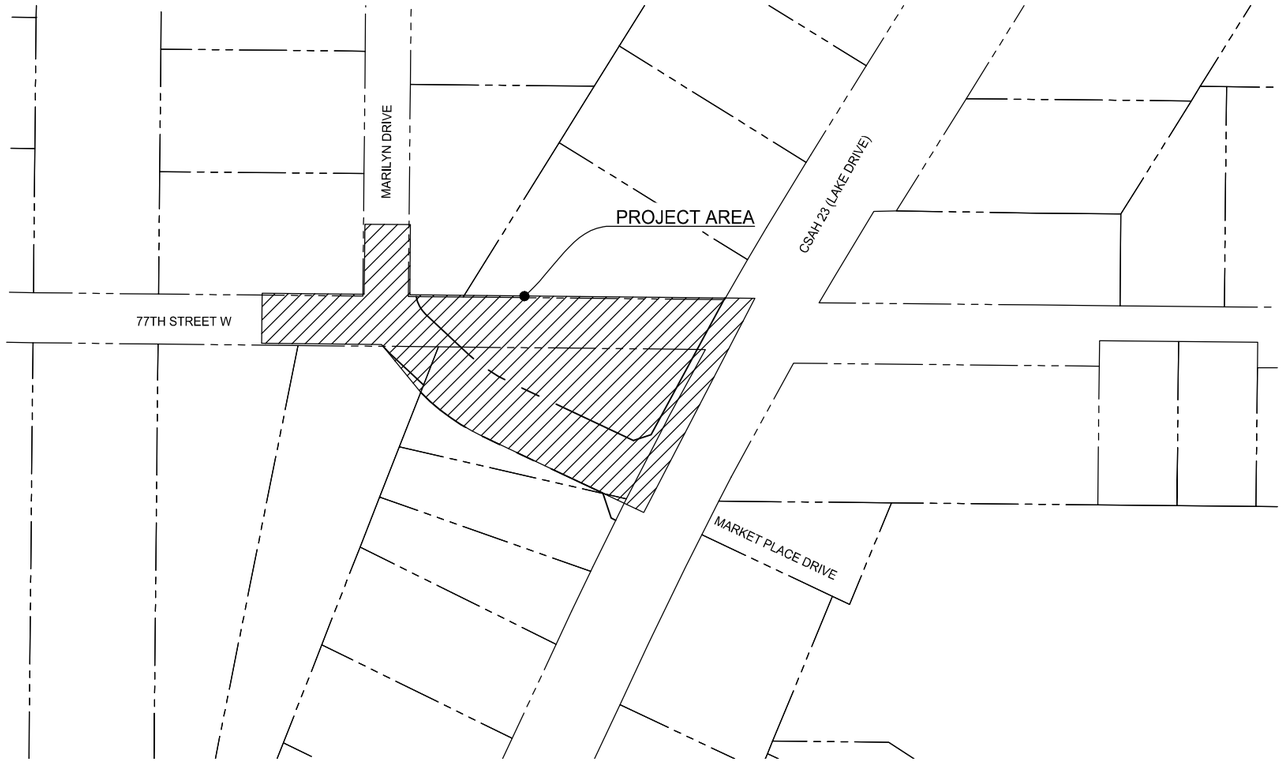
2024 MARKET PLACE DRIVE REALIGNMENT PROJECT

CITY OF LINO LAKES, MN

CONSTRUCTION PLAN FOR SANITARY SEWER, WATER MAIN, STORM SEWER, & ROAD REALIGNMENT

LOCATED ON 77TH STREET FROM MARILYN DRIVE TO CSAH 23 (LAKE DRIVE)

CSAH 23 (LAKE DRIVE) FROM 77TH STREET TO MARKET PLACE DRIVE



PROJECT LOCATION MAP

EXISTING PLAN SYMBOLS

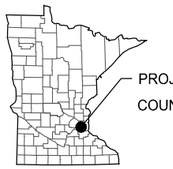
- PROPERTY LINES/RIGHT-OF-WAY
- UTILITY EASEMENT
- TREE LINE
- SIGN
- DECIDUOUS TREE
- SHRUB
- CONIFEROUS TREE

EXISTING UTILITY SYMBOLS

- FIBER OPTIC LINE
- GAS LINE
- COMMUNICATION LINE
- ELECTRIC POWER LINE
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- COMMUNICATIONS PEDESTAL
- POWER POLE
- ELECTRIC BOX
- CATCH BASIN
- STORM APRON
- STORM SEWER MANHOLE
- GATE VALVE
- HYDRANT
- SANITARY SEWER MANHOLE

EXCAVATION NOTICE SYSTEM

A CALL TO GOPHER STATE ONE (651-454-0002) IS REQUIRED A MINIMUM OF 48 HOURS PRIOR TO PERFORMING ANY EXCAVATION.



PROJECT LOCATION

COUNTY: ANOKA

N

0 100 200

H: SCALE IN FEET

UTILITY INFORMATION

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."

GOPHER ONE CALL TICKET NUMBER: 240300396

UTILITY COORDINATION MEETING HELD ON: 8/4/2021

PLAN REVISIONS		
DATE	SHEET NO.	APPROVED BY

GOVERNING SPECIFICATIONS

THIS WORK SHALL BE DONE IN ACCORDANCE WITH THE 2024 EDITION OF THE CITY OF LINO LAKES "GENERAL SPECIFICATIONS AND STANDARD DETAIL PLATES FOR STREET AND UTILITY CONSTRUCTION."

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

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

PLAN SET INDEX

THIS PLAN SET CONTAINS 39 SHEETS

THIS PLAN SET HAS BEEN PREPARED FOR:

CITY OF LINO LAKES
600 TOWN CENTER PARKWAY
LINO LAKES, MN 55014
(651) 982-2400

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

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.

DIANE L. HANKEE, PE

DATE: 12/13/2023 LICENSE NUMBER: 43338

WSB PROJ. NO. 017210-000

LEGEND

SHEET NO.	DESCRIPTION
X	REMOVAL PLAN
X	SANITARY SEWER AND WATERMAIN PLAN
X	STREET AND STORM SEWER PLAN
X	EROSION AND SEDIMENT CONTROL PLAN
X	SIGNING AND STRIPING PLAN

wsb

CITY OF LINO LAKES

SCALE:	DESIGN BY:
AS SHOWN	CJB
PLAN BY:	CHECK BY:
CJB	DLH

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.

DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

GENERAL LAYOUT

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 2 OF 39

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STATEMENT OF ESTIMATED QUANTITIES

NOTES	ITEM NO.	MNDOT SPECIFICATION NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY
A. SURFACE IMPROVEMENTS					
	1	2021.501	MOBILIZATION	LS	1
	2	2101.505	CLEARING	ACRE	0.1
	3	2101.505	GRUBBING	ACRE	0.1
	4	2104.502	REMOVE SIGN	EACH	6
	5	2104.502	SALVAGE SIGN	EACH	1
	6	2104.503	SAWING BIT PAVEMENT (FULL DEPTH)	L F	398
	7	2104.503	REMOVE CURB & GUTTER	L F	395
	8	2104.504	REMOVE CONCRETE DRIVEWAY PAVEMENT	S Y	40
	9	2104.504	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	S Y	80
	10	2104.504	REMOVE BITUMINOUS PAVEMENT	S Y	2756
	11	2104.518	REMOVE CONCRETE WALK	S F	200
	12	2104.601	REMOVE MISCELLANEOUS STRUCTURES	LS	1
	13	2104.602	SEAL WELL SHAFT	EACH	1
	14	2104.602	REMOVE MAIL BOX	EACH	2
	15	2106.507	EXCAVATION - COMMON (P)	C Y	880
	16	2106.507	EXCAVATION - SUBGRADE (P)	C Y	1575
	17	2106.507	SELECT GRANULAR EMBANKMENT (CV)	C Y	1575
	18	2106.507	COMMON EMBANKMENT (CV)	C Y	150
	19	2106.601	DEWATERING	LS	1
	20	2108.504	GEOTEXTILE FABRIC TYPE 5	S Y	2363
	21	2112.519	SUBGRADE PREPARATION	RDST	9
	22	2211.509	AGGREGATE BASE (CV) CLASS 5	TON	1043
	23	2331.603	JOINT ADHESIVE	L F	1290
	24	2357.506	BITUMINOUS MATERIAL FOR TACK COAT	GAL	140
	25	2360.509	TYPE SP 9.5 WEARING COURSE MIX (2;C)	TON	198
	26	2360.509	TYPE SP 12.5 NON WEAR COURSE MIX (2;C)	TON	395
	27	2360.509	TYPE SP 12.5 WEARING COURSE MIX (3;C)	TON	175
	28	2521.518	4" CONCRETE WALK	S F	2390
	29	2531.503	CONCRETE CURB & GUTTER DESIGN B424	L F	250
	30	2531.503	CONCRETE CURB & GUTTER DESIGN B618	L F	990
	31	2531.504	6" CONCRETE DRIVEWAY PAVEMENT	SY	120
	32	2531.618	TRUNCATED DOMES	S F	32
	33	2563.601	TRAFFIC CONTROL	LS	1
	34	2564.518	SIGN PANELS TYPE C	S F	50
	35	2564.518	SIGN PANELS TYPE SPECIAL	S F	50
	36	2564.602	INSTALL SALVAGED SIGN	EACH	1
	37	2565.516	TRAFFIC CONTROL SIGNAL SYSTEM	SYS	1
	38	2573.501	STABILIZED CONSTRUCTION EXIT	EACH	3
	39	2573.502	STORM DRAIN INLET PROTECTION	EACH	5
	40	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER	L F	450
	41	2574.507	COMMON TOPSOIL BORROW	C Y	617
	42	2574.508	FERTILIZER TYPE 3	LB	410
	43	2575.504	SODDING TYPE LAWN	S Y	110
	44	2575.504	ROLLED EROSION PREVENTION CATEGORY 20	S Y	1110
	45	2575.505	SEEDING	ACRE	1
	46	2575.508	SEED MIXTURE 25-151	LB	230
	47	2575.508	SEED MIXTURE 33-261	LB	7
	48	2575.508	SEED MIXTURE 35-221	LB	7
	49	2575.508	HYDRAULIC STABILIZED FIBER MATRIX	LB	3100
	50	2582.503	4" SOLID LINE MULTI COMP	L F	400
	51	2582.503	24" SOLID LINE MULTI COMP	L F	90
	52	2582.503	4" DBLE SOLID LINE MULTI COMP	L F	510
	53	2582.518	PAVT MSSG MULTI COMP	S F	190
	54	2582.518	CROSSWALK MULTI COMP	S F	240
B. SANITARY SEWER IMPROVEMENTS					
2	55	2503.503	8" PVC PIPE SEWER	L F	130
2	56	2503.503	10" PVC PIPE SEWER	L F	650
	57	2503.602	CONNECT TO EXISTING MANHOLES (SAN)	EACH	1
1	58	2503.602	10"X8" PVC WYE	EACH	1
	59	2503.603	TELEVISE SANITARY SEWER	L F	800
	60	2504.604	4" POLYSTYRENE INSULATION	S Y	10
	61	2506.502	ADJUST FRAME AND RING CASTING	EACH	1
	62	2506.602	CASTING ASSEMBLY (SANITARY)	EACH	3
	63	2506.602	CHIMNEY SEAL	EACH	3
	64	2506.603	CONSTRUCT 48" DIA SANITARY MANHOLE	L F	91.5

STATEMENT OF ESTIMATED QUANTITIES

NOTES	ITEM NO.	MNDOT SPECIFICATION NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY
C. WATER MAIN IMPROVEMENTS					
	65	2104.502	REMOVE GATE VALVE	EACH	1
	66	2104.502	REMOVE HYDRANT	EACH	1
	67	2104.503	REMOVE WATER MAIN	L F	10
	68	2504.602	CONNECT TO EXISTING WATER MAIN	EACH	1
	69	2504.602	HYDRANT ASSEMBLY	EACH	2
	70	2504.602	ADJUST GATE VALVE & BOX	EACH	2
	71	2504.602	12" GATE VALVE & BOX	EACH	2
	72	2504.603	6" WATERMAIN DUCTILE IRON CL 52	L F	66
	73	2504.603	8" WATERMAIN DUCTILE IRON CL 52	L F	70
	74	2504.603	12" WATERMAIN DUCTILE IRON CL 52	L F	641
	75	2504.604	INSULATION 4" POLY	SY	140
	76	2504.608	DUCTILE IRON FITTINGS	LB	790
D. STORM SEWER IMPROVEMENTS					
	77	2104.502	REMOVE DRAINAGE STRUCTURE	EACH	1
	78	2106.507	EXCAVATION - CHANNEL AND POND (P)	C Y	980
	79	2501.502	15" RC PIPE APRON	EACH	1
	80	2501.602	TRASH GUARD FOR 15" PIPE APRON	EACH	1
	81	2503.503	15" RC PIPE SEWER CLASS V	L F	70
	82	2503.602	CONNECT TO EXISTING STORM SEWER	EACH	2
	83	2506.502	CASTING ASSEMBLY	EACH	2
	84	2506.502	CASTING ASSEMBLY TYPE D	EACH	1
	85	2506.503	CONST DRAINAGE STRUCTURE DES 48-4020	L F	12
	86	2506.602	CONST DRAINAGE STRUCTURE DESIGN SPEC (2'X3')	EACH	2
	87	2511.507	RANDOM RIPRAP CL III	C Y	5

NOTES

1. TOKEN QUANTITY
2 INCLUDES ROCK BEDDING

K:\017210-000\Cad\Plan\017210-000-C-SEQU-TABS.dwg 7/8/2024 12:52:50 PM

wsb

CITY OF LINO LAKES

SCALE: AS SHOWN
DESIGN BY: CJB
PLAN BY: CJB
CHECK BY: DLH

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.

DIANE L. HANKEE, P.E. LIC. NO: 43338

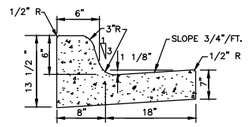
DATE: 12/13/2023

STATEMENT OF ESTIMATED QUANTITIES

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

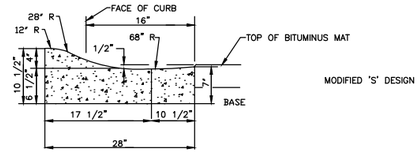
WSB PROJECT NO. 017210-000

SHEET 3 OF 39



MnDOT B618

CY CONCRETE PER LIN. FT. = .0582
LIN. FT. PER CY OF CONCRETE = 17.2

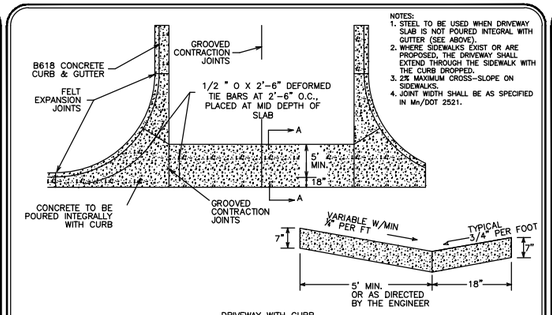


MODIFIED 'S' DESIGN

NOTES:
1. MINIMUM OF 3" AGGREGATE BASE, CL 5 UNDER ALL CURB AND GUTTER
2. STAMP W FOR WATER SERVICE AND S FOR SANITARY SERVICE

NO SCALE

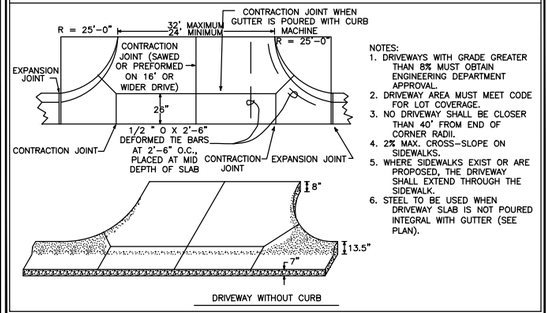
CITY OF LINO LAKES | CONCRETE CURB AND GUTTER | JANUARY, 2024 | GEN-4



DRIVEWAY WITH CURB

SECTION A-A

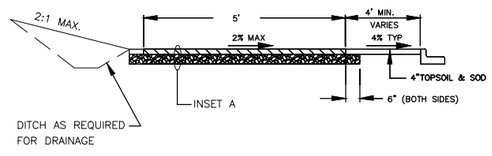
NOTES:
1. STEEL TO BE USED WHEN DRIVEWAY SLAB IS NOT POURED INTEGRAL WITH GUTTER (SEE ABOVE).
2. WHERE SIDEWALKS EXIST OR ARE PROPOSED, THE DRIVEWAY SHALL EXTEND THROUGH THE SIDEWALK WITH THE CURB DROPPED.
3. 2% MAXIMUM CROSS-SLOPE ON SIDEWALKS.
4. JOINT WIDTH SHALL BE AS SPECIFIED IN Mn/DOT 2521.

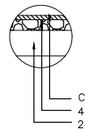


DRIVEWAY WITHOUT CURB

NOTES:
1. DRIVEWAYS WITH GRADE GREATER THAN 8% MUST OBTAIN ENGINEERING DEPARTMENT APPROVAL.
2. DRIVEWAY AREA MUST MEET CODE FOR LOT COVERAGE.
3. NO DRIVEWAY SHALL BE CLOSER THAN 40' FROM END OF CORNER RADII.
4. 2% MAX. CROSS-SLOPE ON SIDEWALKS.
5. WHERE SIDEWALKS EXIST OR ARE PROPOSED, THE DRIVEWAY SHALL EXTEND THROUGH THE SIDEWALK.
6. STEEL TO BE USED WHEN DRIVEWAY SLAB IS NOT POURED INTEGRAL WITH GUTTER (SEE PLAN).

CITY OF LINO LAKES | COMMERCIAL/MULTI-FAMILY/ INDUSTRIAL DRIVEWAY | JANUARY, 2024 | GEN-6

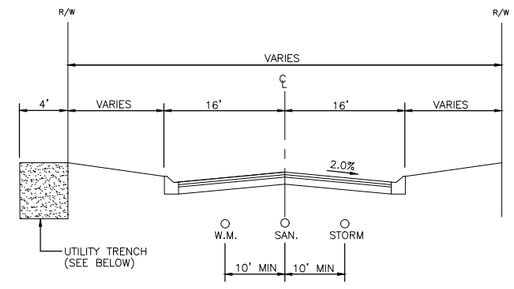




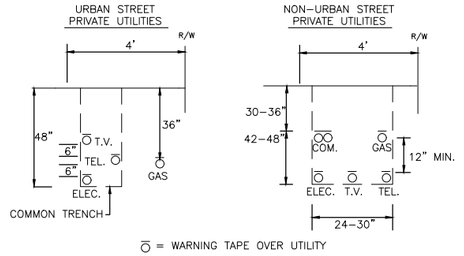
INSET A

*MINIMUM CONCRETE WALK THICKNESS IS 4". CONCRETE WALK SHALL BE A MINIMUM OF 6" THICK ACROSS ALL DRIVEWAYS, IN AREAS WITH REGULARLY SPACED DRIVEWAYS, OR AS DIRECTED BY THE CITY ENGINEER.

CITY OF LINO LAKES | CONCRETE WALK | JANUARY, 2024 | GEN-10

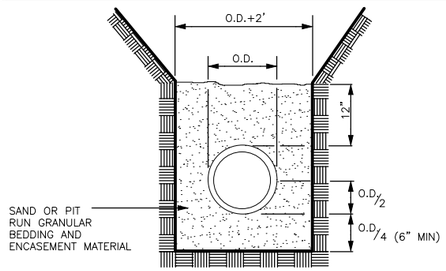


NOTE: MINIMUM R/W CROSSING DEPTH 30".

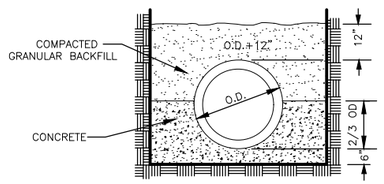


$\overline{O}$ = WARNING TAPE OVER UTILITY

CITY OF LINO LAKES | UTILITY LOCATION | JANUARY, 2024 | GEN-11

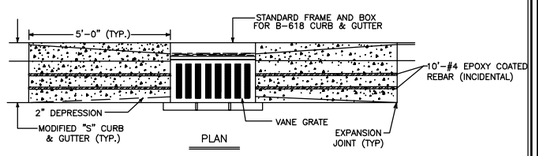


GRANULAR MATERIAL ENCASEMENT

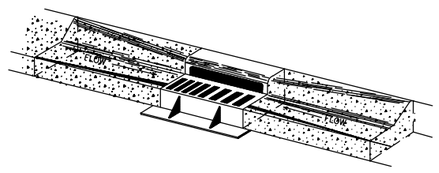


CONCRETE CRADLE

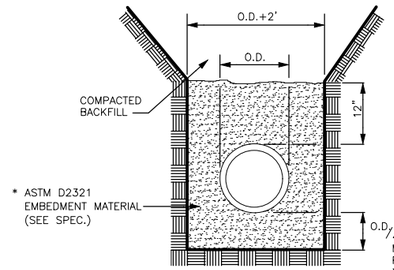
CITY OF LINO LAKES | PIPE BEDDING DETAILS | JANUARY, 2024 | GEN-13



PLAN



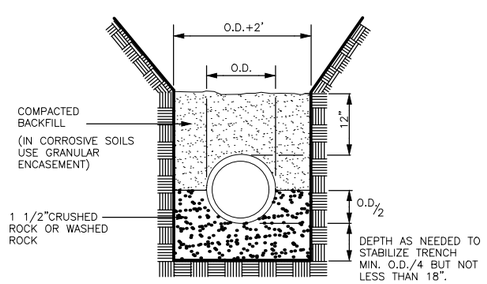
CITY OF LINO LAKES | CATCH BASIN INSTALLATION | JANUARY, 2024 | GEN-8



PIPE INSTALLATION IN ACCORDANCE WITH ASTM D 2321, TABLE 2.

* EMBEDMENT MATERIAL SHALL CONFORM TO ASTM D2321, TABLE 1.

CITY OF LINO LAKES | GRANULAR MATERIAL BEDDING METHOD (FOR PVC PIPE) | JANUARY, 2024 | GEN-14



NOTE: STABILIZING OR DEWATERING OF TRENCH IS INCIDENTAL TO THE PIPE INSTALLATION UNLESS A SPECIFIC BID ITEM IS PROVIDED.

CITY OF LINO LAKES | SPECIAL FOUNDATION FOR STABILIZING OR DEWATERING OF TRENCH | JANUARY, 2024 | GEN-15

wsb | CITY OF LINO LAKES

SCALE:	DESIGN BY:
AS SHOWN	CJB
PLAN BY:	CHECK BY:
CJB	DLH

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.

DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

MISCELLANEOUS DETAILS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 4 OF 39

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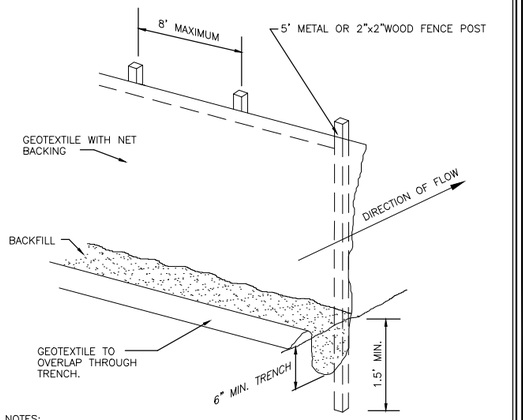
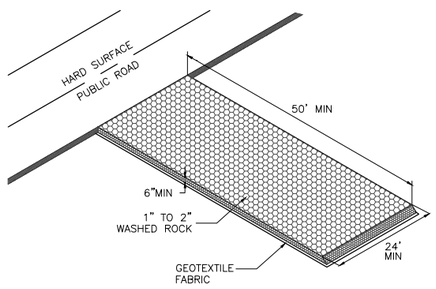


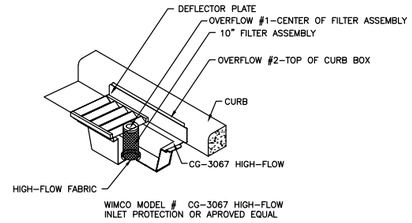
NOTES:

1. SILT FENCE SHALL CONFORM TO MNDOT 3886, (GTF 100 OR EQUAL)
2. FENCING SHALL BE PLACED ALONG CONTOURS OR AS DIRECTED BY ENGINEER.

CITY OF LINO LAKES	SILT FENCE	JANUARY, 2024 GEN-16

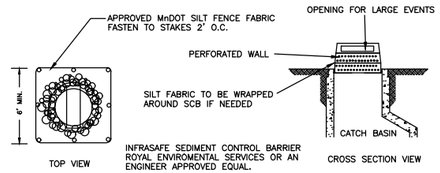


CITY OF LINO LAKES	ROCK CONSTRUCTION ENTRANCE	JANUARY, 2024 GEN-17



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

CURB AND GUTTER INLET PROTECTION
NO SCALE



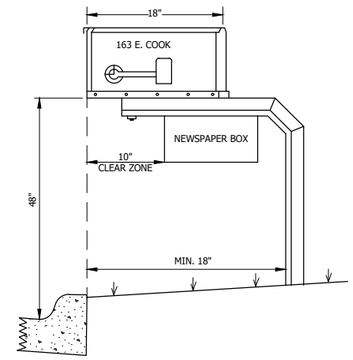
INFRASAFE SEDIMENT CONTROL BARRIER ROYAL ENVIROMENTAL SERVICES OR AN ENGINEER APPROVED EQUAL.

REAR YARD INLET PROTECTION
NO SCALE

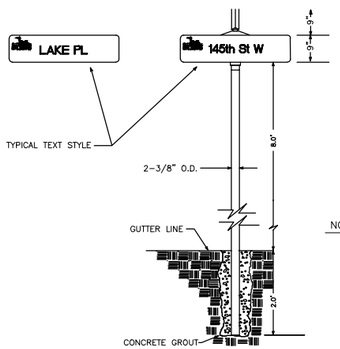
CITY OF LINO LAKES	INLET PROTECTION	JANUARY, 2024 GEN-19

NOTES:
DIMENSIONS AS PER U.S. POSTAL SERVICE

ADDRESS MUST BE ON SIDE OF BOX FROM WHICH CARRIER APPROACHES IN LETTERS ABOUT ONE INCH HIGH (OR ON FRONT WHERE BOXES ARE GROUPED).



CITY OF LINO LAKES	MAIL BOX	JANUARY, 2024 GEN-20



NO SCALE

STREET SIGN SPECIFICATIONS

MATERIAL:

ALUMINUM BLANKS SHALL BE CONSTRUCTED OF 5052-H38 ALLOY, HAVE A GAUGE OF .080, BE NOTCHED FOR USE WITH E-450 BRACKETS, HAVE HOLES PUNCHED AT EACH END FOR BOLTING TOGETHER AND BE 9" AS REQUIRED. BLANKS SHALL HAVE 1 1/2" ROUND CORNERS.

PLATES SHALL BE COVERED WITH ENGINEERING GRADE REFLECTIVE SHEETING, WHITE ON GREEN. (PRIVATE STREETS SHALL BE WHITE ON BROWN) LETTERING SHALL BE SERIES C, 6" U.C. AND 4.5" L.C.

E-450 BRACKETS ARE TO BE ALUMINUM DESIGNED FOR USING 9" PLATES AS REQUIRED.

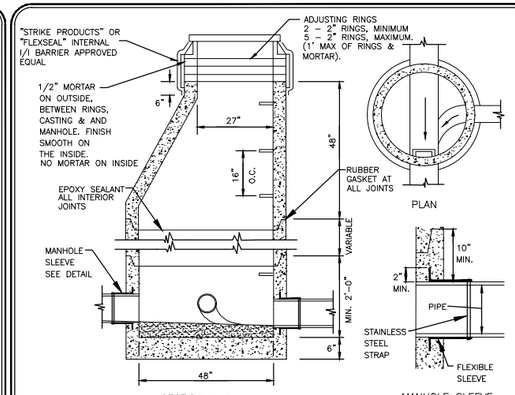
TUBULAR POSTS SPECIFICATIONS

TUBULAR POSTS USED FOR MOUNTING STREET NAME/TRAFFIC CONTROL SIGNS, SHALL VARY IN LENGTH, SHALL BE 2-3/8" O.D., SHALL BE GALVINIZED AND SHALL HAVE A WEIGHT OF 2LB./FT.

ABBREVIATIONS

Ave FOR AVENUE
Blvd FOR BOULEVARD
Cir FOR CIRCLE
Ct FOR COURT
Dr FOR DRIVE
E FOR EAST
Pkwy FOR PARKWAY
Pl FOR PLACE
St FOR STREET
Ter FOR TERRACE
Trl FOR TRAIL
W FOR WEST

CITY OF LINO LAKES	STREET SIGN	JANUARY, 2024 GEN-23



"INFI-SHIELD", "GATOR WRAP" OR APPROVED EQUAL ALL JOINTS AND RINGS.

A URETHANE OR BUTYL SEAL SHALL BE USED TO SEAL THE TOP RING TO THE CASTING AND THE BOTTOM RING TO THE CONE OR TOP SLAB.

ALL INTERIOR JOINTS TO BE COVERED WITH REINFORCED EPOXY SEALANT PER SPECIFICATION.

NO WOOD SHALL BE USED FOR ADJUSTING CASTING; CEMENT MORTAR ONLY. ADJUSTING RINGS MAY BE CONCRETE OR PLASTIC.

CAST IRON MANHOLE FRAME & COVER AS PER SPECIFICATIONS.

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

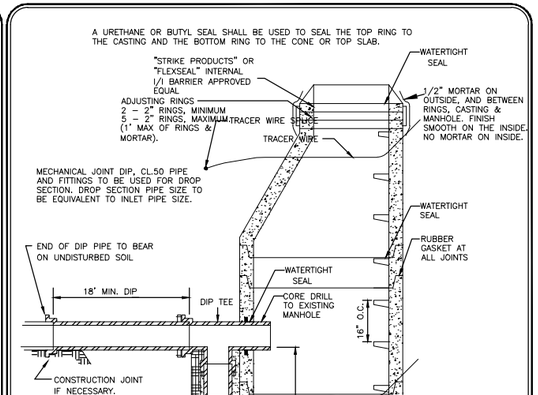
PRECAST REINFORCED CONCRETE MANHOLE SECTIONS PER ASTM C478, FURNISHED WITH O-RING GASKETS AND LUBRICANT EXCEPT AS OTHERWISE SPECIFIED. A 12" OR 18" BARREL SECTION SHALL BE INSTALLED UNDER THE CONE WHENEVER POSSIBLE.

PIPE CONNECTIONS TO MANHOLE SHALL BE MADE WATER TIGHT BY CAST INPLACE RUBBER BOOT AND CEMENT MORTAR. INSIDE SURFACE SHALL BE FINISHED SMOOTH.

PROTECT MANHOLE FROM RAINWATER, INFILTRATION AND SEDIMENT DURING CONSTRUCTION BY GRADING, SEALING AND COVERING.

CITY OF LINO LAKES	SANITARY SEWER MANHOLE TYPE 301 (PIPES 27" OR LESS)	JANUARY, 2024 SAN-1

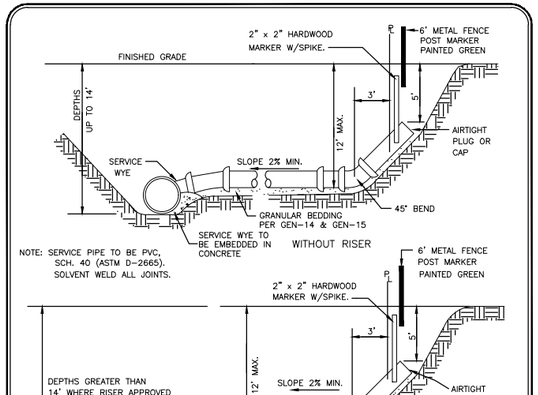
A URETHANE OR BUTYL SEAL SHALL BE USED TO SEAL THE TOP RING TO THE CASTING AND THE BOTTOM RING TO THE CONE OR TOP SLAB.



