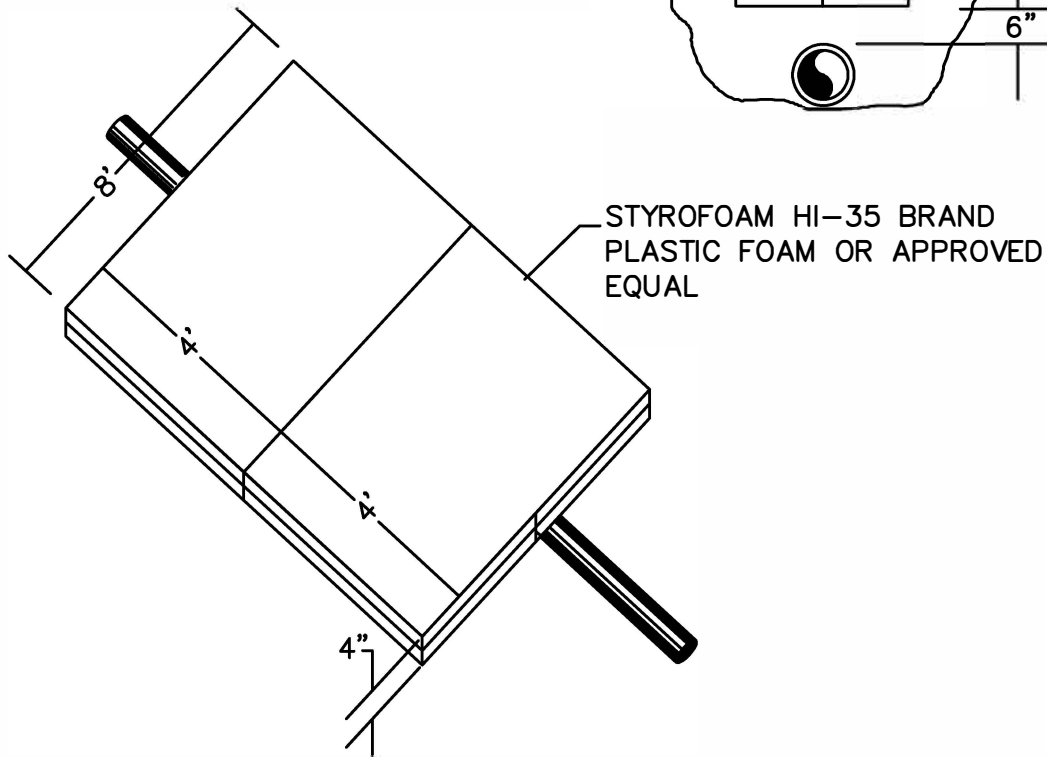
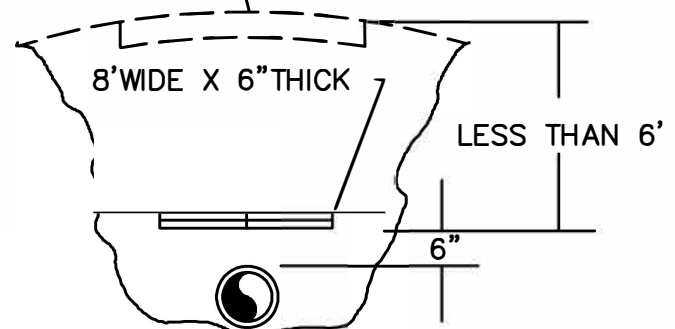
DETAIL NO.

MISC-001

GRASSY AREA



BITUMINOUS SURFACE



NOTE:
UNDERGROUND UTILITY PIPE CROSSING
8'X 8'X 4"THICK CENTERED OVER PIPE

Natural Area



This area's vegetation:

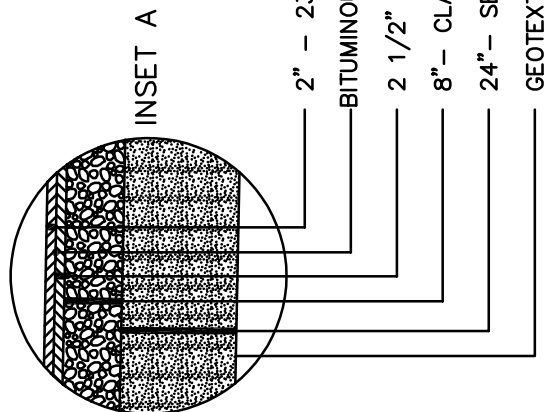
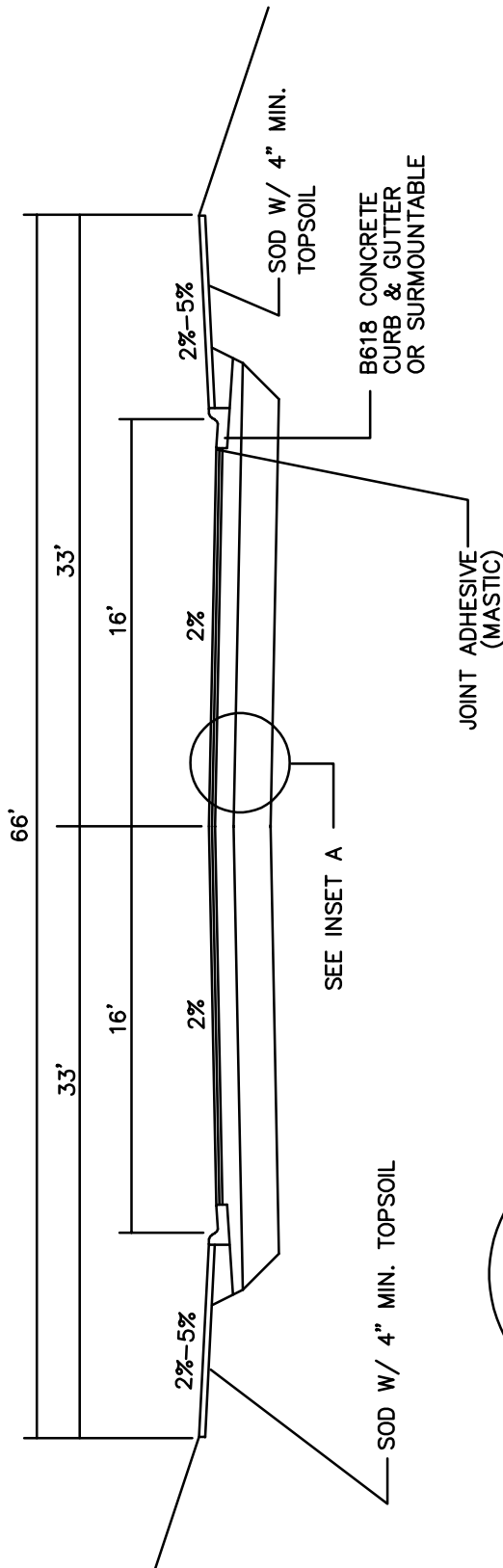
Stabilizes soil to prevent erosion

Filters out pollutants for clean water

Provides food & habitat for wildlife

PLEASE

No dumping, mowing or spraying!



NOTES:

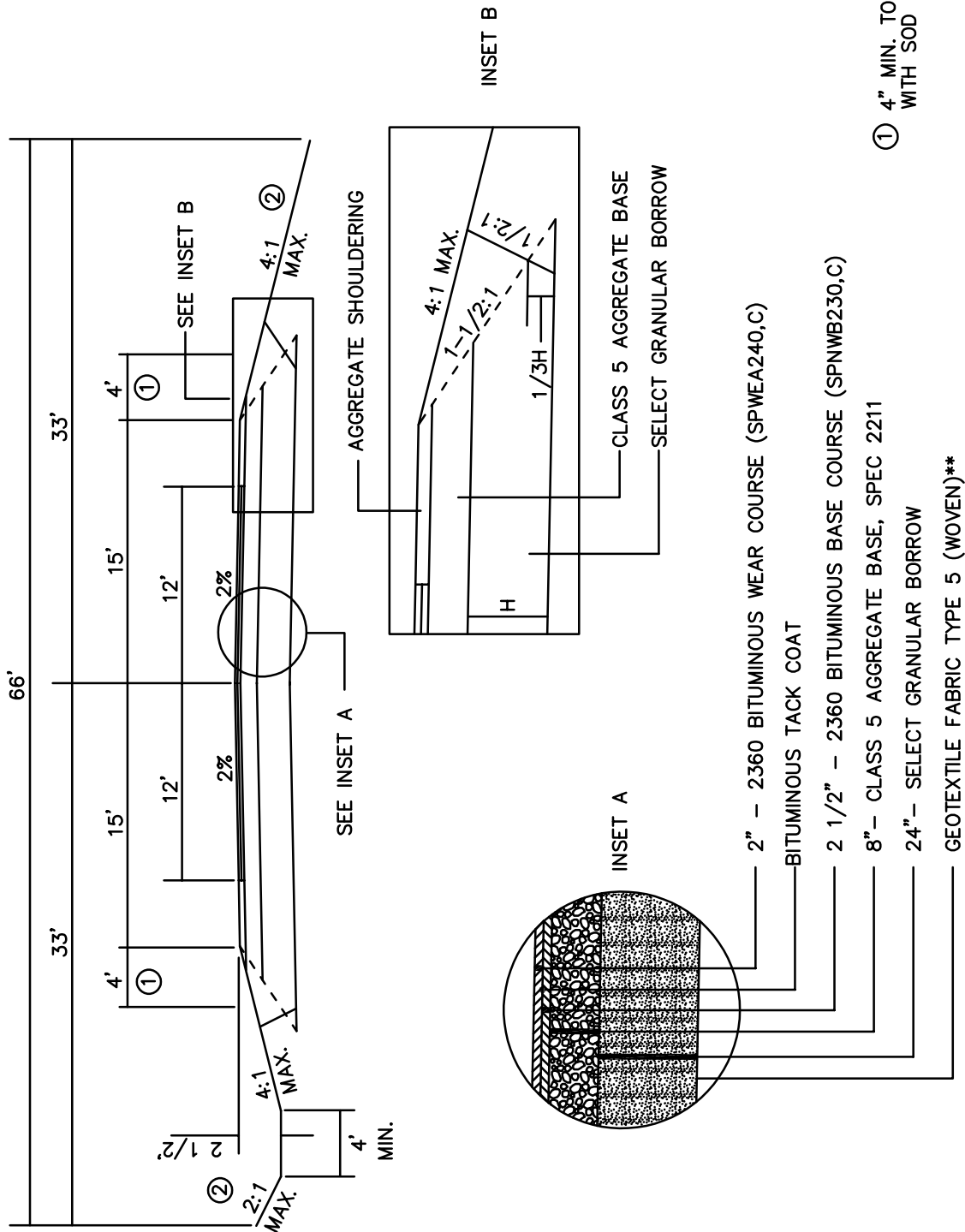
1. DESIGN MAY CHANGE UPON REVIEW OF THE SOIL CONDITIONS.
2. NO STREET CUTS ARE ALLOWED AFTER NOVEMBER 1. STREET CUT PERMIT IS VALID FOR 30 DAYS.
3. PAVEMENT SHALL BE LAID TO MINIMIZE SEAMS. PAVER SCREED SHALL BE 16' WIDE.

**WHERE UNSUITABLE MATERIALS EXIST, AS DIRECTED BY THE ENGINEER



CITY OF NORTH BRANCH
TYPICAL RESIDENTIAL URBAN
STREET
NO SCALE

2025 STANDARD DETAIL
DETAIL NO.
RDW - 001

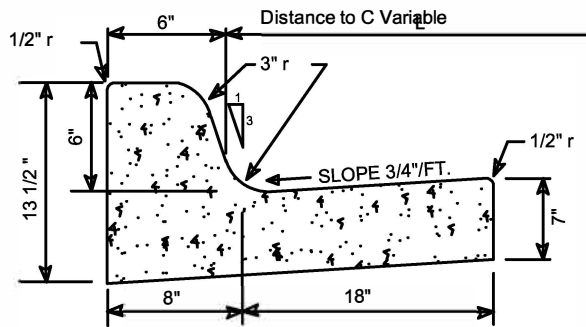


NOTES:

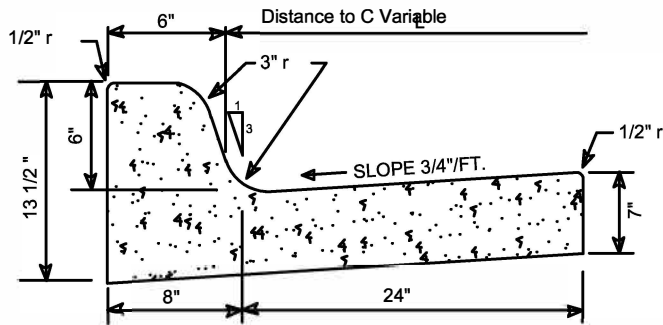
1. DESIGN MAY CHANGE UPON REVIEW OF THE SOIL CONDITIONS.
2. NO STREET CUTS ARE ALLOWED AFTER NOVEMBER 1. STREET CUT PERMIT IS VALID FOR 30 DAYS.
3. PAVEMENT SHALL BE LAID TO MINIMIZE SEAMS. PAVER SCREED SHALL BE 16' WIDE.

****WHERE UNSUITABLE MATERIALS EXIST, AS DIRECTED BY THE ENGINEER**

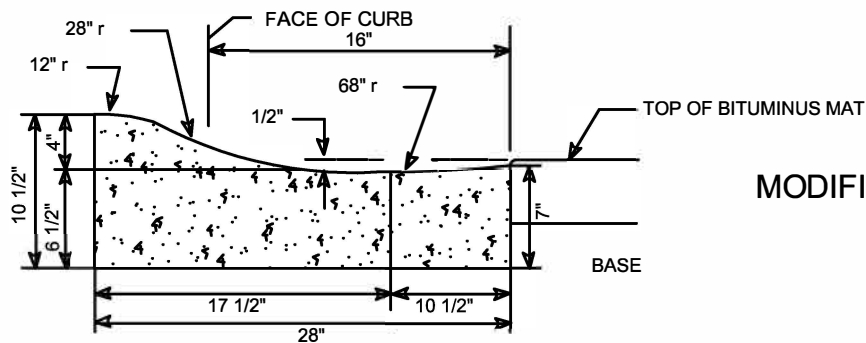
- ① 4" MIN. TOPSOIL WITH SOD
- ② 4" MIN. TOPSOIL WITH SEED



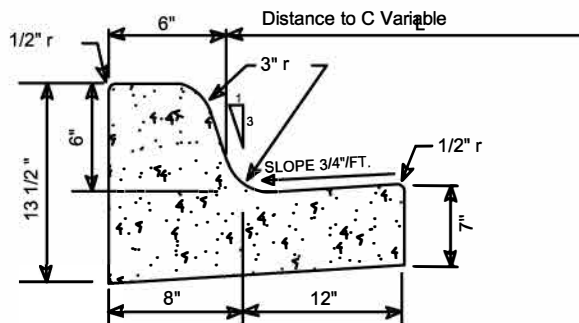
Mn/DOT B 618



Mn/DOT B 624

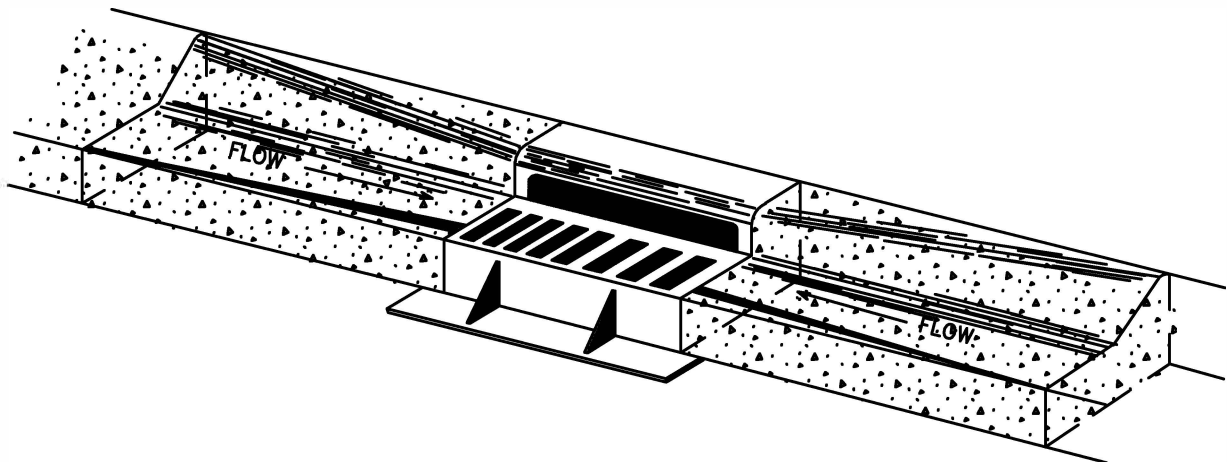
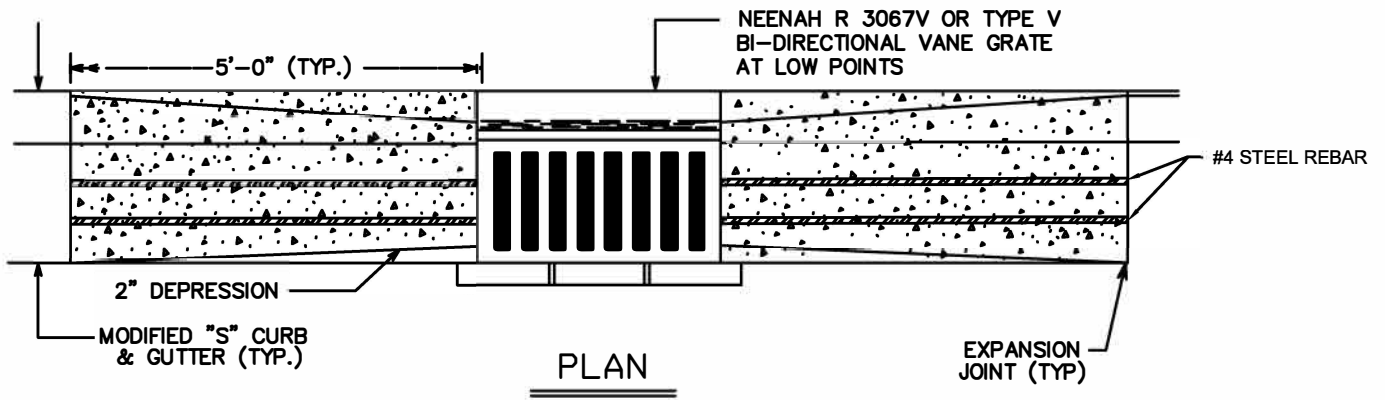


MODIFIED 'S' DESIGN

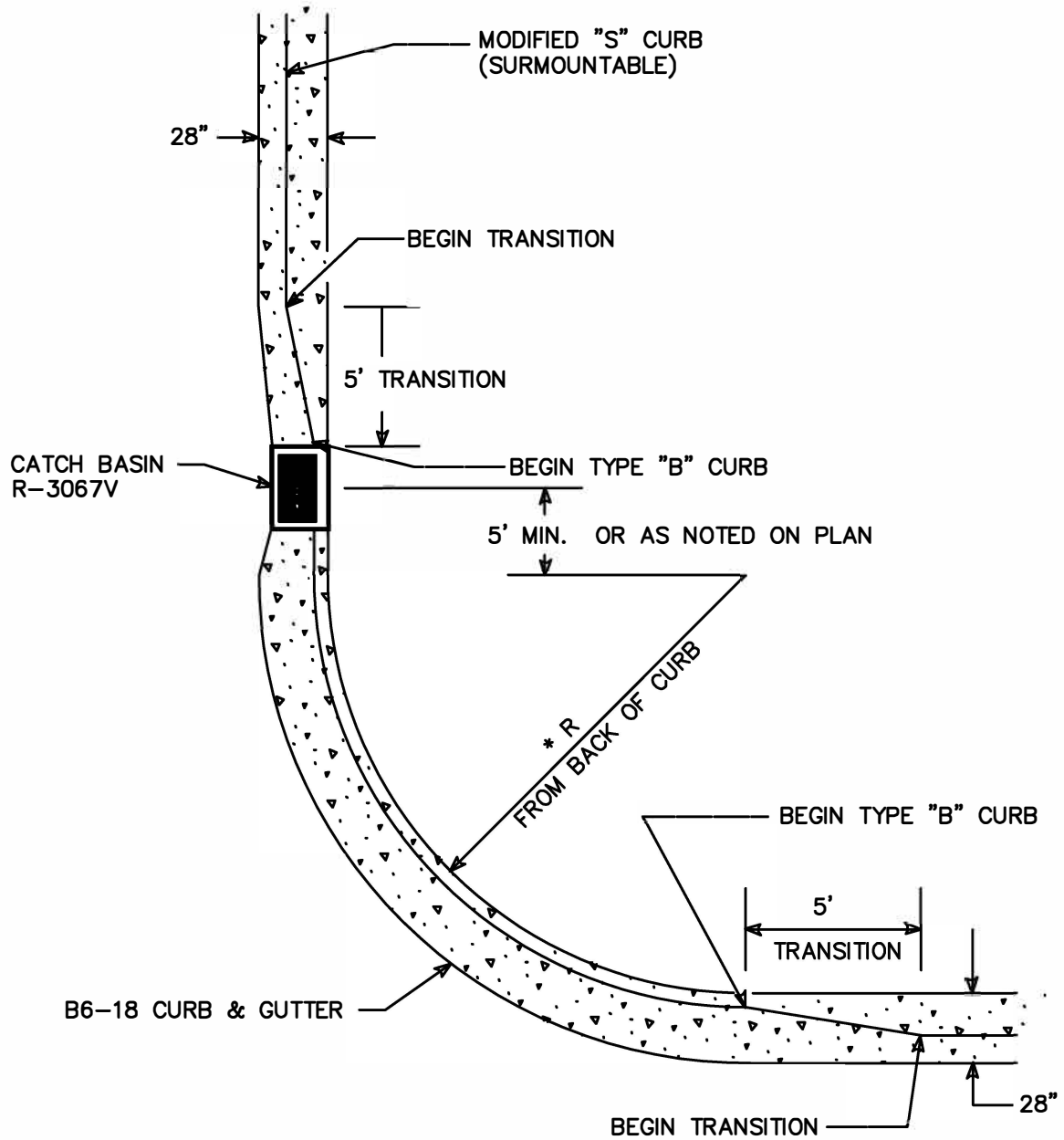


Mn/DOT B 612

NOTE: A MINIMUM OF 3" OF CLASS 5 AGGREGATE BASE SHALL BE USED UNDER ALL CURB AND GUTTER.

