NORTH BRANCH
—Minnesota—

Kevin Schieber
Mayor

Robert Canada
Councilmember/Acting Mayor

Travis Miles
Councilmember

Kelly Neider
Councilmember

Peter Schaps
Councilmember

CITY COUNCIL
REGULAR AGENDA
TUESDAY, SEPTEMBER 24, 2024 @ 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 — ACTION
   b. Renewal of ARMER Subscriber and User Agreements with Chisago County — ACTION
   c. ECRAC Arts and Culture Heritage Fund Legacy Grant - Summer Concerts — ACTION
   d. Ordinance 384-24 Amending the Industrial Design Standards Zone Overlay District Map — ACTION
   e. Vocational Training Facility - Resolution 90-2024 Approving the Preliminary and Final Plat for the Laborers Training Center Addition — ACTION

f. Resolution R-92-2024 Approving 2024 Road Gravel Quotes ACTION

g. Water and Sanitary Utility Service Application Update and City Code Change ACTION

8. PUBLIC HEARINGS

9. STAFF REPORTS

a. Vocational Training Facility - Resolution 91-2024 Approving the Conditional Use Permit for a Vocational Training Facility at 41499 Forest Blvd ACTION

b. RESOLUTION R-89-2024 ACCEPTING PLANS AND SPECIFICATIONS AND AUTHORIZE ADVERTISEMENT FOR BIDS FOR THE CSAH 30 CORRIDOR IMPROVEMENT PROJECT ACTION

c. Approve Second Amendment to Purchase Agreement with Sunrise River Commons, LLC. ACTION

d. Traffic Control Configuration on Maple St. and Elm St. ACTION

e. Request for Wastewater Treatment Plant Facility Report and Sanitary Sewer Comprehensive Plan Update ACTION

f. Ordinance 381-24 Creating Chapter 18 Business, Article XII Cannabis Regulation ACTION

g. Planning Commission Update INFO

h. PTOS Commission Update INFO

10. MAYOR/CITY COUNCIL

11. ADJOURNMENT

Remote Participation

Due to medical leave, Councilmember Canada will be participating remotely via iPad and/or phone connectivity from 4539 Isanti Trail, North Branch, Minnesota

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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.

City of North Branch
Staff Report

Prepared By: Ragini Varma, City Clerk / IT Director

Presenter: Ragini Varma, City Clerk / IT Director

Date: 08/06/2024

Board & Commission: City Council

Subject: Approve Agenda

Council will approve the agenda as is or with modification by a motion and second, before proceeding with the meeting.

Voting Requirements:

Voting Options	**Simple Majority**

City of North Branch
Staff Report

Prepared By: Ragini Varma, City Clerk / IT Director

Presenter: Ragini Varma, City Clerk / IT Director

Date: 08/06/2024

Board & Commission: City Council

Subject: Claims

Council to approve the monthly claims presented.

Voting Requirements:

Voting Options **Simple Majority**

City of
North Branch

ACH Checks

5564 to 5573- $ 80,146.71

Checks

90082 to 90174 - $672,039.96

Payroll

September 13, 2024 - $117,335.98

Accounts Payable

Check Detail

User: TiffaniFolstad
Printed: 09/23/2024 - 9:47AM

Check Number	Check Date	Amount
1118 - Commissioner Of Revenue (W/H)		
5571	09/13/2024	
Inv 0913 STATE		8,226.69
5571 Total:		8,226.69
1118 - Commissioner Of Revenue (W/H) Total:		8,226.69
1365 - Minnesota Energy Resources		
5565	09/13/2024	
Inv 505650311-00001		29.89
5565 Total:		29.89
5566	09/16/2024	
Inv 506279043-00004		53.69
Inv 506279043-00005		22.55
Inv 506279043-00006		22.55
Inv 506279043-00007		53.69
Inv 506279043-00008		25.90
Inv 506279043-00009		51.54
5566 Total:		229.92
5567	09/05/2024	
Inv 503985460-00004		136.19
Inv 505053332-00001		47.84
Inv 505590187-00001		21.67
Inv 506279043-00003		89.79
Inv 507851907-00001		50.00
5567 Total:		345.49
1365 - Minnesota Energy Resources Total:		605.30
1372 - Minnesota State Retirement		
5568	09/13/2024	
Inv 0913 MSRS		1,050.00
5568 Total:		1,050.00
1372 - Minnesota State Retirement Total:		1,050.00

Check Number	Check Date	Amount
1431 - Nationwide Retirement Solution		
5569	09/13/2024	
Inv 0913 NAT		5.00
5569 Total:		5.00
1431 - Nationwide Retirement Solution Total:		5.00
1468 - PERA (Payroll W/H)		
5572	09/13/2024	
Inv 0913 PERA		33,783.25
5572 Total:		33,783.25
1468 - PERA (Payroll W/H) Total:		33,783.25
1475 - Pitney Bowes Bank Inc Purchase Power		
5573	09/19/2024	
Inv 0911		500.00
5573 Total:		500.00
1475 - Pitney Bowes Bank Inc Purchase Power Total:		500.00
1585 - United States Treasury		
5570	09/13/2024	
Inv 0913FED		35,902.64
5570 Total:		35,902.64
1585 - United States Treasury Total:		35,902.64
1630 - XCEL Energy		
5564	09/09/2024	
Inv 51-0012033162-9		73.83
5564 Total:		73.83
1630 - XCEL Energy Total:		73.83
Total:		80,146.71

Accounts Payable

Computer Check Proof List by Vendor

NJS 9/13/2024

User: TiffaniFolstad
Printed: 09/13/2024 - 12:47PM
Batch: 00002.09.2024 - 09132024

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: 1646	Ameritas			Check Sequence: 1	ACH Enabled: False
0913 AMER	OTHER RETIREMENT	90.00	09/13/2024	101-00000-21705	
	Check Total:	90.00			
Vendor: 1921	Bituminous Roadways, Inc.			Check Sequence: 2	ACH Enabled: False
R-88-2024	PAY REQUEST 6 HWY 95 WATERMAIN	194,940.12	09/13/2024	615-49550-50530	
	Check Total:	194,940.12			
Vendor: 1899	BlueCross/Blue Shield Minnesota			Check Sequence: 3	ACH Enabled: False
240830140583	VISION INS FOR AUG 2024	117.62	09/13/2024	101-00000-21706	
	Check Total:	117.62			
Vendor: 1160	Emergency Equip. Connections			Check Sequence: 4	ACH Enabled: False
2325	USED GMC UPDATES	6,672.80	09/13/2024	101-42280-50237	
	Check Total:	6,672.80			
Vendor: 1166	Enterprise FM Trust			Check Sequence: 5	ACH Enabled: False
508722-090524	Lease Charge 2020 DODGE DURANGO	455.39	09/13/2024	101-42110-50229	
	Check Total:	455.39			
Vendor: 1268	IUOE Local #49			Check Sequence: 6	ACH Enabled: False
FOR OCT 2024	UNION DUES	420.00	09/13/2024	101-00000-21708	
	Check Total:	420.00			
Vendor: 1663	Kwik Trip			Check Sequence: 7	ACH Enabled: False
AUG 2024	AUG 2024 MOTOR FUELS	92.94	09/13/2024	101-42280-50212	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	92.94			
Vendor: 1396	MN Peip - C/O MMB Fiscal Srvs			Check Sequence: 8	ACH Enabled: False
1429351	DENTAL FOR OCT 2024	2,007.56	09/13/2024	101-00000-21718	
1429351	LIFE FOR OCT 2024	682.20	09/13/2024	101-00000-21714	
1429351	HEALTH FOR OCT 2024	38,534.92	09/13/2024	101-00000-21706	
	Check Total:	41,224.68			
Vendor: 2074	The Osseo Constructions Company LLC			Check Sequence: 9	ACH Enabled: False
R-87-2024	PAY REQUEST 8 WATER TOWER 1 REHAB	50,782.25	09/13/2024	615-49550-50530	
	Check Total:	50,782.25			
Vendor: 1601	Vinocopia, Inc.			Check Sequence: 10	ACH Enabled: False
0355107-IN	WINE	359.50	09/13/2024	609-48000-50253	
	Check Total:	359.50			
Vendor: 1788	Witmer Public Safety Group, Inc.			Check Sequence: 11	ACH Enabled: False
491364	TRAKLITE HELMET LIGHTING SYSTEM	921.14	09/13/2024	101-42280-50404	
CM31892	RETURNS CM 31892	-908.70	09/13/2024	101-42280-50404	
	Check Total:	12.44			
	Total for Check Run:	295,167.74			
	Total of Number of Checks:	11			

Accounts Payable

Computer Check Proof List by Vendor

User: TiffaniFolstad
Printed: 09/20/2024 - 2:55PM
Batch: 00003.09.2024 - 09202024

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: 2140	Alert 360 Opco, Inc.			Check Sequence: 1	ACH Enabled: False
19248533	CELL MONITORING	56.16	09/20/2024	609-49750-50300	
19248658	CELL MONITORING	70.45	09/20/2024	609-48000-50300	
	Check Total:	126.61			
Vendor: 1662	Amazon Capital Services			Check Sequence: 2	ACH Enabled: False
19LV-CLWV-644P	OFFICE SUPPLIES	143.25	09/20/2024	101-42110-50210	
	Check Total:	143.25			
Vendor: 2173	Kyle & Jordan Anderson			Check Sequence: 3	ACH Enabled: False
CUST 9968	WATER/SEWER CUST 9968 REFUND	72.89	09/20/2024	612-00000-11500	
	Check Total:	72.89			
Vendor: 1025	Anderson and Koch Ford			Check Sequence: 4	ACH Enabled: False
504240	2023 MAV OIL CHANGE/ROTATE/INSP	77.19	09/20/2024	101-45000-50404	
	Check Total:	77.19			
Vendor: 1029	Artisan Beer Company			Check Sequence: 5	ACH Enabled: False
3708115	BEER	115.40	09/20/2024	609-48000-50252	
3708116	N/A SALES	55.40	09/20/2024	609-48000-50250	
3708117	BEER	80.00	09/20/2024	609-48000-50252	
3709889	THC	557.60	09/20/2024	609-49750-50254	
3709890	THC	557.60	09/20/2024	609-48000-50254	
3711681	BEER	83.00	09/20/2024	609-49750-50252	
3711682	THC	152.30	09/20/2024	609-49750-50254	
3711683	BEER	124.60	09/20/2024	609-48000-50252	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	1,725.90			
Vendor: 2144	AT&T			Check Sequence: 6	ACH Enabled: False
831-001-3908169	HAND BILLING ACCT	30.75	09/20/2024	101-43000-50321	
	Check Total:	30.75			
Vendor: 1038	Automatic Systems Co.			Check Sequence: 7	ACH Enabled: False
42110	GEN SCADA UPGRADE	10,630.00	09/20/2024	620-49600-50580	
42117	GEN SCADA UPGRADE	142.80	09/20/2024	620-49600-50580	
	Check Total:	10,772.80			
Vendor: 1049	Bellboy Corporation			Check Sequence: 8	ACH Enabled: False
0204871800	THC CREDIT	-96.00	09/20/2024	609-48000-50254	
0204871900	THC	108.00	09/20/2024	609-48000-50254	
0204912100	LIQUOR	3,434.00	09/20/2024	609-49750-50251	
0204912400	LIQUOR	1,954.25	09/20/2024	609-48000-50251	
0204945300	LIQUOR	248.25	09/20/2024	609-49750-50251	
0205004200	LIQUOR	1,259.00	09/20/2024	609-49750-50251	
	Check Total:	6,907.50			
Vendor: 1655	Bent Brewstillery			Check Sequence: 9	ACH Enabled: False
INV-014246	BEER	66.60	09/20/2024	609-49750-50252	
INV-014246	THC	216.00	09/20/2024	609-49750-50254	
	Check Total:	282.60			
Vendor: 1052	Bernicks			Check Sequence: 10	ACH Enabled: False
10262765	THC	532.00	09/20/2024	609-49750-50254	
10262766	BEER	3,636.15	09/20/2024	609-49750-50252	
10262766	N/A SALES	86.75	09/20/2024	609-49750-50250	
10262767	N/A SALES	33.60	09/20/2024	609-49750-50250	
10262768	BEER CREDIT	-76.80	09/20/2024	609-49750-50252	
10262778	THC	85.00	09/20/2024	609-48000-50254	
10262779	N/A SALES	54.25	09/20/2024	609-48000-50250	
10262779	BEER	1,671.40	09/20/2024	609-48000-50252	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
10262780	BEER	-58.80	09/20/2024	609-48000-50252	
10265619	N/A SALES	96.00	09/20/2024	609-49750-50250	
10265619	BEER	4,229.55	09/20/2024	609-49750-50252	
10265620	N/A SALES	16.80	09/20/2024	609-49750-50250	
10265621	BEER CREDIT	-96.76	09/20/2024	609-49750-50252	
4367104	THC	277.00	09/20/2024	609-48000-50254	
4367105	BEER	2,201.55	09/20/2024	609-48000-50252	
	Check Total:	12,687.69			
Vendor: 1066	Breakthru Beverage MN			Check Sequence: 11	ACH Enabled: False
117457087	N/A SALES	60.95	09/20/2024	609-48000-50250	
117457088	WINE	542.60	09/20/2024	609-48000-50253	
117457089	LIQUOR	1,225.07	09/20/2024	609-48000-50251	
117457224	WINE	117.65	09/20/2024	609-49750-50253	
117567718	LIQUOR	1,523.88	09/20/2024	609-48000-50251	
117569541	LIQUOR	1,165.94	09/20/2024	609-49750-50251	
117678302	LIQUOR	2,554.30	09/20/2024	609-48000-50251	
117678303	WINE	404.95	09/20/2024	609-48000-50253	
117678646	LIQUOR	3,198.83	09/20/2024	609-49750-50251	
117678647	WINE	863.55	09/20/2024	609-49750-50253	
117679139	BEER	142.50	09/20/2024	609-48000-50252	
117679155	BEER	555.00	09/20/2024	609-49750-50252	
412714356	WINE CREDIT	-117.65	09/20/2024	609-49750-50253	
	Check Total:	12,237.57			
Vendor: 1905	Cemstone Products Co., Inc.			Check Sequence: 12	ACH Enabled: False
7579037	NORTHWOOD PARK DNR GRANT	3,410.00	09/20/2024	486-46500-50506	
	Check Total:	3,410.00			
Vendor: 1114	Coffee Mill Inc			Check Sequence: 13	ACH Enabled: False
266914	FILTER CHANGE	198.00	09/20/2024	101-41940-50210	
267323	COFFEE AND FIELD SERVICE	169.00	09/20/2024	101-41940-50210	
	Check Total:	367.00			

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: 1122	Crystal Springs Ice			Check Sequence: 14	ACH Enabled: False
1005758	N/A SALES	80.56	09/20/2024	609-48000-50250	
1005761	N/A SALES	280.56	09/20/2024	609-49750-50250	
1005762	N/A SALES	-2.26	09/20/2024	609-49750-50250	
1005776	N/A SALES	191.52	09/20/2024	609-49750-50250	
4010030	N/A SALES	60.80	09/20/2024	609-48000-50250	
4010032	N/A SALES	107.20	09/20/2024	609-49750-50250	
	Check Total:	718.38			
Vendor: 1129	Dahlheimer Distributing			Check Sequence: 15	ACH Enabled: False
2271630	BEER	4,293.90	09/20/2024	609-48000-50252	
2271929	THC	642.00	09/20/2024	609-48000-50254	
2276775	BEER	4,428.07	09/20/2024	609-48000-50252	
2276776	N/A SALES	31.00	09/20/2024	609-48000-50250	
2277034	N/A SALES	222.65	09/20/2024	609-49750-50250	
2277035	BEER	11,352.25	09/20/2024	609-49750-50252	
2277035	LIQUOR	643.75	09/20/2024	609-49750-50251	
2277088	THC	144.00	09/20/2024	609-48000-50254	
2277089	THC	173.50	09/20/2024	609-49750-50254	
2279082	BEER	1,000.00	09/20/2024	609-49750-50252	
2282719	THC	85.50	09/20/2024	609-48000-50254	
2282720	LIQUOR	141.25	09/20/2024	609-48000-50251	
2282720	BEER	3,272.25	09/20/2024	609-48000-50252	
2282949	THC	245.50	09/20/2024	609-49750-50254	
2282950	N/A SALES	416.75	09/20/2024	609-49750-50250	
2282970	LIQUOR	47.25	09/20/2024	609-49750-50251	
2282970	BEER	8,838.65	09/20/2024	609-49750-50252	
969-00169	N/A SALES	55.55	09/20/2024	609-48000-50250	
	Check Total:	36,033.82			
Vendor: 2180	Katherine Davis			Check Sequence: 16	ACH Enabled: False
CUST 11308	WATER/SEWER USAGE/REFUND CUST 113(	261.89	09/20/2024	612-00000-11500	
CUST 11308	WATER/SEWER USAGE/REFUND CUST 113(	-37.99	09/20/2024	602-00000-11500	
CUST 11308	WATER/SEWER USAGE/REFUND CUST 113(	-44.28	09/20/2024	615-00000-11500	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	179.62			
Vendor: 1144	Dresser Trap Rock, Inc.			Check Sequence: 17	ACH Enabled: False
146025	ROCK-BEAVER DAM REMOVAL 392ND	1,718.21	09/20/2024	612-49700-50407	
	Check Total:	1,718.21			
Vendor: 1147	East Central Energy - Braham			Check Sequence: 18	ACH Enabled: False
ECE BROADBAND	Pledged Funds for ECE's Broadband Project	100.00	09/20/2024	101-49990-50430	
	Check Total:	100.00			
Vendor: 1180	Ferguson US Holdings, Inc			Check Sequence: 19	ACH Enabled: False
536069	METER WIRE/GASKETS	879.10	09/20/2024	615-49550-50210	
	Check Total:	879.10			
Vendor: 1690	Flagship Recreation			Check Sequence: 20	ACH Enabled: False
23041	NORTHWOODS SLIDE REPAIR	1,062.88	09/20/2024	101-45000-50404	
	Check Total:	1,062.88			
Vendor: 1706	Flaherty & Hood, P.A.			Check Sequence: 21	ACH Enabled: False
FOR AUG 2024	REAL ESTATE MATTERS	820.00	09/20/2024	201-46500-50304	
FOR AUG 2024	GENERAL MUNICIPAL	1,746.25	09/20/2024	101-41610-50304	
	Check Total:	2,566.25			
Vendor: 1195	Forest Lake Printing			Check Sequence: 22	ACH Enabled: False
21115	BUSINESS CARDS - CL JOB 24-71836	104.50	09/20/2024	101-42110-50210	
	Check Total:	104.50			
Vendor: 1206	Genesis Technology Communications, LLC			Check Sequence: 23	ACH Enabled: False
144119	NB PARKS WIFI 10/8 TO 11/7	179.95	09/20/2024	101-45000-50321	
	Check Total:	179.95			
Vendor: 2181	Kristi Gerten			Check Sequence: 24	ACH Enabled: False
CUST 10075	WATER/SEWER USAGE/REFUND CUST 100′	343.36	09/20/2024	612-00000-11500	
CUST 10075	WATER/SEWER USAGE/REFUND CUST 100′	-8.12	09/20/2024	602-00000-11500	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
CUST 10075	WATER/SEWER USAGE/REFUND CUST 100′	41.29	09/20/2024	615-00000-11500	
	Check Total:	376.53			
Vendor: 1208	Government Finance Officers Association			Check Sequence: 25	ACH Enabled: False
3160942	Annual Governmental GAAP Update	135.00	09/20/2024	101-41500-50332	
	Check Total:	135.00			
Vendor: 1224	Gratitude Farms			Check Sequence: 26	ACH Enabled: False
FOR AUG 2024	MONTHLY RATE FOR SERVICES	350.00	09/20/2024	101-42700-50310	
	Check Total:	350.00			
Vendor: 1908	GTG Properties, LLC			Check Sequence: 27	ACH Enabled: False
FOR OCT 2024	PYLON SIGN	100.00	09/20/2024	609-48000-50300	
	Check Total:	100.00			
Vendor: 2060	David Haack			Check Sequence: 28	ACH Enabled: False
CUST 11864	CHARGES CUSTOMER 11864	-15.67	09/20/2024	615-00000-11500	
CUST 11864	REFUND CUSTOMER 11864	70.33	09/20/2024	612-00000-11500	
CUST 11864	CHARGES CUSTOMER 11864	-10.97	09/20/2024	602-00000-11500	
CUST 11864	REFUND CUSTOMER 11864	0.04	09/20/2024	615-49550-50610	
CUST 11864	REFUND CUSTOMER 11864	50.00	09/20/2024	615-00000-21400	
	Check Total:	93.73			
Vendor: 1245	Hitch-It			Check Sequence: 29	ACH Enabled: False
5187	SPRAY BEDLINER 2013 CHEV SILVER 3500	800.00	09/20/2024	101-42280-50404	
	Check Total:	800.00			
Vendor: 1246	Hohensteins, Inc.			Check Sequence: 30	ACH Enabled: False
750115	BEER	252.00	09/20/2024	609-49750-50252	
	Check Total:	252.00			
Vendor: 1263	Intoximeters, Inc.			Check Sequence: 31	ACH Enabled: False
768430	OPERATING SUPPLIES	125.00	09/20/2024	101-42110-50210	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	125.00			
Vendor: 1265	Isanti-Chisago County Star			Check Sequence: 32	ACH Enabled: False
082421135	ADVERTISING	70.00	09/20/2024	609-49750-50340	
1844185	2024 GRAVEL BID	37.17	09/20/2024	101-43000-50351	
1845430	PLAN COMMISSION	16.09	09/20/2024	101-41910-50351	
	Check Total:	123.26			
Vendor: 1276	Kabao Jennrich			Check Sequence: 33	ACH Enabled: False
Q1 PC ATT	Q1 PLAN COMM ATT -REISSUE	50.00	09/20/2024	101-41110-50300	
	Check Total:	50.00			
Vendor: 2037	Alan Johnson			Check Sequence: 34	ACH Enabled: False
LEADERSHIP	LEADERSHIP TRAINING 2023-REISSUE	13.53	09/20/2024	101-42280-50332	
	Check Total:	13.53			
Vendor: 1279	Johnson Brothers Liquor Co.			Check Sequence: 35	ACH Enabled: False
103413	WINE CREDIT	-16.25	09/20/2024	609-49750-50253	
103413	LIQUOR CREDIT	-15.83	09/20/2024	609-49750-50251	
2613816	LIQUOR	161.46	09/20/2024	609-48000-50251	
2613820	LIQUOR	380.64	09/20/2024	609-48000-50251	
2613821	LIQUOR	357.74	09/20/2024	609-48000-50251	
2613823	LIQUOR	590.28	09/20/2024	609-48000-50251	
2613824	WINE	99.64	09/20/2024	609-48000-50253	
2618304	WINE	285.10	09/20/2024	609-49750-50253	
2618305	N/A SALES	38.82	09/20/2024	609-49750-50250	
2618306	LIQUOR	154.82	09/20/2024	609-49750-50251	
2618307	LIQUOR	3,493.18	09/20/2024	609-49750-50251	
2618309	WINE	692.41	09/20/2024	609-49750-50253	
2618310	N/A SALES	33.82	09/20/2024	609-49750-50250	
2618311	N/A SALES	38.82	09/20/2024	609-48000-50250	
2618312	WINE	99.64	09/20/2024	609-48000-50253	
2618313	LIQUOR	323.46	09/20/2024	609-48000-50251	
2618314	LIQUOR	1,904.52	09/20/2024	609-48000-50251	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
2618315	LIQUOR	114.32	09/20/2024	609-48000-50251	
2623229	WINE	684.74	09/20/2024	609-48000-50253	
2623230	LIQUOR	1,272.22	09/20/2024	609-49750-50251	
2623231	WINE	684.74	09/20/2024	609-49750-50253	
2623232	LIQUOR	1,212.40	09/20/2024	609-49750-50251	
2623233	WINE	2,939.70	09/20/2024	609-49750-50253	
2623234	LIQUOR	328.46	09/20/2024	609-49750-50251	
2623235	WINE	199.43	09/20/2024	609-49750-50253	
2623236	LIQUOR	206.64	09/20/2024	609-48000-50251	
2623238	WINE	1,323.30	09/20/2024	609-48000-50253	
2624299	LIQUOR	353.00	09/20/2024	609-49750-50251	
	Check Total:	17,941.22			
Vendor: 1281	Jones Contruction Services Inc			Check Sequence: 36	ACH Enabled: False
3752	BEAVER DAM REMOVAL 392ND S/O EVERI	1,100.00	09/20/2024	612-49700-50300	
	Check Total:	1,100.00			
Vendor: 2174	Joy & Kevin Kubat			Check Sequence: 37	ACH Enabled: False
CUST 10022	FINAL SEWER USAGE CUST 10022	-20.62	09/20/2024	602-00000-11500	
CUST 10022	FINAL WATER USAGE CUST 10022	-27.20	09/20/2024	615-00000-11500	
CUST 10022	CUST 10022 REFUND	175.14	09/20/2024	612-00000-11500	
	Check Total:	127.32			
Vendor: 2179	Lakes Sotheby's International Realty			Check Sequence: 38	ACH Enabled: False
CUST 12407	WATER/SEWER USAGE/REFUND CUST 124(	-6.23	09/20/2024	612-00000-11500	
CUST 12407	WATER/SEWER USAGE/REFUND CUST 124(	-14.50	09/20/2024	602-00000-11500	
CUST 12407	WATER/SEWER USAGE/REFUND CUST 124(	29.21	09/20/2024	615-00000-11500	
	Check Total:	8.48			
Vendor: 1296	Lamar Companies			Check Sequence: 39	ACH Enabled: False
116287136	I35 BILLBOARD	222.50	09/20/2024	609-48000-50340	
116287136	I35 BILLBOARD	222.50	09/20/2024	609-49750-50340	
	Check Total:	445.00			

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: 1878	Larkin Hoffman Attorneys			Check Sequence: 40	ACH Enabled: False
844328	2024 Legislative Representation	2,500.00	09/20/2024	101-41800-50300	
	Check Total:	2,500.00			
Vendor: 1304	League Of Minnesota Cities			Check Sequence: 41	ACH Enabled: False
411081	4MO DUES 9/1 TO 12/31/24	4,403.00	09/20/2024	101-49990-50433	
	Check Total:	4,403.00			
Vendor: 1315	Paxton Lind			Check Sequence: 42	ACH Enabled: False
400343	2021 REIMBURSE - REISSUE	176.11	09/20/2024	602-49450-50237	
	Check Total:	176.11			
Vendor: 1327	Macqueen Equipment Inc.			Check Sequence: 43	ACH Enabled: False
35429	25 BADGES	558.15	09/20/2024	101-42280-50237	
	Check Total:	558.15			
Vendor: 1329	Main Street Church			Check Sequence: 44	ACH Enabled: False
03052024	HALL RENTAL POLLING - REISSUE	200.00	09/20/2024	101-41410-50210	
09122024	HALL RENTAL POLLING	200.00	09/20/2024	101-41410-50210	
	Check Total:	400.00			
Vendor: 1330	Main Street Hardware			Check Sequence: 45	ACH Enabled: False
157390	RAID WASP & HORNET	53.94	09/20/2024	101-42110-50210	
	Check Total:	53.94			
Vendor: 1738	Maverick Beverage Company Minnesota LLC			Check Sequence: 46	ACH Enabled: False
INV1347157	WINE	339.00	09/20/2024	609-49750-50253	
	Check Total:	339.00			
Vendor: 1643	McDonald Distributing			Check Sequence: 47	ACH Enabled: False
5760549	BEER CREDIT	-44.20	09/20/2024	609-48000-50252	
766052	BEER	-93.00	09/20/2024	609-48000-50252	
766053	LIQUOR	119.00	09/20/2024	609-48000-50251	
766053	BEER	752.50	09/20/2024	609-48000-50252	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
766055	LIQUOR	178.50	09/20/2024	609-49750-50251	
766056	LIQUOR	33.60	09/20/2024	609-49750-50251	
766056	N/A SALES	142.80	09/20/2024	609-49750-50250	
766056	BEER	7,579.05	09/20/2024	609-49750-50252	
766056	THC	71.76	09/20/2024	609-49750-50254	
766097	BEER CREDIT	-358.30	09/20/2024	609-49750-50252	
767139	BEER CREDIT	-16.00	09/20/2024	609-49750-50252	
767184	BEER	2,877.25	09/20/2024	609-48000-50252	
767184	N/A SALES	57.25	09/20/2024	609-48000-50250	
767184	LIQUOR	59.50	09/20/2024	609-48000-50251	
767206	BEER	7,887.70	09/20/2024	609-49750-50252	
767206	THC	143.52	09/20/2024	609-49750-50254	
767208	THC	289.28	09/20/2024	609-48000-50254	
767311	LIQUOR	211.60	09/20/2024	609-49750-50251	
	Check Total:	19,891.81			
Vendor: 1339	Patrick Meacham			Check Sequence: 48	ACH Enabled: False
Q1 PC ATT	Q1 PLAN COM ATT -REISSUE	25.00	09/20/2024	101-41110-50300	
	Check Total:	25.00			
Vendor: 1644	Mega Beer			Check Sequence: 49	ACH Enabled: False
IN-15087	THC	150.05	09/20/2024	609-48000-50254	
IN-15087	BEER	245.75	09/20/2024	609-48000-50252	
	Check Total:	395.80			
Vendor: 1991	MN Department of Commerce			Check Sequence: 50	ACH Enabled: False
1000052213	2nd Quarter Fiscal Year 2025 Indirect Assessmer	527.90	09/20/2024	620-49600-50433	
	Check Total:	527.90			
Vendor: 1405	MN UI Fund - Unemployment			Check Sequence: 51	ACH Enabled: False
Q2 UI	Q2 UNEMPLOYMENT	463.44	09/20/2024	101-49990-50142	
	Check Total:	463.44			
Vendor: 1411	Moose Lake Brewing Co. LLC			Check Sequence: 52	ACH Enabled: False

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
SB38-002	BEER	71.00	09/20/2024	609-48000-50252	
SB38-003	BEER	56.00	09/20/2024	609-49750-50252	
	Check Total:	127.00			
Vendor: 1421	N.B. Area Chamber Of Commerce			Check Sequence: 53	ACH Enabled: False
3379	EDA DUES 2022 - REISSUE CK 84879	79.00	09/20/2024	201-46500-50433	
	Check Total:	79.00			
Vendor: 1423	N.B. Area Public Schools-Fuel			Check Sequence: 54	ACH Enabled: False
2024-011	AUG 2024 FUELS	464.57	09/20/2024	615-49550-50212	
2024-011	AUG 2024 FUELS	160.59	09/20/2024	612-49700-50212	
2024-011	AUG 2024 FUELS	146.61	09/20/2024	101-42400-50212	
2024-011	AUG 2024 FUELS	335.83	09/20/2024	101-43000-50212	
2024-011	AUG 2024 FUELS	2,843.34	09/20/2024	101-42110-50212	
2024-011	AUG 2024 FUELS	44.00	09/20/2024	620-49600-50212	
2024-011	AUG 2024 FUELS	458.22	09/20/2024	101-42280-50212	
2024-011	AUG 2024 FUELS	123.74	09/20/2024	602-49450-50212	
2024-011	AUG 2024 FUELS	269.00	09/20/2024	101-45000-50212	
	Check Total:	4,845.90			
Vendor: 1432	NCPERS Group Life Ins.			Check Sequence: 55	ACH Enabled: False
66160202024	LIFE INSURANCE	64.00	09/20/2024	101-00000-21714	
	Check Total:	64.00			
Vendor: 2176	Mike & Kellee Nightengale			Check Sequence: 56	ACH Enabled: False
CUST 9376	WATER/SEWER USAGE/REFUND CUST 937(	-7.29	09/20/2024	615-00000-11500	
CUST 9376	WATER/SEWER USAGE/REFUND CUST 937(	-5.97	09/20/2024	602-00000-11500	
CUST 9376	WATER/SEWER USAGE/REFUND CUST 937(	66.55	09/20/2024	612-00000-11500	
	Check Total:	53.29			
Vendor: 1763	Office of MNIT Services-Accounts Receivable			Check Sequence: 57	ACH Enabled: False
DV24080436	WIDE AREA NETWORK SERVICES MONTH	1,150.00	09/20/2024	101-41940-50243	
	Check Total:	1,150.00			

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: 1474	Phillips Wine & Spirits, Inc.			Check Sequence: 58	ACH Enabled: False
6839178	LIQUOR	331.31	09/20/2024	609-48000-50251	
6839179	WINE	199.28	09/20/2024	609-48000-50253	
6842671	LIQUOR	575.20	09/20/2024	609-49750-50251	
6842672	WINE	287.81	09/20/2024	609-49750-50253	
6842673	N/A SALES	98.46	09/20/2024	609-49750-50250	
6842674	LIQUOR	536.43	09/20/2024	609-48000-50251	
6842675	WINE	303.89	09/20/2024	609-48000-50253	
6846604	WINE	288.28	09/20/2024	609-48000-50253	
6846605	LIQUOR	122.02	09/20/2024	609-49750-50251	
6846606	WINE	728.66	09/20/2024	609-49750-50253	
6846607	N/A SALES	165.88	09/20/2024	609-49750-50250	
6846609	WINE	95.28	09/20/2024	609-48000-50253	
	Check Total:	3,732.50			
Vendor: 1884	SUSO 4 North Branch, LP Pine Tree Commercial Realty			Check Sequence: 59	ACH Enabled: False
For Oct 2024	STORE 2 RENT - OCTOBER 2024	8,721.11	09/20/2024	609-48000-50412	
	Check Total:	8,721.11			
Vendor: 1484	Premium Waters Inc.			Check Sequence: 60	ACH Enabled: False
855536-07-24	OPERATING SUPPLIES	121.15	09/20/2024	609-49750-50210	
855617-07-24	OPERATING SUPPLIES	40.58	09/20/2024	609-48000-50210	
	Check Total:	161.73			
Vendor: 2019	Quadient, Inc			Check Sequence: 61	ACH Enabled: False
40235606	SERVICE REQUEST	113.34	09/20/2024	615-49550-50300	
40235606	SERVICE REQUEST	113.33	09/20/2024	612-49700-50300	
40235606	SERVICE REQUEST	113.33	09/20/2024	602-49450-50300	
	Check Total:	340.00			
Vendor: 1494	Red Bull Distribution Company			Check Sequence: 62	ACH Enabled: False
2019496752	N/A SALES	210.00	09/20/2024	609-49750-50250	
	Check Total:	210.00			

Invoice No		Description	Amount	Pmt Date	Acct Number	Reference
Vendor:	2066	RMB Environmental Laboratories, Inc.			Check Sequence: 63	ACH Enabled: False
14573		WEEKLY WW TESTING	158.20	09/20/2024	602-49450-50315	
14659		MONTHLY BAC SAMPLES	105.00	09/20/2024	615-49550-50315	
14665		WEEKLY WW TESTING	224.00	09/20/2024	602-49450-50315	
14688		BACTERIA TEST TOWER #1 PROJECT	17.50	09/20/2024	615-49550-50315	
14803		SCHOOLSIDE VILLAGE 4TH BAC SAMPLES	105.00	09/20/2024	615-49550-50315	
65703		BACTERIA TEST TOWER #1 PROJECT	17.50	09/20/2024	615-49550-50315	
		Check Total:	627.20			
Vendor:	2040	Rustic Roots Winery, Inc.			Check Sequence: 64	ACH Enabled: False
421587		WINE	470.40	09/20/2024	609-48000-50253	
421588		WINE	453.60	09/20/2024	609-49750-50253	
		Check Total:	924.00			
Vendor:	2163	SBI Rents Inc.			Check Sequence: 65	ACH Enabled: False
1507		EQUIPMENT RENTAL	36,000.00	09/20/2024	602-49450-50300	
1516		EQUIPMENT DELIVERY	9,660.00	09/20/2024	602-49450-50300	
		Check Total:	45,660.00			
Vendor:	1534	Southern Glazers Wine & Spirits of Minnesota			Check Sequence: 66	ACH Enabled: False
2522266		LIQUOR	2,915.32	09/20/2024	609-48000-50251	
2522266		WINE	113.38	09/20/2024	609-48000-50253	
2524790		WINE	51.99	09/20/2024	609-48000-50253	
2524790		LIQUOR	168.37	09/20/2024	609-48000-50251	
2525282		LIQUOR	955.70	09/20/2024	609-49750-50251	
2525283		WINE	47.51	09/20/2024	609-49750-50253	
2527716		LIQUOR	331.71	09/20/2024	609-48000-50251	
2527716		WINE	514.07	09/20/2024	609-48000-50253	
2528247		LIQUOR	872.74	09/20/2024	609-49750-50251	
2528248		WINE	1,033.53	09/20/2024	609-49750-50253	
		Check Total:	7,004.32			
Vendor:	1677	Springbrook Holding Company, LLC			Check Sequence: 67	ACH Enabled: False
8255		CITY UB IMPLEMENTATION	1,860.00	09/20/2024	615-49550-50300	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	1,860.00			
Vendor: 1552	Sun Life Assurance Company			Check Sequence: 68	ACH Enabled: False
FOR OCT	LTD/STD FOR OCTOBER 2024	2,450.18	09/20/2024	101-00000-21715	
	Check Total:	2,450.18			
Vendor: 1557	T.A. Schifsky & Sons, Inc.			Check Sequence: 69	ACH Enabled: False
70584	ASPHALT PATCHING	242.19	09/20/2024	101-43000-50224	
	Check Total:	242.19			
Vendor: 2175	Antonio & Ellysia Turrito			Check Sequence: 70	ACH Enabled: False
CUST 9688	WATER/SEWER USAGE/REFUND CUST 968	74.74	09/20/2024	612-00000-11500	
CUST 9688	WATER/SEWER USAGE/REFUND CUST 968	-9.42	09/20/2024	615-00000-11500	
CUST 9688	WATER/SEWER USAGE/REFUND CUST 968	-8.15	09/20/2024	602-00000-11500	
	Check Total:	57.17			
Vendor: 1584	U.S. Bank Equipment Finance			Check Sequence: 71	ACH Enabled: False
537717209	COPY MACHINE LEASE	185.00	09/20/2024	101-41940-50219	
538049743	COPY MACHINE LEASE	136.19	09/20/2024	101-42110-50219	
538049743	COPY MACHINE LEASE	206.74	09/20/2024	101-41940-50219	
538049743	COPY MACHINE LEASE	69.33	09/20/2024	101-42280-50219	
538049743	COPY MACHINE LEASE	69.33	09/20/2024	602-49450-50219	
538049743	COPY MACHINE LEASE	69.33	09/20/2024	609-49750-50219	
538049743	COPY MACHINE LEASE	129.84	09/20/2024	101-43000-50219	
538049743	COPY MACHINE LEASE	69.33	09/20/2024	615-49550-50219	
538049743	COPY MACHINE LEASE	69.33	09/20/2024	101-41940-50219	
538049743	COPY MACHINE LEASE	69.33	09/20/2024	101-42110-50219	
538049743	COPY MACHINE LEASE	69.33	09/20/2024	609-48000-50219	
	Check Total:	1,143.08			
Vendor: 1593	USA Bluebook			Check Sequence: 72	ACH Enabled: False
469552	3 PHASE POWER MONITOR TIME MARK	217.40	09/20/2024	602-49450-50404	
	Check Total:	217.40			

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
Vendor: 1598	Viking Coca-Cola Bottling Co.			Check Sequence: 73	ACH Enabled: False
3508731	N/A SALES	206.30	09/20/2024	609-48000-50250	
3508732	N/A SALES	208.15	09/20/2024	609-49750-50250	
	Check Total:	414.45			
Vendor: 1601	Vinocopia, Inc.			Check Sequence: 74	ACH Enabled: False
0357999-IN	LIQUOR	403.70	09/20/2024	609-48000-50251	
0357999-IN	WINE	236.84	09/20/2024	609-48000-50253	
	Check Total:	640.54			
Vendor: 1611	Watson Company			Check Sequence: 75	ACH Enabled: False
144767	N/A SALES	754.05	09/20/2024	609-49750-50250	
144913	N/A SALES	1,178.12	09/20/2024	609-49750-50250	
	Check Total:	1,932.17			
Vendor: 2177	Dan Webber			Check Sequence: 76	ACH Enabled: False
CUST 8405	WATER/SEWER USAGE/REFUND CUST 840	139.54	09/20/2024	612-00000-11500	
CUST 8405	WATER/SEWER USAGE/REFUND CUST 840	-30.01	09/20/2024	602-00000-11500	
CUST 8405	WATER/SEWER USAGE/REFUND CUST 840	-26.31	09/20/2024	615-00000-11500	
	Check Total:	83.22			
Vendor: 2178	Jessica or John Webster			Check Sequence: 77	ACH Enabled: False
CUST 1902	WATER/SEWER USAGE/REFUND CUST 190	90.83	09/20/2024	612-00000-11500	
CUST 1902	WATER/SEWER USAGE/REFUND CUST 190	-7.83	09/20/2024	615-00000-11500	
CUST 1902	WATER/SEWER USAGE/REFUND CUST 190	-6.28	09/20/2024	602-00000-11500	
	Check Total:	76.72			
Vendor: 1761	WEX BANK			Check Sequence: 78	ACH Enabled: False
99660563	MOTOR FUELS	53.18	09/20/2024	101-42110-50212	
	Check Total:	53.18			
Vendor: 1622	Wine Merchants			Check Sequence: 79	ACH Enabled: False
7488364	WINE	960.63	09/20/2024	609-49750-50253	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	960.63			
Vendor: 1623	Winebow, Inc.			Check Sequence: 80	ACH Enabled: False
MN00153775	WINE	217.00	09/20/2024	609-49750-50253	
MN00153775	LIQUOR	289.00	09/20/2024	609-49750-50251	
	Check Total:	506.00			
Vendor: 1628	WSB & Associates, Inc.			Check Sequence: 81	ACH Enabled: False
FOR JULY 2024	R-025673-000-3 LEAD SERVICE LINE INV	281.50	09/20/2024	615-49550-50530	
FOR JULY 2024	R-021286-000-17 FOX RUN DEVELOP	9,452.00	09/20/2024	101-00000-21140	
FOR JULY 2024	R-026345-000-1 LIUNA	880.00	09/20/2024	101-00000-21173	
FOR JULY 2024	R-023138-000-11 LES SCHWAB	1,171.00	09/20/2024	101-00000-21154	
FOR JULY 2024	R-022541-000-16 WATERMAIN IMPROVE	39,130.75	09/20/2024	615-49550-50530	
FOR JULY 2024	R-021646-000-10 FOREST AVE SRTS TRL	6,079.00	09/20/2024	486-46500-50303	
FOR JULY 2024	R-026028-000-1 CITY PLANNING	75.00	09/20/2024	101-00000-21154	
FOR JULY 2024	R-019771-000-19 MS4 SERVICES	1,150.00	09/20/2024	612-49700-50303	
FOR JULY 2024	R-024317-000-6 MEADOWS RIDGE	7,064.75	09/20/2024	101-00000-21165	
FOR JULY 2024	R-024887-000-2 WESTSIDE COM 2ND ADD	440.00	09/20/2024	101-00000-21163	
FOR JULY 2024	R-025529-000-3 NORTH NAT GAS	505.00	09/20/2024	101-00000-21168	
FOR JULY 2024	R-026028-000-1 CITY PLANNING	809.25	09/20/2024	101-00000-21173	
FOR JULY 2024	R-022305-000-16 TOWER 1 REHAB	28,058.50	09/20/2024	615-49550-50530	
FOR JULY 2024	R-025057-000-4 2024 OVERLAY	5,050.00	09/20/2024	401-43100-50303	
FOR JULY 2024	R-022237-000-13 WESTSIDE COMMONS	88.50	09/20/2024	101-00000-21146	
FOR JULY 2024	R-025057-000-4 2024 OVERLAY	5,050.00	09/20/2024	458-43000-50303	
FOR JULY 2024	R-026028-000-1 CITY PLANNING	9,674.88	09/20/2024	101-41910-50300	
FOR JULY 2024	R-026028-000-1 CITY PLANNING	1,587.00	09/20/2024	101-00000-21167	
FOR JULY 2024	R-023681-000-7 2024 ENGINEERING	5,270.00	09/20/2024	101-41700-50303	
FOR JULY 2024	R-020200-000-10 SCHOOLSIDE VIL 4TH ADI	10,865.00	09/20/2024	101-00000-21144	
FOR JULY 2024	R-026425-000-1 KELLER ACRES	660.00	09/20/2024	101-00000-21166	
FOR JULY 2024	R-025883-000-2 MEMBERS COOP	1,199.75	09/20/2024	101-00000-21172	
FOR JULY 2024	R-020015-000-18 MEADOWS NORTH 4TH	2,165.50	09/20/2024	101-00000-21142	
FOR JULY 2024	R-025975-000-2 SUNRISE BLUFF 3RD	1,690.25	09/20/2024	101-00000-21167	
FOR JULY 2024	R-024886-000-4 MEADOWS N TWNHM 2ND	70.00	09/20/2024	101-00000-21164	
FOR JULY 2024	R-026028-000-1 CITY PLANNING	9,674.87	09/20/2024	201-46500-50300	

Invoice No	Description	Amount	Pmt Date	Acct Number	Reference
	Check Total:	148,142.50			
Vendor: 1630	XCEL Energy			Check Sequence: 82	ACH Enabled: False
51-0012033162-9	LIQUOR STORE 2 UTILITY GAS	66.83	09/20/2024	609-48000-50380	
51-6102224-2	LIQUOR STORE 1 UTILITY GAS	29.19	09/20/2024	609-49750-50380	
51-7498295-5	LIBRARY UTILITY GAS	137.04	09/20/2024	101-45500-50380	
	Check Total:	233.06			
	Total for Check Run:	376,872.22			
	Total of Number of Checks:	82			

City of North Branch
Staff Report

Prepared By: Dan Meyer, Police Chief

Presenter: Dan Meyer, Police Chief

Date: 08/29/2024

Board & Commission: City Council

Subject: Renewal of ARMER Subscriber and User Agreements with Chisago County

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Background Information:

Since 2012, the City of North Branch and the other cities within the county have had agreements with Chisago County for the operation of the County's Allied Radio Matrix for Emergency Response (ARMER) system. Our current Communications System User and Subscriber Agreements were approved in 2019 and need to be renewed. Key definitions in understanding the ARMER program include:

- **SUBSCRIBERs include police and fire departments utilizing uniform radios purchased, provided by, maintained by, and warrantied through Chisago County**

- **USERs include police and fire departments who secure their own radios, radio warranties, and radio maintenance and/or who accepted the County's "as is" sale of older ARMER Radios.**

Attached are the current User and Subscriber Agreements that the Chisago County Board approved on March 6, 2024. Other than the term dates, the only other change to our current agreements is section 2.4, which addresses the User and Subscriber fees that entities pay Chisago County for each radio they have on the ARMER system. The fee is calculated by dividing the sum of the MESB fee and the Minnesota State Infrastructure (SUA2) fee by total Chisago County controlled radios, (this would include County radios, User radios and Subscriber radios), and adding a fixed fee per radio. Currently, the fixed fee is $30/radio. The Chisago County Board approved the fixed fee to increase to $100/radio in 2025 and $125/radio in 2026.

Financial/Budget Impacts:

Currently, the North Branch Police and Fire Departments have a total of 63 radios on the ARMER system. The 2025 increase of $70/radio in 2025 and the additional $25/radio in 2026 will have a minimal impact on the city's overall budget and have been included in the city's proposed 2025 budget.

Requested Action & Staff Recommendation:
I respectfully request that the City Council approve the 2025-2026 ARMER User and Subscriber Agreements with Chisago County.

Voting Requirements:

Voting Options Simple Majority

Chisago County
313 North Main Street
Center City, MN 55012

Regionwide Public Safety Radio Communications System

Communications System Subscriber Agreement (2025-2026)

City of North Branch

Between Chisago County and Authorized Subscriber Regarding:

Use of the Regionwide Public Safety Radio Communications System,

Maintenance and Repair of Subscriber Radios,

Administrative and Operational Support of the Subscriber Radio Fleet

THIS AGREEMENT is made and entered into effective January 1, 2025 by and between the COUNTY OF Chisago, a body politic and corporate, under the laws of the STATE OF MINNESOTA, hereinafter referred to as the "COUNTY," 313 North Main Street, Center City, Minnesota 55012, and the City of North Branch (the "CITY" or "SUBSCRIBER"), 6408 Elm St., North Branch, Minnesota, 55056, acting through its duly authorized officers, identified as the SUBSCRIBER.

WITNESSETH:

WHEREAS, the COUNTY operates a Local Subsystem as part of the Regionwide Public Safety Radio Communications System, hereinafter referred to as "System" or "ARMER System" and provides for cities, agencies, districts, and other authorized users within the COUNTY to have access to the System; and

WHEREAS, the COUNTY has provided for the capability of Cities, Agencies, Districts and Other Authorized Users within the County to have access to the System; and

WHEREAS, the CITY participates as a system SUBSCRIBER with regard to 25 (twenty-five) newer-model ARMER radios owned and maintained by the COUNTY; and

WHEREAS, the COUNTY bears primary responsibility for the health, security and integrity of the System and other communications systems; and

WHEREAS, the CITY has elected to participate as a subscriber with the newer-model ARMER radios owned and maintained by the COUNTY and operating on the System (the "SUBSCRIBER Radios").

NOW, THEREFORE, in consideration of the mutual undertakings and agreements hereinafter set forth, the COUNTY and the SUBSCRIBER agree as follows:

1. PURPOSE AND INTRODUCTION

The purpose of this Agreement is to define the rights and obligations of the COUNTY and the SUBSCRIBER with respect to the cooperative and coordinated purchase, maintenance, technical and administrative support and use of portable, mobile, desktop and other end user radios by the SUBSCRIBER on the COUNTY's System.

The System is a multi-site general purpose wireless communications system designed to provide, among other things, access to a wide area nine county regionwide public safety radio communications system, multiple system redundancies with backup power, a wide range of talk groups, electronic identification of all radios on all transmissions, 99.999% microwave system reliability, encryption availability, system security, radio interoperability, 24 hour a day system monitoring and repair response, access to a pool of special event radios and SUBSCRIBER radio user training.

The Agreement applies only to the **25** newer-model ARMER SUBSCRIBER Radios and Equipment for use by the CITY on the ARMER System, whether in use as of the effective date hereof or added to the System as provided herein.

2. DUTIES AND RESPONSIBILITIES OF SUBSCRIBER

2.1 Conformance to Statewide Radio Board (SRB), Metropolitan Emergency Services Board (MESB) and COUNTY Standards

SUBSCRIBER agrees to be aware of and conform to all applicable standards, policies, procedures and protocols established or amended by the SRB, MESB and COUNTY related to use of the System including but not limited to radio user training requirements, radio operating guidelines, audit, monitoring and compliance.

2.2 Conformance to Federal Laws and Regulations

SUBSCRIBER agrees to be aware of and conform to all applicable Federal Rules, Regulation and Laws pertaining to use of the System including but not limited to the Communications Act of 1934 as Amended and Part 90 of the Federal Communications Commission Rules and Regulations.

2.3 Response to Improper Use

In the event COUNTY informs, SUBSCRIBER, by way of a detailed notice letter containing all relevant facts and information, that statistical analysis of System usage or other information indicates that SUBSCRIBER personnel may have inappropriately used the System, or may have violated standards, policies, procedures, rules, regulations or laws regarding proper operation of the System, or may have violated the provisions of this Agreement, SUBSCRIBER agrees to take immediate and appropriate investigative and corrective action to stop the violation and eliminate any reoccurrence.

2.4 Subscriber Fees

2.4. A. SUBSCRIBER agrees to pay COUNTY a SUBSCRIBER Fee consisting of a Dedicated Replacement Radio Fund contribution and a User fee, both as further defined herein. The annual Dedicated Replacement Radio Fund contribution is a set amount as determined in accordance with paragraph 2.4.B below. The 2025 USER Fee is calculated by dividing the sum of the MESB fee and the Minnesota State Infrastructure (SUA2) fee by total Chisago County controlled radios, (this would include County radios, User radios and Subscriber radios), and adding a fixed fee of $100 per radio. For 2025, the parties agree that the SUBSCRIBER Fee will equal the USER Fee plus a minimum of $315, which is the Dedicated Replacement Radio Fund contribution per radio. For 2026, the parties agree that the SUBSCRIBER Fee will equal the USER Fee plus a minimum of $315, which is the Dedicated Replacement Radio Fund contribution. For each year thereafter, SUBSCRIBER agrees to pay the Subscriber Fee as calculated based upon the definitions and formulas set forth in this section.

2.4.B. The COUNTY has designated a "Dedicated Radio Replacement Fund" ("Replacement Fund" or "sinking fund") where the Dedicated Radio Replacement Fund contribution payments received from the CITY shall be deposited. The Replacement Fund for the acquisition of replacement radios shall remain allocated for replacement radios for SUBSCRIBER use only and shall not be diverted by the COUNTY for other costs associated with the System or for any other purpose. The parties agree that a minimum contribution shall be $315 per radio annually unless adjusted as provided in paragraph 2.4 C below. Upon cancellation of this Agreement, all funds held by the County in the Replacement Fund for the benefit of the SUBSCRIBER, shall be refunded to the CITY within 30 days of the effective date of cancellation.

2.4.C. The Dedicated Replacement Fund contribution may be increased voluntarily by the SUBSCRIBER or as adjusted upon agreement of the pool of Subscribers utilizing radios acquired under the County's Agreement with Motorola Solutions, Inc. Any adjustment of the Replacement Fund Fee that establishes a new mandatory annual contribution by SUBSCRIBER shall be reduced to writing as an amendment to this Agreement and signed by the officer of each party.

2.4.D. COUNTY and CITY acknowledge that the CITY has contributed $**<INSERT>** to the Radio Replacement Fund during the year preceding the term of the Agreement.

2.5 Additional Subscriber Units

SUBSCRIBER shall supply a detailed request for additional subscriber units to the COUNTY for the following year by February 15th of each year. The Subscriber Fees due hereunder shall be increased in accordance with the formula set forth in Section 2.4 based on the number of new SUBSCRIBER Radios added to the System.

2.6 Invoicing and Payment Terms

COUNTY will invoice SUBSCRIBER annually for all fees specified herein. Subscriber counts will be determined as those radios active on the system on the 1st of March of each year. Payment to the County will be made directly to the County within 45 days from receipt of the invoice.

2.7 Flow Down Metropolitan Emergency Services Board Contract Provisions

SUBSCRIBER agrees to comply with all applicable flow down provisions contained in the Agreement between the COUNTY and the MESB, formerly known as the Metropolitan Radio Board, (MRB). Such flow down provisions, including any amendments thereto, are hereby incorporated herein as being part of this Agreement by this reference.

2.8 No Use of CITY Purchased and Owned Radios and Radio Software
Any Radios purchased by CITY under a grant or any other funding source or financing mechanism, must be certified by the County for use on the System and governed by a USER Agreement to be entered into by the CITY and the COUNTY.

2.9 Network Changes / Upgrades which Obsolete SUBSCRIBER Radios
At the direction of the SRB and/or MESB, the COUNTY may decertify any model of radios, batteries, other operating equipment, and/or radio operating software version. The COUNTY must provide SUBSCRIBER with 365 days' Notice of intent, unless required sooner by the State of Minnesota, to decertify any model of radios, batteries, other operating equipment, and/or radio operating software version. De-certified radios or radios operating with decertified equipment and/or software versions will not be allowed to access or use the System. SUBSCRIBER agrees to fully comply with and follow such COUNTY determinations regarding decertification.

2.10 Individual Radio Deactivation
User agrees to immediately discontinue use of a non-functioning radio from the system upon notification of a condition or defect of that radio that impairs System or radio performance, and to continue non-use until such time as the condition is corrected or remedied. If the condition cannot be corrected to render the radio functional to operational specifications, the radio will be permanently removed from the System.

2.11 Limitation of Radio Programming, Radio Code Plug Programming Files and System Key File
All radios on the System shall be programmed only by the COUNTY, and the COUNTY shall retain an archived electronic copy of all radio code plug programming files and encryption keys files installed in all SUBSCRIBER Radios covered under this Agreement. The configuration of all radio code plug programming files and radio templates shall be subject to approval by the COUNTY before the radios will be activated on the System. All radio code plug programming files, system key files and encryption key files are the sole property of the COUNTY and contain information that is classified as security information and non-public government data. Unless specifically authorized by the COUNTY in writing, SUBSCRIBER may not directly or indirectly, or permit any third party to: view, read, print, extract, copy, archive, edit, create, clone, transfer, tamper with or otherwise compromise the security of any radio code plug programming file, system key file or encryption key file for any radio on the System. In the event SUBSCRIBER learns that any party has improperly or fraudulently obtained radio code plug programming file information, system key file or encryption key file, SUBSCRIBER will immediately notify COUNTY of the security breach.

2.12 Payment for Damaged, Lost, or Stolen Radios
SUBSCRIBER radios that are damaged beyond repair, due to the negligence of the SUBSCRIBER, lost, or stolen will be replaced by COUNTY at the SUBSCRIBER's written request, in the sole discretion of SUBSCRIBER. The COUNTY shall notify SUBSCRIBER of the purchase price of the new SUBSCRIBER Radio, the cost of which will be taken from the Dedicated Radio Replacement Fund.

2.13 Notification to COUNTY of Lost or Stolen Radios
SUBSCRIBER agrees to immediately notify COUNTY of any missing, lost or stolen radios, so the radio can be deactivated on the system.

3. DUTIES AND RESPONSIBILITIES OF COUNTY

3.1 Allocation of System Resources
COUNTY will allocate to SUBSCRIBER, on a fair and non-discriminatory basis, sufficient System resources including Talk Groups, Announcement Groups, Radio Unit IDs, Alias IDs, etc. In order to provide SUBSCRIBER with an equivalent grade of service afforded to other comparable System users.

3.2 Monitoring of SUBSCRIBER Talk Groups
COUNTY will periodically monitor talk groups allocated to SUBSCRIBER for SUBSCRIBER's internal use for system management purposes including but not limited to maintenance, troubleshooting, system performance assessments, unusual traffic patterns (sudden jump in usage), policy and procedure compliance checks, etc. COUNTY monitoring of SUBSCRIBER's talk groups may occur at any time, for any duration, may be without notice and may be subject to recording.

3.3 Radio Operator Training
COUNTY will provide SUBSCRIBER with access to end user radio training instructional materials provided to COUNTY from the SRB, MESB or other sources as available and subject to budget restrictions.

3.4 Database Administration
COUNTY will manage and administer the System database records containing the information related to inventory, configuration, programming history, software version control, radio IDs, service levels, statistical usage analysis, etc. for SUBSCRIBER's radios used on the System.

3.5 Radio Station Licenses
COUNTY shall hold and administer all FCC licenses on behalf of all users of the System. SUBSCRIBER shall operate as authorized mobile, portable and control station units under the COUNTY's FCC radio station licenses.

3.6 Maintenance and Repair of Subscriber Radios
COUNTY shall repair and maintain the SUBSCRIBER Radios as needed by SUBSCRIBER. COUNTY shall replace damaged units to the extent that it is able to after considering the available number of replacement radios in COUNTY's possession. If a replacement unit is not available, COUNTY will undertake repairs or manage other repairs in a manner in which allows COUNTY to expedite the repairs of the damaged SUBSCRIBER Radio.

4. TERM AND CANCELLATION

4.1 Term of Agreement
This Agreement shall be for an Initial Term beginning January 1, 2025 and continuing through December 31, 2026. At the time of termination pursuant to this Paragraph, CITY shall take ownership of the SUBSCRIBER Radios, and COUNTY shall execute all necessary documentation to effectuate such transfer. CITY and COUNTY acknowledge that at the time of termination pursuant to this Paragraph, the SUBSCRIBER Radios shall be deemed owned by the CITY, and as such, the use of such radios will be subject to another USER Agreement. In the event that no such Agreement exists thirty (30) days after termination under this Paragraph, this Agreement shall automatically renew for a one (1) year term. This SUBSCRIBER Agreement becomes effective January 1, 2025 at 12:01 a.m. regardless of whether this document has been fully executed, if the CITY has any active radios on the System at that time or any time thereafter.

4.2 Cancellation of Agreement
This Agreement may not be cancelled during the Initial Term, except pursuant to Section 6 of this Agreement. Thereafter, this Agreement may be cancelled with or without cause by either party upon three (3) years' written notice, provided that any such cancellation by the COUNTY shall require action by the Board of the Chisago County Commissioners. Any remaining CITY funds in the Dedicated Radio Replacement Fund, shall be refunded to the CITY upon cancelation of this agreement.

5. MERGER AND MODIFICATION

5.1 Entire Agreement
It is understood and agreed that the entire Agreement between the parties is contained herein and that this Agreement supersedes all oral agreements and negotiations between the parties relating to the subject matter hereof. All items referred to in this Agreement are incorporated or attached and are deemed to be part of this Agreement.

5.2 Amendments to Agreement
Any alterations, variations, modifications, or waivers of provisions of this Agreement, shall only be valid when they have been reduced to writing as an amendment to this Agreement signed by the parties hereto.

6. DEFAULT

6.1 If either party fails to perform any material term of this Agreement, and such failure continues for thirty (30) days following written notice to the non-performing party, this shall constitute a default. Unless the SUBSCRIBER's default is excused by the COUNTY, the COUNTY may upon thirty (30) days written notice immediately cancel this Agreement in its entirety. Unless the COUNTY's default is excused by the SUBSCRIBER, the SUBSCRIBER may upon thirty (30) days' written notice cancel this Agreement in its entirety.

6.2 In the event the COUNTY cancels this Agreement due to SUBSCRIBER's default, SUBSCRIBER shall return all equipment and other materials provided to SUBSCRIBER by COUNTY and SUBSCRIBER shall cease all use of COUNTY's System. In the event the SUBSCRIBER cancels this Agreement due to the COUNTY's default, SUBSCRIBER shall seek any damages in the manner prescribed by law or this Agreement.

6.3 Notwithstanding any provision of this Agreement to the contrary, the defaulting party shall not be relieved of liability to the other party for damages sustained by the nondefaulting party by virtue of any breach of this Agreement by the defaulting party.

6.4 The above remedies shall be in addition to any other right or remedy available under this agreement, law, statute, rule, and/or equity.

6.5 The failure to insist upon strict performance of any provision or to exercise any right under this Agreement shall not be deemed a relinquishment or waiver of the same, unless consented to in writing. Such consent shall not constitute a general waiver or relinquishment throughout the entire term of the Agreement.

7. MISCELLANEOUS PROVISIONS

7.1 Independent Parties
It is mutually understood that this Agreement does not create an employment relationship between the parties, nor does it create a partnership or joint venture, nor does it constitute a cooperative agreement or joint powers agreement.

7.2 Liability
Each party agrees that it will be responsible for its own acts and the results thereof, to the extent authorized by law, and shall not be responsible for the acts of the other party and the results thereof. The COUNTY's and the SUBSCRIBERS's liability is governed by the provisions of Minnesota Statutes Chapter 466.

7.3 Data Privacy
SUBSCRIBER, its officers, agents, owners, partners, employees, volunteers or subcontractors agree to abide by the provisions of the Minnesota Government Data Practices Act, Minnesota Statutes, Chapter 13, and all other applicable state and federal laws, rules, regulations and orders relating to data privacy or confidentiality, and as any of the same may be amended.

7.4 Records – Availability/ Access
Subject to the requirements of Minnesota Statutes Section 16C.05, Subd. 5 (as may be amended), the SUBSCRIBER agrees that the COUNTY, the State Auditor, the Legislative 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 the SUBSCRIBER and involve transactions relating to this Agreement. Such materials shall be maintained, and such access and rights shall be in force and effect during the period of the Agreement and for six (6) years after its termination or cancellation.

7.5 Agreement Administration
In order to coordinate the services of the SUBSCRIBER with the activities of the COUNTY so as to accomplish the purposes of this Agreement, **<Insert Name of Contact, Title, CITY, Mailing Address, PO Box ____, City, MN Zip>**; shall manage this Agreement on behalf of the SUBSCRIBER and serve as liaison between the COUNTY and the SUBSCRIBER.

7.6 Notices
Any notice or demand which must be given or made by a party hereto under the terms of this Agreement or any statute or ordinance shall be in writing and shall be sent certified mail. Notices to the COUNTY shall be sent to the County Administrator with a copy to the Office of the County Sheriff and the Office of Management of Information and Communications Systems (MICS) at the address given below. Notice to the SUBSCRIBER shall be sent to the address stated below.

To COUNTY: Chisago County Administrator
313 North Main Street, Room 174
Center City, MN 55012

COPY: Chisago County ARMER Program Manager
c/o Chisago County MICS Department
313 North Main St.
Center City, MN 55012

SUBSCRIBER: **City Administrator**
6408 Elm St.,
North Branch, Minnesota, 55056

7.7 ARMER Subscriber/User Advisory Committee
7.7.A. A Subscriber/User Advisory Committee shall exist, comprised of two Chisago County Board members and any interested representatives from SUBSCRIBER (together with Communication System USERs), to make recommendations to the County related to public safety procedures and operations as they relate to the System and this Agreement. The Subscriber/User Advisory Committee shall meet each prior to February 15 each year and shall record and distribute to members a listing of attendance, items discussed, and recommendations made. The COUNTY must schedule each meeting. Written notice of the time and place of each meeting shall be mailed by the COUNTY to the SUBSCRIBER at the address given in Section 7.6 above, at least two weeks prior to the meeting. For purposes of this section, notice shall be effective as of the date of mailing.

7.7.B. A Technical Issues Subcommittee shall exist, comprised of at least one representative from the Chisago County Sheriff's Office, at least one representative from the Chisago County MICS Department, and any interested representatives from SUBSCRIBER (together with representatives from Communications System USERS). The purpose of the Technical Issues Subcommittee shall be to make recommendations to the COUNTY and SUBSCRIBER regarding technical issues as they relate to the System and this Agreement, including certification of new radios. The Technical Issues Subcommittee shall meet a minimum of four times per year and shall record and distribute to members a listing of

attendance, items discussed, and recommendations made. The COUNTY must schedule each meeting. Written notice of the time and place of each meeting shall be mailed by the COUNTY to the SUBSCRIBER at the address given above, at least two weeks prior to the meeting. For purposes of this section, notice shall be effective as of the date of mailing.

7.8 Minnesota Laws Govern

The Laws of the State of Minnesota shall govern all questions and interpretations concerning the validity and construction of this Agreement and the legal relations between the herein parties and performance under it. The appropriate venue and jurisdiction for any litigation hereunder will be those courts located within the County of Chisago, State of Minnesota. Litigation, however, in the federal courts involving the herein parties will be in the appropriate federal court within the State of Minnesota. If any provision of this Agreement is held invalid, illegal or unenforceable, the remaining provisions will not be affected.

8. DISPUTE RESOLUTION

8.1 Grievance Procedure.

A grievance governed by this section is defined as a dispute or disagreement related to the financial terms of this Agreement or the inability of the parties to reach a mutually agreeable System Subscriber Agreement in the future regarding financial terms contained in section 2.4 this Agreement. The parties are committed to resolve the occurrence of any grievance on an informal basis at the earliest opportunity. If the matter is not resolved by informal discussion, it shall be settled in accord with the following procedure.

8.2 Mediation.

If the parties are unable to resolve the grievance informally, either party may submit a letter stating its desire to move forward with mediation of financial terms contained in section 2.4 of this agreement. The mediation shall be administrated by the Bureau of Mediation Services located at 1380 Energy Lane, Suite Two, Saint Paul, Minnesota 55108.

8.3 Mediation Fees.

The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held at a mutually agreed upon location.

8.4 Mediation Enforceability. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

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SUBSCRIBER and the COUNTY having duly approved this Agreement on the dates set forth below authorize the designated officials to sign and execute this Agreement and agree to be bound by the provisions set forth herein.

COUNTY APPROVAL

Reviewed and Approved to Form:

JANET REITER, COUNTY ATTORNEY

Signed: ***/s/ Jeffrey B. Fuge***
Jeffrey B. Fuge
Assistant County Attorney

Dated: February 29, 2024

COUNTY OF CHISAGO
STATE OF MINNESOTA

Signed: Marlys Dunne

Name: Marlys Dunne Date 3/6/24

Attest: _____ Date 3/6/24
Chase Burnham
County Administrator

SUBSCRIBER APPROVAL

CHISAGO COUNTY
MAR - 6 2024
BOARD APPROVED

SUBSCRIBER – **City of North Branch**

Signed: _____

Name (Print):_____ Date _____
Mayor

and

By: _____ Date _____
City Administrator

Chisago County
313 North Main Street
Center City, MN 55012

Regionwide Public Safety
Radio Communications System

Communications System User Agreement 2025-2026

Between Chisago County and **City of North Branch** Regarding:

- Terms of Use of the Regionwide Public Safety Radio Communications System
- Responsibilities for Programming User-provided Radios
- Administrative and Operational Support for the Regionwide Public Safety Radio Communications System

THIS AGREEMENT is made and entered into by and between the County of Chisago, a body politic and corporate, under the laws of the State of Minnesota, hereinafter referred to as the "COUNTY," 313 North Main Street, Center City, Minnesota 55012, and City of North Branch, a body politic and corporate, under the laws of the State of Minnesota, 6408 Elm St., North Branch, MN 55056, acting by and through its duly authorized officers, hereinafter referred to as the "USER".

WITNESSETH:

WHEREAS, the COUNTY operates a Local Subsystem as part of the Regionwide Public Safety Radio ARMER Communications System, hereinafter referred to as "System"; and

WHEREAS, the COUNTY has provided for the capability of Cities, Agencies, Districts and Other Authorized Users within the COUNTY to have access to the System; and

WHEREAS, the COUNTY bears primary responsibility for the health, security and integrity of the System and other communications Systems; and

WHEREAS, the USER has elected to participate as a System user, with USER owned radios operating on the System.

NOW, THEREFORE, in consideration of the mutual undertakings and agreements hereinafter set forth, the COUNTY and the USER agree as follows:

1. RECITALS, PURPOSE AND INTRODUCTION

1.1 Recitals
The above recitals are hereby incorporated into this Agreement as if set forth herein.

1.2 Purpose
The purpose of this Agreement is to define the rights and obligations of the COUNTY and the USER with respect to the cooperative and coordinated technical and administrative support of the COUNTY's System and use of portable, mobile, desktop and other end-user radios by the USER on the COUNTY's System.

1.3 System
The System is a multi-site general purpose wireless communications System designed to provide, among other things, access to a wide area nine county regionwide public safety radio communications System, multiple System redundancies with backup power, a wide range of talk groups, electronic identification of all radios on all transmissions, 99.999% microwave System reliability, encryption availability, System security, radio interoperability, 24 hour-a-day System monitoring and response, access to a pool of special event radios and general training for USER.

1.4 Application
This Agreement applies only to USER's use of the System.

2. DUTIES AND RESPONSIBILITIES OF USER

2.1 Conformance to Statewide Radio Board (SRB), Metropolitan Emergency Services Board (MESB) and COUNTY Standards

USER agrees to be aware of and conform to all applicable standards, policies, procedures and protocols established or amended by the SRB and MESB related to use of the System including but not limited to radio technical specifications and configurations, system and radio user training requirements, radio operating guidelines, audit, monitoring and compliance.

2.2 Conformance to Federal Laws and Regulations

USER agrees to be aware of and conform to all applicable Federal Rules, Regulation and Laws pertaining to use of the System including but not limited to the Communications Act of 1934 as Amended and Part 90 of the Federal Communications Commission Rules.

2.3 Response to Improper Use

In the event COUNTY informs USER that statistical analysis of System usage or other information indicates that USER personnel may have violated standards, policies, procedures, rules, regulations or laws regarding proper use of or operation of the System, or may have violated the provisions of this Agreement, USER agrees to take immediate and appropriate investigative and corrective action to stop the violation and eliminate any reoccurrence.

2.4 USER-owned Radio Fees (User Fee)

USER agrees to pay COUNTY a USER-owned Radio Fees for the System per radio for the year of 2025 and 2026. The 2025 fee will be calculated by dividing the MESB fee and the Minnesota State Infrastructure (SUA2) fee by the number of all radios on the system (including the County's radios) and adding a fixed fee of $100 per radio. For 2026, the USER-owned Radio Fee shall be calculated by dividing the MESB fee and the Minnesota State Infrastructure (SUA2) fee by the number of all radios on the system (including the County's radios) and adding a fixed fee of $125 per radio.

2.5 Notification of USER-Owned Radio Units

USER shall supply a detailed listing of projected USER-owned Radios to the COUNTY for the following year by February 15th of each preceding year. This listing of projected units will be used to calculate the USER Fee. The COUNTY may limit the number of USER-Owned Radio units allowed on the system, based upon system capacity, configuration, and approval of COUNTY, MESB and State governing bodies overseeing the ARMER system.

2.6 Invoicing and Payment Terms

COUNTY will invoice USER annually for all fees specified herein. For annual billing purposes, USER counts will be determined as those radios active on the System on the 1st day of March of each year USER counts may be adjusted by mutual consent and annual charges will be prorated accordingly. Payment to the COUNTY will be made directly to the COUNTY within 45 days from receipt of invoices.

2.7 Flow Down Metropolitan Emergency Services Board Contract Provisions

USER agrees to comply with all applicable flow down provisions contained in the Agreement between the COUNTY, the MESB, and/or the SRB. Such flow down provisions, including any amendments thereto, are hereby incorporated herein as being part of this Agreement by this reference.

2.8 Use of USER Purchased and Owned Radios and Radio Software

Any Radios purchased by USER must be certified by the COUNTY. The Technical Issues Subcommittee shall provide the COUNTY with a list of radio models which the Technical Issues Subcommittee will recommend be certified by the COUNTY and the COUNTY shall update the list as necessary based upon the recommendations and the requirements established by the FCC, SRB, and MESB. At no time shall this list contain fewer than 2 radio models, unless restricted by the FCC, SRB, or MESB. A list of certified radio models is attached to this Agreement as Appendix A. Appendix A may be amended without an executed amendment to this Agreement, based upon a recommendation of members of the Technical Issues Subcommittee, which is in compliance with the FCC, SRB and MESB requirements.

2.9 Network Changes / Upgrades which Obsolete USER Radios

At the direction of the SRB and/or MESB, the COUNTY may decertify any model of radios, batteries, other operating equipment, and/or radio operating software version. The COUNTY must provide USER with 365 days' Notice of intent, unless required sooner by the State, to decertify any model of radios, batteries, other operating equipment, and/or radio operating software version. De-certified radios or radios operating with decertified equipment and/or software versions will not be allowed to access or use the System. USER agrees to fully comply with and follow such COUNTY determinations regarding decertification.

2.10 Individual Radio Deactivation

User agrees to immediately discontinue use of a non-functioning radio from the system upon notification of a condition or defect of that radio that impairs System or radio performance, and to continue non-use until such time as the condition is corrected or remedied. If the condition cannot be corrected to render the radio functional to operational specifications, the radio will be permanently removed from the system.

2.11 Limitation of Radio Programming, Radio Code Plug Programming Files and System Key File

All radios on the System shall be programmed only by the COUNTY, and the COUNTY shall retain an archived electronic copy of all radio code plug programming files and encryption keys files installed in all USER radios covered under this Agreement. The configuration of all radio code plug programming files and radio templates shall be subject to approval by the COUNTY before the radios will be activated on the System. All radio code plug programming files, System key files and encryption key files are the sole property of the COUNTY and contain information that is classified as security information and non-public government data. Unless specifically authorized by the COUNTY in writing, USER may not directly or indirectly, or permit any third party to: view, read, print, extract, copy, archive, edit, create, clone, transfer, tamper with or otherwise compromise the security of any radio code plug programming file, System key file or encryption key file for any radio on the System. In the event USER learns that any party has improperly or fraudulently obtained radio code plug programming file information, System key file or encryption key file, USER will immediately notify COUNTY of the security breach.

2.12 Notification to COUNTY of Lost or Stolen Radios

USER agrees to immediately notify COUNTY of any missing, lost or stolen radios, so the radio can be deactivated on the System.

2.13 Required destruction of programming (IE Code Plug) information upon radio decommissioning

Before any radio is sold, given to another agency, decommissioned, etc. the code plug programming must be wiped to the NIST standard by the COUNTY, or the device must be physically shredded by the USER.

3. DUTIES AND RESPONSIBILITIES OF COUNTY

3.1 Allocation of System Resources

COUNTY will allocate to USER, on a fair and non-discriminatory basis, sufficient System resources including Talk Groups, Announcement Groups, Radio Unit IDs, Alias IDs, etc. in order to provide USER with an equivalent grade of service afforded to other comparable System users.

3.2 Monitoring of USER Talk Groups

COUNTY may periodically monitor talk groups allocated to USER for USER's internal use for System management purposes, including but not limited to maintenance, troubleshooting, System performance assessments, unusual traffic patterns (sudden jump in usage), and policy and procedure compliance checks. COUNTY monitoring of USER's talk groups may occur at any time, for any duration, may be without notice and may be subject to recording.

3.3 Radio Operator Training

COUNTY will provide USER with access to end-user radio training instructional materials provided to COUNTY from the SRB, MESB or other sources as available and subject to budget restrictions.

3.4 Database Administration

COUNTY will manage and administer the System database records containing the information related to inventory, configuration, programming history, software version control, radio IDs, service levels, statistical usage analysis, etc. for USER's radios used on the System.

3.5 Radio Station Licenses

COUNTY shall hold and administer all FCC licenses on behalf of all users of the System. USER shall operate as authorized mobile, portable and control station units under the COUNTY's FCC radio station licenses.

3.6 Radio Programming

COUNTY shall provide basic System access and use programming for USER-provided Radios, subject to USER compliance with Sections 2.7 – 2.15 of this Agreement.

4. TERM AND CANCELLATION

4.1 Term of Agreement

This Agreement shall be for an initial term beginning on January 1, 2025 and continue through December 31, 2026 ("Initial Term"). Thereafter, this Agreement shall renew for successive one (1) year terms, beginning January 1, 2027, and continue, unless written notice is provided by either Party of intent not to renew as set forth in paragraph 4.2 herein. This USER Agreement becomes effective January 1, 2025 at 12:01 a.m. regardless of whether this document has been fully executed, if the USER has any active radios on the System at that time or any time thereafter.

4.2 Cancellation of Agreement

This Agreement may not be cancelled during the Initial Term, except pursuant to Section 6 of this Agreement. Thereafter, this Agreement may be canceled with or without cause by either party upon three (3) years' written notice, provided that any such cancellation by COUNTY shall require action by the Board of Chisago County Commissioners.

4.3 Actions Upon Expiration or Cancellation

Upon expiration or cancellation of this Agreement as provided for herein, USER shall return all COUNTY provided equipment and shall cease all use of the System.

5. MERGER AND MODIFICATION

5.1 Entire Agreement

It is understood and agreed that the entire Agreement between the parties is contained herein, and that this Agreement supersedes all oral agreements and negotiations between the parties relating to the subject matter hereof. All items referred to in this Agreement are incorporated or attached and are deemed to be part of this Agreement.

5.2 Amendments to Agreement

Any alterations, variations, modifications, or waivers of provisions of this Agreement shall only be valid when they have been reduced to writing as an amendment to this Agreement signed by the parties hereto.

6. DEFAULT

6.1 If either party fails to perform any material term of this Agreement, and such failure continues for 30 days following written notice to the non-performing party, this shall constitute a default. Unless the USER's default is excused by the COUNTY, the COUNTY may upon (30) days written notice cancel this Agreement in its entirety. Unless the COUNTY's default is excused by the USER, the USER may, upon thirty (30) days' written notice, cancel this Agreement in its entirety.

6.2 Notwithstanding any provision of this Agreement to the contrary, the defaulting party shall not be relieved of liability to the other party for damages sustained by the non-defaulting party by virtue of any breach of this Agreement by the defaulting party.

6.3 The above remedies shall be in addition to any other right or remedy available under this Agreement, law, statute, rule, and/or equity.

6.4 The failure to insist upon strict performance of any provision or to exercise any right under this Agreement shall not be deemed a relinquishment or waiver of the same, unless consented to in writing. Such consent shall not constitute a general waiver or relinquishment throughout the entire term of the Agreement.

7. MISCELLANEOUS PROVISIONS

7.1 Independent Parties

It is mutually understood that this Agreement does not create an employment relationship between the parties, nor does it create a partnership or joint venture, nor does it constitute a cooperative agreement or joint powers agreement.

7.2 Liability

Each party agrees that it will be responsible for its own acts and the results thereof, to the extent authorized by law, and shall not be responsible for the acts of the other party and the results thereof. The COUNTY's and the USER's liability is governed by the provisions of Minnesota Statutes Chapter 466.

7.3 Data Privacy

COUNTY, USER, and respective officers, agents, owners, partners, employees, volunteers or subcontractors agree to abide by the provisions of the Minnesota Government Data Practices Act, Minnesota Statutes, Chapter 13, and all other applicable state and federal laws, rules, regulations and orders relating to data privacy or confidentiality, and as any of the same may be amended.

7.4 Records – Availability/ Access

Subject to the requirements of Minnesota Statutes Section 16C.05, Subd. 5 (as may be amended), all parties agree that the COUNTY, USER, the State Auditor, the Legislative 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 the USER or COUNTY and involve transactions relating to this Agreement. Such materials shall be maintained, and such access and rights shall be in force and effect during the period of the Agreement and for six (6) years after its expiration or cancellation.

7.5 Agreement Administration

In order to coordinate the services of the USER with the activities of the COUNTY so as to accomplish the purposes of this Agreement, [ORGANIZATION CONTACT NAME & TITLE, ADDRESS, PHONE, FAX and EMAIL] shall manage this Agreement on behalf of the USER and serve as liaison between the COUNTY and the USER.

7.6 Notices

Any notice or demand which must be given or made by a party hereto under the terms of this Agreement or any statute or ordinance shall be in writing and shall be sent certified mail.
Notices to the COUNTY shall be sent to the Chisago County Administrator with a copy to the Management of Information and Communications Systems (MICS) Department at the address given below. Notice to the USER shall be sent to the address(es) stated below.

To COUNTY: Chisago County
c/o County Administrator
313 North Main St. Suite 170
Center City, MN 55012

COPY: Chisago County ARMER Program Manager
c/o Chisago County MICS Department
313 North Main St. Suite 140
Center City, MN 55012

To USER: Mr. Jason Ziemer,
Interim City Administrator
City of North Branch
6408 Elm St.
North Branch, MN 55056

7.7 ARMER Subscriber/User Advisory Committee

7.7.A. A Subscriber/User Advisory Committee shall exist, comprised of two Chisago County Board members and any interested representatives from USER, to make recommendations to the County related to public safety procedures and operations as they relate to the System and this Agreement. The Subscriber/User Advisory Committee shall meet prior to February 15 each year and shall record and distribute to members a listing of attendance, items discussed, and recommendations made. The COUNTY must schedule each meeting. Written notice of the time and place of each meeting shall be mailed by

the COUNTY to the USER at the address given in Section 7.6 above, at least two weeks prior to the meeting. For purposes of this section, notice shall be effective as of the date of mailing.

7.7.B. A Technical Issues Subcommittee shall exist, comprised of at least one representative from the Chisago County Sheriff's Office, at least one representative from the Chisago County MICS Department, and any interested representatives from USER. The purpose of the Technical Issues Subcommittee shall be to make recommendations to the COUNTY and USER regarding technical issues as they relate to the System and this Agreement, including certification of new radios. The Technical Issues Subcommittee shall meet a minimum of four times per year and shall record and distribute to members a listing of attendance, items discussed, and recommendations made. The COUNTY must schedule each meeting. Written notice of the time and place of each meeting shall be mailed by the COUNTY to the USER at the address given above, at least two weeks prior to the meeting. For purposes of this section, notice shall be effective as of the date of mailing.

7.8 Minnesota Laws Govern

The Laws of the State of Minnesota shall govern all questions and interpretations concerning the validity and construction of this Agreement and the legal relations between the herein parties and performance under it. The appropriate venue and jurisdiction for any litigation hereunder will be those courts located within the County of Chisago, State of Minnesota. Litigation, however, in the federal courts involving the herein parties will be in the appropriate federal court within the State of Minnesota. If any provision of this Agreement is held invalid, illegal or unenforceable, the remaining provisions will not be affected.

8. DISPUTE RESOLUTION

8.1 Grievance Procedure. A grievance governed by this section is defined as a dispute or disagreement related to the financial terms of this Agreement or the inability of the parties to reach a mutually agreeable System USER Agreement in the future regarding the financial terms contained in section 2.4 of this Agreement. The parties are committed to resolve the occurrence of any grievance on an informal basis at the earliest opportunity. If the matter is not resolved by informal discussion, it shall be settled in accord with the following procedure.

8.2 Mediation. If the parties are unable to resolve the grievance informally, either party may submit a letter stating its desire to move forward with mediation of financial terms contained in section 2.4 of the Agreement. The mediation shall be administrated by the Bureau of Mediation Services located at 1380 Energy Lane, Suite Two, Saint Paul, Minnesota 55108.

8.3 Mediation Fees. The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held at a mutually agreed upon location.

8.4 Mediation Enforceability. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

[Signature Page Follows]

The USER and the COUNTY having duly approved this Agreement on the dates set forth below have authorized the designated officials to sign and execute this Agreement, and agree to be bound by the provisions set forth herein

COUNTY APPROVAL

Reviewed and Approved as to Form:

JANET REITER, COUNTY ATTORNEY

By: ***/s/ Jeffrey B. Fuge***
Jeffrey B. Fuge
Assistant County Attorney

Dated: February 29, 2024

COUNTY OF CHISAGO
STATE OF MINNESOTA

Name (Print): Marlys Dunn Date 3/6/24
Chair Board of Commissioners

Signed: Marlys Dunn

Attest: _____
County Administrator

CHISAGO COUNTY
MAR - 6 2024
BOARD APPROVED

USER APPROVAL

USER – City of North Branch

Signed: _____

Name (Print):_____ Date _____

Position/Role: _____

and

Signed: _____

Name (Print):_____ Date _____

Position/Role: _____

Appendix A

Motorola XTL 2500
Motorola XTS 2500
Motorola APX 7

City of North Branch
Staff Report

Prepared By: Nathan Sondrol, GIS Specialist/Parks Director

Presenter: Nathan Sondrol, GIS Specialist/Parks Director

Date: 09/11/2024

Board & Commission: Parks, Trails and Open Space Commission

Subject: ECRAC Arts and Culture Heritage Fund Legacy Grant - Summer Concerts

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The Minnesota State Arts Board and Minnesota's designated regional arts councils are entrusted with stewardship of funding through the State of Minnesota's Arts and Cultural Heritage Fund (ACHF.) Proceeds from the fund may be spent only on arts and arts access, arts education and arts and cultural heritage. The fund is intended to create a strong arts legacy in Minnesota.

The East Central Regional Arts Council has Arts and Cultural Heritage Fund (also known as Legacy) grants available for arts projects sponsored by groups, organizations, nonprofits, and units of government located within the Region 7E service area. This category provides support to organizations for a wide variety of larger arts projects involving the creation, sponsorship, publication, performance, and/or exhibition of art. Arts producing activities should result from the project. There is no limit on the number of grants that can be received each fiscal year, at this time, but applicants are limited to submitting one application per grant deadline. An Outcome Evaluation Plan is required for this funding program.

The ECRAC funds ACHF requests from $5,000 up to $15,000 for organizations, nonprofits, schools, and units of government. Schools are also eligible for funding, but please see the guidelines for limitations. There are three application deadlines per year for this program; October 1, February 1, and April 1 for projects starting about 3 months later or more.

The City has submitted applications in conjunction with North Branch Area Community Education and received funding for the past 6 years to support the Concerts in the Park Series in Central Park. Last year's events were received with great support and feedback. City Staff would work with Community Ed on submitting an application to continue these efforts again for the 2025 Summer Concert Series.

Financial/Budget Impacts:
The estimated city cost is not to exceed $3,500 with funds coming from the Park Improvement Fund.

Deadline:
The grant is due October 1, 2024.

PTOS Commission Recommmendation:
The Parks, Trails and Open Space Commission recommended approval to submit an application to the ECRAC Arts and Culture Heritage Fund Legacy Grant program for the 2025 Summer Concerts in the Park Series. at their September 9, 2024 meeting.

Requested City Council Action :
To approve City Staff to submit an application to the ECRAC Arts and Culture Heritage Fund Legacy Grant program for the 2025 Summer Concerts in the Park Series.

Voting Requirements:

Voting Options **Simple Majority**

City of North Branch
Staff Report

Prepared By: Colette Baumgardner, WSB Graduate Community Planner

Presenter: Nathan Sondrol, GIS Specialist/Parks Director

Date: 09/18/2024

Board & Commission: Planning Commission

Subject: Ordinance 384-24 Amending the Industrial Design Standards Zone Overlay District Map

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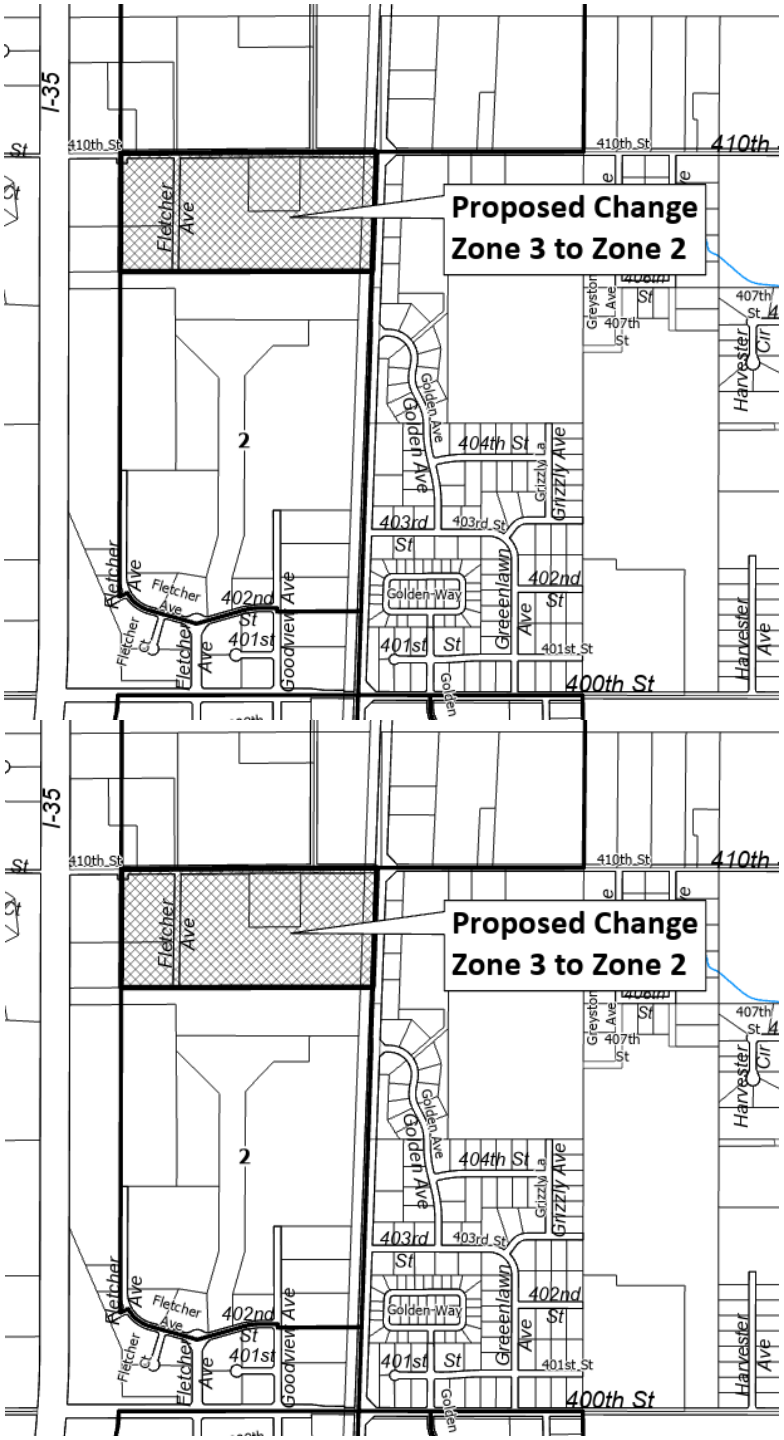
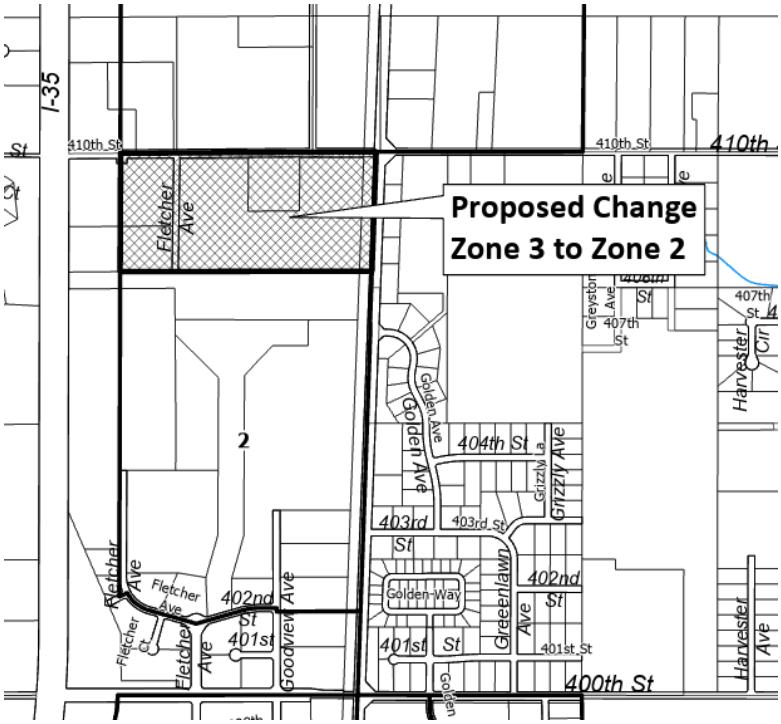
Overview / Background

In July 2024, the City Council with recommendation from the Planning Commission updated the design standards for properties in Zone 3 of Section 66-943 of the City Code. The majority of the properties in Zone 3 have existing buildings that did not meet the previous design standards, and the standards limited the ability of local businesses to expand onto vacant properties. The full text of the new code for Zone 3 can be found in Ordinance 376-24.

When updating the standards for Zone 3, staff recommended a future ordinance amendment to update the Design Overlay District Map to rezone the area currently Zone 3 of the "new industrial park" to be Zone 2. The new industrial park is bordered to the south by 410th Street, north by 400th Street, west by I-35, and east by Forest Blvd. Currently, the approximately 75 acres on the northern edge of the park are in design district Zone 3, while the remainder of the interior portions of the park is Zone 2. The areas adjacent to I-35 are held to higher design standards and in Zone 1.



I-35
410th St
Fletcher Ave
Proposed Change
Zone 3 to Zone 2
Greystone Ave
407th St
Harvester Cir
Golden Ave
404th St
Grizzly Ave
403rd St
Golden Way
Greenlawn Ave
402nd St
401st St
Fletcher Ct
Goodview Ave
Harvester Ave
400th St
2



The recent updates to the design standards have spurred more conversations among staff about the design standards and the impact on the "new industrial park" with the City-owned land. The park has been vacant for many years, and it could be helpful to consider if the design standards are providing the intended benefit to the City.

Issues to Consider

1. Architectural Continuity
2. Nonconformity

Analysis of Issues

1. Architectural Continuity

The City of North Branch is committed to having a high quality industrial park that offers local employment opportunities to residents and surrounding area. The buildings constructed to the City's design standards set a tone of professionalism, permanence, and overall community investment. It is important for the design standards to be consistent across the entire industrial park, as it will create a consistent tone and overall sense of continuity in quality throughout the park.

The public sewer and water connections are on the southern edge of the park, so it is anticipated that development will occur south to north. However, this may not be the case. As City staff have talked with interested businesses, some have considered constructing on the north end due to their operations. The first new business to build in the industrial park could be on the north end, and this location would set the tone for the other development in the park.

2. Nonconformity

There are two existing businesses in the industrial park currently - Stoneworks Cornerstone Building Brands and Viking Coca-Cola Bottling Co. These businesses are in the area proposed to be rezoned. These businesses were constructed before the City's design standards were adopted, and the buildings do not conform with the City's design standards. From what Staff can see on the street, it appears that the buildings do not conform with the design standards for Zone 2, the previous standards for Zone 3, or the updated design standards for Zone 3. These buildings are a legal, nonconforming use, and the businesses can continue operations without being in compliance with City Code. Additionally, the buildings could expand by 75% with the existing design. The only impact would be that these businesses could not expand onto a new parcel within the industrial park with their existing building design.

Staff sent a public hearing notice via mail to all the impacted properties and has not received any comments or questions to date.

Planning Commission Summary

The Planning Commission discussed the proposed ordinance amendment at their meeting on September 3, 2024, and they unanimously recommended approval. After a short presentation by Staff, the Planning Commission opened a public hearing where no members of the public spoke. The Planning Commission then discussed the ordinance and asked about the impacts to existing businesses. The impact to existing businesses would be minimal, as long as the business expands or remodels on their current parcel. If they were to expand to a new parcel, then the business would be held to higher design standards. The Commission also discussed interest in talking about the design standards in the industrial park more broadly and if the existing standards are achieving their intended purpose.

Recommendation from Planning Commission

Motion to approve Ordinance 384-24 Amending the Design District Map of the City of North Branch and authorize the publication by title and summary.

Attachments

1. Design Standard Zone Map - Existing
2. Ordinance 384-24 Amending the Design District Map of the City of North Branch

Voting Requirements:

Voting Options **Simple Majority**

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

ORDINANCE NO. 384-24

AN ORDINANCE AMENDING THE DESIGN OVERLAY DISTRICT MAP OF THE CITY OF NORTH BRANCH.

THE CITY COUNCIL OF THE CITY OF NORTH BRANCH DOES ORDAIN THAT

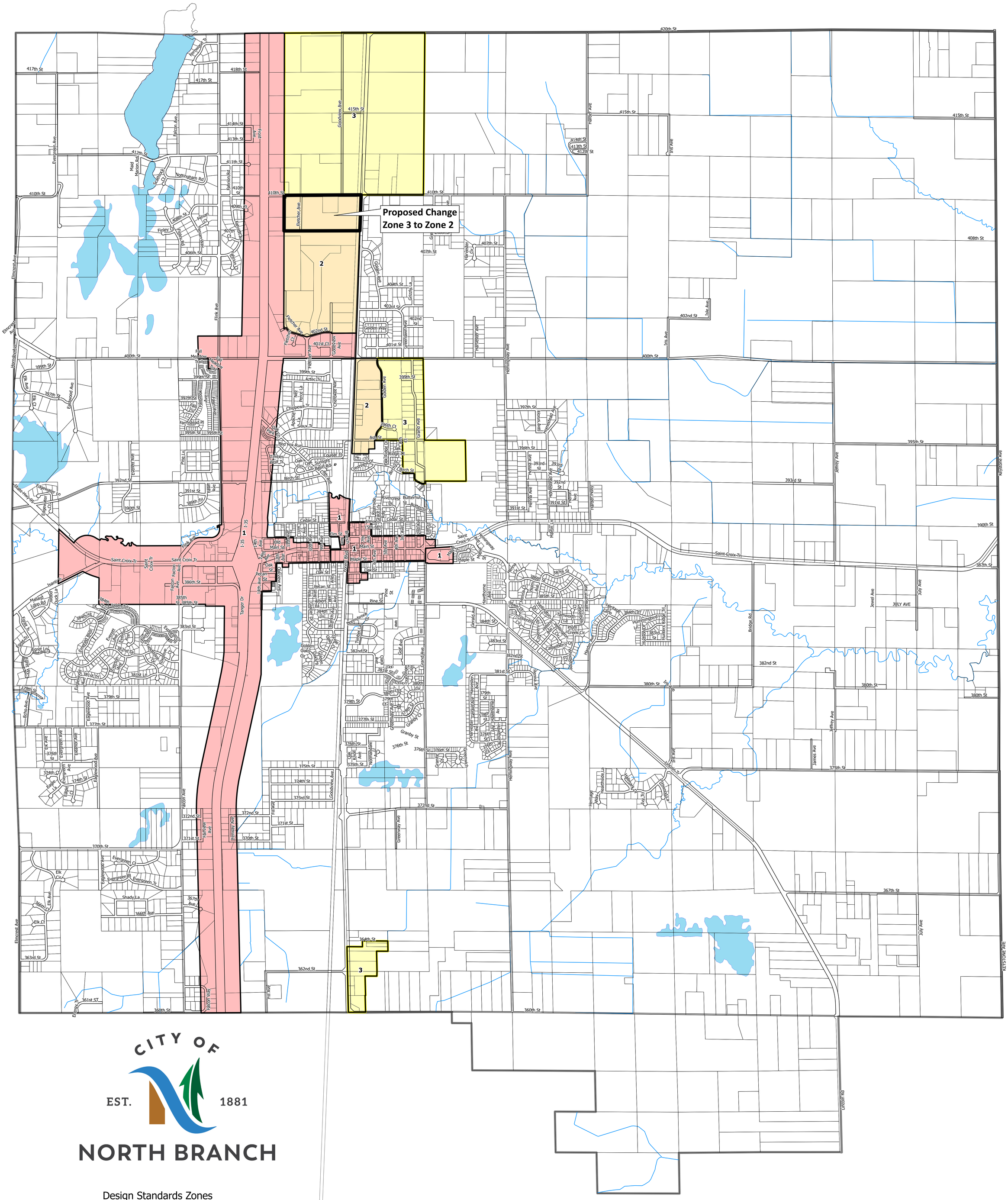
THE DESIGN DISTRICT OVERLAY ZONING MAP IN SEC 66-943 MAP; DESIGN STANDARDS OF THE CITY OF NORTH BRANCH, IS HEREBY AMENDED AS FOLLOWS:

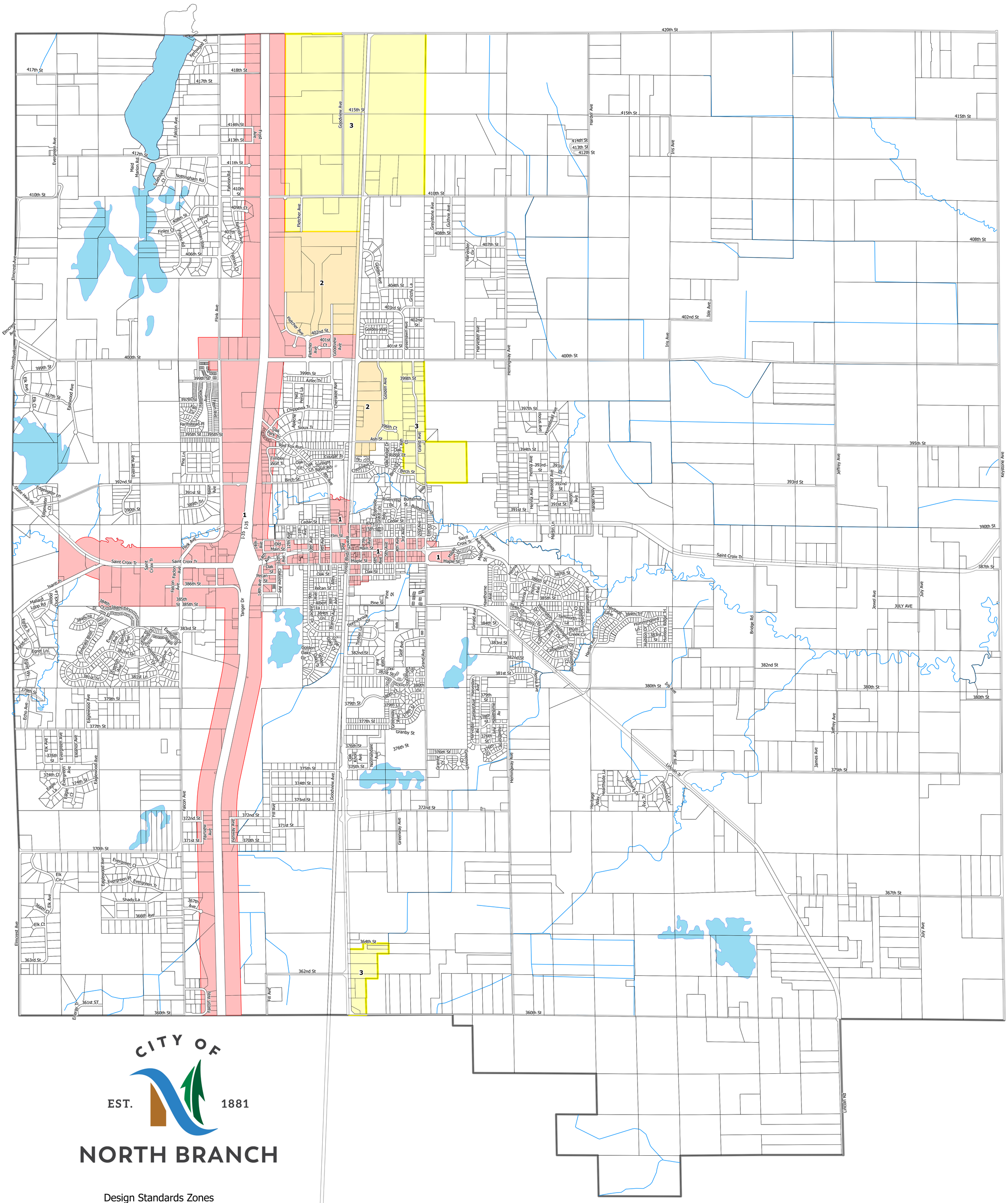
SECTION #1: The Subject Property depicted in Exhibit A is hereby rezoned from Design Overlay District Zone 3 to Zone 2. The rezoning is consistent with the Land Use Plan and guiding of the Subject Properties and the underlying zoning district.

SECTION #2: The following summary is approved by the City Council and shall be published in lieu of publishing the entire ordinance pursuant to Minnesota Statutes section 412.191: Ordinance 384-24, as adopted, rezoned the overlay district for the approximately 75 acres south of 410th street and west of Forest Blvd from Zone 3 to Zone 2.

SECTION #3: The City Clerk is hereby directed to revise the Design Overlay District Map in Sec 66-943 to be consistent with this Ordinance. This ordinance shall have full force effect upon its passage and publication.

Exhibit A of Ordinance 384-24




CITY OF
EST. 1881
NORTH BRANCH
Design Standards Zones
1
2
3

City of North Branch
Staff Report

Prepared By: Colette Baumgardner, WSB Graduate Community Planner

Presenter: Colette Baumgardner, WSB Graduate Community Planner

Date: 09/19/2024

Board & Commission: City Council

Subject: Vocational Training Facility - Resolution 90-2024 Approving the Preliminary and Final Plat for the Laborers Training Center Addition

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Overview / Background

The Construction Laborers' Education, Apprenticeship and Training Fund of Minnesota and North Dakota (Applicant) has applied for a preliminary plat, final plat, and conditional use permit for a vocational training facility at 41499 Forest Blvd (PID: 11.00058.00). The Applicant would like to use the property as a training facility offering construction, environmental, and safety skills courses. The courses would be offered approximately 10-12 weeks out of the year, and students will be able to practice skills such as pipe laying and excavation, structural concrete building, wind tower production, clean energy, solar installation, commercial driver's license, etc.

Upon recommendation of the Planning Commission, the City Council approved a Comprehensive Plan Amendment and rezoning of the property to industrial through Resolution 75-2024 and Ordinance 378-24, respectively. The City Council also approved a vocational training facility as a conditional use in the industrial zoning districts via Ordinance 379-24.

Requests and Issues to Consider

1. Preliminary and Final Plat
    a. Land Use and Zoning
    b. Plat Standards
    c. Easements

Analysis of Requests

1. Preliminary and Final Plat

a. Land Use and Zoning

The properties subject to the Plat are currently guided **Industrial**, per the Comprehensive Plan, and zoned **I2 - Heavy Industrial**. Per Ordinance 379-24, a vocational training facility is a *Conditional Use* in the **I2** zoning district.

Land Use and Zoning standards are satisfied, pending approval of the conditional use permit.

b. Plat Standards

Minimum Lot Standards

Minimum lot dimensional standards for properties in the **I2** zoning district are as follows:

Type	Lot Standards			Setbacks				
	Area (acres)	Width	Depth	Front	Side	Corner	Rear-I	Rear-C
Heavy Industrial outside of MUSA	10	300′	300′	50′	50′	50′	50′	50′

Rear-I and Rear-C mean rear yard setbacks for interior and corner lots.

Maximum building height in this zoning district is 75 feet; the maximum lot coverage for impervious surfaces is 90% The shortest side of a lot is used to determine minimum standards. Lot width is measured at the front yard setback. The Plat proposes the following for the new lot configurations.

	Lot Standards		
Type	Area (acres)	Width	Depth
Lot 1	95.79	853′	1,939′
Lot 2	20.02	467′	1,859′

Minimum lot dimensional standards are satisfied.

For lots outside of the urban service area, preliminary plats are required to show the lots contain a Soil Treatment Area (as defined in section 14-25) that meets the sewer requirements of Chapter 14. The Applicant has provided soil tests, reviewed by the City

Building Official, that show sufficient soils for an alternate and primary septic site on both lots.

Septic site requirement is satisfied.

c. Easements

The Plat proposes to provide all drainage and utility easements as is required by City Code.

Minimum easements requirements are satisfied.

PTOS Commission Recommendation

The PTOS Commission recommended the acceptance of cash for park dedication based on the additional demands of the city's parks, trails, and open space system.

Planning Commission Summary

The Planning Commission reviewed the application and unanimously recommended approval. Prior to opening the public hearing, the Commission asked clarifying questions of staff regarding traffic, operations, screening, and the operating conditions on the conditional use permit. The Commission held a public hearing where the applicant spoke and one adjoining property owner. The applicant discussed the planned operations and site work. The applicant expressed that they would be willing to comply with the conditions on the CUP and the facility would like to be a good neighbor to the adjoining properties. The adjoining property owner shared that while she would not like the development to occur, she felt the conditions on the CUP addressed most of her concerns. The Planning Commission closed the public hearing and after some additional discussion unanimously recommended approval of the preliminary plat and CUP.

Planning Commission Recommendation

The Planning Commission and Staff recommend the following motions:

1. Motion to approve Resolution 90-2024 approving the Preliminary and Final Plat for the Laborers Training Center Addition with conditions and findings of fact as presented by Staff.

Findings and Conditions

Preliminary Plat/Final Plat

Findings of Fact

1. The proposed preliminary and final plat is consistent with the City's Comprehensive Plan.
2. The proposed preliminary and final plat is consistent with the City's Zoning and Subdivision Ordinances with conditions.

Conditions of approval

1. The Applicant shall provide soil tests that show a primary and secondary septic site in compliance with Chapter 14 of the City Code.
2. The Applicant shall enter into a Site Improvement Agreement and pay all applicable fees and provide security prior to commencing construction on the site.
3. All necessary permits as may be applicable must be provided to the City before activity begins and/or before building permits are issued.
4. Title work for the Plat shall be provided to and conform to any requirements resulting from City staff and/or the City Attorney's review of the title work and plat opinion.
5. The Preliminary and Final Plat shall be updated with the owner information prior to the release for recording.
6. The Applicant shall address any comments received from Chisago County.
7. The Applicant shall address comments provided by the City Engineer on August 26, 2024.
8. The Applicant shall pay all applicable Development Fees associated with platting, including, but not limited to: utility trunk area charges, WAC and SAC, and Park Dedication Fees.
9. The Applicant shall be responsible for all costs associated with the plat application.
10. All fees and financial obligations shall be received by the City prior to the releasing of the final plat for recording.
11. The applicant shall record the final plat and plans with the Chisago County Recorder following the procedure in Section 54-70 of the City Code.
12. Except as otherwise expressly authorized by City resolution or ordinance, all aspects of the Development shall comply with all applicable state laws and city codes, ordinance, and regulations.

Voting Requirements:

Voting Options **Simple Majority**

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

CITY COUNCIL RESOLUTION NO. R-90-2024

RESOLUTION APPROVING THE PRELIMINARY AND FINAL PLAT FOR THE LABORERS TRAINING CENTER ADDITION

WHEREAS, Construction Laborers Education, Apprenticeship & Training Fund of Minnesota and North Dakota ("Applicant") on behalf of Loren and Jane Magnison ("Owners") has requested Preliminary and Final Plat approval for the Laborers Training Center Addition ("Plat"); and,

WHEREAS, the property is legally described in Exhibit A ("Subject Property"), and

WHEREAS, the Subject Property is guided as Industrial, per the Comprehensive Plan ("Land Use"), and zoned as I2-Heavy Industrial ("Zoning"); and,

WHEREAS, the Plat results in two lots with Lot 2 sized at 95.75 acres and Lot 2 sized at 20.02 acres; and,

WHEREAS, pursuant to Minnesota Statute §462.357 the Planning Commission ("Commission") held a Public Hearing ("Hearing") on September 3, 2024 to consider and receive public comment regarding the proposed preliminary plat; and,

WHEREAS, notice of the Hearing was posted, published in the City's official newspaper, and mailed to any and all owners of affected properties, as required by State Statute; and,

WHEREAS, all persons desiring to be heard concerning the preliminary plat were given the opportunity to speak thereon; and,

WHEREAS, following the Hearing, the Commission found the preliminary plat satisfies all Land Use and Zoning standards and City platting requirements, and unanimously recommended approval of the Laborers Training Center Addition plat with conditions as stated herein; and,

WHEREAS, the final plat is in substantial conformance with the preliminary plat; and

WHEREAS, the City Council of the City of North Branch, on September 24, 2024, considered the requested preliminary and final plat and how it might affect public health, safety, or welfare and found that the project will not negatively impact the public health, safety, or welfare.

NOW THEREFORE BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF NORTH BRANCH, MINNESOTA, the Preliminary and Final Plat for Laborers Training Center Addition is

hereby approved based on the following findings of fact:

1. The proposed preliminary and final plat is consistent with the City's Comprehensive Plan.
2. The proposed preliminary and final plat is consistent with the City's Zoning and Subdivision Ordinances with conditions.

BE IT FURTHER RESOLVED that the approval of the preliminary and final plat for the Laborers Training Center Addition shall be subject to the following conditions:

1. The Applicant shall enter into a Site Improvement Agreement, pay all applicable fees, and provide security prior to commencing construction on the site.
2. All necessary permits as may be applicable must be provided to the City before activity begins and/or before building permits are issued.
3. Title work for the Plat shall be provided to and conform to any requirements resulting from City staff and/or the City Attorney's review of the title work and plat opinion.
4. The Applicant shall address any comments received from Chisago County.
5. The Preliminary and Final Plat shall be updated with the owner information prior to the release for recording.
6. The Applicant shall address comments provided by the City Engineer on August 26, 2024.
7. The Applicant/Owner shall pay all applicable Development Fees associated with platting, including, but not limited to: utility trunk area charges, WAC and SAC, and Park Dedication Fees.
8. The Applicant/Owner shall enter into a Development Agreement prior to the recording of the Final Plat.
9. The Applicant shall be responsible for all costs associated with the plat application.
10. All fees and financial obligations shall be received by the City prior to the releasing of the final plat for recording.
11. The applicant shall record the final plat and plans with the Chisago County Recorder following the procedure in Section 54-70 of the City Code.
12. Except as otherwise expressly authorized by City resolution or ordinance, all aspects of the Development shall comply with all applicable state laws and city codes, ordinance, and regulations.

BE IT FURTHER RESOLVED, the Final Plat shall be not released for recording until all fees and other financial obligations and agreements, if required, are executed and received by the City; recording of the Final Plat with the land records office of Chisago County must occur within 30 days of its release by the City to Owner.

Exhibit A:

Current Legal Description:
All that part of the NE¼ of SE¼ of Section 4, T35N, R21W, lying west of the following described line:

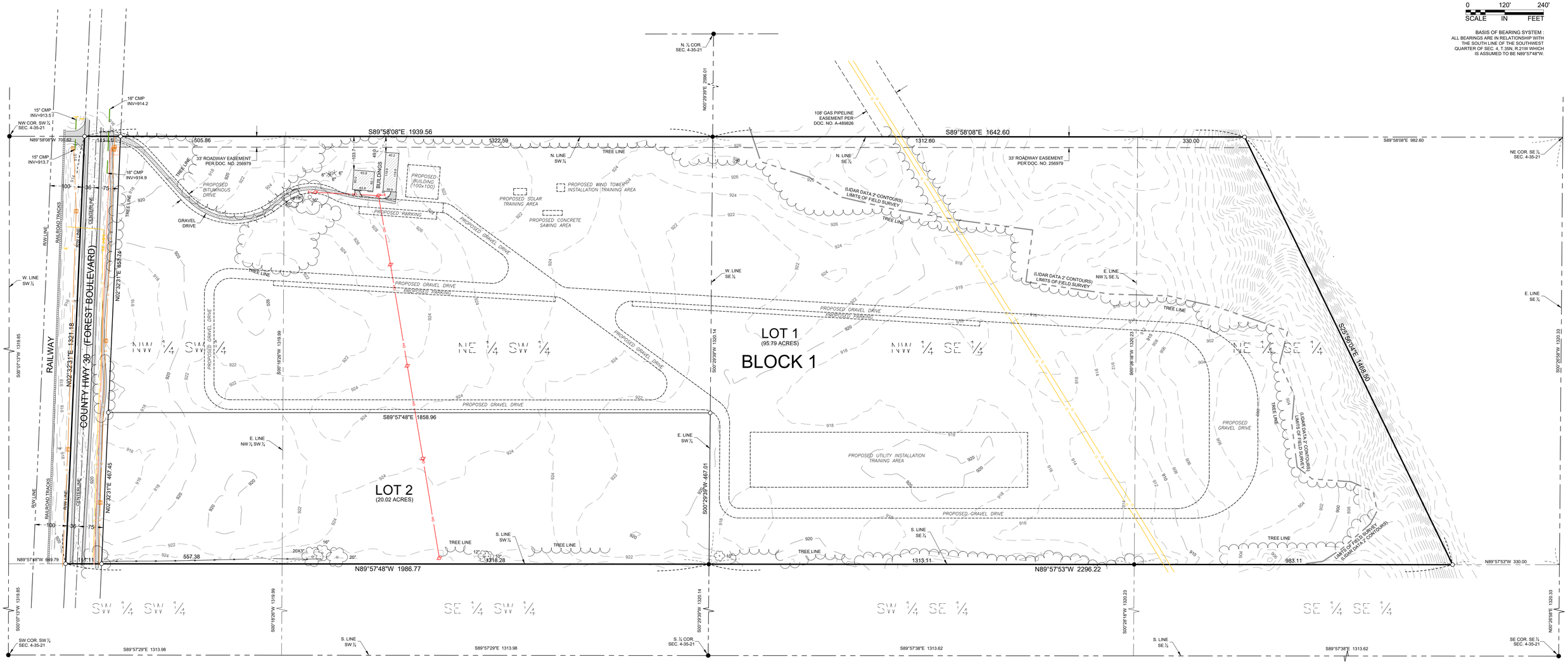
Beginning at a point on the South line of the NE¼ of the SE¼ of Section 4, T35N, R21W, which lies 330 feet West of the Southeast corner of said parcel, thence running Northwesterly in a straight line to a point on the North line of the said parcel which lies 330 feet East of the Northwest corner thereof. Together with and subject to a non-exclusive roadway easement over and across the North 33 feet of the N½ of the SW¼ lying East of County Road No. 30 and the North 33 feet of the N½ of the SE¼ lying West of the above described line, all located in Section 4, T35N, R21W all in Chisago County, Minnesota.

The Northwest Quarter of Southeast Quarter (NW¼ of SE¼), and the Northeast Quarter of the Southwest Quarter (NE¼ of SW¼), and the Northwest Quarter of the Southwest Quarter (NW¼ of SW¼) excepting the Railroad Right-of Way and excepting that part of the North Half of the Southwest Quarter (N½ of SW¼) lying West of the Westerly Right-of-Way of the Burlington Northern Right-of-Way, all in Section Four (4), Township Thirty-Five North (T35N) and Range Twenty-One West (R21W), Chisago County, Minnesota.

(Per Ancona Title and Escrow Commitment for Title Insurance, Commitment No. 2024-229005 with an effective date of April 15, 2024)

Proposed Legal Description:
Lot 1, Block 1, Laborers Training Center Addition
Lot 2, Block 1, Laborers Training Center Addition

LABORERS TRAINING CENTER ADDITION



LEGEND

- UTILITY POLE
- GUY WIRE
- SIGN
- FIBER OPTIC VAULT
- COMMUNICATION PEDESTAL
- GAS VALVE (ABOVE GROUND)
- UNDERGROUND GAS MARKER / SIGN
- STORM LINE
- UNDERGROUND COMMUNICATION
- UNDERGROUND FIBER OPTIC
- UNDERGROUND GAS
- OVERHEAD POWER
- FENCE
- BITUMINOUS
- CONCRETE
- GRAVEL
- DECIDUOUS / CONIFEROUS TREE
- FOUND IRON SURVEY MONUMENT
- SET IRON SURVEY MONUMENT

PROPERTY DESCRIPTION

(Per Ancona Title and Escrow Commitment for Title Insurance, Commitment No. 2024-229005 with an effective date of April 15, 2024)

All that part of the NE¼ of SE¼ of Section 4, T35N, R21W, lying west of the following described line:

Beginning at a point on the South line of the NE¼ of the SE¼ of Section 4, T35N, R21W, which lies 330 feet West of the Southeast corner of said parcel, thence running Northwesterly in a straight line to a point on the North line of the said parcel which lies 330 feet East of the Northwest corner thereof.
Together with and subject to a non-exclusive roadway easement over and across the North 33 feet of the N½ of the SW¼ lying East of County Road No. 30 and the North 33 feet of the N½ of the SE¼ lying West of the above described line, all located in Section 4, T35N, R21W all in Chisago County, Minnesota.

The Northwest Quarter of Southeast Quarter (NW¼ of SE¼), and the Northeast Quarter of the Southwest Quarter (NE¼ of SW¼), and the Northwest Quarter of the Southwest Quarter (NW¼ of SW¼) excepting the Railroad Right-of Way and excepting that part of the North Half of the Southwest Quarter (N½ of SW¼) lying West of the Westerly Right-of-Way of the Burlington Northern Right-of-Way, all in Section Four (4), Township Thirty-Five North (T35N) and Range Twenty-One West (R21W), Chisago County, Minnesota.

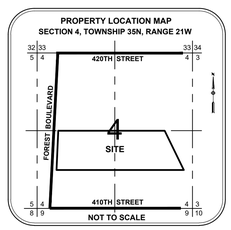
GENERAL NOTES

(GN1) Location, sizes and types of underground utilities shown are a combination of observed evidence and plan information, together with field markings by those utility locators that responded to Gopher State One Call Ticket No. 241344554. However, lacking excavation, the exact location of underground features cannot be accurately, completely, and reliably depicted. WSB LLC makes no guarantee that the utilities shown comprise all of the utilities in the area. Where additional or more detailed information is required, the client is advised that excavation and/or a private utility locate request may be necessary.

(GN2) Easements shown are as identified in Ancona Title and Escrow Commitment for Title Insurance, Commitment No. 2024-229005 with an effective date of April 15, 2024. No other search of the public records for easements or encumbrances was made by the undersigned.

SITE DATA SUMMARY

TOTAL ACREAGE = 119.18
PROPOSED RIGHT OF WAY AREA = 3.37 ACRES
LOT 1 = 95.79 ACRES LOT 2 = 20.02 ACRES
PROPOSED LOTS = 2
PROPOSED OUTLOTS = 0



OWNER

Loren D. and Jane L. Magnison

DEVELOPER

LIUNA Training

SURVEYOR'S CERTIFICATION

I hereby certify that this survey, plan, or report was prepared by me or under my direct supervision and that I am a duly Licensed Land Surveyor under the laws of the State of Minnesota.

Dated this _____ day of _____, 2024.

_____
Jeffrey J. Rolfson, PS, Minnesota License No. 49003

Client: LIUNA TRAINING

Job No. 025845

Surveyed By: TH, JD
Drawn By: JJR
Checked By: JJR
Scale: 1" = 120' CAD No. 025845 V-PP
Date: 07/10/2024

wsb
3701 40th Avenue NW
Rochester, MN 55901
507-218-3745
www.wsbeng.com

PRELIMINARY PLAT
PART OF N ½ SE ¼
PART OF N ½ SW ¼
SEC. 04, T.35N, R.21W
CHISAGO COUNTY, MINNESOTA

LABORERS TRAINING CENTER ADDITION

KNOW ALL PERSONS BY THESE PRESENTS: That XXX, a XXX, owner of the following described property:

All that part of the NE¼ of SE¼ of Section 4, T35N, R21W, lying west of the following described line:

Beginning at a point on the South line of the NE¼ of the SE¼ of Section 4, T35N, R21W, which lies 330 feet West of the Southeast corner of said parcel, thence running Northwesterly in a straight line to a point on the North line of the said parcel which lies 330 feet East of the Northwest corner thereof.

ALSO

The Northwest Quarter of Southeast Quarter (NW¼ of SE¼), and the Northeast Quarter of the Southwest Quarter (NE¼ of SW¼), and the Northwest Quarter of the Southwest Quarter (NW¼ of SW¼) excepting the Railroad Right-of Way and excepting that part of the North Half of the Southwest Quarter (N½ of SW¼) lying West of the Westerly Right-of-Way of the Burlington Northern Right-of-Way, all in Section Four (4), Township Thirty-Five North (T35N) and Range Twenty-One West (R21W), Chisago County, Minnesota.

Containing in all, 119.18 acres, more or less.

Has caused the same to be surveyed and platted as LABORERS TRAINING CENTER ADDITION and does hereby dedicate to the public for public use, the public ways as created by this plat.

In witness whereof, said XXX, a XXX, has caused these presents to be signed by its proper officer this _____day of _____, 20__.

SIGNED: XXX

_____
XXX, XXX

STATE OF _____
COUNTY OF _____

This instrument was acknowledged before me on _____ by XXX, XXX of XXX, a XXX.

_____ _____
Notary Public, _____ County, Minnesota Notary Printed Name

My commission expires _____

SURVEYOR'S CERTIFICATE

I, Jeffrey J. Rolfson, do hereby certify that this plat was prepared by me or under my direct supervision; that I am a duly Licensed Land Surveyor in the State of Minnesota; that this plat is a correct representation of the boundary survey; that all mathematical data and labels are correctly designated on this plat; that all monuments depicted on this plat have been, or will be correctly set within one year; that all water boundaries and wet lands, as defined in Minnesota Statutes, Section 505.01, Subd. 3, as of the date of this certificate are shown and labeled on this plat; and all public ways are shown and labeled on this plat.

Dated this _____ day of _____, 20__.

_____
Jeffrey J. Rolfson, Professional Surveyor
Minnesota License No. 49003

STATE OF MINNESOTA
COUNTY OF _____

This instrument was acknowledged before me on _____ by Jeffrey J. Rolfson.

_____ _____
Notary Public, _____ County, Minnesota Notary Printed Name

My commission expires _____

CHISAGO COUNTY SURVEYOR

Pursuant to Chisago County Subdivision Ordinance Number 99-2, I hereby certify that this plat has been checked and approved as to compliance with Chapter 505, Minnesota Statutes this _____ day of _____, 20__.

_____
Chisago County Surveyor

CITY APPROVAL

STATE OF MINNESOTA
COUNTY OF CHISAGO
CITY OF NORTH BRANCH

This plat was approved by the City Council of the City of North Branch, Minnesota, this _____ day of _____, 20__, and is compliant with the provisions of all Section 505.03, Subdivision 2, Minnesota Statutes.

_____ _____
Mayor City Clerk

PROPERTY RECORDS AND LICENSING

I hereby certify that the taxes for the year 20__ on the property described herein are paid this _____ day of _____, 20__.

_____
Chisago County Treasurer

DOCUMENT NUMBER _____

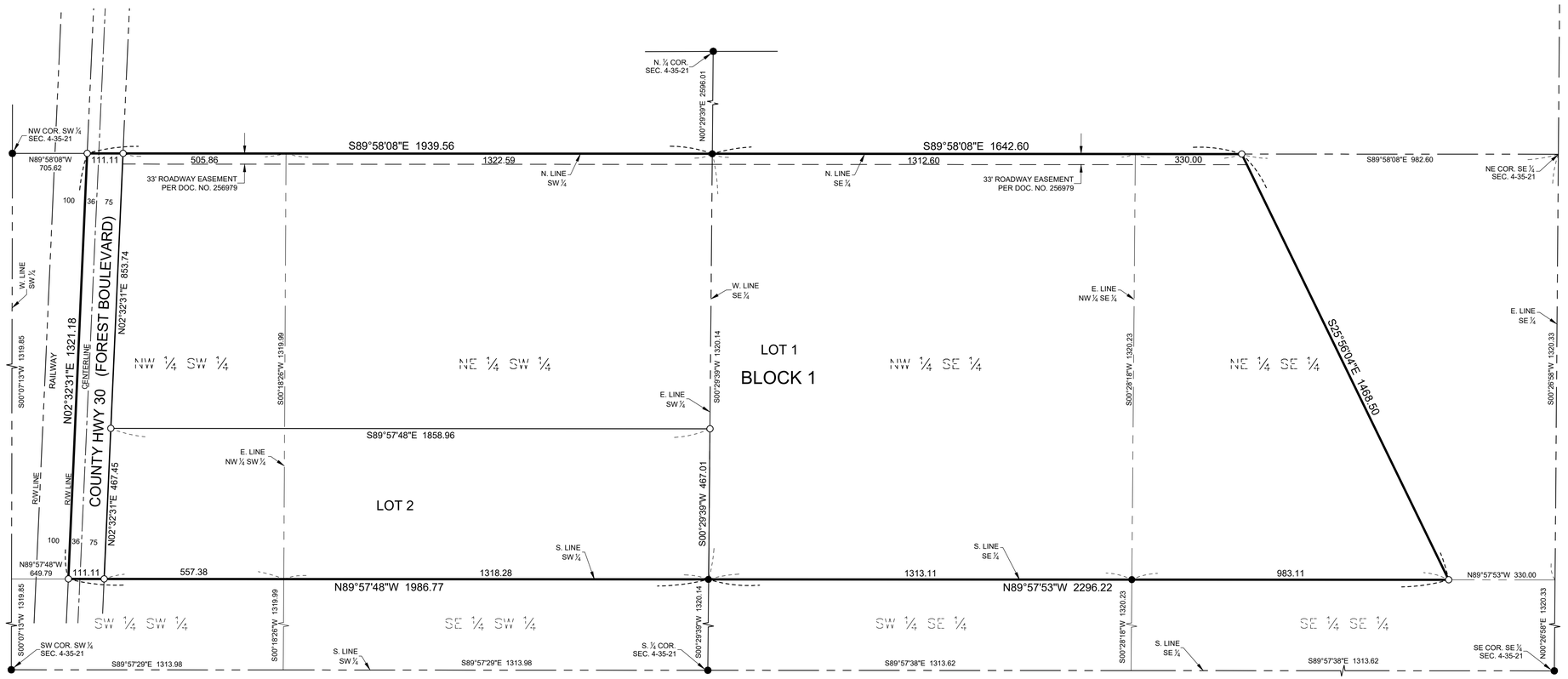
I hereby certify that this instrument was filed in the Office of the County Recorder for the record on this _____ day of _____, 20__, at _____ o'clock ___M., and was duly recorded in the Chisago County records.

_____
Chisago County Recorder

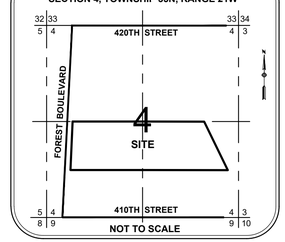
N

0 200 400
SCALE IN FEET

BASIS OF BEARING SYSTEM :
ALL BEARINGS ARE IN RELATIONSHIP WITH THE SOUTH LINE OF THE SOUTHWEST QUARTER OF SEC. 4, T.35N, R.21W WHICH IS ASSUMED TO BE N89°57'48"W.



PROPERTY LOCATION MAP
SECTION 4, TOWNSHIP 35N, RANGE 21W



NOTE:

ALL MONUMENTS SHOWN THUS: ○
ARE SET 3/8 INCH BY 14 INCH CAPPED IRON REBAR WITH LICENSE NO. 49003 WHICH WILL BE SET WITHIN 1 YEAR AFTER RECORDING OF THIS PLAT.

ALL MONUMENTS SHOWN THUS: ●
ARE FOUND 5/8 INCH IRON PIPES UNLESS OTHERWISE NOTED.

3701 40th Avenue NW
Rochester, MN 55901
wsb
507-218-3745
www.wsbeng.com

025845

City of North Branch
Staff Report

Prepared By: Shawn Williams, Public Works Director

Presenter: Shawn Williams, Public Works Director

Date: 09/20/2024

Board & Commission: City Council

Subject: Resolution R-92-2024 Approving 2024 Road Gravel Quotes

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The City of North Branch has 30 miles of gravel roads to maintain. Part of the maintenance is re-graveling these roads. Our goal is to pave the higher traffic gravel roads when funding becomes available. Over the last 10 years, we have paved 6 miles of our highest traffic gravel roads, and it has worked well. Until they are paved re-graveling the existing gravel is the required maintenance practice.

The 2024 Road Gravel Request for quote was published in legal newspapers on August 29, 2024, and September 5, 2024. Submission deadline was no later than 10am on Tuesday, September 17, 2024. Two quotes were received before the deadline. The quotes were opened in front of the City Clerk/IT Director Ragini Varma by Public Works Director Shawn Williams and here are the results.

The low quote is from Ryberg and Son Inc. out of Pine City Mn and I recommend council accepting their quote. We have used them many times in the past and their gravel exceeds our specifications. This is funded annually by the public works street maintenance fund-road graveling. The budgeted amount is $140K. This will allow us to complete approximately 5 miles of roads, keeping us on track for a 6 year re-graveling plan.

- Rydberg & Sons Inc. $13.47/ton.
- Beach Transport LLC $19.89/ton.

Voting Requirements:

Voting Options **Simple Majority**

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

CITY COUNCIL RESOLUTION NO. R-92-2024

Resolution R-92-2024 Approving 2024 Road Gravel Quotes

WHEREAS, the City of North Branch has gravel roads to maintain by means of re-graveling and the City has advertised for quotes in our legal paper the Isanti-Chisago Star and,

WHEREAS, the City received two quotes that were received on September 17th, 2024 and opened and read aloud in the council chambers by the City Clerk and Public Works Director. The quotes were from Beach Transport LLC for $19.89/ ton and the second quote from Rydberg and Son Inc. for $13.47/ ton.

WHEREAS, the low quote for road gravel is from Rydberg and Son in the amount of $13.47/ton.

NOW, THEREFORE, BE IT RESOLVED THAT: the City of North Branch City Council approve the low quote from Rydberg and Son for road gravel 2024 for 6,000 tons more or less of modified class 5 aggregate.

QUOTE

RYDBERG & SONS, INC.

P.O. BOX 63
PINE CITY, MN 55063
(320)629-2503

QUOTE SUBMITTED TO	PHONE	DATE
City of North Branch		9/17/2024
STREET	**JOB NAME**	
P.O. Box 910		
CITY, STATE AND ZIP CODE	**JOB LOCATION**	
North Branch, MN 55056		
ARCHITECT	**DATE OF PLANS**	**JOB PHONE**

We hereby submit specifications and estimates for:

6,000 tons (more or less) of modified Class 5 as specified in Minnesota Standards #3138 standard specifications for construction, except that the number 200 sieve shall be modified to 9-12%. Material is to be spread by belly dumps, minimum of 5 trucks per day of hauling, scale tickets are to be provided. The City may do random truck weight compliance scaling.

$13.47/ton

Not including sales tax if applicable

We Quote hereby to furnish material and labor-complete in accordance with above specifications, for the sum of:

_____ dollars ($_____).

Payment to be made as follows:

All material is guaranteed to be as specified All work to be completed in a workmanlike manner according to standard practices Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate All agreements contingent upon strikes, accidents or delays beyond our control Owners to carry fire, tornado, and other necessary insurance Our workers are fully covered by Workmen's Compensation Insurance

Authorized Signature _____

Note: This quote may be withdrawn by us if not accepted within 30 days.

Acceptance of Quote-The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Signature_____

Signature_____

Date of Acceptance: _____

BEACH TRANSPORT

4792 400th Street
North Branch, MN 55056

Estimate

Date	Estimate #
09/16/2024	230

Name / Address

North Branch, City of

ROAD GRAVEL QUOTE

DBE, TGB, MCUB CERTIFIED

Project
2024 Gravely Overlyays

Description	Item	Rate
Supply and deliver Gravlel for City Roads Gravel Source Knife River Kohler Pit Firm fixed price no fuel surchages to be added	Ton	$19 89

City of North Branch
Staff Report

Prepared By:

Presenter:

Date: 09/20/2024

Board & Commission: City Council

Subject: Water and Sanitary Utility Service Application Update and City Code Change

---

With the dissolution of the North Branch Water and Light, the city has been in the process of updating policies and procedures. This includes forms and vendor accounts, and implementing a new utility billing system and payment option that will now be in the City of North Branch's name as we are now doing the utility billing.

Part of this process is to update the customer application for service. I have attached the application for the council to see. Also attached is an update we will need to make to the city code regarding delinquent accounts. Going forward, we will be certifying these unpaid utility bills, including any other delinquent bills the city has quarterly to property taxes, rather than annually as in the past. Changes to the application for utility service include that we will no longer require a $50 deposit. This deposit needed to be tracked and paid back with interest when the account was closed in good standing. This was very time-consuming as it had to be tracked and accounted for when it came in and when refunded. Going forward, I am recommending we charge a non-refundable fee of $25.00 for the account set up to be collected with the first bill. There is also a change to the Minnesota cold weather rule that now says we cannot disconnect if water is the primary source of heat. This language is now included in the application, including changes to the title VI of the Civil Rights Act of 1964.

These change will improve the cash flow for the city related to these accounts, it will reduce delinquency rates, the amount certified will be smaller and easier to pay, and it allows for fewer errors such as when the property changes ownership. These changes will help us maintain financial stability, improve our service delivery and build better relationships with property owners and our customers.

Voting Requirements:

Voting Options **Simple Majority**

CITY OF NORTH BRANCH

6408 Elm Street, PO Box 910
North Branch, MN 55056
Phone: 651-674-8113

www.ci.north-branch.mn.us | utilities@ci.north-branch.mn.us

APPLICATION FOR WATER & SEWER SERVICE

Service Address: _____, North Branch, MN 55056

Customer Type: *(select one)* ☐ Residential ☐ Commercial Owner ☐ Commercial Renter

Owner Name(s): _____

Business Name: *(if applicable)* _____

Address: _____
Street Address PO Box *(if applicable)* City State/Zip

Billing Address: _____
(if different from above) Street Address PO Box *(if applicable)* City State/Zip

Phone: _____ **Email:** _____

COMMERCIAL RENTER ONLY

As the commercial owner(s), do you allow the City to work with renter(s) directly? ☐ Yes ☐ No

Renter Name(s): _____

Business Name: *(if applicable)* _____

Address: _____
Street Address PO Box *(if applicable)* City State/Zip

Billing Address: _____
(if different from above) Street Address PO Box *(if applicable)* City State/Zip

Phone: _____ **Email:** _____

Is the primary heat source water? ☐ Yes ☐ No

PLEASE READ THE CONDITIONS OF APPLICATION FOR SERVICE AS PRINTED WITH THIS APPLICATION.

Owner's Signature(s): _____ **Date:** _____

_____ **Date:** _____

Commercial Renter's Signature(s): _____ **Date:** _____

_____ **Date:** _____

Updated 9/5/2024

MANAGE YOUR ACCOUNT ONLINE

To learn more about managing your account please visit our website at www.ci.north-branch.mn.us.

Create your online account at https://northbranch.enerlyte.com

- **PAY ONLINE** Once you receive your first bill in the mail.
- **AUTO PAY** is available for your convenience. Set-up automatic payments
- **PAPERLESS BILLING** will get you your bill faster than the postal service. This option also supports the City's Green Initiatives by reducing paper.

CONDITIONS OF APPLICATION FOR WATER/SEWER SERVICE

1. The signed Application for Water/Sewer Service shall constitute a contract between the parties upon acceptance by the City of North Branch (the City). It shall remain in force until terminated at the request of the property owner or the City.
2. Water/Sewer service purchased from the City will be purchased at rates set by the City. The property owner shall pay a monthly bill based on the number of gallons processed. The property owner shall be liable to pay for the service to the premises, and the service is furnished to the premises by the City only upon the condition that the owner of the premises is liable, therefore, to the City.
3. A non-refundable new service fee of $25.00 will be included on the first billing.
4. All payments are due by the 22nd of each month.
5. Late payment assessment of $10.00 or 10%, whichever is HIGHER.
6. Disconnect notices for delinquent accounts (according to the City Code Sec 58-27) shall be sent out by
7. If no payment or satisfactory arrangement is made before the shut off date, the water service will be shut off without further notice.
8. When water service to any premises has been disconnected, service shall not be restored except upon the payment of the total amount due to the City, including the current bill and a service fee of $50.00 for reconnection during city business hours or $150.00 for reconnection after hours. Reconnections will not be made after 9 p.m. or on Holidays.
9. Where satisfactory arrangements have not been made, delinquent account balances will be assessed to property taxes quarterly.
10. In accordance with the Minnesota Cold Weather Rule, the City will not disconnect water service to a residential unit during cold weather months (Oct. 15 through April 15), if that shut-off would in any way affect the primary heat source of the unit. The Cold Weather Rule only applies to a customer whose account is current for the billing period immediately prior to Oct. 15 or who, at any time, enters into a payment schedule that considers the financial resources of the household and is reasonably current with payments under the schedule.
11. The cost of all repairs, replacements, and maintenance of any plumbing from the building water service (not including the meter & meter valves) up to but not including the curb stop), and from the building sewer up to the City's main sewer line (including the connection to the main sewer line), including thawing frozen pipes, shall be borne entirely by the owner of the property affected.
12. Costs of repair and replacement of meters size 1" and smaller, as well as meter valves and curb stops, are the responsibility of the City unless damaged by the occupant of the premises, in which case the occupant/owner shall be responsible for all costs. The property owner is responsible for all costs associated with meters over 1" in size.

Please provide the following information so that the City of North Branch will be in compliance with Title VI of the Civil Rights Act of 1964. The information regarding race, color or national origin designated is requested in order to assure the Federal Government that the City of North Branch complies with Federal Laws prohibiting discrimination on the basis of race, color or national origin. Your are not required to furnish this information, but are encouraged to do so. The information will be used in evaluating your request for services or to discriminate against you in any way. However, if you choose not to furnish this information, we are required to note your race and national origin on the basis of visual observation or surname.

Please check the appropriate information below:

RACIAL CATEGORIES *(select one)*

- ❑ American Indian or Alaskan Native
- ❑ Asian
- ❑ Black or African American
- ❑ Native Hawaiian or Pacific Islander
- ❑ White

ETHNIC CATEGORIES *(select one)*

- ❑ Hispanic or Latino
- ❑ Not Hispanic or Latino

The City of North Branch is an equal opportunity provider.

CITY OF NORTH BRANCH
PO BOX 910
NORTH BRANCH MN 55056

SERVICE ADDRESS ->
[redacted]

[redacted]
[redacted]
NORTH BRANCH MN 55056

PROPERTY TAX CERTIFICATION

ACCOUNT NO.	ID #	TOTAL AMOUNT	DATE
1 74	[redacted]	$172.18	09/30/24

This letter is your notice that the City of North Branch is preparing to certify your unpaid utility charges to your 2024 property taxes. If these unpaid charges are not paid by **November 22, 2024**, pursuant to the authority granted by Minn. Stat. §444.075 and North Branch City Code, Chapter 58, Utilities, Tax Certification, you are hereby notified that the account above is delinquent and subject to property tax certification.

You have the right to request a hearing in front of the City Council if you believe the amount stated is not actually due and unpaid. Please prepare a written appeal and ensure it is received before November 1, 2024 by 4:30 PM. You may email utilities@ci.north-branch.mn.us or mail PO Box 910, 6408 Elm St, North Branch MN 55056. If the written appeal request is not received within such time period, you shall have no further hearing or appeal rights. All appeals will be heard at the regular November 12, 2024 City Council meeting.

If you request an appeal hearing, you must appear at the hearing. You may be represented at the appeal hearing in person and by counsel or any other person of your choosing. You may present orally or in writing your position to the City Council. The City Council shall review such facts and documents and conduct such appeal hearing and in such manner as it shall determine to be appropriate to make a decision regarding the appeal. The decision of the North Branch City Council is final. This is the only notice you will receive.

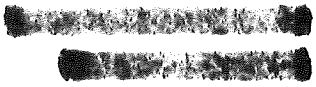
If the unpaid charges are not paid within the timeframe specified above, the unpaid amounts shall be certified to the tax roll for collection including your total account balance at that time, plus $15 per service type will be forwarded to the North Branch City Council. The City Council, by resolution, will consider the certification of your unpaid delinquent utility amounts plus penalties, to be certified to the Chisago County Auditor.

To make a payment now, visit the online payment portal at **https://northbranch.enerlyte.com** or you may return this letter with a check payable to the City of North Branch, or you may call the office at 651.674.7100. If you have recently sent your payment, you can disregard this notice. Payment arrangements are no longer an acceptable
payment option for tax certifications.

THIS IS THE ONLY NOTICE YOU WILL RECEIVE BEFORE THE CITY COUNCIL WILL CERTIFY YOUR UNPAID BALANCES TO BE COLLECTED WITH YOUR PROPERTY TAXES

Sincerely,

City of North Branch



Sec 58-27 Discontinuation Of Service - Notice And Hearing Procedures

(a) Delinquent accounts~~-~~. ~~The City shall mail written notice to all accounts 30 days delinquent stating that water service will be shut off unless the account is brought current or a hearing is requested within 10 days.~~ **A shut-off notice will be sent first-class mail to the account holder by the City to all accounts 30 days delinquent, stating that water service will be shut off unless the account is brought current or a hearing is requested within 45 days of past due.** If the account is not brought current and no hearing is requested, the City shall inspect the property to determine if it is vacant and shall post notice on the property that water service will be shut off in 15 days unless the account is brought current ~~or a hearing is requested within 10 days~~. The City shall shut off water service to the address no earlier than 15 days from the date of the posted notice (unless an emergency shut off is warranted). If a hearing is requested, it shall be held pursuant

to Section 58-25(b).

(b) Hearing procedure~~-~~. If a hearing is requested, the City shall hold a hearing before the City Council. Written notice of the hearing date shall be given to the account holder at least 10 days before the hearing date. The City Council shall make findings of facts regarding whether the account is delinquent or if shut off is warranted for other reasons. If a finding is made that shut off is warranted, the City Council shall set a date for water shut~~-~~off, and the City shall shut the water off no earlier than that date.

HISTORY

Repealed & Replaced by Ord. 370-24 on 5/14/2024

The City needs to have a policy in place for the timely payment of water bills. The City has a fiduciary responsibility to all utility customers to collect funds due to the City. Therefore, the City will follow its shut-off policy to prevent large past-due bills and lost revenue for the water and sewer funds.

Water Shut-Off Policy

Utility billing will be done as outlined in the City Code, Chapter 58 Utilities. In addition, all bills will include this statement: "Unpaid utility charges constitute a lien against the property," to serve as an additional notice of the possible consequences of failure to pay utility charges.

A customer with a delinquent account will be sent a shut-off notice when their past-due balance reaches over 30 days past due. This past-due balance includes late fees posted to the account. The shut-off notice will clearly explain how a customer can dispute a bill, shut-off, or certification, whom to contact at specific phone numbers and times, and how to object to the pending shut-off or certification. The shut-off notice will be sent by first-class mail.

The City will follow the shut-off procedures outlined by the City Code. Households with military personnel are protected from utility shut-offs by state statutes. Therefore, the City will not disconnect utility service to a home if a household member has active-duty orders or receives other types of military orders. The City will ask the customer to agree to a payment plan.

The utility billing process should follow these steps:

- The City sends out utility bills monthly.
- If no payment is received by the due date of the following month, late charges are applied
- When delinquency reaches 30 days past due, shut off notice is sent first class mail to the account holder
- A hearing is requested within 45 days of past due. If a hearing is requested, it shall be held pursuant to Section 58-25(b). If the account is not brought current and no hearing is requested, the City shall inspect the property to determine if it is vacant and shall post a notice on the property that water service will be shut off in 15 days unless the entire balance of the account is brought current.
- A service fee of $25.00 will be charged when the notice is posted at the property.
- The City shall shut off water service to the address no earlier than 15 days from the date of the posted notice (unless an emergency shut-off is warranted).
- Shut-off occurs if no payment or arrangements are made by the shut-off date.
- Service shall not be restored except upon the payment of the total amount due to the City, including the current bill and a service fee of $50.00 for reconnection during city business hours or $150.00 for reconnection after hours. Reconnections will not be made after 9 p.m. or on Holidays. The City will not accept personal checks or debit cards for accounts in shut-off status.

- If shut off does not result in payment, the water remains shut off, and the City Council will initiate a special assessment against the property for the entire balance, or through revenue recapture.
- Sewer-only accounts are unable to be shut off; the City will send a delinquent notice. If not paid, the City will initiate a special assessment against the property for the entire balance, or through revenue recapture.

City staff will follow the special assessment procedures for non-payment of utility charges according to Minnesota Statutes §444.075, subd. 3e, as may be amended from time to time.

City of North Branch
Staff Report

Prepared By: Colette Baumgardner, WSB Graduate Community Planner

Presenter: Colette Baumgardner, WSB Graduate Community Planner

Date: 09/20/2024

Board & Commission: City Council

Subject: Vocational Training Facility - Resolution 91-2024 Approving the Conditional Use Permit for a Vocational Training Facility at 41499 Forest Blvd

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Overview / Background

The Construction Laborers' Education, Apprenticeship and Training Fund of Minnesota and North Dakota (Applicant) has applied for a preliminary plat, final plat, and conditional use permit for a vocational training facility at 41499 Forest Blvd (PID: 11.00058.00). The Applicant would like to use the property as a training facility offering construction, environmental, and safety skills courses. The courses would be offered approximately 10-12 weeks out of the year, and students will be able to practice skills such as pipe laying and excavation, structural concrete building, wind tower production, clean energy, solar installation, commercial driver's license, etc.

Upon recommendation of the Planning Commission, the City Council approved a Comprehensive Plan Amendment and rezoning of the property to industrial through Resolution 75-2024 and Ordinance 378-24, respectively. The City Council also approved a vocational training facility as a conditional use in the industrial zoning districts via Ordinance 379-24.

Requests and Issues to Consider

1. Conditional Use Permit
   a. Development Review
   b. General CUP Standards

Analysis of Requests

1. Conditional Use Permit

a. Development Review

General Plan

The applicant is proposing a vocational training facility with a new 10,000 sq ft building, two existing storage buildings, and exterior training activities.The following exterior training facility spaces are proposed on the site plan: hardscape installation; concrete installation, maintenance, and sawing; solar installation, maintenance, and decommissioning; windtower installation, maintenance, and decommissioning; commercial drivers license course; and utility installation and maintenance such as pipelaying and excavation for fiber, water, storm, and sanitary pipe. The conditional use permit allows for the training facility spaces as proposed, and additional training areas added to the property would require for the applicant to come forward with a conditional use permit amendment application.

There are two existing buildings on site - building 1 is approximately 4,845 sq ft and building 2 is approximately 3,828 sq ft. The buildings are legal, nonconforming uses from the property being used agriculturally. While a change of use is occurring on the property, the use of the buildings will be substantially similar to that of an agricultural building. Staff is proposing that these buildings be permitted to stay on the property through the conditional use permit, but the buildings must be evaluated for their change of use. A change of use permit with engineer review proposed as a condition of approval.

Traffic

Given the traffic and speeds on CSAH 30, Chisago County has requested that the Applicant construct a right turn lane into the site. In the imminent use of the site, the Applicant anticipates that they will hold classes 10-12 weeks out of the year with an average class size of approximately 10 students. However, the use could increase over time. The Applicant is currently in discussions with Chisago County regarding the turnlane requirement.

Parking

The facility is planning a parking area of 24 stalls. The use table within the City Code does not specify the parking requirements for this kind of facility, so the parking can be approved through planning agency review through City Code Section 66-866. The Conditional Use permit allows for a maximum of two courses to be conducted concurrently at the facility, and the average class size is expected to be about 10 students. Staff anticipates that the parking provided would be sufficient for the planned activities on site.

Staff has listed in the conditions of approval that the parking lot would be permitted to be expanded by 75% without an amendment to the conditional use permit at the time of the building permit for the principal building. At the time of constructing the building, the applicant will need to provide a more detailed plan for the parking lot, and staff

anticipates that they may be interested in providing additional parking adjacent to the future building.

Landscape & Tree Preservation Plan

The tree preservation plan shows approximately 22.85 acres of the site is covered in trees. The applicant is proposing to remove 0.10 acres of trees for the construction of the driveway. The majority of the trees on site are on the eastern portion with some trees on the southern edge that serve as screening between the residential properties and the facility.

The proposed site plan does not meet the City Code requirements in Section 66-973 for screening between industrial and residential properties. As a condition of approval, the applicant will be required to add screening along the southern property line. Where existing vegetation is present, it will be considered as providing the necessary softening for the screening. The screening will be required to extend from the western line separating lot 1 and lot 2 to within 300 feet of the eastern lot line at approximately the 898 contour line. Staff does not recommend requiring the screening to extend to the easternmost lot line due to the density of the natural vegetation on the southeastern corner of the property.

Signage

No signage is shown on the site plan provided. Staff proposes that signage be allowed on site without a conditional use permit amendment. As long as a future sign meets City Code Sec 66-824 for Permitted Signs, the sign can be permitted administratively.

Tower Height

The applicant is proposing to install a wind tower on site with a maximum of 160 feet. City Code Section 66-935 requires that all towers, or other like structures, exceeding 75 require a conditional use permit. This code primarily applies to cell towers and antennas, but the code does not specifically state that towers are limited to these uses. Staff proposes that the additional height be included within the additional conditional use permit proposed for the vocational training facility.

There are existing towers similar to this height located in the area. A cell tower at Fletcher Ave and 410th Street was permitted for 120 feet. The City of North Branch water tower off Forest Blvd and Cougar Trail is 139 feet. While the windtower may be slightly taller than these structures, the additional height is not anticipated to cause issues. Staff has recommended in the conditions that the windtower shall be at setback from all property lines and buildings for distance equal to or greater than that of its height to protect against any potential damage from wind tower failure.

b. General CUP Standards

A vocational training facility is considered a Conditional Use in the I2-Heavy Industrial zoning district, so a CUP is required for the proposed facility to be allowed. In order for a CUP to be approved, the proposed use shall meet the standards for conditional uses

detailed in City Code Section §66-64. These standards relate to the overall impacts to the City's character, utility service, traffic, and surrounding properties in the area. The applicant provided a line by line analysis of their use against these standards in the narrative attached. Staff agrees with the findings provided by the applicant. Staff has provided more detailed findings of fact in the staff recommendation below.

Impact to Adjacent Properties

During the comprehensive plan and zoning amendment, multiple members of the public expressed concern about the facility. The City Code screening requirements will provide some reduction of the impact on the adjoining properties. Additionally, the applicant has agreed to the following requirements to be included on their conditional use permit:

1. The hours of operation shall occur within 7 am - 5 pm on Monday - Friday.
2. A calendar of scheduled courses shall be mailed annually to the adjoining properties to the north, south, and east.

PTOS Commission Recommendation

The PTOS Commission recommended the acceptance of cash for park dedication based on the additional demands of the city's parks, trails, and open space system.

Planning Commission Summary

The Planning Commission reviewed the application and unanimously recommended approval. Prior to opening the public hearing, the Commission asked clarifying questions of staff regarding traffic, operations, screening, and the operating conditions on the conditional use permit. The Commission held a public hearing where the applicant spoke and one adjoining property owner. The applicant discussed the planned operations and site work. The applicant expressed that they would be willing to comply with the conditions on the CUP and the facility would like to be a good neighbor to the adjoining properties. The adjoining property owner shared that while she would not like the development to occur, she felt the conditions on the CUP addressed most of her concerns. The Planning Commission closed the public hearing and after some additional discussion unanimously recommended approval of the preliminary plat and CUP.

Planning Commission Recommendation

The Planning Commission and Staff recommend the following motions:

1. Motion to approve Resolution 91-2024 approving the conditional use permit for a vocational training facility with conditions and findings of fact as presented by Staff.

Conditional Use Permit

Findings of Fact

1. The proposed CUP amendment is consistent with the City's 2040 Comprehensive Plan and the proposed use is compatible with present and future land uses of the area.
2. Subject to conditions, the proposed use conforms with all performance standards contained in the City's Zoning Ordinance.
3. The proposed vocational training facility is a permitted conditional use within the I2-Heavy Industrial zoning district.
4. The proposed use will be served by private utilities and will not overextend the City's infrastructure.
5. Traffic generation by the proposed use is within capabilities of streets serving the property.
6. The use will not impose additional unreasonable costs on the public.

Conditions of Approval

1. The Applicant shall address any comments received from Chisago County.
2. The Applicant shall address comments provided by the City Engineer on August 26, 2024.
3. The Applicant shall apply for a change of use permit for the existing buildings and have the buildings be evaluated by a MN licensed engineer for suitability of the change of use.
4. The Applicant shall provide an updated site plan showing screening that meets City Code Section 66-973 align the southern property line from the western property line adjoining Lot 2 to within 400 feet of the eastern property line, excluding the area within the gas transmission line easement. Where existing vegetation is present, it will be considered as providing the necessary softening for the screening.
5. The Applicant shall submit a site plan for review at the time of applying for a building permit. The site plan must be substantially similar to the one approved with the Conditional Use Permit. The parking lot is permitted to be expanded by 75% at time of constructing the principal building without an amendment to the Conditional Use Permit.
6. All necessary permits as may be applicable must be provided to the City before activity begins and/or before building permits are issued.
7. The Applicant shall record the Conditional Use Permit with the Chisago County Recorder.
8. The Applicant shall be responsible for all costs associated with the Conditional Use Permit application.
9. All fees and financial obligations shall be received by the City prior to the releasing of the approval documents for recording.
10. Other conditions identified during the review process by Staff, the Planning Commission, or the City Council.
11. Approval of this request is subject to the concurrent approval of the related land use and zoning requests pertaining to the development.

Standards of the Conditional Use Permit

1. No more than two instructional courses shall occur concurrently on site.
2. The following exterior training facility spaces are permitted in the locations specified on the site plan: hardscape installation; concrete installation, maintenance, and sawing; solar installation, maintenance, and decommissioning; windtower installation, maintenance, and decommissioning; commercial drivers license course; and utility installation and maintenance such as pipelaying and excavation for fiber, water, storm, and sanitary pipe. Additional course offerings requiring a new exterior training station shall require a Conditional Use Permit amendment.
3. The solar installation shall meet the standards set forth in Section 66-980 of the City Code.
4. The hours of operation shall occur within 7 am - 5 pm on Monday - Friday.
5. A calendar of scheduled courses shall be mailed annually to the adjoining properties to the north, south, and east.
6. All exterior storage shall be related to a course that has occurred within the previous 5 days or is scheduled to occur within the following 30 days.
7. The windtower shall be allowed to exceed the height of the zoning district to a maximum allowed height of 160 feet.
    a. The windtower shall be at setback from all property lines and buildings for distance equal to or greater than that of its height.
    b. No signage, banners, or similar materials are permitted on the windtower.
8. Signage meeting standards of City Code Section 66-824 shall be permitted on site through administrative approval. All signs shall apply for the necessary permits prior to installation.
9. The two existing buildings on the property shall only be used for storage of materials. If the buildings are used for any other purposes, the buildings shall be improved to meet the appropriate zoning and building code standards.
10. All safety best management practices shall be practiced on the site for related training courses.
11. Erosion and sediment control measures must be implemented during all construction activities as to prevent runoff/sedimentation to adjacent properties, waterbodies/waterways and roadways.
12. For any activities that disturb more than 1 acre of land, the owner shall receive a NPDES permit and operate and maintain the SWMPP plan as required by MPCA prior to and during construction or related training activities that may require a NPDES permit.
13. Approval of this CUP does not eliminate permitting requirements and approvals as may be required by the City of North Branch, Chisago County, State of Minnesota, and any related laws, rules, ordinances and policies of said entities, including, but not limited to: grading permits; building, plumbing and electrical permits; stormwater and wastewater permits; sign permits; etc.

Voting Requirements:

Voting Options	**Simple Majority**

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

CITY COUNCIL RESOLUTION NO. R-91-2024

RESOLUTION APPROVING THE CONDITIONAL USE PERMIT FOR A VOCATIONAL TRAINING FACILITY AT 41499 FOREST BLVD

WHEREAS, Construction Laborers Education, Apprenticeship & Training Fund of Minnesota and North Dakota ("Applicant") has requested a conditional use permit for a vocational training facility on the property known as 41499 Forest Blvd; and,

WHEREAS, the property is legally described as:
Lot 1, Block 1 of the Laborers Training Center Addition

and,

WHEREAS, the Subject Property is guided as Industrial, per the Comprehensive Plan ("Land Use"), and zoned as I2-Heavy Industrial ("Zoning"); and,

WHEREAS, a vocational training facility is a conditional use in the I2-Heavy Industrial district; and,

WHEREAS, pursuant to Minnesota Statute §462.357 the Planning Commission ("Commission") held a Public Hearing ("Hearing") on September 3, 2024 to consider and receive public comment regarding the proposed conditional use permit; and,

WHEREAS, notice of the Hearing was posted, published in the City's official newspaper, and mailed to any and all owners of affected properties, as required by State Statute; and,

WHEREAS, all persons desiring to be heard concerning the conditional use permit were given the opportunity to speak thereon; and,

WHEREAS, following the Hearing, the Commission found the conditional use permit satisfies zoning standards and unanimously recommended approval of the requested conditional use permit with conditions as stated herein; and,

WHEREAS, the City Council of the City of North Branch, on September 24, 2024, considered the requested conditional use permit and how it might affect public health, safety, or welfare and found that the project will not negatively impact the public health, safety, or welfare.

NOW THEREFORE BE IT RESOLVED, BY THE CITY COUNCIL OF THE CITY OF NORTH BRANCH, MINNESOTA, the Conditional Use Permit for a vocational training facility at 41499 Forest

Blvd is hereby approved based on the following findings of fact:

1. The proposed CUP amendment is consistent with the City's 2040 Comprehensive Plan and the proposed use is compatible with present and future land uses of the area.
2. Subject to conditions, the proposed use conforms with all performance standards contained in the City's Zoning Ordinance.
3. The proposed vocational training facility is a permitted conditional use within the I2-Heavy Industrial zoning district.
4. The proposed use will be served by private utilities and will not overextend the City's infrastructure.
5. Traffic generation by the proposed use is within capabilities of streets serving the property.
6. The use will not impose additional unreasonable costs on the public.

BE IT FURTHER RESOLVED that approval of the Conditional Use Permit for the Vocational Training Facility shall be subject to the following conditions:

1. The Applicant shall address any comments received from Chisago County.
2. The Applicant shall address comments provided by the City Engineer on August 26, 2024.
3. The Applicant shall apply for a change of use permit for the existing buildings and have the buildings be evaluated by a MN licensed engineer for suitability of the change of use.
4. The Applicant shall provide an updated site plan showing screening that meets City Code Section 66-973 align the southern property line from the western property line adjoining Lot 2 to within 400 feet of the eastern property line, excluding the area within the gas transmission line easement. Where existing vegetation is present, it will be considered as providing the necessary softening for the screening.
5. The Applicant shall submit a site plan for review at the time of applying for a building permit. The site plan must be substantially similar to the one approved with the Conditional Use Permit. The parking lot is permitted to be expanded by 75% at time of constructing the principal building without an amendment to the Conditional Use Permit.
6. All necessary permits as may be applicable must be provided to the City before activity begins and/or before building permits are issued.
7. The Applicant shall record the Conditional Use Permit with the Chisago County Recorder.
8. The Applicant shall be responsible for all costs associated with the Conditional Use Permit application.
9. All fees and financial obligations shall be received by the City prior to the releasing of the approval documents for recording.
10. Other conditions identified during the review process by Staff, the Planning Commission, or the City Council.
11. Approval of this request is subject to the concurrent approval of the related land use and zoning requests pertaining to the development.

(Reserved for Recording Data)

CITY OF NORTH BRANCH

CHISAGO COUNTY, MINNESOTA

CONDITIONAL USE PERMIT FOR A VOCATIONAL TRAINING FACILITY

1. PERMIT. Subject to the terms and conditions set forth herein, the CITY OF NORTH BRANCH IS hereby grants a Conditional Use Permit to allow the following: vocational training facility.

2. PROPERTY. This Conditional Use Permit is for the following described property in the City of North Branch, Chisago County, Minnesota:

   Lot 1, Block 1 of the Laborers Training Center Addition

3. CONDITIONS. This Conditional Use Permit is issued subject to construction in accordance with the approved plans submitted with the application and the following conditions:

   1. No more than two instructional courses shall occur concurrently on site.
   2. The following exterior training facility spaces are permitted in the locations specified on the site plan: hardscape installation; concrete installation, maintenance, and sawing; solar installation, maintenance, and decommissioning; windtower installation, maintenance, and decommissioning; commercial drivers license course; and utility installation and maintenance such as pipelaying and excavation for fiber, water, storm, and sanitary pipe. Additional course offerings requiring a new exterior training station shall require a Conditional Use Permit amendment.
   3. The solar installation shall meet the standards set forth in Section 66-980 of the City Code.
   4. The hours of operation shall occur within 7 am - 5 pm on Monday - Friday.

5. A calendar of scheduled courses shall be mailed annually to the adjoining properties to the north, south, and east.
6. All exterior storage shall be related to a course that has occurred within the previous 5 days or is scheduled to occur within the following 30 days.
7. The windtower shall be allowed to exceed the height of the zoning district to a maximum allowed height of 160 feet.
    a The windtower shall be at setback from all property lines and buildings for distance equal to or greater than that of its height.
    b No signage, banners, or similar materials are permitted on the windtower.
8. Signage meeting standards of City Code Section 66-824 shall be permitted on site through administrative approval. All signs shall apply for the necessary permits prior to installation.
9. The two existing buildings on the property shall only be used for storage of materials. If the buildings are used for any other purposes, the buildings shall be improved to meet the appropriate zoning and building code standards.
10. All safety best management practices shall be practiced on the site for related training courses.
11. Erosion and sediment control measures must be implemented during all construction activities as to prevent runoff/sedimentation to adjacent properties, waterbodies/waterways and roadways.
12. For any activities that disturb more than 1 acre of land, the owner shall receive a NPDES permit and operate and maintain the SWMPP plan as required by MPCA prior to and during construction or related training activities that may require a NPDES permit.
13. Approval of this CUP does not eliminate permitting requirements and approvals as may be required by the City of North Branch, Chisago County, State of Minnesota, and any related laws, rules, ordinances and policies of said entities, including, but not limited to: grading permits; building, plumbing and electrical permits; stormwater and wastewater permits; sign permits; etc.

4. TERMINATION OF PERMIT. The City may revoke the permit following a public hearing for violation for the terms of this permit.

5. LAPSE. If within one (1) year of the issuance of this Conditional Use Permit the allowed construction has not commenced, this permit shall lapse.

6. RECORDING. This Conditional Use Permit shall be recorded by the City against the title to the Property.

Dated: September 24, 2024.

CITY OF NORTH BRANCH

BY: _____

Kevin Schieber, Mayor

(SEAL)

AND _____

Linda Wolfe, Interim City Administrator

STATE OF MINNESOTA

Memorandum

To: ***North Branch Development Review Committee***

From: ***Justin Messner, WSB***

Date: ***August 26, 2024***

Re: ***Liuna Training Center Plan Review***
WSB Project No. 025975-000

Plans were resubmitted for the proposed Liuna Training Center development in the City of North Branch, Chisago County. The project is located east of Forest Boulevard, north of 410th Street, south of 415th street and County Ritch No. 3 on the west side of the site. Engineering review comments were generated from the following documents:

- Liuna Training Center, Site Plan, WSB, dated 7/10/24
- Liuna Training Center, SWMP, WSB, dated 7/10/24
- Liuna Training Center, Preliminary Plat, WSB, dated 7/10/24
- Liuna Training Center, Final Plat, WSB, dated 7/10/24

The following items should be addressed including the redline comments on the submitted plans.

General

1. Submit for and provide copies to the City of all required permits from regulatory agencies (MCES, Minnesota Pollution Control Agency, Minnesota Department of Health, etc.)
    a. Note a SWPPP should be provided in future submittals based on a disturbance area over one acre.
2. Address all redlines on the attached Civil Plans and review memo below. Provide a response memo that explains how each comment was addressed.
3. Use current City Standard Detail Plates for all City facilities and where applicable. http://www.ci.north-branch.mn.us/NORTH%20BRANCH%20City%20Spec%20ENTIRE%20April%202024.pdf

Preliminary Plat

4. Show required setbacks and buffers for the wetland adjacent to the eastern side of the site.
5. Include the disturbed area on the plans.

Site/Utility Plan

Grading and Erosion Control Plans

6. Note the proposed pipe and structure details for the proposed storm sewer going into and leaving the West Basin.
7. Riprap should be shown on the grading and erosion control plans.

Details

8. Include the City of North Branch riprap detail.
9. Include the City of North Branch erosion control blanket detail.

178 E 9TH STREET | SUITE 200 | SAINT PAUL, MN | 55101 | 651.286.8450 | WSBENG.COM

Storm Sewer/Surface Water Management

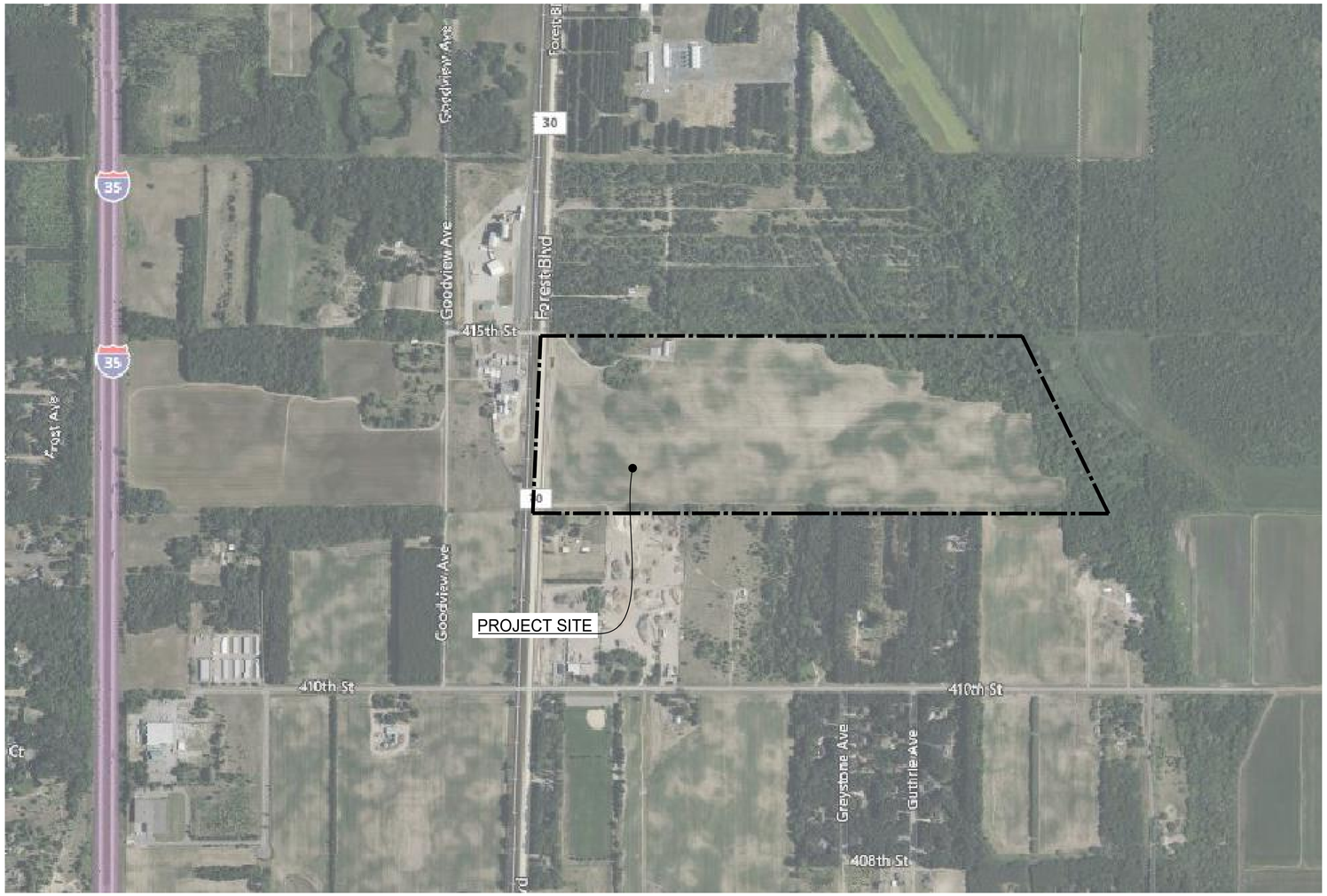
10. Proposed storm sewer should be shown in profile view as part of final plat plans. Provide sizing calculations for proposed storm sewer.
11. The Proposed Drainage Area Summary should be updated to show the correct area values as shown in the Proposed HydroCAD Model.

In any resubmittal from the applicant, we request that the comments above be restated, and the applicant identify how each comment was addressed. Any questions or comments can be directed to Justin Messner at jmessner@wsbeng.com.

LIUNA TRAINING CENTER

North Branch, MN

WSB Project Number 025845-000
Issue Date ..... 07/10/2024; ISSUED FOR DD



1 C101 PROJECT LOCATION MAP
SCALE: NOT TO SCALE

HORIZONTAL DATUM:
VERTICAL DATUM:

THIS PLAN SET HAS BEEN PREPARED FOR:

Construction Laborers Education,
Apprenticeship and Training Fund of Minnesota & North Dakota
2350 Main St.
Lino Lakes, MN 55038

N
0 500 1000
H: SCALE IN FEET

SHEET LIST TABLE

C101	TITLE SHEET
C102	SURVEY
CS101	SITE PLAN
CS102	SITE PLAN
CS501	SITE DETAILS
CG101	GRADING PLAN
CG102	GRADING PLAN
CG103	EROSION CONTROL PLAN
CG104	EROSION CONTROL PLAN
CG501	EROSION CONTROL DETAILS
CU101	STORM SEWER PLAN
CU102	STORM SEWER PLAN

wsb

SCALE:	DESIGN BY:
AS SHOWN	MSG
PLAN BY:	CHECK BY:
MSG	VJV

REVISIONS

NO.	DATE	DESCRIPTION

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.

Vicki Van Dell LIC. NO: 41352
DATE: 07-10-2024

TITLE SHEET

LIUNA TRAINING CENTER

WSB PROJECT NO.
025845-000

SHEET
C101

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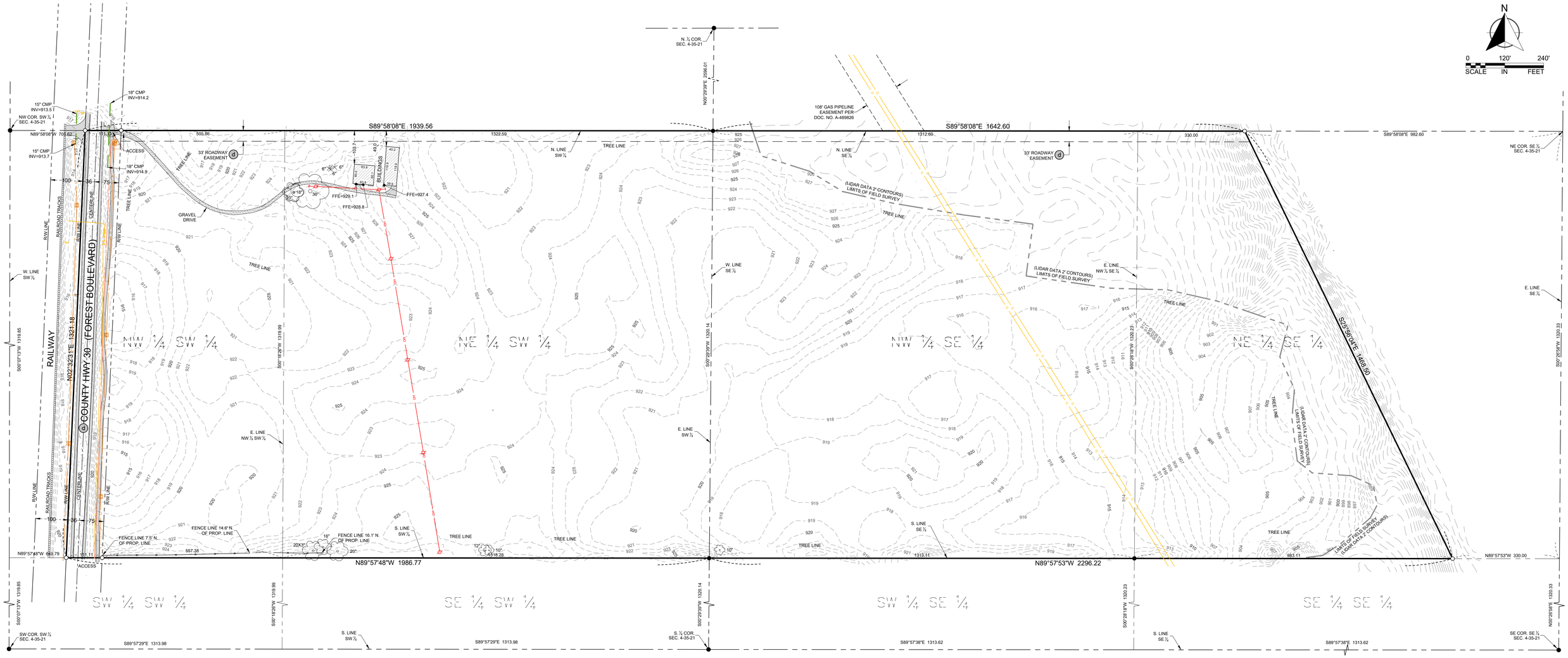


LEGEND

- UTILITY POLE
- GUY WIRE
- SIGN
- FIBER OPTIC VAULT
- COMMUNICATION PEDESTAL
- GAS VALVE (ABOVE GROUND)
- UNDERGROUND GAS MARKER / SIGN
- STORM LINE
- UNDERGROUND COMMUNICATION
- UNDERGROUND FIBER OPTIC
- UNDERGROUND GAS
- OVERHEAD POWER
- FENCE
- BITUMINOUS
- CONCRETE
- GRAVEL
- DECIDUOUS / CONIFEROUS TREE
- FOUND IRON SURVEY MONUMENT
- SET IRON SURVEY MONUMENT

PROPERTY DESCRIPTION

(Per Ancona Title and Escrow Commitment for Title Insurance, Commitment No. 2024-229005 with an effective date of April 15, 2024)

All that part of the NE¼ of SE¼ of Section 4, T35N, R21W, lying west of the following described line:

Beginning at a point on the South line of the NE¼ of the SE¼ of Section 4, T35N, R21W, which lies 330 feet West of the Southeast corner of said parcel, thence running Northwesterly in a straight line to a point on the North line of the said parcel which lies 330 feet East of the Northwest corner thereof. Together with and subject to a non-exclusive roadway easement over and across the North 33 feet of the N½ of the SW¼ lying East of County Road No. 30 and the North 33 feet of the N½ of the SE¼ lying West of the above described line, all located in Section 4, T35N, R21W all in Chisago County, Minnesota.

The Northwest Quarter of Southeast Quarter (NW¼ of SE¼), and the Northeast Quarter of the Southwest Quarter (NE¼ of SW¼), and the Northwest Quarter of the Southwest Quarter (NW¼ of SW¼) excepting the Railroad Right-of Way and excepting that part of the North Half of the Southwest Quarter (N½ of SW¼) lying West of the Westerly Right-of-Way of the Burlington Northern Right-of-Way, all in Section Four (4), Township Thirty-Five North (T35N) and Range Twenty-One West (R21W), Chisago County, Minnesota.

SCHEDULE B - SECTION 2 EXCEPTIONS

Items (b), (c), (g), (h), (i), (j), (k), (l), (m), (p) and (q) are not survey related, and therefore, are not shown on this survey.

(a) Property ID/Parcel Number 11.00058.00.
(Surveyor's Note: Parcel Number per Title Commitment)

(d) Subject to a non-exclusive roadway easement over and across the North 33 feet of the N½ of the SW¼ lying East of County Road No. 30 and the North 33 feet of the N½ of the SE¼ lying West of the above described line, all located in Section 4, T35N, R21W all in Chisago County, Minnesota, as shown in Deed recorded on November 22, 1993 as Document No. 256979.
(Surveyor's Note: Said easement appears to fall within the subject properties boundary and is shown.)

(e) Subject to Chisago County Highway Department Highway Easement as disclosed in document recorded on February 7, 1996 as Document No. 280394, references Chisago County Highway Right-of-way Plat No. 14.
(Surveyor's Note: The described location of said Easement and Right-of way Plat No. 14 fall within a different Section and do not lie within or adjacent to the subject properties boundary. Said locations are not shown on the survey.)

(f) Subject to Pipeline over a part of the NW of the SE of Section 4, T35N, R21W as shown in public documents. Note: no easement found specific to the subject premises. Further information has been requested from the county archive records.
(Surveyor's Note: The location of said gas pipelines were field located per Gopher State One Call and are shown on the survey. The location of gas pipelines and related easement on the northerly adjacent property are shown on the survey per Document Number A-489826.)

(n) Subject to public roads.
(Surveyor's Note: The right of way of County Highway 30 (Forest Boulevard) is shown on the survey.)

(o) Easements for utilities and drainage of record, if any.
(Surveyor's Note: No easements for utilities or drainage were referenced within said Title Commitment and therefore, none are shown.)

TABLE A ITEMS

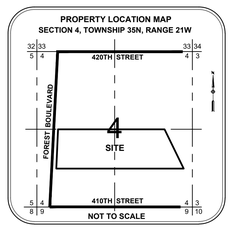
Table A Items 1, 5, 7(a), 7(b)(1), 8 and 13 are as shown on survey.

2. Property address: 41499 Forest Boulevard, North Branch, MN 55056
3. Said described property is located within "Zone X", as determined by the FEMA Flood Insurance Rate Map 27025C0165D with an effective date of April 17, 2012. Zone "X" areas are determined to be outside 500 year floodplain.
4. The area of the property described above is 5,191,338 square feet (119.18 acres), as surveyed.
9. The total number of visible striped parking spaces as presently marked on the subject property is 0 regular spaces and 0 handicap spaces.
11. (a) Utilities shown per survey field location, asbuilt plan sets, and Gopher State One Call markings and maps.
16. No visible evidence of current earth moving work, building construction or building additions observed within the subject property boundaries.

GENERAL NOTES

(GN1) Location, sizes and types of underground utilities shown are a combination of observed evidence and plan information, together with field markings by those utility locators that responded to Gopher State One Call Ticket No. 241344554. However, lacking excavation, the exact location of underground features cannot be accurately, completely, and reliably depicted. WSB LLC makes no guarantee that the utilities shown comprise all of the utilities in the area. Where additional or more detailed information is required, the client is advised that excavation and/or a private utility locate request may be necessary.

(GN2) Easements shown are as identified in Ancona Title and Escrow Commitment for Title Insurance, Commitment No. 2024-229005 with an effective date of April 15, 2024. No other search of the public records for easements or encumbrances was made by the undersigned.



SURVEYOR'S CERTIFICATION

To LIUNA Training; and Ancona Title & Escrow:

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 5, 7(a), 7(b)(1), 8, 9, 11(a), 13 and 16 of Table A thereof. The field work was completed on June 4, 2024.

Dated this _____ day of _____, 2024.

_____
Jeffrey J. Rolfson, PS, Minnesota License No. 49003

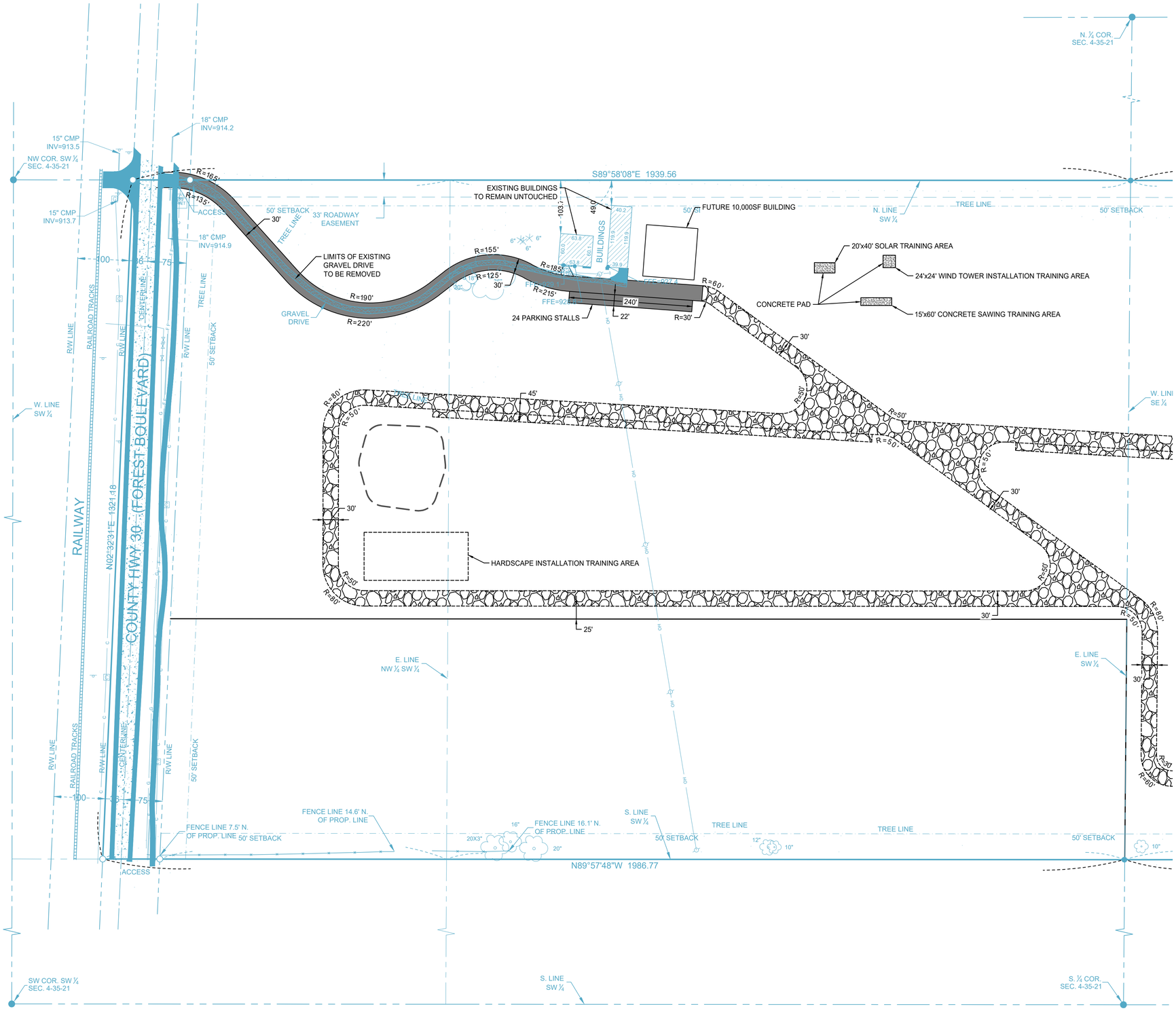
Client: LIUNA TRAINING

Job No. 025594

Surveyed By: TH, JD
Drawn By: JJR
Checked By: JJR
Scale: 1" = 120' | CAD No. 025594 V-ALTA
Date: 07/02/2024

wsb
3701 40th Avenue NW
Rochester, MN 55901
507-218-3745
www.wsbeng.com

ALTA/NSPS LAND TITLE SURVEY
PART OF N ½ SE ¼
PART OF N ½ SW ¼
SEC. 04, T.35N, R.21W
CHISAGO COUNTY, MINNESOTA



NOTES:

1. THE CONTRACTOR SHALL CONSTRUCT ALL PAVEMENTS TO CONFORM WITH THE CORRECT LINES AND FINISHED GRADES AS INDICATED ON THE PLANS AND TO MATCH EXISTING PAVEMENT GRADES AT TIE-IN POINTS. NO PONDING OF WATER WILL BE ALLOWED.
2. DIMENSIONS ARE TO EDGE OF PAVEMENT AND EXTERIOR FINISH FACE OF STRUCTURES UNLESS OTHERWISE NOTED.
3. PATCH EXISTING STREET PAVEMENTS TO MATCH EXISTING WHEN INSTALLING ENTRANCE ROAD.

LEGEND

- PROPOSED HEAVY DUTY BITUMINOUS
- PROPOSED GRAVEL ROAD
- PROPOSED CONCRETE PAD

N

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H: SCALE IN FEET

wsb

SCALE:	DESIGN BY:
AS SHOWN	MSG
PLAN BY:	CHECK BY:
MSG	VJV

REVISIONS

NO.	DATE	DESCRIPTION

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.

Vicki Van Dell LIC. NO.: 41352

DATE: 07-10-2024

SITE PLAN

LIUNA TRAINING CENTER

WSB PROJECT NO.
025845-000

SHEET
CS101

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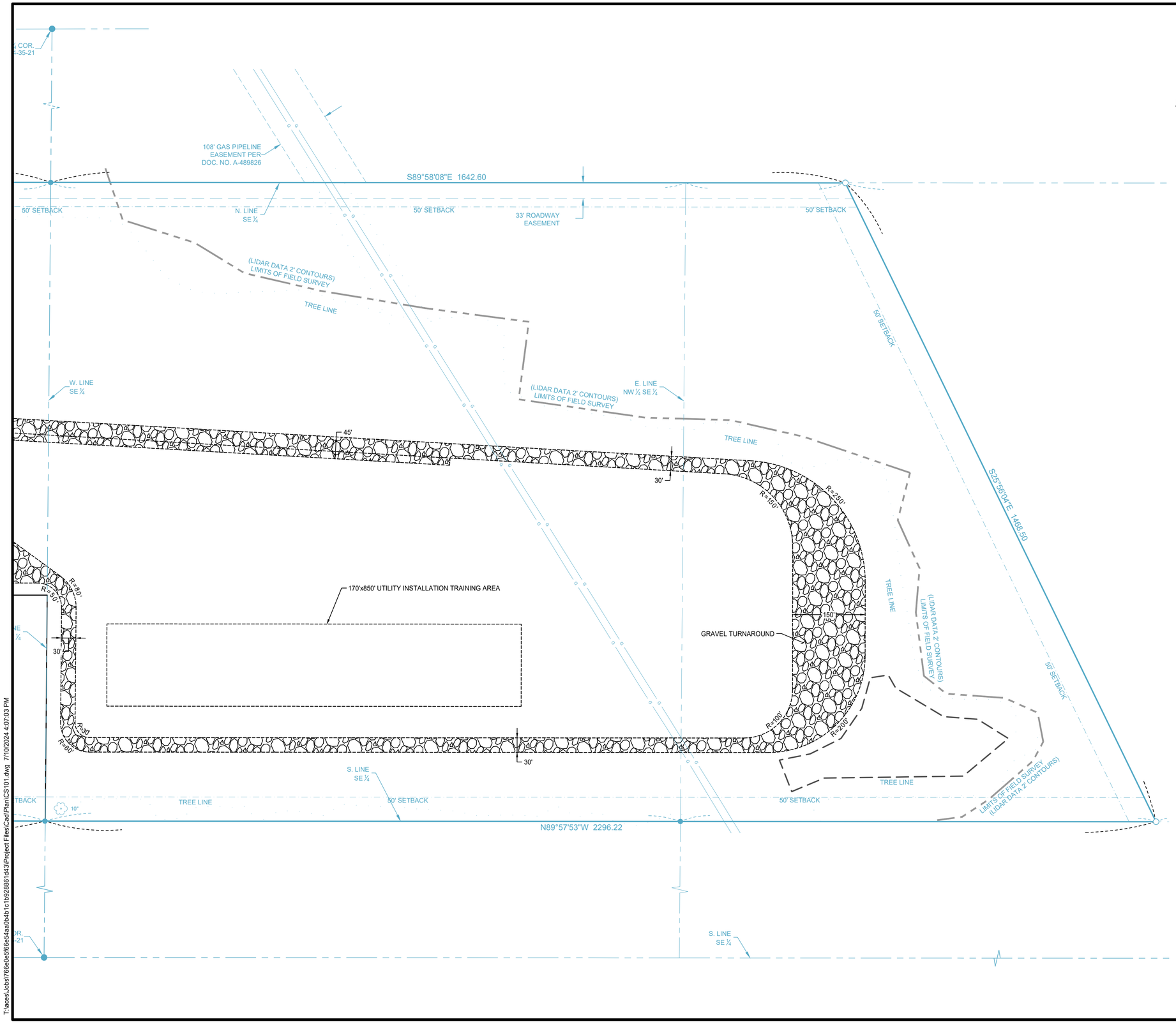

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Vicki Van Dell LIC. NO: 41352

DATE: 07-10-2024

SITE PLAN

LIUNA TRAINING CENTER

WSB PROJECT NO.
025845-000

SHEET
CS102

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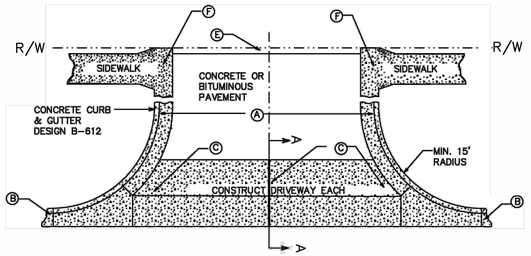


NOTES:
1 WHERE THERE IS NO EXISTING CURB AND GUTTER, END PROPOSED CURB AND GUTTER TO END RADIUS WITH "BEAVER TAIL".
2 PAYMENT FOR CONCRETE DRIVEWAY SHALL BE FROM BACK OF CURB.
3 CONCRETE MIX DESIGNATION SHALL CONFORM TO THE CURRENT MnDOT STANDARD SPECIFICATIONS.

(A) TYPICAL 28' F-F DRIVEWAY WIDTH IN EXISTING CONDITIONS MIN 24' MAX. 40' F-F DRIVEWAY WIDTH

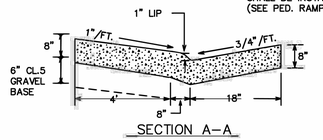
(B) 1/2" EXPANSION JOINT

(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

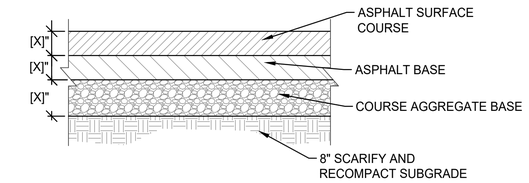
(F) IF EXISTING OR PROPOSED CURB AND GUTTER EXTENDS THROUGH SIDEWALK, PEDESTRIAN RAMPS SHALL BE INSTALLED (SEE PED. RAMP DETAIL)



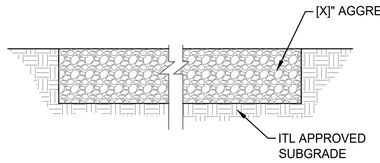
SECTION A-A

CITY OF NORTH BRANCH	CITY OF NORTH BRANCH	2024 - STANDARD DETAIL
	TYPICAL COMMERCIAL DRIVEWAY ENTRANCE	DETAIL NO.
	NO SCALE	RDW-008

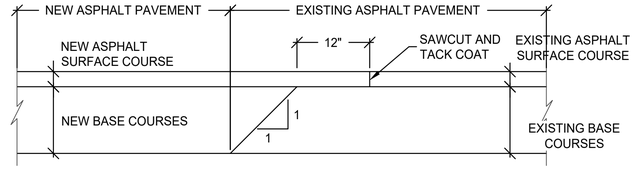
1 CS501 TYPICAL COMMERCIAL DRIVEWAY ENTRANCE
SCALE: NO SCALE



2 CS501 ASPHALT PAVEMENT SECTION
SCALE: NO SCALE



4 CS501 GRAVEL PARKING SURFACE
SCALE: NO SCALE



3 CS501 NEW AND EXISTING ASPHALT PAVEMENT INTERFACE
SCALE: NO SCALE

wsb

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AS SHOWN	MSG
PLAN BY:	CHECK BY:
MSG	VJV

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Vicki Van Dell
DATE: 07-10-2024 LIC. NO: 41352

SITE DETAILS

LIUNA TRAINING CENTER

WSB PROJECT NO.
025845-000

SHEET
CS501

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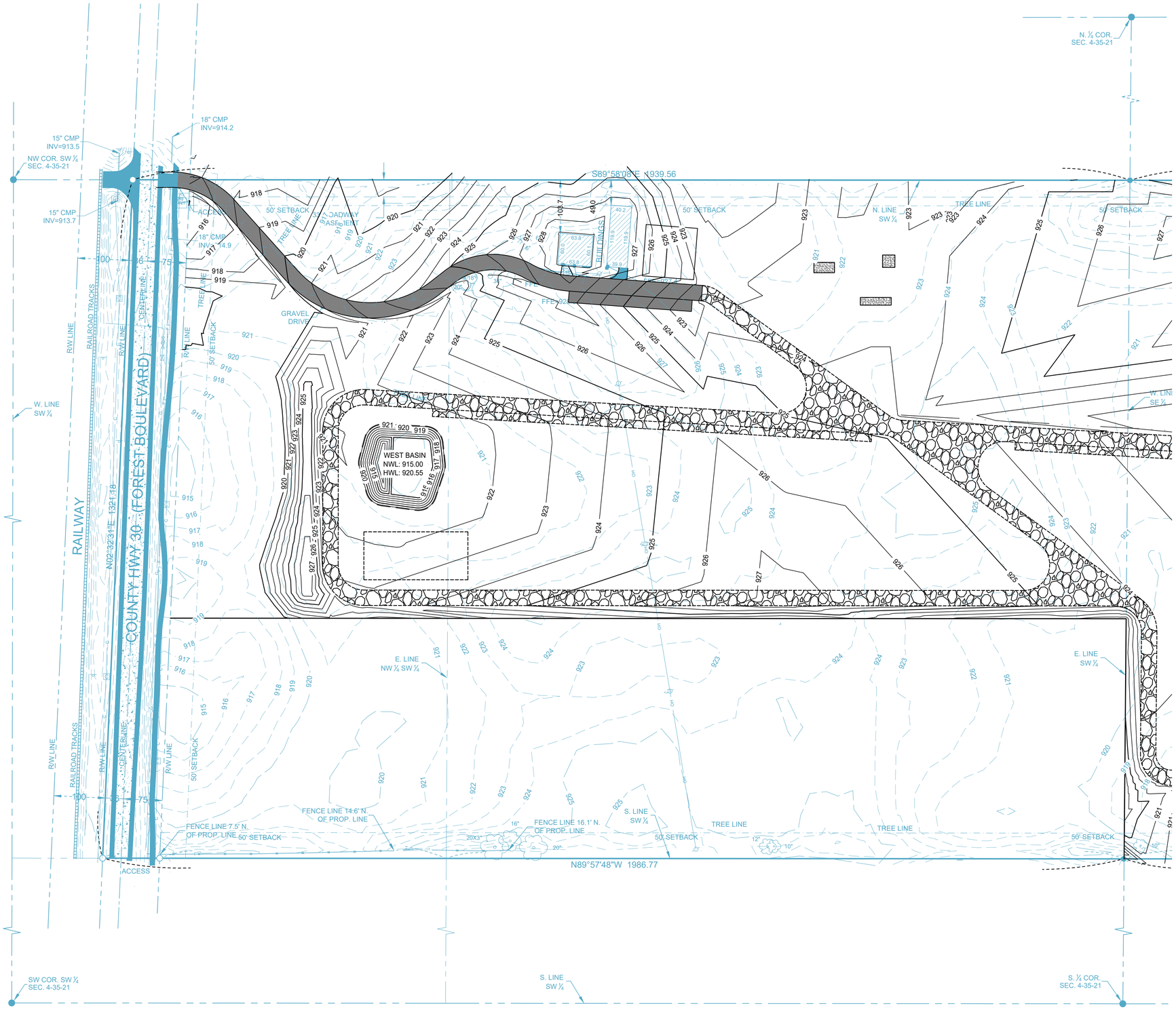

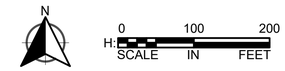

GRADING NOTES:

1. THE PROPOSED GRADES SHOWN ON THE GRADING PLAN ARE FINISHED GRADES.
2. GRADING ACTIVITY WHICH BLOCKS TRAFFIC OF ANY STREET, ALLEY, OR DRIVE IS SUBJECT TO APPROVAL BY THE CITY.
3. CONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY THE ENGINEER AND OWNER IF CONTAMINANTS ARE FOUND IN THE EXISTING SOILS.
4. IN AREAS WHERE NEW FILL IS TO BE PLACED ON SLOPING GROUND, BENCHING THE SURFACE SHALL BE COMPLETED PRIOR TO PLACING THE FILL. BENCHING SHALL BE COMPLETED WHERE SLOPES ARE STEEPER THAN 4:1 (HORIZONTAL:VERTICAL).
5. PROVIDE POSITIVE DRAINAGE AT ALL TIMES WITHIN THE CONSTRUCTION AREA. DO NOT ALLOW WATER TO POND IN EXCAVATION AREAS, AND MAINTAIN ALL EXISTING DRAINAGE PATTERNS.
6. UNLESS OTHERWISE NOTED, FINISH GRADE SHALL BE SIX INCHES BELOW FINISHED FLOOR IN NON-PAVED AREAS. GRADE SHALL SLOPE AWAY FROM BUILDING STRUCTURES AT FIVE PERCENT FOR A MINIMUM DISTANCE OF TEN FEET IN UNPAVED AREAS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL OSHA REGULATIONS IN THE EXECUTION OF WORK UNDER THIS CONTRACT.
8. THE CONTRACTOR SHALL REVIEW GEOTECHNICAL REPORT TO DETERMINE IF DEWATERING IS REQUIRED TO PERFORM WORK. IF WORK ENTAILS DEWATERING, CONTRACTOR IS REQUIRED TO OBTAIN MnDNR DEWATERING PERMIT AND SUBMIT PLAN TO THE CITY OF ANDOVER (PERMIT IS INCIDENTAL).
9. ALL NON-PAVED AREAS SHALL RECEIVE A FOUR-INCH (4") LAYER OF TOPSOIL. REFER TO EARTH MOVING SPECIFICATION 31 20 00 FOR DEFINITION OF TOPSOIL. REFER TO LANDSCAPE PLANS FOR AREAS TO RECEIVE PERMANENT SEED, SOD, TREES, & SHRUBS.
10. THE CONTRACTOR SHALL ADJUST TO GRADE ALL MANHOLE STRUCTURES AND APPURTENANCES THAT FALL WITHIN THE LIMITS OF THIS CONTRACT. THE CONTRACTOR SHALL KEEP ALL SAID EXISTING UTILITIES AND THEIR APPURTENANCES FREE OF DEBRIS AND OPERABLE AT ALL TIMES DURING CONSTRUCTION.
11. ALL GRADES WITHIN THE LANDSCAPED AREA SHALL NOT EXCEED 3 HORIZONTAL TO 1 VERTICAL AND HAVE A MINIMUM GRADE OF 2%, UNLESS OTHERWISE NOTED. GRADED SWALES MUST HAVE A MINIMUM BOTTOM SLOPE OF 2.0%.
12. ALL PAVEMENT GRADES SHALL BE AS FOLLOWS IN THE DIRECTION OF FLOW:
    ASPHALT PAVEMENT - 1% MINIMUM, 5% MAXIMUM
    CONCRETE PAVEMENT - 1% MINIMUM, 5% MAXIMUM
13. REFER TO SHEET CG103-CG104 FOR ALL EROSION CONTROL MEASURES.

wsb

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Vicki Van Dell LIC. NO.: 41352

DATE: 07-10-2024

GRADING PLAN

LIUNA TRAINING CENTER

WSB PROJECT NO.
025845-000

SHEET
CG101

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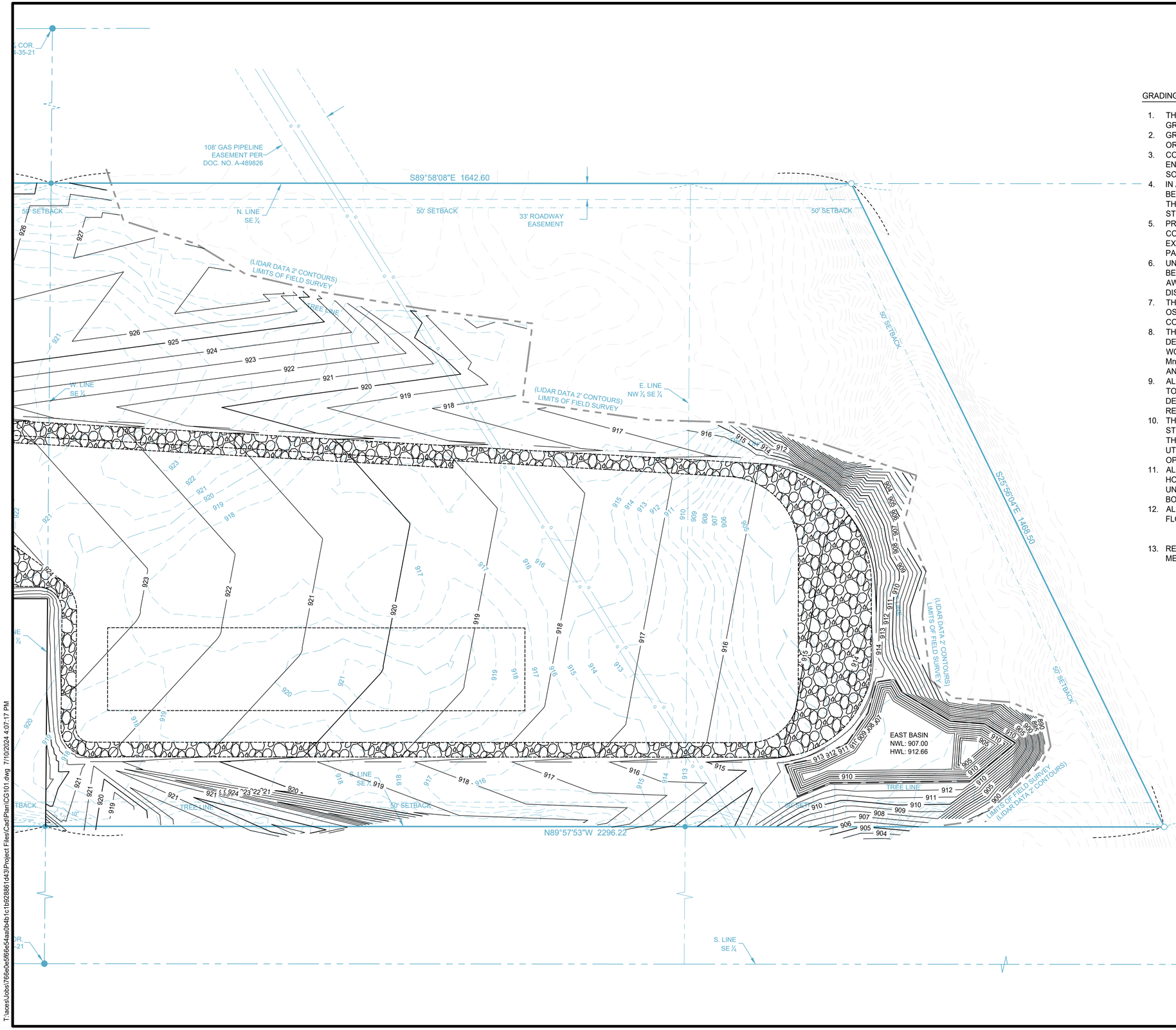

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Vicki Van Dell LIC. NO: 41352

DATE: 07-10-2024

GRADING PLAN

LIUNA TRAINING CENTER

WSB PROJECT NO.
025845-000

SHEET
CG102

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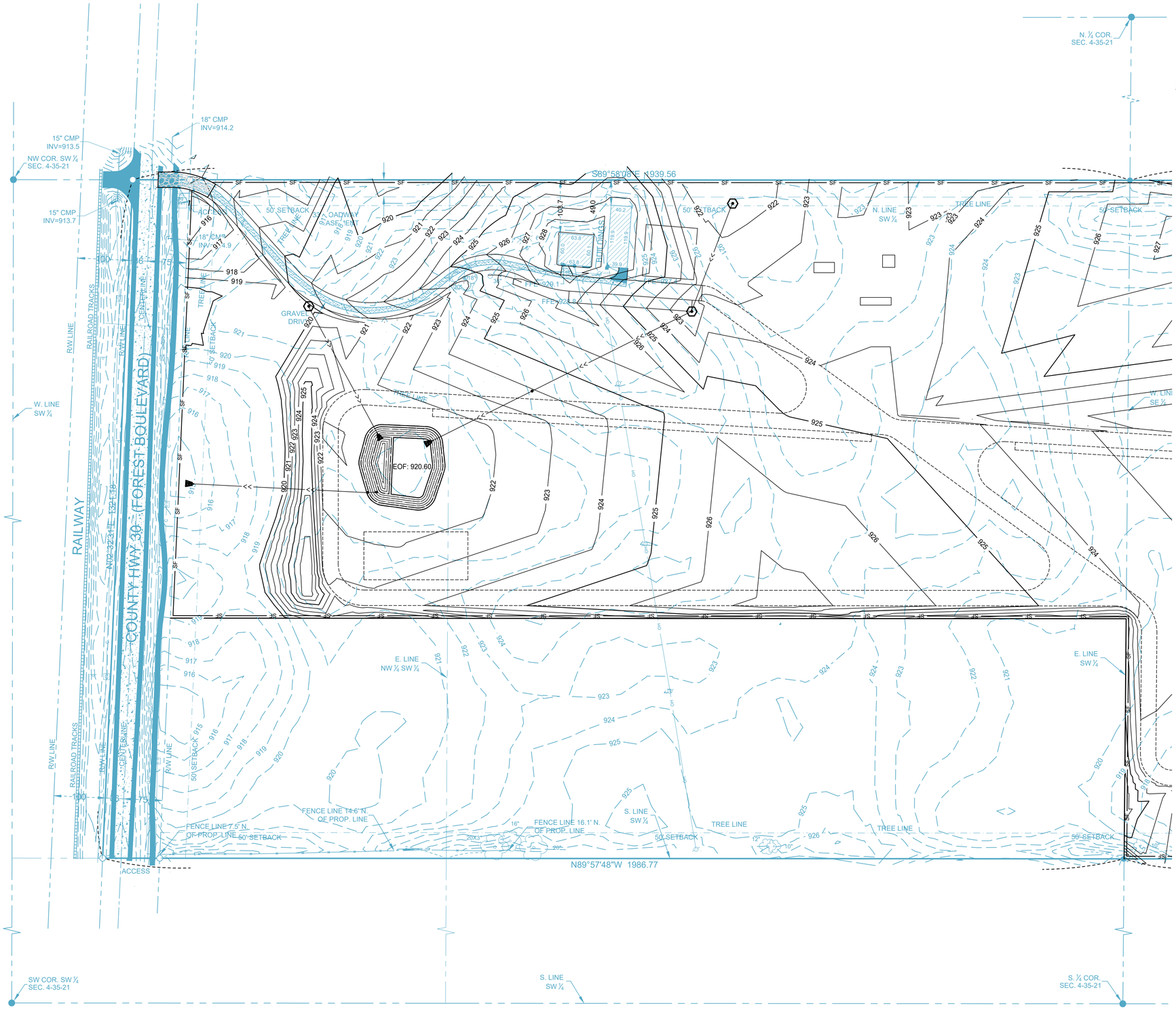

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NOTES

1. ESTABLISH SEDIMENT CONTROL MEASURES AT THE BEGINNING OF CONSTRUCTION AND MAINTAIN DURING THE ENTIRE LENGTH OF CONSTRUCTION. AREAS WHICH ARE SUBJECT TO SEVERE EROSION AND OFF-SITE AREAS WHICH ARE ESPECIALLY VULNERABLE TO DAMAGE FROM EROSION AND/OR SEDIMENTATION ARE TO BE IDENTIFIED AND RECEIVE ADDITIONAL SEDIMENT CONTROL MEASURES AS DIRECTED BY THE OWNER'S CONSTRUCTION REPRESENTATIVE. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO ANY REMOVALS.
2. LOCATIONS OF STABILIZED CONSTRUCTION ENTRANCES INDICATED ON PLANS ARE APPROXIMATE. CONTRACTOR SHALL ADJUST LOCATION AND SIZE OF ENTRANCES TO ACCOMMODATE CONSTRUCTION VEHICLES AND ACTIVITIES.
3. COORDINATE ALL LAND DISTURBING ACTIVITIES AND CONDUCT SO AS TO MINIMIZE THE SIZE OF THE AREA TO BE EXPOSED AT ANY ONE TIME AND MINIMIZE THE TIME OF EXPOSURE. MASS CLEARING AND GRADING OF THE ENTIRE SITE SHOULD BE AVOIDED. COORDINATE ALL LAND DISTURBING ACTIVITIES SO AS TO MINIMIZE OFF-SITE SEDIMENTATION DAMAGE. RESTABILIZE DISTURBED AREAS AS SOON AS POSSIBLE AFTER CONSTRUCTION IS COMPLETED, BUT IN NO CASE LATER THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASES.
4. PERIODICALLY CLEAN OUT AND DISPOSE OF ALL SEDIMENT ONCE THE STORAGE CAPACITY OF THE DRAINAGE FEATURE OR STRUCTURE RECEIVING THE SEDIMENT IS REDUCED BY ONE-HALF. CLEAN OUT AND DISPOSE OF ALL SEDIMENT AT THE COMPLETION OF THE PROJECT. ALL STREETS IN AND ADJACENT TO THE PROJECT SHALL REMAIN CLEAN AND PASSABLE AT ALL TIMES. ANY SEDIMENT OR DEBRIS SHALL BE REMOVED WITHIN 24 HOURS, OR AS OFTEN AS NEEDED TO ENSURE PUBLIC SAFETY
5. INLET PROTECTION WILL BE INSTALLED AT ALL CATCH BASINS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL PROVIDE APPROPRIATE SEDIMENT CONTROL DEVICES FOR STOCKPILE AREAS, INLETS, AND DITCHES MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE, OR FROM THE POINT OF DISCHARGE TO ANY SURFACE WATER. STABILIZATION MUST BE COMPLETED WITHIN 24 HOURS OF CONNECTION.
6. REMOVE THE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AND VERIFY THE CLEANING OUT OF ALL STORM DRAINAGE STRUCTURES, INCLUDING FLUMES, PIPES, AND DITCHES ONCE FINAL STABILIZATION HAS OCCURRED.
7. ADDITIONAL EROSION AND SEDIMENT CONTROLS MAY BE ADDED DURING ANY PHASE OF CONSTRUCTION AS DIRECTED BY THE ENGINEER.
8. THE CONTRACTOR SHALL PROVIDE PERIMETER CONTROL DAY - TO - DAY AT DISTURBED, UNSTABILIZED AREAS WHERE EROSION OR SEDIMENTATION COULD BE A PROBLEM. THE ENGINEER SHALL DIRECT THE CONTRACTOR AS TO WHERE PLACEMENT OF PERIMETER CONTROL WILL BE REQUIRED.
9. WASHOUT STATIONS SHALL BE DESIGNED TO PREVENT WASTE / RUNOFF CONTACTING THE GROUND. A WASHOUT LOCATION SIGN SHALL BE INSTALLED AT EVERY WASHOUT STATION.
10. STREET SWEEPING: STREET SWEEPING IS AN IMPORTANT TEMPORARY EROSION CONTROL BEST MANAGEMENT PRACTICE AND SHALL BE PERFORMED WITH THE USE OF WATER. DRY SWEEPING IS PROHIBITED. ADDITIONALLY, TRUCKS HAULING IN AND OUT OF THE SITE, FOR ANY ACTIVITY INCLUDING BUT NOT NECESSARILY LIMITED TO PAVING, EXCAVATION, ETC., NEEDS TO ENSURE CLEAN OFF ALL MUD FLAPS TO AVOID ANY BUILDUP ON THE STREET PAVEMENT.

LEGEND

- INLET PROTECTION
- FLOW DIRECTION
- RIP RAP
- SF — SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION BLANKET

wsb

SCALE:	DESIGN BY:
AS SHOWN	MSG
PLAN BY:	CHECK BY:
MSG	VJV

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Vicki Van Dell — LIC. NO.: 41352

DATE: 07-10-2024

EROSION CONTROL PLAN

LIUNA TRAINING CENTER

WSB PROJECT NO. 025845-000

SHEET CG103

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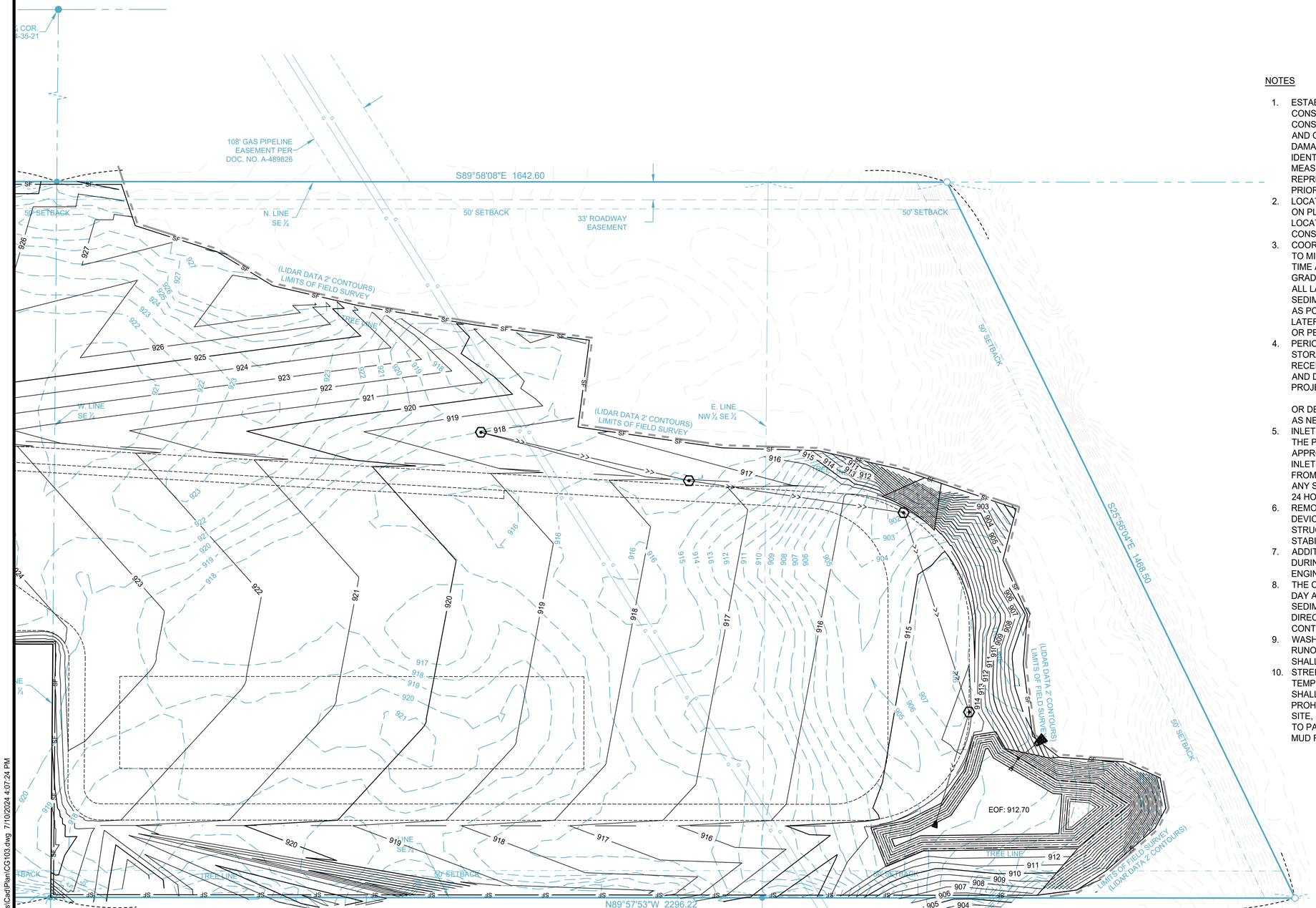

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SCALE IN FEET

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3. COORDINATE ALL LAND DISTURBING ACTIVITIES AND CONDUCT SO AS TO MINIMIZE THE SIZE OF THE AREA TO BE EXPOSED AT ANY ONE TIME AND MINIMIZE THE TIME OF EXPOSURE. MASS CLEARING AND GRADING OF THE ENTIRE SITE SHOULD BE AVOIDED. COORDINATE ALL LAND DISTURBING ACTIVITIES SO AS TO MINIMIZE OFF-SITE SEDIMENTATION DAMAGE. RESTABILIZE DISTURBED AREAS AS SOON AS POSSIBLE AFTER CONSTRUCTION IS COMPLETED, BUT IN NO CASE LATER THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASES.
4. PERIODICALLY CLEAN OUT AND DISPOSE OF ALL SEDIMENT ONCE THE STORAGE CAPACITY OF THE DRAINAGE FEATURE OR STRUCTURE RECEIVING THE SEDIMENT IS REDUCED BY ONE-HALF. CLEAN OUT AND DISPOSE OF ALL SEDIMENT AT THE COMPLETION OF THE PROJECT. ALL STREETS IN AND ADJACENT TO THE PROJECT SHALL REMAIN CLEAN AND PASSABLE AT ALL TIMES. ANY SEDIMENT OR DEBRIS SHALL BE REMOVED WITHIN 24 HOURS, OR AS OFTEN AS NEEDED TO ENSURE PUBLIC SAFETY
5. INLET PROTECTION WILL BE INSTALLED AT ALL CATCH BASINS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL PROVIDE APPROPRIATE SEDIMENT CONTROL DEVICES FOR STOCKPILE AREAS, INLETS, AND DITCHES MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE, OR FROM THE POINT OF DISCHARGE TO ANY SURFACE WATER. STABILIZATION MUST BE COMPLETED WITHIN 24 HOURS OF CONNECTION.
6. REMOVE THE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AND VERIFY THE CLEANING OUT OF ALL STORM DRAINAGE STRUCTURES, INCLUDING FLUMES, PIPES, AND DITCHES ONCE FINAL STABILIZATION HAS OCCURRED.
7. ADDITIONAL EROSION AND SEDIMENT CONTROLS MAY BE ADDED DURING ANY PHASE OF CONSTRUCTION AS DIRECTED BY THE ENGINEER.
8. THE CONTRACTOR SHALL PROVIDE PERIMETER CONTROL DAY - TO - DAY AT DISTURBED, UNSTABILIZED AREAS WHERE EROSION OR SEDIMENTATION COULD BE A PROBLEM. THE ENGINEER SHALL DIRECT THE CONTRACTOR AS TO WHERE PLACEMENT OF PERIMETER CONTROL WILL BE REQUIRED.
9. WASHOUT STATIONS SHALL BE DESIGNED TO PREVENT WASTE / RUNOFF CONTACTING THE GROUND. A WASHOUT LOCATION SIGN SHALL BE INSTALLED AT EVERY WASHOUT STATION.
10. STREET SWEEPING: STREET SWEEPING IS AN IMPORTANT TEMPORARY EROSION CONTROL BEST MANAGEMENT PRACTICE AND SHALL BE PERFORMED WITH THE USE OF WATER. DRY SWEEPING IS PROHIBITED. ADDITIONALLY, TRUCKS HAULING IN AND OUT OF THE SITE, FOR ANY ACTIVITY INCLUDING BUT NOT NECESSARILY LIMITED TO PAVING, EXCAVATION, ETC., NEEDS TO ENSURE CLEAN OFF ALL MUD FLAPS TO AVOID ANY BUILDUP ON THE STREET PAVEMENT.

LEGEND

- INLET PROTECTION
- FLOW DIRECTION
- RIP RAP
- SF — SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION BLANKET

wsb

SCALE:	DESIGN BY:
AS SHOWN	MSG
PLAN BY:	CHECK BY:
MSG	VJV

REVISIONS

NO.	DATE	DESCRIPTION

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.

Vicki Van Dell LIC. NO: 41352

DATE: 07-10-2024

EROSION CONTROL PLAN

LIUNA TRAINING CENTER

WSB PROJECT NO. 025845-000

SHEET CG104

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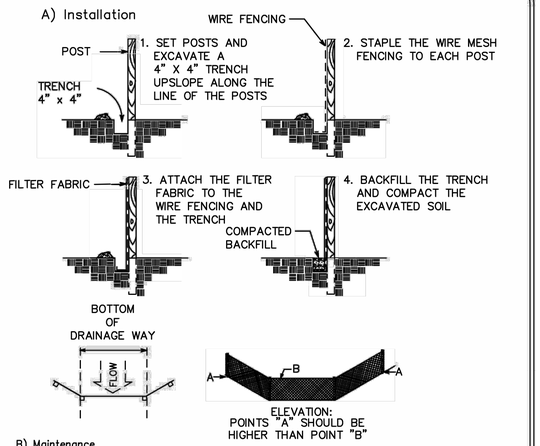
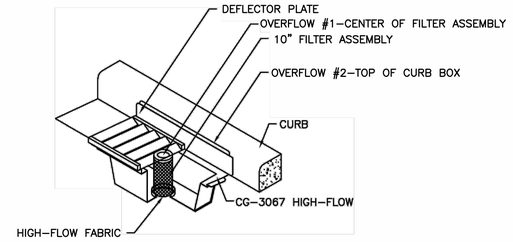


B) Maintenance

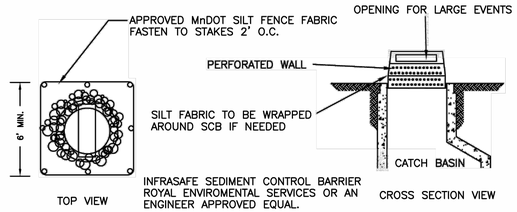
1. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USEABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY 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 SEEDED, OR REMOVED

CITY OF NORTH BRANCH	CITY OF NORTH BRANCH	2024 - STANDARD DETAIL
	PLACEMENT AND CONSTRUCTION OF SILT FENCE	DETAIL NO.
	NO SCALE	ERO-001



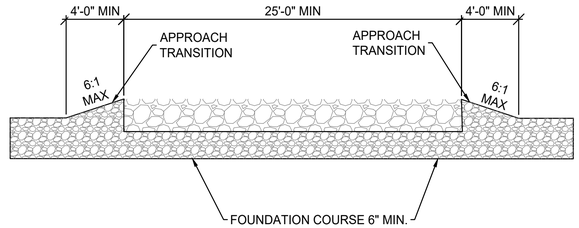
WIMCO MODEL # CG–3067 HIGH–FLOW INLET PROTECTION OR APROVED EQUAL

CURB AND GUTTER INLET PROTECTION
NO SCALE



REAR YARD INLET PROTECTION
NO SCALE

CITY OF NORTH BRANCH	CITY OF NORTH BRANCH	2024 - STANDARD DETAIL
	STORM SEWER INLET PROTECTION	DETAIL NO.
	NO SCALE	ERO-003



PROFILE

STABILIZATION CONSTRUCTION EXIT NOTES:

1. THE LENGTH OF THE TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 1" TO 1 1/2".
3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1.
4. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE, GEOWEB LOAD SUPPORT SYSTEM (OR EQUIVALENT GEOTEXTILE SYSTEM) OR OTHER MATERIAL CAPABLE OF SUPPORTING ANTICIPATED CONSTRUCTION TRAFFIC WHILE MAINTAINING OPERABLE EXIT.
5. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
6. THE GUIDELINES SHOWN HEREON ARE GUIDELINES ONLY AND MAY BE MODIFIED BY THE CONTRACTOR AS NEEDED TO MEET NPDES AND ALL OTHER PERMITTING REQUIREMENTS.

1 CG501 PLACEMENT AND CONSTRUCTION OF SILT FENCE
SCALE: NO SCALE

2 CG501 STORM SEWER INLET PROTECTION
SCALE: NO SCALE

3 CG501 STABLIZED CONSTRUCTION ENTRANCE
SCALE: NO SCALE

wsb

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AS SHOWN	MSG
PLAN BY:	CHECK BY:
MSG	VJV

REVISIONS

NO.	DATE	DESCRIPTION

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Vicki Van Dell LIC. NO: 41352

DATE: 07-10-2024

EROSION CONTROL DETAILS

LIUNA TRAINING CENTER

WSB PROJECT NO. 025845-000

SHEET CG501

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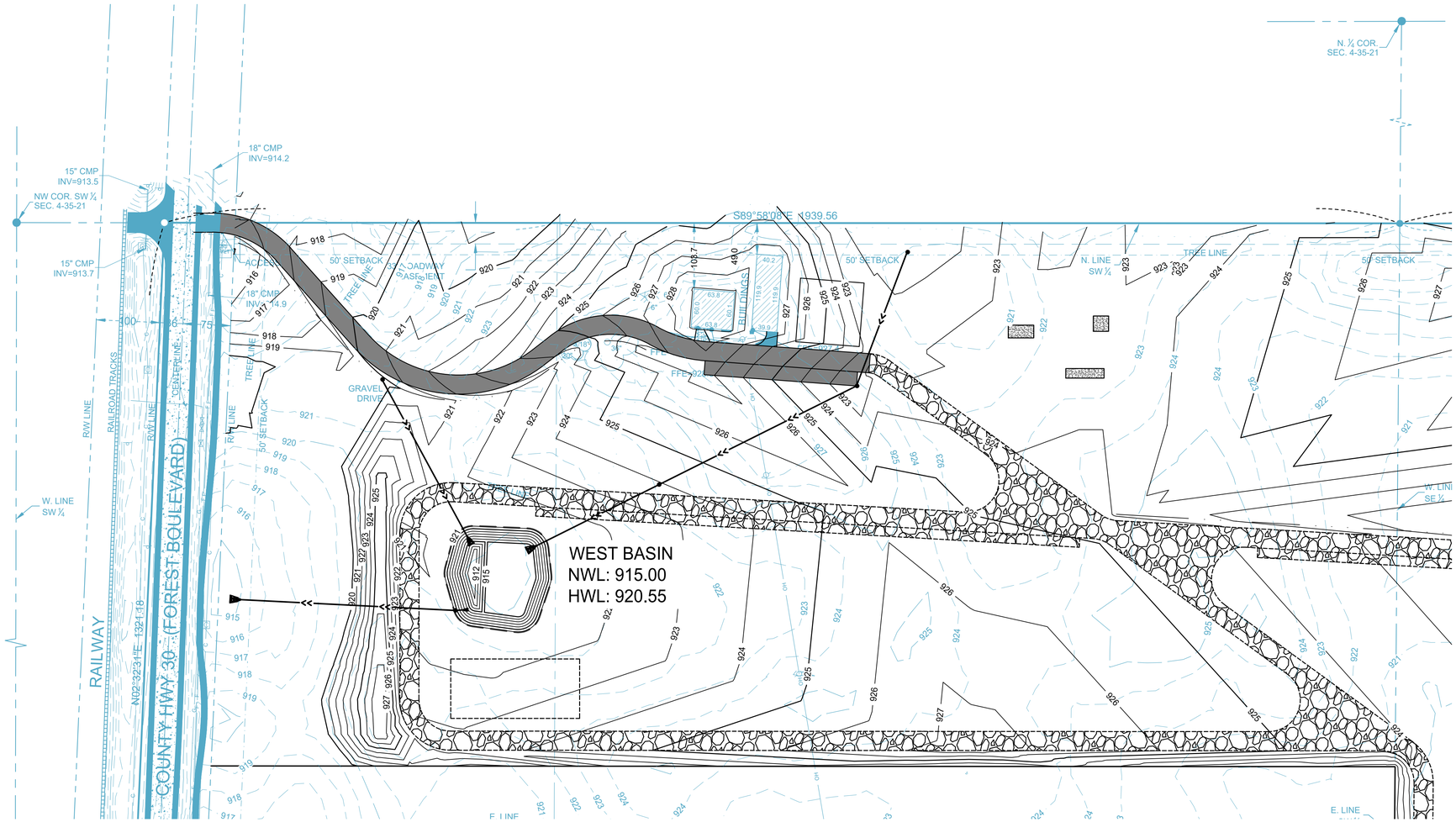

GRADING NOTES:

1. THE PROPOSED GRADES SHOWN ON THE GRADING PLAN ARE FINISHED GRADES.
2. GRADING ACTIVITY WHICH BLOCKS TRAFFIC OF ANY STREET, ALLEY, OR DRIVE IS SUBJECT TO APPROVAL BY THE CITY.
3. CONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY THE ENGINEER AND OWNER IF CONTAMINANTS ARE FOUND IN THE EXISTING SOILS.
4. IN AREAS WHERE NEW FILL IS TO BE PLACED ON SLOPING GROUND, BENCHING THE SURFACE SHALL BE COMPLETED PRIOR TO PLACING THE FILL. BENCHING SHALL BE COMPLETED WHERE SLOPES ARE STEEPER THAN 4:1 (HORIZONTAL:VERTICAL).
5. PROVIDE POSITIVE DRAINAGE AT ALL TIMES WITHIN THE CONSTRUCTION AREA. DO NOT ALLOW WATER TO POND IN EXCAVATION AREAS, AND MAINTAIN ALL EXISTING DRAINAGE PATTERNS.
6. UNLESS OTHERWISE NOTED, FINISH GRADE SHALL BE SIX INCHES BELOW FINISHED FLOOR IN NON-PAVED AREAS. GRADE SHALL SLOPE AWAY FROM BUILDING STRUCTURES AT FIVE PERCENT FOR A MINIMUM DISTANCE OF TEN FEET IN UNPAVED AREAS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL OSHA REGULATIONS IN THE EXECUTION OF WORK UNDER THIS CONTRACT.
8. THE CONTRACTOR SHALL REVIEW GEOTECHNICAL REPORT TO DETERMINE IF DEWATERING IS REQUIRED TO PERFORM WORK. IF WORK ENTAILS DEWATERING, CONTRACTOR IS REQUIRED TO OBTAIN MnDNR DEWATERING PERMIT AND SUBMIT PLAN TO THE CITY OF ANDOVER (PERMIT IS INCIDENTAL).
9. ALL NON-PAVED AREAS SHALL RECEIVE A FOUR-INCH (4") LAYER OF TOPSOIL. REFER TO EARTH MOVING SPECIFICATION 31 20 00 FOR DEFINITION OF TOPSOIL. REFER TO LANDSCAPE PLANS FOR AREAS TO RECEIVE PERMANENT SEED, SOD, TREES, & SHRUBS.
10. THE CONTRACTOR SHALL ADJUST TO GRADE ALL MANHOLE STRUCTURES AND APPURTENANCES THAT FALL WITHIN THE LIMITS OF THIS CONTRACT. THE CONTRACTOR SHALL KEEP ALL SAID EXISTING UTILITIES AND THEIR APPURTENANCES FREE OF DEBRIS AND OPERABLE AT ALL TIMES DURING CONSTRUCTION.
11. ALL GRADES WITHIN THE LANDSCAPED AREA SHALL NOT EXCEED 3 HORIZONTAL TO 1 VERTICAL AND HAVE A MINIMUM GRADE OF 2%, UNLESS OTHERWISE NOTED. GRADED SWALES MUST HAVE A MINIMUM BOTTOM SLOPE OF 2.0%.
12. ALL PAVEMENT GRADES SHALL BE AS FOLLOWS IN THE DIRECTION OF FLOW:
    ASPHALT PAVEMENT - 1% MINIMUM, 5% MAXIMUM
    CONCRETE PAVEMENT - 1% MINIMUM, 5% MAXIMUM
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14. NPDES PERMIT WILL BE PULLED AND PAID FOR BY CITY AND TRANSFERRED TO CONTRACTOR. CITY WILL PAY FOR ALL REQUIRED ESCROWS FOR WATERSHED PERMIT.

