FED. PROJ. NO. STPE 0220 (116)

MINNESOTA DEPARTMENT OF TRANSPORTATION
ANOKA COUNTY

CONSTRUCTION PLAN FOR GRADING, BITUMINOUS SURFACING, SIGNALS

LOCATED ON C.S.A.H. 78 FROM 400' SOUTH OF C.S.A.H. 11 TO C.S.A.H. 14

STATE PROJ. NO. 002-678-025

GROSS LENGTH	5139.93	FEET	0.97	MILES
BRIDGES-LENGTH	43.58	FEET	0.01	MILES
EXCEPTIONS-LENGTH	0.00	FEET	0.00	MILES
NET LENGTH	5193.93	FEET	0.97	MILES

NOTE: LENGTH AND DESCRIPTION BASED ON C.S.A.H. 78 NORTHBOUND ALIGNMENT

PROJECT LOCATION
ANOKA COUNTY
CITY OF COON RAPIDS
MNDOT TRANSP. DISTRICT - METRO
SECTION 10, 11
TOWNSHIP 31 N
RANGE 24W

ANOKA COUNTY
R 24 W

R 24 W

BEGIN S.P. 002-678-025
C.S.A.H. 78
STA. 245+50.17

END S.P. 002-678-025
C.S.A.H. 78 N.B.
STA. 296+90.10

BRIDGE #95884

EQUATIONS

C.S.A.H. 78 N.B. STA 296+90.10 BK =
C.S.A.H. 78 N.B. STA 67+02.53 R 2 AH

C.S.A.H. 78 S.B. STA 191+36.66 BK =
C.S.A.H. 78 S.B. STA 61+70.52 R 2 AH

PROJECT LOCATION
COUNTY : ANOKA
DISTRICT : METRO

SCALES

PLAN	50'	
PROFILE	50' HORIZ.	5' VERT.
INDEX MAP	1/2 MI	
GENERAL LAYOUT	300'	

PLAN REVISIONS

DATE	SHEET NO.	APPROVER

C.S.A.H. 78 DESIGN DESIGNATION

FUNCTIONAL CLASSIFICATION = MINOR ARTERIAL

Design Speed 45 MPH		TON DESIGN 10
Design ESALS	20 YR = 2,525,000	NO. OF PARKING LANES = 0
R-VALUE	= 35	Based on STOPPING Sight Distance
NO. OF TRAFFIC LANES	= 4	Height of eye 3.5' Height of object 2.0'
ADT (Current Year) 2017	= 29,500	Design Speed not achieved at: N/A
ADT (Future Year) 2040	= 33,600	STA. N/A TO STA. N/A MPH
T (Heavy Commercial)	= 3.1 %	STA. N/A TO STA. N/A MPH

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

GOVERNING SPECIFICATIONS

THE 2018 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

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THIS PLAN CONTAINS 230 SHEETS

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.

PRINT NAME: BRETT A. VOTH LICENSE # 49045

DATE: 12/16/2019 SIGNATURE: Brett Voth

APPROVED ______ ANOKA COUNTY ENGINEER 12-17 20 19

APPROVED ______ CITY OF COON RAPIDS ENGINEER 12/17 20 19

REVIEWED FOR COMPLIANCE WITH STATE AID AND FEDERAL RULES/POLICY ______ DISTRICT STATE AID ENGINEER 12/17 20 19

APPROVED FOR STATE AID AND FEDERAL AID FUNDING ______ STATE AID ENGINEER 12/17 20 19

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, WERE 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.

PRINT NAME: ______ LICENSE #: ______

DATE: ______ SIGNATURE: ______

ANOKA COUNTY S.P. 002-678-025
CITY OF COON RAPIDS S.P. 114-020-053
CITY OF COON RAPIDS C.P. 17-30

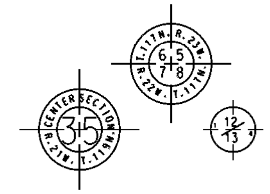
PLAN SYMBOLS

- COUNTY LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- NEW RIGHT OF WAY LINE
- EXISTING RIGHT OF WAY LINE
- PROPERTY LINE (EXCEPT LAND LINES)
- VACATED PLATTED PROPERTY
- CORPORATE OR CITY LIMITS
- TRUNK HIGHWAY CENTER LINE
- RETAINING WALL
- RAILROAD
- WATER LINE
- MEANDER CORNER
- DRAINAGE DITCH
- DRAIN TILE
- CULVERT
- GUARD RAIL
- BARBED WIRE FENCE
- CHAIN LINK FENCE (XC)
- STONE WALL OR FENCE
- HEDGE
- RAILROAD CROSSING SIGN
- MARSH
- WOODS / ORCHARD / BRUSH / NURSERY (WOODS)
- CATCH BASIN
- FIRE HYDRANT
- BUILDING
- IRON PIPE OR ROD
- MONUMENT (STONE, CONCRETE OR METAL)
- SMALL SIGN

UTILITY SYMBOLS

- POWER POLE
- TELEPHONE POLE
- ANCHOR
- STEEL TOWER
- POWER POLE/LIGHT POLE
- TELEPHONE CABINET (T)
- TELEPHONE PEDESTAL (T)
- SEWER MANHOLE OR ELECTRIC MANHOLE (M)
- TELEPHONE MANHOLE (U)
- WATER MAIN
- BURIED TELEPHONE CABLE (T-BUR)
- OVERHEAD POWER (OHP)
- BURIED ELECTRIC CABLE (P-BUR)
- STORM SEWER
- OVERHEAD UTILITY (OHU)
- SANITARY SEWER
- GAS MAIN (G)
- ABANDONED GAS MAIN (G)
- SIGNAL INTERCONNECT
- BURIED FIBER IN CONDUIT (F/O)
- BURIED FIBER OPTIC (F/O -BUR)
- FIBER OPTIC (F/O)
- COMMUNICATION LINE

SECTION SYMBOLS



NOTE: SECTION NUMBERS READ FROM THE SOUTH.

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR — ANOKA COUNTY

GENERAL LEGEND

SHEET NO. 2 OF 230 SHEETS

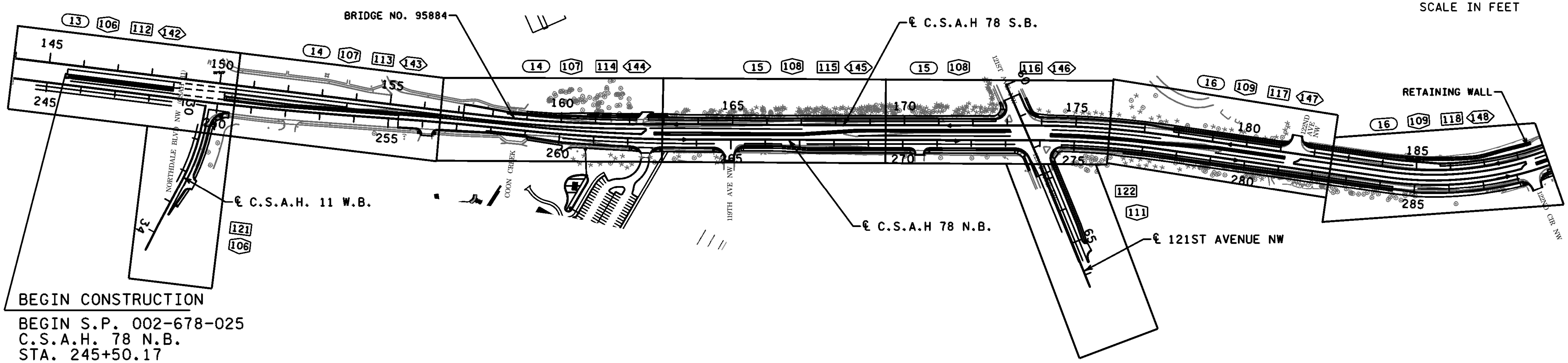
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

ANOKA COUNTY

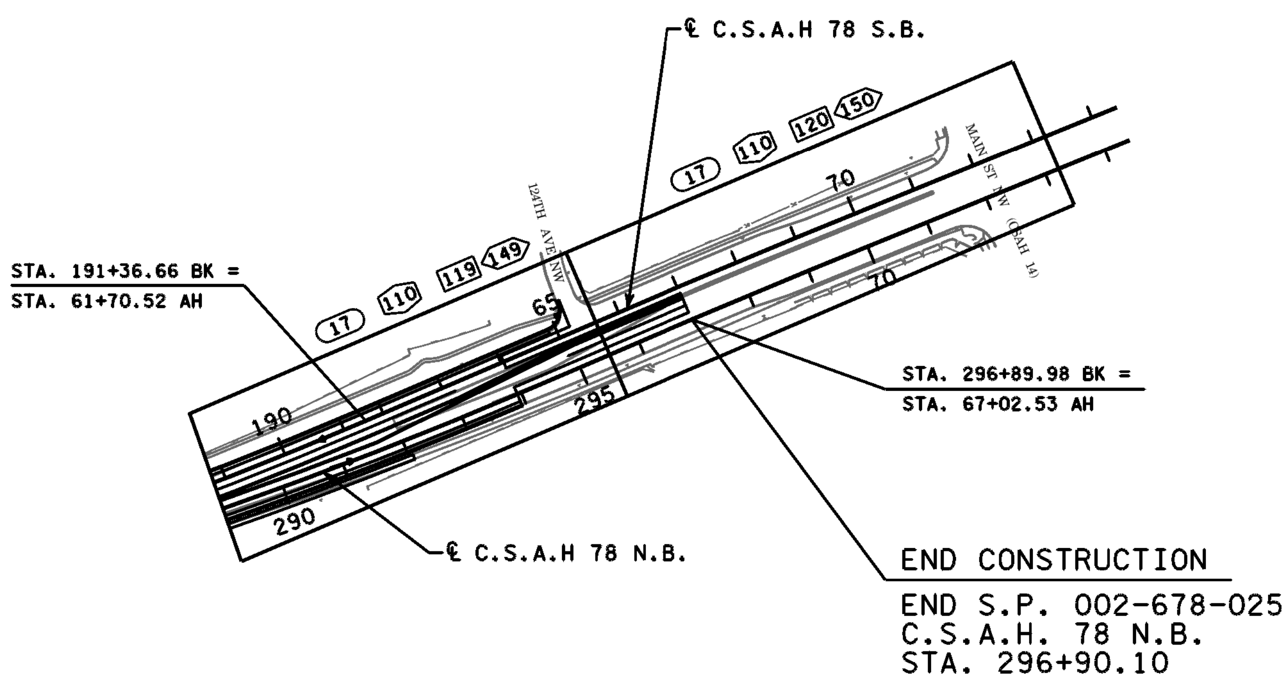
CITY OF COON RAPIDS

2017 ADT = 29,500
2040 ADT = 33,600

300
SCALE IN FEET



300
SCALE IN FEET



LEGEND

- INPLACE PAVEMENT
- TOPOGRAPHY & UTILITY PLAN SHEET NUMBER
- REMOVAL PLAN SHEET NUMBER
- CONSTRUCTION PLAN SHEET NUMBER
- DRAINAGE PLAN SHEET NUMBER

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

ANOKA COUNTY

GENERAL LAYOUT

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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STATEMENT OF ESTIMATED QUANTITIES

TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	NOTE NO.	UNIT	TOTAL ESTIMATED QUANTITY	PARTICIPATING FEDERAL FUNDS			LOCAL FUNDS	
							ANOKA COUNTY S.P. 002-678-025	CITY OF COON RAPIDS S.P. 114-020-053	STORM SEWER	ANOKA COUNTY	CITY OF COON RAPIDS C.P. 17-30
		2021.501	MOBILIZATION		LUMP SUM	1	0.75	0.06	0.17		0.02
		2031.502	FIELD OFFICE TYPE D		EACH	1	1				
A	9	2101.524	CLEARING		TREE	196	196				
A	9	2101.524	GRUBBING		TREE	196	196				
T	94	2102.503	PAVEMENT MARKING REMOVAL		LIN FT	5320	5320				
T	94	2102.518	PAVEMENT MARKING REMOVAL		SQ FT	808	808				
J	158 - 159	2104.502	REMOVE MANHOLE OR CATCH BASIN		EACH	41	41				
L, J	21 , 159	2104.502	REMOVE CASTING		EACH	6	1				5
N	23	2104.502	REMOVE VALVE BOX		EACH	7					7
V	90	2104.502	REMOVE MARKER		EACH	5	5				
Y	90	2104.502	REMOVE SIGN TYPE C		EACH	54	54				
R	178	2104.502	REMOVE SIGNAL SYSTEM A		EACH	1	1				
U	90	2104.502	REMOVE SIGN TYPE SPECIAL		EACH	3	3				
E	10	2104.503	SAWING BIT PAVEMENT (FULL DEPTH)		LIN FT	3921	3921				
J	158 - 159	2104.503	REMOVE SEWER PIPE (STORM)		LIN FT	3157	3157				
D	10	2104.503	REMOVE CURB & GUTTER		LIN FT	13251	13251				
D	10	2104.504	REMOVE CONCRETE PAVEMENT		SQ YD	26	26				
D	10	2104.504	REMOVE BITUMINOUS PAVEMENT	(1)	SQ YD	9360	9360				
D	10	2104.518	REMOVE SIDEWALK		SQ FT	55081	55081				
NN	24	2104.503	REMOVE WATER MAIN		LIN FT	40					40
NN	24	2104.502	REMOVE GATE VALVE & BOX		EACH	2					2
Q	11	2105.504	GEOTEXTILE FABRIC TYPE 1		SQ YD	318	318				
G	11	2105.507	GRANULAR BORROW (CV)		CU YD	1050	1050				
B	8	2105.607	EXCAVATION SPECIAL	(7)	CU YD	3487	3487				
		2105.609	HAUL & DISPOSE OF CONTAMINATED MATERIAL	(8)	TON	397	397				
		2105.609	EXCAVATION SPECIAL	(8)	TON	397	397				
B	8	2106.507	EXCAVATION - COMMON		CU YD	8215	8215				
B	8	2106.507	EXCAVATION - SUBGRADE		CU YD	4144	4144				
Q	11	2106.507	SELECT GRANULAR EMBANKMENT MOD 10% (CV)		CU YD	154	154				
		2123.510	DOZER	(2)	HOUR	20	20				
		2130.523	WATER	(5)	M GALLON	100	100				
F	10	2211.507	AGGREGATE BASE (CV) CLASS 5 (P)		CU YD	12456	12456				
F	10	2231.509	BITUMINOUS PATCHING MIXTURE	(6)	TON	536	536				
D	10	2232.504	MILL BITUMINOUS SURFACE (2.0")		SQ YD	215	215				
G	11	2301.602	DRILL & GROUT REINF BAR (EPOXY COATED)		EACH	133	133				
F	10	2360.509	TYPE SP 4.75 WEARING COURSE MIX (2,B)		TON	392	392				
F	10	2360.509	TYPE SP 12.5 NON WEAR COURSE MIX (4,B)	(3)	TON	5842	5842				
F	10	2360.509	TYPE SP 12.5 WEARING COURSE MIX (4,F)	(3)	TON	7789	7789				
Q	11	2411.618	PREFABRICATED MODULAR BLOCK WALL		SQ FT	2227	2227				
Q	11	2451.507	COARSE FILTER AGGREGATE (CV)		CU YD	60	60				
K	160 - 161	2451.507	FINE AGGREGATE BEDDING (CV)		CU YD	2259			2259		
K	162 - 163	2501.502	18" RC PIPE APRON		EACH	1			1		
K	162 - 163	2501.502	24" RC PIPE APRON		EACH	2			2		
K	162 - 163	2501.502	36" RC PIPE APRON		EACH	1			1		
Q	11	2502.503	4" PERF TP PIPE DRAIN		LIN FT	368	368				
	151	2502.503	6" PERF TP PIPE DRAIN		LIN FT	416	416				
	151	2502.602	6" PVC PIPE DRAIN CLEANOUT		EACH	4	4				
K	162 - 163	2503.503	12" RC PIPE SEWER DES 3006 CL V		LIN FT	54			54		
K	162 - 163	2503.503	15" RC PIPE SEWER DES 3006 CL V		LIN FT	1698			1698		
K	162 - 163	2503.503	18" RC PIPE SEWER DES 3006 CL III		LIN FT	2105			2105		
K	162 - 163	2503.503	21" RC PIPE SEWER DES 3006 CL III		LIN FT	494			494		
K	162 - 163	2503.503	24" RC PIPE SEWER DES 3006 CL III		LIN FT	359			359		
K	162 - 163	2503.503	27" RC PIPE SEWER DES 3006 CL III		LIN FT	991			991		
K	162 - 163	2503.503	36" RC PIPE SEWER DES 3006 CL III		LIN FT	407			407		
K	162 - 163	2503.602	CONNECT TO EXISTING STORM SEWER		EACH	9			9		
NN	24	2504.602	CONNECT TO EXISTING WATER MAIN		EACH	1					1
N	23	2504.602	RELOCATE HYDRANT		EACH	2	2				
N	23	2504.602	RELOCATE HYDRANT & VALVE		EACH	1	1				
N	23	2504.602	INSTALL GATE VALVE		EACH	1					1
N	23	2504.602	VALVE BOX		EACH	7					7
N	23	2504.602	ADJUST GATE VALVE		EACH	6	6				
NN	24	2504.602	8" PIPE PLUG		EACH	1					1
NN	24	2504.602	8" SLEEVE		EACH	1					1
NN	24	2504.602	12" SLEEVE		EACH	1					1
NN	24	2504.602	24" SLEEVE		EACH	3					3
NN	24	2504.602	8"X8" TEE FITTING		EACH	1					1
NN	24	2504.602	24"X8" TEE FITTING		EACH	2					2
NN	24	2504.602	24"X12" TEE FITTING		EACH	1					1
NN	24	2504.602	8" GATE VALVE & BOX		EACH	2					2
NN	24	2504.602	12" GATE VALVE & BOX		EACH	1					1
NN	24	2504.602	8" MEGALUG		EACH	8					8
NN	24	2504.602	12" MEGALUG		EACH	5					5
NN	24	2504.602	24" MEGALUG		EACH	14					14
NN	24	2504.602	24" BUTTERFLY VALVE & BOX		EACH	1					1

NOTES:

(P) = PLAN QUANTITY

(1) BITUMINOUS PAVEMENT REMOVAL SECTION IS VARIES. SEE EXISTING TYPICAL SECTIONS FOR APPROXIMATE DEPTHS.

(2) TO BE USED AT THE ENGINEER'S DISCRETION FOR MISCELLANEOUS GRADING ACTIVITIES.

(3) BITUMINOUS MATERIAL FOR TACK COAT SHALL BE CONSIDERED INCIDENTAL.

(4) FERTILIZER ANALYSIS 22-5-10.

(5) TO BE USED AT THE ENGINEER'S DISCRETION FOR DUST CONTROL.

(6) FOR WORK AROUND MEDIAN RECONSTRUCTION. SEE TAB F FOR MIX DESIGNATION.

(7) POND EXCAVATION.

(8) CONTAMINATED MATERIAL EXCAVATION. TO BE USED AT THE ENGINEER'S DISCRETION.

(9) INCLUDES 6 CY FOR THE POND EMERGENCY OVERFLOW. SEE POND DETAIL SHEET.

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 12/31/2019 DATE

DRAWN BY: GEB

DESIGNED BY: GEB

CHECKED BY: BAV

HDR

ANOKA COUNTY

STATEMENT OF ESTIMATED QUANTITIES

SHEET NO. 4 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

STATEMENT OF ESTIMATED QUANTITIES

TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	NOTE NO.	UNIT	TOTAL ESTIMATED QUANTITY	PARTICIPATING FEDERAL FUNDS			LOCAL FUNDS	
							ANOKA COUNTY S.P. 002-678-025	CITY OF COON RAPIDS S.P. 114-020-053	STORM SEWER	ANOKA COUNTY	CITY OF COON RAPIDS C.P. 17-30
NN	24	2504.603	8" WATERMAIN DUCTILE IRON CL 52		LIN FT	180					180
NN	24	2504.603	12" WATERMAIN DUCTILE IRON CL 52		LIN FT	10					10
NN	24	2504.603	24" WATERMAIN DUCTILE IRON CL 52		LIN FT	20					20
L,J,K	21, 160-163	2506.502	CASTING ASSEMBLY		EACH	102	1		96		5
L, J	21, 160-161	2506.502	ADJUST FRAME & RING CASTING		EACH	15	10				5
K	160 - 161	2506.503	CONST DRAINAGE STRUCTURE DESIGN G		LIN FT	63.9			63.9		
K	160 - 161	2506.503	CONST DRAINAGE STRUCTURE DESIGN H		LIN FT	92.2			92.2		
K	160 - 161	2506.503	CONST DRAINAGE STRUCTURE DESIGN SPECIAL		LIN FT	6.0			6.0		
K	160 - 161	2506.503	CONST DRAINAGE STRUCTURE DES 48-4020		LIN FT	159.1			159.1		
K	160 - 161	2506.503	CONST DRAINAGE STRUCTURE DES 54-4020		LIN FT	18.9			18.9		
K	160 - 161	2506.503	CONST DRAINAGE STRUCTURE DES 60-4020		LIN FT	35.6			35.6		
K	160 - 161	2506.503	CONST DRAINAGE STRUCTURE DES 72-4020		LIN FT	15.0			15.0		
K	160 - 161	2506.503	CONST DRAINAGE STRUCTURE DES 78-4020		LIN FT	21.9			21.9		
K	160 - 161	2506.503	CONST DRAINAGE STRUCTURE DES 84-4020		LIN FT	22.5			22.5		
K	162 - 163	2506.602	CONNECT INTO EXISTING STORM SEWER		EACH	4			4		
K	162 - 163	2511.504	GEOTEXTILE FILTER TYPE 4		SQ YD	123	123				
K	162 - 163	2511.507	RANDOM RIPRAP CLASS II	(9)	CU YD	32	32				
G	11	2521.518	4" CONCRETE WALK		SQ FT	44511	44511				
G	11	2521.518	6" CONCRETE WALK		SQ FT	3432	3432				
G	11	2531.503	CONCRETE CURB & GUTTER DESIGN B418 (MOD)		LIN FT	9565	9565				
G	11	2531.503	CONCRETE CURB & GUTTER DESIGN B424		LIN FT	8106	4053	4053			
G	11	2531.503	CONCRETE CURB & GUTTER DESIGN B618		LIN FT	306	153	153			
G	11	2531.603	CONCRETE CURB DESIGN V		LIN FT	60	60				
G	11	2531.618	TRUNCATED DOMES		SQ FT	489	489				
X	58	2533.503	PORTABLE PRECAST CONC BARRIER DES 8337	(10)	LIN FT	2000	1500	120	340		40
X	58	2533.503	RELOCATE PORT PRECAST CONC BAR DES 8337	(10)	LIN FT	10000	7500	600	1700		200
R	178	2545.502	SERVICE CABINET		EACH	1	1				
K	162 - 163	2554.602	GUIDE POST TYPE SPECIAL		EACH	4	4				
Q	11	2557.503	WIRE FENCE DESIGN 60V-9322		LIN FT	368	368				
X	58	2563.601	TRAFFIC CONTROL		LUMP SUM	1	0.75	0.06	0.17		0.02
X	58	2563.602	RAISED PAVEMENT MARKER TEMPORARY		EACH	451	451				
X	58	2563.602	PORTABLE CONCRETE BARRIER DELINEATOR		EACH	20	20				
		2563.602	PORTABLE CHANGEABLE MESSAGE SIGN		EACH	2	2				
		2563.610	POLICE OFFICER		HOUR	100	100				
W	95	2564.518	SIGN PANELS TYPE C		SQ FT	516	516				
W	95	2564.602	FURNISH AND INSTALL SIGN TYPE SPECIAL		EACH	3	3				
R	178	2565.501	TRAFFIC CONTROL INTERCONNECT		LUMP SUM	1	1				
R	178	2565.501	EMERGENCY VEHICLE PREEMPTION SYSTEM A		LUMP SUM	1		1			
R	178	2565.516	TRAFFIC CONTROL SIGNAL SYSTEM A		SYSTEM	1	0.5	0.5			
R	178	2565.616	REVISE SIGNAL SYSTEM B		SYSTEM	1	0.75	0.25			
H	12	2573.502	STORM DRAIN INLET PROTECTION		EACH	144	144				
H	12	2573.503	SILT FENCE, TYPE MS		LIN FT	5336	5336				
H	12	2573.503	FLOTATION SILT CURTAIN TYPE MOVING WATER		LIN FT	71	71				
H	12	2573.503	SEDIMENT CONTROL LOG TYPE COMPOST		LIN FT	167	167				
S	12	2574.505	SOIL BED PREPARATION		ACRE	1.45	1.45				
B	8	2574.507	FILTER TOPSOIL BORROW		CU YD	158	158				
S	12	2574.508	FERTILIZER TYPE 3	(4)	POUND	532	532				
S	12	2575.504	SODDING TYPE LAWN		SQ YD	501	501				
H	12	2575.504	EROSION CONTROL BLANKETS CATEGORY 3N		SQ YD	1200	1200				
S	12	2575.505	SEEDING		ACRE	1.45	1.45				
S	12	2575.508	SEED MIXTURE 25-151		POUND	175	175				
T	94	2582.503	4" SOLID LINE MULTI COMP		LIN FT	16465	16465				
T	94	2582.503	4" BROKEN LINE MULTI COMP		LIN FT	2143	2143				
T	94	2582.503	4" DOTTED LINE MULTI COMP		LIN FT	28	28				
T	94	2582.503	8" DOTTED LINE MULTI COMP		LIN FT	161	161				
T	94	2582.503	4" DBLE SOLID LINE MULTI COMP		LIN FT	804	804				
T	94	2582.518	PAVT MSSG PREF THERMO		SQ FT	4605	3813	792			

NOTES:

(P) = PLAN QUANTITY

(1) BITUMINOUS PAVEMENT REMOVAL SECTION IS VARIES. SEE EXISTING TYPICAL SECTIONS FOR APPROXIMATE DEPTHS.

(2) TO BE USED AT THE ENGINEER'S DISCRETION FOR MISCELLANEOUS GRADING ACTIVITIES.

(3) BITUMINOUS MATERIAL FOR TACK COAT SHALL BE CONSIDERED INCIDENTAL.

(4) FERTILIZER ANALYSIS 22-5-10.

(5) TO BE USED AT THE ENGINEER'S DISCRETION FOR DUST CONTROL.

(6) FOR WORK AROUND MEDIAN RECONSTRUCTION. SEE TAB F FOR MIX DESIGNATION.

(7) POND EXCAVATION.

(8) CONTAMINATED MATERIAL EXCAVATION. TO BE USED AT THE ENGINEER'S DISCRETION.

(9) INCLUDES 6 CY FOR THE POND EMERGENCY OVERFLOW. SEE POND DETAIL SHEET.

(10) EXEMPTED QUANTITY.

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: _____ 12/31/2019

LICENSED PROFESSIONAL ENGINEER — DATE

DRAWN BY: GEB

DESIGNED BY: GEB

CHECKED BY: BAV

HDR

ANOKA COUNTY

STATEMENT OF ESTIMATED QUANTITIES

SHEET NO. 5 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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SOILS AND CONSTRUCTION NOTES

1. TOP OF THE GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.
2. COMMON EXCAVATION SHALL CONSIST OF ALL EXCAVATION MATERIALS NOT CLASSIFIED AS EXCAVATION - ROCK AND EXCAVATION - MUCK.
3. SELECTED GRADING MATERIALS SHALL CONSIST OF ALL SOILS ENCOUNTERED EXCLUDING TOPSOIL, ORGANIC MATERIAL, ROCK AND OTHER UNSUITABLE MATERIAL. THESE SELECTED GRADING MATERIALS SHALL BE OBTAINED FROM THE SUBGRADE AND THE COMMON EXCAVATION IN ACCORDANCE WITH MnDOT SPEC. 2106.
4. SELECT GRANULAR BORROW REGARDLESS OF SOURCE SHALL MEET THE REQUIREMENTS OF MnDOT SPEC. 3149.2B2.
5. COMPACTION OF ALL EXCAVATION AND EMBANKMENT CONSTRUCTION, INCLUDING CULVERT BACKFILLS, SHALL BE AS DESCRIBED IN MNDOT 2106. AGGREGATE BASE COURSE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF MNDOT 2211. COMPACTION OF ALL AGGREGATE BASE, GRANULAR, AND SELECT GRANULAR MATERIAL SHALL BE IN ACCORDANCE WITH MNDOT'S "MODIFIED PENETRATION INDEX" METHOD. COMPACTION OF ALL BITUMINOUS MIXTURES SHALL BE IN ACCORDANCE WITH MNDOT'S "MAXIMUM DENSITY" METHOD.
6. ALL DISTURBED ROADWAY MATERIALS SUCH AS CONCRETE, BITUMINOUS, AND AGGREGATES MAY BE UTILIZED ACCORDING TO MnDOT SPECIFICATIONS. MATERIALS NOT UTILIZED ON THIS PROJECT WILL BECOME THE PROPERTY OF THE CONTRACTOR AND DISPOSED OF OFF THE RIGHT OF WAY IN ACCORDANCE WITH MnDOT SPECIFICATION 2104 AND AS AGREED UPON BY THE ENGINEER.
7. EXCESS EXCAVATION MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. DISPOSITION OF EXCESS EXCAVATION MATERIAL SHALL BE IN ACCORDANCE WITH SPECIFICATION 2106.3I AND SHALL BE DISPOSED OF OFF THE RIGHT OF WAY, AT NO ADDITIONAL COMPENSATION, AND IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
8. AS A PRECAUTIONARY MEASURE FROM A SOILS STANDPOINT, TRAFFIC LANES USED DURING CONSTRUCTION SHALL BE DELINEATED TO KEEP VEHICLES A SAFE DISTANCE AWAY FROM ADJACENT EXCAVATIONS. THE OUTSIDE EDGE OF THE DELINEATED TRAFFIC SURFACE SHALL HAVE A 1V:2H OR FLATTER SLOPE TO THE BOTTOM OF ANY EXCAVATIONS. STEEPER SLOPES ARE PERMITTED BY APPROVAL OF THE ENGINEER.
9. WHERE CHANGING SUBCUT DEPTHS OR WHERE CONNECTING TO THE INPLACE ROADWAYS AT THE PROJECT TERMINI, CUT VERTICALLY TO THE BOTTOM OF INPLACE AGGREGATE BASE OR THE BOTTOM OF PROPOSED AGGREGATE BASE, WHICHEVER IS DEEPER, THEN TAPER AT A 1(V):20(H) RATE TO THE BOTTOM OF THE RECOMMENDED SUBGRADE EXCAVATION.
10. WHERE SUBCUTS MEET DRIVEWAYS OR LOCAL ROADS, CUT VERTICALLY TO THE BOTTOM OF INPLACE AGGREGATE BASE OR THE BOTTOM OF PROPOSED AGGREGATE BASE, WHICHEVER IS DEEPER, THEN AT A 1(V):4(H) TAPER TO THE BOTTOM OF THE RECOMMENDED SUBGRADE EXCAVATION.
11. COMMON MATERIAL ASSUMED TO MEET THE REQUIREMENTS OF MNDOT 3149.2B1.
12. IT IS ASSUMED THAT POND EXCAVATION MATERIAL WILL MEET MNDOT 3149.2B1.
13. NO OVER EXCAVATION WILL BE ALLOWED INSIDE COUNTY RIGHT OF WAY.
14. EXCESS COMMON MATERIAL MUST BE DEEMED EXCESS BY THE ENGINEER PRIOR TO LEAVING PROJECT.
15. THE CONTRACTOR SHALL PROVIDE TACK COAT BETWEEN ALL BITUMINOUS MIXTURES AND PRIOR TO PLACING ANY BITUMINOUS MIXTURES ON EXISTING PAVEMENT IN ACCORDANCE WITH SPECIFICATION 2357.
16. PROVIDE A SAW CUT WHERE PLACING NEW PAVEMENT NEXT TO INPLACE PAVEMENT TO ENSURE A UNIFORM JOINT.
17. STRIP ALL EXISTING TOPSOIL AND SLOPE DRESSING IN AREAS TO BE DISTURBED BY CONSTRUCTION AND REUSE AS SLOPE DRESSING. PAYMENT FOR STRIPPING IS INCLUDED IN EXCAVATION-COMMON AND PAYMENT FOR SLOPE DRESSING PAYMENT IS INCLUDED IN COMMON EMBANKMENT (CV). FOR ESTIMATING PURPOSES, TOPSOIL ASSUMED TO BE 4".
18. THE TERMINI OF ALL PORTABLE CONCRETE MEDIAN BARRIER LOCATIONS SHALL BE SET BACK IN COMPLIANCE WITH DESIGN STANDARD SET FORTH IN THE MnDOT ROADWAY DESIGN MANUAL, CHAPTER 4, FROM EDGE OF TRAVELED LANE OR PROTECTED BY AN IMPACT ATTENUATOR.
19. NO EXTRA PAYMENT WILL BE MADE FOR TEMPORARY STOCKPILING OF EXCAVATED OR EMBANKMENT MATERIAL.
20. DO NOT BLOCK SIDEWALKS OR PATHS, WHICH REMAIN OPEN, WITH CONSTRUCTION EQUIPMENT OR MATERIALS.
21. THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING CONSTRUCTION IN A MANNER THAT WILL CONTROL EROSION. SEE THE EROSION CONTROL PLANS FOR SUGGESTED LOCATIONS AND DEVICES TO DO SO.

SOILS AND CONSTRUCTION NOTES (CONTINUED)

22. UTILITY RELOCATIONS IN THE AREA WILL BE OCCURRING PRIOR TO AND DURING THE PROJECT. THE CONTRACTOR SHALL EXPECT UTILITY CONFLICTS AND ACCOUNT FOR THEM ACCORDINGLY IN THEIR WORK SCHEDULE AND ANTICIPATED PRODUCTION.
23. PRIOR TO PLACING AGGREGATE BASE MATERIAL, TEST ROLL PAVEMENT SUBGRADES TO DETERMINE IF THE SUBGRADE MATERIALS ARE LOOSE, SOFT OR WEAK, AND IN NEED OF FURTHER STABILIZATION, COMPACTION OR SUB-EXCAVATION, AND RECOMPACTION OR REPLACEMENT. A SECOND TEST ROLL SHALL BE PERFORMED AFTER THE AGGREGATE BASE MATERIAL IS IN PLACE, AND PRIOR TO BITUMINOUS PAVEMENT. TEST ROLLING SHALL ONLY BE REQUIRED FOR ROADWAYS. COMPACTION OF ALL AGGREGATE BASE, GRANULAR, AND SELECT GRANULAR MATERIAL SHOULD BE IN ACCORDANCE WITH MNDOT "MODIFIEID PENETRATION INDEX METHOD".
24. CONSTRUCTION SLOPES SHALL BE COVERED WITH 4" OF TOPSOIL MATERIAL. INPLACE TOPSOIL THAT IS REUSED SHALL MEET MNDOT STANDARD SPECIFICATION 3877 OR APPROVED BY THE ENGINEER AND SHALL BE SCREENED PRIOR TO REUSE. PAYMENT FOR TOPSOIL MATERIAL IS PAID FOR AS COMMON EMBANKMENT.
25. ANY TOPSOIL MATERIAL NOT UTILIZED ON THIS PROJECT SHALL BE THE PROPERTY OF THE OWNER UNTIL RELEASED TO THE CONTRACTOR BY THE ENGINEER FOR USE OR DISPOSAL OUTSIDE OF THE RIGHT OF WAY IN ACCORDANCE WITH SPEC 2104.
26. TEMPORARY AND INTERMEDIATE EXCAVATION LIMITS AND SLOPES ARE TO BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION. DEPENDING ON SOIL PROPERTIES AND SAFETY FACTORS, ADDITIONAL EXCAVATION AND BACKFILL BEYOND THE LIMITS SHOWN IN THE PLAN SHALL BE CONSIDERED THE CONTRACTOR EXPENSE (2106).
27. WHEN REMOVING PAVEMENTS, FULL-DEPTH SAWCUTS SHOULD BE MADE PERPENDICULAR TO THE ROADWAY CENTERLINE.
28. WHERE MATCHING TO INPLACE INTERSECTING PAVEMENT STRUCTURES, CUT VERTICALLY TO THE BOTTOM OF THE INPLACE SURFACING OR TOP OF THE PROPOSED GRADING GRADE, WHICHEVER IS DEEPER, THEN TAPER AT 1:1 (V:H) TO THE BOTTOM OF THE RECOMMENDED SUBGRADE EXCAVATION AT THAT LOCATION.
29. NON-STRUCTURAL GRADING MATERIAL ARE ALL MINERAL SOILS, EXCESS TOPSOIL, AND ORGANIC SOILS, CAPABLE OF SUPPORTING CONSTRUCTION EQUIPMENT. NON-STRUCTURAL GRADING MATERIAL SHALL ONLY BE PLACED OUTSIDE OF THE ROADWAY CORE AND IN A MANNER IN WHICH THE MATERIAL WILL MAINTAIN LONG TERM STABILITY.
30. EXCEPT FOR SUBGRADE ZONES WHERE SELECT GRANULAR MATERIAL IS SPECIFICALLY REQUIRED, THE SUBGRADE SHALL BE CONSTRUCTED OF SELECT GRADING MATERIAL.
31. STORM SEWERS CONNECTING TO MANHOLES AND CATCH BASINS SHALL BE IN ACCORDANCE WITH MNDOT STANDARD SPECIFICATION 2503. BEDDING AND BACKFILL SHALL CONSIST OF UNIFORM SELECT GRADING MATERIAL MATCHING ADJACENT SOILS UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR AS SHOWN IN THE PLAN.
32. WHERE UNSUITABLE MATERIAL IS ENCOUNTERED DURING COMMON OR SUBGRADE EXCAVATION, THE CONTRACTOR SHALL PROVIDE GRANULAR MATERIAL, FOUND ELSEWHERE ON THE JOB SITE. NO DIRECT COMPENSATION WILL BE MADE THEREAFTER.
33. THE TOP OF BACKSLOPES AND THE TOE OF FILL SLOPES SHALL BE ROUNDED TO NATURALIZE THE CONSTRUCTION EVEN THOUGH THE CROSS SECTIONS DO NOT SHOW ANY SUCH ROUNDING.
34. THE CONSTRUCTION LIMITS AS SHOWN IN THE PLANS REPRESENT THE POINT OF INTERSECTION BETWEEN THE REQUIRED FILL OR CUT SLOPE AND THE EXISTING GROUNDLINE AS DEPICTED ON THE CROSS SECTIONS. THE CONSTRUCTION LIMITS DO NOT INCLUDE AREAS REQUIRED FOR SLOPE ROUNDING.

SOILS AND CONSTRUCTION NOTES (ENVIRONMENTAL)

35. BLANDING'S TURTLES HAVE BEEN REPORTED IN THE VICINITY OF THE PROPOSED PROJECT. THE CONTRACTOR SHALL OBTAIN THE BLANDING'S TURTLE FLYER AND FACT SHEET FROM THE MNDNR'S WEBSITE AND PROVIDE THEM TO ALL CONTRACTORS WORKING ON THE SITE. THE CONTRACTOR SHALL USE WILDLIFE FRIENDLY EROSION CONTROL MATERIALS PER THE MNDNR'S RECOMMENDATIONS.

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

STANDARD PLATES

PLATE NO.	DESCRIPTION
3000L	REINFORCED CONCRETE PIPE (5 SHEETS)
3006G	GASKET JOINT FOR R.C. PIPE (2 SHEETS)
3007E	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES
3022C	PRECAST CONCRETE SAFETY APRON (3 SHEETS)
3100G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3133D	RIPRAP AT RCP OUTLETS
3145G	CONCRETE PIPE OR PRECAST BOX CULVERT TIES
4005M	MANHOLE OR CATCH BASIN TYPE A & B CONE SECTIONS PRECAST - DESIGN F
4006L	MANHOLE OR CATCH BASIN PRECAST - DESIGNS G AND H
4010H	CONCRETE SHORT CONE & ADJUSTING RING (SECTIONAL CONCRETE)
4011E	PRECAST CONCRETE BASE
4020J	MANHOLE OR CATCH BASIN (FOR USE WITH OR WITHOUT TRAFFIC LOADS) (2 SHEETS)
4026A	CONCRETE ENCASED CONCRETE ADJUSTING RINGS
4101D	RING CASTING FOR MANHOLE OR CATCH BASIN
4108F	ADJUSTING RINGS FOR CATCH BASINS AND MANHOLES
4110F	COVER CASTING FOR MANHOLE (FOR USE IN ALL TRAFFIC AREAS) - CASTING NO. 715 AND 716
4125D	CATCH BASIN FRAME CASTING (FOR SQUARE GRATE) - CASTING NO. 806
4129G	CATCH BASIN FRAME CASTING (FOR SQUARE GRATE) - CASTING NO. 802A
4132G	CATCH BASIN FRAME CASTING (FOR SQUARE GRATE) - CASTING NO. 805
4154B	CAST BASIN GRATE CASTING - CASTING NO. 816
4160D	CURB BOX CASTING FOR CATCH BASIN
4180J	MANHOLE OR CATCH BASIN STEP
7020K	CONCRETE CURB (DESIGN B, V, S, DR & BR) (2 SHEETS)
7038A	DETECTABLE WARNING SURFACE TRUNCATED DOMES
7100H	CONCRETE CURB AND GUTTER (DESIGN B and DESIGN V)
7111J	INSTALLATION OF CATCH BASIN CASTINGS (CONCRETE CURB AND GUTTER)
7113A	CONCRETE APPROACH NOSE DETAIL
8000J	CHANNELIZERS (3 SHEETS)
8106D	EQUIPMENT PAD B (3 SHEETS)
8110E	TRAFFIC SIGNAL BRACKETING (POLE MOUNTED)
8117G	PRECAST CONCRETE HAND HOLE WITH VEHICLE LOAD
8120Q	POLE FOUNDATION (PA85)
8121H	TRANSFORMER BASE AND POLE BASE PLATE (PA85, PA90 AND PA100) (2 SHEETS)
8122F	PEDESTAL AND PEDESTAL BASE (FOR TRAFFIC CONTROL SIGNALS SUPPORT) (2 SHEETS)
8123G	POLE AND MAST ARM - LUMINAIRES AND TRAFFIC LIGHTS ASSEMBLY (FOR ALL POLE TYPES) (2 SHEETS)
8127E	LIGHT FOUNDATION - DESIGN E PRECAST/CAST-IN-PLACE (40 FT. POLE OR LESS) (2 SHEETS)
8129A	SHIM AND WASHER (TRAFFIC CONTROL SIGNALS AND ROADWAY LIGHTING)
8132B	PREFORMED RIGID PVC CONDUIT LOOP DETECTOR - LAYOUT DETAILS, NOTES, TYPICAL INSTALLATION (3 SHEETS)
9000E	APPROACHES AND ENTRANCES - RECOMMENDED STANDARDS
9322	CHAIN LINK FENCE (2 SHEETS)

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(M) BASIS OF QUANTITIES

BITUMINOUS MIXTURES (ROAD AND TRAIL)	115	LB/SY/IN	
BITUMINOUS TACK COAT	0.05	GAL/SY	
SEED MIXTURE 25-151	120	LB/ACRE	
FERTILIZER TYPE 3, SODDING TYPE LAWN	200	LB/ACRE	(1)
FERTILIZER TYPE 3, SEED MIXTURE 25-151	350	LB/ACRE	(1)

SPECIFIC NOTES:
(1) 22-5-10 ANALYSIS

INDEX OF TABULATIONS, STANDARD PLATES

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

(B) EARTHWORK TABULATIONS

STATION	EXCAVATION		EMBANKMENT (CV)		
	COMMON	SUBGRADE	COMMON	TOPSOIL	SELECT GRANULAR
	CU YD	CU YD	CU YD	CU YD	CU YD
S.P. 002-678-025					
245+56.46					
246+00.00	6	21			
246+50.00	7	25			
247+00.00	7	23			
247+50.00	7	22			
248+00.00	7	24			
248+50.00	7	26			
250+50.00	29	135			
251+00.00	9	40			
251+50.00	9	40			
252+00.00	6	38			
252+50.00	5	34			
253+00.00	7	29			
253+50.00	8	23			
254+00.00	7	20			
254+50.00	8	20			
255+00.00	23	6			
255+29.09	34	4		1	
255+50.00	31	9		2	
256+14.32	46	51		3	
256+50.00	6	33		2	
257+00.00	12	34		5	
257+50.00	17	50		6	
258+00.00	21	56		5	
258+50.00	28	45		5	
259+00.00	63	45		9	
259+50.00	87	50	13	12	
260+00.00	91	48	22	9	
260+50.00	138	37	15	10	
261+00.00	165	35	6	11	
261+50.00	138	39		7	2
262+00.00	108	49	2	6	5
262+53.12	154	55	2	3	8
263+00.00	159	45	1	3	5
263+50.00	105	52	11	6	2
264+00.00	72	51	47	7	1
264+50.00	74	48	52	7	
264+95.59	70	50	17	4	
265+50.00	120	51	4	5	
266+00.00	143	27	1	6	
266+50.00	166	23	2	7	
267+00.00	185	19	2	9	
267+50.00	160	19	3	8	
268+00.00	115	16	7	7	
268+50.00	88	7	15	6	9
269+00.00	83	5	25	8	14
269+50.00	79	16	21	8	4
270+00.00	76	43	7	6	
270+49.28	72	71	2	3	
271+00.00	80	94		4	
271+50.00	90	96	2	7	
272+00.00	88	78	4	7	
SUBTOTAL 1	3316	1977	283	214	50

(B) EARTHWORK TABULATIONS

STATION	EXCAVATION		EMBANKMENT (CV)		
	COMMON	SUBGRADE	COMMON	TOPSOIL	SELECT GRANULAR
	CU YD	CU YD	CU YD	CU YD	CU YD
S.P. 002-678-025					
272+50.00	75	58	6	7	
273+18.11	53	69	10	7	
273+50.00	36	67	4	2	
274+15.26	139	138	3	4	25
274+50.00	85	15	13	4	24
275+00.00	105		24	7	33
275+50.00	75		9	5	41
276+00.00	77		4	5	51
276+50.00	62		2	6	53
277+00.00	52		7	8	43
277+50.00	55		11	9	32
278+00.00	69		12	9	21
278+50.00	80	10	13	10	13
279+00.00	104	17	9	10	9
279+50.00	118	23	5	10	6
280+00.00	111	34	5	9	5
280+50.00	118	32	2	9	5
281+00.00	133	25	1	10	8
281+42.35	88	23		6	12
282+00.00	110	21	4	8	24
282+50.00	124	2	5	9	24
283+00.00	141		1	9	25
283+50.00	151			8	26
284+00.00	143		9	9	23
284+50.00	149		11	8	17
285+00.00	186		10	9	17
285+50.00	226	10	24	15	10
286+00.00	230	28	23	16	4
286+50.00	214	43	7	14	6
287+00.00	193	45		13	7
287+50.00	192	49		14	5
288+00.00	204	59	4	17	2
288+46.83	172	77	4	16	
289+00.00	132	86	4	10	
289+50.00	80	56	5	7	
290+00.00	73	46	1	6	7
290+50.00	69	44		7	13
291+00.00	65	57		8	6
291+50.00	69	84		7	
292+00.00	76	111		7	
292+50.00	75	128		7	
293+00.00	71	138		6	
293+50.00	67	144		5	
294+00.00	41	111		3	
294+50.00	6	72		2	
295+00.00	4	72		1	
295+50.00	1	52			
296+00.00		21			
296+50.00		62			
67+02.53		38			
SUBTOTAL 2	4899	2167	252	378	597
PROJECT TOTAL	8215	4144	535	592	647

(B) POND EARTHWORK

	EXCAVATION SPECIAL	FILTER TOPSOIL BORROW (1)
	CU YD	CU YD
S.P. 002-678-025		
POND	3487	
FILTRATION MEDIA		158
TOTAL	3487	158

(BB) EARTHWORK BALANCE

AVAILABLE EXCAVATION (CY)

COMMON EXCAVATION (EV)	8215	COMMON	6069 (EV) / 1.1	=	5517 (CV)(7)
		TOPSOIL	2144 (EV) / 1.1	=	1949 (CV)(7)
EXCAVATION SPECIAL (EV)	3487	POND	3487 (EV) / 1.1	=	3170 (CV)
SUBGRADE EXCAVATION (EV)	4144	SUBGRADE	4144 (EV) / 1.1	=	3767 (CV)(7)

NEEDED EMBANKMENT (CY)

TOPSOIL	592	592 (CV)
COMMON	535	535 (CV)
SUBGRADE	647	647 (CV)
GRANULAR MATERIAL (8)	1050	1050 (CV)

EXCESS (CY)

	NEEDED			AVAILABLE		
TOPSOIL	592	(CV)	-	1949 (CV)	=	1357 (CV)(5)
COMMON	535	(CV)	-	8687 (CV)	=	8152 (CV)(6)
GRANULAR BORROW	647 (CV)	+ 1050 (CV)	-	3767 (CV)	=	2070 (CV)(6)

B	PAY ITEMS		
EXCAVATION - COMMON (CV)(2)		CY	8215
EXCAVATION SPECIAL (CV)(3)		CY	3487
EXCAVATION - SUBGRADE (CV)(4)		CY	4144
FILTER TOPSOIL BORROW		CY	158

GENERAL NOTES

STATIONING BASED ON CSAH 78 NB ALIGNMENT.

SPECIFIC NOTES
(1) MNDOT TYPE G FILTER TOPSOIL BORROW
(2) TOTAL COMMON EXCAVATION FOR PROJECT. PAID FOR AS 2106.507 EXCAVATION - COMMON.
(3) TOTAL EXCAVATION SPECIAL FOR PROJECT. PAID FOR AS 2106.507 EXCAVATION SPECIAL.
(4) TOTAL SUBGRADE EXCAVATION FOR PROJECT. PAID FOR AS 2106.507 EXCAVATION - SUBGRADE.
(5) EXCESS TOPSOIL TO BE DISTRIBUTED WITHIN PROJECT CONSTRUCTION LIMITS AT ENGINEER'S DISCRETION.
(6) EXCESS COMMON MATERIAL TO BECOME PROPERTY OF CONTRACTOR AND DISPOSED OF OFF SITE.
(7) MATERIAL ASSUMED TO MEET THE REQUIREMENTS FOR MNDOT 3149.2B1.
(8) SEE SHEET 11 FOR TABULATION.

EARTHWORK

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: BRETT A. VOTH LIC. NO. 49045
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 12/31/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

TABULATIONS
SHEET NO. 8 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(A) CLEARING AND GRUBBING				
ALIGN	STATION	LOCATION	CLEAR TREE	GRUB TREE
S.P. 002-678-025				
PCSAH78NB	264+08.96	46' RT	1	1
PCSAH78NB	267+78.80	28' RT	1	1
PCSAH78NB	270+07.45	48' RT	1	1
PCSAH78NB	271+11.08	52' RT	1	1
PCSAH78NB	276+08.99	40' RT	1	1
PCSAH78NB	276+47.44	40' RT	1	1
PCSAH78NB	276+97.23	37' RT	1	1
PCSAH78NB	277+24.83	40' RT	1	1
PCSAH78NB	277+59.89	26' RT	1	1
PCSAH78NB	278+02.66	34' RT	1	1
PCSAH78NB	278+19.10	28' RT	1	1
PCSAH78NB	279+74.92	27' RT	1	1
PCSAH78NB	279+77.55	29' RT	1	1
PCSAH78NB	279+87.02	30' RT	1	1
PCSAH78NB	280+03.73	28' RT	1	1
PCSAH78NB	280+27.25	34' RT	1	1
PCSAH78NB	280+30.62	42' RT	1	1
PCSAH78NB	280+44.07	29' RT	1	1
PCSAH78NB	280+44.38	36' RT	1	1
PCSAH78NB	280+57.87	33' RT	1	1
PCSAH78NB	280+69.09	33' RT	1	1
PCSAH78NB	280+89.27	33' RT	1	1
PCSAH78NB	280+90.60	30' RT	1	1
PCSAH78NB	280+94.24	27' RT	1	1
PCSAH78NB	281+08.07	33' RT	1	1
PCSAH78NB	281+10.23	30' RT	1	1
PCSAH78NB	281+13.49	32' RT	1	1
PCSAH78NB	281+35.92	34' RT	1	1
PCSAH78NB	281+55.82	26' RT	1	1
PCSAH78NB	281+65.48	27' RT	1	1
PCSAH78NB	281+75.11	28' RT	1	1
PCSAH78NB	282+02.55	34' RT	1	1
PCSAH78NB	282+19.22	30' RT	1	1
PCSAH78NB	282+33.11	40' RT	1	1
PCSAH78NB	282+34.17	38' RT	1	1
PCSAH78NB	282+35.33	42' RT	1	1
PCSAH78NB	282+55.05	35' RT	1	1
PCSAH78NB	283+01.21	26' RT	1	1
PCSAH78NB	283+06.13	38' RT	1	1
PCSAH78NB	283+25.31	26' RT	1	1
PCSAH78NB	283+47.11	23' RT	1	1
PCSAH78NB	283+67.93	40' RT	1	1
PCSAH78NB	283+85.04	38' RT	1	1
PCSAH78NB	283+87.62	27' RT	1	1
PCSAH78NB	283+92.89	29' RT	1	1
PCSAH78NB	284+00.65	40' RT	1	1
PCSAH78NB	284+32.81	27' RT	1	1
PCSAH78NB	284+42.38	37' RT	1	1
PCSAH78NB	284+76.69	35' RT	1	1
PCSAH78NB	284+96.14	31' RT	1	1
PCSAH78NB	285+04.17	34' RT	1	1
PCSAH78NB	287+07.35	30' RT	1	1
PCSAH78NB	287+23.32	30' RT	1	1
PCSAH78NB	287+33.39	31' RT	1	1
PCSAH78NB	287+42.15	33' RT	1	1
PCSAH78NB	287+50.33	33' RT	1	1
PCSAH78NB	287+55.49	37' LT	1	1
SUBTOTAL 1			57	57

(A) CLEARING AND GRUBBING				
ALIGN	STATION	LOCATION	CLEAR TREE	GRUB TREE
S.P. 002-678-025				
PCSAH78SB	159+61.43	59' LT	1	1
PCSAH78SB	159+64.29	60' LT	1	1
PCSAH78SB	159+68.74	61' LT	1	1
PCSAH78SB	160+07.71	59' LT	1	1
PCSAH78SB	160+09.55	61' LT	1	1
PCSAH78SB	160+10.26	59' LT	1	1
PCSAH78SB	160+33.63	63' LT	1	1
PCSAH78SB	160+35.21	69' LT	1	1
PCSAH78SB	160+37.42	61' LT	1	1
PCSAH78SB	160+40.56	62' LT	1	1
PCSAH78SB	160+42.63	63' LT	1	1
PCSAH78SB	160+45.68	58' LT	1	1
PCSAH78SB	160+50.82	67' LT	1	1
PCSAH78SB	160+55.82	67' LT	1	1
PCSAH78SB	160+59.92	78' LT	1	1
PCSAH78SB	160+61.81	38' LT	1	1
PCSAH78SB	160+62.75	62' LT	1	1
PCSAH78SB	160+68.16	66' LT	1	1
PCSAH78SB	160+81.02	75' LT	1	1
PCSAH78SB	160+93.14	53' LT	1	1
PCSAH78SB	160+97.15	71' LT	1	1
PCSAH78SB	161+02.77	34' LT	1	1
PCSAH78SB	161+03.25	76' LT	1	1
PCSAH78SB	161+03.67	34' LT	1	1
PCSAH78SB	161+05.45	80' LT	1	1
PCSAH78SB	161+06.06	58' LT	1	1
PCSAH78SB	161+07.53	49' LT	1	1
PCSAH78SB	161+08.43	49' LT	1	1
PCSAH78SB	161+08.49	57' LT	1	1
PCSAH78SB	161+10.43	60' LT	1	1
PCSAH78SB	161+12.04	35' LT	1	1
PCSAH78SB	161+14.26	83' LT	1	1
PCSAH78SB	161+17.11	35' LT	1	1
PCSAH78SB	161+17.99	61' LT	1	1
PCSAH78SB	161+18.74	35' LT	1	1
PCSAH78SB	161+25.06	87' LT	1	1
PCSAH78SB	161+26.49	78' LT	1	1
PCSAH78SB	161+31.93	105' LT	1	1
PCSAH78SB	161+32.04	101' LT	1	1
PCSAH78SB	161+36.29	89' LT	1	1
PCSAH78SB	161+39.66	47' LT	1	1
PCSAH78SB	161+61.04	85' LT	1	1
PCSAH78SB	161+63.24	53' LT	1	1
PCSAH78SB	161+64.33	86' LT	1	1
PCSAH78SB	161+67.96	87' LT	1	1
PCSAH78SB	161+70.76	30' LT	1	1
PCSAH78SB	161+71.59	55' LT	1	1
PCSAH78SB	161+73.73	104' LT	1	1
PCSAH78SB	161+74.37	77' LT	1	1
PCSAH78SB	161+77.60	87' LT	1	1
PCSAH78SB	161+79.91	88' LT	1	1
PCSAH78SB	161+98.51	58' LT	1	1
PCSAH78SB	161+98.81	50' LT	1	1
PCSAH78SB	161+99.00	73' LT	1	1
PCSAH78SB	162+02.60	49' LT	1	1
PCSAH78SB	163+15.95	22' LT	1	1
PCSAH78SB	163+30.75	25' LT	1	1
SUBTOTAL 2			57	57

(A) CLEARING AND GRUBBING				
ALIGN	STATION	LOCATION	CLEAR TREE	GRUB TREE
S.P. 002-678-025				
PCSAH78SB	163+32.52	26' LT	1	1
PCSAH78SB	164+19.40	33' LT	1	1
PCSAH78SB	164+27.26	28' LT	1	1
PCSAH78SB	164+31.90	31' LT	1	1
PCSAH78SB	164+37.49	39' LT	1	1
PCSAH78SB	164+40.66	38' LT	1	1
PCSAH78SB	164+41.20	22' LT	1	1
PCSAH78SB	164+50.91	15' LT	1	1
PCSAH78SB	164+51.96	23' LT	1	1
PCSAH78SB	164+53.20	16' LT	1	1
PCSAH78SB	164+53.25	13' LT	1	1
PCSAH78SB	164+54.84	14' LT	1	1
PCSAH78SB	164+59.16	29' LT	1	1
PCSAH78SB	164+69.29	23' LT	1	1
PCSAH78SB	164+84.71	19' LT	1	1
PCSAH78SB	164+85.12	20' LT	1	1
PCSAH78SB	164+87.05	19' LT	1	1
PCSAH78SB	164+87.13	33' LT	1	1
PCSAH78SB	164+88.02	19' LT	1	1
PCSAH78SB	164+92.10	31' LT	1	1
PCSAH78SB	164+99.90	20' LT	1	1
PCSAH78SB	165+09.36	19' LT	1	1
PCSAH78SB	165+11.33	21' LT	1	1
PCSAH78SB	165+33.41	25' LT	1	1
PCSAH78SB	165+38.46	27' LT	1	1
PCSAH78SB	165+51.11	23' LT	1	1
PCSAH78SB	165+53.30	31' LT	1	1
PCSAH78SB	165+61.78	32' LT	1	1
PCSAH78SB	165+71.04	29' LT	1	1
PCSAH78SB	165+71.98	24' LT	1	1
PCSAH78SB	165+87.77	27' LT	1	1
PCSAH78SB	165+89.62	26' LT	1	1
PCSAH78SB	165+90.20	24' LT	1	1
PCSAH78SB	166+10.21	34' LT	1	1
PCSAH78SB	166+12.96	33' LT	1	1
PCSAH78SB	166+17.33	27' LT	1	1
PCSAH78SB	166+31.16	30' LT	1	1
PCSAH78SB	166+32.73	23' LT	1	1
PCSAH78SB	166+38.48	30' LT	1	1
PCSAH78SB	166+39.52	29' LT	1	1
PCSAH78SB	166+90.08	38' LT	1	1
PCSAH78SB	166+95.10	37' LT	1	1
PCSAH78SB	167+01.64	30' LT	1	1
PCSAH78SB	167+04.70	35' LT	1	1
PCSAH78SB	167+13.27	28' LT	1	1
PCSAH78SB	167+21.30	30' LT	1	1
PCSAH78SB	167+21.36	33' LT	1	1
PCSAH78SB	167+30.56	37' LT	1	1
PCSAH78SB	167+44.12	27' LT	1	1
PCSAH78SB	167+49.29	27' LT	1	1
PCSAH78SB	167+59.48	34' LT	1	1
PCSAH78SB	167+65.13	27' LT	1	1
PCSAH78SB	167+76.17	31' LT	1	1
PCSAH78SB	167+88.97	27' LT	1	1
PCSAH78SB	167+93.61	30' LT	1	1
PCSAH78SB	167+99.35	30' LT	1	1
PCSAH78SB	168+10.37	26' LT	1	1
SUBTOTAL 3			57	57

(A) CLEARING AND GRUBBING				
ALIGN	STATION	LOCATION	CLEAR TREE	GRUB TREE
S.P. 002-678-025				
PCSAH78SB	168+14.81	26' LT	1	1
PCSAH78SB	168+18.93	27' LT	1	1
PCSAH78SB	168+30.75	31' LT	1	1
PCSAH78SB	168+34.78	27' LT	1	1
PCSAH78SB	168+57.36	27' LT	1	1
PCSAH78SB	168+72.86	28' LT	1	1
PCSAH78SB	168+78.91	31' LT	1	1
PCSAH78SB	168+81.29	31' LT	1	1
PCSAH78SB	169+66.51	31' LT	1	1
PCSAH78SB	169+70.99	30' LT	1	1
PCSAH78SB	171+44.06	29' LT	1	1
PCSAH78SB	171+55.92	29' LT	1	1
PCSAH78SB	171+59.89	30' LT	1	1
PCSAH78SB	171+70.21	30' LT	1	1
PCSAH78SB	174+19.78	40' LT	1	1
PCSAH78SB	175+17.38	41' LT	1	1
PCSAH78SB	175+35.66	40' LT	1	1
PCSAH78SB	175+72.53	41' LT	1	1
PCSAH78SB	177+44.31	34' LT	1	1
PCSAH78SB	177+45.40	34' LT	1	1
PCSAH78SB	178+22.15	36' LT	1	1
PCSAH78SB	178+22.15	36' LT	1	1
PCSAH78SB	180+24.64	32' LT	1	1
PCSAH78SB	180+51.11	32' LT	1	1
PCSAH78SB	180+71.82	34' LT	1	1
SUBTOTAL 4			25	25
TOTAL			196	196

CLEARING & GRUBBING
SHEET 1 OF 4

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

TABULATIONS

SHEET NO. 9 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(D) REMOVALS

ROADWAY	ALIGNMENT	STATION	TO	STATION	LOCATION	REMOVE				MILL BITUMINOUS SURFACE (2.0")
						CURB & GUTTER	BITUMINOUS PAVEMENT	CONCRETE PAVEMENT	SIDEWALK	
						LIN FT	SQ YD	SQ YD	SQ FT	SQ YD
S.P. 002-678-025										
CSAH 78	PCSAH78NB	245+49.88	-	248+67.10	LT	629	194		1456	35
CSAH 78	PCSAH78NB	250+18.05	-	255+28.92	LT	1023	78		5735	
CSAH 78	PCSAH78NB	250+18.05	-	253+76.36	LT					40
CSAH 11	CSAH11WB	30+07.75	-	33+36.64	LT	372	41	13	1808	37
CSAH 78	PCSAH78NB	255+29.41	-	256+50.00	RT & LT		209			
CSAH 78	PCSAH78NB	255+29.41	-	255+88.51	LT	60			543	
CSAH 78	PCSAH78NB	255+29.41	-	255+97.07	RT	79				
CSAH 78	PCSAH78NB	253+76.91	-	257+16.16	LT					38
CSAH 78	PCSAH78NB	256+31.10	-	264+81.18	RT	884			2927	
CSAH 78	PCSAH78NB	256+50.00	-	263+00.00	RT & LT		1325			
CSAH 78	PCSAH78NB	263+00.00	-	269+50.00	RT & LT		1410			
CSAH 78	PCSAH78NB	265+09.99	-	270+77.32	RT	642		13	2644	
CSAH 78	PCSAH78NB	268+27.54	-	273+00.29	LT	946			2362	
CSAH 78	PCSAH78NB	269+50.00	-	276+00.00	RT & LT		2027			
CSAH 78	PCSAH78NB	270+77.32	-	273+90.95	RT	357			1683	
121ST AVE NW	121STAVE	62+81.07	-	65+68.98	LT	284	57		1159	32
CSAH 78	PCSAH78NB	274+08.81	-	288+32.76	RT	1554			7166	
CSAH 78	PCSAH78NB	274+33.98	-	279+28.67	LT	496			2698	
CSAH 78	PCSAH78NB	276+00.00	-	282+50.00	RT & LT		1468			
CSAH 78	PCSAH78NB	282+50.00	-	289+00.00	RT & LT		1335			
CSAH 78	PCSAH78NB	288+60.72	-	293+93.43	RT	570			2727	
CSAH 78	PCSAH78NB	289+00.00	-	296+90.10	RT & LT		1216			
CSAH 78	PCSAH78NB	292+00.20	-	67+05.08 R2	LT	491			8799	33
CSAH 78	PCSAH78SB	155+27.30	-	155+87.79	RT	61				
CSAH 78	PCSAH78SB	157+15.05	-	162+35.98	LT	544			1610	
CSAH 78	PCSAH78SB	162+69.93	-	172+90.04	LT	1223			5728	
CSAH 78	PCSAH78SB	173+36.73	-	181+28.86	LT	867			4096	
CSAH 78	PCSAH78SB	174+29.85	-	179+29.92	RT	499				
CSAH 78	PCSAH78SB	181+58.20	-	65+17.97 R2	LT	1381			1940	
CSAH 78	PCSAH78SB	62+11.78 R2	-	65+01.18 R2	RT	289				
TOTAL						13251	9360	26	55081	215

(E) SAWING

ROADWAY	ALIGNMENT	STATION	TO	STATION	OFFSET	NOTES	BITUMINOUS PAVEMENT (FULL DEPTH)
							LIN FT
S.P. 002-678-025							
CSAH 78	PCSAH78NB	245+49.88	-	248+67.10	LT	(3)	665
CSAH 11	CSAH11WB	30+07.75	-	33+36.64	LT		417
CSAH 78	PCSAH78NB	250+17.00	-	257+17.82	LT		1399
CSAH 78	PCSAH78NB	255+28.92	-	255+29.41	LT/RT		34
CSAH 78	PCSAH78NB	255+99.67	-	256+28.99	RT		29
CSAH 78	PCSAH78NB	264+83.18	-	265+07.99	RT		25
CSAH 78	PCSAH78NB	270+35.68	-	270+63.04	RT		27
121ST AVE NW	121STAVE	62+81.07	-	65+68.98	LT		288
CSAH 78	PCSAH78NB	273+92.87	-	274+37.51	RT		41
CSAH 78	PCSAH78NB	288+34.85	-	288+58.83	RT		26
CSAH 78	PCSAH78NB	293+93.33			LT/RT		28
CSAH 78	PCSAH78NB	293+93.33	-	296+90.10	LT		320
CSAH 78	PCSAH78SB	157+16.58			LT/RT		37
CSAH 78	PCSAH78SB	162+38.63	-	162+69.11	LT		31
CSAH 78	PCSAH78SB	172+91.88	-	173+34.92	LT		47
CSAH 78	PCSAH78SB	181+30.72	-	181+56.20	LT		26
CSAH 78	PCSAH78SB	64+04.52 R2			LT/RT		21
CSAH 78	PCSAH78SB	64+04.52 R2	-	65+21.97 R2	LT		161
CSAH 78	PCSAH78SB	64+04.52 R2	-	67+01.26 R2	RT		299
TOTAL							3921

SPECIFIC NOTES
(3) MEDIAN AREA SAWING.

(F) AGGREGATE AND BITUMINOUS PAVEMENT

ROADWAY	ALIGNMENT	STATION	TO	STATION	NOTE	LOCATION	AGG. BASE (CV) CLASS 5	BITUMINOUS TYPE SP 12.5 WEARING COURSE MIX (4,F) (SPWEB440F)	BITUMINOUS TYPE SP 12.5 NON WEARING COURSE MIX (4,B) (SPNWB430B)	AGG. BASE (CV) CLASS 5	BITUMINOUS TYPE SP 4.75 WEARING COURSE MIX (2,B) (SPWEA230B)	AGG. BASE (CV) CLASS 5	BITUMINOUS PATCHING MIXTURE (2)
							CU YD	TON	TON	CU YD	TON	CU YD	TON
S.P. 002-678-025													
CSAH 78	PCSAH78NB	245+49.88	-	248+67.10		LT						247	264
CSAH 78	PCSAH78SB	150+17.70	-	157+14.98		RT						329	272
CSAH 78	PCSAH78NB	250+17.87	-	255+28.70		LT	32	26	20				
CSAH 11	CSAH11WB	30+07.75	-	33+36.64		LT	155	107	80				
CSAH 78	PCSAH78NB	255+28.70	-	262+40.76		LT & RT	1668	1034	776				
CSAH 78	PCSAH78NB	260+07.98	-	262+11.58	(1)	RT				29	37		
CSAH 78	PCSAH78NB	262+70.76	-	273+26.88		LT & RT	3142	2234	1675				
CSAH 78	PCSAH78NB	262+94.66	-	264+51.20	(1)	RT				19	25		
CSAH 78	PCSAH78NB	265+30.26	-	270+24.84	(1)	RT				48	62		
CSAH 78	PCSAH78NB	270+62.93	-	273+33.57	(1)	RT				25	32		
121ST AVE NW	121STAVE	62+81.07	-	65+68.98		LT	128	81	60				
CSAH 78	PCSAH78NB	273+26.88	-	288+46.51		LT & RT	4534	3013	2260				
CSAH 78	PCSAH78NB	274+44.58	-	288+04.02	(1)	RT				151	195		
CSAH 78	PCSAH78NB	288+46.51	-	296+90.10		LT & RT	1917	1294	971				
CSAH 78	PCSAH78NB	288+79.43	-	292+07.14	(1)	RT				32	41		
PROJECT TOTAL							11576	7789	5842	304	392	576	536

SPECIFIC NOTES
(1) TRAIL PAVEMENT.

REMOVAL, SAWCUT, AGG BIT

SHEET 2 OF 4

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

TABULATIONS

SHEET NO. 10 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(G) CONCRETE CURB & GUTTER AND WALK

ROADWAY	ALIGNMENT	STATION	TO STATION	LT/RT	NOTES	TRUNCATED DOMES			DRILL & GROUT REINF. BAR (EPOXY COATED)	GRANULAR BORROW (CV)	WALK		C&G DESIGN			
							RADIAL				4"	6"	B418 (MOD)	B424	B618	V
						SQ FT	SQ FT	RADIUS	EACH	CU YD	SQ FT	SQ FT	LIN FT			
S.P. 002-678-025																
CSAH 78	PCSAH78NB	245+50.85	- 248+67.10	LT	(1)					11	864		315			
CSAH 78	PCSAH78NB	250+18.05	- 255+28.93	LT	(1)					23	1852		506			
CSAH 11	CSAH11WB	30+07.75	- 33+36.64	LT						57	1530	196		349		60
CSAH 78	PCSAH78NB	255+28.92	- 262+38.31	LT	(1)					48	3885		709			
CSAH 78	PCSAH78NB	255+28.92	- 255+97.64	RT		9			4			43		81		
CSAH 78	PCSAH78NB	256+31.01	- 262+41.23	RT		9	48	29'	13	33	891	297		630		
CSAH 78	PCSAH78NB	262+65.01	- 264+81.18	RT			48	29'	9			256		243		
CSAH 78	PCSAH78NB	264+51.20	- 264+74.86	RT			52	29'	10			236				
CSAH 78	PCSAH78NB	262+76.40	- 273+14.70	LT	(1)					38	3045		1038			
CSAH 78	PCSAH78NB	265+09.99	- 270+35.68	RT			36	29'	7			167		566		
CSAH 78	PCSAH78NB	270+24.84	- 270+35.68	RT								126				
CSAH 78	PCSAH78NB	270+62.88	- 273+90.95	RT						6	162	103		390		
CSAH 78	PCSAH78NB	273+26.88	- 273+62.41	RT			47	44'	15			461				
121ST AVE NW	121STAVE	62+81.07	- 65+68.98	LT		9			4	42	1141	40			282	
CSAH 78	PCSAH78NB	274+30.47	- 281+13.96	LT	(1)					23	1826		686			
CSAH 78	PCSAH78NB	274+35.58	- 288+32.97	RT			51	29'	13	8	215	312		1451	24	
CSAH 78	PCSAH78NB	281+43.94	- 288+33.98	LT	(1)					112	9072		690			
CSAH 78	PCSAH78NB	288+04.02	- 288+25.96	RT								168				
CSAH 78	PCSAH78NB	288+60.72	- 293+93.39	RT			32	29'	6			170		558		
CSAH 78	PCSAH78NB	288+64.06	- 296+90.10	LT	(1)					47	3776		825			
CSAH 78	PCSAH78SB	145+50.90	- 148+67.15										316			
CSAH 78	PCSAH78SB	150+23.70	- 162+46.68	RT									1246			
CSAH 78	PCSAH78SB	157+15.05	- 162+35.62	LT						67	1819	49		525		
CSAH 78	PCSAH78SB	162+53.03	- 172+91.67	LT						266	7173	42		1105		
CSAH 78	PCSAH78SB	162+71.80	- 173+08.52	RT									1037			
CSAH 78	PCSAH78SB	172+76.86	- 173+01.06	LT			49	29'	19			329				
CSAH 78	PCSAH78SB	173+36.53	- 181+30.72	LT			42	49'	15	152	4092	167		857		
CSAH 78	PCSAH78SB	174+26.40	- 181+15.10	RT									686			
CSAH 78	PCSAH78SB	181+02.41	- 181+22.55	LT			24	29'	7			110				
CSAH 78	PCSAH78SB	181+56.27	- 65+21.00 R2	LT		9	24	29'	11	117	3168	160		1351		
CSAH 78	PCSAH78SB	181+45.08	- 188+16.99	RT									686			
CSAH 78	PCSAH78SB	188+45.57	- 67+01.26 R2	RT									825			
PROJECT TOTAL						36	453		133	1050	44511	3432	9565	8106	306	60

SPECIFIC NOTES:
(1) PROPOSED MEDIAN PAID FOR AS 4" CONCRETE WALK.

(Q) PREFABRICATED MODULAR BLOCK WALL

ROADWAY	ALIGNMENT	STATION	TO STATION	OFFSET	NOTES	SELECT GRANULAR EMBANKMENT MOD 10%	PREFABRICATED MODULAR BLOCK WALL (3)	COARSE FILTER AGGREGATE (CV)	4" PERF TP PIPE DRAIN	GEOTEXTILE FABRIC TYPE I	WIRE FENCE DESIGN 60V-9322 (2)
						CU YD	SQ FT	CU YD	LIN FT	SQ YD	LIN FT
S.P. 002-678-025											
CSAH 78	PCSAH78SB	184+68.08	- 188+47.50	LT		154	2227	60	368	318	368
PROJECT TOTAL						154	2227	60	368	318	368

(2) WIRE FENCE DESIGN 60V-9322 SHALL HAVE TOP RAIL IN LIEU OF A TENSION WIRE.
(3) BLOCK GRAVITY WALL

CURB & GUTTER, RETAINING WALL
SHEET 3 OF 4

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: BRETT A. VOTH LIC. NO. 49045
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

TABULATIONS
SHEET NO. 11 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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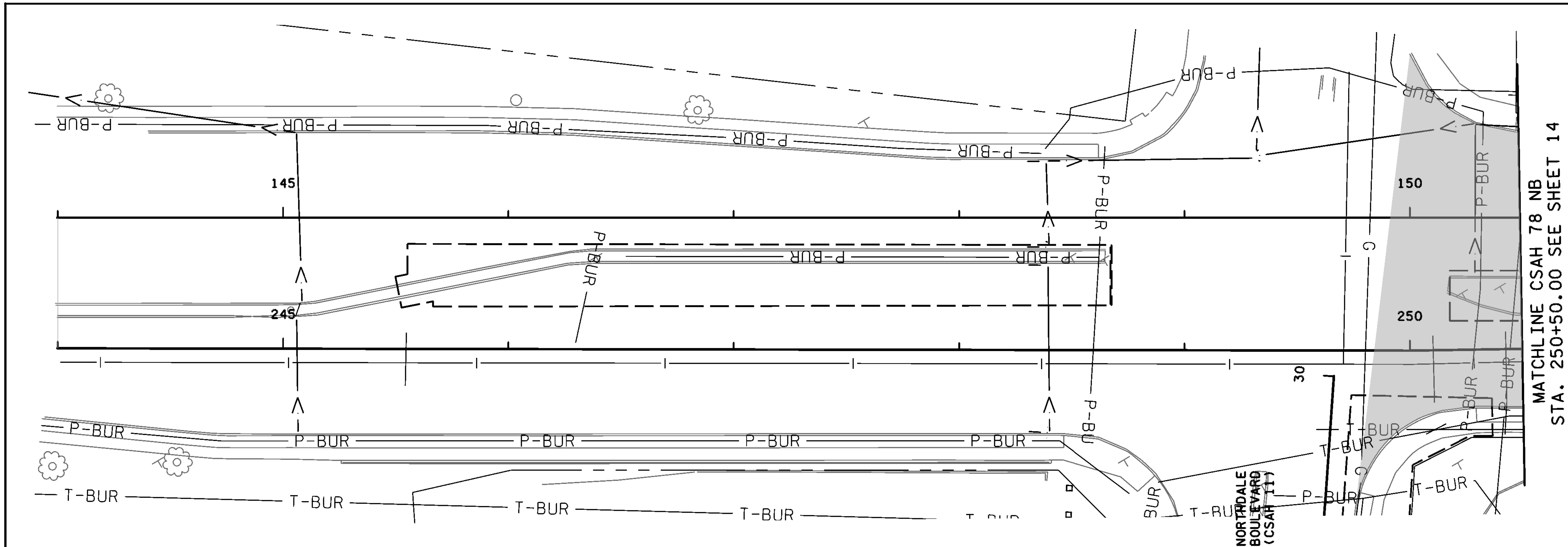
(H)	EROSION CONTROL									
ROADWAY	ALIGNMENT	STATION	TO	STATION	OFFSET	SILT FENCE, TYPE MS	STORM DRAIN INLET PROTECTION	EROSION CONTROL BLANKET CATEGORY 3N	SEDIMENT CONTROL LOG TYPE COMPOST	FLOTATION SILT CURTAIN, TYPE MOVING WATER
						LIN FT	EACH	SQ YD	LIN FT	LIN FT
S.P. 002-678-025										
CSAH 78	PCSAH78NB	248+28.74	-	255+28.92	RT		6			
CSAH 78	PCSAH78NB	248+28.74	-	255+28.92	LT		3			
CSAH 11	CSAH11WB	30+21.53	-	31+85.15	LT	64	1			
CSAH 78	PCSAH78NB	255+28.92	-	257+62.19	RT	272	2			
CSAH 78	PCSAH78NB	257+62.19	-	264+95.59	RT	882	6			34
CSAH 78	PCSAH78NB	257+62.19	-	264+95.59	LT		4			
CSAH 78	PCSAH78NB	264+95.59	-	270+49.28	RT	201	8			
CSAH 78	PCSAH78NB	264+95.59	-	270+49.28	LT		4			
CSAH 78	PCSAH78NB	270+49.28	-	275+50.00	RT		4			
CSAH 78	PCSAH78NB	270+49.28	-	275+50.00	LT		3			
121ST AVE NW	121STAVE	62+34.20	-	63+76.29	LT/RT	88	3			
CSAH 78	PCSAH78NB	275+50.00	-	288+46.83	RT	537	10			
CSAH 78	PCSAH78NB	275+50.00	-	288+46.83	LT		6			
CSAH 78	PCSAH78NB	288+46.83	-	68+70.37 R2	RT	51	9			
CSAH 78	PCSAH78NB	288+46.83	-	68+70.37 R2	LT		6			
CSAH 78	PCSAH78SB	148+27.18	-	155+27.25	LT		7			
CSAH 78	PCSAH78SB	148+27.18	-	155+27.25	RT		9			
CSAH 78	PCSAH78SB	155+27.25	-	157+61.08	LT	171	3			
CSAH 78	PCSAH78SB	157+61.08	-	162+52.36	RT		4			
CSAH 78	PCSAH78SB	157+61.08	-	162+52.36	LT	1569	4	1200	167	37
CSAH 78	PCSAH78SB	162+52.36	-	173+13.18	RT		5			
CSAH 78	PCSAH78SB	162+52.36	-	173+13.18	LT	749	6			
CSAH 78	PCSAH78SB	173+13.18	-	181+42.92	RT		3			
CSAH 78	PCSAH78SB	173+13.18	-	181+42.92	LT	462	5			
CSAH 78	PCSAH78SB	181+42.92	-	188+47.07	RT		3			
CSAH 78	PCSAH78SB	181+42.92	-	188+47.07	LT	290	3			
CSAH 78	PCSAH78SB	188+47.07	-	68+72.01 R2	RT		5			
CSAH 78	PCSAH78SB	188+47.07	-	68+72.01 R2	LT		12			
PROJECT TOTAL						5336	144	1200	167	71

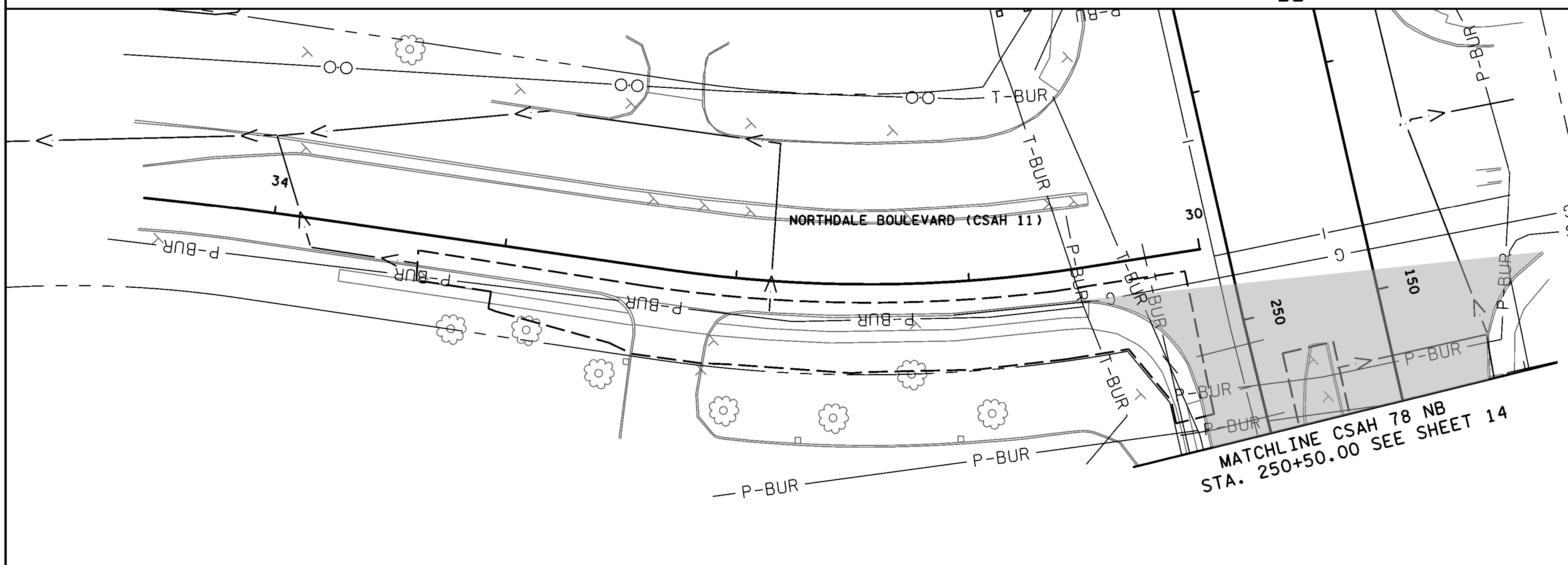
(S)	TURF ESTABLISHMENT										
ROADWAY	ALIGNMENT	STATION	TO	STATION	NOTE	OFFSET	SOIL BED PREPERATION	SEEDING	MIX. 25-151	FERTILIZER TYPE 3	SODDING TYPE LAWN
						LT / RT	ACRE	ACRE	POUND	POUND	SQ YD
S.P. 002-678-025											
CSAH 11	PCSAH11WB	30+49.68	-	32+99.06		LT				5	131
CSAH 78	PCSAH78NB	255+28.94	-	262+38.27		RT	0.12	0.12	14	41	
CSAH 78	PCSAH78SB	158+43.34	-	162+35.62		LT	0.40	0.40	48	139	
CSAH 78	PCSAH78SB	162+53.01	-	172+96.13		LT	0.13	0.13	15	45	
CSAH 78	PCSAH78NB	262+38.27	-	270+32.17		RT	0.11	0.11	14	40	
CSAH 78	PCSAH78NB	270+62.88	-	273+90.76		RT	0.04	0.04	5	20	119
CSAH 78	PCSAH78SB	173+36.53	-	181+28.72		LT	0.13	0.13	16	47	
121ST AVE NW	121STAVE	62+81.12	-	65+17.41		LT	0.04	0.04	5	14	
CSAH 78	PCSAH78NB	274+25.98	-	288+32.97		RT	0.22	0.22	26	77	
CSAH 78	PCSAH78SB	181+58.28	-	65+17.97 R2		LT	0.19	0.19	23	79	251
CSAH 78	PCSAH78NB	288+67.76	-	293+95.40		RT	0.07	0.07	9	25	
PROJECT TOTAL							1.45	1.45	175	532	501



LEGEND

- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- SANITARY SEWER
- P-BUR BURIED POWER
- WATER
- G GAS
- OHU OVERHEAD UTILITY
- T-BUR BURIED TELEPHONE
- COMMUNICATION
- STORM SEWER
- EXISTING PAVEMENT

50
SCALE IN FEET



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NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

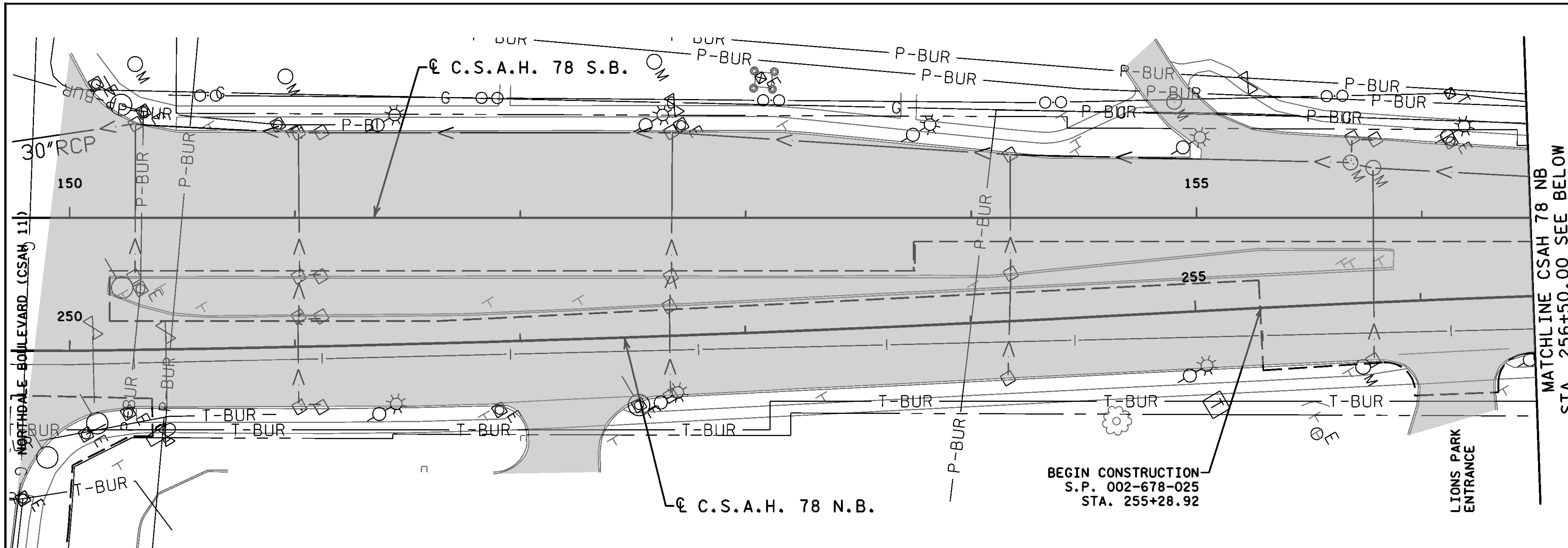
HDR

ANOKA COUNTY

INPLACE UTILITIES & TOPOGRAPHY PLAN

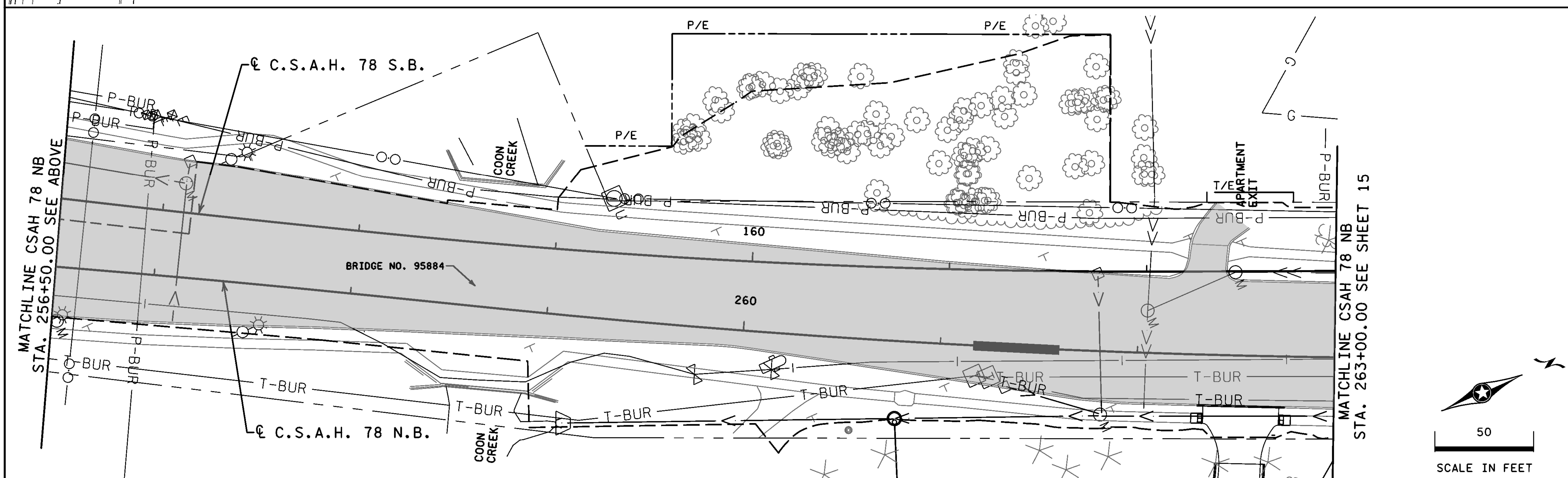
SHEET NO.13 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



LEGEND

Symbol	Description
---·---	EX. RIGHT OF WAY
— — —	CONSTRUCTION LIMITS
———	TEMPORARY EASEMENT
- - - -	PERMANENT EASEMENT
— >> —	SANITARY SEWER
— P-BUR —	BURIED POWER
—I—	WATER
— G —	GAS
— OHU —	OVERHEAD UTILITY
— T-BUR —	BURIED TELEPHONE
—OO—	COMMUNICATION
— > —	STORM SEWER
(shaded)	EXISTING PAVEMENT



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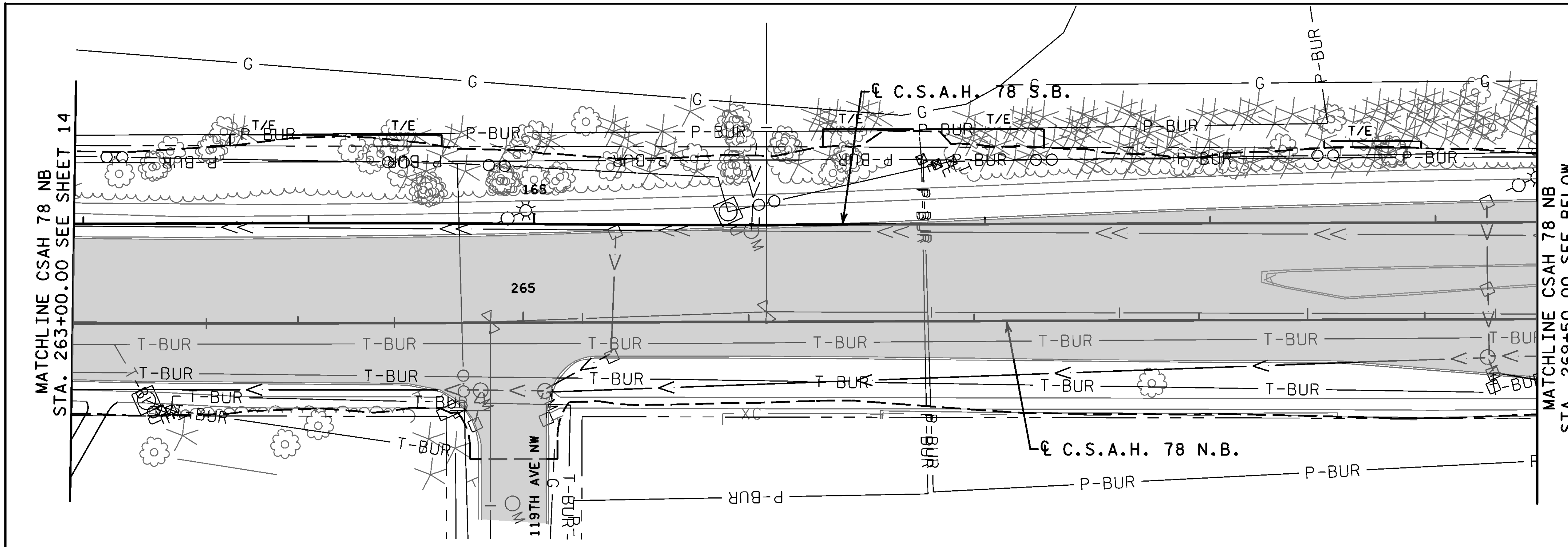
ANOKA COUNTY

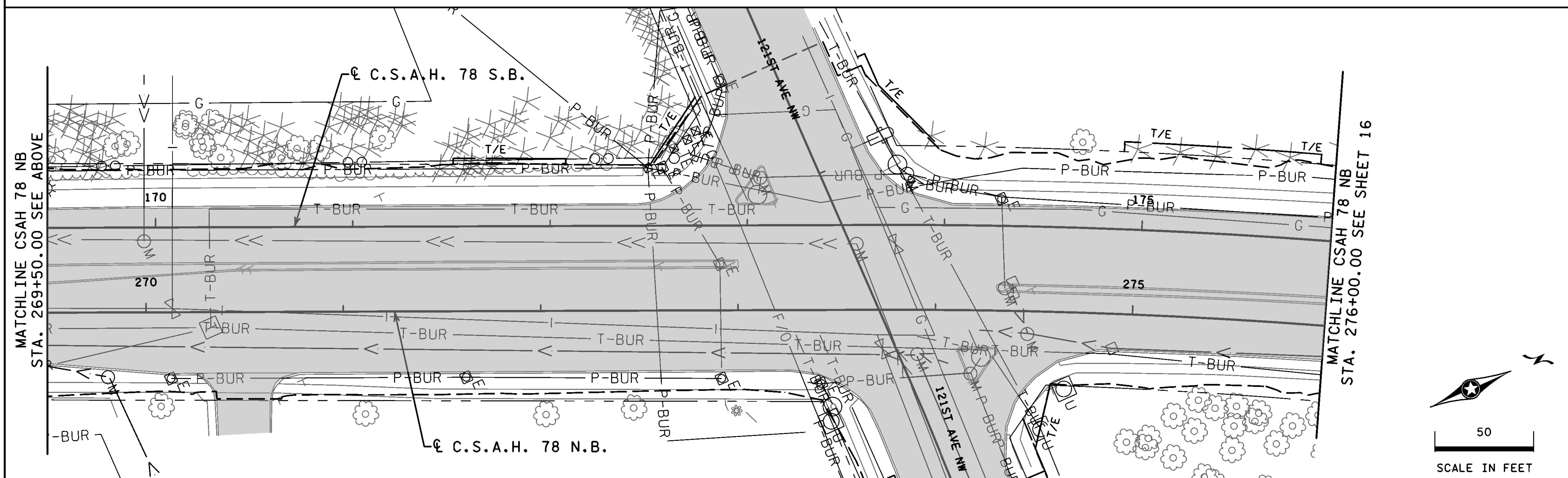
INPLACE UTILITIES & TOPOGRAPHY PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



LEGEND

—·—·—	EX. RIGHT OF WAY
— — —	CONSTRUCTION LIMITS
——— ———	TEMPORARY EASEMENT
- - - -	PERMANENT EASEMENT
—>>—	SANITARY SEWER
—P-BUR—	BURIED POWER
—I—	WATER
—G—	GAS
—OHU—	OVERHEAD UTILITY
—T-BUR—	BURIED TELEPHONE
—OO—	COMMUNICATION
—>—	STORM SEWER
(shaded)	EXISTING PAVEMENT



NO	DATE	BY	CKD	APPR	REVISION

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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

INPLACE UTILITIES & TOPOGRAPHY PLAN

SHEET NO. 15 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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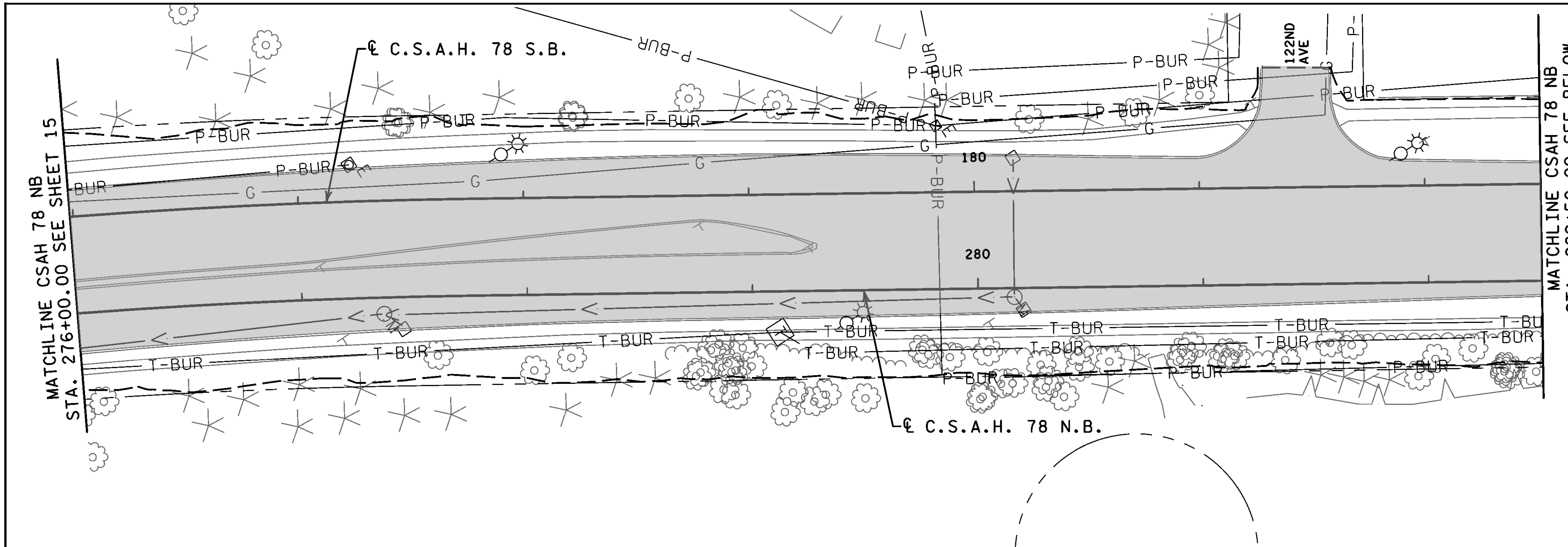

LEGEND

- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
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- COMMUNICATION
- STORM SEWER
- EXISTING PAVEMENT

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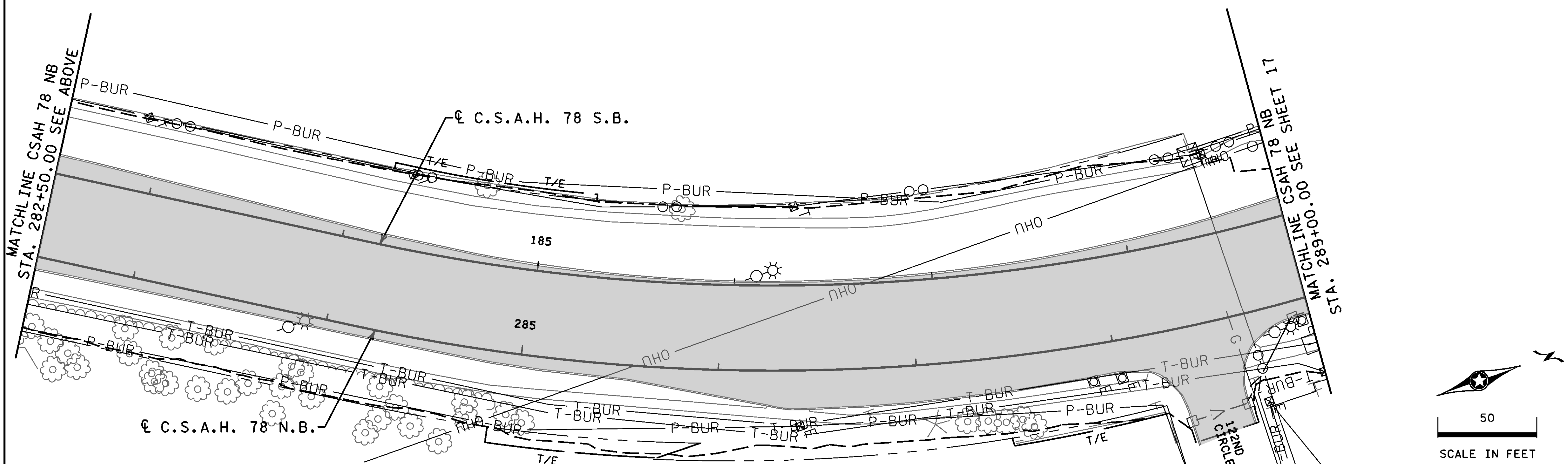
SCALE IN FEET



NO	DATE	BY	CKD	APPR	REVISION

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HDR — ANOKA COUNTY

INPLACE UTILITIES & TOPOGRAPHY PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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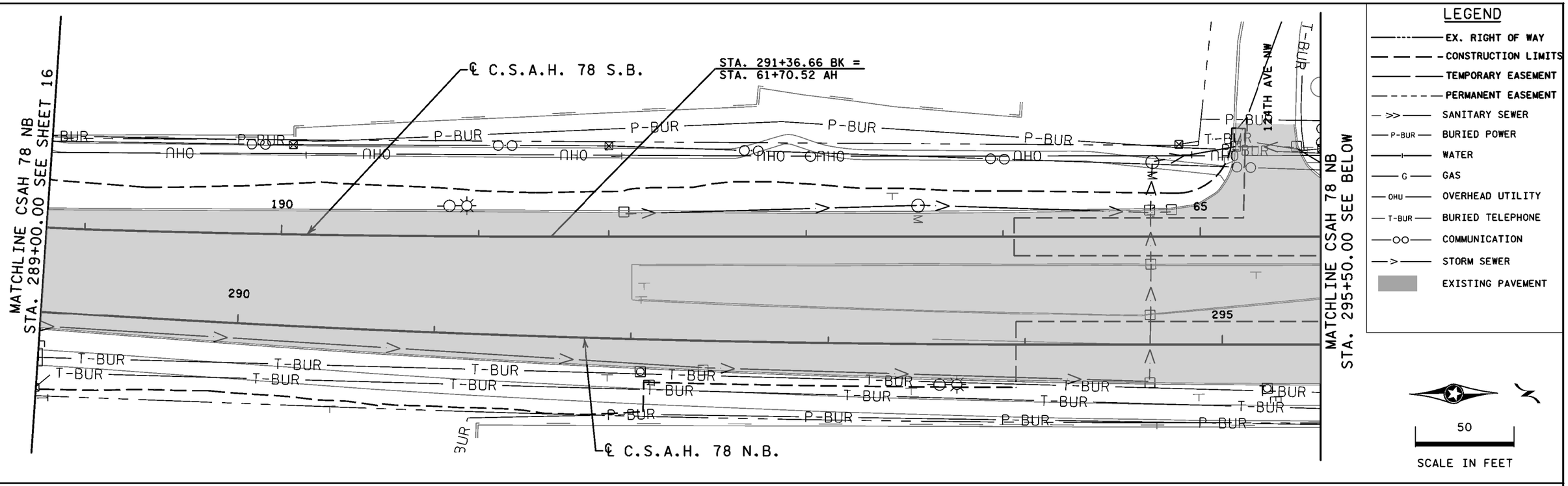

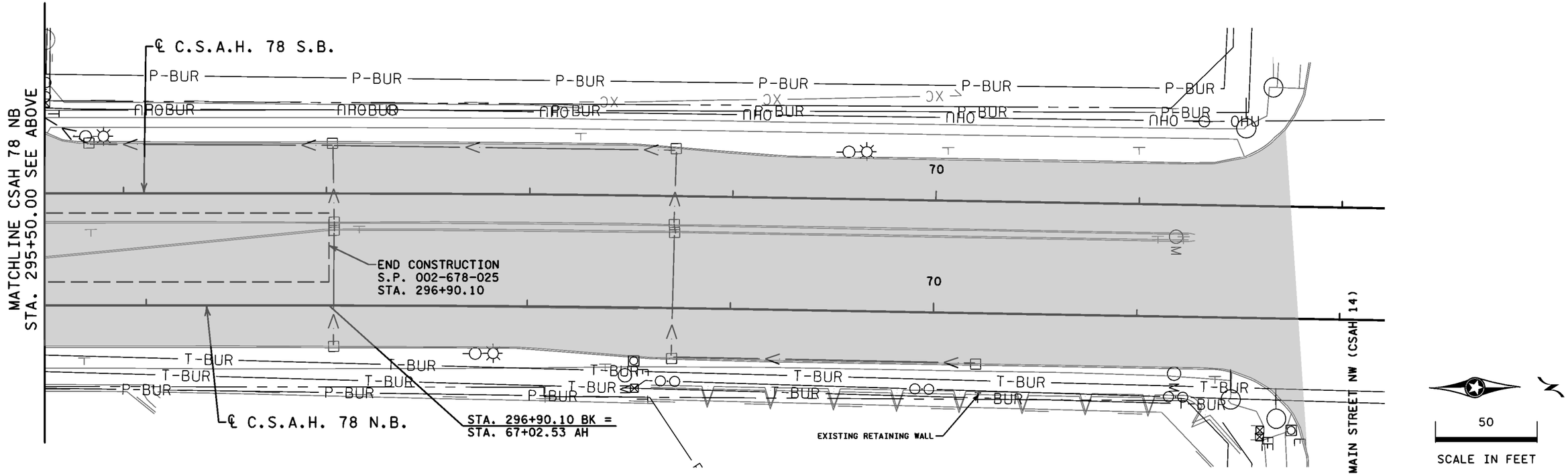

NO	DATE	BY	CKD	APPR	REVISION

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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

INPLACE UTILITIES & TOPOGRAPHY PLAN

SHEET NO. 17 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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UTILITIES

THE FOLLOWING LIST SHOWS THE UTILITY COMPANIES INVOLVED IN THIS PROJECT.

-ANOKA COUNTY

-CITY OF COON RAPIDS

-CENTURYLINK

-MINNESOTA DEPARTMENT OF TRANSPORTATION

-COMCAST

-CONNEXUS ENERGY

-METRO WASTE COMMISSION

-CENTERPOINT ENERGY

-GREAT RIVER ENERGY

OWNERSHIP	
ANOKA	ANOKA COUNTY
CITY	CITY OF COON RAPIDS
CENTURYLINK	CENTURYLINK
MNDOT	MINNESOTA DEPARTMENT OF TRANSPORTATION
COMCAST	COMCAST
CONNEXUS	CONNEXUS ENERGY
MWC	METRO WASTE COMMISSION
CENTERPOINT	CENTERPOINT ENERGY
GRE	GREAT RIVER ENERGY

GENERAL NOTES

1. UTILITY WORK WILL BE PERFORMED BY OTHERS UNLESS NOTED OTHERWISE.
2. THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILTY TO UTILIZE THE GOPHER STATE ONE CALL EXCAVATION NOTICE SYSTEM REQUIRED BY MINNESOTA STATUTE, CHAPTER 216D FOR ALL UNDERGROUND UTILITY LOCATIONS.
4. ALL RELOCATES AND ADJUSTMENTS SUBJECT TO ANOKA COUNTY RIGHT OF WAY.
5. ALL POWERLINES ARE DISTRIBUTION UNLESS NOTED OTHERWISE.
6. UTILITIES TABULATED BASED ON NB CSAH 78 STATIONING UNLESS NOTED OTHERWISE.

UTILITY

ANC = ANC
CHH = COM HH
CPED = COM PED
CVLT = COM VAULT
EHH = P HH
ELIN = P-BUR
EMTR = P METER
OHU = OVERHEAD ELECT LINE
EP = P POLE
EPED = P PED
ETOW = P TOWER
EVLT = P VAULT
F/O-BUR = FIBER OPTIC BURIED
FOCD = FIBER OPTIC IN CONDUIT
FOOH = FIBER OPTIC OVERHEAD
GLIN = GAS
GMTR = GAS METER
GVLV = GAS VALVE
HYD = FIRE HYD
LP = L POLE
PTNK = PETRO TANK
PWEL = PIEZOMETER WELL
SFM = SAN FORCE MAIN
SLIN = SAN
SMH = SAN MH
TCON = T-BUR IN COND
TMH = TEL MH
T-BUR = TELE BURIED
TOH = OVERHEAD TEL LINE
TPED = TEL PED
THH = TEL HH
TP = TEL POLE
TPMH = TEL MH
TV-BUR = TV BURIED
TVOH = OVERHEAD TV CABLE
TVP = TV POLE
TGRP = TELEGRAPH POLE
USI = SIG-INT
USL = U ST LIGHT
UTSW = SIG WIRE
WLIN = WATER
WMH = WATER MH
W/S = WATER/STREAM
WVLV = WATER VLV

UTILITY TABULATION

(C) STATION TO STATION		ROADWAY	ALIGNMENT	OFFSET TO OFFSET (FT)	ITEM INPLACE	OWNER	REMARKS: LEAVE AS IS	REMOVE	ADJUST	RELOCATE	NOTES
COMMUNICATION- S.P. 002-678-025											
244+00.00	- 250+28.21	C.S.A.H. 78	PCSAH78NB	64.82 RT - 58.2 RT	COM BUR	CENTURYLINK	X				
244+13.04		C.S.A.H. 78	PCSAH78NB	28.21 RT	PEDESTAL	COMCAST	X				
244+14.88		C.S.A.H. 78	PCSAH78NB	44.6 RT	PEDESTAL	COMCAST	X				
245+39.51		C.S.A.H. 78	PCSAH78NB	99.54 LT	PEDESTAL	COMCAST	X				
34+56.17	- 30+52.68	C.S.A.H. 11	PCSAH11WB	60.28 RT - 75.56 RT	COM BUR	CENTURYLINK	X				
30+97.43		C.S.A.H. 11	PCSAH11WB	78.07 RT	PEDESTAL	COMCAST	X				
248+87.44	- 250+91.13	C.S.A.H. 78	PCSAH78NB	58.85 RT - 29.78 RT	COM BUR	CENTURYLINK			X		SIGNAL POLE
32+45.81		C.S.A.H. 11	PCSAH11WB	32.87 LT	CABINET	CENTURYLINK				X	
250+00.00	- 253+09.14	C.S.A.H. 78	PCSAH78NB	34.60 RT - 43.48 RT	COM BUR	CENTURYLINK	X				
250+28.21	- 250+44.01	C.S.A.H. 78	PCSAH78NB	58.20 RT - 80.24 RT	COM BUR	CENTURYLINK	X				
250+45.78	- 256+16.60	C.S.A.H. 78	PCSAH78NB	112.71 LT - 91.21 LT	COM BUR	COMCAST	X				
253+09.14	- 259+20.99	C.S.A.H. 78	PCSAH78NB	43.48 RT - 52.42 RT	COM BUR	CENTURYLINK	X				
255+07.00		C.S.A.H. 78	PCSAH78NB	41.98 RT	MANHOLE	CENTURYLINK	X				
256+16.60		C.S.A.H. 78	PCSAH78NB	91.21 LT	PEDESTAL	COMCAST	X				
256+16.60	- 256+89.09	C.S.A.H. 78	PCSAH78NB	91.21 LT - 80.72 LT	COM BUR	COMCAST	X				
256+60.36	- 256+64.31	C.S.A.H. 78	PCSAH78NB	69.47 RT - 114.23 LT	COM BUR	COMCAST	X				VERIFY CROSSING DEPTH
256+89.09		C.S.A.H. 78	PCSAH78NB	80.72 LT	PEDESTAL	COMCAST	X				
256+89.09	- 259+28.70	C.S.A.H. 78	PCSAH78NB	80.72 LT - 61.26 LT	COM BUR	COMCAST	X				
259+20.99	- 261+18.08	C.S.A.H. 78	PCSAH78NB	52.42 RT - 15.34 RT	COM BUR	CENTURYLINK	X				
259+28.70		C.S.A.H. 78	PCSAH78NB	61.26 LT	MANHOLE	COMCAST			X		
259+28.70	- 264+71.00	C.S.A.H. 78	PCSAH78NB	61.26 LT - 70.72 LT	COM BUR	COMCAST			X		VERIFY DEPTH
261+18.08		C.S.A.H. 78	PCSAH78NB	15.34 RT	MANHOLE	CENTURYLINK			X		
261+18.08	- 270+32.80	C.S.A.H. 78	PCSAH78NB	15.34 RT - 7.83 RT	COM BUR	CENTURYLINK			X		STORM SEWER CONFLICTS
261+18.08	- 261+73.53	C.S.A.H. 78	PCSAH78NB	15.34 RT - 24.14 RT	COM BUR	CENTURYLINK			X		STORM SEWER CONFLICTS
261+25.14		C.S.A.H. 78	PCSAH78NB	15.67 RT	MANHOLE	CENTURYLINK			X		
261+73.53	- 269+25.83	C.S.A.H. 78	PCSAH78NB	24.14 RT - 32.49 RT	COM BUR	CENTURYLINK			X		STORM SEWER CONFLICTS
263+18.65	- 263+33.04	C.S.A.H. 78	PCSAH78NB	9.44 RT - 34.32 RT	COM BUR	CENTURYLINK			X		
263+33.04		C.S.A.H. 78	PCSAH78NB	34.32 RT	HANDHOLE	CENTURYLINK			X		
263+33.04	- 263+43.93	C.S.A.H. 78	PCSAH78NB	34.32 RT - 38.45 RT	COM BUR	CENTURYLINK			X		
263+43.93		C.S.A.H. 78	PCSAH78NB	38.45 RT	CABINET	CENTURYLINK			X		
263+43.93	- 264+69.79	C.S.A.H. 78	PCSAH78NB	38.45 RT - 57.21 RT	COM BUR	CENTURYLINK	X				
263+43.93	- 265+20.76	C.S.A.H. 78	PCSAH78NB	38.45 RT - 36.74 RT	COM BUR	CENTURYLINK			X		
264+69.79	- 264+69.92	C.S.A.H. 78	PCSAH78NB	57.21 RT - 149.13 RT	COM BUR	CENTURYLINK	X				
264+71.00	- 264+76.45	C.S.A.H. 78	PCSAH78NB	70.72 LT - 148.08 RT	COM BUR	COMCAST			X		VERIFY CROSSING DEPTH
264+71.00	- 265+91.11	C.S.A.H. 78	PCSAH78NB	70.72 LT - 48.89 LT	COM BUR	COMCAST				X	
265+20.76	- 265+17.75	C.S.A.H. 78	PCSAH78NB	36.74 RT - 152.33 RT	COM BUR	CENTURYLINK			X		STORM SEWER CONFLICT
265+91.11		C.S.A.H. 78	PCSAH78NB	48.89 LT	MANHOLE	COMCAST				X	
265+91.11	- 266+90.25	C.S.A.H. 78	PCSAH78NB	48.89 LT - 70.98 LT	COM BUR	COMCAST				X	
266+90.25		C.S.A.H. 78	PCSAH78NB	70.98 LT	PEDESTAL	COMCAST				X	RELOCATE SOUTHWEST
266+90.25	- 272+60.56	C.S.A.H. 78	PCSAH78NB	70.98 LT - 77.62 LT	COM BUR	COMCAST			X		ADJUST IN R/W
269+25.83	- 270+32.90	C.S.A.H. 78	PCSAH78NB	32.49 RT - 7.83 RT	COM BUR	CENTURYLINK			X		STORM SEWER CONFLICTS
270+32.05	- 270+32.80	C.S.A.H. 78	PCSAH78NB	52.28 LT - 7.83 RT	COM BUR	CENTURYLINK			X		
270+32.05	- 273+07.23	C.S.A.H. 78	PCSAH78NB	52.28 LT - 51.09 LT	COM BUR	CENTURYLINK			X		
270+32.80		C.S.A.H. 78	PCSAH78NB	7.83 RT	MANHOLE	CENTURYLINK			X		
270+32.80	- 274+88.22	C.S.A.H. 78	PCSAH78NB	7.83 RT - 12.71 RT	COM BUR	CENTURYLINK			X		STORM SEWER CONFLICTS
272+47.45	- 272+77.66	C.S.A.H. 78	PCSAH78NB	173.43 LT - 102.44 LT	COM BUR	COMCAST	X				
272+60.56	- 272+77.66	C.S.A.H. 78	PCSAH78NB	77.62 LT - 102.44 LT	COM BUR	COMCAST	X				
272+67.78		C.S.A.H. 78	PCSAH78NB	82.38 LT	PEDESTAL	CENTURYLINK	X				
272+77.66	- 273+83.91	C.S.A.H. 78	PCSAH78NB	102.44 LT - 160.86 RT	FO BUR	COMCAST	X				
272+82.80	- 272+51.77	C.S.A.H. 78	PCSAH78NB	103.76 LT - 175.45 LT	COM BUR	CENTURYLINK	X				
273+07.23	- 272+82.80	C.S.A.H. 78	PCSAH78NB	51.09 LT - 103.76 LT	COM BUR	CENTURYLINK			X		
273+29.30	- 273+95.49	C.S.A.H. 78	PCSAH78NB	12.54 RT - 159.43 RT	COM BUR	CENTURYLINK			X		
273+41.45	- 274+08.35	C.S.A.H. 78	PCSAH78NB	12.74 RT - 159.50 RT	COM BUR	CENTURYLINK			X		
273+41.73	- 274+54.96	C.S.A.H. 78	PCSAH78NB	146.34 LT - 59.50 RT	FO BUR	CENTURYLINK			X		
273+47.03		C.S.A.H. 78	PCSAH78NB	56.42 RT	MANHOLE		X				OWNER TBD
273+90.73	- 274+54.96	C.S.A.H. 78	PCSAH78NB	13.46 RT - 59.50 RT	FO BUR	CENTURYLINK			X		
274+54.96		C.S.A.H. 78	PCSAH78NB	59.50 RT	MANHOLE	CENTURYLINK	X				
274+54.96	- 274+95.10	C.S.A.H. 78	PCSAH78NB	59.50 RT - 147.11 RT	FO BUR	CENTURYLINK	X				
274+66.29		C.S.A.H. 78	PCSAH78NB	38.88 RT	MANHOLE		X				OWNER TBD
274+88.22	- 279+11.97	C.S.A.H. 78	PCSAH78NB	20.32 RT - 18.12 RT	COM BUR	CENTURYLINK			X		STORM SEWER CONFLICTS
279+11.97		C.S.A.H. 78	PCSAH78NB	18.12 RT	MANHOLE	CENTURYLINK				X	
279+11.97	- 288+97.72	C.S.A.H. 78	PCSAH78NB	18.12 RT - 23.40 RT	COM BUR	CENTURYLINK			X		STORM SEWER CONFLICTS
279+11.97	- 288+99.41	C.S.A.H. 78	PCSAH78NB	18.12 RT - 38.65 RT	COM BUR	CENTURYLINK			X		
282+90.73		C.S.A.H. 78	PCSAH78NB	80.81 LT	PEDESTAL	COMCAST	X				
282+90.73	- 284+28.18	C.S.A.H. 78	PCSAH78NB	80.81 LT - 81.05 LT	COM BUR	COMCAST	X				

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: _____ 11/22/2019

LICENSED PROFESSIONAL ENGINEER — DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

INPLACE UTILITY TABULATION

SHEET NO. 18 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(C)	UTILITY TABULATION									
STATION TO STATION	ROADWAY	ALIGNMENT	OFFSET TO OFFSET (FT)	ITEM INPLACE	OWNER	REMARKS: LEAVE AS IS	REMARKS: REMOVE	REMARKS: ADJUST	REMARKS: RELOCATE	NOTES
COMMUNICATION- S.P. 002-678-025										
284+28.18	C.S.A.H. 78	PCSAH78NB	81.05 LT	PEDESTAL	COMCAST	X				
284+28.18 - 286+38.88	C.S.A.H. 78	PCSAH78NB	81.05 LT - 82.88 LT	COM BUR	COMCAST	X				
284+32.51 - 72+60.32 R2	C.S.A.H. 78	PCSAH78NB	66.48 RT - 99.74 LT	OVERHEAD	GRE	X				
286+38.88	C.S.A.H. 78	PCSAH78NB	81.88 LT	PEDESTAL	COMCAST	X				
286+38.88 - 288+59.68	C.S.A.H. 78	PCSAH78NB	81.88 LT - 84.44 LT	COM BUR	COMCAST	X				
288+59.68	C.S.A.H. 78	PCSAH78NB	84.44 LT	CABINET	COMCAST	X				
288+59.68 - 288+77.25	C.S.A.H. 78	PCSAH78NB	84.44 LT - 113.87 RT	COM BUR	COMCAST			X		
288+59.68 - 290+23.93	C.S.A.H. 78	PCSAH78NB	84.44 LT - 92.18 LT	COM BUR	COMCAST	X				
288+97.72	C.S.A.H. 78	PCSAH78NB	23.40 RT	HANDHOLE	CENTURYLINK				X	
288+97.72 - 72+86.42 R2	C.S.A.H. 78	PCSAH78NB	23.40 RT - 35.74 RT	COM BUR	CENTURYLINK			X		
288+99.41	C.S.A.H. 78	PCSAH78NB	38.65 RT	CABINET	CENTURYLINK	X				
288+99.41 - 68+53.44 R2	C.S.A.H. 78	PCSAH78NB	38.65 RT - 39.65 RT	COM BUR	CENTURYLINK	X				
290+23.93	C.S.A.H. 78	PCSAH78NB	92.18 LT	PEDESTAL	COMCAST	X				
290+23.93 - 291+86.09	C.S.A.H. 78	PCSAH78NB	92.18 LT - 97.93 LT	COM BUR	COMCAST	X				
291+86.09	C.S.A.H. 78	PCSAH78NB	97.93 LT	PEDESTAL	COMCAST	X				
291+86.09 - 295+50.19	C.S.A.H. 78	PCSAH78NB	97.93 LT - 88.83 LT	COM BUR	COMCAST	X				
294+77.99	C.S.A.H. 78	PCSAH78NB	101.82 LT	PEDESTAL	COMCAST	X				
294+77.99 - 295+50.59	C.S.A.H. 78	PCSAH78NB	101.82 LT - 99.68 LT	BURIED	COMCAST	X				
295+45.84 - 295+50.59	C.S.A.H. 78	PCSAH78NB	176.37 LT - 99.68 LT	BURIED	COMCAST	X				
295+50.19 - 295+52.20	C.S.A.H. 78	PCSAH78NB	88.83 LT - 177.14 LT	COM BUR	COMCAST	X				
295+50.59	C.S.A.H. 78	PCSAH78NB	99.68 LT	PEDESTAL	COMCAST	X				
68+53.44 R2	C.S.A.H. 78	PCSAH78NB	39.65 RT	PEDESTAL	CENTURYLINK	X				
68+53.44 R2 - 71+56.49 R2	C.S.A.H. 78	PCSAH78NB	39.65 RT - 197.15 RT	COM BUR	CENTURYLINK	X				
68+53.44 R2 - 72+85.38 R2	C.S.A.H. 78	PCSAH78NB	39.65 RT - 41.68 RT	COM BUR	CENTURYLINK	X				

(C)	UTILITY TABULATION									
STATION TO STATION	ROADWAY	ALIGNMENT	OFFSET TO OFFSET (FT)	ITEM INPLACE	OWNER	REMARKS: LEAVE AS IS	REMARKS: REMOVE	REMARKS: ADJUST	REMARKS: RELOCATE	NOTES
POWER/ELECTRIC- S.P. 002-678-025										
244+00.00 - 248+44.58	C.S.A.H. 78	PCSAH78NB	34.39 RT - 40.34 RT	BURIED POWER	CONNEXUS	X				
244+00.00 - 248+36.29	C.S.A.H. 78	PCSAH78NB	99.44 LT - 87.21 LT	BURIED POWER	CONNEXUS	X				
244+72.85	C.S.A.H. 78	PCSAH78NB	41.11 RT	LIGHT POLE	CITY	X				
244+75.48	C.S.A.H. 78	PCSAH78NB	99.34 LT	LIGHT POLE	CITY	X				
245+90.36	C.S.A.H. 78	PCSAH78NB	99.2 LT	LIGHT POLE	CITY	X				
245+94.82	C.S.A.H. 78	PCSAH78NB	40.84 RT	LIGHT POLE	CITY	X				
246+29.80 - 246+38.11	C.S.A.H. 78	PCSAH78NB	2.8 LT - 41.25 LT	BURIED POWER	CONNEXUS	X				
246+38.11 - 248+61.99	C.S.A.H. 78	PCSAH78NB	41.25 LT - 41.15 LT	BURIED POWER	CONNEXUS				X	
247+13.87	C.S.A.H. 78	PCSAH78NB	93.29 LT	LIGHT POLE	CITY	X				
248+36.29 - 248+48.68	C.S.A.H. 78	PCSAH78NB	87.21 LT - 102.58 LT	BURIED POWER	CONNEXUS	X				
248+36.29	C.S.A.H. 78	PCSAH78NB	87.21 LT	HANDHOLE	CONNEXUS	X				
248+44.58 - 248+75.71	C.S.A.H. 78	PCSAH78NB	40.34 RT - 63.78 RT	BURIED POWER	CONNEXUS	X				
30+53.01 - 34+56.17	C.S.A.H. 11	PCSAH11WB	16.62 LT - 19.27 LT	BURIED POWER	CONNEXUS				X	
30+53.01	C.S.A.H. 11	PCSAH11WB	16.62 LT	HANDHOLE	CONNEXUS				X	
32+94.27	C.S.A.H. 11	PCSAH11WB	15.8 LT	HANDHOLE	CONNEXUS				X	
30+54.70 - 30+53.01	C.S.A.H. 11	PCSAH11WB	23.12 RT - 16.62 LT	BURIED POWER	CONNEXUS			X		
32+41.48	C.S.A.H. 11	PCSAH11WB	41.7 LT	LIGHT POLE	CITY	X				
31+70.20	C.S.A.H. 11	PCSAH11WB	67.25 LT	LIGHT POLE	CITY	X				
31+07.42	C.S.A.H. 11	PCSAH11WB	67.8 LT	LIGHT POLE	CITY	X				
250+19.65 - 250+60.80	C.S.A.H. 78	PCSAH78NB	239.21 RT - 150.06 LT	BURIED POWER	CONNEXUS	X				PROTECT IN PLACE
250+60.09 - 256+93.94	C.S.A.H. 78	PCSAH78NB	156.07 LT - 81.15 LT	BURIED POWER	CONNEXUS	X				
250+60.80 - 256+93.94	C.S.A.H. 78	PCSAH78NB	150.06 LT - 81.15 LT	BURIED POWER	CONNEXUS	X				
251+36.69	C.S.A.H. 78	PCSAH78NB	30.74 RT	LIGHT POLE	CITY	X				
251+39.23	C.S.A.H. 78	PCSAH78NB	97.45 LT	LIGHT POLE	CITY	X				
251+89.89	C.S.A.H. 78	PCSAH78NB	30.37 RT	HANDHOLE	CITY	X				
252+51.61	C.S.A.H. 78	PCSAH78NB	30.25 RT	HANDHOLE		X				OWNER TBD
252+59.00	C.S.A.H. 78	PCSAH78NB	93.86 LT	LIGHT POLE	CITY	X				
252+61.27	C.S.A.H. 78	PCSAH78NB	29.47 RT	LIGHT POLE	CITY	X				
252+74.85	C.S.A.H. 78	PCSAH78NB	93.22 LT	HANDHOLE		X				OWNER TBD
253+11.34	C.S.A.H. 78	PCSAH78NB	112.83 LT	CABINET		X				OWNER TBD
253+78.28	C.S.A.H. 78	PCSAH78NB	84.66 LT	LIGHT POLE	CITY	X				
254+15.93 - 253+87.15	C.S.A.H. 78	PCSAH78NB	93.82 LT - 78.61 RT	BURIED POWER	CONNEXUS	X				PROTECT IN PLACE
254+15.93 - 256+93.94	C.S.A.H. 78	PCSAH78NB	93.82 LT - 81.15 LT	BURIED POWER	CONNEXUS	X				
254+95.86	C.S.A.H. 78	PCSAH78NB	28.43 RT	LIGHT POLE	CITY	X				
254+98.37	C.S.A.H. 78	PCSAH78NB	72.89 LT	LIGHT POLE	CITY	X				

GENERAL NOTES

UTILITIES TABULATED BASED ON NB CSAH 78 STATIONING UNLESS NOTED OTHERWISE.

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

INPLACE UTILITY TABULATION

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

(C)		UTILITY TABULATION									
STATION TO STATION		ROADWAY	ALIGNMENT	OFFSET TO OFFSET (FT)	ITEM INPLACE	OWNER	REMARKS				NOTES
							LEAVE AS IS	REMOVE	ADJUST	RELOCATE	
POWER/ELECTRIC- S.P. 002-678-025											
255+51.10		C.S.A.H. 78	PCSAH78NB	57.09 RT	SIGN	CITY	X				
255+73.12		C.S.A.H. 78	PCSAH78NB	28.40 RT	MANHOLE	CONNEXUS	X				
256+14.66		C.S.A.H. 78	PCSAH78NB	72.30 LT	LIGHT POLE	CITY	X				
256+16.00		C.S.A.H. 78	PCSAH78NB	69.95 LT	HANDHOLE	CONNEXUS	X				
256+47.53		C.S.A.H. 78	PCSAH78NB	28.24 RT	LIGHT POLE	CITY	X				
256+52.69		C.S.A.H. 78	PCSAH78NB	27.22 RT	MANHOLE	CONNEXUS	X				
256+93.94		C.S.A.H. 78	PCSAH78NB	81.15 LT	CABINET	CONNEXUS	X				
256+93.94	- 256+93.83	C.S.A.H. 78	PCSAH78NB	81.15 LT - 113.22 RT	BURIED POWER	CONNEXUS	X				PROTECT IN PLACE
256+93.94	- 266+76.93	C.S.A.H. 78	PCSAH78NB	81.15 LT - 71.83 LT	BURIED POWER	CONNEXUS				X	CONNEXUS TO REPLACE
257+02.02		C.S.A.H. 78	PCSAH78NB	81.79 LT	CABINET	CONNEXUS	X				
257+33.54		C.S.A.H. 78	PCSAH78NB	62.05 LT	LIGHT POLE	CITY	X				PROTECT IN PLACE
257+47.30		C.S.A.H. 78	PCSAH78NB	24.72 RT	LIGHT POLE	CITY	X				PROTECT IN PLACE
262+93.67	- 266+76.93	C.S.A.H. 78	PCSAH78NB	83.00 LT - 71.83 LT	BURIED POWER	CONNEXUS			X		
263+36.09		C.S.A.H. 78	PCSAH78NB	39.37 RT	CABINET	CONNEXUS			X		
263+39.36		C.S.A.H. 78	PCSAH78NB	38.71 RT	CABINET	CONNEXUS			X		
264+93.23		C.S.A.H. 78	PCSAH78NB	46.26 LT	LIGHT POLE	CONNEXUS				X	
265+21.88	- 266+79.24	C.S.A.H. 78	PCSAH78NB	79.16 RT - 76.71 RT	BURIED POWER	CONNEXUS	X				
266+76.93		C.S.A.H. 78	PCSAH78NB	71.83 LT	CABINET	CONNEXUS				X	RELOCATE TO THE WEST
266+76.93	- 266+79.24	C.S.A.H. 78	PCSAH78NB	71.83 LT - 76.71 RT	BURIED POWER	CONNEXUS			X		
266+76.93	- 266+81.63	C.S.A.H. 78	PCSAH78NB	71.83 LT - 75.85 RT	BURIED POWER	CONNEXUS			X		
266+76.93	- 268+57.21	C.S.A.H. 78	PCSAH78NB	71.83 LT - 87.12 LT	BURIED POWER	CONNEXUS			X		
266+76.93	- 272+54.62	C.S.A.H. 78	PCSAH78NB	71.83 LT - 72.45 LT	BURIED POWER	CONNEXUS				X	CONNEXUS TO REPLACE
266+81.63	- 269+76.93	C.S.A.H. 78	PCSAH78NB	75.85 RT - 61.78 RT	BURIED POWER	CONNEXUS	X				
266+83.68		C.S.A.H. 78	PCSAH78NB	69.62 LT	CABINET	CONNEXUS				X	RELOCATE TO THE WEST
269+41.99		C.S.A.H. 78	PCSAH78NB	59.41 LT	LIGHT POLE	CONNEXUS				X	
271+29.40	- 272+54.62	C.S.A.H. 78	PCSAH78NB	175.71 LT - 72.45 LT	BURIED POWER	CONNEXUS	X				
272+54.62	- 272+62.90	C.S.A.H. 78	PCSAH78NB	72.45 LT - 66.17 RT	BURIED POWER	CONNEXUS			X		
272+54.62	- 273+58.48	C.S.A.H. 78	PCSAH78NB	72.45 LT - 168.40 LT	BURIED POWER	CONNEXUS	X				
272+54.62	- 279+82.17	C.S.A.H. 78	PCSAH78NB	72.45 LT - 72.53 LT	BURIED POWER	CONNEXUS				X	CONNEXUS TO REPLACE
272+62.90	- 273+80.30	C.S.A.H. 78	PCSAH78NB	66.17 RT - 152.78 RT	BURIED POWER	CONNEXUS	X				
272+74.64		C.S.A.H. 78	PCSAH78NB	86.70 LT	CABINET	CONNEXUS	X				MINOR GRADING CHANGES AT CABINET
272+78.91		C.S.A.H. 78	PCSAH78NB	91.15 LT	CABINET	CONNEXUS	X				MINOR GRADING CHANGES AT CABINET
277+05.35	- 279+82.17	C.S.A.H. 78	PCSAH78NB	156.84 LT - 72.53 LT	BURIED POWER	CONNEXUS	X				
277+89.17		C.S.A.H. 78	PCSAH78NB	62.44 LT	LIGHT POLE	CONNEXUS				X	
279+41.44		C.S.A.H. 78	PCSAH78NB	14.39 RT	LIGHT POLE	CONNEXUS				X	
279+52.97	- 279+82.17	C.S.A.H. 78	PCSAH78NB	251.53 LT - 72.53 LT	BURIED POWER	CONNEXUS	X				
279+82.17		C.S.A.H. 78	PCSAH78NB	72.53 LT	CABINET	CONNEXUS				X	
279+82.17	- 279+83.50	C.S.A.H. 78	PCSAH78NB	72.53 LT - 39.93 RT	BURIED POWER	CONNEXUS			X		VERIFY DEPTH WITH SUBCUT
279+82.17	- 281+17.24	C.S.A.H. 78	PCSAH78NB	72.53 LT - 100.93 LT	BURIED POWER	CONNEXUS	X				
279+82.17	- 281+67.42	C.S.A.H. 78	PCSAH78NB	72.53 LT - 93.92 LT	BURIED POWER	CONNEXUS	X				VERIFY DEPTH AT 122ND AVENUE
279+82.17	- 71+53.23 R2	C.S.A.H. 78	PCSAH78NB	72.53 LT - 101.11 LT	BURIED POWER	CONNEXUS	X				
279+83.50	- 285+03.30	C.S.A.H. 78	PCSAH78NB	39.93 RT - 38.00 RT	BURIED POWER	CONNEXUS	X				
281+88.42		C.S.A.H. 78	PCSAH78NB	57.31 LT	LIGHT POLE	CONNEXUS				X	
283+81.89		C.S.A.H. 78	PCSAH78NB	7.61 RT	LIGHT POLE	CONNEXUS				X	
285+03.30	- 288+18.98	C.S.A.H. 78	PCSAH78NB	38.00 RT - 36.38 RT	BURIED POWER	CONNEXUS				X	VERIFY DEPTH, ADJUST OR RELOCATE
286+18.81		C.S.A.H. 78	PCSAH78NB	47.69 LT	LIGHT POLE	CONNEXUS				X	
286+41.00		C.S.A.H. 78	PCSAH78NB	28.26 RT	CABINET	CONNEXUS				X	RELOCATE BEHIND PROPOSED TRAIL
287+87.54		C.S.A.H. 78	PCSAH78NB	18.71 RT	HANDHOLE	CONNEXUS			X		
288+01.79		C.S.A.H. 78	PCSAH78NB	19.26 RT	HANDHOLE	CONNEXUS				X	CATCH BASIN CONFLICT
288+65.93		C.S.A.H. 78	PCSAH78NB	83.71 LT	CABINET	CONNEXUS	X				
288+68.64	- 288+69.94	C.S.A.H. 78	PCSAH78NB	95.36 RT - 46.21 RT	BURIED POWER	CONNEXUS	X				
288+69.94		C.S.A.H. 78	PCSAH78NB	46.21 RT	CABINET	CONNEXUS	X				
288+69.94	- 289+09.02	C.S.A.H. 78	PCSAH78NB	46.21 RT - 136.00 RT	BURIED POWER	CONNEXUS	X				
288+80.75		C.S.A.H. 78	PCSAH78NB	12.91 RT	LIGHT POLE	CONNEXUS				X	
288+94.66		C.S.A.H. 78	PCSAH78NB	80.88 LT	POWER POLE	GRE	X				
288+95.58		C.S.A.H. 78	PCSAH78NB	10.82 RT	HANDHOLE	CONNEXUS				X	VERIFY DEPTH, ADJUST OR RELOCATE
291+05.25		C.S.A.H. 78	PCSAH78NB	64.71 LT	LIGHT POLE	CONNEXUS				X	
291+18.58	- 68+61.02 R2	C.S.A.H. 78	PCSAH78NB	42.73 RT - 43.98 RT	BURIED POWER	CONNEXUS	X				
292+05.26		C.S.A.H. 78	PCSAH78NB	16.42 RT	HANDHOLE	CONNEXUS				X	
292+89.55		C.S.A.H. 78	PCSAH78NB	94.92 LT	POWER POLE	GRE	X				
293+56.73		C.S.A.H. 78	PCSAH78NB	20.52 RT	LIGHT POLE	CONNEXUS				X	
294+88.79	- 71+41.05 R2	C.S.A.H. 78	PCSAH78NB	114.62 LT - 112.62 LT	BURIED POWER	CONNEXUS	X				
295+23.04		C.S.A.H. 78	PCSAH78NB	22.23 RT	HANDHOLE	CONNEXUS	X				
295+70.17		C.S.A.H. 78	PCSAH78NB	83.27 LT	LIGHT POLE	CONNEXUS	X				

GENERAL NOTES

UTILITIES TABULATED BASED ON NB CSAH 78 STATIONING UNLESS NOTED OTHERWISE.

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB

DESIGNED BY: GEB

CHECKED BY: BAV

HDR

ANOKA COUNTY

INPLACE UTILITY TABULATION

SHEET NO. 20 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(C)	UTILITY TABULATION ①									
STATION TO STATION	ROADWAY	ALIGNMENT	OFFSET TO OFFSET (FT)	ITEM INPLACE	OWNER	REMARKS: LEAVE AS IS	REMARKS: REMOVE	REMARKS: ADJUST	REMARKS: RELOCATE	NOTES
SANITARY- S.P. 002-678-025										
250+31.08	C.S.A.H. 78	PCSAH78NB	126.76 LT	MANHOLE	CITY	X				
250+98.37	C.S.A.H. 78	PCSAH78NB	120.02 LT	MANHOLE	CITY	X				
254+95.63	C.S.A.H. 78	PCSAH78NB	93.29 LT	MANHOLE	CITY	X				
261+93.92 - 262+04.20	C.S.A.H. 78	PCSAH78NB	277.72 LT - 28.04 RT	PIPE	MWC	X				48" RCP
262+04.52	C.S.A.H. 78	PCSAH78NB	21.41 LT	MANHOLE	MWC			X		SEE TAB L
262+48.74 - 262+04.52	C.S.A.H. 78	PCSAH78NB	42.19 LT - 21.41 LT	PIPE	CITY	X				8" PVC
262+48.74	C.S.A.H. 78	PCSAH78NB	42.19 LT	MANHOLE	CITY			X		SEE TAB L
262+48.74 - 273+60.23	C.S.A.H. 78	PCSAH78NB	42.25 LT - 33.46 LT	PIPE	CITY	X				8" PVC
264+94.96	C.S.A.H. 78	PCSAH78NB	80.31 RT	MANHOLE	CITY	X				
266+01.39	C.S.A.H. 78	PCSAH78NB	40.27 LT	MANHOLE	CITY			X		SEE TAB L
266+01.39 - 266+03.75	C.S.A.H. 78	PCSAH78NB	40.27 LT - 79.16 LT	PIPE	CITY	X				8" PVC 2
269+99.07	C.S.A.H. 78	PCSAH78NB	36.01 LT	MANHOLE	CITY			X		SEE TAB L
269+99.41 - 269+99.07	C.S.A.H. 78	PCSAH78NB	120.53 LT - 36.01 LT	SERVICE	CITY	X				8" PVC 2
273+60.23	C.S.A.H. 78	PCSAH78NB	33.46 LT	MANHOLE	CITY			X		SEE TAB L
273+60.23 - 274+26.24	C.S.A.H. 78	PCSAH78NB	33.46 LT - 129.85 RT	PIPE	CITY	X				8" PVC
274+26.24	C.S.A.H. 78	PCSAH78NB	129.85 RT	MANHOLE	CITY	X				

(C)	UTILITY TABULATION									
STATION TO STATION	ROADWAY	ALIGNMENT	OFFSET TO OFFSET (FT)	ITEM INPLACE	OWNER	REMARKS: LEAVE AS IS	REMARKS: REMOVE	REMARKS: ADJUST	REMARKS: RELOCATE	NOTES
GAS- S.P. 002-678-025										
249+70.55 - 249+85.71	C.S.A.H. 78	PCSAH78NB	120.79 RT - 161.32 LT	GAS	CENTERPOINT	X				VERIFY DEPTH CLEAR OF TURN LANE CONSTRUCTION
249+95.64 - 249+96.43	C.S.A.H. 78	PCSAH78NB	160.29 LT - 118.06 LT	GAS	CENTERPOINT	X				
249+96.43 - 255+81.23	C.S.A.H. 78	PCSAH78NB	118.06 LT - 81.81 LT	GAS	CENTERPOINT	X				
262+60.51 - 263+31.94	C.S.A.H. 78	PCSAH78NB	123.34 LT - 250.9 LT	GAS	CENTERPOINT	X				
262+60.51 - 267+12.23	C.S.A.H. 78	PCSAH78NB	123.34 LT - 104.67 LT	GAS	CENTERPOINT	X				
265+08.16 - 265+13.63	C.S.A.H. 78	PCSAH78NB	165.3 RT - 56.35 RT	GAS	CENTERPOINT	X				
267+12.23 - 267+94.04	C.S.A.H. 78	PCSAH78NB	104.67 LT - 325.83 LT	GAS	CENTERPOINT	X				
267+12.23 - 271+45.02	C.S.A.H. 78	PCSAH78NB	104.67 LT - 106.63 LT	GAS	CENTERPOINT	X				
270+86.03 - 271+45.02	C.S.A.H. 78	PCSAH78NB	106.63 LT - 255.38 LT	GAS	CENTERPOINT	X				
271+92.63 - 272+88.68	C.S.A.H. 78	PCSAH78NB	329.21 LT - 99.26 LT	GAS	CENTERPOINT	X				
272+88.68 - 273+49.77	C.S.A.H. 78	PCSAH78NB	99.26 LT - 101.65 LT	GAS	CENTERPOINT	X				VERIFY DEPTH CLEAR OF CONSTRUCTION
273+49.77 - 275+26.90	C.S.A.H. 78	PCSAH78NB	101.65 LT - 294.32 RT	GAS	CENTERPOINT			X		CONFLICT WITH ROADWAY CONSTRUCTION, STORM CROSSING
273+69.83 - 281+55.01	C.S.A.H. 78	PCSAH78NB	51.95 LT - 74.89 LT	GAS	CENTERPOINT				X	CONFLICT WITH ROADWAY CONSTRUCTION
281+55.01 - 282+05.18	C.S.A.H. 78	PCSAH78NB	74.89 LT - 227.67 LT	GAS	CENTERPOINT	X				
288+59.75 - 288+74.24	C.S.A.H. 78	PCSAH78NB	3.23 LT - 189.61 RT	GAS	CENTERPOINT			X		VERIFY DEPTH, CROSSING WITH PROPOSED STORM SEWER

SPECIFIC NOTES

① SEE TAB L ON SHEET 21 FOR SANITARY PAY ITEMS.

GENERAL NOTES

UTILITIES TABULATED BASED ON NB CSAH 78 STATIONING UNLESS NOTED OTHERWISE.

(L)	CITY OF COON RAPIDS SANITARY MANHOLE MODIFICATIONS								
STATION	ROADWAY	ALIGNMENT	OFFSET (FT)	ITEM INPLACE	OWNER	REMOVE CASTING (EACH)	ADJUST FRAME AND RING CASTING (EACH)	CASTING ASSEMBLY (EACH) (1)	NOTES
SANITARY- S.P. 002-678-025									
262+04.52	C.S.A.H. 78	PCSAH78NB	21.47 LT	MANHOLE	MWC	1	1	1	(2)
262+48.74	C.S.A.H. 78	PCSAH78NB	42.25 LT	MANHOLE	CITY	1	1	1	(2)
266+01.39	C.S.A.H. 78	PCSAH78NB	41.16 LT	MANHOLE	CITY	1	1	1	(2)
269+99.07	C.S.A.H. 78	PCSAH78NB	36.01 LT	MANHOLE	CITY	1	1	1	(2)
273+60.23	C.S.A.H. 78	PCSAH78NB	37.01 LT	MANHOLE	CITY	1	1	1	(2)
		PROJECT TOTAL				5	5	5	

SPECIFIC NOTES:
(1) 100% CITY OF COON RAPIDS LOCAL COST
(2) EXISTING MANHOLE CASTING TO BE REMOVED AND REPLACED WITH NEW CASTING.

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: BRETT A. VOTH LIC. NO. 49045
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

INPLACE UTILITY TABULATION

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

(C)		UTILITY TABULATION								
STATION TO STATION	ROADWAY	ALIGNMENT	OFFSET TO OFFSET (FT)	ITEM INPLACE	OWNER	REMARKS				NOTES
						LEAVE AS IS	REMOVE	ADJUST	RELOCATE	
TRAFFIC- S.P. 002-678-025										
248+74.87	C.S.A.H. 78	PCSAH78NB	91.99 LT	SIGNAL POLE	ANOKA	X				
248+48.68 - 248+49.19	C.S.A.H. 78	PCSAH78NB	102.58 LT - 107.41 LT	BURIED POWER	ANOKA	X				
248+48.68	C.S.A.H. 78	PCSAH78NB	102.58 LT	CABINET	ANOKA	X				
248+49.19 - 249+04.58	C.S.A.H. 78	PCSAH78NB	107.41 LT - 122.43 LT	BURIED POWER	ANOKA	X				
248+49.19	C.S.A.H. 78	PCSAH78NB	107.41 LT	CABINET	ANOKA	X				
248+57.19 - 248+64.59	C.S.A.H. 78	PCSAH78NB	40.59 RT - 90.38 LT	BURIED POWER	ANOKA			X		
248+57.19	C.S.A.H. 78	PCSAH78NB	40.59 RT	MANHOLE	ANOKA	X				
248+61.99	C.S.A.H. 78	PCSAH78NB	41.15 LT	MANHOLE	ANOKA				X	
248+62.30	C.S.A.H. 78	PCSAH78NB	42.64 RT	MANHOLE	ANOKA	X				
248+62.30 - 248+57.19	C.S.A.H. 78	PCSAH78NB	42.64 RT - 40.59 RT	BURIED POWER	ANOKA	X				
248+64.59	C.S.A.H. 78	PCSAH78NB	90.38 LT	HANDHOLE	ANOKA	X				
248+89.18	C.S.A.H. 78	PCSAH78NB	103.99 LT	SIGNAL POLE	ANOKA	X				
249+04.58	C.S.A.H. 78	PCSAH78NB	122.43 LT	HANDHOLE	ANOKA	X				
249+04.58 - 250+34.43	C.S.A.H. 78	PCSAH78NB	122.43 LT - 105.59 LT	BURIED POWER	ANOKA	X				
249+90.16	C.S.A.H. 78	PCSAH78NB	47.33 RT	SIGNAL POLE	ANOKA				X	
250+06.70	C.S.A.H. 78	PCSAH78NB	37.24 RT	HANDHOLE	ANOKA				X	
250+06.70 - 250+25.50	C.S.A.H. 78	PCSAH78NB	37.24 RT - 27.90	BURIED POWER	ANOKA			X		
250+11.76	C.S.A.H. 78	PCSAH78NB	32.36 RT	SIGNAL POLE	ANOKA	X			X	
250+13.40	C.S.A.H. 78	PCSAH78NB	118.17 LT	HANDHOLE	ANOKA	X				
250+23.71	C.S.A.H. 78	PCSAH78NB	27.71 LT	MANHOLE	ANOKA	X				
250+24.50	C.S.A.H. 78	PCSAH78NB	108.75 LT	SIGNAL POLE	ANOKA	X				
250+25.50	C.S.A.H. 78	PCSAH78NB	27.90 RT	HANDHOLE	ANOKA	X		X		
250+25.50 - 250+31.86	C.S.A.H. 78	PCSAH78NB	27.90 RT - 27.03 LT	BURIED POWER	ANOKA			X		
250+31.86	C.S.A.H. 78	PCSAH78NB	27.03 LT	HANDHOLE	ANOKA	X			X	
250+31.86 - 250+34.43	C.S.A.H. 78	PCSAH78NB	27.03 LT - 105.59 LT	BURIED POWER	ANOKA			X		
250+34.43	C.S.A.H. 78	PCSAH78NB	105.59 LT	HANDHOLE	ANOKA	X				
250+94.51	C.S.A.H. 78	PCSAH78NB	98.72 LT	HANDHOLE	ANOKA	X				
270+12.52	C.S.A.H. 78	PCSAH78NB	33.62 RT	HANDHOLE	ANOKA				X	
270+12.52 - 272+91.66	C.S.A.H. 78	PCSAH78NB	33.62 RT - 34.53 RT	BURIED POWER	ANOKA			X		
271+62.17	C.S.A.H. 78	PCSAH78NB	33.47 RT	HANDHOLE	ANOKA				X	
272+54.62	C.S.A.H. 78	PCSAH78NB	72.45 LT	CABINET	ANOKA				X	
272+61.78	C.S.A.H. 78	PCSAH78NB	72.66 LT	CABINET	ANOKA				X	
272+61.78 - 272+90.96	C.S.A.H. 78	CSAH78NB	72.66 LT - 23.44 LT	BURIED POWER	ANOKA	X				
272+68.00	C.S.A.H. 78	PCSAH78NB	77.30 LT	PEDESTAL	ANOKA					
272+72.68 - 272+76.31	C.S.A.H. 78	PCSAH78NB	159.28 LT - 79.39 LT	BURIED POWER	ANOKA	X				
272+76.31 - 273+11.55	C.S.A.H. 78	CSAH78NB	79.39 LT - 67.19 LT	BURIED POWER	ANOKA		X			
272+90.96	C.S.A.H. 78	PCSAH78NB	23.44 LT	HANDHOLE	ANOKA		X			
272+90.96 - 272+91.66	C.S.A.H. 78	CSAH78NB	23.44 LT - 34.53 RT	BURIED POWER	ANOKA	X				
272+91.18	C.S.A.H. 78	PCSAH78NB	116.67 LT	HANDHOLE	ANOKA			X		
272+91.66	C.S.A.H. 78	PCSAH78NB	34.53 RT	HANDHOLE	ANOKA				X	
273+10.09	C.S.A.H. 78	PCSAH78NB	58.55 LT	SIGNAL POLE	ANOKA		X			
273+11.55	C.S.A.H. 78	PCSAH78NB	67.19 LT	HANDHOLE	ANOKA		X			
273+11.55 - 273+85.64	C.S.A.H. 78	PCSAH78NB	67.19 LT - 69.01 LT	BURIED POWER	ANOKA		X			
273+42.05	C.S.A.H. 78	PCSAH78NB	37.22 RT	HANDHOLE	ANOKA		X			
273+42.05 - 274+18.25	C.S.A.H. 78	PCSAH78NB	37.22 RT - 31.87 RT	BURIED POWER	ANOKA		X			
273+47.67	C.S.A.H. 78	PCSAH78NB	48.98 RT	SIGNAL POLE	ANOKA		X			
273+80.63	C.S.A.H. 78	PCSAH78NB	73.08 LT	SIGNAL POLE	ANOKA		X			
273+85.64	C.S.A.H. 78	PCSAH78NB	69.01 LT	HANDHOLE	ANOKA		X			
273+85.64 - 274+32.63	C.S.A.H. 78	PCSAH78NB	69.01 LT - 56.64 LT	BURIED POWER	ANOKA		X			
273+85.64 - 277+22.83	C.S.A.H. 78	PCSAH78NB	69.01 LT - 59.30 LT	BURIED POWER	ANOKA		X			
274+18.25	C.S.A.H. 78	PCSAH78NB	31.87 RT	HANDHOLE	ANOKA		X			
274+18.25 - 274+46.47	C.S.A.H. 78	PCSAH78NB	31.87 RT - 97.84 RT	BURIED POWER	ANOKA		X			
274+23.54	C.S.A.H. 78	PCSAH78NB	23.61 RT	SIGNAL POLE	ANOKA		X			
274+32.63	C.S.A.H. 78	PCSAH78NB	56.64 LT	HANDHOLE	ANOKA				X	
274+32.63 - 274+35.08	C.S.A.H. 78	PCSAH78NB	56.64 LT - 11.34 LT	BURIED POWER	ANOKA				X	
274+35.08	C.S.A.H. 78	PCSAH78NB	11.34 LT	MANHOLE	ANOKA				X	
274+46.47	C.S.A.H. 78	PCSAH78NB	97.83 RT	HANDHOLE	ANOKA	X				
277+22.83	C.S.A.H. 78	PCSAH78NB	59.30 LT	HANDHOLE	ANOKA		X			

GENERAL NOTES

UTILITIES TABULATED BASED ON NB CSAH 78 STATIONING UNLESS NOTED OTHERWISE.

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

INPLACE UTILITY TABULATION

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

(C)	UTILITY TABULATION									
STATION TO STATION	ROADWAY	ALIGNMENT	OFFSET TO OFFSET (FT)	ITEM INPLACE	OWNER	REMARKS: LEAVE AS IS	REMARKS: REMOVE	REMARKS: ADJUST	REMARKS: RELOCATE	NOTES
WATER- S.P. 002-678-025										
244+00.00 - 257+96.39	C.S.A.H. 78	PCSAH78NB	6.122 LT - 15.06 RT	MAIN	CITY	X				
245+54.78	C.S.A.H. 78	PCSAH78NB	7.18 LT	GATE VALVE	CITY	X				
32+99.93	C.S.A.H. 11	PCSAH11WB	87.54 RT	GATE VALVE	CITY	X				
32+98.48	C.S.A.H. 11	PCSAH11WB	86.04 RT	HYDRANT	CITY	X				
249+70.75 - 249+72.88	C.S.A.H. 78	PCSAH78NB	6.66 LT - 123.64 LT	12" DIP	CITY	X				
250+10.31	C.S.A.H. 78	PCSAH78NB	6.56 LT	GATE VALVE	CITY	X				
250+10.31 - 250+10.63	C.S.A.H. 78	PCSAH78NB	6.56 LT - 23.32 RT	PIPE	CITY	X				
250+41.70	C.S.A.H. 78	PCSAH78NB	37.93 RT	GATE VALVE	CITY	X				
250+41.70	C.S.A.H. 78	PCSAH78NB	37.93 RT	HYDRANT	CITY	X				
250+41.70 - 250+42.72	C.S.A.H. 78	PCSAH78NB	37.93 RT - 7.78 LT	PIPE	CITY	X				
250+42.72	C.S.A.H. 78	PCSAH78NB	7.78 LT	GATE VALVE	CITY					(1)
252+72.12	C.S.A.H. 78	PCSAH78NB	102.29 LT	GATE VALVE	CITY	X				
255+28.34	C.S.A.H. 78	PCSAH78NB	99.96 LT	GATE VALVE	CITY	X				
257+96.39 - 258+49.50	C.S.A.H. 78	PCSAH78NB	15.06 RT - 37.78 RT	24" DIP MAIN	CITY	X				
258+46.72 - 258+55.08	C.S.A.H. 78	PCSAH78NB	83.94 LT - 71.19 LT	PIPE	CITY	X				AT COON CREEK ELEVATION
258+49.50 - 258+92.56	C.S.A.H. 78	PCSAH78NB	37.78 RT - 35.63 RT	24" DIP MAIN	CITY	X				
258+52.92 - 258+55.80	C.S.A.H. 78	PCSAH78NB	41.90 RT - 65.43 RT	PIPE	CITY	X				AT COON CREEK ELEVATION
258+75.06 - 258+88.86	C.S.A.H. 78	PCSAH78NB	96.83 LT - 64.40 LT	PIPE	CITY	X				AT COON CREEK ELEVATION
258+91.05 - 259+10.08	C.S.A.H. 78	PCSAH78NB	41.53 RT - 55.98 RT	PIPE	CITY	X				AT COON CREEK ELEVATION
259+10.08 - 258+87.32	C.S.A.H. 78	PCSAH78NB	55.98 RT - 73.98 RT	PIPE	CITY	X				AT COON CREEK ELEVATION
258+92.56 - 259+30.69	C.S.A.H. 78	PCSAH78NB	35.63 RT - 17.33 RT	24" DIP MAIN	CITY	X				
259+30.69 - 273+99.73	C.S.A.H. 78	PCSAH78NB	17.33 RT - 9.40 RT	MAIN	CITY	X				24" DIP
259+77.02	C.S.A.H. 78	PCSAH78NB	24.06 RT	GATE VALVE	CITY			X		SEE TAB N
260+15.55	C.S.A.H. 78	PCSAH78NB	18.57 RT	GATE VALVE	CITY				X	SEE TAB N
260+16.88	C.S.A.H. 78	PCSAH78NB	15.15 RT	HYDRANT	CITY				X	SEE TAB N
264+67.40 - 264+85.33	C.S.A.H. 78	PCSAH78NB	39.69 RT - 39.18 RT	PIPE	CITY	X				HYDRANT LEAD
264+67.40	C.S.A.H. 78	PCSAH78NB	39.69 RT	HYDRANT	CITY				X	PROTECT IN PLACE?
264+85.48	C.S.A.H. 78	PCSAH78NB	0.85 LT	GATE VALVE	CITY			X		SEE TAB N
264+85.48 - 264+84.96	C.S.A.H. 78	PCSAH78NB	0.85 LT - 132.54 RT	8" MAIN	CITY	X				
266+07.96	C.S.A.H. 78	PCSAH78NB	5.31 LT	GATE VALVE	CITY			X		SEE TAB N
266+07.96 - 266+08.47	C.S.A.H. 78	PCSAH78SB	5.31 LT - 89.64 LT	8" DIP MAIN	CITY	X				STORM SEWER CROSSING
270+13.34	C.S.A.H. 78	PCSAH78NB	4.19 LT	GATE VALVE	CITY			X		SEE TAB N
270+13.34 - 270+13.80	C.S.A.H. 78	PCSAH78NB	4.19 LT - 120.07 LT	8" MAIN	CITY	X				STORM SEWER CROSSING
273+70.54 - 274+21.82	C.S.A.H. 78	PCSAH78NB	9.08 RT - 137.76 RT	PIPE	CITY	X				12" CIP
273+73.15	C.S.A.H. 78	PCSAH78NB	16.22 RT	GATE VALVE	CITY			X		SEE TAB N
273+33.21 - 273+99.73	C.S.A.H. 78	PCSAH78NB	142.60 LT - 9.40 RT	24" DIP MAIN	CITY	X				STORM SEWER CROSSING
273+58.38 - 273+71.48	C.S.A.H. 78	PCSAH78NB	82.06 LT - 91.43 LT	PIPE	CITY	X				HYDRANT LEAD
273+71.48	C.S.A.H. 78	PCSAH78NB	91.43 LT	HYDRANT	CITY				X	SEE TAB N
273+79.78	C.S.A.H. 78	PCSAH78NB	36.91 LT	GATE VALVE	CITY			X		SEE TAB N

SPECIFIC NOTES

(1) SEE TAB NN ON SHEET 24 FOR PROPOSED WATER PAY ITEMS.

GENERAL NOTES

UTILITIES TABULATED BASED ON NB CSAH 78 STATIONING UNLESS NOTED OTHERWISE.

(N)	CITY OF COON RAPIDS WATER UTILITY MODIFICATIONS										
STATION	ROADWAY	ALIGNMENT	OFFSET (FT)	ITEM INPLACE	OWNER	REMOVE VALVE BOX (1)	VALVE BOX (1)	ADJUST GATE VALVE	RELOCATE HYDRANT AND VALVE	RELOCATE HYDRANT	NOTES
						EACH	EACH	EACH	EACH	EACH	
WATER- S.P. 002-678-025											
259+77.02	C.S.A.H. 78	PCSAH78NB	24.06 RT	GATE VALVE	CITY	1	1	1			
260+15.55	C.S.A.H. 78	PCSAH78NB	18.57 RT	GATE VALVE	CITY	1	1		1		
260+16.88	C.S.A.H. 78	PCSAH78NB	15.15 RT	HYDRANT	CITY						
264+67.40	C.S.A.H. 78	PCSAH78NB	39.69 RT	HYDRANT	CITY					1	
264+85.48	C.S.A.H. 78	PCSAH78NB	0.85 LT	GATE VALVE	CITY	1	1	1			SEE LINE ABOVE
266+07.96	C.S.A.H. 78	PCSAH78NB	5.31 LT	GATE VALVE	CITY	1	1	1			
270+13.34	C.S.A.H. 78	PCSAH78NB	4.19 LT	GATE VALVE	CITY	1	1	1			
273+73.15	C.S.A.H. 78	PCSAH78NB	16.22 RT	GATE VALVE	CITY	1	1	1			
273+71.48	C.S.A.H. 78	PCSAH78NB	91.43 LT	HYDRANT	CITY					1	
273+79.78	C.S.A.H. 78	PCSAH78NB	36.91 LT	GATE VALVE	CITY	1	1	1			
PROJECT TOTAL						7	7	6	1	2	

NOTES:
(1) 100% CITY OF COON RAPIDS LOCAL COST

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NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: Brett Voth — LICENSED PROFESSIONAL ENGINEER

11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

INPLACE UTILITY TABULATION

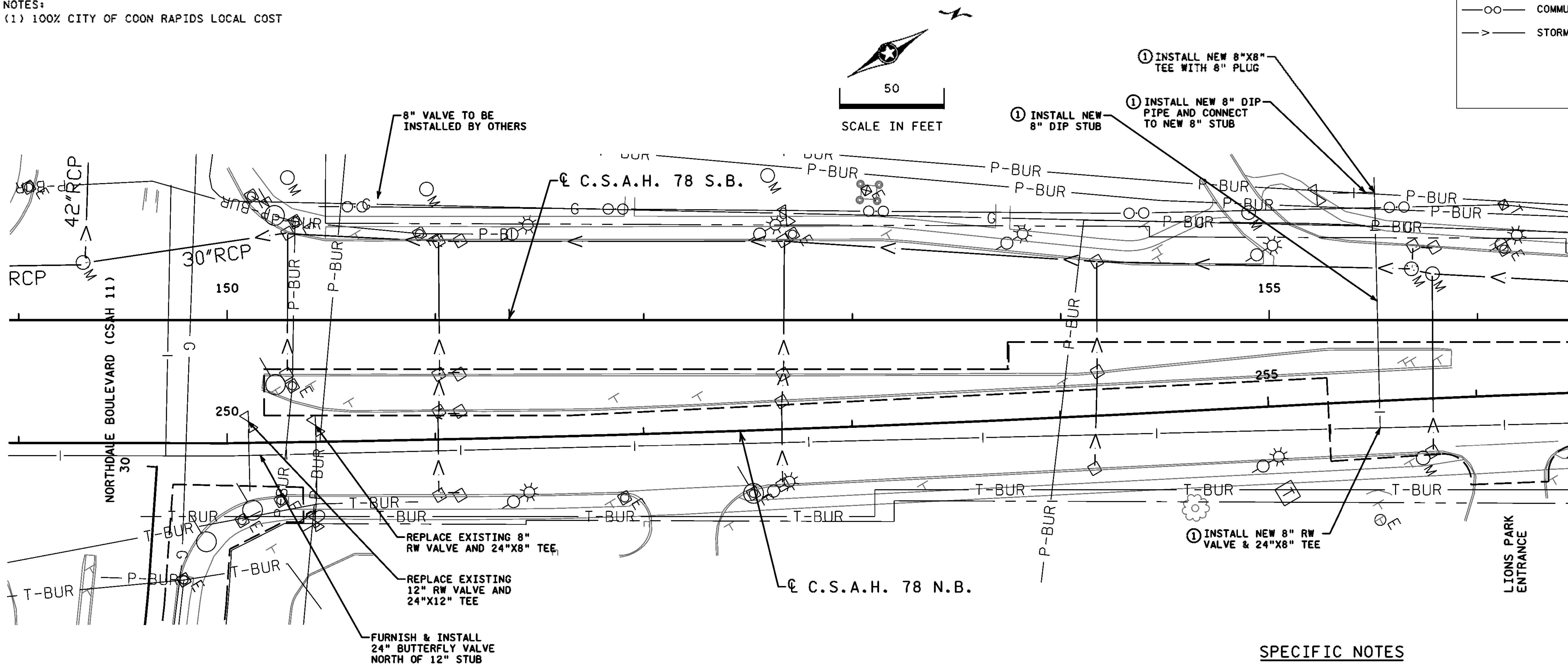
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

(NN)	CITY OF COON RAPIDS PROPOSED WATER UTILITIES (1)																							
							TEE FITTING						MEGALUG			SLEEVE					WATERMAIN DUCTILE IRON CL 52			
STATION	ROADWAY	ALIGNMENT	OFFSET (FT)	OWNER	REMOVE WATER MAIN	REMOVE GATE VALVE & BOX	24"X8"	24"X12"	8"X8"	8" GATE VALVE & BOX	12" GATE VALVE & BOX	24" BUTTERFLY VALVE & BOX	8"	12"	24"	8"	12"	24"	CONNECT TO EXISTING WATERMAIN	8" PIPE PLUG	8"	12"	24"	NOTES
					LIN FT	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	LIN FT	LIN FT	LIN FT	
WATER- S.P. 002-678-025																								
249+70.75 TO 255+53.17	C.S.A.H. 78	PCSAH78NB	N/A	CITY	40	2	2	1	1	2	1	1	8	5	14	1	1	3	1	1	180	10	20	QUANTITIES PROVIDED BY CITY OF COON RAPIDS
PROJECT TOTAL					40	2	2	1	1	2	1	1	8	5	14	1	1	3	1	1	180	10	20	

NOTES:
(1) 100% CITY OF COON RAPIDS LOCAL COST

LEGEND

- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- SANITARY SEWER
- BURIED POWER
- WATER
- GAS
- OVERHEAD UTILITY
- BURIED TELEPHONE
- COMMUNICATION
- STORM SEWER



SPECIFIC NOTES

① LOCATION TO BE DETERMINED IN FIELD BY CITY OF COON RAPIDS REPRESENTATIVE.