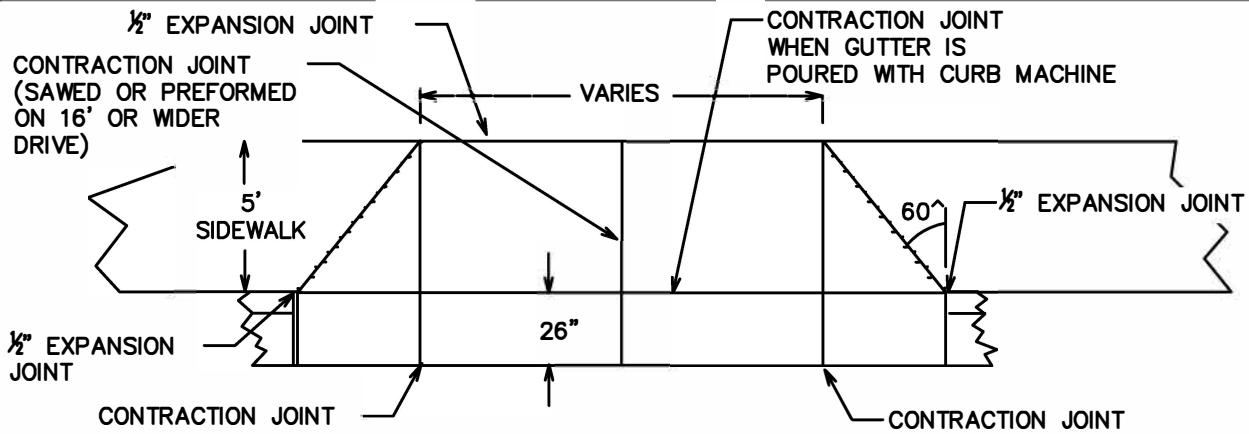


NOTE: MODIFIED "S" CURB & GUTTER TO BE FORMED INTO B618 TYPE CURB AT CATCH BASIN CASTING

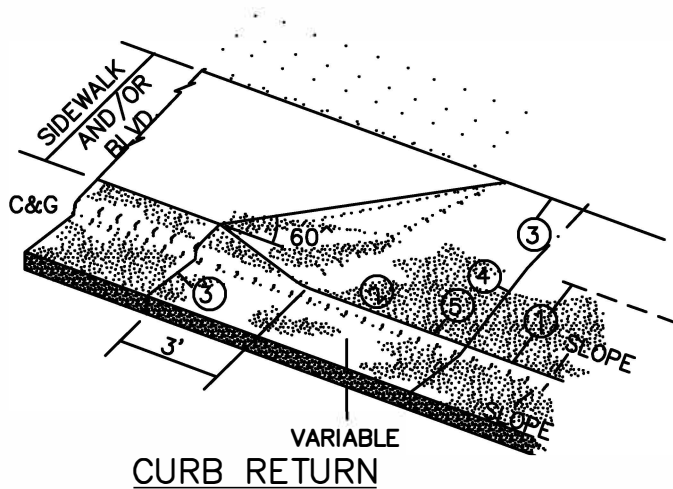


NOTES:

1. SEE STANDARD DETAIL PLATE FOR CONCRETE CURB AND GUTTER DETAILS



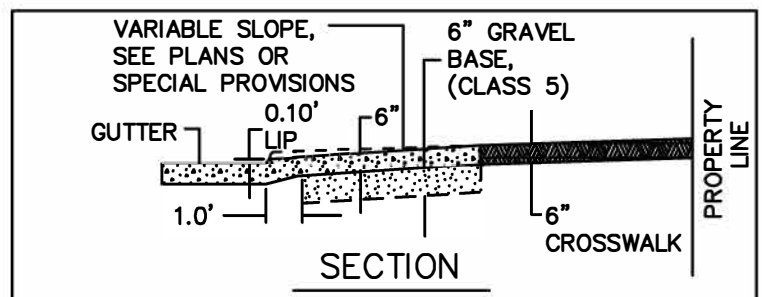
PLAN



- ① WITHOUT SIDEWALK PAVEMENT ONLY TO END OF CURB RETURN WHEN ENTRANCE IS UNSURFACED OR CONSTRUCTION IS NOT NEEDED BEYOND THIS POINT.
- ② WITH SIDEWALK PAVEMENT TO BACK EDGE OF SIDEWALK PAID FOR AS CONCRETE DRIVEWAY PAVEMENT
- ③ 1/2" EXPANSION JOINT
- ④ CONTRACTION JOINT (FORMED OR SAWED)
- ⑤ DRIVEWAY NEED NOT BE POURED MONOLITHICALLY WITH CURB & GUTTER

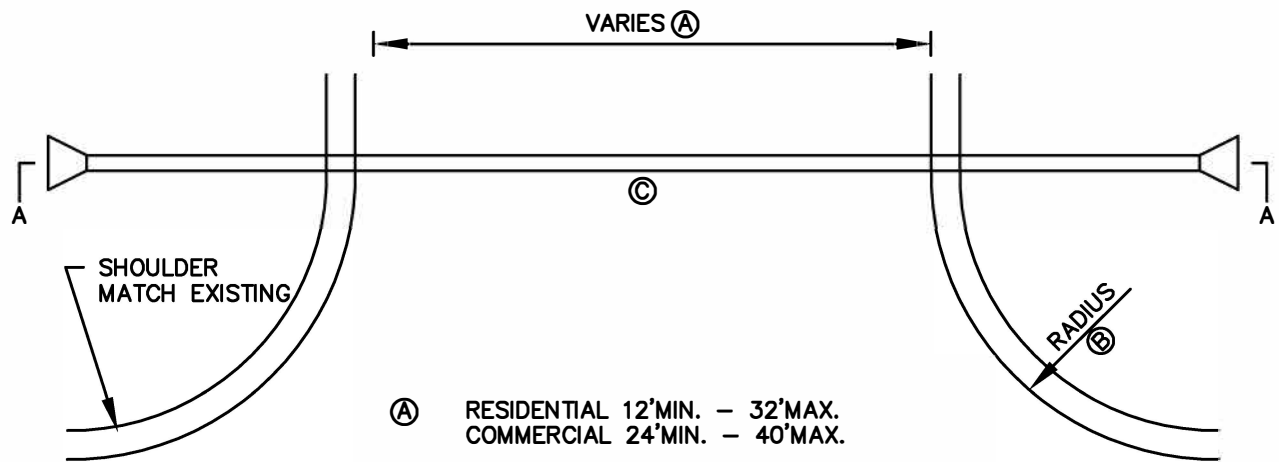
NOTE:

- 1 PAYMENT SHALL BE FROM BACK OF CURB
- 2 WHERE SIDEWALKS EXIST OR ARE PROPOSED THE DRIVEWAY APRON SHALL EXTEND TO THE BACK OF SIDEWALK
- 3 #4 STEEL AT 2' OC TO BE USED WHEN DRIVEWAY SLAB IS NOT POURED INTEGRAL WITH GUTTER



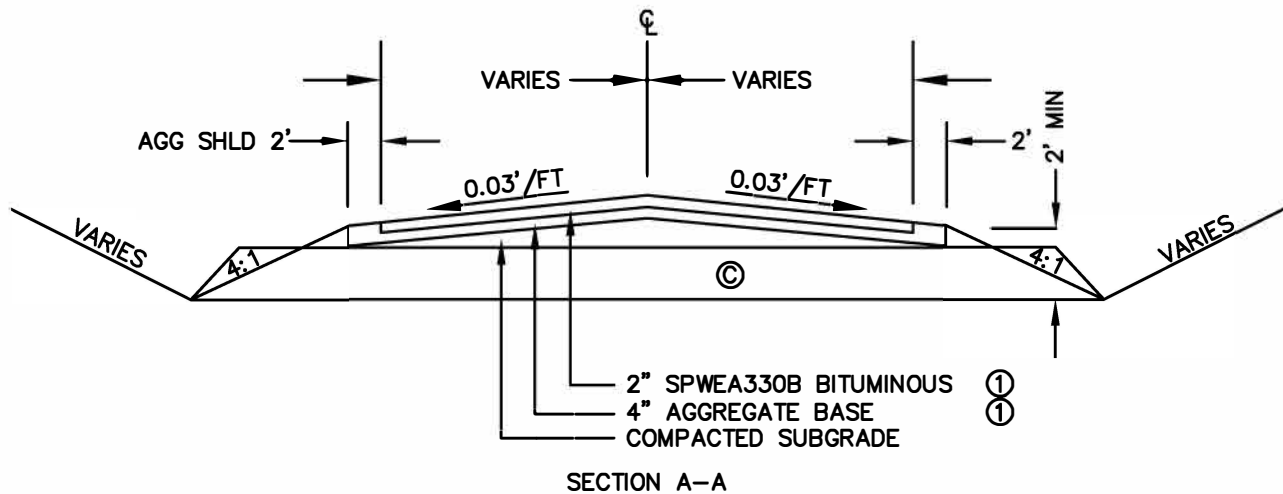
CITY OF NORTH BRANCH
TYPICAL RESIDENTIAL
CONCRETE DRIVEWAY APRON
NO SCALE

2025 - STANDARD DETAIL
DETAIL NO.
RDW - 006



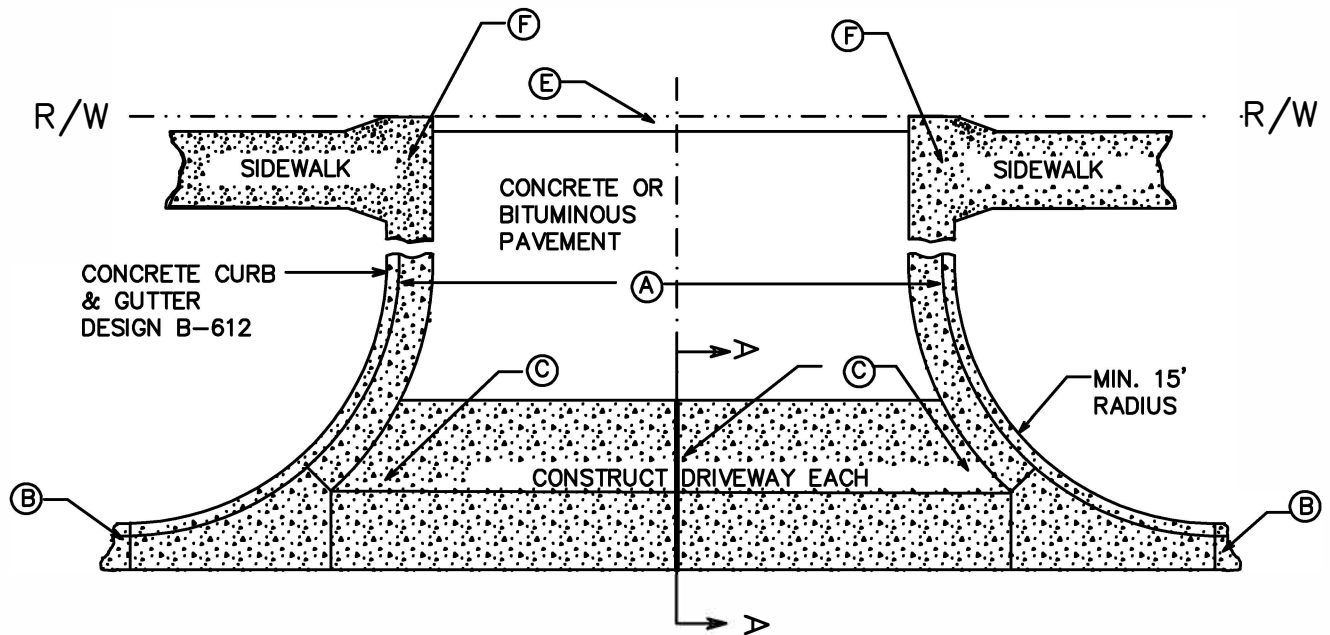
- (A) RESIDENTIAL 12'MIN. - 32'MAX.
COMMERCIAL 24'MIN. - 40'MAX.
- (B) RESIDENTIAL VARIES
COMMERCIAL 24'MIN.
- (C) 15" CORRUGATED METAL PIPE WITH APRONS

NOTES: ELEVATE CULVERT FOR POSITIVE DRAINAGE.
CORRUGATED METAL PIPE SHALL CONFORM
TO MNDOT SPECIFICATION.



- ① WHEN APPROVED IN RURAL RESIDENTIAL
OR AGRICULTURAL ZONING, 6" AGGREGATE
BASE MAY BE SUBSTITUTED IN LIEU OF 2"
BITUMINOUS/4" AGGREGATE BASE.

NOTES: A MINIMUM OF 35' DIRECTLY ADJACENT TO
A PAVED PUBLIC STREET MUST HAVE A
BITUMINOUS SURFACE.



NOTES:

- 1 WHERE THERE IS NO EXISTING CURB AND GUTTER, END PROPOSED CURB AND GUTTER TO END RADIUS WITH "BEAVER TAIL".
- 2 PAYMENT FOR CONCRETE DRIVEWAY SHALL BE FROM BACK OF CURB.
- 3 CONCRETE MIX DESIGNATION SHALL CONFORM TO THE CURRENT MnDOT STANDARD SPECIFICATIONS.

(A) TYPICAL 28' F-F DRIVEWAY WIDTH IN EXISTING CONDITIONS MIN 24' MAX. 40' F-F DRIVEWAY WIDTH

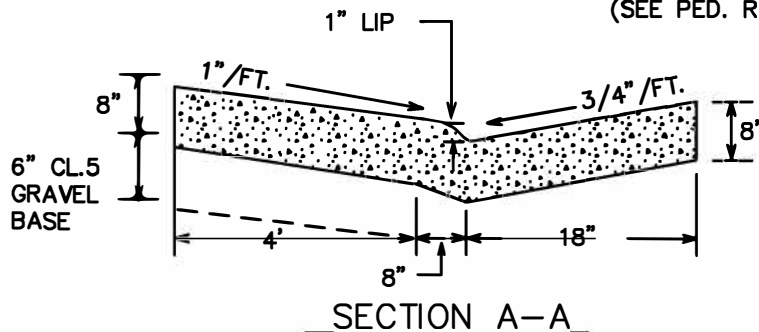
(B) 1/2" EXPANSION JOINT

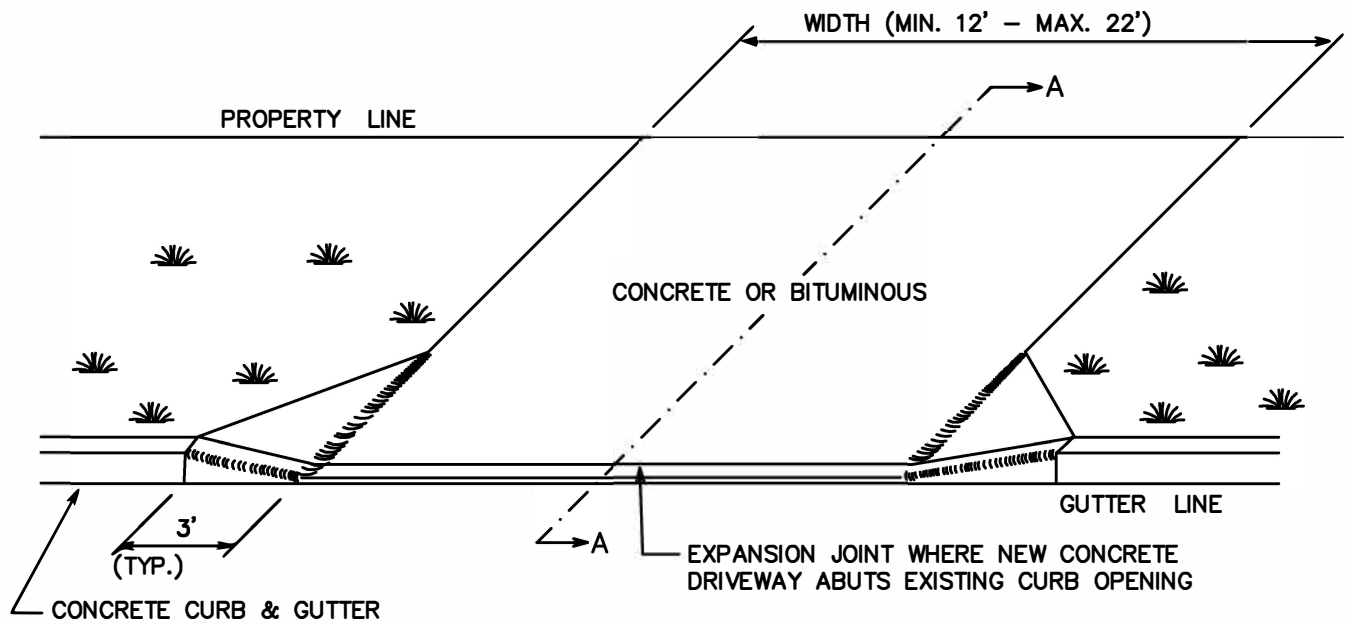
(C) CONTRACTION JOINT

(D) IF DRIVEWAY NOT POURED MONOLITHICALLY WITH CURB AND GUTTER, INSTALL #4 X 2'-6" DEFORMED TIE BARS (EPOXY COATED) AT 2'-6" O.C., PLACED AT MID-DEPTH SLAB.

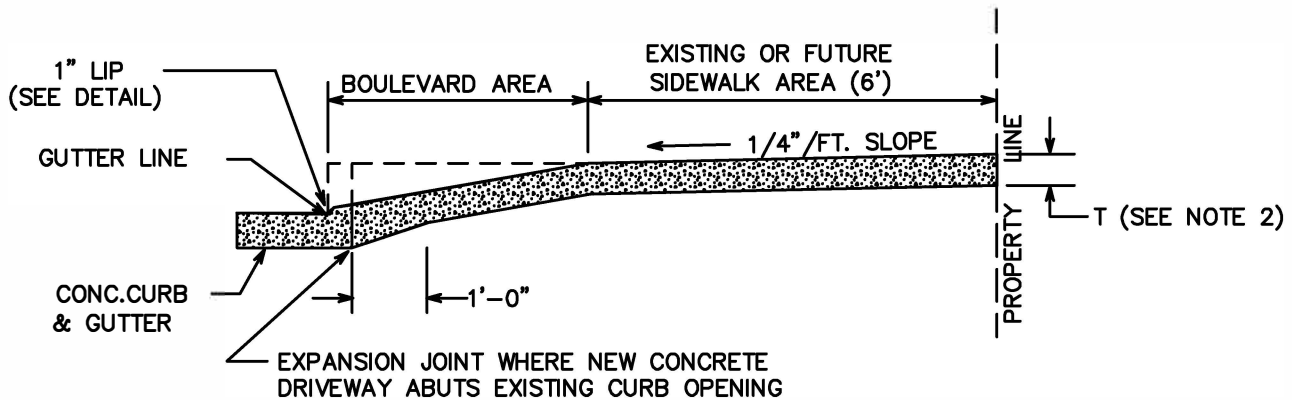
(E) WHERE THERE ARE EXISTING OR PROPOSED CONCRETE WALKS, THE CONCRETE DRIVEWAY SHALL EXTEND TO THE BACK OF THE WALK

(F) IF EXISTING OR PROPOSED CURB AND GUTTER EXTENDS THROUGH SIDEWALK, PEDESTRIAN RAMPS SHALL BE INSTALLED (SEE PED. RAMP DETAIL)





PLAN



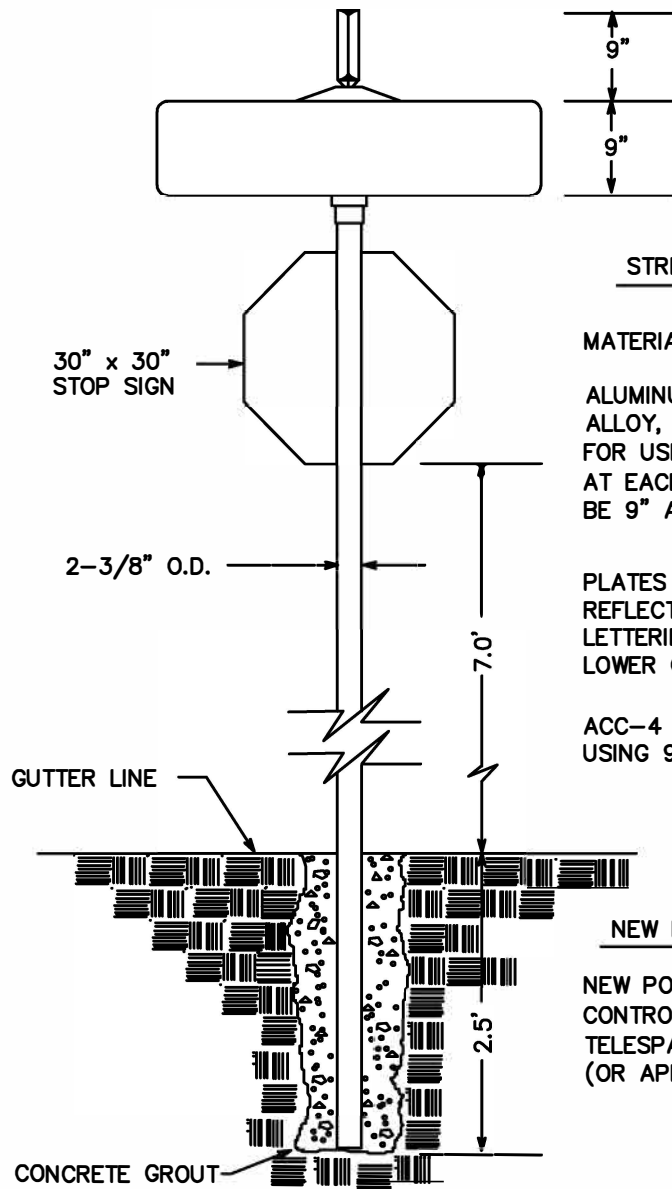
SECTION A-A



CURB DETAIL

NOTES:

1. WHERE EXISTING CURB, CURB & GUTTER OR SIDEWALK SECTIONS ARE REMOVED TO FACILITATE CONSTRUCTION OF NEW DRIVEWAY, SAID SECTIONS SHALL BE REMOVED TO THE NEAREST JOINT. WHERE SAID NEAREST JOINT IS MORE THAN THREE (3) FEET BEYOND THE PROJECTED EDGE OF THE NEW DRIVE, A CLEAN SAW-CUT WILL BE PERMITTED, A BONDING AGENT APPLIED TO THE CUT FACE, AND THE NEW SECTIONS POURED.
2. DRIVEWAY THICKNESS (T) SHALL BE 6" FOR CONCRETE AND 3" FOR BITUMINOUS.
3. EXPANSION/CONTRACTION JOINT REQUIRED ON DRIVEWAY > WHEN WIDTH EXCEEDS 16 FEET.



STREET SIGN SPECIFICATIONS

MATERIAL:

ALUMINUM BLANKS SHALL BE CONSTRUCTED OF 5052-H38 ALLOY, HAVE A GAUGE OF .080, BE NOTCHED FOR USE WITH ACC-4 BRACKETS, HAVE HOLES PUNCHED AT EACH END FOR BOLTING TOGETHER AND BE 9" AS REQUIRED.

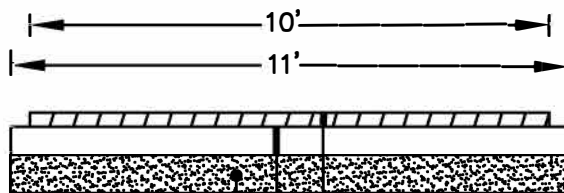
PLATES SHALL BE COVERED WITH HIGH INTENSITY REFLECTIVE SHEETING, SCREENED GREEN WITH MARGIN. LETTERING SHALL BE 6" SERIES C, ALL U.C. LOWER CASE LETTERING SHALL BE 4"

ACC-4 BRACKETS ARE TO BE ALUMINUM DESIGNED FOR USING 9" PLATES AS REQUIRED.