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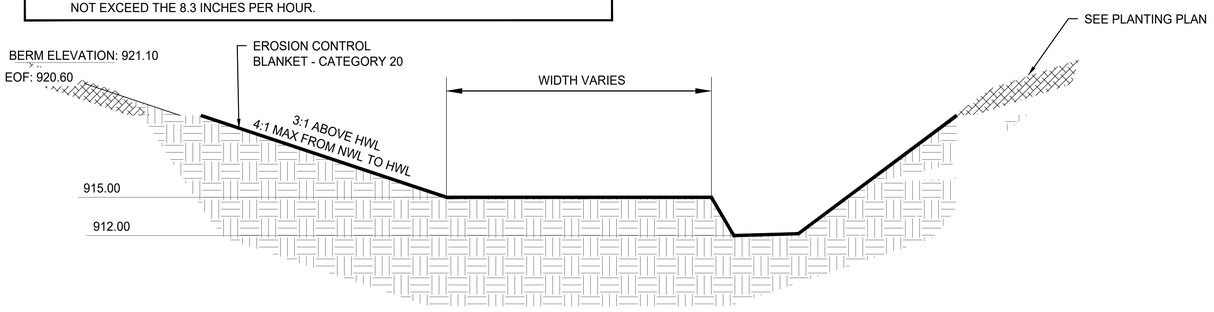
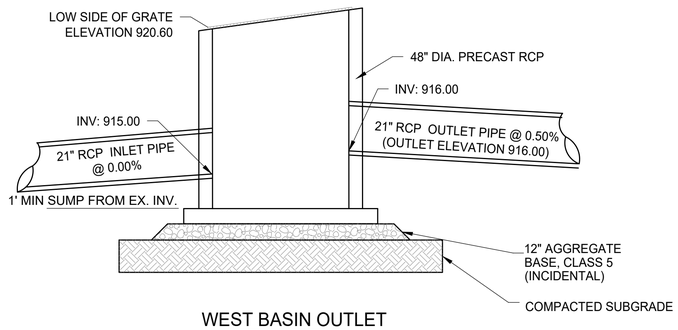


WEST INFILTRATION BASIN



WEST BASIN OUTLET
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wsb

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REVISIONS

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Vicki Van Dell LIC. NO: 41352

DATE: 07-10-2024

STORM SEWER PLAN

LIUNA TRAINING CENTER

WSB PROJECT NO.
025845-000

SHEET
CU101

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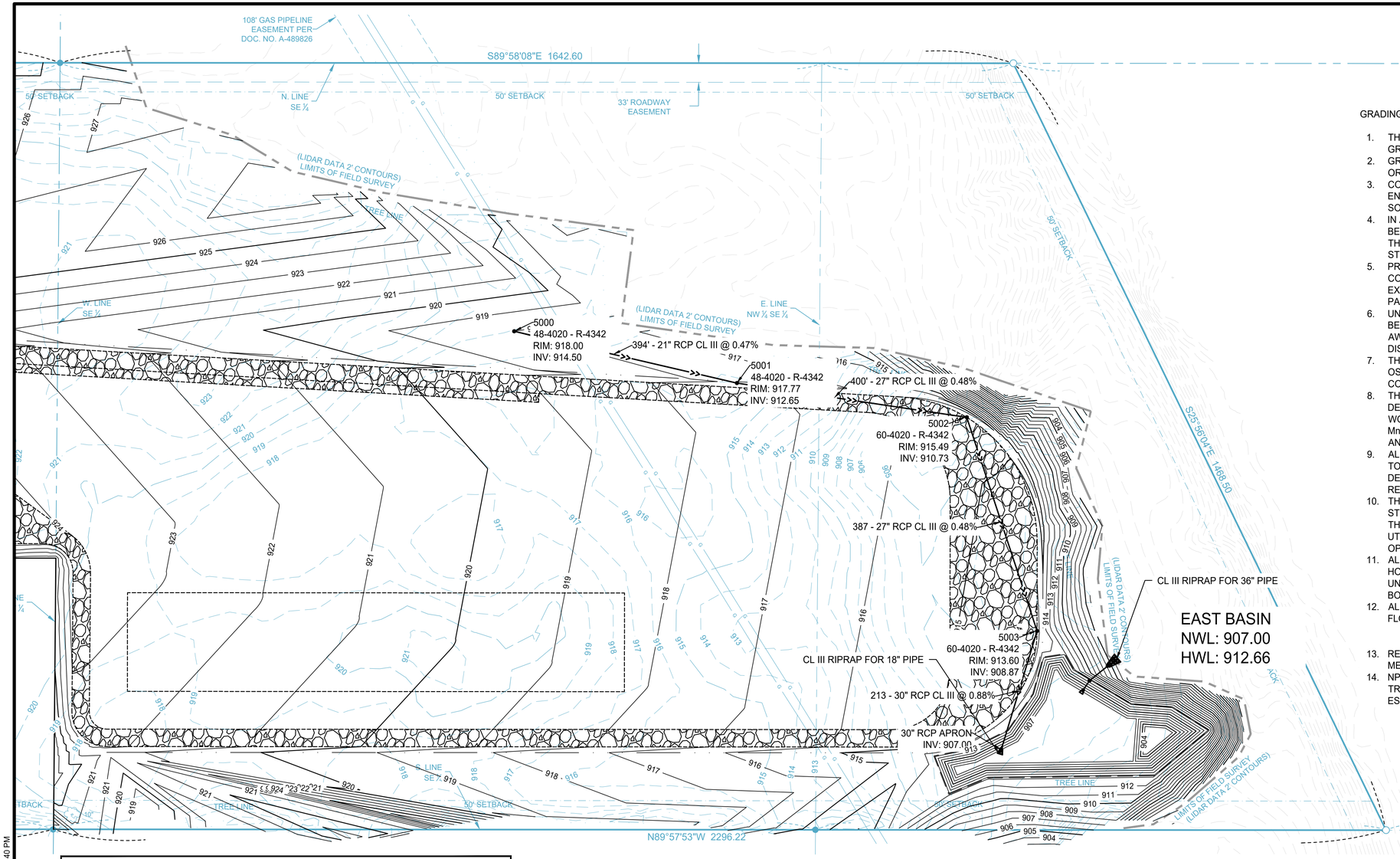

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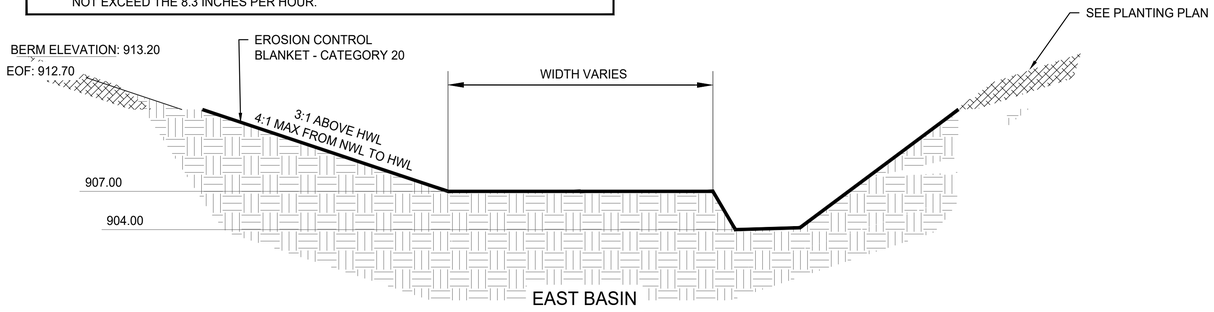
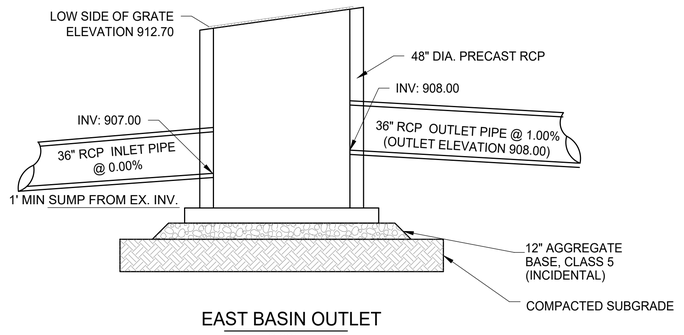


EAST BASIN



EAST BASIN OUTLET
NO SCALE

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Vicki Van Dell LIC. NO: 41352

DATE: 07-10-2024

STORM SEWER PLAN

LIUNA TRAINING CENTER

WSB PROJECT NO. 025845-000

SHEET CU102

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City of North Branch
Staff Report

Prepared By: Nathan Sondrol, GIS Specialist/Parks Director

Presenter: Nathan Sondrol, GIS Specialist/Parks Director

Date: 09/19/2024

Board & Commission: City Council

Subject: RESOLUTION R-89-2024 ACCEPTING PLANS AND SPECIFICATIONS AND AUTHORIZE ADVERTISEMENT FOR BIDS FOR THE CSAH 30 CORRIDOR IMPROVEMENT PROJECT

Background

The City has adopted a Safe Routes to School Plan that was completed in conjunction and coordination with the North Branch Area School District and Chisago County. The goal of the SRTS plan is to instill walking and bicycling habits in school children by putting in place a safe and attractive walking and bicycling environment in and around school areas.

As part of the implementation of the plan, the City of North Branch submitted an application and was awarded a $366,7000 safe routes to school grant to provide trail and crosswalk improvements along the east side of CSAH 30/Forest Blvd (379th St - Maple St) and south side of Maple Street (Forest Blvd - 7th Ave).

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. The plans for the project have been completed and are slated to go out for bids in October 2024 with anticipation of a spring 2025 construction project.

A letter of understanding between Chisago County and the City for the project has been drafted outlining the roles and responsibilities for each entity for the project. The engineers opinion of probable cost (OPC) has 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. The funding for the project was identified in the preliminary budget discussions and through srts grant funding.

Requested Action

Recommend approval of Resolution R-89-2024 APPROVING THE LETTER OF UNDERSTANDING WITH CHISAGO COUNTY AND PLANS AND SPECIFICATIONS AND AUTHORIZATION FOR ADVERTISEMENT FOR BIDS 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-89-2024

A RESOLUTION OF THE CITY COUNCIL OF NORTH BRANCH, MINNESOTA APPROVING THE LETTER OF UNDERSTANDING WITH CHISAGO COUNTY AND PLANS AND SPECIFICATIONS AND AUTHORIZATION FOR ADVERTISEMENT FOR BIDS FOR THE CSAH 30 CORRIDOR IMPROVEMENT PROJECT

WHEREAS, Chisago County has prepared final plans and specifications for the improvement of the CSAH 30 Corridor from 250 feet north of CSAH 17 (Athens Trail) to TH 95; and

WHEREAS, this project includes the CSAH 30 Safe Routes to School Trail Project which includes the construction of a 10-foot wide asphalt trail along the east side of CSAH 30 from 379th Street to Oak Street and a 6-foot wide concrete sidewalk along the east side of CSAH 30 from Oak Street to Maple Street and along the south side of Maple Street from 7 th Avenue; and

WHEREAS, the estimated total cost of CSAH 30 Corridor Improvement Project is $8,567,677.76, with the City of North Branch contributing $1,596,608.22; and

WHEREAS, the City of North Branch's estimated contribution of $1,596,608.22 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

WHEREAS, the City of North Branch has been awarded up to $366,700 in funds under the Minnesota Safe Routes to Schools (SRTS) grant program for the construction of the CSAH 30 Safe Routes to School Trail Project; amd

WHEREAS, a letter of understanding between Chisago County and the City of North Branch has been approved outlining the roles and responsibilities of each entity for the project.

NOW THEREFORE, BE IT RESOLVED BY THE NORTH BRANCH CITY COUNCIL THAT THE CITY OF NORTH BRANCH CITY COUNCIL APPROVES THE LETTER OF UNDERSTANDING WITH CHISAGO COUNTY AND PLANS AND SPECIFICATIONS AND AUTHORIZATION FOR ADVERTISEMENT FOR BIDS FOR THE CSAH 30 CORRIDOR IMPROVEMENT PROJECT

Chisago COUNTY USA | PUBLIC WORKS

JOE TRIPLETT, P.E., DIRECTOR/ENGINEER

OFFICES OF:

ADMINISTRATION
ENGINEERING
COUNTY SURVEYOR
FLEET MAINTENANCE
ROAD MAINTENANCE
TRAFFIC OPERATIONS

MAILING ADDRESS:
313 NORTH MAIN STREET
CENTER CITY, MN 55012

PHYSICAL ADDRESS:
31325 OASIS ROAD
CENTER CITY, MN 55012

PHONE: (651) 213-8700

September 4, 2024

Ms. Lynda Woulfe
City Administrator
City of North Branch
6408 Elm Street
North Branch, MN 55056

Re: Letter of Understanding
CSAH 30 Reconstruction & Safe Routes to School Trail Project

Dear Ms. Woulfe:

Given the many different parts to this project and the funding associated with all of them, I am proposing the following as a letter of understanding (LOU) between the City of North Branch and Chisago County. The intent of the LOU is to address the City and County's involvement in delivering the improvement project, the Safe Routes to School trail and the roundabout at the CSAH 30/377th St. intersection.

Project Understanding
The City of North Branch received a grant to construct a trail on the east side of CSAH 30 and the County programmed an improvement project on CSAH 30 between TH 95 and CSAH 17. As time was of the essence for the trail grant and to minimize the impacts on the adjoining property owners and the highway users, the County and City collaborated to deliver this as one project to be delivered in 2025.

Chisago County acknowledges that there is mutual benefit for both the City and County to partner on the project. Project participation shall be as follows:

- County will provide 100% of the costs for the preparation of plans and specifications for the CSAH 30 and roundabout portion of project.
- City will provide 100% of the costs for the preparation of plans and specifications for the trail portion of project.
- County will provide 100% of the costs for the construction of the CSAH 30 portion of the project.
- County and City will each provide 50% of the costs for the construction of the roundabout at CSAH 30/377th St.
- County will provide 100% of the costs for County Ditch 7 and Sunrise Prairie Trial portions of project.

- City will provide 100% of the construction costs and material testing associated with the Safe Routes to School trail.
- County will provide 100% of costs for the construction engineering for the entire project.
- City will provide inspection oversight for all sanitary sewer and water portions of project.
- City will acquire necessary rights of entries and right of way required to construct the project.

If the participation as outlined above for the project is acceptable to the City of North Branch, please indicate so by signing this letter at the bottom and returning a copy to me.

Sincerely,

Joe Triplett, PE
Director | County Engineer
Chisago County Public Works

Approved by:

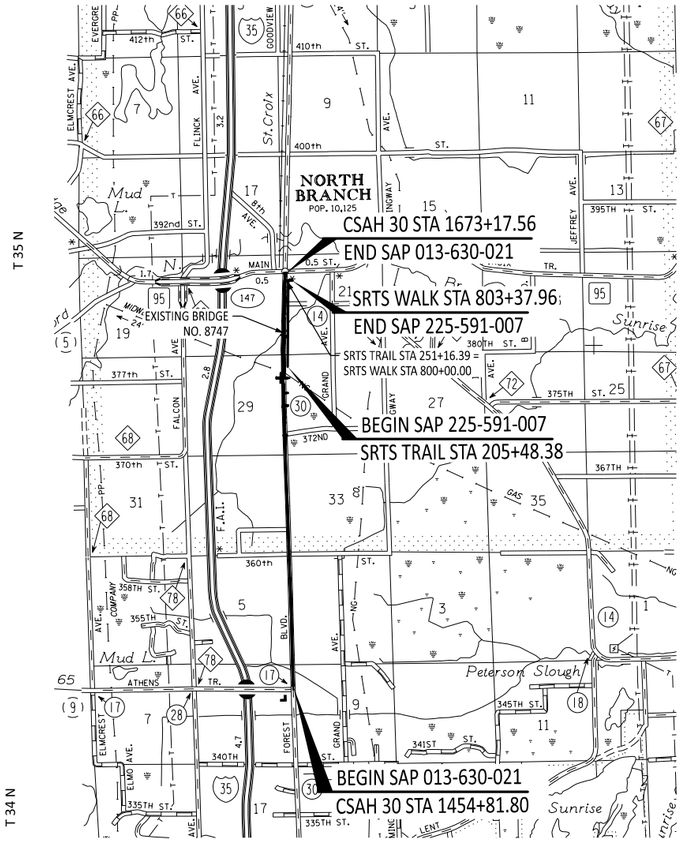
_____ Date: _____

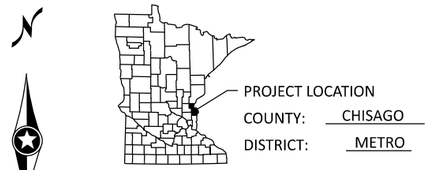
Lynda Woulfe
North Branch City Administrator

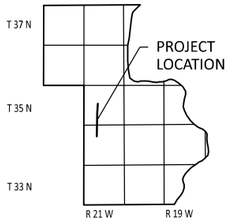
MINNESOTA DEPARTMENT OF TRANSPORTATION
CHISAGO COUNTY, MINNESOTA

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)







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

SCALES

INDEX MAP 0 4000 8000
PLAN 0 50 100
PROFILE HORIZ. 0 50 100
VERT. 0 5 10
CROSS SECTION 0 10 20

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 ACHEIVED 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".

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.

INDEX

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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

_____ DATE: _____
APPROVED: CITY ENGINEER - CITY OF NORTH BRANCH

_____ DATE: _____
APPROVED: CITY ENGINEER - CITY OF STACY

_____ DATE: _____
APPROVED: CHISAGO COUNTY ENGINEER

_____ DATE: _____
DISTRICT STATE AID ENGINEER
REVIEWED FOR COMPLIANCE WITH STATE AID RULES / POLICY

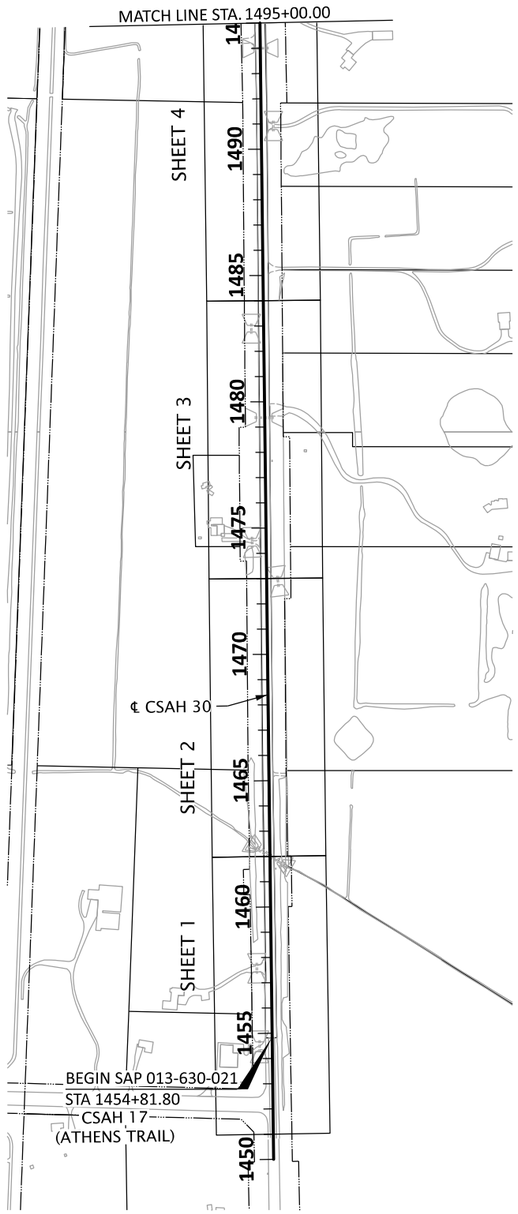
_____ DATE: _____
STATE AID ENGINEER: APPROVED FOR STATE AID FUNDING

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\02366-000\03_Discipline\Roadway\Sheets\02366-000_1sh

CSAH 30 (Forest Blvd)



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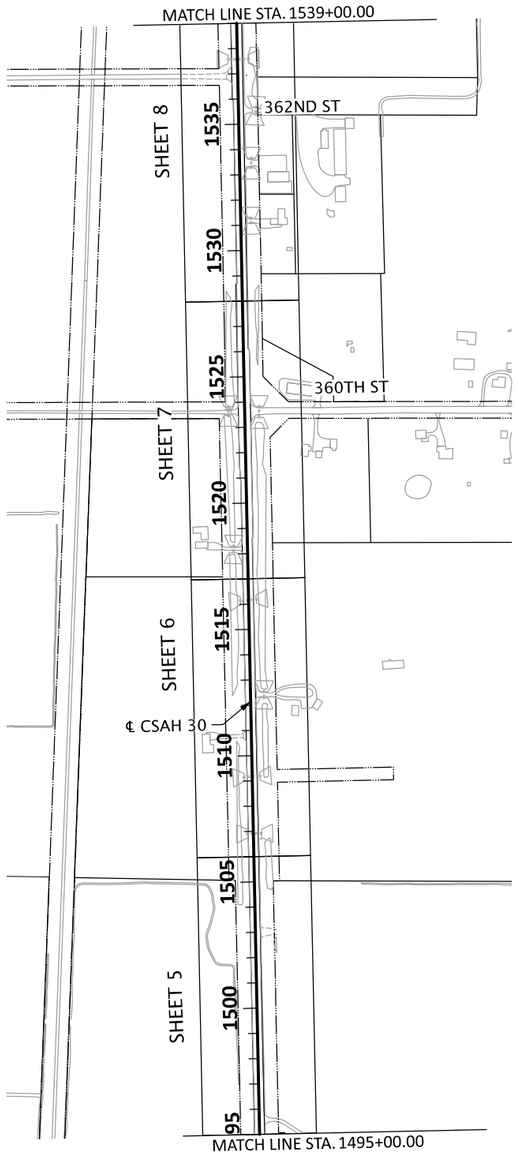

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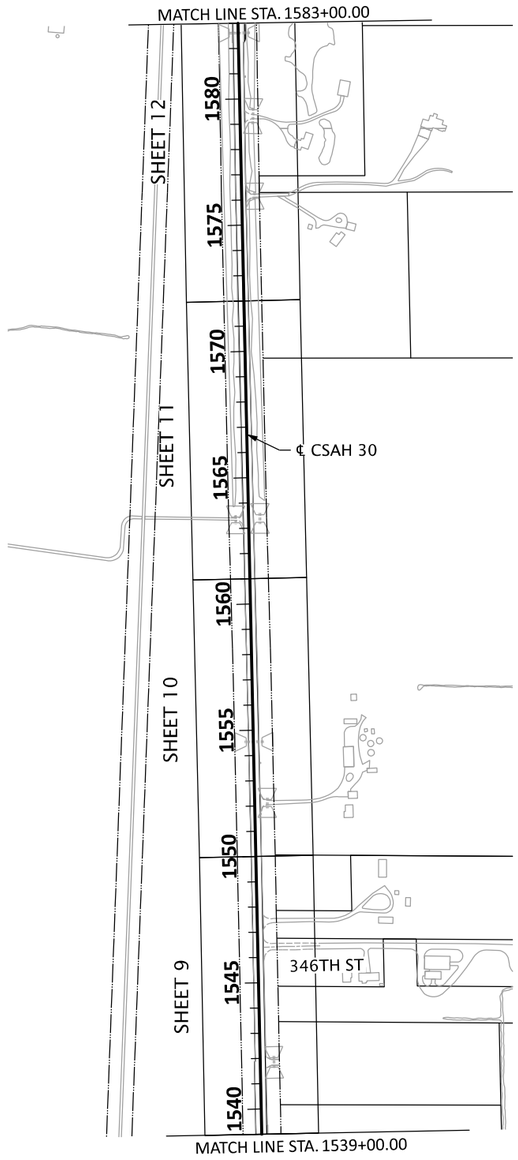

SECTION	INPLACE TOPOGRAPHY & UTIL PLANS	REMOVAL PLANS	CONSTRUCTION PLAN & PROFILE	DRAINAGE PLAN	TURF & EROSION CONTROL PLAN	SIGNING & PAVEMENT MARKING PLAN
1	97	108	119	-	179	193
2	97	108	120	-	179	193
3	98	109	121	-	180	194
4	98	109	122	-	180	194
5	99	110	123	-	181	195
6	99	110	124	-	181	195
7	100	111	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

PLAN SHEET INDEX PER SECTION

LEGEND

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

DATE: 9/12/2024 1:58:16 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_gl

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

Chisago COUNTY USA

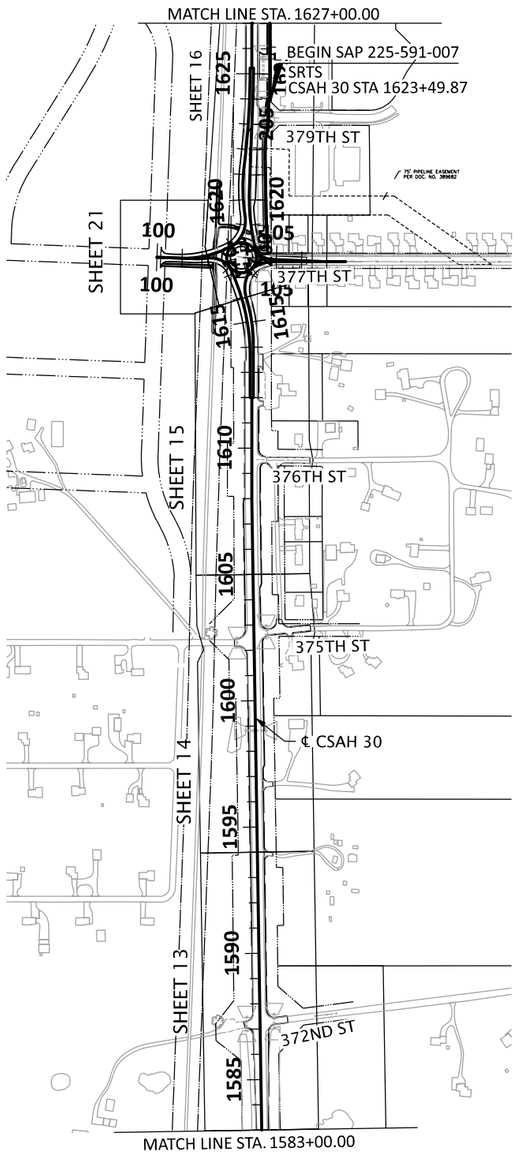
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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)



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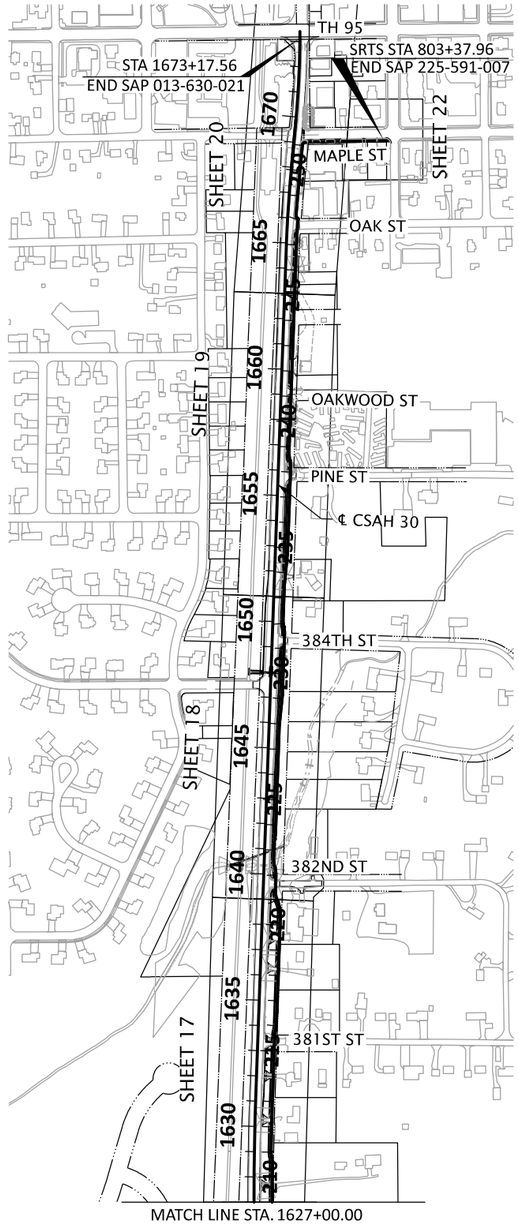

SECTION		INPLACE TOPOGRAPHY & UTIL PLANS	REMOVAL PLANS	CONSTRUCTION PLAN & PROFILE	DRAINAGE PLAN	TURF & EROSION CONTROL PLAN	SIGNING & PAVEMENT MARKING PLAN
13	PLAN SHEET INDEX PER SECTION	103	114	131	164	185	199
14		103	114	132	164	185	199
15		104	115	133	165	186	200
16		104	115	134	165	186	200
17		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
- PROPOSED CONSTRUCTION
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- INPLACE RAILROAD RIGHT OF WAY
- INPLACE RIGHT OF WAY
- CONSTRUCTION LIMITS
- WETLAND DELINEATION - AREA OF ENVIRONMENTAL SENSITIVITY

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

Chisago COUNTY USA

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 3 OF 216 SHEETS

DATE: 9/12/2024 1:58:19 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_gl

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
		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

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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

DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

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 4 OF 216 SHEETS

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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(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).

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(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

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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

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 3:53:04 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
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

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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

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wsb

Chisago COUNTY USA

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 3:53:05 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					
						QUANTITY	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

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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

ESTIMATED QUANTITIES
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SHEET 7 OF 216 SHEETS

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

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														
STA 399+60.04 TO STA 401+25													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

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

SHEET 8 OF 216 SHEETS

DATE: 9/12/2024 1:58:42 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_tab

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															
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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															
STA 399+60.04 TO STA 401+25									1						
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

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

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Chisago COUNTY USA

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 9 OF 216 SHEETS

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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
TOTALRECONSTRUCTION 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

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CHISAGO COUNTY, MINNESOTA

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

SHEET 10 OF 216 SHEETS

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

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CHISAGO COUNTY, MINNESOTA

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

SHEET 11 OF 216 SHEETS

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
TOTALRECONSTRUCTION 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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CHISAGO COUNTY, MINNESOTA

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

SHEET 12 OF 216 SHEETS

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

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:

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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.
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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.

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Checked By: MAN
Approved By: NEH

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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

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

SHEET 14 OF 216 SHEETS

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**

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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

SHEET 15 OF 216 SHEETS

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.

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SOILS AND CONSTRUCTION NOTES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 16 OF 216 SHEETS

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 CONSTRUCTIOON 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.

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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

wsb

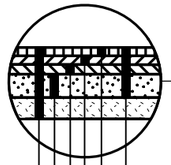
Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

SOILS AND CONSTRUCTION NOTES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 17 OF 216 SHEETS

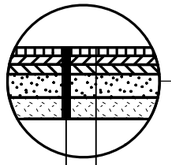


INSET A

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

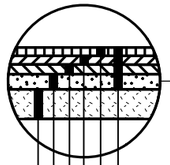
*REMOVE BITUMINOUS PAVEMENT DEPTH SHALL NOT IMPACT THE INPLACE CONCRETE PAVEMENT, ONLY ENOUGH TO PLACE PROPOSED NEW MATERIAL.



INSET B

FOG SEAL
CSAH 30 - SHOULDERS

- FOG SEAL
- INPLACE SHOULDER PAVEMENT

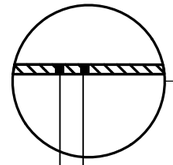


INSET C

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

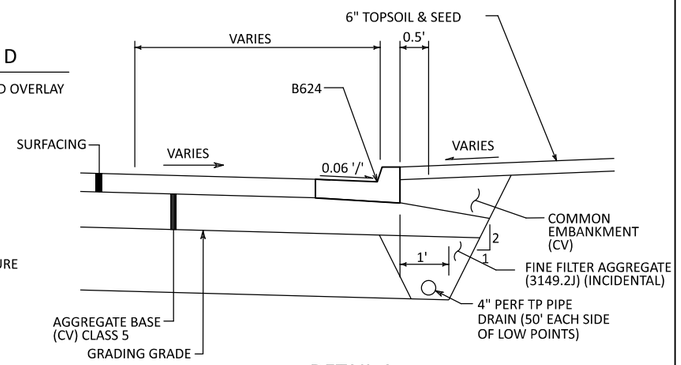
*REMOVE BITUMINOUS PAVEMENT DOWN TO INPLACE CONCRETE PAVEMENT



INSET D

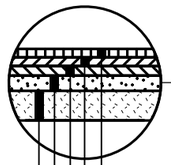
CSAH 30 MILL AND OVERLAY

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



DETAIL A

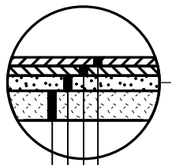
CONCRETE CURB & GUTTER



INSET E

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

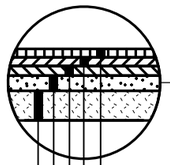
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5" NON-WEAR COURSE MIXTURE (SPNWB330B) MNDOT SPEC 2360
- 6" AGGREGATE BASE (CV) CLASS 5
- 18" SELECT GRANULAR EMBANKMENT



INSET F

RECONSTRUCTION / WIDENING
CSAH 30 - SHOULDERS

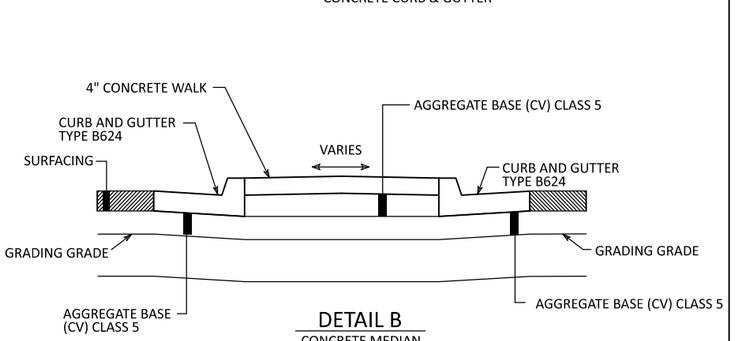
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 8" AGGREGATE BASE (CV) CLASS 5
- 18" SELECT GRANULAR EMBANKMENT



INSET G

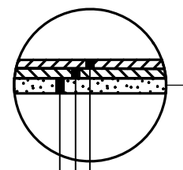
CSAH 30 - ROUNDABOUT

- 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



DETAIL B

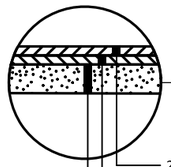
CONCRETE MEDIAN



INSET G1

ALL SIDE STREETS

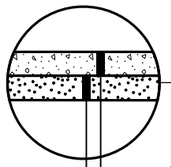
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2.5" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 8" AGGREGATE BASE (CV) CLASS 5



INSET H

BITUMINOUS RESIDENTIAL DRIVEWAY

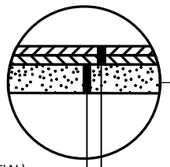
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 2" TYPE SP 12.5 WEAR COURSE MIXTURE (SPWEB340C) MNDOT SPEC 2360
- 6" AGGREGATE BASE (CV) CLASS 5



INSET I

CONCRETE DRIVEWAY

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

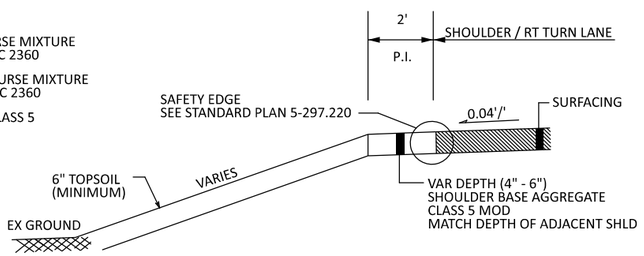


INSET J

BITUMINOUS TRAIL

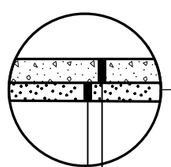
- 3" TYPE SP 9.5 WEAR COURSE MIXTURE** (SPWEA230C) MNDOT SPEC 2360 - 1 LIFTS
- 6" AGGREGATE BASE (CV) CLASS 5

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



DETAIL C

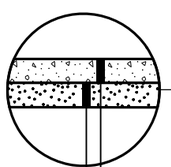
RURAL SHOULDER PI



INSET K

6" CONCRETE WALK
(PED RAMPS & LANDINGS)

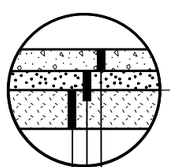
- 6" CONCRETE CURB RAMP WALK
- 4" AGGREGATE BASE (CV) CLASS 5



INSET L

4" CONCRETE WALK
(SIDEWALKS & MEDIANS)

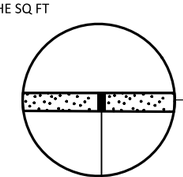
- 4" CONCRETE WALK
- 6" AGGREGATE BASE (CV) CLASS 5



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

DATE: 9/12/2024 1:59:24 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-145typ-001

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

wsb

Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

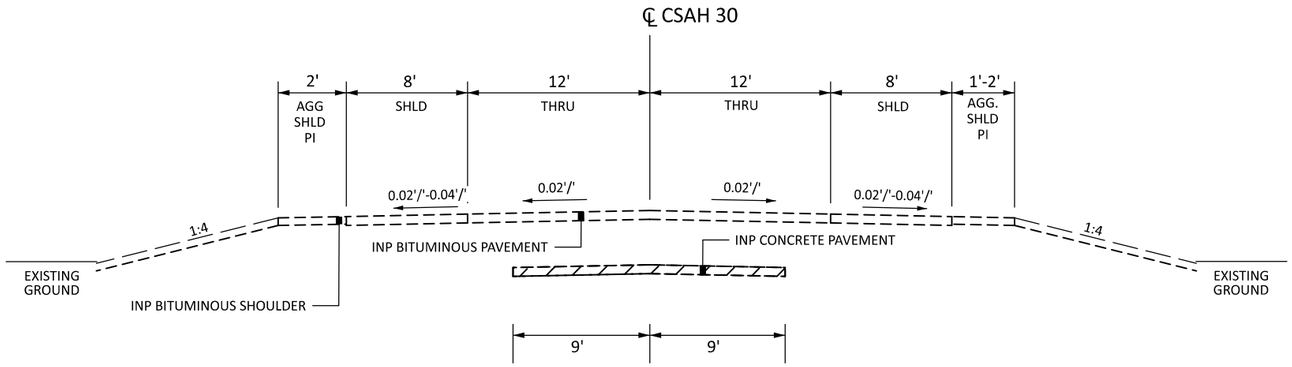
CHISAGO COUNTY, MINNESOTA

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

SHEET 18 OF 216 SHEETS

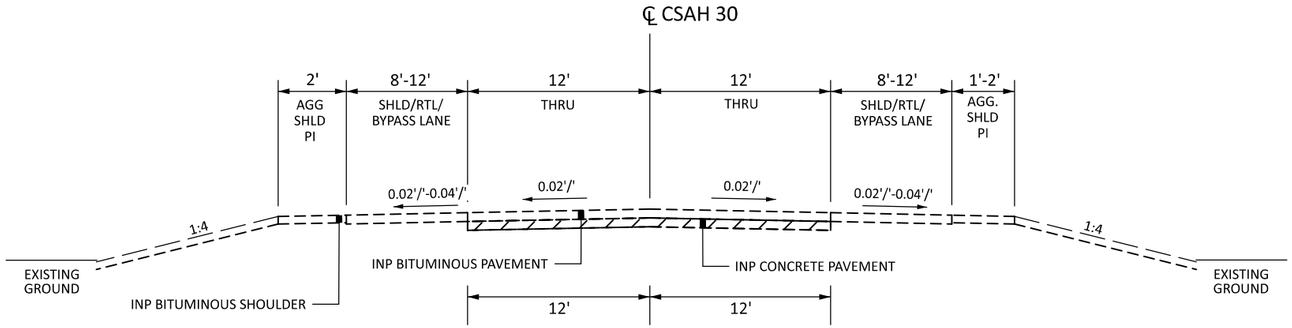
EXISTING CSAH 30

STA 1569+00.00 TO STA 1583+07.00



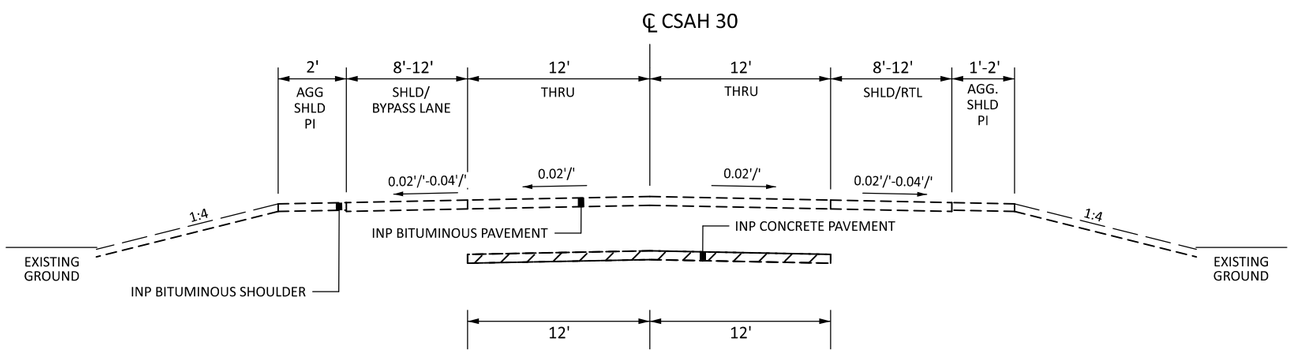
EXISTING CSAH 30

STA 1527+00.00 TO STA 1548+00.00
STA 1637+00.00 TO STA 1653+00.00
STA 1653+00.00 TO STA 1664+00.00



EXISTING CSAH 30

STA 1454+81.80 TO STA 1527+00.00
STA 1548+00.00 TO STA 1569+00.00
STA 1612+00.00 TO STA 1637+00.00



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.

NO.	DATE	BY	CHK	REVISIONS

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

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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 19 OF 216 SHEETS

DATE: 9/12/2024 1:59:28 PM
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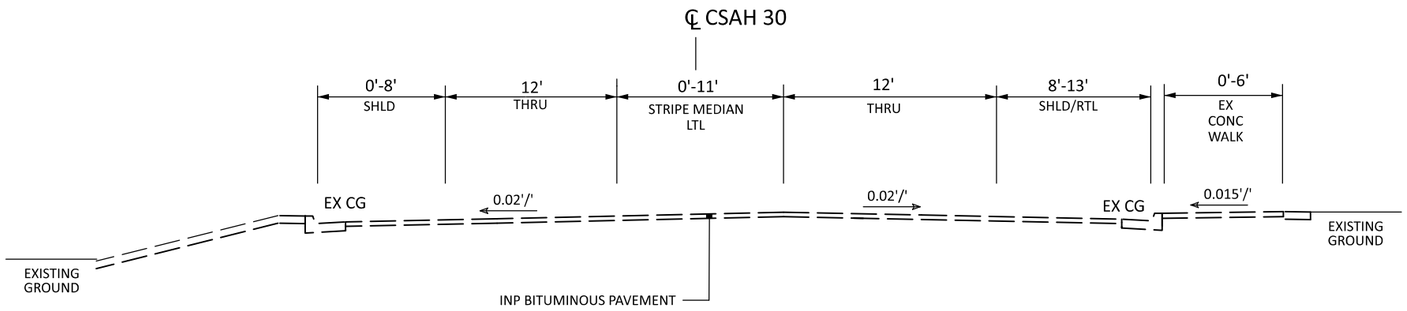
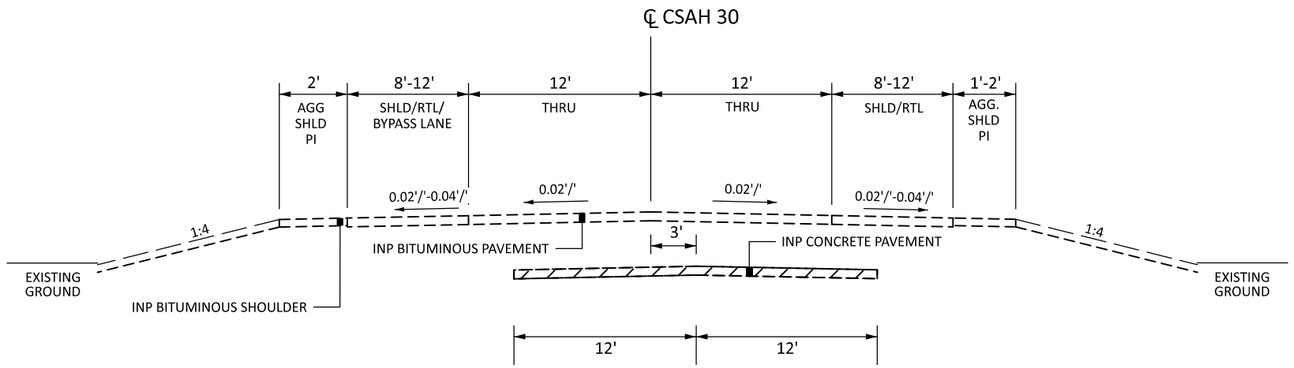
EXISTING CSAH 30

STA 1664+00.00 TO STA 1673+17.56



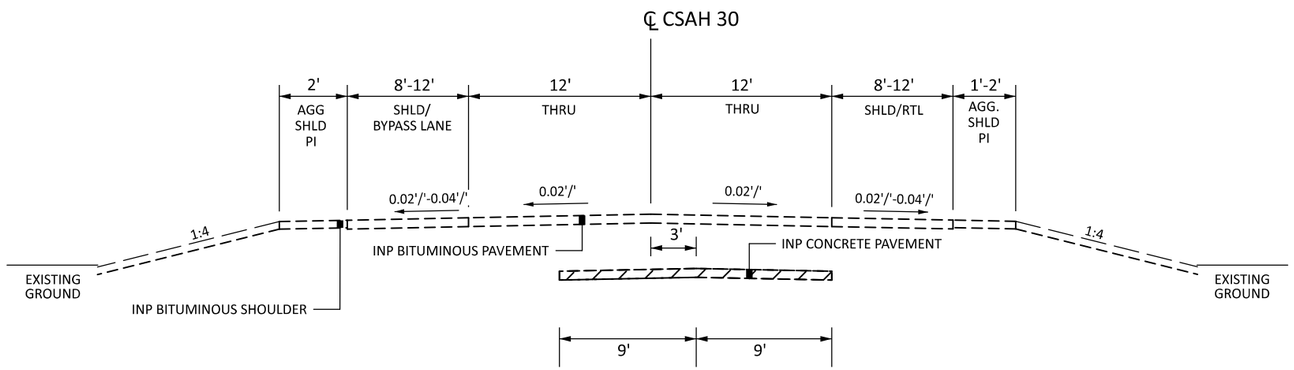
EXISTING CSAH 30

STA 1600+50.00 TO STA 1612+00.00



EXISTING CSAH 30

STA 1583+07.00 TO STA 1600+50.00



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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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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

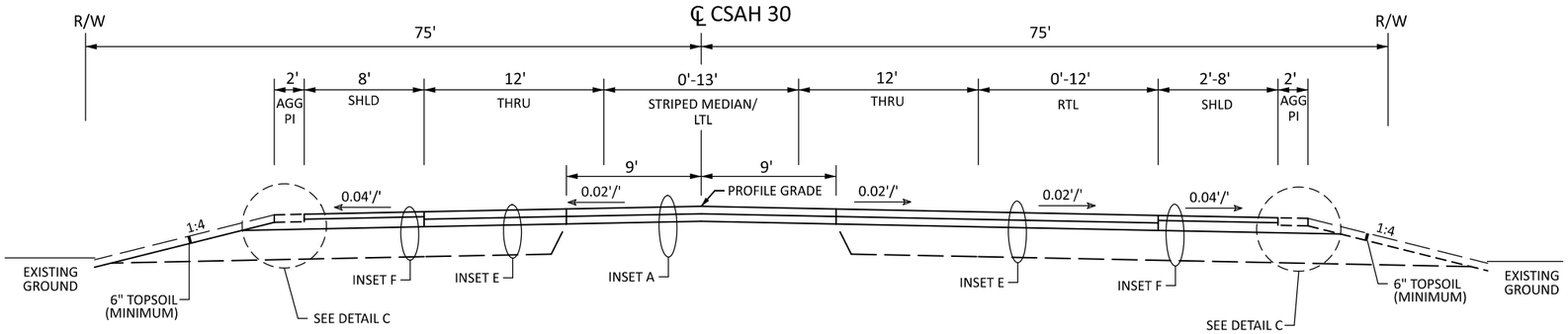
CHISAGO COUNTY, MINNESOTA

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

SHEET 20 OF 216 SHEETS

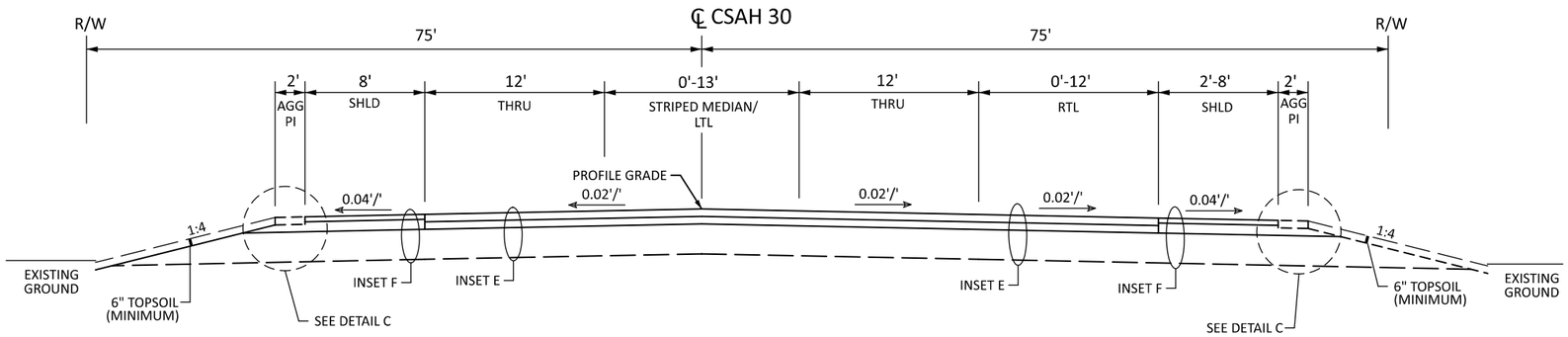
PROPOSED TYPICAL SECTION 3 - CSAH 30

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



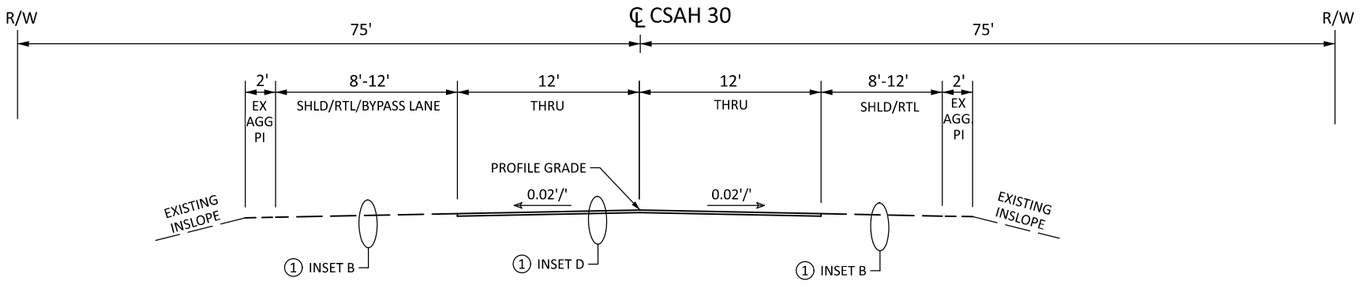
PROPOSED TYPICAL SECTION 2 - CSAH 30

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

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Chisago COUNTY USA

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 21 OF 216 SHEETS

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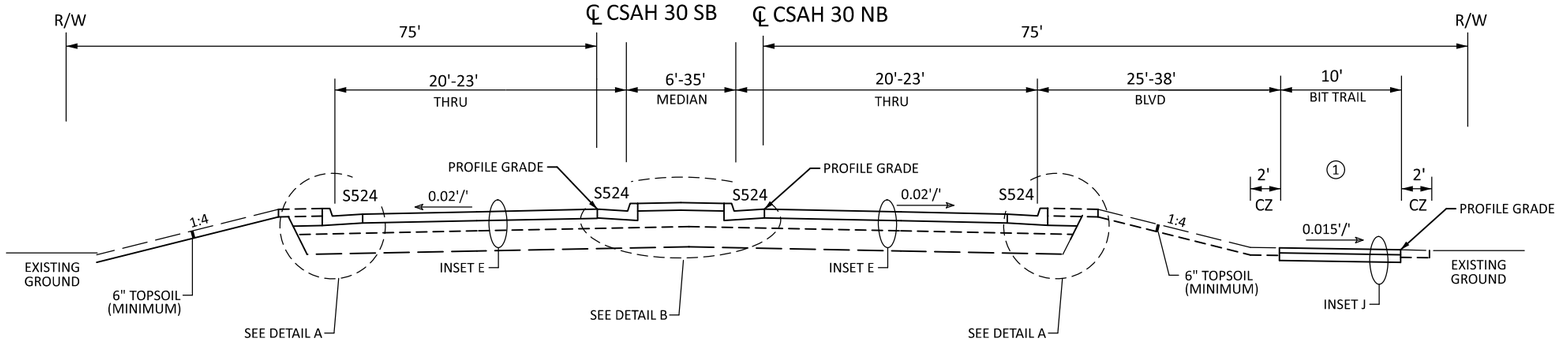
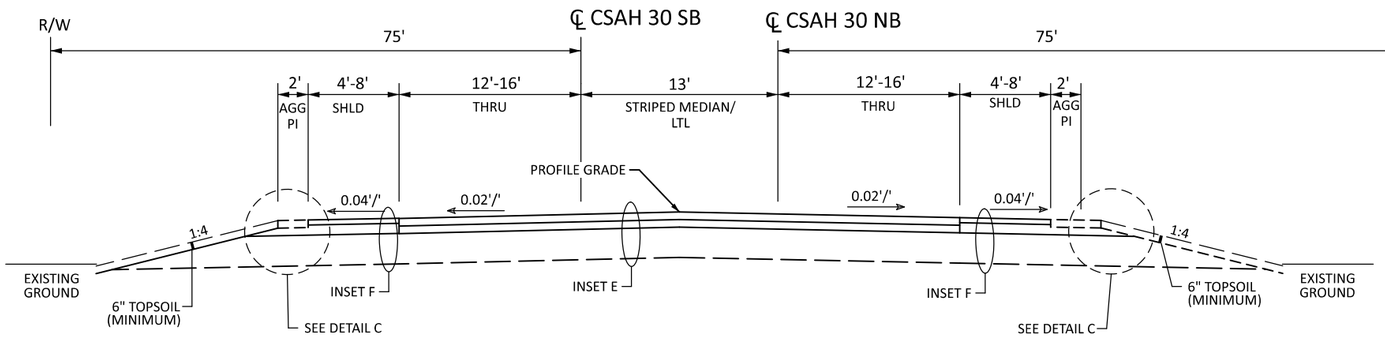
PROPOSED TYPICAL SECTION 6 - CSAH 30

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



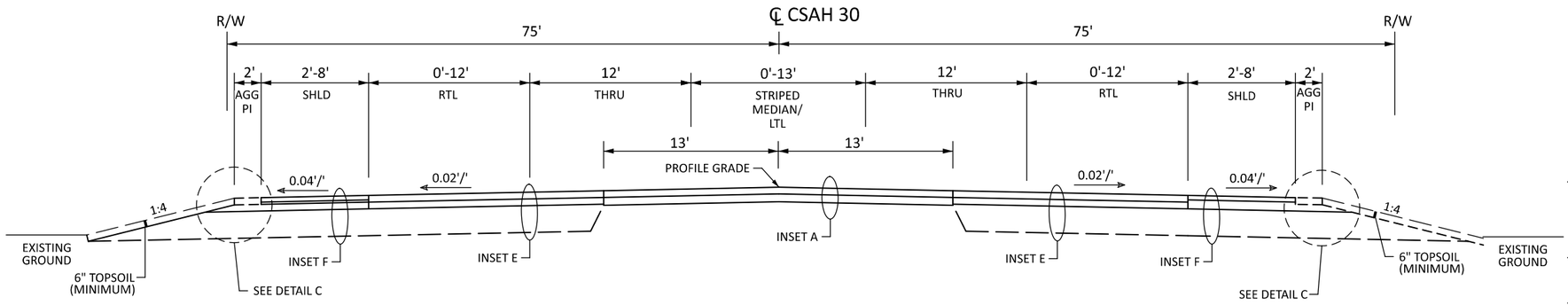
PROPOSED TYPICAL SECTION 5 - CSAH 30

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

NO.	DATE	BY	CHK	REVISIONS

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

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wsb

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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

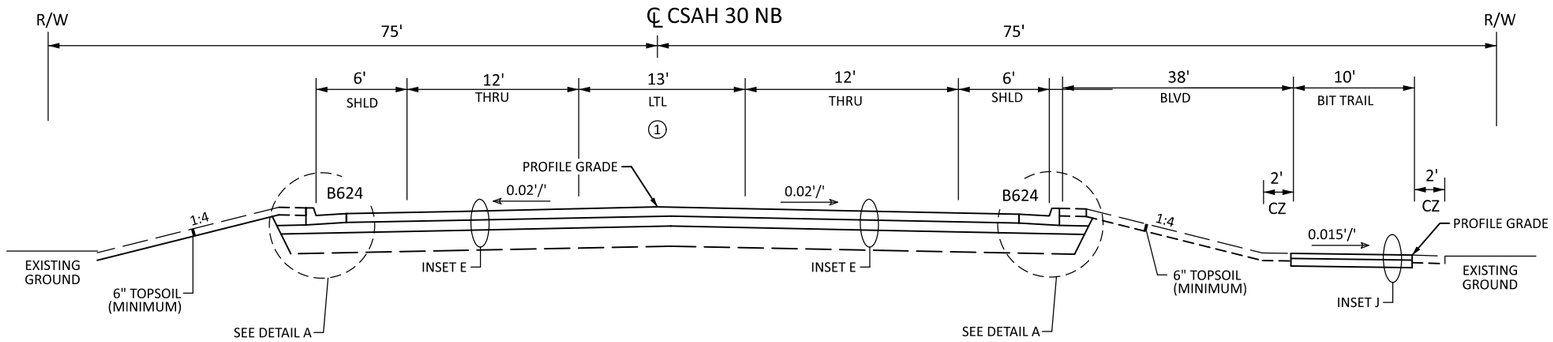
TYPICAL SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 22 OF 216 SHEETS

DATE: 9/12/2024 1:59:30 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-145typ-001

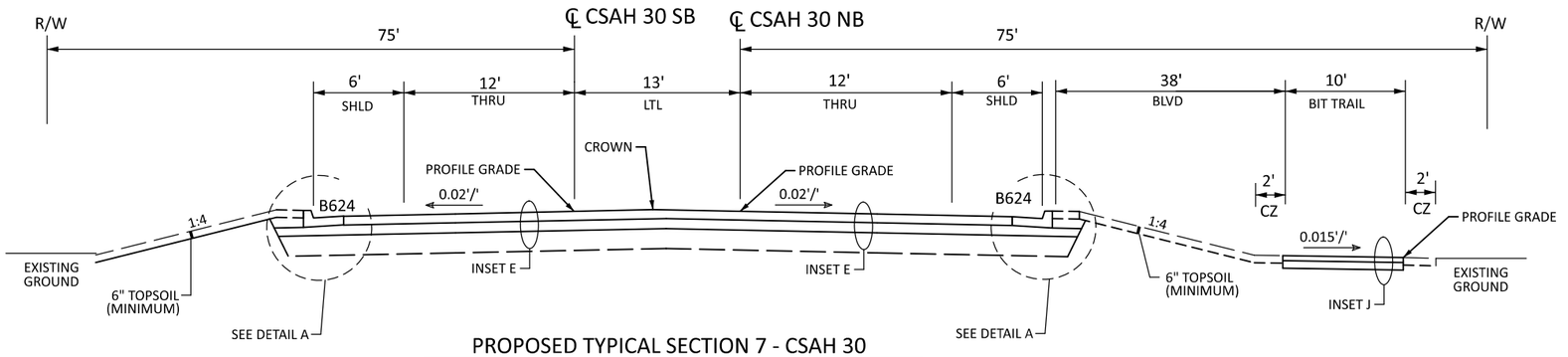
PROPOSED TYPICAL SECTION 9 - CSAH 30

STA 1625+22 TO STA 1626+00



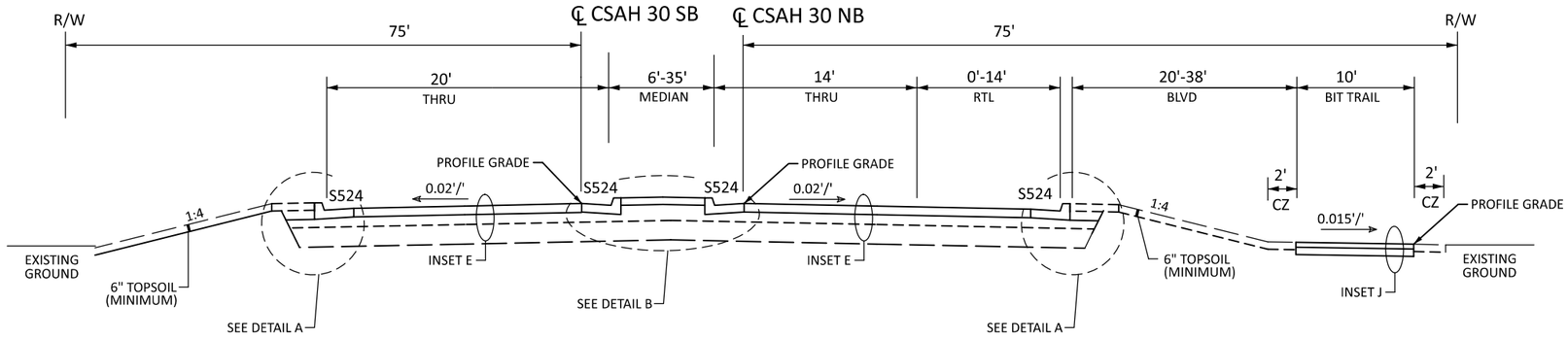
PROPOSED TYPICAL SECTION 8 - CSAH 30

STA 1622+84 TO STA 1625+22



PROPOSED TYPICAL SECTION 7 - CSAH 30

STA 1619+71 TO STA 1622+84



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

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

wsb

Chisago COUNTY USA

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 23 OF 216 SHEETS

DATE: 9/12/2024 1:59:31 PM
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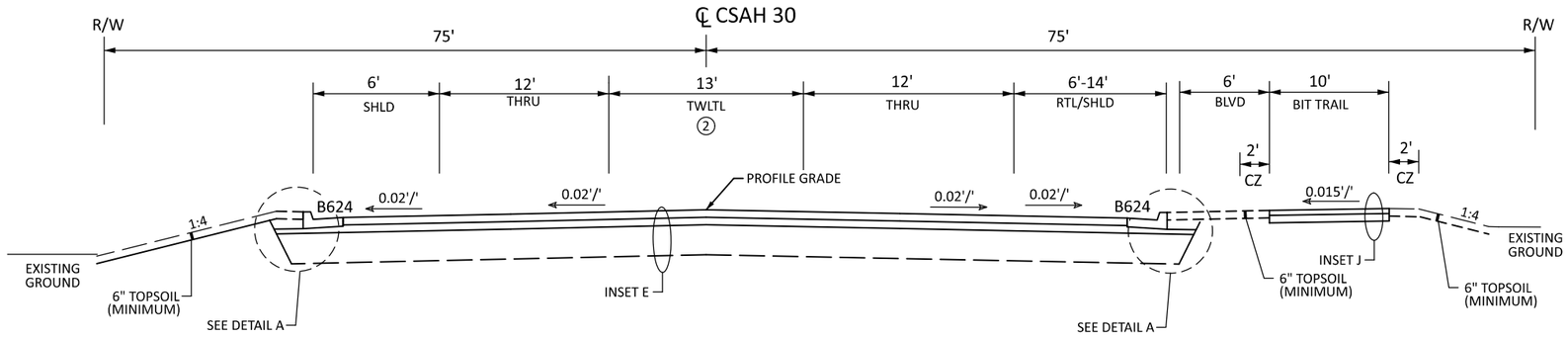
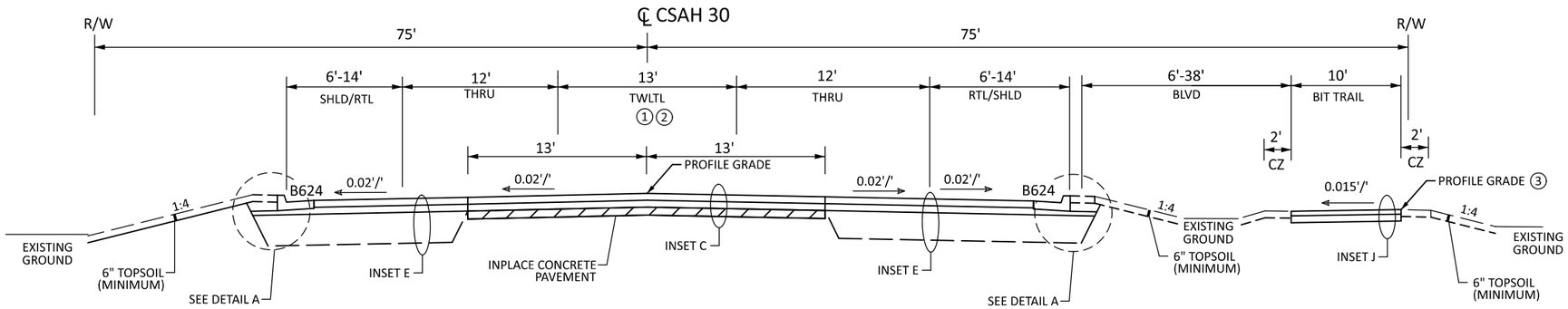
PROPOSED TYPICAL SECTION 12 - CSAH 30

STA 1653+00 TO STA 1665+59



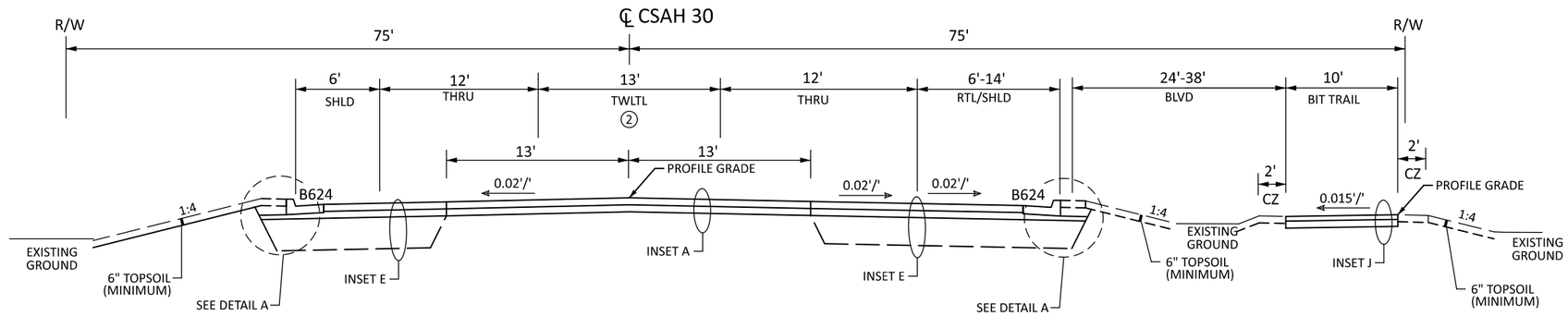
PROPOSED TYPICAL SECTION 11 - CSAH 30

STA 1637+00 TO STA 1653+00



PROPOSED TYPICAL SECTION 10 - CSAH 30

STA 1626+00 TO STA 1637+00



SPECIFIC NOTES:

① SEE CONSTRUCTION PLANS FOR LOCATION OF PEDESTRIAN REFUGE MEDIAN

② SEE CONSTRUCTION PLANS FOR LOCATIONS OF DEDICATED LEFT TURN LANES

③ 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.

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NICHOLAS E. HENTGES, PE

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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

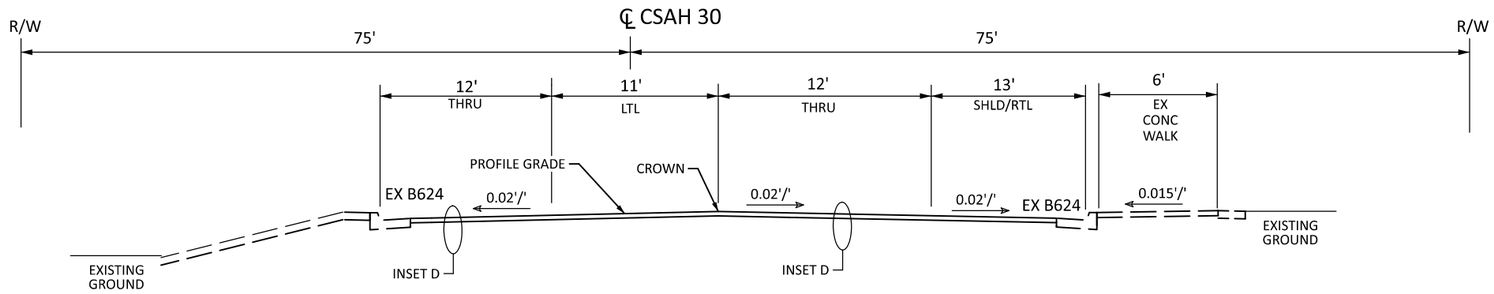
CHISAGO COUNTY, MINNESOTA

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

SHEET 24 OF 216 SHEETS

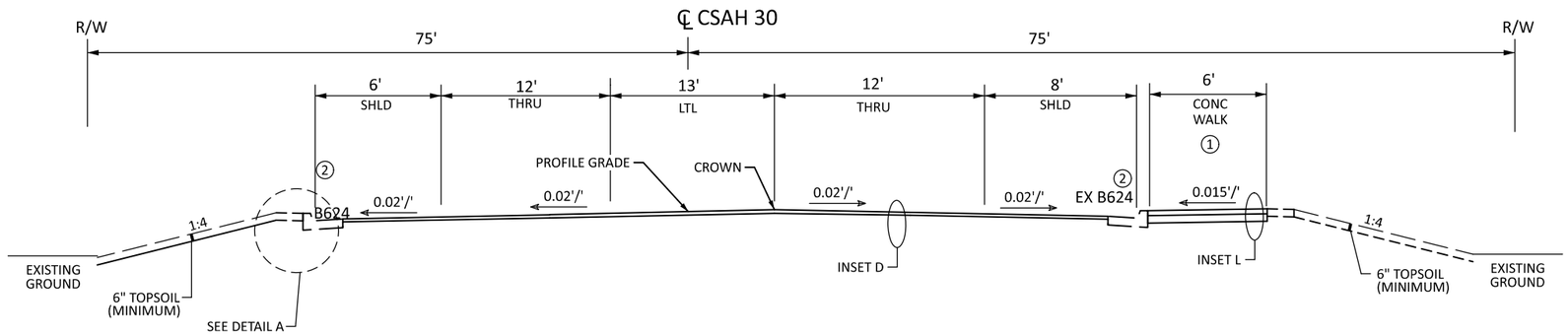
PROPOSED TYPICAL SECTION 15 - CSAH 30

STA 1669+43 TO STA 1673+17.56



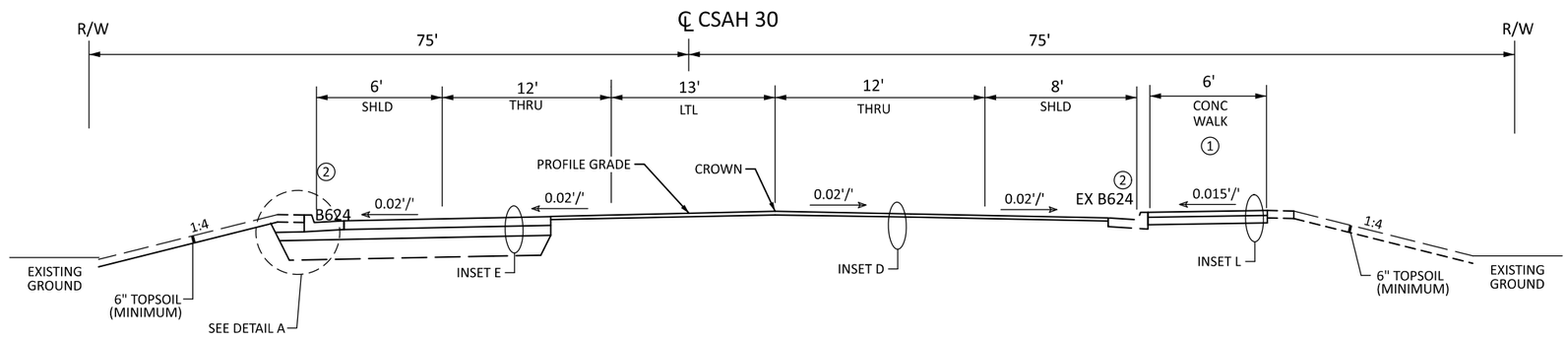
PROPOSED TYPICAL SECTION 14 - CSAH 30

STA 1666+76 TO STA 1669+43



PROPOSED TYPICAL SECTION 13 - CSAH 30

STA 1665+59 TO STA 1666+76



SPECIFIC NOTES:

① SEE CONSTRUCTION PLANS FOR BEGINNING AND END OF CONCRETE WALK AND CURB AND GUTTER CONSTRUCTION

② SEE CONSTRUCTION PLANS FOR BEGINNING AND END OF CURB TRANISITION

GENERAL NOTES:

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

CHISAGO COUNTY, MINNESOTA

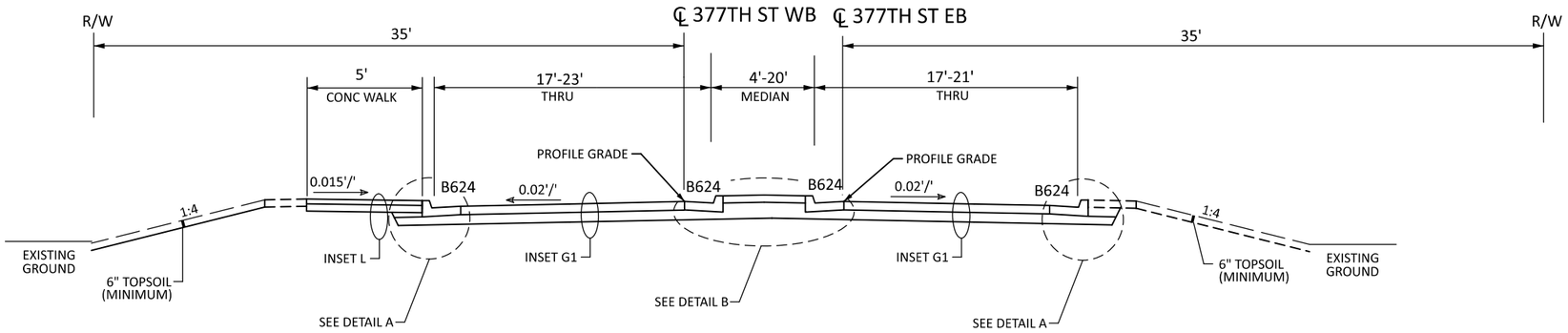
TYPICAL SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 25 OF 216 SHEETS

DATE: 9/12/2024 1:59:32 PM
PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-145typ-001

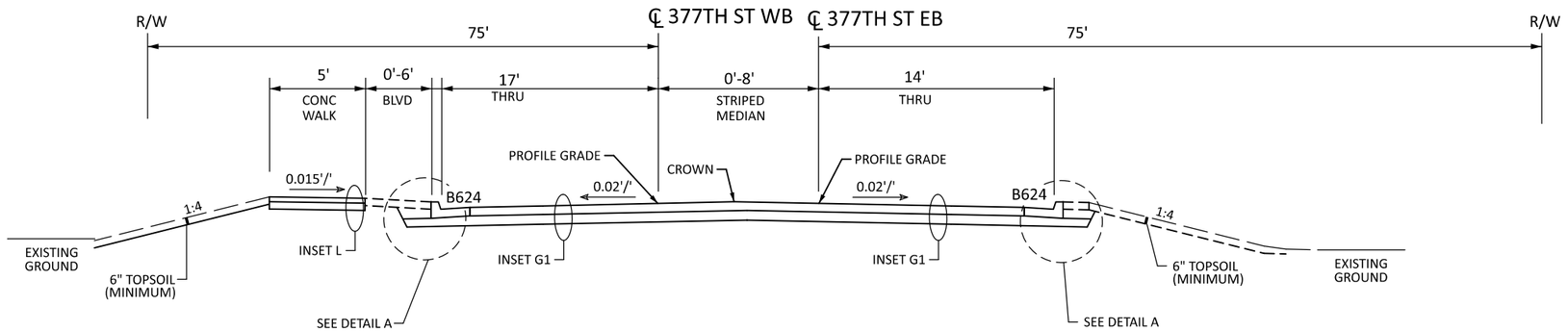
PROPOSED TYPICAL SECTION 18 - 377TH ST

STA 104+42.79 TO STA 104+91.47



PROPOSED TYPICAL SECTION 17 - 377TH ST

STA 104+91.47 TO STA 106+20.00



GENERAL NOTES:

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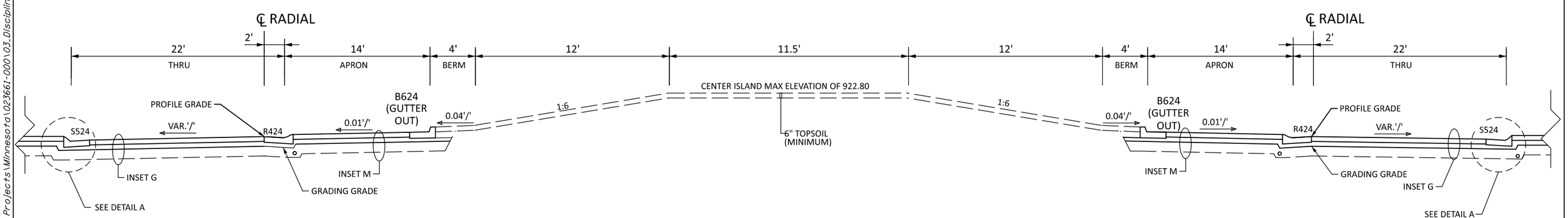
PROPOSED TYPICAL SECTION 16 - CSAH 30

377TH ST ROUNDABOUT



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Plan By: MKV
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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

TYPICAL SECTIONS
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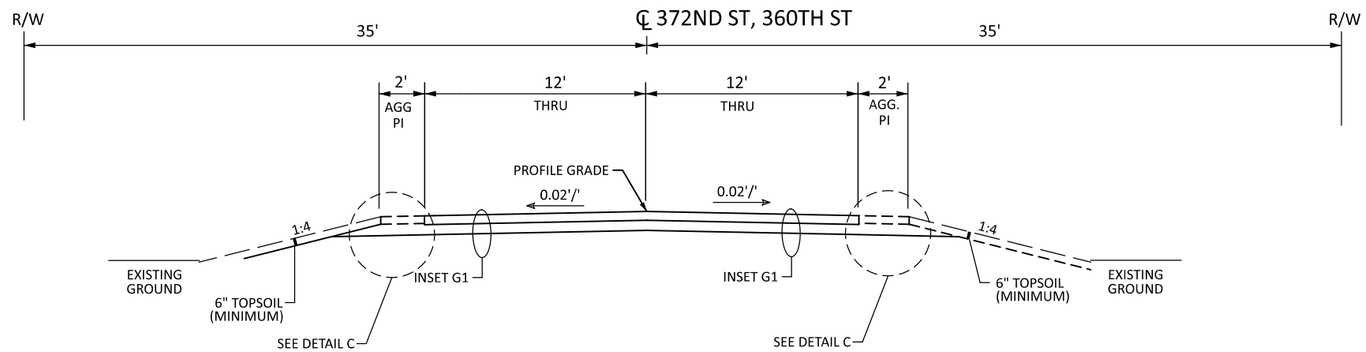
SHEET 26 OF 216 SHEETS

DATE: 9/12/2024 1:59:33 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-145typ-001

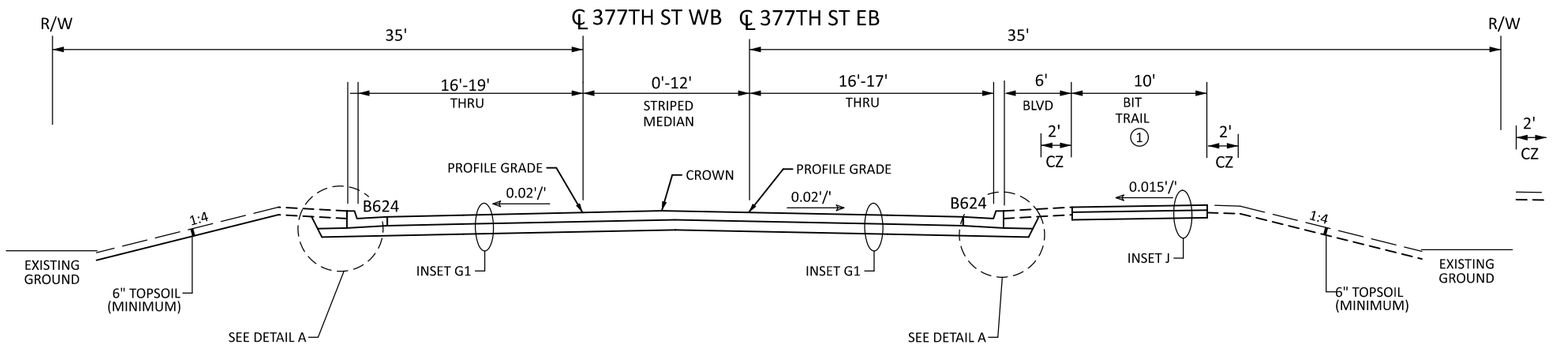
PROPOSED TYPICAL SECTION 21 - 372ND ST

STA 299+40 TO STA 300+23.68



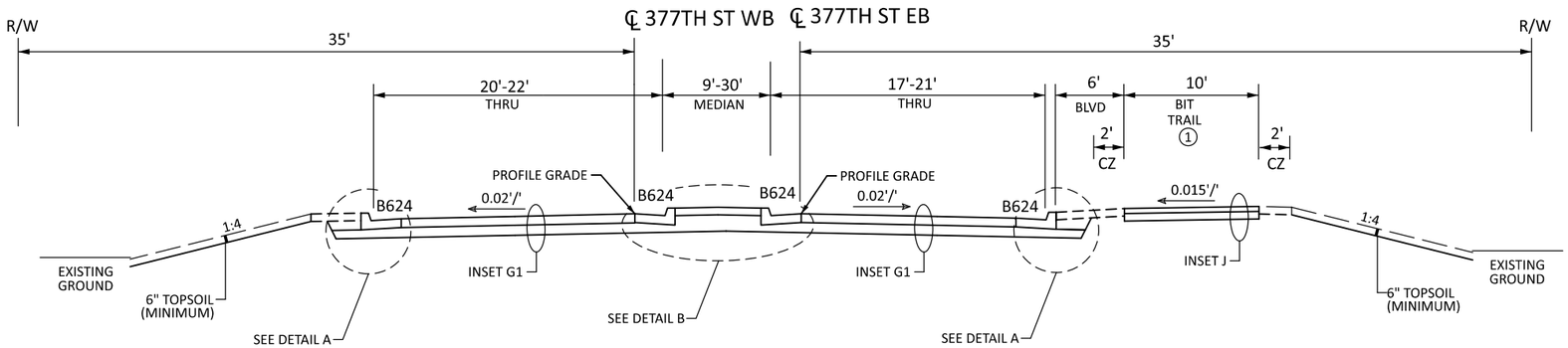
PROPOSED TYPICAL SECTION 20 - 377TH ST

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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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

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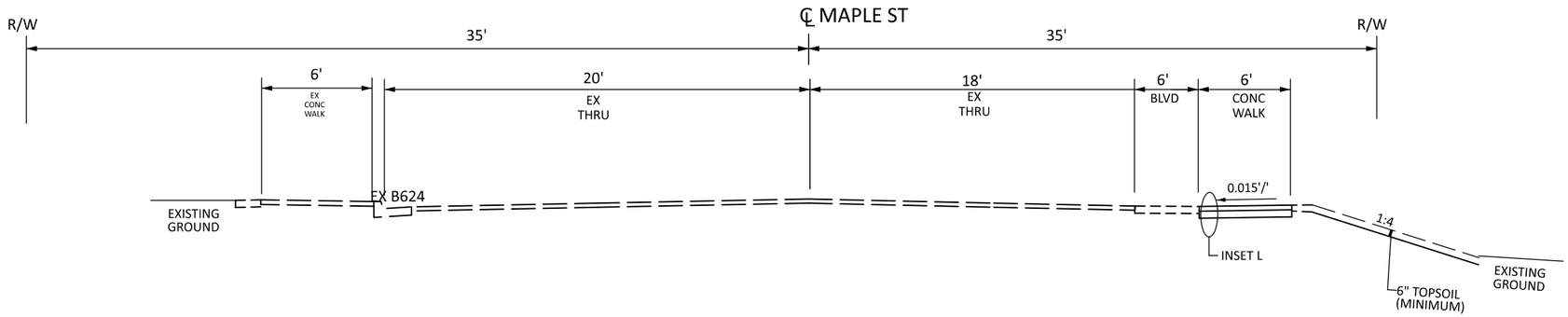
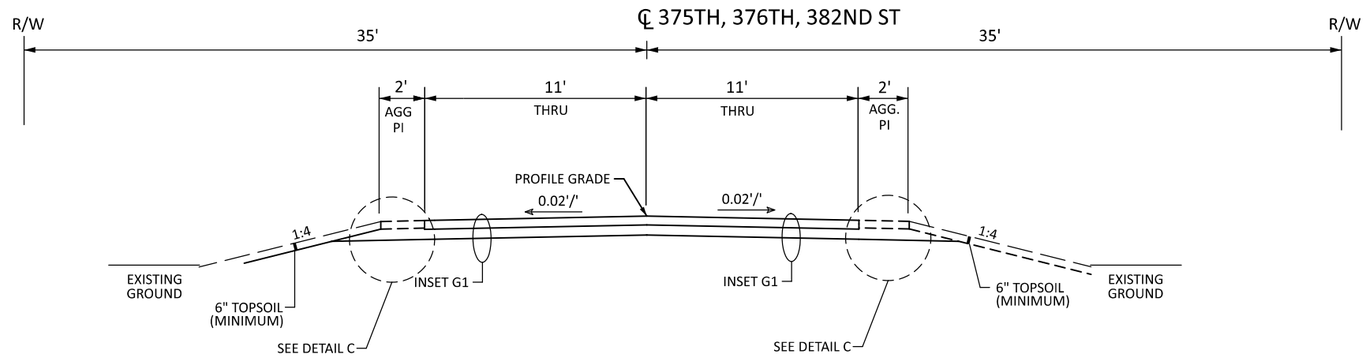
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-145typ-001

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



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CSAH 30 (Forest Blvd) Improvements
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CHISAGO COUNTY, MINNESOTA

TYPICAL SECTIONS
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SHEET 28 OF 216 SHEETS

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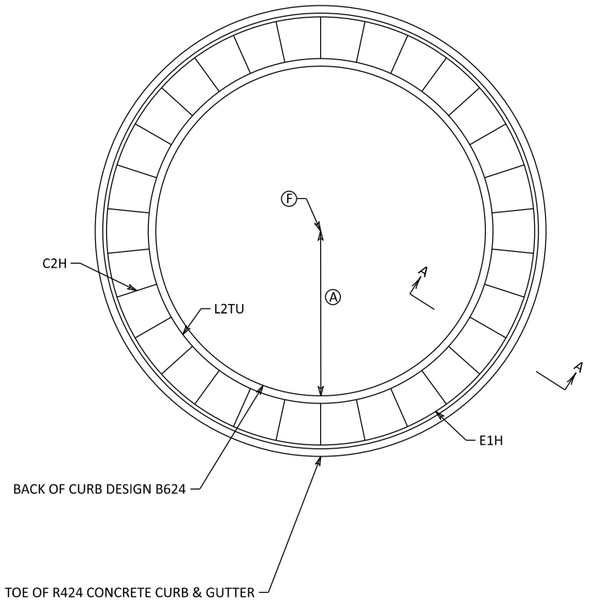
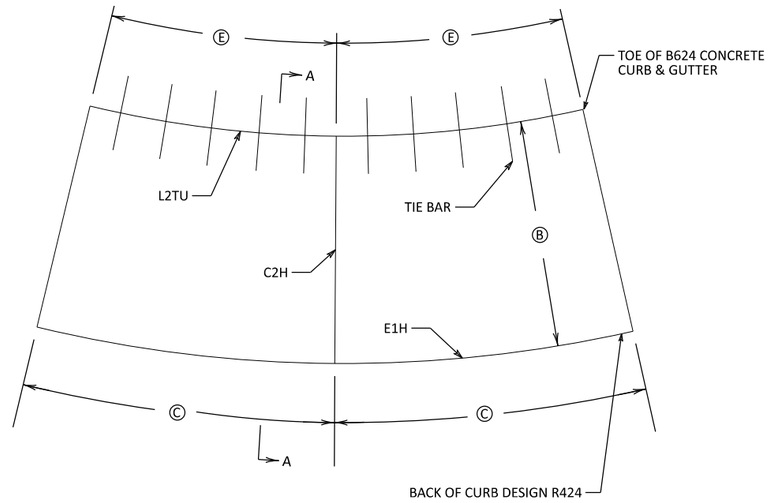
Truck Apron Details

NOT TO SCALE



PLAN VIEW JOINT LAYOUT

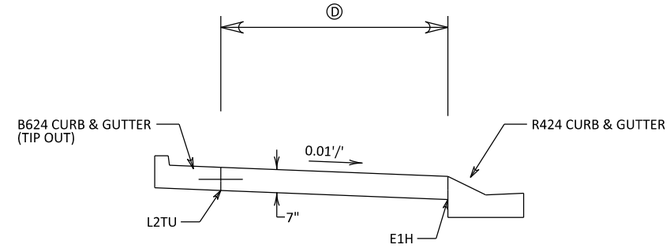
NOTE: CIU JOINT SHOULD EXTEND THROUGH CURB AND GUTTER



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



SECTION A-A

GENERAL NOTES:

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

DATE: 9/12/2024 1:59:43 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_det

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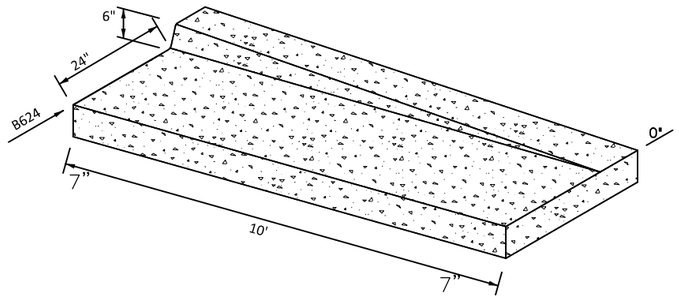
Chisago COUNTY USA

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

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Chisago COUNTY USA

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

INTERNAL DIAMETER OF PIPE (INCHES)	WEIGHT PER LINEAR FEET OF PIPE	MINIMUM WALL THICKNESS	CLASS I		CLASS II		CLASS III		CLASS IV		CLASS V	
			D - LOAD TO PRODUCE A 0.01" CRACK (LBS./LIN. FT./FT. OF DIA.)									
			800		1000		1350		2000		3000	
			D - LOAD TO PRODUCE ULTIMATE LOAD (LBS./LIN. FT./FT. OF DIA.)									
			1200		1500		2000		3000		3750	
			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	— ⑥	—	0.07 ②	—	0.07 ②	—	0.07	—	0.10	—
15	127	2¼	— ⑥	—	0.07 ②	—	0.07 ②	—	0.10	—	0.14	—
18	168	2½	— ⑥	—	0.07 ②	—	0.07 ②	—	0.14	—	0.19	—
21	214	2¾	— ⑥	—	0.07 ②	—	0.07 ②	—	0.20	—	0.24	—
24	265	3	— ⑥	—	0.07 ②	—	0.07 ②	—	0.27	—	0.30	—
27	322	3¼	— ⑥	—	0.13	—	0.16	—	0.31	—	0.38	0.23
30	384	3½	— ⑥	—	0.14	—	0.18	—	0.35	—	0.41	0.25
33	452	3¾	— ⑥	—	0.15	—	0.20	—	0.27	0.16	0.46	0.28
36	524	4	— ⑥	—	0.12 ③	0.07	0.17 ③	0.10	0.30	0.18	0.50	0.30
42	685	4½	— ⑥	—	0.15	0.09	0.21	0.13	0.35	0.21	0.60	0.36
48	867	5	— ⑥	—	0.18	0.11	0.24	0.14	0.42 ⑤	0.25	0.73 ⑤	0.44 ⑤
54	1070	5½	— ⑥	—	0.22	0.13	0.29	0.17	0.50 ⑤	0.30	⑦	⑦
									CONCRETE 5000 PSI			
60	1296	6	0.21	0.13	0.25	0.15	0.34	0.20	0.59 ⑤	0.35	⑦	⑦
66	1542	6½	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 ①⑤	0.58 ⑤
78	2098	7½	0.32	0.19	0.40 ⑤	0.24	0.57 ⑤	0.34	0.71 ①⑤	0.43 ⑤	1.05 ①⑤	0.63 ⑤
84	2410	8	0.37	0.22	0.46 ⑤	0.28	0.64 ⑤	0.38	0.76 ①⑤	0.46 ⑤	1.14 ①⑤	0.68 ⑤
							CONCRETE 5000 PSI					
90	2740	8½	0.41 ⑤	0.25	0.51 ⑤	0.31	0.69 ⑤	0.41 ⑤	0.82 ①⑤	0.49 ⑤	1.23 ①⑤	0.74 ⑤
96	3090	9	0.46 ⑤	0.28	0.57 ⑤	0.34	0.76 ⑤	0.46 ⑤	0.87 ①⑤	0.52 ⑤	1.32 ①⑤	0.79 ⑤
			CONCRETE 5000 PSI		CONCRETE 5000 PSI							
108	3860	10	0.61 ⑤	0.37	0.76 ⑤	0.46 ⑤	1.08 ⑤	0.65 ⑤	0.98 ①⑤	0.59 ⑤	1.50 ①⑤	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*

① 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.

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

③ AS AN ALTERNATIVE, SINGLE-CAGE REINFORCEMENT MAY BE USED. THE REINFORCEMENT AREA IN SQUARE INCHES PER LINEAR FOOT IS 0.20 in^2/LIN. FT. FOR CLASS 2, AND 0.30 in^2/LIN. FT. FOR CLASS 3.

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 MEETS OR EXCEEDS 0.40 in^2/LIN. FT. QUADRANT REINFORCEMENT MAY BE USED AS SHOWN ON SHEET 4 OF 6. THESE ARE SPECIAL DESIGNS IN ACCORDANCE WITH 3236.

⑥ USE CLASS 2 AS THE MINIMUM CLASS OF PIPE.

⑦ USE "C" WALL PIPE.

APPROVED MARCH 5, 2020	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	REINFORCED CONCRETE PIPE B WALL	2501 2503	3000M 1 OF 6

INTERNAL DIA. OF PIPE (INCHES)	WEIGHT PER LINEAR FEET OF PIPE	WALL THICKNESS	CLASS II		CLASS III		CLASS IV		CLASS V	
			D - LOAD TO PRODUCE A 0.01 INCH CRACK (LBS./LIN. FT./FT. OF DIA.)							
			1000		1350		2000		3000	
			D - LOAD TO PRODUCE ULTIMATE LOAD (LBS./LIN. FT./FT. OF DIA.)							
			1500		2000		3000		3750	
			CONCRETE 4000 PSI ④		CONCRETE 4000 PSI ④		CONCRETE 4000 PSI ④		CONCRETE 6000 PSI	
		T	MINIMUM REINFORCEMENT SQUARE INCHES PER LINEAL FOOT OF BARREL							
D	POUNDS	INCHES	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE	INNER CAGE	OUTER CAGE
12	140	2¾	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	3¼	0.07 ②	—	0.07 ②	—	0.07 ②	—	0.10	—
21	280	3½	0.07 ②	—	0.07 ②	—	0.07 ②	—	0.10	—
24	340	3¾	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	4¼	0.07 ②	—	0.10	—	0.09	0.07	0.18	0.11
33	510	4½	0.07 ②	—	0.12	—	0.11	0.07	0.23	0.14
36	630	4¾	0.07 ④	0.07	0.08 ③	0.07	0.14	0.08	0.27	0.16
42	810	5¼	0.10	0.07	0.12	0.07	0.20	0.12	0.36	0.22
48	1010	5¾	0.14	0.08	0.16	0.10	0.26	0.16	0.47 ⑤	0.28
54	1230	6¼	0.17	0.10	0.21	0.13	0.34	0.20	0.58 ⑤	0.35
60	1470	6¾	0.22	0.13	0.25	0.15	0.41 ⑤	0.25	0.70 ⑤	0.42 ⑤
66	1740	7¼	0.25	0.15	0.31	0.19	0.51 ⑤	0.31	0.84 ⑤	0.50 ⑤
							CONCRETE 5000 PSI			
72	2010	7¾	0.30	0.18	0.36	0.22	0.61 ⑤	0.37	0.99 ⑤	0.59 ⑤
78	2330	8¼	0.35	0.21	0.42 ⑤	0.25	0.71 ⑤	0.43 ⑤	0.85 ①⑤	0.51 ⑤
84	2640	8¾	0.41 ⑤	0.25	0.50 ⑤	0.30	0.85 ⑤	0.51 ⑤	0.94 ①⑤	0.56 ⑤
					CONCRETE 5000 PSI					
90	3000	9¼	0.48 ⑤	0.29	0.59 ⑤	0.35	0.74 ①⑤	0.44 ⑤	1.03 ①⑤	0.62 ⑤
96	3370	9¾	0.55 ⑤	0.33	0.70 ⑤	0.42 ⑤	0.79 ①⑤	0.47 ⑤	1.12 ①⑤	0.67 ⑤
			CONCRETE 5000 PSI							
108	4170	10¼	0.70 ⑤	0.42 ⑤	0.99 ⑤	0.59 ⑤	0.90 ①⑤	0.54 ⑤	1.30 ①⑤	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 in^2/LIN. FT. FOR CLASS II, AND 0.20 in^2/LIN. FT. FOR CLASS III.

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

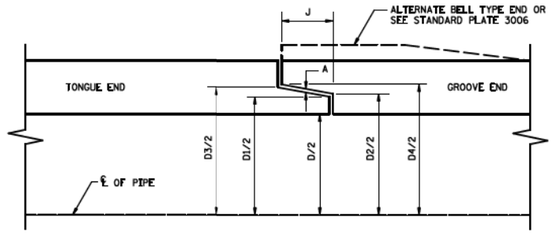
⑤ FOR PIPES 48" AND LARGER, AS AN ALTERNATIVE FOR DESIGNS REQUIRING BOTH INNER AND OUTER CAGES, IF THE REQUIRED REINFORCEMENT FOR EITHER CAGE EXCEEDS 0.40 in^2/LIN. FT. QUADRANT REINFORCEMENT MAY BE USED AS SHOWN ON SHEET 4 OF 6. THESE ARE SPECIAL DESIGNS IN ACCORDANCE WITH 3236.

APPROVED MARCH 5, 2020	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	REINFORCED CONCRETE PIPE C WALL	2501 2503	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	D1, D2, D3, & D4	WALL THICKNESS B WALL	WALL THICKNESS C WALL	J
D	SQ. FT.	INCHES										
12	0.79	1¾	⅜	13¼	13⅝	13⅞	14¼	¼	⅜	⅜	⅜	¼
15	1.23	2	⅜	16½	16⅞	17¼	17⅝	⅝	⅜	⅜	⅜	¼
18	1.77	2¼	⅜	19⅝	20	20⅜	20¾	⅝	⅜	⅜	⅜	¼
21	2.40	2½	⅜	22⅞	23¼	23¾	24⅛	¾	⅜	⅜	⅜	¼
24	3.14	2¾	⅜	26	26⅜	27	27⅜	¾	⅜	⅜	⅜	¼
27	3.98	3	⅜	29¼	29⅝	30¼	30⅝	¾	⅜	⅜	⅜	¼
30	4.91	3¼	⅜	32⅜	32¾	33½	33⅞	¾	⅜	⅜	⅜	¼
33	5.94	3½	¼	35½	36	36⅞	37¼	¾	⅜	¼	⅜	¼
36	7.07	3¾	¼	38¾	39¼	40	40½	¾	⅜	¼	⅜	¼
42	9.62	4	¼	45⅛	45⅝	46½	47	⅞	¼	¼	¼	¼
48	12.57	4¼	¼	51½	52	53	53½	½	¼	¼	⅝	¼
54	15.90	4½	¼	57⅞	58⅜	59⅜	59⅞	⅝	¼	¼	⅝	¼
60	19.63	5	¼	64¼	64¾	66	66½	⅝	¼	⅜	⅝	¼
66	23.76	5½	¼	70⅝	71⅛	72½	73	11/16	¼	⅜	⅜	¼
72	28.27	6	¼	77	77½	79	79½	¾	¼	⅜	¾	¼
78	33.18	6½	¼	83⅜	83⅞	85⅝	86⅛	13/16	¼	⅜	⅞	¼
84	38.48	7	¼	89¾	90¼	92½	92⅝	⅞	¼	⅜	⅞	¼
90	44.18	7	¼	95¾	96¼	98½	98⅝	15/16	¼	⅜	⅞	¼
96	50.27	7	¼	102⅛	102⅝	104½	105	1	¼	⅞	½	¼
108	63.62	7½	¼	115½	116	118	118½	1⅛	¼	½	⅝	¼

NOTE:

LAYING LENGTH: DO NOT UNDERRUN THE LAYING LENGTH BY MORE THAN ½".



SECTION AT PIPE JOINT

APPROVED MARCH 5, 2020	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	REINFORCED CONCRETE PIPE JOINT DIMENSIONS FOR B-WALL AND C-WALL	2501 2503	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. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

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

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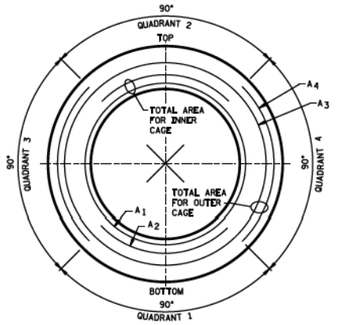


CROSS SECTION FOR QUADRANT REINFORCEMENT

INTERNAL DIAMETER OF PIPE	B WALL QUADRANT REINFORCEMENT LENGTH		C WALL QUADRANT REINFORCEMENT LENGTH	
	LENGTH OF 90° ARC	LENGTH OF 90° ARC	LENGTH OF 90° ARC	LENGTH OF 90° ARC
	A_2	A_4	A_2	A_4
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"	79"
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 0.40 in^2/LF, QUADRANT REINFORCEMENT MAY BE USED.

$A_1 + A_2$ = TOTAL INNER CAGE REINFORCEMENT.
$A_3 + A_4$ = TOTAL OUTER CAGE REINFORCEMENT.

A_1 = REINFORCING OF FULL CIRCULAR INNER CAGE.
A_2 = REINFORCING OF INNER LAP SECTION, 90° MINIMUM ARC.
A_3 = REINFORCING OF FULL CIRCULAR OUTER CAGE.
A_4 = 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.

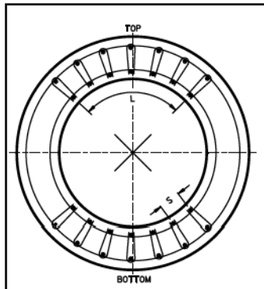
GENERAL NOTES:

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 VERTICAL AXIS 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 $0.75 f_r d_v$ WHERE f_r IS 0.9 IN ACCORDANCE WITH AASHTO SECTION 12.5.5. THE MAXIMUM STIRRUP SPACING HAS BEEN ROUNDED UP FROM THE CALCULATED VALUE TO THE NEAREST ½".

PIN ALL SHEAR REINFORCEMENT. PROVIDE ELEMENT BAR WITH A MINIMUM DIAMETER OF 0.19" 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.

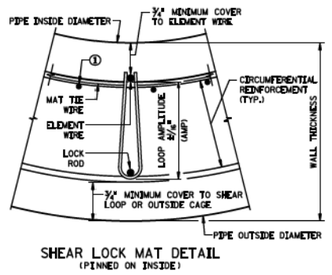
① WHEN SHEAR LOCK MAT ALTERNATE IS USED, LOCATE THE LONGITUDINALS ON THE INNER CAGE AS SHOWN.

INTERNAL DIAMETER OF PIPE	WALL THICKNESS	AMPLITUDE	SHEAR REINFORCEMENT CLASS IV			SHEAR REINFORCEMENT CLASS V		
D	T	AMP	A_r	L	S	A_r	L	S
72"	7"	5"	—	—	—	0.47	58	3.5
78"	7½"	5½"	0.40	49	4.0	0.48	63	4.0
84"	8"	6"	0.41	53	4.5	0.49	67	4.5
90"	8½"	6½"	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 REINFORCEMENT B WALL

INTERNAL DIAMETER OF PIPE	WALL THICKNESS	AMPLITUDE	SHEAR REINFORCEMENT CLASS IV			SHEAR REINFORCEMENT CLASS V		
D	T	AMP	A_r	L	S	A_r	L	S
78"	8½"	6½"	—	—	—	0.46	51	4.5
84"	8½"	6½"	—	—	—	0.47	57	4.5
90"	9"	7"	0.39	42	5.0	0.48	62	5.0
96"	9½"	7½"	0.40	46	5.5	0.49	68	5.5
108"	10½"	8½"	0.41	57	6.0	0.50	79	6.0

SHEAR REINFORCEMENT C WALL



SHEAR LOCK MAT DETAIL (PINNED ON INSIDE)

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 M170, EXCEPT AS SHOWN.

LAP CIRCUMFERENTIAL REINFORCEMENT AT LEAST 20 DIAMETERS FOR DEFORMED BARS AND 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 ¾" 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 TWICE 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 ⅛". 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 MnDOT DRAINAGE MANUAL FOR ALLOWABLE FILL HEIGHTS.

LAYING LENGTH:

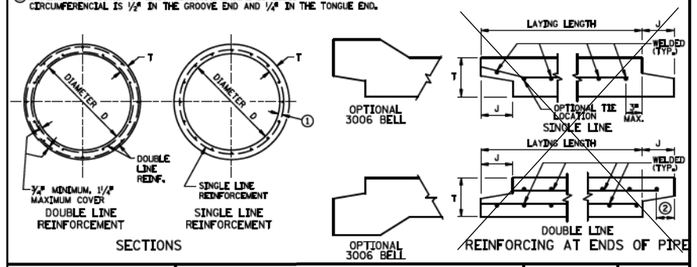
LAYING LENGTH IS DEFINED AS THE TOTAL PIPE SECTION LENGTH MINUS THE TONGUE LENGTH ⊥. THE MINIMUM LAYING LENGTH IS 6' FOR DIAMETERS 108" OR LESS, EXCEPT THAT TWO 4' LENGTHS ARE PERMITTED IN A LINE OF PIPE TO MAKE A REQUIRED LENGTH. THE MINIMUM LAYING LENGTH IS 4' FOR DIAMETERS GREATER THAN 108". FOR ALL 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 M170. FOR PIPE SIZES AND CLASSES THAT ARE NOT INCLUDED IN M170, 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 ML-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 2½", THEN ¾" OF COVER IS REQUIRED.

② MAXIMUM END COVER ON LAST CIRCUMFERENTIAL IS LESSER OF 1/2 THE LENGTH OF THE JOINT OR 3". MINIMUM END COVER TO THE LAST CIRCUMFERENCIAL IS ½" IN THE GROOVE END AND ¼" IN THE TONGUE END.



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

DATE: 9/12/2024 1:59:58 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. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

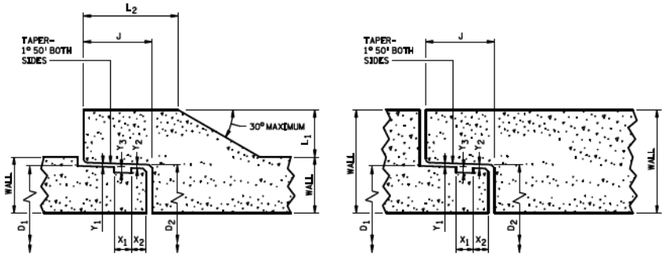
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 32 OF 216 SHEETS

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
INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES	INCHES
12	3⅜	15,223	15,331	5	2	1¼	1	⅞	0,062	0,090	0,313
15	3⅜	18,723	18,831	4¾	2⅜	1⅜	1	⅞	0,062	0,090	0,313
18	3⅜	22,098	22,206	5	2⅜	1⅜	1	⅞	0,062	0,090	0,313
21	3⅜	25,600	25,724	5¼	2⅜	1⅜	1	⅞	0,062	0,090	0,313
24	3½	28,975	29,099	5½	2¾	2	1	⅞	0,062	0,090	0,313
27	4	32,476	32,608	5½	2¾	2	1	⅞	0,062	0,090	0,313
30	4	35,976	36,108	5½	2¾	2	1	⅞	0,062	0,090	0,313
33	4⅛	39,476	39,616	5¾	2⅞	2⅛	1	⅞	0,062	0,090	0,313
36	4⅛	42,976	43,116	6	3⅛	2⅜	1	¼	0,062	0,090	0,313
42	4⅜	50,021	50,183	6¾	3¾	3	1⅛	1	0,067	0,129	0,376
48	4¾	57,023	57,193	7¼	4¼	3⅜	1⅛	1	0,067	0,129	0,376
54	5	63,007	63,192	7½	3⅝	2¼	1⅛	1	0,067	0,129	0,376
60	5	69,007	69,192	7½	3⅛	2⅜	1⅛	1	0,067	0,129	0,376
66	5	75,007	75,192	7½	2¾	2	1⅛	1	0,067	0,129	0,376
72	5¼	79,250	79,400	—	—	—	1⅛	1¼	0,093	0,190	0,376
78	5¼	86,250	86,400	—	—	—	1⅛	1¼	0,093	0,190	0,376
84	5¼	91,500	91,650	—	—	—	1⅛	1¼	0,093	0,190	0,376
90	5¼	97,750	97,900	—	—	—	1⅛	1¼	0,093	0,190	0,376
96	5¼	104,250	104,400	—	—	—	1⅛	1¼	0,093	0,190	0,376
108	6⅛	117,250	117,400	—	—	—	1⅛	1¼	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:

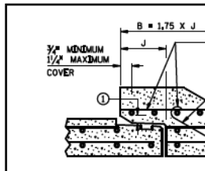
JOINT DIMENSIONS ARE NOMINAL AND SUBJECT TO REASONABLE MANUFACTURING TOLERANCES. FABRICATE THE TONGUE AND GROOVE SUCH THAT WHEN THE PIPE IS JOINTED WITH THE GASKET IN PLACE A PROPER FIT IS OBTAINED. FINAL ACCEPTANCE OF THE PIPE WILL BE AT THE JOB SITE AFTER EFFECTIVE JOINTING HAS BEEN OBTAINED.

DIMENSIONS SHOWN ARE DESIGN DIMENSIONS. INSPECTION MEASUREMENTS WILL BE MADE TO THE NEAREST ⅛".

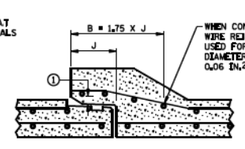
FURNISH GASKETS IN ACCORDANCE WITH ASTM C1619 CLASS C.

① SEE SHEET 2 OF 2 FOR OPTIONAL BELL REINFORCEMENT, CLEARANCES, AND NOTES.

APPROVED MARCH 5, 2020	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	GASKET JOINT FOR R.C. PIPE	2501 2503	3006H 1 OF 2

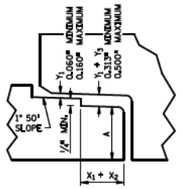


CYLINDRICAL CAGE DETAIL

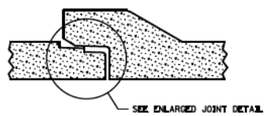


EXPANDED BELL DETAIL

BELL REINFORCEMENT OPTIONS
66" PIPE AND SMALLER



ENLARGED JOINT DETAIL



OPTIONAL TONGUE DETAIL
REINFORCEMENT NOT SHOWN

INT. DIA. PIPE	$X_1 + X_2$	SPIGOT THICKNESS A
12"	1.75"	1.15"
15"		1.50"
18"		1.70"
21"		1.95"
24"		2.15"
27"		2.40"
30"		2.65"
33"		2.90"
36"		3.15"
48"	1.75"	3.15"

NOTES:

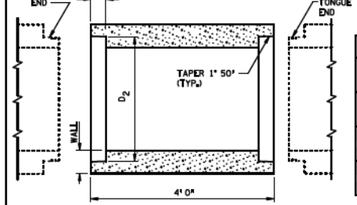
PROVIDE A BELL CAGE AT LEAST AS WIDE AS DIMENSION B.

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 ¾" TO 1½" FROM INNER FACE OF BELL.

② USE A MINIMUM OF THREE NO. 3 HOOK TIES EQUALLY SPACED WITH A MAXIMUM SPACING OF 24".

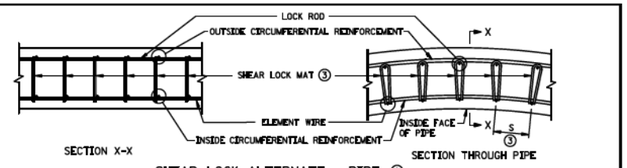


OPTIONAL TRANSITION PIPE
CONNECT TONGUE END TO TONGUE END

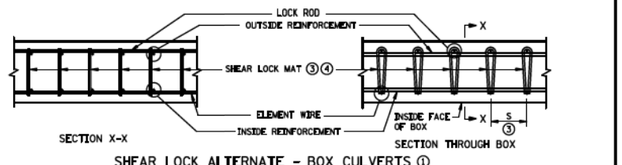
TRANSITION PIPE REINFORCEMENT

INTERNAL DIAMETER	12"	15"	18"	21"	24"	27"	30"
WALL	4"	4⅜"	4⅞"	5¼"	5⅝"	6"	6¼"
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

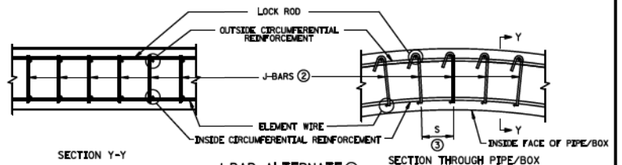
APPROVED MARCH 5, 2020	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	GASKET JOINT FOR R.C. PIPE OPTIONS	2501 2503	3006H 2 OF 2



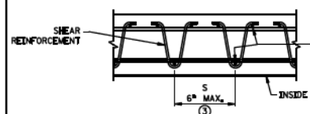
SHEAR LOCK ALTERNATE - PIPE ①



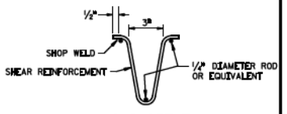
SHEAR LOCK ALTERNATE - BOX CULVERTS ①



J-BAR ALTERNATE①



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. 3301.

ANCHOR SHEAR REINFORCEMENT IN CONFORMANCE WITH SECTION 12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

PIN ALL SHEAR REINFORCEMENT. FOR SHEAR LOCK MAT AND J-BAR ALTERNATES, PROVIDE ELEMENT WIRE WITH A MINIMUM DIAMETER OF 0.19" 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 SPLICED A MINIMUM OF ONE OVERLAP AT OR NEAR ℄ 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 OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES	2501 2503	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

wsb

Chisago COUNTY USA

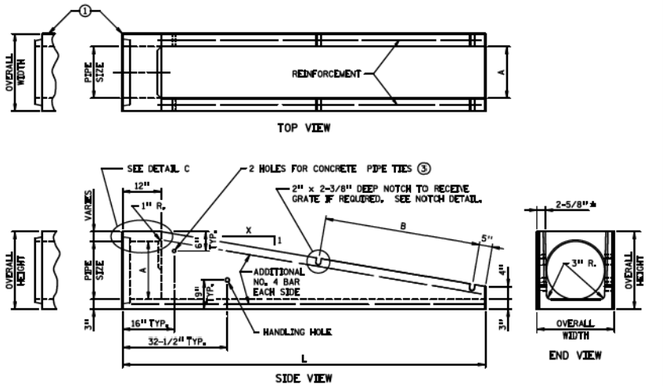
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 33 OF 216 SHEETS

DATE: 9/12/2024 2:00:00 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sp1



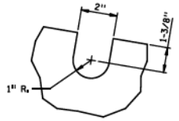
DESIGN OPTION NO. 1

1:6 SLOPES

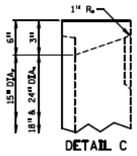
PIPE SIZE	A INSIDE	B ℄ - ℄	L	OVERALL HEIGHT	OVERALL WIDTH	WEIGHT (LBS.)
15"	15"	4'0"	9'4-1/2"	24"	24"	1800
18"	18"	4'0"	9'4-1/2"	24"	24"	1700
24"	24"	6'0"	12'4" ②	30"	30"	2800

1:4 SLOPES

PIPE SIZE	A INSIDE	B ℄ - ℄	L	OVERALL HEIGHT	OVERALL WIDTH	WEIGHT (LBS.)
24"	24"	4'0"	8'5"	30"	30"	1900



NOTCH DETAIL



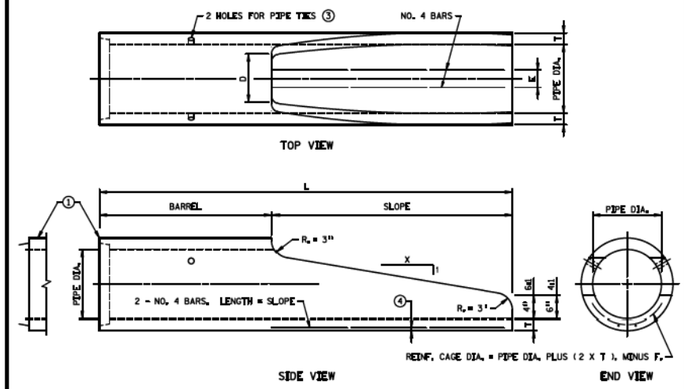
DETAIL C

NOTES:

THE DESIGN USED IS THE CONTRACTOR'S OPTION.
REINFORCING STEEL AND CONCRETE PER AASHTO M170.
REINFORCEMENT SHALL CONFORM TO STANDARD REINFORCED CONCRETE PIPE CLASS II, LOCATED AT CENTER OF WALL PLUS ONE (1) NO. 4 BAR, TOP, BOTTOM AND EACH SIDE.
JOINT IN END SECTION PER STANDARD PLATE 3000.
TOP EXPOSED CONCRETE CORNERS SHALL HAVE 3/4" CHAMFER.
TIE BOLTS AS REQUIRED.

① SEE PLANS FOR TYPE OF END REQUIRED.
② TWO PIECE CONSTRUCTION PERMISSIBLE.
③ SEE STANDARD PLATE 3145 FOR DETAILS.

APPROVED SEPT. 19, 2000	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
Delbert W. Gruber STATE DESIGN ENGINEER	PRECAST CONCRETE SAFETY APRON (DESIGN OPTION NO. 1)	2501 REVISED 3-22-2013 M.J.E.	3022C 1 OF 3



DESIGN OPTION NO. 2

1:6 SLOPES

DIAMETER (IN.)	T (IN.)	L (IN.)	SLOPE (IN.)	BARREL (IN.)	D (IN.)	E (IN.)	F (IN.)	WEIGHT (LBS.)
12	2	72	42	30	6	3	2-1/4	415
15	2-1/4	84	60	24	8	4	2-1/4	595
18	2-1/2	96	81	15	10	5	2-1/2	850
24	3	144 ②	120	24	11	6	2-1/2	NO. 1 1280 NO. 2 720

1:4 SLOPES

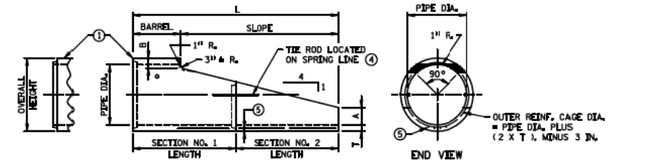
DIAMETER (IN.)	T (IN.)	L (IN.)	SLOPE (IN.)	BARREL (IN.)	D (IN.)	E (IN.)	F (IN.)	WEIGHT (LBS.)
18	2-1/2	72	46	26	10	5	2-1/2	750
24	3	96	72	24	11	6	2-1/2	1450

NOTES:

THE DESIGN USED IS THE CONTRACTOR'S OPTION.
REINFORCEMENT AND CONCRETE SHALL CONFORM TO STANDARD REINFORCED CONCRETE PIPE CLASS II, EXCEPT AS NOTED.
JOINT IN END SECTION PER STANDARD PLATE 3000, OR APPROVED EQUAL.

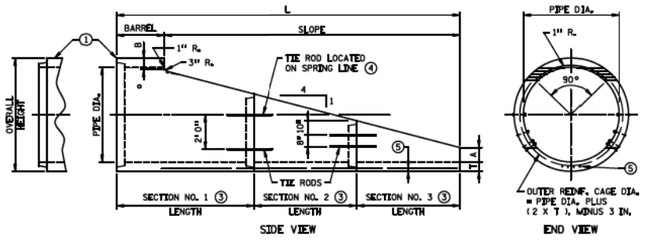
① GROOVE END ON OUTLET END SECTION. TONGUE END ON INLET END SECTION.
② TWO 6 FOOT SECTIONS.
③ SEE STANDARD PLATE 3145 FOR DETAILS.
④ 5/8" CLEAR TO 15" DIA., 3/4" CLEAR OVER 15" DIA.

APPROVED SEPT. 19, 2000	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
Delbert W. Gruber STATE DESIGN ENGINEER	PRECAST CONCRETE SAFETY APRON (DESIGN OPTION NO. 2)	2501 REVISED 3-22-2013 M.J.E.	3022C 2 OF 3



PIPE DIA.	OVERALL HEIGHT	T	A	B	SLOPE	BARREL	L	SECT. 1 LENGTH	SECT. 2 LENGTH	NO. OF BARS ⑤	BAR SPACING ⑤	APPROXIMATE WEIGHT LBS.
2 6 30"	37"	3-1/2"	7-1/2"	5-7/8"	7'6"	1'0"	8'6"	8'6"	NONE	3	4"	2075
2 6 30"	37"	3-1/2"	9-5/8"	5-7/8"	6'0"	2'0"	8'0"	8'0"	NONE	3	4"	2170
2 6 36"	44"	4"	12"	6-1/4"	7'3"	1'3"	8'6"	8'6"	NONE	3	4"	2950
42"	51"	4-1/2"	12"	6-7/8"	9'2-1/2"	2'9-1/2"	12'0"	6'0"	6'0"	3	4"	NO.1-3800 NO.2-2100
48"	58"	5"	12"	7-3/8"	11'2-1/2"	2'9-1/2"	14'0"	8'0"	6'0"	4	4"	NO.1-6080 NO.2-2330
54"	65"	5-1/2"	12"	7-7/8"	13'2-1/2"	2'9-1/2"	16'0"	8'0"	8'0"	4	4"	NO.1-7680 NO.2-4380

SLOPED END SECTION
30" - 54" DIA. PIPE



PIPE DIA.	OVERALL HEIGHT	T	A	B	SLOPE	BARREL	L	SECT. 1 LENGTH	SECT. 2 LENGTH	SECT. 3 LENGTH	NO. OF BARS ⑤	BAR SPACING ⑤	APPROXIMATE WEIGHT LBS.
60"	72"	6"	12"	8-3/8"	15'2-1/2"	2'9-1/2"	18'0"	6'0"	6'0"	6'0"	4	4"	NO.1-7400 NO.2-5170 NO.3-2800
72"	86"	7"	12"	9-3/8"	19'2-1/2"	2'9-1/2"	22'0"	8'0"	8'0"	6'0"	4	4"	NO.1-12130 NO.2-8000 NO.3-4050

THREE PIECE SLOPED END SECTION
60" & 72" DIA. PIPE

NOTES:

REINFORCING STEEL AND CONCRETE PER AASHTO M170.
REINFORCEMENT SHALL CONFORM TO STANDARD REINFORCED CONCRETE PIPE CLASS II.
JOINTS IN END SECTION PER STANDARD PLATE 3000, OR APPROVED EQUAL.
JOINTS SHALL BE SEALED PER SPEC. 2503.3C.
INNER CAGE NOT REQUIRED IN SLOPE AREA.

① SEE PLANS FOR TYPE OF END REQUIRED.
② NO TIE RODS OR ADDITIONAL JOINTS REQUIRED.
③ SECTION LENGTHS MAY VARY, TOTAL LENGTH TO EQUAL L.
④ SEE STANDARD PLATE 3145 FOR DETAILS.
⑤ NO. 4 BARS, MIN. LENGTH = SLOPE. 1" CLEAR ALL SIZES.
⑥ DESIGN USED IS CONTRACTOR'S OPTION.

APPROVED SEPT. 19, 2000	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
Delbert W. Gruber STATE DESIGN ENGINEER	PRECAST CONCRETE SAFETY APRON (1:4 SLOPE)	2501 REVISED 3-22-2013 M.J.E.	3022C 3 OF 3

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

wsb

Chisago COUNTY USA

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 34 OF 216 SHEETS

DATE: 9/12/2024 2:00:01 PM
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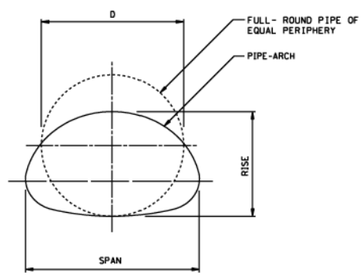


SHEET THICKNESS - GAGE RELATIONSHIP		
GAGE	THICKNESS - EQUIVALENT	
	GALV. STEEL (IN.)	ALUM. ALLOY (IN.)
18	.0516	.048
16	.0635	.060
14	.0785	.075
12	.1084	.105
10	.1382	.135
8	.1681	.164

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 PERMISSABLE IN SPAN AND RISE. ALL DIMENSIONS ARE MEASURED FROM THE INSIDE CRESTS OF THE CORRUGATIONS.

① SEE AASHTO M196M FOR ALUMINUM PIPE-ARCH VALUES.

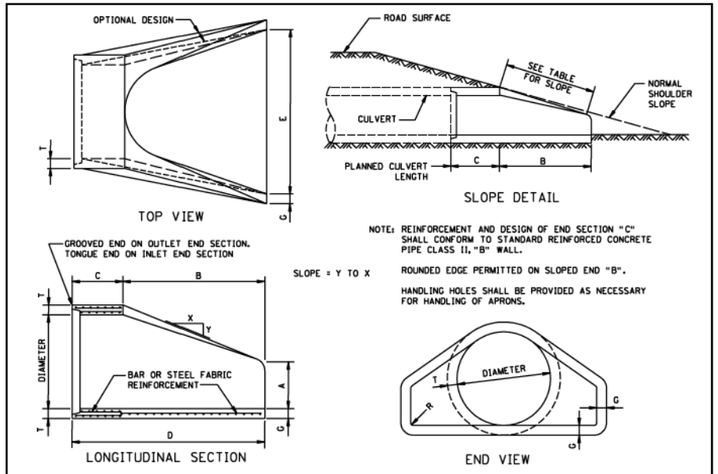
APPROVED Jan. 29, 1979
Director
Construction and Engineering Development

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



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 CAGE 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.~~

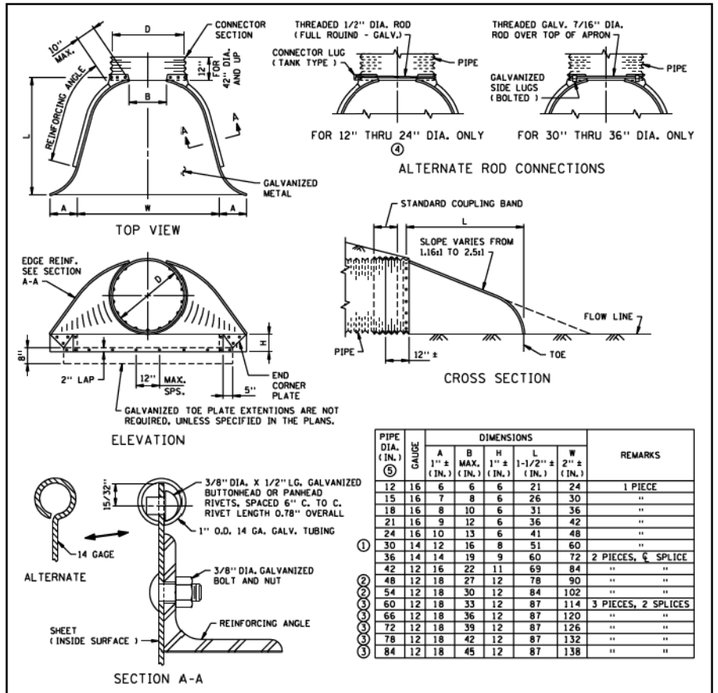
APPROVED May 8, 1985
Assistant Division Director
Technical Services

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



PIPE DIA. (IN.) ⑤	GAUGE	DIMENSIONS A 1" ± (IN.)	B MAX. (IN.)	H 1" ± (IN.)	L 1-1/2" ± (IN.)	W 2" ± (IN.)	REMARKS
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	"
① 30	14	12	16	8	51	60	"
36	14	14	19	9	60	72	2 PIECES, ℄ SPLICE
42	12	16	22	11	69	84	" "
② 48	12	18	27	12	78	90	" "
② 54	12	18	30	12	84	102	" "
③ 60	12	18	33	12	87	114	3 PIECES, 2 SPLICES
③ 66	12	18	36	12	87	120	" "
③ 72	12	18	39	12	87	126	" "
③ 78	12	18	42	12	87	132	" "
③ 84	12	18	45	12	87	138	" "

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.

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, 1986
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

wsb

Chisago COUNTY USA

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

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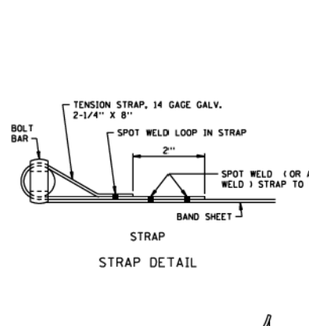
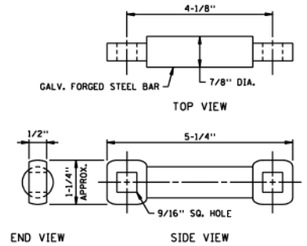
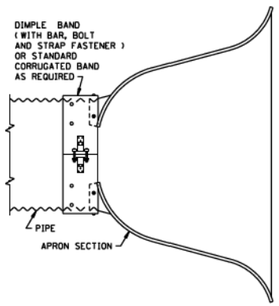


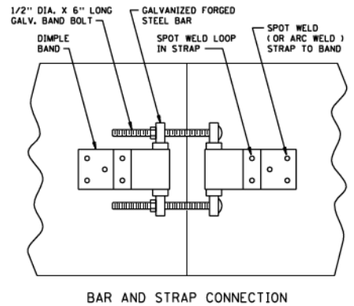
STRAP DETAIL



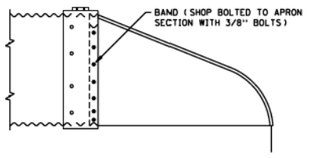
BAR DETAIL



TOP VIEW



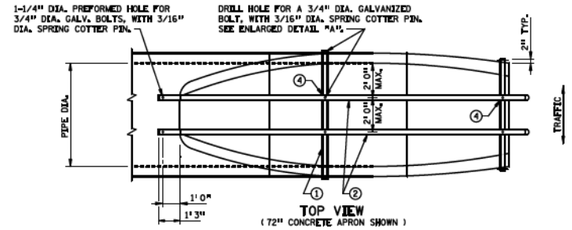
BAR AND STRAP CONNECTION



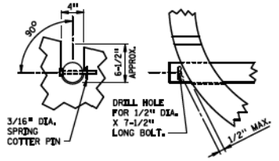
SIDE VIEW

NOTES:
USE FOR ALL PIPE AND PIPE-ARCH SIZES.
FOR OTHER APPROVED CONNECTIONS, SEE STANDARD PLATES 3122 AND 3123.

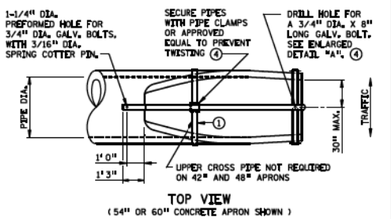
APPROVED July 21, 1983 R H Sulbaran Assistant Division Director Technical Services	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION METAL APRON CONNECTION	SPECIFICATION REFERENCE 2506	STANDARD PLATE NO. 3124B

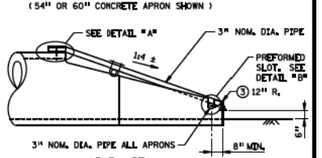


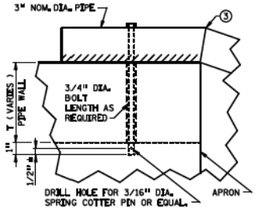
②	APRON SIZE	APPROX. PIPE LENGTHS LONG.	APPROX. PIPE LENGTHS TRANS.	CROSS PIPES REQ'D.	ESTIMATED TOTAL WEIGHT LBS.
	42"	11'8"	46'	1	135
	48"	13'8"	52'	1	145
	54"	15'10"	58'	2	225
	60"	17'11"	64'	2	260
	72"	22'0"	76'	2	500



ENLARGED DETAIL "B"







ENLARGED DETAIL "A"

NOTES:
ALL PIPE IS SCHEDULE 40 GALVANIZED PIPE AS PER SPEC. 3362, 3" NOMINAL DIA. 7.58 LBS. PER FT.
GALVANIZE AFTER FABRICATION AS PER SPEC 2471.3L.
GALVANIZE FASTENERS AS PER SPEC. 3392.
SEE STANDARD PLATE 3022 (3 OF 3) FOR APRONS.
NO GRATE OF ANY KIND IS ALLOWED ON AN OUTLET WITHOUT A GRATE BEING PLACED ON THE INLET ALSO.

① UPPER CROSS PIPE TO HAVE FIRM CONTACT WITH APRON AND LONGITUDINAL PIPE.
② TWO LONGITUDINAL PIPES EQUALLY SPACED REQUIRED ON 72" DIA. APRON.
③ BEND OR CUT AND WELD PIPE AS SHOWN.
④ WELDING AS PER SPEC. 2471 MAY BE USED AT ALL PIPE CONNECTIONS.

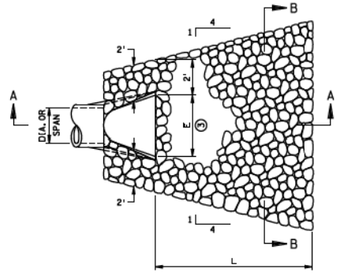
APPROVED DEC. 18, 1996 Gerald J. Rodvold STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION GRATE FOR 1:4 PRECAST CONCRETE APRONS FOR CROSS DRAINS WITH 42" TO 72" DIA. PIPE	SPECIFICATION REFERENCE 3362 2471 REVISED 3-12-2003	STANDARD PLATE NO. 3132A

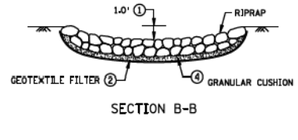
TABLE OF QUANTITIES
RIPRAP AT RCP OUTLETS

DIA. OF ROUND PIPE (IN.)	L (FT.)	CLASS II d_{50} = 6" GEO-TEXTILE FILTER (SQ.YD.)	CLASS II d_{50} = 6" GRANULAR FILTER UNDER APRON (CU.YD.)	CLASS II d_{50} = 6" 12" DEPTH RIPRAP (CU.YD.)	CLASS III d_{50} = 9" GEO-TEXTILE FILTER (SQ.YD.)	CLASS III d_{50} = 9" GRANULAR FILTER UNDER APRON (CU.YD.)	CLASS III d_{50} = 9" 18" DEPTH RIPRAP (CU.YD.)	CLASS IV d_{50} = 12" GEO-TEXTILE FILTER (SQ.YD.)	CLASS IV d_{50} = 12" GRANULAR FILTER UNDER APRON (CU.YD.)	CLASS IV d_{50} = 12" 24" DEPTH RIPRAP (CU.YD.)
12	8	16.9	0.2	3.0	19.6	0.3	4.4	22.6	0.3	5.9
15	8	18.0	0.2	3.2	20.8	0.3	4.8	23.9	0.4	6.4
18	10	22.4	0.3	4.3	25.6	0.4	6.4	29.0	0.5	8.5
21	10	24.1	0.4	4.7	27.4	0.6	7.1	30.9	0.7	9.4
24	12	29.7	0.5	6.2	33.4	0.8	9.2	37.3	1.0	12.3
27	12	31.4	0.6	6.6	35.2	0.9	9.9	39.2	1.2	13.2
30	14	37.4	0.8	8.2	41.6	1.1	12.3	46.0	1.5	16.4
36	16	45.9	1.1	10.1	50.5	1.6	15.8	55.4	2.1	21.1
42	18	52.8	1.2	12.5	57.8	1.7	18.7	63.0	2.3	24.9
48	20	61.1	1.5	14.8	66.5	2.2	22.2	72.0	2.9	29.6

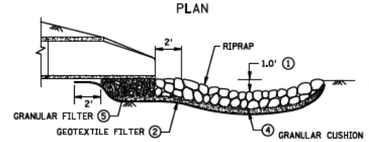
TABLE OF QUANTITIES
RIPRAP AT RCP-A OUTLETS

SPAN OF PIPE ARCH (IN.)	L (FT.)	CLASS II d_{50} = 6" GEO-TEXTILE FILTER (SQ.YD.)	CLASS II d_{50} = 6" GRANUL FILTER UNDER APRON (CU.YD.)	CLASS II d_{50} = 6" 12" DEPTH RIPRAP (CU.YD.)	CLASS III d_{50} = 9" GEO-TEXTILE FILTER (SQ.YD.)	CLASS III d_{50} = 9" GRANUL FILTER UNDER APRON (CU.YD.)	CLASS III d_{50} = 9" 18" DEPTH RIPRAP (CU.YD.)	CLASS IV d_{50} = 12" GEO-TEXTILE FILTER (SQ.YD.)	CLASS IV d_{50} = 12" GRANUL FILTER UNDER APRON (CU.YD.)	CLASS IV d_{50} = 12" 24" DEPTH RIPRAP (CU.YD.)
22	10	22.4	0.3	4.1	25.6	0.4	6.1	29.0	0.5	8.1
28	12	29.5	0.5	5.7	33.2	0.7	8.5	37.1	0.9	11.3
36	14	37.3	0.8	7.5	41.5	1.1	11.2	45.8	1.5	14.9
43	16	45.9	1.1	9.5	50.5	1.6	14.3	55.3	2.1	19.0
51	18	52.5	1.2	11.3	57.5	1.7	16.9	62.7	2.3	22.5
58	20	59.9	1.3	13.2	65.2	1.9	19.8	70.7	2.5	26.4





SECTION B-B



SECTION A-A

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.
① FOR PIPES GREATER THAN OR EQUAL TO 30", USE 1.5'.
② GEOTEXTILE FILTER, SPEC. 3733, SHALL COVER THE BOTTOM AND SIDES OF THE AREA EXCAVATED FOR THE RIPRAP, GRANULAR FILTER MATERIALS.
③ DIMENSION E IS GIVEN ON STANDARD PLATES 3100 AND 3110.
④ GRANULAR FILTER, SPEC. 3601, MAY BE USED AS A CUSHION LAYER. PLACE FILTER PER SPEC. 2511. THE CUSHION LAYER IS INCIDENTAL.
⑤ 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 Christopher Ley STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION RIPRAP AT RCP OUTLETS	SPECIFICATION REFERENCE 3100 3110 3601 3733 2511	STANDARD PLATE NO. 3133D

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

wsb

Chisago COUNTY USA

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

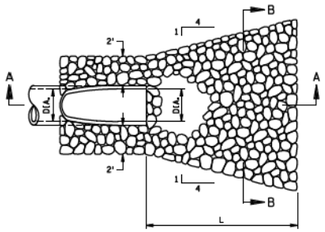
DATE: 9/12/2024 2:00:02 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-spt

TABLE OF QUANTITIES
1:4 SLOPE

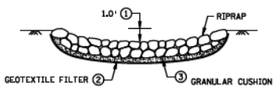
DIA. OF ROUND PIPE (IN.)	L (FT.)	CLASS II d_{50} = 6" GEO-TEXTILE FILTER (SQ.YD.)	CLASS II d_{50} = 6" GRANUL FILTER UNDER APRON (CU.YD.)	CLASS II d_{50} = 6" 12" DEPTH RIPRAP (CU.YD.)	CLASS III d_{50} = 9" GEO-TEXTILE FILTER (SQ.YD.)	CLASS III d_{50} = 9" GRANUL FILTER UNDER APRON (CU.YD.)	CLASS III d_{50} = 9" 18" DEPTH RIPRAP (CU.YD.)	CLASS IV d_{50} = 12" GEO-TEXTILE FILTER (SQ.YD.)	CLASS IV d_{50} = 12" GRANUL FILTER UNDER APRON (CU.YD.)	CLASS IV d_{50} = 12" 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

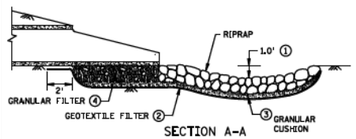
DIA. OF ROUND PIPE (IN.)	L (FT.)	CLASS II d_{50} = 6" GEO-TEXTILE FILTER (SQ.YD.)	CLASS II d_{50} = 6" GRANUL FILTER UNDER APRON (CU.YD.)	CLASS II d_{50} = 6" 12" DEPTH RIPRAP (CU.YD.)	CLASS III d_{50} = 9" GEO-TEXTILE FILTER (SQ.YD.)	CLASS III d_{50} = 9" GRANUL FILTER UNDER APRON (CU.YD.)	CLASS III d_{50} = 9" 18" DEPTH RIPRAP (CU.YD.)	CLASS IV d_{50} = 12" GEO-TEXTILE FILTER (SQ.YD.)	CLASS IV d_{50} = 12" GRANUL FILTER UNDER APRON (CU.YD.)	CLASS IV d_{50} = 12" 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	38.9	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

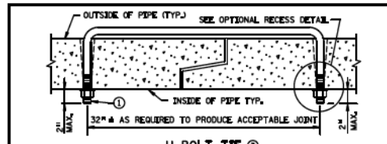


SECTION A-A

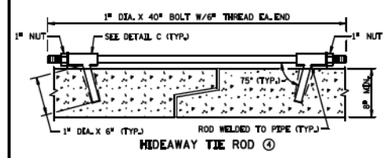
NOTES:
REQUIREMENTS FOR GEOTEXTILE TYPE, RIPRAP SIZE AND THICKNESS WILL BE DESIGNATED IN THE PLANS. PIPE SIZES LARGER THAN THOSE SHOWN REQUIRE A SPECIAL DESIGN.

① FOR PIPES GREATER THAN OR EQUAL TO 30", USE 1.5'.
② GEOTEXTILE FILTER, SPEC. 3733, SHALL COVER THE BOTTOM AND SIDES OF THE AREA EXCAVATED FOR THE RIPRAP, GRANULAR FILTER MATERIALS.
③ GRANULAR FILTER, SPEC. 3601, MAY BE USED AS A CUSHION LAYER. PLACE FILTER PER SPEC. 2511. THE CUSHION LAYER IS INCIDENTAL.
④ 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.

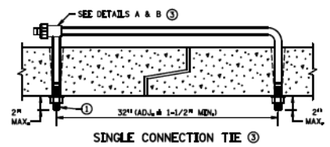
APPROVED DECEMBER 9, 2013	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	RIPRAP AT PRECAST CONCRETE END SECTIONS (1:4 AND 1:6 SLOPES)	2511 3601 3733	3139B



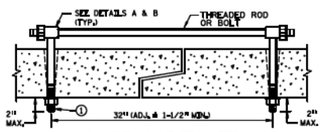
U BOLT TIE ③



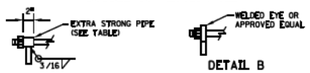
HIDEAWAY TIE ROD ④



SINGLE CONNECTION TIE ③

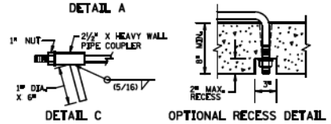


DOUBLE CONNECTION TIE



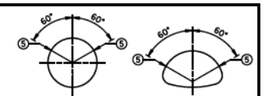
DETAIL A

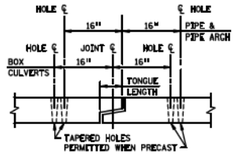
DETAIL B



DETAIL C

OPTIONAL RECESS DETAIL ②





PLACEMENT OF HOLES ⑥

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, TIE THE THREE END SECTIONS (INCLUDING APRON) OF A FREE END (NO MANHOLE).

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.

TIE 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 MnDOT APPROVED PRODUCT LIST FOR APPROVED PAINT COATINGS.

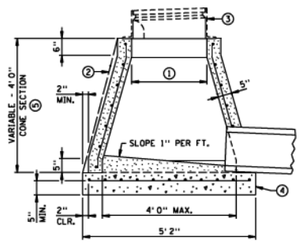
TIES TO BE USED ONLY TO HOLD PIPE SECTIONS TOGETHER. NOT FOR PULLING SECTIONS TIGHT.

FOR BOX CULVERT TIE LOCATIONS SEE MnDOT BRIDGE OFFICE PRECAST CONCRETE BOX CULVERT STANDARDS.

① THE ROD THREADS SHALL PROJECT TO THE INSIDE OF PIPE OR CULVERT EXCEPT AS NOTED IN PLANS.
② THE ROD THREADS SHALL BE RECESSED WHEN PIPE OR CULVERT IS USED AS CATTLE PASS OR PEDESTRIAN TRAIL.
③ THE ROD THREADS MAY PROJECT TO OUTSIDE OF BOX CULVERT PIPE IN MULTIPLE PIPELINE INSTALLATIONS. FACE CONNECTION DOWN STREAM.
④ HIDEAWAY TIE ROD SHALL ONLY BE USED FOR PEDESTRIAN CULVERT APPLICATIONS OR AS SPECIFIED IN PLAN OR SPECIAL PROVISION.
⑤ TIE LOCATION
⑥ 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.

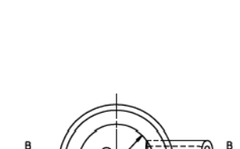
APPROVED SEPT. 14, 2012	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	CONCRETE PIPE OR PRECAST BOX CULVERT TIES	2501 2503	3145G

TOP VIEW
REINFORCEMENT NOT SHOWN

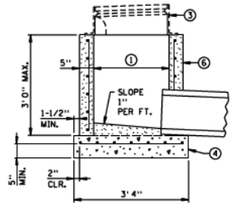


SECTION A-A

DESIGN G



TOP VIEW
REINFORCEMENT NOT SHOWN



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.

① 2'3" NOM. OPENING. WHEN GRATE FRAME CASTING NO. 802A OR NO. 805 IS USED, SEE STANDARD PLATES CASTING LIST.
② A STRAIGHT TAPERED WALL IS ACCEPTABLE.
③ 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.
④ 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.
⑤ 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.
⑥ 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.

DESIGN G
DESIGN H

APPROVED JULY 31, 1995	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	MANHOLE OR CATCH BASIN PRECAST	2506 REVISED 8-22-96	4006L

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

wsb

Chisago COUNTY USA

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 37 OF 216 SHEETS

DATE: 9/12/2024 2:00:03 PM
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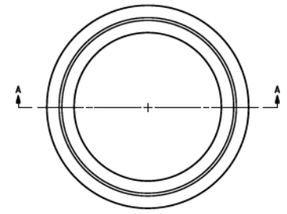
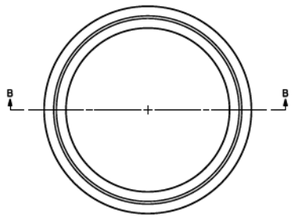




NOTES:

ON CONSTRUCTION OF NEW DRAINAGE STRUCTURES, LIMIT THE NUMBER OF CONCRETE ADJUSTING RINGS USED PER MANHOLE OR CATCH BASIN TO TWO RINGS WITH A TOTAL MAXIMUM THICKNESS OF 9" INCLUDING MORTAR.

UP TO THREE RINGS WITH A MAXIMUM TOTAL THICKNESS OF 12" INCLUDING MORTAR ARE ALLOWED WHEN RECONSTRUCTING INPLACE STRUCTURES WITH A GRADE CHANGE.

CONCRETE ADJUSTING RINGS ARE RECOMMENDED BUT NOT REQUIRED ON ALL STRUCTURES.

CONCRETE ADJUSTING RINGS MUST BE ENCASED IN MORTAR, SEE STANDARD PLATE 4026.

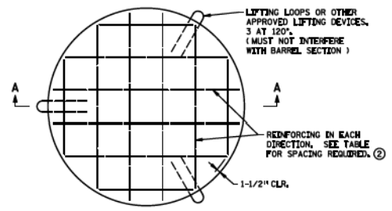
MINIMUM SPECIFIED CONCRETE STRENGTH = 5000 PSI AT TIME OF SHIPMENT.

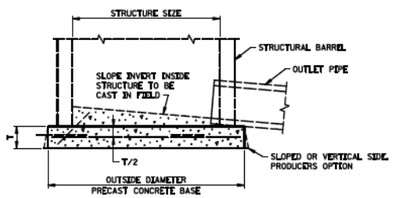
① REINFORCING:
A SINGLE HOOP OF MINIMUM DIAMETER 0.192" DEFORMED WIRE MEETING THE REQUIREMENTS OF ASTM A1064. PLACE WIRE WITHIN THE MIDDLE THIRD OF THE RING (HORIZONTALLY AND VERTICALLY) WITH A 1/2" TOLERANCE, EXCEPT PROVIDE MINIMUM CLEAR COVER OF 1/2" VERTICALLY FOR 2" THICK RINGS.

② VARIABLE THICKNESS, 2" MINIMUM TO 6" MAXIMUM.

③ VARIABLE WIDTH, 4" MINIMUM TO 5" MAXIMUM.

APPROVED 09-30-2022	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	CONCRETE ADJUSTING RINGS	2506	4010I





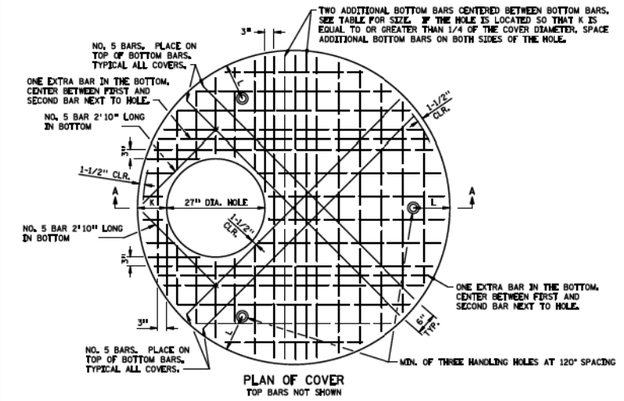
STRUCTURE SIZE (INCHES)	PRECAST CONCRETE BASE: OUTSIDE DIAMETER (INCHES)	T (INCHES)	MINIMUM REINF. ② BAR NUMBER	MINIMUM REINF. ② SPACING (INCHES)	APPROX. WEIGHT (POUNDS)
30	44	6	4	12	790
48	64	6	4	12	1,680
54	72	8	4	12	2,830
60	78	8	4	12	3,320
66	85	8	4	12	3,940
72	92	8	4	12	4,620
78	100	8	4	12	5,460
84	106	8	4	8	6,130
90	114	8	4	8	7,090
96	120	8	4	8	7,850
102	127	8	4	8	8,800
108	132	9	4	8	10,690 ①
120	146	12	4	8	17,440
132	160	12	4	8	20,940
144	174	12	4	6	24,770

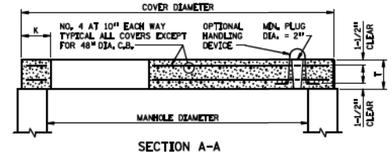
NOTES:

① ALTERNATE T = 10" WITH NO. 4 BAR SPACED AT 10".

② EQUIVALENT WIRE MESH MAY BE USED.

APPROVED OCTOBER 17, 1994	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	PRECAST CONCRETE BASE	2506 REVISED 3-22-2013 M.L.E.	4011E





TABLE

①	C.B. OR M.H. DIA.	COVER DIAMETER	WEIGHT OF SECTION	T	K	L	BOTTOM BARS EACH WAY
	48"	58"	1140 LBS.	6"	6"	8"	NO. 5 AT 6"
	54"	65"	1990 LBS.	8"	6"	8"	NO. 5 AT 8"
	60"	72"	2510 LBS.	8"	7"	9"	NO. 5 AT 7"
	66"	79"	3090 LBS.	8"	7"	9"	NO. 5 AT 7"
	72"	86"	3720 LBS.	8"	8"	10"	NO. 5 AT 6"
	78"	93"	4400 LBS.	8"	8"	10"	NO. 5 AT 5"
	84"	100"	5140 LBS.	8"	9"	11"	NO. 5 AT 5"
	90"	107"	5930 LBS.	8"	9"	11"	NO. 5 AT 5"
	96"	114"	6770 LBS.	8"	9"	11"	NO. 6 AT 6"
	102"	121"	7670 LBS.	8"	9"	12"	NO. 6 AT 5"
	108"	126"	12520 LBS.	12"	10"	12"	NO. 5 AT 5"
	120"	140"	15560 LBS.	12"	11"	13"	NO. 5 AT 4"

① ONLY NECESSARY TO USE BOTTOM LAYER OF STEEL.

NOTES:

AASHTO HS 25 LOADING.

MAXIMUM FILL HEIGHT 15 FT.

THE NO. 4020 SHALL BE PERMANENTLY MARKED ON THE TOP OF THE COVER.

EQUIVALENT STEEL AREAS IN WIRE MESH MAY BE USED.

REINFORCEMENT PER SPEC. 3301, GRADE 60. ANY STEEL REINFORCEMENT THAT IS WELDED DURING FABRICATION SHALL MEET THE REQUIREMENTS OF ASTM A706.

REFER TO PLANS FOR STEP REQUIREMENTS, HEIGHT, & DIAMETER.

SEE SHEET 12 OF 21 FOR INSTALLATION DETAILS.

DESIGNER NOTE:
WHEN STRUCTURE IS USED AS A CATCH BASIN, GIVE X & Y COORDINATES OF BOTH THE CENTERLINE FOR A, C, F OR G STRUCTURE AND THE CENTERLINE FOR THE 4020 STRUCTURE.

DESIGNATION:
DESIGN DIA. - STANDARD PLATE EXAMPLE: DESIGN 66 - 4020

APPROVED NOV. 22, 2000	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	MANHOLE OR CATCH BASIN FOR USE WITH OR WITHOUT TRAFFIC LOADS	2506 REVISION DATE 3-22-2013 M.L.E.	4020J 1 OF 2

DATE: 9/12/2024 2:00:04 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sht

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

wsb

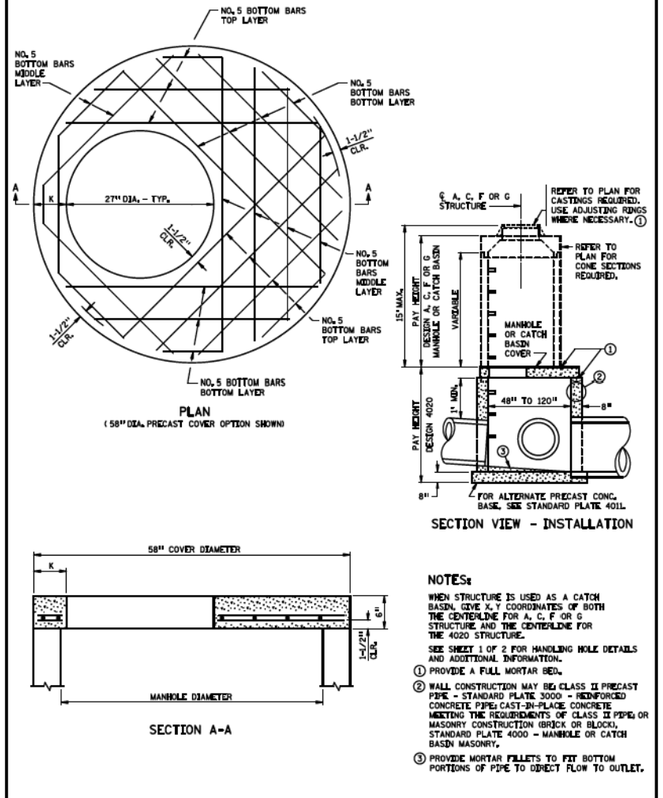
Chisago COUNTY USA

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



NOTES:

WHEN STRUCTURE IS USED AS A CATCH BASIN, GIVE X, Y COORDINATES OF BOTH THE CENTERLINE FOR A, C, F OR G STRUCTURE AND THE CENTERLINE FOR THE 4020 STRUCTURE.

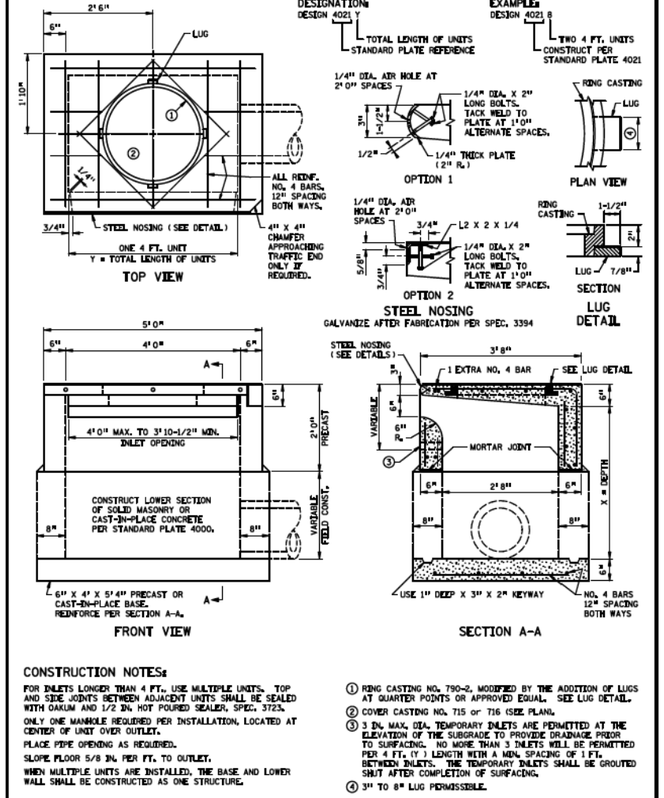
SEE SHEET 1 OF 2 FOR HANDLING HOLE DETAILS AND ADDITIONAL INFORMATION.

① PROVIDE A FULL MORTAR BED.

② WALL CONSTRUCTION MAY BE: CLASS II PRECAST PIPE - STANDARD PLATE 3006 - REINFORCED CONCRETE PIPE; CAST-IN-PLACE CONCRETE MEETING THE REQUIREMENTS OF CLASS II PIPE; OR MASONRY CONSTRUCTION (BRICK OR BLOCK), STANDARD PLATE 4000 - MANHOLE OR CATCH BASIN MASONRY.

③ PROVIDE MORTAR FILLETS TO FIT BOTTOM PORTIONS OF PIPE TO DIRECT FLOW TO OUTLET.

APPROVED NOV. 22, 2000	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
Delbert W. Linder	MANHOLE OR CATCH BASIN	2506	4020J
STATE DESIGN ENGINEER	FOR USE WITH OR WITHOUT TRAFFIC LOADS	REVISED 10-29-2013 M.J.E.	2 OF 2



CONSTRUCTION NOTES:

FOR INLETS LONGER THAN 4 FT., USE MULTIPLE UNITS. TOP AND SIDE JOINTS BETWEEN ADJACENT UNITS SHALL BE SEALED WITH OAKUM AND 1/2 IN. HOT POURED SEALER, SPEC. 3723.

ONLY ONE MANHOLE REQUIRED PER INSTALLATION, LOCATED AT CENTER OF UNIT OVER OUTLET.

PLACE PIPE OPENING AS REQUIRED.

SLOPE FLOOR 5/8 IN. PER FT. TO OUTLET.

WHEN MULTIPLE UNITS ARE INSTALLED, THE BASE AND LOWER WALL SHALL BE CONSTRUCTED AS ONE STRUCTURE.

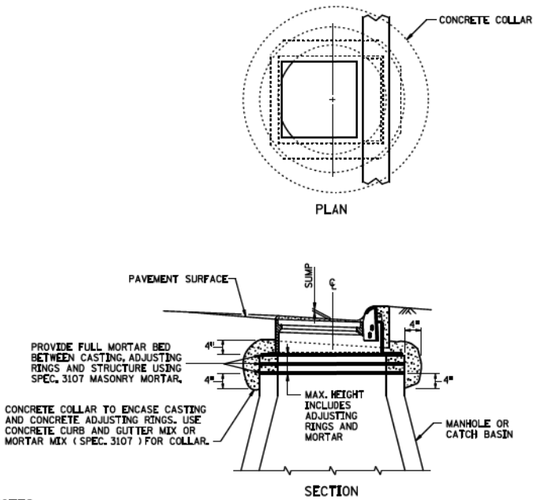
① RING CASTING NO. 790-2, MODIFIED BY THE ADDITION OF LUGS AT QUARTER POINTS OR APPROVED EQUAL. SEE LUG DETAIL.

② COVER CASTING NO. 715 or 716 (SEE PLAN).

③ 3 IN. MAX. DIA. TEMPORARY INLETS ARE PERMITTED AT THE ELEVATION OF THE SUBGRADE TO PROVIDE DRAINAGE PRIOR TO SURFACING. NO MORE THAN 3 INLETS WILL BE PERMITTED PER 4 FT. (Y) LENGTH WITH A MIN. SPACING OF 1 FT. BETWEEN INLETS. THE TEMPORARY INLETS SHALL BE GROUTED SHUT AFTER COMPLETION OF SURFACING.

④ 3" TO 8" LUG PERMISSIBLE.

APPROVED JULY 6, 2001	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	PRECAST CURB OPENING CATCH BASIN	2506 3622	4021F
		REVISED 3-22-2013 M.J.E.	



NOTES:

SEE PLATE 4010 FOR MAXIMUM NUMBER AND HEIGHT OF ADJUSTING RINGS.

USE ADJUSTING RINGS FOR VERTICAL ADJUSTMENTS ONLY.

APPROVED 09-30-2022	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	CONCRETE-ENCASED CONCRETE ADJUSTING RINGS	2506	4026B

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

wsb

Chisago COUNTY USA

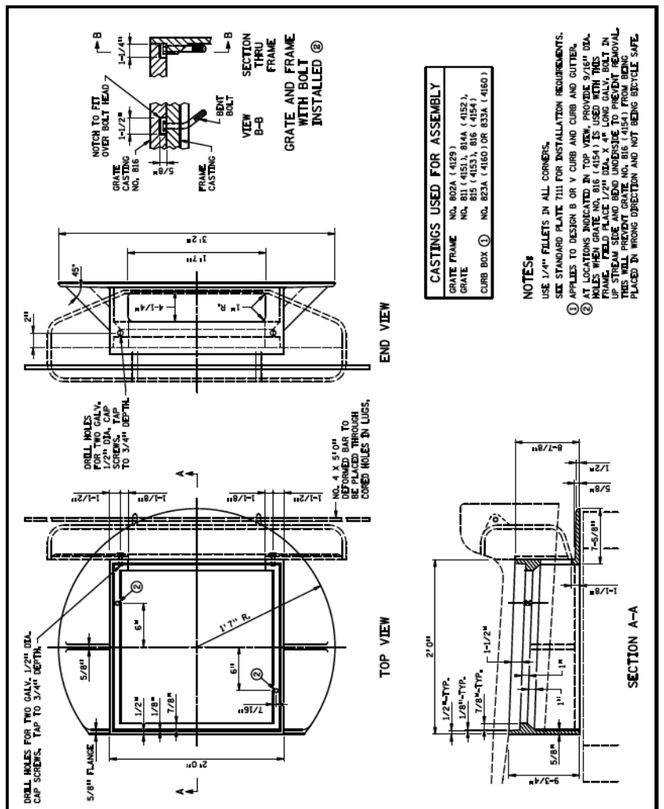
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 39 OF 216 SHEETS

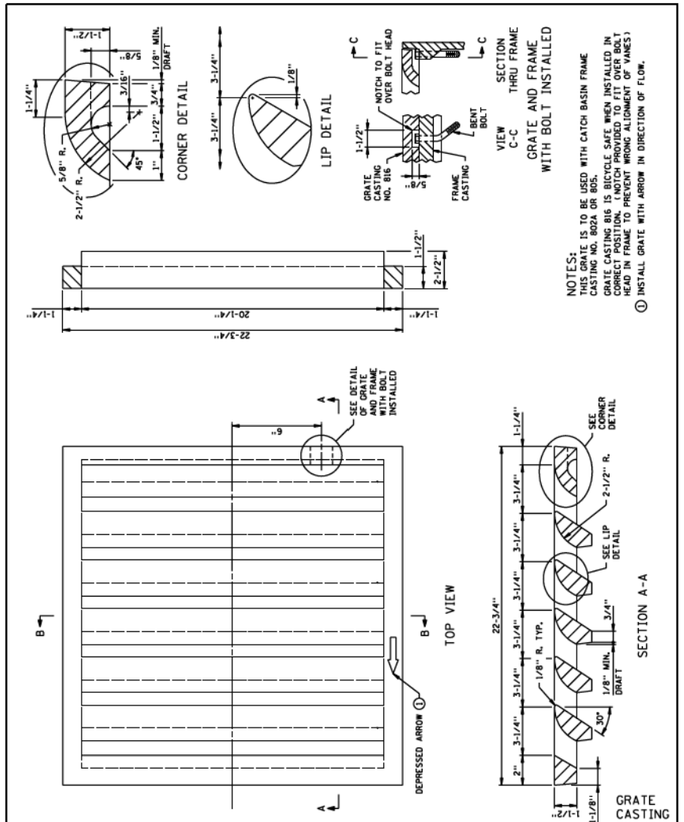
DATE: 9/12/2024 2:00:05 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sht



CASTINGS USED FOR ASSEMBLY	
GRATE FRAME	NO. 802A (4129), NO. 811 (4151), 816 (4154), NO. 815 (4153), NO. 816 (4154)
GRATE	NO. 823A (4160) OR 833A (4160)
CURB BOX ①	

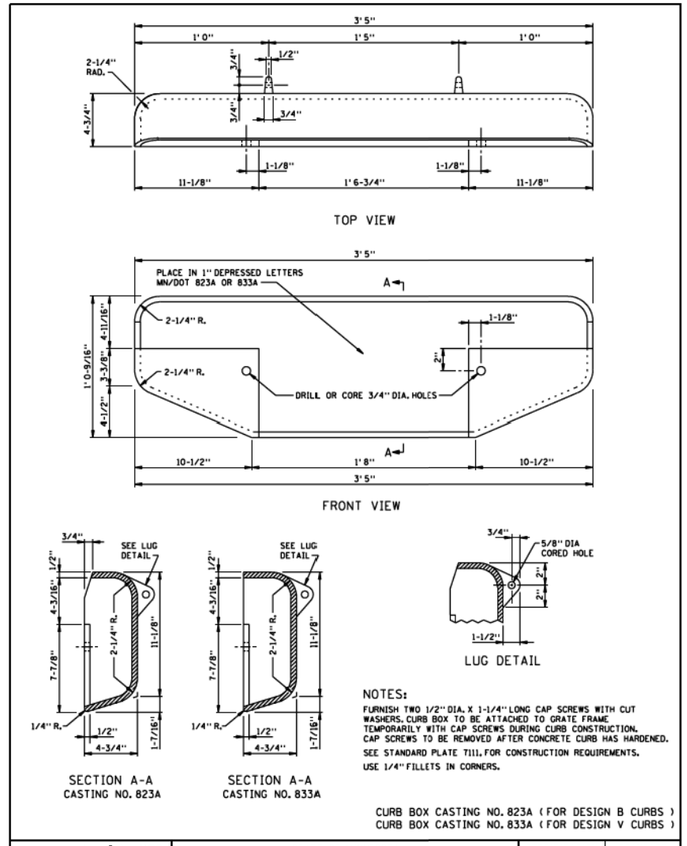
NOTES:
USE 1/4" FILLETS IN ALL CORNERS.
SEE STANDARD PLATE 7111 FOR INSTALLATION REQUIREMENTS.
① APPLIES TO DESIGN B OR V CURB AND CURB AND GUTTER.
② AT LOCATIONS INDICATED IN TOP VIEW, PROVIDE 5/16" DIA. HOLES WHEN GRATE NO. 816 (4154) IS USED WITH THIS FRAME. FIELD PLACE 1/2" DIA. X 4" LONG GALV. BOLT IN BOTTOM HOLE AND WELD TO FRAME. THIS WILL PREVENT GRATE NO. 816 (4154) FROM BEING PLACED IN WRONG ORIENTATION AND NOT BEING BICYCLE SAFE.

APPROVED MARCH 14, 1996	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
Gerald J. Rochrich STATE DESIGN ENGINEER	CATCH BASIN FRAME CASTING FOR SQUARE GRATE	2506 REVISED 3-22-2013 M.L.E.	4129G



NOTES:
THIS GRATE IS TO BE USED WITH CATCH BASIN FRAME CASTING NO. 802A OR 805.
GRATE CASTING 816 IS BICYCLE SAFE WHEN INSTALLED IN CORRECT ORIENTATION. NOTCH MUST BE OVER BOLT HEAD IN FRAME TO PREVENT WRONG ALIGNMENT OF VANES.
① INSTALL GRATE WITH ARROW IN DIRECTION OF FLOW.

APPROVED Oct. 10, 1979	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
S. D. Thompson Director Construction and Engineering Development	CATCH BASIN GRATE CASTING	2506	4154B



NOTES:
FURNISH TWO 1/2" DIA. X 1-1/4" LONG CAP SCREWS WITH CUT WASHERS. CURB BOX TO BE ATTACHED TO GRATE FRAME TEMPORARILY WITH CAP SCREWS DURING CURB CONSTRUCTION. CAP SCREWS TO BE REMOVED AFTER CONCRETE CURB HAS HARDENED.
SEE STANDARD PLATE 7111, FOR CONSTRUCTION REQUIREMENTS.
USE 1/4" FILLETS IN CORNERS.

CURB BOX CASTING NO. 823A (FOR DESIGN B CURBS)
CURB BOX CASTING NO. 833A (FOR DESIGN V CURBS)

APPROVED Dec. 10, 1982	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
R. H. Sullivan Assistant Division Director Technical Services	CURB BOX CASTING FOR CATCH BASIN	2506	4160D

DATE: 9/12/2024 2:00:06 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. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620

wsb

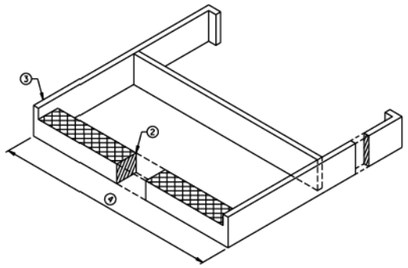
Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

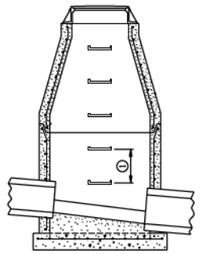
CHISAGO COUNTY, MINNESOTA

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

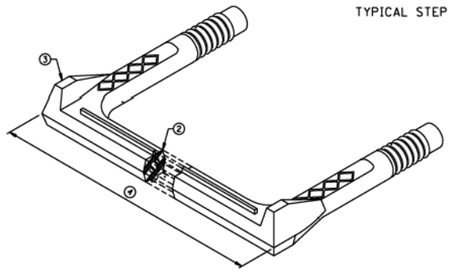
SHEET 40 OF 216 SHEETS



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 OPOSITE WALL OF THE MANHOLE RISER OR CONE SHALL BE 18 IN. MEASURED AT THE CENTER FACE OF THE STEP.

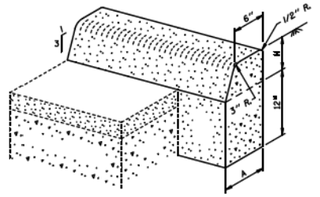
① STEPS SHALL BE SPACED AT A MAXIMUM DESIGN DISTANCE OF 16 IN. APART.

② STEPS SHALL HAVE A MINIMUM CROSS SECTION DIMENSION OF 1 IN.

③ MINIMUM VERTICAL SIDE DIMENSION TO PREVENT FOOT FROM SLIPPING OFF IS 1/2".

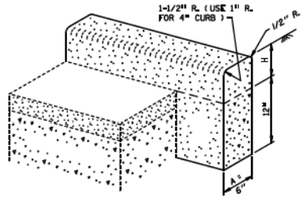
④ THE MINIMUM WIDTH OF RUNGS OR CLEATS SHALL BE 10 IN.

APPROVED DEC. 30, 1996	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
Gerald J. Rohrbach	MANHOLE OR CATCH BASIN STEP	2506	4180J
STATE DESIGN ENGINEER			



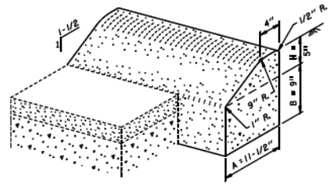
DESIGN B

DESIGN NO.	CURB WIDTH A	CURB HEIGHT H	CONCRETE CU. YDS. PER LIN. FT.	CONCRETE LIN. 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 V

DESIGN NO.	CURB HEIGHT H	CONCRETE CU. YDS. PER LIN. FT.	CONCRETE LIN. 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

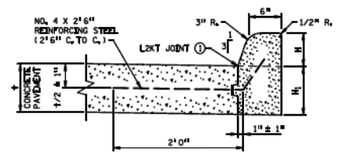


DESIGN S

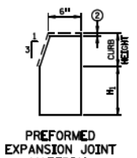
DESIGN NO.	CONCRETE CU. YDS. PER LIN. FT.	CONCRETE LIN. FT. PER CU. YD.
S5	0.0364	27.5

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

APPROVED JULY 25, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
(STATE DESIGN ENGINEER)	CONCRETE CURB DESIGN B, DESIGN V, DESIGN S, DESIGN DR AND DESIGN BR	2531	7020K 1 OF 2



CURB SECTION



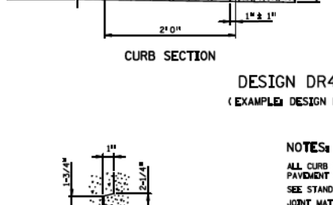
PREFORMED EXPANSION JOINT MATERIAL

TABLE OF CU. YDS. PER LIN. FT. ③

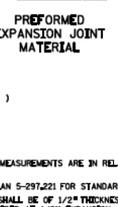
DIMENSION H_1	DIMENSION H 4"	6"	7"	8"	9"	10"
8"	0.0222	0.0275	0.0303	0.0332	0.0361	0.0392
9"	0.0240	0.0295	0.0324	0.0354	0.0384	0.0415
10"	0.0259	0.0315	0.0345	0.0375	0.0407	0.0439
11"	0.0277	0.0335	0.0366	0.0397	0.0429	0.0462
12"	0.0295	0.0355	0.0387	0.0419	0.0452	0.0486

DESIGN BRH-H_1

(EXAMPLE: DESIGN BR6-9)



CURB SECTION



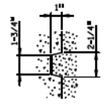
PREFORMED EXPANSION JOINT MATERIAL

TABLE OF CU. YDS. PER LIN. FT. ③

DIMENSION H_1	CU. YDS. CONC.
8"	0.0313
9"	0.0344
10"	0.0374
11"	0.0404
12"	0.0435

DESIGN DR4-H_1

(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 OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
(STATE DESIGN ENGINEER)	CONCRETE CURB DESIGN B, DESIGN V, DESIGN S, DESIGN DR AND DESIGN BR	2531 REVISED 3-22-2013 M.J.E.	7020K 2 OF 2

DATE: 9/12/2024 2:00:07 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-spt

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

wsb

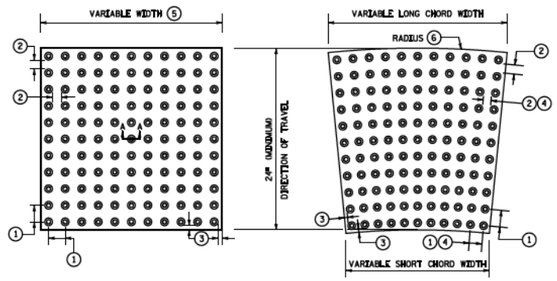
Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

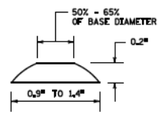
STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 41 OF 216 SHEETS



RECTANGULAR PLATES

RADIAL PLATES



SECTION A-A
TRUNCATED DOME

TYPICAL RADIAL TRUNCATED DOME PLATES

RADIUS (FEET) (7)	LONG CHORD WIDTH (INCHES)	SQUARE FEET PER PLATE	PLATES REQUIRED FOR 90 DEGREE TURN
10	23½	3.53	8
15	18 3/16	2.93	15
15	23½	3.67	12
20	18 3/16	3.00	20
20	18⅛	2.98	20
25	20½	3.28	23
25	23 5/16	3.77	20
30	22¾	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.

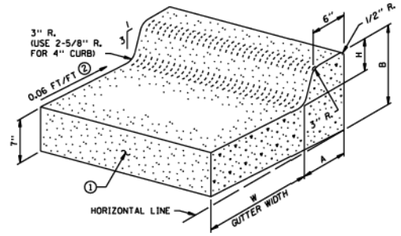
DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT GUTTER, ROADWAY, OR WALKWAY, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. CONTRAST MAY BE PROVIDED ON THE FULL RAMP SURFACE, EXCLUDING THE FLARED SIDES.

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.

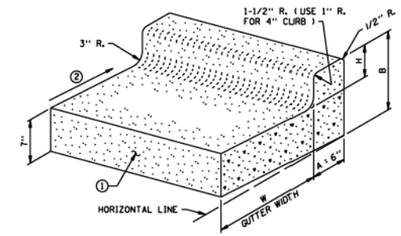
(1) CENTER-TO-CENTER DOME SPACING: 1.6" MINIMUM, 2.4" MAXIMUM.
(2) BASE-TO-BASE DOME SPACING: 0.65" MINIMUM.
(3) DOME BASE TO PLATE EDGE SPACING: 0.35" MINIMUM, 0.75" MAXIMUM.
(4) SPACING VARIES ON RADIAL PLATES.
(5) TYPICAL WIDTHS AVAILABLE: 12", 18", 24", 30", 36", CHECK WITH MANUFACTURERS FOR AVAILABLE WIDTHS.
(6) ON RADIAL PLATE, RADIUS DEFINED AT BACK OF CURB.
(7) TYPICAL RADII. CHECK WITH MANUFACTURERS FOR AVAILABLE RADII.

APPROVED AUGUST 23, 2010	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	DETECTABLE WARNING SURFACE TRUNCATED DOMES	2531 2563 REVISED 01-09-2020 M.J.E.	7038A



DESIGN B

REVERSE SLOPE GUTTER SECTION
(FORMS MAY BE TILTED)



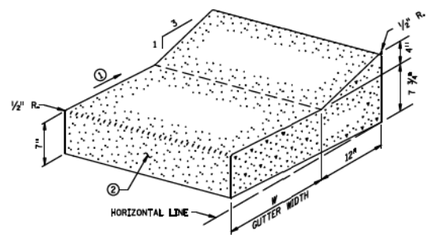
DESIGN V

NOTES:
(1) LONGITUDINAL JOINT WHEN ADJACENT TO RIGID PAVEMENT OR BASE.
SEE STANDARD PLANS MANUAL FOR JOINT INFORMATION.
(2) 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"	
DIMENSIONS			CONCRETE		CONCRETE		CONCRETE		CONCRETE		CONCRETE	
H	A	B	DESIGN NO.	CU. YDS. PER LIN. FT.	DESIGN NO.	CU. YDS. PER LIN. FT.	DESIGN NO.	CU. YDS. PER LIN. FT.	DESIGN NO.	CU. YDS. PER LIN. FT.	DESIGN NO.	CU. YDS. PER LIN. FT.
4	7-3/8"	11-1/2"	B412	0.0421	B418	0.0529	B424	0.0637	B430	0.0745	B436	0.0853
6	8"	13-1/2"	B612	0.0474	B618	0.0582	B624	0.0690	B630	0.0798	B636	0.0906
8	8-5/8"	15-1/2"	B812	0.0529	B818	0.0637	B824	0.0745	B830	0.0853	B836	0.0962
9	9"	16-5/8"	B912	0.0559	B918	0.0667	B924	0.0775	B930	0.0883	B936	0.0991
10	9-3/8"	17-5/8"	B1012	0.0589	B1018	0.0697	B1024	0.0805	B1030	0.0913	B1036	0.1021

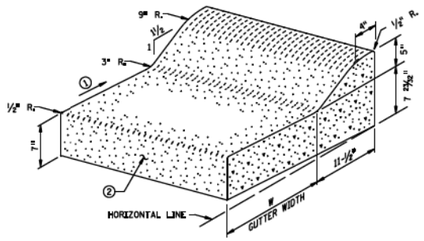
DESIGN V			W = 12"		W = 18"		W = 24"		W = 30"		W = 36"	
DIMENSIONS			CONCRETE		CONCRETE		CONCRETE		CONCRETE		CONCRETE	
H	A	B	DESIGN NO.	CU. YDS. PER LIN. FT.	DESIGN NO.	CU. YDS. PER LIN. FT.	DESIGN NO.	CU. YDS. PER LIN. FT.	DESIGN NO.	CU. YDS. PER LIN. FT.	DESIGN NO.	CU. YDS. PER LIN. FT.
4	6"	11-3/8"	V412	0.0396	V418	0.0504	V424	0.0612	V430	0.0720	V436	0.0828
6	6"	13-3/8"	V612	0.0426	V618	0.0534	V624	0.0642	V630	0.0750	V636	0.0858
8	6"	15-3/8"	V812	0.0457	V818	0.0565	V824	0.0673	V830	0.0781	V836	0.0889
9	6"	16-3/8"	V912	0.0472	V918	0.0580	V924	0.0688	V930	0.0796	V936	0.0904
10	6"	17-3/8"	V1012	0.0487	V1018	0.0595	V1024	0.0703	V1030	0.0811	V1036	0.0919

APPROVED MARCH 11, 1994	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
ACTING STATE DESIGN ENGINEER	CONCRETE CURB AND GUTTER DESIGN B AND DESIGN V	2531 REVISION DATE 2-28-05	7100H



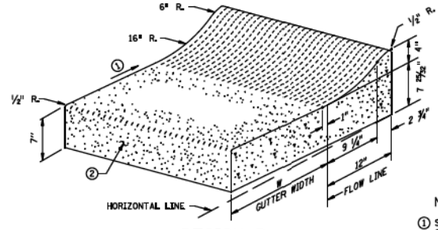
DESIGN D

D DESIGN NO.	GUTTER WIDTH W	CONCRETE CU. YDS. PER LIN. FT.	CONCRETE LIN. FT. PER CU. YD.
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

S DESIGN NO.	GUTTER WIDTH W	CONCRETE CU. YDS. PER LIN. FT.	CONCRETE LIN. FT. PER CU. YD.
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

R DESIGN NO.	GUTTER WIDTH W	CONCRETE CU. YDS. PER LIN. FT.	CONCRETE LIN. FT. PER CU. YD.
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:
(1) SLOPE ¾" PER FOOT NORMAL UNLESS OTHERWISE SPECIFIED. IF A DIFFERENT GUTTER SLOPE IS SPECIFIED, THE FORM MAY BE TILTED.
(2) 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	SPECIFICATION REFERENCE	STANDARD PLATE NO.
STATE DESIGN ENGINEER	CONCRETE CURB AND GUTTER DESIGN D, DESIGN S AND DESIGN R	2531	7102K

DATE: 9/12/2024 2:00:08 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. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620

wsb

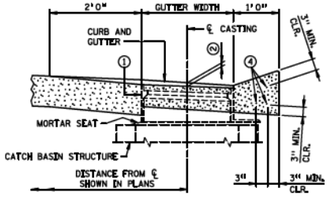
Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

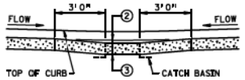
CHISAGO COUNTY, MINNESOTA

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

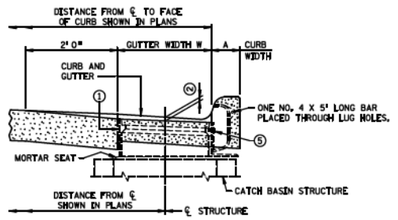
SHEET 42 OF 216 SHEETS



DESIGN D CONCRETE CURB & GUTTER

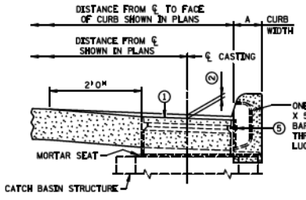


DEPRESSION (SUMP) IN FLOW LINE AT CATCH BASIN LOCATION



DESIGN B CONCRETE CURB & GUTTER

CURB BOX CASTINGS USED FOR ASSEMBLY
821B, 823A, 824, 831A & 833A



DESIGN B CONCRETE CURB

NOTES:

COMPENSATE FOR TILT BY VARYING THE DEPTH OF MORTAR SEAT.

DETAILS ARE TYPICAL AND APPLY TO INSTALLATION OF BOTH TELESCOPING AND NON-TELESCOPING CASTINGS. REFER TO PLANS FOR SPECIFIC ITEMS REQUIRED.

ALL REINFORCEMENT REQUIRED IS INCIDENTAL, WITH NO DIRECT PAYMENT.

① CATCH BASIN CASTING.

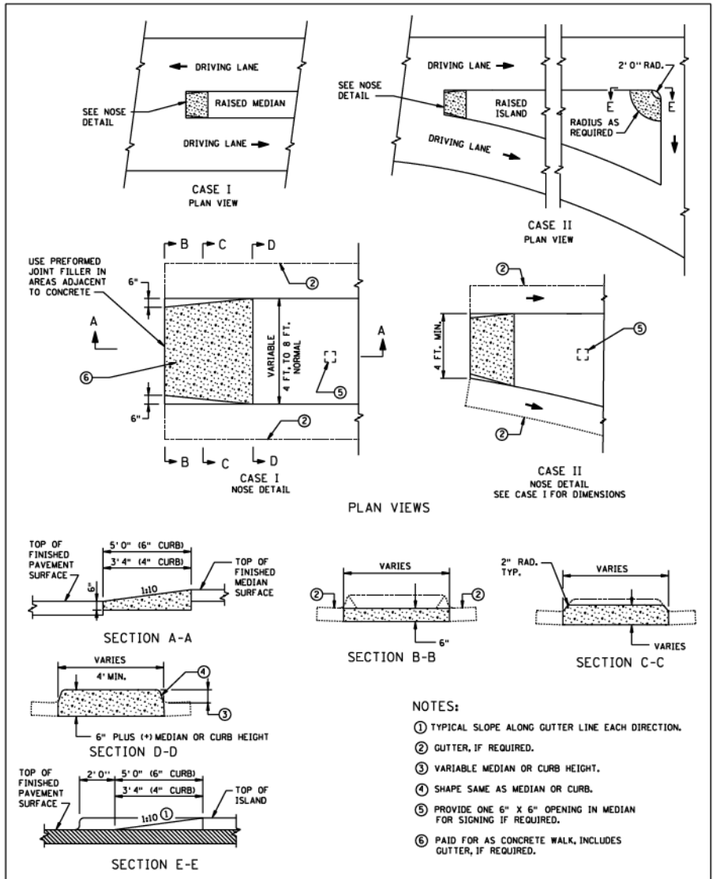
② ON ALL APPLICATIONS USE .10' SUMP. SUMP SHALL BE MEASURED AT CENTER OF CASTING.

③ SAME THICKNESS AS ADJACENT PAVEMENT OR GUTTER.

④ THREE NO. 4 HORIZONTAL BARS 5'0" LONG CENTERED ABOUT ℄ OF CASTING.

⑤ CURB INLET CASTING SHALL BE FASTENED TEMPORARILY TO FRAME CASTING WITH 2 CAP SCREWS, DURING CURB CONSTRUCTION. CAP SCREWS MUST BE REMOVED AFTER CURB HAS HARDENED.

APPROVED APRIL 23, 1996	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
Gerald J. Rohrbach	INSTALLATION OF CATCH BASIN CASTINGS	2531	7111J
STATE DESIGN ENGINEER	CONCRETE CURB & GUTTER	REVISED 3-22-2013 M.L.E.	



NOTES:

① TYPICAL SLOPE ALONG GUTTER LINE EACH DIRECTION.

② GUTTER, IF REQUIRED.

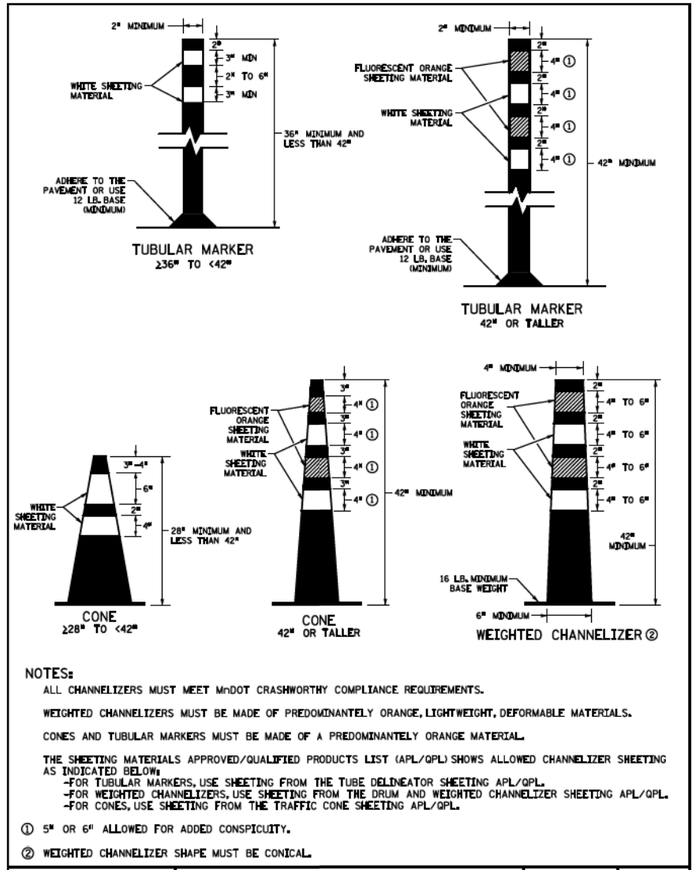
③ VARIABLE MEDIAN OR CURB HEIGHT.

④ SHAPE SAME AS MEDIAN OR CURB.

⑤ PROVIDE ONE 6" X 6" OPENING IN MEDIAN FOR SIGNING IF REQUIRED.

⑥ PAID FOR AS CONCRETE WALK, INCLUDES GUTTER, IF REQUIRED.

APPROVED JUNE 24, 1985	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
R.M. Hill	CONCRETE APPROACH NOSE DETAIL	2531	7113A
STATE DESIGN ENGINEER		REVISION DATE 5-28-2003	



NOTES:

ALL CHANNELIZERS MUST MEET MnDOT CRASHWORTHY COMPLIANCE REQUIREMENTS.

WEIGHTED CHANNELIZERS MUST BE MADE OF PREDOMINANTELY ORANGE, LIGHTWEIGHT, DEFORMABLE MATERIALS.

CONES AND TUBULAR MARKERS MUST BE MADE OF A PREDOMINANTELY ORANGE MATERIAL.

THE SHEETING MATERIALS APPROVED/QUALIFIED PRODUCTS LIST (APL/QPL) SHOWS ALLOWED CHANNELIZER SHEETING AS INDICATED BELOW:
- -FOR TUBULAR MARKERS, USE SHEETING FROM THE TUBE DELINEATOR SHEETING APL/QPL.
- -FOR WEIGHTED CHANNELIZERS, USE SHEETING FROM THE DRUM AND WEIGHTED CHANNELIZER SHEETING APL/QPL.
- -FOR CONES, USE SHEETING FROM THE TRAFFIC CONE SHEETING APL/QPL.

① 5" OR 6" ALLOWED FOR ADDED CONSPICUITY.

② WEIGHTED CHANNELIZER SHAPE MUST BE CONICAL.

APPROVED 05-14-2021	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
Tom Styrbicki	TEMPORARY CHANNELIZERS TYPE A	1710 2563	8000K 1 OF 3
STATE DESIGN ENGINEER			

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

wsb

Chisago COUNTY USA

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 2:00:08 PM
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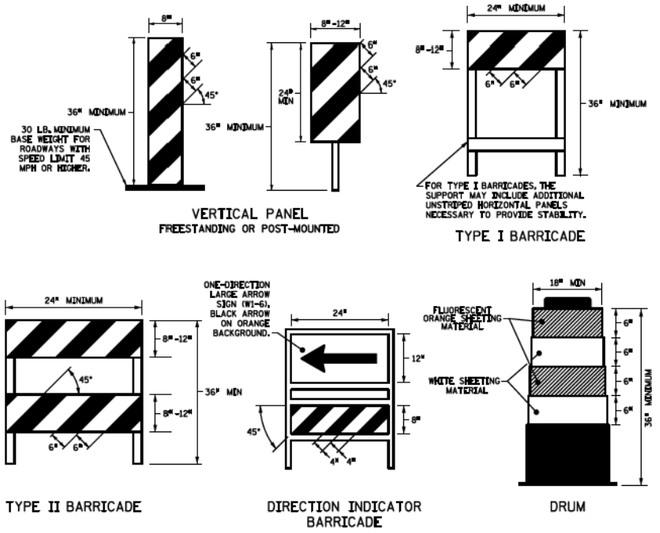


VERTICAL PANEL
FREESTANDING OR POST-MOUNTED

TYPE I BARRICADE

TYPE II BARRICADE

DIRECTION INDICATOR BARRICADE

DRUM

NOTES:

ALL CHANNELIZERS MUST MEET MNDOT CRASHWORTHY COMPLIANCE REQUIREMENTS.

ALL TYPE B CHANNELIZERS MUST HAVE A MINIMUM OF 270 SQUARE INCHES OF RETROREFLECTIVE SHEETING ON THE SIDE FACING ROAD USERS.

PLACE ALL PANELS WITH RETROREFLECTIVE SHEETING PERPENDICULAR TO THE ROADWAY.

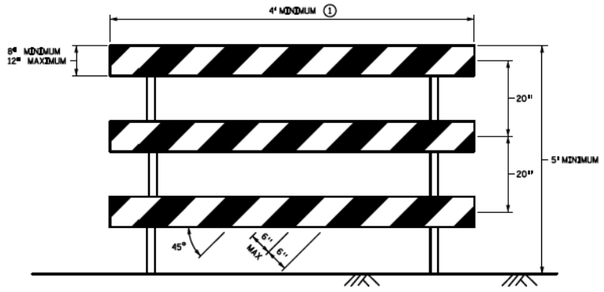
DRUMS MUST BE MADE OF PREDOMINANTLY ORANGE, LIGHTWEIGHT, DEFORMABLE MATERIALS.

STRIPES ON BARRICADE RAILS AND VERTICAL PANELS MUST BE ALTERNATING ORANGE AND WHITE RETROREFLECTIVE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS. BARRICADES AND VERTICAL PANELS WITH STRIPES WHICH BEGIN AT THE UPPER RIGHT SIDE AND SLOPE DOWN DOWNWARD TO THE LEFT LOWER SIDE ARE DESIGNATED AS "RIGHT" (R) BARRICADES AND VERTICAL PANELS. BARRICADES AND VERTICAL PANELS WITH STRIPES WHICH BEGIN AT THE UPPER LEFT SIDE AND SLOPE DOWN DOWNWARD TO THE RIGHT LOWER SIDE ARE DESIGNATED AS "LEFT" (L) BARRICADES AND VERTICAL PANELS. BARRICADE SHEETING, PROPERLY ORIENTED (R OR L) SHALL BE APPLIED TO ANY BARRICADE RAIL BOARD THAT FACES ROAD USERS.

THE SHEETING MATERIALS APPROVED/QUALIFIED PRODUCTS LIST (APL/QPL) SHOWS THE ALLOWED CHANNELIZER SHEETING AS INDICATED BELOW

- FOR BARRICADE RAILS (INCLUDING THAT ON THE DIRECTION INDICATOR BARRICADE) AND VERTICAL PANELS, USE SHEETING FROM THE BARRICADE SHEETING APL/QPL.
- FOR DRUMS, USE SHEETING FROM THE DRUM AND WEIGHTED CHANNELIZER SHEETING APL/QPL.

APPROVED 05-14-2021 STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	TEMPORARY CHANNELIZERS TYPE B	1710 2563	8000K 2 OF 3



TYPE III BARRICADE
R IS SHOWN

NOTES:

ALL CHANNELIZERS MUST MEET MNDOT CRASHWORTHY COMPLIANCE REQUIREMENTS.

ALL PANELS WITH RETROREFLECTIVE SHEETING MUST BE PLACED PERPENDICULAR TO THE ROADWAY.

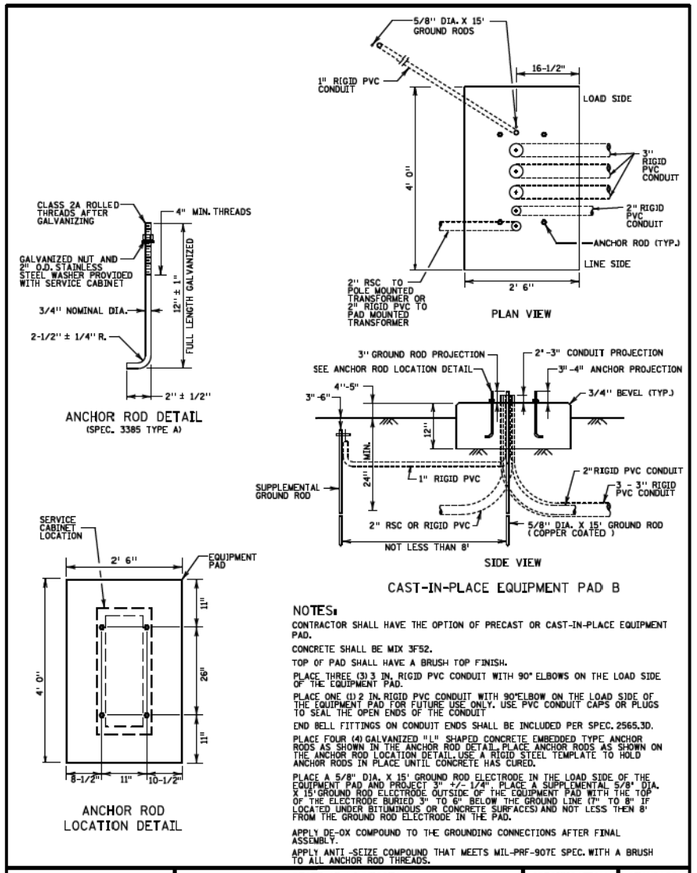
STRIPES ON BARRICADE RAILS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTIVE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS. BARRICADES WITH STRIPES WHICH BEGIN AT THE UPPER RIGHT SIDE AND SLOPE DOWNWARD TO THE LOWER LEFT SIDE ARE DESIGNATED AS "RIGHT" (R) BARRICADES. BARRICADES WITH STRIPES WHICH BEGIN AT THE UPPER LEFT SIDE AND SLOPE DOWNWARD TO THE LOWER RIGHT SIDE ARE DESIGNATED AS "LEFT" (L) BARRICADES. PROPERLY-ORIENTED (R OR L) BARRICADE SHEETING SHALL BE APPLIED TO ANY BARRICADE RAIL BOARD WHICH FACES ROAD USERS.

ALLOWED CHANNELIZER SHEETING IS SHOWN ON THE SHEETING MATERIALS APPROVED/QUALIFIED PRODUCTS LIST (APL/QPL). FOR BARRICADE RAILS, USE SHEETING FROM THE BARRICADE SHEETING APL/QPL.

DO NOT MOUNT SIGNS ON TYPE III BARRICADES THAT COVER MORE THAN 50 PERCENT OF THE TOP TWO RAILS OR 33 PERCENT OF THE TOTAL AREA OF THE THREE RAILS.

(1) ON CONSTRUCTION PROJECTS, UNLESS OTHERWISE SPECIFIED BY THE CONTRACT PROVISIONS OR REGULATIONS, TYPE III BARRICADES FURNISHED BY THE CONTRACTOR MUST HAVE BARRICADE RAILS AT LEAST 6' LONG.

APPROVED 05-14-2021 STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	TEMPORARY CHANNELIZERS TYPE C	1710 2563	8000K 3 OF 3



CAST-IN-PLACE EQUIPMENT PAD B

NOTES:

CONTRACTOR SHALL HAVE THE OPTION OF PRECAST OR CAST-IN-PLACE EQUIPMENT PAD.

CONCRETE SHALL BE MIX 3F52.

TOP OF PAD SHALL HAVE A BRUSH TOP FINISH.

PLACE THREE (3) 3 IN. RIGID PVC CONDUIT WITH 90° ELBOWS ON THE LOAD SIDE OF THE EQUIPMENT PAD.

PLACE ONE (1) 2 IN. RIGID PVC CONDUIT WITH 90° ELBOW ON THE LOAD SIDE OF THE EQUIPMENT PAD FOR FUTURE USE ONLY. USE PVC CONDUIT CAPS OR PLUGS TO SEAL THE OPEN ENDS OF THE CONDUIT

END BELL FITTINGS ON CONDUIT ENDS SHALL BE INCLUDED PER SPEC. 2565.3D.

PLACE FOUR (4) GALVANIZED "L" SHAPED CONCRETE EMBEDDED TYPE ANCHOR RODS AS SHOWN IN THE ANCHOR ROD DETAIL. PLACE ANCHOR RODS AS SHOWN ON THE ANCHOR ROD LOCATION DETAIL. USE A RIGID STEEL TEMPLATE TO HOLD ANCHOR RODS IN PLACE UNTIL CONCRETE HAS CURED.

PLACE A 5/8" DIA. X 15' GROUND ROD ELECTRODE IN THE LOAD SIDE OF THE EQUIPMENT PAD AND PROJECT 3" +/- 1/4". PLACE A SUPPLEMENTAL 5/8" DIA. X 15' GROUND ROD ELECTRODE OUTSIDE OF THE EQUIPMENT PAD WITH THE TOP OF THE ELECTRODE BURIED 5" TO 6" BELOW THE GROUND LINE (7" TO 8" IF LOCATED UNDER BITUMINOUS OR CONCRETE SURFACES) AND NOT LESS THEN 8' FROM THE GROUND ROD ELECTRODE IN THE PAD.

APPLY DE-OX COMPOUND TO THE GROUNDING CONNECTIONS AFTER FINAL ASSEMBLY.

APPLY ANTI -SEIZE COMPOUND THAT MEETS MIL-PRF-907E SPEC. WITH A BRUSH TO ALL ANCHOR ROD THREADS.

APPROVED JULY 15, 2015 STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	EQUIPMENT PAD B	2461, 2545 2550, 2565	8106D 1 OF 3

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

wsb

Chisago COUNTY USA

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 44 OF 216 SHEETS

DATE: 9/12/2024 2:00:09 PM
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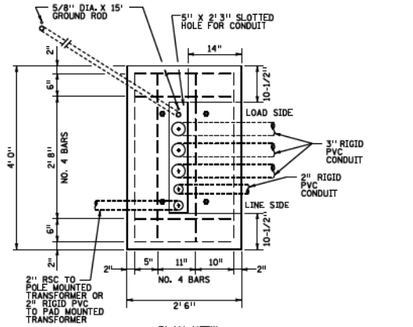
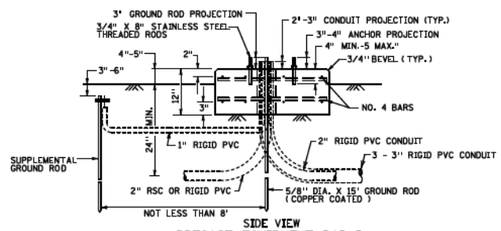


PLAN VIEW



SIDE VIEW
PRECAST EQUIPMENT PAD B

NOTES:

CONTRACTOR SHALL HAVE THE OPTION OF PRECAST OR CAST-IN-PLACE EQUIPMENT PAD.

CONCRETE SHALL BE MIX 3F52.

TOP OF PAD SHALL HAVE A BRUSH TOP FINISH.

SEE ANCHOR ROD LOCATION DETAIL ON SHEET 1 OF 3 FOR BOLT LOCATION.

PLACE THREE (3) 3 IN. RIGID PVC CONDUIT WITH 90° ELBOWS ON THE LOAD SIDE OF THE EQUIPMENT PAD.

PLACE ONE (1) 2 IN. RIGID PVC CONDUIT WITH 90°ELBOW ON THE LOAD SIDE OF THE EQUIPMENT PAD FOR FUTURE USE ONLY. USE PVC CONDUIT CAPS OR PLUGS TO SEAL THE OPEN ENDS OF THE CONDUIT

END BELL FITTINGS ON CONDUIT ENDS SHALL BE INCLUDED PER SPEC. 2565.3D.

FILL AREA AROUND RIGID PVC CONDUIT AND GROUND ROD AS APPROVED BY THE ENGINEER.

PLACE A 5/8" DIA. X 15' GROUND ROD ELECTRODE IN THE LOAD SIDE OF THE EQUIPMENT PAD AND PROJECT 3" +/- 1/4". PLACE A SUPPLEMENTAL 5/8" DIA. X 15' GROUND ROD ELECTRODE OUTSIDE OF THE EQUIPMENT PAD WITH THE TOP OF THE ELECTRODE BURIED 3" TO 6" BELOW THE GROUND LINE (7" TO 9" IF UNDER BITUMINOUS OR CONCRETE SURFACES) AND NOT LESS THAN 8' FROM THE GROUND ROD ELECTRODE IN THE PAD

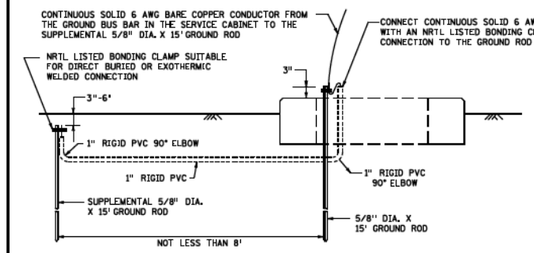
APPLY DE-OX COMPOUND TO THE GROUNDING CONNECTIONS AFTER FINAL ASSEMBLY.

REINFORCEMENT SHALL BE NO. 4 BAR. EACH PAD SHALL CONTAIN: EIGHT (8) 3'-8" LENGTH BARS AND EIGHT (8) 2'-2" LENGTH BARS AS SHOWN.

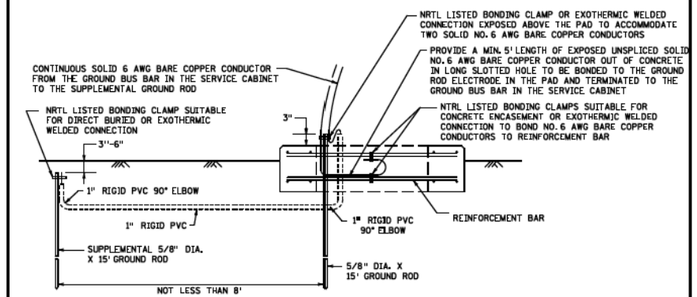
ANCHOR RODS SHALL BE CHAMFERED AND SHALL BE IN ACCORDANCE WITH 3385.2D. RODS SHALL BE ANCHORED USING AN EPOXY ADHESIVE INTO 7/8" DIA. DRILLED HOLE 4" TO 5" IN DEPTH PER MANUFACTURE'S INSTRUCTIONS. MECHANICAL ANCHOR BOLTS OR CONCRETE WEDGE ANCHORS SHALL NOT BE USED. USE AN APPROVED EPOXY ADHESIVE FOR APS PUSH BUTTON BASE ADHESIVE ANCHOR SYSTEMS FROM MnDOT's APPROVED/QUALIFIED PRODUCTS LIST. PLACE ANCHORS AS SHOWN ON THE ANCHOR ROD LOCATION DETAIL. USE NUT AND WASHER PROVIDED WITH THE SERVICE CABINET.

APPLY ANTI-SEIZE COMPOUND THAT MEETS MIL-PRF-907E SPEC. WITH A BRUSH TO ALL ANCHOR ROD THREADS.

APPROVED JULY 15, 2015 STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	EQUIPMENT PAD B	2461, 2545 2550, 2565	8106D 2 OF 3



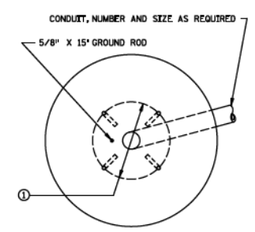
GROUNDING ELECTRODE SYSTEM
FOR CAST-IN-PLACE PAD



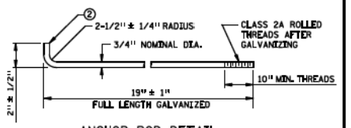
GROUNDING ELECTRODE SYSTEM
FOR PRECAST PAD

NOTES:
APPLY DE-OX COMPOUND TO THE GROUNDING CONNECTIONS AFTER FINAL ASSEMBLY.

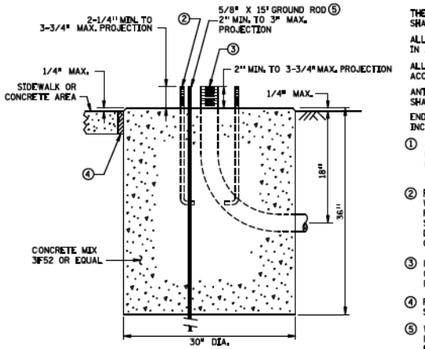
APPROVED JULY 15, 2015 STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	EQUIPMENT PAD B	2461, 2545 2550, 2565	8106D 3 OF 3



TOP VIEW



ANCHOR ROD DETAIL
(SPEC. 3385 TYPE A)



SIDE SECTION

NOTES:

SIZE OF FOUNDATION MAY BE CHANGED IN THE PLANS OR SPECIAL PROVISIONS, OR IN THE FIELD AS DIRECTED BY THE ENGINEER.

A FIBER FORMING TUBE MAY BE USED IN ACCORDANCE WITH 2565.3F.

THE UPPER PART OF THE FOUNDATION SHALL BE BEVELED OR CHAMFERED IN A NEAT MANNER AS DIRECTED BY THE ENGINEER IN THE FIELD.

THE OPEN END OF ALL CONDUIT INTO THE FOUNDATION SHALL BE CAPPED UNTIL CABLES ARE PLACED.

ALL BACKFILLING AROUND THE FOUNDATION MUST BE IN ACCORDANCE WITH 2451.

ALL EXCAVATIONS MUST BE PROPERLY COMPACTED IN ACCORDANCE WITH 2451.

ANTI-SEIZE COMPOUND THAT MEETS MIL-PRF-907E SPEC. SHALL BE APPLIED WITH A BRUSH TO ALL THREADS.

END BELL FITTINGS ON CONDUIT ENDS SHALL BE INCLUDED PER SPEC. 2565.3D.

① 4 ANCHOR RODS EQUALLY SPACED ON 12-3/4" BOLT CIRCLE POSITIONED SUCH THAT THE PEDESTAL BASE ACCESS DOOR IS CONVENIENTLY LOCATED ON THE SIDE AWAY FROM TRAFFIC (IF POSSIBLE).

② FOUR (4) 3/4" DIA. ANCHOR RODS, NUTS AND WASHERS PER SPEC. 3385 (TYPE A), OR APPROVED PEDESTAL MANUFACTURERS' EQUAL. THE WASHERS SHALL BE PER SPEC. 3832.2C3, EXCEPT THAT THE DIMENSIONS OF THE WASHERS SHALL BE ONE OF OPTIONS SHOWN ON STANDARD PLATE 8129.

③ RIGID STEEL CONDUIT PER SPEC. 3801 OR RIGID PVC CONDUIT PER SPEC. 3803. SIZE AND NUMBER AS REQUIRED IN PLANS OR SPECIAL PROVISIONS.

④ PREFORMED JOINT FILLER BETWEEN FOUNDATION AND SIDEWALK OR CONCRETE AREA

⑤ WHEN IN CONTACT WITH ROCK, GROUND RODS SHOULD BE PLACED AS SPECIFIED IN CURRENT NATIONAL ELECTRICAL CODE (NEC)

PLANS SYMBOL
TRAFFIC SIGNAL PEDESTAL

APPROVED JULY 15, 2015 STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	PEDESTAL FOUNDATION (TRAFFIC CONTROL SIGNALS)	2461 2565	8112I

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

wsb

Chisago COUNTY USA

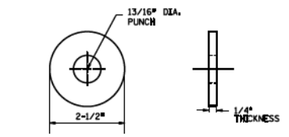
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

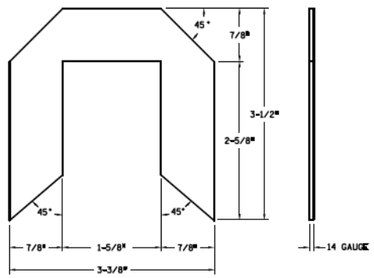
STANDARD PLATES
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 45 OF 216 SHEETS

DATE: 9/12/2024 2:00:10 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sp1



TRAFFIC SIGNAL PEDESTAL WASHERS ①



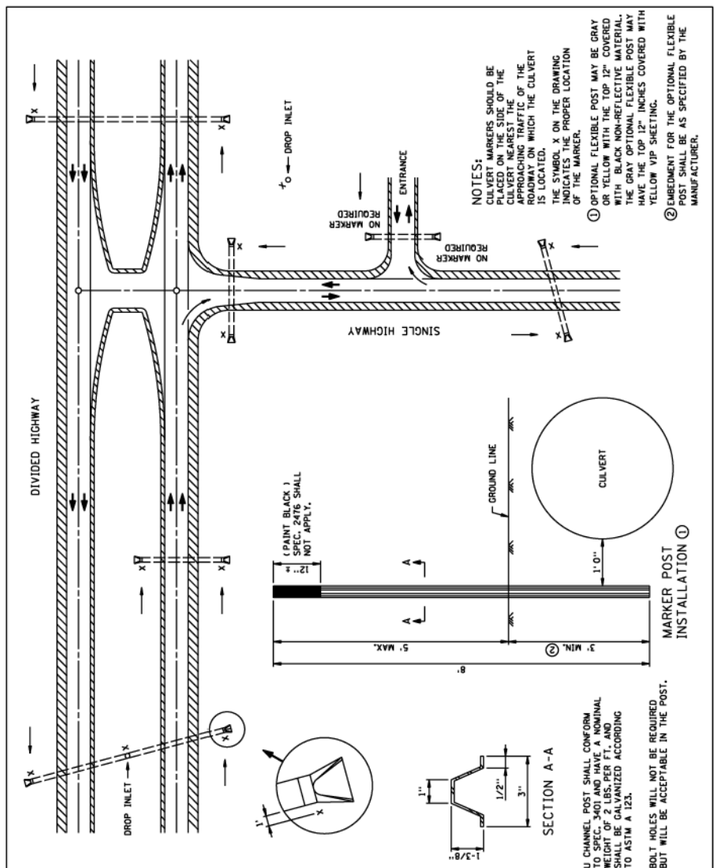
SIGNAL AND LIGHTING LEVELING SHIM ②

NOTES:

① WASHERS PER SPEC. 3832.2C3, EXCEPT THE DIMENSIONS MUST BE AS SHOWN.

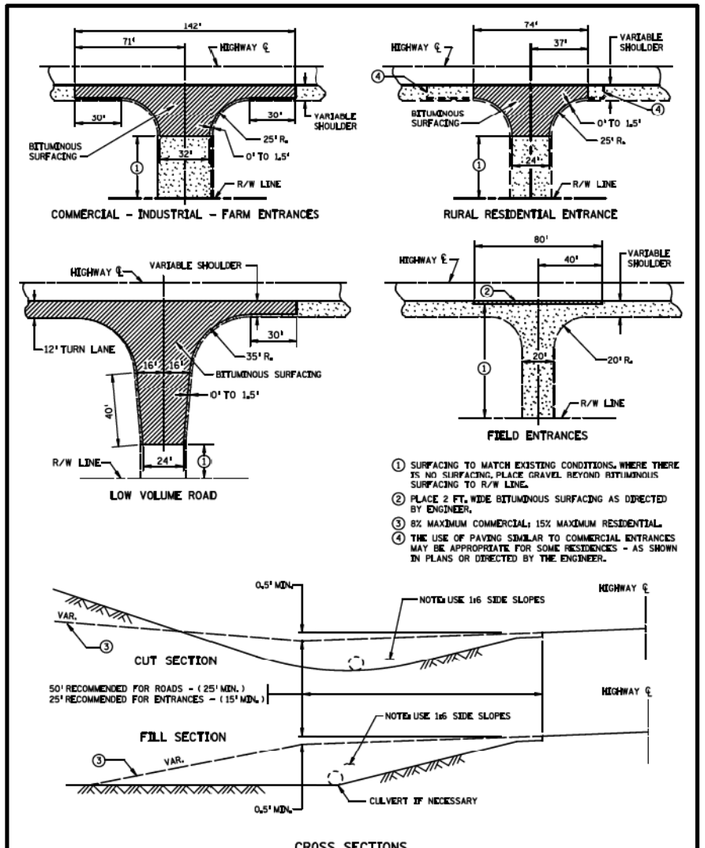
② MATERIAL - GALVANIZED STEEL SHEET 36,000 PSI MIN. YIELD PER ASTM A924. FINISH - PREPLATED GALVANIZED MATERIAL

APPROVED DECEMBER 20, 2011 (STATE DESIGN ENGINEER)	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	SHIM AND WASHER (TRAFFIC CONTROL SIGNALS AND ROADWAY LIGHTING)	2545 2565	8129A



MARKER POST INSTALLATION ①

APPROVED MAY 3, 2004 (STATE DESIGN ENGINEER)	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	INSTALLATION OF CULVERT MARKERS	2554	8150C



① SURFACING TO MATCH EXISTING CONDITIONS. WHERE THERE IS NO SURFACING, PLACE GRAVEL BEYOND BITUMINOUS SURFACING TO R/W LINE.

② PLACE 2 FT. WIDE BITUMINOUS SURFACING AS DIRECTED BY ENGINEER.

③ 8% MAXIMUM COMMERCIAL; 15% MAXIMUM RESIDENTIAL.

④ THE USE OF PAVING SIMILAR TO COMMERCIAL ENTRANCES MAY BE APPROPRIATE FOR SOME RESIDENCES - AS SHOWN IN PLANS OR DIRECTED BY THE ENGINEER.

APPROVED SEPT. 27, 2012 (STATE DESIGN ENGINEER)	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	SPECIFICATION REFERENCE	STANDARD PLATE NO.
	APPROACHES AND ENTRANCES RECOMMENDED STANDARDS		9000E

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

Chisago COUNTY USA

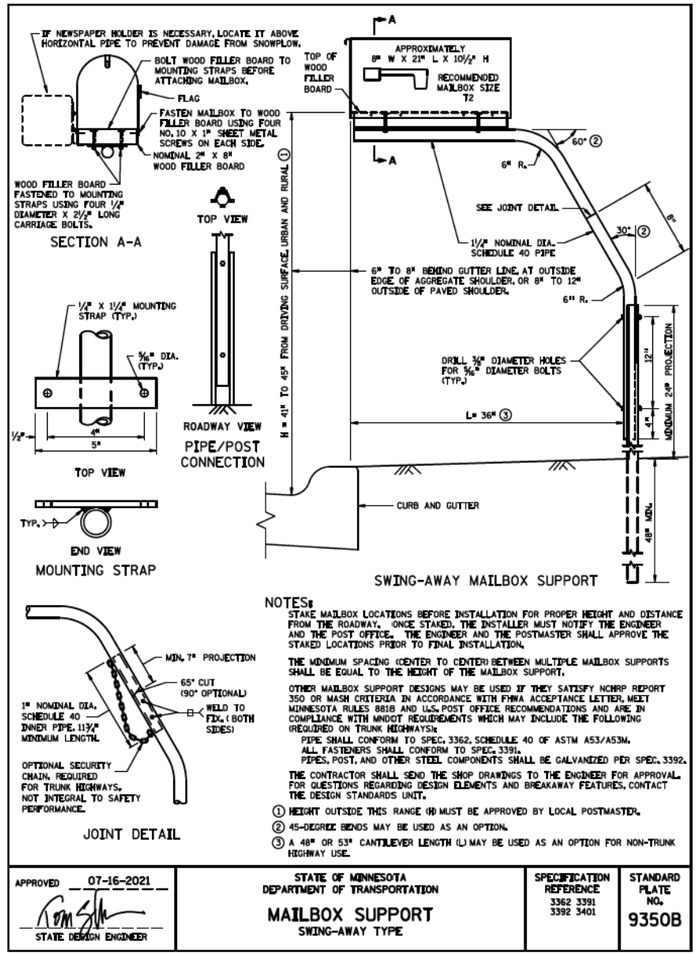
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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 2:00:11 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-sp1



NOTES:

STAKE MAILBOX LOCATIONS BEFORE INSTALLATION FOR PROPER HEIGHT AND DISTANCE FROM THE 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 MAILBOX SUPPORTS SHALL BE EQUAL TO THE HEIGHT OF THE MAILBOX SUPPORT.

OTHER MAILBOX SUPPORT DESIGNS MAY BE USED IF THEY SATISFY NCHRP REPORT 350 OR MASH CRITERIA IN ACCORDANCE WITH FHWA ACCEPTANCE LETTER, MEET MINNESOTA RULES 8818 AND 1455, POST OFFICE RECOMMENDATIONS AND ARE IN COMPLIANCE WITH MNDOT REQUIREMENTS WHICH MAY INCLUDE THE FOLLOWING (REQUIRED ON TRUNK HIGHWAYS):

PIPE SHALL CONFORM TO SPEC. 3362, SCHEDULE 40 OF ASTM A53/A53M.
ALL FASTENERS SHALL CONFORM TO SPEC. 3391.
PIPES, POST, AND OTHER STEEL COMPONENTS SHALL BE GALVANIZED PER SPEC. 3392.

THE CONTRACTOR SHALL SEND THE SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL. FOR QUESTIONS REGARDING DESIGN ELEMENTS AND BREAKAWAY FEATURES, CONTACT THE DESIGN STANDARDS UNIT.

(1) HEIGHT OUTSIDE THIS RANGE (H) MUST BE APPROVED BY LOCAL POSTMASTER.
(2) 45-DEGREE BENDS MAY BE USED AS AN OPTION.
(3) A 48" OR 53" CANTILEVER LENGTH (L) MAY BE USED AS AN OPTION FOR NON-TRUNK HIGHWAY USE.

APPROVED 07-16-2021 STATE DESIGN ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION MAILBOX SUPPORT SWING-AWAY TYPE	SPECIFICATION REFERENCE 3362 3391 3392 3401	STANDARD PLATE NO. 9350B

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

Chisago COUNTY USA

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

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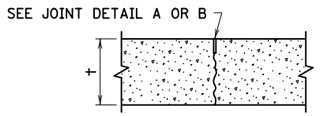
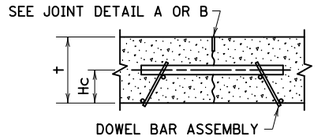
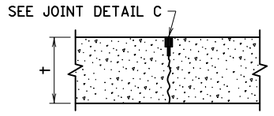


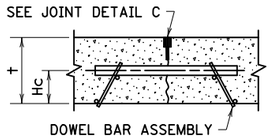
C1U & C2H



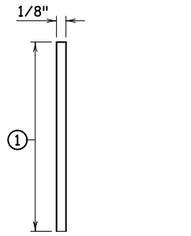
C1U-D & C2H-D (8)



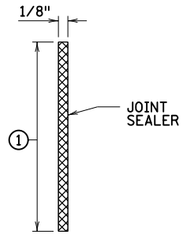
C3P



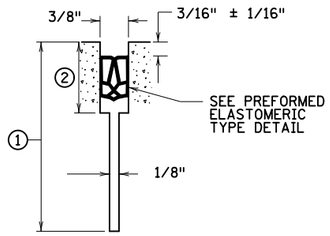
C3P-D (8)



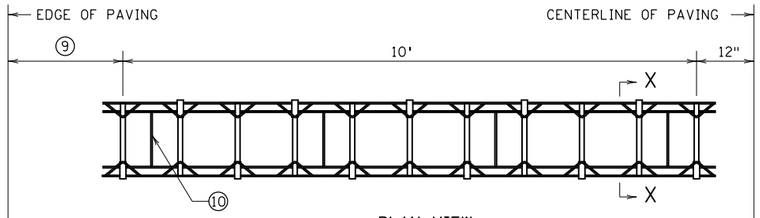
JOINT DETAIL A (3)(5)
SAWED & UNSEALED



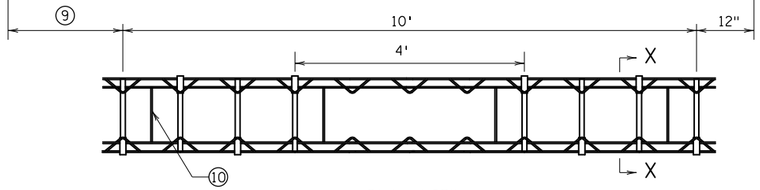
JOINT DETAIL B (4)(5)
SAWED & SEALED



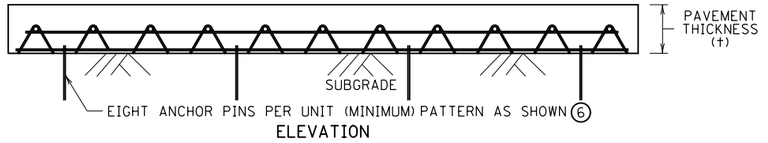
JOINT DETAIL C (4)(5)
SAWED AND SEALED



PLAN VIEW
ELEVEN DOWEL BASKET (SPACED AT 12")



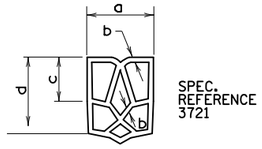
PLAN VIEW
EIGHT DOWEL BASKET (WHEEL PATH DOWELS SPACED AT 12")



ELEVATION

CONTRACTION JOINT DOWEL BAR ASSEMBLIES

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.



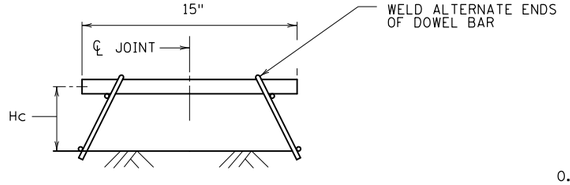
TYPICAL SHAPE FOR SATISFACTORY INSTALLATION IN JOINT (5 CELL MIN.)

PREFORMED ELASTOMERIC TYPE DETAIL (2)

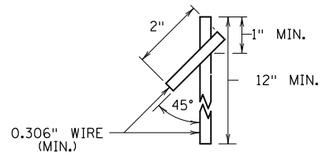
CONTRACTION JOINT REFERENCE, DETAIL & SEALER SPEC. TABLE				
JOINT REFERENCE		JOINT DETAIL	JOINT SEALER SPEC.	JOINT WIDTH
WITHOUT DOWELS	WITH DOWELS			
C1U	C1U-D	A	UNSEALED	1/8"
C2H	C2H-D	B	3725	1/8"
C3P	C3P-D	C	3721	3/8"

LEGEND — EXAMPLE: C2H-D
C = CONTRACTION JOINT
NO. = JOINT REFERENCE
U = UNSEALED
H = HOT POURED
P = PREFORMED
-D = DOWEL BARS

DOWEL BAR TABLE		
t PAVEMENT THICKNESS (IN.)	DOWEL BAR DIAMETER (IN.)	Hc HEIGHT TO CENTER OF DOWEL BAR (IN.)
7 - 7½	1	3
8 - 10	1¼	4
≥ 10½	1½	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: t/3 ± ¼".

(2) JOINT DEPTH ¼" 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 ± ½".

(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.

LEAD EXPERT OFFICE

GLENN ENGSTROM
DIRECTOR
OFFICE OF MATERIALS AND ROAD RESEARCH

DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

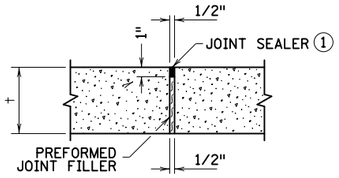
STANDARD PLAN 5-297.221 | 1 OF 4

APPROVED: 10-03-2022
REVISED:

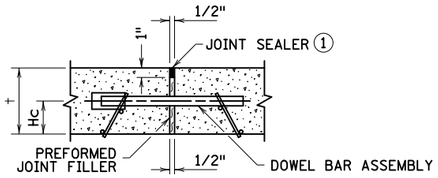
PAVEMENT JOINTS

CONTRACTION (DESIGN C)

DATE: 9/12/2024 TIME: 2:00:23 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn200



E1H



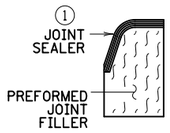
E1H-D (3)

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"

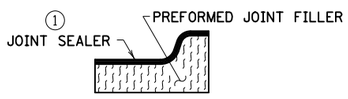
LEGEND — EXAMPLE

E = EXPANSION JOINT
NO. = JOINT REFERENCE
H = HOT POURED
-D = DOWEL BARS

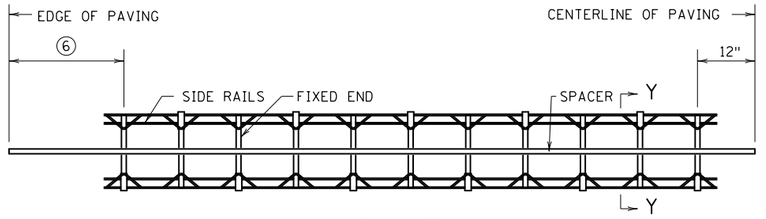
EXAMPLE: E1H-D



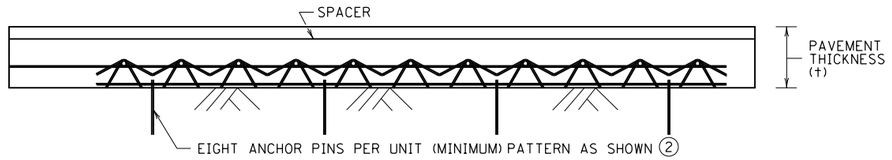
SECTION THRU CURB



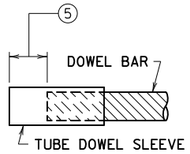
SECTION THRU CURB



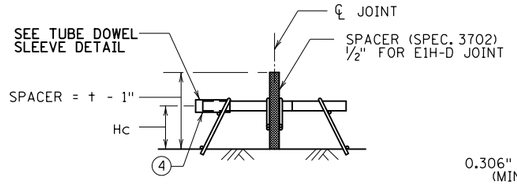
PLAN VIEW
EXPANSION JOINT DOWEL ASSEMBLY



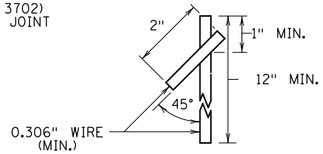
ELEVATION VIEW
EXPANSION JOINT DOWEL BAR ASSEMBLY



TUBE DOWEL SLEEVE DETAIL



SECTION Y-Y (3)



ANCHOR PIN

DOWEL BAR TABLE		
† PAVEMENT THICKNESS (IN.)	DOWEL BAR DIAMETER (IN.)	Hc HEIGHT TO CENTER OF DOWEL BAR (IN.)
7 - 7½	1	3
8 - 10	1¼	4
≥10½	1½	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.

(1) JOINT SEALER SPEC. 3725. CLEAN AND DRY JOINT FACES BY SANDBLASTING AND AIR BLASTING. TOP OF SEALER FLUSH TO ⅛" BELOW TOP OF PAVEMENT SURFACE.

(2) 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.

(3) TOLERANCES:
- PLACE DOWEL BARS PARALLEL TO THE SUBSTRATE SURFACE ±⅛" IN 15".
- PLACE DOWEL BARS PARALLEL TO THE CENTERLINE OF THE PAVEMENT ±¼" IN 15"
- HEIGHT (hC) TO CENTER OF DOWEL BAR ± ½".

(4) PLACE METAL INSTALLATION SHIELDS FOR EXPANSION JOINTS PARALLEL TO THE PAVEMENT SURFACE AND THE PAVEMENT CENTERLINE WITHIN A TOLERANCE OF ¼" WITHIN THE LENGTH OF BAR.

(5) SPACE FROM END OF DOWEL BAR TO END OF SLEEVE IS 1" MINIMUM.

(6) 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.

LEAD EXPERT OFFICE

GLENN ENGSTROM
DIRECTOR
OFFICE OF MATERIALS AND ROAD RESEARCH

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.221 | 2 OF 4

APPROVED: 10-03-2022
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PAVEMENT JOINTS

EXPANSION (DESIGN E)

DATE: 9/12/2024 TIME: 2:00:24 PM
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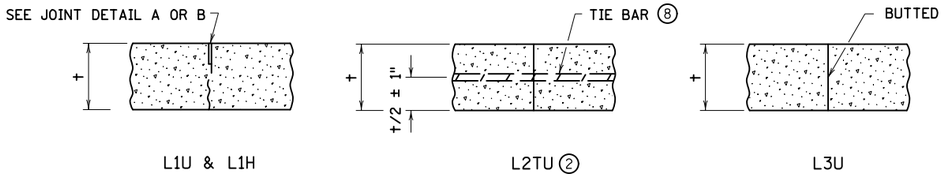


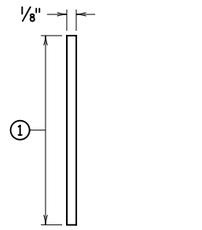
L1U & L1H | L2TU (2) | L3U

L1TU & L1TH (1) | L2KTU (2) (6)

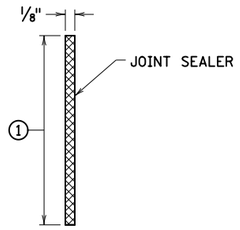
LONGITUDINAL JOINT REFERENCE, DETAIL & SEALER SPECIFICATION TABLE					
JOINT REFERENCE			JOINT DETAIL	JOINT SEALER SPEC	JOINT WIDTH
WITHOUT TIE BARS	WITH TIE BARS	WITH KEYWAY & TIE BARS			
L1U	L1TU		A	UNSEALED	1/8"
L1H	L1TH		B	3725	1/8"
	L2TU	L2KTU	NONE	UNSEALED	
L3U			NONE	UNSEALED	

LEGEND — **EXAMPLE: L2KTU**

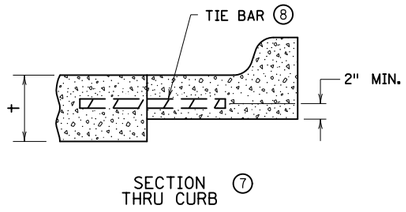
- L = LONGITUDINAL JOINT
- NO. = JOINT REFERENCE
  - 1 = PAVED CONSTRUCTION JOINT
  - 2 = TIED CONSTRUCTION JOINT
  - 3 = BUTTED CONSTRUCTION JOINT
- K = KEYWAY
- T = TIE BARS
- U = UNSEALED
- H = HOT POURED



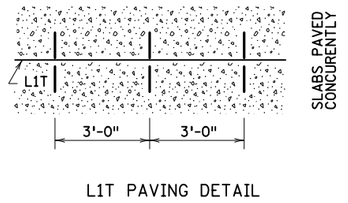
JOINT DETAIL A (3)(5)
SAWED & UNSEALED



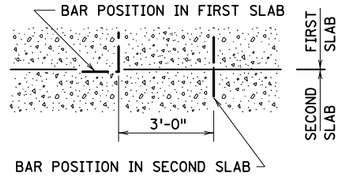
JOINT DETAIL B (4)(5)
SAWED & SEALED



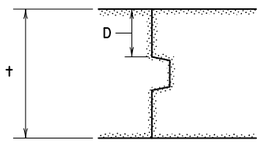
SECTION THRU CURB (7)



L1T PAVING DETAIL



L2T & L2KT TIE BAR BENDING (2) AND PAVING DETAIL



PAVEMENT KEYWAY DETAIL (6)

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

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

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: t/3 ± 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 +1/16" TO -1/32".