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: BRETT A. VOTH LIC. NO. 49045
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

CITY OF COON RAPIDS WATER UTILITY DETAIL
SHEET NO. 24 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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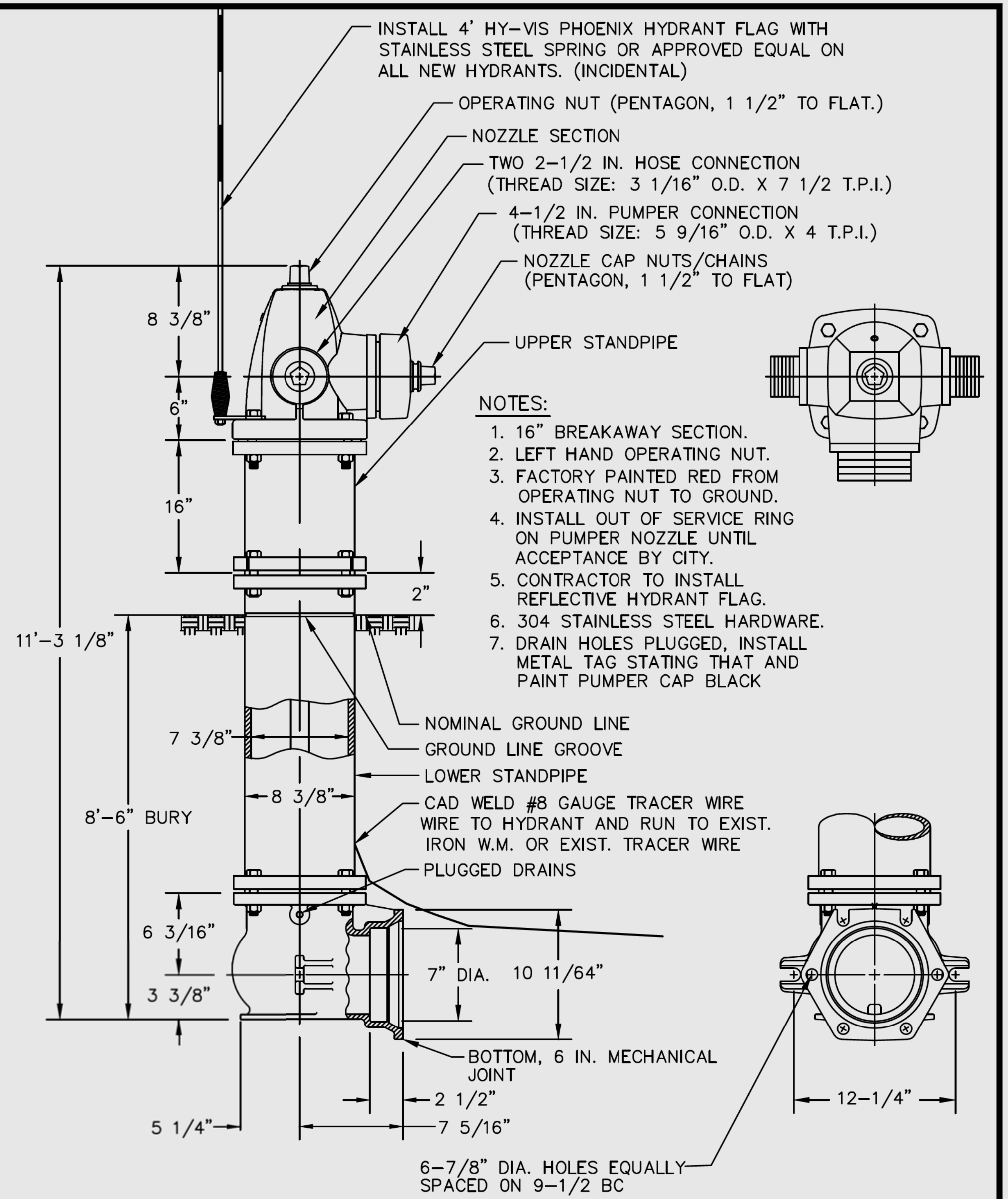

NOTES:

1. 16" BREAKAWAY SECTION.
2. LEFT HAND OPERATING NUT.
3. FACTORY PAINTED RED FROM OPERATING NUT TO GROUND.
4. INSTALL OUT OF SERVICE RING ON PUMPER NOZZLE UNTIL ACCEPTANCE BY CITY.
5. CONTRACTOR TO INSTALL REFLECTIVE HYDRANT FLAG.
6. 304 STAINLESS STEEL HARDWARE.
7. DRAIN HOLES PLUGGED, INSTALL METAL TAG STATING THAT AND PAINT PUMPER CAP BLACK

COON RAPIDS Minnesota
City of Coon Rapids
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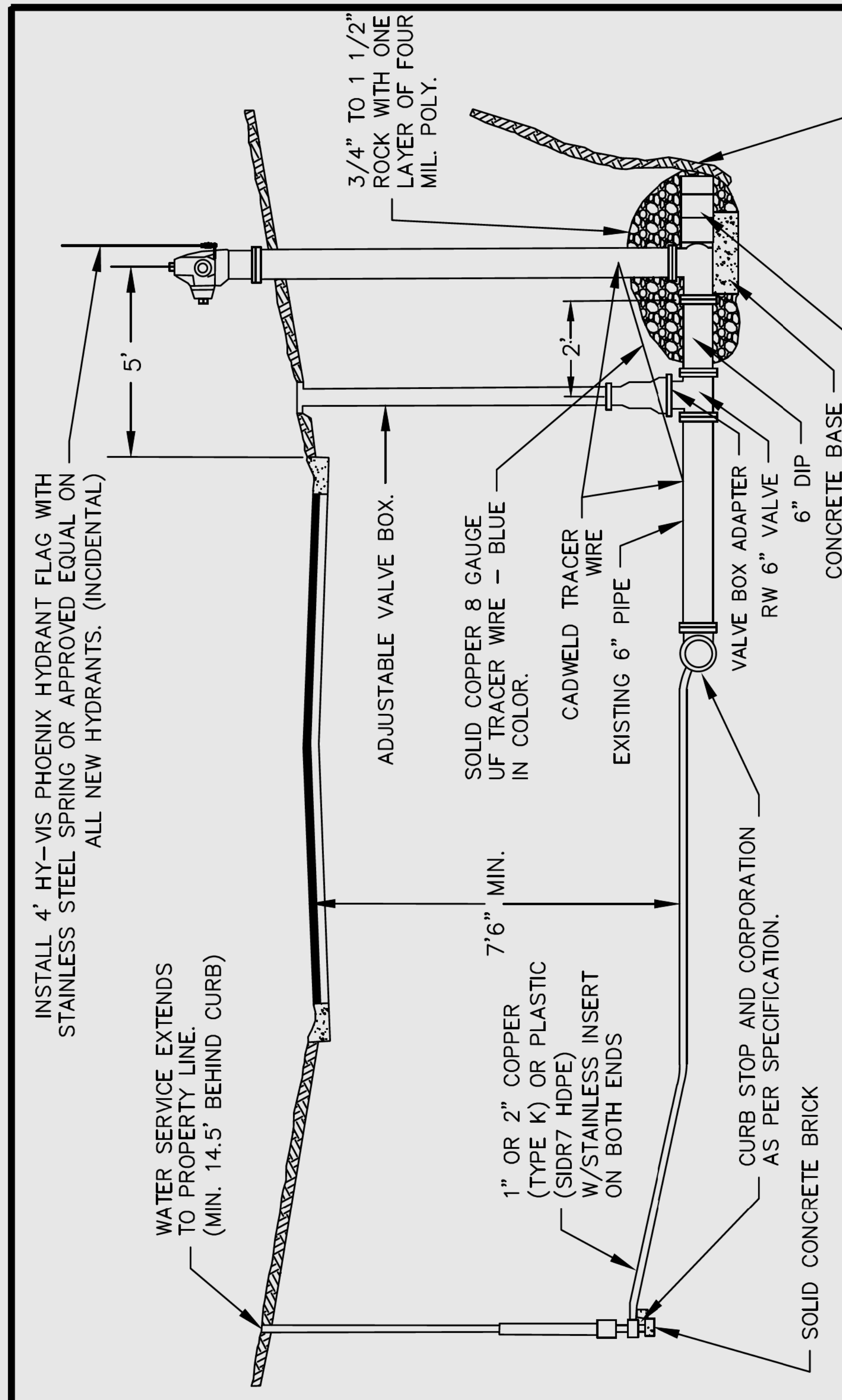
HYDRANT DETAIL WB67 PACER 8'-6" BURY/MECH. JOINT BASE

DRAWN: R.L.S.	DATE: 1/17/2019	SCALE: NONE	PLATE NO. WM-1



NOTES:

1) COPPER SERVICE AT MAIN SHALL NOT EXTEND ABOVE MAIN.
2) MJ DUCTILE IRON MEGA LUG STYLE RETAINER REQUIRED AT ALL MECHANICAL JOINTS. ONLY USE TYPE APPROPRIATE FOR TYPE OF MATERIAL BEING USED.
3) HYDRANT DEPTH TO BE FIELD VERIFIED BEFORE INSTALLATION. TOP NUT OF HYDRANT TO BE 32.5" ABOVE EXISTING GROUND. IF HYDRANT IS INSTALLED TOO HIGH, IT WILL BE FIXED AT THE EXPENSE OF THE CONTRACTOR. IF EXTENSION IS USED APPROPRIATE TAG MUST BE INSTALLED ON HYDRANT.
4) FOR HYDRANTS BURIED BELOW THE WATER TABLE, DRAIN HOLES TO BE PLUGGED, AND THE HYDRANT MARKED BY PAINTING THE PUMPER NOZZLE BLACK AND NO DRAIN TAG INSTALLED.
5) IF DIRECTED BY THE ENGINEER DUE TO CORROSIVE SOILS, CONTRACTOR TO INSTALL POLYETHYLENE SLEEVE (POLY WRAP) OVER HYDRANT STAND PIPE FROM BREAK OFF TO BOTTOM AND HYDRANT LEAD FROM TEE TO HYDRANT. (PAYMENT WILL BE INCIDENTAL TO HYDRANT INSTALL.)

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TYPICAL WATER SERVICE LAYOUT & HYDRANT REPLACEMENT (ONLY) LAYOUT

DRAWN: R.L.S.	DATE: 1/9/2019	SCALE: NONE	PLATE NO. WM-2

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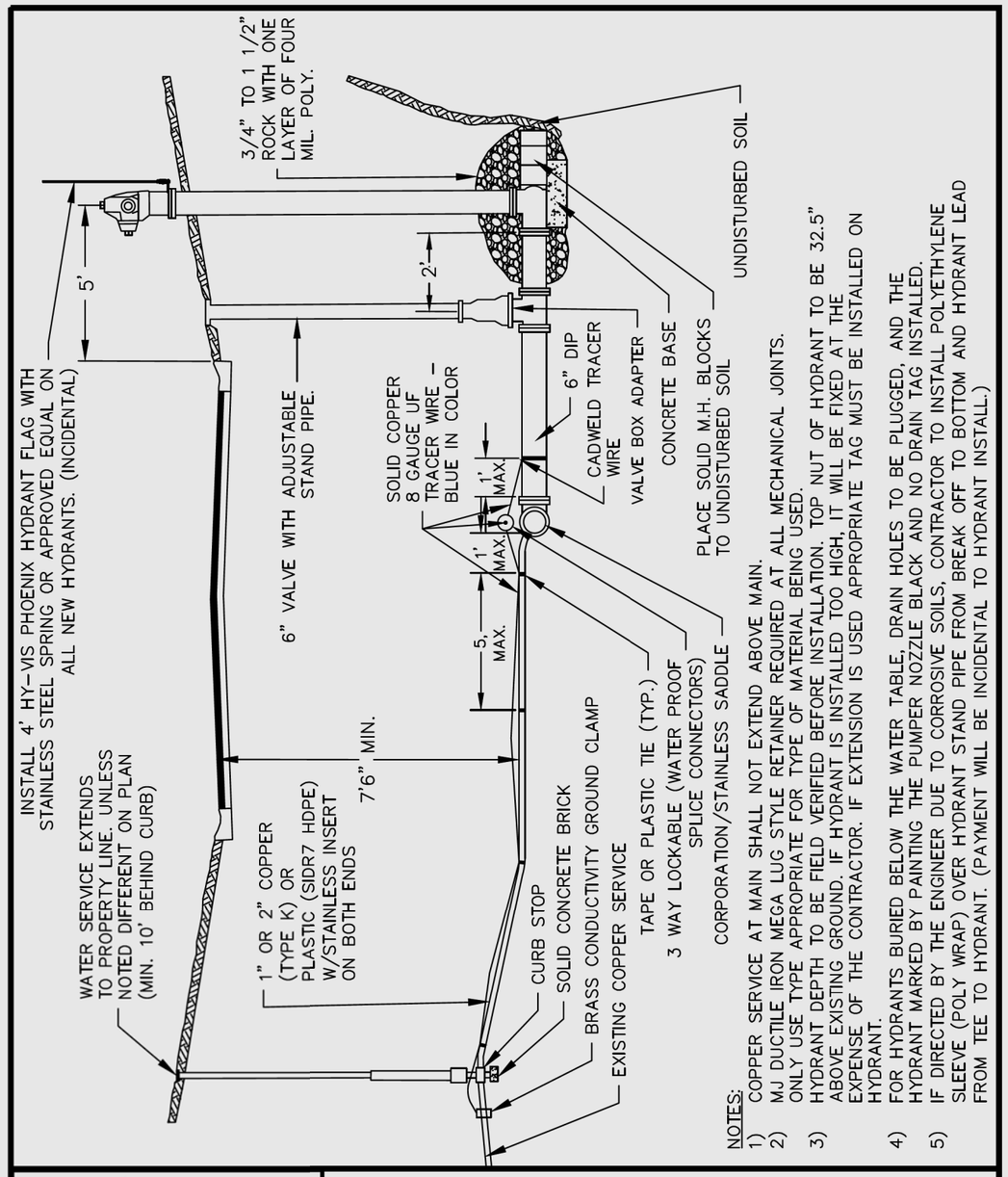
NO	DATE	BY	CKD	APPR	REVISION

HDR
ANOKA COUNTY

CITY OF COON RAPIDS STANDARD PLATES

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



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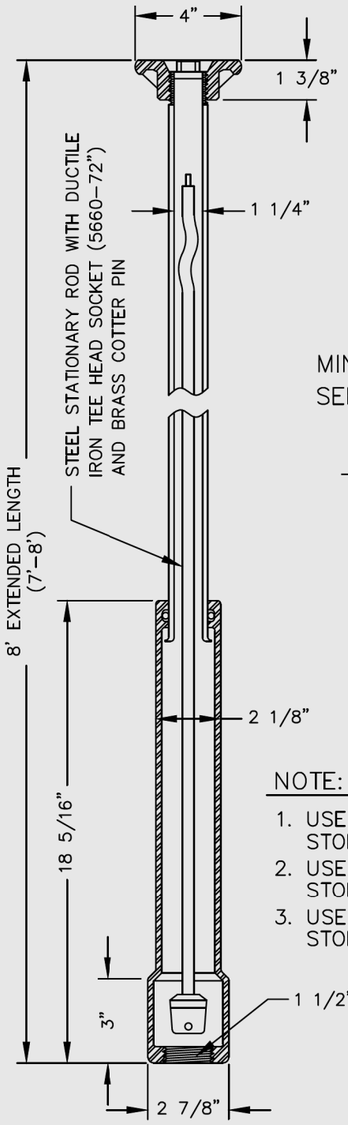
Fax: 763-767-6491
www.coonrapidsmn.gov

COON RAPIDS Minnesota

TYPICAL HYDRANT & WATER SERVICE LAYOUT FOR NEW & TOTAL REPLACEMENT OF WATER MAIN

DRAWN:	DATE:	SCALE:	PLATE NO.
R.L.S.	1/7/2019	NONE	WM-3



PLUG STYLE LID WITH 27/32" BRASS PENTAGON PLUG (REMOVABLE).

McDONALD-DUBUQUE WATER

MINNEAPOLIS PATTERN-BASE TAPPED 1 1/2"
SERIES: 5614-8'

DESCRIPTION:

MINNEAPOLIS STYLE, 1 1/4" UPPER WITH ROD.
USE 5614 LID-27/32" PENTAGON PLUG IN LID.
USE WITH 1" BALL VALVE CURB STOPS.
LID AND BASE MADE OF CAST IRON, CLASS 25.
UPPER SECTION MADE OF STEEL.
PAINTED BLACK ASPHALT.

NOTE:

1. USE 1" BALL VALVE CORPORATION STOPS ON 6" W.M. WITH SADDLE.
2. USE 3/4" X 1" BALL VALVE CORPORATION STOPS ON 8" W.M. OR 1" WITH SADDLE.
3. USE 1" BALL VALVE CORPORATION STOPS ON ALL W.M. OVER 8".

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COON RAPIDS Minnesota

CURB STOP BOX WITH ROD

DRAWN:	DATE:	SCALE:	PLATE NO.
R.L.S.	1/16/2019	NONE	WM-4

NO	DATE	BY	CKD	APPR	REVISION

HDR

ANOKA COUNTY

CITY OF COON RAPIDS STANDARD PLATES

SHEET NO. 26 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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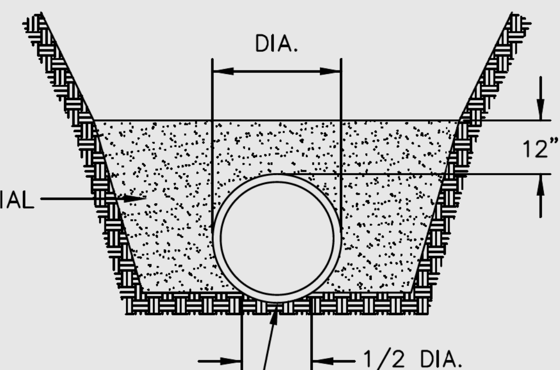
NOTE:
SURROUND THE PIPE TO A MINIMUM OF 12" ABOVE IT'S TOP WITH SELECT FILL MATERIAL, PLACED IN 2 LIFTS, FIRST LIFT NO MORE THEN 1' DEPTH, AND COMPACTED WITH GAS POWERED WHACKER FOR FULL LENGTH OF THE PIPE, TO ENSURE FILLING OF ALL VOIDS UNDER AND ADJACENT TO THE PIPE.



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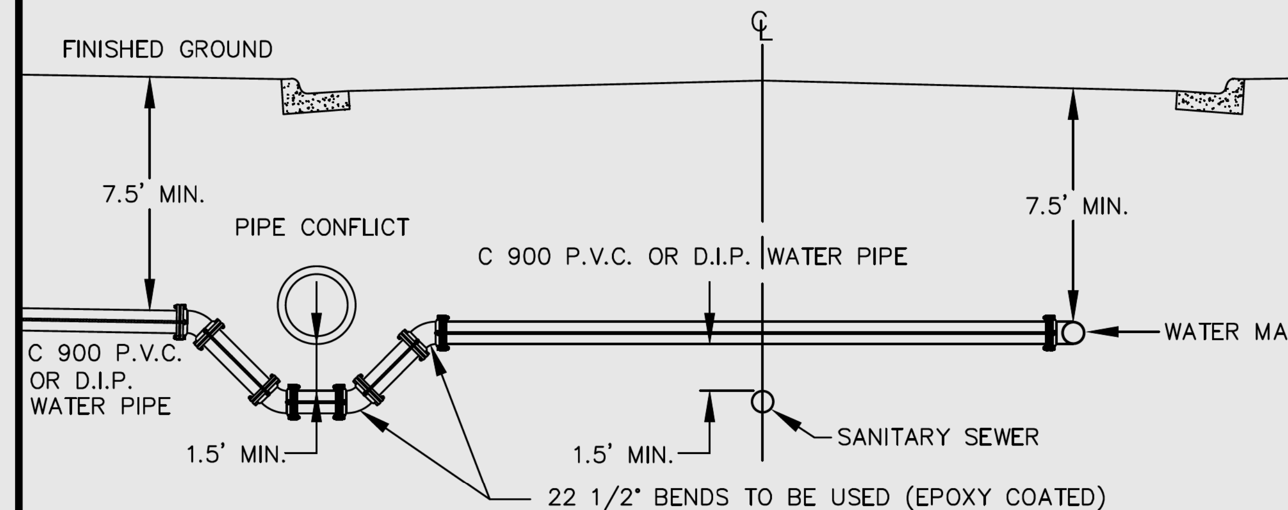
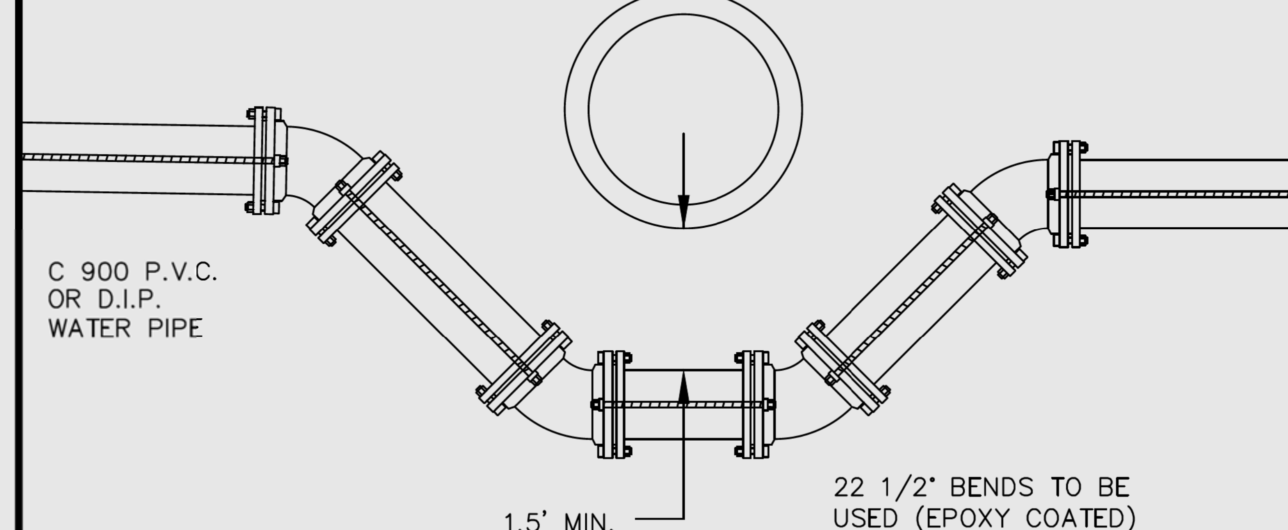
CLASS C PIPE BEDDING

DRAWN: R.L.S.	DATE: 1/12/2005	SCALE: NONE	PLATE NO. WM-5



NOTE: ALL RODDING, EYE BOLTS AND OTHER HARDWARE USED FOR RODDING TO BE SPRAYED WITH TAR COATING AFTER INSTALLATION. C900 WATER PIPE JOINTS WILL HAVE MEGA-LUG MECHANICAL JOINT RESTRAINT AND RODDING. D.I.P. WATER PIPE WILL ONLY HAVE MEGA-LUG MECHANICAL JOINT RESTRAINT.

PIPE CONFLICT



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VERTICAL BENDS DETAIL

DRAWN: R.L.S.	DATE: 1/7/2019	SCALE: NONE	PLATE NO. WM-6

NO	DATE	BY	CKD	APPR	REVISION

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ANOKA COUNTY

CITY OF COON RAPIDS STANDARD PLATES

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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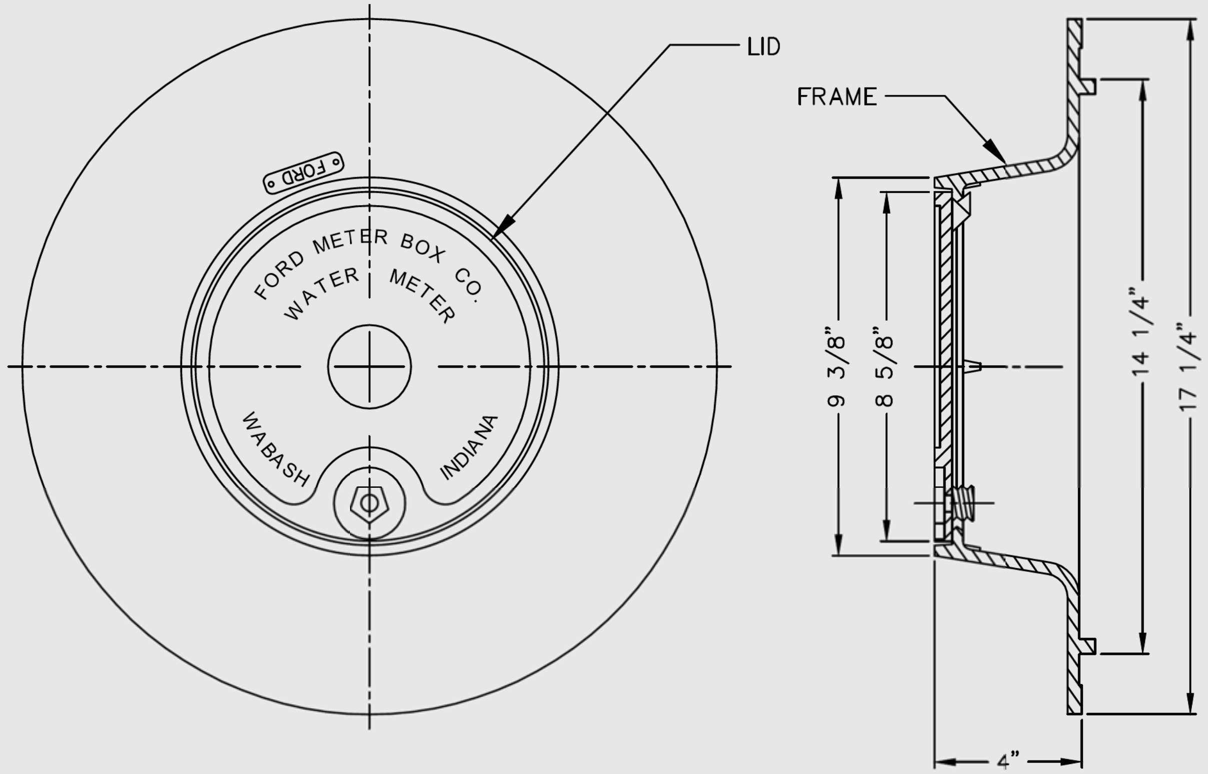

FORD TYPE A1 SINGLE LID COVER
WITH 8" IRON LID (WA1L)

NOTE: METER BOX COVER TO BE USED WHEN WATER SERVICE CURB STOP BOX OR SANITARY SEWER SERVICE CLEANOUTS ARE IN A HARD SURFACE, DRIVEWAY, SIDEWALK, ETC.

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METER BOX COVER

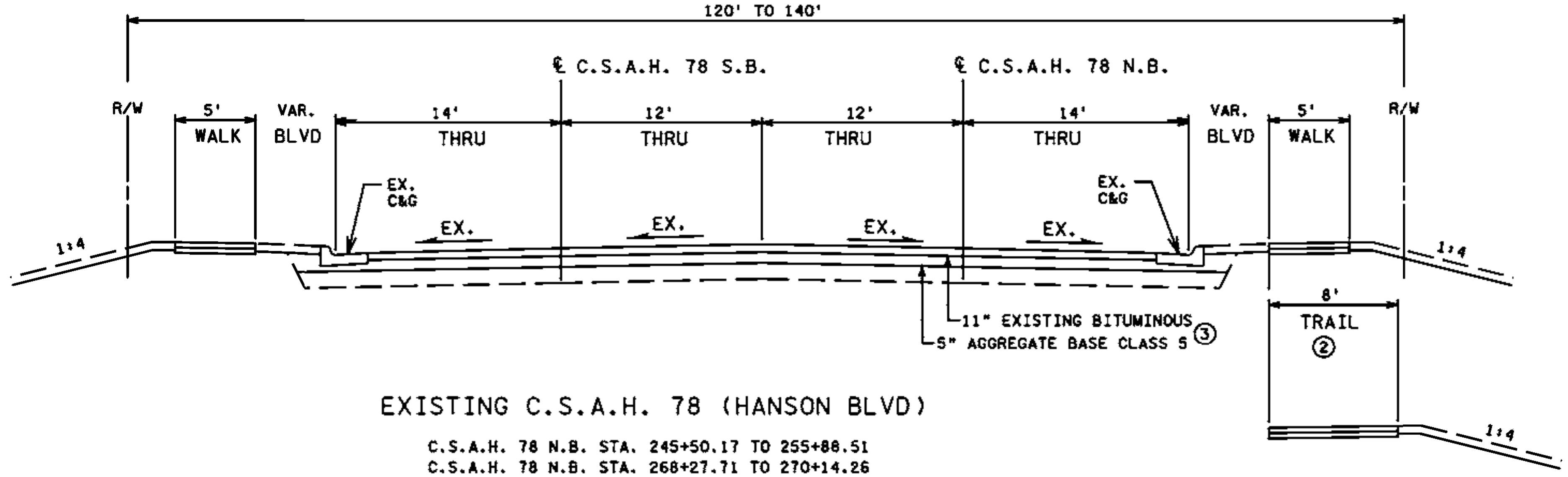
DRAWN:	DATE:	SCALE:	PLATE NO.
R.L.S.	1/23/2019	NONE	WM-7

NO	DATE	BY	CKD	APPR	REVISION

HDR
ANOKA COUNTY

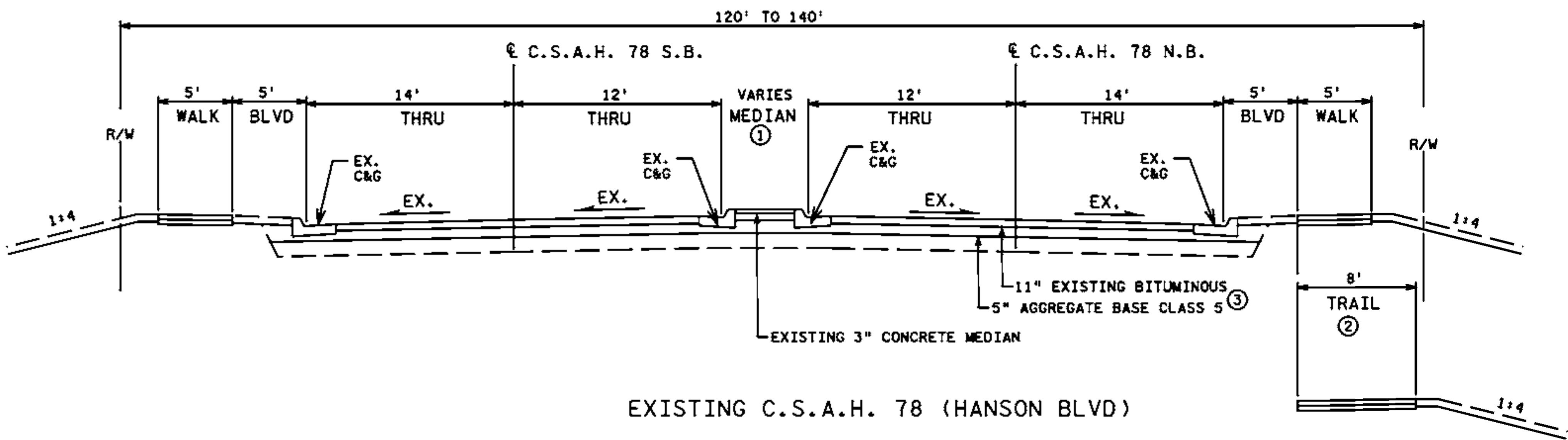
EXISTING C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 255+88.51 TO 268+27.71
C.S.A.H. 78 N.B. STA. 279+26.53 TO 292+03.18
C.S.A.H. 78 N.B. STA. 272+98.34 TO 274+31.78



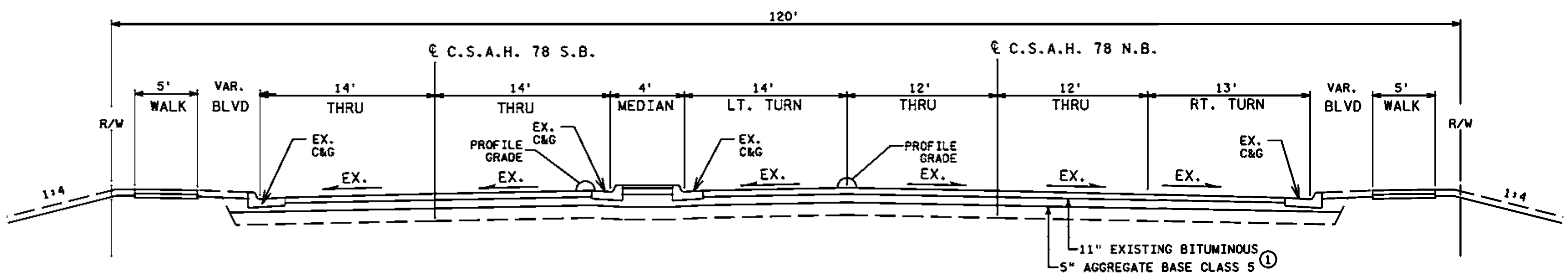
EXISTING C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 245+50.17 TO 255+88.51
C.S.A.H. 78 N.B. STA. 268+27.71 TO 270+14.26
C.S.A.H. 78 N.B. STA. 277+00.86 TO 279+26.53
C.S.A.H. 78 N.B. STA. 292+03.18 TO 296+90.10



EXISTING C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 270+14.26 TO 273+00.21



OBSERVED EXISTING BITUMINOUS PAVEMENT THICKNESS					THICKNESS (IN)	
BORING	LOCATION	ALIGNMENT	APPROX. STATION	RT/LT	BIT.	AGG. BASE
R - 1	MAINLINE	PCSAH78NB	252+77	RT	10	6
R - 2	MAINLINE	PCSAH78NB	255+80	RT	15	6
R - 3	MAINLINE	PCSAH78SB	258+20	LT	7	6
R - 5	MAINLINE	PCSAH78SB	260+50	LT	7	7
R - 6	TURN LANE	PCSAH78NB	262+00	RT	10	6
R - 7	MAINLINE	PCSAH78SB	263+10	LT	7	5
R - 10	TURN LANE	PCSAH78NB	271+85	RT	16	NE*
R - 12	MAINLINE	PCSAH78NB	278+40	RT	14	NE*
R - 14	MAINLINE	PCSAH78NB	283+70	RT	12	NE*
R - 15	MAINLINE	PCSAH78SB	288+60	LT	7	NE*
R - 16	SHOULDER	PCSAH78NB	291+20	RT	14	NE*

NE* = NOT ENCOUNTERED

NOTE: EXISTING PAVEMENT DATA IS FOR INFORMATION ONLY AS COLLECTED IN THE SOIL BORINGS. DEPTHS TO BE VERIFIED BY THE CONTRACTOR.

SPECIFIC NOTES

① MEDIAN WIDTH VARIES FROM 4' - 16'.

② STA. 288+71.71 TO STA. 296+90.00

③ DEPTHS ARE AVERAGES, SEE TABLE AT TOP RIGHT OF THIS SHEET.

EXISTING C.S.A.H. 78

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NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: GINA E. BEERS LIC. NO. 56150
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

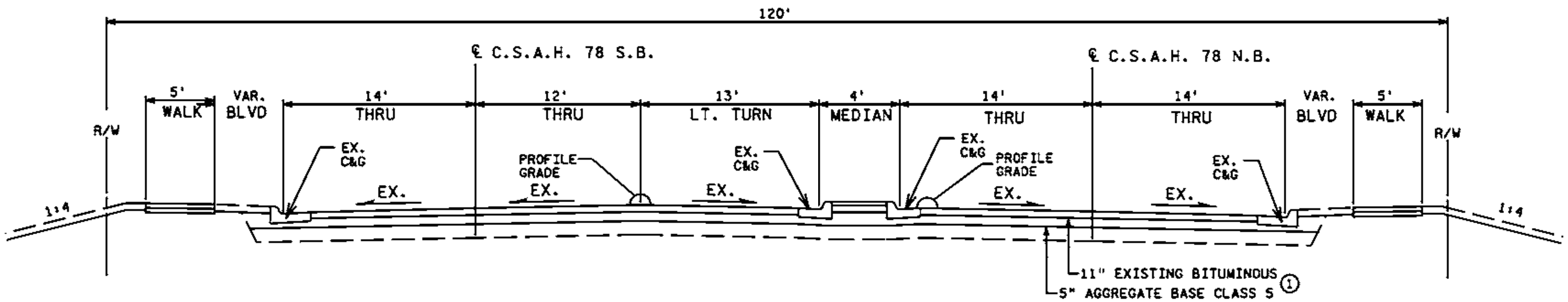
HDR
ANOKA COUNTY

TYPICAL SECTIONS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

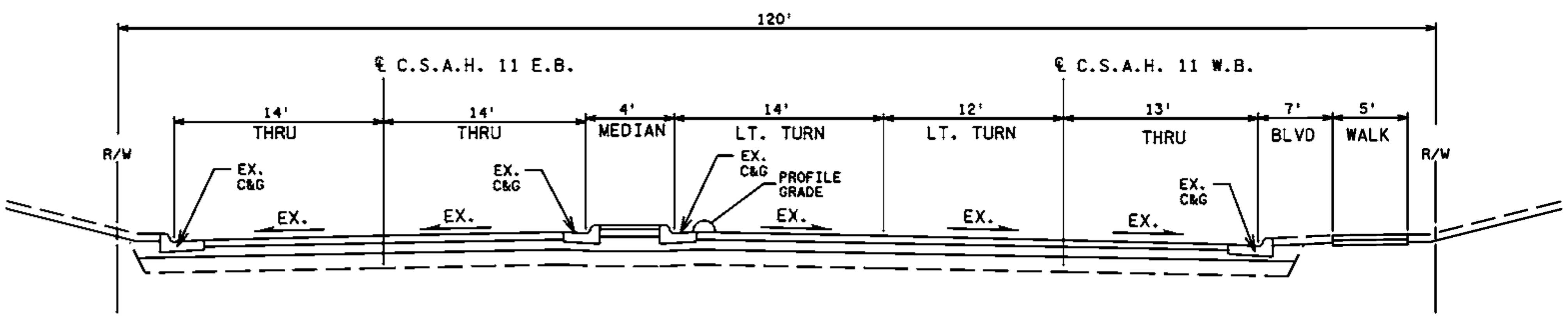
EXISTING C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 274+33.74 TO 277+00.86



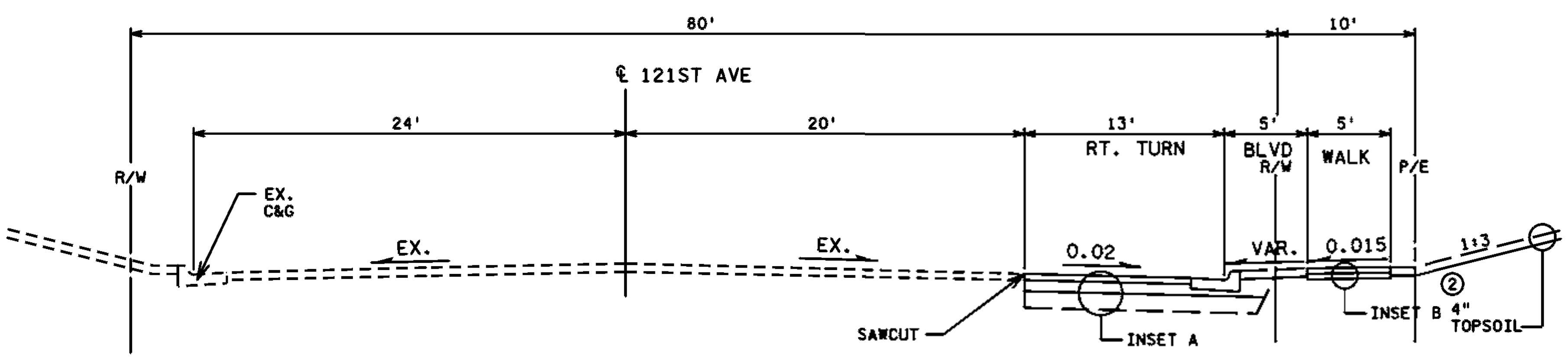
EXISTING C.S.A.H. 11 (NORTHDALE BLVD)

C.S.A.H. 11 W.B. STA. 30+51.05 TO 33+91.24



121ST AVE. NW

121STAVE STA. 62+23.14 TO 65+68.98



OBSERVED EXISTING BITUMINOUS PAVEMENT THICKNESS					THICKNESS (IN)	
BORING	LOCATION	ALIGNMENT	APPROX. STATION	RT/LT	BIT.	AGG. BASE
R - 1	MAINLINE	PCSAH78NB	252+77	RT	10	6
R - 2	MAINLINE	PCSAH78NB	255+80	RT	15	6
R - 3	MAINLINE	PCSAH78SB	258+20	LT	7	6
R - 5	MAINLINE	PCSAH78SB	260+50	LT	7	7
R - 6	TURN LANE	PCSAH78NB	262+00	RT	10	6
R - 7	MAINLINE	PCSAH78SB	263+10	LT	7	5
R - 10	TURN LANE	PCSAH78NB	271+85	RT	16	NE*
R - 12	MAINLINE	PCSAH78NB	278+40	RT	14	NE*
R - 14	MAINLINE	PCSAH78NB	283+70	RT	12	NE*
R - 15	MAINLINE	PCSAH78SB	288+60	LT	7	NE*
R - 16	SHOULDER	PCSAH78NB	291+20	RT	14	NE*

NE* = NOT ENCOUNTERED

NOTE: EXISTING PAVEMENT DATA IS FOR INFORMATION ONLY AS COLLECTED IN THE SOIL BORINGS. DEPTHS TO BE VERIFIED BY THE CONTRACTOR.

GENERAL NOTES

SEE SHEET 36 FOR INSETS.

ALL CROSS SLOPES ARE IN FT. PER FT.

UNLESS OTHERWISE SPECIFIED, GRADING GRADE SLOPES WILL BE THE SAME AS THE PROPOSED DRIVING SURFACE.

SEE SUPERELEVATION PLANS FOR CROSS SLOPES.

SOUTHBOUND PROFILE GRADE IS 12' RIGHT OF ALIGNMENT CENTERLINE.
NORTHBOUND PROFILE GRADE IS 12' LEFT OF ALIGNMENT CENTERLINE.

SEE CONSTRUCTION PLAN SHEETS FOR CONCRETE WALK AND BITUMINOUS TRAIL LOCATIONS. AGGREGATE BASE CLASS 5 SHALL BE EXTENDED 6" ON EACH EDGE OF WALK AND TRAIL WIDTH.

MAXIMUM 0.07 ROLLOVER IN SUPERELEVATION AREAS.

CLEARANCE OF 1.5' MUST BE PROVIDED FROM THE FACE OF CURB TO FIXED OBJECTS.

SPECIFIC NOTES

① DEPTHS ARE AVERAGES, SEE TABLE AT TOP RIGHT OF THIS SHEET.

② BACKFILL WITH SUITABLE GRADING MATERIAL.

EXISTING C.S.A.H. 78

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

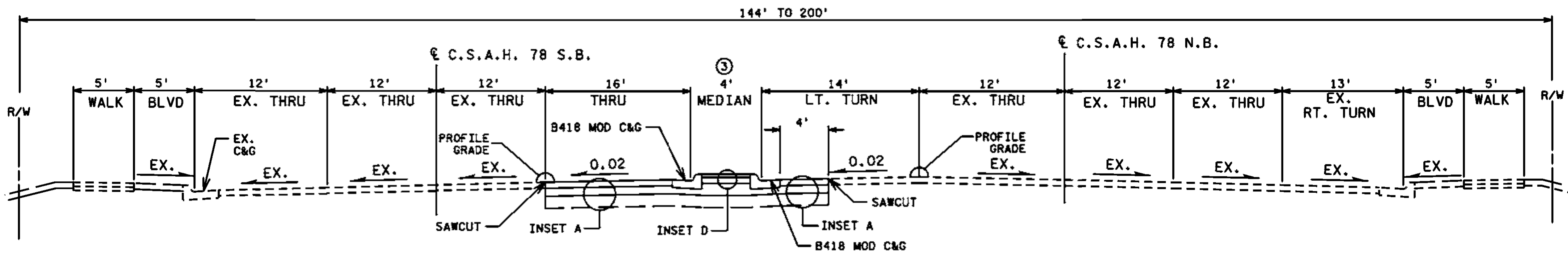
TYPICAL SECTIONS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

C.S.A.H. 78 (HANSON BLVD)

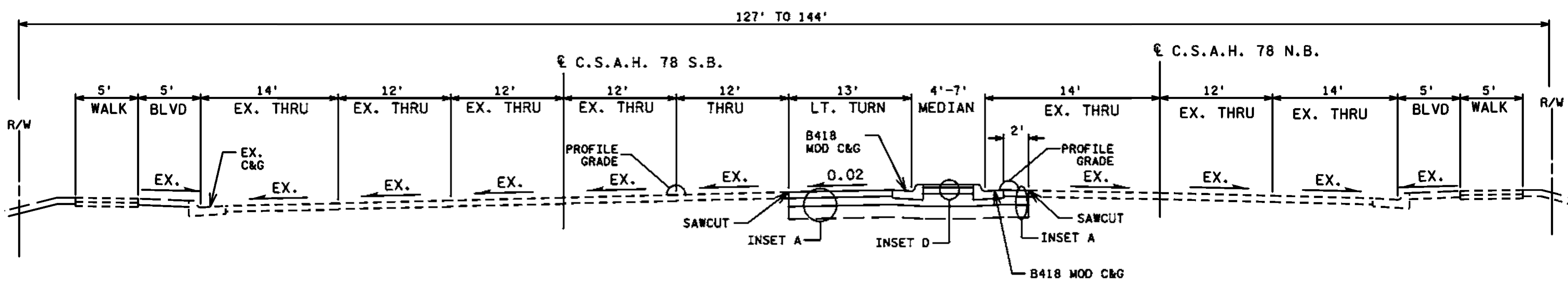
C.S.A.H. 78 N.B. STA. 245+50.17 TO 248+67.10

C.S.A.H. 78 N.B. STA. 248+67.10 TO 250+17.90 (1)



C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 250+17.90 TO 255+28.92

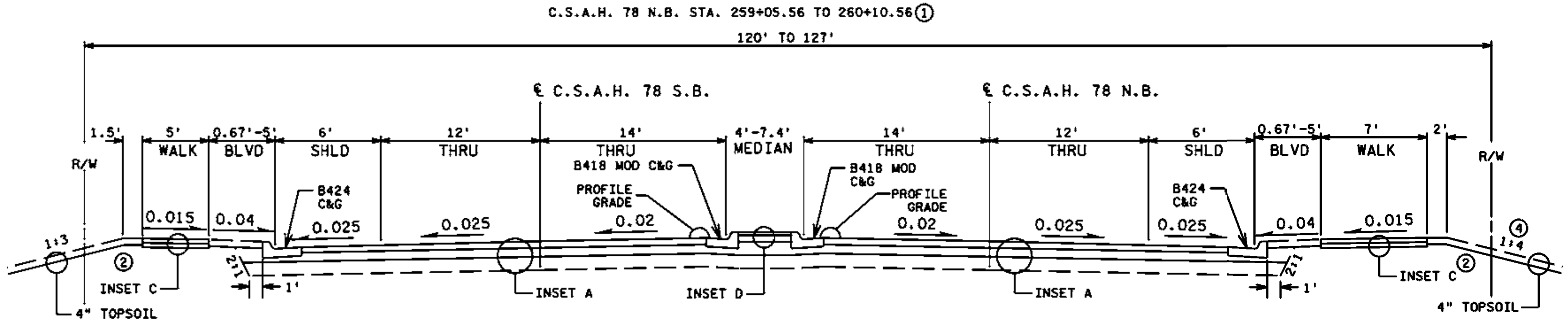


C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 255+28.92 TO 258+42.89 (1)

C.S.A.H. 78 N.B. STA. 258+42.89 TO 259+05.56

C.S.A.H. 78 N.B. STA. 259+05.56 TO 260+10.56 (1)



GENERAL NOTES

SEE SHEET 36 FOR INSETS.

ALL CROSS SLOPES ARE IN FT. PER FT.

UNLESS OTHERWISE SPECIFIED, GRADING GRADE SLOPES WILL BE THE SAME AS THE PROPOSED DRIVING SURFACE.

SEE SUPERELEVATION PLANS FOR CROSS SLOPES.

SOUTHBOUND PROFILE GRADE IS 12' RIGHT OF ALIGNMENT CENTERLINE. NORTHBOUND PROFILE GRADE IS 12' LEFT OF ALIGNMENT CENTERLINE.

SEE CONSTRUCTION PLAN SHEETS FOR CONCRETE WALK AND BITUMINOUS TRAIL LOCATIONS. AGGREGATE BASE CLASS 5 SHALL BE EXTENDED 6" ON EACH EDGE OF WALK AND TRAIL WIDTH.

MAXIMUM 0.07 ROLLOVER IN SUPERELEVATION AREAS.

CLEARANCE OF 1.5' MUST BE PROVIDED FROM THE FACE OF CURB TO FIXED OBJECTS.

SPECIFIC NOTES

(1) TRANSITION SECTION. SEE CONSTRUCTION PLAN.

(2) BACKFILL WITH SUITABLE GRADING MATERIAL.

(3) MEDIAN WIDTH VARIES FROM 4' TO 6' FROM C.S.A.H. 78 N.B. STA. 245+50.17 TO 245+67.74

(4) 1:3 FROM STA. 259+10 TO 259+90.

PROPOSED C.S.A.H. 78

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB

DESIGNED BY: GEB

CHECKED BY: BAV

HDR

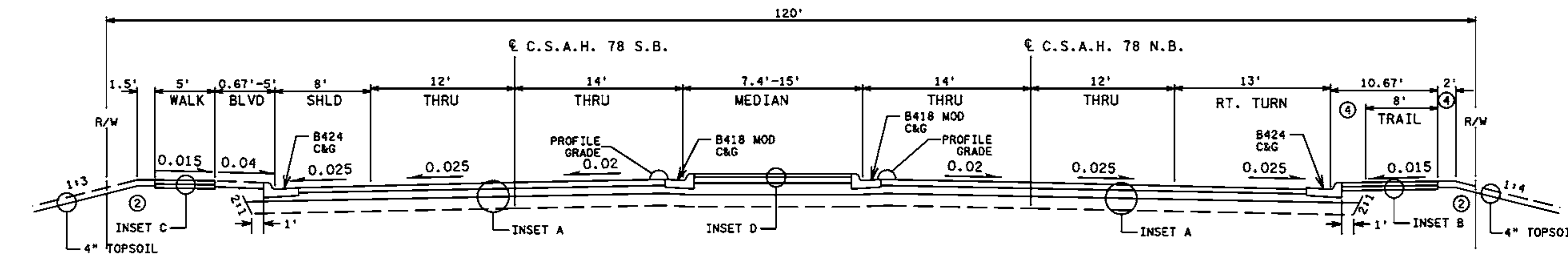
ANOKA COUNTY

TYPICAL SECTIONS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

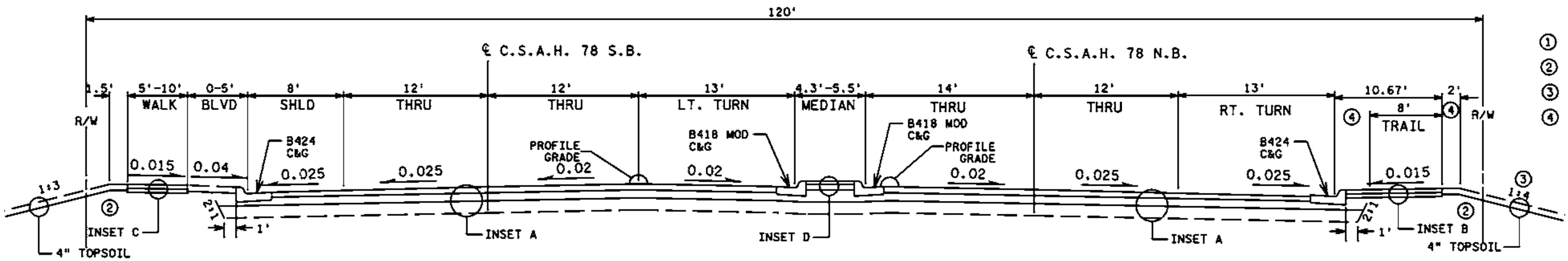
C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 260+10.56 TO 262+24.65
C.S.A.H. 78 N.B. STA. 262+24.65 TO 262+76.45 (1)



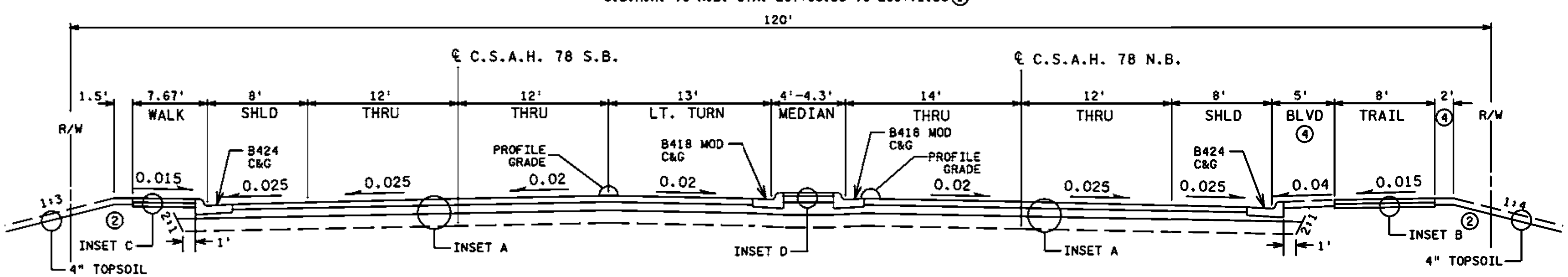
C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 262+76.45 TO 264+51.37
C.S.A.H. 78 N.B. STA. 264+51.37 TO 265+40.14 (1)



C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 265+40.14 TO 267+06.56
C.S.A.H. 78 N.B. STA. 267+06.56 TO 268+71.56 (1)



SPECIFIC NOTES

(1) TRANSITION SECTION. SEE CONSTRUCTION PLAN.
(2) BACKFILL WITH SUITABLE GRADING MATERIAL.
(3) 1:3 FROM STA. 262+90 TO STA. 263+65.
(4) MUST INCLUDE 2' SHLD/CLEAR ZONE FROM EDGE OF TRAIL.

GENERAL NOTES

SEE SHEET 36 FOR INSETS.

ALL CROSS SLOPES ARE IN FT. PER FT.

UNLESS OTHERWISE SPECIFIED, GRADING GRADE SLOPES WILL BE THE SAME AS THE PROPOSED DRIVING SURFACE.

SEE SUPERELEVATION PLANS FOR CROSS SLOPES.

SOUTHBOUND PROFILE GRADE IS 12' RIGHT OF ALIGNMENT CENTERLINE.
NORTHBOUND PROFILE GRADE IS 12' LEFT OF ALIGNMENT CENTERLINE.

SEE CONSTRUCTION PLAN SHEETS FOR CONCRETE WALK AND BITUMINOUS TRAIL LOCATIONS. AGGREGATE BASE CLASS 5 SHALL BE EXTENDED 6" ON EACH EDGE OF WALK AND TRAIL WIDTH.

MAXIMUM 0.07 ROLLOVER IN SUPERELEVATION AREAS.

CLEARANCE OF 1.5' MUST BE PROVIDED FROM THE FACE OF CURB TO FIXED OBJECTS.

PROPOSED C.S.A.H. 78

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: GINA E. BEERS LIC. NO. 56150
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

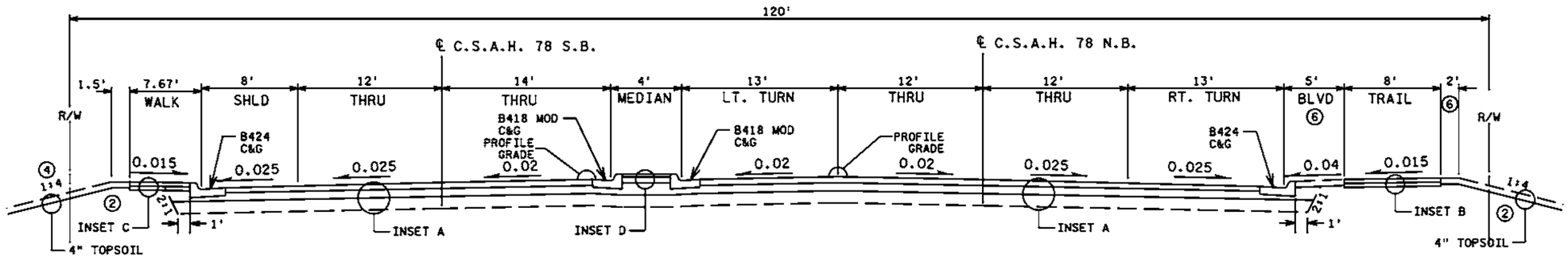
DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

TYPICAL SECTIONS
SHEET NO. 32 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

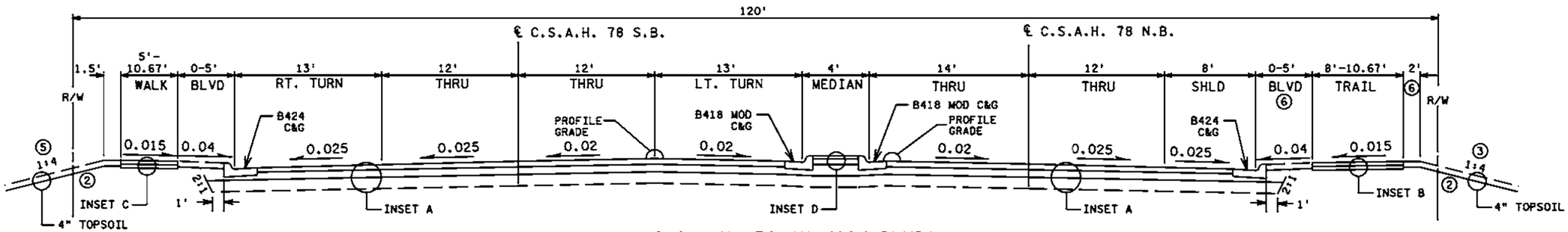
C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 268+71.56 TO 273+28.53
C.S.A.H. 78 N.B. STA. 273+28.53 TO 274+30.47(1)



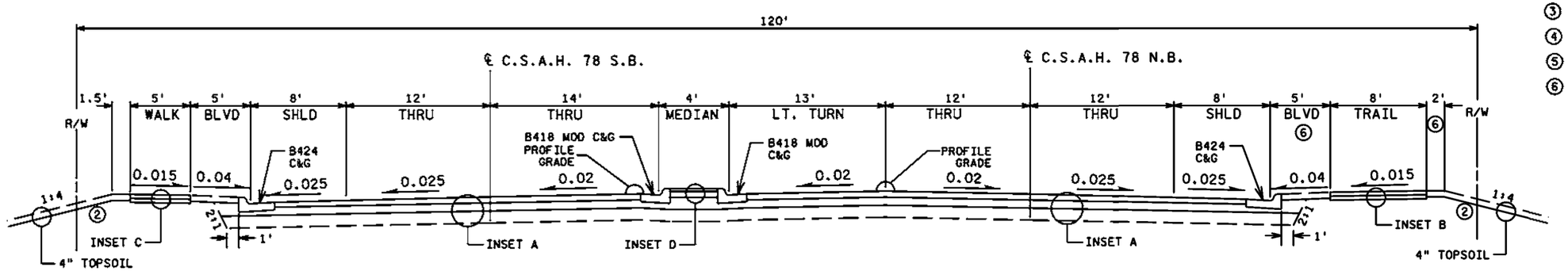
C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 274+30.47 TO 277+50.38
C.S.A.H. 78 N.B. STA. 277+50.38 TO 279+12.40(1)



C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 279+12.40 TO 281+13.96
C.S.A.H. 78 N.B. STA. 281+13.96 TO 281+61.19(1)



GENERAL NOTES

SEE SHEET 36 FOR INSETS.

ALL CROSS SLOPES ARE IN FT. PER FT.

UNLESS OTHERWISE SPECIFIED, GRADING GRADE SLOPES WILL BE THE SAME AS THE PROPOSED DRIVING SURFACE.

SEE SUPERELEVATION PLANS FOR CROSS SLOPES.

SOUTHBOUND PROFILE GRADE IS 12' RIGHT OF ALIGNMENT CENTERLINE.
NORTHBOUND PROFILE GRADE IS 12' LEFT OF ALIGNMENT CENTERLINE.

SEE CONSTRUCTION PLAN SHEETS FOR CONCRETE WALK AND BITUMINOUS TRAIL LOCATIONS. AGGREGATE BASE CLASS 5 SHALL BE EXTENDED 6" ON EACH EDGE OF WALK AND TRAIL WIDTH.

MAXIMUM 0.07 ROLLOVER IN SUPERELEVATION AREAS.

CLEARANCE OF 1.5' MUST BE PROVIDED FROM THE FACE OF CURB TO FIXED OBJECTS.

SPECIFIC NOTES

① TRANSITION SECTION. SEE CONSTRUCTION PLAN.
② BACKFILL WITH SUITABLE GRADING MATERIAL.
③ 1:3 FROM STA. 278+00 TO STA. 278+40.
④ 1:3 FROM STA. 268+71.56 TO STA. 272+50.
⑤ 1:3 FROM STA. 277+50 TO STA. 27+12.
⑥ MUST INCLUDE 2' SHLD/CLEAR ZONE FROM EDGE OF TRAIL.

PROPOSED C.S.A.H. 78

NO	DATE	BY	CKD	APPR	REVISION

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NAME: GINA E. BEERS LIC. NO. 56150
CERTIFIED BY: _____ LICENSED PROFESSIONAL ENGINEER
11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

TYPICAL SECTIONS
SHEET NO. 33 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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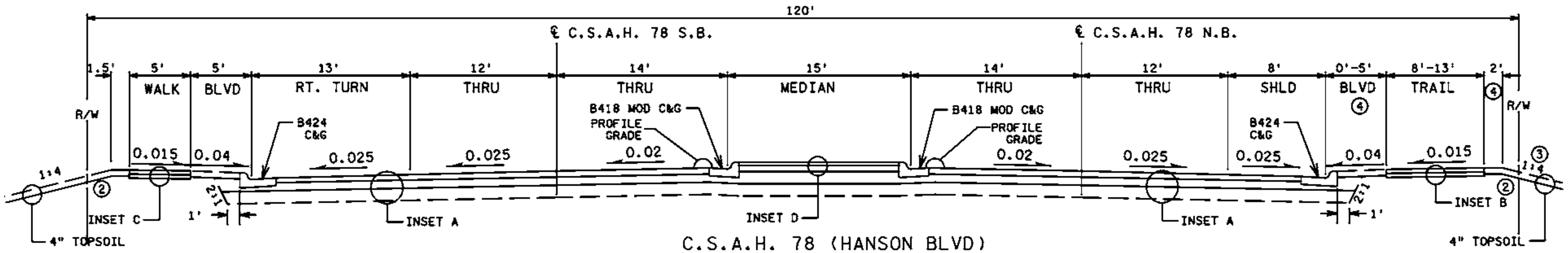
11:57:21 PM
12\06\2019
CSAH78_pentable.tbl

C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 281+61.19 TO 284+37.61

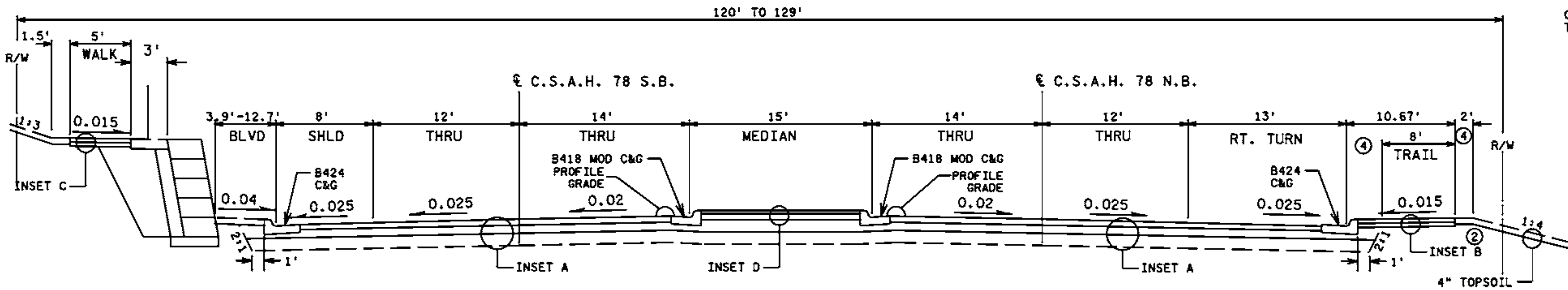
C.S.A.H. 78 N.B. STA. 284+37.61 TO 285+10.78 ①



C.S.A.H. 78 (HANSON BLVD)

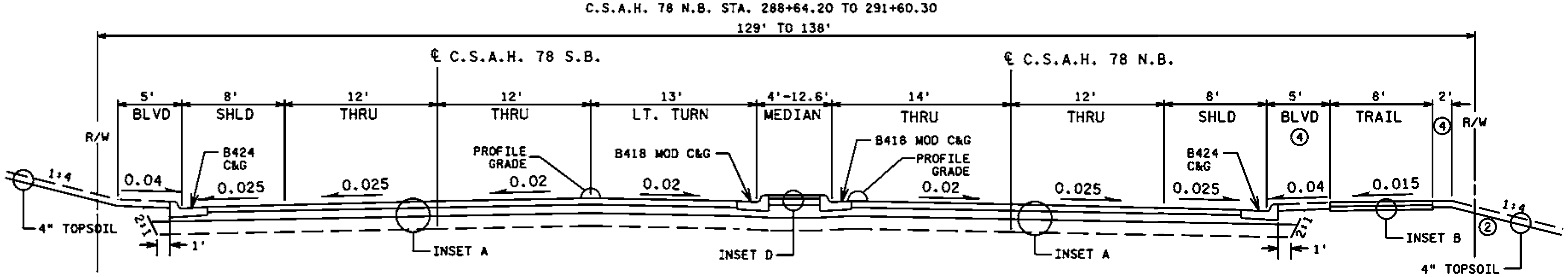
C.S.A.H. 78 N.B. STA. 285+10.78 TO 288+17.03

C.S.A.H. 78 N.B. STA. 288+17.03 TO 288+64.20 ①



C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 288+64.20 TO 291+60.30



GENERAL NOTES

SEE SHEET 36 FOR INSETS.

ALL CROSS SLOPES ARE IN FT. PER FT.

UNLESS OTHERWISE SPECIFIED, GRADING GRADE SLOPES WILL BE THE SAME AS THE PROPOSED DRIVING SURFACE.

SEE SUPERELEVATION PLANS FOR CROSS SLOPES.

SOUTHBOUND PROFILE GRADE IS 12' RIGHT OF ALIGNMENT CENTERLINE. NORTHBOUND PROFILE GRADE IS 12' LEFT OF ALIGNMENT CENTERLINE.

SEE CONSTRUCTION PLAN SHEETS FOR CONCRETE WALK AND BITUMINOUS TRAIL LOCATIONS. AGGREGATE BASE CLASS 5 SHALL BE EXTENDED 6" ON EACH EDGE OF WALK AND TRAIL WIDTH.

MAXIMUM 0.07 ROLLOVER IN SUPERELEVATION AREAS.

CLEARANCE OF 1.5' MUST BE PROVIDED FROM THE FACE OF CURB TO FIXED OBJECTS.

SPECIFIC NOTES

① TRANSITION SECTION. SEE CONSTRUCTION PLAN.

② BACKFILL WITH SUITABLE GRADING MATERIAL.

③ 1:3 FROM STA. 283+90 TO STA. 285+75.

④ MUST INCLUDE 2' SHLD/CLEAR ZONE FROM EDGE OF TRAIL.

PROPOSED C.S.A.H. 78

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB

DESIGNED BY: GEB

CHECKED BY: BAV

HDR

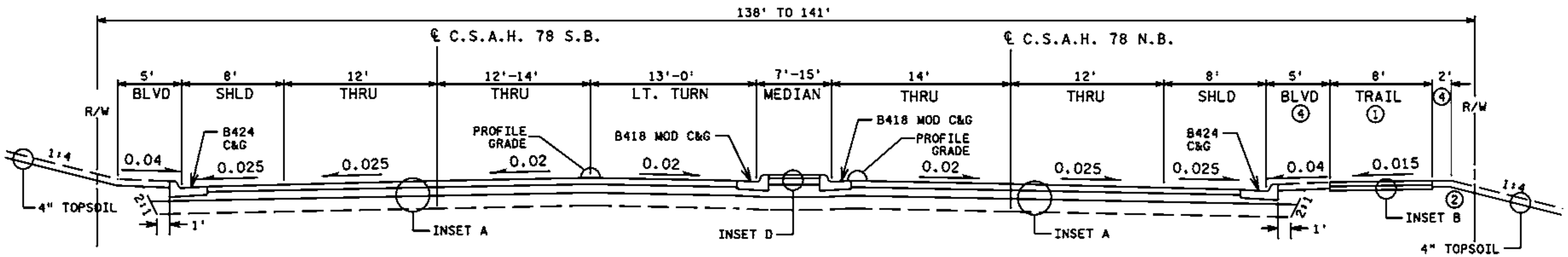
ANOKA COUNTY

TYPICAL SECTIONS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

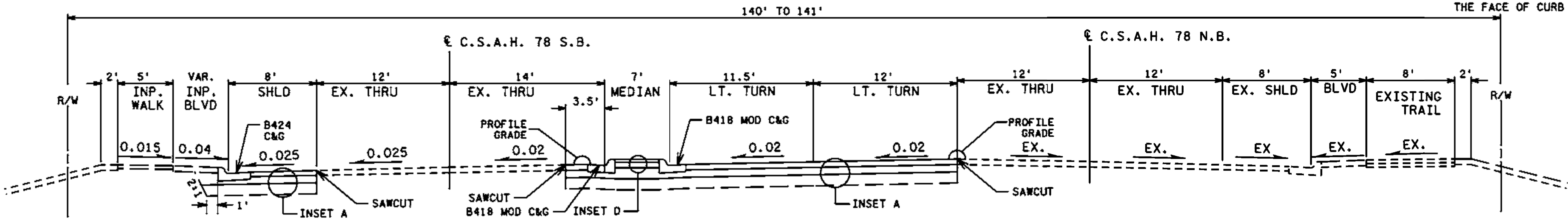
C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 291+60.30 TO 293+93.34



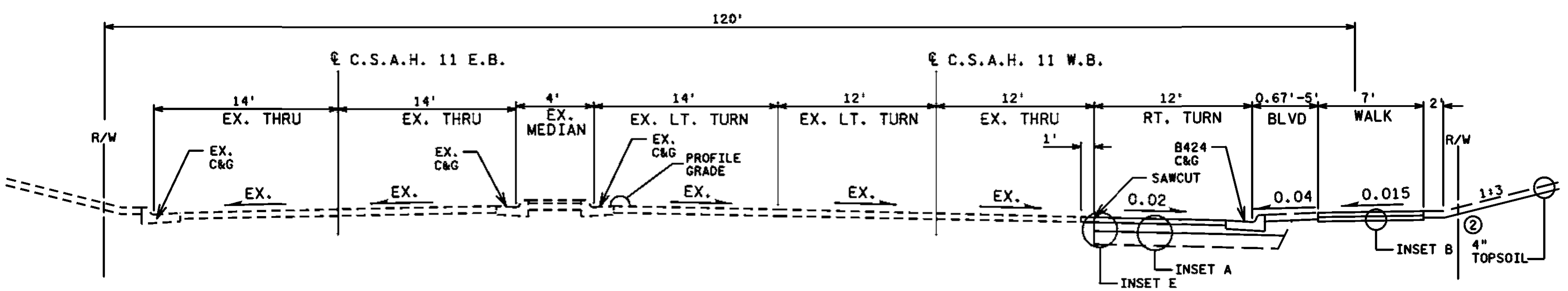
C.S.A.H. 78 (HANSON BLVD)

C.S.A.H. 78 N.B. STA. 293+93.34 TO 296+90.10 ③



C.S.A.H. 11 (NORTHDALE BLVD)

C.S.A.H. 11 W.B. STA. 30+07.94 TO 33+36.16



GENERAL NOTES

SEE SHEET 36 FOR INSETS.

ALL CROSS SLOPES ARE IN FT. PER FT.

UNLESS OTHERWISE SPECIFIED, GRADING GRADE SLOPES WILL BE THE SAME AS THE PROPOSED DRIVING SURFACE.

SEE SUPERELEVATION PLANS FOR CROSS SLOPES.

SOUTHBOUND PROFILE GRADE IS 12' RIGHT OF ALIGNMENT CENTERLINE.
NORTHBOUND PROFILE GRADE IS 12' LEFT OF ALIGNMENT CENTERLINE.

SEE CONSTRUCTION PLAN SHEETS FOR CONCRETE WALK AND BITUMINOUS TRAIL LOCATIONS. AGGREGATE BASE CLASS 5 SHALL BE EXTENDED 6" ON EACH EDGE OF WALK AND TRAIL WIDTH.

MAXIMUM 0.07 ROLLOVER IN SUPERELEVATION AREAS.

CLEARANCE OF 1.5' MUST BE PROVIDED FROM THE FACE OF CURB TO FIXED OBJECTS.

SPECIFIC NOTES

① PROPOSED TRAIL ENDS AT STA. 292+07.14

② BACKFILL WITH SUITABLE GRADING MATERIAL.

③ S.B. OUTSIDE SHOULDER WORK ENDS AT N.B. STA. 295+10.

④ MUST INCLUDE 2' SHLD/CLEAR ZONE FROM EDGE OF TRAIL.

PROPOSED C.S.A.H. 78

NO	DATE	BY	CKD	APPR	REVISION

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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

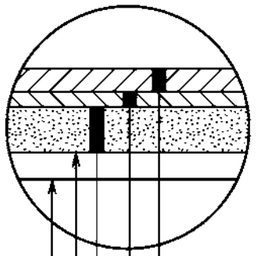
HDR

ANOKA COUNTY

TYPICAL SECTIONS

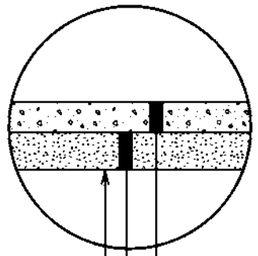
SHEET NO. 35 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



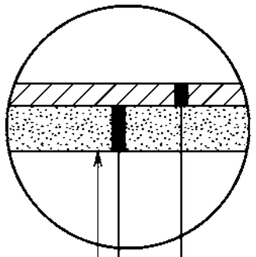
INSET A
RECONSTRUCTION FOR LANE AND SHOULDER

4.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440F)
3.0" TYPE SP 12.5 NON WEARING COURSE MIXTURE (SPNWB430B)
10.0" AGGREGATE BASE (CV) CLASS 5
GRADING GRADE
6.0" SUBGRADE PREPARATION (1)



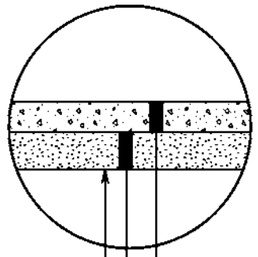
INSET C
CONCRETE SIDEWALK

4" CONCRETE WALK
12.0" GRANULAR MATERIAL
GRADING GRADE



INSET B
BITUMINOUS TRAIL

2.5" TYPE SP 4.75 WEARING COURSE MIXTURE (SPWEA230B)
4.0" AGGREGATE BASE (CV) CLASS 5 (MNDOT SPEC. 2211)
GRADING GRADE



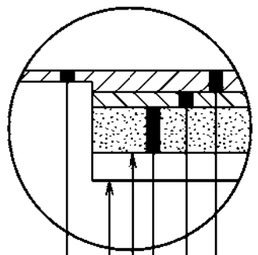
INSET D
CONCRETE MEDIAN >= 4' IN WIDTH

4.0" CONCRETE WALK
4.0" GRANULAR MATERIAL
GRADING GRADE

SPECIFIC NOTES

(1) SUBGRADE PREPARATION SHALL BE THE BLENDING OF THE EXISTING SUBGRADE AS TO UNIFY THE SOILS AT LEAST 1.0' BENEATH THE GRADING GRADE.

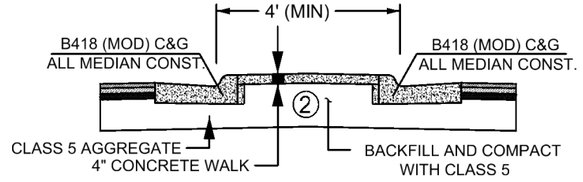
(2) SUBGRADE EXCAVATION, SELECT GRANULAR BORROW AND AGGREGATE BASE TO BE CARRIED THROUGH ENTIRE WIDTH OF MEDIAN WHEN MEDIAN WIDTH IS LESS THAN 8.0' MEASURED FROM FACE OF CURB TO FACE OF CURB.



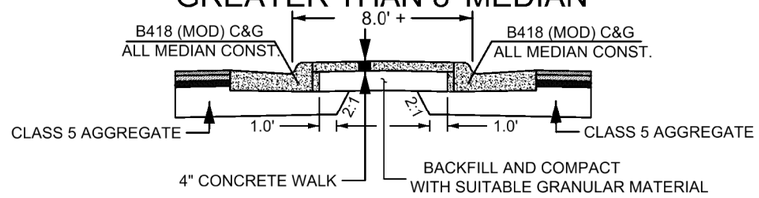
INSET E
MILL OVERLAY

4.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440F)
3.0" TYPE SP 12.5 NON WEARING COURSE MIXTURE (SPNWB430B)
10.0" AGGREGATE BASE (CV) CLASS 5
GRADING GRADE
6.0" SUBGRADE PREPARATION (1)
MILL BITUMINOUS SURFACE (2.0")

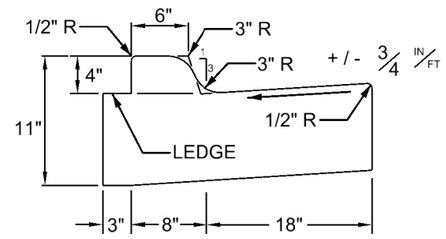
DETAIL "E"
4' - 8' MEDIAN



GREATER THAN 8' MEDIAN



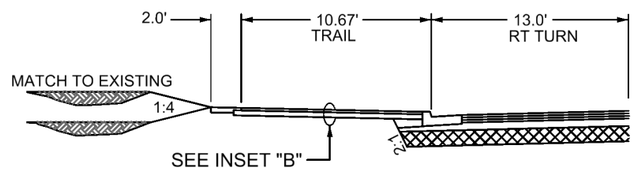
DETAIL "F"
18" MEDIAN CURB
B4 MODIFIED CURB & GUTTER
(NO VARIANCES ALLOWED)



DETAIL "G"

8.0' BITUMINOUS TRAIL STANDARD WHEN NOT TIGHT TO CURB

ALL AREAS THAT HAVE BITUMINOUS TRAIL TIGHT TO CURB WITH NO BLVD. MUST BE 10.0' WIDE



PROPOSED C.S.A.H. 78 INSETS AND MISCELLANEOUS DETAILS

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

TYPICAL SECTIONS

SHEET NO. 36 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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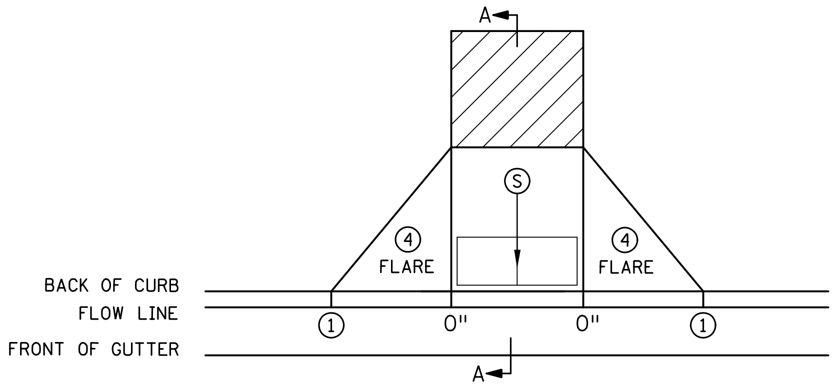
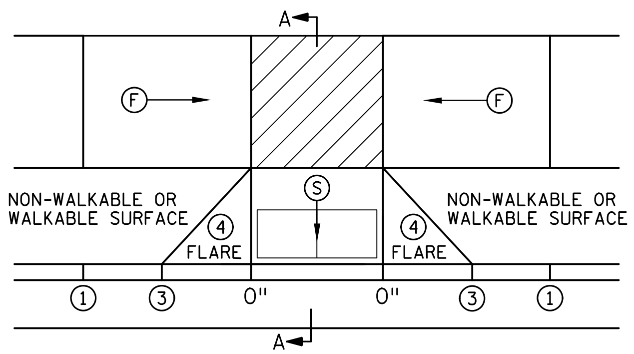
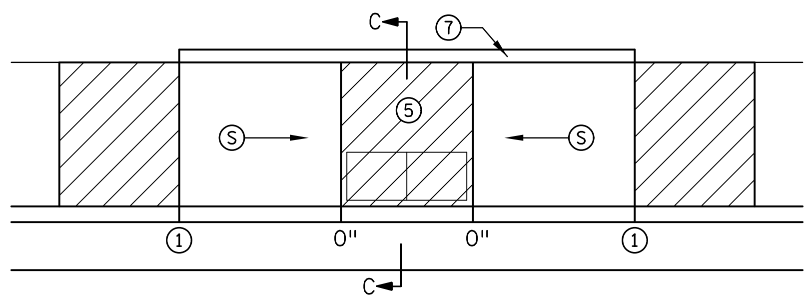
CSAH78_pentaple.tbl

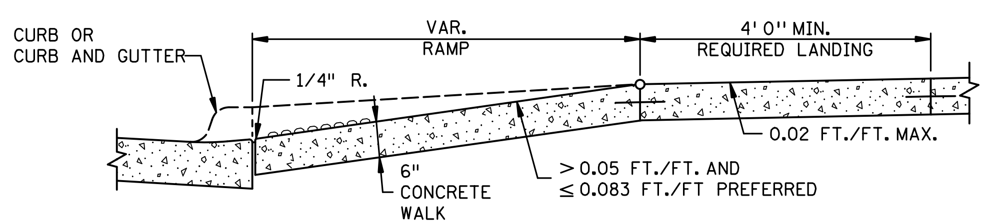


PERPENDICULAR



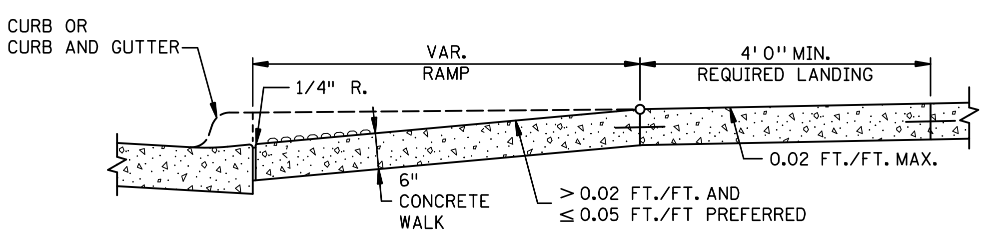
TIERED PERPENDICULAR


PARALLEL



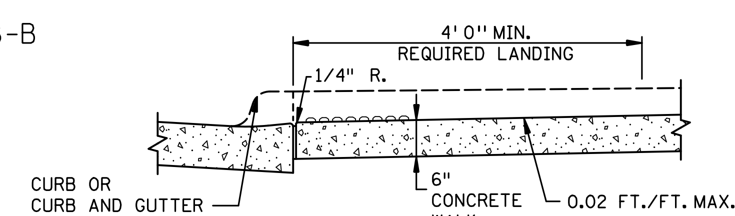
SECTION A-A

PERPENDICULAR/TIERED/DIAGONAL



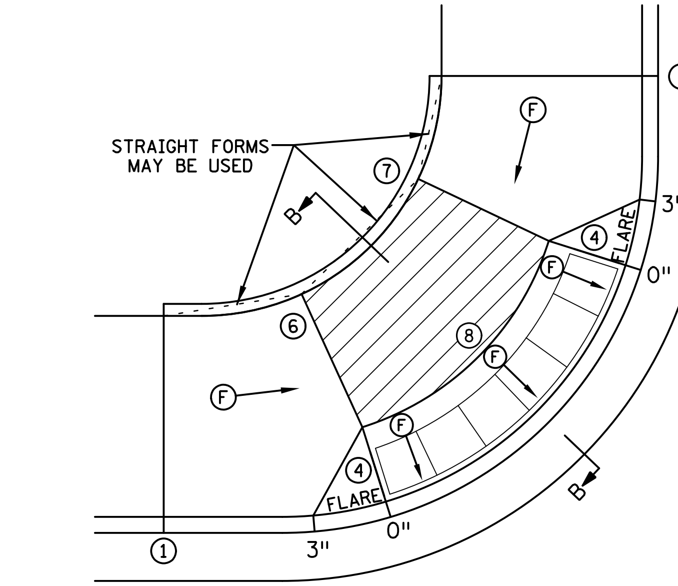
SECTION B-B

FAN

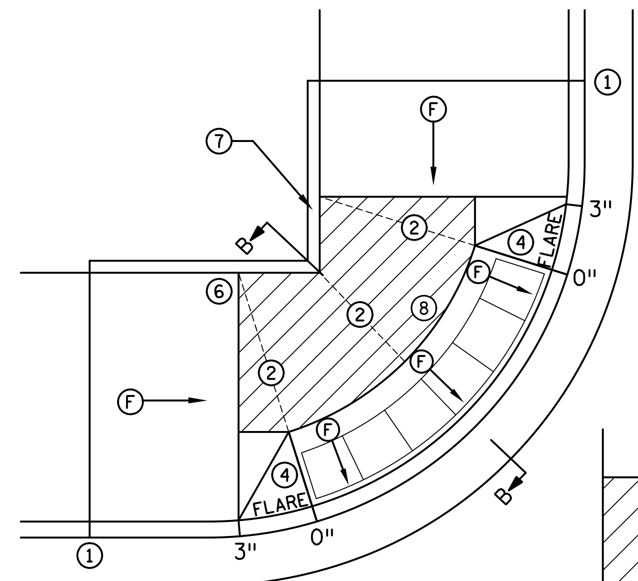


SECTION C-C

PARALLEL/DEPRESSED CORNER

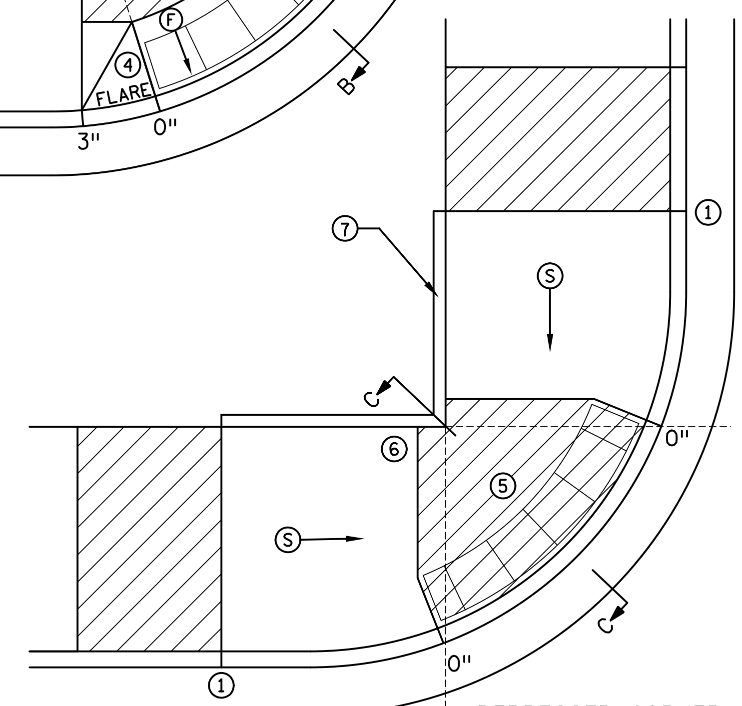


FAN ⑩

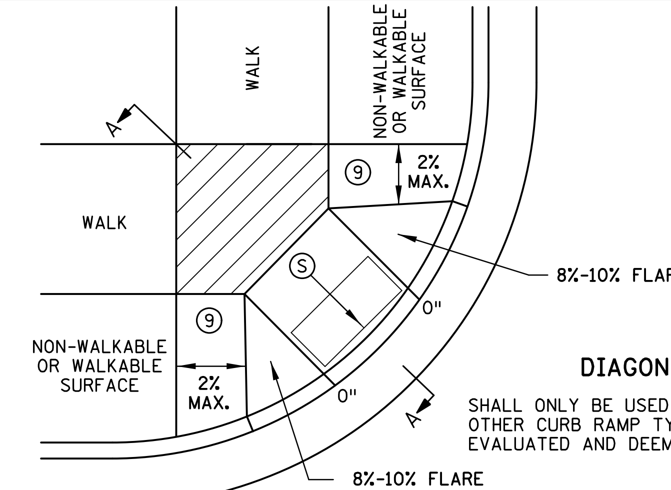


MODIFIED FAN ⑩

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

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 ENTIRE WIDTH OF SHARED-USE PATHS AND THE ENTIRE PAR WIDTH OF THE WALK. DETECTABLE WARNING SHOULD BE 6" LESS THAN THE PAR/TRAIL WIDTH. ARC LENGTH OF 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, WHEN INITIAL LANDING IS AT FULL CURB HEIGHT.
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 SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.
⑧ A 7' MIN TOP RADIUS GRADE BREAK 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.

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%.
Ⓕ↓	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%.
(hatched box)	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

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REVISION:

APPROVED: JANUARY 23, 2017

OPERATIONS ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

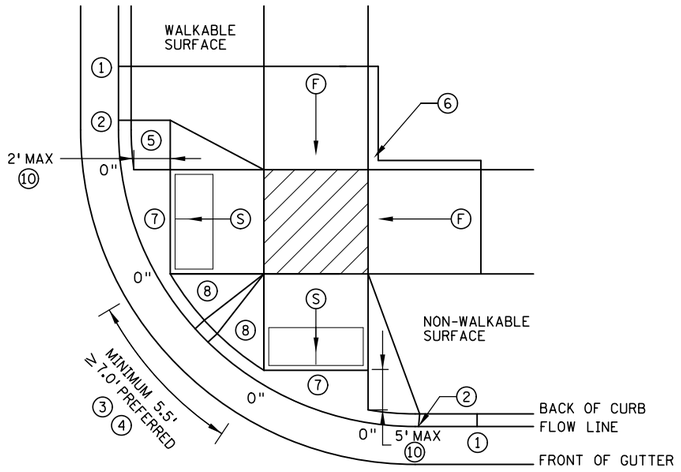
STATE DESIGN ENGINEER

REVISED:

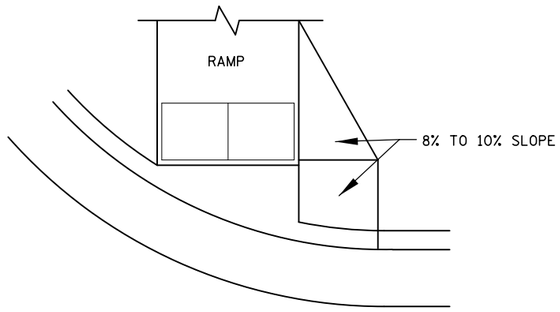
APPROVED:
1-23-2017

PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250 | 1 OF 6



COMBINED DIRECTIONAL ⑨



DIRECTIONAL RAMP WALKABLE FLARE

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 ENTIRE WIDTH OF SHARED-USE PATH AND THE ENTIRE PAR WIDTH OF THE WALK. DETECTABLE WARNING SHOULD BE 6" LESS THAN THE PAR/PATH WIDTH. ARC LENGTH OF 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 SHOULD 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.

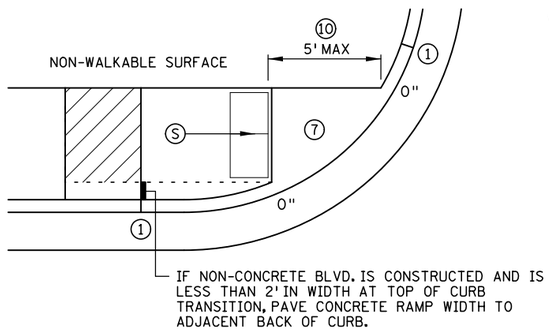
⑩ FRONT EDGE OF DETECTABLE WARNING SHALL BE SET BACK 2' MAXIMUM WHEN ADJACENT TO WALKABLE SURFACE, AND 5' MAXIMUM WHEN ADJACENT TO NON-WALKABLE SURFACE WITH ONE CORNER SET 3" FROM BACK OF CURB. A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP WITHOUT RAISED OBSTACLES THAT COULD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

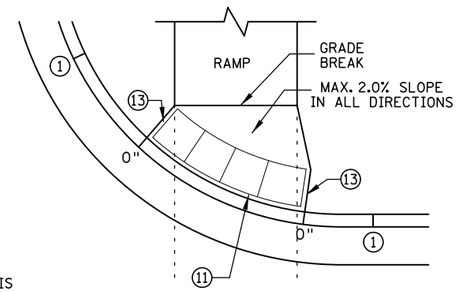
⑫ FOR DIRECTIONAL RAMPS WITH THE DETECTABLE WARNINGS PLACED AT THE BACK OF CURB, THE DETECTABLE WARNINGS SHALL COVER THE ENTIRE WIDTH OF THE WALK/PATH. THIS ENSURES A DETECTABLE EDGE AND HELPS ELIMINATE THE CURB TAPER OBSTRUCTING THE PATH OF PEDESTRIAN TRAVEL.

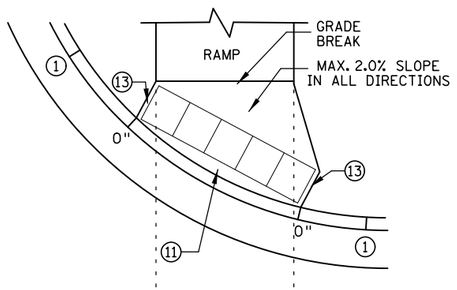
⑬ THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE BACK OF CURB. MAINTAIN 3" BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.

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



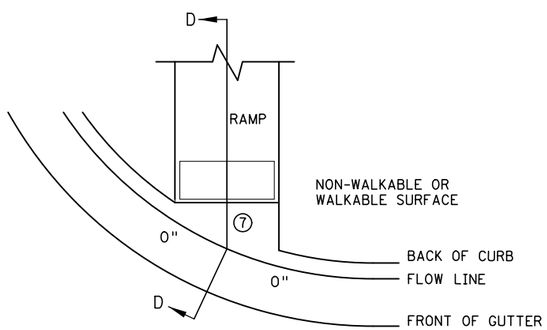
STANDARD ONE-WAY DIRECTIONAL ⑨



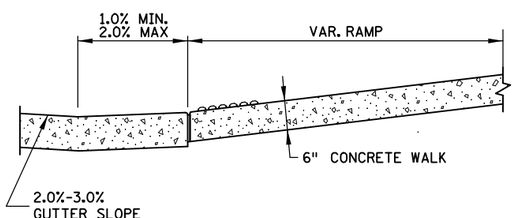


DETECTABLE WARNING PLACEMENT WHEN SETBACK CRITERIA IS EXCEEDED ⑫

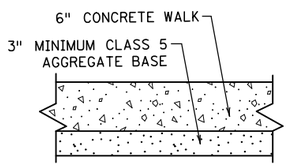
ONE-WAY DIRECTIONAL WITH DETECTABLE WARNING AT BACK OF CURB



CURB FOR DIRECTIONAL RAMPS ⑭



SECTION D-D



TYPICAL SIDEWALK SECTION WITHIN INTERSECTION CORNER

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: JANUARY 23, 2017
OPERATIONS ENGINEER

REVISED:
APPROVED: 1-23-2017
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250 | 2 OF 6

STATE PROJ. NO. 002-678-025, 114-020-053 | SHEET NO. 38 OF 230 SHEETS

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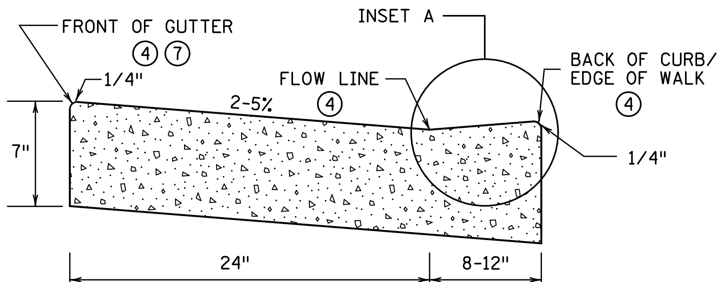
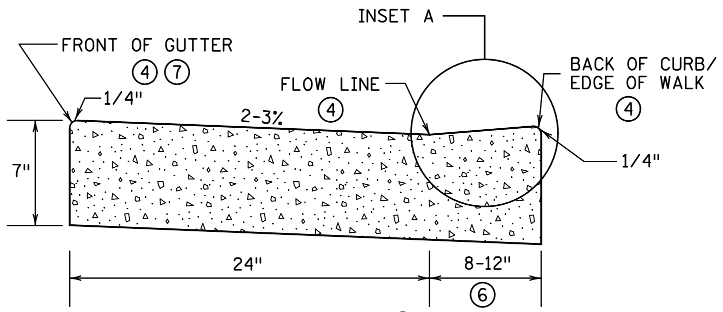
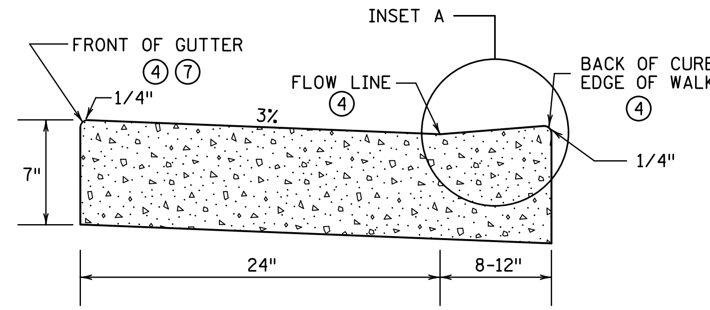


PERPENDICULAR ①



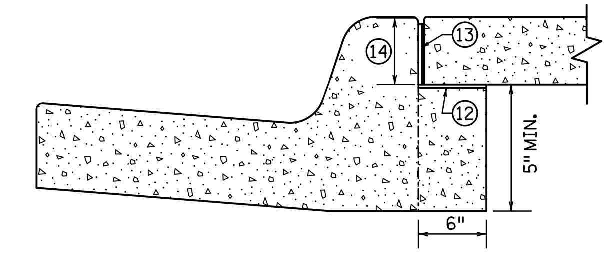
NON PERPENDICULAR ②

PEDESTRIAN ACCESS ROUTE CURB & GUTTER DETAIL



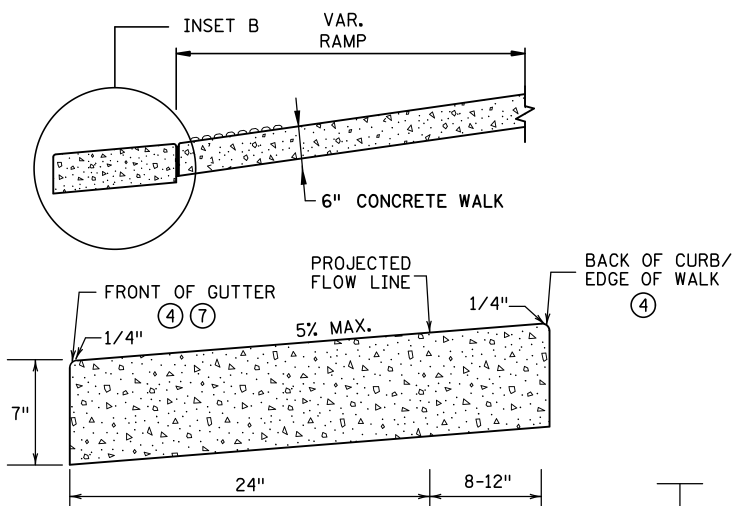
FOR CURB MACHINE PLACEMENT AROUND RADIUS ③

(REGARDLESS OF RAMP TYPE)



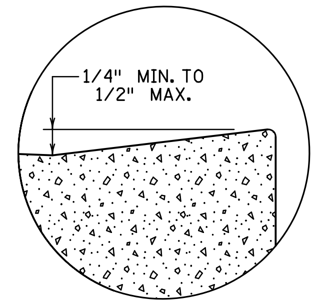
OPTIONAL SILL CURB WHEN SIDEWALK IS AT BACK OF CURB

CONCRETE SILL TO BE USED ONLY WHEN SPECIFIED IN THE PLAN.

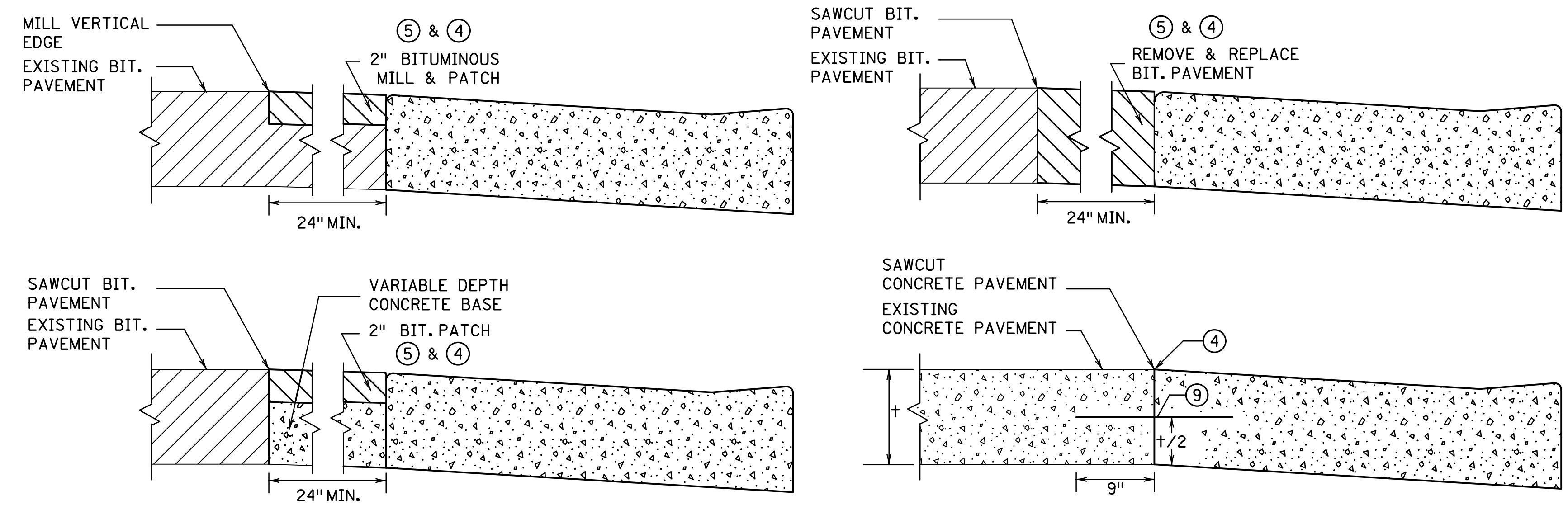


INSET B

OUTFLOW GUTTER ⑧



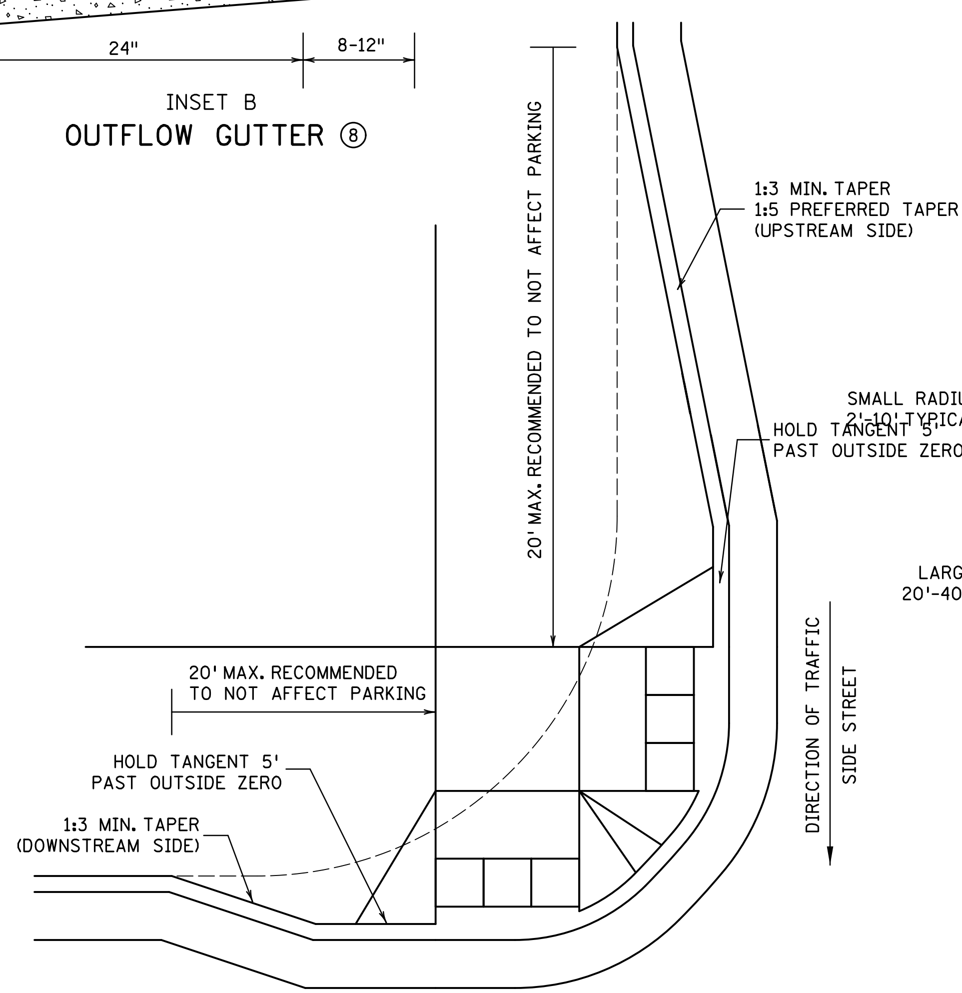
INSET A



ONLY ALLOWED PER ENGINEER'S APPROVAL

PAVEMENT TREATMENT OPTIONS IN FRONT OF CURB & GUTTER

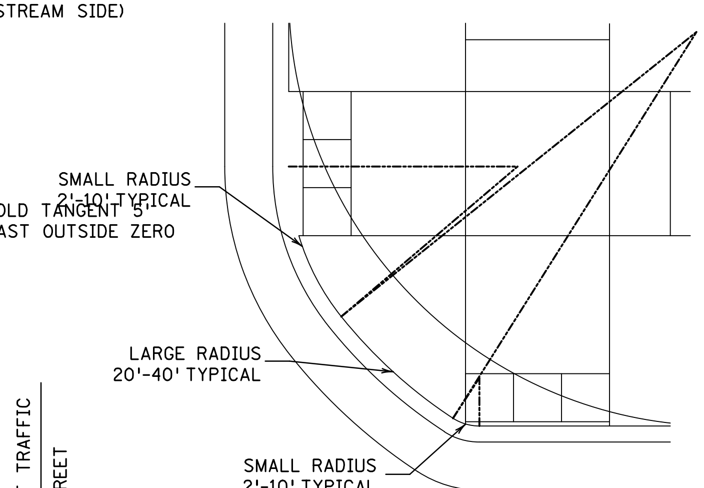
FOR USE ON CURB RAMP RETROFITS



ADA CURB EXTENSION WITH COMPOUND RADIUS (BUMP OUT) ⑪

DIRECTION OF TRAFFIC

MAIN STREET



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.

⑫ PLACE BOND BREAKER BETWEEN WALK AND TOP OF SILL.

⑬ 1/2" PREFORMED JOINT FILLER PER MNDOT SPEC. 3702.

⑭ DIMENSION TO BE SAME AS SIDEWALK THICKNESS, 4" MIN.

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REVISION:
APPROVED: JANUARY 23, 2017
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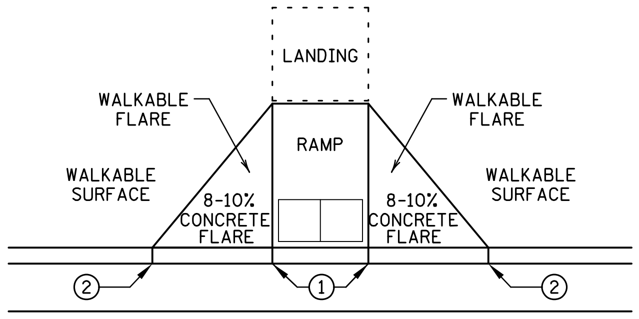
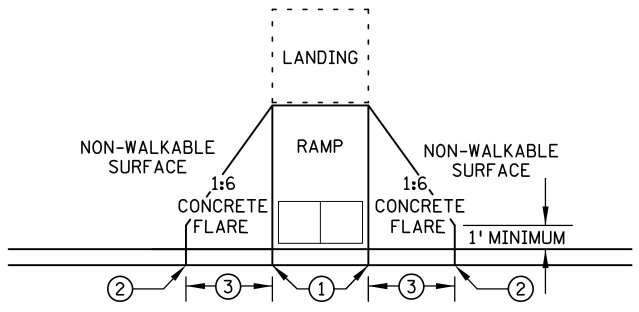
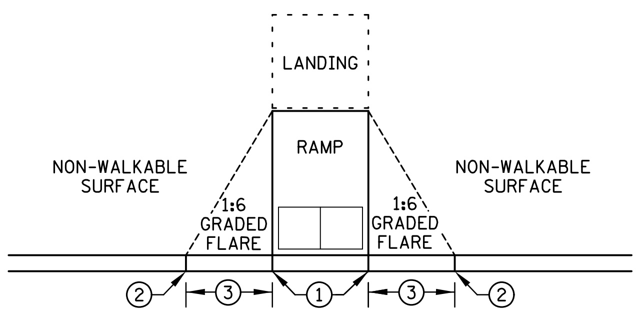
PEDESTRIAN CURB RAMP DETAILS
STANDARD PLAN 5-297.250
3 OF 6
STATE PROJ. NO. 002-678-025, 114-020-053



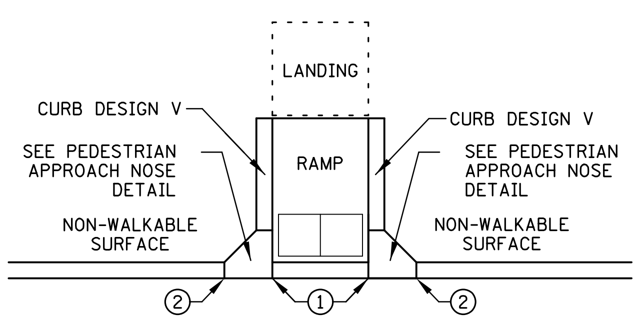
PAVED FLARES
ADJACENT TO WALKABLE SURFACE



PAVED FLARES
ADJACENT TO NON-WALKABLE SURFACE

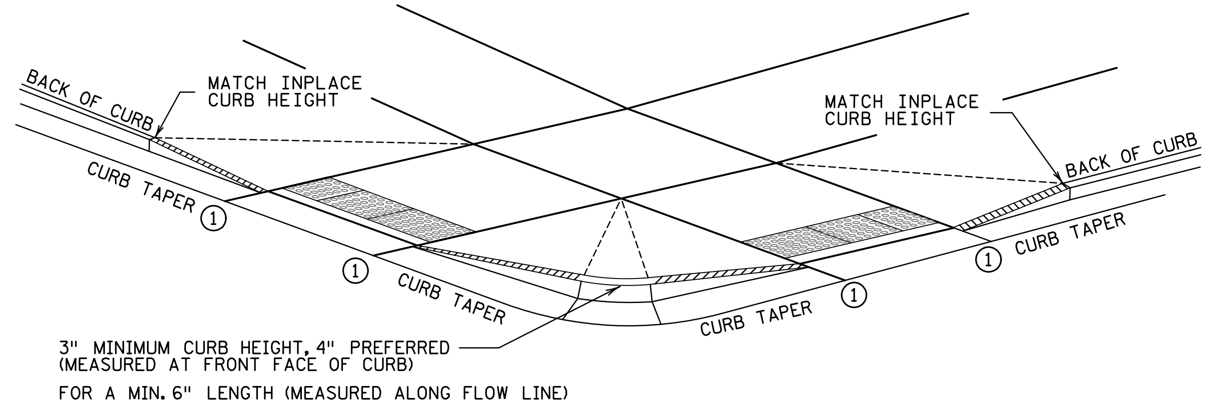


GRADED FLARES

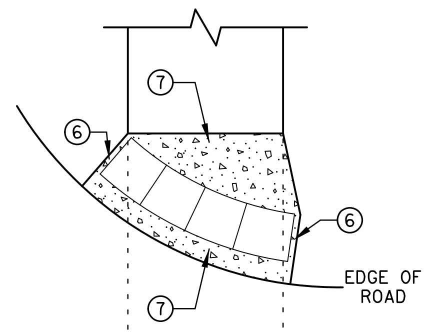


RETURNED CURB ⑤

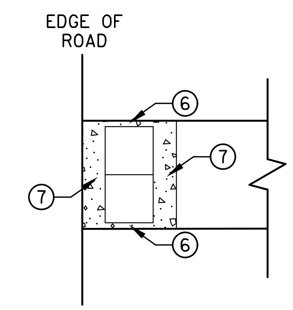
TYPICAL SIDE TREATMENT OPTIONS ④ ⑪



DETECTABLE EDGE WITH ⑧
CURB AND GUTTER

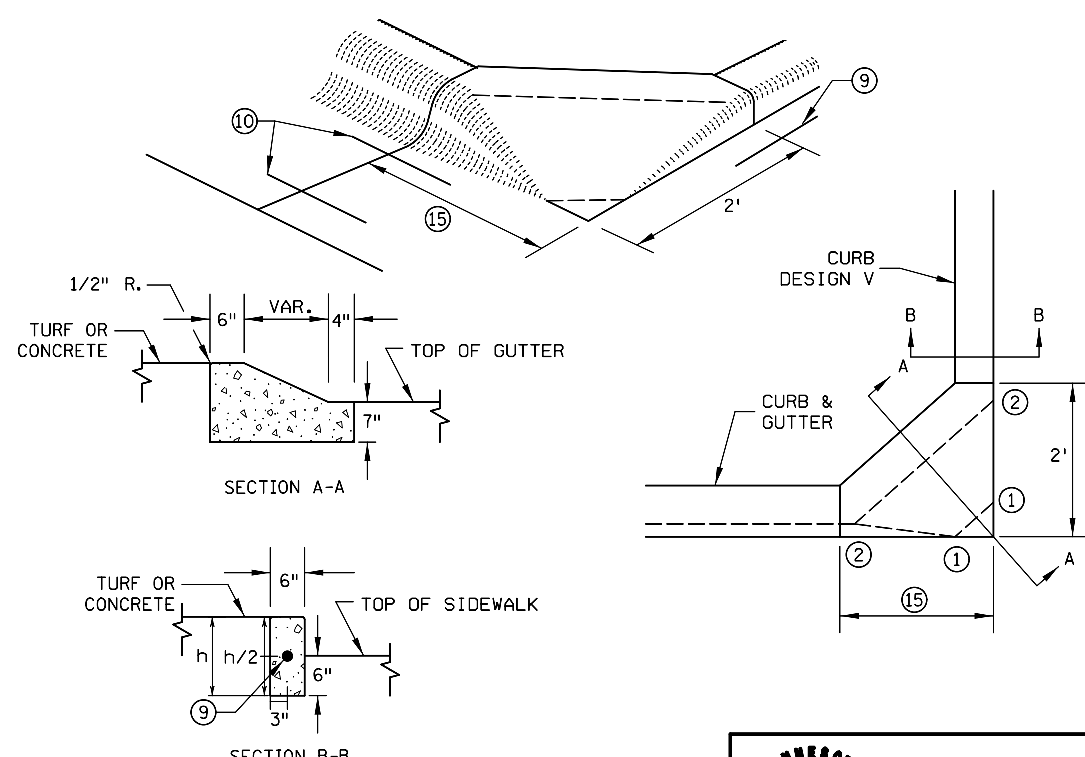


RADIAL DETECTABLE WARNING

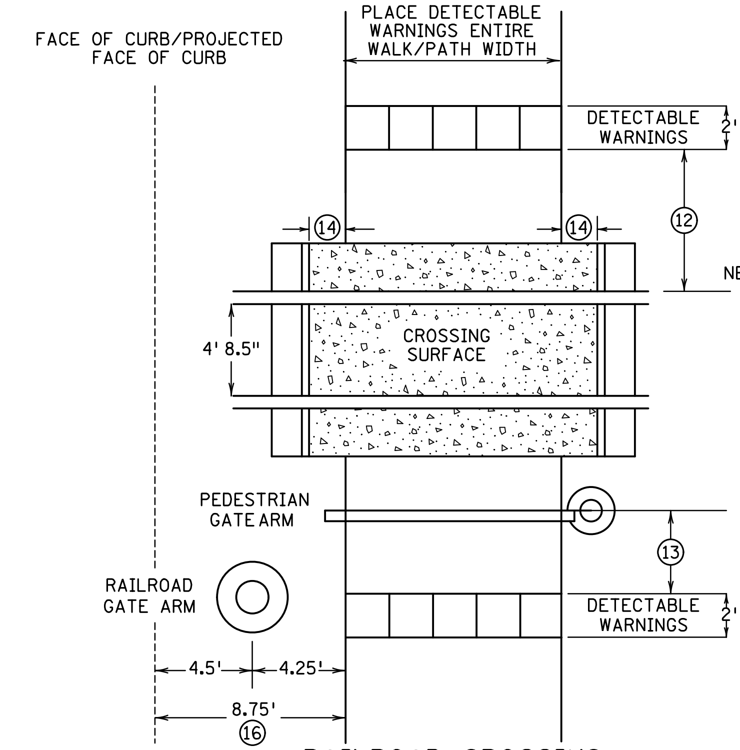


RECTANGULAR DETECTABLE WARNING

DETECTABLE EDGE WITHOUT CURB AND GUTTER



PEDESTRIAN APPROACH
NOSE DETAIL
(FOR RETURNED CURB
SIDE TREATMENT)



RAILROAD CROSSING
PLAN VIEW

NOTES:

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.

② FULL CURB HEIGHT.

③ 2' FOR 4" HIGH CURB AND 3' FOR 6" HIGH CURB.

④ 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.

⑤ TYPICALLY USED FOR MEDIANS AND ISLANDS.

⑥ 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.

⑦ 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.

⑧ 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.

⑨ 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.

⑩ 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.

⑪ 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.

⑫ 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.

⑬ 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 ⑫.

⑭ CROSSING SURFACE SHALL EXTEND 2' MINIMUM PAST THE OUTSIDE EDGE OF WALK OR SHARED-USE PATH.

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

⑯ 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.

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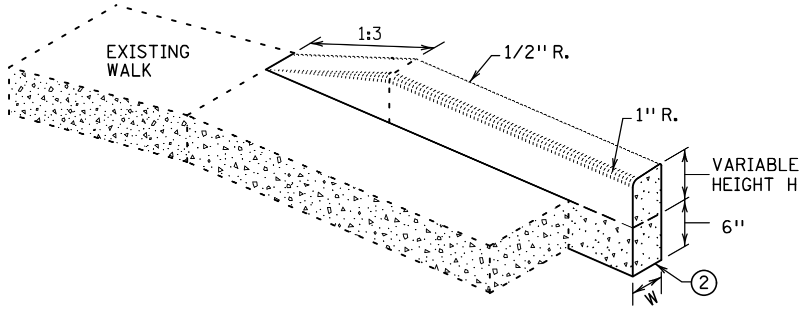
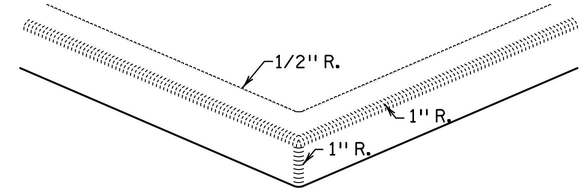
PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250 | 4 OF 6

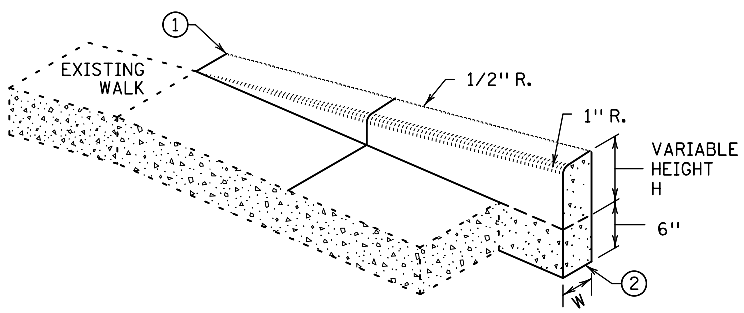


V CURB ADJACENT TO LANDSCAPE

CURB WITHIN SIDEWALK LIMITS



V CURB INTERSECTION



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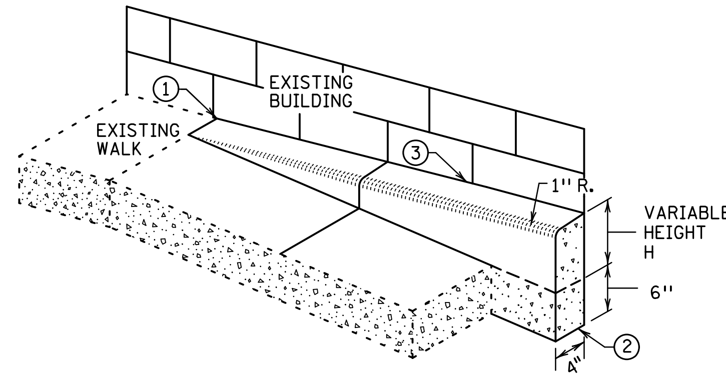
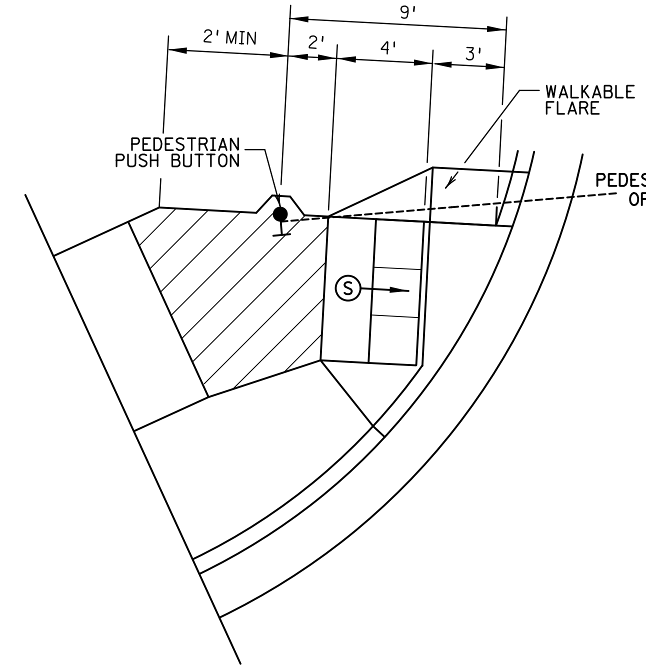
CURB OUTSIDE SIDEWALK LIMITS



V CURB ADJACENT TO BUILDING OR BARRIER

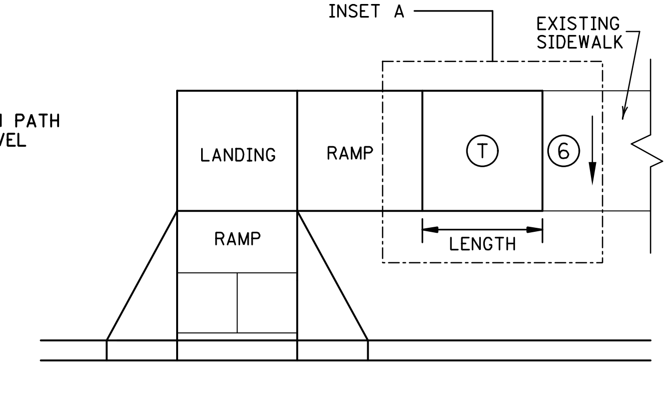
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
<6''	4''
≥6''	6''

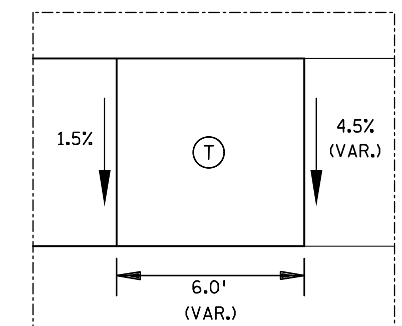


SEMI-DIRECTIONAL RAMP (3,4,9)

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

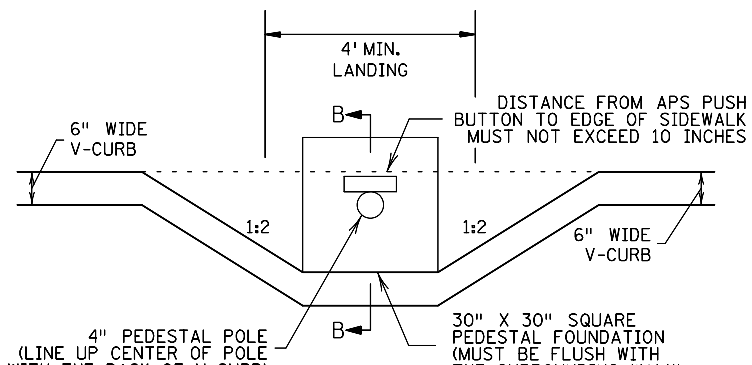
PRIMARILY USED FOR APS APPLICATIONS WHERE THE PAR DOES NOT CONTINUE PAST THE PUSH BUTTON (DEAD-END SIDEWALK)



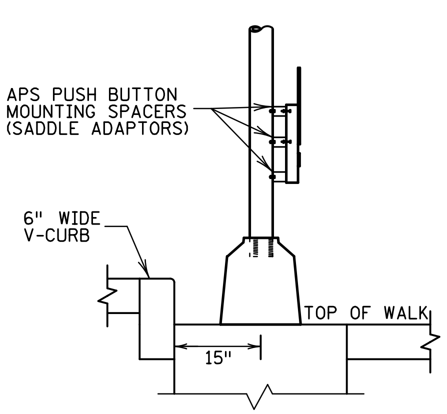


INSET A

TRANSITION PANEL ④⑤

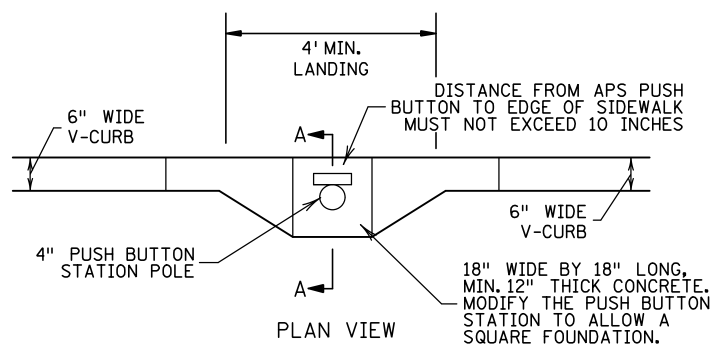


PLAN VIEW

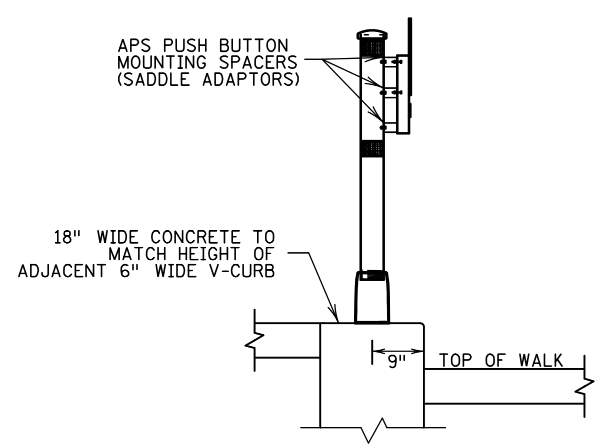


SECTION B-B

SIGNAL PEDESTAL & PUSH BUTTON (V-CURB)



PLAN VIEW



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 EDGE BETWEEN NEW V CURB AND INPLACE STRUCTURE SHALL BE SEALED AND BOND BREAKER SHALL BE USED BETWEEN EXISTING STRUCTURE AND PLACED V-CURB.

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%.

(hatched box) 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.

REVISION:

APPROVED: JANUARY 23, 2017

OPERATIONS ENGINEER

DEPARTMENT OF TRANSPORTATION MINNESOTA

STATE DESIGN ENGINEER

REVISED:

APPROVED: 1-23-2017

PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250

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STATE PROJ. NO. 002-678-025, 114-020-053

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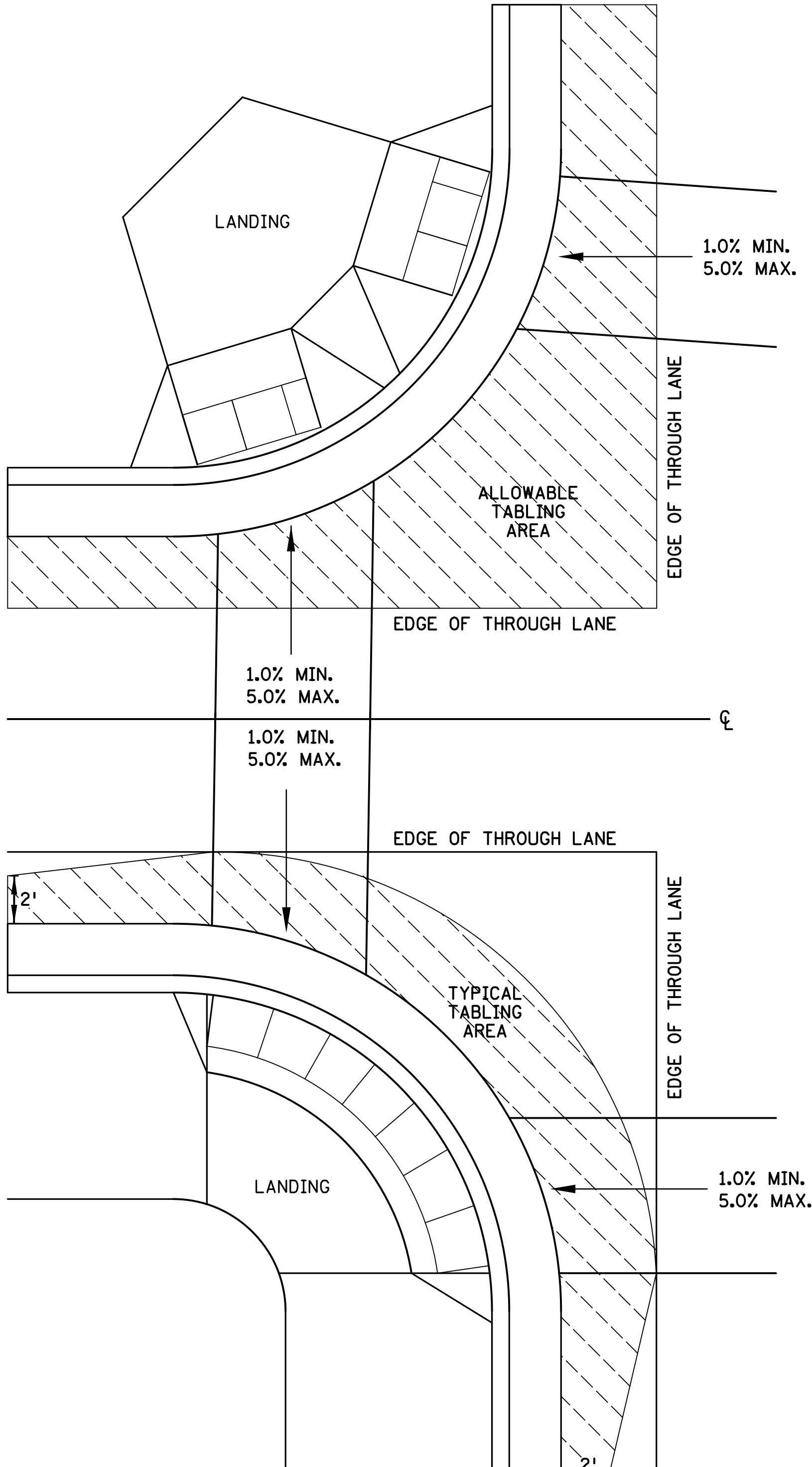
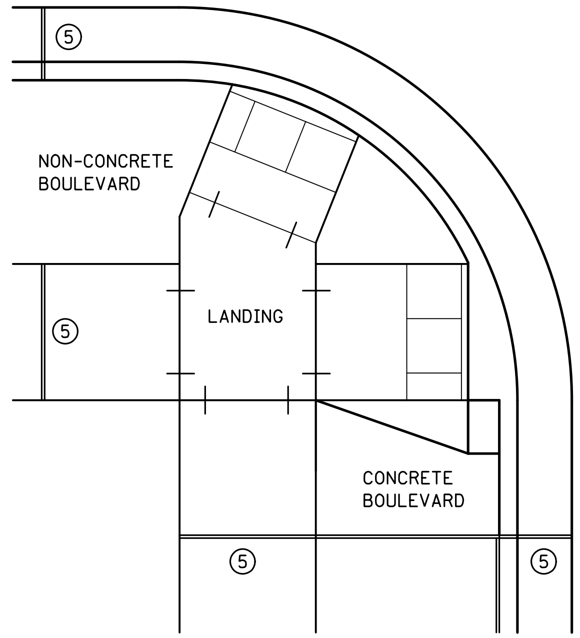
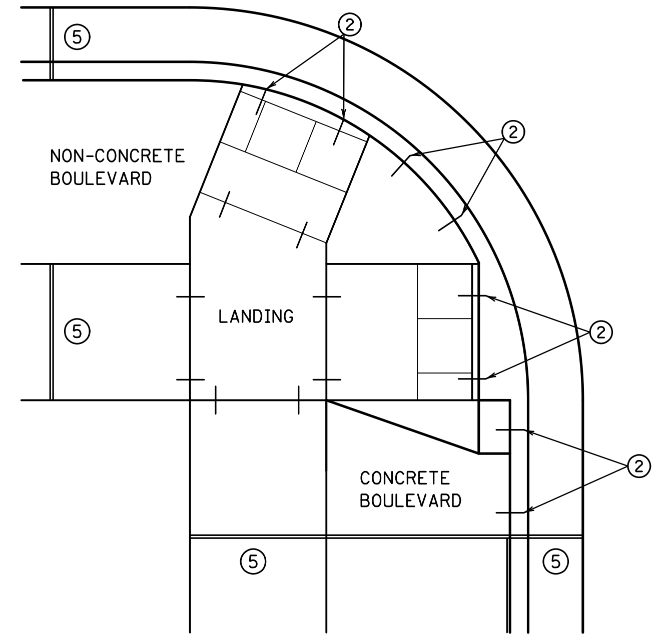


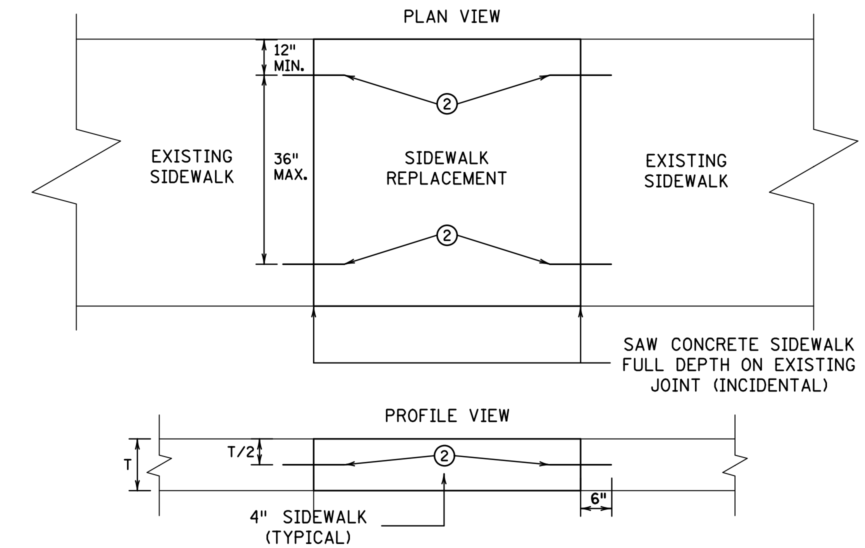
CURB LINE AND ROAD CROSSING ADJUSTMENTS



EXPANSION MATERIAL PLACEMENT FOR CONCRETE AND BITUMINOUS ROADWAYS

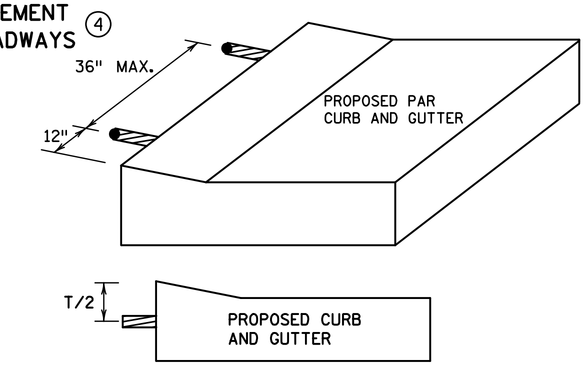


OPTIONAL CURB LINE REINFORCEMENT PLACEMENT ON BITUMINOUS ROADWAYS ④

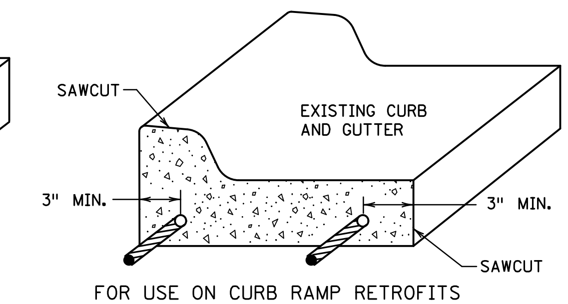


OPTIONAL SIDEWALK REINFORCEMENT

SIDEWALK REINFORCEMENT TO BE USED ONLY WHEN SPECIFIED IN THE PLAN.

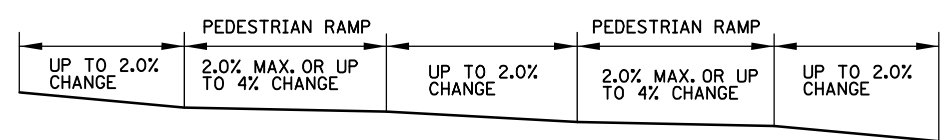


OPTIONAL CURB LINE REINFORCEMENT DETAILS ②④

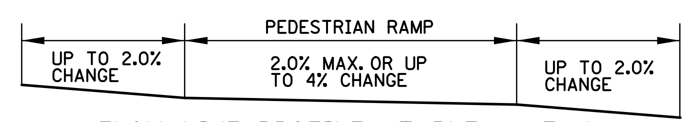


FOR USE ON CURB RAMP RETROFITS

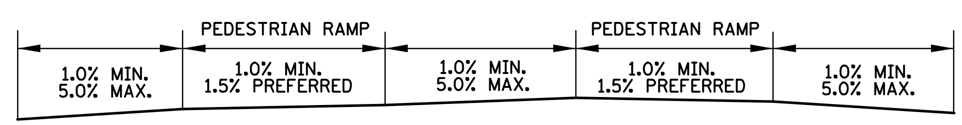
CURB AND GUTTER REINFORCEMENT ③



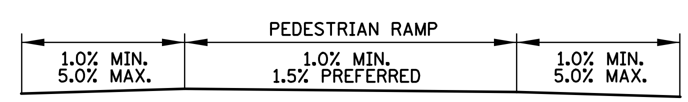
FLOW LINE PROFILE "TABLE" - TWIN PERPENDICULARS



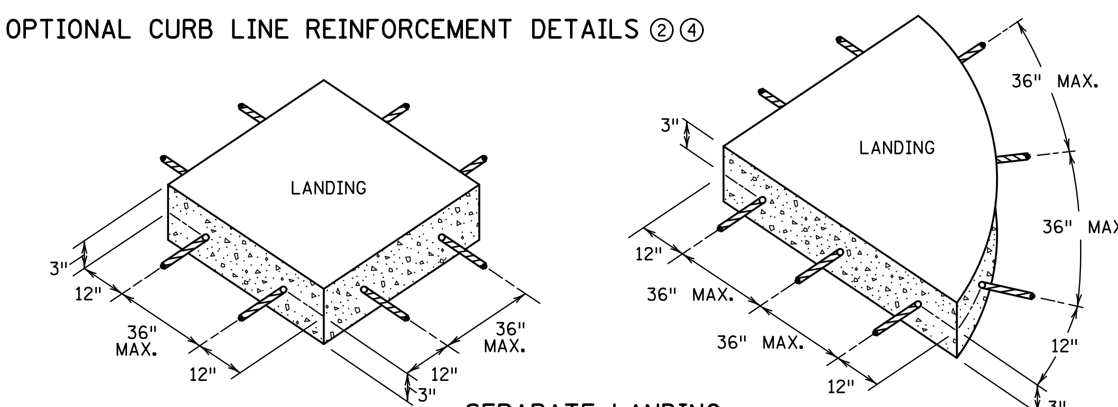
FLOW LINE PROFILE "TABLE" - FAN



FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS



FLOW LINE PROFILE RAISE - FAN



SEPARATE LANDING POUR REINFORCEMENT ①

"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 AT 36" MAXIMUM CENTER TO CENTER (EPOXY COATED). BARS TO BE ADJUSTED TO MATCH RAMP GRADE.

③ DRILL AND GROUT 2 - NO. 4 X 12" LONG REINFORCEMENT BARS (EPOXY COATED). REINFORCEMENT REQUIRED FOR ALL CONSTRUCTION JOINTS WITHIN RADIUS.

④ THIS OPTIONAL CURB LINE REINFORCEMENT DETAIL SHOULD ONLY BE USED ON BITUMINOUS ROADWAYS WHEN SPECIFIED IN THE PLAN.

⑤ 1/2 IN. PREFORMED JOINT FILLER MATERIAL PER MNDOT SPEC. 3702.

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REVISION:

APPROVED: JANUARY 23, 2017

OPERATIONS ENGINEER

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STATE DESIGN ENGINEER

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APPROVED:
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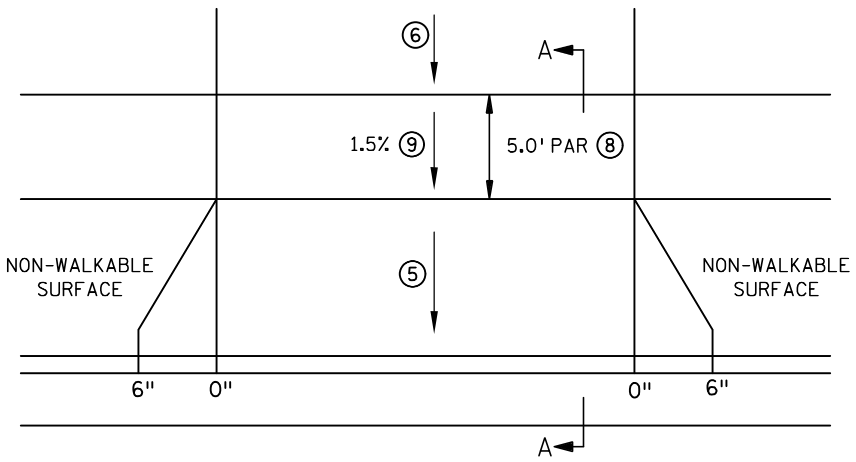
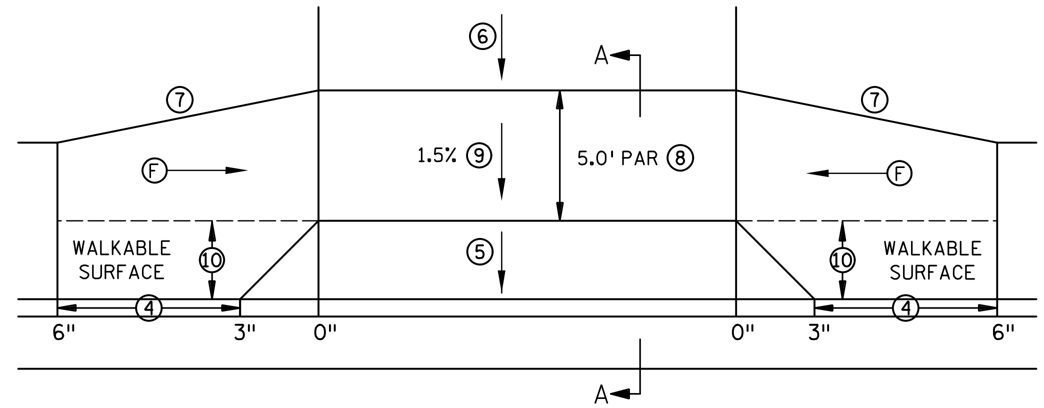
PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250 | 6 OF 6

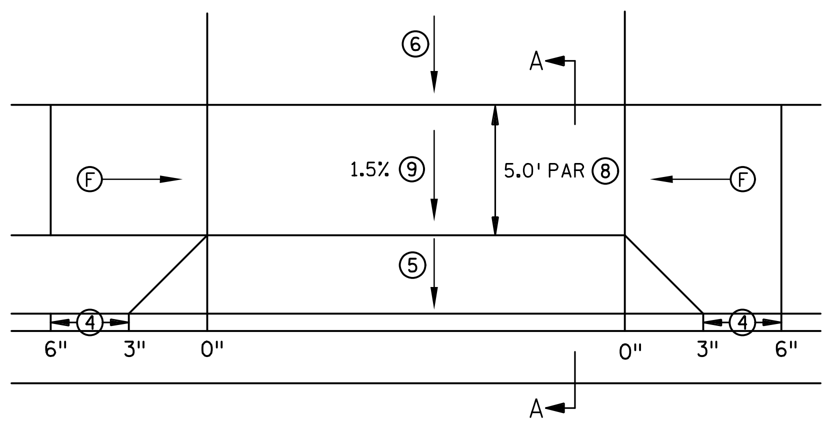
STATE PROJ. NO. 002-678-025, 114-020-053



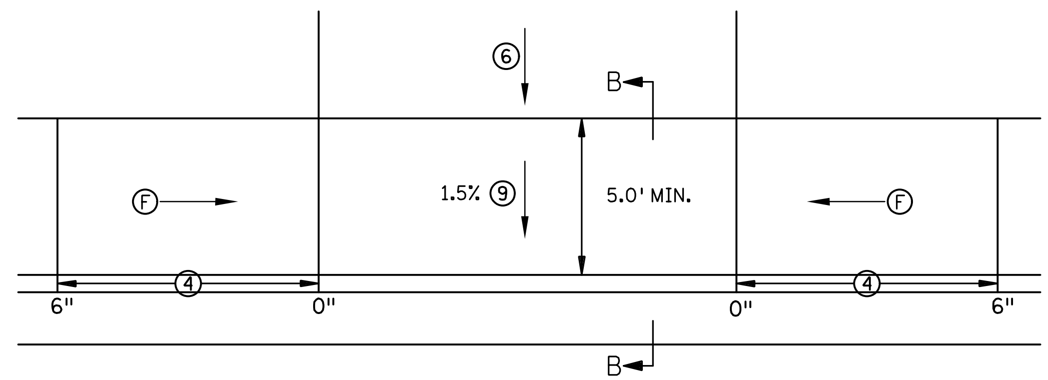
PERPENDICULAR DRIVEWAY ①



TIERED PERPENDICULAR OFFSET DRIVEWAY



TIERED PERPENDICULAR DRIVEWAY ②



PARALLEL DRIVEWAY ③

NOTES:

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

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

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

① TO BE USED WHEN THE DRIVEWAY PAR IS LEVEL WITH OR ABOVE THE TOP OF CURB, RESULTING IN A CONTINUOUS PAR PROFILE.

② TO BE USED WHEN THE DRIVEWAY PAR IS BELOW THE ROADWAY CURB HEIGHT. THIS DRIVEWAY TYPE CAN BE USED FOR BOTH PAVED (AS SHOWN) AND GRASS BOULEVARDS.

③ SHOULD BE USED FOR NEGATIVE SLOPED DRIVEWAYS. DW CURB TYPE 2 CURB SHOULD BE USED TO RAISE PAR ABOVE GUTTER AND REDUCE "ROLLER COASTER" EFFECT. 4" HIGH ROADWAY CURB SHOULD BE USED TO REDUCE "ROLLER COASTER" EFFECT ESPECIALLY WHEN MULTIPLE DRIVEWAYS ARE PRESENT.

④ TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

⑤ 8% MAX. PREFERRED, 10% MAX. FOR COMMERCIAL AND 12% MAX. FOR RESIDENTIAL. SEE GENERAL NOTES ON SHEET 2 FOR MORE INFORMATION.

⑥ 8% MAX. PREFERRED, SEE SHEET 2 FOR MORE INFORMATION.

⑦ 1:3 MIN. 1:5 PREFERRED FOR DRIVEWAY RETROFIT PROJECTS. 1:10 PREFERRED FOR SIDEWALK REPLACEMENT PROJECTS.

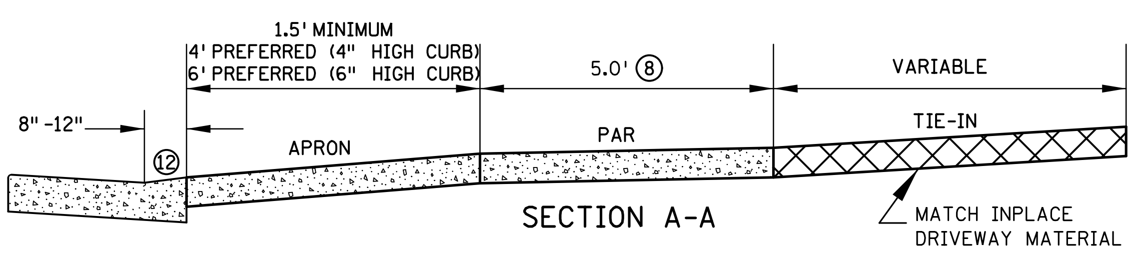
⑧ 5.0' MIN. PAR WIDTH IS THE STANDARD THROUGH DRIVEWAYS. IF FEASIBLE WIDEN DRIVEWAY PAR WIDTH TO MATCH APPROACHING SIDEWALK PAR WIDTHS. IN VERTICALLY CONSTRAINED AREAS PAR WIDTHS CAN INCREMENTALLY BE REDUCED TO 4.5' OR 4' MIN AFTER ALL OTHER OPTIONS HAVE BEEN APPLIED.

⑨ THE PEDESTRIAN ACCESS ROUTE, MAY NOT EXCEED 0.02 FT./FT. AS CONSTRUCTED.

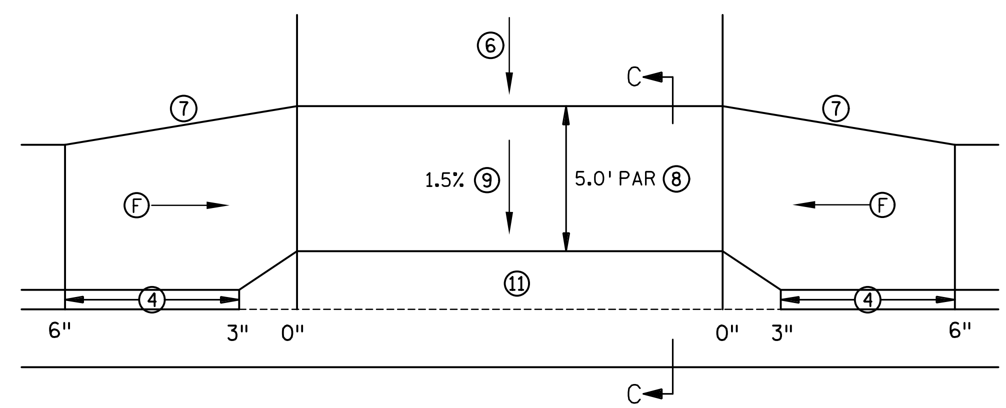
⑩ SIDEWALK OFFSET TO BE LESS THAN OR EQUAL TO HALF THE APPROACHING SIDEWALK WIDTH.

⑪ VALLEY GUTTER APRON TO BE POURED INTEGRAL WITH THE CURB AND GUTTER. SEE SHEET 2 FOR MORE INFORMATION.

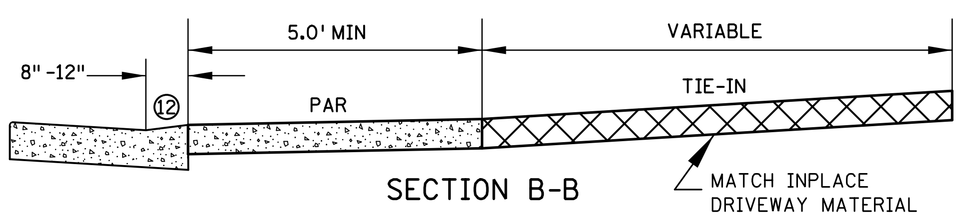
⑫ SEE SHEET 2 FOR CURB TYPE INFORMATION.



SECTION A-A



VALLEY GUTTER DRIVEWAY



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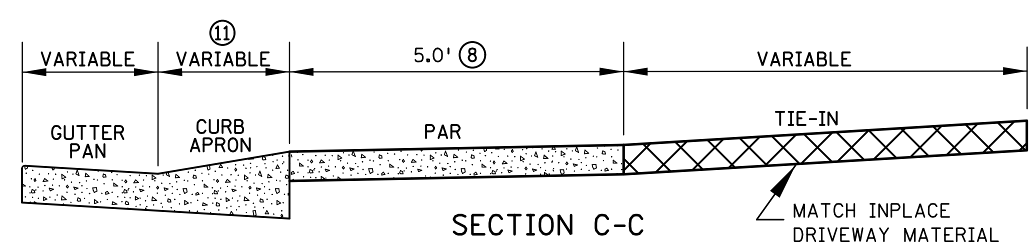

SECTION C-C

LEGEND	
Ⓕ ↓	INDICATES DRIVEWAY RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
X"	CURB HEIGHT (INCHES)

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REVISION:

APPROVED: JANUARY 23, 2017

OPERATIONS ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

REVISED:

APPROVED:

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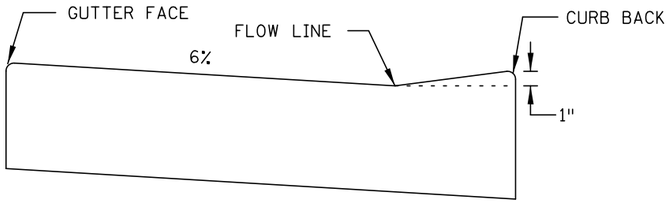
DRIVEWAY AND SIDEWALK DETAILS

STANDARD PLAN 5-297.254

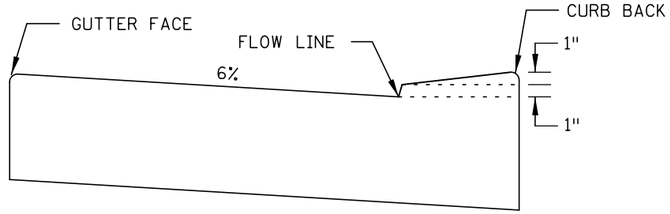
1 OF 4

STATE PROJ. NO. 002-678-025, 114-020-053



DW CURB STANDARD

STANDARD CURB AT DRIVEWAY



DW CURB TYPE 2

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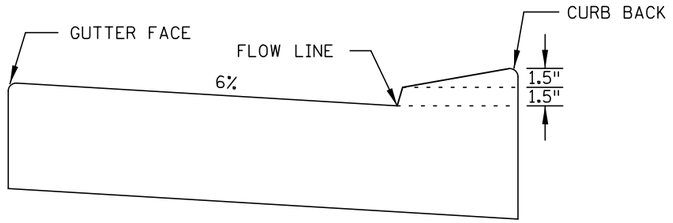

DW CURB TYPE 3

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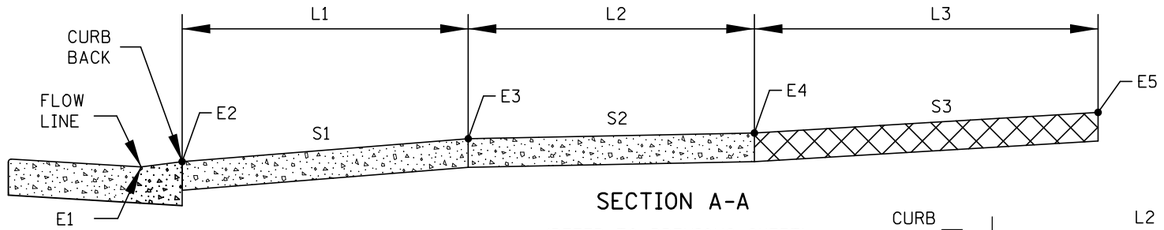
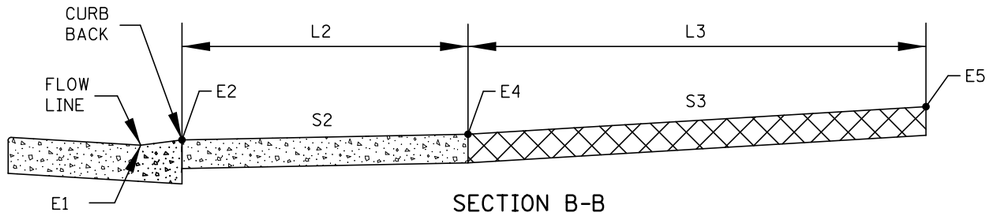


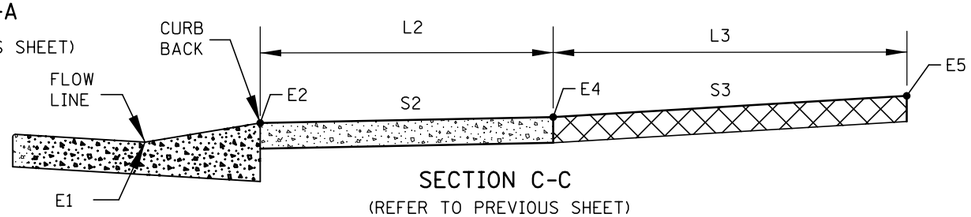
SECTION A-A

(REFER TO PREVIOUS SHEET)



SECTION B-B

(REFER TO PREVIOUS SHEET)

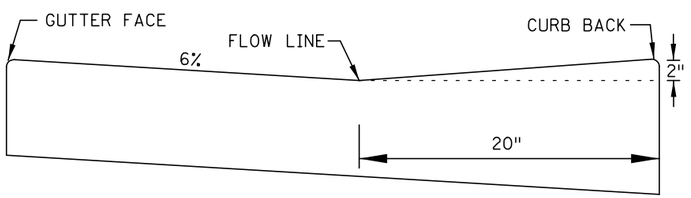


SECTION C-C

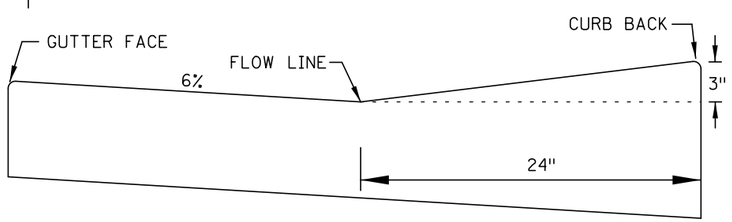
(REFER TO PREVIOUS SHEET)

DRIVEWAY TABULATION ①

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



VG 220



VG 324

VALLEY GUTTER CURB

OTHER CURB HEIGHTS & CURB APRON LENGTHS CAN BE USED

NOTES:

DW CURB STANDARD SHALL BE USED WHEN THE DRIVEWAY ACTS AS A PEDESTRIAN RAMP. THE MAX. APRON SLOPE MUST ADHERE TO ADA CRITERIA AS WELL. DW CURB STANDARD SHOULD BE USED IF THERE IS ON STREET PARKING.

WHERE ROADWAY DRAINAGE IS A CONCERN (NEGATIVE SLOPED APRON) DW CURB TYPE 2 CAN BE USED TO HELP KEEP THE WATER ON PUBLIC RIGHT OF WAY.

S1 8% MAX PREFERRED, 10% MAX. COMMERCIAL AND 12% MAX. RESIDENTIAL. IF EXISTING GRADES ARE STEEPER DO NOT MAKE GRADES APPRECIABLY WORSE BY USING BEST PRACTICES SUCH AS DRIVEWAY CURB HEIGHTS, EXTENDING L3 AND/ OR STEEPEN S3.

DW CURB TYPE 3 SHALL ONLY BE USED IN EXTREME TIE-IN CASES.

S3 8% MAX PREFERRED, IF THIS SLOPE IS EXCEEDED OR IS CONTINUED FOR MORE THAN 5' ANALYZE THE NEED FOR VERTICAL CURVE(S). SEE ROAD DESIGN MANUAL, CHAPTER 5, FOR GEOMETRIC DESIGNS OF DRIVEWAYS.

① EXAMPLE SHOWN TO BE INCLUDED IN PLAN FOR EACH DRIVEWAY.

② SHOULD BE DESIGNED AT 1.5%.

③ DW CURB STANDARD SHALL BE THE STARTING POINT FOR ALL PERPENDICULAR AND TIERED DRIVEWAYS. DW CURB TYPES 2 AND 3 SHALL ONLY BE USED AFTER UTILIZING BEST PRACTICES SUCH AS MAXIMIZING S1, S3, AND L3.