NEW POSTS SPECIFICATIONS

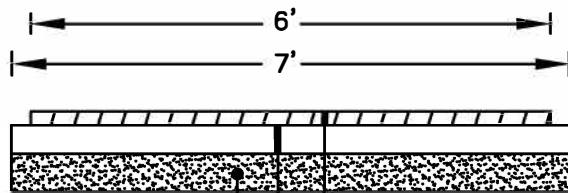
NEW POSTS USED FOR MOUNTING STREET NAME/TRAFFIC CONTROL SIGNS, SHALL VARY IN LENGTH, SHALL BE TELESAR 2"x2"x14 GAUGE OR 3LB GALVANIZED CHANNEL (OR APPROVED EQUAL)

NAME	ABBREVIATION
AVENUE	Ave
BOULEVARD	Blvd
CIRCLE	Cir
COURT	Ct
DRIVE	Dr
EAST	E
PARKWAY	Pkwy
PLACE	Pl
STREET	St
TERRACE	Ter
TRAIL	Trl
WEST	W



3" SP 9.5 SPWEA240B WEAR COARSE MIXTURE
 6" CL 5 AGGREGATE BASE (100% CRUSHED)
 INPLACE APPROVED SUBGRADE SURFACE (TEST ROLLED)

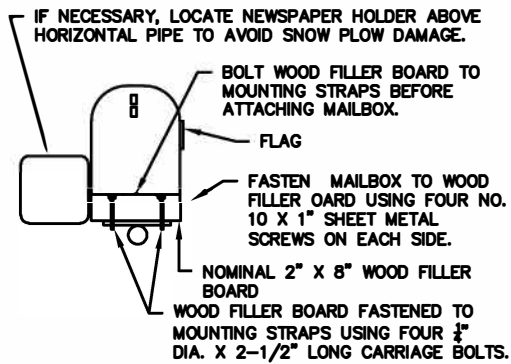
10' WIDE TRAIL TYPICAL SECTION



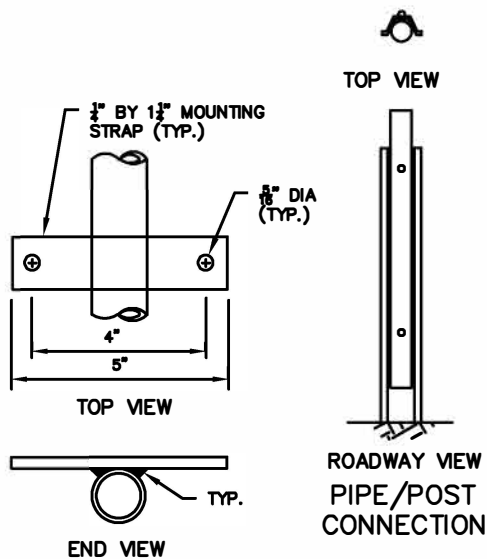
CONCRETE MIX DESIGN
SHALL BE CONSISTENT WITH
THE MOST CURRENT VERSION
OF THE MnDOT STANDARD
SPECIFICATIONS

4" CONCRETE MINIMUM; 6" MINIMUM IN DRIVEWAYS
4" SELECT GRANULAR
INPLACE APPROVED SUBGRADE SURFACE

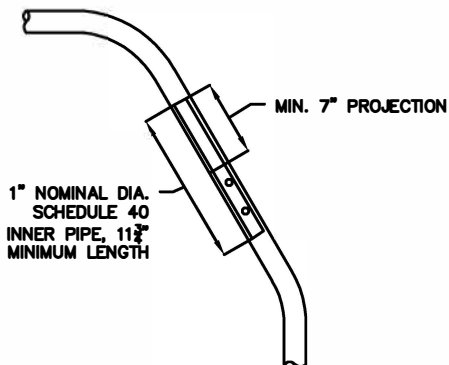
6' WIDE CONCRETE WALK
TYPICAL SECTION



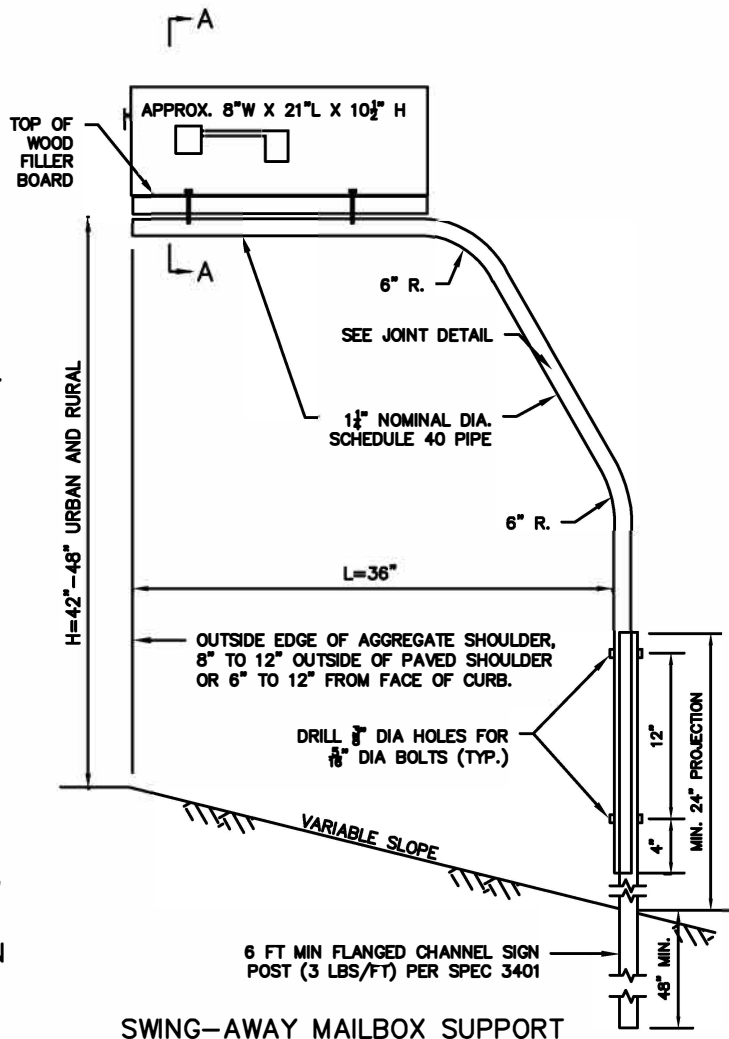
SECTION A-A



MOUNTING STRAP DETAIL



JOINT DETAIL

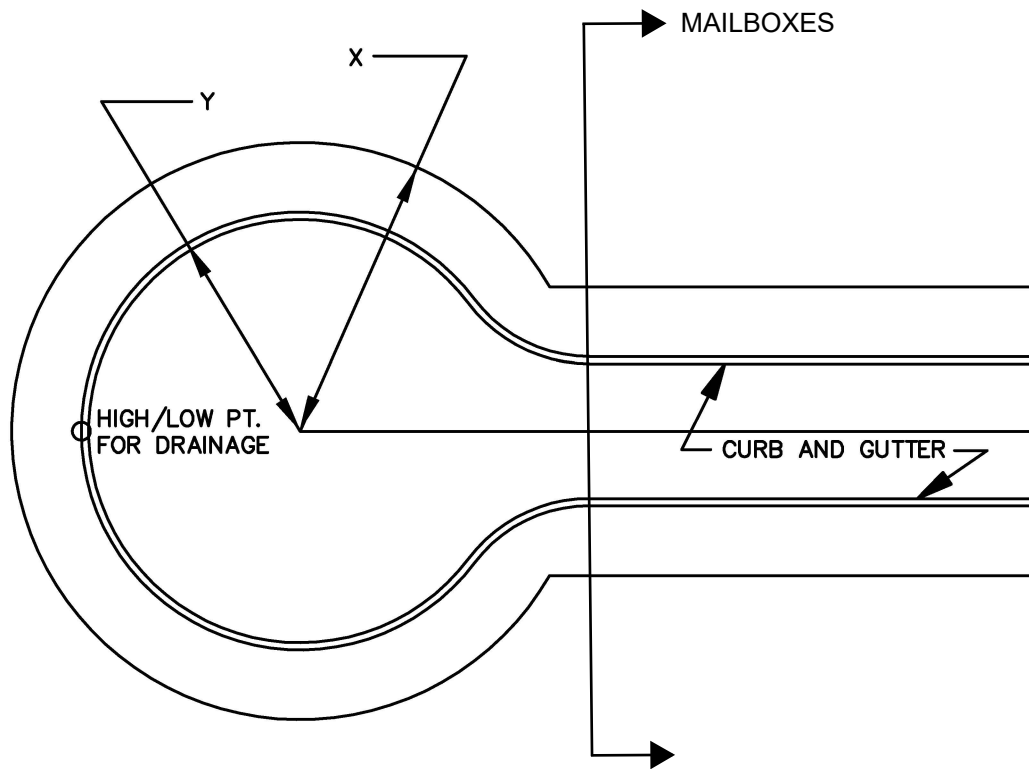


SWING-AWAY MAILBOX SUPPORT

NOTES:

MAILBOX LOCATIONS SHOULD BE STAKED BEFORE INSTALLATION FOR PROPER HEIGHT AND DISTANCE FROM ROADWAY. ONCE STAKED, THE INSTALLER MUST NOTIFY THE ENGINEER AND THE POST OFFICE. THE ENGINEER AND THE POSTMASTER SHALL APPROVE THE STAKED LOCATIONS PRIOR TO FINAL INSTALLATION.

THE MINIMUM SPACING (CENTER TO CENTER) BETWEEN MULTIPLE SUPPORTS SHALL BE EQUAL TO THE HEIGHT OF THE MAILBOX SUPPORT.

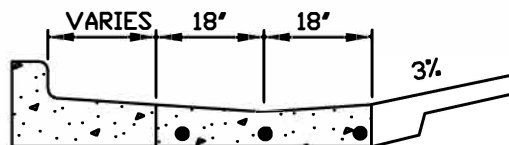
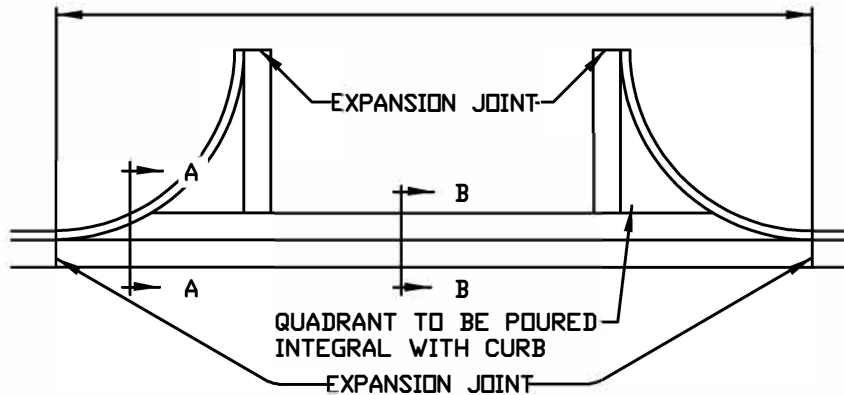


STANDARD CUL-DE-SAC

	X	Y*
COM./IND.	60' RAD.	AS DIRECTED BY THE ENGINEER
URBAN	60' RAD.	45' RAD.
RURAL	60' RAD.	45' RAD.

***NOTE:**

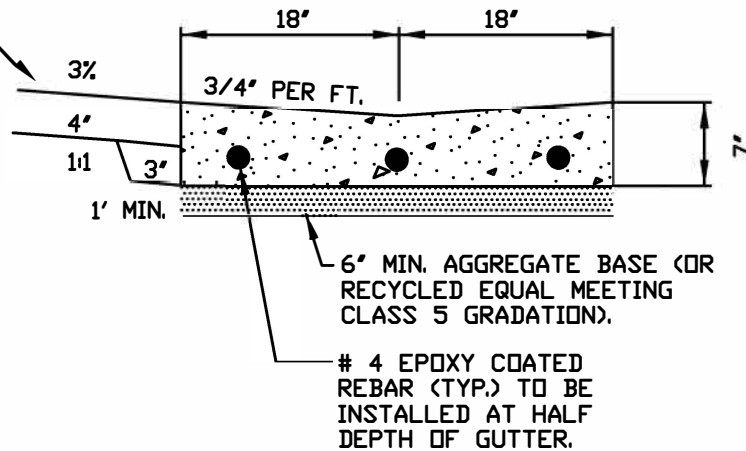
1. ALL DISTANCE FOR STREET WIDTHS ARE MEASURED TO BACK OF CURB.
2. MAILBOXES SHALL NOT BE PLACED WITHIN THE CUL-DE-SAC.



SECTION A-A

THRU B618 C & G

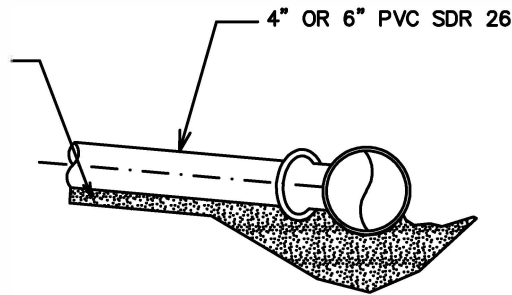
THIS DETAIL
IS THE SAME
FOR BOTH
SIDES OF THE
GUTTER



SECTION B-B

THRU CONCRETE GUTTER

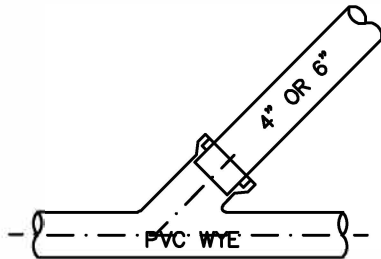
PIPE SHALL BE COMPLETELY
ENTRENCHED AND SHALL
HAVE CLASS "B" BEDDING
WHERE DIRECTED BY THE
ENGINEER



TYPICAL SERVICE WHERE COVER OVER
TOP OF SEWER IS 14' OR LESS

4"x4" MARKER

TRACER WIRE
ACCESS BOX
COPPERHEAD
#LD14*TP OR
CD14*TP



JOINT DETAIL

4" OR 6" PVC
SDR 26

WYE

PLUG

ELEV TO BE
SET BY THE
ENGINEER

PIPE SHALL BE
COMPLETELY
ENTRENCHED
AND SHALL HAVE
CLASS "B" BEDDING
WHERE DIRECTED
BY THE ENGINEER

TRACER WIRE

NOTES:

- 1) ALL SERVICE CONNECTIONS INCLUDING NECESSARY BENDS AND SPECIAL FITTINGS SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOT OF 4" OR 6". NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR CONCRETE ENCASEMENT OR PIPE BEDDING.
- 2) ALL SERVICE CONNECTIONS SHALL TERMINATE 10' INSIDE PROPERTY LINE. UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- 3) SERVICE STUB SHALL BE PLUGGED AND MARKED WITH A 4" x 4" TIMBER PROTRUDING 3' OUT OF GROUND. (PAINTED GREEN)
- 4) NO SADDLES WILL BE ALLOWED
- 5) RETRO-FIT INSTALLATIONS TO BE CONSTRUCTED BY CUTTING IN A PVC WYE AND PVC SLEEVE
- 6) SEWER SERVICES ARE TO BE LOCATED 3' DOWNSTREAM OF WATER SERVICE IF IN THE SAME TRENCH

TYPICAL SERVICE WHERE COVER OVER
TOP OF SEWER IS 14' OR MORE

WRAP ADJUSTING RINGS, EDGE OF CASTING FRAME, AND UPPER BARREL SECTION WITH CHIMNEY SEAL, INFI-SHIELD, OR APPROVED EQUAL FLEXIBLE SEALING PRODUCT PER MANUFACTURER'S SPECS.

POLYETHYLENE (PE) MANHOLE ADJUSTING RINGS, MIN 4" - MAX 12"

ALL MANHOLES WITH INSIDE DROP SECTION SHALL BE 5' DIA (I.D.)

MANHOLE SECTION TO BE ASTM C-478 CLASS II CIRCULAR REINF LATEST REVISION

USE R-2 JOINT FOR ALL MANHOLE JOINTS

"CRE-SEAL", "RESEAL", OR APPROVED EQUAL PRECAST GASKET CONNECTION SHALL BE USED FOR CONNECTION PIPE TO MANHOLE

PRECAST BOTTOM SECTION WITH INVERT

#5 AT 12" OC EACH WAY

VARIABLE

STANDARD NEENAH R-1733 MANHOLE FRAME AND COVER WITH TWO CONCEALED PICK SLOTS

HDPE ADJUSTING RINGS MIN 4" - MAX 1'

27" DIA

4' - 0"

1' - 4"

VARIABLE

8"

8"

VARIABLE

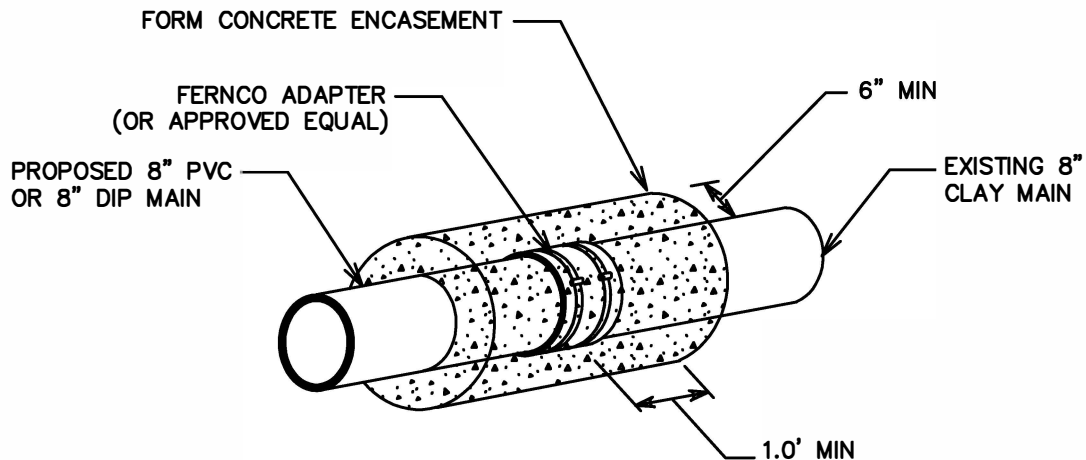
6" MIN

48" DIA

STEPS AT 16" OC

NOTES:

1. MANHOLE STEPS SHALL BE CAST IRON OR MA MODEL PS-I-PF (BY MA INDUSTRIAL INC.) CONFORMING TO ALL OSHA REGULATIONS AND SPACED 16" OC.
2. ALL MANHOLE JOINTS SHALL BE SEAL WRAPPED AS DESCRIBED IN THE SPECIFICATION (INCIDENTAL).



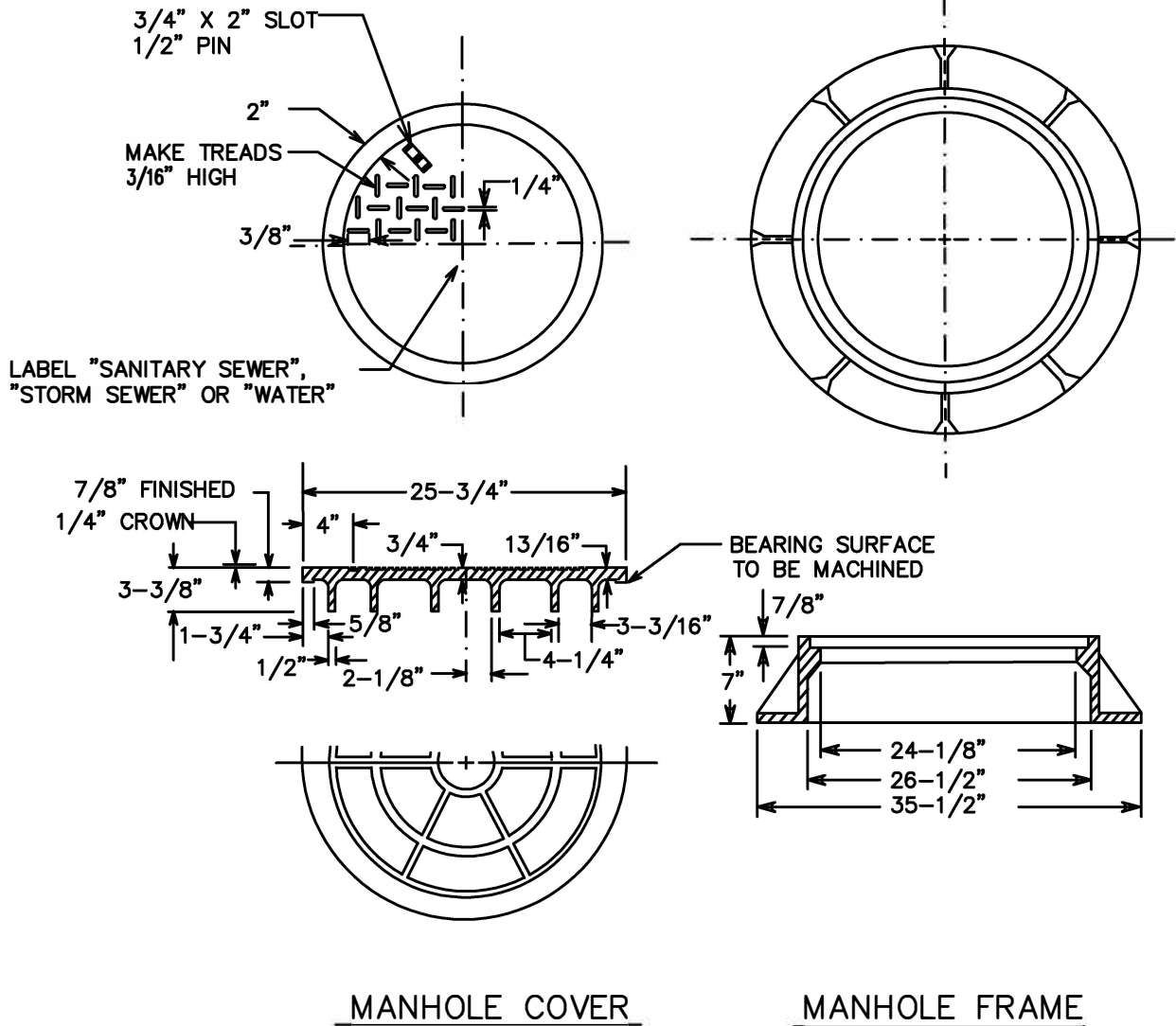
FOR 8" PVC = FERNCO #1002-88 OR EQUAL
 FOR 8" DIP = FERNCO # 1003-85 OR EQUAL

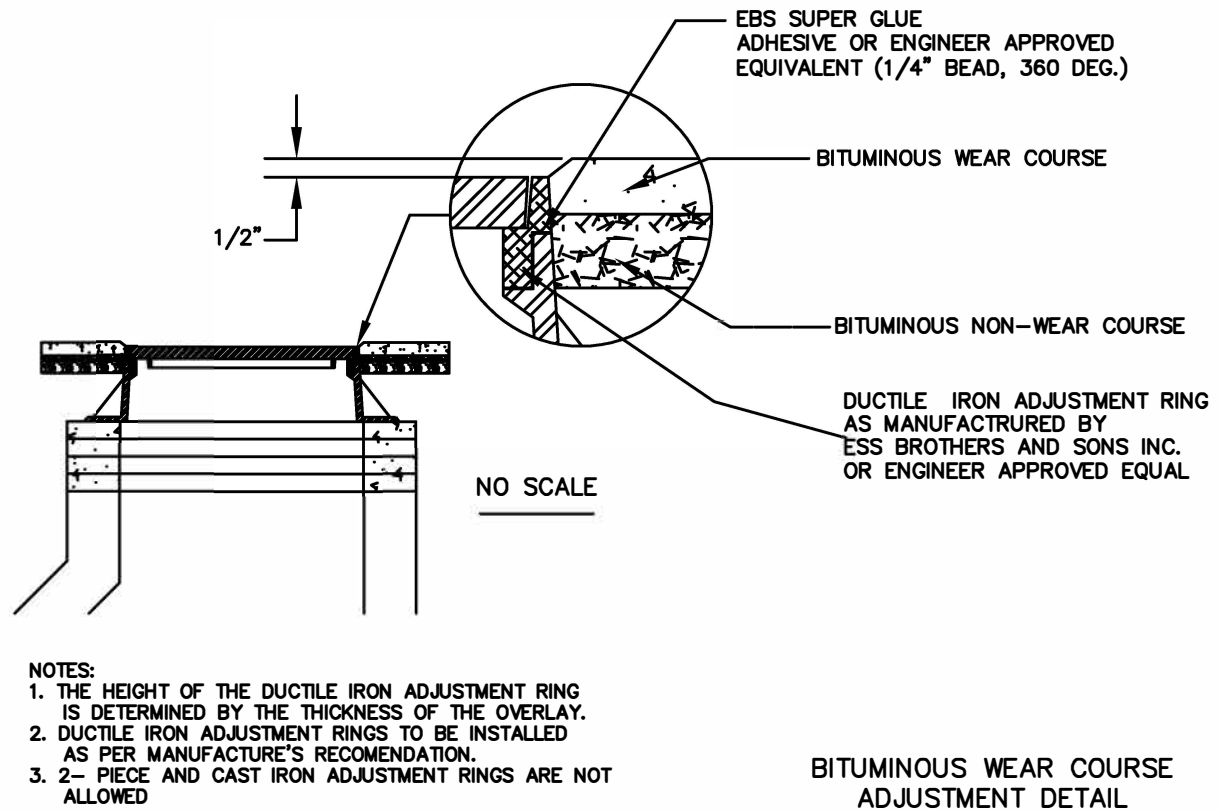
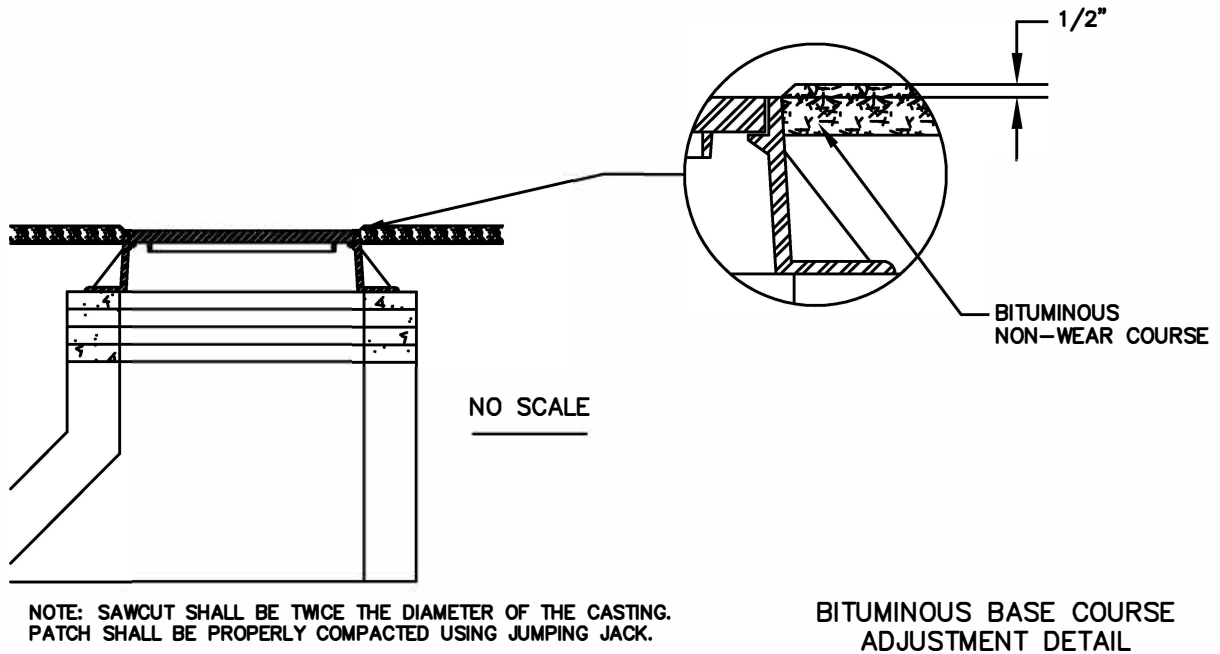
NOTES:

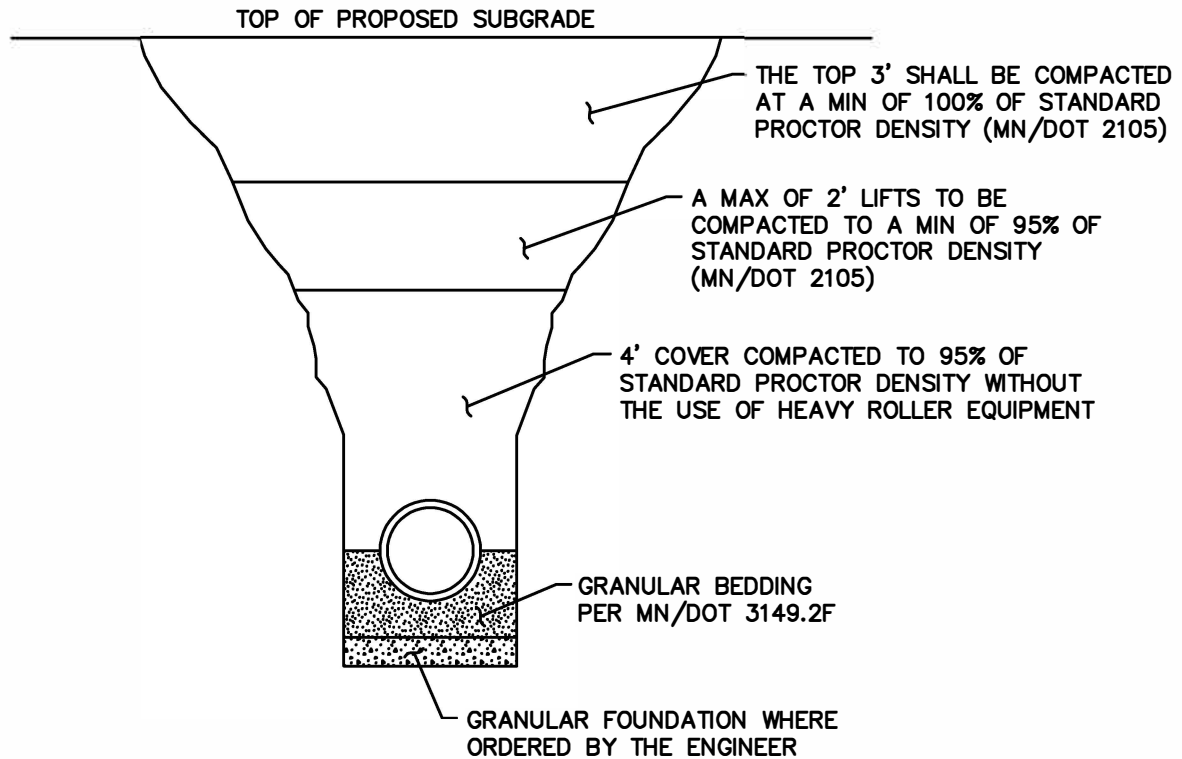
- 1) ALL FERNCO ADAPTORS USED MUST BE MADE FOR CLAY TO PVC TRANSITIONS
- 2) FOR ABANDONED SEWER/WATER LINES, SEWER LINES SHALL BE REMOVED TO THE MAIN AND CAPPED AT WYE. WATERMAIN SERVICES SHALL BE REMOVED TO THE MAIN WITH THE CORPORATION STOP REMOVED AND CAPPED WITH A BRASS PLUG.