(6) CONTRACTOR'S OPTION TO USE KEYWAY WHEN:
- PLACING FIXED FORM CONSTRUCTION.
- PLACING SLIPFORM CONSTRUCTION WHEN t ≥ 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.

LEAD EXPERT OFFICE

GLENN ENGSTROM
DIRECTOR
OFFICE OF MATERIALS AND ROAD RESEARCH

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

APPROVED: 10-03-2022
REVISED:

STANDARD PLAN 5-297.221 | 3 OF 4

PAVEMENT JOINTS

LONGITUDINAL (DESIGN L)

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

SHEET NO. 50 OF 216

DATE: 9/12/2024 TIME: 2:00:25 PM
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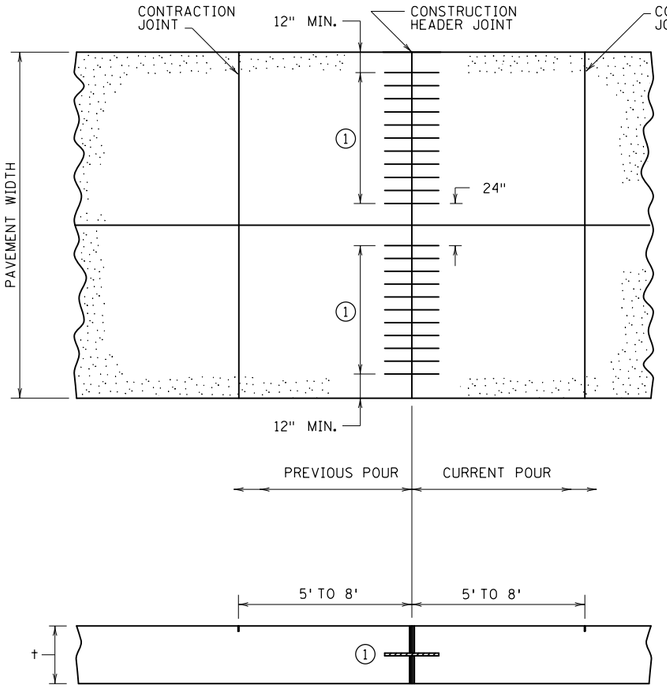
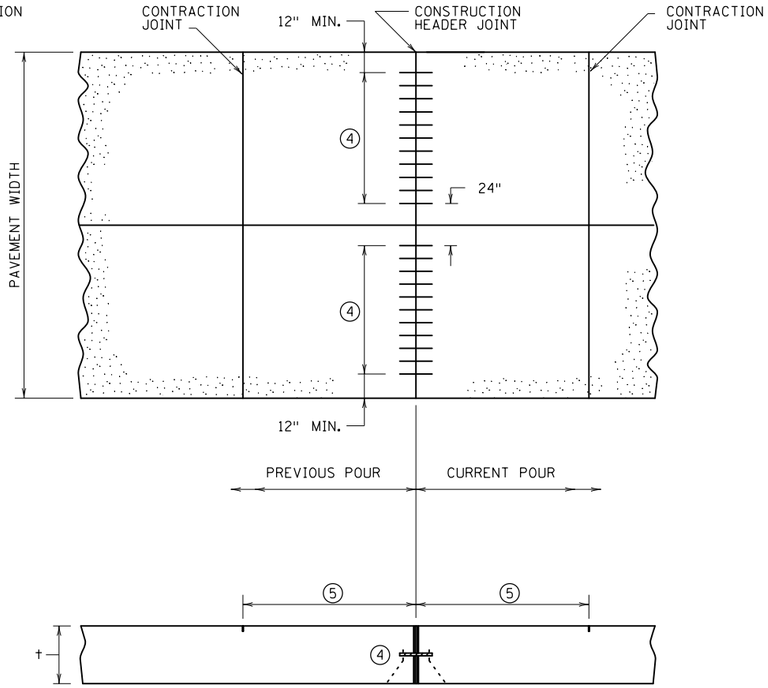
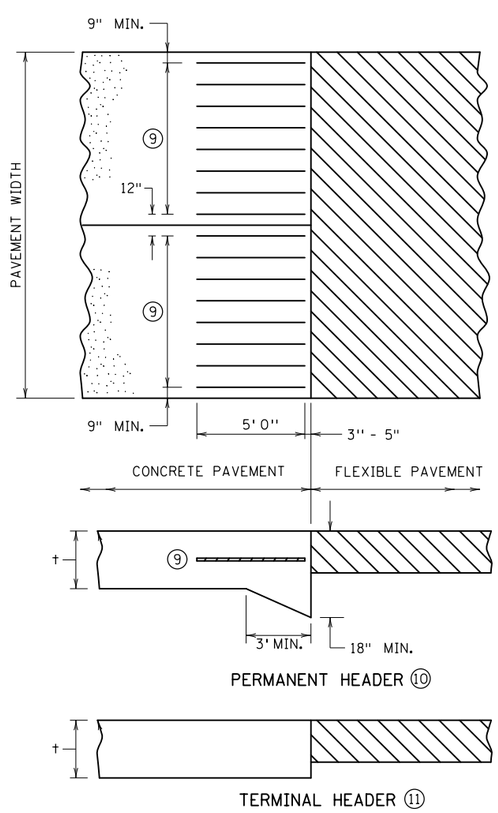


REINFORCEMENT BAR CONSTRUCTION HEADERS

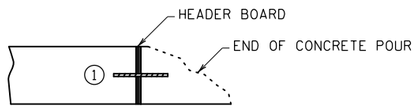


DOWEL BAR CONSTRUCTION HEADERS

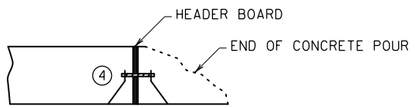


PERMANENT HEADER ⑩

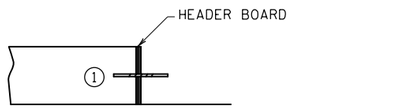
TERMINAL HEADER ⑪



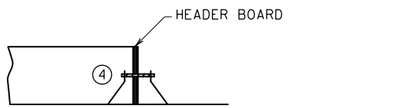
SLIPFORM PLACED REINFORCEMENT BAR HEADER ②



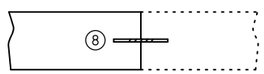
SLIPFORM PLACED DOWEL BAR HEADER ⑥



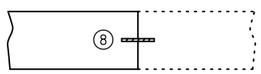
FIXED FORM PLACED REINFORCEMENT BAR HEADER ③



FIXED FORM PLACED DOWEL BAR HEADER ⑦



DRILL AND GROUT REINFORCEMENT BAR HEADER



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 +/- 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. INSERT THE REINFORCEMENT BARS AND FINISH THE CONCRETE BEHIND THE 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 ± 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 ± 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).

DATE: 9/12/2024 TIME: 2:00:26 PM
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LEAD EXPERT OFFICE

GLENN ENGSTROM
DIRECTOR
OFFICE OF MATERIALS AND ROAD RESEARCH

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.221 | 4 OF 4

APPROVED: 10-03-2022
REVISED:

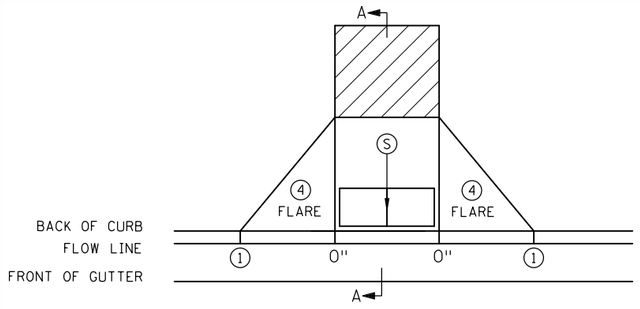
THOMAS STYRBICKI
STATE DESIGN ENGINEER

PAVEMENT JOINTS

CONSTRUCTION AND TERMINAL HEADERS

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

SHEET NO. 51 OF 216



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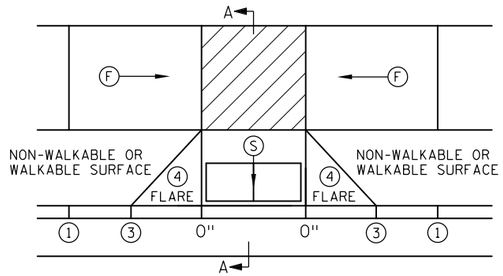

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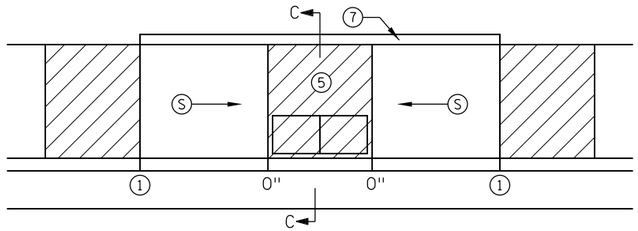
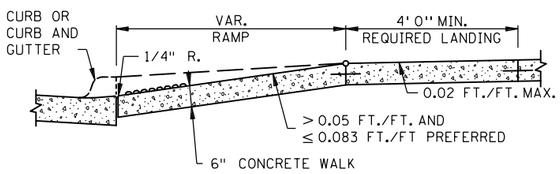
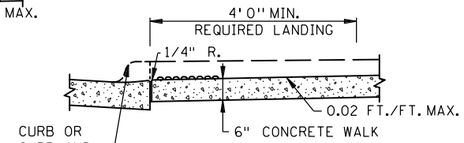


PARALLEL



SECTION A-A

PERPENDICULAR/TIERED/DIAGONAL



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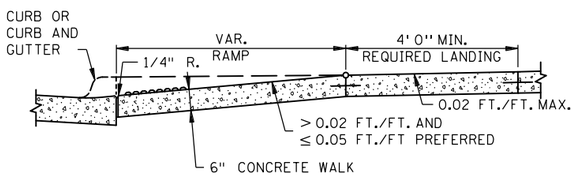
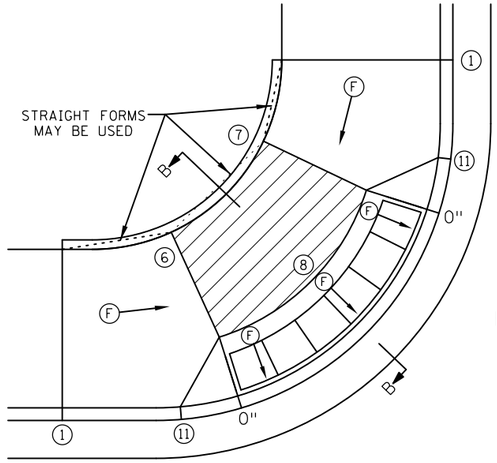
PARALLEL/DEPRESSED CORNER

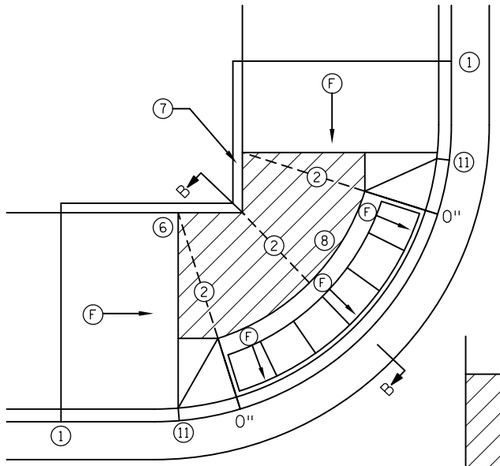


SECTION B-B

FAN

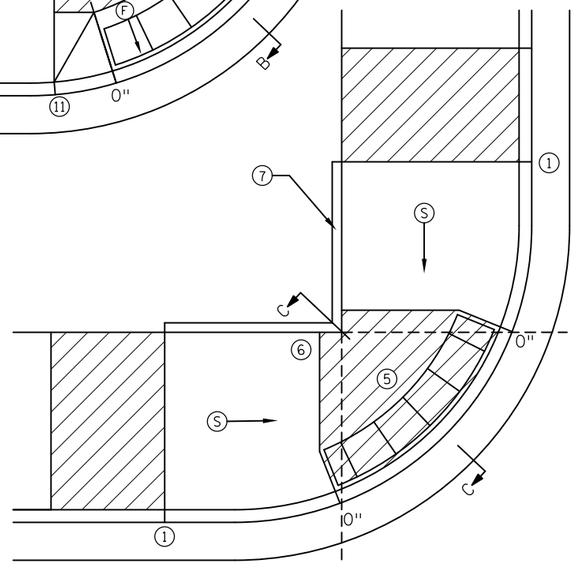


FAN (10)

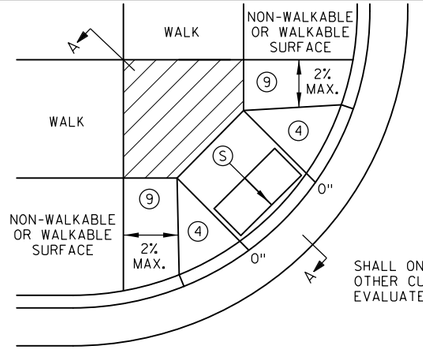


MODIFIED FAN (10)

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.

(S) 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%.

(F) 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%.

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 PARS.

X" CURB HEIGHT

REVISION:

APPROVED: 11-04-2021

JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | **1 OF 6**

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

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

SHEET NO. 52 OF 216

DATE: 9/12/2024 TIME: 2:00:27 PM
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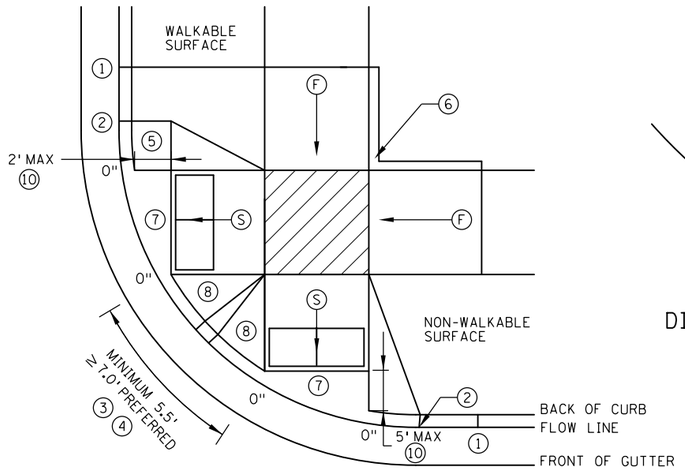
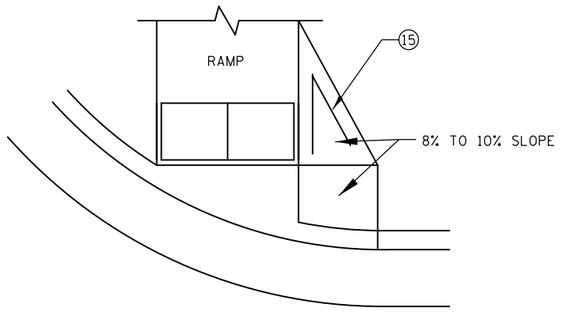
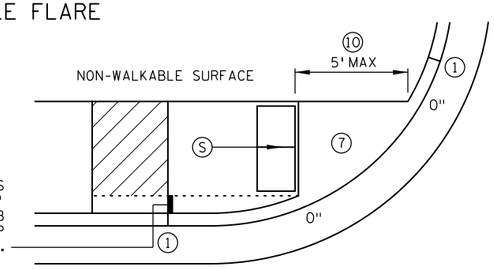


COMBINED DIRECTIONAL

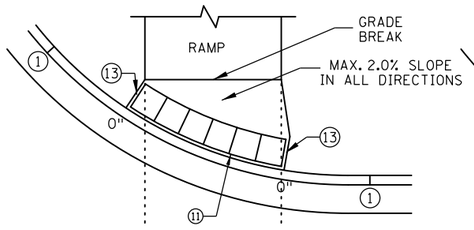


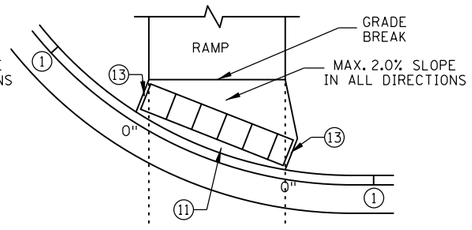
DIRECTIONAL RAMP WALKABLE FLARE

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.



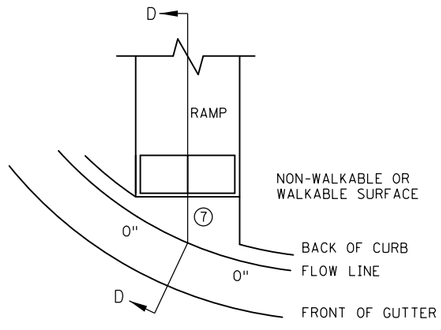
STANDARD ONE-WAY DIRECTIONAL ⑨

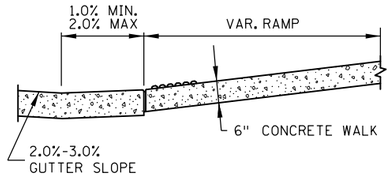




DETECTABLE WARNING PLACEMENT WHEN SETBACK CRITERIA IS EXCEEDED ⑫

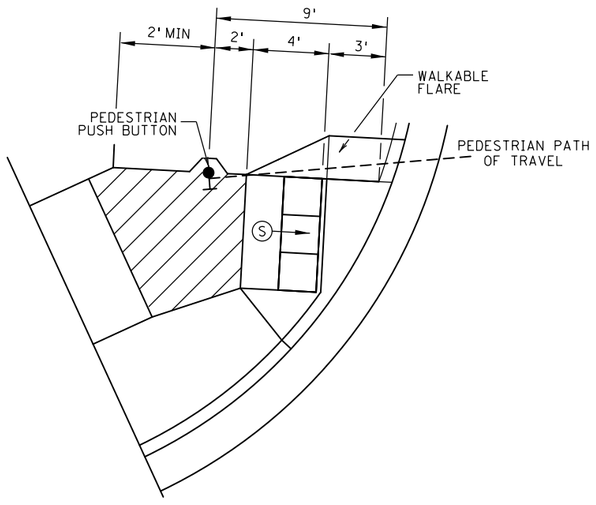
ONE-WAY DIRECTIONAL WITH DETECTABLE WARNING AT BACK OF CURB





SECTION D-D

CURB FOR DIRECTIONAL RAMPS ⑭



SEMI-DIRECTIONAL RAMP ③④⑨

3' DOME SETBACK, 4' LONG RAMP AND PUSH BUTTON 9' FROM THE BACK OF CURB

PRIMARILY 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.

(S) 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%.

(F) 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%.

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 PARS.

X" CURB HEIGHT

REVISION:

APPROVED: 11-04-2021

JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | 2 OF 6

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

SAP 013-630-021 / SAP 225-591-007 | SHEET NO. 53 OF 216

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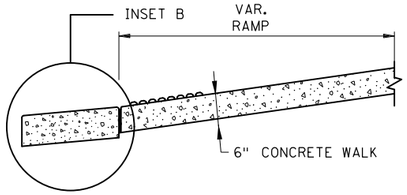
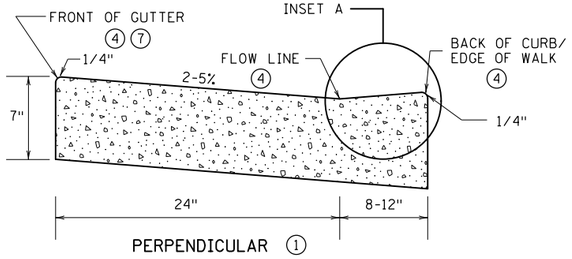
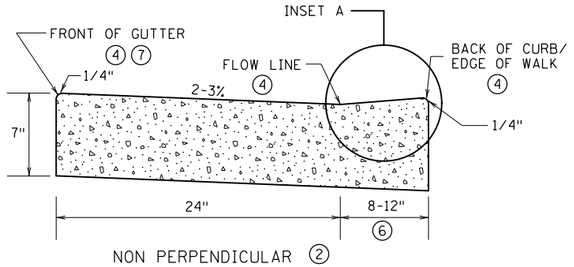




PERPENDICULAR ①



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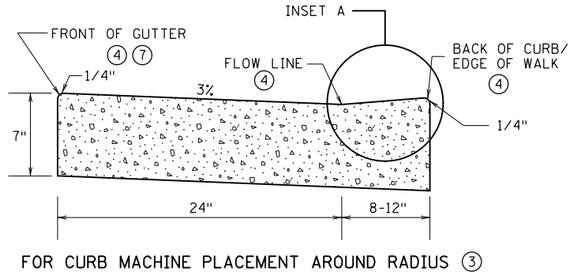
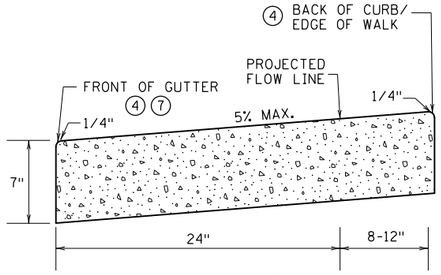
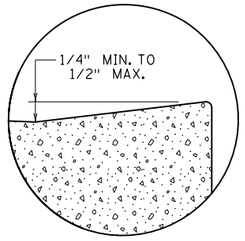


FOR CURB MACHINE PLACEMENT AROUND RADIUS ③
(REGARDLESS OF RAMP TYPE)

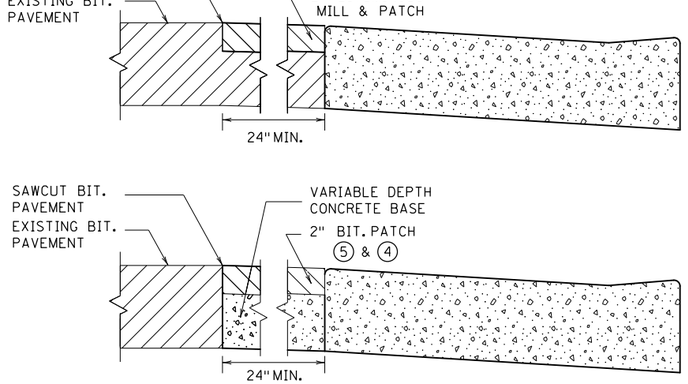
PEDESTRIAN ACCESS ROUTE CURB & GUTTER DETAIL



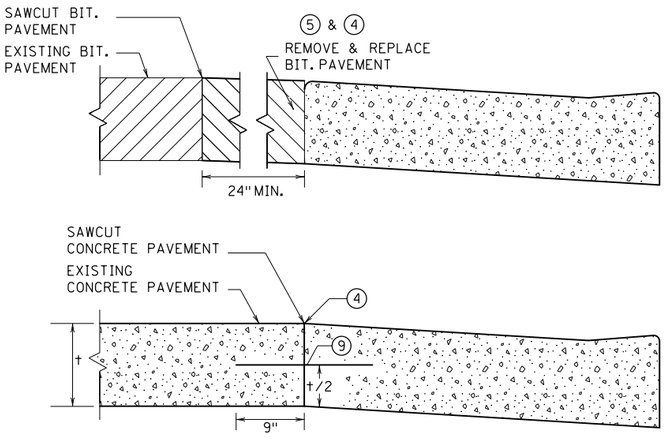
INSET B
OUTFLOW GUTTER ⑧



INSET A

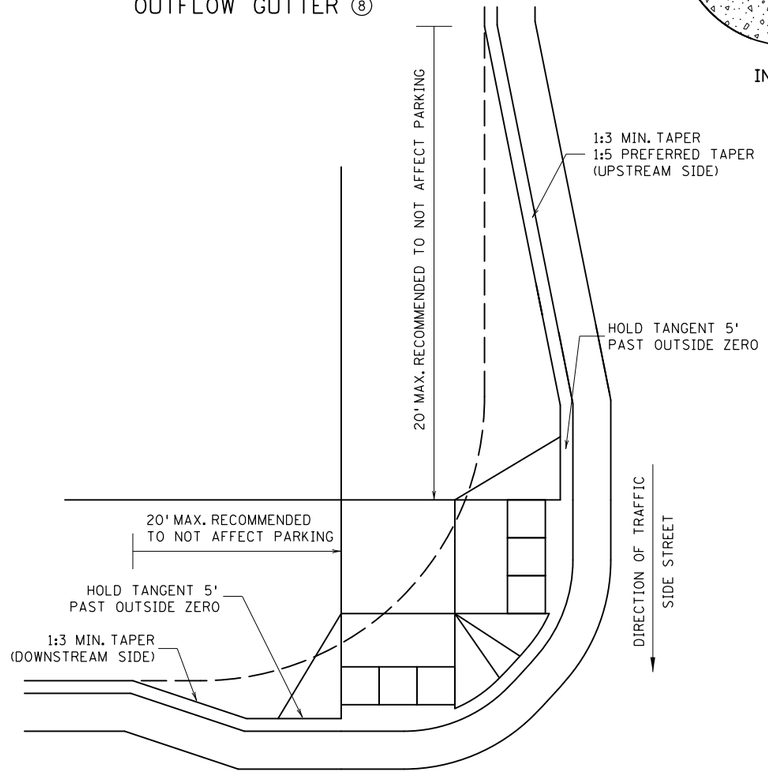


ONLY ALLOWED PER ENGINEER'S APPROVAL

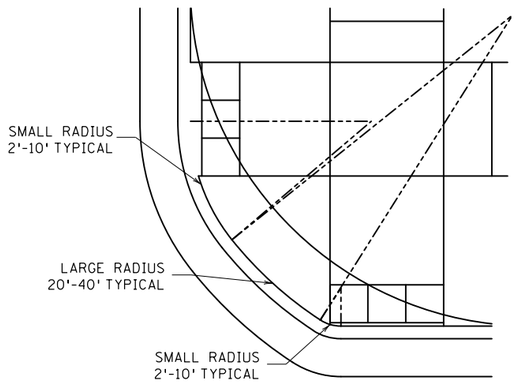


PAVEMENT TREATMENT OPTIONS IN FRONT OF CURB & GUTTER

FOR USE ON CURB RAMP RETROFITS



ADA CURB EXTENSION WITH COMPOUND RADIUS (BUMP OUT) ⑪



COMBINED DIRECTIONAL ⑩
(COMPOUND RADIUS)

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.

REVISION:

APPROVED: 11-04-2021
JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | 3 OF 6

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

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

SHEET NO. 54 OF 216

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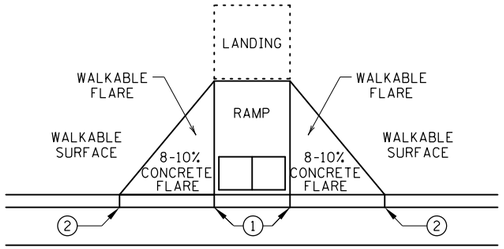
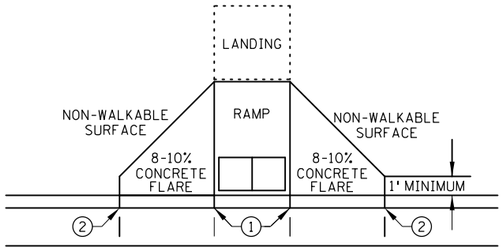
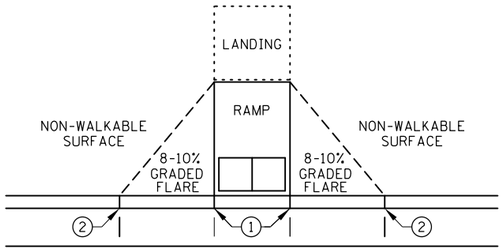


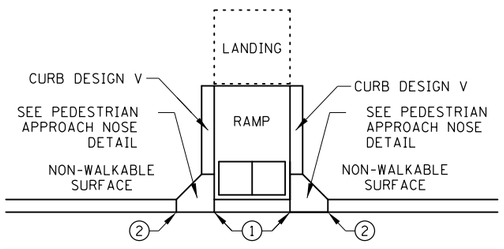
PAVED FLARES
ADJACENT TO WALKABLE SURFACE



PAVED FLARES
ADJACENT TO NON-WALKABLE SURFACE

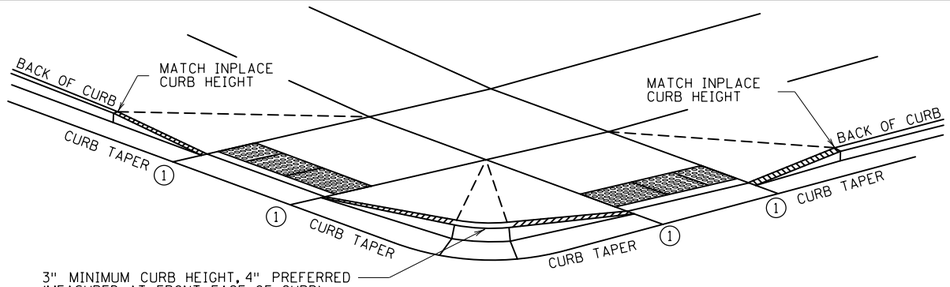


GRADED FLARES

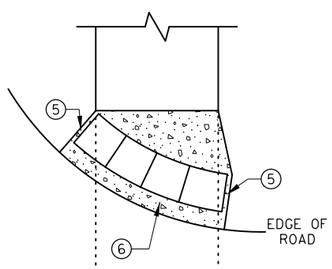


RETURNED CURB (4)

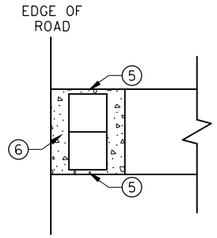
TYPICAL SIDE TREATMENT OPTIONS (3) (10)



DETECTABLE EDGE WITH (7)
CURB AND GUTTER

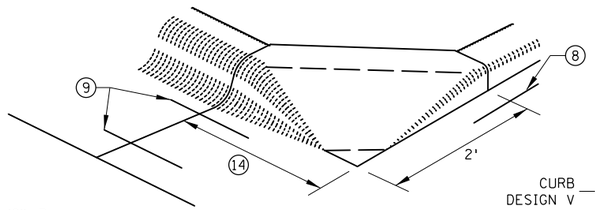


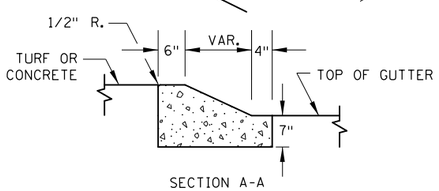
RADIAL DETECTABLE WARNING



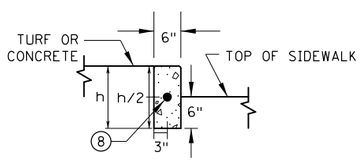
RECTANGULAR DETECTABLE WARNING

DETECTABLE EDGE WITHOUT CURB AND GUTTER

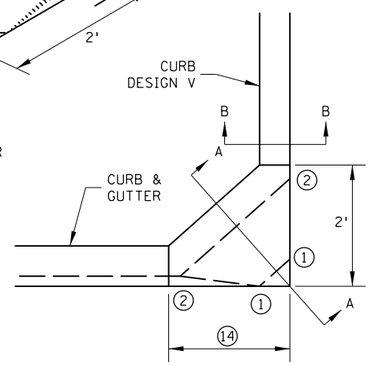




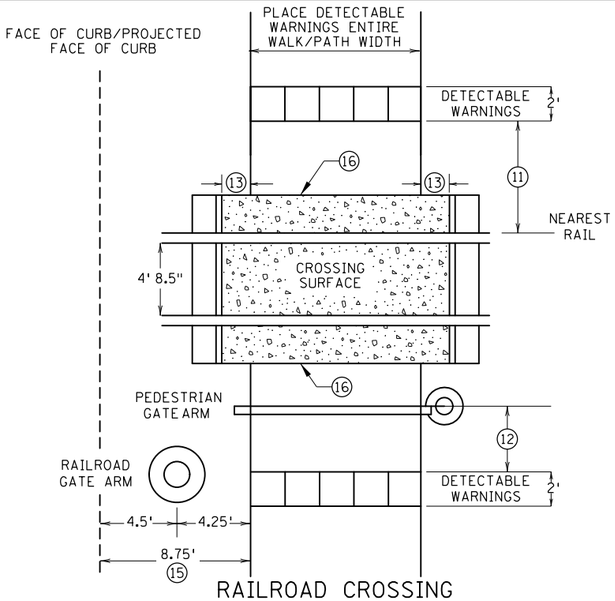
SECTION A-A



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 PLATE 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 PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | **4 OF 6**

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

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

SHEET NO. 55 OF 216

DATE: 9/12/2024 TIME: 2:00:29 PM
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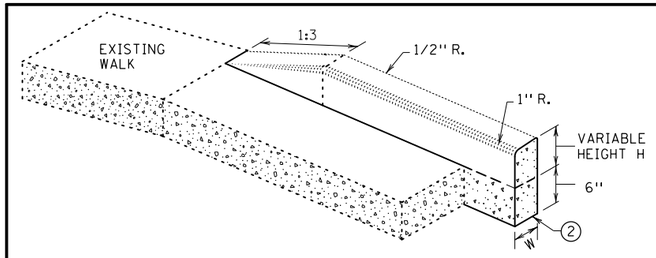
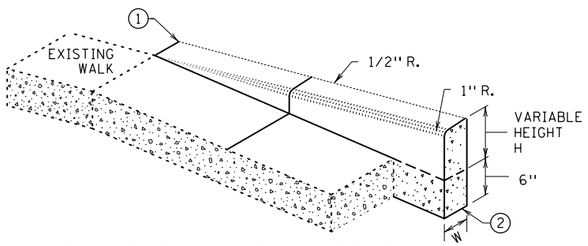


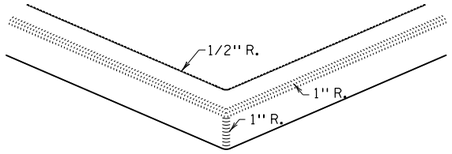
V CURB ADJACENT TO LANDSCAPE

CURB WITHIN SIDEWALK LIMITS



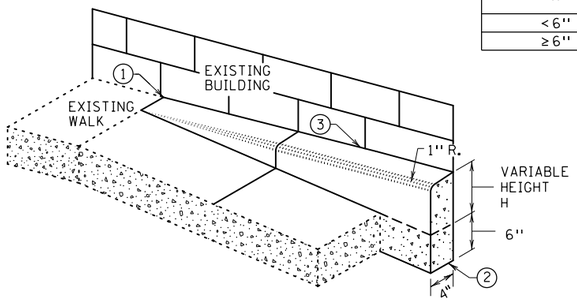
V CURB ADJACENT TO LANDSCAPE

CURB OUTSIDE SIDEWALK LIMITS

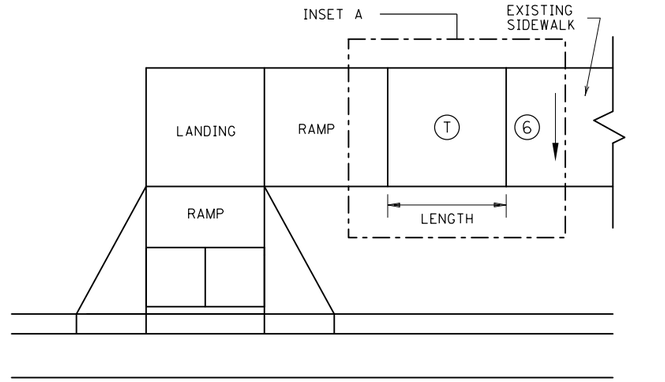


V CURB INTERSECTION

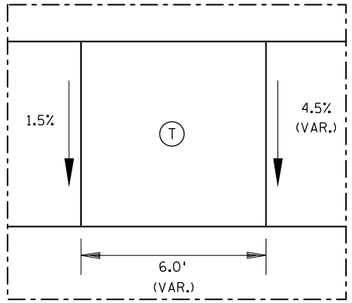
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
< 6"	4"
≥ 6"	6"



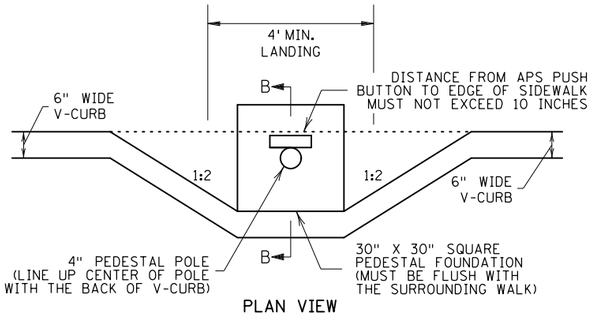
V CURB ADJACENT TO BUILDING OR BARRIER



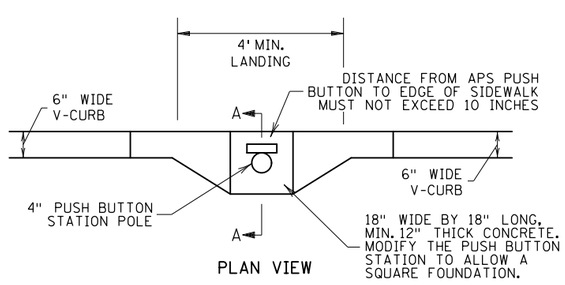
TRANSITION PANEL ④⑤



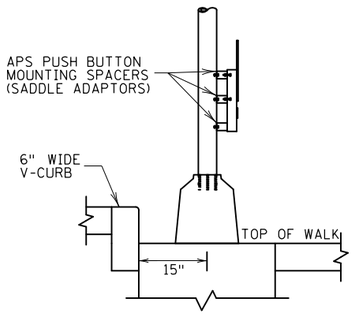
INSET A



PLAN VIEW

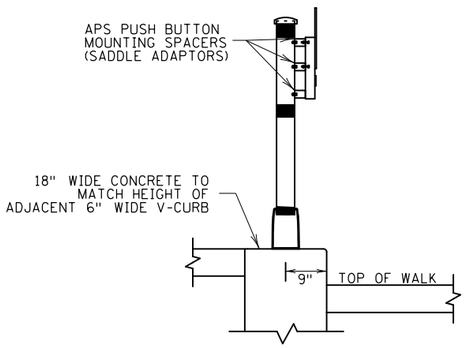


PLAN VIEW



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 ½" 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.

(S) 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 PARS.

(T) 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

JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.250 | **5 OF 6**

APPROVED: 11-04-2021
REVISED:

PEDESTRIAN CURB RAMP DETAILS

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

SHEET NO. 56 OF 216

DATE: 9/12/2024 TIME: 2:00:29 PM
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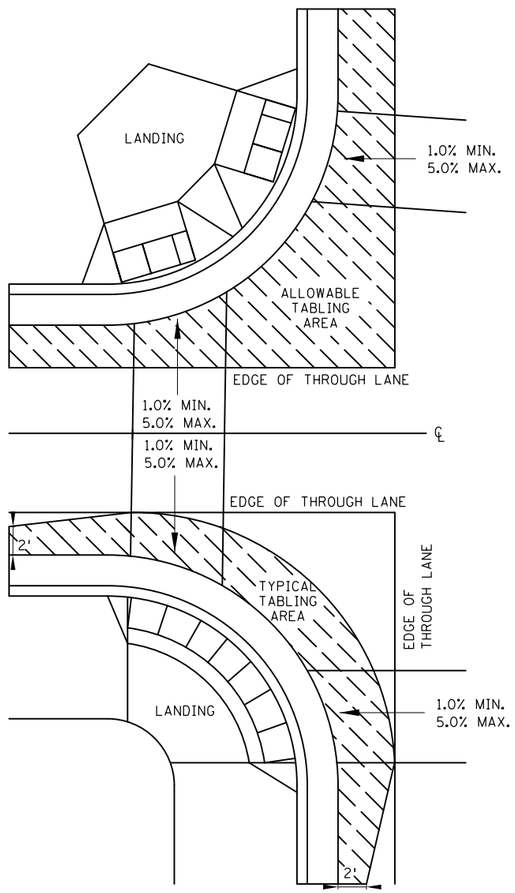
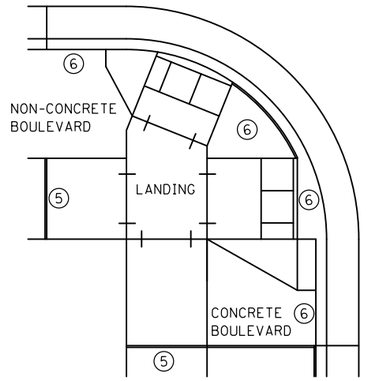
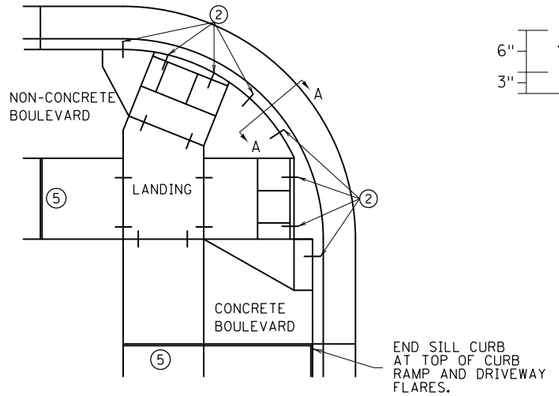


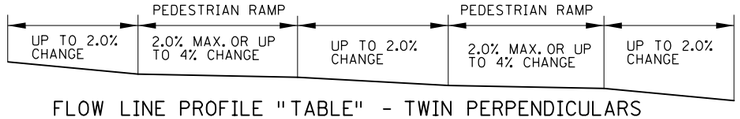
CURB LINE AND ROAD CROSSING ADJUSTMENTS



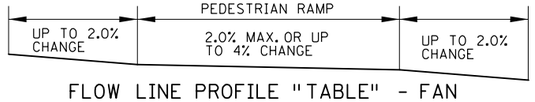
EXPANSION MATERIAL PLACEMENT
FOR CONCRETE ROADWAYS



CURB LINE REINFORCEMENT ④
PLACEMENT ON BITUMINOUS ROADWAYS



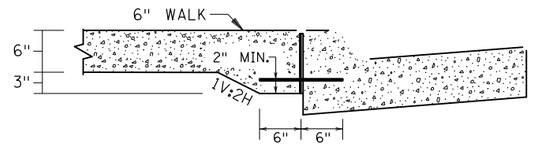
FLOW LINE PROFILE "TABLE" - TWIN PERPENDICULARS



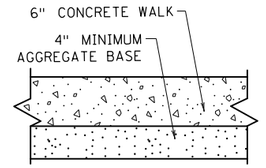
FLOW LINE PROFILE "TABLE" - FAN

FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS

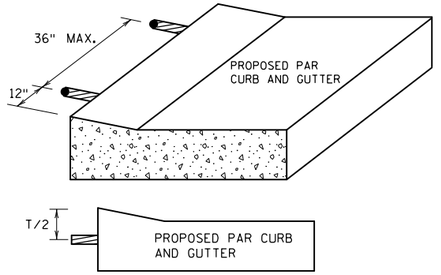
FLOW LINE PROFILE RAISE - FAN



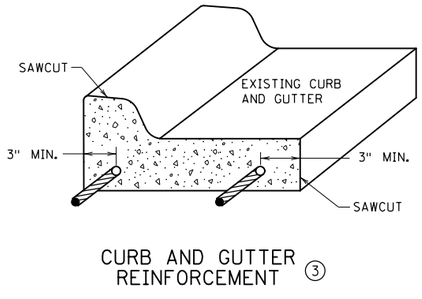
SECTION VIEW A-A
THICKENED SECTION
THROUGH CURB RAMP FLARES



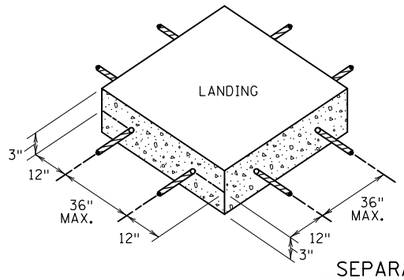
TYPICAL SIDEWALK SECTION
WITHIN INTERSECTION CORNER

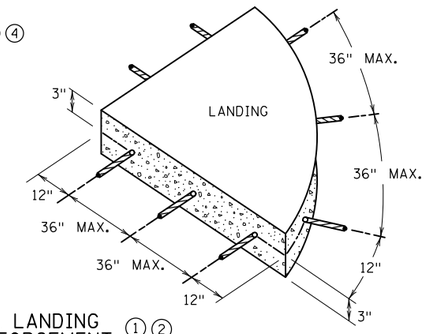


CURB RAMP REINFORCEMENT DETAILS ②④



CURB AND GUTTER
REINFORCEMENT ③





SEPARATE LANDING
POUR REINFORCEMENT ①②

GENERAL NOTES:

"TABLING" OF CROSSWALKS MEANS MAINTAINING LESS THAN 2% CROSS SLOPE WITHIN A CROSSWALK, IS REQUIRED WHEN A ROADWAY IS IN A STOP OR YIELD CONDITION AND THE PROJECT SCOPE ALLOWS.

RECONSTRUCTION PROJECTS: ON FULL PAVEMENT REPLACEMENT PROJECTS "TABLING" OF ENTIRE CROSSWALK SHALL OCCUR WHEN FEASIBLE.

MILL & OVERLAY PROJECTS: "TABLING" OF FLOW LINES, IN FRONT OF THE PEDESTRIAN RAMP, IS REQUIRED WHEN THE EXISTING FLOW LINE IS GREATER THAN 2%. WARPING OF THE BITUMINOUS PAVEMENT CAN NOT EXTEND INTO THE THROUGH LANE. TABLE THE FLOW LINE TO 2% OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA;

1) 1.0% MIN. CROSS-SLOPE OF THE ROAD
2) 5.0% MAX. CROSS-SLOPE OF THE ROAD
3) "TABLE" FLOW LINE UP TO 4% CHANGE FROM EXISTING SLOPE IN FRONT OF PEDESTRIAN RAMP
4) UP TO 2% CHANGE IN FLOW LINE FROM EXISTING SLOPE BEYOND THE PEDESTRIAN CURB RAMP

STAND-ALONE ADA RETROFITS: FOLLOW MILL & OVERLAY CRITERIA ABOVE HOWEVER ALL PAVEMENT WARPING IS DONE WITH BITUMINOUS PATCHING ON BITUMINOUS ROADWAYS AND FULL-DEPTH APRON REPLACEMENT ON CONCRETE ROADWAYS.

RAISING OF CURB LINES SHOULD OCCUR IN VERTICALLY CONSTRAINED AREAS. RAISE THE CURB LINES ENOUGH TO ALLOW COMPLIANT RAMPS OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA;

1) 1.0% MIN. AND 5.0% MAXIMUM CROSS-SLOPE OF THE ROAD
2) 1.0% MIN. FLOW LINE (ON EITHER SIDE OF PEDESTRIAN RAMP) TO MAINTAIN POSITIVE DRAINAGE
3) 5.0% RECOMMENDED MAX. FLOW LINE
4) LONGITUDINAL THROUGH LANE ROADWAY TAPERS SHOULD BE 1" VERTICAL PER 15' HORIZONTAL

NOTES:

① 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 THIS SHEET FOR ALL SEPARATELY POURED INITIAL LANDINGS.

② DRILL AND GROUT NO. 4 12" LONG REINFORCEMENT BARS (EPOXY COATED) AT 36" MAXIMUM CENTER TO CENTER MINIMUM 12" SPACING FROM CONSTRUCTION JOINTS. BARS TO BE ADJUSTED TO MATCH RAMP GRADE. BARS TO BE PAID BY EACH.

③ DRILL AND GROUT 2 - NO. 4 X 12'' LONG (6" EMBEDDED) REINFORCEMENT BARS (EPOXY COATED). REINFORCEMENT REQUIRED FOR ALL CONSTRUCTION JOINTS. BARS TO BE PAID BY EACH.

④ THIS CURB LINE REINFORCEMENT DETAIL SHALL BE USED ON BITUMINOUS ROADWAYS. FOR CONCRETE ROADWAYS, SEE NOTE 6.

⑤ CONSTRUCT WITH EXPANSION MATERIAL PER MNDOT SPECIFICATION 3702 TYPES A-E. EXPANSION MATERIAL SHALL MATCH FULL HEIGHT OF ADJACENT CONCRETE.

⑥ USE AN APPROVED TYPE F (1/4 INCH THICK) SEPARATION MATERIAL. SEPARATION MATERIAL SHALL MATCH FULL HEIGHT DIMENSION OF ADJACENT CONCRETE.

REVISION:

APPROVED: 11-04-2021
JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.250	6 OF 6
APPROVED: 11-04-2021 REVISED:	

PEDESTRIAN CURB RAMP DETAILS

SAP 013-630-021 / SAP 225-591-007 SHEET NO. 57 OF 216

DATE: 9/12/2024 TIME: 2:00:30 PM
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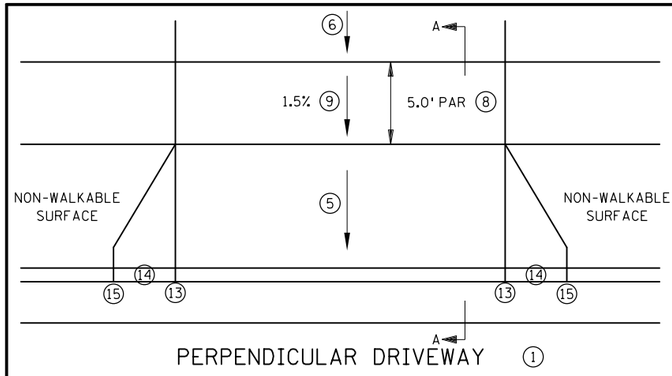
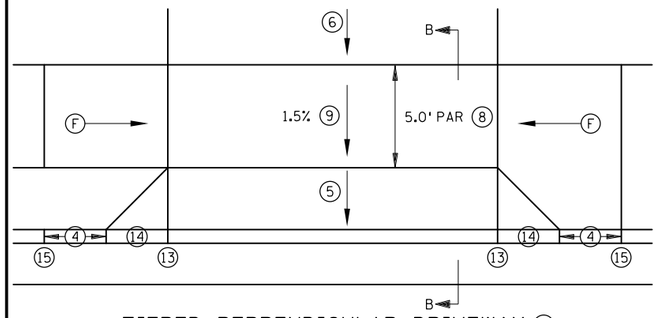
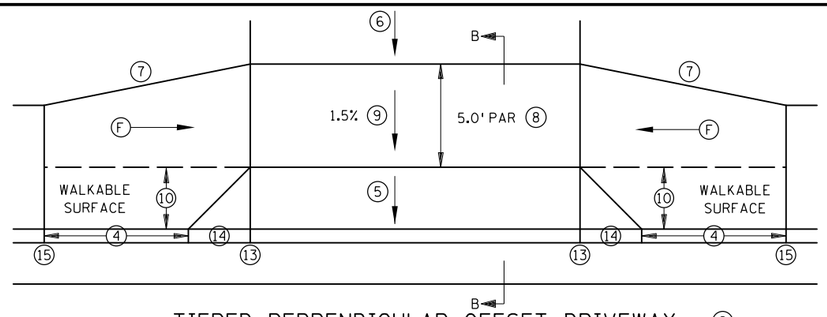


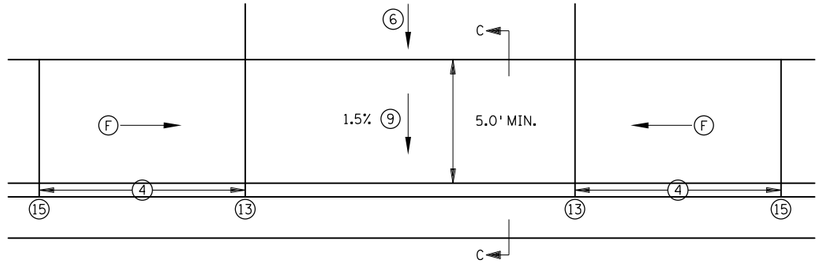
PERPENDICULAR DRIVEWAY ①



TIERED PERPENDICULAR DRIVEWAY ②



TIERED PERPENDICULAR OFFSET DRIVEWAY ②



PARALLEL DRIVEWAY ③

LEGEND

(F)	INDICATES DRIVEWAY 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%

NOTES:

ALL SIDEWALK AND BOULEVARD WIDTHS SHALL BE MEASURE 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%. RAMPS 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.

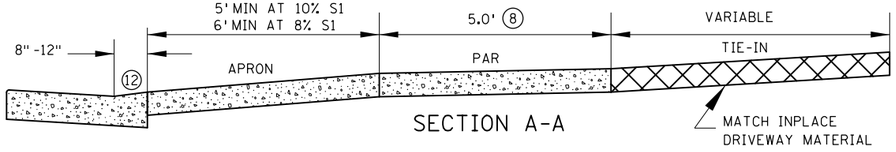
(14) 3' LONG AT 8-10% PREFERRED FOR INITIAL CURB TAPER. REDUCE CURB TAPER SLOPE IF NECESSARY TO MATCH ADJACENT SIDEWALK GRADES.

(15) MATCH FULL CURB HEIGHT.

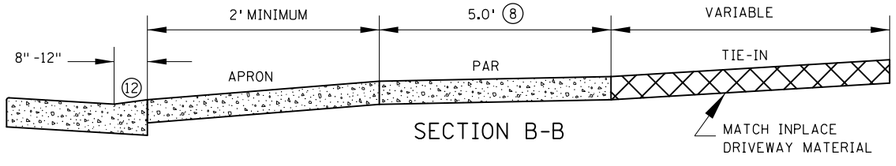
(16) 1:2 TAPER RATE ON INTEGRAL DRIVEWAY APRONS.

(17) SEE SHEET 4 FOR WHEN 6" WALK IS REQUIRED.

WITH 4" CURB HEIGHT:
3' MIN AT 10% S1
4' MIN AT 8% S1
WITH 6" CURB HEIGHT;
5' MIN AT 10% S1
6' MIN AT 8% S1



SECTION A-A



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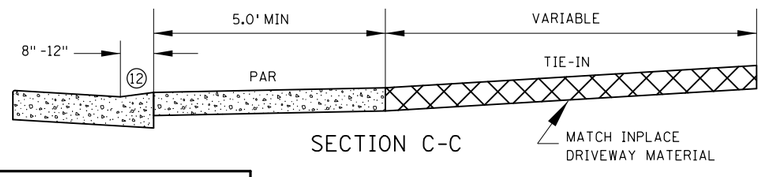

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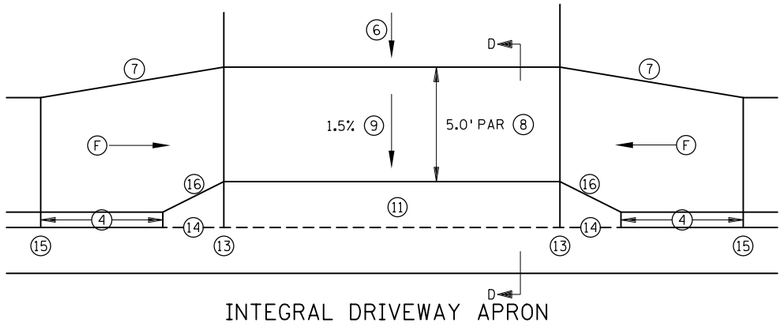
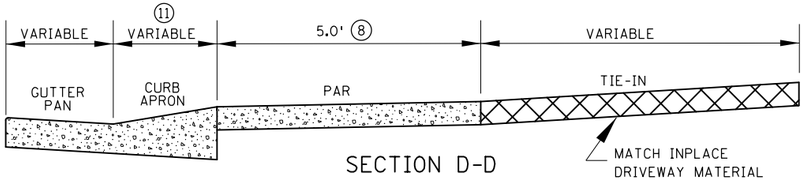


INTEGRAL DRIVEWAY APRON



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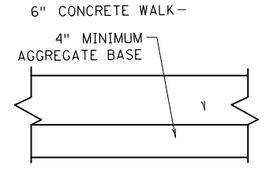
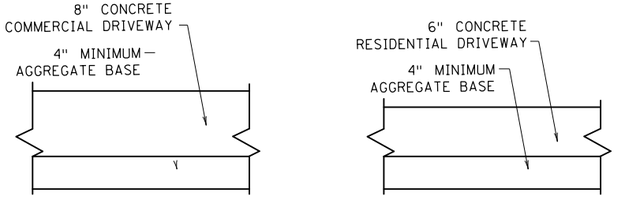


TYPICAL SIDEWALK SECTION (17)



TYPICAL DRIVEWAY SECTIONS

REVISION:

APPROVED: 11-04-2021

JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.254 | 1 OF 4

APPROVED: 11-04-2021
REVISED:

DRIVEWAY AND SIDEWALK DETAILS

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

SHEET NO. 58 OF 216

DATE: 9/12/2024 TIME: 2:00:31 PM
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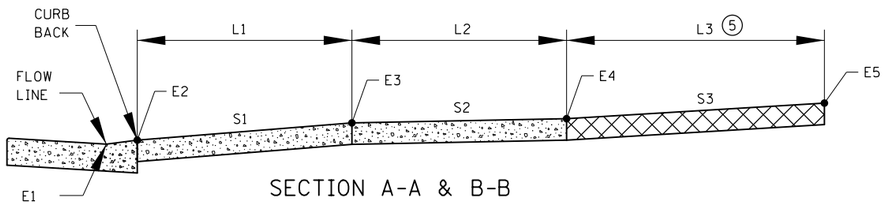
DRIVEWAY TABLE (1)

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	%	%		



SECTION A-A & B-B

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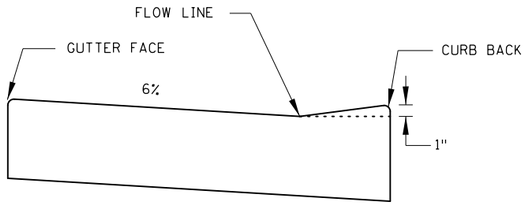
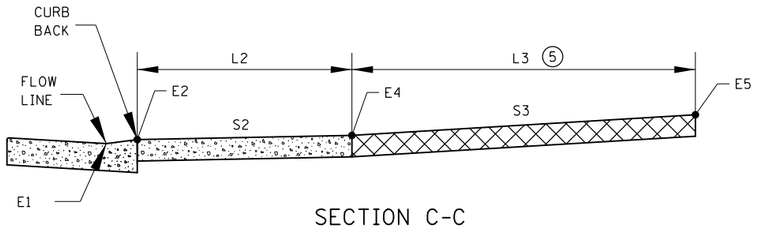


DW CURB TYPE 1

STANDARD CURB AT DRIVEWAY



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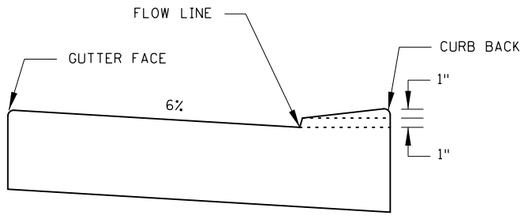
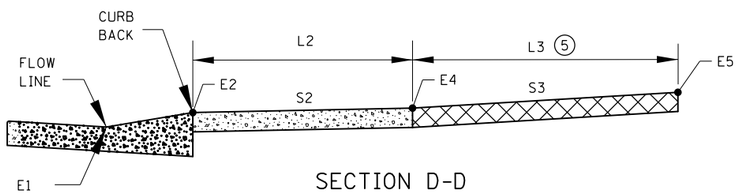


DW CURB TYPE 2

VERTICALLY CONSTRAINED



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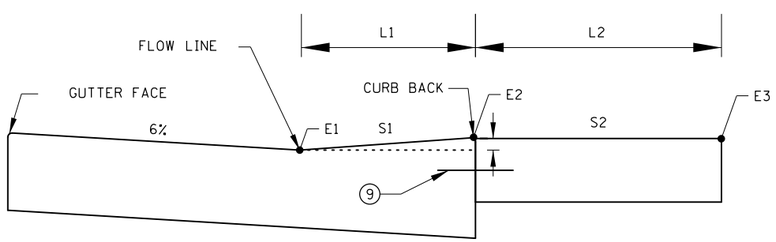

INTEGRAL DRIVEWAY APRON (IDA)

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 FT	E2	S1 (8) %
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

JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.254 | **2 OF 4**

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

DRIVEWAY AND SIDEWALK DETAILS

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

SHEET NO. 59 OF 216

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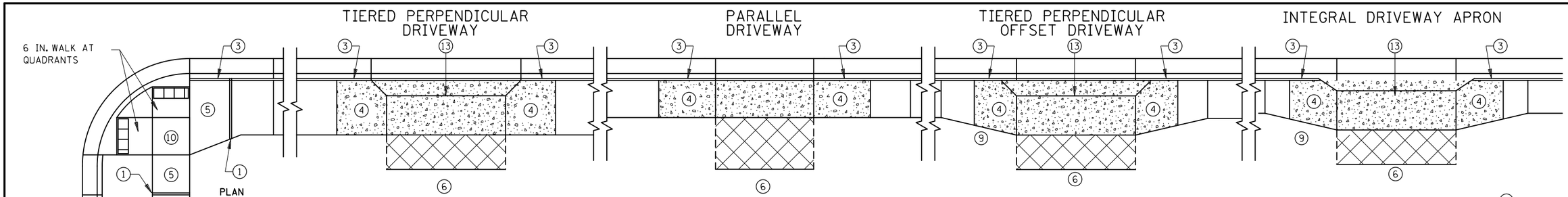
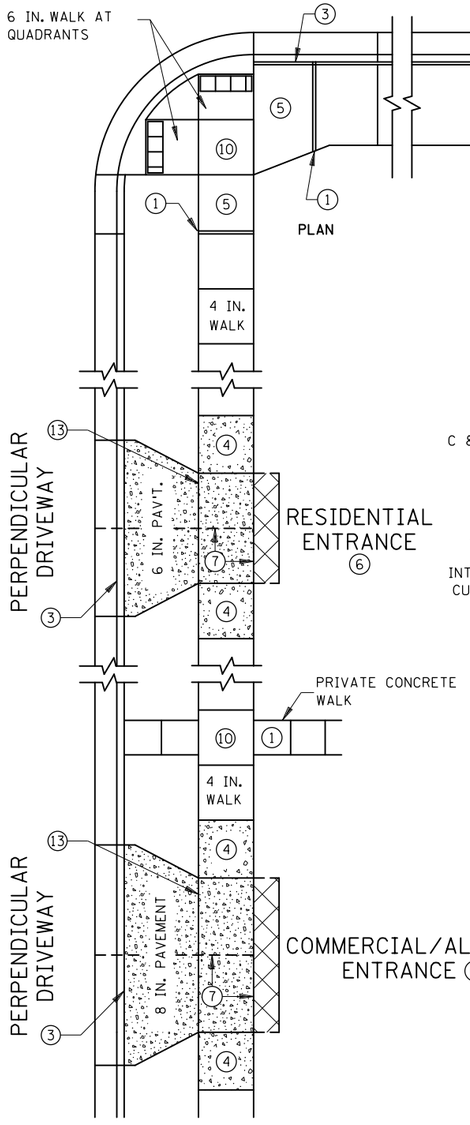
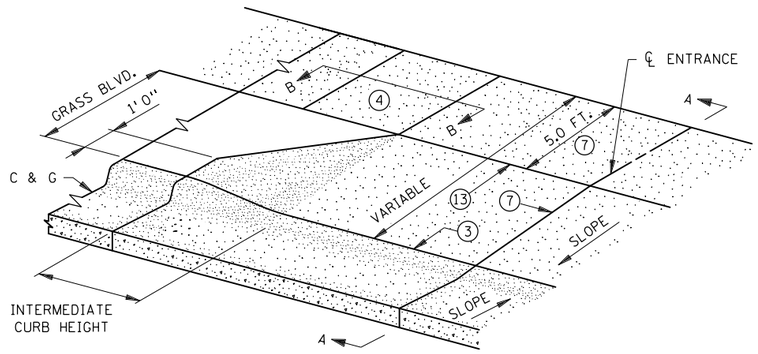
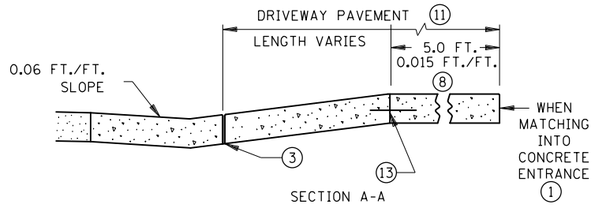




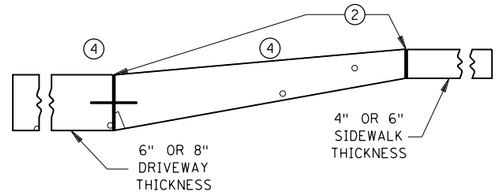


HALF PLAN PERSPECTIVE

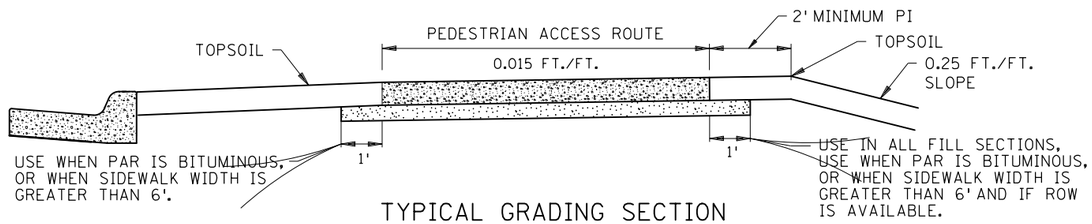
PERPENDICULAR DRIVEWAYS WITH GRASS BOULEVARDS



SECTION THRU DRIVEWAY

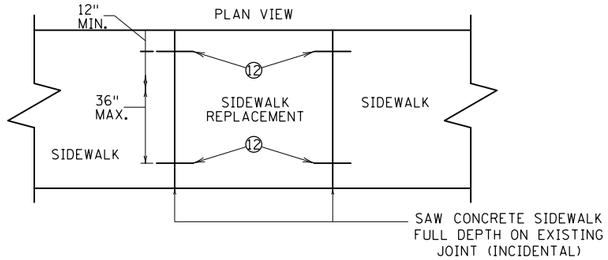


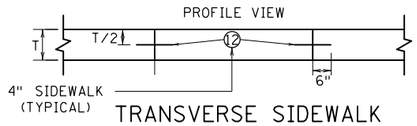
SECTION THRU SIDEWALK THICKNESS TRANSITION



TYPICAL GRADING SECTION

(NOT USED WHEN CONFINED BY CURB, BUILDING, WALL, ETC.)





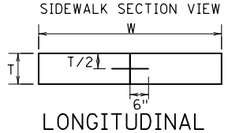
TRANSVERSE SIDEWALK TIE BAR REINFORCEMENT

RETROFITS ONLY

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.



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

JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.254 | **3 OF 4**

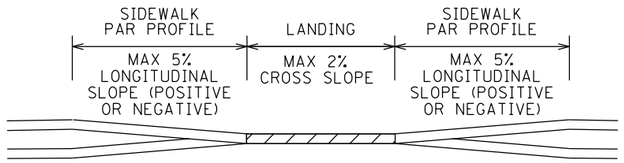
APPROVED: 11-04-2021
REVISED: 12-23-2021

DRIVEWAY AND SIDEWALK DETAILS

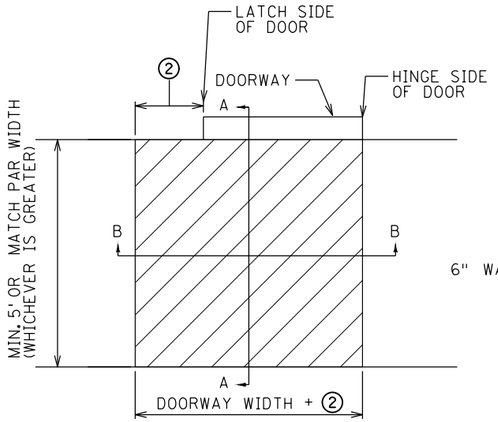
SAP 013-630-021 / SAP 225-591-007

SHEET NO. 60 OF 216

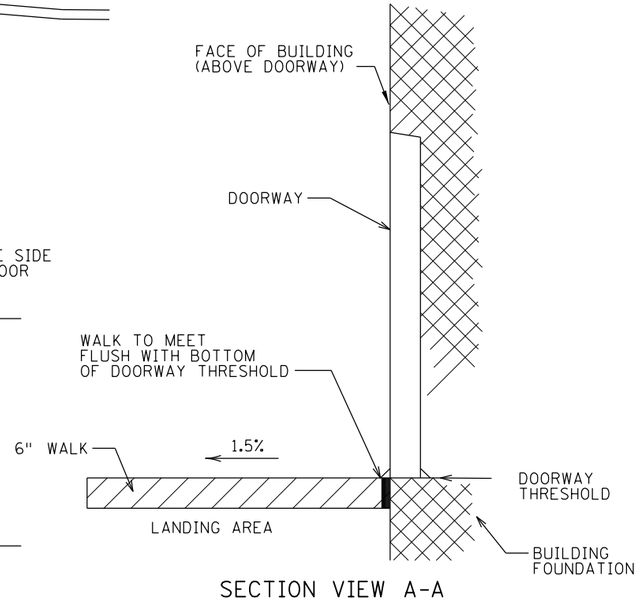
DATE: 9/12/2024 TIME: 2:00:32 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn200



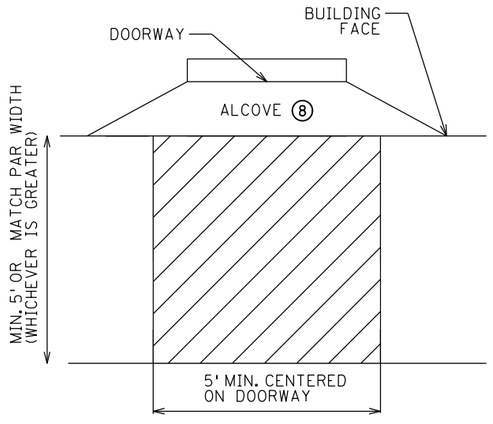
SECTION VIEW B-B



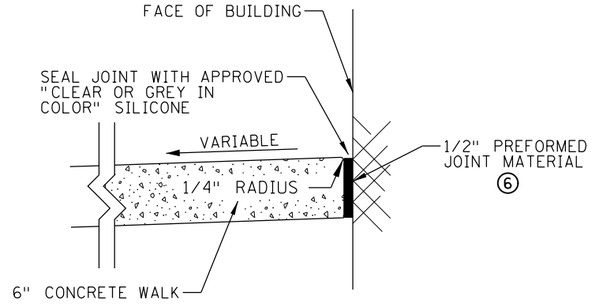
PLAN VIEW DOORWAY



SECTION VIEW A-A

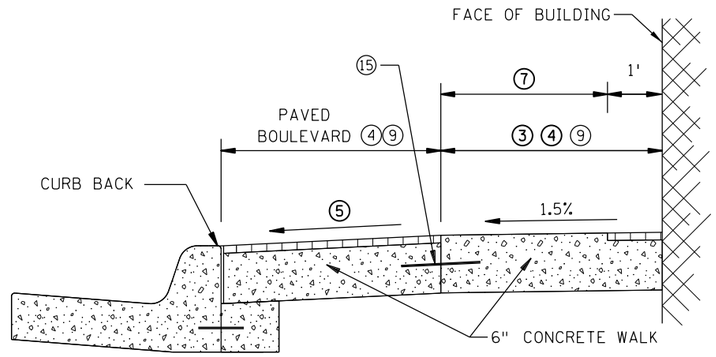


PLAN VIEW DOORWAY WITH ALCOVE

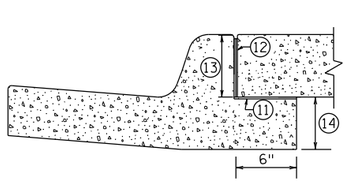


BUILDING JOINT SEAL (INCIDENTAL)

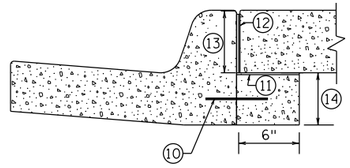
SIDEWALK LANDING REQUIREMENTS ①



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 ½" 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. CONRETE PANEL SIZE SHOULD NOT EXCEED 1½ : 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 (¼ 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
JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.254 | 4 OF 4

APPROVED: 11-04-2021
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

DRIVEWAY AND SIDEWALK DETAILS

SAP 013-630-021 / SAP 225-591-007 | SHEET NO. 61 OF 216

DATE: 9/12/2024 TIME: 2:00:32 PM
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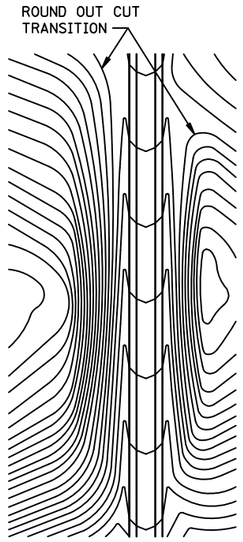
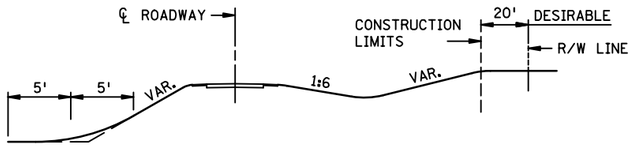
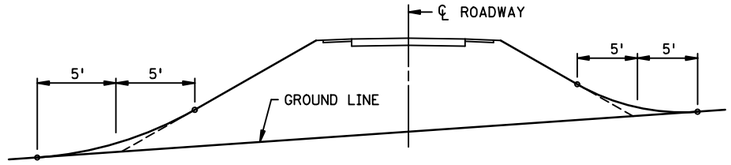


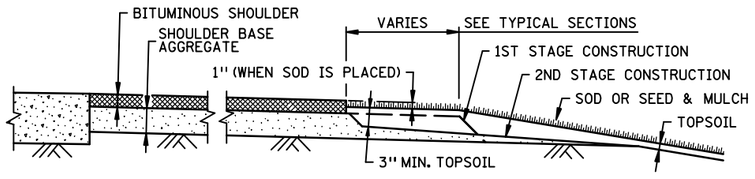
CONTOURING ROAD CUTS



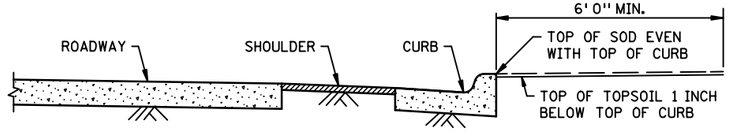
ROUNDING SHOULDERS AND BACKSLOPES



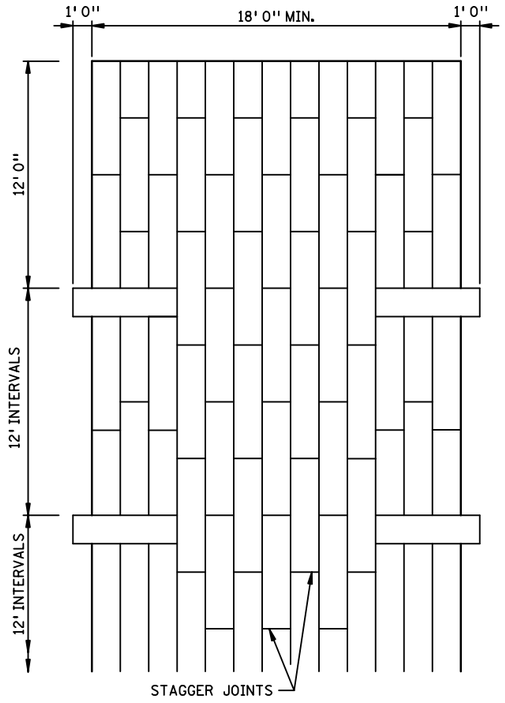
SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES



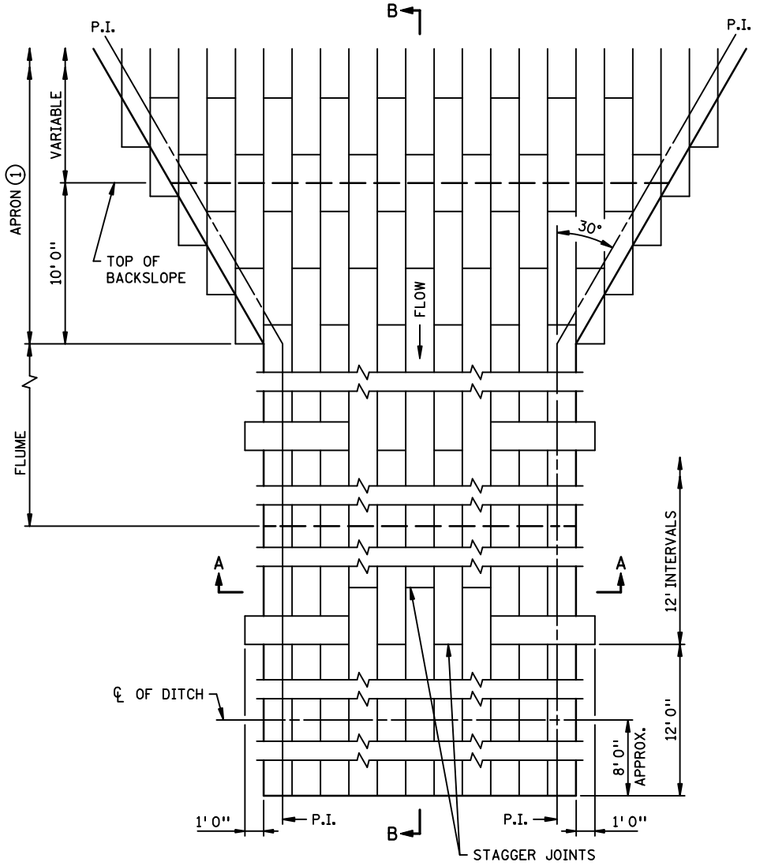
SHAPING AND TOPSOILING INSLOPES



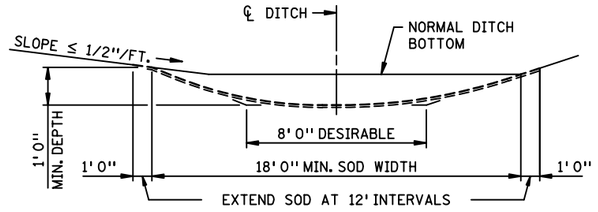
SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED



PLAN VIEW

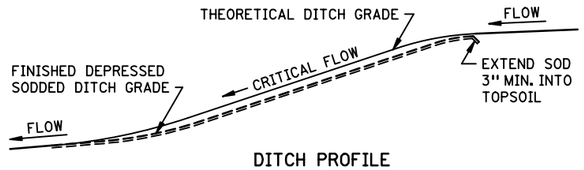


PLAN VIEW



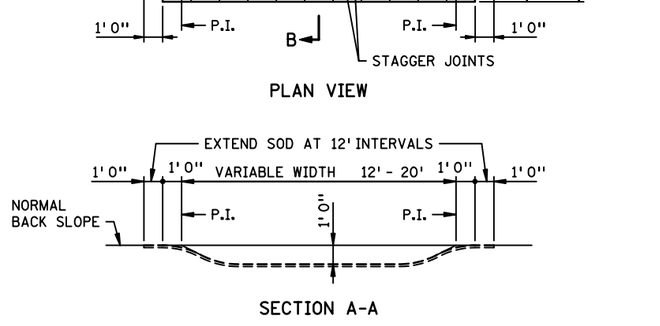
SODDED DITCH CROSS SECTION

WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.), FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.

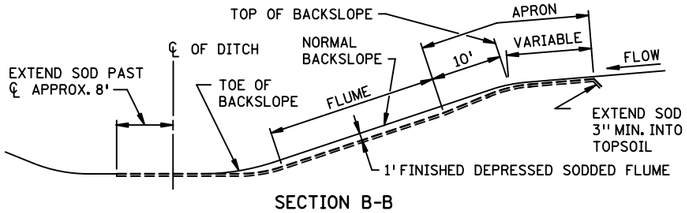


DITCH PROFILE

SODDED DITCH DETAILS



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

APPROVED: 2-28-2017

REVISED:

STATE DESIGN ENGINEER

PERMANENT EROSION CONTROL

ALONG ROADWAYS, DITCHES AND FLUMES

SAP 013-630-021 / SAP 225-591-007 | SHEET NO. 62 OF 216

DATE: 9/12/2024 TIME: 2:00:44 PM
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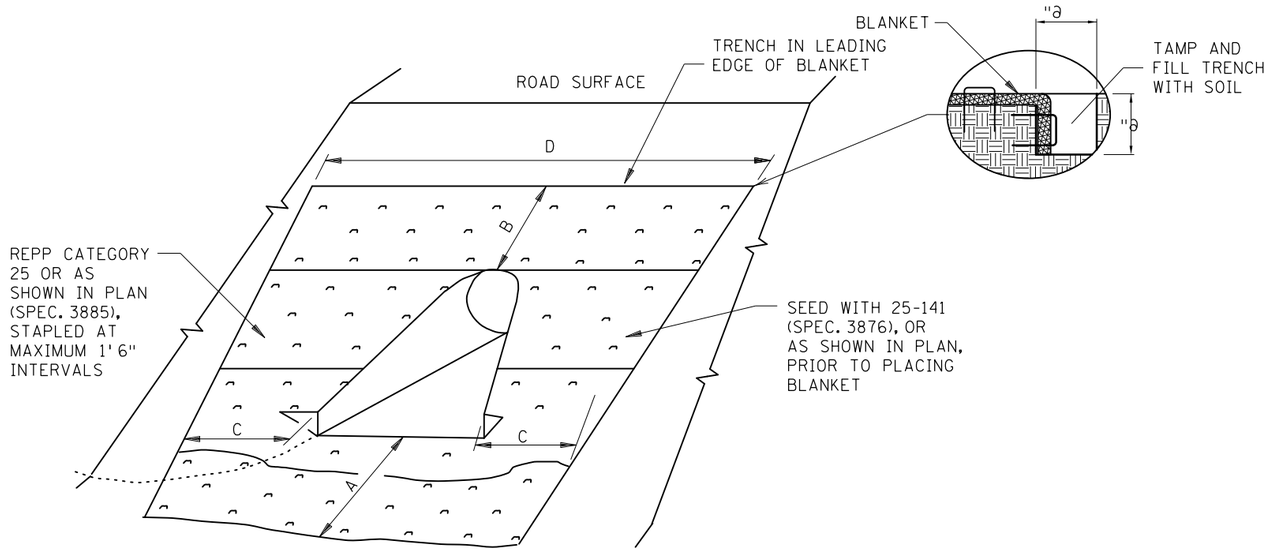
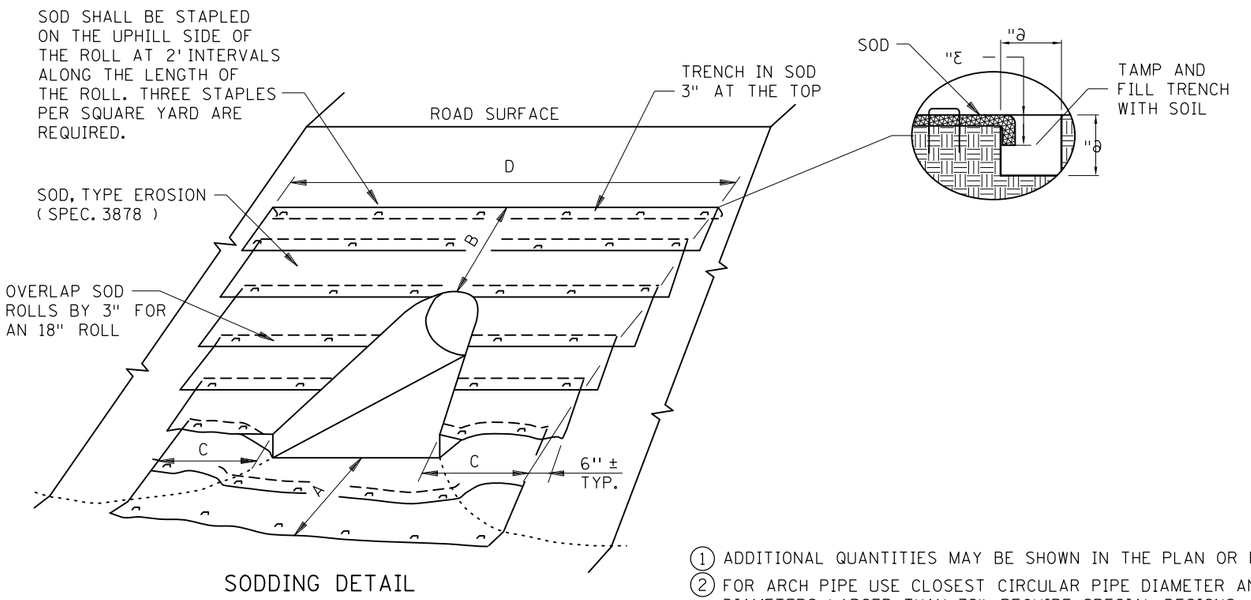


ROLLED EROSION PREVENTION PRODUCT (BLANKET) & SEED DETAIL



SODDING DETAIL

CULVERT INLET APRON ①										
CULVERT DIAMETER ②	SOD OR REPP (SQ. YDS.)						"A"	"B"	"C"	"D"
	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'	3'	13'
18"	13	12	12	14	16	N/A	3'	3'	3'	16'
21"	14	14	14	16	18	14	3'	3'	3'	17'
24"	16	15	16	19	21	17	3'	3'	3'	18'
27"	N/A	20	N/A	N/A	N/A	N/A	3'	4.5'	3'	20'
30"	23	22	25	30	32	N/A	3'	4.5'	3'	22'
36"	34	34	39	48	51	37	4.5'	4.5'	4.5'	27'
42"	43	40	51	64	N/A	N/A	4.5'	6'	4.5'	30'
48"	54	50	66	82	N/A	N/A	4.5'	7.5'	4.5'	34'
54"	65	58	81	102	N/A	N/A	4.5'	9'	4.5'	37'
60"	69	59	91	115	N/A	N/A	4.5'	9'	4.5'	39'
66"	69	63	N/A	N/A	N/A	N/A	4.5'	9'	4.5'	39'
72"	78	72	99	122	N/A	N/A	4.5'	10.5'	4.5'	41'

CULVERT OUTLET APRON ①										
CULVERT DIAMETER ②	SOD OR REPP (SQ. YDS.)						"A"	"B"	"C"	"D"
	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'	3'	13'
18"	13	13	12	14	15	N/A	6'	1.5'	3'	14'
21"	16	14	16	18	19	15	6'	1.5'	3'	15'
24"	18	18	18	21	22	18	7.5'	1.5'	3'	16'
27"	N/A	19	N/A	N/A	N/A	N/A	7.5'	1.5'	3'	17'
30"	23	23	24	28	29	N/A	9'	1.5'	3'	18'
36"	36	35	38	47	48	37	10.5'	1.5'	4.5'	23'
42"	43	40	47	58	N/A	N/A	12'	1.5'	4.5'	25'
48"	50	46	57	70	N/A	N/A	13.5'	1.5'	4.5'	27'
54"	57	50	67	84	N/A	N/A	15'	1.5'	4.5'	29'
60"	74	63	90	113	N/A	N/A	16.5'	1.5'	6'	33'
66"	75	67	N/A	N/A	N/A	N/A	16.5'	1.5'	6'	33'
72"	77	70	92	114	N/A	N/A	16.5'	1.5'	6'	34'

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.

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.

REVISION:

APPROVED: JANUARY 8, 2020

MARNI KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

APPROVED: 1-8-2020
REVISED:

STANDARD PLAN 5-297.404 | 2 OF 3

PERMANENT EROSION CONTROL

TURF ESTABLISHMENT DETAIL AT CULVERT ENDS

SAP 013-630-021 / SAP 225-591-007 | SHEET NO. 63 OF 216

DATE: 9/12/2024 TIME: 2:00:45 PM
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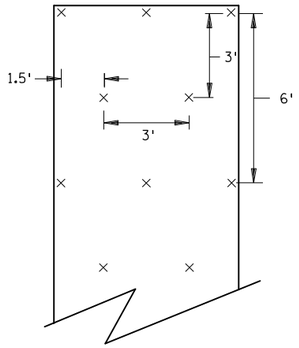
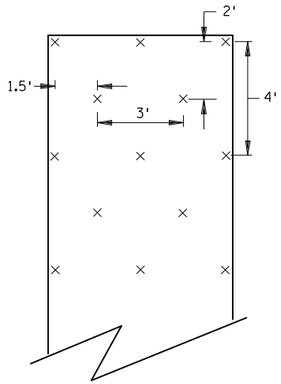
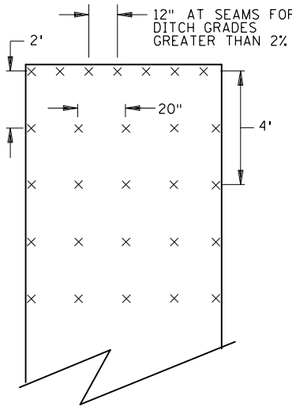


SLOPES FLATTER THAN 1:2
120 STAPLES PER 100 SQ YD

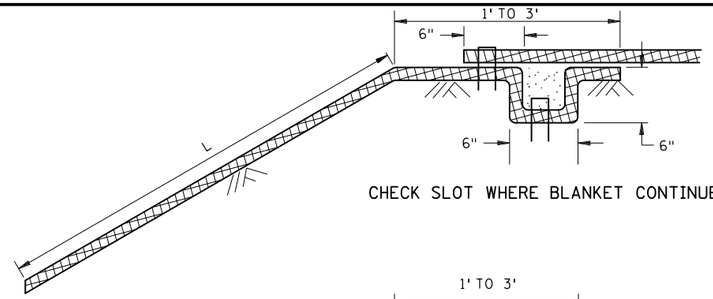


SLOPES 1:2 TO 1:1
170 STAPLES PER 100 SQ YD

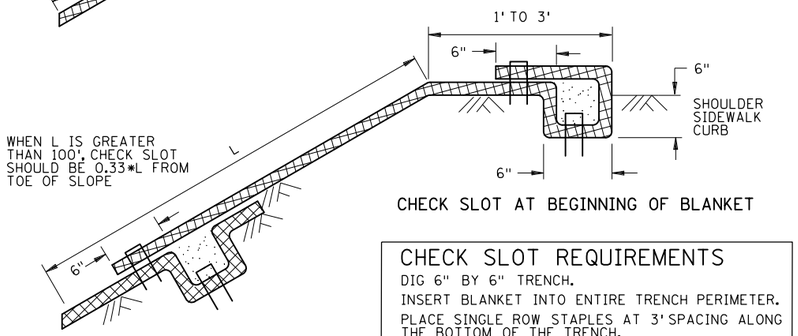


CHANNEL AND DITCH APPLICATIONS
350 STAPLES PER 100 SQ YD

BLANKET STAPLE PATTERN



CHECK SLOT WHERE BLANKET CONTINUES



CHECK SLOT AT BEGINNING OF BLANKET

CHECK SLOT REQUIREMENTS

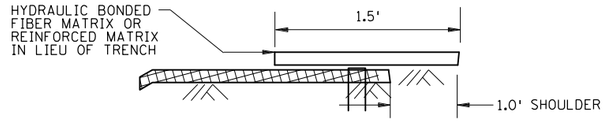
DIG 6" BY 6" TRENCH.

INSERT BLANKET INTO ENTIRE TRENCH PERIMETER.

PLACE SINGLE ROW STAPLES AT 3' SPACING ALONG THE BOTTOM OF THE TRENCH.

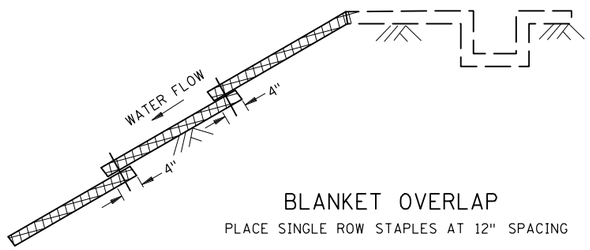
BACKFILL TRENCH WITH SOIL AND TAMP.

PLACE SINGLE ROW STAPLES AT 3' SPACING ON OVERLAP.

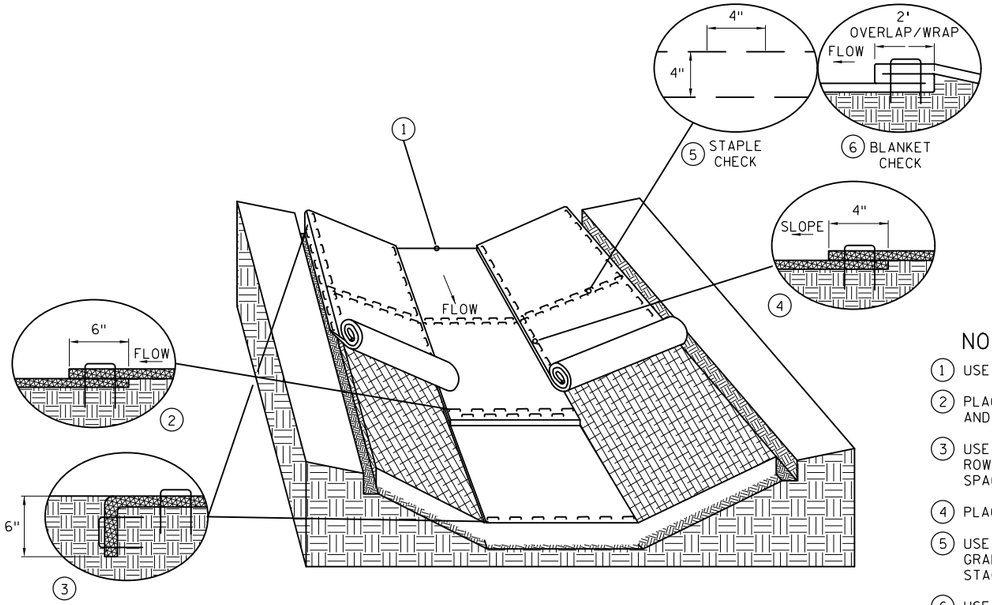


CHECK SLOT ALTERNATIVE
PLACE SINGLE ROW STAPLES AT 12" SPACING

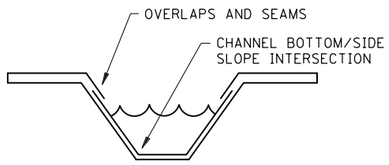
CHECK SLOT DETAILS



BLANKET OVERLAP
PLACE SINGLE ROW STAPLES AT 12" SPACING



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.

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 ⅓ FROM THE BOTTOM OF THE SLOPE.

REVISION:

APPROVED: JANUARY 8, 2020
MARNI KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.404 | 3 OF 3

APPROVED: 1-8-2020
REVISED:
THOMAS STYRBICKI
STATE DESIGN ENGINEER

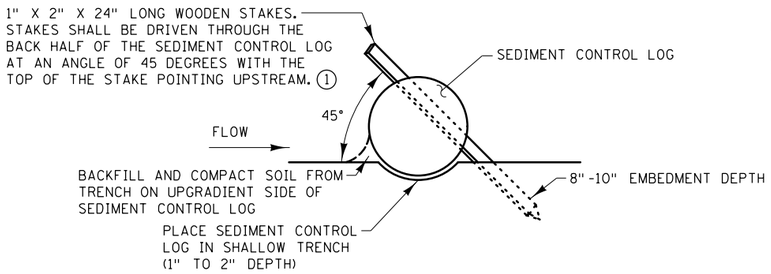
PERMANENT EROSION CONTROL

REPP (BLANKET) STAPLE PATTERN FOR SLOPES

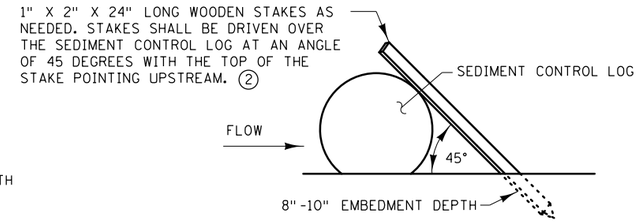
SAP 013-630-021 / SAP 225-591-007

SHEET NO. 64 OF 216

DATE: 9/12/2024 TIME: 2:00:46 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700

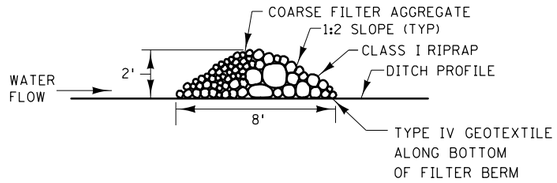


TYPES: STRAW, WOOD FIBER, OR COIR

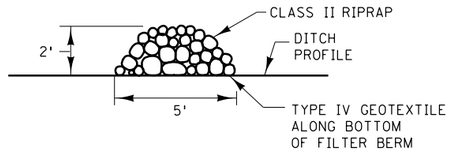


TYPES: WOOD CHIP, COMPOST, OR ROCK

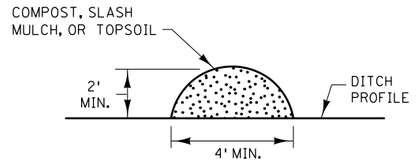
SEDIMENT CONTROL LOGS



TYPE 3 (ROCK WEEPER)

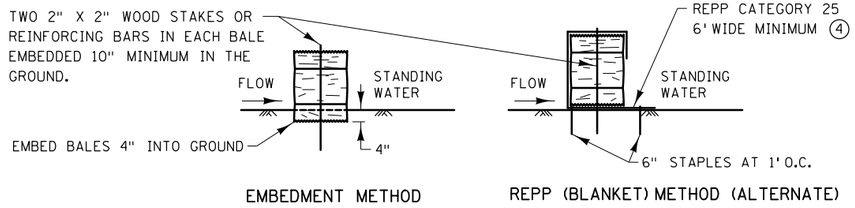


TYPE 5 (ROCK)



TYPE 1 (COMPOST), TYPE 2 (SLASH MULCH), OR TYPE 4 (TOPSOIL)

FILTER BERMS



EMBEDMENT METHOD

REPP (BLANKET) METHOD (ALTERNATE)

BALE BARRIERS (3)

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
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 2 OF 8

APPROVED: 1-8-2020
REVISED:

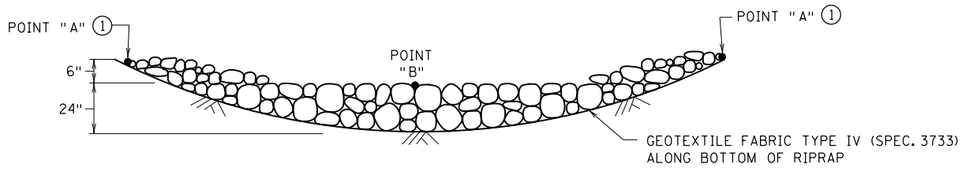
THOMAS STYRBICKI
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL

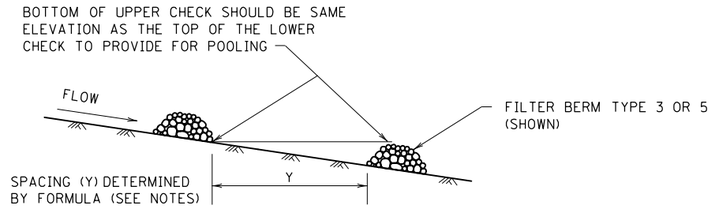
FILTER BERMS, SEDIMENT CONTROL LOGS, AND BALE BARRIERS

SAP 013-630-021 / SAP 225-591-007 | SHEET NO. 65 OF 216

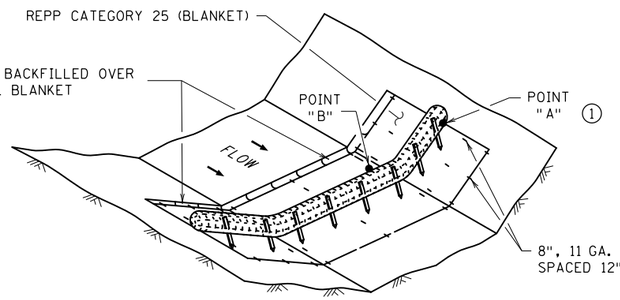
DATE: 9/12/2024 TIME: 2:00:47 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700

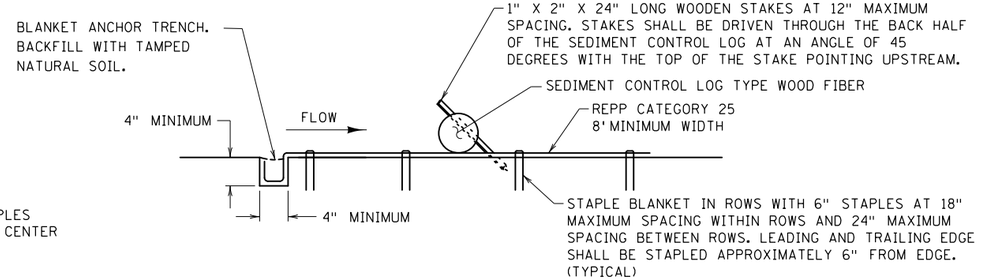


ROCK DITCH CHECKS
FILTER BERMS TYPE 3 (ROCK WEEPER) OR FILTER TYPE 5 (ROCK) ③
FOR USE ON ROUGH-GRADED AREAS
ONLY FOR USE OUTSIDE CLEAR ZONE ②

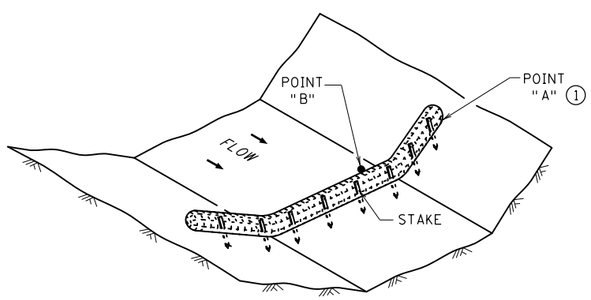


DITCH CHECK SPACING
FOR ALL FILTER BERM TYPES





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.

REVISION:

APPROVED: JANUARY 8, 2020
MARNI KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

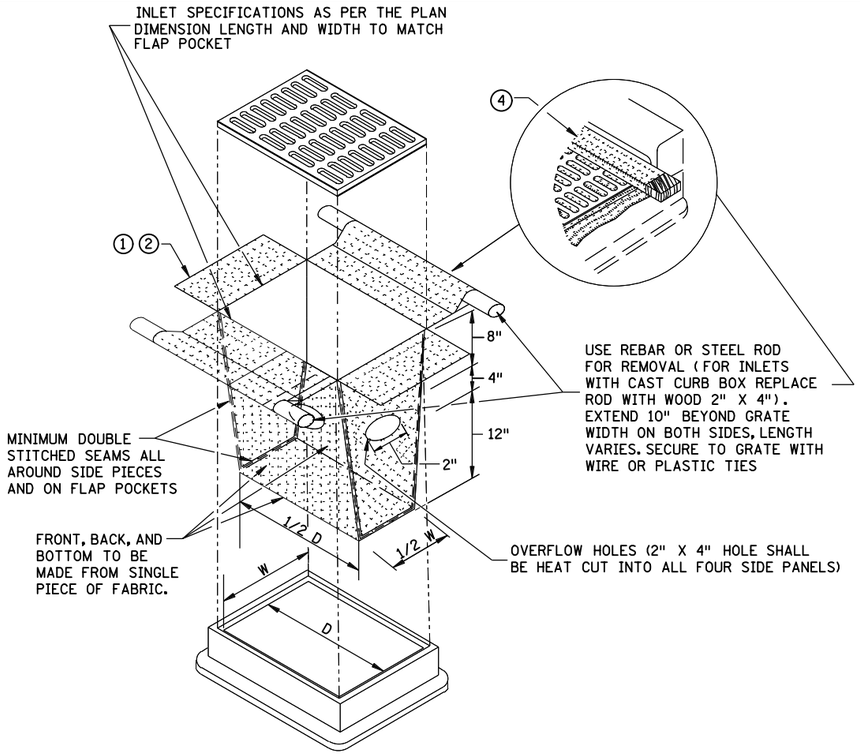
STANDARD PLAN 5-297.405	3 OF 8
APPROVED: 1-8-2020 REVISED:	

THOMAS STYRBICKI
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL
DITCH CHECK

SAP 013-630-021 / SAP 225-591-007 SHEET NO. 66 OF 216

DATE: 9/12/2024 TIME: 2:00:47 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700

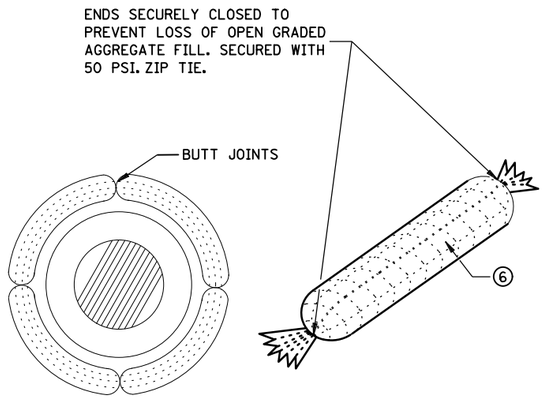


FILTER BAG INSERT ③

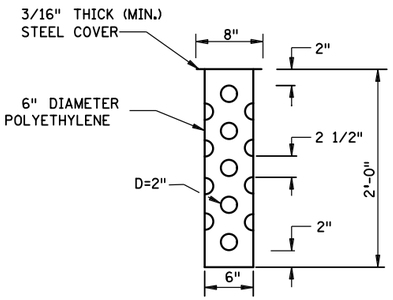
(CAN BE INSTALLED IN ANY INLET TYPE
WITH OR WITHOUT A CURB BOX)

SEDIMENT CONTROL INLET HAT

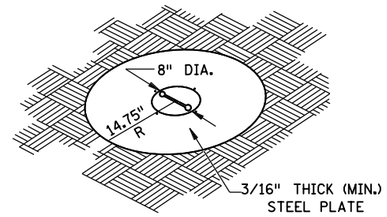
NOTE:
THE SEDIMENT CONTROL BARRIER SHALL BE A METAL OR PLASTIC/POLYETHYLENE RISER SIZED TO FIT INSIDE THE CATCH BASIN/MANHOLE; HAVE PERFORATIONS TO ALLOW FOR WATER INFILTRATION; HAVE AN OVERFLOW OPENING, FLANGES AND A LID/COVER.



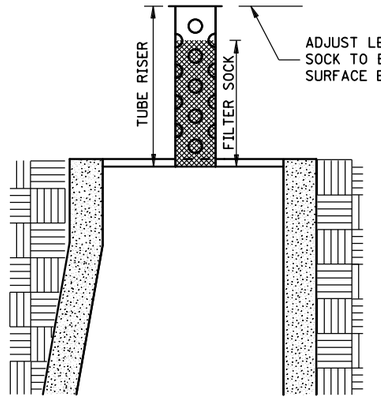
ROCK LOG/COMPOST LOG



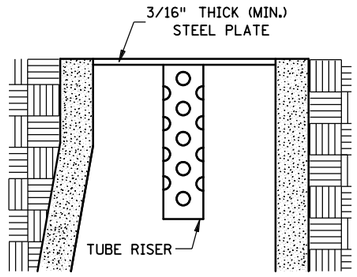
TUBE RISER



PERSPECTIVE VIEW

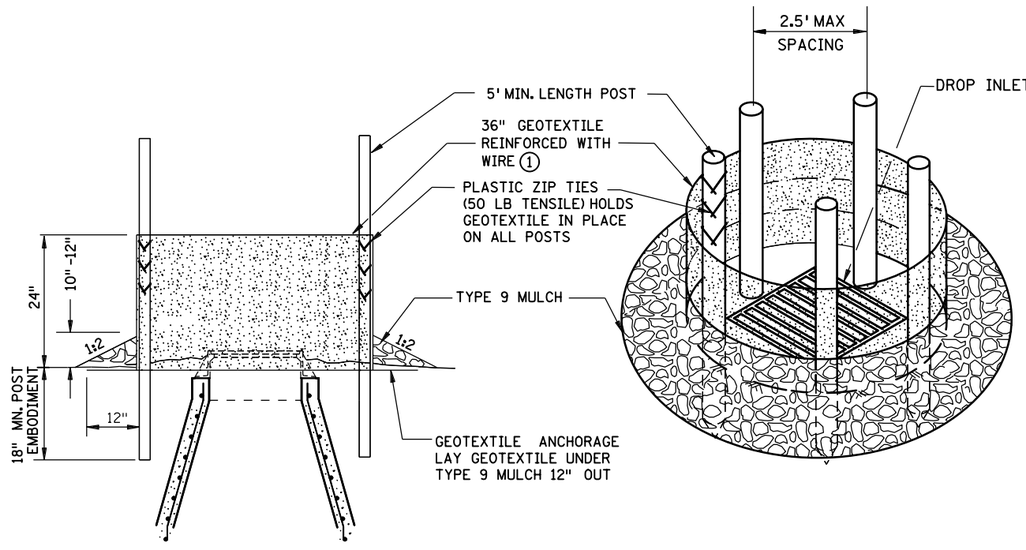


SECTION
(UP POSITION)



SECTION
(DOWN POSITION)

POP-UP HEAD



SILT FENCE RING AND ROCK FILTER BERM

USE WHERE INLET DRAINS IN AN AREA WITH SLOPES AT 1:3 or LESS

NOTES:

SEE SPECS. 2573, 3137, & 3886.

DEVICES MUST BE ADJUSTED ACCORDINGLY AS TO NOT CAUSE FLOODING ON ROADWAY THAT WOULD IMPEED 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.

REVISION:

APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 4 OF 8

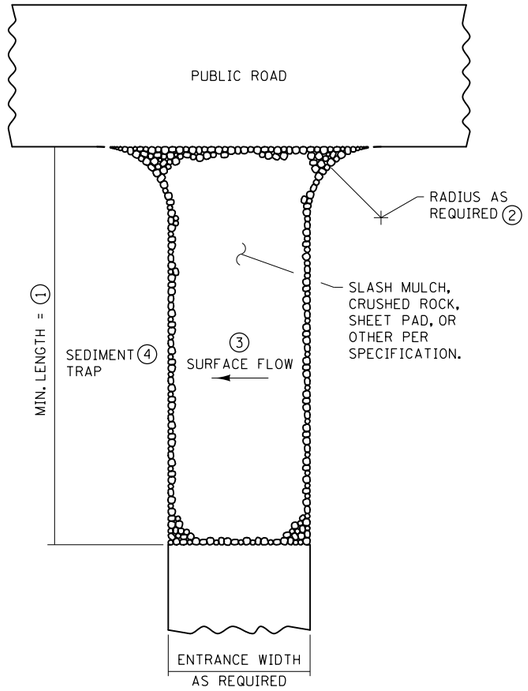
APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL

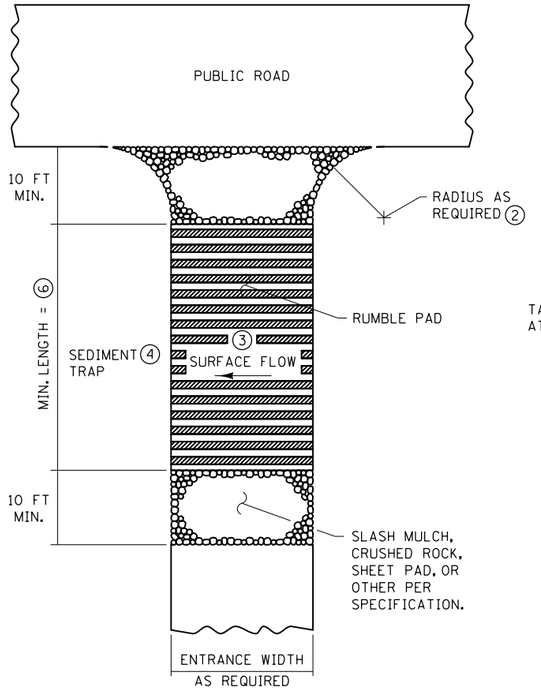
STORM DRAIN INLET PROTECTION

SAP 013-630-021 / SAP 225-591-007 | SHEET NO. 67 OF 216

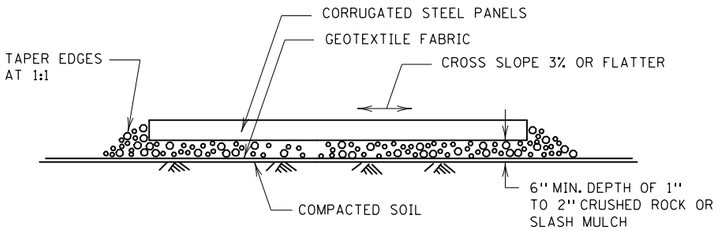
DATE: 9/12/2024 TIME: 2:00:48 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700



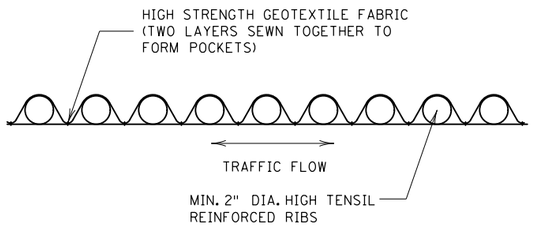
SLASH MULCH, CRUSHED ROCK, OR SHEET PAD CONSTRUCTION EXIT ⑤⑦



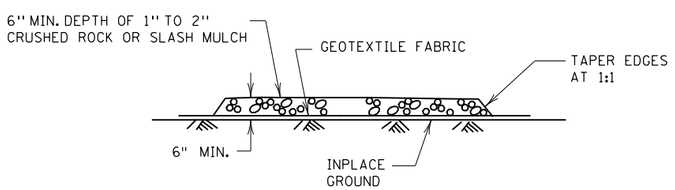
RUMBLE PAD CONSTRUCTION EXIT ⑤⑦



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.

REVISION:

APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 5 OF 8

APPROVED: 2-28-2017
REVISED:

STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL

STABILIZED CONSTRUCTION EXIT

SAP 013-630-021 / SAP 225-591-007 | SHEET NO. 68 OF 216

DATE: 9/12/2024 TIME: 2:00:49 PM
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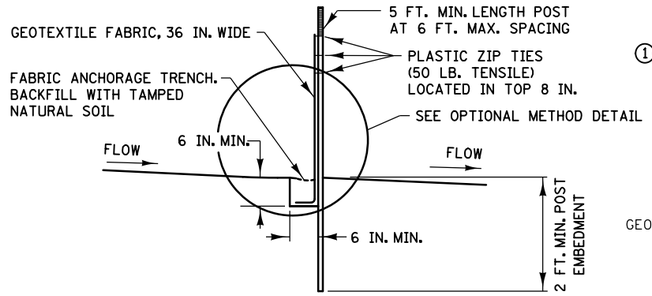
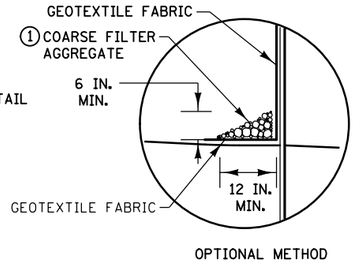
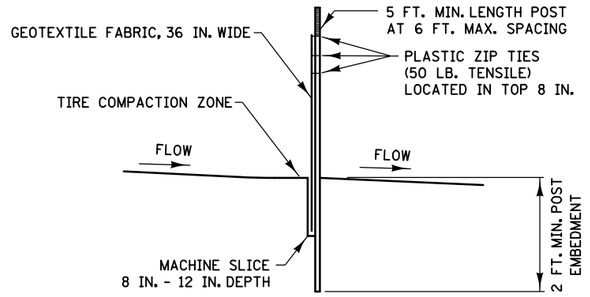
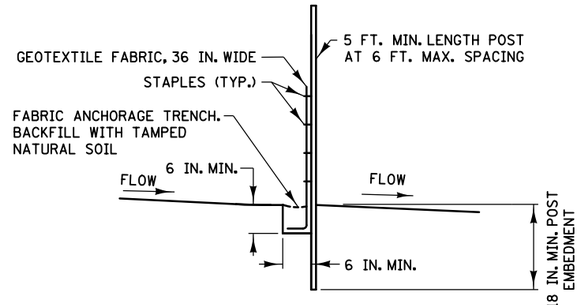




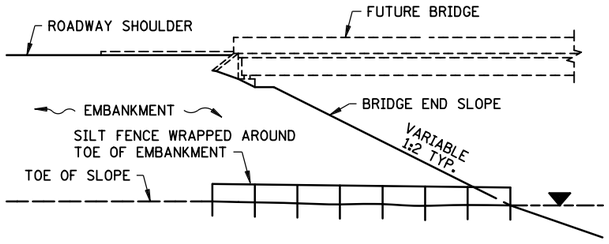
SILT FENCE TYPE HI ②
(HAND INSTALLED)



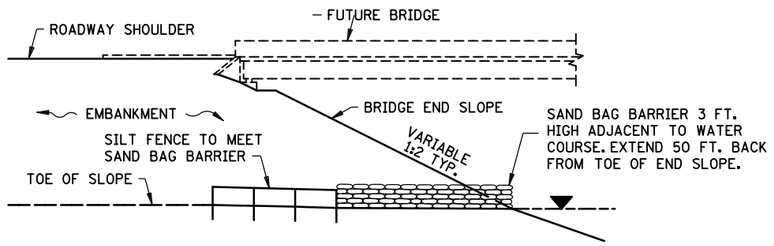
SILT FENCE TYPE MS ②
(MACHINE SLICED)



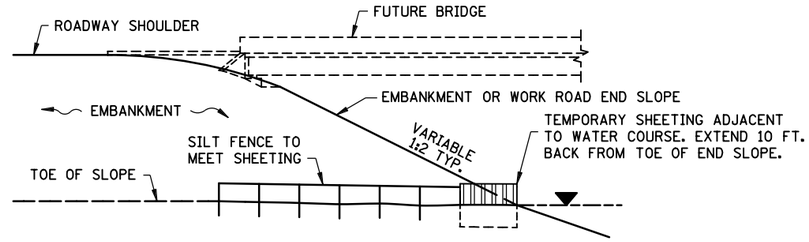
SILT FENCE TYPE PA ③
(PREASSEMBLED)



SILT FENCE ONLY ④

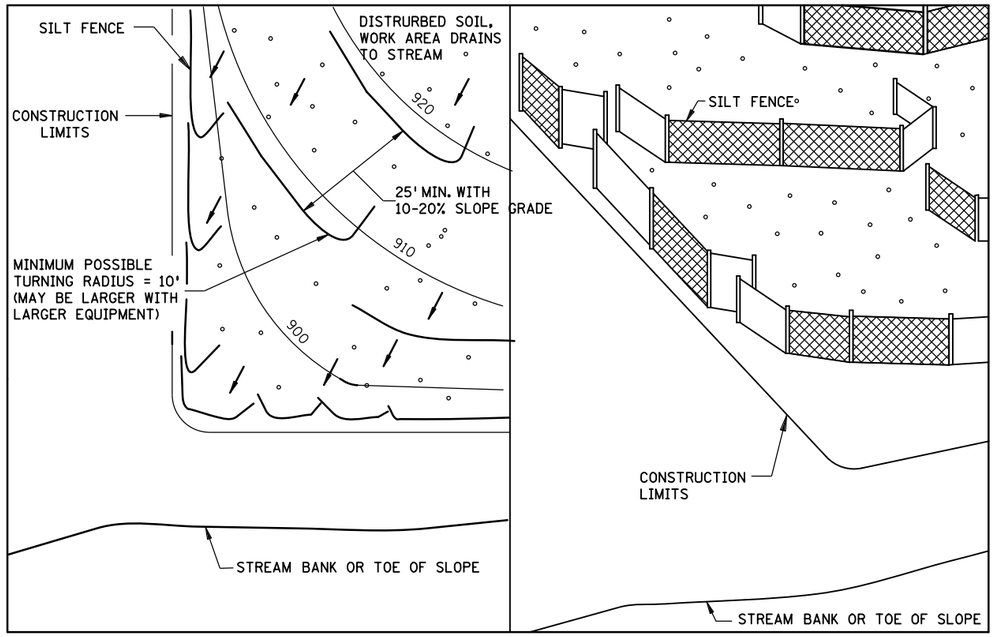


SILT FENCE WITH SAND BAGS ⑤



SILT FENCE WITH SHEETING ⑥

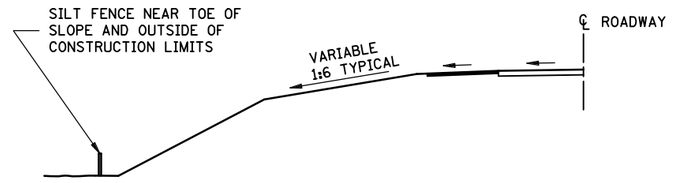
INSTALLATION AT BRIDGE EMBANKMENT ADJACENT TO WATER



PLAN VIEW

PERSPECTIVE VIEW

J-HOOK INSTALLATION



LOCATION AT TOE OF ROADWAY EMBANKMENT

NOTES:

SEE SPECS. 2573, 3149 & 3886.

① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.

② TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 1 ACRE.

③ TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 0.25 ACRE.

④ WATER COURSE FLOW VELOCITY: STANDING.
CONTRIBUTING SLOPE AREA: 1./2 ACRE.

⑤ WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC.
CONTRIBUTING SLOPE AREA: 1. ACRE.

⑥ WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC.
CONTRIBUTING SLOPE AREA: 3 ACRES.

REVISION:

APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 6 OF 8

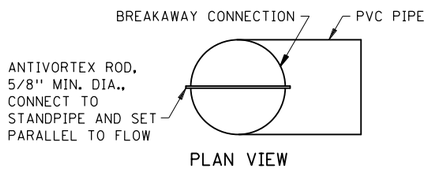
APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL

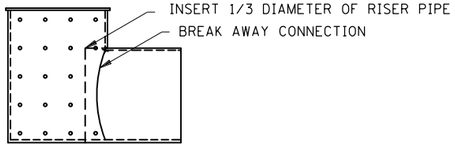
SILT FENCE

SAP 013-630-021 / SAP 225-591-007 SHEET NO. 69 OF 216

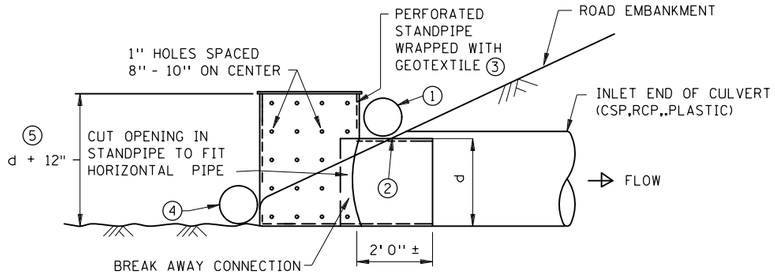
DATE: 9/12/2024 TIME: 2:00:50 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700



PLAN VIEW



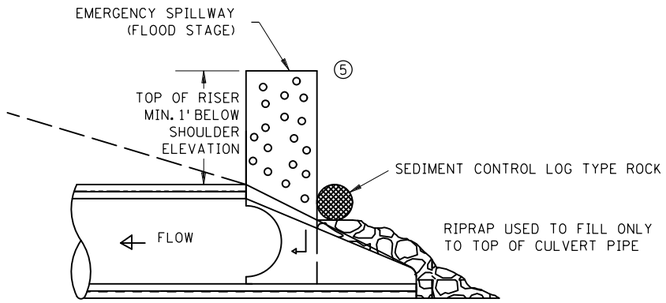
CULVERT STANDPIPE



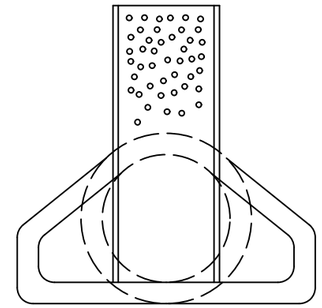
ELEVATION VIEW OF CULVERT INSTALLATION

CULVERT STANDPIPE INSERT (D-RISER)

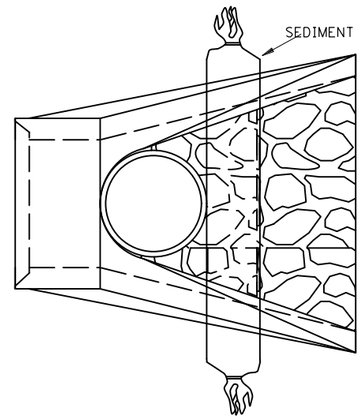
d= CULVERT SIZE: 12" - 36"



LONGITUDINAL SECTION



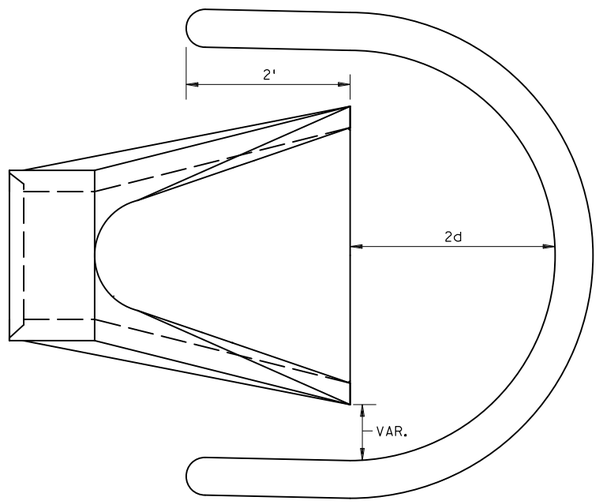
END VIEW



NOTE: SEDIMENT CONTROL LOG TYPE ROCK MAY BE WRAPPED AROUND RISER

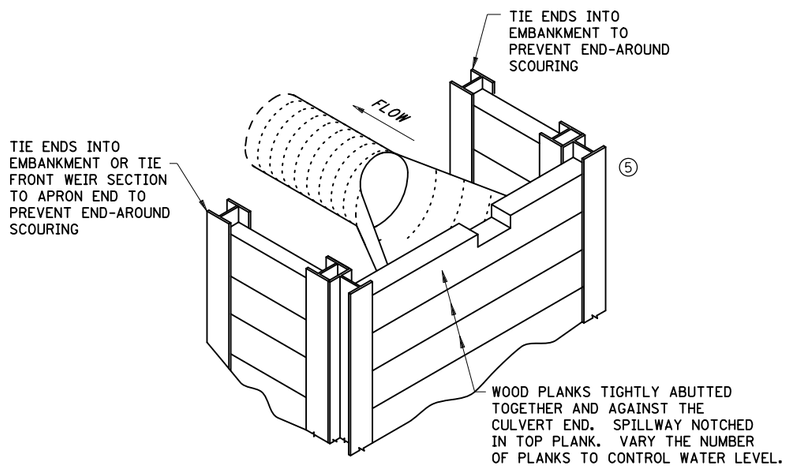
TOP VIEW

CULVERT STANDPIPE INSERT (D-RISER)



SEDIMENT CONTROL LOG WEIR
(COMPOST, WOOD CHIP, OR ROCK)

d = CULVERT SIZE: 12"-36"



WOOD PLANK WEIR

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
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 | 8 OF 8

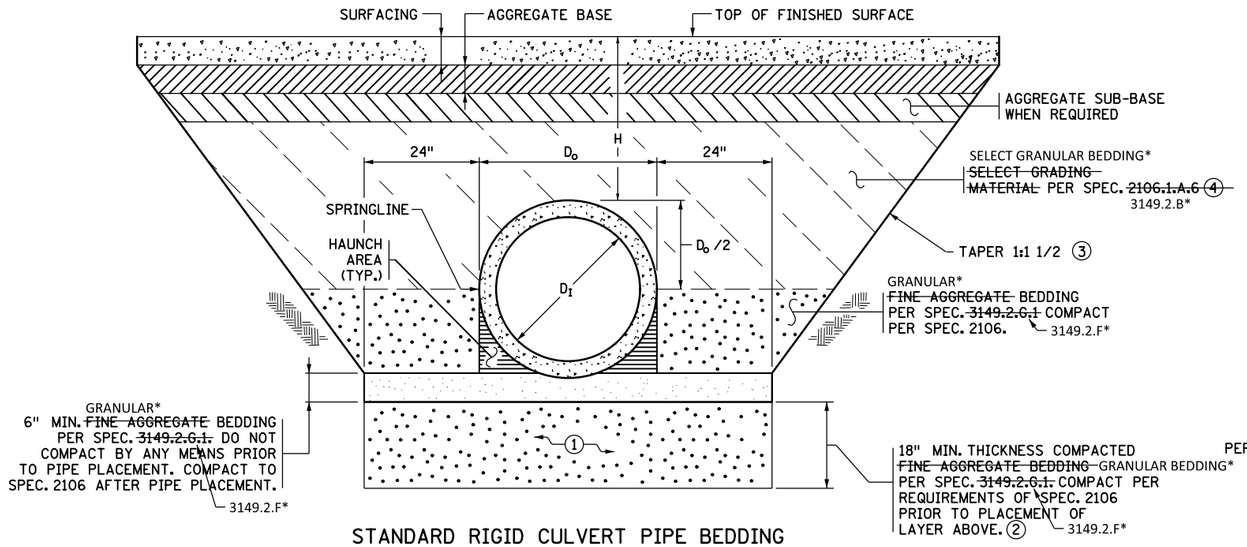
APPROVED: 2-28-2017
REVISED:
STATE DESIGN ENGINEER

TEMPORARY SEDIMENT CONTROL

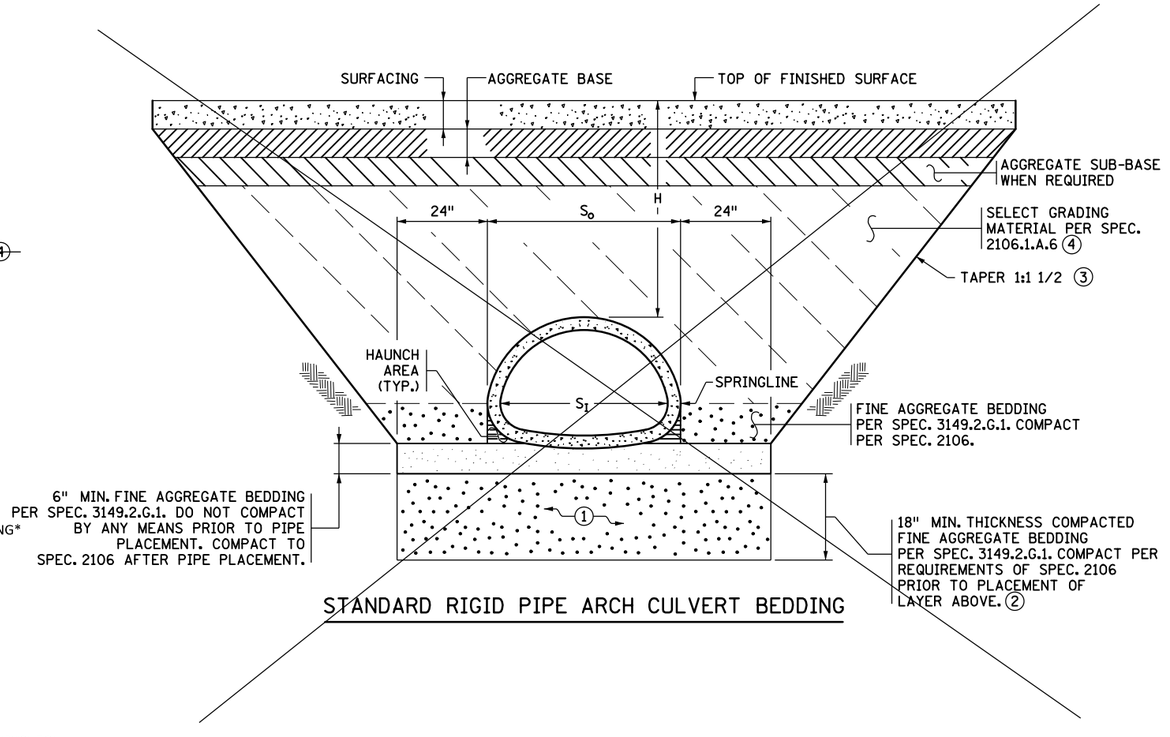
CULVERT END CONTROLS

SAP 013-630-021 / SAP 225-591-007 | SHEET NO. 70 OF 216

DATE: 9/12/2024 TIME: 2:00:50 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700



STANDARD RIGID CULVERT PIPE BEDDING



STANDARD RIGID PIPE ARCH CULVERT BEDDING

-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

CONSTRUCTION SEQUENCE

1. PLACE AND COMPACT 18" OF ~~FINE AGGREGATE~~ GRANULAR* BEDDING TO THE REQUIREMENTS OF SPEC. 2106.
2. LOOSELY PLACE 6" OF ~~FINE AGGREGATE~~ GRANULAR* BEDDING MATERIAL (SPEC. ~~3149.2.G.1~~ 3149.2.F*) 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 HAUNCHH 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.

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".

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 _____ DATE 9/12/2024
LICENSED PROFESSIONAL ENGINEER
NAME: NICHOLAS E. HENTGES, PE LIC NO. 44620

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

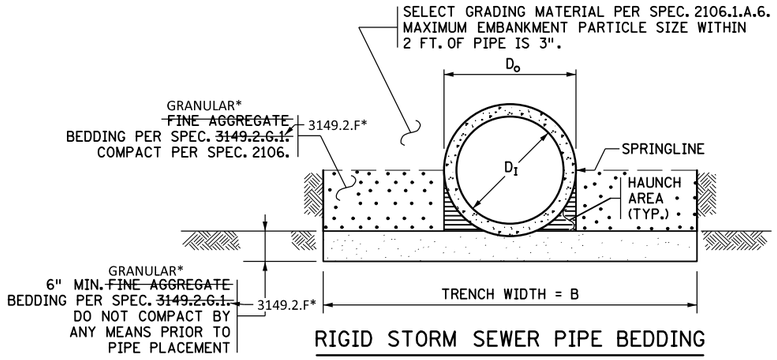
~~STANDARD PLAN 5-297.441~~ 1 OF 1

APPROVED: ~~01-18-2019~~
REVISED:

STANDARD CULVERT BEDDING FOR RIGID PIPE (WITHOUT TREATMENTS)

SAP 013-630-021 / SAP 225-591-007 SHEET NO. 71 OF 216

DATE: 9/12/2024 TIME: 2:00:51 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn400-700

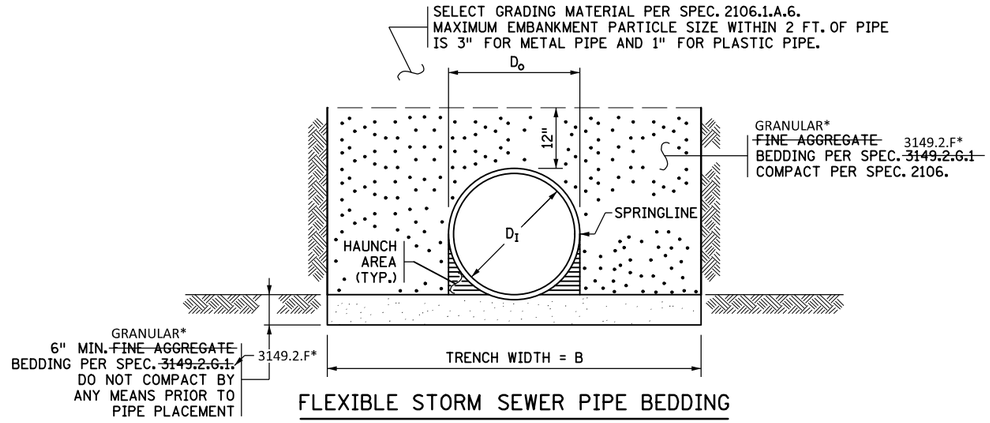


RIGID STORM SEWER PIPE BEDDING

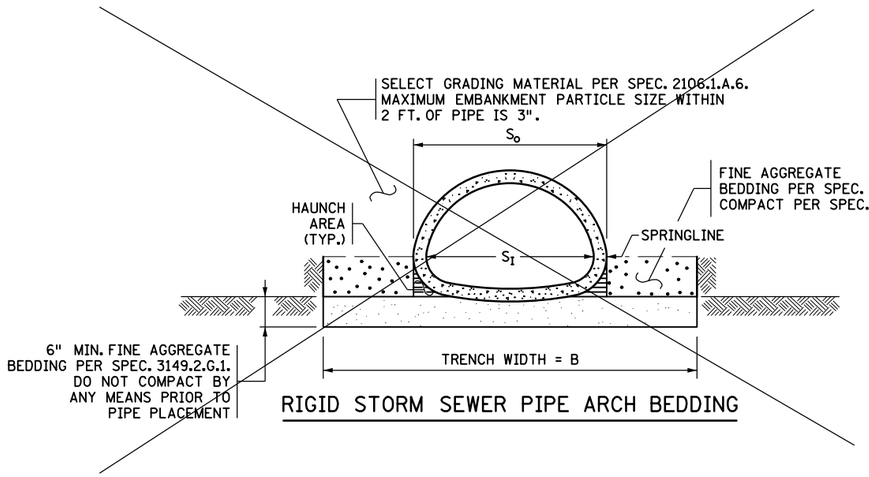
TRENCH BASE WIDTH ①②	
PIPE DIA. D_I OR S_I	TRENCH WIDTH B
< 42"	D_o + 24"
42" TO 54"	1.5 × D_o
> 54"	D_o + 36"

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"



FLEXIBLE STORM SEWER PIPE BEDDING



RIGID STORM SEWER PIPE ARCH BEDDING

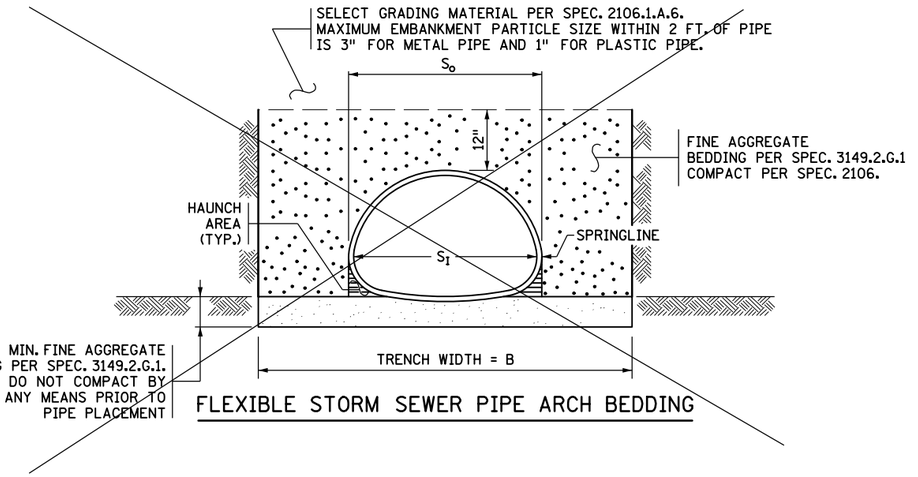
-LEGEND-

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



FLEXIBLE STORM SEWER PIPE ARCH BEDDING

CONSTRUCTION SEQUENCE

1. LOOSELY PLACE 6" OF ~~FINE AGGREGATE~~ GRANULAR* 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~~ GRANULAR* 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\M...

REVISION:

APPROVED: JANUARY 18, 2019
Kevin Western
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

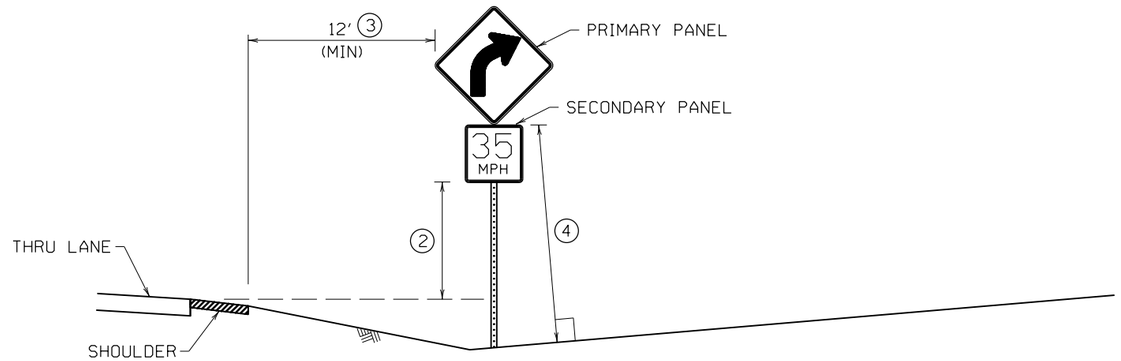
STANDARD PLAN ~~5-297.442~~ | 1 OF 1

APPROVED: 01-18-2019
REVISED:
STATE DESIGN ENGINEER

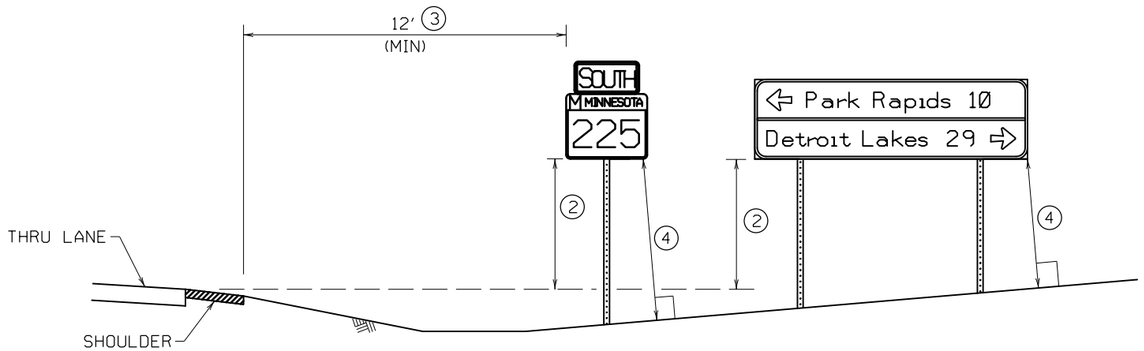
STANDARD STORM SEWER BEDDING
FOR RIGID AND FLEXIBLE PIPE

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

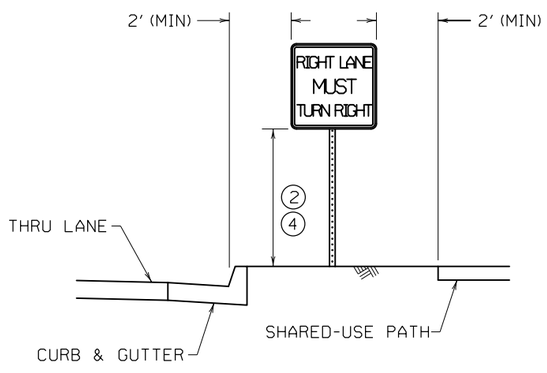
SHEET NO. 72 OF 216



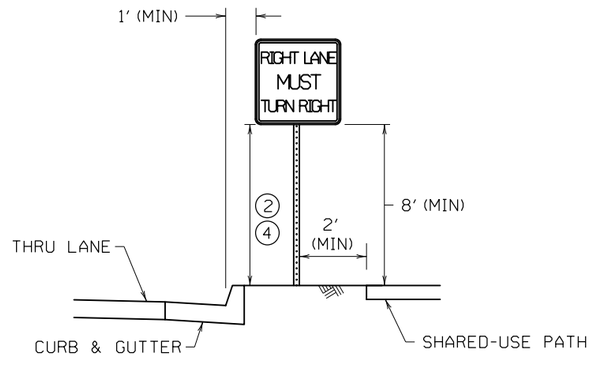
PRIMARY AND SECONDARY PANELS



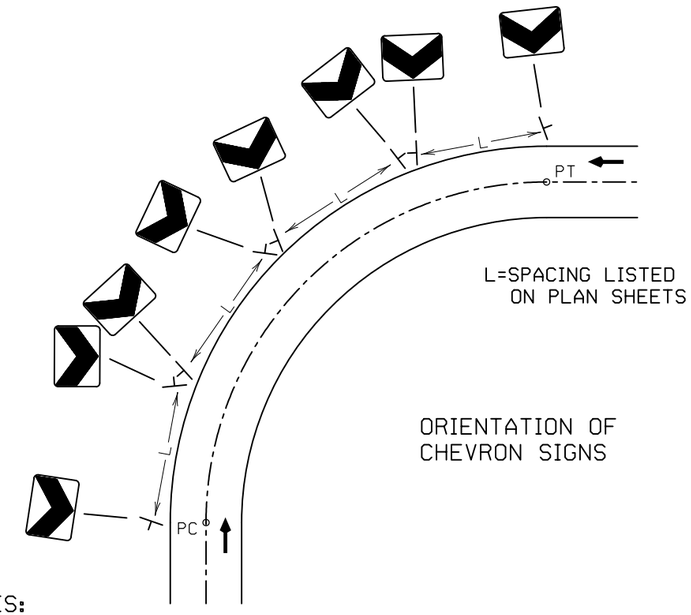
STANDARD LOCATIONS



BOULEVARD LOCATIONS
6′ TO 12′ WIDE



BOULEVARD LOCATIONS①
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.

DATE: 9/12/2024 TIME: 2:01:23 PM
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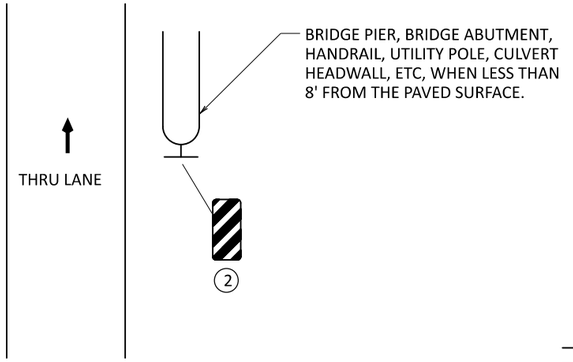
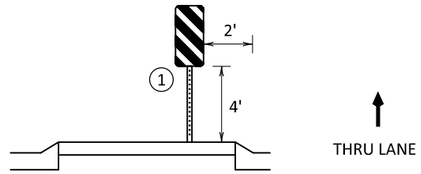
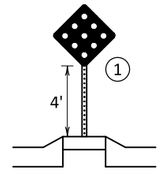
LEAD EXPERT OFFICE	BRIAN SORENSON STATE TRAFFIC ENGINEER OFFICE OF TRAFFIC ENGINEERING		STANDARD SIGN PLACEMENT	APPROVED: 08-09-2023 REVISED:	THOMAS STYRBICKI STATE DESIGN ENGINEER	STANDARD PLAN 5-297.701	1 OF 1



OBSTRUCTION
TYPE 3 OBJECT MARKER

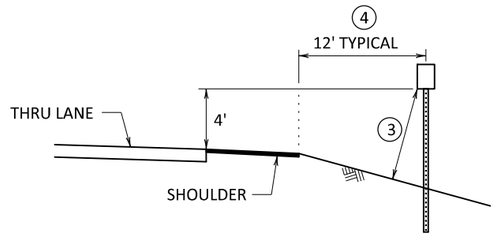


RAISED ISLAND
TYPE 3 OBJECT MARKER

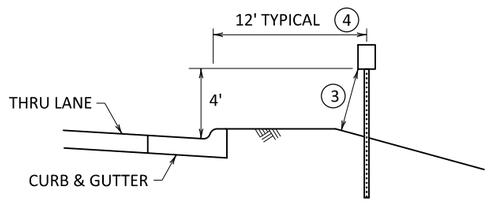


RAISED ISLAND
TYPE 1 OBJECT MARKER

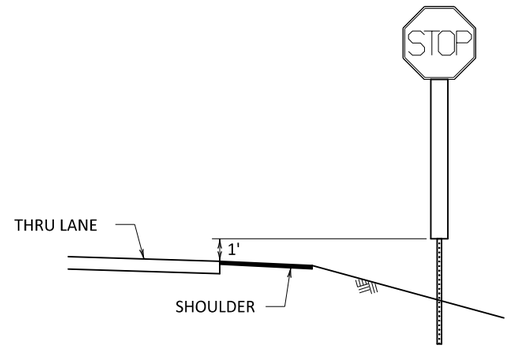
MARKER TYPICAL PLACEMENT



LOCATIONS WITHOUT CURB



LOCATIONS WITH CURB



POST STRIP

DELINEATOR TYPICAL PLACEMENT

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: 2:01:23 PM
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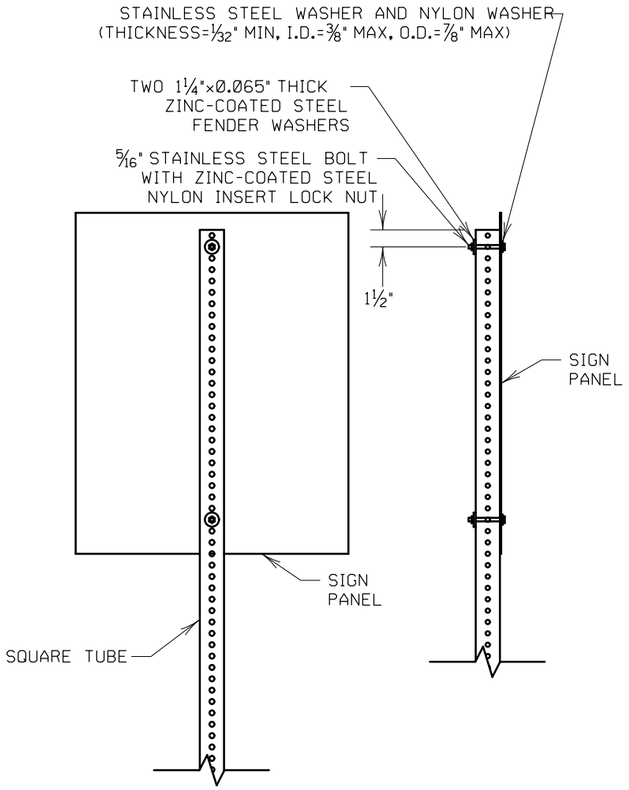
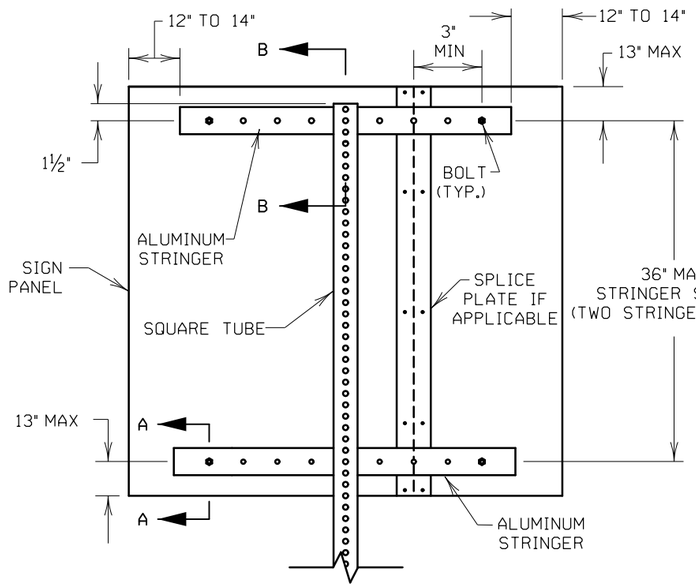
LEAD EXPERT OFFICE	BRIAN SORENSON STATE TRAFFIC ENGINEER OFFICE OF TRAFFIC ENGINEERING		DELINEATOR AND MARKER PLACEMENT	APPROVED: 06-04-2024 REVISED:	THOMAS STYRBICKI STATE DESIGN ENGINEER	STANDARD PLAN 5-297.702	1 OF 1

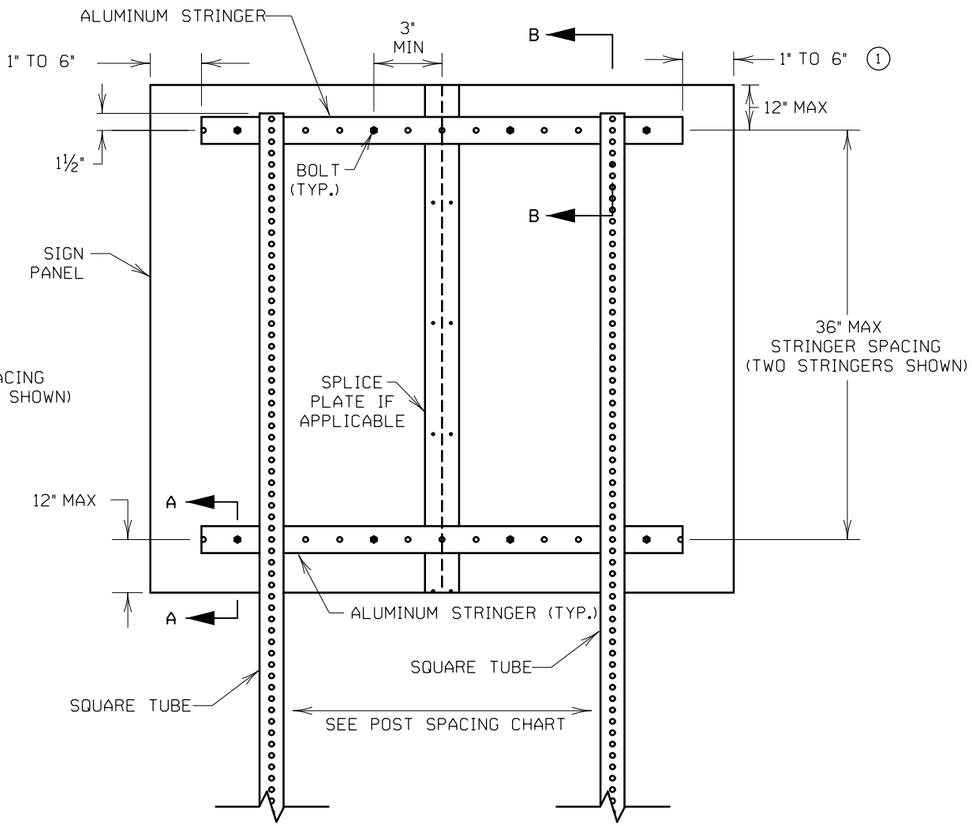
SAP 013-630-021 / SAP 225-591-007 SHEET NO. 74 OF 216



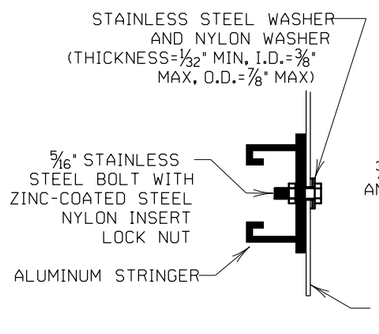
FOR SIGN PANELS UP TO 30" WIDE



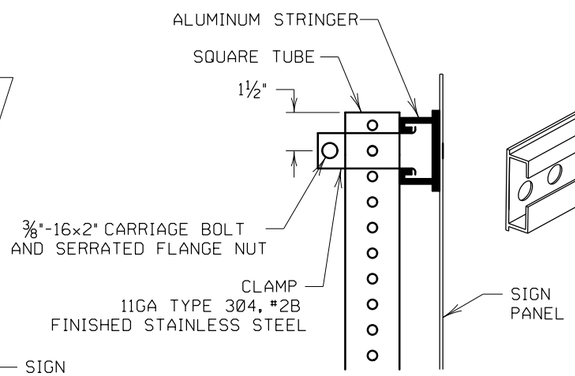
FOR SIGN PANELS 36" WIDE OR GREATER ON ONE POST



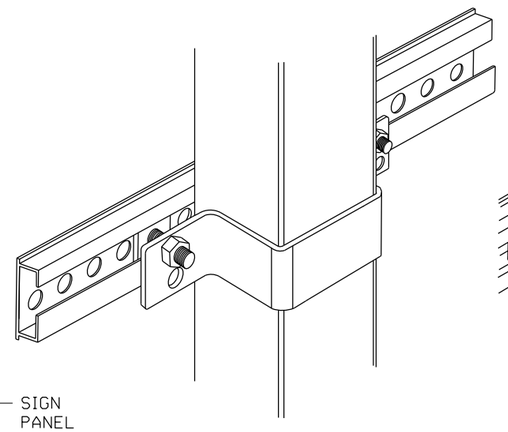
FOR SIGN PANELS ON TWO OR MORE POSTS



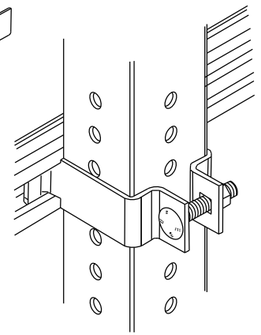
VIEW A-A



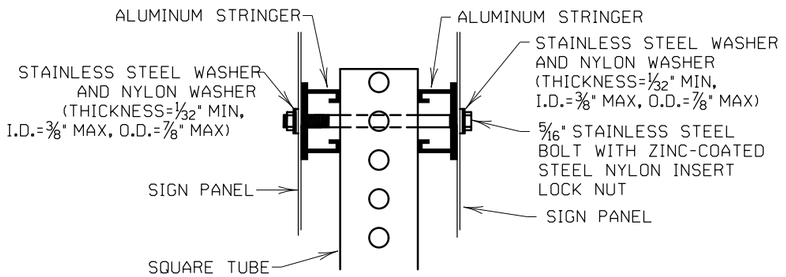
VIEW B-B



CLAMP DETAIL
4" SQUARE TUBE



CLAMP DETAIL
2" AND 2½" 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: 2:01:24 PM
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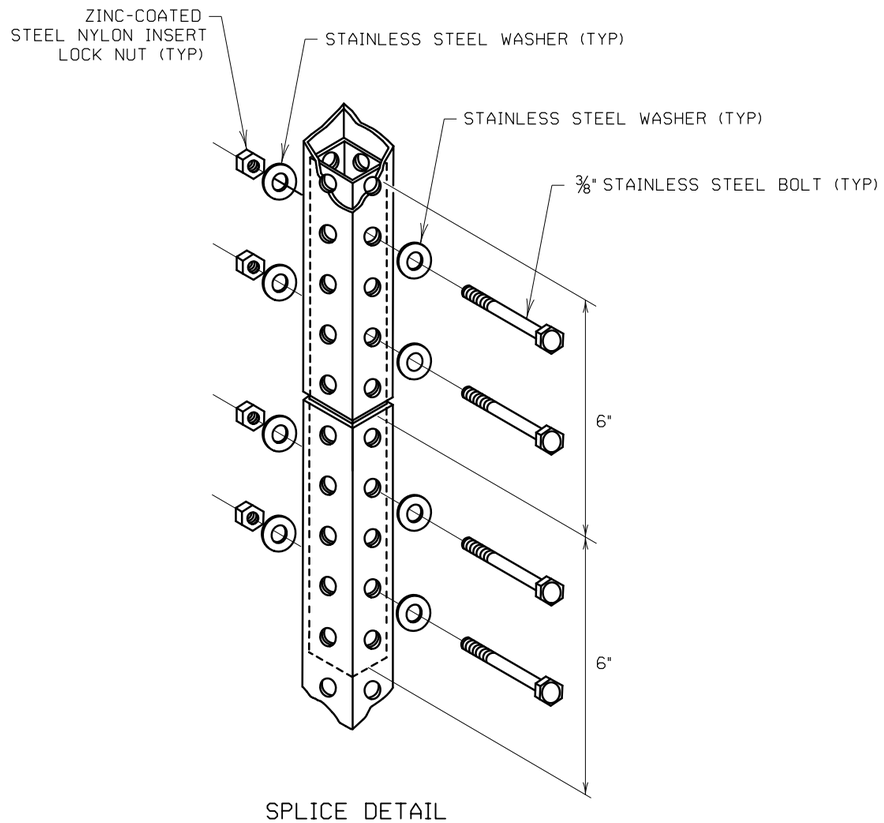
LEAD EXPERT OFFICE	BRIAN SORENSON STATE TRAFFIC ENGINEER OFFICE OF TRAFFIC ENGINEERING		SQUARE-TUBE SIGN MOUNTING DETAILS	APPROVED: 08-09-2023 REVISED:	THOMAS STYRBICKI STATE DESIGN ENGINEER	STANDARD PLAN 5-297.718	1 OF 3

SAP 013-630-021 / SAP 225-591-007 SHEET NO. 75 OF 216



SPLICE DETAIL

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 2$^{3}/_{16}$". IF RISER POST IS 2", INTERIOR POST IS 1¾".

DATE: 9/12/2024 TIME: 2:01:25 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	2 OF 3

NUMBER OF ALUMINUM STRINGERS FOR 2½" OR SMALLER POSTS

PANEL HEIGHT (INCHES)	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336
120	0	0	0	0	4	4	4	4	4				4																																															
114	0	0	0	0	4	4	4	4	4	4			4	4																																														
108	0	0	0	0	4	4	4	4	4	4	4		4	4	4					4	4																																								
102	0	0	0	0	4	4	4	4	4	4	4		4	4	4	4	4			4	4	4	4				4	4	4					4	4																							
96	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		3	3	3	3	3												
90	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3								
84	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3						
78	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
72	0	0	0	0	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
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1 POST | 2 POST | 3 POST | 4 POST | 5 POST | 6 POST

PANEL WIDTH (INCHES)

NUMBER OF STRINGERS FOR 4" POSTS

PANEL HEIGHT (INCHES)	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336
144			5	5	5	5	5	6	6	5	5	5	5	5	5	6	6	6	7	5	5	5	5	6	6	6	6	6	7	5	5	6	6	6	6	6	6	7	7																			
138			5	5	5	5	5	6	6	7	5	5	5	5	5	6	6	6	7	7	5	5	5	5	6	6	6	6	6	7	7	5	6	6	6	6	6	6	7	7	7																	
132			4	4	4	4	5	5	6	7	7	4	4	5	5	5	5	6	6	6	7	7	5	5	5	5	6	6	6	6	6	7	7	5	6	6	6	6	6	6	7	7	7													
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120				4	4	4	4	5	5	6	6	7	7	4	4	5	5	5	5	6	6	6	6	7	7	7	5	5	5	6	6	6	6	6	6	7	7	7	7	6	6	6	6	6	6	6	7	7	7	7	7					
114					4	4	4	5	5	6	6	7	7	8	4	5	5	5	5	5	6	6	6	6	7	7	7	7	5	5	6	6	6	6	6	6	7	7	7	7	7	7	6	6	6	6	6	6	7	7	7	7	7	7	
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96						3	4	4	4	5	5	6	6	6	7	7	8	4	4	5	5	5	5	5	6	6	6	6	6	7	7	7	7	7	8	5	6	6	6	6	6	6	6	7	7	7	7	7	8	8	6	6					
90						3	3	4	4	5	5	5	6	6	6	7	7	8	4	4	5	5	5	5	5	6	6	6	6	6	6	7	7	7	7	7	8	8	5	6	6	6	6	6	6	6	7	7	7	7	7	7	7				
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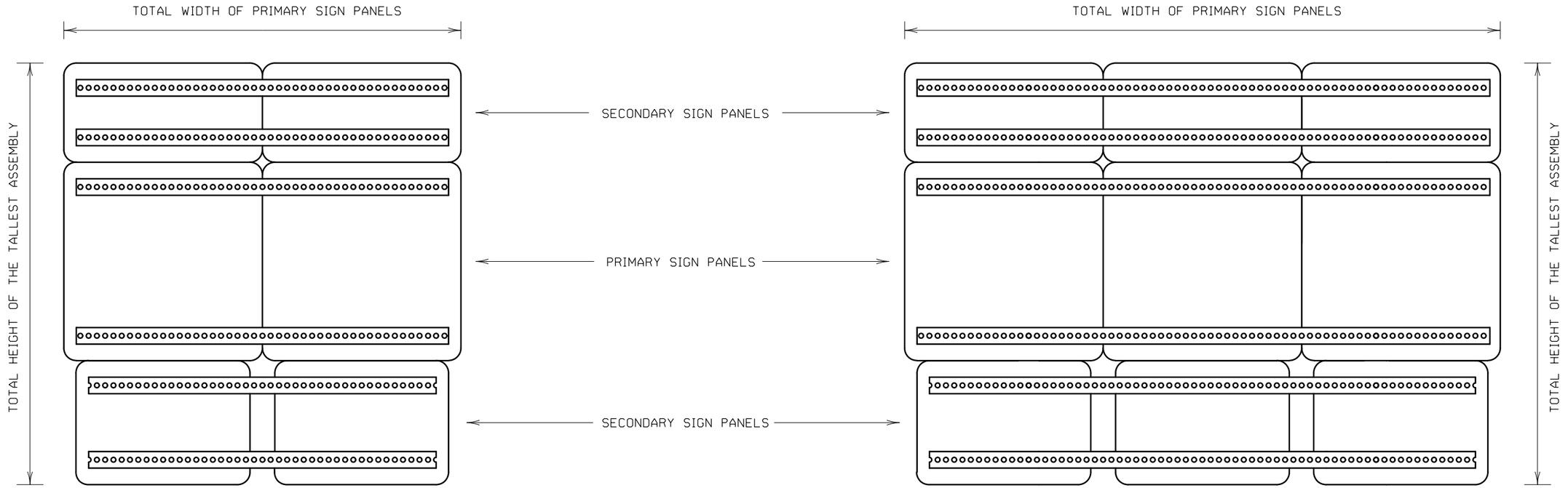
1 POST | 2 POST | 3 POST | 4 POST

PANEL WIDTH (INCHES)

DATE: 9/12/2024 TIME: 2:01:25 PM
FILENAME: Invalid expression

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	3 OF 3

SAP 013-630-021 / SAP 225-591-007 SHEET NO. 77 OF 216



TWO SIDE-BY-SIDE ASSEMBLIES

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.

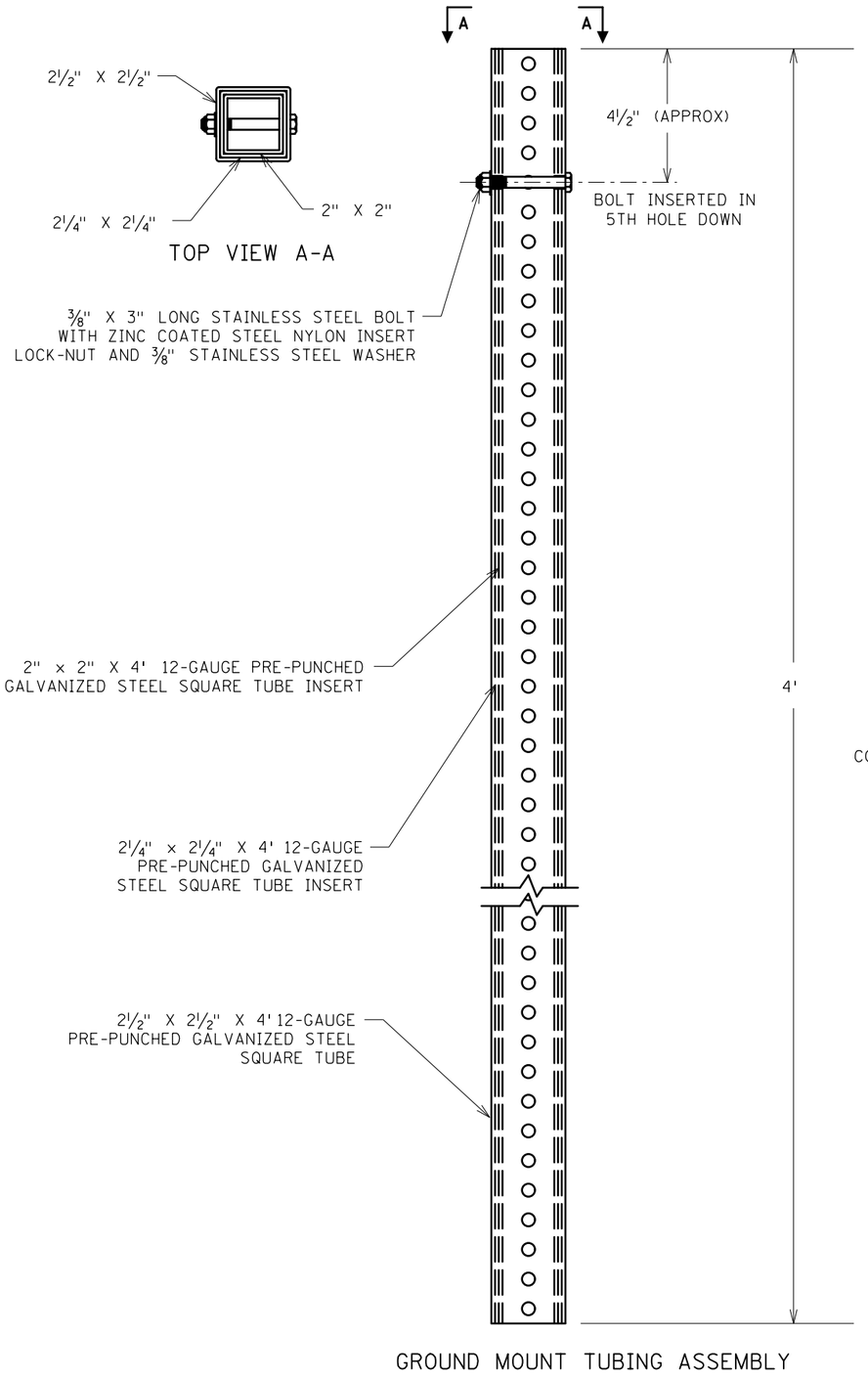
DETERMINE THE NUMBER OF POSTS AND THE POST SPACING BY THE TOTAL WIDTH AND HEIGHT OF THE ASSEMBLIES.

SEE STANDARD PLAN 5-297.718 FOR ADDITIONAL MOUNTING DETAILS.

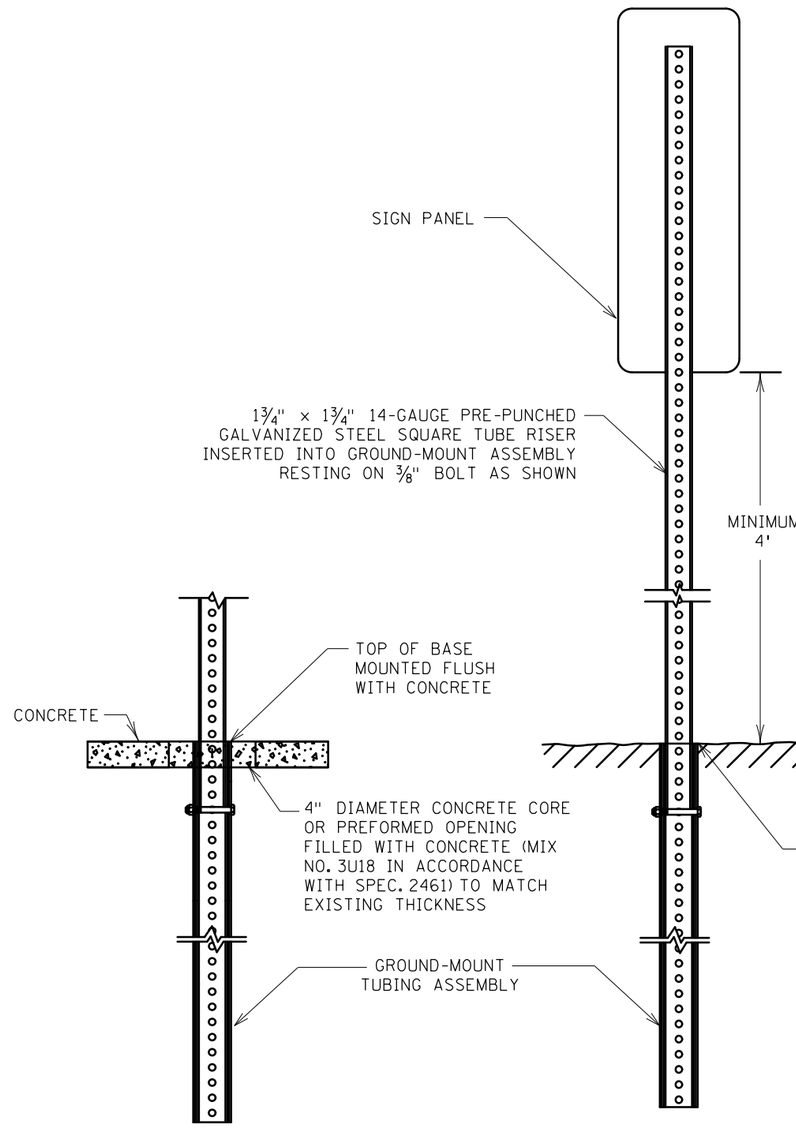
DATE: 9/12/2024 TIME: 2:01:26 PM
FILENAME: Invalid expression

LEAD EXPERT OFFICE	BRIAN SORENSON STATE TRAFFIC ENGINEER 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

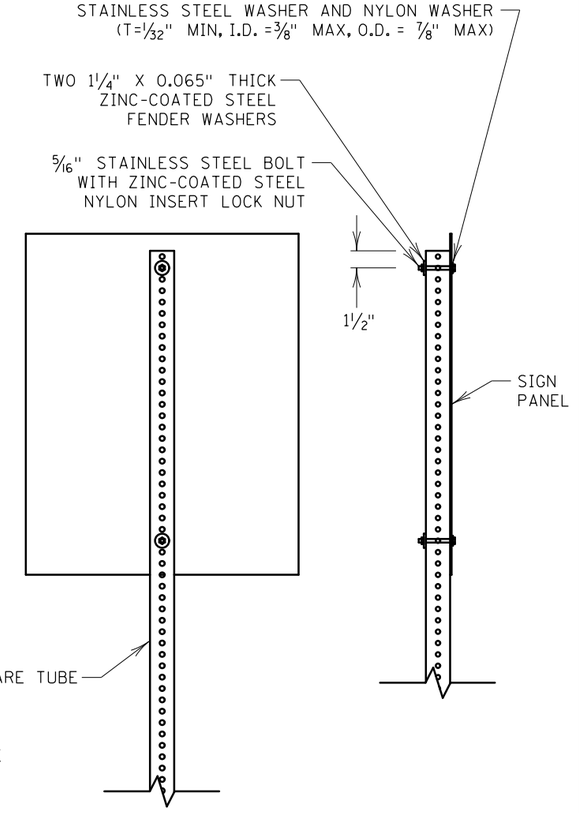


GROUND MOUNT TUBING ASSEMBLY



THREE-WALL BASE CORED THROUGH CONCRETE

THREE-WALL BASE IN SOIL



MOUNTING DETAIL

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.

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

MINNESOTA DEPARTMENT OF TRANSPORTATION

THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.721 | **1 OF 1**

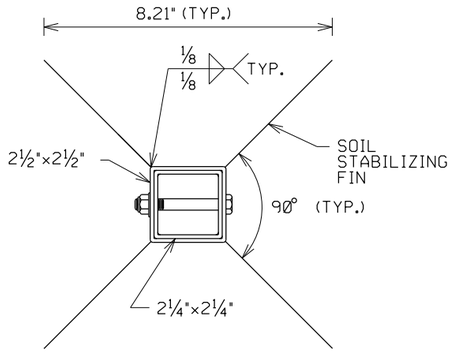
APPROVED: 11-29-2022
REVISED:

THREE-WALL BASE

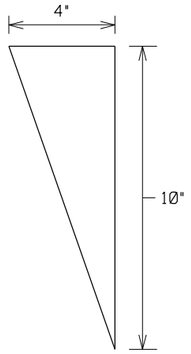
FOR 1¾" SQUARE-TUBE RISER POST

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

SHEET NO. 79 OF 216



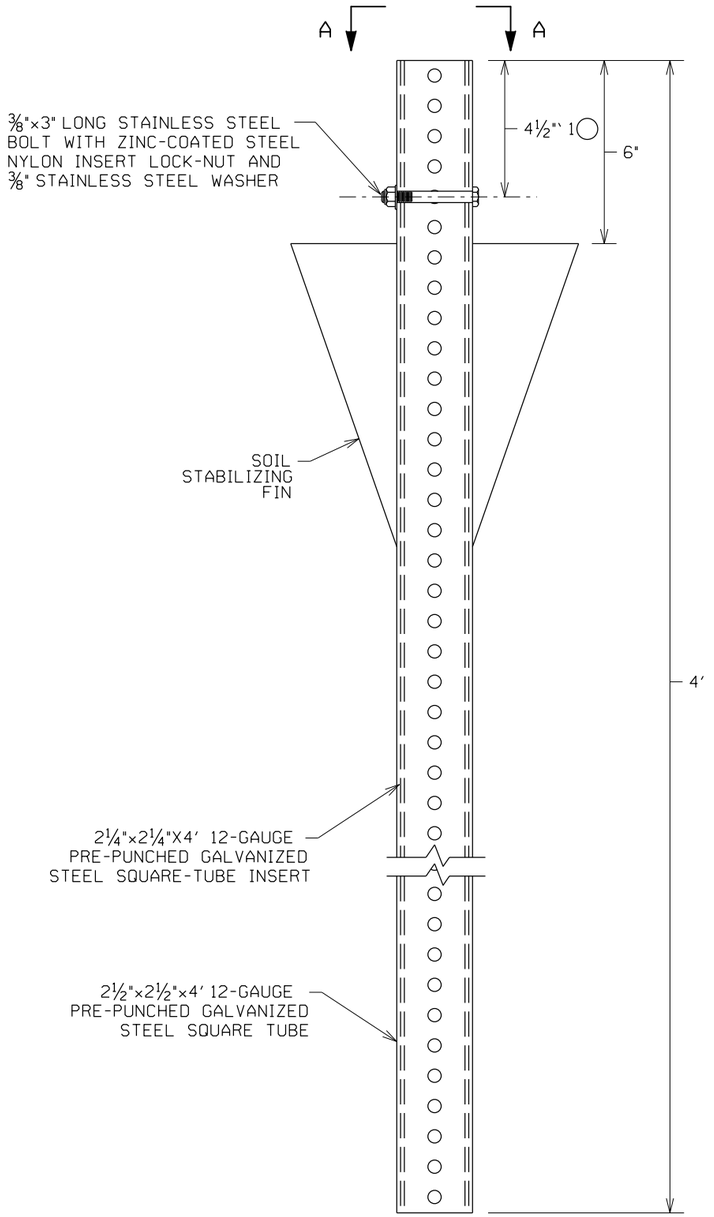
VIEW A-A



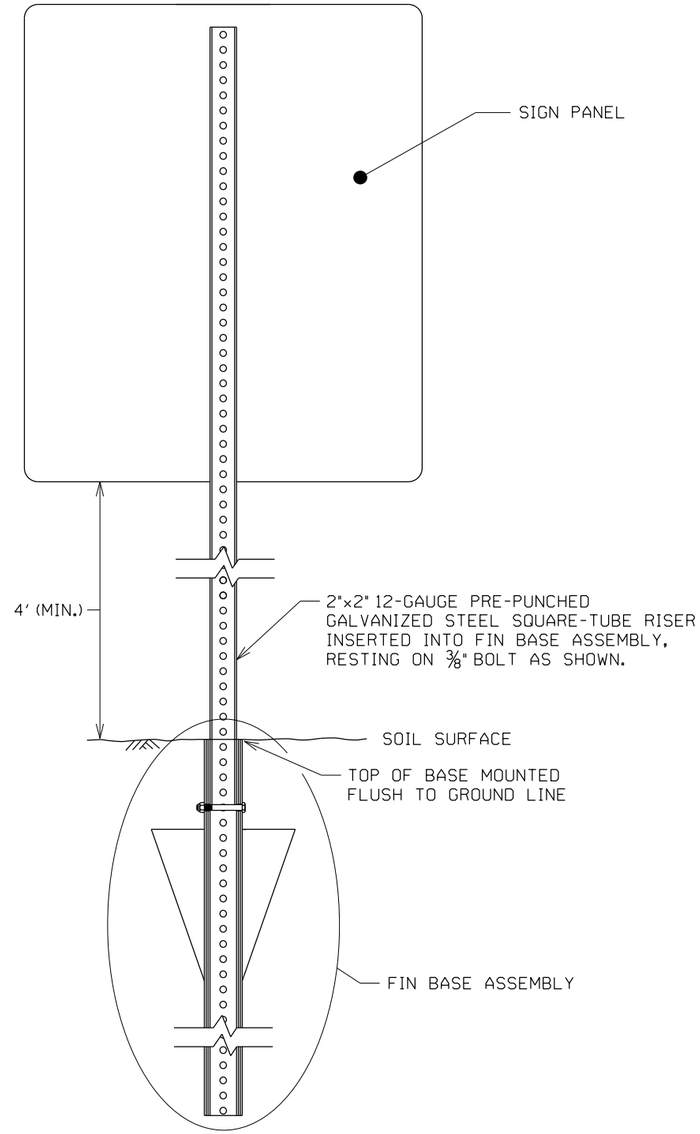
SOIL STABILIZING FIN

FOUR REQUIRED

12-GAUGE PRE-GALVANIZED ASTM A569 STEEL. WELD THE 10" EDGE OF EACH FIN TO EACH CORNER OF THE 2½" SQUARE TUBE. SEE VIEW A-A FOR WELDING DETAILS. WELDS MUST BE ZINC-COATED.



FIN BASE ASSEMBLY



FIN BASE IN SOIL

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.

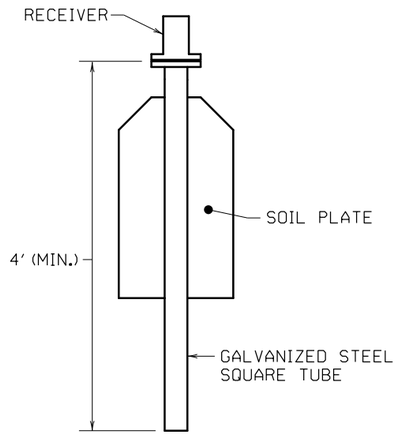
SQUARE-TUBE SIGN POSTS IN ACCORDANCE WITH SPEC. 3402.

(1) INSERT BOLT IN 5TH HOLE DOWN.

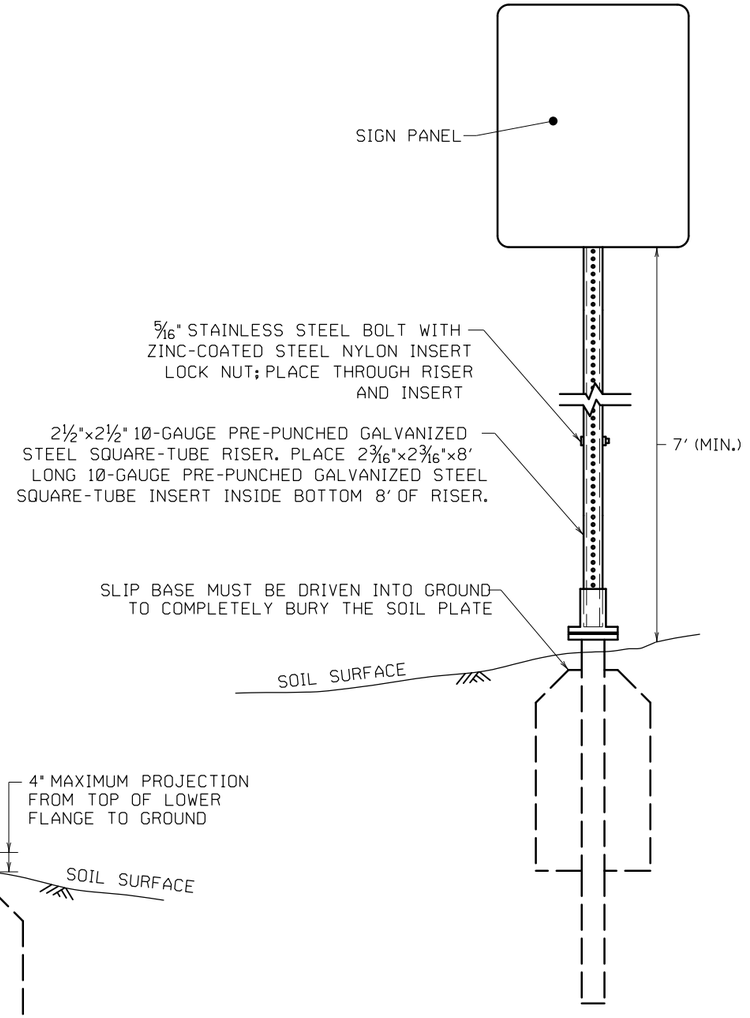
DATE: 9/12/2024 TIME: 2:02:38 PM
FILENAME: Invalid expression

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

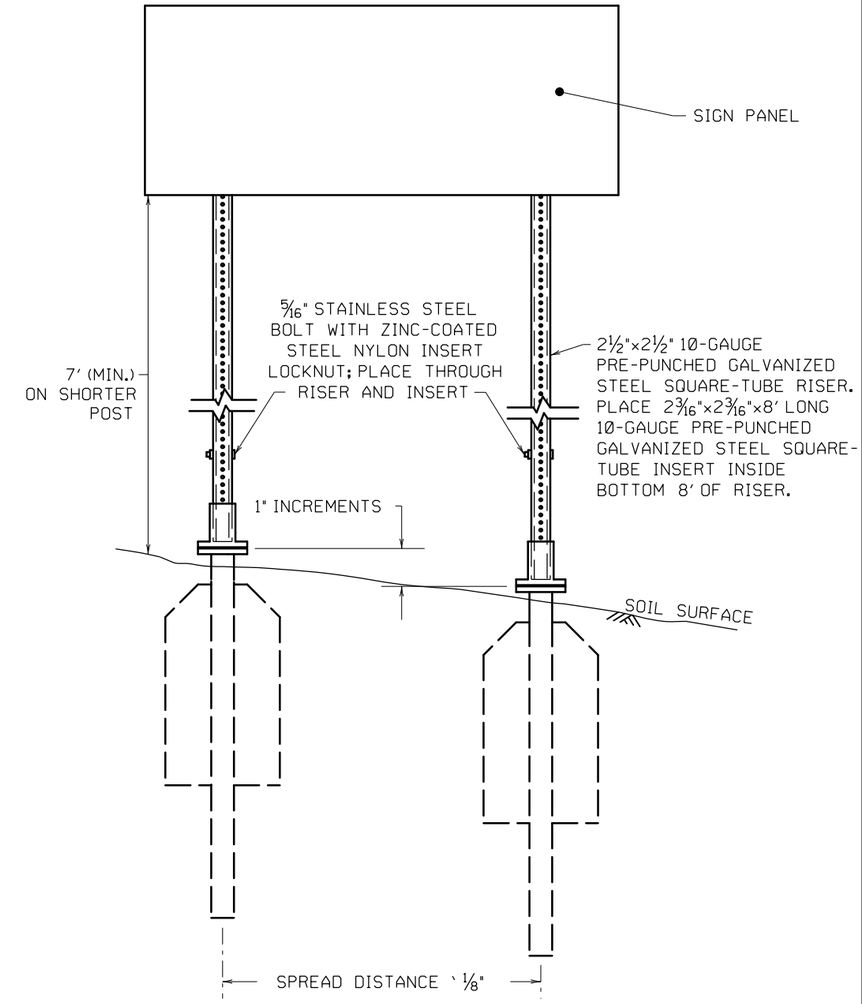
SAP 013-630-021 / SAP 225-591-007 SHEET NO. 80 OF 216



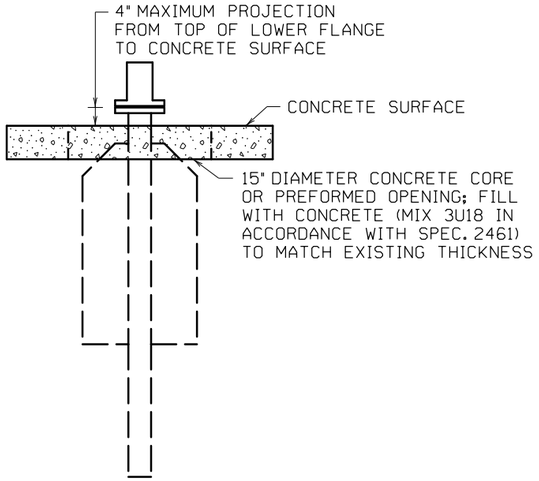
PROPRIETARY SLIP BASE ASSEMBLY①



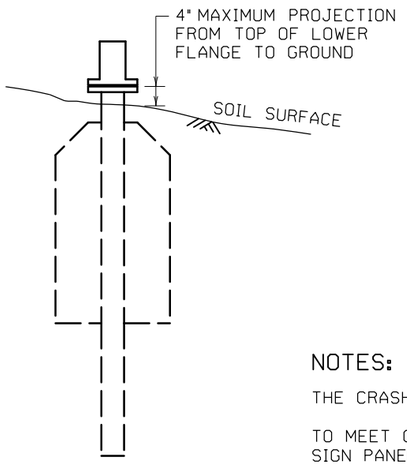
SLIP BASE ASSEMBLY WITH SINGLE-POST SIGN
TYPICAL PLACEMENT IN SOIL



SLIP BASE ASSEMBLY WITH MULTIPLE-POST SIGN②
TYPICAL PLACEMENT IN SOIL



SLIP BASE ASSEMBLY IN CONCRETE



SLIP BASE ASSEMBLY 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.

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 MnDOT SPEC. 3402.

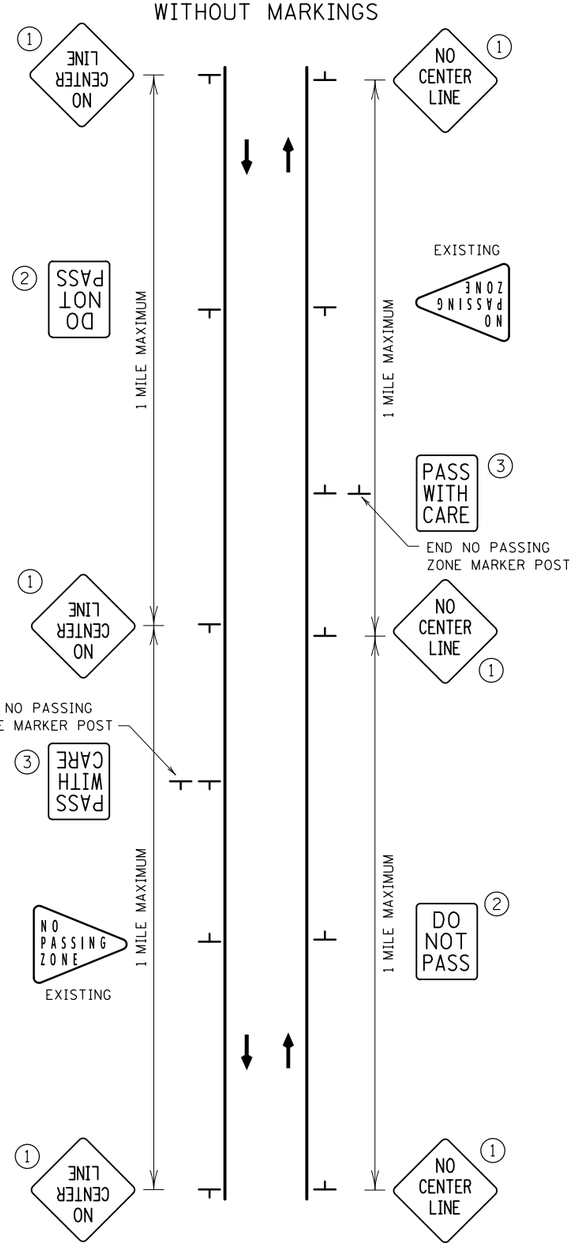
① USE APPROVED PRODUCT FROM THE SIGN STRUCTURES PAGE OF THE SIGNING SECTION OF THE APPROVED PRODUCTS LIST.

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.

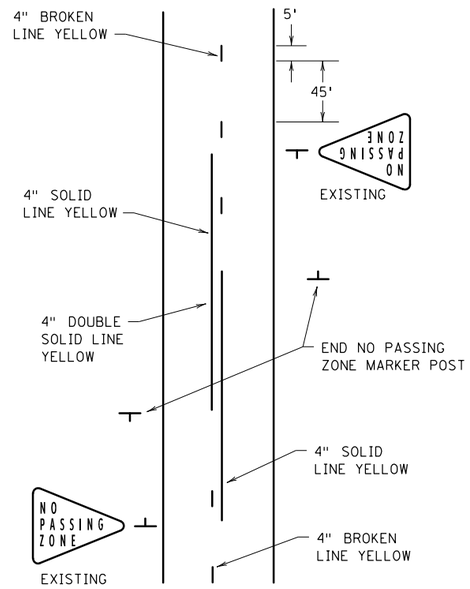
DATE: 9/12/2024 TIME: 2:02:39 PM
FILENAME: Invalid expression

LEAD EXPERT OFFICE	BRIAN SORENSON STATE TRAFFIC ENGINEER OFFICE OF TRAFFIC ENGINEERING		SLIP BASE ASSEMBLY FOR 2½" SQUARE-TUBE RISER POST	APPROVED: 08-09-2023 REVISED:	THOMAS STYRBICKI STATE DESIGN ENGINEER	STANDARD PLAN 5-297.724	1 OF 1

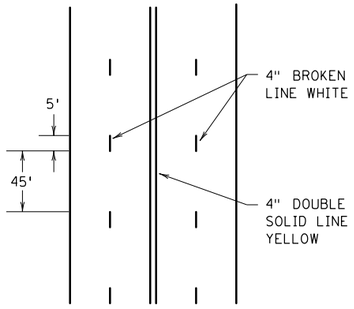
TWO-LANE, TWO-WAY LESS THAN 400 ADT WITHOUT MARKINGS



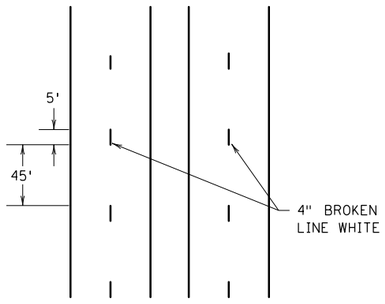
TWO-LANE, TWO-WAY



MULTI-LANE, UNDIVIDED



MULTI-LANE, DIVIDED



GENERAL NOTES:

SEE MnDOT SPEC. 2580 (INTERIM PAVEMENT MARKING).

DO NOT OPEN ANY ROADWAY SEGMENT TO TRAFFIC UNLESS THE FOLLOWING MARKINGS (INTERIM OR PERMANENT) ARE INPLACE: CENTERLINE MARKINGS (INCLUDING NO PASSING ZONES), FLUSH MEDIANS (EXCLUDING CROSSHATCHING), AND LANE LINE (INCLUDING TURN AND AUXILIARY LANE LINES). THIS REQUIREMENT IS WAIVED FOR TANGENT ROAD SEGMENTS LESS THAN 350' IN LENGTH AND CURVED ROAD SEGMENTS WITH DEGREES OF CURVE GREATER THAN 6 DEGREES FOR LESS THAN 50' IN LENGTH.

PLACE INTERIM BROKEN LINE PAVEMENT MARKINGS AT THE SAME CYCLE LENGTH AS FINAL PAVEMENT MARKINGS WITH A MINIMUM LENGTH OF 5 FEET; IF FINAL PAVEMENT MARKING PLAN IS NOT PROVIDED, THE CYCLE LENGTH SHALL BE 50'. PLACE INTERIM DOTTED LINE PAVEMENT MARKINGS AT THE SAME CYCLE LENGTH AND LINE LENGTH AS SHOWN IN THE PLAN; IF FINAL PAVEMENT MARKING PLAN IS NOT PROVIDED, THE CYCLE LENGTH SHALL BE 15' WITH A LINE LENGTH OF 3'.

FOR NO PASSING ZONE LOCATIONS, REFER TO THE SIGNING OR PAVEMENT MARKING PLAN; IF NEITHER IS PROVIDED, FOLLOW INPLACE NO PASSING ZONES.

WHEN PERMANENT PAVEMENT MARKINGS ARE TO BE MULTI-COMPONENT LIQUID AND PAINT IS USED FOR THE INTERIM MARKINGS, PLACE A 10 MIL THICK LAYER OF PAINT. REMOVAL OF THE 10 MIL LAYER OF PAINT IS NOT REQUIRED PRIOR TO PLACING THE MULTI-COMPONENT LIQUID. IF THE LAYER OF PAINT IS GREATER THAN 10 MIL, REMOVE THE PAINT PRIOR TO PLACING THE MULTI-COMPONENT LIQUID.

PLACE INTERIM MARKINGS ON THE FINAL PERMANENT PAVEMENT SURFACE SUCH THAT THEY WILL BE FULLY COVERED BY THE PERMANENT PAVEMENT MARKINGS.

INTERIM PAVEMENT MARKINGS SHOULD NOT BE LEFT INPLACE FOR MORE THAN 14 CALENDAR DAYS UNLESS THEY MEET THE REQUIREMENTS OF PERMANENT OR TEMPORARY MARKINGS.

USING SIGNING IN LIEU OF INTERIM PAVEMENT MARKINGS ON TWO-LANE, TWO-WAY ROADWAYS

ON ROADS WITH AN AVERAGE DAILY TRAFFIC (ADT) OF LESS THAN 400 VEHICLES, THE SIGNS AS SHOWN MAY BE USED IN LIEU OF PAVEMENT MARKINGS FOR UP TO 14 CALENDAR DAYS OR AS DIRECTED BY THE ENGINEER.

(1) PLACE A "NO CENTER LINE" SIGN (W8-12, BLACK ON ORANGE) FOR EACH DIRECTION OF TRAVEL. PLACE ADDITIONAL SIGNS AT MAJOR INTERSECTIONS OR ONE MILE INCREMENTS, WHICHEVER IS LESS.

(2) IF NOT ALREADY INPLACE, PLACE A "DO NOT PASS" SIGN (R4-1) OPPOSITE OF EACH INPLACE "NO PASSING ZONE" SIGN (W14-3).

(3) PLACE A "PASS WITH CARE" SIGN (R4-2) AT THE END OF EACH NO PASSING ZONE, ADJACENT TO THE END OF NO PASSING ZONE MARKER POST.

USING TEMPORARY RAISED PAVEMENT MARKERS (TRPMS) AS INTERIM PAVEMENT MARKING

WHEN USING TRPMS AS INTERIM PAVEMENT MARKINGS, FOLLOW THE REQUIREMENTS BELOW UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

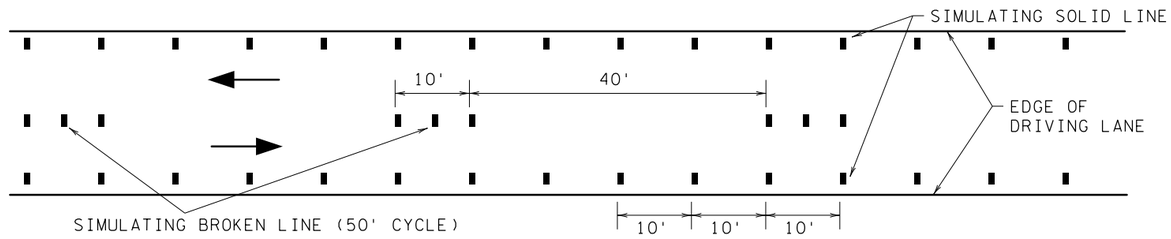
USE DOUBLE-SIDED TRPMS ON TWO-LANE, TWO-WAY ROADS.

BROKEN LINE: USE 3 TRPMS PER 10' BROKEN LINE, 5' SPACING WITH A 40' GAP.

SOLID LINE: USE CONTINUOUS TRPMS; 10' SPACING FOR TANGENTS AND CURVES UNDER 6 DEGREES; 5' SPACING FOR CURVES ≥6 DEGREES, GRADES >5 PERCENT, OR CONCRETE PAVEMENTS.

DOUBLE SOLID LINE: USE TWO CONTINUOUS TRPMS 4" APART, 10' SPACING ON TANGENTS AND CURVES UNDER 6 DEGREES; 5' SPACING FOR CURVES ≥6 DEGREES, GRADES >5 PERCENT, OR CONCRETE PAVEMENTS.

SIMULATING A SOLID LINE AND A BROKEN LINE (50' CYCLE) WITH TRPMS



REVISION:

APPROVED: OCTOBER 10, 2019

BRIAN SORENSON
STATE TRAFFIC ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.801 | **1 OF 1**

APPROVED: 10-10-2019
REVISED:

PETER A. HARFF
STATE DESIGN ENGINEER

INTERIM PAVEMENT MARKINGS AND SIGNING

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

SHEET NO. 82 OF 216

DATE: 9/12/2024 TIME: 2:03:20 PM
FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_spn7-800

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
83	TEMPORARY TRAFFIC CONTROL TITLE SHEET
84 - 85	TEMPORARY SIGN TABULATION
86	TEMPORARY SQUARE TUBE GROUND MOUNTED SIGN PLACEMENT
87	TEMPORARY SIGN COVERING AND MODIFICATION DETAIL
88	SPECIAL SIGN DETAILS
89	DETOUR
90 - 91	TRAFFIC CONTROL

DATE: 9/12/2024 2:03:33 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-425tcp-DETAILS-001

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.

MIKE SHOMION, PE

DATE: 9/12/2024 LICENSE NO. 50488

wsb

Chisago COUNTY USA

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

"M" SERIES

SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (W×H)	ASSEMBLY (IN. X IN.) (W×H)	NUMBER OF POST
DETOUR NORTH SOUTH COUNTY 30	M4-8	BLACK ON ORANGE	24 x 12 36 x 18	24 x 63 36 x 93 (C)	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 M6-3 M5-1 M6-2 M5-2	WHITE ON BLUE	21 x 15 30 x 21 (C)		
END DETOUR NORTH SOUTH COUNTY 30	M4-8a	BLACK ON ORANGE	24 x 18 36 x 24	24 x 69 36 x 99 (C)	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		

"W" SERIES

SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (W×H)	ASSEMBLY (IN. X IN.) (W×H)	NUMBER OF POST
NORTH SOUTH COUNTY 30 ROAD CLOSED AHEAD	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		
NORTH SOUTH COUNTY 30 DETOUR AHEAD	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		
ROAD CLOSED AHEAD XXX FEET	W20-1	BLACK ON ORANGE	48 x 48	48 x 72	1
	W16-2P	BLACK ON ORANGE	36 x 24		
DETOUR AHEAD	W20-2	BLACK ON ORANGE	48 x 48	48 x 48	1
TRAIL CLOSED AHEAD	W20-3M	BLACK ON ORANGE	18 x 18	18 x 18	1

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.

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.

MIKE SHOMION, PE

DATE: 9/12/2024 LICENSE NO. 50488

wsb

Chisago COUNTY USA

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

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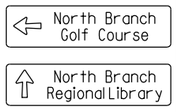
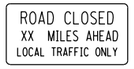
"G" SERIES

SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (W×H)	ASSEMBLY (IN. X IN.) (W×H)	NUMBER OF POST	POST SPACING INCHES
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:

Ⓐ MAY USE 2" SQUARE TUBE POST WITH FIN BASE.

Ⓑ 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.

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SHEET 85 OF 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).

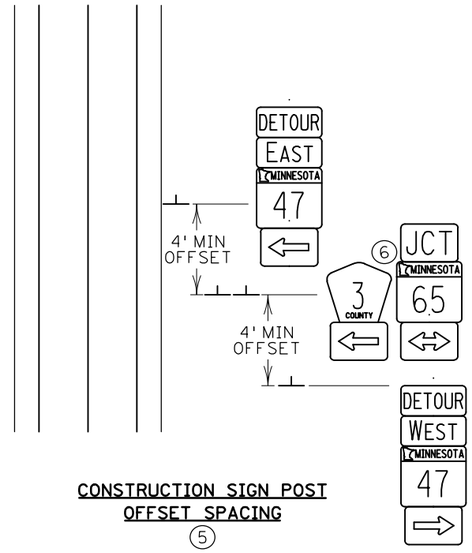
③ IF GROUND MOUNTED TEMPORARY SIGN OR SIGN ASSEMBLY IS PLACED ON 2-1/2" SQUARE TUBE RISER POST(S), THE MINIMUM CLEARANCE FROM THE GROUND LINE TO THE BOTTOM OF THE LOWEST SIGN ON THE ASSEMBLY SHALL BE 7', OR AS SHOWN IN DETAIL, WHICHEVER IS GREATER.

④ 5' MINIMUM IN RURAL. 7' MINIMUM IN BUSINESS, COMMERCIAL, OR RESIDENTIAL AREAS.

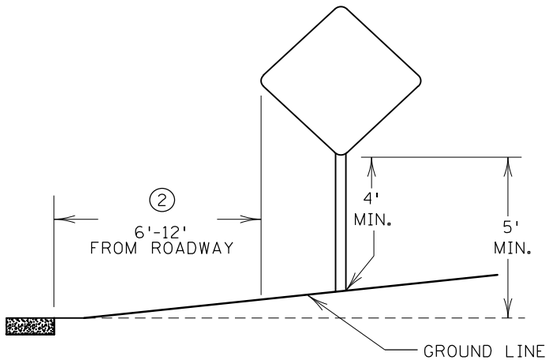
⑤ WHEN MULTIPLE GROUND MOUNTED SIGN STRUCTURES ARE PLACED ADJACENT TO EACH OTHER THERE SHOULD BE NO MORE THAN 2 POSTS WITHIN 84" OF EACH OTHER. WHEN THIS SPACING CAN NOT BE MAINTAINED, THEN SIGN STRUCTURES SHALL BE OFFSET, AND STAGGERED WITH A MINIMUM OF 4' BETWEEN SIGN STRUCTURES BOTH LATERALLY AND LONGITUDINALLY. EXAMPLE SHOWS DETOUR SIGNAGE, BUT THIS REQUIREMENT APPLIES TO ALL SIGNAGE.

⑥ INPLACE AND/OR OTHER CONSTRUCTION SIGNING.

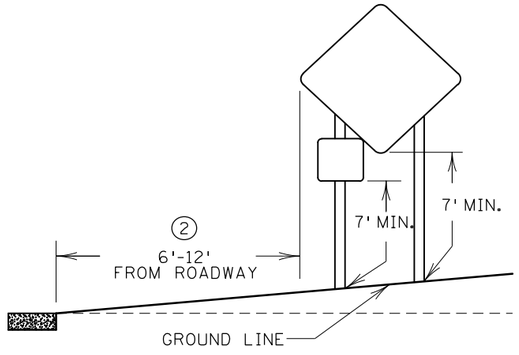
NOT TO SCALE



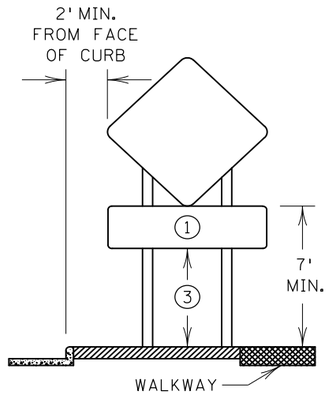
CONSTRUCTION SIGN POST OFFSET SPACING ⑤



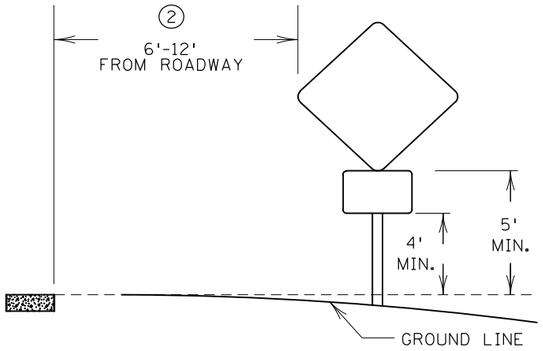
TYPICAL RURAL DESIGN AND 2" RISER POST



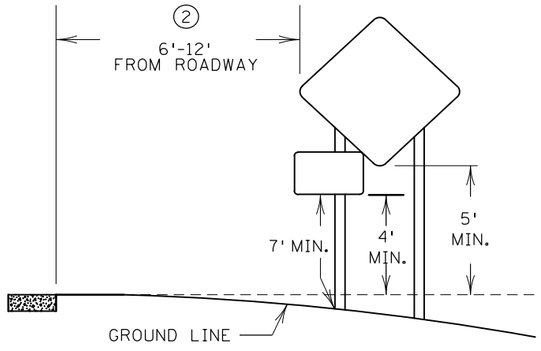
TYPICAL RURAL DESIGN WITH SUPPLEMENTAL PLAQUE AND 2-1/2" RISER POST



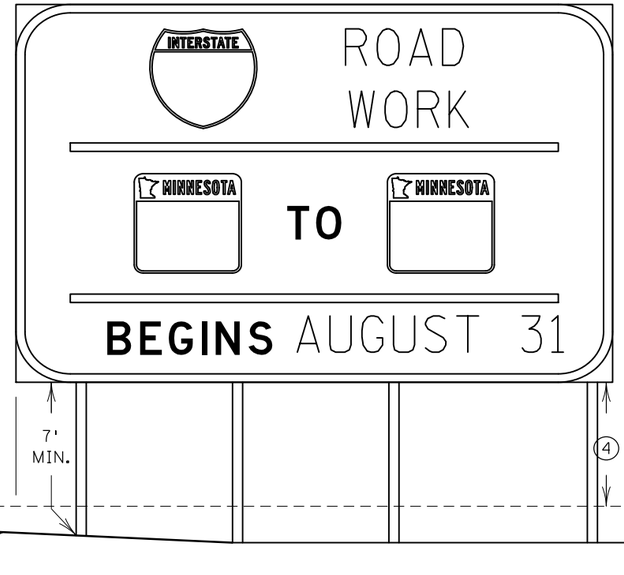
BUSINESS,COMMERCIAL, OR RESIDENTIAL AREA



TYPICAL RURAL DESIGN WITH SUPPLEMENTAL PLAQUE AND 2" RISER POST



TYPICAL RURAL DESIGN 2-1/2" RISER POST



TYPICAL G20-X2 DESIGN

PUBLISHED BY OTE 03/15/2021

TEMPORARY SQUARE TUBE GROUND MOUNTED SIGN PLACEMENT

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS
Plan By: GAD
Checked By: MKV
Approved By: MJS

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MIKE SHOMION, PE
DATE: 9/12/2024 LICENSE NO. 50488

wsb

Chisago COUNTY USA
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
TEMPORARY SQUARE TUBE GROUND MOUNTED SIGN PLACEMENT
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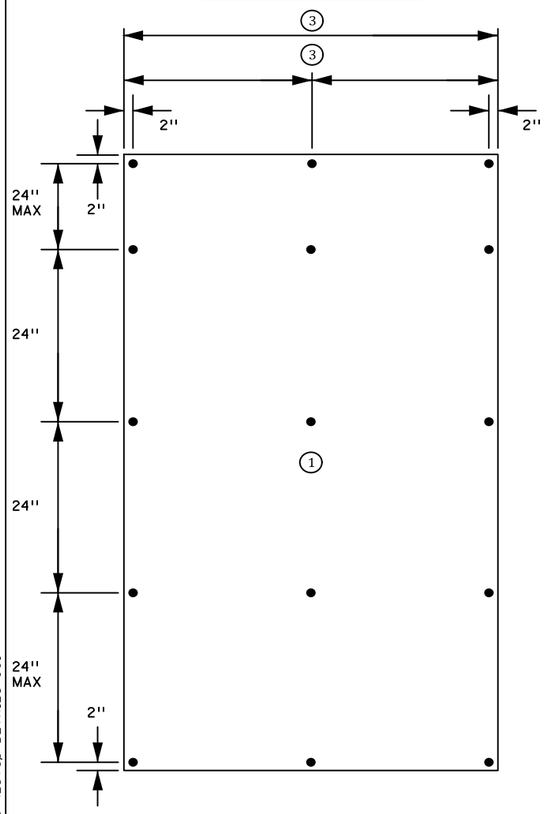
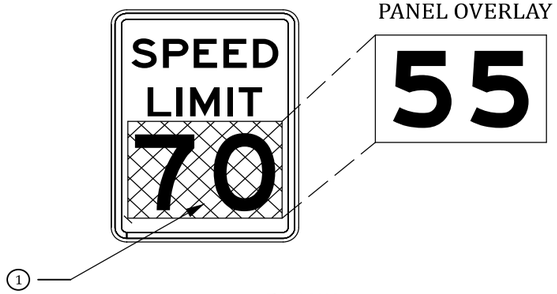
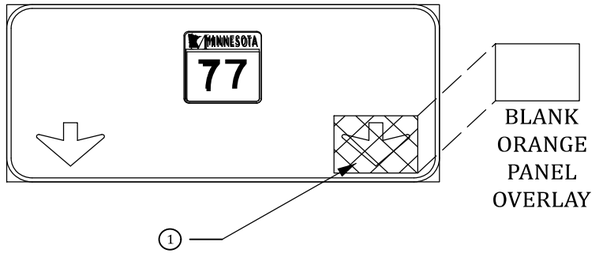
FASTENER SPACING DETAIL
HORIZONTAL PLACEMENT



R2-1

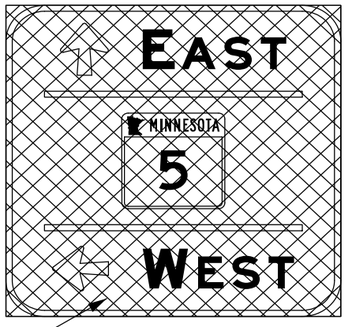
BLACK ON WHITE PANEL OVERLAY



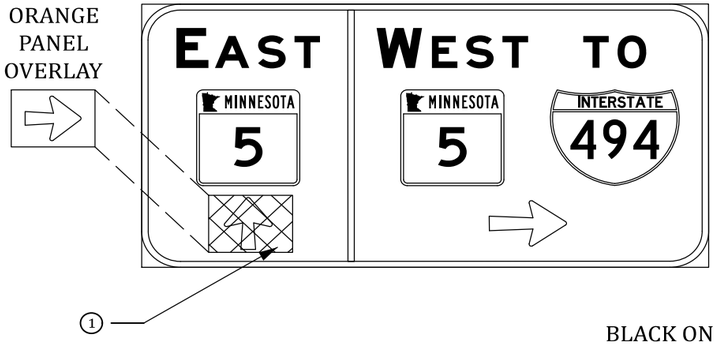


BLANK ORANGE PANEL OVERLAY

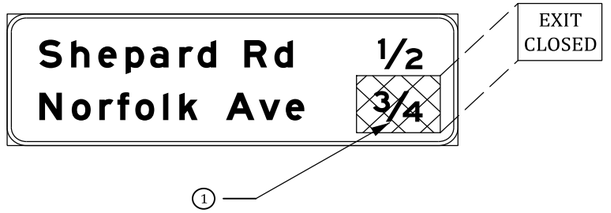
BLANK NON-REFLECTIVE GREEN COVER

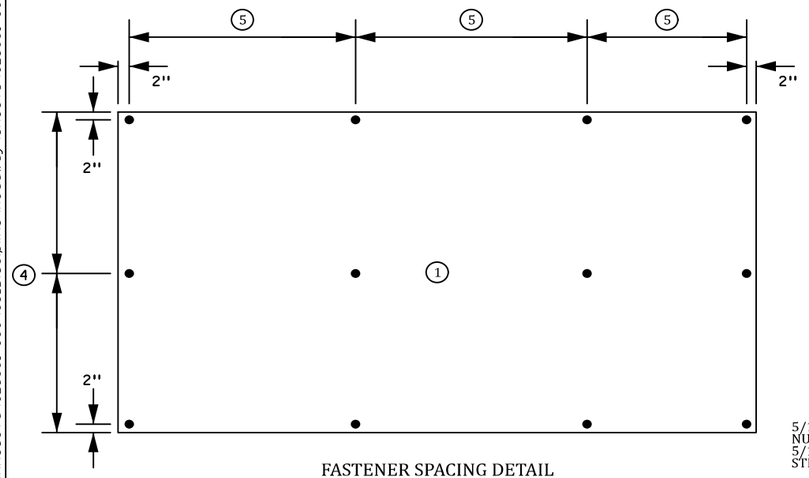


BLACK ON ORANGE PANEL OVERLAY



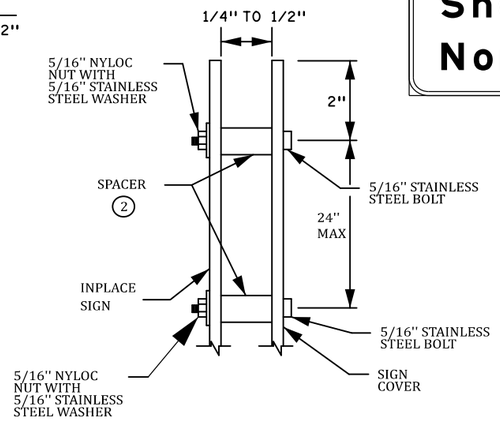
BLACK ON ORANGE PANEL OVERLAY





FASTENER SPACING DETAIL
VERTICAL PLACEMENT

SPACER DETAIL



GENERAL NOTES:

1. 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.

2. 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.

3. MINIMIZE DAMAGE TO THE INPLACE SIGN PANEL. DO NOT APPLY TAPE TO THE INPLACE SIGN SHEETING.

4. SPACERS (SUCH AS PLASTIC OR RUBBER) SHALL BE A MATERIAL THAT WILL NOT HARM THE INPLACE SIGN SHEETING FACE.

5. ATTACH SIGN COVER PANEL OR PANEL OVERLAY USING HARDWARE SHOWN IN THE SPACER DETAIL.

6. 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.

7. REMOVE ALL COVERING MATERIAL, MOUNTING HARDWARE, AND FASTENERS WHEN SIGN COVER PANEL OR PANEL OVERLAY IS REMOVED.

8. NO HANDLE OR OTHER LIFTING DEVICE SHALL BE LEFT ATTACHED TO ANY SIGN COVER PANEL AFTER PLACEMENT.

SPECIFIC NOTES:

(1) THE SIGN COVER OR PANEL OVERLY SHALL FULLY COVER THE MESSAGE BEING COVERED OR MODIFIED.

(2) 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.

(3) 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)).

(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)).

(5) HORIZONTAL SPACING FOR FASTENERS SHALL NOT BE LESS THAN 15 IN OR MORE THAN 24 IN.

ASSEMBLY NOTES:

1. DRILL 11/32 IN HOLES ON THE SIGN COVER OR PANEL OVERLAY IN ACCORDANCE WITHHELD FASTENER SPACING DETAILS.

2. ATTACH PLASTIC SPACERS TO SIGN COVER OR PANEL OVERLAY WITH DOUBLE FACED TAPE. CENTERED BEHIND EACH DRILLED HOLE.

3. POSITION THE COVER OR OVERLAY MATERIAL OVER THE SIGN OR MESSAGE TO BE MODIFIED.

4. DRILL ALL THE OUTSIDE HOLES THROUGH THE INPLACE SIGN PANEL AND ATTACH THE COVER OR OVERLAY MATERIAL WITH APPROPRIATE FASTENERS.

5. 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

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SHEET 87 OF 216 SHEETS

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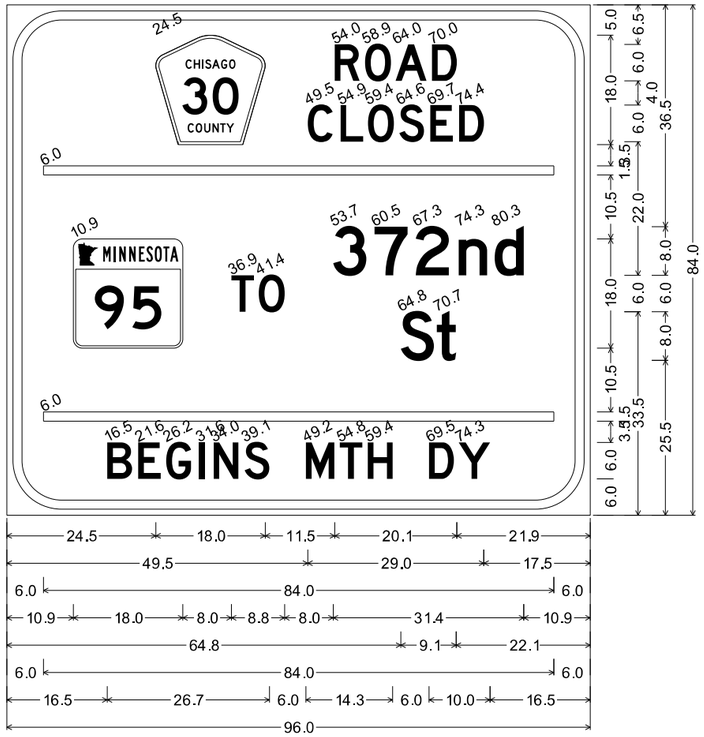
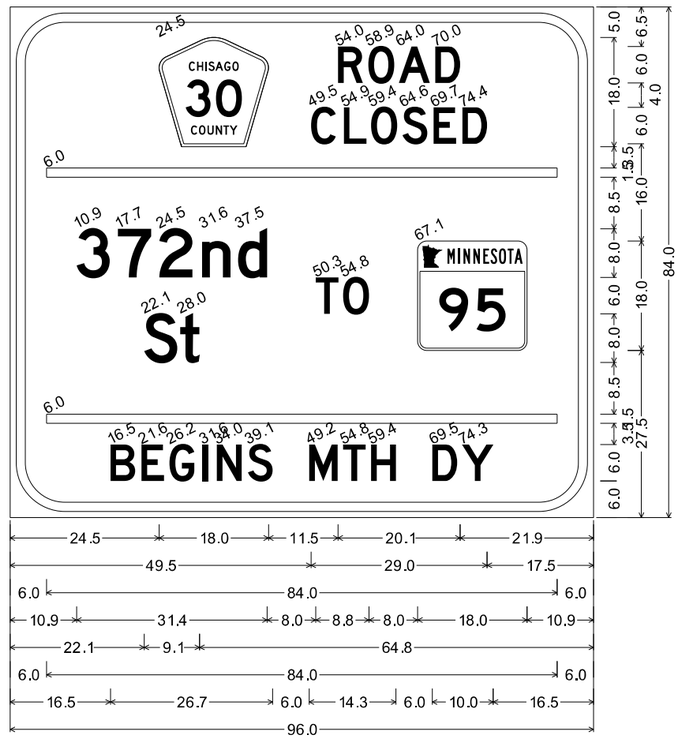
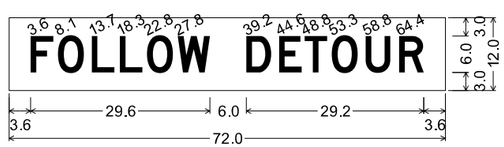


9.0" Radius, 1.5" Border, 1.0" Indent, Black on Orange;
"ROAD", D 2K; "CLOSED", D 2K; State Highway 95 M1-5M; "TO", D 2K;
"372nd", D 2K; "St", D 2K; "BEGINS MTH DY", D 2K;



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

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Plan By: GAD
Checked By: MKV
Approved By: MJS

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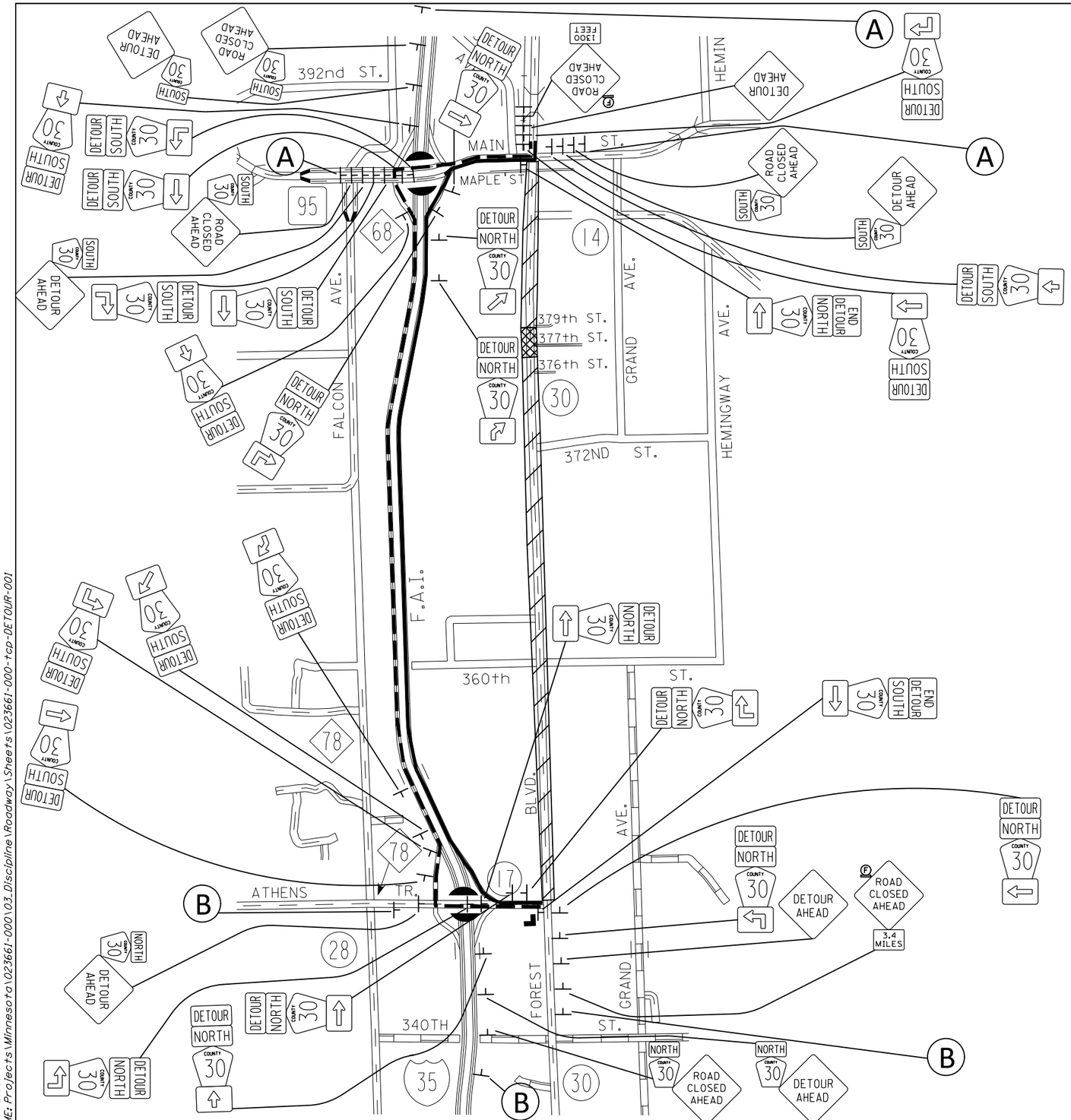


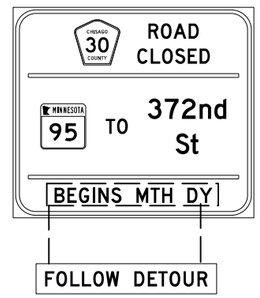
NOTES:

1. MAINTAIN ACCESS TO RESIDENTIAL AREAS AT ALL TIMES

CSAH 30 NORTH DETOUR ROUTE ——————

CSAH 30 SOUTH DETOUR ROUTE — — — — — —

A



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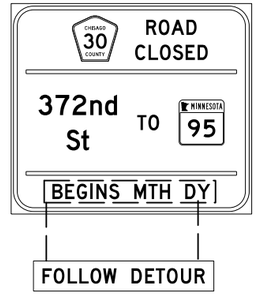

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NO.	DATE	BY	CHK	REVISIONS

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.

MIKE SHOMION, PE

DATE: 9/12/2024 LICENSE NO. 50488

wsb

Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

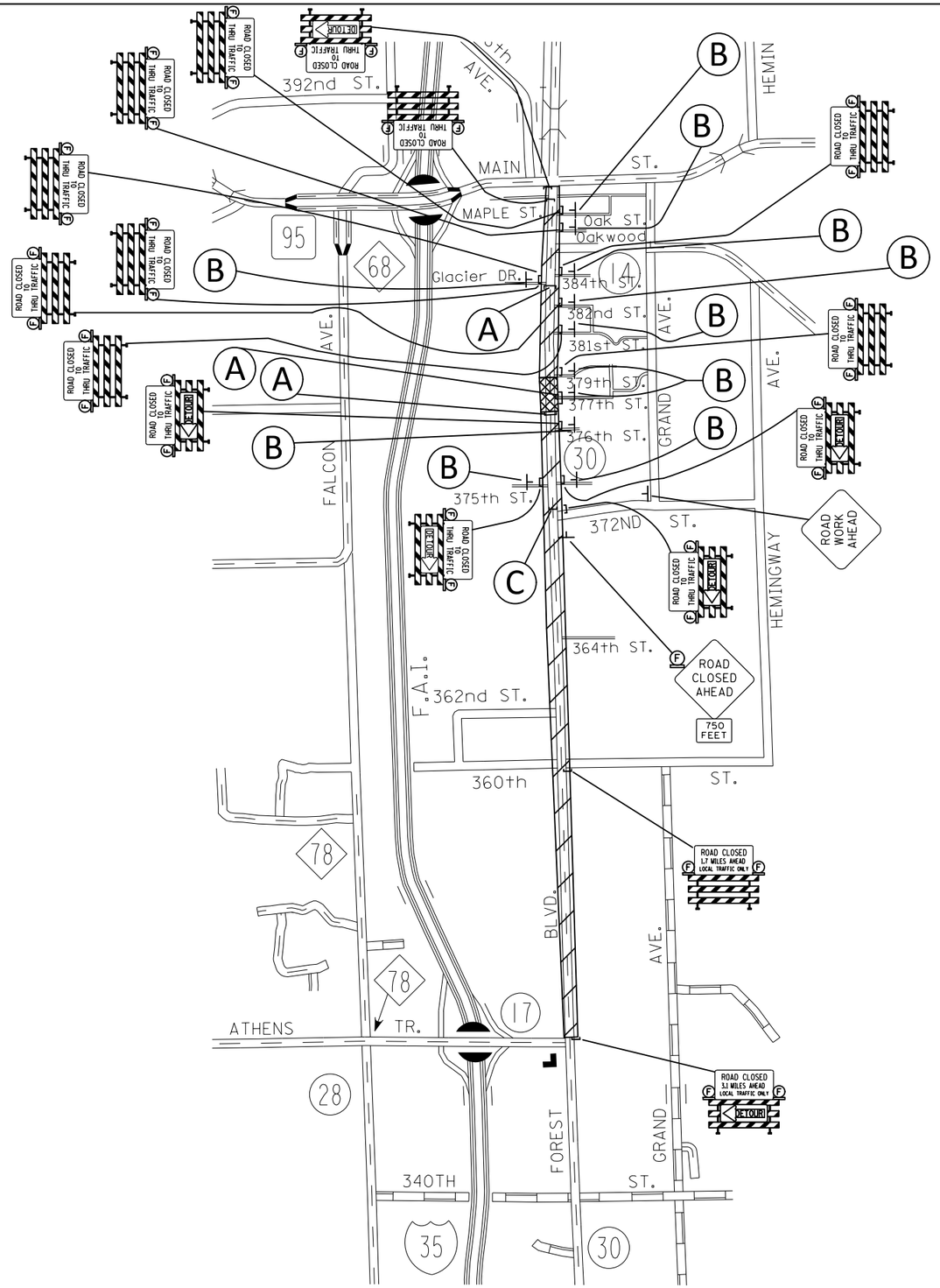
CHISAGO COUNTY, MINNESOTA

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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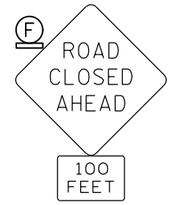

C

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

wsb

Chisago COUNTY USA

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

SHEET 90 OF 216 SHEETS

DATE: 9/12/2024 2:03:46 PM
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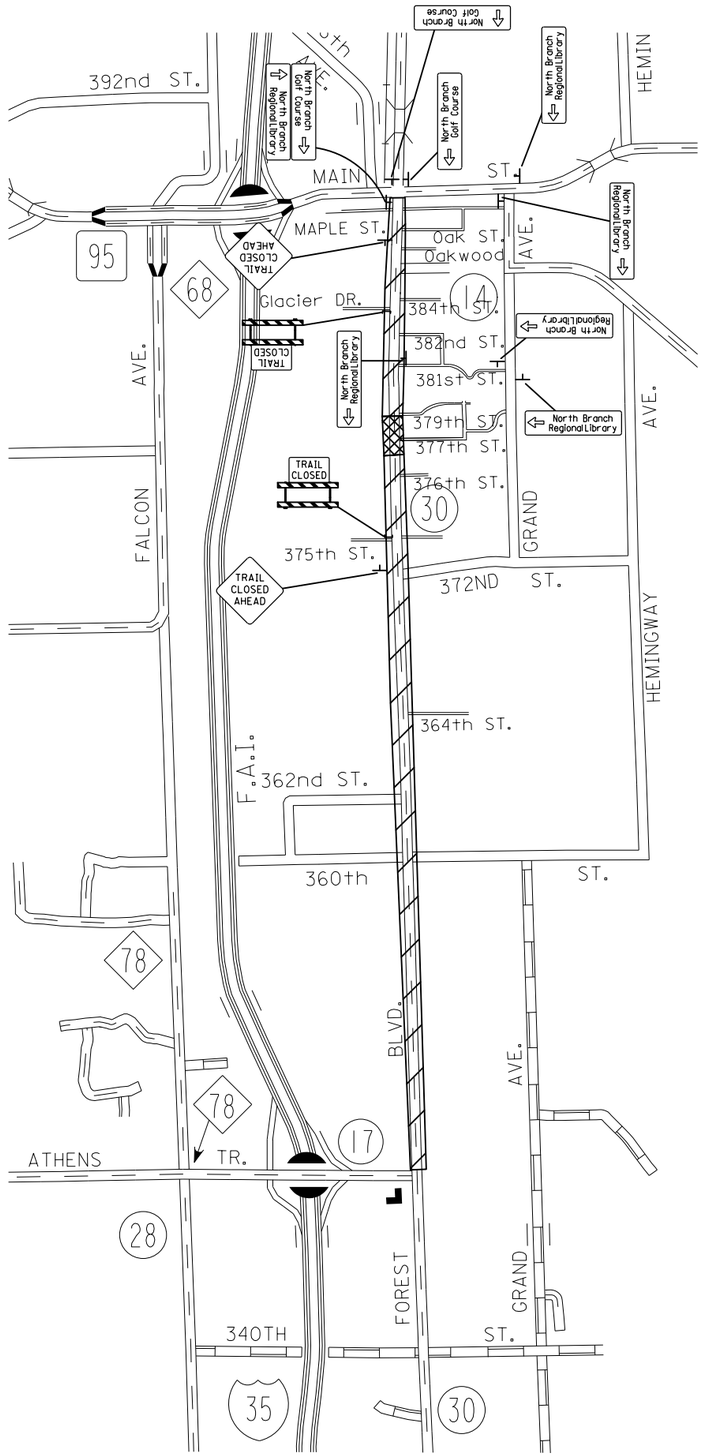

DATE: 9/12/2024 2:03:47 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-tcp-DETOUR-001

NO.	DATE	BY	CHK	REVISIONS

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MIKE SHOMION, PE

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wsb

Chisago COUNTY USA

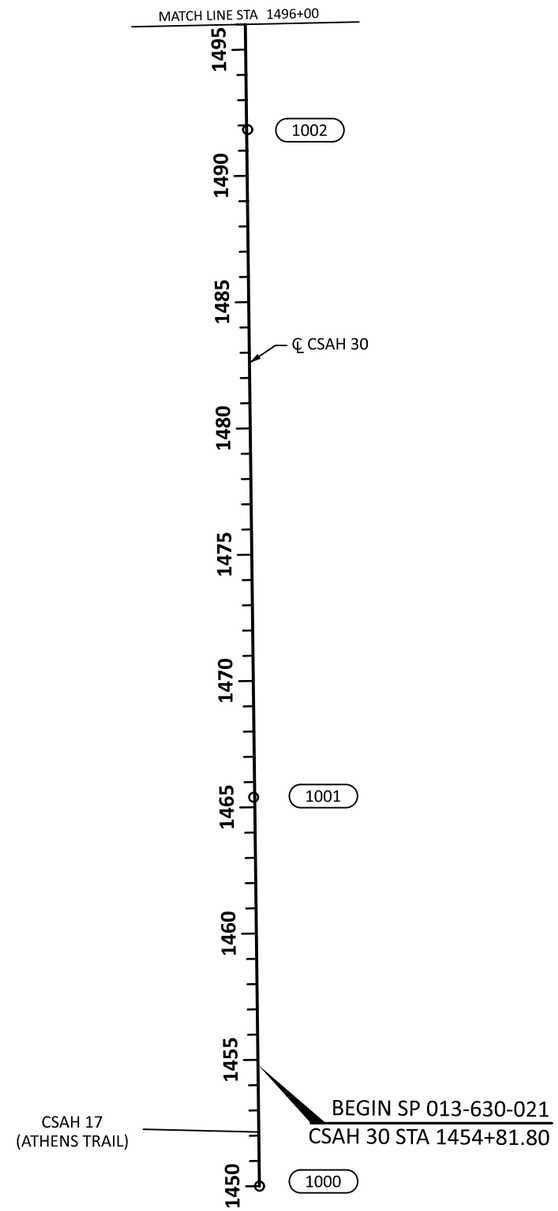
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

TRAFFIC CONTROL
CONSTRUCTION STAGING & TRAFFIC CONTROL
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 91 OF 216 SHEETS

CSAH 30 (Forest Blvd)



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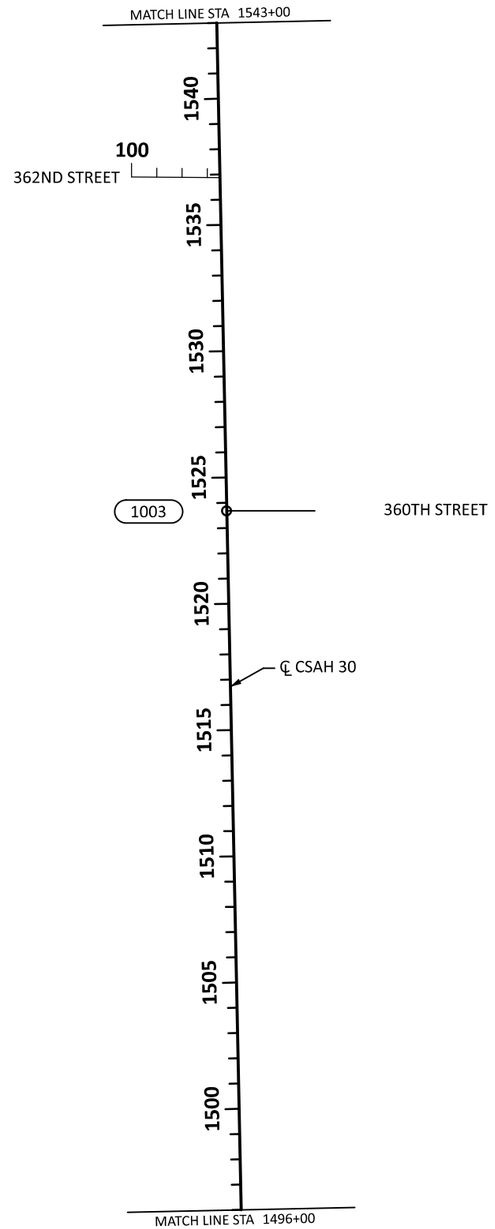

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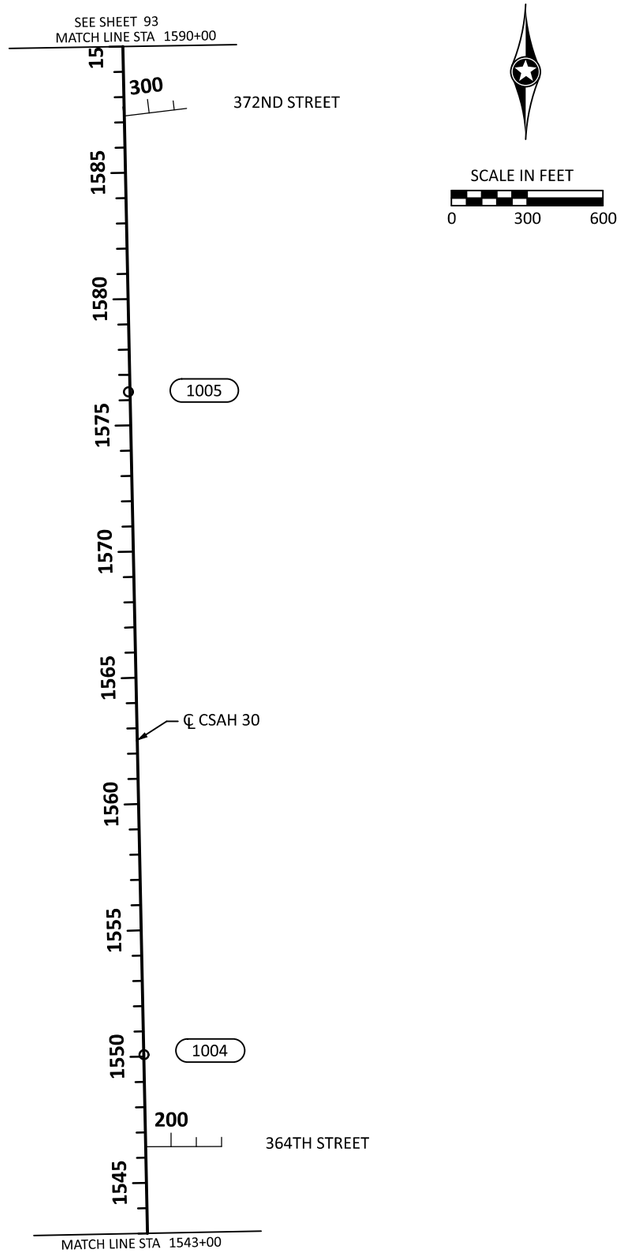

THE HORIZONTAL CONTROL FOR THIS PLAN IS CHISAGO COUNTY COORDINATES NAD 83 (1996 ADJUSTMENT).