REVISION:

APPROVED: JANUARY 23, 2017

OPERATIONS ENGINEER

REVISED:

APPROVED: 1-23-2017

STATE DESIGN ENGINEER

DRIVEWAY AND SIDEWALK DETAILS

STANDARD PLAN 5-297.254 | 2 OF 4

STATE PROJ. NO. 002-678-025, 114-020-053 | SHEET NO. 44 OF 230 SHEETS

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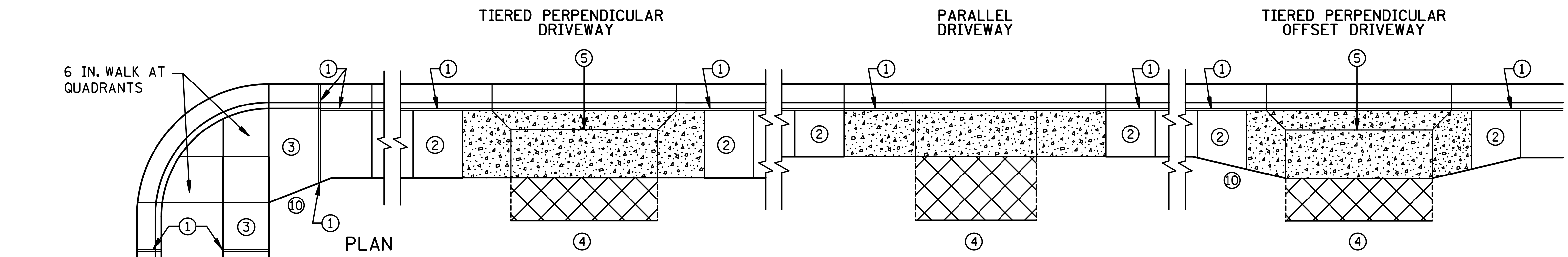
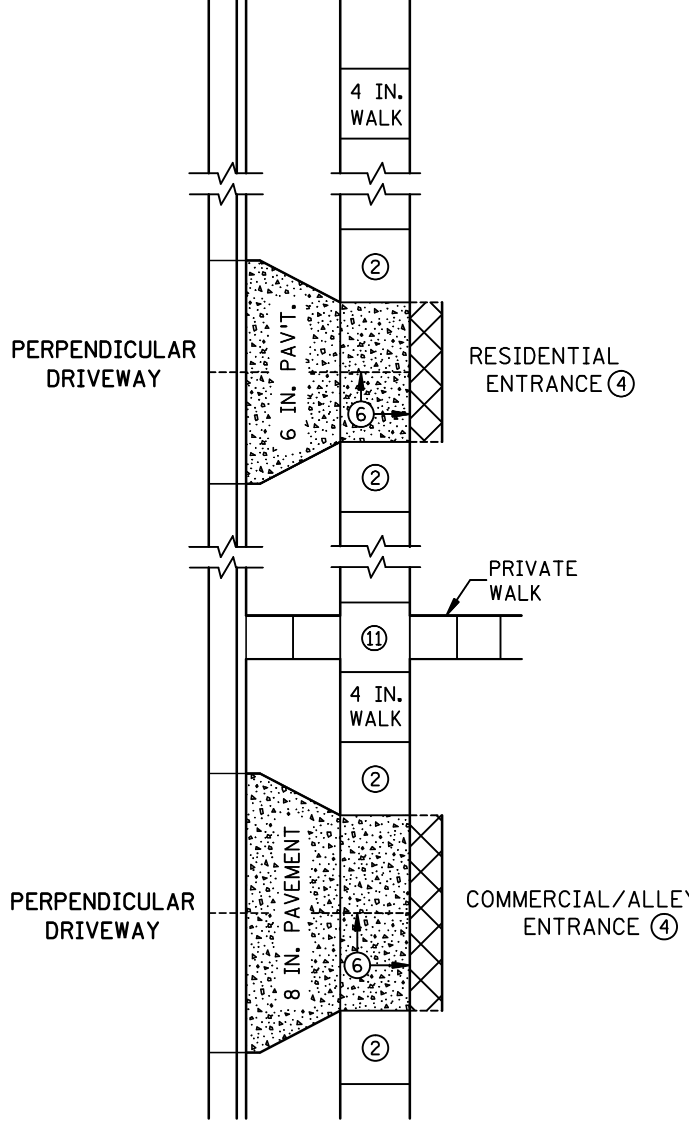
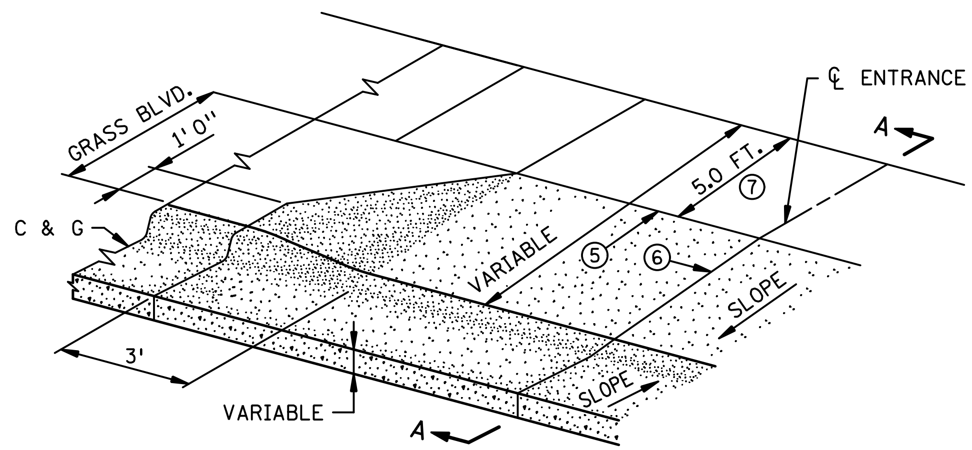
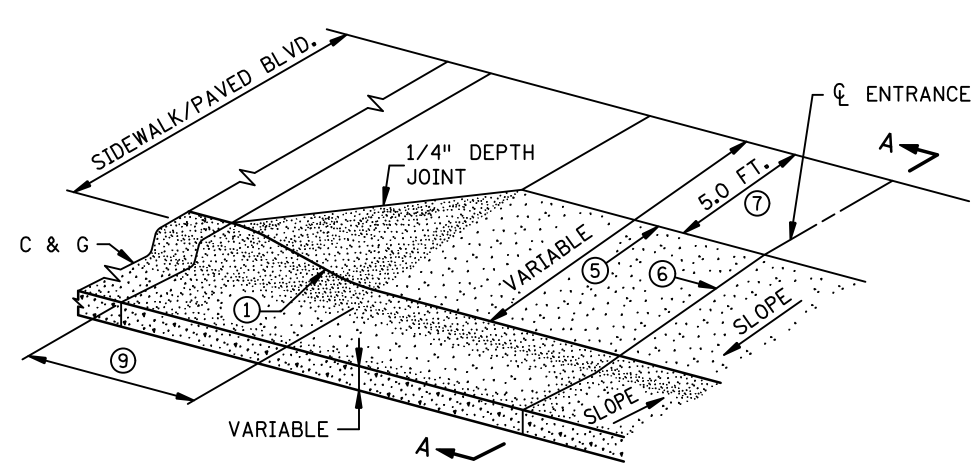






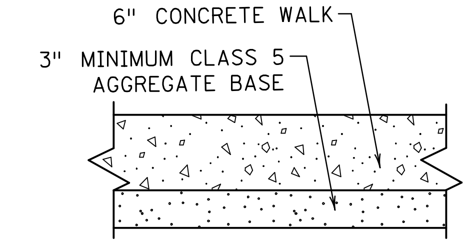
HALF PLAN PERSPECTIVE

PERPENDICULAR DRIVEWAYS WITH GRASS BOULEVARDS

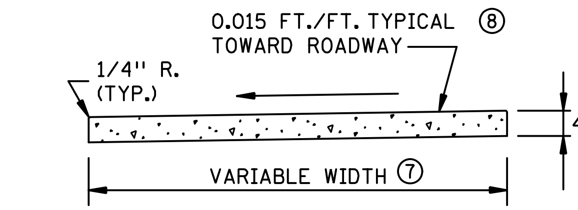


HALF PLAN PERSPECTIVE

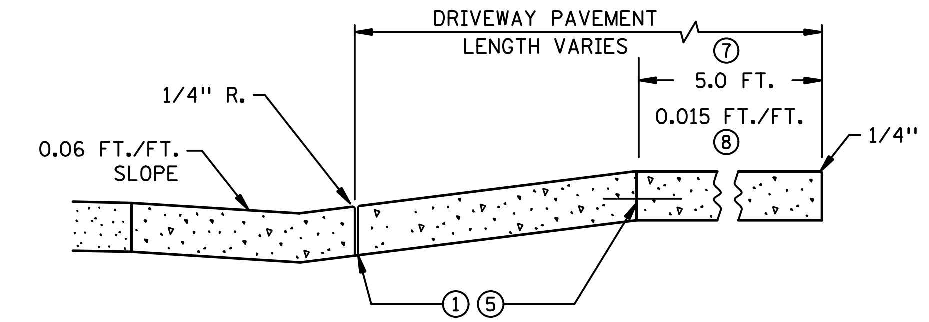
PERPENDICULAR DRIVEWAYS WITH CONCRETE BOULEVARDS AND ALL TIERED DRIVEWAYS



SECTION THRU CURB RAMP



SECTION THRU WALK



SECTION A-A

SECTION THRU DRIVEWAY

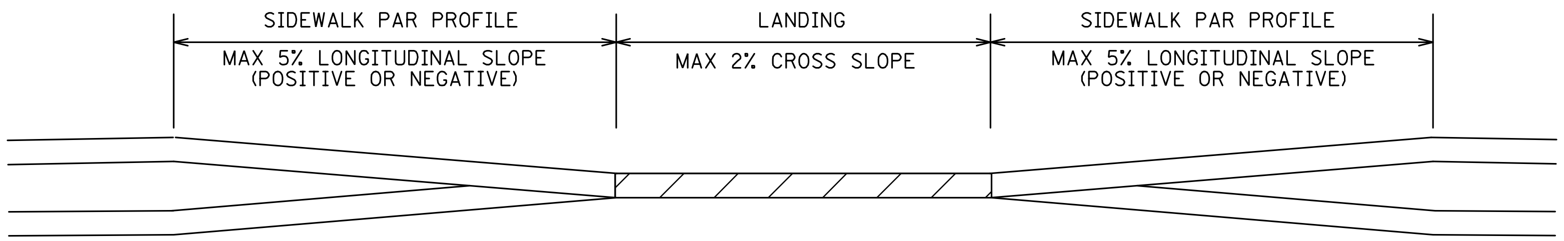
NOTES:

TO MINIMIZE SIDEWALK "ROLLER COASTER" EFFECT IT IS DESIRABLE TO KEEP THE PAR ELEVATION CONTINUOUS OR AT LEAST IN THE UPPER HALF OF CURB HEIGHT. 4" HIGH CURB SHOULD BE USED INSTEAD OF 6" HIGH CURB TO HELP THIS PROBLEM WHEN APPLICABLE.

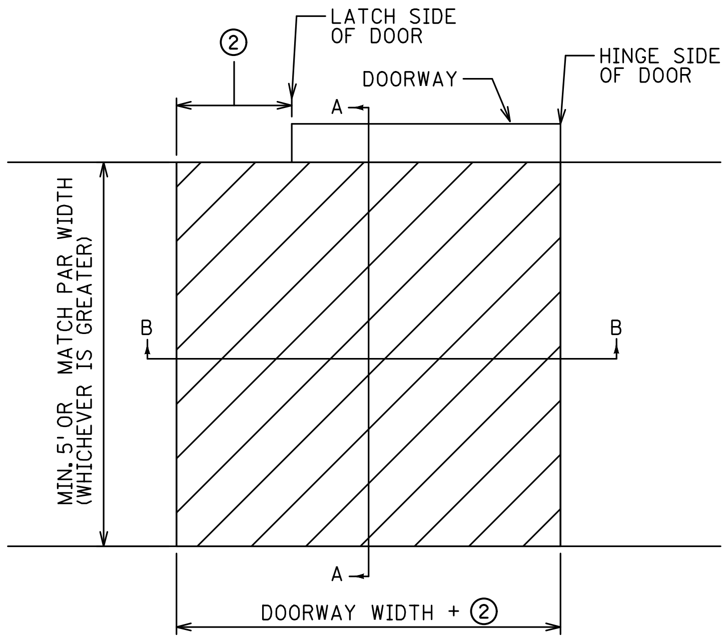
4" HIGH ADJACENT CURB IS PREFERRED WHEN BOULEVARDS 4' OR LESS ARE PRESENT MEASURED FROM THE BACK OF CURB. WHEN THE DRIVEWAY IS SLOPING DOWN FROM THE ROADWAY (NEGATIVE) 4" HIGH ADJACENT CURB SHOULD ALSO BE USED.

SEE ROAD DESIGN MANUAL, CHAPTER 5, FOR GEOMETRIC DESIGN OF DRIVEWAYS.

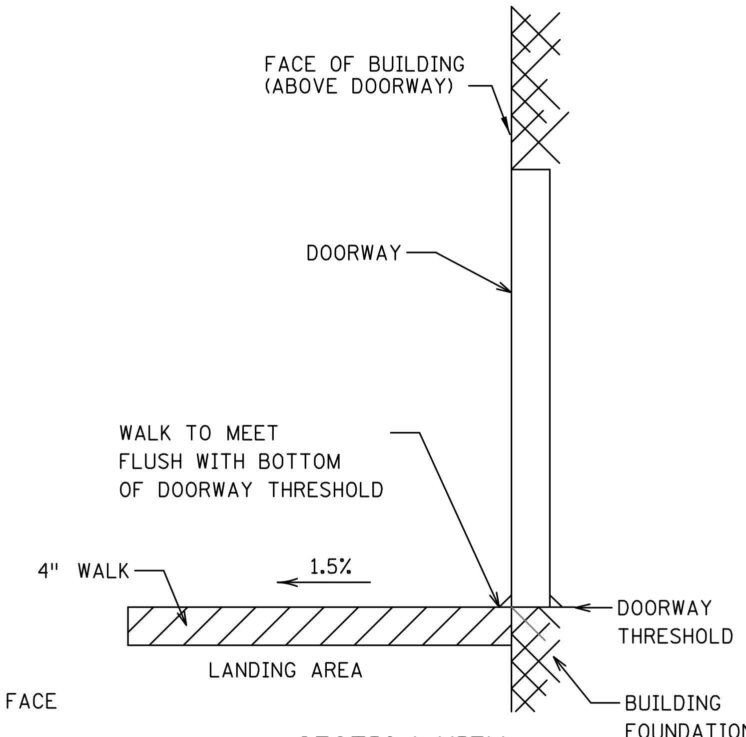
① 1/2 IN. PREFORMED JOINT FILLER MATERIAL PER MnDOT SPEC. 3702, EXCEPT AT GRASS BOULEVARDS.
② TRANSITION DRIVEWAY THICKNESS TO WALK THICKNESS.
③ TRANSITION CURB RAMP THICKNESS TO WALK THICKNESS.
④ MATCH INPLACE DRIVEWAY WIDTH, MATERIAL TYPE AND THICKNESS.
⑤ TIE ONLY IF ADJACENT SECTIONS ARE NOT POURED MONOLITHICALLY. SEE SECTION A-A.
⑥ FORM CONTRACTION JOINT AS NEEDED TO PRODUCE APPROXIMATELY SQUARE PANELS (MAXIMUM WIDTH 15 FT. BETWEEN JOINTS).
⑦ 5.0' MIN. PAR WIDTH IS THE STANDARD THROUGH DRIVEWAYS. IF FEASIBLE WIDEN DRIVEWAY PAR WIDTH TO MATCH APPROACHING SIDEWALK PAR WIDTHS. IN VERTICALLY CONSTRAINED AREAS PAR WIDTHS CAN INCREMENTALLY BE REDUCED TO 4.5' OR 4' MIN AFTER ALL OTHER OPTIONS HAVE BEEN APPLIED.
⑧ THE PEDESTRIAN ACCESS ROUTE CROSS-SLOPE, SHALL NOT EXCEED 0.02 FT./FT. AS CONSTRUCTED.
⑨ 8% TO 10% FLARES SHALL BE USED WHEN ADJACENT TO WALKABLE SURFACES AND FOR ALL TIERED DRIVEWAYS WITH GRASS BOULEVARDS.
⑩ 1:10 MIN. SIDEWALK OFFSET TAPER REQUIRED FOR SIDEWALK REPLACEMENT PROJECTS. 1:3 MIN. AND 1:5 MIN. PREFERRED SIDEWALK OFFSET TAPER FOR DRIVEWAY REPLACEMENT.
⑪ LANDING REQUIRED, SEE NEXT SHEET FOR MORE INFORMATION.



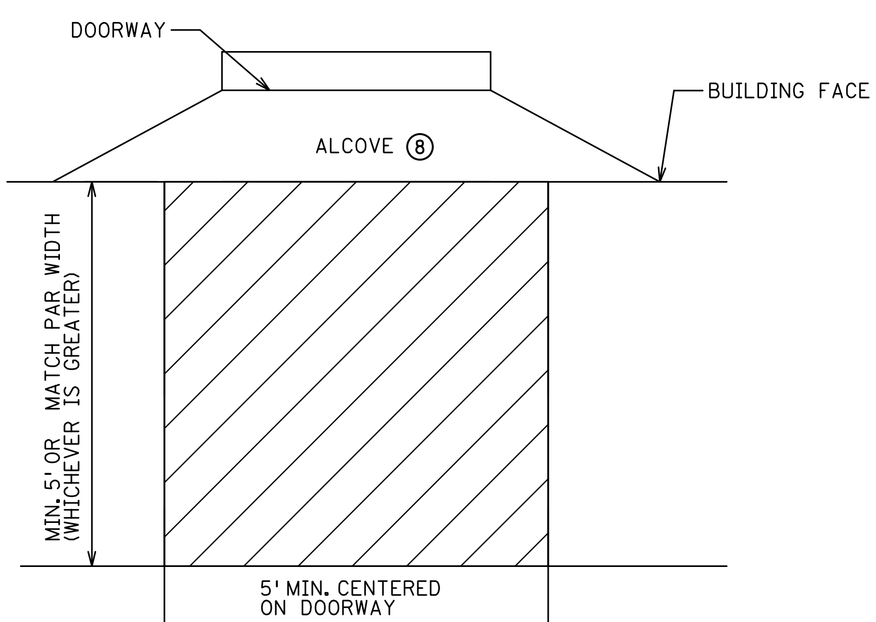
SECTION VIEW B-B



PLAN VIEW DOORWAY

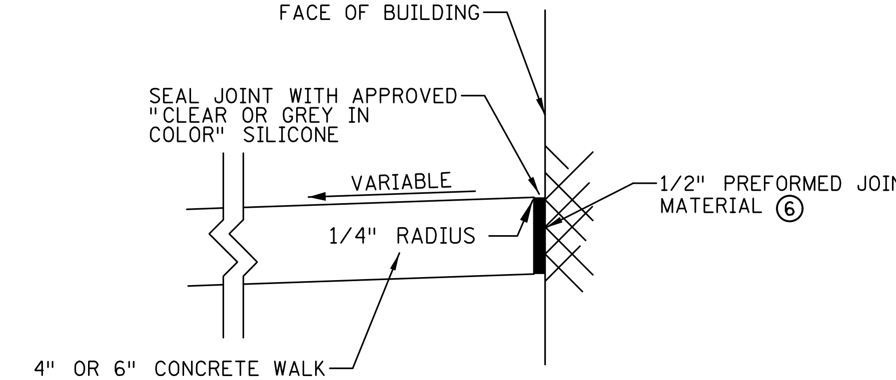


SECTION VIEW A-A

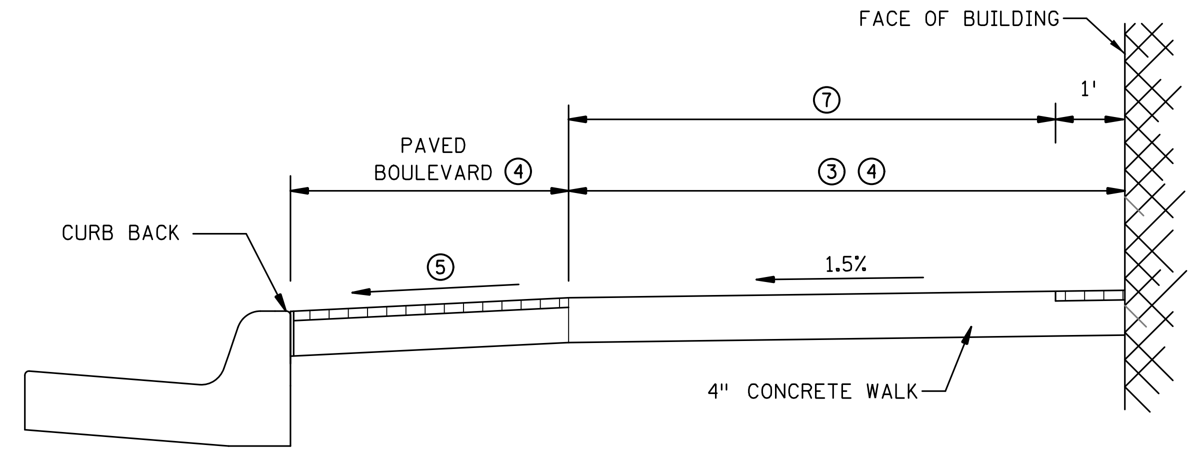


PLAN VIEW DOORWAY WITH ALCOVE

SIDEWALK LANDING REQUIREMENTS ①



BUILDING JOINT SEAL (INCIDENTAL)



DOWNTOWN SIDEWALK TYPICAL SECTION

NOTES:

FIELD ADJUST SIDEWALK PROFILES TO MEET ALL DOORWAY THRESHOLDS.

SIDEWALK MUST MAINTAIN POSITIVE DRAINAGE AWAY FROM THE BUILDING TO THE ROADWAY.

SEE SPECIAL PROVISIONS FOR SILICONE SPECIFICATIONS.

① LANDING CRITERIA IS REQUIRED FOR ALL DOORS, PRIVATE WALKS AND STEPS.

② 18" MIN. WHEN DOOR SWINGS OUTWARD FROM BUILDING.
12" MIN WHEN DOOR SWINGS INWARD FROM BUILDING.

③ 6' MIN. PAR REQUIRED WHEN ADJACENT TO BUILDINGS.

④ 2/3 PAR TO 1/3 BOULEVARD SHOULD BE USED WHEN FEASIBLE.

⑤ 1%-5% FOR THE MAJORITY OF THE BLOCK, WITH EXCEPTIONS UP TO 8% IN CONSTRAINED AREAS. 10% MAX. FOR SHORT SECTIONS ALLOWED TO ACCOUNT FOR FIELD TOLERANCES.

⑥ FURNISH AND INSTALL BACKER ROD OF APPROPRIATE DIAMETER.

⑦ TO MINIMIZE VIBRATION AND ROLLING RESISTANCE, AREA SHOULD BE FREE OF PAVERS, STAMPED CONCRETE, AND/OR EXCESSIVE JOINTING.

⑧ 2% MAX. PER BUILDING CODE. IF GREATER THAN 2%, FLATTEN AS FEASIBLE.

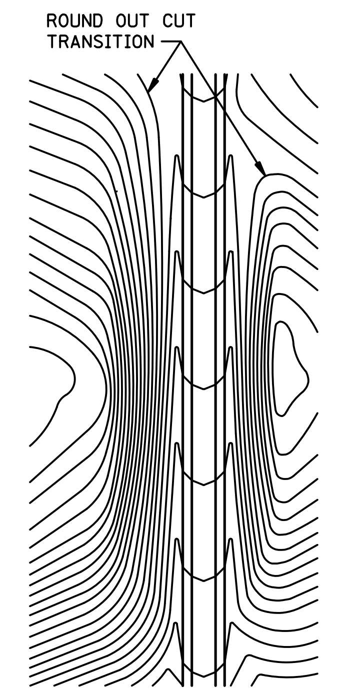
LEGEND	
(hatched)	LANDING - ALL SLOPES TO BE LESS THAN 2%
(vertical lines)	OPTIONAL AESTHETIC TREATMENT

REVISION:
APPROVED: JANUARY 23, 2017
OPERATIONS ENGINEER

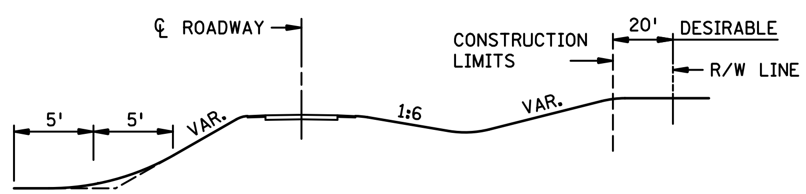
MINNESOTA DEPARTMENT OF TRANSPORTATION
STATE DESIGN ENGINEER
REVISED:
APPROVED: 1-23-2017

DRIVEWAY AND SIDEWALK DETAILS

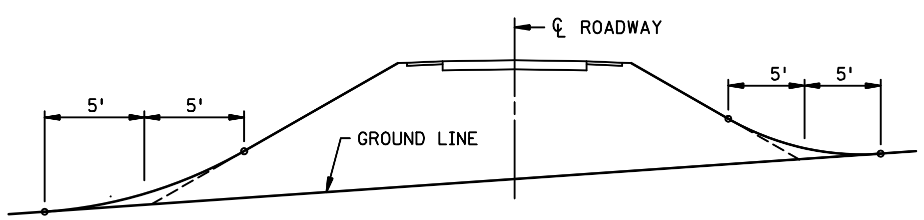
STANDARD PLAN 5-297.254 | 4 OF 4



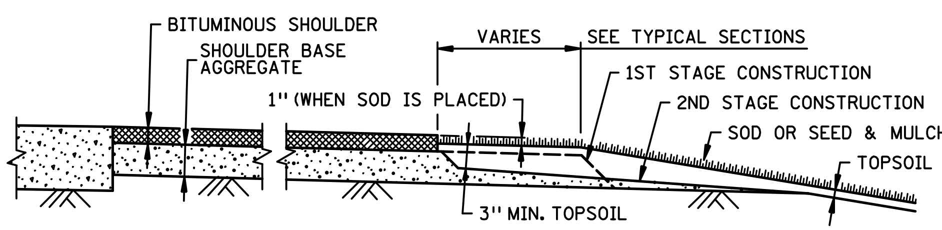
CONTOURING ROAD CUTS



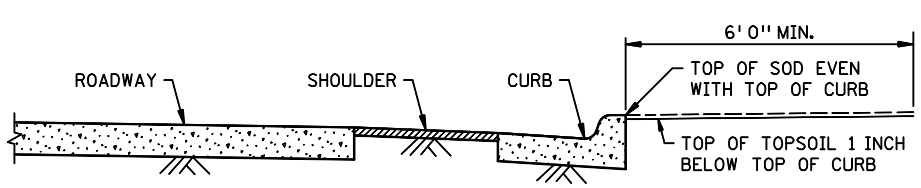
ROUNDING SHOULDERS AND BACKSLOPES



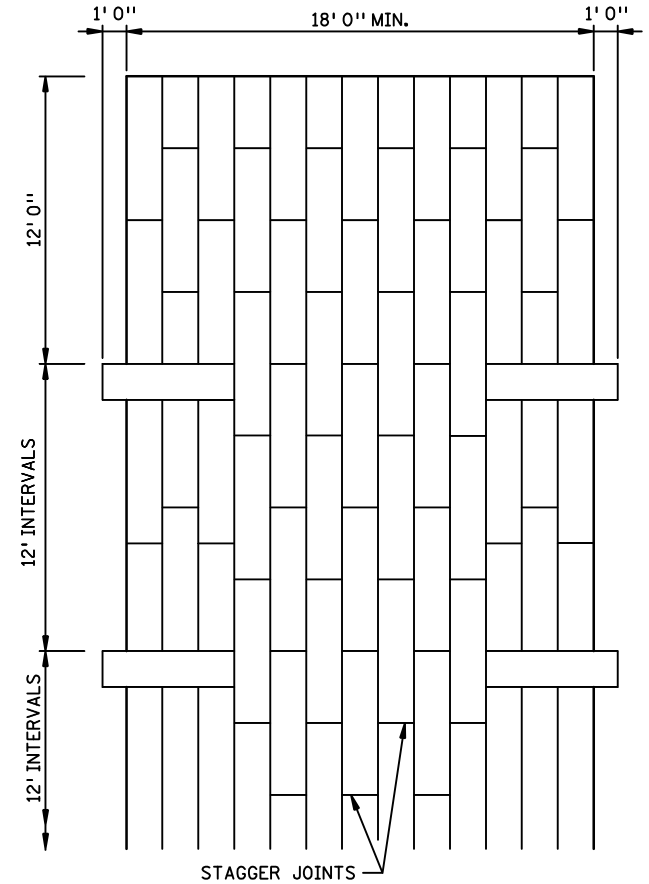
SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES



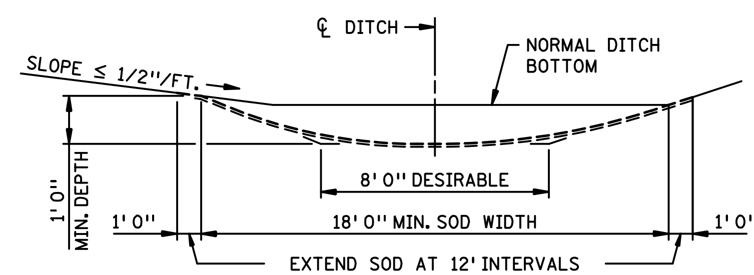
SHAPING AND TOPSOILING INSLOPES



SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED

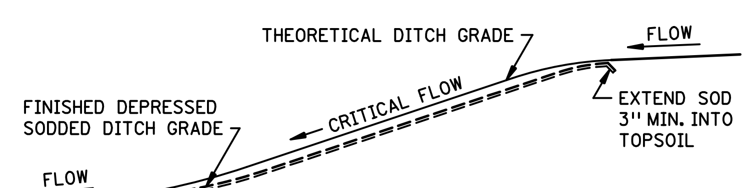


PLAN VIEW



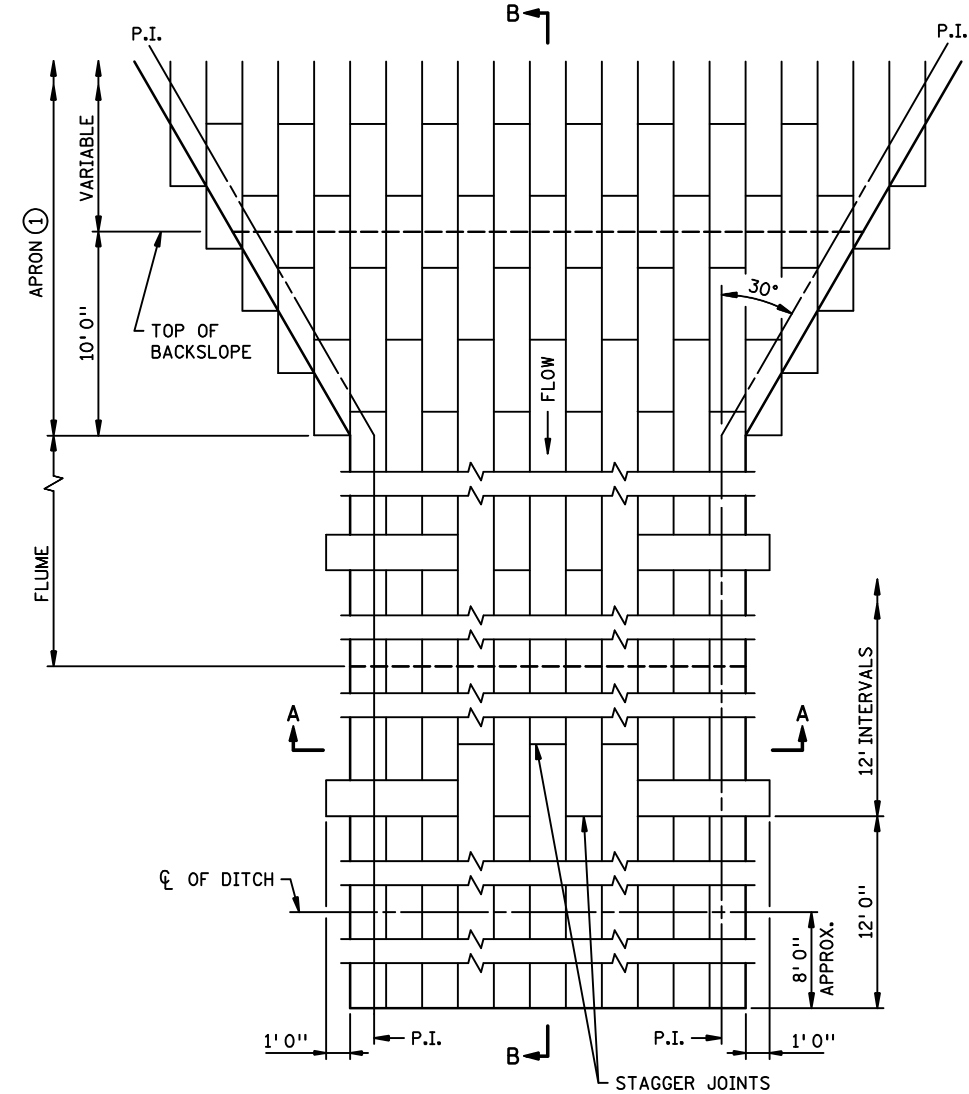
SODDED DITCH CROSS SECTION

WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.), FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.

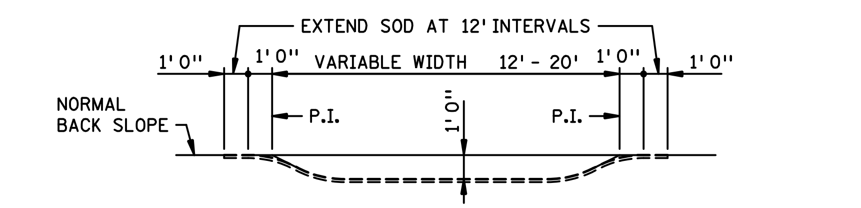


DITCH PROFILE

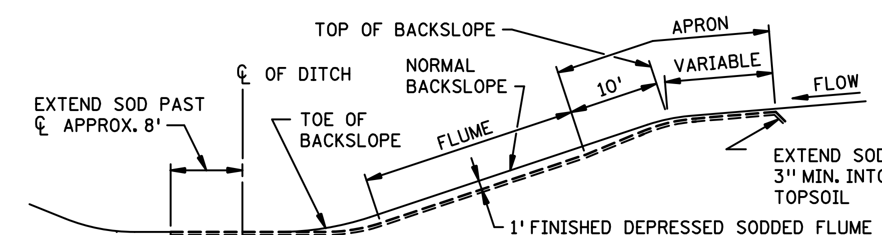
SODDED DITCH DETAILS



PLAN VIEW



SECTION A-A



SECTION B-B

SODDED FLUME DETAILS

NOTES:

SEE SPEC. 2575.3 FOR ADDITIONAL INFORMATION.

① CONSTRUCT TAPER AS DIRECTED BY THE ENGINEER.

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REVISION:

APPROVED: 2-28-2017

CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

REVISED:

APPROVED:

2-28-2017

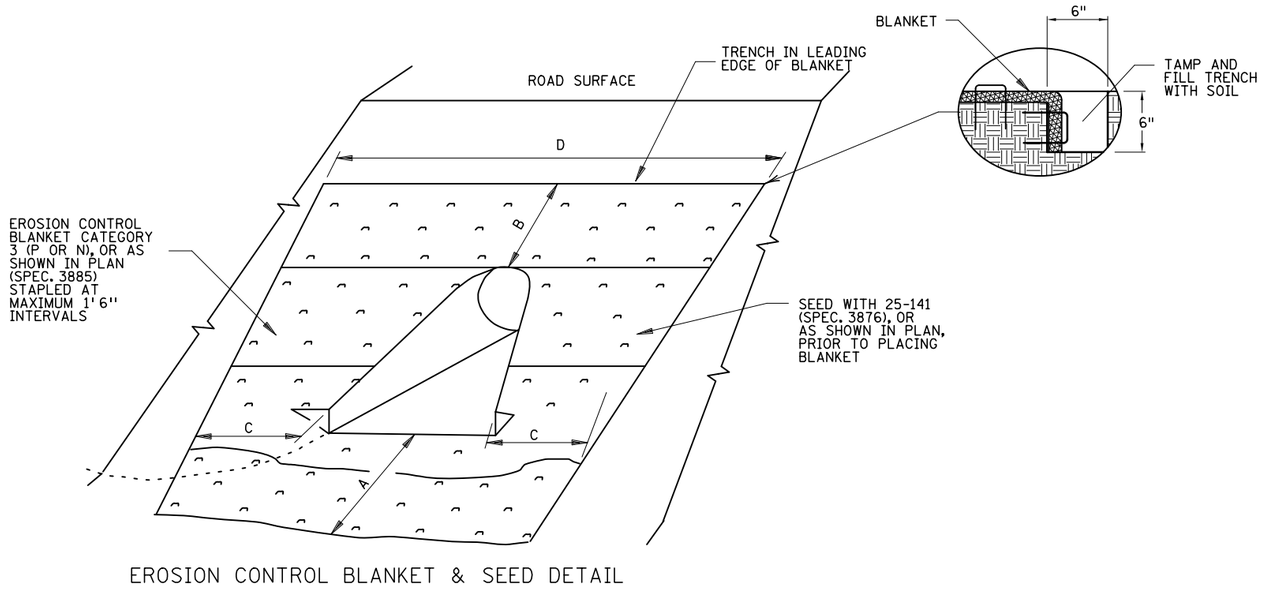
PERMANENT EROSION CONTROL

ALONG ROADWAYS, DITCHES AND FLUMES

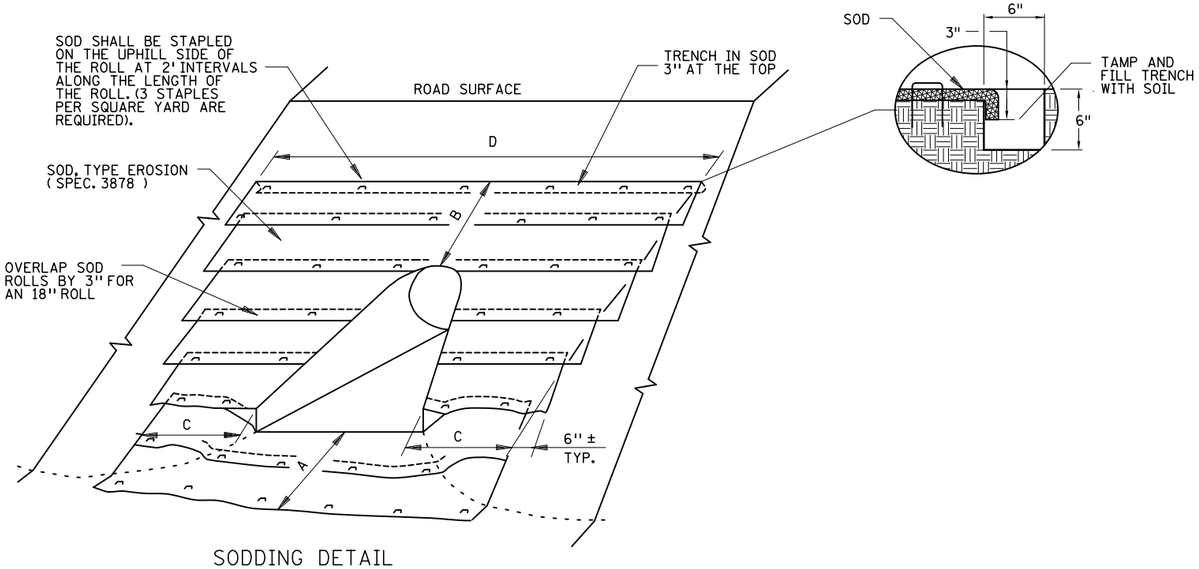
STANDARD PLAN 5-297.404

1 OF 3

STATE PROJ. NO. 002-678-025, 114-020-053



EROSION CONTROL BLANKET & SEED DETAIL



SODDING DETAIL

CULVERT INLET APRON ①

CULVERT DIAMETER ②	SOD OR EROSION CONTROL BLANKET (SQ. YDS.)						"A"	"B"	"C"	"D"
	CIRCULAR AND ARCH PIPE METAL APRON (PLATE 3123, PLATE 3122)	CIRCULAR AND ARCH PIPE CONCRETE APRON (PLATE 3100, PLATE 3110)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:4 SLOPE (PLATE 3148)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:6 SLOPE (PLATE 3148)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:6 SLOPE (PLATE 3128)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:4 SLOPE (PLATE 3128)				
15"	9	9	8	8	N/A	N/A	3'	1.5'	3'	13'
18"	13	12	12	14	16	N/A	3'	3'	3'	16'
21"	14	14	14	16	18	14	3'	3'	3'	17'
24"	16	15	16	19	21	17	3'	3'	3'	18'
27"	N/A	20	N/A	N/A	N/A	N/A	3'	4.5'	3'	20'
30"	23	22	25	30	32	N/A	3'	4.5'	3'	22'
36"	34	34	39	48	51	37	4.5'	4.5'	4.5'	27'
42"	43	40	51	64	N/A	N/A	4.5'	6'	4.5'	30'
48"	54	50	66	82	N/A	N/A	4.5'	7.5'	4.5'	34'
54"	65	58	81	102	N/A	N/A	4.5'	9'	4.5'	37'
60"	69	59	91	115	N/A	N/A	4.5'	9'	4.5'	39'
66"	69	63	N/A	N/A	N/A	N/A	4.5'	9'	4.5'	39'
72"	78	72	99	122	N/A	N/A	4.5'	10.5'	4.5'	41'

CULVERT OUTLET APRON ①

CULVERT DIAMETER ②	SOD OR EROSION CONTROL BLANKET (SQ. YDS.)						"A"	"B"	"C"	"D"
	CIRCULAR AND ARCH PIPE METAL APRON (PLATE 3123, PLATE 3122)	CIRCULAR AND ARCH PIPE CONCRETE APRON (PLATE 3100, PLATE 3110)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:4 SLOPE (PLATE 3148)	CIRCULAR AND ARCH PIPE METAL SAFETY APRON 1:6 SLOPE (PLATE 3148)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:6 SLOPE (PLATE 3128)	CIRCULAR CORRUGATED METAL PIPE SAFETY APRON 1:4 SLOPE (PLATE 3128)				
15"	10	10	9	10	N/A	N/A	4.5'	1.5'	3'	13'
18"	13	13	12	14	15	N/A	6'	1.5'	3'	14'
21"	16	14	16	18	19	15	6'	1.5'	3'	15'
24"	18	18	18	21	22	18	7.5'	1.5'	3'	16'
27"	N/A	19	N/A	N/A	N/A	N/A	7.5'	1.5'	3'	17'
30"	23	23	24	28	29	N/A	9'	1.5'	3'	18'
36"	36	35	38	47	48	37	10.5'	1.5'	4.5'	23'
42"	43	40	47	58	N/A	N/A	12'	1.5'	4.5'	25'
48"	50	46	57	70	N/A	N/A	13.5'	1.5'	4.5'	27'
54"	57	50	67	84	N/A	N/A	15'	1.5'	4.5'	29'
60"	74	63	90	113	N/A	N/A	16.5'	1.5'	6'	33'
66"	75	67	N/A	N/A	N/A	N/A	16.5'	1.5'	6'	33'
72"	77	70	92	114	N/A	N/A	16.5'	1.5'	6'	34'

NOTES:

AREA SHOWN IN SQUARE YARDS IS FOR ONE CULVERT END.

QUANTITIES ARE CALCULATED TO INCLUDE SOD REQUIRED TO PROVIDE A 3" OVERLAP ON ALL 18" WIDE ROLLS. THIS ALLOWS FOR SHRINKAGE OF THE SOD.

FOR PIPE ARCHES USE EQUIVALENT PIPE DIAMETER TO APPROXIMATE AREA.

FOR CORRUGATED POLYETHYLENE PIPE METAL APRON (PLATE 3129), USE THE METAL APRON COLUMN (PLATE 3123).

AREAS AND DIMENSIONS ARE APPROXIMATE AND ARE BASED ON APRON SIDE SLOPES OF NO STEEPER THAN 1:2, UNLESS INDICATED AS FOR SAFETY APRONS.

CARE SHOULD BE TAKEN IN SELECTING SOD TO STABILIZE THE APRON. RIP-RAP SHOULD BE USED FOR FLOW VELOCITIES GREATER THAN 6 FPS.

① ADDITIONAL QUANTITIES MAY BE SHOWN IN THE PLAN OR REQUIRED BY THE ENGINEER.

② FOR ARCH PIPE USE CLOSEST CIRCULAR PIPE DIAMETER AND APRON SLOPE. (DIAMETERS LARGER THAN 72" REQUIRE SPECIAL DESIGNS.)

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REVISION:

APPROVED: 2-28-2017

CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

REVISED:

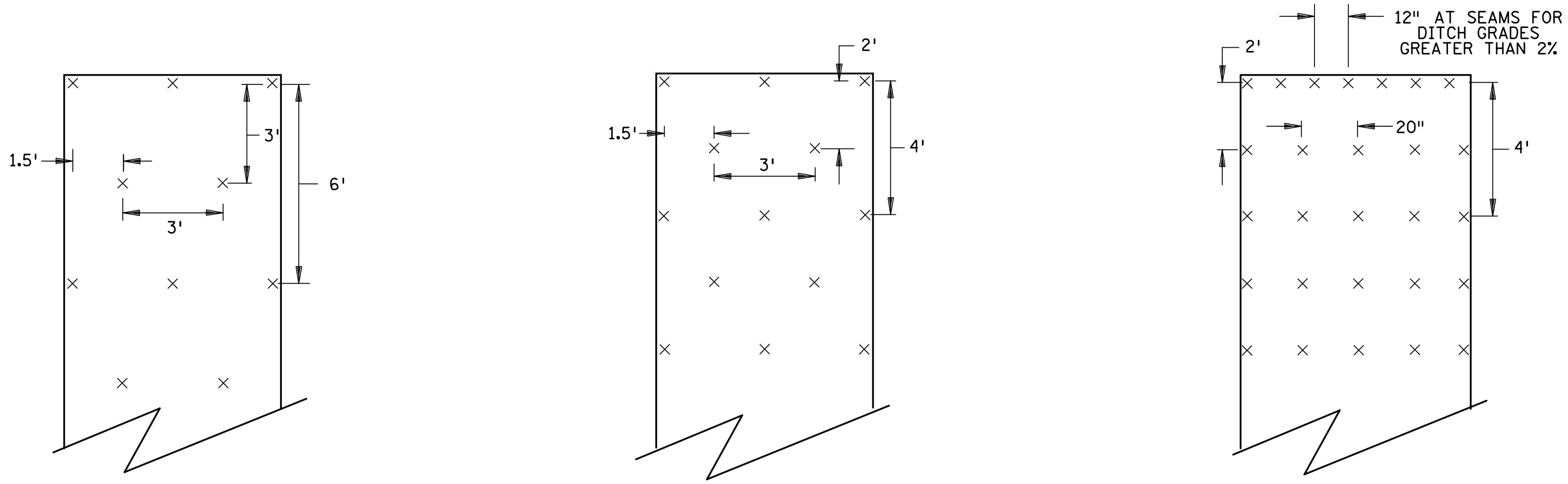
APPROVED: 2-28-2017

PERMANENT EROSION CONTROL

TURF ESTABLISHMENT DETAIL AT CULVERT ENDS

STANDARD PLAN 5-297.404 | 2 OF 3

STATE PROJ. NO. 002-678-025, 114-020-053 | SHEET NO. 48 OF 230 SHEETS

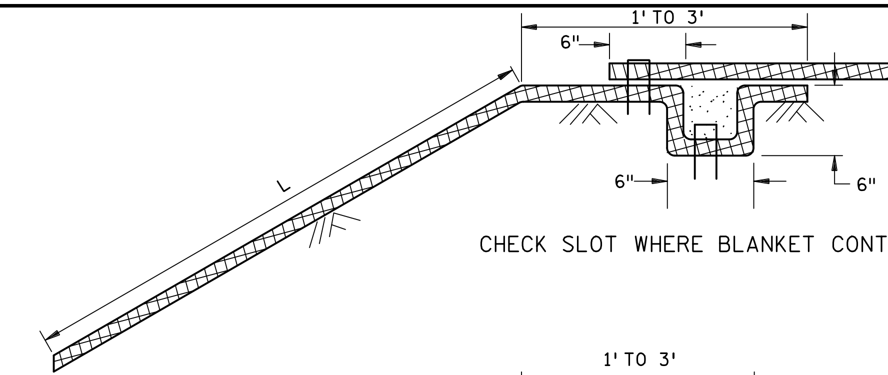


SLOPES FLATTER THAN 1:2
(120 STAPLES PER 100 SQ YD)

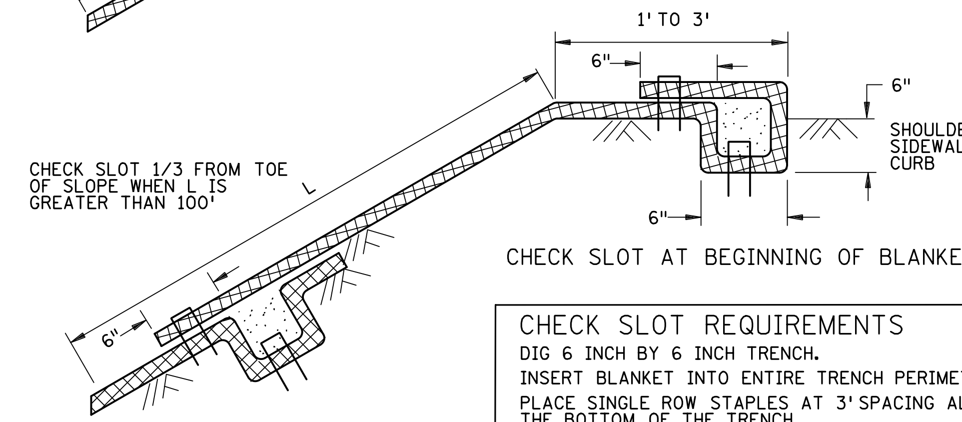
SLOPES 1:2 TO 1:1
(170 STAPLES PER 100 SQ YD)

CHANNEL AND DITCH APPLICATIONS
(350 STAPLES PER 100 SQ YD)

BLANKET STAPLE PATTERN



CHECK SLOT WHERE BLANKET CONTINUES



CHECK SLOT AT BEGINNING OF BLANKET

CHECK SLOT REQUIREMENTS

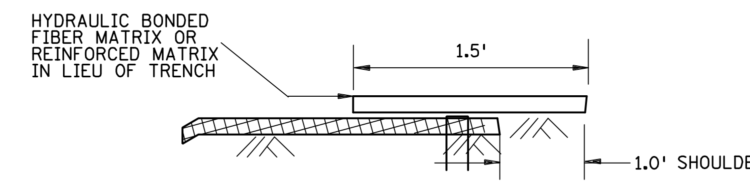
DIG 6 INCH BY 6 INCH TRENCH.

INSERT BLANKET INTO ENTIRE TRENCH PERIMETER.

PLACE SINGLE ROW STAPLES AT 3' SPACING ALONG THE BOTTOM OF THE TRENCH.

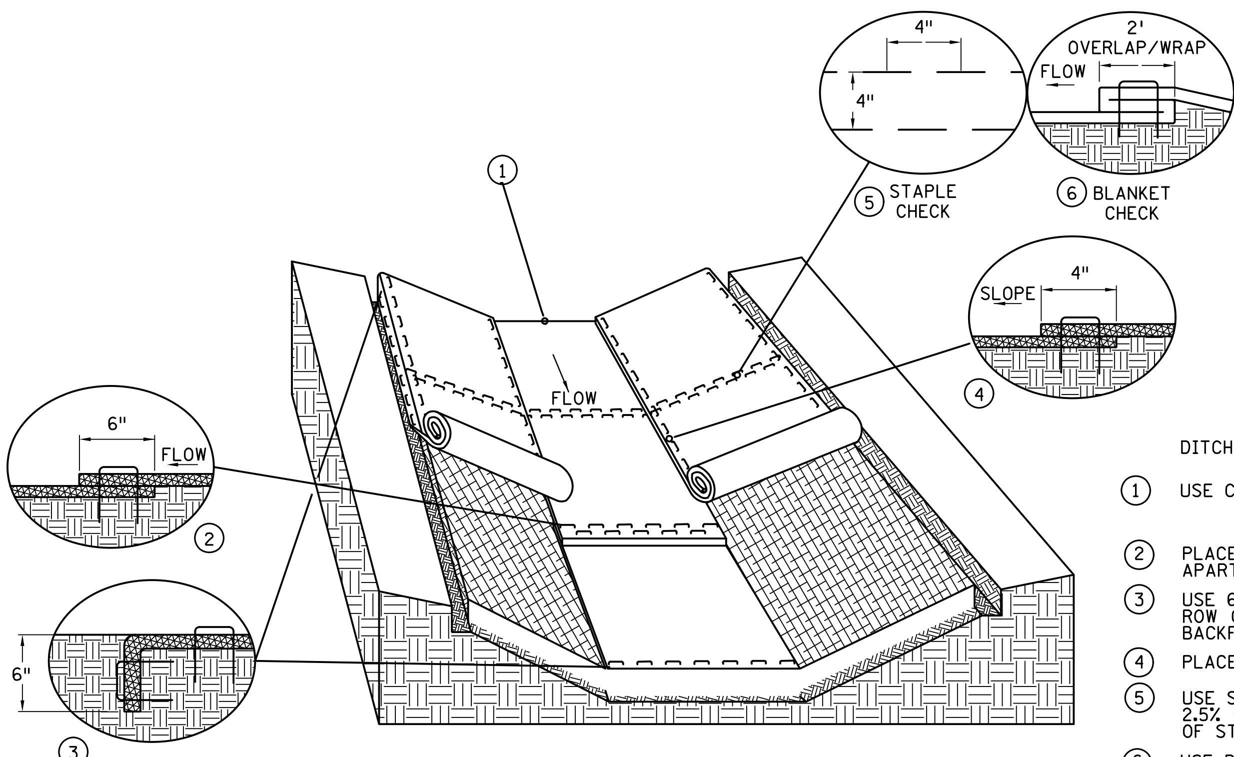
BACKFILL TRENCH WITH SOIL AND TAMP.

PLACE SINGLE ROW STAPLES AT 3' SPACING ON OVERLAP.

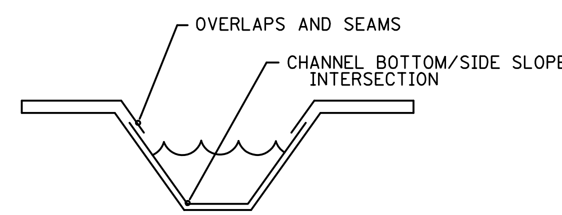


CHECK SLOT ALTERNATIVE
PLACE SINGLE ROW STAPLES AT 12" SPACING

CHECK SLOT DETAILS



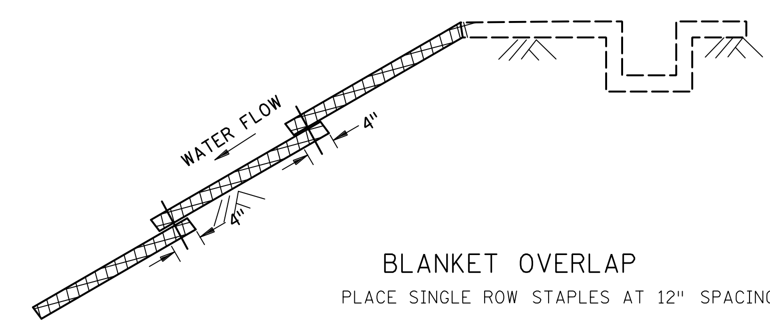
DITCH BLANKET STAPLE DETAIL



DITCH BLANKET CRITICAL POINTS (7)

DITCH BLANKET STAPLE DETAIL NOTES

1. USE CHECK SLOT DETAIL (NO ALTERNATES).
2. PLACE DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER.
3. USE 6" X 6" TRENCH TO PLACE BLANKET. PLACE SINGLE ROW OF STAPLES ON TOP AND TRENCH SIDES AT 12" SPACING. BACKFILL TRENCH WITH SOIL AND TAMP.
4. PLACE SINGLE ROW OF STAPLES AT 12" SPACING.
5. USE STAPLE CHECK FOR CHANNEL SLOPES LESS THAN 2.5% GRADE AT 100 FOOT INTERVALS. PLACE DOUBLE ROW OF STAPLES STAGGERED 4" APART AND AT 4" SPACING.
6. USE BLANKET CHECKS FOR THE FOLLOWING SLOPES:
   2.5%-3% 100 FT INTERVALS
   3%-5% 50 FT INTERVALS
   5%-7% 25 FT INTERVALS
7. CRITICAL POINTS SHALL BE SECURED WITH PROPER STAPLE PATTERNS.



BLANKET OVERLAP
PLACE SINGLE ROW STAPLES AT 12" SPACING

GENERAL BLANKET INSTALLATION REQUIREMENTS

PREPARE SOIL AS PER SPECIFICATION 2574.

LAY PARALLEL OR PERPENDICULAR TO THE DIRECTION OF WATER FLOW.

OVERLAP ADJACENT STRIP EDGES A MINIMUM OF 4 INCHES.

OVERLAP BLANKET 6" (MIN.) AT EACH END. OVERLAP BOTTOM END OF UPPER BLANKET OVER TOP END OF LOWER BLANKET. STAPLE ALONG OVERLAP EVERY 1.5'.

THE UPPERMOST BLANKET OF ALL SLOPE APPLICATIONS MUST START IN A CHECK SLOT. IF SLOPE LENGTH (L) IS 100' OR GREATER, INSERT BLANKET INTO A CHECK SLOT 1/3 FROM THE BOTTOM OF THE SLOPE.

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REVISION: 8-6-2019
APPROVED: 2-28-2017
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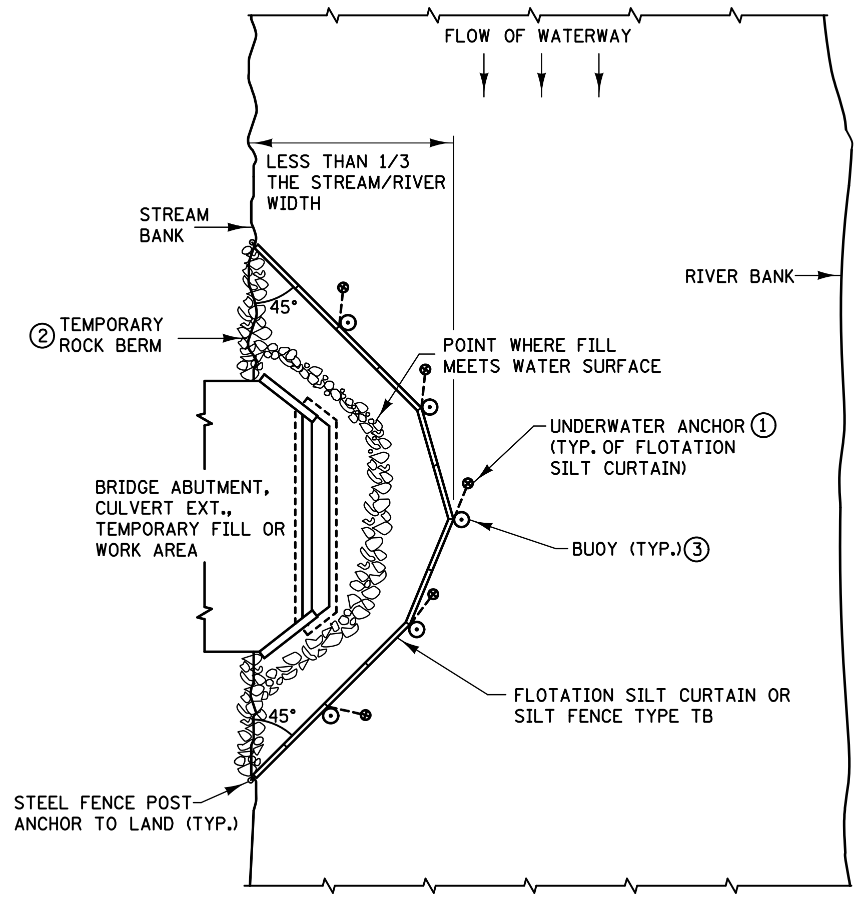
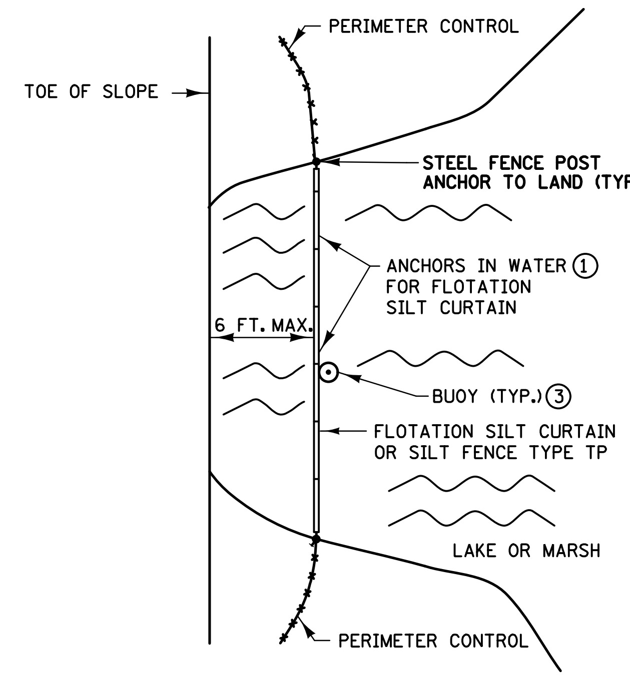
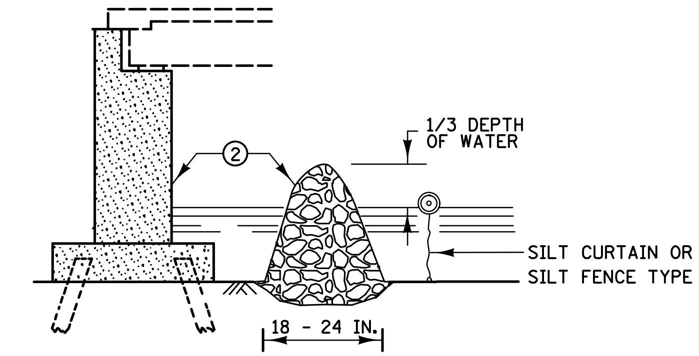


PLAN VIEW FOR STREAM ⑤



PLAN VIEW FOR LAKE OR MARSH ⑤



TEMPORARY ROCK BERM

FOR SEDIMENT CONTROL

INSTALLATION GUIDELINES
SILT FENCE TYPE TB

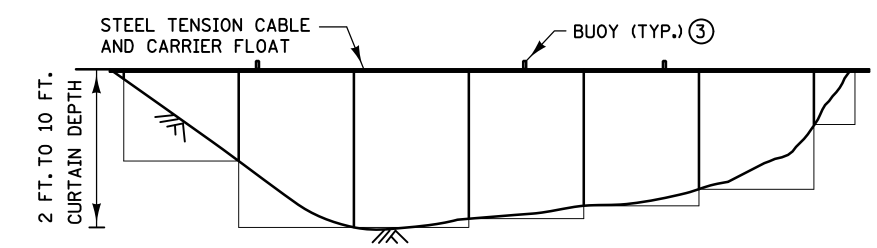
MINIMUM WATER DEPTH: 1 FT.
MAXIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.

INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN
TYPE: STILL WATER

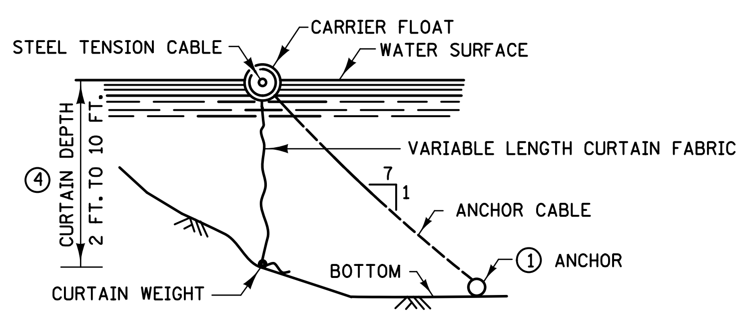
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 2 FT./SEC.
MAXIMUM WAVE HEIGHT: 1 FT

INSTALLATION GUIDELINES ④
FLOTATION SILT CURTAIN
TYPE: MOVING WATER

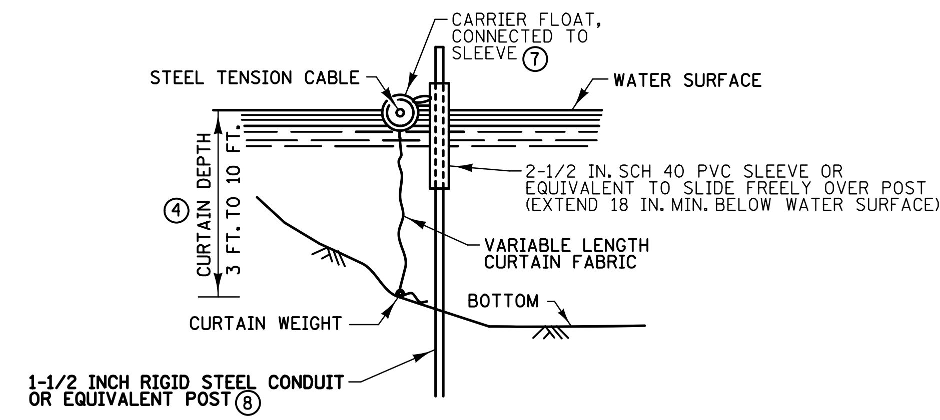
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.
MAXIMUM WAVE HEIGHT: 2 FT.



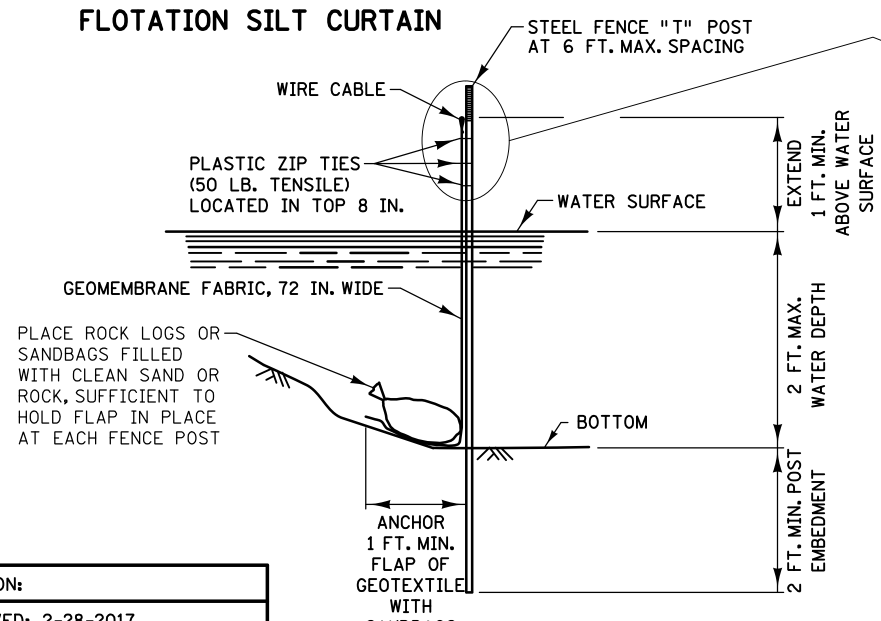
FRONT VIEW FOR FLOTATION SILT CURTAIN



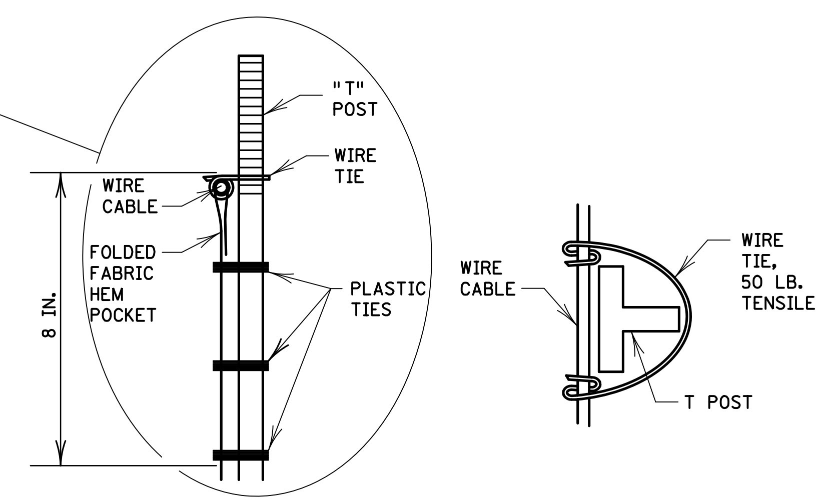
FLOTATION SILT CURTAIN



ALTERNATE FLOTATION SILT CURTAIN



SILT FENCE TYPE TB ⑥



FABRIC/CABLE/POST CONNECTION

NOTES:

SEE SPECS. 2573, 3886, 3887 & 3893.

① FOR ANCHOR SPACING AND WEIGHT REQUIREMENTS, SEE SPEC. 2573.

② IN AREAS WHERE THE PLAN CALLS FOR RIPRAP AT A BRIDGE, CULVERT, OR SLOPE, A TEMPORARY ROCK BERM CONSTRUCTED FROM THE RIPRAP CAN BE USED TO PROVIDE ADDITIONAL PROTECTION. WHEN THE WORK IS COMPLETE THE RIPRAP CAN THEN BE MOVED TO THE PERMANENT LOCATION INDICATED IN THE PLANS. THE TEMPORARY ROCK BERM IS INCIDENTAL.

③ ON U.S. COAST GUARD OR OTHER MOTORIZED WATERWAYS, BUOYS ARE REQUIRED TO MARK THE ENDS AND SPECIAL AREAS FOR VISIBILITY. PLACE BUOYS AS REQUIRED FOR NAVIGATIONAL PURPOSES.

④ MINIMUM WATER DEPTH APPLIES TO THE DEEPEST POINT ALONG THE FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB FOR DETERMINING APPLICABILITY OF FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB.

⑤ SILT CURTAIN SHOULD BE REMOVED WHEN THE AREA CONTRIBUTING DIRECT RUNOFF HAS BEEN TEMPORARILY OR PERMANENTLY STABILIZED. SILT CURTAIN SHOULD ALSO BE REMOVED BEFORE WINTER IF ICE UP OR ICE FLOW IS ANTICIPATED.

⑥ EMBED POST INTO BOTTOM A MINIMUM OF 40% OF THE WATER DEPTH (INCLUDING WAVE HEIGHT), BUT IN NO CASE SHALL EMBEDMENT BE LESS THAN 2 FEET.

⑦ ANCHOR FLOAT MUST BE CONNECTED SECURELY TO SLEEVE WITH A MINIMUM TENSILE STRENGTH OF 100 LBS. CONNECTION METHOD MUST ALLOW FOR SLEEVE TO MOVE FREELY ON POST.

⑧ PROVIDE SUFFICIENT NUMBER OF POST ANCHORS TO MAINTAIN SILT CURTAIN POSITION.

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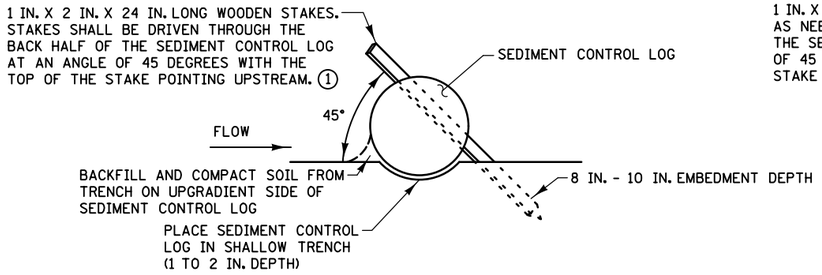
REVISION:
APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION
STATE DESIGN ENGINEER
REVISED:
APPROVED: 2-28-2017

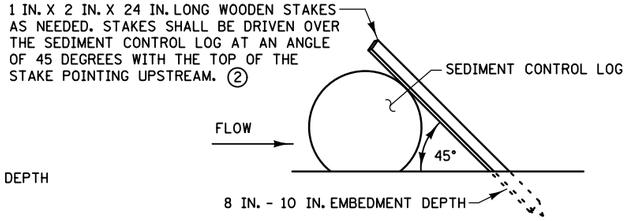
TEMPORARY SEDIMENT CONTROL

SILT CURTAIN OR SILT FENCE TYPE TB

STANDARD PLAN 5-297.405 | 1 OF 8

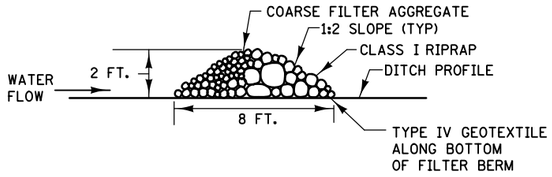


TYPES: STRAW, WOOD FIBER, OR COIR

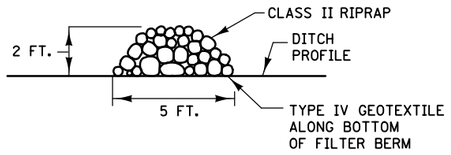


TYPES: WOOD CHIP, COMPOST, OR ROCK

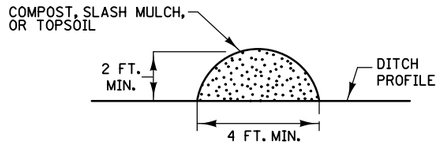
SEDIMENT CONTROL LOGS



TYPE 3 (ROCK WEEPER)

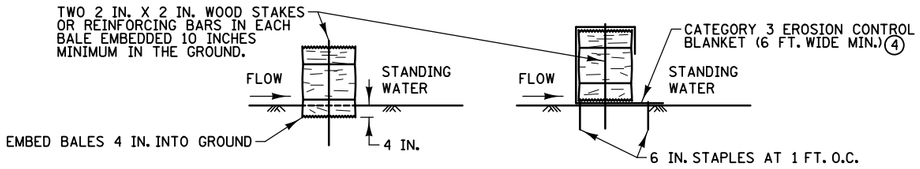


TYPE 5 (ROCK)



TYPE 1 (COMPOST), TYPE 2 (SLASH MULCH), OR TYPE 4 (TOPSOIL)

FILTER BERMS



EMBEDMENT METHOD

BLANKET METHOD (ALTERNATE)

BALE BARRIERS (3)

NOTES:

SEE SPECS. 2573, 3149, 3874, 3882, 3886, & 3897.

(1) SPACE BETWEEN STAKES SHALL BE A MAXIMUM OF 1 FOOT FOR DITCH CHECKS OR 2 FEET FOR OTHER APPLICATIONS.

(2) PLACE STAKES AS NEEDED TO PREVENT MOVEMENT OF SEDIMENT CONTROL LOGS PLACED ON SLOPES OR AS NEEDED DUE TO OTHER FACTORS. STAKES SHALL BE INCIDENTAL.

(3) TO BE USED FOR CRITICAL PERIMETER CONTROL AREAS WHERE STANDING WATER OCCURS (6 INCH MAX. DEPTH). BALES SHALL CONSIST OF TYPE 1 MULCH OF APPROXIMATELY 14 IN. X 18 IN. X 36 IN. LONG. BALES SHALL BE PLACED ON EDGE AND BUTTED TIGHT TO ADJACENT BALES.

(4) INSTEAD OF TRENCHING, PLACE BALE ON THE BLANKET AND WRAP BLANKET AROUND THE BALE. PLACE STAKE THROUGH BALE AND BLANKET.

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REVISION:
APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

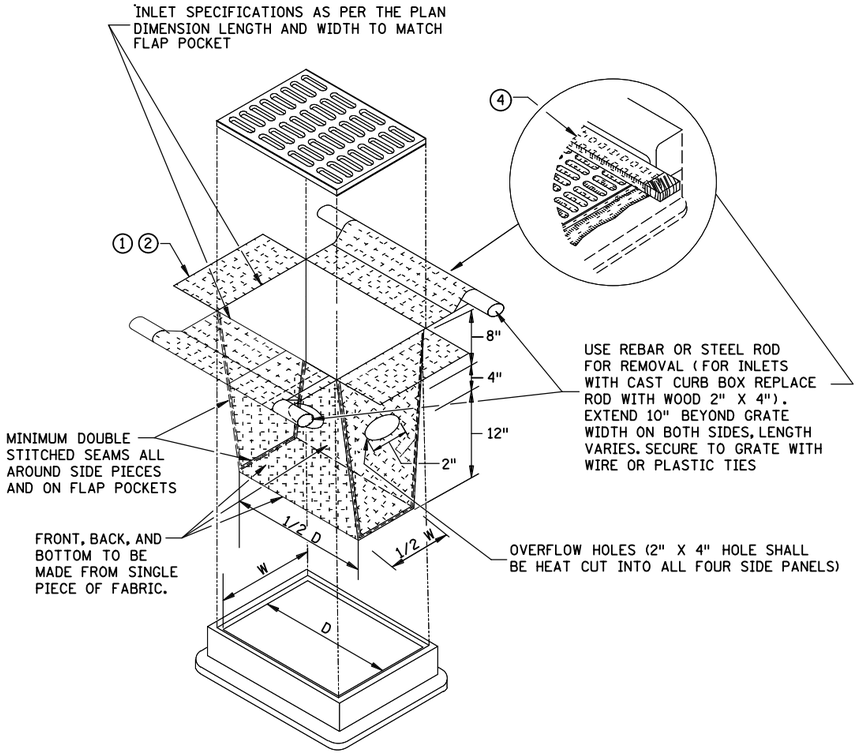
REVISED:

APPROVED: 2-28-2017

TEMPORARY SEDIMENT CONTROL
FILTER BERMS, SEDIMENT CONTROL LOGS, AND BALE BARRIERS

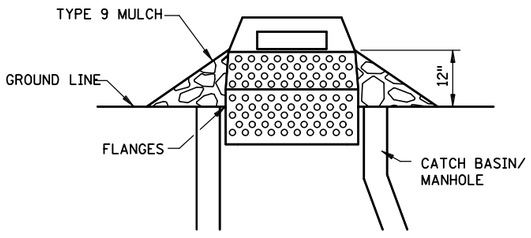
STANDARD PLAN 5-297.405 | 2 OF 8

STATE PROJ. NO. 002-678-025, 114-020-053 | SHEET NO. 51 OF 230 SHEETS



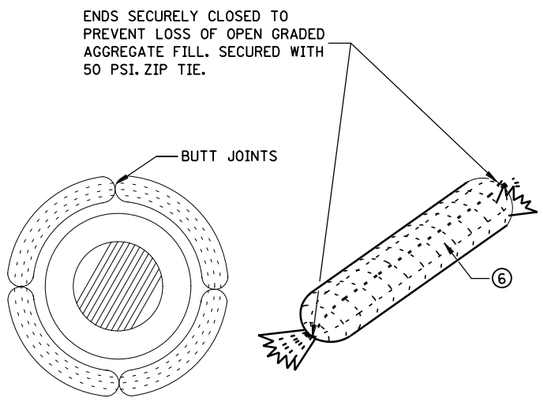
FILTER BAG INSERT ③

(CAN BE INSTALLED IN ANY INLET TYPE
WITH OR WITHOUT A CURB BOX)

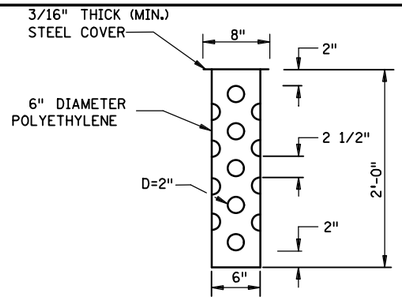


SEDIMENT CONTROL INLET HAT

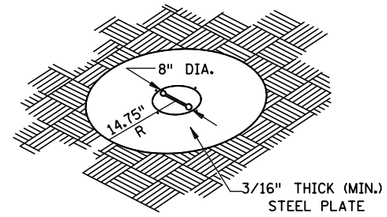
NOTE:
THE SEDIMENT CONTROL BARRIER SHALL BE A METAL
OR PLASTIC/POLYETHYLENE RISER SIZED TO FIT INSIDE
THE CATCH BASIN/MANHOLE; HAVE PERFORATIONS TO ALLOW
FOR WATER INFILTRATION; HAVE AN OVERFLOW OPENING,
FLANGES AND A LID/COVER.



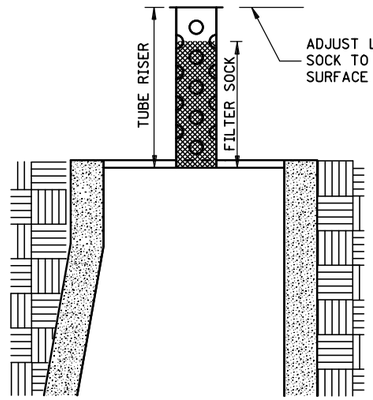
ROCK LOG/COMPOST LOG



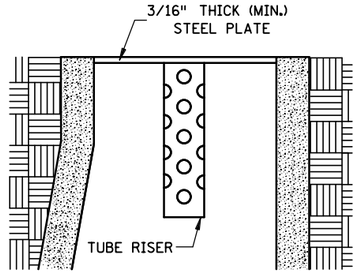
TUBE RISER



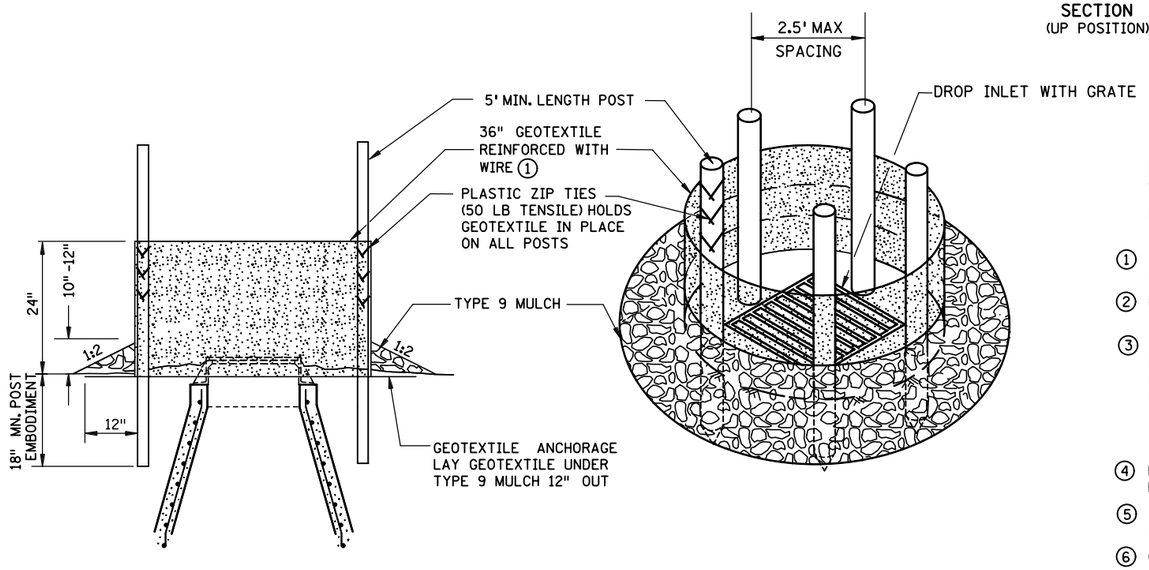
PERSPECTIVE VIEW



SECTION
(UP POSITION)



SECTION
(DOWN POSITION)



SILT FENCE RING AND ROCK FILTER BERM

USE WHERE INLET DRAINS IN AN AREA WITH SLOPES AT 1:3 or LESS

POP-UP HEAD

NOTES:

SEE SPECS. 2573, 3137, & 3886.

DEVICES MUST BE ADJUSTED ACCORDINGLY AS TO NOT CAUSE FLOODING ON ROADWAY THAT WOULD IMPEED TRAFFIC FLOW.

1. ALL GEOTEXTILE USED FOR INLET PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886.
2. FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED SHALL EXTEND A MINIMUM OF 10 INCHES AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
3. INSTALLATION NOTES:
   DO NOT PLACE FILTER BAG INSERT IN INLETS SHALLOWER THAN 30 INCHES, MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. THE PLACED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE OF 3 INCHES BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES. WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3 INCH SIDE CLEARANCE.
4. FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2 INCH X 4 INCH OR USE A ROCK SOCK OR SAND BAGS IN PLACE OF THE FLAP POCKETS.
5. SOCK HEIGHT MUST NOT BE SO HIGH AS TO SLOW DOWN WATER FILTRATION TO CAUSE FLOODING OF THE ROADWAY.
6. GEOTEXTILE SOCK BETWEEN 4-10 FEET LONG AND 4-6 INCH DIAMETER. SEAM TO BE JOINED BY TWO ROWS OF STITCHING WITH A PLASTIC MESH BACKING OR PROVIDE A HEAT BONDED SEAM (OR APPROVED EQUIVALENT). FILL ROCK LOG WITH OPEN GRADED AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF COARSE AGGREGATE CONFORMING TO SPEC. 3137 TABLE 3137-1; CA-3 GRADATION.

REVISION:
APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

REVISED:

STATE DESIGN ENGINEER

APPROVED: 2-28-2017

TEMPORARY SEDIMENT CONTROL
STORM DRAIN INLET PROTECTION

STANDARD PLAN 5-297.405 | 4 OF 8

STATE PROJ. NO. 002-678-025, 114-020-053 | SHEET NO. 52 OF 230 SHEETS

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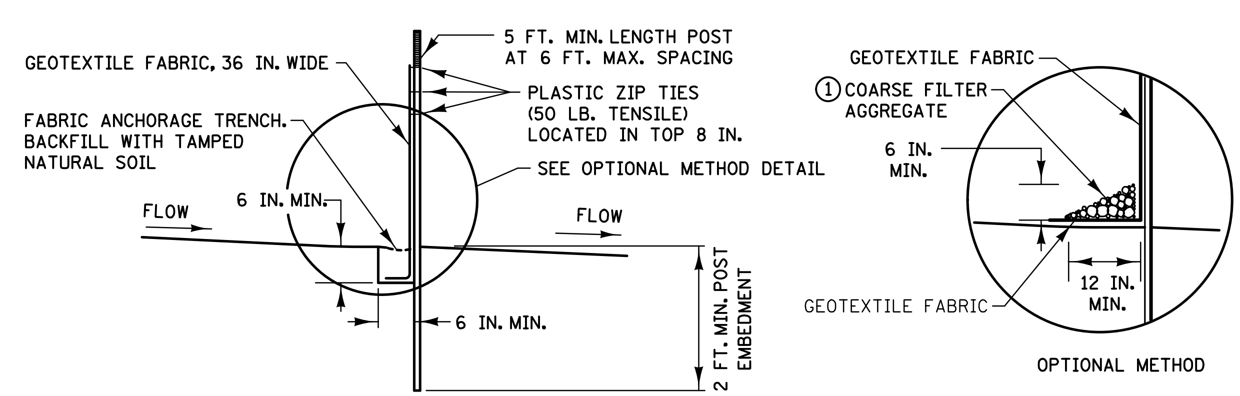
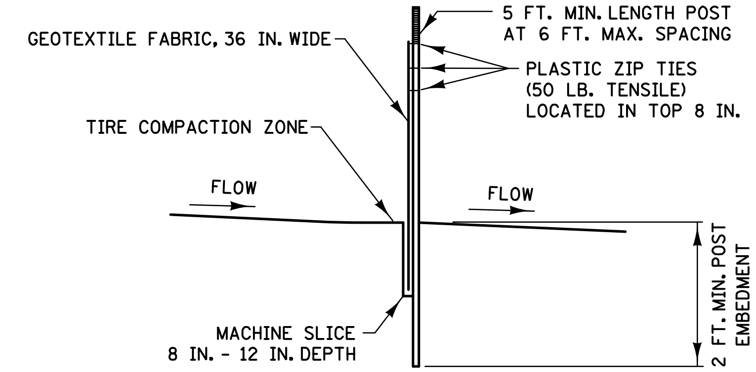
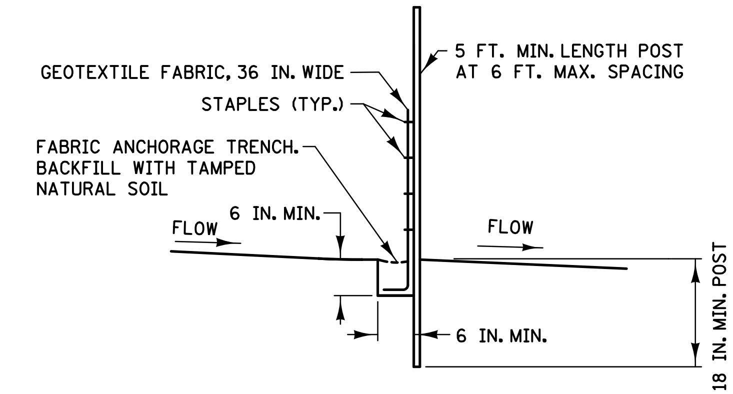


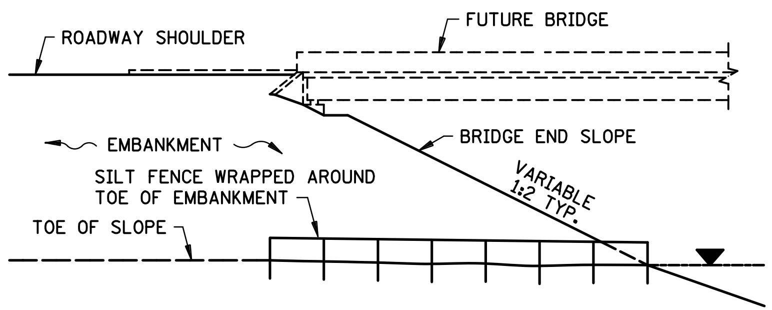
SILT FENCE TYPE HI ② (HAND INSTALLED)



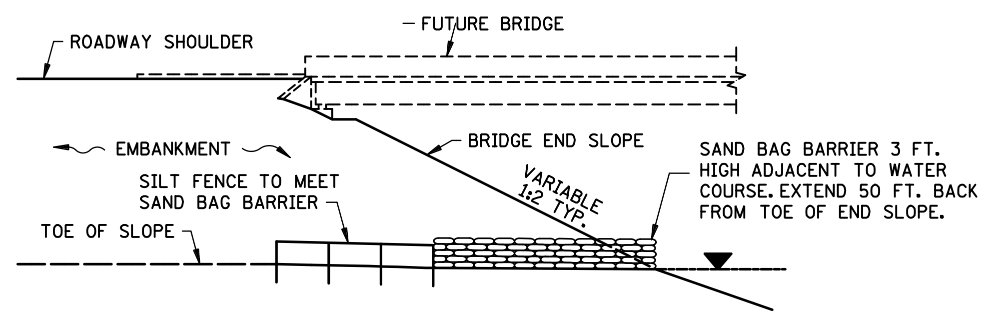
SILT FENCE TYPE MS ② (MACHINE SLICED)



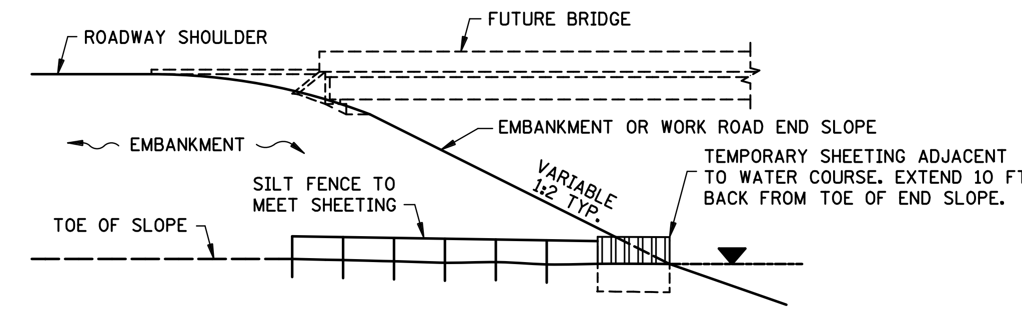
SILT FENCE TYPE PA ③ (PREASSEMBLED)



SILT FENCE ONLY ④

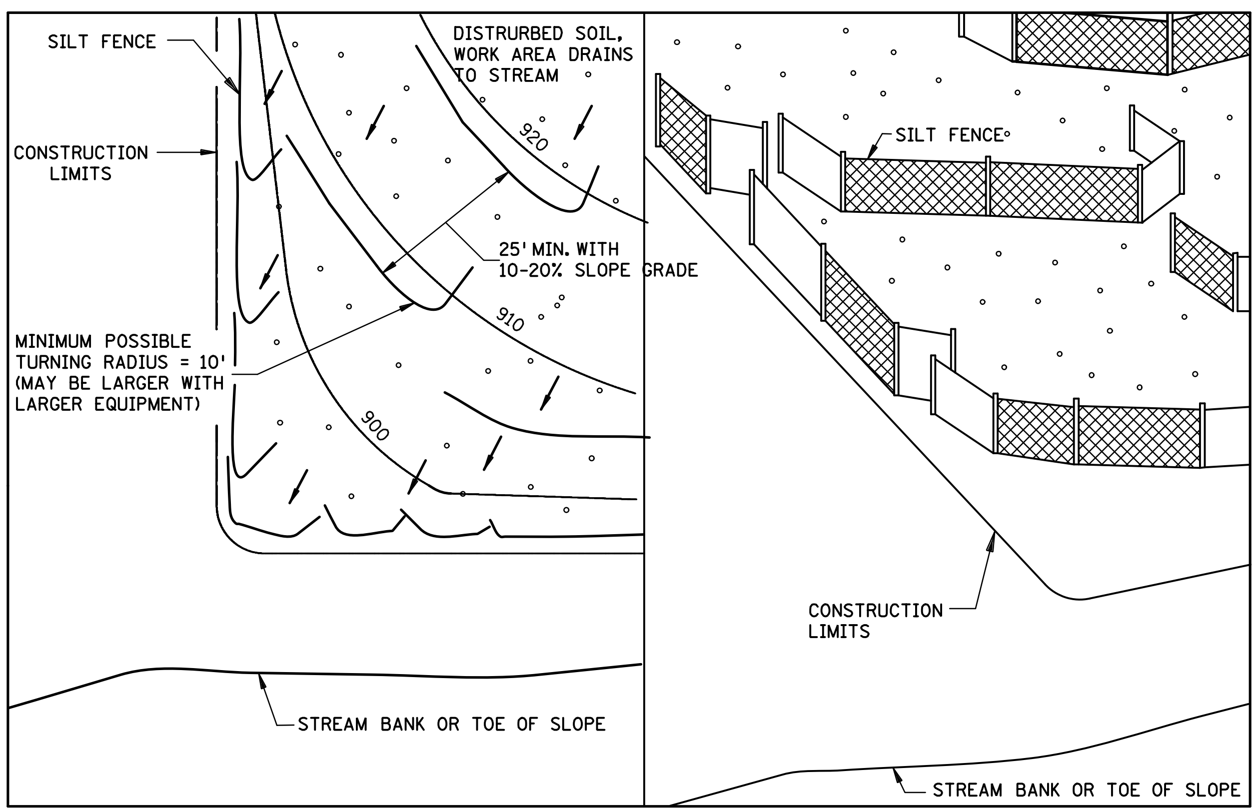


SILT FENCE WITH SAND BAGS ⑤



SILT FENCE WITH SHEETING ⑥

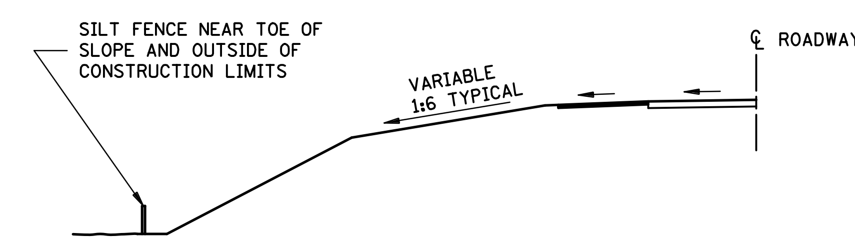
INSTALLATION AT BRIDGE EMBANKMENT ADJACENT TO WATER



PLAN VIEW

PERSPECTIVE VIEW

J-HOOK INSTALLATION



LOCATION AT TOE OF ROADWAY EMBANKMENT

NOTES:

SEE SPECS. 2573, 3149 & 3886.

① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.

② TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 1 ACRE.

③ TO PROTECT AREAS FROM SHEET FLOW. MAXIMUM CONTRIBUTING AREA: 0.25 ACRE.

④ WATER COURSE FLOW VELOCITY: STANDING. CONTRIBUTING SLOPE AREA: 1./2 ACRE.

⑤ WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC. CONTRIBUTING SLOPE AREA: 1. ACRE.

⑥ WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC. CONTRIBUTING SLOPE AREA: 3 ACRES.

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REVISION:

APPROVED: 2-28-2017

CHIEF ENVIRONMENTAL OFFICER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

REVISED:

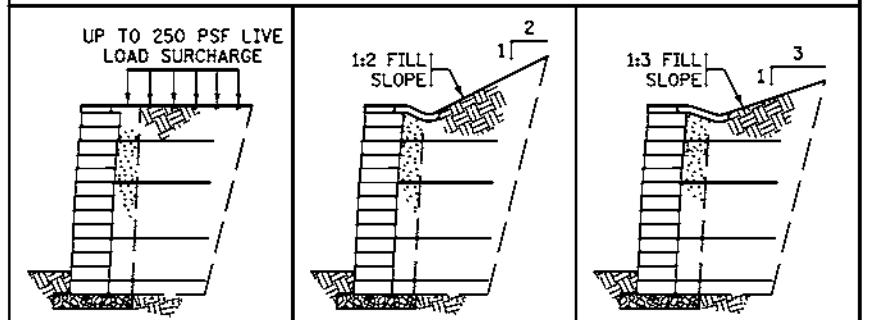
APPROVED: 2-28-2017

TEMPORARY SEDIMENT CONTROL

SILT FENCE

STANDARD PLAN 5-297.405 | 6 OF 8

LOADING CASES



250 PSF - LL SURCHARGE CASE 1 | 1:2 SLOPED FILL CASE 3 | 1:3 SLOPED FILL CASE 4

CASE 2 IS OMITTED INTENTIONALLY

NOTES TO CONTRACTOR:

APPROVED COMBINATIONS OF MODULAR BLOCK UNIT AND SOIL REINFORCEMENT PRODUCTS LIST WITH MBW REINFORCEMENT CLASS NOTED ARE HELD AND MAINTAINED BY THE FOUNDATIONS UNIT, AND POSTED AT http://www.mrr.dot.state.mn.us/geotechnical/foundations/foundations.asp UNDER FOUNDATIONS UNIT. ONLY APPROVED PRODUCT COMBINATIONS, INCLUDING BLOCK PRODUCED FROM APPROVED SOURCES MEETING DURABILITY AND QUALITY CONTROL REQUIREMENTS, MAY BE USED IN STANDARD DESIGNS.

PROVIDE DETAILED DRAWINGS FOR CONSTRUCTION CONTAINING:

- SUBMIT, WITH THE DETAILED DRAWINGS, A COPY OF Mn/DOT STANDARD SHEETS FOR LOADING CASE(S) USED WITH OPTIONS USED MARKED IN THE TABLE.
- ELEVATION VIEW WITH REINFORCEMENT PLACEMENT REQUIREMENTS, WALL FACING LAYOUT, AND GEOMETRIC INFORMATION. TOP OF WALL MAY EXTEND UP TO 4" ABOVE PLAN TOP OF WALL ELEVATION.
- PLAN VIEW WITH BOTTOM AND TOP OF WALL ALIGNMENT, AND PLAN LIMITS OF WALL ALIGNMENT.
- CROSS SECTIONS DETAILING BATTER, REINFORCEMENT, VERTICAL SPACING, REINFORCEMENT LENGTHS, SUBSURFACE DRAINAGE, SURFACE DRAINAGE, AND WATER RUNOFF COLLECTION ABOVE WALL.
- REINFORCEMENT LAYOUT: REINFORCEMENT SHALL BE PLACED AT 100% COVERAGE RATIO. REINFORCEMENT ELEVATIONS SHALL BE CONSISTENT ACROSS LENGTH OF WALL STRUCTURE.
- NOTE BLOCK, REINFORCEMENT, AND FILL PLACEMENT METHODS AND REQUIREMENTS.
- DETAIL ALL WALL FILL PENETRATIONS AND WALL FACE PENETRATIONS. DETAIL REINFORCEMENT AND/OR WALL FACING UNIT PLACEMENT AROUND PENETRATIONS.
- DETAILS THAT ARE SPECIFIC TO VENDOR PRODUCTS AND THEIR INTERACTION WITH OTHER PROJECT COMPONENTS.
- LIST INFORMATION ON APPROVED COMBINATION OF MBW UNIT AND GEOSYNTHETIC REINFORCEMENT, INCLUDING Mn/DOT CLASSIFICATION CODE, NOMINAL BLOCK WIDTH, PROPERTIES FOR FIELD IDENTIFICATION, AND INSTALLATION INSTRUCTIONS.
- DETAILS OF CAP UNITS AND INSTALLATION/FASTENING INSTRUCTIONS FOR THE CAPS. CAP UNITS SHALL BE SET IN A BED OF ADHESIVE DESIGNED TO WITHSTAND MOISTURE AND TEMPERATURE EXTREMES, REMAIN FLEXIBLE, AND SHALL BE SPECIFICALLY FORMULATED FOR BONDING MASONRY TO MASONRY.
- CERTIFICATION BY PROFESSIONAL ENGINEER THAT THE CONSTRUCTION LAYOUT MEETS THE REQUIREMENTS OF PLANS AND Mn/DOT MSEW STANDARDS. DEVIATION FROM STANDARD DESIGN TABLES ARE PERMITTED BY VALUE ENGINEERING SUBMITTAL ONLY ON PROJECTS WITH OVER 5000 SQ. FT. OF WALL.

DEFINITION OF TERMS

Term		Definition
MBW	=	MODULAR BLOCK WALL
LL	=	LIVE LOAD
C.I.P.	=	CAST-IN-PLACE
H	=	WALL HEIGHT
S	=	VERTICAL REINFORCEMENT SPACING
REINFORCEMENT COVERAGE RATIO	=	WIDTH OF SOIL REINFORCEMENTS TO HORIZONTAL SPACING (100% COVERAGE RATIO REQUIRED)

DESIGN CRITERIA

DESIGN CRITERIA FOLLOWS THE AASHTO SPECIFICATION FOR HIGHWAY BRIDGES (16TH EDITION WITH 1998 INTERIMS) EXCEPT FOR THE DEVIATIONS NOTED BELOW. DESIGN CRITERIA ARE IN ACCORDANCE WITH Mn/DOT POLICY, AS RECORDED IN THE Mn/DOT ROAD DESIGN MANUAL.

A. THE MINIMUM REINFORCEMENT LENGTH IS 4 FT. OR 0.7H, WHICHEVER IS GREATER.
B. THE REINFORCEMENT FILL FRICTION ANGLE IS 35°.
C. THE ALLOWABLE CONNECTION LOAD, AT A GIVEN NORMAL LOAD, IS COMPUTED AS THE ULTIMATE CONNECTION STRENGTH REDUCED BY A SAFETY FACTOR EQUAL TO 2.0.
D. THE LATERAL EARTH PRESSURE COMPUTATION FOR EXTERNAL STABILITY CALCULATIONS USES AN INTERFACE ANGLE SET EQUAL TO THE RETAINED BACKFILL ANGLE.
E. THE LATERAL EARTH PRESSURE COMPUTATION FOR INTERNAL STABILITY CALCULATIONS INCORPORATES THE EFFECTS OF WALL FACE BATTER.

MINIMUM FACTORS OF SAFETY:
OVERTURNING: 2.0
SLIDING: 1.5
ECCENTRICITY: $e < L/6$
BEARING CAPACITY: 2.5
DEEP SEATED STABILITY: 1.3

BEARING:
A. SEE FOUNDATION REPORT FOR ALLOWABLE SOIL BEARING PRESSURE.
B. CASES 1 AND 4 - ALLOWABLE SOIL BEARING CAPACITY (ULTIMATE BEARING CAPACITY REDUCED BY A SAFETY FACTOR OF 2.5) OF 2000 PSF IS REQUIRED FOR WALLS UP TO 10 FT. IN HEIGHT. FOR WALLS GREATER THAN 10 FT. IN HEIGHT, THE REQUIRED ALLOWABLE BEARING CAPACITY IS EQUAL TO: 2000 PSF + (H-10)(625 PSF) WITH H IN FEET.
C. CASE 3 - ALLOWABLE SOIL BEARING CAPACITY (ULTIMATE BEARING CAPACITY REDUCED BY A SAFETY FACTOR OF 2.5) OF 2500 PSF IS REQUIRED FOR WALLS UP TO 10 FT. IN HEIGHT. FOR WALLS GREATER THAN 10 FT. IN HEIGHT, THE REQUIRED ALLOWABLE BEARING CAPACITY IS EQUAL TO: 2500 PSF + (H-10)(850 PSF) WITH H IN FEET.

REINFORCED WALL FILL CHARACTERISTICS:
A. SELECT GRANULAR MATERIAL MODIFIED FOLLOWING SPEC. 3149.2B.2. MODIFICATION: SELECT GRANULAR MATERIAL MODIFIED, FOR SPECIAL USE IN EMBANKMENT OR BACKFILL CONSTRUCTION OR OTHER SPECIFIED PURPOSES, MAY BE ANY PIT-RUN OR CRUSHER-RUN MATERIAL THAT IS GRADED FROM COARSE TO FINE, SUCH THAT 100% OF THE MATERIAL MUST PASS THE 2" SIEVE, AND THAT THE RATIO OF THE PORTION PASSING THE #200 SIEVE DIVIDED BY THE PORTION PASSING THE 1" SIEVE MAY NOT EXCEED 10% BY MASS (THAT IS: #200/1" RATIO)
B. INTERNAL ANGLE OF FRICTION (Φ_r) = 35°
C. COHESION (C) = 0
D. MOIST UNIT WEIGHT (γ_r) = 125 PSF

COARSE FILTER AGGREGATE CHARACTERISTICS:
A. COARSE FILTER AGGREGATE TO MEET SPEC. 3149.2H. INCIDENTAL, NO DIRECT PAYMENT WILL BE MADE.

RETAINED BACKFILL CHARACTERISTICS:
A. INTERNAL ANGLE OF FRICTION (Φ_b) = 30°
B. COHESION (C) = 0
C. MOIST UNIT WEIGHT (γ_b) = 120 PSF

FOUNDATION SOILS CHARACTERISTICS:
A. INTERNAL ANGLE OF FRICTION (Φ_f) = 30°
B. COHESION (C) = 0
C. UNIT WEIGHT (γ_f) = 120 PSF

SAMPLE ESTIMATED QUANTITIES FOR MODULAR BLOCK WALLS ③

	ITEM	UNIT	QUANTITY
	STRUCTURE EXCAVATION CLASS ___	CU. YD.	
	SELECT GRANULAR MATERIAL MODIFIED (CV)	CU. YD.	
	STRUCTURAL CONCRETE (1A43)	CU. YD.	
①②	MODULAR BLOCK RETAINING WALL	SQ. FT.	
	TYPE I GEOTEXTILE FABRIC	SQ. YD.	

① VERTICAL FACE AREA OF MODULAR BLOCK AS MEASURED FROM PLAN TOP OF WALL TO 2 FT. BELOW FINISHED GRADE AT BOTTOM OF WALL.

② PAY ITEM FOR MBW WALLS SHALL BE 2411.

③ REFER TO TABULATIONS / ESTIMATE SHEETS FOR QUANTITIES.

NOTES TO DESIGNER:

HEIGHT AND LOCATION RESTRICTIONS FOR ISSUES SUCH AS FREEZE-THAW DURABILITY ARE GOVERNED BY APPROPRIATE TECHNICAL MEMORANDUMS. CURRENT GOVERNING TECH. MEMO. NO.: 14-03-MAT-01.

IN ADDITION TO THE STANDARD SHEETS, PLAN AND FRONT ELEVATION VIEWS OF THE MODULAR BLOCK RETAINING WALLS SHALL BE INCLUDED IN THE PLANS. THE PLAN VIEW MUST SHOW ALIGNMENT BASELINE, LIMITS OF BOTTOM OF WALL ALIGNMENT, AND LIMITS OF TOP OF WALL ALIGNMENT AS ALIGNMENTS VARY WITH BATTER OF WALL SYSTEM ACTUALLY SUPPLIED. THE FRONT ELEVATION MUST IDENTIFY BOTTOM AND TOP OF WALL ELEVATIONS, EXISTING GRADES, AND FINISHED GRADES.

IF THE WALL IS CURVED, THE RADIUS AT THE BOTTOM AND THE TOP OF EACH WALL SEGMENT AND THE P.C. AND P.T. STATION POINTS OFF OF BASELINE AND LIMITS OF BOTTOM AND TOP OF WALL ALIGNMENT MUST BE SHOWN.

REFERENCE STANDARD PLATES AND PROVIDE DETAILS FOR TRAFFIC BARRIERS, CURB AND GUTTER, HANDRAILS AND FENCING AS REQUIRED BY PROJECT CONDITIONS. SEE AASHTO AND Mn/DOT DESIGN MANUALS, STANDARD PLATES AND DETAILS FOR REQUIREMENTS.

SURFACE DRAINAGE PATTERNS SHALL BE SHOWN IN THE PLAN VIEW. PROVIDE DIMENSIONS FOR WIDTH AND DEPTH OF THE DRAINAGE SWALE AS WELL AS THE TYPE OF IMPERVIOUS LINER MATERIAL. SURFACE WATER RUNOFF SHOULD BE COLLECTED ABOVE AND DIVERTED AROUND WALL FACE.

DETAIL LINES AND GRADES OF THE INTERNAL DRAINAGE COLLECTION PIPE. DETAIL OR NOTE THE DESTINATION OF INTERNAL WALL DRAINS AS WELL AS THE METHOD OF TERMINATION (DAYLIGHT END OF PIPE OR CONNECTION INTO HYDRAULIC STRUCTURE). THE SPACING FOR DRAIN PIPE OUTLET SHALL NOT BE MORE THAN 250 FT.

SOFT SOILS AND/OR HIGH WATER CONDITIONS (DEFINED AS GROUNDWATER WITHIN A DEPTH EQUAL TO THE WALL HEIGHT H) MAY NOT BE SUITABLE FOR APPLICATION OF STANDARD DESIGNS AND REQUIRE SPECIAL CONSIDERATION BY THE FOUNDATIONS UNIT.

STANDARD DESIGN CHARTS ARE NOT APPLICABLE TO:
- PROJECT/SITES WHERE FOUNDATION SOILS SHEAR STRENGTH AND/OR BEARING CAPACITY DO NOT MEET OR EXCEED VALUES USED IN THE DEVELOPMENT OF STANDARD DESIGN CHARTS.
- PROJECTS WITH A LARGE QUANTITY OF FACE AREA WHERE PROJECT SPECIFIC DESIGNS ARE RECOMMENDED, AS DEFINED IN Mn/DOT ROAD DESIGN MANUAL.
- WHERE SLOPES IN FRONT OF WALL ARE STEEPER THAN 1:3.
- WHERE MAXIMUM WALL HEIGHT EXCEEDS 12 FT.
- WHERE WALLS ARE TIERED.
- WALLS WITH NOISE WALLS.

IF USING CONCRETE RAILING, INCLUDE STANDARD BRIDGE DETAIL "CONCRETE RAILING (TYPE F)" IN PLAN SET.

PROVIDE PROJECT SPECIFIC AESTHETIC REQUIREMENTS INCLUDING COLOR AND FASCIA SURFACING IN THE SPECIAL PROVISIONS.

CHAPTER 9 OF THE Mn/DOT "ROAD DESIGN MANUAL" CONTAINS GUIDELINES, TRAFFIC SAFETY AND OTHER ASPECTS.

GENERAL NOTES:

UTILITIES:
EXISTING AND PROPOSED UTILITIES ARE SHOWN IN THE GRADING PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING FACILITIES AND SHALL EXERCISE CARE IN ADJACENT CONSTRUCTION.

EXCAVATION AND EARTHWORK:
ALL EXCAVATION AND EMBANKMENT WORK SHALL CONFORM TO Mn/DOT 2451.

CAST-IN-PLACE CONCRETE:
ALL CONCRETE SHALL CONFORM TO Mn/DOT 2461, EXCEPT AS NOTED.

CONSTRUCTION:
CONSTRUCTION SHALL BE IN ACCORDANCE WITH Mn/DOT 2411, EXCEPT AS NOTED.

GEOMETRICS AND GRADES:
DATA FOR BASELINE GEOMETRY IS TABULATED FOR WALL ALIGNMENT, SEE LAYOUT SHEETS. WALL ALIGNMENT REFERENCE IS ALONG FRONT FACE OF WALL.

THE FILL SLOPE CONVENTION OF 1 VERTICAL TO HORIZONTAL IS USED IN THIS PLAN.

COMPACTION REQUIREMENTS:
COMPACT REINFORCED WALL FILL IN ACCORDANCE WITH Mn/DOT SPEC. 2105.3F1 UNLESS RECOMMENDED OTHERWISE BY THE SOILS ENGINEER.

REVISION:
APPROVED: DECEMBER 1, 2014
DIRECTOR, OFFICE OF MATERIALS AND ROAD RESEARCH

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MINNESOTA DEPARTMENT OF TRANSPORTATION
STATE DESIGN ENGINEER
REVISED:
APPROVED: 12-1-2014

MODULAR BLOCK RETAINING WALL
GENERAL NOTES

STANDARD PLAN 5-297.640 | 1 OF 1

MODULAR BLOCK WALL REINFORCEMENT LAYOUT

CASE 1 - LEVEL BACKFILL WITH 250 PSF SURCHARGE

MBW REINFORCEMENT CLASS	STRENGTH OF SOIL REINF. (PLF) LG. TERM (T_{al})	STRENGTH OF SOIL REINF. (PLF) DESIGN (T_{a})	① MINIMUM REINFORCEMENT LENGTH, L (FT.)	MAXIMUM WALL HEIGHT (FT.)	② NOMINAL BLOCK WIDTH (IN.)	WALL BATTER RANGE (DEGREES)	<	③ MAXIMUM UNREINFORCED WALL HT, A (IN.)	ZONE 1 H1 (FT.)	ZONE 1 $S1_{MAX}$ (IN.)	ZONE 2 H2 (FT.)	ZONE 2 $S2_{MAX}$ (IN.)	ZONE 3 H3 (FT.)	ZONE 3 $S3_{MAX}$ (IN.)
MBW-700	1050	700	0.7 H	12.0	12	0	3	15	7.9	24	4.1	16		
						3	7	16	9.8	24	2.2	16		
						7	10	18	11.5	24	0.5	16		
						10	15	18	12.0	24				
					21	0	3	32	4.9	32	3.0	24	4.1	16
						3	7	32	4.9	32	4.9	24	2.2	16
						7	10	32	5.9	32	6.1	24		
						10	15	32	7.2	32	4.8	24		
MBW-1050	1575	1050	0.7 H	12.0	12	0	3	15	12.0	24				
						3	7	16	12.0	24				
						7	10	18	12.0	24				
						10	15	18	12.0	24				
					21	0	3	36	5.9	42	4.9	32	1.2	24
						3	7	40	8.5	42	3.5	32		
						7	10	42	9.8	42	2.2	32		
						10	15	42	9.8	42	2.2	32		
MBW-1400	2100	1400	0.7 H	12.0	12	0	3	15	12.0	24				
						3	7	16	12.0	24				
						7	10	18	12.0	24				
						10	15	18	12.0	24				
					21	0	3	36	6.6	48	3.3	42	2.1	32
						3	7	40	8.2	48	3.8	42		
						7	10	48	9.8	48	2.2	42		
						10	15	48	9.8	48	2.2	42		

INSTRUCTIONS TO CONTRACTOR:

USE AS MANY ZONES AS WALL HEIGHT REQUIRES, STARTING WITH ZONE 1 AND ADDING ADDITIONAL ZONES TO THE BOTTOM OF THE WALL AS NEEDED TO MAKE UP THE TOTAL WALL HEIGHT (H) NEEDED.

REINFORCEMENT CLASS, NOMINAL BLOCK WIDTH AND WALL BATTER ARE GENERALLY THE CONTRACTOR'S OPTION TO SELECT FROM Mn/DOT APPROVED PRODUCTS LISTS LOCATED AT www.mrr.dot.state.mn.us/geotechnical/foundations/foundations.asp.

NOTES TO CONTRACTOR:

① OR 4 FT. MINIMUM, WHICHEVER IS GREATER.

② WIDTH - AS MEASURED FROM FRONT TO BACK FACE OF BLOCK UNIT.

③ MAXIMUM DISTANCE FROM TOP OF WALL TO FIRST REINFORCEMENT LAYER. UNREINFORCED WALLS ARE NOT INCLUDED IN THIS STANDARD BUT MAY BE CONSTRUCTED UP TO AT LEAST THE HEIGHT GIVEN IN THE TABLE FOR A GIVEN NOMINAL BLOCK WIDTH AND THE SPECIFIED FILL MATERIALS CONTAINED IN THIS STANDARD.

④ PAY LIMITS OF STRUCTURAL EXCAVATION. ACTUAL EXCAVATION SLOPE IS DETERMINED BY OSHA REGULATIONS AND IN-SITU SOILS; EXCAVATION BEYOND "LIMITS OF STRUCTURAL EXCAVATION" AT CONTRACTOR'S EXPENSE.

⑤ THE WRAP LENGTH FOR GEOTEXTILE FABRIC SHALL NOT BE MORE THAN 6".

⑥ INSPECT EXCAVATION SLOPES FOR ACTIVE SEEPAGE AND PLACE ADDITIONAL DRAINS WHERE SEEPAGE OCCURS AS DIRECTED BY THE ENGINEER.

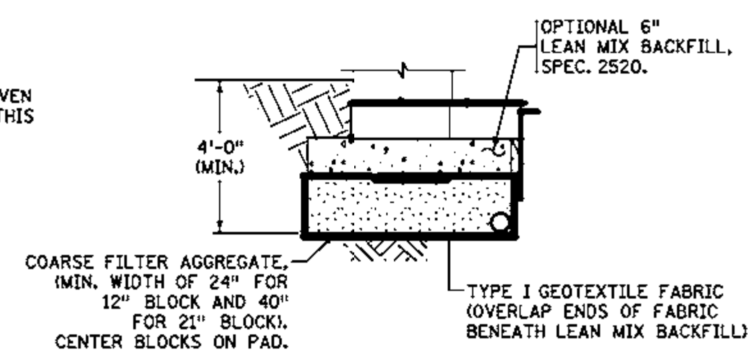
⑦ PLACE DRAIN AT BOTTOM OF REINFORCED SOIL IF PIPE CAN BE SLOPED TO OUTLET. DO NOT OUTLET ONTO A SIDEWALK.

⑧ IF PIPE AT THIS ELEVATION CANNOT BE SLOPED TO DRAIN, OMIT DRAIN AND USE "CONCRETE PAD WITHOUT DRAIN" DETAIL.

⑨ 4" THERMOPLASTIC PERFORATED PIPE, SPEC. 3245, WRAP WITH TYPE I GEOTEXTILE, SPEC. 3733 (TYP.) INSTALLATION AS PER SPEC. 2502, WITH PRECAST CONCRETE HEAD WALL AT OUTLET.

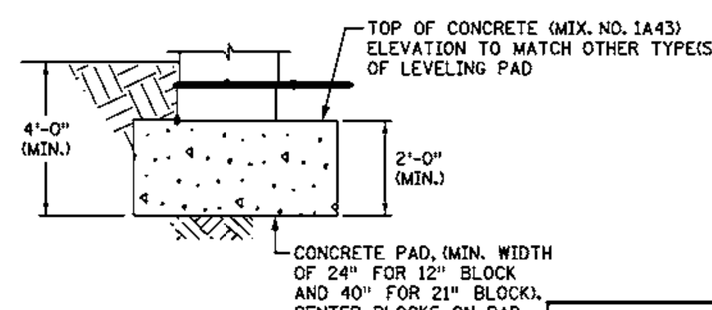
⑩ S_{MAX} = 0.5 $S1_{MAX}$ IF THE WALL HEIGHT IS WITHIN ZONE 1.
S_{MAX} = 0.5 $S2_{MAX}$ IF THE WALL HEIGHT IS WITHIN ZONE 2.
S_{MAX} = 0.5 $S3_{MAX}$ IF THE WALL HEIGHT IS WITHIN ZONE 3.

⑪ THE REINFORCED WALL FILL DRAIN MAY BE CONNECTED INTO FOOTING DRAIN, INSTEAD OF OUT LETTING THROUGH THE WALL, IF CAPACITY IS ADEQUATE TO TRANSMIT THE FLOW.



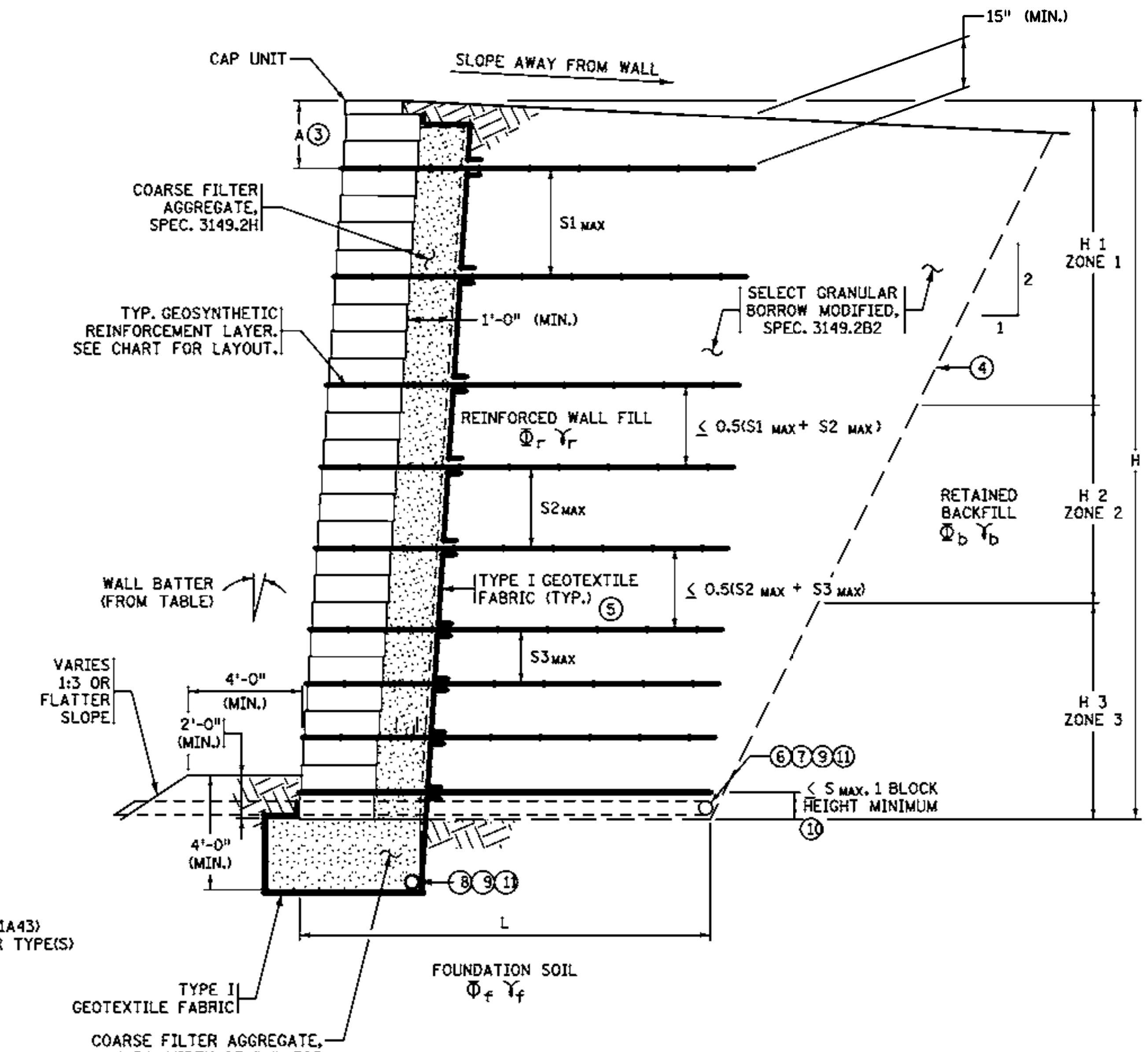
OPTIONAL CONCRETE LEVELING PAD

NOT TO SCALE



CONCRETE PAD WITHOUT DRAIN

NOT TO SCALE



TYPICAL SECTION

CASE 1

NOT TO SCALE

REVISION:

APPROVED: 8-6-2014

DIRECTOR, OFFICE OF MATERIALS AND ROAD RESEARCH

REVISED:

APPROVED:

STATE DESIGN ENGINEER

8-6-2014

MODULAR BLOCK RETAINING WALL

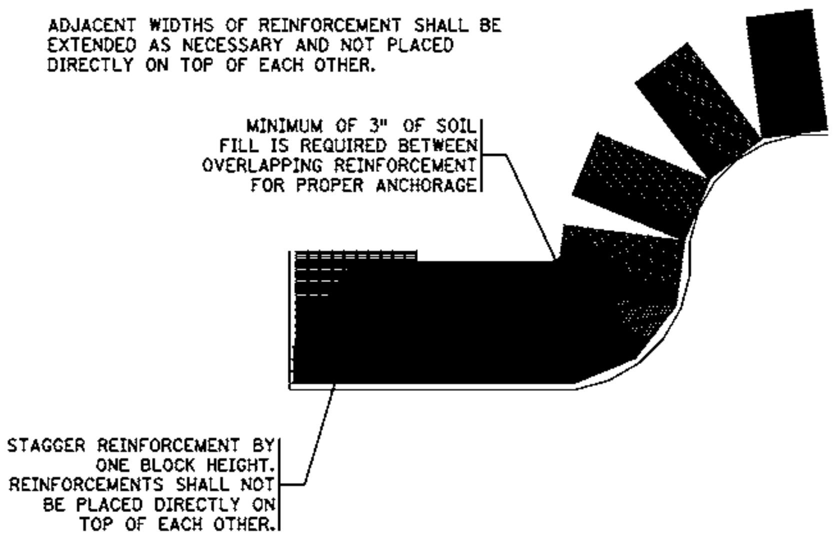
SOIL REINFORCEMENT FOR LEVEL FILL, CASE 1

STANDARD PLAN 5-297.641 | 1 OF 1

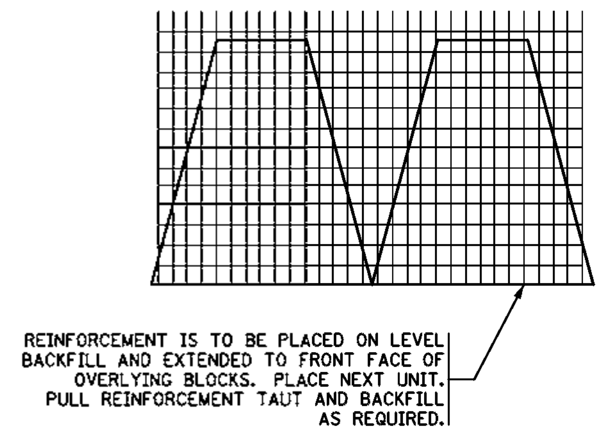
NOTES:

CORRECT ORIENTATION OF GEOSYNTHETIC TO OBTAIN PROPER STRENGTH SHALL BE DETAILED ON CONTRACTOR DRAWINGS.

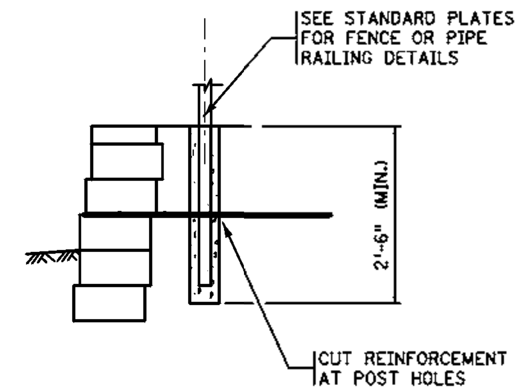
ADJACENT WIDTHS OF REINFORCEMENT SHALL BE EXTENDED AS NECESSARY AND NOT PLACED DIRECTLY ON TOP OF EACH OTHER.



REINFORCEMENT PLACEMENT AROUND CURVES AND CORNERS

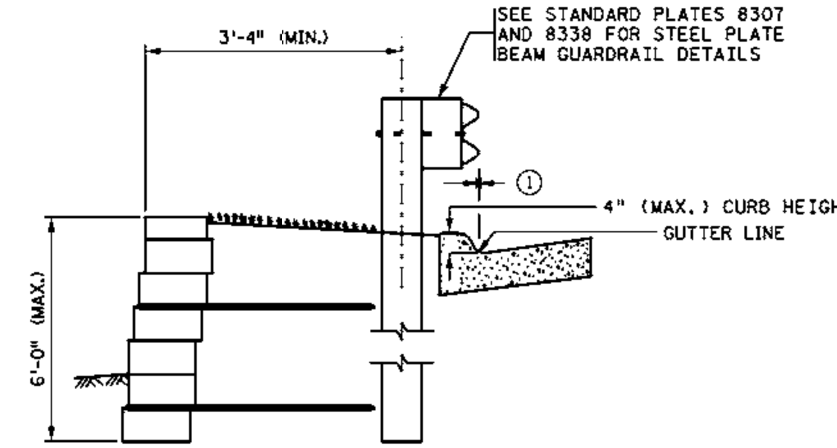


REINFORCEMENT PLACEMENT BETWEEN BLOCK UNITS

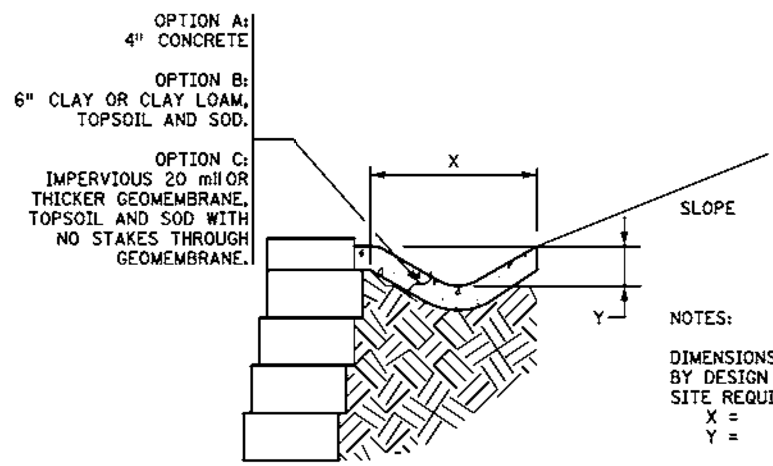


POST DETAIL

TYPICAL HANDRAIL AND/OR FENCE POST



STEEL PLATE BEAM GUARDRAIL DETAIL 1

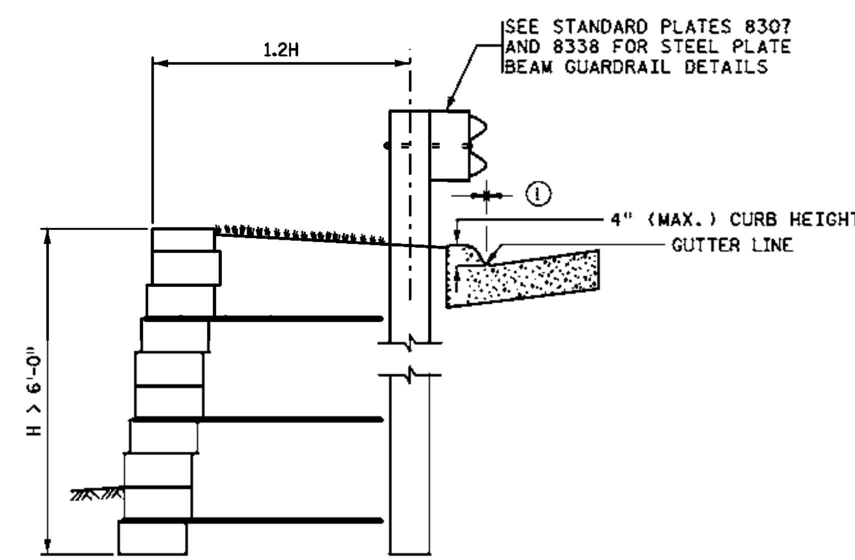


NOTES:

DIMENSIONS TO BE DETERMINED BY DESIGN ENGINEER BASED ON SITE REQUIREMENTS.
X =
Y =

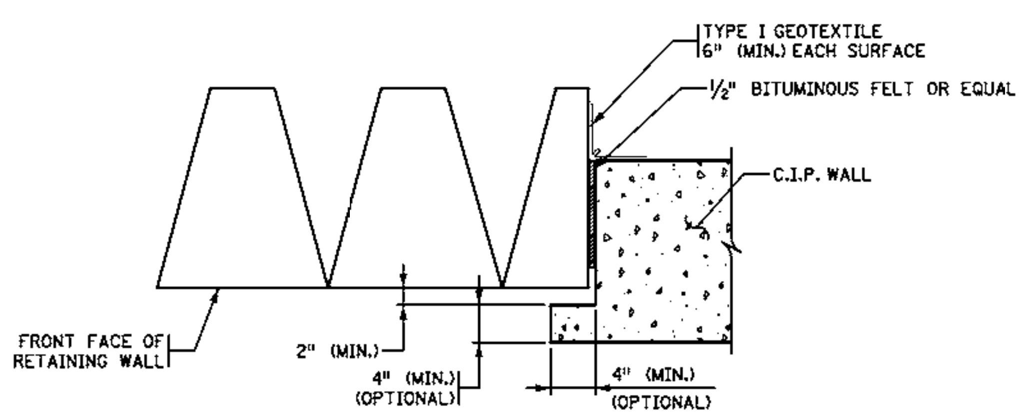
SEE PLAN VIEW FOR SURFACE DRAINAGE PATTERNS.

TYPICAL DRAIN SWALE DETAIL



STEEL PLATE BEAM GUARDRAIL DETAIL 2

(AADT SHALL BE LESS THAN 5000)
STEEL PLATE BEAM GUARDRAIL SHOWN.



CONNECTION DETAIL AT JUNCTURE OF MSEW AND C.I.P. STRUCTURE

NOTES:

① USE CAUTION WHEN PLACING CURB WITH GUARDRAIL. CURBS ADVERSELY AFFECT THE PERFORMANCE OF THE GUARDRAIL.
GENERALLY PLACE CURB DIRECTLY BELOW GUARDRAIL. SEE PLANS OR REFER TO STANDARD PLAN 5-297.601 (2). FOR CURB LOCATIONS ON NCHRP REPORT NO. 350 APPROVED BRIDGE TRANSITIONS, SEE STANDARD PLANS 5-297.603, .605, .606 ETC..

REVISION:
APPROVED: 8-6-2014
DIRECTOR, OFFICE OF MATERIALS AND ROAD RESEARCH

MINNESOTA DEPARTMENT OF TRANSPORTATION
STATE DESIGN ENGINEER
REVISED:
APPROVED: 8-6-2014

MODULAR BLOCK RETAINING WALL
DETAILS

STANDARD PLAN 5-297.645 | 1 OF 1

STATE PROJ. NO. 002-678-025, 114-020-053

NOTES & GUIDELINES

GENERAL INFORMATION:

1. THE CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN THE DEVICES IN THIS TRAFFIC CONTROL PLAN UNLESS OTHERWISE NOTED.
2. FIELD CONDITIONS MAY REQUIRE MODIFICATIONS OF THIS LAYOUT AS DEEMED NECESSARY BY THE ENGINEER.
3. ALL DISTANCES ARE APPROXIMATE.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY WORK AREAS NEAR TRAFFIC IN ACCORDANCE WITH THE MN MUTCD.
5. AN ANNUAL FALL REVIEW OF ALL TRAFFIC CONTROLS WILL BE MADE TO PREPARE FOR WINTER MAINTENANCE OF THE PROJECT. THIS MAY INCLUDE ADJUSTMENTS OR EXCHANGE OF ONE TRAFFIC CONTROL DEVICE FOR ANOTHER. READJUSTMENTS MAY AGAIN BE REQUIRED IN THE SPRING.
6. IF THE CONTRACTOR DECIDES TO PERFORM THE CONSTRUCTION WORK IN A SEQUENCE OTHER THAN SHOWN IN THIS TRAFFIC CONTROL PLAN THE CONTRACTOR SHALL PROVIDE COMPLETE REVISED TRAFFIC CONTROL PLANS TO BE APPROVED BY THE ENGINEER.

SIGNING:

1. ALL TRAFFIC CONTROL DEVICES, INCLUDING OVERHEAD SIGNS ON ROADS OPEN TO TRAFFIC THAT ARE NOT CONSISTENT WITH TRAFFIC OPERATION SHALL BE COVERED, REMOVED OR REVISED AS DIRECTED BY THE ENGINEER.
2. WHEN SIGNS ARE PLACED, THEY SHALL BE MOUNTED ON POSTS DRIVEN INTO THE GROUND AT THE PROPER HEIGHT AND LATERAL OFFSET AS SHOWN IN THE TYPICAL TEMP SIGN FRAMING & INSTALLATION DETAILS IN THE PLAN. IF THIS IS NOT POSSIBLE THEY WILL BE MOUNTED ON PORTABLE SUPPORTS AS APPROVED BY THE ENGINEER. WHEN THE SIGNS ARE REMOVED THE SIGN POSTS SHALL ALSO BE REMOVED AS SOON AS POSSIBLE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY EXTRA SIGNING NEEDED TO FACILITATE TRAFFIC SWITCHES OR FOR TRANSITIONING TRAFFIC FROM ONE STAGE TO ANOTHER.
4. ALL ORANGE WARNING AND ORANGE GUIDE SIGNS SHALL BE FABRICATED WITH SIGN SHEETING MATERIAL AS LISTED ON THE MnDOT APPROVED PRODUCT LIST FOR "SHEETING FOR RIGID TEMPORARY WORK ZONE SIGNS".
5. BARRICADES SHALL BE FABRICATED WITH SIGN SHEETING MATERIAL AS LISTED ON THE MnDOT APPROVED PRODUCT LIST FOR BARRICADE SHEETING.
6. LONGITUDINAL DROPOFFS SHALL BE SIGNED AS SHOWN IN THE "TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS" FIELD MANUAL UNLESS OTHERWISE SPECIFIED IN THESE PLANS.
7. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE FINAL SIGNS TO ASSURE THAT THE FINAL SIGNS ARE PLACED AS NEEDED, OR PROVIDE TEMPORARY SIGNING AT THEIR EXPENSE UNTIL THE FINAL SIGNING IS PLACED.

PAVEMENT MARKING:

1. OBLITERATE ANY CONFLICTING PAVEMENT MARKINGS AS DIRECTED BY THE ENGINEER.
2. PAINT, POLYMER LANE TAPE AND/OR TRPM'S ARE ACCEPTABLE TEMPORARY STRIPING ALTERNATIVES ACCORDING TO ACTUAL CONDITIONS ENCOUNTERED AS DIRECTED BY THE ENGINEER. GENERALLY, ONLY PAINT WILL BE USED BEFORE MAY 1ST OR WHEN THE OTHER MANUFACTURERS' SPECIFICATIONS CAN NOT BE MET.
3. TRPM'S (TEMPORARY RAISED PAVEMENT MARKERS) SHOULD BE USED TO SUPPLEMENT THE LONG TERM (MORE THAN 3 DAYS) EDGELINES ON ALL TRANSITION AREAS WHEN THE CONDITIONS ARE WITHIN THE MANUFACTURERS' SPECIFICATIONS.
4. SEE 1404 IN THE SPECIAL PROVISIONS FOR STRIPING SPOTTING RESPONSIBILITIES.

BARRIER & DELINEATION:

1. TOP MOUNTED BARRIER DELINEATORS WILL HAVE A MINIMUM OF 24 SQ. IN. OF REFLECTIVE SURFACE AREA AND BE PLACED AT 25' SPACES ON TOP OF THE BARRIER WHEN THE BARRIER IS WITHIN 10' OF TRAFFIC UNLESS OTHERWISE NOTED OR AS DIRECTED BY THE ENGINEER. IF THE TRAFFIC ENGINEER REQUIRES SIDE MOUNTED BARRIER DELINEATORS, THEY WILL HAVE A MINIMUM OF 12 SQ. IN. OF REFLECTIVE SURFACE AREA AND BE PLACED AT 25' SPACES. IF A SMALLER APPROVED BARRIER DELINEATOR IS USED IT SHALL BE AT ONE HALF THE SPACING.

CONSTRUCTION INFORMATION SIGNING:

1. THE CONTRACTOR SHALL USE CONSTRUCTION INFORMATION SIGNING AS SHOWN IN THE PLAN AND WHICH ARE TO BE USED AS FOLLOWS:

   G20-X2 WORK ZONE ADVANCE NOTICE SIGNS WITH THE CORRECT STARTING DATE DISPLAYED BEFORE WORK BEGINS. ONCE WORK BEGINS, THE START DATE LEGEND SHALL BE COVERED BY THE SUGGESTED PLAQUE CONTAINED IN THIS PLAN. IF NO ALTERNATE MESSAGE IS SUGGESTED OR IF DIRECTED BY THE PROJECT ENGINEER, THE CORRECT ESTIMATED FINISH DATE, MONTH, OR SEASON SHALL BE DISPLAYED.

   CONSTRUCTION INFORMATION SIGNING NOT VISIBLE TO THE MOTORING PUBLIC ONCE WORK BEGINS WILL BE MOVED BY THE CONTRACTOR TO A SITE IN ADVANCE OF THE WORK ZONE OR CLOSURE AS DIRECTED BY THE PLAN OR PROJECT ENGINEER.

TRAFFIC CONTROL DEVICES & SYMBOLS LEGEND

SYMBOL	DESCRIPTION
	AREA CLOSED TO TRAFFIC / WORK AREA
	TRAFFIC CONTROL SIGN
	TYPE III BARRICADE =
	DRUM-LIKE CHANNELIZER (TYPE B) =
Ⓕ	TYPE A FLASHING WARNING LIGHT
OR	SOLID LINE PAVEMENT MARKING WITH TEMPORARY RAISED PAVEMENT MARKERS AT 10' SPACES
	PORTABLE PRECAST CONC BARRIER DES 8337 WITH DELINEATORS AT 25' SPACES (PPCB)

STRIPING KEY

PAVEMENT MESSAGE (LEFT ARROW)

BROKEN LINE - 50' CYCLE (10' LINE, 40' GAP

DOTTED LINE - 15' CYCLE (3' LINE, 12' GAP, UNLESS SHOWN OTHERWISE IN THE PLAN

CIRCLE - MULTI COMP

PENTAGON - REMOVABLE PREFORMED TAPE

TRIANGLE - PAINT

1ST DIGIT WIDTH	2ND DIGIT PATTERN	3RD DIGIT COLOR
4" OR 8"	S - SOLID	W - WHITE
	B - BROKEN	Y - YELLOW
	D - DASH/DOUBLE	B - BLACK

EXAMPLE: (4SW) = 4" SOLID LINE WHITE - MULTI COMPONENT

INDEX

TRAFFIC CONTROL SHEET NO.	DESCRIPTIONS
57	TITLE SHEET
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60	ADVANCED SIGNING
61	SIGNAL HEAD COVERING DETAILS
62 - 82	LAYOUT SHEETS
83 - 84	TEMPORARY SIGN FRAMING, INSTALLATION, AND COVERING DETAILS
85 -$TC23$	DETAILS

1. ALL TRAFFIC CONTROL DEVICES SHALL CONFIRM TO THE LATEST EDITION OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING THE LATEST FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.
2. THE CONTRACTOR SHALL PROVIDE FLAGGING OPERATIONS AS DIRECTED BY ENGINEER, PER THE "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS", FOR CONSTRUCTION COMPLETED UNDER TRAFFIC. FLAGGING IS CONSIDERED A PART OF THE LUMP SUM BID FOR TRAFFIC CONTROL.

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR ANOKA COUNTY

TRAFFIC CONTROL TABULATION SHEET

"R" SERIES

SIGN	SIGN NO.	COLOR	SIZE
	R3-2	BLACK & RED ON WHITE	24" X 24"
ONLY	R3-5L	BLACK ON WHITE	30" X 36"
	R4-7C	BLACK ON WHITE	18" X 30"
DO NOT ENTER	R5-1	RED ON WHITE	36" X 36"
WRONG WAY	R5-1a	RED ON WHITE	42" X 30"
ONE WAY	R6-1R	BLACK ON WHITE	54" X 18"
SIDEWALK CLOSED	R9-9	BLACK ON WHITE	30" X 18"
SIDEWALK CLOSED USE OTHER SIDE	R9-10	BLACK ON WHITE	48" X 24"
SIDEWALK CLOSED AHEAD CROSS HERE	R9-11L	BLACK ON WHITE	48" X 36"
SIDEWALK CLOSED AHEAD CROSS HERE	R9-11R	BLACK ON WHITE	48" X 36"
LANE CLOSED	R11-2	BLACK ON WHITE	48" X 30"

DEVICES

ITEM	TYPE	COLOR	SIZE
	TYPE C	BLACK ON ORANGE	96" MIN.

"W" SERIES

SIGN	SIGN NO.	COLOR	SIZE
	W1-2R	BLACK ON ORANGE	48" X 48"
	W1-4L	BLACK ON ORANGE	48" X 48"
	W1-4R	BLACK ON ORANGE	48" X 48"
	W1-6	BLACK ON ORANGE	48" X 24"
	W4-2R	BLACK ON ORANGE	48" X 48"
	W4-2L	BLACK ON ORANGE	48" X 48"
	W6-3	BLACK ON ORANGE	48" X 48"
30 MPH	W13-1P	BLACK ON ORANGE	30" X 30"
ROAD WORK AHEAD	W20-1	BLACK ON ORANGE	48" X 48"
ROAD CLOSED AHEAD	W20-3	BLACK ON ORANGE	48" X 48"
MERGE	W20-X3L	BLACK ON ORANGE	48" X 48"
LEFT LANE CLOSED	W21-X5L	BLACK ON ORANGE	48" X 48"
RIGHT LANE CLOSED	W21-X5R	BLACK ON ORANGE	48" X 48"

"G" SERIES

SIGN	SIGN NO.	COLOR	SIZE
END ROAD WORK	G20-2A	BLACK ON ORANGE	48" X 24"
78 ROAD WORK Main Street NW TO Northdale Blvd NW BEGINS XXXX XX	G20-X2	BLACK ON ORANGE	132" X 108"
78 ROAD WORK Northdale Blvd NW TO Main Street NW BEGINS XXXX XX	G20-X2	BLACK ON ORANGE	132" X 108"
TURN LANE	G20-X9	BLACK ON ORANGE	30" X 36"

(X) TRAFFIC CONTROL TABULATION

	ITEM	UNIT	TOTAL
	TRAFFIC CONTROL	LUMP SUM	1
	PORTABLE PRECAST CONCRETE BARRIER DES 8337	LIN FT	500
	RELOCATE PORTABLE PRECAST CONCRETE BARRIER DES 8337	LIN FT	3500
	PORTABLE CONCRETE BARRIER DELINEATOR	EACH	20
(1)	RAISED PAVEMENT MARKER TEMPORARY	EACH	451

SPECIFIC NOTES

(1) 349 ARE YELLOW AND 102 ARE WHITE.

NO	DATE	BY	CKD	APPR	REVISION

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CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN TABULATION

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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CONSTRUCTION NARRATIVE

STAGE 0:

TRAFFIC:

HANSON BLVD

REDUCE NORTHBOUND TRAFFIC FROM THREE THROUGH LANES TO TWO THROUGH LANES FROM ROBINSON DR NW TO SPUI.
CARRY TWO THROUGH LANES FROM SPUI TO NORTHDALE BLVD NW. TAPER FROM TWO THROUGH LANES TO A SINGLE THROUGH LANE ON THE EAST SIDE OF HANSON BLVD BEFORE THE WORK ZONE BEGINS.
TAPER SOUTHBOUND TRAFFIC FROM TWO THROUGH LANES TO A SINGLE THROUGH LANE FROM 127TH AVE NW TO MAIN STREET.
CARRY THE SINGLE THROUGH LANE ON THE WEST SIDE OF HANSON BLVD WITHIN THE PROJECT LIMITS.

GATEWAY DR

CLOSE THE LEFT MOST LEFT TURN LANE.

CONSTRUCTION ACTIVITIES:

REMOVE MEDIANS WITHIN THE PROJECT LIMITS AND PLACE TEMPORARY PAVEMENT OVER REMOVED CENTER MEDIANS.

LOWER, COVER, AND PLATE HAND HOLES IN THE HANSON BOULEVARD MEDIAN (#5, 12, & 13). THE HANDHOLES AND CONDUIT MUST REMAIN FUNCTIONAL PRIOR TO THEIR REPLACEMENT IN STAGE 3.

STAGE 1:

TRAFFIC:

HANSON BLVD

REDUCE NORTHBOUND TRAFFIC FROM THREE THROUGH LANES TO TWO THROUGH LANES FROM ROBINSON DR NW TO SPUI.
CARRY TWO THROUGH LANES FROM SPUI TO NORTHDALE BLVD NW. TAPER FROM TWO THROUGH LANES TO A SINGLE THROUGH LANE ON THE EAST SIDE OF HANSON BLVD BEFORE THE WORK ZONE BEGINS.
TAPER SOUTHBOUND TRAFFIC FROM TWO THROUGH LANES TO A SINGLE THROUGH LANE FROM 127TH AVE NW TO MAIN STREET.
CROSS OVER THE SINGLE THROUGH LANE TO THE EAST SIDE OF HANSON BLVD WITHIN THE PROJECT LIMITS.

PEDESTRIANS:

HANSON BLVD

NORTH-SOUTH PEDESTRIAN TRAFFIC ON THE WEST SIDE OF HANSON BLVD IS DETOURED TOWARDS THE EAST SIDE OF HANSON BLVD WITHIN THE CONSTRUCTION ZONE. PROVIDE TEMPORARY ACCESS ROUTE FOR PEDESTRIAN TRAFFIC WITHIN THE CONSTRUCTION LIMITS.

CONSTRUCTION ACTIVITIES:

CONSTRUCT WEST SIDE OF ROADWAY, INCLUDING CURB AND GUTTER, STORM SEWER, AND CATCH BASINS.
INSTALL PROPOSED SIGNAL EQUIPMENT.

SUB STAGE THE CONSTRUCTION OF LOCAL STREETS AND DRIVEWAYS. MAINTAIN ACCESS TO AND FROM SIDE STREETS AND DRIVEWAYS AT ALL TIMES.

STAGE 2:

TRAFFIC

HANSON BLVD

REDUCE NORTHBOUND TRAFFIC FROM THREE THROUGH LANES TO TWO THROUGH LANES FROM ROBINSON DR NW TO SPUI.
CARRY TWO THROUGH LANES FROM SPUI TO NORTHDALE BLVD NW. TAPER FROM TWO THROUGH LANES TO A SINGLE THROUGH LANE AND CROSS OVER TO THE WEST SIDE OF HANSON BLVD WITHIN THE PROJECT LIMITS.
TAPER SOUTHBOUND TRAFFIC FROM TWO THROUGH LANES TO A SINGLE THROUGH LANE FROM 127TH AVE NW TO MAIN STREET.
CARRY THE SINGLE THROUGH LANE ON THE WEST SIDE OF HANSON BLVD WITHIN THE PROJECT LIMITS.

GATEWAY DR

CLOSE THE RIGHT MOST LEFT TURN LANE.

PEDESTRIANS:

HANSON BLVD

NORTH-SOUTH PEDESTRIAN TRAFFIC ON THE EAST SIDE OF HANSON BLVD IS DETOURED TOWARDS THE WEST SIDE OF HANSON BLVD WITHIN THE CONSTRCUTION ZONE. PROVIDE TEMPORARY ACCESS ROUTE FOR PEDESTRIAN TRAFFIC WITHIN THE CONSTRUCTION LIMITS.

CONSTRUCTION ACTIVITIES:

CONSTRUCT EAST SIDE OF ROADWAY, INCLUDING CURB AND GUTTER, STORM SEWER, AND CATCH BASINS.
INSTALL REMAINING PROPOSED SIGNAL EQUIPMENT NOT INSTALLED IN STAGE 1.

SUB STAGE THE CONSTRUCTION OF LOCAL STREETS AND DRIVEWAYS. MAINTAIN ACCESS TO AND FROM SIDE STREETS AND DRIVEWAYS AT ALL TIMES.

LOWER, COVER, AND PLATE HAND HOLES IN THE NORTHDALE BOULEVARD (#6, 7, 8, 9, & 10). THE HANDHOLES AND CONDUIT MUST REMAIN FUNCTIONAL PRIOR TO THEIR REPLACEMENT AT THE END OF STAGE 2. INSTALL HH #6, 7, 8, 9, & 10 DURING THE SAME WORKING DAY SAID HH'S ARE REMOVED.

STAGE 3:

TRAFFIC:

HANSON BLVD

REDUCE NORTHBOUND TRAFFIC FROM THREE THROUGH LANES TO TWO THROUGH LANES FROM ROBINSON DR NW TO SPUI.
CARRY TWO THROUGH LANES FROM SPUI TO NORTHDALE BLVD NW. TAPER FROM TWO THROUGH LANES TO A SINGLE THROUGH LANE ON THE EAST SIDE OF HANSON BLVD BEFORE THE WORK ZONE BEGINS.
TAPER SOUTHBOUND TRAFFIC FROM TWO THROUGH LANES TO A SINGLE THROUGH LANE FROM 127TH AVE NW TO MAIN STREET.
CARRY THE SINGLE THROUGH LANE TO THE WEST SIDE OF HANSON BLVD WITHIN THE PROJECT LIMITS.

GATEWAY DR

CLOSE THE LEFT MOST LEFT TURN LANE.

CONSTRUCTION ACTIVITIES:

CONSTRUCT REMAINING STORM SEWER, CENTER MEDIANS. COMPLETE REMAINING GRADING AND BASE COURSE PAVING.

INSTALL HH #5, 12, 13 DURING THE SAME WORKING DAY SAID HH'S ARE REMOVED.

STAGE 4 (NOT SHOWN IN PLAN):

TRAFFIC:

HANSON BLVD

ALTERNATE LANE CLOSURES TO FACILITATE A MINIMUM OF ONE LANE OF TRAFFIC IN EACH DIRECTION AT ALL TIMES.

CONSTRUCTION ACTIVITIES:

COMPLETE FINAL PAVING, INSTALL ALL PERMANENT PAVEMENT MARKINGS, AND COMPLETE MISCELLANEOUS REMAINING CONSTRUCTION ITEMS.

NO	DATE	BY	CKD	APPR	REVISION

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CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

CONSTRUCTION NARRATIVE

SHEET NO. 59 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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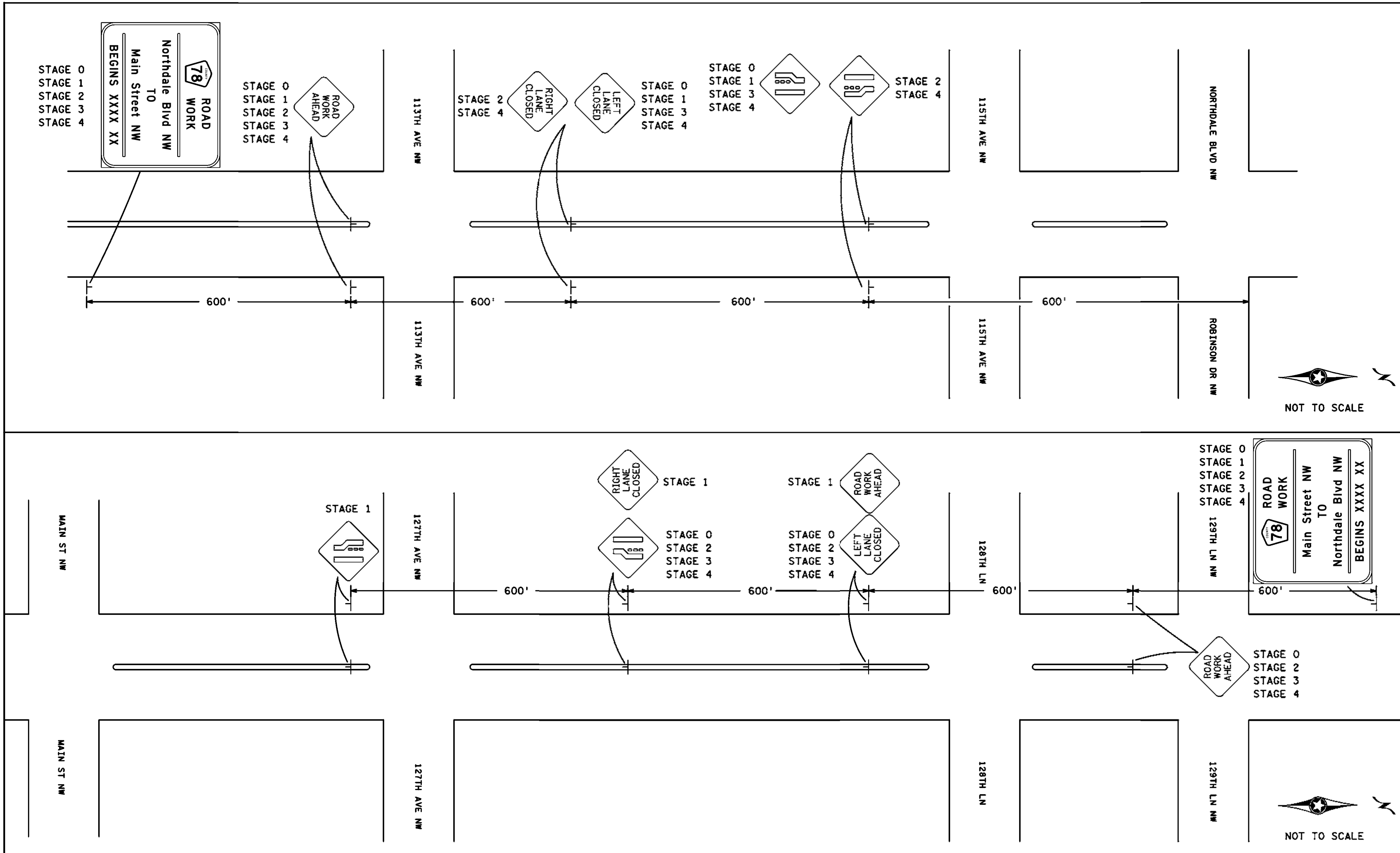

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DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

ADVANCED SIGNING

SHEET NO. 60 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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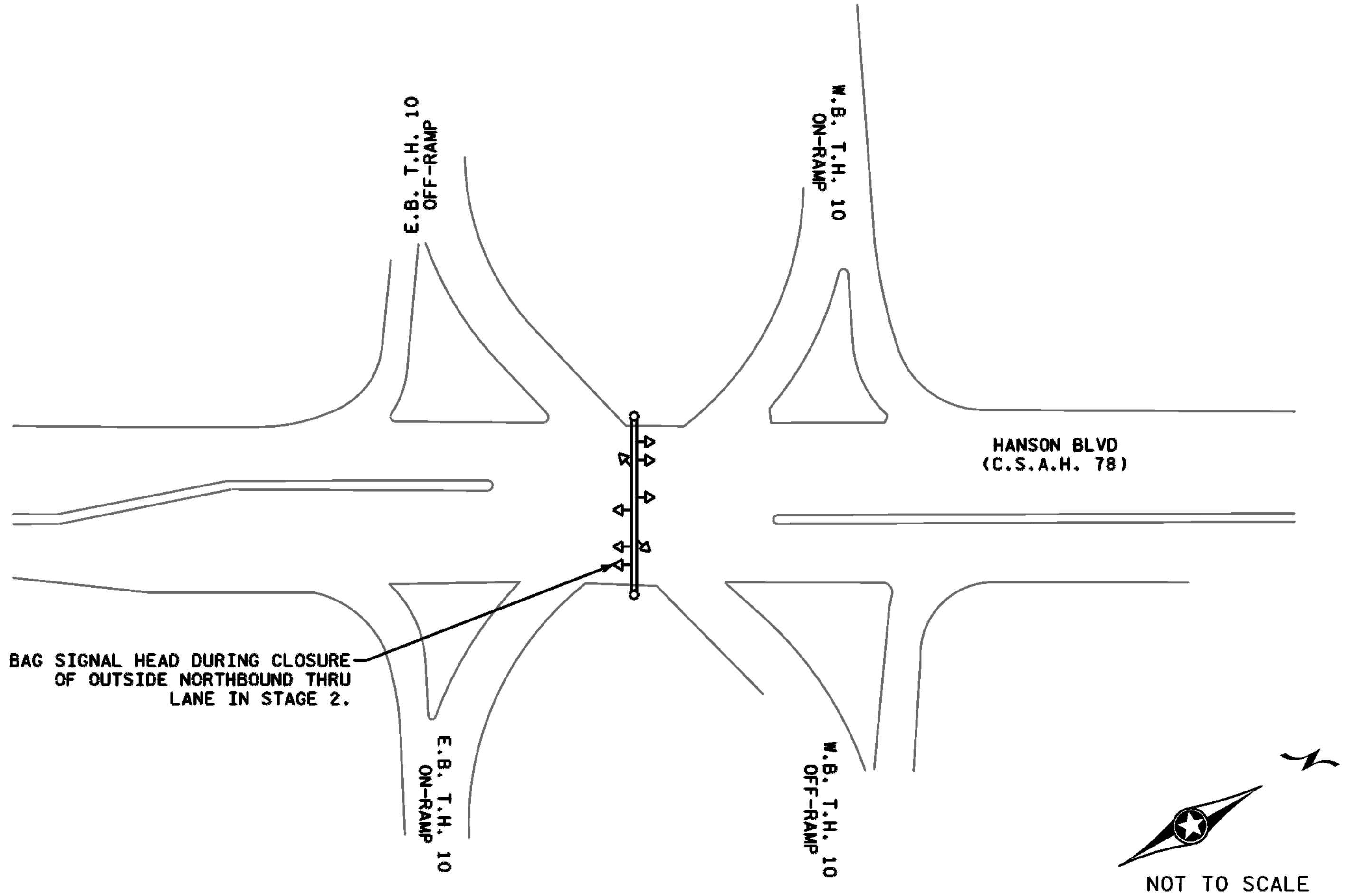

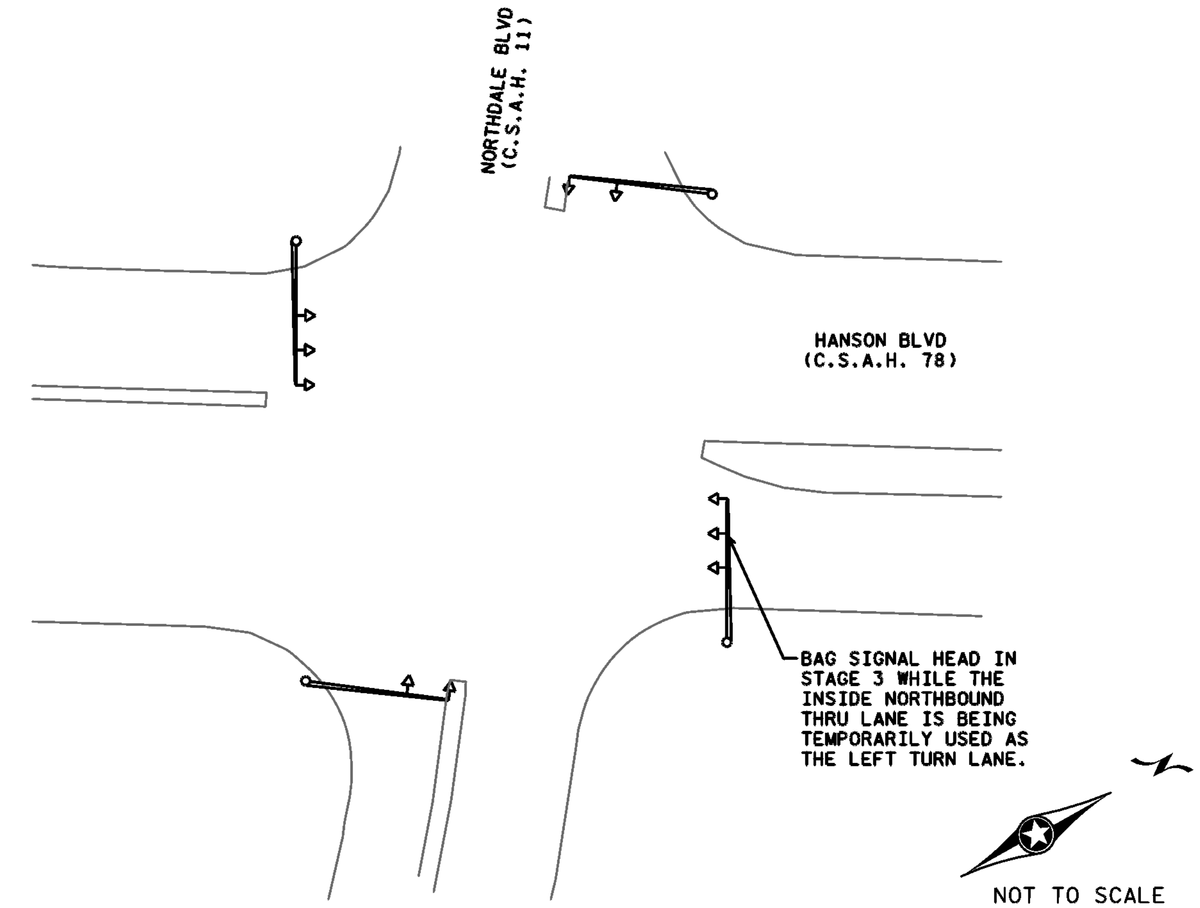

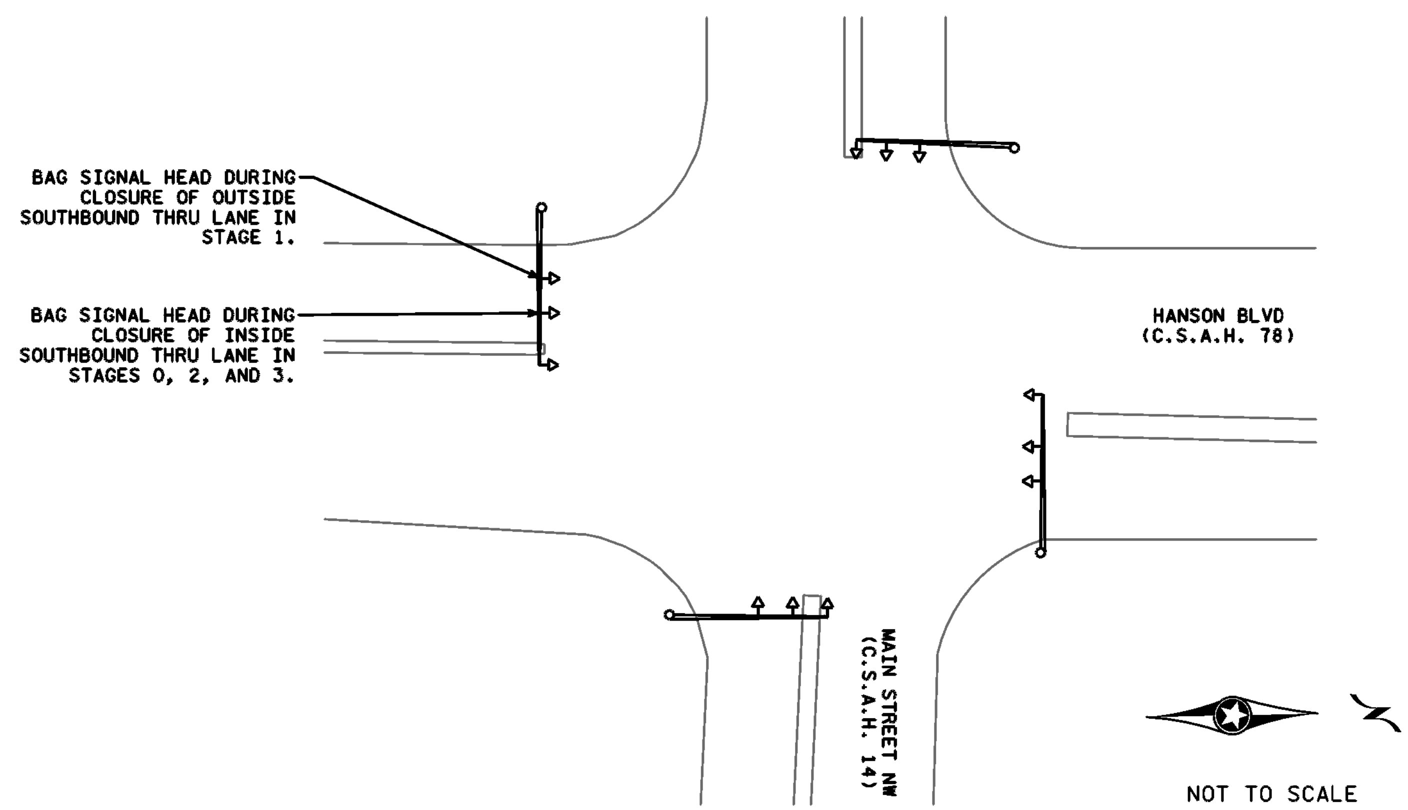

GENERAL NOTES

CONTRACTOR TO VERIFY LOOP DETECTION IS OFF IN LANES CORRESPONDING TO ANY BAGGED SIGNAL HEADS.