NOTE:

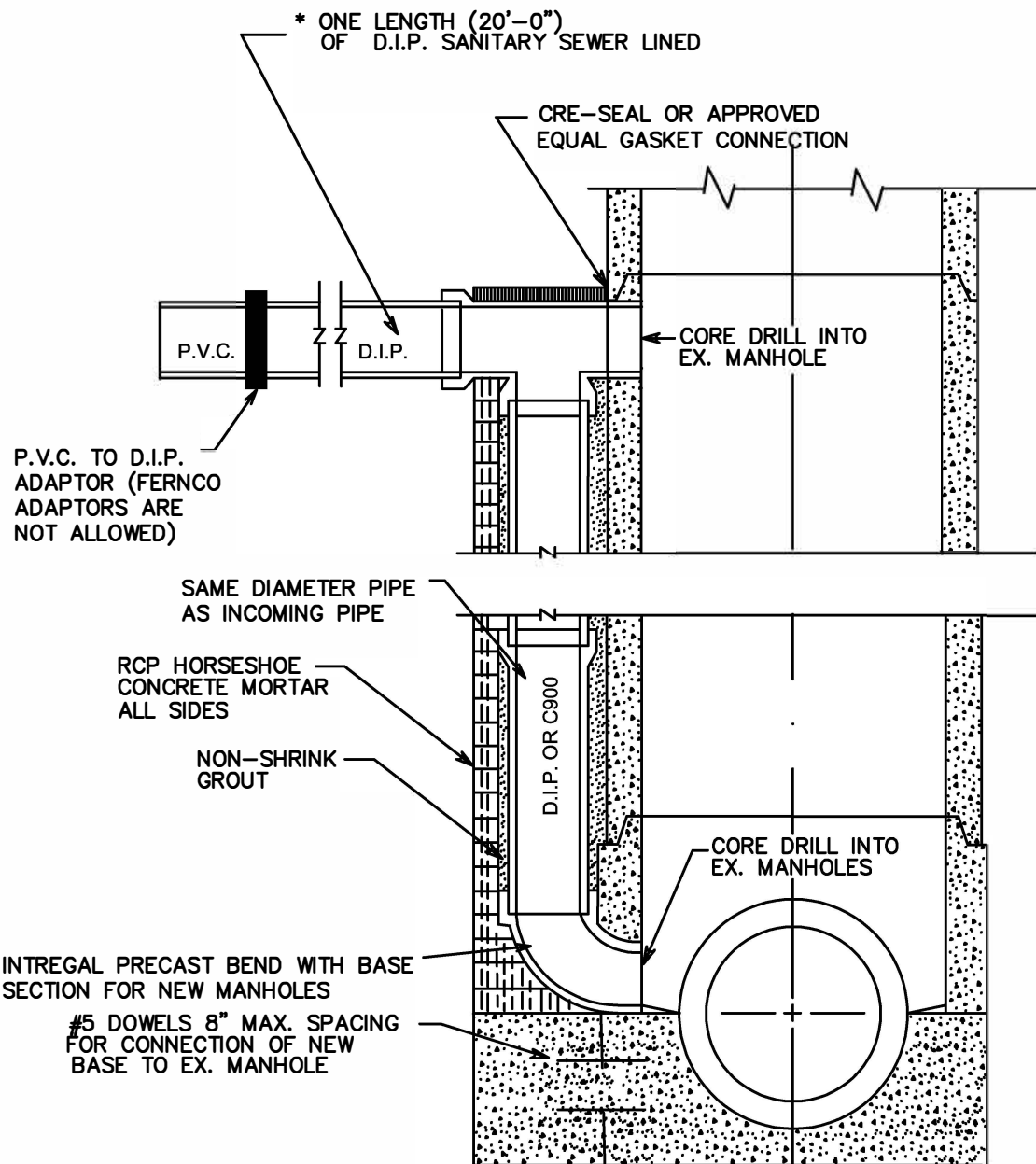
1. FRAME AND SOLID COVER TO BE NEENAH NO. R-1733 WITH NO.MF 25572 CONCEALED PICKHOLE OR APPROVED EQUAL.
2. USE NEENAH R-1755G FOR WATERTIGHT APPLICATIONS.

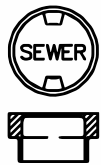




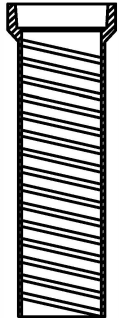


SHOVEL, PLACE, AND HAND COMPACT AROUND PIPE TO 12" ABOVE PIPE. VIBRATORY COMPACTION REQUIRED EACH SIDE OF PIPE, AS DIRECTED BY THE ENGINEER.

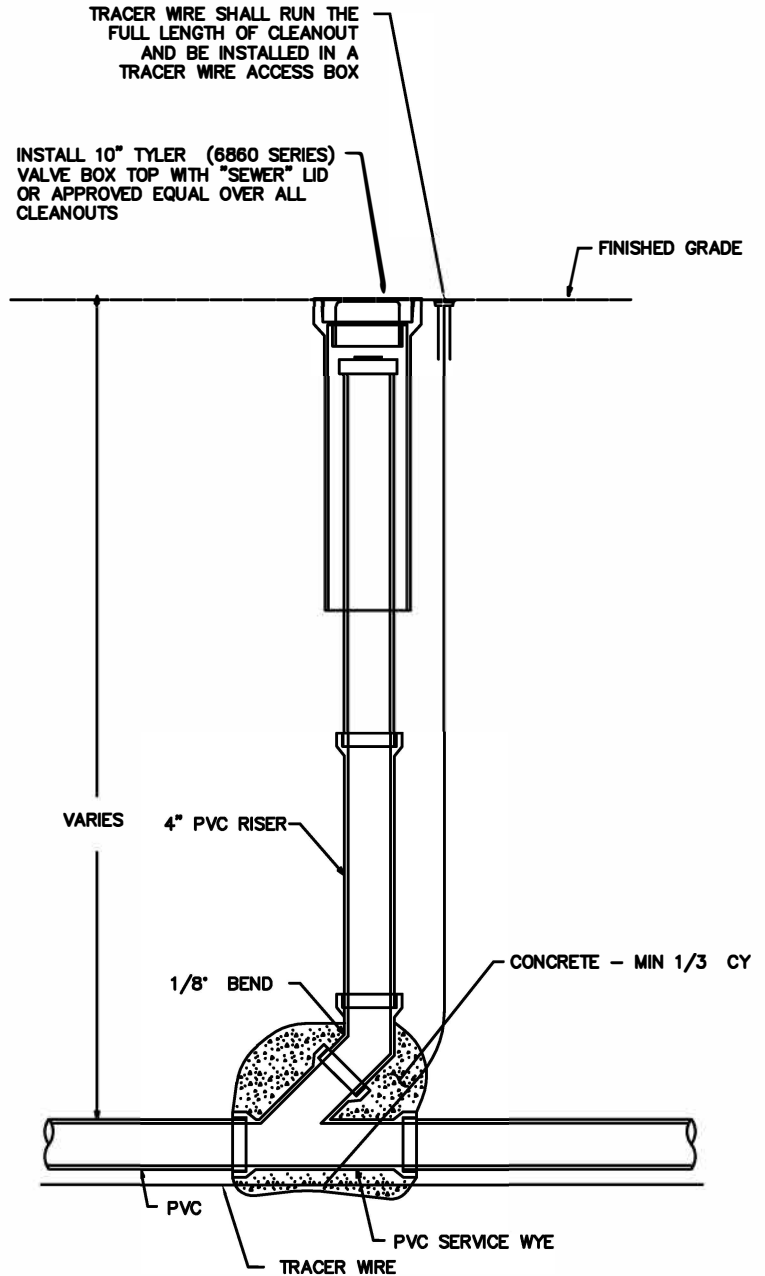




DROP LID
Tyler



TOP
Tyler 6860 SERIES



NOTES:

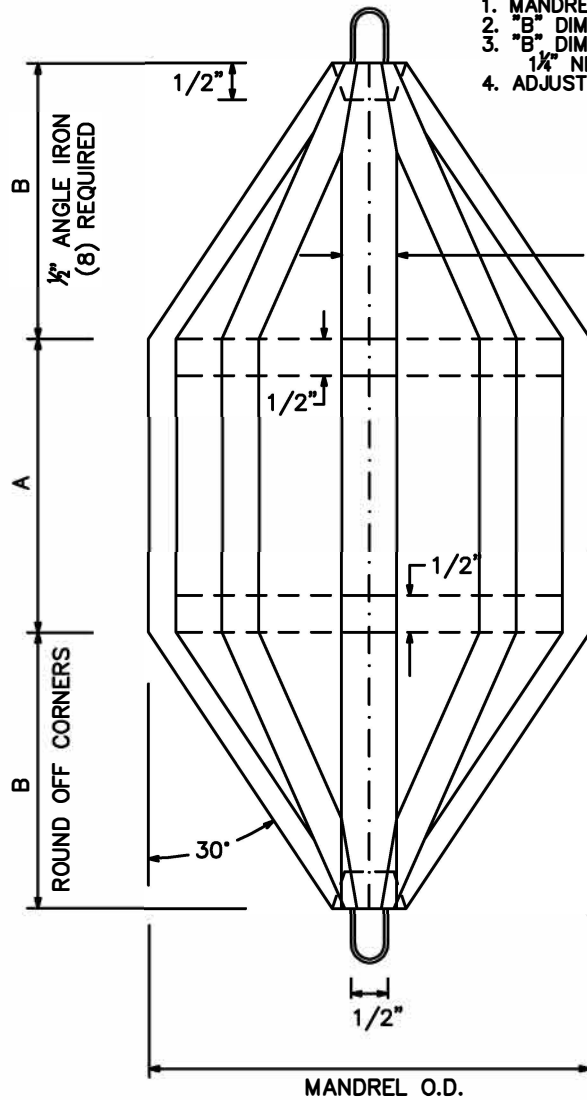
1. TRACER WIRE ACCESS BOX FOR NON-ROADWAY APPLICATIONS SHALL BE GRADE LEVEL COPPERHEAD LITE DUTY #LD14*TP.
2. TRACER WIRE ACCESS BOX FOR CONCRETE/DRIVEWAY APPLICATIONS SHALL BE COPPERHEAD #CD14*TP.
3. CLEANOUTS LOCATED IN DRIVEWAYS SHALL BE COVERED WITH A FORD A-1 METER BOX COVER.

ASTM D3034

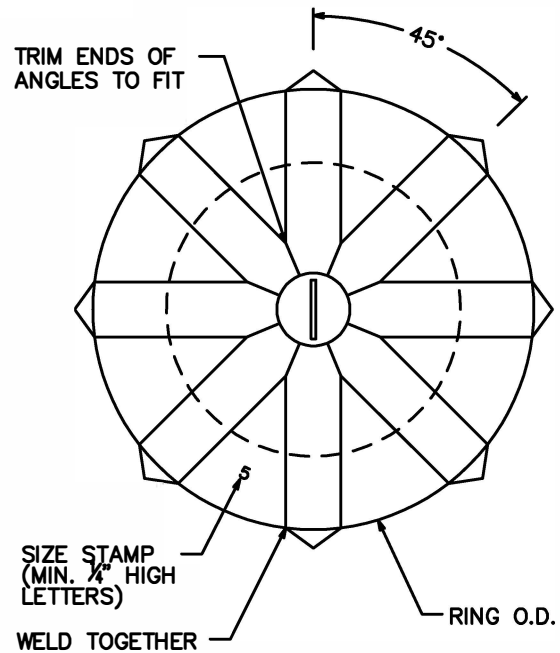
PIPE SIZE	A	BASE INSIDE DIAMETER	MANDREL OUTSIDE DIAMETER	RING OUTSIDE DIAMETER	B	BASE INSIDE DIAMETER	MANDREL OUTSIDE DIAMETER	RING OUTSIDE DIAMETER	B
INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES
6	4	5.742	5.46	4.74	3.6	5.612	5.33	4.62	3.5
8	6	7.665	7.28	6.57	4.9	7.488	7.11	6.40	4.7
10	6	9.563	9.08	8.37	6.4	9.342	8.87	8.16	6.2
12	8	11.361	10.79	10.08	7.9	11.102	10.55	9.84	7.7
15	9	13.898	13.20	12.49	10.0	13.575	12.90	12.19	9.7

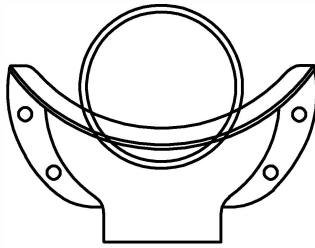
NOTES:

1. MANDREL OUTSIDE DIAMETER = BASE INSIDE DIAMETER X 0.95.
2. "B" DIMENSION FOR 6" PIPE IS FOR 1" NPS PIPE.
3. "B" DIMENSION FOR 8", 10", 12", 15" PIPE IS FOR 1 1/2" NPS PIPE.
4. ADJUST "B" DIMENSION AS REQUIRED FOR OTHER PIPE SIZES.

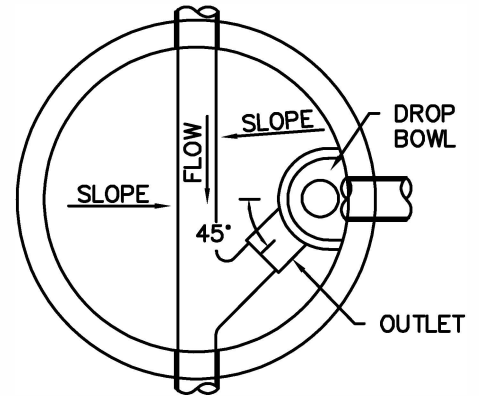


SEE NOTES ABOVE

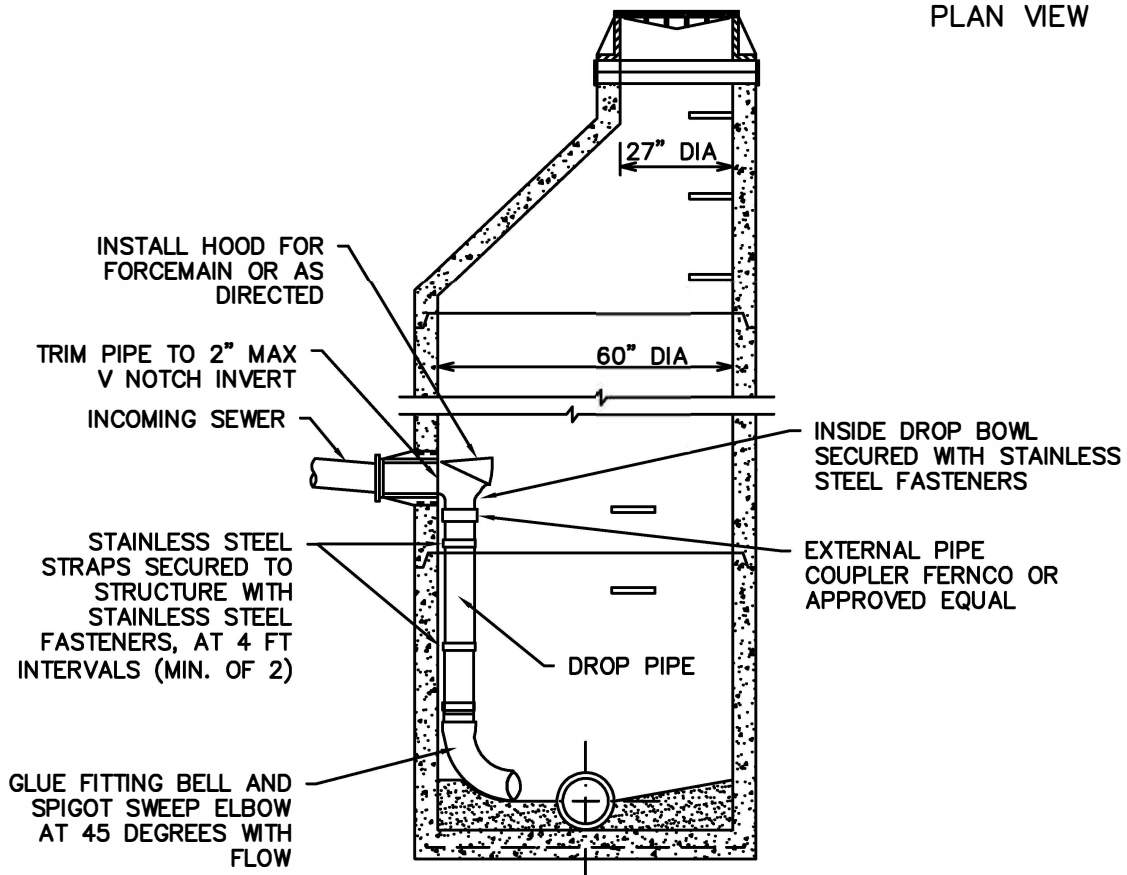




DROP BOWL
MOUNTING POSITION

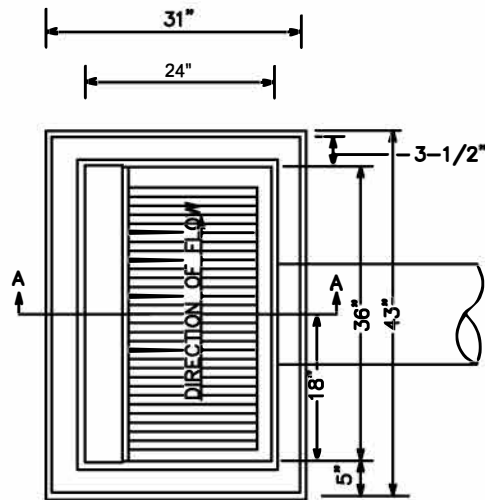


INSIDE DROP
PLAN VIEW

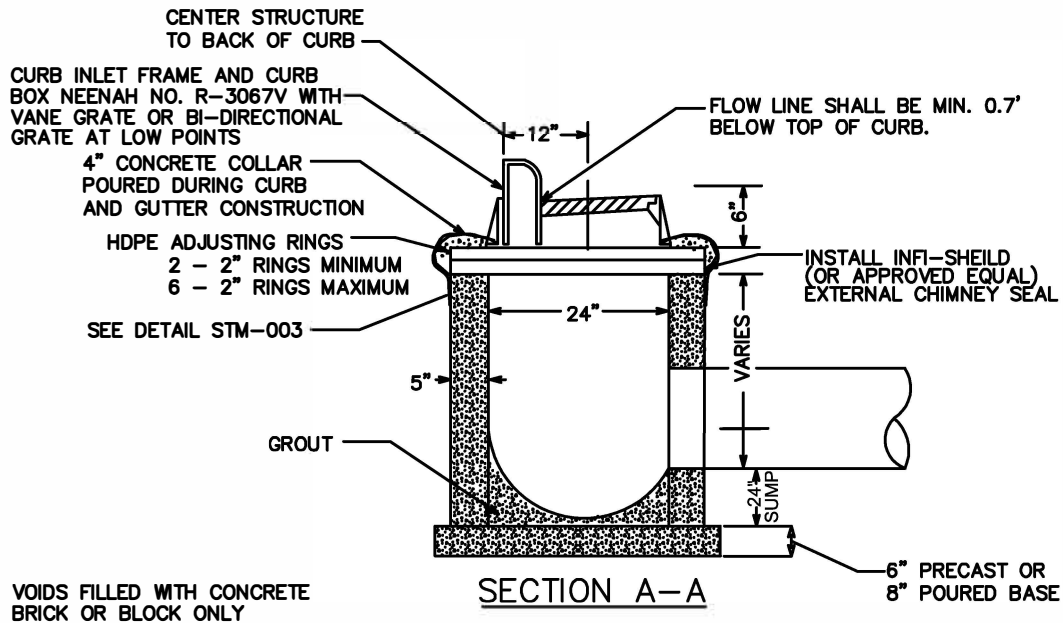


NOTES:

1. INCREASE MANHOLE DIAMETER BY ONE FOOT FOR INSIDE DROP CONNECTIONS.
2. INSTALL DIP TO UNDISTURBED SOILS.
3. INSTALL PER MANUFACTURER'S REQUIREMENTS.
4. SECURE DROP PIPE TO MANHOLE WITH STAINLESS STEEL ADJUSTABLE CLAMPING BRACKETS.