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

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

wsb

Chisago COUNTY USA

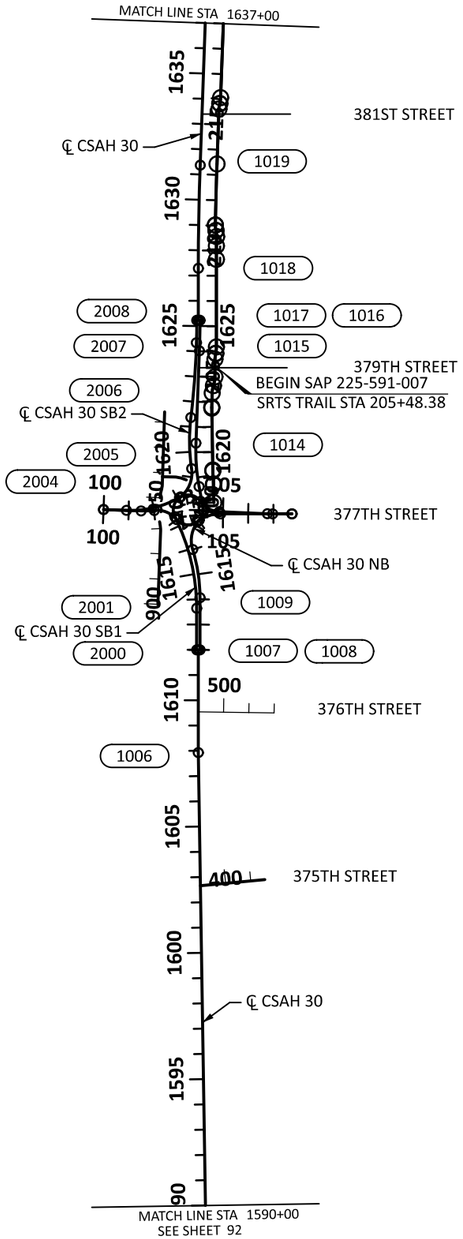
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

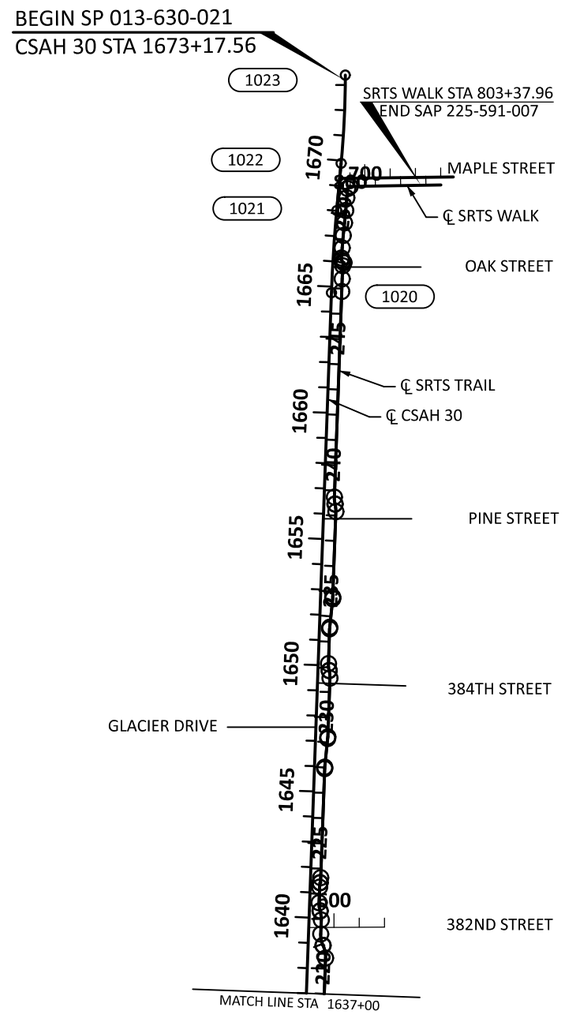
ALIGNMENT PLAN AND TABULATIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 92 OF 216 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

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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

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 93 OF 216 SHEETS

DATE: 9/12/2024 2:03:58 PM
PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_al

ALIGNMENT TABULATION

POINT NUMBER	POINT TYPE	STATION	CIRCULAR CURVE DATA DELTA	CIRCULAR CURVE DATA DEGREE	CIRCULAR CURVE DATA RADIUS	CIRCULAR CURVE DATA TANGENT	CIRCULAR CURVE DATA LENGTH	COORDINATES EASTING (X)	COORDINATES NORTHING (Y)	DIRECTION AZIMUTH
			SPIRAL CURVE DATA THETA	SPIRAL CURVE DATA DEGREE	SPIRAL CURVE DATA ST	SPIRAL CURVE DATA LT	SPIRAL CURVE DATA 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 DELTA	CIRCULAR CURVE DATA DEGREE	CIRCULAR CURVE DATA RADIUS	CIRCULAR CURVE DATA TANGENT	CIRCULAR CURVE DATA LENGTH	COORDINATES EASTING (X)	COORDINATES NORTHING (Y)	DIRECTION AZIMUTH
			SPIRAL CURVE DATA THETA	SPIRAL CURVE DATA DEGREE	SPIRAL CURVE DATA ST	SPIRAL CURVE DATA LT	SPIRAL CURVE DATA 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°

DATE: 9/12/2024 2:03:59 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000.dl

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

wsb

Chisago COUNTY USA

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 94 OF 216 SHEETS

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										
	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°

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°

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

wsb

Chisago COUNTY USA

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 95 OF 216 SHEETS

DATE: 9/12/2024 2:04:00 PM
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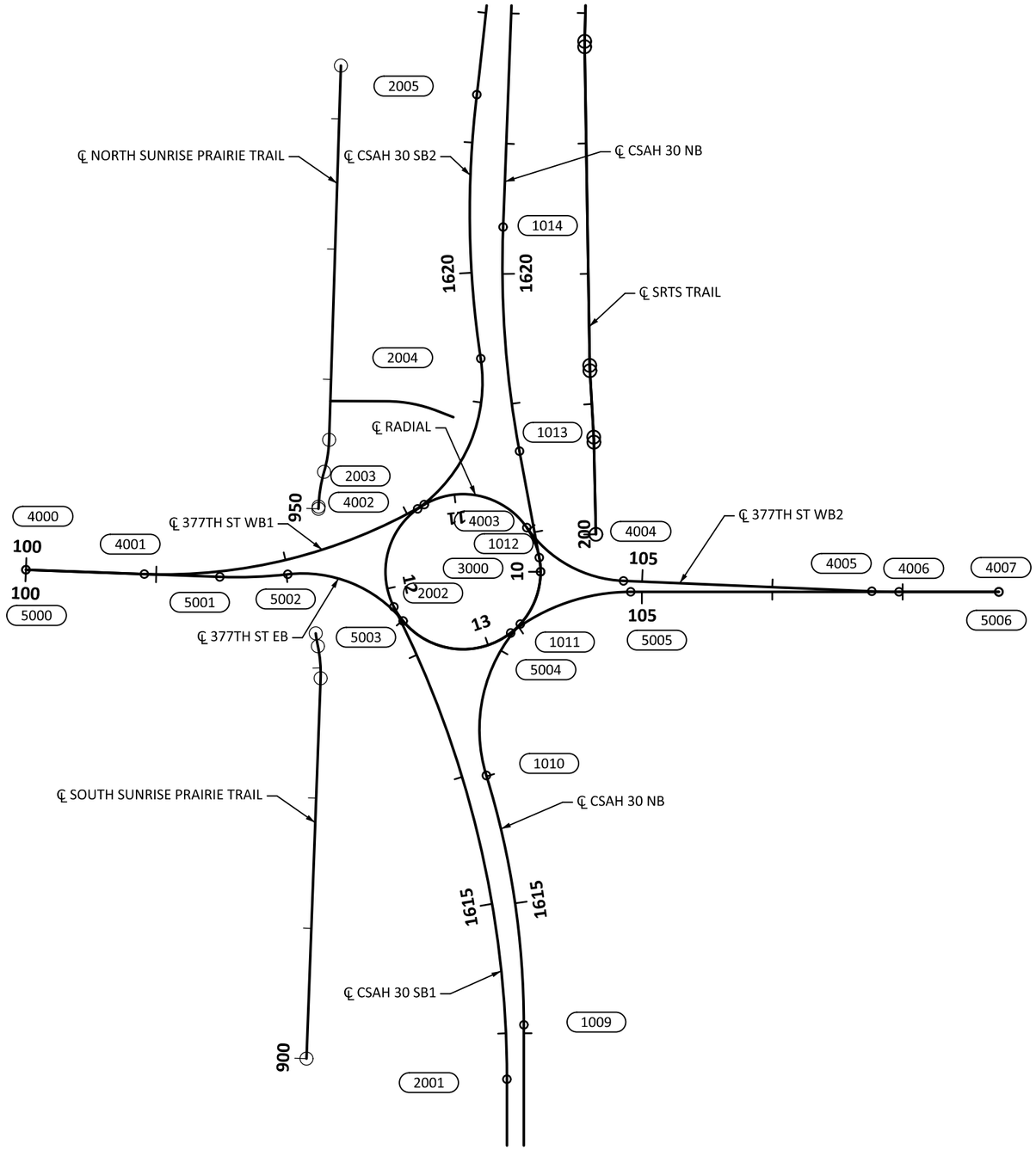

ALIGNMENT TABULATION

POINT NUMBER	POINT TYPE	STATION	CIRCULAR CURVE DATA DELTA	DEGREE	RADIUS	TANGENT	LENGTH	COORDINATES EASTING (X)	NORTHING (Y)	DIRECTION AZIMUTH
			SPIRAL CURVE DATA 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. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

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

DATE: 9/12/2024 2:04:01 PM
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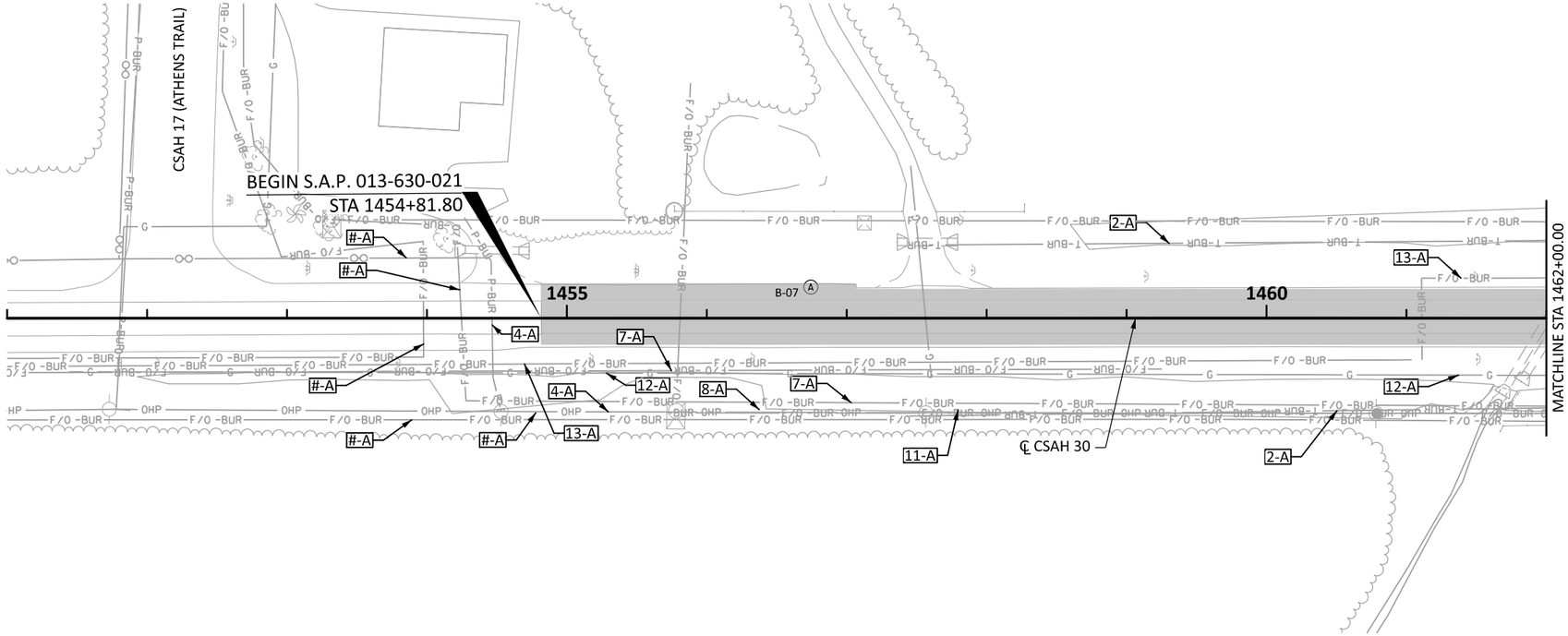
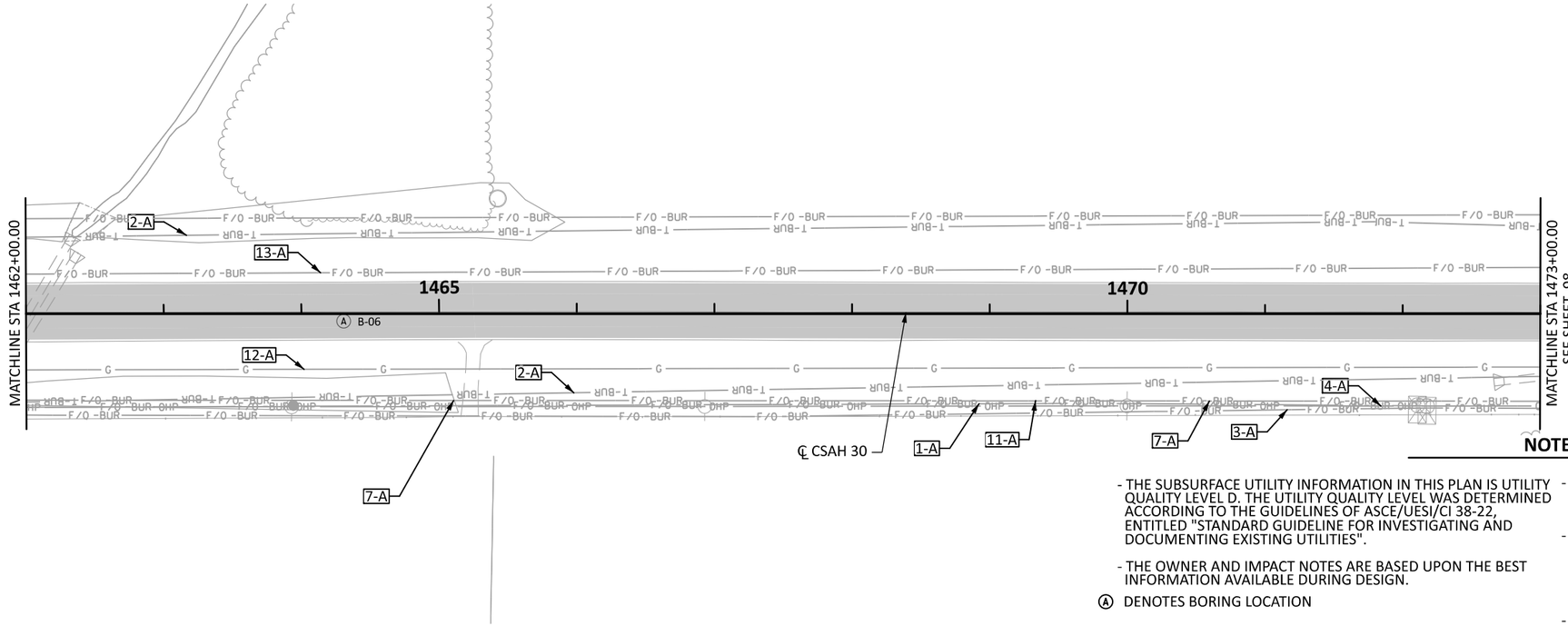


SCALE IN FEET
0 50 100

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
- 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



SCALE IN FEET
0 50 100

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

- 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".
- THE OWNER AND IMPACT NOTES ARE BASED UPON THE BEST INFORMATION AVAILABLE DURING DESIGN.
- (A) 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

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NICHOLAS E. HENTGES, PE
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wsb

Chisago COUNTY USA

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 97 OF 216 SHEETS

DATE: 9/12/2024 2:04:24 PM
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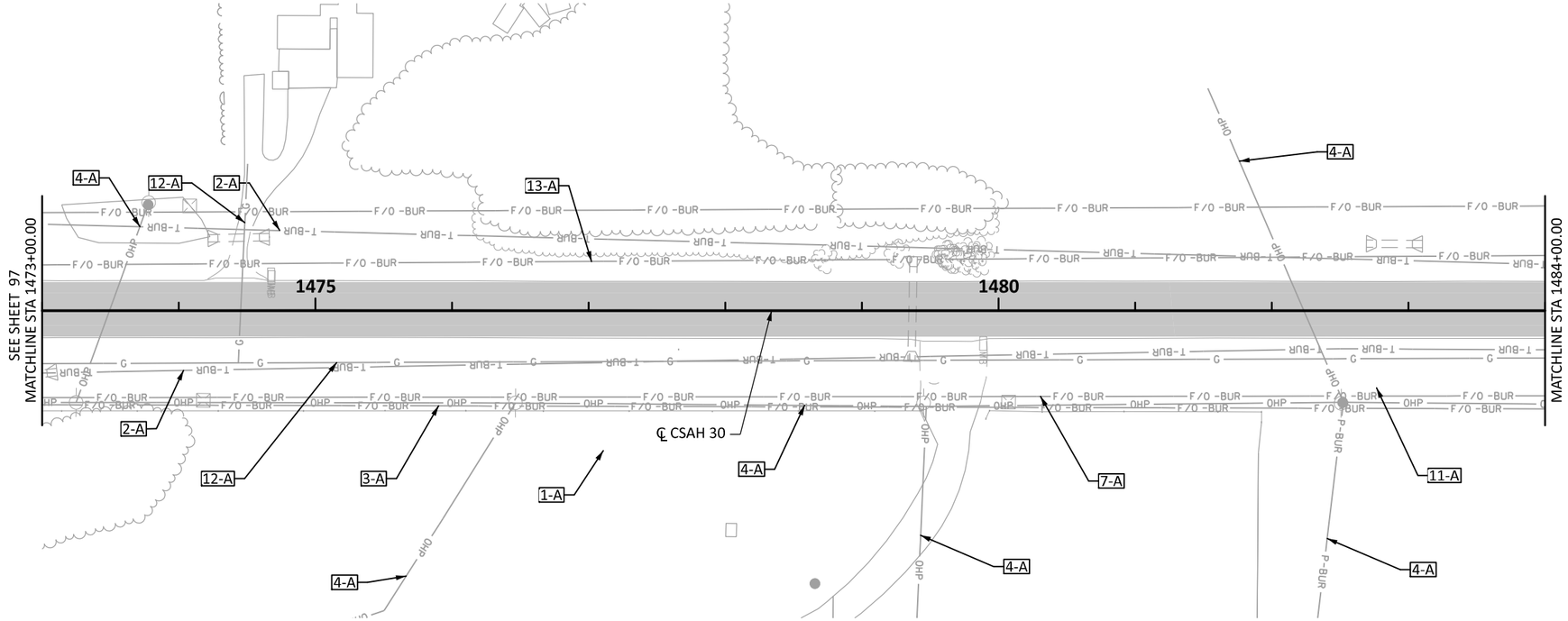

SCALE IN FEET
0 50 100

LEGEND

- CONSTRUCTION LIMITS
- EXISTING R/W
- EXISTING RR R/W
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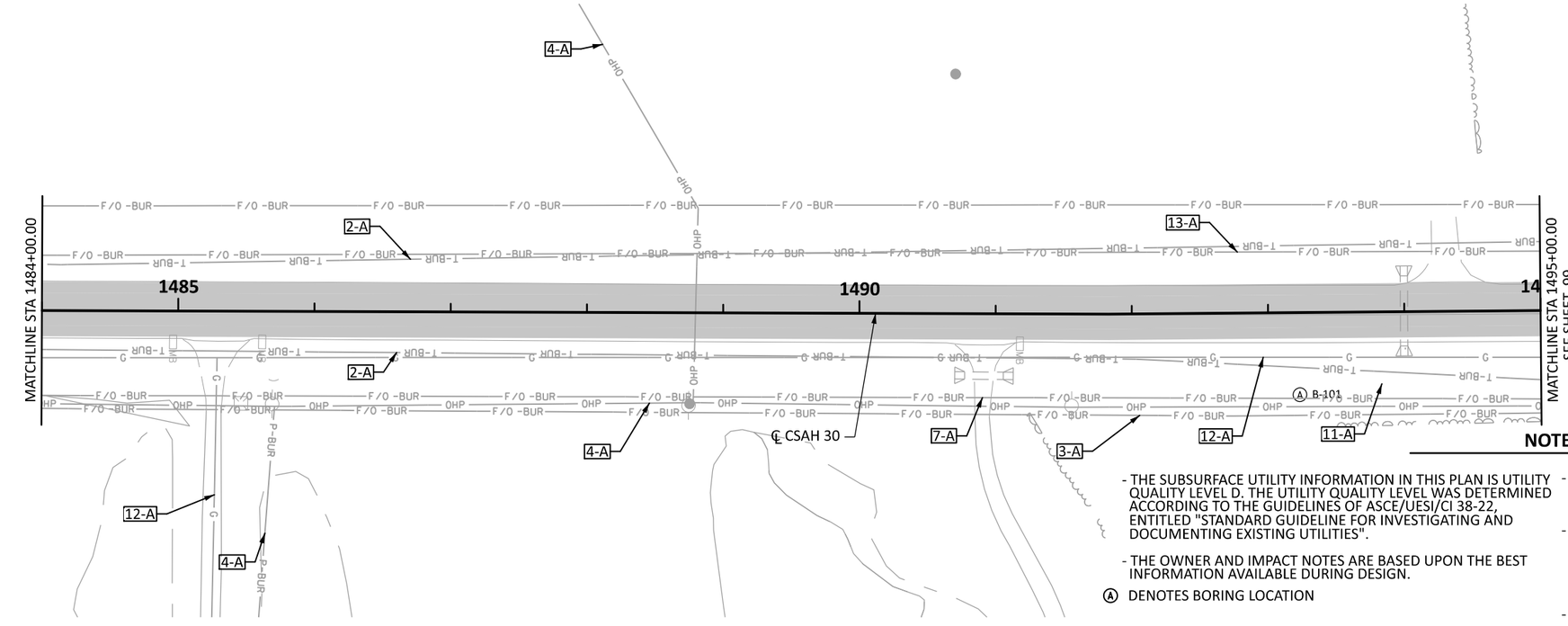

SCALE IN FEET
0 50 100

LEGEND CONT.

1-W — UTILITY CONFLICT (OWNER - IMPACT)
OWNERSHIP:
(1) ARVIG, (2) CENTURY LINK/LUMEN,
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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:
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(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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wsb

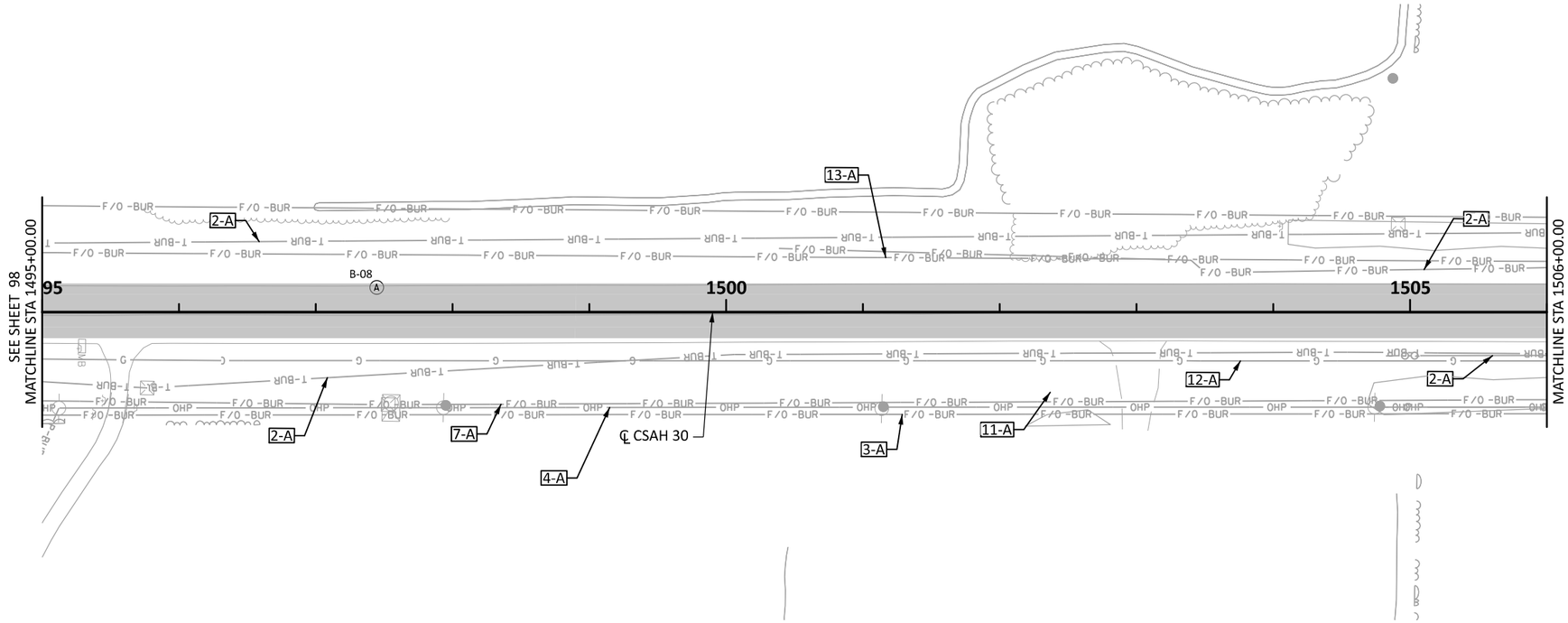
Chisago COUNTY USA

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 98 OF 216 SHEETS



LEGEND

- CONSTRUCTION LIMITS
- EXISTING R/W
- EXISTING RR R/W
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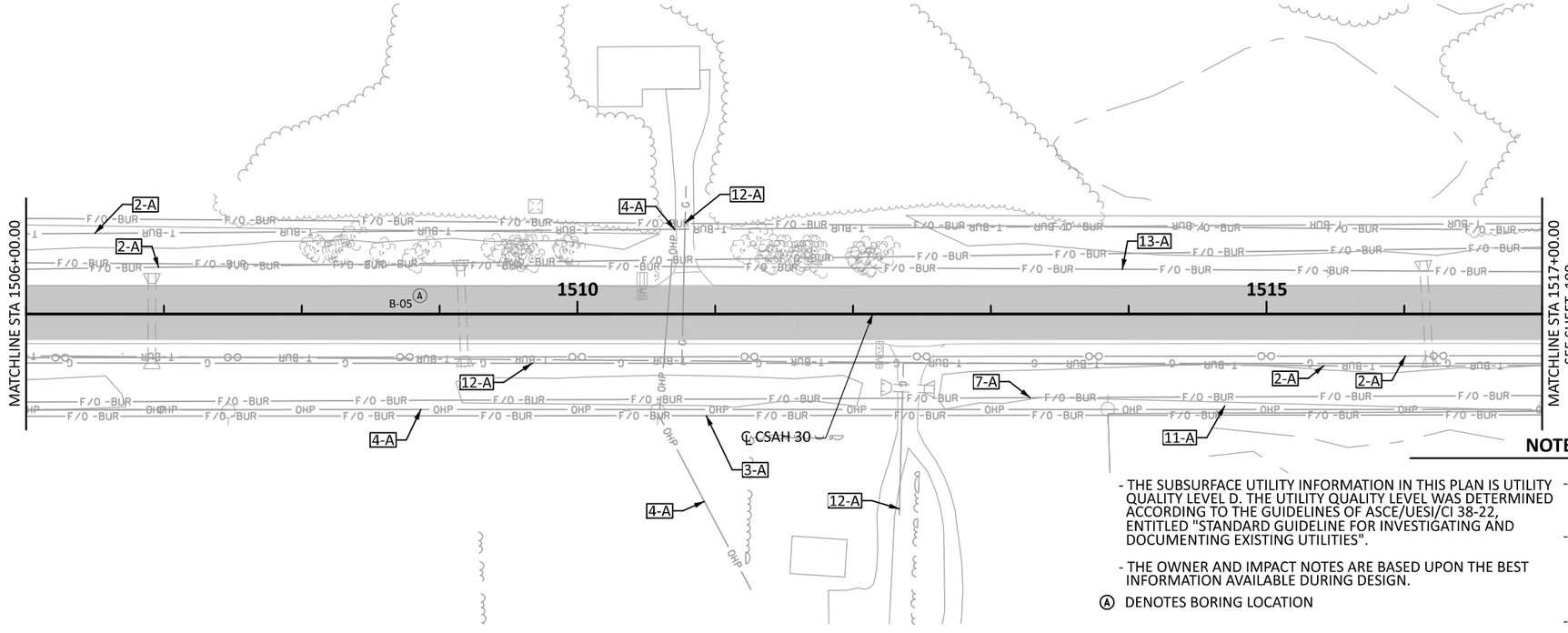

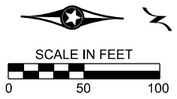

LEGEND CONT.

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,
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(13) ZAYO GROUP, LLC.
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IMPACT NOTES ON PLAN SHEETS:
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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

DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

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 99 OF 216 SHEETS

DATE: 9/12/2024 2:04:26 PM
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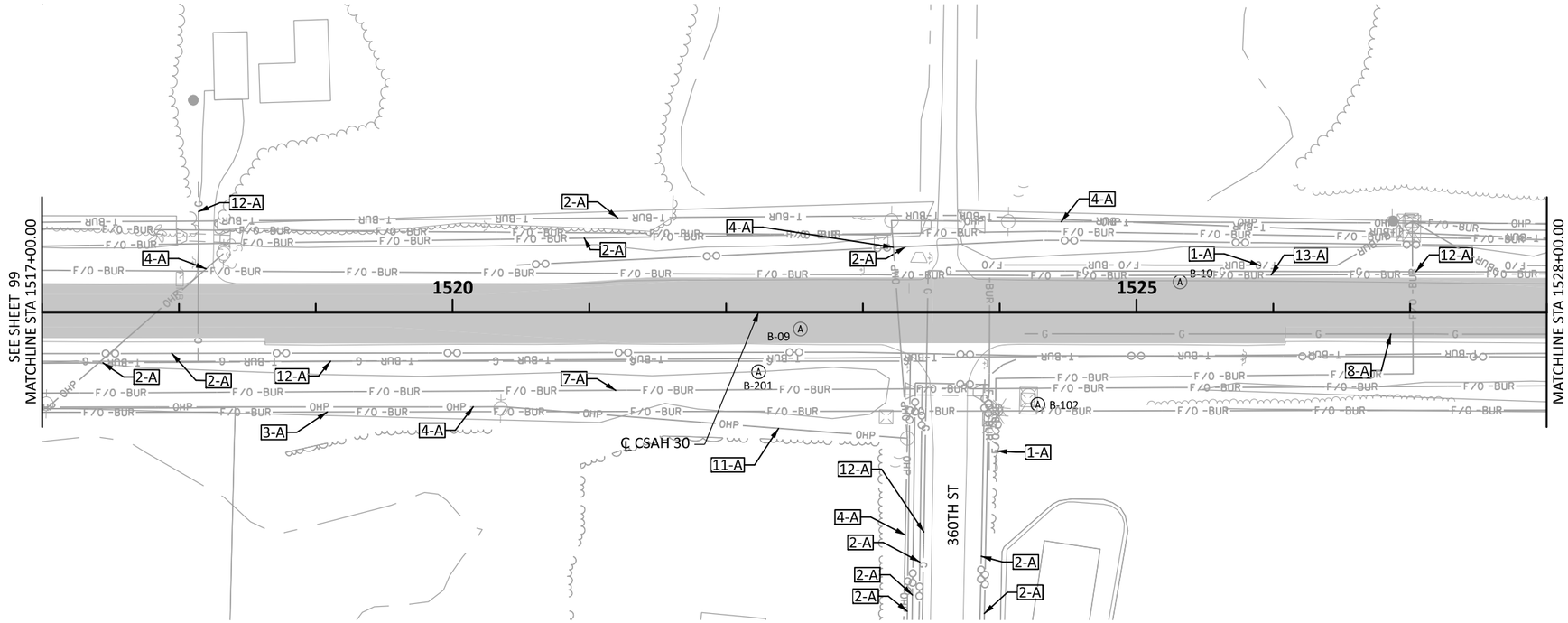

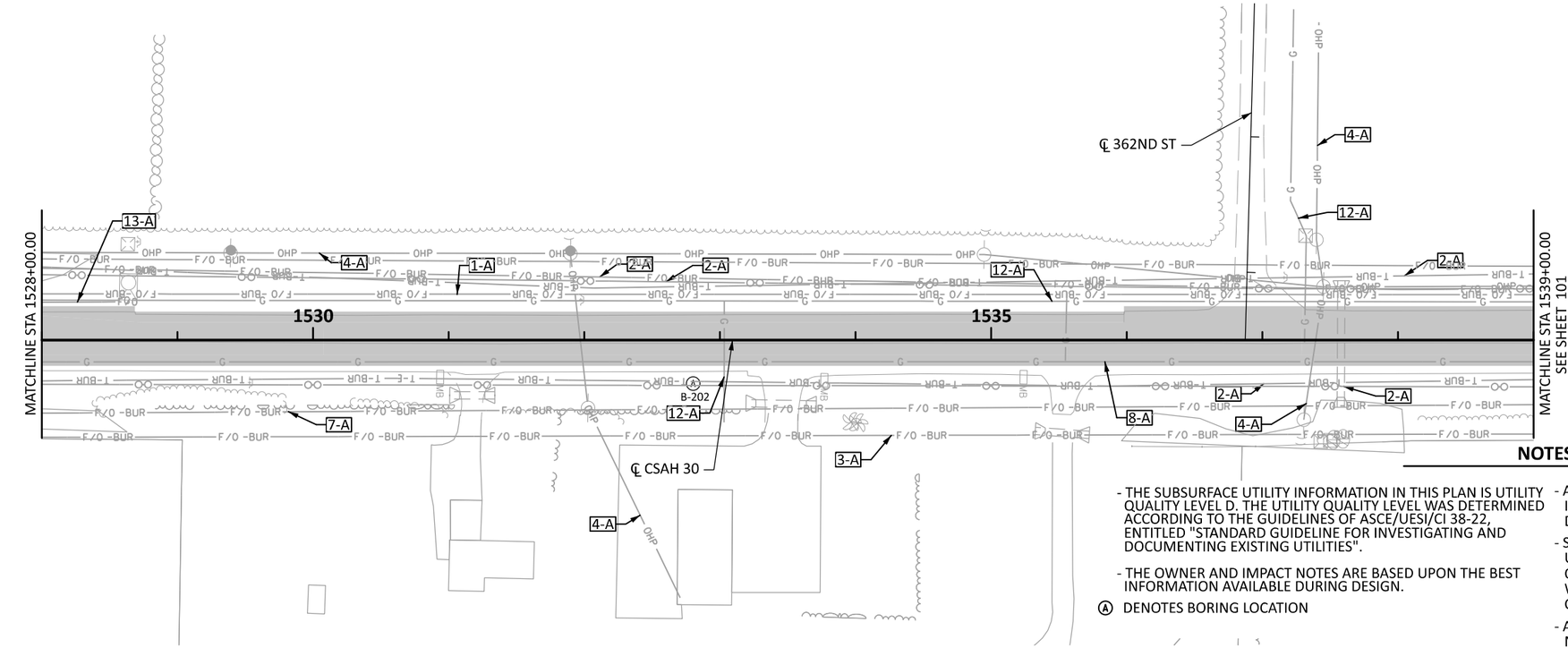

SCALE IN FEET
0 50 100

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
- 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.
(14) SMMPA

IMPACT NOTES ON PLAN SHEETS:
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SHEET 100 OF 216 SHEETS

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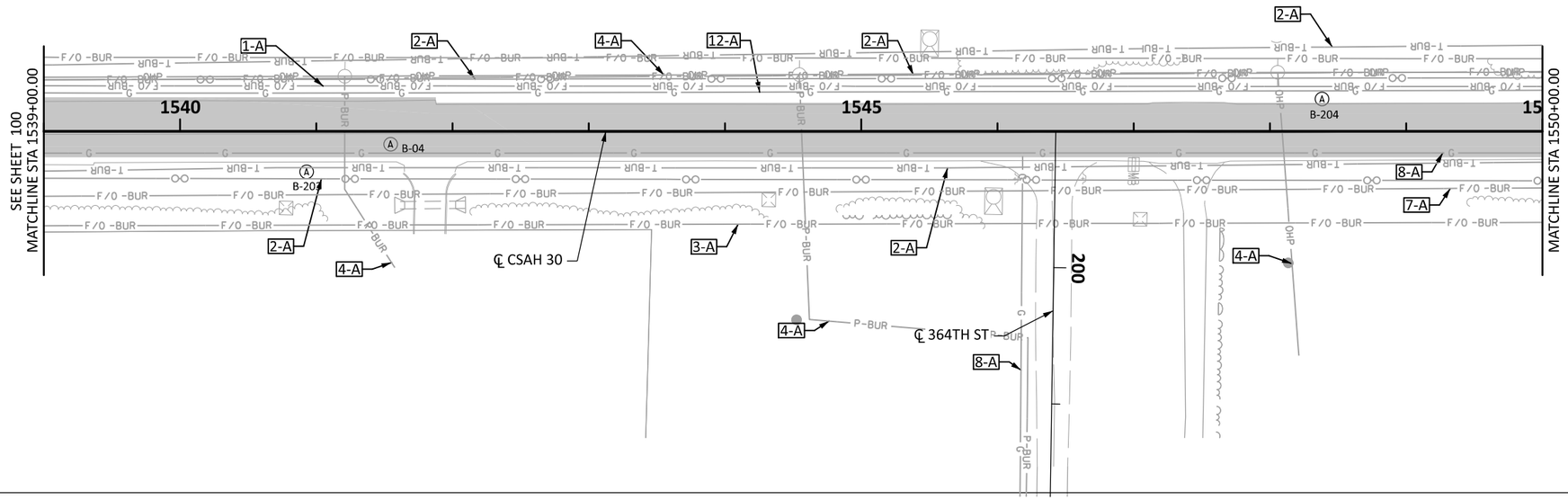

LEGEND

- CONSTRUCTION LIMITS
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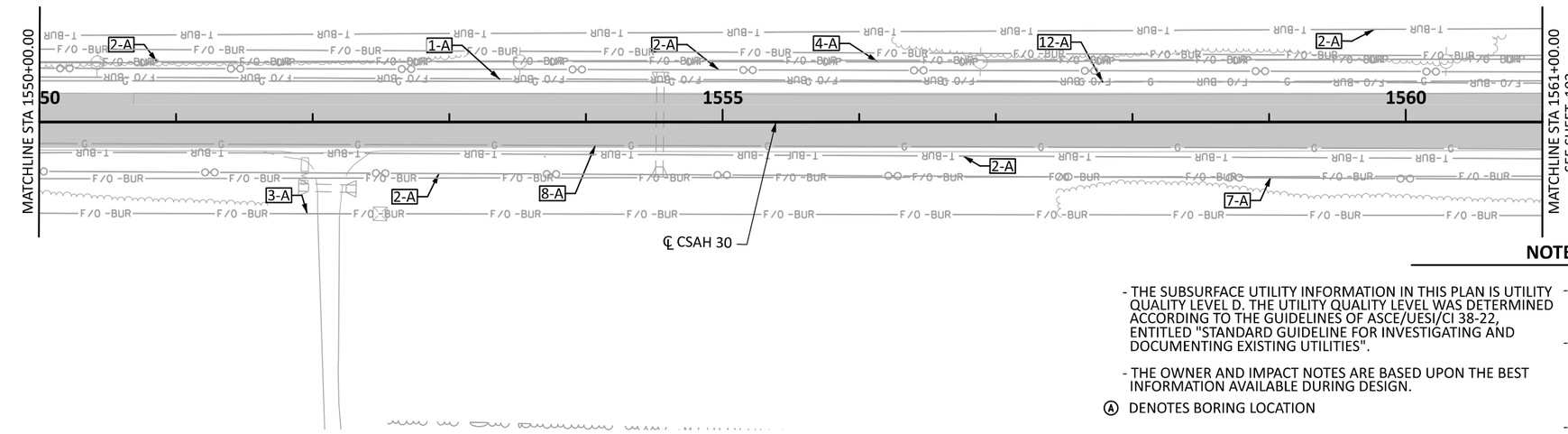

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1-W UTILITY CONFLICT (OWNER - IMPACT)
OWNERSHIP:
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SHEET 101 OF 216 SHEETS

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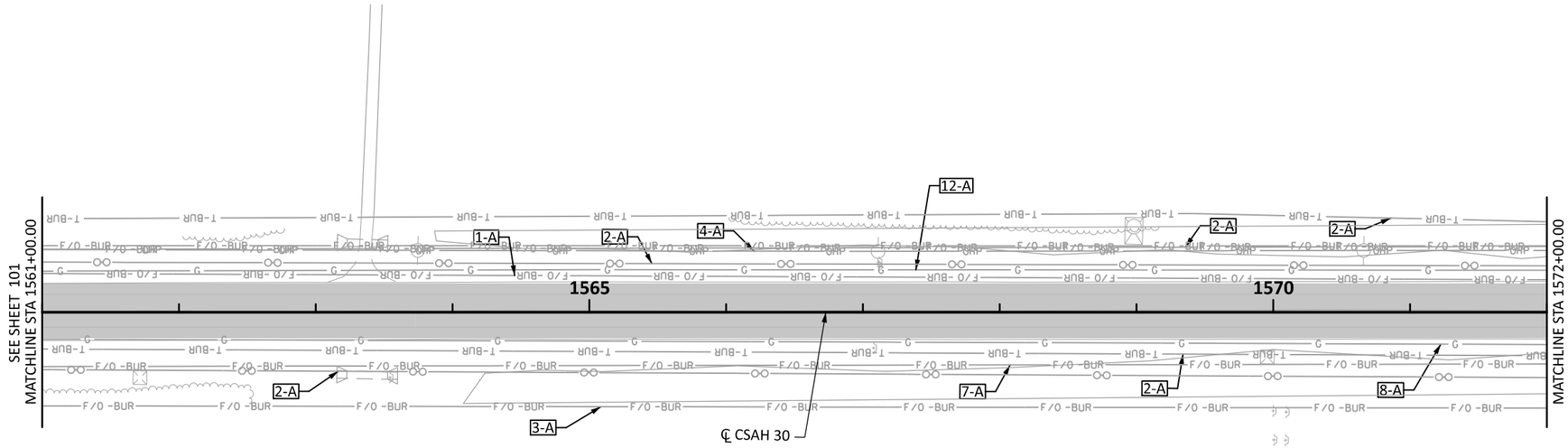

SCALE IN FEET
0 50 100

LEGEND

- CONSTRUCTION LIMITS
- EXISTING R/W
- EXISTING RR R/W
- T-BUR — BURIED TELEPHONE
- G — GAS
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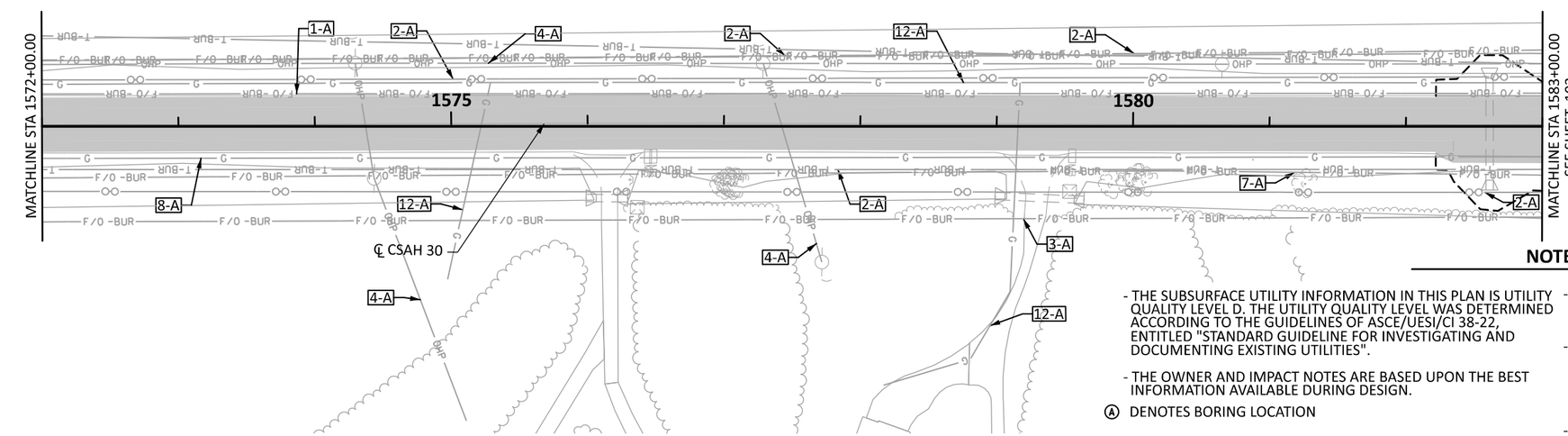

SCALE IN FEET
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LEGEND CONT.

1-W — UTILITY CONFLICT (OWNER - IMPACT)

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SHEET 102 OF 216 SHEETS

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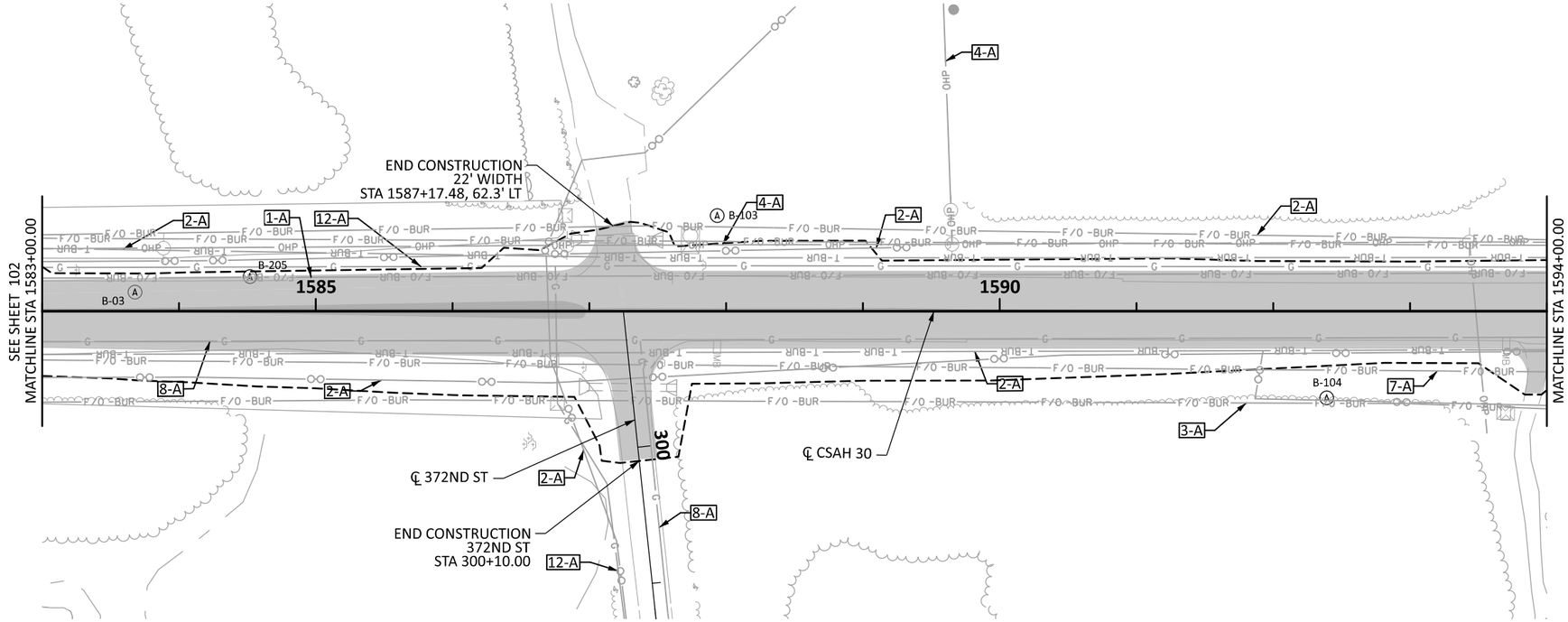

LEGEND

- CONSTRUCTION LIMITS
- EXISTING R/W
- EXISTING RR R/W
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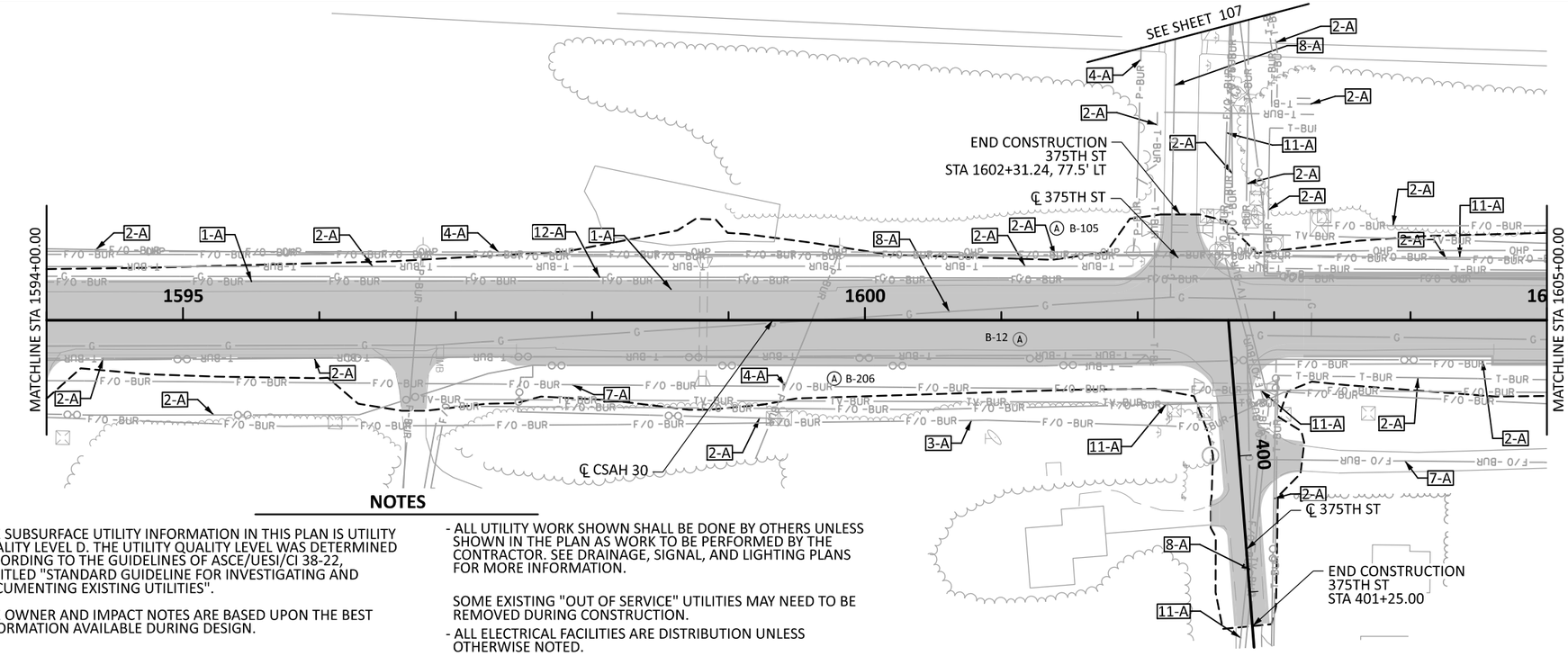

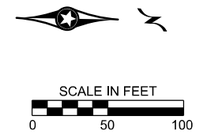

LEGEND CONT.

1-W — UTILITY CONFLICT (OWNER - IMPACT)
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  SOME EXISTING "OUT OF SERVICE" UTILITIES MAY NEED TO BE REMOVED DURING CONSTRUCTION.
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CHISAGO COUNTY, MINNESOTA

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SHEET 103 OF 216 SHEETS

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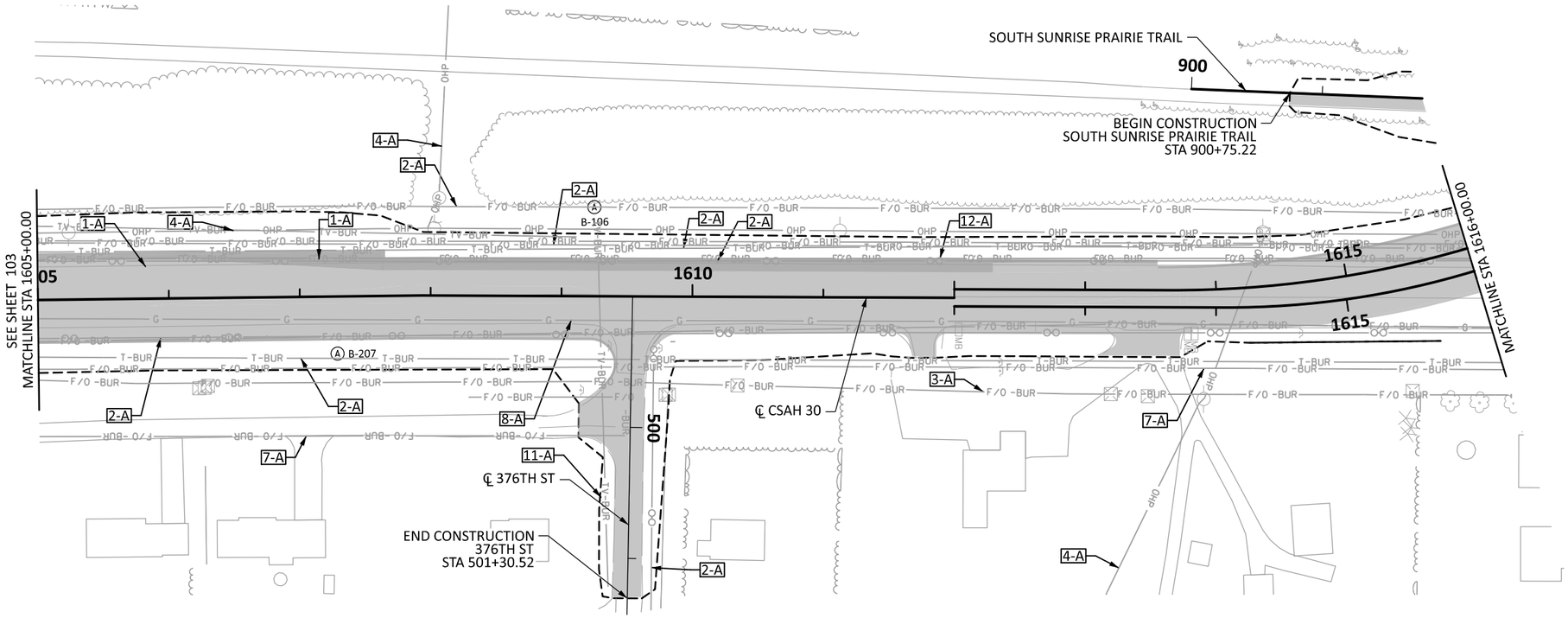

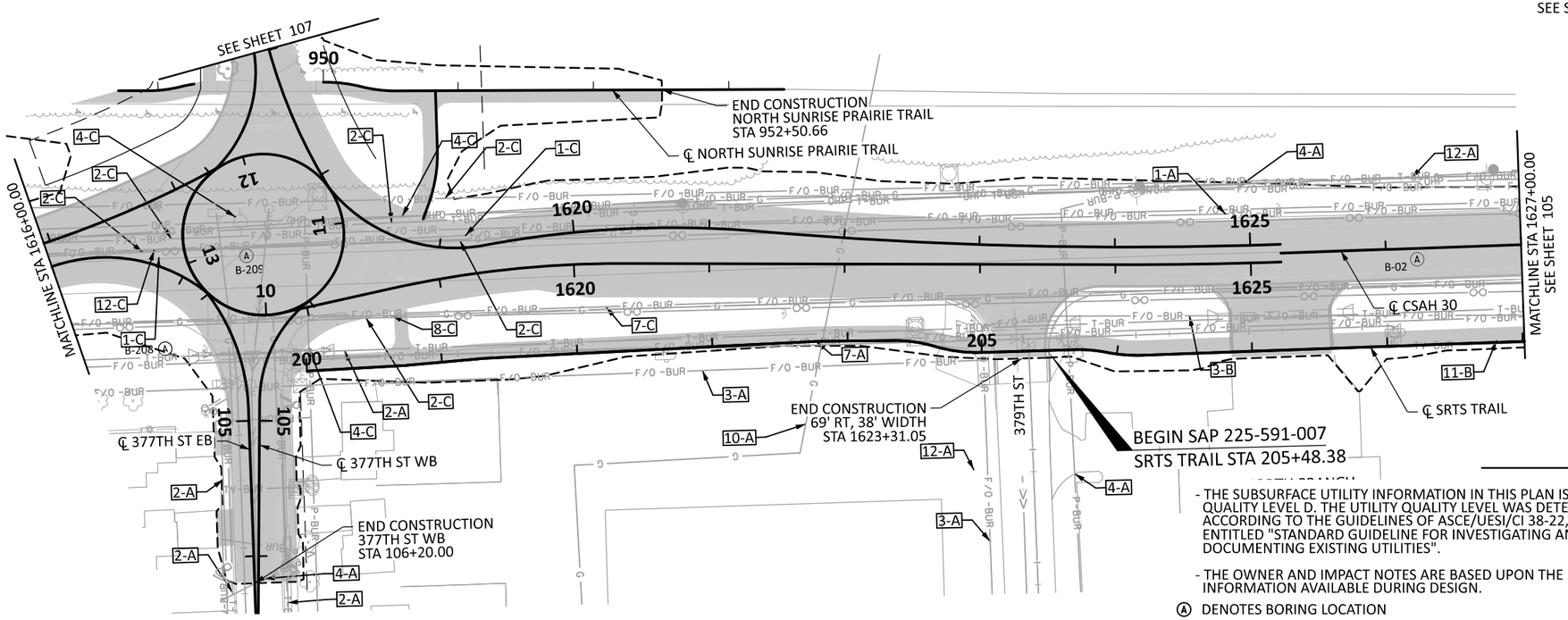

SCALE IN FEET
0 50 100

LEGEND

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SCALE IN FEET
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LEGEND CONT.

1-W UTILITY CONFLICT (OWNER - IMPACT)
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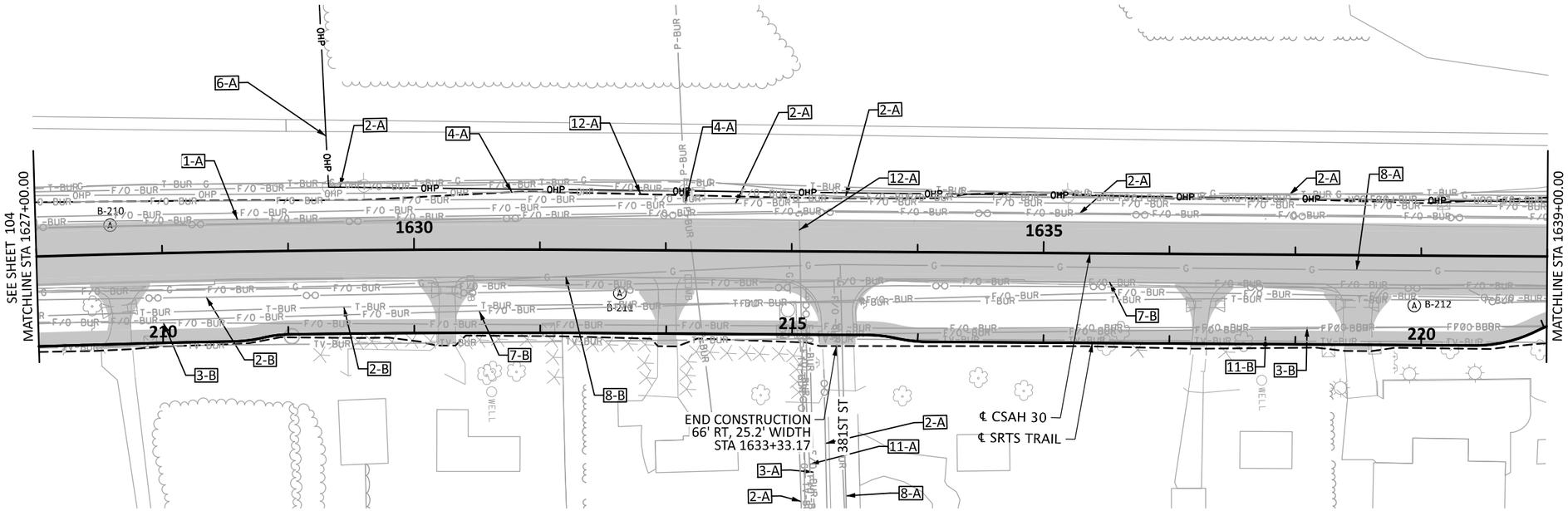

LEGEND

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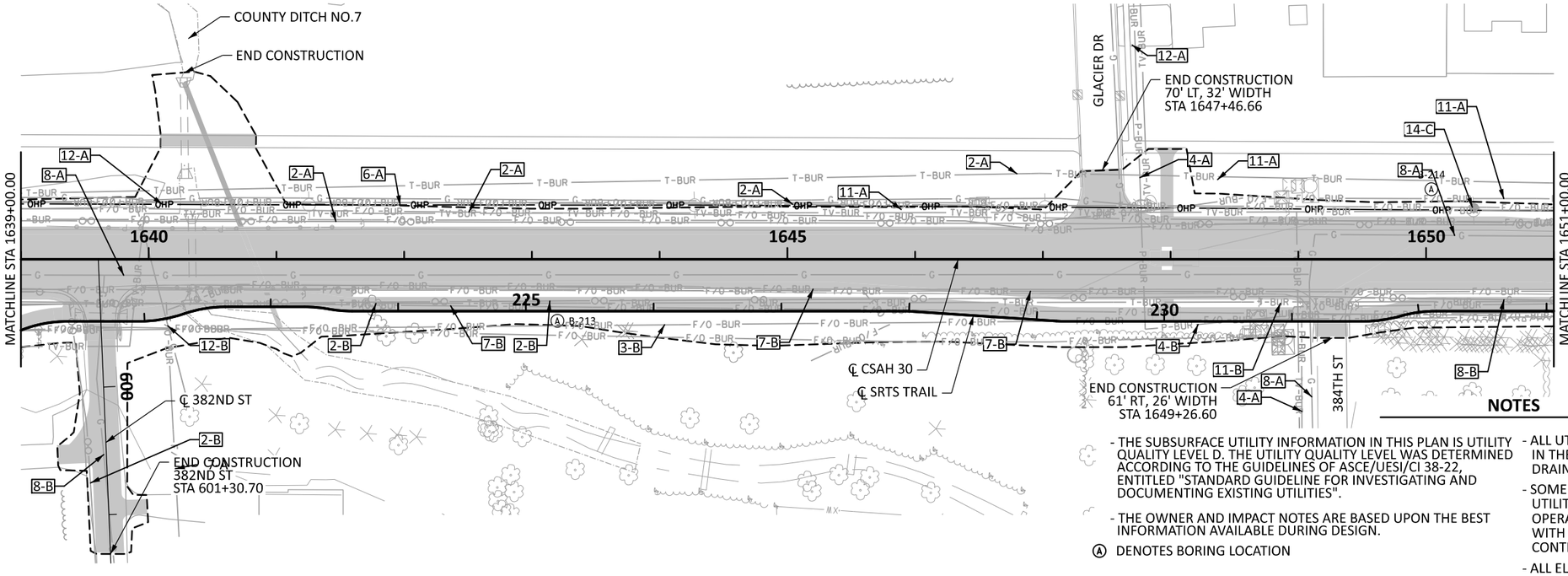

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1-W UTILITY CONFLICT (OWNER - IMPACT)

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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

wsb

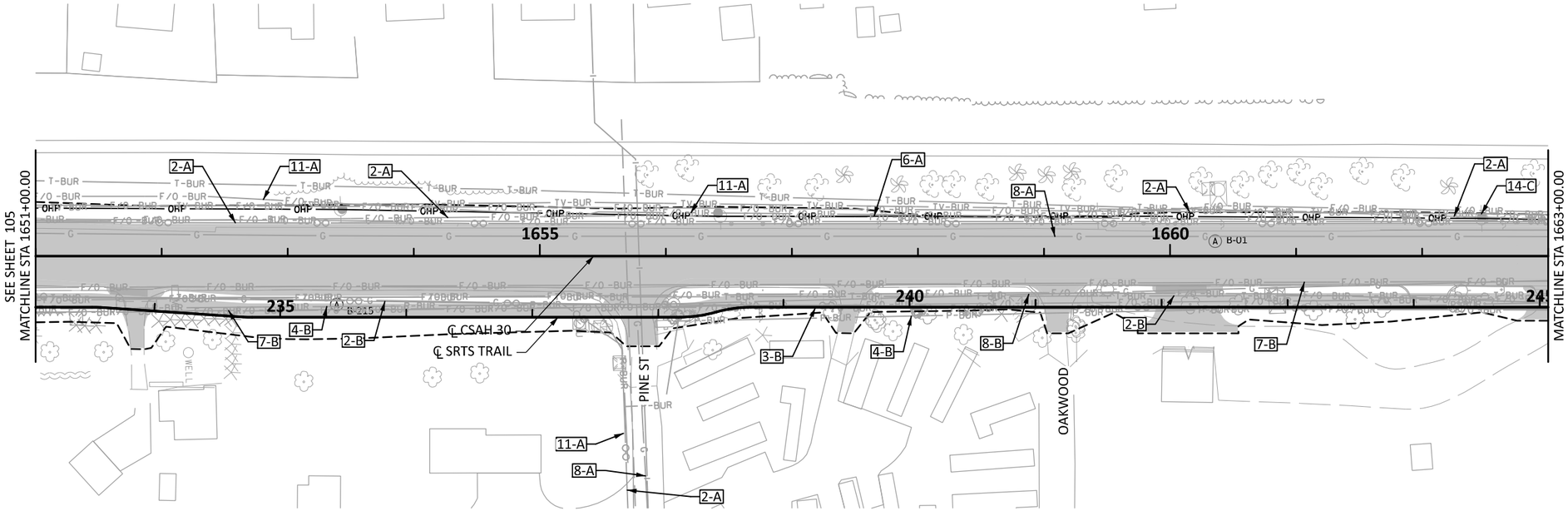
Chisago COUNTY USA

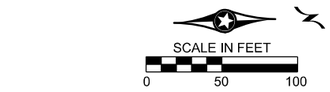
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

INPLACE TOPOGRAPHY & UTILITIES PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

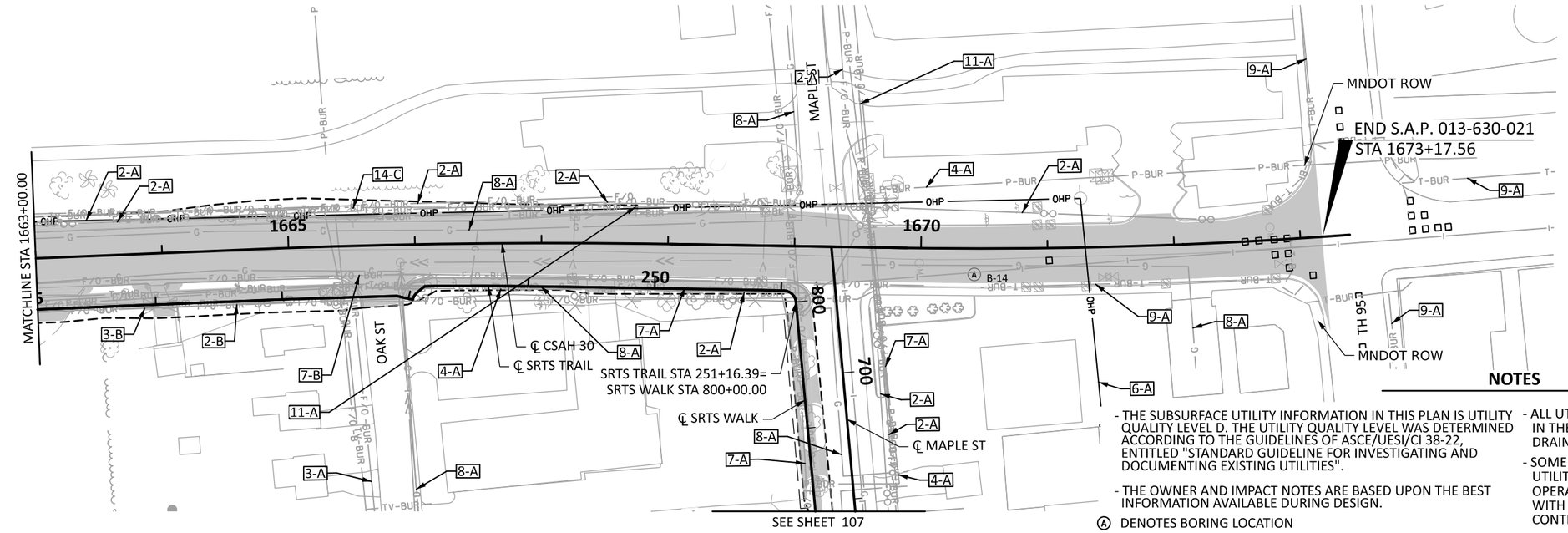
SHEET 105 OF 216 SHEETS





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
- 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.
(14) SMMPA

IMPACT NOTES ON PLAN SHEETS:
(A) LEAVE AS IS,
(B) ADJUST,
(C) RELOCATE,
(D) REMOVE

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/UESI/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.
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Design By: NEH
Plan By: MKV
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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

SHEET 106 OF 216 SHEETS

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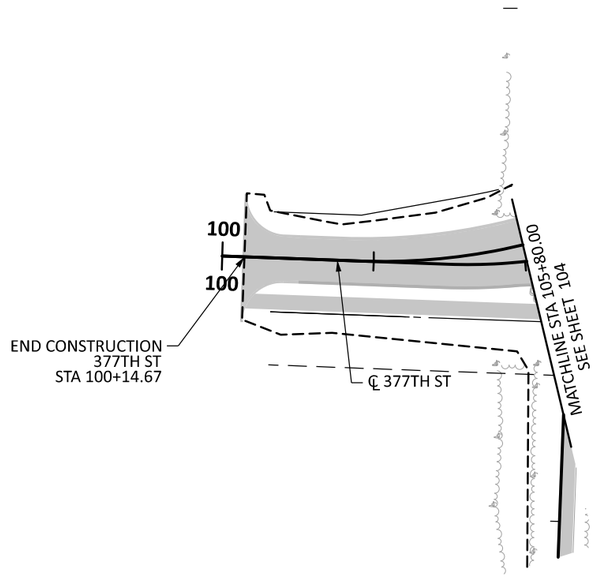

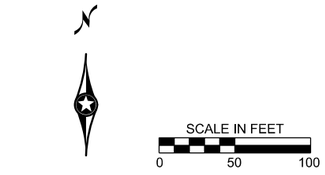

LEGEND

- CONSTRUCTION LIMITS
- EXISTING R/W
- EXISTING RR R/W
- T-BUR — BURIED TELEPHONE
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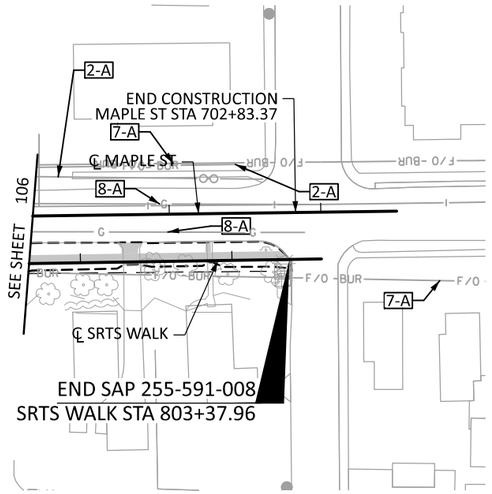

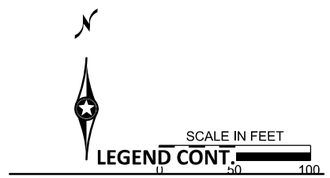

LEGEND CONT.

1-W — UTILITY CONFLICT (OWNER - IMPACT)

OWNERSHIP:
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(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,
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(C) RELOCATE,
(D) REMOVE

NOTES

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Chisago COUNTY USA

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 107 OF 216 SHEETS

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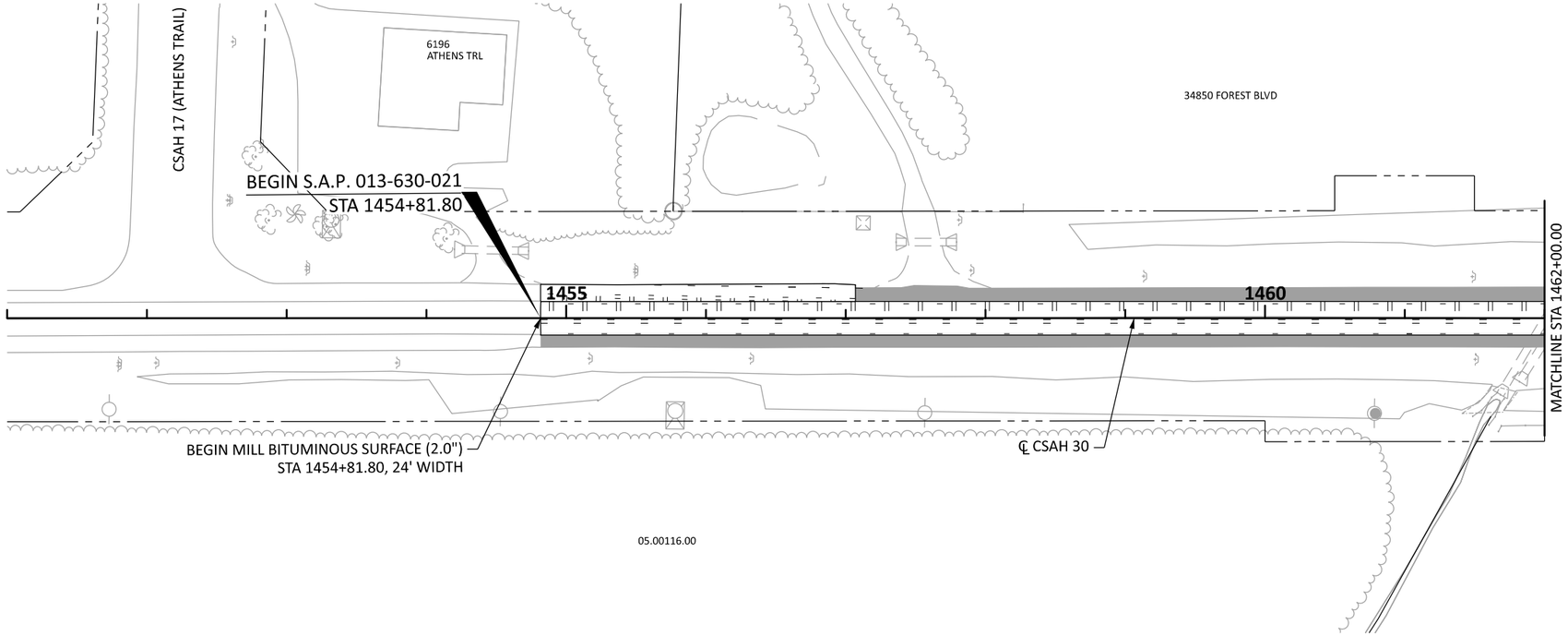
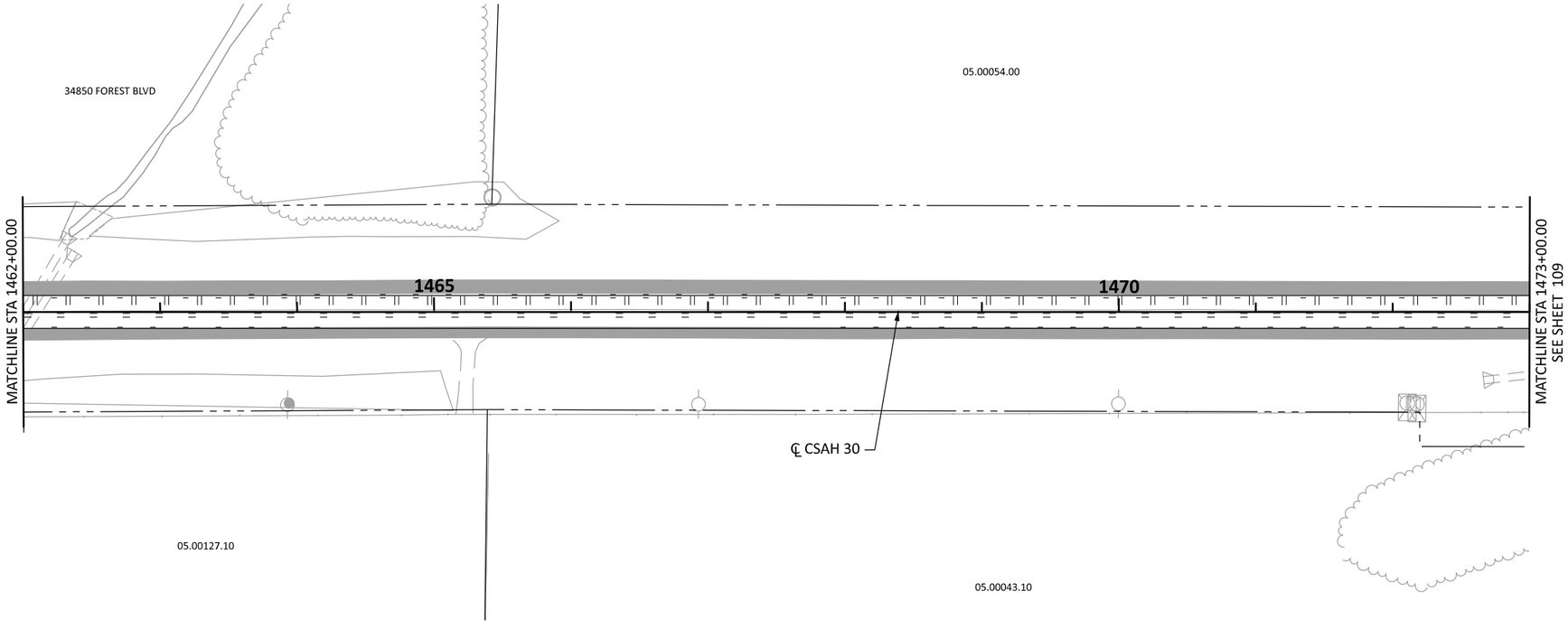


SCALE IN FEET
0 50 100

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)
- (MB) RELOCATE MAILBOX SUPPORT
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- (P) REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION



SCALE IN FEET
0 50 100

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

1. EXACT LIMITS OF CLEARING AND GRUBBING WILL BE ESTABLISHED IN THE FIELD.
2. REMOVAL OF ALL AGGREGATE SURFACING REGARDLESS OF THICKNESS SHALL BE INCLUDED IN EXCAVATION - COMMON.
3. SAWCUTTING FOR CONCRETE CURB AND GUTTER SHALL BE INCIDENTAL.
4. SEE SIGNING PLANS FOR ADDITIONAL REMOVALS.
5. SEE SANITARY AND WATERMAIN PLANS FOR MORE DETAILS.

DATE: 9/12/2024 2:04:52 PM
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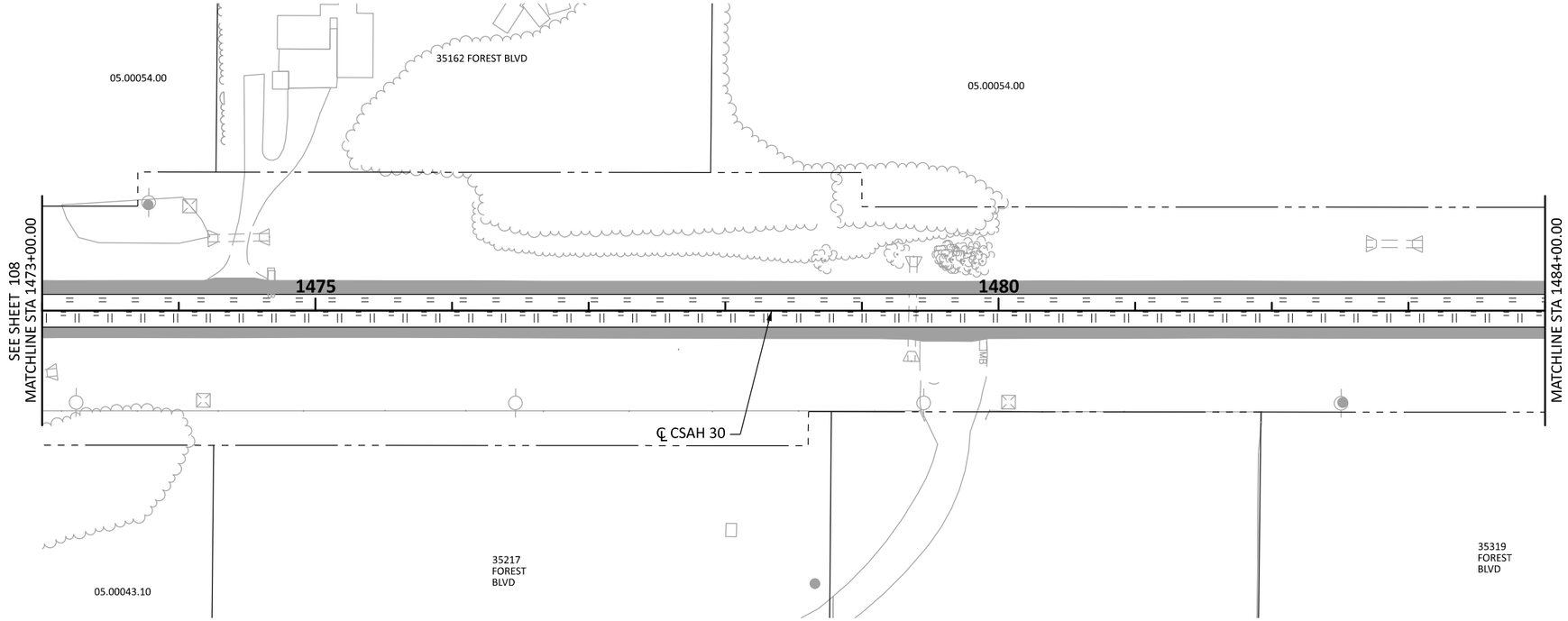
Chisago COUNTY USA

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 108 OF 216 SHEETS



SCALE IN FEET
0 50 100

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)
- (MB) RELOCATE MAILBOX SUPPORT
- CONSTRUCTION LIMITS
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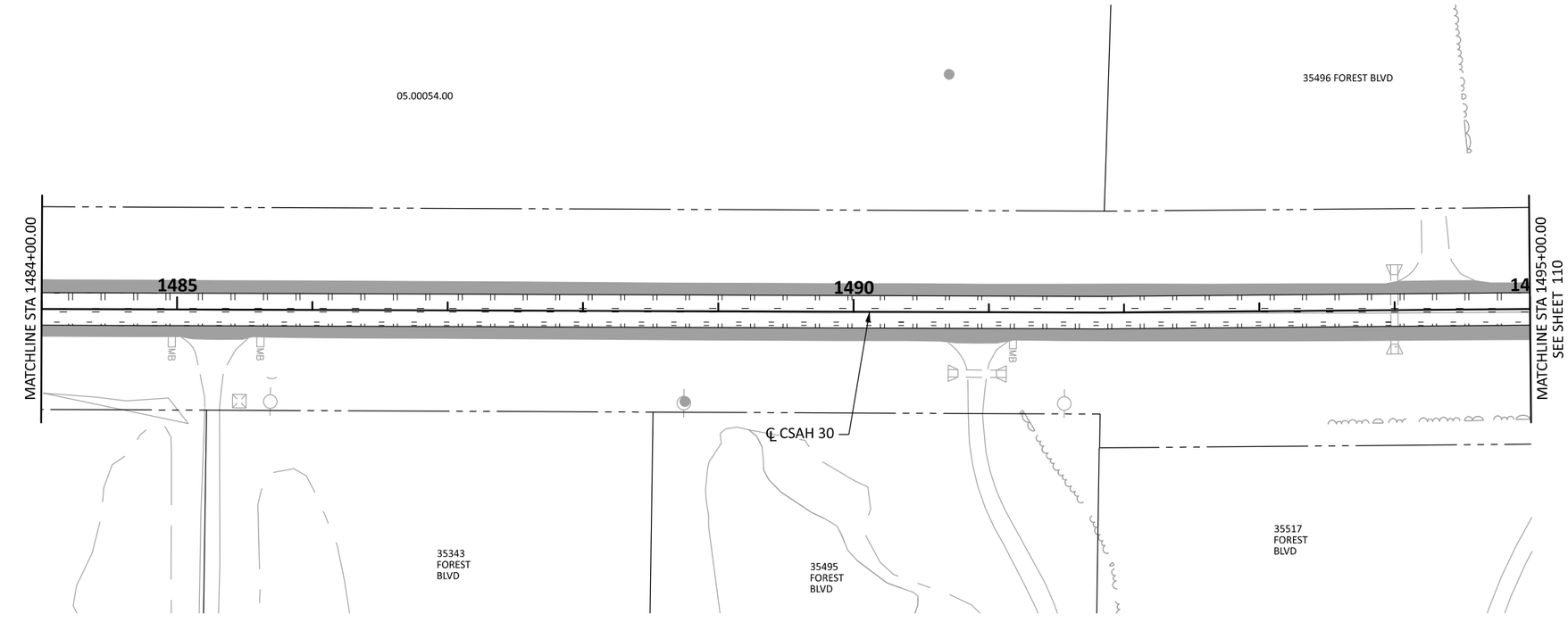
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- (P) REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION



SCALE IN FEET
0 50 100

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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REMOVAL PLAN
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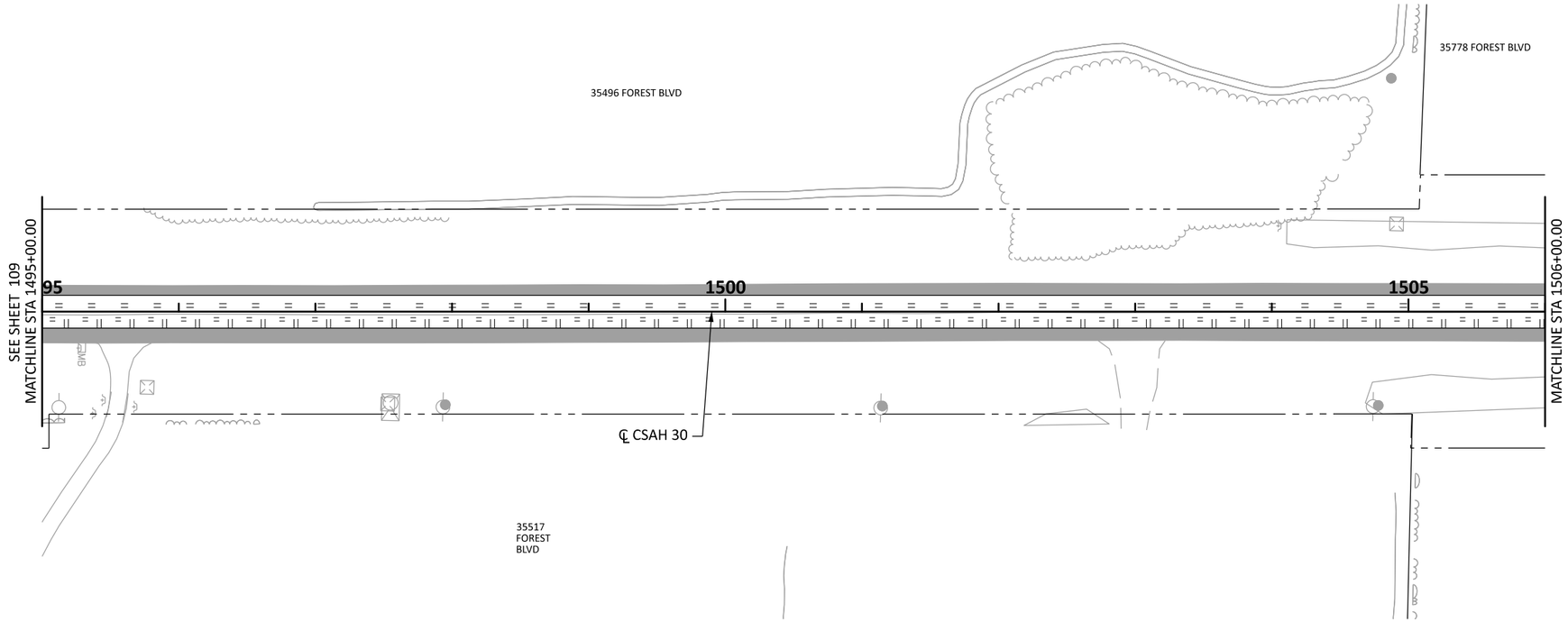
SHEET 109 OF 216 SHEETS



LEGEND

- MILL BITUMINOUS SURFACE (2.0")
- FOG SEAL (EXISTING RURAL SHOULDERS)
- REMOVE BITUMINOUS PAVEMENT
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- (MB) RELOCATE MAILBOX SUPPORT
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- EXISTING R/W
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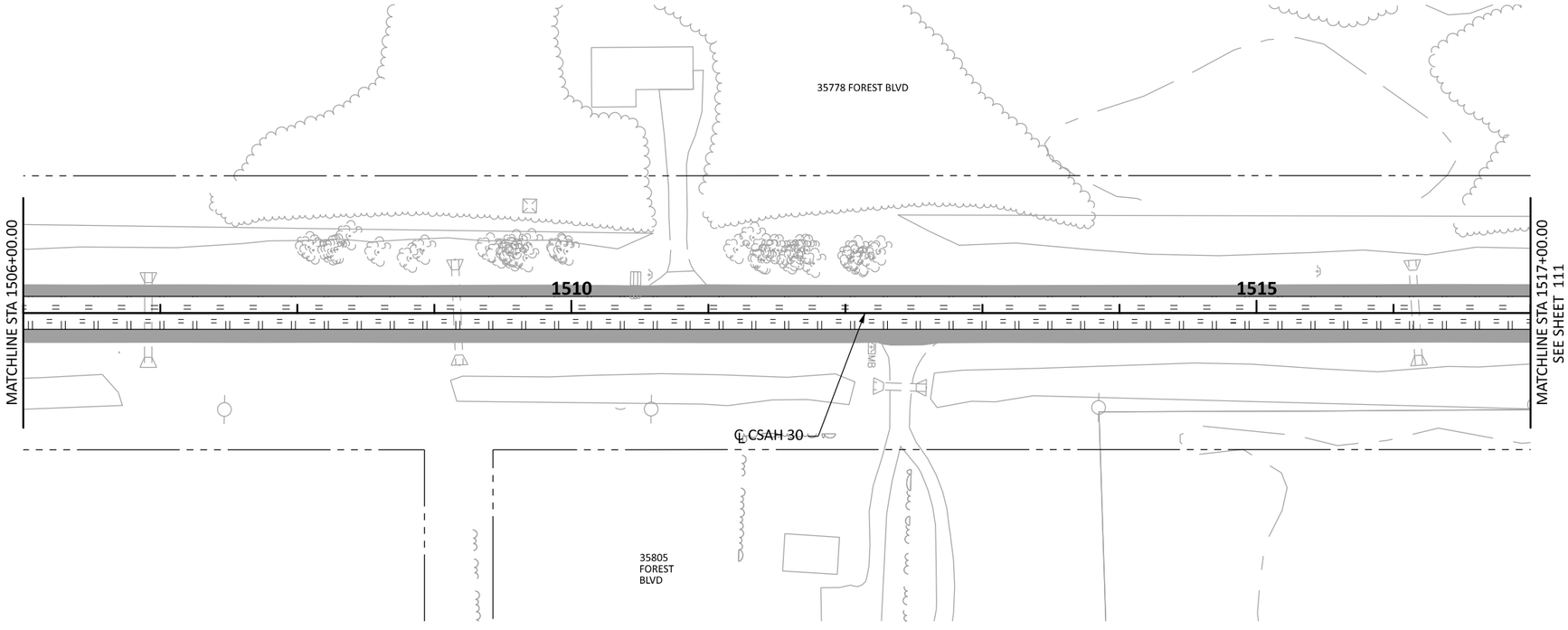
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- (P) REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION



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
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REMOVAL PLAN
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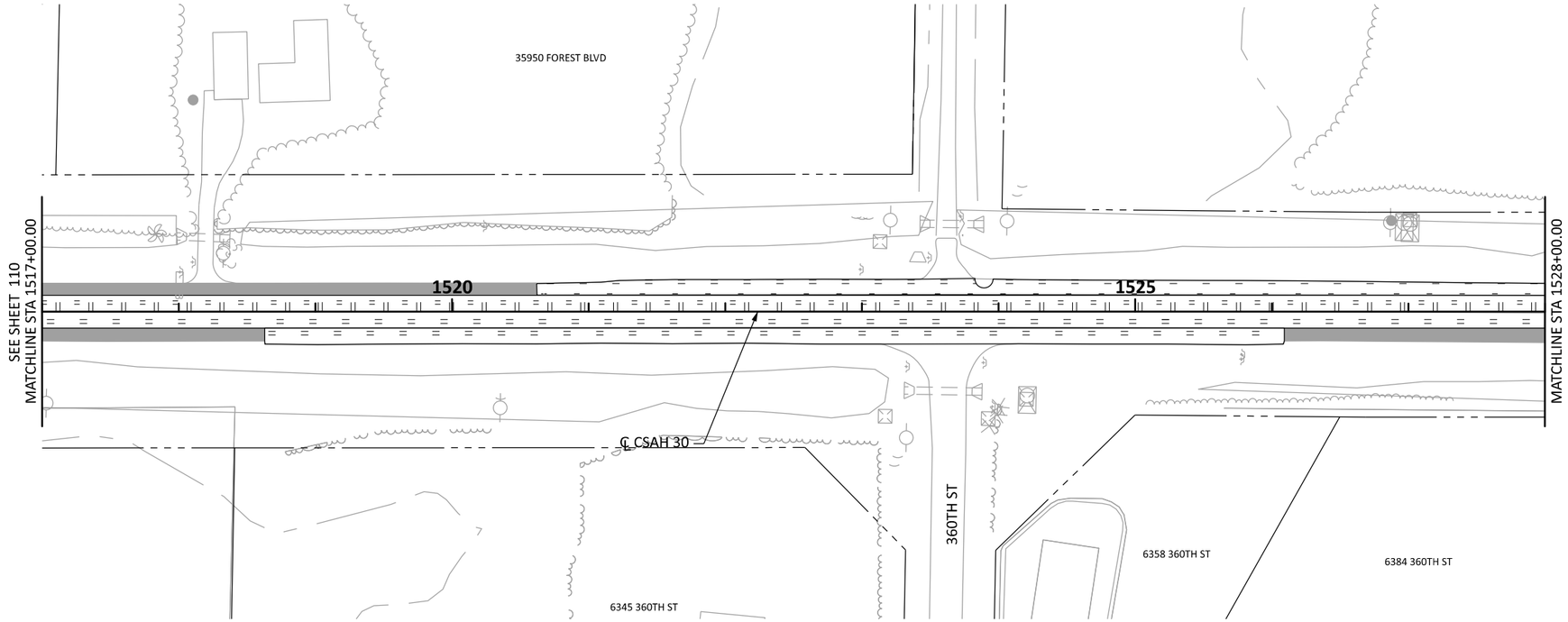
SHEET 110 OF 216 SHEETS



SCALE IN FEET
0 50 100

LEGEND

- MILL BITUMINOUS SURFACE (2.0")
- FOG SEAL (EXISTING RURAL SHOULDERS)
- REMOVE BITUMINOUS PAVEMENT
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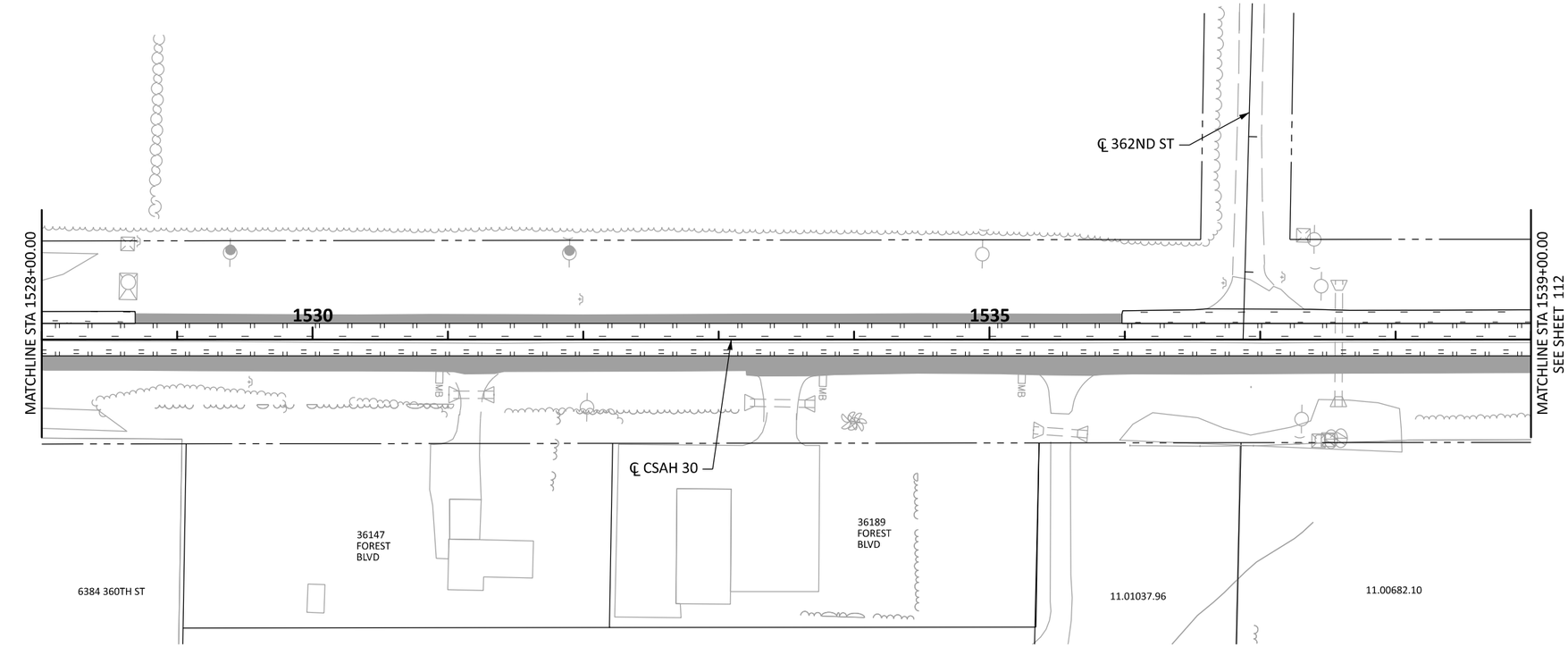
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- P — REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION



SCALE IN FEET
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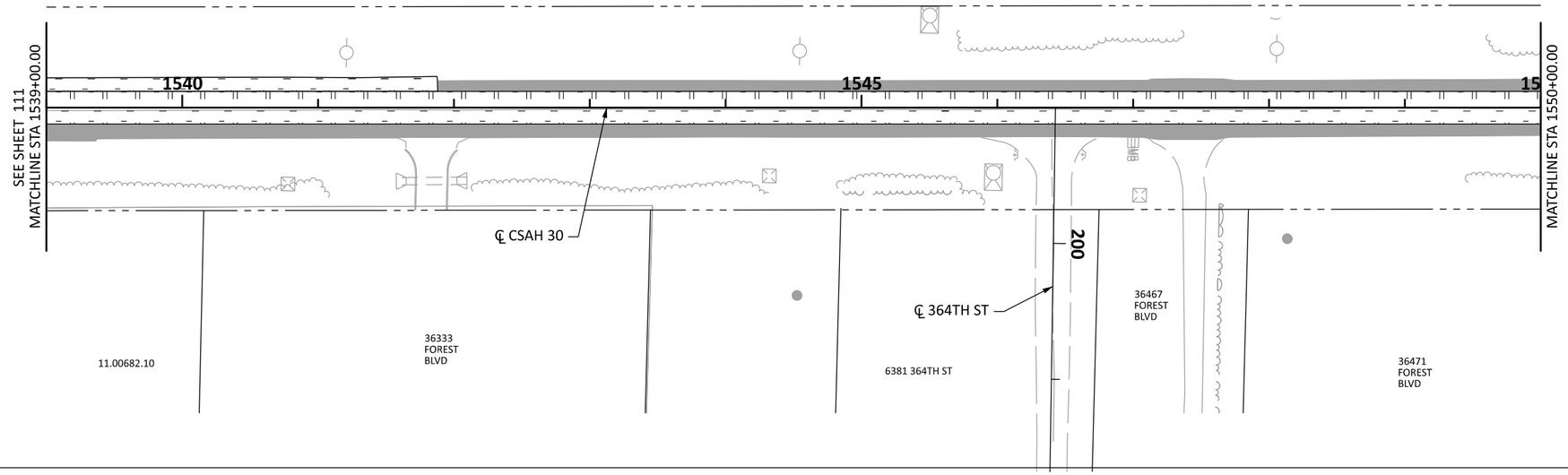
SHEET 111 OF 216 SHEETS



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LEGEND

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- REMOVE BITUMINOUS PAVEMENT
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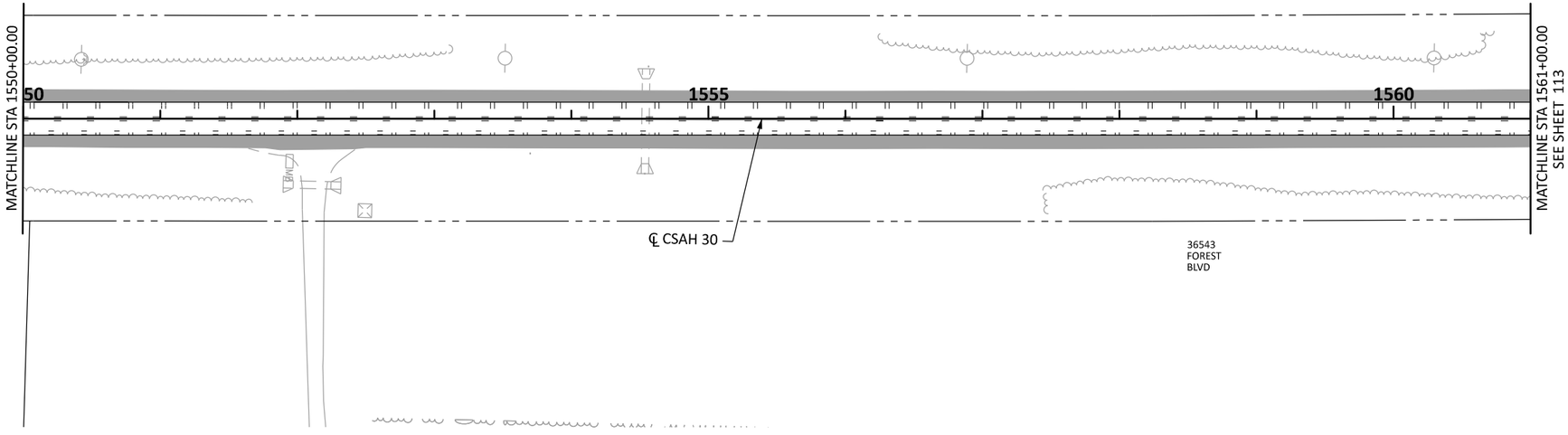
- REMOVE GUARDRAIL- TENSION

110066700



SCALE IN FEET
0 50 100

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

1. EXACT LIMITS OF CLEARING AND GRUBBING WILL BE ESTABLISHED IN THE FIELD.
2. REMOVAL OF ALL AGGREGATE SURFACING REGARDLESS OF THICKNESS SHALL BE INCLUDED IN EXCAVATION - COMMON.
3. SAWCUTTING FOR CONCRETE CURB AND GUTTER SHALL BE INCIDENTAL.
4. SEE SIGNING PLANS FOR ADDITIONAL REMOVALS.
5. SEE SANITARY AND WATERMAIN PLANS FOR MORE DETAILS.

DATE: 9/12/2024 2:04:56 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

wsb

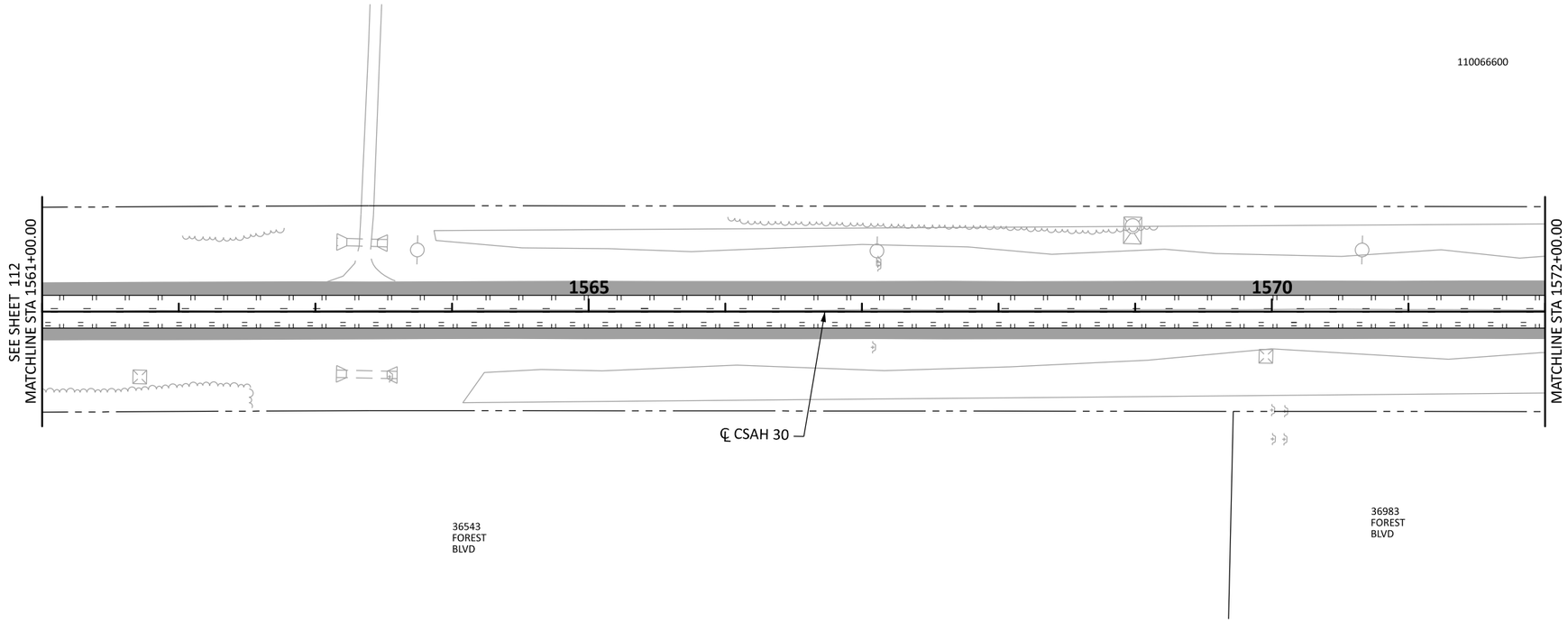
Chisago COUNTY USA

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

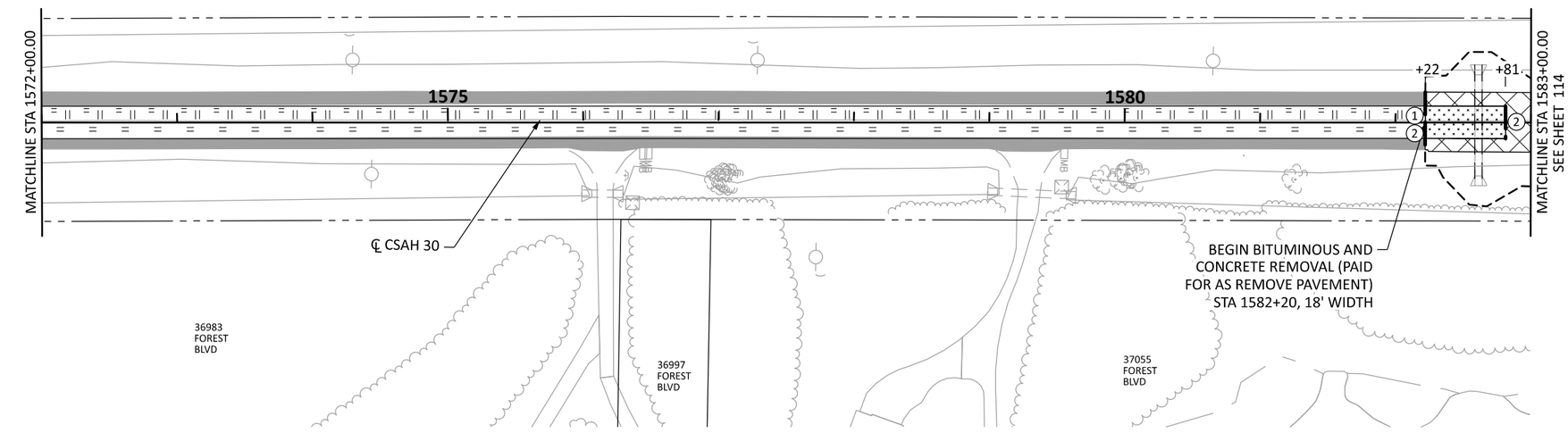
SHEET 112 OF 216 SHEETS



SCALE IN FEET
0 50 100

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)
- (MB) RELOCATE MAILBOX SUPPORT
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- (P) REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION



SCALE IN FEET
0 50 100

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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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH
Plan By: MKV
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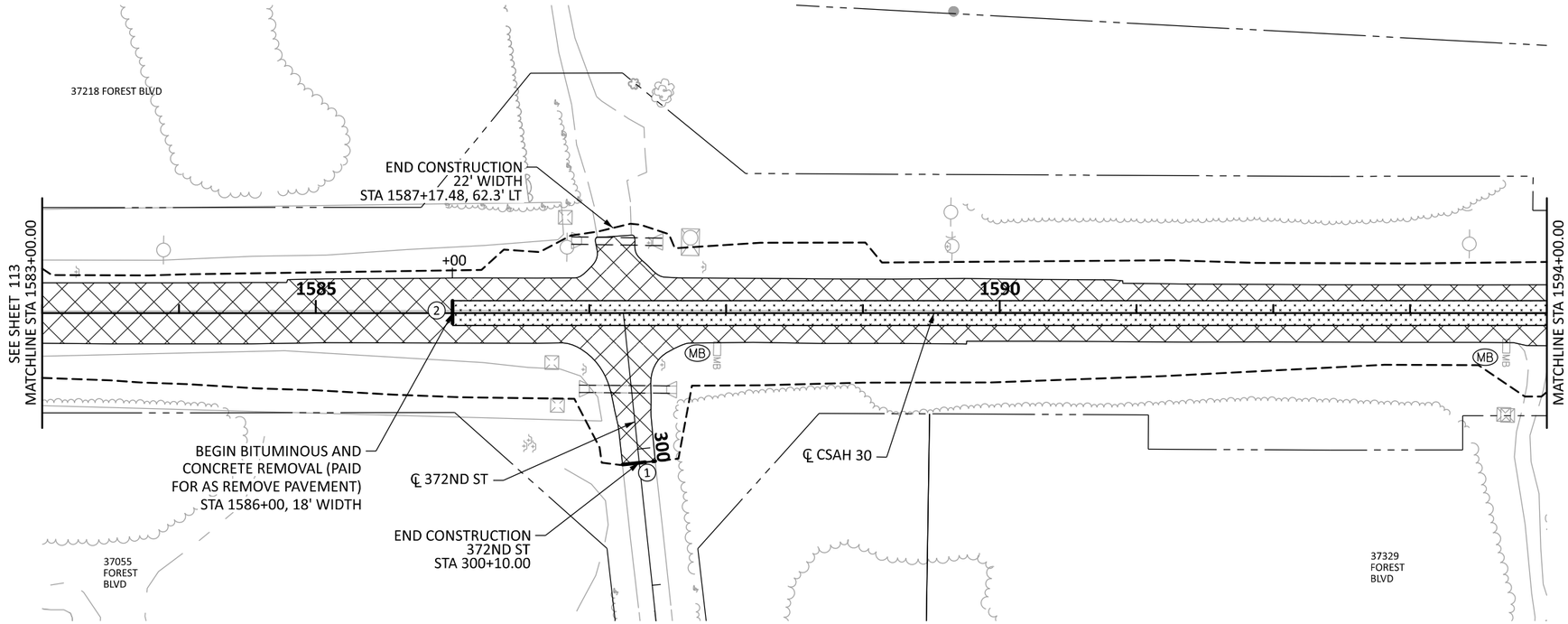
Chisago COUNTY USA

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 113 OF 216 SHEETS



SCALE IN FEET
0 50 100

LEGEND

- MILL BITUMINOUS SURFACE (2.0")
- FOG SEAL (EXISTING RURAL SHOULDERS)
- REMOVE BITUMINOUS PAVEMENT
- REMOVE PAVEMENT
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- REMOVE BITUMINOUS DRIVEWAY PAVEMENT
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- REMOVE CONCRETE WALK
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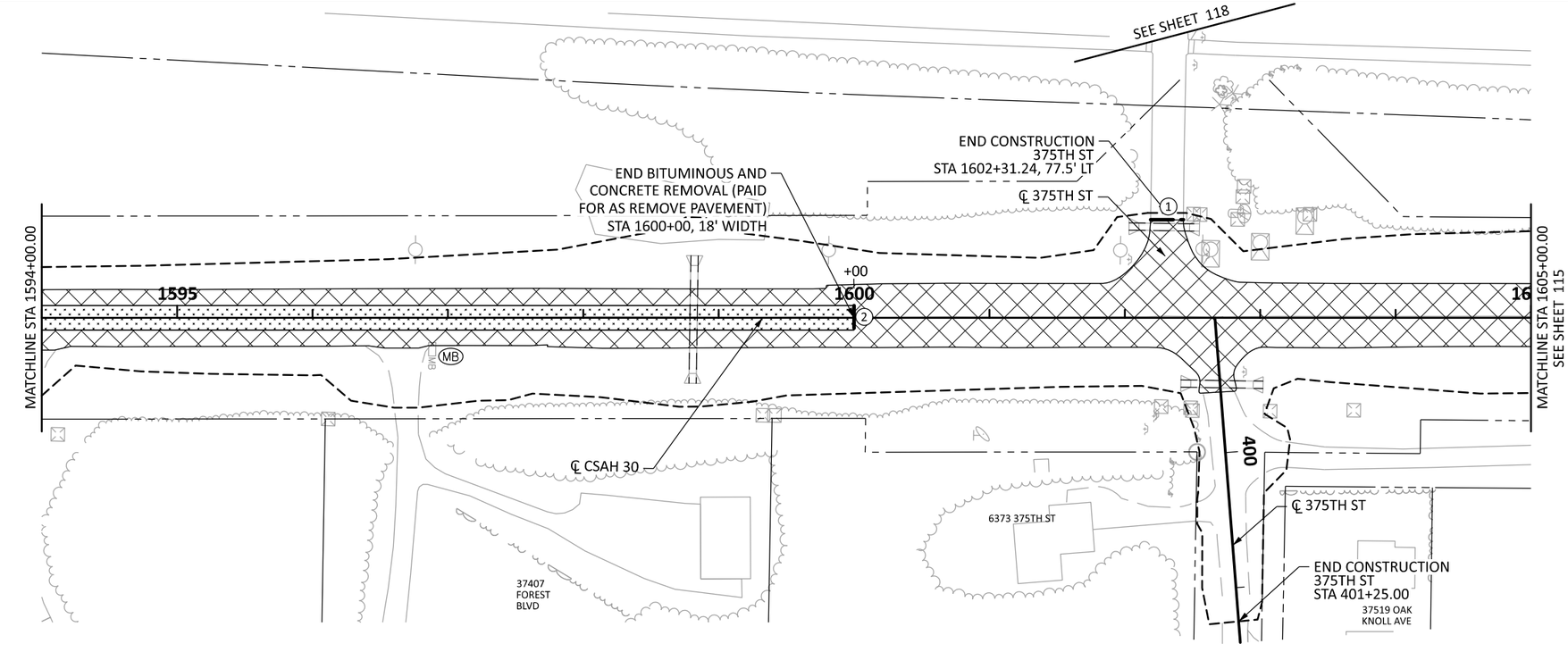
- (MB) RELOCATE MAILBOX SUPPORT
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION



SCALE IN FEET
0 50 100

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
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NOTES

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Design By: NEH
Plan By: MKV
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NICHOLAS E. HENTGES, PE
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Chisago COUNTY USA

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 2:04:58 PM
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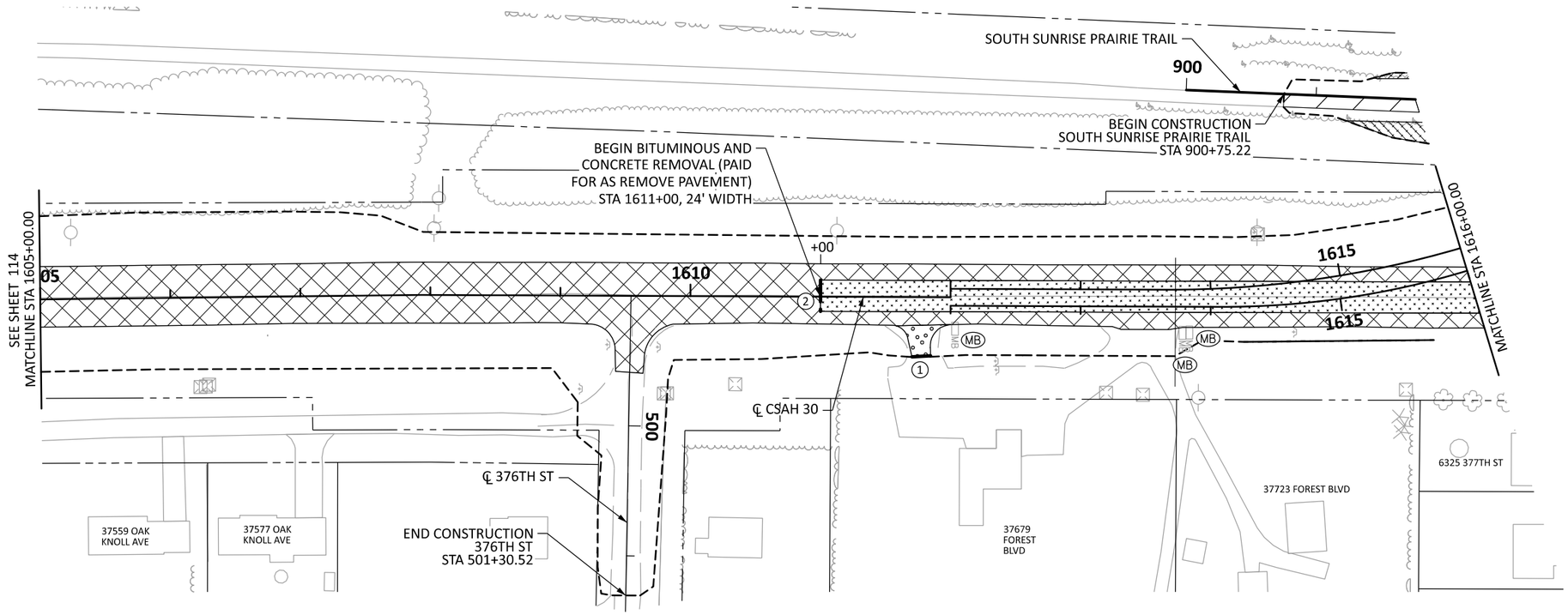
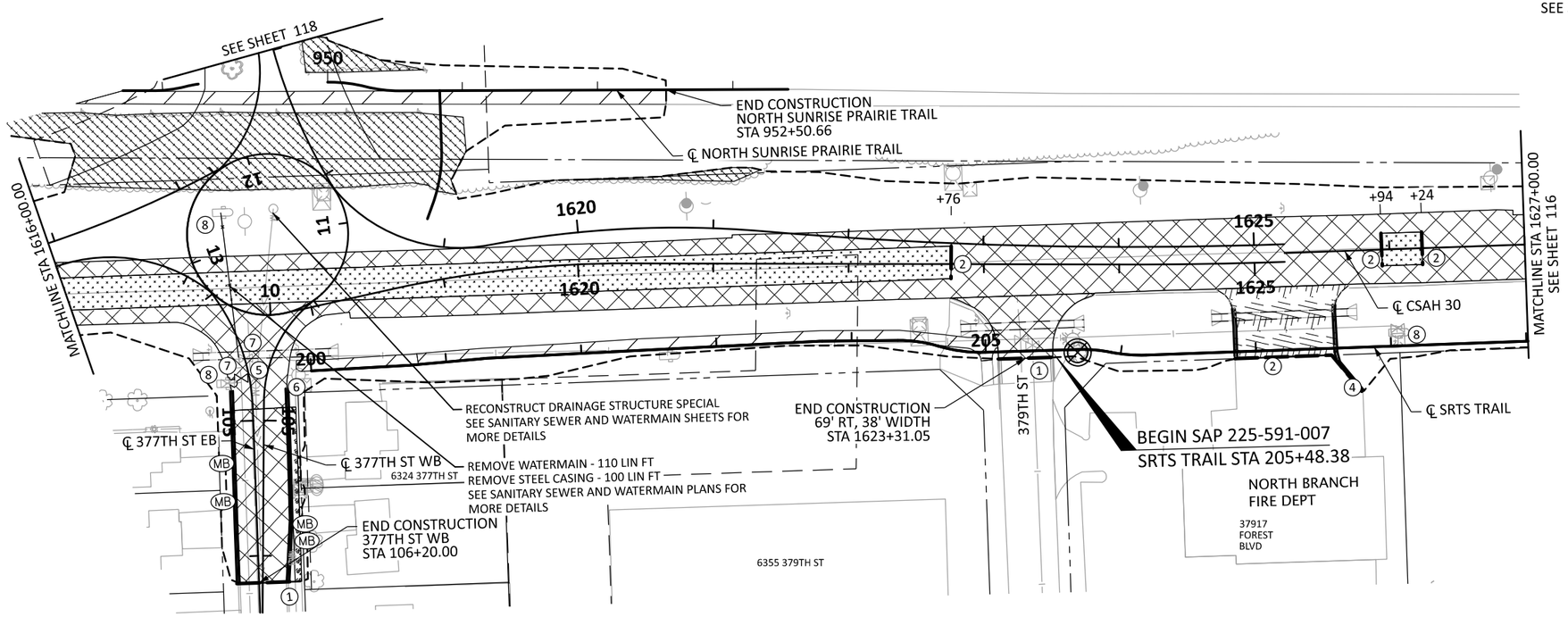


SEE SHEET 116



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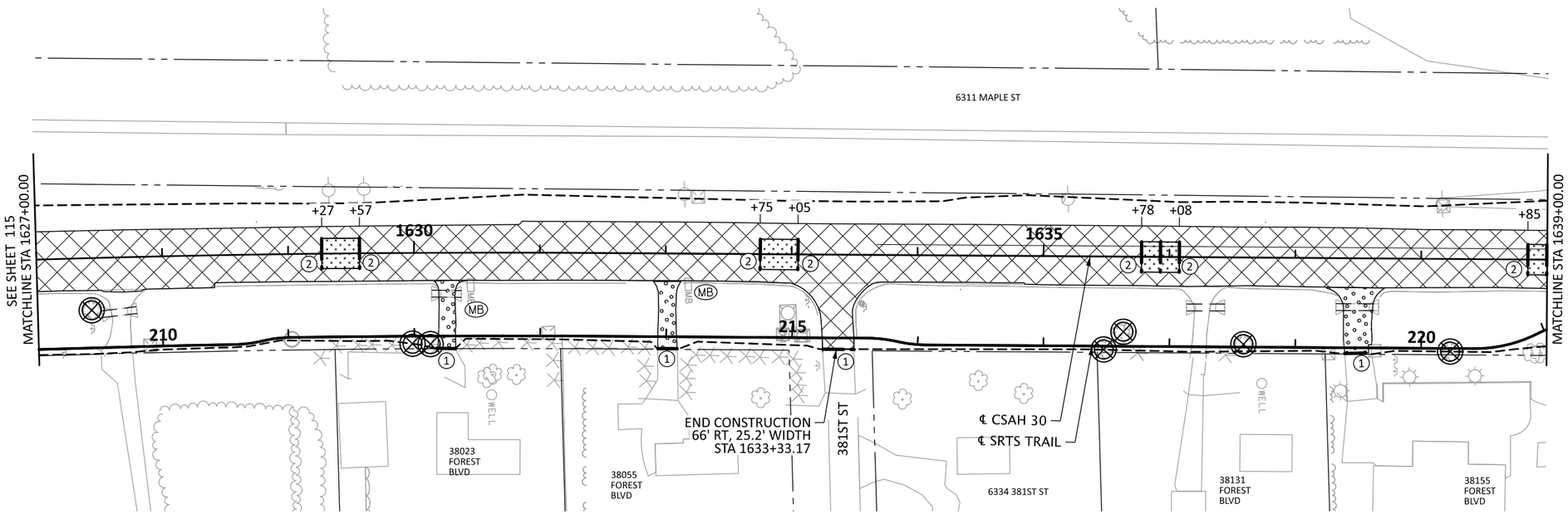
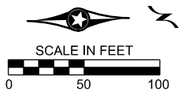
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 115 OF 216 SHEETS





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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- CLEAR & GRUB TREE (EACH)
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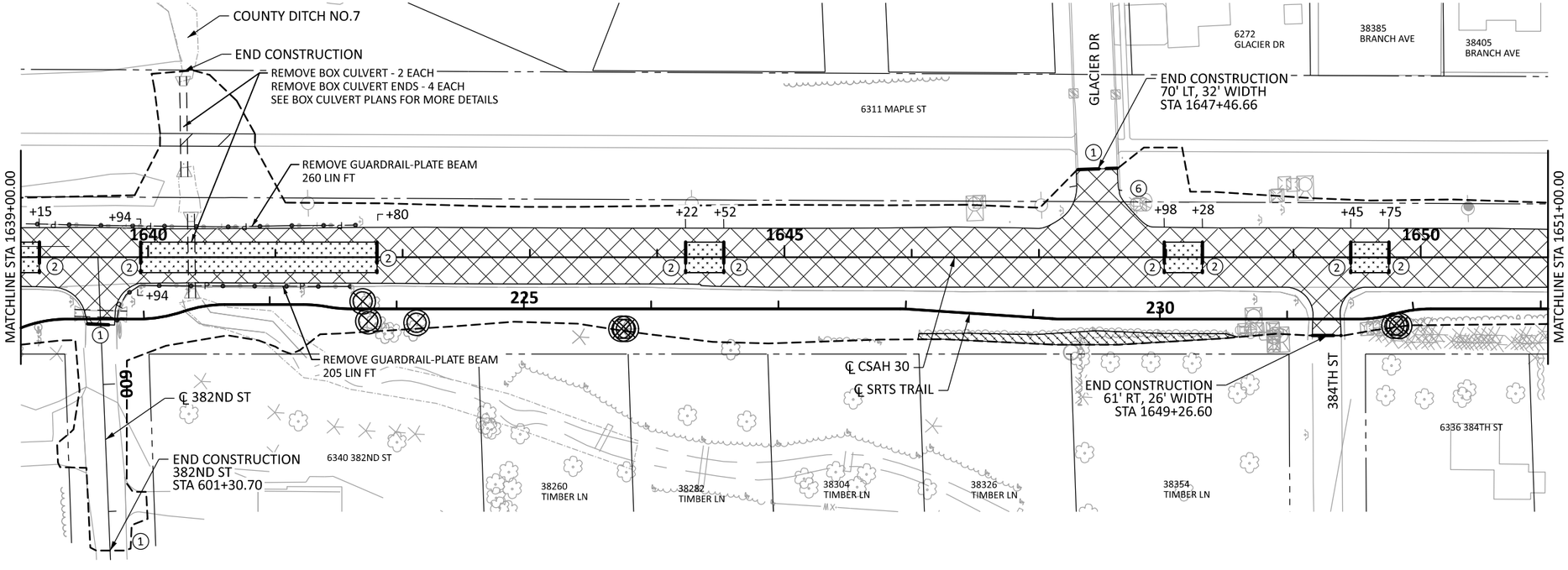
- REMOVE GUARDRAIL- TENSION



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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PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_rem

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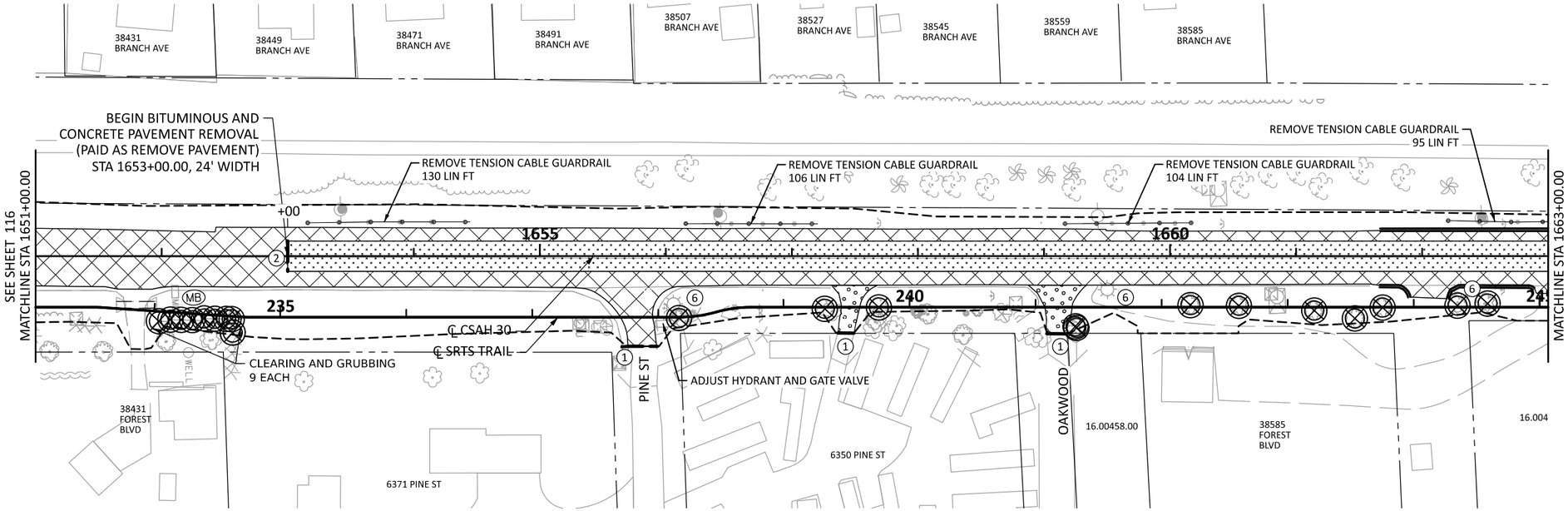
Chisago COUNTY USA

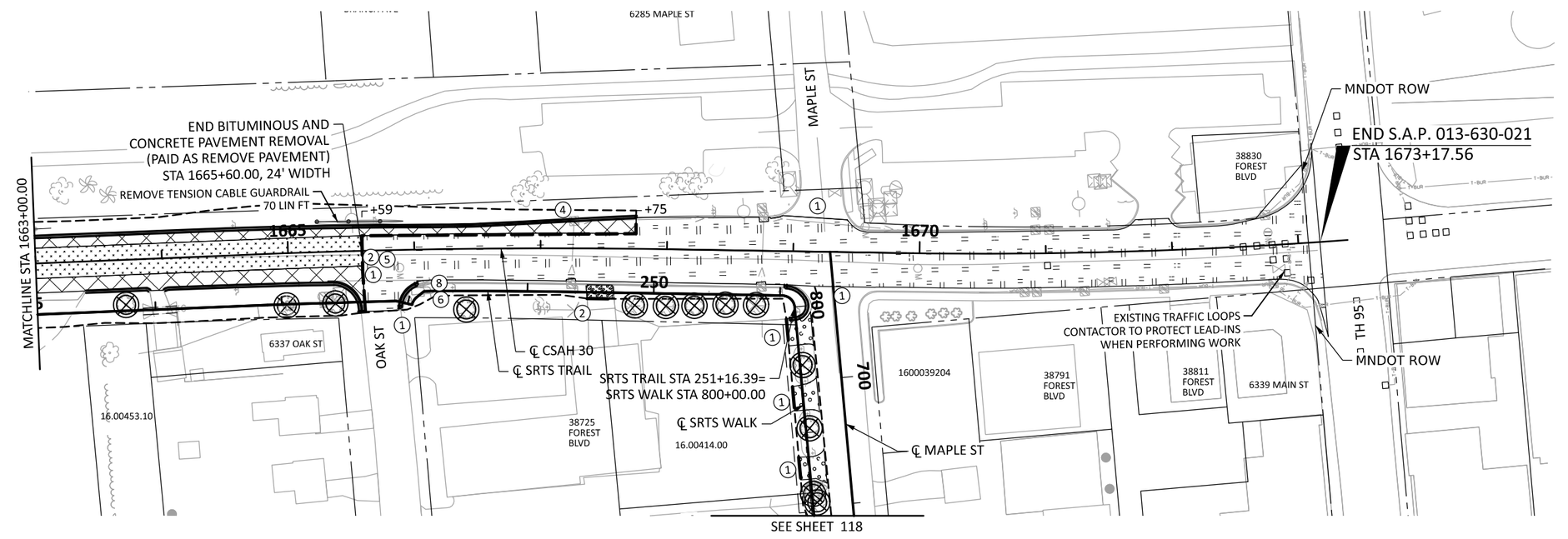
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 116 OF 216 SHEETS





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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

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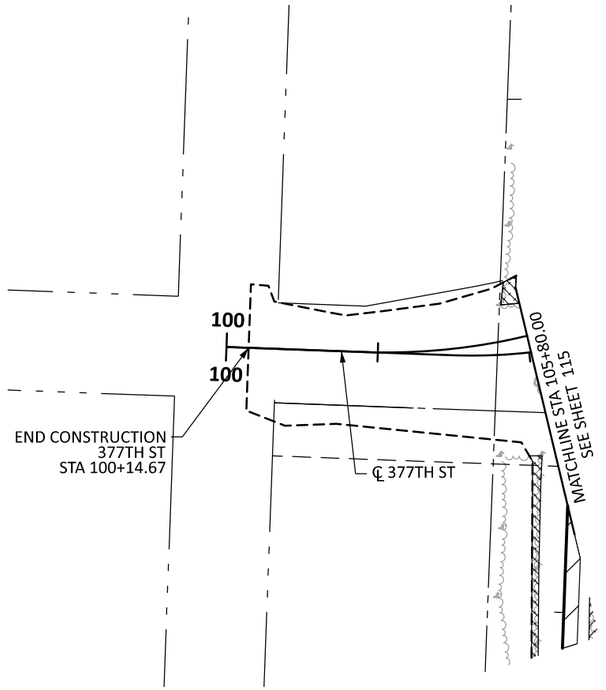

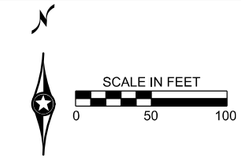

LEGEND

- MILL BITUMINOUS SURFACE (2.0")
- FOG SEAL (EXISTING RURAL SHOULDERS)
- REMOVE BITUMINOUS PAVEMENT
- REMOVE PAVEMENT
- REMOVE CONCRETE DRIVEWAY PAVEMENT
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- CONSTRUCTION LIMITS
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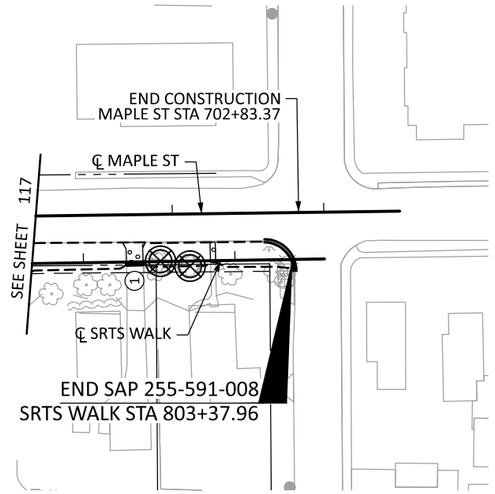
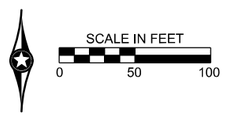
- (P) REMOVE GUARDRAIL- PLATE BEAM
- REMOVE GUARDRAIL- TENSION





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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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

wsb

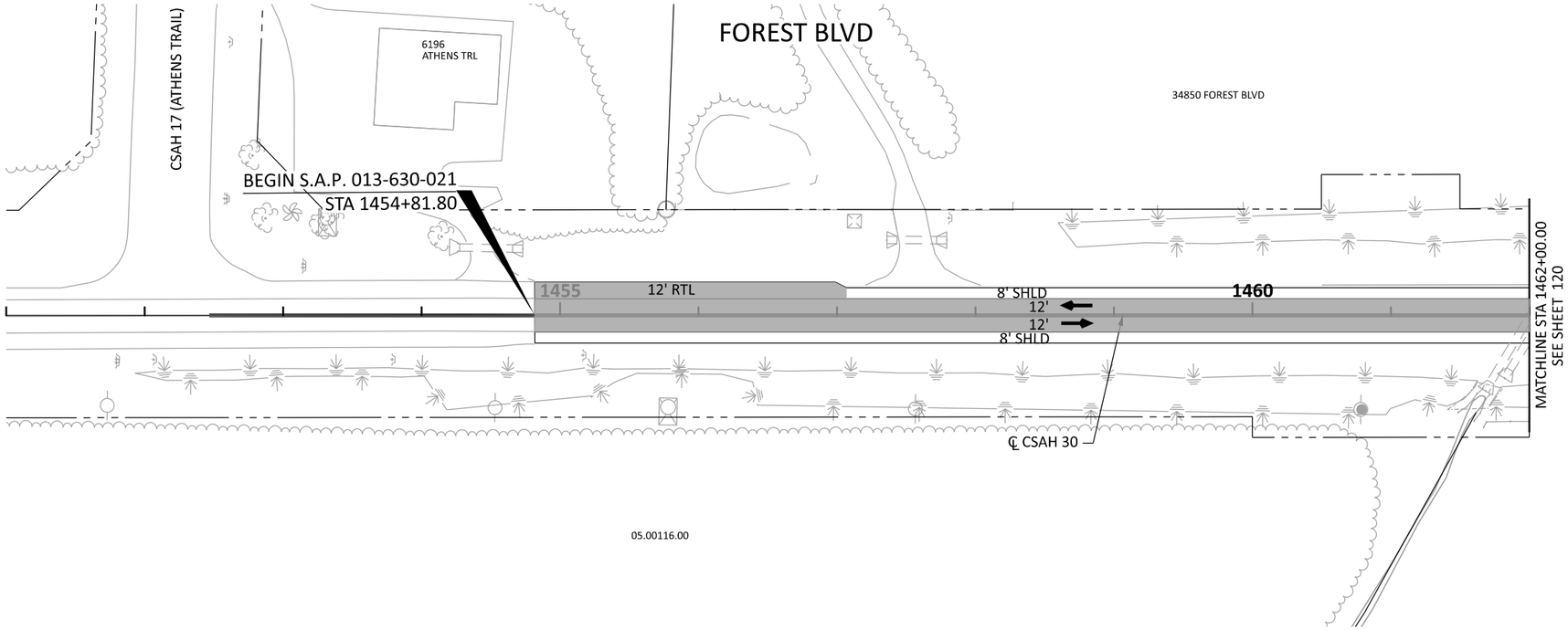
Chisago COUNTY USA

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

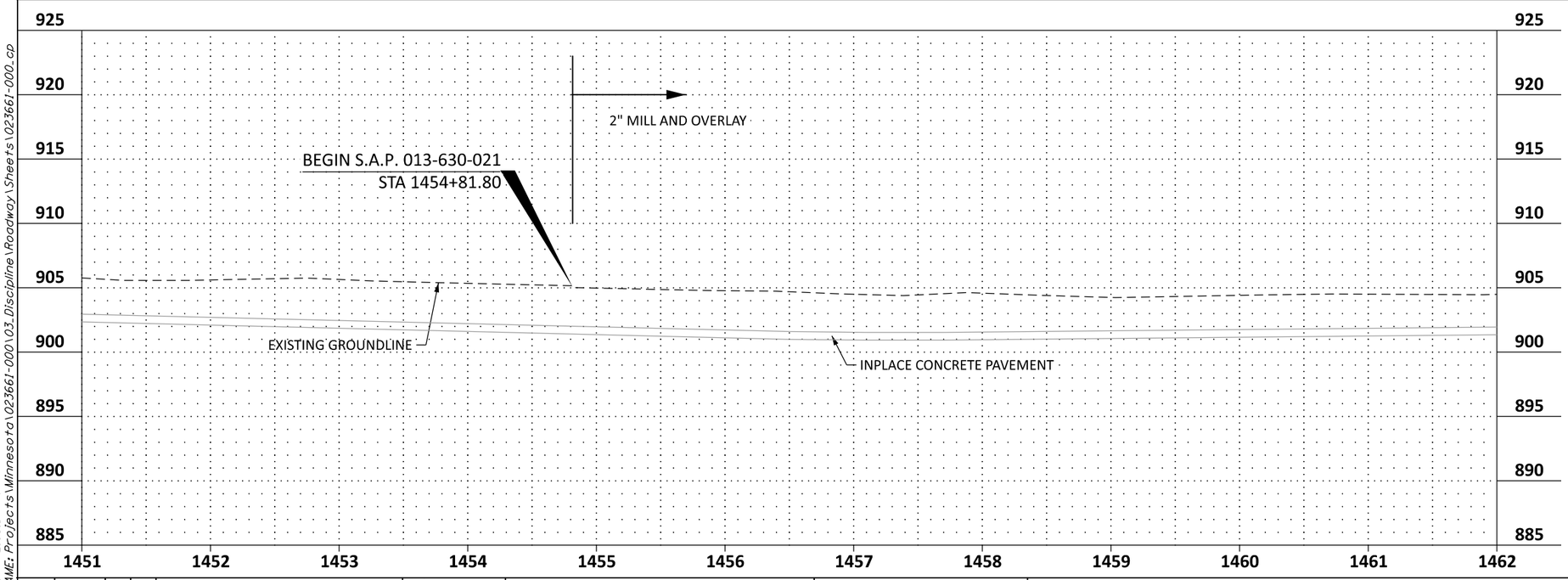


SCALE IN FEET
0 50 100

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

1. ALL DIMENSIONS ARE TO FACE OF CURB OR EDGE OF BITUMINOUS UNLESS OTHERSE NOTED.
2. SEE INTERSECTION DETAILS FOR ADDITIONAL INFORMATION AT INTERSECTIONS.
3. SEE DRIVEWAY DETAIL SHEETS FOR DETAILED DRIVEWAY INFORMATION.

NO.	DATE	BY	CHK	REVISIONS

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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

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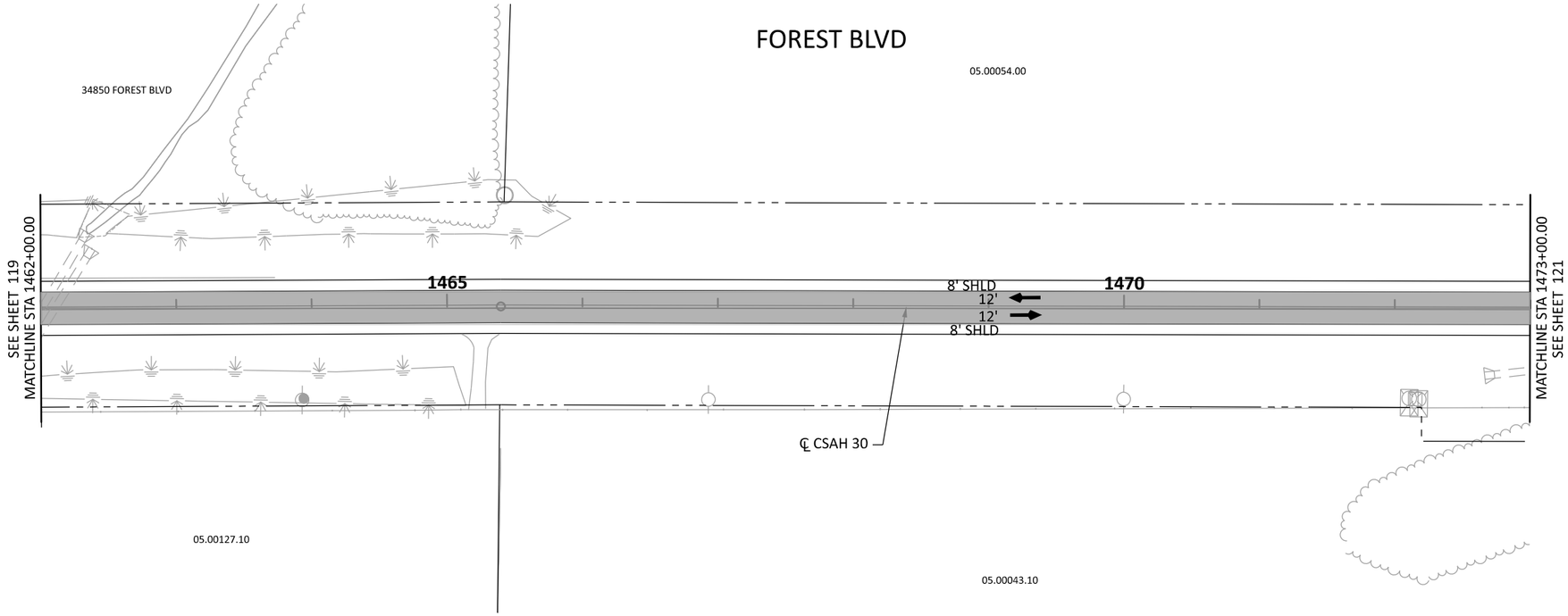
FOREST BLVD



SCALE IN FEET
0 50 100

LEGEND

- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
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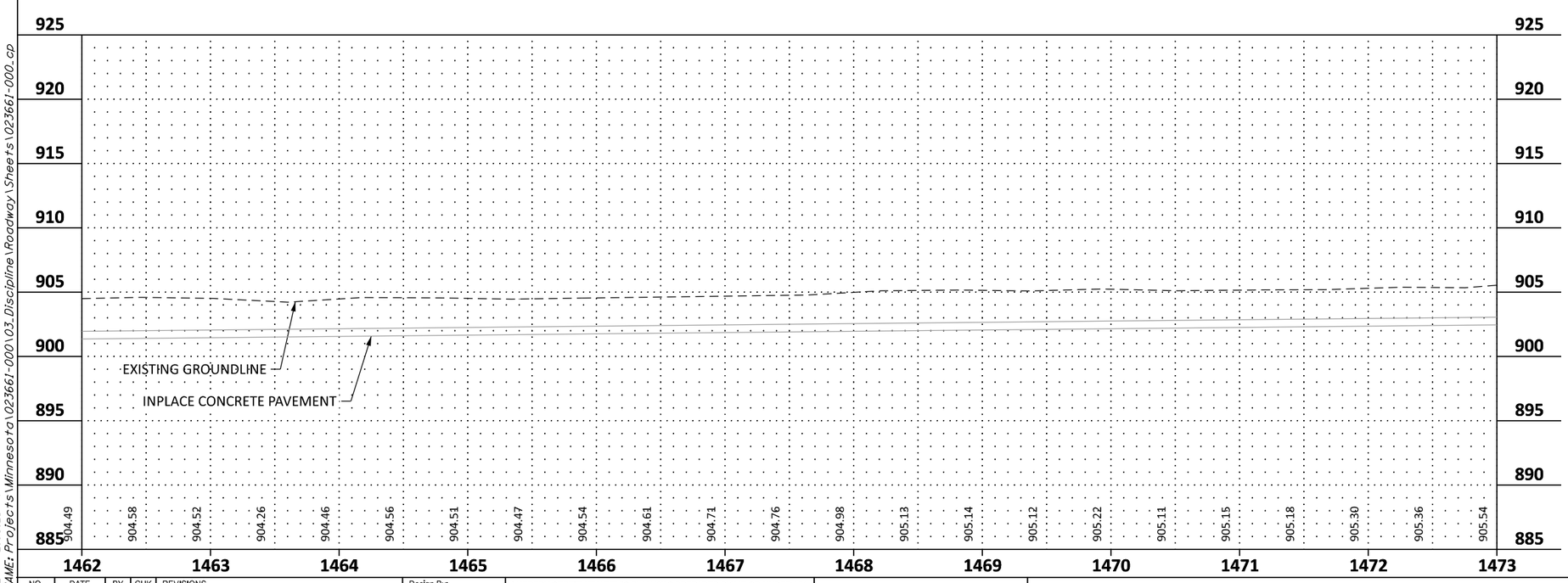

GENERAL NOTES

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2. SEE INTERSECTION DETAILS FOR ADDITIONAL INFORMATION AT INTERSECTIONS.
3. SEE DRIVEWAY DETAIL SHEETS FOR DETAILED DRIVEWAY 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

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 120 OF 216 SHEETS

DATE: 9/12/2024
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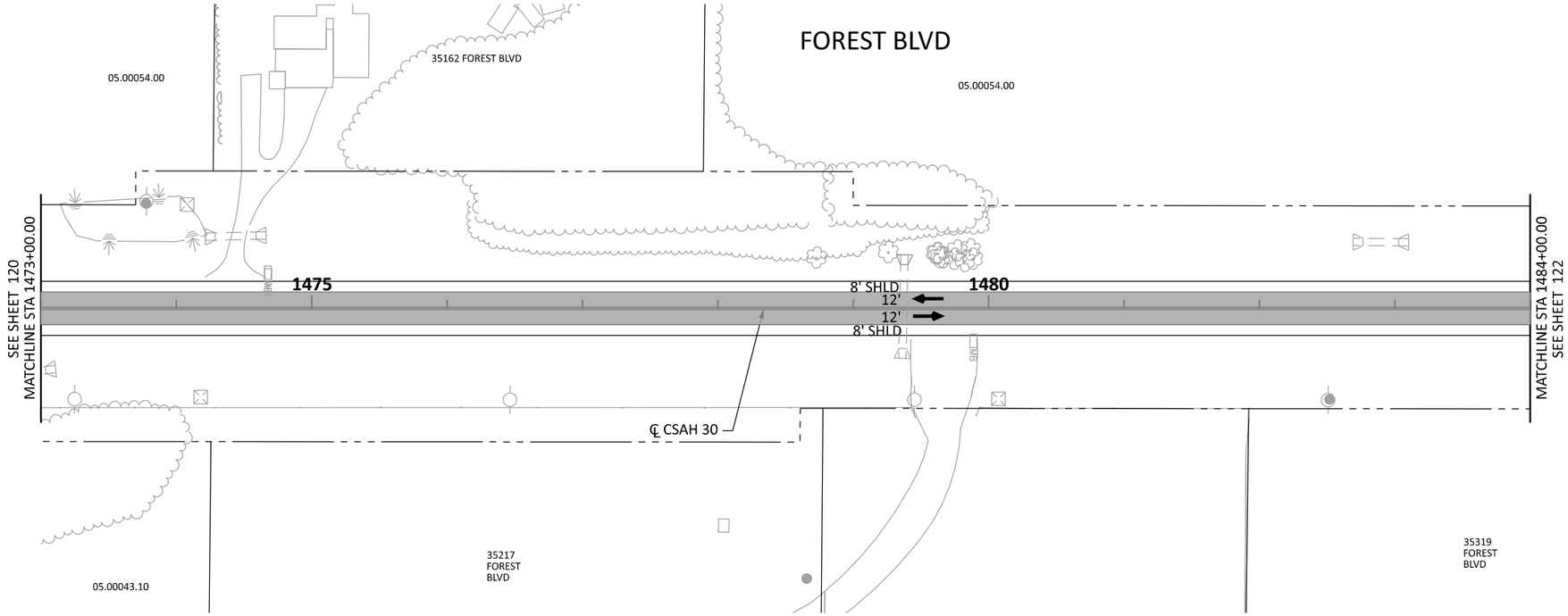
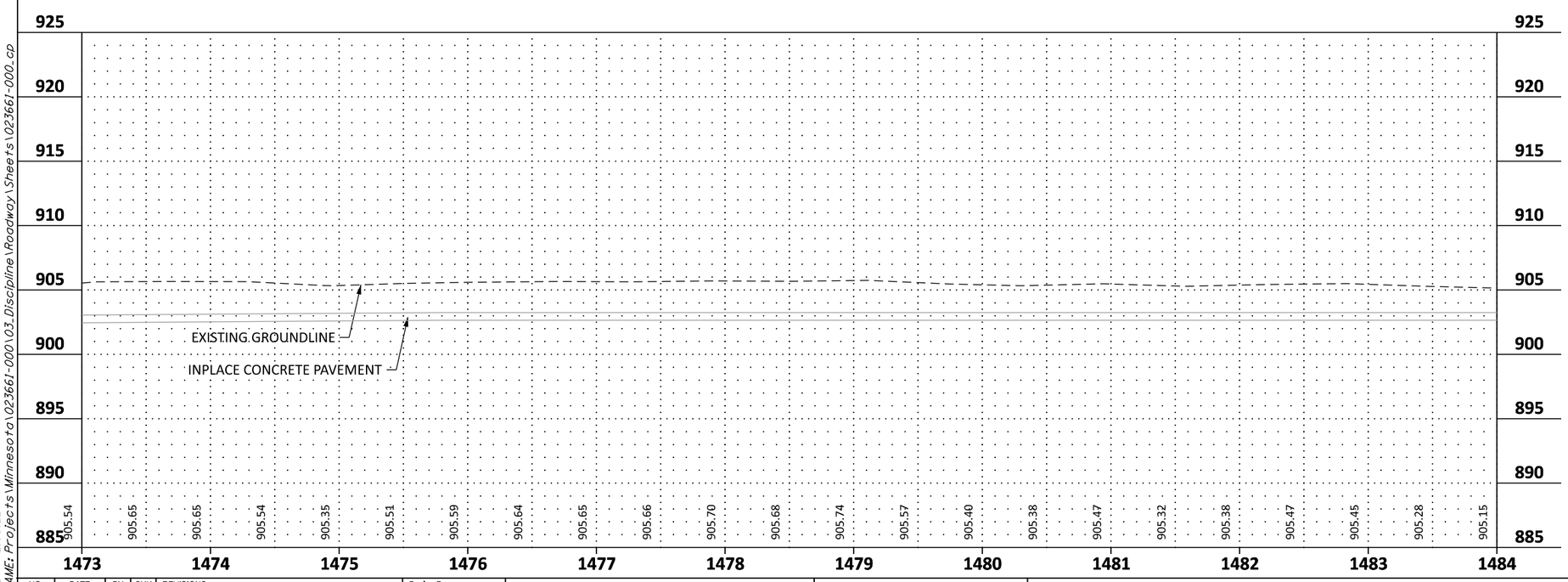


LEGEND

- 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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SHEET 121 OF 216 SHEETS

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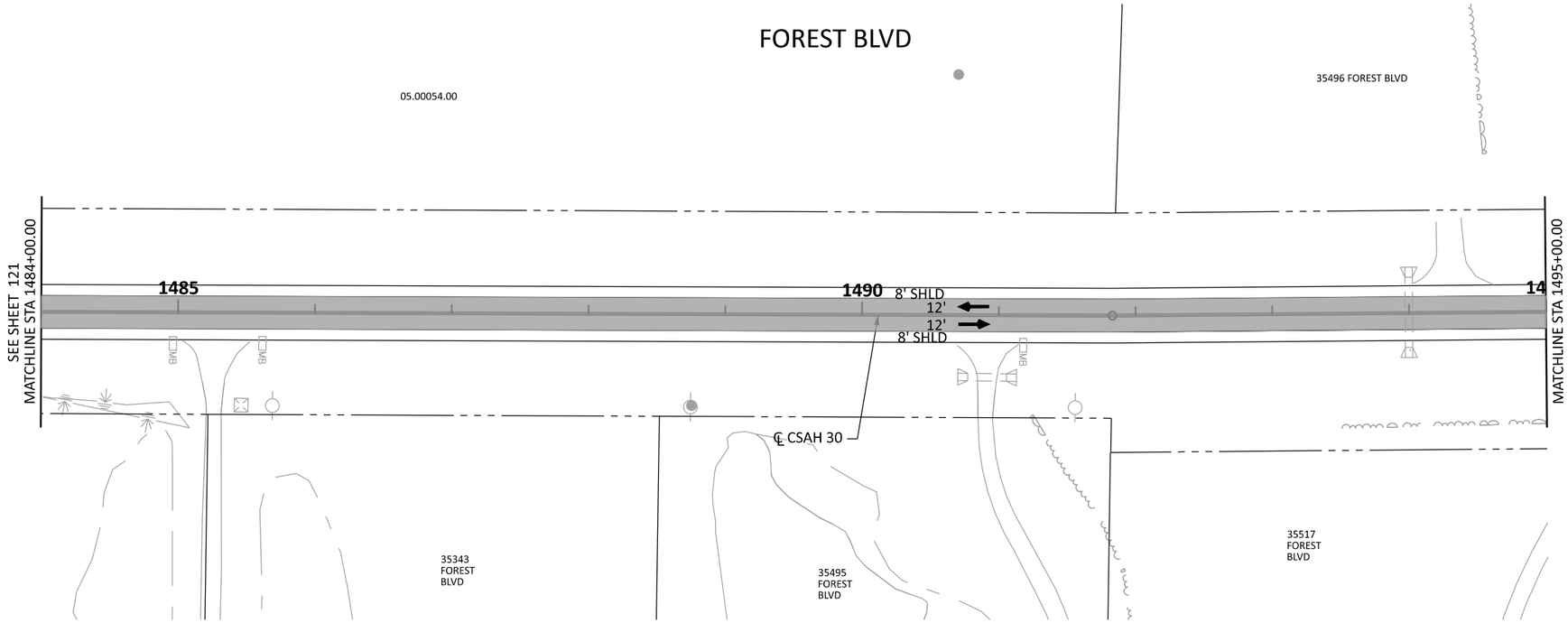

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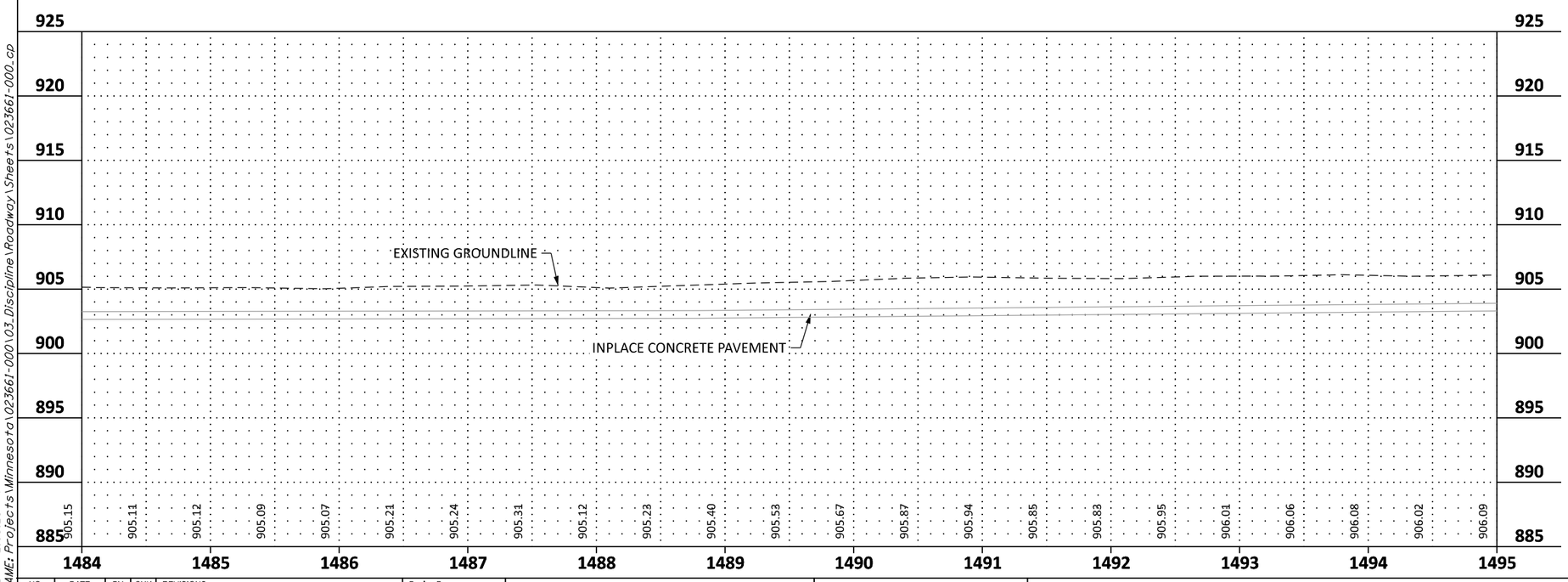

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SHEET 122 OF 216 SHEETS

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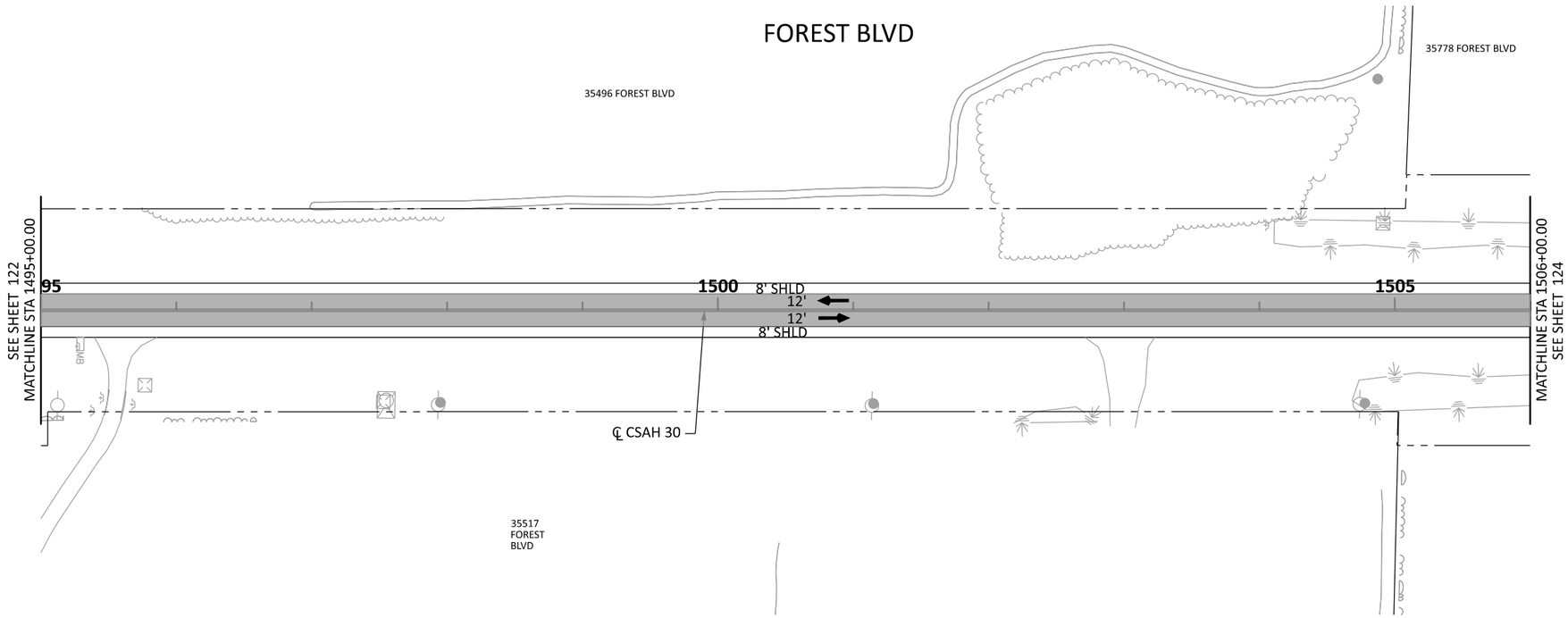

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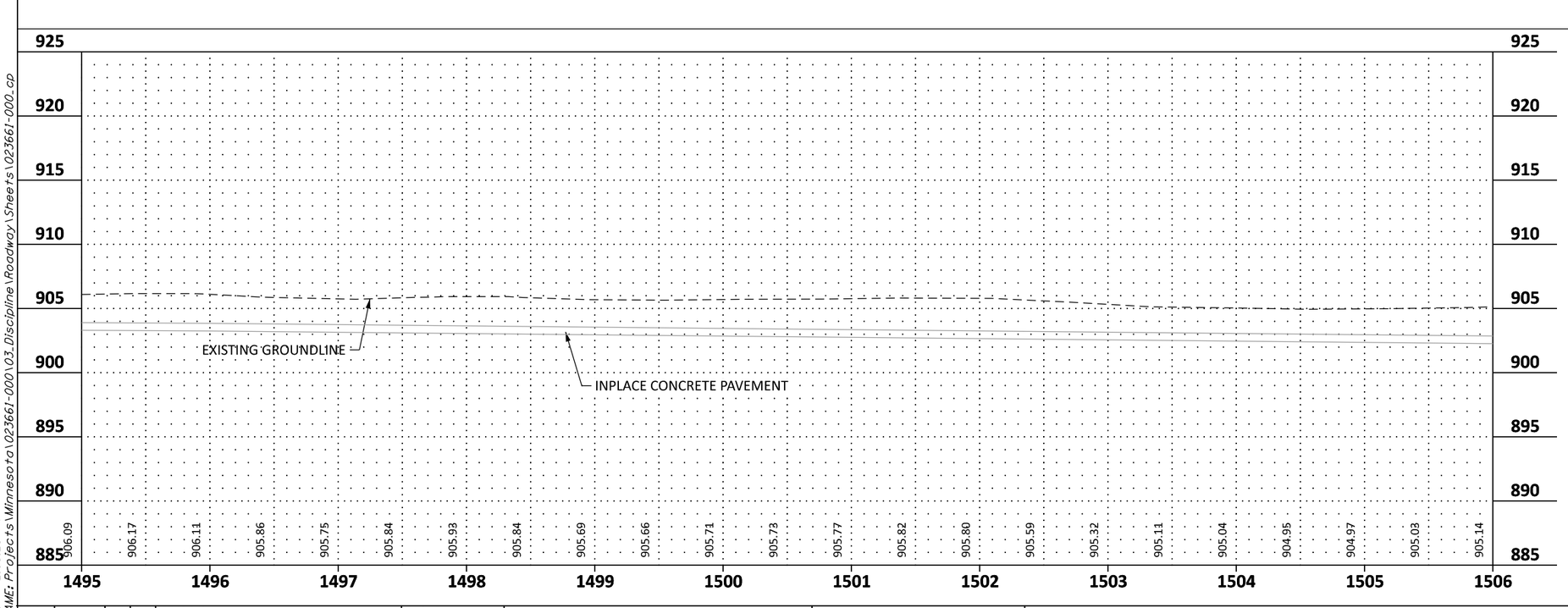

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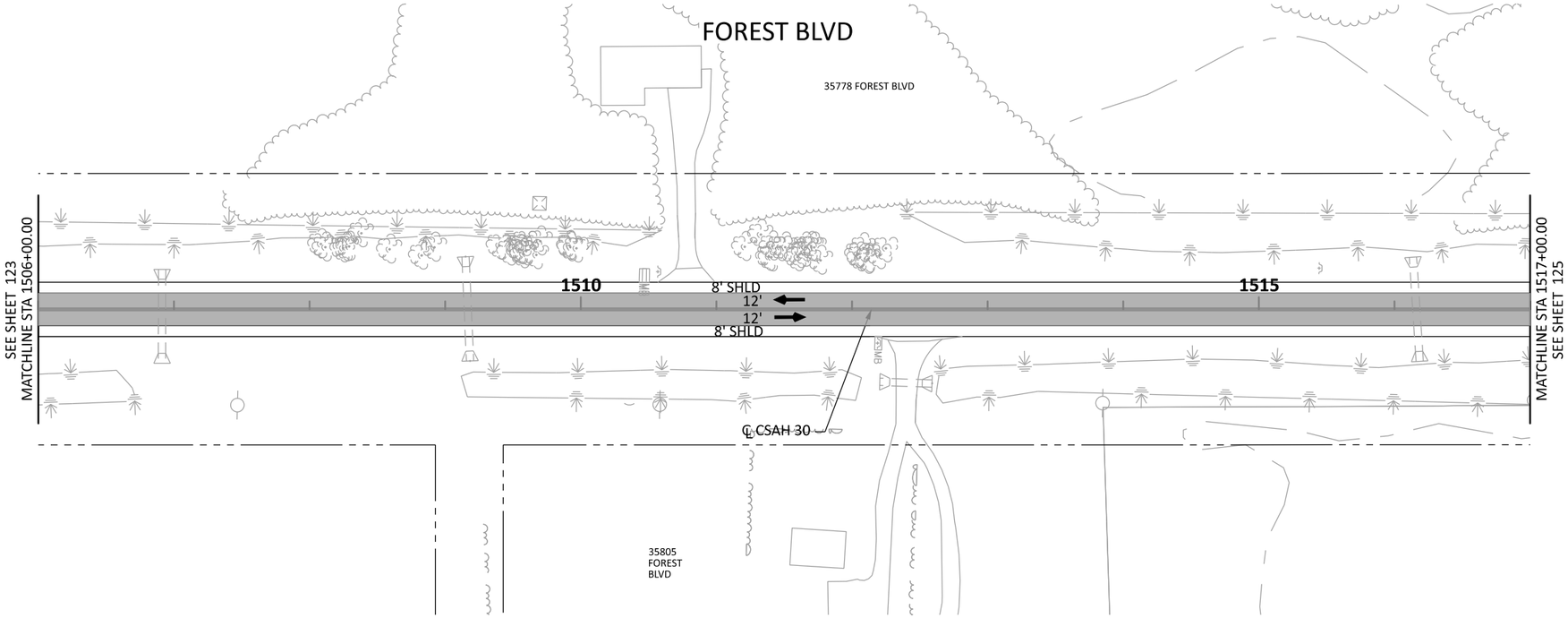
SHEET 123 OF 216 SHEETS



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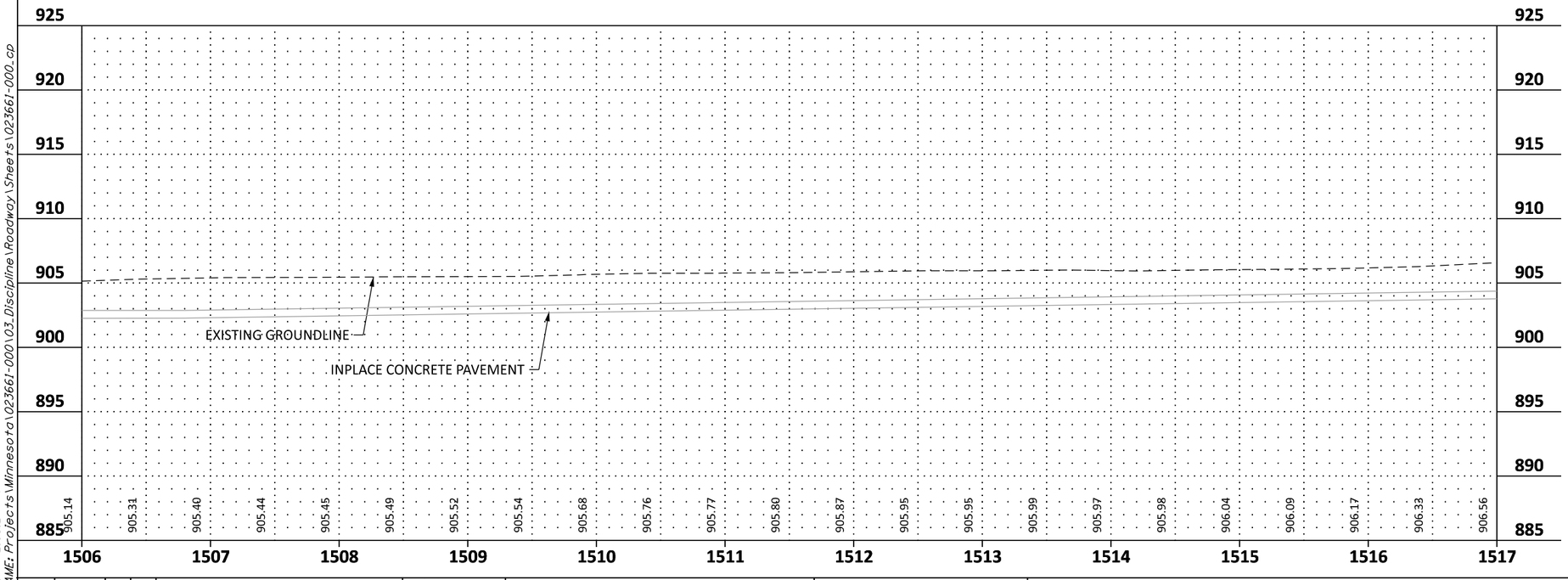

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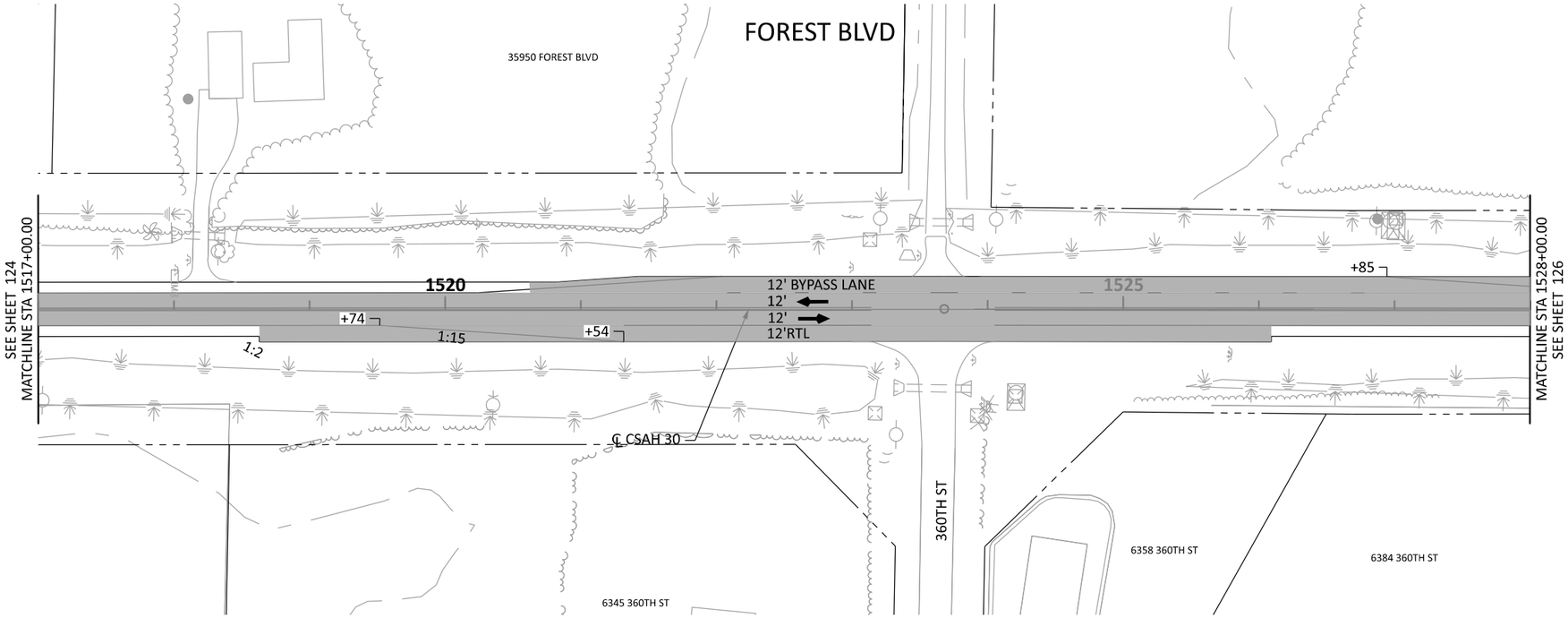
SHEET 124 OF 216 SHEETS

DATE: 9/12/2024 2:05:24 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_cp



SCALE IN FEET
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LEGEND

- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
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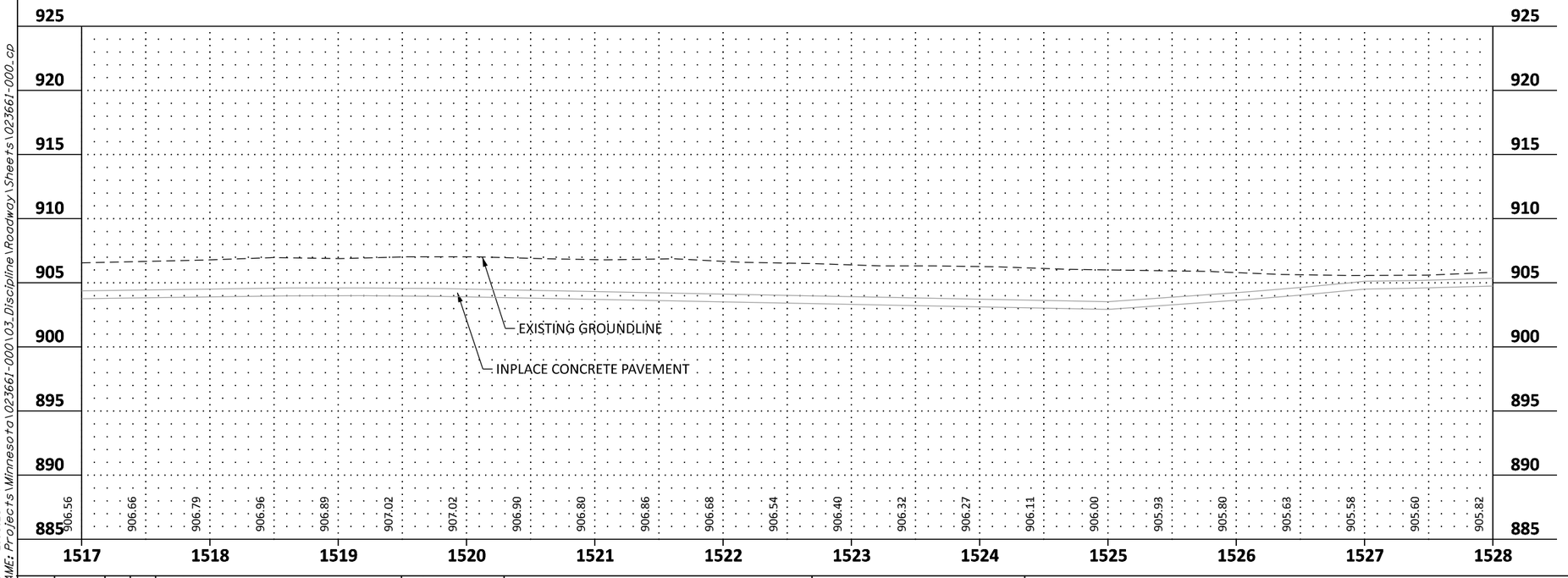

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DATE: 9/12/2024 2:05:25 PM
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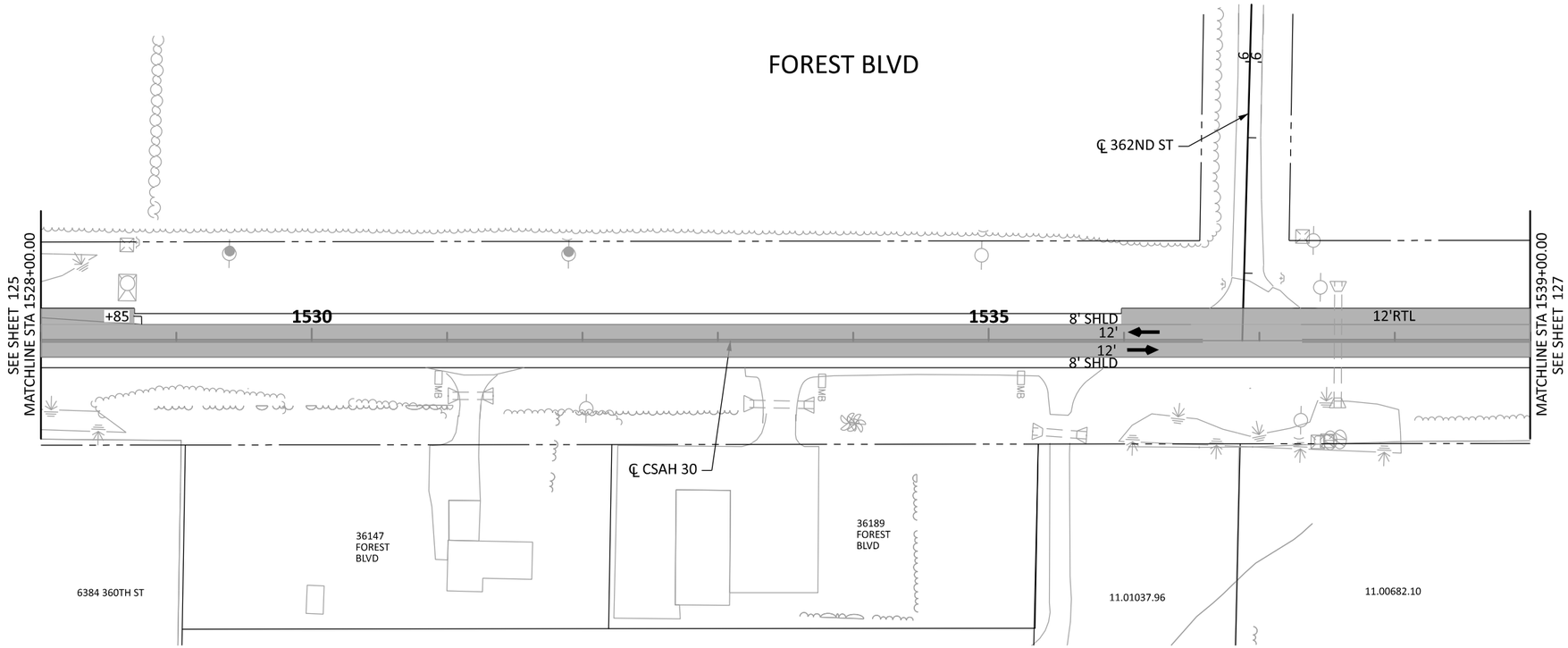
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CONSTRUCTION PLAN & PROFILE
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 125 OF 216 SHEETS



LEGEND

- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
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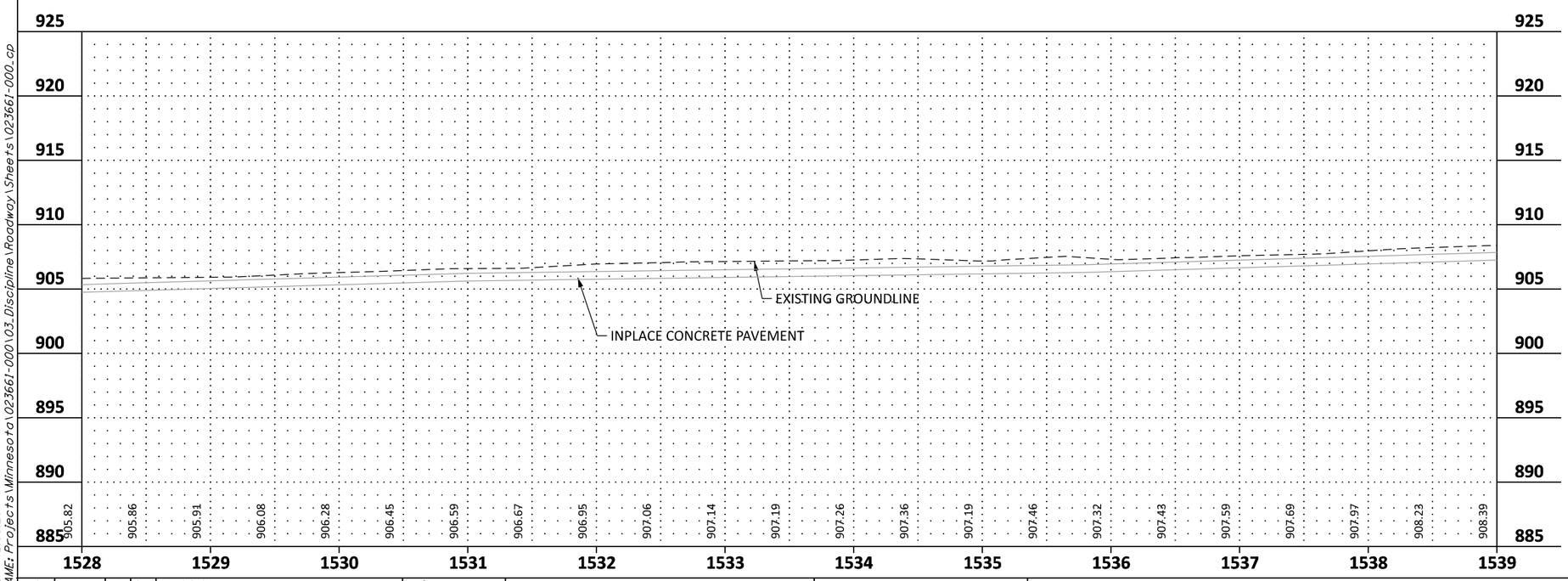

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SHEET 126 OF 216 SHEETS

FOREST BLVD

SCALE IN FEET
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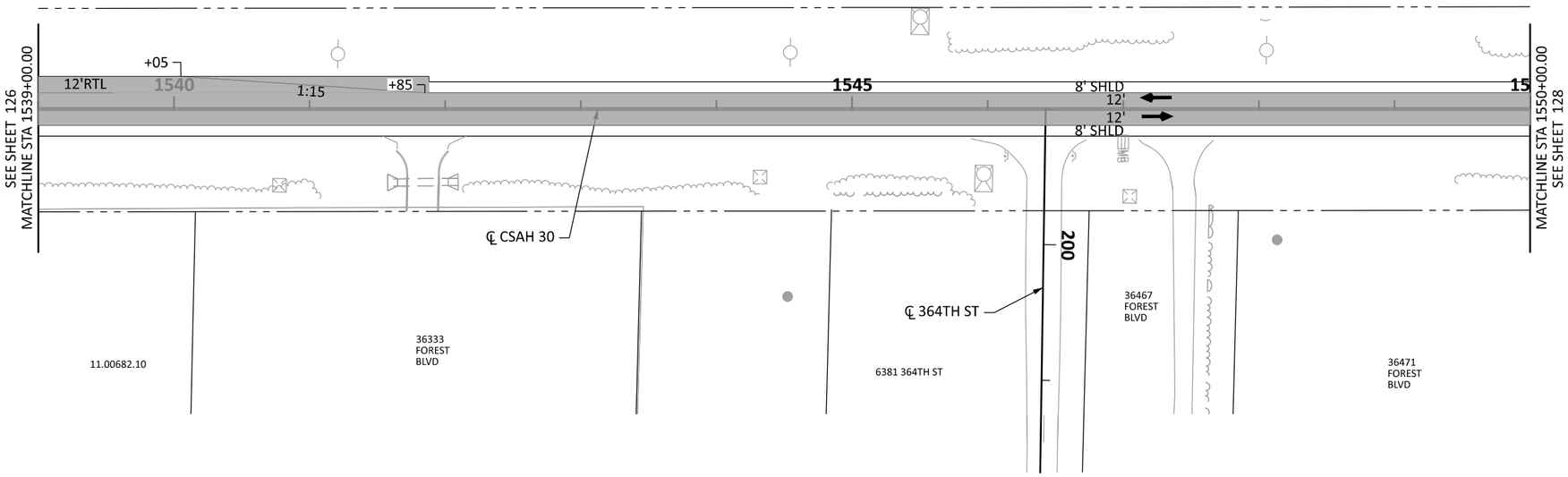

LEGEND

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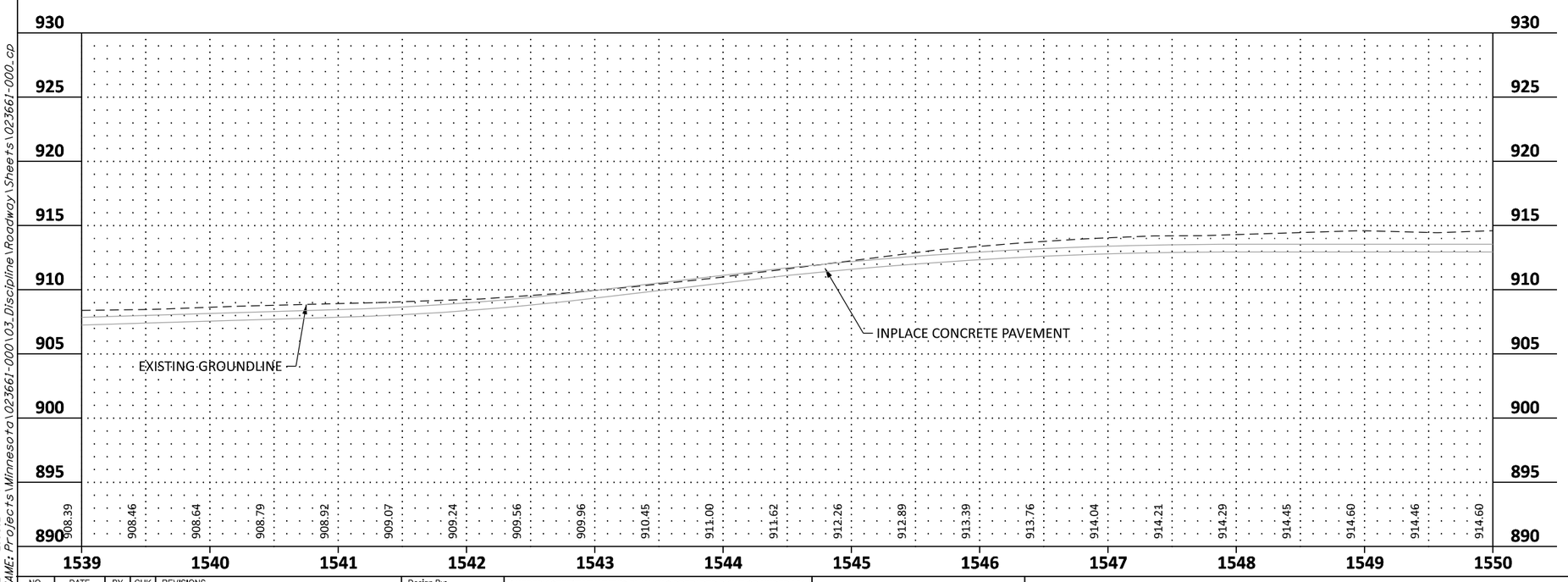

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SHEET 127 OF 216 SHEETS

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110066700

FOREST BLVD

SCALE IN FEET
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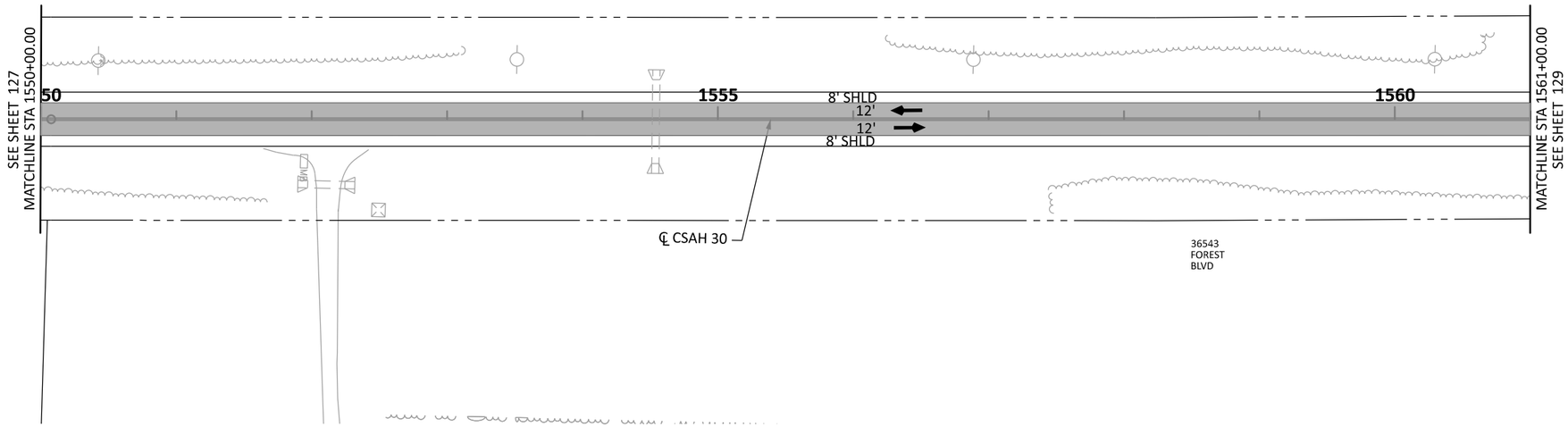

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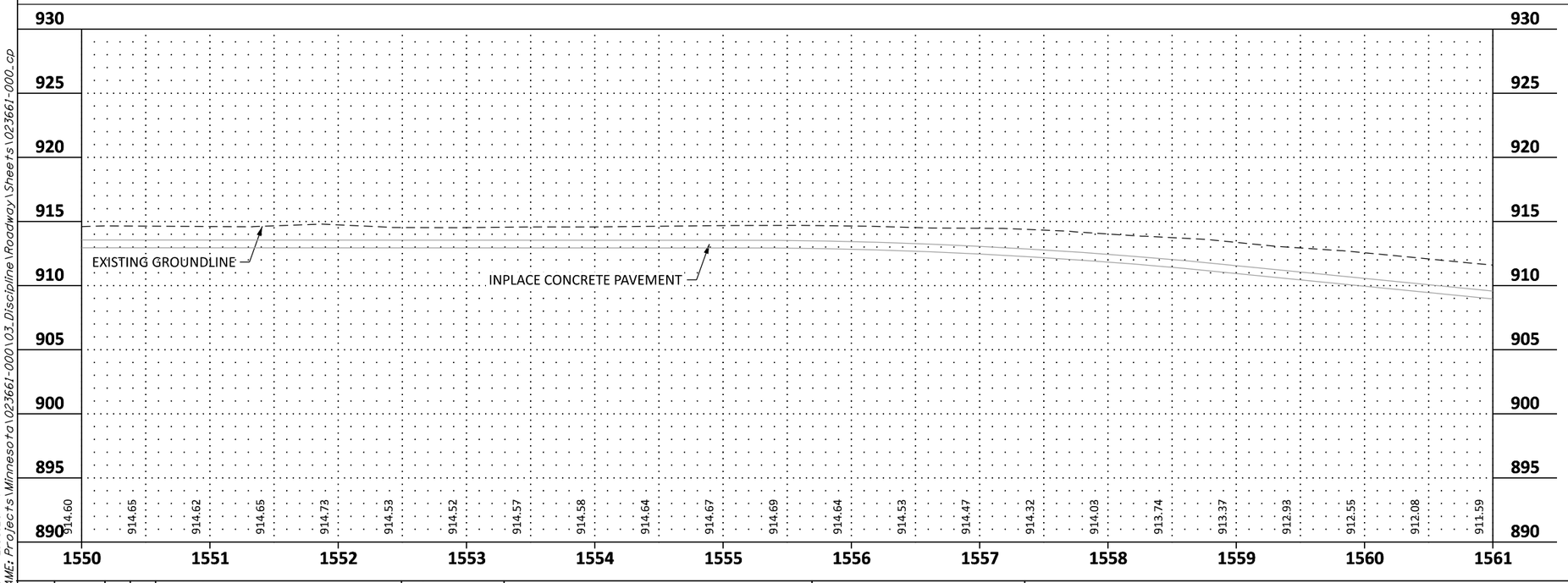

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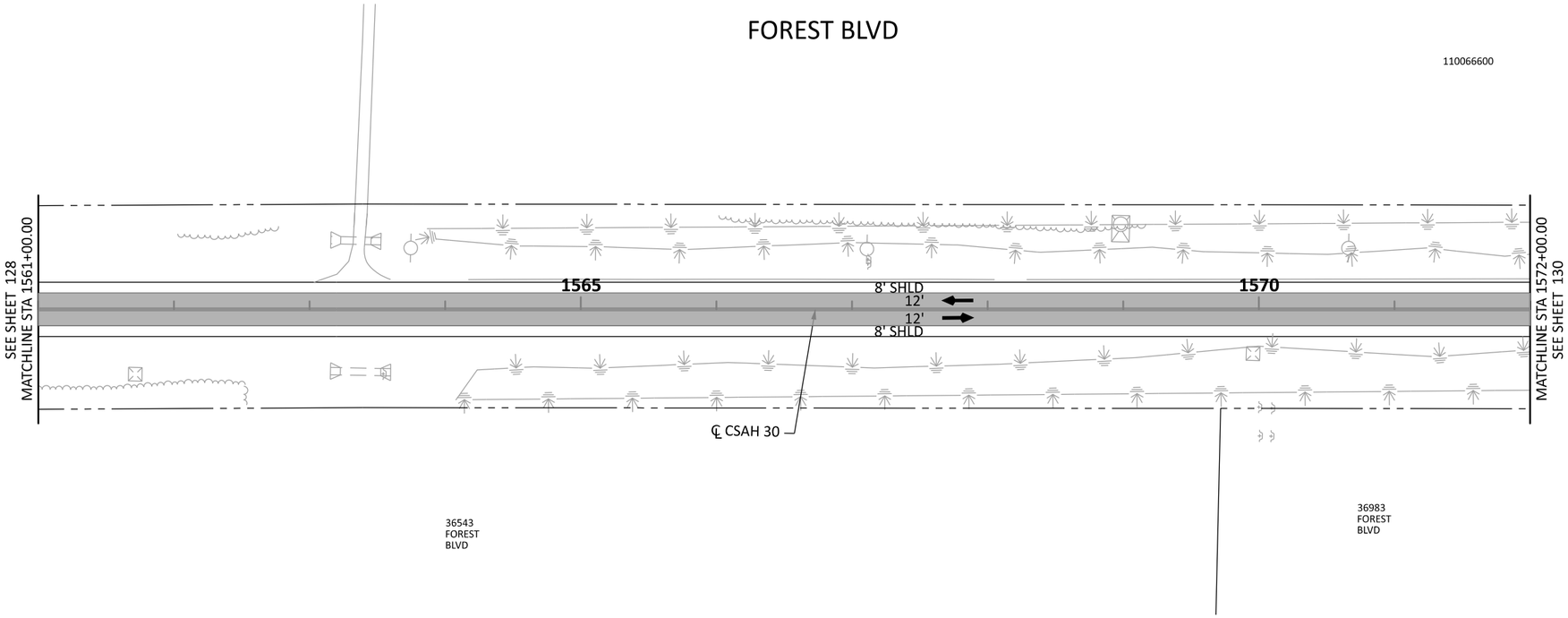
SHEET 128 OF 216 SHEETS

FOREST BLVD



SCALE IN FEET
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LEGEND

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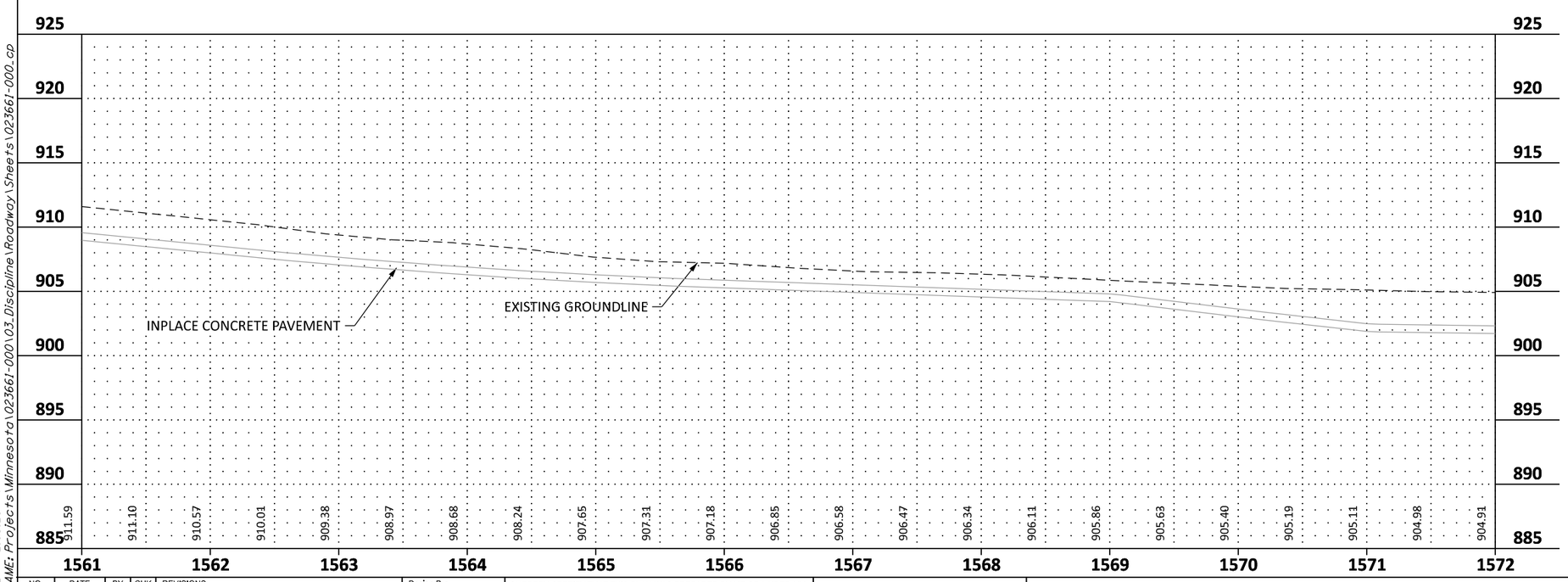

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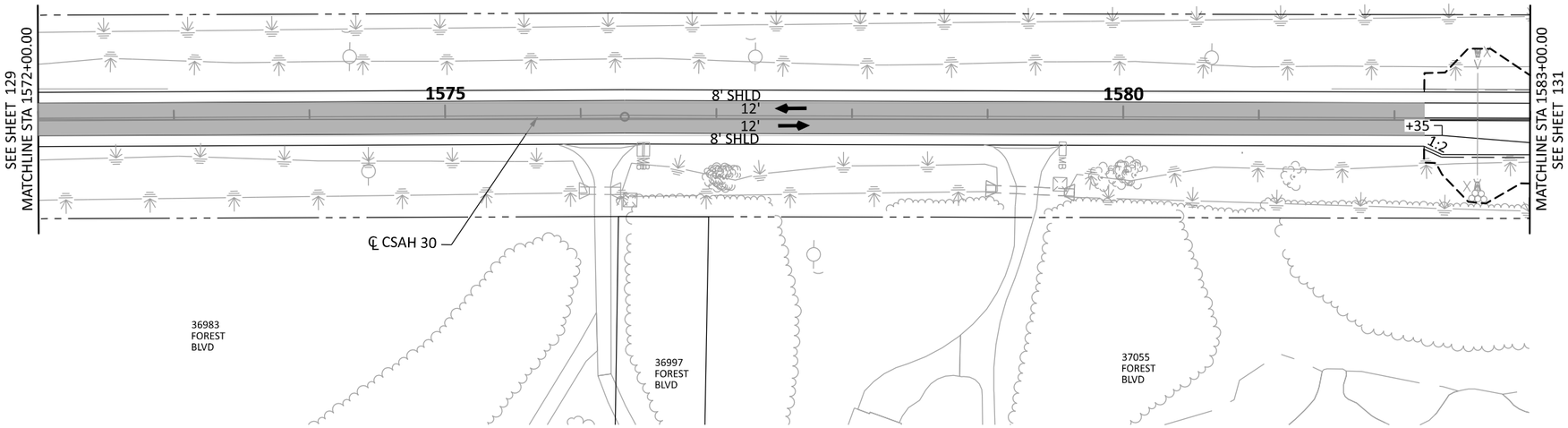
SHEET 129 OF 216 SHEETS

FOREST BLVD



SCALE IN FEET
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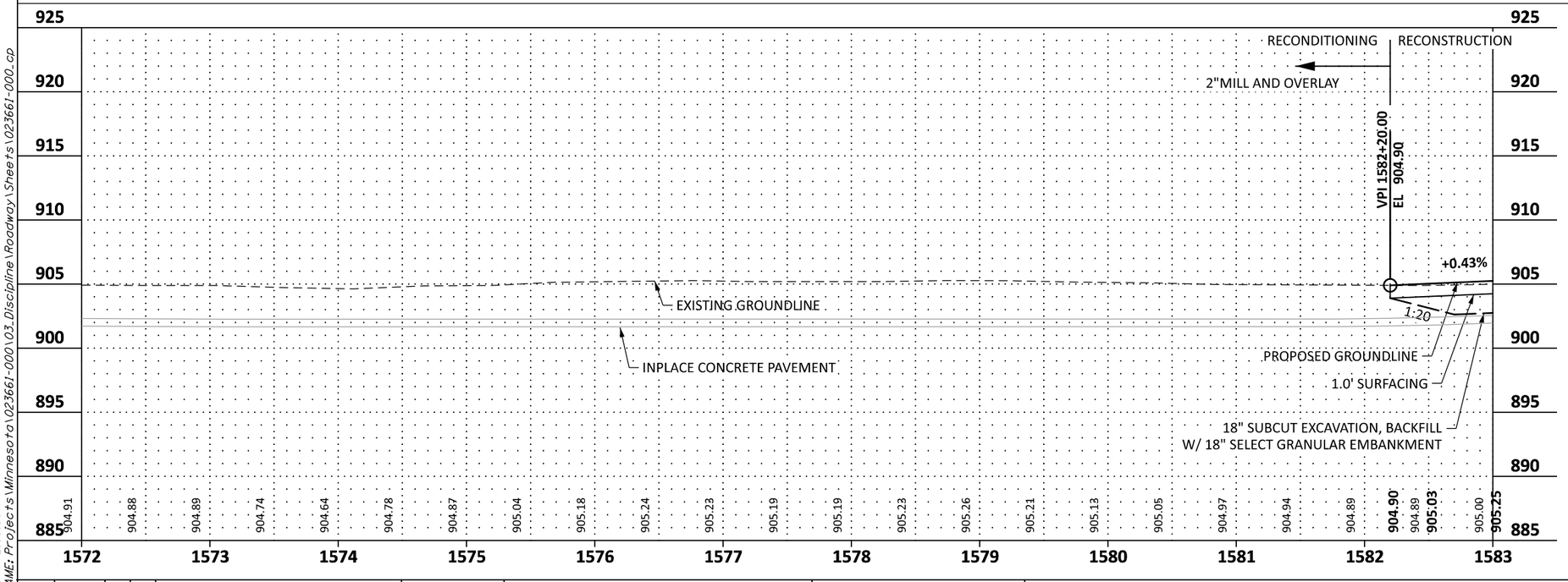
LEGEND

- 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

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2. SEE INTERSECTION DETAILS FOR ADDITIONAL INFORMATION AT INTERSECTIONS.
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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

wsb

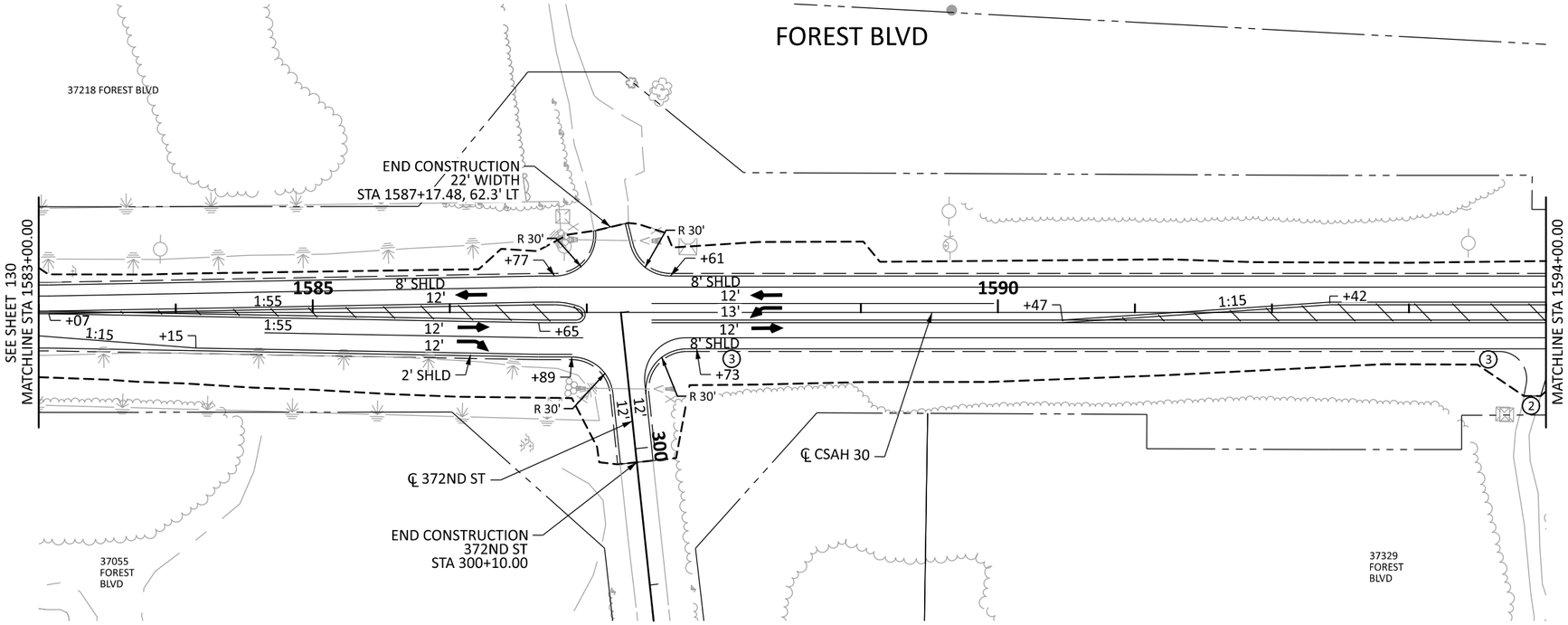
Chisago COUNTY USA

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 130 OF 216 SHEETS



SCALE IN FEET
0 50 100

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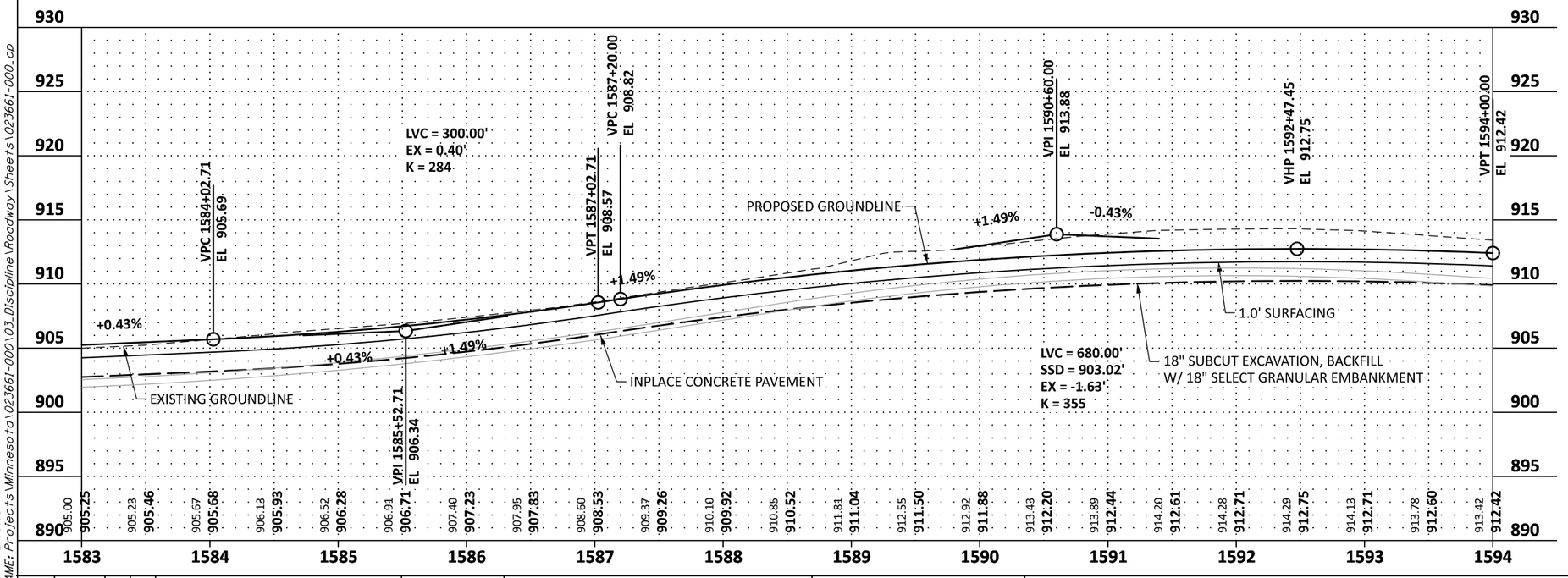

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SHEET 131 OF 216 SHEETS

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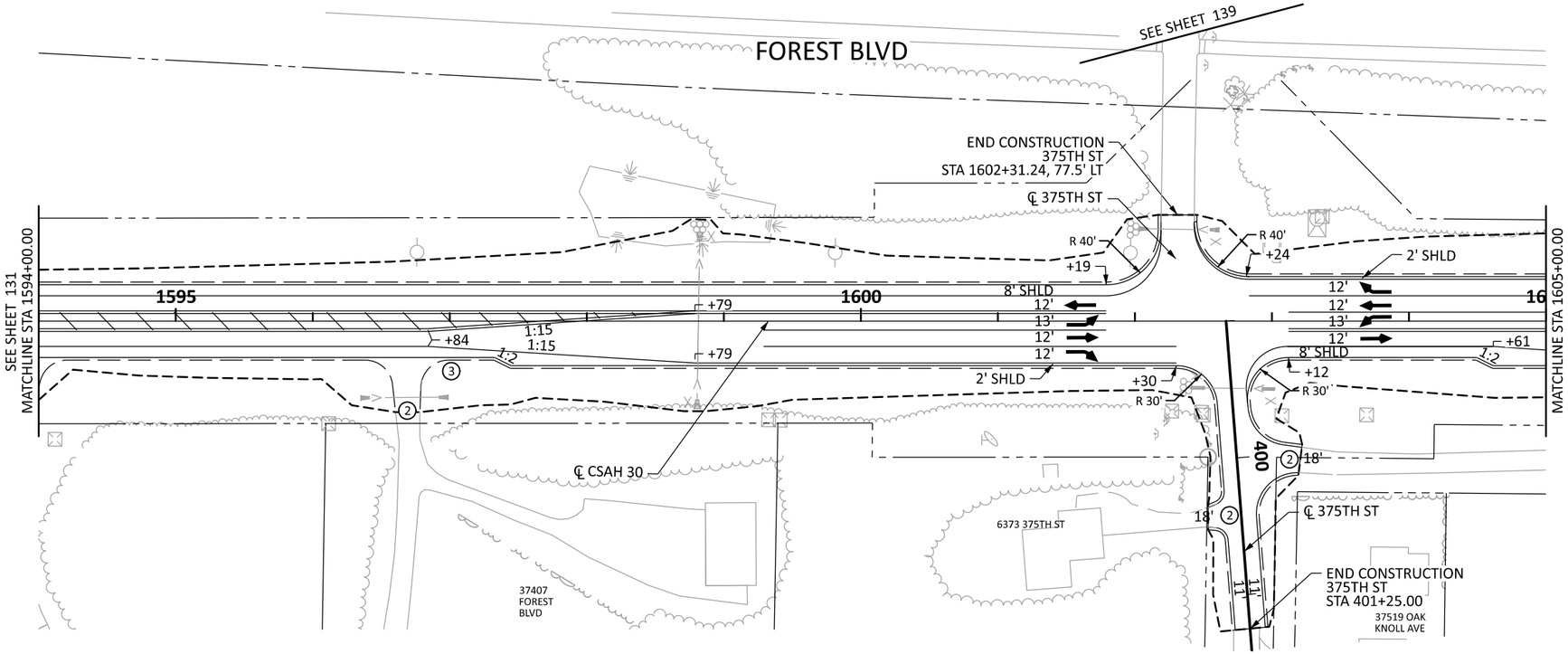

SCALE IN FEET
0 50 100

LEGEND

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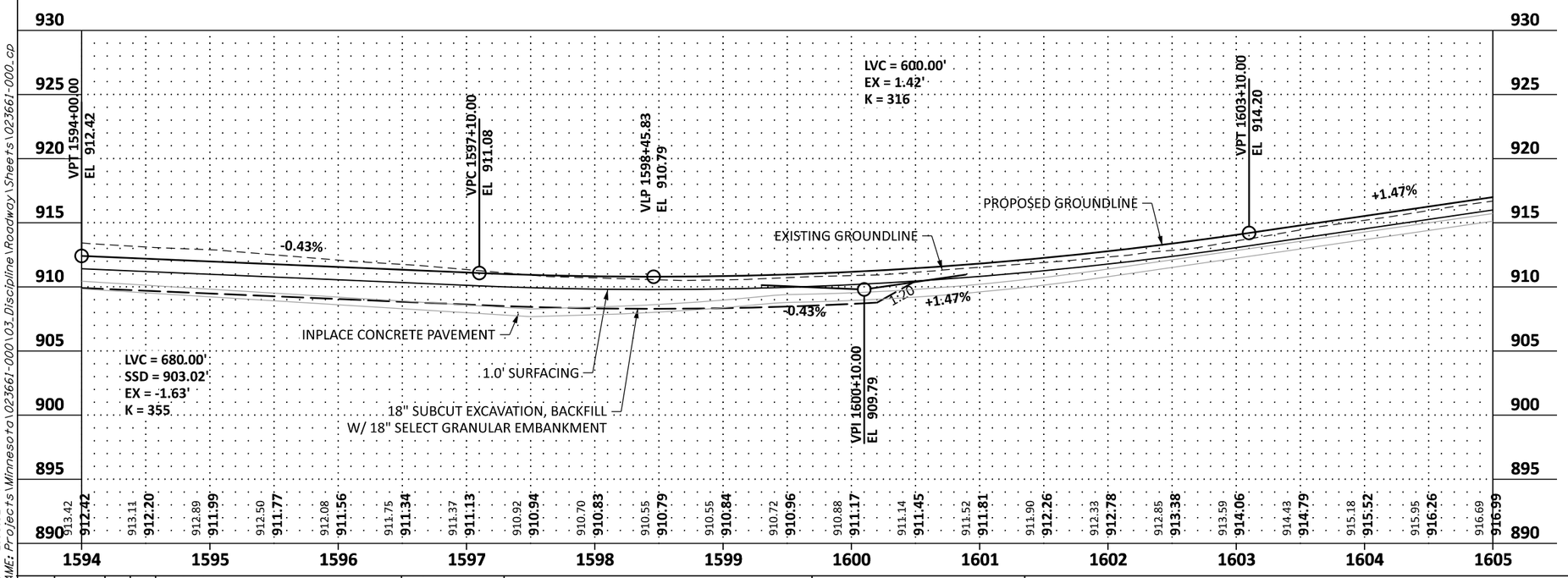

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CHISAGO COUNTY, MINNESOTA

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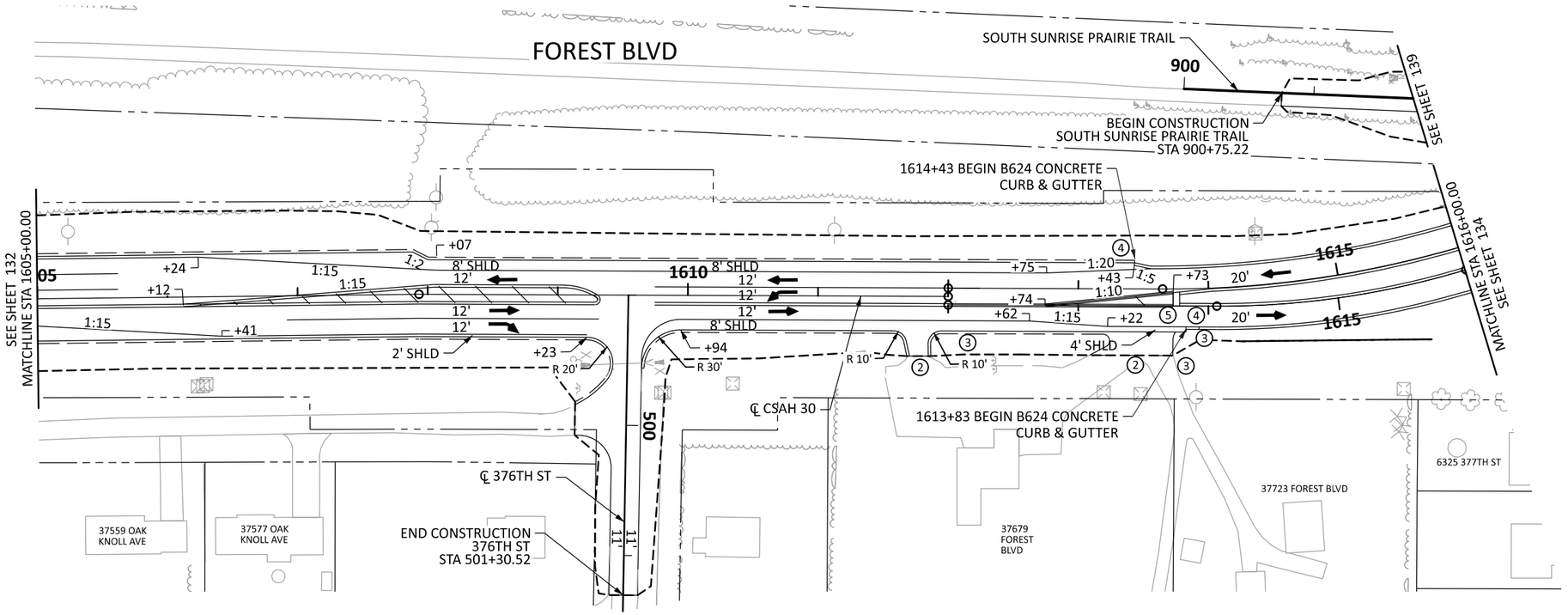
SHEET 132 OF 216 SHEETS



SCALE IN FEET
0 50 100

LEGEND

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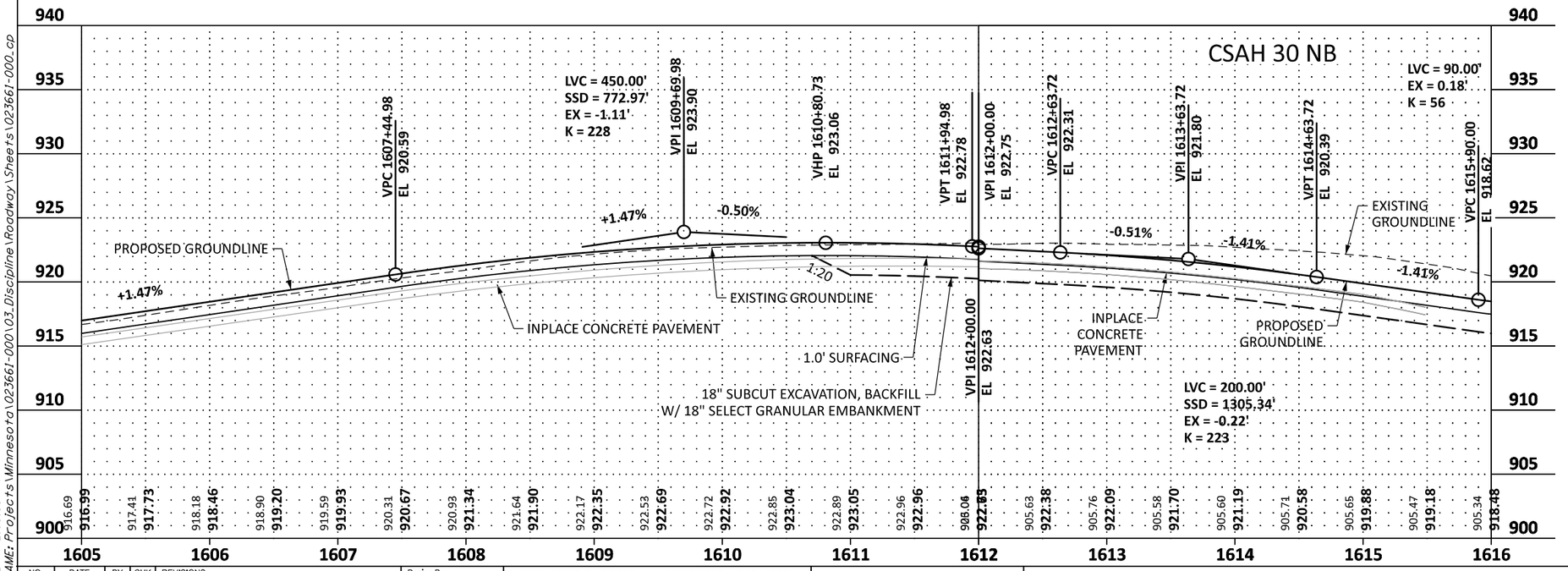

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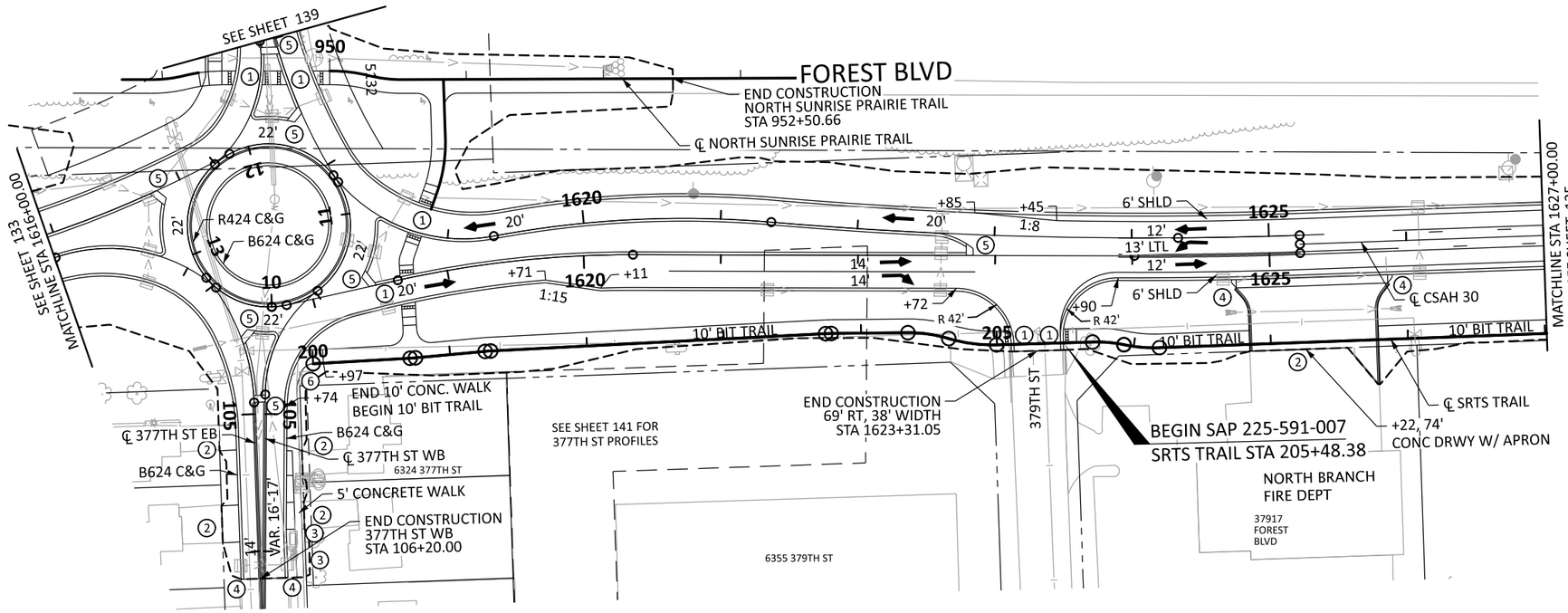
SHEET 133 OF 216 SHEETS



SCALE IN FEET
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LEGEND

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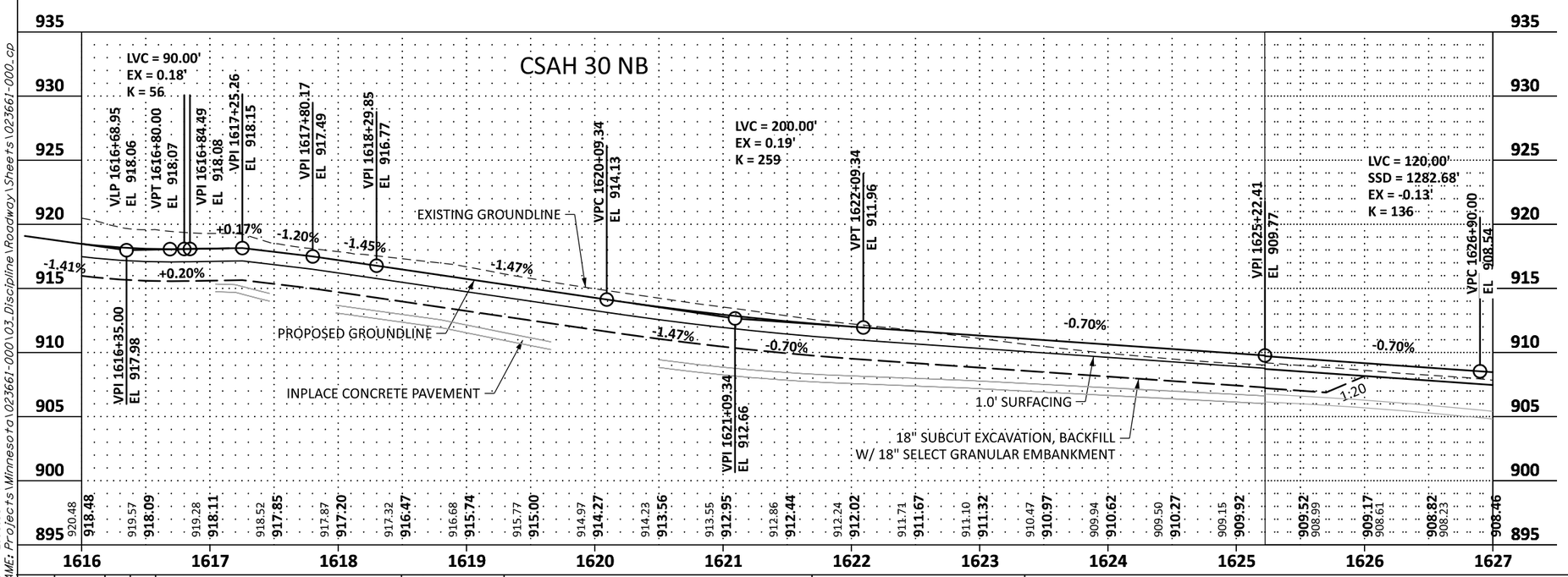

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SHEET 134 OF 216 SHEETS

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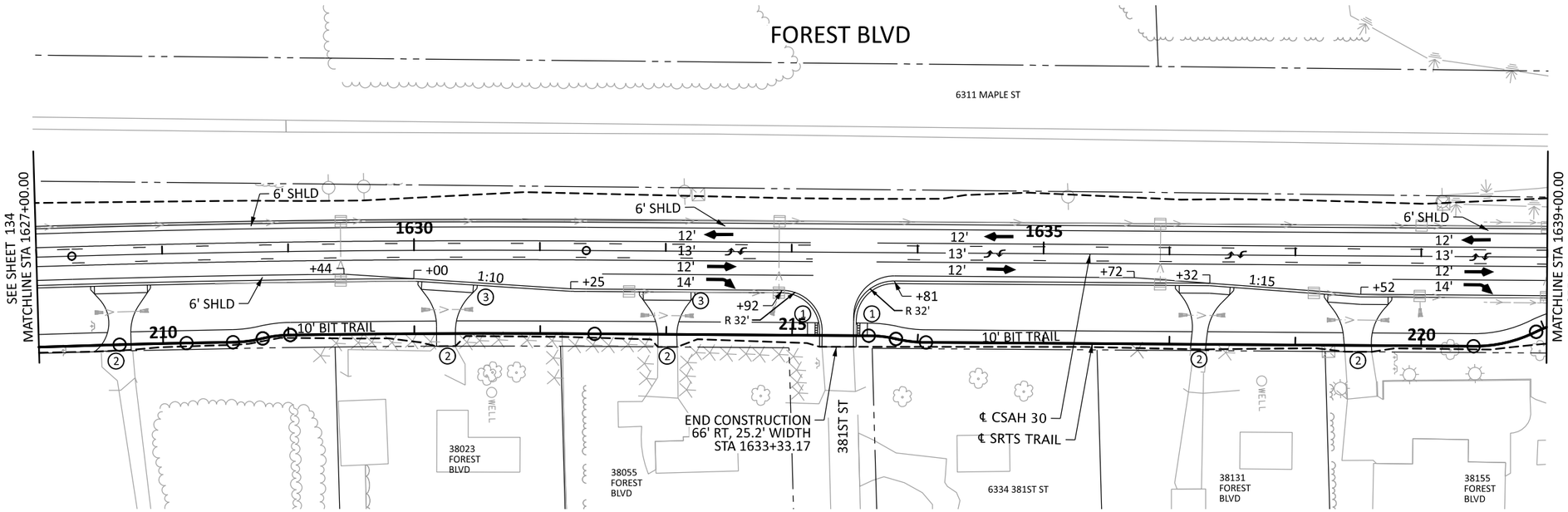

SCALE IN FEET
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LEGEND

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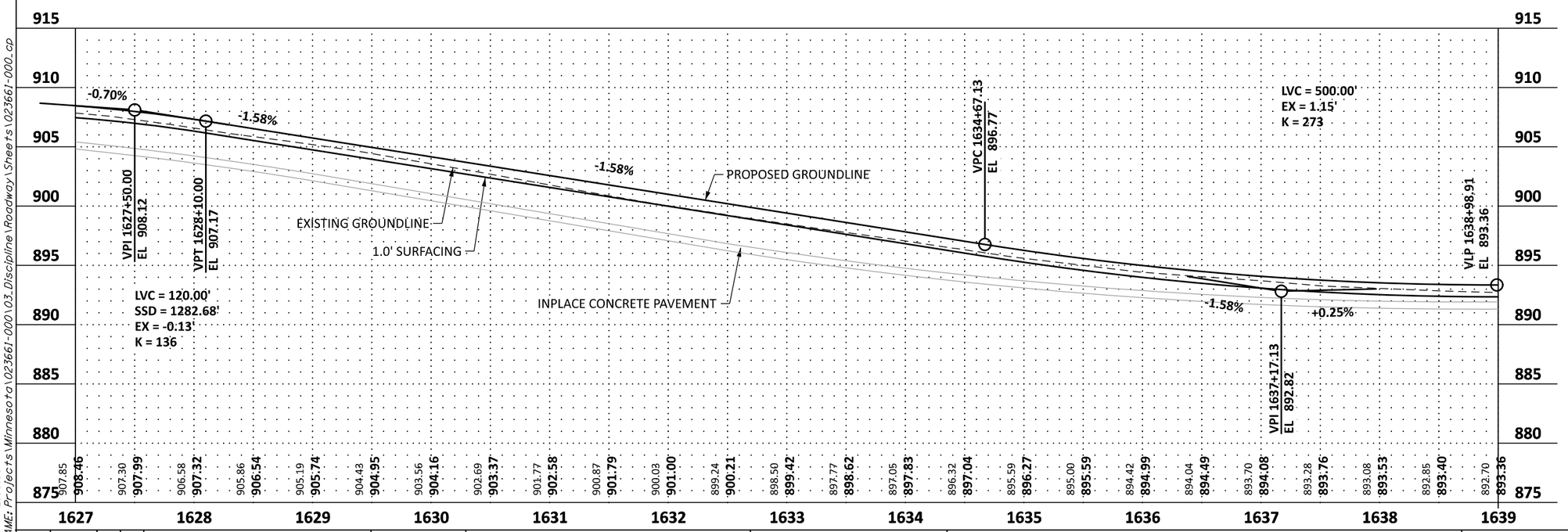

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SHEET 135 OF 216 SHEETS

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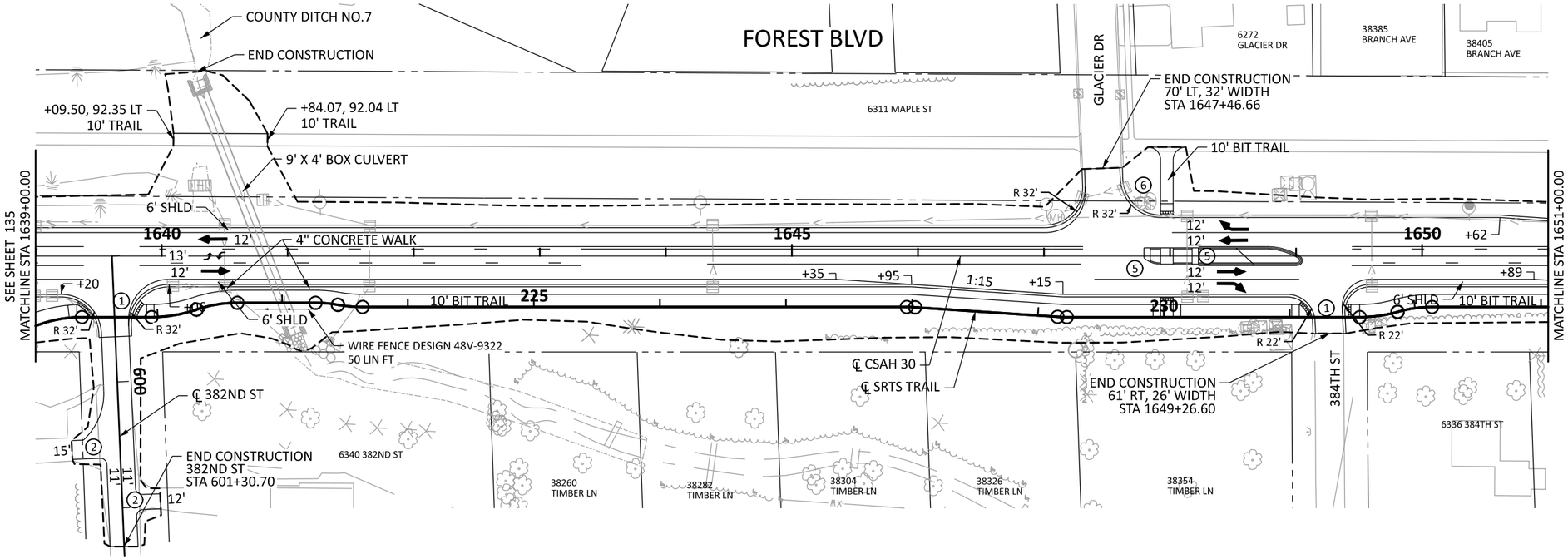

SCALE IN FEET
0 50 100

LEGEND

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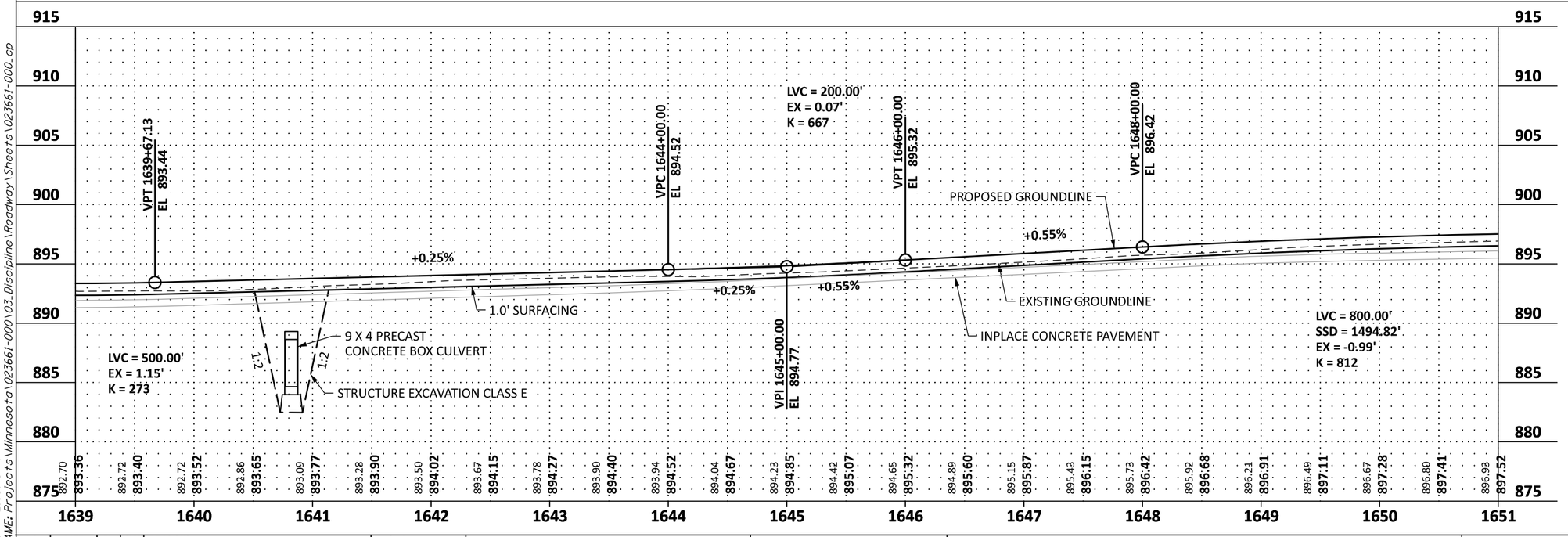

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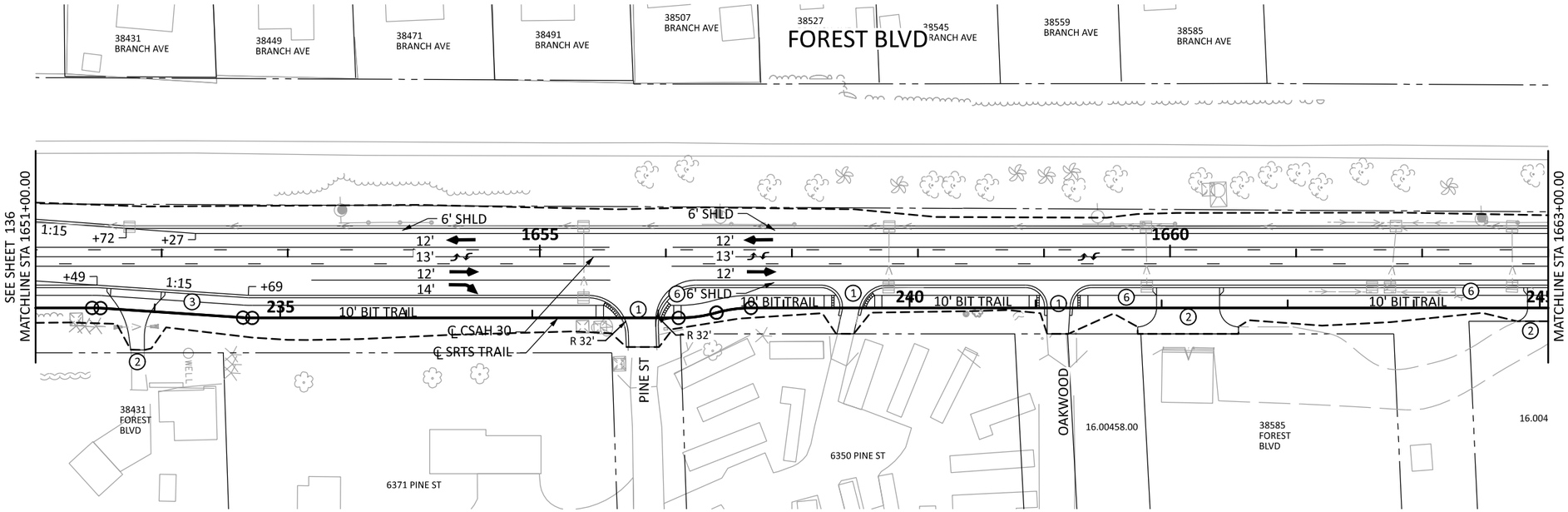
SHEET 136 OF 216 SHEETS



SCALE IN FEET
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LEGEND

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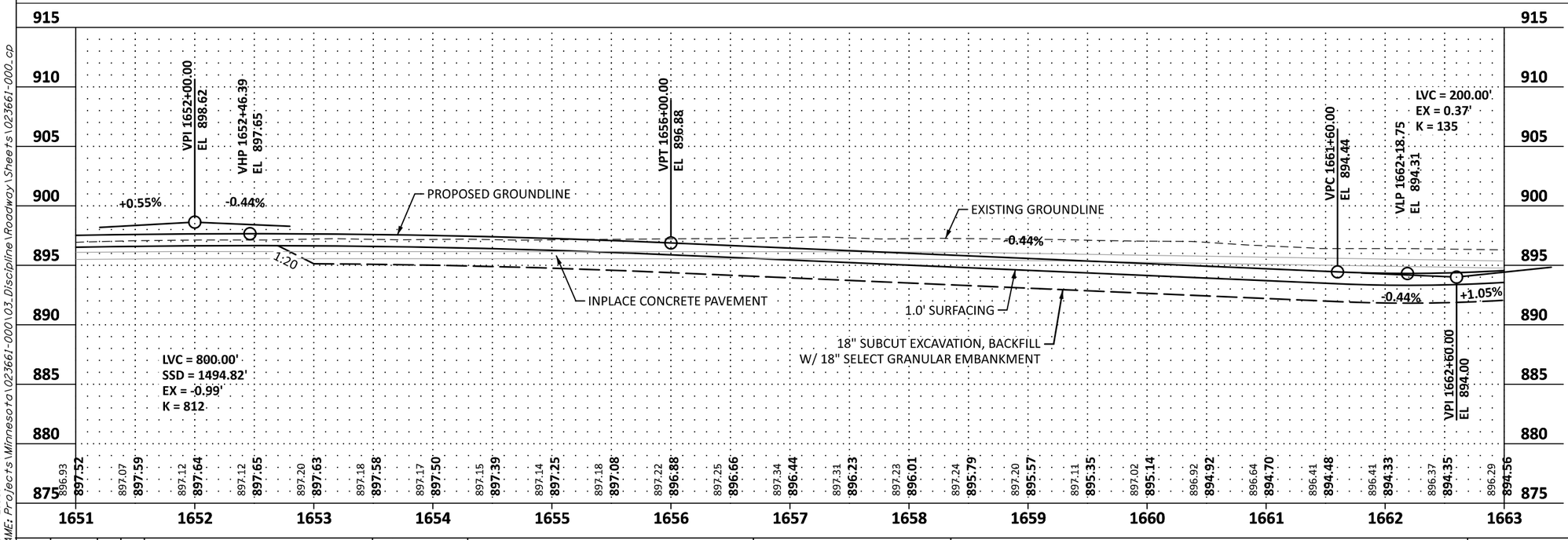

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SHEET 137 OF 216 SHEETS

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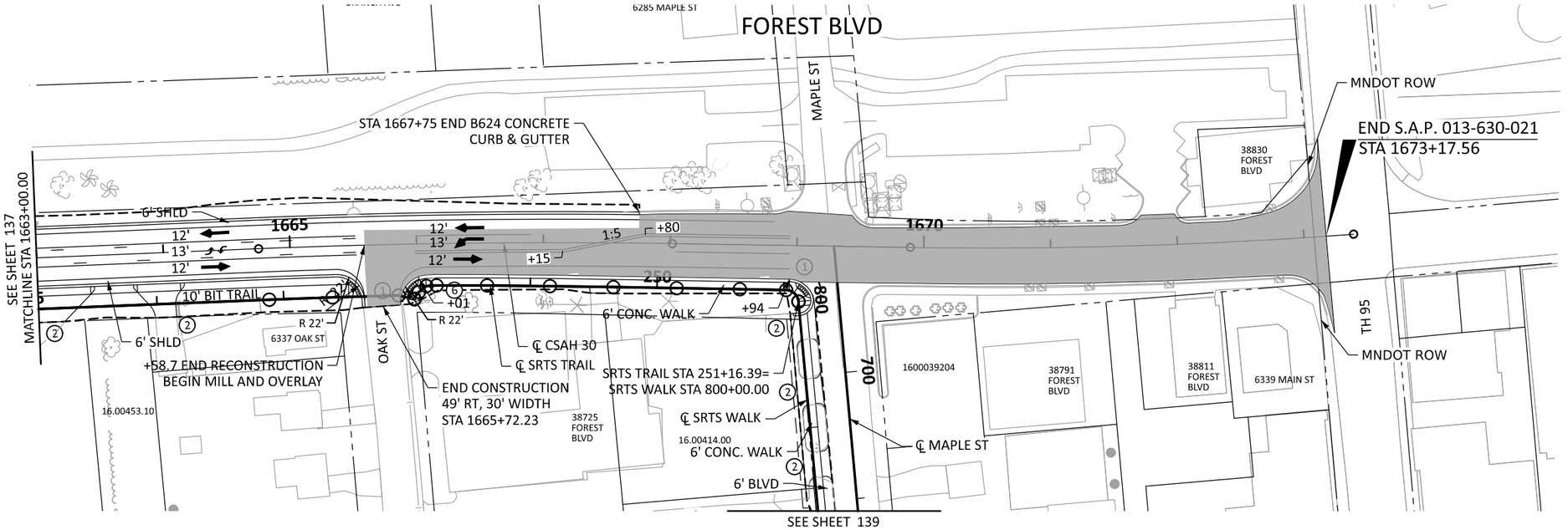

SCALE IN FEET
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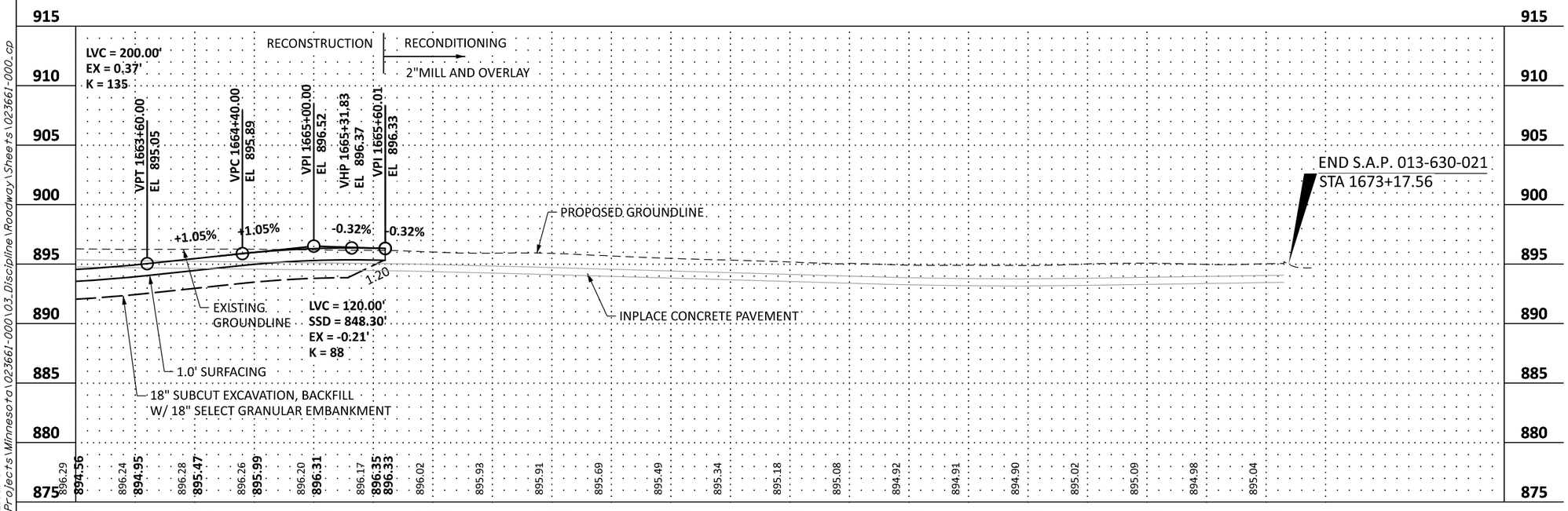

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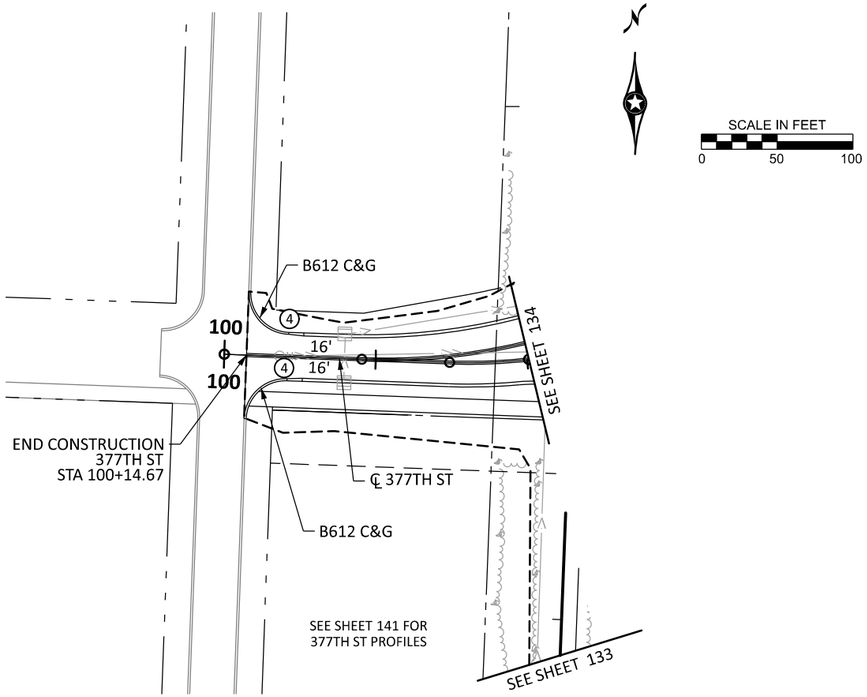
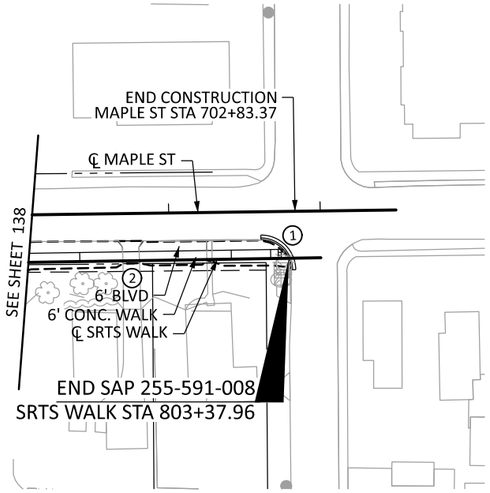
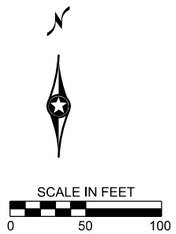




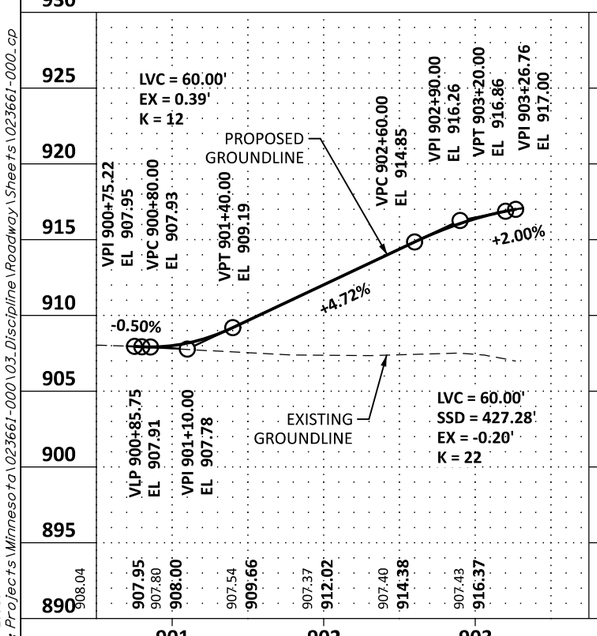


LEGEND

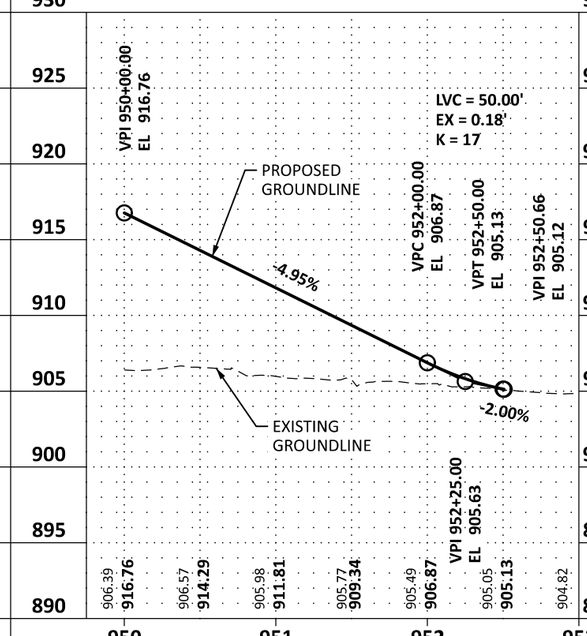
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- WETLAND DELINEATION- AREA OF ENVIRONMENTAL SENSITIVITY
- TRAFFIC FLOW ARROW
- MILL AND OVERLAY

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

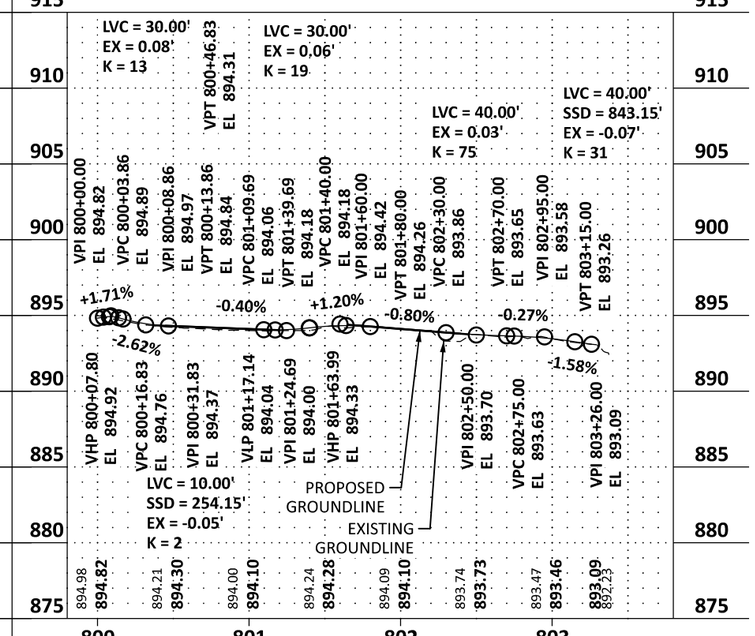
SOUTH SUNRISE PRAIRIE TRAIL



NORTH SUNRISE PRAIRIE TRAIL



SRTS WALK



GENERAL NOTES

1. ALL DIMENSIONS ARE TO FACE OF CURB OR EDGE OF BITUMINOUS UNLESS OTHERSE NOTED.
2. SEE INTERSECTION DETAILS FOR ADDITIONAL INFORMATION AT INTERSECTIONS.
3. SEE DRIVEWAY DETAIL SHEETS FOR DETAILED DRIVEWAY INFORMATION.
4. ALL CURB AND GUTTER TO BE B624 UNLESS OTHERWISE NOTED.