NO	DATE	BY	CKD	APPR	REVISION

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HDR ANOKA COUNTY

SIGNAL HEAD COVERING DETAIL

SHEET NO. 61 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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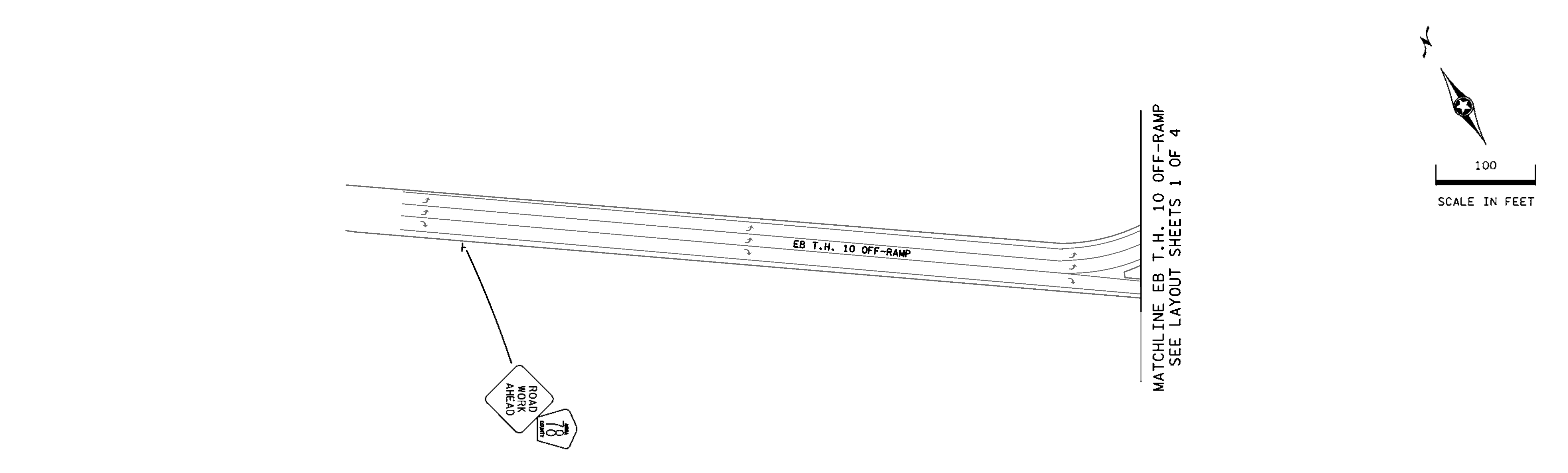

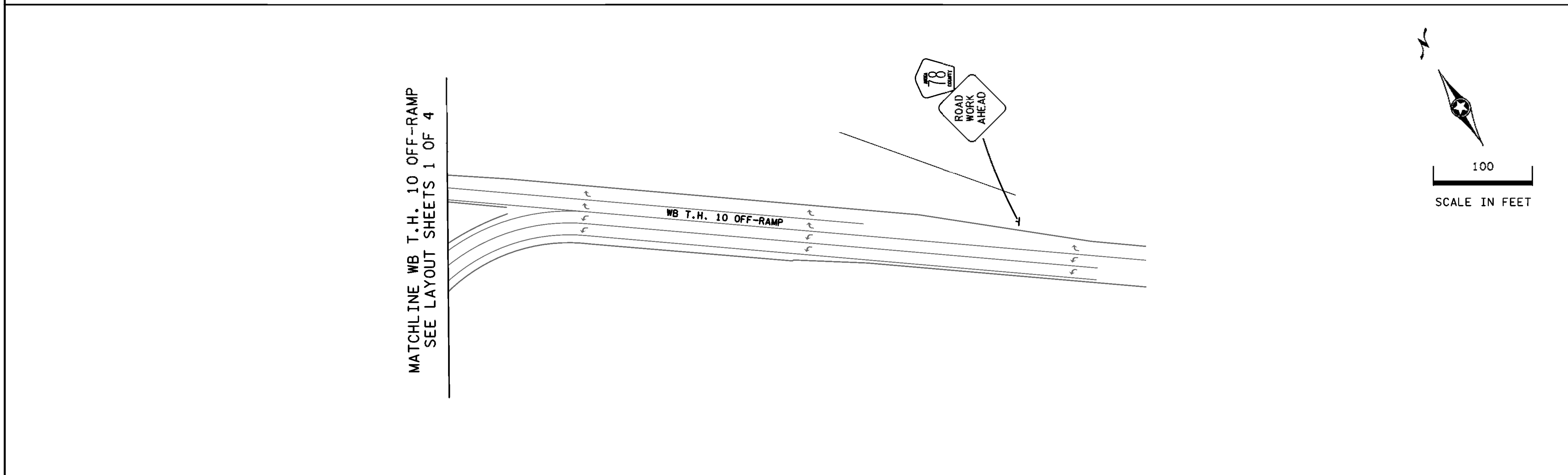

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HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 62 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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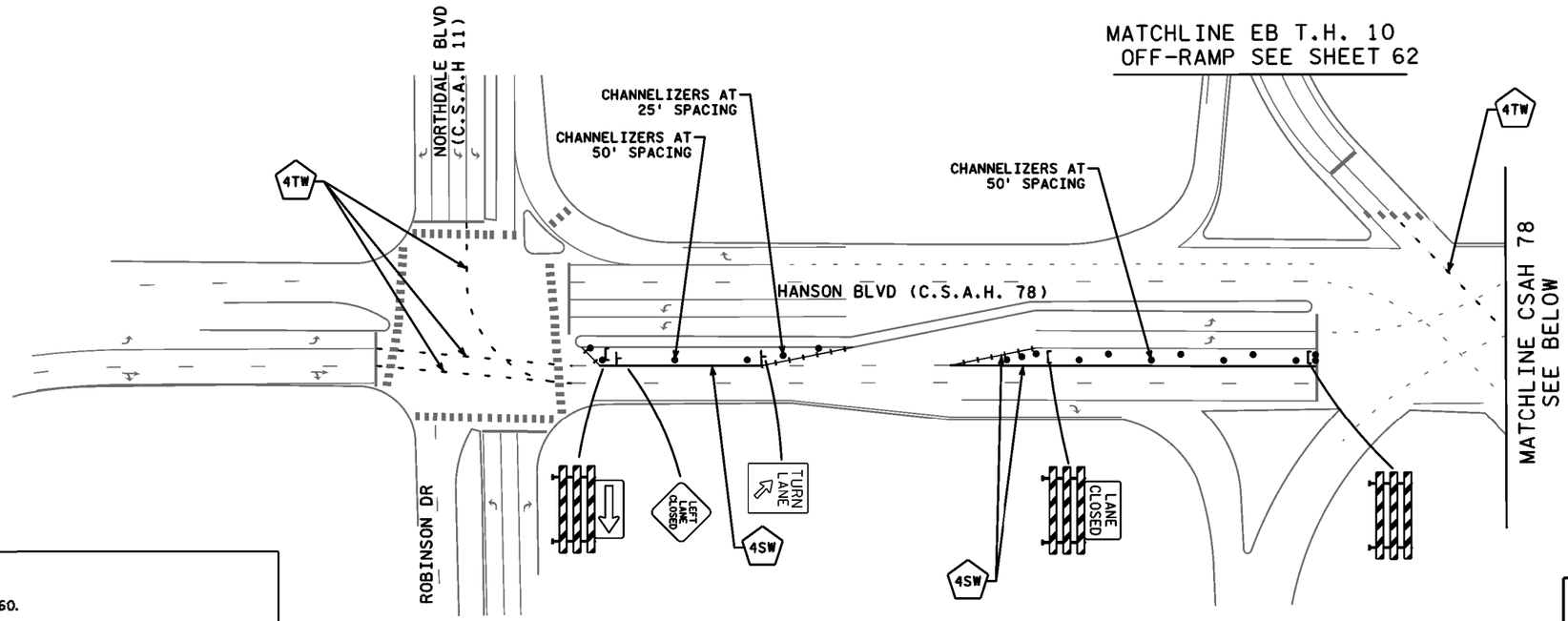

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SCALE IN FEET

GENERAL NOTES

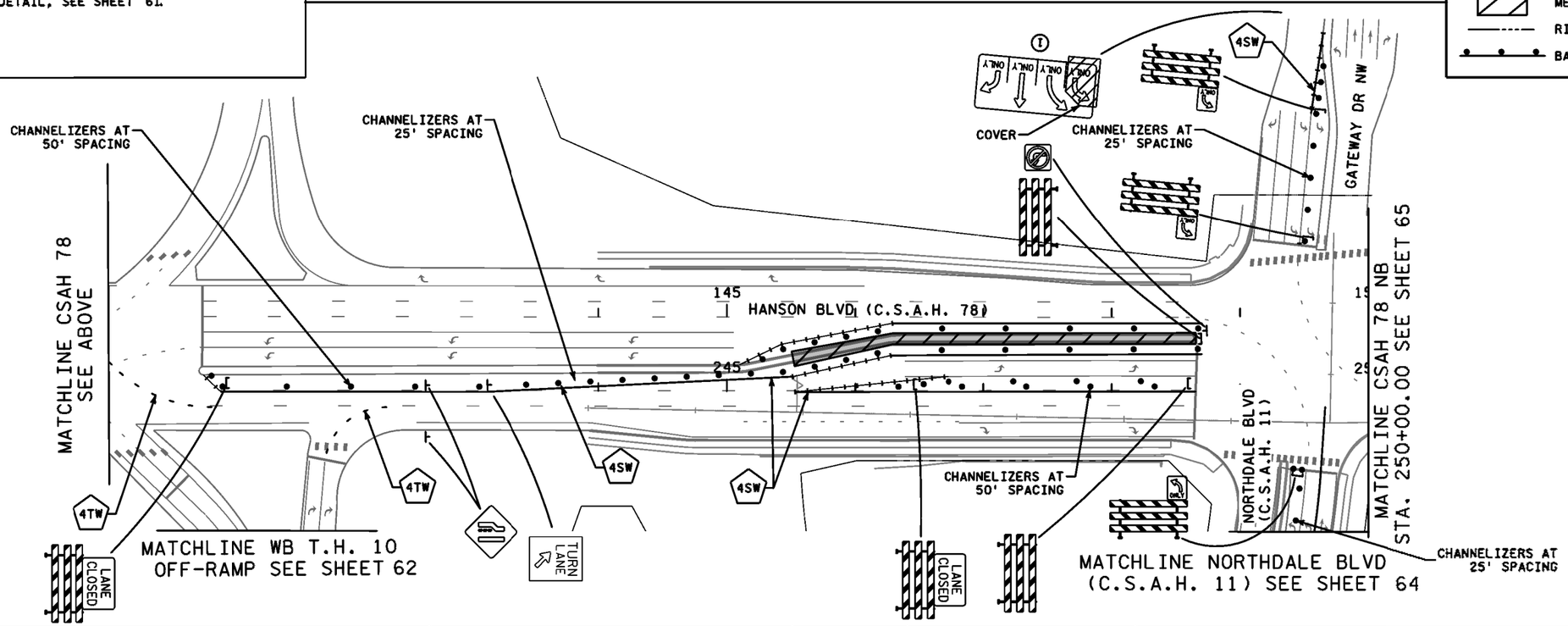
1. FOR ADVANCED SIGNING, SEE SHEET 60.
2. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.
3. FOR SIGNAL HEAD COVERING DETAIL, SEE SHEET 61.

SPECIFIC NOTES

(1) EXISTING SIGN, COVER AS SHOWN

LEGEND

- WORK ZONE
- MEDIAN REMOVAL
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER



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SCALE IN FEET

STAGE 0 - SHEET 1 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 63 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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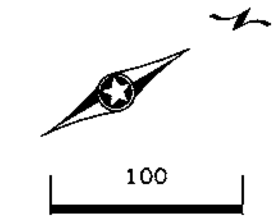

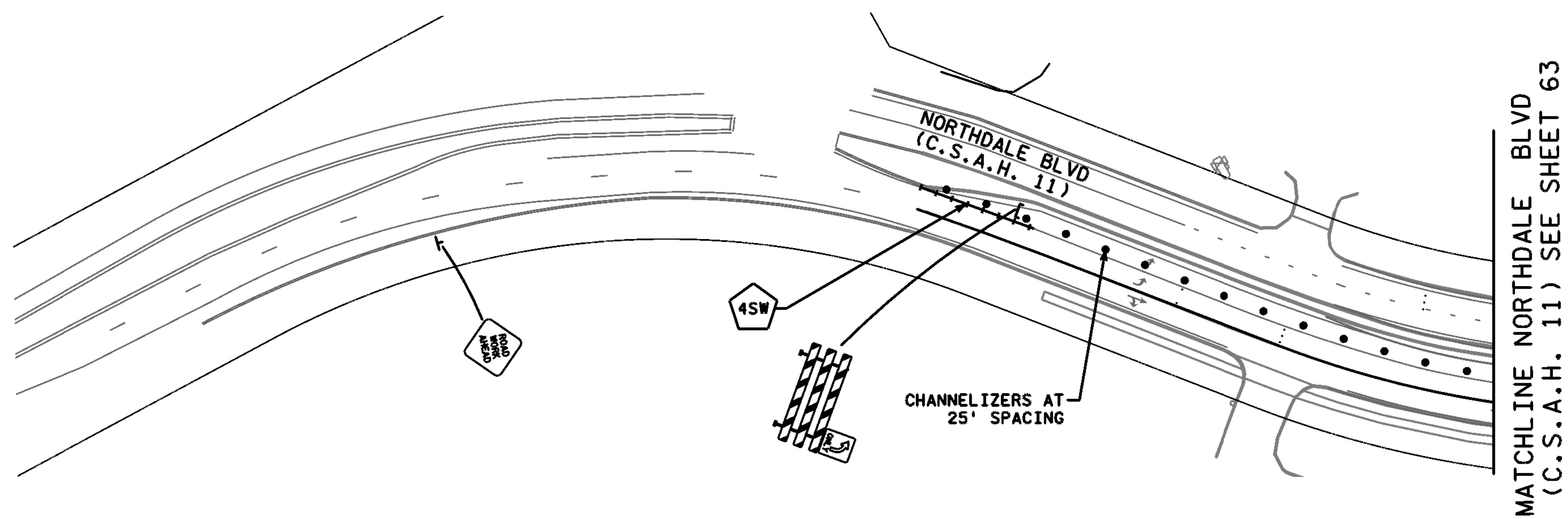

LEGEND

- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER

GENERAL NOTES

1. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.

STAGE 0 - SHEET 2 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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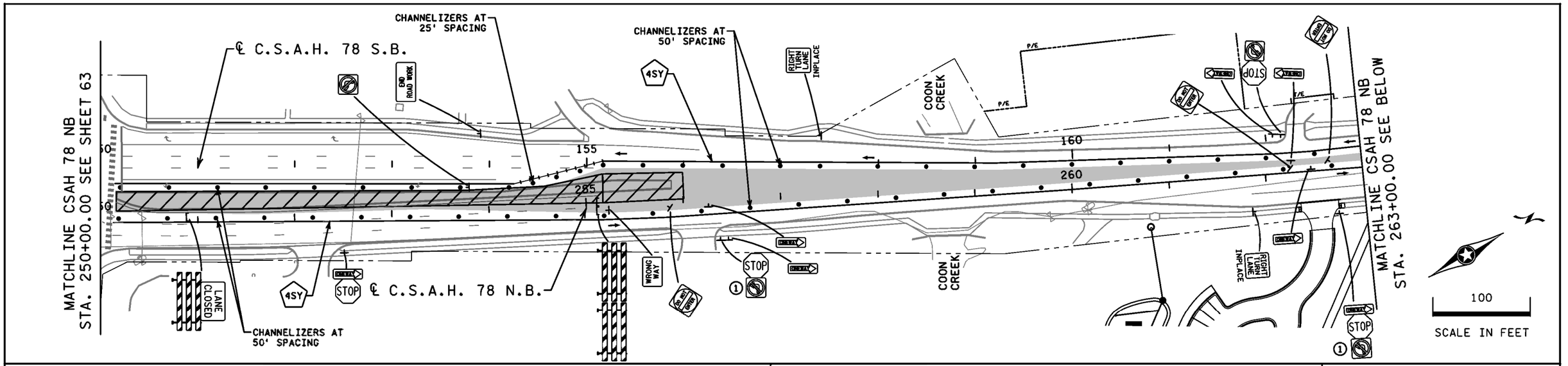
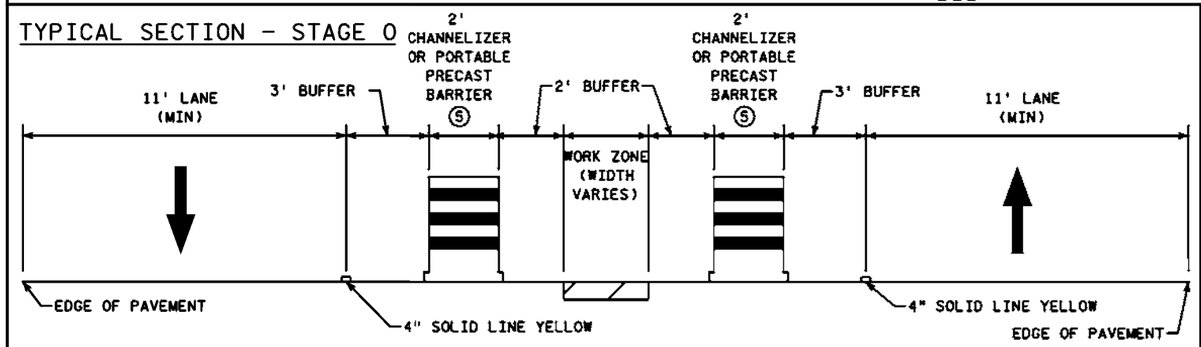


TYPICAL SECTION - STAGE 0



SPECIFIC NOTES

① MOUNT TO EXISTING STOP SIGN ASSEMBLY. PLACE A W20-1 SIGN 100' IN ADVANCE.

② MAINTAIN SIDE STREET MOVEMENTS DURING THIS STAGE.

③ PLACE A W3-1 100 FT IN ADVANCE OF THIS SIGN. PLACE A W20-1 SIGN 325' IN ADVANCE OF THE W3-1.

④ REMOVE PORK CHOP ISLAND AND SIGNAL EQUIPMENT UNDER TRAFFIC AND COVER WITH TEMPORARY PAVEMENT PRIOR TO BEGINNING OF STAGE 0.

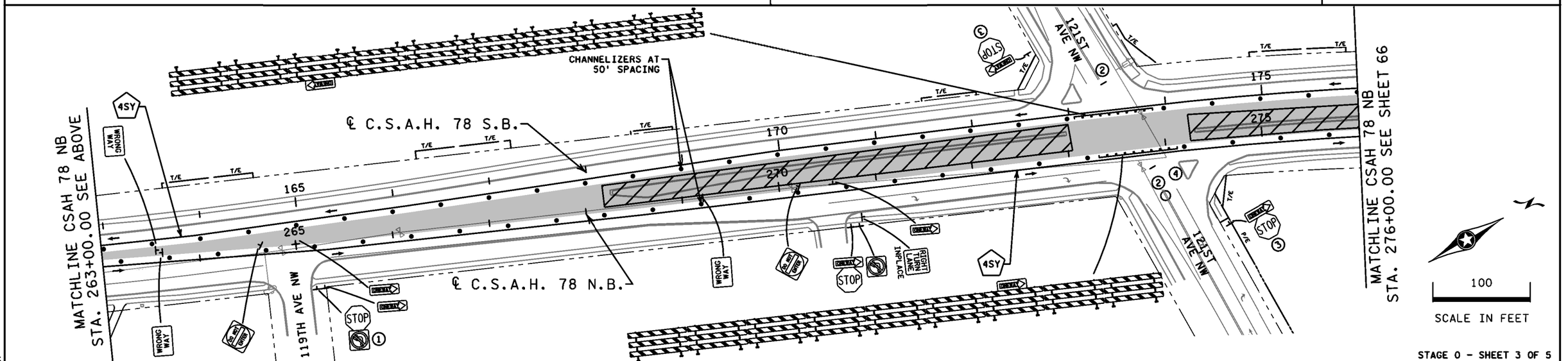
⑤ SEE MNMUTCD CHAPTER 6 LOGITUDINAL DROP-OFF GUIDELINES FOR PORTABLE PRECAST CONCRETE BARRIER REQUIREMENTS.

GENERAL NOTES

1. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.

LEGEND

- WORK ZONE
- MEDIAN REMOVAL
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER
- GENERAL TRAFFIC FLOW 11' MIN. LANE WIDTH SEE TYPICAL SECTION



STAGE 0 - SHEET 3 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT
SHEET NO. 65 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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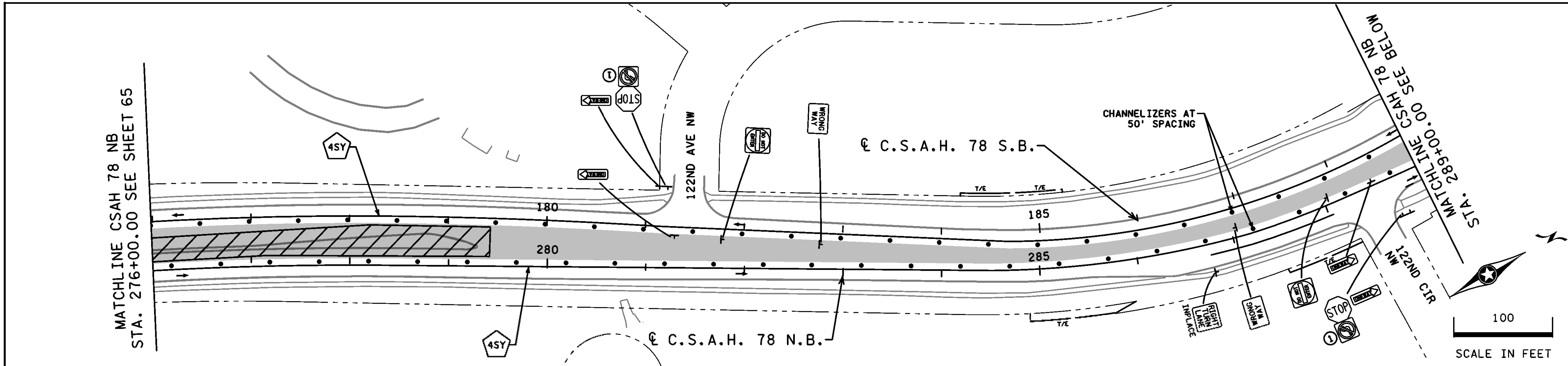
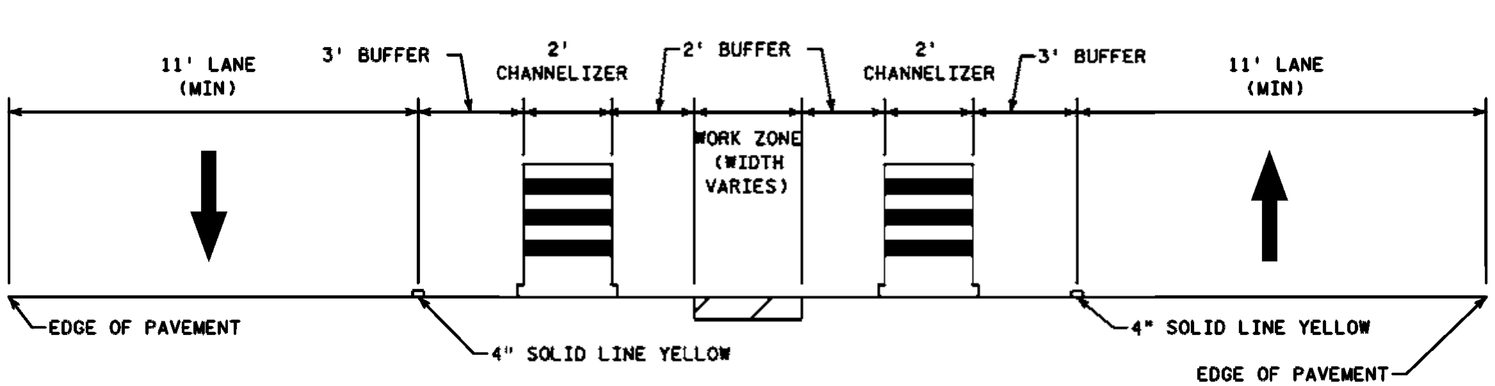


TYPICAL SECTION - STAGE 0

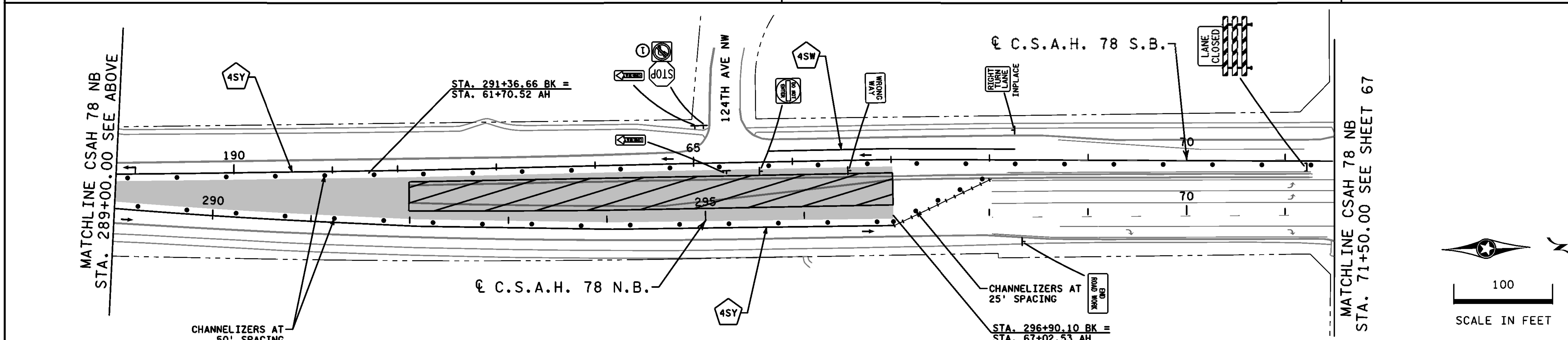


SPECIFIC NOTES

① MOUNT TO EXISTING STOP SIGN ASSEMBLY. PLACE A W20-1 SIGN 100' IN ADVANCE.

LEGEND

- WORK ZONE
- MEDIAN REMOVAL
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER
- GENERAL TRAFFIC FLOW 11' MIN. LANE WIDTH SEE TYPICAL SECTION



STAGE 0 - SHEET 4 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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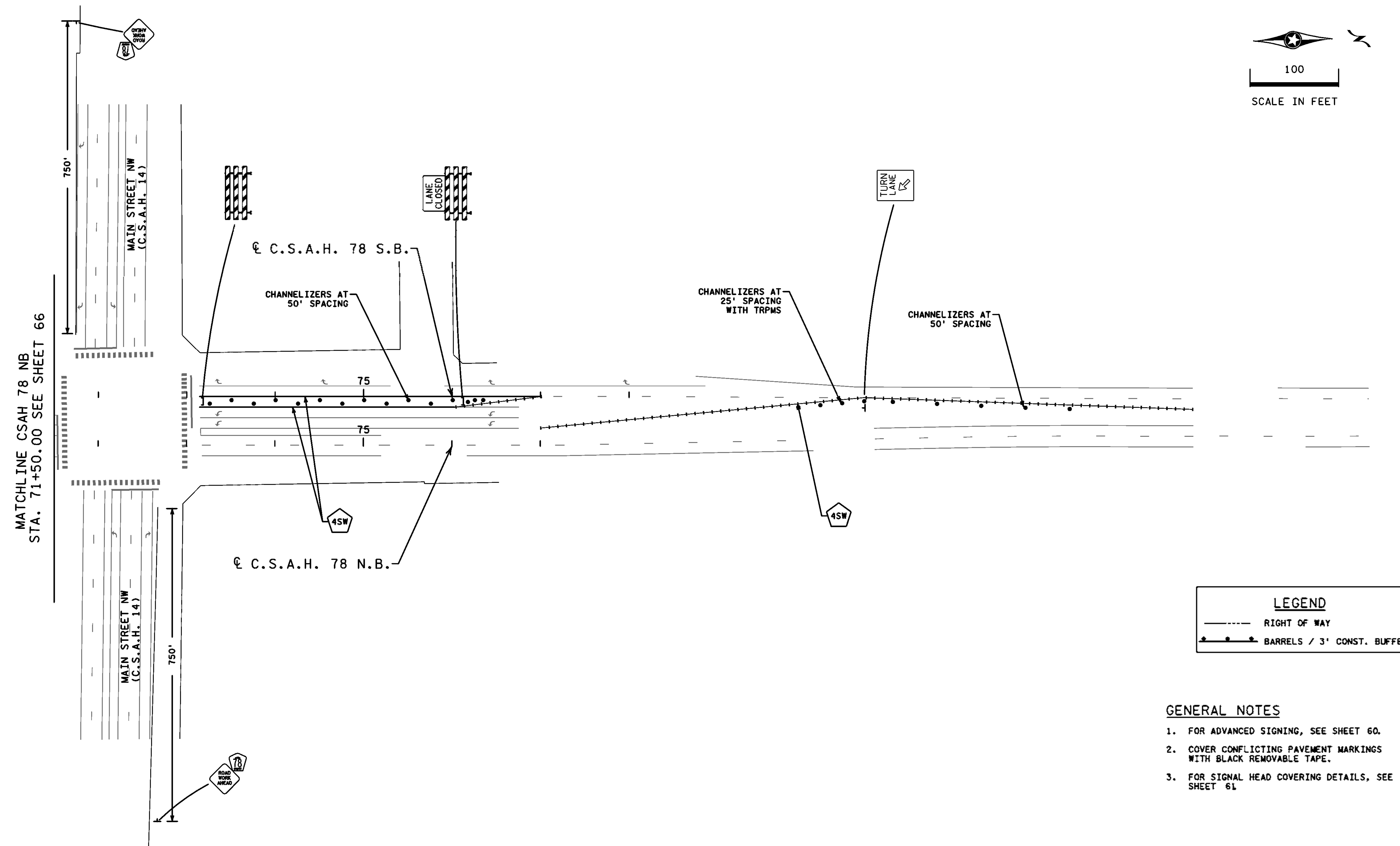
HDR — ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



LEGEND

- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER

GENERAL NOTES

1. FOR ADVANCED SIGNING, SEE SHEET 60.
2. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.
3. FOR SIGNAL HEAD COVERING DETAILS, SEE SHEET 61.

STAGE 0 – SHEET 5 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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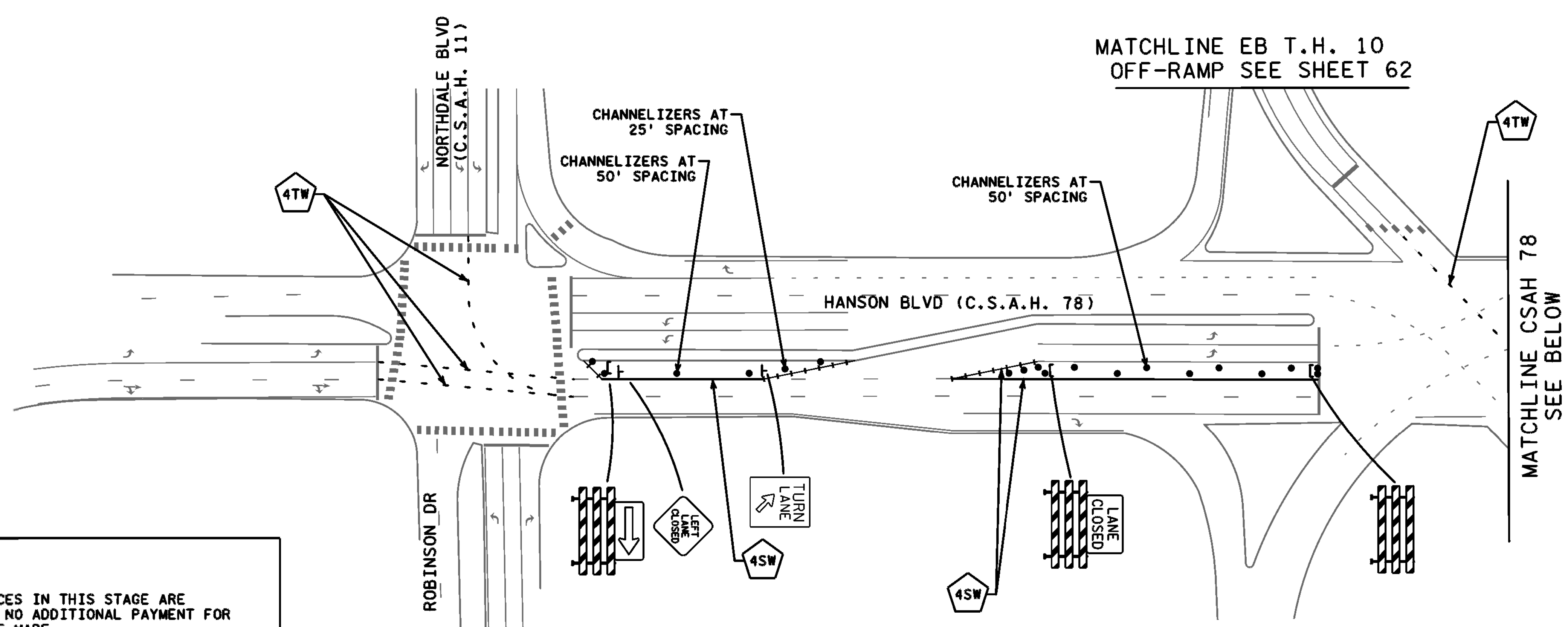


GENERAL NOTES

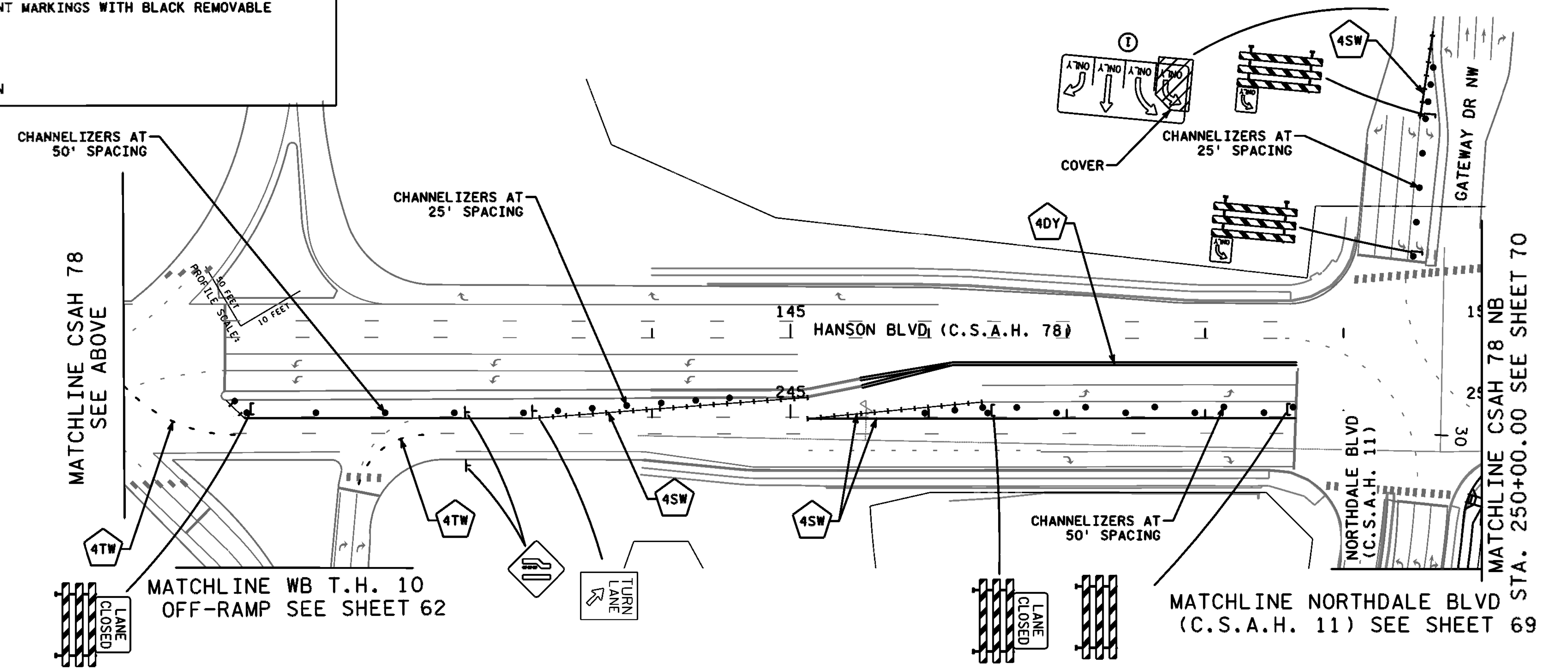
1. SOME PAVEMENT MARKINGS, AND DEVICES IN THIS STAGE ARE INSTALLED IN A PRECEEDING STAGE. NO ADDITIONAL PAYMENT FOR THESE DEVICES OR MARKINGS WILL BE MADE.
2. FOR ADVANCED SIGNING, SEE SHEET 60.
3. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.

SPECIFIC NOTES

(1) EXISTING SIGN, COVER AS SHOWN

LEGEND

- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER



STAGE 1 - SHEET 1 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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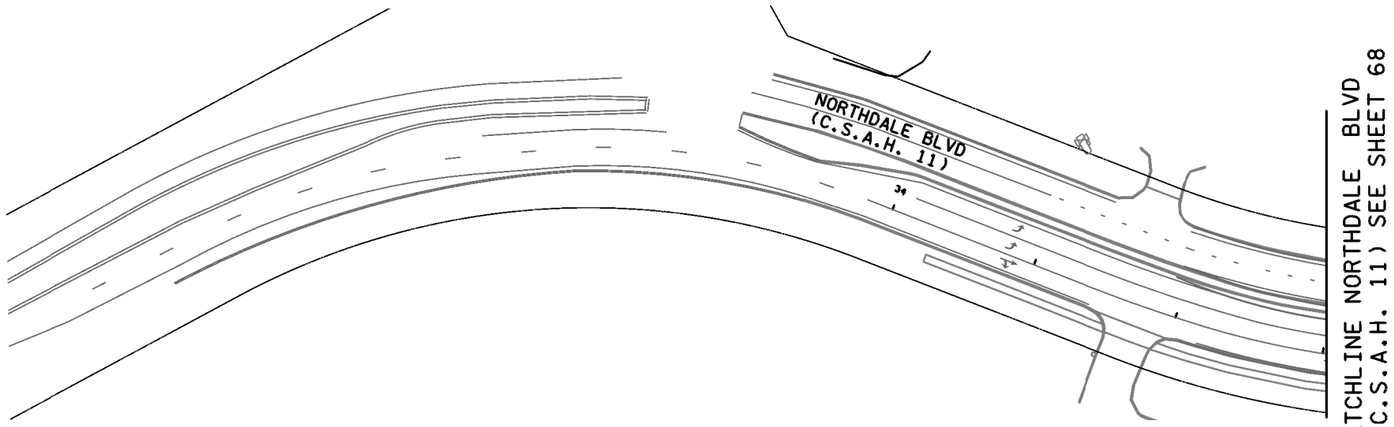
TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



100

SCALE IN FEET

LEGEND

——---—— RIGHT OF WAY

GENERAL NOTES

1. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.

STAGE 1 - SHEET 2 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: _____ 11/22/2019

LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY

DESIGNED BY: SY

CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 69 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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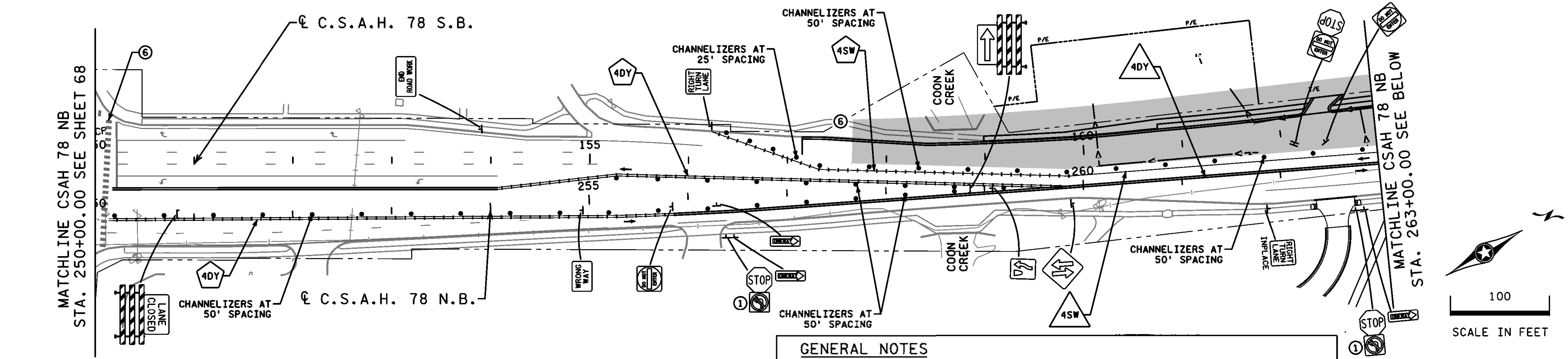
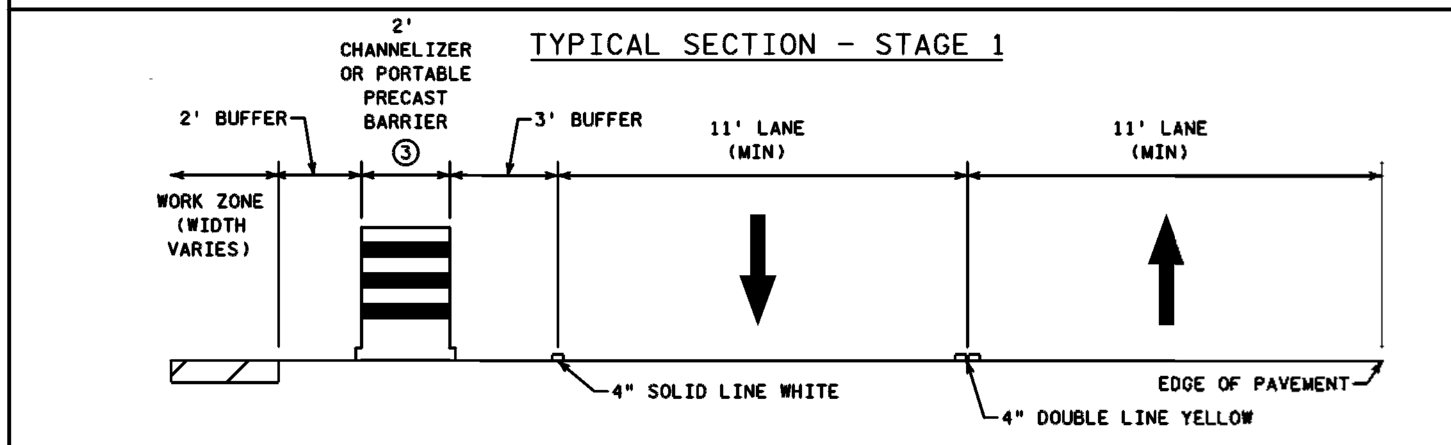




GENERAL NOTES

1. SOME PAVEMENT MARKINGS, AND DEVICES IN THIS STAGE ARE INSTALLED IN A PRECEEDING STAGE. NO ADDITIONAL PAYMENT FOR THESE DEVICES OR MARKINGS WILL BE MADE.
2. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.

SPECIFIC NOTES

(1) MOUNT TO EXISTING STOP SIGN ASSEMBLY. PLACE A W20-1 SIGN 100' IN ADVANCE.

(2) RIGHT IN RIGHT OUT ONLY THIS PHASE.

(3) SEE MNMUTCD CHAPTER 6 LOGITUDINAL DROP-OFF GUIDELINES FOR PORTABLE PRECAST CONCRETE BARRIER REQUIREMENTS.

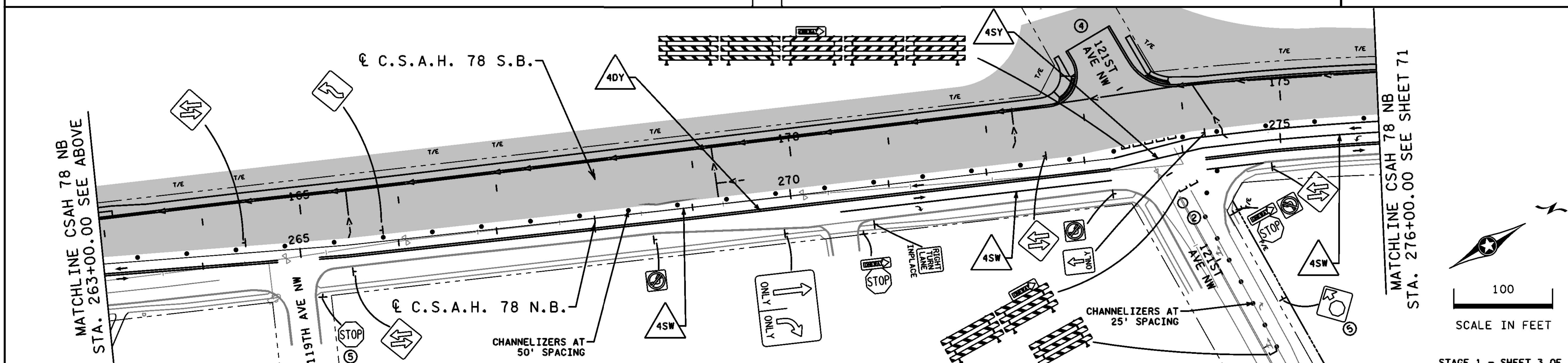
(4) MAINTAIN ACCESS TO EMERGENCY VEHICLES.

(5) PLACE A W20-1 SIGN 100' (OR 325' AT 1251ST AVE NW) IN ADVANCE OF THIS SIGN.

(6) DETOUR NORTH-SOUTH PEDESTRIAN TRAFFIC ON THE WEST SIDE OF HANSON BLVD TO INSTEAD USE THE SIDEWALK ON THE EAST SIDE. CROSS PEDESTRIANS AT NORTHDALE BLVD (C.S.A.H. 11).

LEGEND

- WORK ZONE
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER
- GENERAL TRAFFIC FLOW 11' MIN. LANE WIDTH SEE TYPICAL SECTION
- PROPOSED STORM SEWER SEE DRAINAGE PLANS



STAGE 1 - SHEET 3 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY

DESIGNED BY: SY

CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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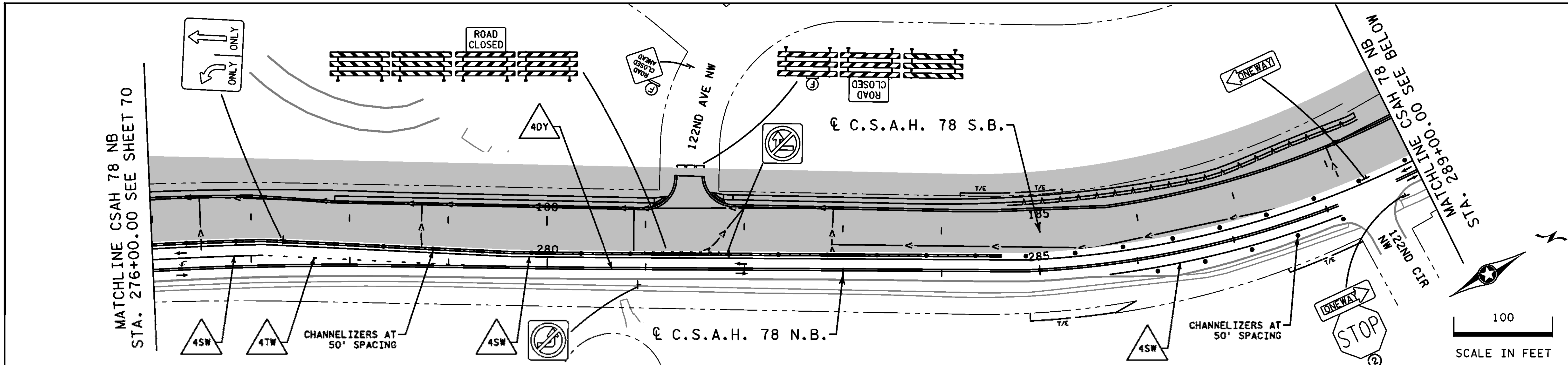
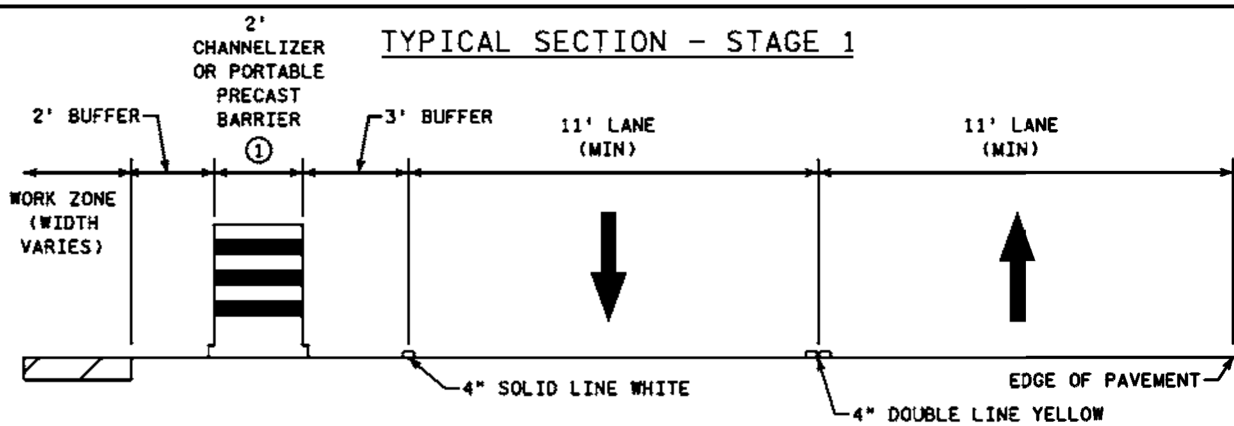


TYPICAL SECTION - STAGE 1



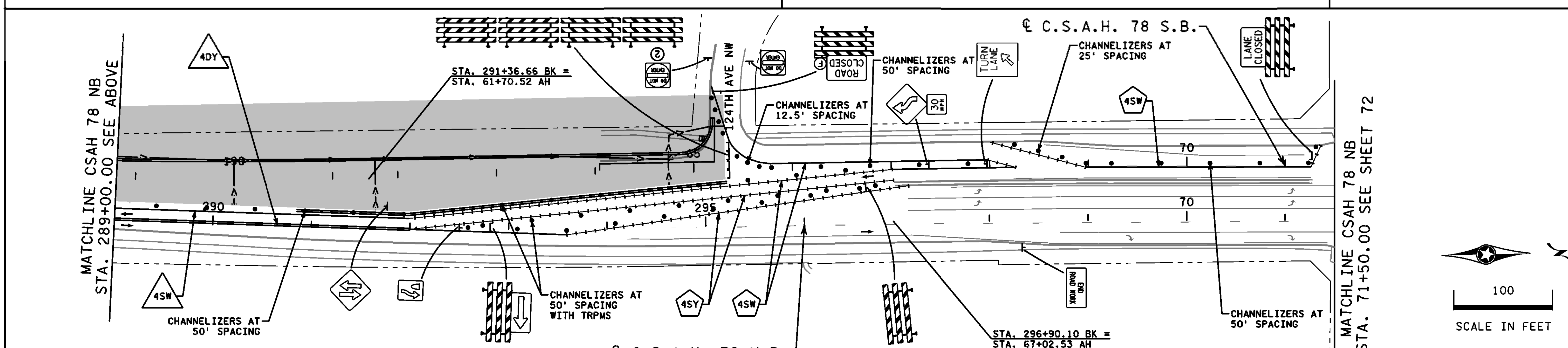
SPECIFIC NOTES

① SEE MNMUTCD CHAPTER 6 LOGITUDINAL DROP-OFF GUIDELINES FOR PORTABLE PRECAST CONCRETE BARRIER REQUIREMENTS.

② PLACE A W20-1 SIGN 100' IN ADVANCE OF THIS SIGN.

LEGEND

- WORK ZONE
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER
- GENERAL TRAFFIC FLOW 11' MIN. LANE WIDTH SEE TYPICAL SECTION
- PROPOSED STORM SEWER SEE DRAINAGE PLANS



STAGE 1 - SHEET 4 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR | ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 71 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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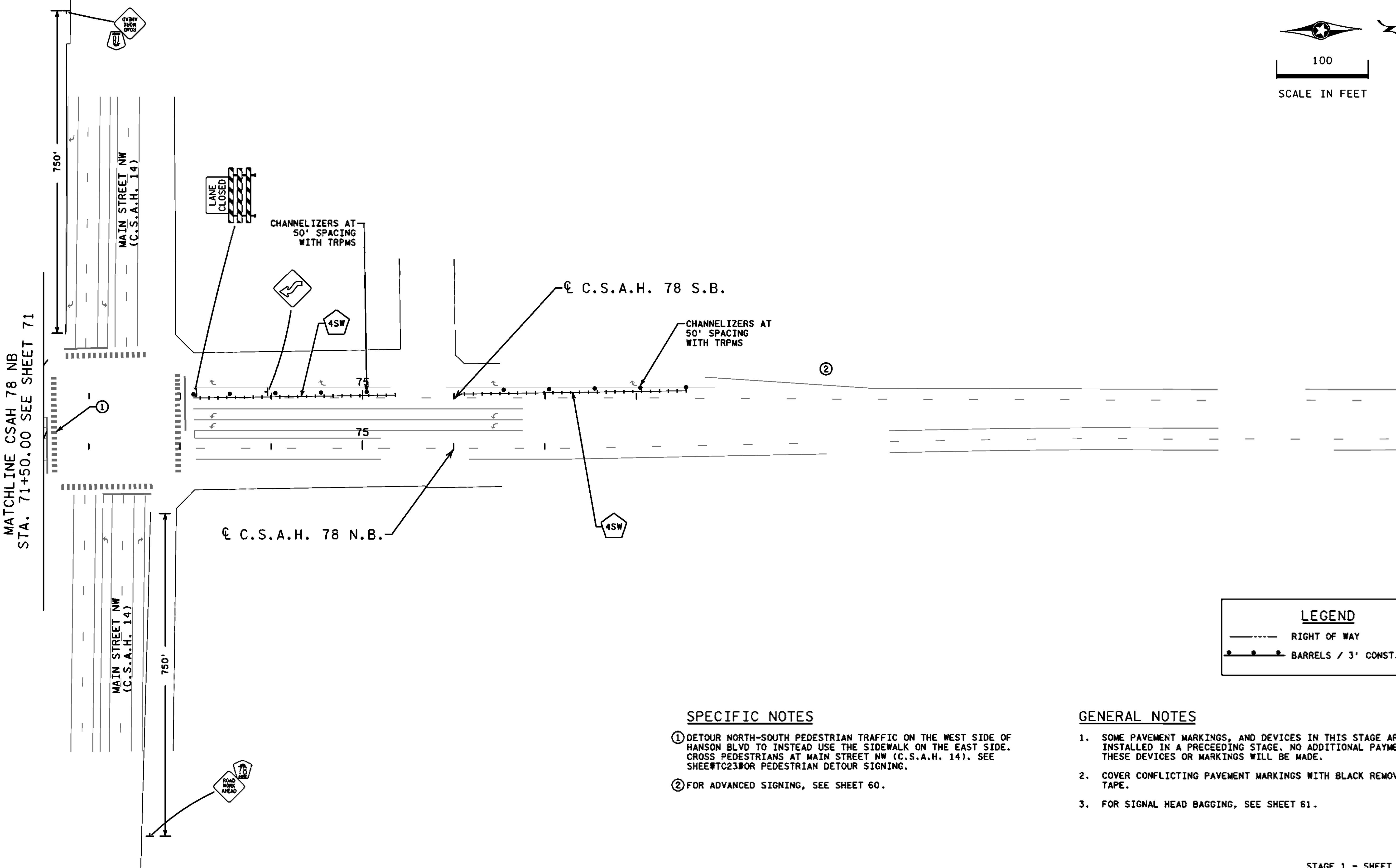

LEGEND

- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER

SPECIFIC NOTES

① DETOUR NORTH-SOUTH PEDESTRIAN TRAFFIC ON THE WEST SIDE OF HANSON BLVD TO INSTEAD USE THE SIDEWALK ON THE EAST SIDE. CROSS PEDESTRIANS AT MAIN STREET NW (C.S.A.H. 14). SEE SHEE#TC23#OR PEDESTRIAN DETOUR SIGNING.

② FOR ADVANCED SIGNING, SEE SHEET 60.

GENERAL NOTES

1. SOME PAVEMENT MARKINGS, AND DEVICES IN THIS STAGE ARE INSTALLED IN A PRECEEDING STAGE. NO ADDITIONAL PAYMENT FOR THESE DEVICES OR MARKINGS WILL BE MADE.
2. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.
3. FOR SIGNAL HEAD BAGGING, SEE SHEET 61.

STAGE 1 - SHEET 5 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 72 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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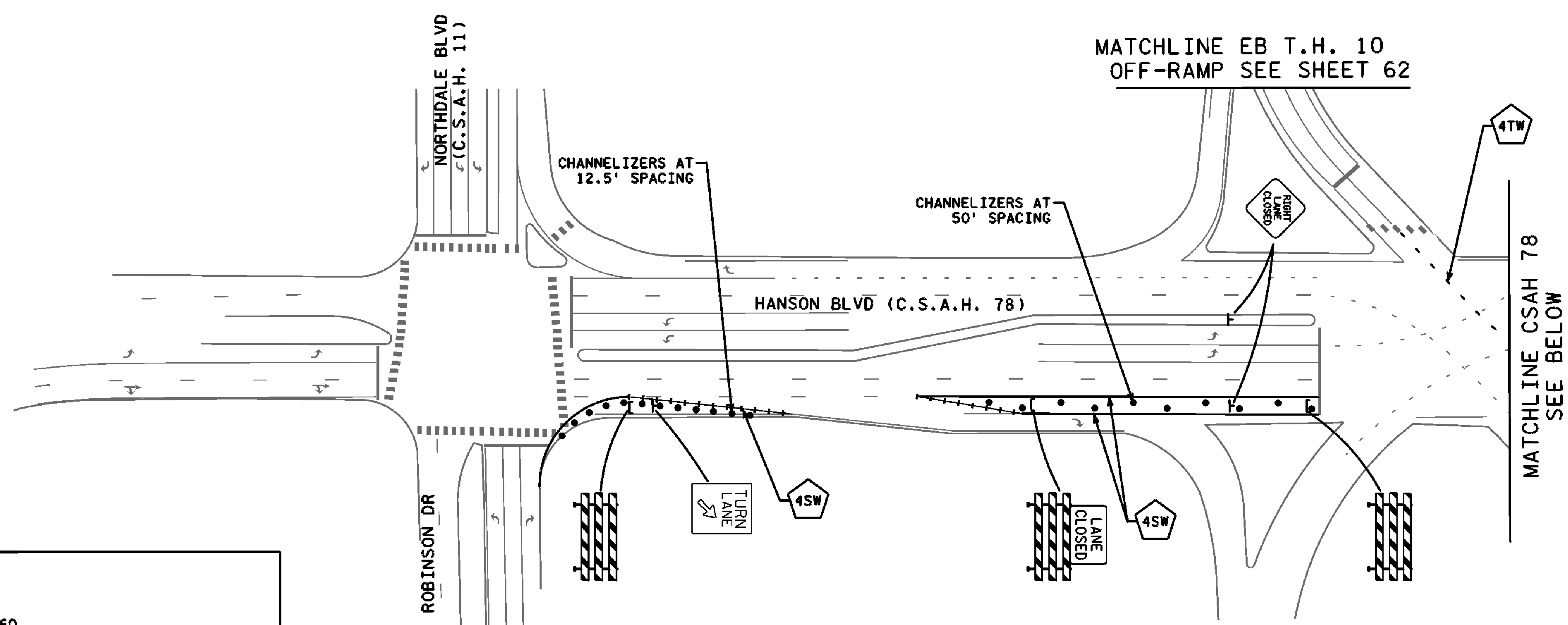

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SCALE IN FEET

GENERAL NOTES

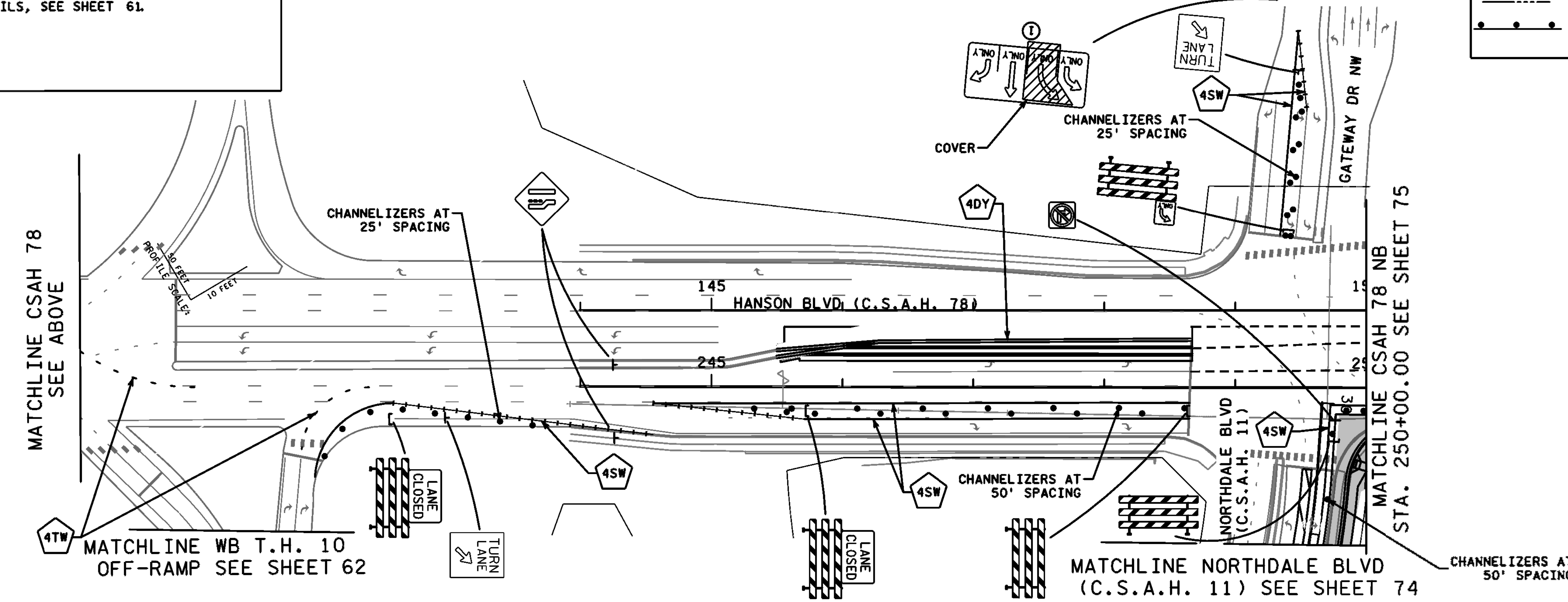
1. FOR ADVANCED SIGNING, SEE SHEET 60.
2. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.
3. FOR SIGNAL HEAD COVERING DETAILS, SEE SHEET 61.

SPECIFIC NOTES

① EXISTING SIGN, COVER AS SHOWN

LEGEND

(shaded)	WORK ZONE
(dash-dot line)	RIGHT OF WAY
(dotted line)	BARRELS / 3' CONST. BUFFER



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SCALE IN FEET

STAGE 2 - SHEET 1 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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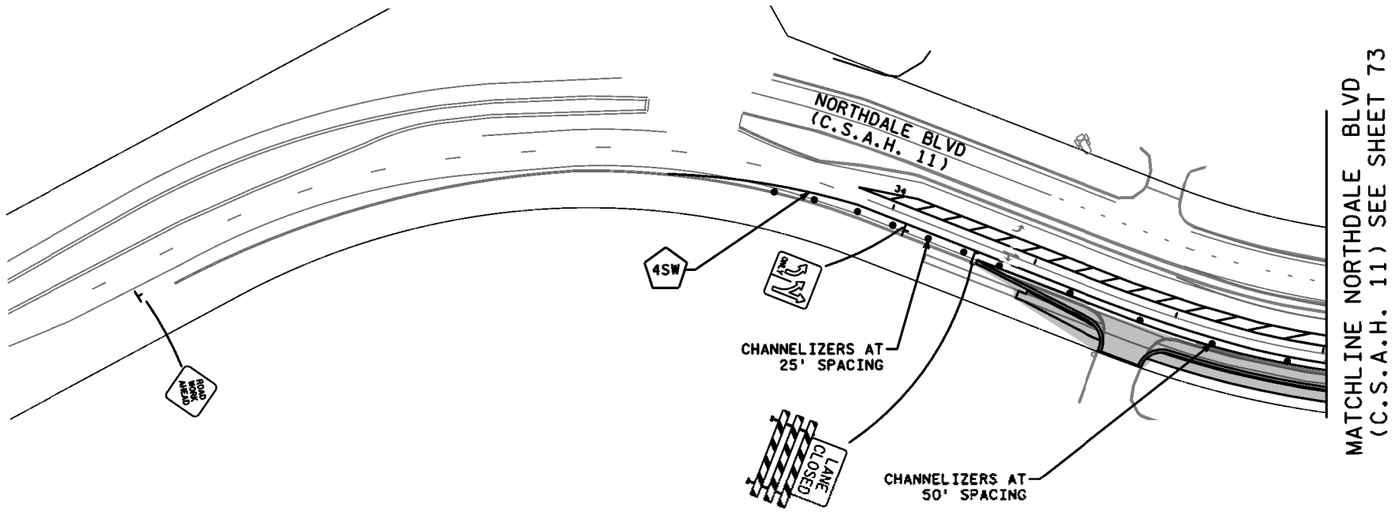

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SCALE IN FEET

LEGEND

- WORK ZONE
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER

GENERAL NOTES

1. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.

STAGE 2 - SHEET 2 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 74 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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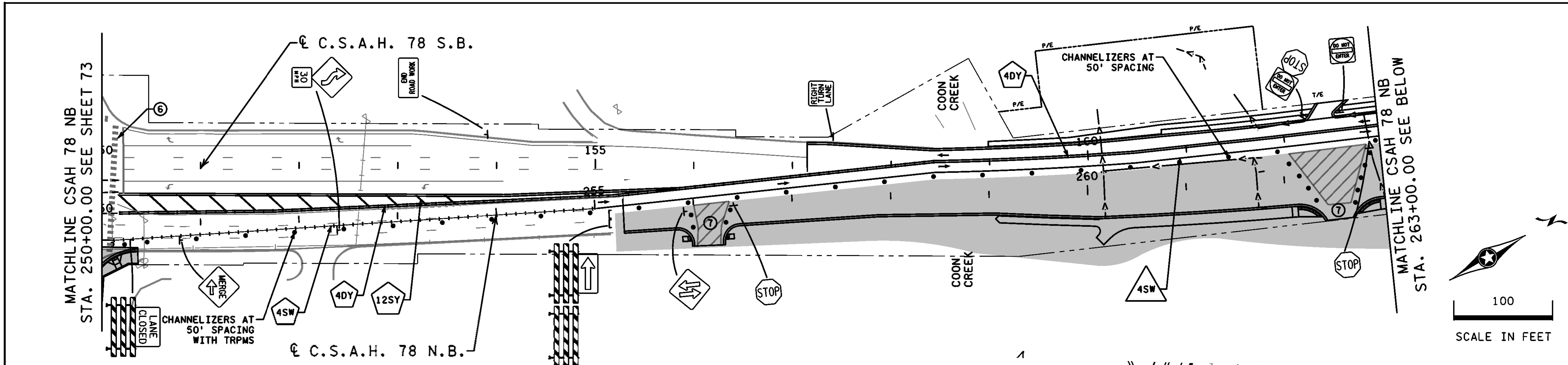
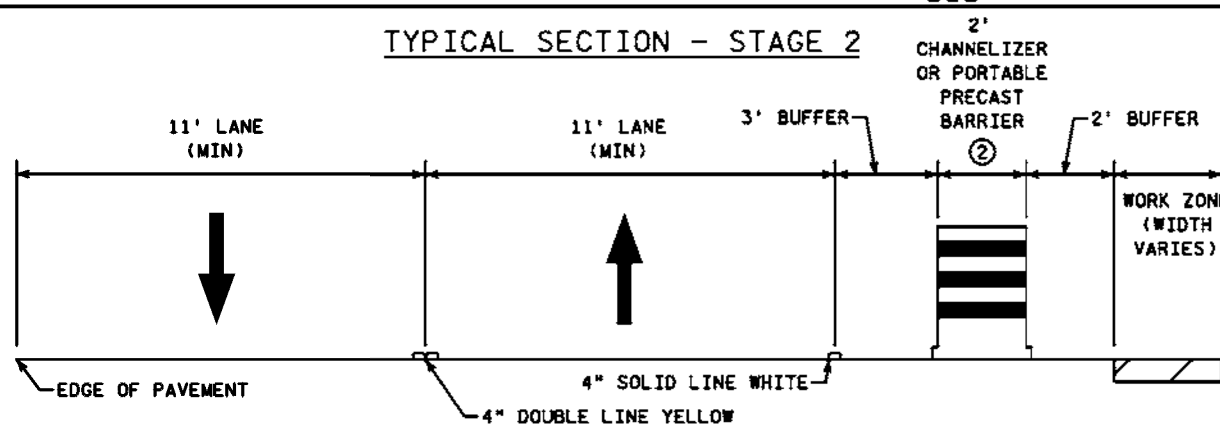


TYPICAL SECTION - STAGE 2

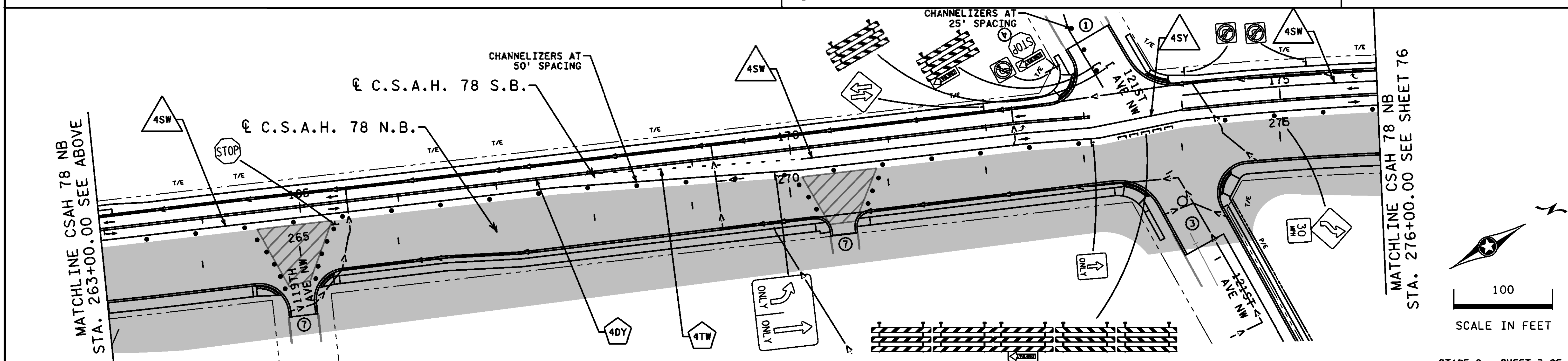


SPECIFIC NOTES

1. RIGHT IN RIGHT OUT ONLY THIS PHASE.
2. SEE MNMUTCD CHAPTER 6 LOGITUDINAL DROP-OFF GUIDELINES FOR PORTABLE PRECAST CONCRETE BARRIER REQUIREMENTS.
3. SEE SHEET TC24 FOR TYPICAL SIGNING FOR ROAD CLOSURE AT 121ST AVE NW. MAINTAIN ACCESS TO EMERGENCY VEHICLES.
4. PLACE A W3-1 SIGN 100' IN ADVANCE OF THE STOP SIGN. PLACE A W20-1 SIGN 325' IN ADVANCE OF THE W3-1 SIGN.
5. PLACE A W20-3 SIGN 100' IN ADVANCE OF THE TYPE III BARRICADE.
6. DETOUR NORTH-SOUTH PEDESTRIAN TRAFFIC ON THE EAST SIDE OF HANSON BLVD TO INSTEAD USE THE SIDEWALK ON THE WEST SIDE. CROSS PEDESTRIANS AT NORTHDALE BLVD (C.S.A.H. 11).
7. MAINTAIN ACCESS AND/OR CONSTRUCT UNDER TRAFFIC.

LEGEND

- WORK ZONE
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER
- GENERAL TRAFFIC FLOW 11' MIN. LANE WIDTH SEE TYPICAL SECTION
- PROPOSED STORM SEWER SEE DRAINAGE PLANS



STAGE 2 - SHEET 3 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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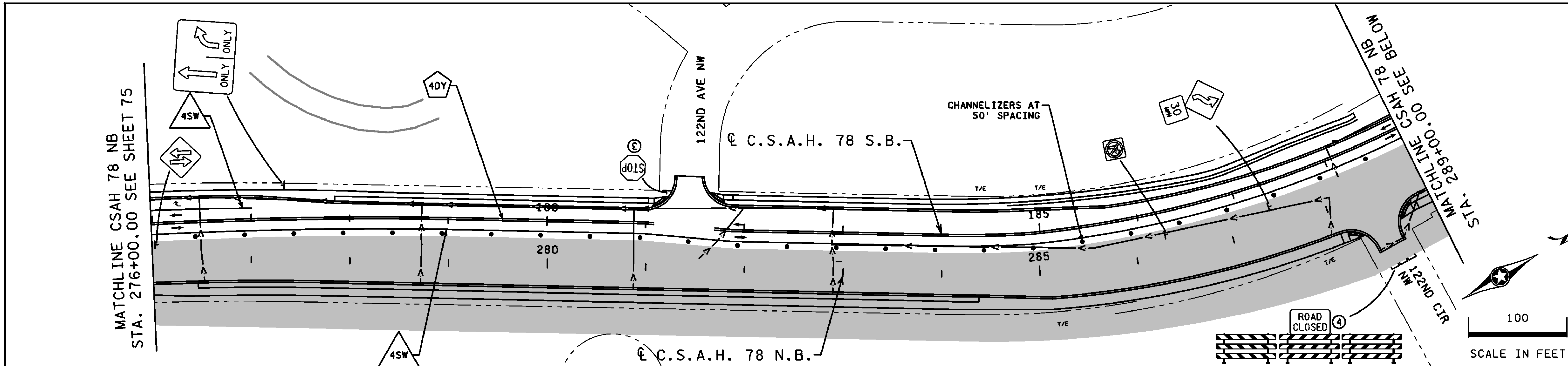
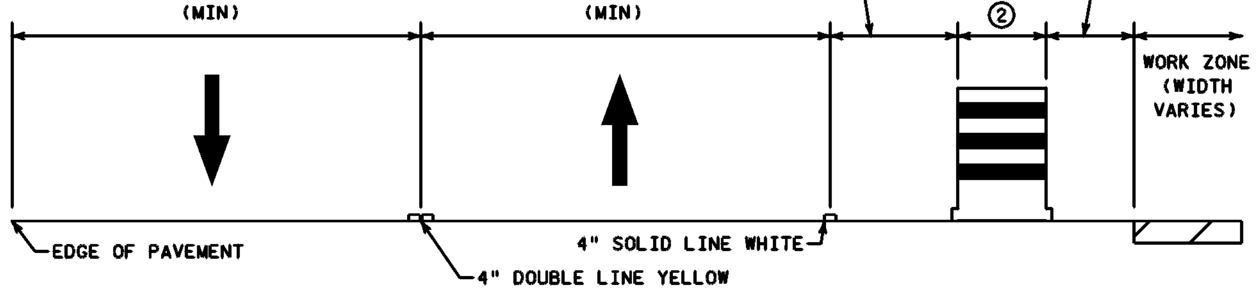


TYPICAL SECTION - STAGE 2

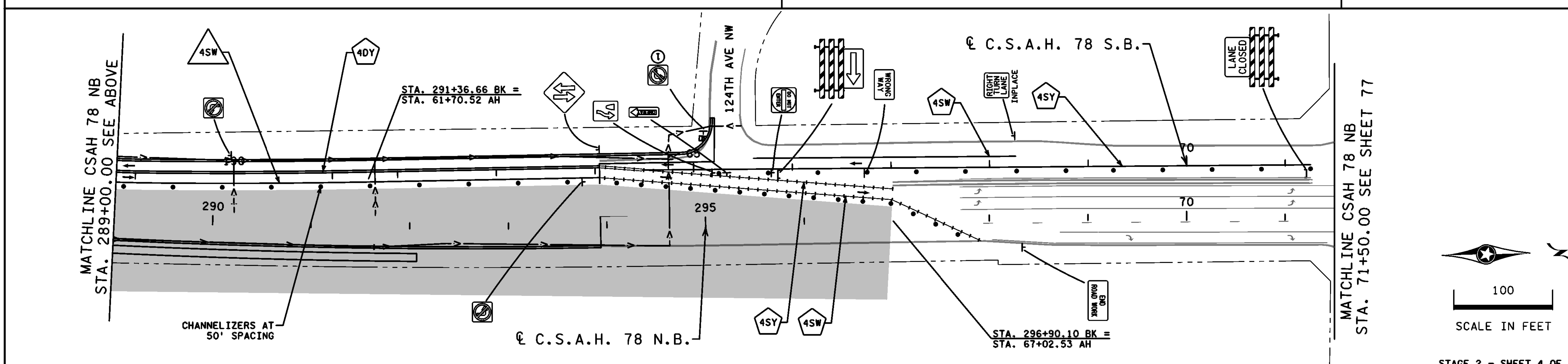


SPECIFIC NOTES

1. MOUNT TO STOP SIGN ASSEMBLY. PLACE A W20-1 SIGN 100' IN ADVANCE.
2. SEE MNMUTCD CHAPTER 6 LOGITUDINAL DROP-OFF GUIDELINES FOR PORTABLE PRECAST CONCRETE BARRIER REQUIREMENTS.
3. PLACE A W20-1 SIGN 100' IN ADVANCE OF THE STOP SIGN.
4. PLACE A W20-3 SIGN 100' IN ADVANCE OF THE TYPE III BARRICADE.
5. DETOUR NORTH-SOUTH PEDESTRIAN TRAFFIC ON THE EAST SIDE OF HANSON BLVD TO INSTEAD USE THE SIDEWALK ON THE WEST SIDE. CROSS PEDESTRIANS AT MAIN STREET NW (C.S.A.H. 14).

LEGEND

- WORK ZONE
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER
- GENERAL TRAFFIC FLOW 11' MIN. LANE WIDTH SEE TYPICAL SECTION
- PROPOSED STORM SEWER SEE DRAINAGE PLANS



STAGE 2 - SHEET 4 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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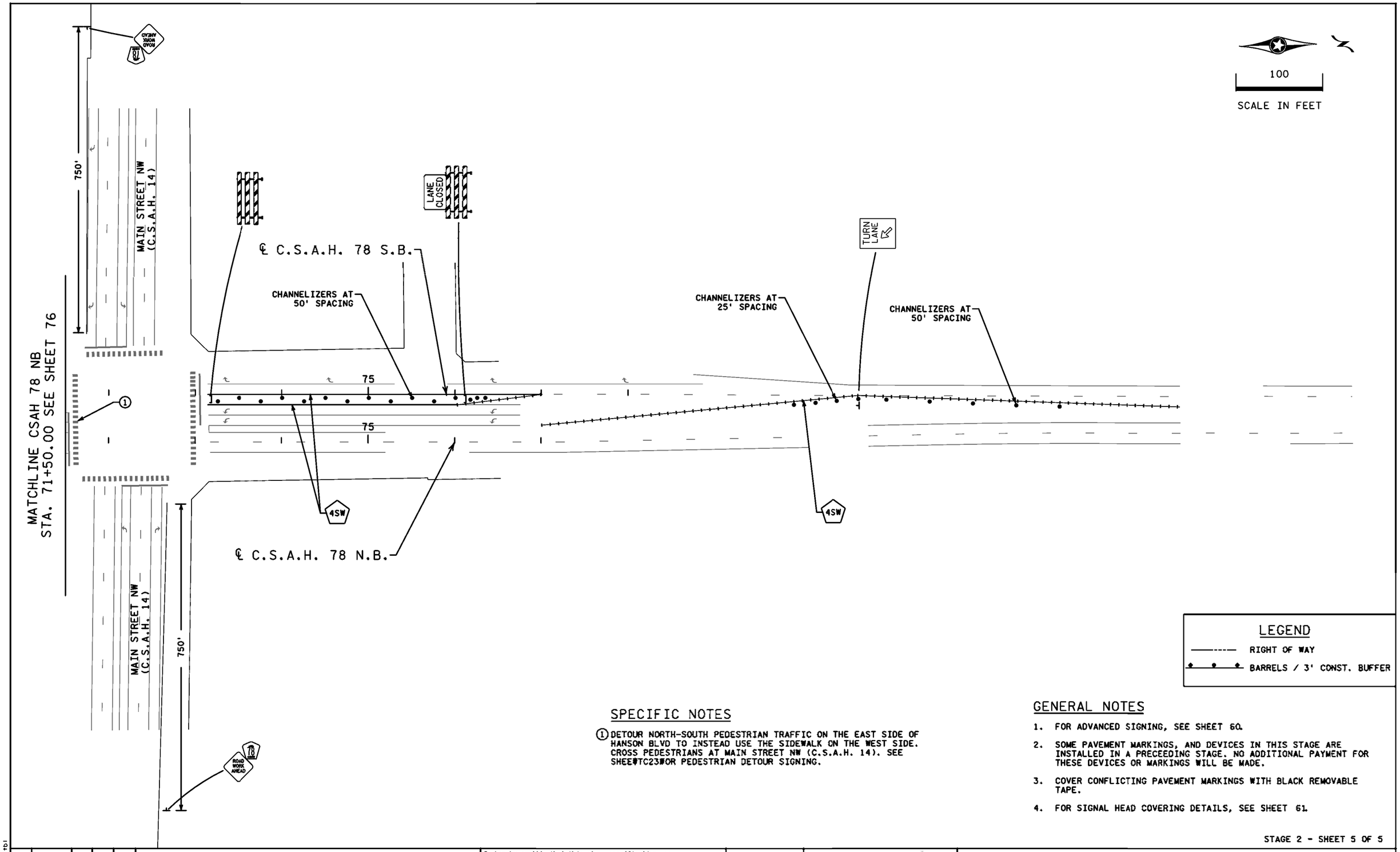

SPECIFIC NOTES

① DETOUR NORTH-SOUTH PEDESTRIAN TRAFFIC ON THE EAST SIDE OF HANSON BLVD TO INSTEAD USE THE SIDEWALK ON THE WEST SIDE. CROSS PEDESTRIANS AT MAIN STREET NW (C.S.A.H. 14). SEE SHEET TC23 FOR PEDESTRIAN DETOUR SIGNING.

LEGEND

RIGHT OF WAY

BARRELS / 3' CONST. BUFFER

GENERAL NOTES

1. FOR ADVANCED SIGNING, SEE SHEET 60.
2. SOME PAVEMENT MARKINGS, AND DEVICES IN THIS STAGE ARE INSTALLED IN A PRECEEDING STAGE. NO ADDITIONAL PAYMENT FOR THESE DEVICES OR MARKINGS WILL BE MADE.
3. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.
4. FOR SIGNAL HEAD COVERING DETAILS, SEE SHEET 61.

STAGE 2 - SHEET 5 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

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LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 77 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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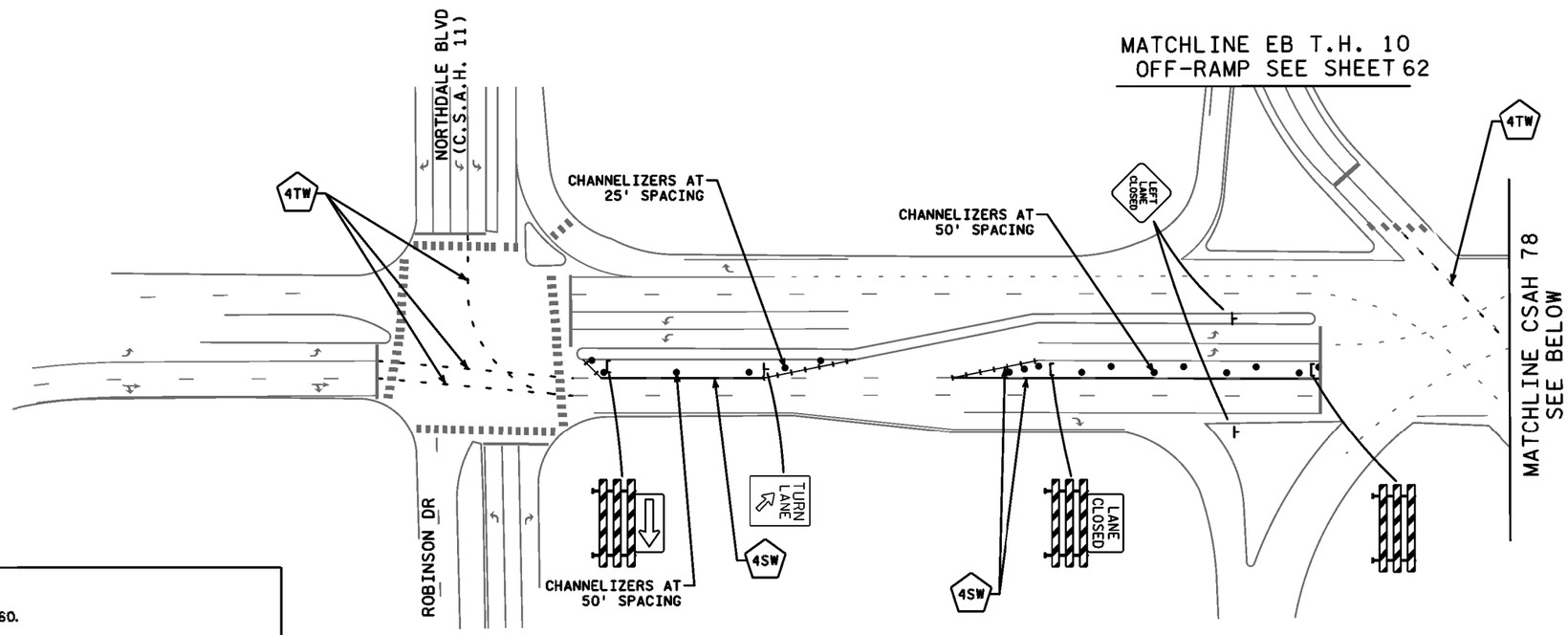


100

SCALE IN FEET

GENERAL NOTES

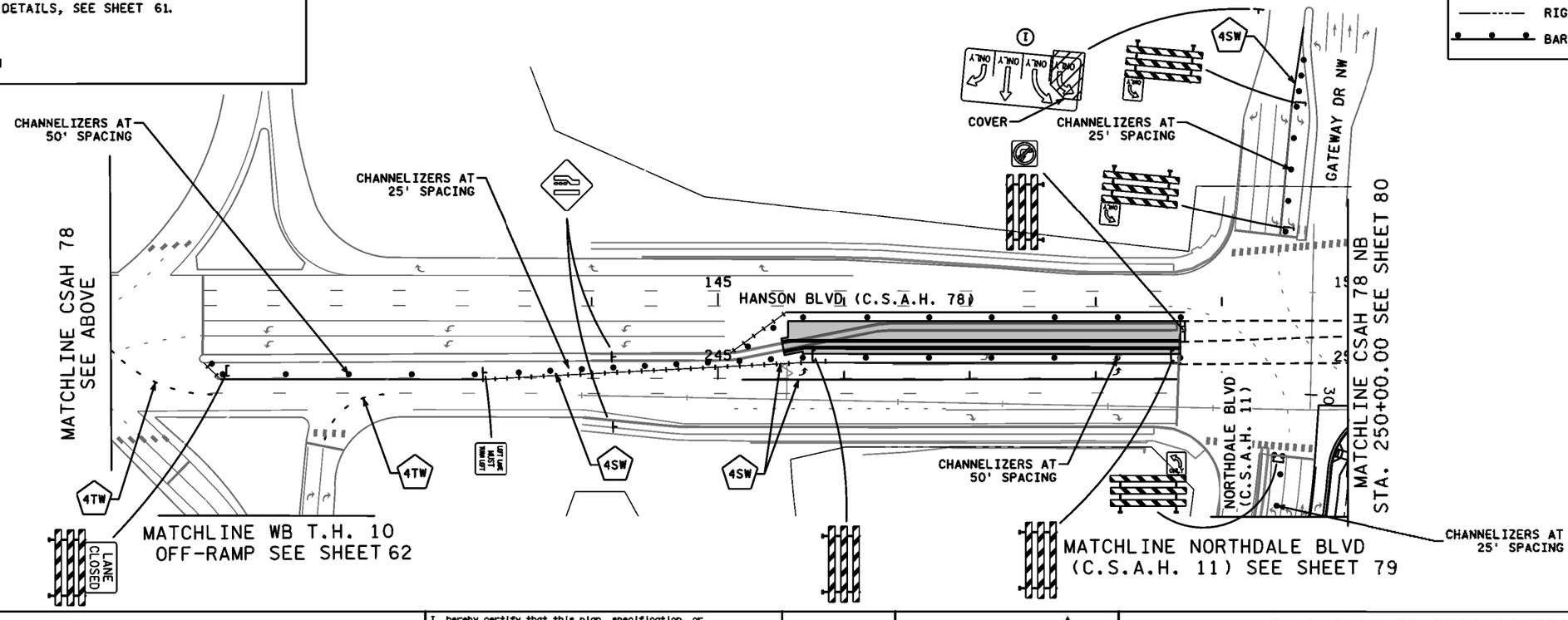
1. FOR ADVANCED SIGNING, SEE SHEET 60.
2. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.
3. FOR SIGNAL HEAD COVERING DETAILS, SEE SHEET 61.

SPECIFIC NOTES

(1) EXISTING SIGN, COVER AS SHOWN

LEGEND

- WORK ZONE
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER



100

SCALE IN FEET

STAGE 3 - SHEET 1 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 78 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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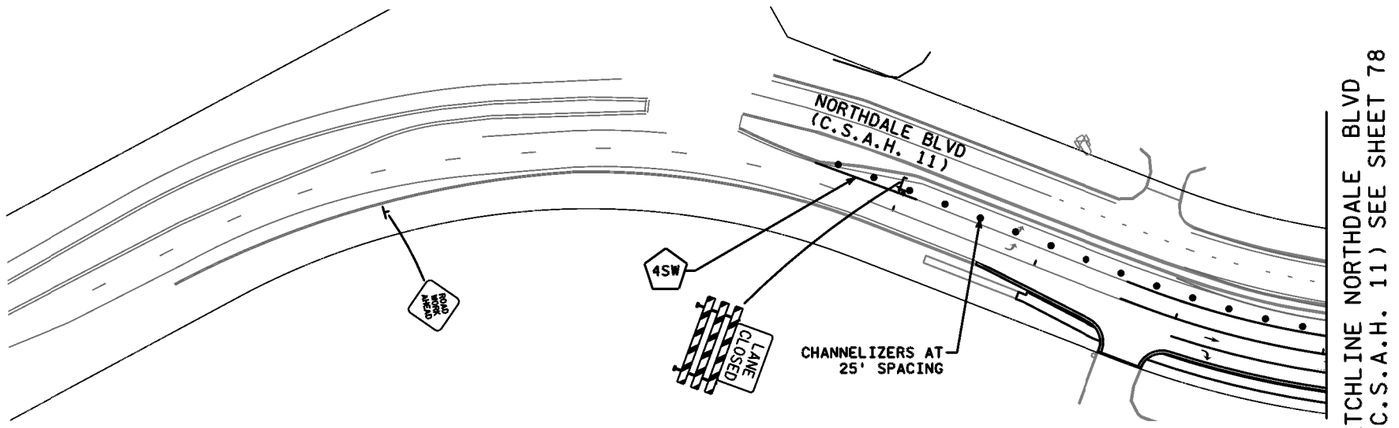

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SCALE IN FEET

LEGEND

RIGHT OF WAY

BARRELS / 3' CONST. BUFFER

GENERAL NOTES

1. COVER CONFLICTING PAVEMENT MARKINGS WITH BLACK REMOVABLE TAPE.

STAGE 3 - SHEET 2 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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NAME: ANDREW J. HENGEL LIC. NO. 52256

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DRAWN BY: SY

DESIGNED BY: SY

CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 79 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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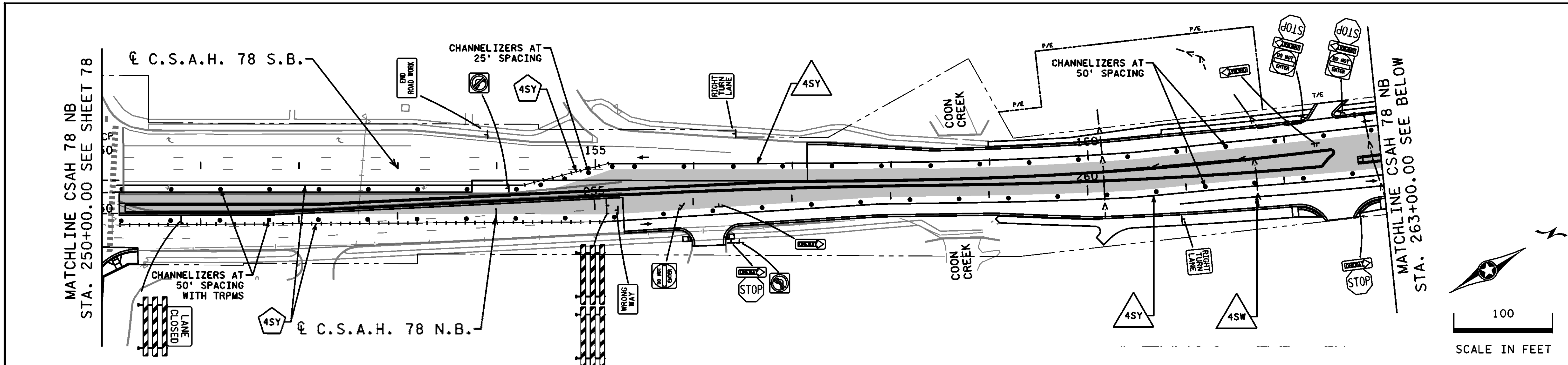
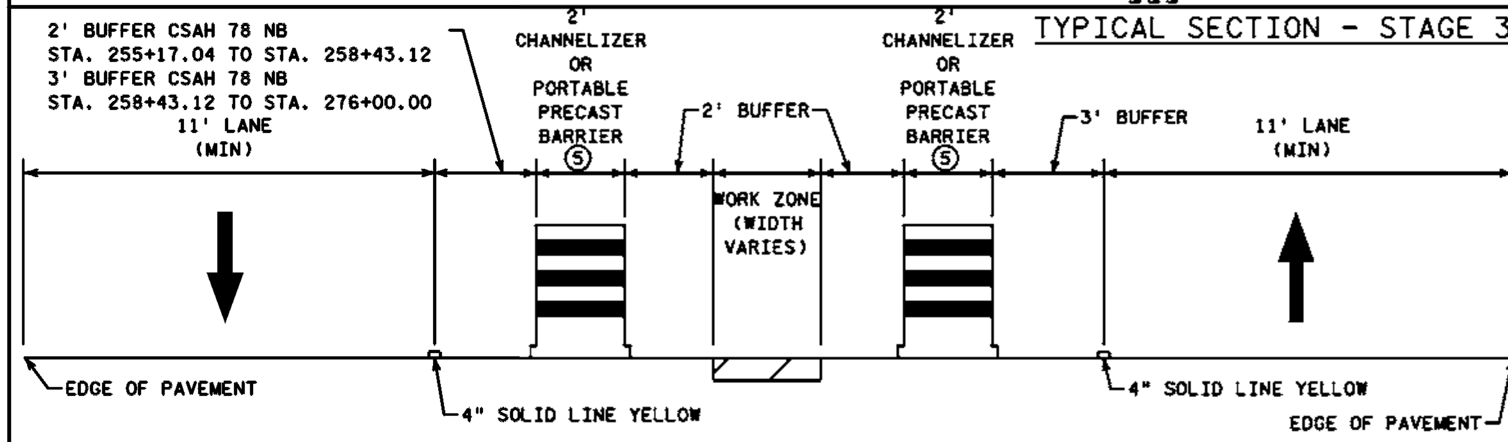


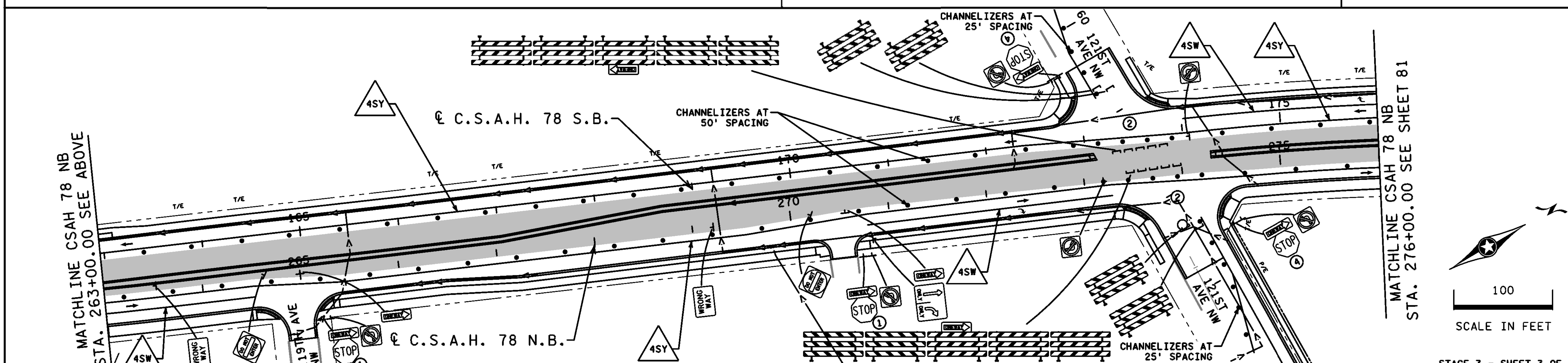


SPECIFIC NOTES

1. PLACE A W20-1 SIGN 100' IN ADVANCE.
2. RIGHT IN RIGHT OUT ONLY THIS PHASE.
3. MAINTAIN ACCESS TO EMERGENCY VEHICLES.
4. PLACE A W3-1 SIGN 100' IN ADVANCE OF THE STOP SIGN. PLACE A W20-1 SIGN 325' IN ADVANCE OF THE W3-1 SIGN.
5. SEE MNMUTCD CHAPTER 6 LOGITUDINAL DROP-OFF GUIDELINES FOR PORTABLE PRECAST CONCRETE BARRIER REQUIREMENTS.

LEGEND

- WORK ZONE
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER
- GENERAL TRAFFIC FLOW 11' MIN. LANE WIDTH SEE TYPICAL SECTION
- PROPOSED STORM SEWER SEE DRAINAGE PLANS



STAGE 3 - SHEET 3 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR — ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 80 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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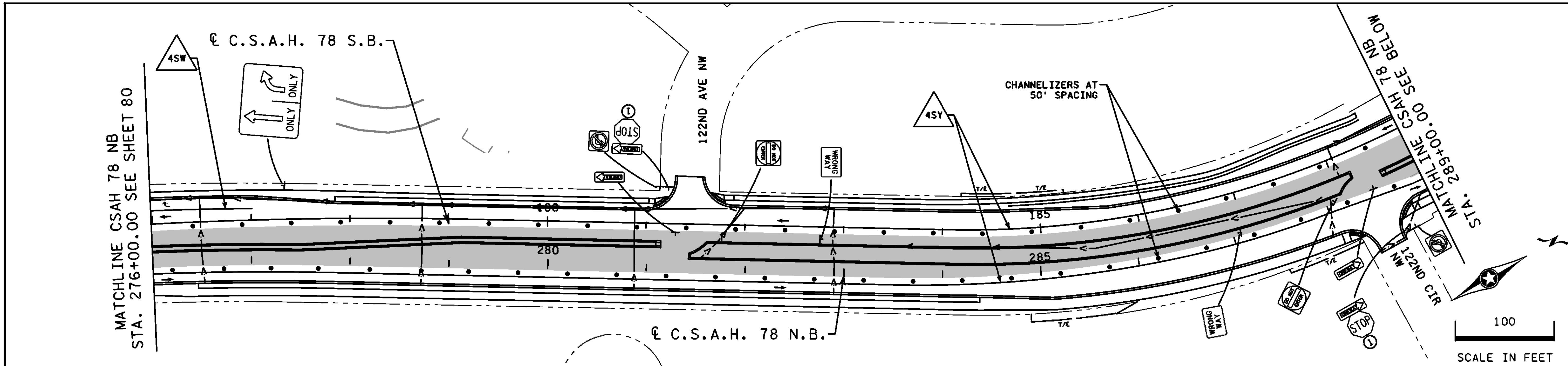
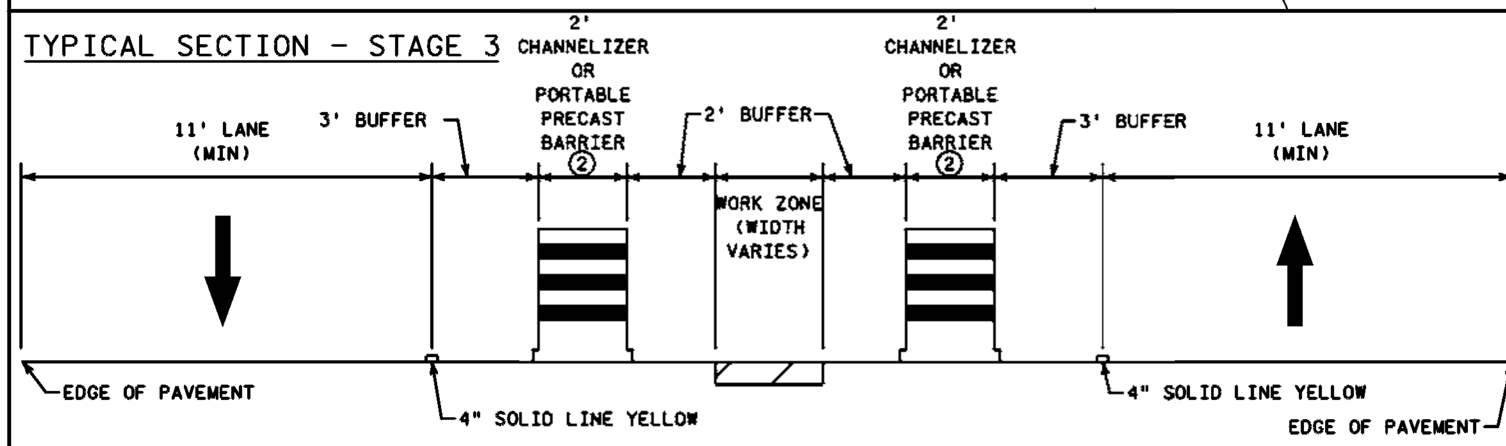


TYPICAL SECTION - STAGE 3



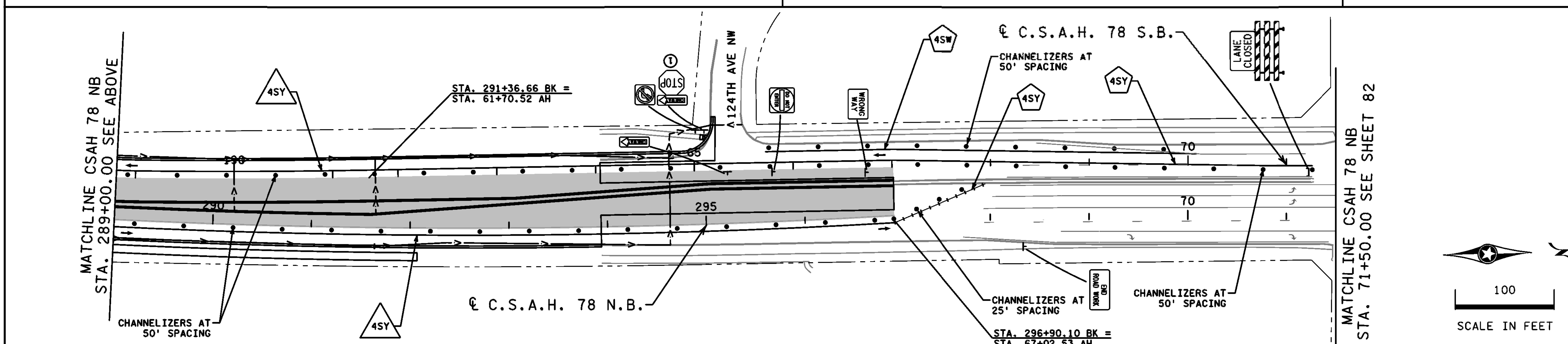
SPECIFIC NOTES

(1) PLACE A W20-1 SIGN 100' IN ADVANCE.

(2) SEE MNMUTCD CHAPTER 6 LOGITUDINAL DROP-OFF GUIDELINES FOR PORTABLE PRECAST CONCRETE BARRIER REQUIREMENTS.

LEGEND

- WORK ZONE
- RIGHT OF WAY
- BARRELS / 3' CONST. BUFFER
- GENERAL TRAFFIC FLOW 11' MIN. LANE WIDTH SEE TYPICAL SECTION
- PROPOSED STORM SEWER SEE DRAINAGE PLANS



STAGE 3 - SHEET 4 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 81 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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100

SCALE IN FEET

MATCHLINE CSAH 78 NB
STA. 71+50.00 SEE SHEET 81

750'

MAIN STREET NW
(C.S.A.H. 14)

LANE CLOSED

℄ C.S.A.H. 78 S.B.

CHANNELIZERS AT
50' SPACING

75

75

CHANNELIZERS AT
25' SPACING

TURN LANE

CHANNELIZERS AT
50' SPACING

4SW

4SW

℄ C.S.A.H. 78 N.B.

MAIN STREET NW
(C.S.A.H. 14)

750'

ROAD WORK AHEAD

78

LEGEND

RIGHT OF WAY

BARRELS / 3' CONST. BUFFER

GENERAL NOTES

1. FOR ADVANCED SIGNING, SEE SHEET 60.
2. FOR SIGNAL HEAD COVERING DETAILS, SEE SHEET 61.

STAGE 3 - SHEET 5 OF 5

NO	DATE	BY	CKD	APPR	REVISION

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TEMPORARY TRAFFIC CONTROL PLAN LAYOUT

SHEET NO. 82 OF 230 SHEETS

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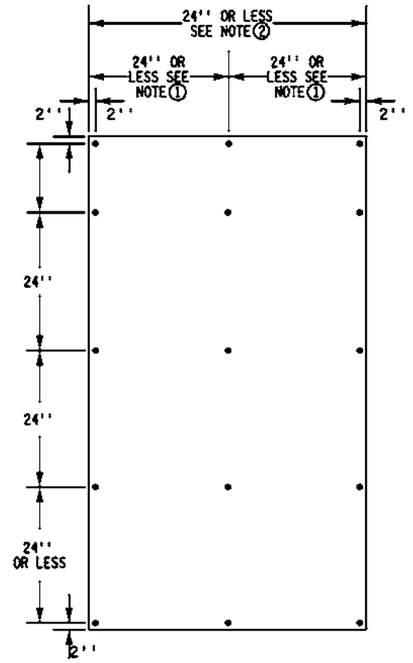
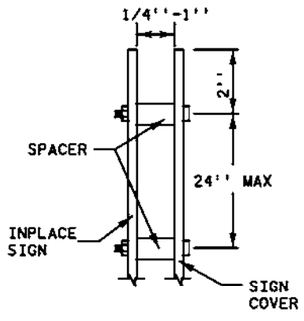
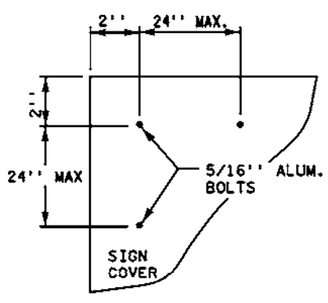
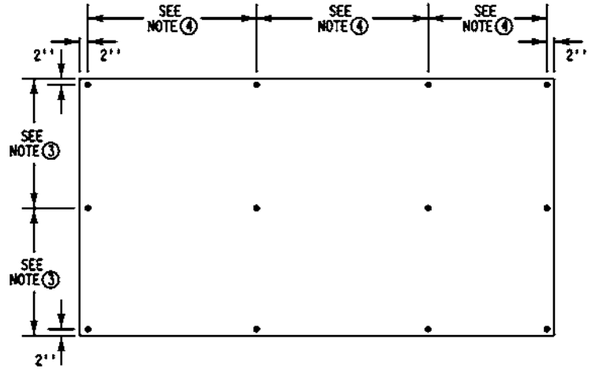








1/26/18

OVERLAY ASSEMBLY STEPS FOR COVERING COMPLETE OR PORTION OF EXTRUDED SIGN PANEL:

1) DRILL 1/4'' HOLES ON THE SHEET ALUMINUM OVERLAYS IN ACCORDANCE WITH THE HOLE SPACING ON THE DIAGRAM. OUTSIDE HOLES SHALL NOT BE SPACED MORE THAN 24'' APART.
2) ATTACH PLASTIC SPACER(S) (1/4'' MIN THICKNESS, 3/8'' I.D. AND 7/8'' O.D.) WITH DOUBLE FACED TAPE, CENTERED BEHIND EACH DRILLED HOLE.
3) POSITION THE FIRST OVERLAY PANEL'S BOTTOM EDGE FLUSH WITH THE BOTTOM OF THE INPLACE EXTRUDED SIGN PANEL AND THE OVERLAY PANEL'S LOWER LEFT EDGE FLUSH WITH THE LOWER LEFT EDGE OF THE BOTTOM INPLACE EXTRUDED PANEL SECTION.
4) DRILL ALL OF THE OUTSIDE HOLES THROUGH THE INPLACE EXTRUDED SIGN PANEL AND ATTACH THE OVERLAY PANEL WITH SHEET METAL SCREWS.
5) DRILL THE INNER HOLES THROUGH THE INPLACE EXTRUDED SIGN PANEL AND ATTACH WITH SHEET METAL SCREWS AS SPECIFIED IN STEP 4 ABOVE.
6) ABUT THE NEXT OVERLAY PANEL TO THE FIRST ATTACHED OVERLAY PANEL AND PERFORM THE SAME WORK AS SPECIFIED IN STEPS 4 AND 5 ABOVE.
7) PLACE EACH ADDITIONAL OVERLAY PANEL AS SPECIFIED IN STEP 6 ABOVE.

NOTES FOR COVERING COMPLETE OR PORTION OF EXTRUDED SIGN PANEL:

① THE CENTER SHEET METAL SCREWS SHALL BE SPACED AT 1/2 OF THE PANELS WIDTH.

② IF THE SHEET ALUMINUM PANEL IS GREATER THAN 48'' WIDE, THE SHEET METAL SCREWS SPACING SHALL BE NO GREATER THAN 24''. IF THE SHEET ALUMINUM PANEL IS LESS THAN 24'' WIDE, THERE SHALL BE NO INNER HOLES.

③ VERTICAL SPACING FOR THE MOUNTING HOLES IS 50% OF THE PANEL HEIGHT. IF THE PANEL IS LESS THAN 24'' HIGH, THERE SHALL BE NO INNER HOLES.

④ HORIZONTAL SPACING FOR MOUNTING HOLES SHALL NOT BE LESS THAN 15'' NOR MORE THAN 24''.

GENERAL NOTES:

SIGN PANEL OVERLAYS SHALL BE MADE OF A RIGID MATERIAL. (SHEET ALUMINUM, PLYWOOD, CORRUGATED PLASTIC, OR OTHER MATERIAL AS APPROVED BY THE ENGINEER), THE INSTALLATION SHALL ALLOW ADEQUATE AIR FLOW BETWEEN THE OVERLAY PANEL AND THE INPLACE SIGN PANEL BY PROVIDING A MINIMUM SPACING OF 1/4'' (1'' MAXIMUM).

IF SHEET METAL SCREWS ARE USED WITH CORRUGATED PLASTIC, FENDER WASHERS SHALL BE PLACED BETWEEN SCREWS AND PANEL OVERLAY.

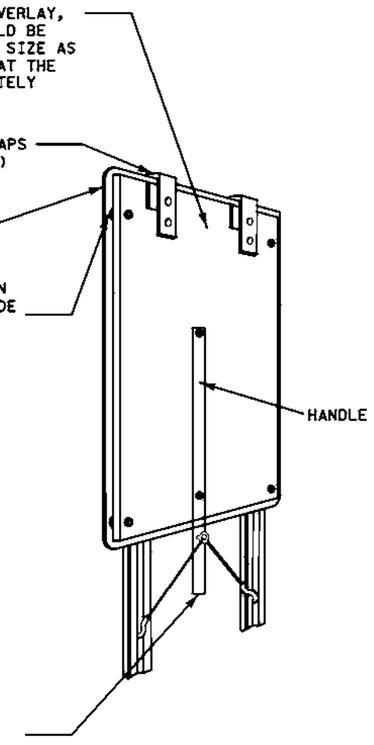
SPACERS SHALL BE A MATERIAL THAT WILL NOT HARM THE SIGN SHEETING FACE (SUCH AS PLASTIC OR RUBBER).

ALL COVERING MATERIAL, MOUNTING HARDWARE AND FASTENERS SHALL BE REMOVED WHEN PANEL OVERLAY IS REMOVED.

SIGN PANEL OVERLAYS USED TO COVER ALL OR PART OF A SIGN SHALL BE THE SAME COLOR AS THE BACKGROUND COLOR OF THE SIGN TO BE COVERED AND SHALL COVER ALL OF THE SIGN OR MESSAGE TO BE COVERED UNLESS SHOWN OTHERWISE IN THE PLAN.

TAPE SHALL NOT BE APPLIED TO THE SIGN SHEETING SURFACE. PRE-MASK OR APPLICATION TAPE SHALL BE REMOVED PRIOR TO EXPOSURE TO SUNLIGHT.

OVERLAY ASSEMBLY COVERING TYPE C OR D SIGN PANEL:



TYPICAL TEMPORARY SIGN COVERING DETAILS

NO	DATE	BY	CKD	APPR	REVISION

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DESIGNED BY: SY
CHECKED BY: AJH

HDR

ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN DETAILS
SHEET NO. 83 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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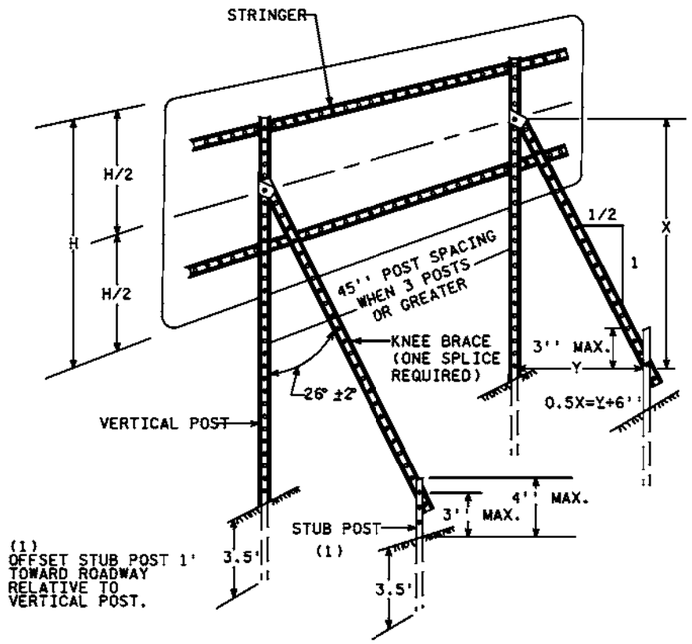
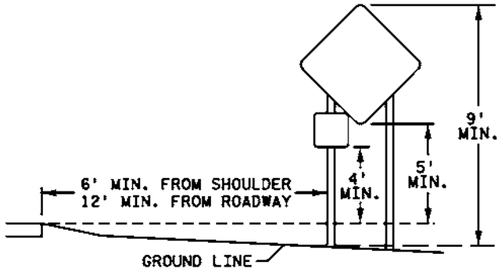
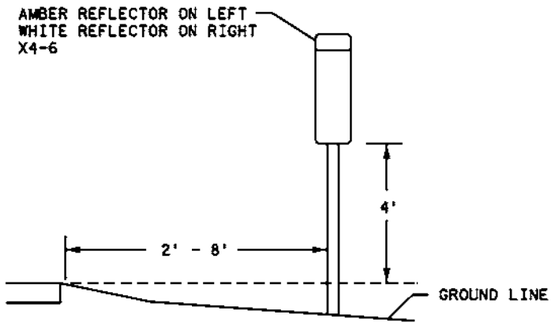


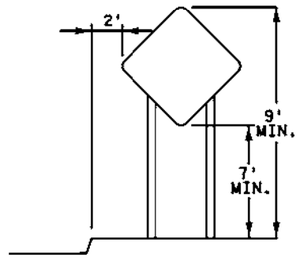
TYPICAL "A-FRAME" INSTALLATION



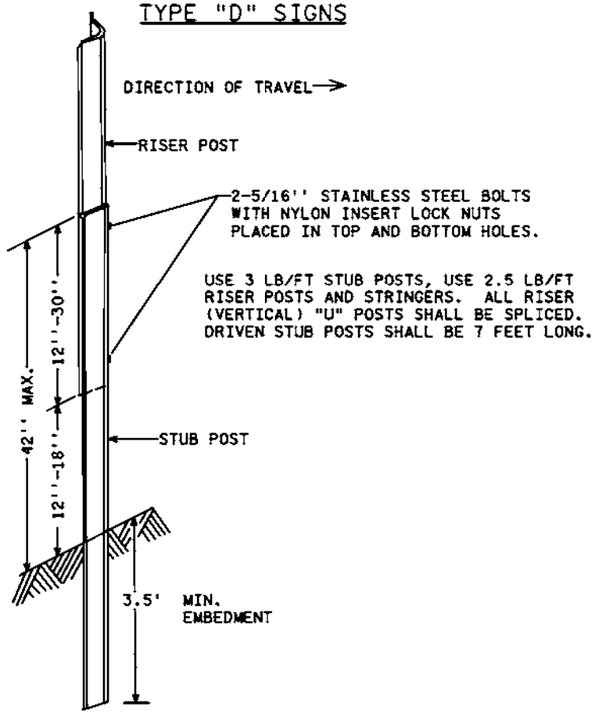
TYPICAL RURAL DESIGN



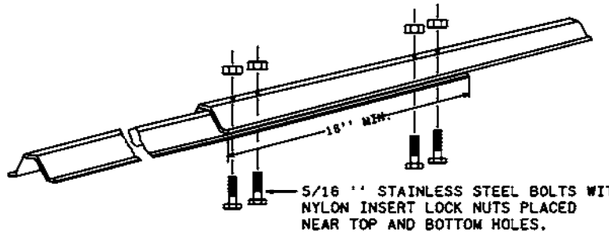
DELINEATION MOUNTING



TYPICAL URBAN DESIGN



1/26/18 "U" POST BREAKAWAY SPLICE



KNEE BRACE STRUCTURAL SPLICE

SIGN DATA

signs to be placed on driven u-posts shall be placed in accordance with table 1 or 2 below. IF THE TTC PLAN PLACES POST MOUNTED TEMPORARY SIGNS ADJACENT to existing structures there shall be no more than two u-post within 84 inches of each other aligned in the same plane so as not to compromise that structure's and the new device's crashworthiness. If it is not possible to maintain this spacing then the POST MOUNTED TEMPORARY SIGNS shall be placed a min of 4' beyond the in place structures. sign panels shall be placed on sign structures to meet the 5' min depicted on the typical rural design detail, the 7' min depicted on the typical urban design detail, and the 9' min depicted on the typical mounting detail on this sheet.

STANDARD CONSTRUCTION SIGNS IN MnDOT STANDARD SIGNS AND MARKINGS MANUAL

TABLE 1

PANEL SIZE (IN.)	POSTS			
	NO. & TYPE	SPACING (IN.)	KNEE BRACES QUANT.	LENGTH (FT.)
24 x 24	2-U	18		13
30 x 24	2-U	18		13
36 x 30	2-U	24		13
36 x 36	2-U	18		14
42 x 36	2-U	30		14
48 x 48	2-U	30		15
60 x 60	2-U	42	1	16
66 X 60	2-U	42	2	16
72 x 72	2-U	42	2	17
96 x 54	2-U	54	2	19
96 X 84	2-U	54	2	19
132 X 108	3-U	45	3	22
168 x 132	4-U	48	4	25

GENERAL NOTES:
1. POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.
2. SEE MnDOT STANDARD SIGNS AND MARKINGS MANUAL FOR PUNCHING HOLES.
3. MINIMUM OF 45" SPACING BETWEEN POSTS MUST BE MAINTAINED WHEN USING MORE THAN TWO POSTS.

TABLE 2

SPECIAL DESIGN CONSTRUCTION SIGNS

PANEL SIZE		POSTS			
LENGTH (IN.)	HEIGHT (IN.)	NO. & TYPE	SPACING (IN.)	KNEE BRACES QUANT.	LENGTH (FT.)
54 - 96	78	2-U	42	2	20
102 - 138	78	3-U	45	3	20
144 - 180	78	4-U	45	4	20

DESIGNER NOTE: INCLUDE SPECIAL SIGN DETAILS IN THE TRAFFIC CONTROL PLAN IN TABLE TWO.

NOTES: FOR TEMPORARY CONSTRUCTION SIGN FRAMING, THE CONTRACTOR MAY USE GRADE 5 ZINC PLATED BOLTS FOR ALL BOLTED CONNECTIONS, EXCEPT FOR THE KNEE BRACE CONNECTION TO THE REAR STUB POST, WHICH SHALL UTILIZE A 5/16 INCH STAINLESS STEEL BOLT AND NYLON INSERT LOCK NUT. ADDITIONAL SIGN FRAMING DETAILS CAN BE FOUND IN THE TRAFFIC ENGINEERING MANUAL PART 6.

IF THE CONTRACTOR ELECTS TO USE SOME OTHER TYPE OF SIGN SUPPORT (OTHER THAN U-CHANNEL SIGN POSTS) FOR MOUNTING CONSTRUCTION SIGNS, DETAILS OF THE PROPOSED SIGN STRUCTURE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING THE SIGN STRUCTURE COMPONENTS. ANY SIGN STRUCTURE TO BE SUBMITTED TO THE ENGINEER SHALL BE AN FHWA ACCEPTED BREAKAWAY SIGN SUPPORT. SIGN STRUCTURE SHALL ALSO BE APPROVED FOR 90 MPH WIND LOAD.

TYPICAL TEMPORARY SIGN FRAMING AND INSTALLATION DETAILS

NO	DATE	BY	CKD	APPR	REVISION

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ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL PLAN DETAILS

SHEET NO. 84 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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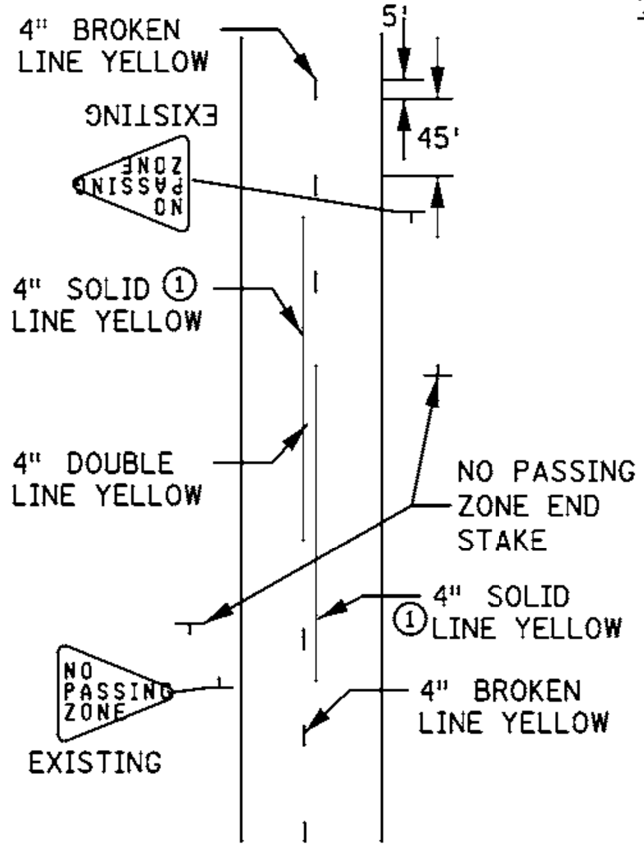
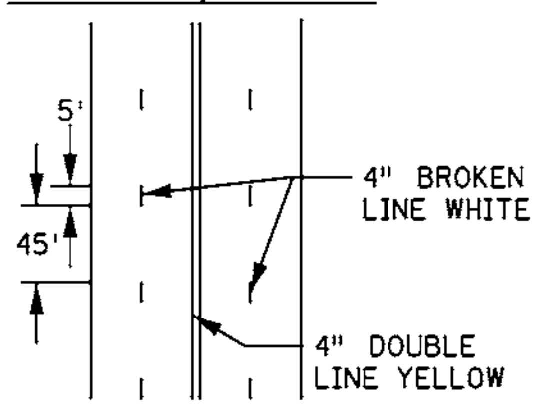
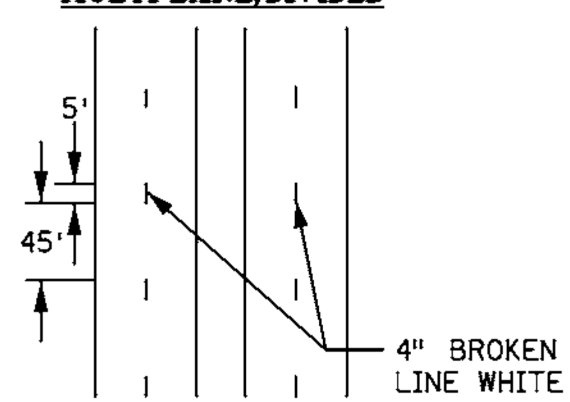
TWO LANE, TWO WAY



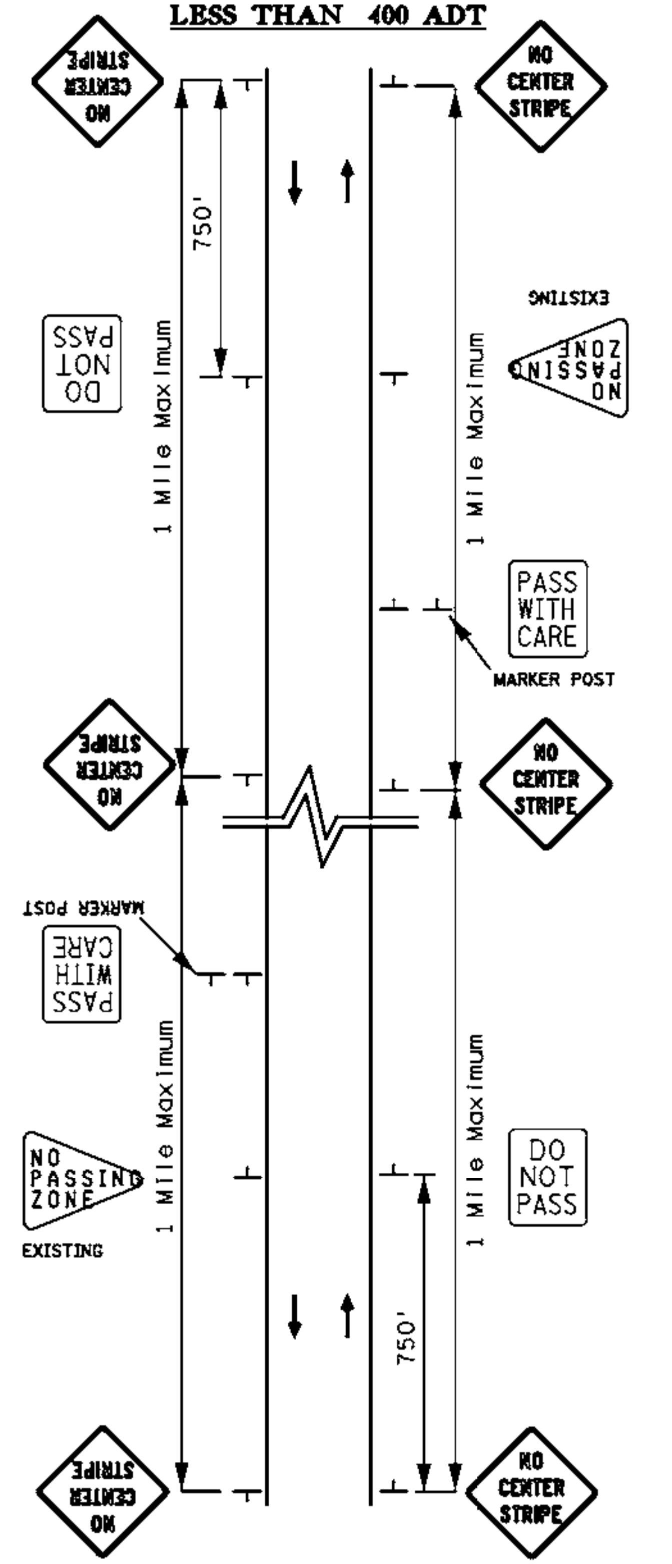
MULTI-LANE, UNDIVIDED



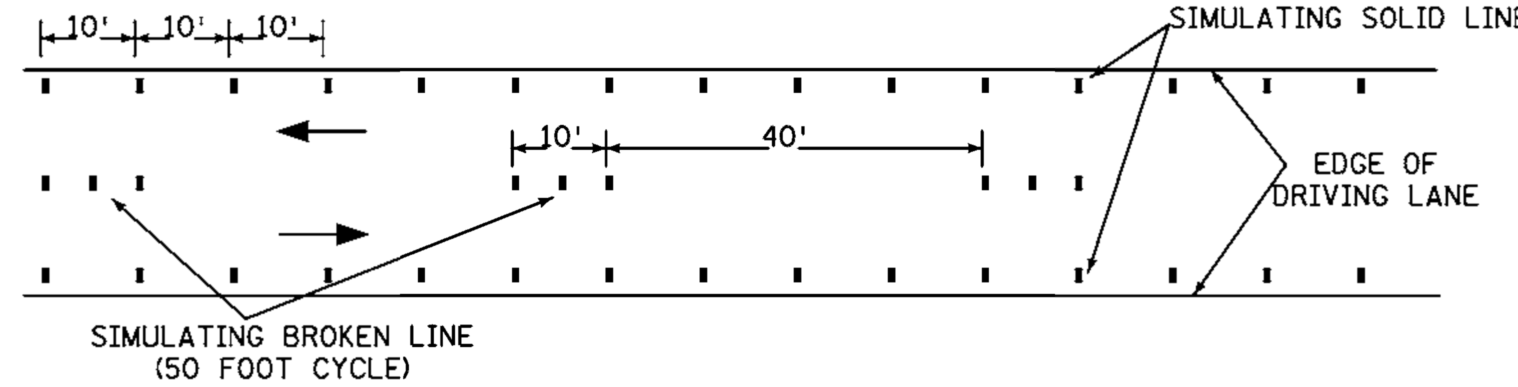
MULTI-LANE, DIVIDED



TWO LANE, TWO WAY - WITHOUT MARKINGS LESS THAN 400 ADT



SIMULATING A SOLID LINE AND A BROKEN LINE (50 FOOT CYCLE) WITH TRPM'S



USING TRPM'S AS INTERIM PAVEMENT MARKING

WHEN TRPM'S ARE USED TO SIMULATE A LINE THE FOLLOWING GUIDELINE APPLIES:

SKIP STRIPE - USES 3 TRPM's PER 10' SKIP STRIPE ON 5' CENTERS WITH A 40' GAP

SOLID LINE - USES TRPM'S ON 10' CENTERS ON TANGENTS, FLATTER GRADES AND CURVES UNDER 6 DEGREES. FOR CURVES OVER 6 DEGREES AND STEEP GRADES, THIS SPACING SHALL BE REDUCED TO 5' CENTERS.

GENERAL NOTES:

SEE SPECIAL PROVISIONS FOR INTERIM PAVEMENT MARKING GUIDELINES

THESE INTERIM PAVEMENT MARKING GUIDELINES APPLY TO ALL TEMPORARY TRAFFIC CONTROL ZONES OF AT LEAST 300' IN LENGTH ON TANGENT AND 50' ON CURVES OF 6 DEGREES OR GREATER.

1. FOR ALL PROJECTS GREATER THAN 1.25 MILES IN LENGTH, INTERIM SKIP STRIPE PAVEMENT MARKINGS SHALL USE THE SAME CYCLE LENGTH AS FINAL PAVEMENT MARKINGS (50') AND SHALL BE A MINIMUM OF 5' LENGTH. DOTTED LINE CYCLE SHALL BE 3' LINE 12' GAP UNLESS STATED OTHERWISE IN THE PLAN.

2. ON PROJECTS GREATER THAN 300' IN LENGTH, BUT LESS THAN 1.25 MILES IN LENGTH, THE INTERIM MARKING SHALL MATCH THE CYCLE LENGTH AT EITHER END OF THE PROJECT. THE INTERIM STRIPE SHALL BE 5' IN LENGTH. DOTTED LINE CYCLE SHALL BE 3' LINE 12' GAP UNLESS STATED OTHERWISE IN THE PLAN.

ALL INTERIM MARKINGS SHALL BE PLACED PRIOR TO REMOVING LANE CLOSURE OR OPENING THE ROADWAY TO TRAFFIC . INTERIM PAVEMENT MARKINGS SHALL CONSIST OF CENTER LINE (INCLUDING NO-PASSING ZONES), PAINTED ISLAND (MINUS CROSSHATCHING), AND ALL LANE LINES (INCLUDING TURN LANE LINES). AND SHALL BE THE SAME WIDTH AS THE CORRESPONDING PERMANENT PAVEMENT MARKINGS.

FINAL MARKINGS AND ALL OTHER PAVEMENT MARKINGS INCLUDING EDGELINES, CHANNELIZING LINES LANE, LANE REDUCTION TRANSITIONS, GORE MARKINGS AND OTHER LONGITUDIUAL MARKINGS AND THE VARIOUS NON-LONGITUDINAL MARKINGS (STOP LINES, RAIL ROAD CROSSING, CROSSWALKS, WORDS, SYMBOLS. ETC) SHOULD BE PLACED WITHIN 14 CALENDAR DAYS.

WHEN FINAL MARKINGS ARE TO BE MULTI COMPONENT AND PAINT IS USED FOR INTERIM SOLID LINES, A 10 MIL THICK LAYER APPLICATION OF A WATER-BASED TRAFFIC MARKING PAINT SHALL BE USED. WITH A 10 MIL LAYER OF PAINT APPLIED, BEADS SHOULD BE APPLIED AT A RATE OF 6 LBS/GAL. REMOVAL OF THE 10 MIL LAYER OF PAINT IS NOT REQUIRED PRIOR TO PLACING THE MULTI COMPONENT.

USING SIGNING AS INTERIM PAVEMENT MARKING

ON LOW VOLUME ROADS WITH AN ADT (AVERAGE DAILY TRAFFIC) OF LESS THAN 400 VEHICLES, THE SIGNS MAY BE USED IN LIEU OF PAVEMENT MARKINGS FOR UP TO 14 CALENDAR DAYS (SEE SECTION 5A.1 OF THE MMUTCD) OR AS DIRECTED BY THE PROJECT ENGINEER.

1. IF NO INTERIM MARKINGS ARE USED A "NO CENTER STRIPE" SIGN (W8-12) SHALL BE USED FOR EACH DIRECTION OF TRAVEL. THIS SIGN SHALL BE REPEATED AT MAJOR INTERSECTIONS OR ONE MILE INTERVALS, WHICHEVER IS GREATER.

2. IF NOT ALREADY IN PLACE, A "DO NOT PASS" SIGN (R4-1) SHALL BE PLACED ON THE RIGHT SIDE OF THE ROAD AT THE BEGINNING OF THE ZONE OPPOSITE OF THE "NO PASSING ZONE" SIGN (W14-3)

PUBLISHED BY OTST: 1 JAN 2018 | MODIFIED BY AJH: 3 MAR 2018

NO	DATE	BY	CKD	APPR	REVISION

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ANOKA COUNTY

TEMPORARY TRAFFIC CONTROL
SHEET NO. 85 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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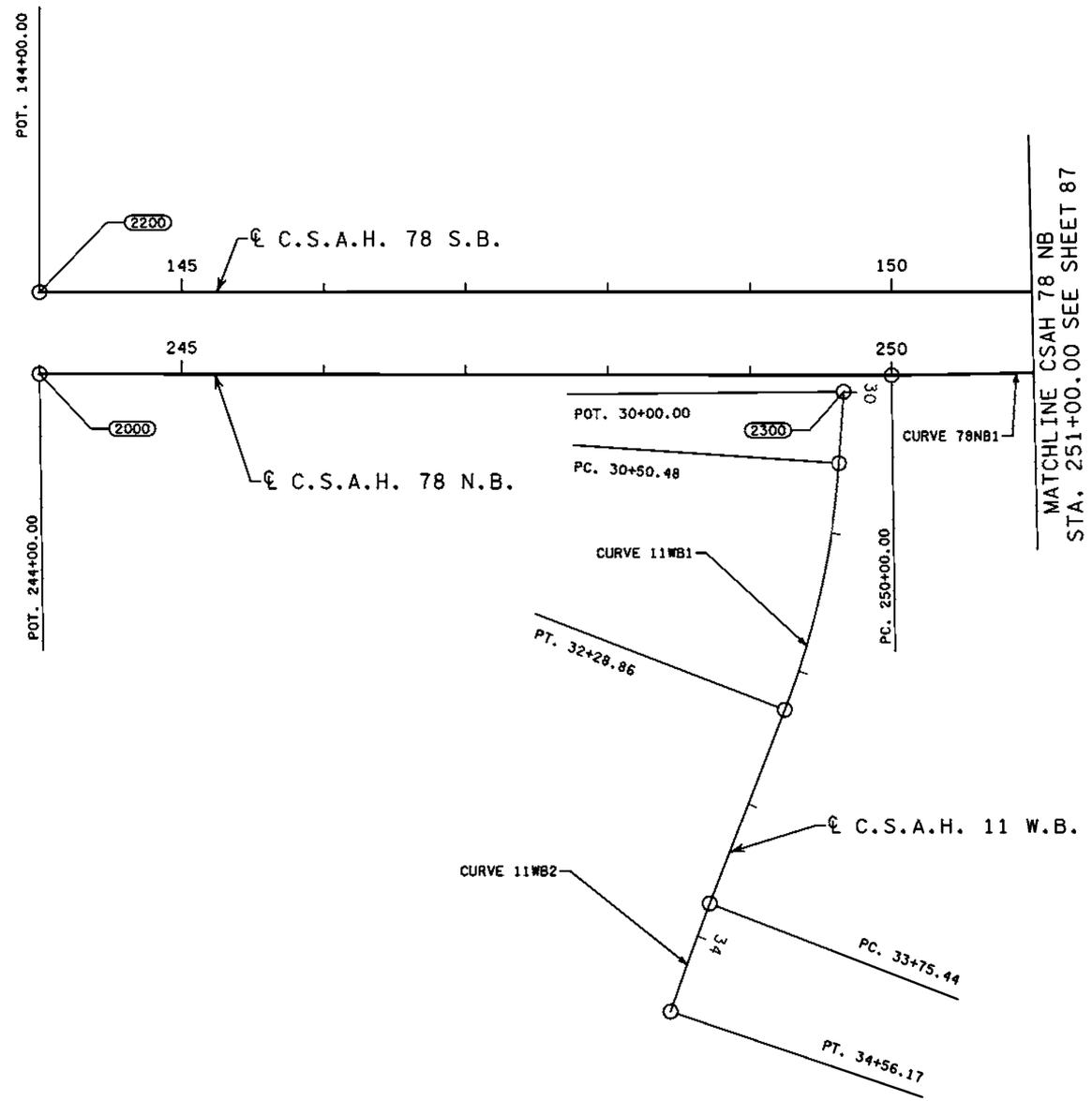

100

SCALE IN FEET

LEGEND

POINT NUMBER	(XXXX)
CURVE NAME	CURVE XXXXX

HORIZONTAL CONTROL

COORDINATES SHOWS IN THIS PLAN ARE BASED ON ANOKA COUNTY CORDINATE SYSTEM, USING NAD 1983 (HARN 1996 ADJUSTMENT) DATUM.

NO	DATE	BY	CKD	APPR	REVISION

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NAME: GINA E. BEERS LIC. NO. 56150

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DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

ALIGNMENT PLAN

SHEET NO. 86 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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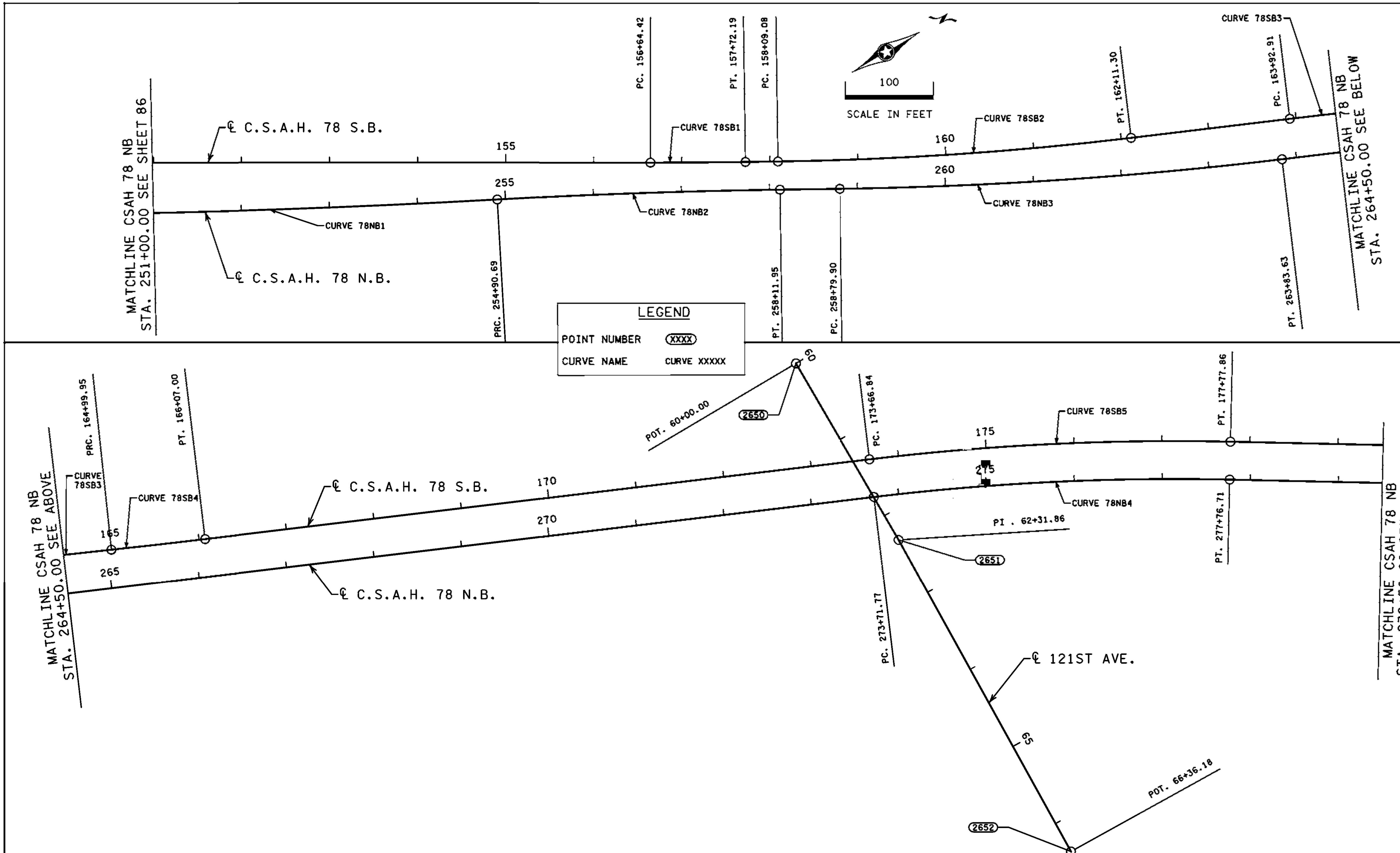

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LEGEND
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℄ C.S.A.H. 78 N.B.
155
160
255
260
PC. 156+64.42
PT. 157+72.19
PC. 158+09.08
PT. 162+11.30
PC. 163+92.91
CURVE 78SB1
CURVE 78SB2
CURVE 78SB3
CURVE 78NB1
CURVE 78NB2
CURVE 78NB3
PRC. 254+90.69
PT. 258+11.95
PC. 258+79.90
PT. 263+83.63
MATCHLINE CSAH 78 NB
STA. 264+50.00 SEE BELOW
MATCHLINE CSAH 78 NB
STA. 264+50.00 SEE ABOVE
CURVE 78SB3
CURVE 78SB4
PRC. 164+99.95
PT. 166+07.00
165
170
175
265
270
275
℄ C.S.A.H. 78 S.B.
℄ C.S.A.H. 78 N.B.
POT. 60+00.00
60
2650
PC. 173+66.84
CURVE 78SB5
PT. 177+77.86
CURVE 78NB4
PI . 62+31.86
2651
PC. 273+71.77
PT. 277+76.71
℄ 121ST AVE.
65
POT. 66+36.18
2652
MATCHLINE CSAH 78 NB
STA. 279+50.00 SEE SHEET 88

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CHECKED BY: BAV

HDR

ANOKA COUNTY

ALIGNMENT PLAN

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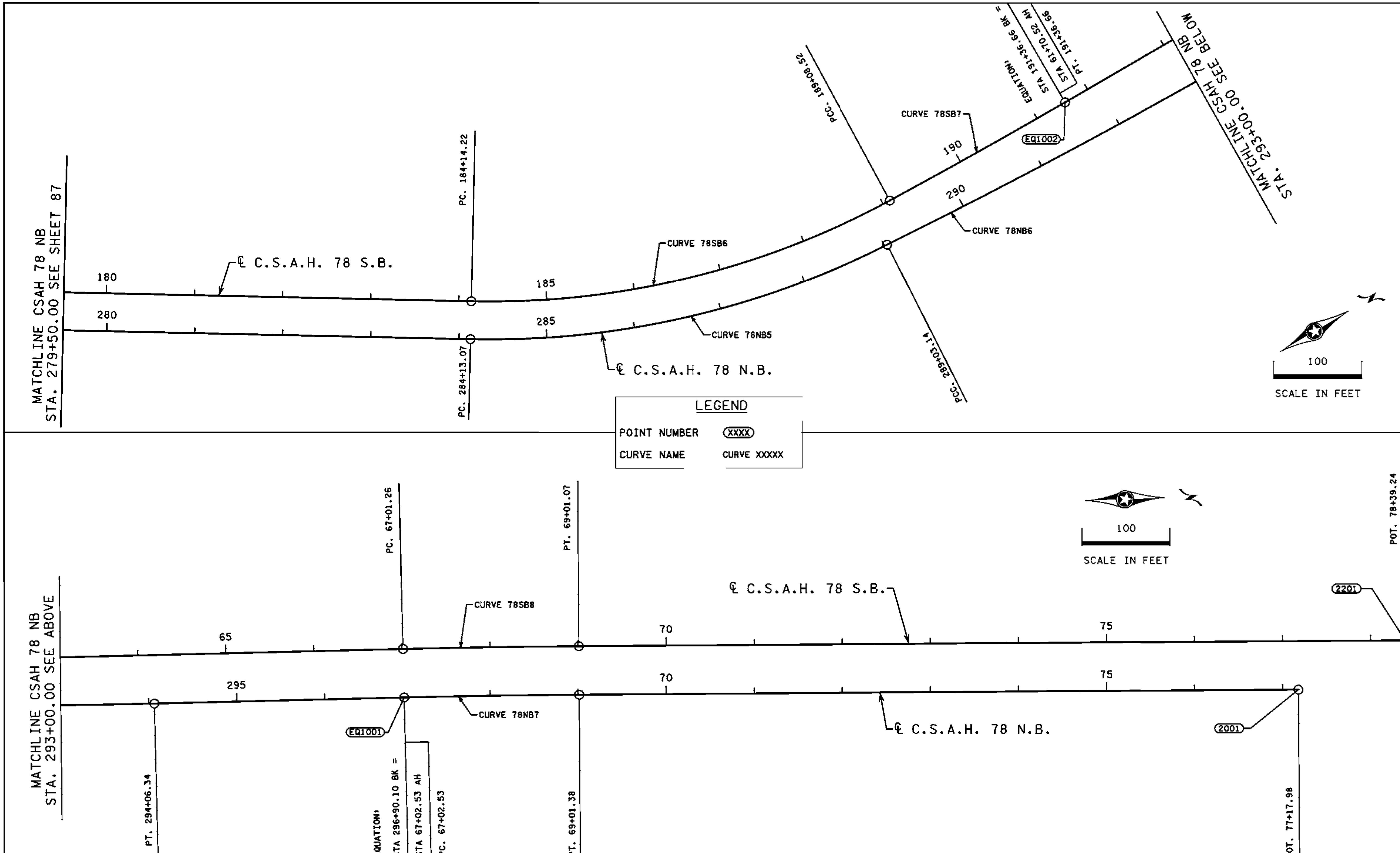

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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: ______ LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

ALIGNMENT PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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ALIGNMENT TABULATION - C.S.A.H 78 N.B. (PCSAH78NB)

POINT / CURVE NUMBER	POINT DESC.	STATION	CURVE DATA: DELTA	DEGREE	RADIUS	TANGENT	LENGTH	COORDINATES: X	Y	AZIMUTH
2000	POT	244+00.000						487,681.7684	153,806.7684	
	PC	250+00.000						487,988.2545	154,322.5142	N 29° 52' 13.32" E
78NB1	PI	252+45.380	2° 27' 24.74" LT	0° 30' 02.53"	11,443.083'	245.380'	490.685'	488,110.4635	154,535.2967	PI
	CC							478,065.3341	160,021.6194	
	PRC	254+90.685						488,223.4387	154,753.1224	N 27° 24' 48.58" E
	PRC	254+90.685						488,223.4387	154,753.1224	N 27° 24' 48.58" E
78NB2	PI	256+51.339	2° 24' 34.53" RT	0° 45' 00.16"	7,638.995'	160.654'	321.260'	488,297.4052	154,895.7360	PI
	CC							495,004.6277	151,236.0614	
	PT	258+11.946						488,377.3021	155,035.1137	N 29° 49' 23.11" E
	PC	258+79.898						488,411.0965	155,094.0670	N 29° 49' 23.11" E
78NB3	PI	261+31.995	6° 01' 58.54" LT	1° 11' 51.56"	4,784.000'	252.097'	503.729'	488,536.4704	155,312.7778	PI
	CC							484,260.6649	157,473.2630	
	PT	263+83.627						488,638.1635	155,543.4541	N 23° 47' 24.58" E
	PC	273+71.770						489,036.7687	156,447.6336	N 23° 47' 24.58" E
78NB4	PI	275+74.578	8° 05' 53.59" RT	1° 59' 59.47"	2,865.000'	202.808'	404.941'	489,118.5791	156,633.2089	PI
	CC							491,658.3267	155,291.9265	
	PT	277+76.711						489,225.7158	156,805.4090	N 31° 53' 18.17" E
	PC	284+13.068						489,561.8818	157,345.7266	N 31° 53' 18.17" E
78NB5	PI	286+63.150	28° 08' 07.50" LT	5° 44' 27.82"	998.000'	250.082'	490.074'	489,693.9919	157,558.0663	PI
	CC							488,714.5011	157,872.9362	
	PCC	289+03.142						489,710.3610	157,807.6124	N 3° 45' 10.66" E
	PCC	289+03.142						489,710.3610	157,807.6124	N 4° 17' 43.19" E
78NB6	PI	291+54.831	3° 46' 27.11" LT	0° 45' 00.15"	7,639.000'	251.690'	503.197'	489,729.2119	158,058.5951	PI
	CC							482,092.8171	158,379.7540	
	PT	294+06.339						489,731.5011	158,310.2744	N 0° 31' 16.08" E
EQ1001	POT	296+90.102						489,734.0820	158,594.0261	
	PC	67+02.533						489,734.0820	158,594.0261	N 0° 31' 16.08" E
78NB7	PI	68+01.958	0° 59' 39.23" RT	0° 30' 00.00"	11,459.156'	99.426'	198.846'	489,734.9863	158,693.4475	PI
	CC							501,192.7639	158,489.8006	
	PT	69+01.379						489,737.6157	158,792.8384	N 1° 30' 55.32" E
2001	POT	77+17.980						489,759.2107	159,609.1539	

ALIGNMENT TABULATION - C.S.A.H 11 W.B. (CSAH11WB)

POINT / CURVE NUMBER	POINT DESC.	STATION	CURVE DATA: DELTA	DEGREE	RADIUS	TANGENT	LENGTH	COORDINATES: X	Y	AZIMUTH
2300	POT	30+00.000						487,981.0049	154,287.6412	
	PC	30+50.477						488,022.5852	154,259.0229	S 55° 27' 42.12" E
11WB1	PI	31+40.341	17° 10' 37.98" RT	9° 37' 46.35"	595.000'	89.864'	178.380'	488,096.6106	154,208.0737	PI
	CC							487,685.2457	153,768.8932	
	PT	32+28.857						488,152.2875	154,137.5353	S 38° 17' 04.14" E
	PC	33+75.440						488,243.1051	154,022.4763	S 38° 17' 04.14" E
11WB2	PI	34+15.812	2° 19' 49.23" LT	2° 53' 11.17"	1,985.000'	40.373'	80.734'	488,268.1186	153,990.7860	PI
	CC							489,801.2193	155,252.3157	
	PT	34+56.174						488,294.4000	153,960.1390	S 40° 36' 53.37" E

ALIGNMENT TABULATION - C.S.A.H 78 S.B. (PCSAH78SB)

POINT / CURVE NUMBER	POINT DESC.	STATION	CURVE DATA: DELTA	DEGREE	RADIUS	TANGENT	LENGTH	COORDINATES: X	Y	AZIMUTH
2200	POT	144+00.000						487,631.7735	153,836.3011	
	PC	156+64.421						488,276.0118	154,924.2888	N 30° 37' 52.91" E
78SB1	PI	157+18.304	0° 48' 29.80" LT	0° 45' 00.15"	7,639.000'	53.883'	107.764'	488,303.4658	154,970.6531	PI
	CC							481,702.9331	158,816.4549	
	PT	157+72.185						488,330.2631	155,017.4000	N 29° 49' 23.11" E
	PC	158+09.077						488,348.6104	155,049.4064	N 29° 49' 23.11" E
78SB2	PI	160+10.376	6° 01' 58.54" LT	1° 29' 59.60"	3,820.000'	201.298'	402.225'	488,448.7209	155,224.0459	PI
	CC							485,034.5116	156,949.1825	
	PT	162+11.302						488,529.9223	155,408.2397	N 23° 47' 24.58" E
	PC	163+92.909						488,603.1803	155,574.4153	N 23° 47' 24.58" E
78SB3	PI	164+46.432	0° 48' 10.37" RT	0° 45' 00.15"	7,639.000'	53.523'	107.045'	488,624.7710	155,623.3906	PI
	CC							495,593.0865	152,492.9332	
	PRC	164+99.954						488,647.0458	155,672.0586	N 24° 35' 34.95" E
	PRC	164+99.954						488,647.0458	155,672.0586	N 24° 35' 34.95" E
78SB4	PI	165+53.478	0° 48' 10.37" LT	0° 45' 00.10"	7,639.142'	53.524'	107.047'	488,669.3210	155,720.7275	PI
	CC							481,700.8755	158,851.2433	
	PT	166+07.000						488,690.9120	155,769.7037	N 23° 47' 24.58" E
	PC	173+66.840						488,997.4225	156,464.9793	N 23° 47' 24.58" E
78SB5	PI	175+72.692	8° 05' 53.59" RT	1° 58' 13.01"	2,908.000'	205.852'	411.018'	489,080.4607	156,653.3398	PI
	CC							491,658.3267	155,291.9265	
	PT	177+77.859						489,189.2054	156,828.1244	N 31° 53' 18.17" E
	PC	184+14.216						489,525.3714	157,368.4420	N 31° 53' 18.17" E
78SB6	PI	186+67.039	29° 39' 22.18" LT	5° 59' 58.41"	955.000'	252.823'	494.306'	489,658.9291	157,583.1084	PI
	CC							488,714.5011	157,872.9362	
	PCC	189+08.522						489,668.7765	157,835.7392	N 2° 13' 55.99" E
	PCC	189+08.522						489,668.7765	157,835.7392	N 2° 13' 55.99" E
78SB7	PI	190+22.598	1° 42' 39.99" LT	0° 45' 00.15"	7,639.000'	114.076'	228.135'	489,673.2197	157,949.7285	PI
	CC							482,035.5731	158,133.2760	
	PT	191+36.657						489,674.2572	158,063.7996	N 0° 31' 16.00" E
EQ1002	POT	61+70.517						489,674.2572	158,063.7996	
	PC	67+01.264						489,679.0843	158,594.5250	N 0° 31' 16.00" E
78SB8	PI	68+01.169	0° 59' 39.31" RT	0° 29' 51.40"	11,514.156'	99.905'	199.805'	489,679.9930	158,694.4259	PI
	CC							501,192.7641	158,489.8041	
	PT	69+01.069						489,682.6349	158,794.2960	N 1° 30' 55.31" E
2201	POT	78+39.245						489,707.4450	159,732.1437	

ALIGNMENT TABULATION - 121ST AVE. NW (121STAVE)

POINT / CURVE NUMBER	POINT DESC.	STATION	CURVE DATA: DELTA	DEGREE	RADIUS	TANGENT	LENGTH	COORDINATES: X	Y	AZIMUTH
2300	POT	30+00.000						487,981.0049	154,287.6412	
2650	POT	60+00.000						488,861.1480	156,448.5560	
2651	POT	62+31.864						489,093.0063	156,446.9355	
2652	POT	66+36.182						489,497.1504	156,435.0766	

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

ANOKA COUNTY

ALIGNMENT TABULATION

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(U) REMOVE SIGN TYPE SPECIAL			
STATION	LOCATION	QUANTITY EACH	SIGN LEGEND
264+55	RT	1	119TH AVE/HANSON BLVD
288+16	RT	1	122ND CIRCLE NW/EAGLE CIRCLE NW/HANSON BLVD NW
281+65	LT	1	122ND AVE/HANSON BLVD
TOTAL		3	

(V) REMOVE MARKER		
TYPE	QUANTITY EACH	LOCATION
X4-4	4	MEDIAN
X4-2	1	MEDIAN
TOTAL	5	

(Y) REMOVE SIGN TYPE C	
TYPE	QUANTITY EACH
REMOVE SIGN TYPE C	54
TOTAL	54

GENERAL NOTES

1. ALIGNMENT AND STATIONING ARE FOR REFERENCE ONLY.

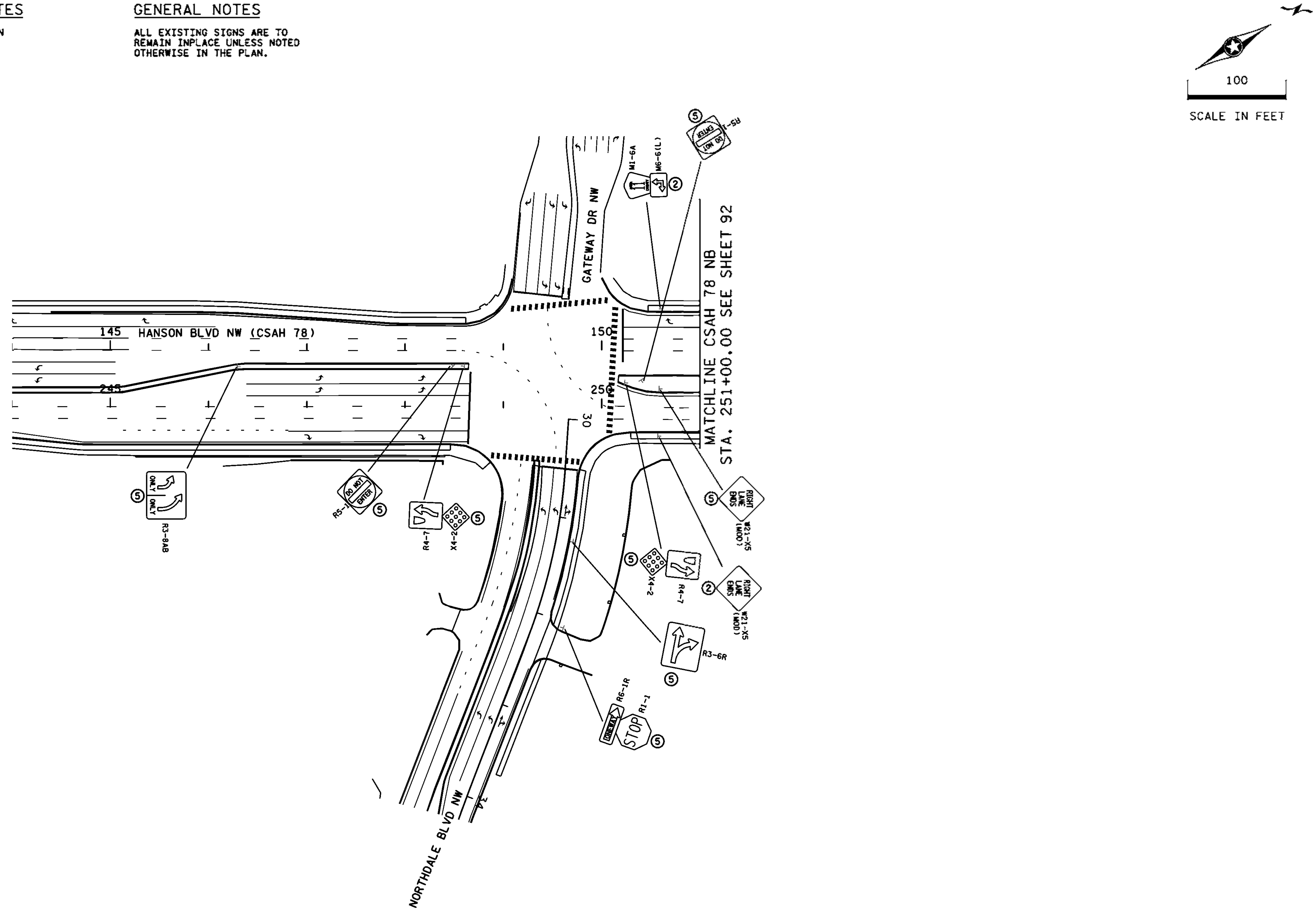
SPECIFIC NOTES

(2) RETAIN INPLACE SIGN

(5) REMOVE SIGN TYPE C

GENERAL NOTES

ALL EXISTING SIGNS ARE TO REMAIN INPLACE UNLESS NOTED OTHERWISE IN THE PLAN.



NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL J. MARTINEZ LIC. NO. 42807

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL

DESIGNED BY: NJL

CHECKED BY: MJM

HDR

ANOKA COUNTY

EXISTING SIGNING & STRIPING

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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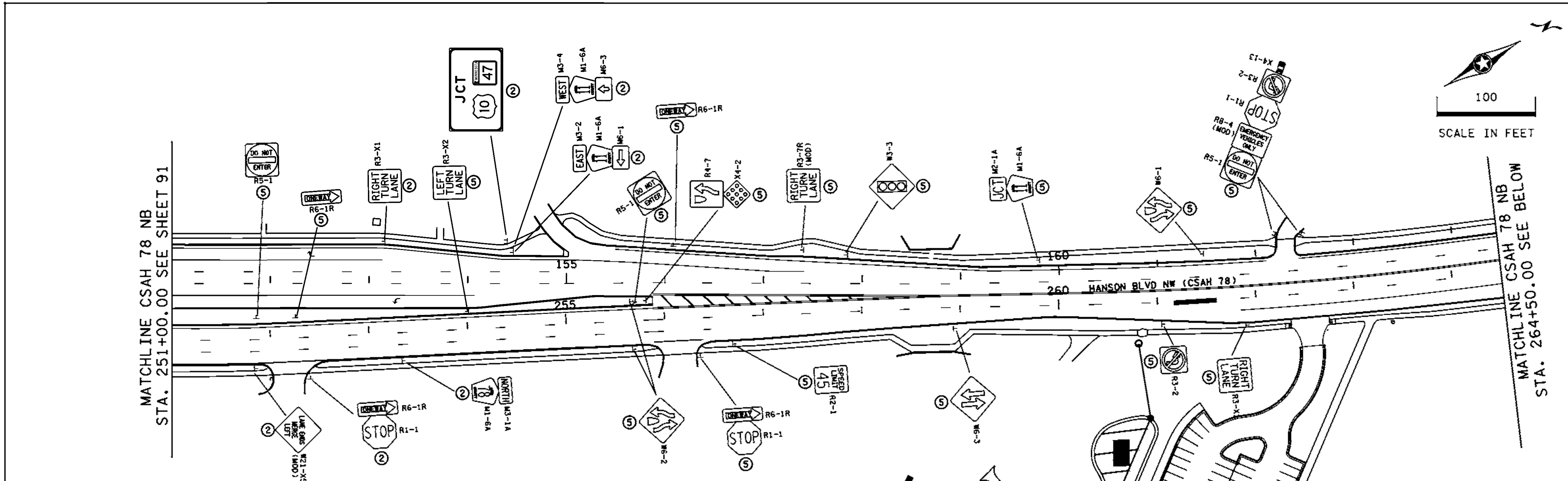
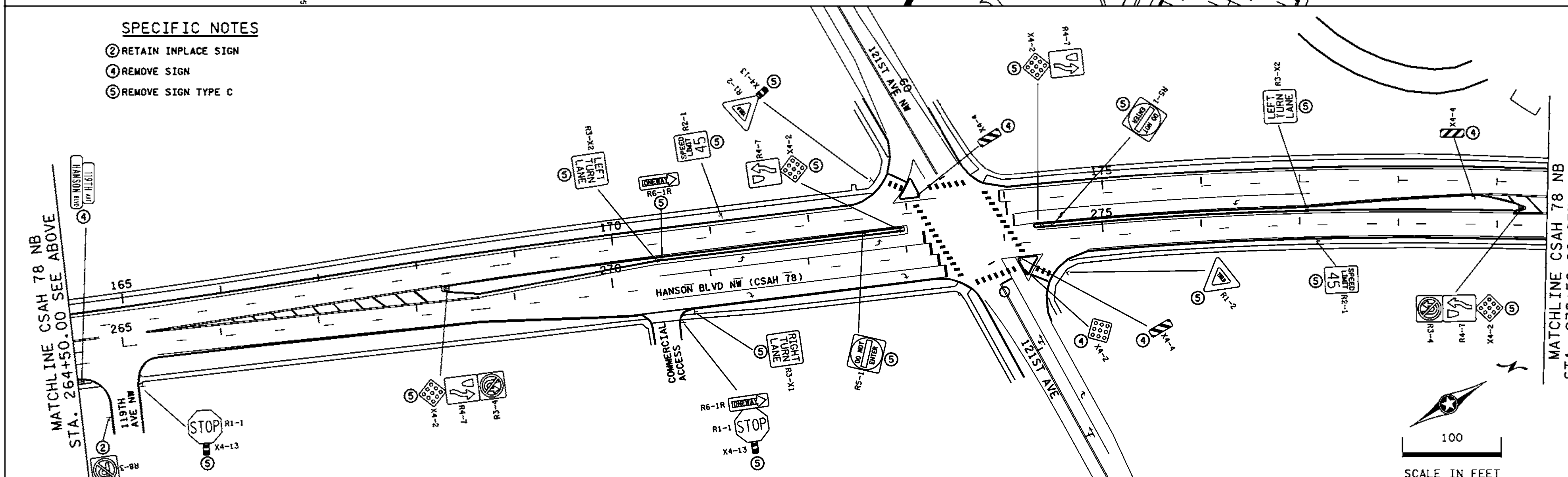


SPECIFIC NOTES

- ② RETAIN INPLACE SIGN
- ④ REMOVE SIGN
- ⑤ REMOVE SIGN TYPE C



NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL J. MARTINEZ LIC. NO. 42807

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: NJL
CHECKED BY: MJM

HDR
ANOKA COUNTY

EXISTING SIGNING & STRIPING

SHEET NO. 92 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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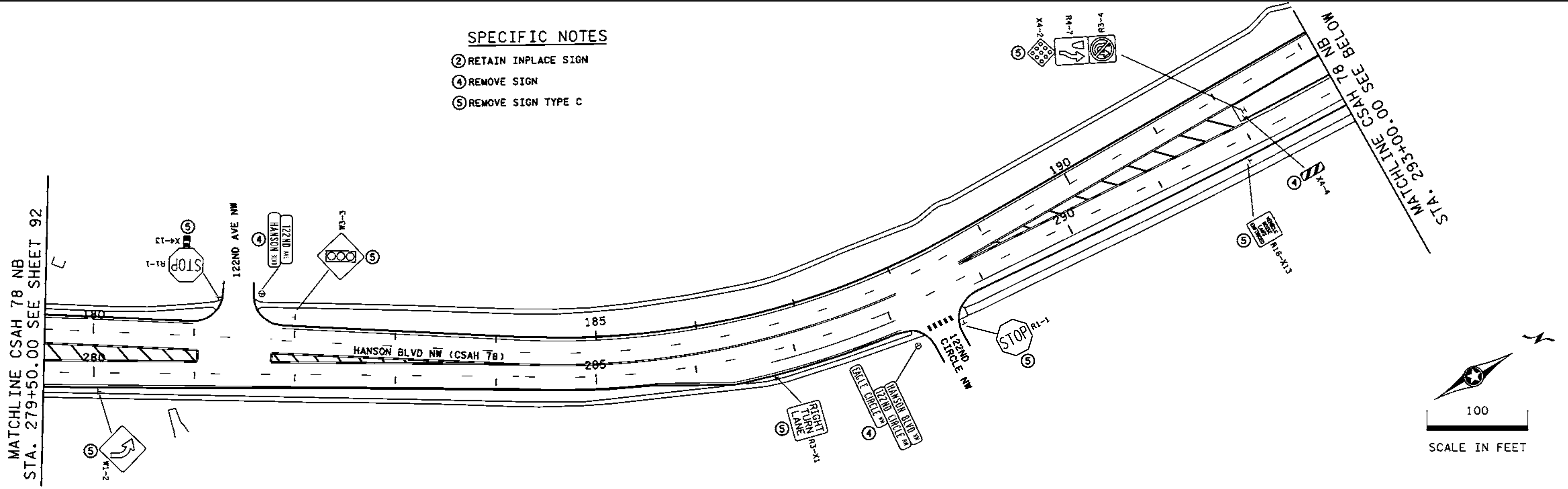
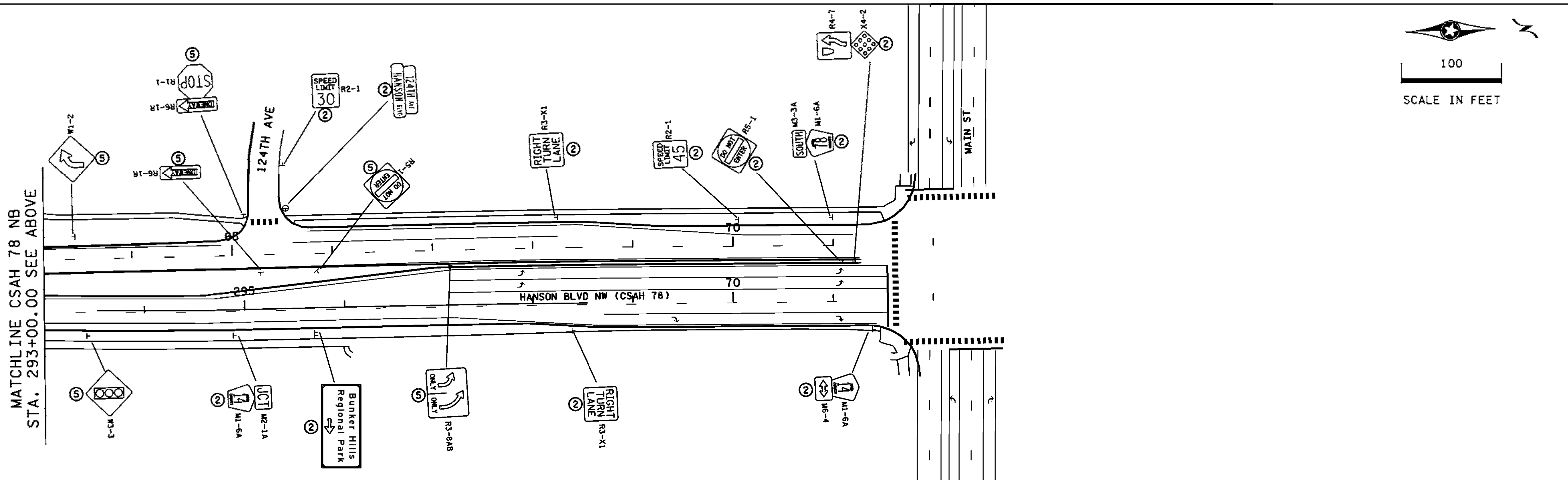
SPECIFIC NOTES

(2) RETAIN INPLACE SIGN

(4) REMOVE SIGN

(5) REMOVE SIGN TYPE C





NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL J. MARTINEZ LIC. NO. 42807

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL

DESIGNED BY: NJL

CHECKED BY: MJM

HDR

ANOKA COUNTY

EXISTING SIGNING & STRIPING

SHEET NO. 93 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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PERMANENT PAVEMENT MARKING PLAN

NOTES & GUIDELINES

GENERAL INFORMATION:

THE ENGINEER'S INVOLVEMENT IN THE APPLICATION OF THE MATERIAL SHALL BE LIMITED TO FIELD CONSULTATION AND INSPECTION. THE CONTRACTOR WILL PLACE NECESSARY "SPOTTING" AT APPROPRIATE POINTS TO PROVIDE HORIZONTAL CONTROL FOR STRIPING AND TO DETERMINE NECESSARY STARTING AND CUTOFF POINTS. LONGITUDINAL JOINTS, PAVEMENT EDGES AND EXISTING MARKINGS MAY SERVE AS HORIZONTAL CONTROL WHEN SO DIRECTED.

EDGE LINES AND LANE LINES ARE TO BE BROKEN ONLY AT INTERSECTIONS WITH PUBLIC ROADS AND AT PRIVATE ENTRANCES IF THEY ARE CONTROLLED BY AN AGENCY PLACED YIELD SIGN, STOP SIGN OR TRAFFIC SIGNAL. THE BREAK POINT IS TO BE AT THE START OF THE RADIUS FOR THE INTERSECTION OR AT MARKED STOP LINES OR CROSSWALKS.

A TOLERANCE OF 1/4 INCH UNDER OR 1/4 INCH OVER THE SPECIFIED WIDTH WILL BE ALLOWED FOR STRIPING PROVIDED THE VARIATION IS GRADUAL AND DOES NOT DETRACT FROM THE GENERAL APPEARANCE. BROKEN LINE SEGMENTS MAY VARY UP TO 3 INCHES FROM THE SPECIFIED LENGTHS PROVIDED THE OVER AND UNDER VARIATIONS ARE REASONABLY COMPENSATORY. ALIGNMENT DEVIATIONS FROM THE CONTROL GUIDE SHALL NOT EXCEED 1 INCH. MATERIAL SHALL NOT BE APPLIED OVER LONGITUDINAL JOINTS. ESTABLISHMENT OF APPLICATION TOLERANCES SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO COMPLY AS CLOSELY AS PRACTICABLE WITH THE PLANNED DIMENSIONS.

JUST PRIOR TO THE PLACEMENT OF PAVEMENT MARKINGS, THE ROAD SURFACE SHALL BE CLEANED AND FREE OF CONTAMINATION AS RECOMMENDED BY THE MATERIAL MANUFACTURER AND ACCEPTABLE TO THE ENGINEER. PORTLAND CEMENT CONCRETE SURFACES SHALL BE SANDBLAST CLEANED TO REMOVE ANY SURFACE TREATMENTS AND/OR LAITANCE.

APPLY ALL PAVEMENT MARKINGS AS RECOMMENDED BY THE MATERIAL MANUFACTURER.

PERMANENT PAVEMENT MARKINGS SHALL NOT BE PLACED OVER TEMPORARY TAPE MARKINGS.

THE FILLING OF TANKS, POURING OF MATERIALS OR CLEANING OF EQUIPMENT SHALL NOT BE PERFORMED ON UNPROTECTED PAVEMENT SURFACES UNLESS ADEQUATE PROVISIONS ARE MADE TO PREVENT SPILLAGE OF MATERIAL.

MULTI-COMPONENT LIQUID:

THE ROAD SURFACE SHALL BE CLEANED AT THE DIRECTION OF THE ENGINEER JUST PRIOR TO APPLICATION. PAVEMENT CLEANING SHALL CONSIST OF AT LEAST BRUSHING WITH A ROTARY BROOM (NON-METALLIC) OR AS RECOMMENDED BY THE MATERIAL MANUFACTURER AND ACCEPTABLE TO THE ENGINEER.

THE MULTI-COMPONENT LIQUID MARKING APPLICATION SHALL IMMEDIATELY FOLLOW THE PAVEMENT CLEANING. GLASS BEADS SHALL BE APPLIED IMMEDIATELY AFTER APPLICATION OF THE MULTI-COMPONENT LIQUID PAVEMENT MARKING.

APPLY MULTI-COMPONENT LIQUID MARKINGS WITH A MINIMUM THICKNESS OF 20 MILS; GLASS BEADS SHALL BE APPLIED AT A RATE OF AT LEAST 25 LB/GAL. THE "NO-TRACKING" CONDITION SHALL BE DETERMINED ON AN APPLICATION OF SPECIFIED THICKNESS TO THE PAVEMENT AND COVERED WITH GLASS BEADS AT THE RATE OF AT LEAST 25 LB/GAL.

PAVEMENT MARKINGS SHALL ONLY BE APPLIED IN SEASONABLE WEATHER WHEN AIR AND PAVEMENT SURFACE TEMPERATURES ARE 40°F OR HIGHER AND SHALL NOT BE APPLIED WHEN THE WIND OR OTHER CONDITIONS CAUSE A FILM OF DUST TO BE DEPOSITED ON THE PAVEMENT SURFACE AFTER CLEANING AND BEFORE THE MARKING MATERIAL CAN BE APPLIED.

PREFORMED MARKINGS:

MANUFACTURER CERTIFICATIONS ARE REQUIRED FOR INSTALLERS, AND WRITTEN CERTIFICATION SHALL BE PRESENTED AT ANYTIME UPON REQUEST OF ENGINEER OR OTHER STATE PERSONAL.

DO NOT USE LINE MATERIAL TO PIECE TOGETHER INDIVIDUAL LETTERS, SYMBOLS, OR CROSSWALKS BLOCKS. UTILIZE PRECUT KITS PROVIDED BY THE MANUFACTURER. TWO STRIPS OF 18" LINE MATERIAL MAY BE USED TO FORM CROSSWALK BLOCKS OF 36" WIDTH.

DO NOT USE NARROWER LINE MATERIAL TO PIECE TOGETHER WIDER LINES.

IF THERE IS A CRACK OR JOINT IN ROAD SURFACE. (FOR TAPE LAY OVER CRACK OR JOINT THEN CUT TAPE 1" ON EACH SIDE OF CRACK OR JOINT). (FOR THERMO MAKE A DEEP SCORE IN THE MATERIAL ONCE IT HAS SET UP BUT NOT ENTIRELY COOLED DOWN).

THE PREFORMED THERMOPLASTIC MARKINGS SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS ON CLEAN AND DRY SURFACES. SEE SPECIAL PROVISIONS FOR PREFORMED THERMOPLASTIC MARKING SPECIFICATIONS.

SYMBOLS & MATERIALS LEGEND

BROKEN LINE-50' CYCLE (10' LINE, 40' GAP

DOTTED LINE-15' CYCLE (3' LINE, 12' GAP, UNLESS SHOWN OTHER WISE IN THE PLAN

CROSSWALK BLOCK

PAVEMENT MESSAGE (LEFT ARROW)

STRIPING KEY

CIRCLE-MULTI COMP

SQUARE-PREF TAPE

TRIANGLE-PAINT

OCTAGON-PREF THERMO

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	

G=GROUND IN	W=WET REFLECTIVE
C=CONTRAST	E=ENHANCED SKID RESISTANCE

EXAMPLE: 4SW GCW = 4" SOLID LINE WHITE PREF THERMO GROUND IN, CONTRAST, WET REFLECTIVE

(T) PERMANENT PAVEMENT MARKING TABULATION

ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL QUANTITY	
2102.503	PAVEMENT MARKING REMOVAL	LIN FT	5320	
2102.518	PAVEMENT MARKING REMOVAL	SQ FT	808	
2582.503	4" SOLID LINE MULTI COMP	LIN FT	16465	(2)
2582.503	4" BROKEN LINE MULTI COMP	LIN FT	2143	
2582.503	4" DOTTED LINE MULTI COMP	LIN FT	28	
2582.503	8" DOTTED LINE MULTI COMP	LIN FT	161	
2582.503	4" DBLE SOLID LINE MULTI COMP	LIN FT	804	
2582.518	PAVT MSSG PREF THERMO	SQ FT	4605	(1)

SPECIFIC NOTES

(1) INCLUDES 20 LEFT TURN ARROWS, 14 RIGHT TURN ARROWS, 3270 SQ FT OF ZEBRA CROSSWALK BLOCKS, AND 810 SQ FT OF STOP BARS.

(2) INCLUDES 14568 FT WHITE AND 1897 FT YELLOW.

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL J. MARTINEZ LIC. NO. 42807

CERTIFIED BY: Michael Martinez 11/22/2019

LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: NJL

DESIGNED BY: NJL

CHECKED BY: MJM

HDR

ANOKA COUNTY

PERMANENT SIGNING & STRIPING

SHEET NO. 94 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(W) SIGN PANELS TYPE C

M.U.T.C.D. CODE	SIZE	INSERT	PANEL AREA SQ FT	TOTAL AREA SQ FT	QUANTITY	NO. POST	MOUNTING HEIGHT (TO PAVEMENT EDGE)
R3-X1	30" x 30"	RIGHT TURN LANE	6.25	62.5	10	1	7.0'
R3-X2	30" x 30"	LEFT TURN LANE	6.25	43.75	7	1	7.0'
R5-1	30" x 30"	DO NOT ENTER	6.25	81.25	13	1	7.0'
R6-1R	54" x 18"	ONE WAY	4.00	20.00	5	2	7.0'
R3-2	24" x 24"		4.00	4.00	1	1	7.0'
R2-1	30" x 36"	SPEED LIMIT 45	5.00	10.00	2	2	7.0'
R10-31P	24" x 9"	AT SIGNAL	1.50	1.50	1	2	7.0'
R3-8AB	36" x 30"	ONLY ONLY	7.50	7.50	1		
R16-X13	24" x 24"		4.00	4.00	1	1	7.0'
R6-1R	36" x 12"	ONE WAY	4.00	16.00	4	1	7.0'
R1-1	30" x 30"	STOP	6.25	25.00	4		
R3-2	24" x 24"		4.00	16.00	4		
X4-13	4" x 15"		0.42	1.67	4		
R6-1R	36" x 12"	ONE WAY	4.00	20.00	5	1	7.0'
R1-1	30" x 30"	STOP	6.25	31.25	5		
X4-13	4" x 15"		0.42	2.08	5		
R3-X1	30" x 30"	RIGHT TURN LANE	6.25	6.25	1	1	10.0'

(W) SIGN PANELS TYPE C

M.U.T.C.D. CODE	SIZE	INSERT	PANEL AREA SQ FT	TOTAL AREA SQ FT	QUANTITY	NO. POST	MOUNTING HEIGHT (TO PAVEMENT EDGE)
R4-7	24" x 30"		5.00	35.00	7	1	7.0'
X4-2	18" x 18"		2.25	15.75	7		
R3-4	24" x 24"		4.00	12.00	3	1	7.0'
R4-7	24" x 30"		5.00	15.00	3		
X4-2	18" x 18"		2.25	6.75	3		
M2-1A	21" x 15"	JCT	2.19	2.19	1	1	7.0'
M1-6A	24" x 24"		4.00	4.00	1		
M3-3A	24" x 12"	SOUTH	2.00	2.00	1	1	7.0'
M1-6A	24" x 24"	78	4.00	4.00	1		
R8-4 (MOD)	30" x 24"	EMERGENCY VEHICLES ONLY	5.00	10.00	2	1	7.0'
R5-1	30" x 30"	DO NOT ENTER	6.25	12.50	2		
W20-100P	30" x 24"	300 FEET	5.00	5.00	1	①	7.0'
W20-100P	30" x 24"	500 FEET	5.00	5.00	1	①	7.0'
W20-X3L	48" x 48"	MERGE	9.00	9.00	1	2	7.0'
W4-2R	48" x 48"		9.00	9.00	1	2	7.0'

(W) SIGN PANELS TYPE C

M.U.T.C.D. CODE	SIZE	INSERT	PANEL AREA SQ FT	TOTAL AREA SQ FT	QUANTITY	NO. POST	MOUNTING HEIGHT (TO PAVEMENT EDGE)
R6-1L	54 x 18"	ONE WAY	4.00	8.00	2	②	
R6-1R	54 x 18"	ONE WAY	4.00	8.00	2	②	
		TOTAL		516			

(W) FURNISH AND INSTALL SIGN TYPE SPECIAL

STATION	LOCATION	QUANTITY EACH	SIGN LEGEND
264+55	RT	1	119TH AVE/HANSON BLVD
288+16	RT	1	122ND CIRCLE NW/EAGLE CIRCLE NW/HANSON BLVD NW
281+65	LT	1	122ND AVE/HANSON BLVD
TOTAL		3	

SPECIFIC NOTES

① MOUNT ON EXISTING SIGN ASSEMBLY

② MOUNT ON SIGNAL POLE

GENERAL NOTES

1. DELINEATORS AND MARKERS SHALL BE MEASURED AND PAID AS SIGN PANELS TYPE C.
2. ALIGNMENT AND STATIONING ARE FOR REFERENCE ONLY.

NO	DATE	BY	CKD	APPR	REVISION

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NAME: MICHAEL J. MARTINEZ LIC. NO. 42807

CERTIFIED BY: (signature) LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: NJL
CHECKED BY: MJM

HDR — ANOKA COUNTY

PERMANENT SIGNING & STRIPING

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

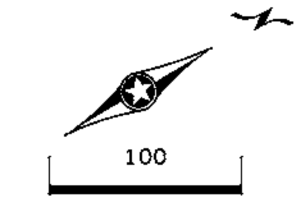
SPECIFIC NOTES

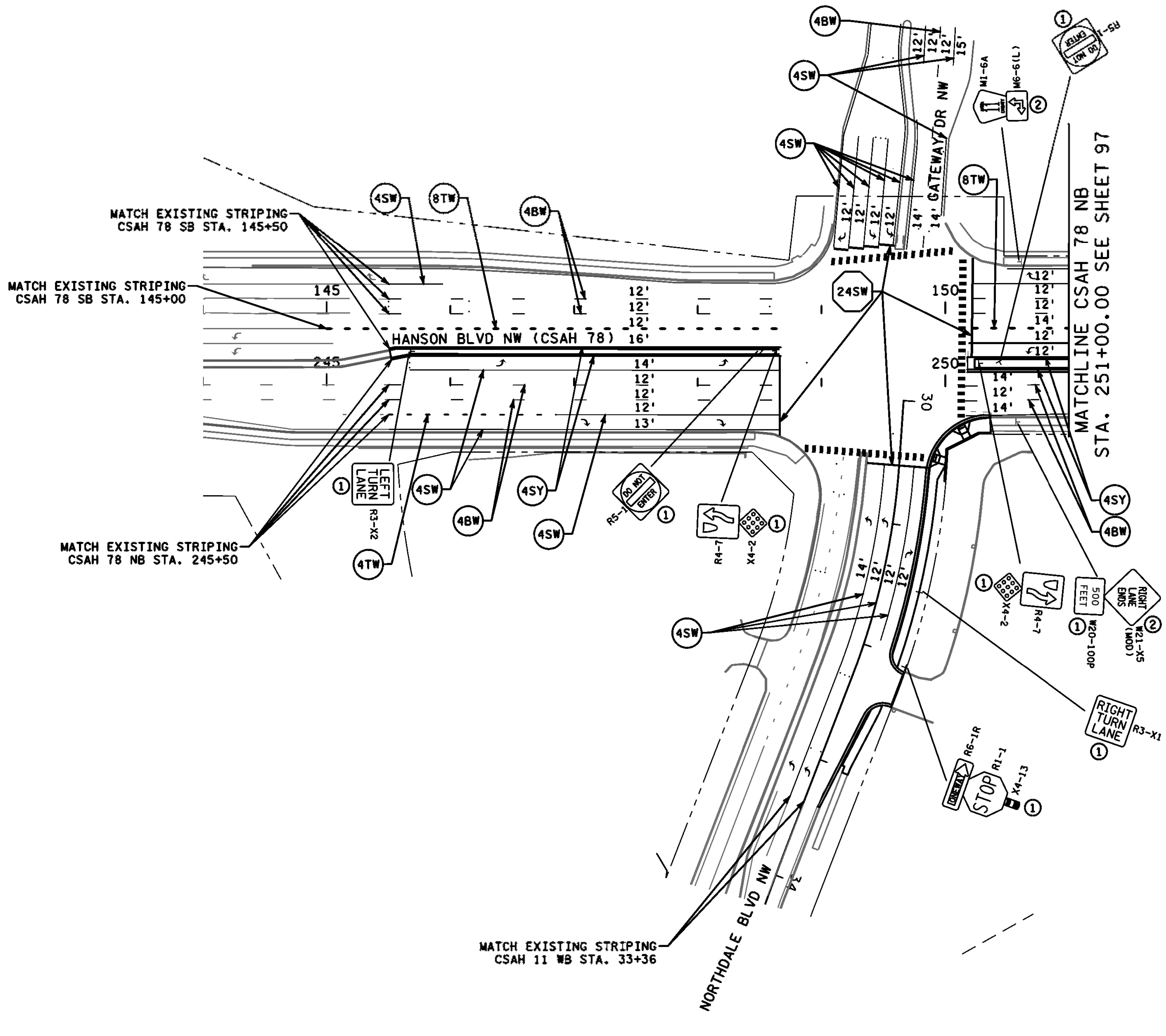
1. FURNISH & INSTALL
2. RETAIN INPLACE SIGN

GENERAL NOTES

TURN LANE DIMENSIONS ARE MEASURED TO FACE OF CURB.

ALL EXISTING SIGNS ARE TO REMAIN INPLACE UNLESS NOTED OTHERWISE IN THE PLAN.





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ANOKA COUNTY

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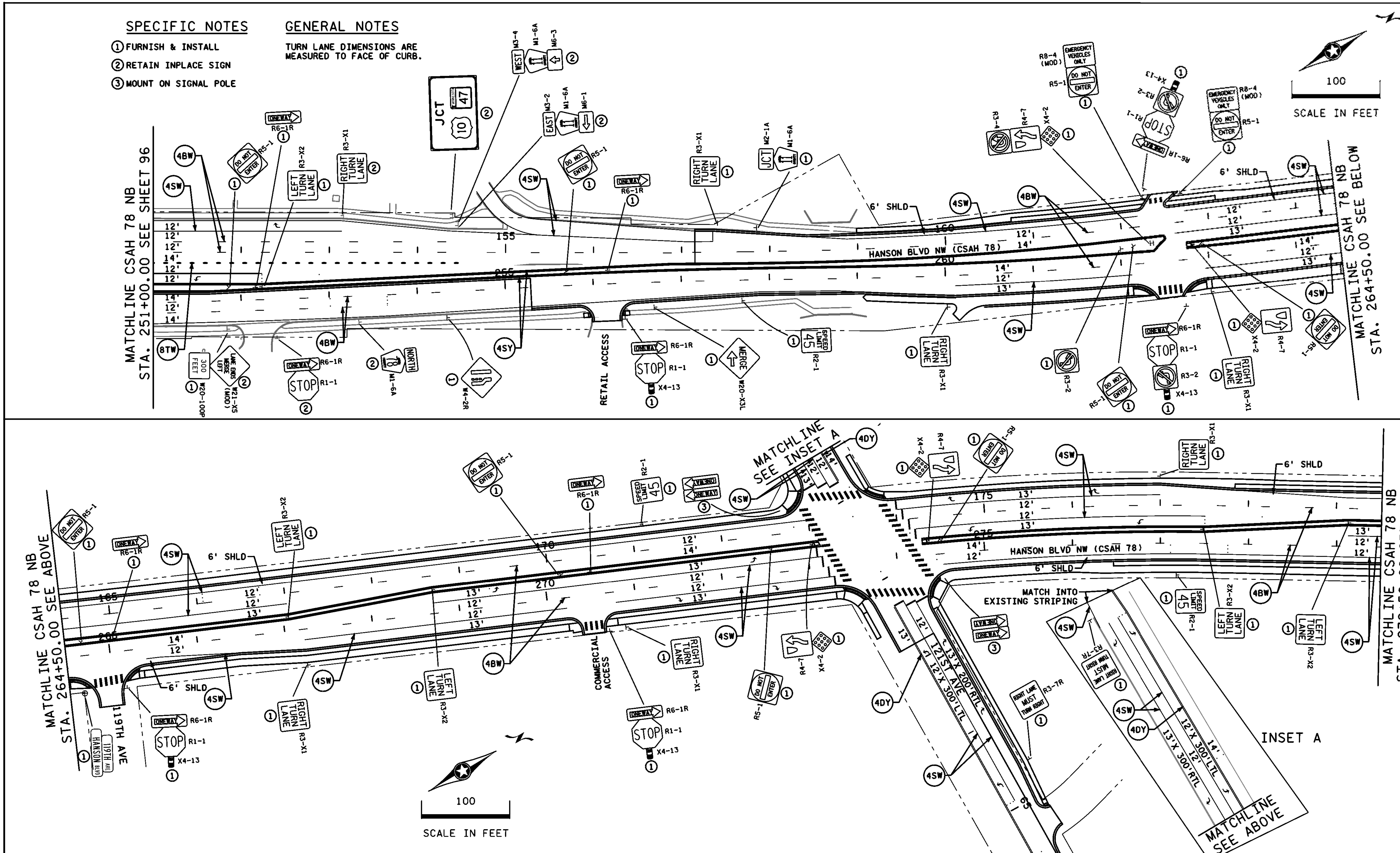

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ANOKA COUNTY

PERMANENT SIGNING & STRIPING

SHEET NO. 97 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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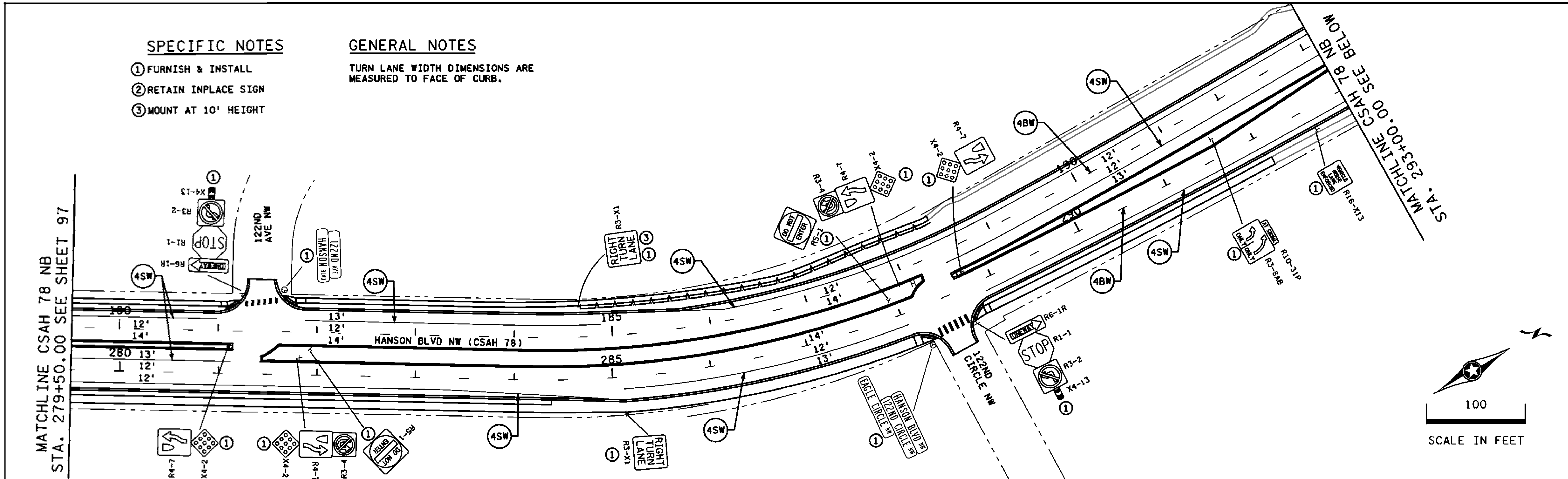
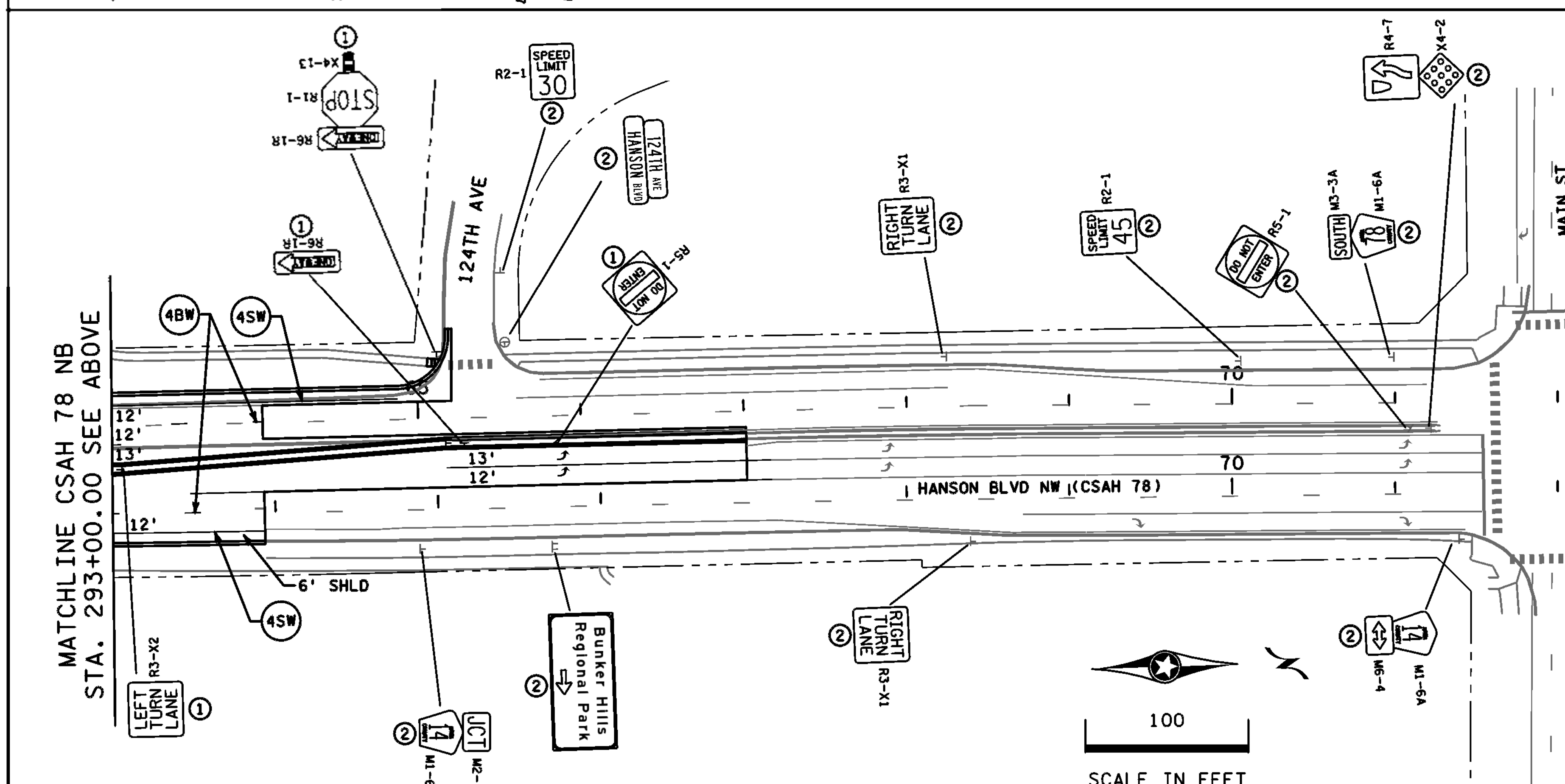
SPECIFIC NOTES

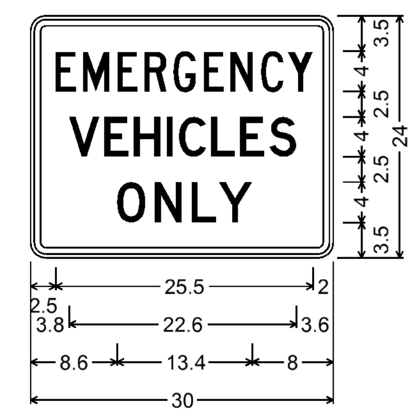
1. FURNISH & INSTALL
2. RETAIN INPLACE SIGN
3. MOUNT AT 10' HEIGHT

GENERAL NOTES

TURN LANE WIDTH DIMENSIONS ARE MEASURED TO FACE OF CURB.







1.5" Radius, 0.6" Border,
0.4" Indent, Black on White;
[EMERGENCY] C specified length;
[VEHICLES] D specified length;
[ONLY] D specified length;

NO	DATE	BY	CKD	APPR	REVISION

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ANOKA COUNTY

PERMANENT SIGNING & STRIPING

SHEET NO. 98 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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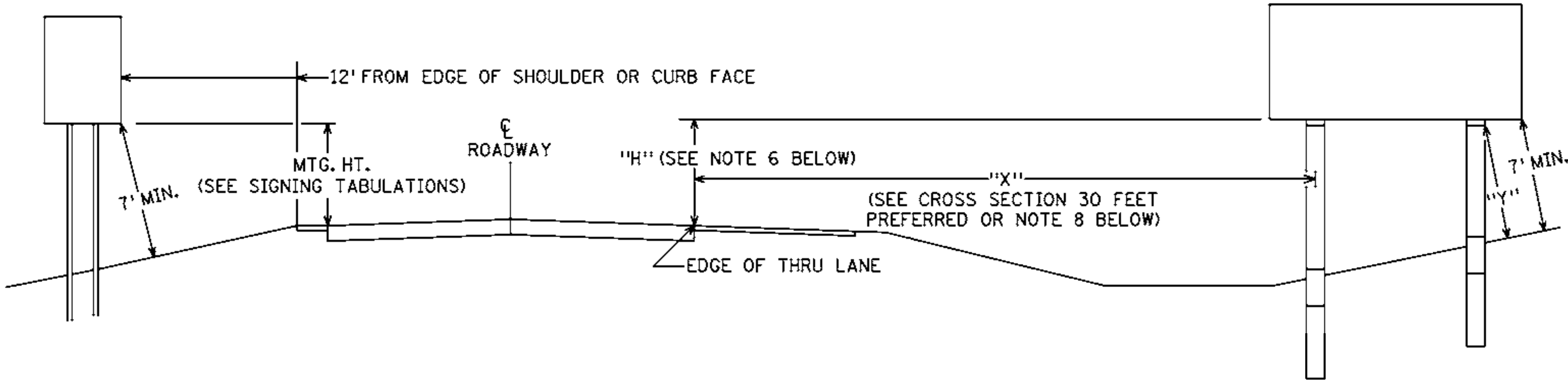
ROADSIDE PLACEMENT



ROUTE MARKER, REGULATORY & WARNING SIGNS - TYPE C

GUIDE SIGNS - TYPE D

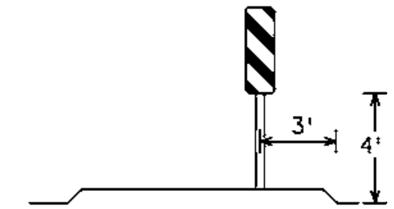
GUIDE SIGN - TYPE A

NOTES:

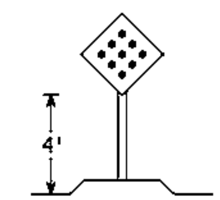
1. ALL TYPE C AND D MOUNTING HEIGHTS ARE MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE ELEVATION OF THE NEAR EDGE OF PAVEMENT IN RURAL AREAS OR TO THE TOP OF THE CURB OR IN THE ABSCENCE OF CURB, TO THE NEAR EDGE OF THE TRAVELED WAY.
2. SIGN FACES SHALL BE VERTICAL.
3. OVERHEAD SIGNS SHALL BE POSITIONED AT RIGHT ANGLES TO THE THRU ROADWAY UNLESS OTHERWISE NOTED.
4. TO AVOID SPECULAR GLARE, ∠A SHALL BE APPROXIMATELY 93° FOR SIGNS LOCATED LESS THAN 30' FROM THE EDGE OF THRU LANE AND APPROXIMATELY 92° FOR SIGNS LOCATED 30' OR MORE FROM EDGE OF THRU LANE. THIS APPLIES TO SIGNS TYPE A, C, & D AND INCLUDES SIGNS IN THE GORE.
5. "Y" IS THE PERPENDICULAR DISTANCE FROM THE GROUND LINE TO THE FRICTION FUSE ON THE POST. THIS DISTANCE SHALL BE AT LEAST 7'.
6. WHERE "X" IS LESS THAN 30', "H" SHALL BE 7'. WHERE "X" IS 30' OR GREATER, MINIMUM AND PREFERRED "H" IS 5'.
7. LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND OR LEFT SIDE INSTALLATION.
8. WHEN A TYPE A SIGN IS INSTALLED DIRECTLY BEHIND TRAFFIC BARRIER, THE LEFT EDGE OF THE SIGN PANEL SHALL BE LOCATED A MINIMUM OF 8 FEET BEHIND THE FACE OF THE TRAFFIC BARRIER.

REVISED: 4-28-17

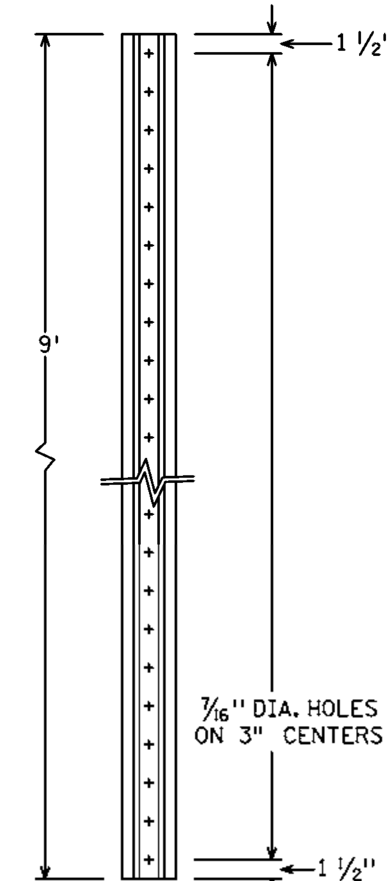
SIGN PLACEMENT



RAISED ISLAND
TYPE 3 OBJECT MARKER
(X4-4)



RAISED ISLAND
TYPE 2 OBJECT MARKER
(X4-2)



MNDOT 3401
NORMAL WEIGHT= 3 LB./FT.

DELINEATOR POST

REVISED: 10-2-2013

DELINEATORS AND MARKERS

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NO	DATE	BY	CKD	APPR	REVISION

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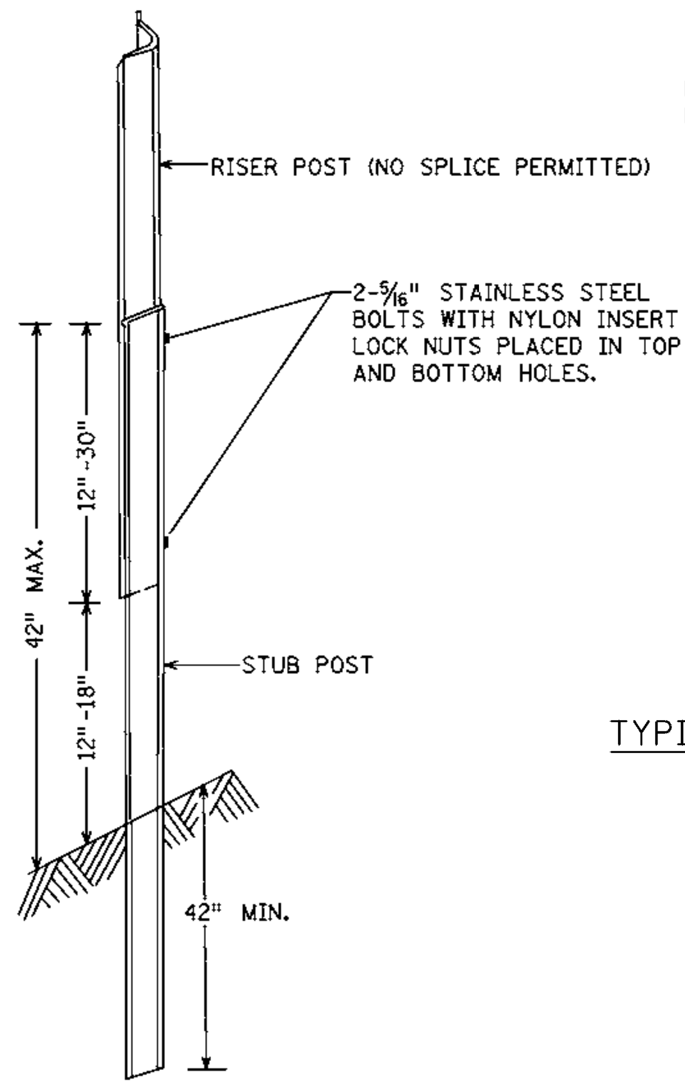
ANOKA COUNTY

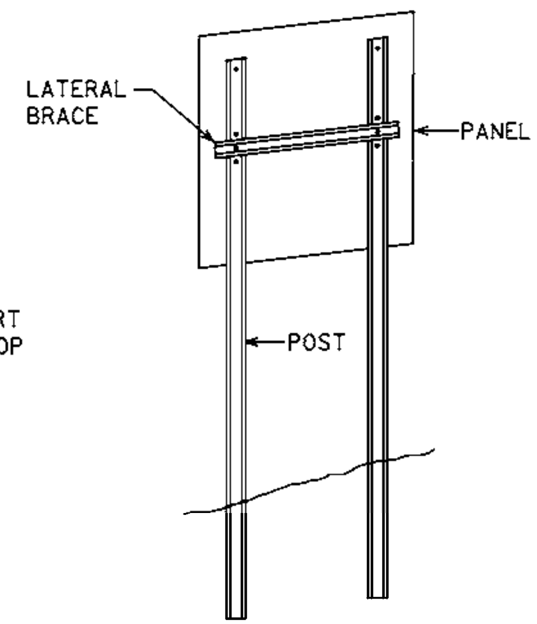
SIGNING AND STRIPING DETAILS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

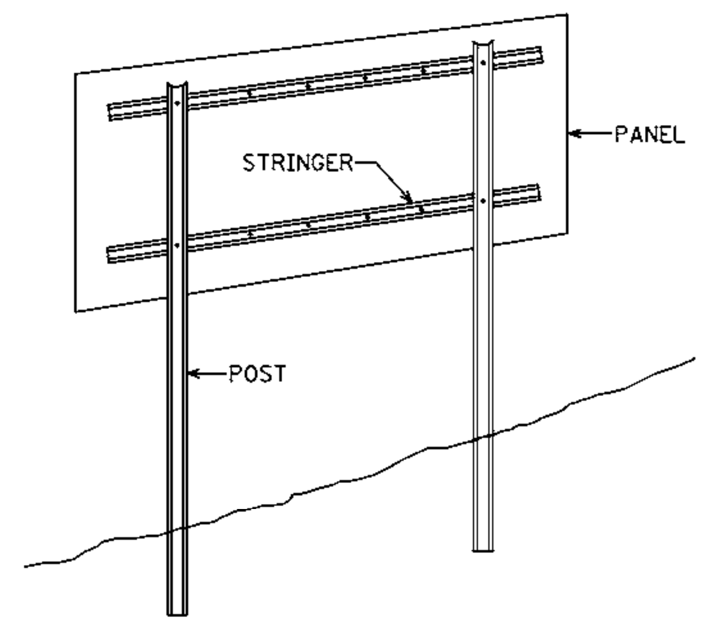
TYPE C & D POST



U POST BREAKAWAY SPLICE



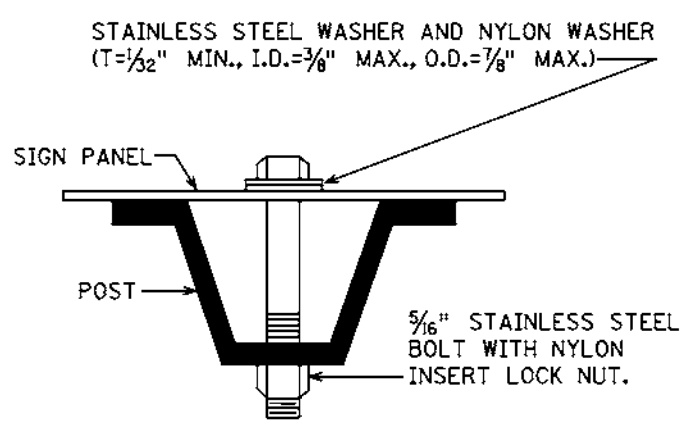
TYPICAL TYPE C INSTALLATION



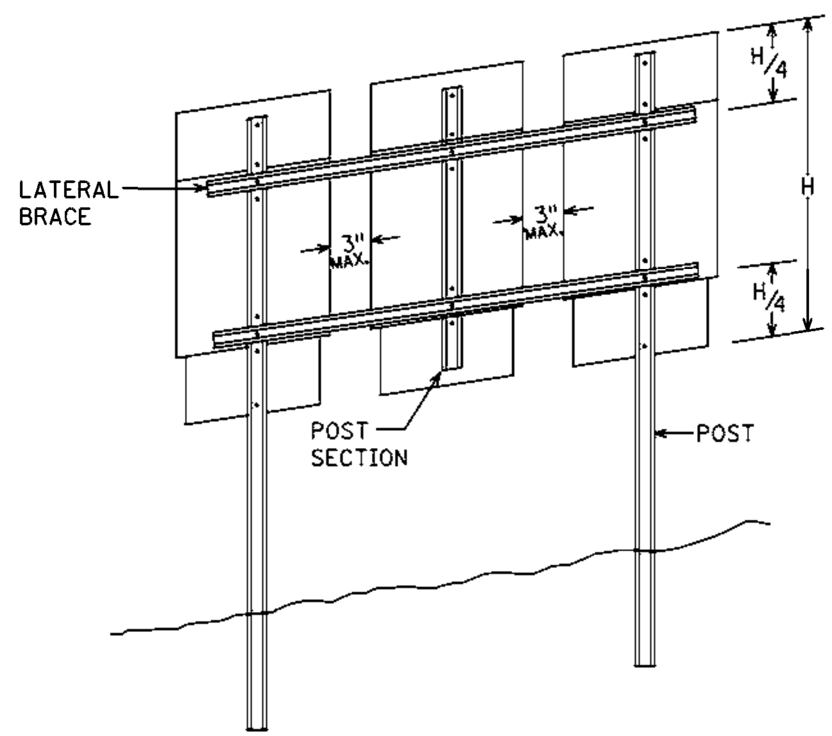
TYPICAL TYPE D INSTALLATION

NOTES:

1. USE 3 LB/FT STUB POSTS. SHALL CONFORM TO MNDOT 3401.
2. USE 2.5 LB/FT RISER POSTS, STRINGERS, KNEE BRACES AND LATERAL BRACES. ALL SHALL CONFORM TO MNDOT 3401.
3. SEE SIGN DATA SHEETS FOR NUMBER OF POSTS, KNEE BRACES, POST LENGTHS AND SPACINGS, AS DETERMINED FROM TEM CHARTS 6.3 AND 6.4.
4. IF MORE THAN TWO POSTS ARE NEEDED, THE MINIMUM SPACING SHALL BE 45' BETWEEN POSTS.
5. TYPE D SIGN PANELS SHALL BE BOLTED TO STRINGERS AT 24" MAXIMUM INTERVALS IN ACCORDANCE WITH THE TYPE D STRINGER AND PANEL-JOINT DETAIL (SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL).
6. MOUNTING (PUNCH CODE) FOR TYPE C SIGN PANELS SHALL BE AS INDICATED IN THE MNDOT STANDARD SIGNS AND MARKINGS MANUAL UNLESS OTHERWISE SPECIFIED.
7. ALL RISER (VERTICAL) U POSTS SHALL BE SPLICED. DRIVEN STUB POSTS SHALL BE AT LEAST 7' LONG.
8. USE STAINLESS STEEL 5/16" BOLTS, WASHERS AND NYLON INSERT LOCK NUTS AS SHOWN FOR ALL GROUND MOUNTED AND OVERHEAD MOUNTED SIGNS.
9. STAINLESS STEEL WASHER WITH SAME DIMENSIONS SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEADS.
10. BRACING STUBS SHALL BE NO MORE THAN 4' ABOVE GROUND AND EMBEDDED AT LEAST 42".
11. A-FRAME BRACKET SHALL BE STEEL CONFORMING TO MNDOT 3306 AND GALVANIZED IN ACCORDANCE WITH MNDOT 3394.
12. COLLARS SHALL BE USED TO SHIM OVERLAYS AND LEGEND COMPONENTS AWAY FROM PANEL WHERE INTERFERENCE WITH BOLT HEADS IS ENCOUNTERED. MNDOT 3352.2A6.
13. 2 POST TYPE C SIGNS SHALL BE REINFORCED WITH AT LEAST ONE LATERAL BRACE. INSTALLATIONS WHERE THE TOTAL PANEL HEIGHT IS 60" OR MORE SHALL HAVE TWO LATERAL BRACES LOCATED APPROXIMATELY AT THE QUARTER POINTS.
14. WHERE 2 SINGLE POST TYPE C SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED LATERALLY BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND LOCATED APPROXIMATELY AT THE QUARTER POINTS.
15. WHERE 3 OR MORE TYPE C SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED LATERALLY BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND POST SECTION AND LOCATED APPROXIMATELY AT THE QUARTER POINTS AS SHOWN IN MODIFIED TYPE C INSTALLATION.



U POST MOUNTING TYPE C SIGNS



MODIFIED TYPE C INSTALLATION

TYPE C & D SIGN STRUCTURAL DETAILS

REVISED: 5-5-2017

NO	DATE	BY	CKD	APPR	REVISION

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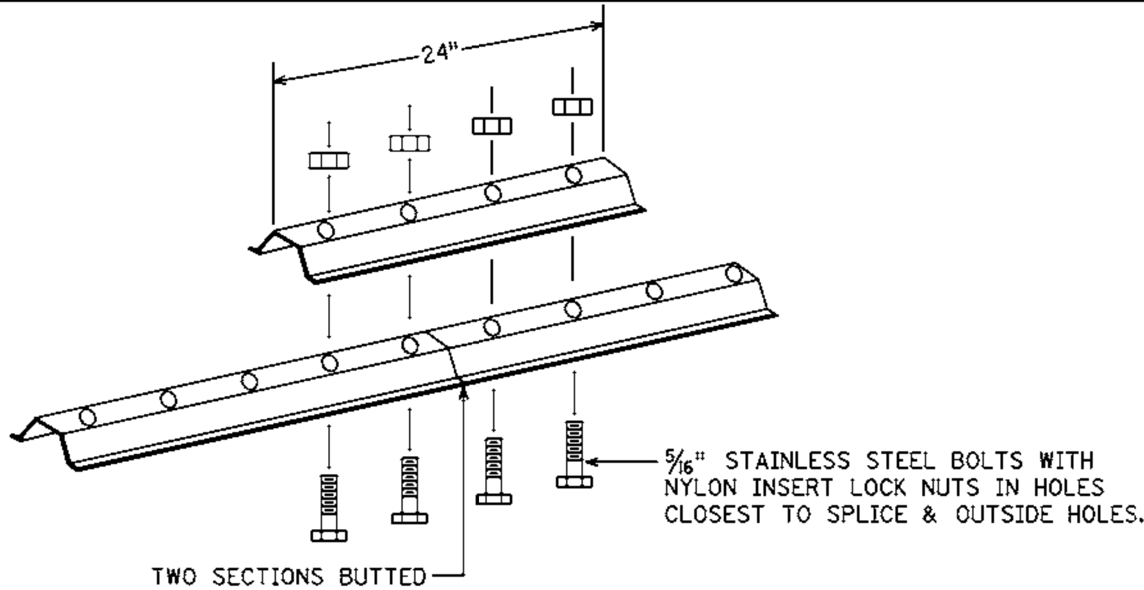
DESIGNED BY: NJL
CHECKED BY: MJM

HDR

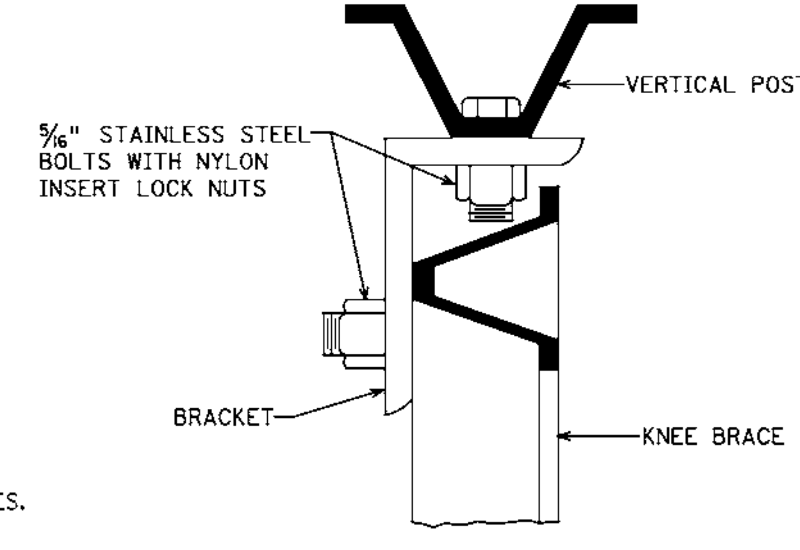
ANOKA COUNTY

SIGNING AND STRIPING DETAILS

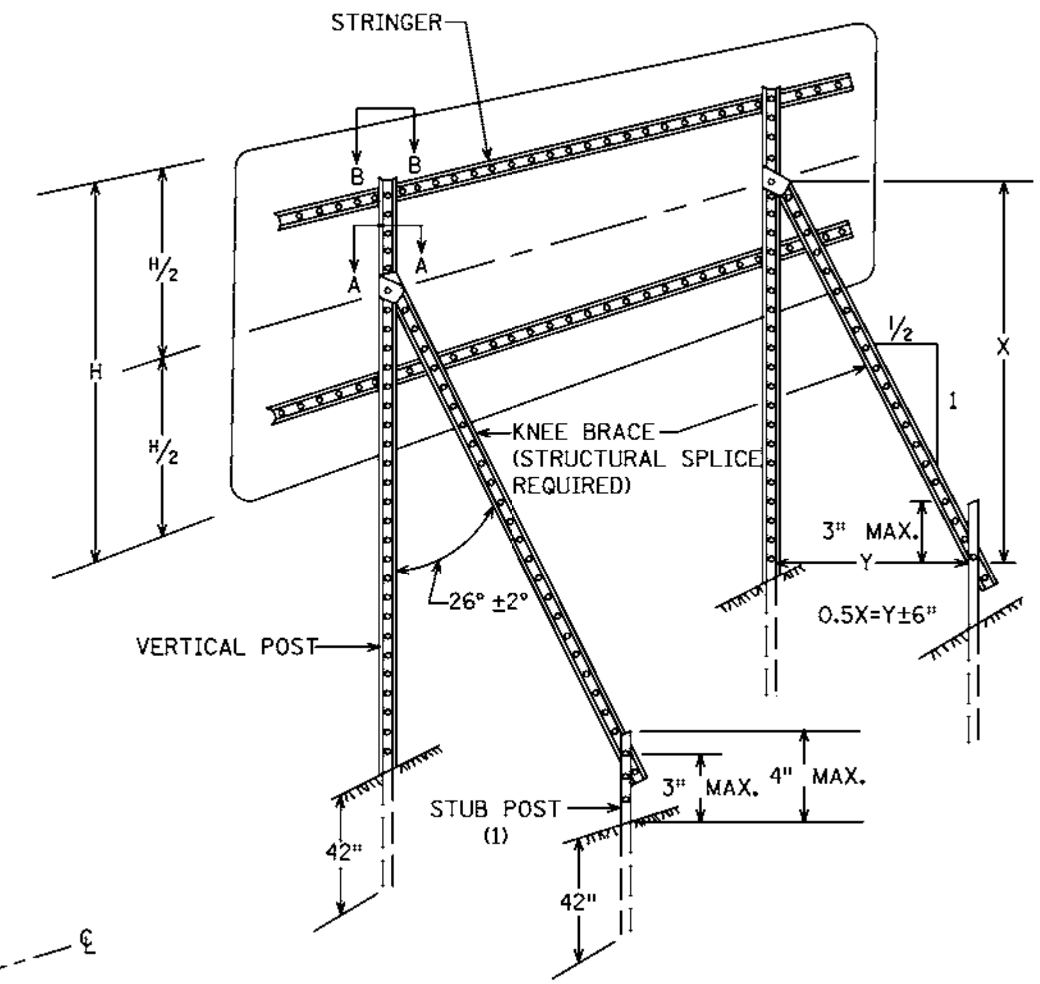
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



LATERAL BRACE OR STRINGER SPLICE DETAIL (EXPLODED VIEW)

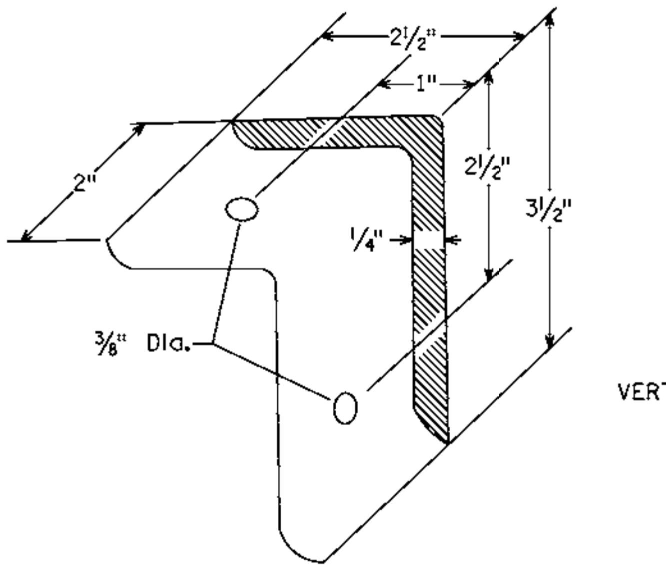


SECTION A-A



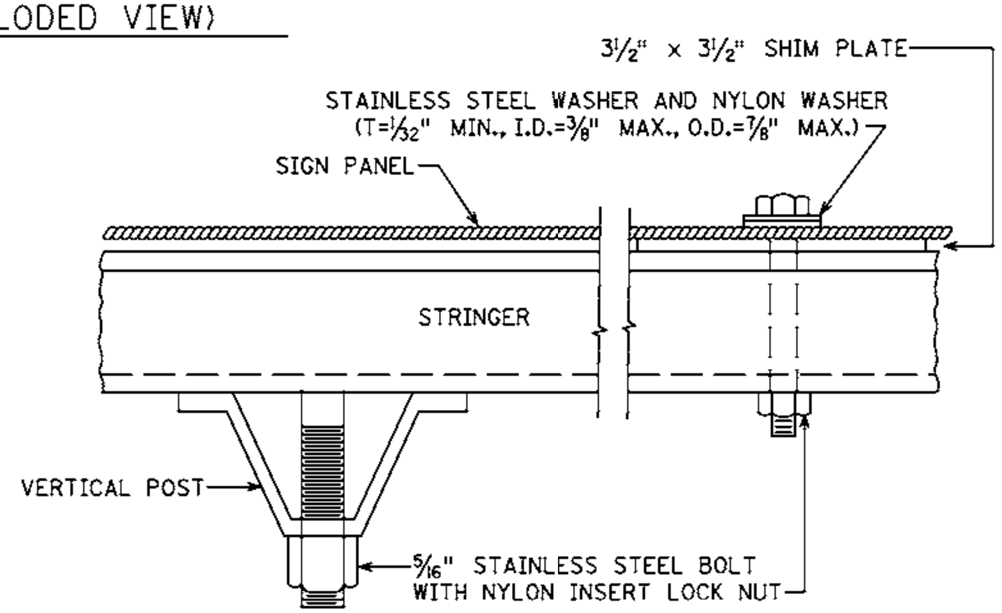
TYPICAL "A-FRAME" INSTALLATION

TYPE "D" SIGNS

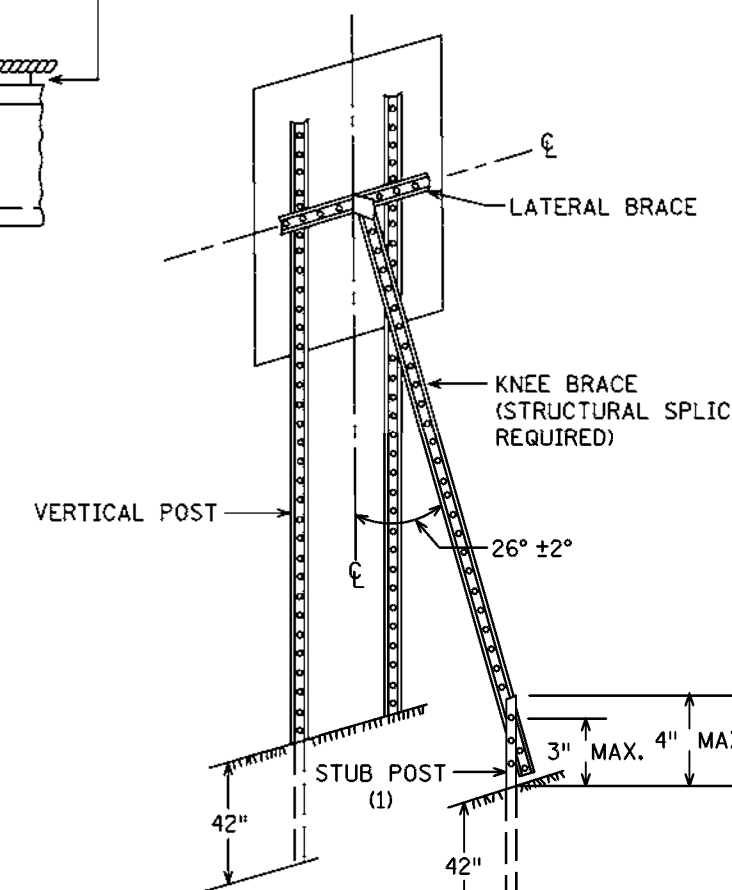


A-FRAME BRACKET

(STEEL MNDOT 3306 GALVANIZED PER MNDOT 3394)

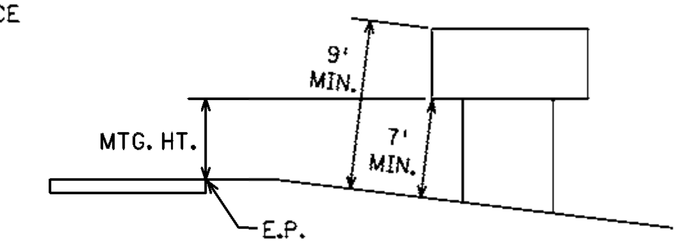


SECTION B-B



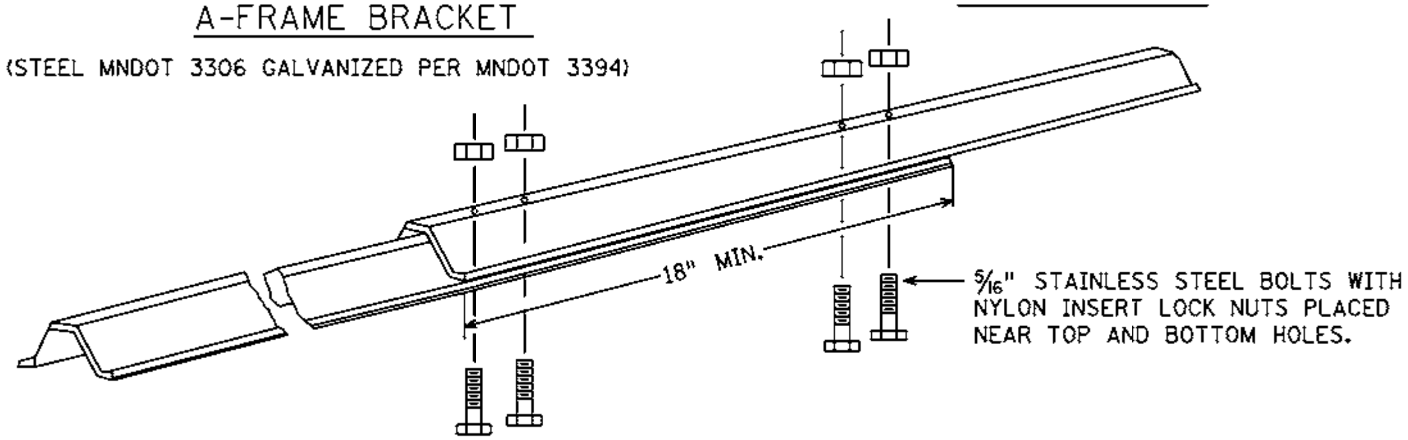
TYPICAL "A-FRAME" INSTALLATION

TYPE "C" SIGNS



TYPICAL MOUNTING

(1) OFFSET STUB POST 1' TOWARD ROADWAY RELATIVE TO VERTICAL POST. ATTACH STUB POST AND KNEE BRACE BACK TO BACK.



STRUCTURAL SPLICE

(USE WHEN IT IS NECESSARY TO FABRICATE THE CORRECT LENGTH OF POST FROM TWO PIECES)

TYPE C & D SIGN STRUCTURAL DETAILS

REVISED: 5-5-2017

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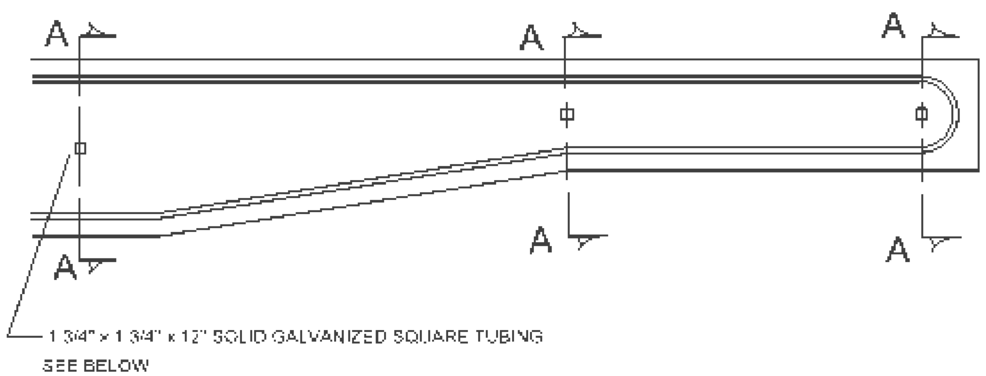
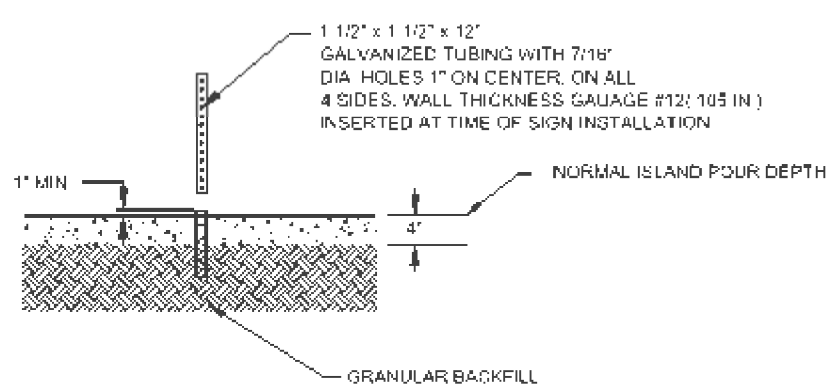
SIGNING AND STRIPING DETAILS

SHEET NO. 101 OF 230 SHEETS

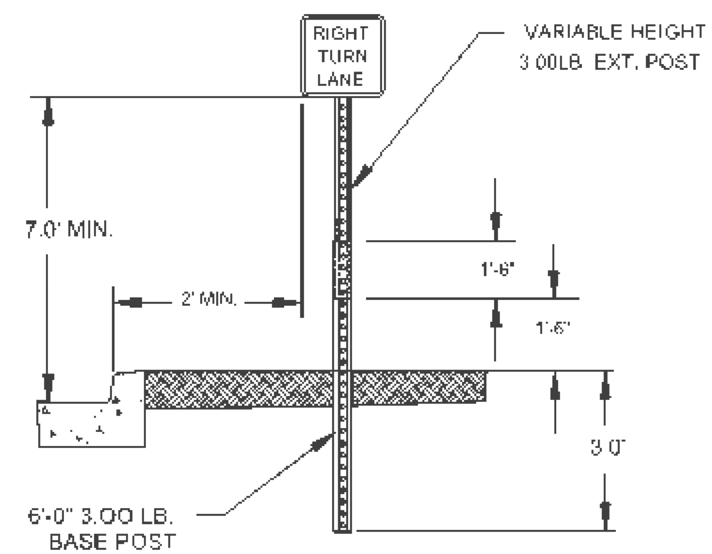
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



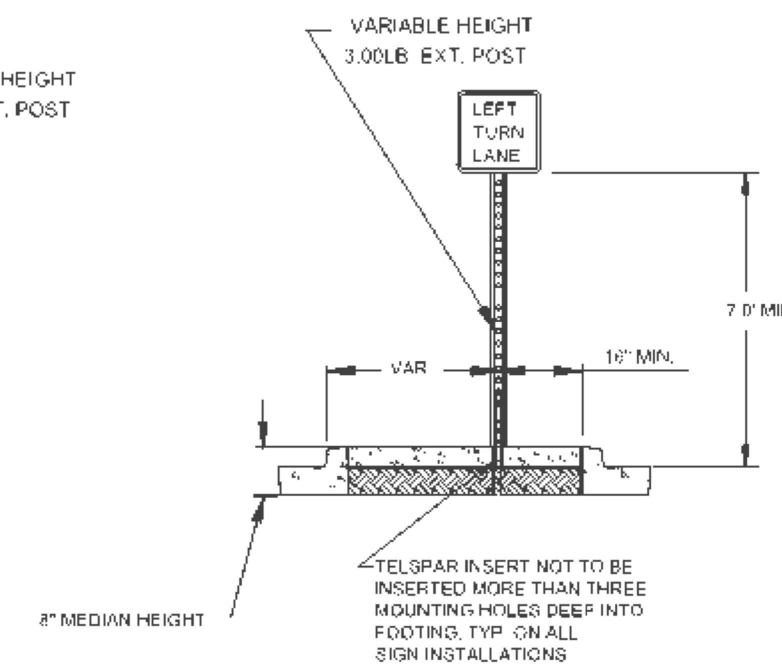


SECTION A - A

GROUND POST MOUNT SIGN
INSTALLATION TYPICAL



ISLAND MOUNT BREAK-AWAY SIGN
INSTALLATION TYPICAL



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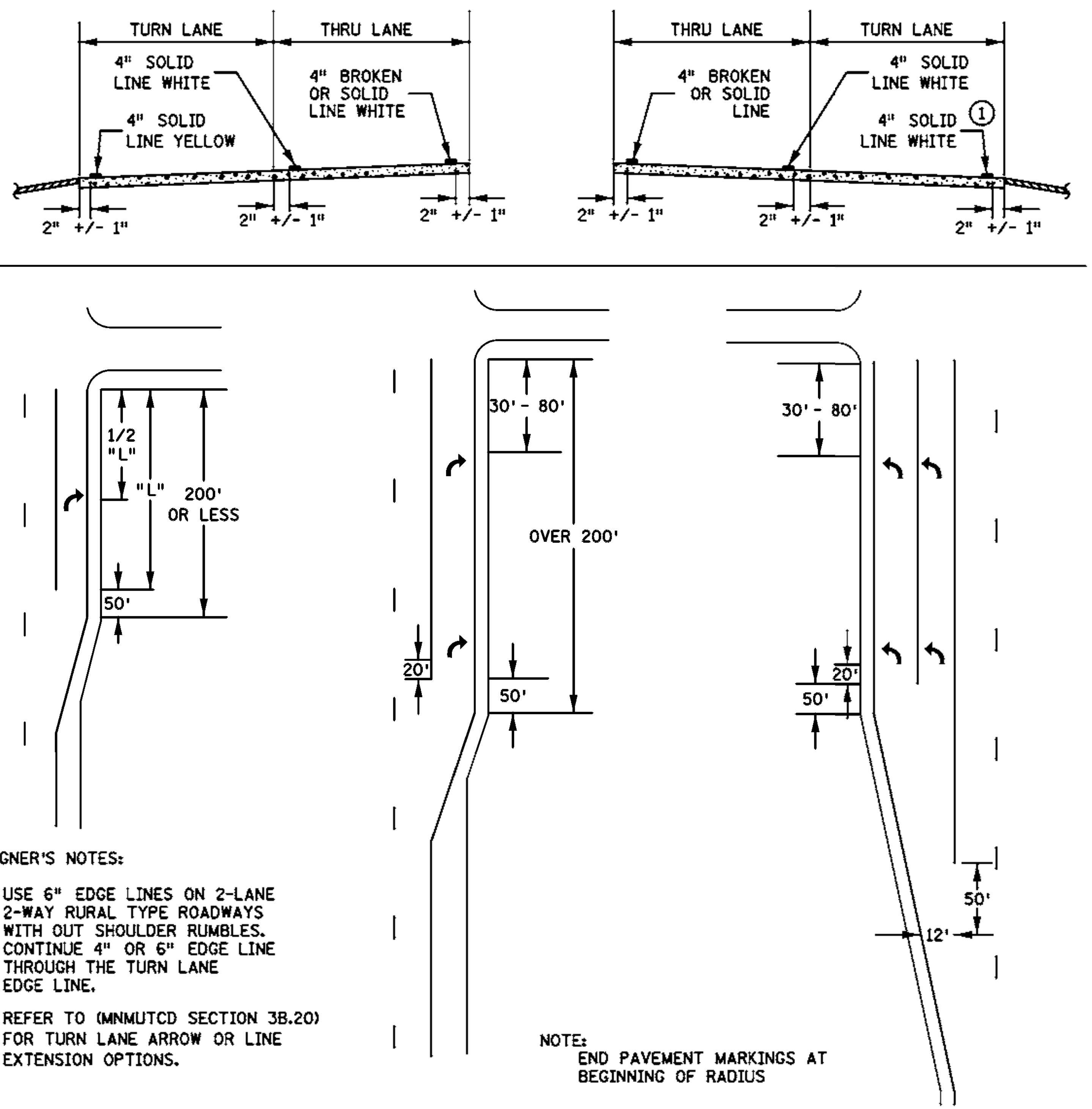
TURN LANE WITH ARROW MESSAGE

LEFT TURN LANE / RIGHT TURN LANE



DESIGNER'S NOTES:

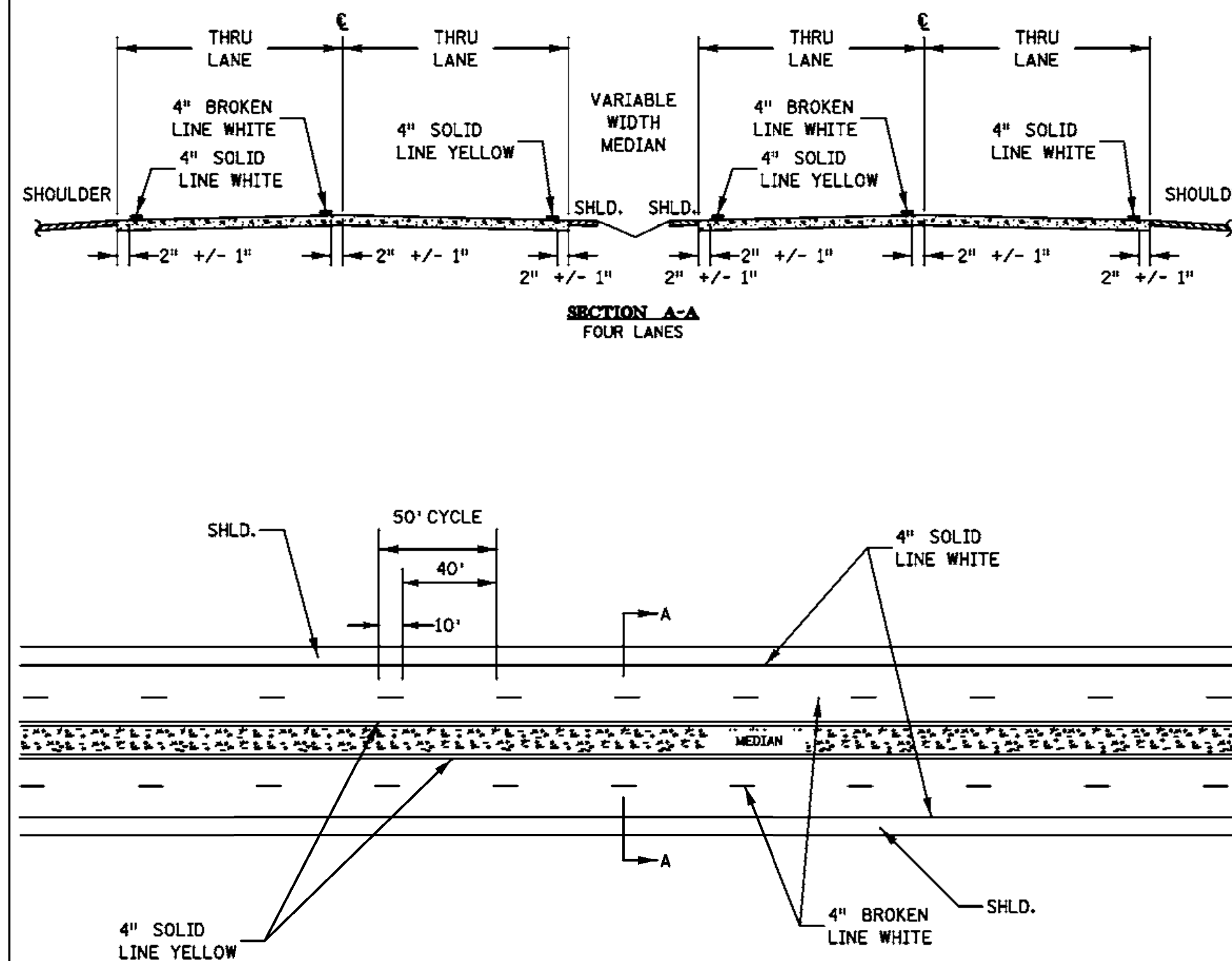
① USE 6" EDGE LINES ON 2-LANE 2-WAY RURAL TYPE ROADWAYS WITH OUT SHOULDER RUMBLES. CONTINUE 4" OR 6" EDGE LINE THROUGH THE TURN LANE EDGE LINE.

REFER TO (MNMUTCD SECTION 3B.20) FOR TURN LANE ARROW OR LINE EXTENSION OPTIONS.

NOTE:
END PAVEMENT MARKINGS AT BEGINNING OF RADIUS

PUBLISHED BY OTST: 14 OCT 2016

FOUR-LANE DIVIDED LANE



PUBLISHED BY OTST: 20 NOV 2015

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ANOKA COUNTY

SIGNING AND STRIPING DETAILS
SHEET NO. 103 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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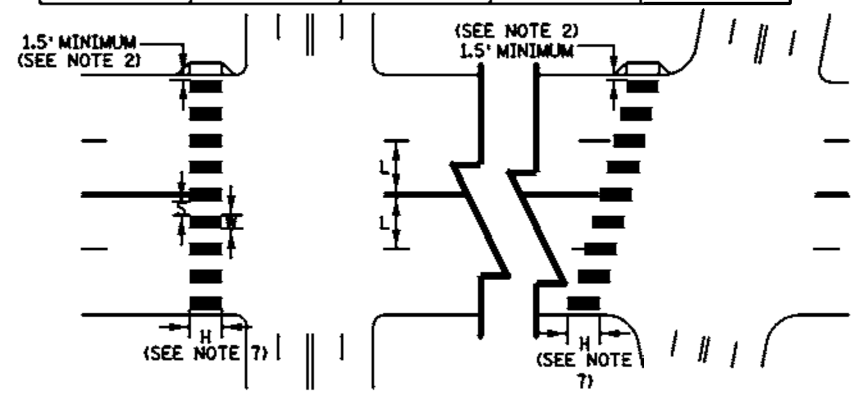
PEDESTRIAN CROSSWALK MARKINGS

(L) WIDTH OF INSIDE LANE	(W) WIDTH OF PAINTED AREA	(S) WIDTH OF SPACE	ALTERNATE (W) WIDTH OF PAINTED AREA	ALTERNATE (S) WIDTH OF SPACE
9'	2.0'	2.5'	—	—
10'	2.5'	2.5'	2.0'	3.0'
11'	2.5'	3.0'	2.0'	3.5'
12'	3.0'	3.0'	2.5'	3.5'
13'	3.0'	3.5'	—	—



NOTES:

1. PAINTED AREAS TO BE CENTERED ON CENTERLINE AND LANE LINES.
2. A MINIMUM OF 1.5 FT. CLEAR DISTANCE SHALL BE LEFT ADJACENT TO THE CURB FACE. IF LAST PAINTED AREA FALLS INTO THIS DISTANCE IT MUST BE OMITTED.
3. ON TWO LANE TWO WAY STREETS, USE SPACING SHOWN FOR AN 11 FT. INSIDE LANE.
4. FOR DIVIDED ROADWAYS, ADJUSTMENTS IN SPACING OF THE BLOCKS SHOULD BE MADE IN THE MEDIAN SO THAT THE BLOCKS ARE MAINTAINED IN THEIR PROPER LOCATION ACROSS THE TRAVELED PORTION OF THE ROADWAY.
5. AT SKEWED CROSSWALKS, THE BLOCKS ARE TO REMAIN PARALLEL TO THE LANE LINES AS SHOWN.
6. THE BLOCKS SHALL BE PLACED SO THAT THEY ARE NOT LOCATED IN THE WHEEL PATH OF THE VEHICLES.
7. THE BLOCKS SHALL BE A MINIMUM OF 6' LONG AND AT LEAST AS LONG AS THE TRUNCATED DOMES, FOR FANNED TRUNCATED DOMES THE BLOCKS SHALL BE AT LEAST AS LONG AS THE APPROACHING SIDEWALK OR SHARED USE PATH.
8. THE ALTERNATE (W) AND (S) MAY BE USED WHEN BLOCKS LONGER THAN 6' (H) ARE USED.

PUBLISHED BY OTST: 20 NOV 2015

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: MICHAEL J. MARTINEZ LIC. NO. 42807
CERTIFIED BY: [signature] 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: NJL
DESIGNED BY: NJL
CHECKED BY: MJM

HDR
ANOKA COUNTY

SIGNING AND STRIPING DETAILS
SHEET NO. 104 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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PANTONE MATCHING COLORS

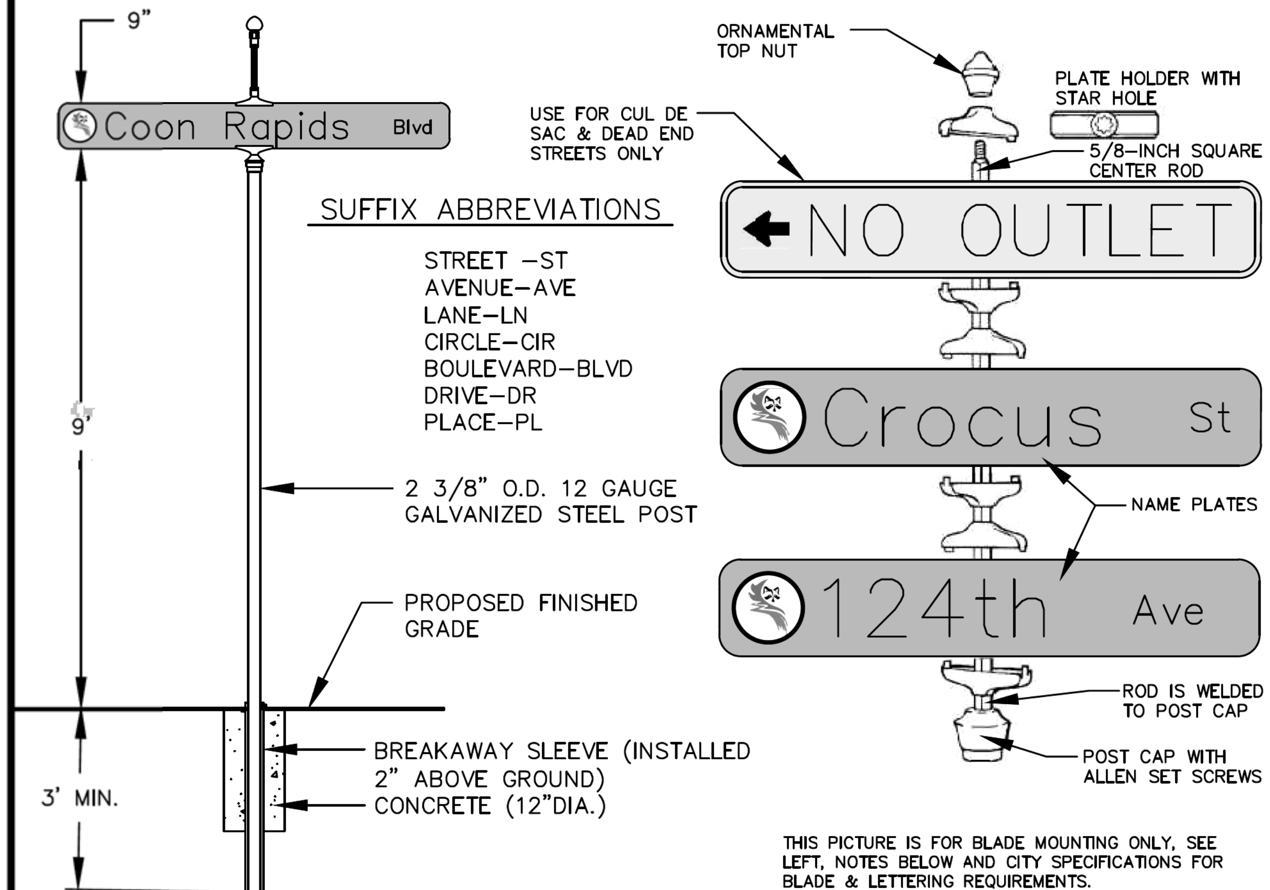
BLUE=PMS 285
GREEN=PMS 370
BLACK

City of Coon Rapids
11155 Robinson Drive
Coon Rapids, MN 55433-3761
Tel: 763-755-2880
Fax: 763-767-6491
www.coonrapidsmn.gov

COON RAPIDS Minnesota

STREET SIGN LOGO

DRAWN:	DATE:	SCALE:	PLATE NO.
R.L.S.	3/18/2011	NONE	STR-12



SUFFIX ABBREVIATIONS

STREET -ST
AVENUE-AVE
LANE-LN
CIRCLE-CIR
BOULEVARD-BLVD
DRIVE-DR
PLACE-PL

THIS PICTURE IS FOR BLADE MOUNTING ONLY, SEE LEFT, NOTES BELOW AND CITY SPECIFICATIONS FOR BLADE & LETTERING REQUIREMENTS.

NOTES:

1. SIGN BLADE SIZE IS 9" FOR 40 MPH AND LESS, 12" FOR 45 MPH AND GREATER, ARE MADE OUT OF .080" THICK ALUMINUM AND HAVE ROUNDED CORNERS.
2. BLADE LENGTH SHALL BE 24" MIN. OR AS NECESSARY TO FIT NAME AND LOGO.
3. BLADES SHALL BE SINGLE FACED AND FASTENED TOGETHER WITH STAINLESS STEEL BOLTS WITH NYLON INSERT LOCK NUTS.
4. LETTER SIZE IS 6" UPPER CASE & 4.5" LOWER CASE FOR STREET NAME ON 9" BLADES, 8" UPPER CASE & 6" LOWER CASE FOR STREET NAME ON 12" BLADES, 3" UPPER CASE & 2.5" LOWER CASE FOR SUFFIX ON 9" & 12" BLADES. NO OUTLET ALL UPPER CASE.
5. THE FONT TO USE FOR LETTERING IS SERIES B.
6. WHITE DIAMOND GRADE SHEETING, MNDOT GREEN BACKGROUND FOR PUBLIC STREETS MNDOT BLUE BACKGROUND FOR PRIVATE STREETS, EC FILM OVERLAY WITH LOGO AND NO BORDER.
7. THE CITY LOGO WILL PRECEDE THE STREET NAME ON BLADE.
8. STREET NAMES SHALL BE SPELLED COMPLETELY EXCEPT FOR SUFFIXES.
9. SIGN BRACKETS SHALL BE LYLE SIGNS NO. E450 OR E650 FOR NO OUTLET.
10. SIGN POST SHALL BE 2 3/8" O.D. X 12' LONG GALVANIZED ROUND TUBE AND INSTALLED WITH BREAKAWAY SLEEVE IN CONCRETE.
11. A SIGN PLAN SHOWING SIGN COLORS, SIZES AND LETTERING MUST BE SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL.
12. SEE CITY SPECIFICATIONS FOR MORE DETAILS ON MATERIALS AND LAYOUT.

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COON RAPIDS Minnesota

STREET SIGN INSTALLATION

DRAWN:	DATE:	SCALE:	PLATE NO.
R.L.S.	1/28/2017	NONE	STR-13

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NO	DATE	BY	CKD	APPR	REVISION

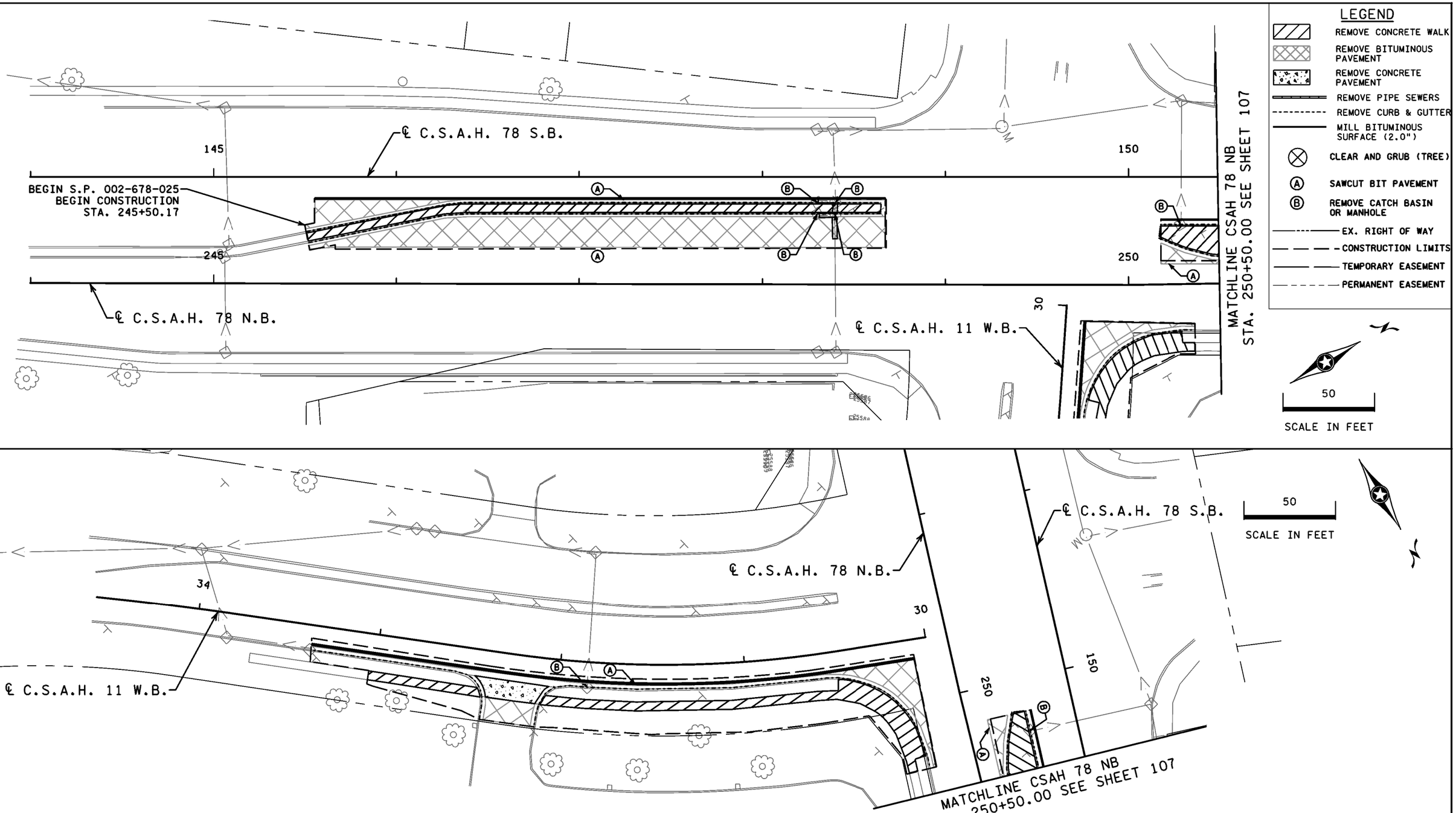
DRAWN BY:	NJL
DESIGNED BY:	NJL
CHECKED BY:	MJM

HDR

ANOKA COUNTY

SIGNING AND STRIPING DETAILS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY:	NJL
DESIGNED BY:	GEB
CHECKED BY:	BAV

HDR

ANOKA COUNTY

REMOVAL PLAN

SHEET NO. 106 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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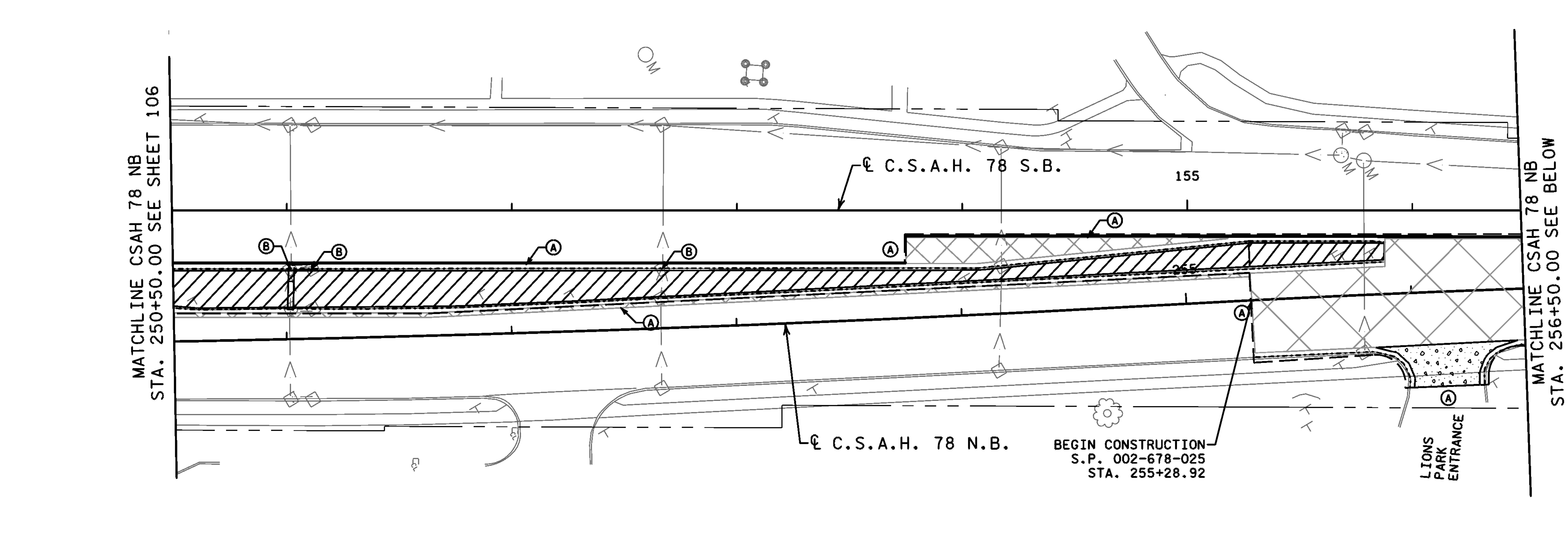
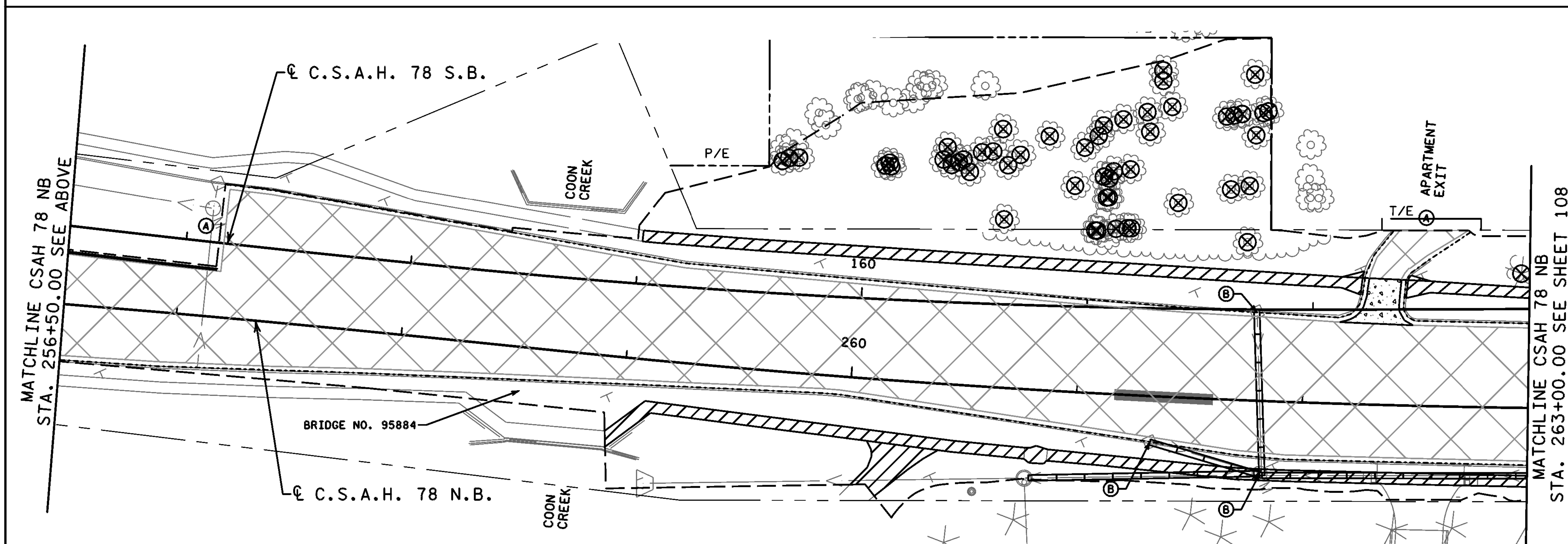


LEGEND

- REMOVE CONCRETE WALK
- REMOVE BITUMINOUS PAVEMENT
- REMOVE CONCRETE PAVEMENT
- REMOVE PIPE SEWERS
- REMOVE CURB & GUTTER
- MILL BITUMINOUS SURFACE (2.0")
- ⊗ CLEAR AND GRUB (TREE)
- Ⓐ SAWCUT BIT PAVEMENT
- Ⓑ REMOVE CATCH BASIN OR MANHOLE
- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

50
SCALE IN FEET



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CHECKED BY: BAV

HDR
ANOKA COUNTY

REMOVAL PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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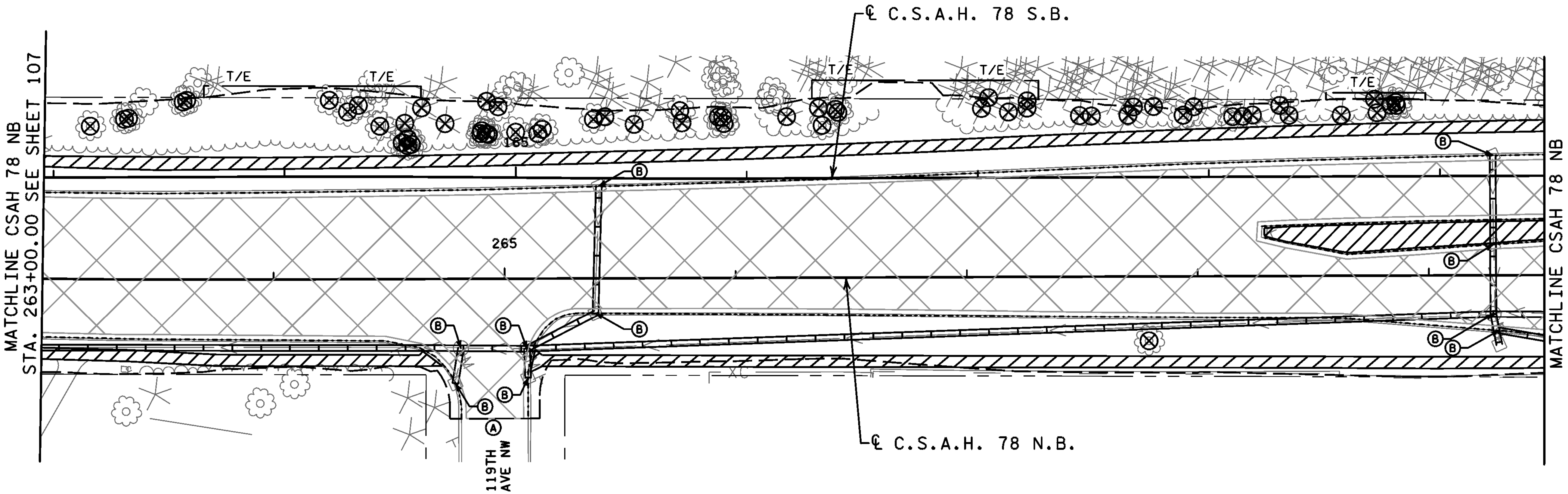
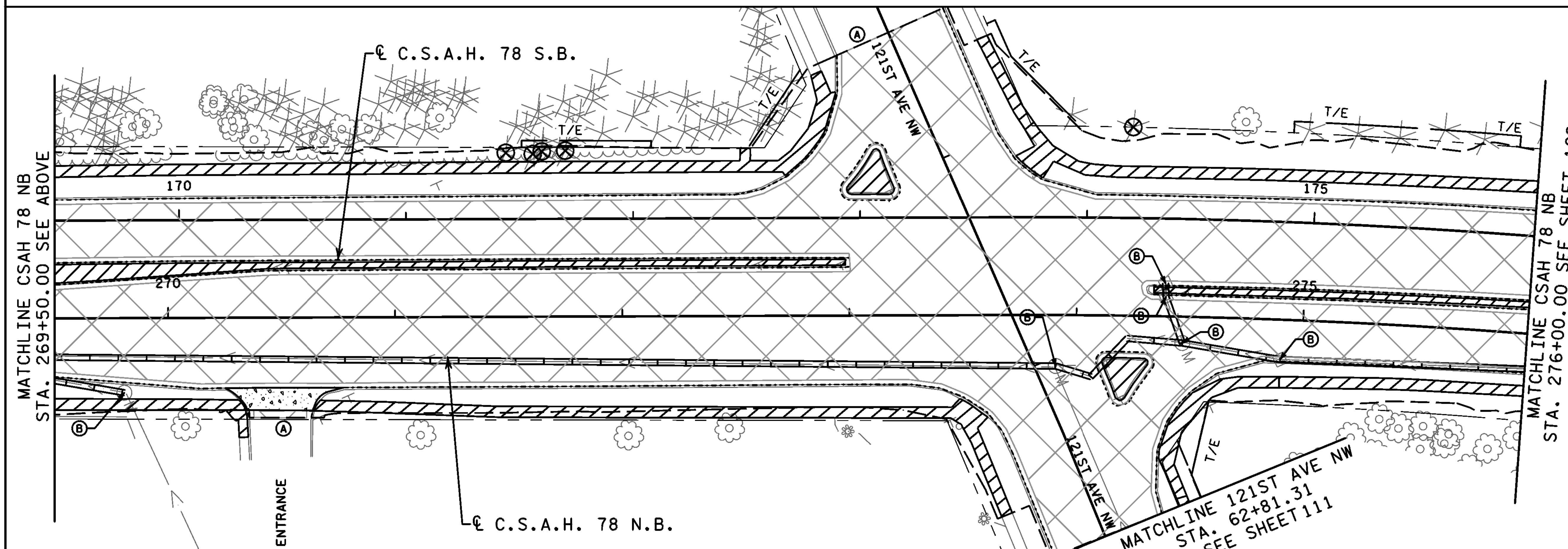


LEGEND

- REMOVE CONCRETE WALK
- REMOVE BITUMINOUS PAVEMENT
- REMOVE CONCRETE PAVEMENT
- REMOVE PIPE SEWERS
- REMOVE CURB & GUTTER
- MILL BITUMINOUS SURFACE (2.0")
- CLEAR AND GRUB (TREE)
- (A) SAWCUT BIT PAVEMENT
- (B) REMOVE CATCH BASIN OR MANHOLE
- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

50
SCALE IN FEET



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DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

REMOVAL PLAN

SHEET NO. 108 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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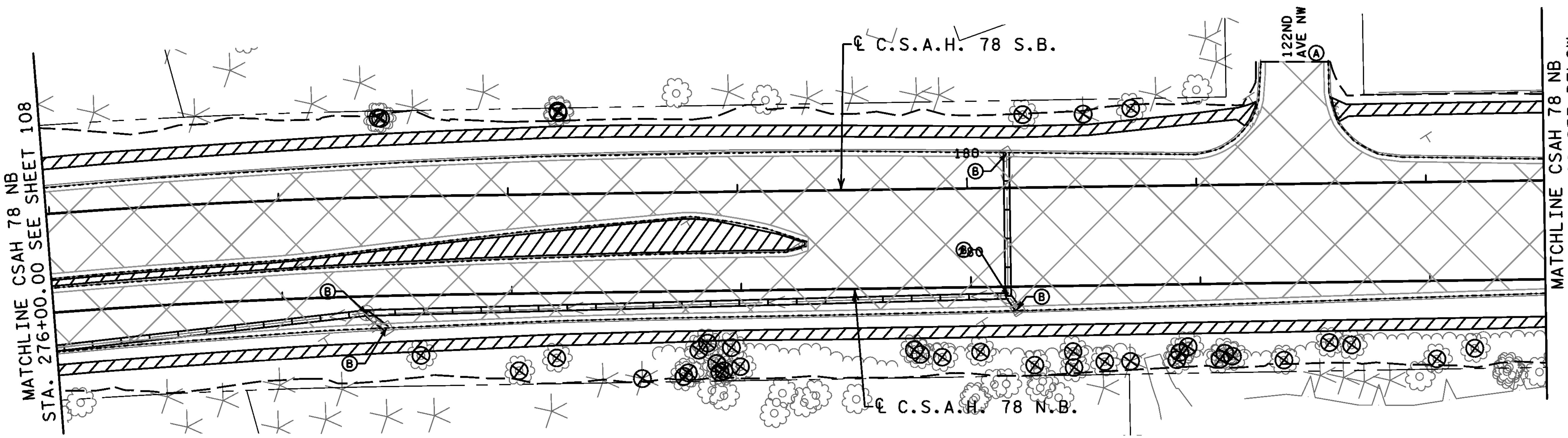
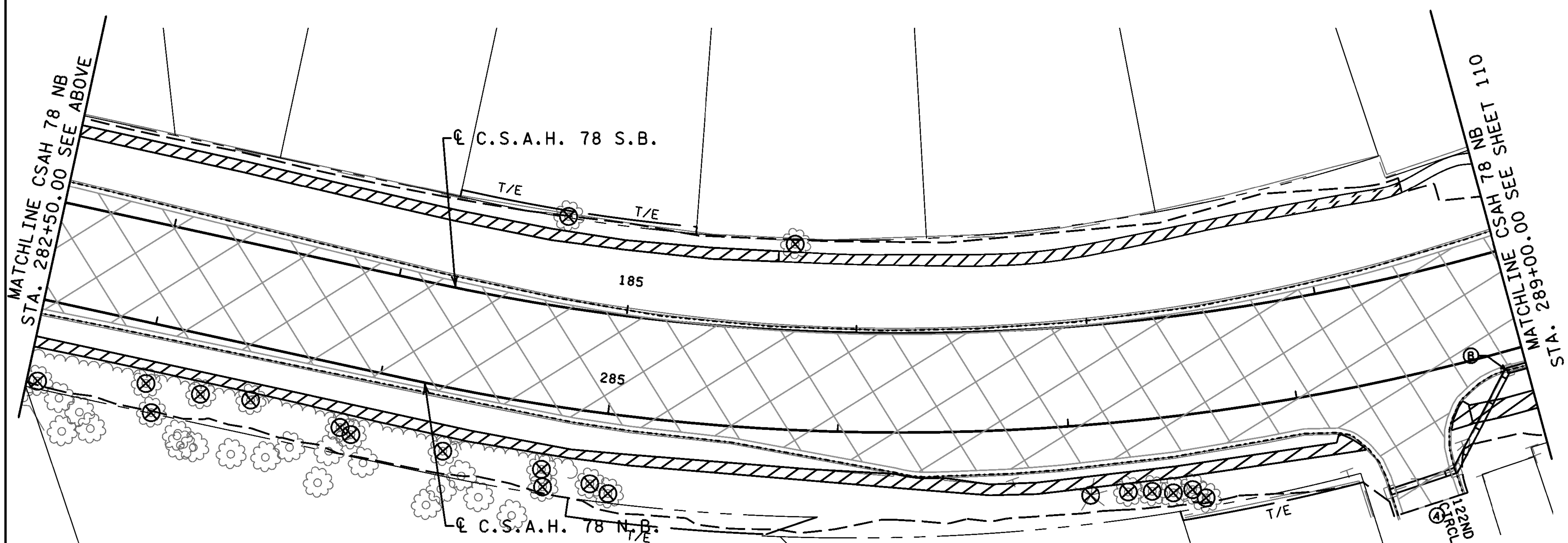


LEGEND

- REMOVE CONCRETE WALK
- REMOVE BITUMINOUS PAVEMENT
- REMOVE CONCRETE PAVEMENT
- REMOVE PIPE SEWERS
- REMOVE CURB & GUTTER
- MILL BITUMINOUS SURFACE (2.0")
- CLEAR AND GRUB (TREE)
- (A) SAWCUT BIT PAVEMENT
- (B) REMOVE CATCH BASIN OR MANHOLE
- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

50

SCALE IN FEET



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SCALE IN FEET

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DRAWN BY: NJL
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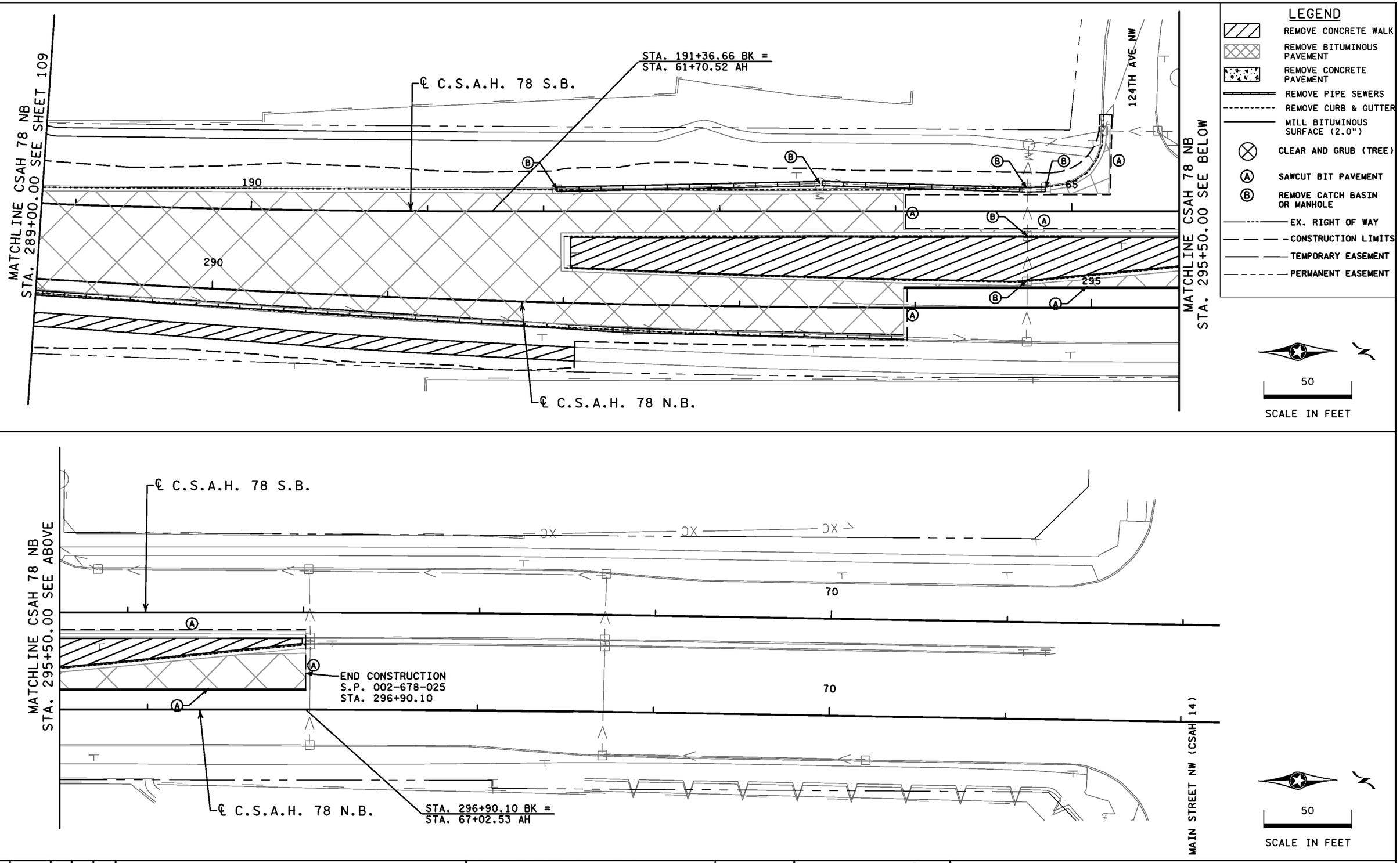
CHECKED BY: BAV

HDR

ANOKA COUNTY

REMOVAL PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



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LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY:	NJL
DESIGNED BY:	GEB
CHECKED BY:	BAV

HDR

ANOKA COUNTY

REMOVAL PLAN

SHEET NO. 110 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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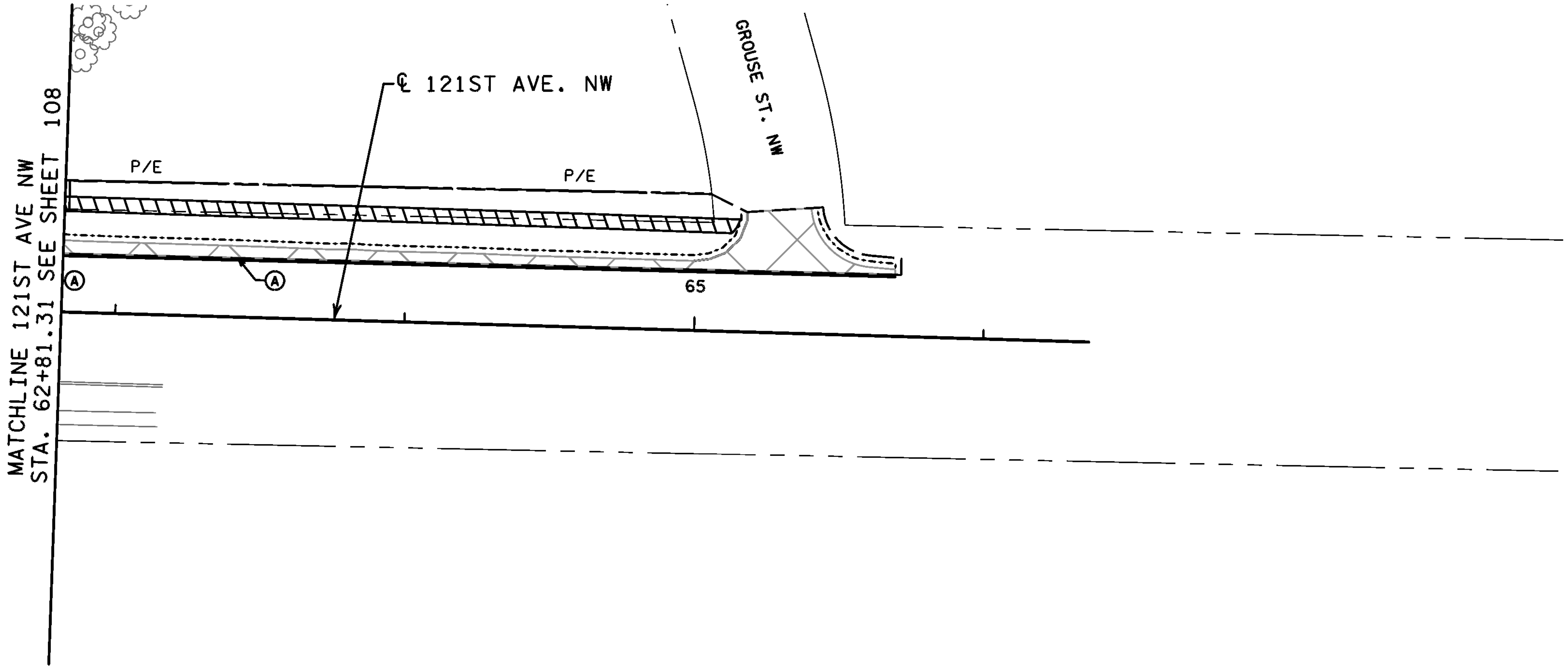

LEGEND

- REMOVE CONCRETE WALK
- REMOVE BITUMINOUS PAVEMENT
- REMOVE CONCRETE PAVEMENT
- REMOVE PIPE SEWERS
- REMOVE CURB & GUTTER
- MILL BITUMINOUS SURFACE (2.0")
- CLEAR AND GRUB (TREE)
- (A) SAWCUT BIT PAVEMENT
- (B) REMOVE CATCH BASIN OR MANHOLE
- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

N

50

SCALE IN FEET

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DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

REMOVAL PLAN

SHEET NO. 111 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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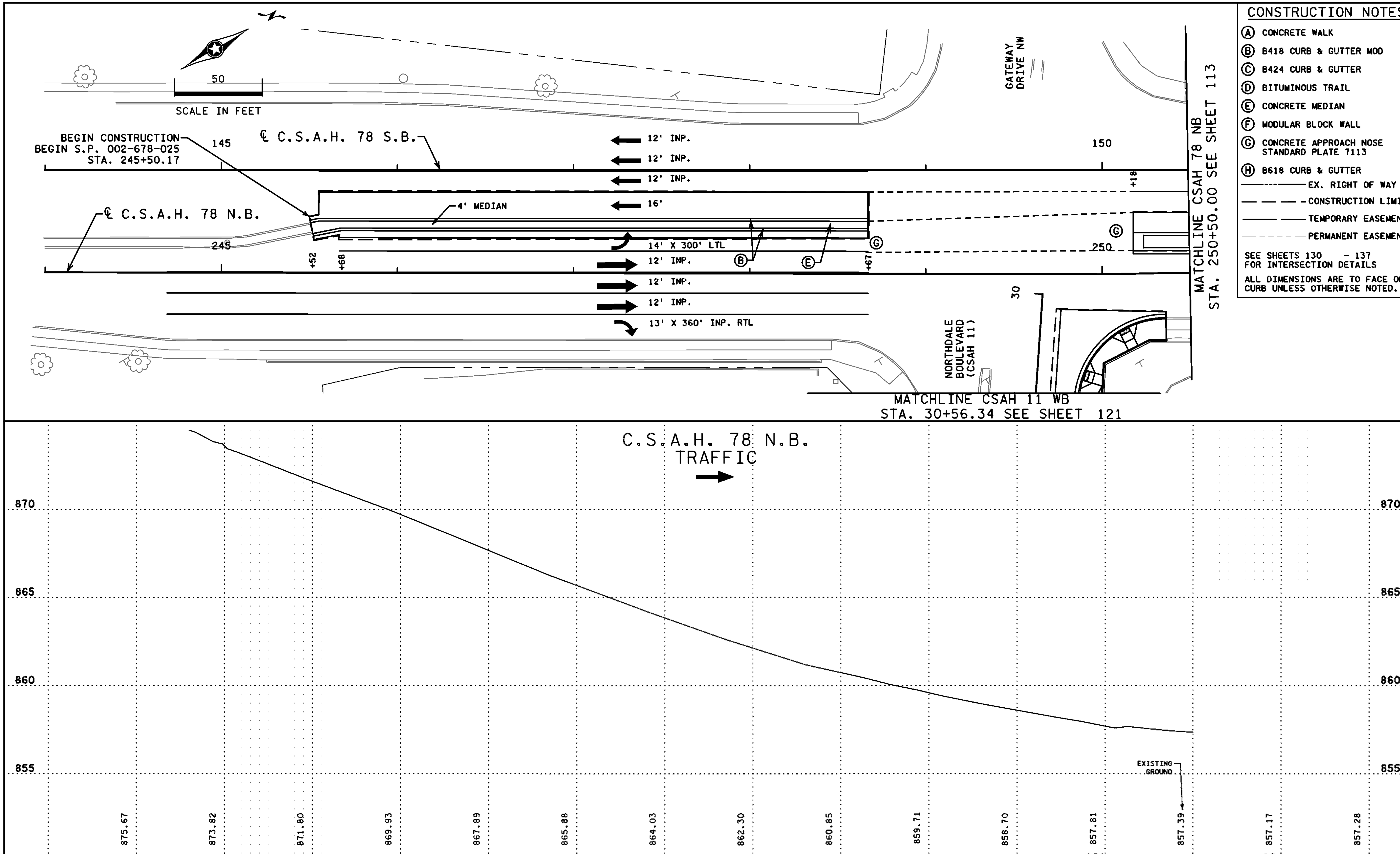

NO	DATE	BY	CKD	APPR	REVISION

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CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

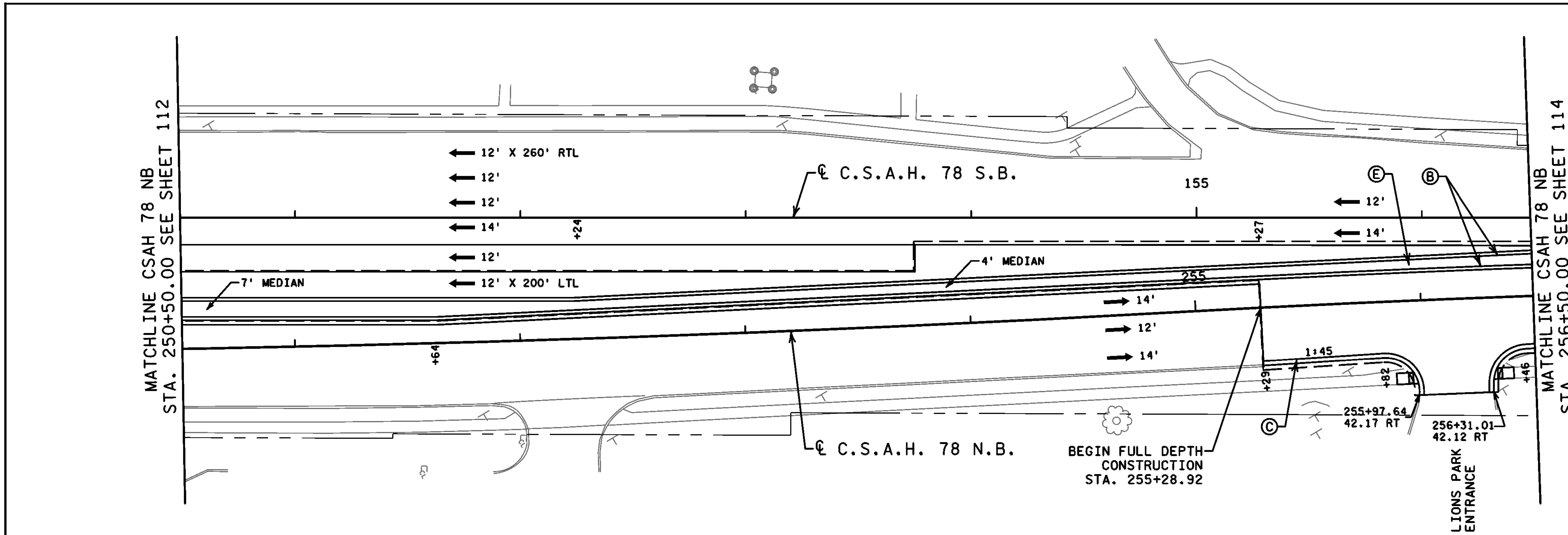
HDR

ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

SHEET NO. 112 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



CONSTRUCTION NOTES

- (A) CONCRETE WALK
- (B) B418 CURB & GUTTER MOD
- (C) B424 CURB & GUTTER
- (D) BITUMINOUS TRAIL
- (E) CONCRETE MEDIAN
- (F) MODULAR BLOCK WALL
- (G) CONCRETE APPROACH NOSE STANDARD PLATE 7113
- (H) B618 CURB & GUTTER

EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT

SEE SHEETS 130 - 137 FOR INTERSECTION DETAILS

ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.

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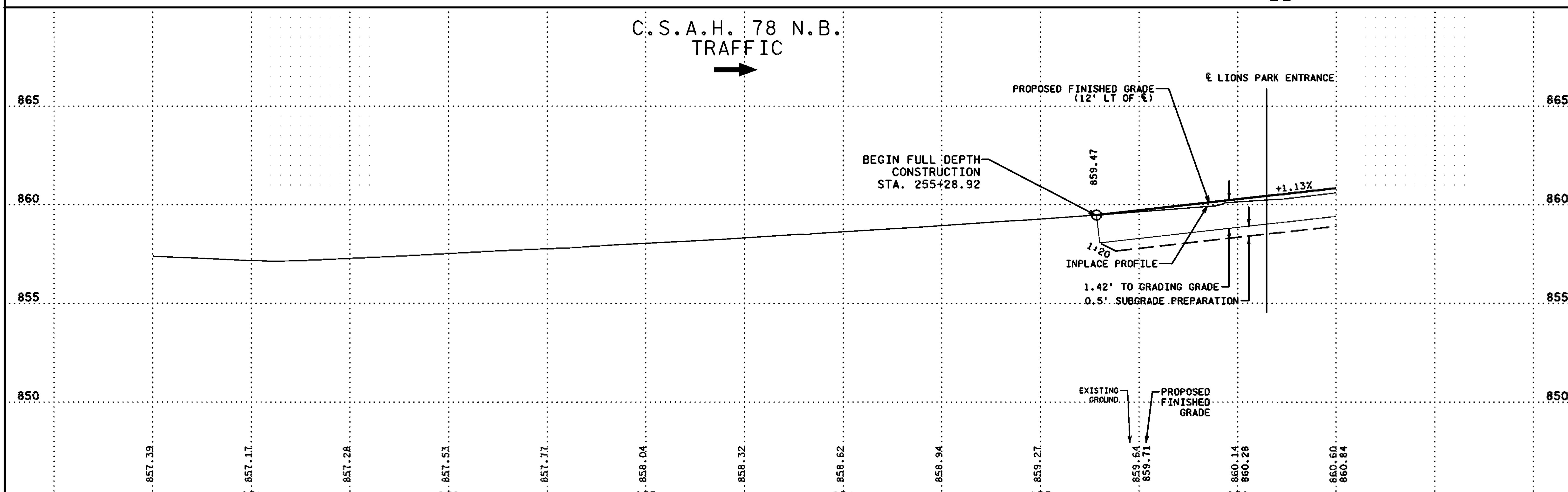
SCALE IN FEET



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ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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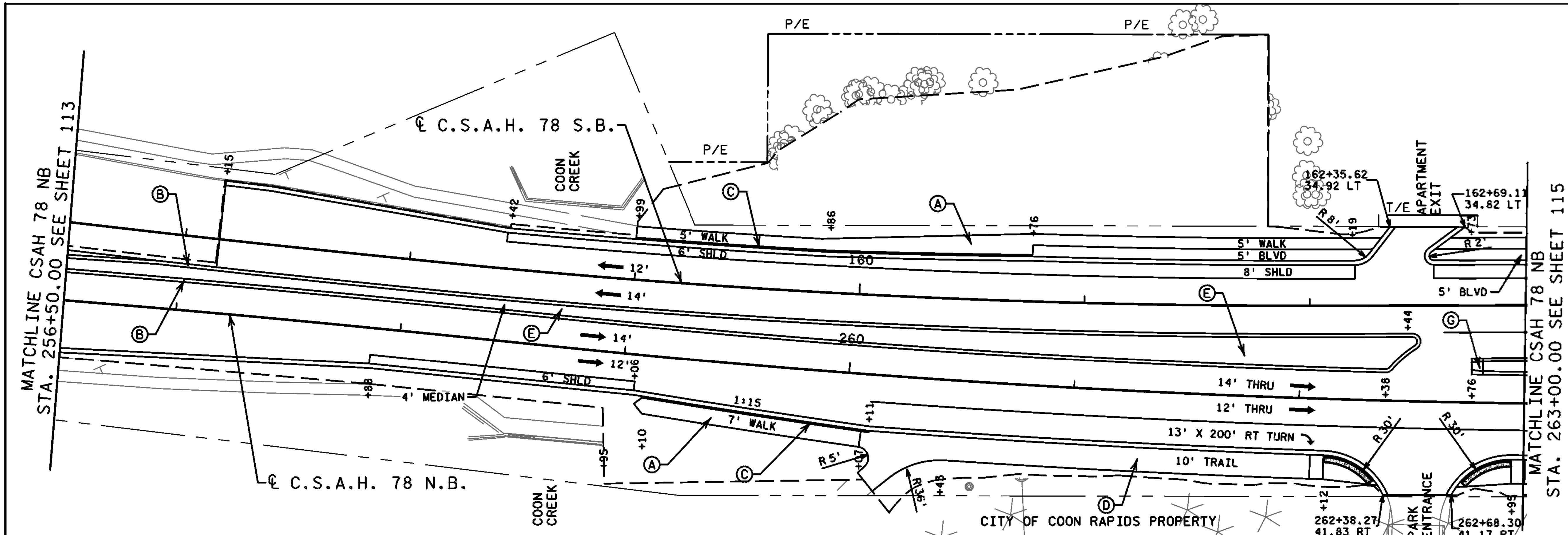

CONSTRUCTION NOTES

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- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
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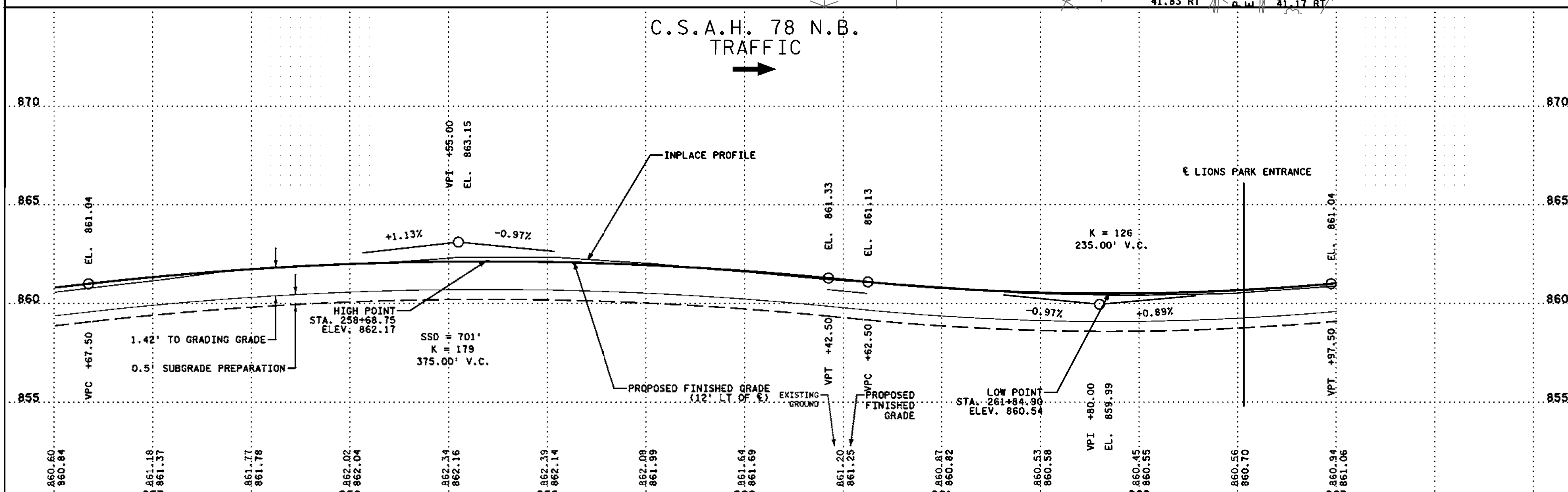
SCALE IN FEET



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DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

SHEET NO. 114 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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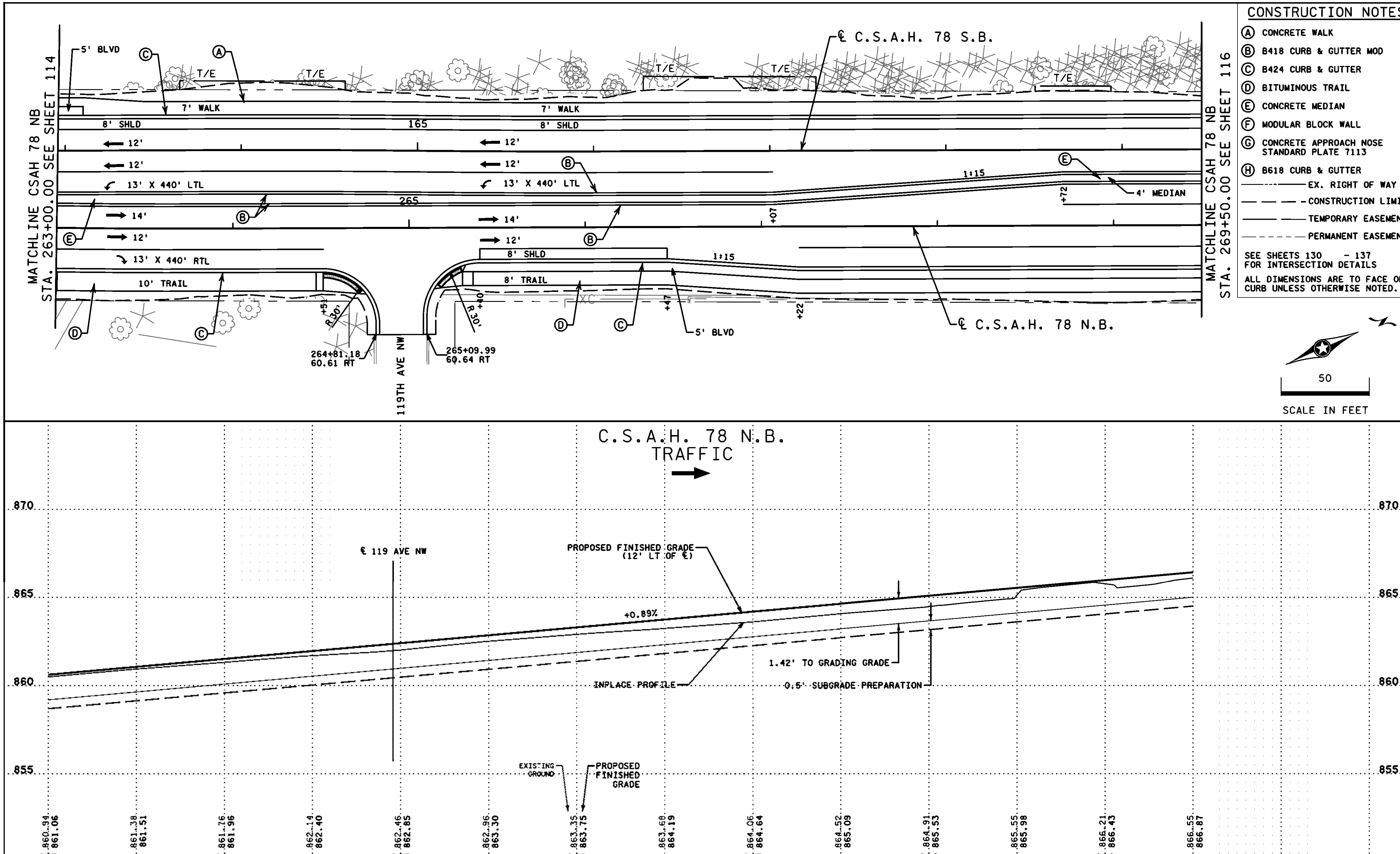

CONSTRUCTION NOTES

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- (C) B424 CURB & GUTTER
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- (E) CONCRETE MEDIAN
- (F) MODULAR BLOCK WALL
- (G) CONCRETE APPROACH NOSE STANDARD PLATE 7113
- (H) B618 CURB & GUTTER

EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT

SEE SHEETS 130 - 137 FOR INTERSECTION DETAILS

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NO	DATE	BY	CKD	APPR	REVISION

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DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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11/22/2019

MATCHLINE CSAH 78 NB
STA. 269+50.00 SEE SHEET 115

℄ C.S.A.H. 78 S.B.

172+89.84
71.57 LT

173+36.53
92.15 LT

121ST AVE NW

4' MEDIAN

T/E

R 50'

+67

7' WALK

8' SHLD

12'

14'

13' X 440' LTL

+16

12'

12'

13' X 600' RTL

5' BLVD

8' TRAIL

R 45'

+21

+71

270+35.68
43.95 RT

270+62.88
44.10 RT

℄ C.S.A.H. 78 N.B.

+27

5' WALK

13' X 300' RTL

12'

12'

13' X 320' LTL

+30

14'

12'

8' SHLD

10' TRAIL

+75

R 30'

5' CURB TRANSITION
B424 TO B618

MATCHLINE 121ST AVE NW
STA. 62+81.31
SEE SHEET 122

MATCHLINE CSAH 78 NB
STA. 276+00.00 SEE SHEET 117

CONSTRUCTION NOTES

- (A) CONCRETE WALK
- (B) B418 CURB & GUTTER MOD
- (C) B424 CURB & GUTTER
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- (H) B618 CURB & GUTTER

EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT

SEE SHEETS 130 - 137
FOR INTERSECTION DETAILS

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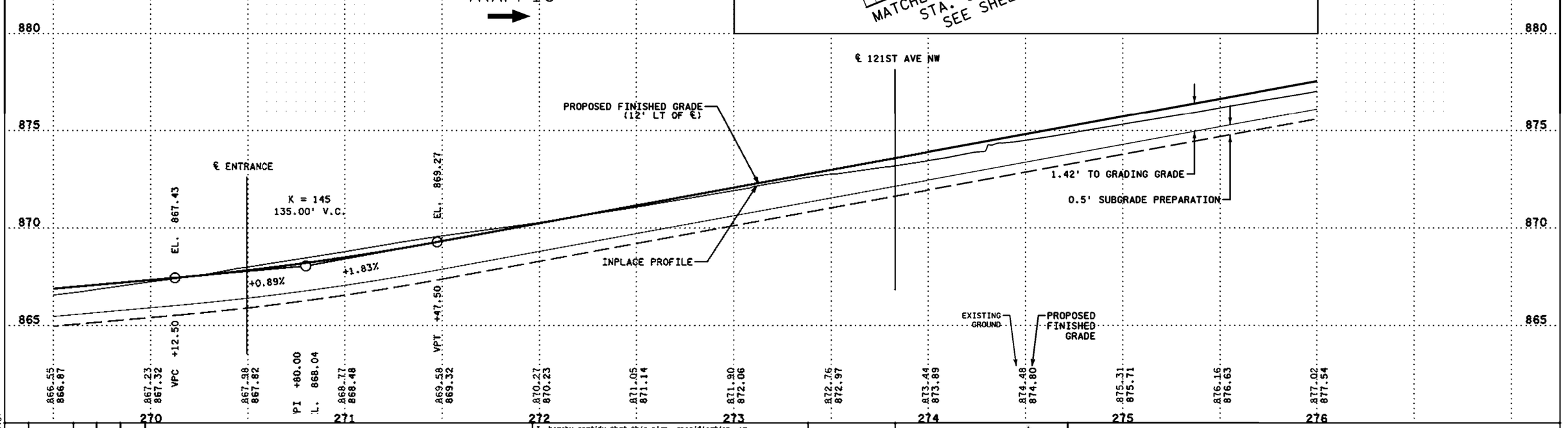
50
SCALE IN FEET

C.S.A.H. 78 N.B.
TRAFFIC



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DRAWN BY: NJL
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CHECKED BY: BAV

HDR

ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE
SHEET NO. 116 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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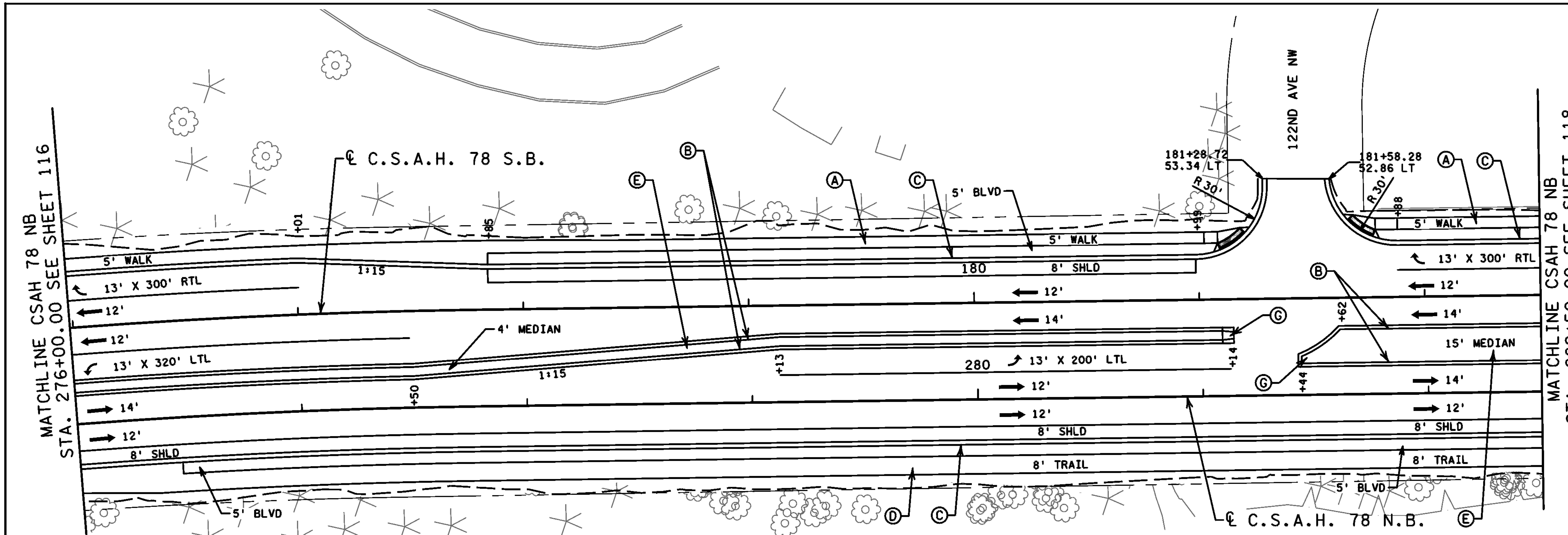

CONSTRUCTION NOTES

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- (C) B424 CURB & GUTTER
- (D) BITUMINOUS TRAIL
- (E) CONCRETE MEDIAN
- (F) MODULAR BLOCK WALL
- (G) CONCRETE APPROACH NOSE STANDARD PLATE 7113
- (H) B618 CURB & GUTTER
- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

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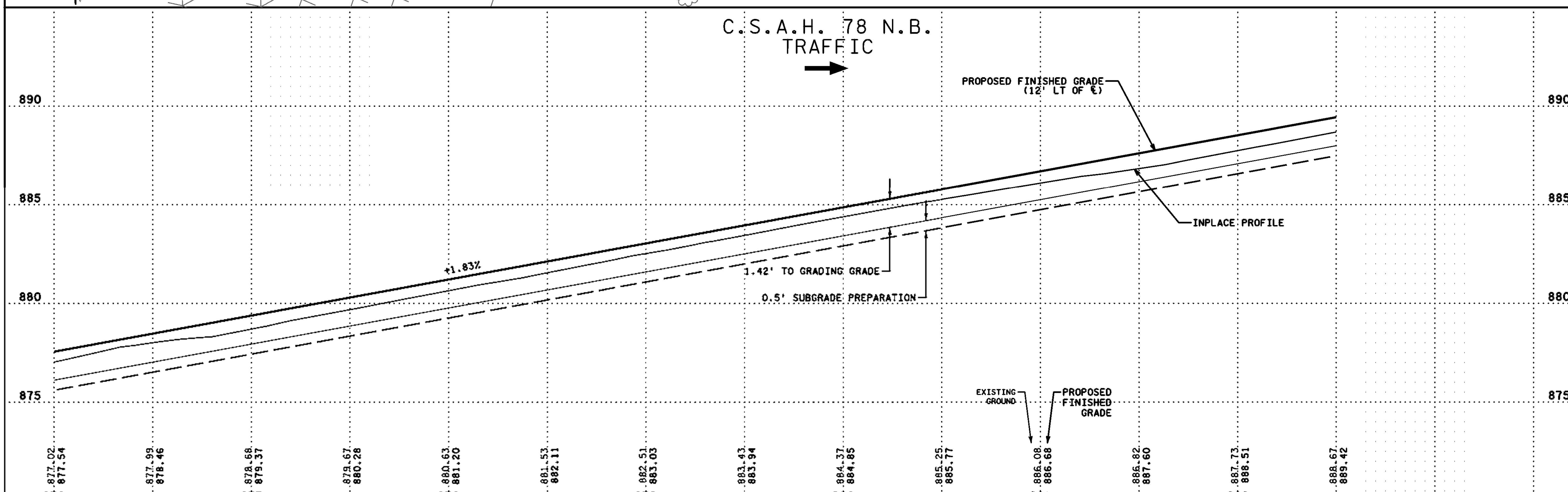
SCALE IN FEET



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DRAWN BY: NJL
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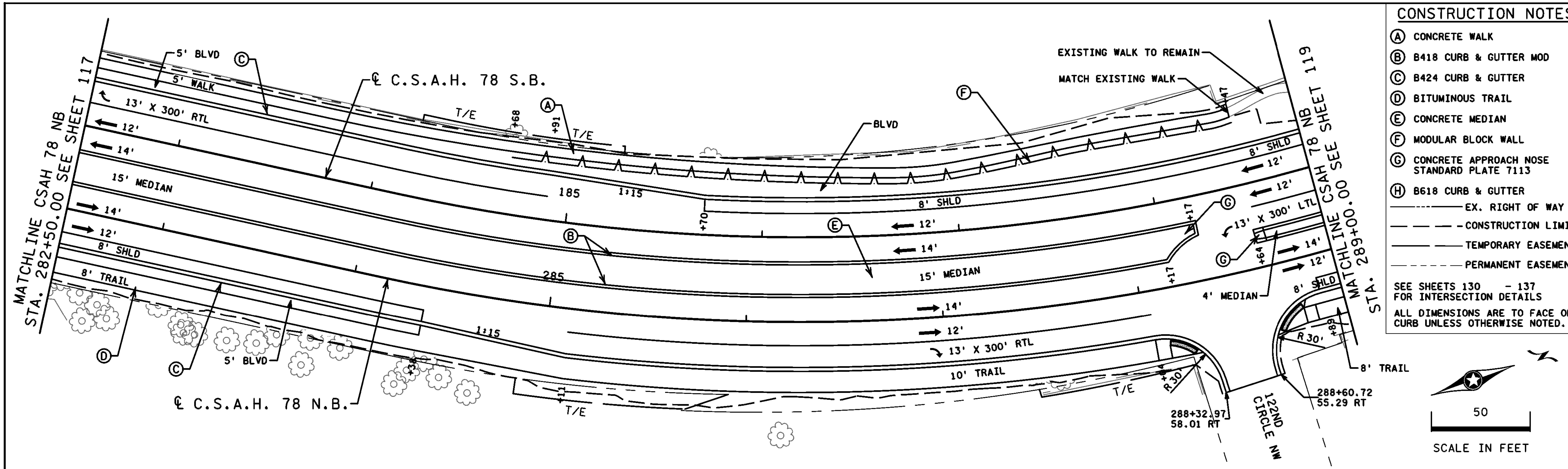
ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



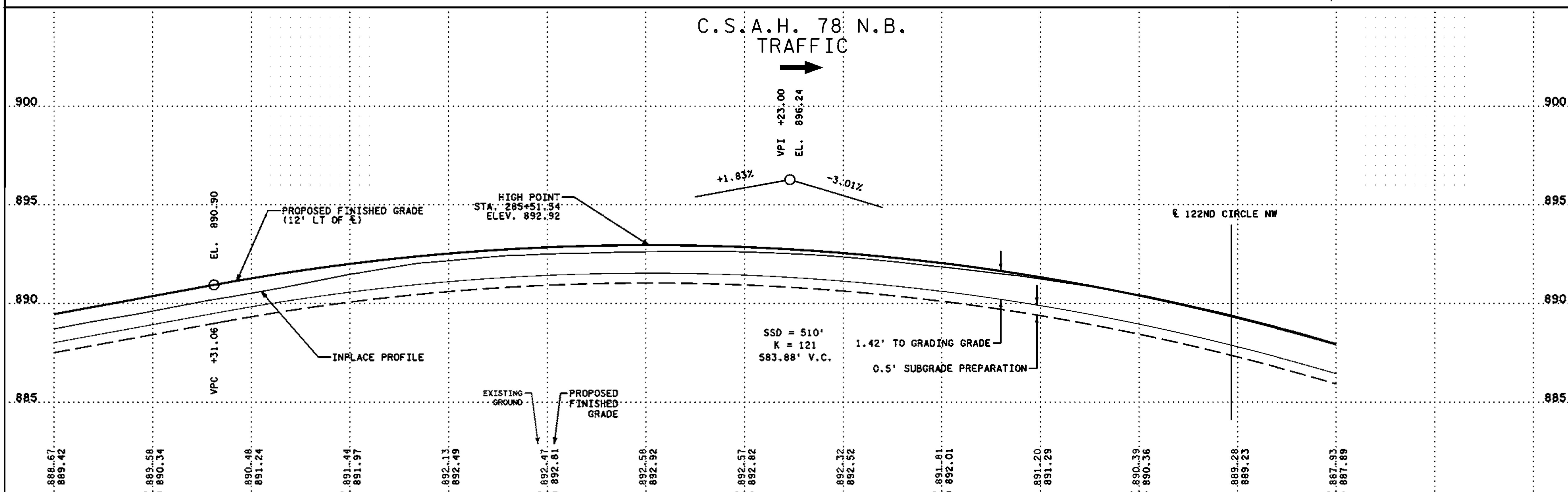
CONSTRUCTION NOTES

- (A) CONCRETE WALK
- (B) B418 CURB & GUTTER MOD
- (C) B424 CURB & GUTTER
- (D) BITUMINOUS TRAIL
- (E) CONCRETE MEDIAN
- (F) MODULAR BLOCK WALL
- (G) CONCRETE APPROACH NOSE STANDARD PLATE 7113
- (H) B618 CURB & GUTTER

EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT

SEE SHEETS 130 - 137 FOR INTERSECTION DETAILS

ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.



NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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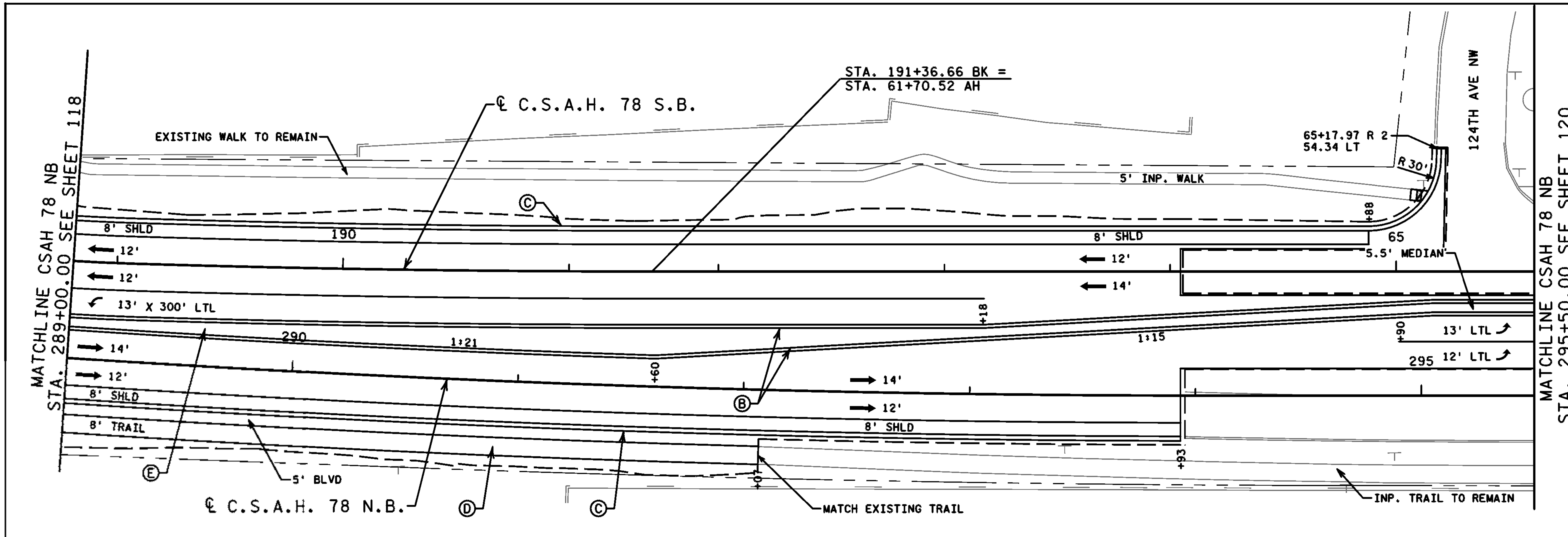


MATCHLINE CSAH 78 NB
STA. 289+00.00 SEE SHEET 118
STA. 191+36.66 BK =
STA. 61+70.52 AH
℄ C.S.A.H. 78 S.B.
EXISTING WALK TO REMAIN
5' INP. WALK
65+17.97 R 2
54.34 LT
R 30'
124TH AVE NW
8' SHLD
190
12'
12'
13' X 300' LTL
290
1:21
1:15
+18
+60
+88
65
+90
5.5' MEDIAN
14'
13' LTL
12' LTL
295
14'
12'
8' SHLD
8' TRAIL
5' BLVD
8' SHLD
+93
+07
℄ C.S.A.H. 78 N.B.
MATCH EXISTING TRAIL
INP. TRAIL TO REMAIN
MATCHLINE CSAH 78 NB
STA. 295+50.00 SEE SHEET 120

CONSTRUCTION NOTES

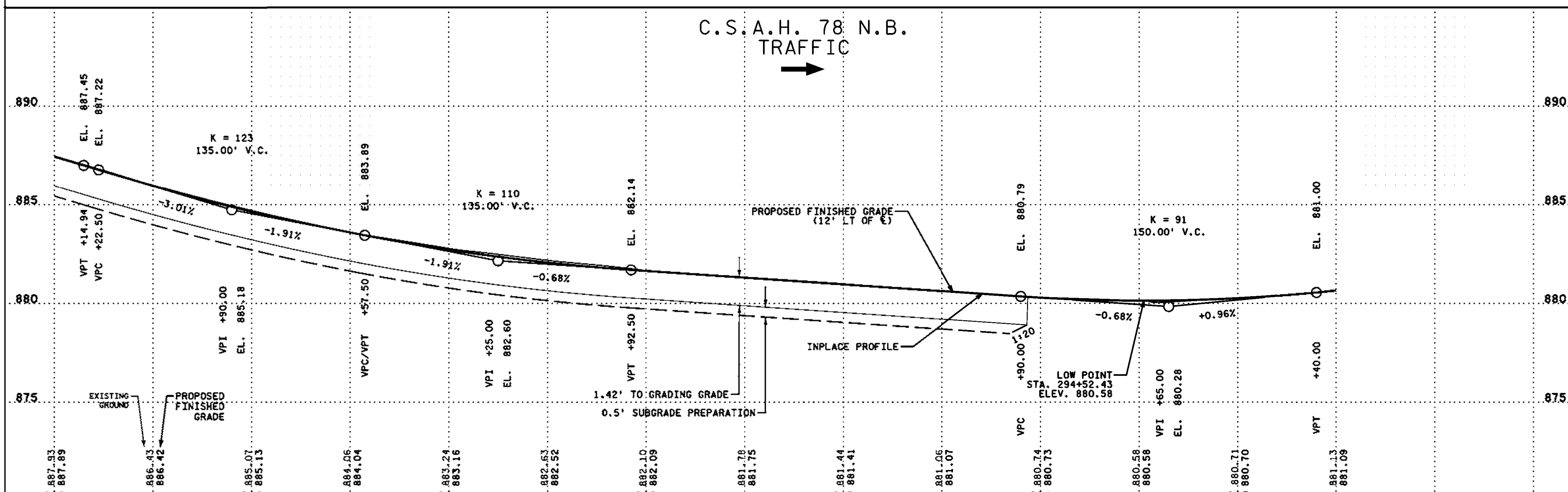
- (A) CONCRETE WALK
- (B) B418 CURB & GUTTER MOD
- (C) B424 CURB & GUTTER
- (D) BITUMINOUS TRAIL
- (E) CONCRETE MEDIAN
- (F) MODULAR BLOCK WALL
- (G) CONCRETE APPROACH NOSE STANDARD PLATE 7113
- (H) B618 CURB & GUTTER

EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT

SEE SHEETS 130 - 137 FOR INTERSECTION DETAILS

ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.

50
SCALE IN FEET



C.S.A.H. 78 N.B.
TRAFFIC
890
885
880
875
EL. 887.45
EL. 887.22
VPT +14.94
VPC +22.50
K = 123
135.00' V.C.
-3.01%
-1.91%
VPI +90.00
EL. 885.18
EL. 883.89
VPC/VPT +57.50
K = 110
135.00' V.C.
-1.91%
VPI +25.00
EL. 882.60
-0.68%
EL. 882.14
VPT +92.50
PROPOSED FINISHED GRADE
(12' LT OF ℄)
INPLACE PROFILE
1.42' TO GRADING GRADE
0.5' SUBGRADE PREPARATION
EL. 880.79
+90.00
VPC
1:20
K = 91
150.00' V.C.
-0.68%
+0.96%
LOW POINT
STA. 294+52.43
ELEV. 880.58
VPI +65.00
EL. 880.28
EL. 881.00
+40.00
VPT
EXISTING GROUND
PROPOSED FINISHED GRADE
887.93 887.89
886.43 886.42
885.07 885.13
884.06 884.04
883.24 883.16
882.63 882.52
882.10 882.09
881.78 881.75
881.44 881.41
881.06 881.07
880.74 880.73
880.58 880.58
880.71 880.70
881.13 881.09
289
290
291
292
293
294
295

NO	DATE	BY	CKD	APPR	REVISION

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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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MATCHLINE CSAH 78 NB
STA. 295+50.00 SEE SHEET 119

℄ C.S.A.H. 78 S.B.

5.5' MEDIAN

Ⓑ

Ⓔ

13' LTL

12' LTL

+01

+90

END CONSTRUCTION
END S.P. 002-678-025
STA. 296+90.10

70

70

MAIN STREET NW (CSAH 14)

℄ C.S.A.H. 78 N.B.

STA. 296+90.10 BK =
STA. 67+02.53 AH

CONSTRUCTION NOTES

- Ⓐ CONCRETE WALK
- Ⓑ B418 CURB & GUTTER MOD
- Ⓒ B424 CURB & GUTTER
- Ⓓ BITUMINOUS TRAIL
- Ⓔ CONCRETE MEDIAN
- Ⓕ MODULAR BLOCK WALL
- Ⓖ CONCRETE APPROACH NOSE STANDARD PLATE 7113
- Ⓗ B618 CURB & GUTTER
- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

SEE SHEETS 130 - 137
FOR INTERSECTION DETAILS

ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.

50

SCALE IN FEET

C.S.A.H. 78 N.B.
TRAFFIC

MATCH EXISTING PAVEMENT

EQUATION:
BK 296+90.10 =
AH 67+02.53

882.44

INPLACE PROFILE

PROPOSED FINISHED GRADE
(12' LT OF ℄)

INPLACE PROFILE

END CONSTRUCTION
S.P. 002-678-025
STA. 296+90.10

EL. 881.00

+40.00

VPT

EXISTING GROUND

PROPOSED FINISHED GRADE

890
885
880
875

295	296	67	68	69	70	71
880.71 / 880.70	881.13 / 881.09	881.63 / 881.57	882.08 / 882.05	882.94	883.44	883.93	884.46	884.93	885.35	885.75	886.12	886.48

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LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: NJL
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HDR

ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

SHEET NO. 120 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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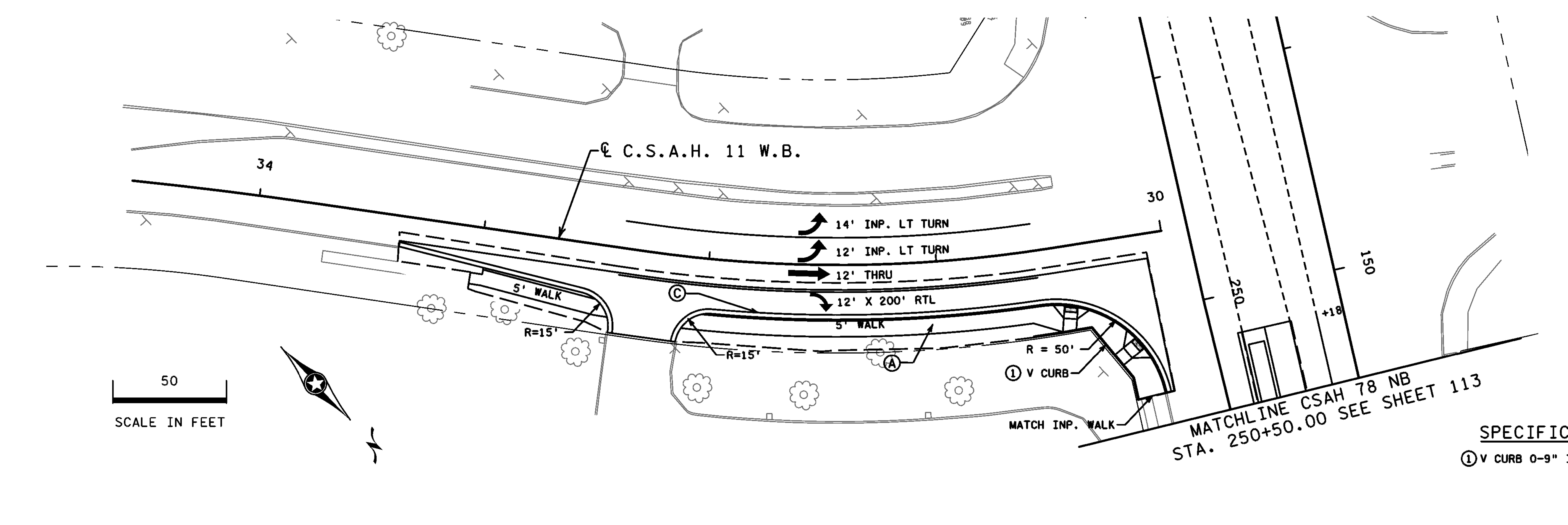

CONSTRUCTION NOTES

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- (C) B424 CURB & GUTTER
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- (E) CONCRETE MEDIAN
- (F) MODULAR BLOCK WALL
- (G) CONCRETE APPROACH NOSE STANDARD PLATE 7113
- (H) B618 CURB & GUTTER

EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT

SEE SHEETS 130 - 137 FOR INTERSECTION DETAILS

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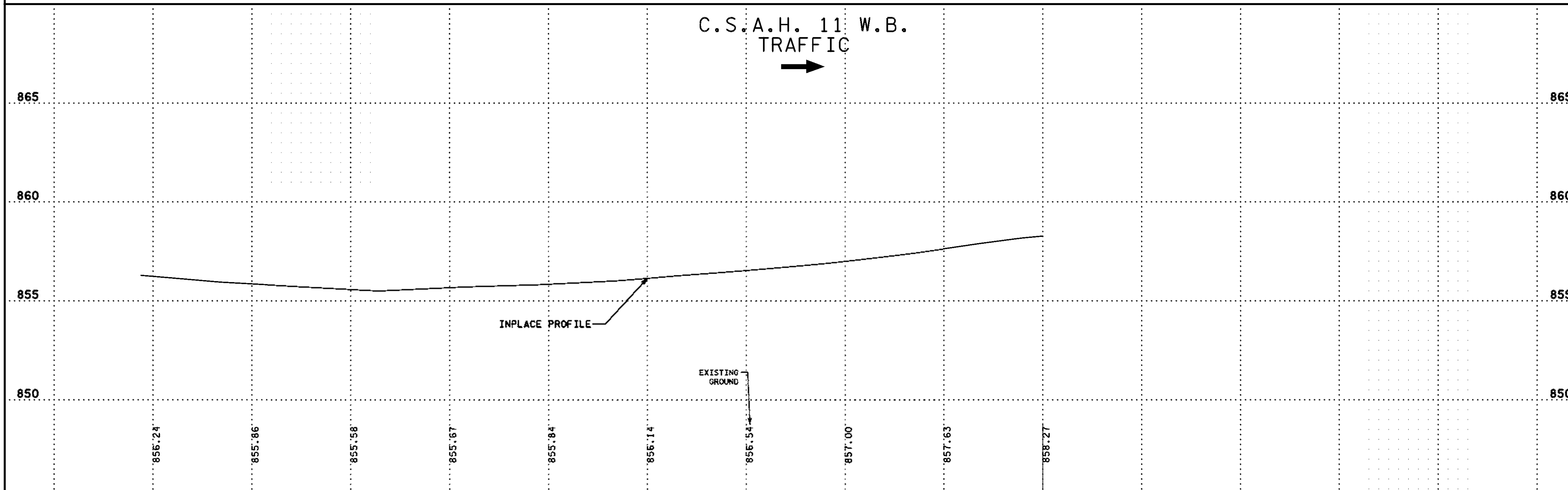
SPECIFIC NOTES

(1) V CURB 0-9" IN HEIGHT.