NOTES:
1. #5 DOWELS 8" MAX SPACING FOR CONNECTION OF PIPE TO EXISTING MANHOLE.
2. 4" ø SERVICE PIPE TO BE PVC, SCH. 40 (ASTM D-2665). SOLVENT WELD ALL JOINTS. 6" ø PIPE TO BE SDR 26
3. TRACER WIRE SHALL RUN FROM SEWER MAIN TO PROPERTY LINE

FOR MANHOLE REQUIREMENTS SEE NOTES IN SAN-1

CITY OF LINO LAKES	SANITARY SEWER OUTSIDE DROP	JANUARY, 2024 SAN-4



NOTES:
1. 4" ø SERVICE PIPE TO BE PVC, SCH. 40 (ASTM D-2665). SOLVENT WELD ALL JOINTS.
2. 6" ø PIPE TO BE SDR 26.

CITY OF LINO LAKES	SANITARY SEWER SERVICE	JANUARY, 2024 SAN-6

wsb | CITY OF LINO LAKES

SCALE:	DESIGN BY:
AS SHOWN	CJB
PLAN BY:	CHECK BY:
CJB	DLH

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.

DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

MISCELLANEOUS DETAILS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 5 OF 39

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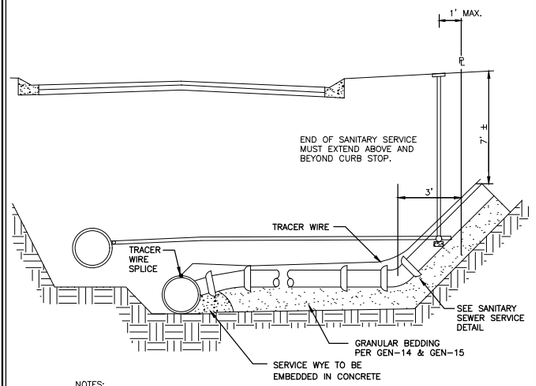
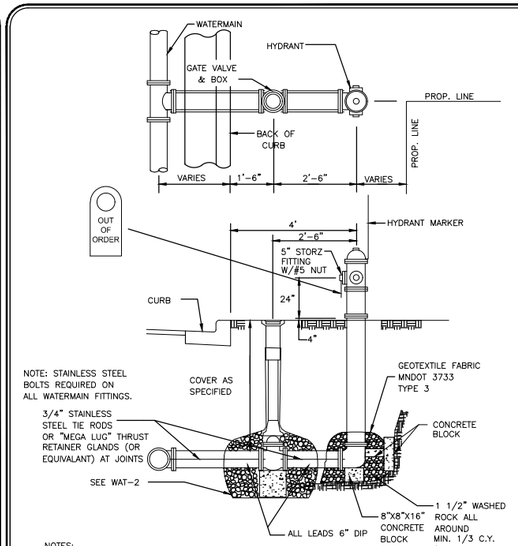


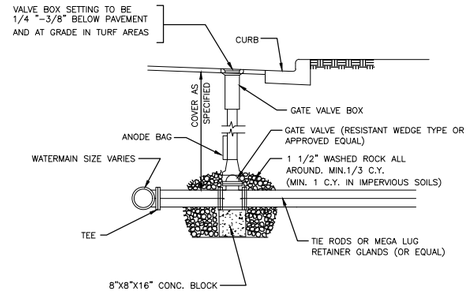
NOTES:
1. SERVICES SHALL BE 4" DIAMETER PVC SCHEDULE 40
2. SEWER SERVICES ARE LOCATED 3' DOWNSTREAM OF WATER SERVICE IF IN SAME TRENCH
3. TRACER WIRE SHALL BE INSTALLED ON ALL SANITARY SEWER SERVICES
4. AN "S" SHALL BE STAMPED INTO THE CURB ABOVE THE SANITARY SERVICE FOR FUTURE LOCATING PURPOSES.

CITY OF LINO LAKES	SERVICE DETAILS	JANUARY, 2024 SAN-7



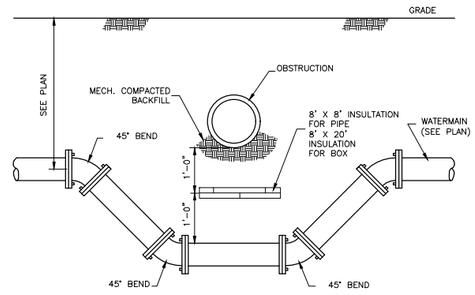
NOTES:
1. ALL FITTINGS SHALL BE MECHANICAL JOINTS
2. MEGALUG OPTION PERMITTED UPON CITY REVIEW
3. HYDRANTS SHALL HAVE 16" BREAKAWAY SECTION
4. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE POLYETHYLENE ENCASED
5. NO EXTENSIONS ARE ALLOWED.
6. GATE VALVE SHALL MEET ALL REQUIREMENTS OF WAT-2
7. VENTED CAP
8. HYDRANT TO BE INSTALLED WITH "OUT OF ORDER" TAG AND MARKER IN PLACE

CITY OF LINO LAKES	TYPICAL HYDRANT DETAILS (VALVE IN BOULEVARD)	JANUARY, 2024 WAT-1



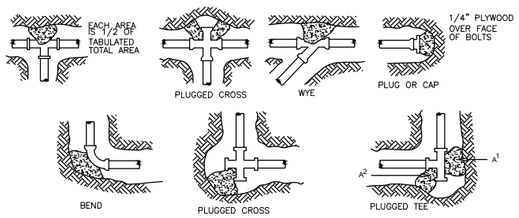
NOTES:
1. GATE VALVES SHOULD BE USED ON 6" THROUGH 16" WATERMAIN.
2. VALVE BOX INSERTS ARE NOT ALLOWED UNLESS APPROVED BY THE ENGINEER.
3. VALVE BOXES SHALL BE INSTALLED PLUMB AND SHALL ALLOW A 4" P.V.C. PIPE TO PASS ENTIRELY OVER THE GATE VALVE NUT AFTER INSTALLATION IS COMPLETE.
4. ALL VALVES SHALL BE TIED WITH 3/4" THREADED TIE RODS TO THE MAIN. MEGALUGS MAY BE USED IN LIEU OF THE RODS.
5. THE INITIAL & FINAL RAISING OF VALVE BOXES SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
6. BONNET ADAPTOR SHALL BE INSTALLED ON TOP OF GATE VALVE.
7. STAINLESS STEEL BOLTS REQUIRED ON ALL WATERMAIN FITTINGS.

CITY OF LINO LAKES	GATE VALVE & BOX INSTALLATION	JANUARY, 2024 WAT-2



NOTES:
1. TIE ALL JOINTS WITH MEGALUGS 8 REQUIRED.
2. STAINLESS STEEL BOLTS REQUIRED ON ALL WATERMAIN FITTINGS.

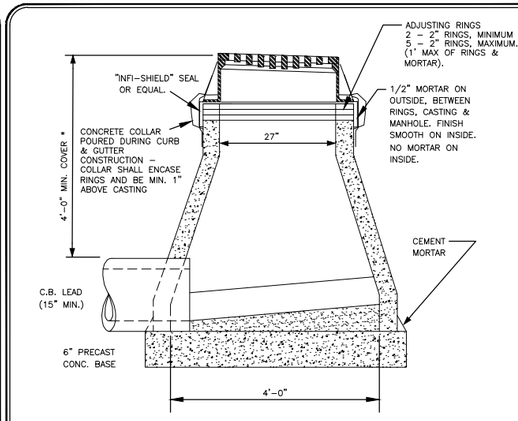
CITY OF LINO LAKES	WATER LOWER	JANUARY, 2024 WAT-3



NOMINAL FITTING SIZE, INCHES	TEE, WYE, PLUG OR CAP	90^ BEND, PLUGGED CROSS	TEE PLUGGED ON RUN A1	TEE PLUGGED ON RUN A2	45^ BEND	22-1/2^ BEND	11-1/4^ BEND
4	1.0	1.4	1.9	1.4	1.0	-	-
6	2.1	3.0	4.3	3.0	1.6	1.0	-
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.6	1.2
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7
14	11.5	16.3	23.0	16.3	8.9	4.6	2.3
16	15.0	21.3	30.0	21.3	11.6	6.0	3.0
18	19.0	27.0	38.0	27.0	14.6	7.6	3.8
20	23.5	33.3	47.0	33.3	18.1	9.4	4.7
24	34.0	48.0	68.0	48.0	26.2	13.6	6.8

NOTES:
1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
3. REQUIRED BEARING AREAS AT FITTING SHALL BE AS NOTED ABOVE, UNLESS INDICATED OTHERWISE.
4. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON THE PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD PLATE.
5. ABOVE BEARING AREAS BASED ON TEST PRESSURES OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 LBS. PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION: BEARING AREA = (TEST PRESSURE/150) X (2000/SOIL BEARING STRESS) X (TABLE VALUE).

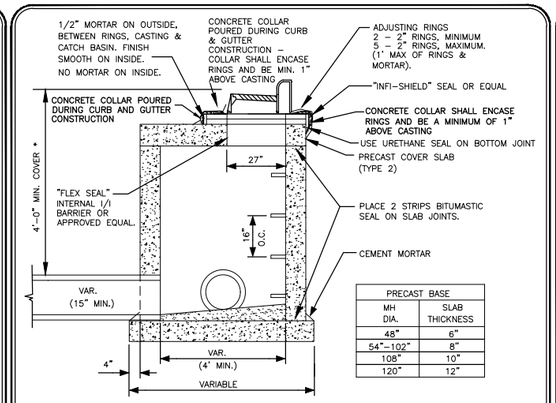
CITY OF LINO LAKES	DUCTILE IRON PIPE REACTION BLOCKING (FOR BENDS)	JANUARY, 2024 WAT-4



1. A URETHANE OR BUTYL SEAL SHALL BE USED TO SEAL THE TOP RING TO THE CASTING AND THE BOTTOM RING TO THE CONE OR TOP SLAB.
2. NO WOOD SHALL BE USED FOR ADJUSTING CASTING; CEMENT MORTAR ONLY.
3. RINGS MAY BE CONCRETE OR PLASTIC.
4. CAST IRON CATCH BASIN FRAME & COVER CASTINGS PER SPECIFICATIONS.
5. PRECAST REINFORCED CONCRETE CONE SECTION & PRECAST BASE PER ASTM C478.
6. FILL OPENING BETWEEN PIPE AND MANHOLE WALL WITH CEMENT MORTAR INSIDE SURFACE SHALL BE FINISHED SMOOTH.

* MINIMUM PIPE COVER CAN BE REDUCED FROM 4' TO 2'-6" WITH INSTALLATION OF PERFORATED PIPE DRAIN PER "GRANULAR SUBCUT AND PERFORATED PIPE DRAIN" DETAIL.

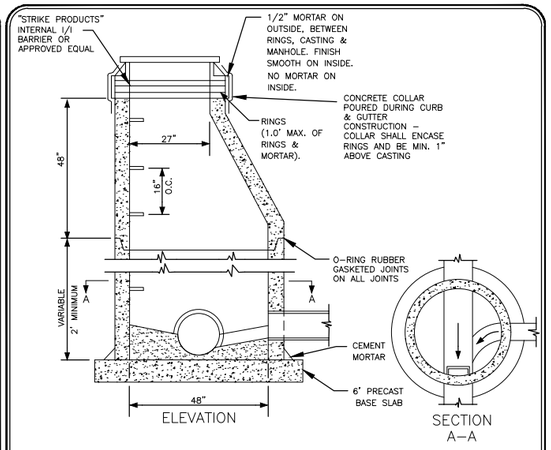
CITY OF LINO LAKES	CATCH BASIN TYPE G	JANUARY, 2024 STR-1



PRECAST BASE	
MH DIA.	SLAB THICKNESS
48"	6"
54"-102"	8"
108"	10"
120"	12"

1. "INFI-SHIELD", "GATOR WRAP" OR APPROVED EQUAL ALL JOINTS AND RINGS.
2. A URETHANE OR BUTYL SEAL SHALL BE USED TO SEAL THE TOP RING TO THE CASTING AND THE BOTTOM RING TO THE CONE OR TOP SLAB.
3. NO WOOD SHALL BE USED FOR ADJUSTING CASTING; CEMENT MORTAR ONLY.
4. RINGS MAY BE CONCRETE OR PLASTIC.
5. CAST IRON FRAME & GRATE CASTINGS PER SPECIFICATIONS.
6. MANHOLE STEPS SHALL BE CAST IRON, ALUMINUM OR STEEL REINFORCED PLASTIC PER ASTM C478. LOCATION SHALL BE AS NOTED IN THE SPECIFICATIONS.
7. PRECAST REINFORCED CONCRETE BASE SLAB & COVER SLAB PER ASTM C478.
8. PRECAST REINFORCED CONCRETE MANHOLE SECTIONS PER ASTM C478, OR 8" CONCRETE MANHOLE BLOCK WITH 1/2" MORTARED EXTERIOR.
9. FURNISH PRECAST CONCRETE MANHOLE SECTIONS WITH O-RING GASKETS & LUBRICANT EXCEPT AS OTHERWISE SPECIFIED.
10. FILL OPENING BETWEEN PIPE AND MANHOLE WALL WITH CEMENT MORTAR. INSIDE SURFACE SHALL BE FINISHED SMOOTH.
11. MANHOLES THAT HOLD WATER AFTER CONSTRUCTION SHALL HAVE "FLEX SEAL" APPLIED TO ENTIRE INTERIOR OF STRUCTURE.
12. * MINIMUM PIPE COVER CAN BE REDUCED FROM 4' TO 2'-6" WITH INSTALLATION OF PERFORATED PIPE DRAIN PER "GRANULAR SUBCUT AND PERFORATED PIPE DRAIN" DETAIL.

CITY OF LINO LAKES	CATCH BASIN TYPE 4020	JANUARY, 2024 STR-2



1. "INFI-SHIELD", "GATOR WRAP" OR APPROVED EQUAL ALL JOINTS AND RINGS.
2. A URETHANE OR BUTYL SEAL SHALL BE USED TO SEAL THE TOP RING TO THE CASTING AND THE BOTTOM RING TO THE CONE OR TOP SLAB.
3. NO WOOD SHALL BE USED FOR ADJUSTING CASTING; CEMENT MORTAR ONLY.
4. ADJUSTING RINGS MAY BE CONCRETE OR PLASTIC.
5. CAST IRON MANHOLE FRAME & COVER AS PER SPECIFICATIONS.
6. MANHOLE STEPS SHALL BE CAST IRON, ALUMINUM OR STEEL REINFORCED PLASTIC PER ASTM C478. LOCATION SHALL BE AS NOTED IN THE SPECIFICATIONS.
7. PRECAST REINFORCED CONCRETE MANHOLE SECTIONS & BASE SLAB PER ASTM C478.
8. FURNISH PRECAST MANHOLE SECTIONS WITH O-RING GASKETS & LUBRICANT EXCEPT AS OTHERWISE SPECIFIED.
9. A 12" OR 18" BARREL SECTION SHALL BE INSTALLED UNDER THE CONE WHENEVER POSSIBLE.
10. FILL OPENING BETWEEN PIPE & MH WALL WITH CEMENT MORTAR. INSIDE SURFACE SHALL BE FINISHED SMOOTH.

CITY OF LINO LAKES	STORM SEWER MANOLE TYPE 4020 (PIPES 27" OR LESS)	JANUARY, 2024 STR-3

wsb | CITY OF LINO LAKES

SCALE:	DESIGN BY:
AS SHOWN	CJB
PLAN BY:	CHECK BY:
CJB	DLH

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.

DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

MISCELLANEOUS DETAILS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 6 OF 39

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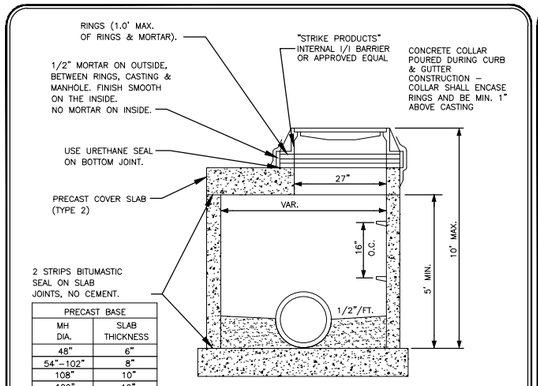
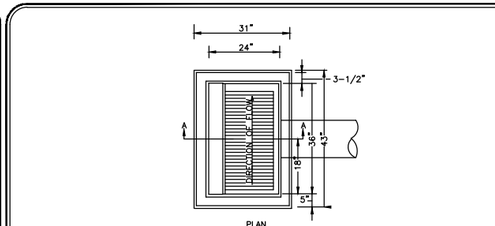


PRECAST BASE	
MH DIA.	SLAB THICKNESS
48"	6"
54"–102"	8"
108"	10"
120"	12"

1. A URETHANE OR BUTYL SEAL SHALL BE USED TO SEAL THE TOP RING TO THE CASTING AND THE BOTTOM RING TO THE CONE OR TOP SLAB.
2. NO WOOD SHALL BE USED FOR ADJUSTING CASTING; CEMENT MORTAR ONLY.
3. ADJUSTING RINGS MAY BE CONCRETE OR PLASTIC.
4. CAST IRON MANHOLE FRAME & COVER AS PER SPECIFICATIONS.
5. MANHOLE STEPS SHALL BE CAST IRON, ALUMINUM OR STEEL REINFORCED PLASTIC PER ASTM C478. LOCATION SHALL BE AS NOTED IN THE SPECIFICATIONS.
6. PRECAST REINFORCED CONCRETE MANHOLE SECTIONS & BASE SLAB PER ASTM C478.
7. FURNISH PRECAST MANHOLE SECTIONS WITH O–RING GASKETS & LUBRICANT EXCEPT AS OTHERWISE SPECIFIED.
8. A 12" OR 18" BARREL SECTION SHALL BE INSTALLED UNDER THE CONE WHENEVER POSSIBLE.
9. FILL OPENING BETWEEN PIPE & MH WALL WITH CEMENT MORTAR. INSIDE SURFACE SHALL BE FINISHED SMOOTH.

CITY OF LINO LAKES	STORM SEWER MANHOLE TYPE 4020	JANUARY, 2024 STR-5



NOTES:
1. REINFORCING TO CONSIST OF #4 BARS @ 8" O.C., 4' MINIMUM LENGTH, EACH SIDE OF CASTING
2. GROUT BOTTOM TO DRAIN TO CENTER
3. PIPE CUT–OUTS TO BE LOCATED WHERE REQUIRED
4. ADJUSTING RINGS SHALL HAVE MORTAR JOINTS – PLASTER OUTSIDE, STRIKE CLEAN INSIDE
5. CATCH BASINS THAT HOLD WATER AFTER CONSTRUCTION SHALL HAVE "FLEX SEAL" APPLIED TO ENTIRE INTERIOR OF STRUCTURE.
6. INLET PROTECTION TO BE INSTALLED IN CATCH BASIN AND MAINTAINED AS DIRECTED BY THE ENGINEER

NO SCALE

CITY OF LINO LAKES	2 x 3 CATCH BASIN	JANUARY, 2024 STR-6

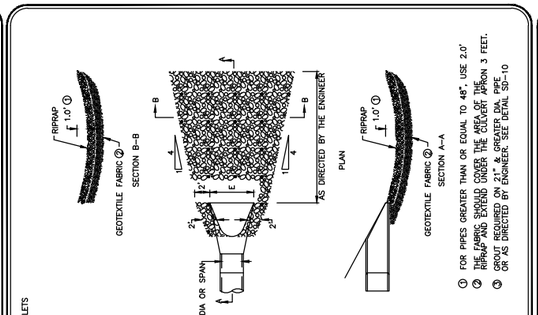


TABLE OF QUANTITIES

RCP AT OUTLETS

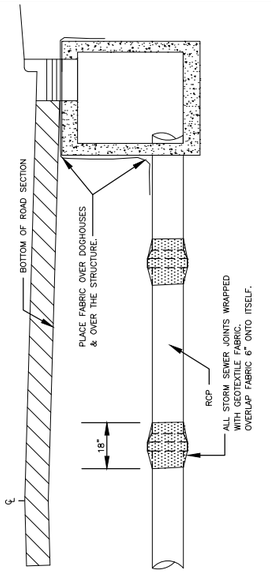
DIA. ROUND PIPE	RIPRAP AT RCP OUTLETS: CLASS III, D 50mm 9" DEPTH RIPRAP	CLASS III, D 50mm 9" DEPTH GRANULAR BEDDING	CLASS IV, D 50mm 12" DEPTH RIPRAP	CLASS IV, D 50mm 12" DEPTH GRANULAR BEDDING	CLASS V, D 50mm 15" DEPTH RIPRAP	CLASS V, D 50mm 15" DEPTH GRANULAR BEDDING
(IN)	(CU. YD)	(CU. YD)	(CU. YD)	(CU. YD)	(CU. YD)	(CU. YD)
12	1.4	0.8	1.7	1.0	2.0	1.2
15	2.0	1.2	2.5	1.5	3.0	1.8
18	2.9	1.7	3.5	2.1	4.1	2.5
21	3.9	2.3	4.8	2.8	5.7	3.4
24	5.1	3.0	6.3	3.7	7.4	4.4
27	6.4	3.8	7.9	4.6	9.3	5.5
30	7.9	4.7	9.7	5.7	11.5	6.8
36	11.3	6.7	13.9	8.2	16.4	9.7
42	15.4	9.1	18.9	11.2	22.3	13.2
48	20.1	11.9	24.7	14.6	29.1	17.2
54	25.4	15.0	31.2	18.4	36.8	21.7
60	31.4	18.5	38.5	22.7	45.4	26.8
66	38.0	22.4	46.6	27.5	54.9	32.4
72	45.2	26.7	55.4	32.7	65.3	38.5
78	53.1	31.3	65.0	38.4	76.6	45.2
84	61.6	36.3	75.4	44.5	88.8	52.4
90	70.7	41.7	86.5	51.1	101.9	60.2

RIPRAP AT RCP–A OR BOXES OF EQUIVALENT SPAN (IN)	SPAN RISE (IN)	CLASS III, D 50mm 9" DEPTH RIPRAP (CU. YD)	9" DEPTH GRANULAR BEDDING (CU. YD)	CLASS IV, D 50mm 12" DEPTH RIPRAP (CU. YD)	12" DEPTH GRANULAR BEDDING (CU. YD)	CLASS V, D 50mm 15" DEPTH RIPRAP (CU. YD)	15" DEPTH GRANULAR BEDDING (CU. YD)
22	13	2.9	1.7	3.5	2.1	4.1	2.5
28	18	5.8	3.4	7.0	4.2	8.2	4.9
36	23	9.6	5.7	11.7	7.0	13.7	8.2
43	27	11.1	6.5	13.4	8.1	15.7	9.4
51	32	13.5	8.1	16.4	9.8	19.2	11.5
58	36	15.6	9.3	18.9	11.3	22.1	13.2
65	41	19.3	11.6	23.4	14.0	27.4	16.4
73	46	23.1	13.8	28.0	16.8	32.8	19.6
88	55	32.4	19.4	39.2	23.5	45.9	27.5
95	60	37.6	22.5	45.5	27.3	53.3	31.9
110	69	49.0	29.4	59.4	35.6	69.5	41.7
117	74	55.6	33.3	67.4	40.4	78.9	47.3
124	78	62.7	37.6	76.0	45.6	88.9	53.3
133	83	71.8	43.1	87.0	52.2	101.8	61.1
140	88	79.6	47.8	96.5	57.9	112.9	67.7
147	92	88.0	52.8	106.7	64.0	124.8	74.9
154	97	96.9	58.1	117.4	70.4	137.4	82.4

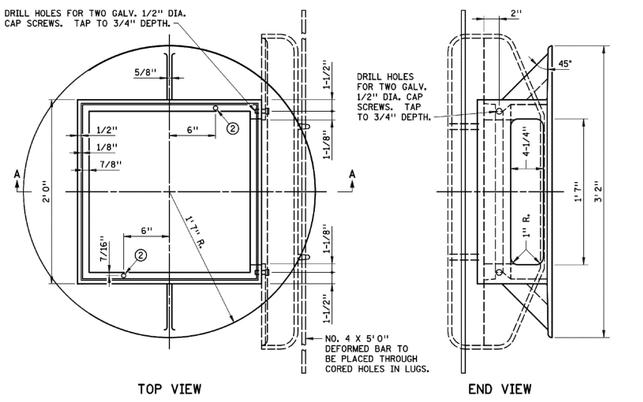
NOTE: REQUIREMENTS FOR RIPRAP SIZE, THICKNESS, WILL BE DESIGNATED IN PLANS.

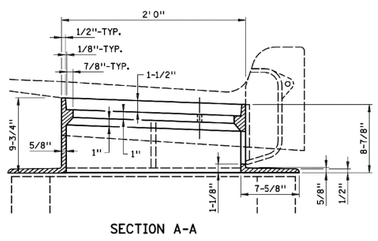
① FOR PIPES GREATER THAN OR EQUAL TO 48", USE 2.0' RIPRAP AND EXTEND UNDER THE CULVERT APRON 3 FEET.
② THE FABRIC SHOULD COVER THE AREA OF THE GROUT REQUIRED ON 21" & GREATER DIA. PIPE OR AS DIRECTED BY ENGINEER. SEE DETAIL SD–10

CITY OF LINO LAKES	RIPRAP AT RCP OUTLETS	JANUARY, 2024 STR-7



CITY OF LINO LAKES	WRAPPING OF STORM SEWER JOINTS	JANUARY, 2024 STR-11





CASTINGS USED FOR ASSEMBLY	
GRATE	NO. 816 (MNDOT STD PLATE 4154B)
CURB BOX ①	NO. 823A (MNDOT STD PLATE 4160) OR

NOTES:

USE 1/4" FILLETS IN ALL CORNERS.
SEE MNDOT 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 9/16" DIA. HOLES WHEN GRATE NO 816 (MNDOT STD PLATE 4154) IS USED WITH THIS FRAME. FIELD PLACE 1/2" DIA X 4" LONG GALV BOLT IN UP STREAM SIDE AND BENT UNDERSIDE TO PREVENT REMOVAL. THIS WILL PREVENT GRATE NO. 816 (MNDOT STD PLATE 4154) FROM BEING PLACED IN WRONG AND NOT BEING BICYCLE SAFE

wsb

CITY OF LINO LAKES

SCALE:	DESIGN BY:
AS SHOWN	CJB
PLAN BY:	CHECK BY:
CJB	DLH

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.

DIANE L. HANKEE, P.E. LIC. NO.: 43338

DATE: 12/13/2023

MISCELLANEOUS DETAILS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 7 OF 39

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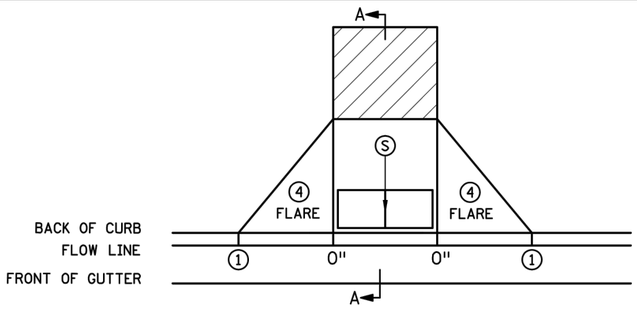
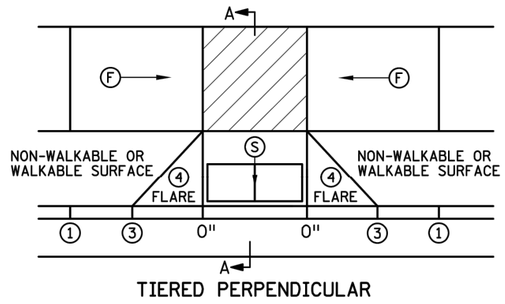


PERPENDICULAR



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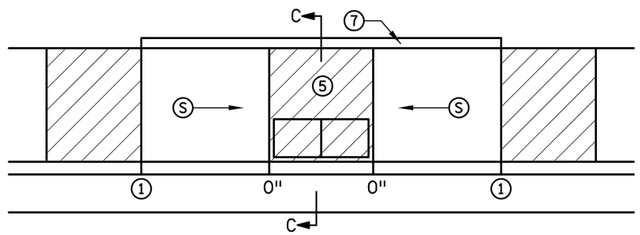
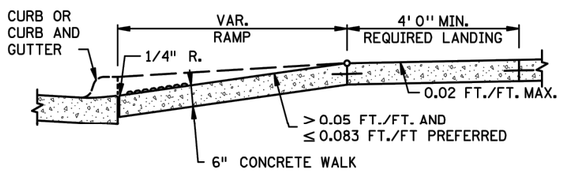
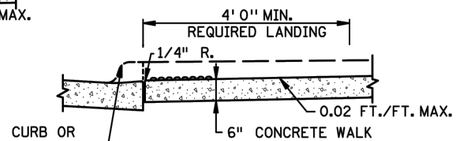


PARALLEL



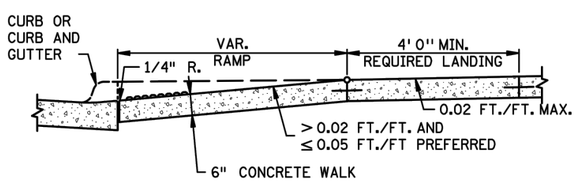
SECTION A-A

PERPENDICULAR/TIERED/DIAGONAL



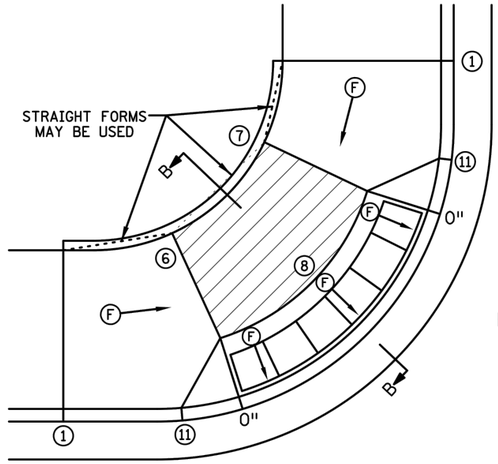
SECTION C-C

PARALLEL/DEPRESSED CORNER

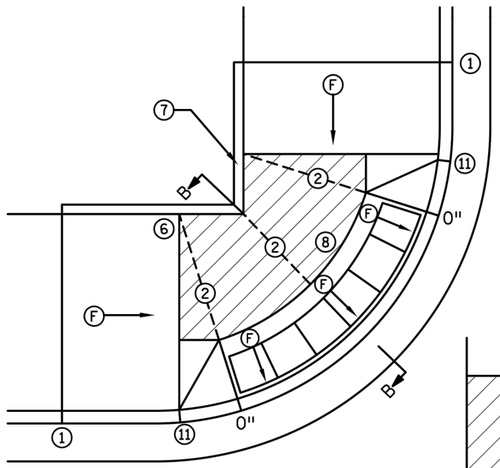


SECTION B-B

FAN

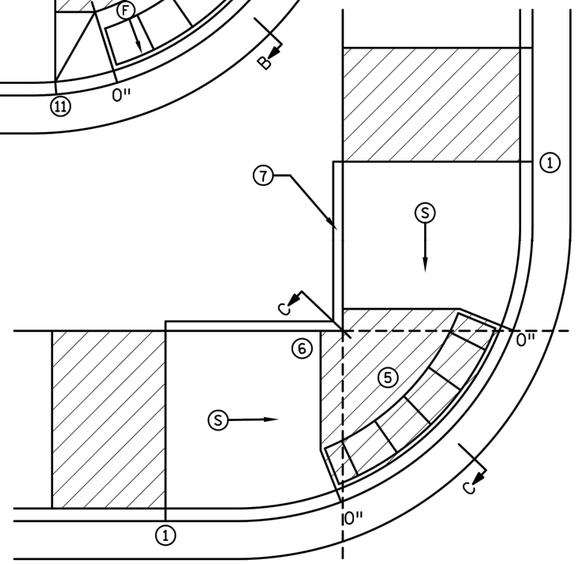


FAN ⑩

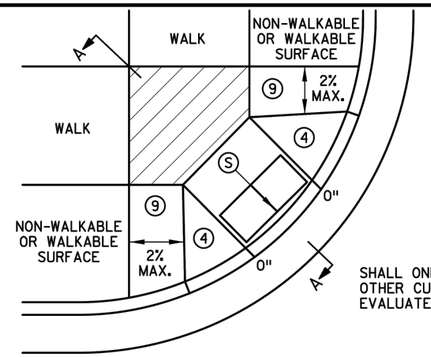


MODIFIED FAN ⑩

USED WHEN RIGHT-OF-WAY IS CONSTRAINED



DEPRESSED CORNER



DIAGONAL

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

NOTES:

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

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

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

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

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

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

WHEN SIDEWALK IS AT BACK OF CURB, TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

MAINTAIN POSITIVE BOULEVARD DRAINAGE TO TOP OF CURB.