DATE: 9/12/2024 2:05:47 PM
PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_cp

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

Chisago COUNTY USA

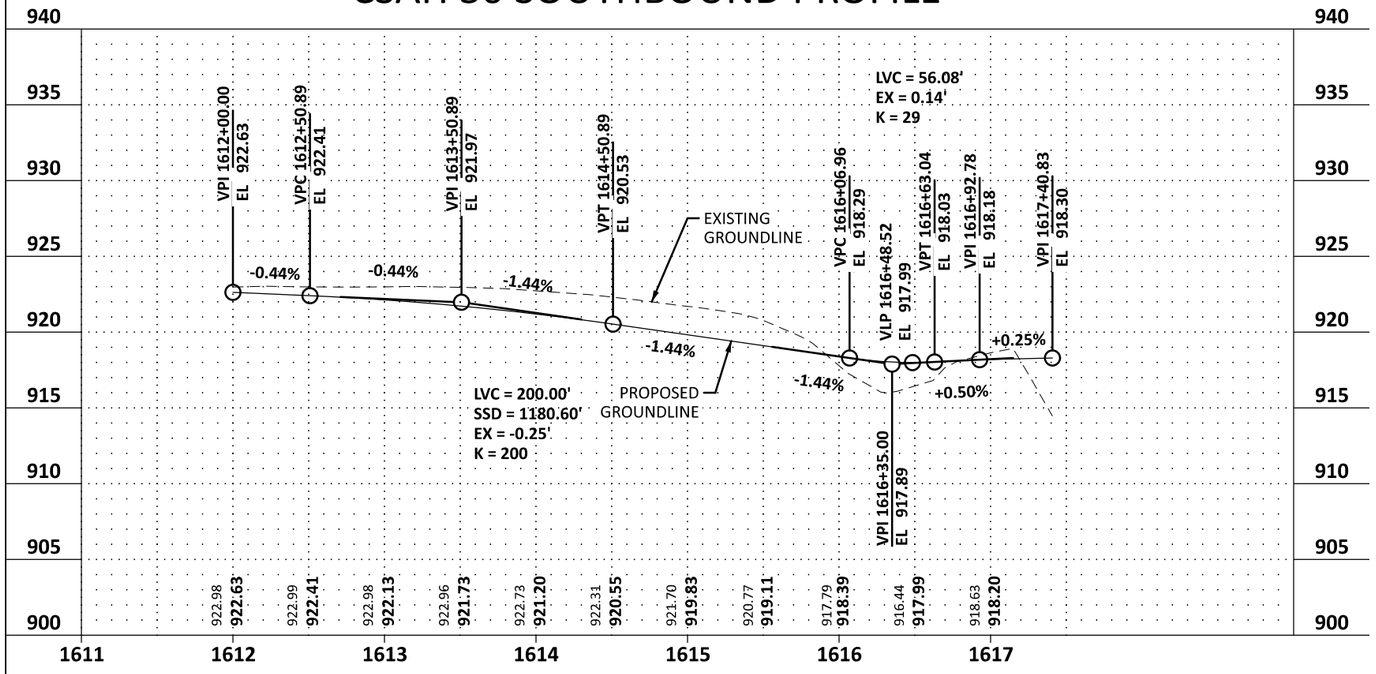
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

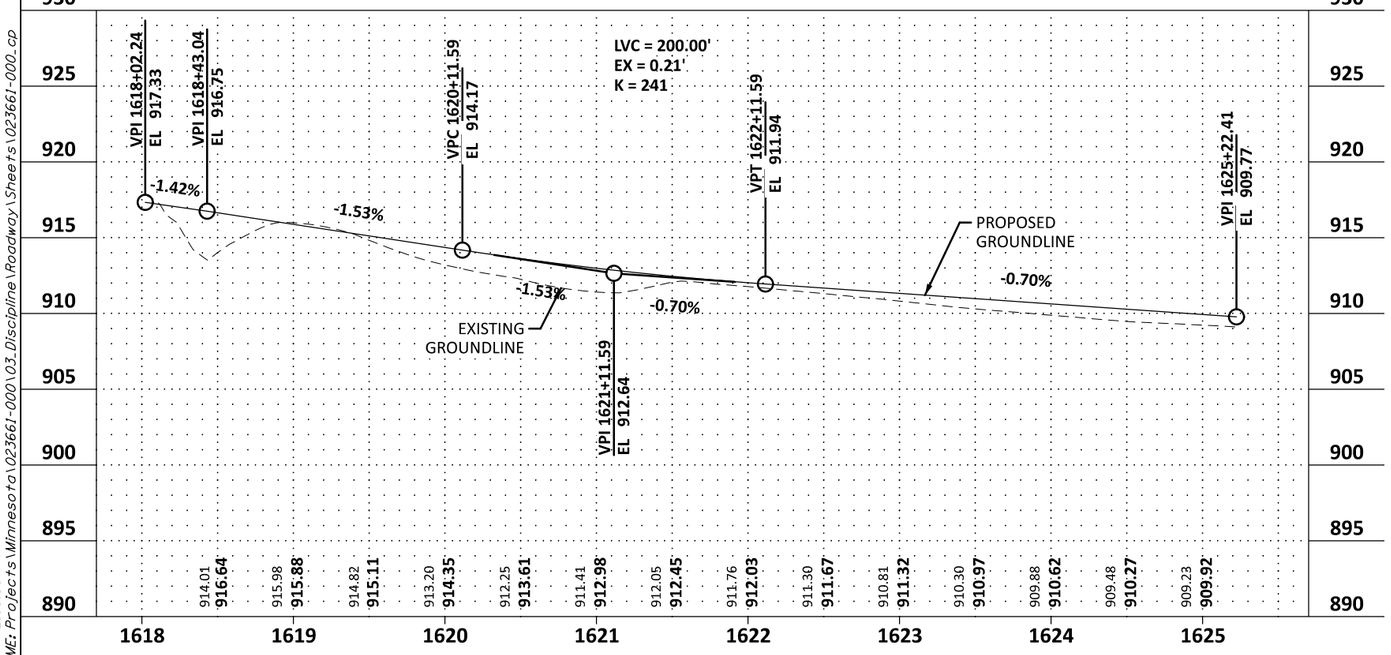
CONSTRUCTION PLAN & PROFILE
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 139 OF 216 SHEETS

CSAH 30 SOUTHBOUND PROFILE



CSAH 30 SOUTHBOUND PROFILE



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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 140 OF 216 SHEETS

DATE: 9/12/2024 2:05:50 PM
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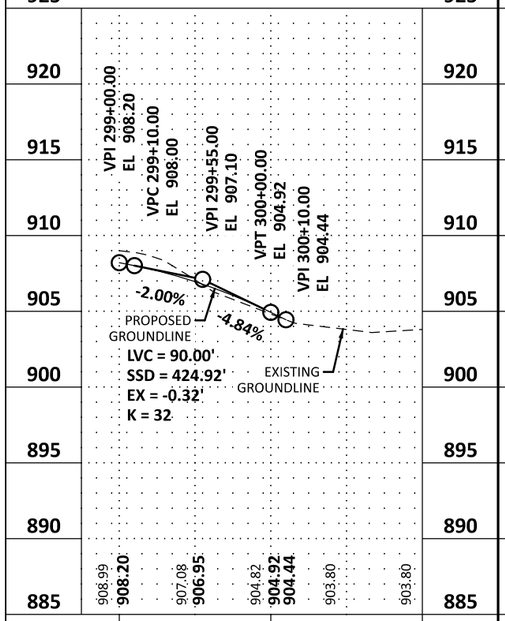
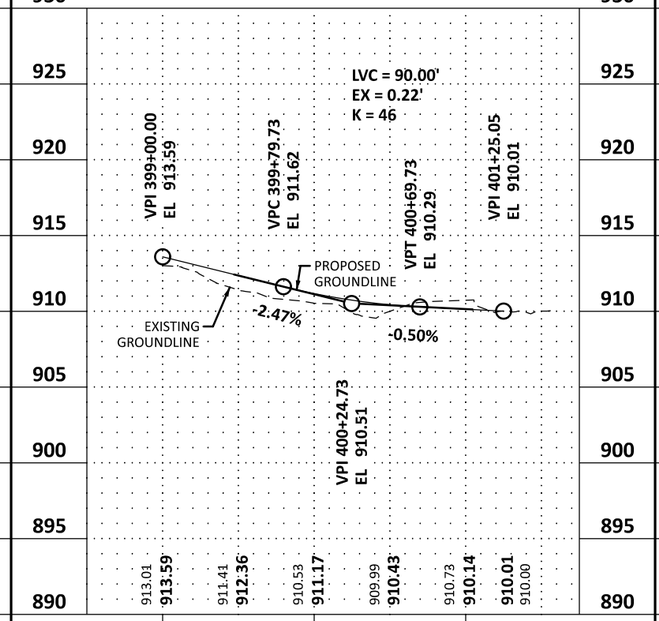
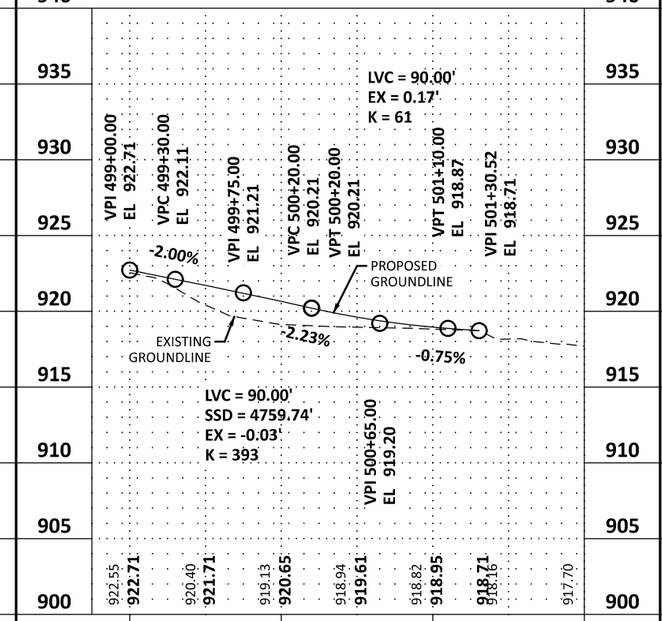
372ND STREET



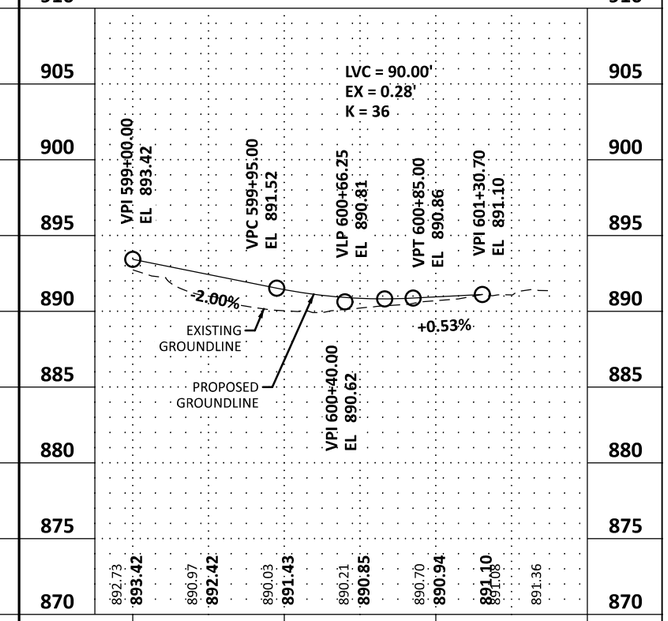
375TH STREET



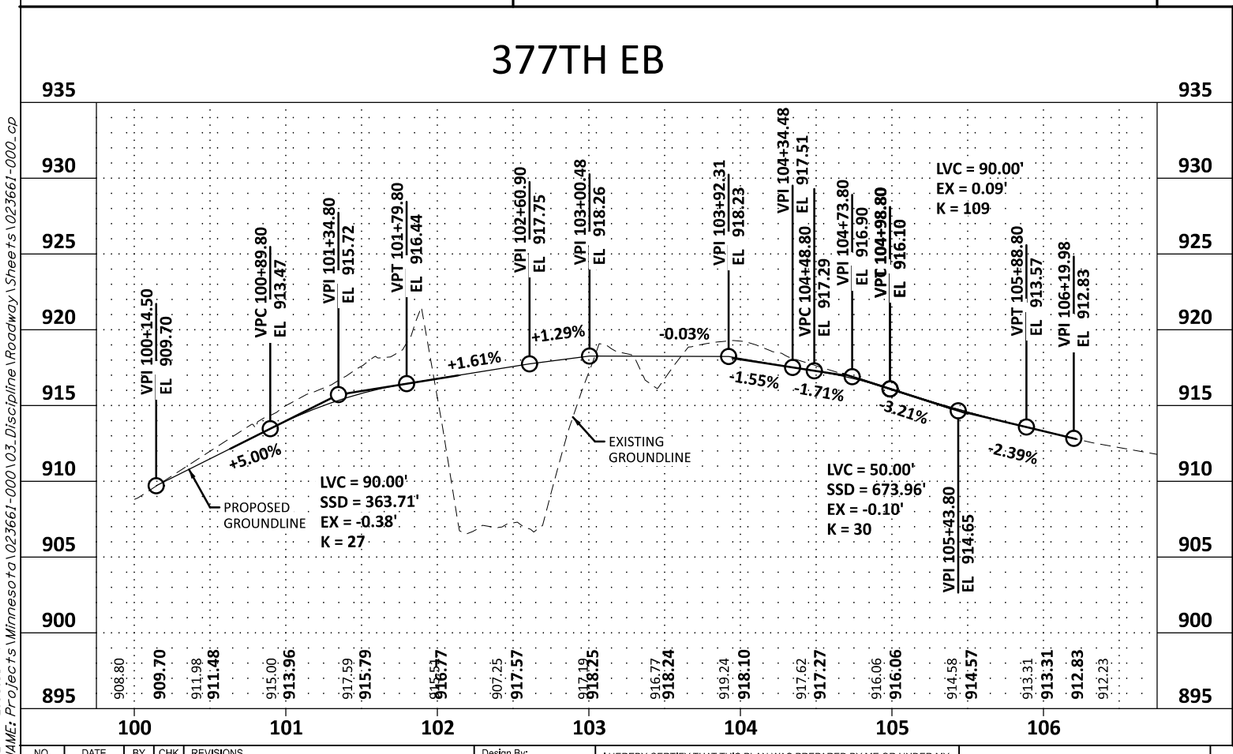
376TH STREET



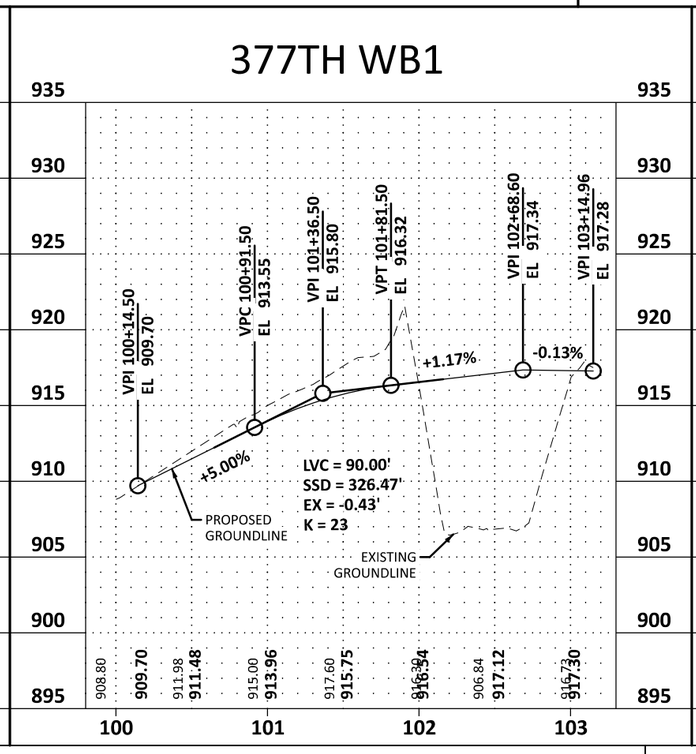
382ND STREET



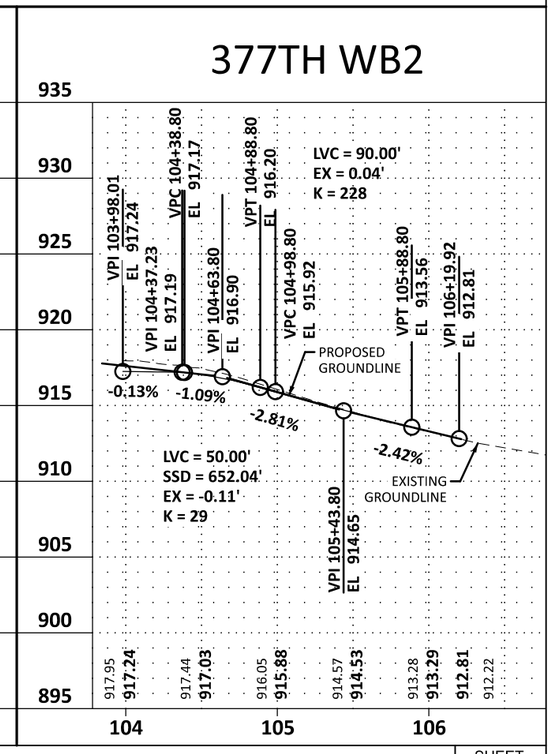
377TH EB



377TH WB1



377TH WB2



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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
DATE: 9/12/2024 LICENSE NO. 44620

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Chisago COUNTY USA

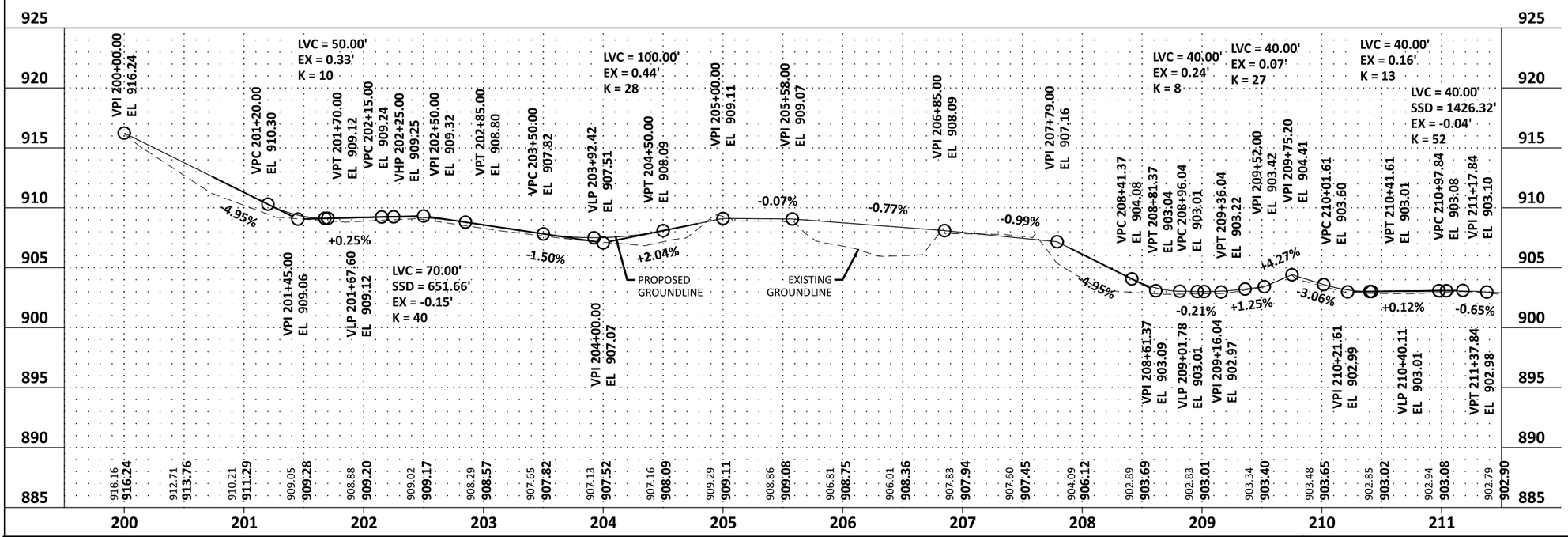
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 141 OF 216 SHEETS

SRTS TRAIL



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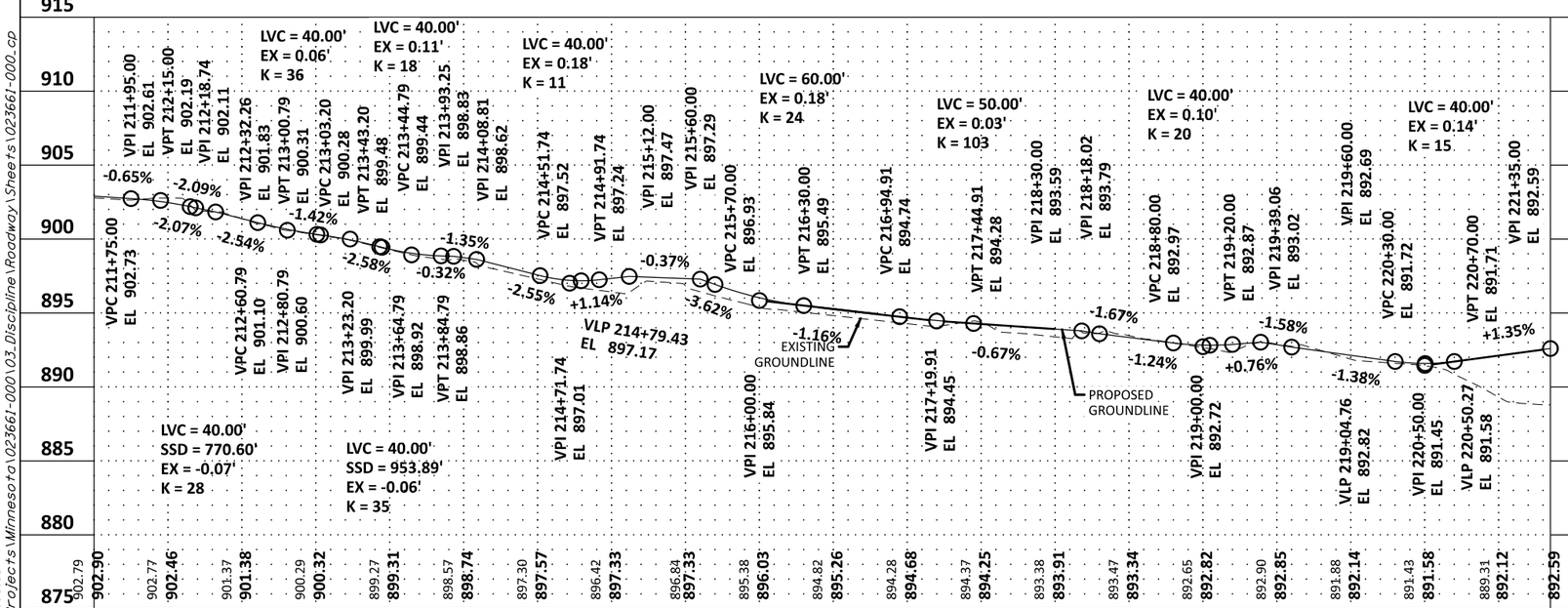
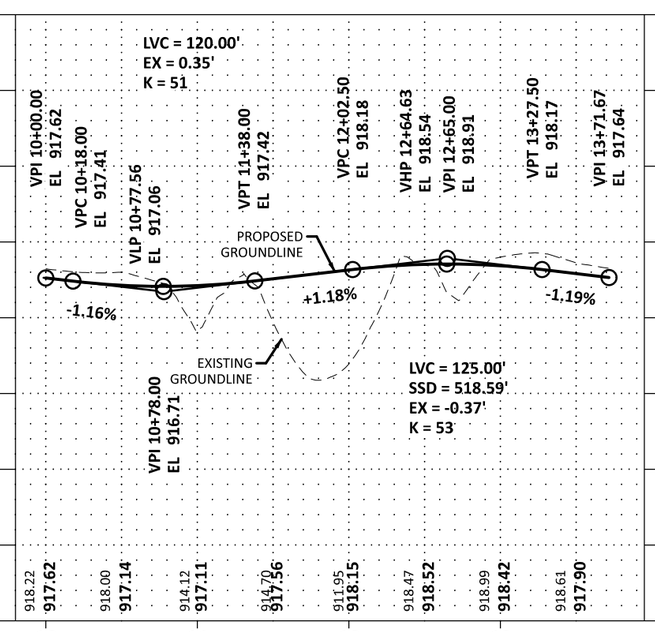


RADIAL



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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 142 OF 216 SHEETS

DATE: 9/12/2024 2:05:51 PM
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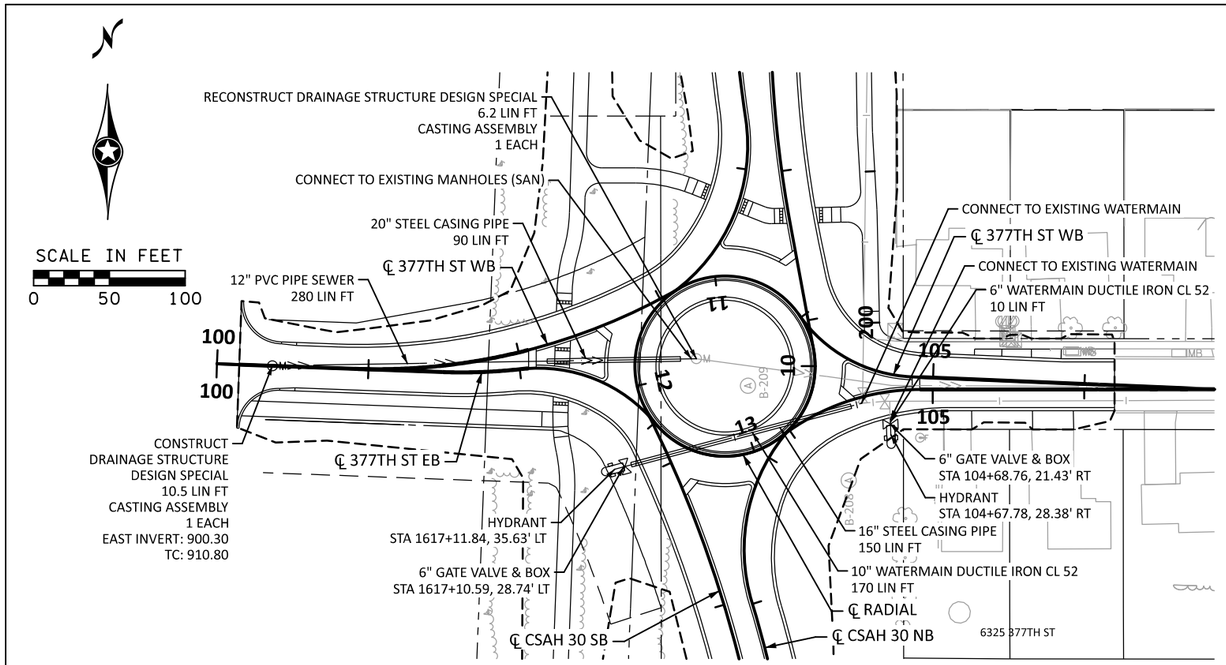

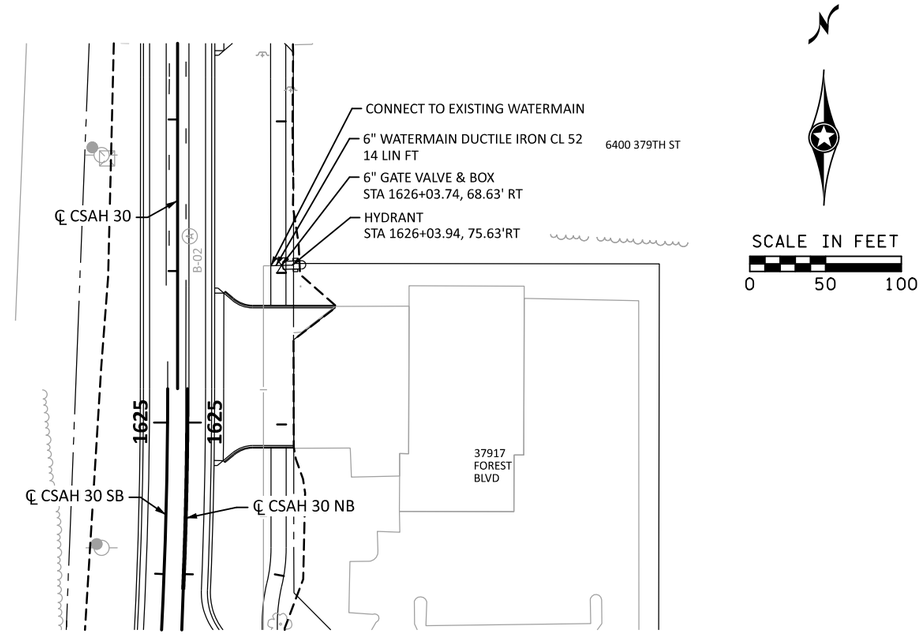

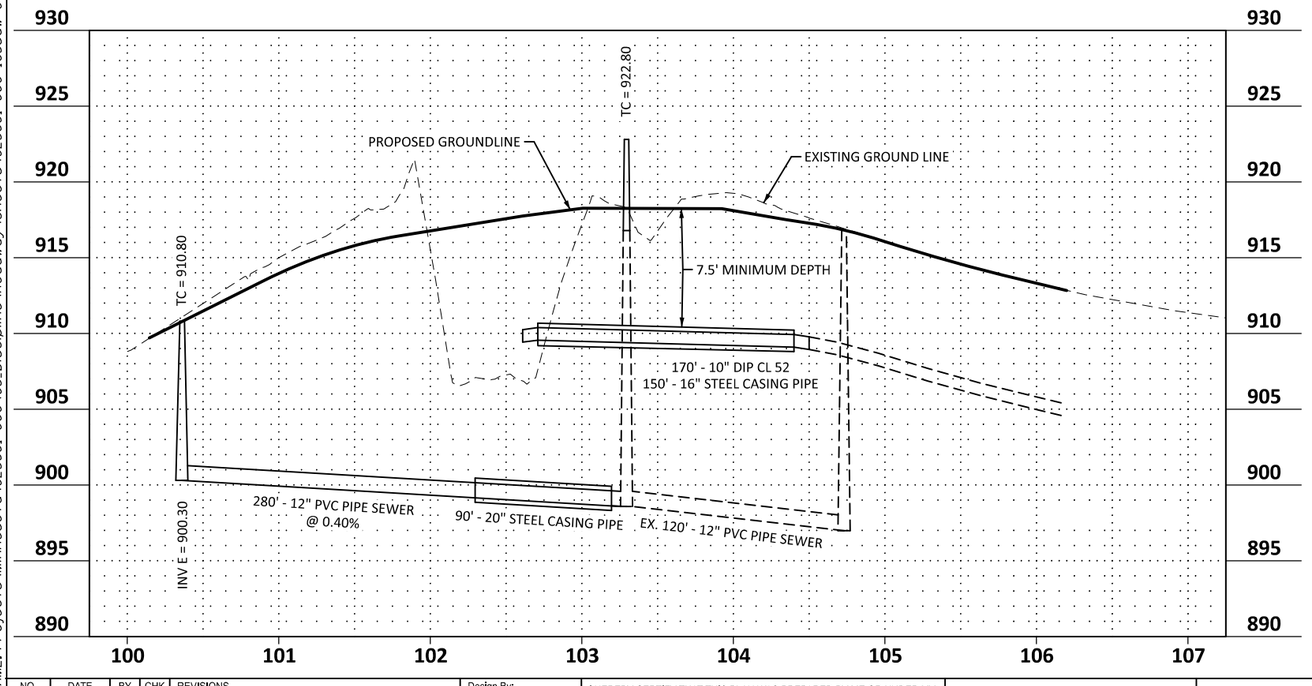

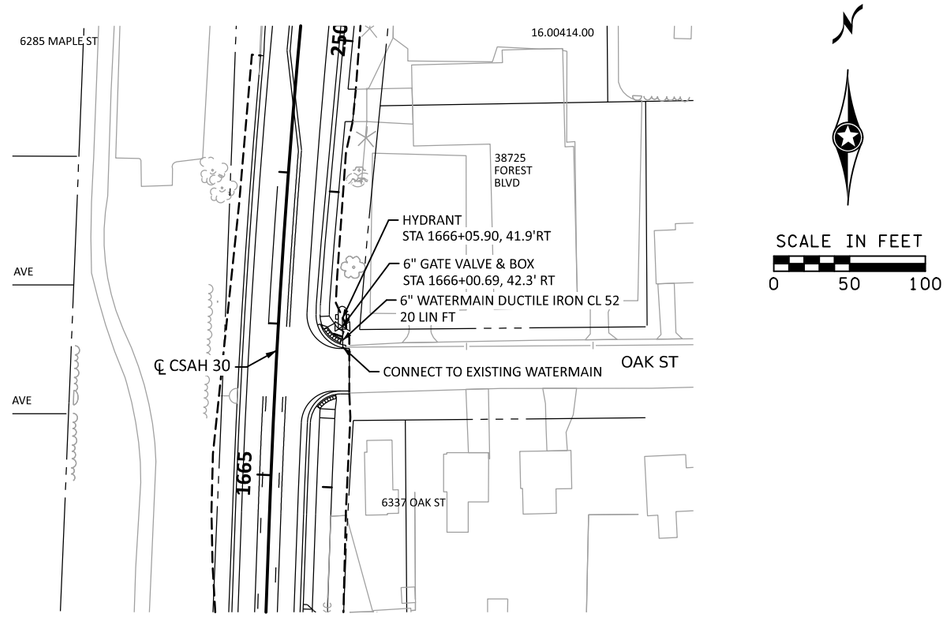

NO.	DATE	BY	CHK	REVISIONS

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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

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Chisago COUNTY USA

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

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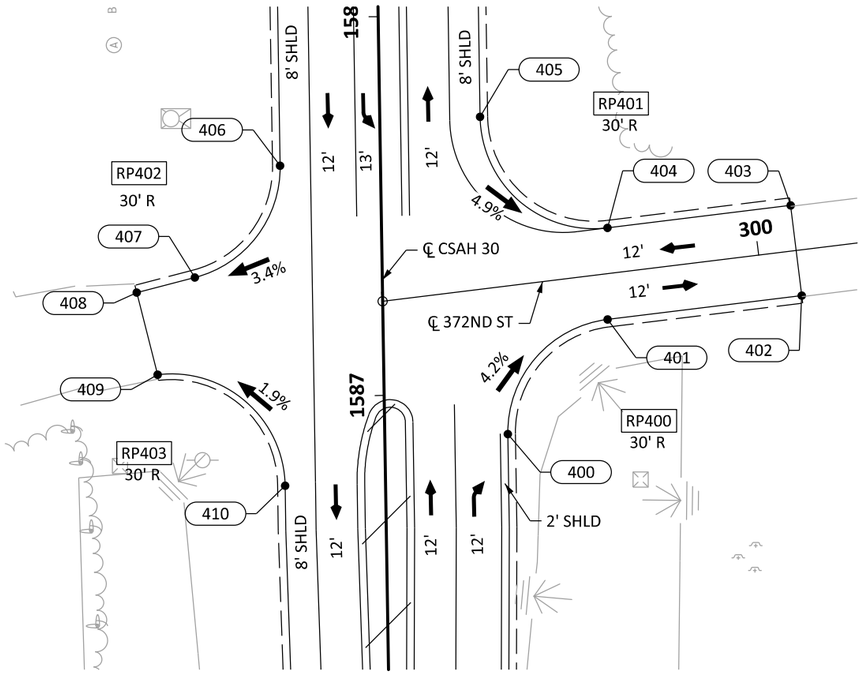
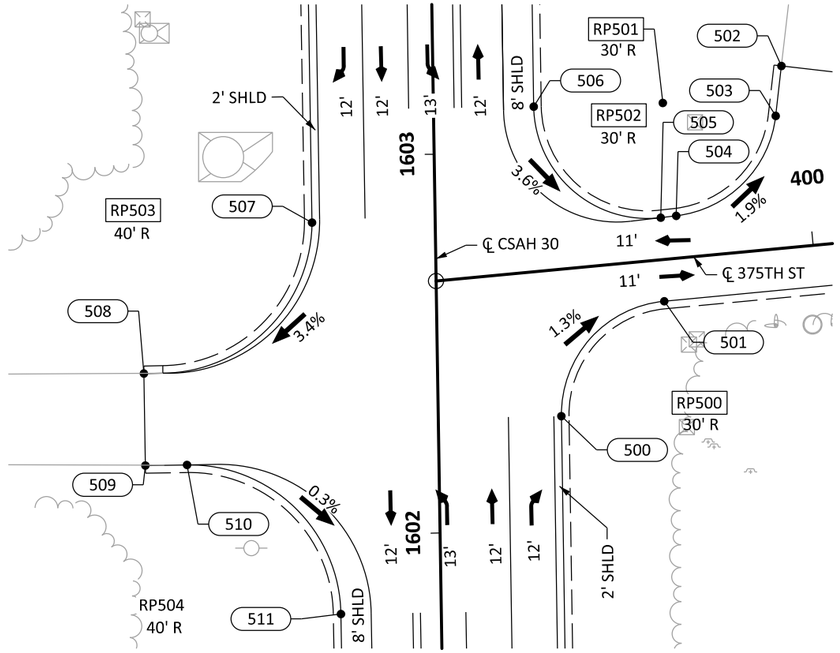
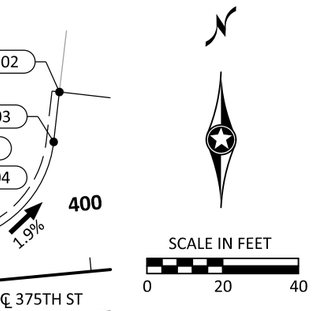
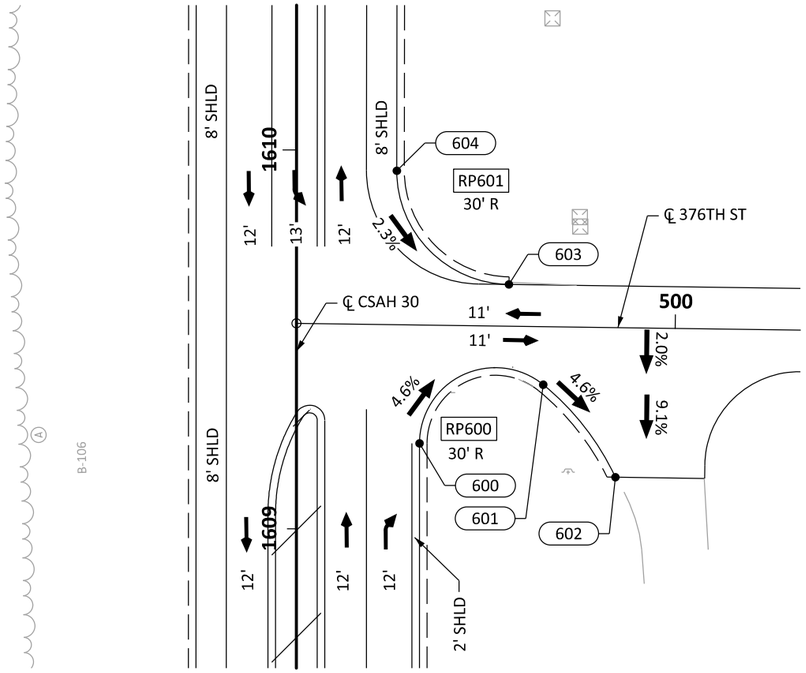


GUTTER CONTROL POINTS			
POINT NO.	X	Y	ELEV
400	526345.335	169806.676	907.722
401	526371.677	169836.929	905.885
402	526436.491	169844.884	903.727
403	526433.567	169868.705	904.104
404	526371.657	169861.106	906.533
405	526338.006	169890.407	909.044
406	526285.204	169877.514	908.881
407	526262.712	169847.992	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





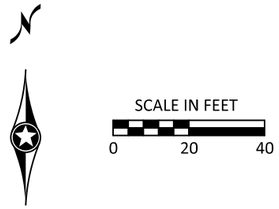


GUTTER CONTROL POINTS			
POINT NO.	X	Y	ELEV
600	526311.983	172039.160	921.863
601	526344.634	172054.648	919.780
602	526350.855	172048.905	918.336
603	526335.591	172081.113	921.319
604	526305.993	172111.114	922.368

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



LEGEND

- TRAFFIC FLOW
- DRAINAGE FLOW ARROW
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

DATE: 9/12/2024 2:06:16 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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DATE: 9/12/2024 LICENSE NO. 44620

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Chisago COUNTY USA

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 144 OF 216 SHEETS

NORTH WEST

NORTH EAST

SOUTH WEST

SOUTH EAST

℄ SB CSAH 30- 377TH ST-NW QUAD

℄ CSAH 30 SB

℄ CSAH 30 NB

℄ NB CSAH 30- 377TH ST-NE QUAD

℄ SB CSAH 30- 377TH ST-SW QUAD

℄ NB CSAH 30- 377TH ST-SE QUAD

℄ 377TH ST WB

℄ 377TH ST EB

377TH ST

END S524 C&G

S524 C&G

B624 C&G

R424 C&G

℄ RADIAL

CENTER ISLAND MAX ELEVATION OF 922.80

SCALE IN FEET

0 20 40

LEGEND

- TRAFFIC FLOW
- DRAINAGE FLOW ARROW
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

DATE: 9/12/2024 2:06:17 PM
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Chisago COUNTY USA

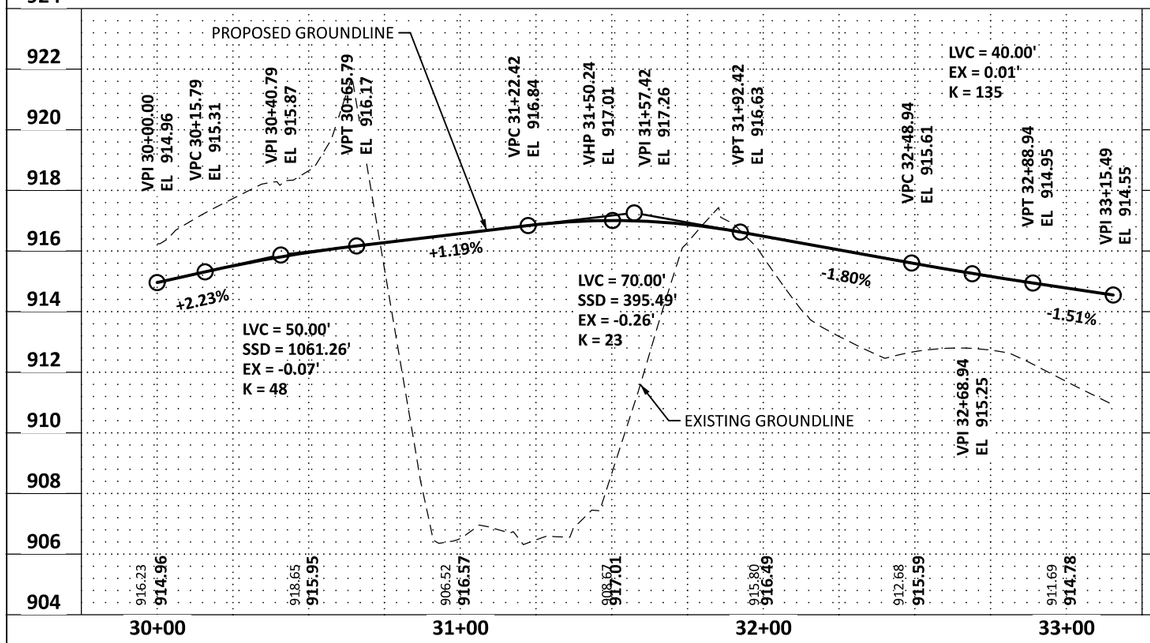
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

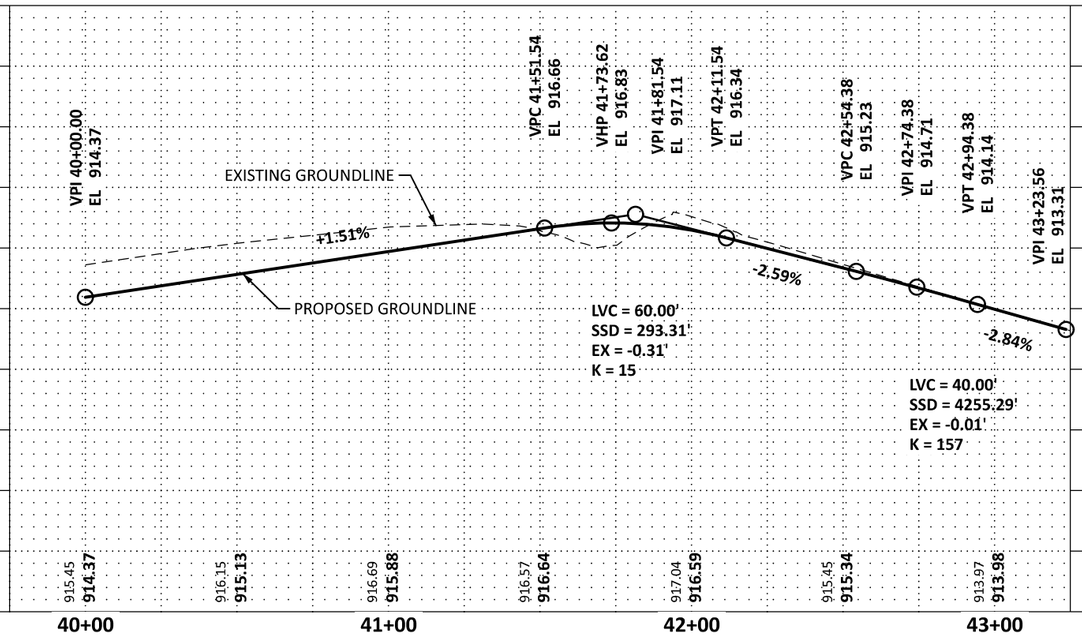
ROUNDABOUT DETAIL
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 145 OF 216 SHEETS

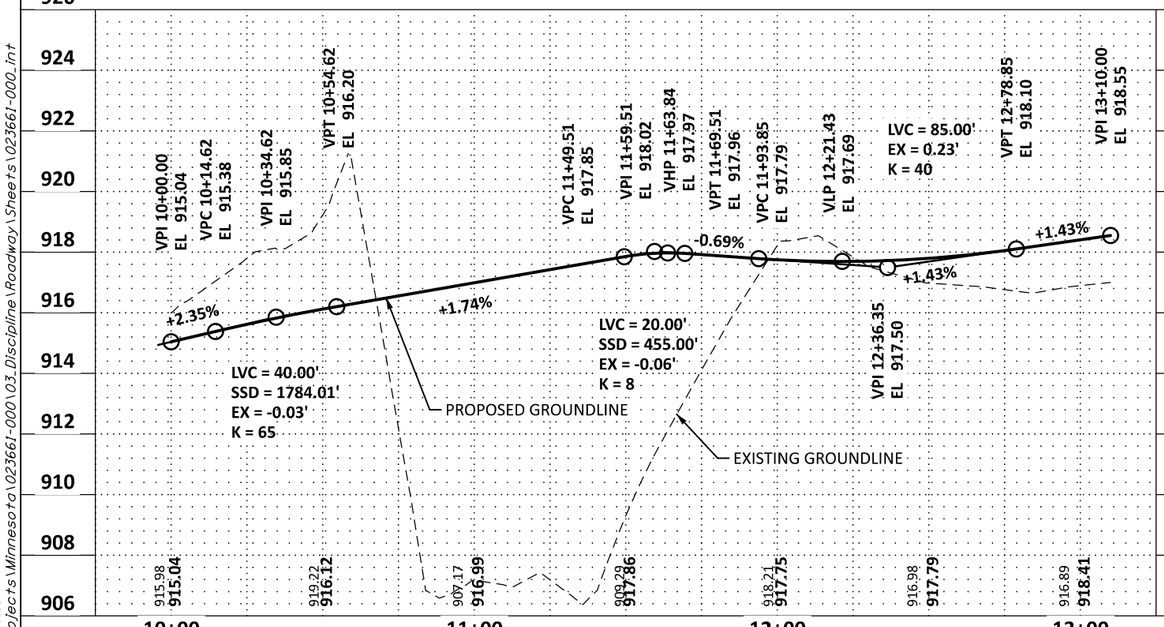
CSAH 30 AND 377TH ST - NW QUAD



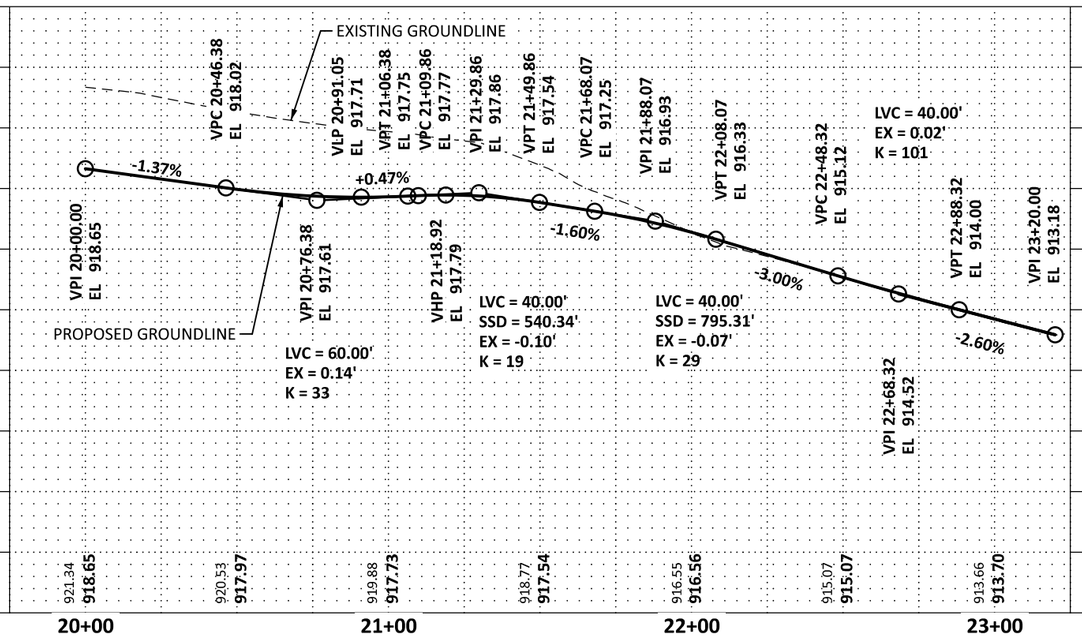
CSAH 30 AND 377TH ST - NE QUAD



CSAH 30 AND 377TH ST - SW QUAD



CSAH 30 AND 377TH ST - SE QUAD



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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 146 OF 216 SHEETS

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 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

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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

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Chisago COUNTY USA

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 147 OF 216 SHEETS

DATE: 9/12/2024 2:06:20 PM
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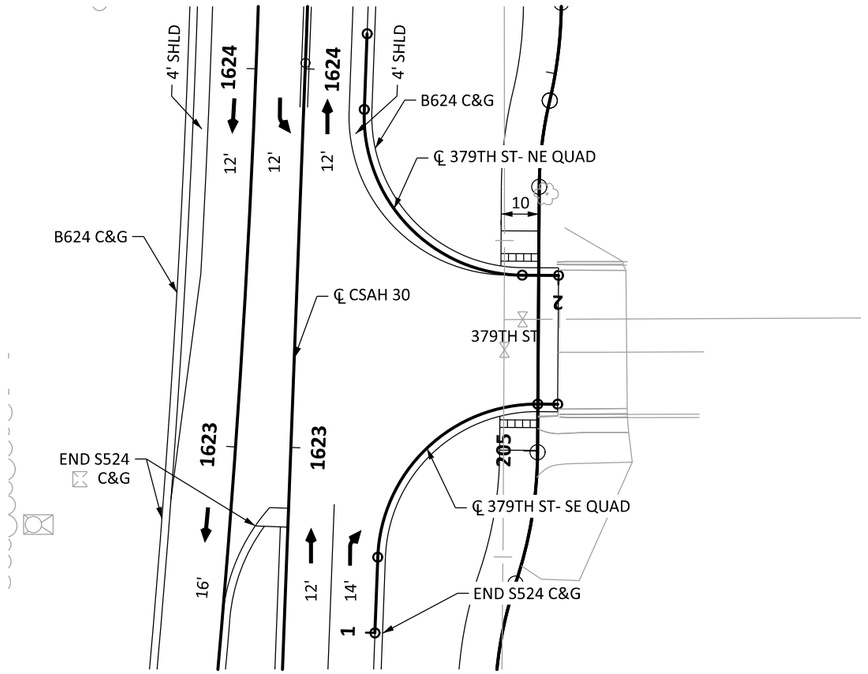

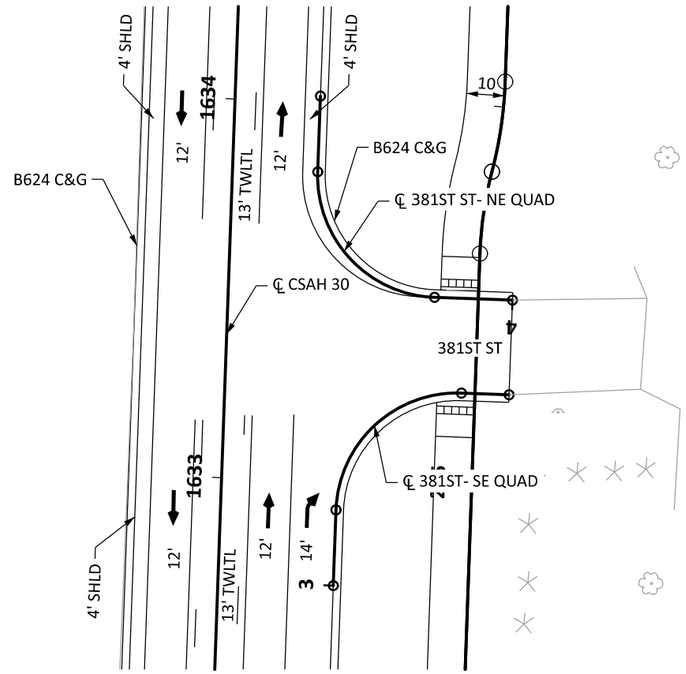

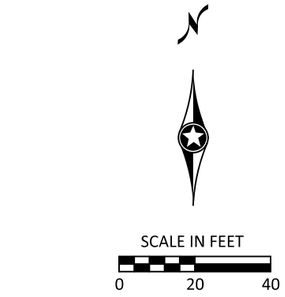

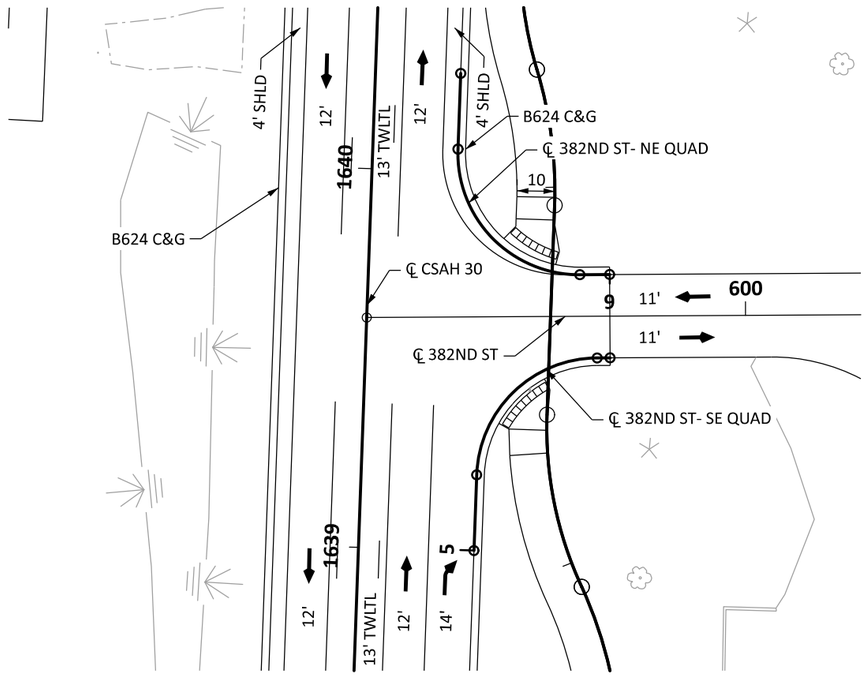

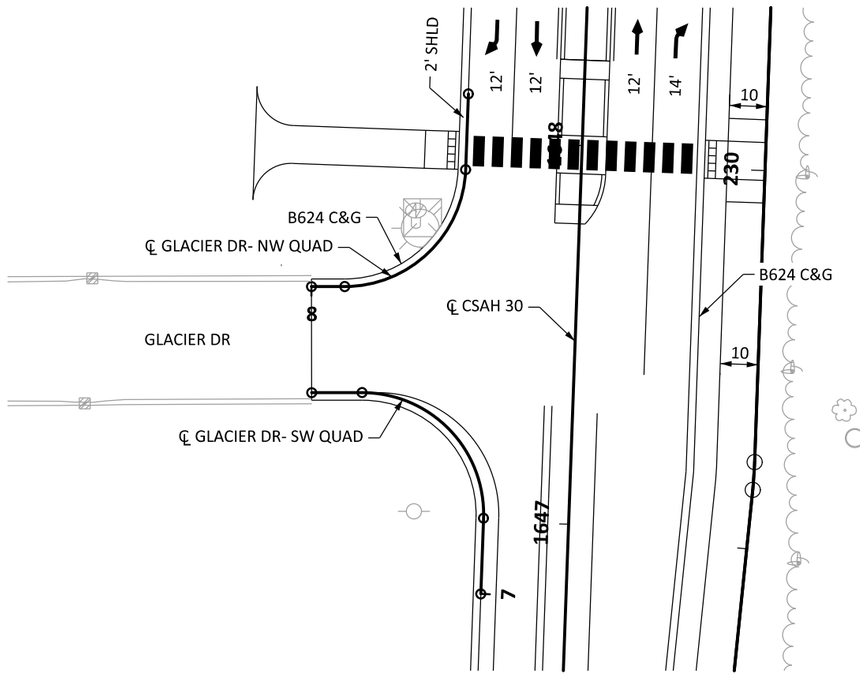

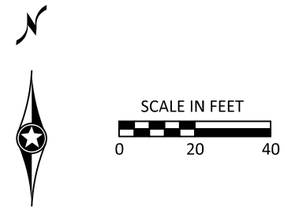

LEGEND

- TRAFFIC FLOW
- DRAINAGE FLOW ARROW
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

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SHEET 148 OF 216 SHEETS

DATE: 9/12/2024 2:06:21 PM
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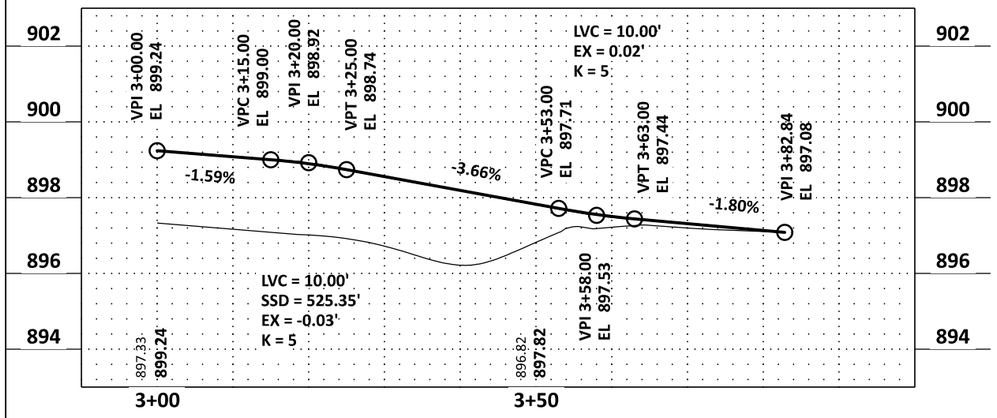
381ST ST - SOUTHEAST QUAD PROFILE



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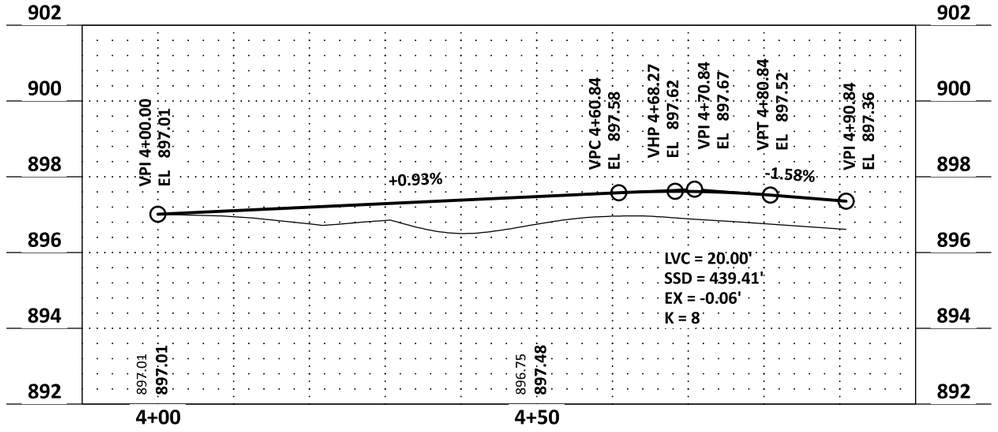

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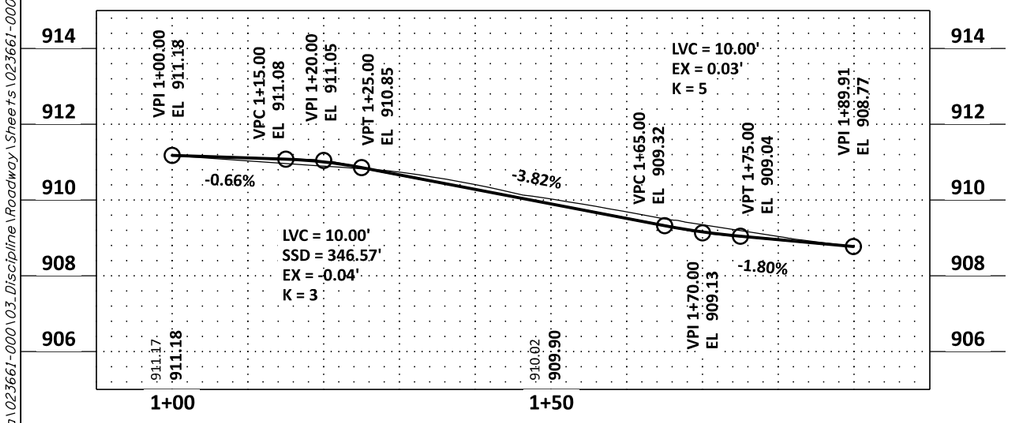

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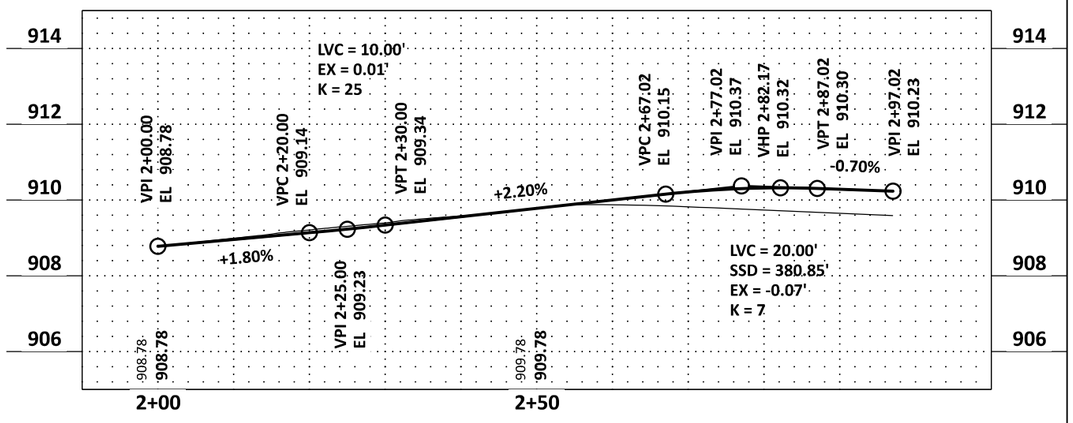

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NO.	DATE	BY	CHK	REVISIONS

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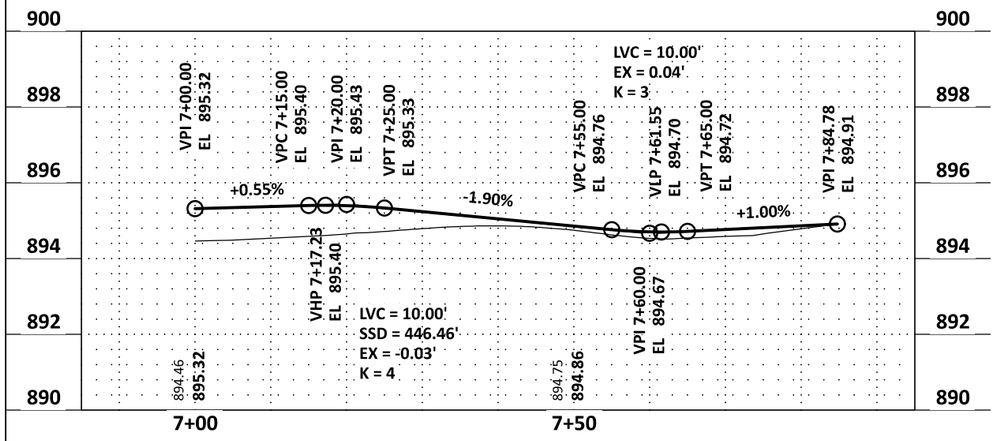
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 149 OF 216 SHEETS

GLACIER DR - SOUTHWEST QUAD PROFILE



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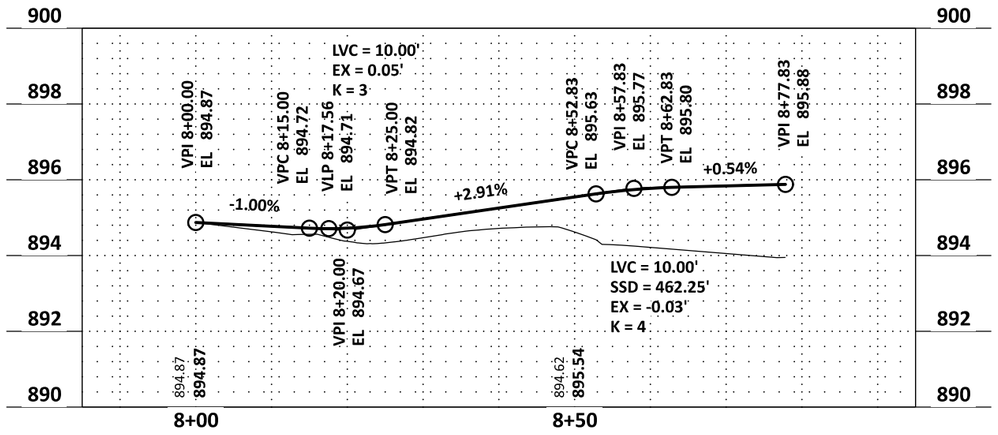

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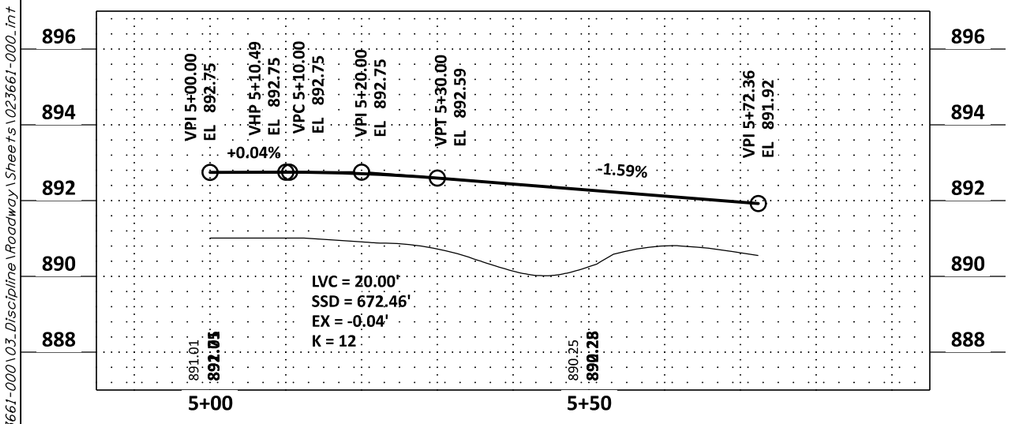

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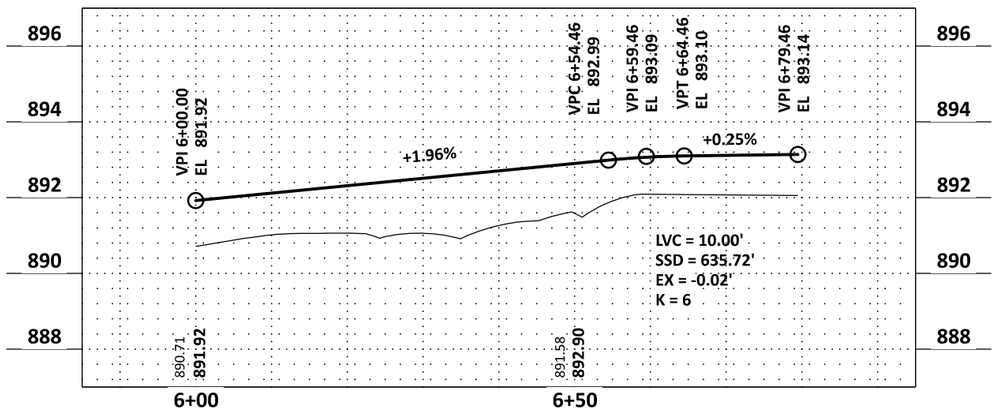

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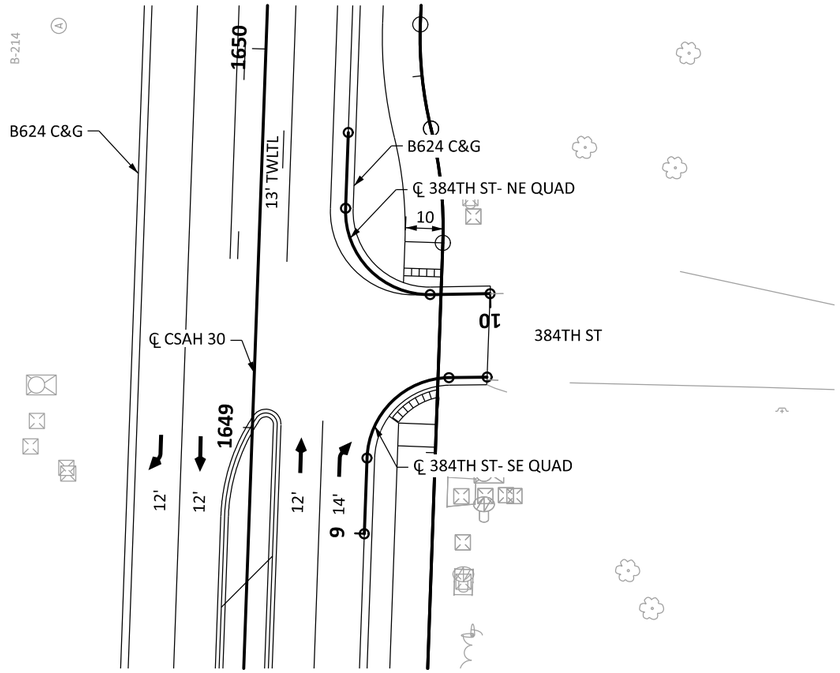
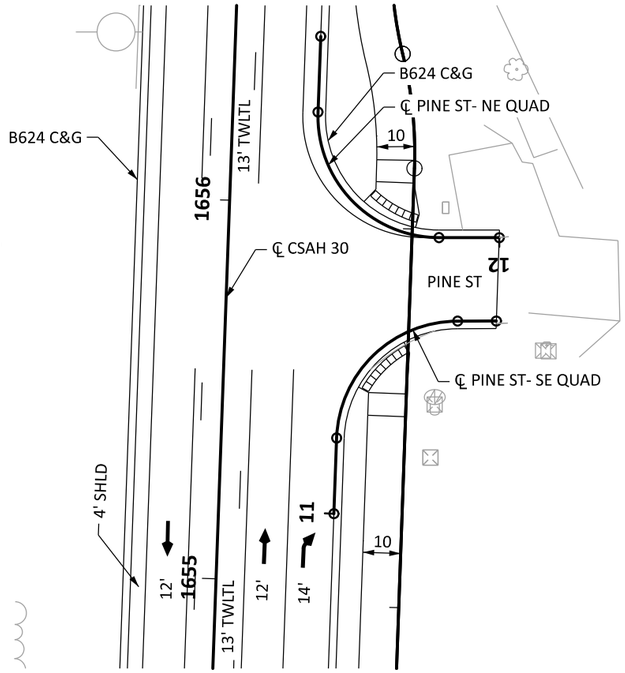
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 150 OF 216 SHEETS





SCALE IN FEET

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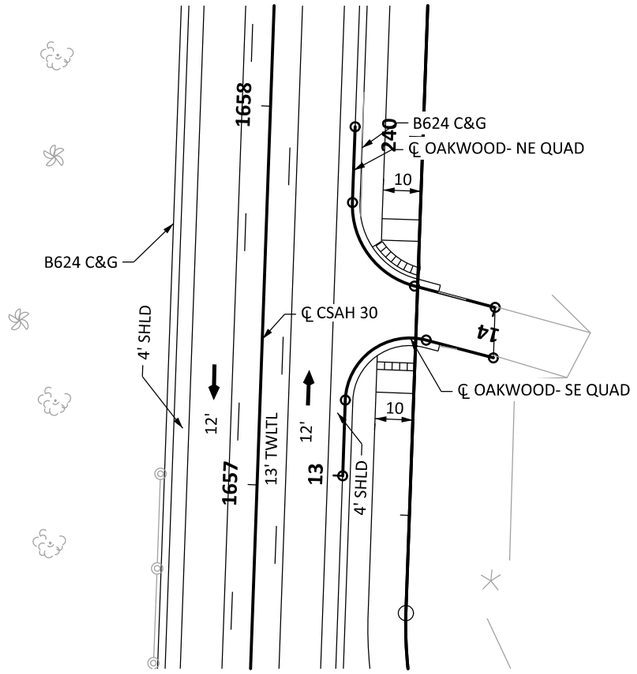

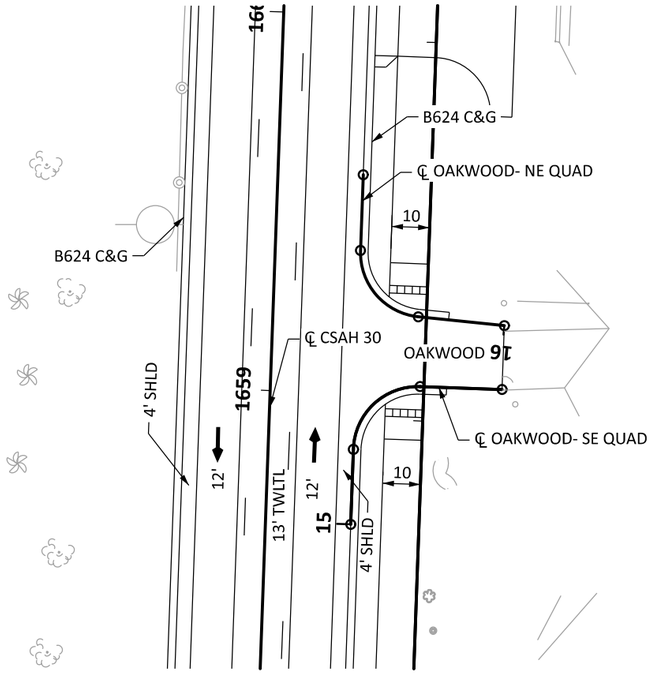

SCALE IN FEET

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LEGEND

- TRAFFIC FLOW
- DRAINAGE FLOW ARROW
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INTERSECTIONS DETAILS
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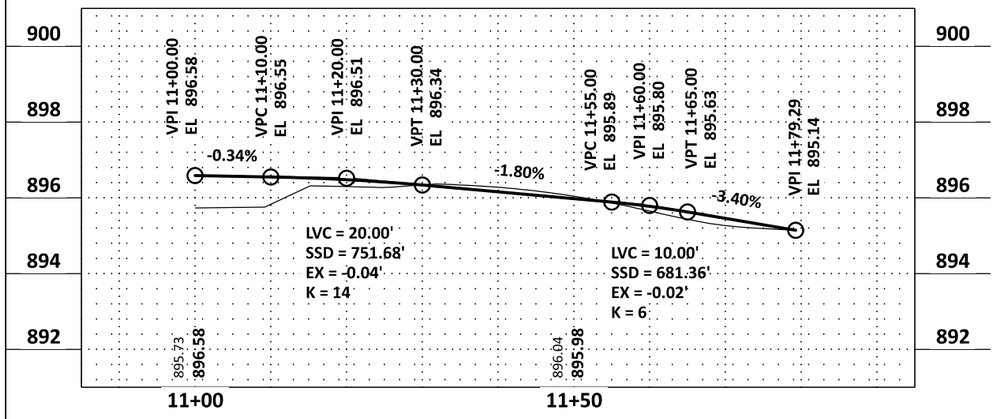
SHEET 151 OF 216 SHEETS

DATE: 9/12/2024 2:06:23 PM
PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_int

PINE ST - SOUTHEAST QUAD PROFILE



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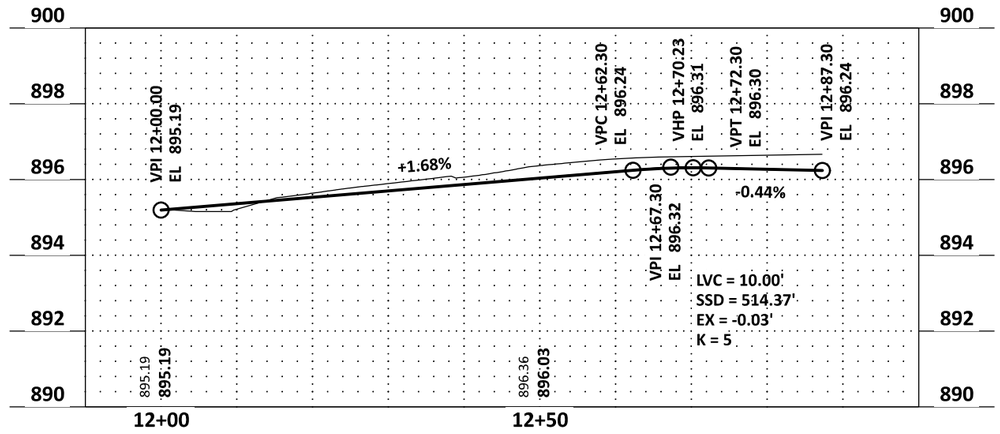

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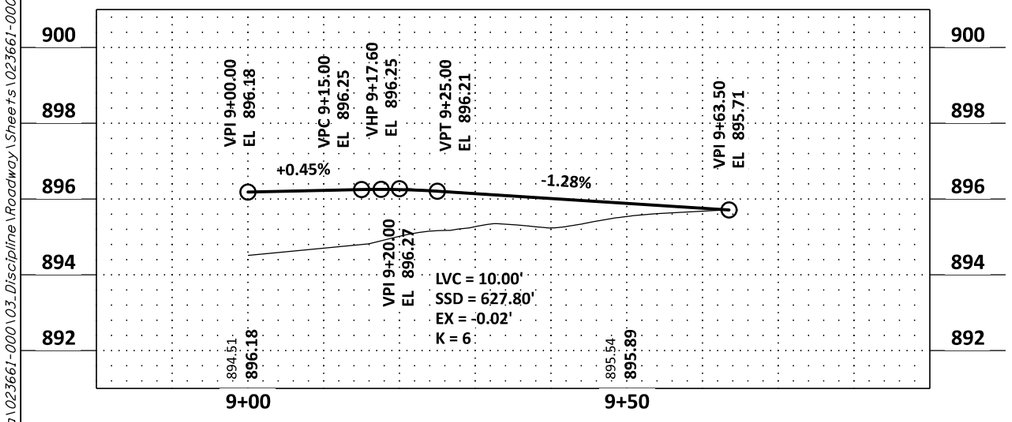

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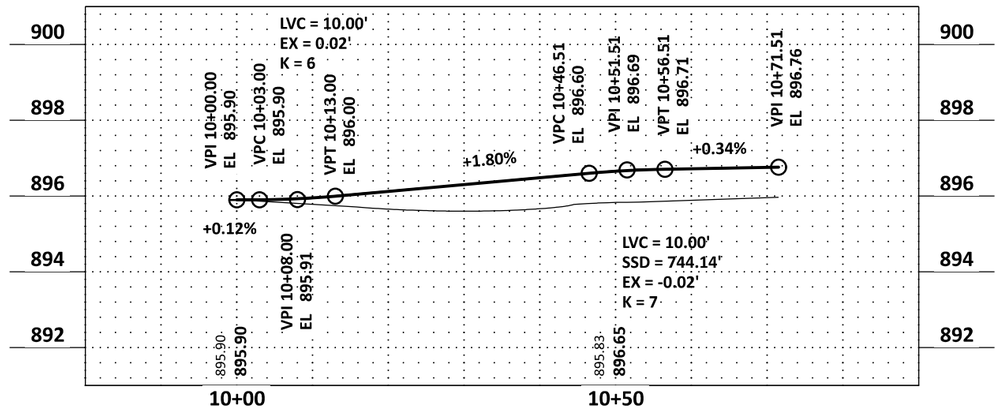

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NO.	DATE	BY	CHK	REVISIONS

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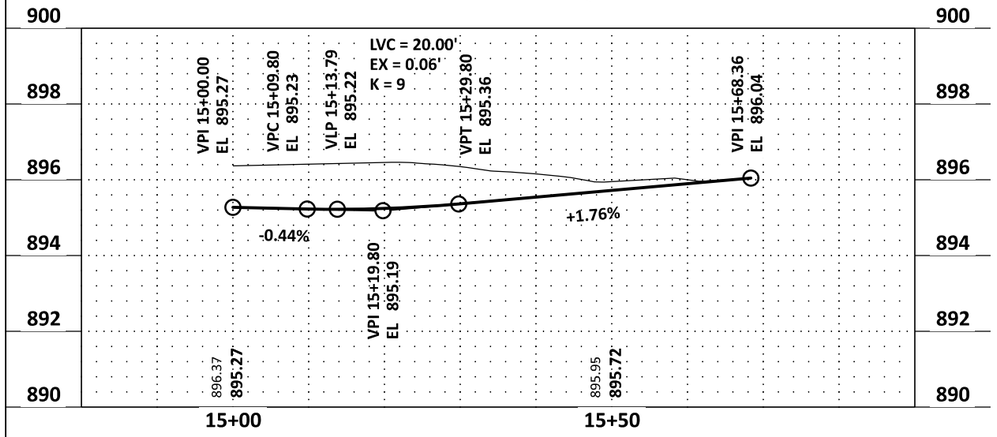
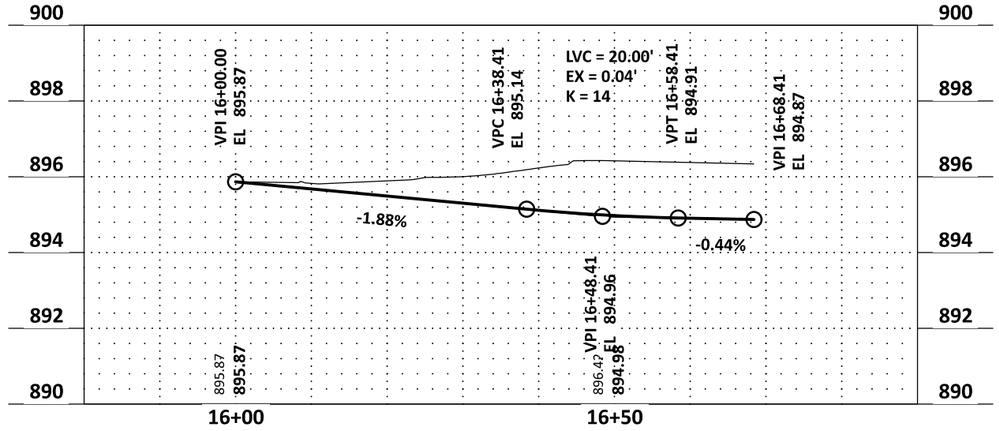
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 152 OF 216 SHEETS

OAKWOOD ST N - SOUTHEAST QUAD PROFILE



OAKWOOD ST N - NORTHEAST QUAD PROFILE



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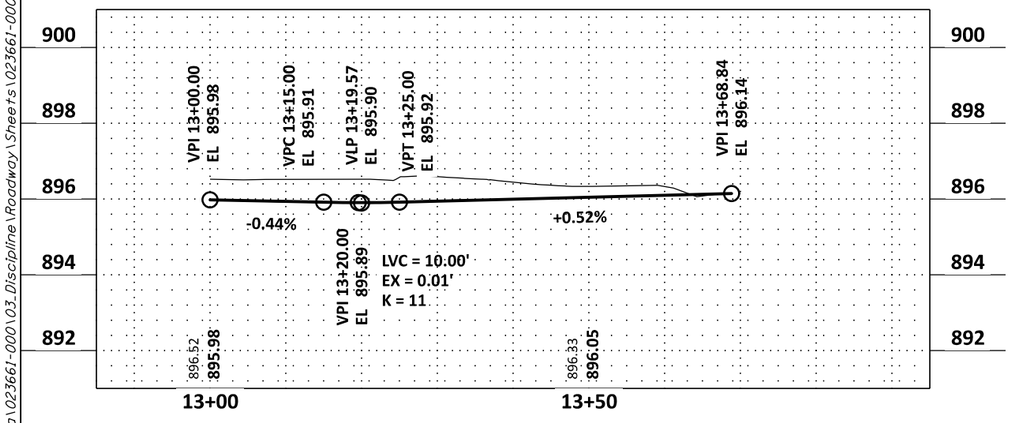
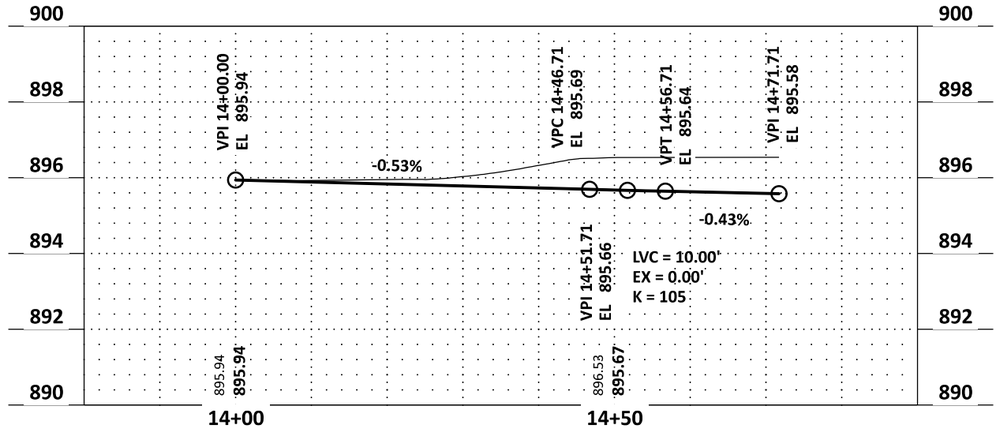


OAKWOOD ST S - NORTHEAST QUAD PROFILE



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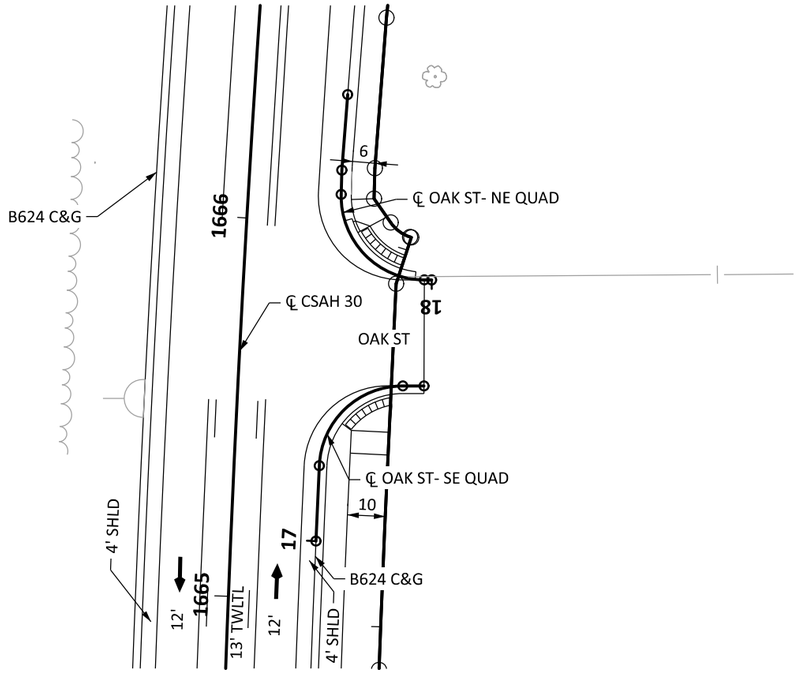
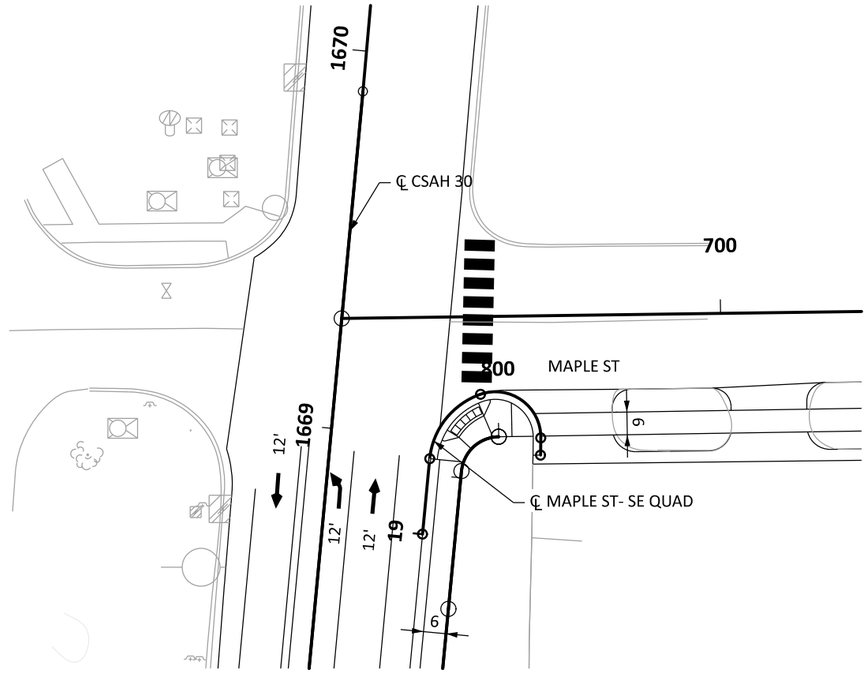
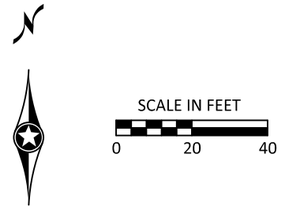
SHEET 153 OF 216 SHEETS







LEGEND

- TRAFFIC FLOW
- DRAINAGE FLOW ARROW
- CONSTRUCTION LIMITS
- EXISTING R/W
- PROPOSED R/W
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

DATE: 9/12/2024 2:06:25 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

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

wsb

Chisago COUNTY USA

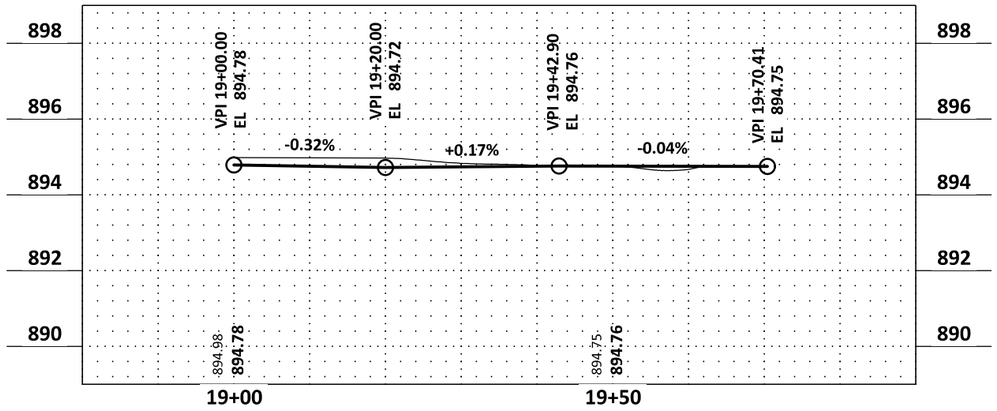
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

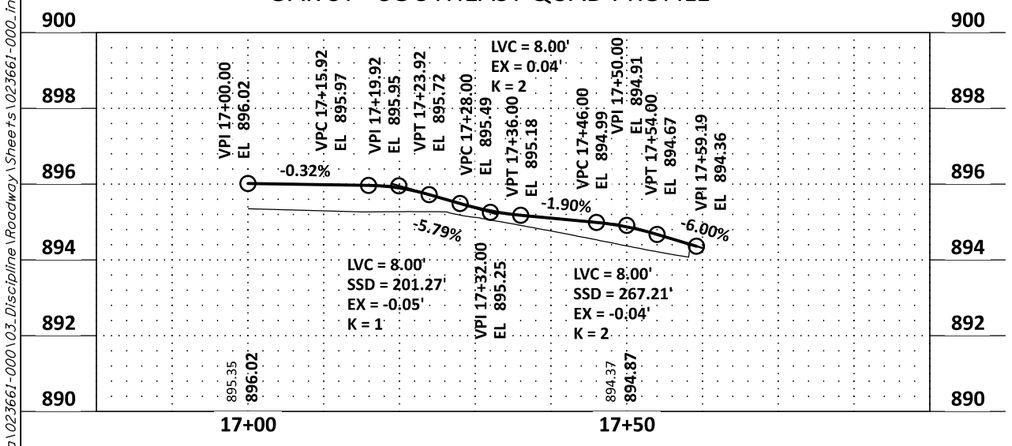
INTERSECTIONS DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 154 OF 216 SHEETS

MAPLE ST - SOUTHEAST QUAD PROFILE



OAK ST - SOUTHEAST QUAD PROFILE



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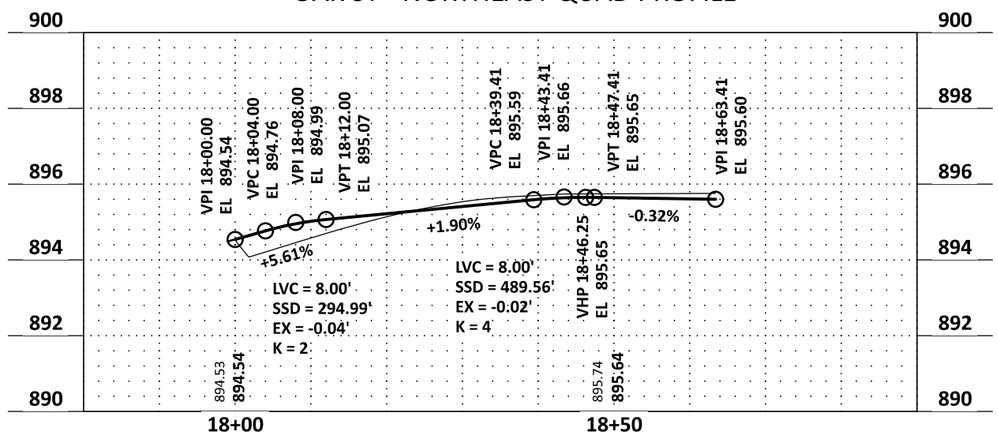

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INTERSECTIONS DETAILS
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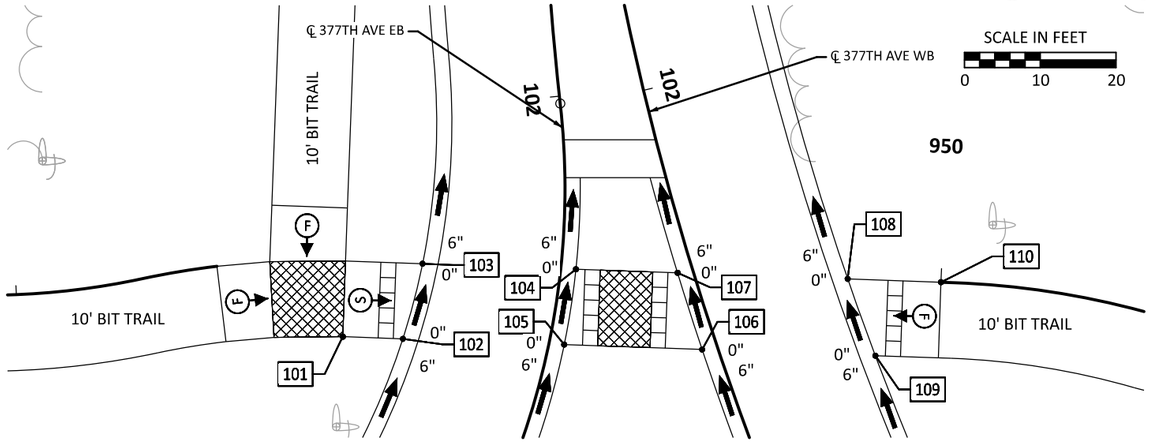
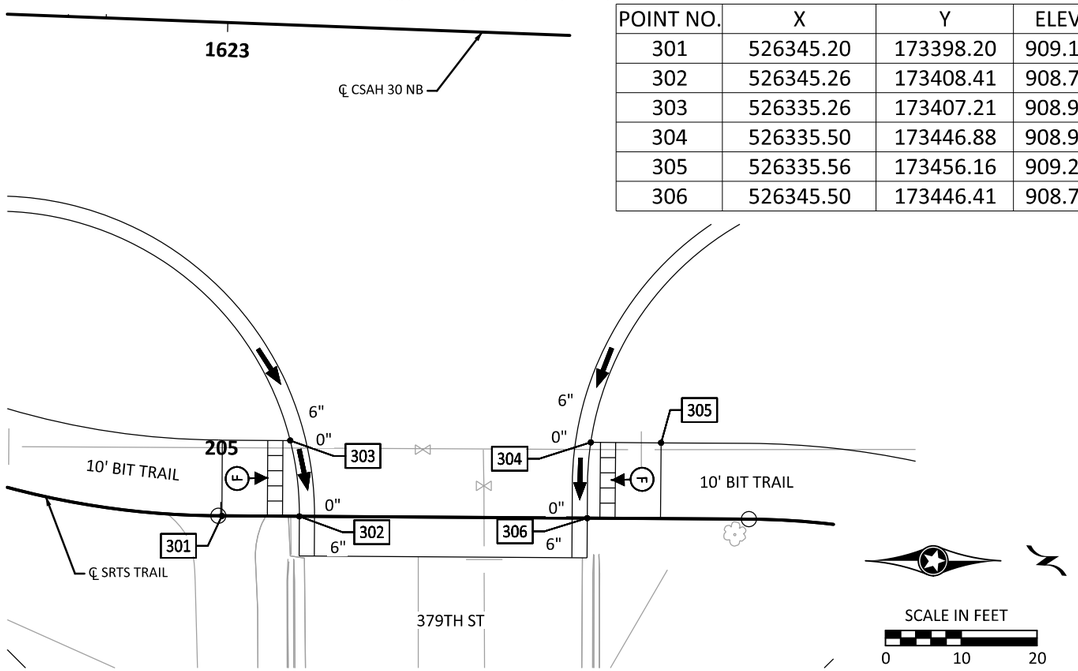
SHEET 155 OF 216 SHEETS

CSAH 30 AT 377TH ST WEST LEG



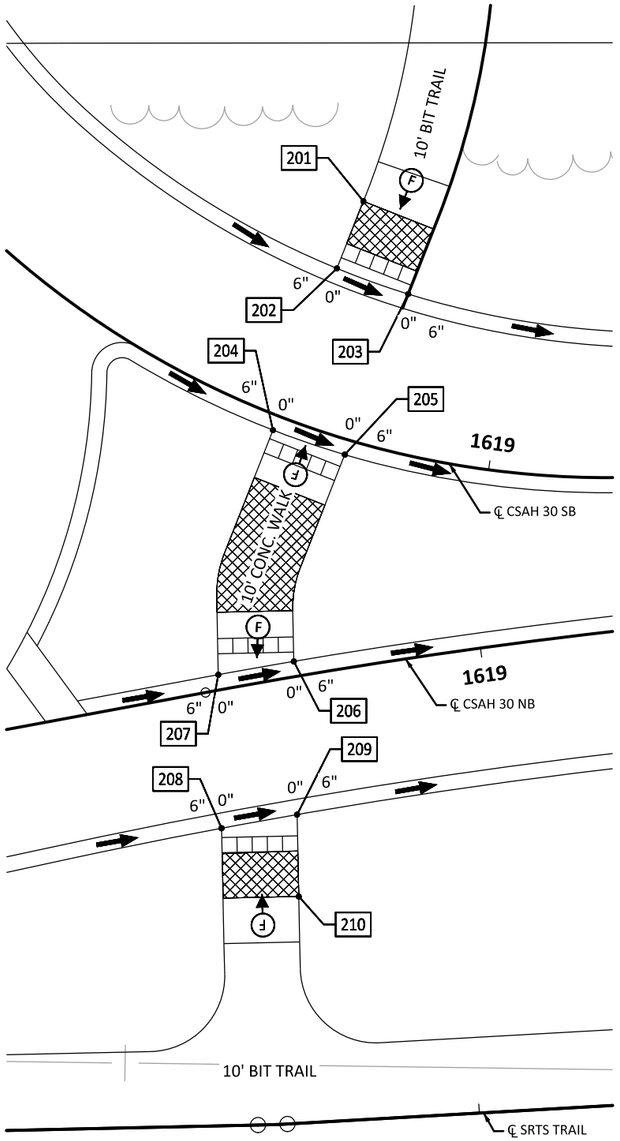
POINT NO.	X	Y	ELEV
101	526135.73	172840.07	917.12
102	526136.02	172847.99	916.64
103	526126.10	172850.58	916.49
104	526126.82	172870.83	916.78
105	526136.78	172869.28	917.03
106	526137.42	172887.49	916.82
107	526127.30	172884.24	916.70
108	526128.13	172906.70	916.45
109	526138.24	172910.35	916.57
110	526128.54	172919.01	916.76

CSAH 30 AT 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

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

LEGEND

- XXX — CONTROL POINTS AT PED. RAMP AND GUTTER FLOW LINE
- DRAINAGE FLOW ARROW
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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

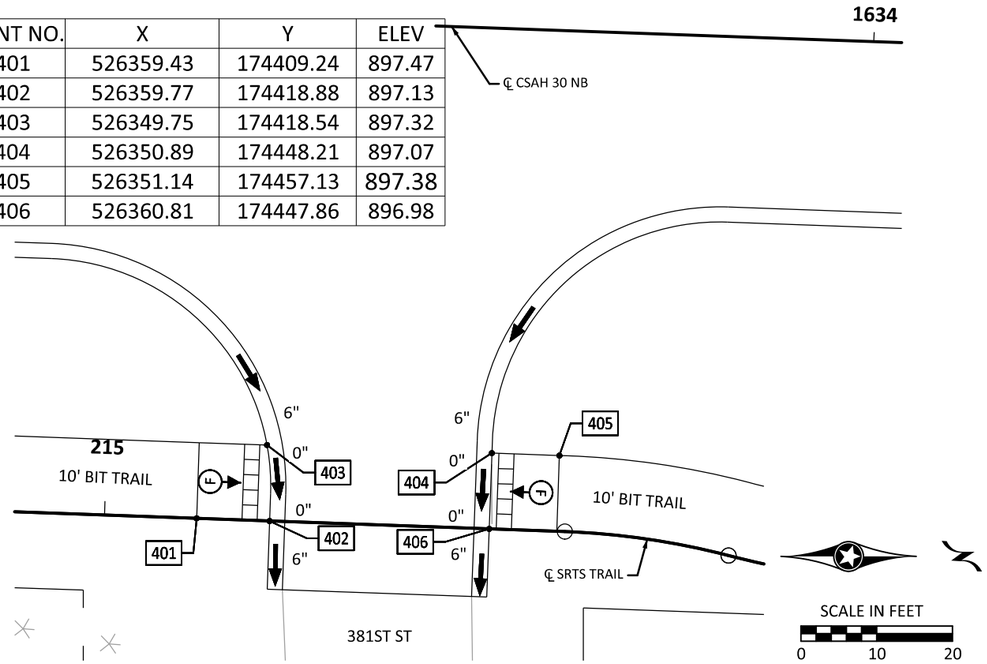
CHISAGO COUNTY, MINNESOTA

PEDESTRIAN RAMP DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

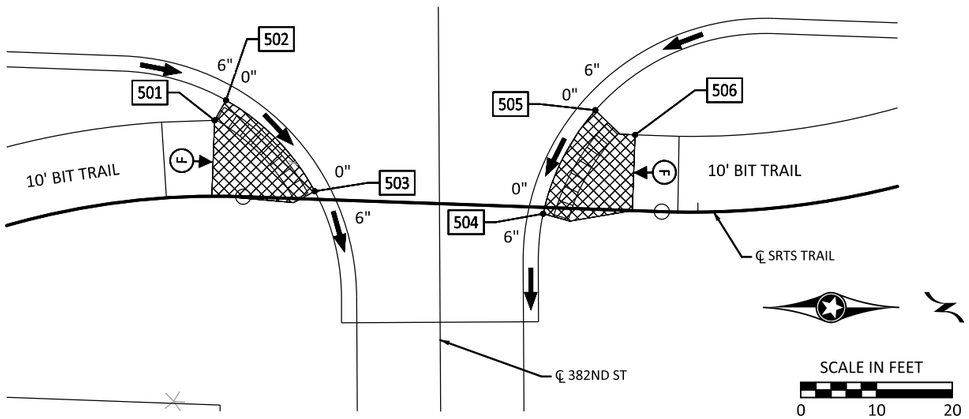
SHEET 156 OF 216 SHEETS

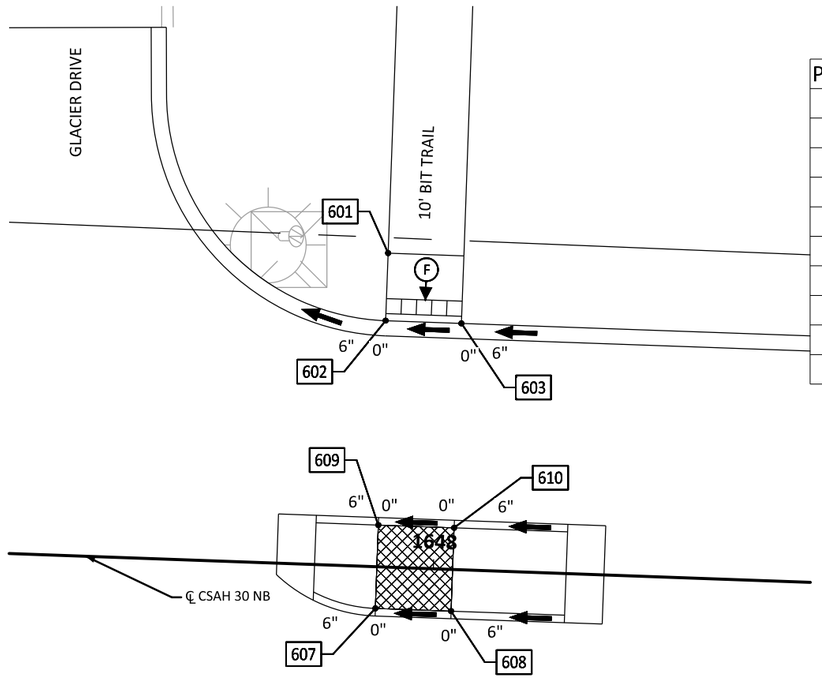
DATE: 9/12/2024 2:06:39 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ped

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



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





POINT NO.	X	Y	ELEV
601	526304.97	175891.76	895.93
602	526313.88	175891.44	895.62
603	526314.24	175901.43	895.71
604	526379.20	175899.10	895.71
605	526378.84	175889.11	895.65
606	526394.83	175888.54	896.22
607	526351.86	175890.08	896.28
608	526352.22	175900.07	896.34
609	526340.86	175890.47	896.28
610	526341.22	175900.46	896.34

SCALE IN FEET
0 10 20

LEGEND

- XXX — CONTROL POINTS AT PED. RAMP AND GUTTER FLOW LINE
- DRAINAGE FLOW ARROW
- CATCH BASIN
- TRUNCATED DOMES
- X" — CURB HEIGHT
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Design By: NEH
Plan By: MKV
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NICHOLAS E. HENTGES, PE
DATE: 9/12/2024 LICENSE NO. 44620

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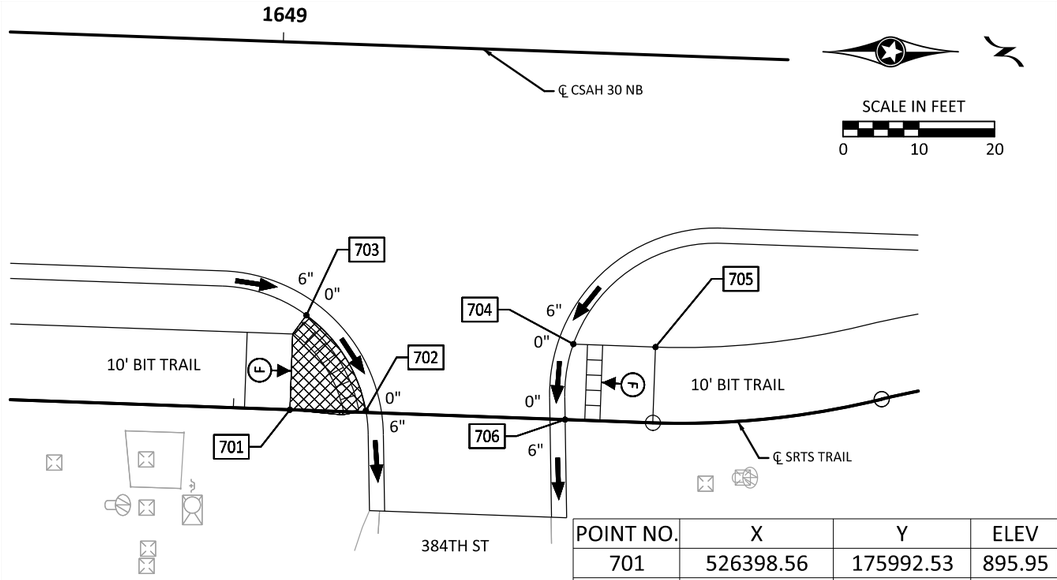
Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

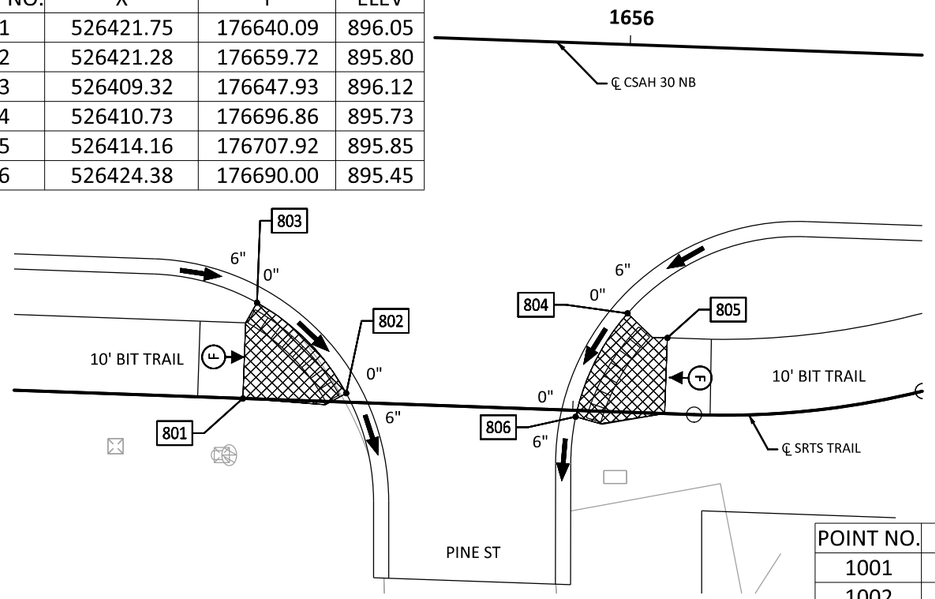
PEDESTRIAN RAMP DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 157 OF 216 SHEETS



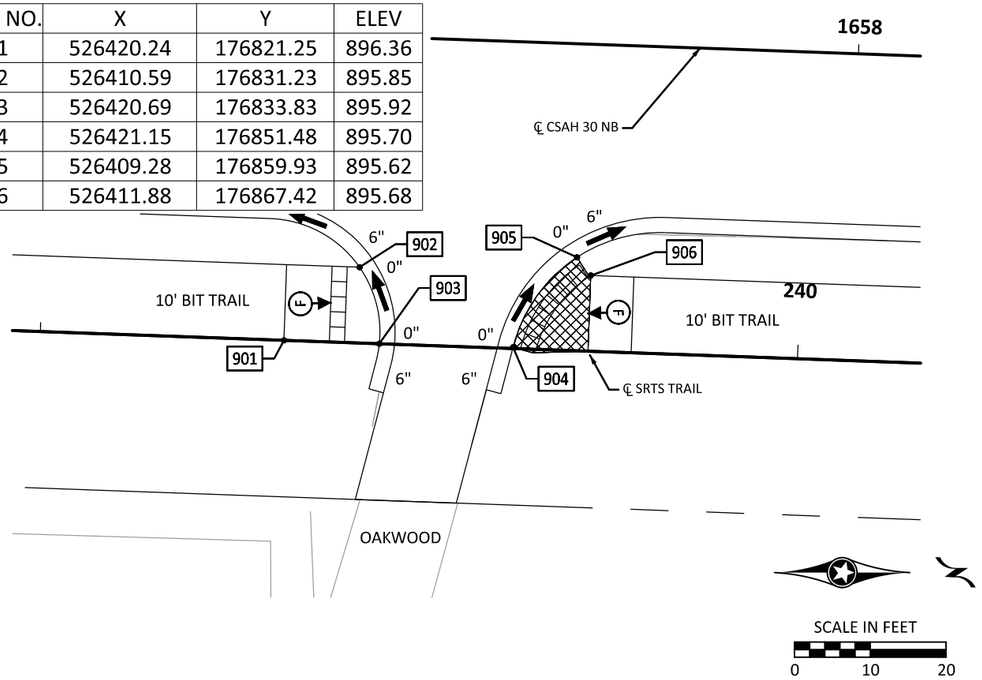
POINT NO.	X	Y	ELEV
701	526398.56	175992.53	895.95
702	526398.88	176008.56	895.77
703	526386.30	176000.70	895.98
704	526390.10	176035.95	896.07
705	526390.49	176046.79	896.45
706	526400.07	176034.85	895.87

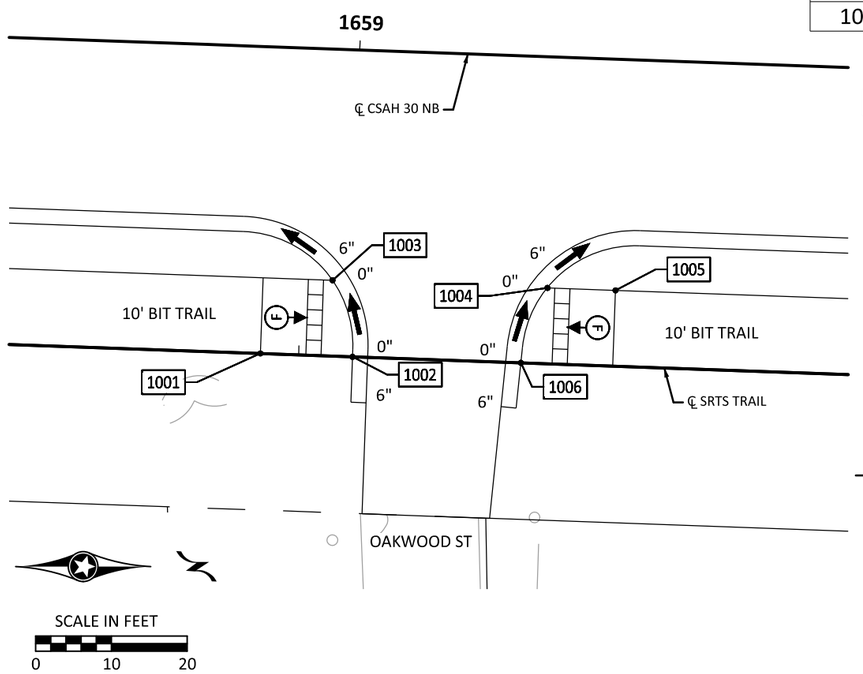
POINT NO.	X	Y	ELEV
801	526421.75	176640.09	896.05
802	526421.28	176659.72	895.80
803	526409.32	176647.93	896.12
804	526410.73	176696.86	895.73
805	526414.16	176707.92	895.85
806	526424.38	176690.00	895.45



POINT NO.	X	Y	ELEV
1001	526426.06	176983.90	895.88
1002	526426.50	176996.06	895.56
1003	526416.40	176993.42	895.35
1004	526417.41	177021.80	895.13
1005	526417.73	177030.77	895.44
1006	526427.29	177018.29	895.34

POINT NO.	X	Y	ELEV
901	526420.24	176821.25	896.36
902	526410.59	176831.23	895.85
903	526420.69	176833.83	895.92
904	526421.15	176851.48	895.70
905	526409.28	176859.93	895.62
906	526411.88	176867.42	895.68





LEGEND

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- DRAINAGE FLOW ARROW
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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 158 OF 216 SHEETS

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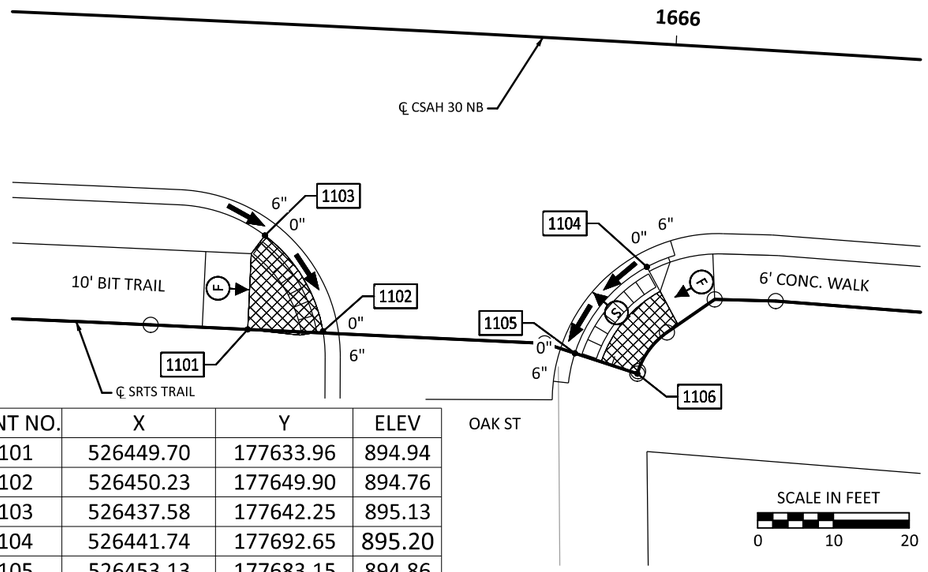
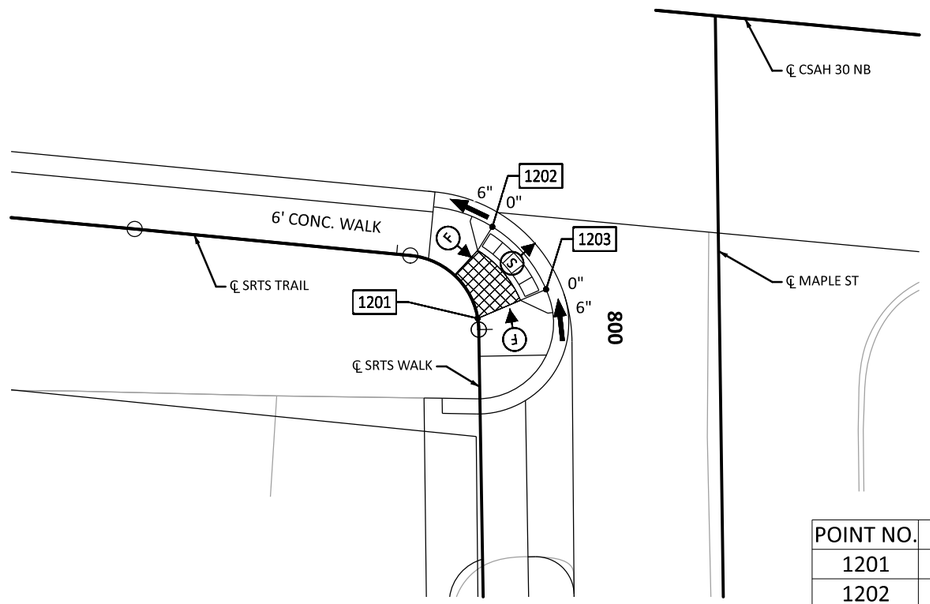
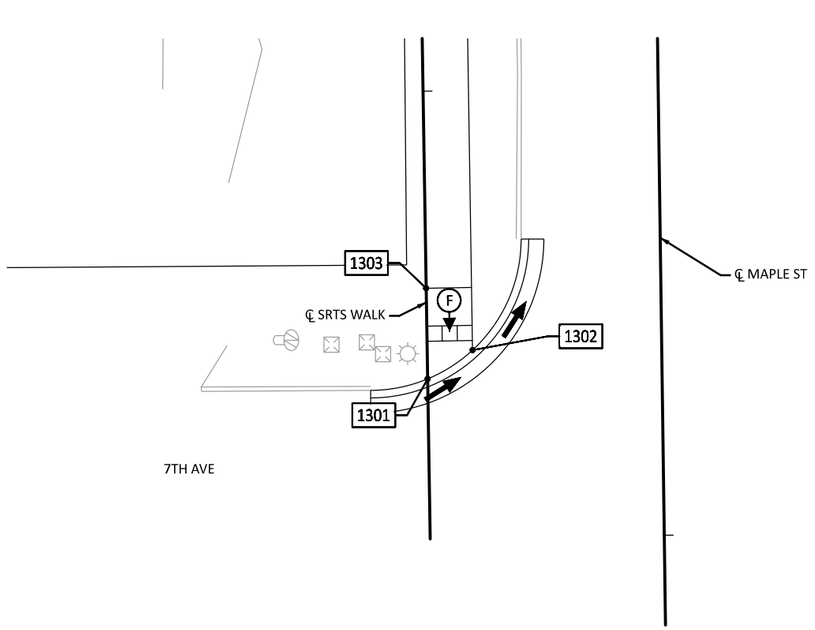
PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ped



POINT NO.	X	Y	ELEV
1101	526449.70	177633.96	894.94
1102	526450.23	177649.90	894.76
1103	526437.58	177642.25	895.13
1104	526441.74	177692.65	895.20
1105	526453.13	177683.15	894.86
1106	526455.82	177691.39	895.02



POINT NO.	X	Y	ELEV
1201	526479.30	177993.16	894.82
1202	526467.21	177995.08	894.62
1203	526475.48	1778002.17	894.64



POINT NO.	X	Y	ELEV
1301	526818.71	177998.70	892.23
1302	526814.91	178004.64	892.07
1303	526806.75	177998.51	893.09

LEGEND

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SHEET 159 OF 216 SHEETS

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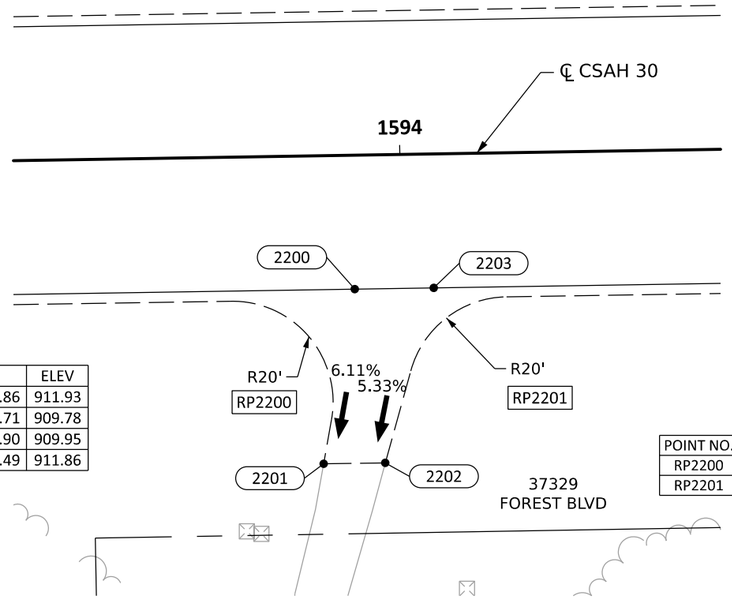
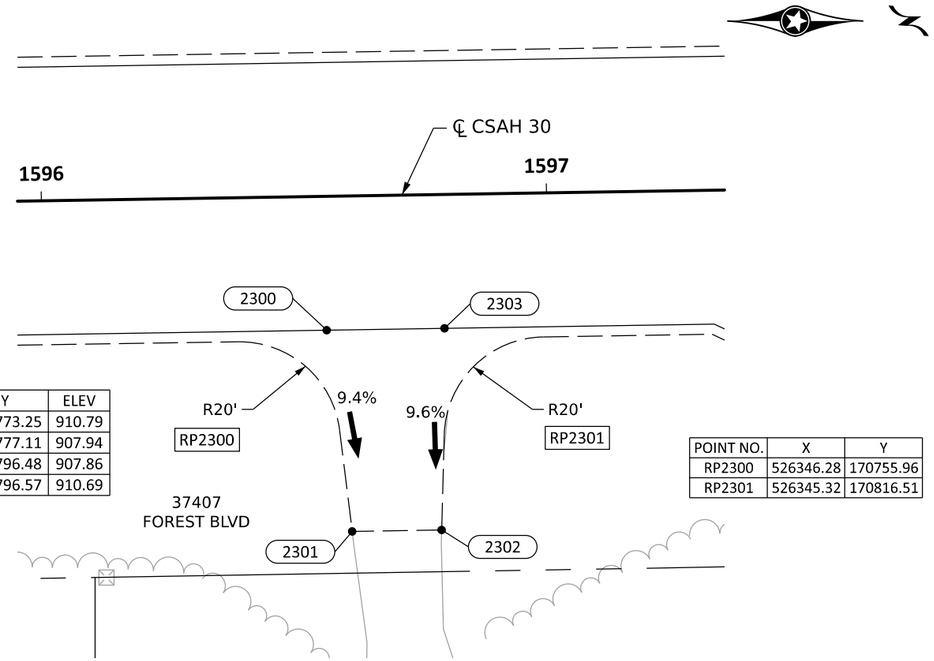


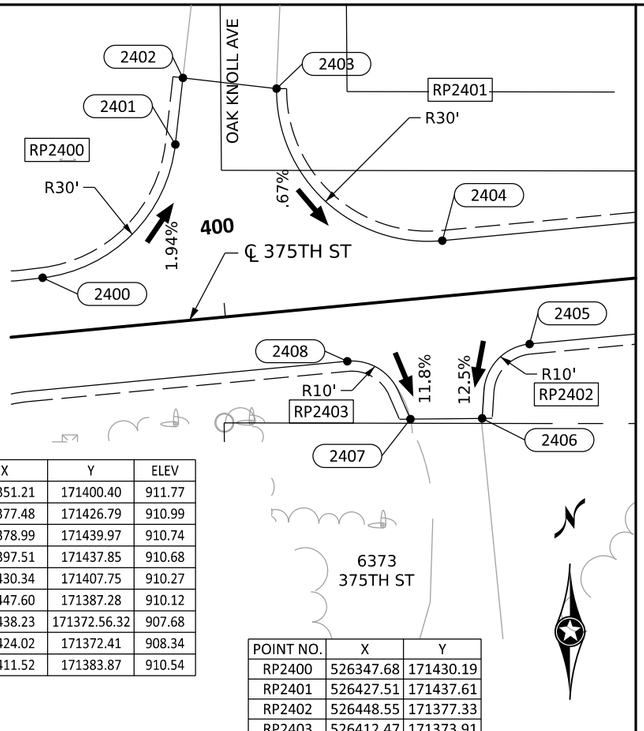
POINT NO.	X	Y	ELEV
2200	526328.21	170507.86	911.93
2201	526362.80	170501.71	909.78
2202	526362.60	170513.90	909.95
2203	526327.96	170523.49	911.86

POINT NO.	X	Y
RP2200	526350.60	170483.56
RP2201	526349.73	170538.21



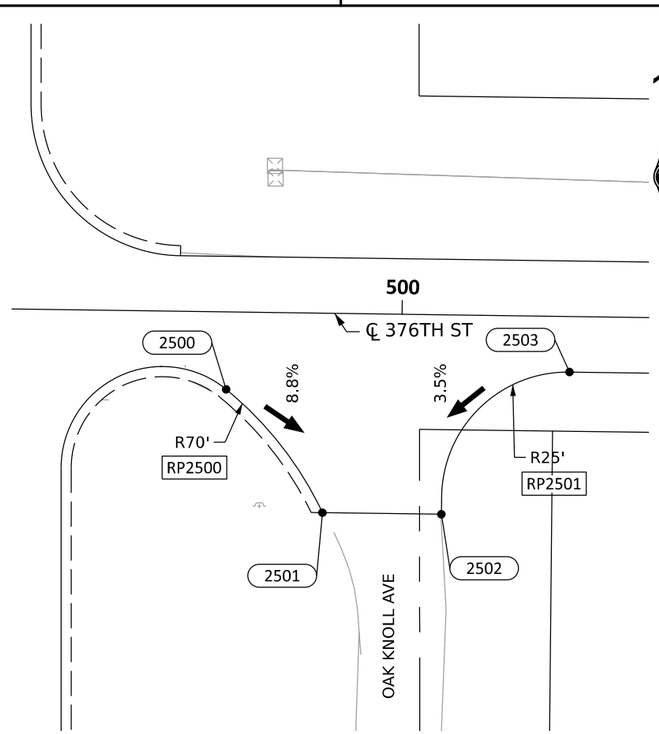
POINT NO.	X	Y	ELEV
2300	526324.00	170773.25	910.79
2301	526353.85	170777.11	907.94
2302	526353.55	170796.48	907.86
2303	526323.63	170796.57	910.69

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	171372.56.32	907.68
2407	526424.02	171372.41	908.34
2408	526411.52	171383.87	910.54

POINT NO.	X	Y
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

SCALE IN FEET
0 15 30

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

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(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:
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

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

wsb

Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

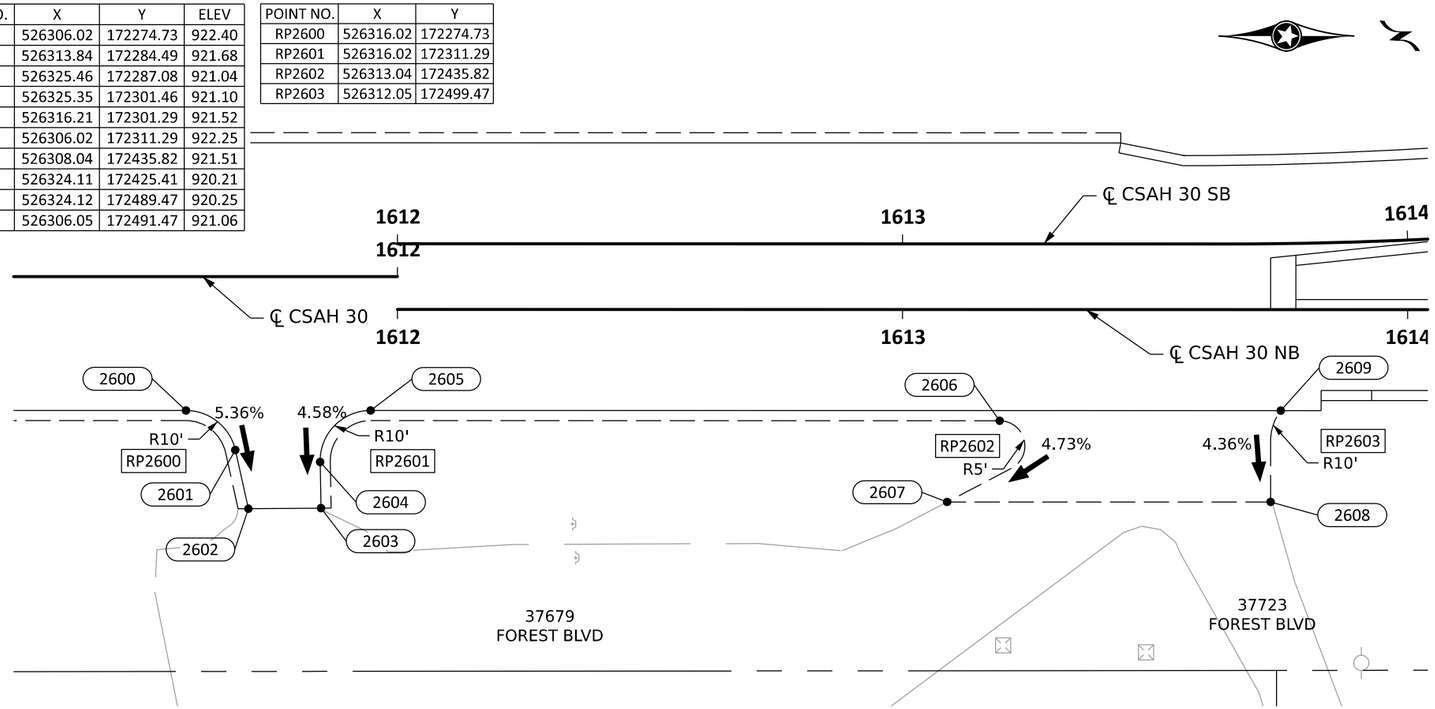
DRIVEWAY DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 160 OF 216 SHEETS

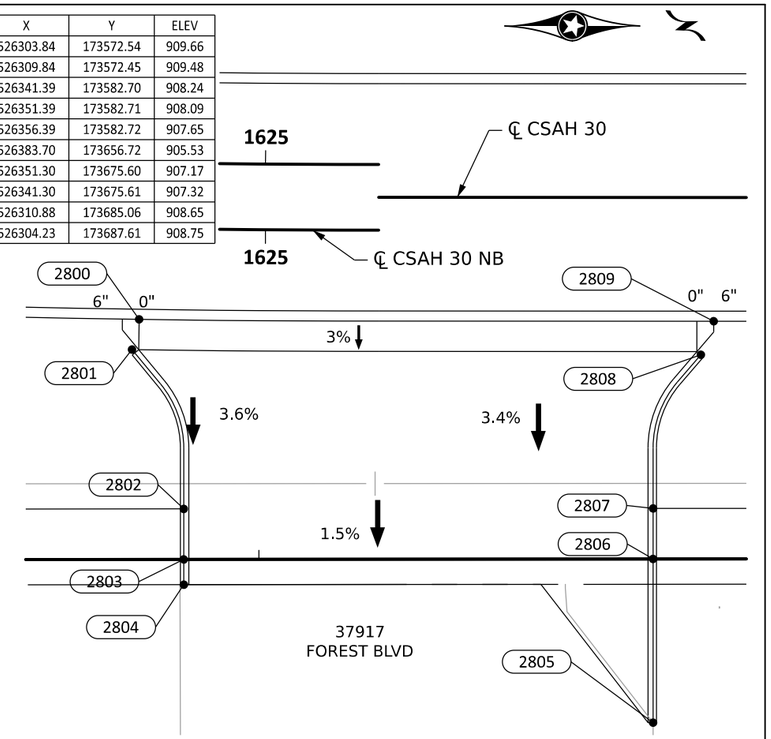
DATE: 9/12/2024 2:06:55 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000.dwy

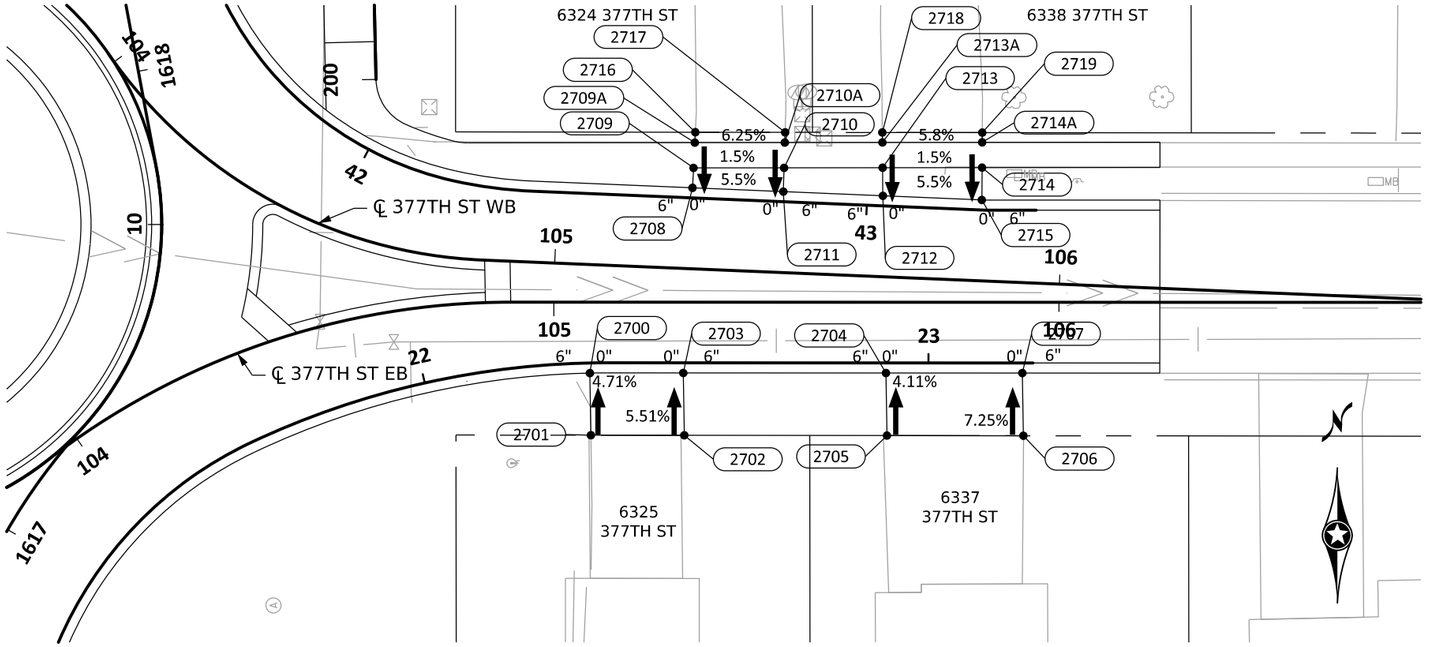
POINT NO.	X	Y	ELEV
2600	526306.02	172274.73	922.40
2601	526313.84	172284.49	921.68
2602	526325.46	172287.08	921.04
2603	526325.35	172301.46	921.10
2604	526316.21	172301.29	921.52
2605	526306.02	172311.29	922.25
2606	526308.04	172435.82	921.51
2607	526324.11	172425.41	920.21
2608	526324.12	172489.47	920.25
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	914.91
2704	526442.27	172841.28	913.91
2705	526442.47	172828.91	914.42
2706	526469.48	175828.88	914.02
2707	526469.28	172841.28	913.12
2708	526403.97	172877.95	914.82
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	913.21
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

SCALE IN FEET

0 15 30

LEGEND

- XXX — CONTROL POINTS
- RXX' — RADIUS CALLOUT
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(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:

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. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

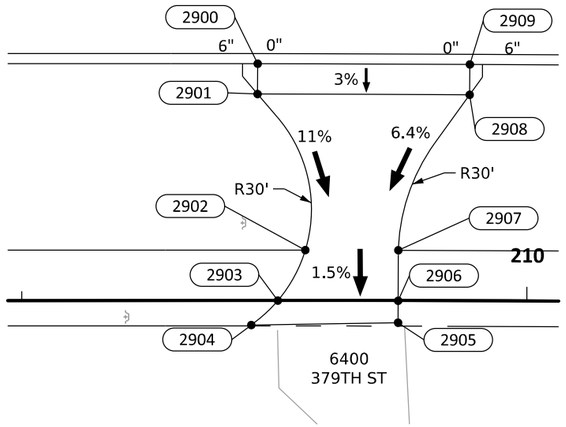
CHISAGO COUNTY, MINNESOTA

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

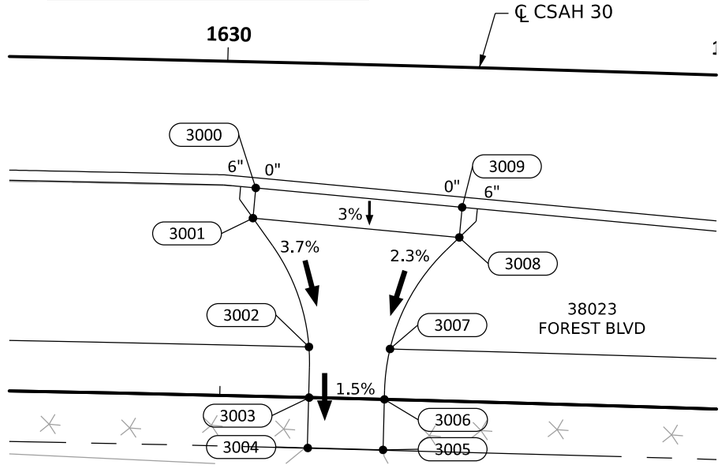
SHEET 161 OF 216 SHEETS

DATE: 9/12/2024 2:06:56 PM
PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_dwy

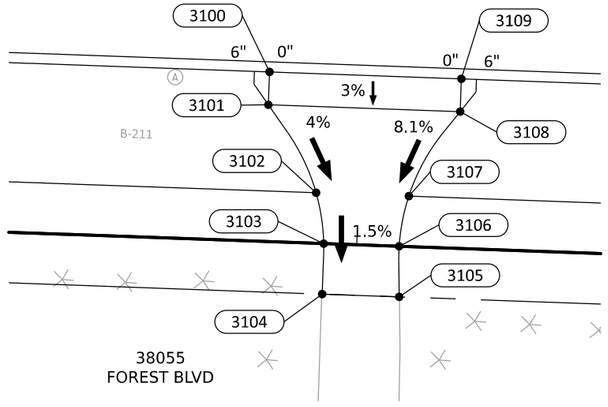
POINT NO.	X	Y	ELEV
2900	526304.26	173844.27	907.47
2901	526310.26	173844.26	907.29
2902	526341.16	173853.71	903.57
2903	526351.15	173848.28	903.42
2904	526356.00	173842.96	903.06
2905	526355.52	173872.07	904.34
2906	526351.20	173872.09	904.41
2907	526341.20	173872.14	904.55
2908	526310.41	173886.26	906.76
2909	526304.41	173886.29	906.94

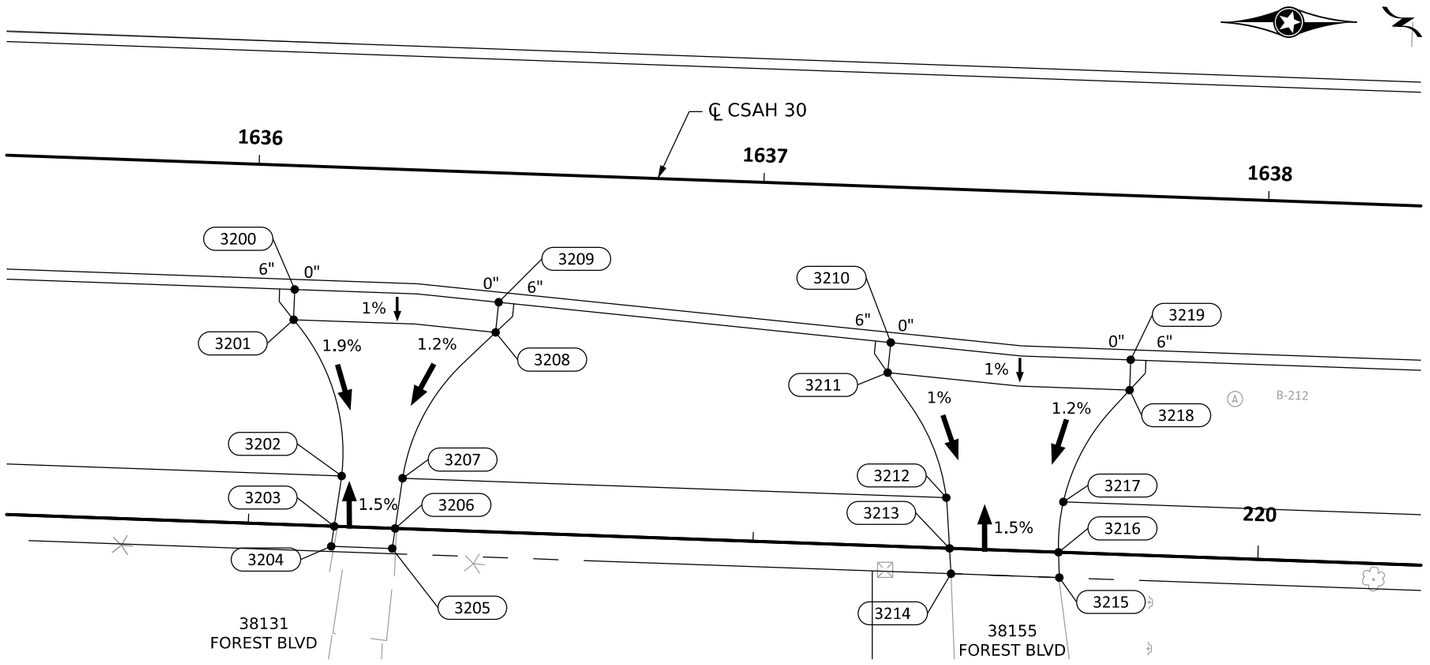


POINT NO.	X	Y	ELEV
3000	526308.10	174104.38	903.48
3001	526314.07	174103.82	903.30
3002	526339.57	174114.90	902.26
3003	526349.64	174114.85	902.11
3004	826359.55	174114.58	901.96
3005	526359.95	174129.58	901.68
3006	526349.95	174129.85	901.83
3007	526339.96	174130.96	901.98
3008	526317.90	174144.68	902.60
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

SCALE IN FEET
0 15 30

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
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(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:

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2. SEE DRIVEWAY TAB FOR QUANTITY INFORMATION.

DATE: 9/12/2024 2:06:57 PM
PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000.dwg

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

wsb

Chisago COUNTY USA

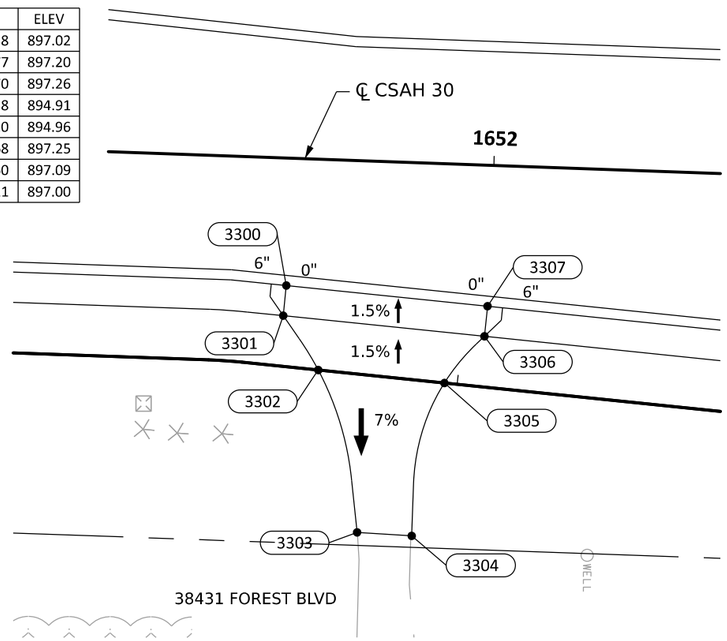
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

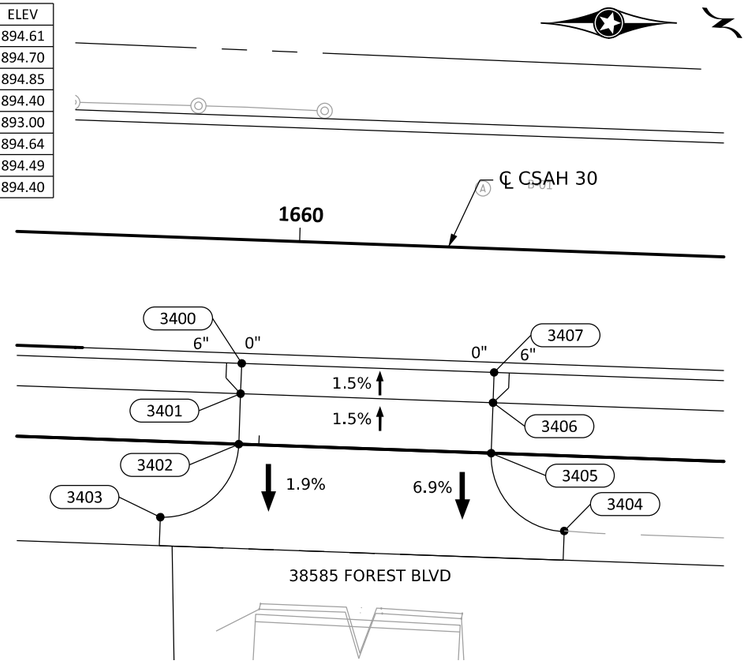
DRIVEWAY DETAILS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

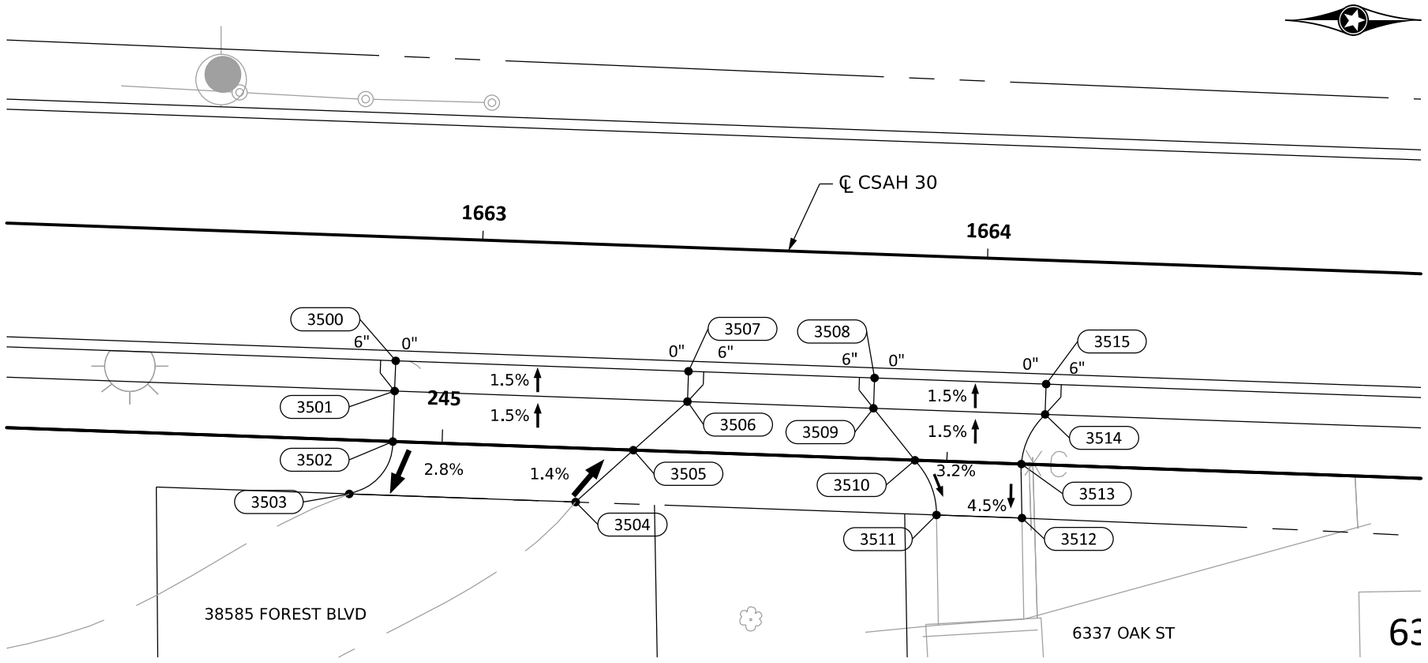
SHEET 162 OF 216 SHEETS

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

SCALE IN FEET
0 15 30

LEGEND

- XXX — CONTROL POINTS
- RXX' — RADIUS CALLOUT
- PROPOSED CATCH BASIN
- CONSTRUCT CONCRETE CURB AND GUTTER
- DRAINAGE FLOW ARROW
- CONSTRUCTION LIMITS
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- RIGHT OF WAY
- TEMPORARY EASEMENT
- PERMANENT EASEMENT DRAINAGE/ UTIL

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(2) 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.

DATE: 9/12/2024 2:06:58 PM
PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_dwy

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

wsb

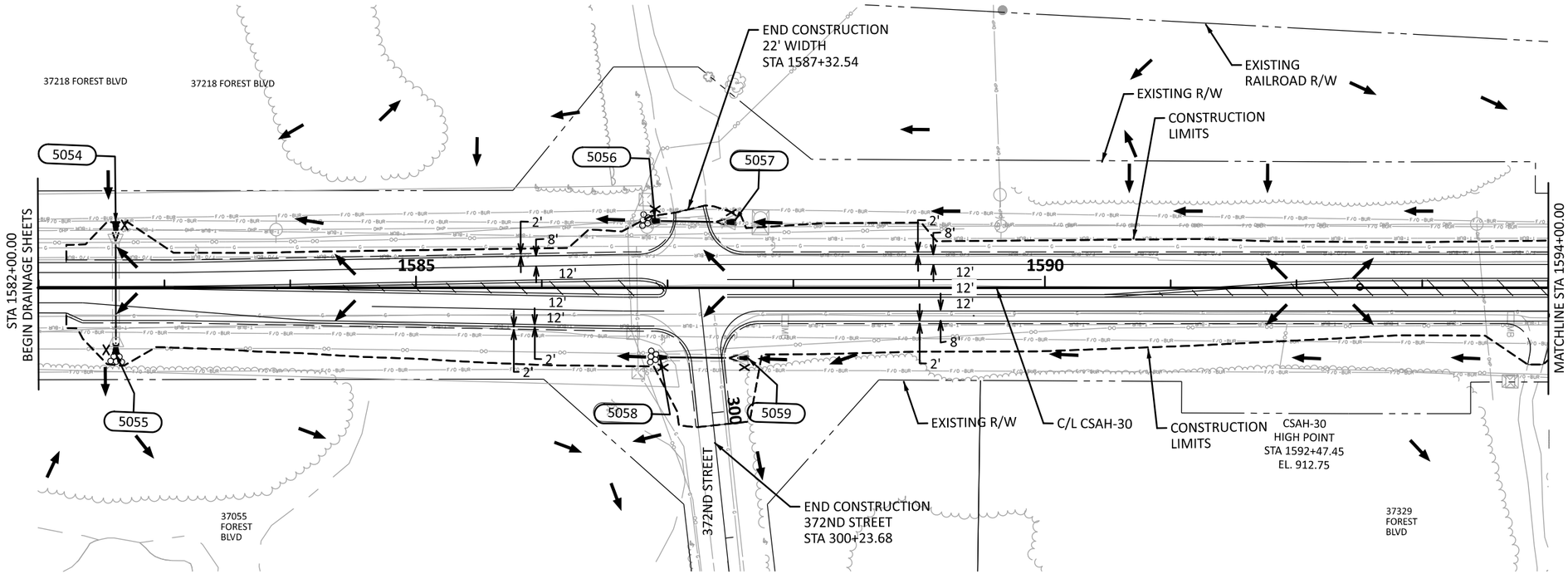
Chisago COUNTY USA

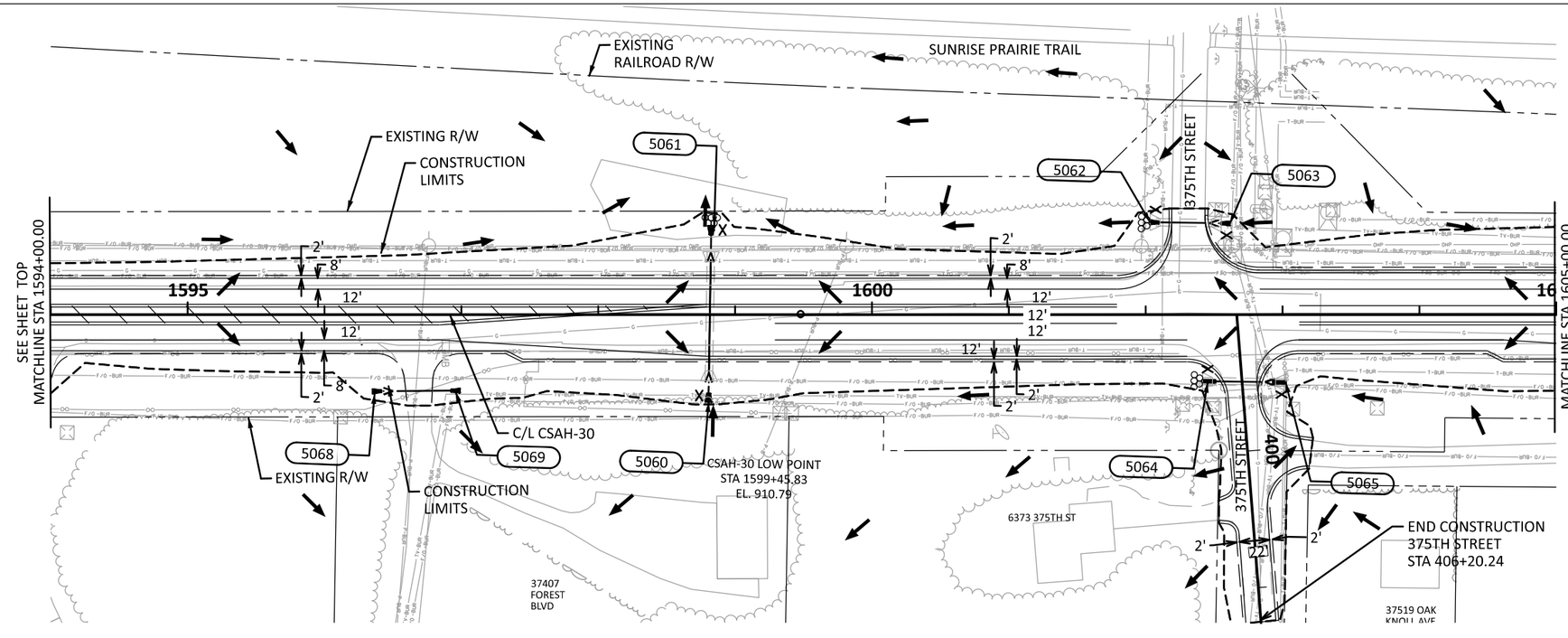
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 163 OF 216 SHEETS





LEGEND

- (0000) STRUCTURE NUMBER
- CATCH BASIN
- MANHOLE
- APRON
- EXISTING CULVERT PIPE
- CULVERT PIPE
- STORM SEWER PIPE
- 4" PERF PE PIPE DRAIN
- RANDOM RIPRAP
- X GUIDE POST TYPE B WITH X4-3
- SURFACE FLOW DIRECTION
- WETLAND DELINEATION - AREA OF ENVIRONMENTAL SENSITIVITY

NOTES

1. SEE TYPICAL SECTION FOR PAVEMENT CROSS SLOPE.
2. 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.

EARTH A. EVANS, PE
DATE: 9/12/2024 LICENSE NO. 44235

wsb

Chisago COUNTY USA

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 164 OF 216 SHEETS

DATE: 9/12/2024 2:07:25 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Drainage\Sheets\023661-000-301drp-plan-001

SUNRISE PRAIRIE TRAIL
EXISTING RAILROAD R/W
EXISTING R/W
CONSTRUCTION LIMITS
900
5166
5165
SEE SHEET 164
MATCHLINE STA 1605+00.00
MATCHLINE STA 1616+00.00
SEE SHEET BOTTOM
2'
8'
12'
12'
12'
1610
1615
1615
05
5090
5091
500
CSAH-30 HIGH POINT
STA 1610+80.73
EL. 923.06
EXISTING R/W
CONSTRUCTION LIMITS
CSAH-30 LOW POINT
STA 1616+68.95
EL. 918.06
6325 377TH ST
37723 FOREST BLVD
37577 OAK KNOLL AVE
37615 OAK KNOLL AVE
37679 FOREST BLVD
END CONSTRUCTION
376TH STREET
STA 501+30.52
100
100
5129
5128
SCALE IN FEET
0 50 100

EXISTING TRAIL R/W
SUNRISE PRAIRIE TRAIL
EXISTING R/W & TRAIL R/W
377TH STREET
NEW TRAIL
5125
5167
5165
5137
5132
5126
5139
5155
CONSTRUCTION LIMITS
EXISTING R/W
5103
5194
5156
5157
SEE SHEET TOP
MATCHLINE STA 1616+00.00
VARIES
5190
5191
5152
5159
5127
1620
1620
1625
1625
MATCHLINE STA 1627+00.00
SEE SHEET 166
5134
EXISTING TRAIL
NEW TRAIL
5168
200
205
5153
5189
5193
5102
5070
5071
5113
RADIAL LOW POINT
STA 10+80.86
EL. 916.94
6324 377TH ST
CONSTRUCTION LIMITS
EXISTING R/W
FIRE HOUSE DRIVEWAY
BEGIN SAP 225-591-007
CSAH-30 STA 1623+49.87
END CONSTRUCTION
69' RT, 34' WIDTH
STA 1623+31.59
379TH STREET
377TH STREET
505
505
5131
5130
6355 379TH ST
37917 FOREST BLVD
SCALE IN FEET
0 50 100

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

1. SEE TYPICAL SECTION FOR PAVEMENT CROSS SLOPE.
2. 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.

EARTH A. EVANS, PE
DATE: 9/12/2024 LICENSE NO. 44235

wsb

Chisago COUNTY USA

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 165 OF 216 SHEETS

DATE: 9/12/2024 2:07:32 PM
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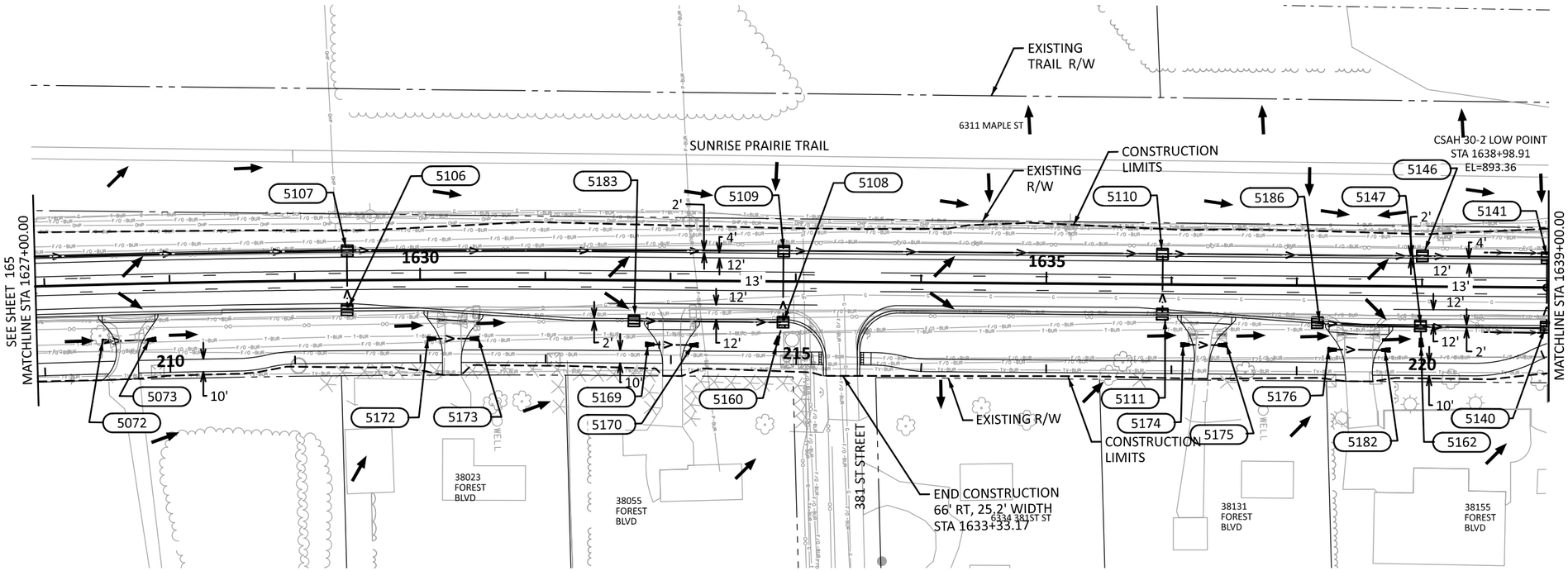

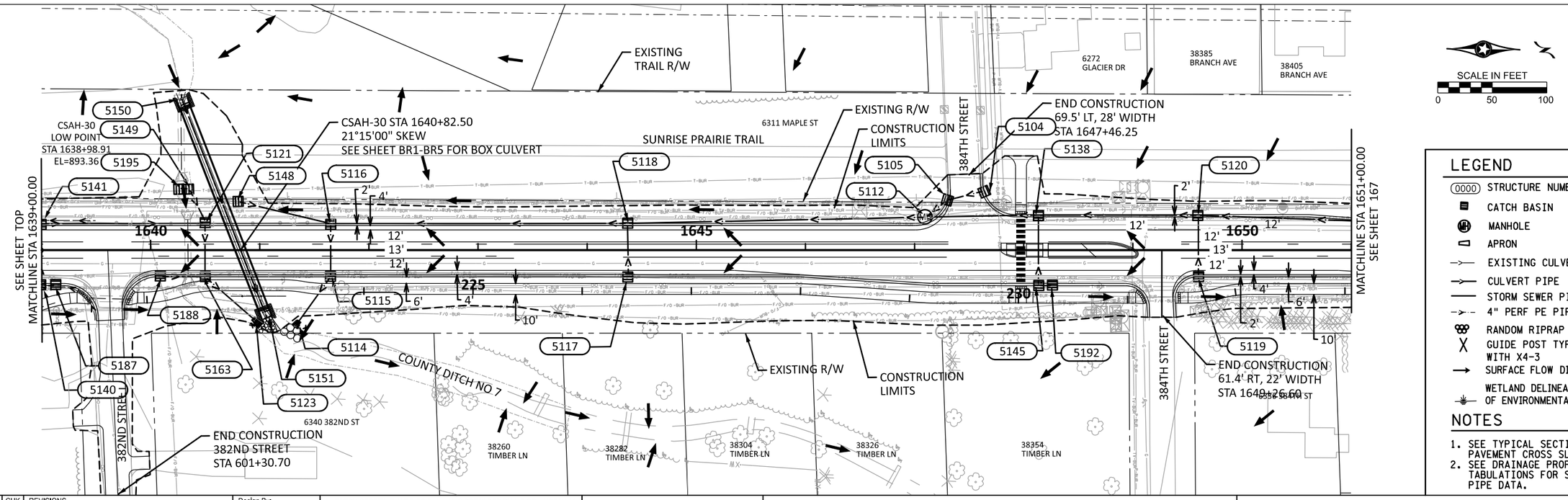

LEGEND

- (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

1. SEE TYPICAL SECTION FOR PAVEMENT CROSS SLOPE.
2. SEE DRAINAGE PROFILES AND TABULATIONS FOR STRUCTURE & PIPE DATA.

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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 2:07:36 PM
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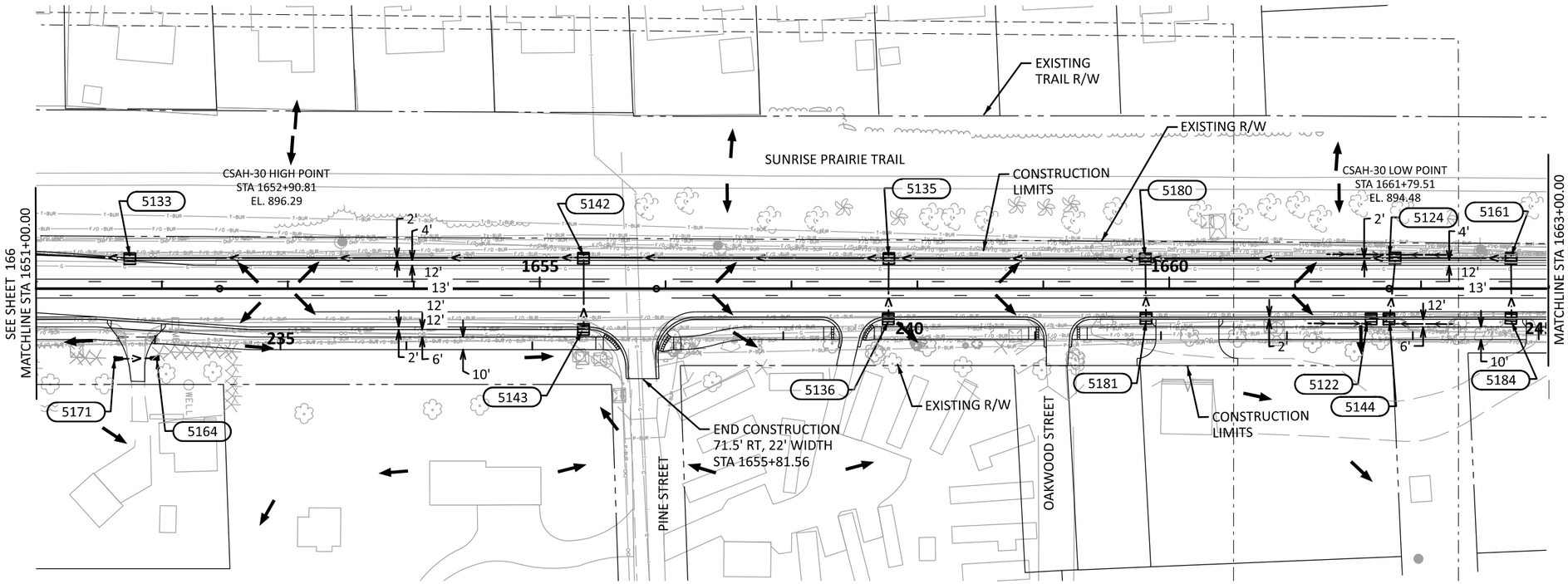

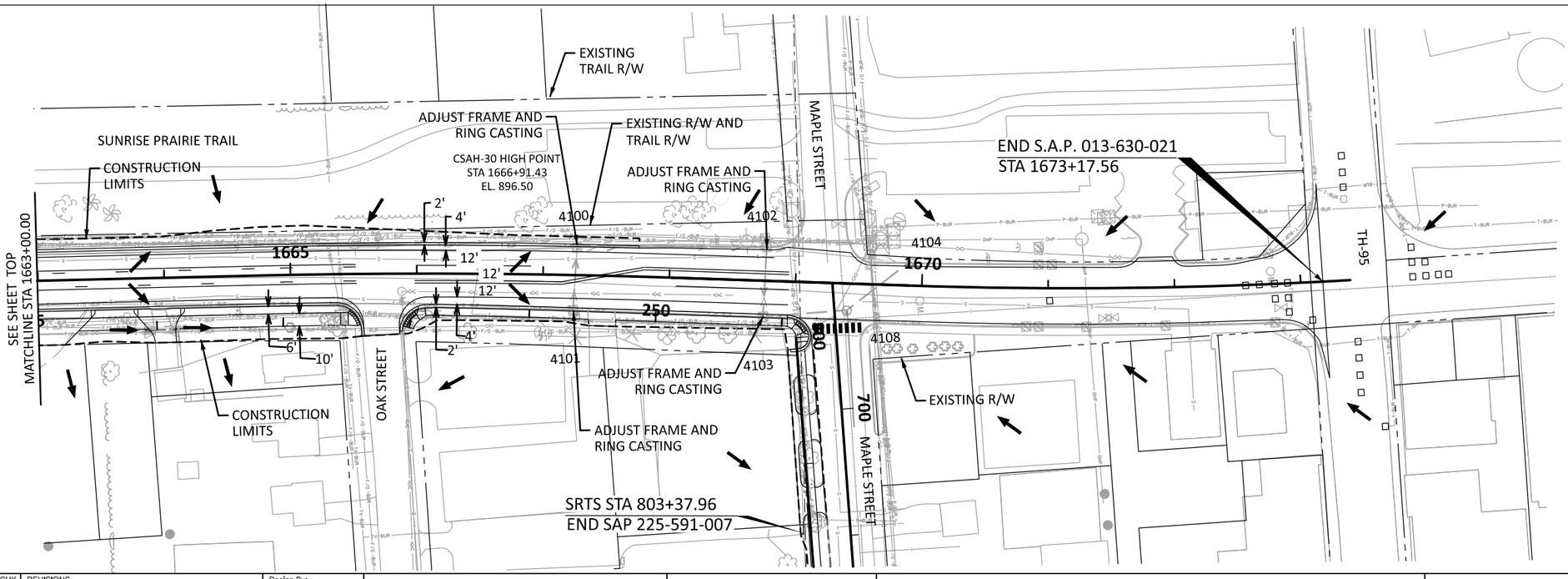

LEGEND

- (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

1. SEE TYPICAL SECTION FOR PAVEMENT CROSS SLOPE.
2. SEE DRAINAGE PROFILES AND TABULATIONS FOR STRUCTURE & PIPE DATA.

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Chisago COUNTY USA

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 2:07:41 PM
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DATE: 9/12/2024 5:19:25 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Drainage\Sheets\023661-000-302dr+-CSAH-30-prof-001

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EARTH A. EVANS, PE
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Chisago COUNTY USA

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 168 OF 216 SHEETS

DATE: 9/12/2024 5:19:27 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Drainage\Sheets\023661-000-302dr1-CSAH-30-prof-001

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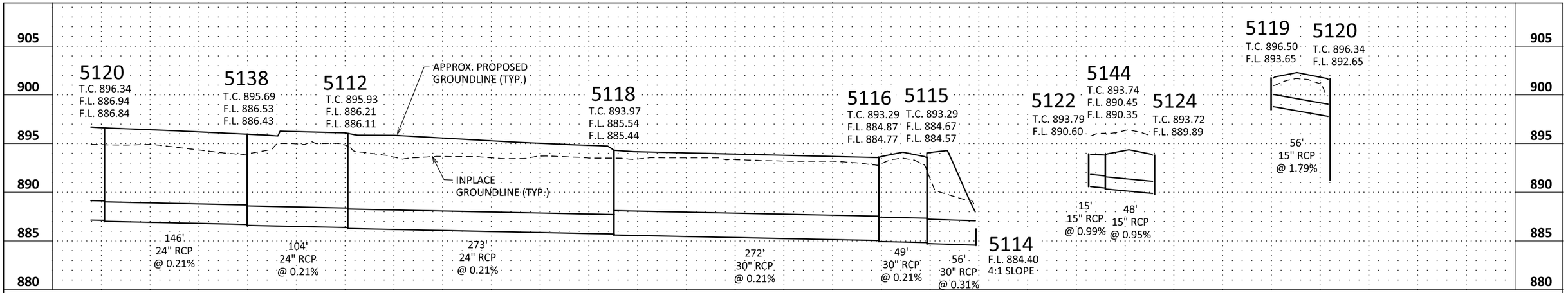
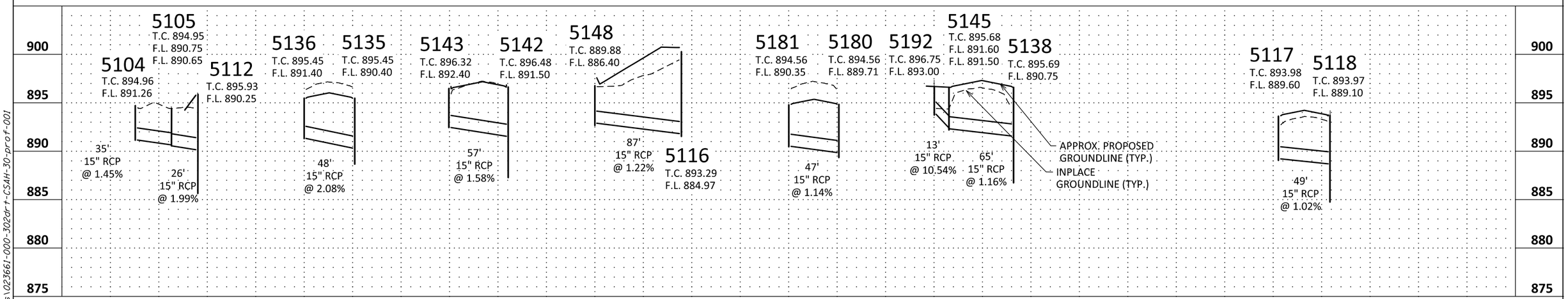
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET 169 OF 216 SHEETS





STRUCTURES FOUND ON THIS SHEET:						
	5104	5105	5112	5114	5115	5116
	5117	5118	5119	5120	5122	5124
	5135	5136	5138	5142	5143	5144
	5145	5148	5180	5181	5192	

NO.	DATE	BY	CHK	REVISIONS

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Chisago COUNTY USA

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 170 OF 216 SHEETS

DATE: 9/12/2024 5:19:28 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Drainage\Sheets\023661-000-302dr1+CSAH-30-prof-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
FLOWS FROM	FLOWS TO	ALIGN.	STATION	OFFSET			LIN FT	LIN FT	LIN FT	EACH		CU YD	EACH	
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 APRON(2)		1	
5064		CSAH 30-1	1602+42	48.6' RT	908.95	0.70%				1	18" RC PIPE SAFETY APRON(2)	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 GIVIEN 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
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Approved By: EAE

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Chisago COUNTY USA

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

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PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Drainage\Sheets\023661-000-130tab-CSAH-30-plan-001

STORM SEWER TABULATION

H

STRUCTURE NO.		STRUCTURE LOCATION			DRAINAGE STRUCTURES					TOP OF CASTING ELEV	FLOWS FROM PIPE OUTLET ELEV	FLOWS TO PIPE INLET ELEV	15" RC PIPE SEWER DES 3006 CL V	18" RC PIPE SEWER DES 3006 CL III	24" RC PIPE SEWER DES 3006 CL III	30" RC PIPE SEWER DES 3006 CL III	36" RC PIPE SEWER DES 3006 CL III	APRON	APRON TYPE	RIPRAP CLASS II	GUIDE POSTS TYPE B WITH X 4-3 (INCIDENTAL)	REMARKS
					PAY HEIGHT			CASTING ASSEMBLY TYPE	STEPS REQ'D													
FLOWS FROM	FLOWS TO	ALIGN.	STATION	OFFSET	G	48-4020	60-4020															
					LIN FT	LIN FT	LIN FT						LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH		CU YD	EACH	
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	

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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.

EARTH A. EVANS, PE
DATE: 9/12/2024 LICENSE NO. 44235

wsb

Chisago COUNTY USA

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 172 OF 216 SHEETS

STORM SEWER TABULATION

H

STRUCTURE NO. FLOWS FROM	STRUCTURE NO. FLOWS TO	STRUCTURE LOCATION ALIGN.	STATION	OFFSET	DRAINAGE STRUCTURES PAY HEIGHT G	48-4020	60-4020	CASTING ASSEMBLY TYPE	STEPS REQ'D	TOP OF CASTING ELEV	FLOWS FROM PIPE OUTLET ELEV	FLOWS TO PIPE INLET ELEV	15" RC PIPE SEWER DES 3006 CL V	18" RC PIPE SEWER DES 3006 CL III	24" RC PIPE SEWER DES 3006 CL III	30" RC PIPE SEWER DES 3006 CL III	36" RC PIPE SEWER DES 3006 CL III	APRON	APRON TYPE	RIPRAP CLASS II	GUIDE POSTS TYPE B WITH X 4-3 (INCIDENTAL)	REMARKS
					LIN FT	LIN FT	LIN FT						LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH		CU YD	EACH	
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 GIVIEN 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 UTILZING 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

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EARTH A. EVANS, PE

DATE: 9/12/2024 LICENSE NO. 44235

wsb

Chisago COUNTY USA

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

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STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE

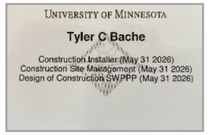
PROJECT NAME: CHISAGO COUNTY CSAH 30 CORRIDOR IMPROVEMENTS **PROJECT NUMBER:** SAP 013-630-021; WSB 023661-000
PROJECT LOCATION: STREET: 379th STREET CITY: NORTH BRANCH COUNTY: CHISAGO COUNTY
STATE: MINNESOTA ZIP: 55056 LATITUDE/LONGITUDE: 45.4977/-92.9807

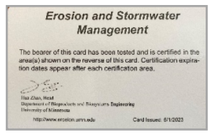
THE PLANNED SCOPE OF THE PROJECT INCLUDES:
CHISAGO COUNTY IS PROPOSING THE RECONDITIONING AND RECONSTRUCTION OF FOREST BOULEVARD FROM ATHENS TRAIL TO SAINT CROIX TRAIL. CONSTRUCTION ACTIVITIES INCLUDE ROADWAY RECONDITIONS AND RECONSTRUCTION FROM CSAH 17 (ATHENS TRAIL) IN STACY TO TRUNK HIGHWAY 95 IN 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

CONTRACTOR TO COMPLETE

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 INFEASIBLE, 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	PSS1Ad	SHRUB SWAMP	0.02
8	PSS1Ad	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

DATE: 9/12/2024 2:08:24 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

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Chisago COUNTY USA

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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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 CR 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 AVALIABLE 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 FCLLOWING 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.

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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

wsb

Chisago COUNTY USA

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 HECP. 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 CUTLET 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.