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HDR

ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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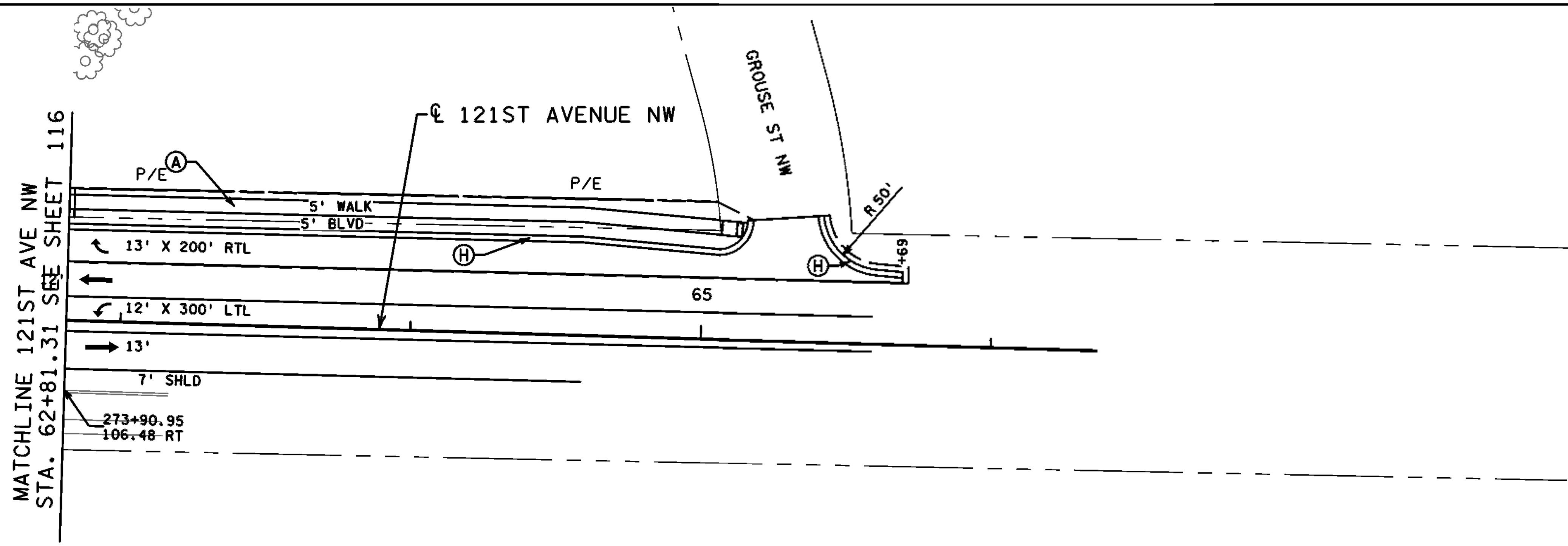

CONSTRUCTION NOTES

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- (C) B424 CURB & GUTTER
- (D) BITUMINOUS TRAIL
- (E) CONCRETE MEDIAN
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- (G) CONCRETE APPROACH NOSE STANDARD PLATE 7113
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EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT

SEE SHEETS 130 - 137 FOR INTERSECTION DETAILS

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50
SCALE IN FEET

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ANOKA COUNTY

CONSTRUCTION PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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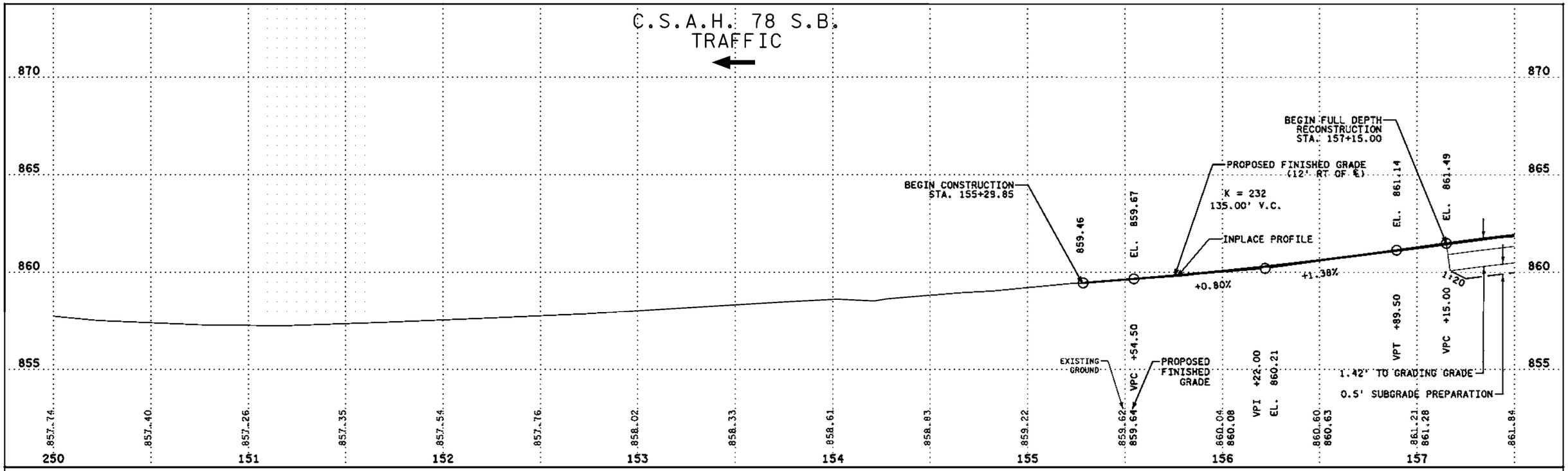

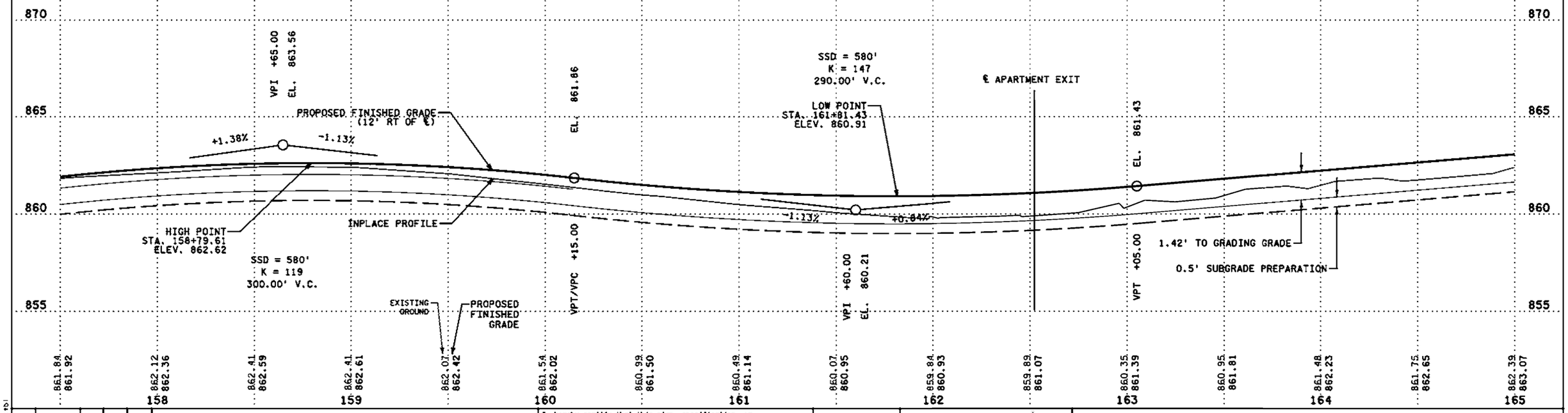

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LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY:	GEB
DESIGNED BY:	GEB
CHECKED BY:	BAV

HDR

ANOKA COUNTY

ADDITIONAL PROFILES

SHEET NO. 123 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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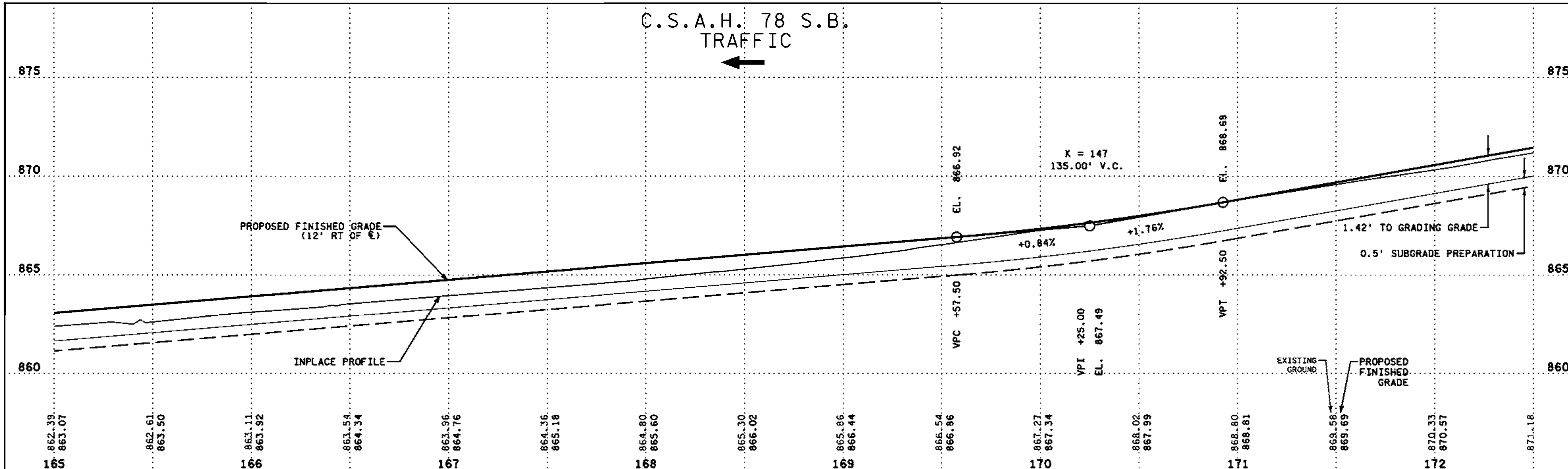

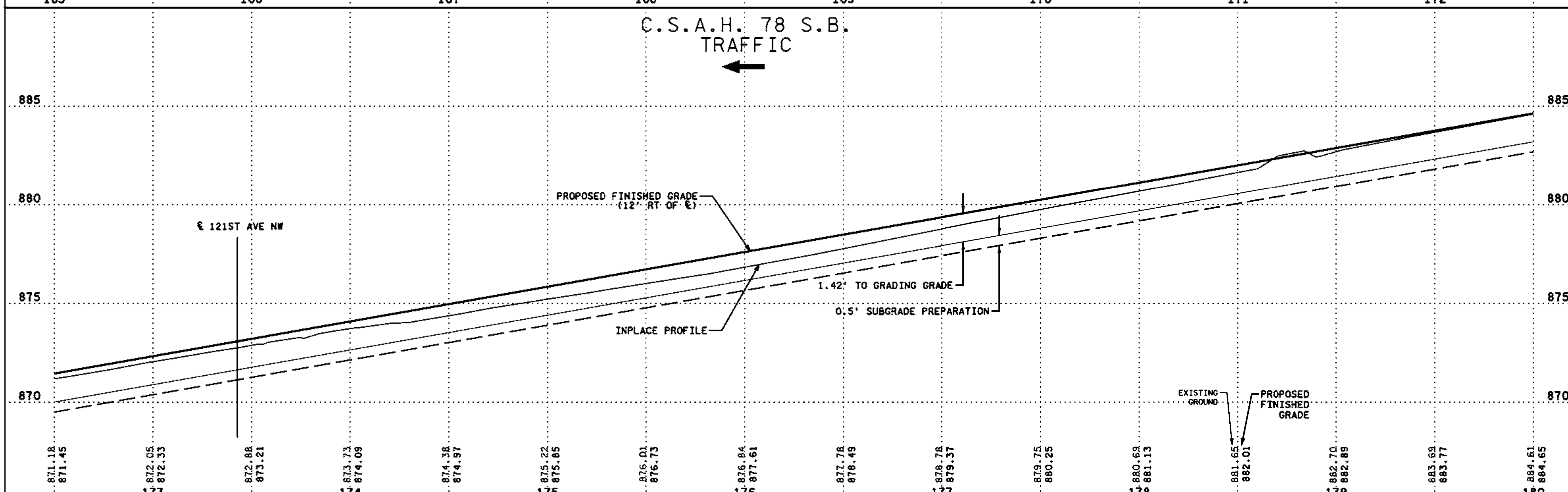

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ANOKA COUNTY

ADDITIONAL PROFILES

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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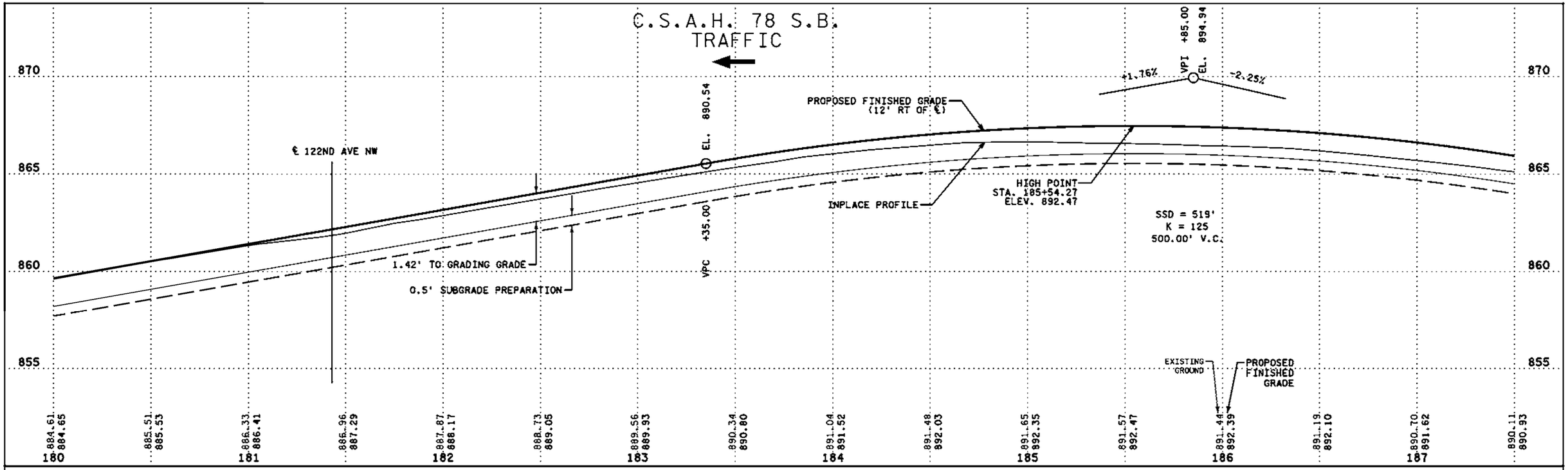

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LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY:	GEB
DESIGNED BY:	GEB
CHECKED BY:	BAV

HDR

ANOKA COUNTY

ADDITIONAL PROFILES

SHEET NO. 125 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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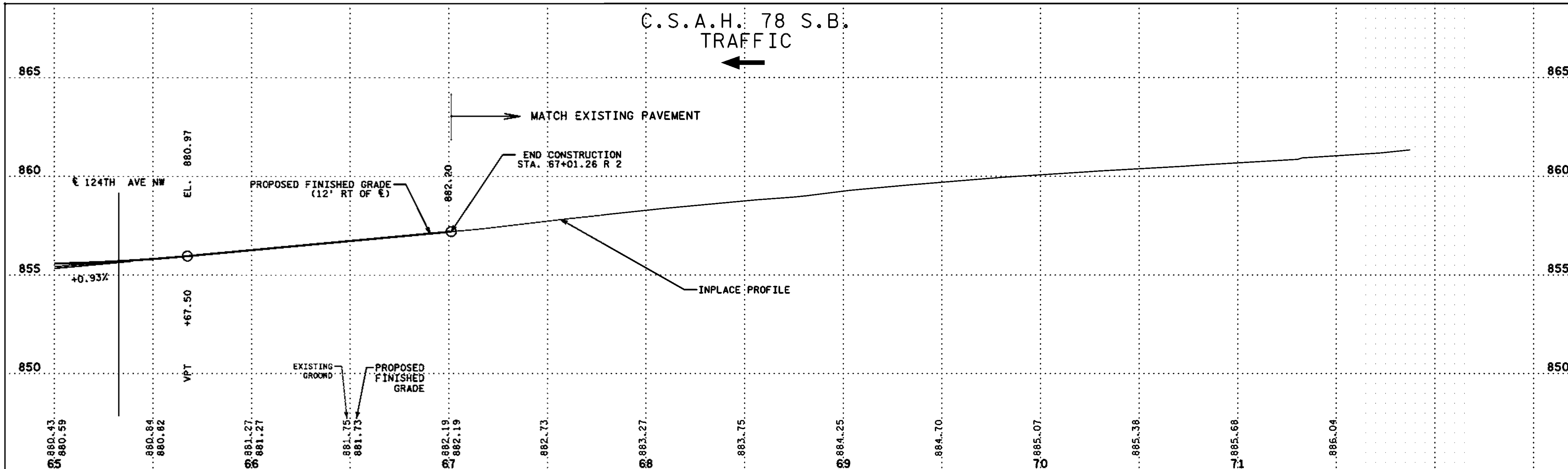

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CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

ADDITIONAL PROFILES

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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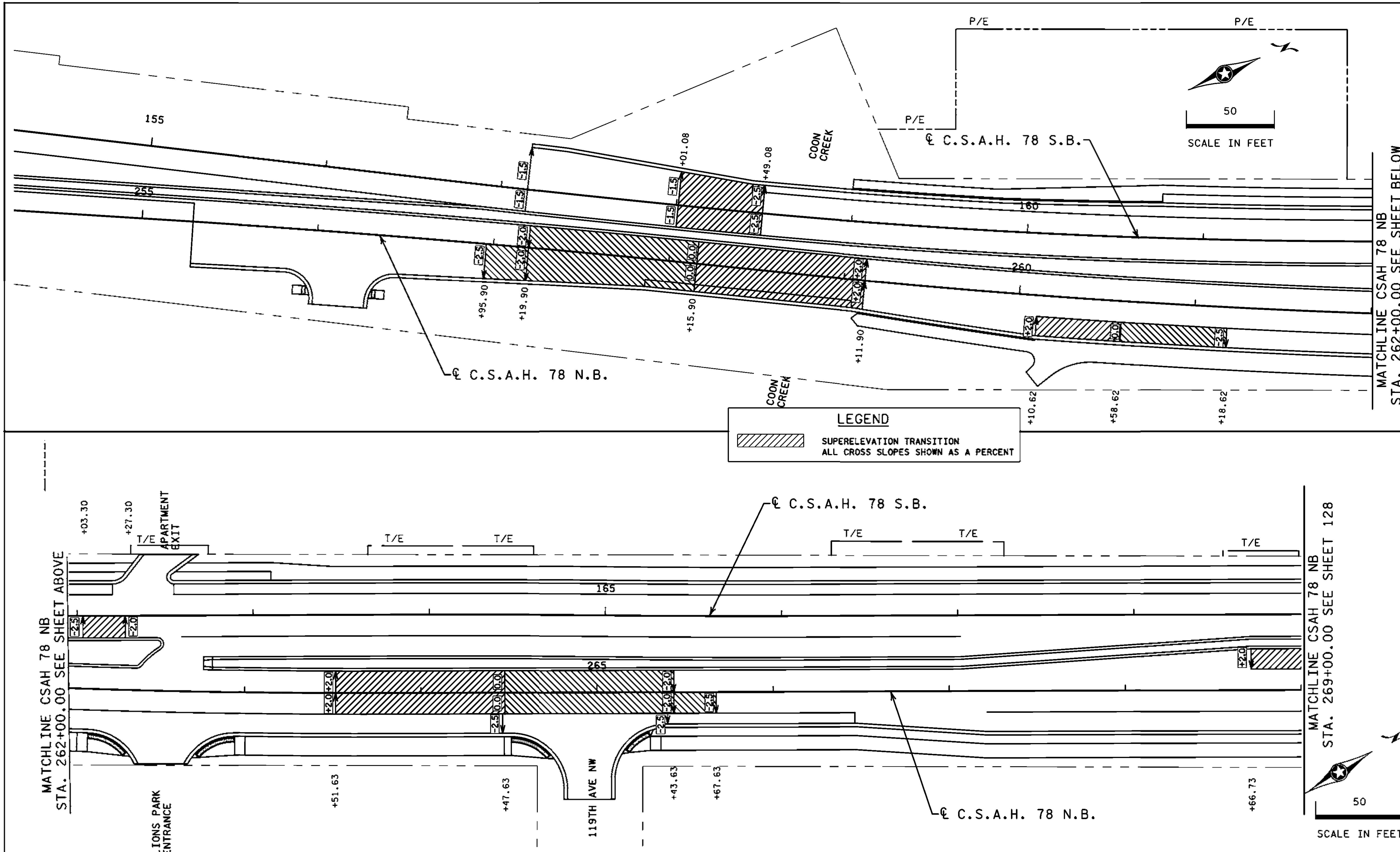

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CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
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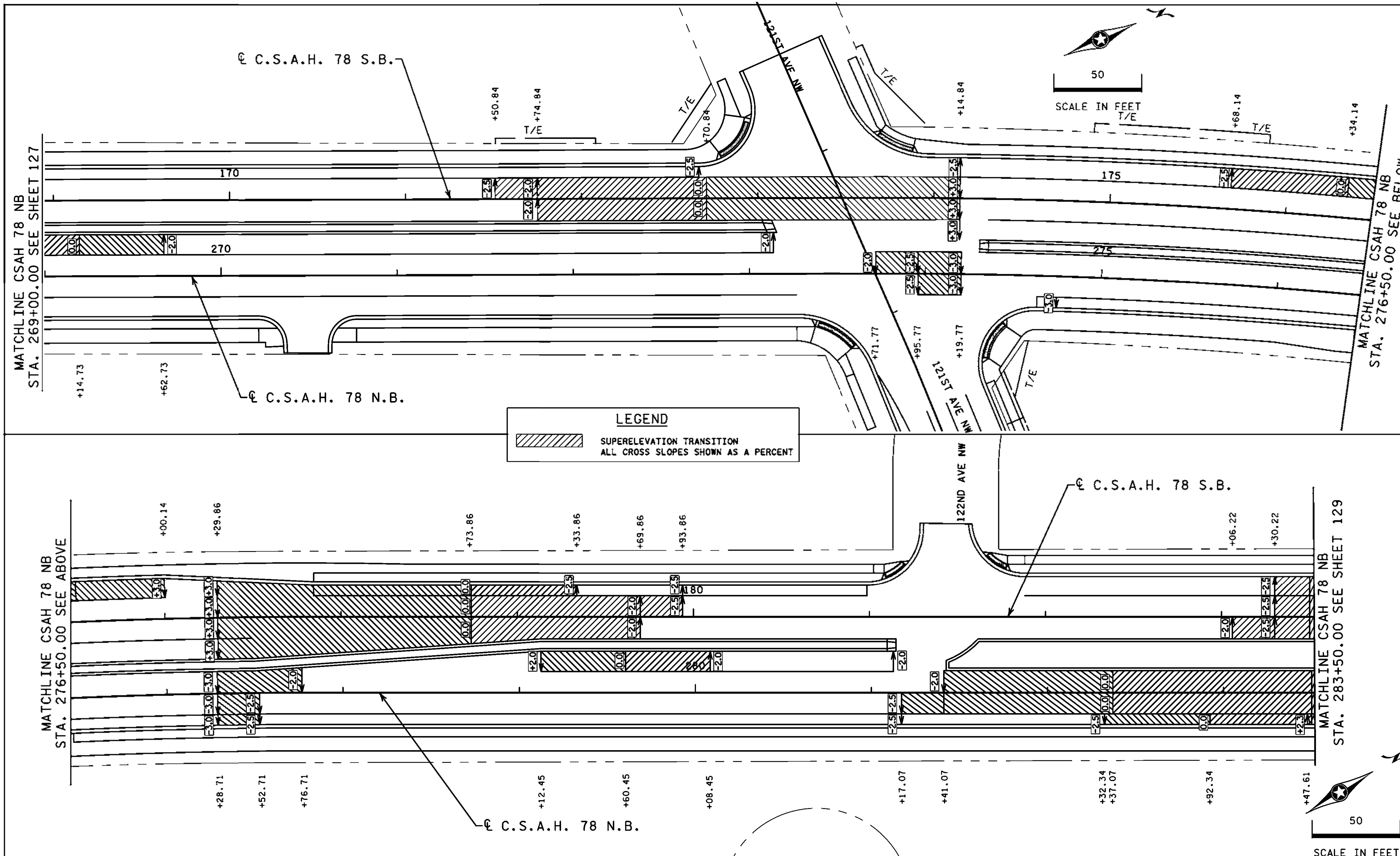
CHECKED BY: BAV

HDR

ANOKA COUNTY

SUPERELEVATION PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



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DRAWN BY: NJL

DESIGNED BY: GEB

CHECKED BY: BAV

NO	DATE	BY	CKD	APPR	REVISION

HDR

ANOKA COUNTY

SUPERELEVATION PLAN

SHEET NO. 128 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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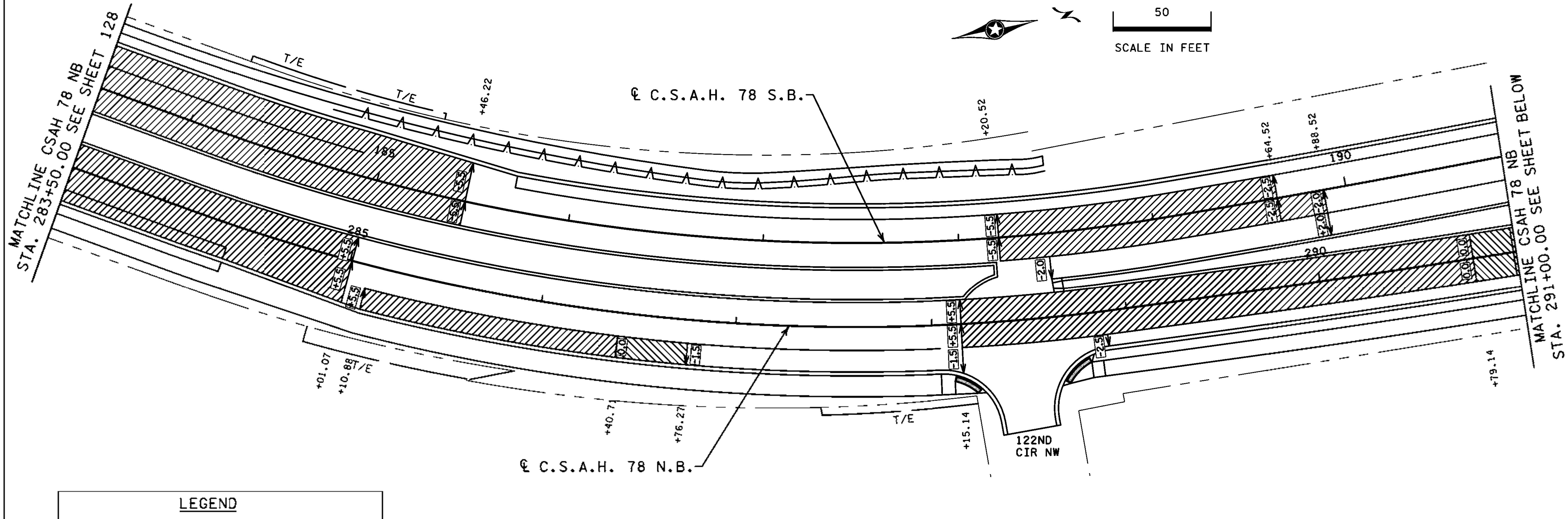
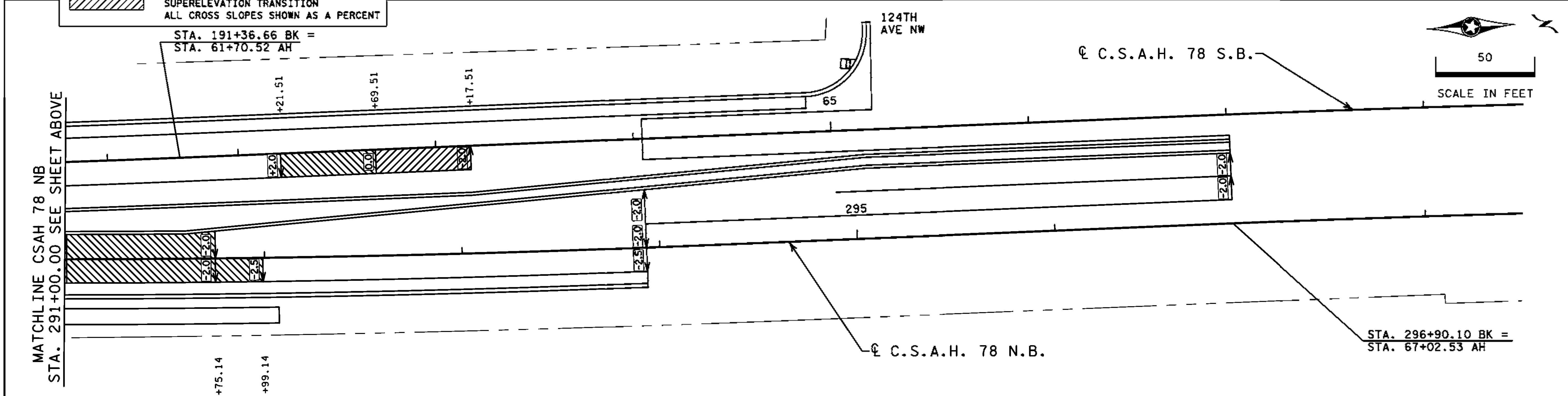


LEGEND

SUPERELEVATION TRANSITION
ALL CROSS SLOPES SHOWN AS A PERCENT



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CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

SUPERELEVATION PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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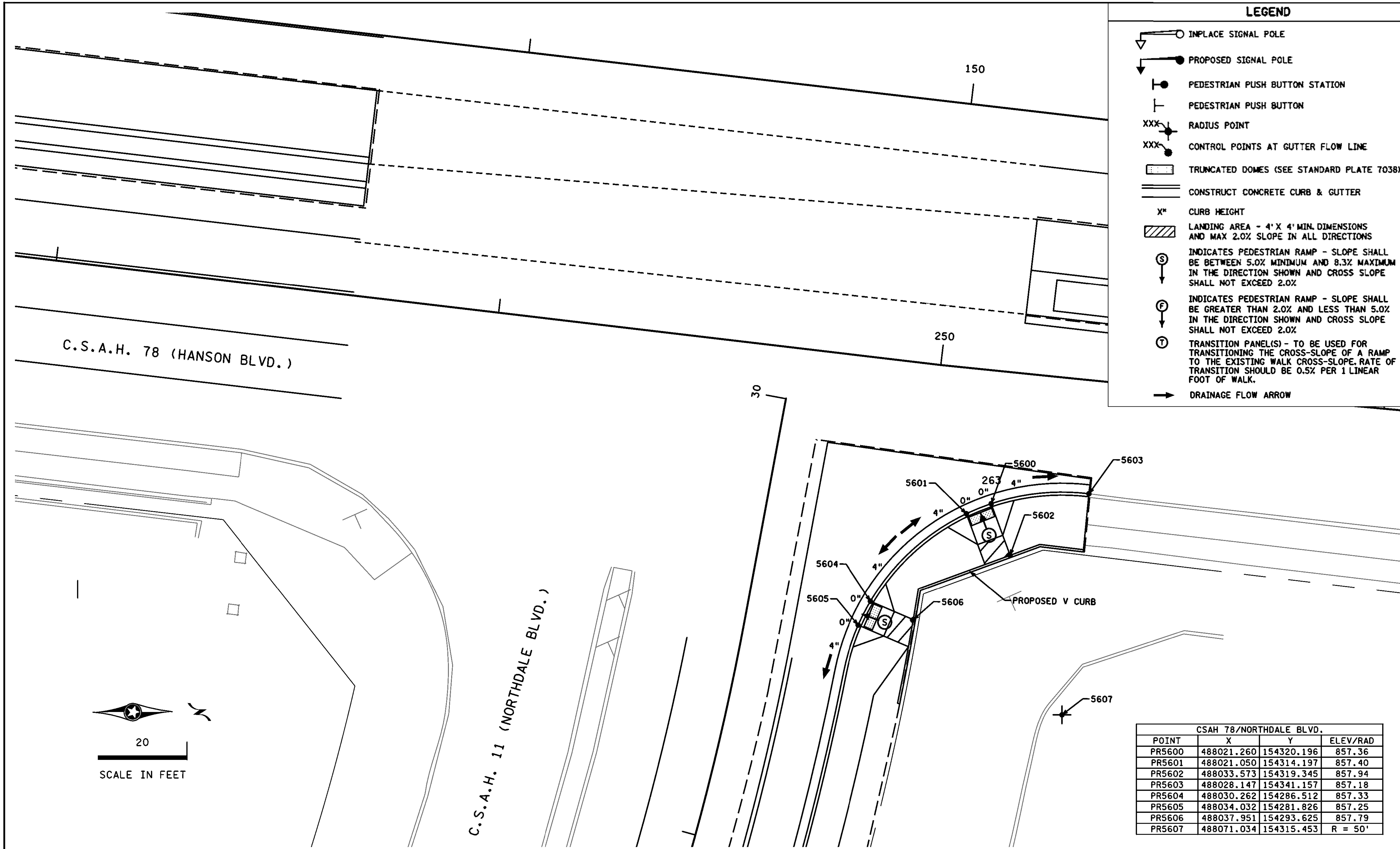

LEGEND

- INPLACE SIGNAL POLE
- PROPOSED SIGNAL POLE
- PEDESTRIAN PUSH BUTTON STATION
- PEDESTRIAN PUSH BUTTON
- XXX RADIUS POINT
- XXX CONTROL POINTS AT GUTTER FLOW LINE
- TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- CONSTRUCT CONCRETE CURB & GUTTER
- X" CURB HEIGHT
- LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
- (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%
- (T) TRANSITION PANEL(S) - TO BE USED FOR TRANSITIONING THE CROSS-SLOPE OF A RAMP TO THE EXISTING WALK CROSS-SLOPE. RATE OF TRANSITION SHOULD BE 0.5% PER 1 LINEAR FOOT OF WALK.
- DRAINAGE FLOW ARROW

CSAH 78/NORTHDALE BLVD.			
POINT	X	Y	ELEV/RAD
PR5600	488021.260	154320.196	857.36
PR5601	488021.050	154314.197	857.40
PR5602	488033.573	154319.345	857.94
PR5603	488028.147	154341.157	857.18
PR5604	488030.262	154286.512	857.33
PR5605	488034.032	154281.826	857.25
PR5606	488037.951	154293.625	857.79
PR5607	488071.034	154315.453	R = 50'

NO	DATE	BY	CKD	APPR	REVISION

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CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

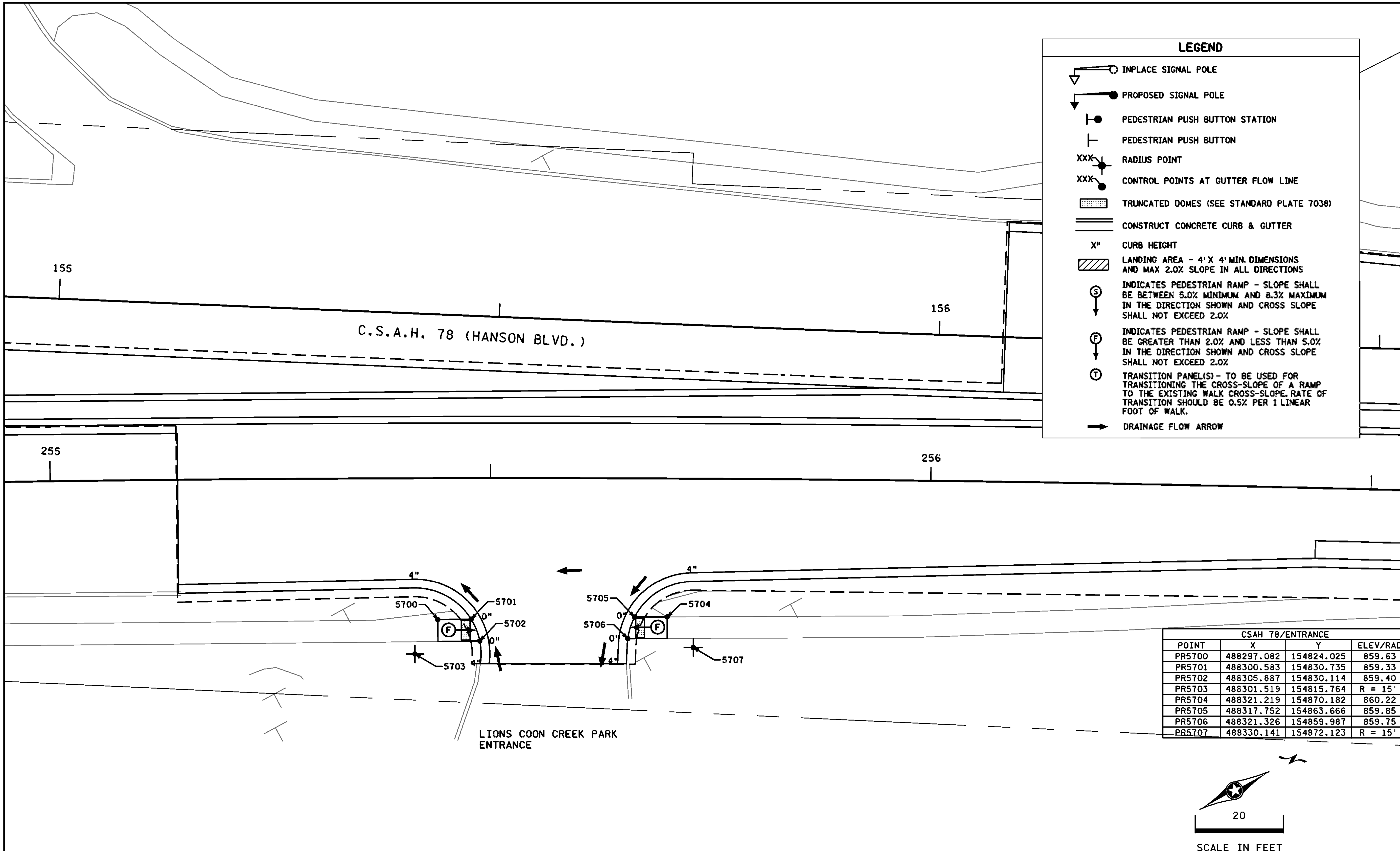
DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

INTERSECTION DETAIL

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



LEGEND

- INPLACE SIGNAL POLE
- PROPOSED SIGNAL POLE
- PEDESTRIAN PUSH BUTTON STATION
- PEDESTRIAN PUSH BUTTON
- XXX — RADIUS POINT
- XXX — CONTROL POINTS AT GUTTER FLOW LINE
- TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- CONSTRUCT CONCRETE CURB & GUTTER
- X" — CURB HEIGHT
- LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
- (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%
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- DRAINAGE FLOW ARROW

CSAH 78/ENTRANCE			
POINT	X	Y	ELEV/RAD
PR5700	488297.082	154824.025	859.63
PR5701	488300.583	154830.735	859.33
PR5702	488305.887	154830.114	859.40
PR5703	488301.519	154815.764	R = 15'
PR5704	488321.219	154870.182	860.22
PR5705	488317.752	154863.666	859.85
PR5706	488321.326	154859.987	859.75
PR5707	488330.141	154872.123	R = 15'

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NO	DATE	BY	CKD	APPR	REVISION

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NAME: GINA E. BEERS LIC. NO. 56150

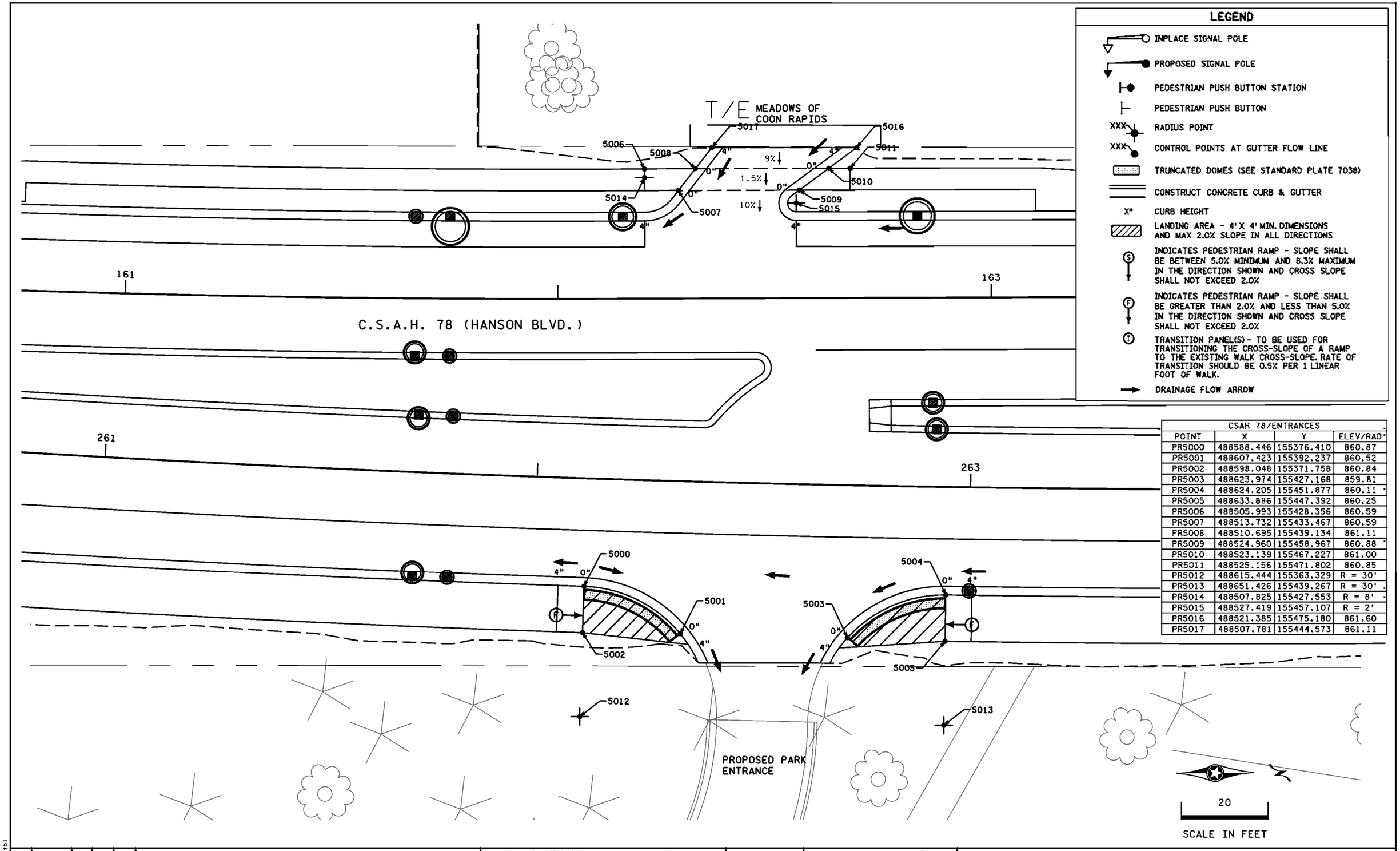
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

ANOKA COUNTY

INTERSECTION DETAIL

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



LEGEND

- INPLACE SIGNAL POLE
- PROPOSED SIGNAL POLE
- PEDESTRIAN PUSH BUTTON STATION
- PEDESTRIAN PUSH BUTTON
- XXX — RADIUS POINT
- XXX — CONTROL POINTS AT GUTTER FLOW LINE
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- DRAINAGE FLOW ARROW

CSAH 78/ENTRANCES			
POINT	X	Y	ELEV/RAD*
PR5000	488588.446	155376.410	860.87
PR5001	488607.423	155392.237	860.52
PR5002	488598.048	155371.758	860.84
PR5003	488623.974	155427.168	859.81
PR5004	488624.205	155451.877	860.11
PR5005	488633.886	155447.392	860.25
PR5006	488505.993	155428.356	860.59
PR5007	488513.732	155433.467	860.59
PR5008	488510.695	155439.134	861.11
PR5009	488524.960	155458.967	860.88
PR5010	488523.139	155467.227	861.00
PR5011	488525.156	155471.802	860.85
PR5012	488615.444	155363.329	R = 30'
PR5013	488651.426	155439.267	R = 30'
PR5014	488507.825	155427.553	R = 8'
PR5015	488527.419	155457.107	R = 2'
PR5016	488521.385	155475.180	861.60
PR5017	488507.781	155444.573	861.11

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HDR

ANOKA COUNTY

INTERSECTION DETAIL

SHEET NO. 132 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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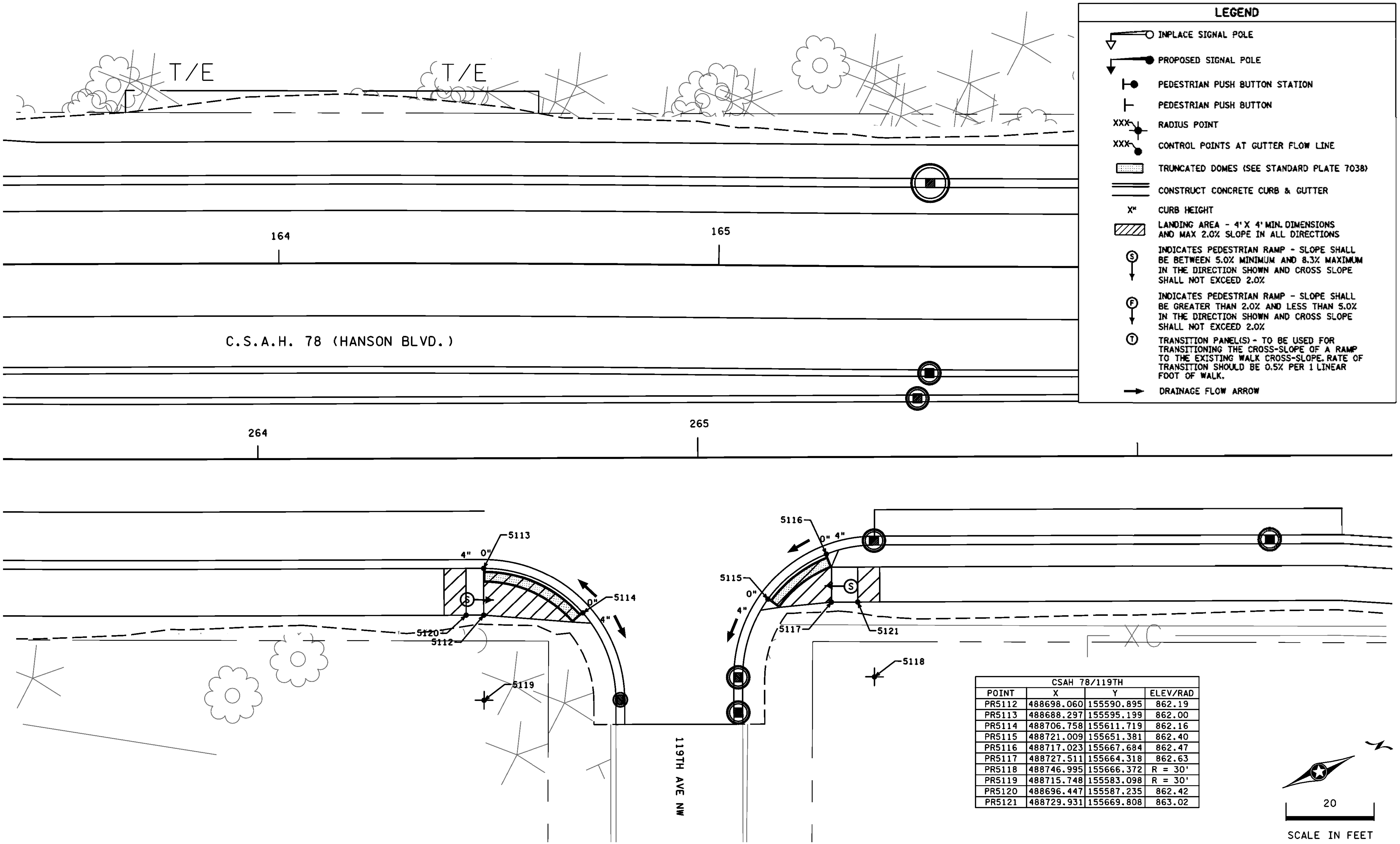

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- DRAINAGE FLOW ARROW

CSAH 78/119TH			
POINT	X	Y	ELEV/RAD
PR5112	488698.060	155590.895	862.19
PR5113	488688.297	155595.199	862.00
PR5114	488706.758	155611.719	862.16
PR5115	488721.009	155651.381	862.40
PR5116	488717.023	155667.684	862.47
PR5117	488727.511	155664.318	862.63
PR5118	488746.995	155666.372	R = 30'
PR5119	488715.748	155583.098	R = 30'
PR5120	488696.447	155587.235	862.42
PR5121	488729.931	155669.808	863.02

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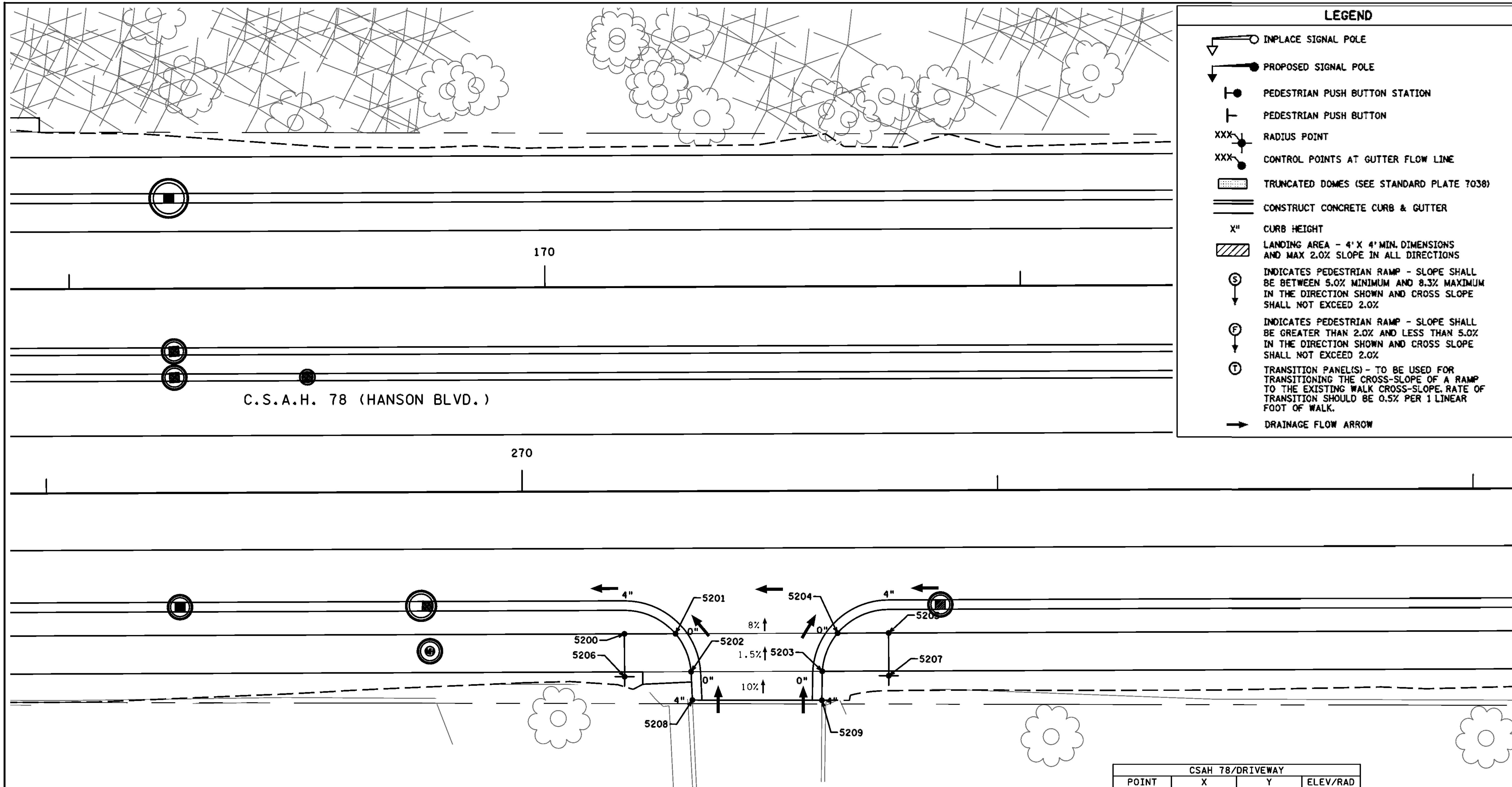

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- DRAINAGE FLOW ARROW

CSAH 78/DRIVEWAY			
POINT	X	Y	ELEV/RAD
PR5200	488922.905	156114.980	867.00
PR5201	488927.231	156124.793	867.18
PR5202	488935.858	156124.531	867.30
PR5203	488946.976	156149.750	867.74
PR5204	488940.963	156155.942	867.61
PR5205	488945.289	156165.755	867.64
PR5206	488931.140	156111.350	R = 14'
PR5207	488953.524	156162.124	R = 14'
PR5208	488941.412	156122.368	867.74
PR5209	488952.522	156147.203	868.25

20

SCALE IN FEET

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ANOKA COUNTY

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S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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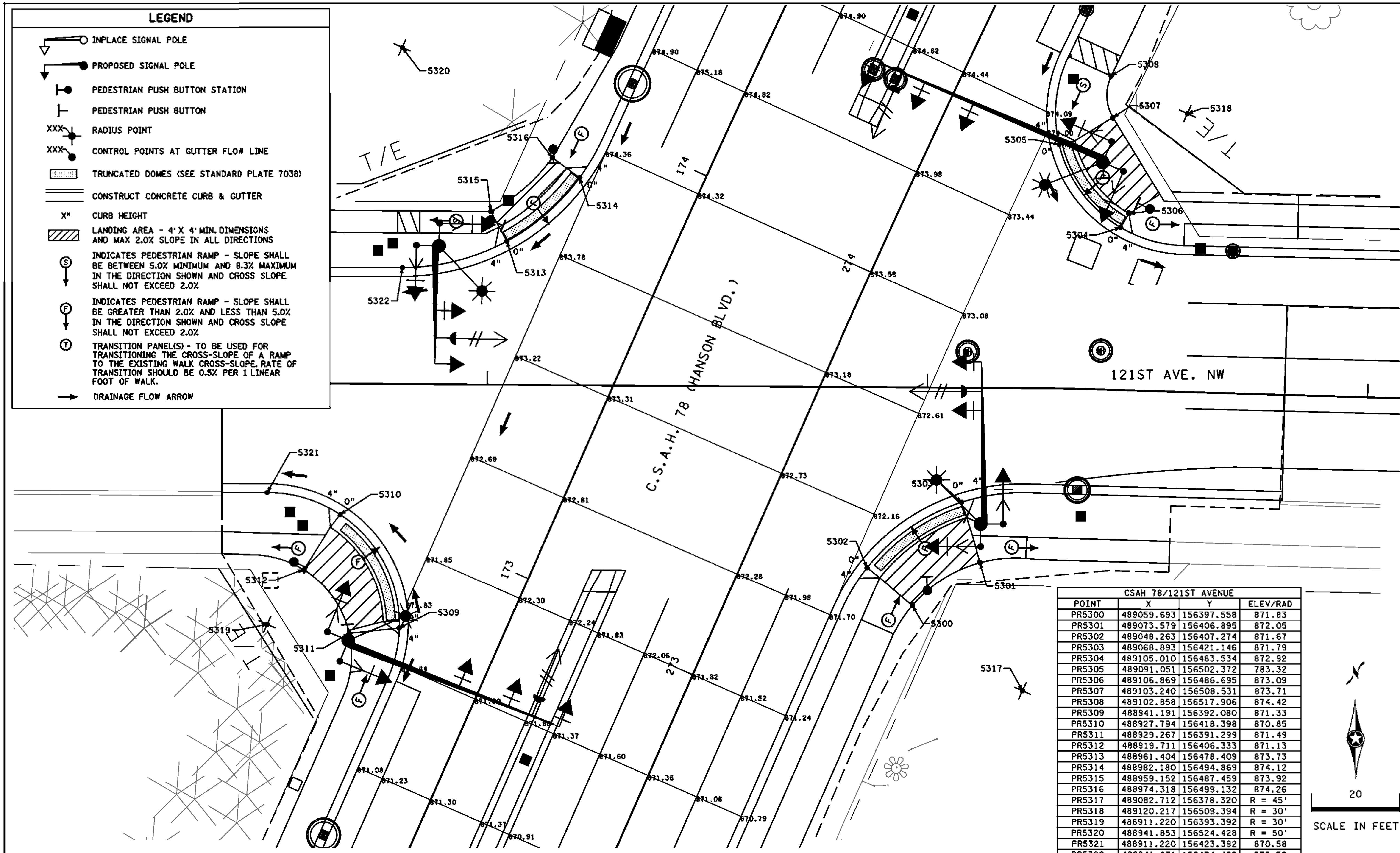

CSAH 78/121ST AVENUE			
POINT	X	Y	ELEV/RAD
PR5300	489059.693	156397.558	871.83
PR5301	489073.579	156406.895	872.05
PR5302	489048.263	156407.274	871.67
PR5303	489068.893	156421.146	871.79
PR5304	489105.010	156483.534	872.92
PR5305	489091.051	156502.372	783.32
PR5306	489106.869	156486.695	873.09
PR5307	489103.240	156508.531	873.71
PR5308	489102.858	156517.906	874.42
PR5309	488941.191	156392.080	871.33
PR5310	488927.794	156418.398	870.85
PR5311	488929.267	156391.299	871.49
PR5312	488919.711	156406.333	871.13
PR5313	488961.404	156478.409	873.73
PR5314	488982.180	156494.869	874.12
PR5315	488959.152	156487.459	873.92
PR5316	488974.318	156499.132	874.26
PR5317	489082.712	156378.320	R = 45'
PR5318	489120.217	156509.394	R = 30'
PR5319	488911.220	156393.392	R = 30'
PR5320	488941.853	156524.428	R = 50'
PR5321	488911.220	156423.392	870.58
PR5322	488941.871	156474.428	872.50

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ANOKA COUNTY

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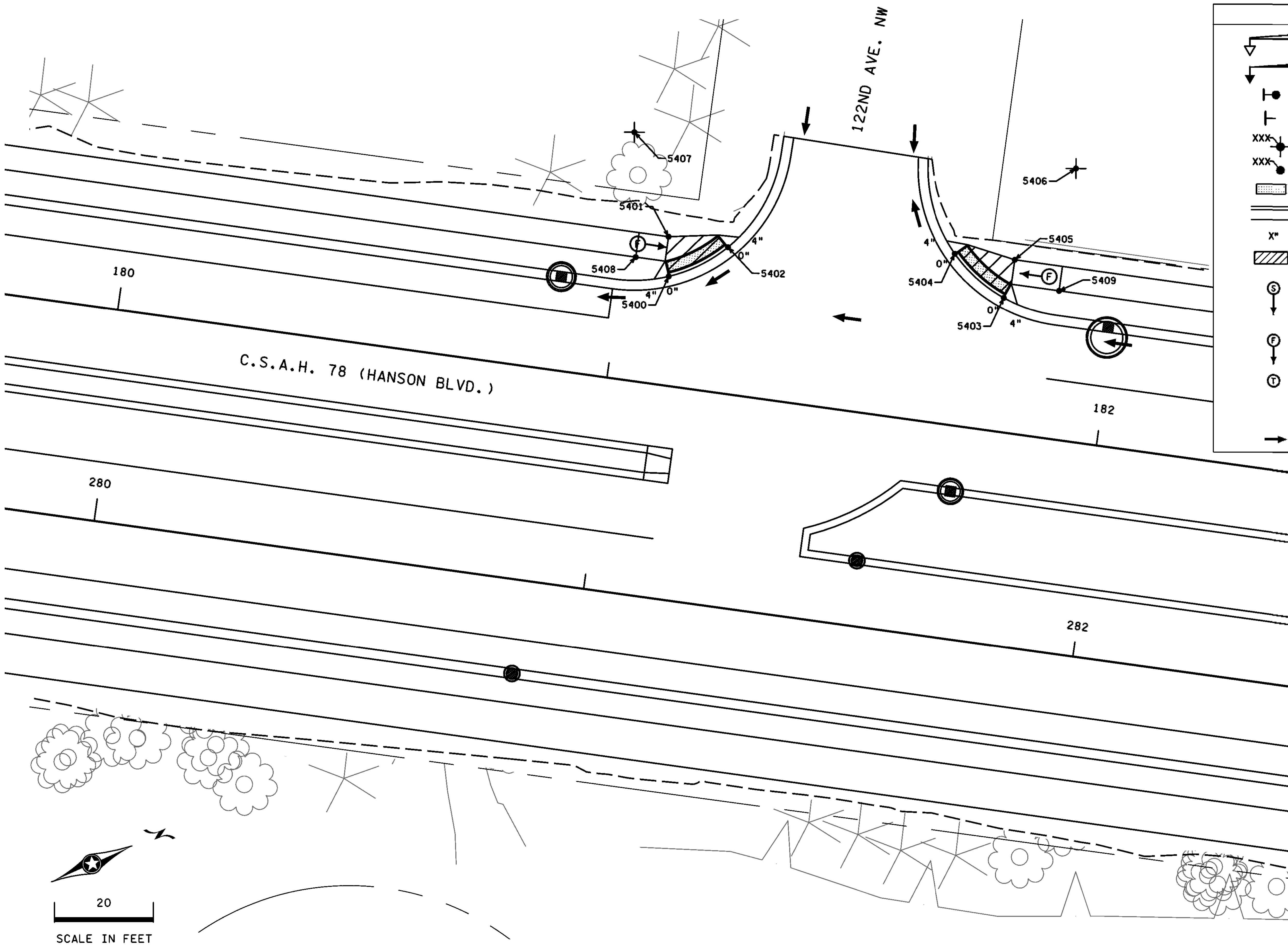

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CSAH 78/122ND AVENUE			
POINT	X	Y	ELEV/RAD
PR5400	489345.711	157121.408	885.85
PR5401	489338.350	157124.633	886.01
PR5402	489345.185	157134.754	886.15
PR5403	489377.259	157181.580	886.96
PR5404	489365.055	157176.155	886.86
PR5405	489371.114	157186.759	887.05
PR5406	489359.277	157205.594	R = 30'
PR5407	489316.223	157126.929	R = 30'
PR5408	489339.425	157116.897	886.06
PR5409	489380.504	157192.387	887.43

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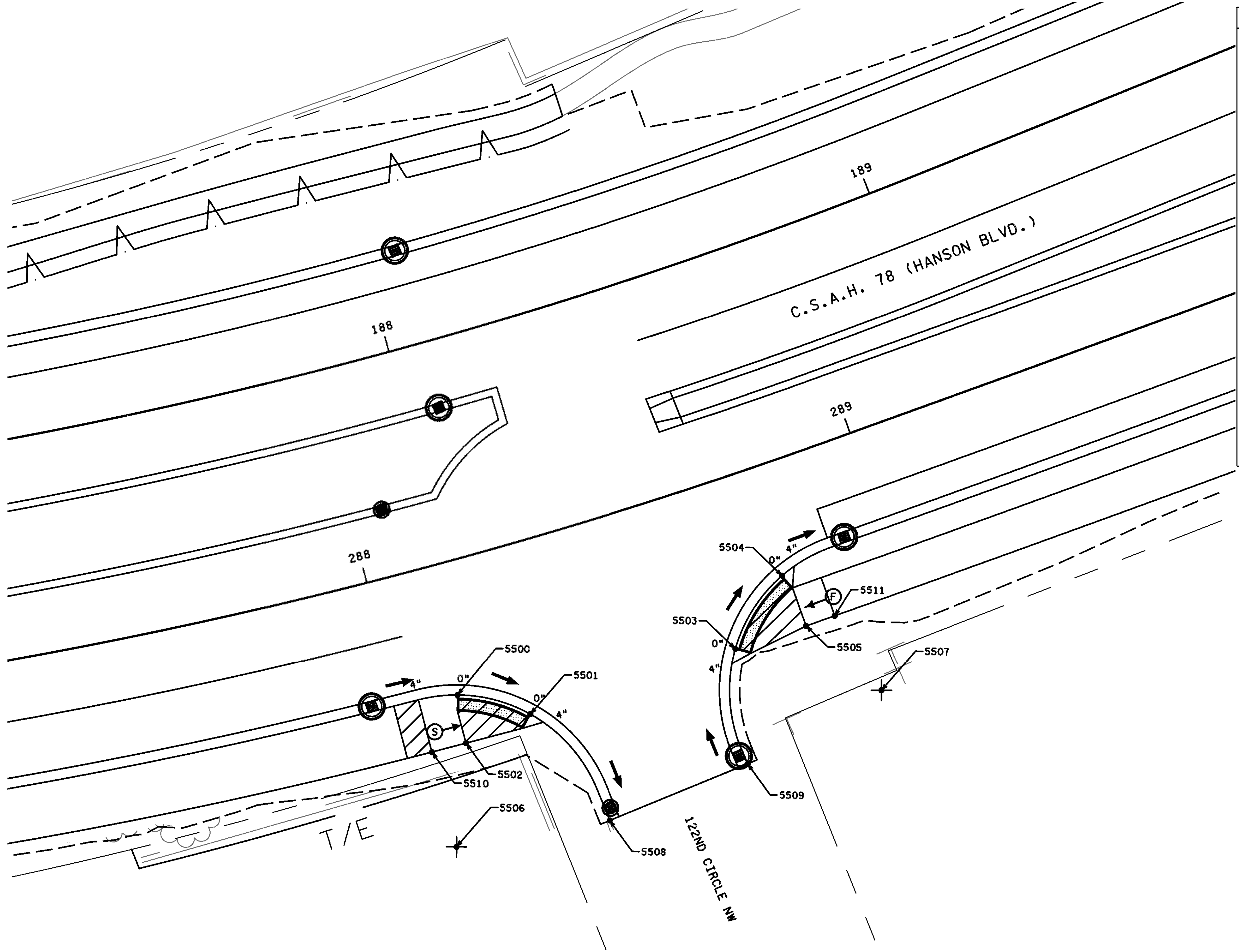
ANOKA COUNTY

INTERSECTION DETAILS

SHEET NO. 136 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



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CSAH 78/122ND CIRCLE			
POINT	X	Y	ELEV/RAD
PR5500	489725.903	157712.541	891.20
PR5501	489735.215	157724.152	890.98
PR5502	489735.279	157710.211	891.25
PR5503	489739.874	157766.431	889.25
PR5504	489730.410	157780.737	889.03
PR5505	489741.419	157781.033	889.27
PR5506	489753.230	157700.163	R = 30'
PR5507	489759.119	157789.444	R = 30'
PR5508	489760.787	157729.953	889.58
PR5509	489761.655	157759.396	889.29
PR5510	489734.159	157703.335	891.79
PR5511	489741.885	157787.014	889.46

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SCALE IN FEET

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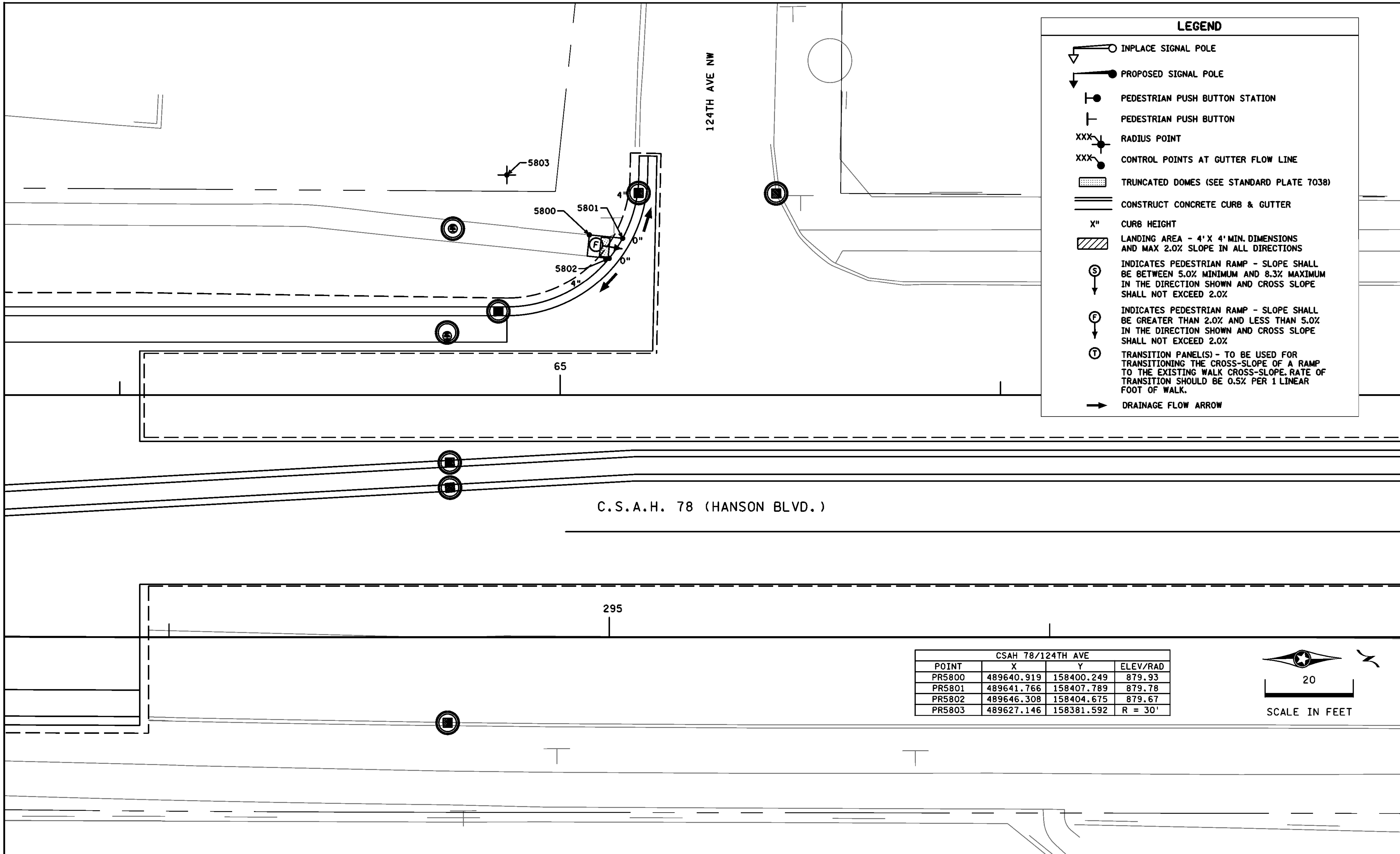
INTERSECTION DETAILS

SHEET NO. 137 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



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- DRAINAGE FLOW ARROW

CSAH 78/124TH AVE			
POINT	X	Y	ELEV/RAD
PR5800	489640.919	158400.249	879.93
PR5801	489641.766	158407.789	879.78
PR5802	489646.308	158404.675	879.67
PR5803	489627.146	158381.592	R = 30'

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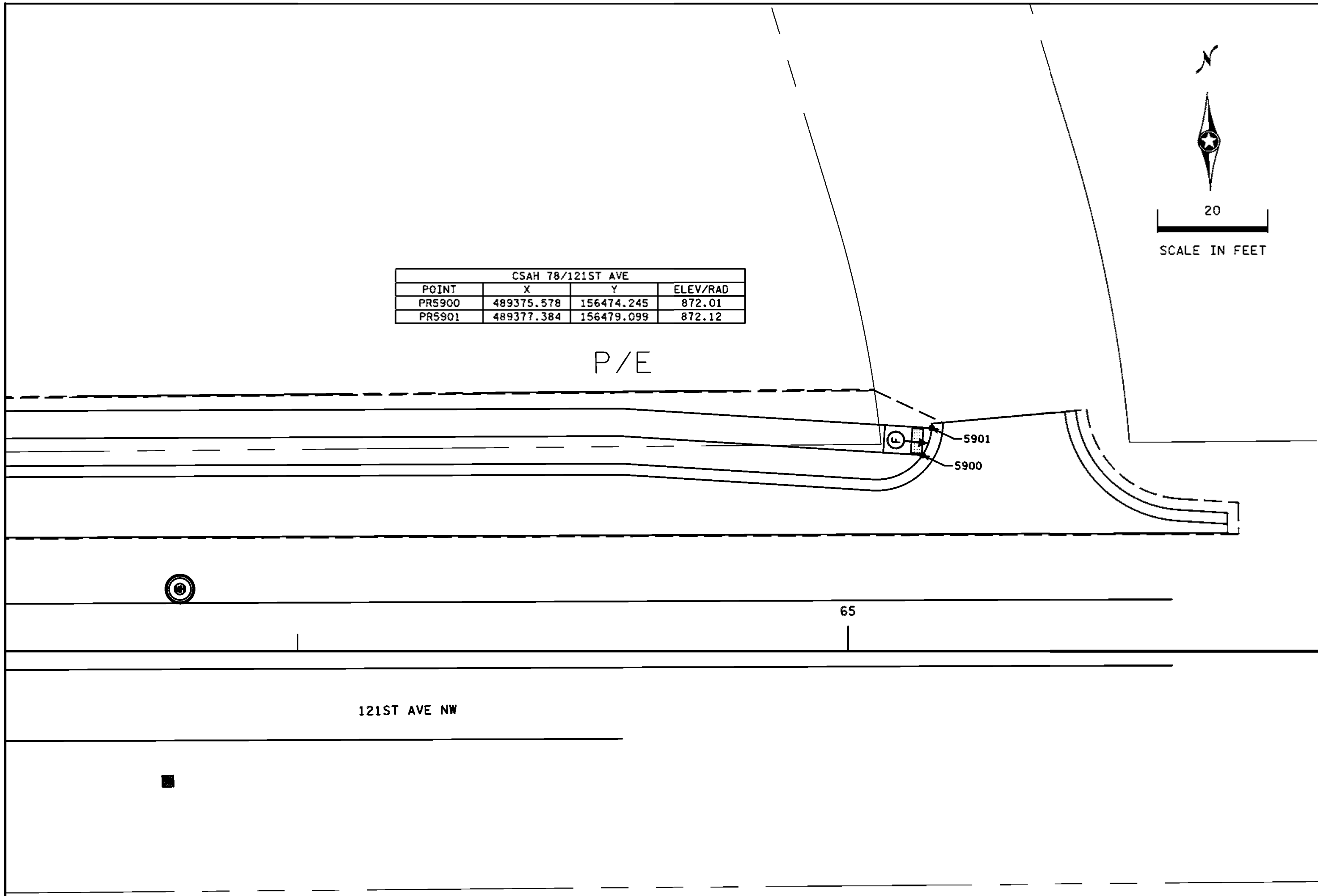
CSAH 78/121ST AVE			
POINT	X	Y	ELEV/RAD
PR5900	489375.578	156474.245	872.01
PR5901	489377.384	156479.099	872.12



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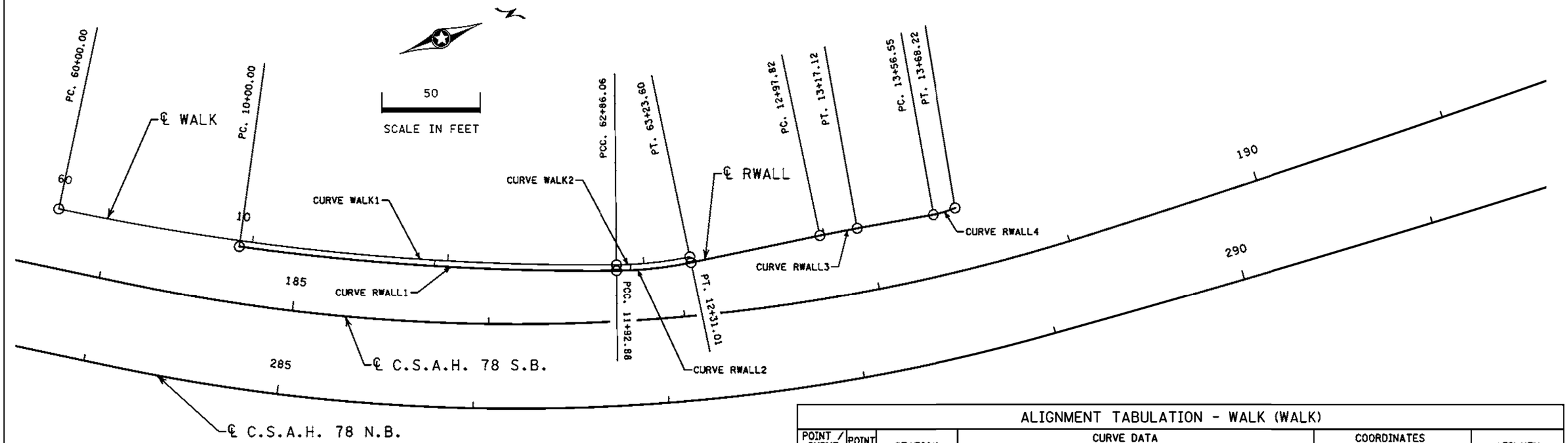

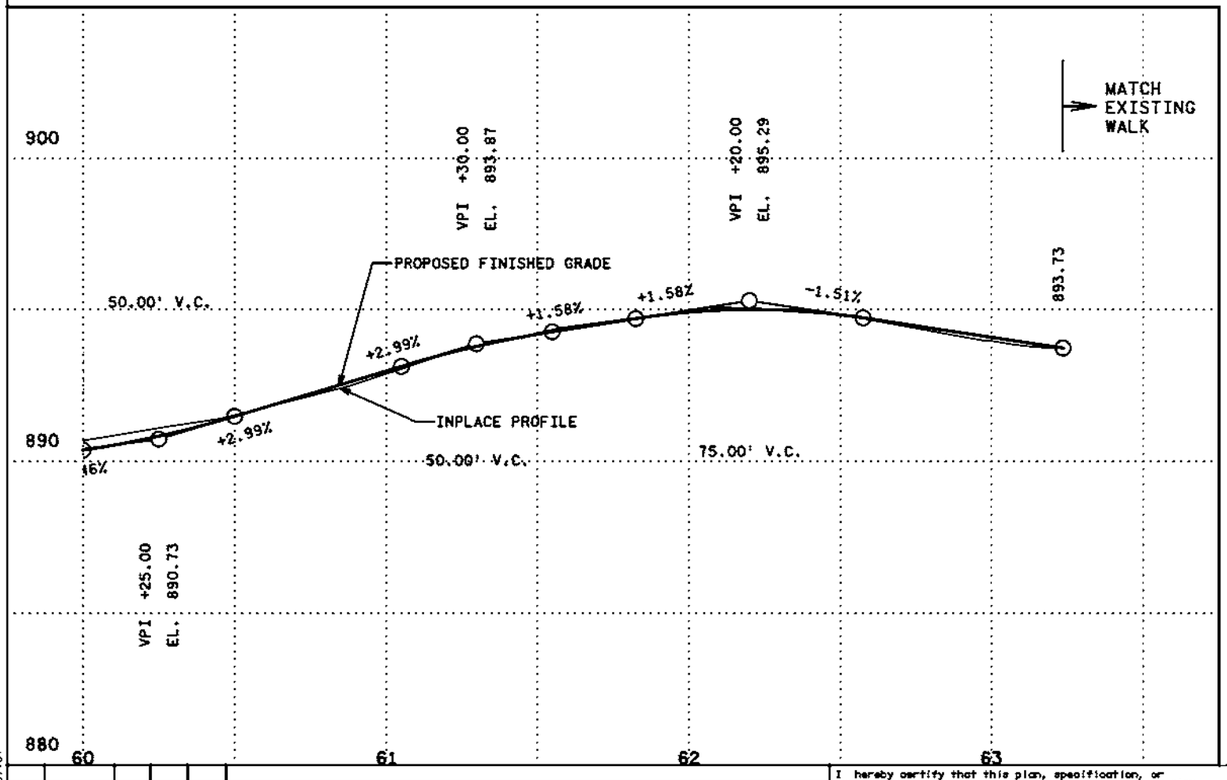

ALIGNMENT TABULATION - WALK (WALK)

POINT / CURVE NUMBER	POINT DESC.	STATION	CURVE DATA					COORDINATES		AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	
	PC	60+00.000						489,477.9429	157,349.0000	N 31° 53' 18.16" E
WALK1	PI	61+43.608	12° 33' 34.54" LT	4° 23' 25.73"	1,305.000'	143.608'	286.064'	489,553.8059	157,470.9341	PI
	CC							488,369.8950	158,038.3873	
	PCC	62+86.064						489,601.3384	157,606.4473	N 19° 19' 43.62" E
	PCC	62+86.064						489,601.3384	157,606.4473	N 19° 19' 43.62" E
WALK2	PI	63+04.894	11° 19' 09.83" LT	30° 09' 20.42"	190.000'	18.830'	37.537'	489,607.5707	157,624.2155	PI
	CC							489,422.0478	157,669.3351	
	PT	63+23.601						489,610.1944	157,642.8614	N 8° 00' 33.79" E

ALIGNMENT TABULATION - BACK OF WALL (RWALL)

POINT / CURVE NUMBER	POINT DESC.	STATION	CURVE DATA					COORDINATES		AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	
	PC	10+00.000						489,527.1658	157,428.8069	N 27° 46' 39.18" E
RWALL1	PI	10+96.613	8° 26' 55.55" LT	4° 22' 49.48"	1,308.000'	96.613'	192.876'	489,572.1914	157,514.2868	PI
	CC							488,369.8950	158,038.3873	
	PCC	11+92.876						489,604.1693	157,605.4543	N 19° 19' 43.62" E
	PCC	11+92.876						489,604.1693	157,605.4543	N 19° 19' 43.62" E
RWALL2	PI	12+12.003	11° 19' 09.83" LT	29° 41' 12.96"	193.000'	19.127'	38.129'	489,610.5000	157,623.5031	PI
	CC							489,422.0478	157,669.3351	
	PT	12+31.005						489,613.1651	157,642.4434	N 8° 00' 33.79" E
	PC	12+97.817						489,622.4743	157,708.6030	N 8° 00' 33.79" E
RWALL3	PI	13+07.471	1° 44' 31.50" RT	9° 01' 22.65"	635.000'	9.654'	19.307'	489,623.8195	157,718.1632	PI
	CC							490,251.2800	157,620.1251	
	PT	13+17.124						489,625.4547	157,727.6781	N 9° 45' 05.30" E
	PC	13+56.551						489,632.1326	157,766.5351	N 9° 45' 05.30" E
RWALL4	PI	13+62.413	13° 22' 25.01" LT	114° 35' 29.61"	50.000'	5.862'	11.671'	489,633.1254	157,772.3124	PI
	CC							489,582.8550	157,775.0038	
	PT	13+68.221						489,632.7551	157,778.1626	N 3° 37' 19.71" W

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: _____ 11/22/2019

LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY:

DESIGNED BY:

CHECKED BY:

HDR

ANOKA COUNTY

WALK PLAN AND PROFILE

SHEET NO. 140 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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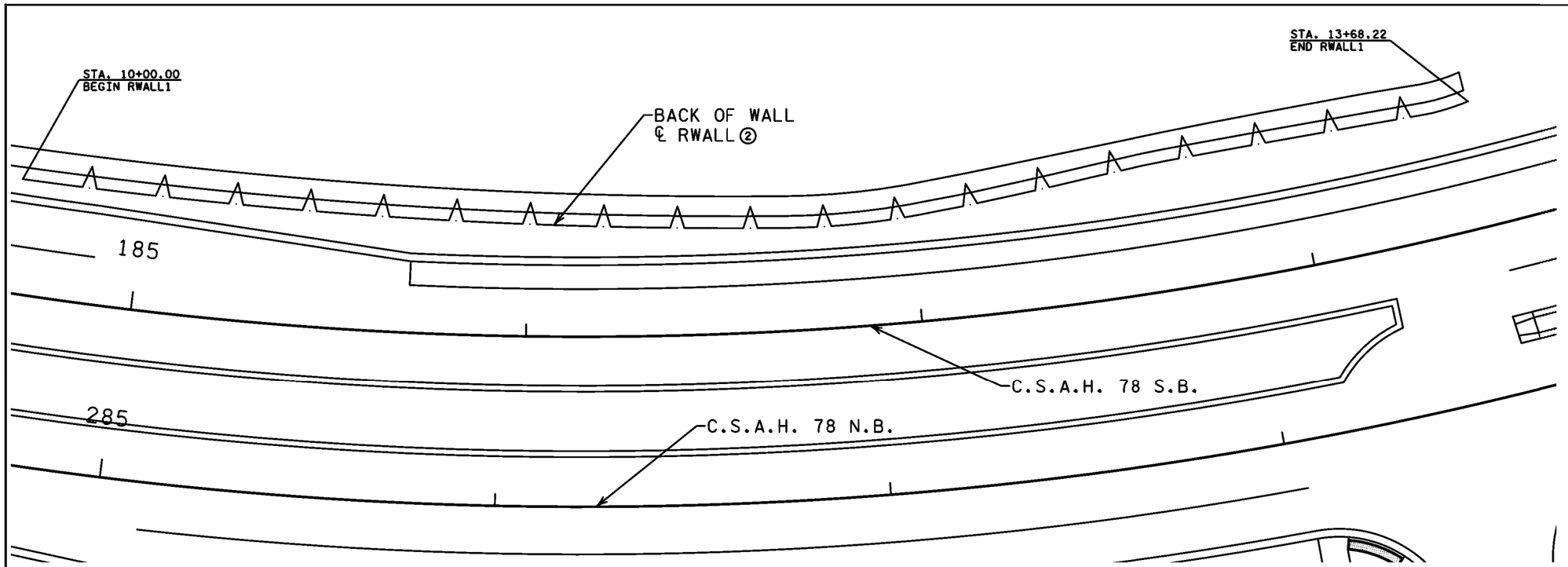

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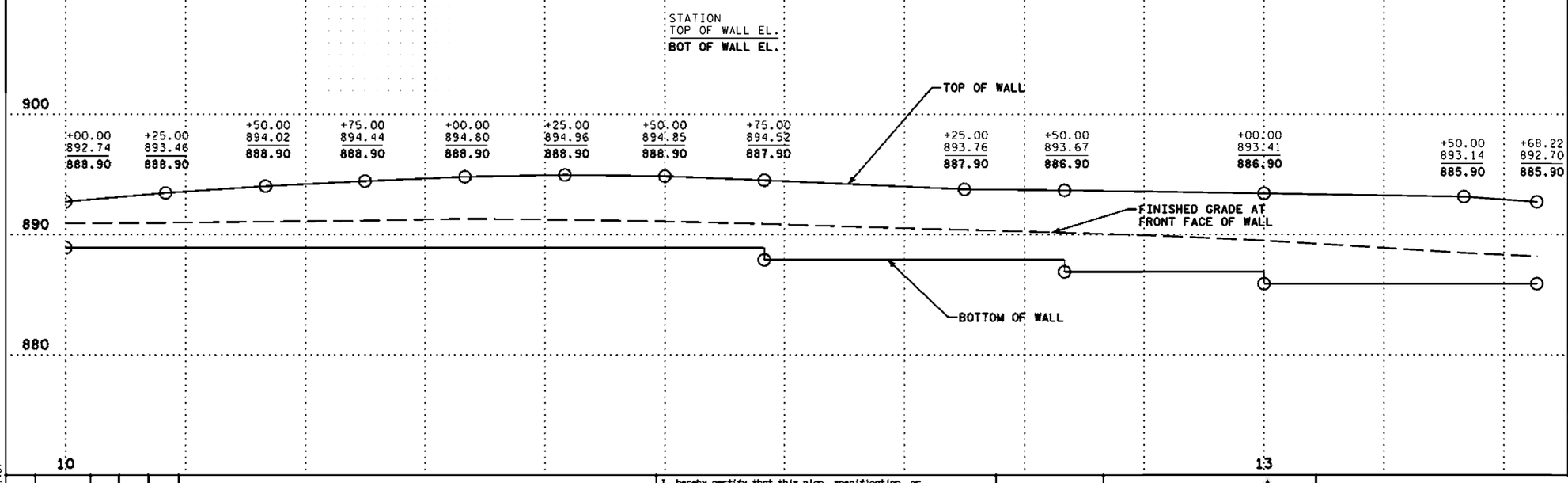
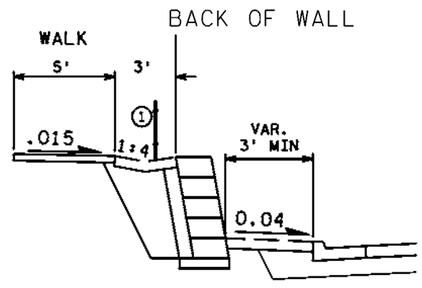


MODULAR BLOCK RETAINING WALL DETAIL



SPECIFIC NOTES

① SEE MNDOT STANDARD PLATE NO. 9322 FOR SUPPLEMENTAL FENCE DETAILS. WIRE FENCE SHALL HAVE TOP RAIL IN LIEU OF A TENSION WIRE. SEE SHEET 56 FOR POST DETAIL BEHIND WALL.

② SEE SHEET 140 FOR RETAINING WALL ALIGNMENT AND ALIGNMENT TABULATION.

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

RETAINING WALL PLAN

SHEET NO. 141 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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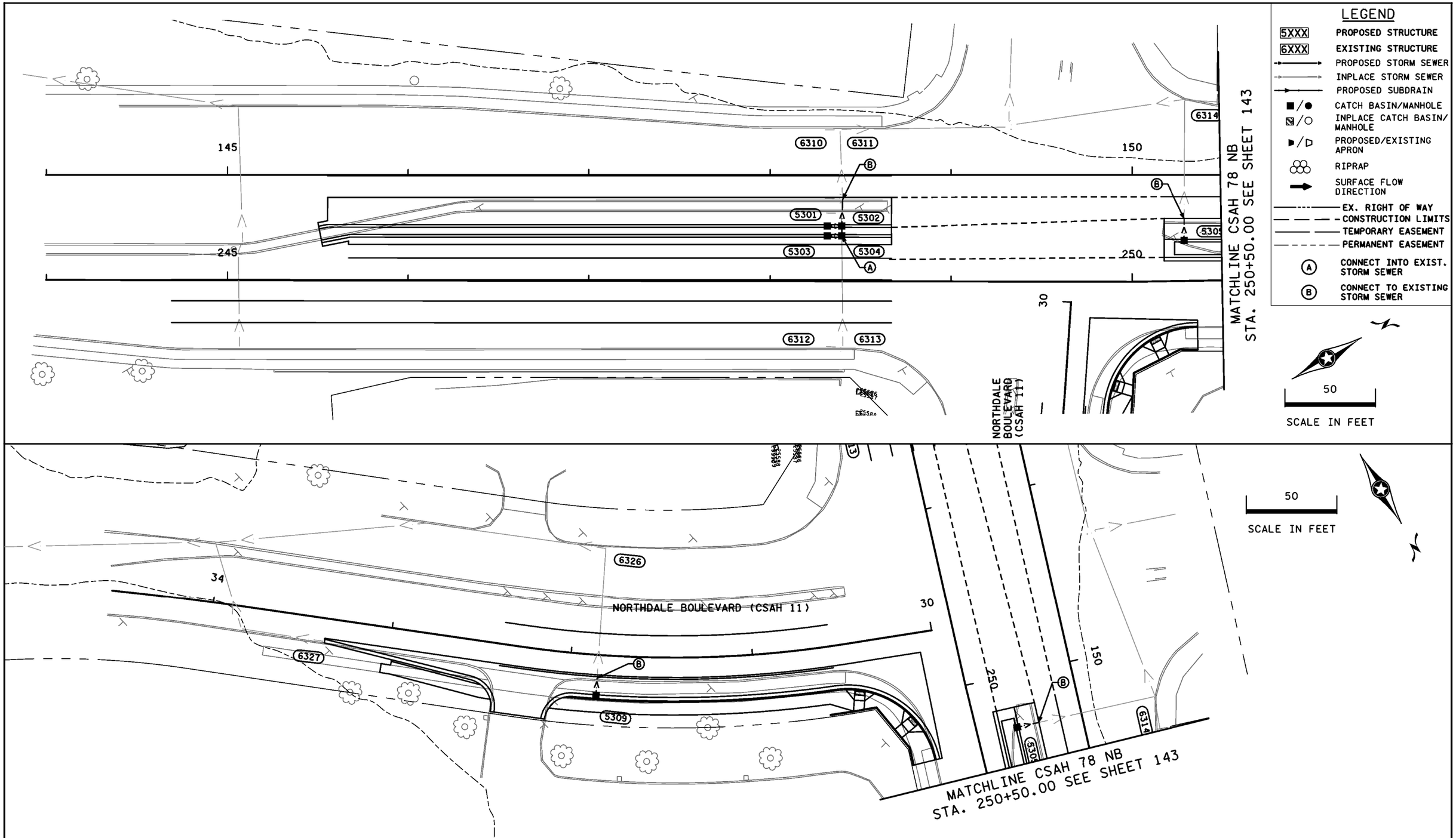

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

DRAINAGE PLAN

SHEET NO.142 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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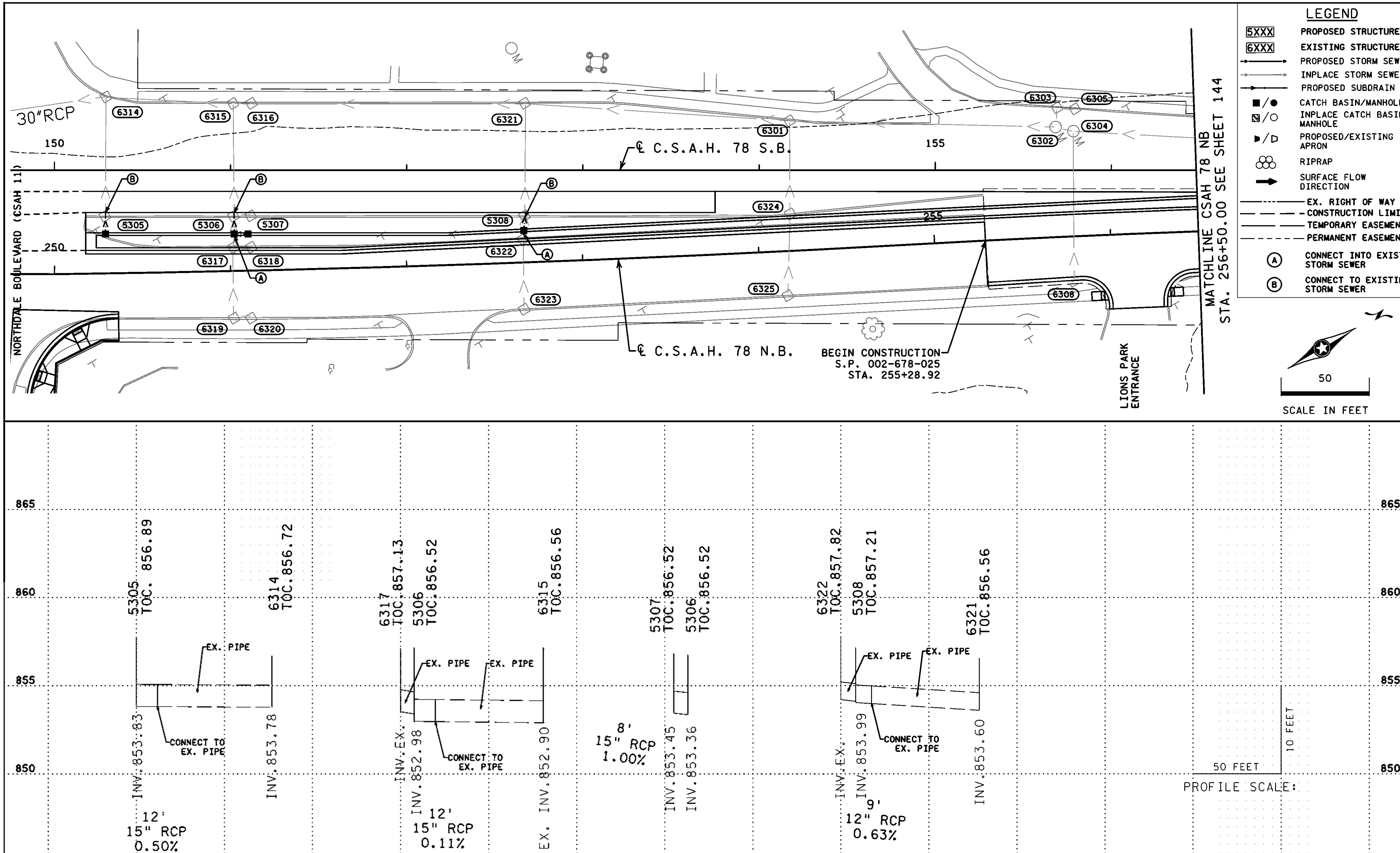

NO	DATE	BY	CKD	APPR	REVISION

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NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

DRAINAGE PLAN & PROFILE

SHEET NO. 143 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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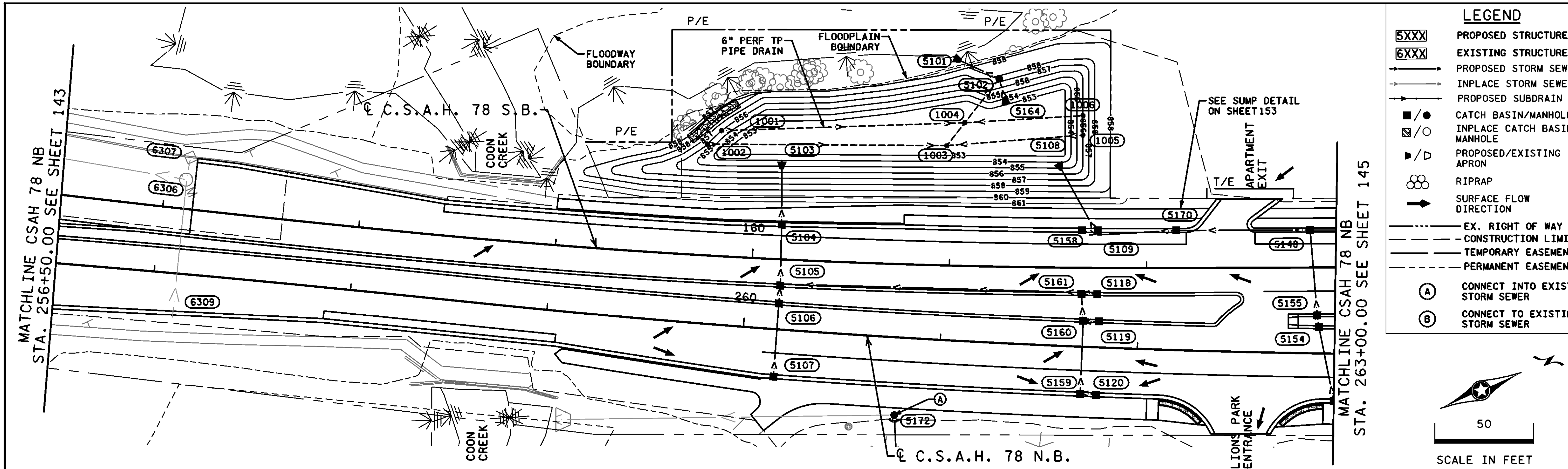

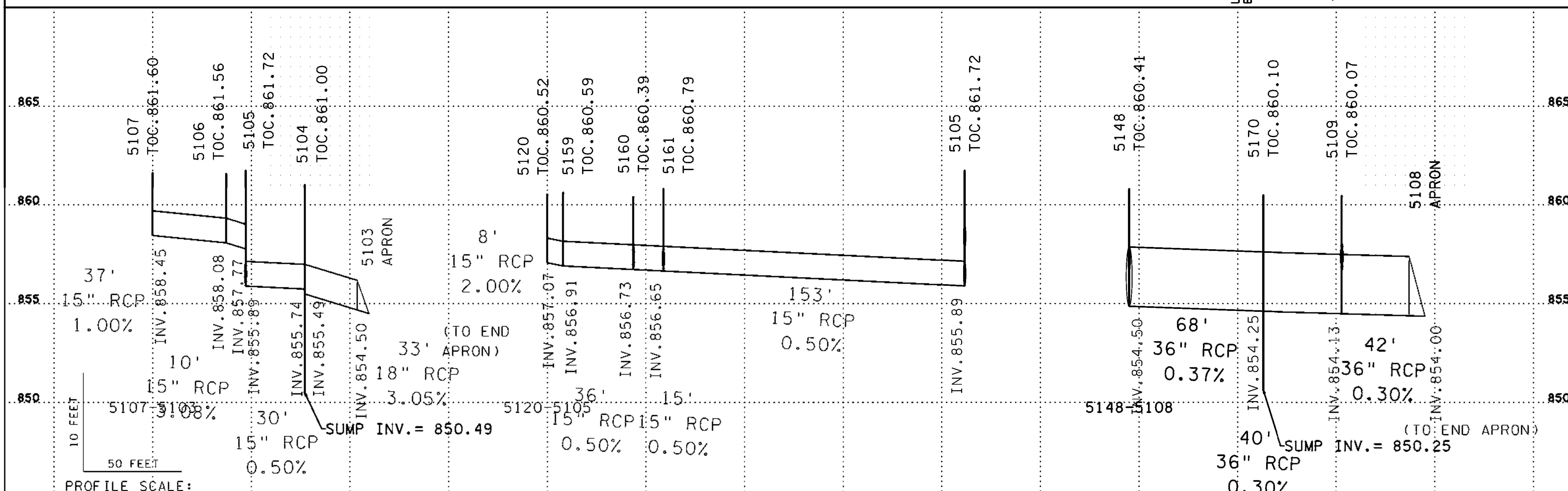

NO	DATE	BY	CKD	APPR	REVISION

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NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 12/31/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

DRAINAGE PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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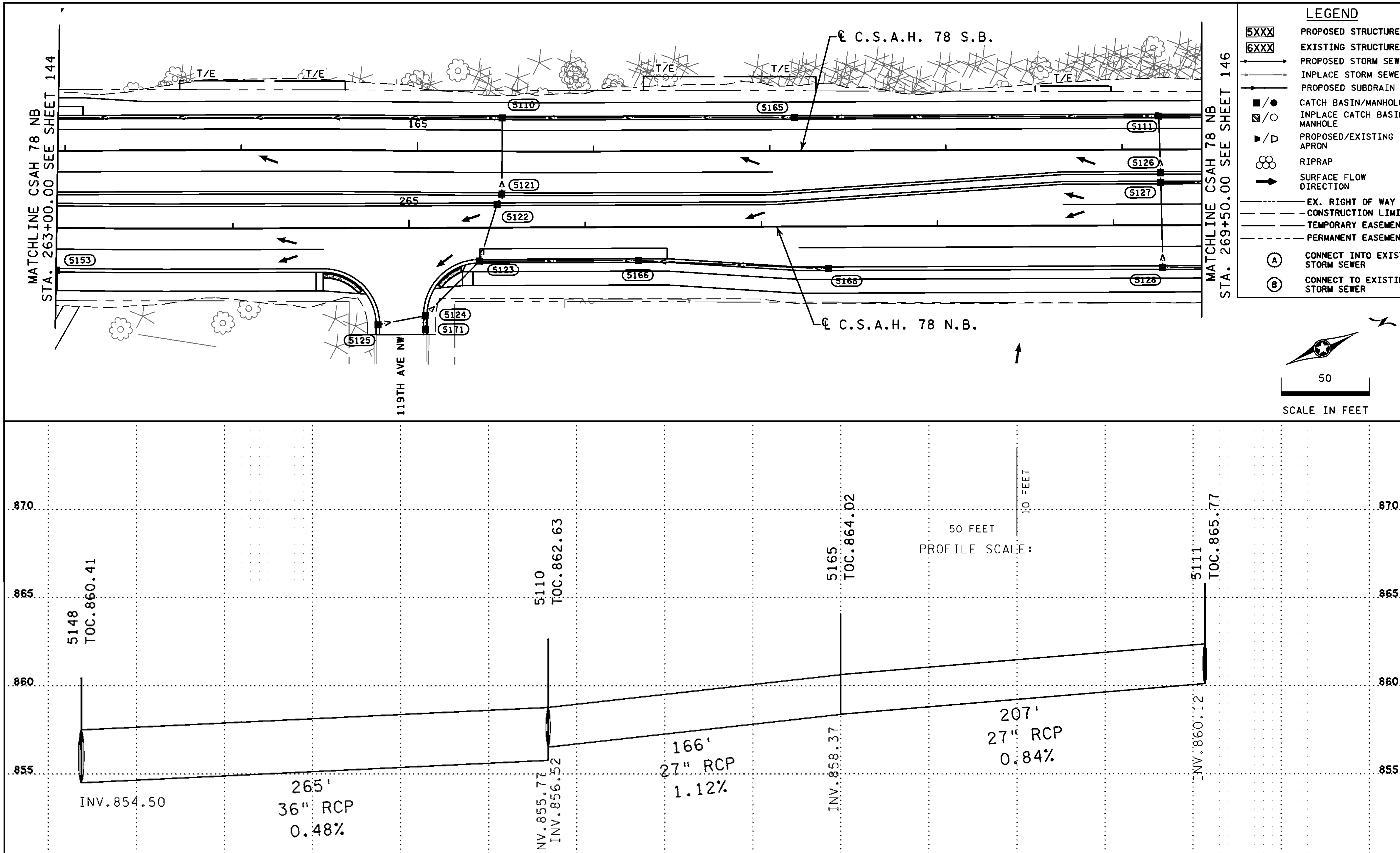

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR ANOKA COUNTY

DRAINAGE PLAN & PROFILE

SHEET NO. 145 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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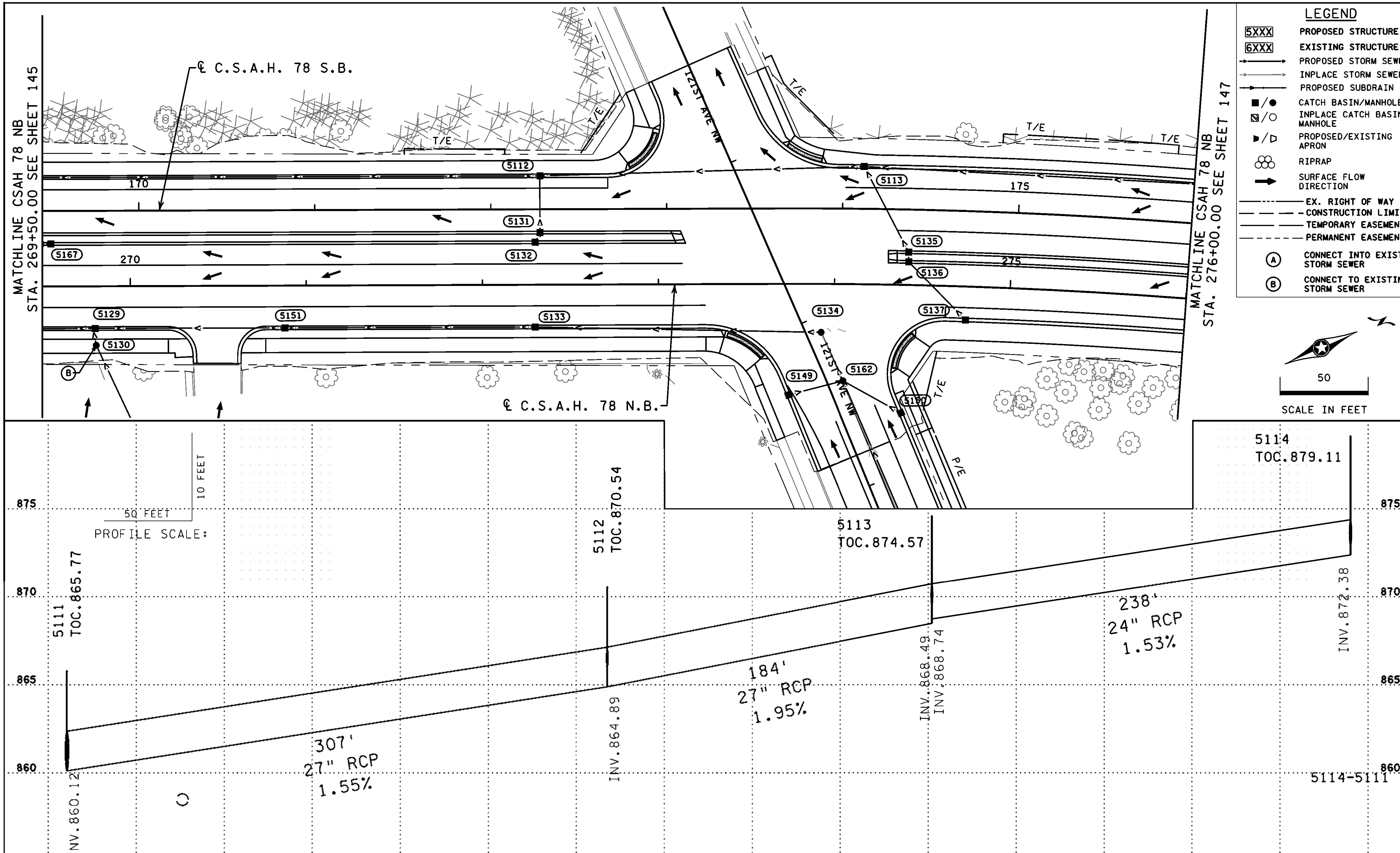

LEGEND
5XXX PROPOSED STRUCTURE
6XXX EXISTING STRUCTURE
PROPOSED STORM SEWER
INPLACE STORM SEWER
PROPOSED SUBDRAIN
CATCH BASIN/MANHOLE
INPLACE CATCH BASIN/ MANHOLE
PROPOSED/EXISTING APRON
RIPRAP
SURFACE FLOW DIRECTION
EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT
CONNECT INTO EXIST. STORM SEWER
CONNECT TO EXISTING STORM SEWER
MATCHLINE CSAH 78 NB STA. 269+50.00 SEE SHEET 145
MATCHLINE CSAH 78 NB STA. 276+00.00 SEE SHEET 147
℄ C.S.A.H. 78 S.B.
℄ C.S.A.H. 78 N.B.
121ST AVE NW
SCALE IN FEET
PROFILE SCALE:
5111 TOC.865.77
INV.860.12
307' 27" RCP 1.55%
5112 TOC.870.54
INV.864.89
184' 27" RCP 1.95%
5113 TOC.874.57
INV.868.49
INV.868.74
238' 24" RCP 1.53%
5114 TOC.879.11
INV.872.38
5114-5111

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR ANOKA COUNTY

DRAINAGE PLAN & PROFILE

SHEET NO. 146 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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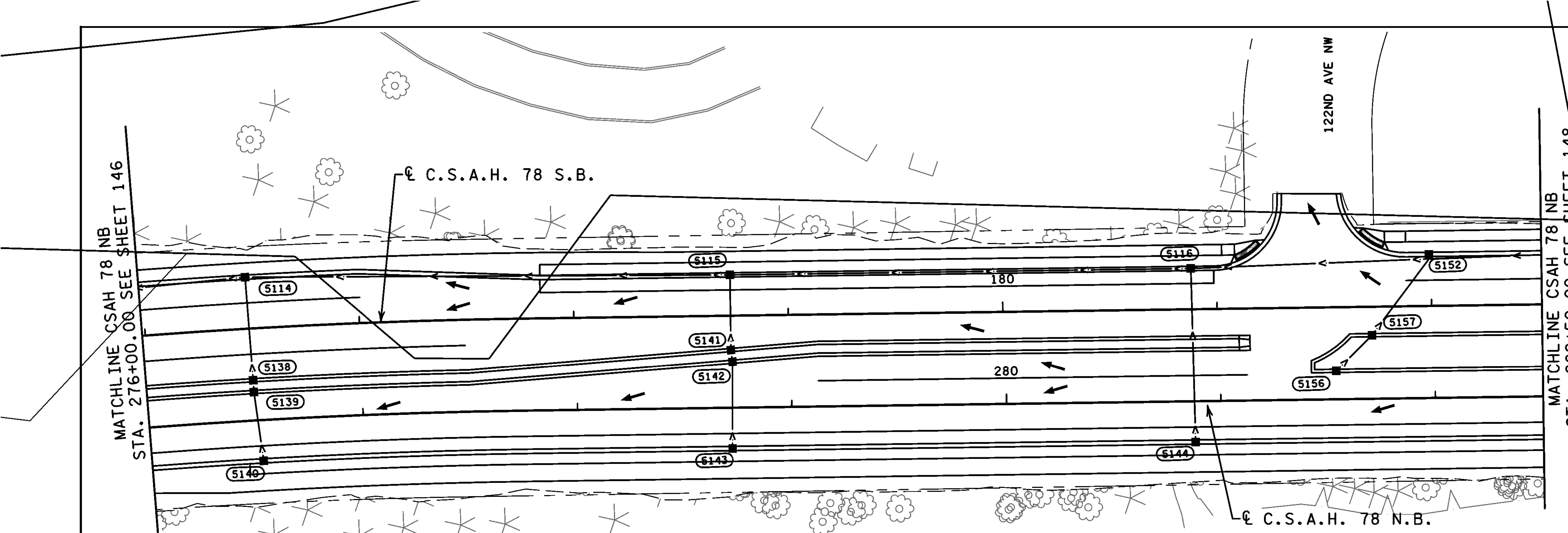
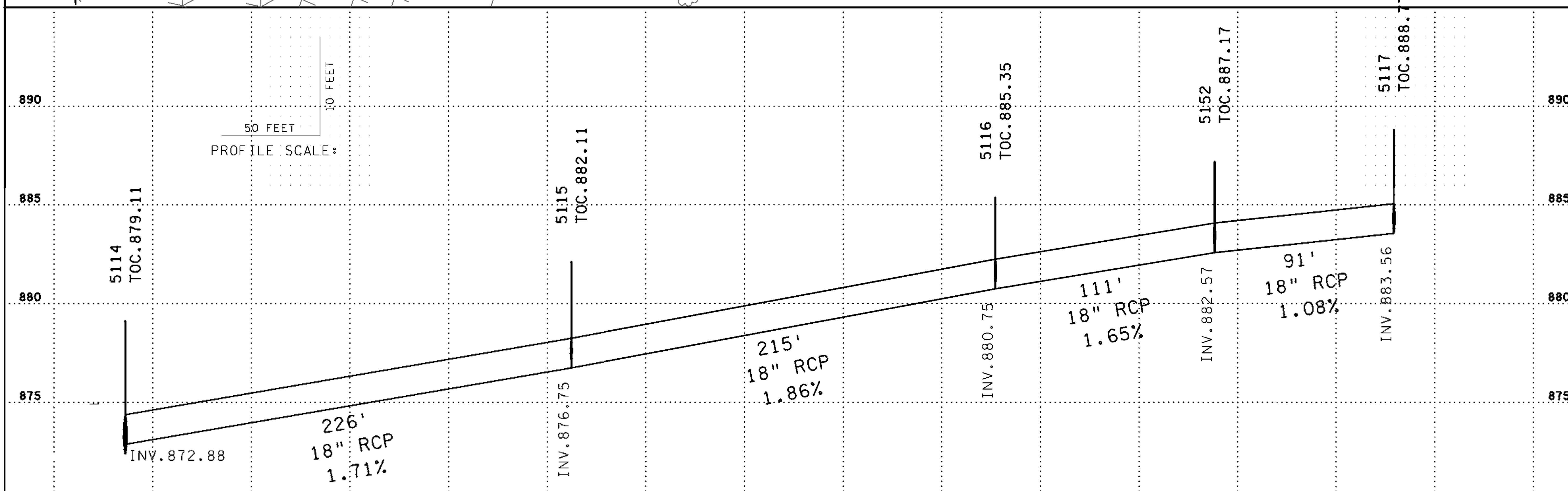


LEGEND

- 5XXX PROPOSED STRUCTURE
- 6XXX EXISTING STRUCTURE
- PROPOSED STORM SEWER
- INPLACE STORM SEWER
- PROPOSED SUBDRAIN
- CATCH BASIN/MANHOLE
- INPLACE CATCH BASIN/MANHOLE
- PROPOSED/EXISTING APRON
- RIPRAP
- SURFACE FLOW DIRECTION
- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT
- (A) CONNECT INTO EXIST. STORM SEWER
- (B) CONNECT TO EXISTING STORM SEWER

50

SCALE IN FEET



NO	DATE	BY	CKD	APPR	REVISION

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NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

DRAINAGE PLAN & PROFILE

SHEET NO. 147 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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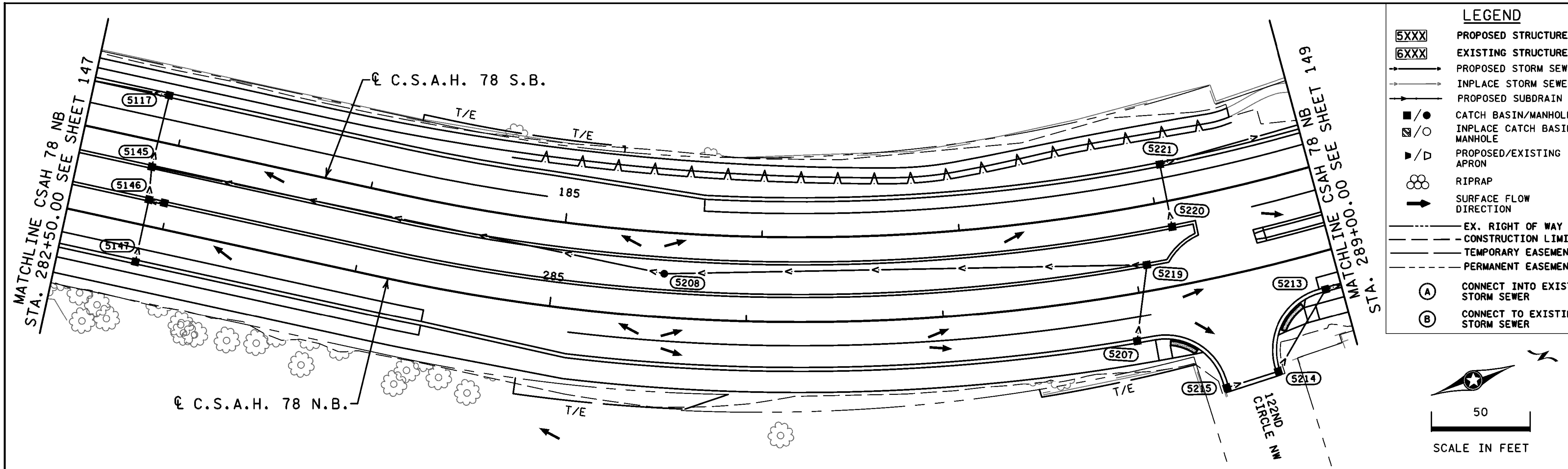

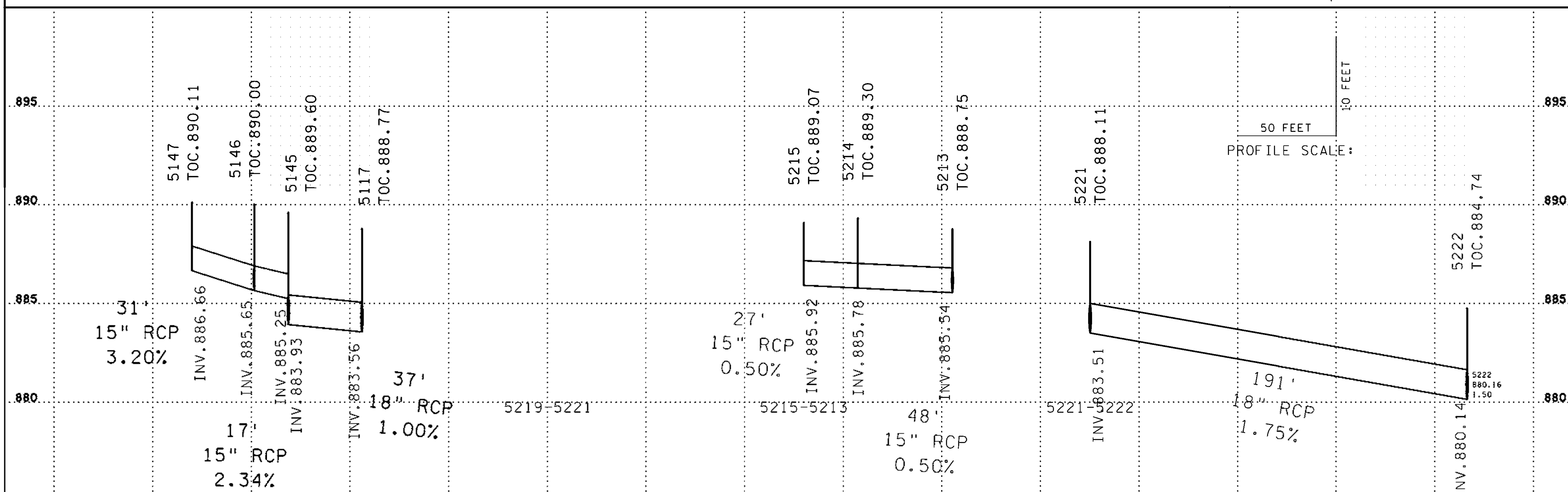

NO	DATE	BY	CKD	APPR	REVISION

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NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR ANOKA COUNTY

DRAINAGE PLAN & PROFILE

SHEET NO. 148 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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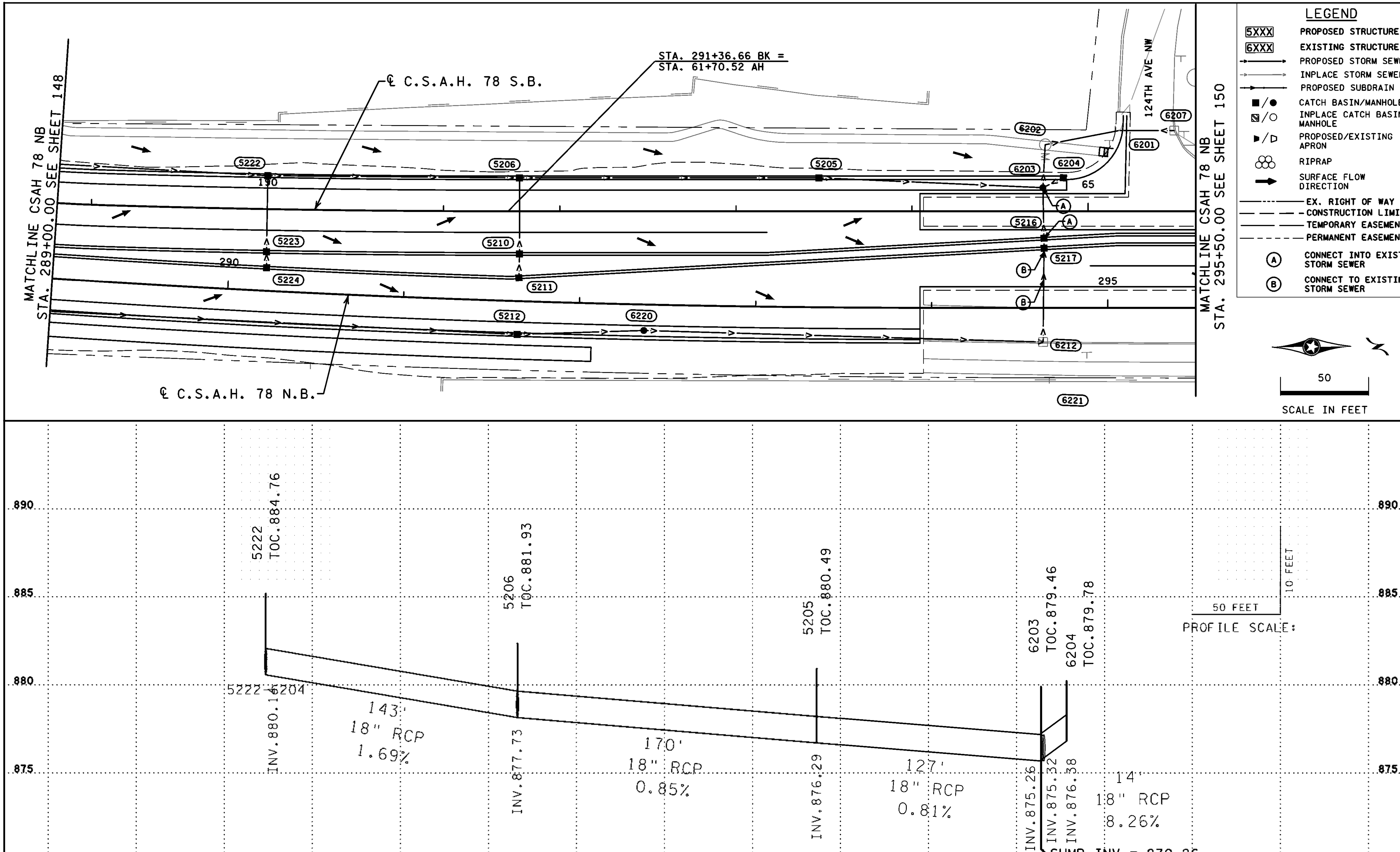

NO	DATE	BY	CKD	APPR	REVISION

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NAME: MICHAEL W. RYAN LIC. NO. 52690

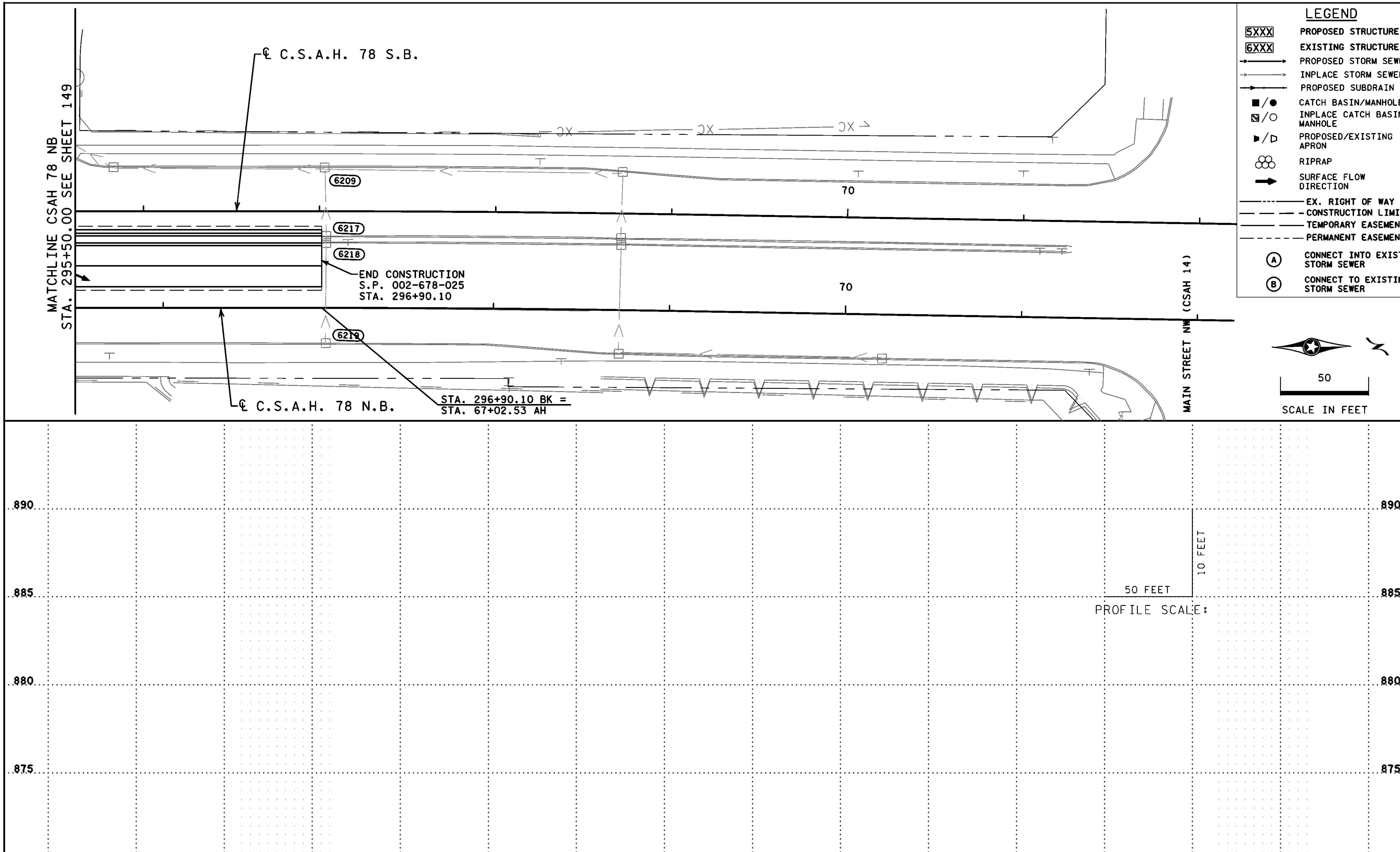
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR — ANOKA COUNTY

DRAINAGE PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



℄ C.S.A.H. 78 S.B.
MATCHLINE CSAH 78 NB
STA. 295+50.00 SEE SHEET 149
6209
6217
6218
6219
70
END CONSTRUCTION
S.P. 002-678-025
STA. 296+90.10
℄ C.S.A.H. 78 N.B.
STA. 296+90.10 BK =
STA. 67+02.53 AH
MAIN STREET NW (CSAH 14)
LEGEND
5XXX PROPOSED STRUCTURE
6XXX EXISTING STRUCTURE
PROPOSED STORM SEWER
INPLACE STORM SEWER
PROPOSED SUBDRAIN
CATCH BASIN/MANHOLE
INPLACE CATCH BASIN/MANHOLE
PROPOSED/EXISTING APRON
RIPRAP
SURFACE FLOW DIRECTION
EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT
A CONNECT INTO EXIST. STORM SEWER
B CONNECT TO EXISTING STORM SEWER
50
SCALE IN FEET
890
885
880
875
10 FEET
50 FEET
PROFILE SCALE:

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR — ANOKA COUNTY

DRAINAGE PLAN & PROFILE

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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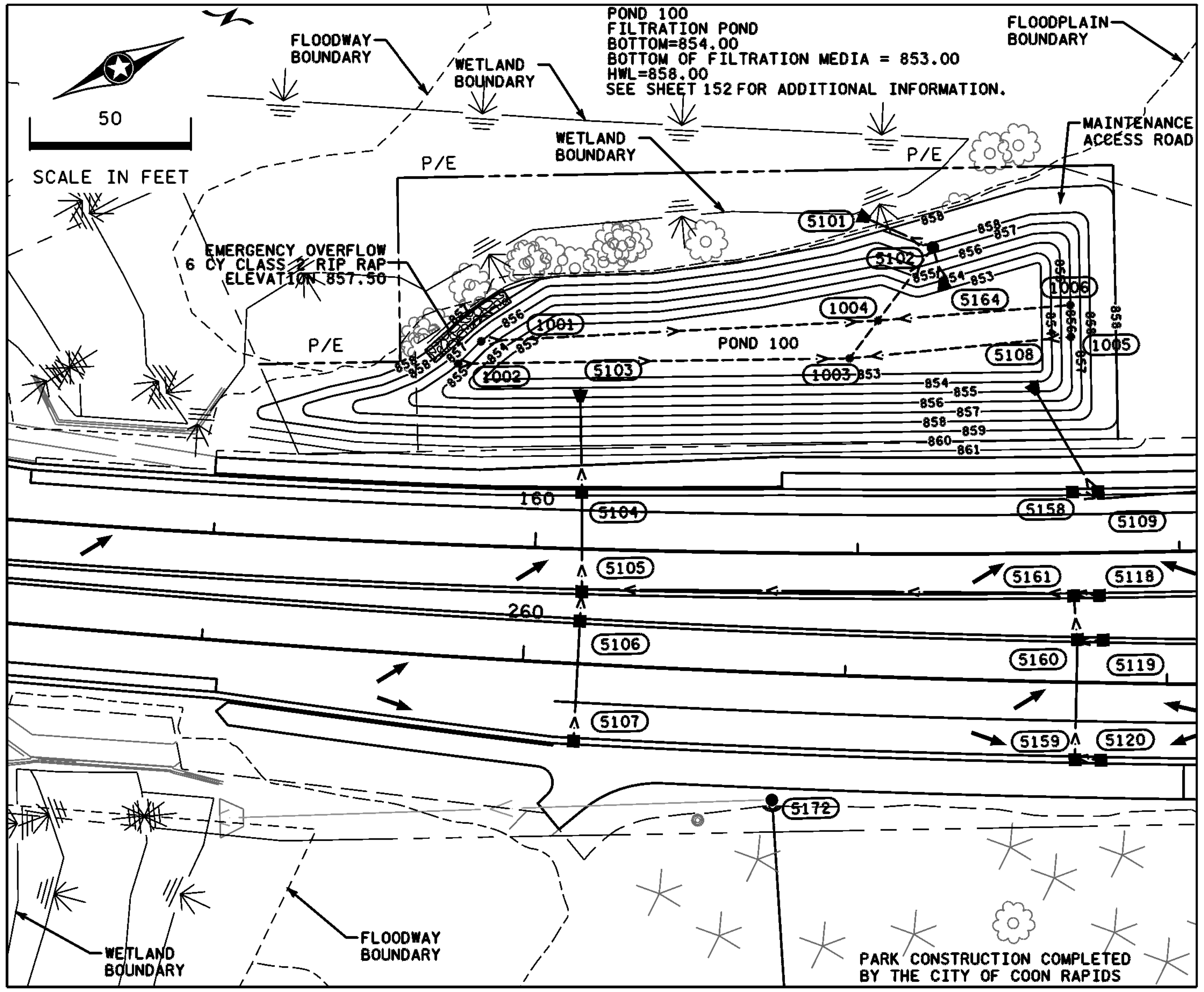
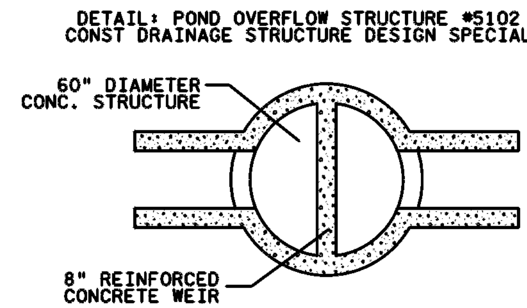
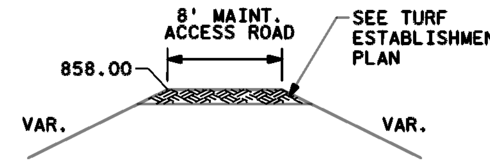
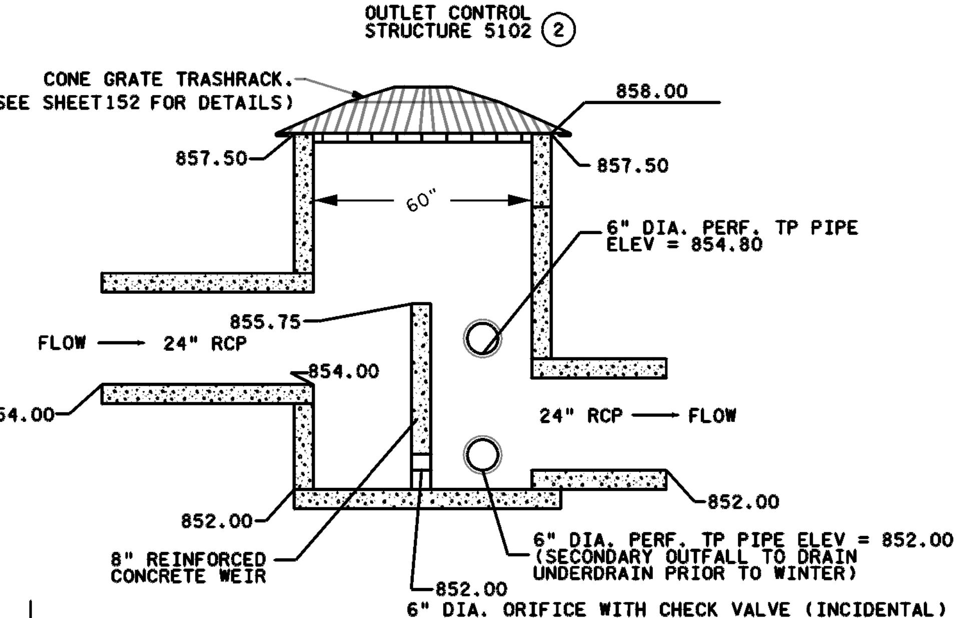
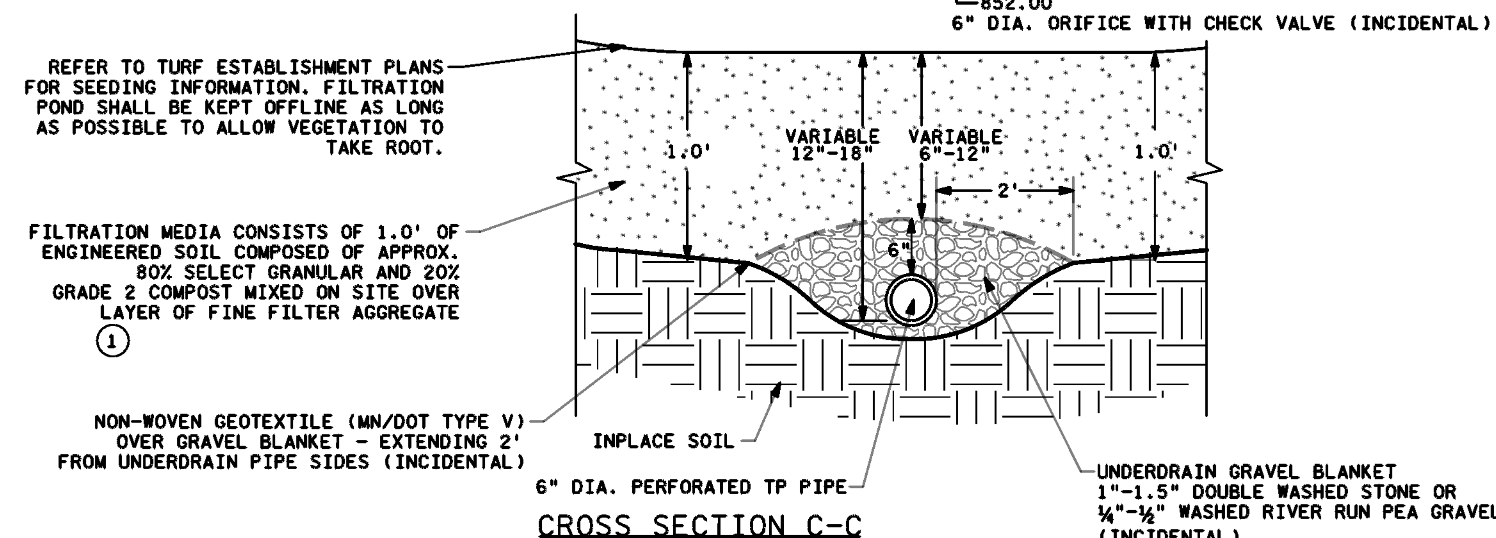










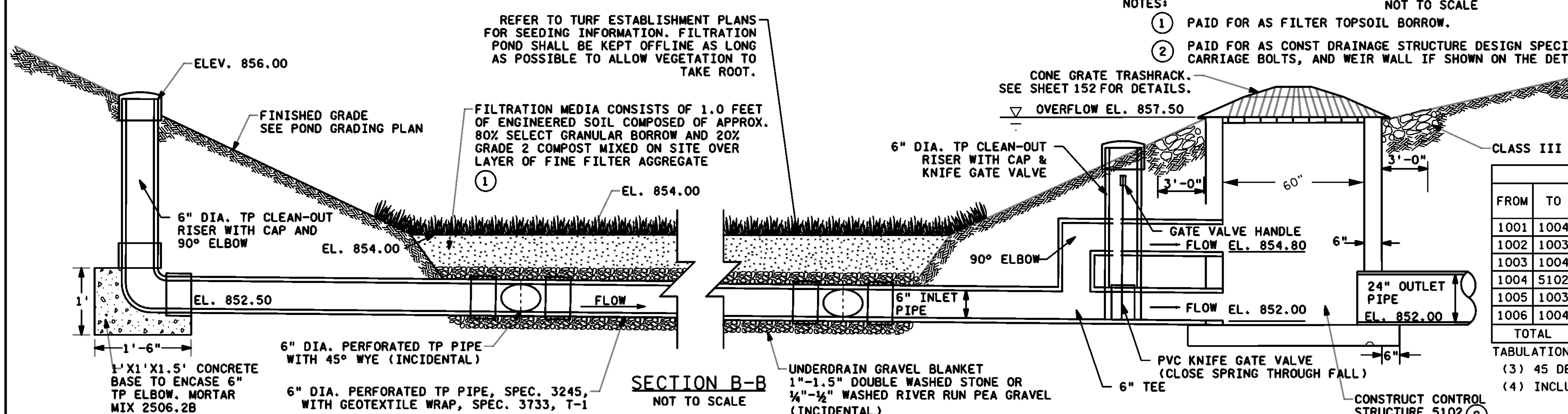
CROSS SECTION C-C
TYPICAL FILTRATION POND 6" PERF TP

NOT TO SCALE

NOTES:

(1) PAID FOR AS FILTER TOPSOIL BORROW.

(2) PAID FOR AS CONST DRAINAGE STRUCTURE DESIGN SPECIAL, WHICH SHALL INCLUDE CONE GRATE TRASHRACK, STRAPS, CARRIAGE BOLTS, AND WEIR WALL IF SHOWN ON THE DETAIL.



SECTION B-B
NOT TO SCALE

FILTRATION POND								
FROM	TO	FROM X	FROM Y	FROM Z	PIPE SIZE (IN)	PIPE GRADE	LENGTH (FT)	NOTE
1001	1004	488374.21	155229.38	852.50	6	0.005	123	(4)
1002	1003	488377.47	155220.00	852.50	6	0.005	121	(4)
1003	1004	488427.54	155330.61	852.13	6	0.005	15	(3)
1004	5102	488420.66	155343.58	852.08	6	0.005	28	(3)
1005	1003	488450.70	155395.72	852.50	6	0.005	69	(4)
1006	1004	488441.72	155399.74	852.50	6	0.005	60	(4)
TOTAL							416	

TABULATION NOTES:

(3) 45 DEGREE WYE. INCIDENTAL.

(4) INCLUDES 6" PVC CLEANOUT RISER.

POND DETAILS

SHEET 1 OF 2

NO	DATE	BY	CKD	APPR	REVISION

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NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 12/31/2019 DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

DRAINAGE PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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Thursday, January 02, 2020 08:13:54 AM
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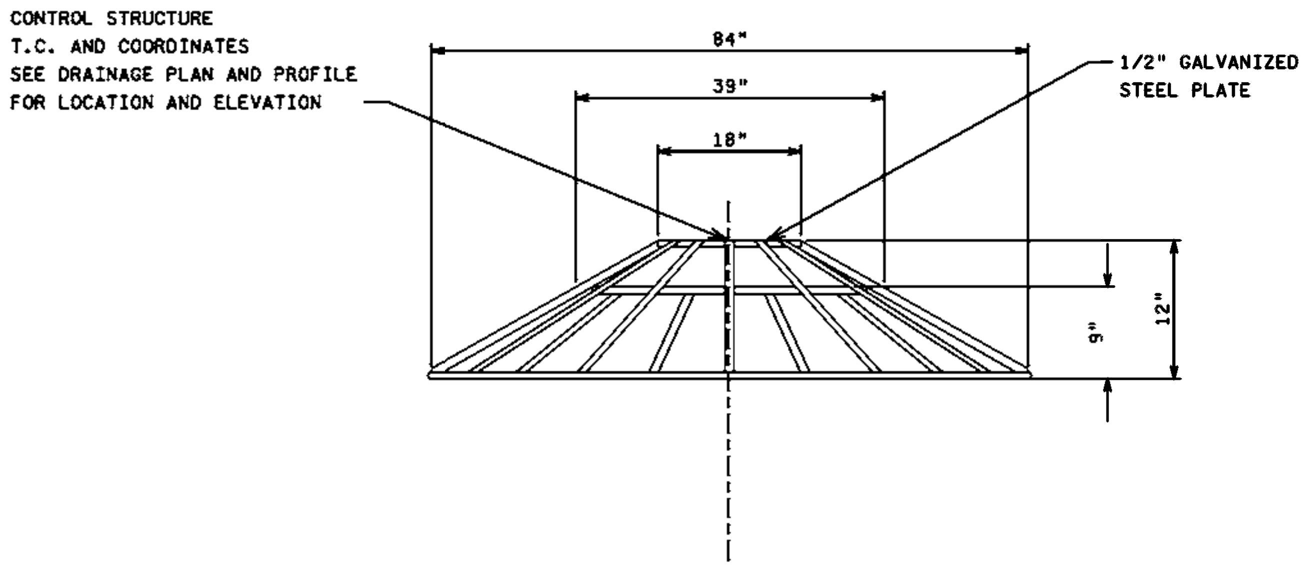
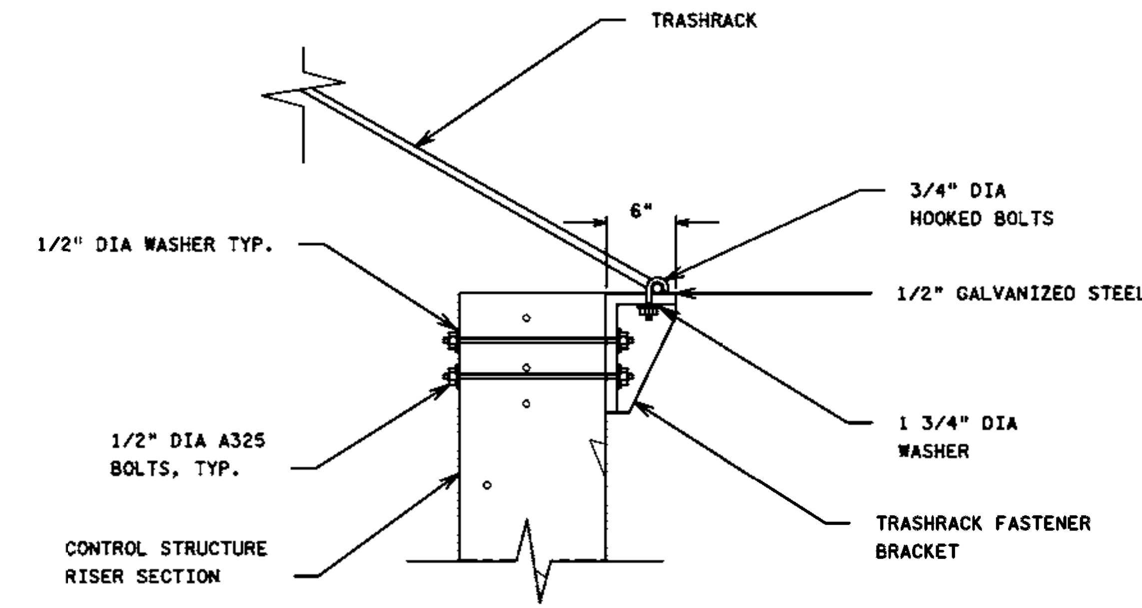
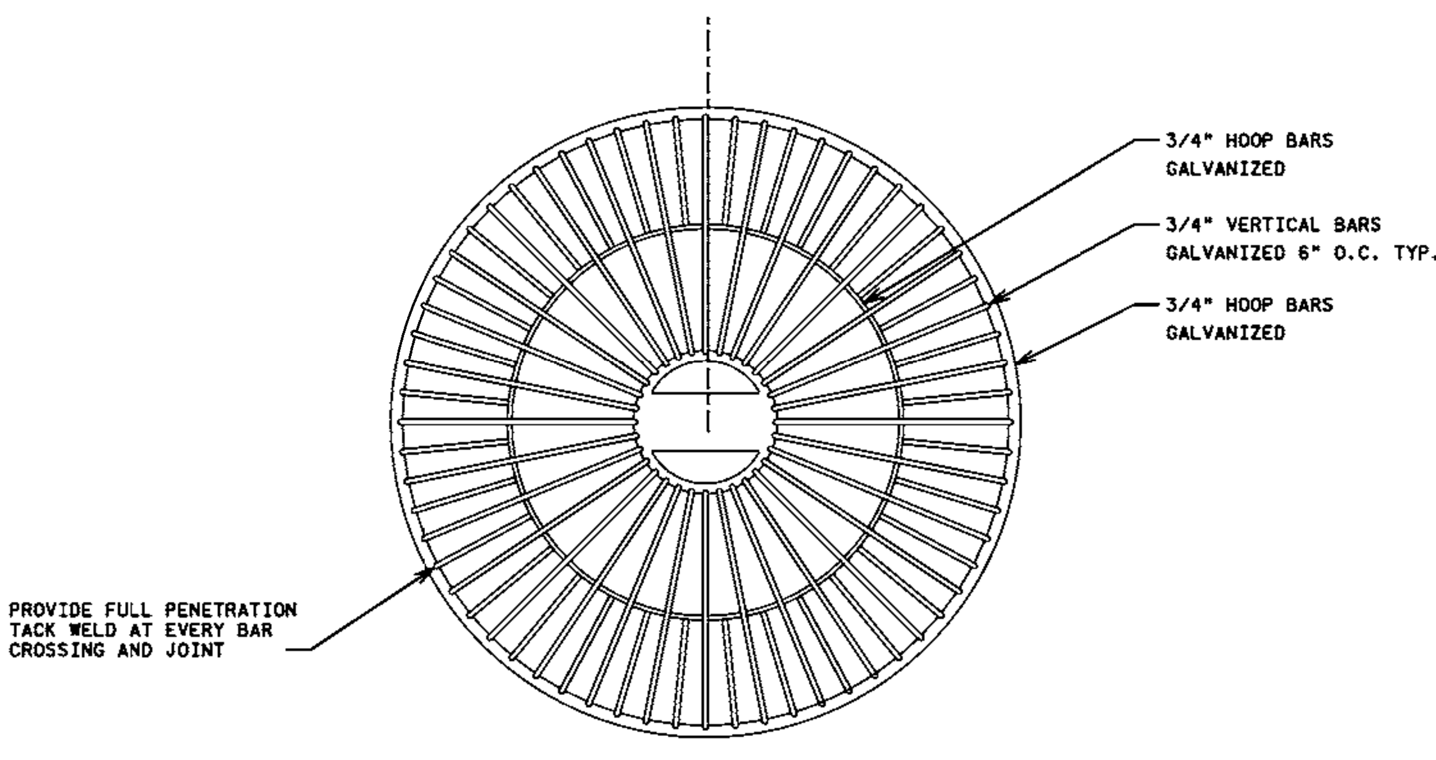


SECTION - CONE GRATE TRASHRACK
NOT TO SCALE



TRASHRACK FASTENER ATTACHMENT
NOT TO SCALE



CONE GRATE TRASHRACK
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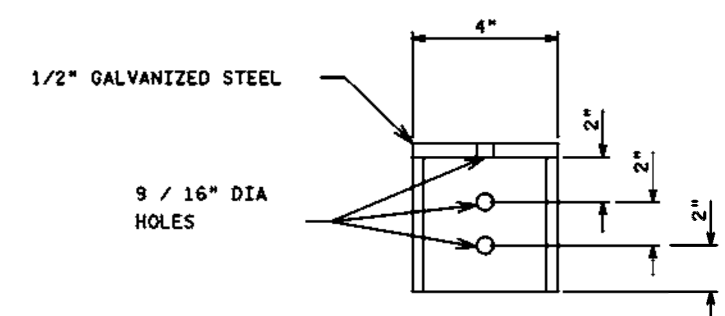

FASTENER BRACKET
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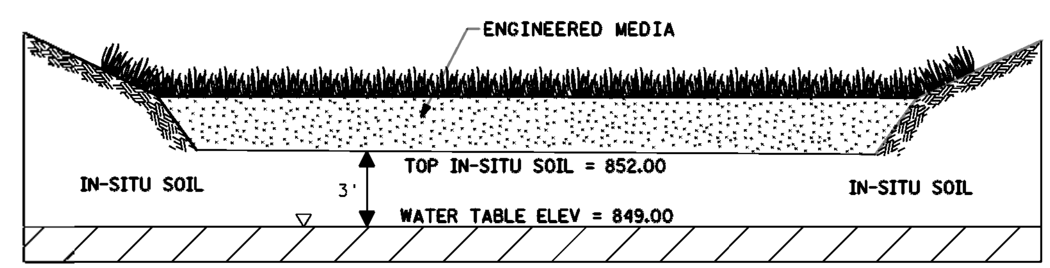


POND WATER TABLE DETAIL
NOT TO SCALE

POND TREATMENT VOLUME NOTE:
POND TREATMENT VOLUMES PER THE POND GRADING PLAN AND DETAILS AND COON CREEK WATERSHED DISTRICT RECOMMENDATIONS ARE AS FOLLOWS:
INFILTRATION TREATMENT VOLUME (9.6" DEPTH) = 5,484 CF
FILTRATION TREATMENT VOLUME (48-HOUR DRAWDOWN) = 6,872 CF
TOTAL TREATMENT VOLUME = 12,356 CF

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: MICHAEL W. RYAN LIC. NO. 52690
CERTIFIED BY: [signature] 12/31/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

HDR
ANOKA COUNTY

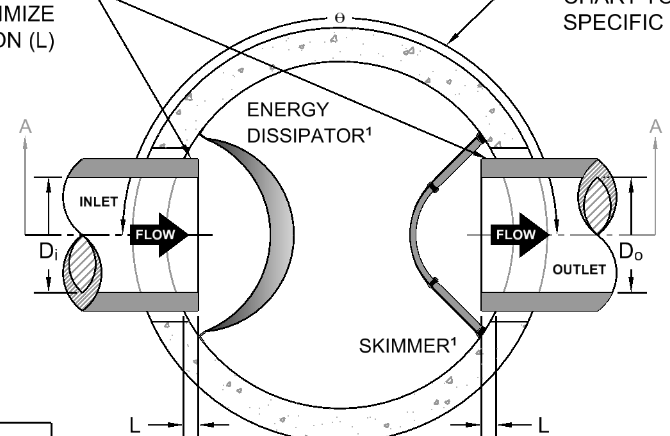
DRAINAGE PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

PLAN VIEW

FOR NEW MANHOLE CONSTRUCTION, CONTRACTOR TO MINIMIZE PIPE PROTRUSION (L)

REFER TO MANHOLE SIZING CHART TO ENSURE PROJECT SPECIFIC DESIGN FEASIBILITY



GENERAL NOTES

SUMP DETAIL FOR STRUCTURE 5170, SEE DRAINAGE PLAN FOR LOCATION. DESIGN SHALL MEET SPECIFICATIONS AS DESCRIBED OR APPROVED EQUAL.

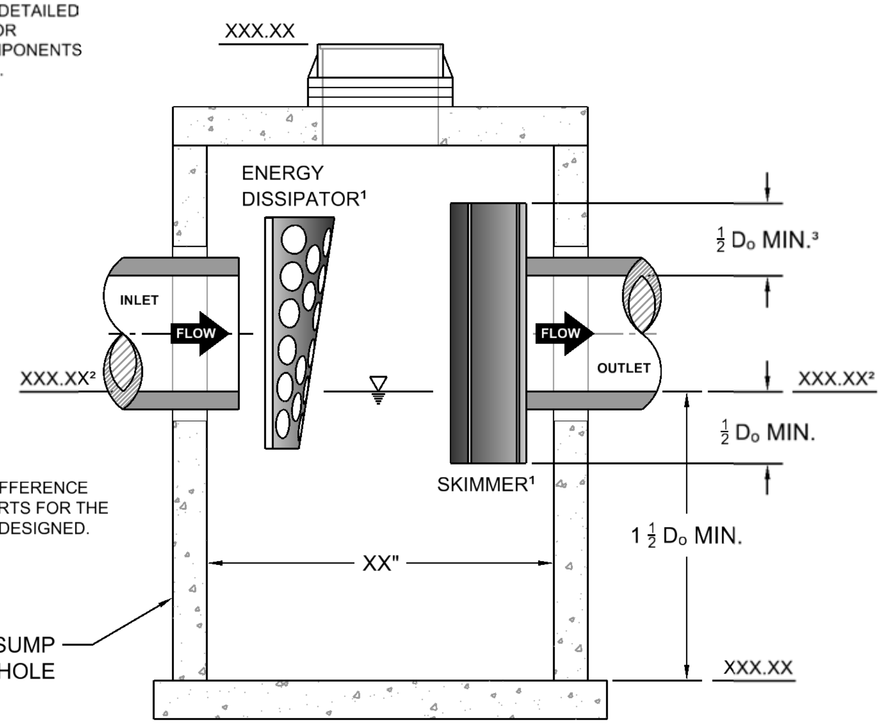
STRUCTURE DIAMETER	MAXIMUM PIPE DIAMETER*		
	DISSIPATOR ONLY	SKIMMER ONLY	DISSIPATOR & SKIMMER
48"	27"	24"	15"
60"	36"	30"	24"
72"	48"	42"	30"
84"		48"	36"
96"			48"

*RECOMMENDED TO PROVIDE ADEQUATE SPACING BETWEEN COMPONENTS FOR ACCESS & MAINTENANCE. REFER TO MANHOLE SIZING CHARTS FOR MORE DETAILED STRUCTURE SIZING OR CONTACT MOMENTUM FOR PROJECT SPECIFIC DETAILS. PRESERVER™ COMPONENTS ACCOMMODATE PIPE SIZES UP TO 48" DIAMETER.

OUTLET DIAMETER	ALLOWABLE PEAK FLOW
0"-15"	20 CFS
16"-21"	35 CFS
22"-27"	60 CFS
28"-36"	100 CFS
37"-48"	175 CFS

NOTE 1: THE PRESERVER™ ENERGY DISSIPATOR WAS DESIGNED AND TESTED TO FUNCTION WITH OR WITHOUT A SKIMMER. DISSIPATORS & SKIMMERS CAN BE UTILIZED IN TANDEM OR INDEPENDENTLY.

CROSS SECTION AA



NOTE 2: MINIMIZE ELEVATION DIFFERENCE BETWEEN INLET AND OUTLET INVERTS FOR THE PRESERVER™ TO FUNCTION AS DESIGNED.

NOTE 3: STOCK SKIMMERS HAVE A MINIMUM FREEBOARD DEPTH OF ½ Dₒ. FOR GREATER FREEBOARD DEPTHS, DESIGNERS CAN UPSIZE THE SKIMMER, OR USE A CUSTOMIZED SKIMMER. FOR CUSTOM DESIGNS, AND/OR PROJECT SPECIFIC DETAILS, CONTACT MOMENTUM.

Not to Scale

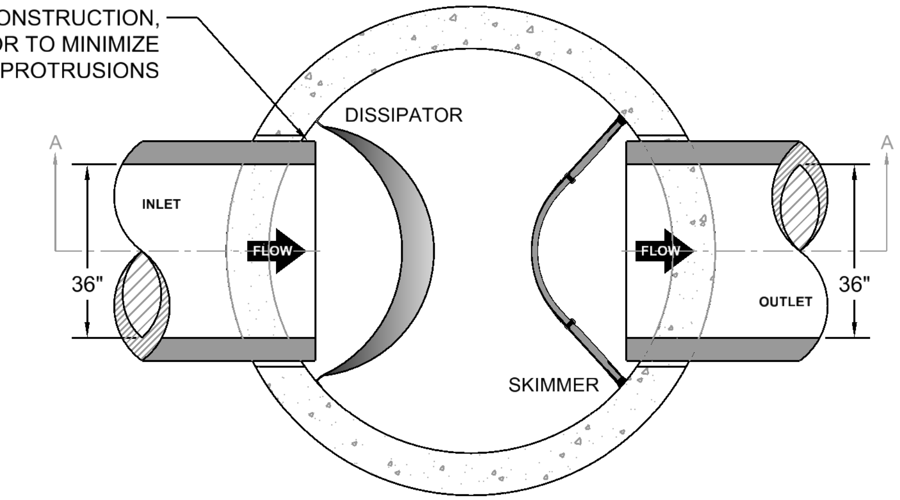
877-773-0073 • www.MomentumEnv.com	**THE PRESERVER™** STANDARD DETAIL ENERGY DISSIPATOR AND/OR SKIMMER	CONCEPTUAL PLAN DISCLAIMER: THIS GENERIC DETAIL DOES NOT ENCOMPASS THE SIZING, FIT, AND APPLICABILITY OF THE PRESERVER FOR THIS SPECIFIC PROJECT. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ASSURE THAT THE STORMWATER SYSTEM DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. MOMENTUM ENVIRONMENTAL LLC DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS. THE DESIGN ENGINEER IS RESPONSIBLE FOR ALL DESIGN DECISIONS.

GENERAL NOTES

SUMP DETAIL FOR STRUCTURE 5170, SEE DRAINAGE PLAN FOR LOCATION. DESIGN SHALL MEET SPECIFICATIONS AS DESCRIBED OR APPROVED EQUAL.