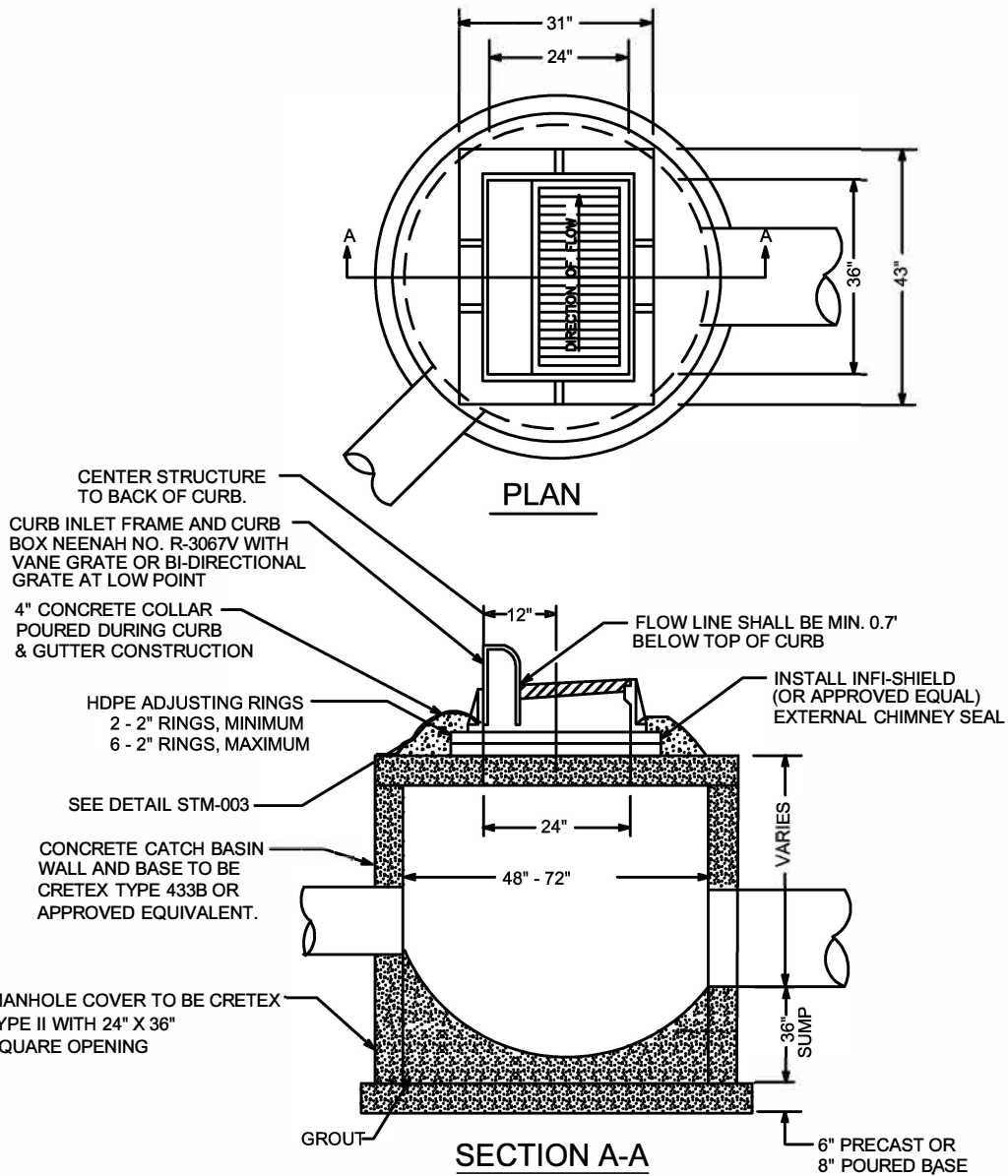


PLAN



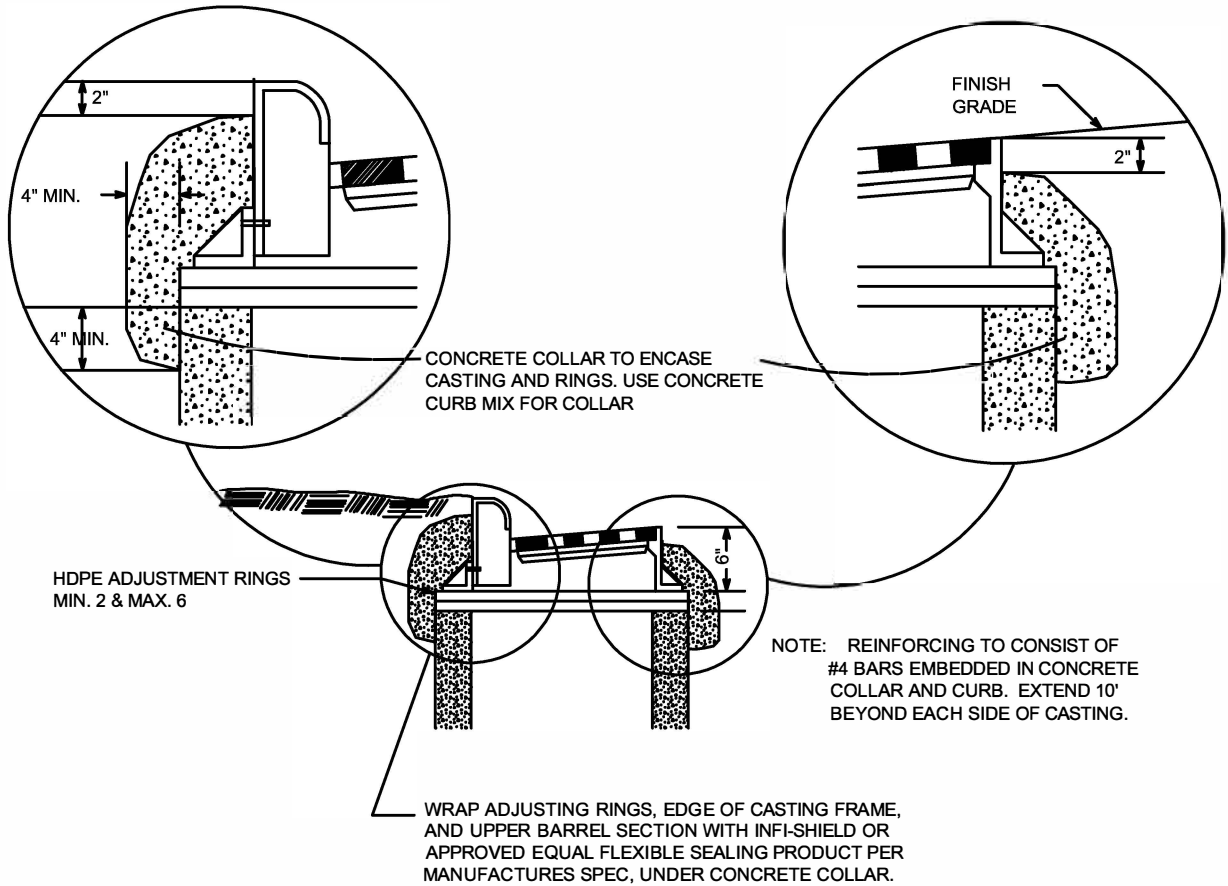
NOTES:

1. REINFORCING TO CONSIST OF #4 BARS @ 8" O.C. BOTH WAYS
2. GROUT BOTTOM TO DRAIN TO CENTER
3. PIPE CUT-OUTS TO BE LOCATED WHERE REQUIRED
4. ADJUSTING RINGS SHALL BE HDPE AND INSTALLED ACCORDING TO MANUFACTURERS' REQUIREMENTS.
5. WIMCO OR APPROVED EQUAL INLET PROTECTION SHALL BE MAINTAINED AND KEPT IN GOOD SHAPE UNTIL WEAR COURSE IS PAVED
6. SURMOUNTABLE CURB DRIVE OVER CASTING - NEENAH 3501-TB
7. B-618 CURB DRIVE OVER CASTING - NEENAH 3290A

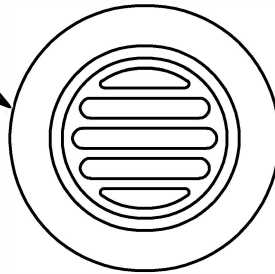


NOTES:

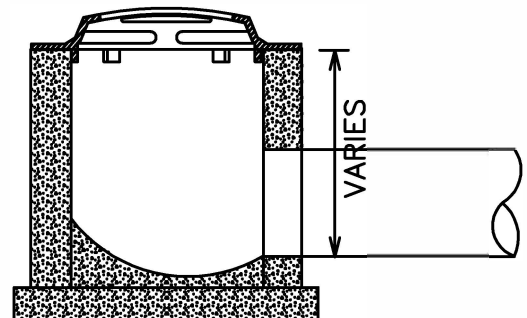
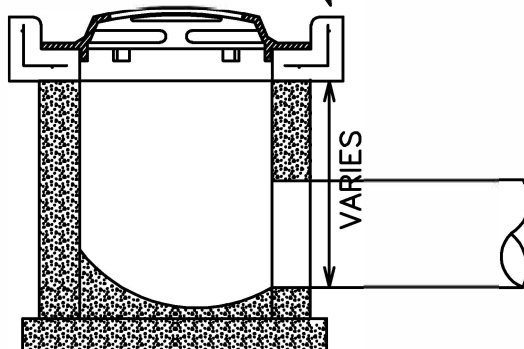
1. REINFORCING TO CONSIST OF #4 BARS @ 8" O.C. BOTH WAYS
2. MANHOLE STEPS SHALL BE CAST ALUMINUM OR MA INDUSTRY WITH VINYL COATING OR APPROVED EQUIVALENT AND SHALL BE LOCATED @ 16" O.C. PARALLEL WITH THE CURB
3. GROUT BOTTOM TO DRAIN TO CENTER
4. PIPE CUT-OUTS TO BE LOCATED WHERE REQUIRED
5. ADJUSTING RINGS SHALL BE HDPE INSTALLED ACCORDING TO MANUFACTURERS' REQUIREMENTS.
6. WIMCO OR APPROVED EQUAL INLET PROTECTION SHALL BE MAINTAINED AND KEPT IN GOOD SHAPE UNTIL WEAR COURSE IS PAVED
7. SURMOUNTABLE CURB DRIVE OVER CASTING - NEENAH 3501-TB
8. B-618 CURB DRIVE OVER CASTING - NEENAH 3290A



NEENAH R-4342
DITCH GRATE
STOOL TYPE



CONCRETE FRAME
MN/DOT PLATE 4143E



FOR MAINTAINED YARDS

FOR BOULEVARD AREAS



CITY OF NORTH BRANCH

BEEHIVE MANHOLE GRATE

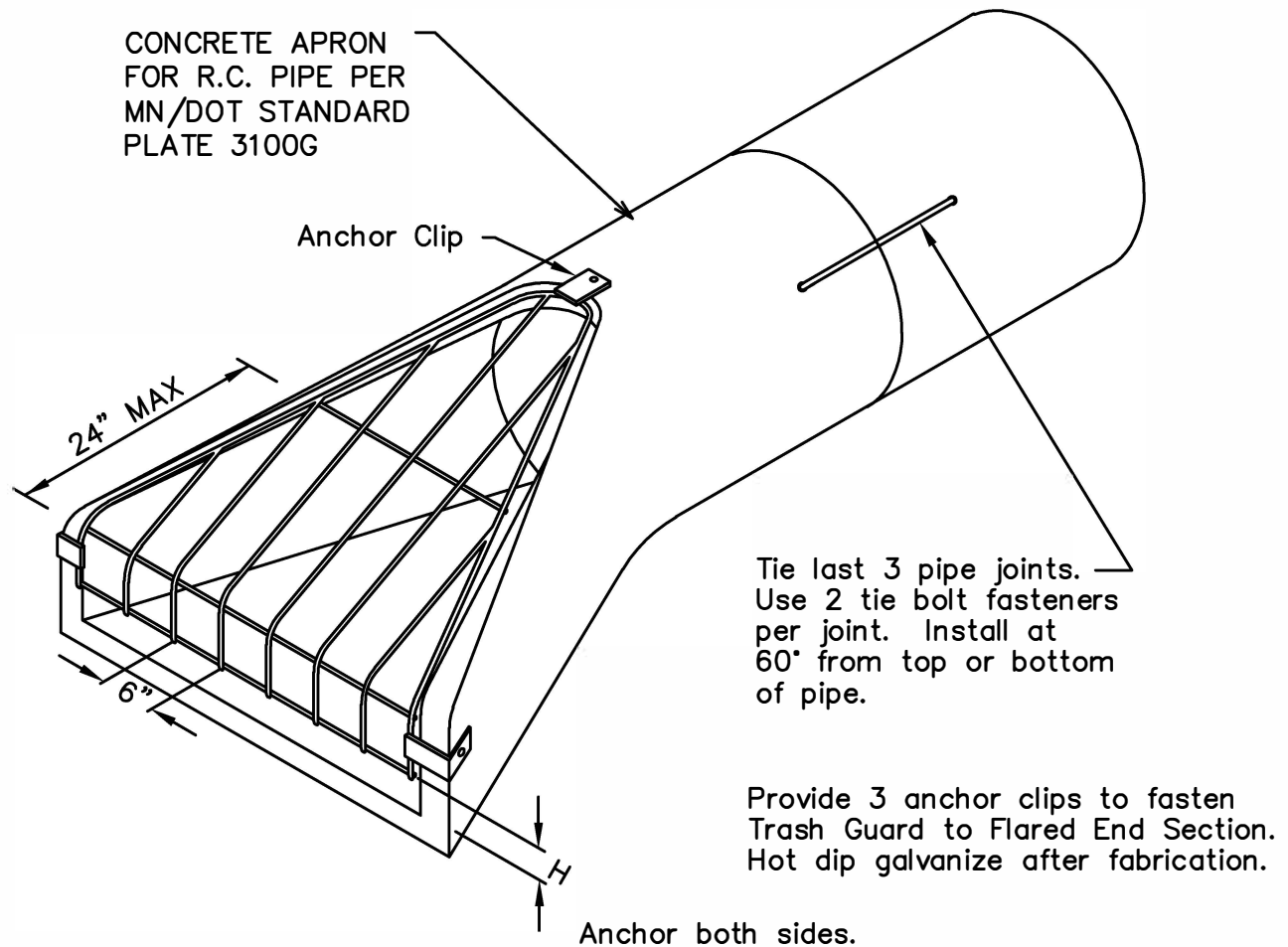
NO SCALE

2025 - STANDARD DETAIL

DETAIL NO.

STM-004

See City Detail No. STM-007 for riprap placement.



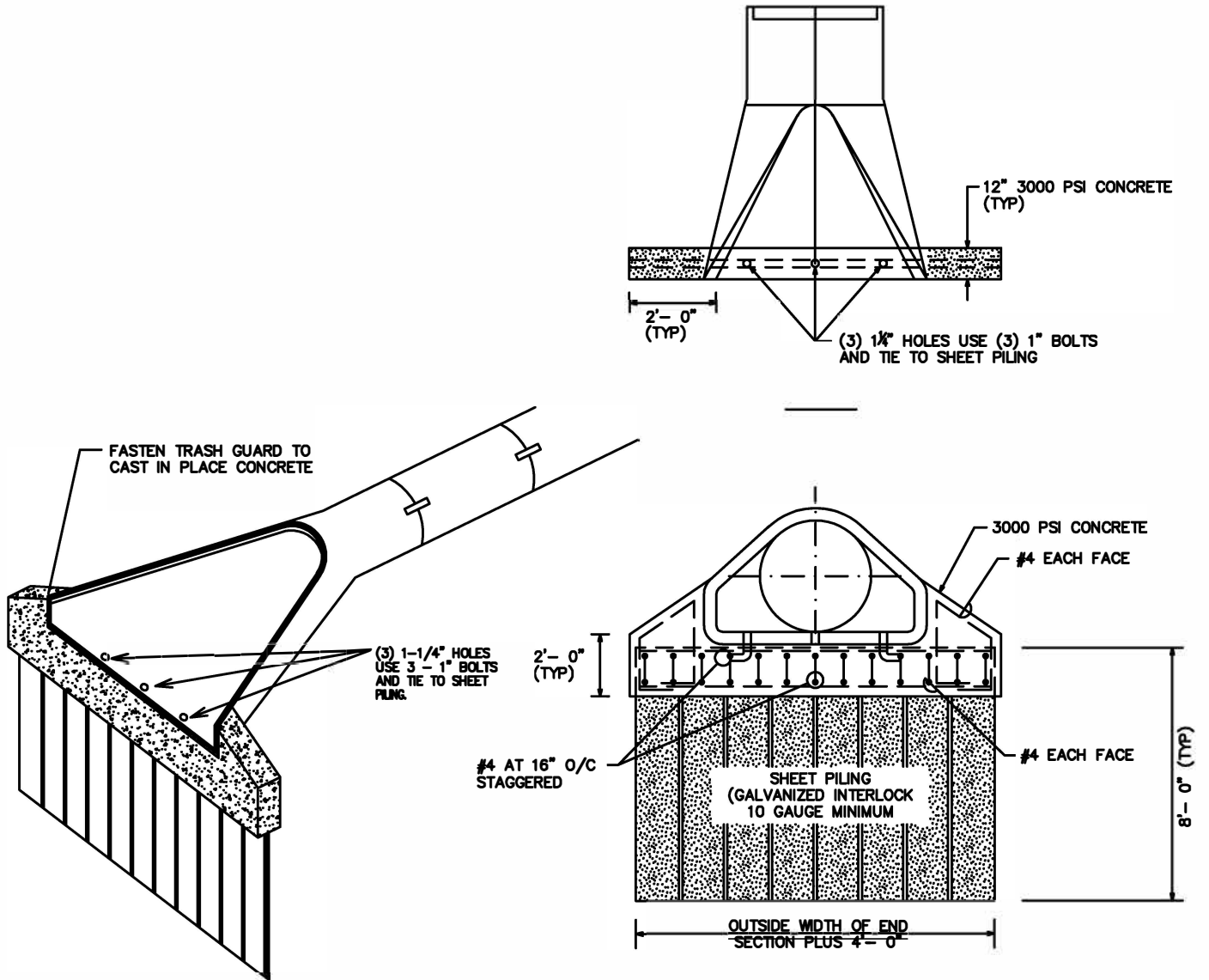
TRASH GUARD SIZING			
Pipe Size	Bars	'H'	Bolts
12"—18"	3/4"Ø	4"	5/8"
21"—42"	1"Ø	6"	3/4"
48"—72"	1 1/4"Ø	12"	1"

NOTES:

1. Entire Trash Guard assembly to be HOT-DIP galvanized after fabrication.
2. Size of Trash Guard variable dependent on size of Flared End Section.
3. Trash Guards required on all Aprons 21" and larger unless otherwise noted.
4. Galvanized metal apron per MN/DOT standard plate 3129A to be used with HDPE pipe in green areas.
5. Install 7 foot 3lb galvanized post with 360 degree reflector (X4-13) at all flared end sections.

NOTE:

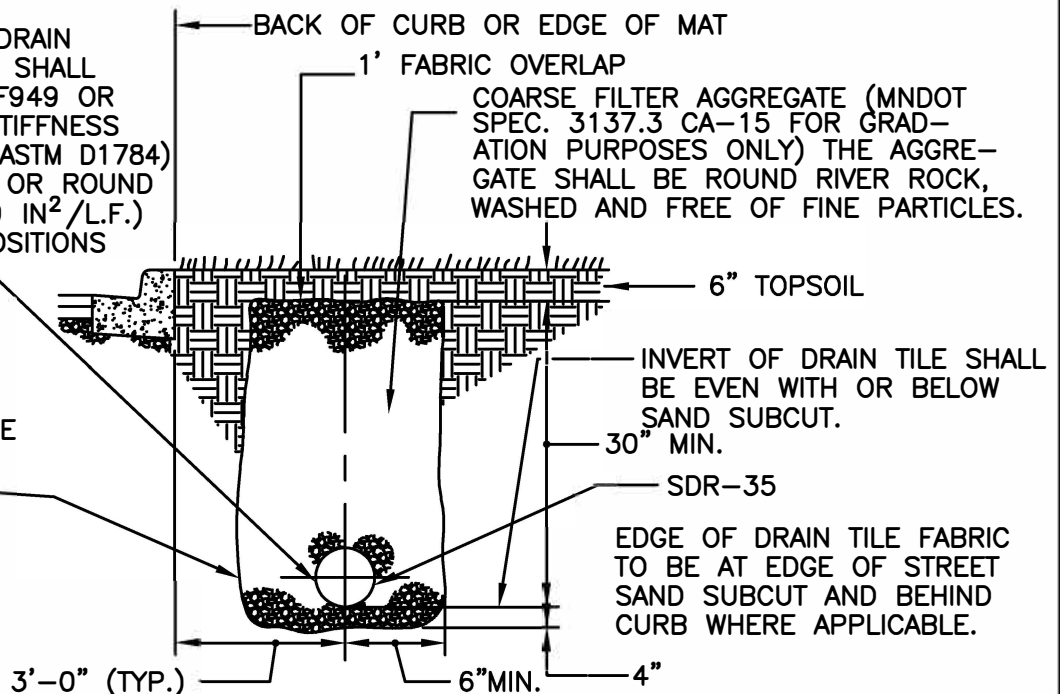
1. THIS DRAWING IS TYPICAL FOR ALL FLARED END SECTIONS ALL TRASH GUARDS WILL BE GALVANIZED.
2. TIE ALL PIPE JOINTS (INCIDENTAL).



PVC PERFORATED UNDERDRAIN PIPE (PIPE AND FITTINGS SHALL BE PVC, MEETING ASTM F949 OR D3034 WITH MIN. PIPE STIFFNESS 46 P.S.I., RESIN 12454B (ASTM D1784) GASKETED JOINTS, SLOT, OR ROUND HOLE PERFORATIONS (1.9 IN²/L.F.) AT 5 AND 7 O'CLOCK POSITIONS OR APPROVED EQUAL.

6" DIA. FOR MAINLINE
4" DIA. FOR SERVICE LINE

FILTER FABRIC WRAP

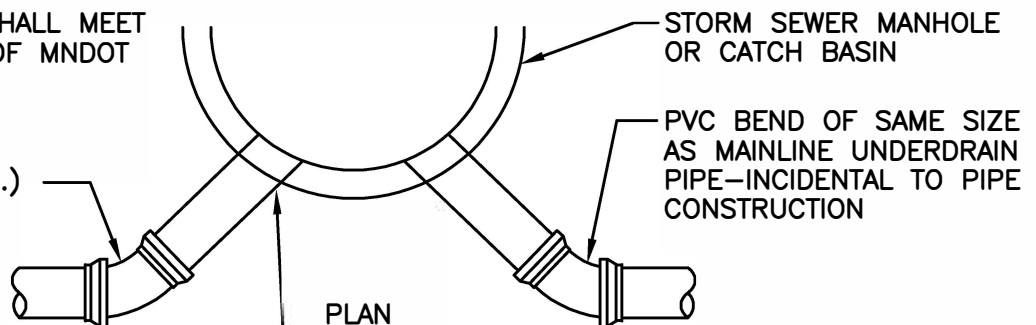


SECTIONAL VIEW

IN UNSTABLE SOILS FILTER FABRIC WRAP TYPE SHALL BE SELECTED BY THE SOILS ENGINEER FROM THE FOLLOWING.

GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF MNDOT 3733, TYPE 1

45° BEND (TYP.)