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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

wsb

Chisago COUNTY USA

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 176 OF 216 SHEETS

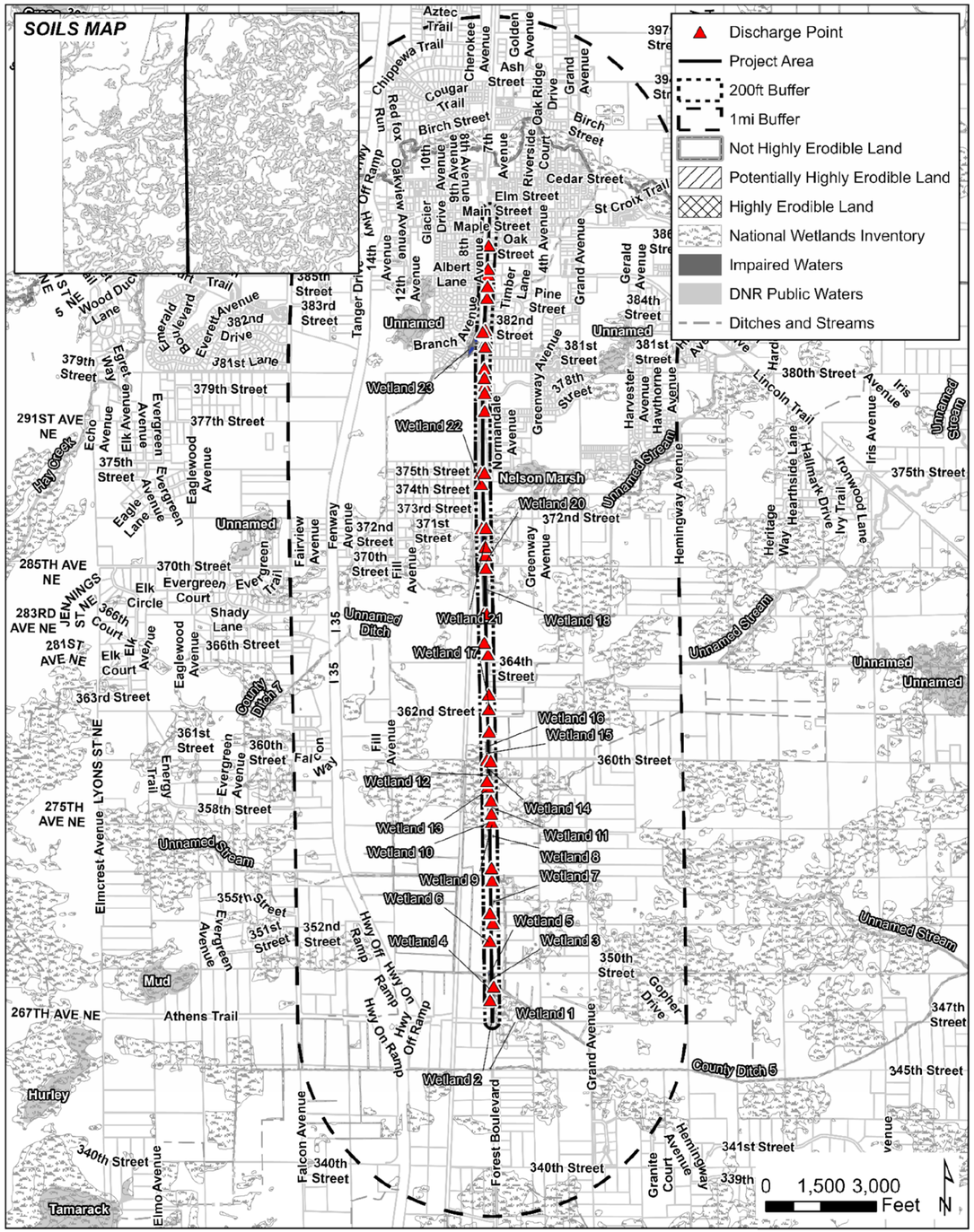

Figure 1. SWPPP Resource Map

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

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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

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Chisago COUNTY USA

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 177 OF 216 SHEETS

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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 SWEPT 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 FEASIBILE.
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

MS — SILT FENCE, TYPE MS

BR — SEDIMENT CONTROL LOG, TYPE STRAW

CP — 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

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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
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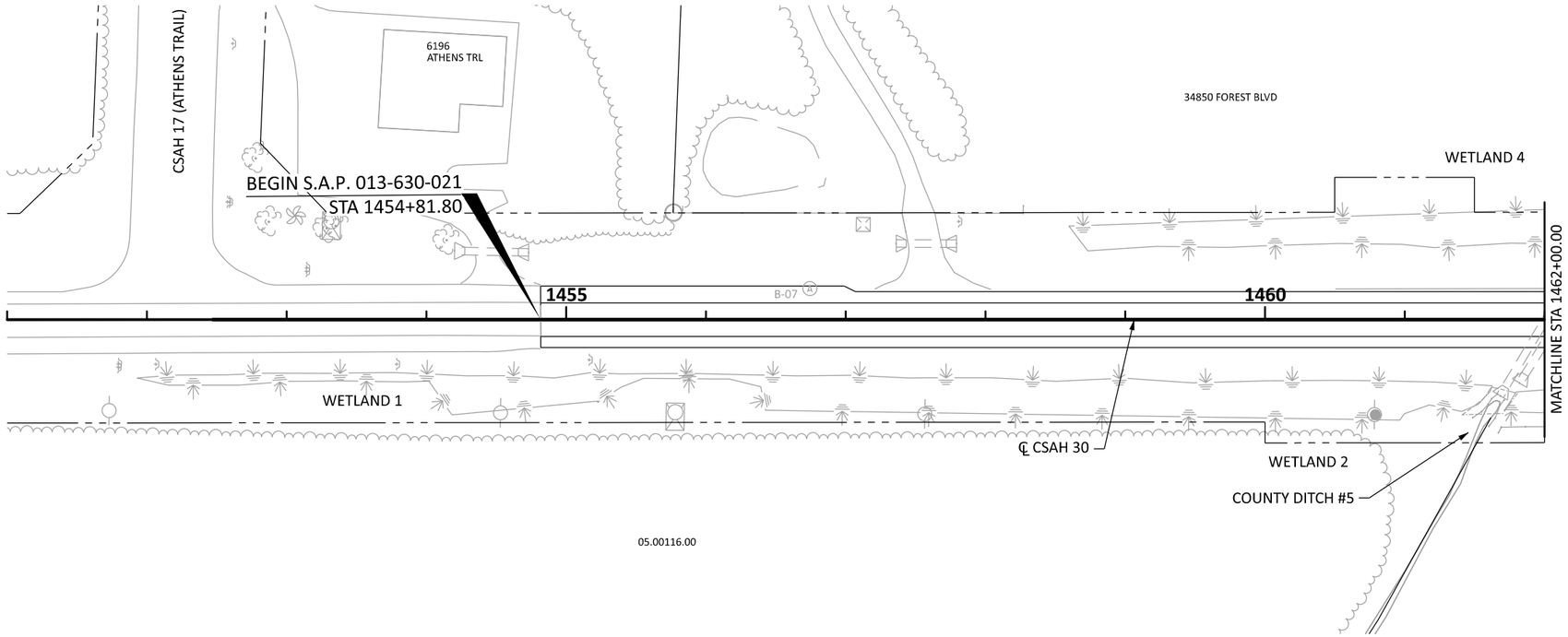
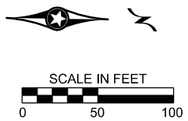
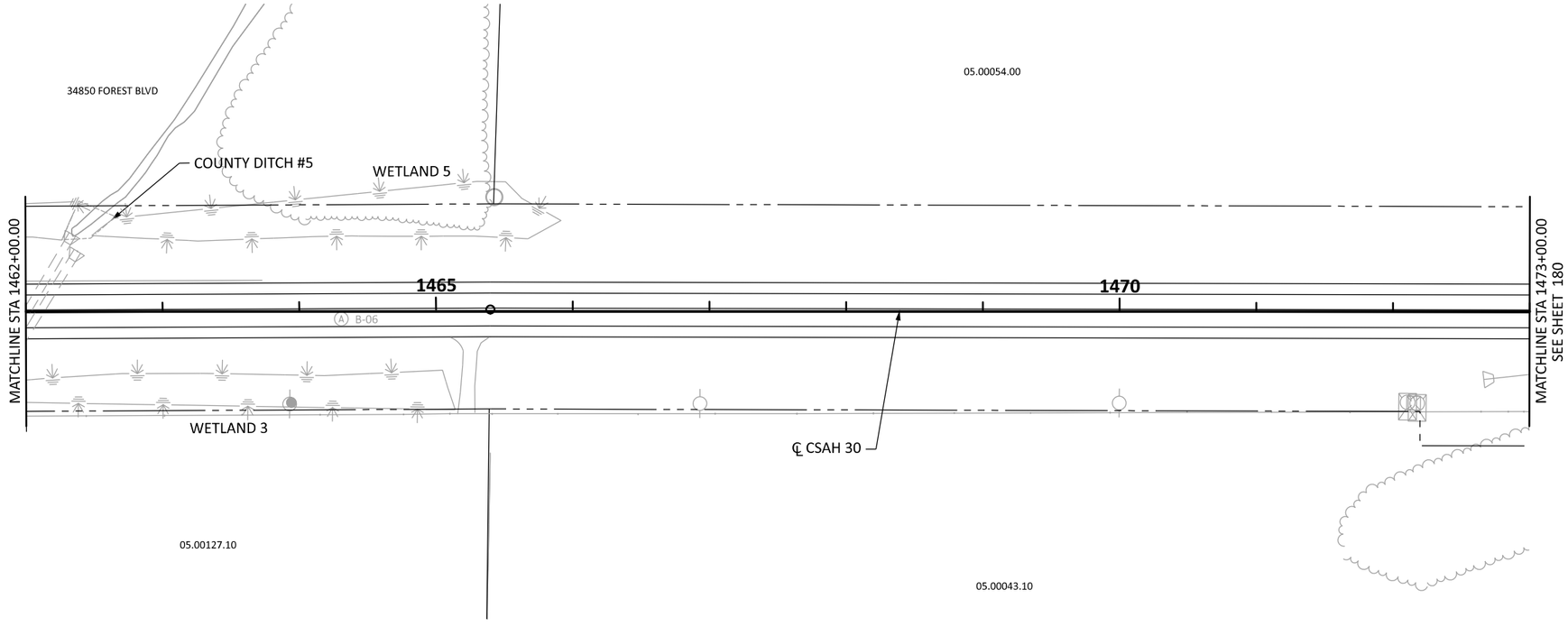
CHISAGO COUNTY, MINNESOTA

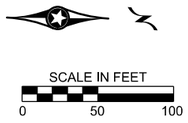
EROSION CONTROL & TURF ESTABLISHMENT PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 178 OF 216 SHEETS









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CSAH 30 (Forest Blvd) Improvements
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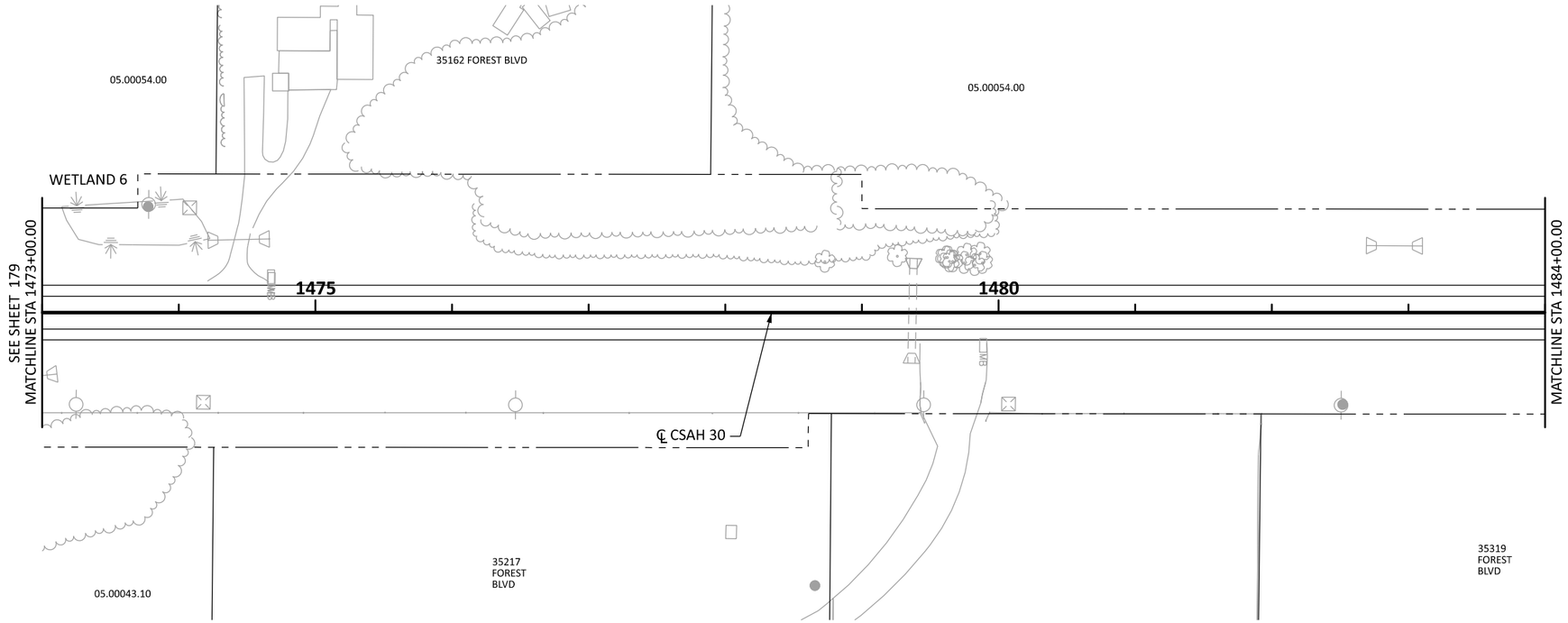
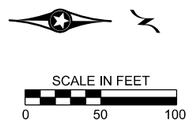
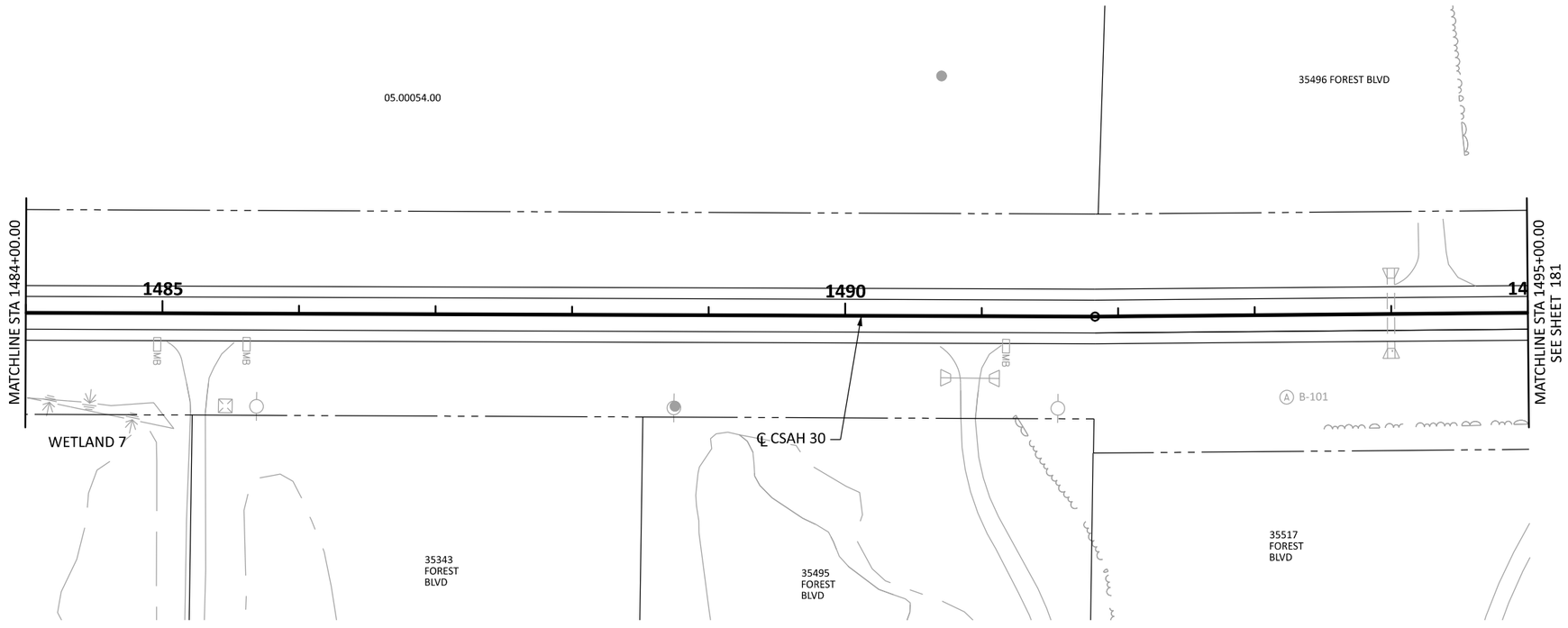
CHISAGO COUNTY, MINNESOTA

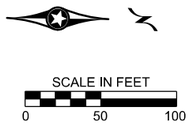
TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 179 OF 216 SHEETS









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TURF ESTABLISHMENT & EROSION CONTROL PLAN
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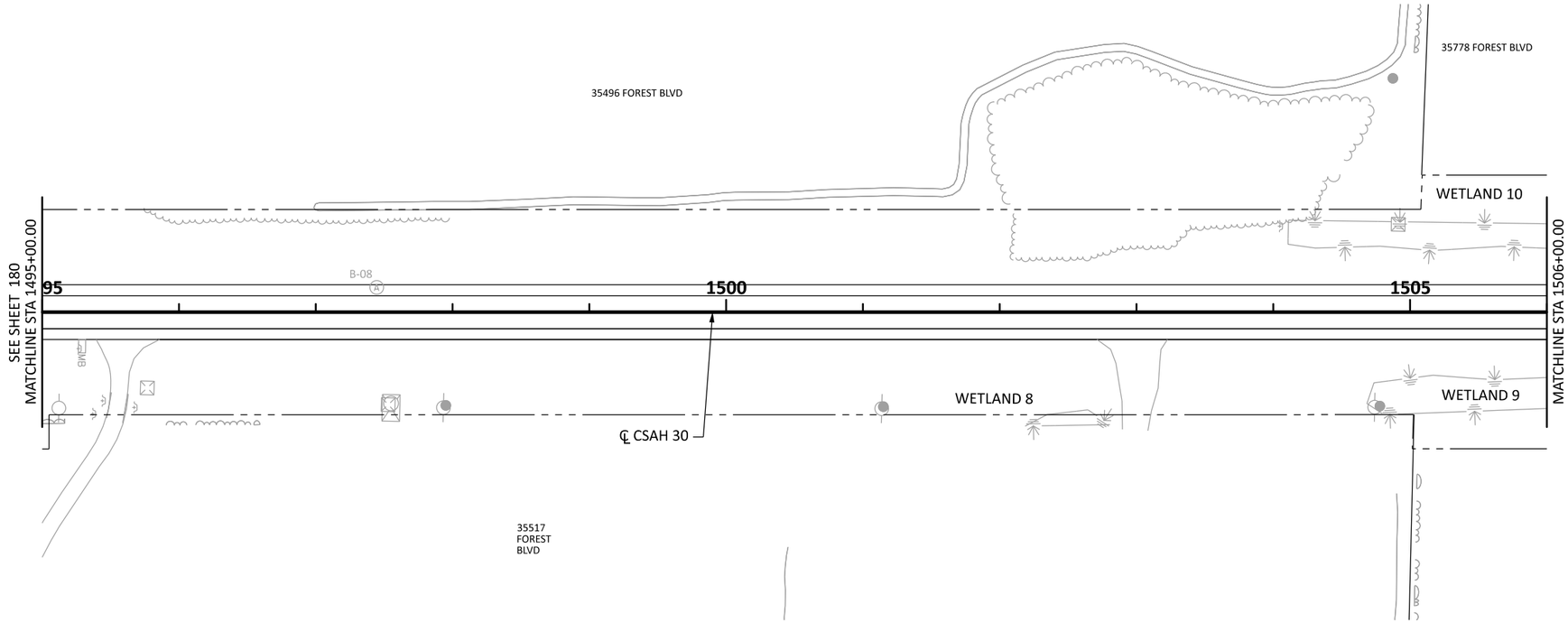
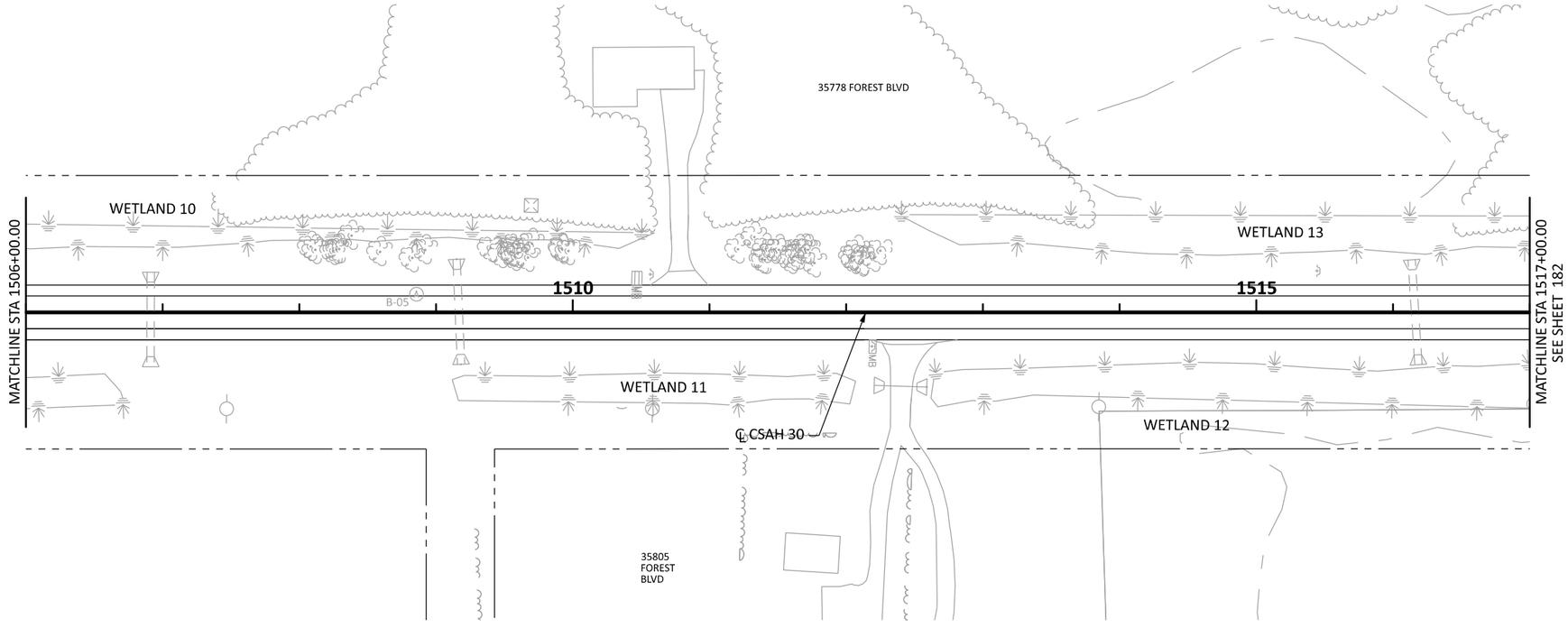
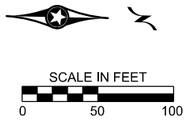
SHEET 180 OF 216 SHEETS







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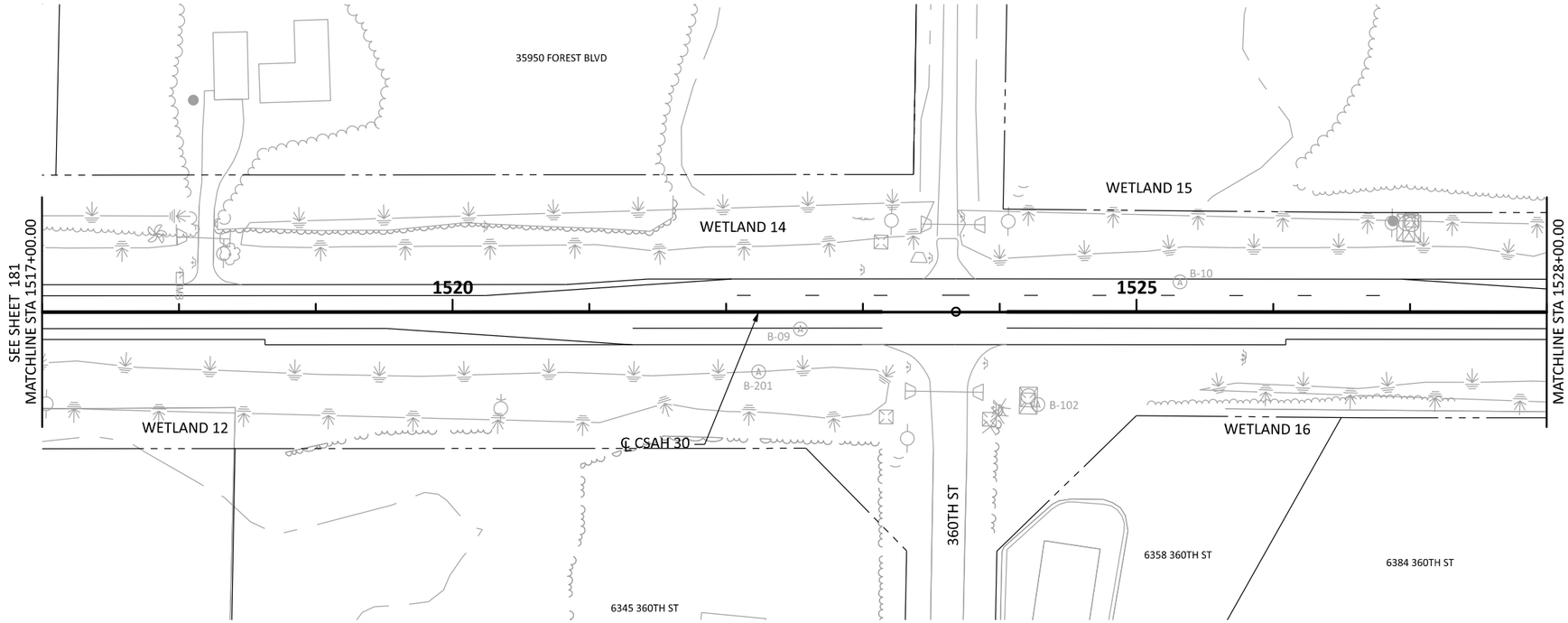
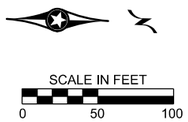
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

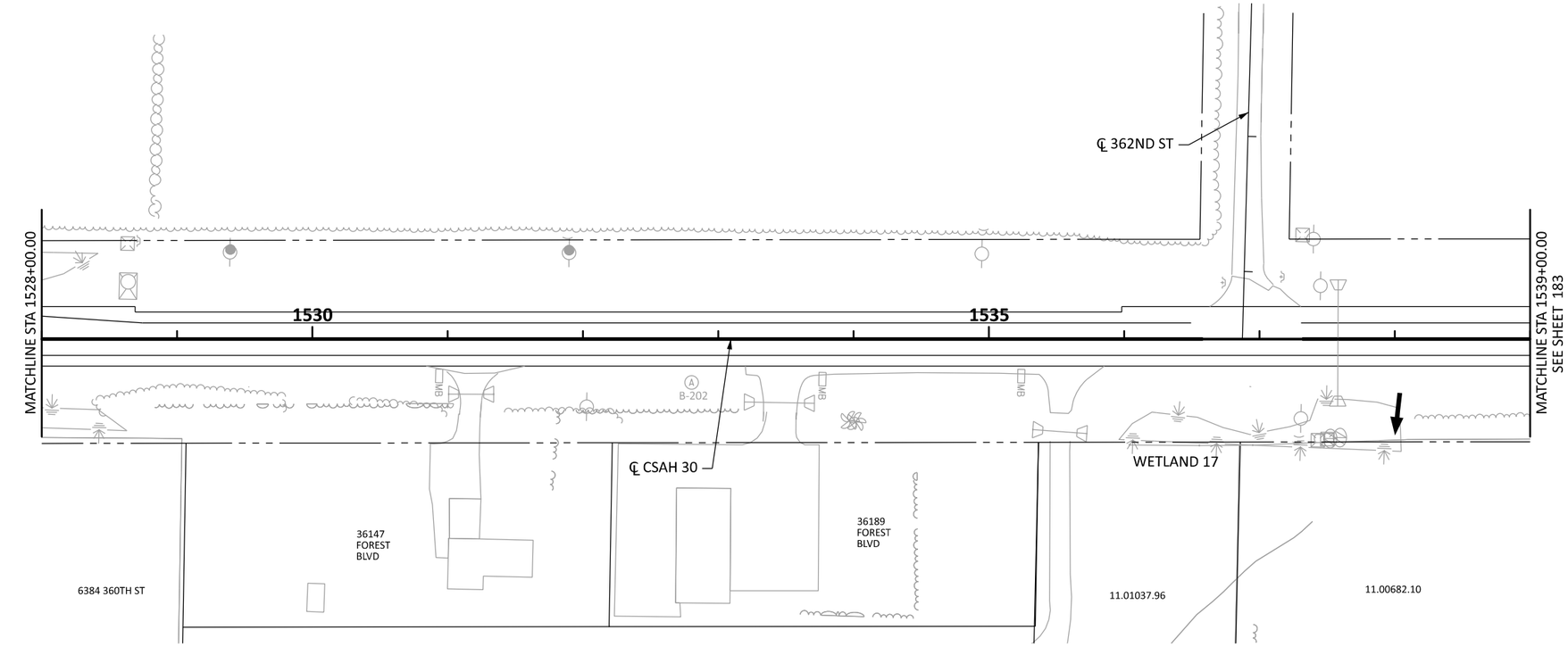
CHISAGO COUNTY, MINNESOTA

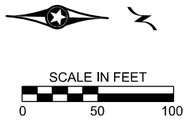
TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 181 OF 216 SHEETS









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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

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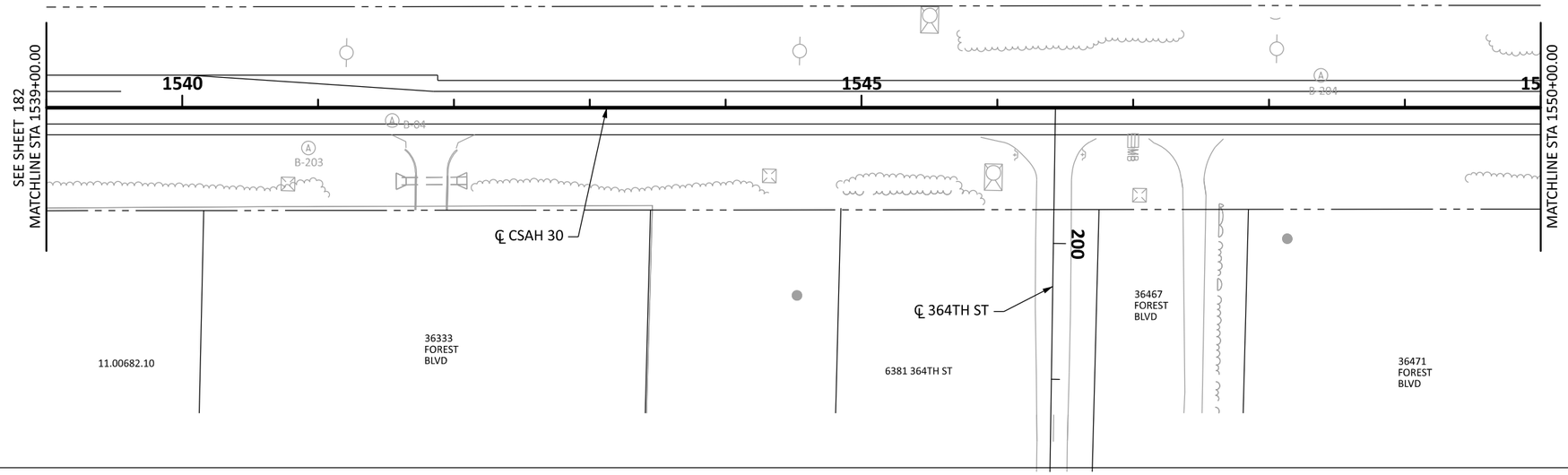

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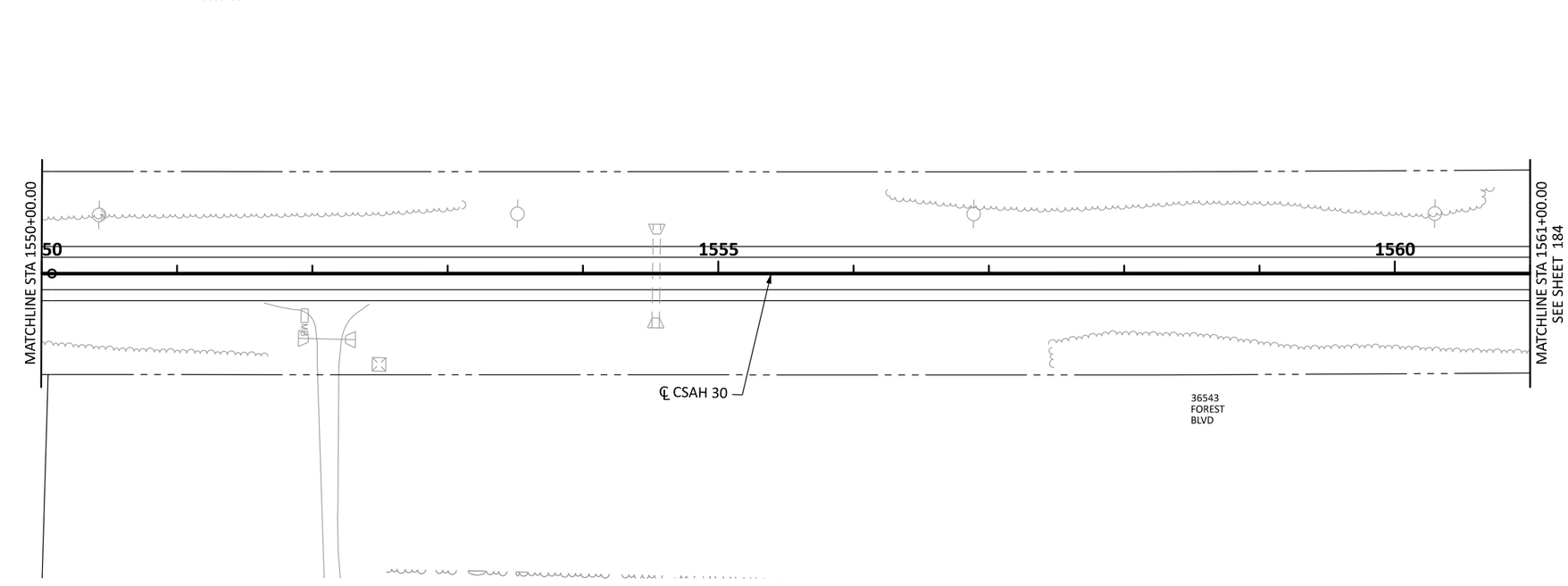

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CHISAGO COUNTY, MINNESOTA

TURF ESTABLISHMENT & EROSION CONTROL PLAN
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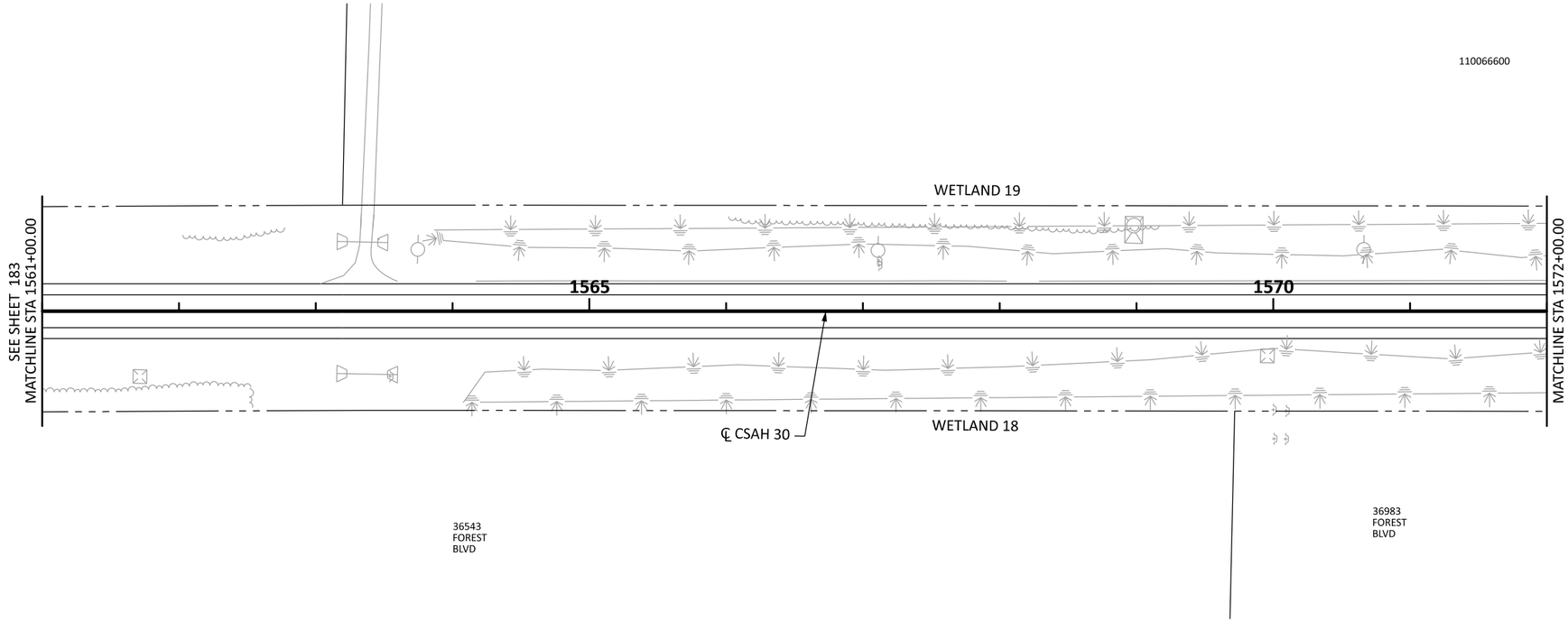

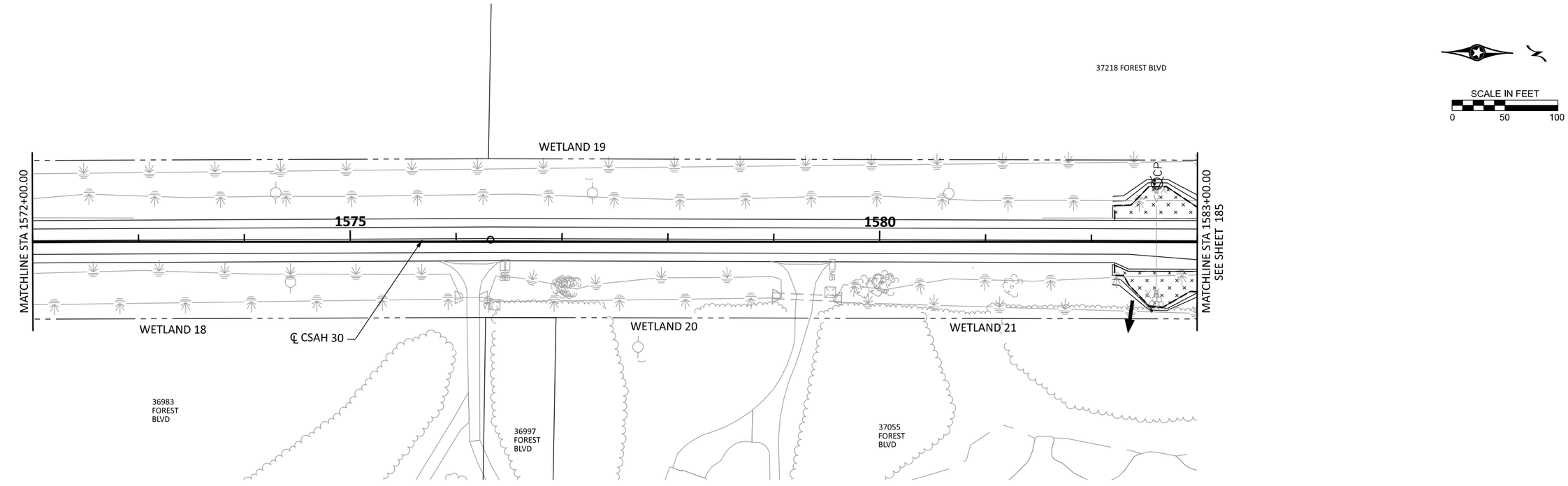

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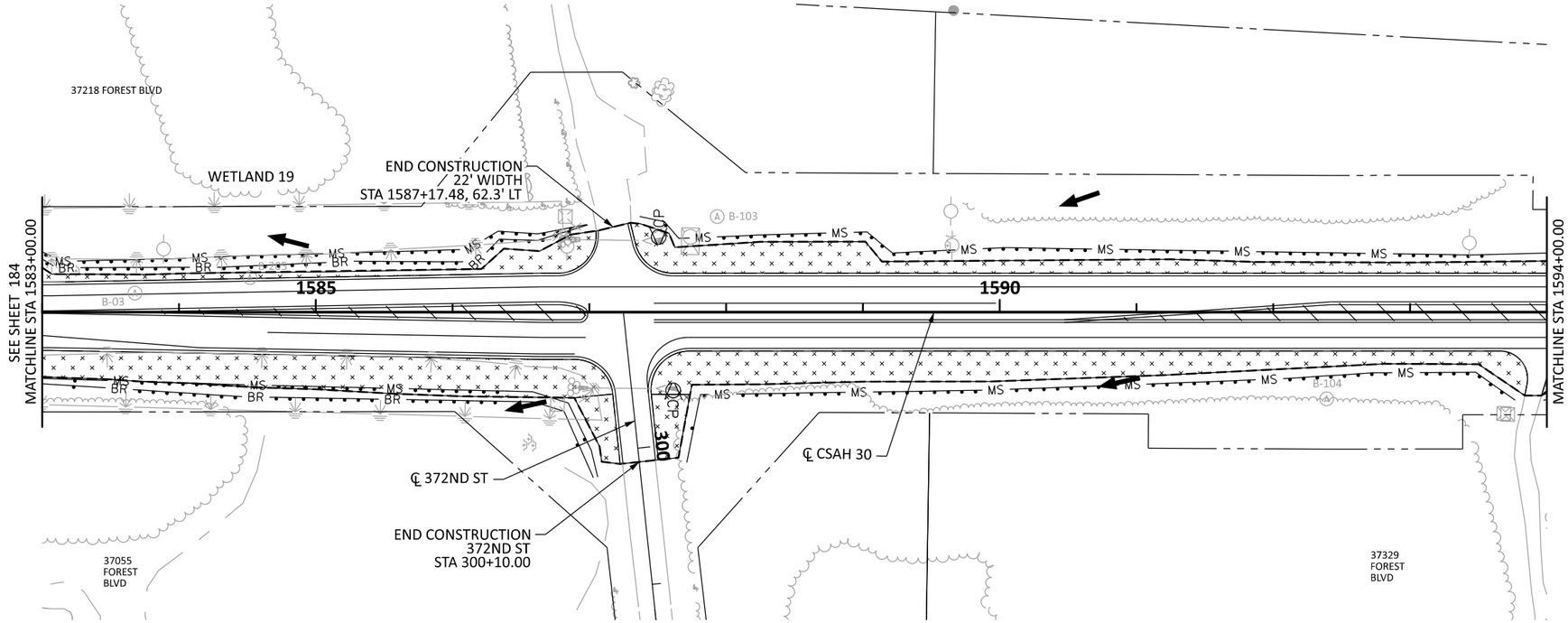
SHEET 184 OF 216 SHEETS



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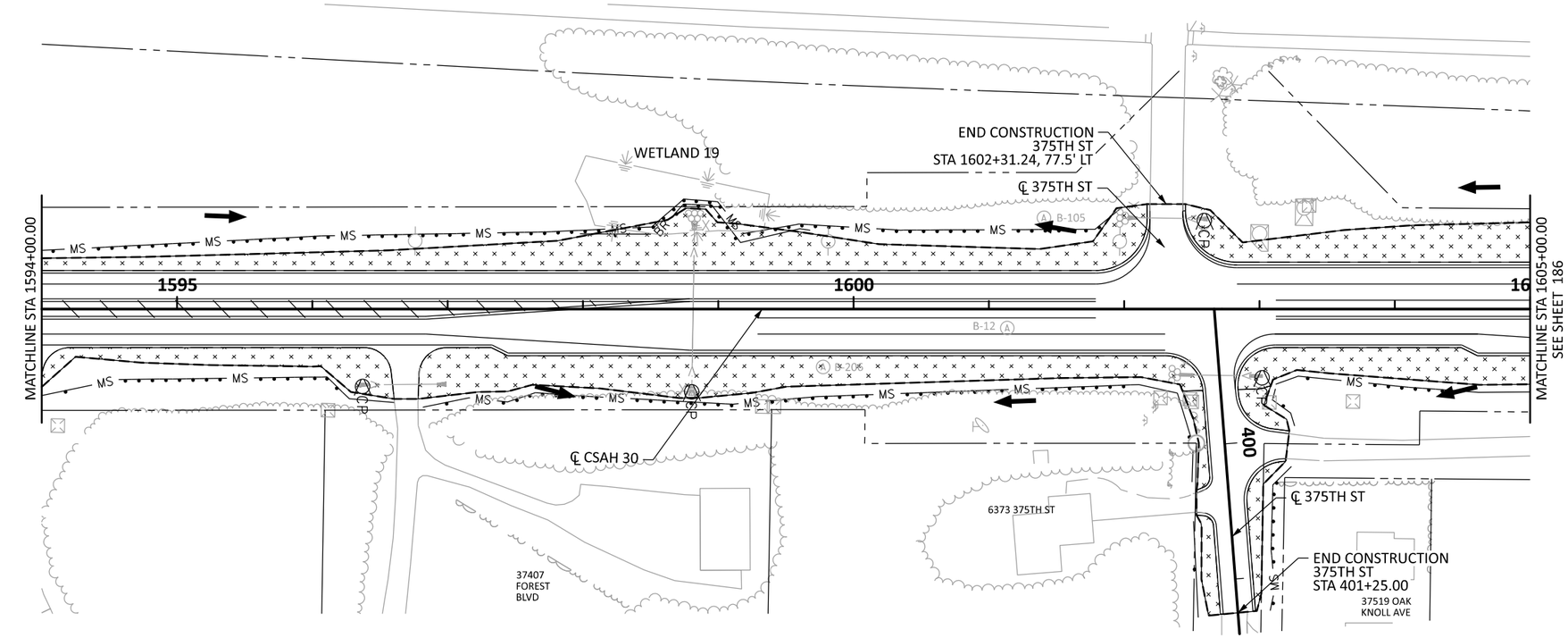

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TURF ESTABLISHMENT & EROSION CONTROL PLAN
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SHEET 185 OF 216 SHEETS

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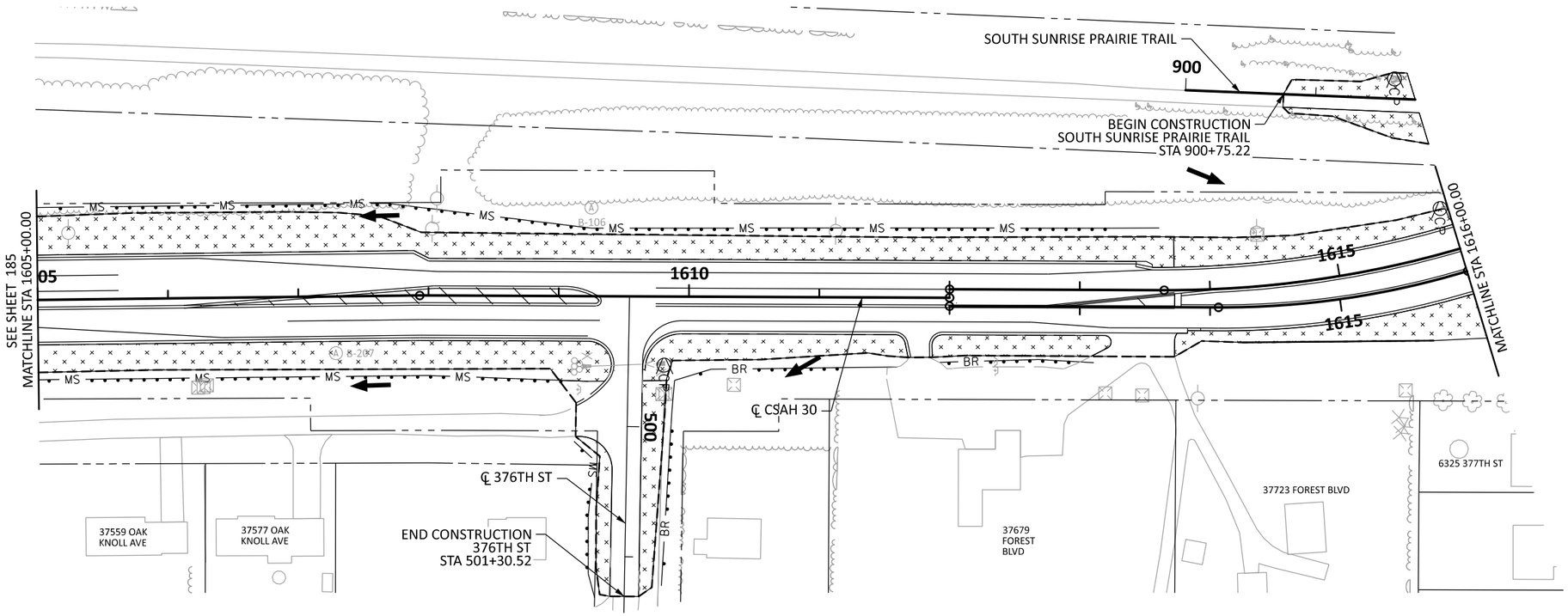

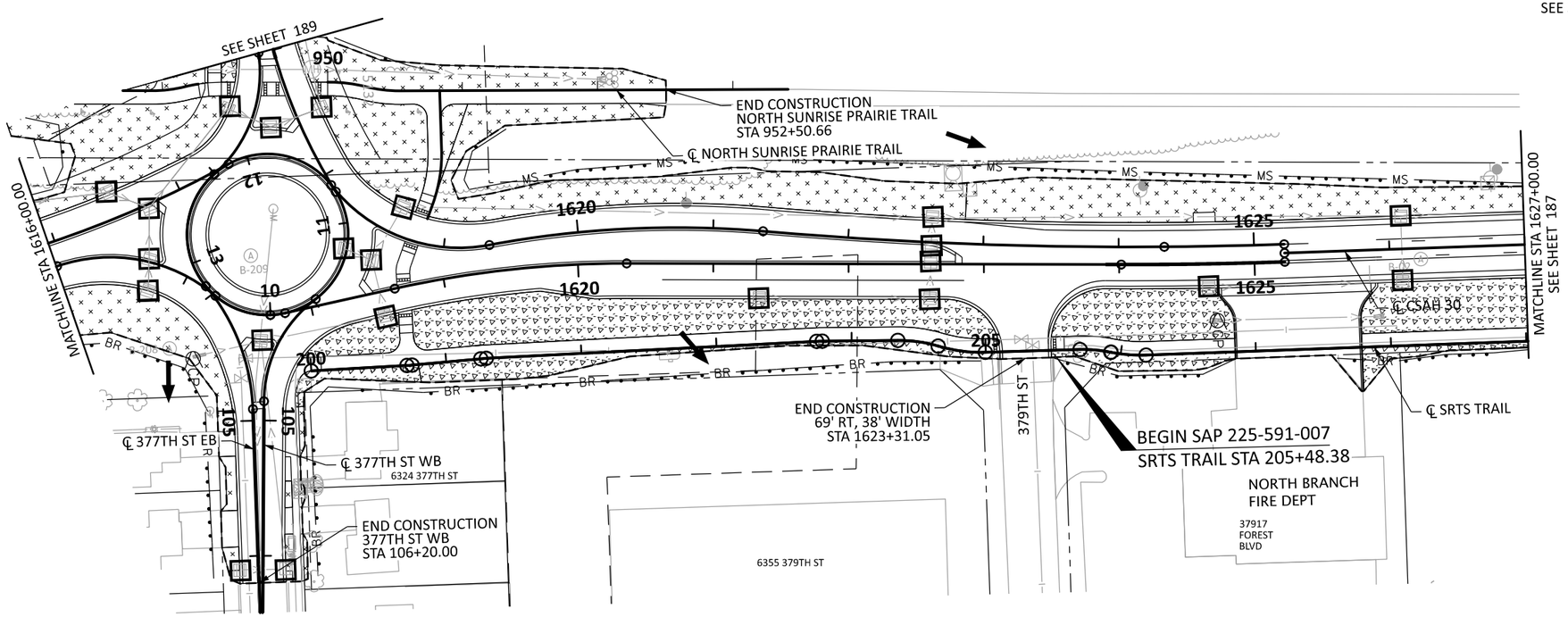

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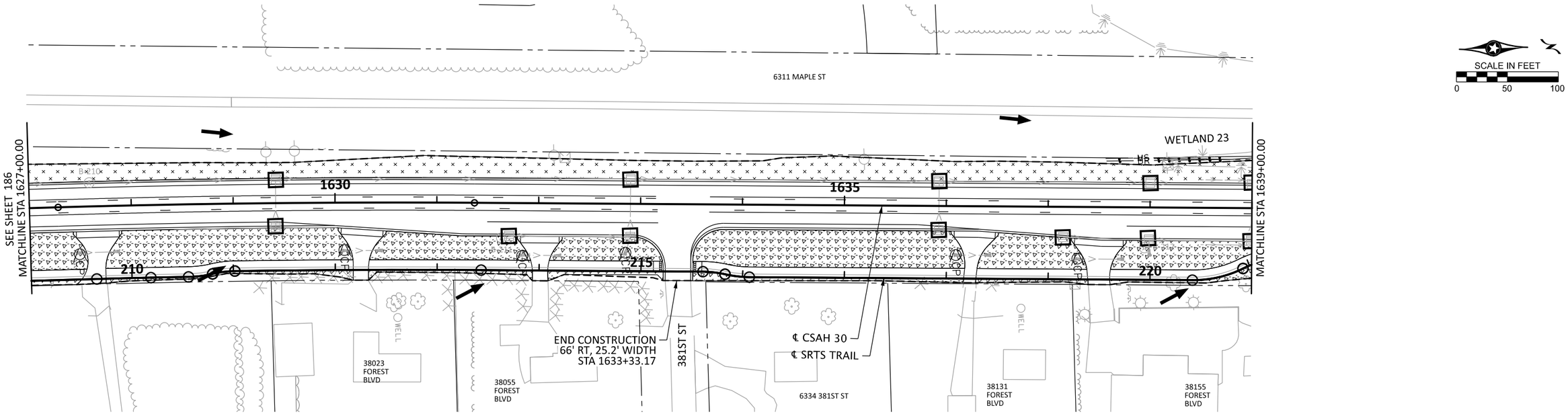
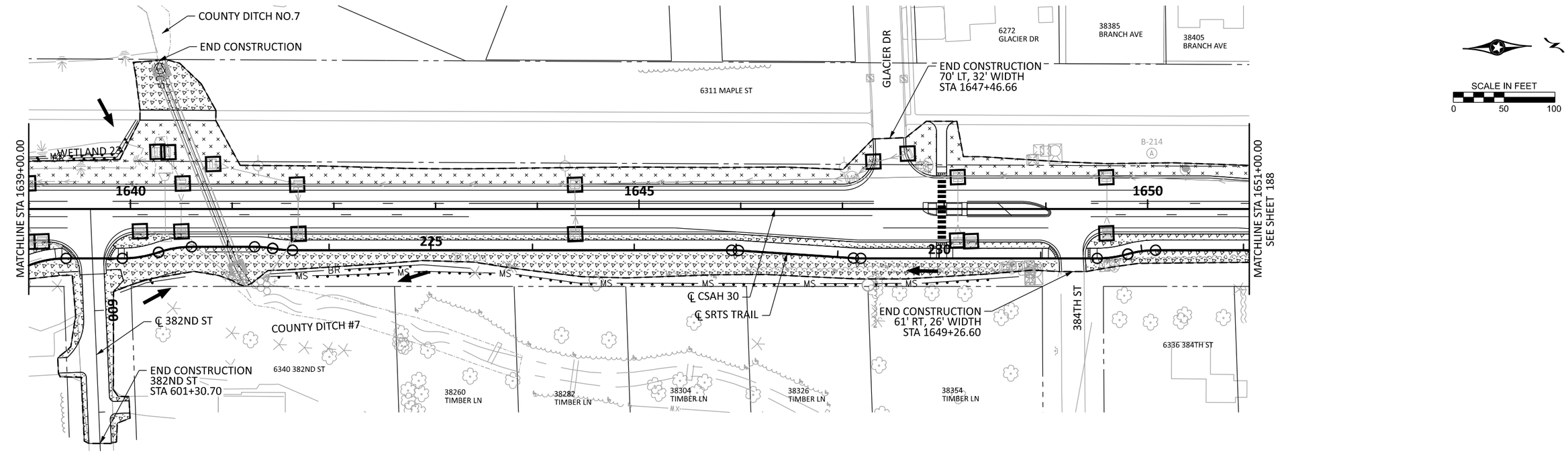
SHEET 186 OF 216 SHEETS





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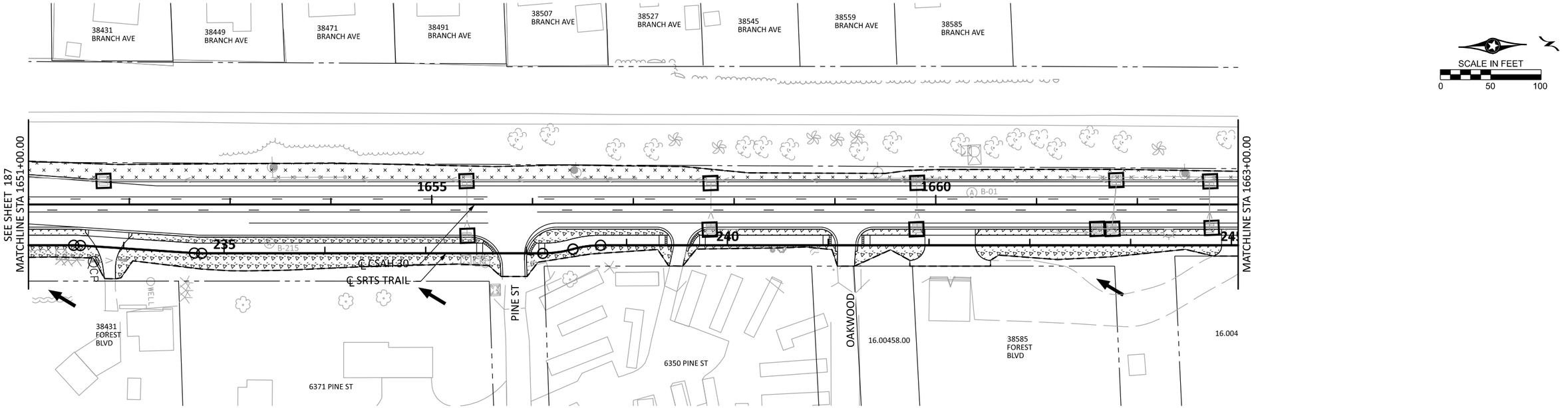
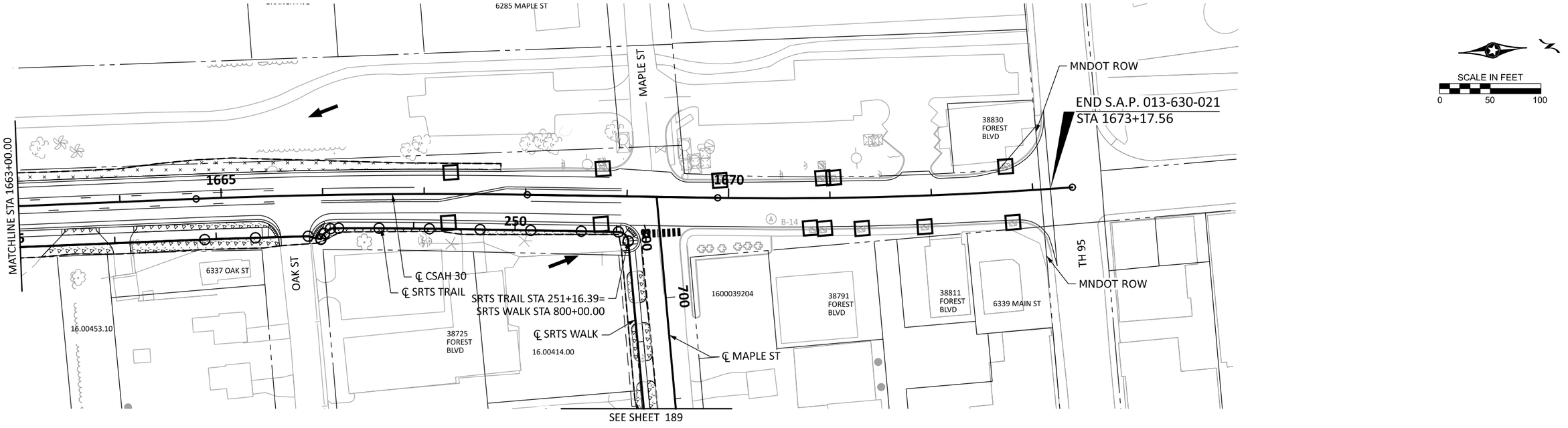
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 187 OF 216 SHEETS





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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

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

wsb

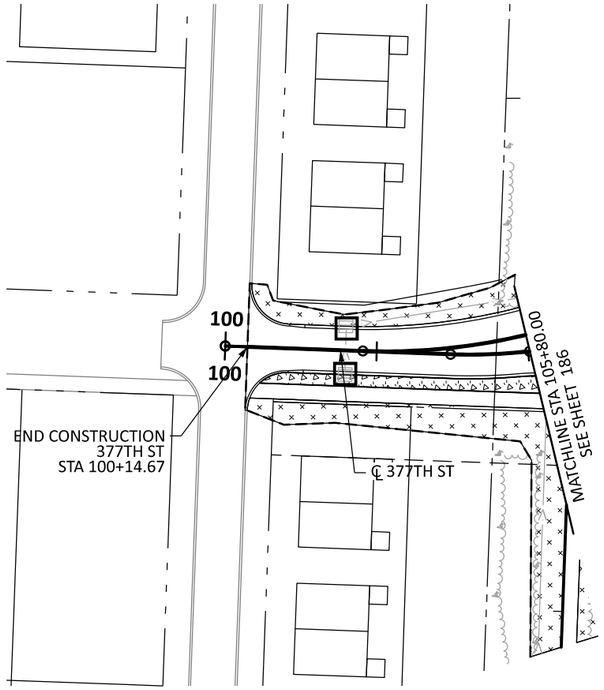
Chisago COUNTY USA

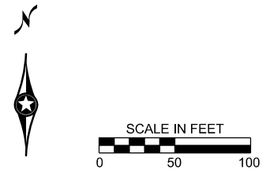
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

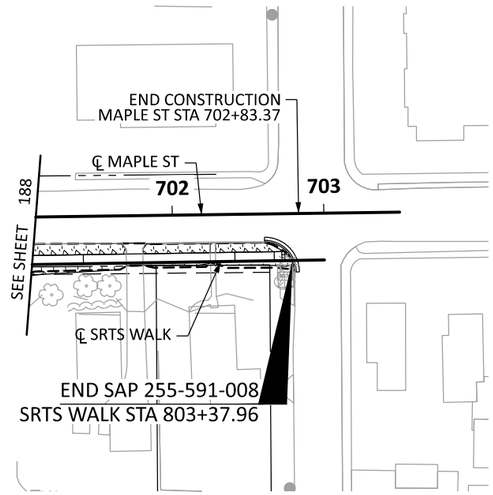
CHISAGO COUNTY, MINNESOTA

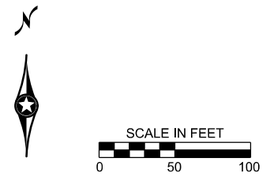
TURF ESTABLISHMENT & EROSION CONTROL PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 188 OF 216 SHEETS









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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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NICHOLAS E. HENTGES, PE

DATE: 9/12/2024 LICENSE NO. 44620

wsb

Chisago COUNTY USA

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 189 OF 216 SHEETS

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) EACH	(B) EACH	(C) SQ FT	(A) SQ FT	(B) SQ FT	(C) SQ FT	(A) EACH	(A) EACH	(A) EACH	(A) EACH	(B) EACH	(C) EACH	(A) EACH	(B) EACH	(C) EACH
			INCHES	FEET		INCHES																
S-1	NOT USED																					
S-2	NOT USED																					
S-3	NOT USED																					
S-4	NOT USED																					
S-5	NOT USED																					
S-6	NOT USED																					
S-7	NOT USED																					
S-8	NOT USED																					
S-9	NOT USED																					
S-10	NOT USED																					
S-11	NOT USED																					
S-12	NOT USED																					
S-13	NOT USED																					
S-14	NOT USED																					
S-15	NOT USED																					
S-16	NOT USED																					
S-17	NOT USED																					
S-18	NOT USED																					
S-19	NOT USED																					
S-20	NOT USED																					
S-21	NOT USED																					
S-22	NOT USED																					
S-23	NOT USED																					
S-24	NOT USED																					
S-25	W14-3	NO PASSING ZONE	48 x 48 x 36	7	SQ-SOIL	2-1/2	1	1			5.60											
S-26	R9-X6L	BRANCH LANDSCAPE NURSERY	72 x 18	7	SQ-SOIL	2-1/2	1							1	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											
	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											
	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1		
S-31	NOT USED																					
S-32	NOT USED																					
S-33	NOT USED																					
S-34	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00											
	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	SQ-CONC	2-1/2	1					5.00										
	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4																	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	ROUNDABOUT PLAQUE	36 x 12	7	SQ-SOIL	2-1/2	1					3.00										
	W2-6	ROUNDABOUT	30 x 30									6.25										
	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											
	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1		
S-46	DESIGN	ROUNDABOUT 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	ROUNDABOUT PLAQUE	36 x 12	7	SQ-SOIL	2-1/2	1					3.00										
	W2-6	ROUNDABOUT	30 x 30									6.25										
	W13-1P	20 MPH PLAQUE	18 x 18									2.25										
S-49	R4-7	KEEP RIGHT	24 x 30	7	SQ-CONC	2-1/2	1					5.00										
	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4																	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											
	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											
	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											
	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1		
S-56	W11-2	PEDESTRIAN CROSSING (FL YEL-GR)	30 x 30	7	SQ-SOIL	2-1/2	1				6.25											
	W16-7PL	DOWN ARROW LEFT PLAQUE (FL YEL-GR)	24 x 12								2.00											
S-57	I-8	LIBRARY	24 x 24	7	SQ-SOIL	2	1		1			4.00										
	M6-1R	ARROW RIGHT (GREEN)	21 x 15									2.19										
S-58	W11-8	FIRE STATION	30 x 30	7	SQ-SOIL	2	1					6.25										
S-59	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1					6.25										
S-60	R3-9dP	END PLAQUE	30 x 12	7	SQ-SOIL	2-1/2	1				2.50											
	R3-9B	TWO WAY LEFT TURN LANE	24 x 36								6.00											
S-61	W11-8	FIRE STATION	30 x 30	7	SQ-SOIL	2	1				6.25											
S-62	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1				6.25											
S-63	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00											
S-64	W11-2	PEDESTRIAN CROSSING (FL YEL-GR)	30 x 30	7	SQ-SOIL	2-1/2	1				6.25											
	W16-7PL	DOWN ARROW LEFT PLAQUE (FL YEL-GR)	24 x 12								2.00											
S-65	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1				6.25											
S-66	X36	SNOWPLOW MARKER LOWER BLADE	x													1						
S-67	X36	SNOWPLOW MARKER RAISE BLADE	x													1						
S-68	R3-9B	TWO WAY LEFT TURN LANE	24 x 36	7	SQ-SOIL	2	1				6.00											
S-69	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00											
S-70	NOT USED																					
S-71	R2-1	SPEED LIMIT 55	x					1														
S-72	R2-1	SPEED LIMIT 40	24 x 30	7	SQ-SOIL	2	1				5.00											

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

wsb

Chisago COUNTY USA

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 190 OF 216 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 CODE	PANEL LEGEND	PANEL SIZE (W x H)	PANEL MOUNTING HEIGHT	SUPPORT TYPE	SUPPORT RISER POST SIZE	SUPPORT NUMBER OF POSTS	REMOVE SIGN (A)	REMOVE SIGN (B)	REMOVE SIGN (C)	SIGN (A)	SIGN (B)	SIGN (C)	SALVAGE SIGN	INSTALL SIGN	REMOVE DELINEATOR /MARKER	DELINEATOR /MARKER (A)	DELINEATOR /MARKER (B)	DELINEATOR /MARKER (C)	DELINEATOR /MARKER PANEL (A)	DELINEATOR /MARKER PANEL (B)	DELINEATOR /MARKER PANEL (C)
			INCHES	FEET		INCHES		EACH	EACH	SQ FT	SQ FT	SQ FT	SQ FT	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
S-73	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1				6.25											
S-74	R3-9B	TWO WAY LEFT TURN LANE	24 x 36	7	SQ-SOIL	2	1				6.00											
S-75	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00											
	X63	CYLINDER STYLE DELINEATOR (WHITE)	6 x 9																	1		
S-76	R2-1	SPEED LIMIT 40	x					1														
S-77	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4	SQ-CONC	1-3/4	1										1					
S-78	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1				6.25											
S-79	R3-8AC	L-T	36 x 30	7	SQ-SOIL	2	1				7.50											
S-80	W11-2	PEDESTRIAN CROSSING (FL YEL-GR)	30 x 30	7	SQ-SOIL	2	1				6.25											
S-81	X36	SNOWPLOW MARKER BLADE DOWN	x													1						
S-82	NOT USED																					
S-83	X36	SNOWPLOW MARKER BLADE UP	x													1						
S-84	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00											
S-85	W11-2	PEDESTRIAN CROSSING (FL YEL-GR)	30 x 30	7	SQ-SOIL	2	1				6.25											
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							
	DESIGN	NORTH BRANCH GOLF COURSE LEFT	x																			
S-89	M4-X1	OLD (WHITE)	24 x 12	7	SQ-SOIL	2	1							1	1							
	M1-4	US 61	24 x 24																			
S-90	M4-X1	OLD (WHITE)	24 x 12	7	SQ-SOIL	2	1							1	1							
	M1-4	US 61	24 x 24																			
S-91	R2-1	SPEED LIMIT 40	x					1														
S-92	NOT USED																					
S-93	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00											
S-94	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	7	SQ-SOIL	2	1				6.25											
S-95	R2-1	SPEED LIMIT 40	24 x 30	7	SQ-SOIL	2	1	1			5.00											
S-96	R3-9cP	BEGIN PLAQUE	30 x 12	7	SQ-SOIL	2-1/2	1				2.50											
	R3-9B	TWO WAY LEFT TURN LANE	24 x 36								6.00											
S-97	X36	SNOWPLOW MARKER RAISE BLADE	x													1						
S-98	R3-8AC	L-T	36 x 30	7	SQ-SOIL	2	1				7.50											
S-99	M2-1	JCT (BLUE)	21 x 15	7	SQ-SOIL	2	1	1			2.19											
	M1-5M	MINNESOTA HWY 95	24 x 24								4.00											
S-100	R3-8AD	L-TR	36 x 30	7	SQ-SOIL	2	1	1			7.50											
S-101	W3-3	SIGNAL AHEAD	30 x 30	7	SQ-SOIL	2	1	1			6.25											
S-102	R1-1	STOP	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00											
S-103	R2-1	SPEED LIMIT 30	24 x 30	7	SQ-SOIL	2	1	1			5.00											
S-104	R3-9dP	END PLAQUE	30 x 12	7	SQ-SOIL	2-1/2	1				2.50											
	R3-9B	TWO WAY LEFT TURN LANE	24 x 36								6.00											
S-105	NOT USED																					
S-106	NOT USED																					
S-107	DESIGN	377TH ST ARROW	42 x 24	7	SQ-CONC	2-1/2	1						7.00									
	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4																		1
S-108	R6-1R	ONE WAY RIGHT	36 x 12	4	SQ-CONC	2-1/2	1					3.00										
	R6-4B	ROUNDABOUT DIRECTIONAL (4 ARROWS)	60 x 24									10.00										
S-109	R1-2	YIELD	30 x 30	7	SQ-SOIL	2-1/2	1					6.25										
S-110	R1-2	YIELD	30 x 30	7	SQ-CONC	2-1/2	1					6.25										
	R6-2R	ONE WAY RIGHT	24 x 30									5.00										
S-111	W14-3	NO PASSING ZONE	x						1													
S-112	R1-2	YIELD	30 x 30	7	SQ-SOIL	2-1/2	1						6.25									
S-113	DESIGN	FOREST BLVD ARROW	48 x 24	7	SQ-CONC	2-1/2	1					8.00										
	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4																	1	
S-114	R1-1	STOP	x							1												
S-115	R1-2	YIELD	30 x 30	7	SQ-CONC	2-1/2	1						6.25									
	R6-2R	ONE WAY RIGHT	24 x 30										5.00									
S-116	W16-17P	ROUNDABOUT PLAQUE	36 x 12	7	SQ-SOIL	2-1/2	1						3.00									
	W2-6	ROUNDABOUT	30 x 30										6.25									
S-117	R4-7	KEEP RIGHT	24 x 30	7	SQ-CONC	2-1/2	1						5.00									
	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4																		1
S-118	R2-1	SPEED LIMIT 30	24 x 30	7	SQ-SOIL	2	1			1			5.00									
S-119	R6-1R	ONE WAY RIGHT	36 x 12	4	SQ-CONC	2-1/2	1					3.00										
	R6-4A	ROUNDABOUT DIRECTIONAL (3 ARROWS)	48 x 24									8.00										
S-120	DESIGN	377TH ST ARROW	42 x 24	7	SQ-CONC	2-1/2	1						7.00									
	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4																		1
S-121	R1-2	YIELD	30 x 30	7	SQ-SOIL	2-1/2	1					6.25										
S-122	R1-2	YIELD	30 x 30	7	SQ-CONC	2-1/2	1					6.25										
	R6-2R	ONE WAY RIGHT	24 x 30									5.00										
S-123	R6-1R	ONE WAY RIGHT	36 x 12	4	SQ-CONC	2-1/2	1					3.00										
	R6-4B	ROUNDABOUT DIRECTIONAL (4 ARROWS)	60 x 24									10.00										
S-124	DESIGN	FOREST BLVD ARROW	48 x 24	7	SQ-CONC	2-1/2	1					8.00										
	OM1-2	TYPE 1 OBJECT MARKER	18 x 18	4																	1	
S-125	R6-1R	ONE WAY RIGHT	36 x 12	4	SQ-CONC	2-1/2	1					3.00										
	R6-4A	ROUNDABOUT DIRECTIONAL (3 ARROWS)	48 x 24									8.00										
S-126	R1-2	YIELD	30 x 30	7	SQ-SOIL	2-1/2	1						6.25									
S-127	R1-2	YIELD	30 x 30	7	SQ-CONC	2-1/2	1						6.25									
	R6-2R	ONE WAY RIGHT	24 x 30										5.00									
S-128	R3-8AD	L-TR	36 x 36	7	SQ-SOIL	2-1/2	1	1			9.00											
	R8-3	NO PARKING	24 x 24								4.00											
S-129	M3-3	SOUTH (BLUE)	24 x 12	7	SQ-SOIL	2	1	1			2.00											
	M1-6M	CHISAGO COUNTY 30	24 x 24								4.00											
S-130	R3-8ACA	L-T-R	54 x 30	7	SQ-SOIL	2-1/2	1	1			11.25											
	R8-3	NO PARKING	24 x 24								4.00											
						GROUP SUBTOTAL		22	1	2	441	173	68	5	5	5	1	2	0	6	4	3
						PROJECT TOTAL			25			682		5	5	5		3			13	

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 DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SEAN DELMORE, PE
DATE: 9/12/2024 LICENSE NO. 40945

wsb

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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 191 OF 216 SHEETS

DATE: 9/12/2024 2:09:50 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss

SIGN SPECIAL

J

SIGN NUMBER	PANEL LEGEND	PANEL SIZE (W x H)	PANEL MOUNTING HEIGHT	SUPPORT TYPE	SUPPORT RISER POST SIZE	SUPPORT NUMBER OF POSTS	REMOVE SIGN SPECIAL (B)	SALVAGE SIGN SPECIAL (A)	INSTALL SIGN SPECIAL (A)	SALVAGE SIGN PANEL SPECIAL (A)	INSTALL SIGN PANEL SPECIAL (A)
		INCH	FEET		INCHES		EACH	EACH	EACH	EACH	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				158	220		2200								
STA 1517+00 TO STA 1528+00				1009	230		2270		88			31			
STA 1528+00 TO STA 1539+00				621	220		2288					16			
STA 1539+00 TO STA 1550+00					220		2187					16			
STA 1550+00 TO STA 1561+00					220		2200								
STA 1561+00 TO STA 1572+00					220		2200								
STA 1572+00 TO STA 1582+20				420	210		2040								
TOTAL RECONDITIONING SAP 013-630-021				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	2846			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	86	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: 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

wsb

Chisago COUNTY USA

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 192 OF 216 SHEETS

DATE: 9/12/2024 2:09:51 PM
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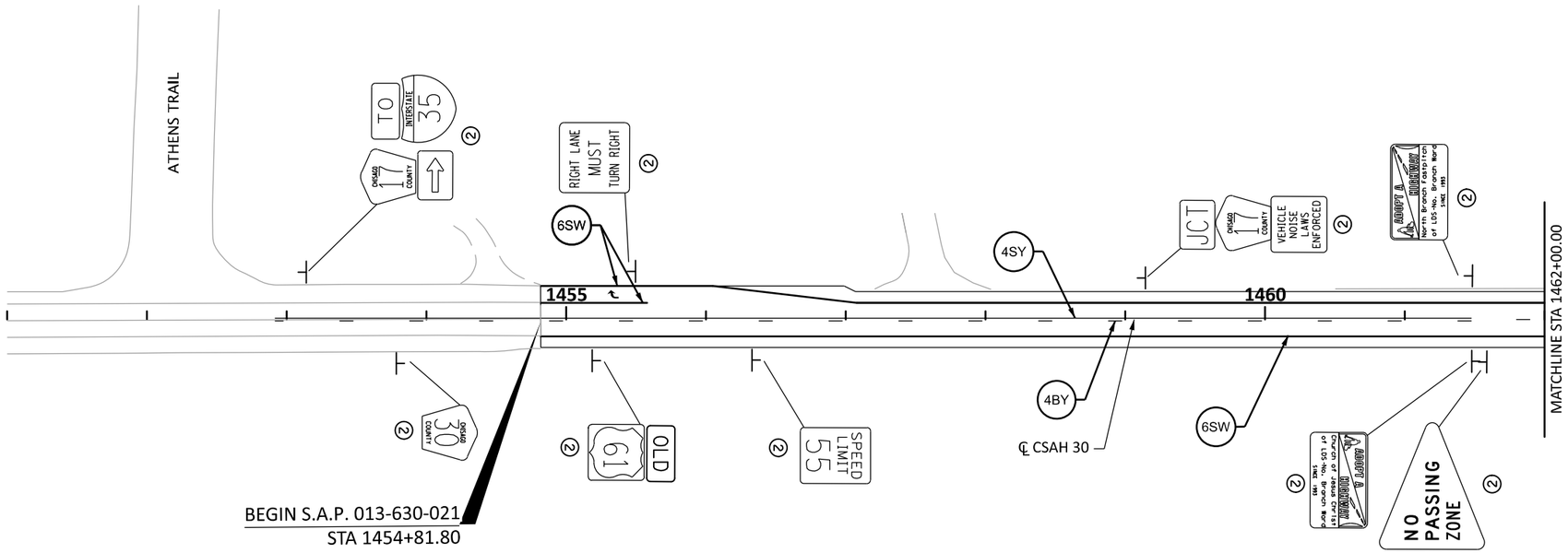

SCALE IN FEET
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STRIPING LEGEND

- ARROWS - PAINT
- CROSSWALK - PREF THERMO
- CIRCLE - PAINT
- SQUARE - PREF THERMO

2ND DIGIT PATTERN
S = SOLID
B = BROKEN
D = DOUBLE
T = DOTTED

1ST DIGIT WIDTH
4",8",ETC.

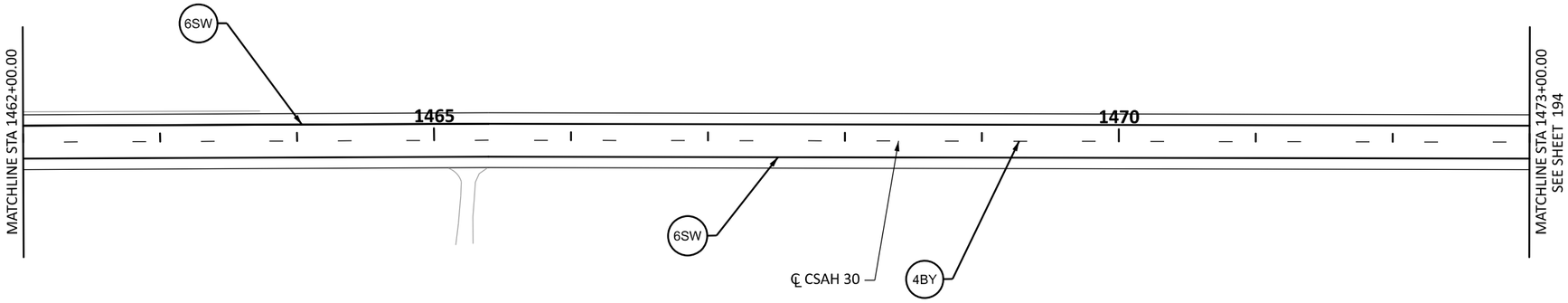
3RD DIGIT COLOR
W = WHITE
Y = YELLOW
B = BLACK

G = GROUND IN
W = WET REFLECTIVE

EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

(2) INPLACE



SCALE IN FEET
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SHEET 193 OF 216 SHEETS

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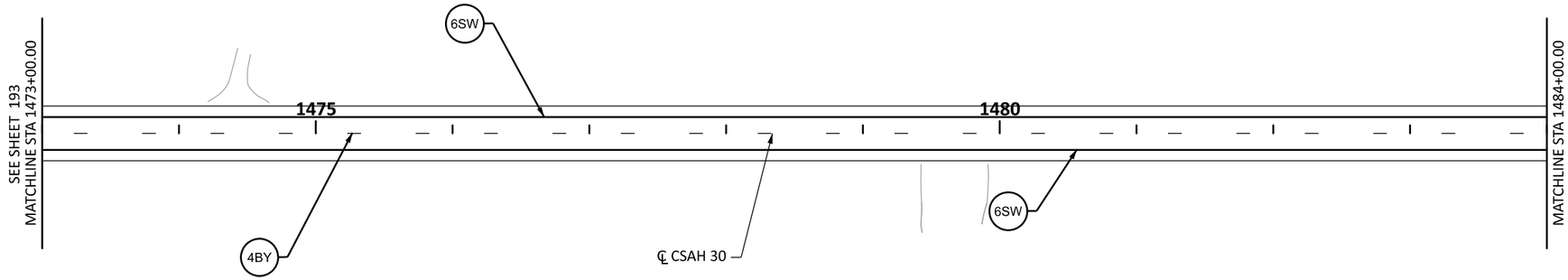

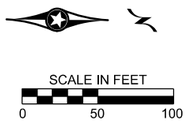

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CIRCLE - PAINT

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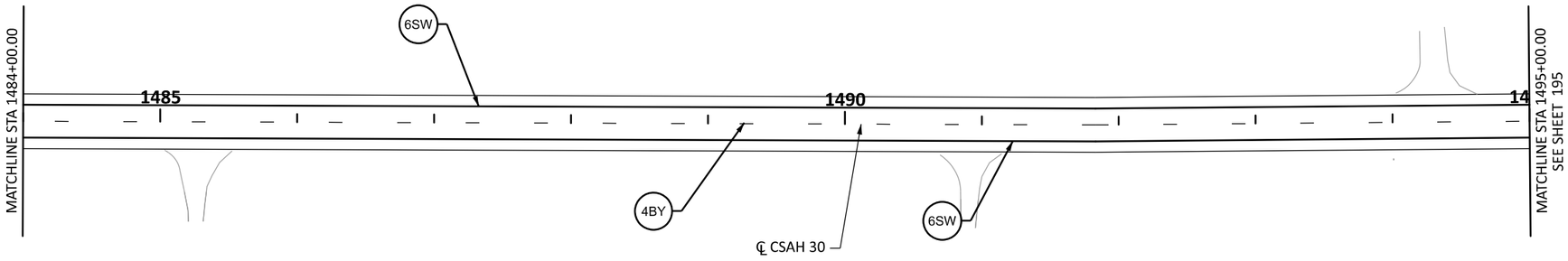

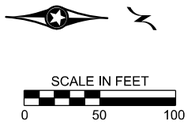

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CHISAGO COUNTY, MINNESOTA

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SHEET 194 OF 216 SHEETS

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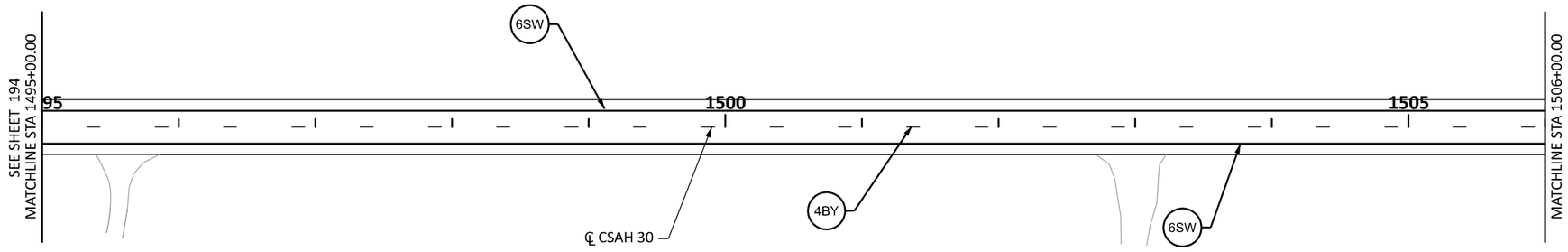

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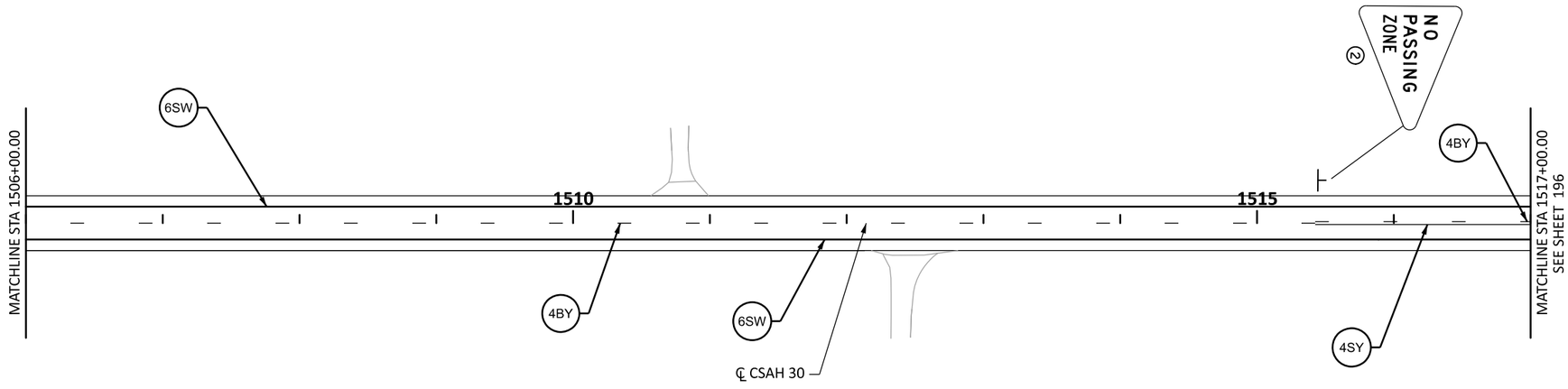
EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

(2) INPLACE



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SHEET 195 OF 216 SHEETS

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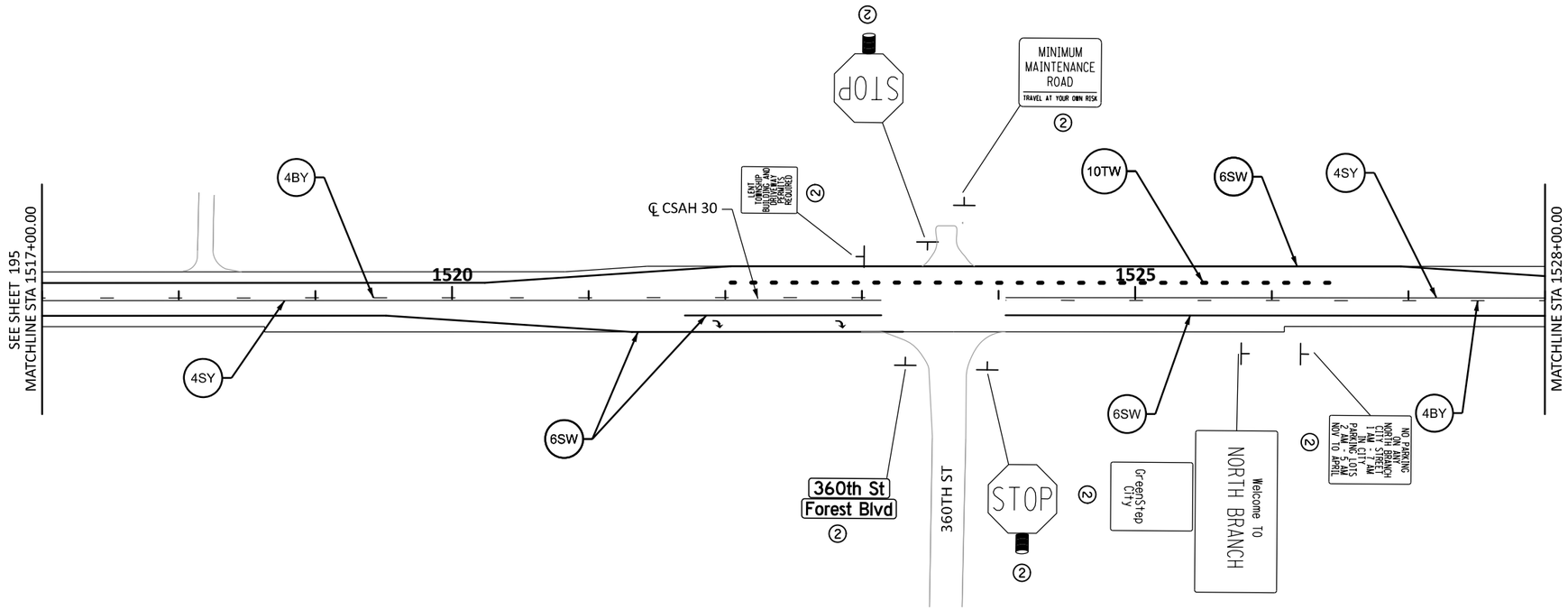

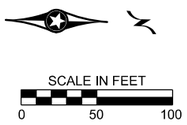

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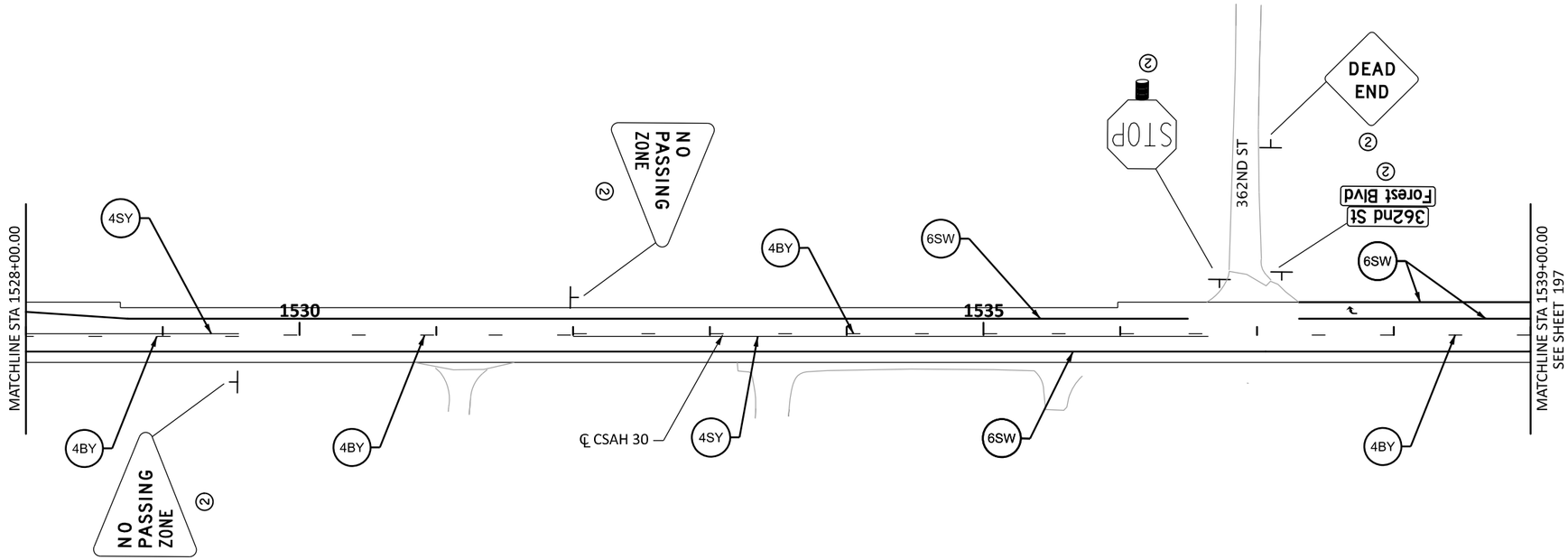
EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

② INPLACE



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SHEET 196 OF 216 SHEETS

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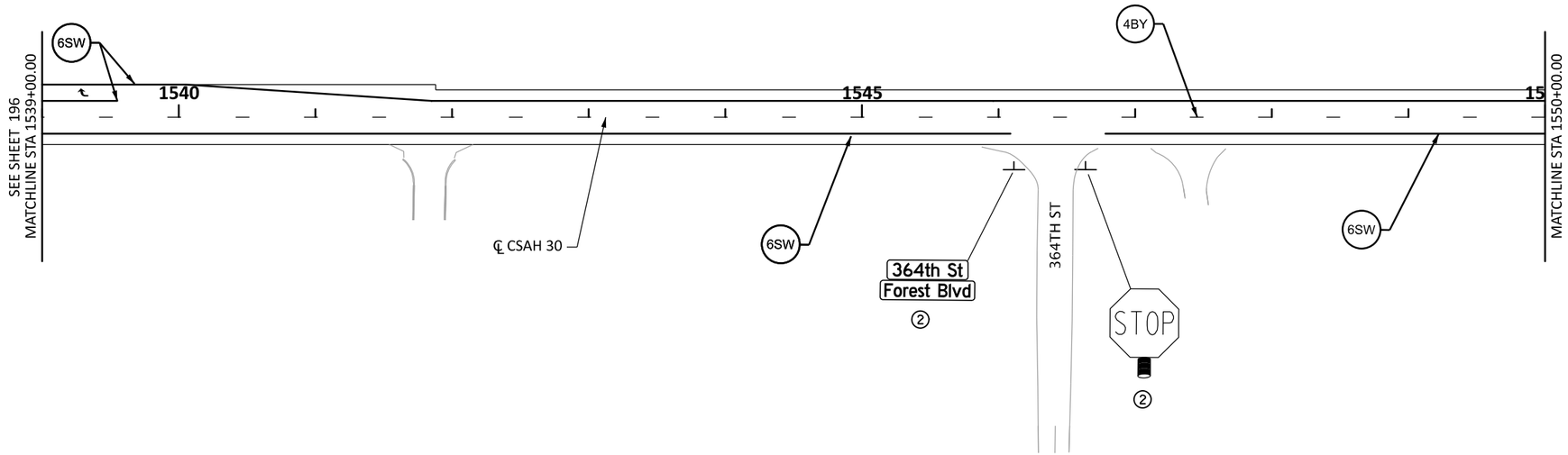

STRIPING LEGEND

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CROSSWALK - PREF THERMO

CIRCLE - PAINT

SQUARE - PREF THERMO

2ND DIGIT PATTERN
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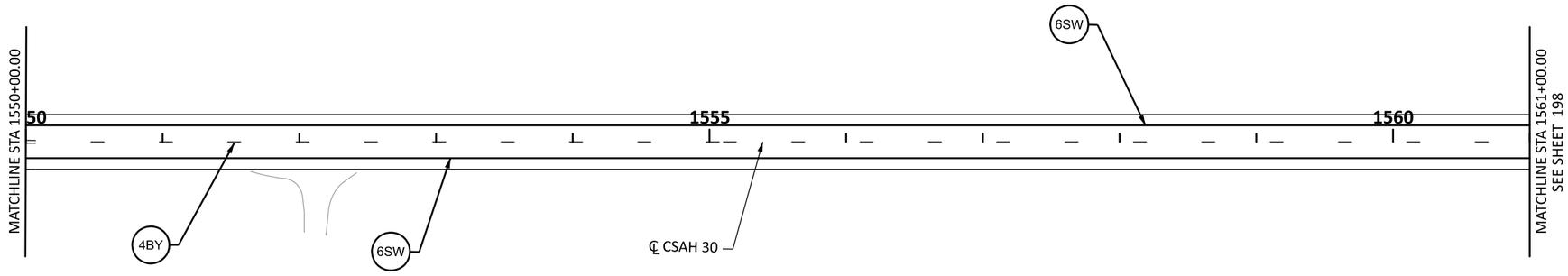
EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

② INPLACE



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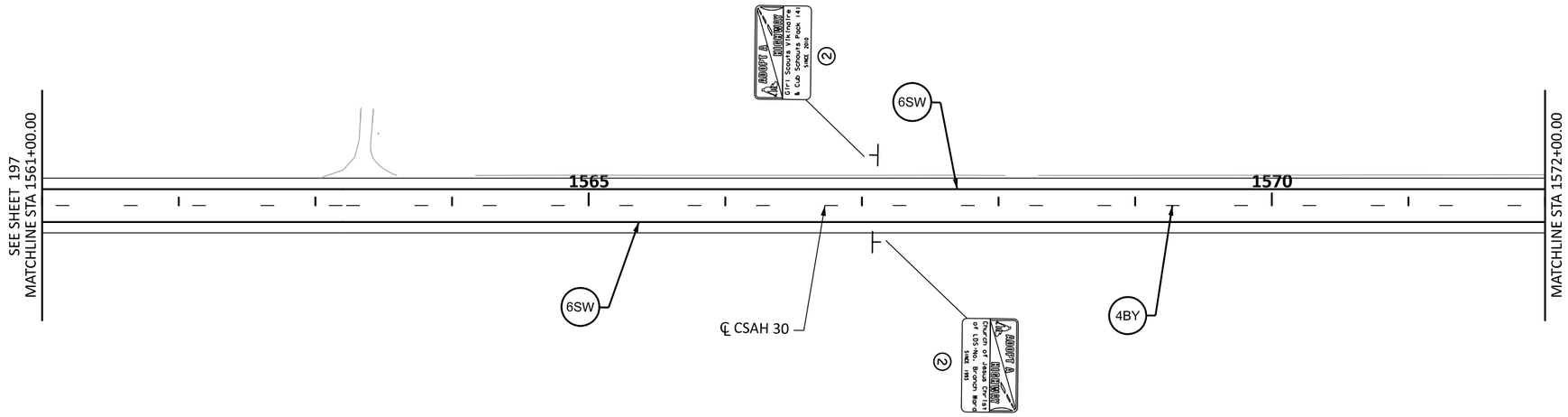
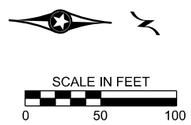
SHEET 197 OF 216 SHEETS





STRIPING LEGEND

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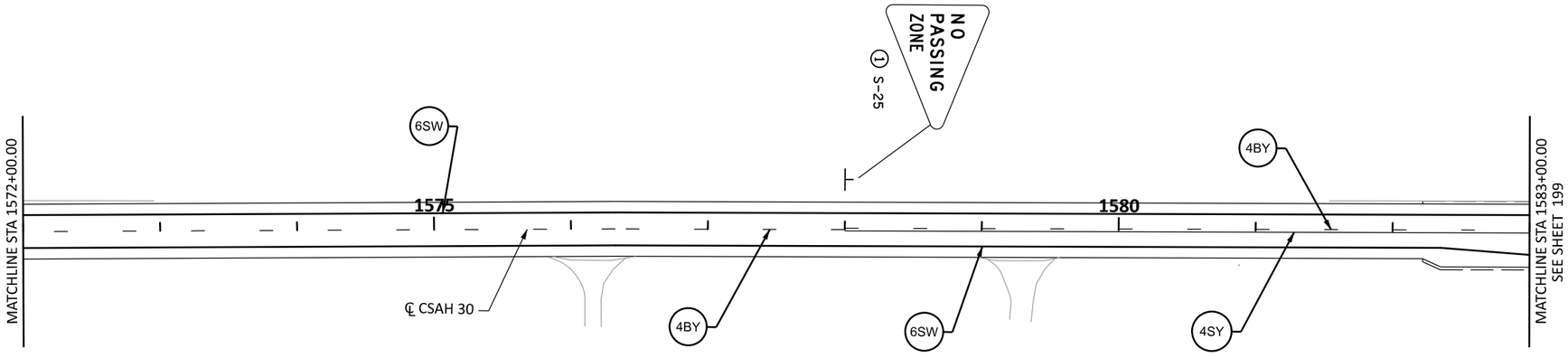
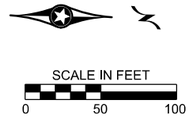
G = GROUND IN
W = WET REFLECTIVE

EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

1. FURNISH & INSTALL
2. INPLACE





NO.	DATE	BY	CHK	REVISIONS

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SHEET 198 OF 216 SHEETS

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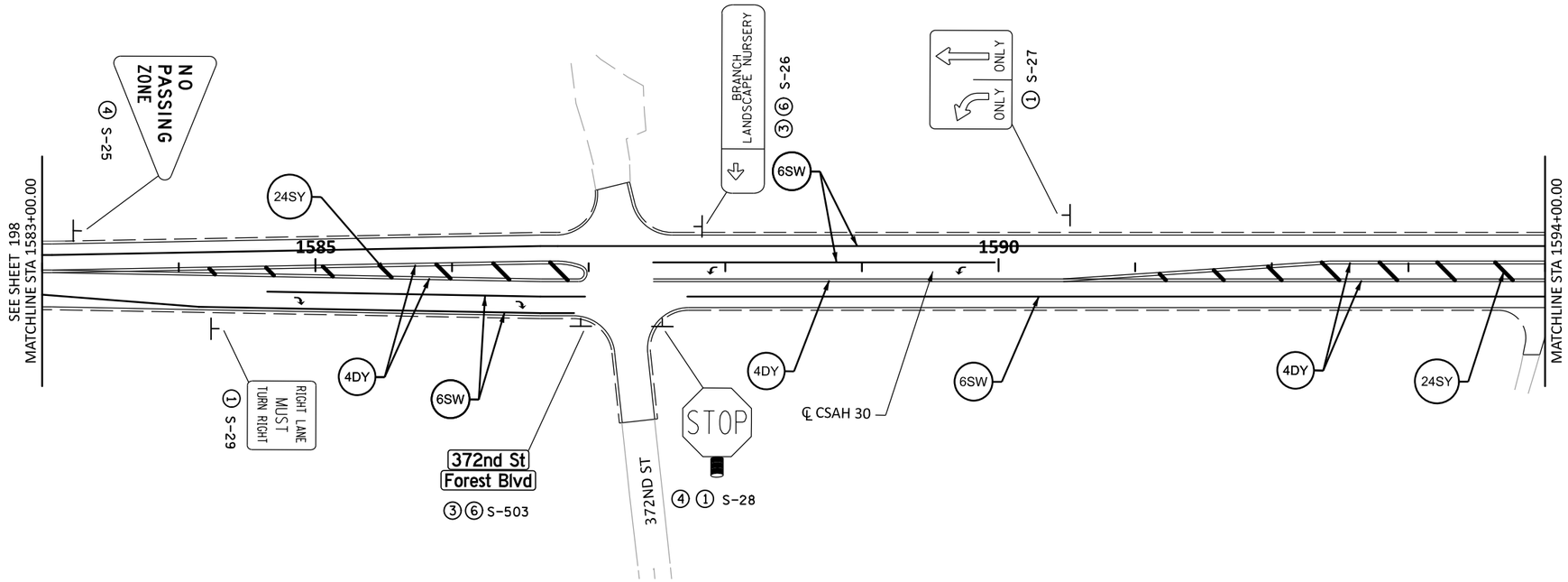

STRIPING LEGEND

- ARROWS - PAINT
- CROSSWALK - PREF THERMO
- CIRCLE - PAINT
- SQUARE - PREF THERMO

2ND DIGIT PATTERN
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1ST DIGIT WIDTH
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Y = YELLOW
B = BLACK

G = GROUND IN
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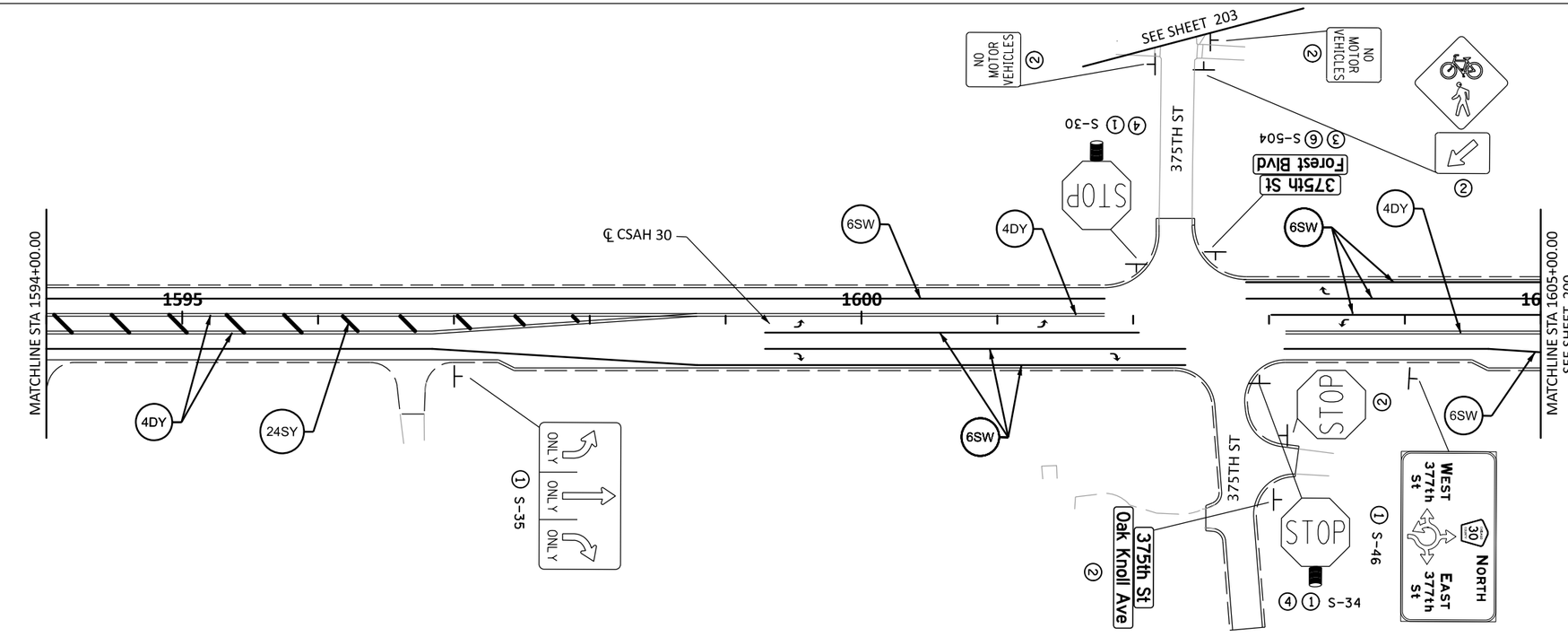
EXAMPLE: (4SW) = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

(1) FURNISH & INSTALL
(3) SALVAGE
(4) REMOVE
(6) INSTALL



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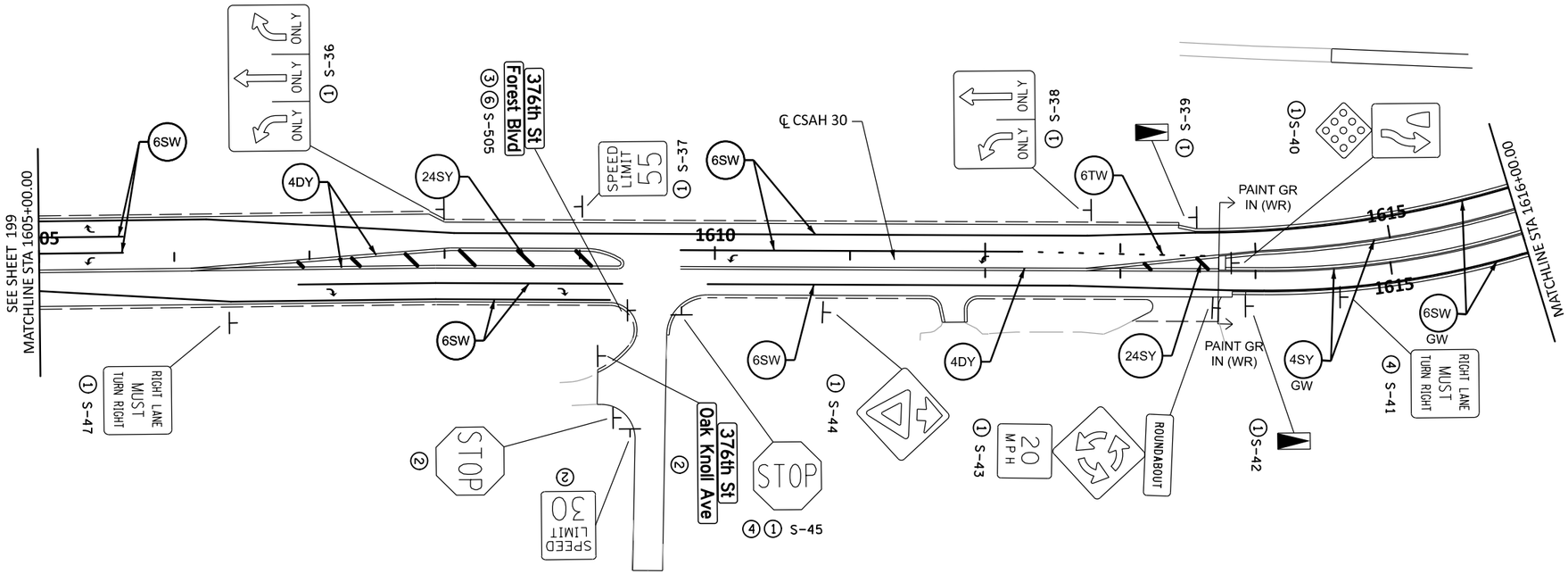
SHEET 199 OF 216 SHEETS



SCALE IN FEET
0 50 100

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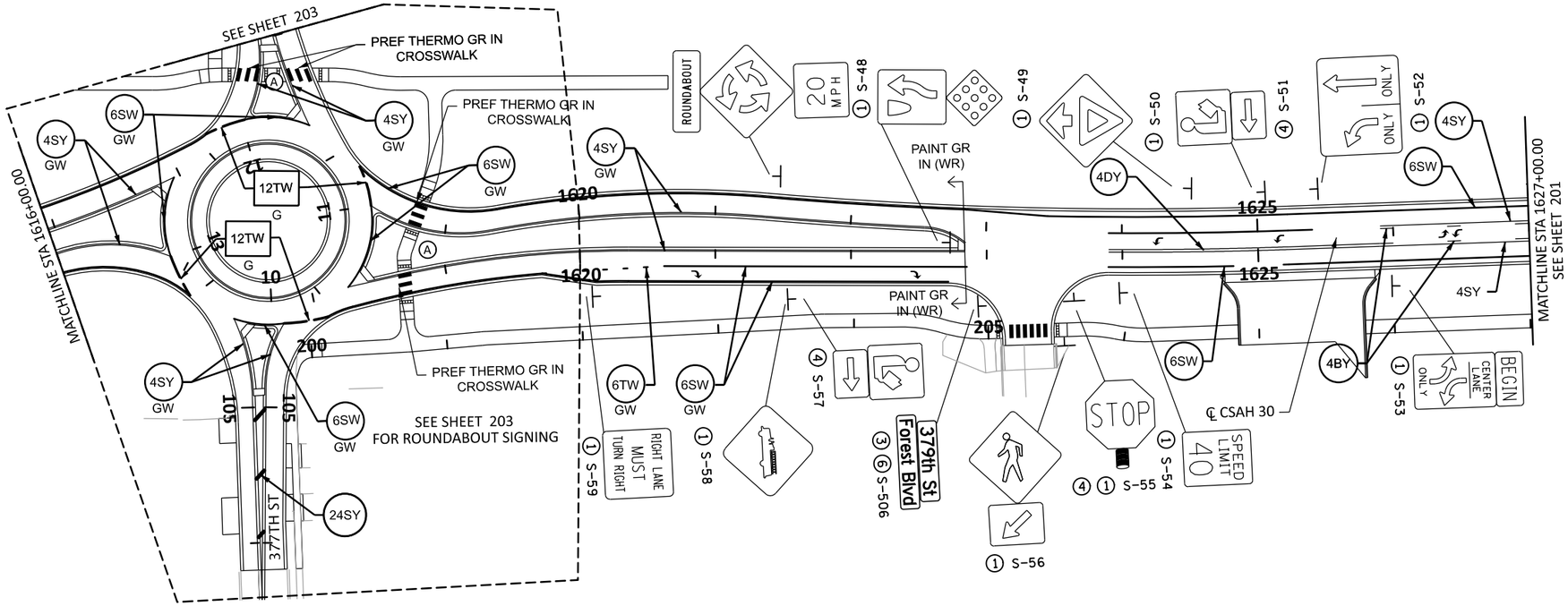
EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

- ① FURNISH & INSTALL
- ③ SALVAGE
- ④ REMOVE
- ⑥ INSTALL



SCALE IN FEET
0 50 100

Ⓐ SEE SHEETS 214 - 216 FOR RRFB PLAN.

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

wsb

Chisago COUNTY USA

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 SHEETS

DATE: 9/12/2024 2:09:59 PM
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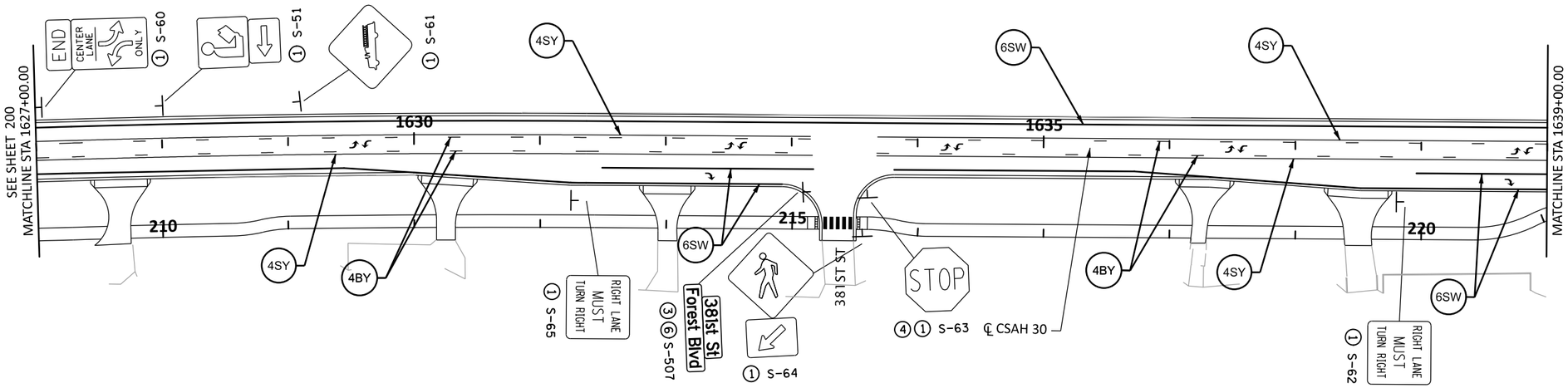

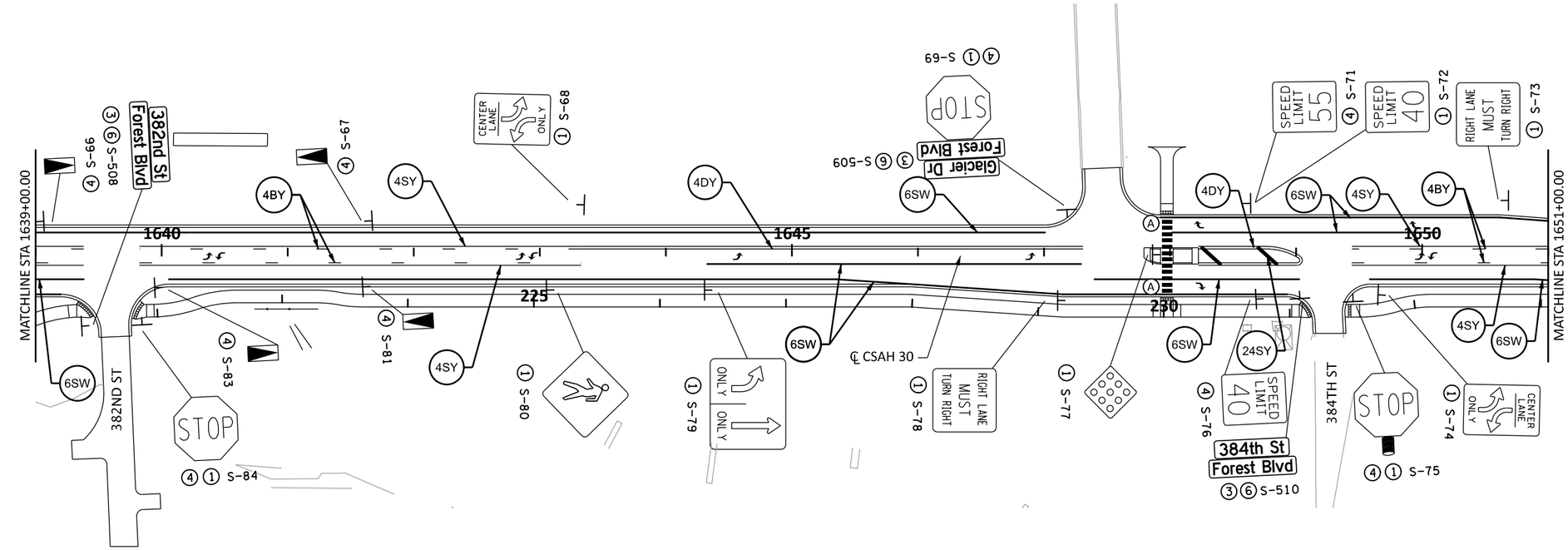

SCALE IN FEET
0 50 100

STRIPING LEGEND

ARROWS - PAINT

CROSSWALK - PREF THERMO

CIRCLE - PAINT

SQUARE - PREF THERMO

2ND DIGIT PATTERN
S = SOLID
B = BROKEN
D = DOUBLE
T = DOTTED

1ST DIGIT WIDTH
4",8",ETC.

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

NOTES

Ⓐ SEE SHEETS 214 - 216 FOR RRFB PLAN.

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SHEET 201 OF 216 SHEETS

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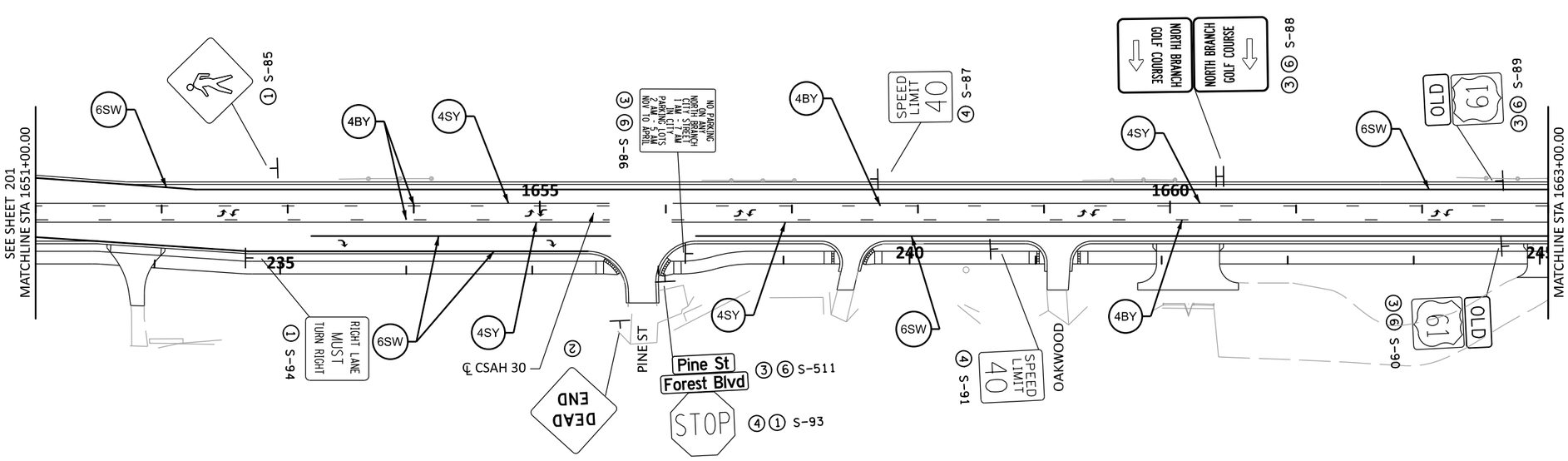

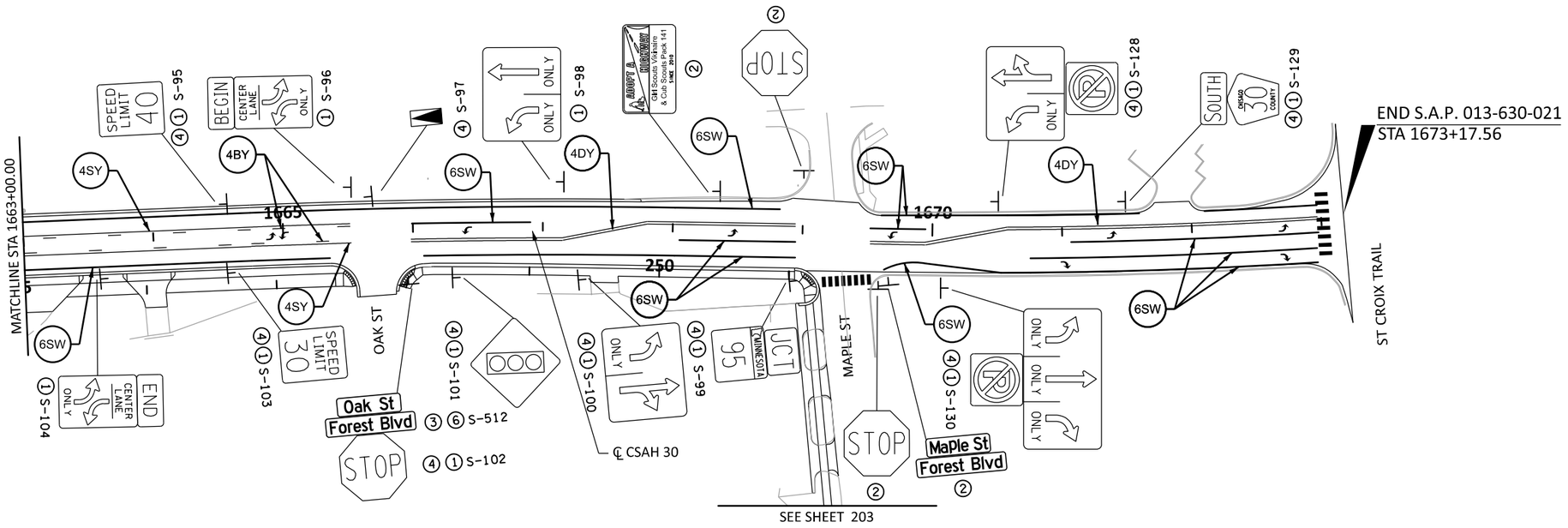

SCALE IN FEET
0 50 100

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- CROSSWALK - PREF THERMO
- CIRCLE - PAINT
- SQUARE - PREF THERMO

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W = WET REFLECTIVE

EXAMPLE: 4SW = 4" SOLID LINE WHITE PAINT

SIGNING LEGEND

1. FURNISH & INSTALL
2. INPLACE
3. SALVAGE
4. REMOVE
6. INSTALL

DATE: 9/12/2024 2:10:00 PM
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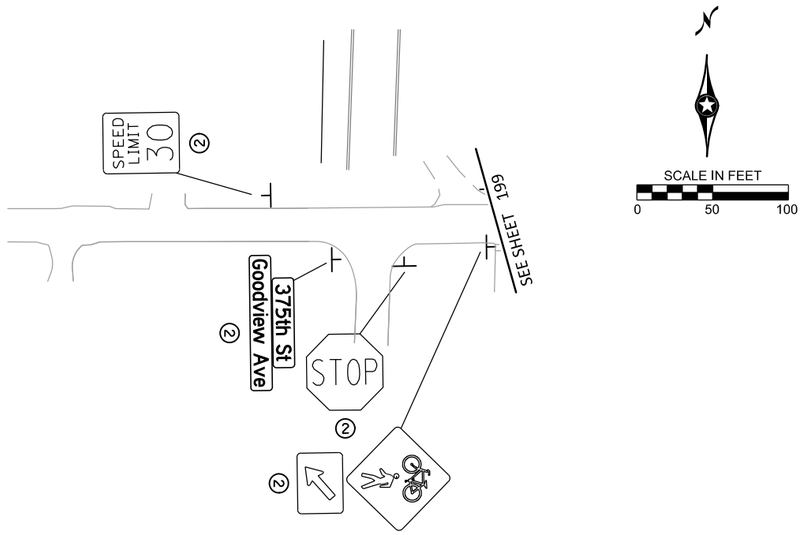
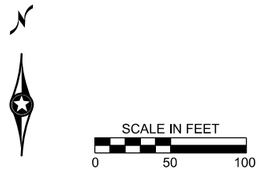
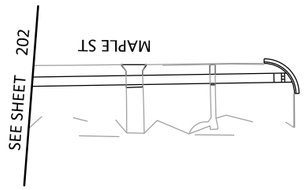
SHEET 202 OF 216 SHEETS







STRIPING LEGEND

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- CROSSWALK - PREF THERMO GR IN
- CIRCLE - PAINT
- SQUARE - PREF THERMO

2ND DIGIT PATTERN
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SIGNING LEGEND

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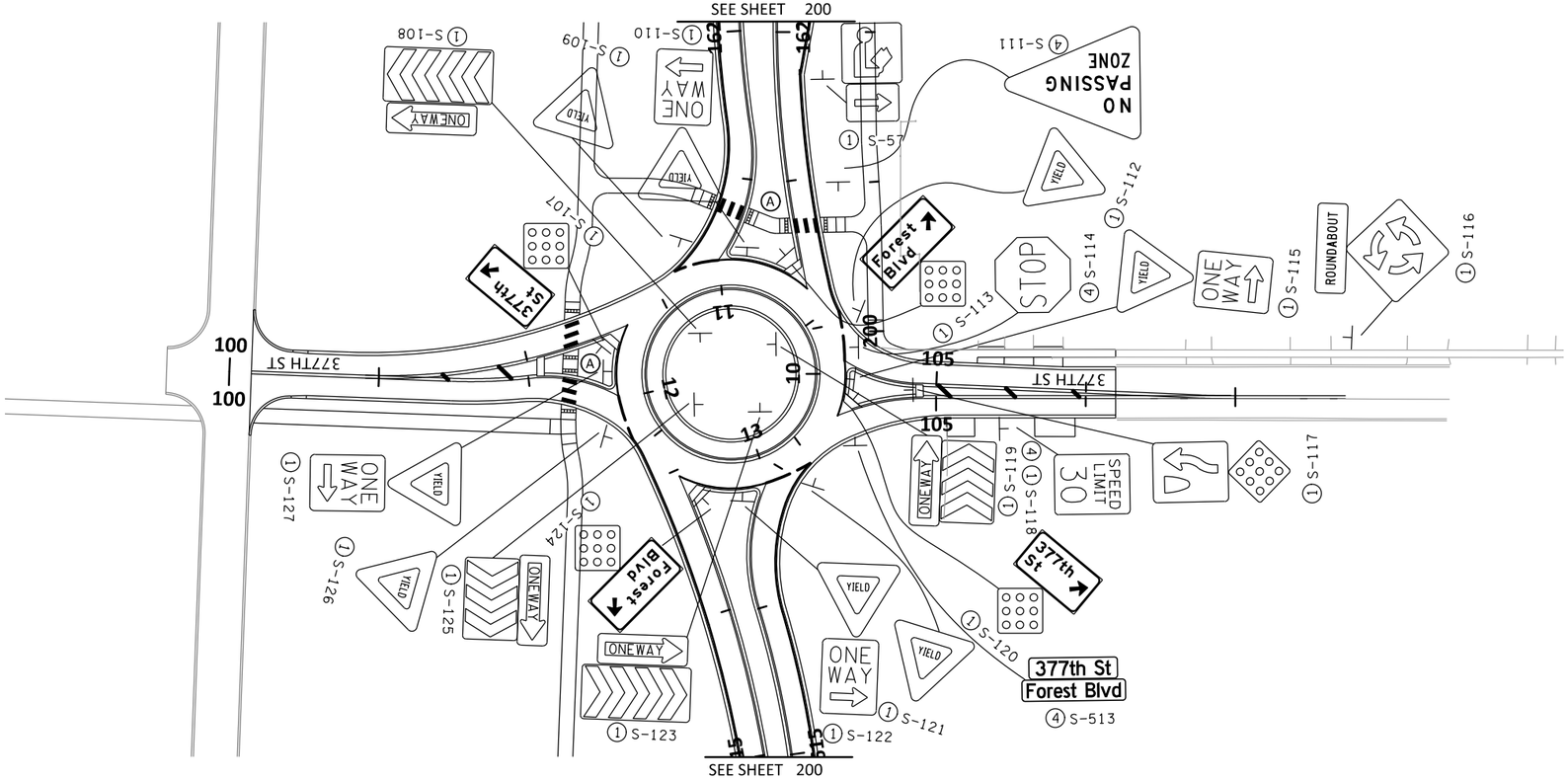
2. INPLACE
3. SALVAGE
4. REMOVE
6. INSTALL



NOTES

(A) SEE SHEETS 214 - 216 FOR RRFB PLAN.

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CSAH 30 (Forest Blvd) Improvements
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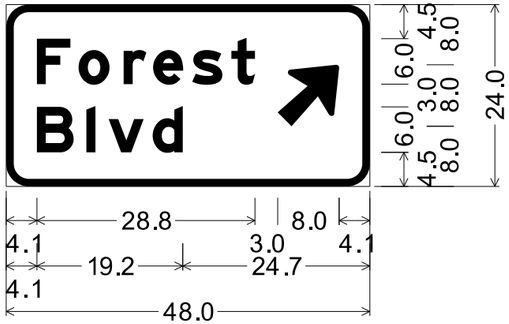
CHISAGO COUNTY, MINNESOTA

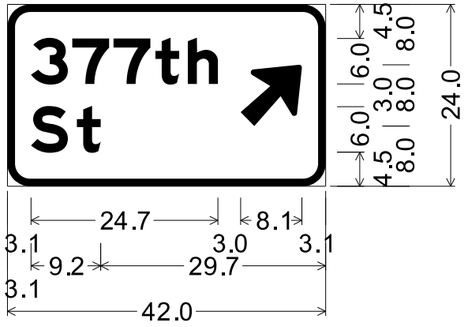
SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 203 OF 216 SHEETS

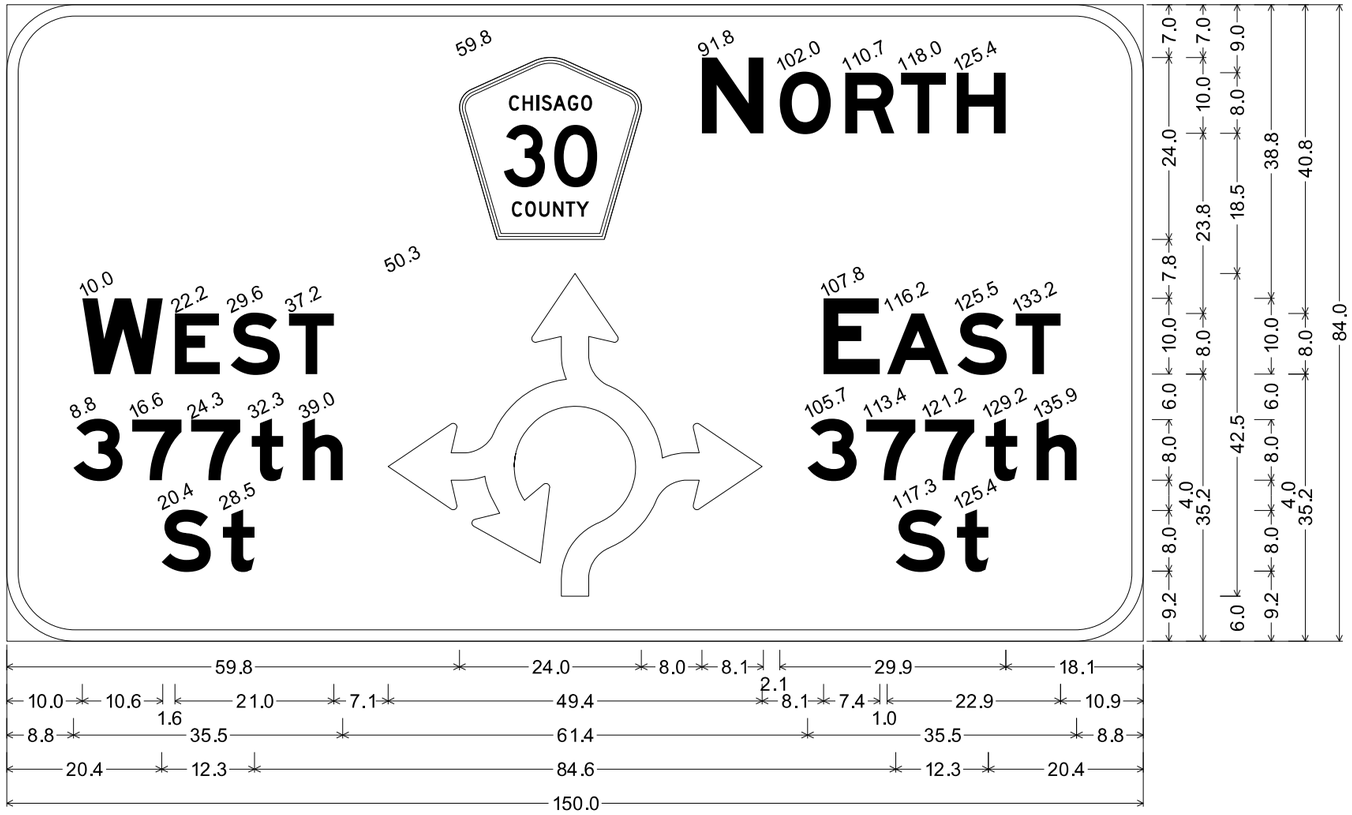
DATE: 9/12/2024 2:10:01 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss



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
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss

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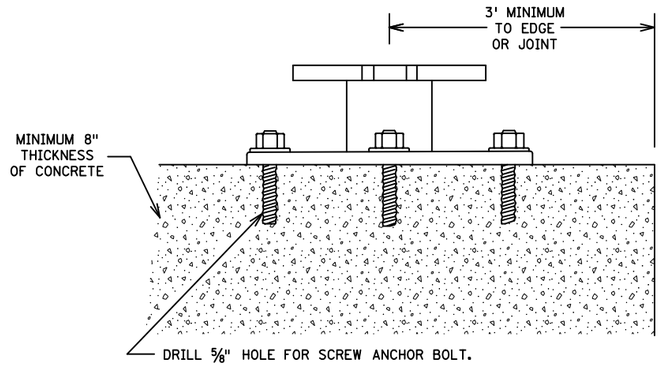
Chisago COUNTY USA

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

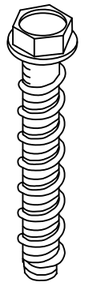
SHEET 204 OF 216 SHEETS



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 ½" OF SHIM WASHERS MAY BE USED BETWEEN SHEAR BOLT BASE AND CONCRETE FOR LEVELING.
IF MORE THAN ½" OF SHIMS ARE REQUIRED, THEN CORE THROUGH THE CONCRETE.
IF CONCRETE IS LESS THAN 8" THICK, THEN CORE THROUGH THE CONCRETE.



SCREW
ANCHOR BOLT

6" LONG CARBON STEEL
WITH 2700 POUNDS OF
PULL OUT STRENGTH.

REV 5/04/21

SLIP BASE

MOUNTED TO CONCRETE SURFACE

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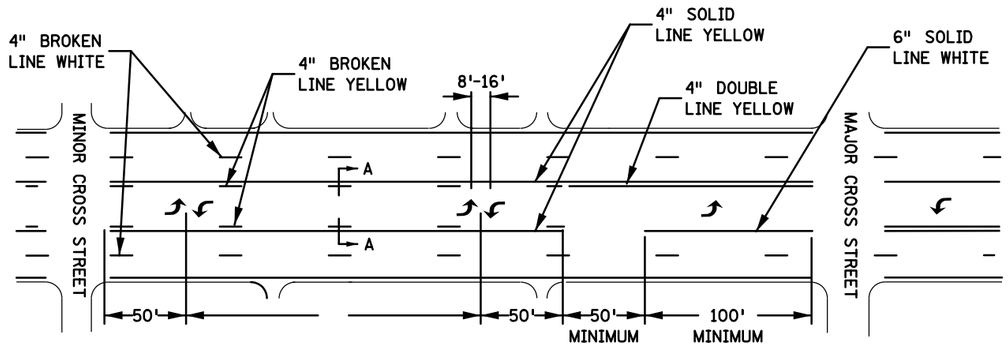
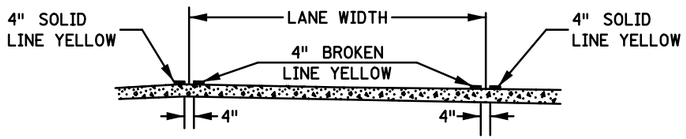
SHEET 205 OF 216 SHEETS

DATE: 9/12/2024 2:10:02 PM
PATH & FILENAME: Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000_ss

TWO-WAY LEFT-TURN LANE





SECTION A-A
TWO WAY LEFT TURN LANE

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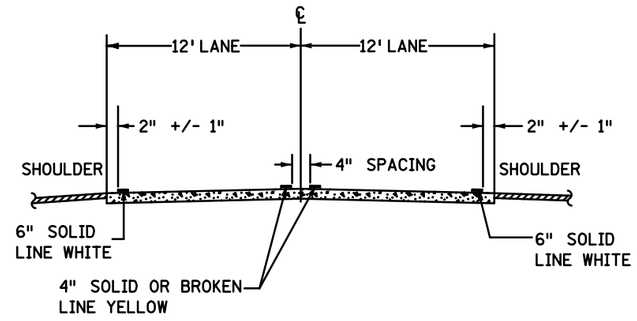
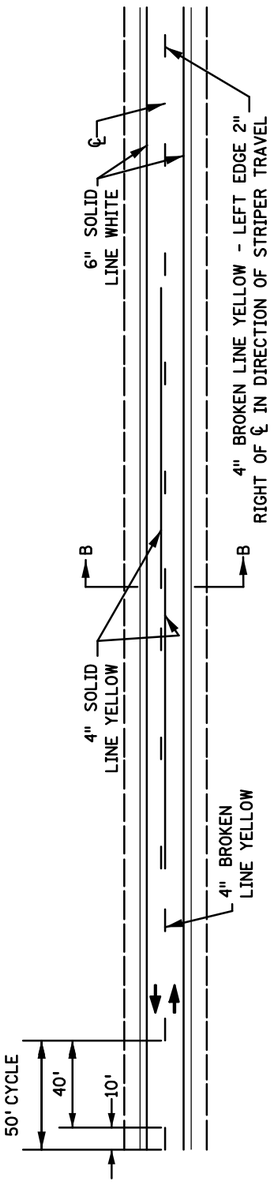
TWO-LANE, TWO-WAY



SECTION B-B



PUBLISHED BY OTE: 16 NOV 2021 | MODIFIED:

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Chisago County, Minnesota

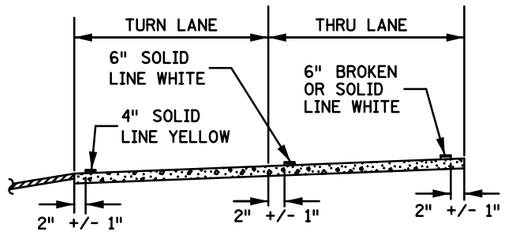
CHISAGO COUNTY, MINNESOTA

SIGNING & PAVEMENT MARKING PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

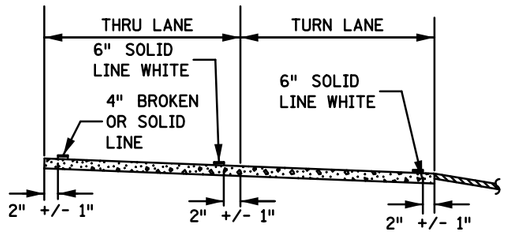
SHEET 206 OF 216 SHEETS

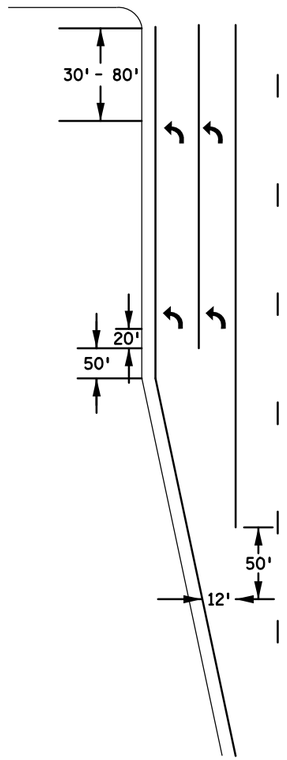
TURN LANE WITH ARROW MESSAGE

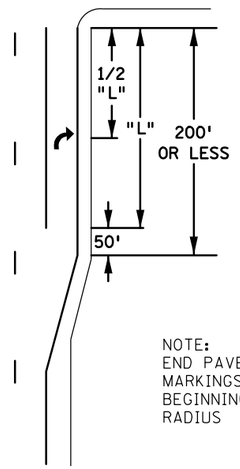
LEFT TURN LANE



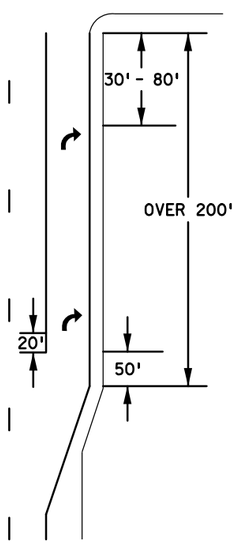
RIGHT TURN LANE







NOTE:
END PAVEMENT MARKINGS AT BEGINNING OF RADIUS



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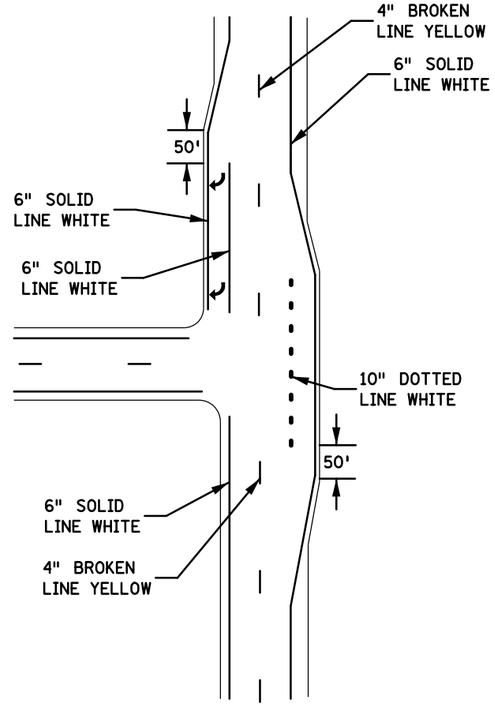
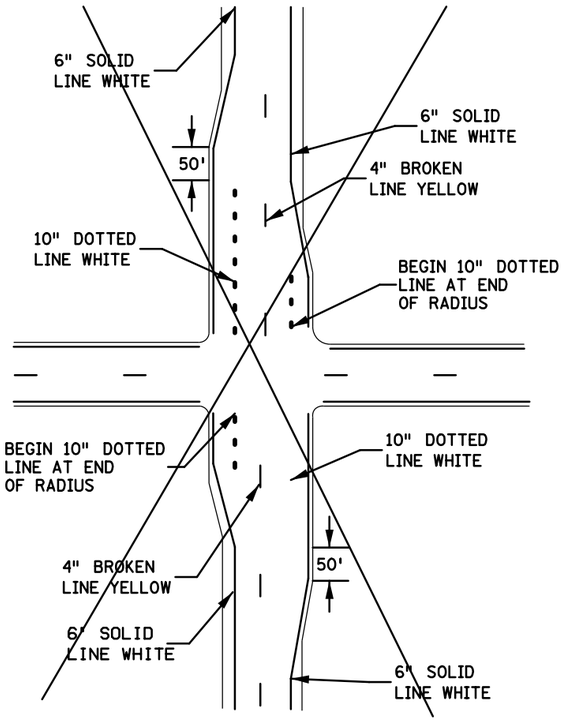
BYPASS LANE





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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 207 OF 216 SHEETS

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
- FIBER OPTIC SPLICE VAULT
- PULL VAULT
- LUMINAIRE NO.
- SIGNAL BASE NO.
- SIGNAL HEAD NO./FLASHER HEAD NO.
- BARREL MOUNT BASE NO.
- WOOD POLE NO.
- TELEVISION CAMERA (CCTV)
- VIDEO DETECTION

FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL

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

DATE: 9/12/2024 2:10:15 PM
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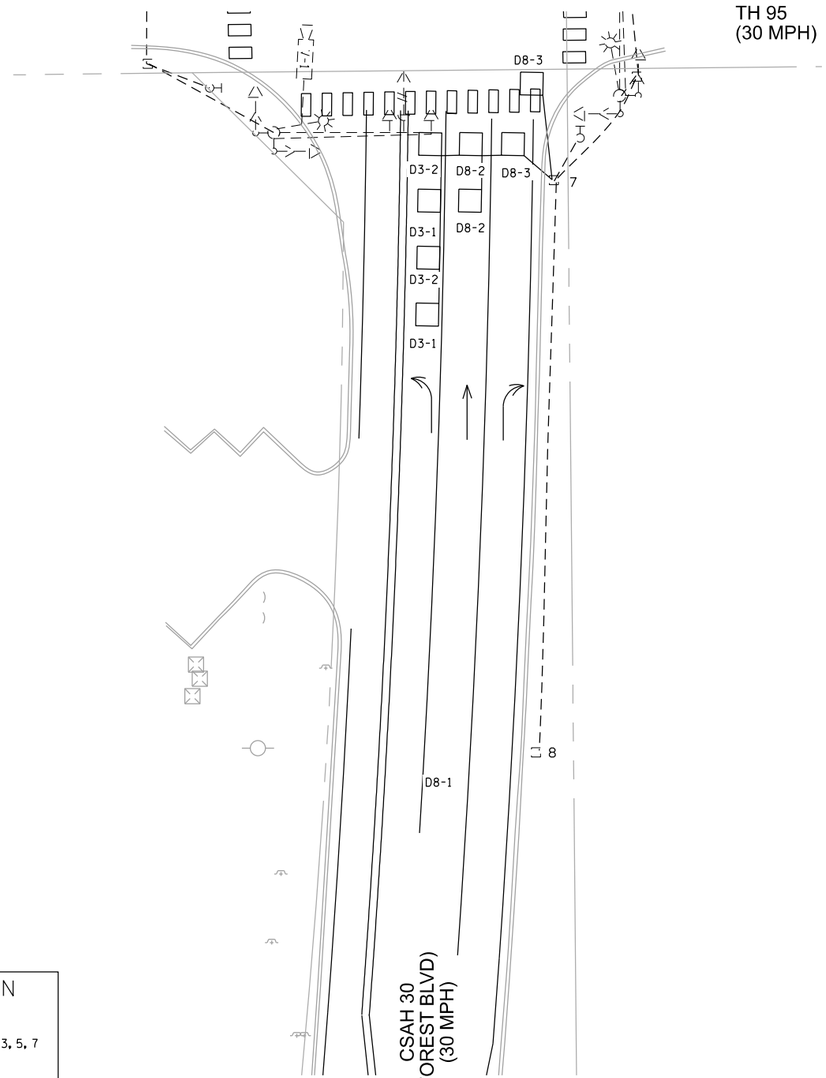
CHISAGO COUNTY, MINNESOTA
ABBREVIATIONS
TRAFFIC CONTROL SIGNAL SYSTEM
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 208 OF 216 SHEETS

NOTES:

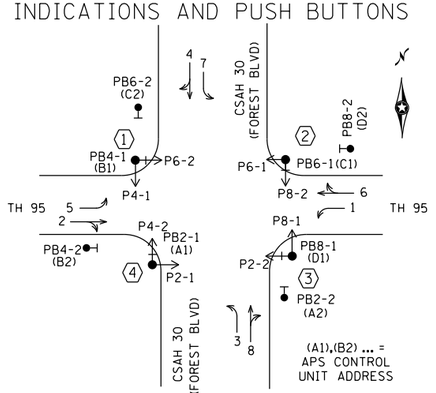
1. CONTRACTOR SHALL TEST LOOP DETECTORS D3-1, D3-2, D8-1, D8-2 AND D8-3 PRIOR TO THE MILLING AND AFTER THE MILLING IS COMPLETED. IF ANY LOOP DETECTOR FAILS, THE CONTRACTOR SHALL FURNISH AND INSTALL NEW.
2. CONTRACTOR SHALL CONTACT PETE ELLWANGER, METRO SIGNAL CONSTRUCTION COORDINATOR (651-775-1279) PRIOR 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



PEDESTRIAN PUSH BUTTONS SHALL BE LOCATED AS SHOWN ABOVE

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.

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

wsb

Chisago COUNTY USA

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 2:10:25 PM
PATH & FILENAME: P:\Projects\Minnesota\023661-000\03_Discipline\Roadway\Sheets\023661-000-445sgp-002

NOTES:
1. SEE SPECIAL PROVISIONS FOR STATE FURNISHED MATERIALS.
2. 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.
3. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE TRAFFIC SIGNAL.
4. FOR TYPE D SIGNS SEE DETAIL SHEET. ALL SIGNS REQUIRED ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL SIGNAL SYSTEM PAY ITEM.
5. PAVEMENT MARKINGS ARE INCLUDED IN PAVEMENT MARKING PLAN.
6. CONSTRUCTION OF PEDESTRIAN CURB RAMPS ARE PART OF THE CONSTRUCTION PLAN AND ARE NOT INCLUDED IN PAYMENT FOR THE SIGNAL SYSTEM.
7. 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.
8. 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.
9. ITEMS DENOTED WITH AN * ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
10. 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:
4-12/C#14
4-4/C#14
*2-3/C#14
*2-3/C#20
6-2/C#14
1-1/C#6 INS.GR.
4" CONDUIT TO HH 1:
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 SWINGE 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
PA90 SWING AWAY HINGES
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.

PED PUSH BUTTON STATION
1-APS PEDESTRIAN PUSH BUTTON AND SIGN (RT ARROW PB6-2)
2" CONDUIT INTO HH 1:
1-2/C#14

PED PUSH BUTTON STATION
1-APS PEDESTRIAN PUSH BUTTON AND SIGN (RT ARROW PB4-2)
2" CONDUIT TO HH 9:
1-2/C#14

PED PUSH BUTTON STATION
1-APS PEDESTRIAN PUSH BUTTON AND SIGN (RT ARROW PB8-2)
2" CONDUIT INTO HH 4:
1-2/C#14

PED PUSH BUTTON STATION
1-APS PEDESTRIAN PUSH BUTTON AND SIGN (RT ARROW PB2-2)
2" CONDUIT INTO HH 7:
1-2/C#14

MATCH LINE "A"
MATCH LINE "B"
TH 95 (30 MPH)
CSAH 30 (FOREST BLVD) (30 MPH)
HH 1, HH 2, HH 3, HH 4, HH 5, HH 6, HH 7, HH 9, HH 10, HH 11, HH 12
D1-1, D1-2, D2-1, D3-1, D3-2, D4-1, D4-2, D4-3, D5-1, D5-2, D6-1, D7-1, D7-2, D8-1, D8-2, D8-3
*1 & 6 EVP
*2 & 5 EVP
*3 & 8 EVP
*4 & 7 EVP

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	●	●	●				

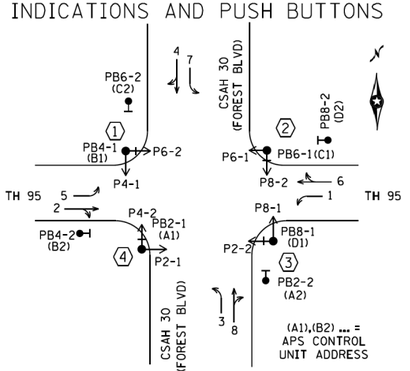
-ALL SIGNAL INDICATIONS SHALL BE 12" LED
-ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BACKGROUND SHIELDS

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

CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



PEDESTRIAN PUSH BUTTONS SHALL BE LOCATED AS SHOWN ABOVE

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.

FOR INFORMATION ONLY

NO.	DATE	BY	CHK	REVISIONS

wsb

Chisago COUNTY USA

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

SHEET 210 OF 216 SHEETS

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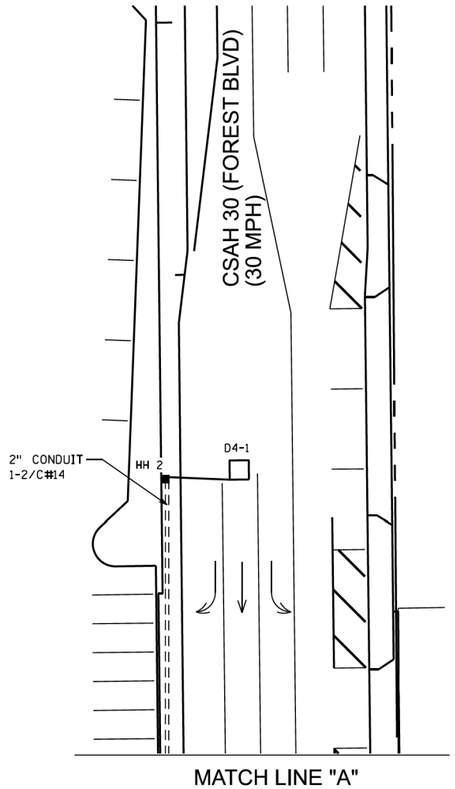
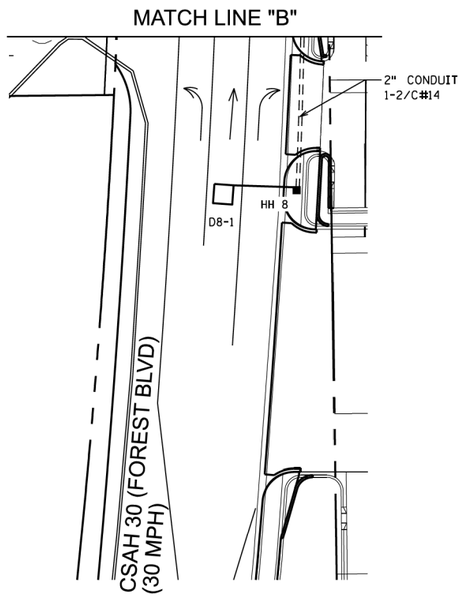


MATCH LINE "A"

MATCH LINE "B"



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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA
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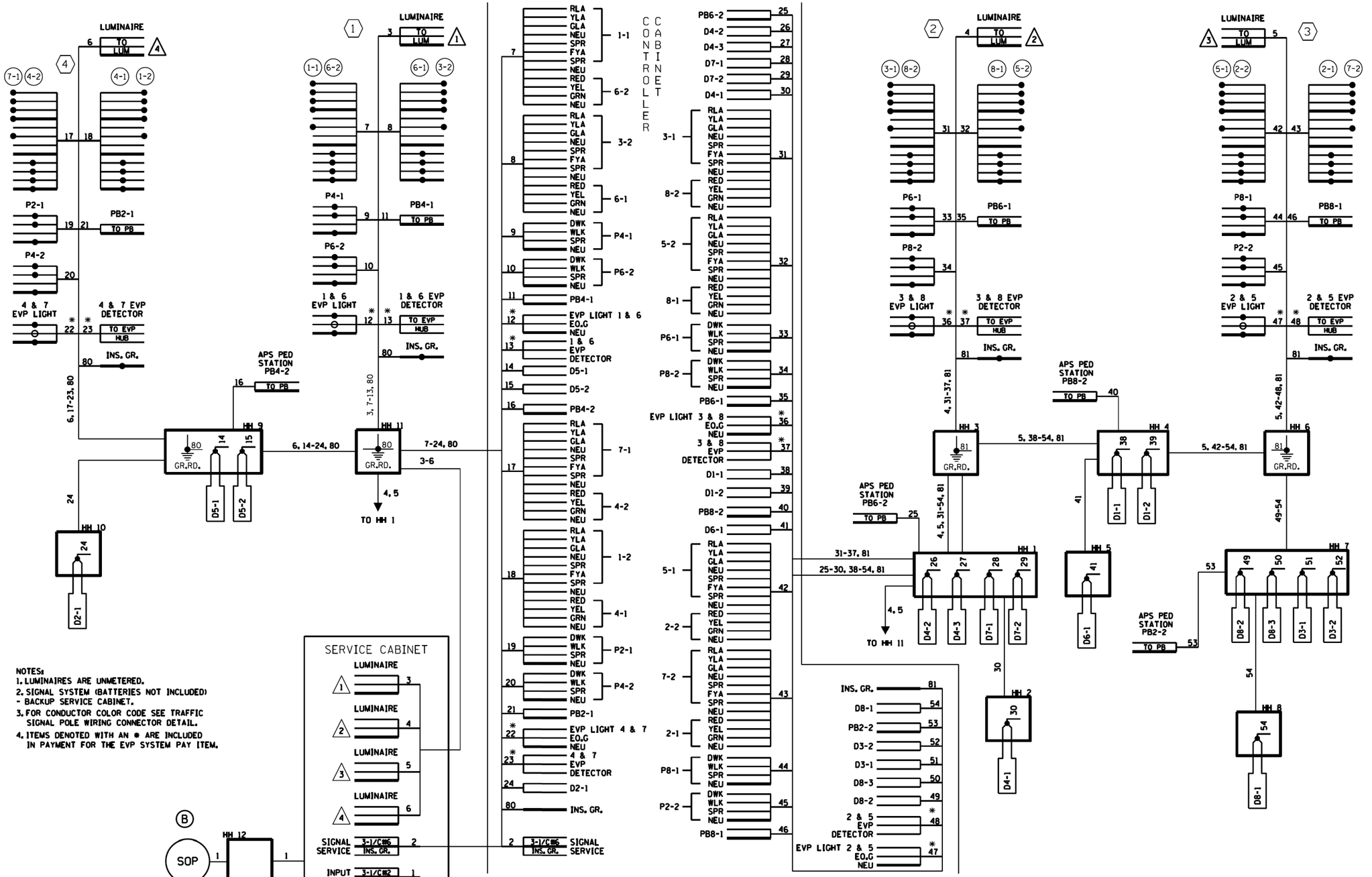
TRAFFIC CONTROL SIGNAL SYSTEM
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 211 OF 216 SHEETS



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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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SHEET 212 OF 216 SHEETS

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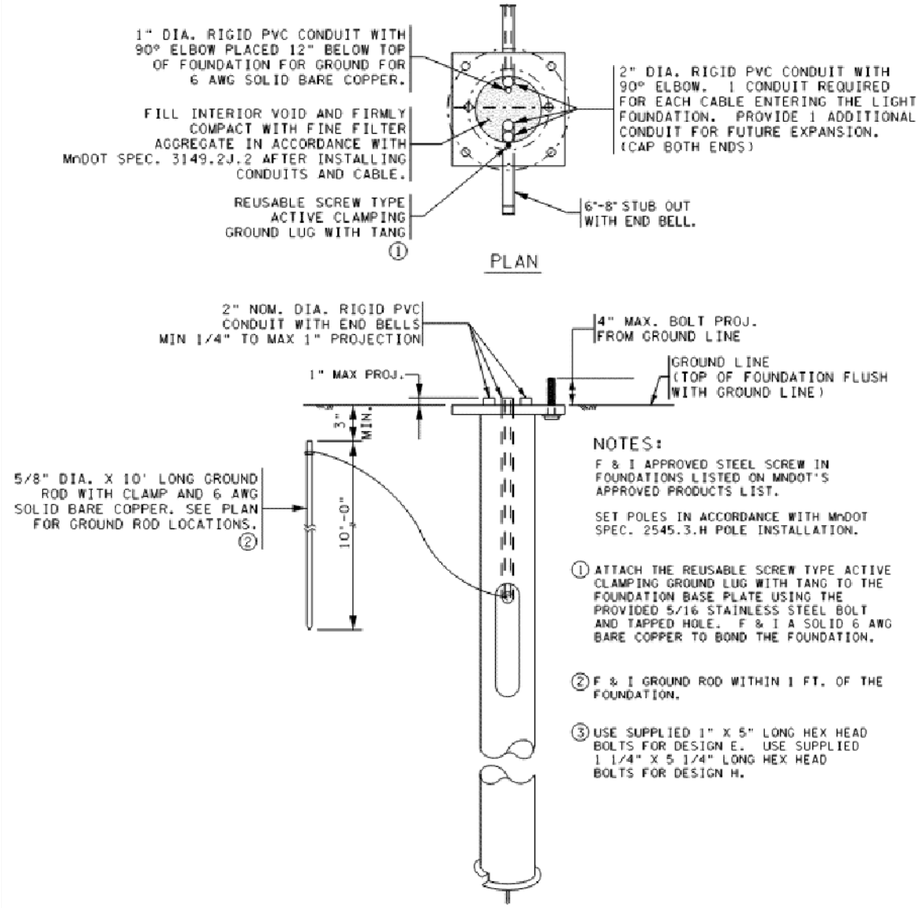
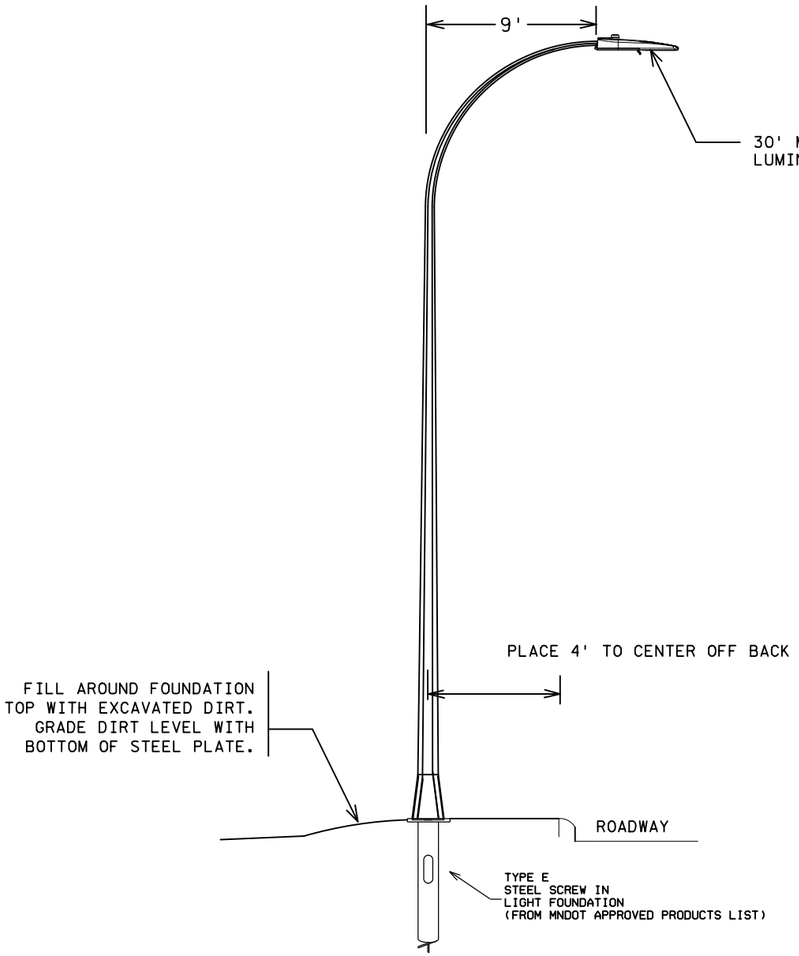


STEEL SCREW IN LIGHT FOUNDATION DESIGN E

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.

DATE: 9/12/2024 2:11:17 PM
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Design By: DS
Plan By: DS
Checked By: ES
Approved By: SD

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DATE: 9/12/2024 LICENSE NO. 40945

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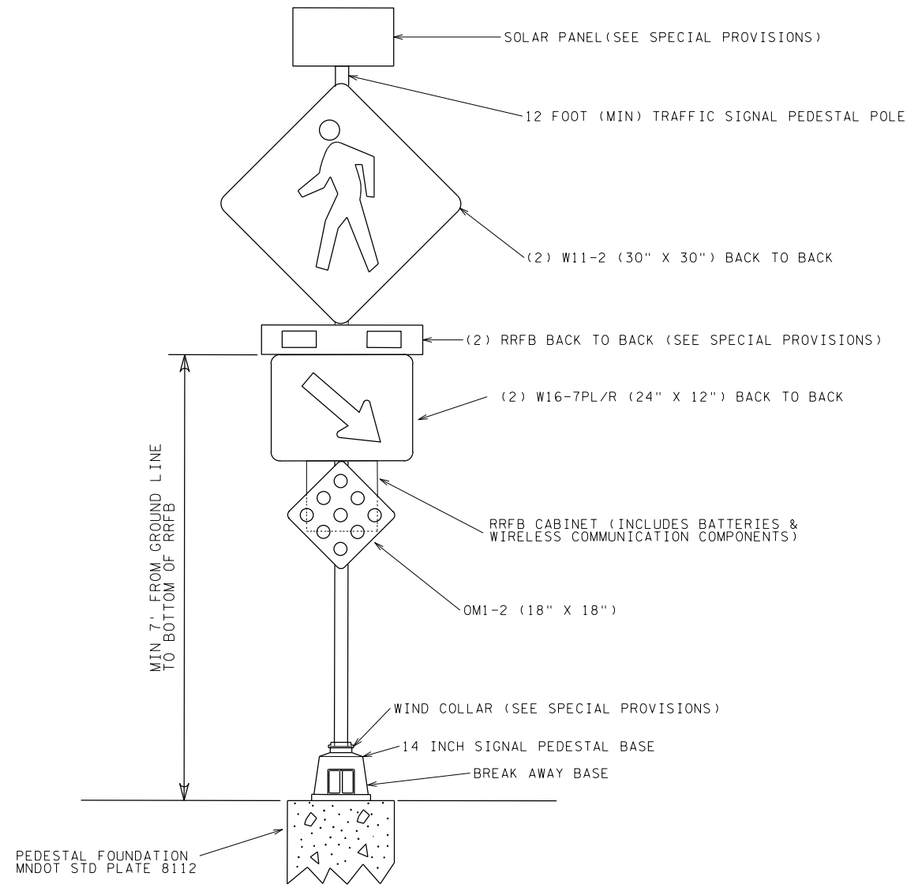
Chisago County, Minnesota

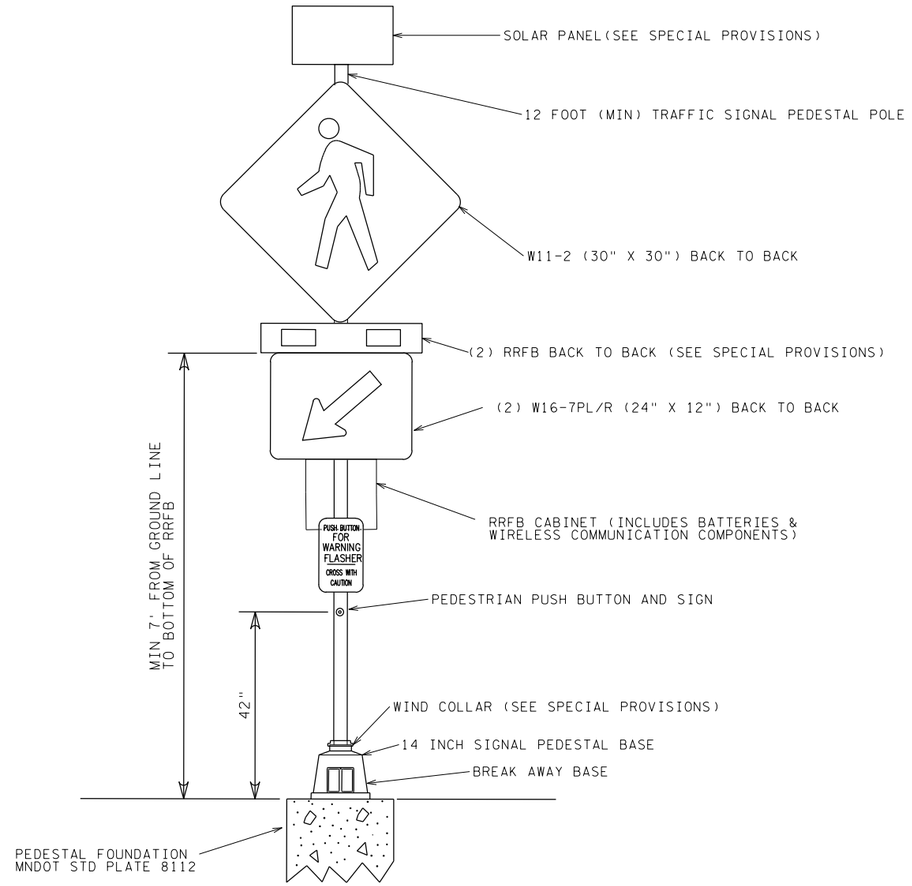
CHISAGO COUNTY, MINNESOTA

LIGHTING & RRFB PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 213 OF 216 SHEETS



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 NO. & TYPE	MOUNTING HEIGHT	PANEL SIZE (W x H) INCH		QTY EACH	PANEL LEGEND
R10-25	(B)	3.5	6	12	6	PUSH BUTTON TO ACTIVATE FLASHER
W11-2	(B)	9.5	30	30	18	PEDESTRIAN CROSSING
W16-7PL	(B)	7	24	12	6	DOWN ARROW (LEFT)
W16-7PR	(B)	7	24	12	12	DOWN ARROW (RIGHT)
OM1-2	(B)	4	18	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 TRAFFICALM BRAND.

NO.	DATE	BY	CHK	REVISIONS

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Approved By: SD

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SHEET 214 OF 216 SHEETS

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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
- (x/x) LIGHTING SYSTEM ID / LIGHTING UNIT #

SCALE IN FEET

0 50 100

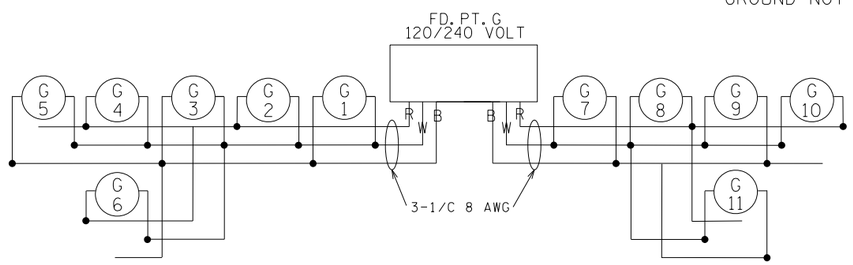
377TH ST

1615 1620

200 205

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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SEAN DELMORE, PE

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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

LIGHTING & RRFB PLAN
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET 215 OF 216 SHEETS

DATE: 9/12/2024 2:11:25 PM
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5. EXACT LOCATIONS OF LIGHT, PEDESTALS AND SERVICE CABINET FOUNDATIONS SHALL BE STAKED IN THE FIELD FOR ENGINEER APPROVAL.

1645

1650

230

℄ CSAH 30

384TH ST

SCALE IN FEET

0 25 50

NO.	DATE	BY	CHK	REVISIONS

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Plan By: DS
Checked By: ES
Approved By: SD

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SHEET 216 OF 216 SHEETS

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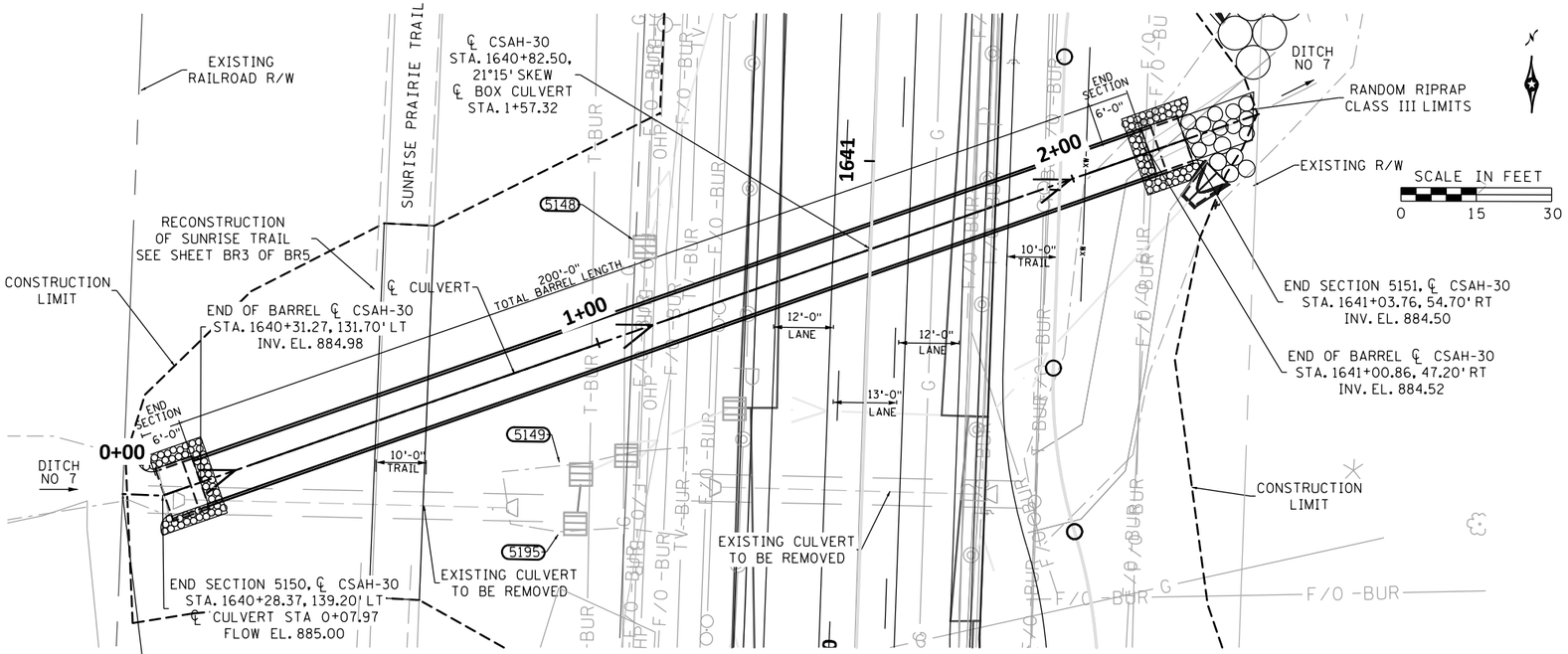
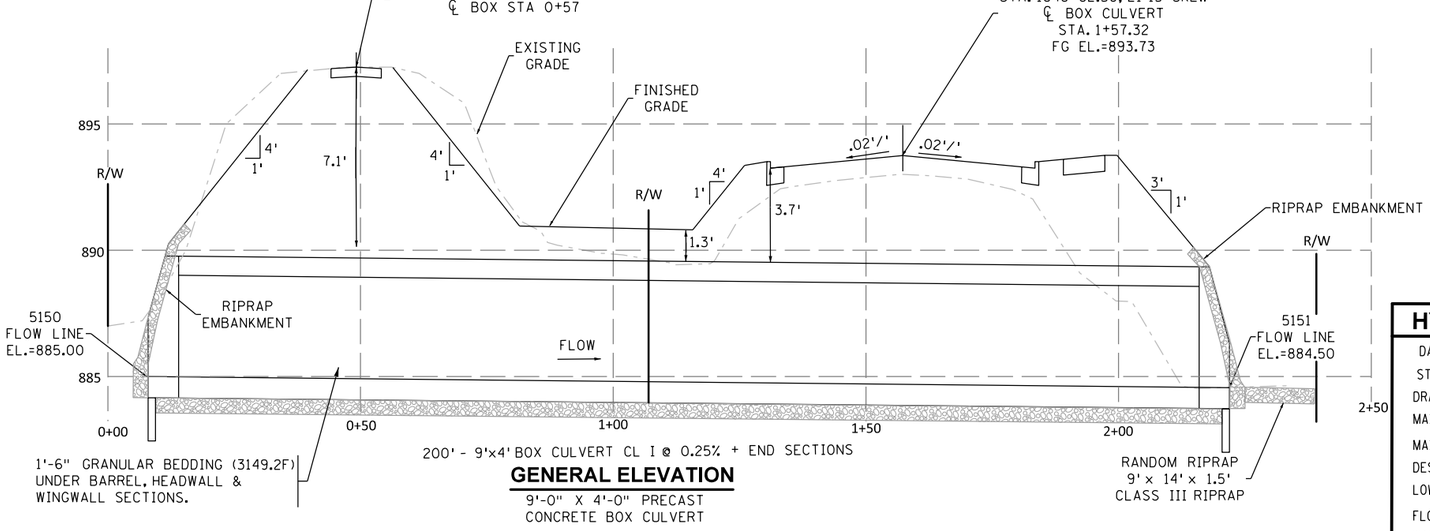
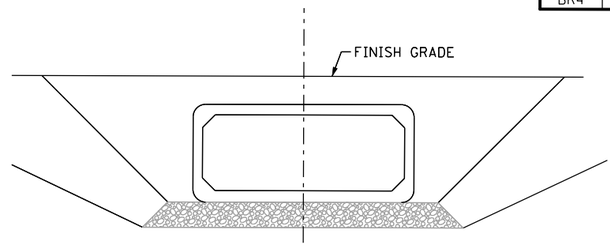


GENERAL PLAN



GENERAL ELEVATION

9'-0" X 4'-0" PRECAST CONCRETE BOX CULVERT



TYPICAL CULVERT SECTION (N.T.S)

SEE CONCRETE BOX CULVERT BEDDING DETAIL SHEET BR4 OF BR5

CONSTRUCTION NOTES

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

BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301

THE BARS SHOWN IN THE PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. 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 UTILITY DATA".

FINISH ALL EXPOSED EDGES OF CONCRETE WITH 1"2" OR 3"4" CHAMFER OR RADIUS, UNLESS OTHERWISE NOTED.

SEE SPECIAL PROVISIONS AND ROADWAY PLANS FOR CONSTRUCTION DEWATERING REQUIREMENTS.

DESIGN DATA

2020 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
LOAD AND RESISTANCE FACTOR DESIGN METHOD
DESIGN LOADING HL-93 LIVE LOAD

INSIDE HEIGHT	4'-0"
INSIDE WIDTH	9'-0"
LENGTH	200'-0"
UNIT WEIGHT FILL	120 LBS./CU. FT.
SKEW ANGLE	21°15'00"
ANGLE INTERNAL FRICTION	32°
MINIMUM FILL DEPTH	4.37'
MAXIMUM FILL DEPTH	8.47'

MAXIMUM ALLOWABLE DESIGN STRESSES:
MAX ALLOWABLE GROSS BEARING PRESURE: 2500 PSF
MAXIMUM BEARING LOAD (DESIGN): 1500 PSF

REINFORCED CONCRETE:
f'c = 5,000 PSI
fy = 60,000 PSI REINFORCEMENT BARS
fy = 65,000 PSI WWF REINFORCEMENT

STRUCTURAL STEEL:
fy = 36,000 PSI
STRUCTURAL STEEL MNDOT 3306

DESIGN SPEED: OVER = 55 MPH
ADT (2025) = 4,590
ADT (2045) = 5,049

HL-93 OPERATING RATING FACTOR = 1.3 (LRFD)

LIST OF SHEETS

NO.	DESCRIPTION
BR1	GENERAL PLAN AND ELEVATION
BR2	PRECAST CONCRETE BARREL DETAILS
BR3	BOX CULVERT BEDDING DETAIL
BR4	EMBANKMENT PROTECTION FOR BOX CULVERTS

SCHEDULE OF QUANTITIES FOR 9' x 4' CONCRETE BOX CULVERT — M

ITEM	2106.507 SELECT GRANULAR EMBANKMENT MOD 10% (CV)	2573.602 TEMPORARY STREAM DIVERSION SYSTEM	2411.507 STRUCTURE EXCAVATION CLASS E (CY)	2412.502 9 X 4 PRECAST CONCRETE END SECTION	2412.503 9 X 4 PRECAST CONCRETE BOX CULVERT	2104.502 REMOVE BOX CULVERT	2104.502 REMOVE CULVERT END	2451.507 GRANULAR BEDDING (CV)	2511.504 GEOTEXTILE FILTER TYPE 7	2511.507 RANDOM RIPRAP, CLASS I	2511.507 RANDOM RIPRAP, CLASS III
UNIT	CU. YD.	EACH	CU. YD.	EACH	LIN. FT.	EACH	EACH	CU. YD.	SQ. YD.	CU. YD.	CU. YD.
QUANTITY	10.8	1	2743	2	200	2	4	183	398	7	400

HYDRAULIC ENGINEERS RECOMMENDATION

DATED: 06/30/2024 (NAVD88)
STREAM OR DITCH DESIGNATION DITCH NO 7.
DRAINAGE AREA 4.4 SQ. MILES
MAX. DISCHARGE ON RECORD NA DESIGN DISCHARGE (100YR. FREQ.) 268 C.F.S.
MAX. HIGHWATER ELEVATION NA DESIGNED HIGHWATER ELEVATION NA
DESIGNED MEAN VELOCITY THROUGH STRUCTURE 7.44 F.P.S.
LOW SUPERSTRUCTURE AT OR ABOVE ELEVATION NA
FLOWLINE ELEVATION 885.0 SKEW ANGLE 21° 15'
WATERWAY AREA REQ'D. BELOW ELEVATION 889.0 = 36 SQ. FT.
@ RIGHT ANGLES TO CHANNEL
IN THE INTEREST OF FLOOD PLAIN ZONING THE REGIONAL FLOOD (100 YR. FREQ.) IS 268 C.F.S. AT STAGE 890.63 AND MEAN VELOCITY OF 0.96 F.P.S. WITH 2 FT. SWELLHEAD. THE ABOVE RECOMMENDATION WILL PROVIDE A STRUCTURE OF ADEQUATE WATERWAY TO PASS THE REGIONAL FLOOD WITHIN CRITERIA ESTABLISHED BY THE DEPARTMENT OF NATURAL RESOURCES.
PIER SCOUR EL. NA

NOTES:
PAY ITEM 2411.507 INCLUDES EXCAVATION FOR BOX CULVERT AND HEADWALLS.

GENERAL PLAN AND ELEVATION

CSAH-30 OVER DITCH NO 7 IN CHISAGO COUNTY

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

wsb

Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

GENERAL PLAN AND ELEVATION
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET BR1 OF BR5 SHEETS

DATE: 9/12/2024 2:11:54 PM
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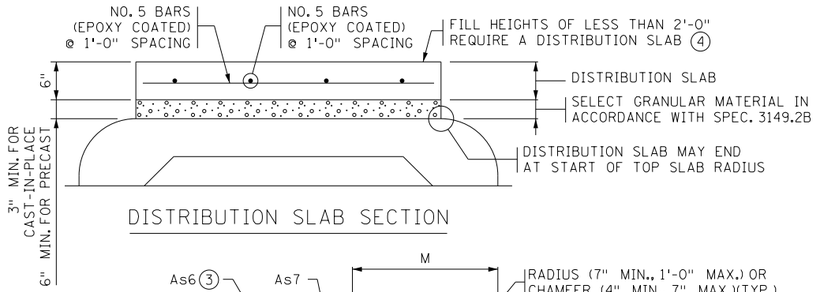
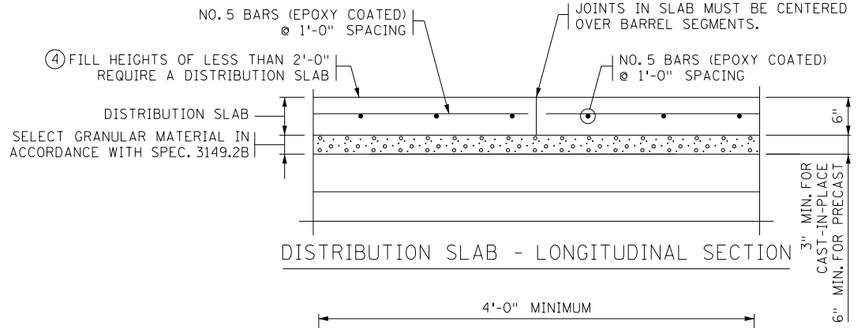
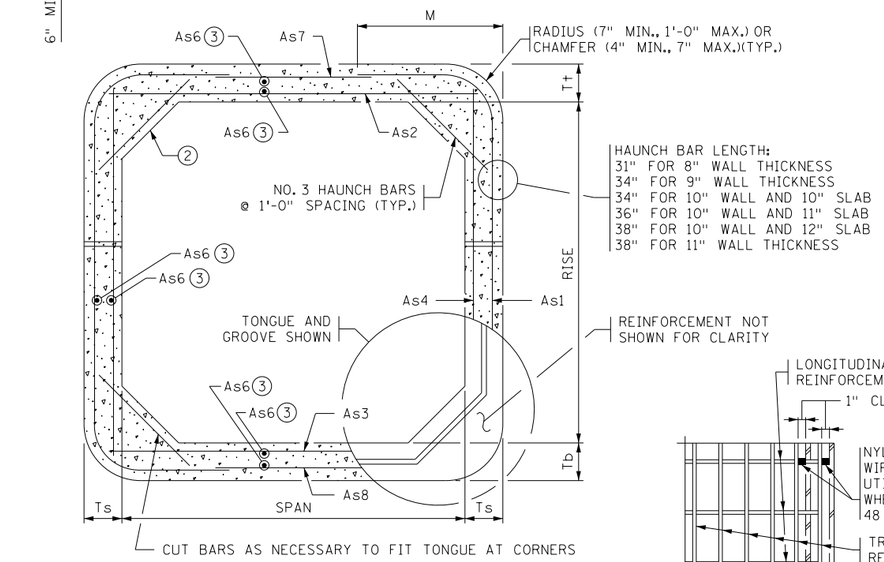


DISTRIBUTION SLAB SECTION

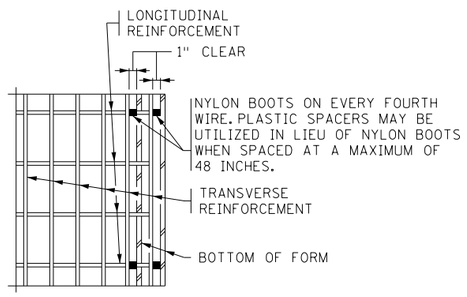


DISTRIBUTION SLAB - LONGITUDINAL SECTION

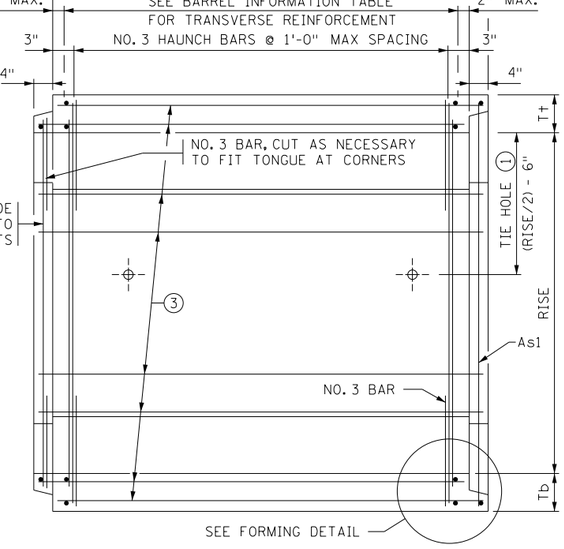


TRANSVERSE BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

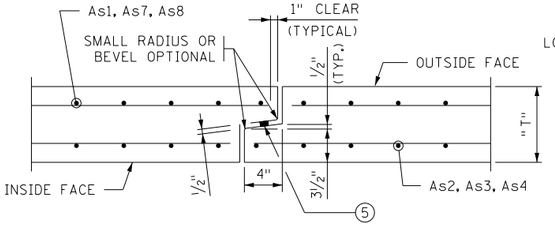


PLAN

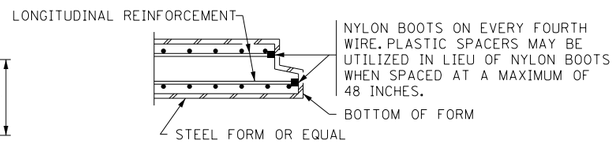


LONGITUDINAL BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

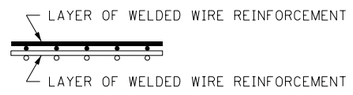


TONGUE AND GROOVE JOINT DETAIL



SECTION

FORMING DETAIL



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.

1½" 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.

(1) USE 1" DIAMETER CULVERT TIES. SEE STANDARD PLATE NO. 3145 FOR DETAILS.

(2) USE 12" VERTICAL, 12" HORIZONTAL HAUNCHES ON ALL BOX SIZES.

(3) PLACE LONGITUDINAL REINFORCEMENT DENOTED AS As6 IN ALL SLABS AND WALLS WITH A MINIMUM OF 0.06 SQ. IN./FT.

(4) 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.

(5) REFER TO SPEC. 2412 FOR SEALANT REQUIREMENTS.

(6) 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 ***

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											
													As1			As2		As3		As4		As7		As8	
							SPAN (FT.)	RISE (FT.)	Tt (IN.)	Tb (IN.)	Ts (IN.)		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"

* 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.

REVISION: DECEMBER 21, 2022

APPROVED: MARCH 24, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

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

wsb

Chisago COUNTY USA

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

FIG. 5-395.101(A)

SHEET BR2 OF BR5 SHEETS

DATE: 9/12/2024 2:11:54 PM
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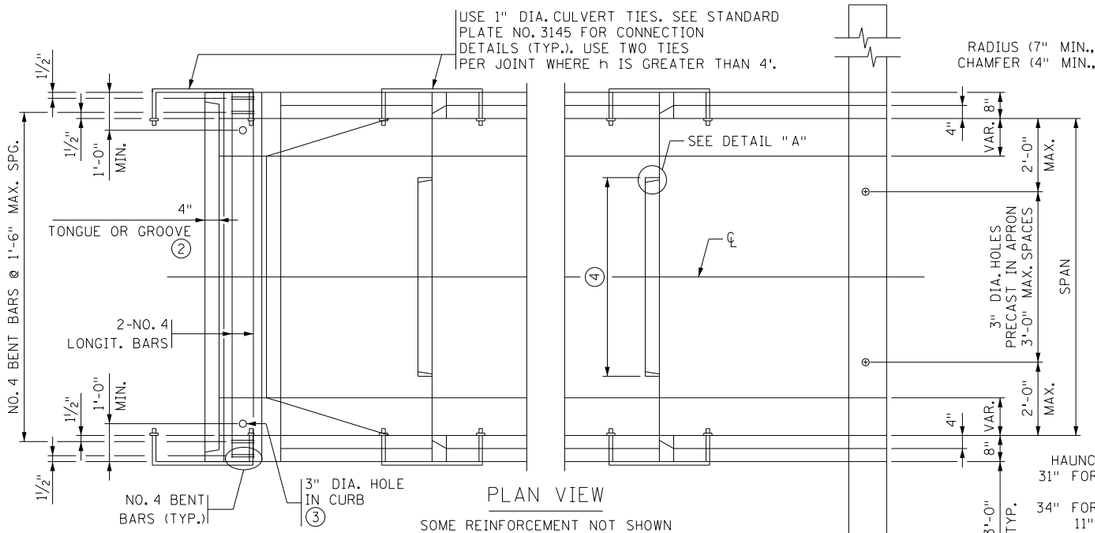
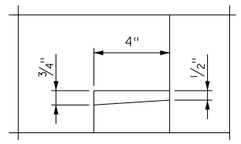
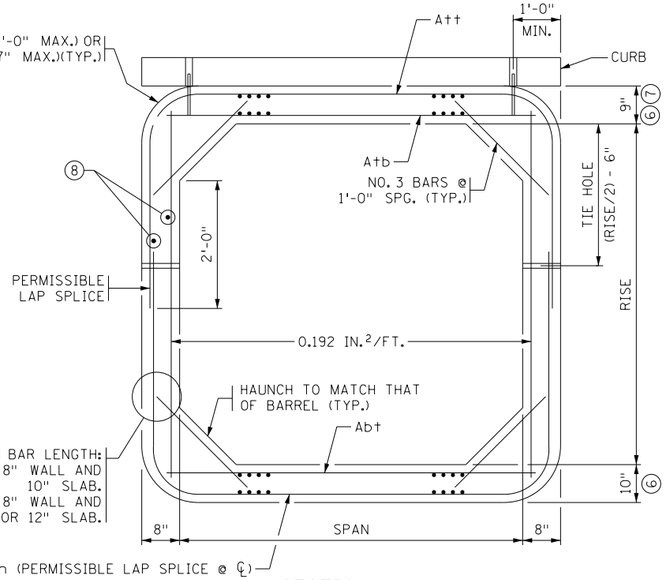


PLAN VIEW

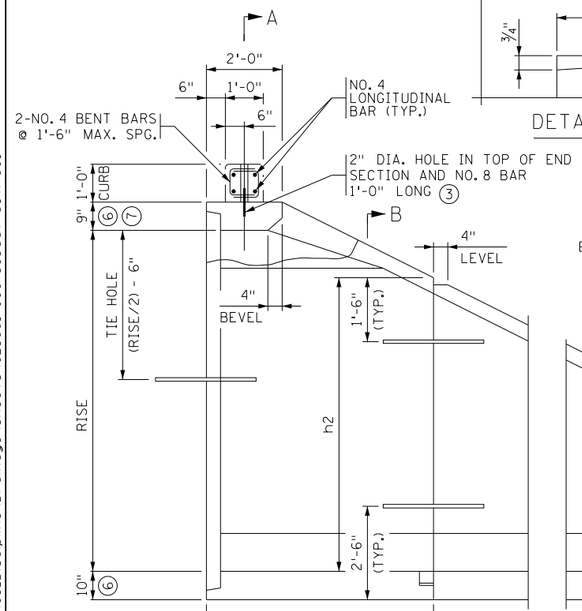
SOME REINFORCEMENT NOT SHOWN

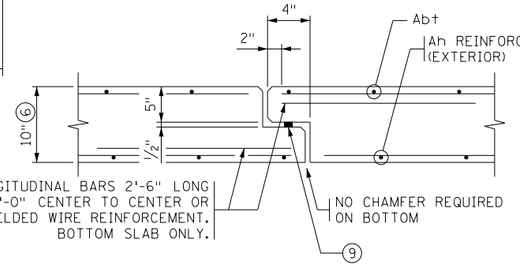


DETAIL "A"



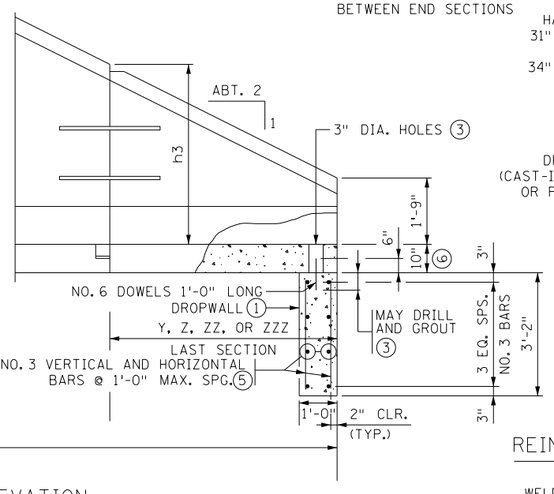
SECTION A-A



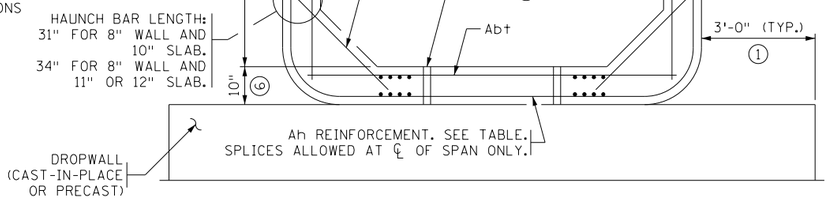


TONGUE AND GROOVE JOINT DETAIL

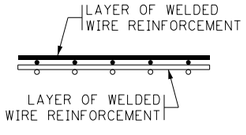
BETWEEN END SECTIONS



SIDE ELEVATION



SECTION B-B



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

SEE STANDARD FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.

USE CONCRETE MIX NO. 3W82 WITH NO CALCIUM CHLORIDE ALLOWED.

ALL END SECTIONS REQUIRE CURB ON LINTEL BEAM.

ON ALL END SECTIONS FOR WATERWAYS, USE DROPWALLS ON INLET AND OUTLET ENDS.

SEE STANDARD FIG. 5-395.115 FOR EMBANKMENT PROTECTION.

FINISH ALL EXPOSED EDGES OF CONCRETE WITH ½" OR ¾" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.

MAXIMUM SIZE OF REINFORCEMENT BARS IS NO. 6, EXCEPT NO. 7 OR 8 BARS MAY BE USED FOR A†b ON SPANS GREATER THAN 14'. THE MAXIMUM WELDED WIRE REINFORCEMENT SIZE IS W23 PER LAYER (MAXIMUM OF 2 LAYERS).

(1) WITH DOUBLE BOXES LOCATE DROPWALL JOINTS BETWEEN END SECTIONS. SEE STANDARD FIG. 5-395.111 FOR ALTERNATE DROPWALLS. LIMITS OF EXCAVATION FOR DROPWALL ARE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. DROPWALL CONCRETE MIX IS 3S52, OR 3Y82 IF PRECAST. FURNISHING AND INSTALLATION OF DROPWALL TO BE INCLUDED IN PRICE BID FOR END SECTIONS. DROPWALL NOT REQUIRED FOR NON-WATERWAY USE.

(2) CHECK LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED.

(3) FILL HOLE WITH GROUT. GROUT CONSISTS OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX MAXIMUM SLUMP IS 4".

(4) 3'-6" MIN. TONGUE AND 3'-7" MIN. GROOVE FOR CULVERTS WITH 6'-0" SPANS. 5'-0" MIN. TONGUE AND 5'-1" MIN. GROOVE FOR CULVERTS WITH SPANS GREATER THAN 6'-0". CENTER TONGUE AND GROOVE ON ℄ OF EACH APRON JOINT. TONGUE AND GROOVE JOINT ON ALL THREE SIDES OF APRON IS PERMISSIBLE.

(5) WELDED WIRE REINFORCEMENT OF EQUAL AREA MAY BE SUBSTITUTED FOR REBAR.

(6) APRON TOP AND BOTTOM SLAB THICKNESS MAY BE 8" FOR CULVERTS WITH 6' SPANS ONLY. BOTTOM SLAB THICKNESS MAY BE INCREASED UP TO 2" MAX. PROVIDED CONCRETE COVER IS 1½" MIN., 2" MAX.

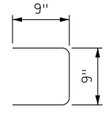
(7) 10" MINIMUM TOP SLAB FOR 14' AND 16' SPANS.

(8) PLACE LONGITUDINAL REINFORCEMENT PERPENDICULAR TO THE CULVERT SPAN WITH A MINIMUM OF 0.06 SQUARE INCHES PER PERIPHERAL FOOT ON ALL FACES OF THE BARREL.

(9) REFER TO SPEC. 2412 FOR SEALANT REQUIREMENTS.

(10) BOX CULVERT IS A NON-STANDARD SIZE. VALUES THAT REFERENCE A 4' RISE AND 10' SPAN WILL BE USED FOR DESIGN.

NO. 4 BENT BAR



A††, A†b REINFORCEMENT

SPAN (FT.)	A†† (IN²/FT.)	A†b (IN²/FT.)
6	0.27	0.44
8	0.47	0.60
(10) 10	0.62	0.74
12	0.88	1.06
14	1.20	1.58
16	1.52	2.09

Ab† REINFORCEMENT

SPAN (FT.)	Ab† (IN²/FT.)
(10) 6-10	0.20
12	0.30
14	0.39
16	0.39

APRON DIMENSIONS & Ah REINFORCEMENT

RISE FT.	L FT.	SECTION 1 X	SECTION 1 Ah	h2	SECTION 2 Y	SECTION 2 Ah	h3	SECTION 3 Z	SECTION 3 Ah	h4	SECTION 4 ZZ	SECTION 4 Ah	h5	SECTION 5 ZZZ	SECTION 5 Ah	h6
(10) 4	8	8' (4')	0.192	1'-9" (3'-9")	(4')	(0.192)	(1'-9")									
5	10	6'	0.192	3'-9"	4'	0.192	1'-9"									
6	12	6'	0.192	4'-9"	6'	0.192	1'-9"									
7	14	6'	0.192	5'-9"	8' (4')	0.192	1'-9" (3'-9")	(4')	(0.192)	(1'-9")						
8	16	6'	0.20	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"						
9	18	6'	0.29	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"						
10	20	6'	0.42	8'-9"	6'	0.29	5'-9"	8' (4')	0.192	1'-9" (3'-9")	(4')	(0.192)	(1'-9")			
11	22	6'	0.60	9'-9"	6'	0.42	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"			
12	24	6'	0.78	10'-9"	6'	0.60	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"			
13	26	6'	1.03	11'-9"	6'	0.78	8'-9"	6'	0.28	5'-9"	8' (4')	0.192	1'-9" (3'-9")	(4')	(0.192)	(1'-9")
14	28	6'	1.38	12'-9"	6'	1.03	9'-9"	6'	0.40	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"

NOTE: Ah IS AREA OF REINFORCEMENT PER FOOT OF LENGTH (IN²/FT.) VALUES IN ( ) MAY BE USED FOR END SECTIONS WITH SPANS OF 14' AND 16' ONLY.

FIG. 5-395.102

REVISION: DECEMBER 21, 2022

APPROVED: MARCH 24, 2011
Nancy Daubenberger
STATE BRIDGE ENGINEER

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

wsb

Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET BR3 OF BR5 SHEETS

DATE: 9/12/2024 2:11:55 PM
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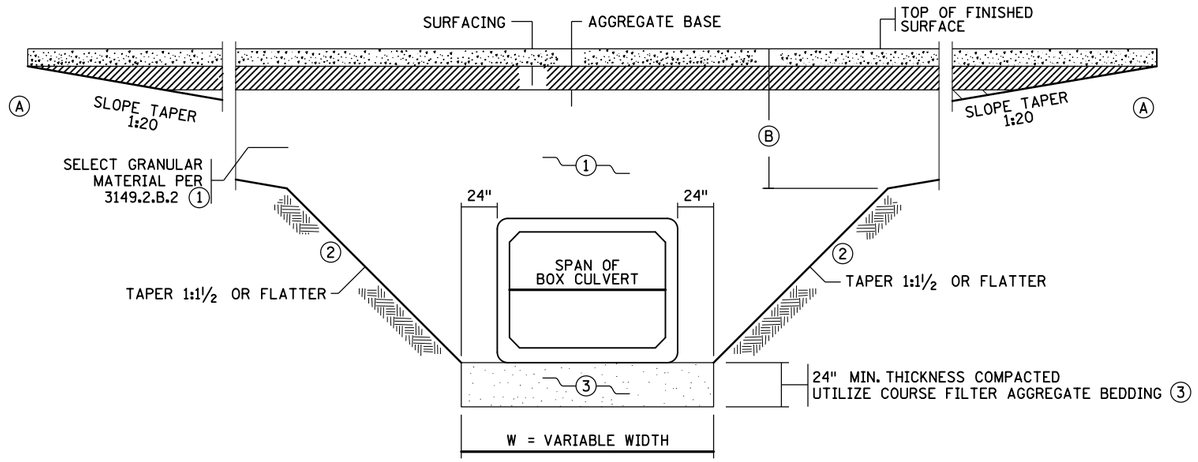

CONCRETE BOX CULVERT BEDDING

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.

DATE: 9/12/2024 2:11:56 PM
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NO.	DATE	BY	CHK	REVISIONS

Design By: WAR
Plan By: WAR
Checked By: EAE
Approved By: EAE

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EARTH A. EVANS, PE

DATE: 9/12/2024 LICENSE NO. 44235

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Chisago COUNTY USA

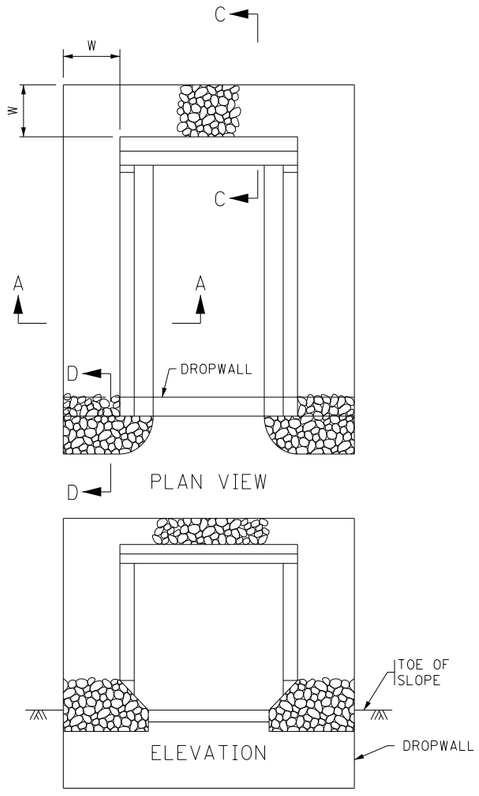
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

BOX CULVERT BEDDING

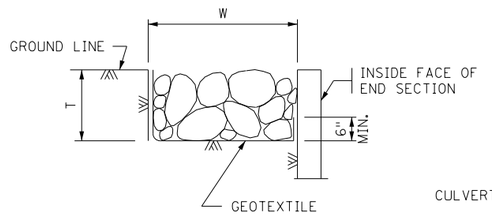
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

SHEET BR4 OF BR5 SHEETS

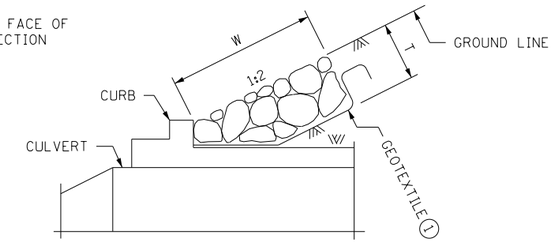


SINGLE BARREL

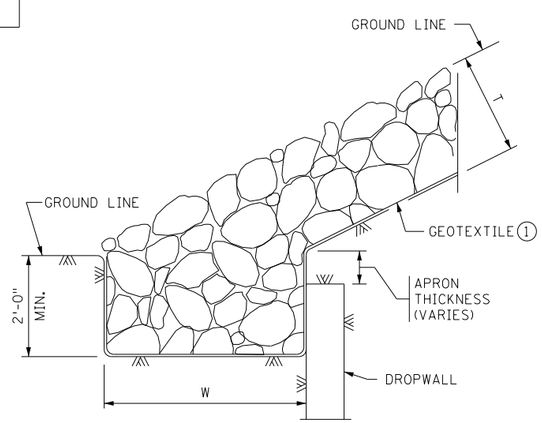
CLASS III OR IV SHOWN
FOR SKEWS UP TO 7½°



SECTION A-A



SECTION C-C



SECTION D-D

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"

REVISION: DECEMBER 21, 2022

APPROVED: SEPTEMBER 11, 2014
Nancy Daubenberger
STATE BRIDGE ENGINEER

FIG. 5-395.115

NO.	DATE	BY	CHK	REVISIONS

Design By: WAR
Plan By: WAR
Checked By: EAE
Approved By: EAE

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EARTH A. EVANS, PE

DATE: 9/12/2024 LICENSE NO. 44235

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Chisago COUNTY USA

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 SHEETS

DATE: 9/12/2024 2:11:56 PM
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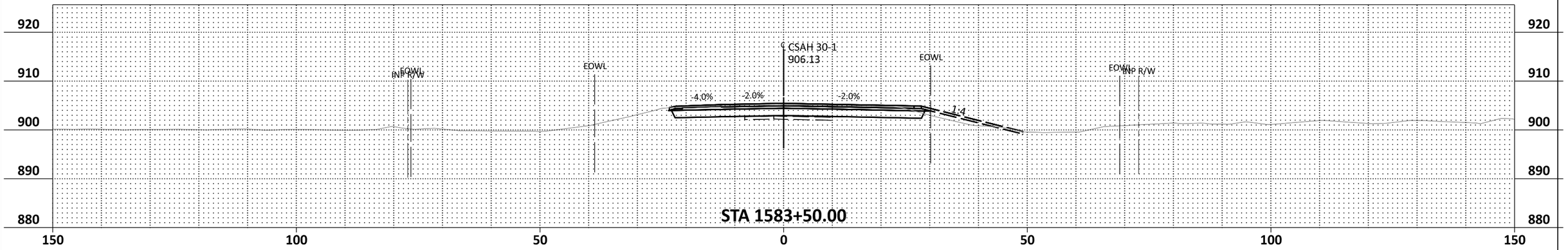

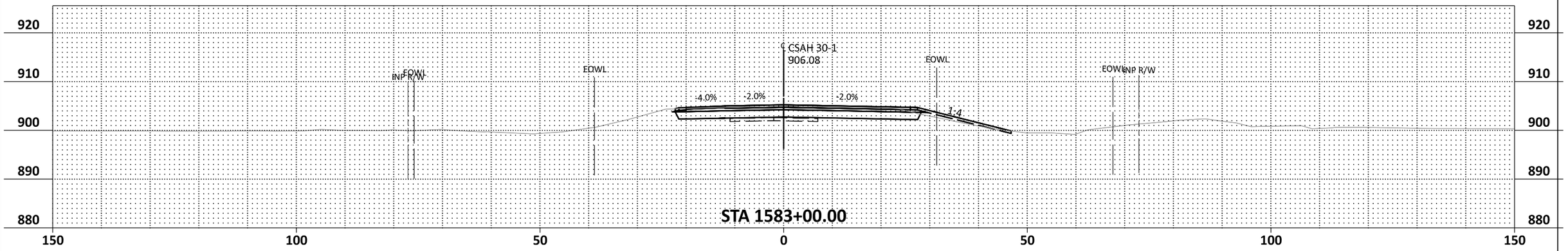

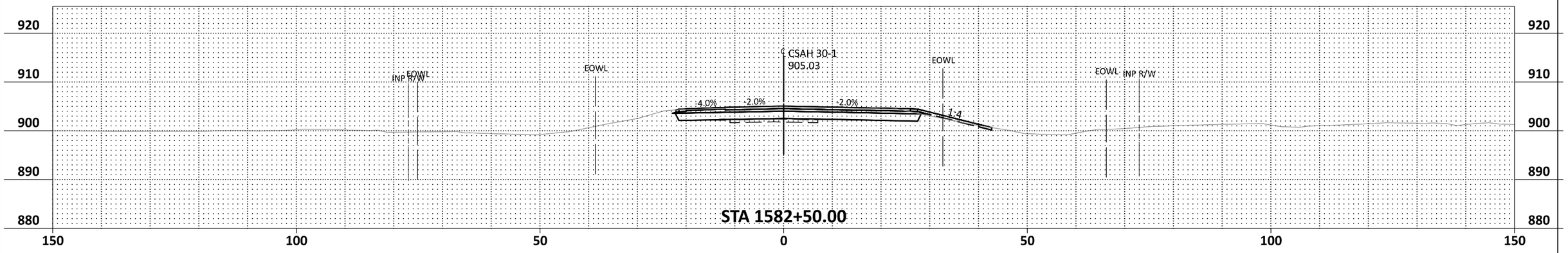

NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

wsb

Chisago COUNTY USA

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 X1 OF X65 SHEETS

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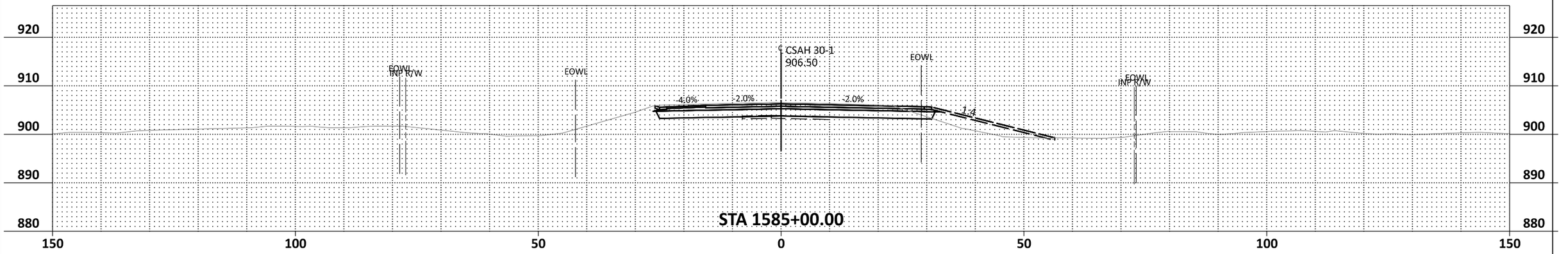

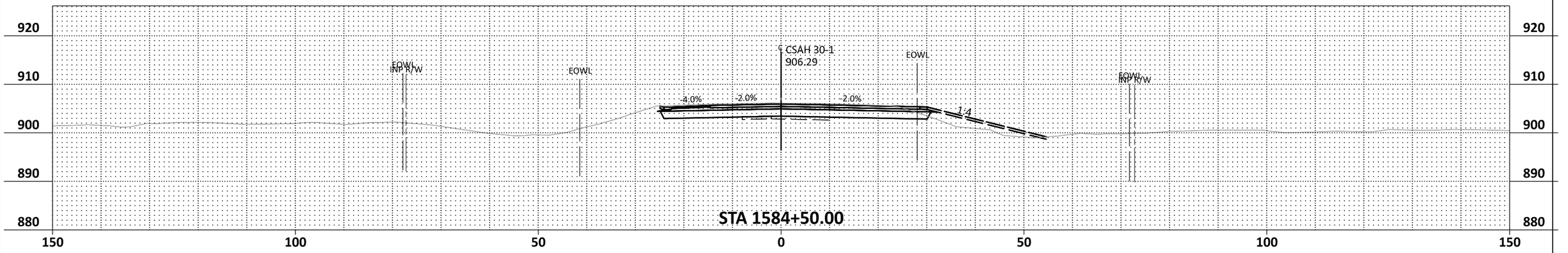

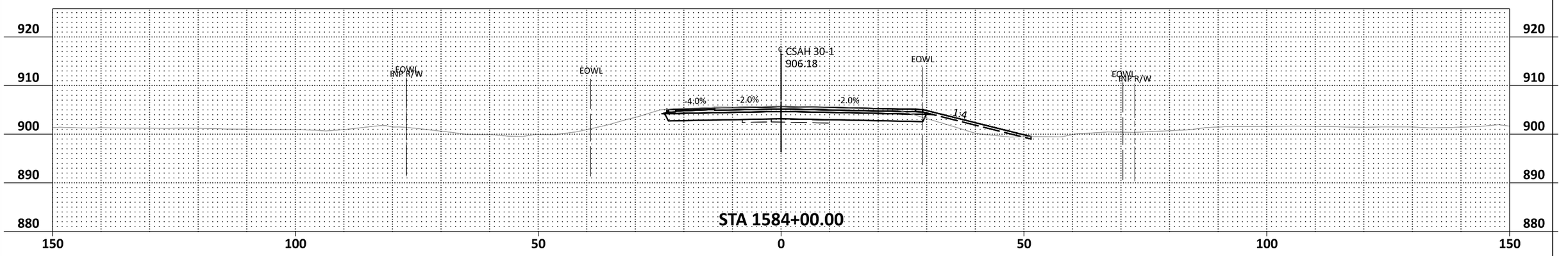

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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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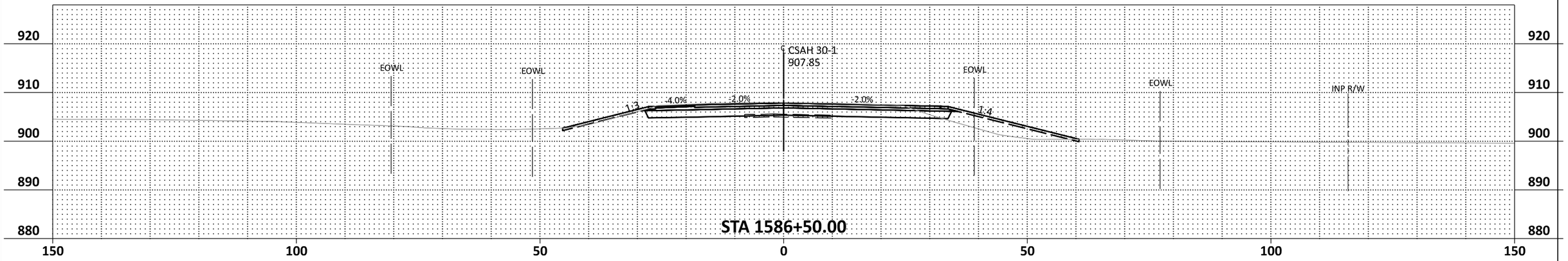
Chisago COUNTY USA

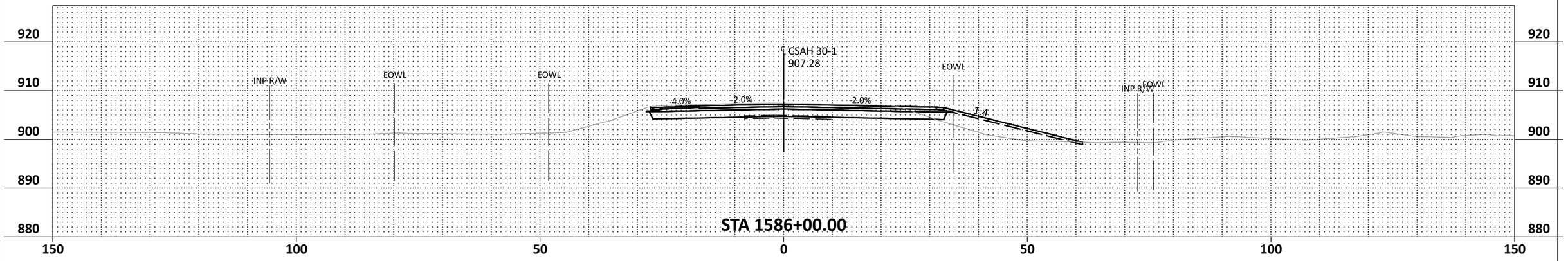
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

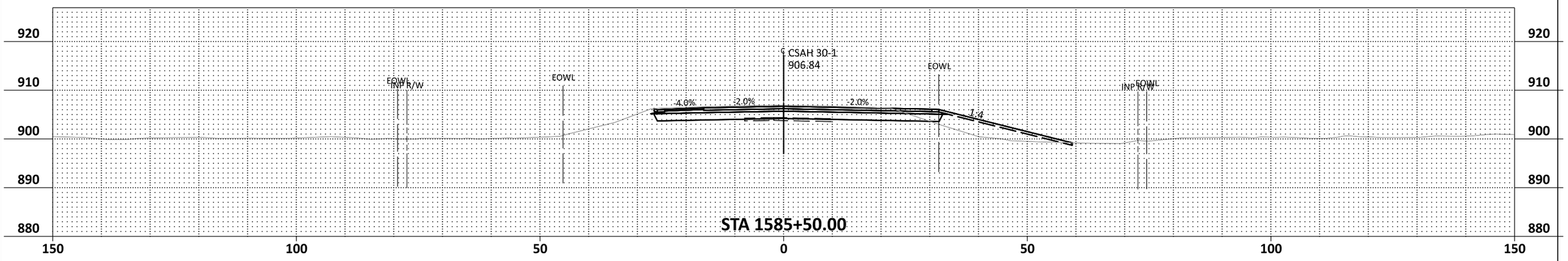
CHISAGO COUNTY, MINNESOTA

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

SHEET X2 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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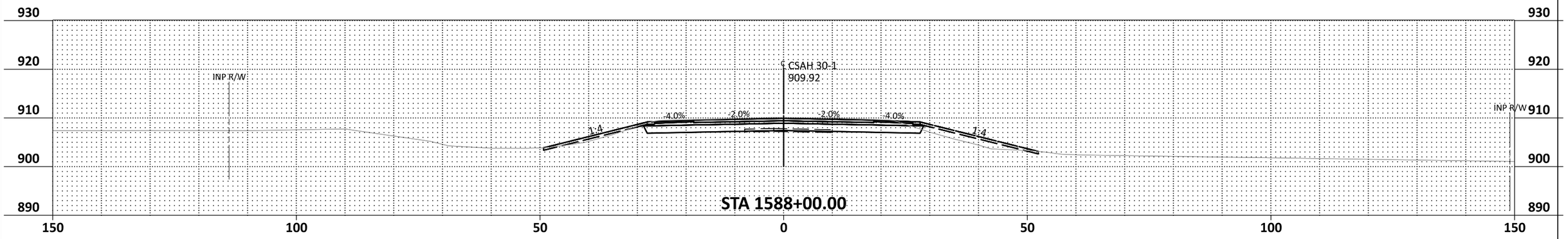
Chisago COUNTY USA

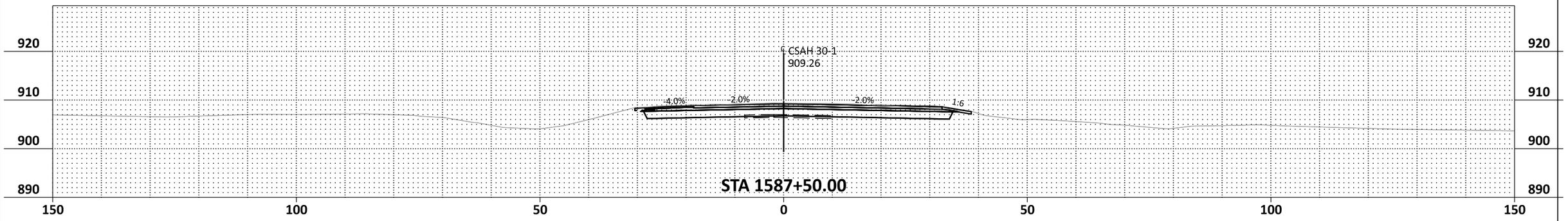
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

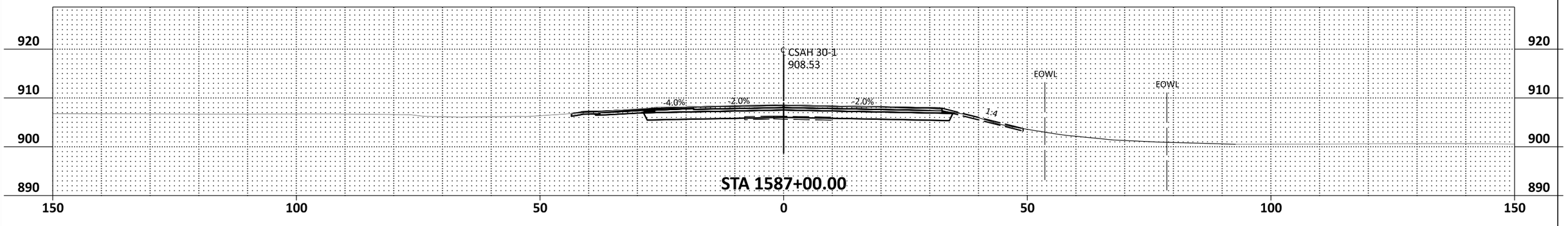
CHISAGO COUNTY, MINNESOTA

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

SHEET X3 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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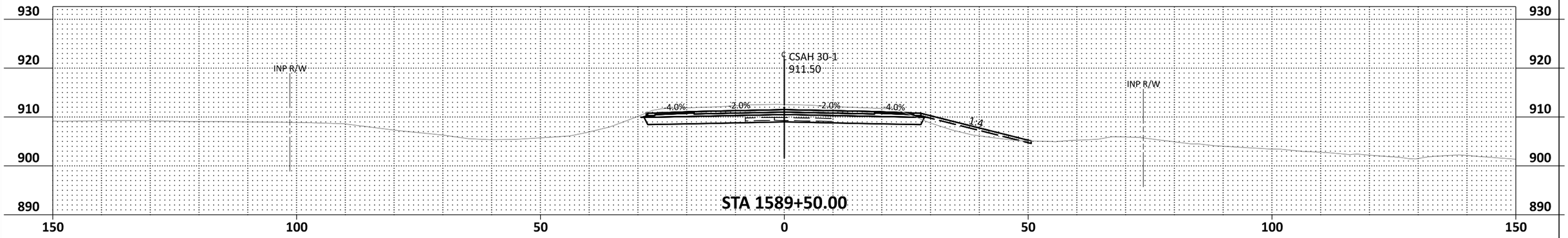
Chisago COUNTY USA

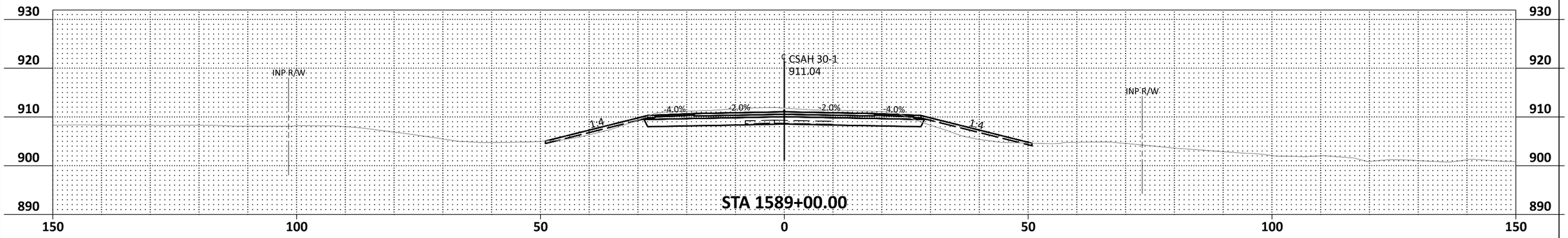
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

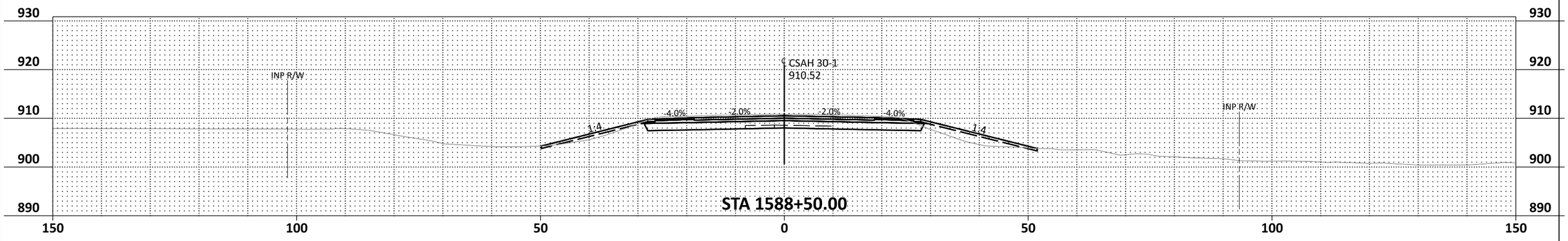
CHISAGO COUNTY, MINNESOTA

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

SHEET X4 OF X65 SHEETS







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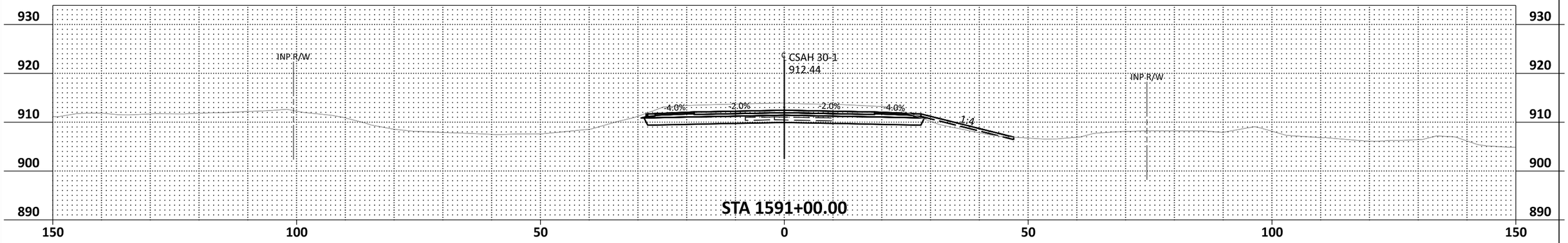
Chisago COUNTY USA

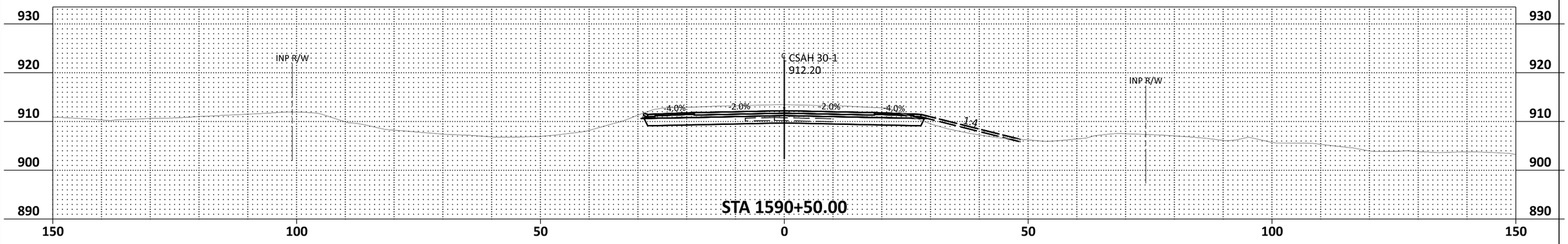
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

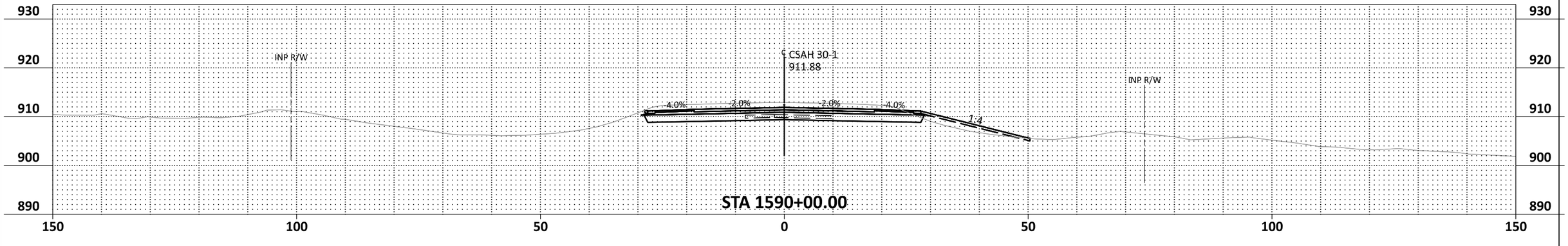
CHISAGO COUNTY, MINNESOTA

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

SHEET X5 OF X65 SHEETS







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Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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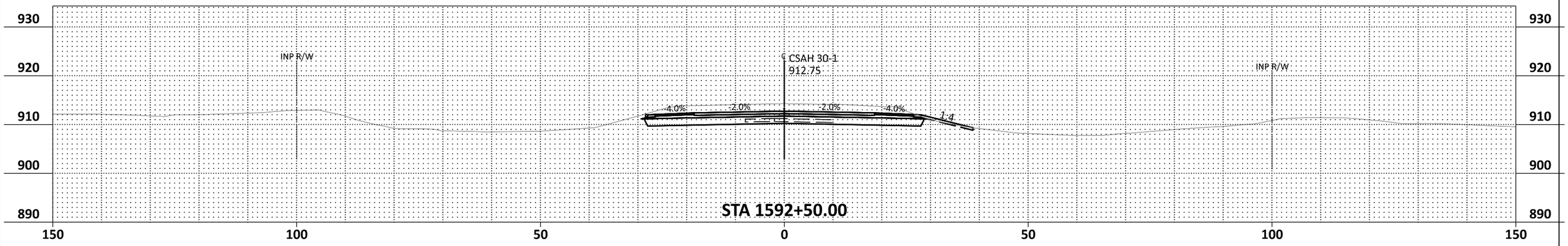
Chisago COUNTY USA

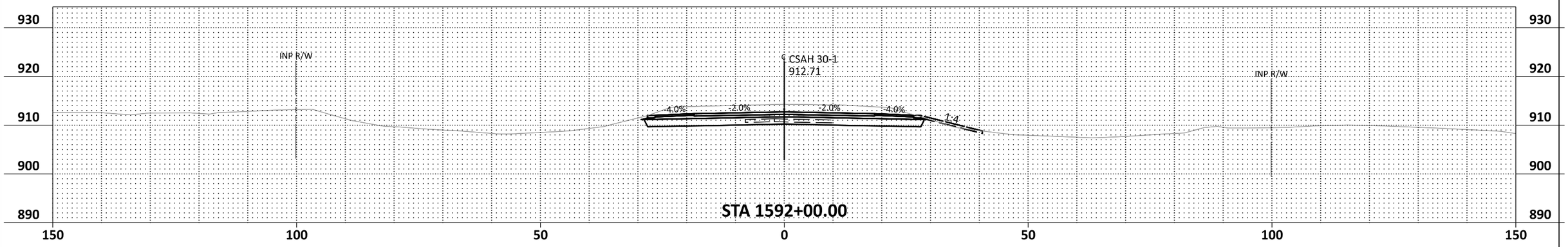
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

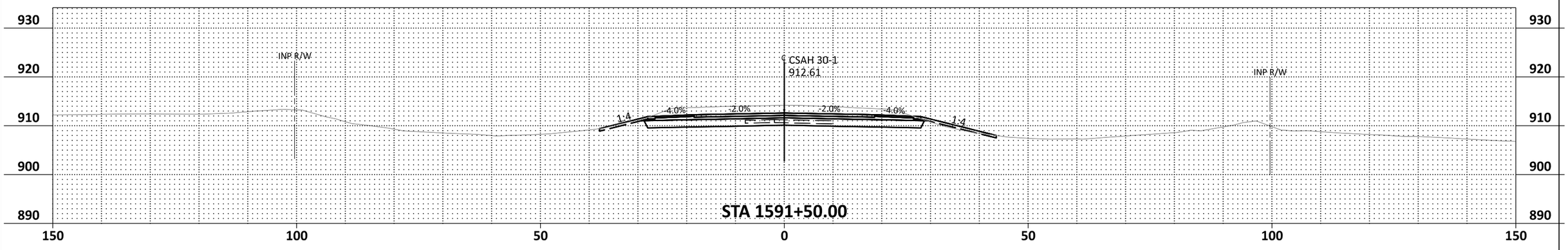
CHISAGO COUNTY, MINNESOTA

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

SHEET X6 OF X65 SHEETS







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Plan By: GAD
Checked By: AJP
Approved By: MKV

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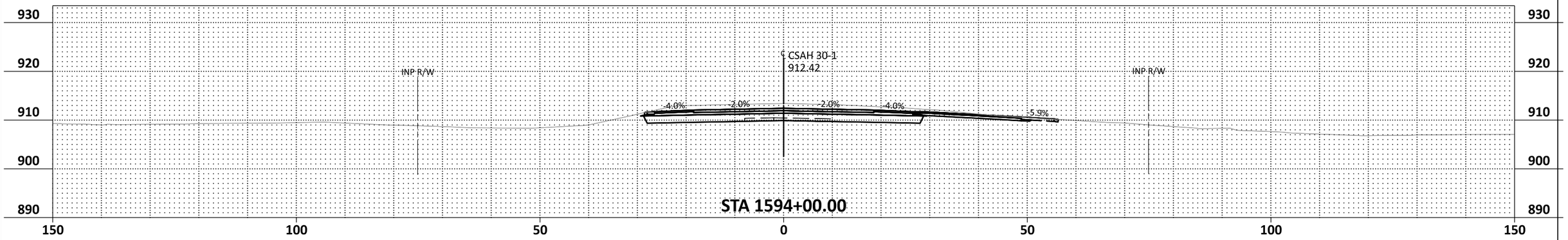
Chisago COUNTY USA

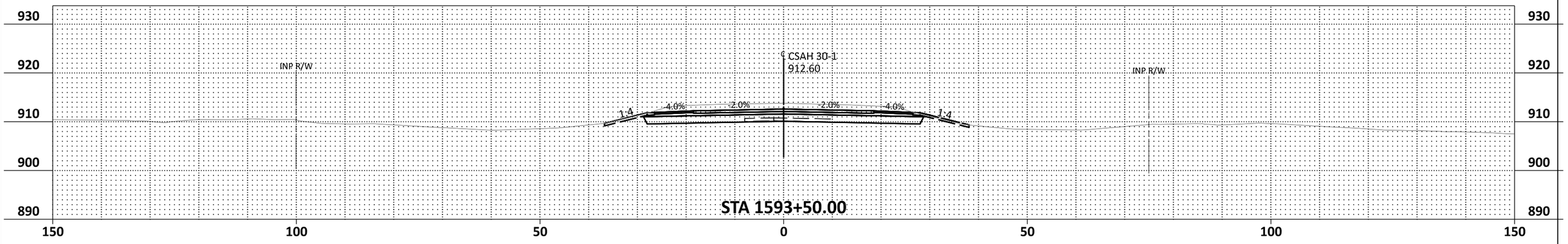
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

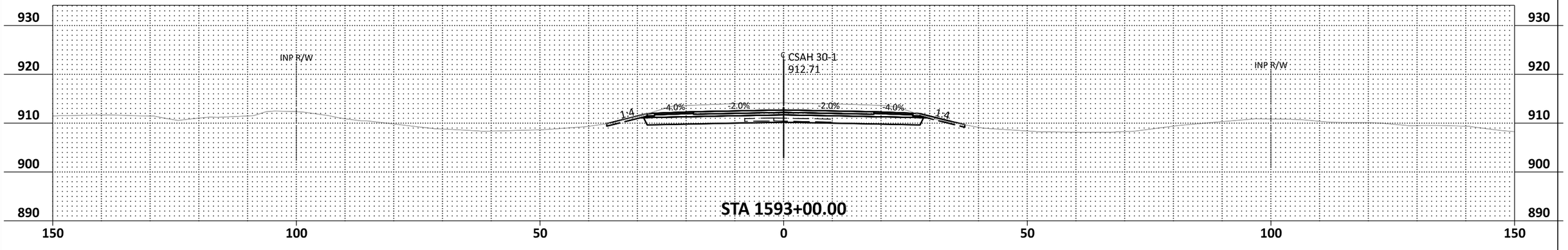
CHISAGO COUNTY, MINNESOTA

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

SHEET X7 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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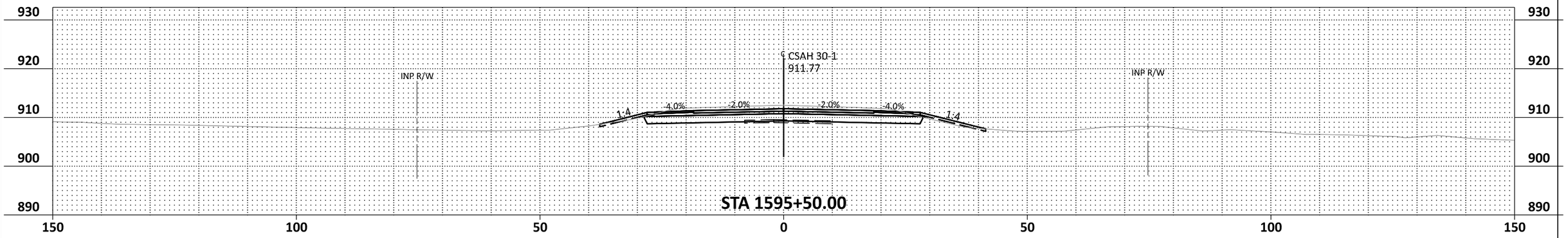
Chisago COUNTY USA

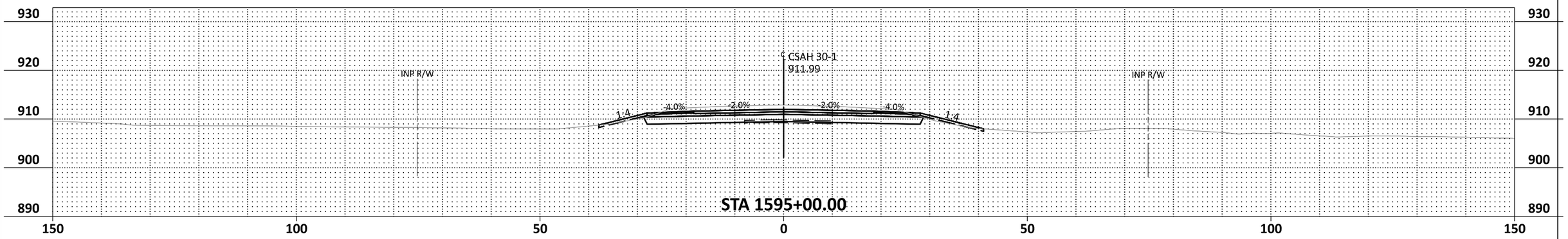
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

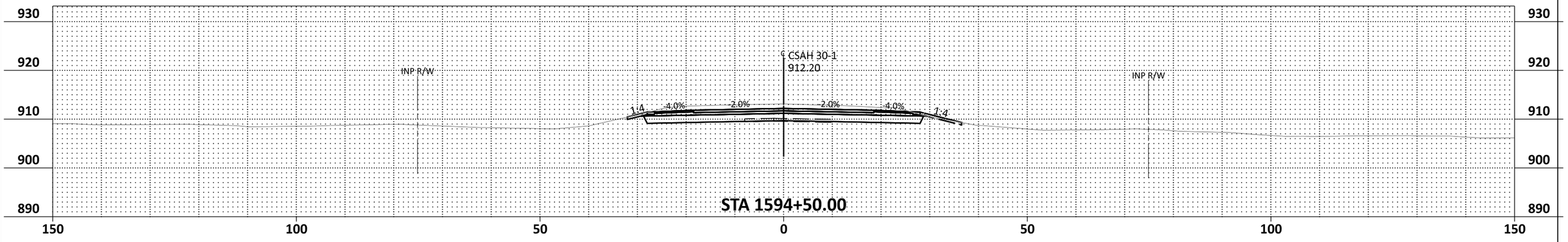
CHISAGO COUNTY, MINNESOTA

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

SHEET X8 OF X65 SHEETS







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Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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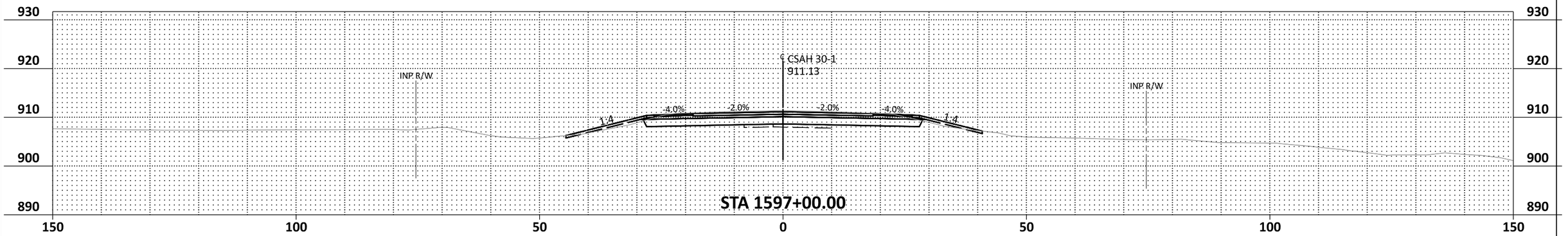
Chisago COUNTY USA

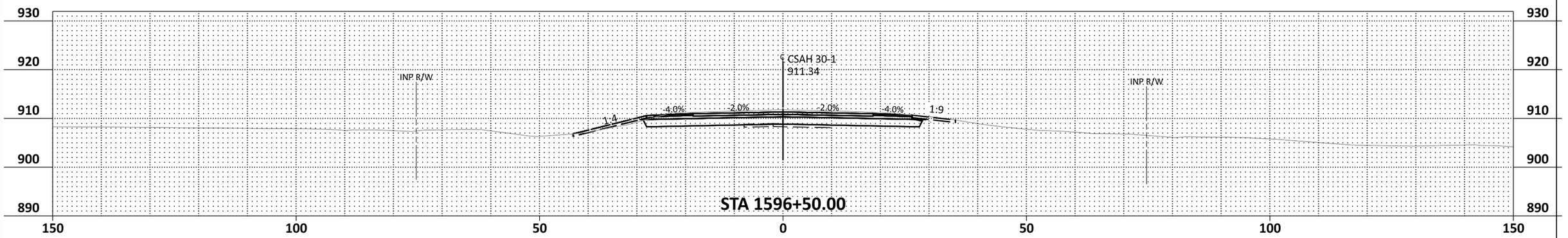
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

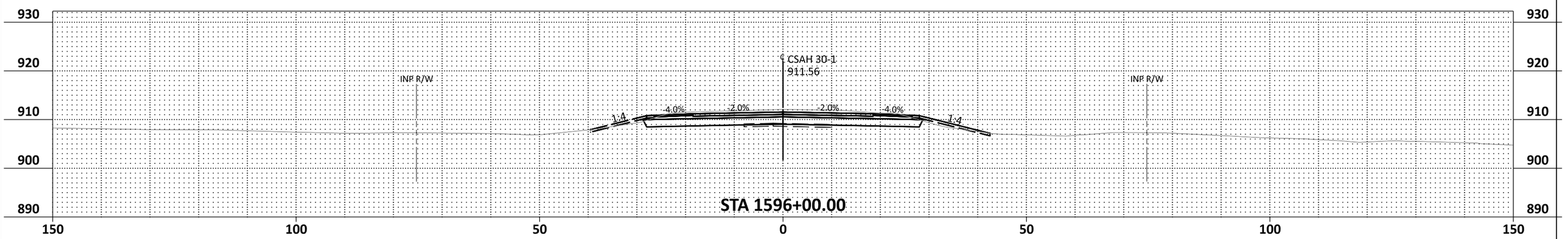
CHISAGO COUNTY, MINNESOTA

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

SHEET X9 OF X65 SHEETS







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Plan By:	GAD
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Chisago COUNTY USA

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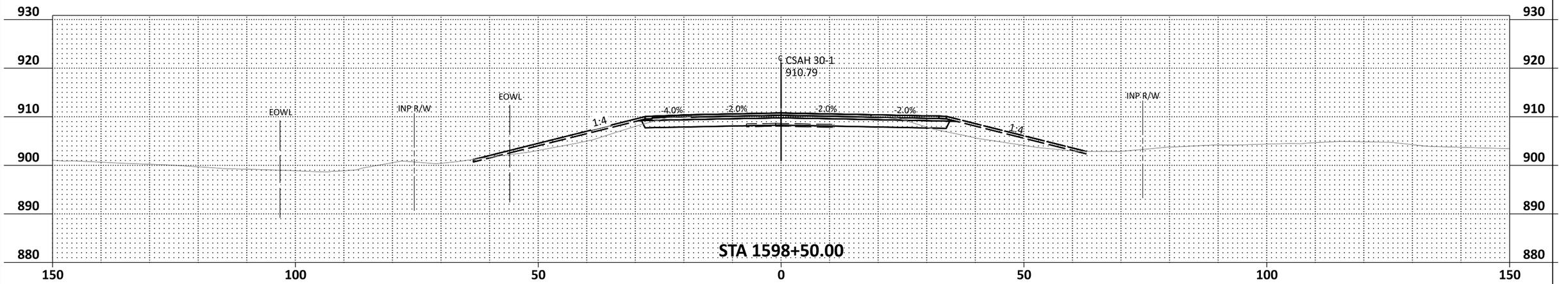
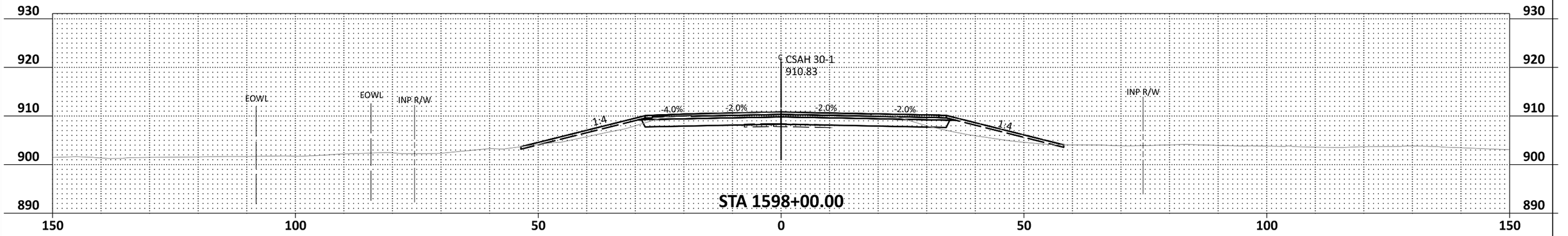
Chisago County, Minnesota

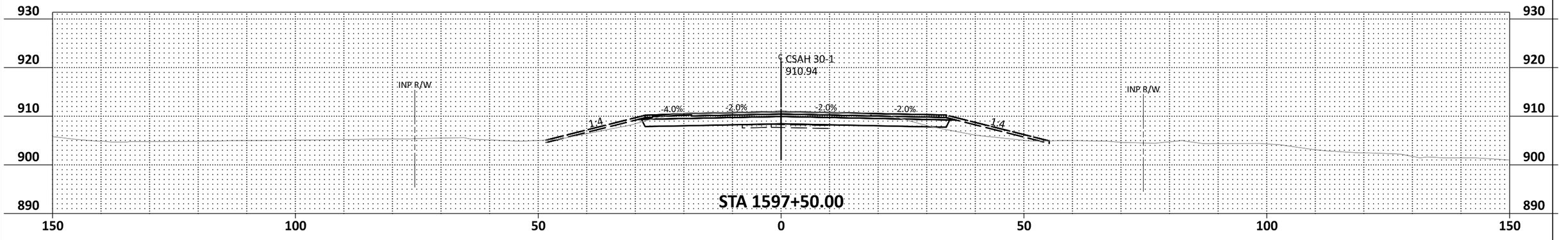
CHISAGO COUNTY, MINNESOTA

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

SHEET X10 OF X65 SHEETS







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CHISAGO COUNTY, MINNESOTA

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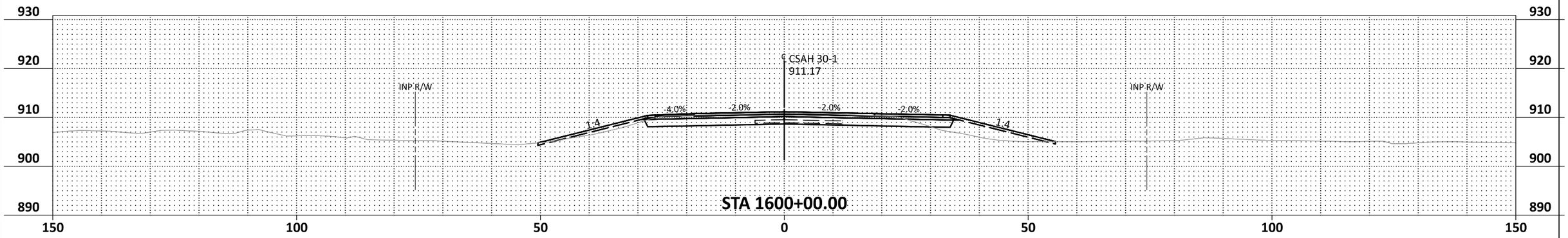
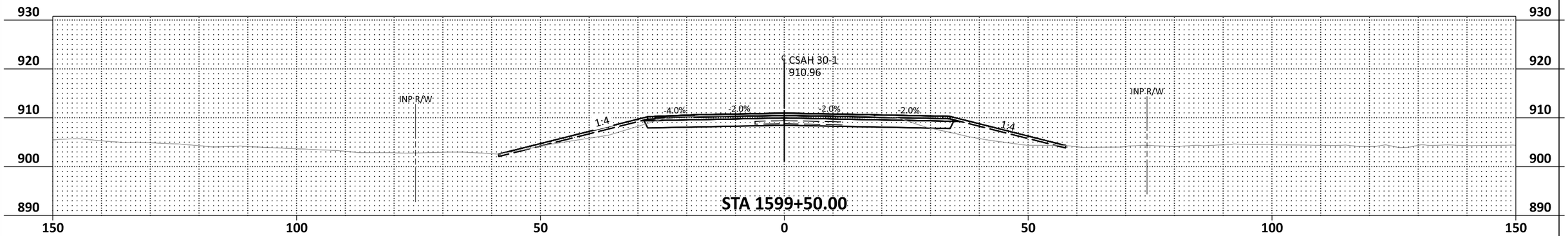
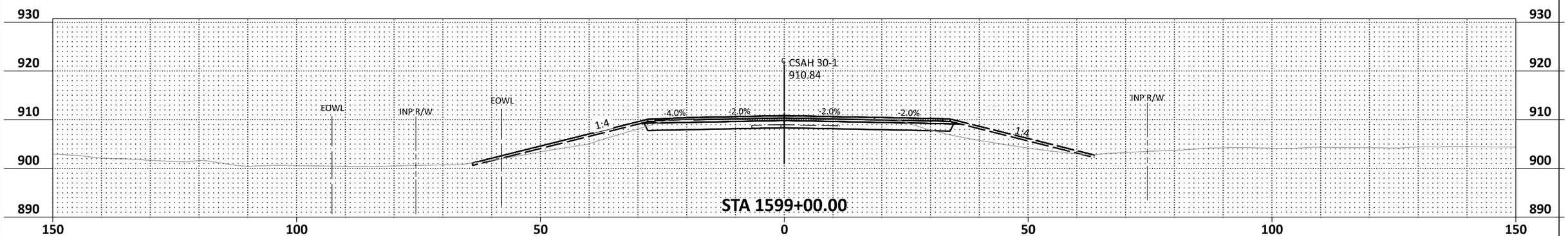
SHEET X11 OF X65 SHEETS







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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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SHEET X12 OF X65 SHEETS

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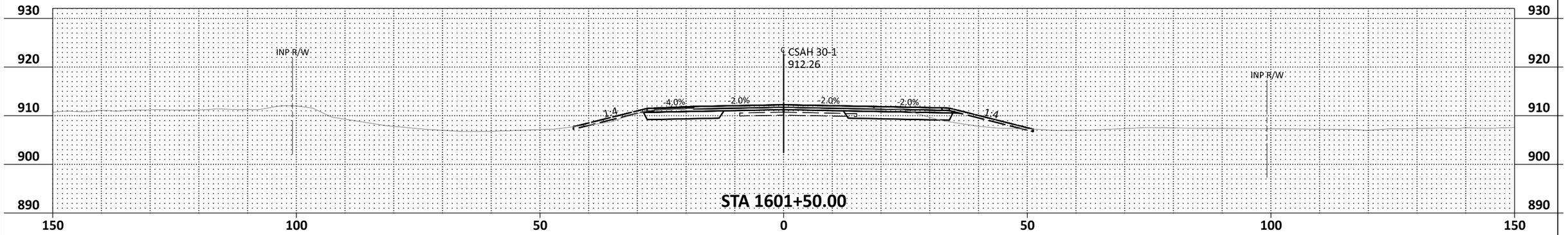