PLAN VIEW

FOR NEW MANHOLE CONSTRUCTION, CONTRACTOR TO MINIMIZE ALL PIPE PROTRUSIONS

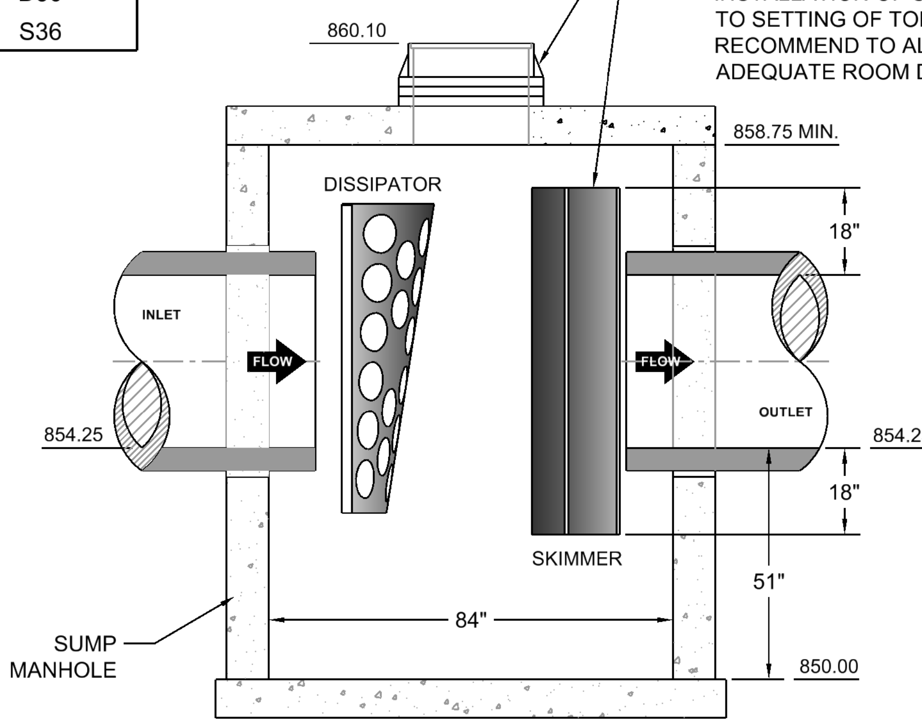


COMPONENT	PART #
DISSIPATOR	D36
SKIMMER	S36

CROSS SECTION AA

SHALLOW STRUCTURE NOTES:

- 4" LOW-PROFILE CASTING WITH NO ADJUSTING RINGS RECOMMENDED
- INSTALLATION OF SKIMMER PRIOR TO SETTING OF TOP SLAB RECOMMEND TO ALLOW ADEQUATE ROOM DURING INSTALL



Not to Scale

DESIGNED AND MANUFACTURED BY: ThePreserver.com • 1-877-773-0073	**THE PRESERVER™** ENERGY DISSIPATOR & SKIMMER	STRUCTURE ID: 5170 PROJECT: C.S.A.H. 78 LOCATION: COON RAPIDS, MN	DRWN: LRH 9-11-19 REVISIONS:

NO	DATE	BY	CKD	APPR	REVISION

SUMP DETAILS

DRAINAGE PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

ANOKA COUNTY

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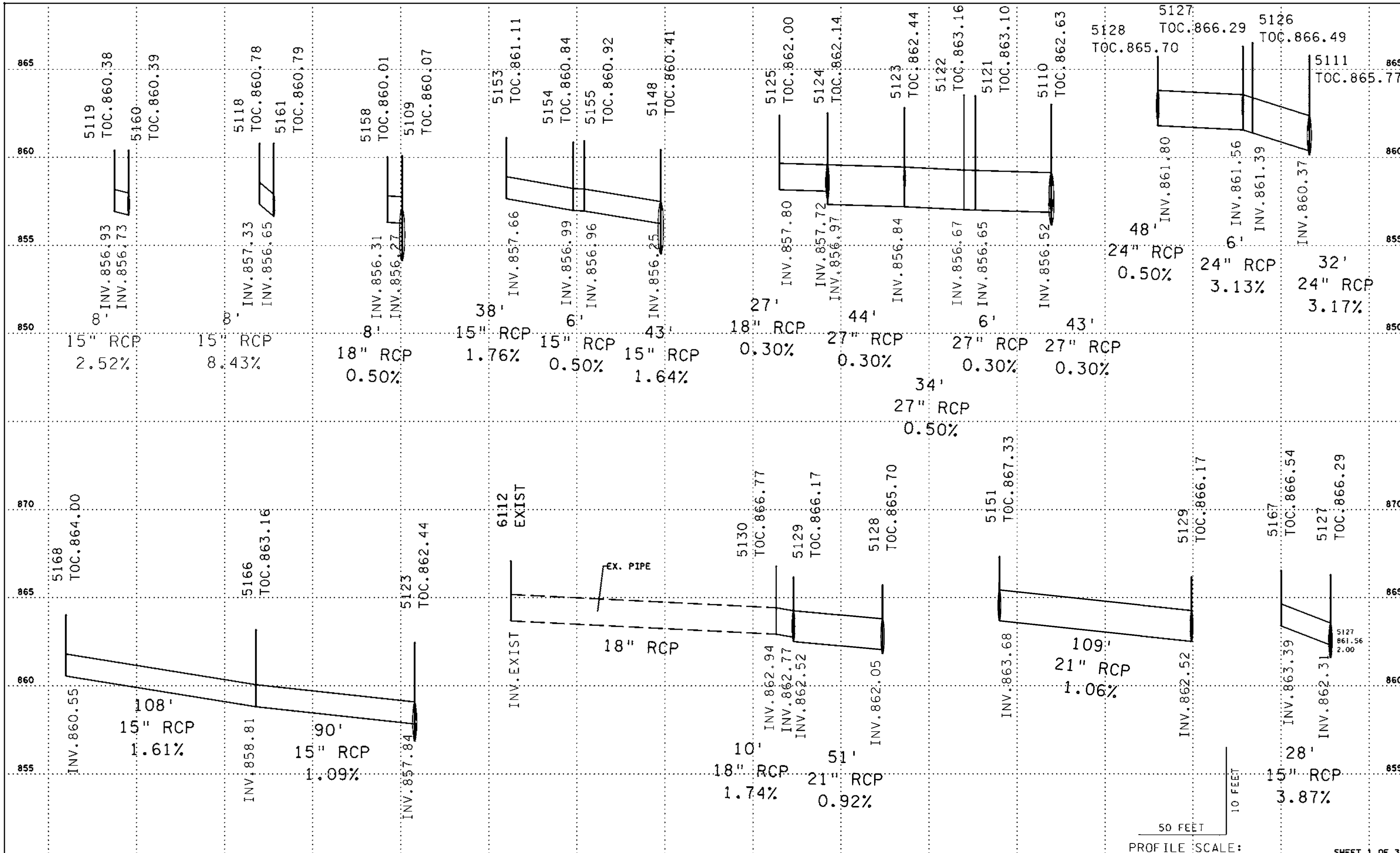

SHEET 1 OF 3

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: [signature] 11/22/2019

LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: GEB
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

DRAINAGE PROFILES

SHEET NO. 154 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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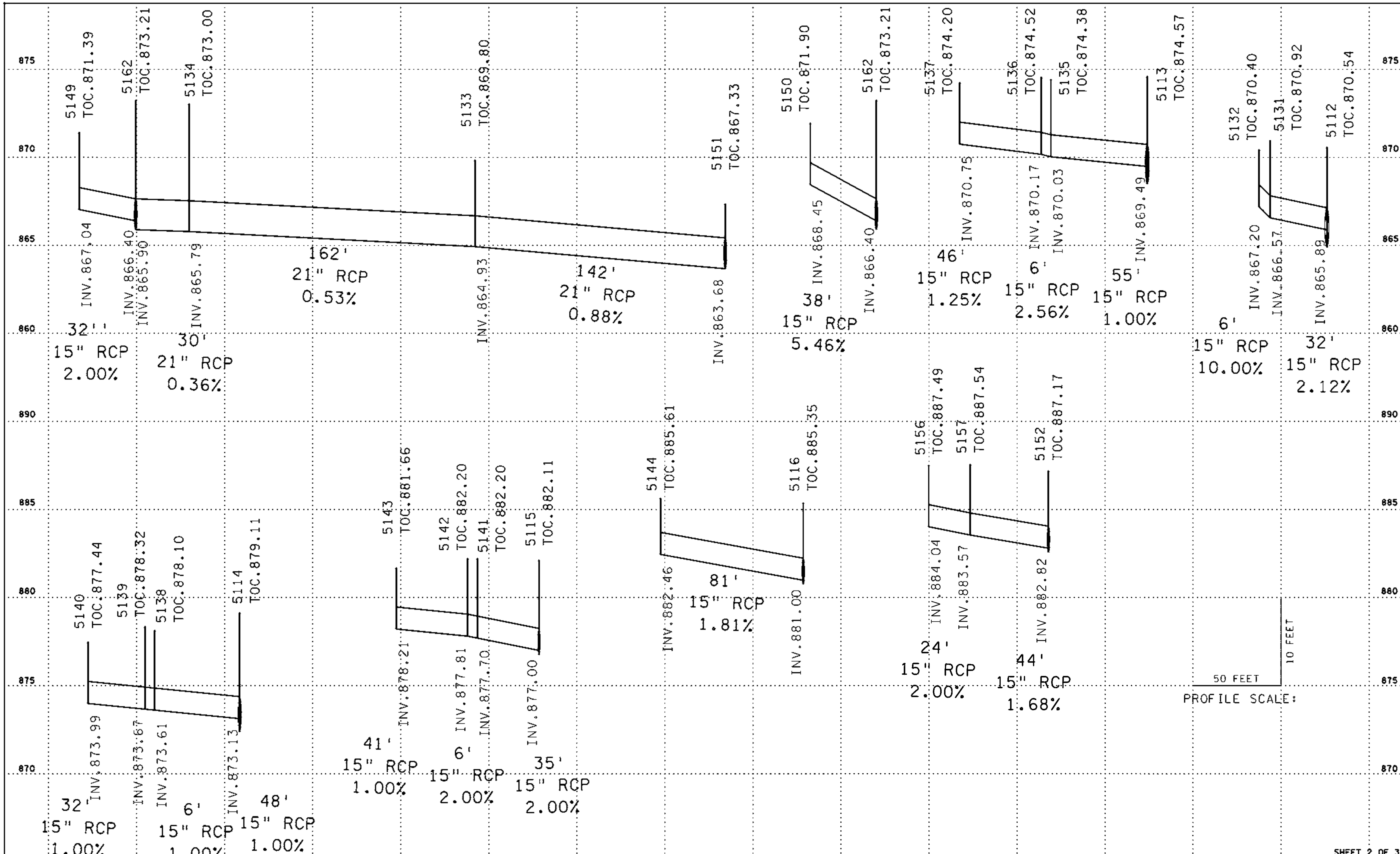

SHEET 2 OF 3

NO	DATE	BY	CKD	APPR	REVISION

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NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

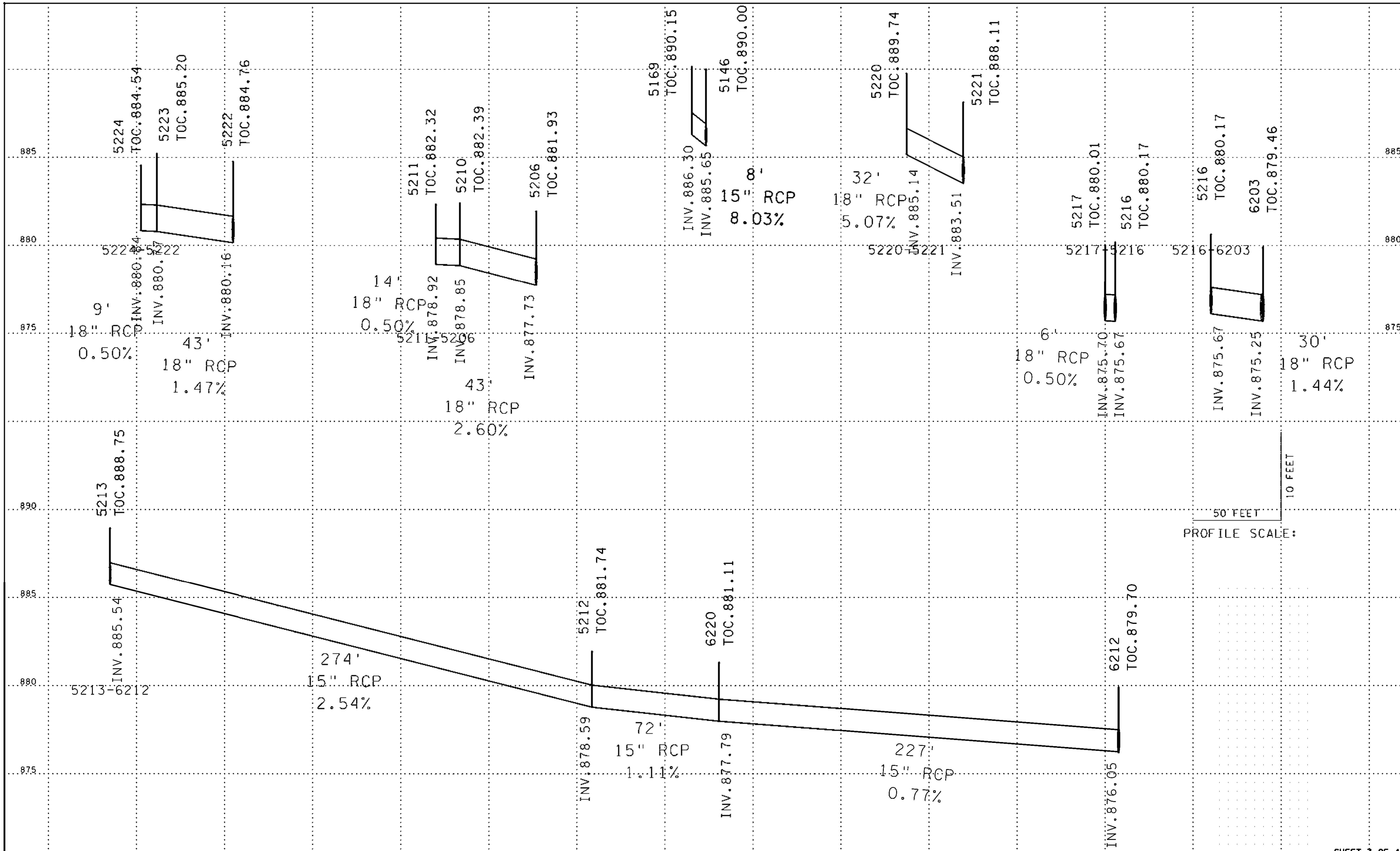
HDR

ANOKA COUNTY

DRAINAGE PROFILES

SHEET NO. 155 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



SHEET 3 OF 4

NO	DATE	BY	CKD	APPR	REVISION

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ANOKA COUNTY

DRAINAGE PROFILE

SHEET NO. 156 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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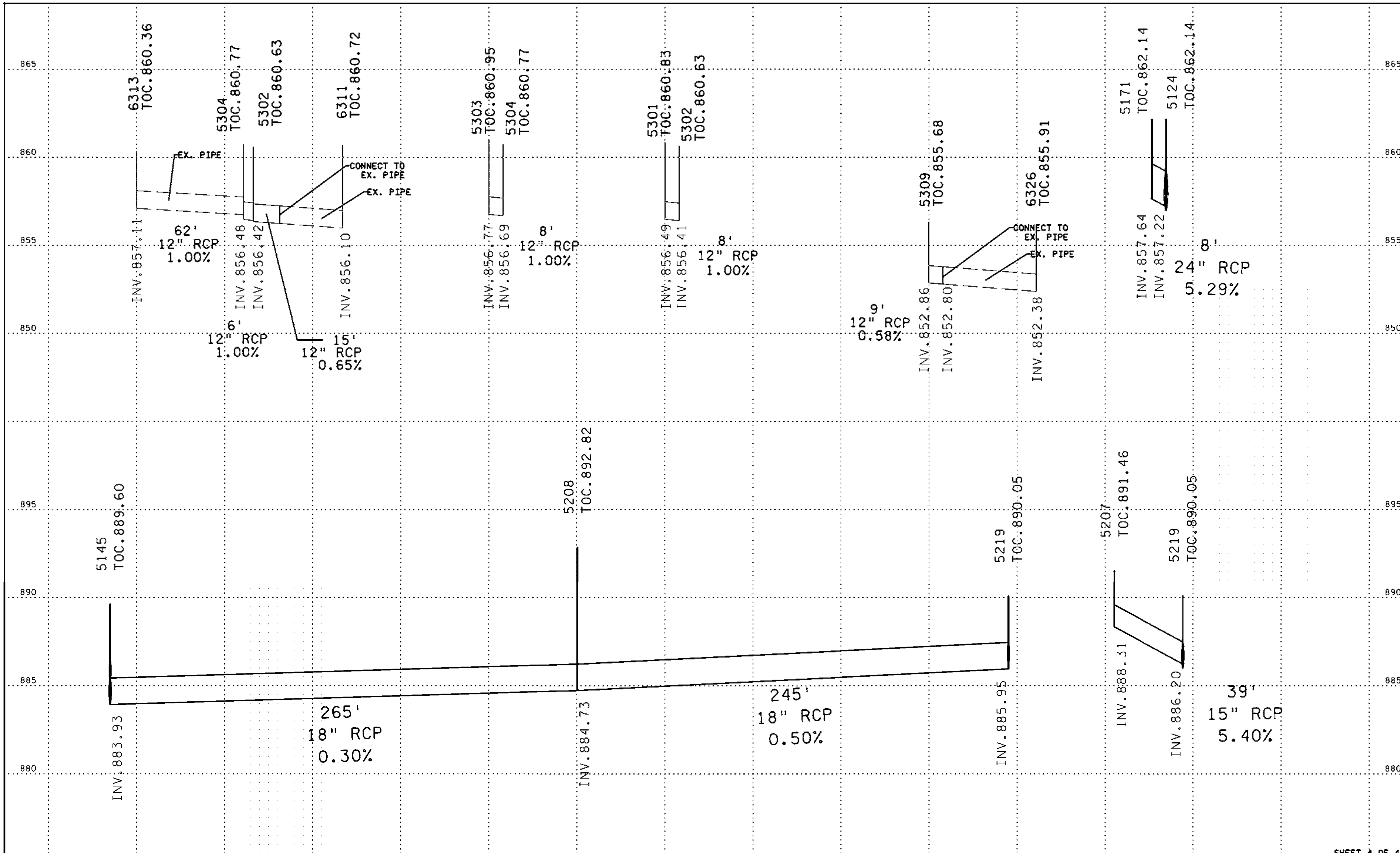

SHEET 4 OF 4

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ANOKA COUNTY

DRAINAGE PROFILE

SHEET NO. 157 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

(J)

EXISTING DRAINAGE SUMMARY

ALIGNMENT	ITEM EXISTING	STATION	OFFSET	LT/RT	TO	ITEM EXISTING	STATION	OFFSET	LT/RT	LEAVE AS IS	EXISTING PIPE SIZE	REMOVE CONC PIPE APRON	REMOVE CB	REMOVE MH	REMOVE SEWER PIPE (STORM)	ADJUST FRAME & RING CASTING (1)	CASTING ASSEMBLY	REMOVE CASTING	PLUG FILL AND ABANDON PIPE	EXISTING TOP OF CASTING	PROPOSED TOP OF CASTING (1)	EXISTING OUTLET	EXISTING INLET DOWN-STREAM	NOTES
												EACH	EACH	EACH	LIN FT	EACH	EACH	EACH	LIN FT	ELEV	ELEV	ELEV	ELEV	
S.P. 002-678-025																								
PCSAH78SB	CB	148+30.36	24.94	LT						X														STRUCTURE 6310
PCSAH78SB	CB	148+30.29	13.01	RT							12" RCP		1		8									
PCSAH78NB	CB	248+29.76	38.45	LT							12" RCP		1		8									
PCSAH78NB	CB	248+30.13	37.19	RT						X														STRUCTURE 6312
PCSAH78SB	CB	148+37.89	25.19	LT						X														STRUCTURE 6311
PCSAH78SB	CB	148+39.27	13.04	RT							12" RCP		1											
PCSAH78NB	CB	248+39.36	38.65	LT							12" RCP		1											
PCSAH78NB	CB	248+40.05	37.23	RT						X														STRUCTURE 6313
CSAH11WB	CB	31+85.36	60.23	RT						X														STRUCTURE 6326
CSAH11WB	CB	31+84.71	13.65	LT									1											
CSAH11WB	CB	33+36.94	13.53	LT						X														STRUCTURE 6327
PCSAH78SB	CB	150+29.22	41.60	LT						X														STRUCTURE 6314
PCSAH78SB	CB	150+28.62	26.04	RT									1											
PCSAH78NB	CB	251+01.40	26.88	RT						X														STRUCTURE 6319
PCSAH78NB	CB	251+01.94	13.41	LT												1				857.13	856.98			STRUCTURE 6317
PCSAH78SB	CB	151+01.60	26.02	RT									1											
PCSAH78SB	CB	151+01.32	37.92	LT						X														STRUCTURE 6315
PCSAH78NB	CB	251+11.18	27.06	RT						X														STRUCTURE 6320
PCSAH78NB	CB	251+12.06	13.22	LT												1				857.11	856.97			STRUCTURE 6318
PCSAH78SB	CB	151+11.50	25.89	RT									1											
PCSAH78SB	CB	151+11.82	37.96	LT						X														STRUCTURE 6316
PCSAH78NB	CB	252+65.76	26.62	RT						X														STRUCTURE 6323
PCSAH78NB	CB	252+66.68	13.08	LT												1				857.82	857.66			STRUCTURE 6322
PCSAH78SB	CB	152+66.77	25.90	RT									1											
PCSAH78SB	CB	152+66.83	38.03	LT						X														STRUCTURE 6321
PCSAH78SB	CB	154+17.25	28.00	LT						X														STRUCTURE 6301
PCSAH78SB	CB	154+17.57	24.46	RT												1				858.3	858.41			STRUCTURE 6324
PCSAH78NB	CB	254+15.43	25.58	RT		CB	254+18.86	21.34	LT	X														STRUCTURE 6325
PCSAH78NB	CB	255+77.78	25.60	RT												1				859.15	858.99			STRUCTURE 6308
PCSAH78SB	CB	155+69.11	35.50	LT						X														STRUCTURE 6303
PCSAH78SB	CB	155+79.20	34.80	LT						X										859.15				STRUCTURE 6305
PCSAH78SB	MH	155+68.13	24.50	LT						X										859.26				STRUCTURE 6302
PCSAH78SB	MH	155+78.40	22.20	LT						X										859.35				STRUCTURE 6304
PCSAH78NB	CB	257+11.32	23.21	RT												1				N/A				STRUCTURE 6309
PCSAH78SB	CB	157+11.28	26.21	LT						X										860.61				STRUCTURE 6307
PCSAH78SB	MH	157+10.29	14.76	LT						X										861.02				STRUCTURE 6306
PCSAH78NB	APRON	259+09.82	54.92	RT						X														CITY PROJECT OUTLET
PCSAH78NB	CB	261+33.45	20.39	RT	TO	MH	261+82.36	32.06	RT		15" RCP		1		49									
PCSAH78NB	MH	261+82.36	32.06	RT	TO	APRON	259+09.82	54.92	RT		36" RCP			1	103									(3)
PCSAH78SB	CB	161+75.11	1.23	RT	TO	MH	261+82.36	32.06	RT		12" RCP		1		71									
PCSAH78NB	MH	264+80.94	30.30	RT	TO	MH	261+82.36	32.06	RT		36" RCP			1	299									
PCSAH78NB	CB	264+78.54	45.34	RT	TO	MH	264+80.94	30.30	RT		15" RCP		1		15									
PCSAH78NB	MH	265+09.54	30.45	RT	TO	MH	264+80.94	30.30	RT		36" RCP			1	29									
PCSAH78NB	CB	265+09.97	43.05	RT	TO	MH	265+09.54	30.45	RT		12" RCP		1		13									
PCSAH78NB	CB	265+39.30	15.21	RT	TO	MH	265+09.54	30.45	RT		12" RCP		1		34									
PCSAH78SB	CB	165+36.02	3.35	RT	TO	CB	265+39.30	15.21	RT		12" RCP		1		55									
PCSAH78NB	MH	269+27.74	16.69	RT	TO	MH	265+09.54	30.45	RT		30" RCP			1	418									
PCSAH78NB	CB	269+30.39	24.02	RT	TO	MH	269+27.74	16.69	RT		24" RCP		1		8									
SUBTOTAL THIS SHEET													16	4	1110	6								

GENERAL NOTES:
- SEE REMOVAL PLAN SHEETS FOR LOCATIONS OF THE EXISTING DRAINAGE SYSTEMS AND PROPOSED REMOVALS.
- SEE DRAINAGE PLAN SHEETS FOR LOCATIONS OF THE STRUCTURE ADJUSTMENTS & RECONSTRUCTIONS.
- 80% FEDERAL FUNDS, 20% STATE FUNDS UNLESS STATED OTHERWISE.

SPECIFIC NOTES:
(1) MAX RIM ADJUSTING LIMITS: 0.5' RIM LOWERING, 1.5' RIM RAISING.
(2) EASTERLY EXISTING PIPE INTO STRUCTURE TO REMAIN AND BE EXTENDED TO STRUCTURE 5217. SEE PROPOSED STORM TAB.
(3) CITY PARK PROJECT TO USE SECTION OF EXISTING PIPE AS OUTLET TO COON CREEK. REMOVE PIPE AS DEPICTED IN THE PLAN TO THE NEW DRAINAGE STRUCTURE CONNECTION TO THE PARK PROJECT POND OUTLET.

NO	DATE	BY	CKD	APPR	REVISION

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NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

HDR

ANOKA COUNTY

DRAINAGE TABULATION

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(J)

EXISTING DRAINAGE SUMMARY

ALIGNMENT	ITEM EXISTING	STATION		OFFSET	LT/RT	TO	ITEM EXISTING	STATION		OFFSET	LT/RT	LEAVE AS IS	EXISTING PIPE SIZE	REMOVE				ADJUST FRAME & RING CASTING (1)	CASTING ASSEMBLY	REMOVE CASTING	PLUG FILL AND ABANDON PIPE	EXISTING TOP OF CASTING	PROPOSED TOP OF CASTING (1)	EXISTING OUTLET	EXISTING INLET DOWN-STREAM	NOTES
														CONC PIPE APRON	CB	MH	SEWER PIPE (STORM)									
														EACH	EACH	EACH	LIN FT	EACH	EACH	EACH	LIN FT	ELEV	ELEV	ELEV	ELEV	
S.P. 002-678-025																										
PCSAH78SB	CB	169+22.96		.8.97	LT	TO	CB	269+28.07		13.27	LT		12" RCP		1		30									
PCSAH78NB	CB	269+28.07		13.27	LT	TO	MH	269+27.74		16.69	RT		12" RCP		1		39									
PCSAH78NB	MH	269+80.54		32.92	RT	TO	CB	269+30.39		24.02	RT		15" RCP			1	54									
PCSAH78NB	PIPE	270+44.36		169.50	RT	TO	MH	269+80.54		32.92	RT	X	15" RCP													
PCSAH78NB	MH	273+90.91		22.48	RT	TO	MH	269+27.74		16.69	RT		24" RCP			1	463									
PCSAH78NB	MH	274+65.44		184.30	RT	TO	MH	273+90.91		22.48	RT	X	24" RCP			1										
PCSAH78NB	MH	274+46.94		11.65	RT	TO	MH	273+90.91		22.48	RT		24" RCP			1	57									
PCSAH78NB	CB	274+39.07		14.31	LT	TO	CB	274+39.33		8.50	LT		12" RCP		1		6									
PCSAH78NB	CB	274+39.33		8.50	LT	TO	MH	274+46.94		11.65	RT		12" RCP		1		22									
PCSAH78NB	CB	274+90.34		17.60	RT	TO	MH	274+46.94		11.65	RT		12" RCP		1		43									
PCSAH78NB	MH	277+36.40		7.22	RT	TO	CB	274+90.34		17.60	RT		18" RCP			1	245									
PCSAH78NB	CB	277+44.94		14.21	RT	TO	MH	277+36.40		7.22	RT		12" RCP		1		11									
PCSAH78NB	MH	280+16.16		4.05	RT	TO	MH	277+36.40		7.22	RT		18" RCP			1	280									
PCSAH78NB	CB	280+20.17		9.74	RT	TO	MH	280+16.16		4.05	RT		12" RCP		1		7									
PCSAH78SB	CB	180+17.30		14.75	LT	TO	MH	280+16.16		4.05	RT		12" RCP		1		62									
PCSAH78NB	CB	288+31.71		47.59	RT	TO	CB	288+59.83		44.51	RT		12" RCP				30	1				889.44	889.90			
PCSAH78NB	CB	288+59.83		44.51	RT	TO	CB	288+91.54		8.25	RT		15" RCP				50	1				889.17	889.40			
PCSAH78NB	CB	288+91.54		8.25	RT	TO	CB	292+36.93		14.72	RT		15" RCP		1		346									
PCSAH78NB	CB	292+36.93		14.72	RT	TO	CB	294+63.27		19.40	RT	X	15" RCP					1	1	1		881.22	881.20			CONVERT TO MH, MH 6220
PCSAH78NB	CB	294+63.27		19.40	RT	TO	CB	294+63.38		15.17	RT	X	15" RCP													
PCSAH78NB	CB	294+63.38		15.17	LT	TO	CB	64+75.00	R 2	13.94	RT		18" RCP		1		26					880.51				(2)
PCSAH78SB	CB	62+07.72	R 2	12.50	LT	TO	MH	63+56.82	R 2	15.80	LT		12" RCP		1		149									
PCSAH78SB	MH	63+56.82	R 2	15.80	LT	TO	CB	64+74.32	R 2	13.40	LT		12" RCP			1	117									
PCSAH78SB	CB	64+75.00	R 2	13.94	RT	TO	CB	64+74.32	R 2	13.40	LT		18" RCP		1							880.27				
PCSAH78SB	CB	64+74.32	R 2	13.40	LT	TO	MH	64+75.62	R 2	37.80	LT		18" RCP		1											
PCSAH78SB	MH	64+75.62	R 2	37.80	LT	TO	CB	65+17.82	R 2	45.90	LT	X	18" RCP													
PCSAH78SB	CB	64+85.42	R 2	13.60	LT	TO	CB	64+74.32	R 2	13.40	LT		12" RCP		1		10									
PCSAH78SB	CB	65+17.82	R 2	45.90	LT	TO	OFFSITE						18" RCP					1				879.42	879.01			
PCSAH78SB	CB	65+49.02	R 2	45.80	LT	TO	CB	65+17.82	R 2	45.90	LT	X	18" RCP													
PCSAH78NB	CB	64+04.87	R 2	20.07	RT	TO	CB	67+03.93	R 2	1.34	RT	X	12" RCP													
PCSAH78SB	CB	67+03.93	R 2	1.34	RT	TO	CB	67+03.90	R 2	13.90	RT	X	12" RCP													
PCSAH78SB	CB	67+03.90	R 2	13.90	RT	TO	CB	67+02.83	R 2	23.95	LT	X	12" RCP													
PCSAH78SB	CB	67+02.83	R 2	23.95	LT							X	15" RCP													
SUBTOTAL THIS SHEET															14	7	2047	4	1	1						
TOTAL															30	11	3157	10	1	1						

GENERAL NOTES:
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NO	DATE	BY	CKD	APPR	REVISION

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CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

HDR

ANOKA COUNTY

DRAINAGE TABULATION
SHEET NO. 159 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(K) DRAINAGE TABULATION SP 002-678-025

STRUCTURE NO. FLOWS FROM	STRUCTURE NO. FLOWS TO	STRUCTURE LOCATION ALIGN.	STRUCTURE LOCATION STATION (3)	STRUCTURE LOCATION OFFSET (3)	DRAINAGE STRUCTURES TYPE	DESIGN	EST LIN FT	H LIN FT	G LIN FT	48-4020 LIN FT	54-4020 LIN FT	60-4020 LIN FT	72-4020 LIN FT	78-4020 LIN FT	84-4020 LIN FT	POND OUTLET SPECIAL LIN FT	CASTING ASSEMBLY TYPE(1)	STEPS REQ'D	TOP OF CASTING ELEV	OUTLET ELEV.	INLET ELEV. (2)	FINE AGGREGATE BEDDING CU YD
5101		PCSAH78SB	161+00.74	117.2' LT	APR															854.50		
5102	5101	PCSAH78SB	161+06.65	88.7' LT	SPEC		6.0									6.0			858.00	854.00	852.00	8
5103		PCSAH78SB	160+12.59	48.5' RT	APR																854.50	
5104	5103	PCSAH78SB	160+14.00	17.6' LT	CB	60-4020	5.4					10.4					B - 7	Y	861.00	855.49	854.50	9
5105	5104	PCSAH78SB	160+14.81	13.3' RT	CB	48-4020	5.8			5.8							B - 7	Y	861.72	855.89	855.74	9
5106	5105	PCSAH78NB	260+17.00	13.3' LT	CB	G	3.4		3.4								B - 7		861.56	858.08	857.77	3
5107	5106	PCSAH78NB	260+17.00	24.0' RT	CB	H	3.1	3.1									B - 7		861.60	858.45	858.08	11
5108		PCSAH78SB	16+154.16	53.4' LT	APR																854.00	
5109	5108	PCSAH78SB	161+75.00	19.0' LT	CB	84-4020	5.9								5.9		B - 17	Y	860.07	854.13	854.00	21
5110	5148	PCSAH78SB	165+48.00	19.0' LT	CB	84-4020	6.8								6.8		B - 7	Y	862.63	855.77	854.50	162
5111	5165	PCSAH78SB	169+21.00	19.0' LT	CB	78-4020	5.6							5.6			B - 7	Y	865.77	860.12	858.37	96
5112	5111	PCSAH78SB	172+28.00	19.0' LT	CB	72-4020	5.6						5.6				B - 7	Y	870.54	864.89	860.12	143
5113	5112	PCSAH78SB	174+12.00	24.0' LT	CB	78-4020	6.0							6.0			B - 7	Y	874.57	868.49	864.89	86
5114	5113	PCSAH78SB	176+48.00	24.0' LT	CB	60-4020	6.7					6.7					B - 7	Y	879.11	872.38	868.74	100
5115	5114	PCSAH78SB	178+73.00	19.0' LT	CB	54-4020	5.3				5.3						B - 7	Y	882.11	876.75	872.88	75
5116	5115	PCSAH78SB	180+88.00	19.0' LT	CB	54-4020	4.5				4.5						B - 7		885.35	880.75	876.75	72
5117	5152	PCSAH78SB	182+90.00	24.0' LT	CB	48-4020	5.1			5.1							B - 7	Y	888.77	883.56	882.57	30
5118	5161	PCSAH78SB	161+75.00	13.3' RT	CB	H	3.4	3.4									B - 17		860.78	857.33	856.65	2
5119	5160	PCSAH78NB	261+80.00	13.3' LT	CB	H	3.4	3.4									B - 17		860.38	856.93	856.73	2
5120	5159	PCSAH78NB	261+80.00	24.0' RT	CB	H	3.4	3.4									B - 17		860.52	857.07	856.91	2
5121	5110	PCSAH78SB	165+48.00	24.3' RT	CB	G	6.4		6.4								B - 7	Y	863.10	856.65	856.52	20
5122	5121	PCSAH78NB	265+50.00	13.3' LT	CB	G	6.4		6.4								B - 7	Y	863.16	856.67	856.65	3
5123	5122	PCSAH78NB	265+40.00	19.0' RT	CB	48-4020	5.5			5.5							B - 7	Y	862.44	856.84	856.67	16
5124	5123	PCSAH78NB	265+09.00	50.0' RT	CB	48-4020	5.1			5.1							B - 7	Y	862.14	856.97	856.84	20
5125	5124	PCSAH78NB	264+82.20	55.0' RT	CB	H	4.1	4.1									B - 7		862.00	857.80	857.72	10
5126	5111	PCSAH78SB	169+22.00	13.3' RT	CB	G	5.0		5.0								B - 7	Y	866.49	861.39	860.37	13
5127	5126	PCSAH78NB	269+27.00	24.3' LT	CB	G	4.7		4.7								B - 7	Y	866.29	861.56	861.39	3
5128	5127	PCSAH78NB	269+28.00	24.0' RT	CB	48-4020	3.8			3.8							B - 7		865.70	861.80	861.56	20
5129	5128	PCSAH78NB	269+80.00	24.0' RT	CB	60-4020	3.6					3.6					B - 7		866.17	862.52	862.05	19
5130	5129	PCSAH78NB	269+80.53	33.5' RT	MH	48-4020	3.9			3.9							A - 7		866.77	862.94	862.77	3
5131	5112	PCSAH78SB	172+28.00	13.3' RT	CB	48-4020	4.3			4.3							B - 7		870.92	866.57	865.89	9
5132	5131	PCSAH78NB	272+30.00	24.3' LT	CB	H	3.1	3.1									B - 7		870.40	867.20	866.57	2
5133	5151	PCSAH78NB	272+30.00	24.0' RT	CB	54-4020	4.8				4.8						B - 7	Y	869.80	864.93	863.68	53
5134	5133	PCSAH78NB	273+92.50	27.5' RT	MH	48-4020	7.3			7.3							A - 7	Y	873.00	865.79	864.93	61
5135	5113	PCSAH78SB	174+38.00	24.3' RT	CB	48-4020	4.3			4.3							B - 7		874.38	870.03	869.49	16
5136	5135	PCSAH78NB	274+42.00	13.3' LT	CB	48-4020	4.3			4.3							B - 7		874.52	870.17	870.03	2
5137	5136	PCSAH78NB	274+75.14	19.0' RT	CB	H	3.4	3.4									B - 7		874.20	870.75	870.17	13
5138	5114	PCSAH78SB	176+49.00	24.3' RT	CB	G	4.4		4.4								B - 7		878.10	873.61	873.13	14
5139	5138	PCSAH78NB	276+49.76	13.3' LT	CB	G	4.6		4.6								B - 7	Y	878.32	873.67	873.61	2
5140	5139	PCSAH78NB	276+52.49	19.0' RT	CB	H	3.4	3.4									B - 7		877.44	873.99	873.67	9
5141	5115	PCSAH78SB	178+73.00	16.0' RT	CB	G	4.4		4.4								B - 7		882.20	877.70	877.00	10
5142	5141	PCSAH78NB	278+72.56	21.5' LT	CB	G	4.3		4.3								B - 7		882.20	877.81	877.70	2
5143	5142	PCSAH78NB	278+72.00	19.0' RT	CB	H	3.4	3.4									B - 7		881.66	878.21	877.81	12
5144	5116	PCSAH78NB	280+88.00	19.0' RT	CB	H	3.1	3.1									B - 7		885.61	882.46	881.00	24
5145	5117	PCSAH78SB	182+89.00	13.3' RT	CB	48-4020	5.6			5.6							B - 7	Y	889.60	883.93	883.56	12
5146	5145	PCSAH78NB	282+90.00	13.3' LT	CB	48-4020	4.3			4.3							B - 7		890.00	885.65	885.25	5
5147	5146	PCSAH78NB	282+90.00	19.0' RT	CB	H	3.4	3.4									B - 7		890.11	886.66	885.65	9
5148	5170	PCSAH78SB	162+83.00	19.0' LT	CB	78-4020	5.8							5.8			B - 7	Y	860.41	854.50	854.25	41
5149	5162	PCSAH78NB	273+73.68	63.0' RT	CB	54-4020	4.3				4.3						B - 7		871.39	867.04	866.40	9
5150	5162	PCSAH78NB	274+39.24	72.7' RT	CB	H	3.4	3.4									B - 7		871.90	868.45	866.40	11
5151	5129	PCSAH78NB	270+87.90	24.0' RT	CB	48-4020	3.6			3.6							B - 7		867.33	863.68	862.52	41
SUBTOTAL THIS SHEET							223.4	40.6	43.6	62.9	18.9	20.7	5.6	17.4	12.7	6.0	47					1315

SPECIFIC NOTES:
(1) FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE TAB P.
(2) INLET ELEVATION AT DOWNSTREAM STRUCTURE.
(3) CENTER OF CASTING (GRATE OR COVER) OR END OF APRON.
(4) EXISTING PIPE TO REMAIN.
(5) EXTEND EXISTING PIPE TO NEW STRUCTURE.
(6) EXISTING PIPE AND STRUCTURE TO REMAIN.
(7) CONVERT TO MANHOLE.
(8) PROPOSED PIPE CONNECTS TO EXISTING PIPE FOLLOWING EXISTING DRAINAGE STRUCTURE REMOVAL FOR CURB LINE MODIFICATION.

GENERAL NOTES:
- INVERT ELEVATIONS ARE GIVEN AT CENTER OF STRUCTURE AND END OF APRON.
- IF STEPS REQUIRED, STRUCTURE TO INCLUDE MANHOLE STEPS 16" ON CENTER. SEE MNDOT STANDARD PLATE 4180.
- ALL PIPE JOINTS SHALL BE TIED FROM APRON TO THE FIRST STRUCTURE. PIPE TIES SHALL BE INCIDENTAL.
- ALL CONCRETE PIPE SEWER IS DESIGN 3006 GASKET JOINT PIPE.

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: MICHAEL W. RYAN LIC. NO. 52690
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 12/31/2019 DATE

DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

HDR
ANOKA COUNTY

(K) DRAINAGE TABULATION SP 002-678-025

STRUCTURE NO.		STRUCTURE LOCATION			DRAINAGE STRUCTURES											POND OUTLET					FINE AGGREGATE BEDDING
FLOWS FROM	FLOWS TO	ALIGN.	STATION (3)	OFFSET (3)	TYPE	DESIGN	EST LIN FT	H LIN FT	G LIN FT	48-4020 LIN FT	54-4020 LIN FT	60-4020 LIN FT	72-4020 LIN FT	78-4020 LIN FT	84-4020 LIN FT	SPECIAL LIN FT	CASTING ASSEMBLY TYPE(1)	STEPS REQ'D	TOP OF CASTING ELEV	OUTLET ELEV.	INLET ELEV. (2)	CU YD
5152	5116	PCSAH78SB	181+99.08	24.0' LT	CB	78-4020	4.5							4.5			B - 7		887.17	882.57	880.75	37
5153	5154	PCSAH78NB	263+00.00	24.0' RT	CB	H	3.4	3.4									B - 7		861.11	857.66	856.99	11
5154	5155	PCSAH78NB	262+92.00	13.3' LT	CB	G	3.8		3.8								B - 7		860.84	856.99	856.96	2
5155	5148	PCSAH78SB	162+86.50	24.3' RT	CB	G	3.9		3.9								B - 7		860.92	856.96	856.25	13
5156	5157	PCSAH78NB	281+54.00	13.3' LT	CB	H	3.4	3.4									B - 7		887.49	884.04	883.57	7
5157	5152	PCSAH78SB	181+72.00	13.3' RT	CB	G	3.9		3.9								B - 7		887.54	883.57	882.82	13
5158	5109	PCSAH78SB	161+67.00	19.0' LT	CB	H	3.6	3.6									B - 17		860.01	856.31	856.27	3
5159	5160	PCSAH78NB	261+72.00	24.0' RT	CB	48-4020	3.6			3.6							B - 17		860.59	856.91	856.73	11
5160	5161	PCSAH78NB	261+72.00	13.3' LT	CB	48-4020	3.6			3.6							B - 17		860.39	856.73	856.65	4
5161	5105	PCSAH78SB	161+67.00	13.3' RT	CB	48-4020	4.1			4.1							B - 17		860.79	856.65	855.89	45
5162	5134	PCSAH78NB	274+05.36	55.0' RT	MH	48-4020	7.4			7.4							A - 7	Y	873.21	865.90	865.79	11
5164	5102	PCSAH78SB	161+27.27	82.1' LT	APR																853.00	3
5165	5110	PCSAH78SB	167+14.00	19.0' LT	CB	60-4020	5.6					5.6					B - 7	Y	864.02	858.37	856.52	77
5166	5123	PCSAH78NB	266+30.00	19.0' RT	CB	G	4.3		4.3								B - 7		863.16	858.81	857.84	26
5167	5127	PCSAH78NB	269+55.00	24.3' LT	CB	H	3.1	3.1									B - 7		866.54	863.39	862.31	8
5168	5166	PCSAH78NB	267+37.85	24.0' RT	CB	H	3.4	3.4									B - 7		864.00	860.55	858.81	32
5169	5146	PCSAH78NB	282+98.00	13.3' LT	CB	H	3.8	3.8									B - 7		890.15	886.30	885.65	2
5170	5109	PCSAH78SB	162+15.00	19.0' LT	CB	84-4020	5.8								9.8		B - 7	Y	860.10	854.25	854.13	24
5171	5124	PCSAH78NB	265+09.00	58.0' RT	CB	48-4020	4.4			4.4							B - 7		862.14	857.64	857.22	3
5172	EX. APR	PCSAH78NB	260+78.90	39.4' RT	MH	72-4020	9.4						9.4				A - 7	Y	860.75	851.44	849.63	
5205	6203	PCSAH78SB	63+47.00 R 2	19.0' LT	CB	48-4020	4.1			4.1							B - 7		880.49	876.29	875.25	43
5206	5205	PCSAH78SB	61+77.02 R 2	19.0' LT	CB	48-4020	4.1			4.1							B - 7		881.93	877.73	876.29	57
5207	5219	PCSAH78NB	287+95.00	24.0' RT	CB	48-4020	3.1			3.1							B - 7		891.46	888.31	886.20	11
5208	5145	PCSAH78NB	285+56.92	22.1' LT	MH	48-4020	8.2			8.2							A - 7	Y	892.82	884.73	883.93	89
5210	5206	PCSAH78SB	61+77.02 R 2	24.3' RT	CB	48-4020	3.5			3.5							B - 7		882.39	878.85	877.73	14
5211	5210	PCSAH78NB	291+65.00	13.4' LT	CB	48-4020	3.3			3.3							B - 7		882.32	878.92	878.85	5
5212	6220	PCSAH78NB	291+65.01	18.9' RT	CB	48-4020	3.1			3.1							B - 7		881.74	878.59	877.79	21
5213	5212	PCSAH78NB	288+92.00	18.9' RT	CB	48-4020	3.1			3.1							B - 7		888.75	885.54	878.59	80
5214	5213	PCSAH78NB	288+59.63	53.3' RT	CB	48-4020	3.4			3.4							B - 7		889.30	885.78	885.54	14
5215	5214	PCSAH78NB	288+33.74	55.7' RT	CB	H	3.1	3.1									B - 7		889.07	885.92	885.78	8
5216	6203	PCSAH78SB	64+74.92 R 2	15.3' RT	CB	48-4020	4.4			4.4							B - 7		880.17	875.67	875.25	
EX. PIPE	5217	PCSAH78NB	294+63.38	15.2' LT																875.75	875.70	9
5217	5216	PCSAH78NB	294+63.81	34.0' LT	CB	48-4020	4.2			4.2							B - 7		880.01	875.70	875.67	2
5219	5208	PCSAH78NB	288+06.50	13.3' LT	CB	H	4.0	4.0									B - 7		890.05	885.95	884.73	82
5220	5221	PCSAH78SB	188+06.50	13.3' RT	CB	48-4020	4.5			4.5							B - 7		889.74	885.14	883.51	11
5221	5222	PCSAH78SB	188+06.50	19.0' LT	CB	48-4020	4.5			4.5							B - 7		888.11	883.51	880.14	64
5222	5206	PCSAH78SB	190+00.00	19.0' LT	CB	48-4020	4.5			4.5							B - 7		884.74	880.14	877.73	48
5223	5222	PCSAH78SB	190+00.00	24.3' RT	CB	G	4.4		4.4								B - 7		885.20	880.77	880.14	14
5224	5223	PCSAH78NB	290+21.50	13.3' LT	CB	H	3.6	3.6									B - 7		884.51	880.81	880.77	3
6203	6202	PCSAH78SB	64+74.32 R 2	13.4' LT	MH	60-4020	4.3					9.3					A - 7		879.46	875.25	874.97	8
6204	6203	PCSAH78SB	64+85.95 R 2	19.0' LT	CB	48-4020	3.3			3.3							B - 7		879.78	876.38	875.25	5
6220	6212	PCSAH78NB	292+36.80	14.7' RT	MH	48-4020											A - 7		881.11	877.79	876.05	
5301	5302	PCSAH78SB	148+31.44	28.2' RT	CB	H	4.3	4.3									B - 7		860.83	856.49	856.41	2
5302	6311	PCSAH78SB	148+39.44	28.2' RT	CB	48-4020	4.1			4.1							B - 7		860.63	856.42	852.90	4
5303	5304	PCSAH78NB	248+31.44	25.0' LT	CB	H	4.1	4.1									B - 7		860.95	856.77	856.69	2
5304	5302	PCSAH78NB	248+39.46	25.0' LT	CB	48-4020	4.2			4.2							B - 7		860.77	856.48	856.42	2
5305	6314	PCSAH78SB	150+28.95	36.2' RT	CB	H	3.0	3.0									B - 7		856.89	853.83	853.78	4
5306	6315	PCSAH78SB	151+02.08	36.2' RT	CB	48-4020	3.5			3.5							B - 7		856.52	852.98	852.90	4
5307	5306	PCSAH78SB	151+10.08	36.2' RT	CB	H	3.0	3.0									B - 7		856.52	853.45	853.36	2
5308	6321	PCSAH78SB	152+66.46	34.1' RT	CB	H	3.1	3.1									B - 7		857.21	853.99	853.60	2
5309	6326	PCSAH11WB	31+84.78	23.0' LT	CB	H	2.7	2.7									B - 7		855.68	852.86	852.38	2
SUBTOTAL THIS SHEET							197.7	51.6	20.3	96.2	18.9	14.9	9.4	4.5	9.8		49					944
PROJECT TOTAL							421.1	92.2	63.9	159.1	18.9	35.6	15.0	21.9	22.5	6.0	96					2259

SPECIFIC NOTES:
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(4) EXISTING PIPE TO REMAIN.
(5) EXTEND EXISTING PIPE TO NEW STRUCTURE.
(6) EXISTING PIPE AND STRUCTURE TO REMAIN.
(7) CONVERT TO MANHOLE.
(8) PROPOSED PIPE CONNECTS TO EXISTING PIPE FOLLOWING EXISTING DRAINAGE STRUCTURE REMOVAL FOR CURB LINE MODIFICATION.

GENERAL NOTES:
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- IF STEPS REQUIRED, STRUCTURE TO INCLUDE MANHOLE STEPS 16" ON CENTER. SEE MNDOT STANDARD PLATE 4180.
- ALL PIPE JOINTS SHALL BE TIED FROM APRON TO THE FIRST STRUCTURE. PIPE TIES SHALL BE INCIDENTAL.
- ALL CONCRETE PIPE SEWER IS DESIGN 3006 GASKET JOINT PIPE.

CASTING ASSEMBLIES SUMMARY (P)

ASSEMBLY	RING OR FRAME	COVER OR GRATE	CURB BOX	STANDARD PLATE NUMBER	USE	TOTAL
B-7	805	814A		4132 4152		81
B-17	806	816	825	4125 4154 4134		8
A-7	700-7	715		4101 4110		7
TOTAL						96

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: MICHAEL W. RYAN LIC. NO. 52690
CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

HDR

ANOKA COUNTY

DRAINAGE TABULATION
SHEET NO. 161 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(K) DRAINAGE TABULATION SP 002-678-025

STRUCTURE NO. FLOWS FROM	STRUCTURE NO. FLOWS TO	STRUCTURE LOCATION ALIGN.	STRUCTURE LOCATION STATION (3)	STRUCTURE LOCATION OFFSET (3)	DRAINAGE STRUCTURES TYPE	DRAINAGE STRUCTURES DESIGN	DRAINAGE STRUCTURES EST LIN FT	12" RCP CL V LIN FT	15" RCP CL V LIN FT	18" RCP CL III LIN FT	21" RCP CL III LIN FT	24" RCP CL III LIN FT	27" RCP CL III LIN FT	36" RCP CL III LIN FT	APRON EACH	APRON TYPE	GEOTEXTILE FILTER SQ YD	RIPRAP CLASS II CU YD	GUIDE POSTS TYPE SPEC EACH	CONNECT INTO EXISTING STORM SEWER EACH	CONNECT TO EXISTING STORM SEWER EACH	REMARKS
5101		PCSAH78SB	161+00.74	117.2' LT	APR										1	RC APRON	29.7	6.2	1			24" RC APRON
5102	5101	PCSAH78SB	161+06.65	88.7' LT	SPEC		6.0					19										SEE POND DETAIL SHEET
5103		PCSAH78SB	160+12.59	48.5' RT	APR										1	RC APRON	18.0	3.2	1			18" RC APRON
5104	5103	PCSAH78SB	160+14.00	17.6' LT	CB	60-4020	5.4			26												SUMP STRUCTURE, 5' SUMP DEPTH
5105	5104	PCSAH78SB	160+14.81	13.3' RT	CB	48-4020	5.8		30													
5106	5105	PCSAH78NB	260+17.00	13.3' LT	CB	G	3.4		10													
5107	5106	PCSAH78NB	260+17.00	24.0' RT	CB	H	3.1		37													
5108		PCSAH78SB	16+154.16	53.4' LT	APR										1	RC APRON	45.9	10.6	1			36" RC APRON
5109	5108	PCSAH78SB	161+75.00	19.0' LT	CB	84-4020	5.9							34								
5110	5148	PCSAH78SB	165+48.00	19.0' LT	CB	84-4020	6.8							265								
5111	5165	PCSAH78SB	169+21.00	19.0' LT	CB	78-4020	5.6						207									
5112	5111	PCSAH78SB	172+28.00	19.0' LT	CB	72-4020	5.6						307									
5113	5112	PCSAH78SB	174+12.00	24.0' LT	CB	78-4020	6.0						184									
5114	5113	PCSAH78SB	176+48.00	24.0' LT	CB	60-4020	6.7					238										
5115	5114	PCSAH78SB	178+73.00	19.0' LT	CB	54-4020	5.3			226												
5116	5115	PCSAH78SB	180+88.00	19.0' LT	CB	54-4020	4.5			215												
5117	5152	PCSAH78SB	182+90.00	24.0' LT	CB	48-4020	5.1			91												
5118	5161	PCSAH78SB	161+75.00	13.3' RT	CB	H	3.4		8													
5119	5160	PCSAH78NB	261+80.00	13.3' LT	CB	H	3.4		8													
5120	5159	PCSAH78NB	261+80.00	24.0' RT	CB	H	3.4		8													
5121	5110	PCSAH78SB	165+48.00	24.3' RT	CB	G	6.4						43									
5122	5121	PCSAH78NB	265+50.00	13.3' LT	CB	G	6.4						6									
5123	5122	PCSAH78NB	265+40.00	19.0' RT	CB	48-4020	5.5						34									
5124	5123	PCSAH78NB	265+09.00	50.0' RT	CB	48-4020	5.1						44									
5125	5124	PCSAH78NB	264+82.20	55.0' RT	CB	H	4.1			27												
5126	5111	PCSAH78SB	169+22.00	13.3' RT	CB	G	5.0					32										
5127	5126	PCSAH78NB	269+27.00	24.3' LT	CB	G	4.7					6										
5128	5127	PCSAH78NB	269+28.00	24.0' RT	CB	48-4020	3.8					48										
5129	5128	PCSAH78NB	269+80.00	24.0' RT	CB	60-4020	3.6				51											
5130	5129	PCSAH78NB	269+80.53	33.5' RT	MH	48-4020	3.9			10											1	
5131	5112	PCSAH78SB	172+28.00	13.3' RT	CB	48-4020	4.3		32													
5132	5131	PCSAH78NB	272+30.00	24.3' LT	CB	H	3.1		6													
5133	5151	PCSAH78NB	272+30.00	24.0' RT	CB	54-4020	4.8				142											
5134	5133	PCSAH78NB	273+92.50	27.5' RT	MH	48-4020	7.3				162											
5135	5113	PCSAH78SB	174+38.00	24.3' RT	CB	48-4020	4.3		55													
5136	5135	PCSAH78NB	274+42.00	13.3' LT	CB	48-4020	4.3		6													
5137	5136	PCSAH78NB	274+75.14	19.0' RT	CB	H	3.4		46													
5138	5114	PCSAH78SB	176+49.00	24.3' RT	CB	G	4.4		48													
5139	5138	PCSAH78NB	276+49.76	13.3' LT	CB	G	4.6		6													
5140	5139	PCSAH78NB	276+52.49	19.0' RT	CB	H	3.4		32													
5141	5115	PCSAH78SB	178+73.00	16.0' RT	CB	G	4.4		35													
5142	5141	PCSAH78NB	278+72.56	21.5' LT	CB	G	4.3		6													
5143	5142	PCSAH78NB	278+72.00	19.0' RT	CB	H	3.4		41													
5144	5116	PCSAH78NB	280+88.00	19.0' RT	CB	H	3.1		81													
5145	5117	PCSAH78SB	182+89.00	13.3' RT	CB	48-4020	5.6			37												
5146	5145	PCSAH78NB	282+90.00	13.3' LT	CB	48-4020	4.3		17													
5147	5146	PCSAH78NB	282+90.00	19.0' RT	CB	H	3.4		31													
5148	5170	PCSAH78SB	162+83.00	19.0' LT	CB	78-4020	5.8							68								
5149	5162	PCSAH78NB	273+73.68	63.0' RT	CB	54-4020	4.3		32													
5150	5162	PCSAH78NB	274+39.24	72.7' RT	CB	H	3.4		38													
5151	5129	PCSAH78NB	270+87.90	24.0' RT	CB	48-4020	3.6				109											
SUBTOTAL THIS SHEET							223.4		613	632	464	343	825	367	3		94	20	3		1	

SPECIFIC NOTES:
(1) FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE TAB P.
(2) INLET ELEVATION AT DOWNSTREAM STRUCTURE.
(3) CENTER OF CASTING (GRATE OR COVER) OR END OF APRON.
(4) EXISTING PIPE TO REMAIN.
(5) EXTEND EXISTING PIPE TO NEW STRUCTURE.
(6) EXISTING PIPE AND STRUCTURE TO REMAIN.
(7) CONVERT TO MANHOLE.
(8) PROPOSED PIPE CONNECTS TO EXISTING PIPE FOLLOWING EXISTING DRAINAGE STRUCTURE REMOVAL FOR CURB LINE MODIFICATION.

GENERAL NOTES:
- INVERT ELEVATIONS ARE GIVEN AT CENTER OF STRUCTURE AND END OF APRON.
- IF STEPS REQUIRED, STRUCTURE TO INCLUDE MANHOLE STEPS 16" ON CENTER. SEE MNDOT STANDARD PLATE 4180.
- ALL PIPE JOINTS SHALL BE TIED FROM APRON TO THE FIRST STRUCTURE. PIPE TIES SHALL BE INCIDENTAL.
- ALL CONCRETE PIPE SEWER IS DESIGN 3006 GASKET JOINT PIPE.

SHEET 3 OF 4

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: MICHAEL W. RYAN LIC. NO. 52690
CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

HDR
ANOKA COUNTY

DRAINAGE TABULATION
SHEET NO. 162 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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(K) DRAINAGE TABULATION SP 002-678-025

STRUCTURE NO.		STRUCTURE LOCATION			DRAINAGE STRUCTURES			12" RCP CL V	15" RCP CL V	18" RCP CL III	21" RCP CL III	24" RCP CL III	27" RCP CL III	36" RCP CL III	APRON	APRON TYPE	GEOTEXTILE FILTER	RIPRAP CLASS II	GUIDE POSTS TYPE SPEC	CONNECT INTO EXISTING STORM SEWER	CONNECT TO EXISTING STORM SEWER	REMARKS
FLOWS FROM	FLOWS TO	ALIGN.	STATION (3)	OFFSET (3)	TYPE	DESIGN	EST LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	EACH		SQ YD	CU YD	EACH	EACH	EACH	
5152	5116	PCSAH78SB	181+99.08	24.0' LT	CB	78-4020	4.5			111												
5153	5154	PCSAH78NB	263+00.00	24.0' RT	CB	H	3.4		38													
5154	5155	PCSAH78NB	262+92.00	13.3' LT	CB	G	3.8		6													
5155	5148	PCSAH78SB	162+86.50	24.3' RT	CB	G	3.9		43													
5156	5157	PCSAH78NB	281+54.00	13.3' LT	CB	H	3.4		24													
5157	5152	PCSAH78SB	181+72.00	13.3' RT	CB	G	3.9		44													
5158	5109	PCSAH78SB	161+67.00	19.0' LT	CB	H	3.6			8												
5159	5160	PCSAH78NB	261+72.00	24.0' RT	CB	48-4020	3.6		36													
5160	5161	PCSAH78NB	261+72.00	13.3' LT	CB	48-4020	3.6		15													
5161	5105	PCSAH78SB	161+67.00	13.3' RT	CB	48-4020	4.1		153													
5162	5134	PCSAH78NB	274+05.36	55.0' RT	MH	48-4020	7.4				30											
5164	5102	PCSAH78SB	161+27.27	82.1' LT	APR							8			1	RC APRON	29.7	6.2	1			24" RC APRON, SEE POND DETAIL
5165	5110	PCSAH78SB	167+14.00	19.0' LT	CB	60-4020	5.6						166									
5166	5123	PCSAH78NB	266+30.00	19.0' RT	CB	G	4.3		90													
5167	5127	PCSAH78NB	269+55.00	24.3' LT	CB	H	3.1		28													
5168	5166	PCSAH78NB	267+37.85	24.0' RT	CB	H	3.4		108													
5169	5146	PCSAH78NB	282+98.00	13.3' LT	CB	H	3.8		8													
5170	5109	PCSAH78SB	162+15.00	19.0' LT	CB	84-4020	5.8							40								SUMP STRUCTURE, SEE SHEET 151
5171	5124	PCSAH78NB	265+09.00	58.0' RT	CB	48-4020	4.4					8										
5172	EX. APR	PCSAH78NB	260+78.90	39.4' RT	MH	72-4020	9.4													1		PARK POND OUTLET CONNECTION
5205	6203	PCSAH78SB	63+47.00 R 2	19.0' LT	CB	48-4020	4.1			128												
5206	5205	PCSAH78SB	61+77.02 R 2	19.0' LT	CB	48-4020	4.1			170												
5207	5219	PCSAH78NB	287+95.00	24.0' RT	CB	48-4020	3.1		39													
5208	5145	PCSAH78NB	285+56.92	22.1' LT	MH	48-4020	8.2			265												
5210	5206	PCSAH78SB	61+77.02 R 2	24.3' RT	CB	48-4020	3.5			43												
5211	5210	PCSAH78NB	291+65.00	13.4' LT	CB	48-4020	3.3			14												
5212	6220	PCSAH78NB	291+65.01	18.9' RT	CB	48-4020	3.1		72													
5213	5212	PCSAH78NB	288+92.00	18.9' RT	CB	48-4020	3.1		274													
5214	5213	PCSAH78NB	288+59.63	53.3' RT	CB	48-4020	3.4		48													
5215	5214	PCSAH78NB	288+33.74	55.7' RT	CB	H	3.1		27													
5216	6203	PCSAH78SB	64+74.92 R 2	15.3' RT	CB	48-4020	4.4													1		(4)
EX. PIPE	5217	PCSAH78NB	294+63.38	15.2' LT						26											1	(5)
5217	5216	PCSAH78NB	294+63.81	34.0' LT	CB	48-4020	4.2			6											1	
5219	5208	PCSAH78NB	288+06.50	13.3' LT	CB	H	4.0			245												
5220	5221	PCSAH78SB	188+06.50	13.3' RT	CB	48-4020	4.5			32												
5221	5222	PCSAH78SB	188+06.50	19.0' LT	CB	48-4020	4.5			191												
5222	5206	PCSAH78SB	190+00.00	19.0' LT	CB	48-4020	4.5			143												
5223	5222	PCSAH78SB	190+00.00	24.3' RT	CB	G	4.4			43												
5224	5223	PCSAH78NB	290+21.50	13.3' LT	CB	H	3.6			9												
6203	6202	PCSAH78SB	64+74.32 R 2	13.4' LT	MH	60-4020	4.3			25												(7), SUMP 5' IN DEPTH
6204	6203	PCSAH78SB	64+85.95 R 2	19.0' LT	CB	48-4020	3.3			14												
6220	6212	PCSAH78NB	292+36.80	14.7' RT	MH	48-4020																(7)(6)
5301	5302	PCSAH78SB	148+31.44	28.2' RT	CB	H	4.3	8														
5302	6311	PCSAH78SB	148+39.44	28.2' RT	CB	48-4020	4.1	15												1	1	(8)
5303	5304	PCSAH78NB	248+31.44	25.0' LT	CB	H	4.1	8														
5304	5302	PCSAH78NB	248+39.46	25.0' LT	CB	48-4020	4.2	6													1	(8)
5305	6314	PCSAH78SB	150+28.95	36.2' RT	CB	H	3.0		12												1	(8)
5306	6315	PCSAH78SB	151+02.08	36.2' RT	CB	48-4020	3.5		12											1	1	(8)
5307	5306	PCSAH78SB	151+10.08	36.2' RT	CB	H	3.0		8													
5308	6321	PCSAH78SB	152+66.46	34.1' RT	CB	H	3.1	8													1	(8)
5309	6326	PCSAH11WB	31+84.78	23.0' LT	CB	H	2.7	9													1	(8)
SUBTOTAL THIS SHEET							197.7	54	1085	1473	30	16	166	40	1		30	6	1	4	8	
PROJECT TOTAL							421.1	54	1698	2105	494	359	991	407	4		123	26	4	4	9	

SPECIFIC NOTES:
(1) FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE TAB P.
(2) INLET ELEVATION AT DOWNSTREAM STRUCTURE.
(3) CENTER OF CASTING (GRATE OR COVER) OR END OF APRON.
(4) EXISTING PIPE TO REMAIN.
(5) EXTEND EXISTING PIPE TO NEW STRUCTURE.
(6) EXISTING PIPE AND STRUCTURE TO REMAIN.
(7) CONVERT TO MANHOLE.
(8) PROPOSED PIPE CONNECTS TO EXISTING PIPE FOLLOWING EXISTING DRAINAGE STRUCTURE REMOVAL FOR CURB LINE MODIFICATION.

GENERAL NOTES:
- INVERT ELEVATIONS ARE GIVEN AT CENTER OF STRUCTURE AND END OF APRON.
- IF STEPS REQUIRED, STRUCTURE TO INCLUDE MANHOLE STEPS 16" ON CENTER. SEE MNDOT STANDARD PLATE 4180.
- ALL PIPE JOINTS SHALL BE TIED FROM APRON TO THE FIRST STRUCTURE. PIPE TIES SHALL BE INCIDENTAL.
- ALL CONCRETE PIPE SEWER IS DESIGN 3006 GASKET JOINT PIPE.

SHEET 4 OF 4

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: MICHAEL W. RYAN LIC. NO. 52690
CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

HDR
ANOKA COUNTY

DRAINAGE TABULATION

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE

PROJECT DESCRIPTION/LOCATION

THE PROJECT IS LOCATED ON COUNTY STATE AID HIGHWAY (CSAH) 78 (HANSON BOULEVARD) IN THE CITY OF COON RAPIDS, ANOKA COUNTY, MINNESOTA. THE PROJECT INVOLVES THE RECONSTRUCTION OF CSAH 78 FROM JUST NORTH OF NORTHDALE BOULEVARD TO JUST SOUTH OF MAIN ST. ALONG WITH THE CONSTRUCTION OF A STORMWATER FILTRATIONPOND AND THE INSTALLATION OF NEW STORM SEWER. RECEIVING WATERS FOR STORMWATER FROM THIS PROJECT INCLUDE COON CREEK WHICH IS ON THE SOUTH END OF PROJECT.

ENVIRONMENTAL FEATURES

THIS PROJECT IS NOT LOCATED IN A DRINKING WATER SUPPLY MANAGEMENT AREA.

THIS PROJECT IS NOT LOCATED IN A WELLHEAD PROTECTION AREA.

THERE ARE NO KARST FEATURES IN THE PROJECT LIMITS.

SPECIAL AND IMPAIRED WATERS

COON CREEK (AUID 07010206-530) IS LOCATED ADJACENT TO THE PROJECT AND IS IMPAIRED FOR AQUATIC MACROINVERTEBRATE BIOASSESSMENTS AND E. COLI. SAND CREEK (AUID 070010206-558) IS LOCATED WITHIN ONE MILE OF THE PROJECT, HOWEVER NO STORMWATER RUNOFF FROM THE PROJECT FLOWS TO SAND CREEK. DUE TO THE PROXIMITY TO COON CREEK AND THE AQUATIC MACROINVERTEBRATE BIOASSESSMENTS IMPAIRMENT, THE BMPS DESCRIBED IN LINES 23.9 AND 23.10 OF THE NPDES PERMIT WILL BE APPLIED TO THIS PROJECT. THOSE BMPS REQUIRE STABILIZATION OF EXPOSED SOILS WITHIN SEVEN (7) CALENDAR DAYS OF CONSTRUCTION ENDING IN THAT PORTION OF THE SITE, AND A TEMPORARY SEDIMENT BASIN FOR COMMON DRAINAGE AREAS THAT SERVE AN AREA WITH FIVE (5) OR MORE ACRES DISTURBED AT ONE TIME.

SOIL INFORMATION

ACCORDING TO THE NRCS WEB SOIL SURVEY, SOILS IN THE PROJECT AREA PRIMARILY CONSIST OF FINE SANDS OR SANDY LOAMS. A GEOTECHNICAL EVALUATION WAS PERFORMED IN OCTOBER 2017. SOIL BORINGS INDICATE THAT THE PROJECT AREA CONSISTS OF SILTY SAND AND POORLY GRADED SAND WITH SILT.

LAND FEATURES

TOTAL DISTURBED AREA = 11.46 ACRES
EXISTING IMPERVIOUS SURFACE AREA = 7.62 ACRES
EXISTING PERVIOUS SURFACE AREA = 3.84 ACRES
PROPOSED IMPERVIOUS SURFACE AREA = 9.95 ACRES
PROPOSED PERVIOUS SURFACE AREA = 1.51 ACRES
NEW IMPERVIOUS SURFACE AREA (FULL RECONSTRUCT AREA) = 2.33 ACRES

POND TREATMENT VOLUMES PER THE POND GRADING PLAN AND DETAILS AND COON CREEK WATERSHED DISTRICT RECOMMENDATIONS ARE AS FOLLOWS:
INFILTRATION TREATMENT VOLUME (9.6" DEPTH) = 5,484 CF
FILTRATION TREATMENT VOLUME (48-HOUR DRAWDOWN) = 6,872 CF
TOTAL TREATMENT VOLUME = 12,356 CF

LONG TERM OPERATION AND MAINTENANCE

ANOKA COUNTY WILL BE RESPONSIBLE FOR THE LONG TERM OPERATION AND MAINTENANCE OF THE PERMANENT STORMWATER MANAGEMENT SYSTEM.

1440 BUNKER LAKE BOULEVARD
ANDOVER, MN 55304
PHONE: 763-324-3100

PROJECT PERSONNEL AND TRAINING

THIS SWPPP WAS PREPARED BY PERSONNEL THAT ARE CERTIFIED IN THE DESIGN OF CONSTRUCTION SWPPPS. COPIES OF THE CERTIFICATIONS ARE ON FILE WITH MNDOT AND ARE AVAILABLE UPON REQUEST.

PROVIDE A CERTIFIED EROSION CONTROL SUPERVISOR IN GOOD STANDING WHO IS KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES. THE EROSION CONTROL SUPERVISOR WILL WORK WITH THE PROJECT ENGINEER TO OVERSEE 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 PRECONSTRUCITON MEETING. WORK WILL NOT BE ALLOWED TO COMMENCE UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT ENGINEER.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A CERTIFIED EROSION CONTROL SUPERVISOR THAT IS RESPONSIBLE FOR OVERSEEING THE IMPLEMENTATION OF THE SWPPP. THE CONTRACTOR MUST PROVIDE PROOF OF CERTIFICATION AT THE PRECONSTRUCTION MEETING AND WILL NOT BE ALLOWED TO COMMENCE WORK UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT MANAGER.

THE EROSION CONTROL SUPERVISOR IS INCIDENTAL.

PROVIDE AT LEAST ONE CERTIFIED INSTALLER FOR EACH CONTRACTOR OR SUBCONTRACTOR THAT PLACES THE PRODUCTS LISTED IN SPECIFICATION SECTION 2573.3.A.2. 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.

PROJECT CONTACTS

THE PROJECT ENGINEER AND CONTRACTOR ARE RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND INSTALLATION, INSPECTION AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION HAS BEEN FILED. ANOKA COUNTY STAFF ARE ALSO AVAILABLE FOR TECHNICAL ASSISTANCE.

ORGANIZATION	CONTACT	PHONE
MPCA	BRANDON DAHL	651-757-2279
ANOKA COUNTY	NICK DOBDA	763-324-3100
CITY OF COON RAPIDS	TIM HIMMER	763-755-2880
COON CREEK WATERSHED DISTRICT	TIM KELLY	763-755-0975
HDR, INC.	BRETT VOTH	763-591-5400

LOCATION OF SWPPP REQUIREMENTS

THE REQUIRED SWPPP ELEMENTS MAY BE LOCATED IN MANY PLACES WITHIN THE PLAN SET AS WELL AS IN THE SPECIAL PROVISIONS, MNDOT SPEC BOOK (2018 EDITION) OR ON FILE WITH MNDOT. THE NOTES AND TABLE BELOW ARE INTENDED TO BE A QUICK REFERENCE FOR THE CONTRACTOR AND PROJECT ENGINEER TO USE IN THE FIELD. THERE MAY BE ADDITIONAL REQUIRED SWPPP ELEMENTS INCLUDED ON THE PROJECT THAT ARE NOT LISTED ON THIS SHEET.

DESCRIPTION	LOCATION
TEMPORARY EROSION CONTROL MEASURES	SHEETS NO. 166 - 171
PERMANENT EROSION AND SEDIMENT CONTROL MEASURES	SHEETS NO. 172 - 177
DIRECTION OF FLOW	SHEETS NO. 142 - 150
FINAL STABILIZATION	SHEETS NO. 172 - 177
DRAINAGE STRUCTURES	SHEETS NO. 158 - 163
DRAINAGE TABULATIONS	SHEETS NO. 158 - 163
STORM SEWER TABULATIONS	SHEETS NO. 158 - 163
STORM SEWER PROFILE SHEETS	SHEETS NO. 142 - 150 , 154- 157
EROSION AND SEDIMENT CONTROL DETAILS	SHEETS NO. 47 - 53
EROSION CONTROL TABULATION	SHEET NO. 12
TURF ESTABLISHMENT TABULATION	SHEET NO. 12

SITE INSPECTION AND MAINTENANCE

INSPECT THE ENTIRE CONSTRUCTION SITE A MINIMUM OF ONCE EVERY SEVEN DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. INSPECT ALL TEMPORARY AND PERMANENT WATER QUALITY MANAGEMENT, EROSION PREVENTION AND SEDIMENT CONTROL BMPS UNTIL THE SITE HAS UNDERGONE FINAL STABILIZATION AND THE NOT HAS BEEN SUBMITTED. INSPECT CONSTRUCTION SITE VEHICLE EXIT LOCATIONS FOR EVIDENCE OF TRACKING ONTO PAVED SURFACES. INSPECT SURROUNDING PROPERTIES FOR EVIDENCE OF OFF SITE SEDIMENT ACCUMULATION. INSPECT FILTRATION AREAS FOR SIGNS OF SEDIMENT DEPOSITION AND COMPACTION (TO ENSURE THAT EQUIPMENT IS NOT BEING DRIVEN ACROSS THE AREA).

RECORD ALL INSPECTIONS AND MAINTENANCE ACTIVITIES IN WRITING WITHIN 24 HOURS. SUBMIT INSPECTION REPORTS IN A FORMAT THAT IS ACCEPTABLE TO THE PROJECT ENGINEER. INCLUDE THE FOLLOWING IN THE RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY:

A. DATE AND TIME OF INSPECTIONS;
B. NAME OF PERSONS CONDUCTING INSPECTIONS;
C. FINDINGS OF INSPECTION, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS;
D. CORRECTIVE ACTION TAKEN INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES;
E. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCH IN 24 HOURS;
F. DOCUMENTS AND CHANGES MADE TO THE SWPPP.

ENVIRONMENTAL REVIEW

THERE ARE NO STORMWATER MITIGATION MEASURES REQUIRED AS A RESULT OF AN ENVIRONMENTAL, ARCHEOLOGICAL OR AGENCY REVIEW. ALL MITIGATION MEASURES HAVE BEEN ADDRESSED IN THIS PLAN SET OR THE SPECIAL PROVISIONS.

SHEET 1 OF 2

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: MICHAEL W. RYAN LIC. NO. 52690
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 12/31/2019 DATE

DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

HDR
ANOKA COUNTY

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE

GENERAL SWPPP NOTES FOR CONSTRUCTION ACTIVITY

1. THIS PROJECT DOES REQUIRE A NPDES PERMIT. THE CONTRACTOR IS RESPONSIBLE TO COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION STORMWATER PERMIT AT ALL TIMES PER MNDOT SPEC 1717. THE CONTRACTOR WILL DEVELOP A CHAIN OF COMMAND WITH ALL OPERATORS ON THE SITE TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED AND STAY IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE, THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION, AND A NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED TO THE MPCA.

2. THE CONTRACTOR WILL PREPARE A WRITTEN, NOT ORAL, WEEKLY SCHEDULE OF PROPOSED EROSION CONTROL ACTIVITIES FOR THE PROJECT ENGINEERS APPROVAL AS PER MNDOT SPEC. 1717.

3. THE CONTRACTOR WILL COMPLY WITH THE REQUIREMENTS REGARDING POLLUTION PREVENTION MANAGEMENT DURING CONSTRUCTION, WHICH WILL INCLUDE, BUT IS NOT LIMITED TO, PROVIDING:
   - A. CONCRETE WASHOUT AREAS FOR USE BY ALL SUBCONTRACTORS AND MNDOT PERSONNEL. LOCATION OF WASHOUT AREAS MUST BE IDENTIFIED BY SIGNAGE AND MUST BE AT LEAST 200' FROM SITE PLAN REQUIREMENT AREAS OR ENVIRONMENTALLY SENSITIVE AREAS, AND UTILIZE A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER THAT PREVENTS RUNOFF ONTO ADJACENT SOILS. AN ENGINEERED COLLECTION SYSTEM CAN ALSO BE USED IF IT IS APPROVED BY THE PROJECT ENGINEER.
   - B. SOLID WASTE COLLECTION AND REMOVAL.
   - C. SECONDARY CONTAINMENT.
   - D. SECURED HAZARDOUS WASTE STORAGE CONTAINERS.
   - F. CHEMICAL SPILL KITS.
   - G. PORTABLE RESTROOM FACILITIES THAT ARE ANCHORED TO PREVENT TIPPING.

4. CHEMICALS MUST BE KEPT IN A SECURE STORAGE AREA WHEN NOT IN USE. CHEMICAL STORAGE CONTAINERS MUST HAVE SECONDARY CONTAINMENT WHEN BEING USED OR STORED ON THE PROJECT SITE. CHEMICAL SPILLS OF ANY KIND (OIL, FUEL, FERTILIZER, ETC.) MUST BE CLEANED UP AND REMOVED FROM THE SITE IMMEDIATELY. THE CONTRACTOR MUST HAVE A SPILL KIT ON SITE AT ALL TIMES.

5. THE CONTRACTOR IS RESPONSIBLE FOR CREATING AND FOLLOWING A WRITTEN DISPOSAL PLAN FOR ALL WASTE MATERIALS. THE PLAN WILL INCLUDE HOW THE MATERIAL WILL BE DISPOSED OF AND THE LOCATION OF THE DISPOSAL SITE. THE PLAN WILL BE SUBMITTED TO THE ENGINEER.

6. BURNING OF ANY MATERIAL IS NOT ALLOWED WITHIN PROJECT BOUNDARY.

7. THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS WILL BE PLACED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND TO CAPTURE SEDIMENT ON SITE. ALL EROSION CONTROL MEASURES WILL BE IN PLACE PRIOR TO COMMENCEMENT OF ANY REMOVAL WORK AND/OR GROUND DISTURBING ACTIVITIES AND WILL BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION HAS BEEN ELIMINATED.

8. SEDIMENT CONTROL DEVICES MUST BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN. SEDIMENT CONTROL DEVICES INCLUDE, BUT ARE NOT LIMITED TO:
   - A. PERIMETER CONTROL SHALL BE LOCATED ON THE CONTOUR TO CAPTURE OVERLAND, LOW-VELOCITY SHEET FLOWS DOWN GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS WITH THE BMP J-HOOKED AT A MAXIMUM OF 100 FOOT INTERVALS AND SHALL CONTAIN NO MORE THAN 1/4 ACRE OF DRAINAGE AREA.
   - B. DITCH CHECKS WILL BE PLACED AS INDICATED ON THE PLANS DURING ALL PHASES OF CONSTRUCTION.
     1. TEMPORARY DITCH CHECKS WILL CONSIST OF USING ROCK DITCH CHECKS, BIOLOGS, AND ROCK WEEPERS IN FRONT OF CULVERT INLETS. IN LIEU OF REMOVING TEMPORARY DITCH CHECKS, THE ROCK MAY BE PUSHED INTO THE GROUND.
     2. FILTER LOGS WILL BE PLACED DURING PERMANENT TURF ESTABLISHMENT AT THE INTERVALS IDENTIFIED IN THE PLAN.
   - C. SEDIMENT DAMAGE FROM STOCKPILES WILL BE MINIMIZED BY PLACING A ROW OF SILT FENCE A MINIMUM 5 FEET FROM THE TOE. IF THERE IS NOT ADEQUATE PROJECT AREA TO PLACE THE SILT FENCE MORE THAN 5 FEET FROM THE TOE OF THE SLOPE THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE FOR APPROVAL BY THE PROJECT ENGINEER.

9. STORM SEWER INLETS WILL BE PROTECTED AT ALL TIMES WITH THE APPROPRIATE INLET PROTECTION FOR EACH SPECIFIC PHASE OF CONSTRUCTION. INLET PROTECTION DEVICES MAY NEED TO BE PLACED MULTIPLE TIMES IN THE SAME LOCATION OVER THE LIFE OF THE CONTRACT. INLET PROTECTION DEVICES WILL BE PAID FOR ONCE PER INLET REGARDLESS OF THE NUMBER OF TIMES THE BMP IS PLACED. ALL STORM SEWER INLET PROTECTION DEVICES WILL BE KEPT IN GOOD FUNCTIONAL CONDITION AT ALL TIMES. IF THE PROJECT ENGINEER DEEMS AN INLET PROTECTION DEVICE TO BE NONFUNCTIONAL, IN POOR CONDITION, INEFFECTIVE, OR NOT APPROPRIATE FOR THE CURRENT CONSTRUCTION ACTIVITIES IT WILL BE REPLACED WITH A SUITABLE ALTERNATIVE AT NO COST TO MNDOT.

10. THE CONTRACTOR WILL PLACE CONSTRUCTION EXITS, AS NECESSARY, TO PREVENT TRACKING OF SEDIMENT ONTO PAVED SURFACES AND IN COMPLIANCE WITH PART IV OF THE NPDES PERMIT. CONSTRUCTION EXITS WILL BE SUFFICIENTLY SIZED AND MAINTAINED TO PREVENT TRACK OUT. TYPE 5 MULCH (SLASH MULCH) OR AN APPROVED ENGINEERED PRODUCT WILL BE ALLOWED FOR CONSTRUCTION EXITS IN LIEU OF CRUSHED ROCK.

11. THE CONTRACTOR MUST USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT DISCHARGE OR PLACEMENT OF BITUMINOUS GRINDING, CUTTINGS, MILLINGS, AND OTHER BITUMINOUS WASTES FROM AREAS OF EXISTING OR FUTURE VEGETATED SOILS AND ALL WATER CONVEYANCE SYSTEMS, INCLUDING INLETS.

12. THE CONTRACTOR MUST USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT CONCRETE DUST, PARTICLES, SAW CUT SLURRY, PLANNING WASTE AND OTHER CONRETE WASTES FROM LEAVING MNDOT RIGHT OF WAY, DEPOSITING IN EXISITING OR FUTURE VEGETATED AREAS, OR ENTERING STORMWATER CONVEYANCE SYSTEMS, INCLUDING INLETS AND CURB FLOW LINES.

13. DITCHES AND EXPOSED SOILS MUST BE KEPT IN AN EVEN ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES AND BLANKETS.

14. ALL EXPOSED SOIL AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED NO MORE THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THAT PORTION OF THE SITE THAT HAS BEEN TEMPORARILY CEASED. IN MANY INSTANCES, THIS WILL REQUIRE STABILIZATION TO OCCUR MORE THAN ONCE DURING ROUGH GRADING. RAPID STABILIZATION METHOD 3 OR 4 WILL BE USED TO PROVIDE TEMPORARY COVER IN THESE AREAS AS APPROPRIATE.

15. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH THAT DRAINS WATER FROM THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE CONSTRUCTION SITE, MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE OR POINT OF DISCHARGE TO ANY SURFACE WATER. STABILIZATION MUST OCCUR WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER, EXISTING GUTTER, STORM SEWER INLET, DRAINAGE DITCH, OR OTHER STORMWATER CONVEYANCE SYSTEM ACCORDING TO MNDOT SPEC 1717. THE REMAINDER OF THE DITCH MUST BE STABLILIZED WITHIN 7 DAYS OF CONNECTING TO THE SURFACE WATER. PERMANENT EROSION CONTROL BLANKET WILL BE USED TO STABILIZE THESE AREAS. DISC ANCHORED MULCH AND HYDRAULIC SOIL STABILIZERS ARE NOT ALLOWED FOR PERMANENT DITCH STABILIZATION.

16. OUTLETS INTO SURFACE WATERS SHALL BE STABILIZED WITH ENERGY DISSIPATION WITHIN 24 HOURS OF BEING CONSTRUCTED.

17. ALL EXPOSED SOIL AREAS WILL BE STABILIZED PRIOR TO THE ONSET OF WINTER. ANY WORK STILL BEING PERFORMED WILL BE SNOW MULCHED, SEEDED, OR BLANKETED WITHIN THE TIME FRAMES LISTED IN THE MPCA'S GENERAL NPDES CONSTRUCTION STORMWATER PERMIT.

18. ALL TOPSOIL BERMS SHALL BE STABILIZED WITH HYDROMULCH.

19. THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING INSPECTION AND MAINTENANCE REQUIREMENTS:
   - A. A SILT FENCE MUST BE REPAIRED, REPLACED OR SUPPLEMENTED WHEN IT BECOME NON-FUNCTIONAL OR 1/2 THE HEIGHT OF THE SILT FENCE. REPAIRS MUST BE MADE WITHIN 24 HOURS OF DISCOVERY.
   - B. INLET PROTECTION DEVICES SHOULD BE REPAIRED WHEN THEY BECOME NON-FUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT AND/OR DEPTH OF THE DEVICE.
   - C. TEMPORARY SEDIMENT BASIN MUST HAVE THE SEDIMENT REMOVED ONCE THE SEDIMENT HAS REACHED 1/2 THE STORAGE VOLUME WITHINN 72 HOURS OF DISCOVERY.
   - D. TRACKED SEDIMENT MUST BE REMOVED WITHIN 24 HOURS OF DISCOVERY OF TRACKING ONTO PAVED SURFACES.
   - E. ALL OTHER NONFUNCTIONAL BMPS MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WITHIN 24 HOURS OF DISCOVERY.
   - F. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL BMPS UNTIL WORK HAS BEEN COMPLETED, SITE HAS GONE UNDER FINAL STABILIZATION, AND THE NOTICE OF TERMINATION HAS BEEN SUBMITTED TO THE MPCA IN ACCORDANCE WITH PART II.B.5 OF THE CONSTRUCTION GENERAL PERMIT.

20. IF SEDIMENT DEPOSITS IN A WATER OF THE STATE, THE MATERIAL MUST BE REMOVED WITHIN 7 DAYS.

21. PAVEMENT SURFACES WILL BE SWEPT WITHIN 24 HOURS OF DISCOVERY OF SEDIMENT OR TRACKING ONTO PAVEMENT THAT DRAINS TO CURB, INLETS, DITCHES, OR PONDS. PAVEMENT WILL BE LIGHTLY WETTED PRIOR TO SWEEPING.(INCIDENTAL)

22. AMEND THE SWPPP AND DOCUMENT ANY AND ALL CHANGES TO THE SWPPP AND ASSOCIATED PLAN SHEETS IN A TIMELY MANNER. STORE THE SWPPP AND ALL AMENDMENTS ON SITE AT ALL TIMES.

FILTRATION CONSTRUCTION NOTES

1. DO NOT STOCKPILE MATERIALS OR PARK EQUIPMENT OR VEHICLES IN A PROPOSED OR CONSTRUCTED INFILTRATION/FILTRATION AREA. STAKE OFF OR OTHERWISE MARK OFF FILTRATION AREAS TO PREVENT HEAVY CONSTRUCTION VEHICLES AND EQUIPMENT FROM DRIVING THROUGH THEM.
2. DO NOT PLACE FILTER MATERIAL IN FILTRATION BASINS UNTIL ALL UPGRADIENT LAND DISTURBANCE ACTIVITY HAS BEEN COMPLETED AND THE DRAINAGE AREA HAS BEEN STABILIZED. PROVIDE RIGOROUS EROSION PREVENTION AND SEDIMENT CONTROL BMPS, INCLUDING MAINTENANCE OF THEM, IF THE FILTRATION AREA MUST BE COMPLETELY EXCAVATED PRIOR TO COMPLETION OF GROUND DISCTURBING ACTIVITIES.
3. INSTALL SEDIMENT CONTROL BMPS AT THE TOE OF THE ADJACENT SLOPE IMMEDIATELY AFTER PLACEMENT OF FILTER MATERIAL.
4. SUBMIT A SITE MANAGEMENT PLAN TO THE ENGINEER FOR THE CONSTRUCTION OF FILTRATION AREAS.
5. STABILIZE SIDE SLOPES PRIOR TO PLACING ANY FILTER MATERIAL IN THE BOTTOM OF THE FILTRATION AREA.
6. DO NOT DRAIN TURBID OR SEDIMENT LADEN WATER TO THE FILTRATION AREA.
7. USE ONLY LOW IMPACT TRACKED VEHICLES WITHIN FILTRATION AREAS.
8. THE CONTRACTOR MAY NOT DRIVE ANY EQUIPMENT ON FINISHED FILTRATION AREAS OR ADJACENT SIDE SLOPES. RESTORE DISTURBED FILTRATION AREAS AND ADJACENT SIDE SLOPES TO PRE DISTURBANCE CONDITIONS WITHIN 24 HOURS. ANY RUTS OR DAMAGED TURF THAT COULD CREATE SEDIMENT DISCHARGE TO FILTRATION AREAS MUST BE REPAIRED WITHIN 24 HOURS. SUBSOIL THE FILTRATION AREA TO REMOVE ANY COMPACTION CAUSED BY VEHICLE TRAFFIC.
9. EXCAVATE ANY SEDIMENT THAT WASHES INTO FILTRATION AREAS. REMOVE AND REPLACE ANY AMENDED TOPSOIL THAT HAS SEDIMENT DEPOSITS VISIBLE AT THE SURFACE.
10. REPORT ANY SIGNS OF HIGH WATER TABLE OR COMPACTION OF THE IN PLACE SOILS TO THE ENGINEER.

DEWATERING

EXCAVATION AND CONSTRUCTION ACTIVITIES WILL OCCUR ABOVE THE OBSERVED WATER TABLE DEPTH. THEREFORE, NO DEWATERING IS ANTICIPATED AS PART OF PROJECT CONSTRUCTION. IF DEWATERING BECOMES REQUIRED TO FACILITATE CONSTRUCTION, THE CONTRACTOR SHALL DEVELOP A DEWATERING PLAN IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. IF DEWATERING BECOMES REQUIRED, THE DEWATERING PLAN MUST BE SUBMITTED TO AND APPROVED BY COON CREEK WATERSHED DISTRICT PRIOR TO THE START OF DEWATERING. DEWATERING SHALL BE INCIDENTAL IF DEEMED NECESSARY BY THE ENGINEER.

SOIL & EROSION CONTROL SCHEDULE

THE CONTRACTOR WILL PREPARE A WRITTEN, WEEKLY SCHEDULE OF PROPOSED EROSION CONTROL ACTIVITIES FOR THE PROJECT ENGINEERS APPROVAL AS PER MNDOT SPEC. 1717.

THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS WILL BE PLACED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND TO CAPTURE SEDIMENT ON SITE. SEDIMENT CONTROL DEVICES WILL BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN. ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES WILL REMAIN IN PLACE AND WILL BE MAINTAINED UNTIL THE POTENTIAL FOR UP GRADIENT EROSION HAS BEEN ELIMINATED.

FILTRATION AREAS WILL NOT BE EXCAVATED UNTIL ALL UP GRADIENT LAND DISTURBANCE ACTIVITY HAS BEEN COMPLETED AND THE DRAINAGE AREA HAS BEEN STABILIZED. SIDE SLOPES WILL BE STABILIZED PRIOR TO PLACING ANY AMENDED TOPSOIL IN THE BOTTOM OF THE FILTRATION AREA.

ALL EXPOSED SOIL AREAS WILL BE TEMPORARILY OR PERMANENTLY STABILIZED NO MORE THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THAT PORTION OF THE SITE THAT HAS BEEN TEMPORARILY OR PERMANENTLY CEASED.

SHEET 2 OF 2

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: MICHAEL W. RYAN LIC. NO. 52690

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 12/31/2019 DATE

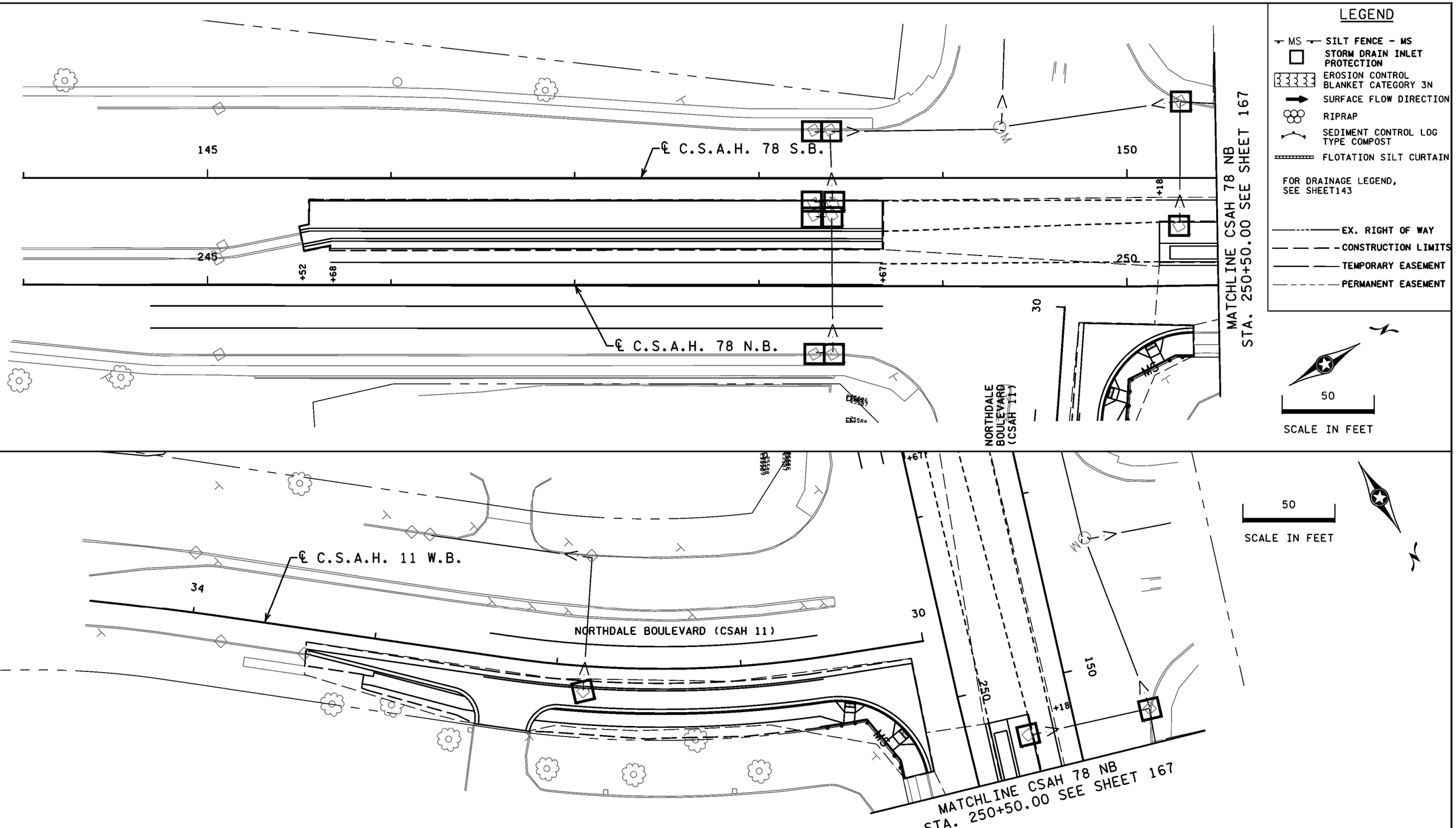
DRAWN BY: MWR
DESIGNED BY: MWR
CHECKED BY: BAV

HDR

ANOKA COUNTY

STORMWATER POLLUTION PREVENTION PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY:	NJL
DESIGNED BY:	GEB
CHECKED BY:	BAV

HDR

ANOKA COUNTY

EROSION CONTROL PLAN

SHEET NO.166 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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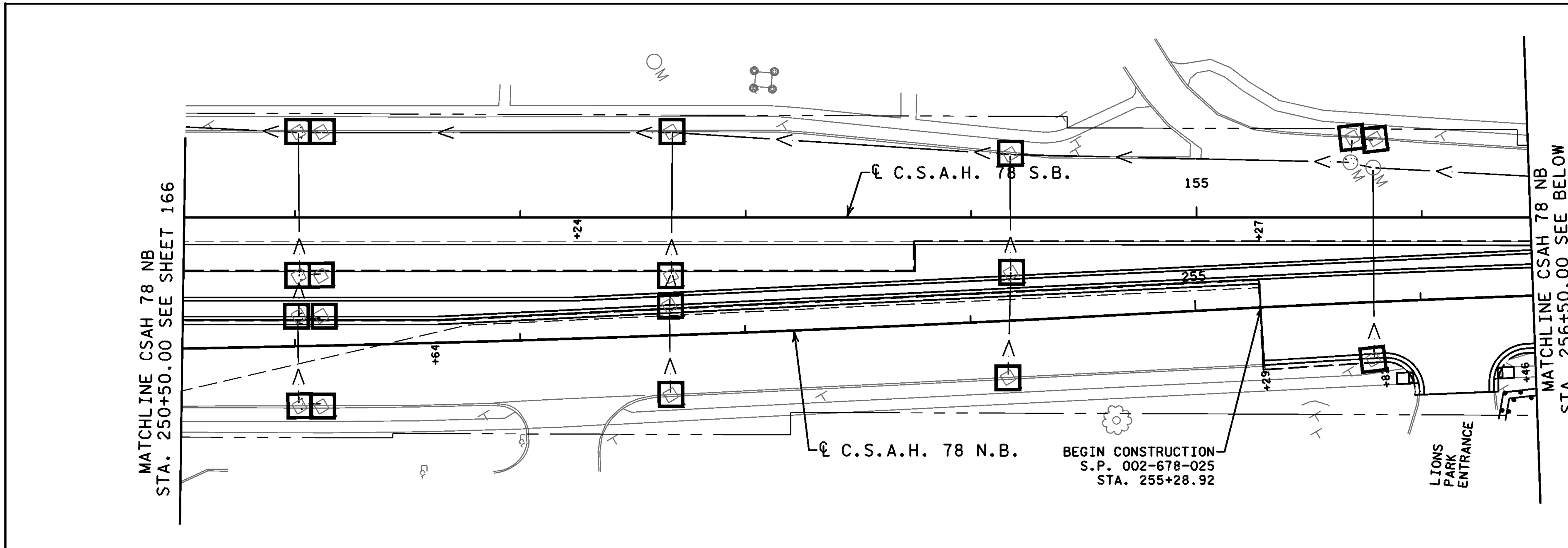

LEGEND

- MS — SILT FENCE - MS
- STORM DRAIN INLET PROTECTION
- EROSION CONTROL BLANKET CATEGORY 3N
- SURFACE FLOW DIRECTION
- RIPRAP
- SEDIMENT CONTROL LOG TYPE COMPOST
- FLOTATION SILT CURTAIN

FOR DRAINAGE LEGEND, SEE SHEET143

- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

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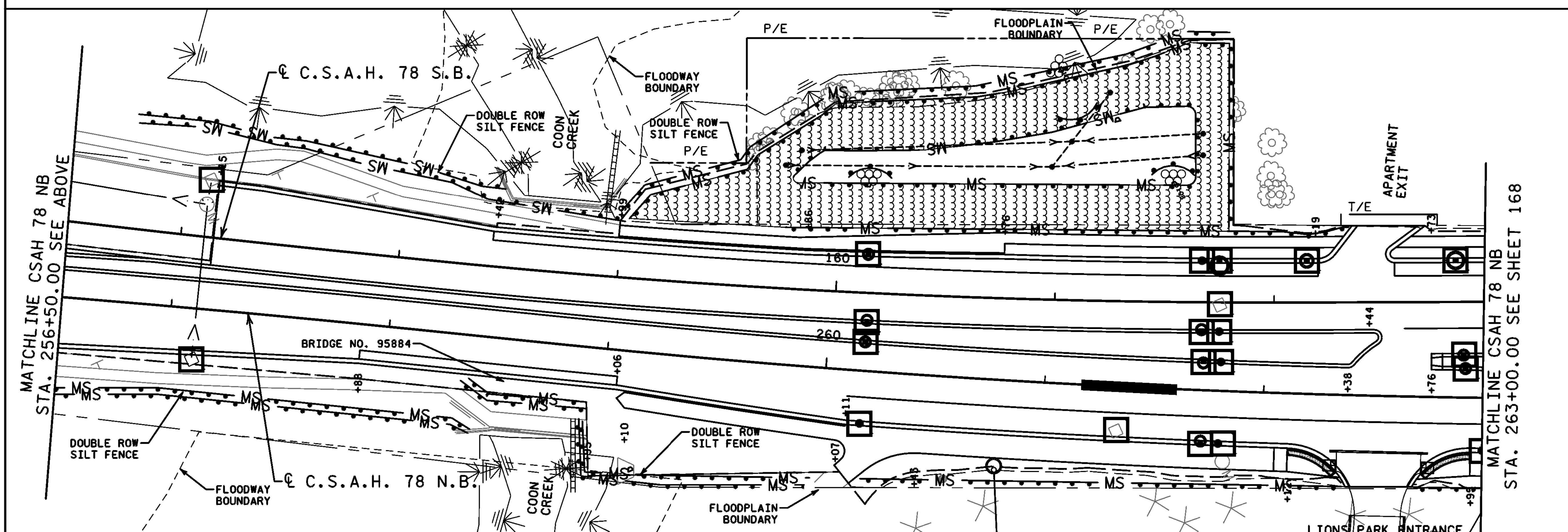

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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 12/31/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR ANOKA COUNTY

EROSION CONTROL PLAN

SHEET NO. 167 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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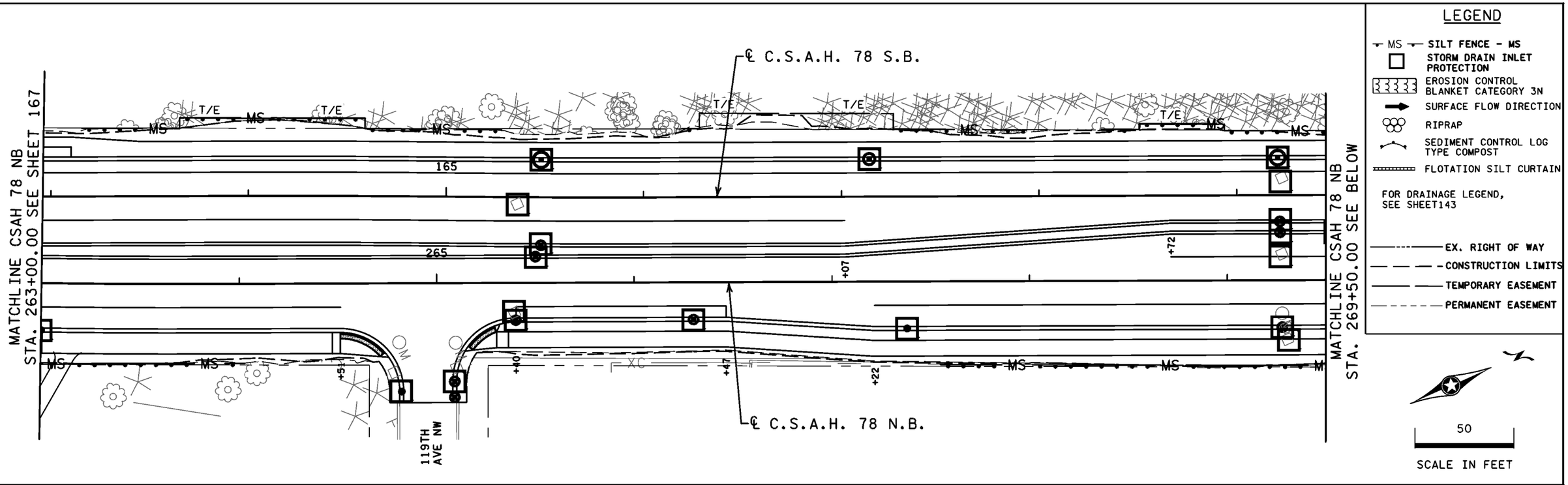

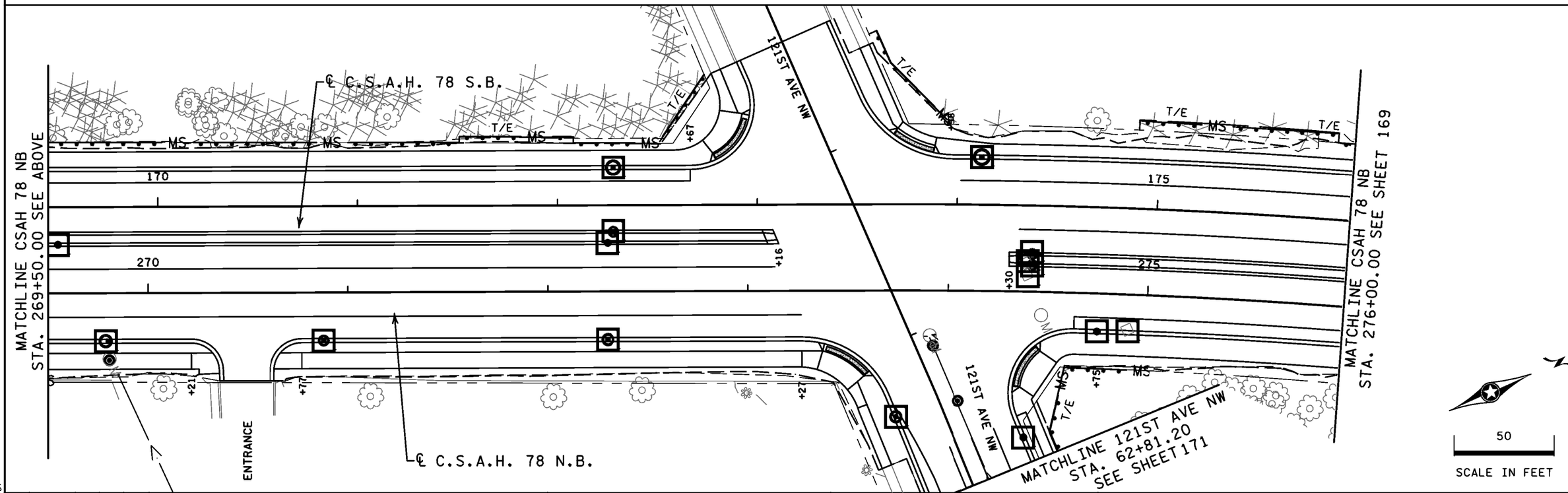

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LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

EROSION CONTROL PLAN

SHEET NO. 168 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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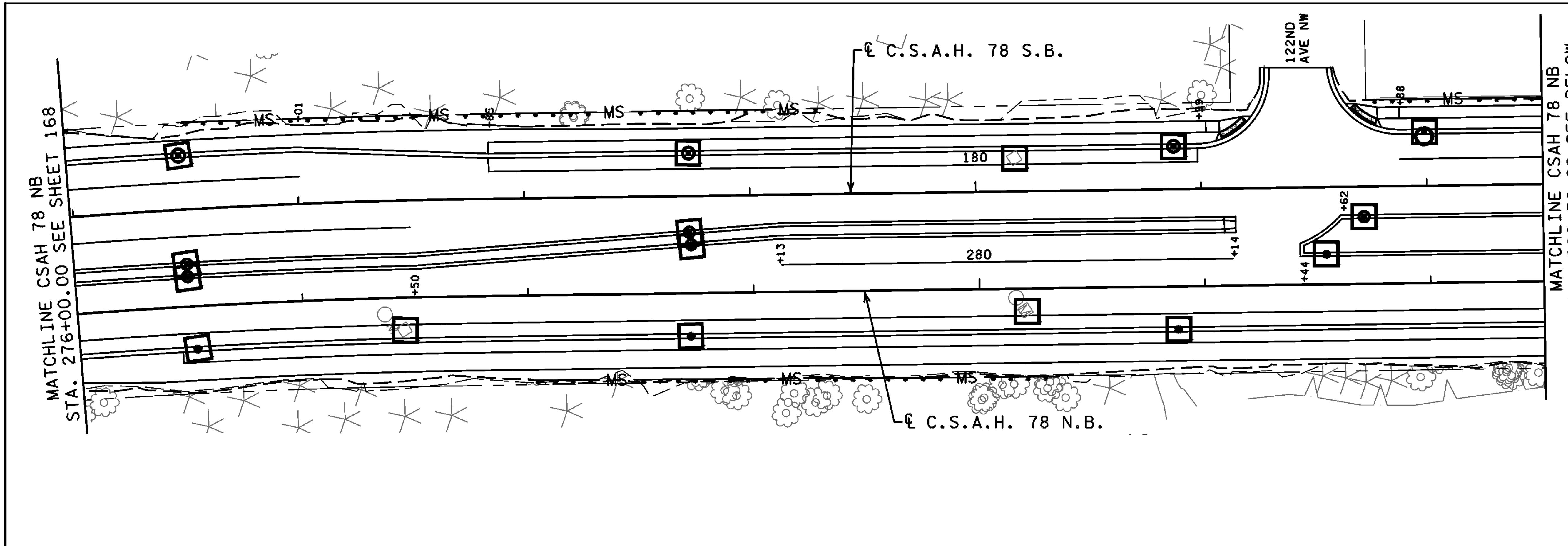
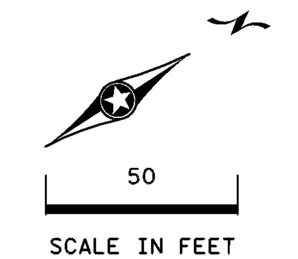


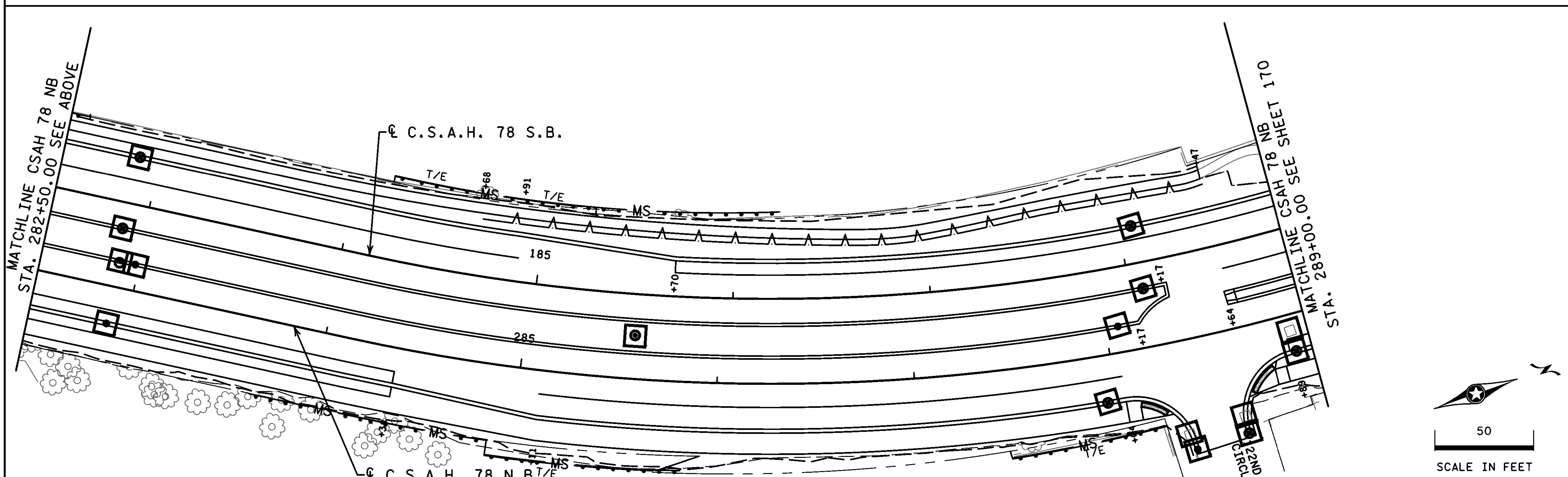
LEGEND

- MS — SILT FENCE - MS
- STORM DRAIN INLET PROTECTION
- EROSION CONTROL BLANKET CATEGORY 3N
- SURFACE FLOW DIRECTION
- RIPRAP
- SEDIMENT CONTROL LOG TYPE COMPOST
- FLOTATION SILT CURTAIN

FOR DRAINAGE LEGEND, SEE SHEET143

- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT





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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

EROSION CONTROL PLAN

SHEET NO. 169 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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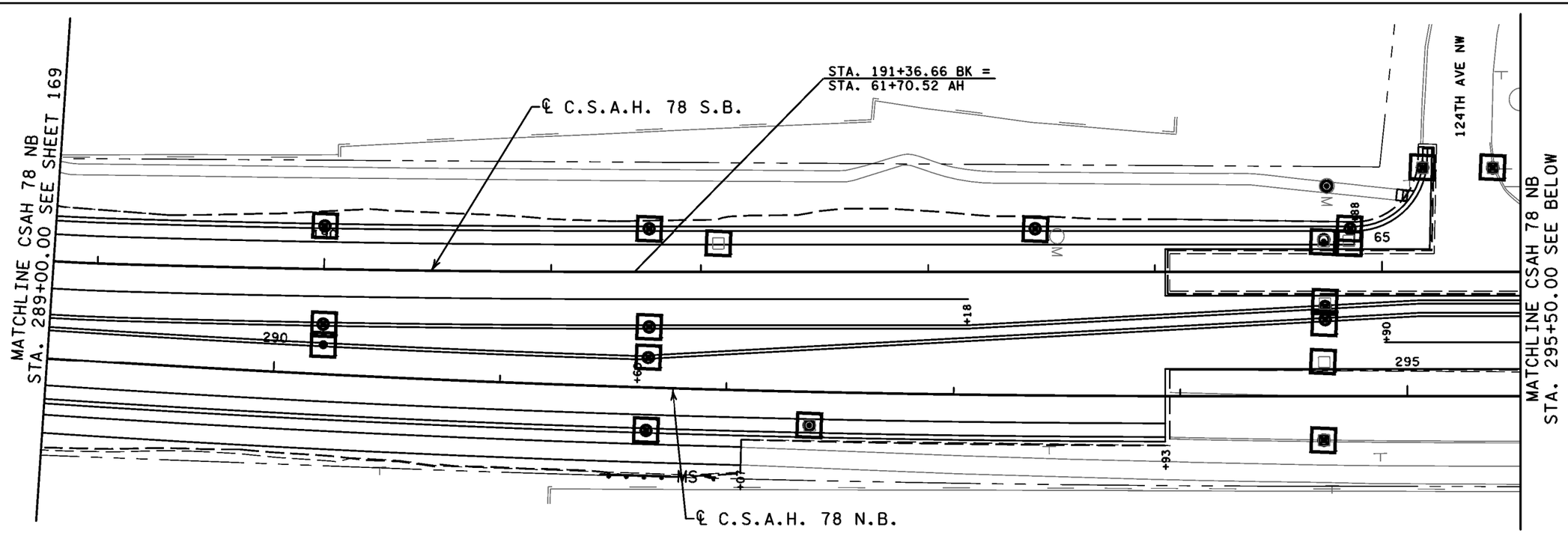

LEGEND

- MS — SILT FENCE - MS
- STORM DRAIN INLET PROTECTION
- EROSION CONTROL BLANKET CATEGORY 3N
- SURFACE FLOW DIRECTION
- RIPRAP
- SEDIMENT CONTROL LOG TYPE COMPOST
- FLOTATION SILT CURTAIN

FOR DRAINAGE LEGEND, SEE SHEET143

- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

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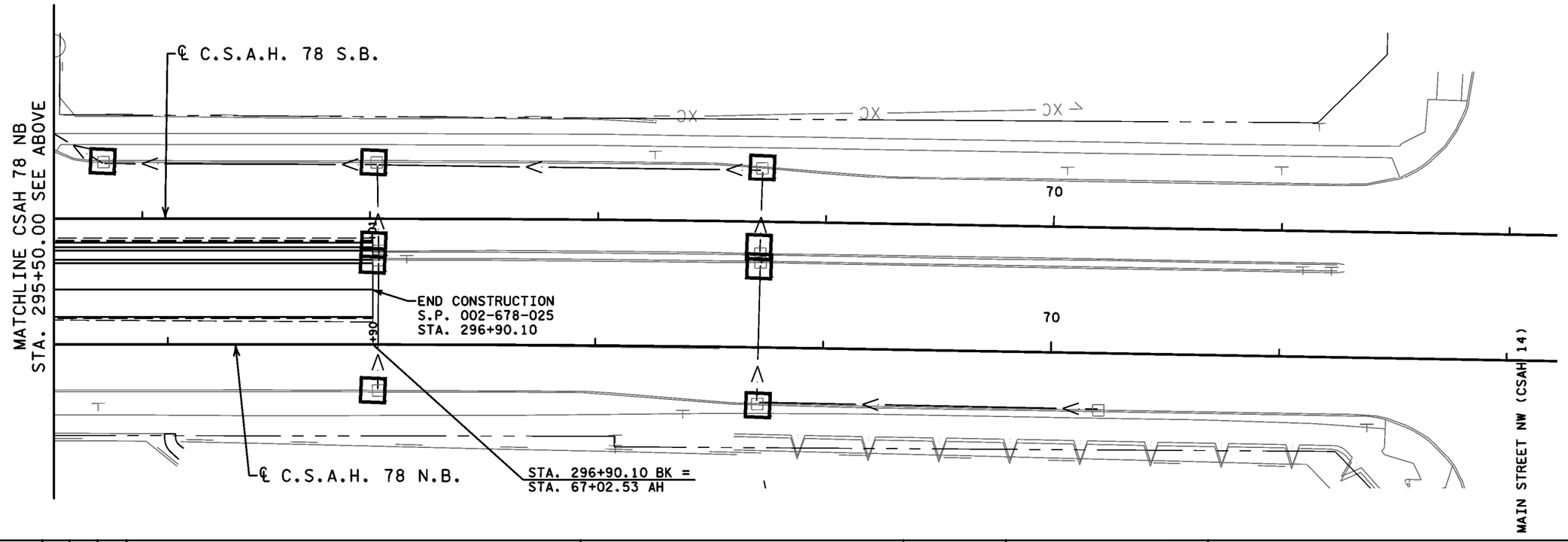

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SCALE IN FEET

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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: _____ 11/22/2019

LICENSED PROFESSIONAL ENGINEER — DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

EROSION CONTROL PLAN

SHEET NO. 170 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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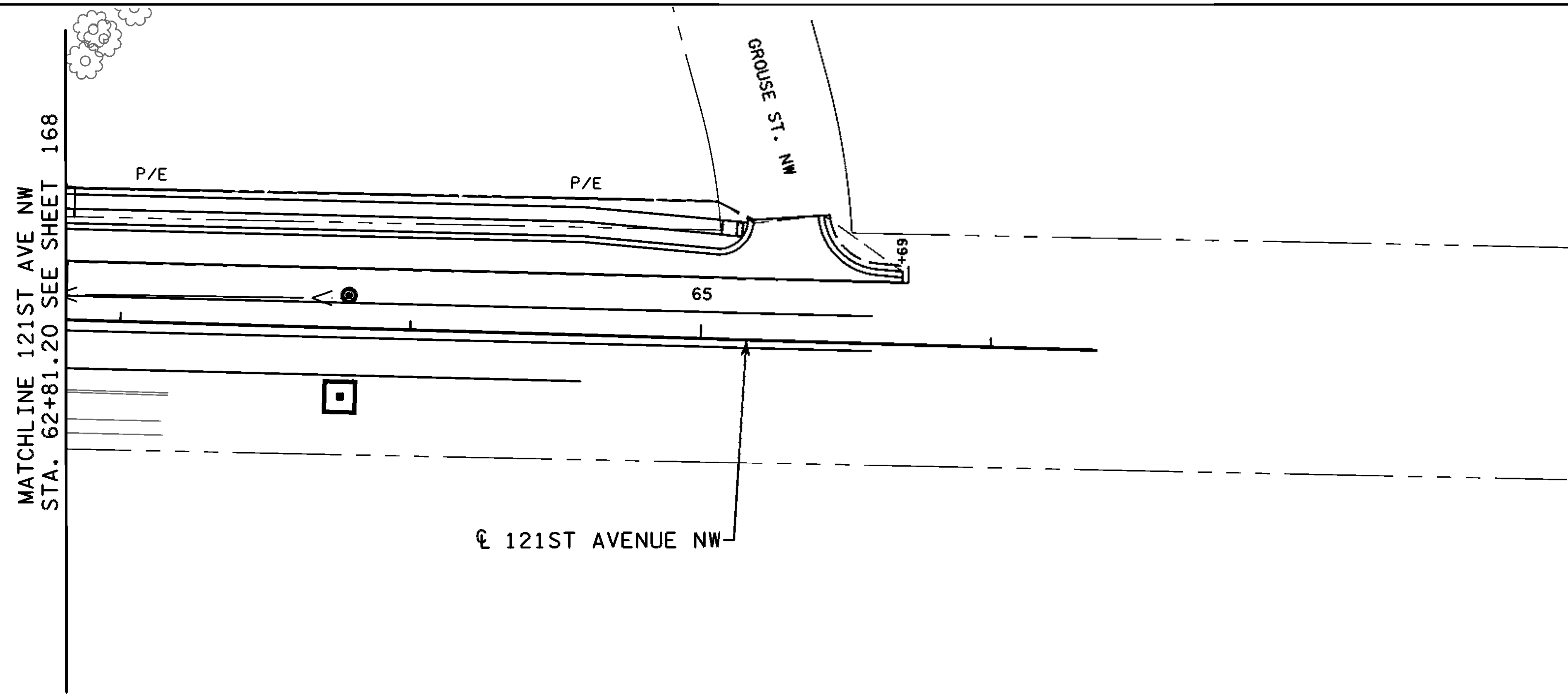

LEGEND

- MS — SILT FENCE - MS
- STORM DRAIN INLET PROTECTION
- EROSION CONTROL BLANKET CATEGORY 3N
- SURFACE FLOW DIRECTION
- RIPRAP
- SEDIMENT CONTROL LOG TYPE COMPOST
- FLOTATION SILT CURTAIN

FOR DRAINAGE LEGEND, SEE SHEET143

- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT

N

50

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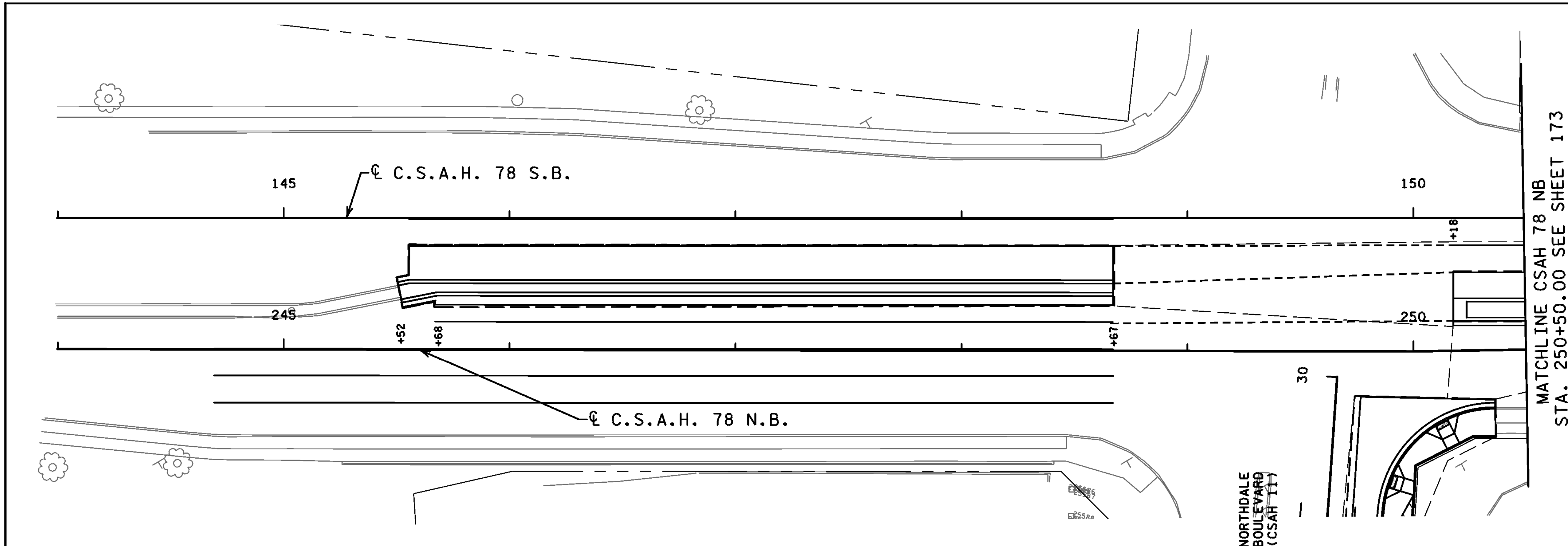
DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR

ANOKA COUNTY

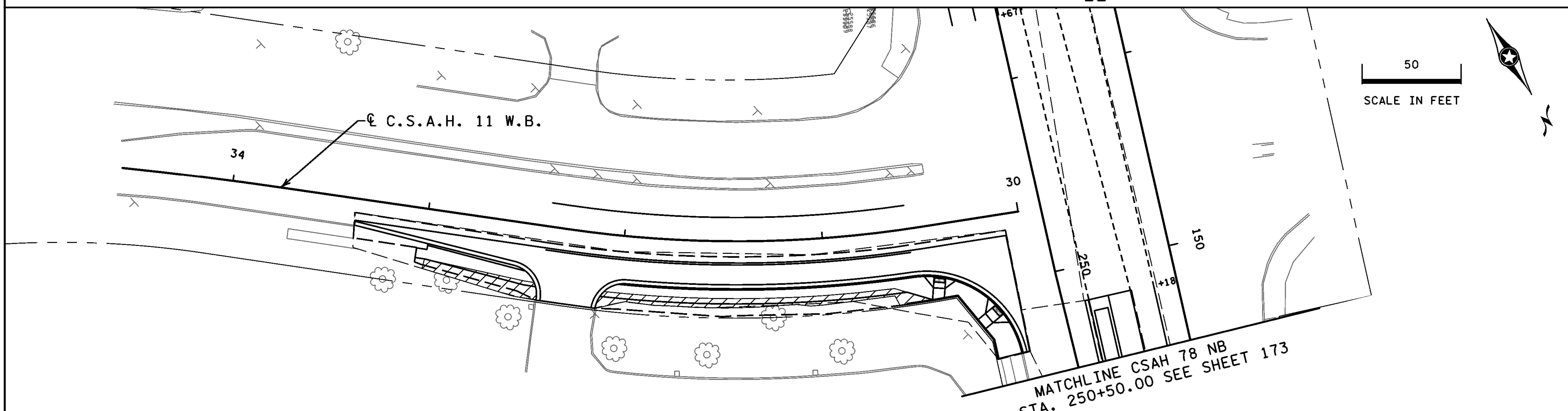
EROSION CONTROL PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



LEGEND

- SEED MIX 25-151 FERTILIZER TYPE 3, 22-5-10 @ 350 LBS/ACRE
- SODDING TYPE LAWN FERTILIZER TYPE 3, 22-5-10 @ 200 LBS/ACRE
- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- PERMANENT EASEMENT



NO	DATE	BY	CKD	APPR	REVISION

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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR — ANOKA COUNTY

TURF ESTABLISHMENT PLAN

SHEET NO. 172 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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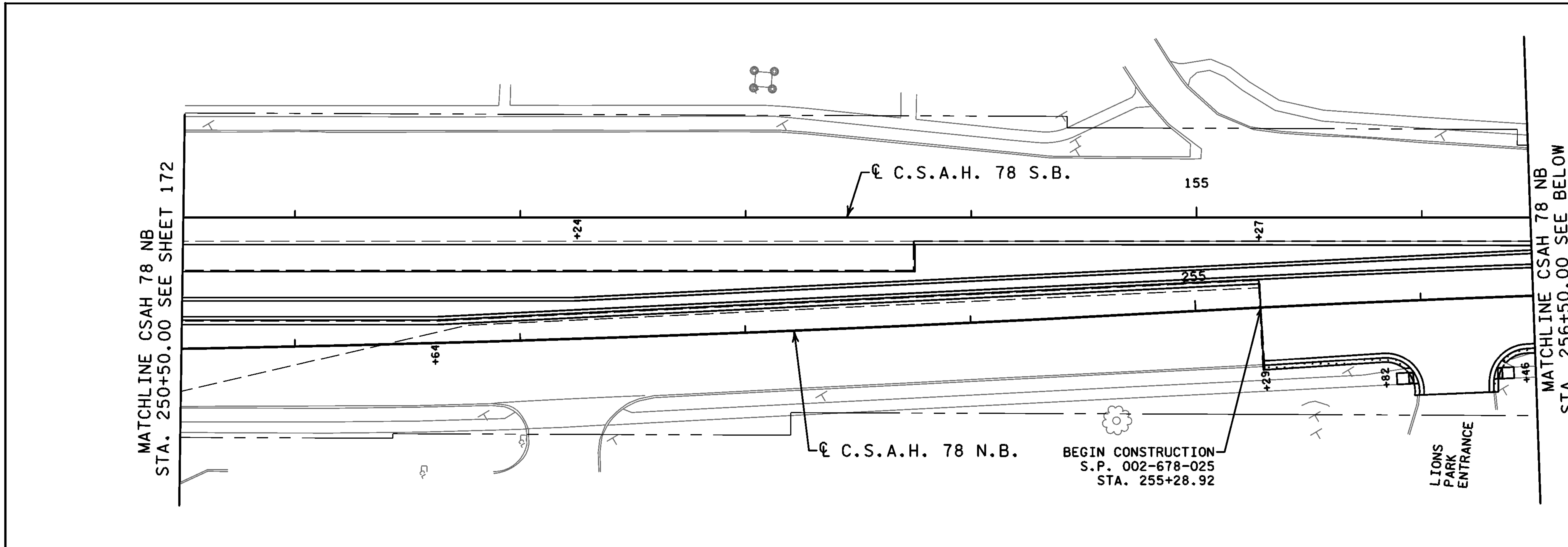
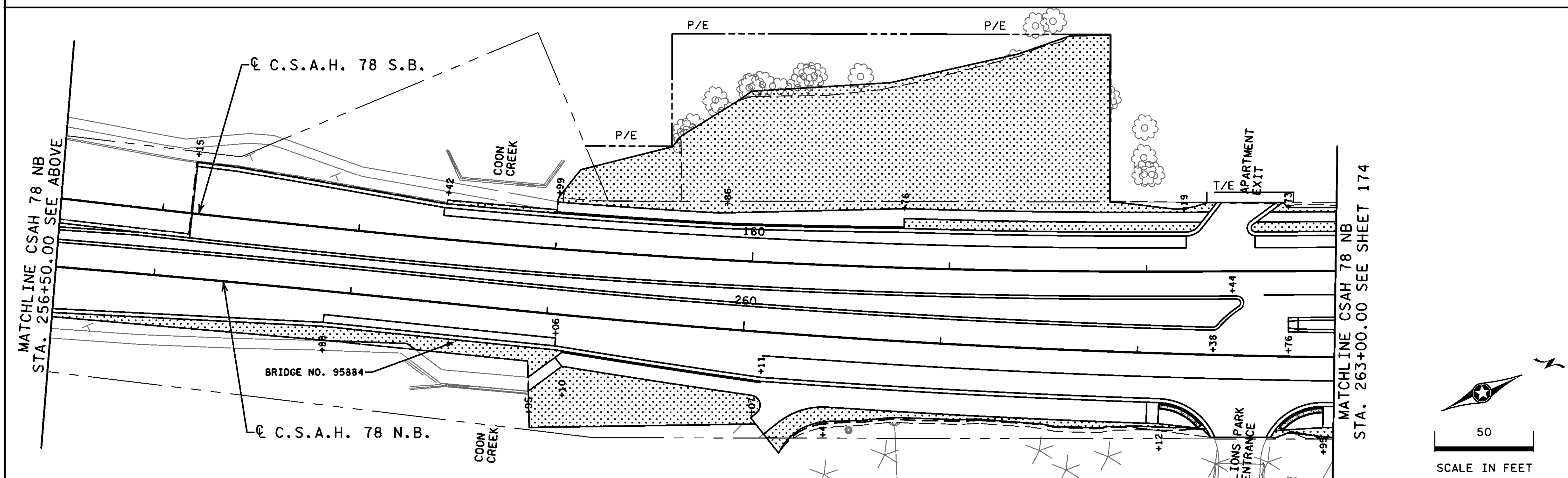


LEGEND

SEED MIX 25-151
FERTILIZER TYPE 3,
22-5-10 @ 350 LBS/ACRE

SODDING TYPE LAWN
FERTILIZER TYPE 3,
22-5-10 @ 200 LBS/ACRE

EX. RIGHT OF WAY
CONSTRUCTION LIMITS
TEMPORARY EASEMENT
PERMANENT EASEMENT



NO	DATE	BY	CKD	APPR	REVISION

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NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: NJL
DESIGNED BY: GEB
CHECKED BY: BAV

HDR
ANOKA COUNTY

TURF ESTABLISHMENT PLAN

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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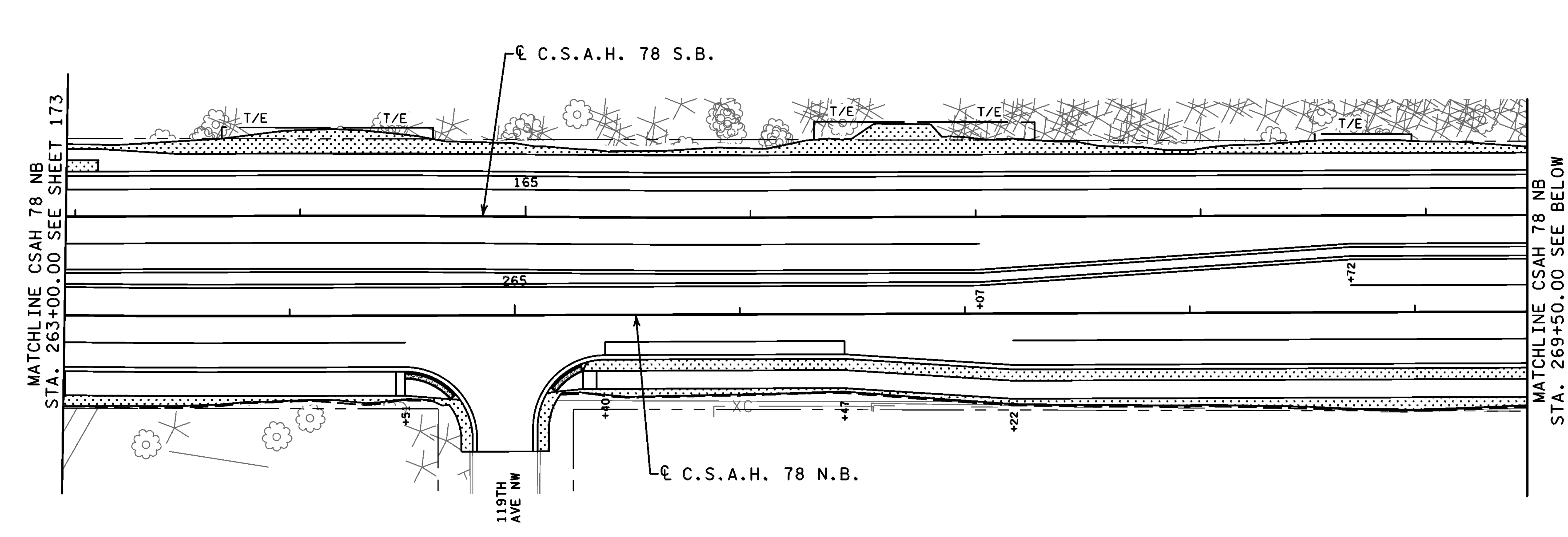


LEGEND

SEED MIX 25-151
FERTILIZER TYPE 3,
22-5-10 @ 350 LBS/ACRE

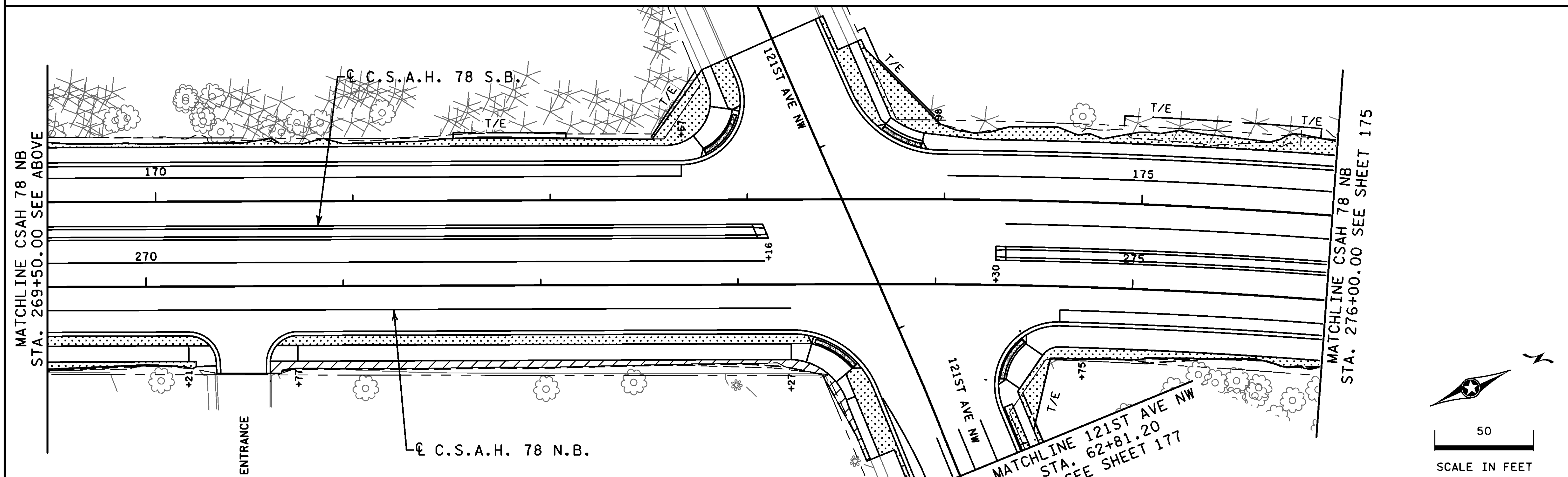
SODDING TYPE LAWN
FERTILIZER TYPE 3,
22-5-10 @ 200 LBS/ACRE

EX. RIGHT OF WAY

CONSTRUCTION LIMITS

TEMPORARY EASEMENT

PERMANENT EASEMENT



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TURF ESTABLISHMENT PLAN

SHEET NO. 174 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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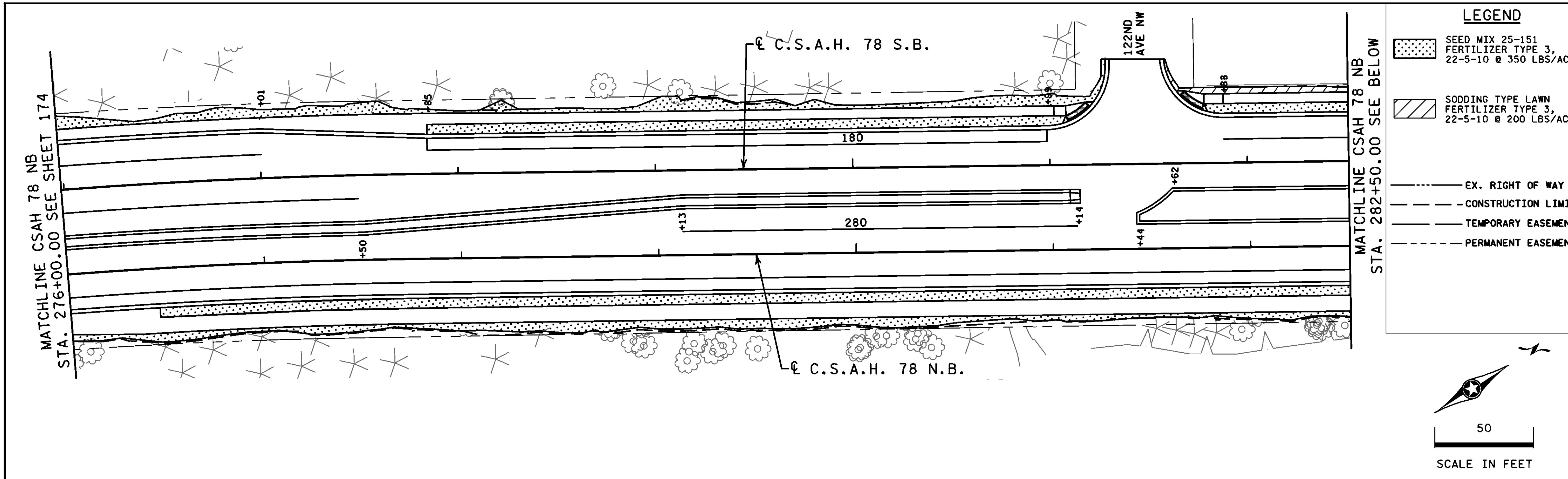

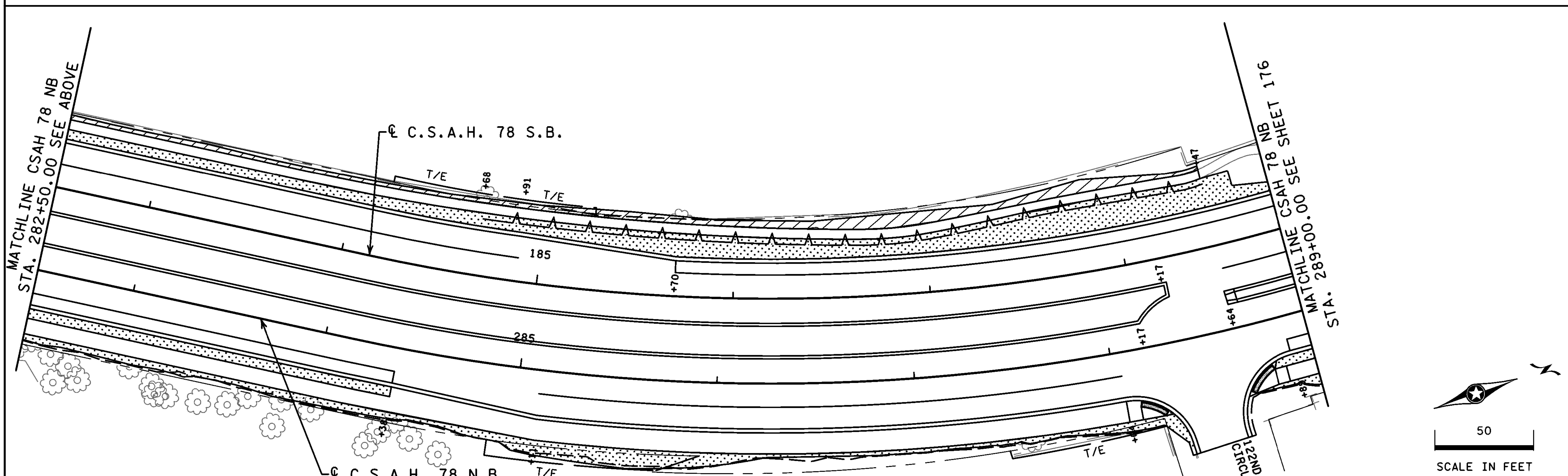

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HDR — ANOKA COUNTY

TURF ESTABLISHMENT PLAN

SHEET NO. 175 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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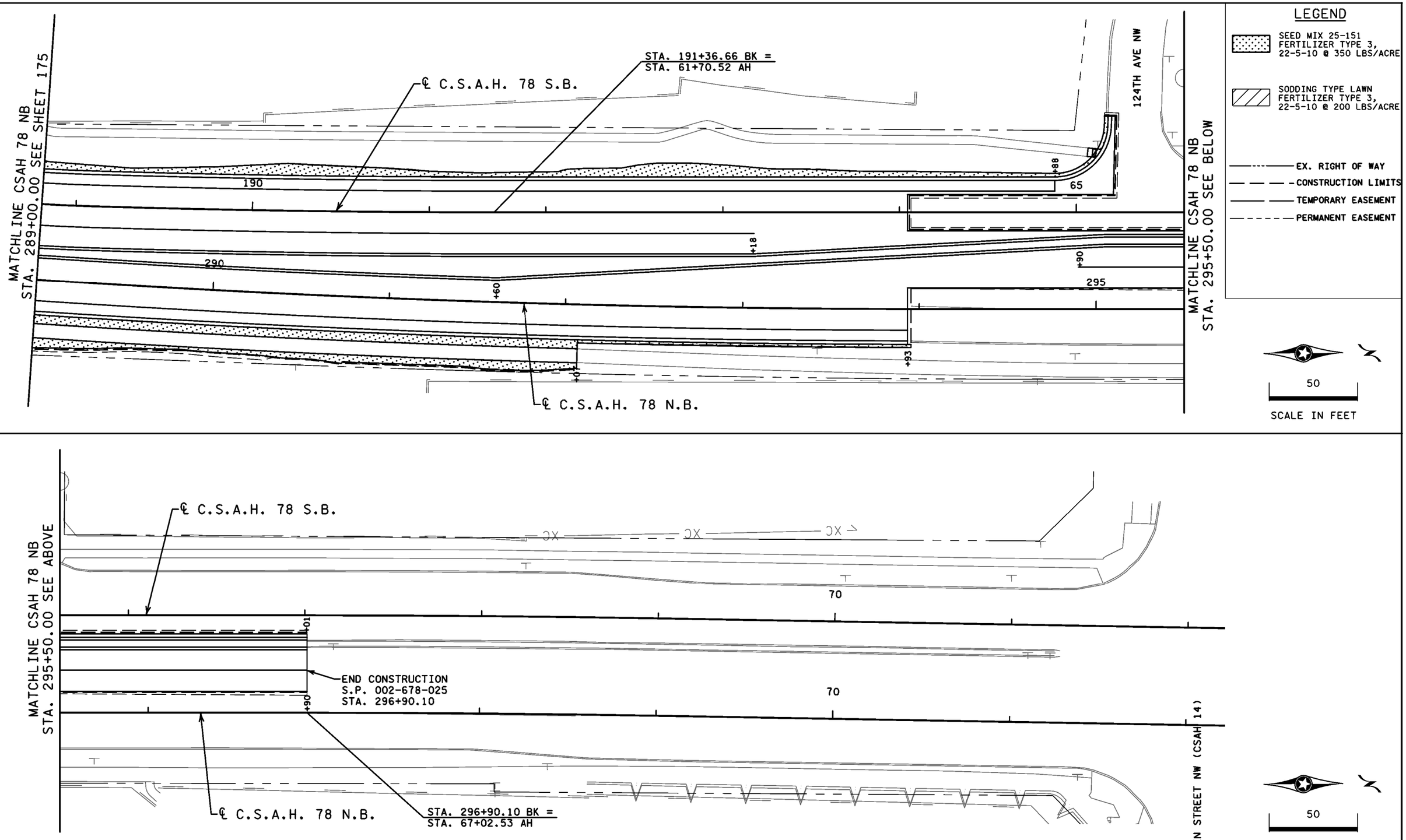

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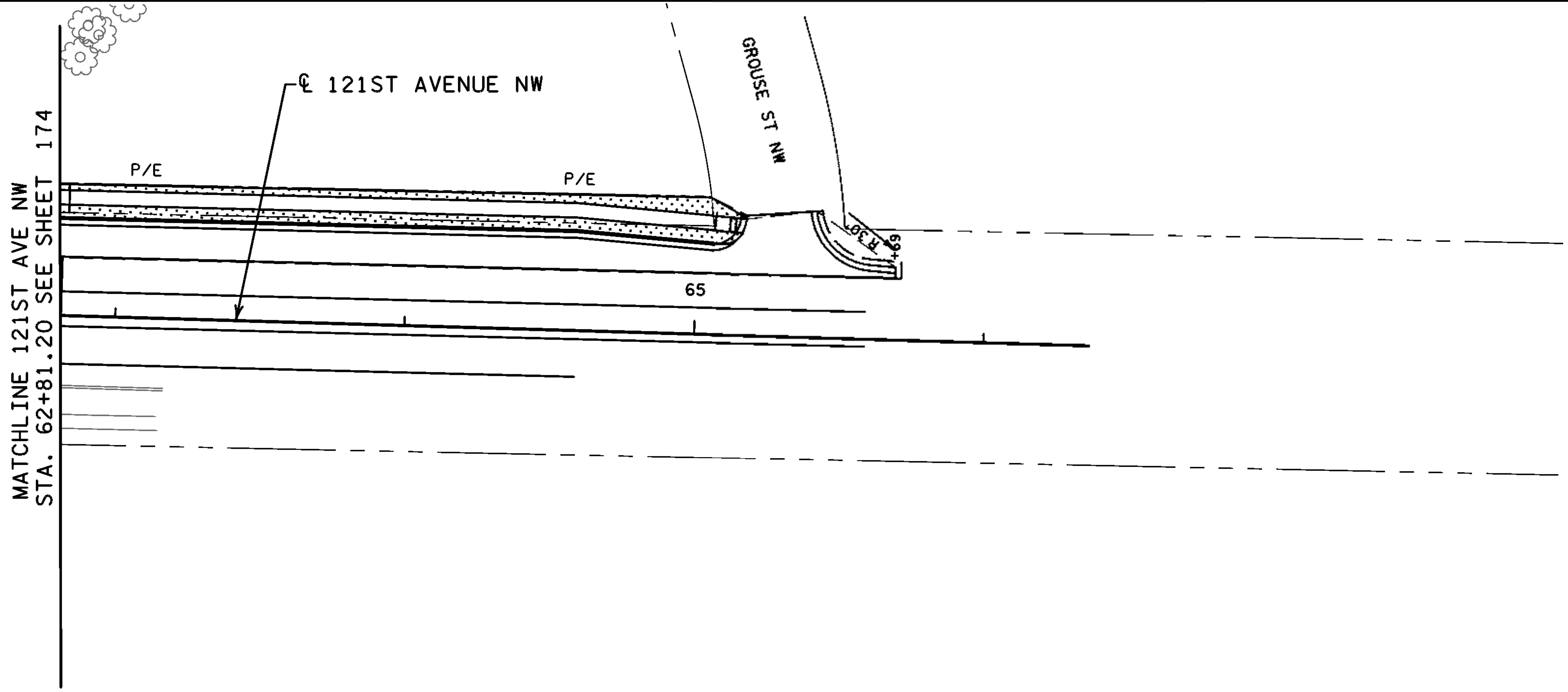
ANOKA COUNTY

TURF ESTABLISHMENT PLAN

SHEET NO. 176 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



LEGEND

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FERTILIZER TYPE 3,
22-5-10 @ 350 LBS/ACRE

SODDING TYPE LAWN
FERTILIZER TYPE 3,
22-5-10 @ 200 LBS/ACRE

EX. RIGHT OF WAY
CONSTRUCTION LIMITS
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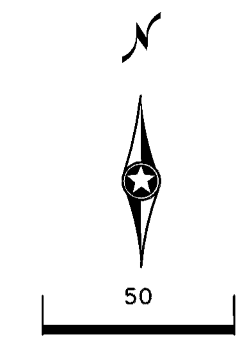
PERMANENT EASEMENT



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TURF ESTABLISHMENT PLAN

SHEET NO. 177 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

LEGEND OF SYMBOLS

CONTROLLER AND SERVICE EQUIP. NO's
SIGNAL BASE NO.
SIGNAL FACE NO.
LUMINAIRE NO.
CONTROLLER AND CABINET
CONTROLLER AND CABINET – IN PLACE
HANDHOLE
HANDHOLE – IN PLACE
RIGID STEEL CONDUIT (RSC)
RIGID STEEL CONDUIT (RSC) – IN PLACE
SIGNAL FACE WITH BACKGROUND SHIELD
SIGNAL FACE W/O BACKGROUND SHIELD
SIGNAL FACE – IN PLACE
PEDESTRIAN INDICATORS
PEDESTRIAN INDICATORS – IN PLACE
PEDESTRIAN PUSH BUTTONS ON PEDESTAL OR POLE
PEDESTRIAN PUSH BUTTON STATION
TRAFFIC SIGNAL PEDESTAL
TRAFFIC SIGNAL PEDESTAL – INPLACE
TRAFFIC SIGNAL POLE AND MAST ARM
TRAFFIC SIGNAL POLE AND MAST ARM – IN PLACE
STREET LIGHT POLE AND LUMINAIRE
STREET LIGHT POLE AND LUMINAIRE – IN PLACE
MAST ARM AND LUMINAIRE
MAST ARM AND LUMINAIRE – INPLACE
WOOD POLE
WOOD POLE – IN PLACE
SOURCE OF POWER
RAILROAD SIGNAL – IN PLACE
RIGHT OF WAY LINE
CENTERLINE
EDGE OF ROADWAY
SHOULDERLINE
CURB LINE
STOP BAR
EMERGENCY VEHICLE PREEMPTION DETECTOR

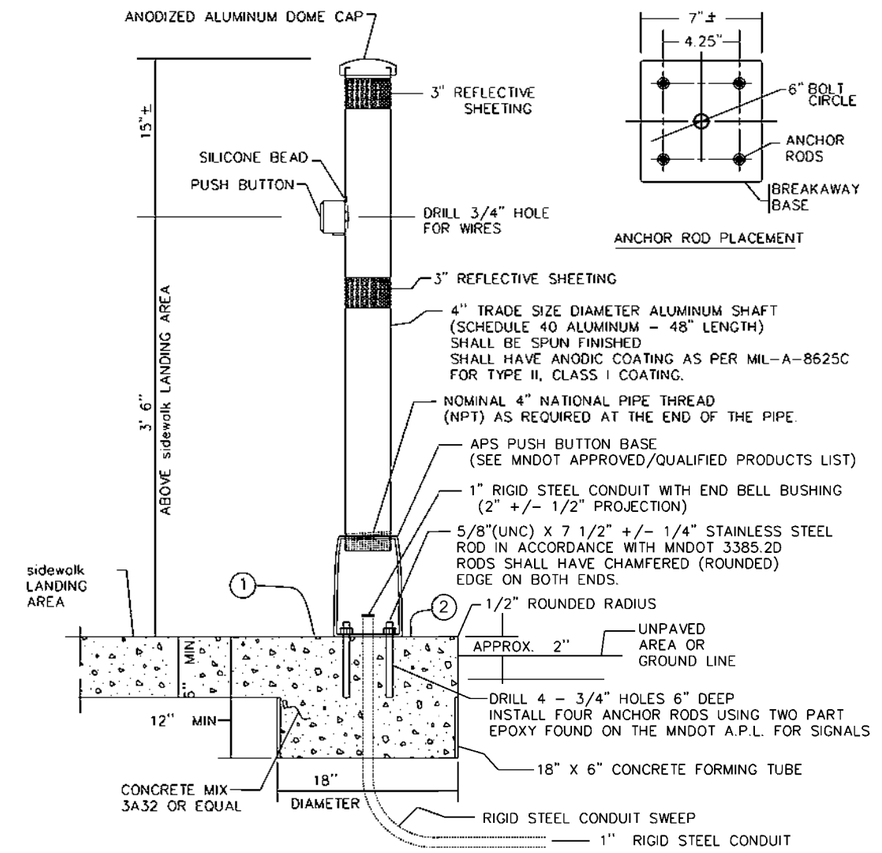
ABBREVIATIONS

3-1(EG)	SIGNAL HEAD PHASE "3" – NO "1"
BR. GR.	BARE GROUND
CH. SW.	CHECK SWITCH
CLR	CLEAR
D2-1(EG)	DETECTOR PHASE "2" – NO. "1"
DWK	DON'T WALK
EQG	EQUIPMENT GROUND
EVP	EMERGENCY VEHICLE PRE-EMPTION
F&I	FURNISH AND INSTALL
FL	FLASH/FLASHING
G	GREEN
GLTA	GREEN LEFT TURN ARROW
GRN	GREEN
GR. R	GROUND ROD
GRTA	GREEN RIGHT TURN ARROW
GTHA	GREEN THRU ARROW
HH	HANDHOLE
HPS	HIGH PRESSURE SODIUM
JB	JUNCTION BOX
LUM	LUMINAIRE
NEU	NEUTRAL
NMC	NONMETALLIC CONDUIT
P2-1(EG)	PED INDICATION PHASE "2" – NO. "1"
PB	PUSH BUTTON
PB2-1(EG)	PUSH BUTTON PHASE "2" – NO. "1"
PEC	PHOTOELECTRIC CELL
PED	PEDESTRIAN
R	RED
R&S	REMOVE AND SALVAGE
RLTA	RED LEFT TURN ARROW
RRTA	RED RIGHT TURN ARROW
RSC	RIGID STEEL CONDUIT
SOP	SOURCE OF POWER
SPR	SPARE
ST LHT	STREET LIGHT
STA	STATION
SW	SWITCH
SWD	SWITCHED
S&R	SALVAGE AND REINSTALL
TDW	TELEPHONE DROP WIRE
WLK	WALK
YEL	YELLOW
YLTA	YELLOW LEFT TURN ARROW
YRTA	YELLOW RIGHT TURN ARROW
YTHA	YELLOW THRU ARROW

CONDUCTOR COLOR CODE

R	RED
O	ORANGE
BL	BLUE
WH	WHITE
R/BLK	RED WITH BLACK TRACER
O/BLK	ORANGE WITH BLACK TRACER
BL/BLK	BLUE WITH BLACK TRACER
WH/BLK	WHITE WITH BLACK TRACER
BLK	BLACK
BLK/WH	BLACK WITH WHITE TRACER
G/BLK	GREEN WITH BLACK TRACER
G	GREEN

PEDESTRIAN PUSH BUTTON STATION DETAILS



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 POST TO A TIGHTENED POSITION BEFORE MOUNTING ACCESSIBLE PEDESTRIAN PUSH BUTTON UNIT TO THE POST.
- 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.
- BLIND THREADED INSERTS (RIVET NUT) MUST BE INSERTED USING MANUFACTURERS SPECIFIC INSTALLATION TOOL. NO OTHER METHOD OF INSTALLATION IS ACCEPTABLE.
- BLIND THREADED INSERTS SHALL BE ZINC PLATED STEEL WITH 1/4 – 20 UNC THREADS. INSERT SHALL BE SUITABLE FOR USE ON A MOUNTING SURFACE WALL THICKNESS OF .337". APPROVED BLIND THREADED INSERTS CAN BE FOUND ON THE MN/DOT QUALIFIED PRODUCTS LIST FOR SIGNALS.
- MOUNTING BOLTS SHALL BE 1/4 – 20 STAINLESS STEEL. APPLY BRUSH ON ANTI SEIZE COMPOUND TO BOLTS PRIOR TO ASSEMBLY.
- APPLY A BEAD OF 100% SILICONE SEALANT ALONG THE TOP OF THE PUSH BUTTON UNIT WHERE IT COMES IN CONTACT WITH THE 4" POST.
- THE REFLECTIVE SHEETING SHALL BE WHITE AT INTERSECTION CORNERS AND SHALL BE YELLOW WHEN USED IN CENTER MEDIANS. SEE MN/DOT SIGNING QUALIFIED PRODUCTS LIST (QPL) FOR APPROVED TUBE DELINEATOR SHEETING.
- ANTI-SEIZE COMPOUND MUST BE USED ON ALL THREADED BOLTS WHEN INSTALLING PEDESTRIAN PUSH BUTTON STATIONS.

(1) THE PUSH BUTTON STATION FOUNDATION IS CONSTRUCTED AS PART OF THE SIDEWALK. INCREASE THE SIDEWALK THICKNESS TO 12" THICK (MIN.) TO PROVIDE FOR THE PUSH BUTTON STATION FOUNDATION.

(2) ALL JOINTS SHALL BE A MINIMUM OF 9" FROM THE CENTER OF THE PUSH BUTTON FOUNDATION.

[R] TABULATION OF SIGNAL QUANTITIES

ITEM NO	ITEM	UNIT	TOTAL ESTIMATED QUANTITY
2104	REMOVE SIGNAL SYSTEM "A"	EACH	1
2545	SERVICE CABINET	EACH	1
2565	EMERGENCY VEHICLE PREEMPTION SYSTEM "A"	LUMP SUM	1
2565	TRAFFIC CONTROL SIGNAL SYSTEM "A"	SYSTEM	1
2565	REVISE SIGNAL SYSTEM "B"	SYSTEM	1
2565	TRAFFIC CONTROL INTERCONNECT	LUMP SUM	1

TRAFFIC SIGNAL STANDARD PLATES

THESE TRAFFIC SIGNAL STANDARD PLATES AS APPROVED BY FHWA SHALL APPLY:

	PLATE NO.	DESCRIPTION
*	8111 E	TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED) (3 SHEETS)
*	8118 D	SERVICE EQUIPMENT & POLE-TRAFFIC CONTROL SIGNALS
*	8119 C	GROUND MOUNTED CABINET FOUNDATION
*	8120 Q	POLE FOUNDATION (PA85)
*	8121 H	TRANSFORMER BASE & POLE BASE PLATE (2 SHEETS)
*	8123 G	POLE & MAST ARM-LUMINAIRES & TRAFFIC LIGHTS ASSEMBLY (2 SHEETS)
*	8126 L	POLE FOUNDATION (PA90 & PA100)
*	8129 A	SHIM AND WASHER (TRAFFIC CONTROL SIGNALS AND ROADWAY LIGHTING)

* – APPLIES TO THIS PROJECT

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DESIGNED BY: AJH
CHECKED BY: KAS

HDR

ANOKA COUNTY

TRAFFIC CONTROL SIGNAL TITLE SHEET

SHEET NO. 178 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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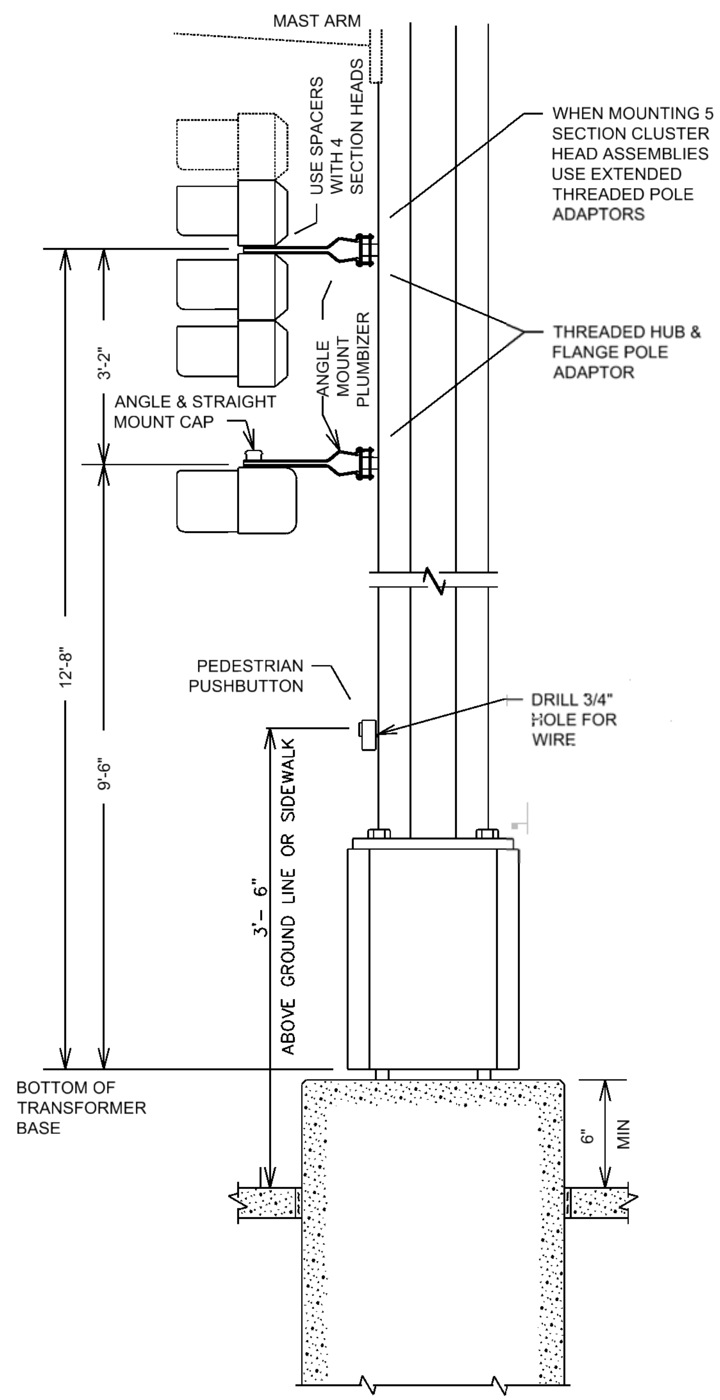
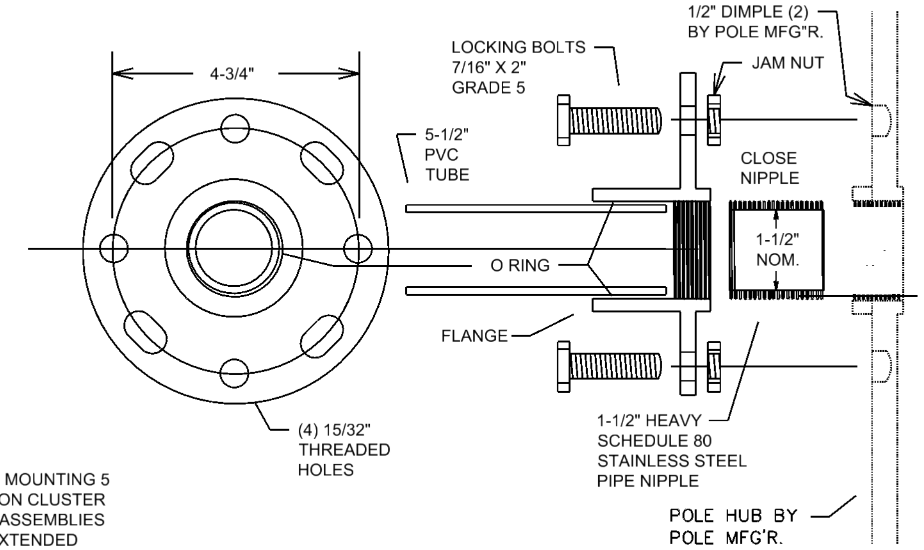
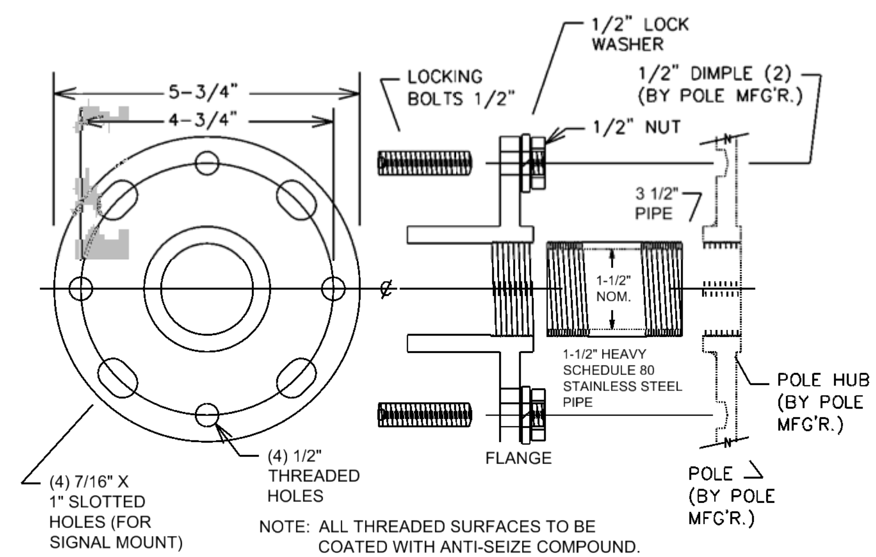


TYPICAL SIGNAL POLE MOUNTING

NOT TO SCALE



THREADED HUB AND FLANGE POLE ADAPTOR



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

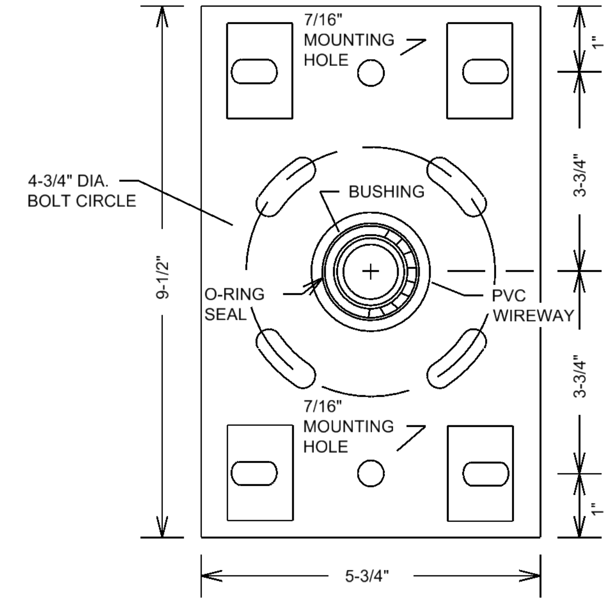
EXTENDED THREADED POLE ADAPTER

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

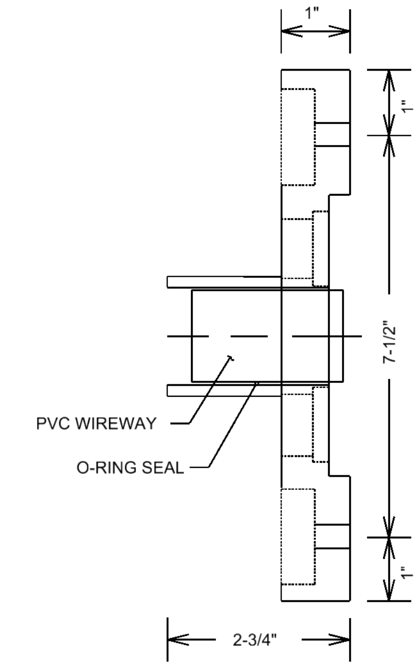
2. USE SIGNAL HEAD MOUNTED SPACERS FOR 4 SECTION POLY HEADS.