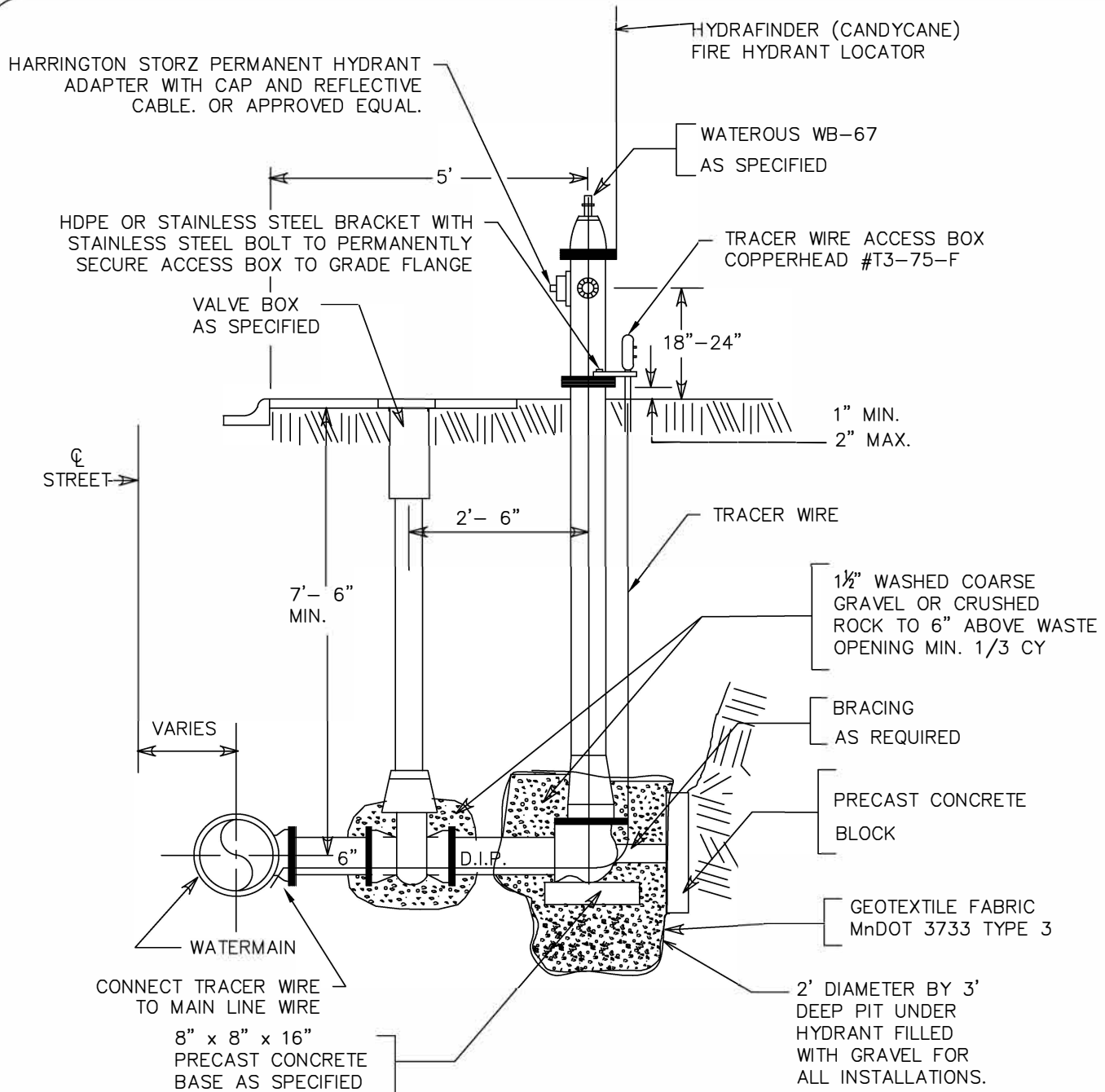


PLAN

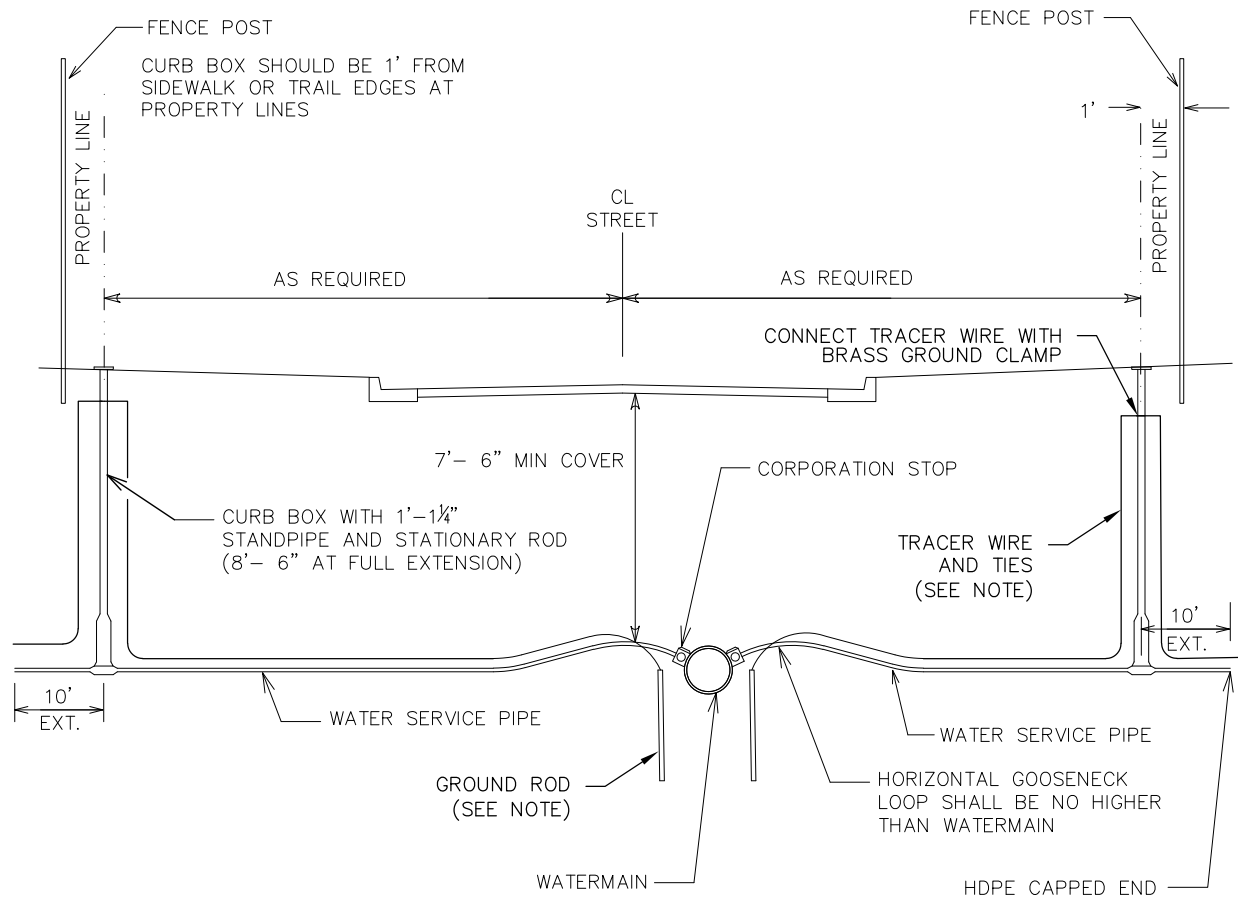
CONNECTION TO STORM SEWER STRUCTURE SHALL BE AT SPRING LINE OR 6" MIN. ABOVE INVERT ALL GROUTING MUST BE AN APPROVED NON-SHRINKABLE GROUT.

INVERT OF DRAIN TILE TO BE DETERMINE INFIELD BY DEPTH OF SAND SUBCUT OR EXISTING GROUND WATER CONDITIONS.

NOTE: ALL DRAINTILE MUST HAVE TRACER WIRE INSTALLED WITHIN THE TRENCH. TRACER WIRE WILL BE 8 GAUGE AND SHALL BE TAPED TO THE TOP OF PIPE AND WILL BE BROUGHT TO THE SURFACE AT EACH STRUCTURE OR CLEAN OUT. FOLLOW U.S.E. GUIDELINES FOR UNDERGROUND BURY. FOLLOWING COMPLETION CONTRACTOR WILL BE REQUIRED TO PERFORM A LOW VOLTAGE CONDUCTIVITY TEST.



NOTE:
ALL HYDRANT LEADS SHALL BE TIED WITH 3/4" GALVANIZED STEEL TIE RODS, EXTENDING FROM TEE TO VALVE AND FROM VALVE TO HYDRANT OR MEGA-LUG BRAND THRUST RETAINER GLANDS AT JOINTS (INCIDENTAL).



NOTES:

1. CURB BOXES INSTALLED IN AREAS WHERE BOULEVARD IS TO BE CUT AT A LATER DATE SHALL BE INSTALLED AT DEPTH REQUIRED, CURB BOX EXTENSION FOR BOXES EXCEEDING 7.5' IN LENGTH ARE TO BE BID AT CONTRACT PRICE AND SHALL INCLUDE STACK COUPLINGS, CONNECTIONS, ETC..
2. CURB BOX LOCATIONS SHALL BE MARKED WITH A STEEL FENCE POST PAINTED BLUE.
3. WATER SERVICE SHALL BE INSTALLED WITH A HORIZONTAL SEPARATION OF THREE FEET (3') FROM THE SANITARY SEWER SERVICE AND SHALL BE INSTALLED UPSTREAM OF THE SANITARY SEWER SERVICE.
4. CURB BOXES LOCATED IN A DRIVEWAY OR PARKING LOT SHALL BE COVERED WITH A FORD A-1 METER BOX COVER OR ENGINEER APPROVED EQUAL.
5. HDPE WATER SERVICES – INSTALL MAGNESIUM GROUNDING ANODE ROD, LOCATING WIRE, WIRE CONNECTORS, AND TIES PER SPECIFICATIONS.



CITY OF NORTH BRANCH

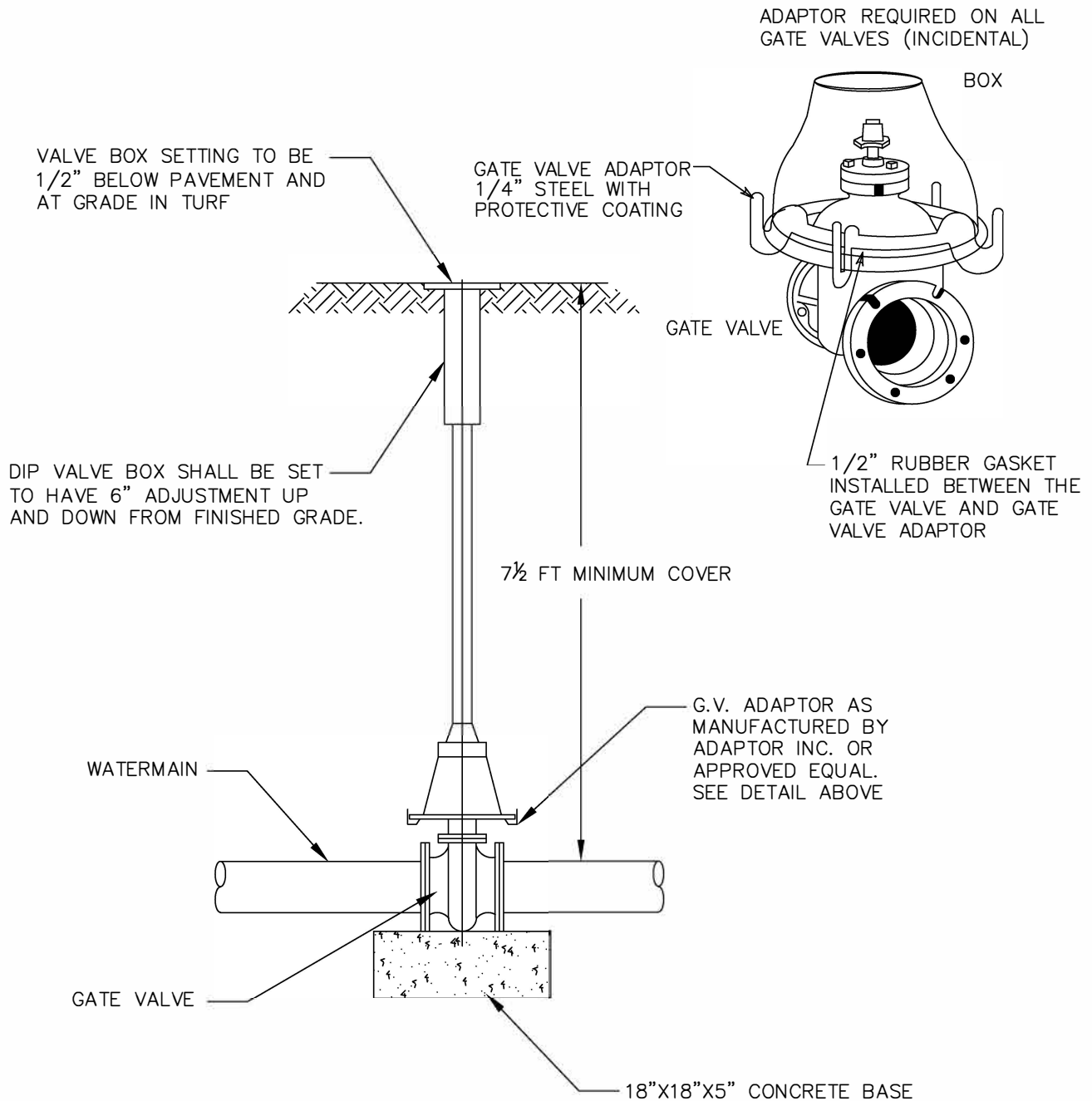
TYPICAL WATER SERVICE

NO SCALE

2025 - STANDARD DETAIL

DETAIL NO.

WM-002



NOTES:

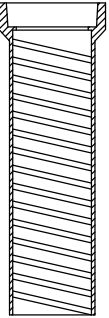
1. VALVE BOX INSERTS ARE NOT ALLOWED UNLESS APPROVED BY THE ENGINEER.
2. VALVE BOXES SHALL BE INSTALLED PLUMB AND SHALL ALLOW A 4" P.V.C. PIPE TO PASS ENTIRELY OVER THE GATE VALVE NUT AFTER INSTALLATION IS COMPLETE.
3. ALL VALVES SHALL BE TIED WITH 3/4" THREADED TIE RODS TO THE MAIN. MEGA LUGS MAY BE USED IN LIEU OF TIE RODS.
4. THE INITIAL & FINAL RAISING OF VALVE BOXES SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
5. ROCK BEDDING FOR DRAINAGE SHALL BE INSTALLED AT GATE VALVE, AS DIRECTED BY THE ENGINEER.



DROP LID
Tyler

No. 6860

7.5' Minimum cover required
over top of water main.

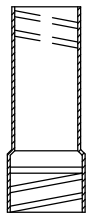


TOP
Tyler

No. 6860

26"

Adjust top to 1/2" below
grade. Box to be set to
provide 12" of adjustment.



EXTENSION
Tyler

No. 58

14"

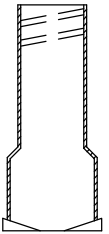
No. 59

18"

No. 60

24"

Tyler No. 6860
Gate valve box, screw type,
3 piece, 5 1/4" shaft, size
G box, 7'-6" extended,
#6 round base



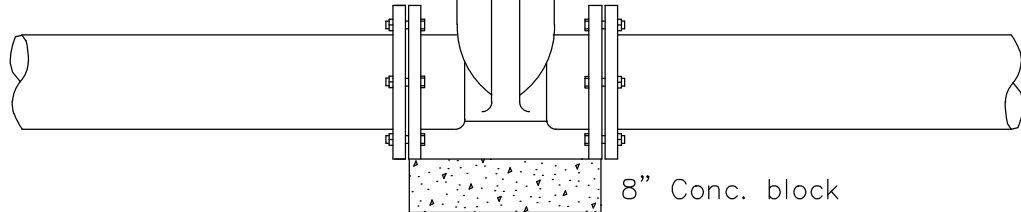
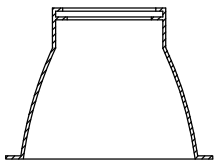
BOTTOM
Tyler

No. 6860

65"

Resilient Wedge Valve
Conforming to AWWA
C-509-80 standards

BASE



8" Conc. block



NORTH BRANCH

CITY OF NORTH BRANCH

BUTTERFLY VALVE
INSTALLATION

NO SCALE

2025 - STANDARD DETAIL

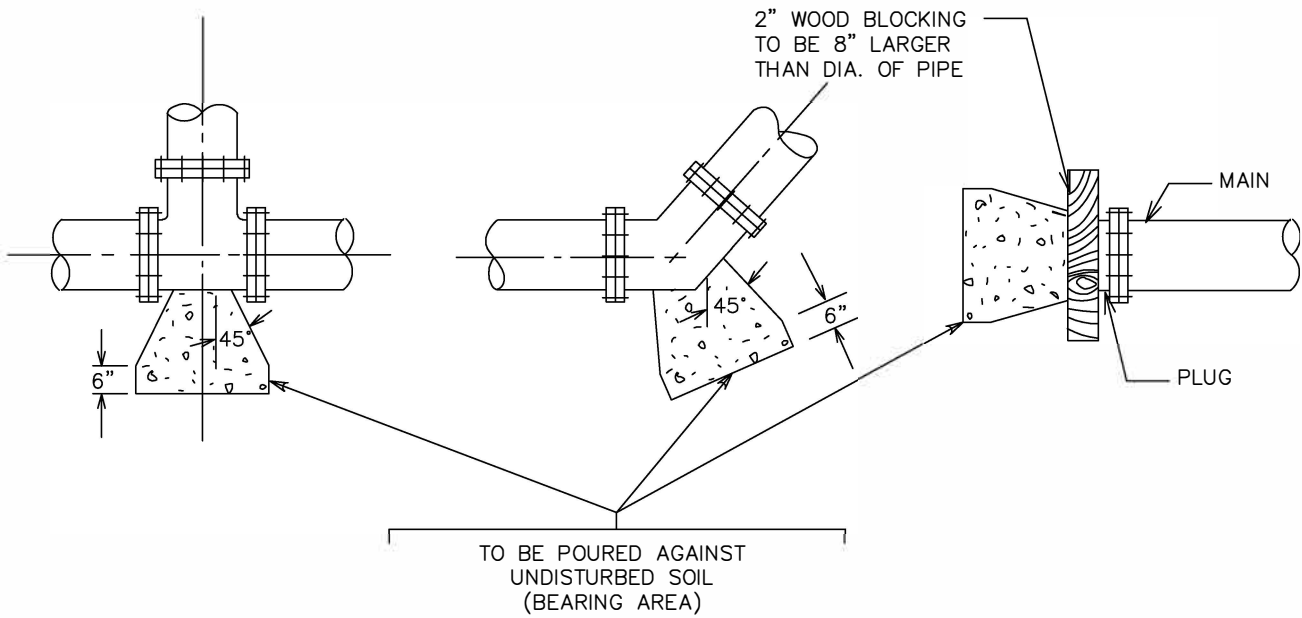
DETAIL NO.

WM - 004

TEE AND BEND

BEND

PLUG



PIPE SIZE	BEARING AREA
6"	4.0 SQ. FT.
8"	6.0 "
10" – 12"	12.0 "
16"	20.0 "

NOTE:

1. RETAINER GLANDS/MEGA LUGS ARE TO BE USED AS SPECIFIED AT ALL CHANGES IN DIRECTION, FITTINGS, AND VALVES.
2. THRUST BLOCKING TO BE USED FOR BENDS 22-1/2" AND OVER.
3. THRUST BLOCKING SHALL ONLY BE USED WHERE WORKING PRESSURES ARE LESS THAN 150 PSI.
4. COVER FITTINGS WITH POLYETHYLENE (4 MIL) PRIOR TO POURING CONCRETE.
5. CONCRETE SHALL HAVE 2500 PSI, 28 DAY STRENGTH.



NORTH BRANCH

CITY OF NORTH BRANCH

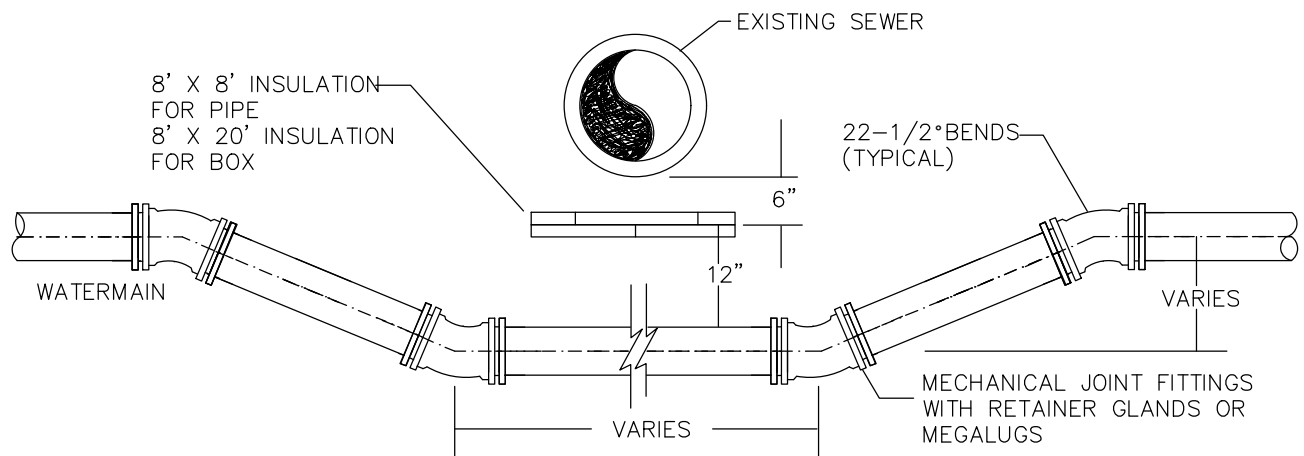
THRUST BLOCKING

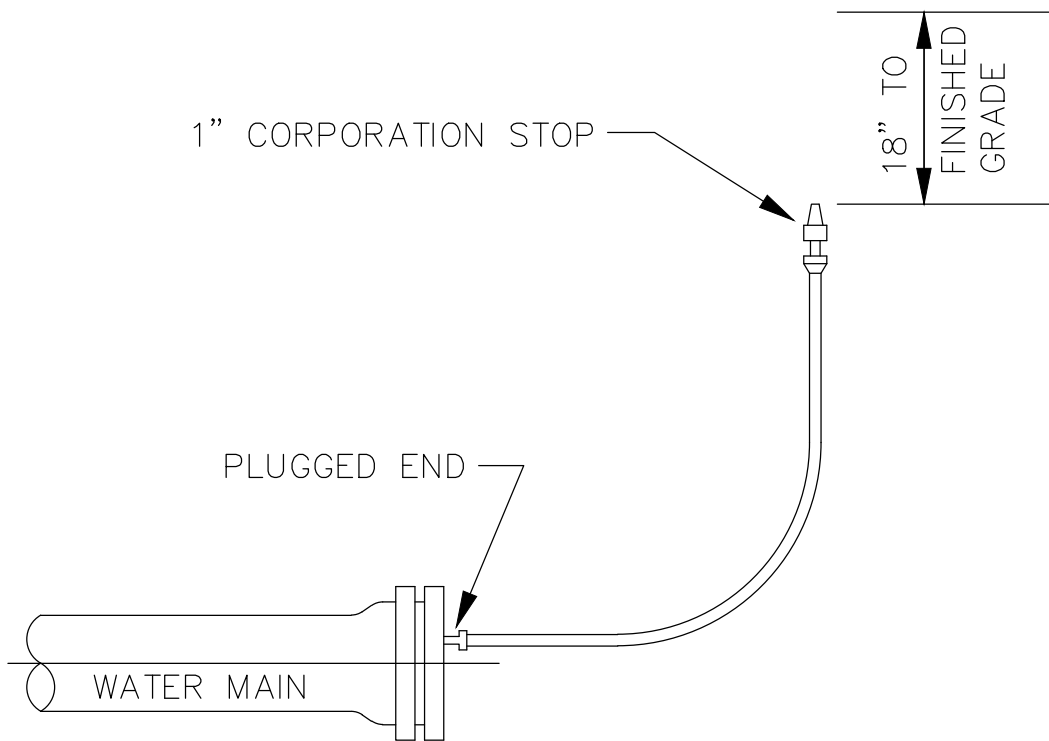
NO SCALE

2025 - STANDARD DETAIL

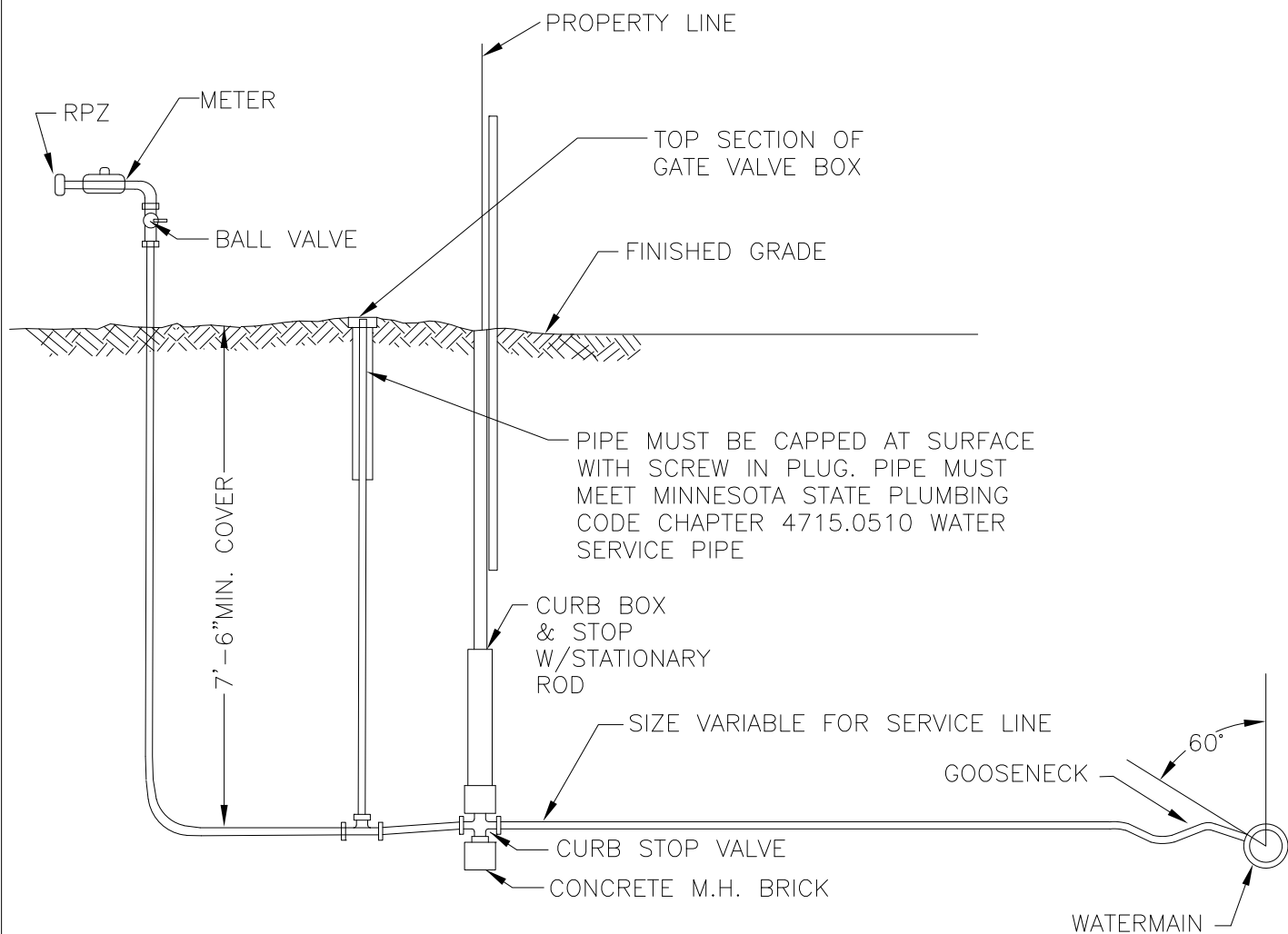
DETAIL NO.

WM-005





AFTER MEETING TEST REQUIREMENTS
THE AIR BLEED LINE SHALL BE
DISCONNECTED AT THE PLUG WITH
NO ADDITIONAL COMPENSATION.