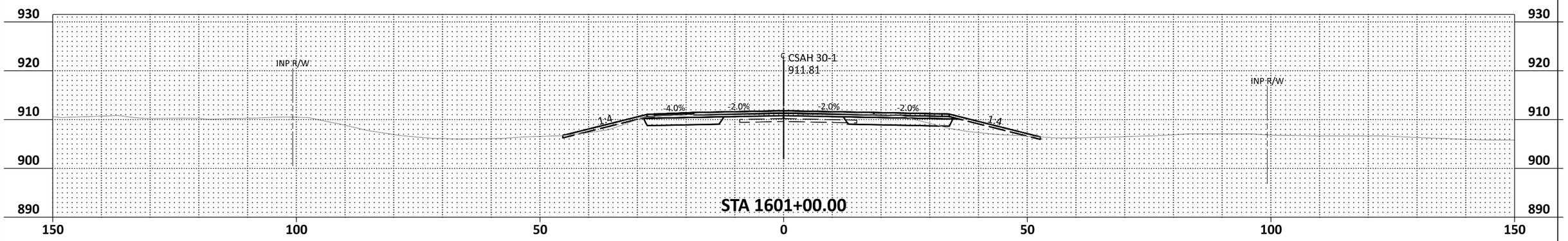

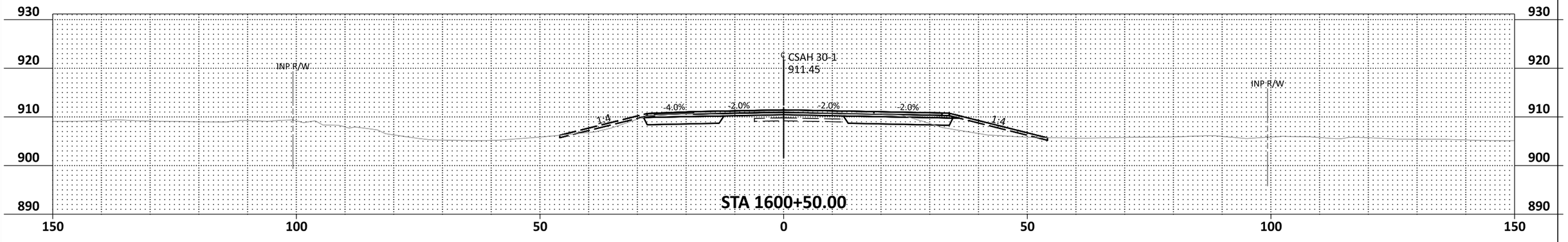

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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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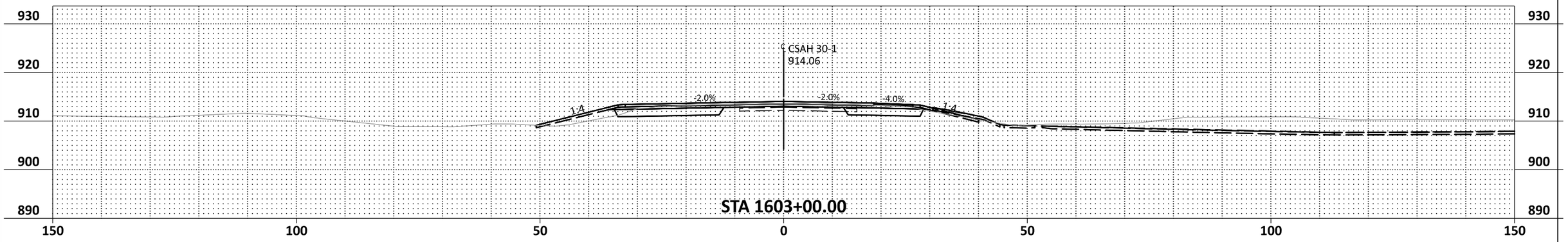
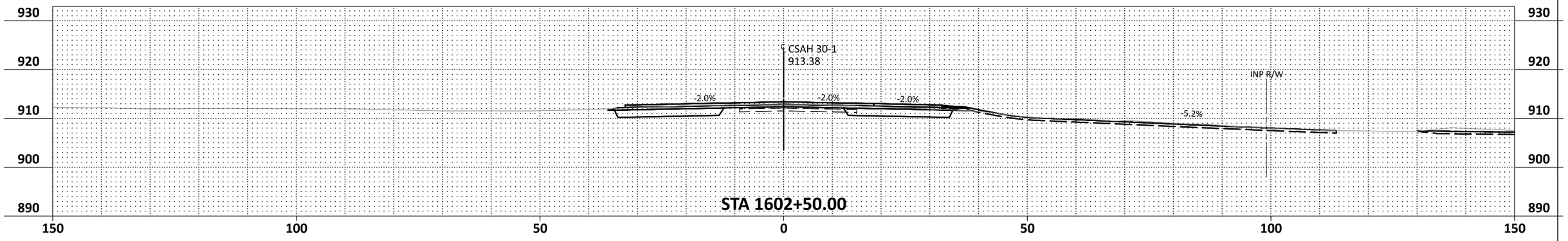
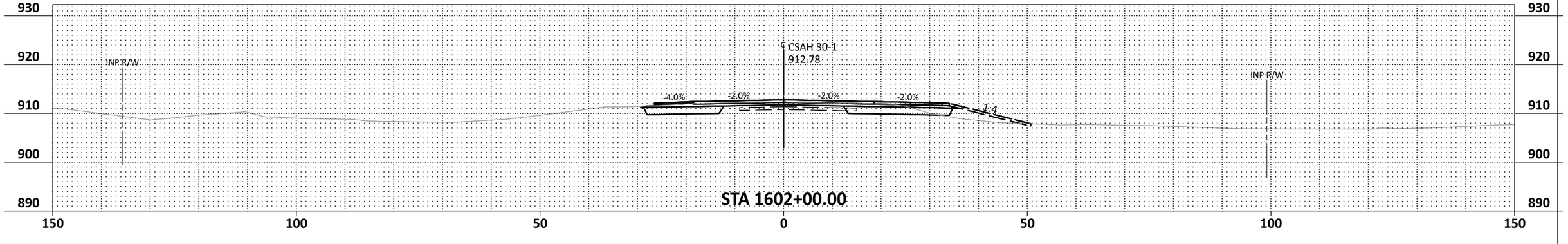
SHEET X13 OF X65 SHEETS







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Plan By:	GAD
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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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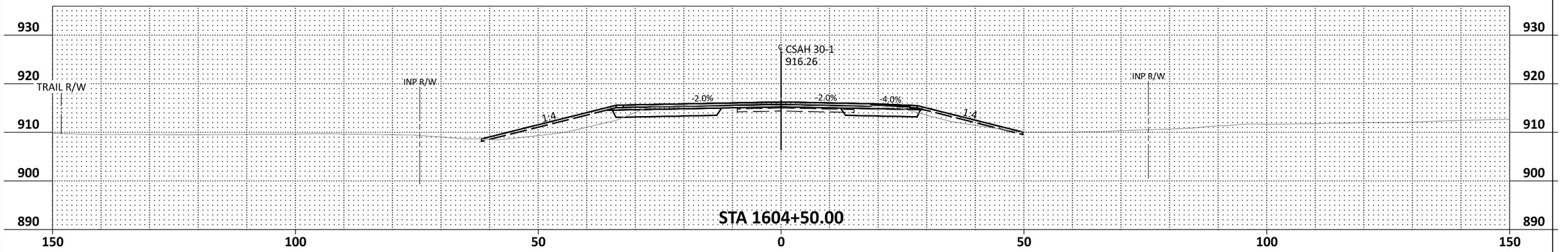
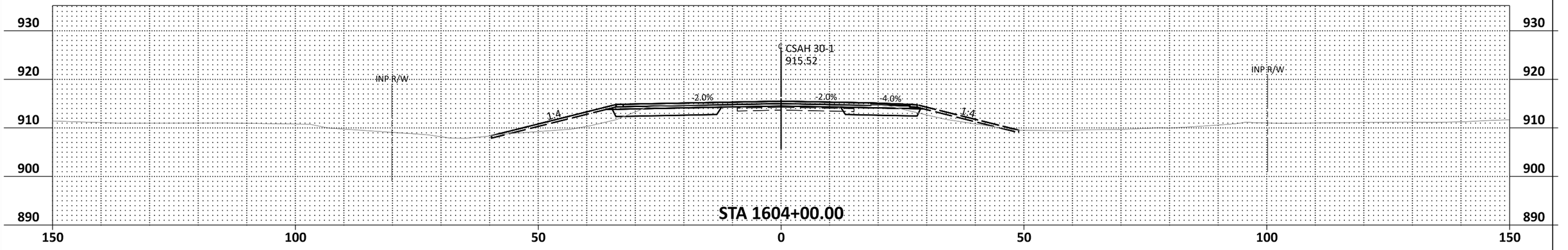
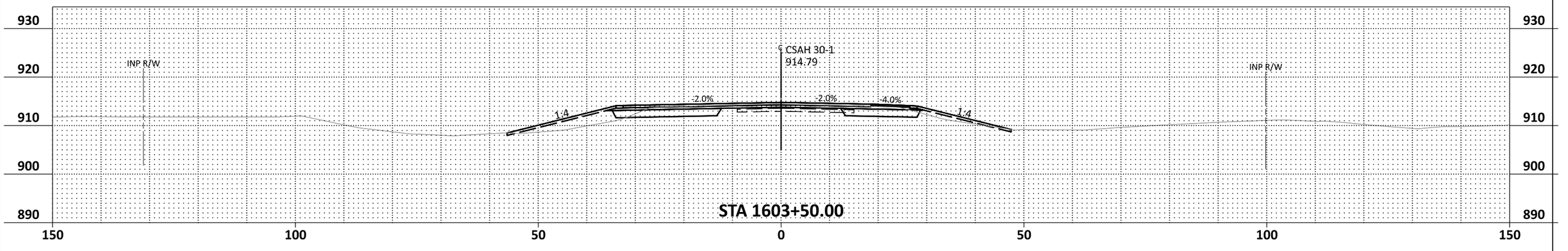
SHEET X14 OF X65 SHEETS







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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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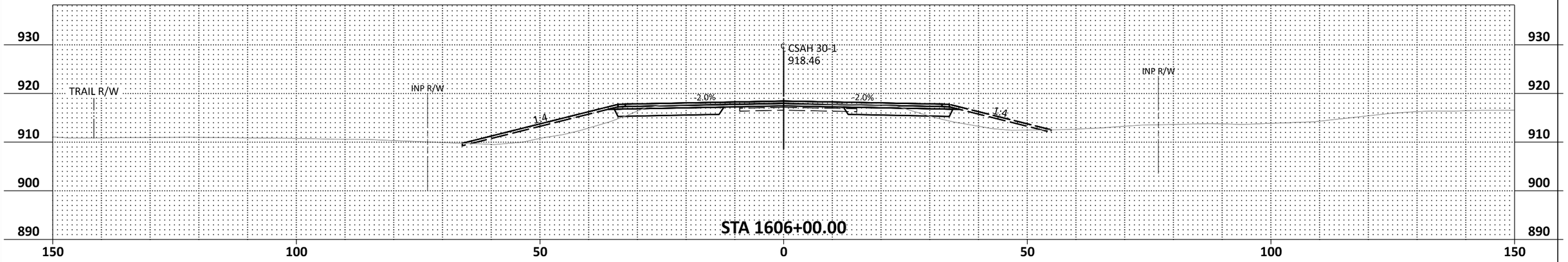
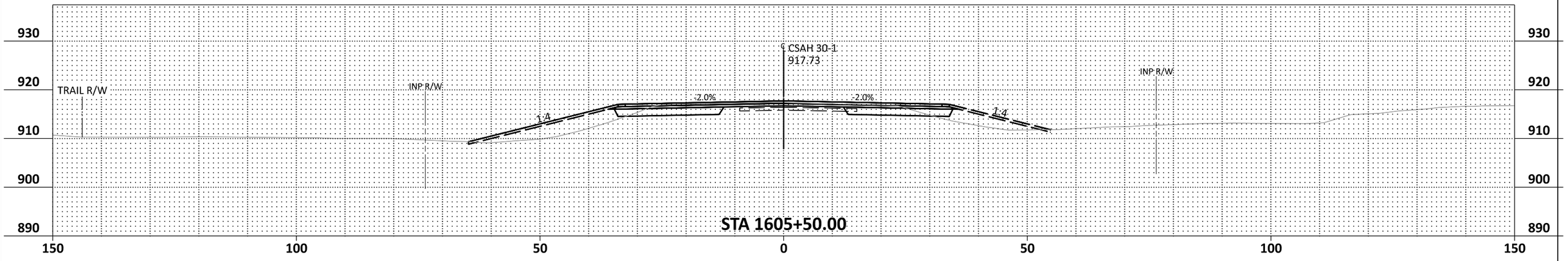
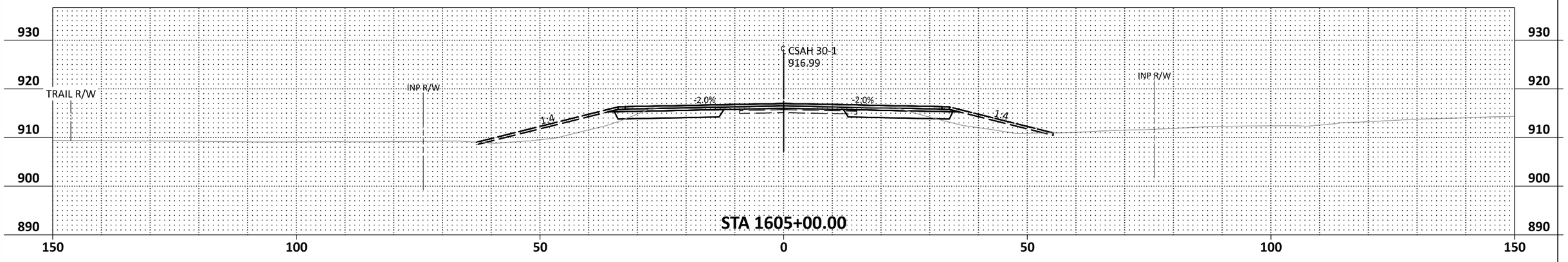
SHEET X15 OF X65 SHEETS







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Plan By: GAD
Checked By: AJP
Approved By: MKV

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Chisago COUNTY USA

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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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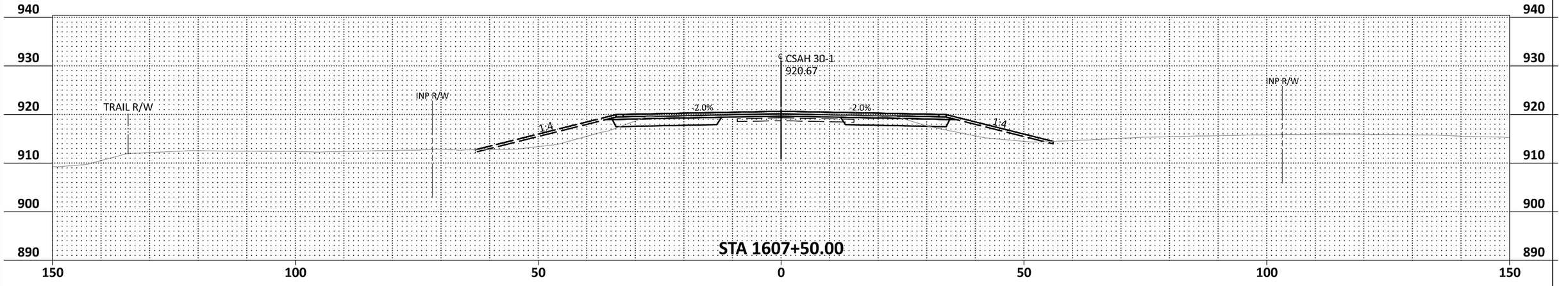
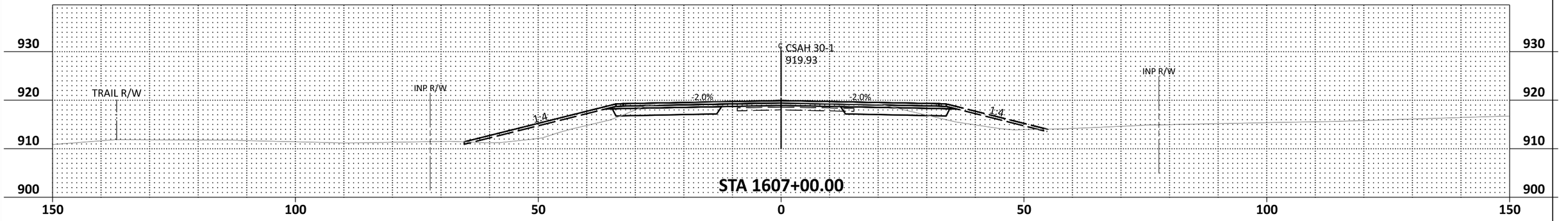
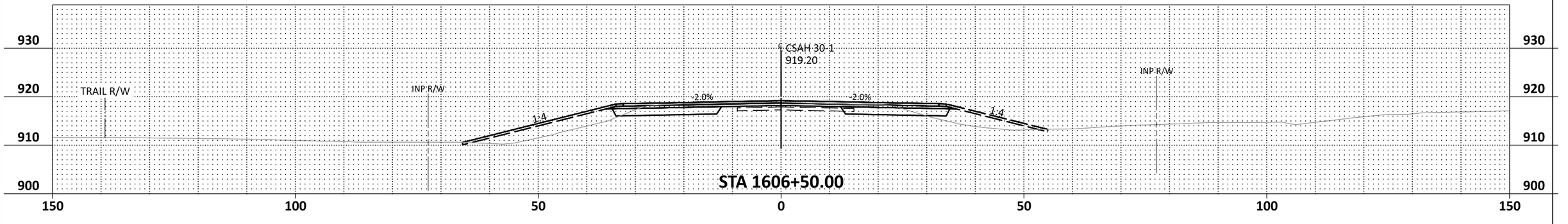
SHEET X16 OF X65 SHEETS







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Chisago COUNTY USA

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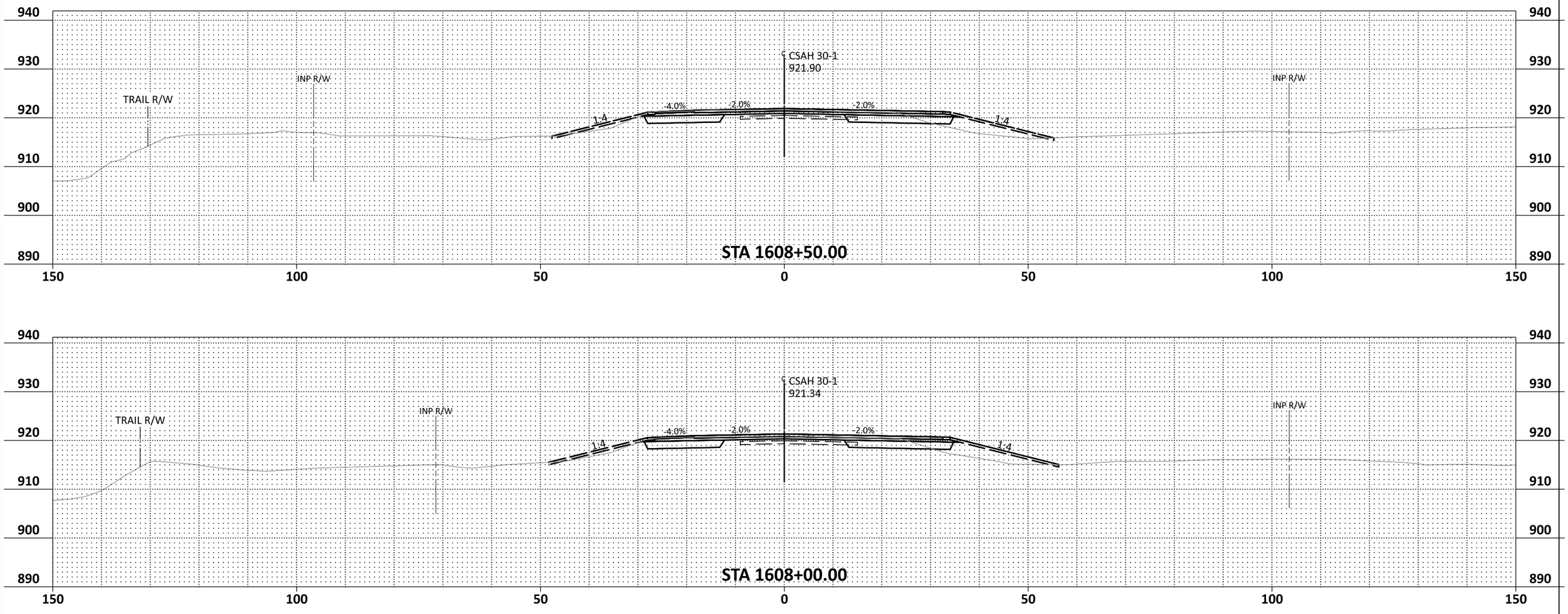
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET X17 OF X65 SHEETS



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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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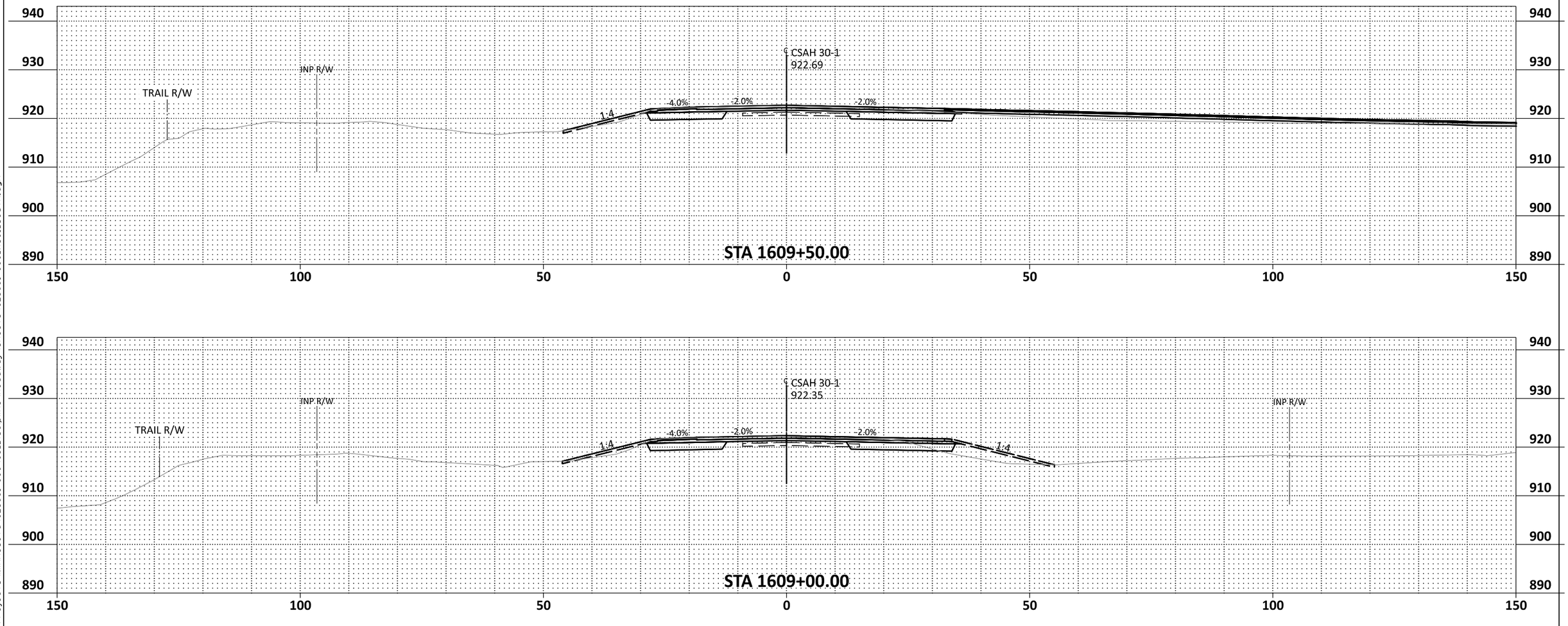
SHEET X18 OF X65 SHEETS



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Chisago County, Minnesota

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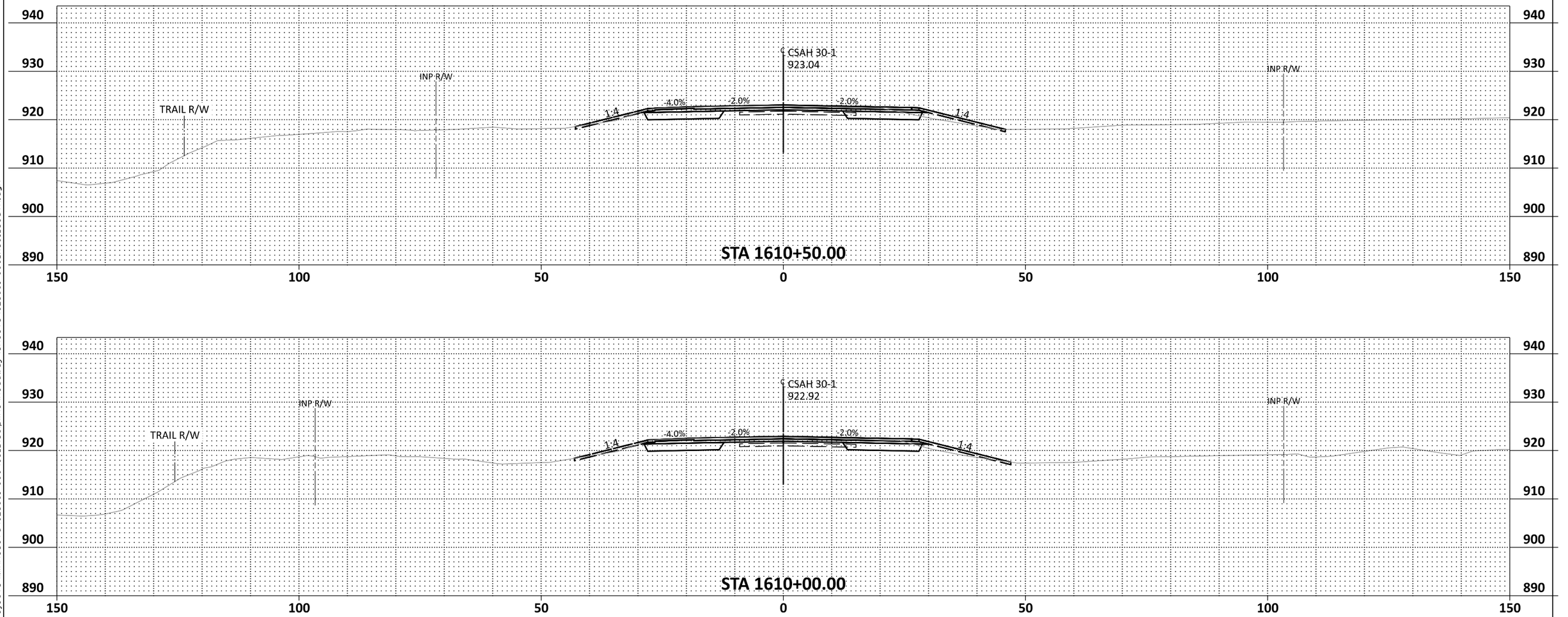
SHEET X19 OF X65 SHEETS



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CHISAGO COUNTY, MINNESOTA

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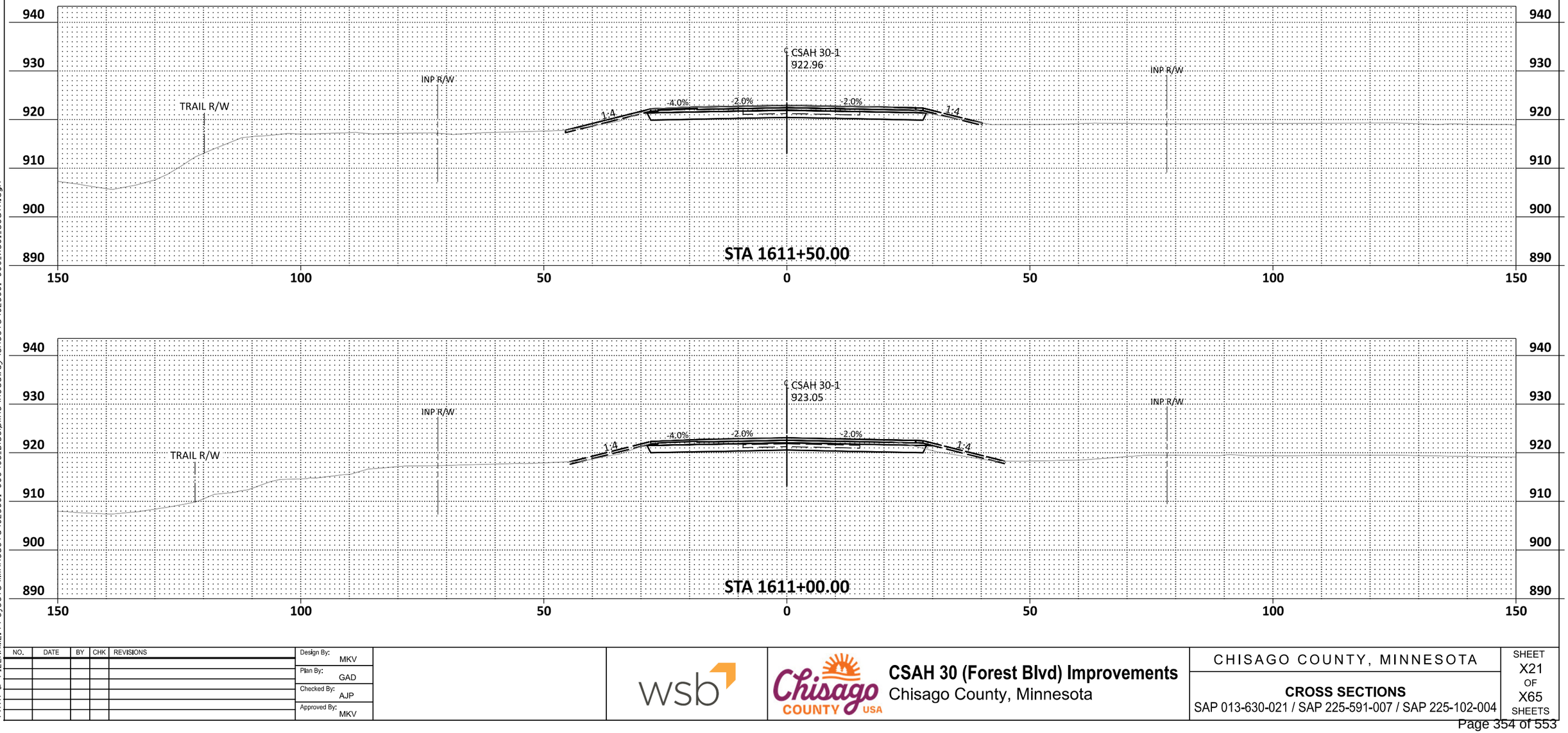
SHEET X20 OF X65 SHEETS



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CHISAGO COUNTY, MINNESOTA

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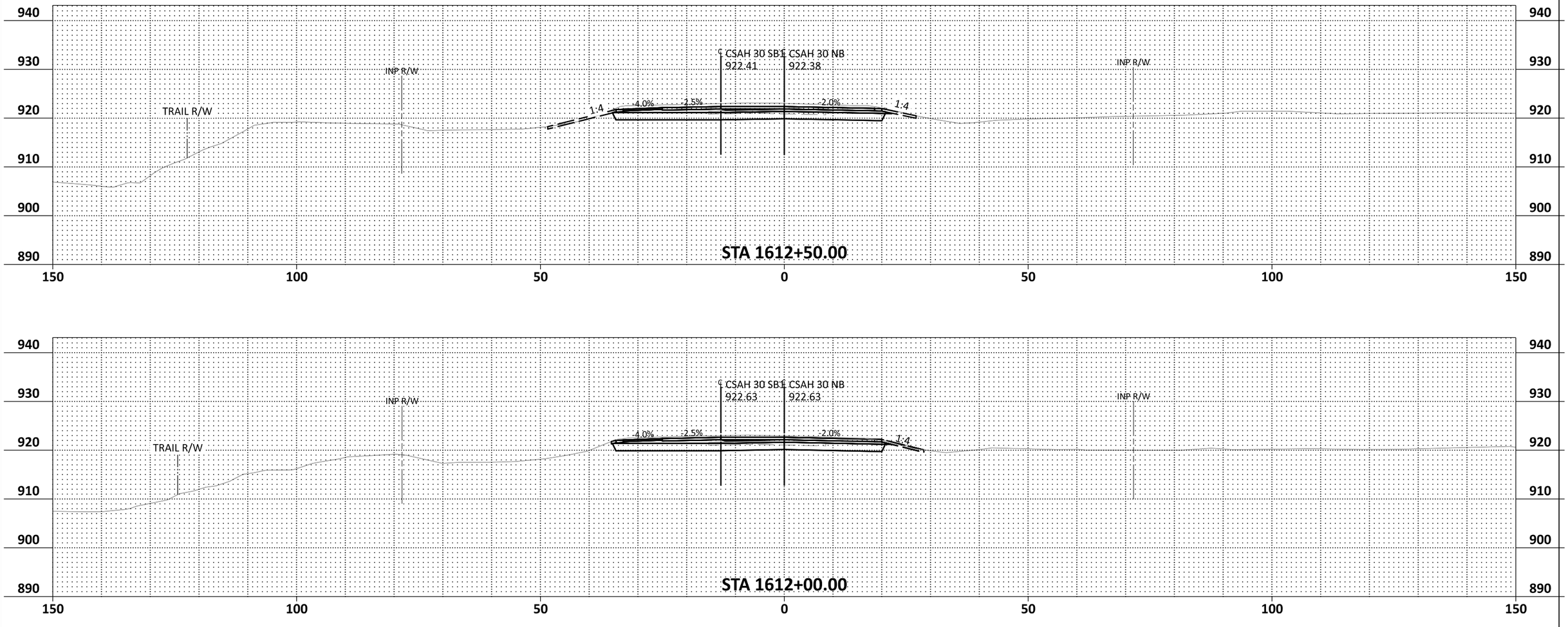
SHEET X21 OF X65 SHEETS



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CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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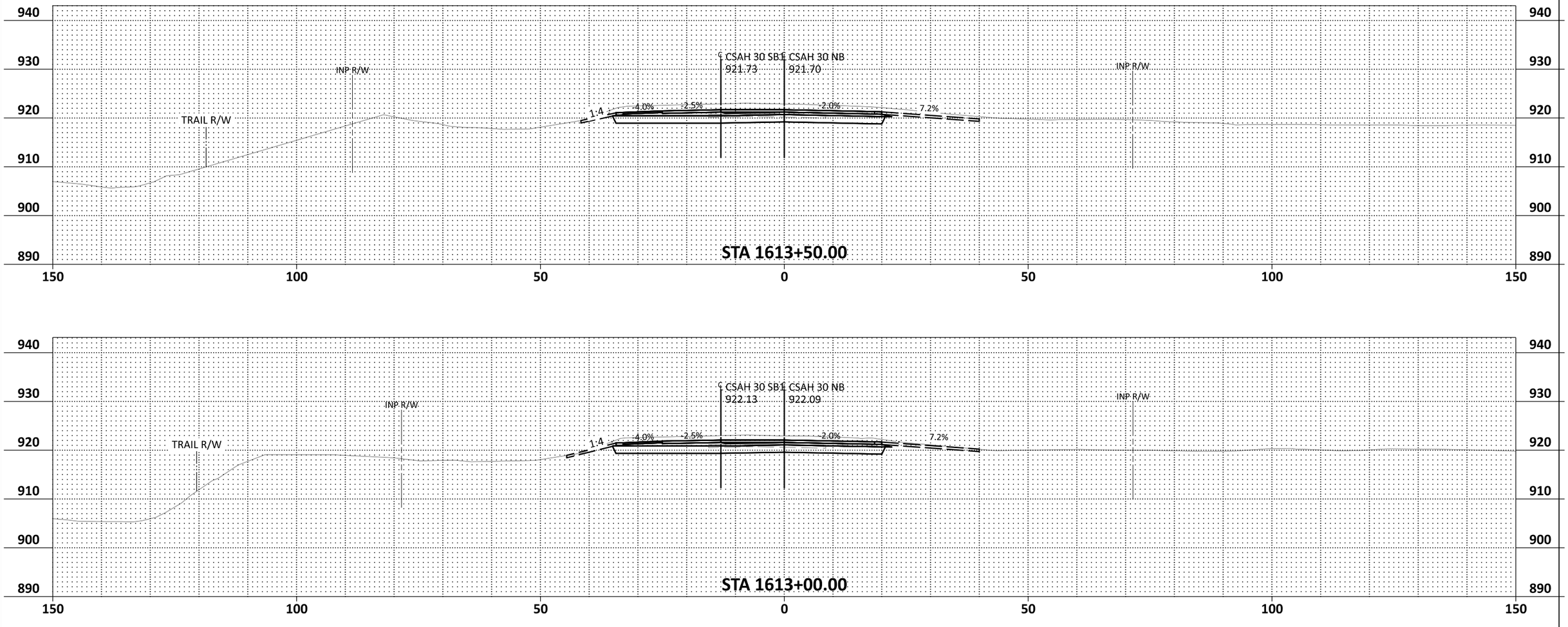
SHEET X22 OF X65 SHEETS



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CHISAGO COUNTY, MINNESOTA

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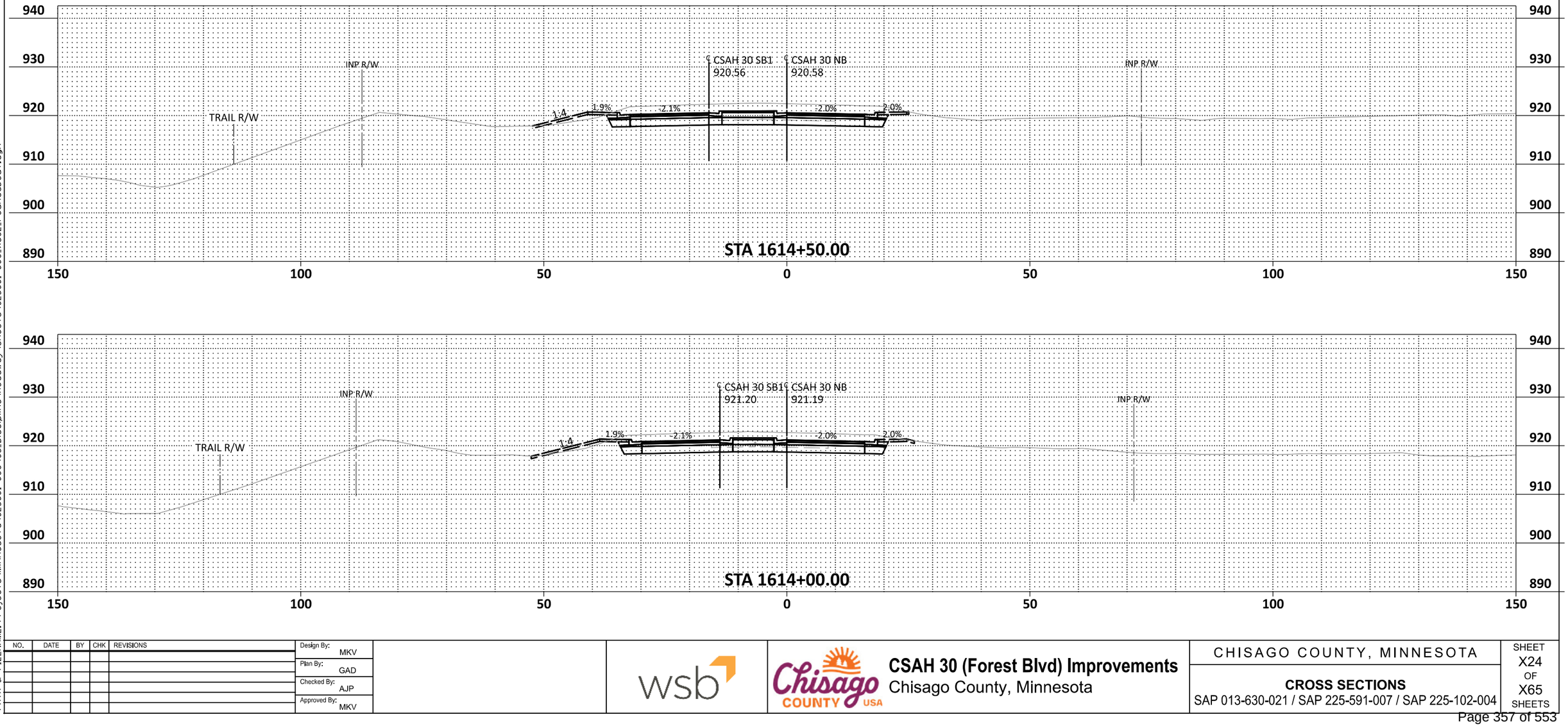
SHEET X23 OF X65 SHEETS



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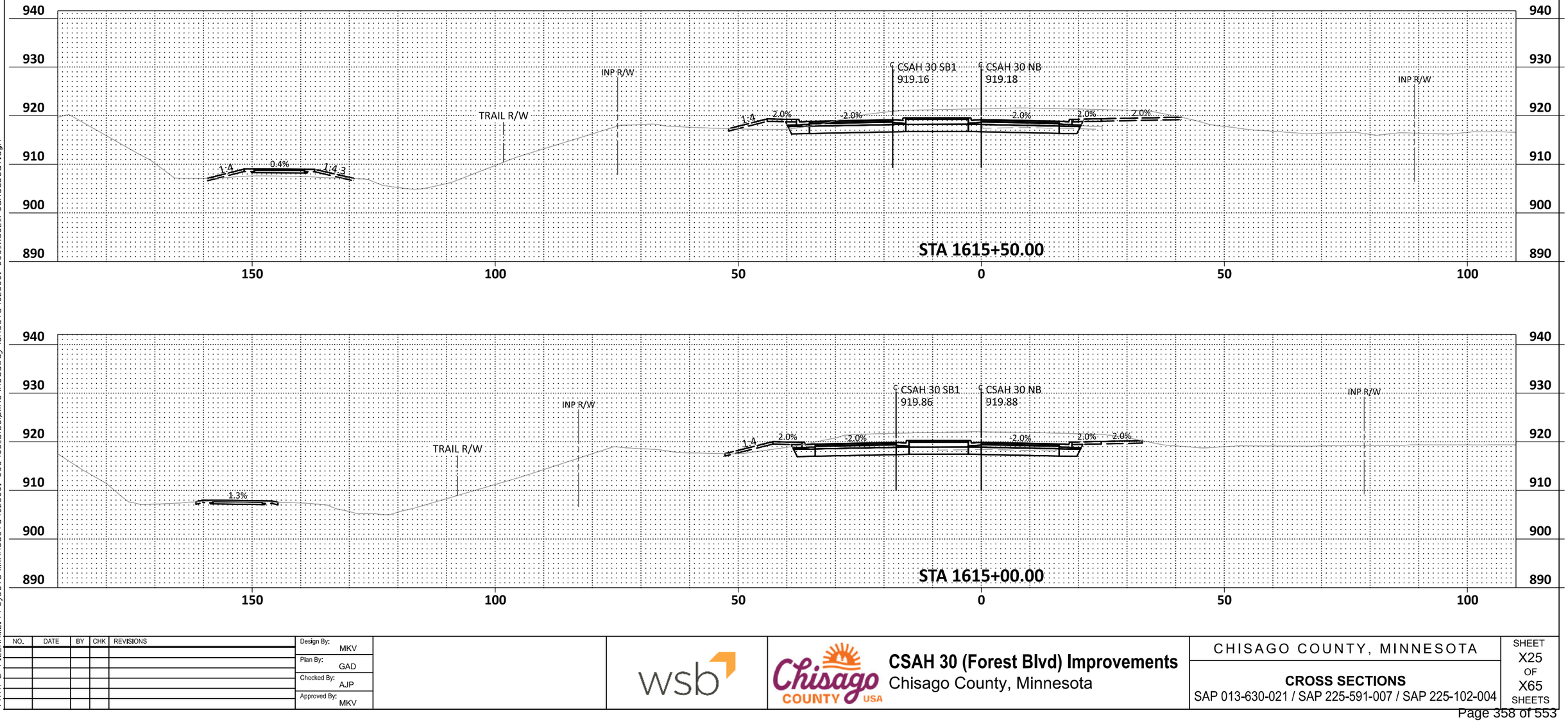
SHEET X24 OF X65 SHEETS



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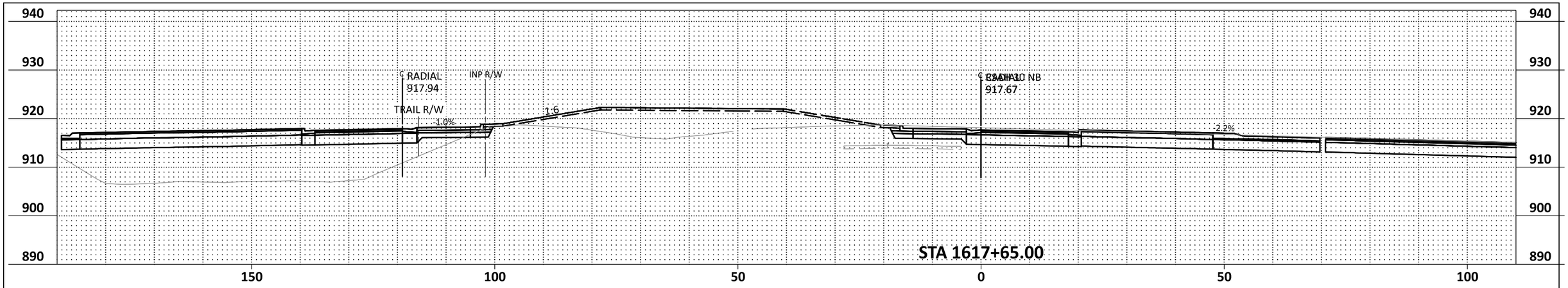
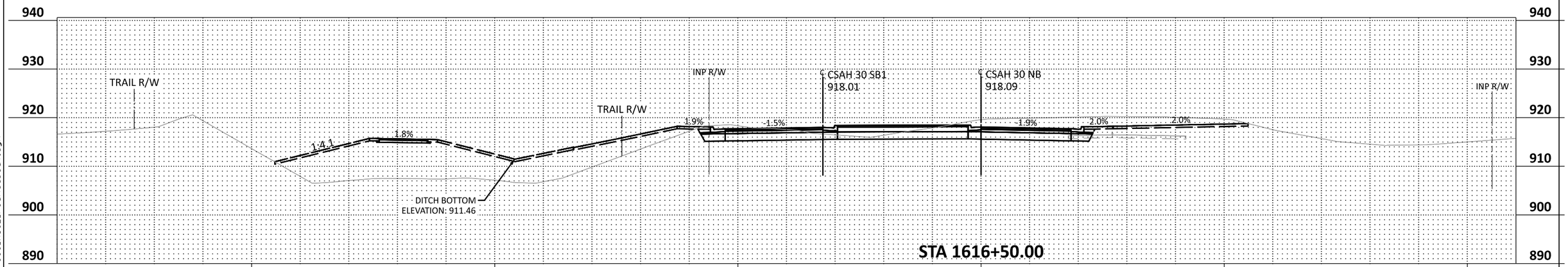
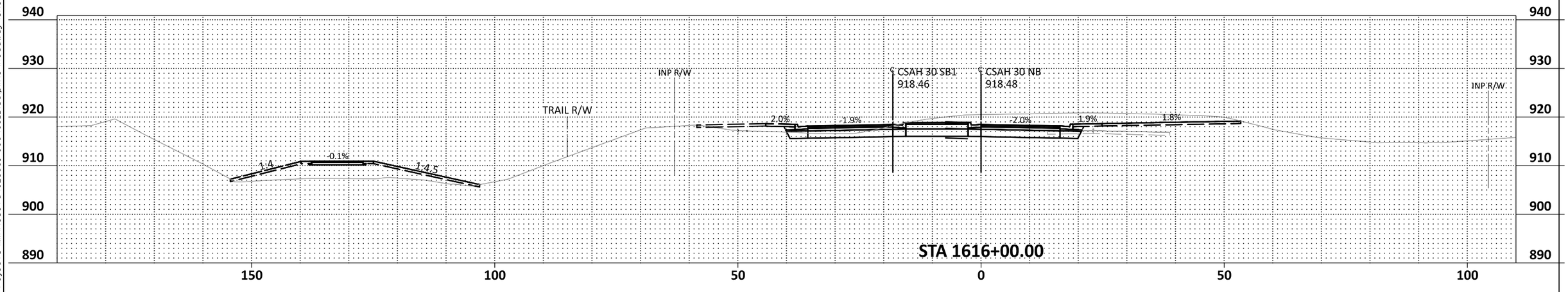
SHEET X25 OF X65 SHEETS







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Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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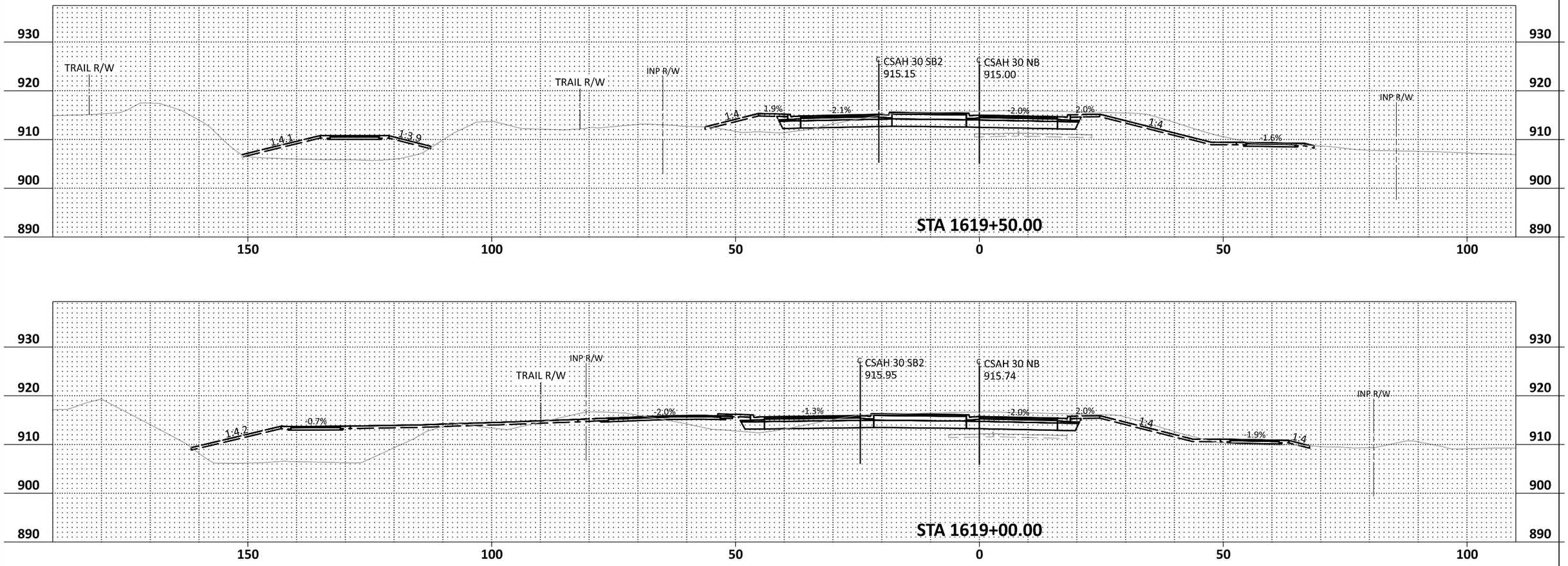
Chisago COUNTY USA

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 X26 OF X65 SHEETS



NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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SHEET X27 OF X65 SHEETS

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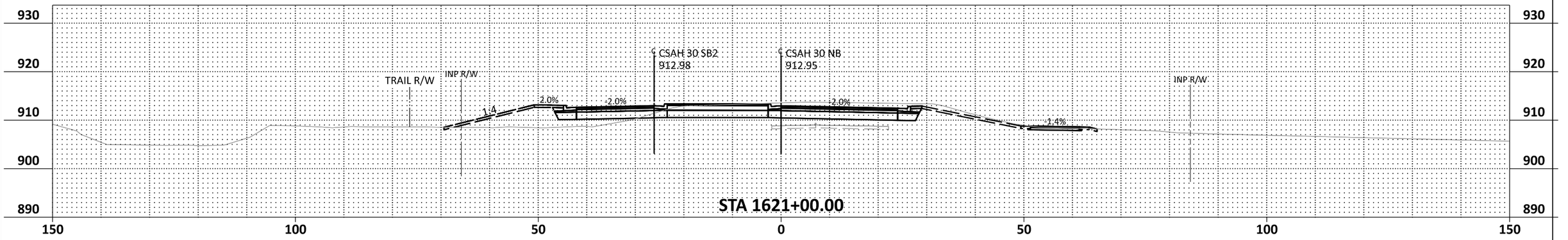

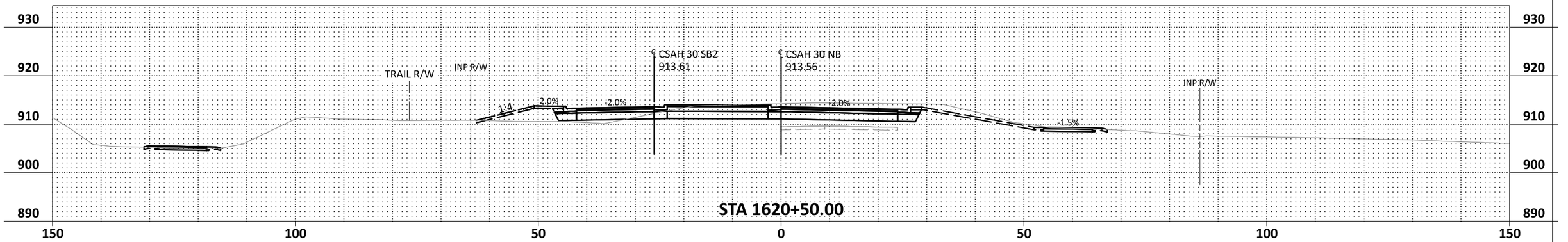

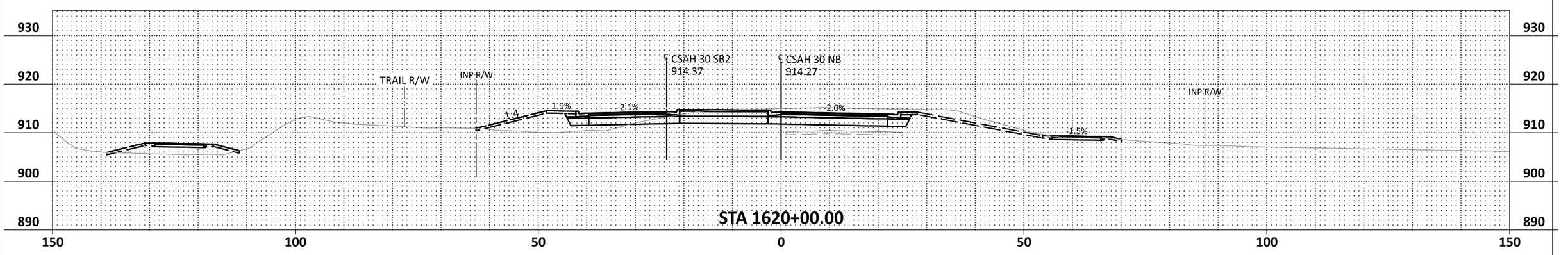

NO.	DATE	BY	CHK	REVISIONS

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Chisago COUNTY USA

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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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SHEET X28 OF X65 SHEETS

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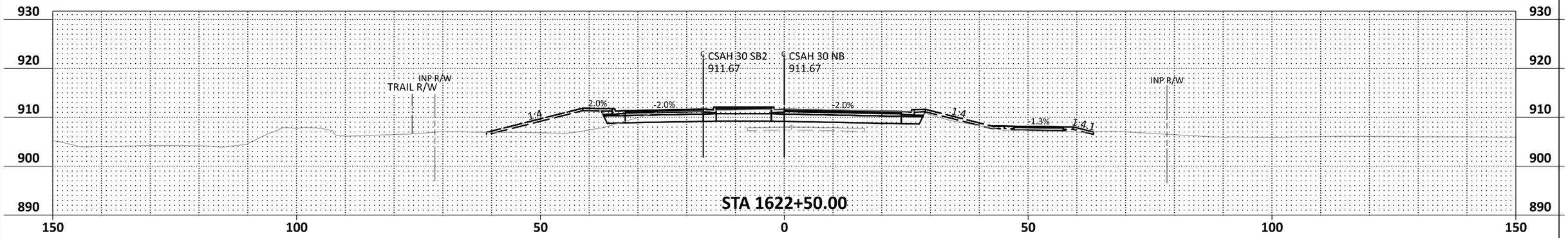

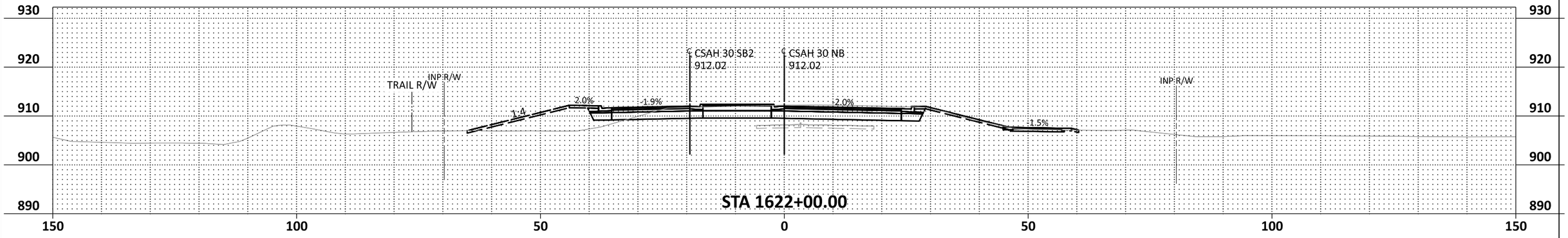

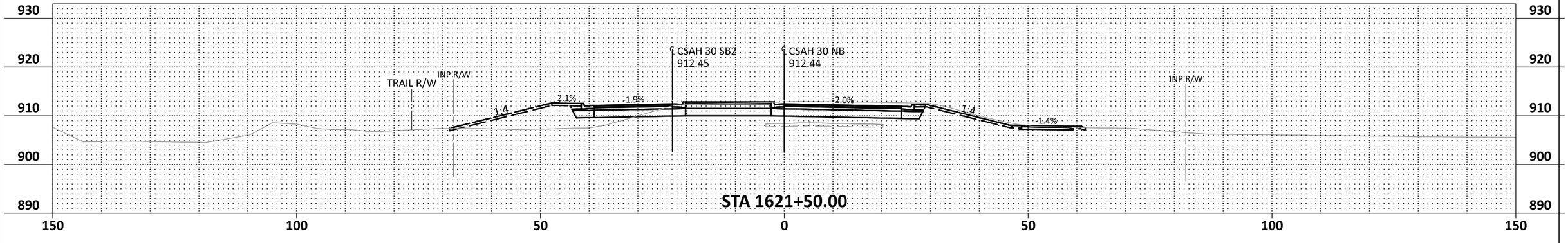

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CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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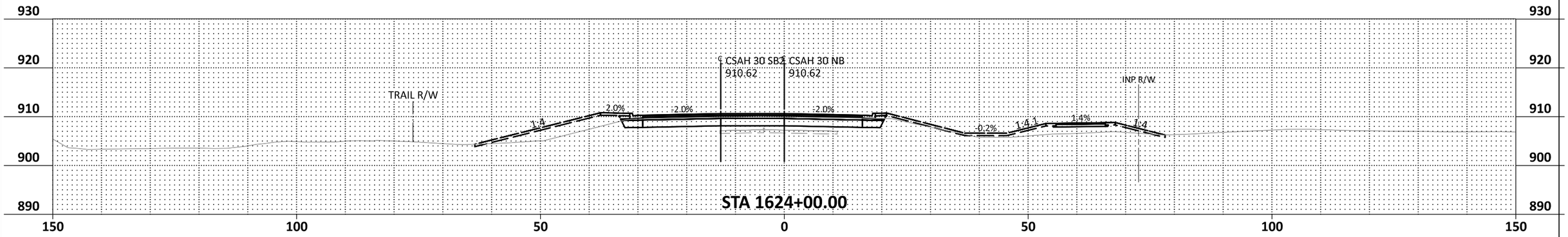
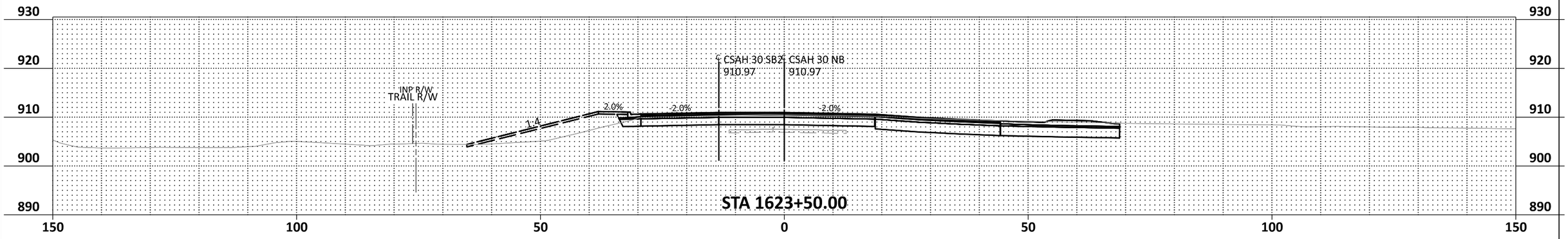
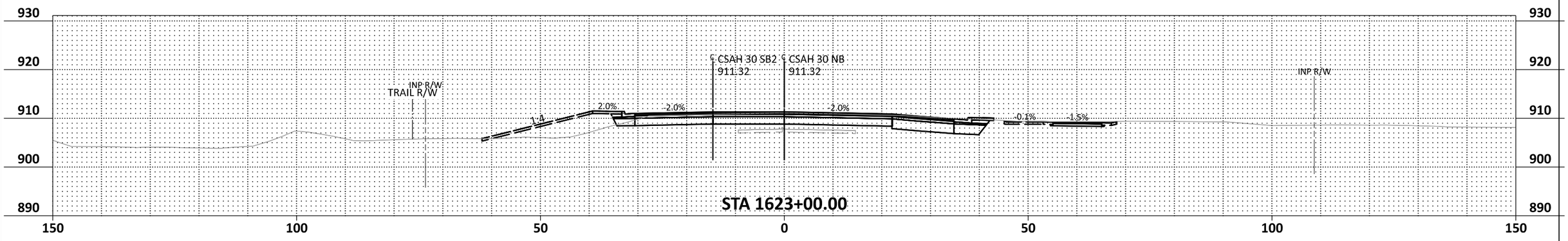
SHEET X29 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
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Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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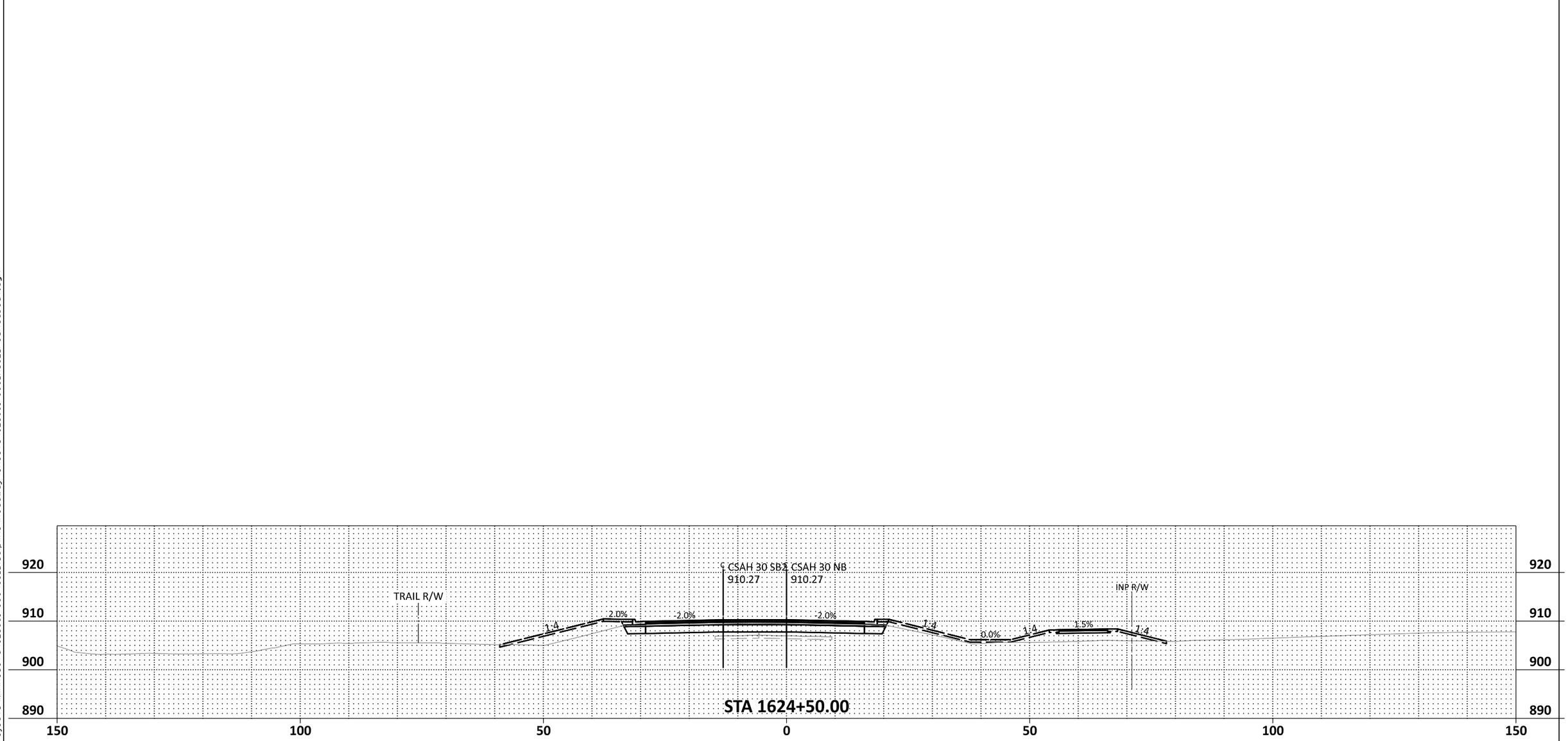
SHEET X30 OF X65 SHEETS



NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
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CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

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CROSS SECTIONS
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SHEET X31 OF X65 SHEETS

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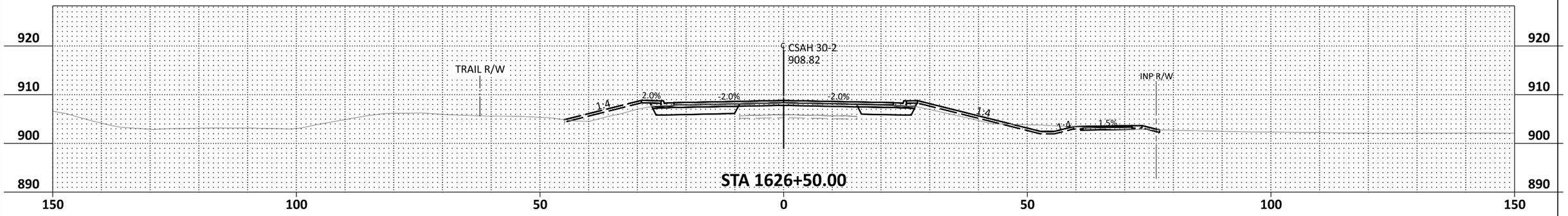

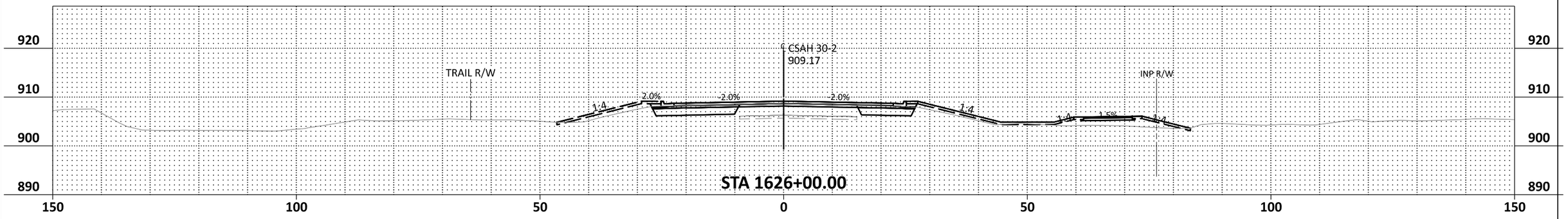

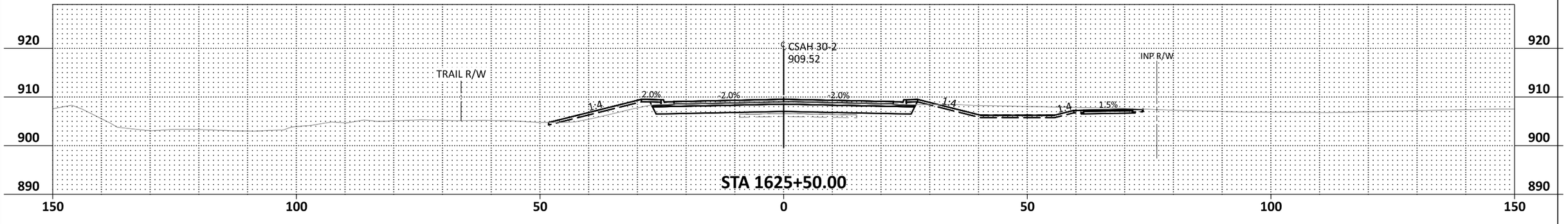

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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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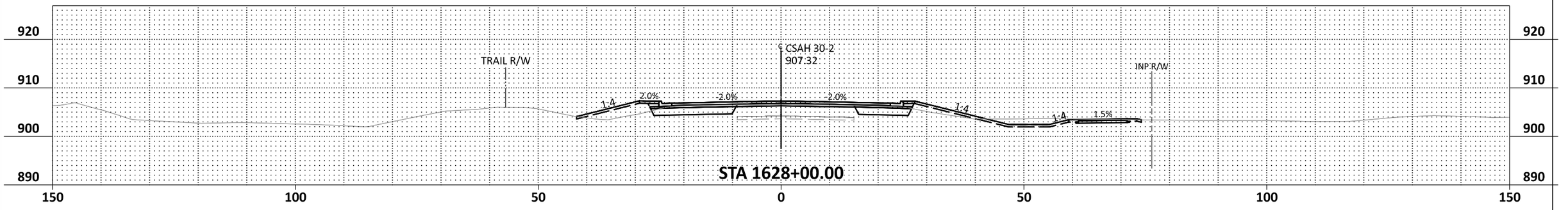
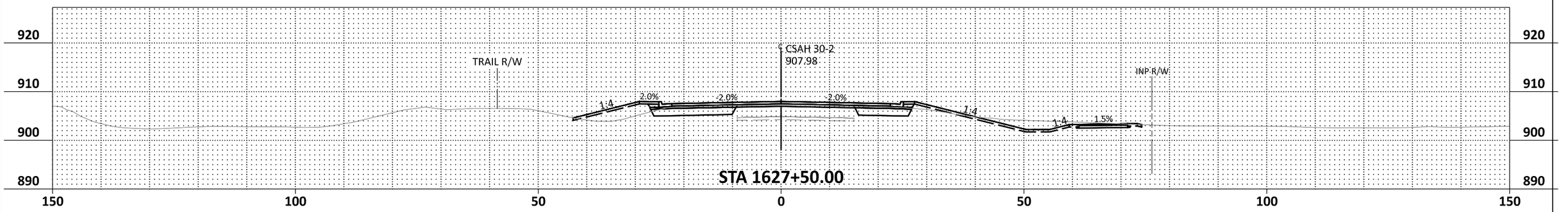
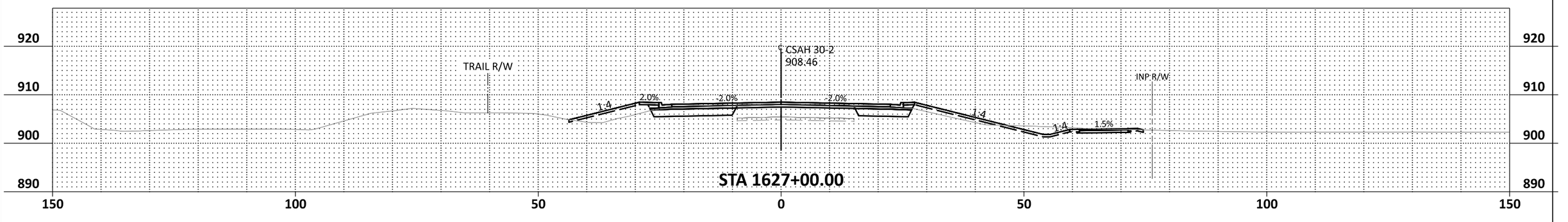
SHEET X32 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

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Plan By: GAD
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Approved By: MKV

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Chisago COUNTY USA

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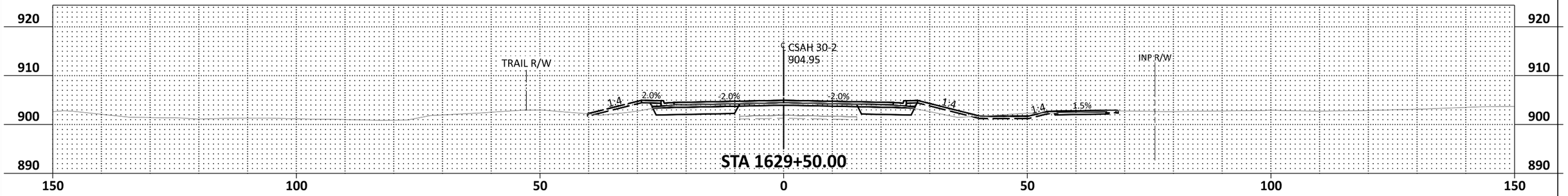
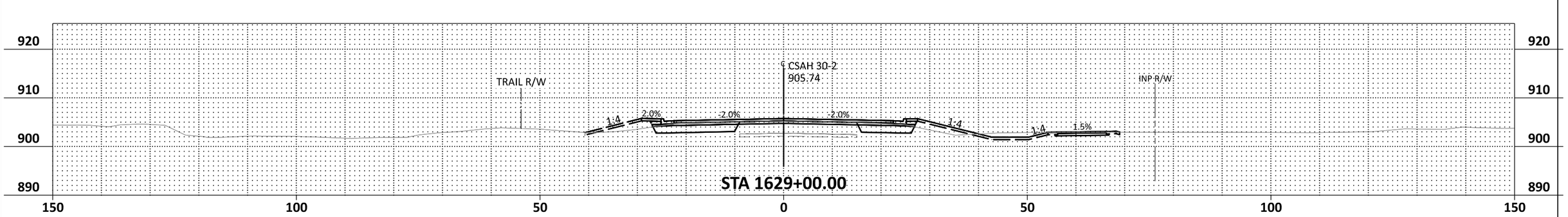
Chisago County, Minnesota

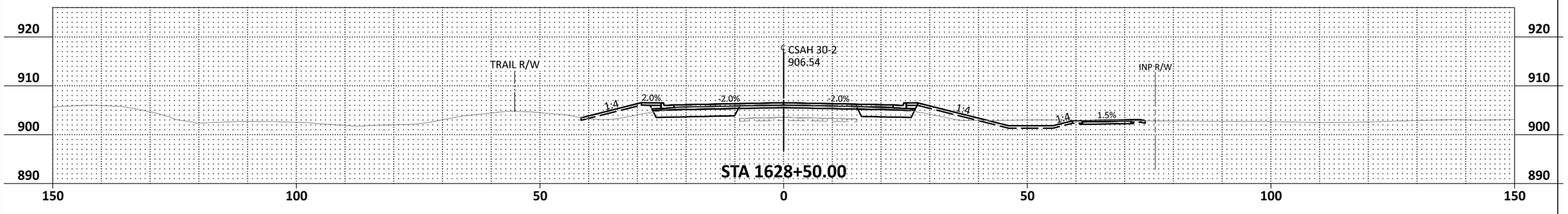
CHISAGO COUNTY, MINNESOTA

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

SHEET X33 OF X65 SHEETS







NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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SHEET X34 OF X65 SHEETS

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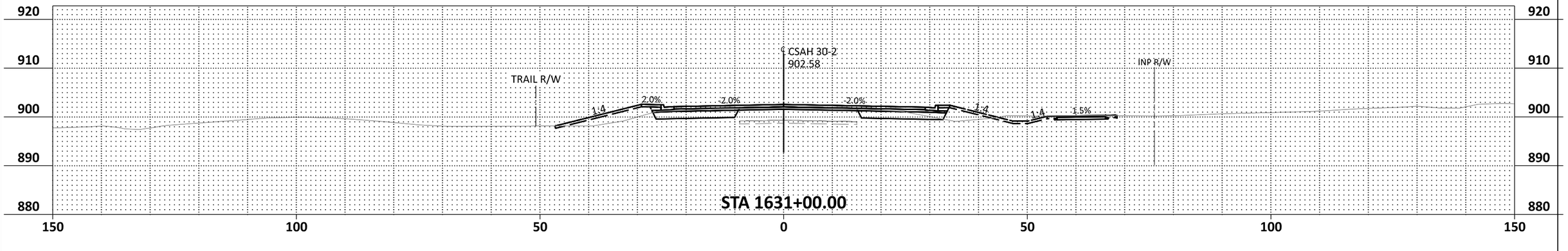

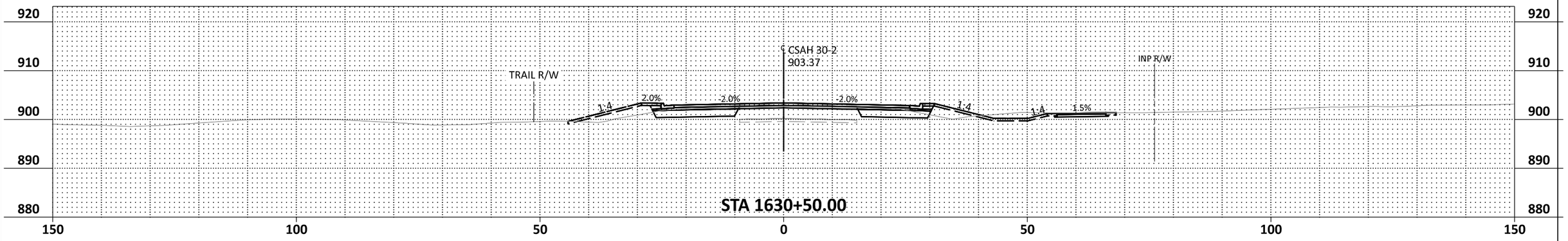

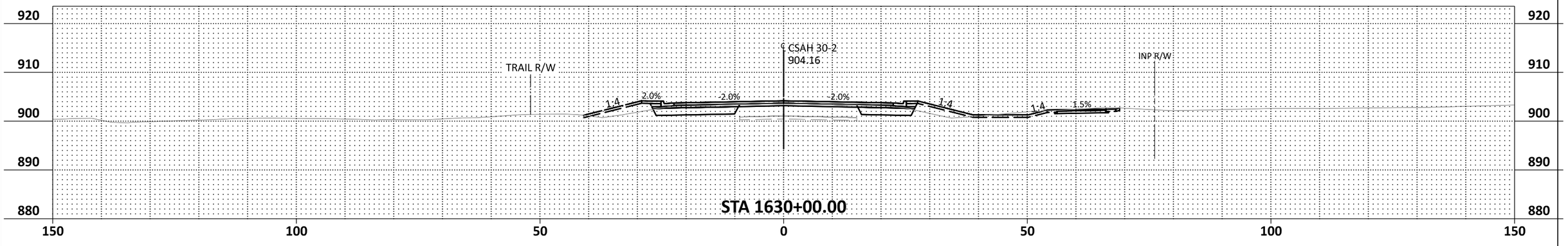

NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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SHEET X35 OF X65 SHEETS

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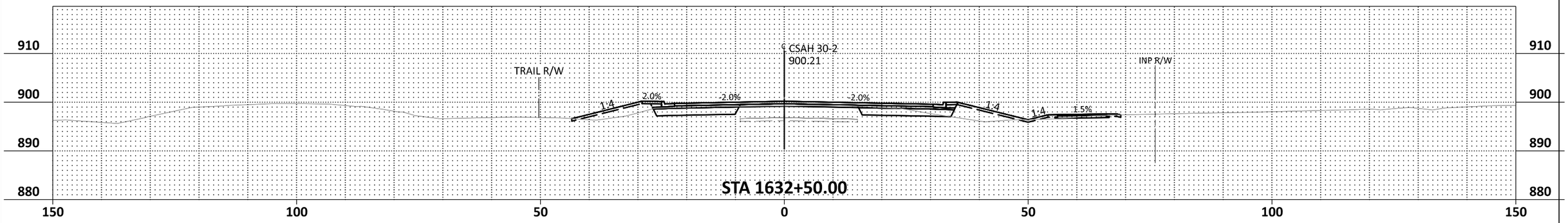

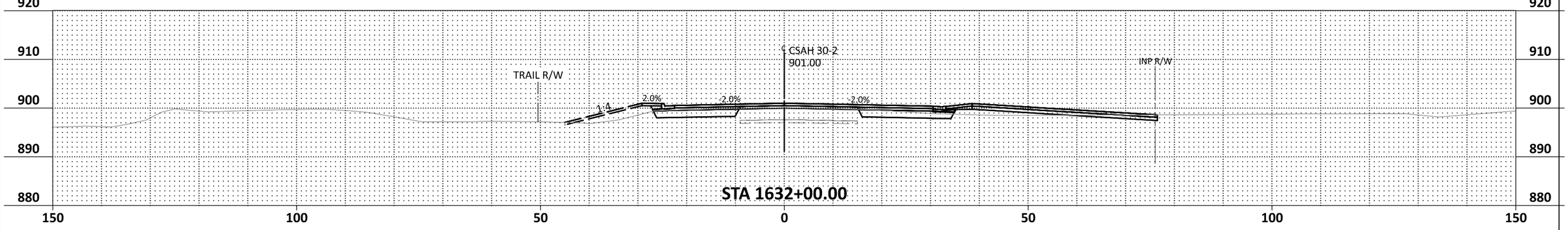

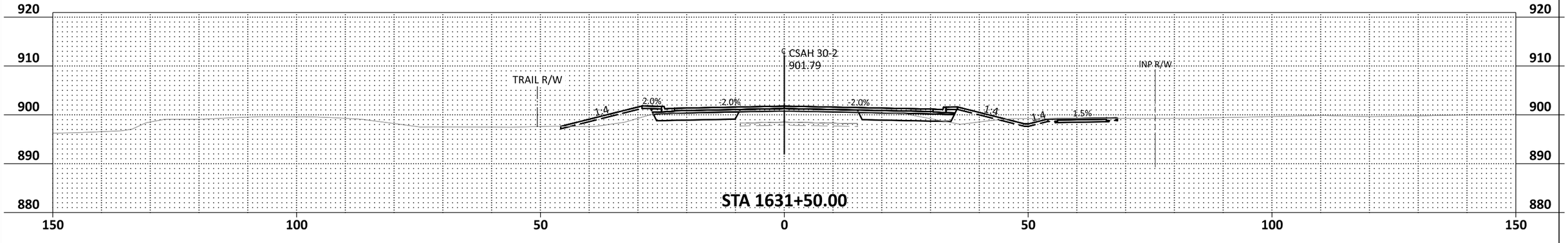

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NO.	DATE	BY	CHK	REVISIONS

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Plan By: GAD
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Approved By: MKV

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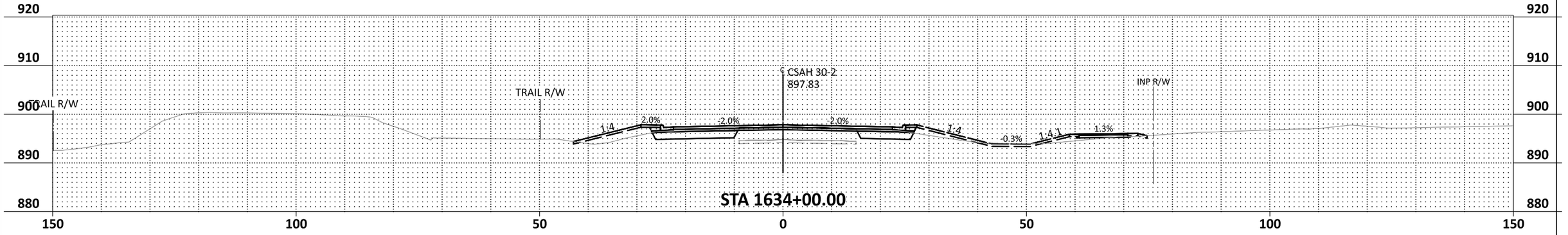
Chisago COUNTY USA

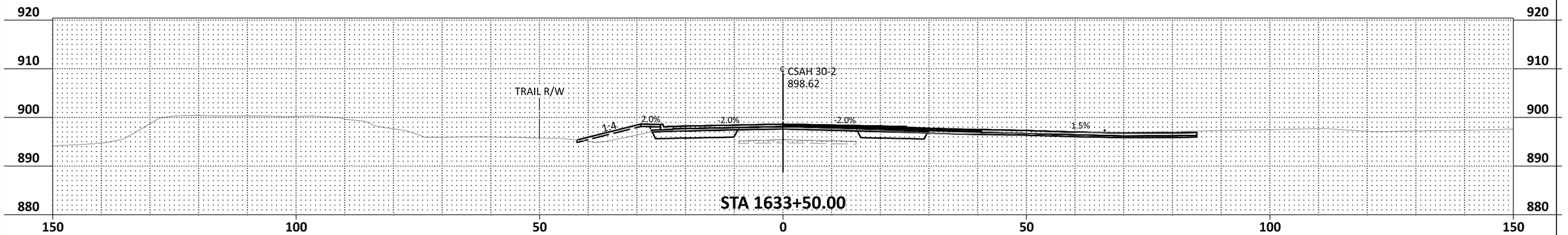
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

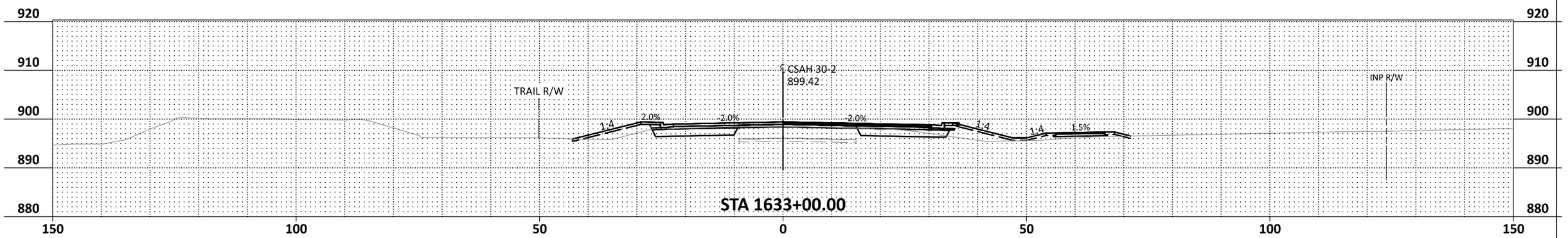
CHISAGO COUNTY, MINNESOTA

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

SHEET X36 OF X65 SHEETS







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Design By: MKV
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SHEET X37 OF X65 SHEETS

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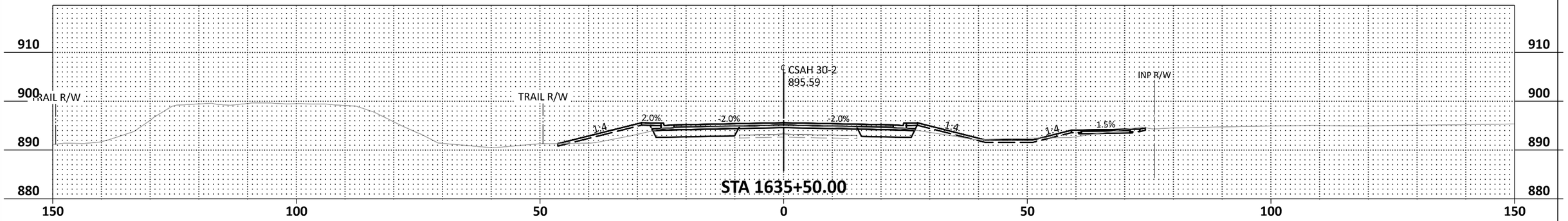

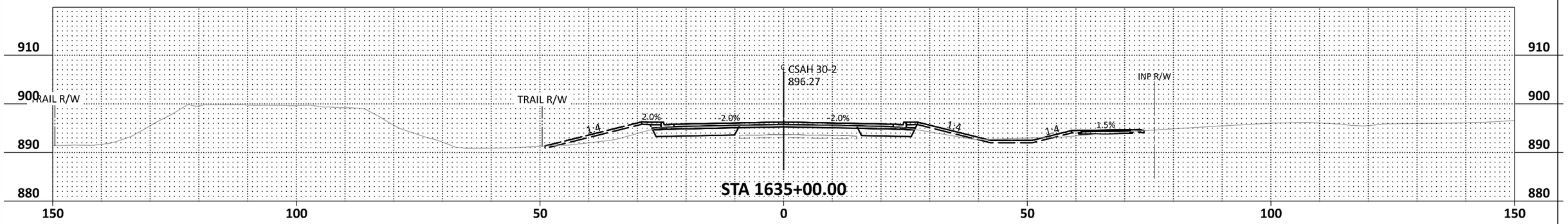

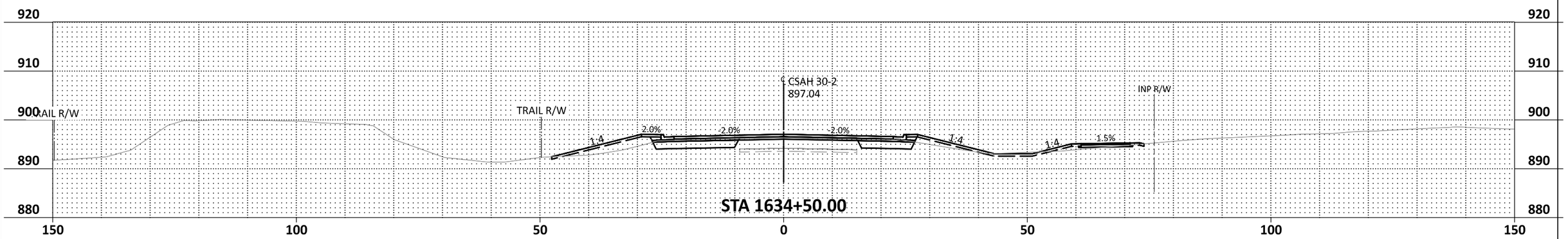

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CHISAGO COUNTY, MINNESOTA

CROSS SECTIONS
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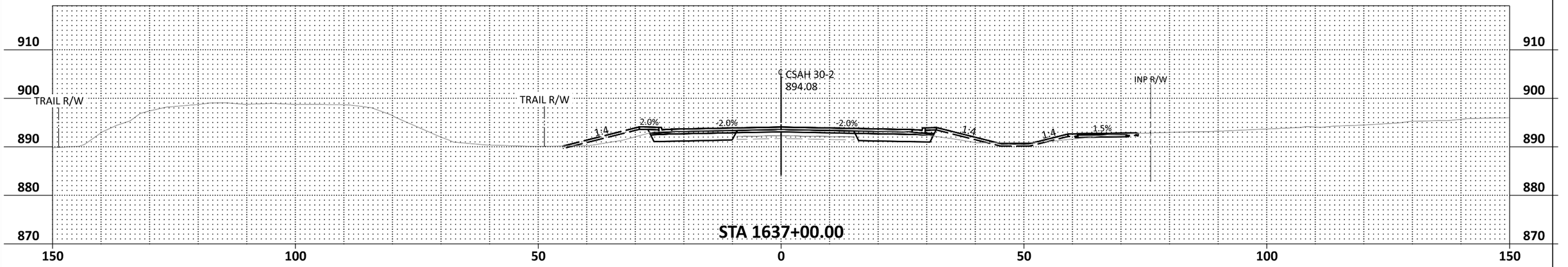
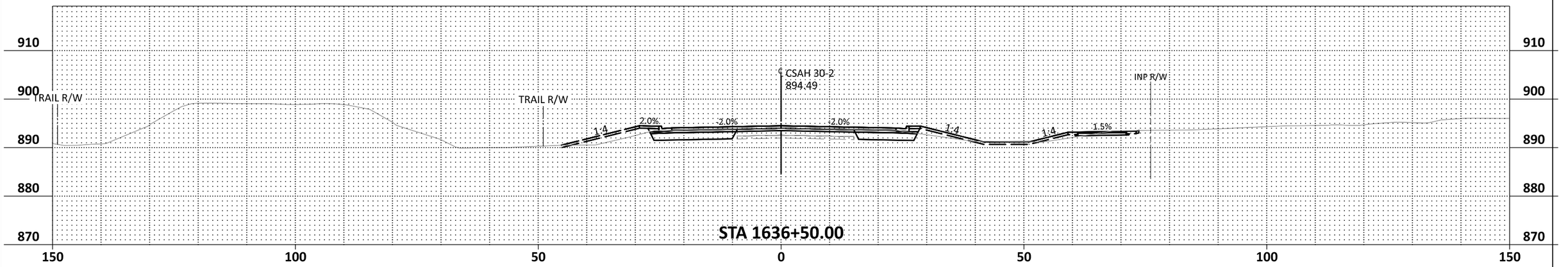
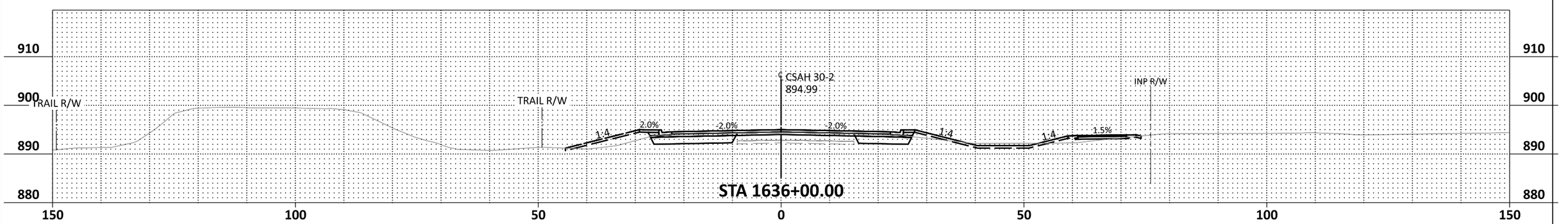
SHEET X38 OF X65 SHEETS







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CROSS SECTIONS
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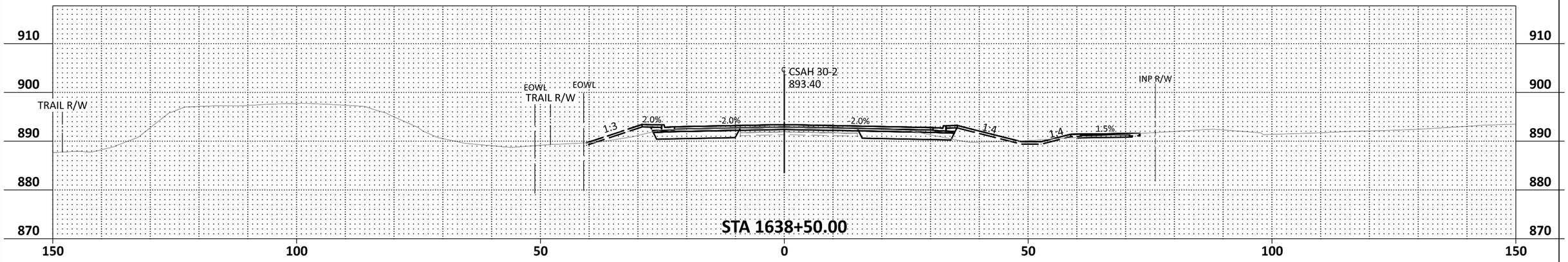
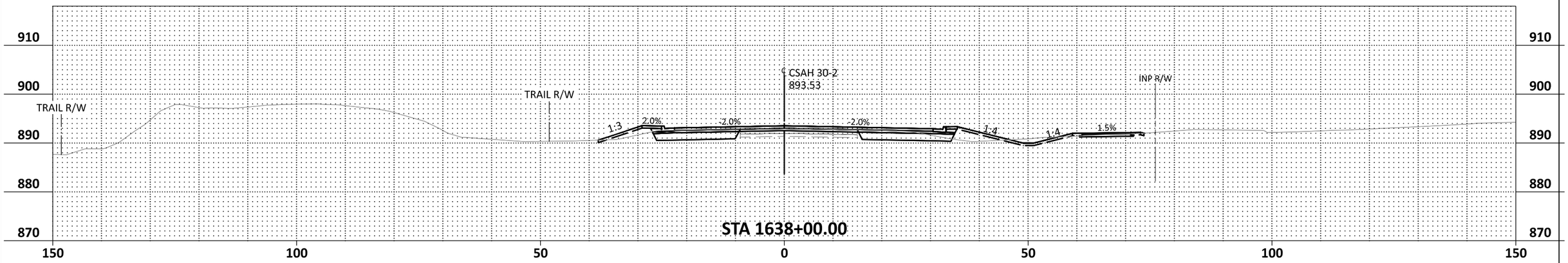
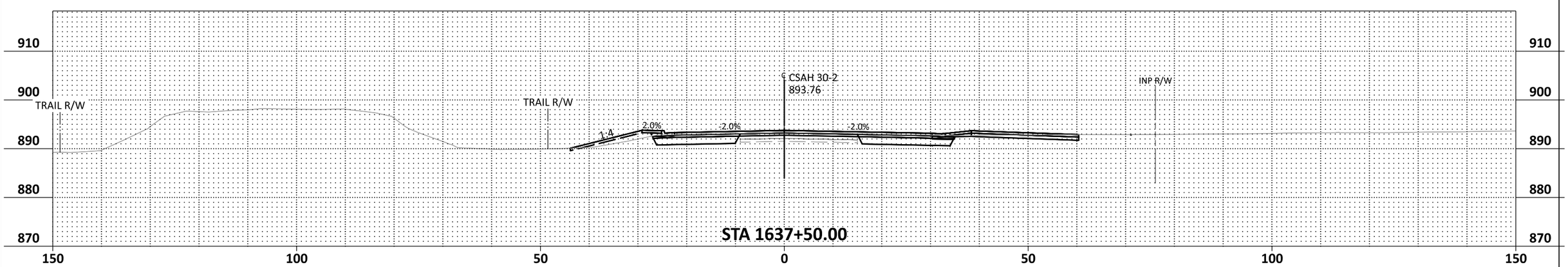
SHEET X39 OF X65 SHEETS







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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

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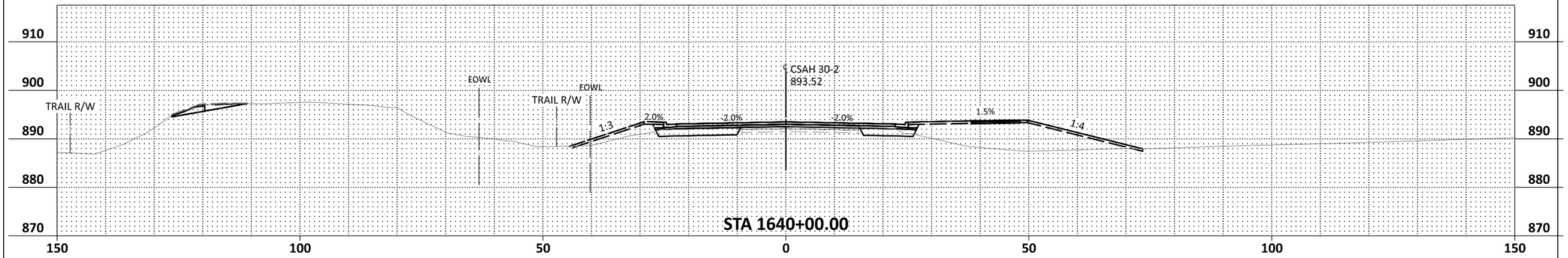
Chisago COUNTY USA

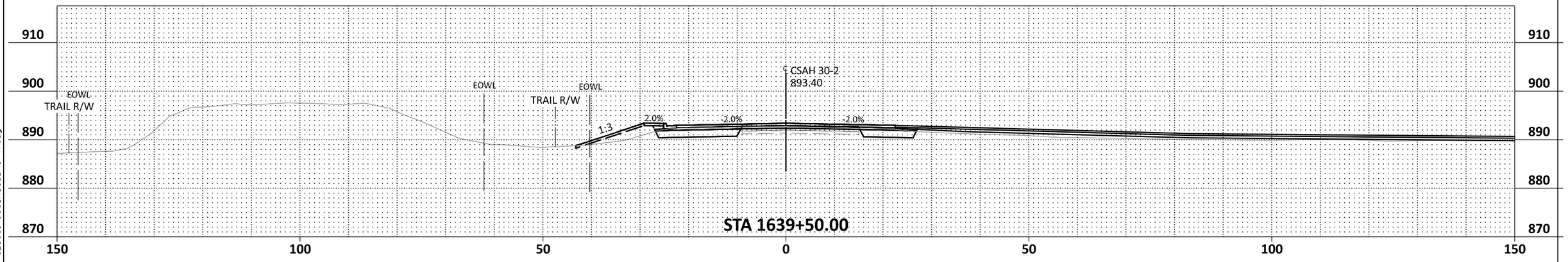
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

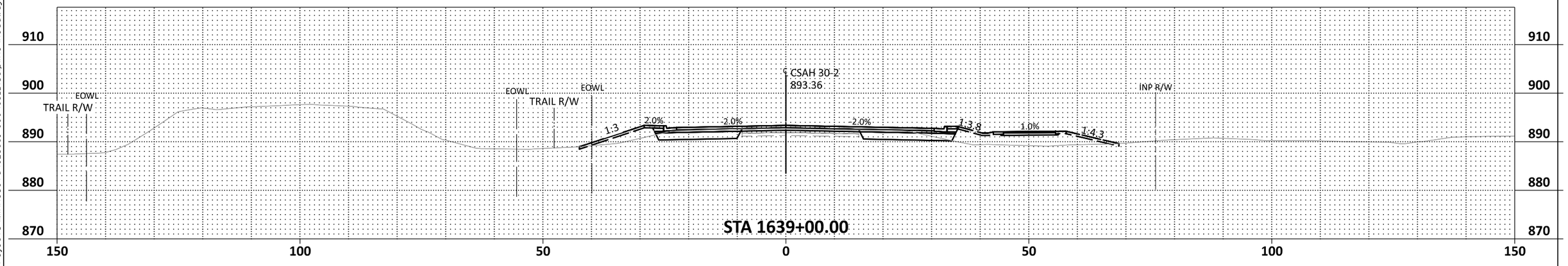
CHISAGO COUNTY, MINNESOTA

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

SHEET X40 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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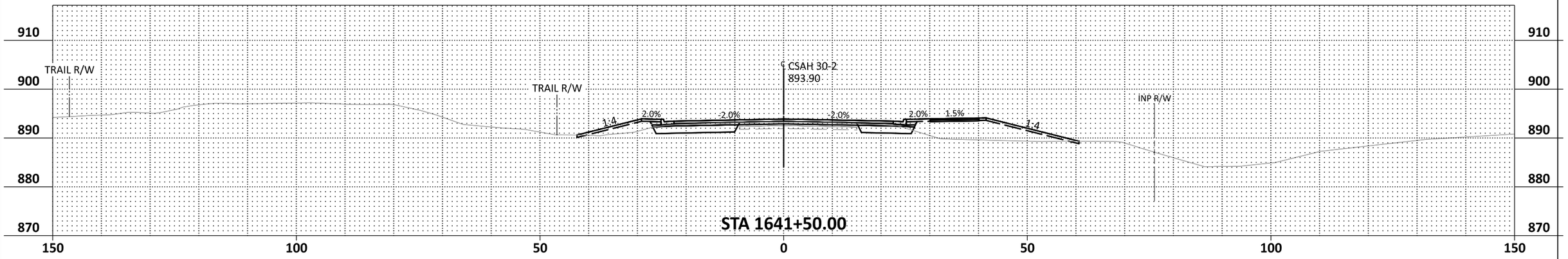
Chisago COUNTY USA

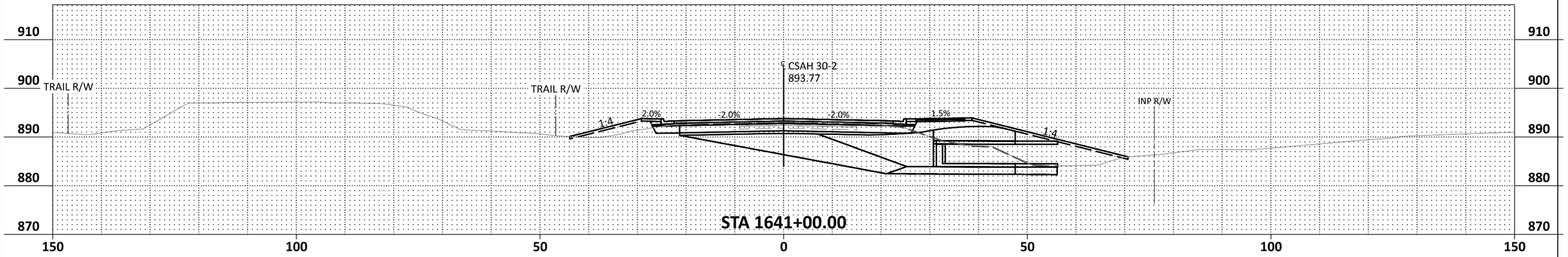
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

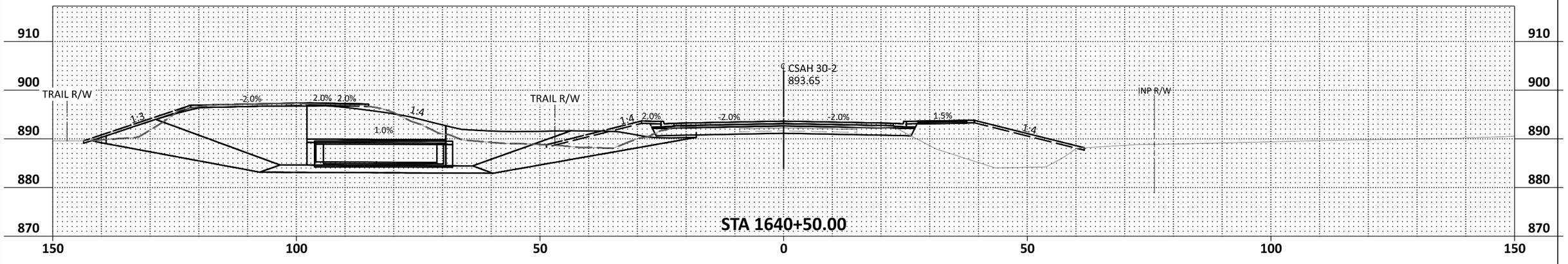
CHISAGO COUNTY, MINNESOTA

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

SHEET X41 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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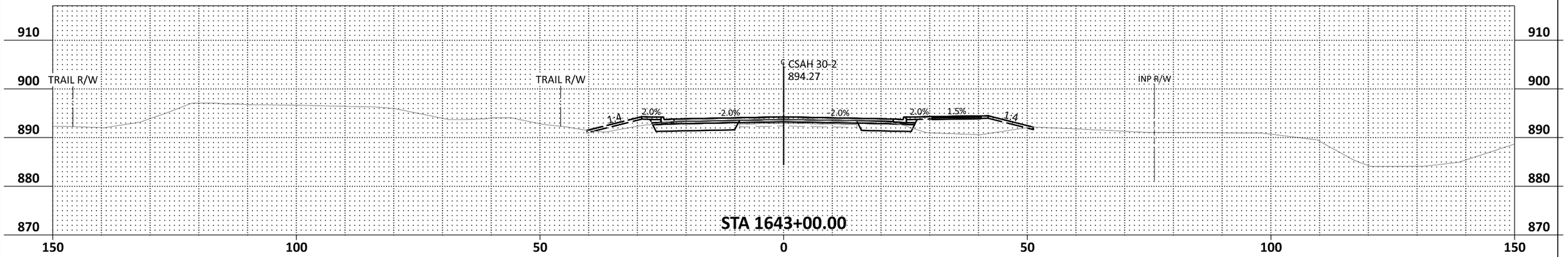
Chisago COUNTY USA

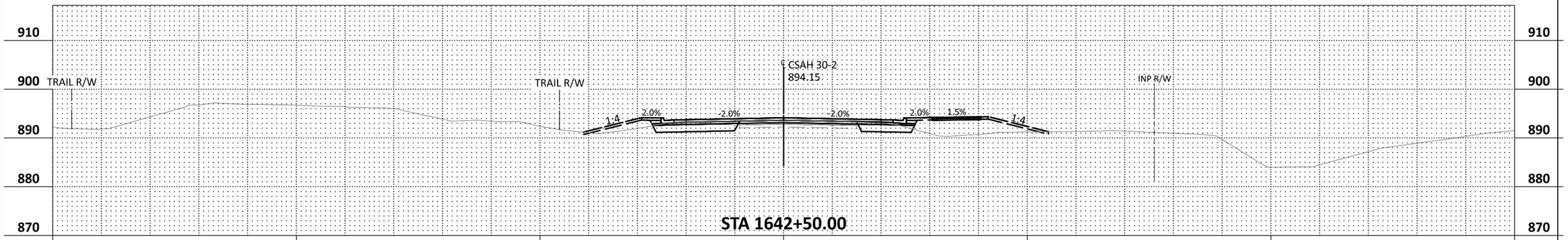
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

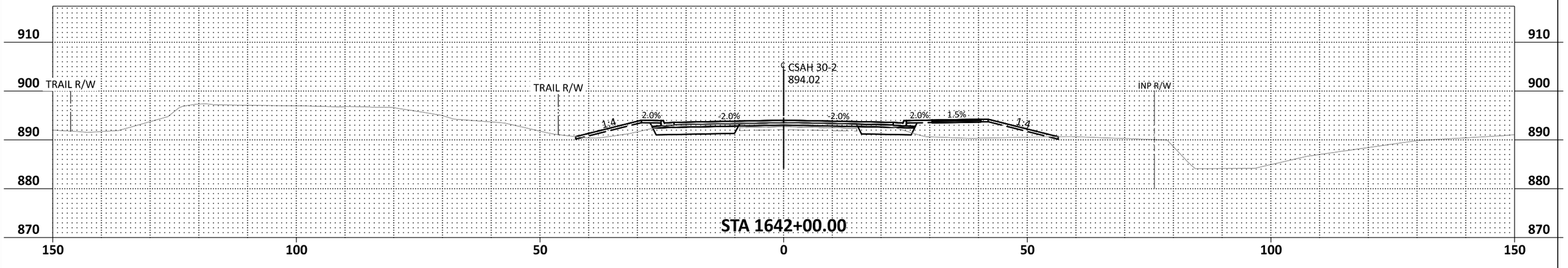
CHISAGO COUNTY, MINNESOTA

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

SHEET X42 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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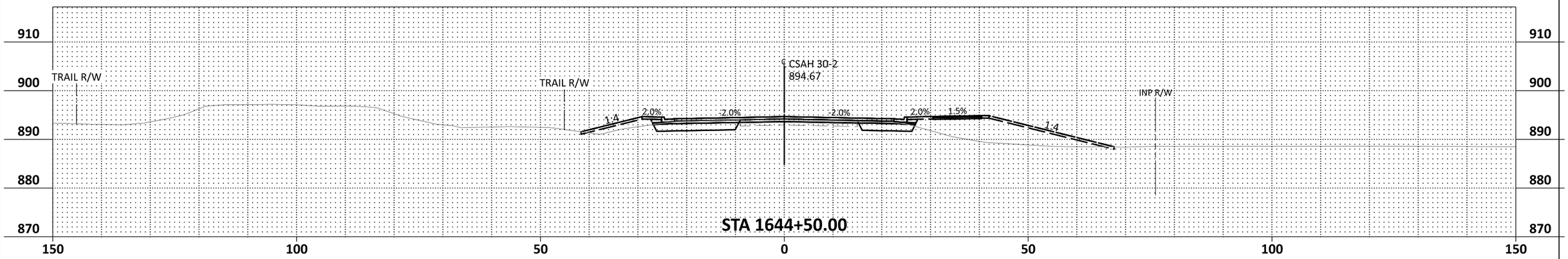
Chisago COUNTY USA

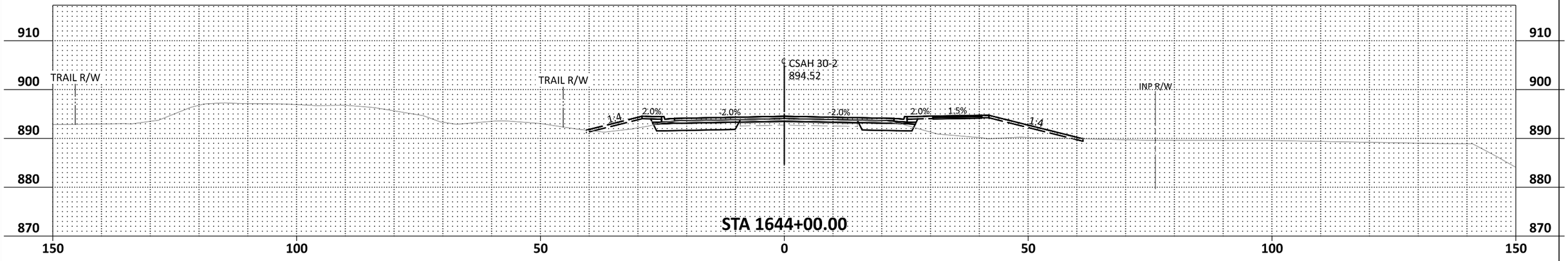
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

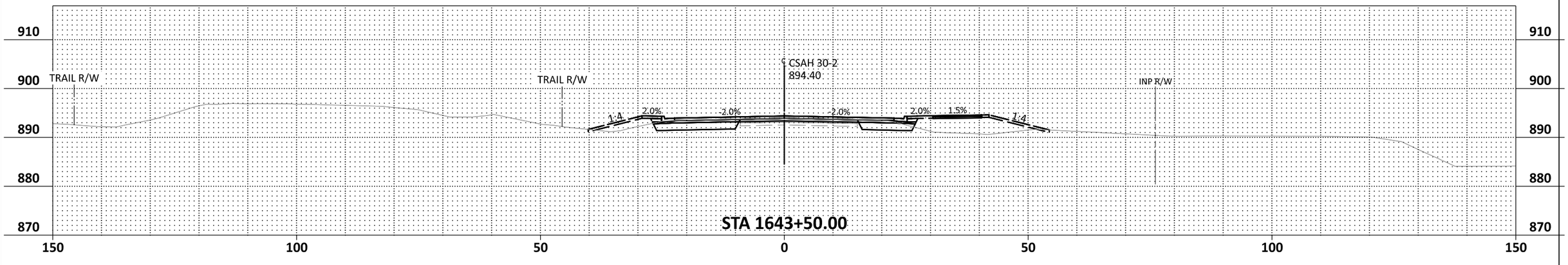
CHISAGO COUNTY, MINNESOTA

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

SHEET X43 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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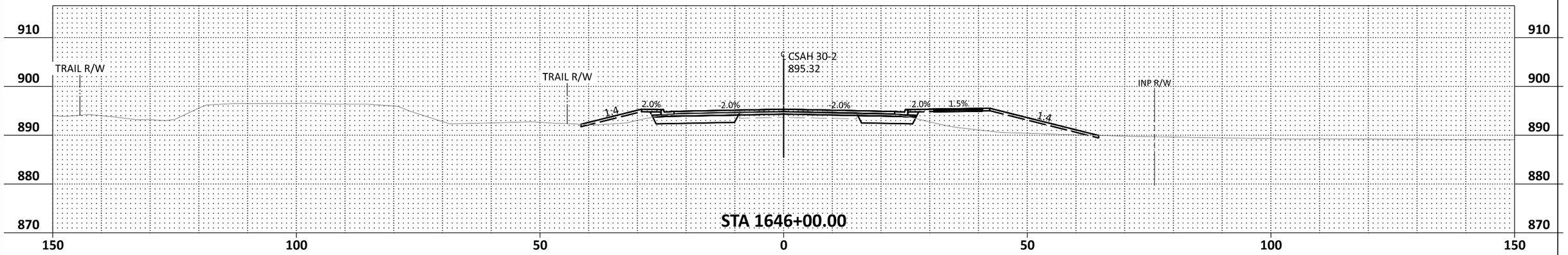
Chisago COUNTY USA

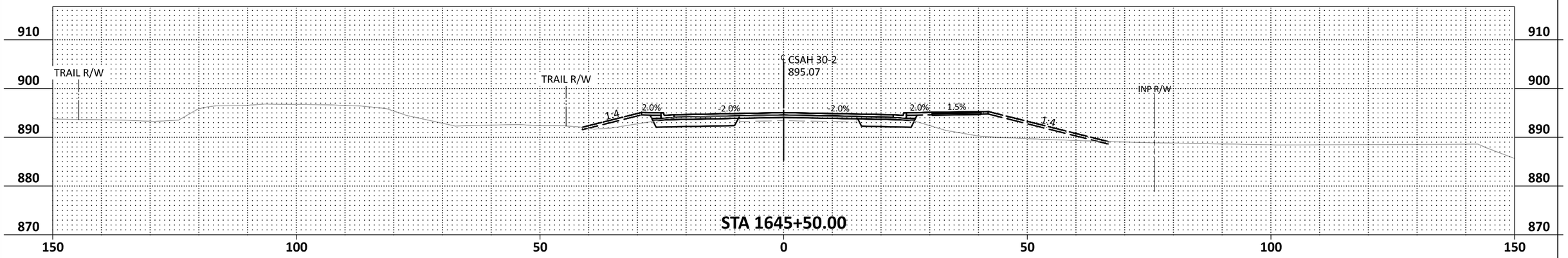
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

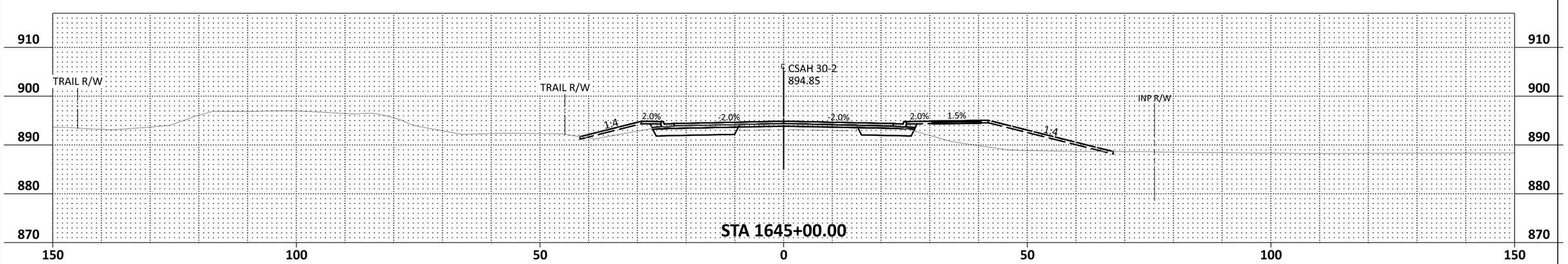
CHISAGO COUNTY, MINNESOTA

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

SHEET X44 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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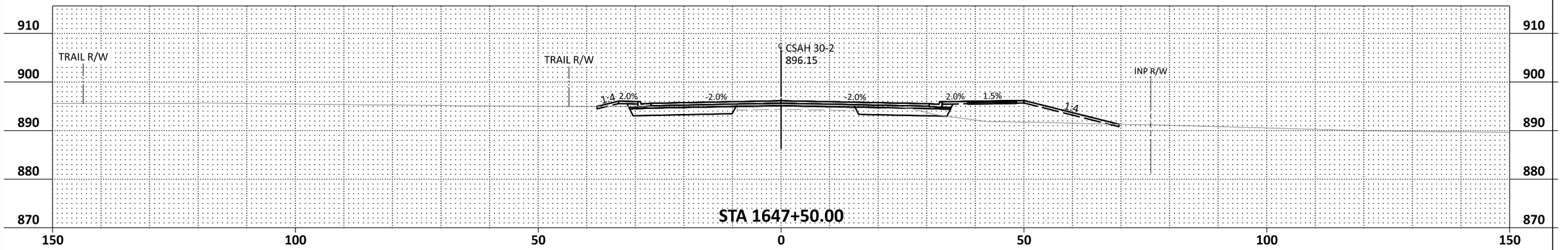
Chisago COUNTY USA

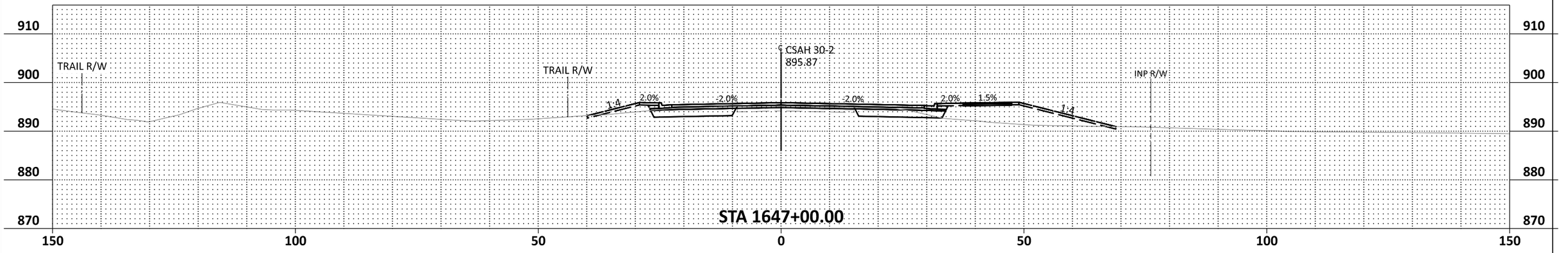
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

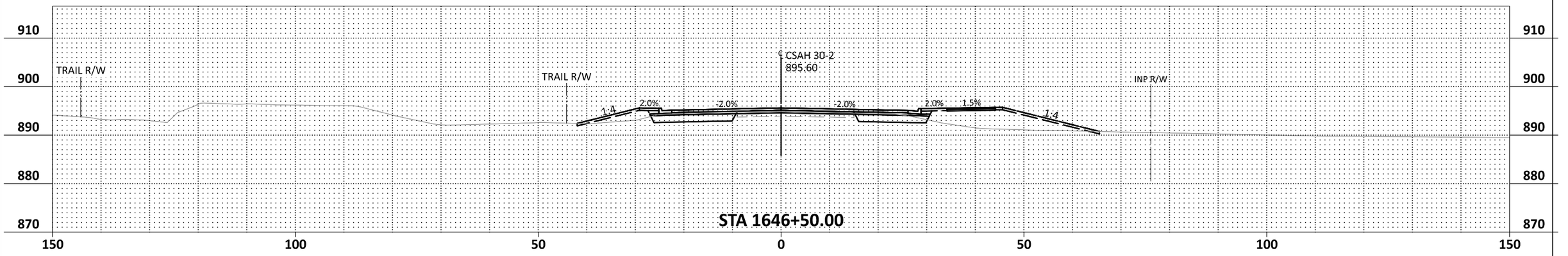
CHISAGO COUNTY, MINNESOTA

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

SHEET X45 OF X65 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

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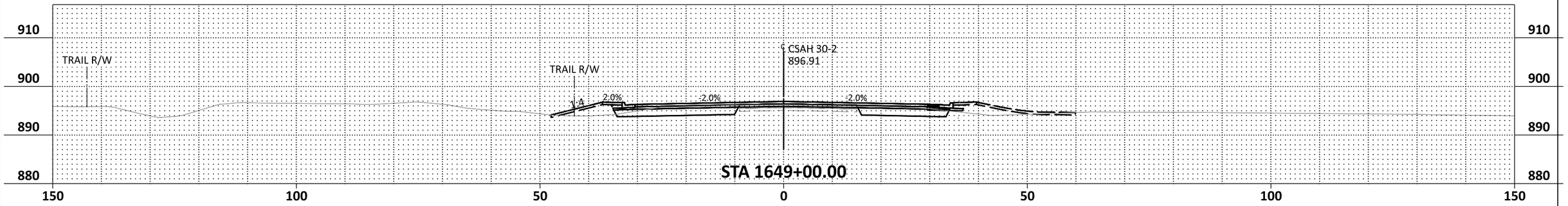
Chisago COUNTY USA

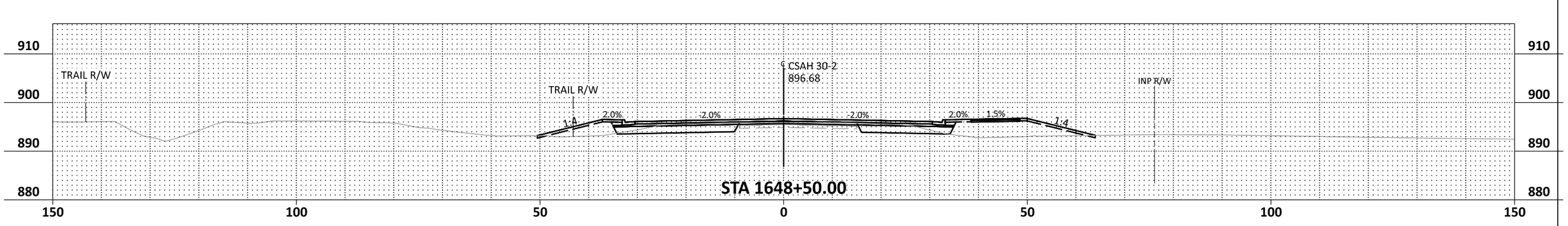
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

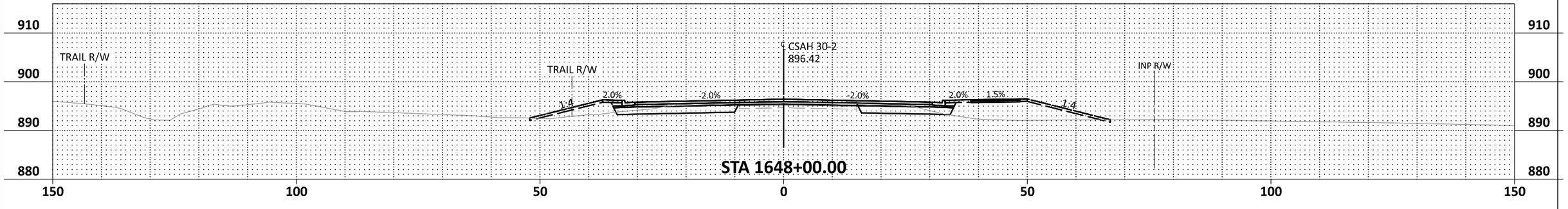
CHISAGO COUNTY, MINNESOTA

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

SHEET X46 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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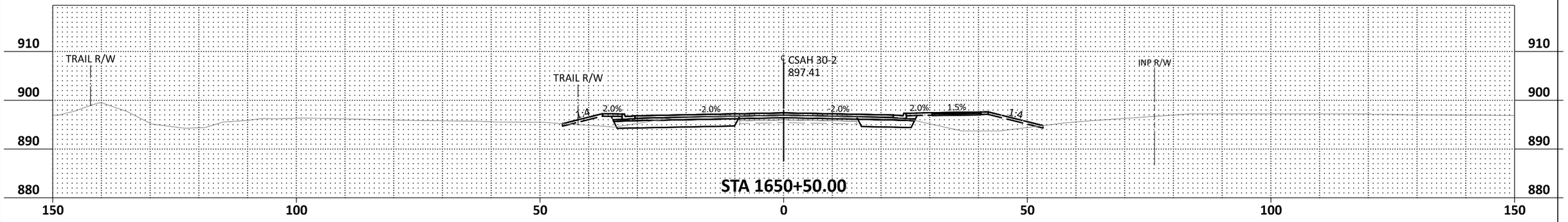
Chisago COUNTY USA

CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

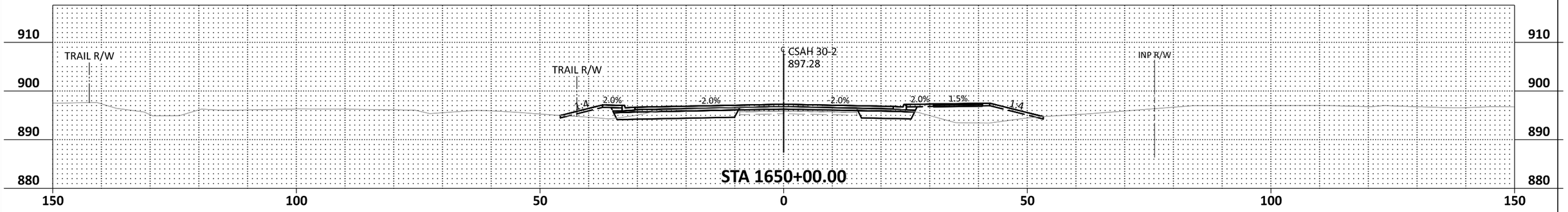
CHISAGO COUNTY, MINNESOTA

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

SHEET X47 OF X65 SHEETS



STA 1650+50.00



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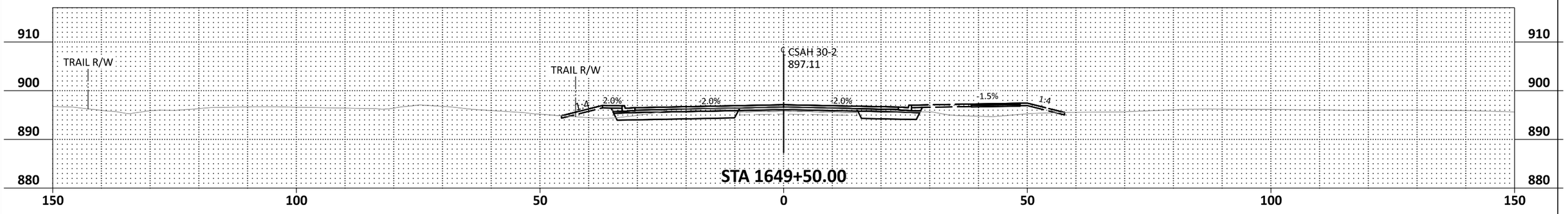

STA 1649+50.00

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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

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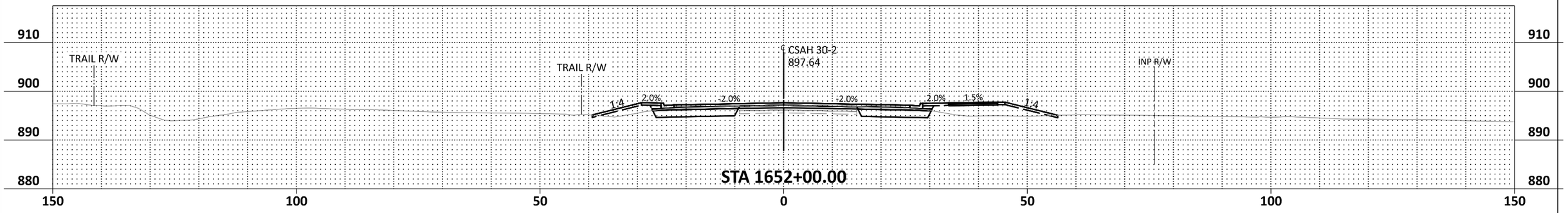
Chisago COUNTY USA

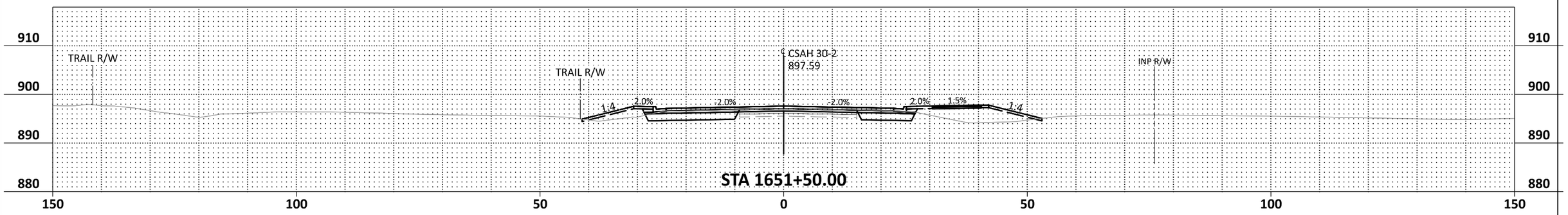
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

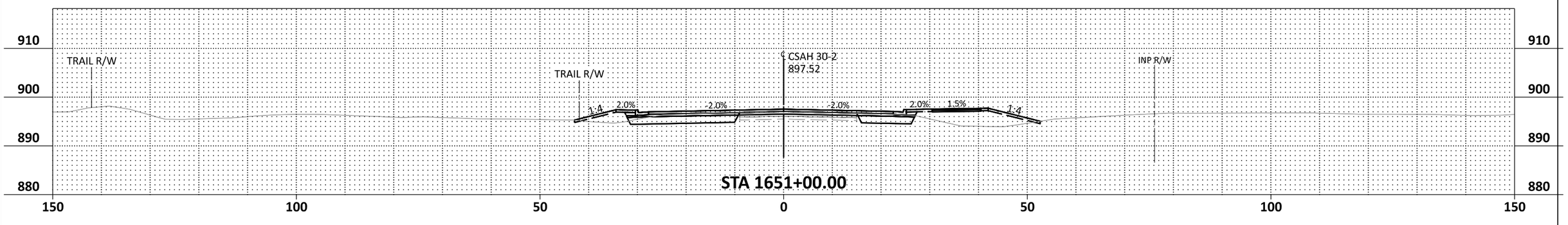
CHISAGO COUNTY, MINNESOTA

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

SHEET X48 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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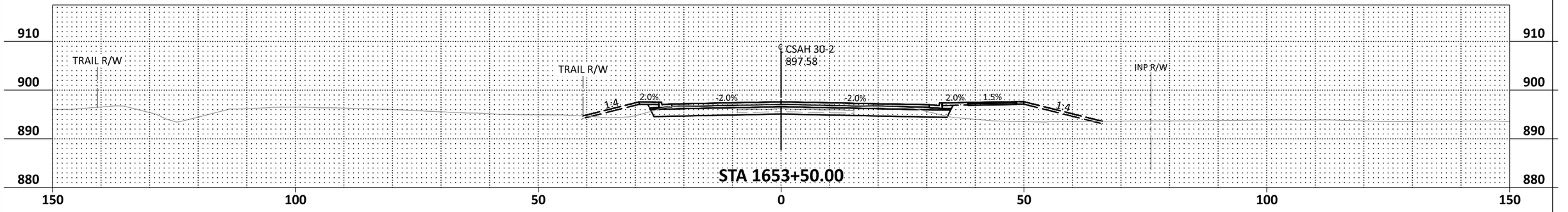
Chisago COUNTY USA

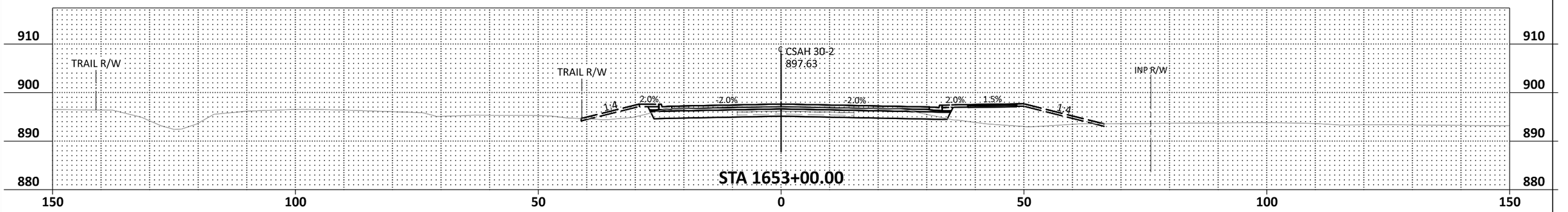
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

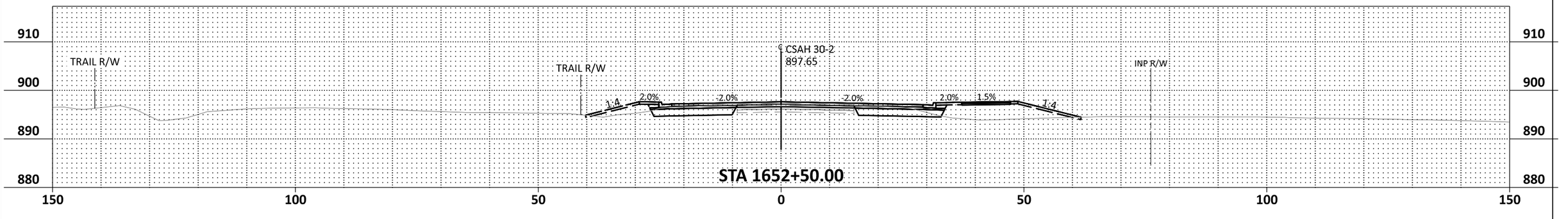
CHISAGO COUNTY, MINNESOTA

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

SHEET X49 OF X65 SHEETS







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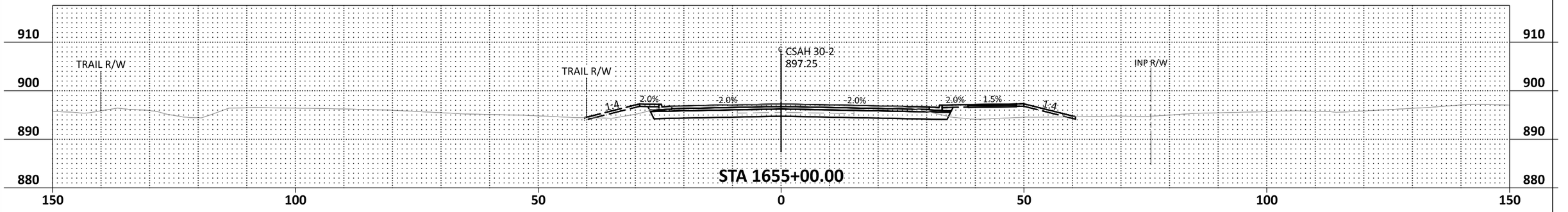
Chisago COUNTY USA

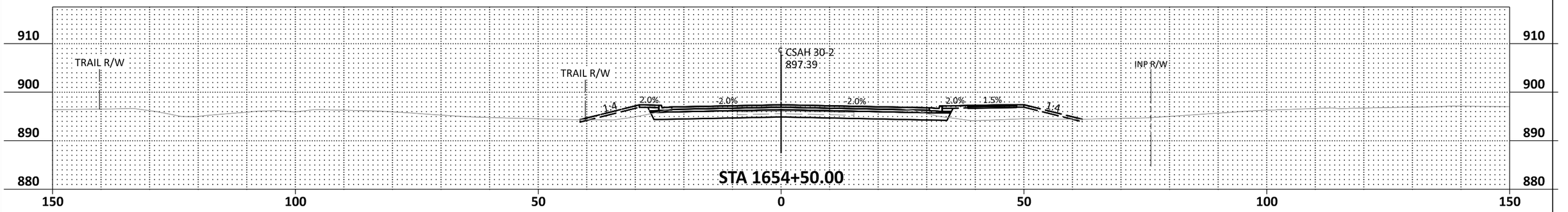
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

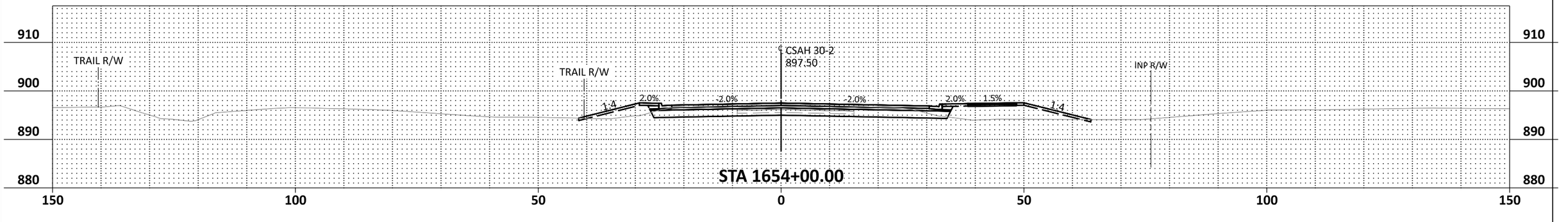
CHISAGO COUNTY, MINNESOTA

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

SHEET X50 OF X65 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

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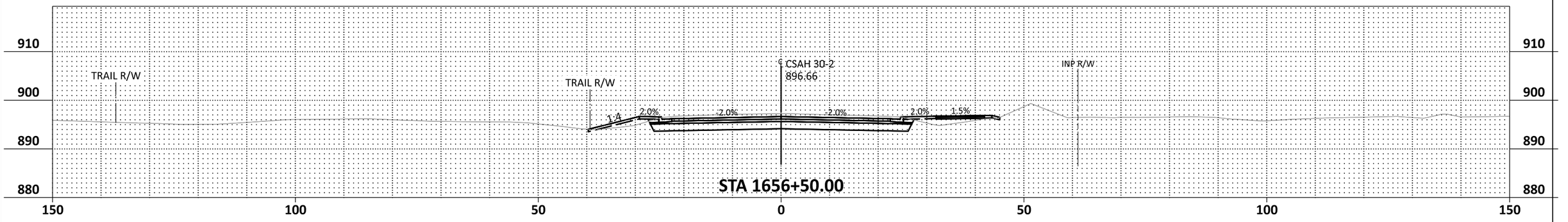
Chisago COUNTY USA

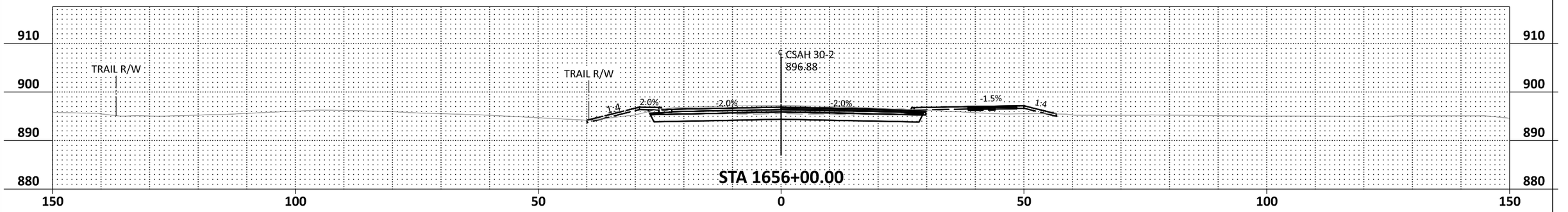
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

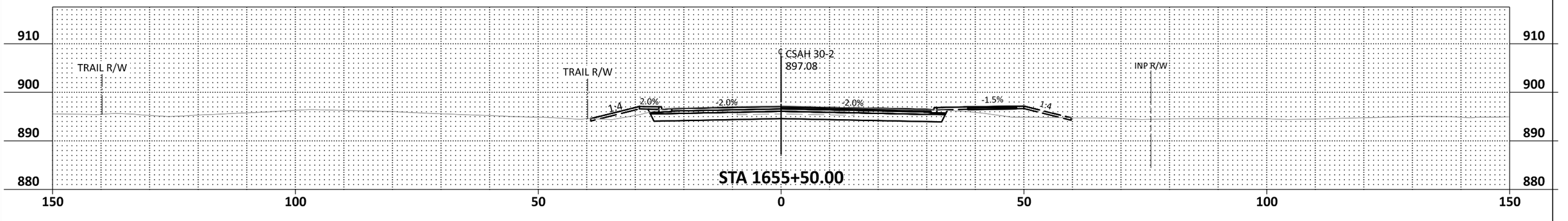
CHISAGO COUNTY, MINNESOTA

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

SHEET X51 OF X65 SHEETS







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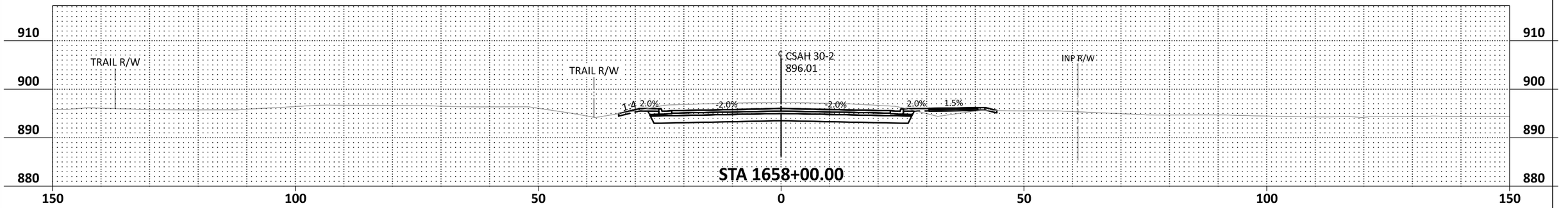
Chisago COUNTY USA

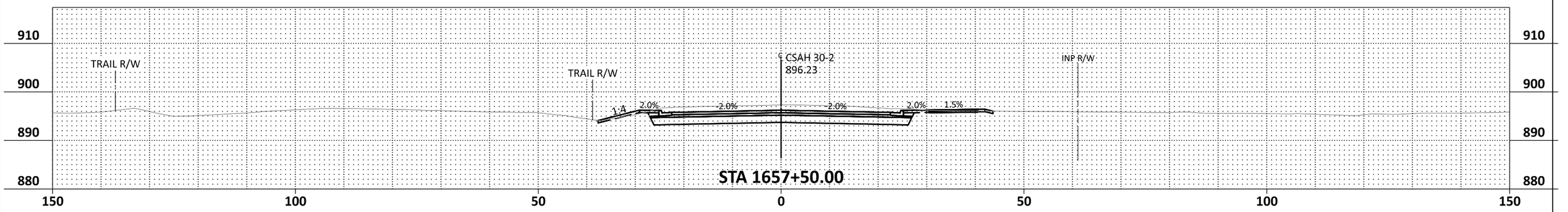
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

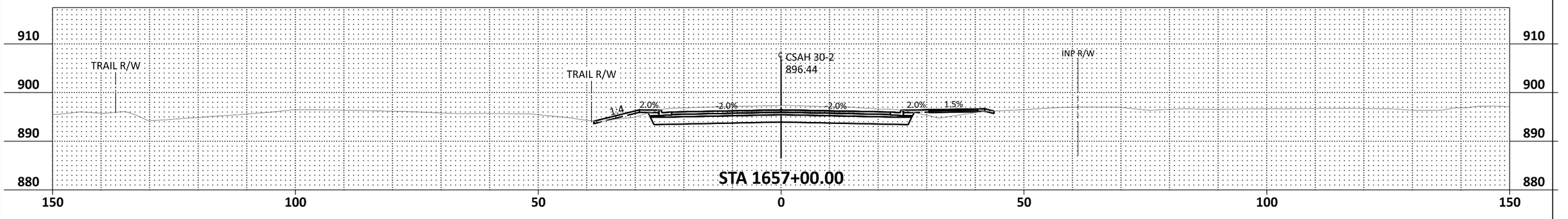
CHISAGO COUNTY, MINNESOTA

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

SHEET X52 OF X65 SHEETS







NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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Chisago COUNTY USA

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 X65 SHEETS

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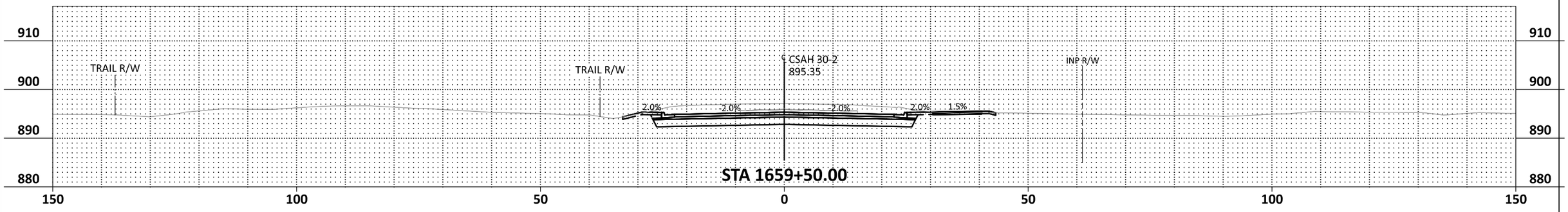

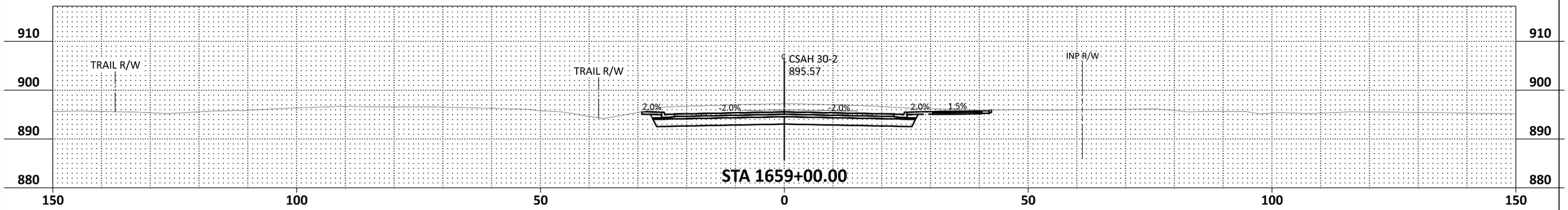

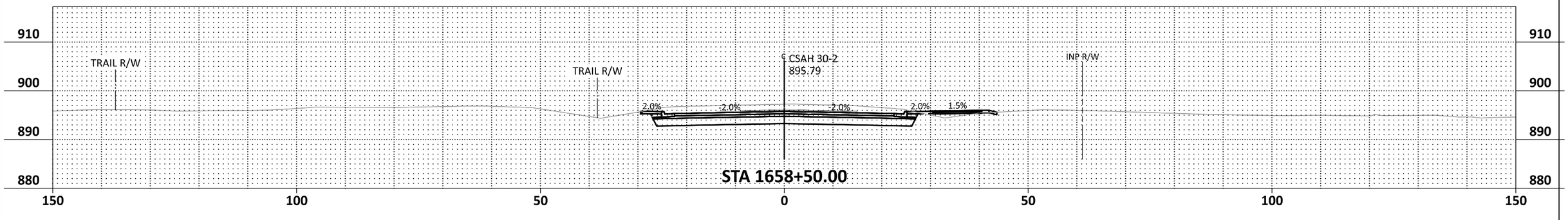

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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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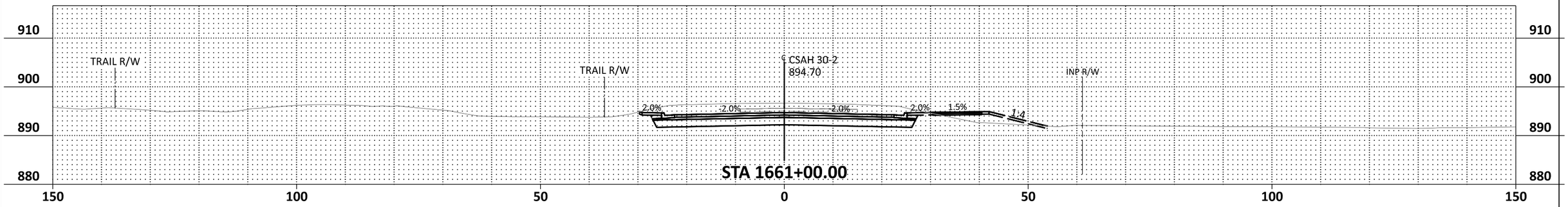
Chisago COUNTY USA

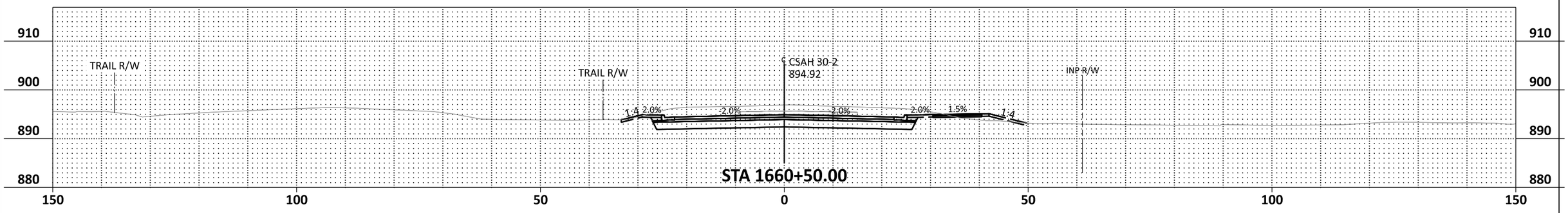
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

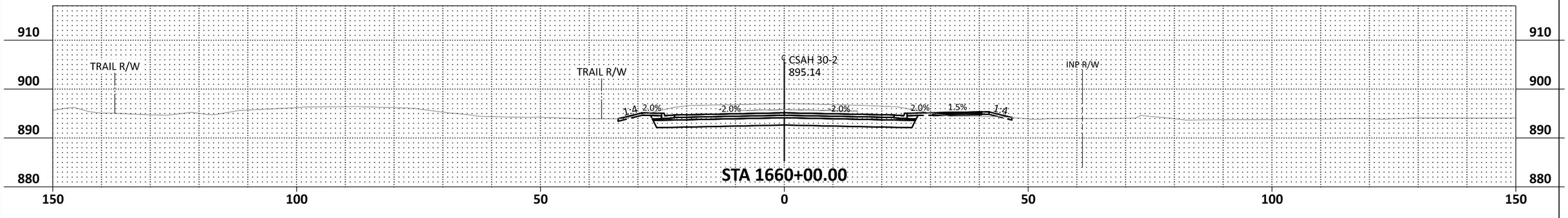
CHISAGO COUNTY, MINNESOTA

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

SHEET X54 OF X65 SHEETS







NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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Chisago COUNTY USA

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 X55 OF X65 SHEETS

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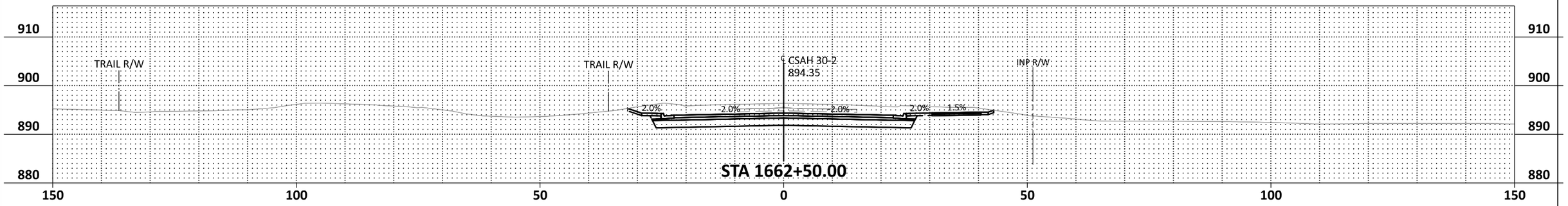

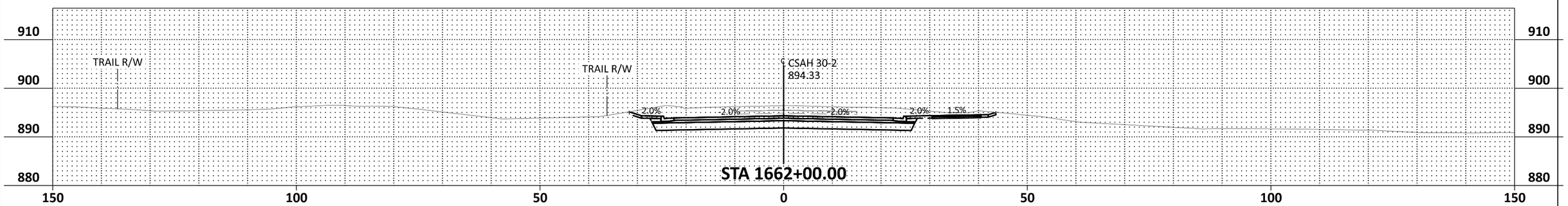

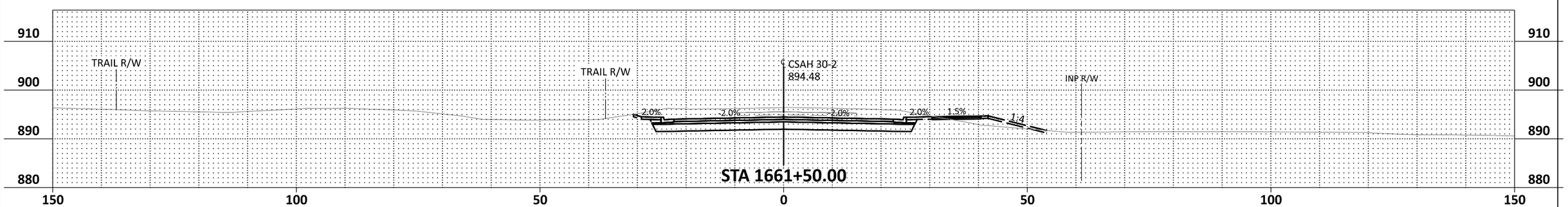

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NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
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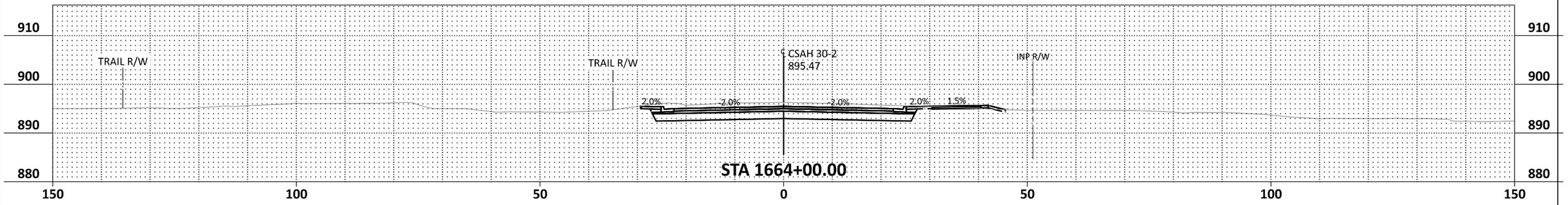
Chisago COUNTY USA

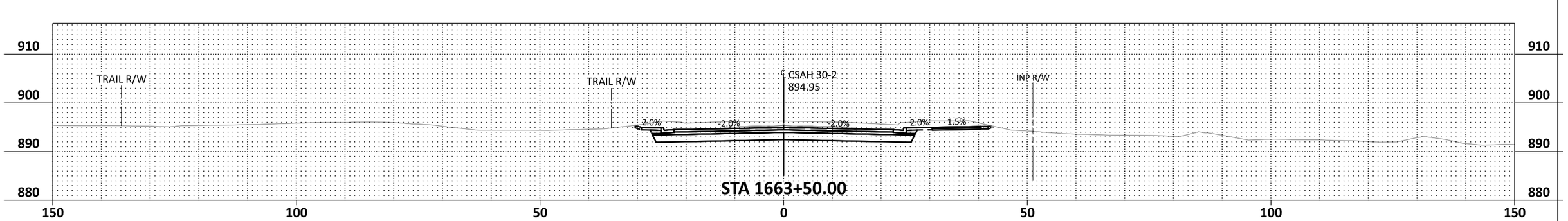
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

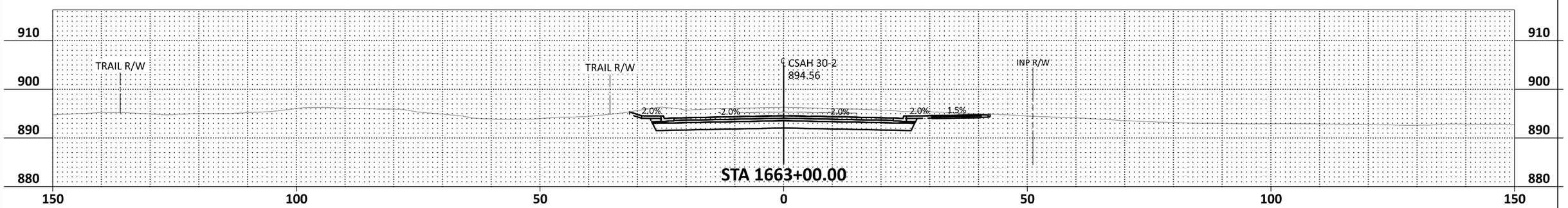
CHISAGO COUNTY, MINNESOTA

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

SHEET X56 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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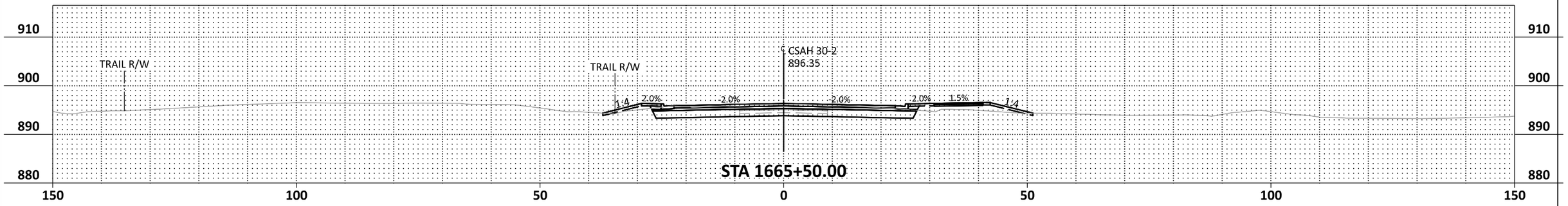
Chisago COUNTY USA

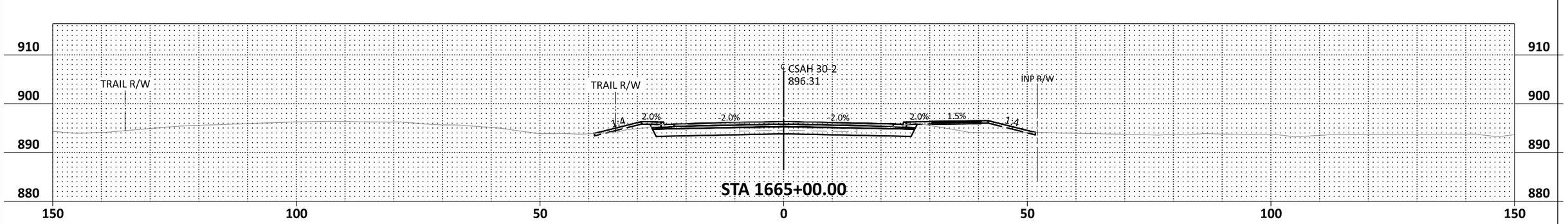
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

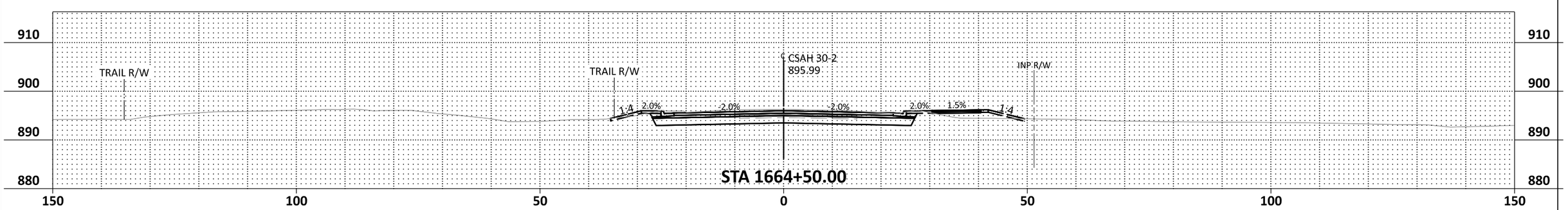
CHISAGO COUNTY, MINNESOTA

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

SHEET X57 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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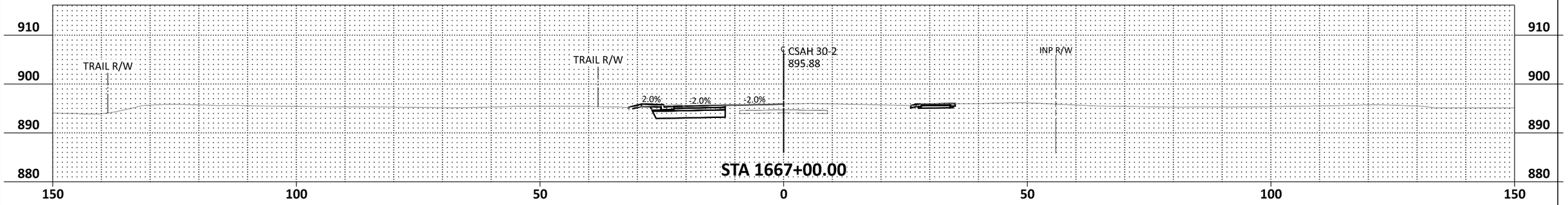
Chisago COUNTY USA

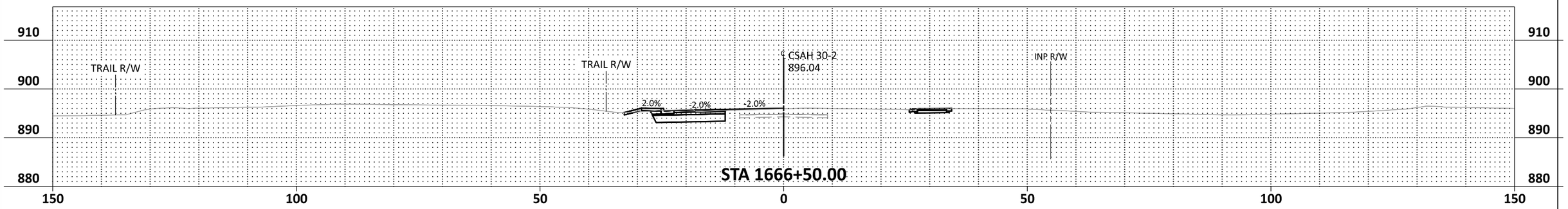
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

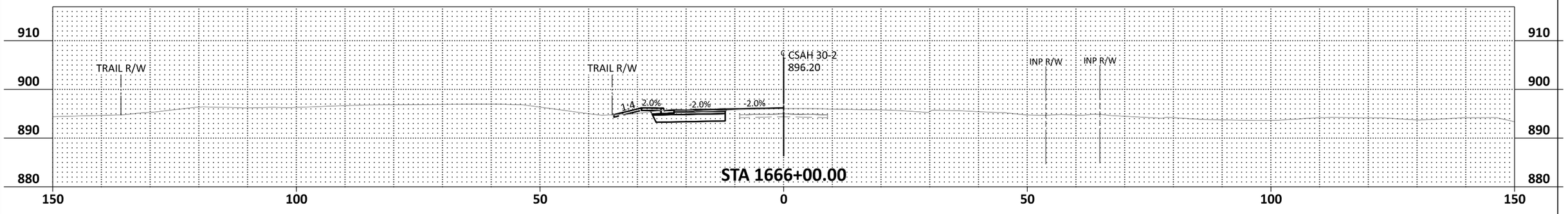
CHISAGO COUNTY, MINNESOTA

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

SHEET X58 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

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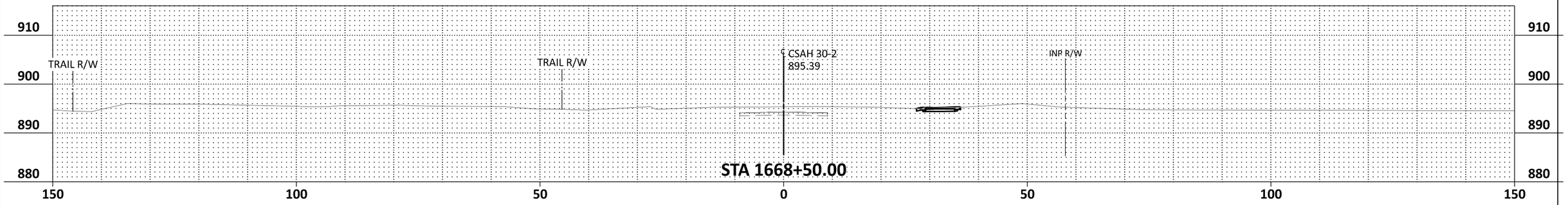
Chisago COUNTY USA

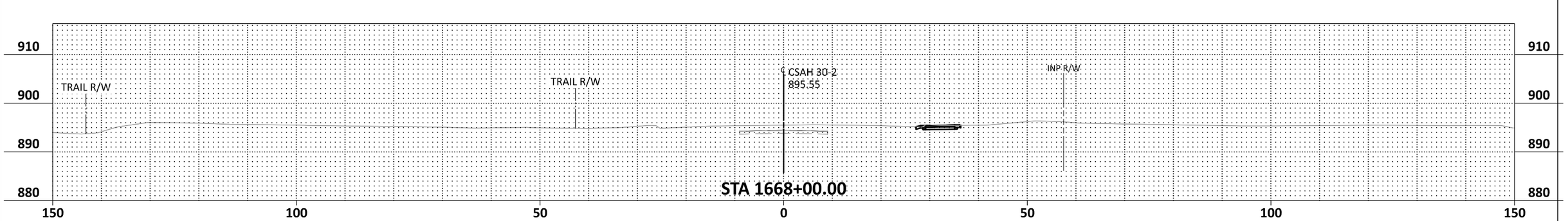
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

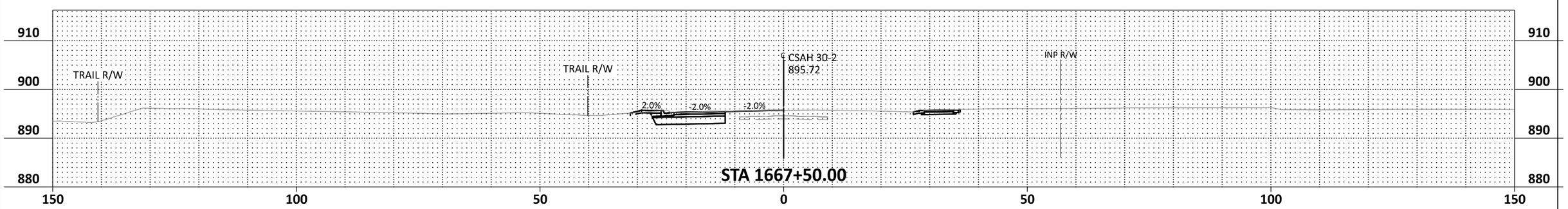
CHISAGO COUNTY, MINNESOTA

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

SHEET X59 OF X65 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

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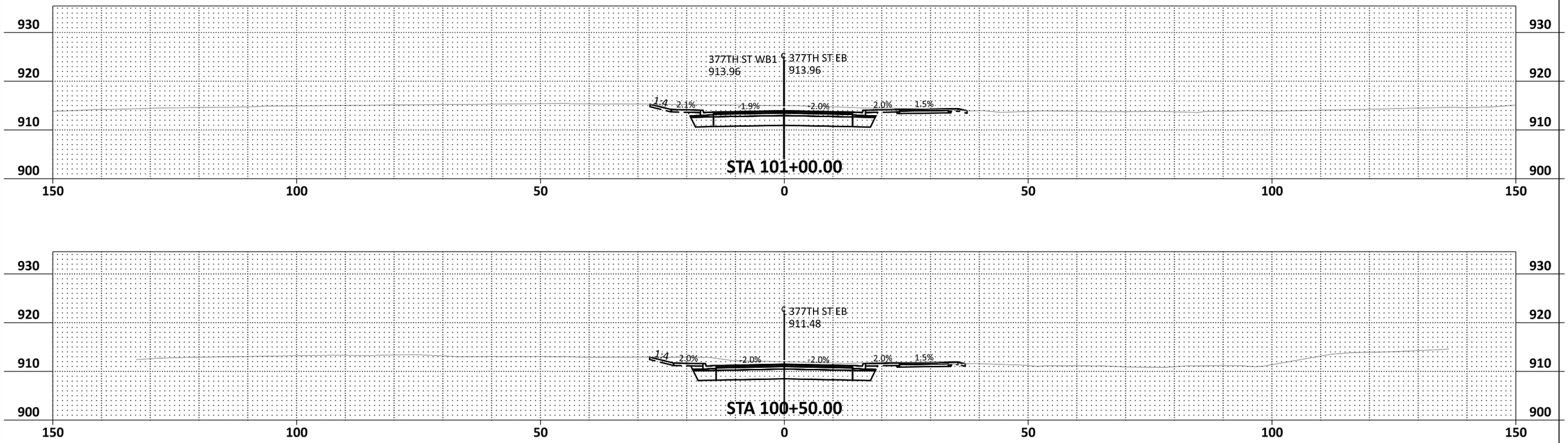
Chisago COUNTY USA

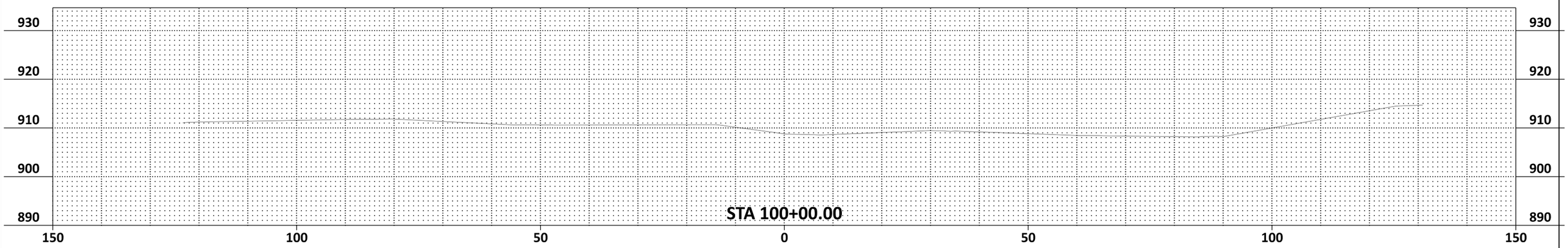
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

CHISAGO COUNTY, MINNESOTA

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

SHEET X60 OF X65 SHEETS





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NO.	DATE	BY	CHK	REVISIONS

Design By: MKV
Plan By: GAD
Checked By: AJP
Approved By: MKV

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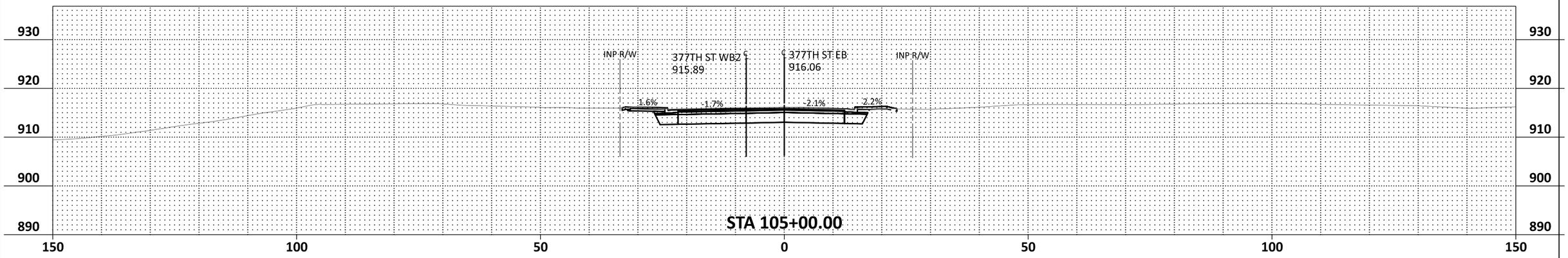
Chisago COUNTY USA

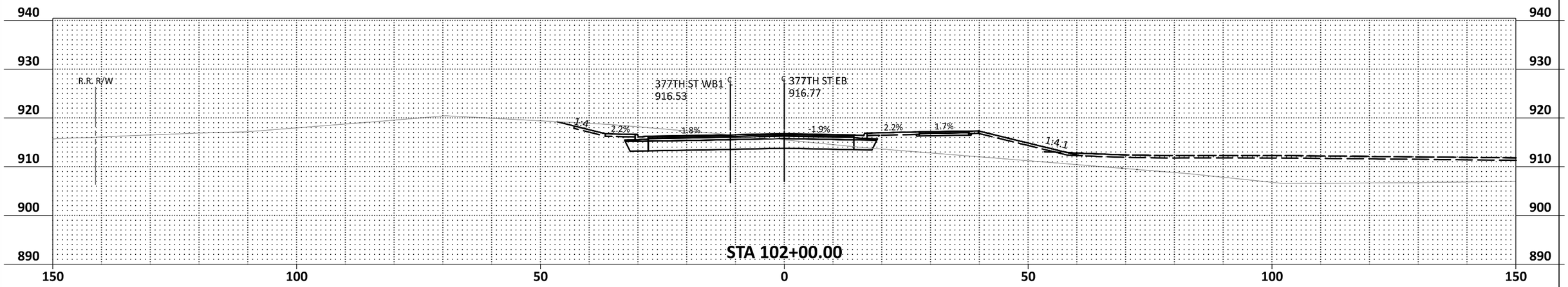
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

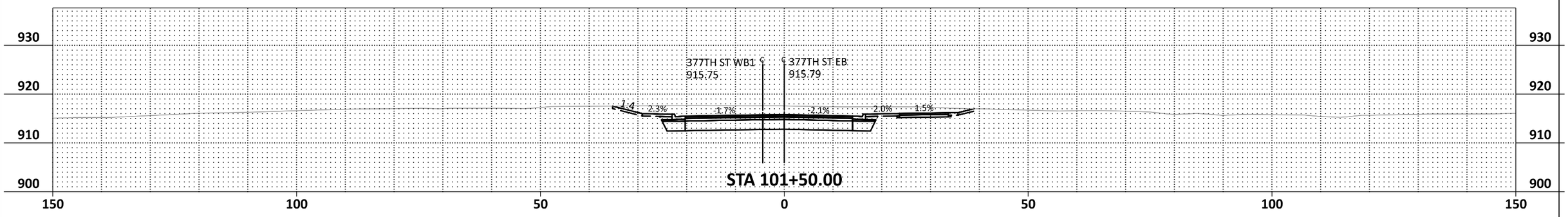
CHISAGO COUNTY, MINNESOTA

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

SHEET X61 OF X65 SHEETS







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NO.	DATE	BY	CHK	REVISIONS

Design By:	MKV
Plan By:	GAD
Checked By:	AJP
Approved By:	MKV

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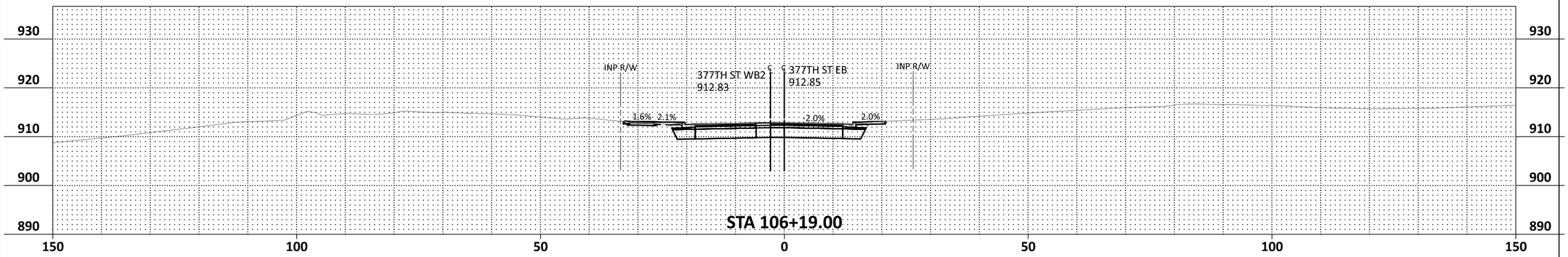
Chisago COUNTY USA

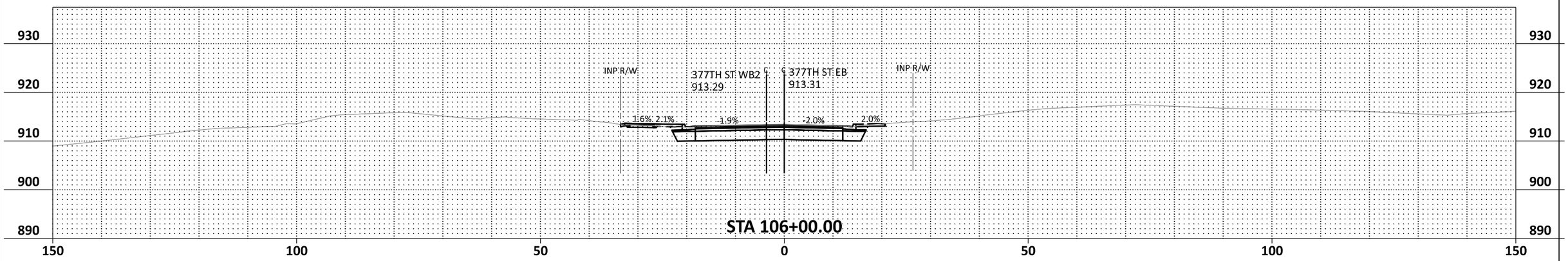
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

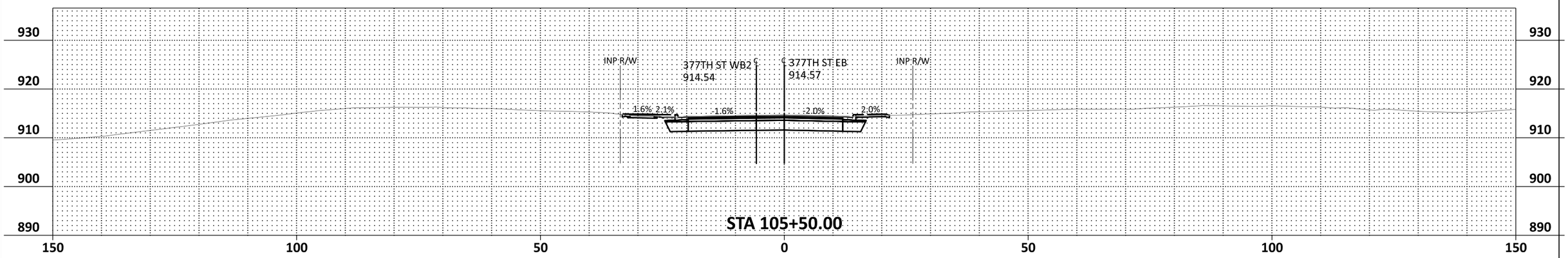
CHISAGO COUNTY, MINNESOTA

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
Plan By:	GAD
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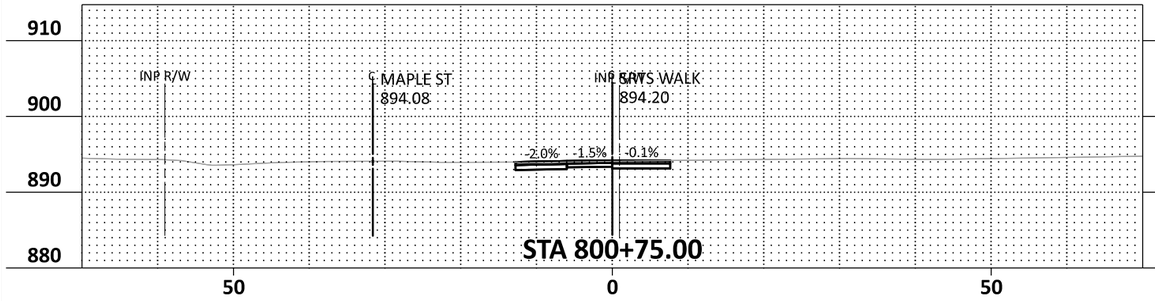
Chisago COUNTY USA

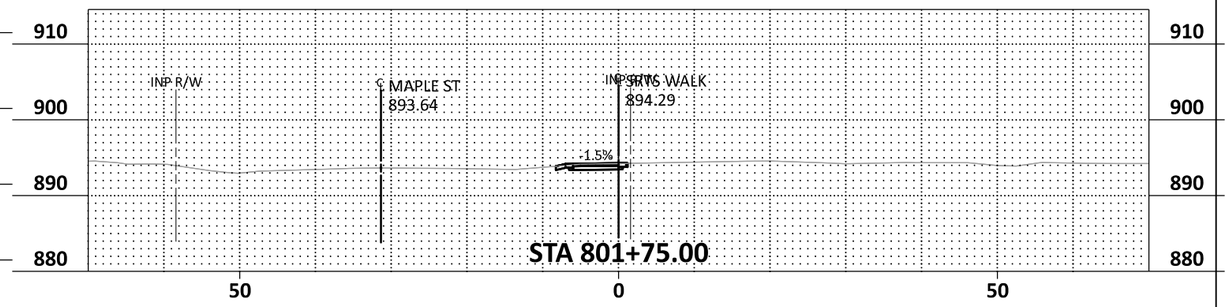
CSAH 30 (Forest Blvd) Improvements
Chisago County, Minnesota

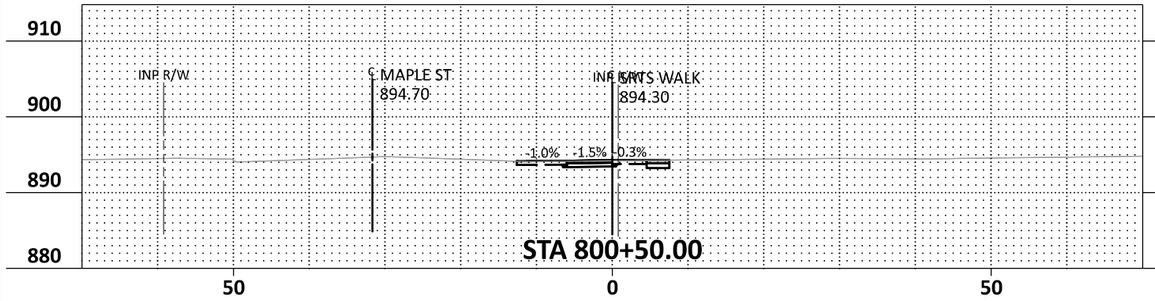
CHISAGO COUNTY, MINNESOTA

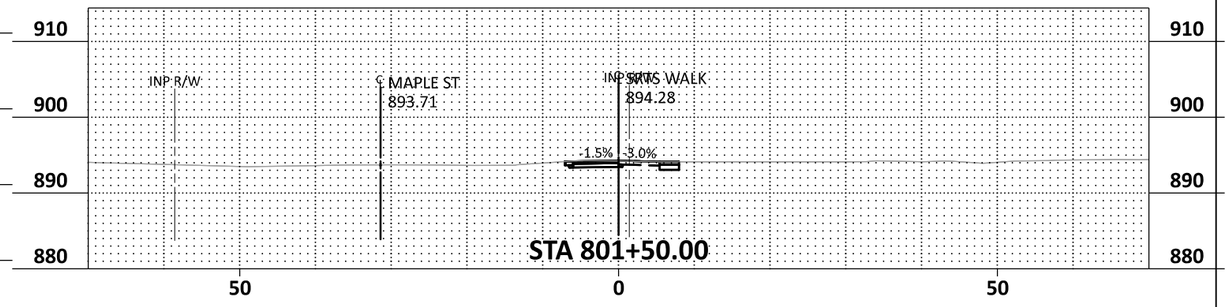
CROSS SECTIONS
SAP 013-630-021 / SAP 225-591-007 / SAP 225-102-004

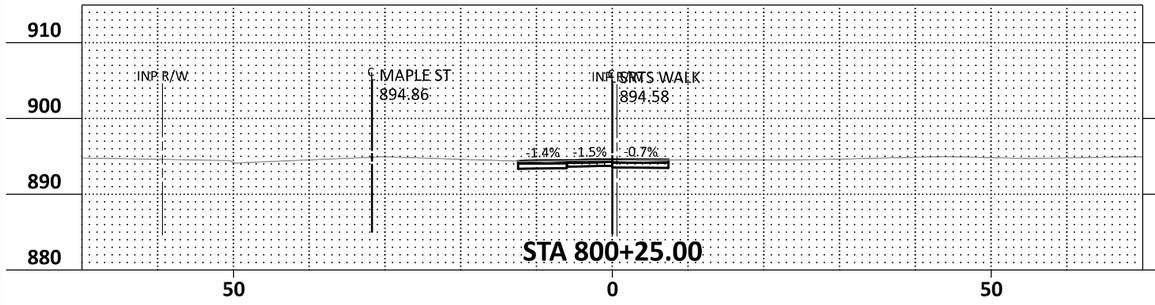
SHEET X63 OF X65 SHEETS

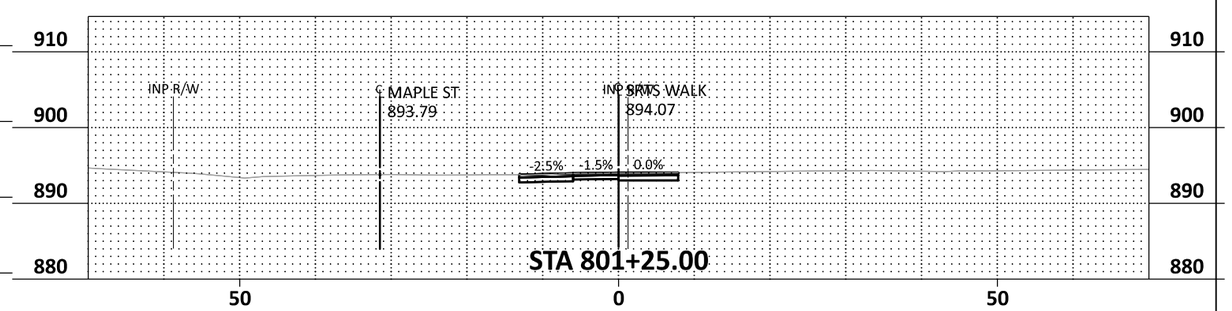


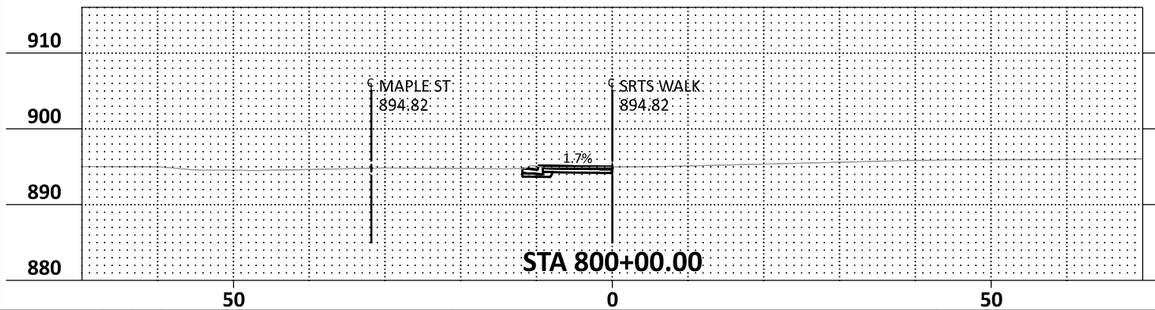


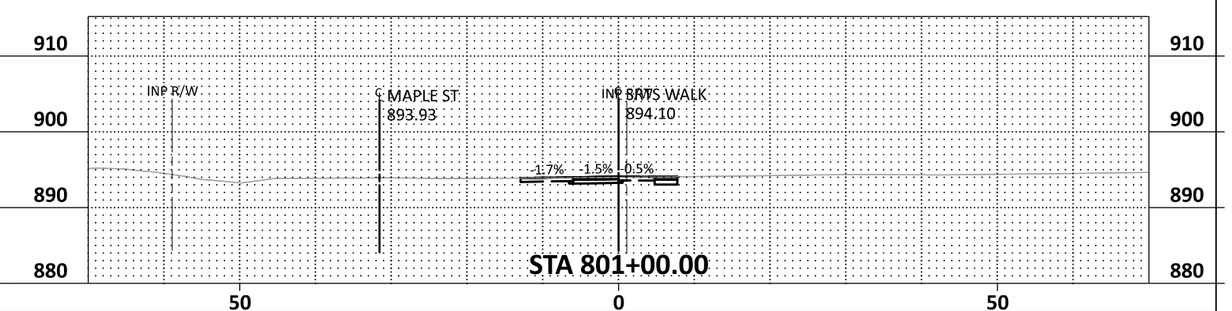












NO.	DATE	BY	CHK	REVISIONS

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 X64 OF X65 SHEETS

DATE: 9/12/2024 2:15:04 PM
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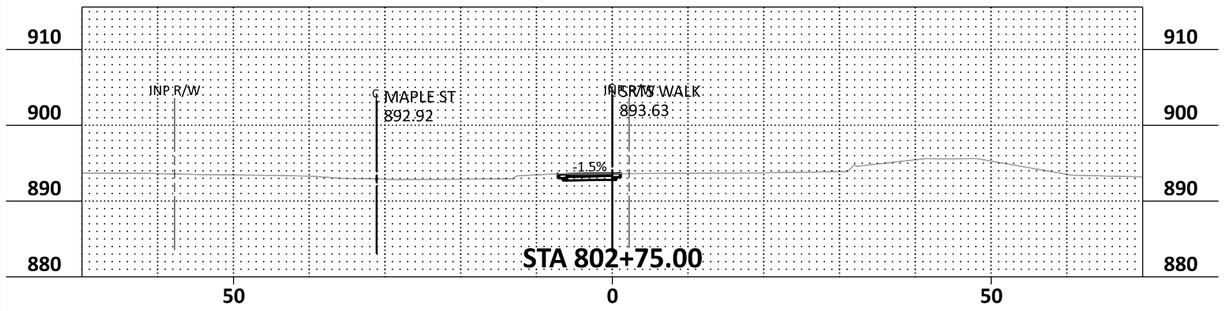

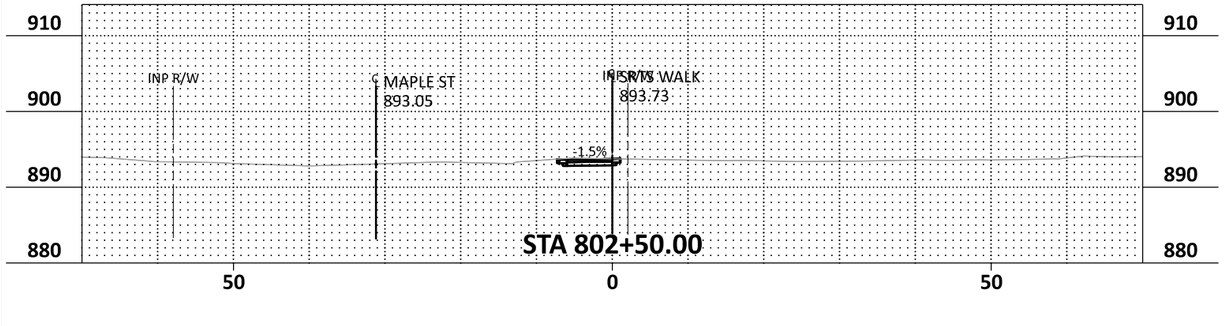

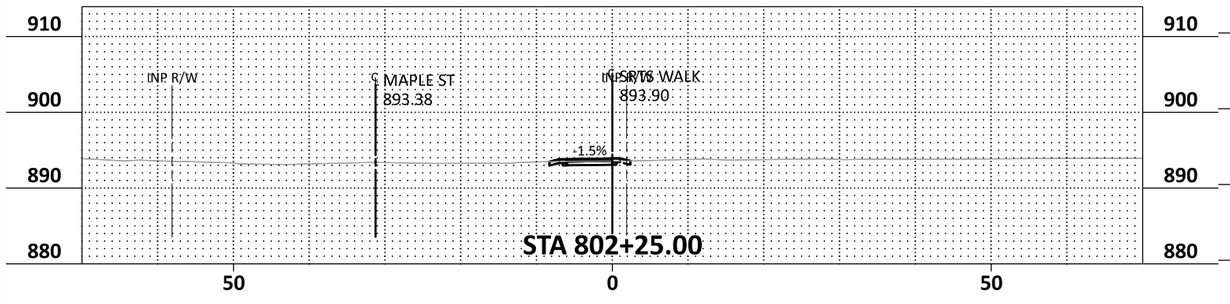

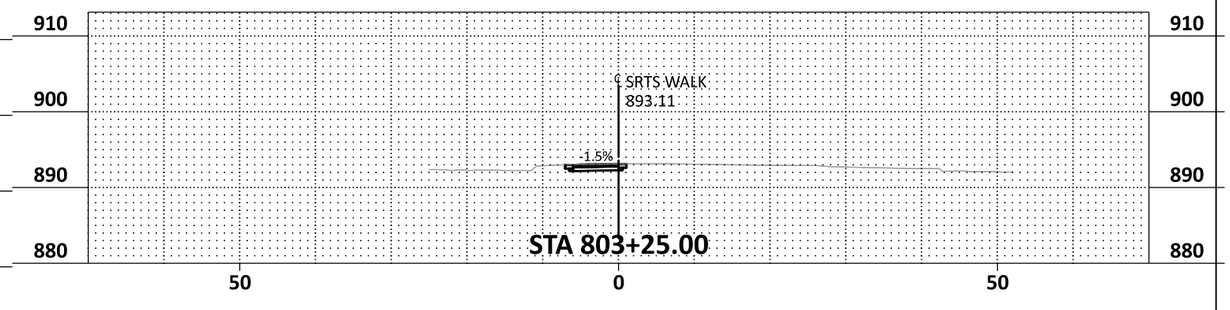

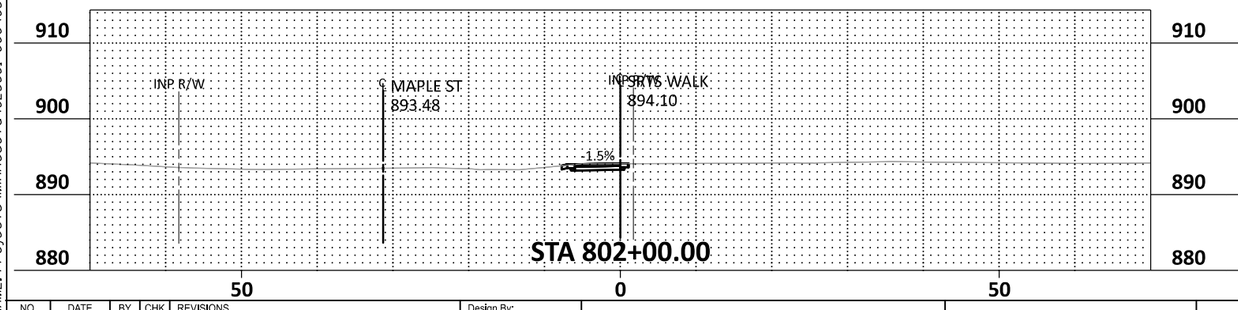

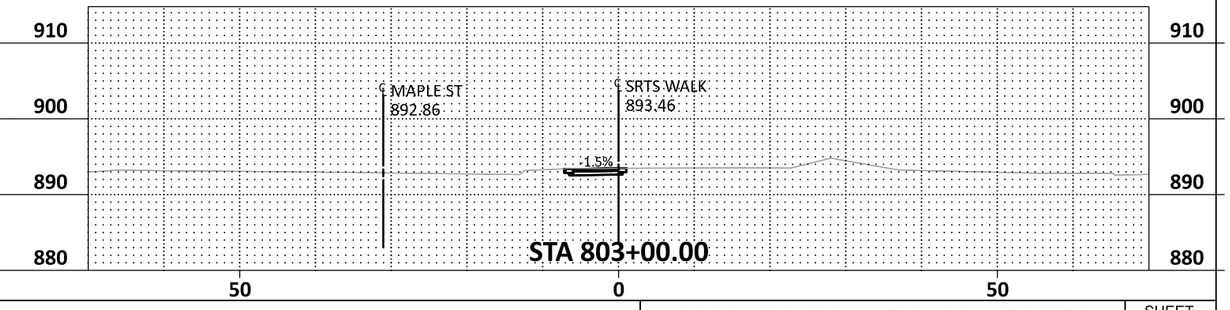

NO.	DATE	BY	CHK	REVISIONS

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 X65 OF X65 SHEETS

DATE: 9/12/2024 2:15:06 PM
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100% OPINIO

WSB Project: CSAH 30 (Forest Blvd) Corridor Improvements
Project Location: North Branch, Chisago County, MN
Project No.: SAP 013-630-021, 225-591-007, 225-102-004
Date: 9/12/2024

STATEMENT OF

Item No.	Description	Notes	Unit	Unit Price	PROJECT TOTAL		Cl ROAD RECONDITIONING	
					Estimated Quantity	Estimated Cost	Estimated Quantity	Estimated Cost
2021.501	MOBILIZATION		LUMP SUM	$390,000.00	1	$390,000.00	0.06	$23,400.00
2051.501	MAINT AND RESTORATION OF HAUL ROADS		LUMP SUM	$5,000.00	1	$5,000.00		
2101.502	CLEARING		EACH	$325.00	51	$16,575.00		
2101.502	GRUBBING		EACH	$265.00	51	$13,515.00		
2101.505	CLEARING		ACRE	$5,400.00	0.7	$3,780.00		
2101.505	GRUBBING		ACRE	$5,600.00	0.7	$3,920.00		
2104.502	REMOVE BOX CULVERT		EACH	$12,000.00	2	$24,000.00		
2104.502	REMOVE BOX CULVERT END		EACH	$2,000.00	4	$8,000.00		
2104.502	REMOVE GATE VALVE AND BOX		EACH	$500.00	4	$2,000.00		
2104.502	REMOVE HYDRANT		EACH	$600.00	4	$2,400.00		
2104.502	REMOVE DELINEATOR / MARKER		EACH	$40.00	5	$200.00		
2104.502	REMOVE SIGN		EACH	$60.00	25	$1,500.00		
2104.502	REMOVE LIGHT FOUNDATION		EACH	$400.00	6	$2,400.00		
2104.502	SALVAGE LIGHTING UNIT		EACH	$450.00	6	$2,700.00		
2104.502	SALVAGE SIGN		EACH	$60.00	5	$300.00		
2104.502	SALVAGE MAIL BOX SUPPORT		EACH	$45.00	14	$630.00		
2104.503	SAWING CONCRETE PAVEMENT (FULL DEPTH)		LIN FT	$8.00	695	$5,560.00		
2104.503	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)		LIN FT	$2.50	758	$1,895.00		
2104.503	REMOVE PIPE CULVERTS		LIN FT	$15.00	914	$13,710.00		
2104.503	REMOVE WATER MAIN		LIN FT	$25.00	110	$2,750.00		
2104.503	REMOVE CURB AND GUTTER		LIN FT	$5.00	1120	$5,600.00		
2104.503	REMOVE GUARDRAIL-PLATE BEAM		LIN FT	$7.00	465	$3,255.00		
2104.503	REMOVE STEEL CASING		LIN FT	$20.00	100	$2,000.00		
2104.503	REMOVE TENSION CABLE GUARDRAIL		LIN FT	$5.00	505	$2,525.00		
2104.504	REMOVE PAVEMENT	(3) (4)	SQ YD	$8.00	10531	$84,248.00		
2104.504	REMOVE CONCRETE DRIVEWAY PAVEMENT		SQ YD	$14.00	431	$6,034.00		
2104.504	REMOVE BITUMINOUS DRIVEWAY PAVEMENT		SQ YD	$6.00	710	$4,260.00		
2104.504	REMOVE BITUMINOUS PAVEMENT	(4)	SQ YD	$4.50	35469	$159,610.50		
2104.518	REMOVE BITUMINOUS WALK		SQ FT	$1.50	10035	$15,052.50		
2104.518	REMOVE CONCRETE WALK		SQ FT	$2.00	970	$1,940.00		
2104.602	REMOVE SIGN SPECIAL		EACH	$75.00	1	$75.00		
2104.602	SALVAGE SIGN SPECIAL		EACH	$60.00	7	$420.00		
2104.602	SALVAGE SIGN PANEL SPECIAL		EACH	$70.00	3	$210.00		
2106.507	EXCAVATION - COMMON	(P)	CU YD	$12.00	21939	$263,268.00		
2106.507	EXCAVATION - SUBGRADE	(P)	CU YD	$14.00	20851	$291,914.00		
2106.507	SELECT GRANULAR EMBANKMENT (CV)	(P)	CU YD	$23.00	24404	$561,292.00		
2106.507	SELECT GRANULAR EMBANKMENT MOD 10% (CV)	(P)	CU YD	$50.00	11	$540.00		
2106.507	COMMON EMBANKMENT (CV)	(P)	CU YD	$9.00	13075	$117,675.00		
2106.601	DEWATERING	(2)	LUMP SUM	$45,000.00	1	$45,000.00		
2130.523	WATER	(6)	M GALLON	$60.00	400	$24,000.00		
2211.507	AGGREGATE BASE (CV) CLASS 5	(P)	CU YD	$30.00	12188	$365,640.00		
2221.509	SHOULDER BASE AGGREGATE CLASS 5 MOD		TON	$35.00	494	$17,290.00		
2232.504	MILL BITUMINOUS SURFACE (2.0")		SQ YD	$1.70	40837	$69,422.90	36863	$62,667.10
2355.506	BITUMINOUS MATERIAL FOR FOG SEAL		GALLON	$2.50	2163	$5,407.50	2163	$5,407.50
2357.506	BITUMINOUS MATERIAL FOR TACK COAT		GALLON	$2.50	11170	$27,925.00	3326	$8,315.00
2360.509	TYPE SP 12.5 NON WEARING COURSE MIXTURE (3,B)		TON	$82.00	5102	$418,364.00		
2360.509	TYPE SP 12.5 WEARING COURSE MIXTURE (3,C)		TON	$84.00	17081	$1,434,804.00	4413	$370,692.00
2360.509	TYPE SP 12.5 WEARING COURSE MIXTURE (4;F)		TON	$95.00	477	$45,315.00		
2360.509	TYPE SP 12.5 NON WEARING COURSE MIXTURE (4;F)		TON	$90.00	239	$21,510.00		
2411.507	STRUCTURE EXCAVATION CLASS E		CU YD	$22.00	2743	$60,346.00		
2412.502	9X4 PRECAST CONCRETE BOX CULVERT END SECTION	(9)	EACH	$20,000.00	2	$40,000.00		
2412.503	9X4 PRECAST CONCRETE BOX CULVERT	(9)	LIN FT	$1,400.00	200	$280,000.00		

100% OPINION

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STATEMENT OF

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					Estimated Quantity	Estimated Cost	Estimated Quantity	Estimated Cost
2451.507	GRANULAR BEDDING (CV)		CU YD	$30.00	183	$5,490.00		
2501.502	18" GS PIPE APRON		EACH	$1,300.00	14	$18,200.00		
2501.502	15" RC PIPE APRON		EACH	$1,150.00	2	$2,300.00		
2501.502	18" RC PIPE APRON		EACH	$1,400.00	8	$11,200.00		
2501.502	24" RC PIPE APRON		EACH	$1,650.00	6	$9,900.00		
2501.502	30" RC PIPE APRON		EACH	$1,800.00	3	$5,400.00		
2501.502	36" RC PIPE APRON		EACH	$3,000.00	1	$3,000.00		
2501.502	15" RC SAFETY APRON		EACH	$1,500.00	2	$3,000.00		
2501.502	18" RC SAFETY APRON		EACH	$1,600.00	2	$3,200.00		
2501.503	18" CAS PIPE CULVERT		LIN FT	$65.00	320	$20,800.00		
2501.503	18" RC PIPE CULVERT DESIGN 3006 CLASS III		LIN FT	$110.00	260	$28,600.00		
2501.503	24" RC PIPE CULVERT DESIGN 3006 CLASS III		LIN FT	$93.00	300	$27,900.00		
2502.503	4" PERF TP PIPE DRAIN		LIN FT	$10.00	450	$4,500.00		
2503.503	12" PVC PIPE SEWER		LIN FT	$140.00	280	$39,200.00		
2503.503	15" RC PIPE SEWER DESIGN 3006 CLASS V		LIN FT	$86.00	3307	$284,402.00		
2503.503	18" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	$94.00	1012	$95,128.00		
2503.503	24" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	$112.00	2054	$230,048.00		
2503.503	30" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	$139.00	947	$131,633.00		
2503.503	36" RC PIPE SEWER DESIGN 3006 CLASS III		LIN FT	$200.00	267	$53,400.00		
2503.602	CONNECT TO EXISTING MANHOLES (SAN)		EACH	$2,000.00	1	$2,000.00		
2503.603	20" STEEL CASING PIPE		LIN FT	$425.00	90	$38,250.00		
2504.602	CONNECT TO EXISTING WATER MAIN		EACH	$3,000.00	4	$12,000.00		
2504.602	HYDRANT		EACH	$7,500.00	4	$30,000.00		
2504.602	ADJUST HYDRANT AND GATE VALVE		EACH	$3,730.00	1	$3,730.00		
2504.602	ADJUST GATE VALVE AND BOX		EACH	$750.00	2	$1,500.00		
2504.602	6" GATE VALVE AND BOX		EACH	$3,300.00	4	$13,200.00		
2504.603	6" WATERMAIN DUCTILE IRON CL 52		LIN FT	$85.00	44	$3,740.00		
2504.603	10" WATERMAIN DUCTILE IRON CL 52		LIN FT	$105.00	170	$17,850.00		
2504.603	16" STEEL CASING PIPE		LIN FT	$250.00	150	$37,500.00		
2506.502	CASTING ASSEMBLY	(13)	EACH	$1,000.00	70	$70,000.00		
2506.502	ADJUST FRAME AND RING CASTING		EACH	$750.00	2	$1,500.00		
2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN G		LIN FT	$650.00	96	$62,400.00		
2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48-4020		LIN FT	$710.00	324	$230,040.00		
2506.503	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60-4020		LIN FT	$1,010.00	29	$29,290.00		
2506.602	ADJUST FRAME AND RING CASTING (SPECIAL)		EACH	$950.00	2	$1,900.00		
2506.603	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL	(10)	LIN FT	$850.00	11	$8,925.00		
2506.603	RECONSTRUCT DRAINAGE STRUCTURE SPECIAL		LIN FT	$920.00	6.2	$5,704.00		
2511.504	GEOTEXTILE FILTER TYPE 7		SQ YD	$3.00	398	$1,194.00		
2511.507	RANDOM RIPRAP CLASS I		CU YD	$150.00	7	$1,050.00		
2511.507	RANDOM RIPRAP CLASS II	(1)	CU YD	$115.00	62.8	$7,222.00		
2511.507	RANDOM RIPRAP CLASS III		CU YD	$115.00	400	$46,000.00		
2521.518	4" CONCRETE WALK		SQ FT	$7.10	19101	$135,617.10		
2521.518	7" CONCRETE WALK	(8)	SQ FT	$12.00	3525	$42,300.00		
2521.518	3" BITUMINOUS WALK		SQ FT	$2.25	49336	$111,006.00		
2521.602	DRILL AND GROUT REINF BAR (EPOXY COATED)	(7)	EACH	$12.00	93	$1,116.00		
2521.618	CONCRETE CURB RAMP WALK		SQ FT	$16.00	4449	$71,184.00		
2531.503	CONCRETE CURB AND GUTTER DESIGN B612		LIN FT	$38.00	270	$10,260.00		
2531.503	CONCRETE CURB AND GUTTER DESIGN B624		LIN FT	$30.00	9892	$296,760.00		
2531.503	CONCRETE CURB AND GUTTER DESIGN R424		LIN FT	$34.00	374	$12,716.00		
2531.503	CONCRETE CURB AND GUTTER DESIGN S524		LIN FT	$30.00	3687	$110,610.00		
2531.504	6" CONCRETE DRIVEWAY PAVEMENT		SQ YD	$90.00	340	$30,600.00		
2531.504	8" CONCRETE DRIVEWAY PAVEMENT		SQ YD	$115.00	628	$72,220.00		

100% OPINION

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Date: 9/12/2024

STATEMENT OF E

Item No.	Description	Notes	Unit	Unit Price	PROJECT TOTAL		Cl ROAD RECONDITIONING	
					Estimated Quantity	Estimated Cost	Estimated Quantity	Estimated Cost
2531.618	TRUNCATED DOMES		SQ FT	$60.00	580	$34,800.00		
2540.602	INSTALL MAIL BOX SUPPORT	(5)	EACH	$250.00	14	$3,500.00		
2545.502	LIGHTING UNIT TYPE 9-30		EACH	$4,250.00	11	$46,750.00		
2545.502	LIGHT FOUNDATION DESIGN E		EACH	$972.00	6	$5,832.00		
2545.502	LIGHT FOUNDATION DESIGN STEEL E		EACH	$1,300.00	11	$14,300.00		
2545.502	SERVICE CABINET -TYPE L1		EACH	$10,000.00	1	$10,000.00		
2545.502	SERVICE EQUIPMENT		EACH	$2,500.00	1	$2,500.00		
2545.502	EQUIPMENT PAD B		EACH	$2,000.00	1	$2,000.00		
2545.503	2" NON-METALLIC CONDUIT		LIN FT	$8.00	1500	$12,000.00		
2545.503	UNDERGROUND WIRE 1/C 8 AWG		LIN FT	$2.50	6500	$16,250.00		
2545.602	INSTALL LIGHTING UNIT		EACH	$750.00	6	$4,500.00		
2554.502	GUIDE POST TYPE B	(11)	EACH	$120.00	21	$2,520.00		
2557.503	WIRE FENCE DESIGN 48V-9322		LIN FT	$50.00	50	$2,500.00		
2563.601	TRAFFIC CONTROL	(12)	LUMP SUM	$230,000.00	1	$230,000.00	0.06	$13,800.00
2563.613	PORTABLE CHANGEABLE MESSAGE SIGN		UNIT DAY	$120.00	100	$12,000.00		
2563.618	CONSTRUCTION SIGN SPECIAL	(14)	SQ FT	$75.00	7	$525.00		
2564.602	INSTALL SIGN		EACH	$500.00	5	$2,500.00		
2564.602	INSTALL SIGN SPECIAL		EACH	$375.00	7	$2,625.00		
2564.602	INSTALL SIGN PANEL SPECIAL		EACH	$375.00	3	$1,125.00		
2564.602	DELINEATOR / MARKER		EACH	$250.00	3	$750.00		
2564.602	DELINEATOR / MARKER PANEL		EACH	$110.00	13	$1,430.00		
2564.618	SIGN		SQ FT	$75.00	682	$51,150.00		
2565.602	RIGID PVC LOOP DETECTOR 6'X6'	(15)	EACH	$1,800.00	9	$16,200.00		
2565.616	PEDESTRIAN CROSSWALK FLASHER SYSTEM		SYSTEM	$30,000.00	3	$90,000.00		
2573.501	STABILIZED CONSTRUCTION EXIT		LUMP SUM	$5,000.00	1	$5,000.00		
2573.501	EROSION CONTROL SUPERVISOR		LUMP SUM	$10,000.00	1	$10,000.00		
2573.502	STORM DRAIN INLET PROTECTION		EACH	$175.00	78	$13,650.00		
2573.502	CULVERT END CONTROLS		EACH	$175.00	17	$2,975.00		
2573.503	SILT FENCE, TYPE MS		LIN FT	$1.50	8278	$12,417.00		
2573.503	SEDIMENT CONTROL LOG TYPE STRAW		LIN FT	$4.00	3678	$14,712.00		
2573.602	TEMPORARY STREAM DIVERSION SYSTEM		EACH	$15,000.00	1	$15,000.00		
2574.508	FERTILIZER TYPE 1		POUND	$1.25	2270	$2,837.50		
2574.508	FERTILIZER TYPE 3		POUND	$1.25	1114	$1,392.50		
2575.504	RAPID STABILIZATION METHOD 4		SQ YD	$1.60	31170	$49,872.00		
2575.505	SEEDING		ACRE	$300.00	12.3	$3,690.00		
2575.505	DISK ANCHORING		ACRE	$90.00	8.4	$756.00		
2575.508	HYDRAULIC STABILIZED FIBER MATRIX		POUND	$1.50	9445	$14,167.50		
2575.509	MULCH MATERIAL TYPE 3		TON	$330.00	12.4	$4,092.00		
2575.523	RAPID STABILIZATION METHOD 3		M GALLON	$525.00	22	$11,550.00		
2575.608	SEED TURFGRASS		POUND	$12.00	645	$7,740.00		
2575.608	SEED MESIC INSLOPE		POUND	$6.00	648	$3,888.00		
2582.503	4" SOLID LINE PAINT		LIN FT	$0.15	9597	$1,439.55	3065	$459.75
2582.503	6" SOLID LINE PAINT		LIN FT	$0.20	44609	$8,921.80	25698	$5,139.60
2582.503	24" SOLID LINE PAINT		LIN FT	$7.00	545	$3,815.00		
2582.503	4" BROKEN LINE PAINT		LIN FT	$0.15	3950	$592.50	2610	$391.50
2582.503	6" DOTTED LINE PAINT		LIN FT	$0.50	37	$18.50		
2582.503	10" DOTTED LINE PAINT		LIN FT	$0.75	88	$66.00	88	$66.00
2582.503	4" DOUBLE SOLID LINE PAINT		LIN FT	$0.30	6680	$2,004.00		
2582.503	4" SOLID LINE PAINT GROUND IN (WR)		LIN FT	$0.75	2869	$2,151.75		

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STATEMENT OF

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2582.503	6" SOLID LINE PAINT GROUND IN (WR)		LIN FT	$1.00	3856	$3,856.00		
2582.503	6" DOTTED LINE PAINT GROUND IN (WR)		LIN FT	$1.00	46	$46.00		
2582.503	12" DOTTED LINE PREFORM THERMO GROUND IN		LIN FT	$16.00	86	$1,376.00		
2582.518	PAVEMENT MESSAGE PAINT		SQ FT	$10.00	1105	$11,050.00	79	$790.00
2582.518	CROSSWALK PREFORM THERMOPLASTIC		SQ FT	$14.00	474	$6,636.00		
2582.518	CROSSWALK PREFORM THERMOPLASTIC GROUND IN		SQ FT	$16.00	360	$5,760.00		
		ROADWAY CONSTRUCTION TOTAL				**$8,159,693.10**		**$491,128.45**

NOTES:

GEOTEXTILE FILTER TYPE 4 IS INCIDENTAL FOR RANDOM RIPRAP CLASS II

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

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

SEE GEOTECHNICAL REPORT FOR INPLACE PAVEMENT THICKNESSES.

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

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

City of North Branch
Staff Report

Prepared By: Nathan Sondrol, GIS Specialist/Parks Director

Presenter: Nathan Sondrol, GIS Specialist/Parks Director

Date: 09/11/2024

Board & Commission: City Council

Subject: Approve Second Amendment to Purchase Agreement with Sunrise River Commons, LLC.

Overview / Background

On July 25, 2023, the City Council approved Resolution No. 49-23-CC, authorizing the purchase from Chisago County two (2) tax forfeit parcels within the North Branch Development District. The two (2) lots are located on Highway 95, west of Interstate 35 (PINs: 11.00410.14 and 11.00410.28). Both properties have remained vacant since they were created by plat in 2008. Parcel 1 (11.00410.14) is located north of the Holiday gas station; Parcel 2 (11.00410.28) is located at northwest corner of Interstate-35 and Highway 95 (Subject Properties). The purchase price for the Subject Properties, as set by Chisago County, was $206,731 (Parcel 1) and $258,296 (Parcel 2). The purpose of acquiring the two (2) properties was identified as necessary to facilitate development opportunities in this area.

At that same meeting, the City Council authorized City staff to negotiate a purchase agreement with SMNPT 1, LLC, renamed to Sunrise River Commons, LLC (Developer). The City is required to sell both parcels for the same price as what the City paid for them. The Developer was responsible for developing the Chipotle and Starbucks development. The Purchase Agreement was finalized on November 27, 2023, and executed by both the City and Developer on February 15, 2024.

The Developer has since been working through its due diligence, notably identifying potential users, and has requested a second extension to the Closing Date and Contingency Period identified in the Purchase Agreement. The Council approved a first amendment on May 28, 2024, to extend the closing date to September 28, 2024. The new Closing Date would be December 1, 2024. The Developer would be required to deposit an additional $10,000 earnest money. The Developer has signed the purchase agreement amendment.

The Developer is looking at two (2) retail buildings on the lot north of Holiday, and they have a letter of intent (LOI) that is scheduled to be approved by the real estate committee in early October. They are continuing conversations with several others interested. Types of businesses include service and quick service retail/restaurants (QSRs).

The EDA is not scheduled to meet until October 15, 2024 for their consideration of this item

Requested City Council Action
Motion to approve the Second Amendment to the Purchase Agreement with Sunrise River Commons, LLC related to two (2) City-owned properties adjacent to Highway 95 and Interstate 35.

Voting Requirements:

Voting Options Simple Majority

CITY OF NORTH BRANCH EST. 1881

Subject Properties

N

SECOND AMENDMENT TO REAL ESTATE PURCHASE AGREEMENT

This SECOND AMENDMENT TO REAL ESTATE PURCHASE AGREEMENT ("**Amendment**") dated as of September ___, 2024 (the "**Effective Date**"), and entered into by and between the City of North Branch, a Minnesota municipal corporation ("**Seller**"), and SUNRISE RIVER COMMONS LLC, a Minnesota limited liability company ("**Buyer**").

RECITALS

WHEREAS, Seller and Buyer have entered into that certain Real Estate Purchase Agreement dated the 27th day of November, 2023 and fully executed on the 16th day of February, 2024,~~as of January 8, 2024~~ and amended by the First Amendment to Real Estate Purchase Agreement dated May 14, 2024 and fully executed on the 11th day of June, 2024 (collectively the "**Purchase Agreement**").

WHEREAS, Seller and Buyer desire to extend the Closing Date and Contingency Period, as defined in the Purchase Agreement subject to the terms contained herein, as well as to clarify certain terms under the Purchase Agreement as set forth in this Amendment.

AGREEMENT

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto, intending to be legally bound, hereby agree as follows:

1. **Effective Date.** Buyer and Seller agree that the Effective Date of the Purchase Agreement is February 16, 2024, which is the date the Purchase Agreement was fully executed.

2. **Extension of Closing Date Additional Earnest Money Deposit**. The Closing Date shall be extended to December 1, 2024 . Within one (1) business day of execution of this Amendment, Buyer shall deposit an additional Ten Thousand and 00/100 Dollars ($10,000.00) ("**Additional Deposit**") with Title Company. The Additional Deposit shall be treated the same as the Earnest Money, as provided in the Purchase Agreement.

3. **Miscellaneous.**

a. Definitions. Capitalized terms used in this Amendment that are not otherwise defined herein shall have the meanings ascribed to such terms in the Purchase Agreement.

b. Partial Invalidity. If any term or provision of this Amendment or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Amendment, or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each such term and provision of this Amendment shall be valid and enforced to the fullest extent permitted by law.

c. No Waivers. No waiver of any breach of any covenant or provision herein contained shall be deemed a waiver of any preceding or succeeding breach thereof, or of any other

covenant or provision herein contained. No extension of time for performance of any obligation or act shall be deemed an extension of the time for performance of any other obligation or act.

d. Binding Effect. This Amendment shall be binding upon and inure to the benefit of the parties hereto and their respective permitted successors and assigns.

e. Entire Agreement; No Other Modification. This Amendment is the final expression of, and contains the entire agreement among, the parties hereto with respect to the subject matter set forth herein and may not be modified other than by an agreement in writing signed each party hereto. Except as expressly modified by this Amendment, all terms and conditions of the Purchase Agreement, together with any and all exhibits thereto, shall remain unmodified and are in full force and effect and enforceable in accordance with their terms. In the event of a conflict between the Purchase Agreement and this Amendment, the terms and provisions of this Amendment shall control.

f. Governing Law; Venue. The parties hereto expressly agree that this Amendment shall be governed by, interpreted under, and construed and enforced in accordance with the laws of the State of Minnesota. Any dispute arising under this Amendment or the documents referred to herein will be adjudicated exclusively in the courts of the State in which the Real Property is located.

g. Counterparts. This Amendment may be executed in counterparts, each of which shall constitute a separate document but all of which together shall constitute one and the same agreement. Signature pages may be detached and reattached to physically form one document. A signature scanned and sent by facsimile and/or e-mail shall be binding as an original signature.

[Signatures follow on next page(s)]

IN WITNESS WHEREOF, the parties have executed this Amendment as of the date first set forth above.

SELLER
CITY OF NORTH BRANCH

_____
Kevin Schieber, Mayor

_____
Linda Woulfe, Interim City Administrator

STATE OF MINNESOTA)

_____) SS

COUNTY OF _____)

The foregoing instrument was acknowledged before me this ____ day of _____, 2024 by Kevin Schieber and Linda Woulfe, Mayor and Interim City Administrator, of the City of North Branch, a Minnesota municipal corporation, on behalf of the corporation.

_____
_____ Notary Public

BUYER
SUNRISE RIVER COMMONS LLC

_____
Paul Tucci, Manager

STATE OF MINNESOTA)

_____) SS

COUNTY OF _____)

The foregoing instrument was acknowledged before me this ____ day of _____, 2024 by Paul Tucci, Manager, of the Sunrise River Commons, LLC, a Minnesota limited liability company, on behalf of said company.

_____
Notary Public

City of North Branch
Staff Report

Prepared By: Shawn Williams, Public Works Director

Presenter: Shawn Williams, Public Works Director

Date: 09/20/2024

Board & Commission: City Council

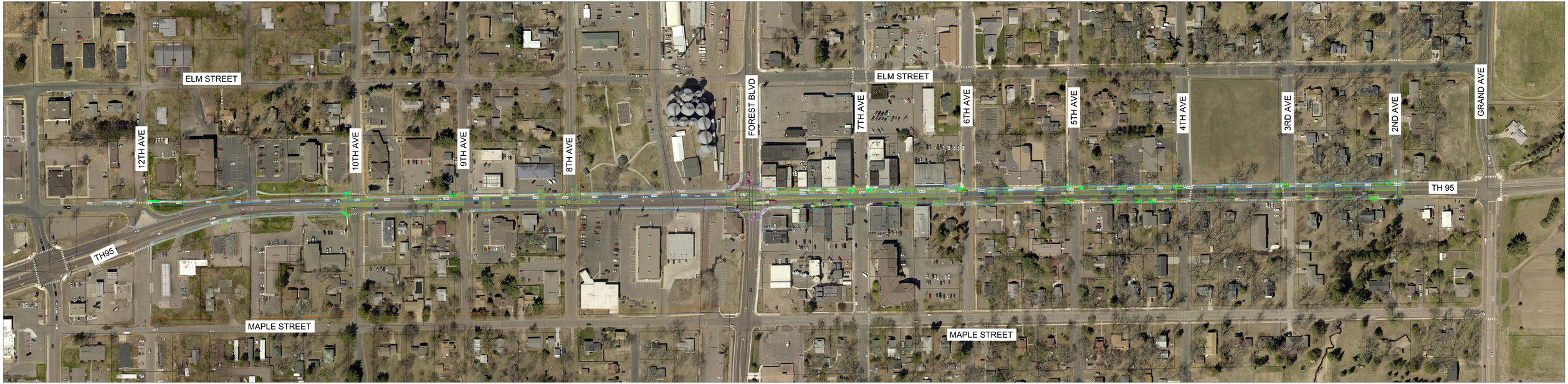
Subject: Traffic Control Configuration on Maple St. and Elm St.

As the council is aware, for the Hwy. 95 Water Main Replacement Project, the stop signs were re-configured to allow uninterrupted traffic flow on the project's detour routes. These routes were Maple St. and Elm St., this worked well during the project. Once the project was completed, a survey was conducted to determine residents' opinion on returning traffic controls, i.e. the stop signs on Maple Street and Elm Street back to preconstruction configuration or have them remain as currently configured.

Survey results show out of 336 responses 58.3% want to have traffic control returned to prior to construction configuration. Approximately forty-eight residents attended an open house at City Hall on September 3, 2024 to have an open discussion about the traffic controls. The unanimous response from the open house was to return the traffic control to preconstruction configuration. I am asking council to accept this survey response approving this and public works will begin making the change if council approves this at this meeting.

Voting Requirements:

Voting Options **Simple Majority**



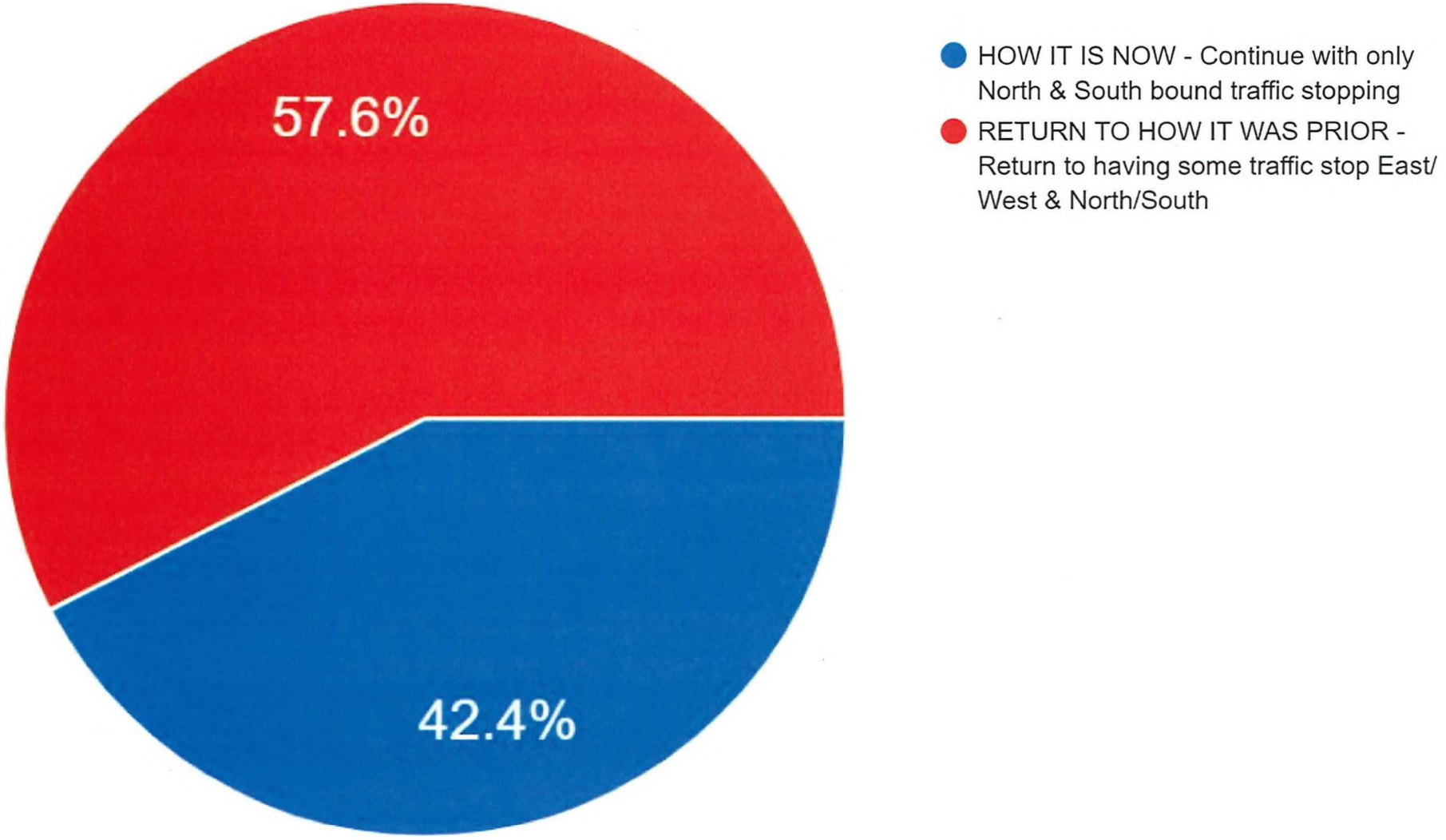
TH 95 WATERMAIN IMPROVEMENTS

0 100 200
H: SCALE IN FEET

N

Should the stop signs stay how they are or return to how they were prior to construction?

311 responses



Additional comments:

161 responses

It is ridiculous to return it back. Never should have had the stop signs to begin with.

Please return the stop sign by the park on the corner of 8th Ave and Elm to how it was. People driving east to west fly through there and with the pedestrian traffic it is not safe!

Ease of flow and uniformity with directional control is nice.

It's a NIGHTMARE to turn left onto or off of these streets with there not being any stop signs on Elm and Maple.

So much more dangerous than it was!

Concerns are speeding vehicles.

Please return to how it was prior

I like the way it is now, it's much more efficient

The shrubs on Maple and Branch block the view when trying to pull out from Branch Avenue. They are on private property but it would be much safer if they were trimmed back some.

Without the stop signs going E to W people are truly flying down maple and it's honestly terrifying. Even with the stop signs how they were people still went fast but now nothing is stopping them. There are many children off both roads mentioned, and many that will be walking to school soon utilizing both roads. I strongly urge the City to go back to how it was due to safety concerns.

People are still speeding and with the stop signs going west to east ot makes them slow down.

Specifically the stop signs on 8th by Petersons mill. Either how it was, or make it a 4 way stop. The current configuration has people going quite fast down the side streets. More 4 way stops would not be a bad thing.

Traffic moves so much smoother with the current set up.

Need a round a bout at the 4 way stop sign on Grand and 95!

Creates better corridors during crashes and other events shutting down Main

Keep 4 way stop 61 and oak

I feel the biggest improvement would be made by eliminating left hand turns to get on Main Street especially during peak hours. These backup side streets and are unnecessary. Drivers can go down one or two streets to a controlled intersection and safely maneuver there.

Without the stop signs, some people are still going 45mph+ down these residential roads. This will cause accidents and pedestrians will get hurt. There's quite a bit of foot and bicycle traffic on these roads and I think it's important to maintain a safer place for this to happen while also reducing the risk of accidents, and keeping the noise pollution down in the residential neighborhoods.

People often didn't stop at the stop sign on Maple and 4th before. With no stop signs the speed on Maple is excessive and dangerous!

We need the stop signs to control speed. Or hire two more officers ONLY to work those streets and give out tickets. I wish there were more stop signs on Elm Street. A kid is going to get hurt one of these days. Don't be stupid, you can be replaced!!

Elm and 12th Ave stop sign configuration can stay. Also you have 11th Ave circled in the map, not 12th. People have been speeding down elm with the current layout.

I like it how it is now, except I would put the 4 way stop back at Glacier and Maple.

The traffic flows smoother. But lower the speed limit to 25 on those two streets.

I feel people drive faster now

Safer for bus stops for the kids safety!!

I live on the corner of oakview and maple. My apartment balcony is facing caribou. The amount of almost accidents and almost hit pedestrians, mostly kids and older people, that I would sit and watch was insane. People walk down maple constantly and I worry with out the stop signs they will eventually speed and or pay less attention. Also there was over 25 cars in an hour that were texting while driving. That was just one time I counted. I liked having the stop light at maple and Forest Blvd. The worst thing was having a stop sign at oakvietand maple point north bound on oakview. The anger and frustration people displayed was dangerous. That intersection needs to be looked at. I will try to be at the meeting. I would like to see some sidewalks or bike lanes or something like that on maple.

Going north on 8th at Elm, having to stop at that north bound stop sign has a major issue with not being able to see traffic coming from the West due to the driveway right there. There is literally always a car blocking your line of sight so you have to creep out into the intersection too far. It's been scary multiple times.