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

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

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

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

① MATCH FULL HEIGHT CURB.

② 4' MINIMUM DEPTH LANDING REQUIRED ACROSS TOP OF RAMP.

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

④ SEE SHEET 4 OF 6, TYPICAL SIDE TREATMENT OPTIONS, FOR DETAILS ON FLARES AND RETURNED CURBS.

⑤ DETECTABLE WARNINGS MAY BE PART OF THE 4' X 4' MIN. LANDING AREA IF IT IS NOT FEASIBLE TO CONSTRUCT THE LANDING OUTSIDE OF THE DETECTABLE WARNING AREA.

⑥ THE GRADE BREAK SHALL BE PERPENDICULAR TO THE BACK OF WALK. THIS WILL ENSURE THAT THE GRADE BREAK IS PERPENDICULAR TO THE DIRECTION OF TRAVEL. (TYPICAL FOR ALL)

⑦ WHEN ADJACENT TO GRASS, GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS LESS THAN 5% RUNNING SLOPE SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.

⑧ A 7' MIN TOP RADIUS GRADE BREAK IS REQUIRED TO BE CONSTRUCTIBLE.

⑨ PAVE FULL WALK WIDTH.

⑩ "S" SLOPES ON FANS SHALL ONLY BE USED WHEN ALL OTHER FEASIBLE OPTIONS HAVE BEEN EVALUATED AND DEEMED IMPRACTICAL.

⑪ INTERMEDIATE CURB HEIGHTS TAPER SHALL RISE AT 8-10% TO A MINIMUM 3" CURB HEIGHT. REDUCE INTERMEDIATE CURB HEIGHT TO 2+ INCHES IF NECESSARY TO MATCH ADJACENT BOULEVARD OR SIDEWALK GRADES.

LEGEND

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

(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

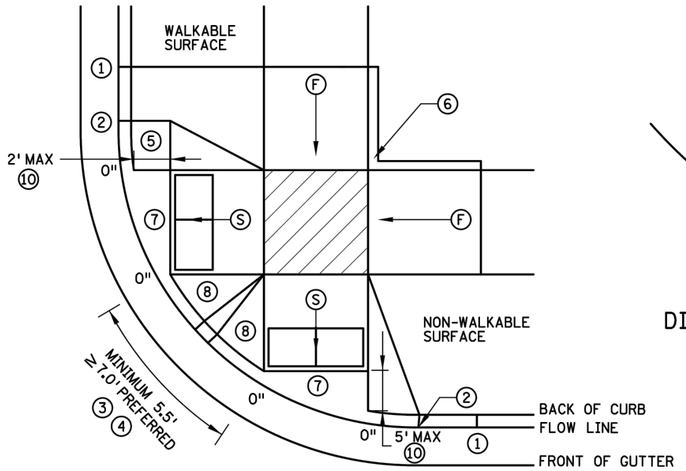
STANDARD PLAN 5-297.250 | 1 OF 6

APPROVED: 11-04-2021
REVISED:

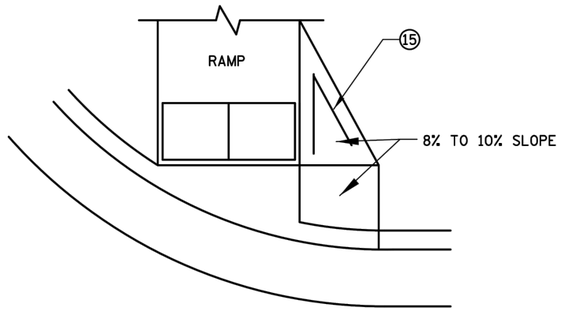
THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

STATE PROJ. NO. (TH) SHEET NO. 8 OF 39 SHEETS

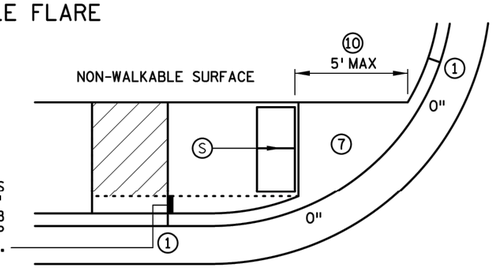


COMBINED DIRECTIONAL

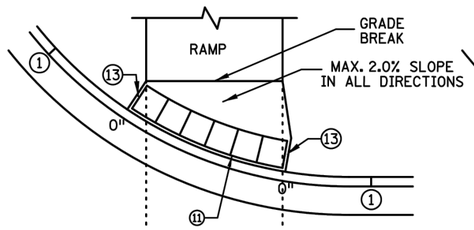


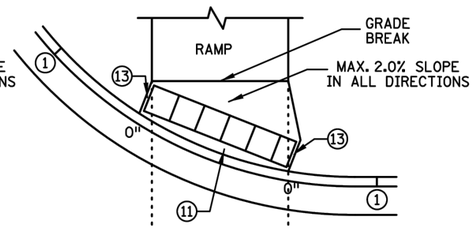
DIRECTIONAL RAMP WALKABLE FLARE

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.



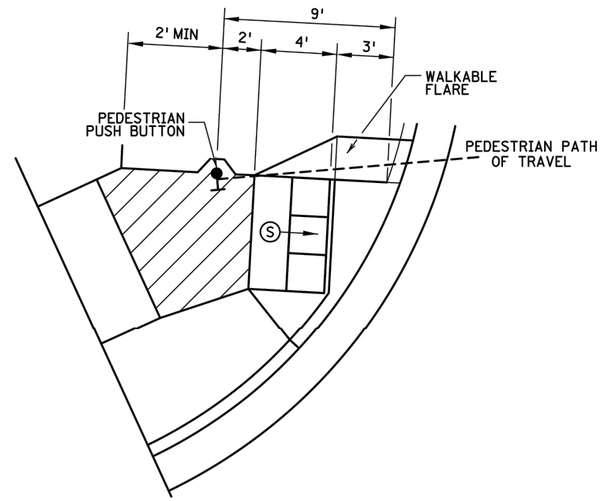
STANDARD ONE-WAY DIRECTIONAL ⑨





DETECTABLE WARNING PLACEMENT WHEN SETBACK CRITERIA IS EXCEEDED ⑫

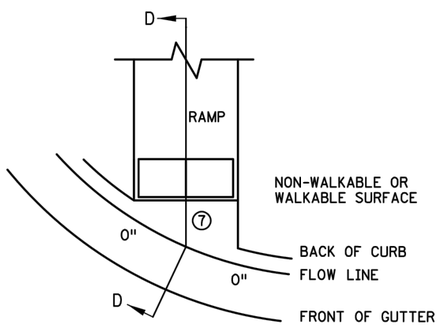
ONE-WAY DIRECTIONAL WITH DETECTABLE WARNING AT BACK OF CURB

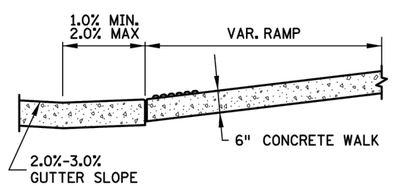


SEMI-DIRECTIONAL RAMP ③④⑨

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)





SECTION D-D

CURB FOR DIRECTIONAL RAMPS ⑭

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

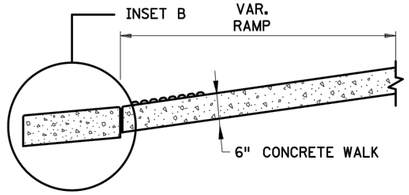
THOMAS STYRBICKI
STATE DESIGN ENGINEER

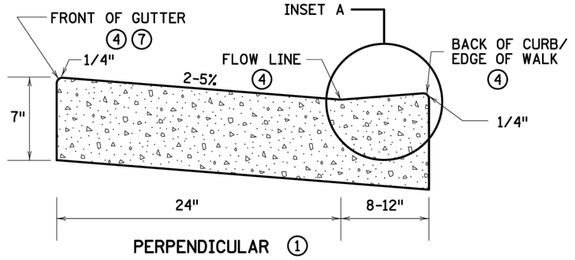
STANDARD PLAN 5-297.250 | 2 OF 6

APPROVED: 11-04-2021
REVISED:

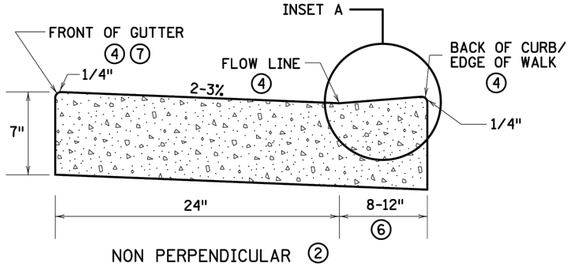
PEDESTRIAN CURB RAMP DETAILS

STATE PROJ. NO. (T.H.)

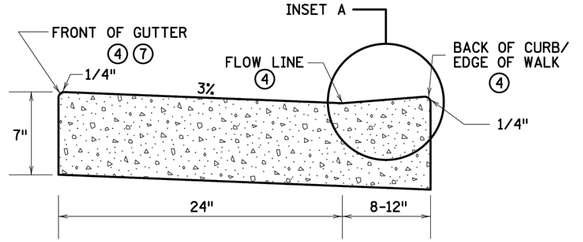




PERPENDICULAR ①

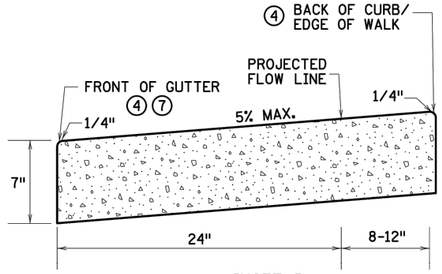


NON PERPENDICULAR ②

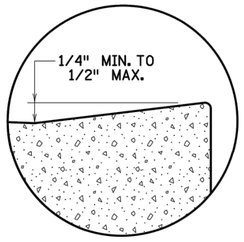


FOR CURB MACHINE PLACEMENT AROUND RADIUS ③
(REGARDLESS OF RAMP TYPE)

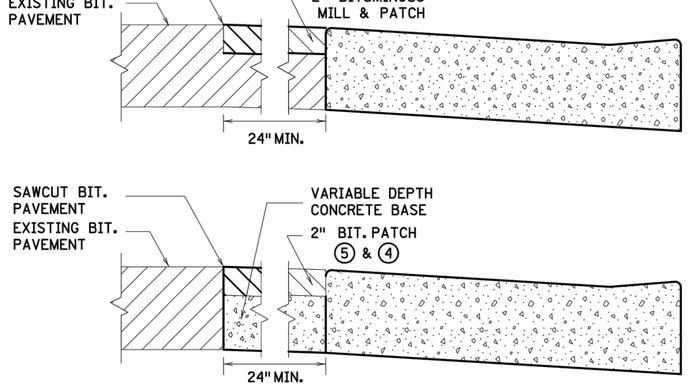
PEDESTRIAN ACCESS ROUTE CURB & GUTTER DETAIL



INSET B
OUTFLOW GUTTER ⑧



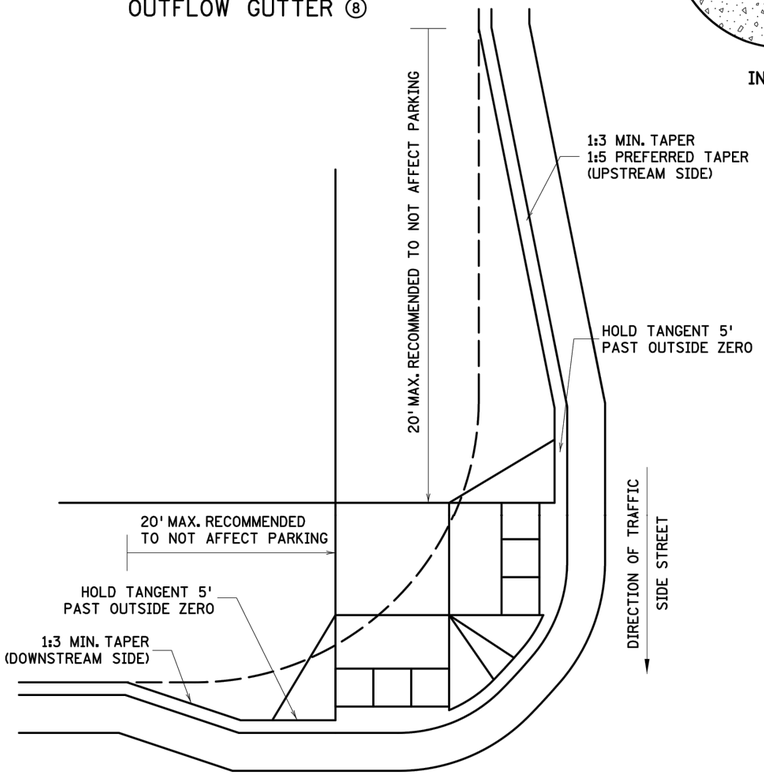
INSET A



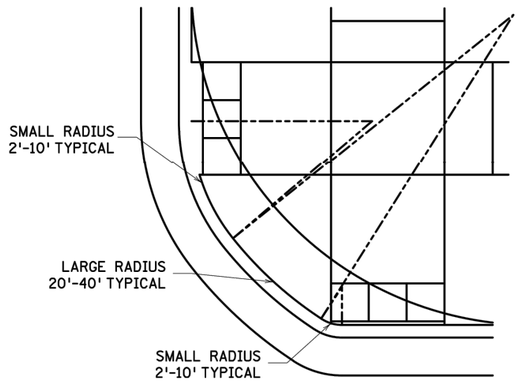
ONLY ALLOWED PER ENGINEER'S APPROVAL

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

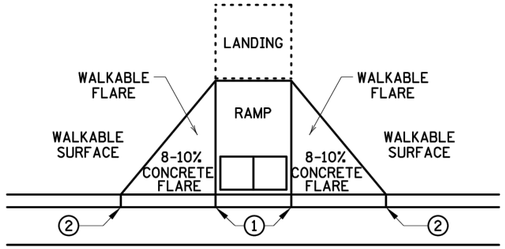
STANDARD PLAN 5-297.250 | 3 OF 6

APPROVED: 11-04-2021
REVISED:

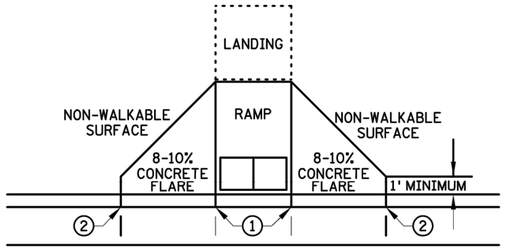
THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

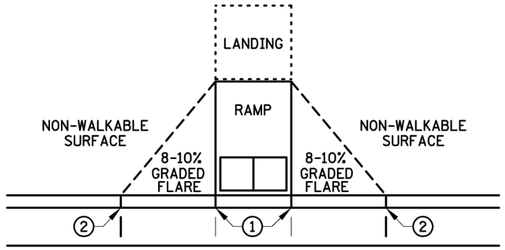
STATE PROJ. NO. (TH) SHEET NO. 10 OF 39 SHEETS



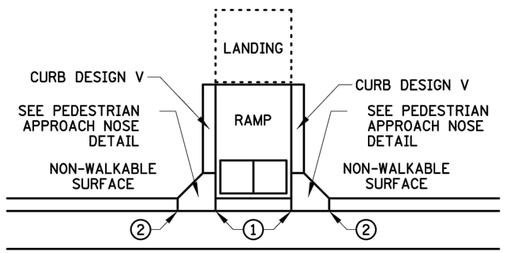
PAVED FLARES
ADJACENT TO WALKABLE SURFACE



PAVED FLARES
ADJACENT TO NON-WALKABLE SURFACE

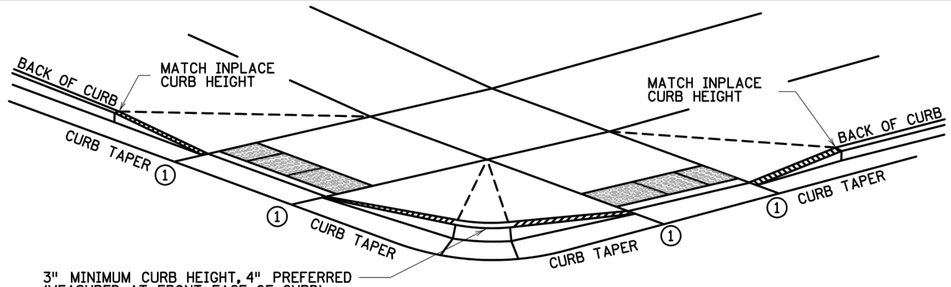


GRADED FLARES

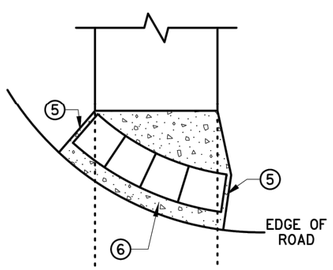


RETURNED CURB ④

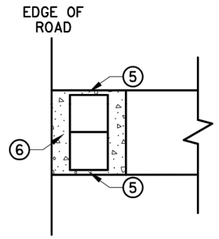
TYPICAL SIDE TREATMENT OPTIONS ③ ⑩



DETECTABLE EDGE WITH ⑦
CURB AND GUTTER

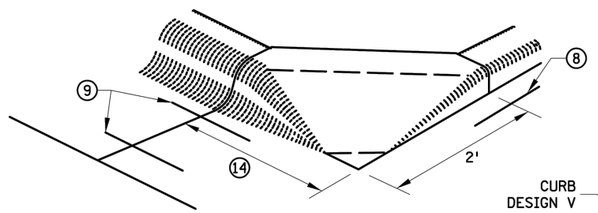


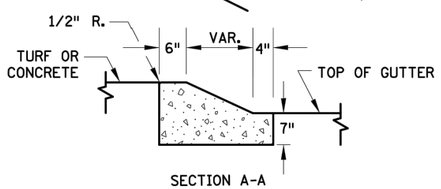
RADIAL DETECTABLE WARNING



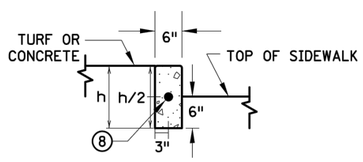
RECTANGULAR DETECTABLE WARNING

DETECTABLE EDGE WITHOUT CURB AND GUTTER

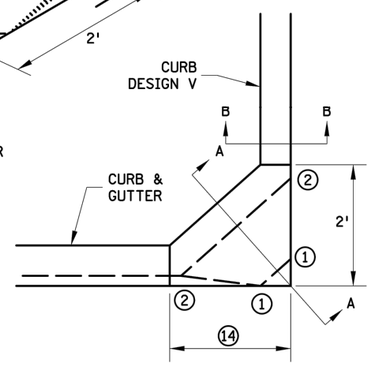




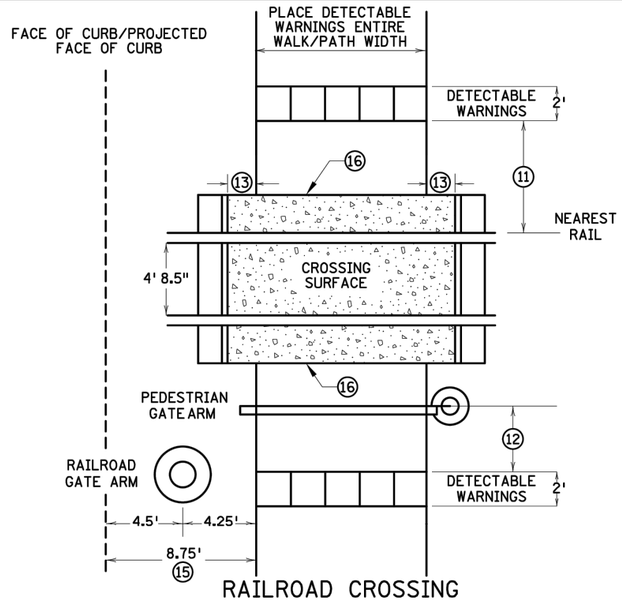
SECTION A-A



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.

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JEFFREY PERKINS
OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | 4 OF 6

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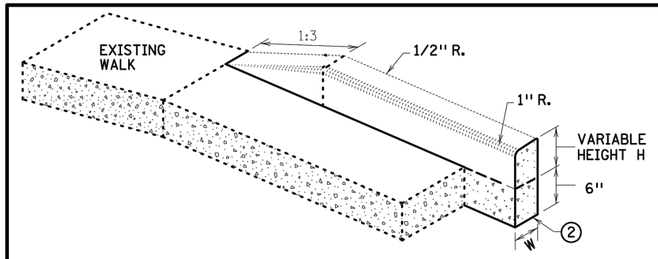
REVISED:

THOMAS STYRBICKI
STATE DESIGN ENGINEER

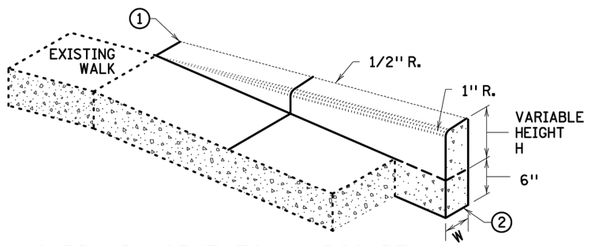
PEDESTRIAN CURB RAMP DETAILS

STATE PROJ. NO. (TH) SHEET NO. 11 OF 39 SHEETS



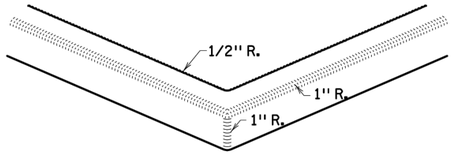
V CURB ADJACENT TO LANDSCAPE

CURB WITHIN SIDEWALK LIMITS



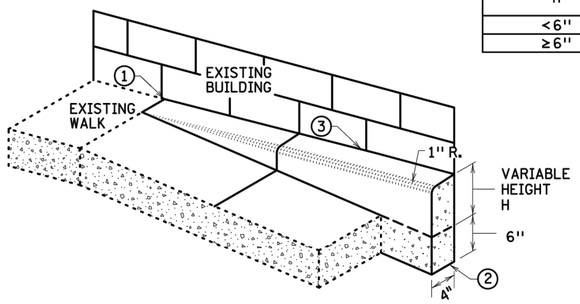
V CURB ADJACENT TO LANDSCAPE

CURB OUTSIDE SIDEWALK LIMITS

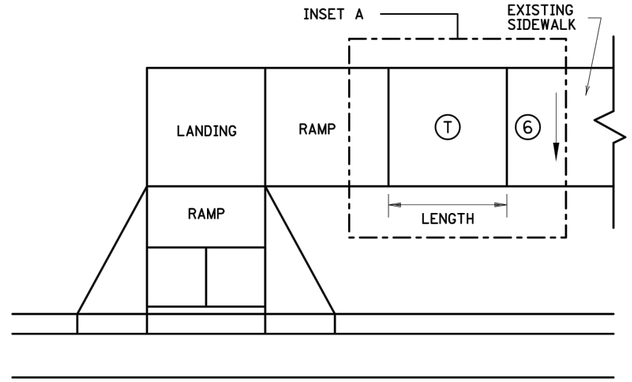


V CURB INTERSECTION

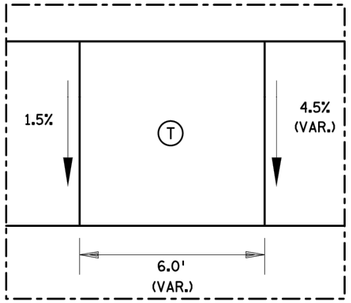
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
< 6"	4"
≥ 6"	6"



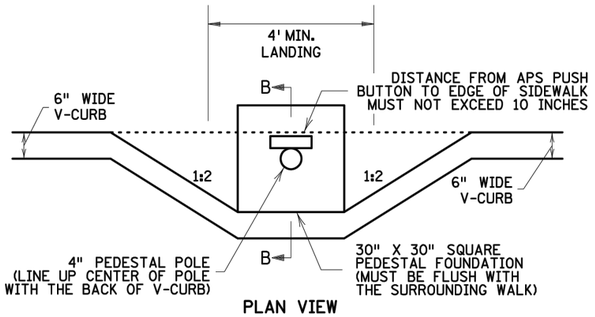
V CURB ADJACENT TO BUILDING OR BARRIER



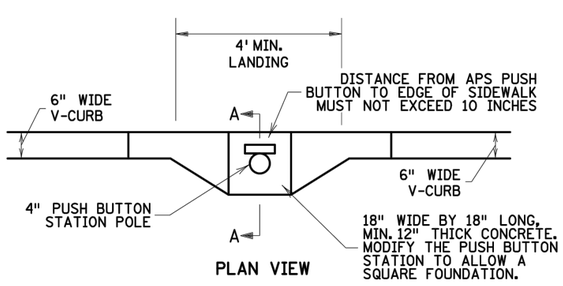
TRANSITION PANEL ④⑤



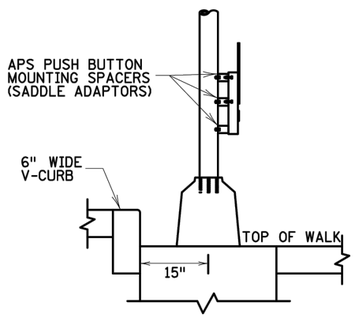
INSET A



PLAN VIEW

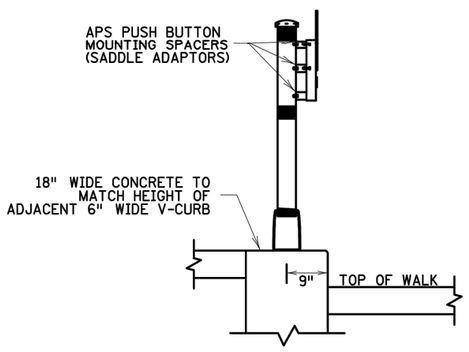


PLAN VIEW



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.

Ⓢ 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.

Ⓣ 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.

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OPERATIONS DIVISION

MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 | 5 OF 6

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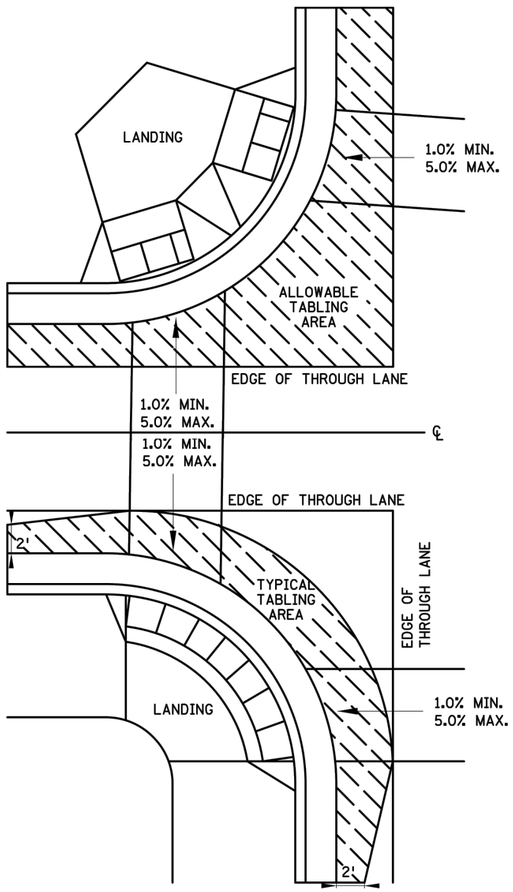
REVISED:

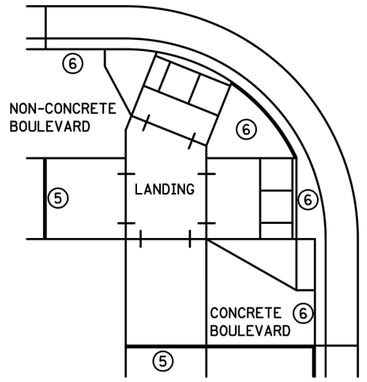
THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

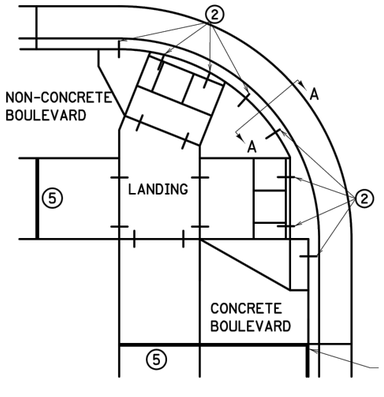
STATE PROJ. NO. (TH) SHEET NO. 12 OF 39 SHEETS



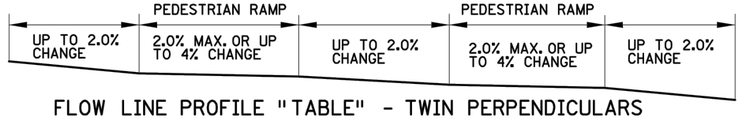
CURB LINE AND ROAD CROSSING ADJUSTMENTS



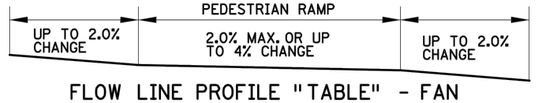
EXPANSION MATERIAL PLACEMENT
FOR CONCRETE ROADWAYS



CURB LINE REINFORCEMENT ④
PLACEMENT ON BITUMINOUS ROADWAYS

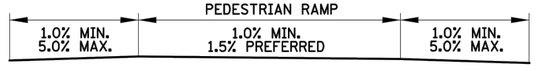


FLOW LINE PROFILE "TABLE" - TWIN PERPENDICULARS

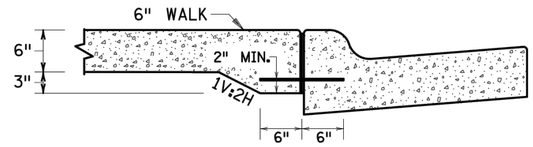


FLOW LINE PROFILE "TABLE" - FAN

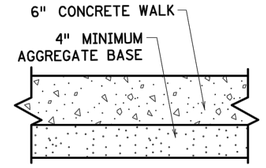
FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS



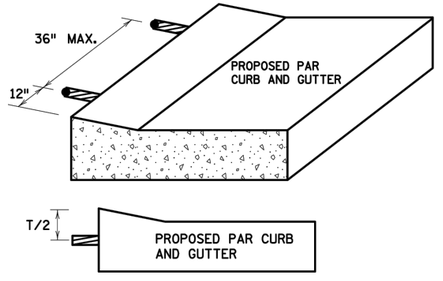
FLOW LINE PROFILE RAISE - FAN

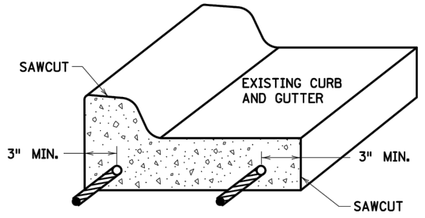


SECTION VIEW A-A
THICKENED SECTION
THROUGH CURB RAMP FLARES



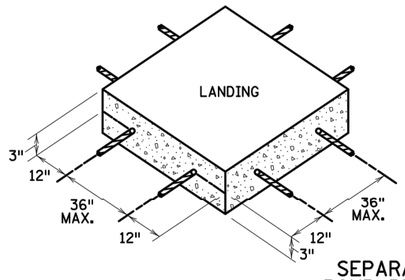
TYPICAL SIDEWALK SECTION
WITHIN INTERSECTION CORNER