APPENDIX C

DUCTILE IRON MECHANICAL JOINT FITTINGS
AWWA C153 COMPACT FITTING WEIGHTS

Ductile Iron Mechanical Joint Fittings (Watermain Greater than 16" and Forcemain)

Weight in Pounds per AWWA C110/A21.10-03

BENDS (MJ-MJ)				
Size	90°	45°	22 1/2°	11 1/4°
4"	55	50	50	50
6"	85	75	75	75
8"	125	110	110	110
10"	190	155	160	160
12"	255	215	220	220
14"	340	270	275	275
16"	430	340	345	345
18"	545	420	430	430
20"	680	530	535	540
24"	1025	755	765	770

TEES (MJ-MJ)										
Size	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
4"	80									
6"	115	125								
8"	185	175	185							
10"	235	250	260	310						
12"	315	325	340	390	410					
14"		435	450	465	495	520				
16"		540	550	570	590	620	650			
18"		590	605	620	640	755	785	820		
20"		725	735	755	775	795	945	1140	1020	
24"		985	1000	1020	1030	1055	1075	1400	1450	1535

CROSSES (MJ-MJ)										
Size	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
4"	105									
6"	140	160								
8"	185	205	235							
10"	260	285	310	380						
12"	340	360	385	460	495					
14"		475	500	540	585	635				
16"		575	605	645	685	735	790			
18"		625	655	685	725	870	930	995		
20"		760	790	820	860	905	1085	1155	1230	
24"		1025	1045	1085	1110	1155	1200	1590	1675	1835

REDUCERS (MJ-MJ)										
Size	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
6"	60									
8"	80	95								
10"	105	115	135							
12"	135	150	165	190						
14"		190	210	230	255					
16"		230	250	280	305	335				
18"			295	325	350	380	415			
20"				375	405	430	470	510		
24"					550	575	615	660	705	

SOLID SLEEVES (MJ)			
Size		Short	Long
4"		35	45
6"		45	65
8"		65	85
10"		85	115
12"		110	145
14"		150	195
16"		180	235
18"		215	285
20"		240	325
24"		320	425

CAPS (MJ) FLAT		
Size		
4"	15	
6"	25	
8"	45	
10"	60	
12"	80	
14"	120	
16"	155	
18"	195	
20"	240	
24"	345	

PLUGS (MJ) FLAT	
Size	
4"	15
6"	25
8"	45
10"	65
12"	85
14"	115
16"	145
18"	185
20"	225
24"	335

NOTE:

When possible DO NOT use 90° bends. Use (2) 45° bends whenever possible.

Ductile Iron Mechanical Joint Compact Fittings

Weight in Pounds per AWWA C153

BENDS (MJ-MJ)				
Size	90°	45°	22 1/2°	11 1/4°
4"	25	22	18	16
6"	39	32	31	30
8"	57	46	46	42
10"	89	70	64	58
12"	108	86	80	67
14"	210	160	136	93
16"	264	202	172	148
18"	335	250	255	205
20"	400	305	310	245
24"	565	405	412	315

NOTE:

DO NOT use 90° bends.

Use (2) 45° bends.

TEES (MJ-MJ)										
Size	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
4"	32									
6"	46	56								
8"	60	72	86							
10"	78	90	105	120						
12"	94	110	125	140	160					
14"	172	182	206	228	234	280				
16"		228	248	264	280	316	322			
18"		275	295	315	335	380	405	435		
20"		315	345	370	395	440	465	505	535	
24"		415	445	470	500	550	580	625	660	720

CROSSES (MJ-MJ)										
Size	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
4"	40									
6"	68	75								
8"	90	108	105							
10"	98	118	138	145						
12"	100	140	162	190	213					
14"	162	181	259	223	244	299				
16"		250	289	345	397	333	385			
18"		260	282	308		384		630		
20"		306	341	370	392	451	634	547	605	
24"		403	431	465	494	553	714		809	830

REDUCERS (MJ-MJ)										
Size	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
6"	32									
8"	43	54								
10"	61	64	62							
12"	82	85	82	82						
14"		108	104	100	100					
16"		136	132	128	125	140				
18"		194	196	185	190	190	196			
20"				225	210	208	225	233		
24"					310	315	324	312	315	

SOLID SLEEVES (MJ)		
Size	Short	Long
4"	17	20
6"	28	33
8"	38	46
10"	49	62
12"	56	76
14"	111	140
16"	123	170
18"	160	200
20"	195	255
24"	225	335

CAPS (MJ) FLAT	
Size	
4"	9
6"	15
8"	22
10"	32
12"	42
14"	66
16"	92
18"	114
20"	125
24"	166

PLUGS (MJ) FLAT	
Size	
4"	10
6"	16
8"	26
10"	36
12"	46
14"	75
16"	95
18"	121
20"	135
24"	175

APPENDIX D

RECORD DRAWINGS/AS-BUILT INFORMATION

CITY OF NORTH BRANCH
CONSTRUCTION DRAWING “AS-BUILTS” – FORMAT STANDARDS

General Requirements:

1. 3 – Sets 11" x 17" paper drawings
 1 – Set 22" x 34" mylar drawings
 1 – Set 22" x 34" paper drawings
 1 – Set electronic .PDF files for all plan sheets (export each sheet from CAD file and name files corresponding sheet name and number).
 1 – Electronic file with x,y,z coordinates for all curb stops, hydrants, gate valves and manholes.
 1 – Utility, Drainage, Ponds and Grading As-Builts (CAD file)
2. All curb stop boxes, gate valves and manholes/catch basins outside the roadway shall be tied with at least two ties, under 100', using the following priority:
 - A. Fire hydrant
 - B. Storm or sanitary manhole
 - C. Catch basin
 - D. Gate valves
 - E. Corners of existing houses or buildings
 - F. Streetlight (get streetlight number)
 - G. Telephone or power pole
 - H. Electric, telephone or cable pedestal
3. Show service information by lot and block. Follow this example:

 Lot 4, Blk 5
 Curb Stop
 37.5' to SSMH 3005
 83.2' to HYD 5+46
 San. Serv. Inv. = 963.52
4. Show TNH elevations at **all hydrants visible** on every sheet.
5. All planned elevation and pipe lengths shall be crossed out and replaced with “as-built” elevations.
6. Show all sewer and water stub locations and elevations.
7. Include pavement section and street widths on all street plan and profile sheets.
8. Street names shall be clearly labeled on all sheets.
9. Show easements and widths where applicable.
10. Orientate all lot and block numbers to face viewer.
11. Remove all clutter from sheets (example: survey/topo coordinates, revision clouds, ghosted existing wetlands, removals).
12. Provide statement of verification from surveyor that proper monumentation has been set at all lot corners as required by state statute.

APPENDIX E
CONSTRUCTION STORMWATER INSPECTION CHECKLIST

Construction stormwater inspection checklist

Construction Stormwater Program

Doc Type: Permitting Checklist

Note: This inspection checklist is an option for small construction sites. Large construction sites and linear projects require more extensive/more location specific inspection requirements. This inspection report does not address all aspects of the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater Permit (Permit) issued on August 1, 2018. The completion of this checklist does not guarantee that all permit requirements are in compliance; it is the responsibility of the Permittee(s) to read and understand the permit requirements.

Facility information

Site name: _____
 Site address: _____ Permit number: _____
 City: _____ State: _____ Zip code: _____

Inspection information

Inspector name: _____ Phone number: _____

Organization/Company name: _____

Date (mm/dd/yyyy): _____ Time: _____ ☐ am ☐ pm

Is the inspector trained in sediment and erosion control and is it documented in the Stormwater Pollution Prevention Plan (SWPPP)?
☐ Yes ☐ No

Is this inspection routine or in response to a storm event: ☐ 7 day ☐ Rain

Rainfall amount (if applicable): _____

Is site within one aerial mile of special or impaired water that can potentially receive discharge from the site? ☐ Yes ☐ No

If yes, follow Section 23 and other applicable permit requirements.

Note: If NA is selected at any time, specify **why** in the comment area for that section.

Erosion prevention requirements (Section 8.1)

	Yes	No	NA
1. Are soils stabilized where no construction activity has occurred for 14 days (including stockpiles)? (7 days where applicable, or 24 hours during Minnesota Department of Natural Resources [DNR] Fish Spawning restrictions)	☐	☐	☐
2. Has the need to disturb steep slopes been minimized?	☐	☐	☐
3. If steep slopes are disturbed, are stabilization practices designed for steep slopes used?	☐	☐	☐
4. All ditches/swales stabilized 200' back from point of discharge or property edge within 24 hours? (Mulch, hydromulch, tackifier, or similar best management practices [BMPs] are not acceptable in ditches/swales if the slope is greater than 2%)	☐	☐	☐
5. Do pipe outlets have energy dissipation (within 24 hours of connection)?	☐	☐	☐
6. Is construction phasing being followed in accordance with the SWPPP?	☐	☐	☐
7. Are areas not to be disturbed marked off (flags, signs, etc.)?	☐	☐	☐

Comments:

Sediment control requirements (Section 9.1))

	Yes	No	NA
1. Are perimeter sediment controls installed properly on all down gradient perimeters?	☐	☐	☐
2. Are appropriate BMPs installed protecting inlets, catch basins, and culvert inlets?	☐	☐	☐
3. Is a 50 foot natural buffer preserved around all surface waters during construction?	☐	☐	☐
If No, have redundant sediment controls been installed?	☐	☐	☐
4. Do all erodible stockpiles have perimeter control in place?	☐	☐	☐
5. Is there a temporary sediment basin on site, and is it built as required in Section 14 of the permit?	☐	☐	☐
6. Is soil compaction being minimized where not designed for compaction?	☐	☐	☐
7. Is topsoil being preserved unless infeasible?	☐	☐	☐
8. If chemical flocculants are used, is there a chemical flocculant plan in place?	☐	☐	☐

Comments:

Maintenance and inspections (Section 11)

	Yes	No	NA
1. Are all previously stabilized areas maintaining ground cover?	☐	☐	☐
2. Are perimeter controls maintained and functioning properly, sediment removed when one-half full?	☐	☐	☐
3. Are inlet protection devices maintained and adequately protecting inlets?	☐	☐	☐
4. Are the temporary sediment basins being maintained and functioning properly?	☐	☐	☐
5. Are vehicle tracking BMPs at site exists in place and maintained and functioning properly?	☐	☐	☐
6. Is all tracked sediment being removed within 24 hours?	☐	☐	☐
7. Have all surface waters, ditches, conveyances, and discharge points been inspected?	☐	☐	
8. Were any discharges seen during this inspection (i.e., sediment, turbid water, or otherwise)?	☐	☐	

If yes, record the location of all points of discharge. Photograph and describe the discharge (size, color, odor, foam, oil sheen, time, etc.). Describe how the discharge will be addressed. Was the discharge a sediment delta? If yes, will the delta be recovered within seven days and in accordance with item 11.5 of the permit?

Comments:

Pollution prevention (Section 12)

	Yes	No	NA
1. Are all construction materials that can leach pollutants under cover or protected?	☐	☐	☐
2. Are hazardous materials being properly stored?	☐	☐	☐
3. Are appropriate BMPs being used to prevent discharges associated with fueling and maintenance of equipment or vehicles?	☐	☐	☐
4. Are all solid wastes being properly contained and disposed of?	☐	☐	☐
5. Is there a concrete/other material washout area on site and is it being used?	☐	☐	☐
6. Is the concrete washout area marked with a sign?	☐	☐	☐
7. Are the concrete/other material washout areas properly maintained?	☐	☐	☐

Comments:

Other

	Yes	No	NA
1. Is a copy of the SWPPP, inspection records, and training documentation located on the construction site, or can it be made available within 72 hours?	☐	☐	☐
2. Has the SWPPP been followed and implemented on site, and amended as needed?	☐	☐	☐
3. Is any dewatering occurring on site?	☐	☐	☐
If yes, what BMPs are being used to ensure that clean water is leaving the site and the discharge is not causing erosion or scour?			
4. Will a permanent stormwater management system be created for this project if required and in accordance with Section 15 of the permit (if adding an acre or more of new impervious surface)?	☐	☐	☐
If yes, describe:			
5. If infiltration/filtration systems are being constructed, are they marked and protected from compaction and sedimentation?	☐	☐	☐

6. Description of areas of non-compliance noted during the inspection, required corrective actions, and recommended date of completion of corrective actions:

7. Proposed amendments to the SWPPP:

8. Potential areas of future concern:

9. Additional comments:

Disclosures:

- After discovery, the permit requires many of the deficiencies that may be found on site be corrected within a specified period of time. See permit for more details.
- The Permittee(s) is/are responsible for the inspection and maintenance of temporary and permanent water quality management BMPs as well as erosion prevention and sediment control BMPs until another Permittee has obtained coverage under this Permit according to Section 3, or the project has met the termination conditions of the permit and a Notice of Termination has been submitted to the Minnesota Pollution Control Agency.

APPENDIX F
TRACER WIRE SPECIFICATION GUIDE

Sewer/Water Utility - Trace Wire Specification

Materials

General

All trace wire and trace wire products shall be domestically manufactured in the U.S.A.

All trace wire shall have HDPE insulation intended for direct bury, color coated per APWA standard for the specific utility being marked.

Trace wire

- **Open Trench** - Trace wire shall be #12 AWG Copper Clad Steel, High Strength with minimum 450 lb. break load, with minimum 30 mil HDPE insulation thickness.
- **Directional Drilling/Boring** - Trace wire shall be #12 AWG Copper Clad Steel, Extra High Strength with minimum 1,150 lb. break load, with minimum 30 mil HDPE insulation thickness.
- **Trace wire – Pipe Bursting/Slip Lining** - Trace wire shall be 7 x 7 Stranded Copper Clad Steel, Extreme Strength with 4,700 lb. break load, with minimum 50 ml HDPE insulation thickness.

Connectors

- All mainline trace wires must be interconnected in intersections, at mainline tees and mainline crosses. At tees, the three wires shall be joined using a single 3-way lockable connector. At Crosses, the four wires shall be joined using a 4-way connector. Use of two 3-way connectors with a short jumper wire between them is an acceptable alternative.
- **Direct bury wire connectors** – shall include 3-way lockable connectors and mainline to lateral lug connectors specifically manufactured for use in underground trace wire installation. Connectors shall be dielectric silicon filled to seal out moisture and corrosion, and shall be installed in a manner so as to prevent any uninsulated wire exposure.
- Non locking friction fit, twist on or taped connectors are prohibited.

Termination/Access

- All trace wire termination points must utilize an approved trace wire access box (above ground access box or grade level/in-ground access box as applicable), specifically manufactured for this purpose.
- All grade level/in-ground access boxes shall be appropriately identified with “sewer” or “water” cast into the cap and be color coded.
- A minimum of 2 ft. of excess/slack wire is required in all trace wire access boxes after meeting final elevation.
- All trace wire access boxes must include a manually interruptible conductive/connective link between the terminal(s) for the trace wire connection and the terminal for the grounding anode wire connection.
- Grounding anode wire shall be connected to the identified (or bottom) terminal on all access boxes.

This Standard specification was prepared by Joe Rubbelke (joe.rubbelke@gmail.com), Jeff Dale (jeff.dale@mrwa.com) and Frank Stuemke (frank.stuemke@mrwa.com), and is a work-in-progress, intended for redistribution, modification and immediate use by any municipality (March 2014). The end user must accept all liabilities and hold harmless the contributors of this information.

Sewer/Water Utility - Trace Wire Specification

- **Service Laterals on public property** - Trace wire must terminate at an approved grade level/in-ground trace wire access box, located at the edge of the road right-of-way, and out of the roadway.
- **Service Laterals on private property** - Trace wire must terminate at an approved above-ground trace wire access box, affixed to the building exterior directly above where the utility enters the building, at an elevation not greater than 5 vertical feet above finished grade, or terminate at an approved grade level/in-ground trace wire access box, located within 2 linear feet of the building being served by the utility.
- **Hydrants** – Trace wire must terminate at an approved above-ground trace wire access box, properly affixed to the hydrant grade flange. (affixing with tape or plastic ties shall not be acceptable)
- **Long-runs, in excess of 500 linear feet without service laterals or hydrants** - Trace wire access must be provided utilizing an approved grade level/in-ground trace wire access box, located at the edge of the road right-of-way, and out of the roadway. The grade level/in-ground trace wire access box shall be delineated using a minimum 48" polyethylene marker post, color coded per APWA standard for the specific utility being marked.

Grounding

- Trace wire must be properly grounded at all dead ends/stubs
- Grounding of trace wire shall be achieved by use of a drive-in magnesium grounding anode rod with a minimum of 20ft of #12 red HDPE insulated copper clad steel wire connected to anode (minimum 1.5 lb.) specifically manufactured for this purpose, and buried at the same elevation as the utility.
- When grounding the trace wire at dead ends/stubs, the grounding anode shall be installed in a direction 180 degrees opposite of the trace wire, at the maximum possible distance.
- When grounding the trace wire in areas where the trace wire is continuous and neither the mainline trace wire or the grounding anode wire will be terminated at/above grade, install grounding anode directly beneath and in-line with the trace wire. Do not coil excess wire from grounding anode. In this installation method, the grounding anode wire shall be trimmed to an appropriate length before connecting to trace wire with a mainline to lateral lug connector.
- Where the anode wire will be connected to a trace wire access box, a minimum of 2 ft. of excess/slack wire is required after meeting final elevation.

Installation

General

- Trace wire installation shall be performed in such a manner that allows proper access for connection of line tracing equipment, proper locating of wire without loss or deterioration of low frequency (512Hz) signal for distances in excess of 1,000 linear feet, and without distortion of signal caused by multiple wires being installed in close proximity to one another.
- Trace wire systems must be installed as a single continuous wire, except where using approved connectors. No looping or coiling of wire is allowed.

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Sewer/Water Utility - Trace Wire Specification

- Any damage occurring during installation of the trace wire must be immediately repaired by removing the damaged wire, and installing a new section of wire with approved connectors. Taping and/or spray coating shall not be allowed.
- Trace wire shall be installed at the bottom half of the pipe and secured (taped/tied) at 5' intervals.
- Trace wire must be properly grounded as specified.
- Trace wire on all service laterals/stubs must terminate at an approved trace wire access box located directly above the utility, at the edge of the road right-of-way, but out of the roadway. (See Trace wire Termination/Access)
- At all mainline dead-ends, trace wire shall go to ground using an approved connection to a drive-in magnesium grounding anode rod, buried at the same depth as the trace wire. (See Grounding)
- Mainline trace wire shall not be connected to existing conductive pipes. Treat as a mainline dead-end, ground using an approved waterproof connection to a grounding anode buried at the same depth as the trace wire.
- All service lateral trace wires shall be a single wire, connected to the mainline trace wire using a mainline to lateral lug connector, installed without cutting/splicing the mainline trace wire.
- In occurrences where an existing trace wire is encountered on an existing utility that is being extended or tied into, the new trace wire and existing trace wire shall be connected using approved splice connectors, and shall be properly grounded at the splice location as specified.

Sanitary Sewer System

- A mainline trace wire must be installed, with all service lateral trace wires properly connected to the mainline trace wire, to ensure full tracing/locating capabilities from a single connection point.
- Lay mainline trace wire continuously, by-passing around the outside of manholes/structures on the North or East side.
- Trace wire on all sanitary service laterals must terminate at an approved trace wire access box color coded green and located directly above the service lateral at the edge of road right of way.

Water System

- A mainline trace wire must be installed, with all service lateral trace wires properly connected to the mainline trace wire, to ensure full tracing/locating capabilities from a single connection point.
- Lay mainline trace wire continuously, by-passing around the outside of valves and fittings on the North or East side.
- Trace wire on all water service laterals must terminate at an approved trace wire access box color coded blue and located directly above the service lateral at the edge of road right of way.
- Above-ground tracer wire access boxes will be installed on all fire hydrants.
- All conductive and non-conductive service lines shall include tracer wire.

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Sewer/Water Utility - Trace Wire Specification

Storm Sewer System

This section shall be included at the discretion of the facility owner.

- If the storm sewer system includes service laterals for connection of private drains and tile lines, it shall be specified the same as a sanitary sewer application.
- Lay mainline trace wire continuously, by-passing around the outside of manholes/structure on the North or East side.

Prohibited Products and Methods

The following products and methods shall not be allowed or acceptable

- Uninsulated trace wire
- Trace wire insulations other than HDPE
- Trace wires not domestically manufactured
- Non locking, friction fit, twist on or taped connectors
- Brass or copper ground rods
- Wire connections utilizing taping or spray-on waterproofing
- Looped wire or continuous wire installations, that has multiple wires laid side-by-side or in close proximity to one another
- Trace wire wrapped around the corresponding utility
- Brass fittings with trace wire connection lugs
- Wire terminations within the roadway, i.e. in valve boxes, cleanouts, manholes, etc.
- Connecting trace wire to existing conductive utilities

Testing

All new trace wire installations shall be located using typical low frequency (512Hz) line tracing equipment, witnessed by the contractor, engineer and facility owner as applicable, prior to acceptance of ownership.

This verification shall be performed upon completion of rough grading and again prior to final acceptance of the project.

Continuity testing in lieu of actual line tracing shall not be accepted.

Sewer/Water Utility - Trace Wire Specification

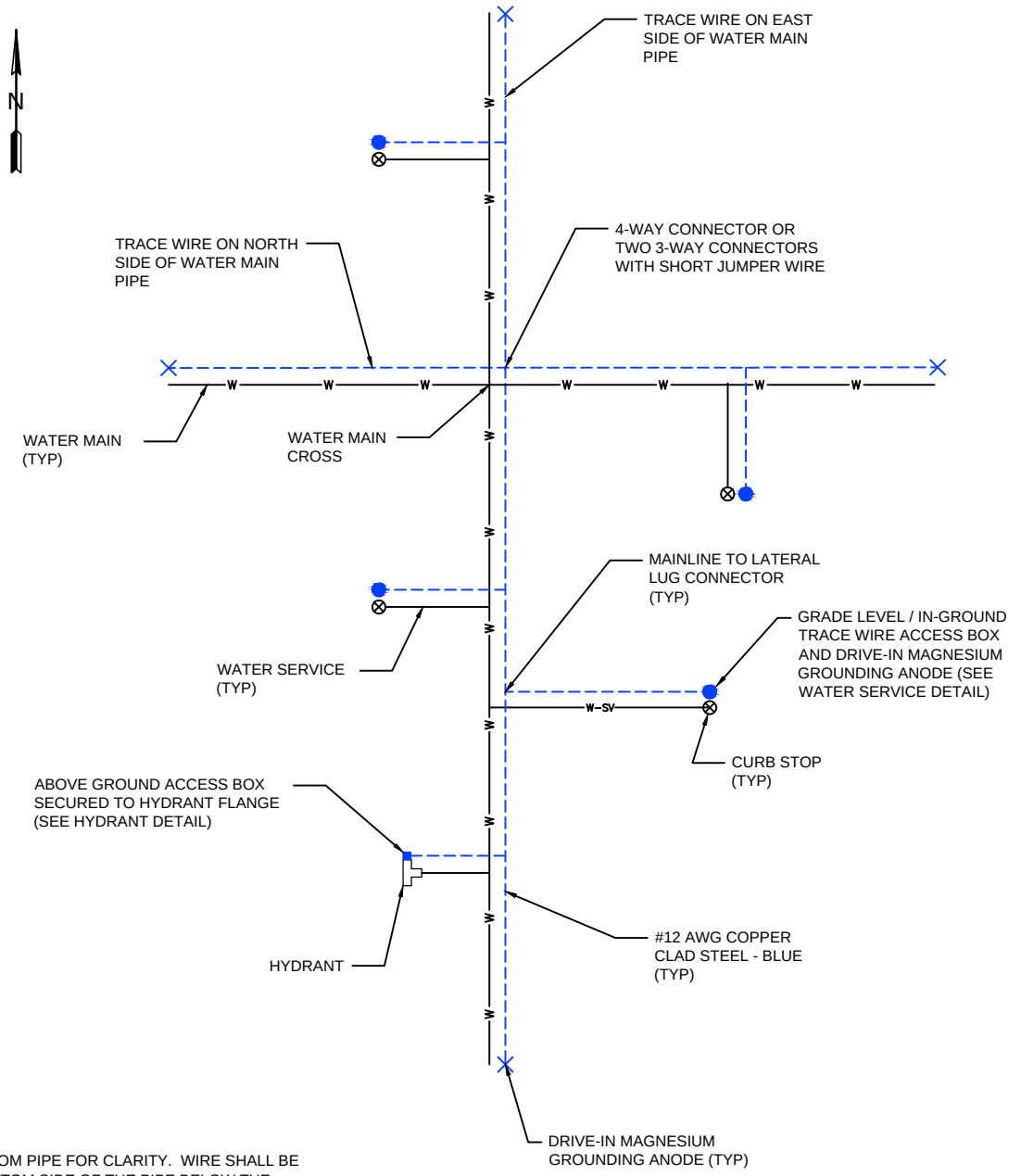
Products

The following products have been deemed acceptable and appropriate. These products are a guide only to help you choose the correct applications for your tracer wire project.