Crosswalks should be painted with signs and more space for walkers and bikes on the sides of the street.

Keep the stop sign at Forest and Elm and the one at corner of Central Park

Elm Street is a narrow residential Street not meant for this high speed traffic

Changing traffic signals will cause more accident again!

If I lived there I would want stop signs back to slow and control traffic in a resident area

There are too many people speeding down the road. The stop sign makes it so they have to slow down.

Speeders are still going at it. Please help.

8th and Elm you can not see to cross intersection from the cars parked in the one driveway. Traveling north on eighth, house on the left at the stop sign at elm.

I think east/west traffic on both Elm and Maple should have stop signs at the beginning and end along with at the Forest Boulevard intersection. That's all for those streets. North/south traffic on Forest Boulevard should only have to stop at the lights on Hwy 95 intersection. Also Elm and Maple should be 30 mph the entire length, not 25.

More stops signs with 25 mph speed signs, the traffic is always too fast, can't walk or get out of our driveways

Leave intersection by post office as is now. Stopping going east to look North is very hard with the PO right on the corner. Leave one of the intersections by Peterson's/Central Park to favor east/west. I drive Elm a lot and those changes would be very helpful

Living off of Maple for 6 years now, traffic has been under control with the stop signs to allow cars and kids to safety cross the roads. I do understand that even with the stop signs along Maple ST there have been cars that do rolling stops or barely slow down, but it does still help give attention to the roads and its surroundings. I always thought of them as being an inconvenience but now with 3 kids living off of Maple St, I want them back more then I ever thought possible.

With the removal of the stop signs on Maple ST, it has caused cars to speed down the road with less caution over the speed limit of 25. Now when I drive down it at the speed limit, I have cars drive up on me and honk. Simply because I am going to slow, or drive closer than necessary even on a city side road.

School is also approaching and with the bus stops along Maple, it is safer for the stop signs to be put back the way they were so that traffic is more cautious and aware.

The intersection along Maple and old HWY 61 should also be given a cross walk and lights (to match Maple and Grand Ave crossing) to allow safer crossings for kids getting to and from school and the trail.

I truly hope for the best for the families and community. I know you will do what's best. Thank you for you time.

My answer is both - keep Maple without stop signs and Elm with stop signs. We have a lot of walkers in NW Old Town. There are no sidewalks along Elm.

I think the stops signs should be in place for the safety of the kids in the area

There are limited sidewalks on both Maple and Elm Street forcing people to walk on the street in some areas, making this traffic pattern an unsafe situation. This was supposed to be a short term fix for use during construction. Is the city considering adding sidewalks where there are none? These cars are speeding through our residential neighborhoods on both Elm and Maple. Highway 95 is completely open now, they can go back to using that route through the downtown area where they may support small business owners. There are few businesses on Elm or Maple to attract consumers. Give us our quiet streets back. In addition, a four way stop should be in place at the corner of Elm and 8th by the city park to keep children and families safe. That non-stop route from the hill on 8th Avenue to 95 past the city park has been going on for far too long.

At Maple Street and Branch Avenue there is a large bush that causes a blind for turning left off Branch to Maple. One can't know if there are any cars coming eastbound on Maple. It needs to be trimmed back significantly or removed. I have had some close calls there not sure if there's any traffic coming or being able to gauge how fast they are moving.

My kids live at 6171 Elm with their mom, and they have seen a noticeable increase in speed during the construction with the removal of the E/W stop signs. I think it's safest to return to some stop signs each way to reduce high speed travel in residential areas.

Until Maple and Elm, west of Cty. Rd. 30 has sidewalks, the traffic needs to be slowed down. I can't believe that future plans to put sidewalk in southbound on Cty Rd 30 are planned before our neighborhood roads are done. I have lived on the "West side of the tracks" for 65 years and find it SHAMEFUL that nothing has been updated on the West side.

Add speed bumps! We have lots of kids in the neighborhood and most cars speed very fast down maple. Without the stop signs it's difficult to cross maple and leave the driveway.

I travel elm to 4th to see relatives and I miss the way it was. But those that are late for school will want how it is now because they have a straight shot. But safety concerns is my reason.

Strangely, I feel like it has been easier to get around town this year than it has in the past.

Personally I like how traffic flows the way things are. I feel if the stops signs are reinstalled, that will only cause more traffic incidents as the community is use to the current flow of traffic. Furthermore if there are future events or closures on Hwy 95 there would be two alternative routes that would be ready for use without extra signage work.

Keeping the flow of traffic on the side streets was amazing, I avoid Main Street because of people trying to park and they slow the flow. The 25 mph speed limit should stay the same due to so many residents

My neighbors and I would like the stop signs to return to how they were because it keeps traffic coming through slowly. People have been cruising through without those stop signs where they were.

People are driving way too fast without the stop signs. My kids and many others walk Maple regularly. Put them back before school starts please.

I have grandchildren that live in Maple and without the additional stops along that road people are driving much to fast. It's dangerous, and knowing school starts soon and more kids will be using this road to get to the schools just makes it all the more important to have the additional stop sign put back.

The number of stop signs could be reduced. One, or maybe two stop signs would hopefully be enough to slow traffic down. There are too many speeders if there are no stop signs.

People speed too much along there as is. There needs to be something to slow them down. Plus tons of people walk through there and need to cross the street. The intersection by auto tech and the trailer park is terrible for line of sight coming from the north or the south. Car block the view at auto tech and tree/bushes block the side by holiday.

Some days more so in summer there is atpeast a 5 to 10 minute wait just to get out of the trauler park I reside in

With a mix of east/west and North/south it will keep the speed of traffic down.

In the winter it is almost impossible some times to get traction leaving the countryside trailer court. Without that's stop sign no one will be able to get out. It also shows the traffic down on these back streets my son also rids the bus to school and having that stop sign there makes people have to pay attention more.

At least when it comes to the four way stop going in to the trailer park, it's on an incline with obstructed view so there needs to be a four way stop there. I can't count how many times I've almost been hit there since construction started

Keep the speed limit on the side roads 25 and have more cops attentive to the side roads with people speeding down them

Maybe consider putting one stop sign east and west along each section would still help traffic flow better, while slowing vehicles down, and allowing vehicles to enter from north and south, into the east-west directions.

Way to easy to speed. Scary when sitting outside and you know which houses have little kids.

It is hard to get out or in to the trailer park because drivers are just flying through and people walk down maple with their families it needs traffic control

Maple and Elm are dangerous. Without the stop signs cars are routinely traveling well above the speed limits. It's bad enough that traffic of 95 is already going 40+ MPH, not they're going nearly that on the two adjacent streets too. Someone on a bicycle who is avoiding the main road is going to get hit on the side street.

I think a 4 way stop would be very helpful at the intersection of Elm Street and 8th Ave. (Petersons/Central Park) with the addition of a crosswalk painted on the road. Lots of families and children in the area, and drivers who blow through stop signs on these roads.

More stop signs, actually, and speed bumps.

I think this is a great alternative to 95. As long as people drive 25mph, it will be safe.

The amount of times we have to dodge cars just checking the mail is ridiculous.. plus the many accidents that have been happening since the change is crazy

The stop signs on the intersection of 8th ave and elm are unnecessary and should be placed the original direction

If the roads are left without stop signs, I can definitely see people speeding down them, which is very unsafe for pedestrians and other cars

East/west traffic is usually speeding thru these neighborhoods & without any sidewalks it's dangerous for pedestrians.

How it is now works great aside from the stop sign on 8th and elm. The cars to the left, when going north are to see when the resident to the left is home. It blocks the view of on coming cars.

Traffic seems to flow better now then it did before.

Too much traffic on Maplest. Cars are driving faster now that HWY 95 is open they seem to speed faster on Maple. Stop signs would help slow traffic. Rather than have so much traffic on residential streets, build the bypass North of town

I had to select an option above because it a mandatory question. But I am not in favor of either answer.

I believe there should be a hybrid approach considered here. Neither solution (before or after construction) is the best solution. I would also recommend we include Cedar Street for

alignment and consistency.

The inconsistency in where stop signs are placed creates a lot of confusion and cars pick and choose when to stop. Some blocks are every other, some are every block, some are no blocks. This decreases the driver's experience and expectation leading to many violations.

As a resident of Cedar/2nd Ave I can attest to having watched numerous cars fail to stop at the stop sign traveling east/west. It has resulted in accidents!

I believe a solution prioritizing consistency should be considered. Every other block and major intersections traveling east/west seems to make sense. On the alternating block, ensuring north/south traffic stops. Also including how those alternate between blocks needs to be considered, from Maple to Elm to Cedar.

If nothing else, if a stop sign is replaced at Elm/4th the tree on the northeast corner needs to be removed. It completely blocked the traffic control stop sign.

By removing all stops signs (as it exists today and through construction) it promotes cars traveling at higher speeds. Let's not forget what a stop sign is intended to do, not only control traffic but it has the potential to slow traffic down too. If we keep it the way it exists today, we are promoting cars to favor side streets over the main artery of Hwy 95 for local traffic. Side streets should be for local traffic only.

It would be nice for grand ave to be connected north of 95 to assist traffic in going around down town

For people that live in the neighborhoods the stop signs as they currently are suck and it is hard to see all the traffic when crossing

I come to 10th to get out. Traffic flies down Maple Street. Far to dangerous...

Keep speed to 25 mph on Elm and Maple.
Post another 25 mph speed limit sign by 10th avenue on Elm. By the time vehicles get to our intersection they have speeded up and are going at least 40 mph. Because we get quite a few walkers and wheel chair people from Shields Plaza, crossing at our intersection going to the banks or gas station convenience stores, this would make our intersection safer.
Ask police to drive down Elm street more frequently.
Thank you for asking for our feedback and for getting the project finished.

We have lived in NB since 1996 and use 8th St frequently and there have been a few times family members have almost been in a collision due to the traffic changes. The changes should remain temporary please

Hello! I am the General Manager of the Dominos in town. On behalf of all of my drivers, we would absolutely love it if we could keep the traffic control how it is now. I've been managing the store for almost 16 years, and we can definitely tell that the traffic flow is much more efficient in it's present state. Thank you!!

Better flow through town this way

As someone who lives in a different neighborhood, but has daycare drop off/pick up and work in these areas, traffic has been way smoother with the signs being how they are now. There's significantly less people coming north/south than there are East/west so this way has been very efficient.

If you do keep traffic control the way it is currently there needs to be visible speed limit signs.

Drivers of motor vehicles and motorcycles frequently speed on this route. Putting the previous stop signs back up is a wise decision regarding public safety for pedestrians. There are many people and animals that frequent this route (walkers, walkers with a baby stroller along with their other children, people walking their dogs, and bicyclists to name a few. I'm in support of the stop signs to go back up.

In a perfect world people would comply with speed limits. But there aren't sidewalks all the way along these routes. It's an accident in the making. Please don't prioritize auto traffic over safety and consideration for those walking, biking, pushing strollers...in all seasons and various weather conditions and lighting conditions. Both the drivers and those on the road are too susceptible too distractions.

Traffic is moving too fast on elm and maple streets now since there are no stop signs to slow traffic down. The corner of 8th and elm is hard to see the oncoming traffic from the west due to a car almost always parked in the street on elm st please put the stop signs back up.

Feel like I can't take my kids for walks anymore with the way traffic is currently from the construction, would love it to be back. People are blowing the current stop signs constantly, also.

While traffic may slow down a little, with the amount of foot traffic some of these areas are seeing I think it makes sense to keep these to improve public safety. Worthwhile trade off.

I think the stop sign by the City Park needs to stay.

Even living on the west side of 35, having these stop signs gone has helped so much with avoiding the congestion on 95 everyday. I travel to the schools everyday for sports and school and it's been amazing and quick!!

The smooth traffic flow that they changed to during construction makes more sense. Rather than sometimes having to stop and sometimes having the right of way.

Heading north on 8th my Peterson's Mill, there is a house with a truck parked in their driveway and it is difficult to see around with the stop signs how they currently are. Please return it to the old way.

This intersection at 8th and elm st has had multiple accidents the way it is now. The site line looking east and west for north bound traffic is obstructed in both directions due to park fence to the east and a house/driveway to the west. Ideally this would be a four way stop due to a park and business at the intersection. If the signs stay the way they are now it will give drivers the ability to build up speed from forest blvd to the next stop sign to the west.

Heading north on 8th by Peterson's Mill, there is a house with a truck parked in their driveway and it is difficult to see around with the stop signs how they currently are. Please return it to the old way.

With 95 open again, it doesn't seem like Elm has significant enough traffic to require Stops for East/West flow. It is low enough traffic that vehicles filtering on from North or South will not wait long to turn onto Elm in either direction. If the speed limit remains lower than that of 95, Elm and Maple will remain lightly traveled roads even with the East/West Stops removed.

We get our mail on Elm street, no sidewalks, no parking space, narrow road, no cross walks. People with wheel chairs, powered chairs, walkers, people on bikes, and pedestrians from Schild's plaza. Hiway 95 is the main road, you want to make the other two streets, Elm amd Maple, main roads as well. The speed limit is almost never enforced, patrolled yes but I've never seen a radar out there. Even with the stop signs drivers don't stop. This is our neighborhood. We live here, we want our streets safe enough for us to use. Not for those wanting to miss traffic tieups on 95 or get ahead of 6 cars. 95 and old 61 are the main and only roads through north branch, that you cannot change. Use them and help keep our neighborhoods safe.

Keeping the stop signs the way they are now is dangerous! Elm and Maple are way too narrow to be safe for people walking, biking, skateboarding, electric scooter chairs (Shields Plaza residents and others), even parking in front of houses. It is downright scary just to walk to get our mail. Our boxes are on Elm street. Cars do not slow down even when they see people on the side of the street. Please, please RETURN TO HOW IT WAS PRIOR to the 95 roadwork. Let 95 be the main express east and west through North Branch. Hwy 95 is built for the traffic, Elm and Maple ARE NOT! We would like our quiet neighborhoods back.

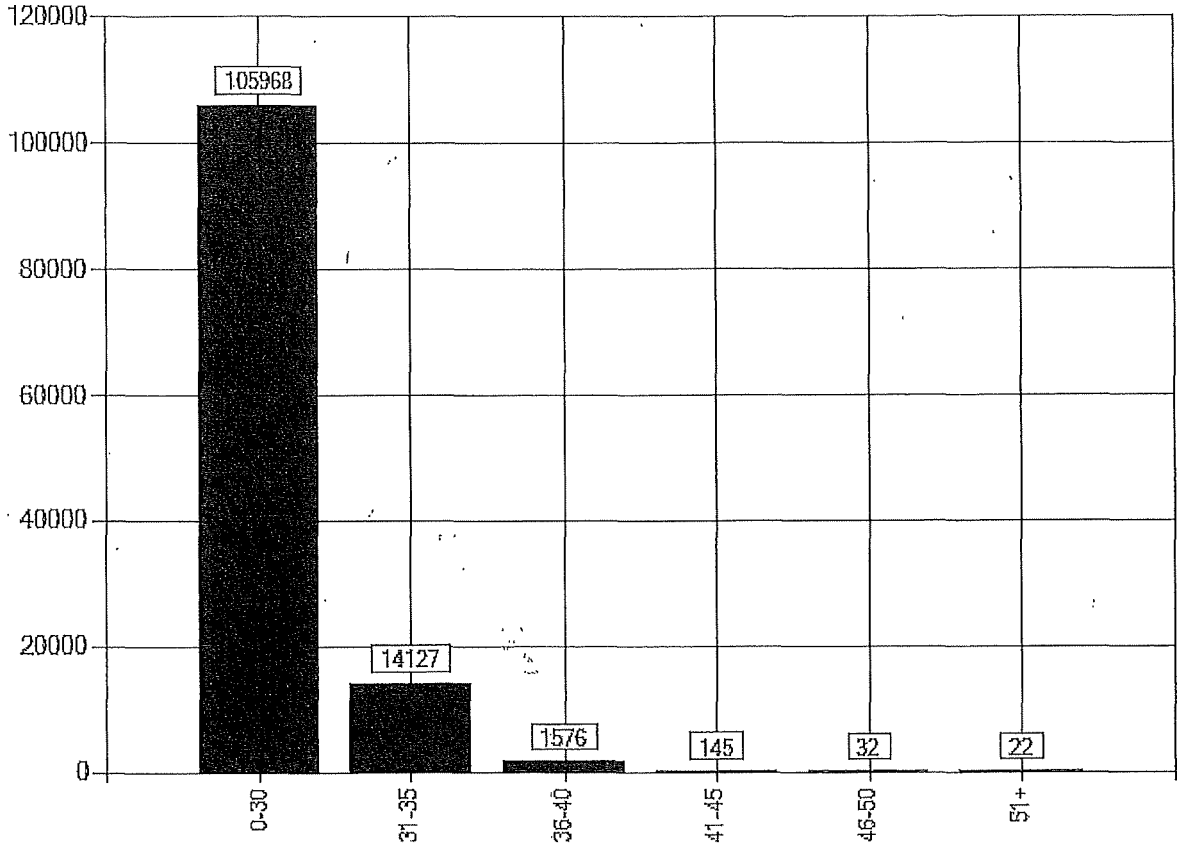
With having stops on Elm and Maple, it seems to slow people down.
I have noticed way too many people going way to fast on these streets and it's just not acceptable.
It is very convenient to not have stops on these streets and it makes traffic run smoothly. However, for those that live on these streets, I sympathize. I would be very frustrated having some of the "rule breakers" speeding down my quiet little road with no reason to slow down or pay attention.
Stop signs please 🙏

The intersection on 8th and elm by central park is dangerous how it is now. Residential driveway creates a blind intersection with its current arrangement.

61 more responses are hidden

Date: 07/30/2024 12:00 AM
Report Start Date: 06/30/2024 10:00 AM
Report End Date: 07/24/2024 07:00 PM
Time Interval: 60 minutes
Speed Interval: 5 mph
Posted Speed Limit: 35 mph
Average Speed: 23 mph
Highest Speed: 91 mph
50th Percentile: 26 mph
85th Percentile: 30 mph
Number Above Speed Limit: 1775
Total Number of Vehicles: 121870

Comments:



Attachment 1

Building a Better World for All of Us®

February 16, 2024

RE: City of North Branch
Sanitary Sewer Comprehensive Plan
SEH No. NORBR 14.00

Mr. Shawn Williams
Public Works Director
City of North Branch
6388 Maple St
North Branch, MN 55056

Dear Mr. Williams:

Short Elliott Hendrickson Inc. (SEH) appreciates the opportunity to assist in the City's effort to complete master planning for the sanitary sewer system. The SEH Team's scope of services reflects our collaborative approach to provide the City of North Branch (City) with a collection system plan that will serve the City well into the future. We will deliver the project with a well-developed work activity plan that provides tasks coordinated to meet the project goals.

TECHNICAL APPROACH OVERVIEW

The final product will define short- and long-term infrastructure and operation/maintenance needs delivered through a Comprehensive Plan Sanitary Sewer System that provides for flexible implementation of projects to accommodate the uncertainties in growth projections, timing of future regulations, and estimates of infrastructure useful life.

The Comprehensive Sanitary Sewer Plan will incorporate the City's vision for the future. It will look to improvements that focus on lifecycle costs and optimal investments for the region.

COLLECTION SYSTEM EVALUATION

The collection system evaluation will be initiated with concurrent work activities focused on the hydraulic model and infrastructure review, followed by an optimization of the existing system and then an evaluation of future needs.

Hydraulic Modeling. Our team recommends using InfoSWMM to develop the City's hydraulic model of the existing and future sanitary sewer systems.

Dry weather flows will be established using existing land use records, water sales and metering data. We will calibrate the land use record loading rates using the water sales as well as available metering data or pump run hours. Flows will be allocated to each manhole (that has elevation data) based on the properties that contribute to each respective manhole.

We will work with City staff to review existing flow data to establish dry and wet weather flow conditions in the model. This will be needed to calibrate the model and establish hydraulic capacity under dry and wet weather periods. We will meet with the City to review all final flow data summaries and insert the existing

sanitary sewer collection system GIS geodatabase data into the model and check for hydraulic irregularities throughout the collection system. Any issues will need to be field verified to ensure the model accurately represents the City's existing system.

Other modeling activities will include adding recently installed pipe segments, updating pipe segments in new growth areas, and establishing additional wastewater collection system flows, calibrating the model with dry and wet weather flow meter data from the WWTP and available lift station data, running flow simulations to evaluate various scenarios to determine pipe capacity of the system and determining the collection system's ability to meet future needs.

Our hydraulic modeling efforts will produce improved GIS data as well as analysis of the system's capacity at current usage.

We will work with the City to establish assumptions for I/I and its role in potential capacity restrictions. The hydraulic model can be updated to reflect data collected during a future I/I study and evaluate the impacts of I/I reduction activities along with future development or land use changes.

Lift Stations. Lift station condition assessments will be completed using a team of wastewater and electrical engineers. Recent studies with condition assessment findings will be reviewed to identify any gaps in information. Site investigations will be carried out for the City's 12 lift stations. We realize there are facility-specific needs that must be addressed, but we will look to standardize where possible to provide efficiencies. Pump drawdown testing can be completed to confirm existing pumps are performing as anticipated.

Existing System Optimization and Future Needs. The calibrated hydraulic model will be used to identify operational modifications to optimize capacity, recommend improvements to meet the future flow scenarios established in the planning framework and improve the useful life of each asset.

Collection System Capital Improvement Plan. We will utilize the results of our hydraulic modeling efforts, condition assessments and system optimization to produce a CIP that will establish yearly investments for rehabilitation and replacement as well as investigative activities.

COLLABORATIVE WORK PLAN APPROACH

We have developed a scope of services based on the major tasks and deliverables we anticipate for the project. It is based upon established milestones for decision-making and deliverables during the project as listed in the detailed task descriptions below.

The preliminary schedule following the scope of services shows the general relationship of the tasks, workshops for decision-making and deliverables.

SCOPE OF WORK

Objectives

Evaluate the existing collection system and provide recommendations on improvements to optimize peak flow capacity, plan for projected growth and develop a CIP. The work involves assisting the City with the, creation of a model and calibrating the model with flow data. Tasks include existing infrastructure review, collection system optimization, evaluation of collection system flow and recommendations on future system needs.

City Responsibilities

1. Provide information requested and address questions based on review of the data.
2. Participate in progress and planning meetings and provide follow-up information if requested.
3. Work with the stakeholder team (through workshops and progress meetings) to gain consensus on the assumptions, approach, and recommendations of the long-range plan.
4. Review outline, draft, and final deliverables.

Task 1.1 – Existing Collection System Review

Activities

1. Prepare formal information requests and submit to City.
2. Obtain and review existing collection system data: pipe and manhole data, GIS land use, comprehensive plan, population data, planning reports, and other relevant data.
3. Obtain and review GIS data, flow monitoring data, pipe inspection data, other data, and relevant reports.

Task 1.2 – Lift Station Evaluation / Assessment (12)

Activities

1. Lift Station Assessment
    A. Existing Data Collection
    B. On Site Inspections, including pump drawdown testing as needed
    C. Evaluation of Defects and Ratings
    D. System Rehabilitation Prioritization
2. Prepare Lift Station Condition Assessment Technical Memorandum.

Deliverables

- Draft and Final Lift Station Condition Assessment Technical Memorandum – electronic transmittal

Task 1.3 – Sanitary Sewer Flow Projections

Activities

1. Develop flow and loading projections for future land use within the Ultimate and 20 Year service areas.
2. Establish Existing Dry Weather Flow Distribution using water records, land use, meter data and lift station run times. The land use loadings will be calibrated based on the actual uses for each parcel.
3. Establish Existing Wet Weather Flow Distribution using available information.
4. Prepare technical memorandum outlining desired flows and model scenarios to evaluate and verify in the model.

Deliverables

- Draft and Final Flow Projections technical memorandum – electronic transmittal.

Task 1.4 – Sanitary Sewer Model Development

Activities

1. Develop sanitary sewer hydraulic model using data collected from the existing system and GIS geodatabase data. SEH recommends utilizing InfoSWMM.
2. Model Calibration – Once the model is running, we will review our findings with City staff to determine whether the model is running with reasonable results. We will modify our input parameters to reflect the actual findings.

Deliverables

- Sanitary Sewer Model in InfoSWMM
- Model calibration meeting with the City (agenda and meeting summary)

Task 1.5 – Existing System Modeling Evaluation

Activities

1. Model the existing system for wet weather and dry weather conditions, two scenarios are anticipated.
2. Review of capacity and infrastructure deficiency findings.
3. Meet with the City to review final flow data summaries.

Task 1.6 – Future System Modeling Evaluation

Activities

1. Model the future sanitary sewer system running flow simulations to evaluate various scenarios to determine pipe capacity of the system and determining the collection system's ability to meet future needs. Two scenarios are assumed in this proposal. Additional scenarios can be run based on system improvements and growth projections at the authorization of the city.
2. Review of capacity and infrastructure deficiency findings.
3. Reprioritization of system upgrades and rehabilitation.
4. Evaluation of alternatives for both system upsizing and connections to new developments.

Deliverables

- Draft and Final Collection System Optimization and Future Needs Technical Memorandum – electronic transmittal

Task 1.7 – Prepare Comprehensive Sanitary Sewer Plan

Activities

1. Summarize interceptor, manhole and lift station improvement recommendations.
2. Prioritize collection system projects with a preliminary schedule.

Deliverables

- Draft Comprehensive Sanitary Sewer Plan – electronic transmittal

Task 1.8 – Final Document Submittal and Project Meetings

Activities

1. Incorporate comments on the draft Comprehensive Sanitary Sewer Plan document and prepare final draft.
2. Prepare for and facilitate kickoff meeting.
3. Progress Meetings - Facilitate biweekly/monthly meetings with established City team and other staff as appropriate. Project manager, task leaders and key team members (will vary with topic) will be at these meetings, held as a Microsoft Teams Meeting, or in person with project manager attending as available.
4. Project Meetings – Establish a plan for subject-specific stakeholder meetings and facilitate meetings. Although a large unknown at the project start, an assumed 6 meetings will be held in addition to progress meetings. Hours will be included within specific project tasks for smaller group meetings as part of this work activity. It is also assumed that as many meetings as possible will be held in conjunction with other in-person project meetings and the remainder will be through Microsoft Teams.

Deliverables

- Final Sanitary Comprehensive Plan – electronic transmittal
- Meeting agendas and summaries

COMPENSATION

Compensation shall be on an hourly basis, based on the actual hours worked for SEH personnel assigned to the project, plus reimbursable expenses.

FEE

The estimated fee is $80,774 including expenses.

SCHEDULE

SEH proposes to complete the Comprehensive Plan within 40 weeks of receiving a signed agreement from the City of North Branch and receiving requested data necessary to prepare the Comprehensive Plan. We will have some ability to adjust the schedule if required.

We look forward to working with the City of North Branch on this project. If you should have any questions, please contact William Lueck directly at 612.716.8435.

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.

William Lueck
Project Manager
(Lic. MN)

WFL
c: Miles Jensen, SEH, Bill Lueck, SEH
c:\users\wlueck\documents\sanitary comp plan scope_20240130_aep.docx

Building a Better World for All of Us®

Attachment 1

February 2, 2024

RE: City of North Branch
Wastewater Treatment Facilities Plan
SEH No. NORBR 14.00

Mr. Shawn Williams
Public Works Director
City of North Branch
6388 Maple St
North Branch, MN 55056

Dear Mr. Williams:

Thank you for the opportunity to present this Proposal for completing a wastewater treatment facilities plan. Minnesota Administrative Rule 7077.0272 sets forth the requirements for a wastewater Facilities Plan. We are providing a proposed scope of work for the evaluation of the existing treatment system, establishment of future loading conditions, and analysis of alternatives. Costs will be presented in the evaluation of alternatives.

BACKGROUND

The City's wastewater treatment facility was constructed in 2004 with a design capacity of 0.812 million gallons per day, with consideration at that time for a second phase of expansion. Since 2004, the population has grown from 9,000 people to over 11,000 people, with further growth anticipated.

With the treatment facility approaching 20 years of age, facility planning is important for the City to properly plan for investment in future infrastructure, understand capacity and condition limitations, and develop a road map to help the City plan and anticipate improvements to the treatment system. A complete Facilities Plan involves alternative evaluation of improvements to meet anticipated permit conditions and anticipated future flows and loads. A Facilities Plan is also a requirement to obtain project financing and funding from the Minnesota Public Facilities Authority (PFA). While a long-term plan is always a good idea, some communities have avoided the requirement to complete a Facilities Plan by self-funding their projects. Unless funds are already in place, SEH recommends a Facilities Plan to keep funding and financing options available.

Below is a suggested scope of work for the Facilities Plan.

SCOPE OF WORK

SEH proposes the following work scope for preparing a Facilities Plan for the City of North Branch's Wastewater Treatment Facility.

Task 1: Existing Facilities Conditions

As required in the Minnesota Rules, a Facilities Plan must describe existing conditions. SEH will complete the following:

1. Describe existing treatment system. Address treatment capabilities of each treatment unit, the systems' abilities to meet current permit requirements, and the location, frequency, and quantity of any bypasses. Include a summary of the capacity, condition, and remaining useful life of key equipment, systems, and processes.
2. Review performance of existing treatment facilities as related to current effluent standards and Minnesota Rules Chapter 7041 for biosolids.
3. Review recommended wastewater treatment plant reliability in accordance with published MPCA Reliability Guidelines and Ten State Standards.
4. Provide a wastewater treatment facility site map including surrounding features.
5. Summarize the wastewater influent characteristics (suspended solids, BOD, ammonia nitrogen, alkalinity, and phosphorous loads). Update the comparison of domestic loads to expected loads based on typical per capita waste contributions. Report existing flow and loading information on MPCA's required form.
6. Complete a cursory evaluation of infiltration/inflow (I/I) as required by the Minnesota State Statute 7077.0272 for facility planning purposes. This preliminary analysis will use existing flow records to determine approximate rates of infiltration and inflow entering the collection system. If these rates exceed the standards as set forth by the MPCA, additional evaluation outside the scope presented herein may be required, though this is not expected.

Task 2: Future Loading Conditions and Limits

The Facilities Plan must look forward and project future conditions. A formal preliminary effluent limit request is required by the MPCA. As part of Task 2, SEH will complete the following:

1. Project future populations and present the 2044 projections on the forms required by the MPCA. Population projections will be based on the City's 2018 Comprehensive Plan.
2. Describe the planning area and indicate on a map.
3. Review other treatment objectives in the Facilities Plan that may not be addressed by the reissued NPDES permit (e.g. nitrate, total nitrogen).

Task 3: Evaluation of Alternatives

Multiple treatment alternatives capable of treating to the required effluent limits will be evaluated. For each alternative, cost evaluations will consider capital costs, operation and maintenance costs (including staffing), and salvage values. Together these costs will be presented in the form of a life-cycle cost, which allows the comparison of alternative. Alternatives will also be evaluated by their ability to meet anticipated future limits, and other non-monetary criteria. Alternative evaluation will include operational requirements (Class A or B licensed operators). The scope is based upon the following evaluations:

1. **Preliminary Treatment:** Improvements to replace/upgrade equipment will be identified, but no alternatives will be evaluated.
2. **Grit Removal:** Improvements to replace/upgrade equipment will be identified, but no alternatives will be evaluated.
3. **Secondary Treatment/Oxidation Ditches:** The MPCA has long foreshadowed total nitrogen (TN) limits and, fortunately, the existing facility is well set-up to achieve the anticipated effluent TN limit of 10 mg/L. Further, the secondary treatment system is doing a remarkable job at reducing the phosphorus levels. Therefore, the anticipated needs of the secondary treatment system are potentially capacity, redundancy, and equipment replacement. The following alternatives will be evaluated for the secondary treatment system:

a. Addition of second oxidation ditch keeping with the same aeration/mixing (baseline alternative).
b. Addition of second oxidation ditch with new aeration and mixing technology in both oxidation ditches.
c. Addition of tankage and construction of a 3-train activated sludge system with existing clarifiers.
d. Addition of tankage and construction of a 3-train activated sludge system with an MBR; freeing the clarifiers for sludge handling.

4. **Secondary Clarifiers:** Improvements to replace equipment will be identified, and additional capacity, as needed.
5. **Solids Processing:** The facility currently processes solids in an aerated tank and stores the liquid sludge in storage tanks for seasonal land application. The aeration tanks provide some level of solids stabilization, but without meeting the EPA Part 503 regulations, the biosolids must be incorporated into the fields to meet the vector attraction requirements. The City is finding it more challenging to find land for biosolids application, and this may continue to get more challenging with public PFAS concerns. As it relates to solids handling, SEH will consider the following alternatives.
   a. Solids Stabilization: The following five alternatives will be evaluated:
      - Aerated storage (existing, baseline alternative)
      - Aerobic Digestion
      - Anaerobic Digestion
      - Lime Stabilization
      - Temperature-phased aerobic digestion (TPAD)
   b. Solids Handling: Biosolids can be handled as liquid (like today), or further processed to reduce storage and hauling volumes.
      - Liquid sludge storage. This alternative would maintain the existing liquid sludge storage tanks (baseline alternative).
      - Dewatering & Cake Storage. Under this alternative, the stabilized biosolids would be dewatered. There are a number of dewatering technologies available, but for this alternative, we will assume dewatering is via screw presses.
      - Drying. Drying the solids to >60% solids can significantly reduce the biosolids volume, but with a greater input of energy. SEH will evaluate one drying alternative.
6. **Disinfection:** The facility currently has chlorine disinfection. SEH will evaluate an alternative of UV disinfection.
7. **Water Reuse:** The MPCA recently updated Facilities Plan requirements to include an evaluation of water reuse. SEH will identify the cost to further utilize treated effluent within the plant boundary. SEH will also take a high-level look at the costs associated with producing reuse-quality water for offsite uses.

Task 4: Recommendations

Based upon the cost evaluations, SEH will summarize recommendations for plant improvements. The recommendations will include:

1. A project timeline for phasing, project design, MPCA review and approval, advertising and bidding, construction, and start-up.
2. Summary of the rate impact. Based on current operating costs and revenue, SEH will estimate the impact to the user rates for the recommendations identified.

3. Discuss opportunities for funding, including Public Facilities Authority (PFA) low interest loans, the Point Source Implementation Grant (PSIG), Green Project Reserve (GPR) grant funds, and funding opportunities for water reuse.

Task 5: Public Hearing

Before adopting a Facilities Plan, the City must hold a Public Hearing to discuss the project including alternatives evaluated and costs associated with the proposed alternatives. SEH will assist by:

1. Preparing presentation materials for the Public Hearing
2. Attending and speaking at the Public Hearing

Task 6: Facilities Plan Supplement

Minnesota Rules require specific items to be submitted with a Facilities Plan. SEH will work with the City to compile the following items:

1. Complete list of addresses used for public notices purposes.
2. Summary of information presented, and comments received at Public Hearing
3. Formal resolution adopting the Facilities Plan
4. List of ordinances and inter-municipal agreements necessary for the successful implementation and administration of the project
5. A completed Environmental Information Worksheet (EIW).
6. A completed Section 106 review.
7. Documentation of notification to other governmental units, summaries of comments received and county certification, as required.
8. The MPCA Facilities Plan Checklist also requires a completed Cost and Effectiveness Certification Form.

Deliverables

Prepare a draft report summarizing the information from Tasks 1-4 above. After review with the City, prepare final report. . Submit final report to the MPCA and assist with Project Priority List (PPL) application.

Meetings

The following meetings are assumed for this project:

- Kick-off meeting and site tour. For a thorough condition assessment, SEH will have mechanical, electrical, structural, operations, and process team members complete a walk-through.
- Existing and Future Conditions workshop to discuss the MPCA's anticipated effluent limits and any capacity concerns.
- Alternatives Workshop to review the findings of the alternative evaluations.
- Meeting to review the draft Facilities Plan.
- Public Hearing.

CITY'S RESPONSIBILITIES:
The City shall:

1. Assist SEH by placing at SEH's disposal all available information pertinent to the Project, including the following:
    - Four years of Daily Monitoring Reports (DMRs) for influent flow, BOD, TSS, ammonia nitrogen/nitrates, and phosphorous data.
    - Operating data from last 4 years.
    - Peak hourly and peak instantaneous flow data.
    - Water use data broken down by quarter and classification.
    - Biosolids quantities and characteristics for the past four years.
    - Application for the preliminary effluent limit request. This is a cost of $1,550 to the MPCA.
    - List and contact information for the significant industrial users (SIUs).
    - A copy of any significant industrial user agreements with industries.

ADDITIONAL SERVICES

If authorized by the Owner, SEH shall furnish a proposal for additional services including:

1. Performing hydrogeological studies or soil borings (not anticipated).
2. Performing property or site surveys.
3. Developing treatment agreements with major contributing industries.
4. Structural inspections of enclosed or operational tanks or structures.
5. Geotechnical investigation of site soils.
6. Identification of all assets and their replacement needs (instrumentation, valving, piping)
7. Detailed cost-of-service rate study.
8. Antidegradation Evaluation. The MPCA does not allow any discharger to degrade the water quality of the receiving stream more than currently allowed. This means that with projected growth, the MPCA will require the facility to accept frozen mass limits. An antidegradation evaluation is required by the MPCA if the frozen mass limits are unattainable or too expensive to attain. Upon completing flow and loading projections, we can discuss whether an antidegradation evaluation is required.
9. Environmental Assessment Worksheet (EAW). If the projected flows are greater than 1.2 MGD, the MPCA will require an EAW rather than an EIW. An EIW is included in the scope of work. An EAW would be additional effort.
10. Archaeological Study. In response to environmental reviews (EIW/EAW), SEH has seen a request for a more detailed archeological study. If this is deemed necessary from the state agencies, SEH would recommend bringing in a specialist to complete this study.

FEE

The estimated fee is $69,750 including expenses.

SCHEDULE

SEH proposes to complete the Facilities Plan within 40 weeks of receiving a signed agreement from the City of North Branch and receiving requested data necessary to prepare the Facilities Plan. However, this schedule may be driven by the MPCA's timing on the preliminary effluent limit request. The estimated fee in the Letter Agreement is based on receiving an executed proposal and requested data by March 1, 2024.

We look forward to working with the City of North Branch on this project. If you should have any questions, please contact Susan Danzl directly at 651.490.2064.

Sincerely,

SHORT ELLIOTT HENDRICKSON INC.

Susan Danzl
Project Manager
(Lic. CA, MN, CO, VA, IA, NV)

SRD
c: Miles Jensen, SEH, Bill Lueck, SEH
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September 11, 2024

Mr. Shawn Williams
Public Works Director
City of North Branch, MN
PO Box 910
North Branch, MN 55056

Re: Proposal and Fee Estimate for Professional Engineering Services
Comprehensive Sanitary Sewer Plan

Dear Mr. Williams:

WSB is pleased to present this proposal to the City of North Branch (City) to provide professional engineering services to prepare a Comprehensive Sanitary Sewer Plan (Plan). The Plan will include the creation and calibration of a new SewerCAD computer model of the sanitary sewer system. Completion of the updated Plan will rely on as much information as possible from the 2004 Comprehensive Sanitary Sewer Plan and the 2018 Comprehensive Plan to maximize efficiency and minimize cost. The following tasks will be provided for the Plan:

Task 1: Project Management and Coordination

Project management is a key task included in each project undertaken by WSB. This task consists of management, project coordination, and communication with the City on the project. Proper completion of this task will help keep all affected parties routinely updated and informed regarding project challenges, as well as keep the project on schedule and within budget. The proposed work plan will include two (2) meetings with City staff. Additional meetings can be added, if requested, and will be charged on an hourly rate.

Kick-off Meeting: Meet with City staff to reach consensus on the future land use plan to be analyzed, boundaries of future development, population projections, and wastewater flow projections.

Draft Report Review Meeting: Meet with City staff to review the draft report.

Task 2: Collect GIS Data

The City's current GIS sanitary sewer data includes pipe diameters for nearly all pipes, but the remaining data is limited. Approximately one thousand entries will be updated to include pipe material, pipe age, and invert elevations. WSB staff will go through all sanitary sewer as-builts and enter this information into the GIS database. The updated database will be used to create the SewerCAD model described below.

Task 3: SewerCAD Model

Task 3.1: Estimate existing wastewater flows by sanitary sewer district based on land use.

Task 3.2: Calibrate the estimated wastewater flows using meter data from the wastewater treatment plant, any available lift station runtime data, and any available testing and metering data.

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Task 3.3: Construct a new computer model of the sanitary sewer system using SewerCAD modeling software, based on sanitary sewer system GIS data. Input lift station dimensions and controls based on record plans.

Task 3.4: Input the calibrated wastewater flows into the SewerCAD model by sanitary sewer district.

Task 3.5: Analyze the calibrated model to identify critical areas of the system, diagnose potential issues, and recommend future improvements. Generate model output for use in the Plan.

Task 4: Comprehensive Wastewater Plan

Task 4.1: Review the 2004 Comprehensive Sanitary Sewer Plan, 2018 Comprehensive Plan, and other previous plans and studies to account for previous sanitary sewer service planning efforts.

Task 4.2: Prepare text and tables analyzing the capacity within the City's sanitary sewer system based on existing and projected wastewater flows.

Task 4.3: Identify the sanitary sewer system improvements that will be necessary to convey projected wastewater flows and prepare cost estimates for those improvements.

Task 4.4: Prepare GIS maps as detailed in the proposed Table of Contents below.

Task 4.5: Prepare a draft report based on our findings.

Task 4.6: Finalize the Plan based on comments from City staff and provide six copies to the City. The final report will include a description of the work completed, assumptions made, and figures as listed above. It will also include an electronic copy of the City's newly created SewerCAD model. The Plan will include the following Table of Contents and content:

Proposed Table of Contents:

1.0 Executive Summary
2.0 Introduction
    2.1 Authorization
    2.2 Scope
    2.3 Data Available
3.0 Existing Sanitary Sewer System
    3.1 Service Area
    3.2 Gravity Sewers
    3.3 Lift Stations
    3.4 Individual Sewage Treatment Systems
4.0 Land Use
    4.1 Land Use Breakdown
    4.2 Developable Areas
    4.3 Potential Ultimate Service Area
    4.4 Residential Units Per Acre
5.0 Growth Projections
    5.1 Strategic Growth Management
    5.2 Projected Residential Growth
    5.3 Projected Non-Residential Growth
6.0 Sanitary Sewer Design Criteria
    6.1 Estimated Wastewater Flow Rates

6.2 Peak Flow Factors
6.3 Inflow and Infiltration (I/I)
7.0 Future Sanitary Sewer System
7.1 Sanitary Sewer Districts
7.2 Wastewater Flow Projections
7.3 Future Trunk System
7.4 Wastewater Treatment Capacity
8.0 Capital Improvement Plan
9.0 Trunk System Policies
9.1 General
9.2 System Expansion (Orderly Development)
9.3 Leapfrogging
9.4 Overdepth and Oversizing
9.5 Lift Stations
9.6 Existing Developed Unserviced Properties
9.7 Existing Non-Residential Properties
9.8 Trunk Fee Payment
10.0 Recommendations

Tables
Table 1 Existing Lift Stations
Table 2 Ultimate Gross Developable Acres
Table 3 Potential Ultimate Service Area
Table 4 Historical Population
Table 5 Growth Projections
Table 6 Estimated Wastewater Flow Rates
Table 7 Peak Flow Factors
Table 8 Ratio of Peak Month Flow to Average Annual Flow
Table 9 Ultimate Wastewater Flow Projections
Table 10 Estimated Costs

Figures
Figure 1 Land Use Map
Figure 2 Gross Developable Acres
Figure 3 Potential Ultimate Service Area
Figure 4 Existing Sanitary Sewer System
Figure 5 Sanitary Sewer Districts
Figure 6 20-Year Trunk System Layout
Figure 7 20-Year Trunk System Improvements

Fee

WSB will complete the proposed Comprehensive Sanitary Sewer Plan for $46,000. The hourly breakdown by task for each employee class proposed for the project is shown on the attached spreadsheet. The proposed fee is based on our 2025 hourly rate schedule.

Schedule

WSB will complete the Plan within six (6) months of receipt of a written authorization. An estimated timeframe for completing the Plan includes the following milestones:

Task	Estimated Completion Date
City Council Authorization	October 2024
Kick-Off Meeting	November 2024
Collect GIS Data	Nov.-Dec. 2024
Complete Draft Plan	March 2025
Complete Final Plan	April 2025

Acceptance

This letter represents our entire understanding of the project scope. All work under this letter proposal will be governed by the Professional Services Agreement entered into between the City of North Branch and WSB on January 4, 2022. If the scope and fee appear to be appropriate, please sign on the space provided and return one copy to our office. We are available to begin work once we receive signed authorization.

Sincerely,

WSB

Jon Christensen
Project Manager
612-437-7967

Justin Messner, PE
Director of Municipal Operations
612-388-9652

I hereby authorize WSB to proceed with the above-referenced work under the terms and conditions of the Professional Services Agreement entered into City of North Branch and WSB on January 4, 2022.

By: _____

Name: _____

Title: _____

Date: _____

Fee Estimate
City of North Branch, Minnesota
Professional Services to Complete
Comprehensive Sanitary Sewer Plan

Task No.	Description	Estimated Hours							Total Labor Cost
		Sr. Project Manager (John Lapointe)	City Engineer (Justin Messner)	Project Engineer (Jon Christensen)	Graduate Engineer (Mitch Howe)	GIS Services (Michael Phillippi)	Administration (Karla Pederson)	Total Hours	
1	***Project Management and Coordination***								
1.1	Project management	4	2					6	$ 1,404.00
1.2	Project kick-off meeting	2	2	2	2			8	$ 1,648.00
1.3	Draft report review meeting	2	2	2	2			8	$ 1,648.00
	SUBTOTAL	***8***	***6***	***4***	***4***	***0***	***0***	***22***	***$ 4,700.00***
2	***Update GIS Data***								
2	Update the GIS Sanitary Sewer Database					48		48	$ 5,952.00
	SUBTOTAL	***0***	***0***	***0***	***0***	***48***	***0***	***48***	***$ 5,952.00***
3	***SewerCAD Model***								
3.1	Calculate wastewater flows based on land use			2	8			10	$ 1,546.00
3.2	Calibrate wastewater flows with meter data			2	8			10	$ 1,546.00
3.3	Build SewerCAD model with GIS data and lift station records	2		8	16	4		30	$ 4,814.00
3.4	Input wastewater flows			2	4			6	$ 970.00
3.5	Analyze model results and generate output	2		4	12			18	$ 2,954.00
	SUBTOTAL	***4***	***0***	***18***	***48***	***4***	***0***	***74***	***$ 11,830.00***
4	***Comprehensive Sanitary Sewer Plan***								
4.1	Review of previously completed plan(s)				4			4	$ 576.00
4.2	Prepare system capacity analysis			4	12			16	$ 2,516.00
4.3	Prepare proposed improvements and cost estimates	2		2	8			12	$ 1,984.00
4.4	Prepare GIS maps and figures			2	4	16		22	$ 2,954.00
4.5	Prepare draft report	16	1	4	32		8	61	$ 10,396.00
4.6	Finalize report	4	1	2	16		8	31	$ 5,070.00
	SUBTOTAL	***22***	***2***	***14***	***76***	***16***	***16***	***146***	***$ 23,496.00***
Total Hours (Tasks 1-4)		34	8	36	128	68	16	290	
WSB 2025 Hourly Billing Rates		$ 219.00	$ 264.00	$ 197.00	$ 144.00	$ 124.00	$ 154.00		
Total Direct Labor Costs (Tasks 1-4)		$ 7,446.00	$ 2,112.00	$ 7,092.00	$ 18,432.00	$ 8,432.00	$ 2,464.00		**$ 46,000.00**

June 28, 2024

Mr. Shawn Williams
Public Works Director
City of North Branch
6408 Elm Street
North Branch, MN 55056

Re: Proposal For Wastewater Treatment Facility Plan
City of North Branch, Minnesota

Dear Mr. Williams:

As requested, the following work plan outlines the scope of services and the associated engineering fee estimate to prepare a wastewater treatment facility plan for the City of North Branch.

PROJECT UNDERSTANDING

The City of North Branch's wastewater treatment system consists of a gravity sewer collection system, wastewater lift stations, an oxidation ditch wastewater treatment facility, and an outfall to the North Branch of the Sunrise River. The facility has been meeting effluent standards; however, because of the rapid expansion of the City of North Branch and the length of time required to plan, design, obtain approval/permits, secure financing and construct new infrastructure, it is time to start an evaluation of the path forward for the municipal wastewater treatment system. Due to recent legislative rule changes, the anti-degradation process required for expanding wastewater treatment facilities can take 2-3 years to complete before the design and construction can begin. Thus, being proactive on the expansion is well served to ensure growth within the City of North Branch can continue uninterrupted.

PROJECT APPROACH

For this important City of North Branch project, WSB has teamed with Nero Engineering to provide comprehensive wastewater facility planning services. Nero Engineering is a Twin Cities based consulting firm which specializes in wastewater treatment projects, including Facility Planning reports for municipal WWTFs. Some of Nero Engineering's recent municipal wastewater planning and design projects that are similar to the needs of North Branch include the cities of Owatonna, Hutchinson and Zimmerman, Minnesota. A focus of Nero's expertise in these projects is their experience and success in working with the MPCA and their clients on navigating the updated anti-degradation process. Their approach is generally to utilize the anti-degradation process to maintain as many existing permit requirements as possible so the community can maintain its long-term viability relative to its wastewater treatment. By going through this process, it provides the opportunity to keep the community growing without pause in development simply because of wastewater treatment permit or capacity limitations.

SCOPE OF SERVICES

The North Branch WWTF Facility Plan report will be divided into several chapters focusing on the following areas:

- Wastewater flow and organic strength data analysis to determine facility requirements for present and future population, commercial and industrial growth
- Future flow and load projections for the community.

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- Impacts of future growth on the existing facilities.
- Feasible and realistic alternatives for upgrading the North Branch WWTF.

The Facility Planning report will assist the decision-makers in the City of North Branch with the selection of appropriate and cost-effective solutions to their future wastewater treatment needs. The report will include cost estimates associated with an expansion of the existing treatment system and costs associated with alternative wastewater treatment systems.

It will contain information required by regulatory agencies such as the Minnesota Pollution Control Agency (MPCA) prior to their consideration of a wastewater treatment project for grant and/or loan participation.

After an opportunity for public input and upon acceptance by the City of North Branch, this report will be submitted to the MPCA for review and approval. Upon approval by MPCA, it will become the framework for future work at the wastewater treatment facility.

The tasks described below have been developed to provide the necessary consulting services to complete the Facility Plan report in accordance with guidelines established by the MPCA.

Task 1: Existing Facilities Assessment

- Kickoff Meeting
- Site walk-through w/Team for existing facilities assessment
- Review existing and historical plant data, including existing NPDES Permit
- Determine if additional data collection is needed
- Liquid train plant hydraulics review
- Gather & assess existing equipment/process data
- Tech Memo 1- Existing Facilities Assessment

Task 2- Future Conditions

- Develop service area
- Develop population projections
- Investigate Industrial Growth
- Determine Design Flows and Loadings
- Inflow & Infiltration Evaluations
- Design Flows and Loadings Meeting with Staff
- Submit the Preliminary Effluent Limits Request to the MPCA
- Tech Memo 2- Flows and Loadings Summary

Task 3- Alternatives Evaluations

- Develop cost opinions on existing facility upgrades
- Develop prelim process flow diagrams of Expansion Alternatives
- Expansion Alternatives Brainstorming Workshop with Staff

- Develop Final process flow diagrams of Expansion Alternatives
- Develop Site Plans for Alternatives
- Develop Concept Layouts for Alternatives
- Develop cost opinions for alternatives
- Tech Memo 3- Alternatives Evaluations
- Present Alternatives and Costs to Staff

Task 4- Preliminary Anti-degradation Review

- Submit Preliminary Effluent Limits Request
- Meet with MPCA to review antidegradation review process and determine preliminary contaminants of concern
- Determine parameters for anti-degradation review and parameters with accepted load caps
- Meet with City to discuss Prelim Effluent Limits and anti-degradation path

The facility plan effort only includes a preliminary anti-degradation review based upon the preliminary effluent limits the City receives from the MPCA. If the City decides to pursue either a partial or full permit anti-degradation analysis based upon the preliminary review, the entire anti-degradation process will be scoped out and performed as its own project. This will also be true for the Environmental Assessment Worksheet (EAW) that will be required with the expansion. The scope for both the anti-degradation analysis and EAW is based upon the alternative analysis and recommendation and thus will be addressed with the City as the Facility Plan effort guides the specific direction for both of these required tasks.

Task 5- Recommendations & Funding Opportunities

- Detailed Recommendation for Upgrades
- Determine Funding/Grant Opportunities
- Detailed Recommendation for Expansion Alternative
- Develop Implementation Schedule

Task 6- Facility Plan Preparation & Submittal

- Prepare Draft Facility Plan, to include the following information:
  - **Introduction**
    - Description of Existing Background and Scope
  - **Environment**
    - Community Setting
    - Municipal Water Supply
    - Surface Water, Geological Features, and Rainfall
    - Historical, Archeological, and Cultural Elements
    - Rare, Threatened, and Endangered Species
  - **Existing Wastewater Treatment Facilities**
    - Effluent Standards
    - Wastewater Treatment Plant Basis of Design/Condition and History
    - Wastewater Collection System and Lift Stations Overview
    - Historical Flows and Loadings

  - Inflow and Infiltration (I&I)
  - Existing Wastewater Facility Capabilities
- **Design Values**
  - Planning Period
  - Planning Area
  - Population Trends
  - Historical Data
  - Projected Wastewater Flows and Loads
  - Design Flow Determination
  - Load Projection
- **Discussion of Treatment Alternatives**
  - Development of Alternatives
    - Preliminary Treatment
    - Biological Treatment
    - Disinfection
    - Biosolids Processing
    - Process Building
    - Control Building
    - Phosphorus Removal
- **Evaluation of Alternatives**
  - Technical Considerations, including Innovative Technologies
  - Cost Considerations, including Funding Options
  - Environmental Considerations, including Anti-Degradation Requirements
- **Conclusions, Recommendations and Implementation**
  - Conclusions
  - Recommendations
  - Implementation Schedule

- Present Recommendations to Staff & City Council
- Submit Final Facility Plan
- Schedule and conduct public hearing on the proposed improvements

PROPOSED FEE

TASK	DESCRIPTION	FEE
1	Existing Facilities Assessment	$31,700
2	Future Conditions	$11,100
3	Alternatives Evaluations	$24,600
4	Preliminary Anti-Degradation Review	$8,600
5	Recommendations & Funding Opportunities	$7,400
6	Facility Plan Preparation & Submittal	$14,000
	SUBTOTAL: ENGINEERING SERVICES FEE	$97,400
	ESTIMATED EXPENSES	$2,000
	TOTAL ESTIMATED FEE	$99,400

Based on the proposed task hour budget, WSB will complete the scope of services previously discussed on an hourly basis, not to exceed for a fee of $99,400.

If additional work outside of the described scope is determined to be necessary, it will proceed only after City approval. This additional work would be billed on an hourly basis in accordance with the WSB 2024 Fee Schedule.

This represents our complete understanding and scope of the project. If the scope and fee are acceptable, please sign on the space provided below and return one (1) copy to our office as our authorization to proceed. We are available to begin work immediately based on your authorization.

We appreciate the opportunity to provide you with this proposal and we are again looking forward to working with you and your staff toward the completion of these projects. Please feel free to contact me directly with any questions or concerns you may have.

Sincerely,

WSB

Steve Nelson, PE
Director, Water/Wastewater

WSB

Justin Messner, PE
Director of Municipal Services

ACCEPTED BY:

City of North Branch:

_____
Authorized Signature

_____
Title

_____
Date

January 2004

Comprehensive Sanitary Sewer Plan

Prepared for:

City of North Branch
P.O. Box 910 - North Branch, MN 55056

WSB Project No. 1231-55

Prepared by:

4150 Olson Memorial Highway, Suite 300
Minneapolis, MN 55422 (763) 541-4800

WSB & Associates, Inc.

Comprehensive Sanitary Sewer Plan

Prepared for:

City of North Branch
P.O. Box 910
North Branch, MN 55056

January 2004

Prepared by
WSB & Associates, Inc.
4150 Olson Memorial Highway, Suite 300
Minneapolis, MN 55422
(763) 541-4800
(763) 541-1700 (fax)

WSB
& Associates, Inc.

January 5, 2004

Honorable Mayor and
City Council Members
City of North Branch
P.O. Box 910
North Branch, MN 55056

Re: Comprehensive Sanitary Sewer Plan
City of North Branch
WSB Project No. 1231-55

Dear Mayor and Council Members:

We are pleased to submit our Comprehensive Sanitary Sewer Plan for your review and comment.

The Comprehensive Sewer Plan establishes a basis for future sanitary sewer trunk system needs, which will serve as the basis for the calculation of the sanitary sewer trunk area charge used to pay for future trunk improvements. The plan is intended to help the City of North Branch meet its short-term and long-term sanitary sewer needs.

Thank you for your assistance and insight during preparation of this report. It is a pleasure to have the opportunity to work with each of you.

Sincerely,

WSB & Associates, Inc.

Jason Benson, P.E.
Project Manager

Enclosure

4150 Olson
Memorial Highway
Suite 300
Minneapolis
Minnesota
55422
763-541-4800
763-541-1700 FAX

INFRASTRUCTURE ENGINEERS PLANNERS

Certification

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

Jason B. Benson, P.E.

Date: January 5, 2004 Reg. No. 26795

Quality Control Review By:

Nancy Zeigler, P.E.

Date: January 5, 2004

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1.0 EXECUTIVE SUMMARY

The North Branch Comprehensive Sewer Plan is primarily intended to serve as a guide to completing the future sanitary sewer trunk system as well as an inventory of the City's existing sanitary sewer facilities. The document also serves as the basis for the calculation of the sanitary sewer trunk area charge used to pay for future trunk improvements. The plan is intended to help the City of North Branch meet its short-term and long-term sanitary sewer needs.

The City of North Branch has been experiencing considerable growth and anticipates the growth to continue. In recent years, the City has averaged approximately 140 residential housing units per year. The population served by public utilities has increased by 65% in the past five years. Commercial and Industrial growth is presently occurring and is anticipated to continue in the future. The focus of this study is the next 20 years, however, ultimate projections were developed for service area, population, and wastewater generation rates from the ultimate land use map prepared by the City Planning Commission. These ultimate projections were used in sizing the 20-year trunk facilities.

The City is divided into six major sanitary sewer service areas or districts. For the purpose of sanitary sewer planning, these major districts are further divided into subdistricts. Each subdistrict contributes wastewater flow to the sanitary sewer collection system. The amount of flow that each subdistrict contributes depends on a variety of parameters such as land use, population density, wastewater generation rates, development restrictions, wetlands, dedicated green space, etc.

The topography of undeveloped areas was studied to estimate the locations and determine the extent of gravity sewer areas for future trunk facilities. The intention with laying out the future system was to minimize the number of trunk lift stations, while keeping the maximum depth of the gravity sewers to around 20 feet deep. The City is generally very flat which makes it difficult to avoid lift stations without deeper sewers. The 20-year trunk system was sized and laid out. A rough layout was prepared for the ultimate service area outside of the projected 20-year service area, so that entry points of future areas into the 20-year system could be determined for sizing purposes. The 20-year trunk system improvements were sized to handle ultimate conditions. The layout of the system is general in nature and exact routing will be determined by the particular conditions at the time of final design. It is important that the general concept and sizing be adhered to for assurance of an economical and adequate ultimate system.

Construction cost estimates were developed for the completion of the 20-year trunk system. These trunk facilities include all gravity sewer mains 10-inches in diameter and larger, lift stations, forcemains, and jacking/boring for highway and river crossings. Trunk costs do not include the cost of installing lateral sewer (8-inch diameter). Trunk costs only include the cost required for oversizing and overdepth. Trunk lift stations are considered lift stations larger than 150 gpm in capacity and serving more than one single development will be paid for 100% by trunk fees. Lift stations not fitting the description of a trunk lift station shall be paid for by developers. Existing trunk or lateral sewers requiring upsizing for future trunk facilities include the cost of replacement of a 20-foot wide bituminous street section as well as the cost of the

lateral (8-inch diameter) sewer. The estimated cost (trunk portion only) to complete the 20-year trunk facilities is approximately $7,500,000 in today's dollars.

The 20-year trunk improvements were broken down into 34 separate projects and then were prioritized based upon need and the anticipated areas of growth for developing a capital improvements plan (CIP). As part of the CIP the trunk improvement projects were grouped into five year increments, spreading out the cost of the trunk improvements over the 20-year period. The projects were grouped with an "outward growth" philosophy in mind. Phasing of future trunk system improvements and construction next to existing trunk facilities are important aspects of providing a system that meets requirements in an economically responsible manner.

As the City of North Branch grows it is important to provide a funding mechanism for construction of the major infrastructure improvements needed to serve the growth. The City of North Branch has established that growth should pay for the change in the facilities. Developers are expected to pay for new trunk facilities and expansions of existing facilities through trunk and other fees.

Trunk fees will be established based on the total gross acreage of developable land available and the cost of trunk improvements necessary to serve that area. The trunk fee for all types of property shall be based upon this per acreage basis. However, how the fee is charged to types of properties will vary. Residential development will be charged on a per unit basis as it is now, and non-residential development and apartments will be charged on a per acre basis.

The per acre based fee will be established by taking the total cost of the trunk system improvements and dividing it by the total gross acreage developed, including all residential and non-residential properties. Non-residential development generally has a larger impact on the system than residential, so an equivalency factor will be applied to the per acre charge for residential development establishing a separate per acre charge for residential and non-residential properties. The ratio of the average per acre wastewater flow generation rates will be used to determine the equivalency factor.

An average of 2.0 units per gross developable acre will be used as the basis for establishing a per unit charge for single family residential and townhomes from the per acre based residential fee. Residential apartment buildings will be charged by the acre in the same manner as non-residential development.

A financial analysis was completed utilizing the projected capital improvements plan and the trunk fee philosophy described above to determine the trunk fees necessary to provide enough money to pay for the proposed trunk improvements. Based upon the detailed financial analysis the trunk fee starting in 2004 shall be approximately $3,400 per gross developable acre for residential ($1,850 per residential unit) and $5,100 per gross developable acre for non-residential properties.

The following recommendations are presented for staff and council considerations:

1. Adopt this report as the Comprehensive Sanitary Sewer Plan for the City of North Branch.

2. Review and adopt the preliminary Capital Improvement Plan (CIP) for trunk sanitary sewer facilities.

3. Adopt the trunk system policy changes and updated and/or revised ordinances in the City Code with regards to the sanitary sewer system charges included in Appendix E of this report.

4. Revise the trunk fee structure in accordance with the improvements recommended in this report. A summary of the recommended 2004 trunk fees are as follows:

Trunk Fee	
Residential:	$1,700/unit
Apartments & Non-Residential:	$5,100/gross acre
Increase both at 3%/year	

5. That the trunk fees be reviewed on an annual basis to determine an appropriate annual multiplier based upon inflation rates and the overall health of the trunk fund balance.

6. Annually review the trunk system needs by evaluating past wastewater usage, planned development, and the financing plan. Conduct a comprehensive sewer study every five years.

7. Continue to reduce infiltration and inflow (I/I) from the existing collection system and that provisions be maintained for controlling I/I into the sanitary sewer system for new construction.

2.0 *INTRODUCTION*

2.1 *Authorization*

In July 2003, the North Branch City Council approved the Supplemental Agreement proposed by WSB & Associates, Inc. to provide engineering services related to the preparation of a Comprehensive Sanitary Sewer Plan Update.

2.2 *Scope*

The City of North Branch has experienced considerable growth in recent years and anticipates similar growth to continue. With the current growth and resulting expansion and upgrade of the City's wastewater treatment facility and recent trunk sewer expansions within the City it was determined that the existing comprehensive sewer plan is now outdated.

The purpose of this study is to provide the City of North Branch with a current Comprehensive Sewer Plan that will serve as a guide to completing the future sanitary sewer trunk system as well as an inventory of the City's existing sanitary sewer facilities. The document also serves as the basis for the calculation of the sanitary sewer trunk area charges used to pay for future trunk improvements. The plan is intended to help the City of North Branch meet its short-term and long-term sanitary sewer needs.

This comprehensive sewer plan will look at the current trunk sanitary sewer system capacities as well as project future needs. The study will utilize the 20-year population projections from the wastewater treatment facility plan and provide population and flow projections for beyond 20 years based upon the potential service areas outside the current MUSA boundary. A potential ultimate service area will be defined based upon the Land Use map prepared for the City's comprehensive plan and looking at areas that can be reasonably serviced by sanitary sewer in the future. Following definition of the ultimate service area, sanitary sewer districts will be defined and flow rates will be projected for each of the sewer districts based upon the respective land uses in each service district. The projected flow rates will be used to size the future trunk sewer system.

The anticipated 20-year trunk improvements will be defined, with the intention that the trunk system is sized to serve the needs of the entire ultimate service area. A rough layout of potential trunk system improvements will be provided to aid in determining where future flow beyond the anticipated 20-year service area will enter the system. An opinion of probable costs will be provided for the 20-year trunk system improvements, and the improvements will be prioritized based upon the anticipated growth areas. A preliminary Capital Improvements Plan (CIP) will be developed for the trunk sanitary sewer system and a financial analysis will be prepared to establish sanitary sewer trunk fees. The existing trunk fee policy will also be reviewed and upgraded as required. Flexibility in planning, design and construction in the near-term and long-term are of high importance, since such flexibility will allow savings in time and money when changes to the trunk sanitary sewer system are necessary.

2.3 Data Available

In preparing this report, the following sources of information were utilized:

- City of North Branch Parcel Maps
- City of North Branch Sanitary Sewer Base Map
- Topographic Surveys performed by WSB & Associates, Inc., various dates in 2003
- Aerial Photos and Topographic Maps prepared by Horizons, Inc., November 2003.
- As-built plans provided by the City of North Branch
- Wastewater Treatment Facility Plan – City of North Branch, MN, prepared by WSB & Associates, Inc., March 2002.
- Comprehensive Sewer and Water Plans – City of North Branch, MN, prepared by TKDA & Associates, Inc. May 2000.
- The City of North Branch City Code – Title 13 Public Services.

3.0 *EXISTING SANITARY SEWER SYSTEM*

3.1 *Sanitary Sewer Service Areas*

The existing serviced area within the City of North Branch comprises approximately 1,500 gross acres. A Municipal Urban Service Area Boundary was established which included the existing serviced area plus an additional 600 acres of developable land, some of which has already been developed in the last several years since the Comprehensive Sewer Plan update in 2000. The existing comprehensive sewer plan was based upon this area only, and does not take into consideration areas outside the MUSA boundary. The sanitary sewer service areas were developed within the existing MUSA boundary based upon areas of gravity service. The area within the MUSA line was divided into eight sanitary sewer service areas; the existing, S, SE, SW, W, NW, NE, and E. Wastewater flow from all of the service areas eventually ends up at the main lift station located on Grand Avenue on the north side of the river where it is pumped to the existing wastewater treatment facility.

3.2 *Gravity Sewers*

The City of North Branch sanitary sewer system is comprised of gravity sewers ranging in size from 8-inches to 24-inches in diameter. Figure 3.1 is a map of the existing sanitary sewer system. Construction of the existing sanitary sewer system began in 1921 with vitrified clay pipe. The sanitary sewer system has been expanded numerous times as the community has grown. Some of the older vitrified clay pipe sanitary sewers have be replaced, however, many remain in service yet today. The existing sanitary sewer system, although old in some instances, appears to be in good overall condition. A good indication of this is that infiltration and inflow (I/I) has not been found to be excessive in the City of North Branch.

The existing system consists of two major trunk mains; one along Grand Avenue and one along Main Street. The Main Street trunk sewer is a 12-inch diameter PVC pipe which serves the downtown area and everything west of CSAH 30, including the Tanger Commercial Area. The Main Street trunk sewer actually extends from Eighth Avenue to Second Avenue along Main Street then flows north from Main Street to Cedar Street along Second Avenue. The trunk sewer was upgraded to 18-inches from Second Avenue east to Grand Avenue along Cedar Street.

The Grand Avenue trunk sewer consists of 15-inch, 18-inch, 21-inch, and 24-inch gravity sewer. The Grand Avenue trunk sewer serves everything south of Highway 95 and east of County Road 30, including the School, Casselberry Ponds, and Wood Duck Ponds. The Grand Avenue trunk sewer has been upgraded with several projects over the last few years. The Main Street and Grand Avenue Trunk sewers combine at the intersection of Cedar Street and Grand Avenue. From there they flow across the river to the Lift Station No. 1 (Grand Ave.).

The area north of the river and east of County Road 30, which includes the existing industrial park area, is served by an 8-inch gravity sewer along Grand Avenue which flows to the Lift Station No. 1.

3.3 Lift Stations

The existing sanitary sewer system includes ten (10) lift stations and associated forcemains. The lift stations range in capacity from approximately 50 gpm to 1,200 gpm. All of the existing lift stations are submersible type lift stations with precast concrete wet wells. Grand Avenue, Tanger, and the Wood Duck Ponds lift stations also have precast concrete valve vaults. Lift Station No. 1 (Grand Ave.) takes the wastewater flow from the entire City and pumps it to the existing wastewater treatment facility. Figure 3.1 shows the locations of the existing lift stations. Table 3.1 summarizes capacity information for each of the lift stations.

Six of the ten lift stations are on a radio SCADA alarm system. The existing SCADA system does not allow operators to access the system remotely to determine the extent of the problem that may trigger an alarm condition. Flow measurement from the lift stations is provided with running time meters. The existing SCADA system is being upgraded and all of the existing lift stations will be put on the SCADA system as part of the wastewater treatment facility expansion and upgrade project that is currently under construction.

3.4 On-Site Sewage Disposal Systems

There are many areas throughout the City of North Branch that are currently on septic systems and wells. Some of these areas are developed with one to two acre lots that will not be further developed in the future.

The City of North Branch Zoning Ordinance now requires a minimum unsewered single family lot size of ten (10) acres. North Branch's enforcement authority is regulated by Section 13.12 of the City Code. This section adopts the Chisago County On-Site Sewage Treatment System Ordinance by reference, which references the Minnesota Pollution Control Agency Rule 7080.

4.0 LAND USE

4.1 Land Use Breakdown

Figure 4.1 is a land use map of the City of North Branch. This map was developed by the North Branch Planning Commission and separates North Branch into twelve (12) different land use categories. Land use is an important factor in determining future trunk sewer systems because different land uses generate different wastewater flow rates.

4.2 Developable Areas

The area within the city limits of North Branch is 36 square miles, or 23,040 acres. The existing area with sanitary sewer service is approximately 1,500 acres. There are, therefore, many areas within the city limits that could be developed. Not all of this acreage is considered developable. Areas considered undevelopable include wetlands, lakes, rivers, parks, open space, public areas, semi-public areas. In addition the City has identified areas for future green space as part of the "green corridor" as shown on Figure 4.1.

Each land use section's total acreage was calculated. Existing serviced, developed unserviced areas, and undevelopable areas were subtracted to obtain an estimate of developable acreage. This is identified as "Gross" Developable Acreage because it includes roads and common or public areas that would be included in developments. The Gross Developable Acreages by land use categories are shown in Figure 4.2 and summarized in Table 4.1.

4.3 Potential Ultimate Service Area

The potential ultimate service area quantifies gross developable acres in terms of those that are most likely to develop and when development is anticipated. The potential ultimate service area is shown in Figure 4.3 and summarized in Table 4.2. The potential service area is shown for 0 to 20 years, and 20 years and beyond. In addition, residential and non-residential areas are identified.

Growth is projected to occur primarily surrounding the existing serviced areas. The 20-year service area takes into consideration the amount of gross acreage needed to serve the anticipated residential and non-residential growth over the next 20 years. This may vary somewhat depending on exactly how dense the residential developments are, where available land is located, and how fast non-residential development actually occurs. Growth will occur where it is most economically viable, which means typically it will happen in an outward fashion adjacent to areas where existing services are. Some areas or regions may grow at different rates than others. Area that is earmarked as part of the 20-year area may not happen in the next 20 years, while other areas adjacent to the 20-year area may happen before the next 20-years is up. Land availability and cost effectiveness will play an important role in how the growth occurs.

The large agricultural (AG) areas were not considered to be part of the potential ultimate service area because they are generally furthest away from the existing serviced area, and much of the agricultural areas have undevelopable features such as wetlands. In some cases, such as the

larger agricultural area in the northeastern section of North Branch, there are physical features separating the area from existing facilities that may make servicing the area more costly.

4.4 Residential Units per Acre

The number of residential units per gross acre in existing and future developments is important in estimating population and future sanitary sewer flows from the potential ultimate service area. An average of 2.0 residential units per gross acre (including future roads and other common or public areas) will be used in calculating trunk fees for residential properties. This is equivalent to approximately 3.0 residential units per net acre (taking out area for future roads and public areas), which is in line with the City's comprehensive plan and the minimum lot sizes required for single-family residential in the City's zoning requirements. There are some areas that are earmarked for medium and high density development which will average much higher than 2.0 units per gross acre, however, a lot of the single family may average a little less than 2.0 units per acre so on an overall basis 2.0 units per gross acre will be used in the calculation of trunk fees. A majority of the acreage is single-family residential. The recent residential developments within the City, like Casselberry Ponds and Wild Ridge, have averaged less than 2.0 units per gross acre. For the calculation of wastewater flows for each specific area the actual densities for the various residential land use types will be used so that individual trunk lines are sized appropriately.

5.0 GROWTH PROJECTIONS

5.1 Strategic Growth Management

Strategic growth management is a key factor in a community's success as it grows. It is important to promote new commercial and industrial development while also balancing such growth with residential growth. Residential development needs to be guided in terms of amount, type, location and quality. While accommodating growth, it is also essential that environmental quality in North Branch be protected. North Branch's ability to deliver reliable services must be maintained throughout growth and there needs to be an awareness of all services, such as water (distribution system, wells, storage, treatment), sewer (trunk sewer system, wastewater treatment and discharge), storm water, transportation, schools, and other public facilities and services.

5.2 Projected Residential Growth

5.2.1 Population Projection (20-Year)

The historical population is included in Table 5.1. The communities of North Branch and Branch merged in November 1994. Therefore, North Branch data before 1994 have been adjusted to include Branch. The population served has increased 65% in the past five years, or approximately 10.5% per year.

In recent years, North Branch has been growing at a rate of approximately 140 units/year. By far, the majority of this growth is occurring in areas receiving sanitary sewer service. North Branch's growth has been projected using three different scenarios. Projection 1 uses a straight line projection of 140 units/year, this follows the projections found in the wastewater treatment facility plan prepared in 2001. Projection 2 uses straight line growth at a rate of 140 units per year to the year 2011 and then a 2.5% annual increase in housing units after 2011. Projection 3 uses straight line growth at a rate of 140 units per year to the year 2006 and then a 3% annual increase in housing units after 2006.

An average conversion factor of 2.89 people per household was used to convert units/year to people/year. 2.89 people per household is based on population and corresponding number of households data for the City of North Branch. Single-family residential may average more people per household than this, but medium and higher density generally average less than this so as an average this a good number for planning purposes. The resulting annual growth and population served is presented in Table 5.2 for Projections 1, 2 and 3.

The 2023 range of population projections, 12,600 to 14,800 people (serviced population), is comparable to numbers found in the City's Comprehensive Plan.

5.2.2 Population Projection (Ultimate)

The ultimate projected population is based upon the amount of developable land available within the projected ultimate service area for the City of North Branch. In looking at the gross developable residential acreage and applying the appropriate units per gross acre and average people per household the ultimate serviced population for the City of North Branch would be approximately 50,000 to 60,000 people. This will most likely vary depending on actual housing densities. As the City grows and becomes much larger the average housing densities may go up, which would ultimately impact the population. Based upon current growth rates the ultimate population is not likely to happen within the next 40 years. Ultimate "build-out" may not occur for the next 50, 60, or 70 years and beyond. At this point it is only a rough estimate based upon the amount of developable land available and the current projected land uses, but it is important in providing a basis for projecting wastewater flows for sizing the future trunk sewer system.

5.3 Projected Non-Residential Growth

5.3.1 Non-Residential Projection (20-Year)

Historically, the non-residential portion of North Branch has been mostly commercial development. The majority of the wastewater flow is currently generated from residential. There has not been a lot of industrial growth or large wastewater generators. The land use map (Figure 4.1) that was developed by the North Branch Planning Commission does include some large industrial parks. Industrial properties are currently being developed in the northern portion of the City. The City of North Branch and its economic development authority are working hard to promote more commercial/industrial growth. Based upon the land use map there are approximately 600 acres of non-residential land available for development within the 20-Year growth area. It is anticipated that the non-residential growth will occur in a linear fashion, or approximately 30 acres a year over the next 20 years. This includes all types of anticipated commercial and industrial development. The commercial/industrial growth is important in making the City of North Branch an economically viable place to live as well as helping create a higher quality of life for existing and future residents.

5.3.2 Non-Residential Projection (Ultimate)

Based upon the ultimate service area and projected land uses (Figure 4.3) there are approximately 1,100 acres of developable land outside of the 20-year service area that have been classified as some sort of commercial or industrial development. As the City grows this may vary, but those needs will define themselves as the population base is established in the City of North Branch as well as the surrounding areas. Projecting out non-residential growth to the ultimate "build-out" conditions for the City provides a basis for calculation of wastewater flows and sizing the future trunk sewer system.

6.0 SANITARY SEWER DESIGN CRITERIA

6.1 Estimated Flow Generation Rates

6.1.1 General

Wastewater flows were determined by applying unit flow rates to each of the land use categories from the land use map. The unit flow rate is based upon the daily average wastewater flow generated by each land use category in gallons per net acre per day. Historical generation rates for the City of North Branch were reviewed along with text book values and data from other communities within the Twin Cities metropolitan area.

The existing flow generation rates for the City of North Branch were a bit lower than the averages used by other growing communities in the metropolitan area. This may be due to a smaller commercial/industrial component and a fairly tight sewer system (low infiltration and inflow). The text book values were quite a bit higher than the average for the area. In working with City staff it was decided that it would be better to be a little on the conservative side, so the average generation rates used by other growing communities in the twin cities metropolitan area were used as a basis. Most of the communities looked at such as; Lakeville, Maple Grove, Shakopee, Rosemount, and Woodbury, have already experienced a significant amount of growth both on the residential and non-residential side. They have seen what average wastewater generation rates can be expected from different land use categories. Wastewater flow rates were divided into two categories; residential and non-residential (commercial/industrial).

6.1.2 Residential Flow Rates

To determine the residential flow generation rates in gallons per net acre per day, a population density for each land use category was applied. Densities in units per net acre were determined based upon the minimum lot size criteria found in the City's zoning requirements.

The number of units was then multiplied by a population density (people per unit). These numbers are based upon averages developed by the Metropolitan Council for communities in the metropolitan area. The density information is shown on Table 6.1. The number of people per net acre was then multiplied by the estimated residential per capita unit flow rate, again based upon average numbers found in the twin cities metropolitan area. In looking at the historical per capita numbers (which include I/I), they are comparable with the projected per capita flow rates.

Table 6.1 summarizes the flow generation rates by land use in gallons per net acre per day.

6.1.3 Non-Residential Flow Rates

To determine the non-residential flow generation rates in gallons per net acre per day, values used by other communities in their comprehensive sewer plans were looked at. The communities selected for this comparison have already and are continuing to experience significant growth. The existing average non-residential flow, which is based upon applying the percentage of water used to the existing wastewater flow and developed land measurements, is

between 600 and 700 gallons per acre per day (gpad). In looking at other communities they range from 1,000 to 1,500 gpad for most general commercial and light industrial type businesses.

Accordingly, commercial and industrial flow generation rates for ultimate development are being projected at 1,200 gpad. Table 6.1 lists the non-residential wastewater generation rates used in the calculation of flows for ultimate development in the City of North Branch.

Existing non-residential properties may be generating more or less flow per acre than the future rates being projected. However, upon ultimate development, it is assumed that the areas which are currently developed may redevelop to a land use which could generate the projected flows.

Significant industrial dischargers have not been considered. If a significant industrial discharger would like to establish themselves in the City, their impacts to the sanitary sewer system will be reviewed on an individual basis. Significant industrial dischargers are classified as those who discharge at least an average of 25,000 gallons per day, or are a minimum of five (5) percent of the total average daily flow to the wastewater treatment facility.

6.2 Peak Flow Factors

The sanitary sewer collection system must be capable of handling not only average flows, but also the anticipated peak flows. These peak flows can be expressed as a variable ratio applied to average flow rates. This variable ratio, called the peak flow factor, has been found to decrease as the average flow increases. The peak flow factors applied in this study are listed in Table 6.2. These values were obtained from the Metropolitan Council Environmental Services (MCES). They are generally considered conservative, and are widely used for planning in municipalities throughout the twin cities metropolitan area.

6.3 Infiltration/Inflow (I/I)

6.3.1 General

Infiltration is water that enters the sanitary sewer system by entering through defects in the sewer pipes, joints, manholes, and service laterals, or by deliberate connection of building foundation drains. Water that enters the sewer system from cross connections with storm sewers, sump pumps, roof drains, or manhole covers is considered inflow.

The quantity of I/I entering a wastewater collection system can be estimated utilizing wastewater pumping records, daily rainfall data, and water usage characteristics. Water from inflow and infiltration can consume available capacity in the wastewater collection system and increase the hydraulic load on the treatment facility. In extreme cases, the added hydraulic load can cause bypasses or overflows of raw wastewater. This extra hydraulic load also necessitates larger capacity collection and treatment components, which results in increased capital, operation and maintenance, and replacement costs. As sewer systems age and deteriorate, I/I can become an increasing problem. Therefore, it is imperative that I/I be reduced whenever it is cost effective to do so.

The MPCA considers infiltration excessive if the average per-capita flow during periods with high groundwater levels but no recent precipitation events is greater than 125 gallons per capita

per day (gpcd). Inflow is considered excessive if the per-capita flow during periods with significant runoff from a 25-year, 1-hour storm, exceeds 275 gallons per capita per day.

The Metropolitan Council Environmental Services (MCES) also has a method for indicating the severity of a municipality's I/I problem. MCES has established a goal that the ratio of maximum month sewage flow to annual average sewage flow should not exceed 1.67.

6.3.2 I/I Analysis

Table 6.3 shows the ratios of peak month flows to average annual flows over the last seven years. The average ratio of peak month flow to average annual flow over the last seven years is 1.25. This is less than the value of 1.67, which MCES considers the upper threshold when determining whether a community has excessive I/I. In fact the highest ratio of the peak day flow to the average annual flow during this time period is only 1.58, which is also less than the 1.67 value from MCES. In reviewing the historical data over the last few years the flow is relatively steady throughout the year. All of these things indicate that the sanitary sewer system in North Branch does not have excessive I/I, and that they have a relatively tight sewer system.

The future sanitary sewer system will be sized to accommodate some I/I, however, the City will continue to reduce I/I wherever feasible. If the I/I can be reduced, it will serve to extend the life of the sanitary sewer collection system and the wastewater treatment facility. The City should continue to reduce sources of I/I by:

- Testing new sewer lines for leakage.
- Employ special design considerations for areas of high ground water.
- Inspect all sanitary sewer manholes repairing cracks, holes, and other deterioration.
- Replace ill-fitting or damaged castings.
- Use concealed pick holes in the manhole covers.
- Repair new sources of I/I found during the normal cleaning, televising, and maintenance of the system.
- Disconnect any roof drains, sump pumps, and foundation drains from sanitary sewers. Emphasize enforcement of the City Ordinance which prohibits such connections.
- Replacement of aged infrastructure components when completing other capital improvement projects.

7.0 FUTURE SANITARY SEWER SYSTEM

7.1 Sanitary Sewer Service Districts

The future sanitary sewer trunk system is based upon dividing up the ultimate potential service area into major service areas or districts and then dividing those major service districts into subdistricts. Generally the selection of these areas is governed by existing topography and/or other existing features such as major roadways. The ultimate potential service area is broken up into six (6) major sanitary sewer districts; the Central (C), North (N), Northwest (NW), West (W), South (S), and the East (E). Each major district was divided into subdistricts which were assigned a number corresponding to its major district (eg. N-120). Figure 7.1 shows the major sanitary sewer districts and corresponding subdisticts. Each subdistrict has corresponding land uses based upon the land use map.

The following is a brief summary of the steps taken to develop the future trunk sanitary sewer system based upon the ultimate service area and projected sanitary sewer districts:

1. The ultimate potential service area for the City of North Branch was determined eliminating large areas likely not be serviced in the future.

2. The ultimate service area was divided into sanitary sewer subdistricts based upon gravity sewer constraints and other natural and physical boundaries.

3. Sanitary sewer flows were generated for each subdistrict based upon the gross developable acreage and the anticipated land uses. Large wetlands, green space, and other undevelopable areas were taken out of the area calculations. The wastewater flow generation rates for the various land use categories found in Section 6.0 of this report were used to project the future wastewater flows.

4. A conceptual 20-year sanitary sewer trunk system was laid out based upon existing ground contours which govern how far the gravity trunk sewers can feasibly be extended and other physical features which help determine potential trunk sewer locations.

5. Potential future trunk improvements beyond 20 years were roughed out to determine where future subdistricts might enter the trunk system in 20 years so that the system is adequately sized to accommodate growth beyond 20 years.

6. The trunk gravity sewer mains, lift stations, and forcemains needed to accommodate the anticipated growth for the next 20 years were then sized to handle the sanitary sewer flows from those subdistricts which are tributary to each particular trunk gravity sewer main or lift station.

7.2 Wastewater Flow Projections

Wastewater flow projections were generated for each major sanitary sewer district and corresponding subdistricts based upon the gross developable acreage available, anticipated land uses, and wastewater flow generation rates. The wastewater flow generation rates for the various land use categories found in Section 6.0 of this report were used to project the future wastewater flows. Appendix A contains summaries of the projected wastewater flows for each major district and corresponding subdistricts.

The wastewater flow generation rate summary table is based upon units per net acre, so the gross developable acreage in each subdistrict was converted to a net developable acreage for calculating the wastewater flows from each subdistrict. As an example the single family residential (LU-1) is based upon three (3) units per net acre (this is equivalent to the minimum lot size), but in actuality on a gross acreage basis when factoring in future roads, ponding areas, parks, etc. the average number of units will be around two (2) units per gross acre. Taking the number of gross acres and multiplying it by the ratio of units per gross acre over units per net acre (2/3) results in the number of net acres available.

Table 7.1 shows a summary of the projected average and peak design wastewater flows for each of the major subdistricts. Peak flow factors were applied to the average wastewater flows for sizing the sanitary sewer collection system as indicated in Section 6.2 of this report. These flows are based upon the ultimate developed conditions for the City of North Branch.

7.3 Future Trunk Sanitary Sewer System

7.3.1 General

The 20-year trunk sanitary sewer system layout is shown in Figure 7.2. This map shows the major district and subdistrict boundaries, existing and proposed trunk sanitary sewers, lift stations, and forcemains. The map also includes a conceptual layout of the ultimate trunk system beyond 20 years showing the anticipated entry points into the 20-year system. Using the projected wastewater flows for each of the major districts and subdistricts, design flows were determined for each segment of trunk sewer to determine sizing requirements. Flows from subdistricts located outside of the 20-year service area were included for sizing the 20-year trunk system.

The sanitary sewer trunk system, as shown on Figure 7.2, was divided into pipe lengths with collection and connect points. Each subdistrict was designated one collection point, and the collection point was assumed to be the location where the subdistrict's flow entered the pipe network. Collection points were located near the center of the subdistrict for improved accuracy in cumulative flow calculations and corresponding pipe sizing. Connect points were designated where two or more trunks connected and flow was added to the pipe network. The collection and connect points are generally numbered sequentially by major district from downstream to upstream on the sanitary sewer pipe network. The nomenclature of the points consists of a prefix corresponding to the particular major district followed by a number. For example, the collection point for Subdistrict NW-110 in the Northwest District would be labeled NWC-1. Appendix B

summarizes the peak design flows and corresponding pipe size and slopes required for each of the pipe segments from the major subdistricts. A large future trunk system map has been included in the back of this study which details the collection points as well as the approximate sizes of the future 20-year trunk facilities.

Pipe capacity constraints have been identified for the existing trunk sewer system. The existing pipe capacities were calculated using an average slope between collection and connect points. These pipe lengths may be a combination of manhole to manhole pipe segments with unique slopes. The capacity constraints will be reconstructed or upgraded as part of the proposed trunk system improvements.

7.3.2 Central District

The Central District includes the existing serviced area with the exception of the Tanger Commercial Area, as shown in Figure 7.1. A majority of this district is already developed, but there are some areas that can be developed, including the area west of the existing Casselberry Ponds development and the area surrounding the new Wood Duck Ponds development. The wastewater flow in this district is split, with everything west of Grand Avenue flowing from west to east, and everything east of Grand Avenue flowing from east to west. There are two existing main trunk sewers; the Main Street trunk sewer and the Grand Avenue trunk sewer. They combine in the northern portion of the district at the intersection of Cedar Street and Grand Avenue (CC-3) before flowing to the Lift Station No. 1 (Grand Ave.). There are a number of trunk improvements that will need to be made in the Central District to provide service to the projected 20-year and ultimate service areas.

The 15-inch diameter Grand Avenue trunk sewer will have to be extended to the south in Subdistrict C-260 to serve the new middle school and the adjacent Nelson property. This trunk sewer will also ultimately serve the entire South District. The South District will enter at point CC-13. Once the new middle school comes on line the existing Lift Station No. 5 (Blakeslee) will need to be upgraded soon thereafter to meet the current and long term future peak design flows.

A 10-inch diameter trunk sewer will have to be constructed along Hemingway Avenue in Subdistrict C-260 to serve the area surrounding the Wood Duck Ponds development. The flow from this trunk sewer will go to existing Lift Station No. 10 (Wood Duck Ponds). The lift station's wet well and forcemain are sized to handle the entire flow from this area, but as the area becomes fully developed the existing pumps will have to be upsized to handle the fully developed peak flow conditions. The flow from Lift Station No. 10 enters the Grand Avenue trunk sewer at CC-7, just south of Lift Station No. 5.

The flow from the West district, currently the Tanger Commercial Area, is pumped from Lift Station No. 7 (Tanger) to the Mystic Woodlands Development where it flows by gravity through a 12-inch diameter line to Lift Station No. 2 (Mystic Woodlands). The flow from Lift Station No. 2 then enters the existing Main Street trunk sewer at point CC-28. Capacity constraints in the Mystic Woodlands sewer system as well as the Main Street trunk sewer will require major rerouting of the trunk sewer through town to meet future design capacities. A new 18-inch trunk sewer is proposed to be constructed along Maple Street through town to Grand Avenue. This

will free up capacity in the Mystic Woodlands system for development in Subdistrict C-270, as well as the Main Street trunk sewer for any future redevelopment in town.

Lift Station No. 14 and a 10-inch trunk sewer will need to be constructed to serve the developable area within Subdistrict C-270.

An existing 12-inch trunk sewer located in Subdistrict C-240 can be extended across County Road 30 to serve future development in Subdistrict C-280.

A 10-inch trunk sewer will need to be extended from existing Lift Station No. 3 (Green Acres) to serve the area east of Casselberry Ponds in Subdistrict C-250. The existing Lift Station No. 3 and forcemain will need to be upgraded to meet the future peak design flows. A 12-inch trunk sewer will need to extended from Grand Avenue east to Hemingway along CSAH 14 to serve the Lift Station No. 3 area in the future as well as some of the adjacent properties along CSAH 14.

The Grand Avenue trunk sewer has been recently upgraded and has the capacity to meet the future peak design flows, but the existing Lift Station No. 1 (Grand Ave.) will have to be upgraded. The upgrades to the lift station will need to occur in phases. The existing capacity will be increased slightly as part of the construction of the new wastewater treatment facility due to the rerouting of the forcemain and the reduced head conditions. The lift station, however, is in dire need of emergency standby power as well as an electrical upgrade. The lift station's electrical systems will be upgraded, standby power will be added, and the pumps will be upsized to meet demands in the immediate future. As development occurs, eventually the lift station will have to undergo a major upgrade, including adding wet well capacity.

7.3.3 North District

The North District includes all serviceable areas north of the river and east of Highway 35. The existing industrial park and residential development north of the river are included in this district. There is currently an 8-inch gravity sewer main that serves these areas. Most of this district remains undeveloped, and a large portion includes the planned north industrial park area. The northern most portion is outside of the projected 20-year service area, but the trunk system will be sized for the ultimate conditions. To serve the areas north of Ash Street, a new lift station (LS #11) will need to be constructed and two trunk sewers (North Industrial Park & Schmidt Property) will need to be constructed to the north.

The lift station (LS #11) will be constructed at the wastewater treatment plant site and will be one of two main lift stations that pump directly to the wastewater treatment plant. The lift station will ultimately serve the North, Northwest, and East Districts. The lift station will be constructed in phases as development occurs. The anticipated 20-year peak design flow of LS #11 is approximately 3.5 mgd with an ultimate projected design flow of approximately 10 mgd. The lift station structure will be sized to handle the 20-year design flow with provisions for future expansion. The pumps will initially be sized to handle the flows for the next 10 years, and then will either be replaced and/or an additional pump will be added to meet the projected 20-year design needs.

The North Industrial Park trunk sewer will extend from Ash Street north to 400th Street and then west crossing County Road 30. The trunk sewer will need to be 21-inches in size from points NC-2 to NC-5. From there the trunk sewer will extend north up through the planned north industrial park area (15 & 18-inch from points NC-5 to NC-13). Ultimately trunk sewer will extend from point NC-13 to serve the area north of 410th Street and the northern portion of the Northwest District (Subdistricts NW-150 & NW-190), which are outside of the 20-Year growth area. Lift stations will be required to serve these future areas. A 15-inch trunk extension will be required to the west along 400th Street from point NC-5 to serve the majority of the Northwest District.

The Schmidt Property trunk sewer will extend from the treatment plant site to the north serving the undeveloped areas north of Ash Street and east of County Road 30. A 24-inch trunk sewer will run from point NC-2 to point NC-9. To the north, 18-inch and 15-inch sewer will run from point NC-9 to point NC-12. Ultimately trunk sewer will continue north from point NC-12 to serve area outside of the projected 20-year service area. From point NC-9, a 24-inch trunk sewer will need to be extended to the east to point NC-16, which will ultimately provide service to the existing developed unserviced properties in Subdistrict N-190 as well as the entire East District.

7.3.4 Northwest District

The Northwest District includes the area north of Highway 95 and west of Highway 35. The northern portion by Chain Lake consists mostly of existing developed unserviced properties. The area just north of Highway 95 and along Flink Avenue is designated future commercial. The wastewater will generally flow from the north to the south towards the river. A lift station will need to be constructed on the north side of the river to serve a majority of this district. The proposed lift station (LS #12) will pump through a forcemain that runs along Flink Avenue north to 400th Street then west crossing Highway 35 and discharging into the gravity system at point NC-16 in the North District.

The projected 20-year lift station design capacity for the proposed LS #12 is 0.7 mgd, with an ultimate capacity of 2.0 mgd. The lift station wet well will be sized for ultimate capacity, but the pumps will be initially sized for the 20-year capacity. Due to the length of forcemain required and the wide range of design capacity between the 20-year and ultimate conditions, a dual forcemain will likely be constructed to meet the ultimate conditions. The second forcemain will either be installed with the first one or at some date in the future. Gravity sewer will be extended from the lift station to serve the undeveloped areas.

The Northwest Area trunk sewer will extend from point NWC-2 near the LS #12 to point NWC-4 north of 400th Street. The Northwest Area trunk sewer will serve Subdistrict NW-100 as part of the projected 20-year service area, but will be sized for ultimate conditions. The Northwest Area trunk sewer will consist of 12-inch and 15-inch gravity sewer. 8-inch and 10-inch sewers will be stubbed to the west to serve Subdistricts NW-120, NW-130, and NW-140, which are currently outside of the 20-year service area. Lift stations will have to be provided in Subdistricts NW-160, NW-170, and NW-180 to serve them in the future from the Northwest Area trunk sewer.

A proposed lift station (LS #13) will need to be constructed to serve Subdistrict NW-110, which is located north of Highway 95 and south of the river. A forcemain will need to be constructed across the river, and will discharge at the proposed LS #12. The 20-year and ultimate design capacity of LS #13 is projected to be 0.24 mgd.

To serve Subdistricts NW-150 and NW-190, which are located outside of the projected 20-year service area, a lift station and trunk sewer will need to be constructed in NW-150. A forcemain will need to be constructed from the lift station to the east, crossing Highway 35 and eventually discharging at point NC-13 in the North District.

7.3.5 West District

The West District encompasses the area south of Highway 95 and west of Highway 35, including the existing Tanger Commercial Area. Presently the Tanger Lift Station (LS #7) serves the commercial area and the Wildridge Development. The forcemain from the Tanger Lift Station crosses Highway 35 eventually discharging into the existing system near the Mystic Woodland development. In the future all flow from the West District will continue to go to the Tanger Lift Station. The lift station will have to be upgraded, the forcemain will have to be rerouted, and trunk sewers will need to be extended to the west and south from the lift station to serve the future areas of development.

The Tanger Lift Station currently has a capacity of approximately 0.50 mgd. The projected 20-year design capacity is 1.2 mgd and the ultimate projected capacity if 2.1 mgd. The lift station can be upgraded in stages to meet future design flow requirements. To meet the 20-year design requirements the lift station pumps and controls will have to be upgraded as well as the discharge piping and forcemain routing. There are capacity constraints through the existing Mystic Woodlands development which will not be able to handle the projected 20-year design flow from the Tanger Lift Station. The forcemain will be rerouted to the new Cedar Street trunk sewer located in the Central District. The portion of the existing forcemain to be rerouted will be upsized as well to reduce headlosses and increase the capacity of the lift station. Eventually additional wet well capacity and pumps will have to be added to meet the projected ultimate design flow condtions. When this occurs the forcemain will also need to be upsized from the lift station across Highway 35 to the point where the forcemain was upsized and rerouted as part of the 20-year trunk improvements.

A new 12-inch and 10-inch sewer will be extended to the west (from WC-2 to WC 5) to serve future commercial development south of Highway 95. The gravity sewer will be extended to the western side of Subdistrict W-100. A future lift station will serve Subdistrict W-120, which is outside of the projected 20-year service area, and discharge into the gravity system at point WC-5.

To serve additional commercial property south of Tanger a new 15-inch and 12-inch trunk sewer will be constructed from the lift station (from points WC-2 to WC-6). This trunk sewer will ultimately provide service to Subdistricts W-130 and W-140, which are outside the projected 20-year service area. In addition, a 10-inch gravity connection will be extended to the existing Wildridge development, eventually eliminating the existing Wild Ridge Lift Station. A couple

of smaller non-trunk lift stations will be required to serve some lower areas within the West District, including one in the future phase of the Wild Ridge development.

7.3.6 South District

The South District is located in the southern portion of the ultimate service area and includes a large industrial park area along County Road 30 at the southern edge of the City. With the exception of a small amount of area along Grand Avenue just south of the new middle school site the South District is located outside of the projected 20-year service area. The projected ultimate average design flow from the South District is approximately 0.74 mgd, which will all be discharged into the existing 15-inch Grand Avenue trunk sewer located in the Central District. Additional lift stations will be required to route the flow to the existing trunk sewer on Grand Avenue. The lift stations and trunk sewer locations in the South District were "roughed in" to adequately determine where their flow would enter the 20-year trunk system, and more approximate locations should be developed in the future as development nears the projected 20-year service area. The flows for the future subdistricts in the South District and the projected future design capacities are summarized in Appendices A & B respectively.

Upon ultimate development of the South District as well as the rest of the Central District, there may be several existing sections of trunk sewer along Grand Avenue in the Central District that may need to be replaced. According to existing record drawings there are a couple of sections that have flatter than anticipated slopes indicating there may be a capacity constraint in the future. This will likely not to occur for 40 plus years. It will also depend on a lot of factors that are somewhat unknown at this time; like the large industrial park in the South District as well as the commercial flow from the West District. If there is less flow than anticipated from these areas then there may not be a capacity constraint in the future. It is simply recommended at this time that it be looked at in more detail in the future as growth progresses and the future wastewater flows are more defined. There may be other options for routing a portion of the flow from the South District through other potential future trunk sewers.

7.3.7 East District

The East District is primarily located south of Highway 95 on the eastern side of the City. The entire East District is outside of the projected 20-year service area. The lift stations and trunk sewers were "roughed in" to adequately determine where their flow would enter the 20-year trunk system. The ultimate projected average and peak design flows from the East District are 1.66 mgd and 4.5 mgd respectively, which will be discharged to the North District at point NC-17 and will ultimately flow to LS #11 at the wastewater treatment plant site.

Discharging into the Central District was avoided due to future capacity constraints in the Grand Avenue trunk sewer and the limited site capabilities at the existing Grand Avenue main lift station. As development approaches the projected 20-year service area, the lift stations and trunk sewer locations in the East District should be reviewed to determine more approximate locations. The flows for the future subdistricts in the East District and the projected future design capacities are summarized in Appendices A & B respectively.

7.4 Wastewater Treatment

The existing aerated pond wastewater treatment facility is currently being upgraded to a mechanical wastewater treatment facility. The first phase of the new facility will have a peak month flow capacity of approximately 0.812 mgd. Currently the peak month flow is approaching 0.5 mgd. It is anticipated that the first phase will meet the City's needs for the next five to ten years. The second phase will then have to be constructed bringing the total capacity to 1.62 mgd. It was anticipated that this would meet the 20-year growth requirements, but with the recent addition of Anderson Windows and perhaps other potential industries the second phase may not meet those requirements.

The projected commercial/industrial growth has changed since completion of the facility planning document for the wastewater treatment facility. The addition of the large north industrial park and Anderson windows may speed up future expansions. It is recommended that after Anderson Windows comes on line and more interest has been generated in the new industrial park, the projections for timing of future expansions of the wastewater treatment facility be reexamined. It would also be beneficial to examine the existing sanitary sewer access charge, which will be used to pay for the future expansions. A proactive approach to adjusting this fee should be taken.

8.0 CAPITAL IMPROVEMENTS PLAN

8.1 Estimated Cost of Trunk System Improvements

The projected 20-year sanitary sewer trunk system was broken down into 34 separate trunk improvement projects. The overall cost associated with trunk system components over the next 20-years is estimated to be approximately $7.5 million based upon today's dollars. Table 8.1 identifies the estimated trunk costs in today's dollars for the anticipated trunk improvements. The estimated costs do not include all of the costs associated with the improvements, only the trunk portion of the costs.

The costs include 20% construction contingencies and 20% overhead (i.e. legal, engineering, and administrative). Street and easement costs and other miscellaneous costs that may be related to final construction are not included. Appendix C includes a detailed breakdown of the costs for the trunk system components and a cost for all of the proposed trunk lift stations.

8.2 Schedule of Improvements

The 34 separate improvement projects were prioritized based upon anticipated needs and expected areas of development with input from City staff. The projects are grouped into 5-year increments to spread out the costs over the 20 year period, and to help schedule the projects with other projects and the City's five year capital improvements plan. Figure 8.1 shows the projected timing and corresponding location of each of the separate improvement projects.

The timing of future trunk sanitary sewer improvements will be influenced by a number of parameters. Items such as the new bridge proposed across Highway 35, development pressure in specific areas, availability of funds, etc., all play a role in the timing of future development. Because of the many factors involved, it is difficult to accurately predict the timing of future improvements, especially those which may occur far into the future. It is important to spread out the cost of the improvements over a 20-year period, so that projects between 5-year periods can be interchangeable if one area is growing at a faster rate than anticipated and another area is not growing as fast as anticipated for one reason or another. This allows flexibility in the timing of improvements, while preserving the cash flow and the corresponding trunk fees that are required to construct the improvements.

9.0 SANITARY SEWER SYSTEM FINANCING

9.1 Current Sanitary Sewer Fee System

The City's current sewer fee structure is summarized in Table 9.1. Fees consist of sewer user fees, Trunk Sewer Fees, and Sewer Availability Charge Fees (SAC). Currently the trunk sewer fees and SAC fees are all calculated based upon the Metropolitan Council's SAC Procedure Manual, which converts non-residential units into equivalent residential units based upon the type of business being served and their impact to the system.

9.2 Sanitary Sewer System Fee Basis

9.2.1 General Philosophy

The purpose of sewer system fees is to cover the operation, maintenance and replacement costs of existing systems through sewer rates and provide a funding mechanism for construction of the major infrastructure improvements needed to serve growth with trunk and SAC fees. The City of North Branch has established that growth should be funded and paid for by those who are in need of the facilities. The parties creating the need for additional sanitary sewer system improvements are expected to pay for new trunk facilities and expansion of existing facilities through trunk and SAC fees.

9.2.2 Trunk Sewer Fees

The trunk sewer fee will fund the following improvements:

- Trunk Lift Stations and forcemains which are defined as those larger than 150 gpm and serving more than a single development project. (100%)
- Cost Sharing for other lift stations if it is found that there is a larger benefit for serving a greater area outside of a single development project.
- Oversizing of gravity sewer mains more than what is needed for the development itself, generally considered sewer mains which exceed 8-inches in diameter.
- Oversizing of existing trunk or lateral sewer mains (trunk costs shall include replacement of 20 foot wide bituminous street section).
- Extra depth of sewer lines if there is a benefit to a larger area.
- Jacked or bored highway or river crossings.

Currently the trunk fee is calculated on a residential equivalency factor (REF). Residential units are charged $1,685 and commercial and industrial units are charged $1,685 times their REF, where the REF is based on their SAC units in the City's ordinance. The City's SAC ordinance is based on the SAC system used by the Metropolitan Council in the Twin Cities. This works well for the SAC fee as it is used for wastewater treatment where the flow and load are both important parameters in determining the impact to the system, but the trunk fee is for the collection system where generally only the flow component provides the impact. This can create an inequity between different types of businesses that perhaps have the same flow component, but are considered far different in their residential equivalency from the SAC chart due to the load

component. Since the load component does not play a role in the trunk sewer system and therefore the trunk fee, a more equitable approach to calculating the trunk fee was explored.

The existing method of trunk fee calculation for commercial and industrial establishments based on SAC units was compared to other adjustment methods used widely by other communities. The important thing to keep in mind is that whatever the method of calculation, the trunk fee or fees that are established have to be enough to cover the cost of improvements that are needed.

After review of different alternatives, the recommended method is to use a trunk fee based upon gross acreage for all types of properties. The per acre based fee will be established by taking the total cost of the trunk system improvements and dividing it by the total gross acreage developed, including all residential and non-residential properties. Since non-residential development generally has a larger impact on the system than residential, an equivalency factor will be applied to the fee for non-residential development, thereby establishing a separate per acre charge for residential and non-residential properties. The ratio of the average daily wastewater flow per acre for commercial/industrial and residential is 1,200/800 (or 1.50), and is a good comparison value to use in establishing an equivalency factor. The commercial/industrial per acre trunk fee will be calculated by multiplying the per acre trunk fee for residential by a factor of 1.50.

The trunk fees for all types of property will be based upon this per acreage basis. However, how the fee is charged to types of properties will vary. Residential development will be charged on a per unit basis as it is now, and non-residential development and apartments will be charged on a per acre basis. An average of 2.0 units per gross developable acre will be used as the basis for establishing a per unit charge for single family residential and townhomes from the per acre based residential fee. Some medium and high density residential developments will average much higher than 2.0 units per gross acre, but a lot of the available residential property is single-family residential, which can average less than 2.0 units per gross acre.

In some cases the future per acre trunk fee for commercial/industrial properties is lower than what it would be using the existing trunk fee system, and in other cases it will be more, but overall there will be more equity between the various types of commercial and industrial businesses that may want to become established in the City of North Branch.

9.2.3 Sewer Availability Charge (SAC)

The sanitary sewer availability charge (SAC) is established based upon the costs associated with expansion of the City's wastewater treatment facility required for new development. The SAC rate for any budget year will adjusted on an annual basis by the City Council as required. Charges will be on a per unit basis as described below:

- Single family houses, townhouses, and duplex units shall each comprise one SAC unit.
- Apartments shall comprise eighty percent of one SAC unit.
- Commercial and Industrial properties shall be assessed a number of SAC units based upon the determination from the SAC chart in the City Code, which was based upon the Metropolitan Council's SAC procedure manual.

9.2.4 User Charges (Sewer Rates)

User charges will fund the following:

- Operations, maintenance, and replacement costs of wastewater treatment facilities and the sanitary sewer collection system.

User charges will be established based on the cost of operations, maintenance, and replacement of all wastewater system facilities. The fees consist of a usage fee per 1,000 gallons with a minimum monthly charge. The monthly water usage is used to estimate the amount of wastewater usage for individual users.

9.3 Trunk Fee Financial Analysis

Cash flow analyses were conducted for the Trunk fee using the capital improvement plan and the trunk system costs discussed previously. The analyses are presented in Appendix D. The overall cost associated with trunk system components over the next 20-years is estimated to be approximately $7.5 million based upon today's dollars.

Cash flows were completed assuming that each group of projects in a five year period would be combined into two separate bonds for that five year period. The bond terms vary from 15 to 20 years based upon the bond amount and use a 5% or 6% percent annual interest rate. The expenditures were inflated using a 3.0% annual inflation factor.

Different revenue and expenditure bases were explored, but upon review with City staff the terms of the cash flow analyses were narrowed down to two separate cash flows utilizing the same revenue and expenditure basis.

The trunk fee revenue in the cash flows is based upon a development scenario of approximately 120 residential units per year (60 gross acres), and divides the commercial and industrial growth area evenly over 20 years (approximately 30 gross acres per year). The population projections in Section 5.0 of this report indicate a larger growth rate, but it was decided that a more conservative approach be taken with estimating the amount of revenue being generated each year. The amount and timing of improvements (expenditures) are reflective of this revenue scenario.

The cash flows assume a starting balance of approximately $50,000 in the trunk fund in 2003 and include a 3% annual increase in the trunk fee.

Cash Flow 1 uses a uniform per acre trunk fee for all types of property, and Cash Flow 2 uses a separate per acre trunk fee for residential and non-residential properties.

Upon review with City staff and the City Council it was decided to establish a separate per acre trunk fee for residential and non-residential properties as shown in Cash Flow 2.

9.4 Sanitary Sewer Trunk Fees

The overall philosophy or basis for trunk fees has not changed from the existing system (the fee is established so that development pays for the improvements), essentially just how the fee is charged to non-residential properties has changed. Residential properties will still be charged on a per unit basis by dividing the per acre residential fee by an average of 2.0 residential units per gross developable acre. Non-residential properties and apartments will be charged on a per acre basis instead of using the Met Council SAC chart for residential equivalency. The 2003 trunk fees are summarized in Table 9.1 and the 2004 trunk fees are summarized in Table 9.2.

Based upon the cash flow analysis the per unit fee for residential will need to start out at approximately the same level as in 2003, but with a slight increase for inflation. The separate per acre fee for non-residential properties will be new in 2004, but overall the charges will be distributed more equitably between different types of businesses.

10.0 TRUNK SYSTEM POLICIES

10.1 General

The following items are general trunk system policy guidelines to be considered when establishing the trunk fee ordinances in the City Code and associated trunk fees. Appendix E contains a copy of the portion of the City Code that pertains to the sanitary sewer charges.

10.2 System Expansion (Orderly Development)

Development shall occur in an orderly fashion. Properties that abut parcels served by municipal utilities will be considered as the next feasible property for development. The City may limit development activities to selected areas. Petitions to expand in areas not already under development will be considered. Factors that will be considered include but are not limited to; capacity in the wastewater treatment facility, capacity in the collection system, economic factors including costs, number of developments under construction and the staff resources available to deal with the requested development.

10.3 Leapfrogging

Leapfrogging refers to the circumstance where certain parties want to develop an area not currently adjacent to the limits of the City of North Branch's existing services. The applicant wants to "leapfrog" over areas located adjacent to the City's existing services that would be the next logical area to be developed. In this circumstance, the City of North Branch could decide whether or not to approve such a development. If approved, it is recommended that the party pay for the entire cost of installing services to their property and resulting system upgrades. The developer shall be offered no credit or reimbursement for these costs. If development of the property that was "leapfrogged" is later initiated, payment of all trunk charges for the property will still be required regardless of the fact that the facilities were already installed before development occurred.

10.4 Overdepth and Oversizing

The costs of additional depth shall be defined by differences in cost for the depth required by the development and the depth required for trunk facilities. Trunk oversizing as defined by the City and installed by a developer will be credited using the differential of pipe costs between the larger and the minimum pipe size required for the development. Bid pricing shall not be the sole determinate in defining a developer credit. The City shall determine if a credit will be given for a project.

10.5 Lift Stations

Trunk lift stations should be defined as those larger than 150 gpm in capacity and serving more than one single development project. The trunk fees will pay for 100 percent of the cost of trunk lift stations. Lift stations that do not fit the definition for a trunk lift station are to be paid for by the developer. All lift stations shall be designed and constructed in accordance with City standards. The City will consider cost sharing for other lift stations if it is found that a particular lift station may be able to serve a greater area than the single development. The cost sharing

shall include the oversizing or overdepth required to serve additional area and associated SCADA system costs to establish the lift station on the City's SCADA system.

10.6 Existing Developed Unserviced Properties

There area a number of existing developed areas (one to two acre lots) that do not receive sewer and water service within the City limits of North Branch. The trunk system has been designed to handle all existing developed unserviced properties within the City, but it is not the policy of the City to force individual property owners to hookup to City services if they become available. If an individual property owner or group of neighboring property owners wishes to hookup to City services where it is not yet available, the City will review whether or not it is an economically viable alternative to provide services to the area at the time of the request for hookup. Existing developed unserviced residential properties will be required to pay all connection fees as required by the City Code.

10.7 Existing Non-Residential Properties

10.7.1 Existing Unserviced

Existing unserviced commercial/industrial or other non-residential properties wishing to expand or hookup to municipal utilities shall be treated the same as new development and will be required to pay all connection fees as required by the City Code.

10.7.2 Existing Serviced

Existing commercial/industrial or other non-residential properties currently serviced by municipal utilities wishing to expand or change the designated use shall be required to pay a trunk fee based upon the gross acreage of the expansion area (area includes buildings, parking areas, etc.). A change in use shall require payment based upon the entire site acreage (including buildings, parking areas, etc.). Payment shall only be required for a change in use if it is determined that the change in use will have a larger impact on the system than the current use. No credit or reimbursement shall be given if the change in use results in a reduction of impact to the system from the current use. A change in use for existing properties will be reviewed on an individual basis by the City. The current per acre commercial/industrial or non-residential trunk fee rates shall be used at the time of expansion or issuance of the building permit to calculate the trunk charges.

An expansion or change in use shall also trigger a SAC charge based upon the residential equivalency units of the expansion from the chart in the City Code. The current SAC fee at the time of expansion or issuance of the building permit shall be used to calculate the charges required.

10.8 Trunk Fee Payment

10.8.1 Residential Development

Payment of trunk charges for residential development shall be collected by the City at the time of final platting of a parcel or at the time of a lot split of unplatted or previously platted land. For residential development over ten lots, the City may at their discretion allow the developer to pay

the charge in the following manner: 33 percent at the time of final plat filing, 33 percent one year later, and the balance at two years after filing of the final plat or as may be amended by the City Council. Interest in the amount of seven percent (7%) per annum shall be added to any balance carried over to the next year. If this option is chosen, financial security in a form approved by the City Attorney, must accompany the first installment. Advancement of the payment of installments will be triggered by issuance of 66 percent, and 100 percent of the building permits within the development.

10.8.2 Non-Residential Development

The trunk fee per acre charge for commercial/industrial or other non-residential property shall be collected by the City at the time of the issuance of a building permit.

10.8.3 Existing Non-Residential Properties

The trunk fee per acre charge for existing commercial/industrial or other non-residential properties shall be collected by the City at the time of issuance of a building permit for an expansion or change in use or at the time an existing non-serviced property wishes to connect to municipal utilities.

10.8.4 No Waivers

The City shall not offer waivers or reductions in the proposed fee from what the policy dictates. Special circumstances shall not be considered. All properties shall be charged on the basis of the trunk fee policies.

11.0 RECOMMENDATIONS

Based on the results and analysis of this study, it is recommended that the City of North Branch and City Council where applicable:

1. Adopt this report as the Comprehensive Sanitary Sewer Plan for the City of North Branch.

2. Review and adopt the preliminary Capital Improvement Plan (CIP) for trunk sanitary sewer facilities.

3. Adopt the trunk system policy changes and updated and/or revised ordinances in the City Code with regards to the sanitary sewer system charges included in Appendix E of this report.

3. Revise the trunk fee structure in accordance with the improvements recommended in this report. A summary of the recommended 2004 trunk fees are as follows:

Trunk Fee	
Residential:	$1,700/unit
Apartments & Non-Residential:	$5,100/gross acre
Increase both at 3%/year	

4. Annually review the trunk system needs by evaluating past wastewater usage, planned development, and the financing plan. Conduct a comprehensive sewer study every five years.

5. Continue to reduce infiltration and inflow (I/I) from the existing collection system and that provisions be maintained for controlling I/I into the sanitary sewer system for new construction.

TABLES

TABLE 3.1

Existing Lift Station Summary

Lift Station No.	Location	Year Constructed	Capacity (gpm)	Motor HP	Pump Manufacturer
1	Grand Avenue	1987	1200	25	Hydromatic
2	Mystic Woodlands	1995	250	9.4	ABS
3	Green Acres	1994	215	20	Flygt - Grinder
4	Eighth Avenue	1990	150	5	Flygt
5	Stonegate/ Blakeslee	1997	150	2	ABS
6	Oakview	1989/1999	200	3	Hydromatic
7	Tanger	1992/2001	250	7.5	ABS – Grinder
8	Riverside Court	1993	50	4	ABS – Grinder
9	Wildridge	2001	200	5	Flygt
10	Wood Duck Ponds	2002	320	10	ABS

TABLE 4.1

City of North Branch
Ultimate Gross Developable Acreages

Land Use	Acres
AG/Rural	6,700
Residential	6,435
Commercial	3l0
Industrial	1,475
Total	**14,920**

TABLE 4.2

City of North Branch
Potential Ultimate Service Area
(Gross Developable Acreages)

Land Use Category	0-20 Years (acres)	20+ Years (acres)
Residential	1,710	4,725
Non-Residential	650	1,135
Total	**2,360**	**5,860**

TABLE 5.1

City of North Branch
Historical Population

Year	Population	No. of Households
1980*	3,463	1,190
1990*	4,267	1,510
2000	8,023	2,815
2001	8,574	3,009
2002	8,978	3,160

* Includes Branch and North Branch

Table 5.2
City of North Branch Comprehensive Sewer
Growth Projections (2.0 units/ac)

Year	Projection 1 Straightline Projection (year 2002 est pop served = 4,120) Projection (units/yr)	Growth (# people/yr)	Estimated Sewered Residents	Cumulative Area Used (2.0 units/ac)	
2002			4,120		
2003	140	405	4,525	70.0	
2004	140	405	4,929	140.0	
2005	140	405	5,334	210.0	
2006	140	405	5,738	280.0	
2007	140	405	6,143	350.0	
2008	140	405	6,548	420.0	
2009	140	405	6,952	490.0	
2010	140	405	7,357	560.0	
2011	140	405	7,761	630.0	
2012	**140**	405	**8,166**	**700.0**	
2013	140	405	8,571	770.0	
2014	140	405	8,975	840.0	
2015	140	405	9,380	910.0	
2016	140	405	9,784	980.0	
2017	140	405	10,189	1050.0	
2018	140	405	10,594	1120.0	
2019	140	405	10,998	1190.0	
2020	140	405	11,403	1260.0	
2021	140	405	11,807	1330.0	
2022	140	405	12,212	1400.0	
2023	140	405	12,617	1470.0	
2024	140	405	13,021	1540.0	
2025	**140**	405	**13,426**	**1610.0**	
2026	140	405	13,830	1680.0	
2027	140	405	14,235	1750.0	
2028	140	405	14,640	1820.0	
2029	140	405	15,044	1890.0	
2030	140	405	15,449	1960.0	
2031	140	405	15,853	2030.0	
2032	140	405	16,258	2100.0	
2033	140	405	16,663	2170.0	
2034	140	405	17,067	2240.0	
2035	140	405	17,472	2310.0	
2036	140	405	17,876	2380.0	
2037	140	405	18,281	2450.0	
2038	140	405	18,686	2520.0	
2039	140	405	19,090	2590.0	
2040	**140**	405	**19,495**	**2660.0**	
2041	140	405	19,899	2730.0	
2042	140	405	20,304	2800.0	
2043	140	405	20,709	2870.0	
Totals	5,740	16,589			
			Average Wet Weather Design Flow (30 day)		

Notes:

1. ***Bold denotes when wastewater treatment facility phase wou**
2. Area used based on units per gross developable acre.
3. Estimate 100 gallons of wastewater generated per new resident p
4. Estimate 2.89 people per household.
5. Ratio of Average Wet Weather Flow to Average Annual Flow is 1

TABLE 6.1

City of North Branch
Wastewater Flow Generation Rate Summary

Land Use	Description	Units/ Net Acre	People/ Unit	Gallons/ Person/ Day	Gallons/ Acre/ Day
LU-1	Single Family Residential	3	3.16	85	800
LU-2	Medium Density Residential	5	2.50	80	1,000
LU-3	High Density Residential	16	2.20	65	2,280
LU-4	Manufactured Housing	8	2.89	75	1,735
EX	Existing Developed Unserviced	1	3.16	85	270
C	Commercial	-	-	-	1,200
CB	Central Business	-	-	-	1,000
CL	Commercial Limited	-	-	-	1,000
CN	Neighborhood Commercial	-	-	-	1,000
IP	Planned Industrial	-	-	-	1,200
AG	Agricultural/Rural	-	-	-	0
PUB	Public/Semi Public	-	-	-	480
P	Park	-	-	-	60

TABLE 6.2

Sanitary Sewer Peak Flow Factors
(MCES Peaking Factors)

Average Flow (mgd)	Peaking Factor
0.00 – 0.11	4.0
0.12 – 0.18	3.9
0.19 – 0.23	3.8
0.24 -0.29	3.7
0.30 – 0.39	3.6
0.40 – 0.49	3.5
0.50 – 0.64	3.4
0.65 – 0.79	3.3
0.80 – 0.99	3.2
1.00 – 1.19	3.1
1.20 – 1.49	3.0
1.50 – 1.89	2.9
1.90 – 2.29	2.8
2.30 – 2.89	2.7
2.90 – 3.49	2.6
3.50 – 4.19	2.5
4.20 – 5.09	2.4
5.10 – 6.39	2.3
6.40 – 7.99	2.2
8.00 – 10.39	2.1
10.40 – 13.49	2.0
13.50 – 17.99	1.9
18.00 – 29.99	1.8
Over 30.00	1.7

TABLE 6.3

City of North Branch
Ratio of Peak Month Flow to Average Annual Flow

Year	Peak Month Flow (mgd)	Average Annual Flow (mgd)	Ratio
1996	0.370	0.259	1.43
1997	0.333	0.267	1.25
1998	0.322	0.272	1.18
1999	0.325	0.275	1.21
2000	0.376	0.329	1.14
2001	0.429	0.369	1.16
2002	0.505	0.428	1.18

TABLE 7.1

City of North Branch
Ultimate Wastewater Flow Projections
(by District)

Sanitary Sewer District	Average Flow (mgd)	Peak Design Flow (mgd)
Central	0.992	3.07
North	1.695	4.91
Northwest	0.752	2.48
West	0.627	2.13
South	0.740	2.44
East	1.659	4.81
Total	**6.465**	**14.22**

Table 8.1
Estimated Costs of Trunk Sanitary Sewer System Improvements
City of North Branch, MN

Time Period	Trunk Improvement Number	Trunk System Improvement Description	Associated Trunk Cost	Total Trunk Cost
5 Years	1	**2003 Grand Avenue Trunk Extension**		
		Gravity Trunk Sewer	$43,000	
				$43,000
	2	**Hemingway Avenue Trunk Sewer**		
		Gravity Trunk Sewer	$183,000	
				$183,000
	3	**North Industrial Park Sewer Extension**		
		Gravity Trunk Sewer	$876,000	
		Lift Station No. 11	$285,000	
		Forcemain	$18,000	
				$1,179,000
	4	**Grand Avenue Lift Station No. 1 Upgrade**		
		Lift Station Improvements	$175,000	
				$175,000
	5	**Tanger Commercial Area Trunk Sewer**		
		Gravity Trunk Sewer	$211,000	
				$211,000
	6	**Oakview LS Upgrade**		
		Lift Station Improvements	$150,000	
				$150,000
		Non-Trunk Lift Station Cost Sharing		
		Misc. Small Lift Stations	$100,000	
				$100,000
	Total			**$2,041,000**
10 Years	7	**North Industrial Park Phase 2**		
		Gravity Trunk Sewer	$57,000	
				$57,000
	8	**North Industrial Park Phase 3**		
		Gravity Trunk Sewer	$76,000	
				$76,000
	9	**Wild Ridge Trunk Extension**		
		Gravity Trunk Sewer	$82,000	
				$82,000
	10	**Northwest Area Trunk Sewer**		
		Gravity Trunk Sewer	$135,000	
		Lift Station No. 12	$235,000	
		Forcemain	$350,000	
				$720,000
	11	**Maple Street Trunk Sewer**		
		Gravity Trunk Sewer	$820,000	
				$820,000
	12	**Northwest Highway 95 Commercial**		
		Lift Station No. 13	$165,000	
		Forcemain	$35,000	
				$200,000
	13	**Tanger Commercial Area Phase 2**		
		Gravity Trunk Sewer	$29,000	
				$29,000
	14	**South Grand Avenue Trunk Extension**		
		Gravity Trunk Sewer	$61,000	
				$61,000
	15	**Blakeslee Lift Station No. 5 Upgrade**		
		Lift Station No. 5	$175,000	
		Forcemain	$10,000	
				$185,000
	16	**Schmidt Property Trunk Sewer**		
		Gravity Trunk Sewer	$222,000	
				$222,000
		Non-Trunk Lift Station Cost Sharing		
		Misc. Small Lift Stations	$75,000	
				$75,000
	Total			**$2,527,000**

Year	Trunk Improvement Number	Trunk System Improvement Description	Associated Trunk Cost	Total Trunk Cost
15 Years	17	**Anderson Property**		
		Gravity Trunk Sewer	$9,000	
		Lift Station No. 14	$180,000	
		Forcemain	$75,000	
				$264,000
	18	**Tanger Lift Station No. 7 Upgrade**		
		Lift Station No. 7	$100,000	
		Forcemain	$92,000	
				$192,000
	19	**Grand Avenue Lift Station No. 1 Upgrade**		
		Lift Station No. 1	$300,000	
		Forcemain	$60,000	
				$360,000
	20	**North Industrial Park Phase 4**		
		Gravity Trunk Sewer	$37,000	
				$37,000
	21	**Schmidt Property Trunk Sewer Phase 2**		
		Gravity Trunk Sewer	$162,000	
				$162,000
	22	**Northwest Area Trunk Sewer Phase 2**		
		Gravity Trunk Sewer	$267,000	
				$267,000
	23	**Green Acres No. 3 Upgrade**		
		Gravity Trunk Sewer	$31,000	
		Lift Station No. 3	$220,000	
				$251,000
	24	**Lift Station No. 10 Upgrade**		
		Lift Station No. 10 Upgrade	$40,000	
				$40,000
	25	**Schmidt Property Trunk Sewer Phase 3**		
		Gravity Trunk Sewer	$234,000	
				$234,000
	26	**Tanger Commercial Area Phase 3**		
		Gravity Trunk Sewer	$25,000	
				$25,000
		Non-Trunk Lift Station Cost Sharing		
		Misc. Small Lift Stations	$75,000	
				$75,000
	Total			**$1,907,000**
20 Years	27	**Tanger Commercial Area Phase 4**		
		Gravity Trunk Sewer	$82,000	
				$82,000
	28	**CSAH 14 Trunk Sewer**		
		Gravity Trunk Sewer	$106,000	
		Forcemain	$201,000	
				$307,000
	29	**Northwest Area Trunk Sewer Phase 3**		
		Gravity Trunk Sewer	$29,000	
				$29,000
	30	**East CSAH 95 Trunk Sewer**		
		Gravity Trunk Sewer	$24,000	
				$24,000
	31	**Nelson Property**		
		Gravity Trunk Sewer	$13,000	
				$13,000
	32	**Schmidt Property Trunk Sewer Phase 4**		
		Gravity Trunk Sewer	$200,000	
				$200,000
	33	**Schmidt Property Trunk Sewer Phase 5**		
		Gravity Trunk Sewer	$87,000	
				$87,000
	34	**Lift Station No. 11 Upgrade**		
		Lift Station No. 11 Upgrade	$175,000	
				$175,000
		Non-Trunk Lift Station Cost Sharing		
		Misc. Small Lift Stations	$125,000	
				$125,000
	Total			**$1,042,000**
Total Estimated Trunk Sewer System Component Cost				**$7,517,000**

TABLE 9.1

Existing Sewer Fee Structure – 2003

Sewer Charge Fee

(Sewer User Rates) $3.52 / 1,000 gallons
3,000 gallon minimum

Associated Costs: Operation, Maintenance and Replacement

Trunk Sewer Fee $1,685/REF

Per Ordinance:
Associated Cost: Lift Stations, forcemains, sewer mains over 8-inches in diameter, jacked or bored highway crossings, sewer laterals, and/or sewer service lines to extend to an area adjacent to the improvement project that can't be assessed at this time, hereinafter referred to as trunk sewer mains.

Sewer Access Fee (SAC) $1,838/REF

Customers are charged a fee according to the number of SAC or WAC units in the City's ordinance, which is based on the Metropolitan Council's Service Availability charges.

Residential Single Family	=	1 SAC unit
Residential – Apartments	=	0.8 SAC unit
Commercial/Industrial	=	According to City Ordinance

Associated Cost: Wastewater treatment facility expansions.

Notes:

(1) Sewer Fund: SAC and Trunk Fee are in the same fund.

(2) REF = Residential Equivalency Factor

TABLE 9.2

Sewer Fee Structure – 2004

Sewer Charge Fee

(Sewer User Rates) $3.97 / 1,000 gallons
3,000 gallon minimum

Associated Costs: Operation, Maintenance and Replacement

Trunk Sewer Fee $1,700/unit ($3,400/acre) - Residential
$5,100/acre - Non-residential

Per Ordinance:
Associated Cost:

- Lift Stations and forcemains larger than 150 gpm and serving more than one single development project.
- Cost Sharing for other lift stations if it is found that a particular lift station may be able to serve a greater area than the single development. The cost sharing shall include oversizing and overdepth required to serve additional area and associated SCADA system costs to establish the lift station on the City's SCADA system.
- Oversizing of gravity sewer mains more than what is needed for the development itself, generally considered sewer mains which exceed 8-inches in diameter.
- Oversizing of existing trunk or lateral sewer mains (trunk costs shall include replacement of 20 foot wide bituminous street section).
- Extra depth of sewer lines if there is a benefit to a larger area.
- Jacked or bored highway or river crossings.

Sewer Access Fee (SAC) $1,838/REF

Customers are charged a fee according to the number of SAC or WAC units in the City's ordinance, which is based on the Metropolitan Council's Service Availability charges.

Residential Single Family	=	1 SAC unit
Residential – Apartments	=	0.8 SAC unit
Commercial/Industrial	=	According to City Ordinance

Associated Cost: Wastewater treatment facility expansions.

Notes:

(1) Sewer Fund: SAC and Trunk Fee are in the same fund.
(2) REF = Residential Equivalency Factor

FIGURES

FIGURES

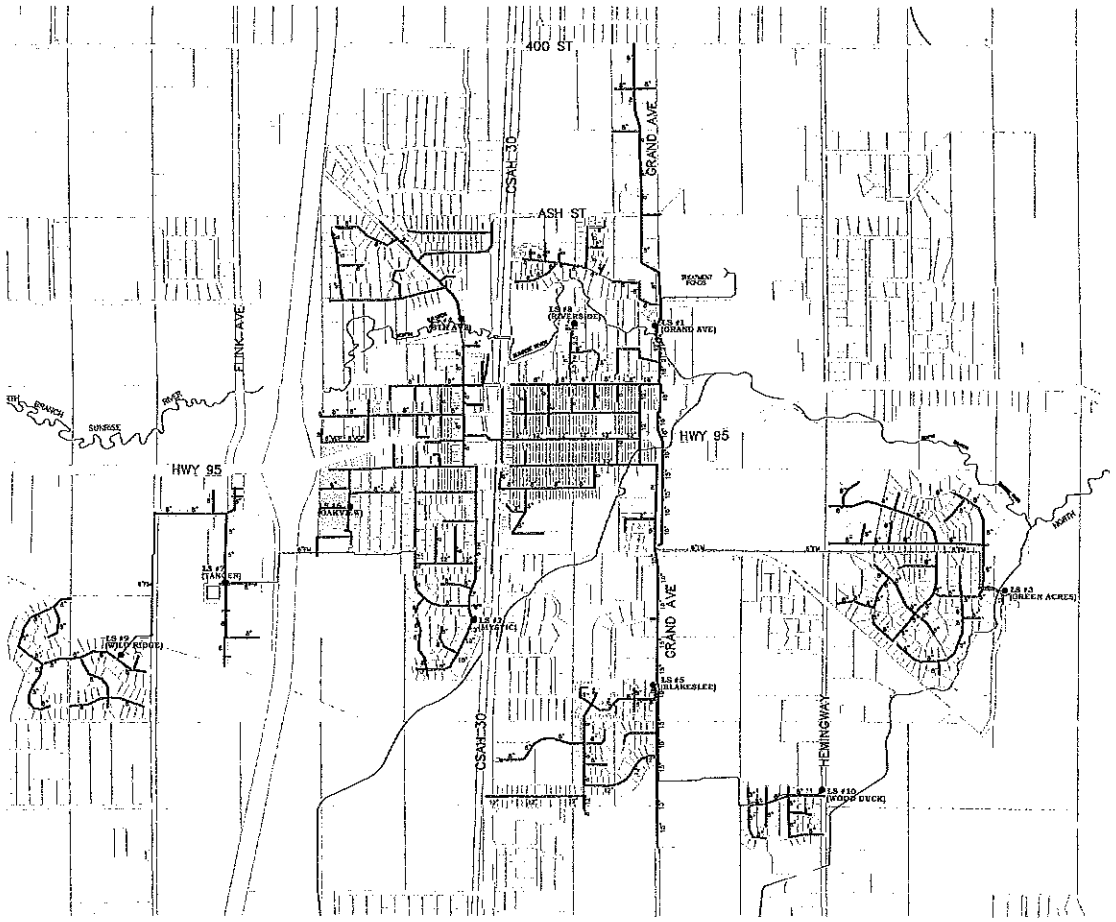
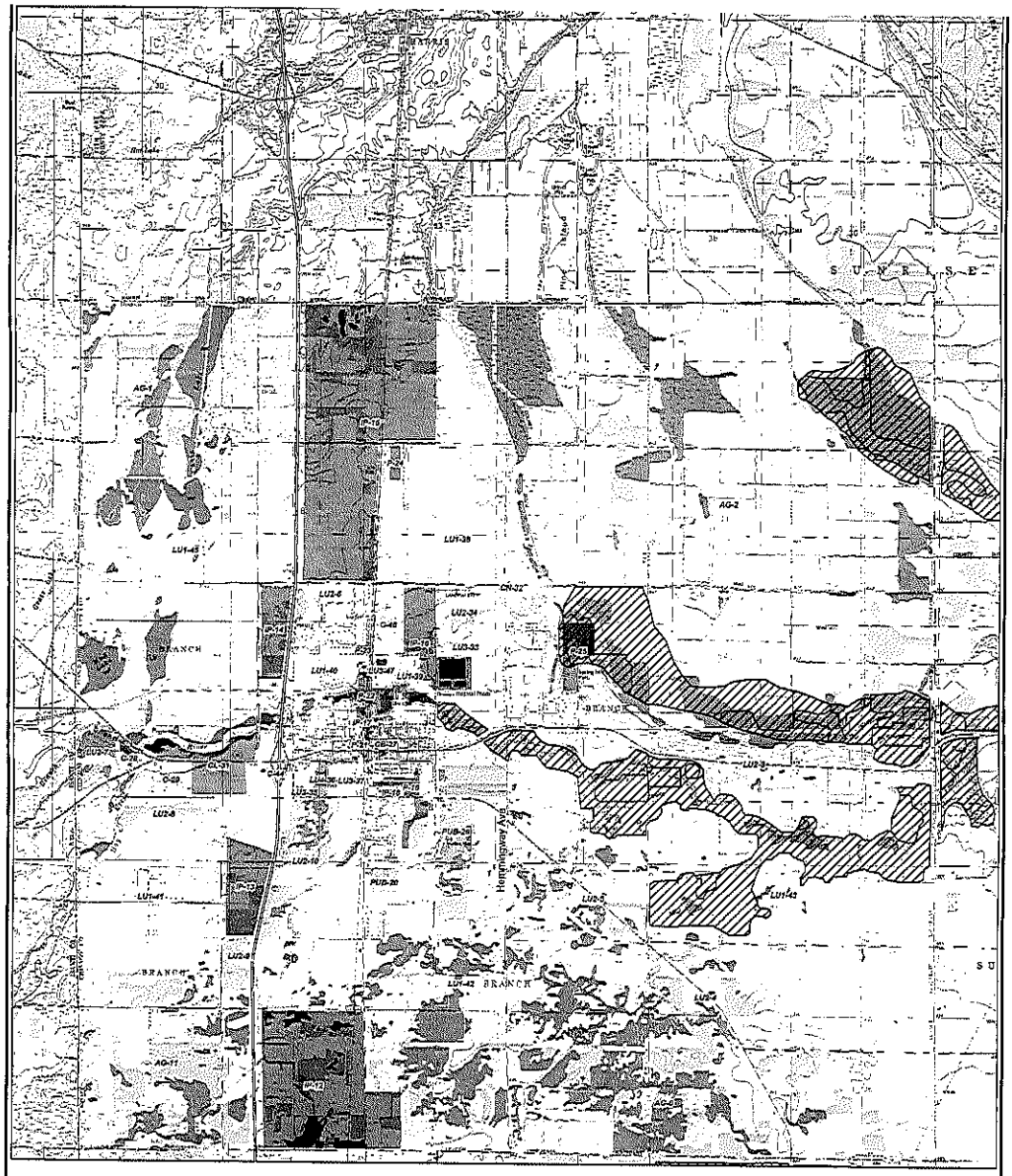


Figure 3.1

City of North Branch

Existing Sanitary Sewer System



WSB Project No. 1231-55

FIGURE 4.1
LAND USE
NORTH BRANCH, MN

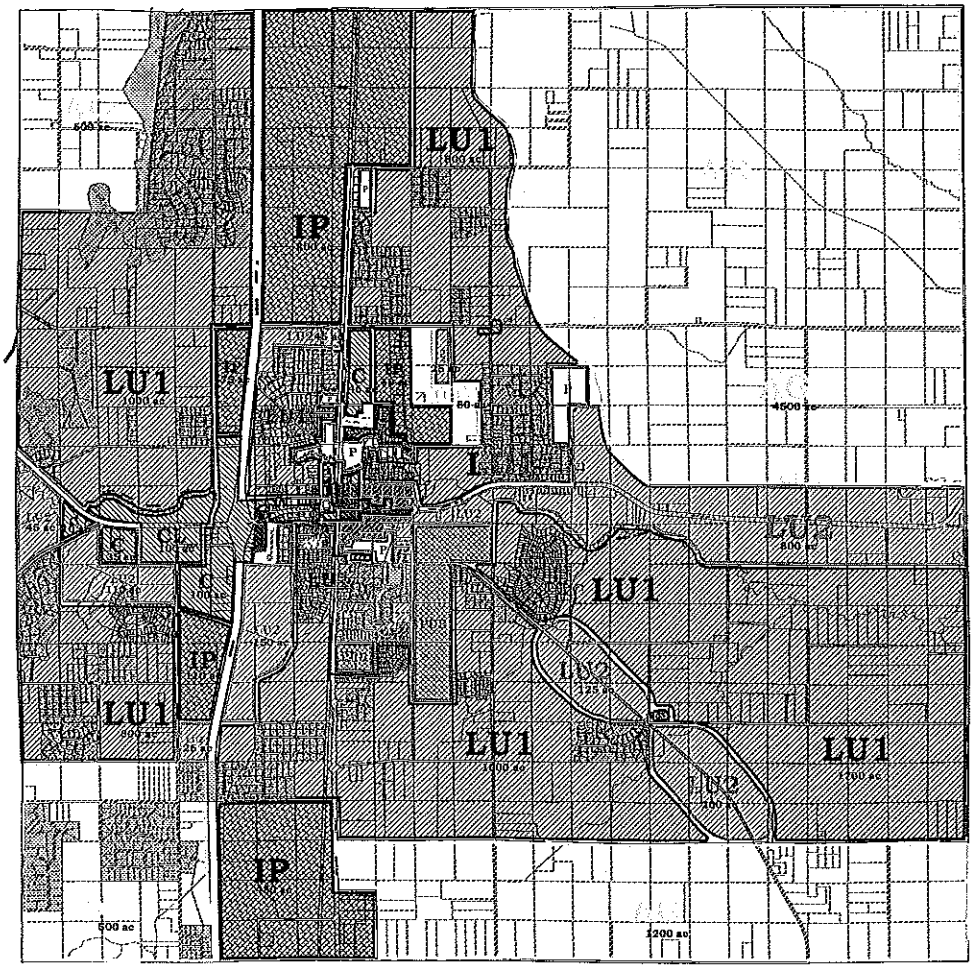


Figure 4.2

City of North Branch

Ultimate Land Use

- LU1 – Single-Family (4,800 acres)
- LU2 – Medium-Density (1,525 acres)
- LU4 – Manufactured Home
- C – Commercial (190 acres)
- CB – Central Business
- CL – Commercial Limited (100 acres)
- CN – Neighborhood Commercial (20 acres)
- IP – Planned Industrial (1,475 acres)
- P – Park/Open Space
- PUB – Public/Semi Public
- Existing Developed Unserviced or Undevelopable Areas

608 ac Gross Developable Acres

NO SCALE

December 2003

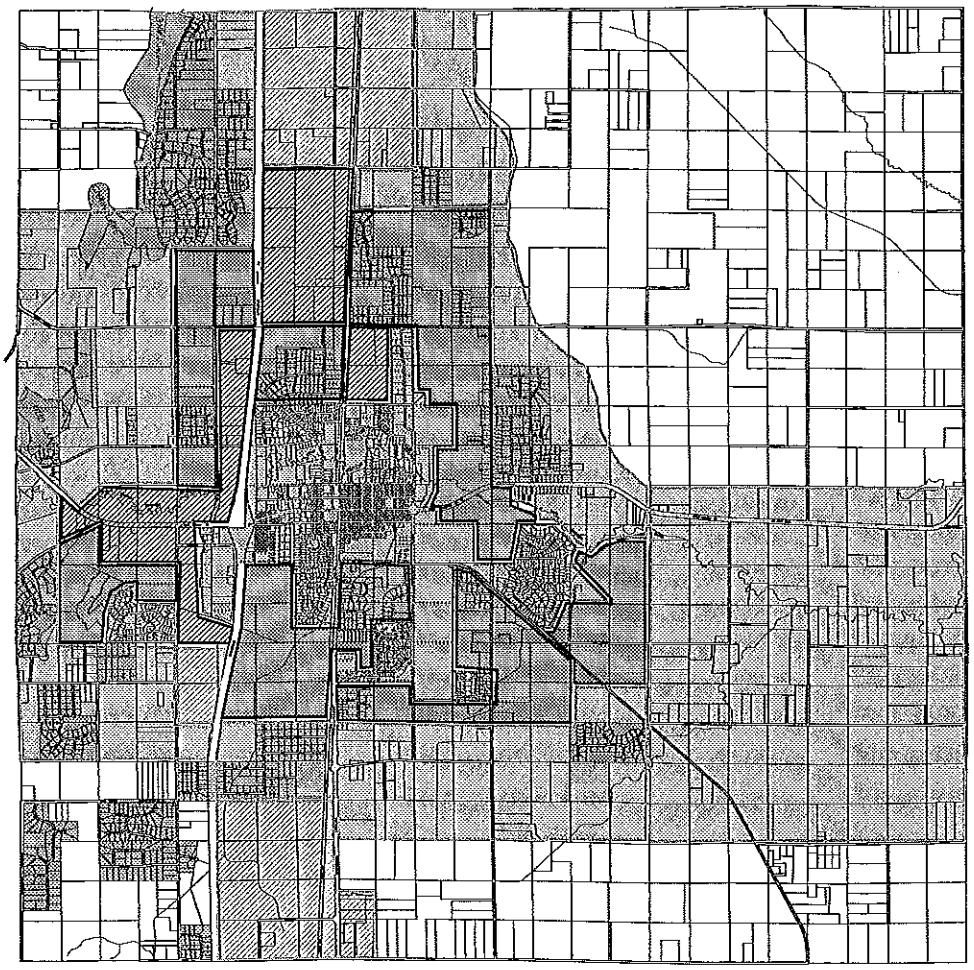


Figure 4.3
City of
North Branch

Growth Areas
(20-Year and Ultimate)

- Existing Serviced
- Existing Developed Unserviced
- 0 – 20 Years Residential (1,710 acres)
- 0 – 20 Years Non–Residential (650 acres)
- 20+ Years Residential (4,725 acres)
- 20+ Years Non–Residential (1,135 acres)

NO SCALE

December 2003

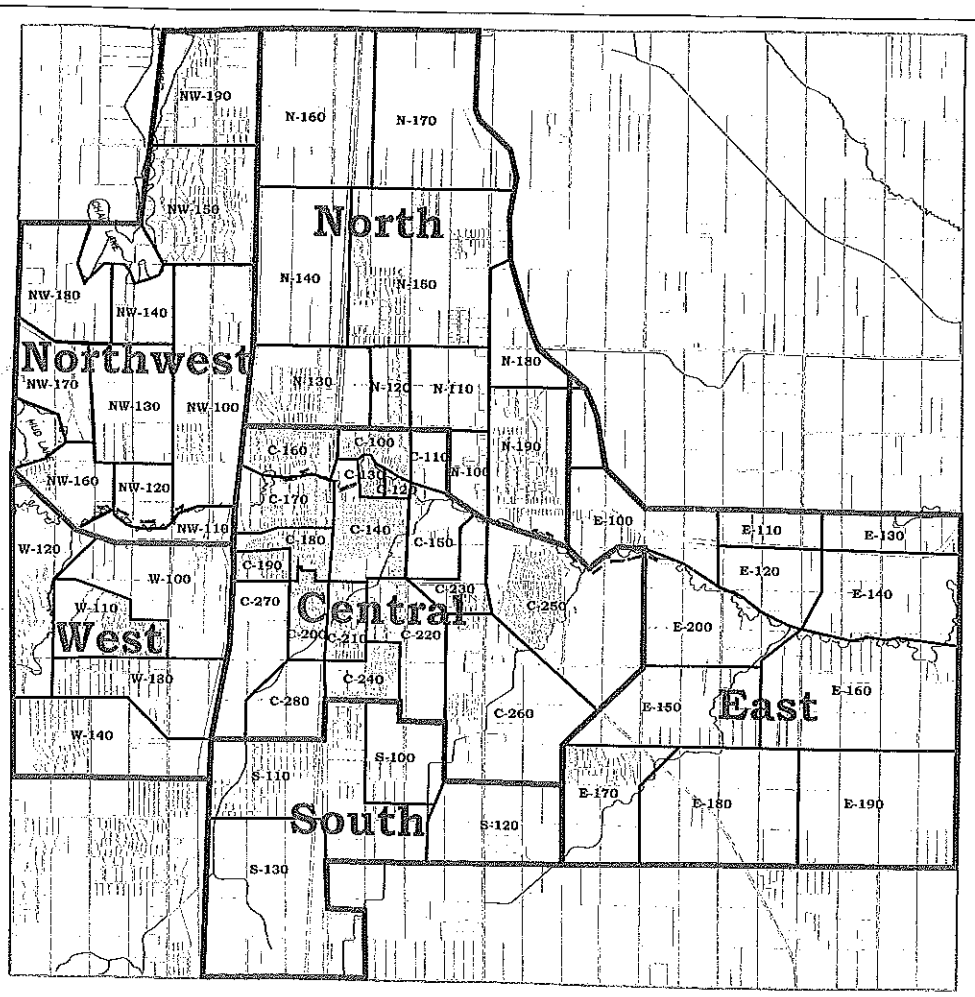


Figure 7.1
City of North Branch

Sanitary Sewer Service Districts

MAJOR SEWER SERVICE DISTRICT BOUNDARY

SANITARY SEWER SUBDISTRICT BOUNDARY

E-190 SANITARY SEWER SUBDISTRICT DESIGNATION

NO SCALE

October 2003

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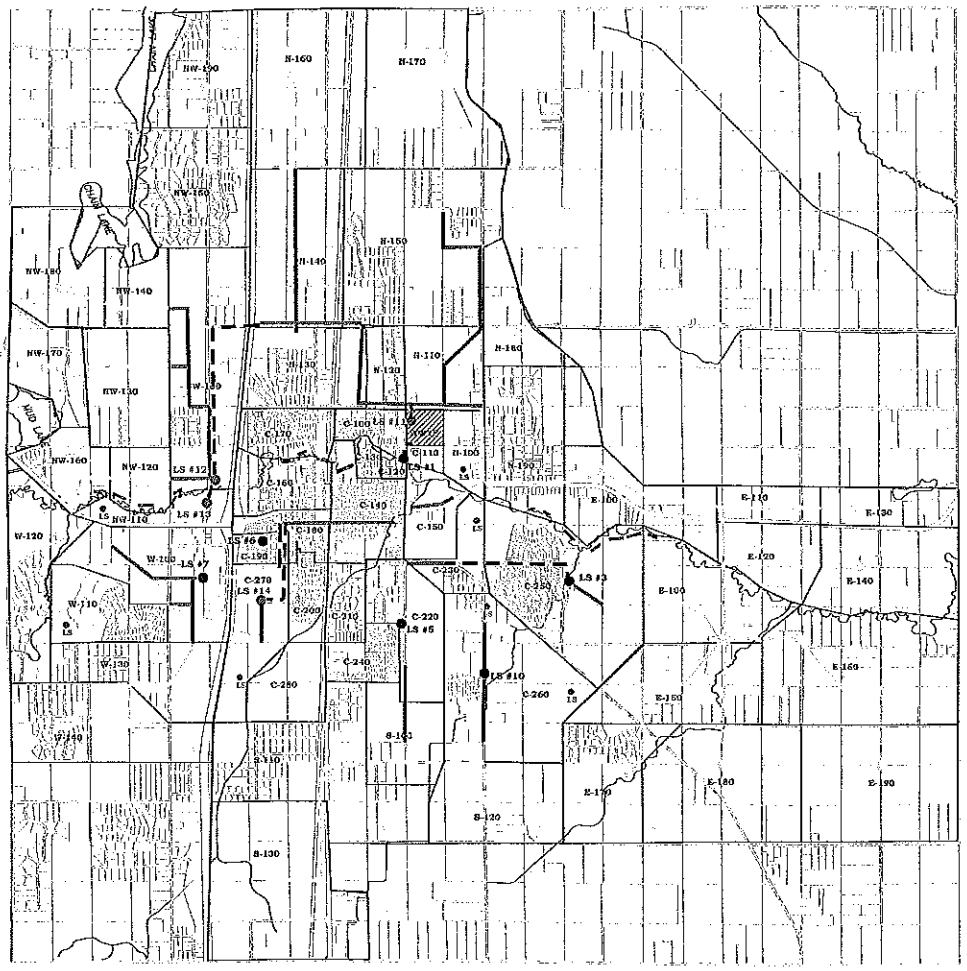


Figure 7.2

City of North Branch

20-Year Trunk System Layout

- GRAVITY SEWER
- FORCEMAIN
- LIFT STATION
- EXISTING LIFT STATION (UPGRADED)
- LS — NON-TRUNK LIFT STATION
- FUTURE TRUNK SYSTEM (>20 YEARS)
- SANITARY SEWER SUBDISTRICT BOUNDARY
- E-190 SANITARY SEWER SUBDISTRICT DESIGNATION

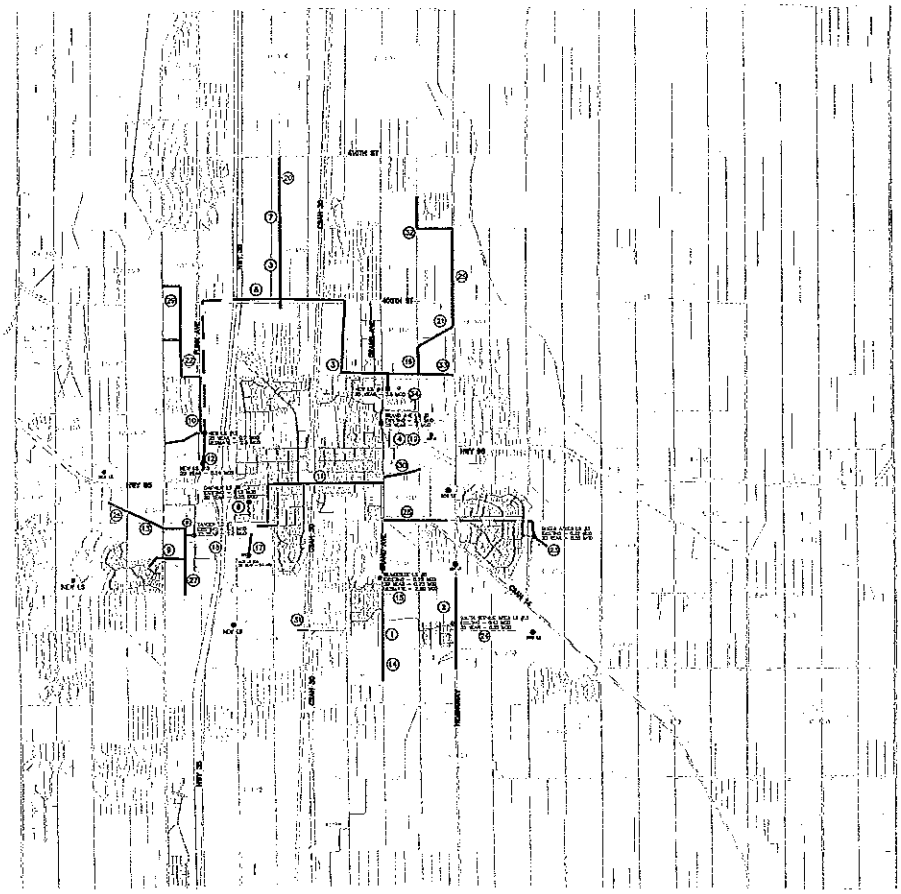
NO SCALE

December 2003

Figure 8.1

City of North Branch

20–Year Trunk System Improvement Projects



20–YEAR TRUNK SYSTEM IMPROVEMENTS

1. 2003 GRAND AVENUE TRUNK EXTENSION
2. HEMINGWAY AVENUE TRUNK SEWER
3. NORTH INDUSTRIAL PARK TRUNK SEWER EXTENSION
4. GRAND AVENUE LIFT STATION NO. 1 UPGRADE PHASE 1
5. TANGER COMMERCIAL AREA TRUNK SEWER
6. OAKVIEW LIFT STATION NO. 6 UPGRADE
7. NORTH INDUSTRIAL PARK PHASE 2
8. NORTH INDUSTRIAL PARK PHASE 3
9. WILD RARE TRUNK EXTENSION
10. NORTHWEST AREA TRUNK
11. MAPLE AVENUE TRUNK SEWER
12. NORTHWEST HIGHWAY 95 COMMERCIAL
13. TANGER COMMERCIAL AREA PHASE 2
14. SOUTH GRAND AVENUE TRUNK EXTENSION
15. BLAKESLEE LIFT STATION NO. 5 UPGRADE
16. SCHMIDT PROPERTY TRUNK SEWER
17. ANDERSON PROPERTY
18. TANGER LIFT STATION NO. 7 UPGRADE
19. GRAND AVENUE LIFT STATION NO. 1 UPGRADE PHASE 2
20. NORTH INDUSTRIAL PARK PHASE 4
21. SCHMIDT PROPERTY TRUNK SEWER PHASE 2
22. NORTHWEST AREA TRUNK SEWER PHASE 2
23. GREEN ACRES LIFT STATION NO. 3 UPGRADE
24. LIFT STATION NO. 10 UPGRADE
25. SCHMIDT PROPERTY TRUNK SEWER PHASE 3
26. TANGER AREA COMMERCIAL PHASE 3
27. TANGER AREA COMMERCIAL PHASE 4
28. CSAH 14 TRUNK SEWER
29. NORTHWEST AREA TRUNK SEWER PHASE 3
30. EAST CSAH 95 TRUNK SEWER
31. NELSON PROPERTY
32. SCHMIDT PROPERTY TRUNK SEWER PHASE 4
33. SCHMIDT PROPERTY TRUNK SEWER PHASE 5
34. LIFT STATION NO. 11 UPGRADE

KEY

- 5 YEARS
- 10 YEARS
- 15 YEARS
- 20 YEARS
- FUTURE TRUNK SYSTEM (>20 YEARS)
- (2) TRUNK IMPROVEMENT NUMBER
- ---- SANITARY SEWER SUBDISTRICT BOUNDARY
- SANITARY SEWER SUBDISTRICT DESIGNATION

NO SCALE

DECEMBER 2003

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A

APPENDIX A

City of North Branch
Central Sanitary Sewer Service District
Summary of Subdistrict Land Use and Sewer Flows

Subdistrict Designation	Land Use	Gross Developable Acres	Net Acres	Flow Rate (gpad)	Average Flow Added (MGD)	Total Average Subdistrict Flow (MGD)
C-100	LU-1 (ex)	40	27	600	0.016	0.033
	LU-3 (ex)	5	4	1,500	0.005	
	IP (ex)	20	15	800	0.012	
	P (ex)	4	3	60	0.000	
C-110	LU-1	15	11	800	0.009	0.011
	P	40	29	60	0.002	
C-120	LU-1 (ex)	10	7	600	0.004	0.004
	P (ex)	5	4	60	0.000	
C-130	LU-1 (ex)	18	12	600	0.007	0.008
	P (ex)	7	5	60	0.000	
C-140	LU-1 (ex)	20	13	600	0.008	0.092
	LU-2 (ex)	100	73	800	0.059	
	C (ex)	20	15	850	0.012	
	CB (ex)	20	15	850	0.012	
	P (ex)	15	11	60	0.001	
C-150	LU-2	40	29	1,000	0.029	0.047
	PUB (ex)	60	44	400	0.018	
C-160	LU-1 (ex)	60	40	600	0.024	0.050
	C (ex)	40	29	850	0.025	
	P (ex)	15	11	60	0.001	
C-170	LU-1 (ex)	20	13	600	0.008	0.079
	LU-2 (ex)	100	73	800	0.059	
	C (ex)	20	15	850	0.012	
	P (ex)	2	1	60	0.000	
C-180	LU-2 (ex)	45	33	800	0.026	0.042
	C (ex)	25	18	850	0.016	
C-190	LU-2 (ex)	15	11	850	0.009	0.022
	C (ex)	20	15	850	0.012	
C-200	LU-1 (ex)	80	54	600	0.032	0.032
C-210	LU-1 (ex)	60	40	600	0.024	0.025
	P (ex)	15	11	60	0.001	
C-220	LU-1 (ex)	10	7	600	0.004	0.044
	PUB (ex)	60	44	400	0.018	
	PUB	60	44	480	0.021	
	P (ex)	20	15	60	0.001	
C-230	LU-1	50	34	800	0.027	0.033
	EX	30	22	270	0.006	
C-240	LU-1 (ex)	70	51	600	0.031	0.038
	PUB (ex)	10	7	400	0.003	
	PUB	12	9	480	0.004	
C-250	LU-1 (ex)	230	154	600	0.092	0.216
	LU-1	230	154	800	0.123	
C-260	LU-1 (ex)	35	23	600	0.014	0.217
	LU-1	270	181	800	0.145	
	LU-2	80	59	1,000	0.059	
C-270	LU-2	135	99	1,000	0.099	0.099
C-280	LU-1	130	87	800	0.070	0.070
Total		2,388	1751			**0.992**

City of North Branch
North Sanitary Sewer Service District
Summary of Subdistrict Land Use and Sewer Flows

Subdistrict Designation	Land Use	Gross Developable Acres	Net Acres	Flow Rate (gpad)	Average Flow Added (MGD)	Total Average Subdistrict Flow (MGD)
N-100	LU-3	20	15	2,280	0.033	0.033
N-110	LU-1	150	101	800	0.080	0.081
	EX	5	3	270	0.001	
N-120	IP	35	26	1,200	0.031	0.054
	IP (ex)	40	29	800	0.023	
N-130	LU-2	45	33	1,000	0.033	0.102
	C	45	33	1,200	0.040	
	EX	150	110	270	0.030	
N-140	IP	180	132	1,200	0.158	0.360
	LU-3	80	58	2,280	0.131	
	C	80	59	1,200	0.070	
N-150	LU-1	300	201	800	0.161	0.206
	CN	5	4	1,000	0.004	
	EX	210	154	270	0.042	
N-160	IP	450	330	1,200	0.396	0.396
N-170	IP	200	147	1,200	0.176	0.310
	LU-1	250	168	800	0.134	
N-180	LU-1	130	87	800	0.070	0.077
	CN	10	7	1,000	0.007	
N-190	LU-2	40	29	1,000	0.029	0.075
	P	40	29	60	0.002	
	EX	240	161	270	0.043	
Total		2,705	1,984			**1.695**

City of North Branch
Northwest Sanitary Sewer Service District
Summary of Subdistrict Land Use and Sewer Flows

Subdistrict Designation	Land Use	Gross Developable Acres	Net Acres	Flow Rate (gpad)	Average Flow Added (MGD)	Total Average Subdistrict Flow (MGD)
NW-100	LU-1	240	161	800	0.129	0.139
	IP	75	55	1,200	0.066	
	EX	50	37	270	0.010	
NW-110	C	20	15	1,200	0.018	0.062
	CL	60	44	1,000	0.044	
NW-120	LU-1	80	54	800	0.043	0.043
NW-130	LU-1	210	141	800	0.113	0.114
	EX	10	7	270	0.002	
NW-140	LU-1	100	67	800	0.054	0.054
NW-150	EX	300	201	270	0.054	0.054
NW-160	LU-1	100	67	800	0.054	0.055
	EX	10	7	270	0.002	
NW-170	LU-1	60	40	800	0.032	0.047
	EX	80	54	270	0.014	
NW-180	LU-1	180	121	800	0.096	0.098
	EX	10	7	270	0.002	
NW-190	LU-1	120	80	800	0.064	0.086
	EX	120	80	270	0.022	
Total		1,825	1338			**0.752**

City of North Branch
West Sanitary Sewer Service District
Summary of Subdistrict Land Use and Sewer Flows

Subdistrict Designation	Land Use	Gross Developable Acres	Net Acres	Flow Rate (gpad)	Average Flow Added (MGD)	Total Average Subdistrict Flow (MGD)
W-100	LU-2	80	59	1,000	0.059	0.190
	C	30	22	1,200	0.026	
	CL	30	22	1,000	0.022	
	IP	30	22	1,200	0.026	
	C (ex)	90	66	850	0.056	
W-110	LU-1 (ex)	60	40	600	0.024	0.080
	LU-1	50	34	800	0.027	
	LU-2	40	29	1,000	0.029	
W-120	LU-1	50	34	800	0.027	0.086
	LU-2	40	29	1,000	0.029	
	C	15	11	1,100	0.012	
	EX	100	67	270	0.018	
W-130	LU-1	50	34	800	0.027	0.147
	IP	70	51	1,200	0.062	
	EX	80	54	1,100	0.059	
W-140	LU-1	125	84	800	0.067	0.123
	LU-2	35	26	1,000	0.026	
	EX	170	114	270	0.031	
Total		1,145	840			**0.627**

City of North Branch
South Sanitary Sewer Service District
Summary of Subdistrict Land Use and Sewer Flows

Subdistrict Designation	Land Use	Gross Developable Acres	Net Acres	Flow Rate (gpad)	Average Flow Added (MGD)	Total Average Subdistrict Flow (MGD)
S-100	LU-1	160	107	800	0.086	0.086
S-110	LU-1	200	134	800	0.107	0.151
	EX	240	161	270	0.043	
S-120	LU-1	200	134	800	0.107	0.108
	EX	5	3	270	0.001	
S-130	IP	450	330	1,200	0.396	0.396
Total		1,255	920			**0.740**

City of North Branch
East Sanitary Sewer Service District
Summary of Subdistrict Land Use and Sewer Flows

Subdistrict Designation	Land Use	Gross Developable Acres	Net Acres	Flow Rate (gpad)	Average Flow Added (MGD)	Total Average Subdistrict Flow (MGD)
E-100	LU-2	210	154	1,000	0.154	0.154
E-110	LU-2	75	55	1,000	0.055	0.055
E-120	LU-1	75	50	800	0.040	0.095
	LU-2	75	55	1,000	0.055	
E-130	LU-2	90	66	1,000	0.066	0.066
E-140	LU-1	180	121	800	0.096	0.184
	LU-2	120	88	1,000	0.088	
E-150	LU-1	220	147	800	0.118	0.169
	LU-2	60	44	1,000	0.044	
	CN	10	7	1,000	0.007	
E-160	LU-1	500	335	800	0.268	0.268
E-170	LU-1	120	80	800	0.064	0.101
	LU-2	30	22	1,000	0.022	
	EX	80	54	270	0.014	
E-180	LU-1	240	161	800	0.129	0.231
	LU-2	140	103	1,000	0.103	
E-190	LU-1	450	302	800	0.241	0.241
E-200	LU-1	175	117	800	0.094	0.094
Total		2,850	2090			**1.659**

B

APPENDIX B

City of North Branch
Central Sanitary Sewer District
Summary of Trunk Sewer Design Flows and Capacities

From Point	To Point	Subdistrict Added	Average Flow Added (MGD)	Cumulative Average Flow Added (MGD)	MCES Peaking Factor	Peak Design Flow (MGD)	Existing or Proposed	Size	Length	Upstream Elevation (ft)	Downstream Elevation (ft)	Slope (%)	Full Flow Capacity (MGD)	Capacity/ Design Flow
CC2	CC1			2.397	2.7	6.47	Existing	21				0.52	7.40	1.14
CC3	CC2			2.36	2.7	6.37	Existing	21				0.78	9.07	1.42
CC4	CC3	C120	0.004	2.129	2.8	5.95	Existing	18				0.18	2.89	0.48
CC36	CC4			2.125	2.8	5.95	Existing	18				0.18	2.89	0.49
CC6	CC36	C150 (1/2)	0.024	1.278	3	3.83	Existing	18				0.18	2.89	0.75
CC7	CC6			1.278	3	3.83	Existing	18				0.22	3.19	0.83
CC9	CC7	C220 (1/2)	0.02	1.029	3.1	3.19	Existing	15				0.20	1.87	0.59
CC11	CC9	C220 (1/2)	0.02	0.76	3.3	2.51	Existing	15				0.20	1.87	0.75
CC13	CC11	South	0.74	0.74	3.3	2.44	Existing	15				0.20	1.87	0.77
CC15	CC3	C130	0.008	0.231	3.7	0.85	Existing	18				0.44	4.52	5.28
CC16	CC15	C140 (1/2)	0.046	0.223	3.8	0.85	Existing	12				0.27	1.20	1.42
CC17	CC16	C140 (1/2)	0.047	0.177	3.9	0.69	Existing	12				0.32	1.31	1.89
CC18	CC17			0.001	4	0.00	Existing	8				0.40	0.50	123.82
CC37	CC18	West	0.627	0.847	3.2	2.71	Proposed	18	4200			0.32	3.85	1.42
CC19	CC37	C180 (1/2)	0.021	0.043	4	0.17	Existing	12				0.22	1.08	6.30
CC20	CC19			0.022	4	0.09	Existing	12				0.22	1.08	12.31
CC21	CC20	C190	0.022	0.022	4	0.09	Existing	8				0.40	0.50	5.63
CC5	CC4	C150 (1/2)	0.023	0.023	4	0.09	Proposed	10	1350			0.4	0.90	9.76
CC14	CC2	C120	0.004	0.004	4	0.02	Existing	8				0.4	0.50	30.96
CC8	CC7	C230	0.033	0.249	3.7	0.92	Existing	8				0.4	0.50	0.54
CC32	CC8	C250	0.216	0.216	3.8	0.82	Existing	8				0.4	0.50	0.60
CC10	CC9	C240 (1/2)	0.019	0.019	4	0.08	Existing	8				0.4	0.50	6.52
CC30	CC9	C260	0.23	0.23	3.7	0.85	Existing	8				0.4	0.50	0.58
CC12	CC11	C240 (1/2)	0.018	0.088	4	0.35	Existing	8				0.4	0.50	1.41
CC29	CC12	C280	0.07	0.07	4		Proposed							
CC28	CC18	C180 (1/2)	0.021	0.177	3.8	0.67	Existing	12				0.22	1.08	1.61
CC27	CC28	C200 (1/2)	0.016	0.156	3.9	0.61	Existing	12				0.22	1.08	1.78
CC26	CC27			0.14	3.9	0.55	Existing	12				0.22	1.08	1.98
CC25	CC26	C200 (1/2)	0.016	0.115	3.9	0.45	Existing	12				0.22	1.08	2.41
CC24	CC25			0.099	4	0.40	Existing	12				0.22	1.08	2.73
CC38	CC37	C270	0.099	0.099	4	0.40	Proposed	10				0.22	0.67	1.68
CC39	CC26	C210	0.025	0.025	4	0.10	Proposed	10				0.28	0.75	7.51
CC22	CC17	C160	0.05	0.129	3.9	0.50	Existing	8				0.4	0.50	0.98
CC23	CC22	C170	0.079	0.079	4	0.32	Existing	8				0.4	0.50	1.57
CC33	CC1	C110	0.011	0.033	4	0.13	Existing	8				0.4	0.50	3.75
CC34	CC33	C100 (1/2)	0.016	0.016	4	0.06	Existing	8				0.4	0.50	7.74
CC35	CC33	C100 (1/2)	0.017	0.017	4	0.07	Existing	8				0.4	0.50	7.28

City of North Branch
North Sanitary Sewer District
Summary of Trunk Sewer Design Flows and Capacities

From Point	To Point	Subdistrict Added	Average Flow Added (MGD)	Cumulative Average Flow Added (MGD)	MCES Peaking Factor	Peak Design Flow (MGD)	Existing or Proposed	Size	Length	Upstream Elevation (ft)	Downstream Elevation (ft)	Slope (%)	Full Flow Capacity (MGD)	Capacity/ Design Flow
NC2	NC1			4.357	2.3	10.02	Proposed	27	565			0.26	10.23	1.02
NC3	NC2	N120	0.054	1.927	2.8	5.40	Proposed	21	500			0.28	5.43	1.01
NC4	NC3	N130	0.102	1.873	2.8	5.24	Proposed	21	3250			0.28	5.43	1.04
NC5	NC4			1.771	2.8	4.96	Proposed	21	3050			0.28	5.43	1.10
NC6	NC5	N140	0.36	0.962	3.2	3.08	Proposed	18	2100			0.22	3.19	1.04
NC13	NC6	NW150	0.206	0.602	3.4	2.05	Proposed	15	3100			0.24	2.05	1.00
NC14	NC13	N160	0.396	0.396	3.5	1.39	Proposed	10" FM	3000				1.31	
NC7	NC5	N130	0.057	0.057	4	0.23	Proposed	8	350			0.4	0.50	2.17
NC8	NC5	NW	0.752	0.752	3.3	2.48	Proposed	15	1250			0.37	2.55	1.03
NC9	NC2			2.43	2.6	6.32	Proposed	24	1150			0.2	6.56	1.04
NC10	NC9	N110	0.081	0.663	3.3	2.19	Proposed	18	3400			0.15	2.64	1.21
NC11	NC10	N180	0.077	0.582	3.4	1.98	Proposed	18	2750			0.15	2.64	1.33
NC12	NC11	N150	0.195	0.505	3.4	1.72	Proposed	15	2500			0.2	1.87	1.09
NC15	NC12	N170	0.31	0.31	3.6	1.12	Proposed	12	1500			0.22	1.08	0.97
NC16	NC9	N100	0.033	1.767	2.8	4.95	Proposed	24	1300			0.12	5.08	1.03
NC17	NC16	N190	0.075	1.734	2.8	4.86	Proposed	24	2600			0.12	5.08	1.05
NC18	NC17	East	1.659	1.659	2.8	4.65	Proposed	21	2700			0.21	4.71	1.01

City of North Branch
Northwest Sanitary Sewer District
Summary of Trunk Sewer Design Flows and Capacities

From Point	To Point	Subdistrict Added	Average Flow Added (MGD)	Cumulative Average Flow Added (MGD)	MCES Peaking Factor	Peak Design Flow (MGD)	Existing or Proposed	Size	Length	Upstream Elevation (ft)	Downstream Elevation (ft)	Slope (%)	Full Flow Capacity (MGD)	Capacity/ Design Flow
NWC2	NWC1	NW110	0.062	0.609	3.3	2.01	Proposed	15	150			0.28	2.22	1.10
NWC3	NWC2	NW100 (1/2)	0.069	0.451	3.5	1.58	Proposed	15	4500			0.2	1.87	1.19
NWC4	NWC3	NW100 (1/2)	0.069	0.221	3.7	0.82	Proposed	12	2000			0.22	1.08	1.32
NWC8	NWC4	NW140	0.054	0.152	3.9	0.59	Proposed	10	675			0.28	0.75	1.27
NWC11	NWC8	NW180	0.098	0.098	3.9	0.38	Proposed	8	2250			0.4	0.50	1.30
NWC7	NWC3	NW130	0.114	0.161	3.9	0.63	Proposed	10	675			0.28	0.75	1.20
NWC10	NWC7	NW170	0.047	0.047	4	0.19	Proposed	8	2750			0.4	0.50	2.63
NWC5	NWC2	NW120	0.041	0.096	4	0.38	Proposed	8	1350			0.4	0.50	1.29
NWC9	NWC5	NW160	0.055	0.055	4	0.22	Proposed	8	2650			0.4	0.50	2.25
NWC13	NWC12	NW150	0.054	0.135	3.9	0.53	Proposed	10	1350			0.22	0.67	1.26
NWC14	NWC13	NW190	0.081	0.081	3.9	0.32	Proposed	6" FM	1400					

City of North Branch
West Sanitary Sewer District
Summary of Trunk Sewer Design Flows and Capacities

From Point	To Point	Subdistrict Added	Average Flow Added (MGD)	Cumulative Average Flow Added (MGD)	MCES Peaking Factor	Peak Design Flow (MGD)	Existing or Proposed	Size	Length	Upstream Elevation (ft)	Downstream Elevation (ft)	Slope (%)	Full Flow Capacity (MGD)	Capacity/ Design Flow
WC2	WC1	Existing	0.058	0.627	3.4	2.13	Proposed	18	310			0.12	2.36	1.11
WC3	WC2	W100 (1/2)	0.067	0.416	3.5	1.46	Proposed	15	900			0.15	1.62	1.11
WC4	WC3	W110	0.079	0.079	4	0.32	Proposed	10	850			0.28	0.75	2.38
WC5	WC2	W100 (1/2)	0.067	0.153	3.9	0.60	Proposed	10	3300			0.28	0.75	1.26
WC8	WC5	W120	0.086	0.086	4	0.34	Proposed	8				0.4	0.50	1.44
WC6	WC3	W130	0.147	0.27	3.7	1.00	Proposed	12	1350			0.22	1.08	1.08
WC7	WC6	W140	0.123	0.123	3.9	0.48	Proposed	8				0.4	0.50	1.03

City of North Branch
South Sanitary Sewer District
Summary of Trunk Sewer Design Flows and Capacities

From Point	To Point	Subdistrict Added	Average Flow Added (MGD)	Cumulative Average Flow Added (MGD)	MCES Peaking Factor	Peak Design Flow (MGD)	Existing or Proposed	Size	Length	Upstream Elevation (ft)	Downstream Elevation (ft)	Slope (%)	Full Flow Capacity (MGD)	Capacity/ Design Flow
SC2	SC1	S100	0.086	0.741	3.3	2.45	Proposed	15				0.22	1.96	0.80
SC3	SC2	S120	0.108	0.108	3.9	0.42	Proposed	10				0.28	0.75	1.78
SC4	SC2			0.547	3.4	1.86	Proposed	15				0.2	1.87	1.01
SC5	SC4	S110	0.151	0.547	3.4	1.86	Proposed	15				0.2	1.87	1.01
SC6	SC5	S130	0.396	0.396	3.6	1.43	Proposed	12				0.22	1.08	0.76

City of North Branch
East Sanitary Sewer District
Summary of Trunk Sewer Design Flows and Capacities

From Point	To Point	Subdistrict Added	Average Flow Added (MGD)	Cumulative Average Flow Added (MGD)	MCES Peaking Factor	Peak Design Flow (MGD)	Existing or Proposed	Size	Length	Upstream Elevation (ft)	Downstream Elevation (ft)	Slope (%)	Full Flow Capacity (MGD)	Capacity/ Design Flow
EC2	EC1	E100	0.154	1.604	2.8	4.49	Proposed	21				0.25	5.13	1.14
EC3	EC2	E110	0.055	0.121	3.9	0.47	Proposed	10				0.28	0.75	1.59
EC6	EC3	E130	0.066	0.066	4	0.26	Proposed	8				0.4	0.50	1.88
EC4	EC2			1.329	3	3.99	Proposed	21				0.18	4.36	1.09
EC5	EC4	E120	0.093	0.272	3.7	1.01	Proposed	12				0.22	1.08	1.08
EC7	EC5	E140	0.179	0.179	3.8	0.68	Proposed	10				0.28	0.75	1.10
EC8	EC4			1.057	3.1	3.28	Proposed	21				0.15	3.98	1.21
EC9	EC8	E200	0.089	0.089	4	0.36	Proposed	8						
EC12	EC8	E180	0.225	0.225	3.7	0.83	Proposed	12				0.22	1.08	1.30
EC13	EC8			0.483	3.4	1.64	Proposed	15				0.18	1.78	1.08
EC14	EC13	E160	0.254	0.483	3.4	1.64	Proposed	15				0.18	1.78	1.08
EC15	EC14	E190	0.229	0.229	3.7	0.85	Proposed	12				0.22	1.08	1.28
EC10	EC8	E150	0.163	0.26	3.7	0.96	Proposed	12				0.22	1.08	1.13
EC11	EC10	E170	0.097	0.097	3.9	0.38	Proposed	8				0.4	0.50	1.31

C

APPENDIX C

Trunk Sewer Cost Estimate
City of North Branch

Trunk Improvement Number	Trunk Improvement Description	Pipe Size (inches)	Pipe Length (feet)	Min Depth (feet)	Max Depth (feet)	Average Depth (feet)	Number Manhole Structures	Pipe Cost ($/foot)	Manhole Cost ($/foot)	Cost ($)	Engineering/ Admin 20%	Contingency 20%	Total Cost ($)	8" Cost ($)	Trunk Cost ($)
New Trunk Sewer															
1	2003 Grand Avenue Trunk Extension	15	1,022	18	23	20.50	4	$42	$126	$53,451	$10,690	$10,690	$74,831	$35,750	$39,081
		8	125	18	23	20.50	1	$39	$126	$6,163	$1,233	$1,233	$8,628	$4,373	$4,255
2	Hemingway Avenue Trunk Sewer	10	1,200	19	20	19.50	4	$60	$128	$82,020	$16,404	$16,404	$114,828	$40,480	$74,348
		10	1,600	17	22	19.50	5	$60	$128	$109,360	$21,872	$21,872	$153,104	$53,973	$99,131
		8	200	19	20	19.50	1	$52	$128	$12,070	$2,414	$2,414	$16,898	$6,747	$10,151
3	North Industrial Park Trunk Sewer Extension	27	600	20	21	20.50	2	$125	$126	$80,150	$16,030	$16,030	$112,210	$20,240	$91,970
		21	600	10	13	11.50	2	$60	$169	$33,242	$6,648	$6,648	$46,538	$16,867	$29,672
		21	1,950	11	16	13.00	7	$65	$158	$140,075	$28,015	$28,015	$196,105	$65,780	$130,325
		21	1,300	15	21	18.00	4	$80	$133	$114,400	$22,880	$22,880	$160,160	$43,853	$116,307
		21	3,000	20	22	21.00	10	$90	$124	$296,100	$59,220	$59,220	$414,540	$101,200	$313,340
		18	2,100	15	20	17.25	7	$76	$136	$173,933	$34,787	$34,787	$243,506	$70,840	$172,666
		8	500	15	20	17.50	2	$46	$135	$27,942	$5,588	$5,588	$39,118	$16,867	$22,252
5	Tanger Commercial Area Trunk Sewer	18	350	21	22	21.50	1	$90	$123	$34,686	$6,917	$6,917	$48,420	$11,807	$36,614
		15	900	21	22	21.50	3	$80	$123	$79,935	$15,987	$15,987	$111,909	$30,360	$81,549
		12	1,000	18	22	20.00	3	$76	$127	$83,467	$16,693	$16,693	$116,853	$33,733	$83,120
		8	200	18	22	20.00	1	$52	$127	$12,093	$2,419	$2,419	$16,931	$6,747	$10,184
7	North Industrial Park Phase 2	15	1,650	12	15	13.50	6	$42	$154	$80,768	$16,154	$16,154	$113,075	$55,660	$57,415
8	North Industrial Park Phase 3	15	1,250	13	22	17.50	4	$60	$135	$84,854	$16,971	$16,971	$118,796	$42,167	$76,629
9	Wild Ridge Trunk Extension	10	1,100	17	22	19.25	4	$60	$129	$75,121	$15,024	$15,024	$105,169	$37,107	$68,063
		10	450	15	17	15.75	2	$35	$142	$19,114	$3,823	$3,823	$26,759	$15,180	$11,579
		8	60	17	22	19.50	0	$50	$128	$3,501	$700	$700	$4,901	$2,024	$2,877
10	Northwest Area Trunk Sewer	15	850	11	14	12.50	3	$40	$161	$39,709	$7,942	$7,942	$55,593	$28,673	$26,920
		15	1,300	15	23	19.50	4	$70	$128	$101,855	$20,371	$20,371	$142,597	$43,853	$98,744
		8	300	12	23	17.50	1	$40	$135	$14,365	$2,873	$2,873	$20,111	$10,120	$9,991
11	Maple Street Trunk Sewer	18	4,400	11	16	13.25	15	$135	$156	$624,323	$124,865	$124,865	$874,053	$148,427	$725,626
13	Tanger Commercial Area Trunk Sewer	10	1,000	12	18	15.00	3	$38	$148	$45,300	$9,060	$9,060	$63,420	$33,733	$29,687
14	South Grand Avenue Trunk Extension	15	500	17	23	20.00	2	$70	$127	$39,233	$7,847	$7,847	$54,927	$16,867	$38,060
		15	650	9	17	13.00	2	$40	$158	$30,442	$6,088	$6,088	$42,618	$21,927	$20,692
		8	60	17	23	20.00	0	$50	$127	$3,508	$702	$702	$4,911	$2,024	$2,887
16	Schmidt Property Trunk Sewer	24	1,100	17	22	19.25	4	$110	$129	$130,121	$26,024	$26,024	$182,169	$37,107	$145,063
		18	1,000	16	17	16.25	3	$70	$140	$77,692	$15,518	$15,518	$108,728	$33,733	$74,995
		8	90	16	17	16.25	0	$35	$140	$3,833	$767	$767	$5,367	$3,036	$2,331
17	Anderson Property	10	300	14	18	16.00	1	$40	$141	$14,260	$2,852	$2,852	$19,964	$10,120	$9,844
20	North Industrial Park Phase 4	15	1,200	6	12	10.00	4	$40	$184	$55,360	$11,072	$11,072	$77,504	$40,480	$37,024
21	Schmidt Property Trunk Sewer Phase 2	18	1,450	12	17	14.50	5	$60	$149	$97,416	$19,483	$19,483	$136,382	$48,913	$87,469
		18	850	17	20	18.50	3	$76	$132	$70,649	$14,130	$14,130	$98,909	$28,673	$70,236
		8	200	12	20	16.00	1	$35	$141	$8,607	$1,701	$1,701	$11,909	$6,747	$5,163
22	Northwest Area Trunk Sewer Phase 2	15	700	22	24	23.00	2	$80	$120	$62,417	$12,483	$12,483	$87,383	$23,613	$63,770
		15	1,350	19	21	20.00	5	$70	$127	$105,930	$21,186	$21,186	$148,302	$45,540	$102,762
		12	700	17	19	18.00	2	$65	$133	$51,100	$10,220	$10,220	$71,540	$23,613	$47,927
		10	700	18	20	19.00	2	$60	$130	$47,763	$9,553	$9,553	$66,869	$23,613	$43,255

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Trunk Sewer Cost Estimate
City of North Branch

Trunk Improvement Number	Trunk Improvement Description	Pipe Size (inches	Pipe Length (feet)	Min Depth (feet)	Max Depth (feet)	Average Depth (feet)	Number Manhole Structures	Pipe Cost ($/foot)	Manhole Cost ($/foot)	Cost ($)	Engineering/ Admin 20%	Contingency 20%	Total Cost ($)	8" Cost ($)	Trunk Cost ($)
New Trunk Sewer															
		8	200	17	22	19.50	1	$50	$128	$11,670	$2,334	$2,334	$16,338	$8,747	$9,591
23	Green Acres Sewer Extension	10	500	17	22	19.50	2	$60	$128	$34,175	$6,835	$6,835	$47,845	$16,867	$30,978
25	Schmidt Property Trunk Sewer Phase 3	18	2,500	17	22	19.50	5	$80	$128	$220,675	$44,175	$44,175	$309,225	$84,333	$224,892
		8	200	17	22	19.50	1	$50	$128	$11,670	$2,334	$2,334	$16,338	$8,747	$9,591
26	Tanger Commercial Area Trunk Sewer Phase 3	10	1,600	12	14	13.00	3	$35	$168	$41,833	$8,367	$8,367	$58,567	$33,733	$24,833
27	Tanger Commercial Area Trunk Sewer Phase 4	12	1,000	20	22	21.00	3	$70	$124	$78,700	$15,740	$15,740	$110,180	$33,733	$76,447
		8	100	20	22	21.00	0	$55	$124	$6,370	$1,274	$1,274	$8,918	$3,373	$5,545
28	CSAH 14 Trunk Sewer	12	1,350	19	21	20.00	5	$70	$127	$105,930	$21,186	$21,186	$148,302	$45,540	$102,762
		8	60	19	21	20.00	0	$55	$127	$3,808	$762	$762	$5,331	$2,024	$3,307
29	Northwest Area Trunk Sewer Phase 3	12	900	13	17	15.00	3	$40	$146	$42,570	$8,514	$8,514	$59,598	$30,360	$29,238
30	East CSAH 95 Trunk Sewer	10	1,000	12	16	14.00	3	$35	$151	$42,067	$8,413	$8,413	$58,893	$33,733	$25,160
31	Nelson Property	10	400	14	16	15.00	1	$40	$146	$18,920	$3,784	$3,784	$26,488	$13,493	$12,995
32	Schmidt Property Trunk Sewer Phase 4	15	2,450	17	22	19.50	8	$70	$128	$191,958	$38,392	$38,392	$268,741	$82,647	$186,094
		8	300	17	22	19.50	1	$50	$128	$17,505	$3,501	$3,501	$24,507	$10,120	$14,387
33	Schmidt Property Trunk Sewer Phase 5	24	1,300	12	16	14.00	4	$65	$161	$93,687	$18,737	$18,737	$131,161	$43,653	$87,508
Total													$5,806,867		$4,016,997
New Forcemain															
3		14	250			7.50	0	$60	$250	$15,469	$3,094	$3,094	$21,656		$21,656
9		12	6,300			7.50	6	$45	$250	$295,313	$59,063	$59,063	$413,438		$413,438
11		4	1,050			7.50	1	$20	$250	$22,969	$4,594	$4,594	$32,156		$32,156
16		6	2,000			7.50	2	$25	$250	$53,750	$10,750	$10,750	$75,250		$75,250
17		12	1,400			7.50	1	$45	$250	$65,625	$13,125	$13,125	$91,875		$91,875
18		14	700			7.50	1	$60	$250	$43,313	$8,663	$8,663	$60,638		$60,638
27		8	4,250			7.50	4	$32	$250	$143,969	$28,794	$28,794	$201,556		$201,556
Total										$640,406	$128,081	$128,081	$896,569		$896,569
Highway & River Crossings															
3		30	200			7.50	1	$225	$250	$46,250	$9,250	$9,250	$64,750		$64,750
9		18	400			7.50	1	$150	$250	$61,875	$12,375	$12,375	$86,625		$86,625
10		24	200			7.50	0	$200	$250	$40,375	$8,075	$8,075	$56,525		$56,525
Total										$149,500	$29,700	$29,700	$207,900		$207,900
Total			69,767							$4,936,688			$6,911,356		$5,121,466

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City of North Branch
Lift Station No. 11 Cost Estimate

1/5/2004

	Initial	20-Year	Ultimate
Required Flow (gpm)	1200	2400	6000
Forcemain Length (feet)	250	250	250
Diameter of Forcemain (in.)	10	14	20
Static Head (feet)	30	30	30
Pump Efficiency (%)	60	60	60
C-Value	130	130	130
Velocity (ft/s)	4.902	5.002041	6.1275
Frictonal Head (feet)	2	2	1
Brake Horsepower Required (hp)	16	32	79

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
LS Excavation		4,692	CY	$3.00	1	1	1.1	$15,500.00
LS Backfill		3,753	CY	$2.50	1	1	1.1	$10,300.00
Manhole	10	27	LF	$900.00	1.065	1.1	1.1	$31,300.00
Grout		2.6	CY	$150.00	1	1	1.1	$400.00
Base slab		1	EA	$2,200.00	1.065	1.2	1.1	$3,100.00
Top slab		1	EA	$2,000.00	1.065	1.2	1.1	$2,800.00
Dewatering		1	LS	$10,000.00	1.065	1	1.1	$11,700.00
Pump/Equipment		1	LS	$45,000.00	1.065	1.2	1.1	$63,300.00
						Lift Station Total =		**$138,400.00**
2 Valve Manhole								
VM Excavation		504	CY	$3.00	1	1	1.1	$1,700.00
VM Backfill		403	CY	$2.50	1	1	1.1	$1,100.00
Manhole	8	12	LF	$600.00	1.065	1.1	1.1	$9,300.00
Grout		1.4	CY	$150.00	1	1	1.1	$200.00
Base slab		1	EA	$1,200.00	1.065	1.2	1.1	$1,700.00
Top slab		1	EA	$1,050.00	1.065	1.2	1.1	$1,500.00
Alum Hatch		1	LS	$1,000.00	1.065	1.2	1.1	$1,400.00
						Valve Manhole Total =		**$16,900.00**
3 Piping and Misc.								
DIP	8	60	LF	$28.00	1.065	1.2	1.1	$2,400.00
Check Valve	8	2	EA	$1,200.00	1.065	1.2	1.1	$3,400.00
Gate Valve	8	2	EA	$1,000.00	1.065	1.2	1.1	$2,800.00
Mega Flange	8	2	EA	$300.00	1.065	1.2	1.1	$800.00
Megalug	8	6	EA	$60.00	1.065	1.2	1.1	$500.00
Link Seal	8	6	EA	$100.00	1.065	1.2	1.1	$800.00
Misc. Fittings	8	800	LBS	$2.00	1.065	1.2	1.1	$2,200.00
						Piping and Misc. Total =		**$12,900.00**
4 Electrical								
Electrical Work		1	LS	$7,000.00	1	1	1.1	$7,700.00
Controls		1	LS	$30,000.00	1	1	1.1	$33,000.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
						Electrical Total =		**$41,800.00**

COST $210,000.00

Contingency (20%) $42,000.00
ELA (15%) $31,500.00

TOTAL COST $283,500.00

City of North Branch
Lift Station No. 1 (Grand) Upgrade (Phase 1)

1/5/2004

	Existing	20-Year	Ultimate
Required Flow (gpm)	1450	2750	4000
Forcemain Length (feet)	1200	1200	1200
Diameter of Forcemain (in.)	10	14	20
Static Head (feet)	30	35	35
Pump Efficiency (%)	60	60	60
C-Value	130	130	130
Velocity (ft/s)	5.92325	5.731505	4.085
Frictonal Head (feet)	15	9	3
Brake Horsepower Required (hp)	27	51	65

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
Top slab		1	EA	$1,100.00	1.065	1.2	1.1	$1,500.00
Pump/Equipment		1	LS	$25,000.00	1.065	1.2	1.1	$35,100.00
						Lift Station Total =		**$36,600.00**
2 Electrical								
Electrical Work		1	LS	$8,500.00	1	1	1.1	$9,400.00
Controls		1	LS	$30,000.00	1	1	1.1	$33,000.00
Generator		1	LS	$50,000.00	1	1	1.1	$55,000.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
						Electrical Total =		**$98,500.00**
							COST	**$135,100.00**
							Contingency (20%)	**$27,020.00**
							ELA (15%)	**$20,265.00**
							TOTAL COST	**$182,385.00**

City of North Branch
Lift Station No. 11 Upgrade

1/5/2004

	Initial	20-Year	Ultimate
Required Flow (gpm)	1200	2400	6000
Forcemain Length (feet)	250	250	250
Diameter of Forcemain (in.)	10	14	20
Static Head (feet)	30	30	30
Pump Efficiency (%)	60	60	60
C-Value	130	130	130
Velocity (ft/s)	4.902	5.002041	6.1275
Frictonal Head (feet)	2	2	1
Brake Horsepower Required (hp)	16	32	79

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
LS Excavation		553	CY	$3.00	1	1	1.1	$1,800.00
LS Backfill		442	CY	$2.50	1	1	1.1	$1,200.00
Manhole	10	12	LF	$900.00	1.065	1.1	1.1	$13,900.00
Grout		2.6	CY	$150.00	1	1	1.1	$400.00
Base slab		1	EA	$2,200.00	1.065	1.2	1.1	$3,100.00
Top slab		1	EA	$2,000.00	1.065	1.2	1.1	$2,800.00
Dewatering		1	LS	$10,000.00	1.065	1	1.1	$11,700.00
Pump/Equipment		1	LS	$27,000.00	1.065	1.2	1.1	$38,000.00
						Lift Station Total =		**$72,900.00**
2 Valve Manhole								
VM Excavation		504	CY	$3.00	1	1	1.1	$1,700.00
VM Backfill		403	CY	$2.50	1	1	1.1	$1,100.00
Manhole	8	12	LF	$600.00	1.065	1.1	1.1	$9,300.00
Grout		1.4	CY	$150.00	1	1	1.1	$200.00
Base slab		1	EA	$1,200.00	1.065	1.2	1.1	$1,700.00
Top slab		1	EA	$1,050.00	1.065	1.2	1.1	$1,500.00
Alum Hatch		1	LS	$1,000.00	1.065	1.2	1.1	$1,400.00
						Valve Manhole Total =		**$16,900.00**
3 Piping and Misc.								
DIP	8	60	LF	$28.00	1.065	1.2	1.1	$2,400.00
Check Valve	8	2	EA	$1,200.00	1.065	1.2	1.1	$3,400.00
Gate Valve	8	2	EA	$1,000.00	1.065	1.2	1.1	$2,800.00
Mega Flange	8	2	EA	$300.00	1.065	1.2	1.1	$800.00
Megalug	8	6	EA	$60.00	1.065	1.2	1.1	$500.00
Link Seal	8	6	EA	$100.00	1.065	1.2	1.1	$800.00
Misc. Fittings	8	800	LBS	$2.00	1.065	1.2	1.1	$2,200.00
						Piping and Misc. Total =		**$12,900.00**
4 Electrical								
Electrical Work		1	LS	$5,000.00	1	1	1.1	$5,500.00
Controls		1	LS	$20,000.00	1	1	1.1	$22,000.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
						Electrical Total =		**$28,600.00**
							COST	**$131,300.00**
							Contingency (20%)	**$26,260.00**
							ELA (15%)	**$19,695.00**
							TOTAL COST	**$177,255.00**

City of North Branch
Lift Station No. 12 Cost Estimate

1/5/2004

	20-Year	Ultimate
Required Flow (gpm)	700	1500
Forcemain Length (feet)	6300	6300
Diameter of Forcemain (in.)	12	12
Static Head (feet)	25	25
Pump Efficiency (%)	60	60
C-Value	130	130
Velocity (ft/s)	1.98576389	4.255208
Frictonal Head (feet)	8	34
Brake Horsepower Required (hp)	10	37

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
LS Excavation		3,049	CY	$3.00	1	1	1.1	$10,100.00
LS Backfill		2,439	CY	$2.50	1	1	1.1	$6,700.00
Manhole	10	23	LF	$900.00	1.065	1.1	1.1	$26,700.00
Grout		2.7	CY	$150.00	1	1	1.1	$400.00
Base slab		1	EA	$2,200.00	1.065	1.2	1.1	$3,100.00
Top slab		1	EA	$2,000.00	1.065	1.2	1.1	$2,800.00
Dewatering		1	LS	$10,000.00	1.065	1	1.1	$11,700.00
Pump/Equipment		1	LS	$30,000.00	1.065	1.2	1.1	$42,200.00
							Lift Station Total =	**$103,700.00**
2 Valve Manhole								
VM Excavation		504	CY	$3.00	1	1	1.1	$1,700.00
VM Backfill		403	CY	$2.50	1	1	1.1	$1,100.00
Manhole	8	12	LF	$600.00	1.065	1.2	1.1	$10,100.00
Grout		1.4	CY	$150.00	1	1	1.1	$200.00
Base slab		1	EA	$1,200.00	1.065	1.2	1.1	$1,700.00
Top slab		1	EA	$1,050.00	1.065	1.2	1.1	$1,500.00
Alum Hatch		1	LS	$1,000.00	1.065	1.2	1.1	$1,400.00
							Valve Manhole Total =	**$17,700.00**
3 Piping and Misc.								
DIP	8	60	LF	$28.00	1.065	1.2	1.1	$2,400.00
Check Valve	8	2	EA	$1,100.00	1.065	1.2	1.1	$3,100.00
Plug Valve	8	2	EA	$675.00	1.065	1.2	1.1	$1,900.00
Mega Flange	8	2	EA	$100.00	1.065	1.2	1.1	$300.00
Megalug	8	6	EA	$60.00	1.065	1.2	1.1	$500.00
Link Seal	8	6	EA	$45.00	1.065	1.2	1.1	$400.00
Misc. Fittings	8	800	LBS	$2.00	1.065	1.2	1.1	$2,200.00
							Piping and Misc. Total =	**$10,800.00**
4 Electrical								
Electrical Work		1	LS	$7,000.00	1	1	1.1	$7,700.00
Controls		1	LS	$30,000.00	1	1	1.1	$33,000.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
							Electrical Total =	**$41,800.00**
							COST	**$174,000.00**
							Contingency (20%)	**$34,800.00**
							ELA (20%)	**$26,100.00**
							TOTAL COST	**$234,900.00**

City of North Branch
Lift Station No. 13 Cost Estimate

1/5/2004

	20-Year
Required Flow (gpm)	167
Forcemain Length (feet)	1050
Diameter of Forcemain (in.)	4
Static Head (feet)	25
Pump Efficiency (%)	63
C-Value	130
Velocity (ft/s)	4.26
Frictonal Head (feet)	21
Brake Horsepower Required (hp)	3

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
LS Excavation		2,382	CY	$3.00	1	1	1.1	$7,900.00
LS Backfill		1,905	CY	$2.50	1	1	1.1	$5,200.00
Manhole	6	22	LF	$350.00	1.065	1.1	1.1	$9,900.00
Grout		0.6	CY	$150.00	1	1	1.1	$100.00
Base slab		1	EA	$700.00	1.065	1.2	1.1	$1,000.00
Top slab		1	EA	$600.00	1.065	1.2	1.1	$800.00
Dewatering		1	LS	$10,000.00	1.065	1	1.1	$11,700.00
Pump/Equipment		1	LS	$20,000.00	1.065	1.2	1.1	$28,100.00
						Lift Station Total =		**$64,700.00**
2 Valve Manhole								
VM Excavation		452	CY	$3.00	1	1	1.1	$1,500.00
VM Backfill		362	CY	$2.50	1	1	1.1	$1,000.00
Manhole	6	12	LF	$350.00	1.065	1.1	1.1	$5,400.00
Grout		0.6	CY	$150.00	1	1	1.1	$100.00
Base slab		1	EA	$700.00	1.065	1.2	1.1	$1,000.00
Top slab		1	EA	$600.00	1.065	1.2	1.1	$800.00
Alum Hatch		1	LS	$500.00	1.065	1.2	1.1	$700.00
						Valve Manhole Total =		**$10,500.00**
3 Piping and Misc.								
DIP	4	60	LF	$20.00	1.065	1.2	1.1	$1,700.00
Check Valve	4	2	EA	$650.00	1.065	1.2	1.1	$1,800.00
Plug Valve	4	2	EA	$500.00	1.065	1.2	1.1	$1,400.00
Mega Flange	4	2	EA	$75.00	1.065	1.2	1.1	$200.00
Megalug	4	6	EA	$50.00	1.065	1.2	1.1	$400.00
Link Seal	4	6	EA	$50.00	1.065	1.2	1.1	$400.00
Misc. Fittings	4	200	LBS	$2.00	1.065	1.2	1.1	$600.00
						Piping and Misc. Total =		**$6,500.00**
4 Electrical								
Electrical Work		1	LS	$10,000.00	1	1	1.1	$11,000.00
Controls		1	LS	$25,000.00	1	1	1.1	$27,500.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
						Electrical Total =		**$39,600.00**
							COST	**$121,300.00**
							Contingency (20%)	**$24,260.00**
							ELA (15%)	**$18,195.00**
							TOTAL COST	**$163,755.00**

City of North Branch
Lift Station No. 5 (Blakeslee) Upgrade

1/5/2004

Required Flow (gpm)	450
Forcemain Length (feet)	50
Diameter of Forcemain (in.)	6
Static Head (feet)	35
Pump Efficiency (%)	60
C-Value	130
Velocity (ft/s)	5.10625
Frictonal Head (feet)	1
Brake Horsepower Required (hp)	7

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
LS Excavation		4,830	CY	$3.00	1	1	1.1	$15,900.00
LS Backfill		3,864	CY	$2.50	1	1	1.1	$10,600.00
Manhole	7	28	LF	$350.00	1.065	1.1	1.1	$12,600.00
Grout		0.9	CY	$150.00	1	1	1.1	$200.00
Base slab		1	EA	$750.00	1.065	1.2	1.1	$1,100.00
Top slab		1	EA	$800.00	1.065	1.2	1.1	$1,100.00
Dewatering		1	LS	$10,000.00	1.065	1	1.1	$11,700.00
Pump/Equipment		1	LS	$23,000.00	1.065	1.2	1.1	$32,300.00
						Lift Station Total =		**$85,500.00**
2 Valve Manhole								
VM Excavation		452	CY	$3.00	1	1	1.1	$1,500.00
VM Backfill		362	CY	$2.50	1	1	1.1	$1,000.00
6' MH	6	12	LF	$350.00	1.065	1.1	1.1	$5,400.00
Grout		0.6	CY	$150.00	1	1	1.1	$100.00
Base slab		1	EA	$750.00	1.065	1.2	1.1	$1,100.00
Top slab		1	EA	$800.00	1.065	1.2	1.1	$1,100.00
Alum Hatch		1	LS	$750.00	1.065	1.2	1.1	$1,100.00
						Valve Manhole Total =		**$11,300.00**
3 Piping and Misc.								
DIP	4	60	LF	$20.00	1.065	1.2	1.1	$1,700.00
Check Valve	4	2	EA	$550.00	1.065	1.2	1.1	$1,500.00
Plug Valve	4	2	EA	$500.00	1.065	1.2	1.1	$1,400.00
Mega Flange	4	2	EA	$45.00	1.065	1.2	1.1	$100.00
Megalug	4	6	EA	$30.00	1.065	1.2	1.1	$300.00
Link Seal	4	6	EA	$25.00	1.065	1.2	1.1	$200.00
Misc. Fittings	4	200	LBS	$2.00	1.065	1.2	1.1	$600.00
						Piping and Misc. Total =		**$5,800.00**
4 Electrical								
Electrical Work		1	LS	$5,000.00	1	1	1.1	$5,500.00
Controls		1	LS	$20,000.00	1	1	1.1	$22,000.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
						Electrical Total =		**$28,600.00**
							COST	**$131,200.00**
							Contingency (20%)	**$26,240.00**
							ELA (15%)	**$19,680.00**
							TOTAL COST	**$177,120.00**

City of North Branch
Lift Station No. 14 Cost Estimate

1/5/2004

	20-Year
Required Flow (gpm)	275
Forcemain Length (feet)	2000
Diameter of Forcemain (in.)	6
Static Head (feet)	20
Pump Efficiency (%)	60
C-Value	130
Velocity (ft/s)	3.12048611
Frictonal Head (feet)	14
Brake Horsepower Required (hp)	4

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
LS Excavation		2,698	CY	$3.00	1	1	1.1	$8,900.00
LS Backfill		2,158	CY	$2.50	1	1	1.1	$5,900.00
Manhole	6	23	LF	$350.00	1.065	1.1	1.1	$10,400.00
Grout		0.6	CY	$150.00	1	1	1.1	$100.00
Base slab		1	EA	$700.00	1.065	1.2	1.1	$1,000.00
Top slab		1	EA	$600.00	1.065	1.2	1.1	$800.00
Dewatering		1	LS	$10,000.00	1.065	1	1.1	$11,700.00
Pump/Equipment		1	LS	$25,000.00	1.065	1.2	1.1	$35,100.00
						Lift Station Total =		**$73,900.00**
2 Valve Manhole								
VM Excavation		452	CY	$3.00	1	1	1.1	$1,500.00
VM Backfill		362	CY	$2.50	1	1	1.1	$1,000.00
Manhole	6	12	LF	$350.00	1.065	1.1	1.1	$5,400.00
Grout		0.6	CY	$150.00	1	1	1.1	$100.00
Base slab		1	EA	$700.00	1.065	1.2	1.1	$1,000.00
Top slab		1	EA	$600.00	1.065	1.2	1.1	$800.00
Alum Hatch		1	LS	$750.00	1.065	1.2	1.1	$1,100.00
						Valve Manhole Total =		**$10,900.00**
3 Piping and Misc.								
DIP	6	60	LF	$25.00	1.065	1.2	1.1	$2,100.00
Check Valve	6	2	EA	$800.00	1.065	1.2	1.1	$2,200.00
Plug Valve	6	2	EA	$750.00	1.065	1.2	1.1	$2,100.00
Mega Flange	6	2	EA	$100.00	1.065	1.2	1.1	$300.00
Megalug	6	6	EA	$65.00	1.065	1.2	1.1	$500.00
Link Seal	6	6	EA	$55.00	1.065	1.2	1.1	$500.00
Misc. Fittings	6	300	LBS	$2.00	1.065	1.2	1.1	$800.00
						Piping and Misc. Total =		**$8,500.00**
4 Electrical								
Electrical Work		1	LS	$10,000.00	1	1	1.1	$11,000.00
Controls		1	LS	$27,500.00	1	1	1.1	$30,300.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
						Electrical Total =		**$42,400.00**
							COST	**$135,700.00**
							Contingency (20%)	**$27,140.00**
							ELA (15%)	**$20,355.00**
							TOTAL COST	**$183,195.00**

City of North Branch
Lift Station No. 7 (Tanger) Upgrade

1/5/2004

	Existing	20-Year	Ultimate
Required Flow (gpm)	350	833	1450
Forcemain Length (feet)	5000	4000	4400
Diameter of Forcemain (in.)	8	8	12
Static Head (feet)	17	17	17
Pump Efficiency (%)	60	60	60
C-Value	130	130	130
Velocity (ft/s)	2.23398438	5.316883	4.113368
Frictonal Head (feet)	13	52	22
Brake Horsepower Required (hp)	4	24	24

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Valve Manhole								
VM Excavation		504	CY	$3.00	1	1	1.1	$1,700.00
VM Backfill		403	CY	$2.50	1	1	1.1	$1,100.00
Manhole	8	12	LF	$600.00	1.065	1.1	1.1	$9,300.00
Grout		1.4	CY	$150.00	1	1	1.1	$200.00
Base slab		1	EA	$1,200.00	1.065	1.2	1.1	$1,700.00
Top slab		1	EA	$1,050.00	1.065	1.2	1.1	$1,500.00
Alum Hatch		1	LS	$1,000.00	1.065	1.2	1.1	$1,400.00
							Valve Manhole Total =	**$16,900.00**
2 Piping and Misc.								
DIP	8	60	LF	$28.00	1.065	1.2	1.1	$2,400.00
Check Valve	8	2	EA	$1,200.00	1.065	1.2	1.1	$3,400.00
Gate Valve	8	2	EA	$1,000.00	1.065	1.2	1.1	$2,800.00
Mega Flange	8	2	EA	$300.00	1.065	1.2	1.1	$800.00
Megalug	8	6	EA	$60.00	1.065	1.2	1.1	$500.00
Link Seal	8	6	EA	$100.00	1.065	1.2	1.1	$800.00
Misc. Fittings	8	500	LBS	$2.00	1.065	1.2	1.1	$1,400.00
							Piping and Misc. Total =	**$12,100.00**
3 Pumps & Electrical								
Electrical Work		1	LS	$7,500.00	1	1	1.1	$8,300.00
Pumps		1	LS	$20,000.00	1	1	1.1	$22,000.00
Controls		1	LS	$25,000.00	1	1	1.1	$27,500.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
							Electrical Total =	**$58,900.00**
							COST	**$87,900.00**
							Contingency (20%)	**$17,580.00**
							ELA (15%)	**$13,185.00**
							TOTAL COST	**$118,665.00**

City of North Branch
Lift Station No. 1 (Grand) Upgrade (Phase 2)

1/5/2004

	Existing	20-Year	Ultimate
Required Flow (gpm)	1450	2750	4000
Forcemain Length (feet)	1200	1200	1200
Diameter of Forcemain (in.)	10	14	20
Static Head (feet)	30	35	35
Pump Efficiency (%)	60	60	60
C-Value	130	130	130
Velocity (ft/s)	5.92325	5.731505	4.085
Frictonal Head (feet)	15	9	3
Brake Horsepower Required (hp)	27	51	65

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
LS Excavation		5,312	CY	$3.00	1	1	1.1	$17,500.00
LS Backfill		4,250	CY	$2.50	1	1	1.1	$11,700.00
Manhole	11	28	LF	$900.00	1.065	1.1	1.1	$32,500.00
Grout		3.4	CY	$150.00	1	1	1.1	$600.00
Base slab		1	EA	$2,200.00	1.065	1.2	1.1	$3,100.00
Top slab		1	EA	$2,100.00	1.065	1.2	1.1	$3,000.00
Pump/Equipment		1	LS	$60,000.00	1.065	1.2	1.1	$84,300.00
							Lift Station Total =	**$152,700.00**
2 Valve Manhole								
VM Excavation		504	CY	$3.00	1	1	1.1	$1,700.00
VM Backfill		403	CY	$2.50	1	1	1.1	$1,100.00
MH	8	12	LF	$600.00	1.065	1.1	1.1	$9,300.00
Grout		1.4	CY	$150.00	1	1	1.1	$200.00
Base slab		1	EA	$1,200.00	1.065	1.2	1.1	$1,700.00
Top slab		1	EA	$1,100.00	1.065	1.2	1.1	$1,500.00
Alum Hatch		1	LS	$750.00	1.065	1.2	1.1	$1,100.00
							Valve Manhole Total =	**$16,600.00**
3 Piping and Misc.								
DIP	12	20	LF	$65.00	1.065	1.2	1.1	$1,800.00
Check Valve	12	2	EA	$1,350.00	1.065	1.2	1.1	$3,800.00
Plug Valve	12	2	EA	$1,150.00	1.065	1.2	1.1	$3,200.00
Mega Flange	12	2	EA	$275.00	1.065	1.2	1.1	$800.00
Megalug	12	6	EA	$175.00	1.065	1.2	1.1	$1,500.00
Link Seal	12	6	EA	$100.00	1.065	1.2	1.1	$800.00
Misc. Fittings	12	600	LBS	$2.00	1.065	1.2	1.1	$1,700.00
							Piping and Misc. Total =	**$13,600.00**
4 Electrical								
Electrical Work		1	LS	$15,000.00	1	1	1.1	$16,500.00
Controls		1	LS	$7,500.00	1	1	1.1	$8,300.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
							Electrical Total =	**$25,900.00**
							COST	**$208,800.00**
							Contingency (20%)	**$41,760.00**
							ELA (15%)	**$31,320.00**
							TOTAL COST	**$281,880.00**

City of North Branch
Lift Station No. 3 (Green Acres) Upgrade

1/5/2004

	Existing	20-Year
Required Flow (gpm)	250	565
Forcemain Length (feet)	6000	4250
Diameter of Forcemain (in.)	6	8
Static Head (feet)	35	35
Pump Efficiency (%)	60	60
C-Value	130	130
Velocity (ft/s)	2.83680556	3.606289
Frictonal Head (feet)	34	27
Brake Horsepower Required (hp)	7	15

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
LS Excavation		5,869	CY	$3.00	1	1	1.1	$19,400.00
LS Backfill		4,695	CY	$2.50	1	1	1.1	$12,900.00
Manhole	7	30	LF	$500.00	1.065	1.1	1.1	$19,300.00
Grout		0.9	CY	$150.00	1	1	1.1	$200.00
Base slab		1	EA	$850.00	1.065	1.2	1.1	$1,200.00
Top slab		1	EA	$750.00	1.065	1.2	1.1	$1,100.00
Dewatering		1	LS	$10,000.00	1.065	1	1.1	$11,700.00
Pump/Equipment		1	LS	$25,000.00	1.065	1.2	1.1	$35,100.00
						Lift Station Total =		**$100,900.00**
2 Valve Manhole								
VM Excavation		452	CY	$3.00	1	1	1.1	$1,500.00
VM Backfill		362	CY	$2.50	1	1	1.1	$1,000.00
6' MH	6	12	LF	$350.00	1.065	1.1	1.1	$5,400.00
Grout		0.6	CY	$150.00	1	1	1.1	$100.00
Base slab		1	EA	$750.00	1.065	1.2	1.1	$1,100.00
Top slab		1	EA	$650.00	1.065	1.2	1.1	$900.00
Alum Hatch		1	LS	$750.00	1.065	1.2	1.1	$1,100.00
						Valve Manhole Total =		**$11,100.00**
3 Piping and Misc.								
DIP	6	60	LF	$26.00	1.065	1.2	1.1	$2,200.00
Check Valve	6	2	EA	$750.00	1.065	1.2	1.1	$2,100.00
Plug Valve	6	2	EA	$700.00	1.065	1.2	1.1	$2,000.00
Mega Flange	6	2	EA	$100.00	1.065	1.2	1.1	$300.00
Megalug	6	6	EA	$45.00	1.065	1.2	1.1	$400.00
Link Seal	6	6	EA	$60.00	1.065	1.2	1.1	$500.00
Misc. Fittings	6	300	LBS	$2.00	1.065	1.2	1.1	$800.00
						Piping and Misc. Total =		**$8,300.00**
4 Electrical								
Electrical Work		1	LS	$7,500.00	1	1	1.1	$8,300.00
Controls		1	LS	$25,000.00	1	1	1.1	$27,500.00
Concrete Pads		1	EA	$1,000.00	1	1	1.1	$1,100.00
						Electrical Total =		**$36,900.00**
							COST	**$157,200.00**
							Contingency (20%)	**$31,440.00**
							ELA (15%)	**$23,580.00**
							TOTAL COST	**$212,220.00**

City of North Branch
Lift Station No. 10 (Wood Duck Ponds) Upgrade

1/5/2004

	Existing	20-Year
Required Flow (gpm)	310	560
Forcemain Length (feet)	4400	4400
Diameter of Forcemain (in.)	8	8
Static Head (feet)	30	35
Pump Efficiency (%)	60	60
C-Value	130	130
Velocity (ft/s)	1.97867188	3.574375
Frictonal Head (feet)	9	28
Brake Horsepower Required (hp)	5	15

Item	Diameter	Quantity	Unit	Unit Cost	Tax	Install	O&P	Estimated Total Cost
1 Lift Station Wet Well								
Top slab		1	EA	$1,100.00	1.065	1.2	1.1	$1,500.00
Pump/Equipment		1	LS	$18,000.00	1.065	1.2	1.1	$25,300.00
						Lift Station Total =		**$26,800.00**
2 Electrical								
Electrical Work		1	LS	$5,000.00	1	1	1.1	$5,500.00
Controls		1	LS	$2,000.00	1	1	1.1	$2,200.00
						Electrical Total =		**$7,700.00**
						COST		**$34,500.00**
						Contingency (15%)		**$5,175.00**
						ELA (15%)		**$5,175.00**
						TOTAL COST		**$44,850.00**

D

APPENDIX D

Cash Flow Analysis - 1
Sanitary Sewer Trunk Fee
(Uniform Per Acre Fee, 120 Res units per year, 3.0% annual multiplier)

City of North Branch
WSB Project No. 01231-55

			Revenue Basis	
Beginning Balance	$50,000		Developed Acreage per Year	
Expenditure Inflation Rate	3.00%		Residential	60
Proposed Trunk Fee	$3,950	per acre	Comm./Ind.	30
Annual Fee Multiplier	3.00%			

Year	Sanitary Trunk Fund					Annual
	Description	Expenditures	Debt Service	Trunk Fee	Balance	Debt Transfer
	Beginning Balance				$50,000	$0
2004			$0	$316,000	$366,000	$0
2005	15 Years @5%	$401,000	$38,616	$366,165	$693,549	$0
2006			$38,616	$377,150	$1,032,082	$0
2007	20 Years @5%	$1,452,234	$155,085	$388,464	$1,265,461	$0
2008			$155,085	$400,118	$1,510,494	$0
2009	15 Years @5%	$360,534	$189,805	$412,122	$1,732,811	$0
2010			$189,805	$424,486	$1,967,492	$0
2011	20 Years @6%	$1,554,561	$325,363	$437,220	$2,079,349	$0
2012			$325,363	$450,337	$2,204,324	$0
2013	20 Years @6%	$1,649,233	$469,176	$463,847	$2,198,995	$0
2014			$469,176	$477,762	$2,207,581	$0
2015			$469,176	$492,095	$2,230,501	$0
2016	20 Years @6%	$1,360,176	$587,783	$506,858	$2,149,576	$0
2017			$587,783	$522,064	$2,083,856	$0
2018	20 Years @6%	$1,443,011	$713,614	$537,726	$1,907,968	$0
2019			$713,614	$553,857	$1,748,212	$0
2020			$674,997	$570,473	$1,643,688	$0
2021	20 Years @6%	$861,134	$750,088	$587,587	$1,481,187	$0
2022			$750,088	$605,215	$1,336,314	$0
2023			$750,088	$623,371	$1,209,597	$0
2024	20 Years @6%	$969,213	$799,884	$642,073	$1,051,785	$0

Cash Flow Analysis - 2
Sanitary Sewer Trunk Fee
(Separate Per Acre Fees, 120 Res units per year, 3.0% annual multiplier)

City of North Branch
WSB Project No. 01231-55

			Revenue Basis	
Beginning Balance	$50,000		Developed Acreage per Year	
Expenditure Inflation Rate	3.00%		Residential	60
Proposed Trunk Fee (Res)	$3,400	per acre	Comm./Ind.	30
Proposed Trunk Fee (Non Res)	$5,100	per acre		
Annual Fee Multiplier	3.00%			

Year	Sanitary Trunk Fund					Annual
	Description	Expenditures	Debt Service	Trunk Fee	Balance	Debt Transfer
	Beginning Balance				$50,000	$0
2004			$0	$357,000	$407,000	$0
2005	15 Years @5%	$401,000	$38,616	$367,710	$736,094	$0
2006			$38,616	$378,741	$1,076,219	$0
2007	20 Years @5%	$1,452,234	$155,085	$390,104	$1,311,237	$0
2008			$155,085	$401,807	$1,557,958	$0
2009	15 Years @5%	$360,534	$189,805	$413,861	$1,782,014	$0
2010			$189,805	$426,277	$2,018,486	$0
2011	20 Years @6%	$1,554,561	$325,363	$439,065	$2,132,188	$0
2012			$325,363	$452,237	$2,259,062	$0
2013	20 Years @6%	$1,649,233	$469,176	$465,804	$2,255,691	$0
2014			$469,176	$479,778	$2,266,293	$0
2015			$469,176	$494,171	$2,291,289	$0
2016	20 Years @6%	$1,360,176	$587,783	$508,997	$2,212,502	$0
2017			$587,783	$524,267	$2,148,986	$0
2018	20 Years @6%	$1,443,011	$713,614	$539,995	$1,975,367	$0
2019			$713,614	$556,194	$1,817,947	$0
2020			$674,997	$572,880	$1,715,830	$0
2021	20 Years @6%	$861,134	$750,088	$590,067	$1,555,809	$0
2022			$750,088	$607,769	$1,413,489	$0
2023			$750,088	$626,002	$1,289,403	$0
2024	20 Years @6%	$969,213	$799,884	$644,782	$1,134,300	$0

E

APPENDIX E

City of North Branch
Staff Report

Prepared By: Linda Woulfe, Interim City Administrator

Presenter: Ragini Varma, City Clerk / IT Director

Date: 09/20/2024

Board & Commission: City Council

Subject: Ordinance 381-24 Creating Chapter 18 Business, Article XII Cannabis Regulation

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The City should adopt an ordinance on cannabis businesses. This ordinance is modeled after the Office of Cannabis Management's model ordinances for local governments. We recommend its adoption as presented, with the allowance for city staff to make any necessary minor formatting changes to match existing code.

Voting Requirements:

Voting Options: Simple Majority

STATE OF MINNESOTA

COUNTY OF CHISAGO

CITY OF NORTH BRANCH

ORDINANCE NO. 381-24

CREATING CHAPTER 18 BUSINESS, ARTICLE XII CANNABIS REGULATION

THE CITY COUNCIL OF THE CITY OF NORTH BRANCH DOES ORDAIN THAT

Section #1. Chapter 2 of the City of North Branch City Code is hereby amended to read as follows:

ARTICLE XII CANNABIS REGULATION

Section 18-359 Findings and Purpose

The City of North Branch makes the following findings:

The purpose of this Ordinance is to implement the provisions of Minnesota Statutes Chapter 342, which authorizes the City of North Branch to protect the public health, safety, and welfare of its residents by regulating cannabis businesses within the legal boundaries of the City. The City finds and concludes that the proposed provisions are appropriate and lawful land use regulations for the City of North Branch, that the proposed amendments will promote the community's interest in reasonable stability in zoning for now and in the future, and that the proposed provisions are in the public interest and for the public good.

Sec. 18-360 Authority & Jurisdiction

The City has the authority to adopt this Ordinance pursuant to:

a. Minnesota Statutes §342.13(c), regarding the authority of a local unit of government to adopt reasonable restrictions of the time, place, and manner of the operation of a cannabis business provided that such restrictions do not prohibit the establishment or operation of cannabis businesses.
b. Minnesota Statutes §342.22, regarding the local registration and enforcement requirements of state-licensed cannabis retail businesses and lower-potency hemp edible retail businesses.
c. Minnesota Statutes §152.0263, subd. 5, regarding the use of cannabis in public places.
d. Minnesota Statutes §394.21, regarding the authority of a local authority to adopt zoning

ordinances.

This ordinance shall be applicable to the legal municipal boundaries for the City of North Branch.

Sec. 18-361 Severability

If any section, clause, provision, or portion of this Ordinance is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of this Ordinance shall not be affected thereby.

Sec. 18-362 Enforcement

The City of North Branch City Administrator or his/her designee is responsible for the administration and enforcement of this Ordinance. Any violation of the provisions of this Ordinance or failure to comply with any of its requirements constitutes a misdemeanor and is punishable as defined by Minnesota law. Violations of this Ordinance can occur regardless of whether a permit is required for a regulated activity listed in this Ordinance.

Sec. 18-363 Definitions

Unless otherwise noted in this Section, words and phrases contained in Minnesota Statutes§ 342.01 and the rules promulgated pursuant to any of these acts shall have the same meanings in this Ordinance.

Cannabis Business: Any person, cooperative, or business that has been issued a license from the Office of Cannabis Management as described to Minnesota Statute §342.01 subd. 14.

Cannabis Cultivation: A cannabis business licensed to grow cannabis plants within the approved amount of space from seed or immature plant to mature plant. Cultivation includes harvesting cannabis flower from mature plants, packaging and labeling immature plants and seedlings and cannabis flower for sale to other cannabis businesses, transporting cannabis flower to a cannabis manufacturer located on the same premises, and performing other actions described in Minnesota Statutes §342.01 subd. 27 and approved by the Office of Cannabis Management.

Cannabis Retail Business: A retail location of a cannabis retailer, a cannabis mezzobusiness with a retail operations endorsement, a cannabis microbusiness with a retail operations endorsement, a medical cannabis retailer, or a medical combination business. This definition excludes lower-potency hemp edible retailers unless otherwise noted in this Ordinance.

Cannabis Retailer: Any person, partnership, firm, corporation, or association, foreign or domestic, selling cannabis product(s) to a consumer and not for the purpose of resale in any

form.

Lower-potency Hemp Edible: As defined under Minnesota Statutes §342.01 subd. 50

Office of Cannabis Management: Minnesota Office of Cannabis Management, referred to as "OCM" in this Ordinance.

Preliminary License Approval: OCM pre-approval for a cannabis business license for applicants who qualify under Minnesota Statutes §342.17.

Retail Registration: An approved registration issued by the City of North Branch to a state-licensed cannabis retail business.

School: A public school as defined under Minnesota Statutes §120A.05 or a nonpublic school that must meet the reporting requirements under Minnesota Statutes §120A.24.

State License: An approved license issued by the State of Minnesota's Office of Cannabis Management to a cannabis retail business.

Sec. 18-364 Registration of Cannabis Businesses
No individual or entity may operate a state-licensed cannabis retail business within the City of North Branch without first registering with the City. Any state-licensed cannabis retail business that sells to a customer or patient without valid retail registration shall incur a civil penalty of up to $2,000 for each violation per Minnesota Statutes §342.22 subd. 5(e).

Sec. 18-365 Compliance Checks Prior to Retail Registration
Prior to issuance of a cannabis retail business registration, the City shall conduct a preliminary compliance check to ensure compliance with local ordinances. Per Minnesota Statutes §342.13(f), within 30 days of receiving a copy of a state license application from OCM, the City shall certify on a form provided by OCM whether a proposed cannabis retail business complies with local zoning ordinances and, if applicable, whether the proposed business complies with the state fire code and building code.

Sec. 18-366 Registration & Application Fees
The City shall not charge an application fee. A registration fee, as established in the City's fee schedule, shall be charged to applicants depending on the type of retail business license applied for.

An initial retail registration fee shall not exceed $500 or half the amount of an initial state

license fee under Minnesota Statutes §342.11, whichever is less. The initial registration fee shall include the initial retail registration fee and the first annual renewal fee.

Any renewal retail registration fee imposed by the City shall be charged at the time of the second renewal and each subsequent renewal thereafter. A renewal retail registration fee shall not exceed $1,000 or half the amount of a renewal state license fee under Minnesota Statutes §342.11, whichever is less.

A medical combination business operating an adult-use retail location may only be charged a single registration fee, not to exceed the lesser of a single retail registration fee, defined under this Section, of the adult-use retail business.

All fees collected by the City of North Branch will be retained by the City of North Branch.

Sec. 18-367 Registration & Application Submittal

The City of North Branch shall issue a retail registration to a state-licensed cannabis retail business that adheres to the requirements of Minnesota Statutes §342.22.
An applicant for a retail registration shall fill out a retail registration form, as provided by the City. Said form shall include, but is not limited to:

- Full name of the property owner and applicant;
- Address, email address, and telephone number of the applicant;
- The address and parcel ID for the property which the retail registration is sought; and
- Certification that the applicant complies with the requirements of local ordinances, including those established pursuant to Minnesota Statutes §342.13.

The applicant shall include with the form:

- the registration fee as required in Section 18-366; and
- a copy of a valid state license or written notice of OCM license preapproval.

Once an application is considered complete, the City shall inform the applicant as such, process the application fees, and review the application for approval or denial. The application fee shall be non-refundable once processed.

Sec. 18-368 Registration & Application Approval

A state-licensed cannabis retail business application *shall not* be approved if the cannabis retail business would exceed the maximum number of registered cannabis retail businesses permitted under Sec. 18-377 Limiting of Registrations.

A state-licensed cannabis retail business application shall not be approved or renewed if the applicant is unable to meet the requirements of this Ordinance.

A state-licensed cannabis retail business application that meets the requirements of this Ordinance shall be approved.

Sec. 18-369 Annual Compliance Checks

The City of North Branch's Police Department shall complete at minimum one compliance check per calendar year of every cannabis business with a retail registration to assess if the business meets age verification requirements, as required under Minnesota Statutes §342.22 subd. 4(b), Minnesota Statutes §342.24, and this Ordinance.

The City's Police Department shall conduct at minimum one unannounced age verification compliance check at least once per calendar year. Age verification compliance checks shall involve persons at least 17 years of age but under the age of 21 who, with the prior written consent of a parent or guardian if the person is under the age of 18, attempt to purchase adult-use cannabis flower, adult-use cannabis products, lower-potency hemp edibles, or hemp-derived consumer products under the direct supervision of a law enforcement officer or an employee of the local unit of government.

Any failures under this Section must be reported to the Office of Cannabis Management.

Sec. 18-370 Location Change

A state-licensed cannabis retail business shall be required to submit a new application for registration if it seeks to move to a new location still within the legal boundaries of the City of North Branch.

Sec. 18-371 Renewal of Registration

The City shall renew an annual registration of a state-licensed cannabis retail business at the same time OCM renews the cannabis retail business' license.

A state-licensed cannabis retail business shall apply to renew registration on a form established by the City.

A cannabis retail registration issued under this ordinance shall not be transferred.

Sec. 18-372 Renewal Fees

The City Clerk shall charge a renewal fee for the registration starting at the second renewal, as established in Section 18-366. the City's fee ordinance schedule.

Sec. 18-373 Renewal Application
The application for renewal of a retail registration shall include, but is not limited to, items required under Sec. 18-367 of this Ordinance.

Sec. 18-374 Suspension of Registration
The City may suspend a cannabis retail business's registration if it violates this Ordinance or poses an immediate threat to the health or safety of the public. The City shall immediately notify the cannabis retail business and the OCM in writing the grounds for the suspension. OCM will provide the City of North Branch and cannabis business retailer a response to the complaint within seven calendar days and perform any necessary inspections within 30 calendar days.

Sec. 18-375 Length of Suspension
The suspension of a cannabis retail business registration may be for up to 30 calendar days, unless OCM suspends the license for a longer period. The business may not make sales to customers if their registration is suspended.

The City of North Branch Auditor may reinstate a registration if it determines that the violations have been resolved. The City of North Branch Auditor shall reinstate the registration if OCM determines that the violation(s) have been resolved.

Sec. 18-376 Civil Penalties
Subject to Minnesota Statutes §342.22, subd. 5(e) the City may impose a civil penalty, as specified in City's Fee Schedule, for registration violations, not to exceed $2,000.

Sec. 18-377 Limiting of Registrations
The City shall allow one active cannabis retail business registration for every 12,500 residents (population as determined by the State of Minnesota Demographer's Office). For purposes of determining the number of cannabis retail business registrations for the City, if a number under 12,500 remains after applying the 12,500 increments to City 's population, that fractional amount is also accorded one active cannabis retail business registration.

In applying this limitation, cannabis retail business applications will be prioritized based upon the date the application is received by the City. Applications will be reviewed in the order the applications were received, starting with the earliest received. Incomplete applications or those not following the requirements of this Ordinance will be removed from the order.

If applications are received on the same day and those applications outnumber the maximum number of registrations allowed, a committee comprised of the City Administrator, Police Chief, and Community Development Director will select which application(s) to accept. The decision

shall be based upon factors such as completeness, feasibility of the proposal, safety, community needs, and distance from other cannabis retailers.

Sec. 18-378 Requirements for Cannabis Businesses

Minimum Buffer Requirements:

- A cannabis business shall not operate within 1,000 feet of a school.
- A cannabis business shall not operate within 500 feet of an attraction within a public park that is regularly used by minors, including a playground or athletic field.
- A cannabis retail business shall not operate within 1,000 feet of another cannabis retail business.

For the purposes of this article, the distance shall be determined by horizontal measurement from the nearest existing school, public park as described above, or cannabis retail business to the nearest point of the structure housing the proposed new cannabis business use.

Per Minnesota Statutes §462.357 subd. 1e, nothing in this section shall prohibit an active cannabis business or a cannabis business seeking registration from continuing operation at the same site if a (school/daycare/residential treatment facility/attraction within a public park that is regularly used by minors) moves within the minimum buffer zone.

Sec. 18-379 Hours of Operation

Cannabis businesses are limited to retail sale of cannabis, cannabis flower, cannabis products, or hemp-derived consumer products between the hours of 9:00 a.m. and 10:00 p.m., seven days a week.

Sec. 18-380 Zoning and Land Use

Zoning requirements for cannabis businesses with located in the City Code Chapter 66 Zoning, Article V Districts and District Regulations.

Cannabis businesses shall follow the City's sign regulations contained in the City Code Chapter 66 Zoning, Article VI Signs.

Sec. 18-381 License or Permit Required for Temporary Cannabis Events

A license or permit is required to be issued and approved by the City prior to holding a Temporary Cannabis Event. A registration fee, as established in City of North Branch's fee schedule, shall be charged to applicants for Temporary Cannabis Events.

The City of North Branch Auditor shall require an application for Temporary Cannabis Events. An applicant shall fill out an application form, as provided by the City. Said form shall include,

but is not limited to:

- Address where the temporary cannabis event will be located;
- Full name of the property owner and applicant; and
- Address, email address, and telephone number of the applicant.

The applicant shall include with the form:

- The registration fee and
- A copy of the OCM cannabis event license application, submitted pursuant to Minnesota Statutes §342.39 subd. 2.

The application shall be submitted to the City Clerk. If the application is deficient with respect to the above requirements, the City shall return the application with a notice of the deficiencies.

Once an application is considered complete, the City shall inform the applicant as such, process the registration fees, and forward the application to the Police Department for final approval. The City may deny an application if the applicant has not sufficiently planned or detailed feasible safety and security plans.

The application fee shall be non-refundable once processed.

The application for a license for a Temporary Cannabis Event shall meet the following standards:

- Except for low-potency cannabis edibles, onsite consumption is prohibited.
- Temporary cannabis events shall only be held between the hours of 10:00 a.m. and 9:00 p.m.
- Temporary cannabis events are prohibited in residential districts.
- Temporary cannabis events must comply with the buffer requirements described in Sec. 18-378.
- Temporary cannabis events must comply with all requirements detailed in Minnesota Statutes §342.40. The application shall include a detailed plan addressing the requirements of Minnesota Statutes §342.40, subds. 3, 4, 5, 6, 7, and 8.

A request for a Temporary Cannabis Event that meets the requirements of this Section shall be approved.

A request for a Temporary Cannabis Event that does not meet the requirements of this Section shall be denied. The City shall notify the applicant of the standards not met and basis for denial.

Sec. 18-382 Local Government as a Cannabis Retailer

The City may establish, own, and operate a municipal cannabis retail business subject to the restrictions in this Ordinance. A municipal cannabis retail store shall not be included in any limitation of the number of registered cannabis retail businesses under Sec. 18-377. A municipal cannabis retail store is subject to all the same rental license requirements and procedures applicable to all other applicants.

Section #2. Summary Publication

The following summary is approved by the City Council and shall be published in lieu of publishing the entire ordinance pursuant to Minnesota Statutes section 412.191:

Ordinance 381-24 Creating Chapter 18 Business, Article XII Cannabis Regulation. The ordinance regulates the time, place, and manner in which cannabis businesses operate within the City to comply with MN state statutes and uphold the health, safety, and welfare of the City's resident.