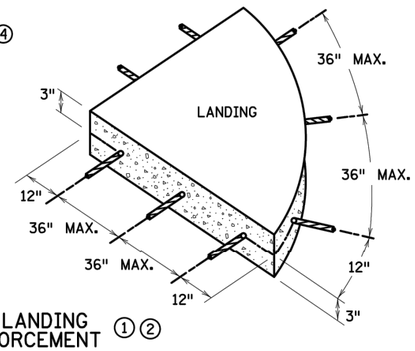




CURB AND GUTTER
REINFORCEMENT ③

CURB RAMP REINFORCEMENT DETAILS ②④





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

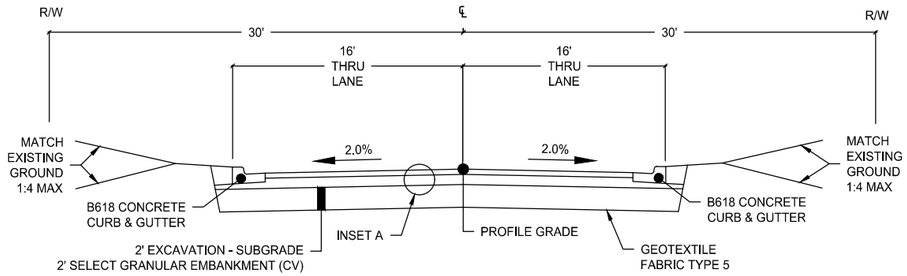
THOMAS STYRBICKI
STATE DESIGN ENGINEER

STANDARD PLAN 5-297.250 | 6 OF 6

APPROVED: 11-04-2021
REVISED:

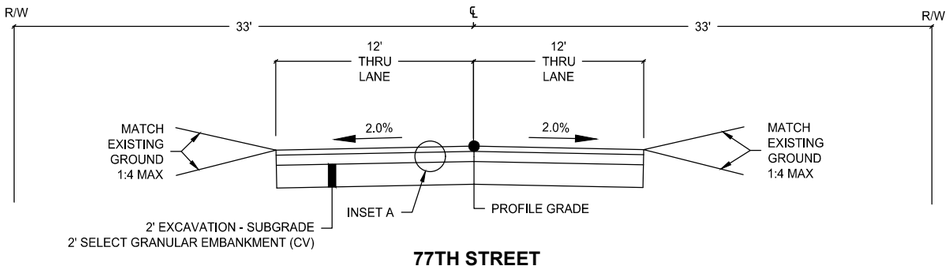
PEDESTRIAN CURB RAMP DETAILS

STATE PROJ. NO. (TH) SHEET NO. 13 OF 39 SHEETS



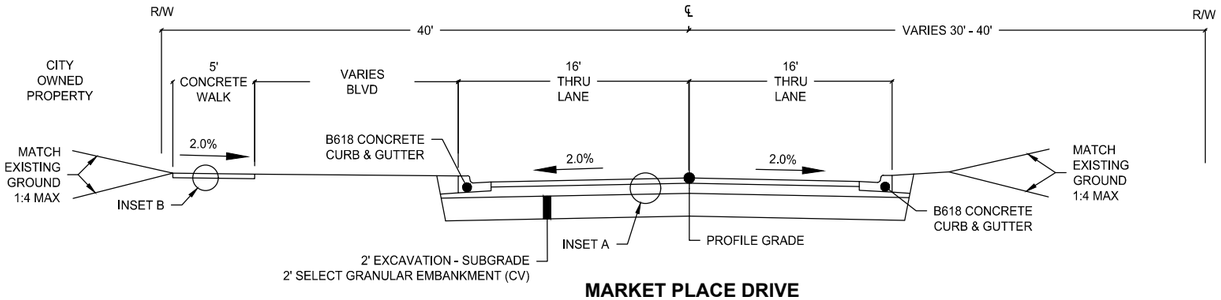
MARILYN DRIVE

STA. 100+50 TO STA. 101+26
NOT TO SCALE



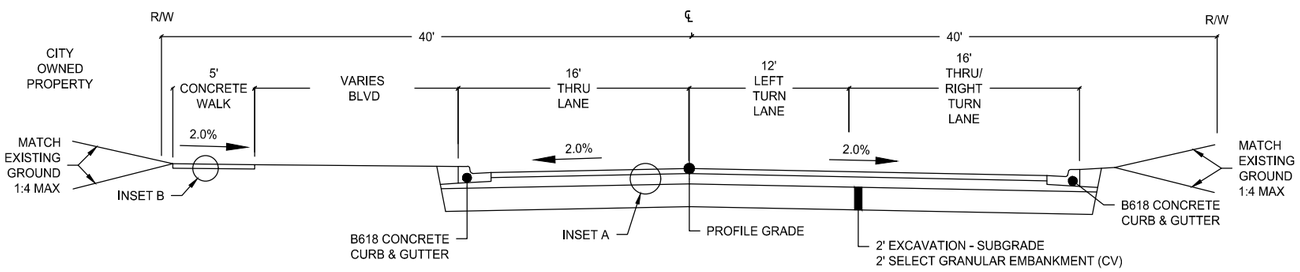
77TH STREET

STA. 203+00 TO STA. 204+07
NOT TO SCALE



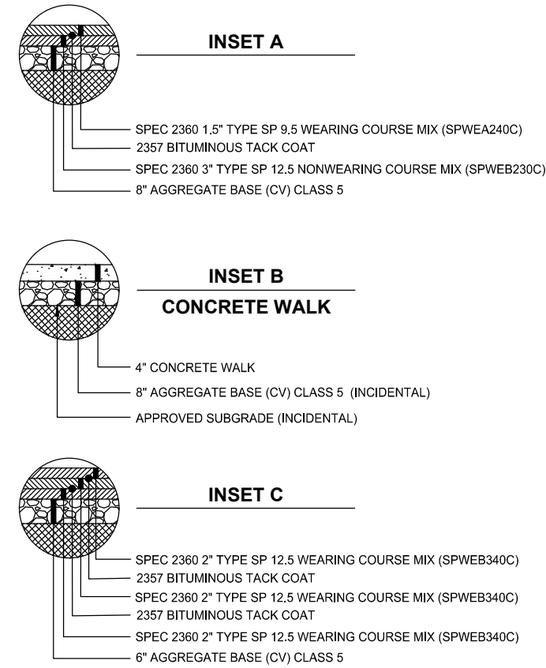
MARKET PLACE DRIVE

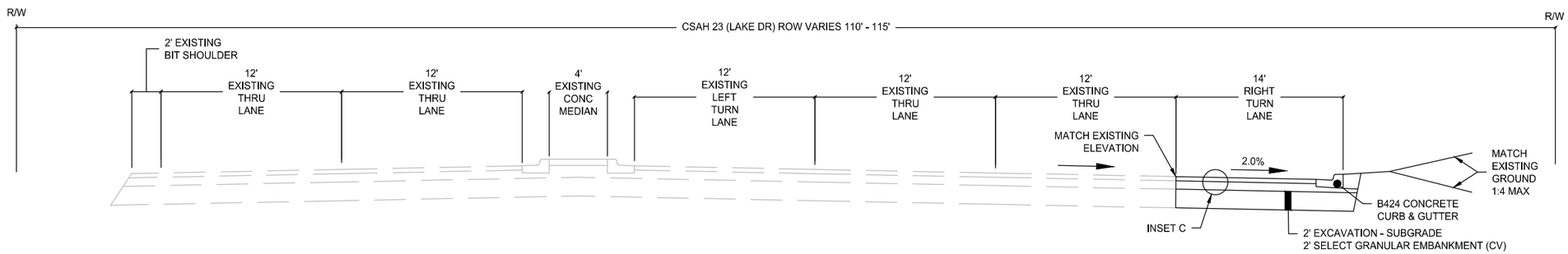
STA. 101+26 TO STA. 102+47
NOT TO SCALE



MARKET PLACE DRIVE

STA. 102+47 TO STA. 105+27
NOT TO SCALE





CSAH 23 (LAKE DRIVE)

STA. 302+34 TO STA. 304+56
NOT TO SCALE

wsb

CITY OF LINO LAKES

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AS SHOWN	CJB
PLAN BY:	CHECK BY:
CJB	DLH

REVISIONS

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DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

TYPICAL SECTIONS

2024 MARKET PLACE DRIVE
REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO.
017210-000

SHEET
14 OF 39

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STAGE 1: CONSTRUCT NEW ALIGNMENT AND TURN LANE

NO SHOULDER SIGN SHALL BE 600 LF FROM CONSTRUCTION. ROAD WORK AHEAD SIGN SHALL BE 600 LF FROM NO SHOULDER SIGN.

MARILYN DR

77TH ST W

CSAH 23 (LAKE DRIVE)

MARKET PLACE DR

CONSTRUCT INTERSECTION UNDER TRAFFIC

ROAD WORK AHEAD

NO SHOULDER

ROAD CLOSED

695

7710

7731

698

7691

7685

7681

7675

100+00 101+00 202+00 203+00 204+00 204+25 103+00 104+00 105+00 105+67 300+00 301+00 302+00 303+00 304+00 305+00 306+1316+00

fiber optics box
elec. meter
transformer

RIM910.86 INV:906.16 W INV:906.16 S
RIM912.49
INV:912.37
RIM911.12 INV:907.25 SE INV:906.12 N
RIM911.04 INV:905.94 N INV:906.04 S
RIM912.83 INV:899.33 NW
RIM911.60 INV:907.25 E INV:907.10 S
RIM910.93 INV:906.13 SE 12 RCP INV:906.23 NW 12 RCP

0 30 60
H: SCALE IN FEET

wsb

CITY OF LINO LAKES

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DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

CONSTRUCTION STAGING & TRAFFIC CONTROL

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 15 OF 39

STAGE 2: REMOVE EXISTING ALIGNMENT

NO SHOULDER SIGN SHALL BE 600 LF FROM CONSTRUCTION. ROAD WORK AHEAD SIGN SHALL BE 600 LF FROM NO SHOULDER SIGN.

7713 7731 695 7710 690 698 7691 7685 7681 7675

MARILYN DR

77TH ST W

CSAH 23 (LAKE DRIVE)

MARKET PLACE DR

ROAD CLOSED

TURN LANE

NO SHOULDER

ROAD WORK AHEAD

TRAFFIC CONTROL CHANGE AHEAD

100+00 101+00 102+00 103+00 104+00 105+00 105+67 202+00 203+00 204+00 204+25 300+00 301+00 302+00 303+00 304+00 305+00 306+13.16

fiber optics box
elec. meter
transformer

RIM910.86 INV:906.16 W INV:906.16 S
RIM912.49
RIM910.90
RIM912.37
RIM911.12 INV:906.72 SE INV:906.72 N
RIM911.02 INV:905.94 N INV:906.04 S
RIM912.83 INV:899.33 NW
RIM911.60 INV:906.24 E INV:906.24 S
RIM912.12 INV:906.28 E INV:906.28 N
RIM910.93 INV:906.13 N 12 RCP INV:906.23 W 12 RCP

0 30 60
H: SCALE IN FEET

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CITY OF LINO LAKES

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DIANE L. HANKEE, P.E. LIC. NO: 43338

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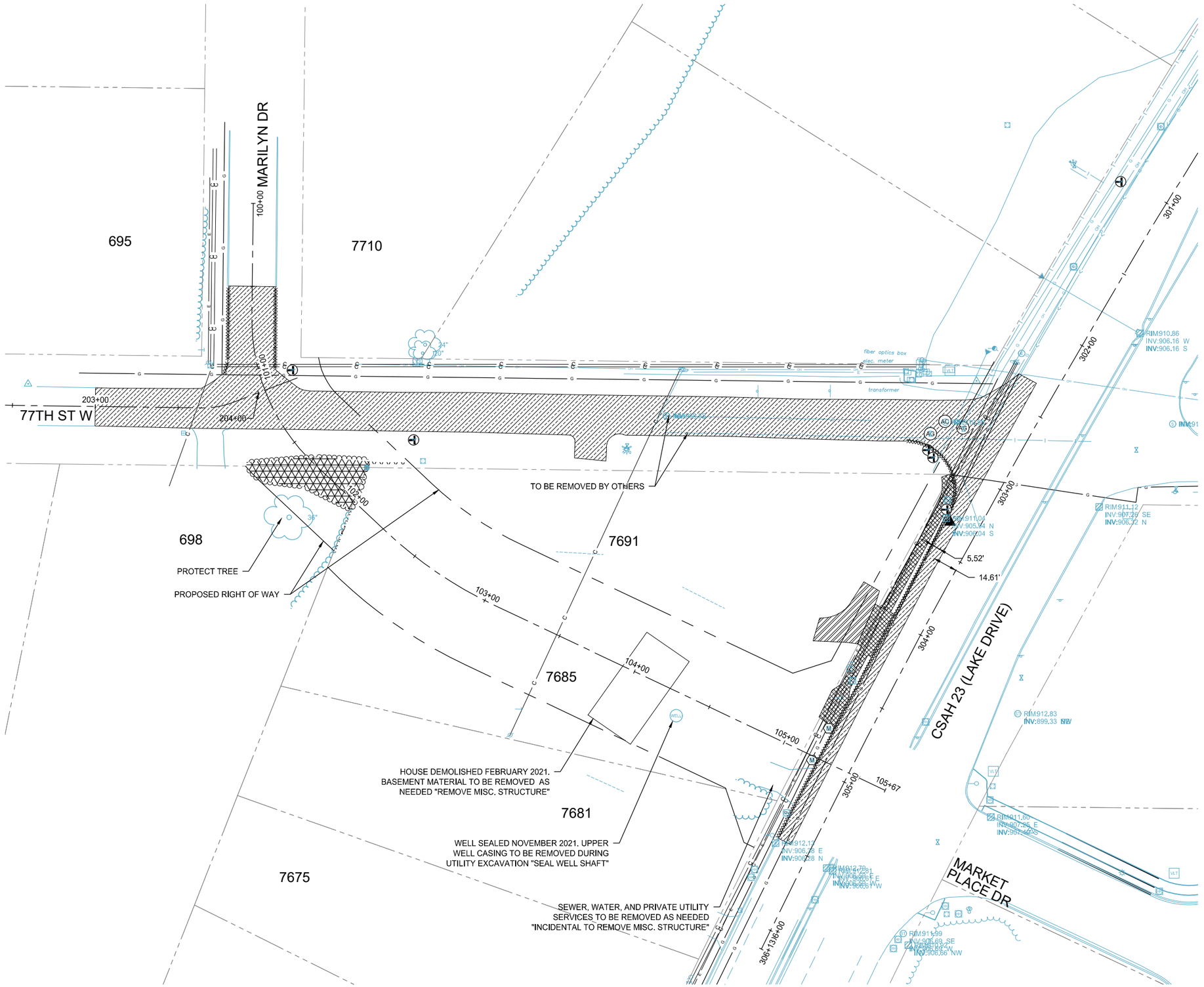
CONSTRUCTION STAGING & TRAFFIC CONTROL

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 16 OF 39



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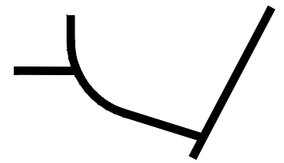

N

0 30 60
H: SCALE IN FEET

LEGEND

- AC — ADJUST CASTING
- REMOVE DRAINAGE STRUCTURE
- REMOVE SIGN
- S — SALVAGE & REINSTALL SIGN
- CLEAR & GRUB TREE
- M — REMOVE MAILBOX
- REMOVE CURB AND GUTTER
- REMOVE BITUMINOUS PAVEMENT
- REMOVE BITUMINOUS DRIVEWAY
- REMOVE CONCRETE WALK
- CLEAR AND GRUB (BY ACRE)

NOTES:
SEE SHEETS SL-01 TO SL-11 FOR TRAFFIC CONTROL SIGNAL REMOVAL.

wsb

CITY OF LINO LAKES

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DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

REMOVAL PLANS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 17 OF 39

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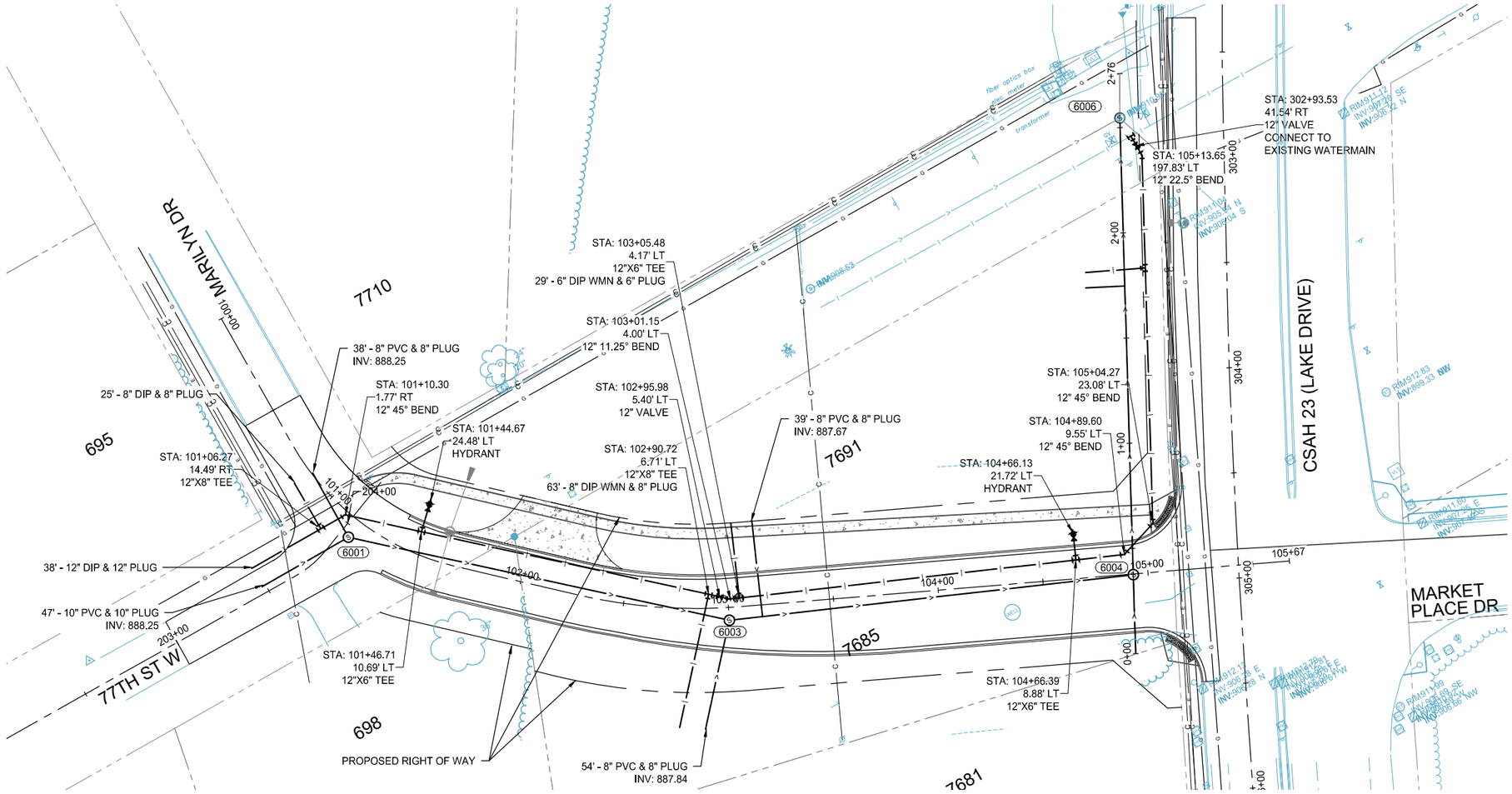

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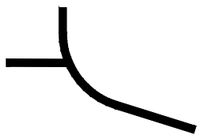


0 30 60
H: SCALE IN FEET

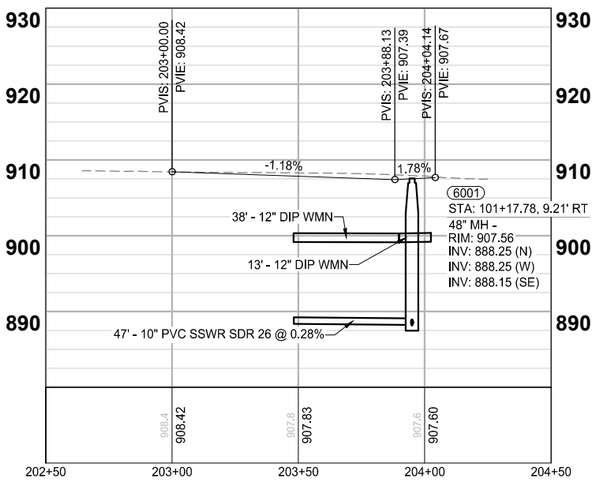
0 10 20
V: SCALE IN FEET

LEGEND

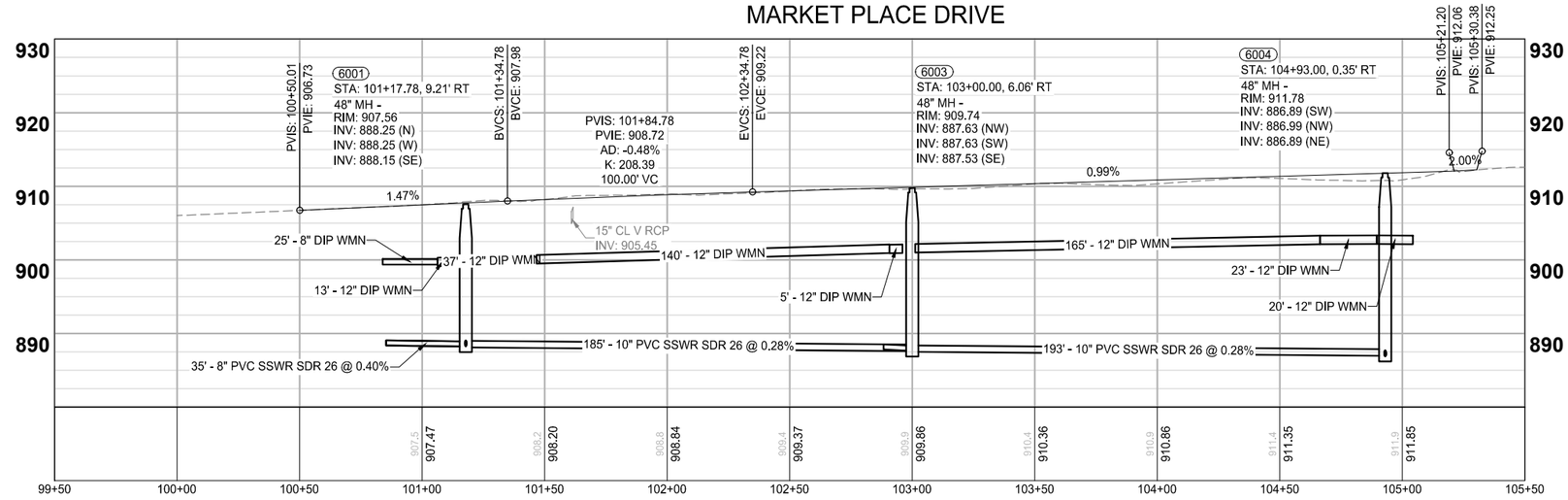
- EXISTING WATERMAIN
- PROPOSED WATERMAIN
- EXISTING WATER SERVICE W/ CURBSTOP
- PROPOSED WATER SERVICE W/ CURBSTOP
- EXISTING HYDRANT W/ VALVE
- PROPOSED HYDRANT W/ VALVE
- PROPOSED WATER FITTINGS
- EXISTING SANITARY SEWER MAIN
- PROPOSED SANITARY SEWER MAIN
- EXISTING SANITARY SEWER SERVICE
- PROPOSED SANITARY SEWER SERVICE
- (S) EXISTING SANITARY STRUCTURE
- (S) PROPOSED SANITARY STRUCTURE

NOTES:
1. SANITARY SEWER SPOIL PILE FOR TRENCH MUST BE KEPT 10 FEET FROM EXISTING CURB LINE.

77TH STREET W



MARKET PLACE DRIVE



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DIANE L. HANKEE, P.E.
DATE: 12/13/2023
LIC. NO: 43338

SANITARY SEWER & WATERMAIN PLANS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO.
017210-000

SHEET
18 OF 39

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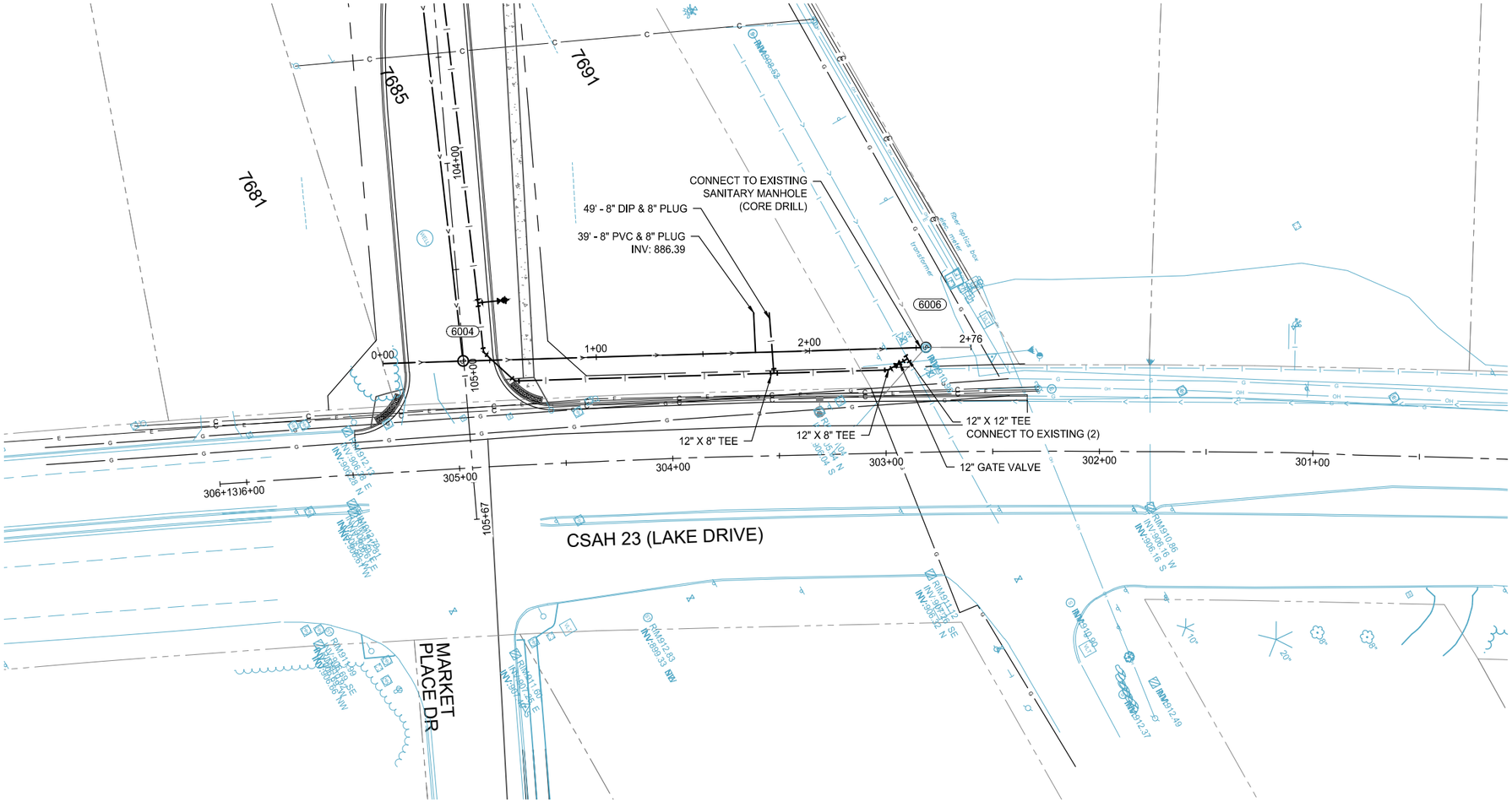


LOCATION

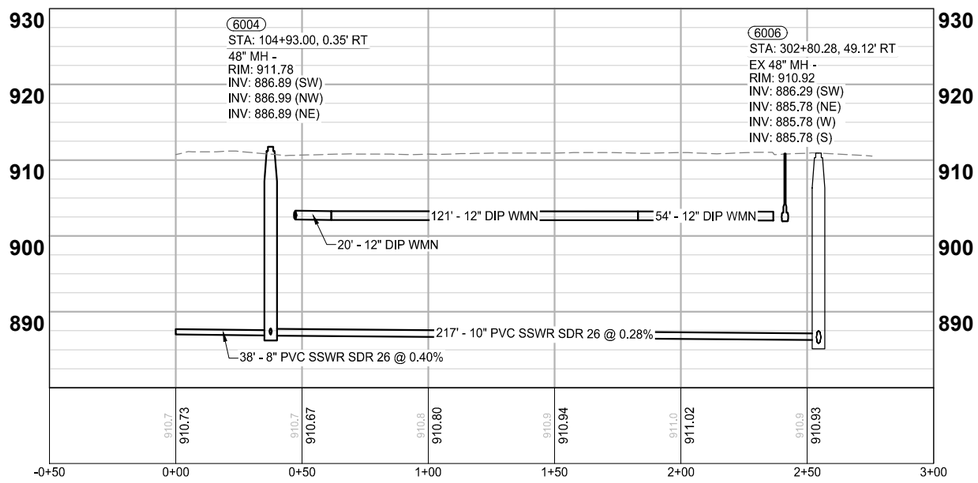
0 30 60
H: SCALE IN FEET

0 10 20
V: SCALE IN FEET

LEGEND

- EXISTING WATERMAIN
- PROPOSED WATERMAIN
- EXISTING WATER SERVICE W/ CURBSTOP
- PROPOSED WATER SERVICE W/ CURBSTOP
- EXISTING HYDRANT W/ VALVE
- PROPOSED HYDRANT W/ VALVE
- PROPOSED WATER FITTINGS
- EXISTING SANITARY SEWER MAIN
- PROPOSED SANITARY SEWER MAIN
- EXISTING SANITARY SEWER SERVICE
- PROPOSED SANITARY SEWER SERVICE
- EXISTING SANITARY STRUCTURE
- PROPOSED SANITARY STRUCTURE

CSAH 23 (LAKE DRIVE)



NOTES:
1. SANITARY SEWER SPOIL PILE FOR TRENCH MUST BE KEPT 10 FEET FROM EXISTING CURB LINE.

wsb

CITY OF LINO LAKES

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DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

SANITARY SEWER & WATERMAIN PLANS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 19 OF 39

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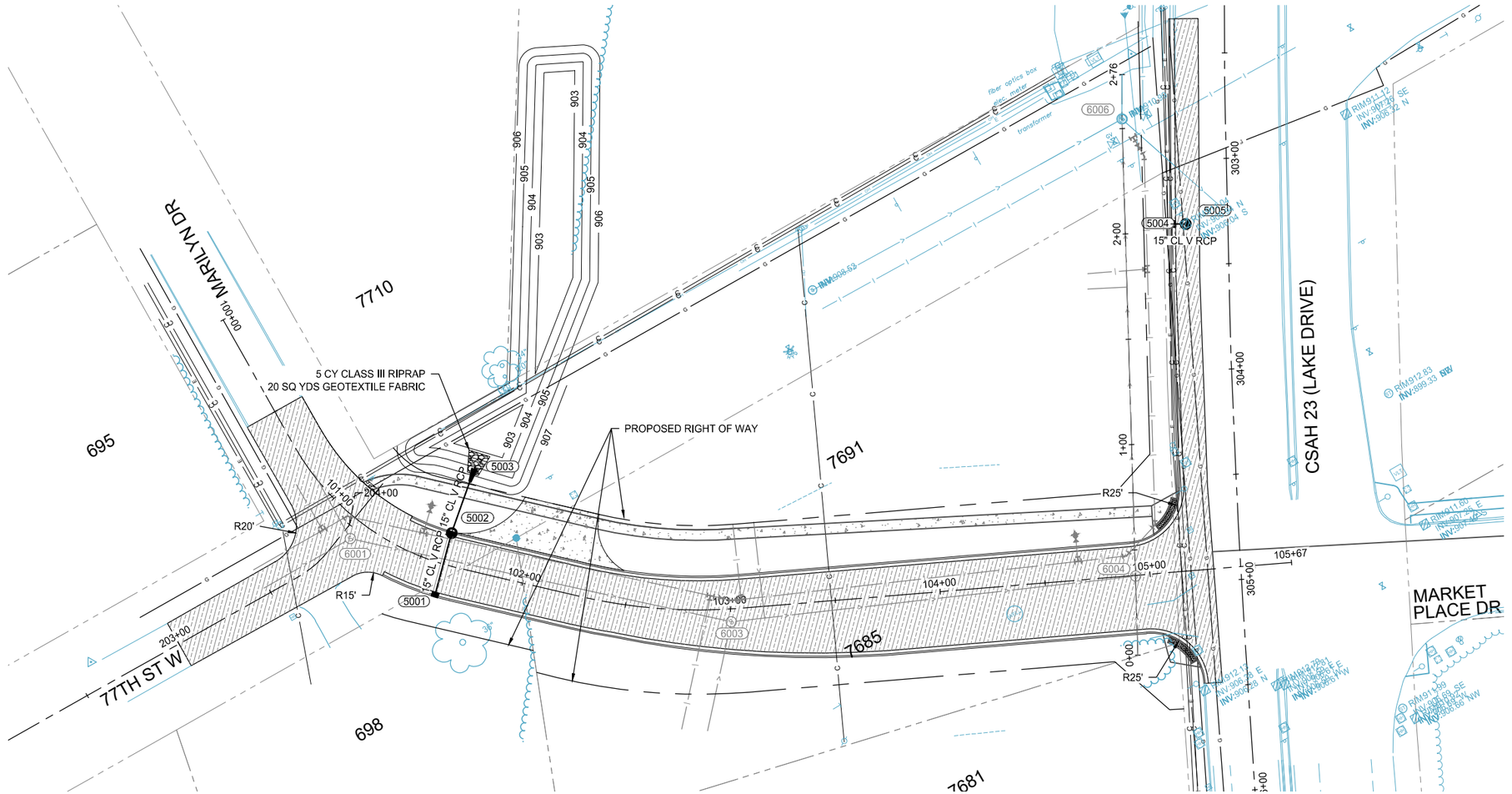


LOCATION

LEGEND

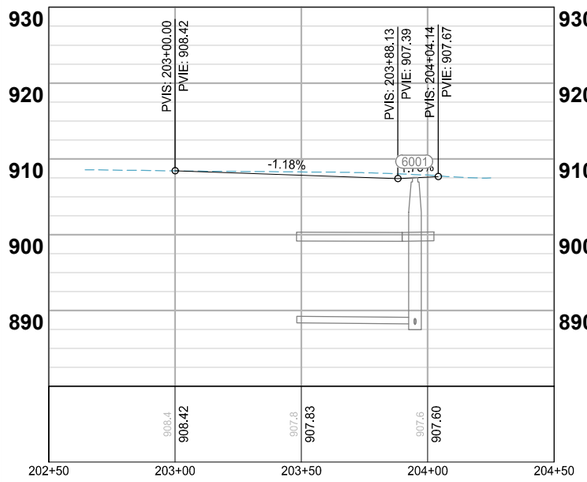
- PROPOSED CURB AND GUTTER
- PROPOSED BITUMINOUS (EDGE)
- EXISTING STORM SEWER PIPE
- EXISTING STORM STRUCTURE
- PROPOSED STORM SEWER PIPE
- PROPOSED DRAINAGE STRUCTURE
- PROPOSED BITUMINOUS ROAD
- PROPOSED CONCRETE WALK
- PROPOSED TRUNCATED DOMES

NOTES:
SEE SHEETS SL-01 TO SL-11 FOR TRAFFIC CONTROL SIGNAL REMOVAL.