- Copper clad Steel (CCS) trace wire
 - o Open Trench – Copperhead #12 High Strength part # 1230*-HS**
 - o Directional Drilling/Boring - Copperhead Extra High Strength part # 1245*-EHS**
 - o Pipe Bursting/Slip Lining – Copperhead SoloShot Extreme Strength 7 x 7 Stranded part # PBX-50*-**
 - * Denotes color: B=Blue, G=Green, P=Purple
 - **Denotes spool size. 500' 1000' 2500'
- Connectors
 - o Copperhead 3-way locking connector part # LSC1230*
 - o DryConn 3- way Direct Bury Lug: Copperhead Part # 3WB-01
- Termination/Access
 - o Non-Roadway access boxes applications: Trace wire access boxes Grade level Copperhead adjustable lite duty Part # LD14*2T-SW
 - o Concrete / Driveway access box applications: Trace wire access boxes Grade level Copperhead Part # CD14*2T-SW
 - o Fire hydrant trace wire access box applications: Above ground two terminal Cobra Test Station, part# T2-*-FLPKG
- Grounding
 - o Drive in Magnesium Anode: Copperhead Part # ANO-12 (1.5 lb)

Manufacture product options:

The information provided by Copperhead Industries gives you product options to help you choose the correct wire – termination/access points – connectors and grounding products. Other manufactures provide these products; this information is only a guide.



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.

TRACE WIRE PLAN (WATER)

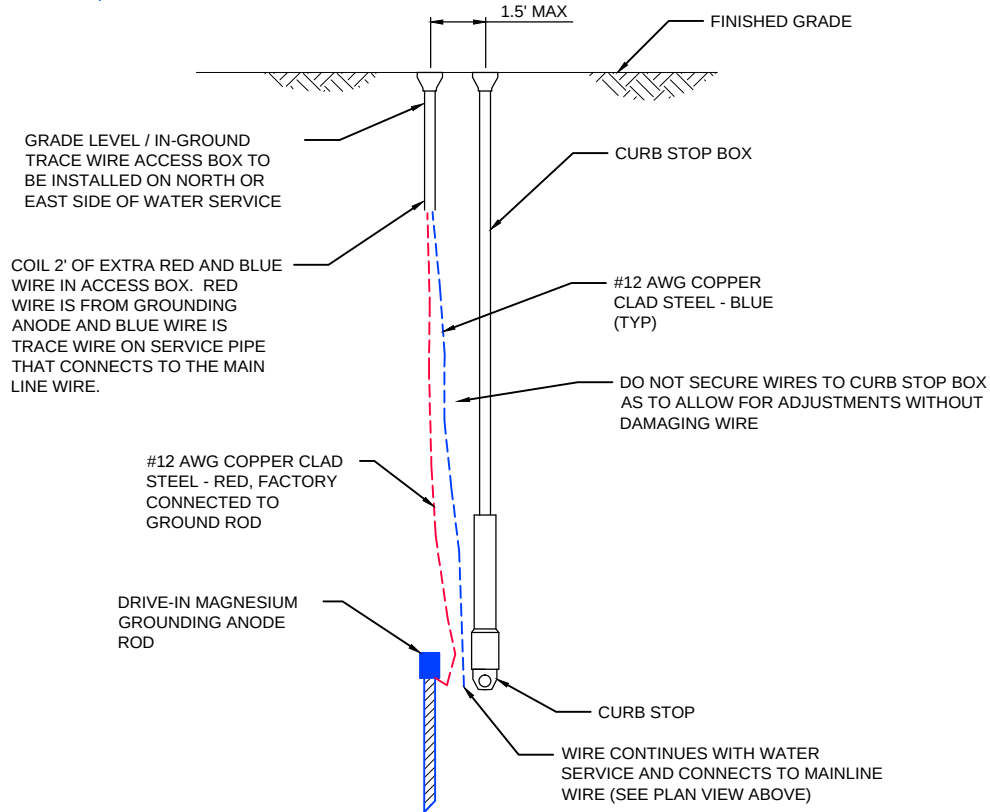
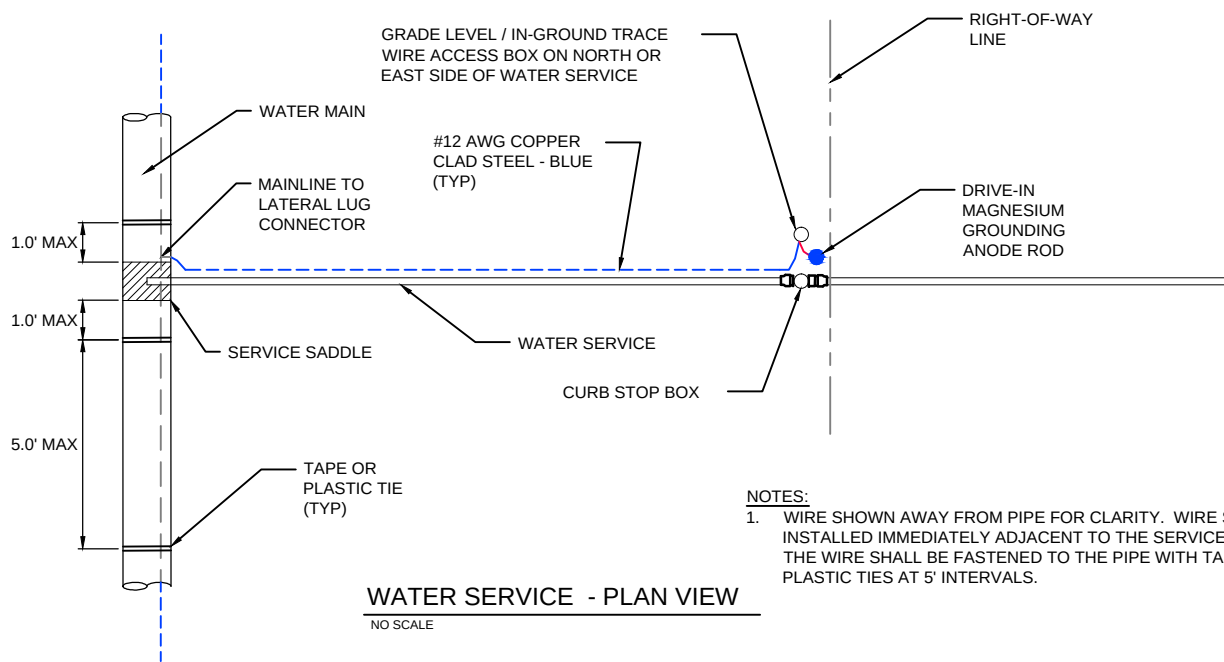
NO SCALE



MINNESOTA RURAL WATER ASSOCIATION
STANDARD DETAIL

TRACE WIRE
SAMPLE WATER PLAN

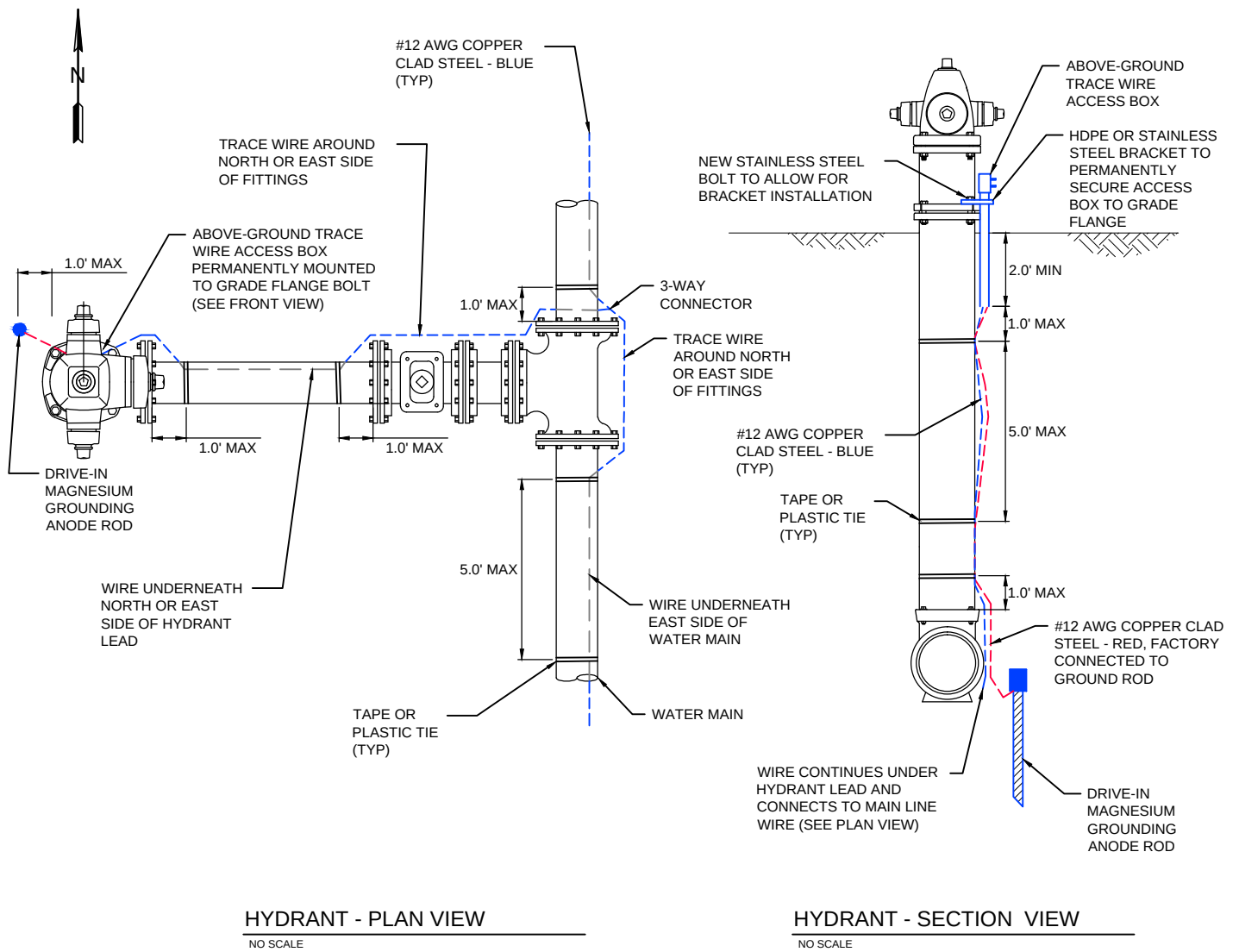
May 28, 2014



MINNESOTA RURAL WATER ASSOCIATION
STANDARD DETAIL

TRACE WIRE
WATER SERVICE DETAIL

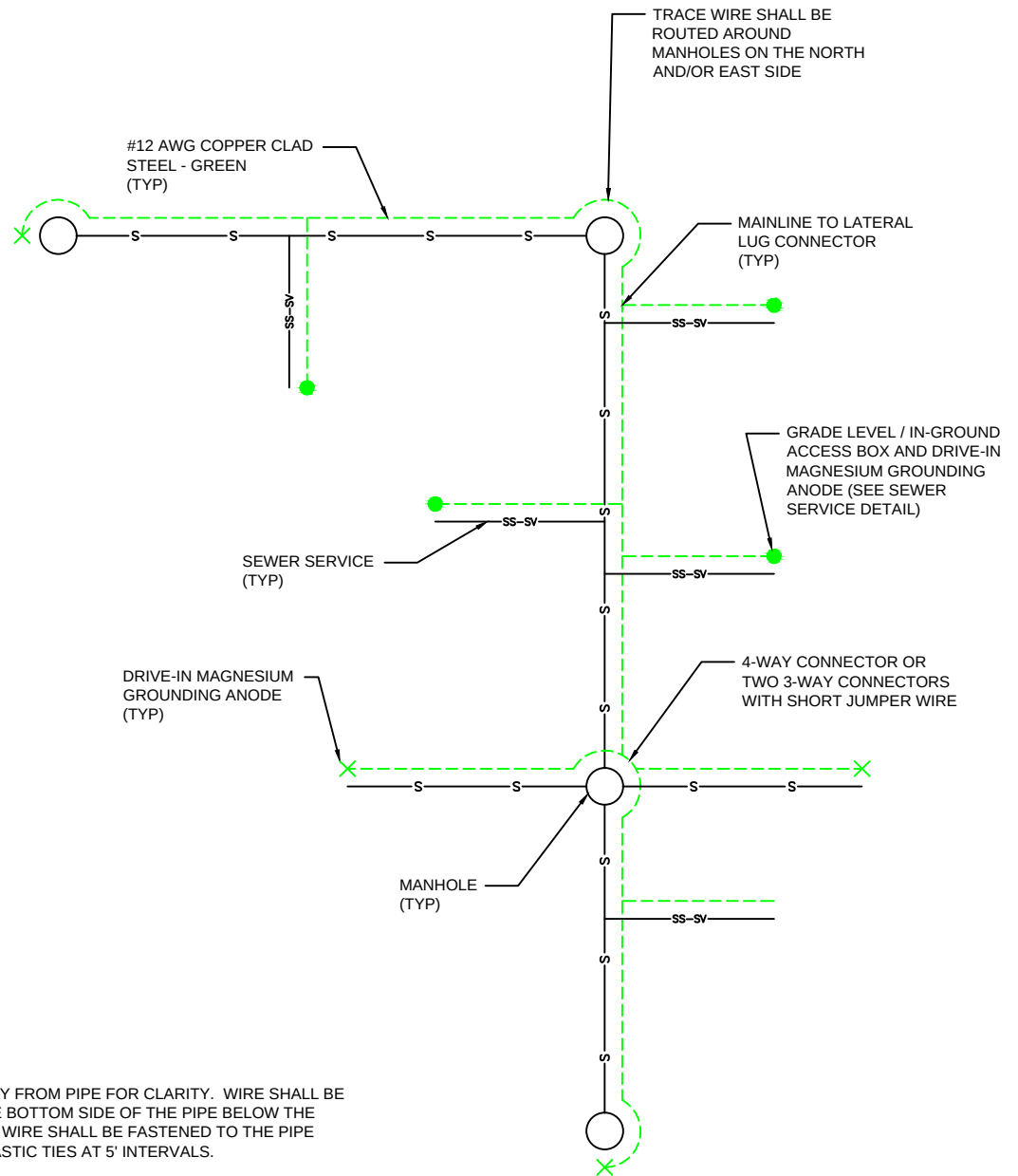
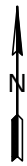
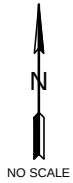
May 28, 2014



MINNESOTA RURAL WATER ASSOCIATION
STANDARD DETAIL

TRACE WIRE
HYDRANT DETAIL

May 28, 2014



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.

TRACE WIRE PLAN (SEWER)

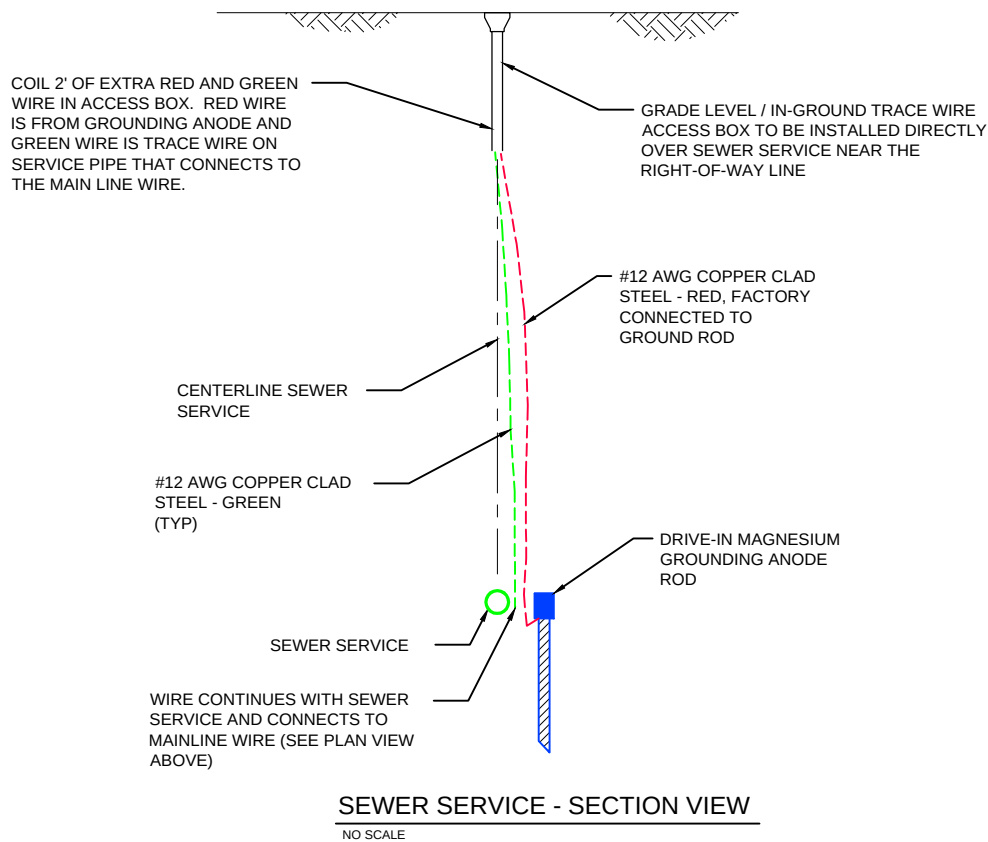
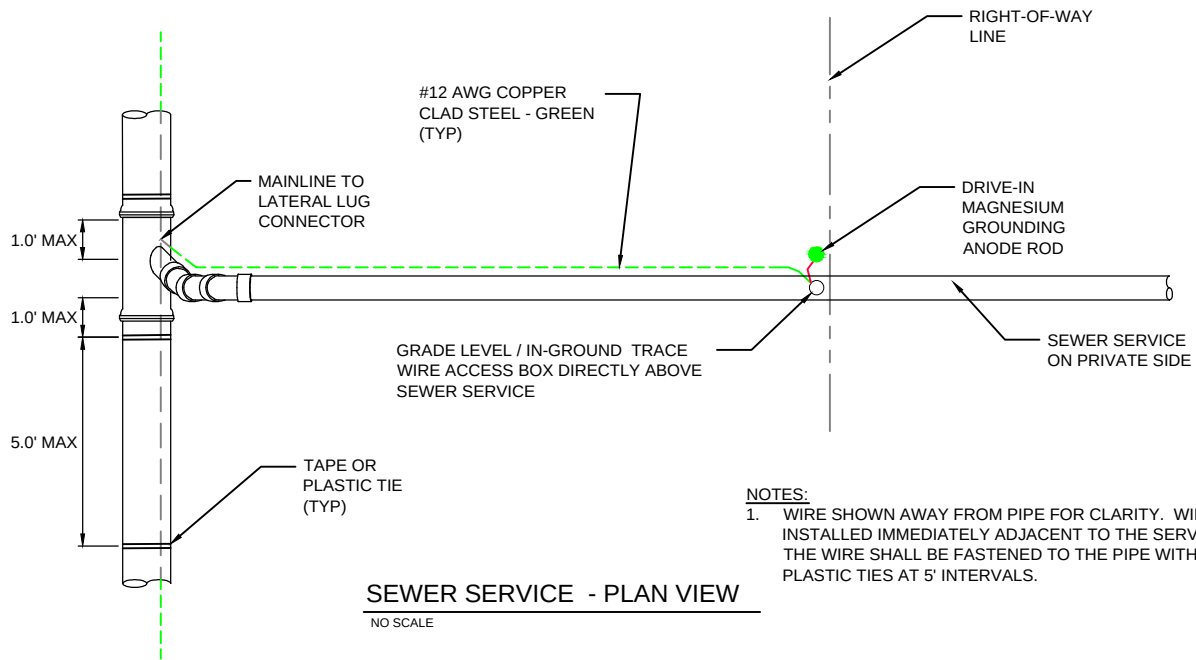
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MINNESOTA RURAL WATER ASSOCIATION
STANDARD DETAIL

TRACE WIRE
SAMPLE SEWER PLAN

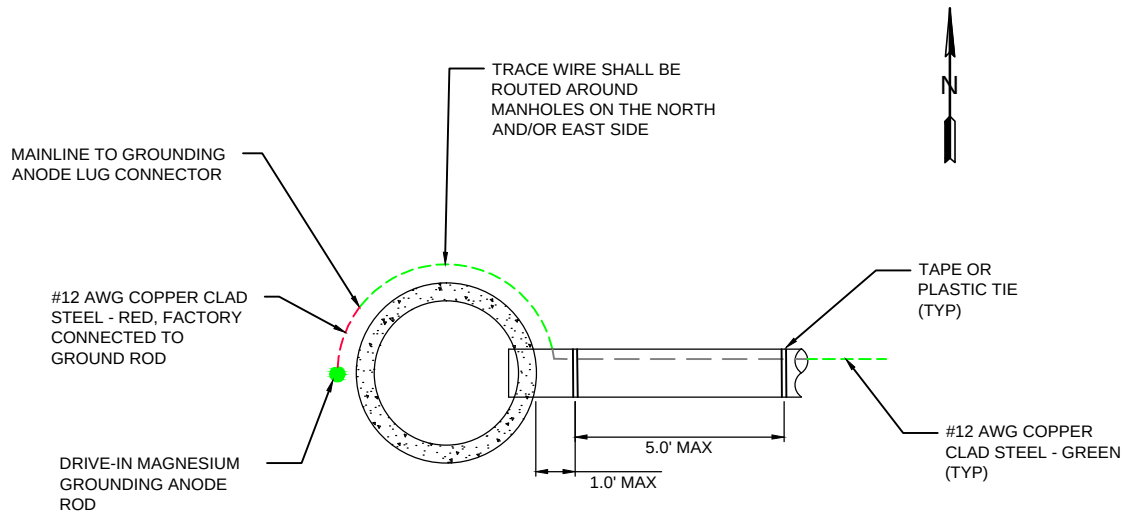
May 28, 2014



MINNESOTA RURAL WATER ASSOCIATION
STANDARD DETAIL

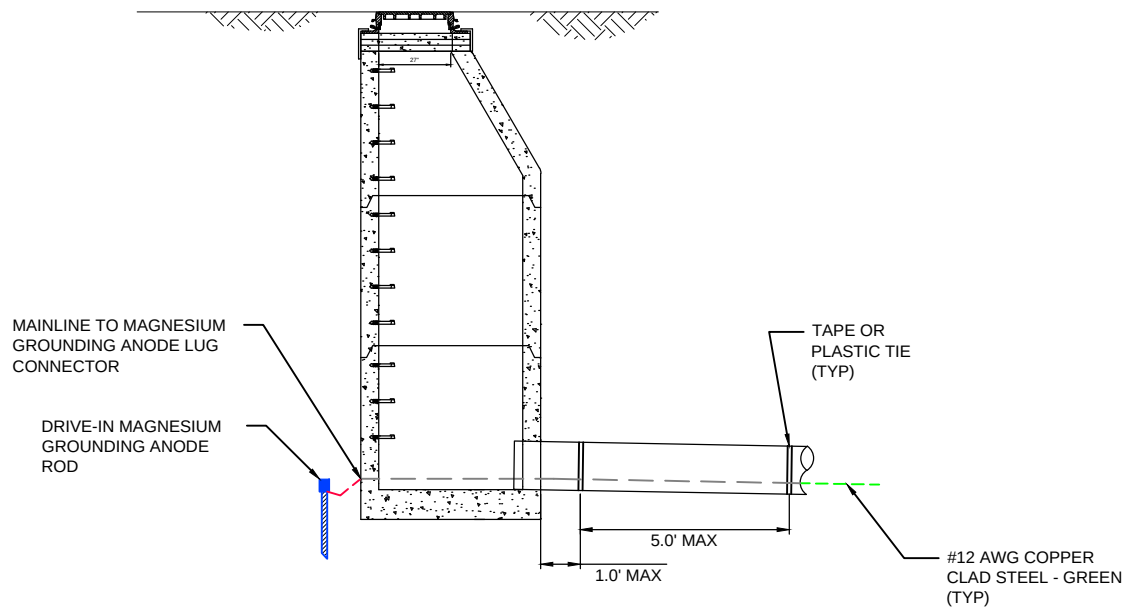
TRACE WIRE
SEWER SERVICE DETAIL

May 28, 2014



SEWER MANHOLE - PLAN VIEW

NO SCALE



SEWER MANHOLE - SECTION VIEW

NO SCALE



MINNESOTA RURAL WATER ASSOCIATION
STANDARD DETAIL

TRACE WIRE
SEWER MANHOLE DETAIL

May 28, 2014



Prepared By: Matthew Hill, City Administrator

Presenter: Matthew Hill, City Administrator

Date: 02/06/2025

Board & Commission: City Council

Subject: Approval to Tabling Council Action relating to Voluntary Resignation of Assignment of Deputy City Clerk until City Council meeting on February 25, 2025, at 7:00pm.

1. Attorney-Client Privileged Advice Correspondence Forthcoming.

The City Council moved to table the request to accept the Resignation of the Deputy Clerk and post the open Clerk position to the Meeting on February 11 at 7:00. The City Administrator requests that the City Council table the discussion again, at the council meeting scheduled for February 25, 2025, at 7:00pm. Attorney-Client privileged advice correspondence will be provided.

Voting Requirements:

Voting Options Simple Majority