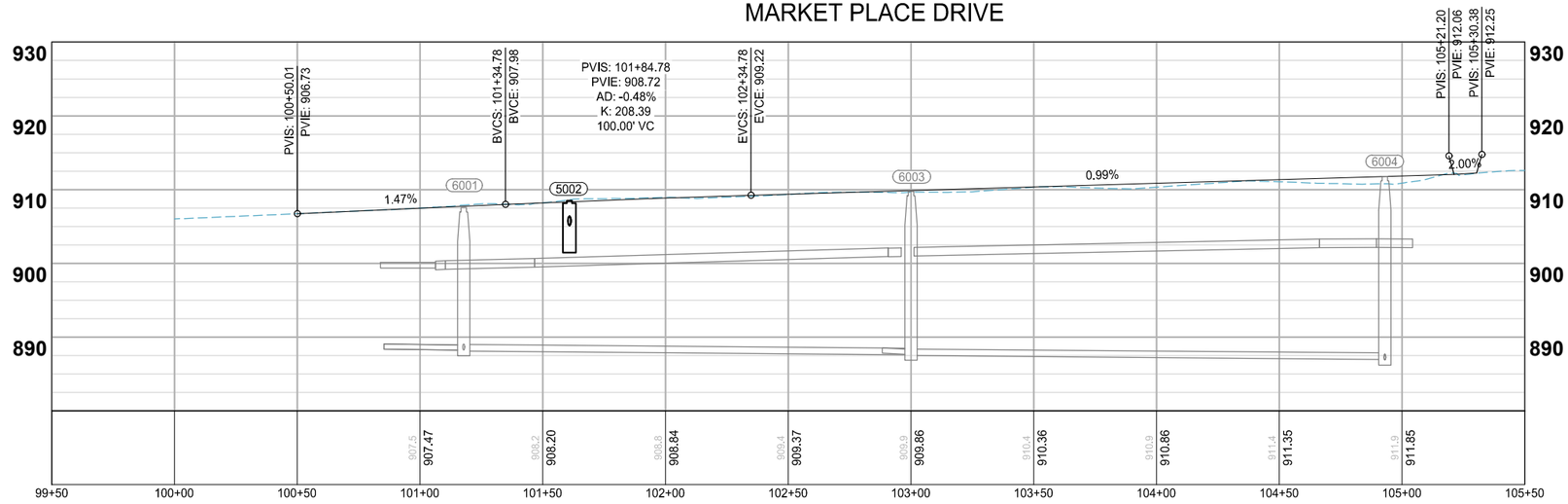
H: 0 30 60 SCALE IN FEET

V: 0 10 20 SCALE IN FEET

77TH STREET W



MARKET PLACE DRIVE



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CITY OF LINO LAKES

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DIANE L. HANKEE, P.E. LIC. NO.: 43338

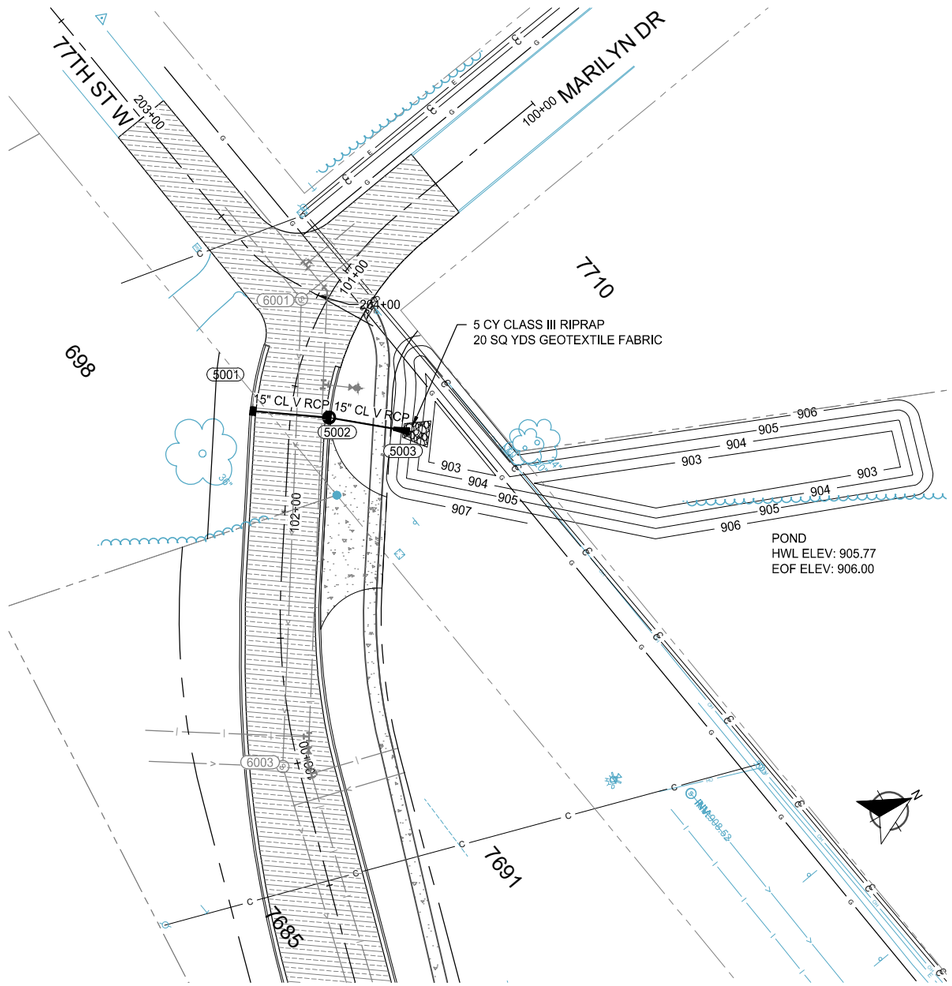
DATE: 12/13/2023

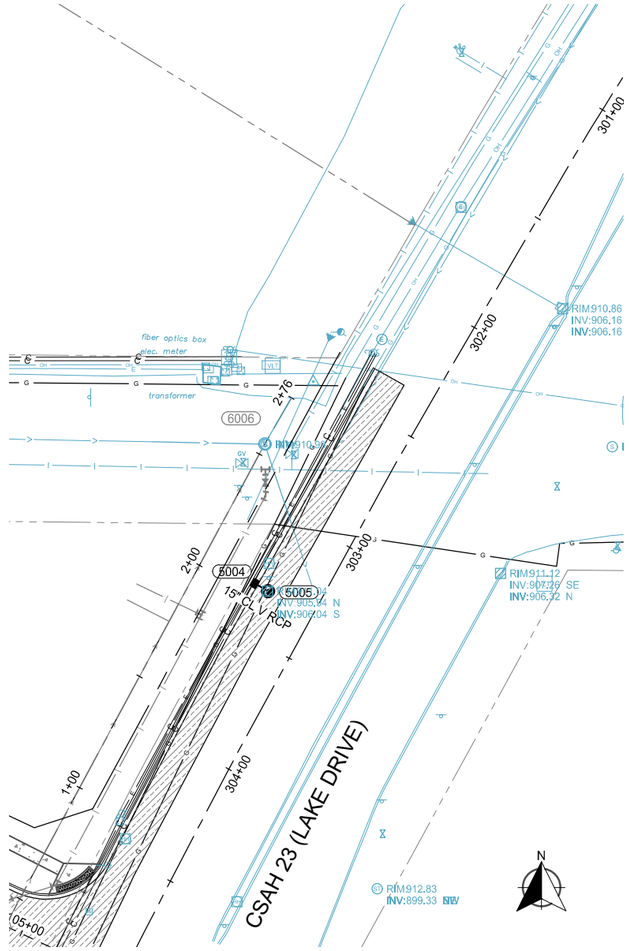
STREET & STORM SEWER PLANS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO.
017210-000

SHEET
20 OF 39





LOCATION

0 30 60
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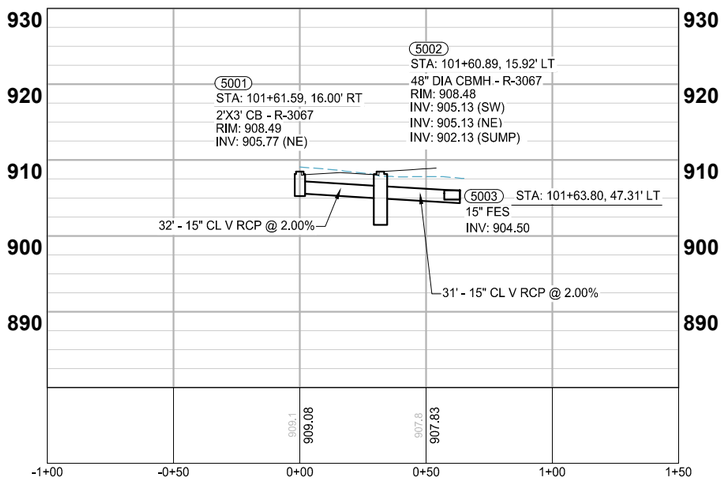
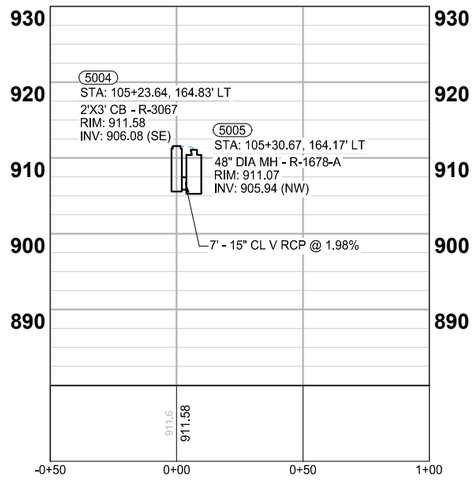
LEGEND

- PROPOSED CURB AND GUTTER
- PROPOSED BITUMINOUS (EDGE)
- EXISTING STORM SEWER PIPE
- EXISTING STORM STRUCTURE
- PROPOSED STORM SEWER PIPE
- PROPOSED DRAINAGE STRUCTURE
- PROPOSED BITUMINOUS ROAD
- PROPOSED CONCRETE WALK
- PROPOSED TRUNCATED DOMES
- 965.77 PROPOSED SPOT ELEVATION
- 965.77 EXISTING SPOT ELEVATION

5001 TO 5003



5004 TO 5005



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CITY OF LINO LAKES

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AS SHOWN	CJB
PLAN BY:	CHECK BY:
CJB	DLH

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.

DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

STREET & STORM SEWER PLANS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 21 OF 39

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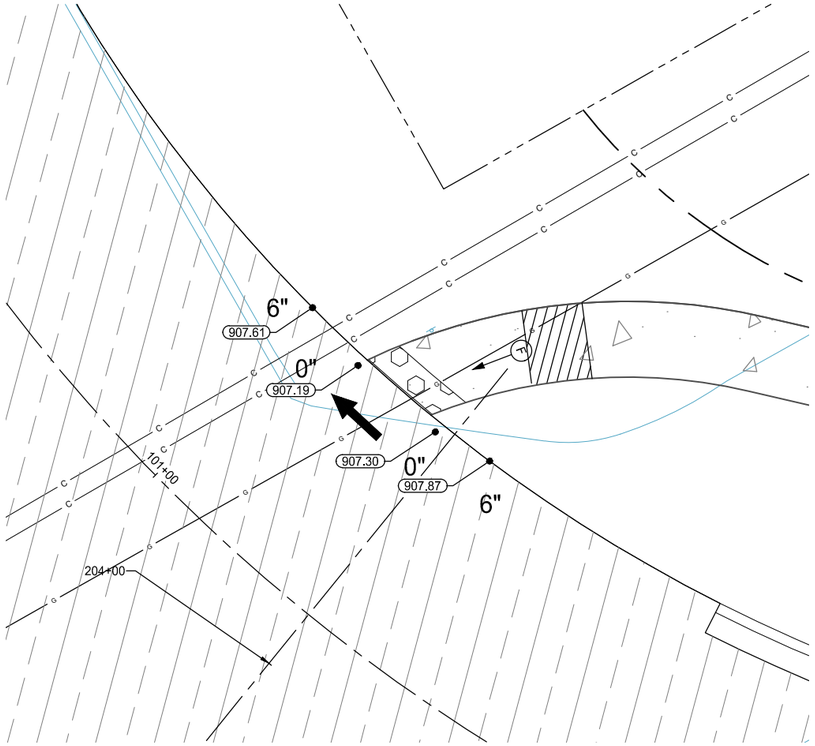
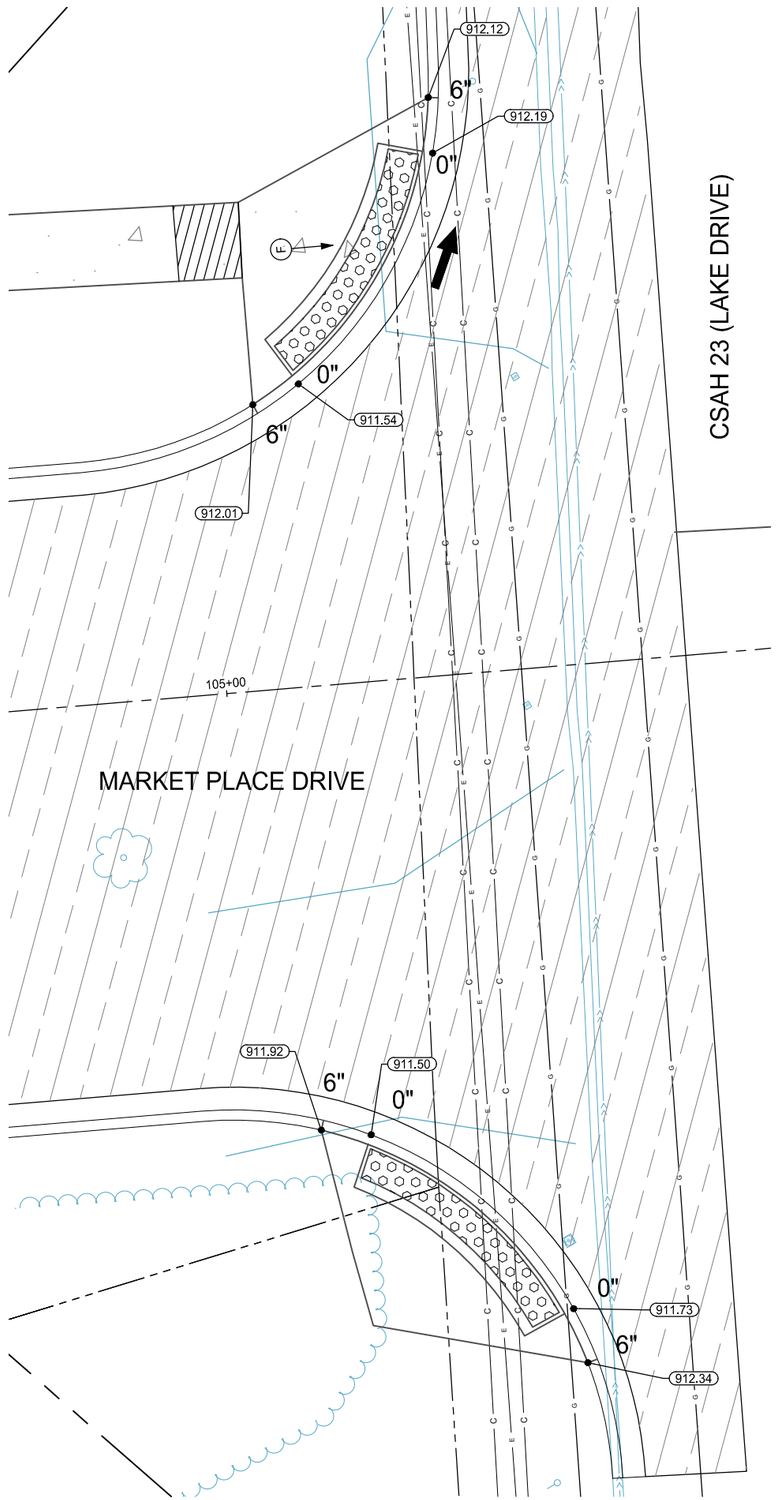


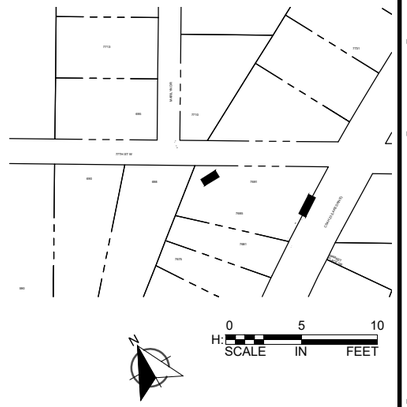
77TH STREET W / MARILYN DRIVE/ MARKET PLACE DRIVE



MARKET PLACE DRIVE

CSAH 23 (LAKE DRIVE)

LOCATION



LEGEND

- (S) INDICATES PEDESTRIAN RAMP: SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- (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%
- PROPOSED LANDING AREA 4'x4' MIN. DIMENSIONS MAX 2% SLOPE IN ALL DIRECTIONS
- PROPOSED TRUNCATED DOMES
- PROPOSED CONCRETE WALK
- 965.77 PROPOSED SPOT ELEVATION
- 965.77 EXISTING SPOT ELEVATION
- X" CURB HEIGHT
- PROPOSED FLOW DIRECTION

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DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

PEDESTRIAN RAMP PLANS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 22 OF 39

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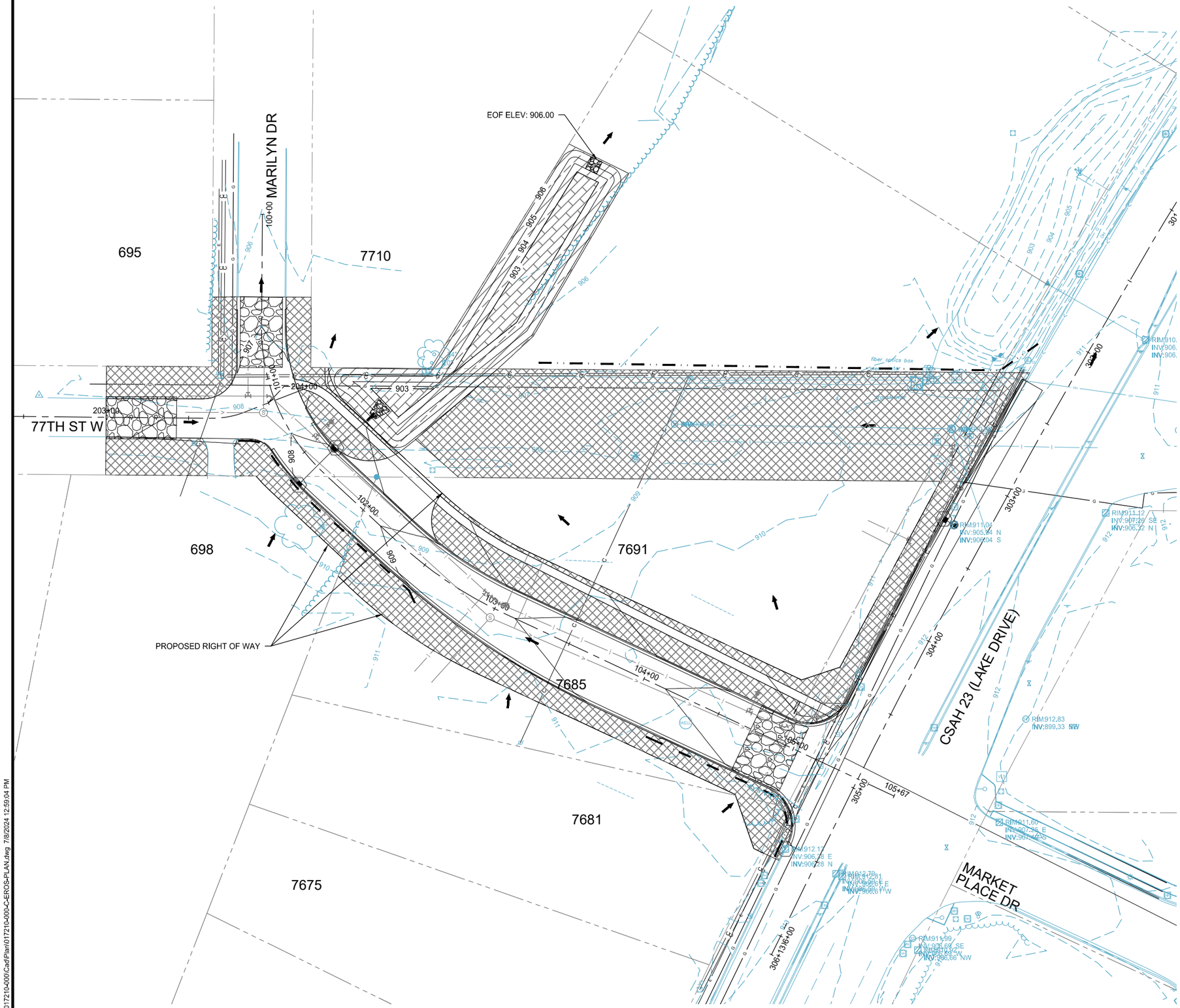
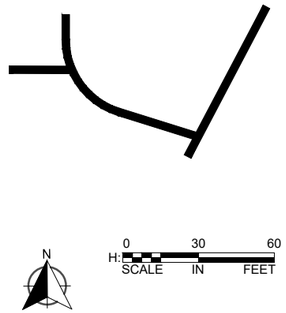


LOCATION



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LEGEND

- INLET PROTECTION
- FLOW DIRECTION
- RIP RAP CL III ENERGY DISSIPATION
- WOOD FIBER BIOROLL
- STABILIZED CONSTRUCTION ENTRANCE
- TEMPORARY: STABILIZED FIBER MATRIX @ 3,000 LBS/ACRE
  PERMANENT: STABILIZED FIBER MATRIX @ 3,000 LBS/ACRE WITH MNDOT SEED MIX TYPE 25-151 @ 220 LBS/ACRE WITH FERTILIZER TYPE 3 @ 350 LBS/ACRE
- TEMPORARY: CATEGORY 20 EROSION CONTROL BLANKET
  PERMANENT: CATEGORY 20 EROSION CONTROL BLANKET WITH MNDOT SEE MIX TYPE 33-261 @ 35 LBS/ACRE WITH FERTILIZER TYPE 3 @ 200 LBS/ACRE
- TEMPORARY: CATEGORY 20 EROSION CONTROL BLANKET
  PERMANENT: CATEGORY 20 EROSION CONTROL BLANKET WITH MNDOT SEE MIX TYPE 35-221 @ 36.5 LBS/ACRE WITH FERTILIZER TYPE 3 @ 200 LBS/ACRE

NOTE: GEORGE WATCH LAKE IS LOCATED 0.70 MILES SOUTHWEST FROM THE PROJECT

wsb

CITY OF LINO LAKES

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DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

EROSION CONTROL PLANS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 23 OF 39

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STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE

PROJECT NAME: 77TH REALIGNMENT PROJECT
PROJECT LOCATION: STREET: 77TH STREET W
CITY: LINO LAKES
STATE: MINNESOTA
ZIP: 55014
PROJECT NUMBER: WSB 017210-000
COUNTY: ANOKA
LATITUDE/LONGITUDE: 45.1858, -93.1113

THE PLANNED SCOPE OF THE PROJECT INCLUDES:
THE CITY OF LINO LAKES PROPOSES TO REMOVE 77TH STREET BETWEEN MARILYN DR AND LAKE DR (CSAH 23) AND REALIGN THE STREET TO THE INTERSECTION OF LAKE DR (CSAH 23) AND MARKET PLACE DR.

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	MAY 2022
GRADING & UTILITY WORK	MAY - JULY 2022
CURB & PAVEMENT	JULY - OCT 2022
FINAL STABILIZATION	NOV 2022

PROJECT PERSONNEL AND TRAINING

SWPPP DEVELOPER:
WSB (MEGHAN LITSEY)
701 XENIA AVE S, SUITE 300
GOLDEN VALLEY, MN 55416
612-723-9166/MLITSEY@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

LINO LAKES 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
MIKE GROCHALA	CITY OF LINO LAKES	OWNER CONTACT	651-982-2427
	CONTRACTOR TO COMPLETE		

AGENCY CONTACTS

ORGANIZATION	CONTACT NAME	PHONE
MPCA (EMERGENCY) 24 HOUR	STATE DUTY OFFICER	1-800-422-0798
MPCA	RACHEL MCPHEE	507-344-5266
RICE CREEK WD	PATRICK HUGHES	763-398-3080

LOCATION OF SWPPP REQUIREMENTS

THE REQUIRED SWPPP ELEMENTS MAY BE LOCATED IN MANY PLACES WITHIN THE PLAN SET AS WELL AS IN THE PROJECT SPECIFICATIONS, OR ON FILE WITH THE PROJECT OWNER.

DESCRIPTION	LOCATION
TEMPORARY/PERMANENT EROSION CONTROL MEASURES	PLAN SHEETS
DIRECTION OF FLOW	PLAN SHEETS
CONSTRUCTION NOTES & STANDARD PLATES	PLAN SHEETS
DRAINAGE PLAN & CONSTRUCTION PLAN	PLAN SHEETS
BMP TABULATION	PLAN SHEETS
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 10/22/2021. 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)
STORMWATER POND 1	N/A
STORMWATER POND 2	N/A
GEORGE WATCH	NUTRIENTS

AREAS OF ENVIRONMENTAL SENSITIVITY (AES) AND INFESTED WATERS

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

THE USDA WEB SOIL SURVEY WAS REVIEWED ON 10/22/2021. THE RESULT OF THIS REVIEW SHOWS THE PREDOMINATING SOIL TYPES WITHIN THE PROJECT AREA INCLUDE FINE SAND AND LOAMY FINE SAND. 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: NO WETLAND IMPACTS ARE PROPOSED. THERE ARE NO WETLANDS WITHIN AND DIRECTLY ADJACENT TO THE PROJECT LIMITS. NO ADDITIONAL STORMWATER-RELATED MITIGATION MEASURES APPLY.

THREATENED/ENDANGERED SPECIES: THE PROJECT AREA DOES NOT CONTAIN CRITICAL HABITAT FOR THREATENED/ENDANGERED SPECIES. NO ADDITIONAL STORMWATER-RELATED MITIGATION MEASURES APPLY

DRINKING WATER/WELLS: ACCORDING TO THE MDH, THE PROJECT IS NOT LOCATED WITHIN A DRINKING WATER SUPPLY MANAGEMENT AREA. HOWEVER, THERE IS ONE EXISTING WELL LOCATION AT APPROXIMATELY STA. 104+50 THAT MAY BE IMPACTED BY THE PROJECT. THE WELL MUST BE SEALED PRIOR TO CONSTRUCTION BY AN MDH LICENSED WELL CONTRACTOR.

CONTAMINATED PROPERTIES: THE MPCA'S "WHAT'S IN MY NEIGHBORHOOD" DATABASE WAS REVIEWED ON 10/22/2021. THE RESULTS OF THIS REVIEW SHOW NO KNOWN CONTAMINATED PROPERTIES WITHIN OR ADJACENT TO THE PROJECT LIMITS. NO ADDITIONAL STORMWATER-RELATED MITIGATION MEASURES APPLY.

FLOOD CONTINGENCY PLAN: PROJECT ACTIVITIES ARE NOT LOCATED WITHIN THE 100-YEAR FLOODPLAIN OR FLOODWAY; HOWEVER, THE PROJECT ENGINEER (AT THEIR DISCRETION) MAY REQUIRE A PREVENTATIVE FLOOD CONTINGENCY PLAN FOR SPECIFIC PROJECT ACTIVITIES AND AREAS IF SEASONAL PRECIPITATION POSSES A POTENTIAL RISK OF FLOODING WORK AREAS WITHIN THE PROJECT LIMITS. THIS PLAN SHALL BE SUBMITTED BY THE OPERATOR TO THE PROJECT ENGINEER FOR APPROVAL A MINIMUM OF 72 HOURS PRIOR TO THE SCHEDULED WORK AND/OR DURING ACTIVE WORK WITHIN THE AREA OF POTENTIAL RISK OF FLOODING. NO WORK CAN COMMENCE IN THE AREA UNTIL WRITTEN APPROVAL HAS BEEN GRANTED BY THE PROJECT ENGINEER.

FISH EXCLUSION DATES: NO IN-WATER WORK IS PROPOSED. NO ADDITIONAL STORMWATER-RELATED MITIGATION MEASURES APPLY

AQUATIC INVASIVE SPECIES: NO IN-WATER WORK IS PROPOSED. NO ADDITIONAL STORMWATER-RELATED MITIGATION MEASURES APPLY.

LAND FEATURE CHANGES

TOTAL AREA TO BE DISTURBED = 2.03 ACRES
IMPERVIOUS AREA: PRE-CONSTRUCTION = 0.43 ACRES/POST-CONSTRUCTION = 0.51 ACRES
NET INCREASE OF IMPERVIOUS AREA = 0.08 ACRES

LONG TERM MAINTENANCE AND OPERATION:
THE NPDES PERMANENT STORMWATER TREATMENT SYSTEM (PART 15.1) IS NOT REQUIRED BECAUSE THE NET NEW IMPERVIOUS AREA CREATED BY THE PROJECT IS LESS THAN ONE ACRE. HOWEVER, A STORMWATER BASIN WILL BE CONSTRUCTED AS PART OF THIS PROJECT TO PROVIDE STORAGE.

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. 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;

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DIANE L. HANKEE, P.E. LIC. NO: 43338
DATE: 12/13/2023

STORM WATER POLLUTION PREVENTION PLAN

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 24 OF 39

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E. DOCUMENTATION OF CHANGES MADE TO THE SWPPP.

REPLACE, REPAIR OR SUPPLEMENT ALL NONFUNCTIONAL BMPS BY THE END OF THE NEXT BUSINESS DAY FOLLOWING DISCOVERY UNLESS LISTED DIFFERENTLY BELOW:

A. REPAIR, REPLACE, OR SUPPLEMENT PERIMETER CONTROL DEVICES WHEN THEY BECOME NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT OF THE DEVICE. COMPLETE REPAIRS BY THE END OF THE NEXT BUSINESS DAY FOLLOWING DISCOVERY.
B. REPAIR OR REPLACE INLET PROTECTION DEVICES WHEN THEY BECOME NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT AND/OR DEPTH OF THE DEVICE.
C. DRAIN AND REMOVE SEDIMENT FROM TEMPORARY AND PERMANENT SEDIMENT BASINS ONCE THE SEDIMENT HAS REACHED 1/2 THE STORAGE VOLUME. COMPLETE WORK WITHIN 72 HOURS OF DISCOVERY.
D. 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.
E. 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.
F. 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 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. THERE IS NO CONSTRUCTION PHASING OR STAGING DEFINED BY THE OWNER FOR THIS PROJECT. THE SCHEDULE FOR INSTALLING TEMPORARY BMPS SHALL BE INCORPORATED INTO THE OPERATOR'S WEEKLY SCHEDULE FOR EACH CONSTRUCTION STAGE AND PRESENTED TO THE OWNER'S REPRESENTATIVE.
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. 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.

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.

HYDRAULIC MATRICES: HYDRAULIC MATRICES ARE EROSION CONTROL PRODUCTS THAT ARE USED TO STABILIZE EXPOSED SOILS. THESE MATRICES ARE APPLIED IN A SLURRY, PRODUCED BY MIXING FIBER, WATER AND A BINDING AGENT TOGETHER IN A MECHANICAL HYDRO-SEEDER. WOOD FIBER IS WIDELY USED BUT OTHER FIBERS CAN INCLUDE PAPER, STRAW, COIR, CORN, ETC. THE EFFECTIVENESS OF THESE HYDRAULIC MATRICES ARE DEPENDENT ON:

- PROPER SOIL PREPARATION
- APPLICATION RATES (DEPENDENT ON THE MANUFACTURERS RECOMMENDATIONS)
- THE TYPE OF FIBERS USED
- THE TYPE OF BOND AGENT(S) ADDED

THESE HYDRAULIC MATRICES ARE CLASSIFIED IN THE MNDOT SPEC BOOK AND APPROVED PRODUCTS LIST, DEPENDING ON THE PRODUCT CHARACTERISTICS, STRENGTH, AND LONGGEVITY. HYDRAULIC MATRICES USED INCLUDE: ORGANIC FIBER MATRIX, HYDRAULIC MULCH MATRIX, STABILIZED FIBER MATRIX, BONDED FIBER MATRIX, AND FIBER REINFORCED MATRIX.

SOD TYPE LAWN: SOD IS A PERMANENT EROSION PREVENTION BMP THAT PROVIDES INSTANTANEOUS SOIL STABILIZATION. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF SOD AS OUTLINED IN THE PROJECT SPECIFICATIONS.

ENERGY DISSIPATER: AN ENERGY DISSIPATER IS A STRUCTURE DESIGNED TO CONTROL EROSION AT THE OUTLET OF A CHANNEL OR CONDUIT.

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

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.

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, 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.

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PLAN BY: CJB
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DIANE L. HANKEE, P.E. LIC. NO: 43338

DATE: 12/13/2023

STORM WATER POLLUTION PREVENTION PLAN

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 25 OF 39

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.

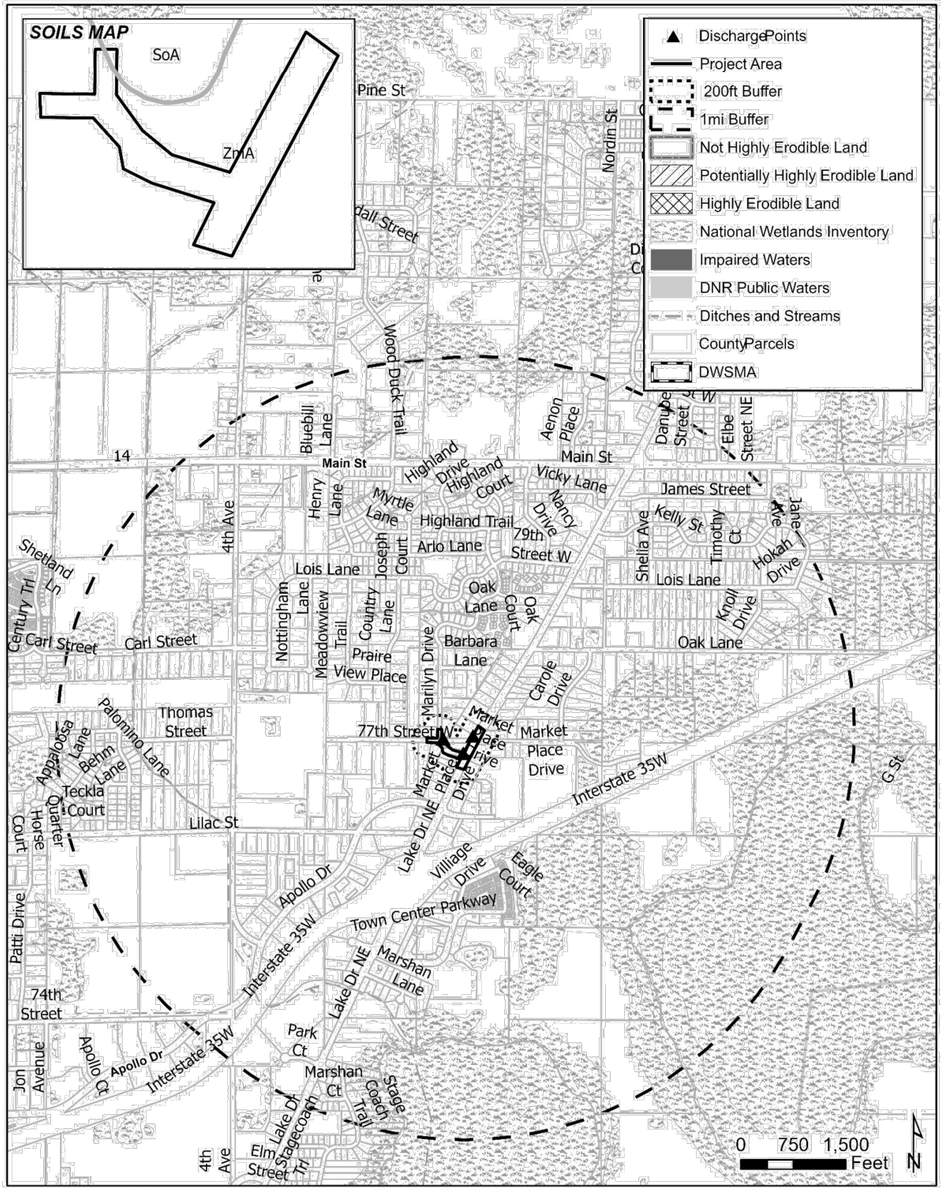

Figure 1. SWPPP Resource Map

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STORM WATER POLLUTION PREVENTION PLAN

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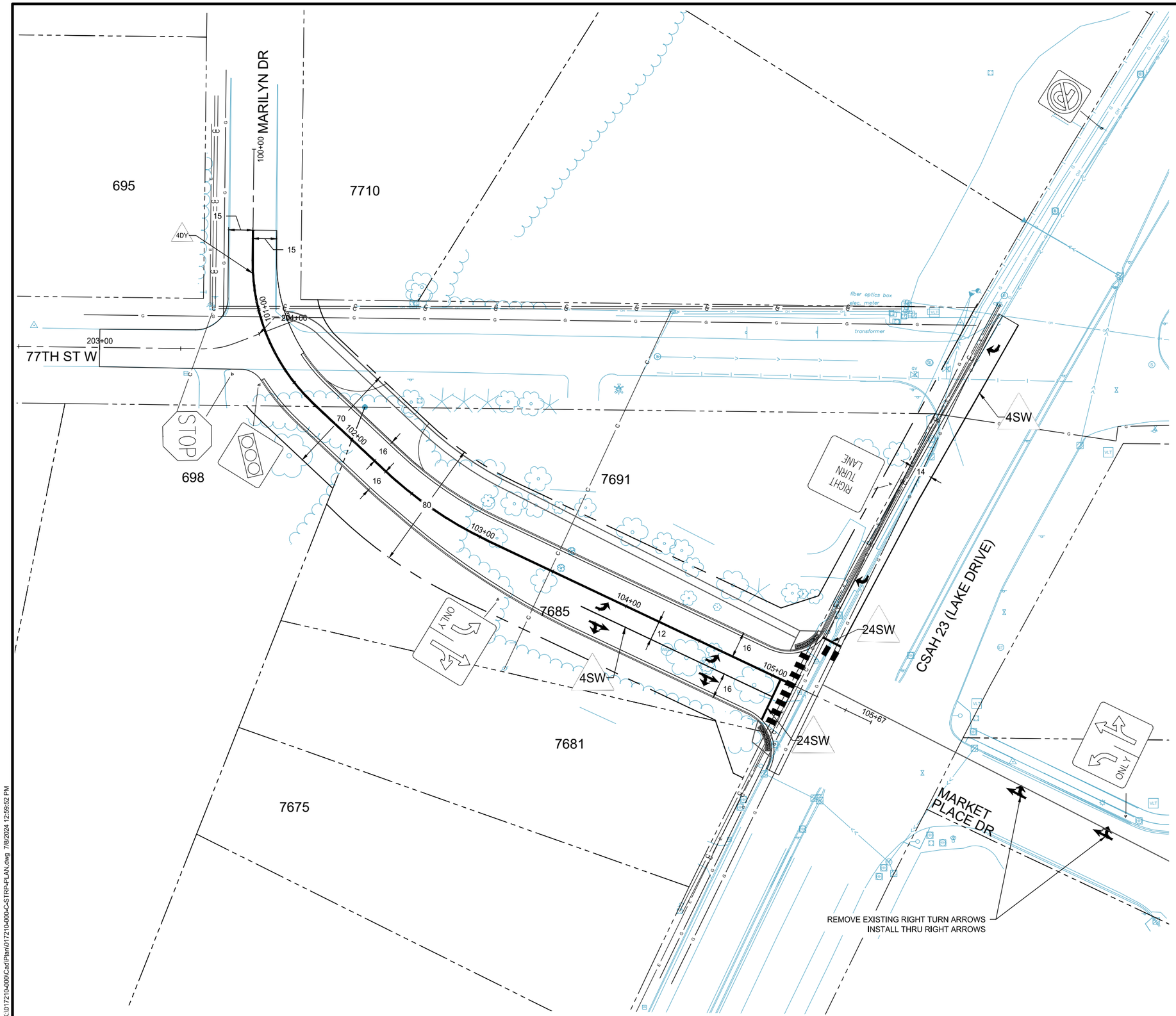
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET 26 OF 39



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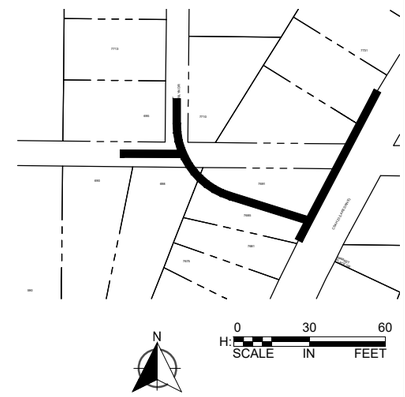

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LEGEND

STRIPING KEY

XXX TRIANGLE-MULTI COMP

PAVEMENT MESSAGE MULTI COMP (LEFT ARROW)

PAVEMENT MESSAGE MULTI COMP (THRU/ RIGHT ARROW)

CROSSWALK BLOCK WHITE MULTI COMP

1ST DIGIT WIDTH	2ND DIGIT PATTERN	3RD DIGIT COLOR
4", 8", ETC.	S - SOLID	W - WHITE
	B - BROKEN	Y - YELLOW
	T - DOTTED	B - BLACK
	D - DOUBLE	
	K - DOUBLE BROKEN	
	H - DOUBLE DOTTED	

NOTES:
SEE SHEETS SL-01 TO SL-11 FOR TRAFFIC CONTROL SIGNAL REMOVAL.

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SIGNING & STRIPING PLANS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT

CITY OF LINO LAKES, MN

WSB PROJECT NO.
017210-000

SHEET
27 OF 39

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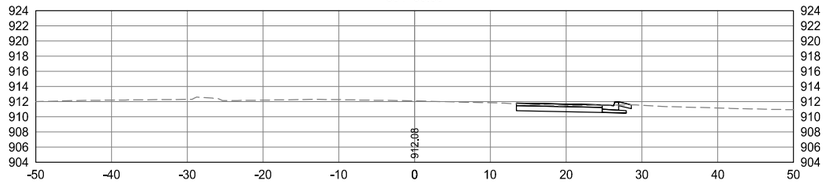

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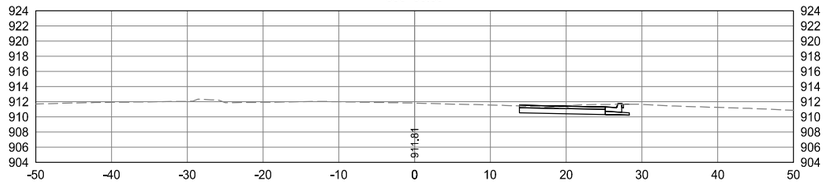

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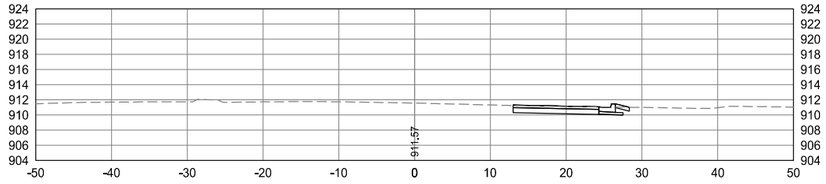

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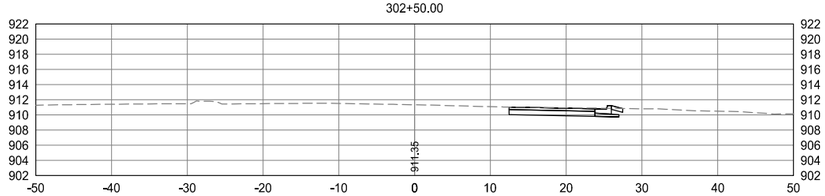

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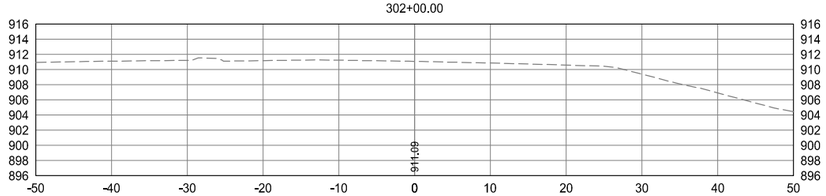

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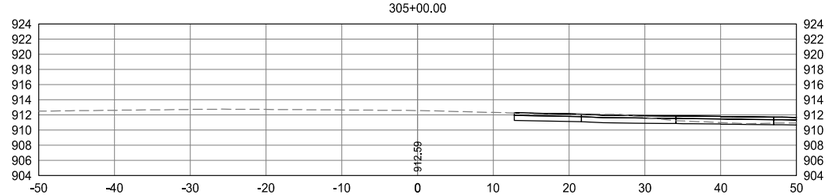

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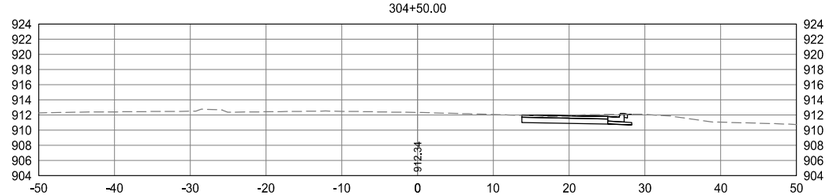

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DIANE L. HANKEE, P.E.

DATE: 12/13/2023 LIC. NO: 43338

CROSS SECTIONS

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO.
017210-000

SHEET
28 OF 39

ABBREVIATIONS

AWF	ADVANCE WARNING FLASHER
C.D.	COUNT DOWN
D2-1 (e.g.)	DETECTOR (PHASE 2, NO. 1)
DEG	DEGREES
DW	DON'T WALK
F&I	FURNISH AND INSTALL
FL	FLASH/FLASHING
FYA	FLASHING YELLOW ARROW
FYLA	FLASHING YELLOW LEFT ARROW
GLA	GREEN LEFT ARROW
GRN	GREEN INDICATION
GR. RD.	GROUND ROD
GRA	GREEN RIGHT ARROW
GTA	GREEN THRU ARROW
HH	HANDHOLE
IND	INDICATION
INP	INPLACE
INS. GR.	INSULATED GROUND
JB	JUNCTION BOX
LED	LIGHT EMITTING DIODE
LUM	LUMINAIRE
NEU	NEUTRAL
P1-1 (e.g.)	PEDESTRIAN HEAD (PHASE 1, NO. 1)
PB	PUSH BUTTON
PB2-1 (e.g.)	PUSH BUTTON (PHASE 2, NO. 1)
PED	PEDESTRIAN
RED	RED INDICATION
R&S	REMOVE AND SALVAGE
RLA	RED LEFT TURN ARROW
S&I	SALVAGE AND INSTALL
SPR	SPARE
STA	STATION
WLK	WALK INDICATION
YEL	YELLOW INDICATION
YLA	YELLOW LEFT ARROW
YRA	YELLOW RIGHT ARROW

SYMBOLS

- HANDHOLE
- EQUIPMENT GROUND 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 PLANS - SIGNAL SYSTEMS

5-297.731	SIGN MOUNTING DETAILS FOR SIGNAL MAST ARMS

STANDARD PLATES - SIGNAL SYSTEMS

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT

PLATE NO.		DESCRIPTION
▻ 8111	E	TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED)
▻ 8119	C	GROUND MOUNTED CABINET FOUNDATION
▻ 8121	H	TRANSFORMER BASE AND POLE BASE PLATE

PLATE NO.		DESCRIPTION
▻ 8122	F	PEDESTAL AND PEDESTAL BASE
▻ 8123	G	POLE AND MAST ARM (2 SHEETS)
▻ 8126	L	POLE FOUNDATION (P4P8 AND P4P8M)
▻ 8129	A	SHIM AND WASHER
▻ 8132	B	PREFORMED RIGID PVC CONDUIT LOOP DETECTOR

▻ STANDARD PLATES APPLICABLE TO THIS PROJECT

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SEAN DELMORE, P.E. LIC. NO: 40945

DATE: 12/13/2023

LEGEND & STANDARD PLATES

TRAFFIC CONTROL SIGNAL SYSTEM

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT

CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET SL01 OF 39

SIGN PANELS ON SIGNALS

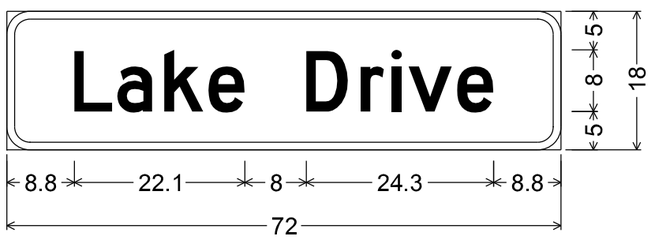
POLE NUMBER	"A" DISTANCE (FEET) OR POLE	PANEL				
		QTY	CODE NUMBER	LEGEND	SIZE (INCHES)	AREA (SQ FT)
1	25.8'	1	D-1	LAKE DRIVE	72 x 18	9.00
2	INP	1	INP	MARKETPLACE DR		
3	INP	1	INP	LAKE DRIVE		
4	INP	1	INP	MARKETPLACE DR		

GENERAL NOTES:

1. SEE THE CURRENT MnDOT STANDARD SIGNS AND MARKINGS MANUAL FOR STANDARD SIGN DESIGNS, ARROW DETAILS AND SPLICE PLATE DETAILS.
2. FOR NON STANDARD SIGN DESIGNS, LAYOUTS ARE INCLUDED. SIGN PANEL DIMENSIONS ARE IN INCHES.
3. SEE DETAIL SHEET FOR SIGN MOUNTING TO MAST ARM.
4. MOUNTING HEIGHT OF POLE MOUNTED SIGN PANELS MUST BE 7 FOOT MINIMUM.
   MOUNTING HEIGHT IS MEASURED FROM BOTTOM OF SIGN PANEL TO SURFACE IMMEDIATELY BELOW THE SIGN PANEL.
5. "A" DISTANCE = DISTANCE FROM THE END OF THE MAST ARM TO THE EDGE OF EACH SIGN PANEL.
6. SEE INTERSECTION LAYOUT FOR SIGN PLACEMENT.

SIGN DETAILS

D-1



3.0" Radius, 1.0" Border, White on, Green;
"Lake Drive", D 2K;

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DATE: 12/13/2023

SIGN DETAILS

TRAFFIC CONTROL SIGNAL SYSTEM

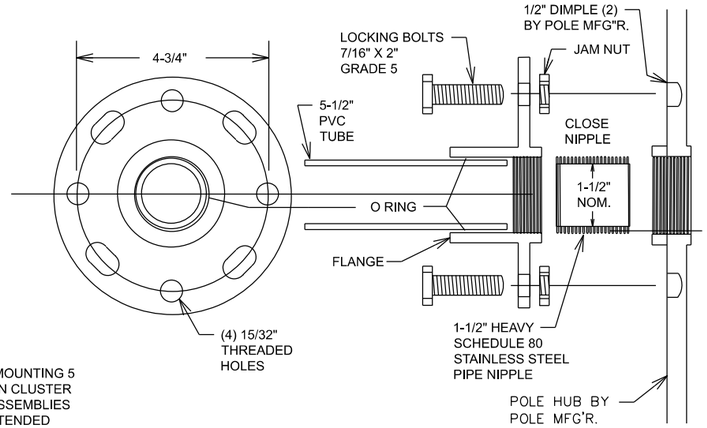
2024 MARKET PLACE DRIVE REALIGNMENT PROJECT

CITY OF LINO LAKES, MN

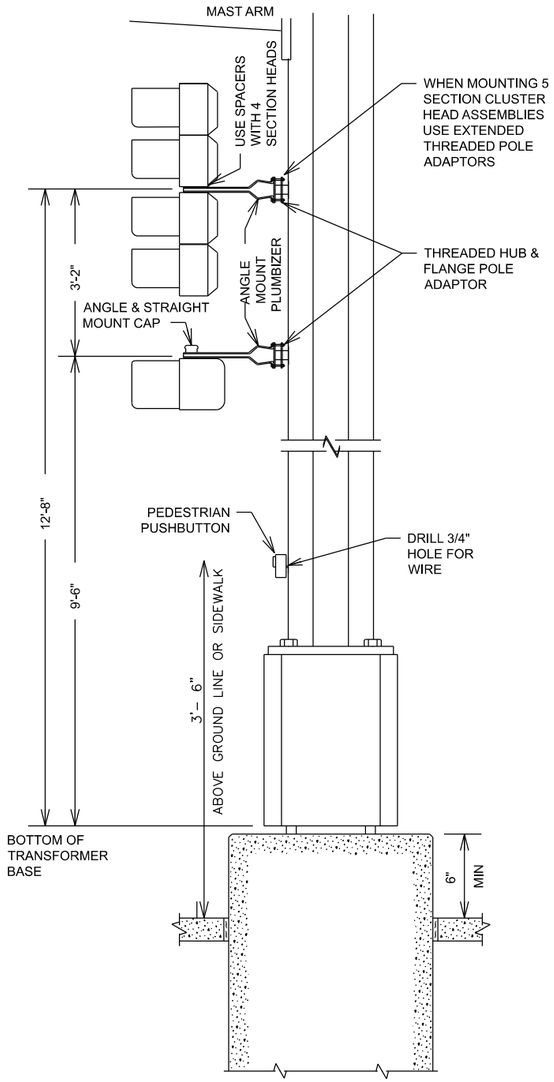
WSB PROJECT NO. 017210-000

SHEET

SL02 OF 39

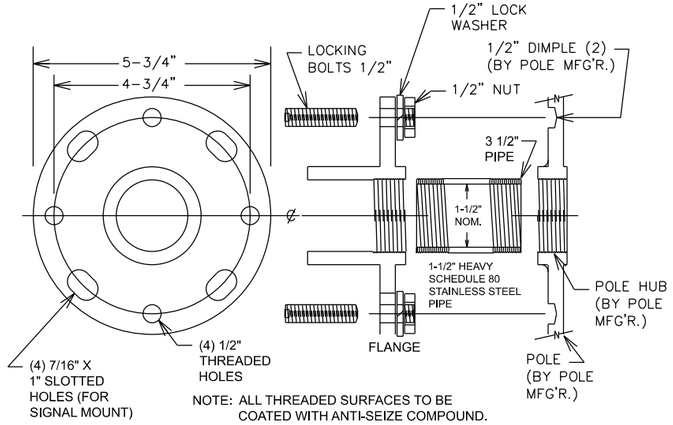


THREADED HUB AND FLANGE POLE ADAPTOR



TYPICAL SIGNAL POLE MOUNTING

NOT TO SCALE



NOTE: ALL THREADED SURFACES TO BE COATED WITH ANTI-SEIZE COMPOUND.

EXTENDED THREADED POLE ADAPTER

NOTES:

1. ALL THREADED SURFACES TO BE COATED WITH ANTI-SEIZE COMPOUND.
2. USE SIGNAL HEAD MOUNTED SPACERS FOR 4 SECTION POLY HEADS.
3. SEE STANDARD PLATE NUMBER 8123 FOR ADDITIONAL SIGNAL POLE DETAILS.
4. EXTENDED THREADED POLE ADAPTOR ONLY USED WITH 5 SECTION CLUSTER HEADS.

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SEAN DELMORE, P.E. LIC. NO: 40945

DATE: 12/13/2023

POLE MOUNTING DETAIL

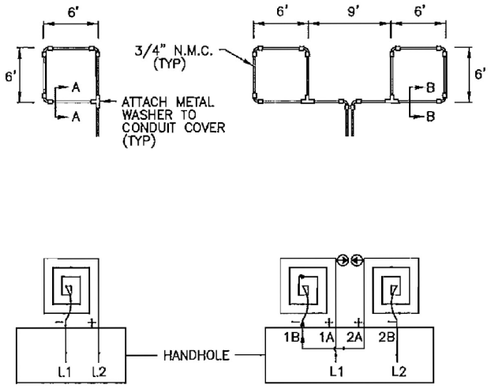
TRAFFIC CONTROL SIGNAL SYSTEM

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT

CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET SL03 OF 39

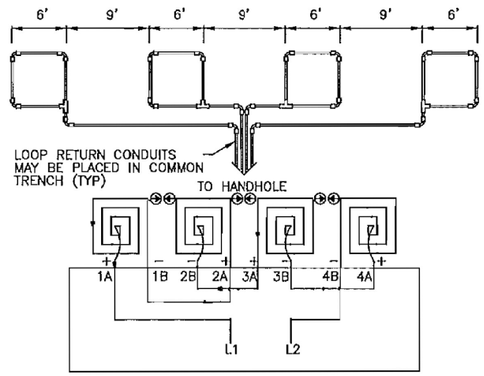


LOOP DETECTOR DETAIL 'A'
(LOOP PHASING FOR SINGLE CONNECTION)

LOOP DETECTOR DETAIL 'B'
(LOOP PHASING FOR SERIES CONNECTION)

LOOP CONNECTIONS SHALL BE LABELED AND SPLICED IN THE HANDHOLE AS FOLLOWS:

L1 TO 1A
1B TO 2A
2B TO L2

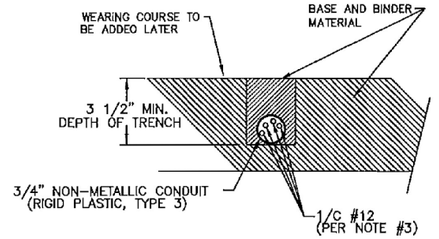


LOOP CONNECTIONS SHALL BE LABELED AND SPLICED IN THE HANDHOLE AS FOLLOWS:

L1 TO 1A	3B TO 4A
1B TO 2A	4B TO L2
2B TO 3A	

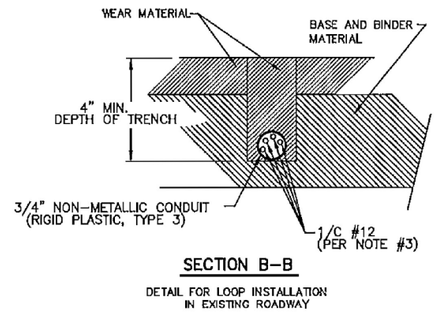
SPLICE CONTROL CABLE TO L1 & L2 IN HANDHOLE. ALL CONDUCTORS SHALL BE TAGGED IN HANDHOLE (1A, 1B, ECT)

LOOP DETECTOR DETAIL 'C'
(LOOP PHASING FOR SERIES CONNECTION)



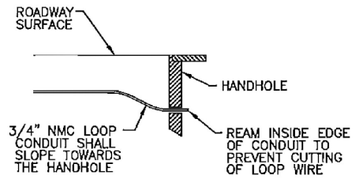
SECTION A-A

DETAIL FOR LOOP INSTALLATION IN NEW ROADWAY



SECTION B-B

DETAIL FOR LOOP INSTALLATION IN EXISTING ROADWAY



DRAINAGE DETAIL

LOOP DETECTOR WIRING

1) ALL CORNERS SHALL BE 90° CONDUIT BENDS.
2) CONNECT WIRES IN HANDHOLES USING SPLICE KIT METHOD DESCRIBED IN THE SPECIAL PROVISIONS.
3) LOOP DETECTOR WIRES SHALL BE #12 AWG CROSSED LINKED POLYETHYLENE (XLP). SEE SPECIAL PROVISIONS.
4) LOOP LEAD IN WIRES SHALL BE TWISTED A MIN. OF (5) TURNS PER FOOT THROUGH THE CONDUIT TO THE HANDHOLE.
5) NMC DESIGNATES NON-METALLIC CONDUIT (SPEC. 3803)
6) LOOPS 6' x 6' THRU 6' x 14' SHALL HAVE (4) TURNS.
7) LOOPS 6' x 15' AND LARGER SHALL HAVE (2) TURNS.

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CITY OF LINO LAKES

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SEAN DELMORE, P.E.
LIC. NO: 40945
DATE: 12/13/2023

LOOP DETECTOR DETAIL

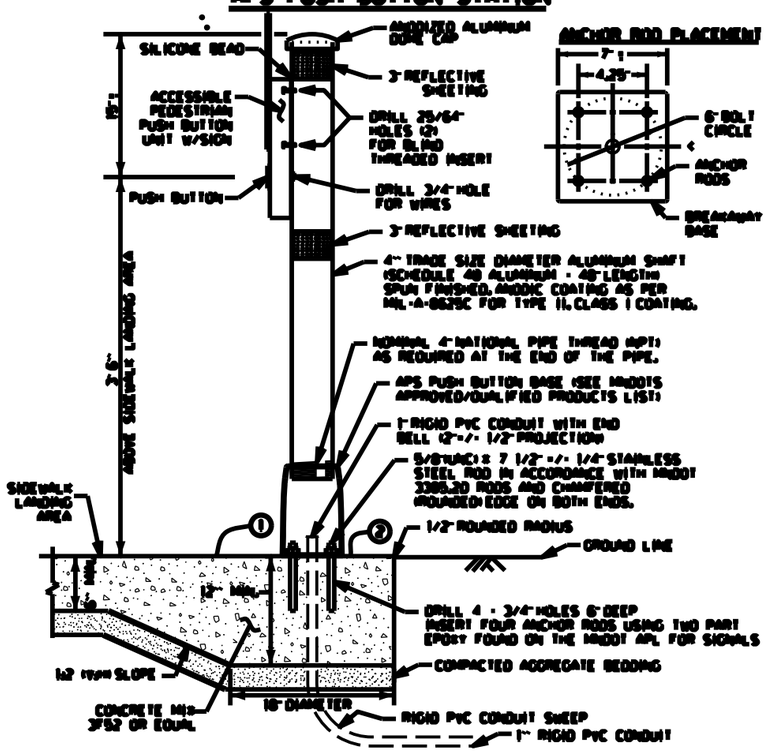
TRAFFIC CONTROL SIGNAL SYSTEM

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

WSB PROJECT NO.
017210-000

SHEET
SL04 OF 39

APS PUSH BUTTON STATION



NOTES:

PLACEMENT AND ORIENTATION OF THE PUSH BUTTON STATION IS CRITICAL. MOUNT THE BUTTON SO THAT THE FACE IS PARALLEL WITH THE ASSOCIATED CROSSWALK. SCREW IN SHAFT TO A TIGHTENED POSITION BEFORE MOUNTING ACCESSIBLE PEDESTRIAN PUSH BUTTON UNIT TO THE SHAFT.

ORIENT ACCESS OPENING ON THE BREAKAWAY PEDESTAL DIRECTLY BELOW THE APS BUTTON.

PLUMB THE PUSH BUTTON STATION WITH LEVELING SHIMS IN ACCORDANCE WITH STANDARD PLATE 8129.

INSTALL BLIND THREADED INSERTS USING MANUFACTURER'S SPECIFIC INSERTION TOOL.

USE ZINC PLATED STEEL 1/4 - 20 UNC BLIND THREADED INSERTS SUITABLE FOR MOUNTING ON SURFACE WALL THICKNESS OF .337. APPROVED BLIND INSERTS ARE LISTED ON MnDOT'S APPROVED/QUALITY PRODUCTS LIST WEBSITE FOR TRAFFIC SIGNALS.

USE APS 1/4 - 20 STAINLESS STEEL MOUNTING BOLTS. APPLY BRUSH ON ANTI SEIZE COMPOUND TO BOLTS PRIOR TO ASSEMBLY.

APPLY A BEAD OF NON SILICONE SEALANT ALONG THE TOP OF THE PUSH BUTTON UNIT WHERE IT COMES IN CONTACT WITH THE 4" SHAFT.

USE WHITE REFLECTIVE SHEETING AT INTERSECTION CORNERS AND YELLOW REFLECTIVE SHEETING IN CENTER MEDIANS. APPROVED TUBE DELINEATOR SHEETING IS LISTED ON MnDOT'S APPROVED/QUALIFIED PRODUCTS LIST WEBSITE FOR SIGNING.

AN 18" x 6" FIBER FORMING TUBE MAY BE USED FOR THE LOWER HALF OF THE FOUNDATION WHEN CONDITIONS DO NOT ALLOW FOR THE 18" x 6" HOLE TO STAND OPEN.

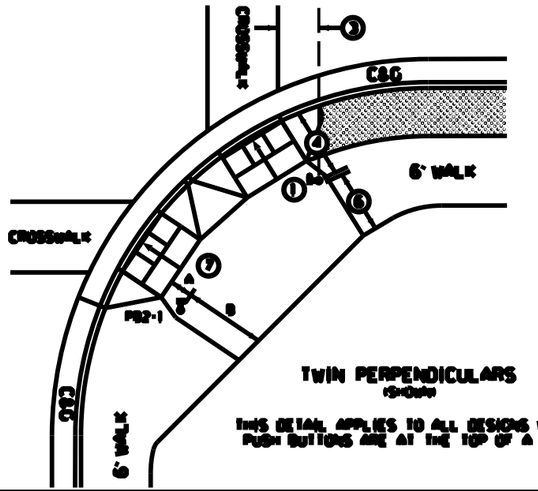
1. THE PUSH BUTTON STATION FOUNDATION IS MONOLITHIC (POURED AT ONE TIME) WITH THE SIDEWALK. PROVIDE A 1:2 max SLOPE GRADE WHERE THE 6" MIN SIDEWALK DEPTH TRANSITIONS TO THE 12" MIN FOUNDATION DEPTH, MAINTAIN THE COMPACTED AGGREGATE BEDDING AND THICKNESS USED FOR THE SIDEWALK THROUGHOUT THE SLOPE AND FOUNDATION GRADING. PROVIDE 1:2 max SLOPE GRADING 360 DEGREES FOR THE TRANSITION FROM THE SIDEWALK TO THE FOUNDATION WHEN THE FOUNDATION IS NOT LOCATED NEAR EDGE OF SIDEWALK AND IS SURROUNDED BY CONCRETE WALK.
2. ENSURE CONCRETE CONTROL JOINTS AND EDGE OF CONCRETE WALK ARE A MINIMUM 4" FROM THE CENTER OF THE PUSH BUTTON FOUNDATION.

TYPICAL PEDESTRIAN PUSH BUTTON LOCATION

THIS IS A GENERAL DETAIL INTENDED TO SHOW THE REQUIREMENTS OF APS PUSH BUTTON LOCATION. FOR PROJECT SPECIFIC INFORMATION REGARDING PEDESTRIAN RAMP LAYOUT AND PUSH BUTTON LOCATIONS, SEE THE PLAN.

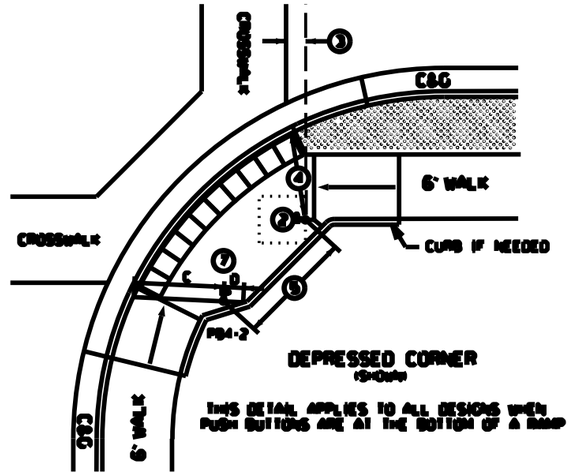
SUPPLEMENTAL GUIDANCE FOR CONSTRUCTING COMPLIANT APS PUSH BUTTONS:

1. THE FACE OF THE BUTTON SHALL BE PARALLEL WITH THE OUTSIDE EDGE OF CROSSWALK.
2. A MINIMUM 4 FT x 4 FT LANDING AREA SHALL BE PROVIDED ADJACENT TO EACH BUTTON, WITH A 2 PERCENT MAXIMUM SLOPE IN ALL DIRECTIONS.
3. BUTTONS SHALL BE WITHIN 5 FT OF THE OUTSIDE EDGE OF THE CROSSWALK.
4. BUTTONS SHALL BE BETWEEN 15 FT AND 10 FT FROM THE BACK OF CURB OR EDGE OF ROADWAY, MEASURED IN THE DIRECTION OF TRAVEL. STANDALONE PUSH BUTTON STATIONS SHOULD BE 4' MINIMUM FROM THE BACK OF CURB TO AVOID KNOCKDOWNS.
5. BUTTONS SHALL BE AT LEAST 10 FT APART.
6. PROVIDE A MAINTENANCE ACCESS ROUTE (MAR) WHEREVER POSSIBLE FOR SNOW REMOVAL PURPOSES. A MAR REQUIRES A 6 FT MINIMUM CLEAR DISTANCE BETWEEN A PUSH BUTTON AND ANY OBSTRUCTIONS, INCLUDING BUILDINGS, V-CURB, ELECTRICAL FOUNDATIONS, SIGNAL CABINETS, OR ANOTHER PUSH BUTTON.
7. BUTTON SHOULD BE 2 FT MINIMUM FROM RAMP GRADE BREAK AND BACK OF WALK.



TWIN PERPENDICULARS

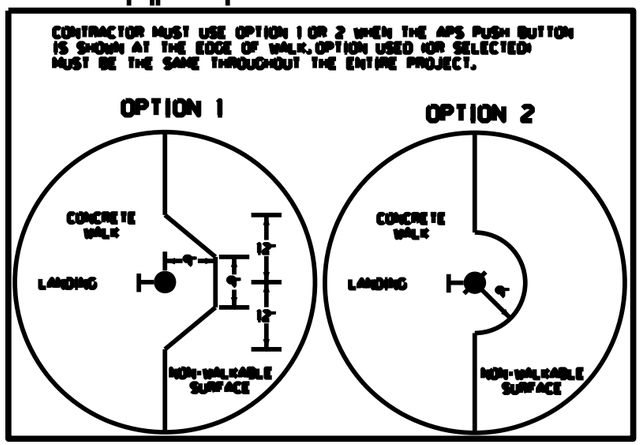
THIS DETAIL APPLIES TO ALL DESIGNS WHEN PUSH BUTTONS ARE AT THE TOP OF A RAMP



DEPRESSED CORNER

THIS DETAIL APPLIES TO ALL DESIGNS WHEN PUSH BUTTONS ARE AT THE BOTTOM OF A RAMP

CONTRACTOR MUST USE OPTION 1 OR 2 WHEN THE APS PUSH BUTTON IS SHOWN AT THE EDGE OF WALK. OPTION USED (OR SELECTED) MUST BE THE SAME THROUGHOUT THE ENTIRE PROJECT.



SIGNAL CONTROL POINTS			DISTANCE TO FRONT OF LANDING (FT)	DISTANCE TO BACK OF LANDING (FT)
SIGNAL NO.	X	Y		
PB2-1	-	-	A	B
PB4-2	-	-	C	D

A - DISTANCE MEASURED FROM THE PUSH BUTTON TO THE FRONT OF LANDING/TOP OF RAMP

B - CLEAR DISTANCE MEASURED FROM THE PUSH BUTTON TO THE BACK OF LANDING/EDGE OF WALK

C - CLEAR DISTANCE MEASURED FROM THE PUSH BUTTON TO THE OUTSIDE EDGE OF CURBS IN THE DIRECTION OF TRAVEL

D - CLEAR DISTANCE FROM THE PUSH BUTTON TO THE BACK OF LANDING MEASURED IN THE OPPOSITE DIRECTION OF TRAVEL

wsb

CITY OF LINO LAKES

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SEAN DELMORE, P.E.

DATE: 12/13/2023 LIC. NO: 40945

PUSH BUTTON DETAIL

TRAFFIC CONTROL SIGNAL SYSTEM

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT

CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET SL05 OF 39

NOTES:
1) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
2) EXACT LOCATION OF PUSH BUTTON STATIONS AND LOOPS SHALL BE DETERMINED IN THE FIELD BY AGENCY PERSONNEL AND VERIFIED BY COUNTY TRAFFIC OFFICE PERSONELL (SEE SPECIAL PROVISIONS FOR CONTACT INFORMATION).
3) CONTRACTOR SHALL SALVAGE EXISTING POLE 3 AND INSTALL NEW FOUNDATION
4) CONTRACTOR SHALL FURNISH & INSTALL NEW LOOP DETECTORS FOR PHASE 4. CONTRACTOR SHALL TEST ALL LOOP DETECTORS AND SUBMIT REPORT.
5) CONTRACTOR SHALL FURNISH AND INSTALL D SIGN FOR MAST ARM 1.
6) THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH ANOKA COUNTY FOR MODIFICATIONS TO THE CABINET AND CONTROLLER.
7) CONTRACTOR SHALL FURNISH AND INSTALL 6 C.D. PED INDICATIONS.
8) CROSSWALK MARKING BY OTHERS (SEE STRIPING PLAN).
9) REFER TO SHEETS FOR INPLACE SIGNAL COMPONENTS
10) FOR CONSTRUCTION OF PEDESTRIAN CURB RAMPS, CONCRETE WALK AND MEDIAN WORK SEE DETAIL SHEET. (NOT INCLUDED IN TRAFFIC CONTROL SYSTEM PAY ITEM).
11) THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER THE ROADWAYS REQUIRE BORING.
12) USE PVC OR HDPE FOR ALL NEW CONDUIT.
13) CONDUIT SIZES ARE NOMINAL DIAMETER.
14) ALL WIRES LISTED ARE AWG (AMERICAN WIRE GAUGE).
15) CONTRACTOR SHALL INSTALL ANOKA COUNTY FURNISHED 40' MAST ARM. CONTRACTOR SHALL PAINT THE MAST ARM.

(A)
INP — EQUIPMENT PAD
SERVICE CABINET
CONTROLLER AND CABINET

INP — CONTROLLER CABINET TO HH 1:
4" CONDUIT
5-12/C 14
2-3/C#20 (EVP)
2-3/C 12 (EVP)
6-2/C#14
1-1/C#6 INS. GR.
✱F&I — 4-2/C 14
5-2/C 14 (SHLD)
4-4/C 18

INP — CONTROLLER CABINET TO HH 14:
4" CONDUIT
4-12/C 14
1-3/C#20 (EVP)
1-3/C 12 (EVP)
4-2/C 14
1-1/C#6 INS. GR.
✱F&I — 1-12/C 14
1-3/C#20 (EVP)
1-3/C 12 (EVP)
3-2/C 14 (SHLD)
4-4/C 18

CONTROLLER CABINET STUB OUT
3" CONDUIT (THREAD AND CAP BOTH ENDS)

INP — SERVICE CABINET TO HH 15:
2" CONDUIT
3-1/C 6
2-3/C 12 (UNMETERED STREET LIGHT SERVICE)
1-1/C#6 INS. GR.

(B)
INP — SOURCE OF POWER
EXTEND INTO HH 16:
2" CONDUIT
3-1/C#2

(2)
INP — PA90 POLE FOUNDATION
TYPE PA90-A-40-D40-9 (DAVIT AT 350 DEG)
3-ONE WAY SIGNALS OVERHEAD AT 0', 11' AND 23'
2-TYPE 10A-POLE MOUNTED 90 AND 180 DEG
TYPE "D" SIGN
R6-1 SIGN PANEL
R9-3a SIGN FACING POLE 1
ONE WAY EVP DETECTOR AND LIGHT (PHASES 1 & 6)
EXTEND INTO HH 5:
3" RSC
3-12/C 12
2-3/C 12
1-3/C 12 (LUM)
1-3/C 20
1-TYPE 10A SIGNAL HEAD

REMOVE — 1-TYPE 10A SIGNAL HEAD
1 TYPE 10B-C.D. PED IND MOUNTED AT 180 DEG
1-PUSH BUTTON & SIGN (RT ARROW) (PB6-2)
✱F&I — EXTEND INTO HH 5:
1-2/C 14
1-3/C 20 (EVP)

✱F&I — 2" CONDUIT
1-3/C 20
1-2/C 14
1-1/C 6 INS. GR.

✱F&I — 2" CONDUIT
1-3/C 20

✱F&I — PED PB STATION
1-PB AND SIGN (RT ARROW) (PB6-2)
EXTEND INTO HH 6:
1" CONDUIT
1-2/C 14 (SHLD)
1-1/C 6 INS. GR.

INP — 2" CONDUIT
3-1/C 2

INP — 4" CONDUIT
5-12/C 14
2-3/C#20 (EVP)
2-3/C 12 (EVP)
6-2/C#14
1-3/C 14 (LUM)
1-1/C#6 INS. GR.
✱F&I — 4-2/C 14
4-2/C 14 (SHLD)
4-4/C 18

INP — 2" CONDUIT
3-1/C 2

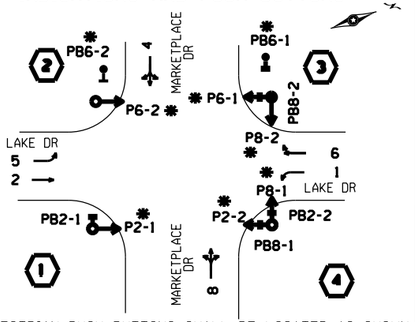
INP — 2" CONDUIT
2-2/C 14
1-6 PR 19 (INTERCONNECT)

• REVISE SIGNAL SYSTEM WORK TO BE COMPLETED WITH THIS PROJECT IS INDICATED WITH A •. ALL OTHER ITEMS SHOWN ARE INPLACE.

(1)
PA100 POLE FOUNDATION
TYPE PA100 POLE
TYPE 10B-POLE MOUNTED AS SHOWN
TYPE 10A-POLE MOUNTED AS SHOWN
INP — PED PUSH BUTTON
R9-3a SIGN FACING POLE 2
EXTEND INTO HH 14:
1-12/C 12
4-3/C 12

REMOVE — PED INDICATION
INSTALL — 40' MAST ARM (COUNTY SUPPLIED)
1-ANGLE MOUNT SIGNAL HEAD MOUNTED AT 0'
1-ONE WAY EVP DETECTOR AND LIGHT (PHASE 4)
✱F&I — 1-TYPE 10B C.D. PED IND
1-SIGN (SEE DETAIL SHEET)
1-3/C 14 (EVP)
1-3/C 20 (EVP)

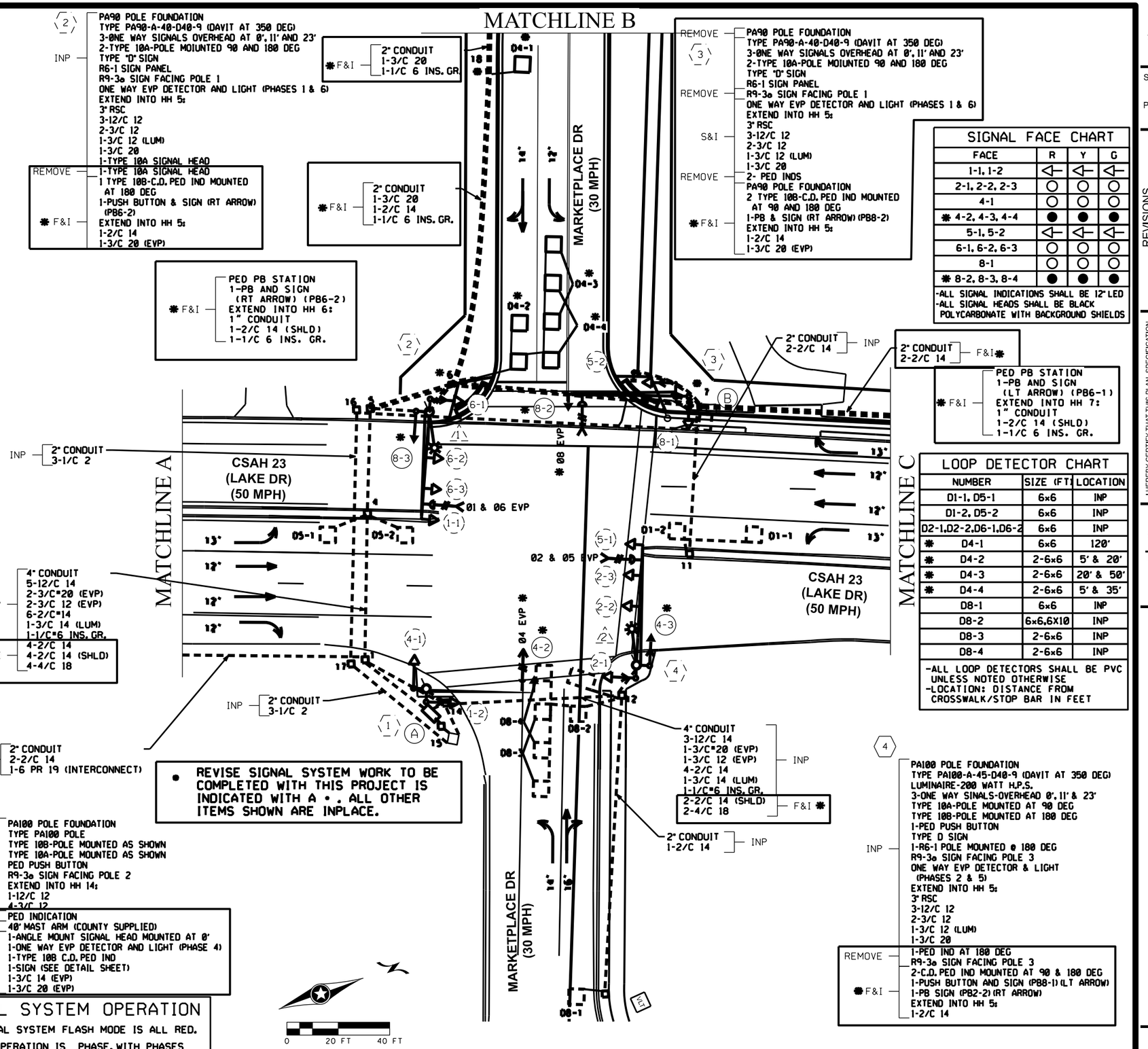
CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



PEDESTRIAN PUSH BUTTONS SHALL BE LOCATED AS SHOWN

SIGNAL SYSTEM OPERATION

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS PHASE, WITH PHASES 1 AND 5 BEING PROTECTED LEFT TURN PHASES.
- PHASES 2 & 6 SHALL BE ON VEHICLE RECALL.



(3)
REMOVE — PA90 POLE FOUNDATION
TYPE PA90-A-40-D40-9 (DAVIT AT 350 DEG)
3-ONE WAY SIGNALS OVERHEAD AT 0', 11' AND 23'
2-TYPE 10A-POLE MOUNTED 90 AND 180 DEG
TYPE "D" SIGN
R6-1 SIGN PANEL
REMOVE — R9-3a SIGN FACING POLE 1
ONE WAY EVP DETECTOR AND LIGHT (PHASES 1 & 6)
EXTEND INTO HH 5:
3" RSC
S&I — 3-12/C 12
2-3/C 12
1-3/C 12 (LUM)
1-3/C 20
REMOVE — 2- PED INDS
PA90 POLE FOUNDATION
2 TYPE 10B-C.D. PED IND MOUNTED AT 90 AND 180 DEG
✱F&I — 1-PB & SIGN (RT ARROW) (PB8-2)
EXTEND INTO HH 5:
1-2/C 14
1-3/C 20 (EVP)

SIGNAL FACE CHART

FACE	R	Y	G
1-1, 1-2	◁	◁	◁
2-1, 2-2, 2-3	○	○	○
4-1	○	○	○
✱ 4-2, 4-3, 4-4	●	●	●
5-1, 5-2	◁	◁	◁
6-1, 6-2, 6-3	○	○	○
8-1	○	○	○
✱ 8-2, 8-3, 8-4	●	●	●

-ALL SIGNAL INDICATIONS SHALL BE 12" LED
-ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BACKGROUND SHIELDS

INP — 2" CONDUIT
2-2/C 14

✱F&I — 2" CONDUIT
2-2/C 14

✱F&I — PED PB STATION
1-PB AND SIGN (LT ARROW) (PB6-1)
EXTEND INTO HH 7:
1" CONDUIT
1-2/C 14 (SHLD)
1-1/C 6 INS. GR.

LOOP DETECTOR CHART

NUMBER	SIZE (FT)	LOCATION
D1-1, D5-1	6x6	INP
D1-2, D5-2	6x6	INP
D2-1,D2-2,D6-1,D6-2	6x6	INP
✱ D4-1	6x6	120'
✱ D4-2	2-6x6	5' & 20'
✱ D4-3	2-6x6	20' & 50'
✱ D4-4	2-6x6	5' & 35'
D8-1	6x6	INP
D8-2	6x6,6X10	INP
D8-3	2-6x6	INP
D8-4	2-6x6	INP

-ALL LOOP DETECTORS SHALL BE PVC UNLESS NOTED OTHERWISE
-LOCATION: DISTANCE FROM CROSSWALK/STOP BAR IN FEET

INP — 4" CONDUIT
3-12/C 14
1-3/C#20 (EVP)
1-3/C 12 (EVP)
4-2/C 14
1-3/C 14 (LUM)
1-1/C#6 INS. GR.
✱F&I — 2-2/C 14 (SHLD)
2-4/C 18

INP — 2" CONDUIT
1-2/C 14

(4)
INP — PA100 POLE FOUNDATION
TYPE PA100-A-45-D40-9 (DAVIT AT 350 DEG)
LUMINAIRE-200 WATT H.P.S.
3-ONE WAY SINALS-OVERHEAD 0', 11' & 23'
TYPE 10A-POLE MOUNTED AT 90 DEG
TYPE 10B-POLE MOUNTED AT 180 DEG
1-PED PUSH BUTTON
TYPE D SIGN
1-R6-1 POLE MOUNTED @ 180 DEG
R9-3a SIGN FACING POLE 3
ONE WAY EVP DETECTOR & LIGHT (PHASES 2 & 5)
EXTEND INTO HH 5:
3" RSC
3-12/C 12
2-3/C 12
1-3/C 12 (LUM)
1-3/C 20
REMOVE — 1-PED IND AT 180 DEG
R9-3a SIGN FACING POLE 3
2-C.D. PED IND MOUNTED AT 90 & 180 DEG
1-PUSH BUTTON AND SIGN (PB8-1) (LT ARROW)
✱F&I — 1-PB SIGN (PB2-2) (RT ARROW)
EXTEND INTO HH 5:
1-2/C 14

wsb — CITY OF LINO LAKES

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SEAN DELMORE, P.E. LIC. NO: 40945
DATE: 12/13/2023

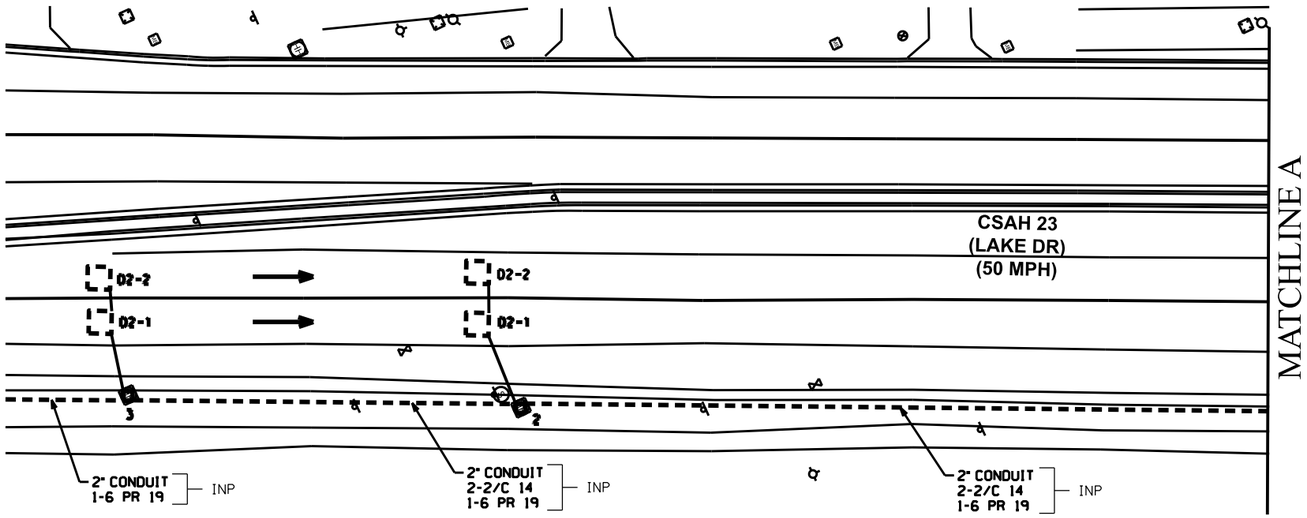
CSAH 23 & MARKETPLACE DR
INTERSECTION LAYOUT
TRAFFIC CONTROL SIGNAL SYSTEM

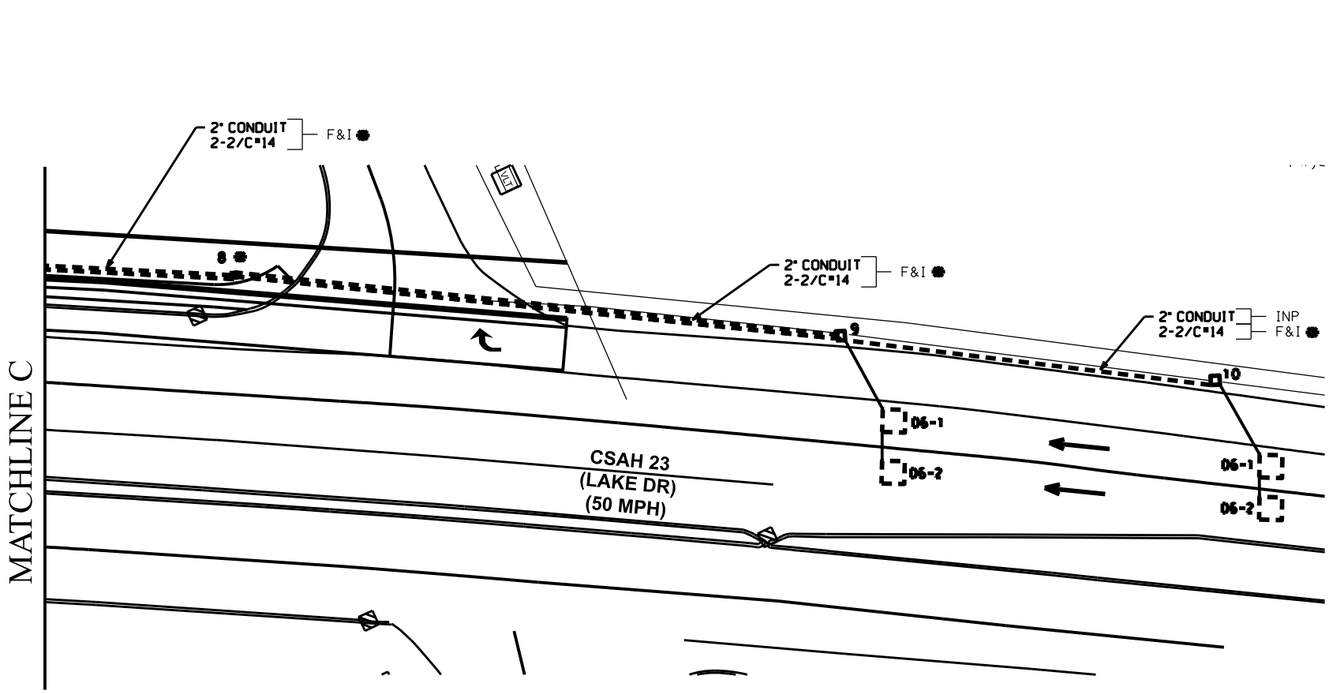
2024 MARKET PLACE DRIVE
REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

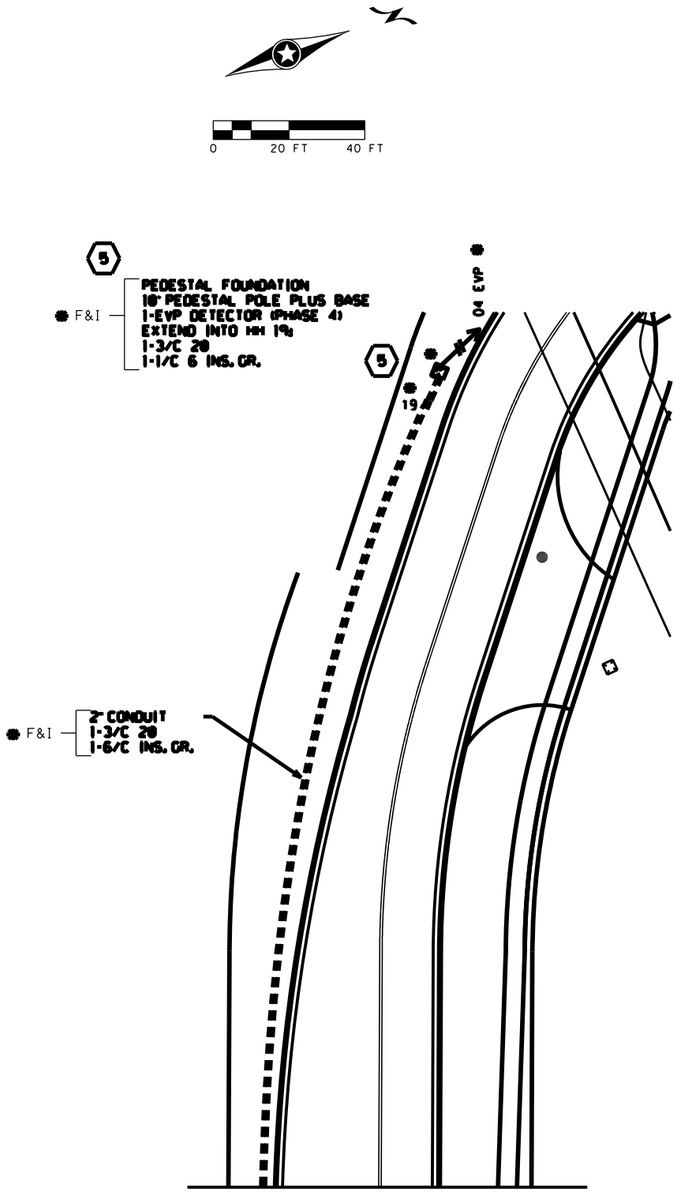
PRELIMINARY PLAN

WSB PROJECT NO.
017210-000

SHEET
SL06 OF 39







REVISE SIGNAL SYSTEM WORK TO BE COMPLETED WITH THIS PROJECT IS INDICATED WITH A ● ALL OTHER ITEMS SHOWN ARE EXISTING.

wsb

CITY OF LINO LAKES

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PLAN BY:

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DATE: 12/13/2023

LIC. NO: 40945

MATCH LINES & POLE NOTES

TRAFFIC CONTROL SIGNAL SYSTEM

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WSB PROJECT NO.
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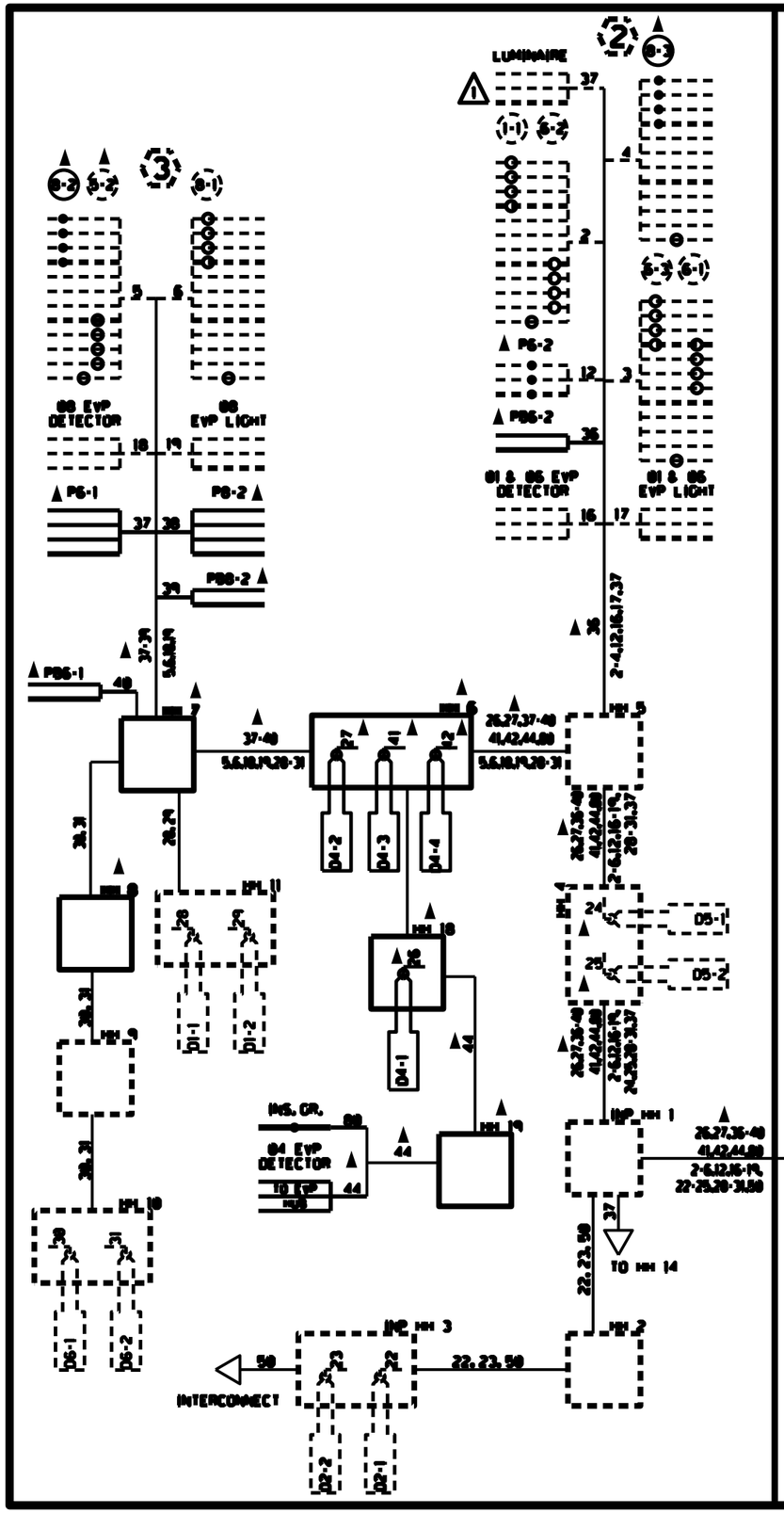
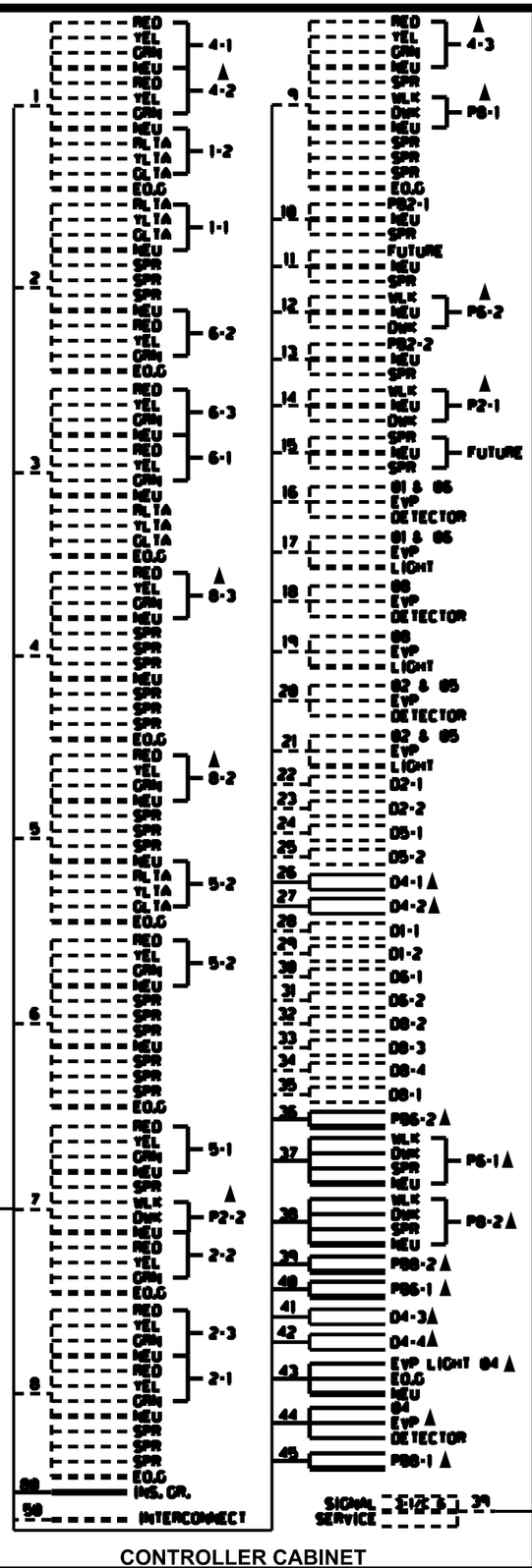
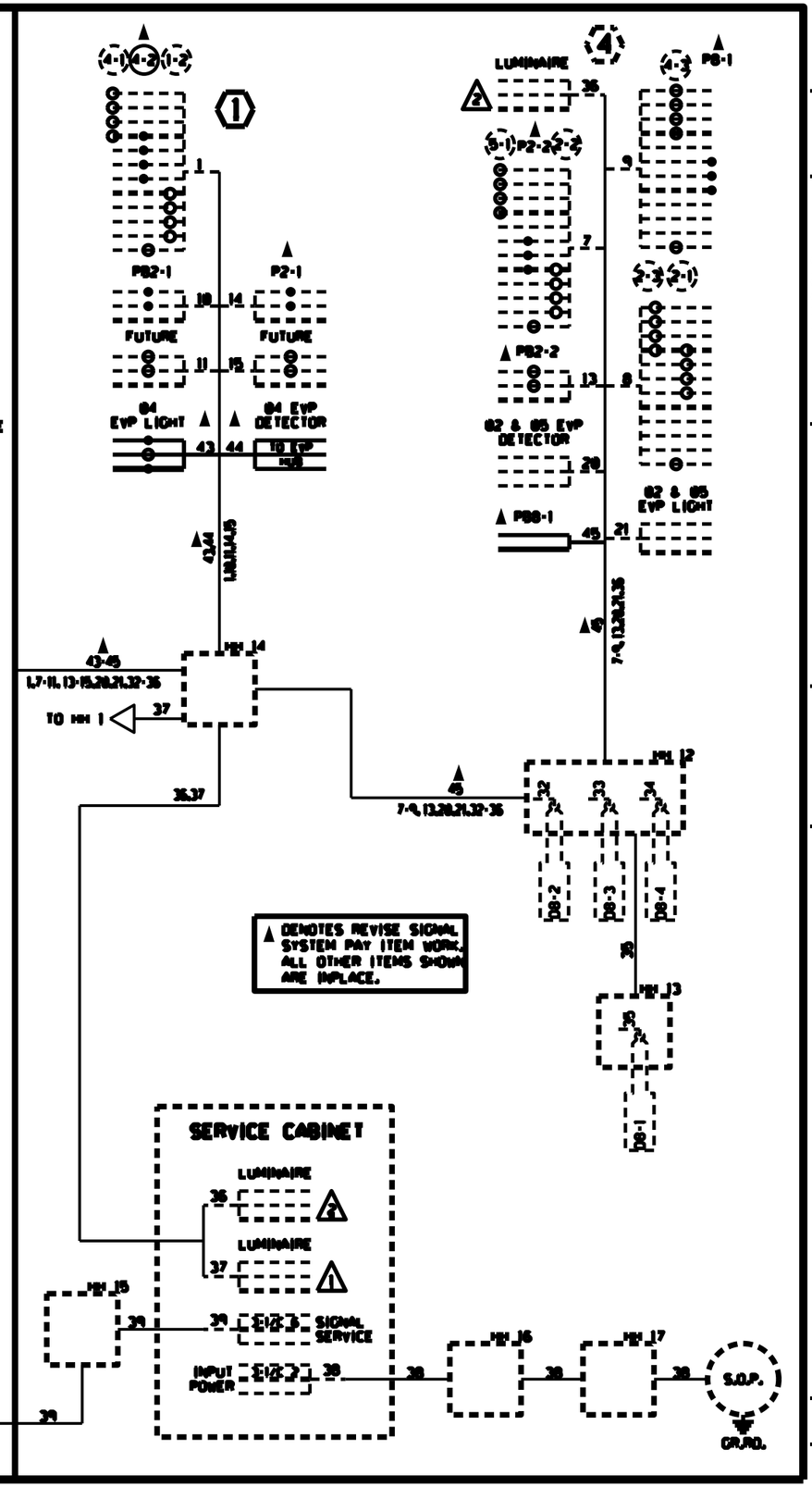
SHEET
SL07 OF 39







▲ DENOTES REVISE SIGNAL SYSTEM PAY ITEM WORK. ALL OTHER ITEMS SHOWN ARE INPLACE.

CONTROLLER CABINET

wsb

CITY OF LINO LAKES

SCALE: DESIGN BY:

PLAN BY: CHECK BY:

REVISIONS

NO.	DATE	DESCRIPTION

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SEAN DELMORE, P.E.

DATE: 12/13/2023 LIC. NO: 40945

WIRING DIAGRAM

TRAFFIC CONTROL SIGNAL SYSTEM

2024 MARKET PLACE DRIVE REALIGNMENT PROJECT

CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET SL08 OF 39

207

LOOP DETECTORS			
NUMBER	SIZE (FT.)	FUNCTION	LOCATION
D1-1	6x6	1	40
D1-2	6x6	1	10
D2-1	6x6	1	400 AND 300
D2-2	6x6	1	400
D4-1	6x6	10	AS SHOWN
D4-2	6x6	10	AS SHOWN
D5-1	6x6	1	40
D5-2	6x6	1	10
D6-1	6x6	1	400 AND 300
D6-2	6x6	1	400
D3-1	6x6	3,8	120
D3-2	2-6x6	1	4 & 34
D3-3	6x10,6x6	7	AS SHOWN
D3-4	2-6x6	1	-5 & 19

LOOP DETECTOR FUNCTIONS

1) CALL AND EXTEND
3) EXTEND ONLY
7) DELAY CALL/IMMEDIATE EXTEND
8) CARRY OVER (STRETCH)
10) DELAY CALL ONLY
LOCATION = DISTANCE FROM STOP LINE TO DETECTOR IN FEET

(2) PA90 POLE FOUNDATION
TYPE PA90-A-40-D40-9 (DAVIT @ 350')
LUMINAIRE-200 WATT H.P.S. WITH PEC AND CHECK SWITCH
3-ONE WAY SIGNALS-OVERHEAD (0', 11' AND 23' FROM LEFT END OF MAST ARM)
2-TYPE 10A-POLE MOUNTED 90' AND 180'
TYPE "D" SIGN PANEL OVERHEAD (D-3)
R6-1 SIGN PANEL (36"X12")-POLE MOUNTED 0'
R9-3a SIGN (NO PED) FACING POLE 1
ONE WAY EVP DETECTOR AND LIGHT-OVERHEAD (Ø6,1)
EXTEND INTO H.H. 5:
3" R.S.C.
3-12/C #12
2-3/C #12
1-3/C #12 (LUM)
1-3/C #20

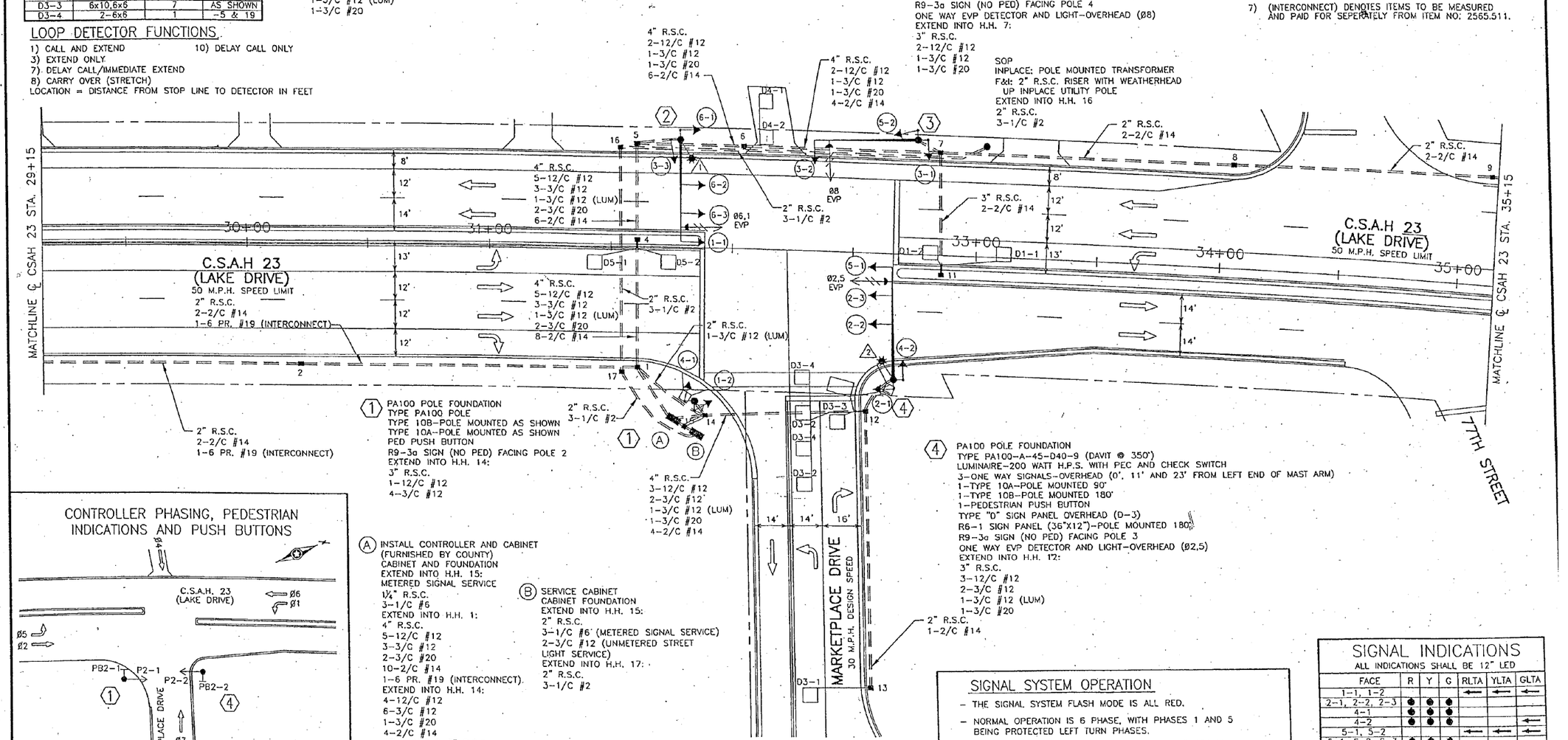
SCALE IN FEET
0 20 40 60 80 100

(3) PA90 POLE FOUNDATION
TYPE PA90-A-40
1-ONE WAY SIGNAL-OVERHEAD (0' FROM LEFT END OF MAST ARM)
2-TYPE 10A-POLE MOUNTED 90' AND 180'
TYPE "D" SIGN PANEL OVERHEAD (D-1)
R9-3a SIGN (NO PED) FACING POLE 4
ONE WAY EVP DETECTOR AND LIGHT-OVERHEAD (Ø8)
EXTEND INTO H.H. 7:
3" R.S.C.
2-12/C #12
1-3/C #12
1-3/C #20

SOP
INPLACE: POLE MOUNTED TRANSFORMER
F&I: 2" R.S.C. RISER WITH WEATHERHEAD
UP INPLACE UTILITY POLE
EXTEND INTO H.H. 16
2" R.S.C.
3-1/C #2

NOTES:

1) LOCATION OF POLES, FOUNDATIONS, LOOP DETECTORS AND HANDHOLES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
2) EACH SIGNAL FACE SHALL HAVE A BACKGROUND SHIELD.
3) ALL VEHICLE INDICATIONS AND ALL PEDESTRIAN SIGNAL INDICATIONS SHALL BE LED.
4) FOR SERVICE CABINET DETAILS SEE SHEET NO. 27
5) FOR NMC LOOP DETAILS SEE SHEET NO. 26
6) FOR SIGN DETAILS SEE SHEET NO. 28
7) (INTERCONNECT) DENOTES ITEMS TO BE MEASURED AND PAID FOR SEPERATELY FROM ITEM NO: 2565.511.



(1) PA100 POLE FOUNDATION
TYPE PA100 POLE
TYPE 10B-POLE MOUNTED AS SHOWN
TYPE 10A-POLE MOUNTED AS SHOWN
PED PUSH BUTTON
R9-3a SIGN (NO PED) FACING POLE 2
EXTEND INTO H.H. 14:
3" R.S.C.
1-12/C #12
4-3/C #12

(A) INSTALL CONTROLLER AND CABINET
(FURNISHED BY COUNTY)
CABINET AND FOUNDATION
EXTEND INTO H.H. 15:
METERED SIGNAL SERVICE
1¼" R.S.C.
3-1/C #6
EXTEND INTO H.H. 1:
4" R.S.C.
5-12/C #12
3-3/C #12
2-3/C #20
10-2/C #14
1-6 PR. #19 (INTERCONNECT).
EXTEND INTO H.H. 14:
4-12/C #12
6-3/C #12
1-3/C #20
4-2/C #14
STUB OUT 2-3" R.S.C.
(THREAD AND CAP BOTH ENDS-FOR FUTURE USE)

(B) SERVICE CABINET
CABINET FOUNDATION
EXTEND INTO H.H. 15:
2" R.S.C.
3-1/C #6 (METERED SIGNAL SERVICE)
2-3/C #12 (UNMETERED STREET LIGHT SERVICE)
EXTEND INTO H.H. 17:
2" R.S.C.
3-1/C #2

(4) PA100 POLE FOUNDATION
TYPE PA100-A-45-D40-9 (DAVIT @ 350')
LUMINAIRE-200 WATT H.P.S. WITH PEC AND CHECK SWITCH
3-ONE WAY SIGNALS-OVERHEAD (0', 11' AND 23' FROM LEFT END OF MAST ARM)
1-TYPE 10A-POLE MOUNTED 90'
1-TYPE 10B-POLE MOUNTED 180'
1-PEDESTRIAN PUSH BUTTON
TYPE "D" SIGN PANEL OVERHEAD (D-3)
R6-1 SIGN PANEL (36"X12")-POLE MOUNTED 180'
R9-3a SIGN (NO PED) FACING POLE 3
ONE WAY EVP DETECTOR AND LIGHT-OVERHEAD (Ø2,5)
EXTEND INTO H.H. 12:
3" R.S.C.
3-12/C #12
2-3/C #12
1-3/C #12 (LUM)
1-3/C #20
2" R.S.C.
1-2/C #14

CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS

SIGNAL SYSTEM OPERATION

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 6 PHASE, WITH PHASES 1 AND 5 BEING PROTECTED LEFT TURN PHASES.
- PHASES 2 AND 6 SHALL OPERATE ON VEHICLE RECALL.

SIGNAL INDICATIONS

ALL INDICATIONS SHALL BE 12" LED

FACE	R	Y	G	RLTA	YLTA	GLTA
1-1, 1-2				←	←	←
2-1, 2-2, 2-3	●	●	●			
4-1	●	●	●			
4-2	●	●	●			←
5-1, 5-2				←	←	←
6-1, 6-2, 6-3	●	●	●			
3-1	●	●	●			
3-2, 3-3	●	●	●			←

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CITY OF LINO LAKES

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SEAN DELMORE, P.E. LIC. NO: 40945
DATE: 12/13/2023

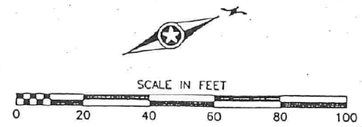
AS BUILTS
TRAFFIC CONTROL SIGNAL SYSTEM

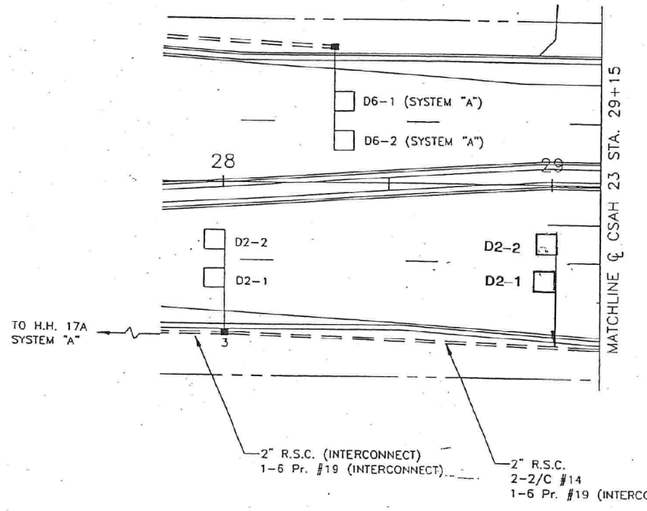
2024 MARKET PLACE DRIVE REALIGNMENT PROJECT
CITY OF LINO LAKES, MN

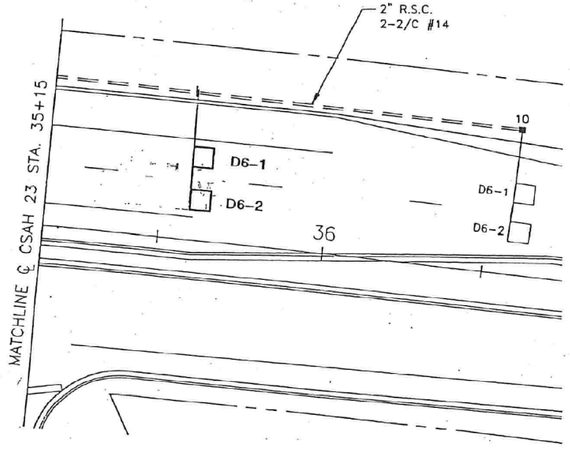
WSB PROJECT NO. 017210-000

SHEET SL09 OF 39

LST DATE: XXXX
ELD BOOK:
DWG:
XREF:







NEW LOOPS FOR SPEED CHANGE

[redacted]

JAN 28, 2002

BDP

AND ASSOCIATES INCORPORATED

IMPROVEMENTS

SYSTEM "B"

12426-01

DWG: K:\PROJECTS\G-M\LINOLAKES\C12+260\LAM\SIGNALS\SHEET15.DWG
XREFs:

OT DATE: XXXX
ID BOOK:

wsb

CITY OF LINO LAKES

SCALE:

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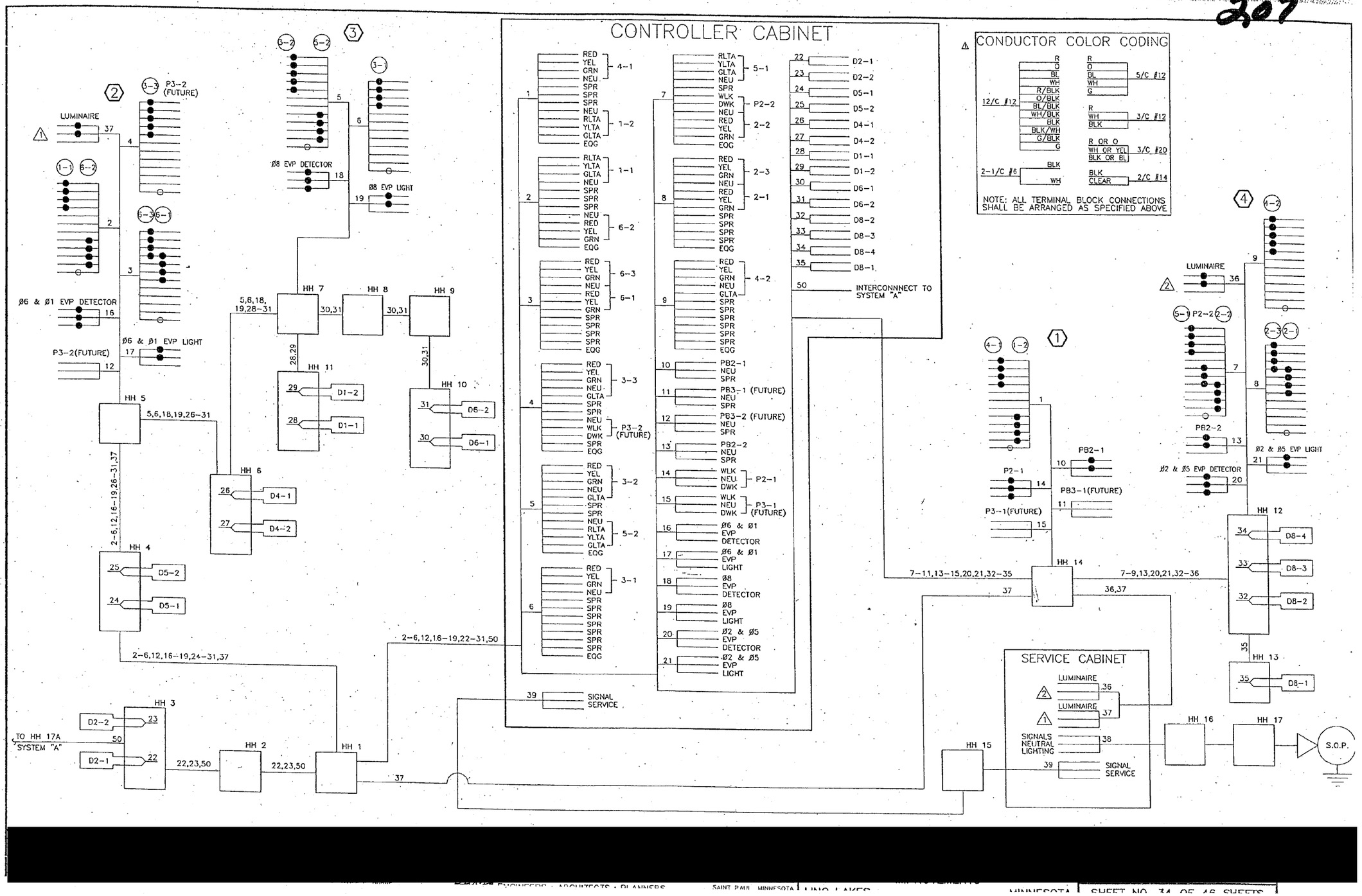
CITY OF LINO LAKES, MN

WSB PROJECT NO. 017210-000

SHEET SL10 OF 39

207



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SAINT PAUL MINNESOTA LINO LAKES MINNESOTA SHEET NO. 34 OF 46 SHEETS

DT DATE: XXXX
LD BOOK:
DWG XREF:
C:\CTS\G-4\LINOLAKES\C12426B1\VAR\SIGNALS\SHEET6.DWG

wsb | CITY OF LINO LAKES

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SHEET SL11 OF 39