3. SEE STANDARD PLATE NUMBER 8123 FOR ADDITIONAL SIGNAL POLE DETAILS.

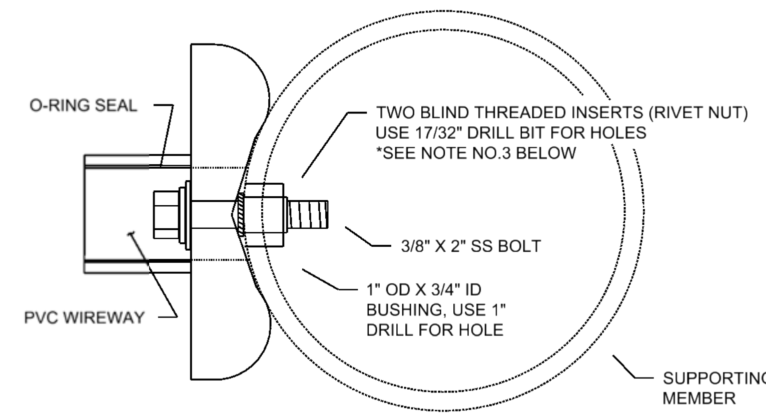
4. EXTENDED THREADED POLE ADAPTOR ONLY USED WITH 5 SECTION CLUSTER HEADS.



BOLT ON HUB & FLANGE



SIDE VIEW



TOP VIEW

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

2. USE SIGNAL HEAD MOUNTED SPACERS FOR 4 SECTION POLY HEADS.

3. BLIND THREADED INSERTS (RIVET NUT) MUST BE INSERTED USING MANUFACTURERS SPECIFIC INSERTION TOOL. NO OTHER METHOD IS ACCEPTABLE.

4. SEE STANDARD PLATE NUMBER 8122 FOR ADDITIONAL PEDESTAL POLE DETAILS.

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POLE MOUNT DETAIL

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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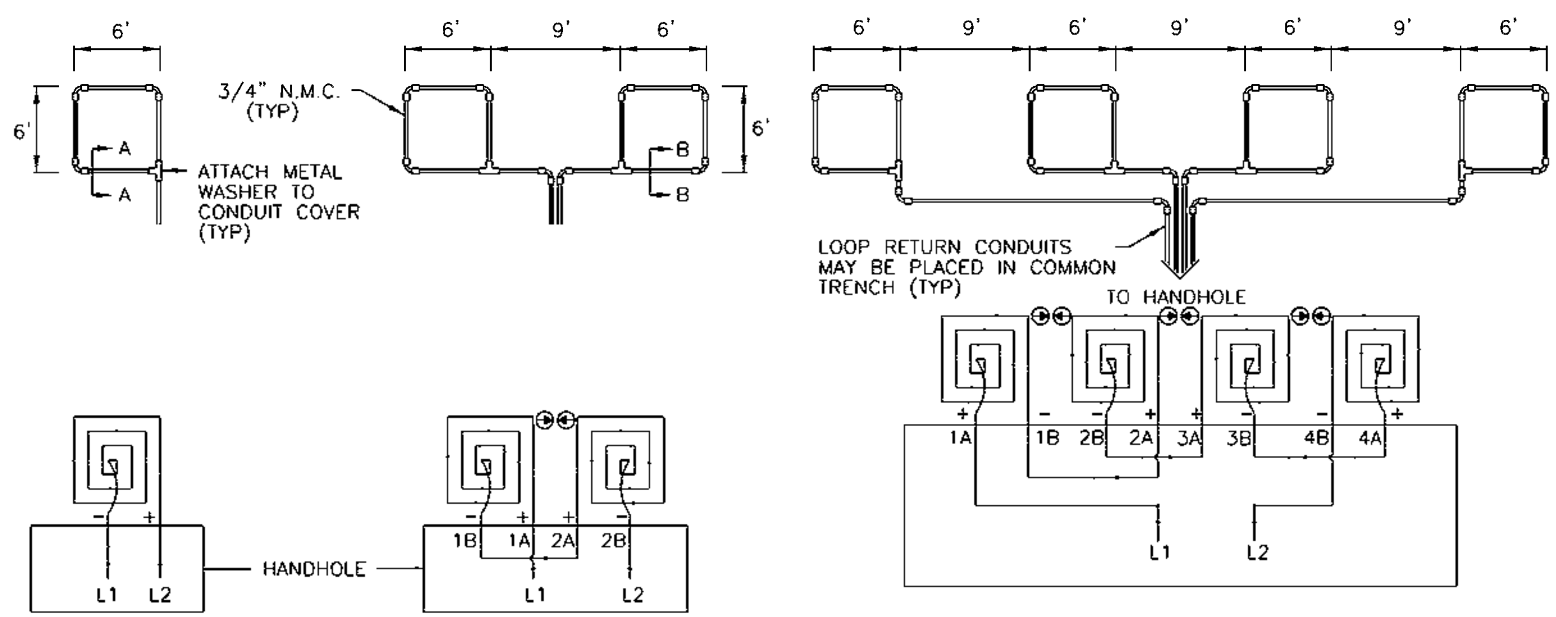


LOOP CONNECTIONS SHALL BE LABELED AND SPLICED IN THE HANDHOLE AS FOLLOWS:

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

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

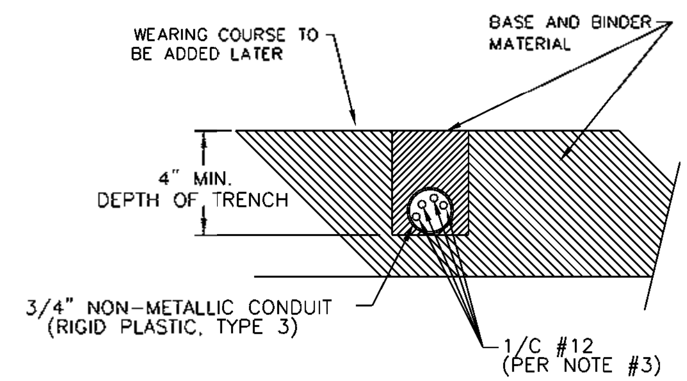
L1 TO 1A 3B TO 4A
1B TO 2A 4B TO L2
2B TO 3A

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

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

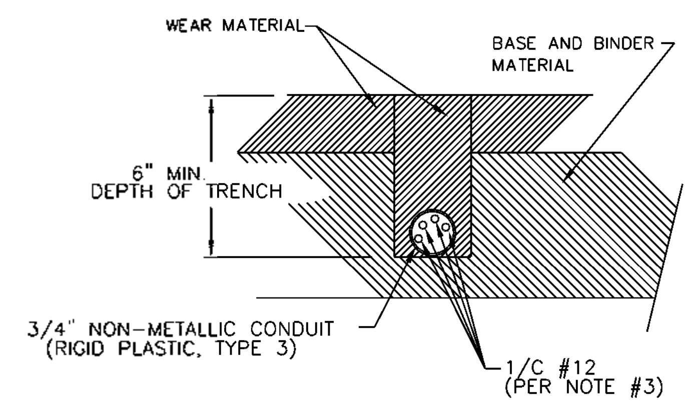
LOOP DETECTOR DETAIL 'B'
(LOOP PHASING FOR SERIES CONNECTION)

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



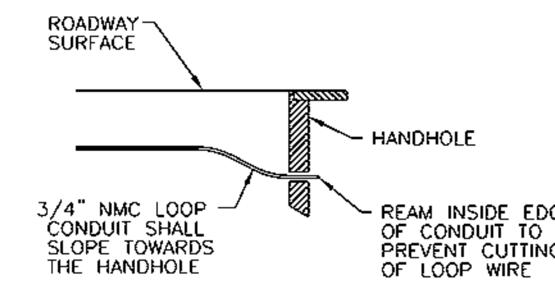
SECTION A-A

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.

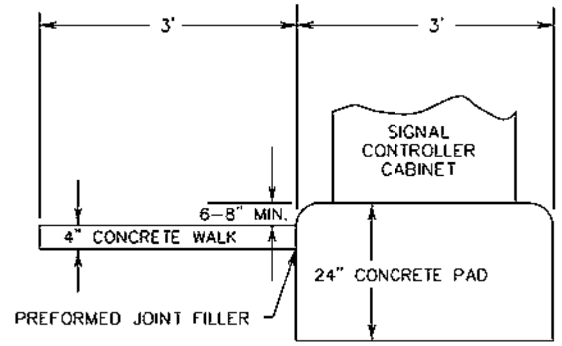
TYPICAL PAD WITH CONTROLLER CABINET AND SERVICE CABINET

SEE INTERSECTION LAYOUT FOR CABLE INFORMATION (NOT TO SCALE)

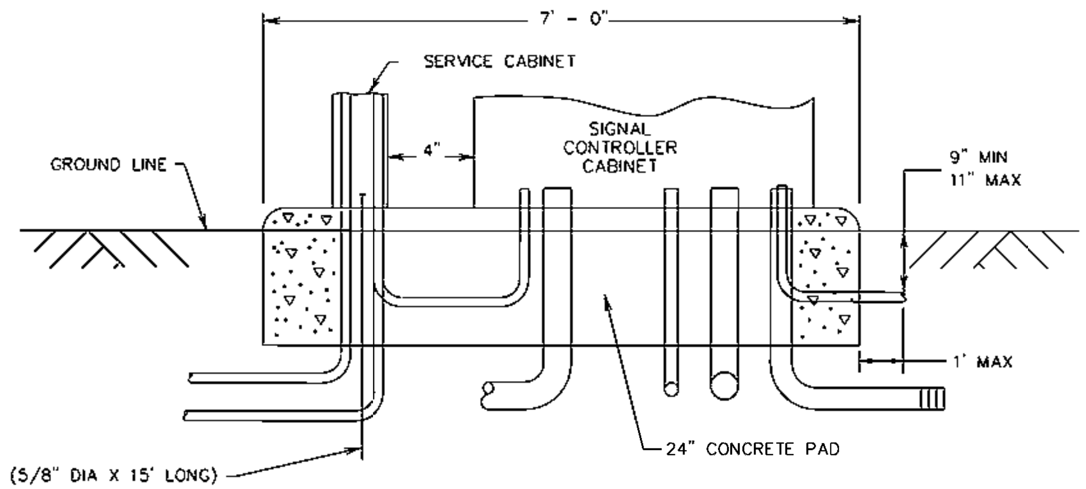
NOTES:

1. THE ANCHOR RODS, NUTS AND WASHERS FOR THE COUNTY FURNISHED CONTROLLERS AND CABINETS SHALL BE FURNISHED BY THE COUNTY AND INSTALLED BY THE CONTRACTOR.
2. THE UPPER PART OF EACH NEW EQUIPMENT PAD SHALL BE BEVELLED OR CHAMFERED IN A NEAT MANNER AS DIRECTED BY THE ENGINEER.
3. THE TOP OF THE CONDUITS SHALL BE THREADED AND CAPPED AFTER INSTALLATION (UNTIL CABLES ARE INSTALLED).
4. CONDUIT SHALL PROJECT A MINIMUM OF 2" ABOVE CONCRETE AND SHALL BE LOCATED INSIDE OF THE CABINET WHERE DIRECTED BY THE ENGINEER, BUT SHALL NOT INTERFERE WITH THE CABINET FUNCTIONS (SUPPORTING MEMBERS, ETC.).
5. CONCRETE MIX 3F52 OR EQUAL SHALL BE USED FOR THE EQUIPMENT PAD AND SIDEWALK.
6. CONDUITS WITH BOTH ENDS TERMINATING WITHIN THE PAD SHALL NOT BE INSTALLED BELOW THE CONCRETE.
7. THE EXACT LOCATION OF CONDUITS WITHIN THE PAD SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.
8. ANCHOR RODS SHALL PROJECT A MINIMUM OF 3" ABOVE THE CONCRETE BUT SHALL NOT INTERFERE WITH THE CABINET FUNCTIONS (SUPPORTING MEMBERS, ETC.).
9. CONTRACTOR SHALL PROVIDE MINIMUM 4-INCH CLEARANCE BETWEEN CONTROLLER AND SERVICE CABINETS ON EACH EQUIPMENT PAD FOUNDATION AS SHOWN.

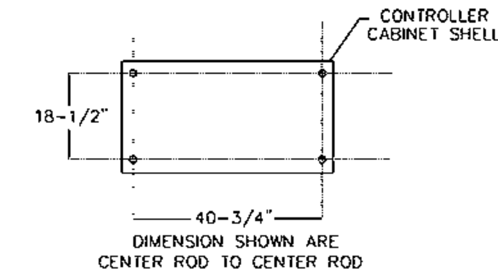
SIDE VIEW



FRONT VIEW

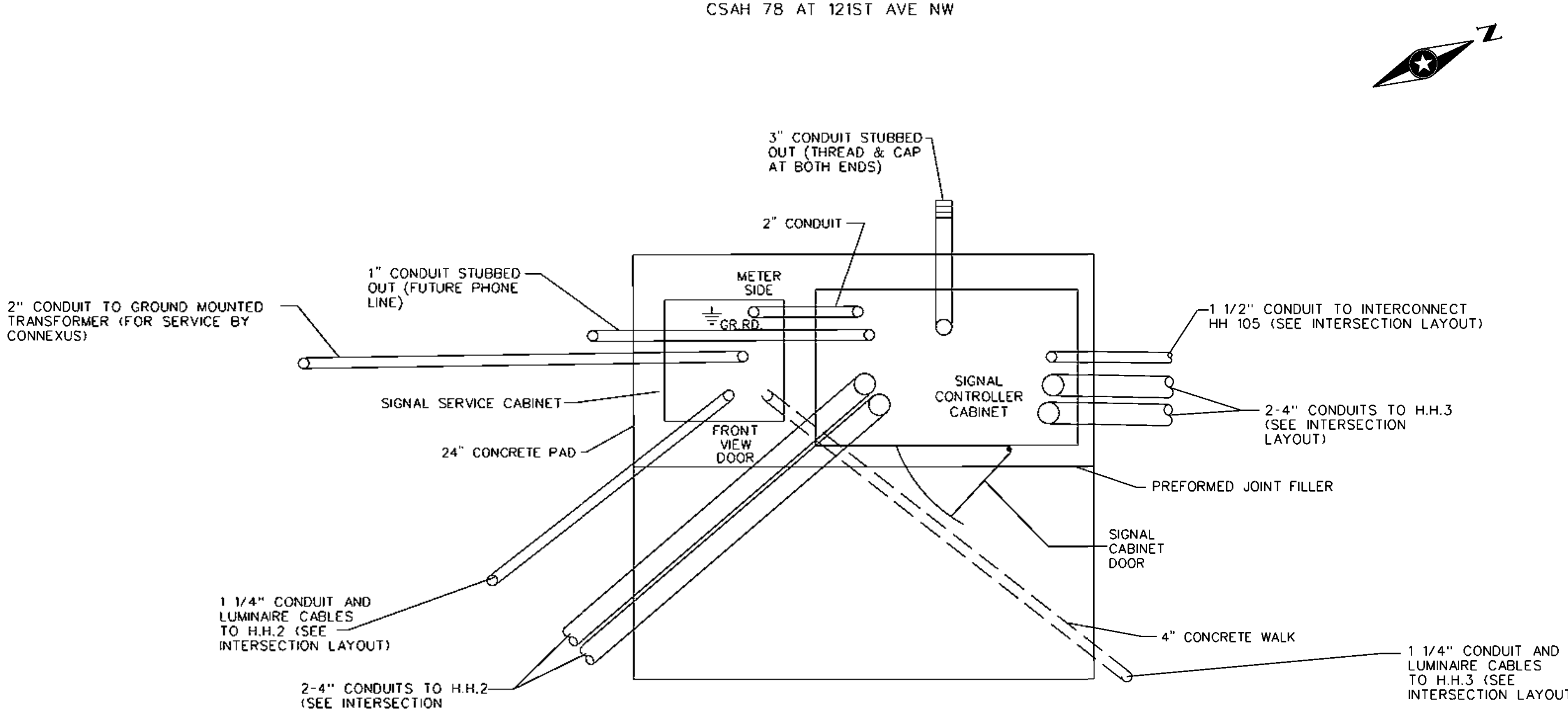


CONTROLLER CABINET TYPE "P" & "R" BOLT PATTERN



PLAN VIEW - SYSTEM "A"

CSAH 78 AT 121ST AVE NW



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CHECKED BY: KAS

HDR

ANOKA COUNTY

SYSTEM "A" EQUIPMENT PAD DETAIL

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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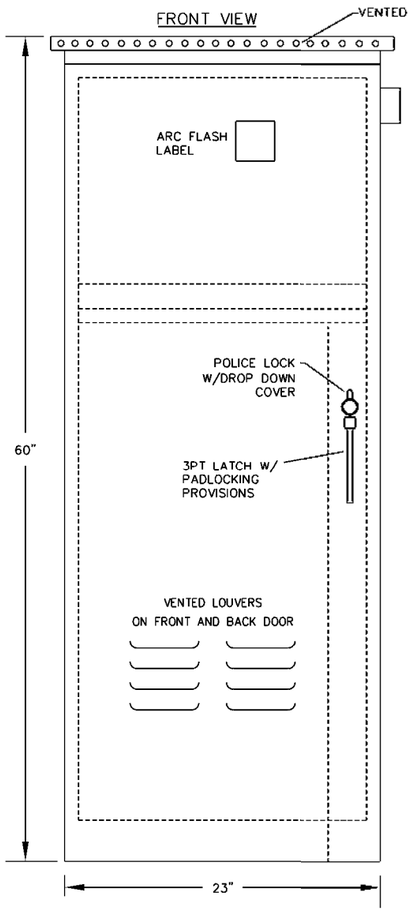
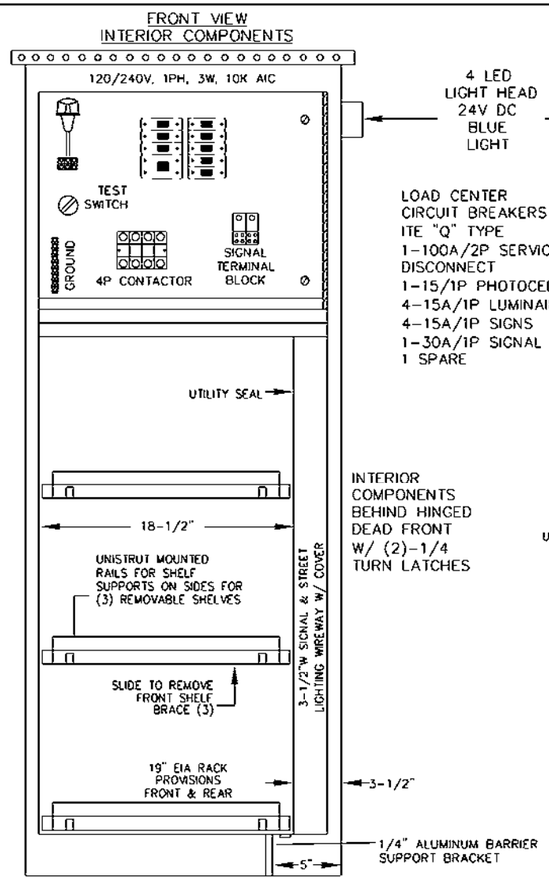
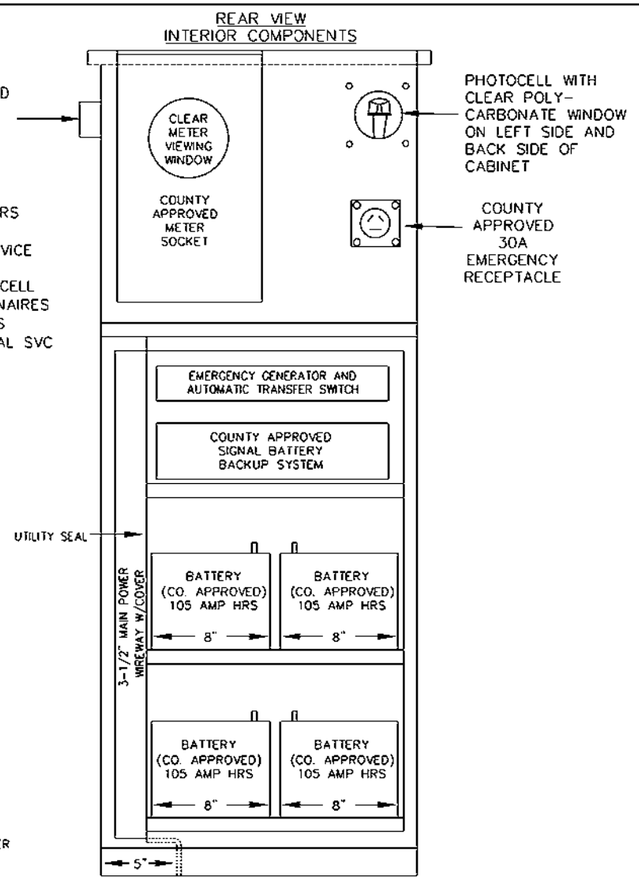


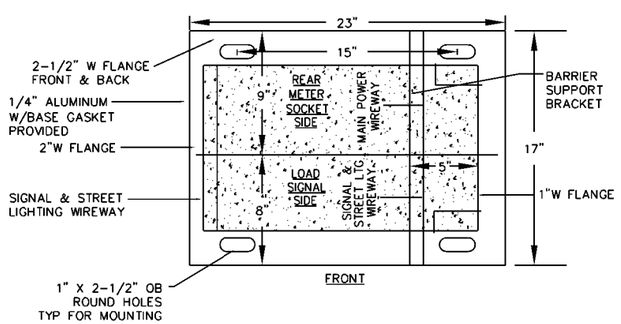


4 LED LIGHT HEAD 24V DC BLUE LIGHT

LOAD CENTER CIRCUIT BREAKERS
ITE "Q" TYPE
1-100A/2P SERVICE DISCONNECT
1-15/1P PHOTOCELL
4-15A/1P LUMINAIRES
4-15A/1P SIGNS
1-30A/1P SIGNAL SVC
1 SPARE

INTERIOR COMPONENTS BEHIND HINGED DEAD FRONT W/ (2)-1/4 TURN LATCHES

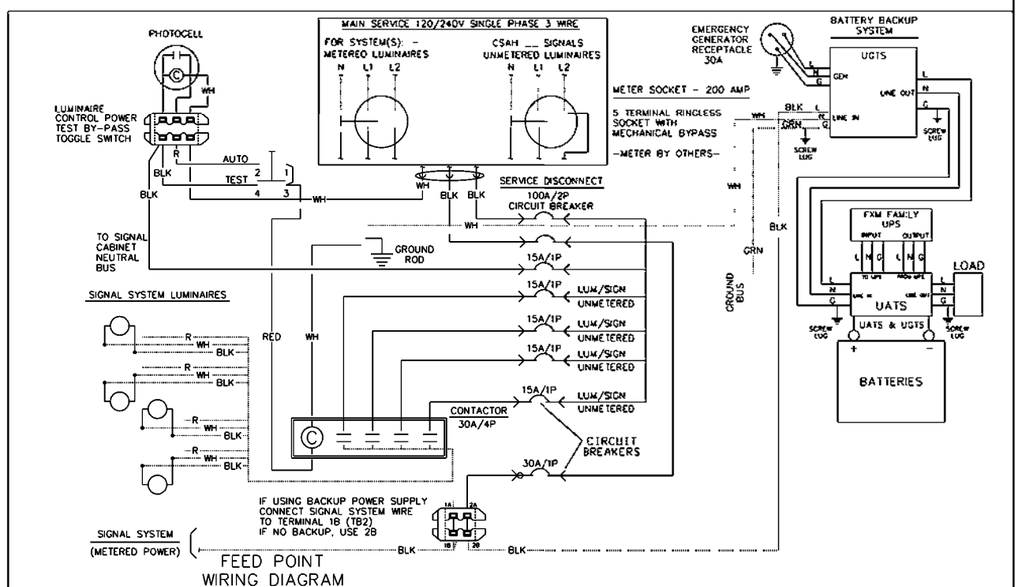




CABINET CONSTRUCTION

-NEMA 3R
-1/8" ALUMINUM 5052-H32
-ANODIZED 30 MINUTE CLEAR
-NEOPRENE GASKETED DOORS
-NON-CORRODING HARDWARE
-ETL LISTED IN ACCORDANCE W/UL508A

SEE SPECIAL PROVISIONS AND STATEMENT OF ESTIMATED QUANTITIES REGARDING SEPARATE PAY ITEM FOR FURNISHING & INSTALLING NEW BATTERY BACK-UP SIGNAL SERVICE CABINETS.



NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY:	SY
DESIGNED BY:	AJH
CHECKED BY:	KAS

HDR

ANOKA COUNTY

SYSTEM "A" SERVICE CABINET DETAIL

SHEET NO. 182 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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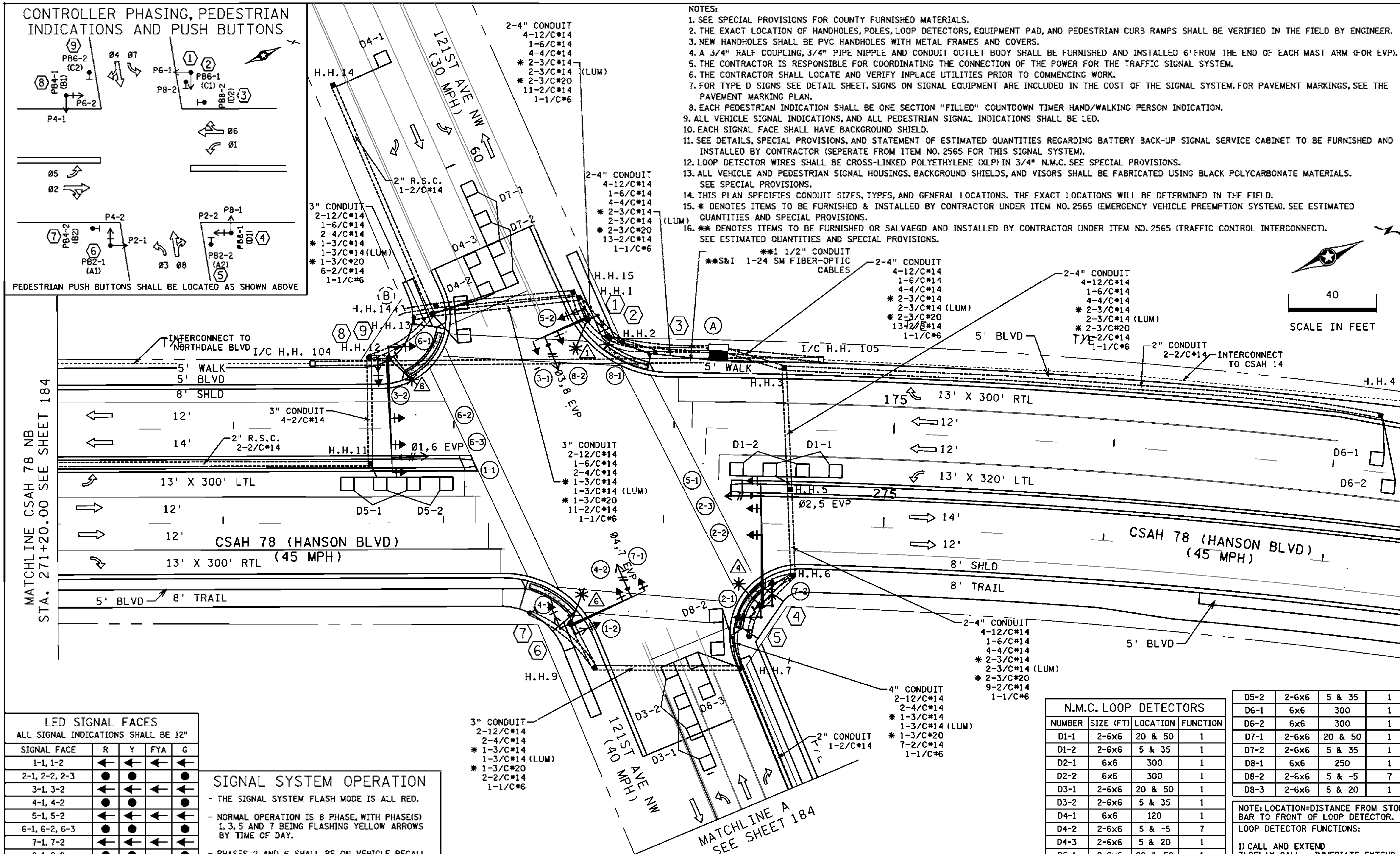

NOTES:
1. SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
2. THE EXACT LOCATION OF HANDHOLES, POLES, LOOP DETECTORS, EQUIPMENT PAD, AND PEDESTRIAN CURB RAMPS SHALL BE VERIFIED IN THE FIELD BY ENGINEER.
3. NEW HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS.
4. A 3/4" HALF COUPLING, 3/4" PIPE NIPPLE AND CONDUIT OUTLET BODY SHALL BE FURNISHED AND INSTALLED 6' FROM THE END OF EACH MAST ARM (FOR EVP).
5. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE TRAFFIC SIGNAL SYSTEM.
6. THE CONTRACTOR SHALL LOCATE AND VERIFY INPLACE UTILITIES PRIOR TO COMMENCING WORK.
7. FOR TYPE D SIGNS SEE DETAIL SHEET. SIGNS ON SIGNAL EQUIPMENT ARE INCLUDED IN THE COST OF THE SIGNAL SYSTEM. FOR PAVEMENT MARKINGS, SEE THE PAVEMENT MARKING PLAN.
8. EACH PEDESTRIAN INDICATION SHALL BE ONE SECTION "FILLED" COUNTDOWN TIMER HAND/WALKING PERSON INDICATION.
9. ALL VEHICLE SIGNAL INDICATIONS, AND ALL PEDESTRIAN SIGNAL INDICATIONS SHALL BE LED.
10. EACH SIGNAL FACE SHALL HAVE BACKGROUND SHIELD.
11. SEE DETAILS, SPECIAL PROVISIONS, AND STATEMENT OF ESTIMATED QUANTITIES REGARDING BATTERY BACK-UP SIGNAL SERVICE CABINET TO BE FURNISHED AND INSTALLED BY CONTRACTOR (SEPERATE FROM ITEM NO. 2565 FOR THIS SIGNAL SYSTEM).
12. LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 3/4" N.M.C. SEE SPECIAL PROVISIONS.
13. ALL VEHICLE AND PEDESTRIAN SIGNAL HOUSINGS, BACKGROUND SHIELDS, AND VISORS SHALL BE FABRICATED USING BLACK POLYCARBONATE MATERIALS. SEE SPECIAL PROVISIONS.
14. THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD.
15. * DENOTES ITEMS TO BE FURNISHED & INSTALLED BY CONTRACTOR UNDER ITEM NO. 2565 (EMERGENCY VEHICLE PREEMPTION SYSTEM). SEE ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.
16. ** DENOTES ITEMS TO BE FURNISHED OR SALVAEGD AND INSTALLED BY CONTRACTOR UNDER ITEM NO. 2565 (TRAFFIC CONTROL INTERCONNECT). SEE ESTIMATED QUANTITIES AND SPECIAL PROVISIONS.

LED SIGNAL FACES

ALL SIGNAL INDICATIONS SHALL BE 12"

SIGNAL FACE	R	Y	FYA	G
1-1, 1-2	←	←	←	←
2-1, 2-2, 2-3	●	●		●
3-1, 3-2	←	←		←
4-1, 4-2	●	●		●
5-1, 5-2	←	←	←	←
6-1, 6-2, 6-3	●	●		●
7-1, 7-2	←	←		←
8-1, 8-2	●	●		●

SIGNAL SYSTEM OPERATION

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE, WITH PHASE(S) 1, 3, 5 AND 7 BEING FLASHING YELLOW ARROWS BY TIME OF DAY.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

N.M.C. LOOP DETECTORS

NUMBER	SIZE (FT)	LOCATION	FUNCTION
D1-1	2-6x6	20 & 50	1
D1-2	2-6x6	5 & 35	1
D2-1	6x6	300	1
D2-2	6x6	300	1
D3-1	2-6x6	20 & 50	1
D3-2	2-6x6	5 & 35	1
D4-1	6x6	120	1
D4-2	2-6x6	5 & -5	7
D4-3	2-6x6	5 & 20	1
D5-1	2-6x6	20 & 50	1
D5-2	2-6x6	5 & 35	1
D6-1	6x6	300	1
D6-2	6x6	300	1
D7-1	2-6x6	20 & 50	1
D7-2	2-6x6	5 & 35	1
D8-1	6x6	250	1
D8-2	2-6x6	5 & -5	7
D8-3	2-6x6	5 & 20	1

NOTE: LOCATION=DISTANCE FROM STOP BAR TO FRONT OF LOOP DETECTOR.

LOOP DETECTOR FUNCTIONS:

1) CALL AND EXTEND
7) DELAY CALL - IMMEDIATE EXTEND

NO	DATE	BY	CKD	APPR	REVISION

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CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: AJH
CHECKED BY: KAS

HDR

ANOKA COUNTY

SYSTEM "A" INTERSECTION LAYOUT

SHEET NO. 183 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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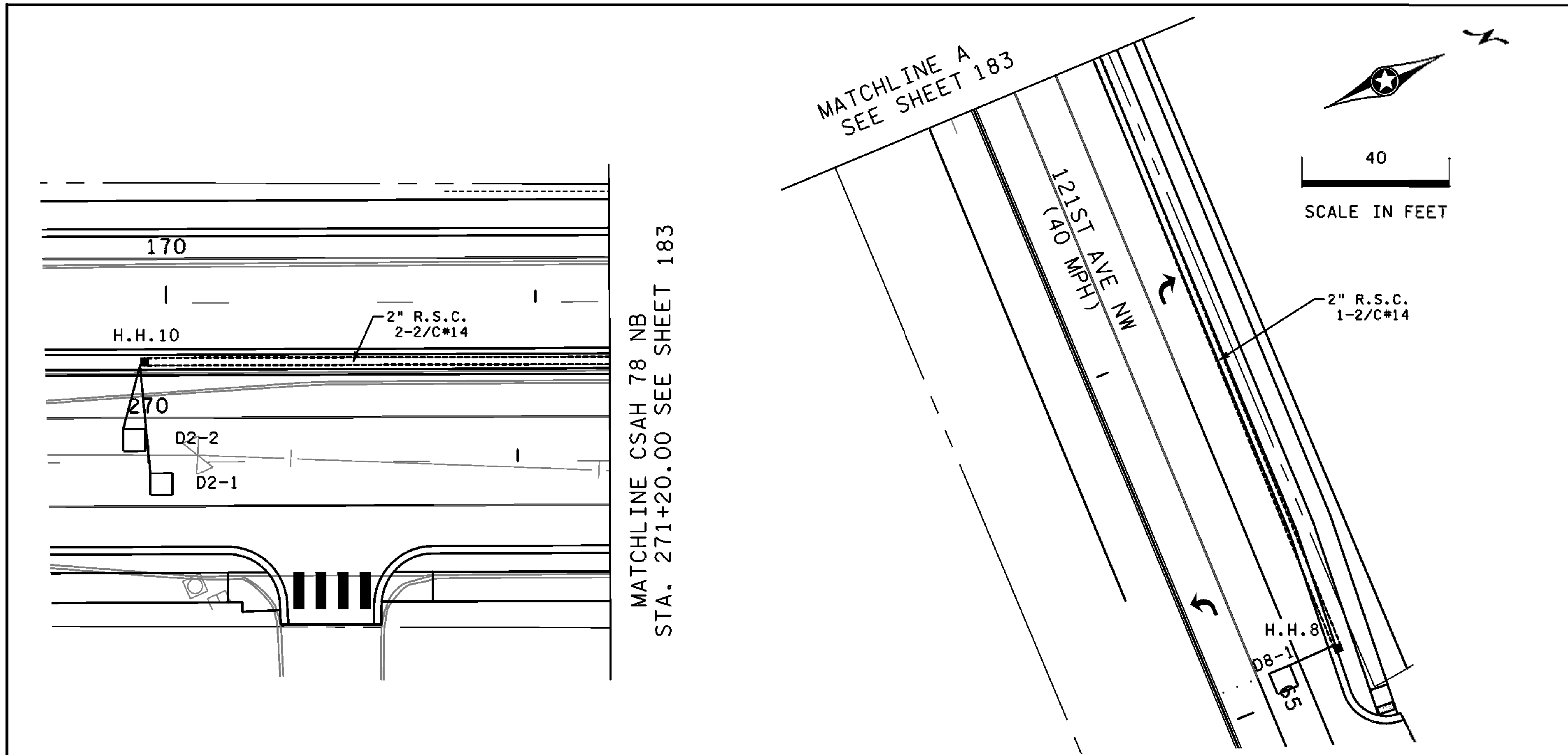

(A) INSTALL (FURNISHED BY COUNTY) - CONTROLLER AND CABINET

F & I
- EQUIPMENT PAD FOUNDATION
- 8BU SIGNAL SERVICE CABINET
- BETWEEN CONTROLLER CABINET AND SERVICE CABINET:
  - METERED SIGNAL SERVICE
  - 2" CONDUIT
  - 3-1/C#6
- CONTROLLER CABINET TO H.H.2:

4" CONDUIT	4" CONDUIT
2-12/C#14	2-12/C#14
1-6/C#14	2-4/C#14
2-4/C#14	* 1-3/C#14
* 1-3/C#14	* 1-3/C#20
* 1-3/C#20	2-2/C#14
11-2/C#14	
1-1/C#6 (GRD)	

- CONTROLLER CABINET TO H.H.3:

4" CONDUIT	4" CONDUIT
2-12/C#14	2-12/C#14
2-4/C#14	1-6/C#14
* 1-3/C#14	2-4/C#14
* 1-3/C#20	* 1-3/C#14
6-2/C#14	* 1-3/C#20
1-1/C#6 (GRD)	7-2/C#14

- CONTROLLER CABINET TO I/C H.H. 105
  - ** 1 1/2" CONDUIT
  - **S&I 2-24 SM FIBER OPTIC CABLES

F & I
- STUB OUT 3" CONDUIT FROM CONTROLLER CABINET (THREAD AND CAP - FOR FUTURE USE)
- STUB OUT 1" CONDUIT FROM CONTROLLER CABINET (FOR FUTURE PHONE LINE BY OTHERS)
- CONTROLLER CABINET TO SERVICE CABINET:
  - 2" CONDUIT
  - 3-1/C#6
- CONTROLLER CABINET TO SERVICE CABINET (COMMS):
  - 2" CONDUIT
  - 1-4/C#14
- SERVICE CABINET TO H.H.15:
  - 2" CONDUIT
  - 3-1/C#2
- H.H.15 TO H.H.14:
  - 2" CONDUIT
  - 3-1/C#2
- H.H.14 TO GROUND MOUNTED TRANSFORMER:
  - 2" CONDUIT
  - 3-1/C#2
- SERVICE CABINET TO H.H.2:
  - 2" CONDUIT
  - 2-3/C#14 (LUM)
- SERVICE CABINET TO H.H.3:
  - 2" CONDUIT
  - 2-3/C#14 (LUM)

(B) INPLACE S.O.P.-GROUND MOUNTED TRANSFORMER (CONNEXUS)
EXTEND INTO H.H.13 (BY CONNEXUS):
2" CONDUIT
3-1/C#2

INTERSECTION NOTES

(1) INSTALL (FURNISHED BY COUNTY)
- TYPE PA85-A-25-D30-9 (DAVIT AT 350 DEG)
- * 1-ONE WAY EVP DETECTOR AND LED CONFIRMATION LIGHT (PHA 1-1/C#6 (GRD) SES 3+8)

F & I
- PA85 POLE FOUNDATION
- LUMINAIRE-LED
- 1-ANGLE MOUNT SIGNAL-OVERHEAD AT 0'
- 1-STRAIGHT MOUNT SIGNALS OVERHEAD AT 11.5'
- 2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG
- 2-ANGLE MOUNT C.D.PED HEADS-POLE MOUNTED AT 90 AND 180 DEG
- 1-R10-X12 SIGN ADJACENT TO HEAD (3-1)
- 1-TYPE D SIGN (D-1) (SEE SIGN DETAILS)
- * ONE WAY EVP MOUNTING HARDWARE (FOR COUNTY FURNISHED DETECTOR AND CONFIRMATION LIGHT)
- EXTEND INTO H.H.1:
  - 3" CONDUIT
  - 2-12/C#14
  - 2-4/C#14
  - * 1-3/C#14
  - 1-3/C#14 (LUM)
  - * 1-3/C#20

(2) F & I
- PEDESTRIAN PUSH BUTTON STATION (SEE DETAILS)
- 1-PEDESTRIAN PUSH BUTTON & SIGN (R10-3e) (LT ARROW)
- EXTEND INTO H.H.2:
  - 1" CONDUIT
  - 1-2/C#14

(3) F & I
- PEDESTRIAN PUSH BUTTON STATION (SEE DETAILS)
- 1-PEDESTRIAN PUSH BUTTON & SIGN (R10-3e) (RT ARROW)
- EXTEND INTO H.H.2:
  - 1" CONDUIT
  - 1-2/C#14

(4) INSTALL (FURNISHED BY COUNTY)
- TYPE PA100-A-55-D30-9 (DAVIT AT 350 DEG)
- * 1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 2+5)

F & I
- PA100 POLE FOUNDATION
- LUMINAIRE-LED
- 1-ANGLE MOUNT SIGNAL-OVERHEAD AT 0'
- 2-STRAIGHT MOUNT SIGNAL OVERHEAD AT 12.5' AND 24.5'
- 2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG
- 2-ANGLE MOUNT C.D.PED HEADS AT 90 AND 180 DEG
- 1-PEDESTRIAN PUSH BUTTON & SIGN (R10-3e) (LT ARROW)
- 1-R10-X12 SIGN ADJACENT TO HEAD (5-1)
- 1-TYPE D SIGN (D-2) (SEE SIGN DETAILS)
- * ONE WAY EVP MOUNTING HARDWAR (FOR COUNTY FURNISHED DETECTOR AND CONFIRMATION LIGHT)
- EXTEND INTO H.H.6:
  - 3" CONDUIT
  - 2-12/C#14
  - 1-6/C#14
  - 2-4/C#14
  - * 1-3/C#14
  - 1-3/C#14 (LUM)
  - * 1-3/C#20
  - 1-2/C#14
  - 1-1/C#6 (GRD)

(5) F & I
- PEDESTRIAN PUSH BUTTON STATION (SEE DETAILS)
- 1-PEDESTRIAN PUSH BUTTON & SIGN (R10-3e) (RT ARROW)
- EXTEND INTO H.H.6:
  - 1" CONDUIT
  - 1-2/C#14

(6) INSTALL (FURNISHED BY COUNTY)
- TYPE PA90-A-35-D30-9 (DAVIT AT 350 DEG)
- * 1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 4+7)

F & I
- PA90 POLE FOUNDATION
- LUMINAIRE-LED
- 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
- 1-STRAIGHT MOUNT SIGNAL OVERHEAD AT 11'
- 2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG
- 2-ANGLE MOUNT C.D.PED HEADS AT 90 AND 180 DEG
- 1-PEDESTRIAN PUSH BUTTON & SIGN (R10-3e) (LT ARROW)
- 1-R10-X12 SIGN ADJACENT TO HEAD (7-1)
- 1-TYPE D SIGN (D-1) (SEE SIGN DETAILS)
- * ONE WAY EVP MOUNTING HARDWARE (FOR COUNTY FURNISHED DETECTOR AND CONFIRMATION LIGHT)
- EXTEND INTO H.H.9:
  - 3" CONDUIT
  - 2-12/C#14
  - 2-4/C#14
  - * 1-3/C#14
  - 1-3/C#14 (LUM)
  - * 1-3/C#20
  - 1-2/C#14
  - 1-1/C#6 (GRD)

(7) F & I
- PEDESTRIAN PUSH BUTTON STATION (SEE DETAILS)
- 1-PEDESTRIAN PUSH BUTTON & SIGN (R10-3e) (RT ARROW)
- EXTEND INTO H.H.9:
  - 1" CONDUIT
  - 1-2/C#14

(8) INSTALL (FURNISHED BY COUNTY)
- TYPE PA100-A-50-D30-9 (DAVIT AT 350 DEG)
- * 1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 1+6)

F & I
- PA100 POLE FOUNDATION
- LUMINAIRE-LED
- 1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'
- 2-STRAIGHT MOUNT SIGNALS OVERHEAD AT 12.5' AND 24.5'
- 2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG
- 2-ANGLE MOUNT C.D.PED HEADS AT 90 AND 180 DEG
- 1-PEDESTRIAN PUSH BUTTON & SIGN (R10-3e) (LT ARROW)
- 1-R10-X12 SIGN ADJACENT TO HEAD (1-1)
- 1-TYPE D SIGN (D-2) (SEE SIGN DETAILS)
- * ONE WAY EVP MOUNTING HARDWARE (FOR COUNTY FURNISHED DETECTOR AND CONFIRMATION LIGHT)
- EXTEND INTO H.H.12:
  - 3" CONDUIT
  - 2-12/C#14
  - 1-6/C#14
  - 2-4/C#14
  - * 1-3/C#14
  - 1-3/C#14 (LUM)
  - * 1-3/C#20
  - 1-2/C#14
  - 1-1/C#6 (GRD)

(9) F & I
- PEDESTRIAN PUSH BUTTON STATION (SEE DETAILS)
- 1-PEDESTRIAN PUSH BUTTON & SIGN (R10-3e) (RT ARROW)
- EXTEND INTO H.H.13:
  - 1" CONDUIT
  - 1-2/C#14

NO	DATE	BY	CKD	APPR	REVISION

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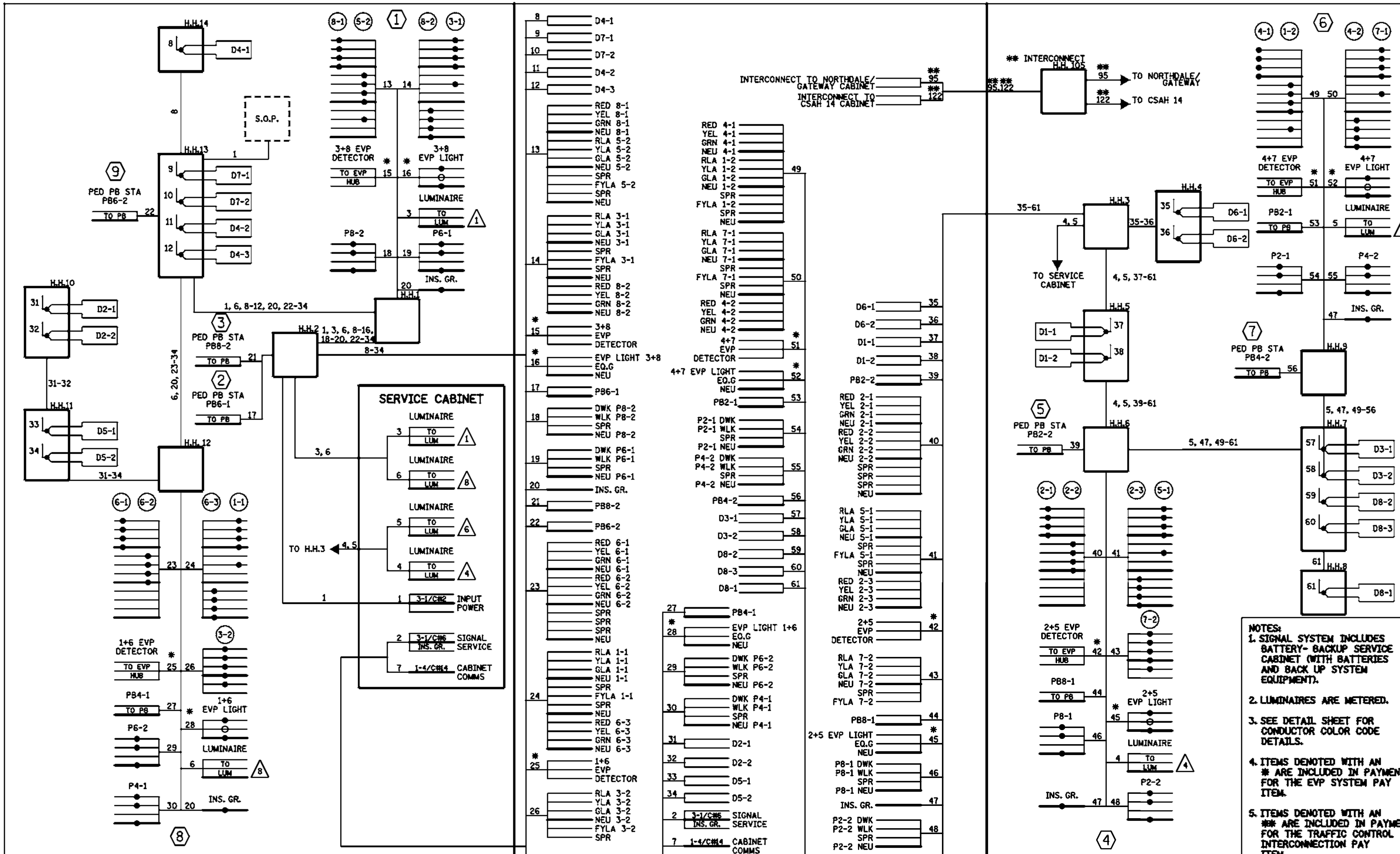
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: AJH
CHECKED BY: KAS

HDR
ANOKA COUNTY

SYSTEM "A" MATCHLINES AND POLE NOTES

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



NOTES:

1. SIGNAL SYSTEM INCLUDES BATTERY- BACKUP SERVICE CABINET (WITH BATTERIES AND BACK UP SYSTEM EQUIPMENT).
2. LUMINAIRES ARE METERED.
3. SEE DETAIL SHEET FOR CONDUCTOR COLOR CODE DETAILS.
4. ITEMS DENOTED WITH AN * ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
5. ITEMS DENOTED WITH AN ** ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECTION PAY ITEM.

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HDR — ANOKA COUNTY

SYSTEM "A" WIRING DIAGRAM

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

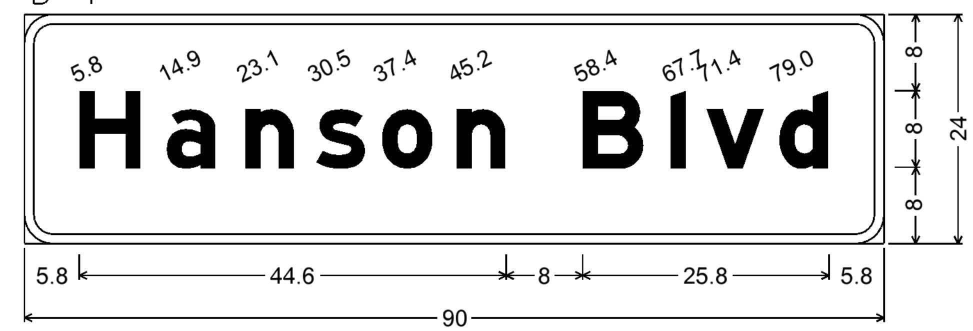
SIGN DETAILS

SIGNS FOR TRAFFIC SIGNAL SYSTEM										
SIGN PANELS TYPE C (SIGNALS) (FURNISH & INSTALL)										
SIGNAL SYSTEM	SIGN PANEL	POLE NO.	a (FT)	b (FT)	SIZE (IN)	MOUNTING BRACKET QUANTITY	MOUNTING BRACKET SPACING (1)	UNIT AREA (SQ FT)	NO. REQ.	PANEL LEGEND
A	R10-X12	1,3,5,7	1.5'	–	42 x 48	2	---	14.00	4	Left Turn Yield on Flashing Yellow Arrow
						TOTAL QUANTITIES		14.00	4	

SIGNS FOR TRAFFIC SIGNAL SYSTEM										
SIGN PANELS TYPE D (SIGNALS) (FURNISH & INSTALL)										
SIGNAL SYSTEM	SIGN PANEL	POLE NO.	a (FT)	b (FT)	SIZE (IN)	MOUNTING BRACKET QUANTITY	MOUNTING BRACKET SPACING (1)	UNIT AREA (SQ FT)	NO. REQ.	PANEL LEGEND
A	D-1	1	–	12'	90 x 24	4	22	15.00	1	Hanson Blvd
A	D-2	3	–	26'	96 x 24	4	24	16.00	1	121St Ave NW
A	D-1	5	–	12.5'	90 x 24	4	22	15.00	1	Hanson Blvd
A	D-2	7	–	26'	96 x 24	4	24	16.00	1	121St Ave NW
						TOTAL QUANTITIES		62.00	4	

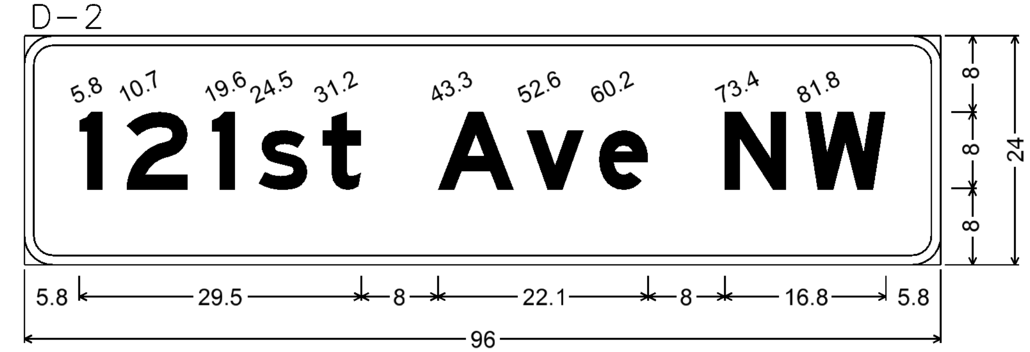
(1) = SPACING BETWEEN STIFFENERS SHALL NOT EXCEED 36 INCHES AND SHALL BE UNIFORMLY SPACED. SEE STANDARD SIGNS MANUAL, PAGE 105A (REVISION DATE 7/06/2007) FOR BRACKET SPACING REQUIREMENTS.

D-1



3.0" Radius, 1.0" Border, White on Green;
[Hanson Blvd] E Mod;

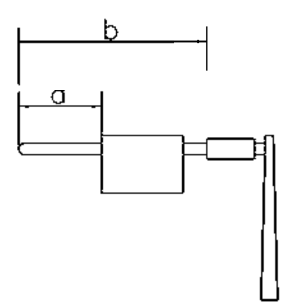
D-2



3.0" Radius, 1.0" Border, White on Green;
[121st Ave NW] E Mod;

GENERAL SIGNING NOTES:

1) COLOR FOR ALL TYPE D SIGNS SHALL BE WHITE LEGEND AND BORDER ON GREEN BACKGROUND, FULLY REFLECTORIZED.
2) CORNERS EXTENDING BEYOND THE BORDER SHALL NOT BE TRIMMED. CORNERS OF STANDARD SIGN PANELS WITH MARGINS SHALL BE TRIMMED.
3) FOR STRUCTURAL DETAILS OF MAST ARM MOUNTED SIGNS, SEE STANDARD SIGNS MANUAL, PAGE 105A (REVISION DATE: 7/06/07), AND SPECIAL PROVISIONS.
4) SEE STANDARD SIGNS MANUAL FOR DETAILED DRAWINGS OF TYPE C SIGN PANELS.
5) FURNISHING AND INSTALLING NEW TYPE C AND TYPE D SIGNS SHALL BE INCLUDED AS PART OF BID ITEM FOR "REVISE SIGNAL SYSTEM A" AND "TRAFFIC CONTROL SIGNAL SYSTEMS B-C". SEE SPECIAL PROVISIONS.
6) MAST ARM POLE MOUNTED AND PEDESTAL POLE MOUNTED SIGN PANELS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR USING CONTRACTOR FURNISHED AND INSTALLED MOUNTING HARDWARE.



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HDR
ANOKA COUNTY

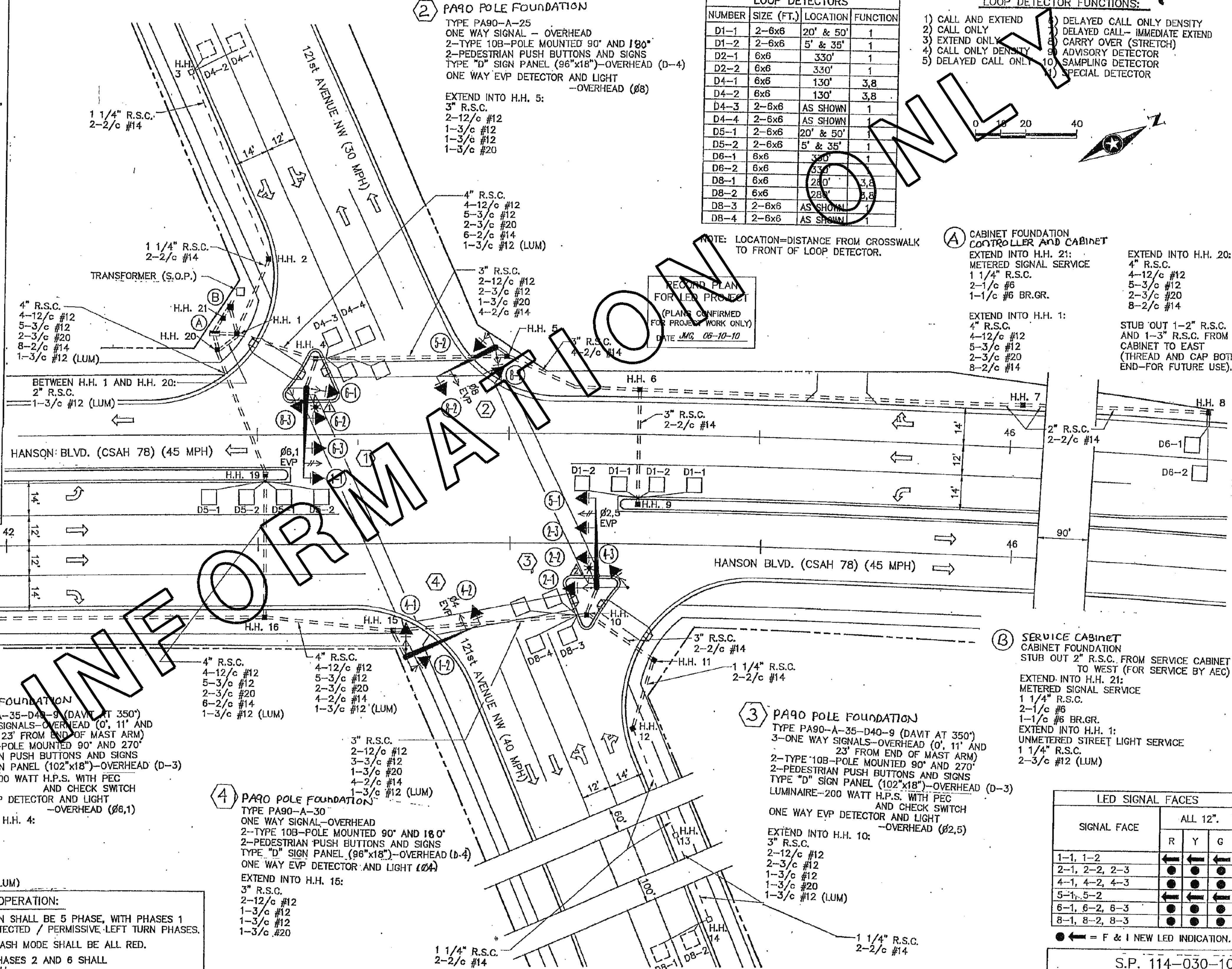
MAST ARM SIGN DETAILS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

7274

LED RETROFIT-SYSTEM "YY" NOTES:

1) ALL ITEMS OF SIGNAL SYSTEM ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE, UNLESS OTHERWISE NOTED ON PLANS.
2) CONTRACTOR SHALL REMOVE ALL INPLACE 12" x 12" 2-SECTION PED SIGNAL INDICATIONS & HOUSINGS, AND SHALL FURNISH AND INSTALL NEW ONE SECTION COUNTDOWN TIMER LED "HAND/WALKING PERSON" PED SIGNALS (HOUSING, VISOR, LENS) IN THEIR PLACE.
3) CONTRACTOR SHALL REMOVE THE INPLACE TYPE 10B BRACKETING (90° & 270°) ON POLES 1 AND 3; SHALL FURNISH & INSTALL NEW TYPE 10B BRACKETING (90° & 270°) IN THEIR PLACE; SHALL SALVAGE, INSTALL, AND MAKE OPERATIONAL SIGNAL HEADS 2-1, 4-3, 6-1, AND 8-3; AND SHALL INCORPORATE NEW ONE SECTION PEDESTRIAN PEDESTRIAN SIGNALS WITHIN NEW BRACKETINGS. ALL WORK LISTED ABOVE SHALL BE CONSIDERED INCIDENTAL TO THE PEDESTRIAN INDICATION PAY ITEM.
4) CONTRACTOR SHALL REMOVE THE INPLACE TYPE 10B BRACKETING (90° & 270°) ON POLES 2 AND 4; SHALL FURNISH & INSTALL NEW TYPE 10B BRACKETING (90° & 180°) IN THEIR PLACE; SHALL SALVAGE, INSTALL, AND MAKE OPERATIONAL SIGNAL HEADS 1-2, 4-1, 5-2, AND 8-1; AND SHALL INCORPORATE NEW ONE SECTION PEDESTRIAN PEDESTRIAN SIGNALS WITHIN NEW BRACKETINGS. CAP UNUSED HUBS AT 270°. ALL WORK LISTED ABOVE SHALL BE CONSIDERED INCIDENTAL TO THE PEDESTRIAN INDICATION PAY ITEM.
5) CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MODIFICATIONS TO INPLACE POLE MOUNTED BRACKETING ON EACH TRAFFIC SIGNAL POLE TO ACCOMMODATE INSTALLATION OF NEW ONE SECTION PEDESTRIAN SIGNAL INDICATIONS (INCLUDING THE REPLACEMENT OF THE POLE MOUNTED BRACKETING IF NEEDED TO ACCOMMODATE EACH PEDESTRIAN SIGNAL INDICATION INSTALLATION) (INCIDENTAL).
6) ANY DAMAGE TO INPLACE TRAFFIC SIGNAL POLES OR VEHICLE SIGNAL HEADS DUE TO WORK ON THIS PROJECT SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE ENGINEER, AT NO EXPENSE TO THE CITY.
7) NEW PEDESTRIAN HOUSINGS AND VISORS SHALL BE FABRICATED USING NEW POLYCARBONATE MATERIALS.
8) CONTRACTOR SHALL REMOVE ALL INPLACE INCANDESCENT "RED", "YELLOW", AND "GREEN" VEHICLE SIGNAL INDICATION LENSES, AND SHALL FURNISH AND INSTALL NEW LED INDICATIONS IN THEIR PLACE.
9) CONTRACTOR SHALL REMOVE ALL INPLACE PEDESTRIAN PUSH BUTTONS (8 TOTAL), R10-4b STICKER SIGNS, AND "MEANING OF WALK" STICKER SIGNS, & SHALL FURNISH & INSTALL NEW SOLID STATE PED PUSH BUTTONS AND R10-3e SIGNS IN THEIR PLACE.
10) CONTRACTOR SHALL MAINTAIN OPERATION OF THE SIGNAL SYSTEM AT ALL TIMES, EXCEPT AS OTHERWISE APPROVED BY THE ENGINEER.
11) SEE STATEMENT OF ESTIMATED QUANTITIES FOR BID ITEMS FOR WORK AT THIS SIGNAL SYSTEM.



LOOP DETECTORS			
NUMBER	SIZE (FT.)	LOCATION	FUNCTION
D1-1	2-6x6	20' & 50'	1
D1-2	2-6x6	5' & 35'	1
D2-1	6x6	330'	1
D2-2	6x6	330'	1
D4-1	6x6	130'	3,8
D4-2	6x6	130'	3,8
D4-3	2-6x6	AS SHOWN	1
D4-4	2-6x6	AS SHOWN	1
D5-1	2-6x6	20' & 50'	1
D5-2	2-6x6	5' & 35'	1
D6-1	6x6	330'	1
D6-2	6x6	330'	1
D8-1	6x6	280'	3,8
D8-2	6x6	280'	3,8
D8-3	2-6x6	AS SHOWN	1
D8-4	2-6x6	AS SHOWN	1

NOTE: LOCATION=DISTANCE FROM CROSSWALK TO FRONT OF LOOP DETECTOR.

LOOP DETECTOR FUNCTIONS:

1) CALL AND EXTEND
2) CALL ONLY
3) EXTEND ONLY
4) CALL ONLY DENSITY
5) DELAYED CALL ONLY
6) DELAYED CALL ONLY DENSITY
7) DELAYED CALL- IMMEDIATE EXTEND
8) CARRY OVER (STRETCH)
9) ADVISORY DETECTOR
10) SAMPLING DETECTOR
11) SPECIAL DETECTOR

(2) PA90 POLE FOUNDATION
TYPE PA90-A-25
ONE WAY SIGNAL - OVERHEAD
2-TYPE 10B-POLE MOUNTED 90° AND 180°
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
TYPE "D" SIGN PANEL (96"x18")-OVERHEAD (D-4)
ONE WAY EVP DETECTOR AND LIGHT -OVERHEAD (Ø8)
EXTEND INTO H.H. 5:
3" R.S.C.
2-12/c #12
1-3/c #12
1-3/c #12
1-3/c #20

(A) CABINET FOUNDATION
CONTROLLER AND CABINET
EXTEND INTO H.H. 21:
METERED SIGNAL SERVICE
1 1/4" R.S.C.
2-1/c #6
1-1/c #6 BR.GR.
EXTEND INTO H.H. 1:
4" R.S.C.
4-12/c #12
5-3/c #12
2-3/c #20
8-2/c #14

EXTEND INTO H.H. 20:
4" R.S.C.
4-12/c #12
5-3/c #12
2-3/c #20
8-2/c #14
STUB OUT 1-2" R.S.C. AND 1-3" R.S.C. FROM CABINET TO EAST (THREAD AND CAP BOTH END-FOR FUTURE USE).

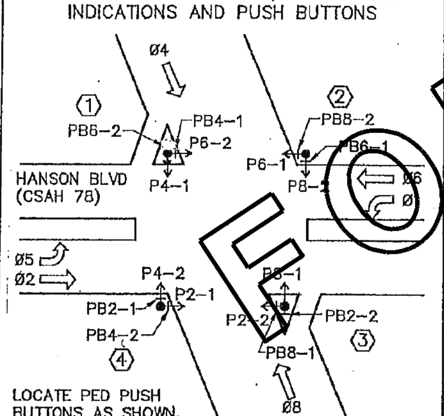
(B) SERVICE CABINET
CABINET FOUNDATION
STUB OUT 2" R.S.C. FROM SERVICE CABINET TO WEST (FOR SERVICE BY AEC)
EXTEND INTO H.H. 21:
METERED SIGNAL SERVICE
1 1/4" R.S.C.
2-1/c #6
1-1/c #6 BR.GR.
EXTEND INTO H.H. 1:
UNMETERED STREET LIGHT SERVICE
1 1/4" R.S.C.
2-3/c #12 (LUM)

(1) PA90 POLE FOUNDATION
TYPE PA90-A-35-D40-9 (DAVIT AT 350°)
3-ONE WAY SIGNALS-OVERHEAD (0', 11' AND 23' FROM END OF MAST ARM)
2-TYPE 10B-POLE MOUNTED 90° AND 270°
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
TYPE "D" SIGN PANEL (102"x18")-OVERHEAD (D-3)
LUMINAIRE-200 WATT H.P.S. WITH PEC AND CHECK SWITCH
ONE WAY EVP DETECTOR AND LIGHT -OVERHEAD (Ø6,1)
EXTEND INTO H.H. 4:
3" R.S.C.
2-12/c #12
2-3/c #12
1-3/c #12
1-3/c #20
1-3/c #12 (LUM)

(4) PA90 POLE FOUNDATION
TYPE PA90-A-30
ONE WAY SIGNAL-OVERHEAD
2-TYPE 10B-POLE MOUNTED 90° AND 180°
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
TYPE "D" SIGN PANEL (96"x18")-OVERHEAD (D-4)
ONE WAY EVP DETECTOR AND LIGHT (Ø4)
EXTEND INTO H.H. 15:
3" R.S.C.
2-12/c #12
1-3/c #12
1-3/c #12
1-3/c #20

(3) PA90 POLE FOUNDATION
TYPE PA90-A-35-D40-9 (DAVIT AT 350°)
3-ONE WAY SIGNALS-OVERHEAD (0', 11' AND 23' FROM END OF MAST ARM)
2-TYPE 10B-POLE MOUNTED 90° AND 270°
2-PEDESTRIAN PUSH BUTTONS AND SIGNS
TYPE "D" SIGN PANEL (102"x18")-OVERHEAD (D-3)
LUMINAIRE-200 WATT H.P.S. WITH PEC AND CHECK SWITCH
ONE WAY EVP DETECTOR AND LIGHT -OVERHEAD (Ø2,5)
EXTEND INTO H.H. 10:
3" R.S.C.
2-12/c #12
2-3/c #12
1-3/c #12
1-3/c #20
1-3/c #12 (LUM)

CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



SIGNAL SYSTEM OPERATION:

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

LED SIGNAL FACES			
SIGNAL FACE	ALL 12".		
	R	Y	G
1-1, 1-2	←	←	←
2-1, 2-2, 2-3	●	●	●
4-1, 4-2, 4-3	●	●	●
5-1, 5-2	←	←	←
6-1, 6-2, 6-3	●	●	●
8-1, 8-2, 8-3	●	●	●

● ← = F & I NEW LED INDICATION.

S.P. 114-030-10
CITY PROJECT NO. 09-18

DRAWN BY: JMG	1	JMG	6/10	RECORD DRAWING FOR PROJECT
DESIGNER: JMG				
CHECKED BY: JMG				
DESIGN TEAM	NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
Date: May 18, 2009 Name: John M. Gray, PE Lic. No. 22457

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

COON RAPIDS, MINNESOTA

LED RETROFIT-SYSTEM "YY"
INTERSECTION LAYOUT
CSAH 78 AT 121ST AVENUE

FILE NO. 107418
DATE 05/18/2009
118 / 131

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NO	DATE	BY	CKD	APPR	REVISION

HDR
ANOKA COUNTY

FOR INFORMATION ONLY
SHEET NO. 187 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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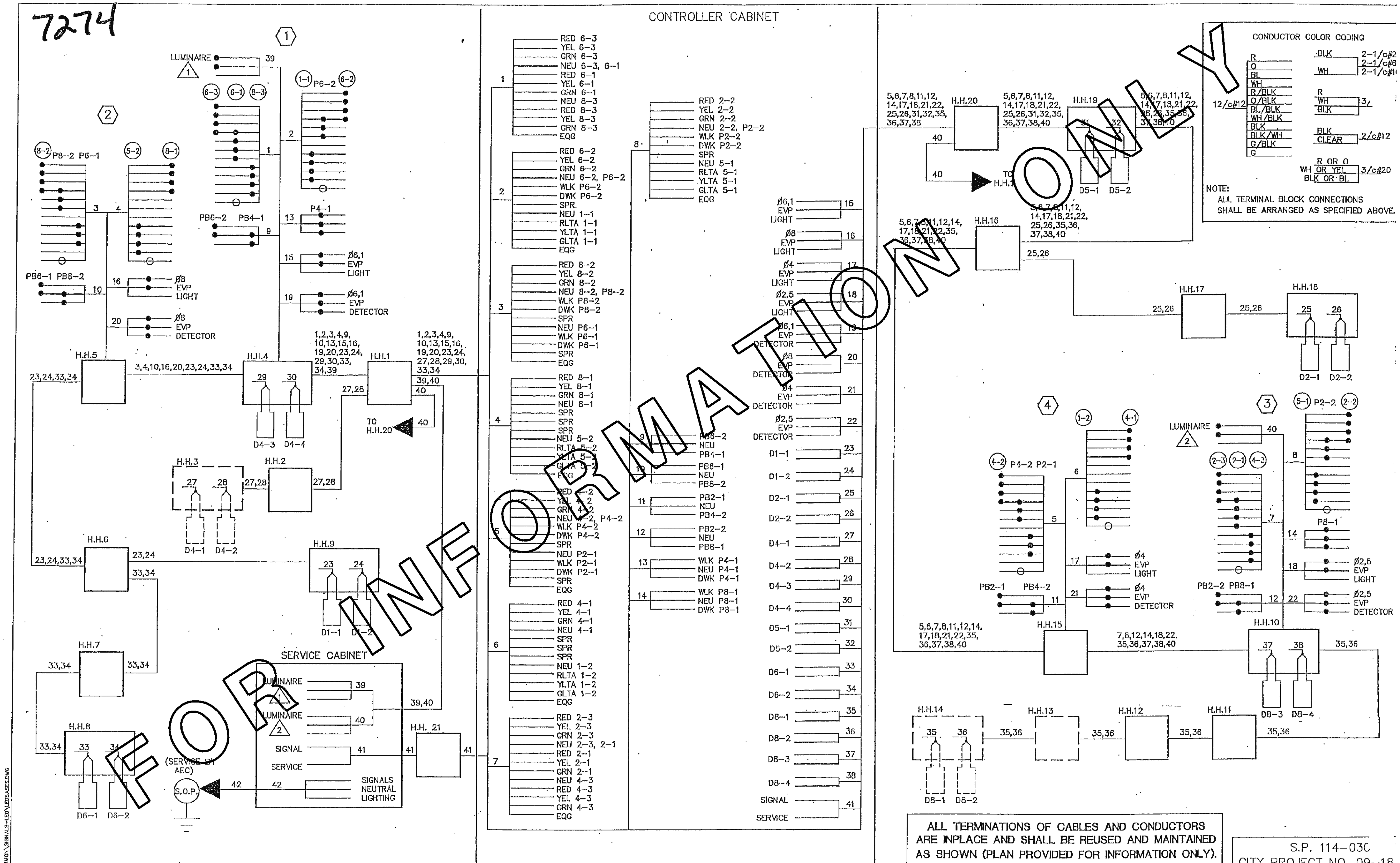

S.P. 114-030
CITY PROJECT NO. 09-18

DRAWN BY: JMG
DESIGNER: JMG
CHECKED BY: JMG
DESIGN TEAM

NO.	BY	DATE	REVISIONS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Date: May 18, 2009 Name: John M. Gray, PE Lic. No. 22457

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

COON RAPIDS, MINNESOTA

LED RETROFIT-SYSTEM "YY"
FIELD WIRING DIAGRAM
CSAH 78 AT 121ST AVENUE

FILE NO. 107418
DATE 05/18/2009
119 / 131

NO	DATE	BY	CKD	APPR	REVISION

HDR
ANOKA COUNTY

FOR INFORMATION ONLY
SHEET NO. 188 OF 230 SHEETS
S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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DESCRIPTION OF WORK

1) SALVAGE AND INSTALL POLE 5 AND ALL ATTACHED EQUIPMENT TO THE PROPOSED LOCATION. FURNISH AND INSTALL A NEW FOUNDATION FOR POLE 5. ADJUST SIGNAL HEAD OFFSETS TO ALIGN WITH LANES.
2) SALVAGE AND INSTALL POLE 4 AND ALL ATTACHED EQUIPMENT TO THE PROPOSED LOCATION. FURNISH AND INSTALL A NEW FOUNDATION FOR POLE 4.
3) SALVAGE AND INSTALL POLE 6 AND ALL ATTACHED EQUIPMENT TO PROPOSED LOCATION. FURNISH AND INSTALL A NEW FOUNDATION FOR POLE 6.
4) REMOVE THE POLE 1 MAST ARM. FURNISH AND INSTALL A NEW MAST ARM TO THE EXISTING POLE 1 POST. FURNISH AND INSTALL A MAST ARM EXTENSION TO THE END OF THE NEW MAST ARM. ADJUST SIGNAL HEAD OFFSETS TO ALIGN WITH LANES.
5) REMOVE SIGNAL HEADS 4-1 AND 4-2. FURNISH AND INSTALL NEW SIGNAL HEADS 4-1 AND 4-2 AT THE EXISTING LOCATIONS.

THE FOLLOWING WORK TO BE DONE DURING OFF-PEAK HOURS WITH TEMPORARY STOP CONTROL.

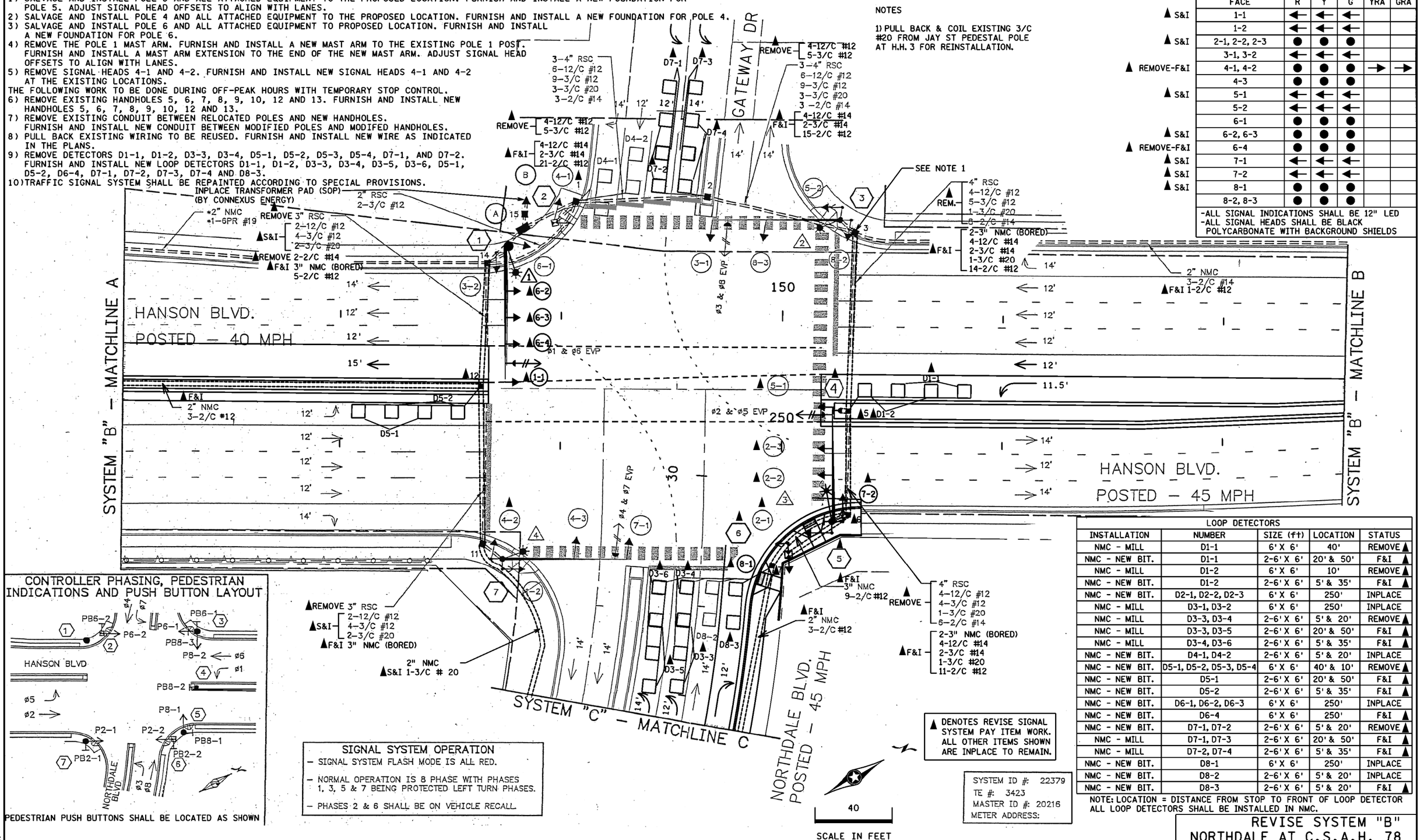
6) REMOVE EXISTING HANDHOLES 5, 6, 7, 8, 9, 10, 12 AND 13. FURNISH AND INSTALL NEW HANDHOLES 5, 6, 7, 8, 9, 10, 12 AND 13.
7) REMOVE EXISTING CONDUIT BETWEEN RELOCATED POLES AND NEW HANDHOLES. FURNISH AND INSTALL NEW CONDUIT BETWEEN MODIFIED POLES AND MODIFED HANDHOLES.
8) PULL BACK EXISTING WIRING TO BE REUSED. FURNISH AND INSTALL NEW WIRE AS INDICATED IN THE PLANS.
9) REMOVE DETECTORS D1-1, D1-2, D3-3, D3-4, D5-1, D5-2, D5-3, D5-4, D7-1, AND D7-2. FURNISH AND INSTALL NEW LOOP DETECTORS D1-1, D1-2, D3-3, D3-4, D3-5, D3-6, D5-1, D5-2, D6-4, D7-1, D7-2, D7-3, D7-4 AND D8-3.
10) TRAFFIC SIGNAL SYSTEM SHALL BE REPAINTED ACCORDING TO SPECIAL PROVISIONS.

NOTES

1) PULL BACK & COIL EXISTING 3/C #20 FROM JAY ST PEDESTAL POLE AT H.H. 3 FOR REINSTALLATION.

SIGNAL FACES					
FACE	R	Y	G	YRA	GRA
1-1	←	←	←		
1-2	←	←	←		
2-1, 2-2, 2-3	●	●	●		
3-1, 3-2	←	←	←		
4-1, 4-2	●	●	●	→	→
4-3	●	●	●		
5-1	←	←	←		
5-2	←	←	←		
6-1	●	●	●		
6-2, 6-3	●	●	●		
6-4	●	●	●		
7-1	←	←	←		
7-2	←	←	←		
8-1	●	●	●		
8-2, 8-3	●	●	●		

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



CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTON LAYOUT

PEDESTRIAN PUSH BUTTONS SHALL BE LOCATED AS SHOWN

SIGNAL SYSTEM OPERATION

- SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE WITH PHASES 1, 3, 5 & 7 BEING PROTECTED LEFT TURN PHASES.
- PHASES 2 & 6 SHALL BE ON VEHICLE RECALL.

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

SCALE IN FEET

LOOP DETECTORS				
INSTALLATION	NUMBER	SIZE (ft)	LOCATION	STATUS
NMC - MILL	D1-1	6' X 6'	40'	REMOVE
NMC - NEW BIT.	D1-1	2-6' X 6'	20' & 50'	F&I
NMC - MILL	D1-2	6' X 6'	10'	REMOVE
NMC - NEW BIT.	D1-2	2-6' X 6'	5' & 35'	F&I
NMC - NEW BIT.	D2-1, D2-2, D2-3	6' X 6'	250'	INPLACE
NMC - MILL	D3-1, D3-2	6' X 6'	250'	INPLACE
NMC - MILL	D3-3, D3-4	2-6' X 6'	5' & 20'	REMOVE
NMC - MILL	D3-3, D3-5	2-6' X 6'	20' & 50'	F&I
NMC - MILL	D3-4, D3-6	2-6' X 6'	5' & 35'	F&I
NMC - NEW BIT.	D4-1, D4-2	2-6' X 6'	5' & 20'	INPLACE
NMC - NEW BIT.	D5-1, D5-2, D5-3, D5-4	6' X 6'	40' & 10'	REMOVE
NMC - NEW BIT.	D5-1	2-6' X 6'	20' & 50'	F&I
NMC - NEW BIT.	D5-2	2-6' X 6'	5' & 35'	F&I
NMC - NEW BIT.	D6-1, D6-2, D6-3	6' X 6'	250'	INPLACE
NMC - NEW BIT.	D6-4	6' X 6'	250'	F&I
NMC - NEW BIT.	D7-1, D7-2	2-6' X 6'	5' & 20'	REMOVE
NMC - MILL	D7-1, D7-3	2-6' X 6'	20' & 50'	F&I
NMC - MILL	D7-2, D7-4	2-6' X 6'	5' & 35'	F&I
NMC - NEW BIT.	D8-1	6' X 6'	250'	INPLACE
NMC - NEW BIT.	D8-2	2-6' X 6'	5' & 20'	INPLACE
NMC - NEW BIT.	D8-3	2-6' X 6'	5' & 20'	F&I

NOTE: LOCATION = DISTANCE FROM STOP TO FRONT OF LOOP DETECTOR
ALL LOOP DETECTORS SHALL BE INSTALLED IN NMC.

SYSTEM ID #: 22379
TE #: 3423
MASTER ID #: 20216
METER ADDRESS:

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
DESIGNED BY: AJH
CHECKED BY: KAS

HDR

ANOKA COUNTY

REVISE SYSTEM "B" NORTHDALE AT C.S.A.H. 78

REVISE SYSTEM "B" INTERSECTION LAYOUT

SHEET NO. 189 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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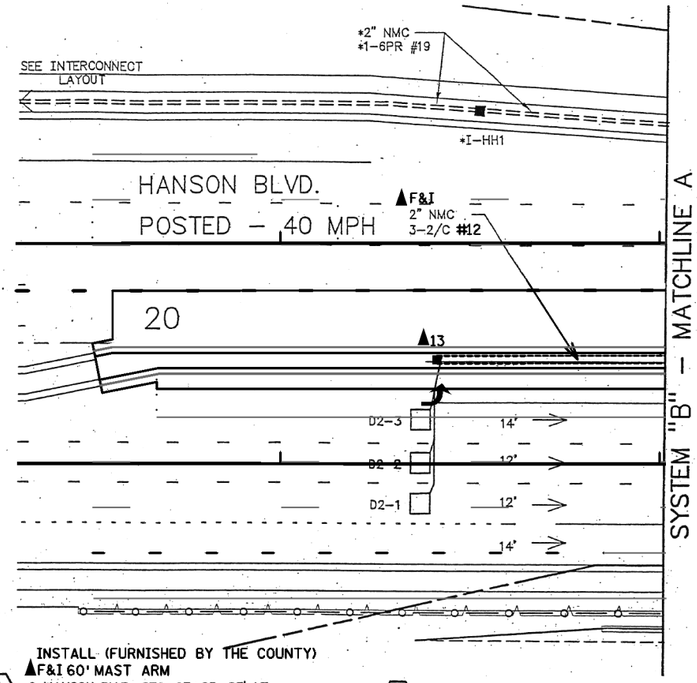

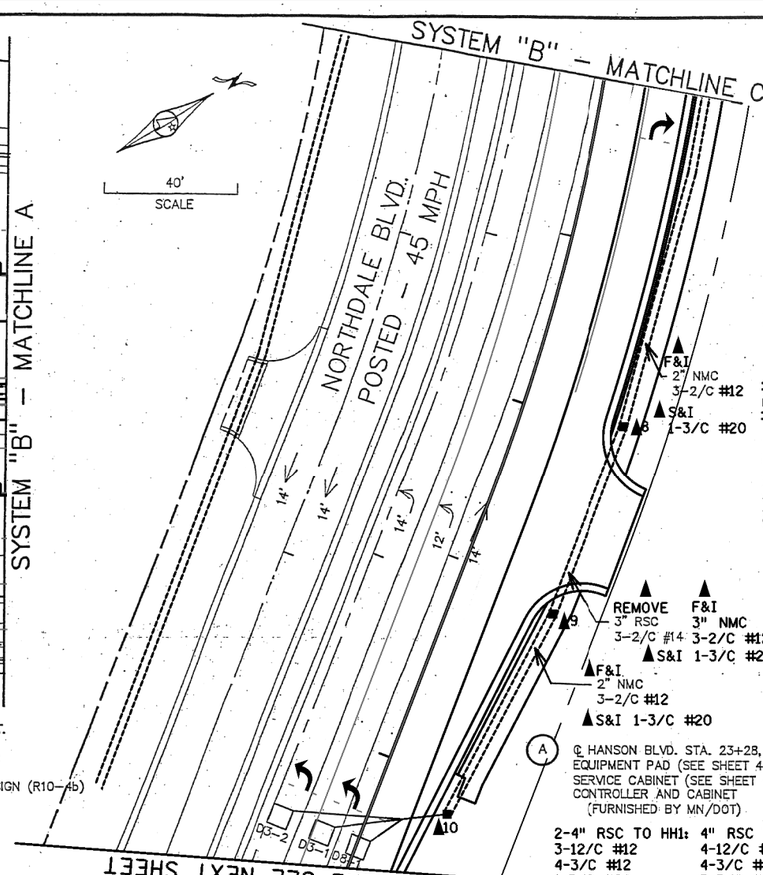

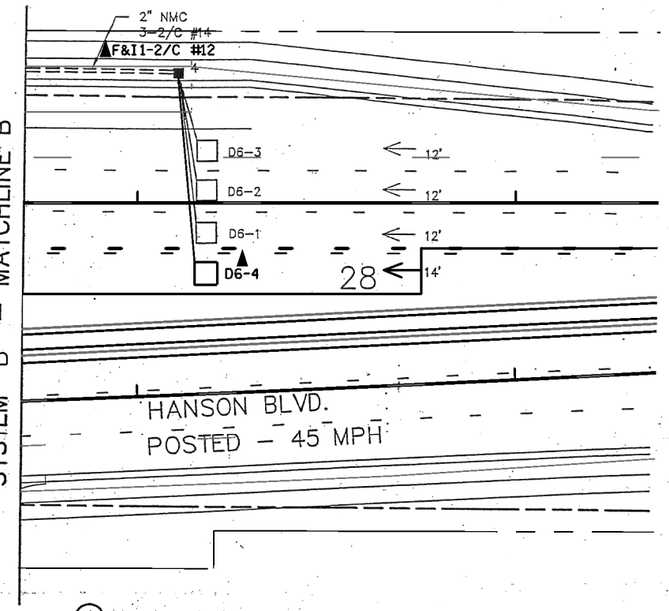

INSTALL (FURNISHED BY THE COUNTY)
▲F&I 60' MAST ARM

(1) ℄ HANSON BLVD. STA. 23+23, 63' LT.
BA60 POLE FOUNDATION
TYPE **BA60-A-60-X30 (REMOVE 50' MAST ARM)▲**
LUMINAIRE ARM AT 350° (SEE SPECIAL PROVISIONS)
3 – ONE WAY SIGNALS OVERHEAD (0', **24'** & **36'** FROM END OF MAST ARM)
2 – TYPE 10A POLE MOUNTED AT 90° & 180°
1 – ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 1 & 6) (5' FROM END OF MAST ARM)
LUMINAIRE – 250W HPS (SEE SPECIAL PROVISIONS)
1 – R9-3a (NO PED) SIGN FACING POLE 7
1 – TYPE D SIGN (D-5) OVERHEAD SEE SHEET 494
2 – R6-1L OR R6-1R SIGN (ONE WAY) POLE MOUNTED
▲F&I 1 - ONE WAY SIGNALS OVERHEAD (12' FROM END OF MAST ARM)
3" RSC TO HH 14:
2-12/C #12
2-3/C #12
1-3/C #20
▲F&I 1-4/C #14

(2) ℄ HANSON BLVD. STA. 23+44, 77' LT.
PEDESTAL POLE FOUNDATION
13' PEDESTAL POLE (INCLUDES BASE)
1 – TYPE 5B
1 – PEDESTRIAN PUSHBUTTON AND SIGN (R10-4b)
2" RSC TO HH 1:
1-12/C #12
1-3/C #12

(3) ℄ HANSON BLVD. STA. 24+74, 76' LT.
PA100 POLE FOUNDATION
TYPE PA100-A-55-X30
LUMINAIRE ARM AT 350° (SEE SPECIAL PROVISIONS)
2 – ONE WAY SIGNALS OVERHEAD (0' & 24' FROM END OF MAST ARM)
2 – TYPE 10B POLE MOUNTED AT 90° & 180°
1 – ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 3 & 8) (5' FROM END OF MAST ARM)
LUMINAIRE – 250W HPS (SEE SPECIAL PROVISIONS)
2 – PEDESTRIAN PUSHBUTTONS AND SIGNS (R10-4b)
1 – TYPE D SIGN (D-6) OVERHEAD SEE SHEET 494
2 – R6-1L OR R6-1R SIGN (ONE WAY) POLE MOUNTED
3" RSC TO HH 3:
2-12/C #12
4-3/C #12
1-3/C #20

(4) CSAH 78 NB STA. 250+26.6, 18.3' LT
▲REMOVE PEDESTRIAN PUSHBUTTON STATION FOUNDATION ▲F&I PEDESTRIAN PUSHBUTTON STATION FOUNDATION
▲S&I PEDESTRIAN PUSHBUTTON STATION (MNDOT STD PLATE 8115)
1 – PEDESTRIAN PUSHBUTTON AND SIGN (R10-4b)
▲REMOVE – 1 1/4" RSC TO HH 5: 1-3/C #12
▲F&I 1 1/4" NMC TO HH 5: 1-2/C #14

(5) CSAH 78 NB STA. 250+22.5, 31.8' RT
▲REMOVE PA100 POLE FOUNDATION ▲F&I PA100 POLE FOUNDATION
TYPE PA100-A-55-X30
LUMINAIRE ARM AT 350° (SEE SPECIAL PROVISIONS)
3 – ONE WAY SIGNALS OVERHEAD (0', **19'** & **30'** FROM END OF MAST ARM)
1 – TYPE 10B POLE MOUNTED AT 90°
1 – TYPE 10A POLE MOUNTED AT 180°
1 – ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 2 & 5) (5' FROM END OF MAST ARM)
LUMINAIRE – 250W HPS (SEE SPECIAL PROVISIONS)
1 – PEDESTRIAN PUSHBUTTON AND SIGN (R10-4b)
1 – TYPE D SIGN (D-4) OVERHEAD SEE SHEET 494
2 – R6-1L OR R6-1R SIGN (ONE WAY) POLE MOUNTED
▲S&I
▲REMOVE-F&I
▲F&I 3" RSC TO HH 6:
▲REMOVE 3-12/C #12, 3-3/C #12, 1-3/C #20 ▲F&I 3-12/C #14, 3-3/C #14, 1-3/C #20

(6) CSAH 78 NB STA. 250+2.95, 46.7' RT
▲REMOVE PEDESTAL POLE FOUNDATION ▲F&I PEDESTAL POLE FOUNDATION
▲S&I 13' PEDESTAL POLE (INCLUDES BASE), 1-TYPE 5B, 1-PEDESTRIAN PUSHBUTTON AND SIGN (R10-4B)
▲F&I 3" RSC TO HH6:
▲REMOVE 1-12/C #12, 1-3/C #12 ▲F&I 1-12/C #14, 1-2/C #14

(7) ℄ HANSON BLVD. STA. 23+22, 78' RT.
PA100 POLE FOUNDATION
TYPE PA100-A-55-X30
LUMINAIRE ARM AT 350° (SEE SPECIAL PROVISIONS)
2 – ONE WAY SIGNALS OVERHEAD (0' & 23' FROM END OF MAST ARM)
1 – TYPE 10B POLE MOUNTED AT 90°
1 – TYPE 10A POLE MOUNTED AT 180°
1 – ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 4 & 7) (5' FROM END OF MAST ARM)
LUMINAIRE – 250W HPS (SEE SPECIAL PROVISIONS)
1 – PEDESTRIAN PUSHBUTTON AND SIGN (R10-4b)
1 – TYPE D SIGN (D-6) OVERHEAD SEE SHEET 494
1 – TYPE R9-3a SIGN (NO PED) FACING POLE 1
2 – R6-1L OR R6-1R SIGN (ONE WAY) POLE MOUNTED
3" RSC TO HH 11:
2-12/C #12
4-3/C #12
1-3/C #20

(A) ℄ HANSON BLVD. STA. 23+28, 74' LT.
EQUIPMENT PAD (SEE SHEET 490)
SERVICE CABINET (SEE SHEET 489)
CONTROLLER AND CABINET (FURNISHED BY MN/DOT)

2-4" RSC TO HH1:
3-12/C #12
4-3/C #12
1-3/C #20
3-2/C #14

4" RSC TO HH 14:
4-12/C #12
4-3/C #12
3-3/C #20
#1-6PR #19

▲REMOVE:
4-12/C #12
4-3/C #12
1-3/C #20

▲REMOVE:
2-2/C #14

▲F&I:
4-12/C #14
3-3/C #14
1-3/C #20
21-2/C #12

▲F&I:
1-4/C #14
5-2/C #12

2" RSC TO SERVICE CABINET:
2-1/C #6
1-1/C #6 INS. GR.

SERVICE CABINET TO HH 1:
2" RSC
4-3/C #12

SERVICE CABINET TO HH 15:
2" RSC
3-1/C #2

3" RSC STUBBED OUT (THREADED AND CAPPED BOTH ENDS)
2" RSC STUBBED OUT (THREADED AND CAPPED BOTH ENDS)
3/4" NMC STUBBED OUT (THREADED AND CAPPED BOTH ENDS)
(FUTURE PHONE LINE)

(B) PROPOSED GROUND MOUNTED TRANSFORMER PAD (SOP)
(BY CONNEXUS ENERGY)
CONTACT PERSON: STEVE ZIMMERMAN

2" RSC TO HH 15:
3-1/C #2

NOTES:
1. SEE SPECIAL PROVISIONS FOR MN/DOT FURNISHED MATERIALS.
2. ALL VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL BE LED. SEE SPECIAL PROVISIONS.
3. THE EXACT LOCATION OF HANDHOLES, POLES, DETECTORS AND EQUIPMENT PAD SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD. MN/DOT TRAFFIC OFFICE PERSONNEL SHALL REVIEW LOCATIONS PRIOR TO INSTALLATION.
4. PEDESTRIAN INDICATIONS SHALL BE A ONE SECTION HAND/WALKING PERSON INDICATION. SEE SPECIAL PROVISIONS.
5. HANDHOLES SHALL BE PVC WITH METAL FRAMES AND COVERS, PER MN/DOT STANDARD PLATE NO. 8114.
6. A 3/4" HALF-COUPLING, 3/4" PIPE NIPPLE AND CONDUIT OUTLET BODY SHALL BE FURNISHED AND INSTALLED 6' FROM THE END OF THE MAST ARM AT POLES 1, 3, 5 & 7.
7. PEDESTAL POLE FOUNDATIONS SHALL BE IN ACCORDANCE WITH MN/DOT STANDARD PLATE 8112.
8. PEDESTAL POLE AND BASE SHALL BE IN ACCORDANCE WITH MN/DOT STANDARD PLATE 8122.
9. FOR TYPE C & TYPE D SIGN DETAILS SEE SHEET 494. POLE AND MAST ARM MOUNTED TYPE C AND TYPE D SIGNS SHALL BE INCIDENTAL.
10. THE SIGNAL CONTRACTOR SHALL COORDINATE THE CONSTRUCTION OF THE TRAFFIC SIGNAL WITH CONSTRUCTION STAGING OF THE AREA ROADWAYS.
11. ALL ITEMS OF THE INPLACE TRAFFIC SIGNAL SHALL BE REMOVED WHEN DIRECTED BY THE ENGINEER. REFER TO THE SPECIAL PROVISIONS FOR ITEMS TO BE SALVAGED. REMOVAL AND SALVAGE OF THE EXISTING SIGNAL SYSTEM SHALL BE INCIDENTAL.
12. HAULING OF SALVAGED SIGNAL EQUIPMENT SHALL BE PAID FOR AS HAUL SALVAGED MATERIAL.
13. SIGNAL EQUIPMENT SHALL BE PAINTED DARK BROWN. SEE SPECIAL PROVISIONS. THE CONTROLLER CABINET AND SERVICE CABINET SHALL NOT BE PAINTED.
14. ITEMS DENOTED WITH AN * ARE INCIDENTAL.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING UTILITIES PRIOR TO COMMENCING WORK.
16. LUMINAIRES ARE UNMETERED.
17. **SEE SHEET 189 FOR DESCRIPTION OF WORK.**

SYSTEM ID #: 22379
TE #: 3423
MASTER ID #: 20216
METER ADDRESS:

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

REVISE SYSTEM "B" NORTHDALE AT C.S.A.H. 78

MATCHLINES AND POLE NOTES

SHEET NO. 190 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

NO	DATE	BY	CKD	APPR	REVISION

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.
NAME: ANDREW J. HENGEL LIC. NO. 52256
CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

DRAWN BY: SY
DESIGNED BY: AJH
CHECKED BY: KAS

HDR

ANOKA COUNTY

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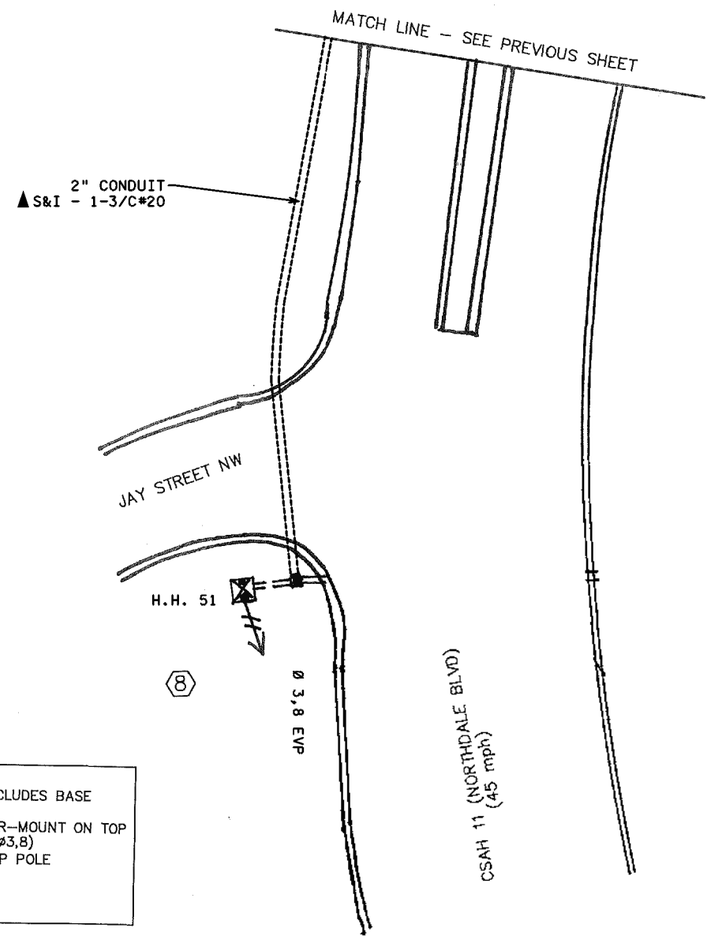

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scale feet

N

8 PEDESTAL FOUNDATION
10' PEDESTAL POLE (INCLUDES BASE AND WIND COLLAR)
ONE WAY EVP DETECTOR–MOUNT ON TOP OF PEDESTAL POLE (ø3,8)
SLIPFITTER COLLAR ATOP POLE
EXTEND TO H.H.51:
2"R.S.C.
▲S&I - 1–3/c#20

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

REVISE SYSTEM "B"
NORTHDALE BLVD AT JAY STREET

MATCHLINES AND POLE NOTES

SHEET NO. 191 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: _____ 11/22/2019
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
DESIGNED BY: AJH
CHECKED BY: KAS

HDR

ANOKA COUNTY

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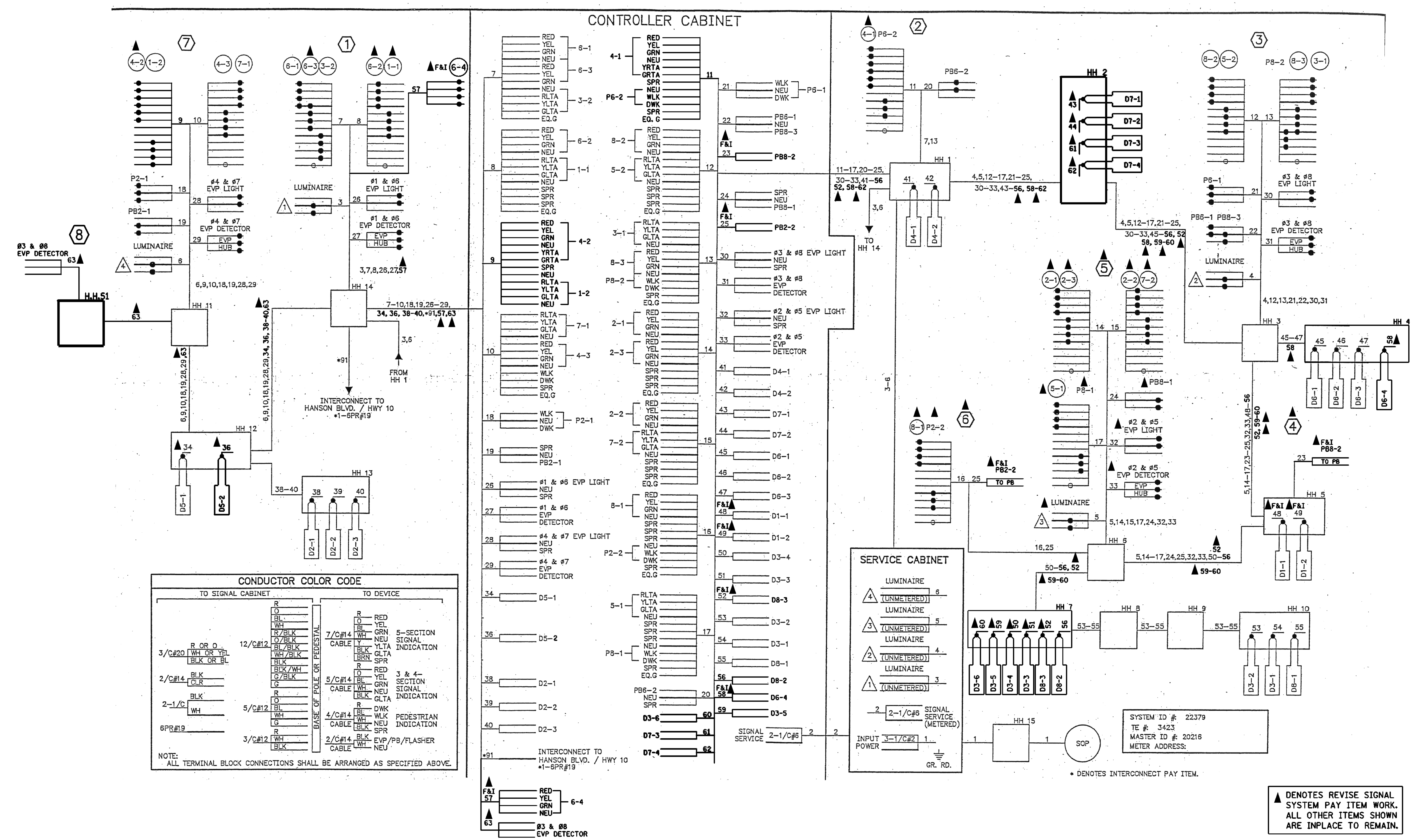


REVISE SYSTEM "B"
NORTHDALE AT C.S.A.H. 78

NO	DATE	BY	CKD	APPR	REVISION

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.

NAME: ANDREW J. HENGEL LIC. NO. 52256

CERTIFIED BY: [signature] LICENSED PROFESSIONAL ENGINEER 11/22/2019 DATE

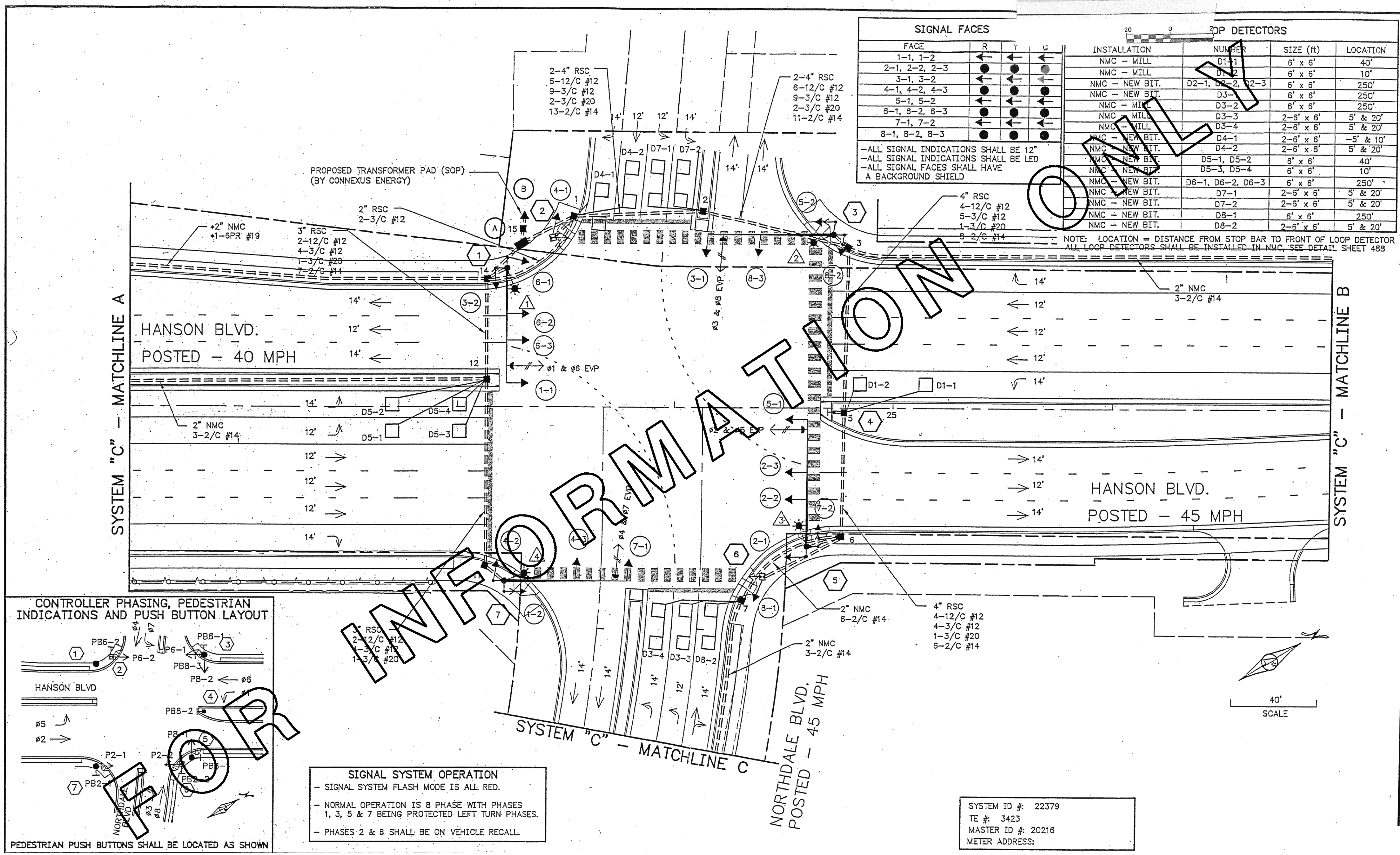
DRAWN BY: SY
DESIGNED BY: AJH
CHECKED BY: KAS

HDR ANOKA COUNTY

REVISE SYSTEM "B" WIRING DIAGRAM

SHEET NO. 192 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



SIGNAL FACES

FACE	R	Y	G
1–1, 1–2	←	←	←
2–1, 2–2, 2–3	●	●	●
3–1, 3–2	←	←	←
4–1, 4–2, 4–3	●	●	●
5–1, 5–2	←	←	←
6–1, 6–2, 6–3	●	●	●
7–1, 7–2	←	←	←
8–1, 8–2, 8–3	●	●	●

–ALL SIGNAL INDICATIONS SHALL BE 12"
–ALL SIGNAL INDICATIONS SHALL BE LED
–ALL SIGNAL FACES SHALL HAVE A BACKGROUND SHIELD

LOOP DETECTORS

INSTALLATION	NUMBER	SIZE (ft)	LOCATION
NMC – MILL	D1–1	6' x 6'	40'
NMC – MILL	D1–2	6' x 6'	10'
NMC – NEW BIT.	D2–1, D2–2, D2–3	6' x 6'	250'
NMC – NEW BIT.	D3–1	6' x 6'	250'
NMC – MILL	D3–2	6' x 6'	250'
NMC – MILL	D3–3	2–6' x 6'	5' & 20'
NMC – MILL	D3–4	2–6' x 6'	5' & 20'
NMC – NEW BIT.	D4–1	2–6' x 6'	–5' & 10'
NMC – NEW BIT.	D4–2	2–6' x 6'	5' & 20'
NMC – NEW BIT.	D5–1, D5–2	6' x 6'	40'
NMC – NEW BIT.	D5–3, D5–4	6' x 6'	10'
NMC – NEW BIT.	D6–1, D6–2, D6–3	6' x 6'	250'
NMC – NEW BIT.	D7–1	2–6' x 6'	5' & 20'
NMC – NEW BIT.	D7–2	2–6' x 6'	5' & 20'
NMC – NEW BIT.	D8–1	6' x 6'	250'
NMC – NEW BIT.	D8–2	2–6' x 6'	5' & 20'

NOTE: LOCATION = DISTANCE FROM STOP BAR TO FRONT OF LOOP DETECTOR
~~ALL LOOP DETECTORS SHALL BE INSTALLED IN NMC, SEE DETAIL SHEET 488~~

SIGNAL SYSTEM OPERATION

- SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE WITH PHASES 1, 3, 5 & 7 BEING PROTECTED LEFT TURN PHASES.
- PHASES 2 & 6 SHALL BE ON VEHICLE RECALL.

SYSTEM ID #: 22379
TE #: 3423
MASTER ID #: 20216
METER ADDRESS:

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NO	DATE	BY	CKD	APPR	REVISION

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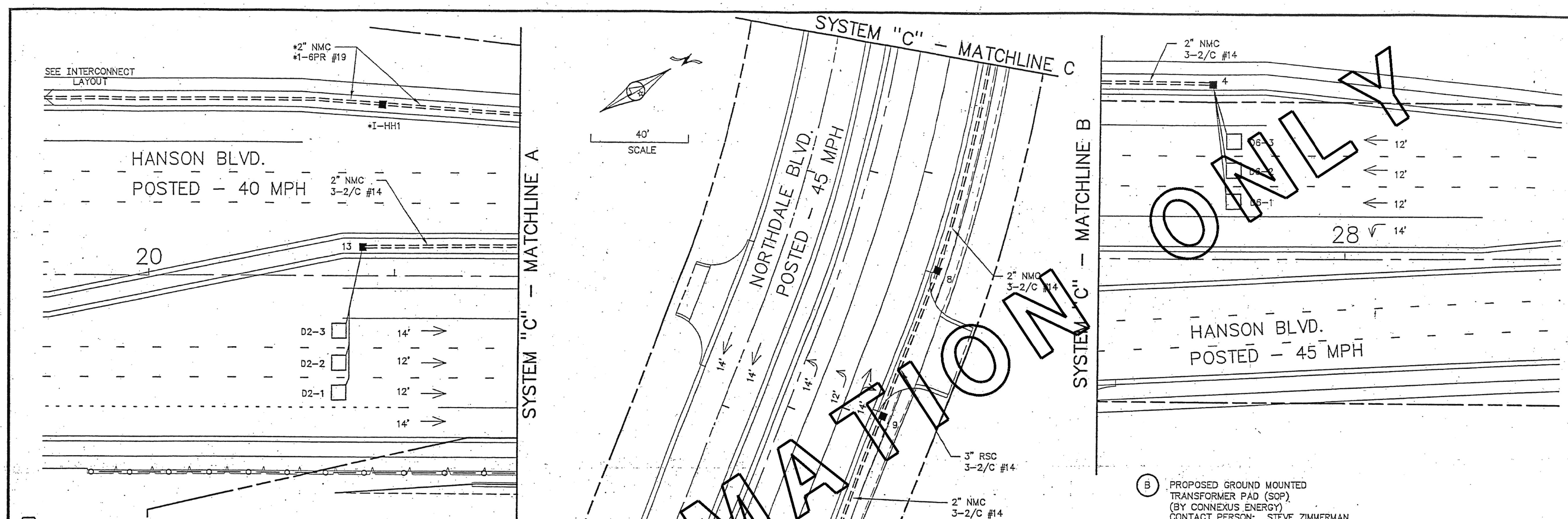
HDR
ANOKA COUNTY

REVISE SYSTEM "B"
NORTHDALE AT C.S.A.H. 78

REVISE SYSTEM "B" FOR INFORMATION ONLY

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053



(1) ℄ HANSON BLVD. STA. 23+23, 63' LT.
PA100 POLE FOUNDATION
TYPE PA100-A-50-X30
LUMINAIRE ARM AT 350° (SEE SPECIAL PROVISIONS)
3 – ONE WAY SIGNALS OVERHEAD (0', 20' & 31' FROM END OF MAST ARM)
2 – TYPE 10A POLE MOUNTED AT 90° & 180°
1 – ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 1 & 6) (6' FROM END OF MAST ARM)
LUMINAIRE – 250W HPS (SEE SPECIAL PROVISIONS)
1 – R9-3a (NO PED) SIGN FACING POLE 7
1 – TYPE D SIGN (D-5) OVERHEAD SEE SHEET 494
2 – R6-1L OR R6-1R SIGN (ONE WAY) POLE MOUNTED

3" RSC TO HH 14:
2-12/C #12
2-3/C #12
1-3/C #20

(2) ℄ HANSON BLVD. STA. 23+44, 77' LT.
PEDESTAL POLE FOUNDATION
13' PEDESTAL POLE (INCLUDES BASE)
1 – TYPE 5B
1 – PEDESTRIAN PUSHBUTTON AND SIGN (R10-4b)

2" RSC TO HH 1:
1-12/C #12
1-3/C #12

(3) ℄ HANSON BLVD. STA. 24+74, 76' LT.
PA100 POLE FOUNDATION
TYPE PA100-A-55-X30
LUMINAIRE ARM AT 350° (SEE SPECIAL PROVISIONS)
2 – ONE WAY SIGNALS OVERHEAD (0' & 24' FROM END OF MAST ARM)
2 – TYPE 10B POLE MOUNTED AT 90° & 180°
1 – ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 3 & 8) (6' FROM END OF MAST ARM)
LUMINAIRE – 250W HPS (SEE SPECIAL PROVISIONS)
2 – PEDESTRIAN PUSHBUTTONS AND SIGNS (R10-4b)
1 – TYPE D SIGN (D-6) OVERHEAD SEE SHEET 494
2 – R6-1L OR R6-1R SIGN (ONE WAY) POLE MOUNTED

3" RSC TO HH 3:
2-12/C #12
4-3/C #12
1-3/C #20

(4) ℄ HANSON BLVD. STA. 24+77, 2' RT.
PEDESTRIAN PUSHBUTTON STATION FOUNDATION
PEDESTRIAN PUSHBUTTON STATION (MNDOT STD PLATE 8115)
1 – PEDESTRIAN PUSHBUTTON AND SIGN (R10-4b)

1 1/4" RSC TO HH 5:
1-3/C #12

(5) ℄ HANSON BLVD. STA. 24+61, 62'RT.
PA100 POLE FOUNDATION
TYPE PA100-A-55-X30
LUMINAIRE ARM AT 350° (SEE SPECIAL PROVISIONS)
3 – ONE WAY SIGNALS OVERHEAD (0', 23' & 35' FROM END OF MAST ARM)
1 – TYPE 10B POLE MOUNTED AT 90°
1 – TYPE 10A POLE MOUNTED AT 180°
1 – ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 2 & 5) (6' FROM END OF MAST ARM)
LUMINAIRE – 250W HPS (SEE SPECIAL PROVSIONS)
1 – PEDESTRIAN PUSHBUTTON AND SIGN (R10-4b)
1 – TYPE D SIGN (D-4) OVERHEAD SEE SHEET 494
2 – R6-1L OR R6-1R SIGN (ONE WAY) POLE MOUNTED

3" RSC TO HH 6:
3-12/C #12
3-3/C #12
1-3/C #20

(6) ℄ HANSON BLVD. STA. 24+41, 76' RT.
PEDESTAL POLE FOUNDATION
13' PEDESTAL POLE (INCLUDES BASE)
1 – TYPE 5B
1 – PEDESTRIAN PUSHBUTTON AND SIGN (R10-4b)

2" RSC TO HH 6:
1-12/C #12
1-3/C #12

(7) ℄ HANSON BLVD. STA. 23+22, 78' RT.
PA100 POLE FOUNDATION
TYPE PA100-A-55-X30
LUMINAIRE ARM AT 350° (SEE SPECIAL PROVISIONS)
2 – ONE WAY SIGNALS OVERHEAD (0' & 23' FROM END OF MAST ARM)
1 – TYPE 10B POLE MOUNTED AT 90°
1 – TYPE 10A POLE MOUNTED AT 180°
1 – ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 4 & 7) (6' FROM END OF MAST ARM)
LUMINAIRE – 250W HPS (SEE SPECIAL PROVSIONS)
1 – PEDESTRIAN PUSHBUTTON AND SIGN (R10-4b)
1 – TYPE D SIGN (D-6) OVERHEAD SEE SHEET 494
1 – TYPE R9-3a SIGN (NO PED) FACING POLE 1
2 – R6-1L OR R6-1R SIGN (ONE WAY) POLE MOUNTED

3" RSC TO HH 11:
2-12/C #12
4-3/C #12
1-3/C #20

(A) ℄ HANSON BLVD. STA. 23+28, 74' LT.
EQUIPMENT PAD (SEE SHEET 490)
SERVICE CABINET (SEE SHEET 489)
CONTROLLER AND CABINET (FURNISHED BY MN/DOT)

2-4" RSC TO HH 1:	4" RSC TO HH 14:
7-12/C #12	4-12/C #12
8-3/C #12	4-3/C #12
2-3/C #20	2-3/C #20
15-2/C #14	7-2/C #14
	*1-6PR #19

2" RSC TO SERVICE CABINET:
2-1/C #6
1-1/C #6 INS. GR.

SERVICE CABINET TO HH 1:
2" RSC
4-3/C #12

SERVICE CABINET TO HH 15:
2" RSC
3-1/C #2

3" RSC STUBBED OUT (THREADED AND CAPPED BOTH ENDS)
2" RSC STUBBED OUT (THREADED AND CAPPED BOTH ENDS)
3/4" NMC STUBBED OUT (THREADED AND CAPPED BOTH ENDS)
(FUTURE PHONE LINE)

SYSTEM ID #: 22379
TE #: 3423
MASTER ID #: 20216
METER ADDRESS:

(B) PROPOSED GROUND MOUNTED TRANSFORMER PAD (SOP)
(BY CONNEXUS ENERGY)
CONTACT PERSON: STEVE ZIMMERMAN

2" RSC TO HH 15:
3-1/C #2

NOTES:

1. SEE SPECIAL PROVISIONS FOR MN/DOT FURNISHED MATERIALS.
2. ALL VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL BE LED. SEE SPECIAL PROVISIONS.
3. THE EXACT LOCATION OF HANDHOLES, POLES, DETECTORS AND EQUIPMENT PAD SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD. MN/DOT TRAFFIC OFFICE PERSONNEL SHALL REVIEW LOCATIONS PRIOR TO INSTALLATION.
4. PEDESTRIAN INDICATIONS SHALL BE A ONE SECTION HAND/WALKING PERSON INDICATION. SEE SPECIAL PROVISIONS.
5. HANDHOLES SHALL BE PVC WITH METAL FRAMES AND COVERS, PER MN/DOT STANDARD PLATE NO. 8114.
6. A 3/4" HALF-COUPLING, 3/4" PIPE NIPPLE AND CONDUIT OUTLET BODY SHALL BE FURNISHED AND INSTALLED 6' FROM THE END OF THE MAST ARM AT POLES 1, 3, 5 & 7.
7. PEDESTAL POLE FOUNDATIONS SHALL BE IN ACCORDANCE WITH MN/DOT STANDARD PLATE 8112.
8. PEDESTAL POLE AND BASE SHALL BE IN ACCORDANCE WITH MN/DOT STANDARD PLATE 8122.
9. FOR TYPE C & TYPE D SIGN DETAILS SEE SHEET 494. POLE AND MAST ARM MOUNTED TYPE C AND TYPE D SIGNS SHALL BE INCIDENTAL.
10. THE SIGNAL CONTRACTOR SHALL COORDINATE THE CONSTRUCTION OF THE TRAFFIC SIGNAL WITH CONSTRUCTION STAGING OF THE AREA ROADWAYS.
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13. SIGNAL EQUIPMENT SHALL BE PAINTED DARK BROWN. SEE SPECIAL PROVISIONS. THE CONTROLLER CABINET AND SERVICE CABINET SHALL NOT BE PAINTED.
14. ITEMS DENOTED WITH AN * ARE INCIDENTAL.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING UTILITIES PRIOR TO COMMENCING WORK.
16. LUMINAIRES ARE UNMETERED.

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NO	DATE	BY	CKD	APPR	REVISION

HDR
ANOKA COUNTY

REVISE SYSTEM "B"
NORTHDALE AT C.S.A.H. 78

REVISE SYSTEM "B" FOR INFORMATION ONLY

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

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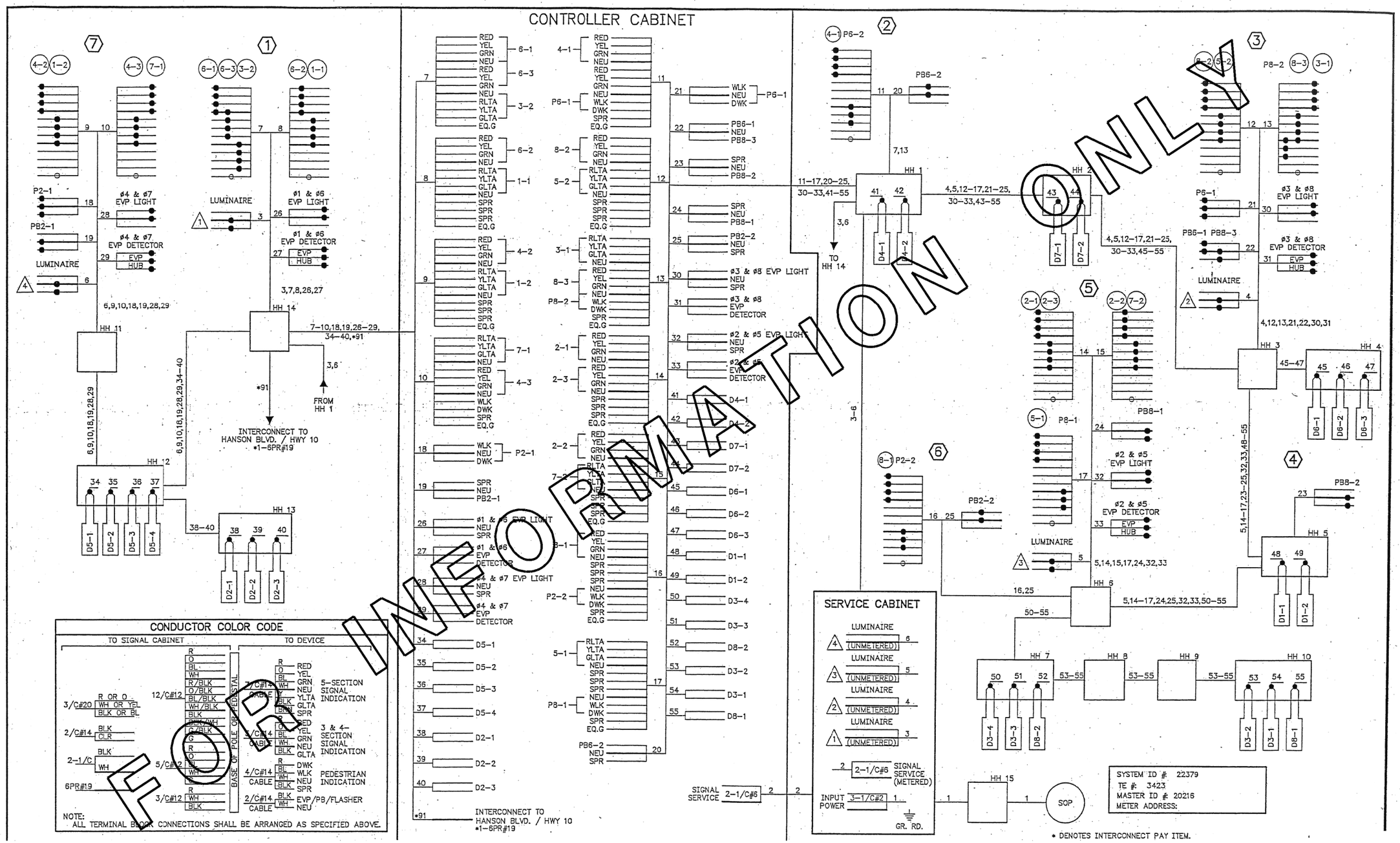

REVISE SYSTEM "B"
NORTHDALE AT C.S.A.H. 78

NO	DATE	BY	CKD	APPR	REVISION

REVISE SYSTEM "B" FOR INFORMATION ONLY

SHEET NO. 195 OF 230 SHEETS

S.P. 002-678-025 (CSAH 78), S.P. 114-020-053

ANOKA COUNTY

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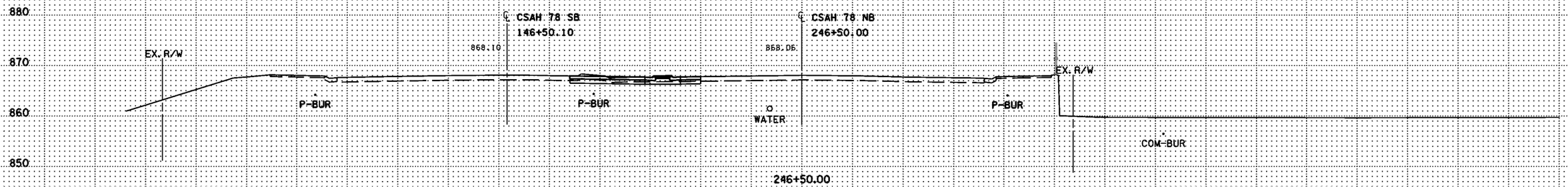

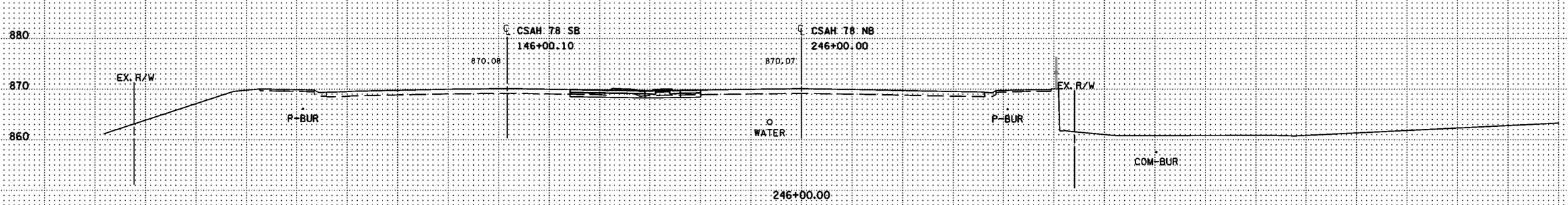

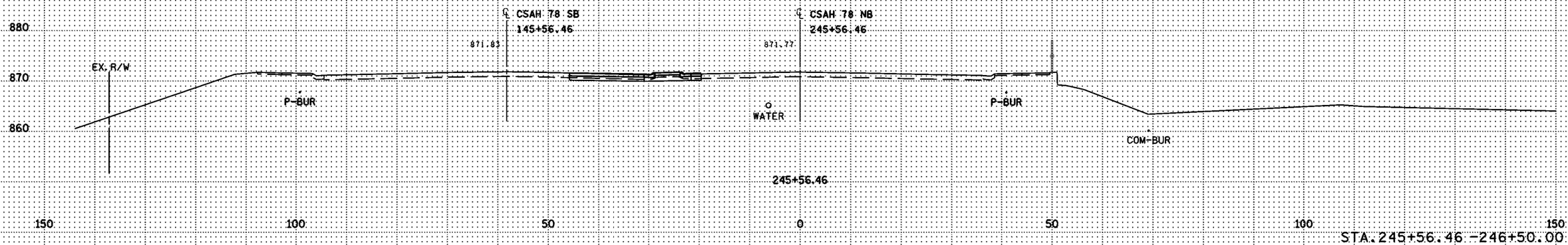

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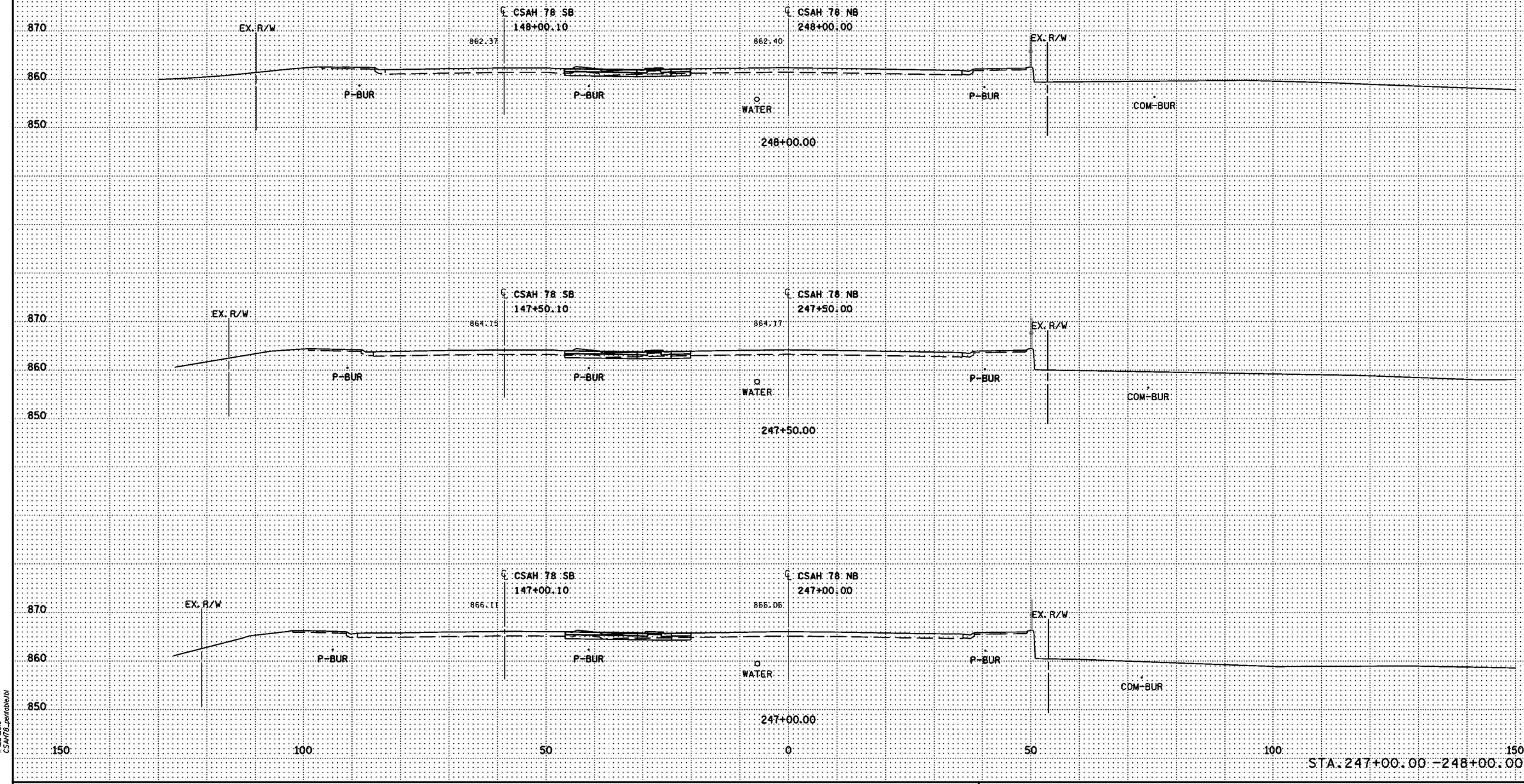

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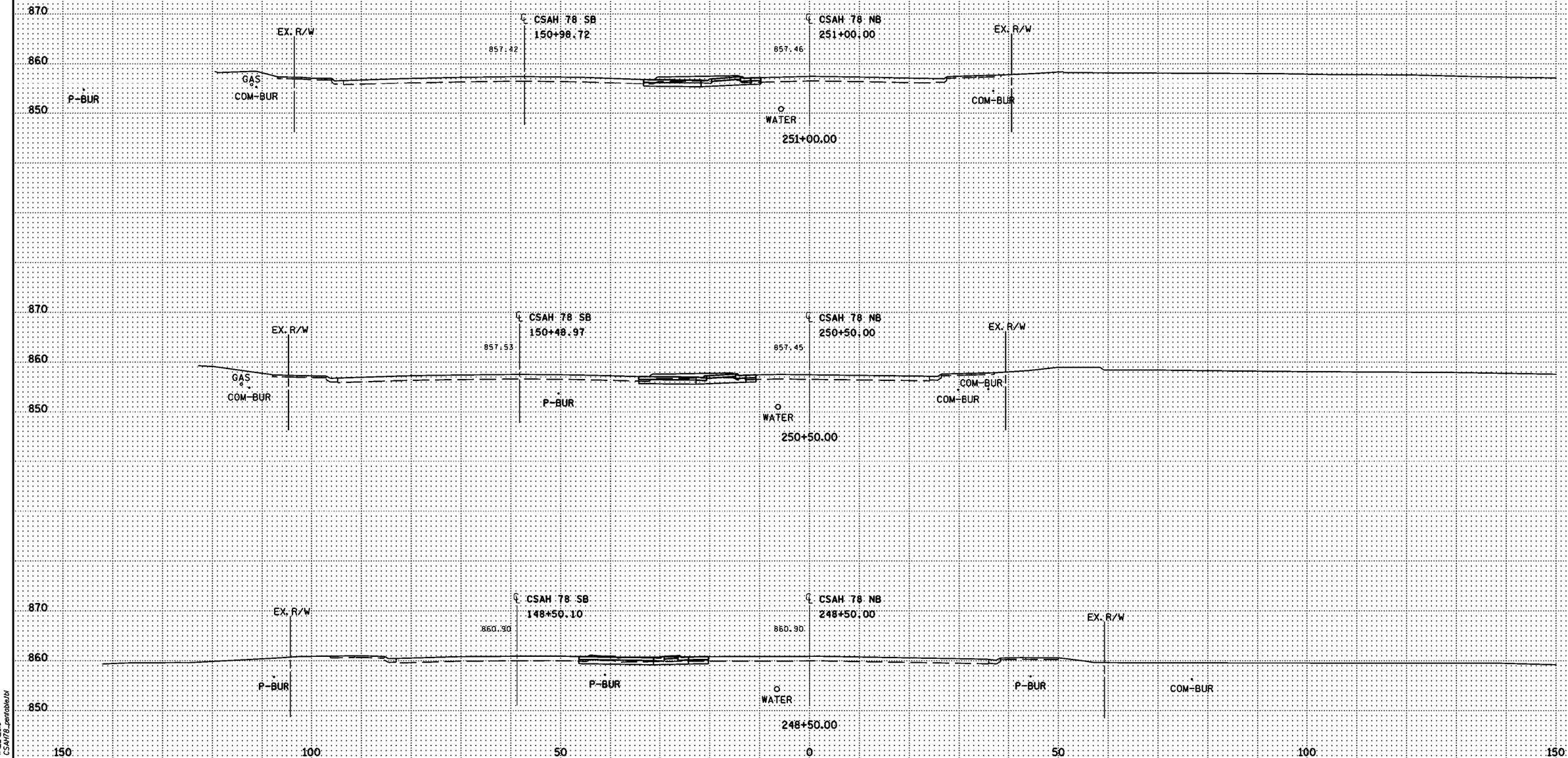

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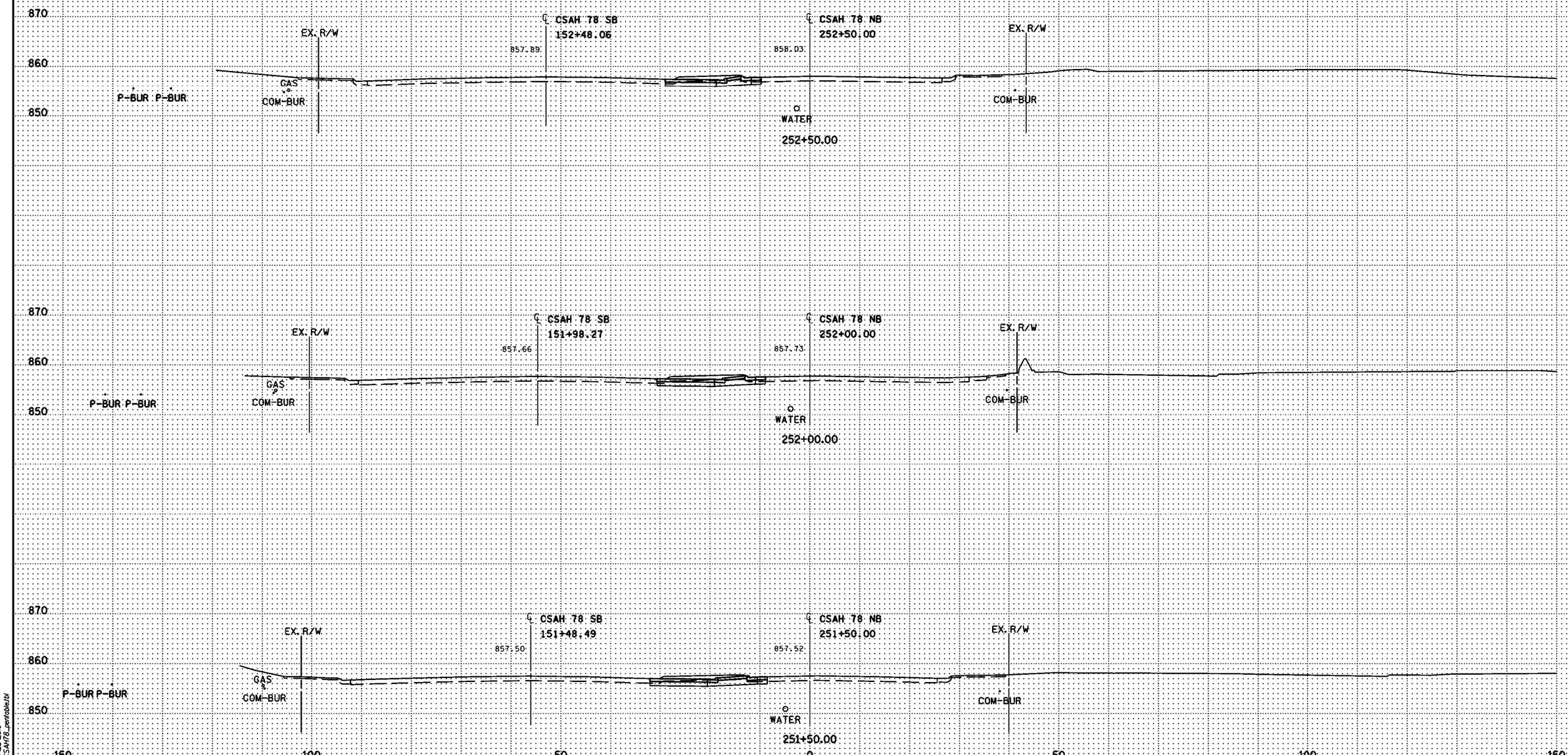

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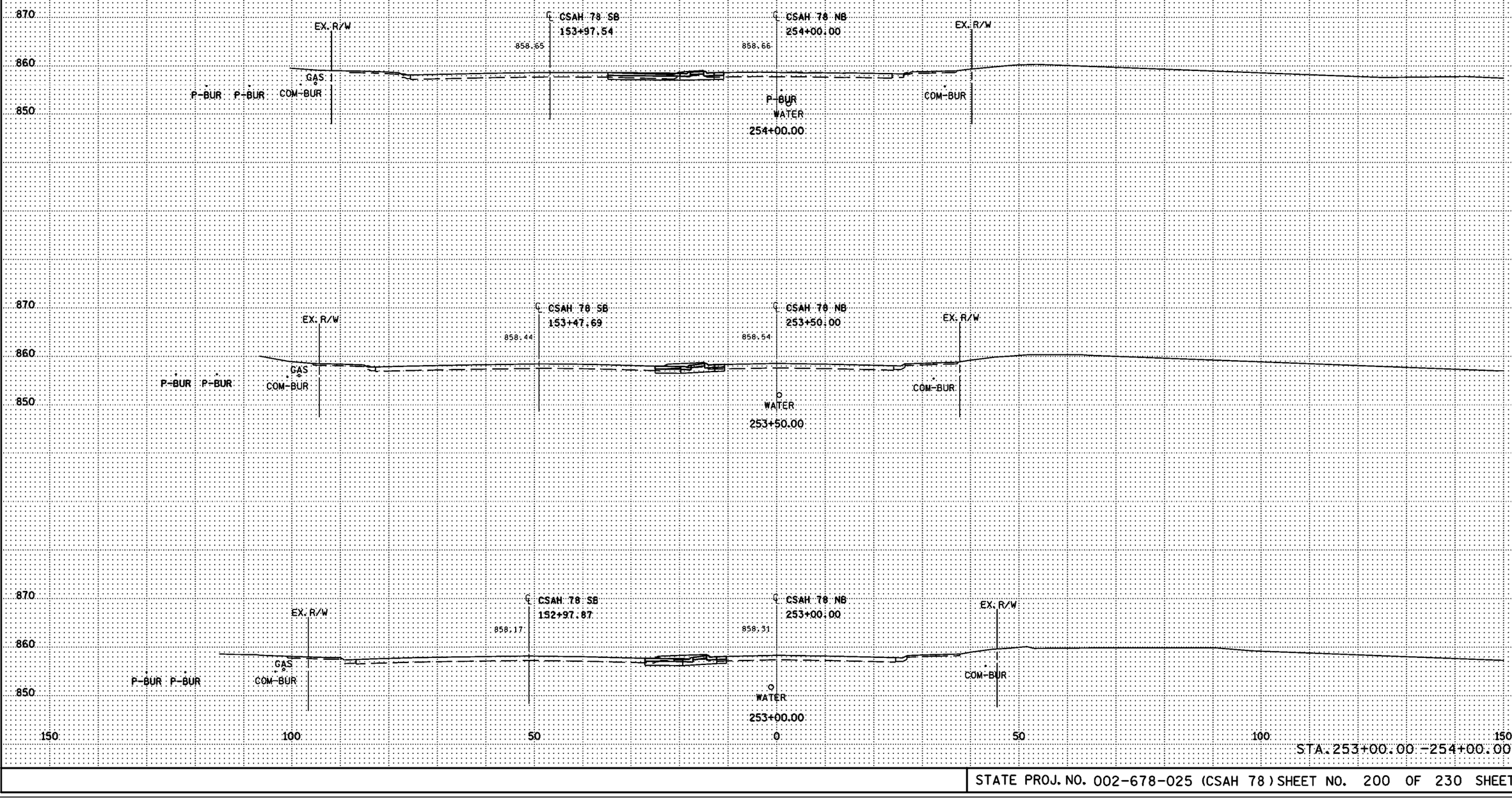

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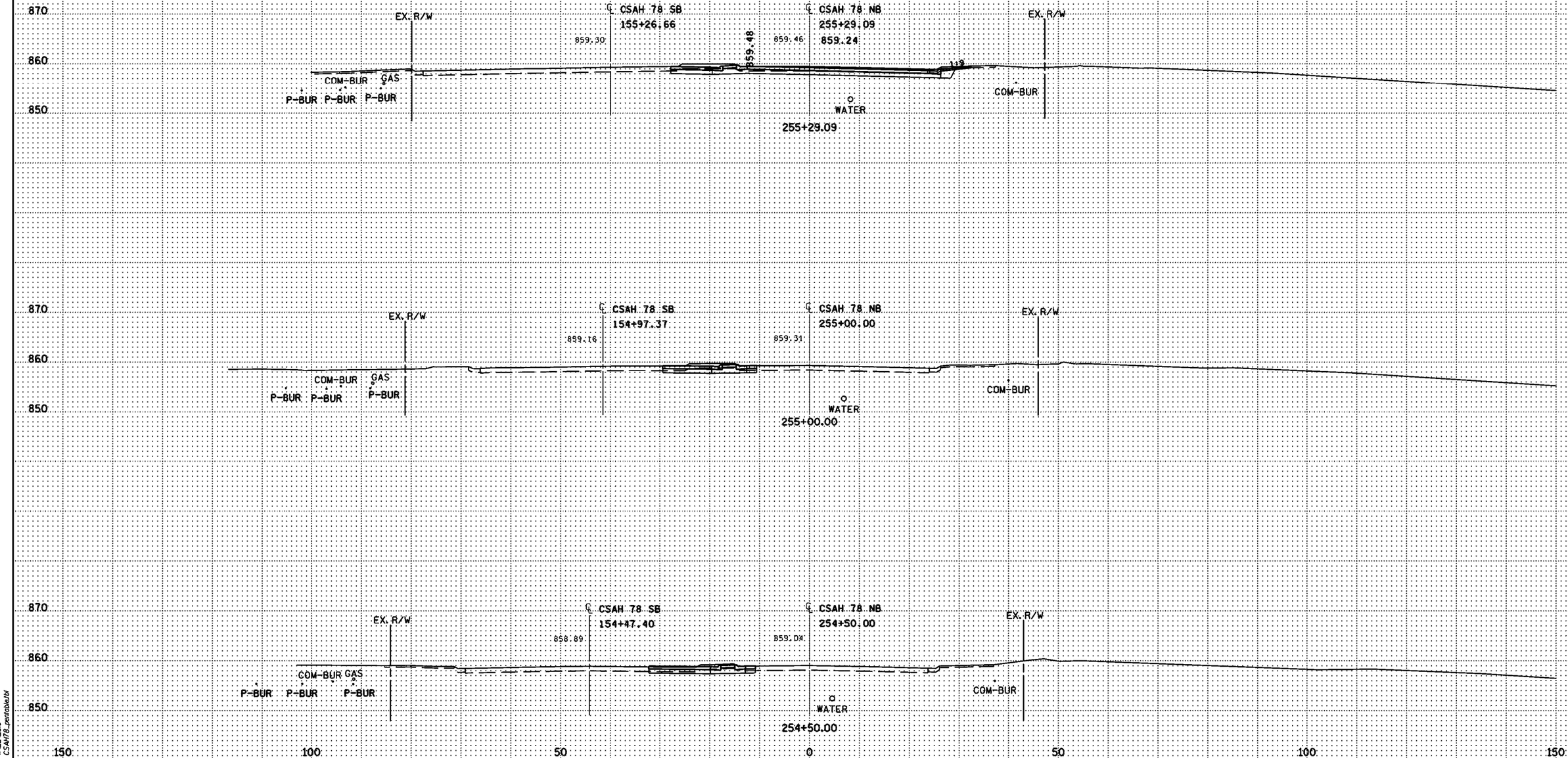

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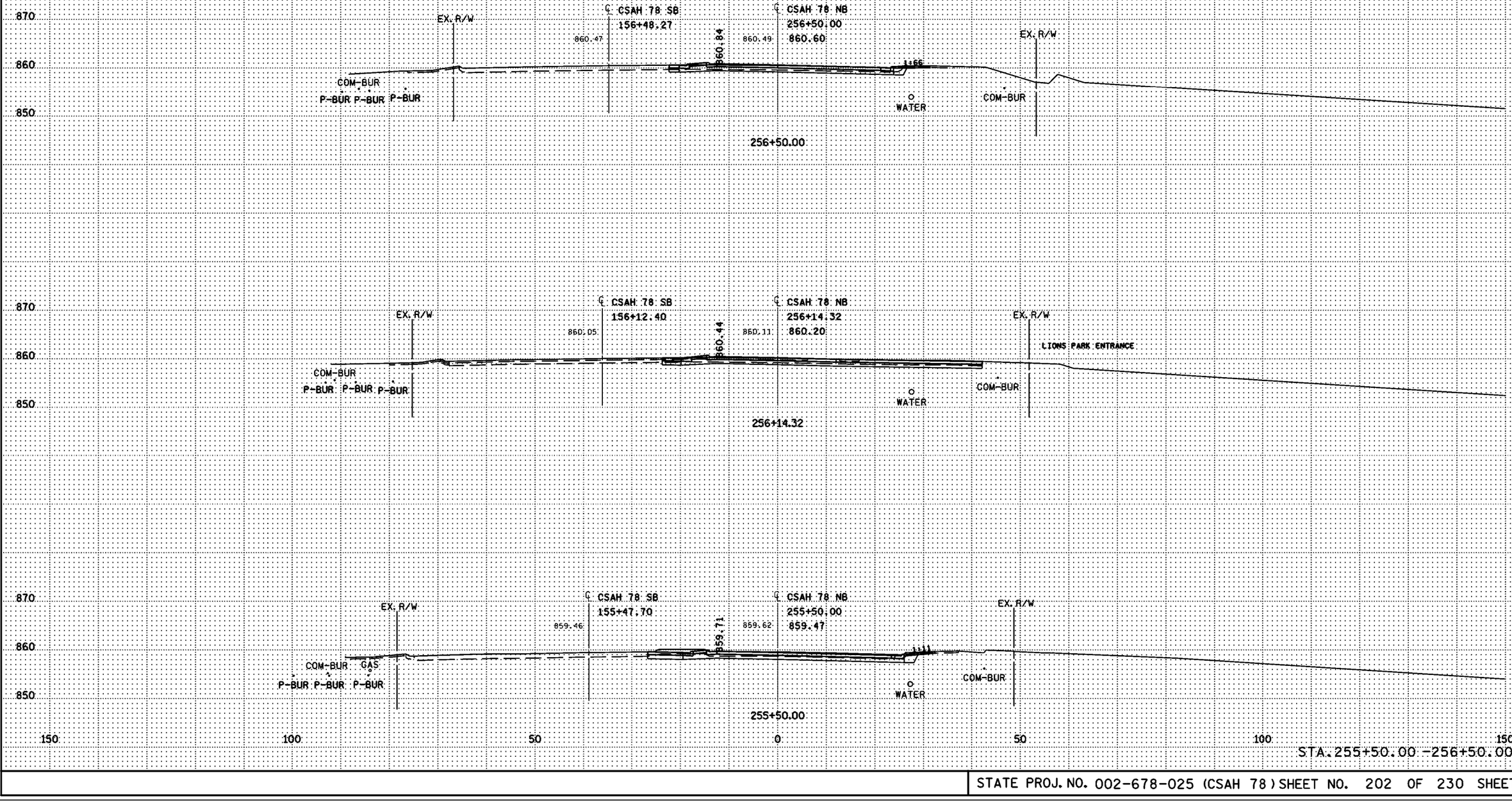

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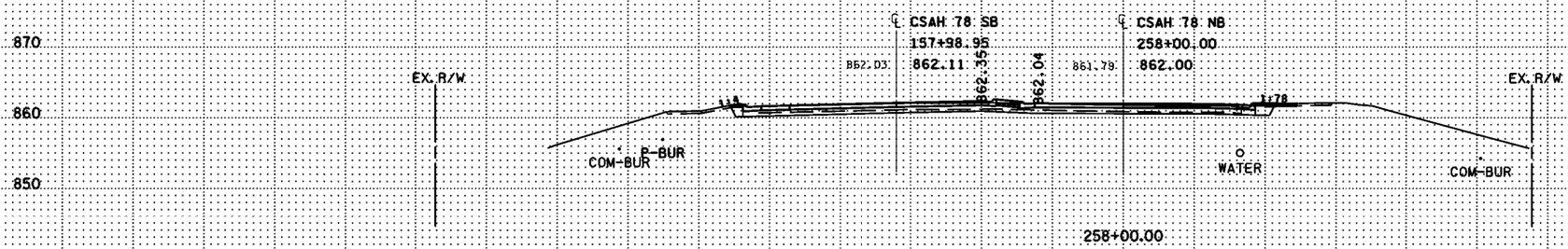

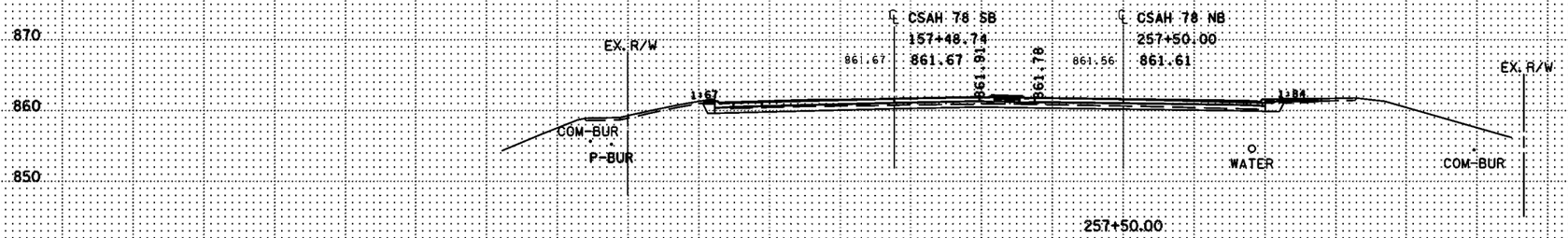

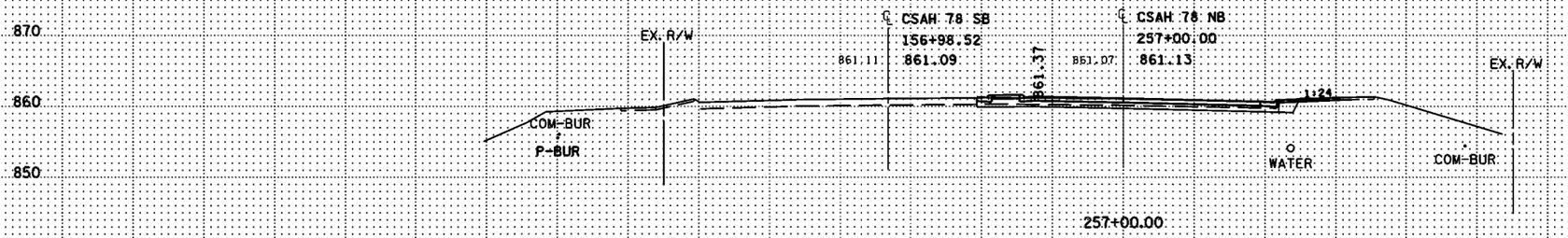

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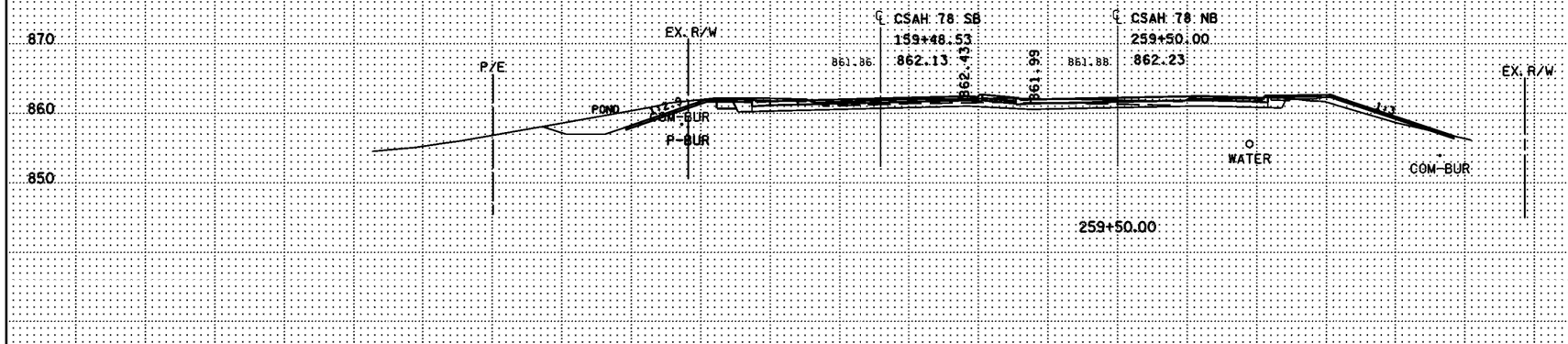
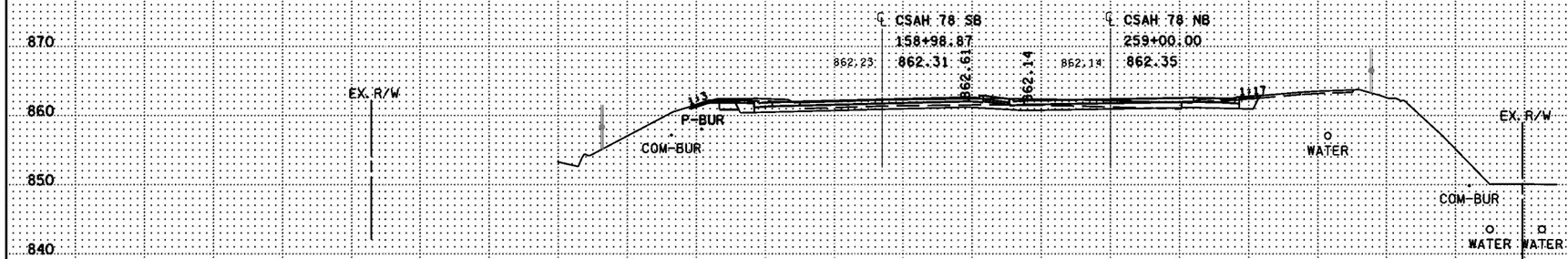
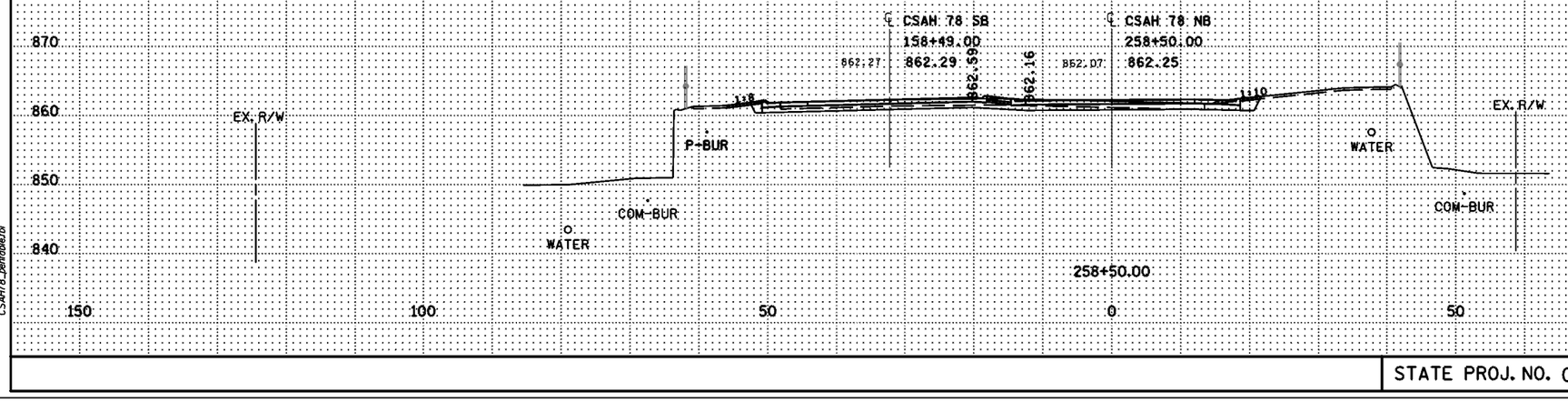
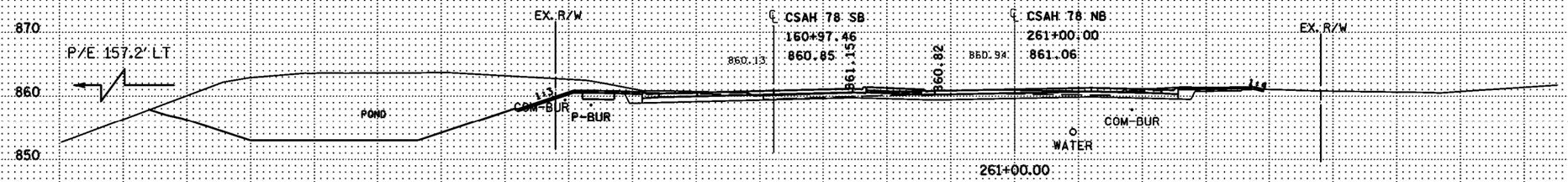
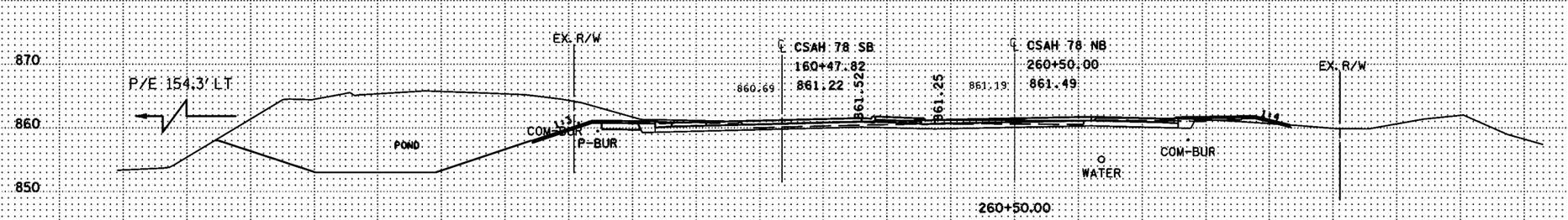


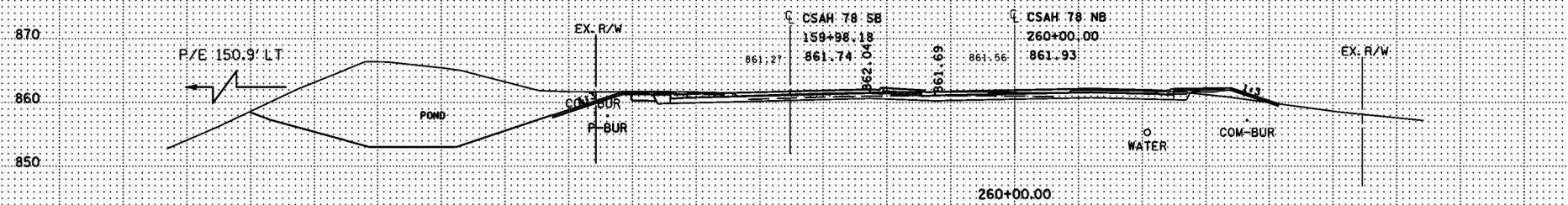




CSAH78_Mainline_XS.dgn
3:24:4 PM
11/22/2019
CSAH78_pentable.tbl

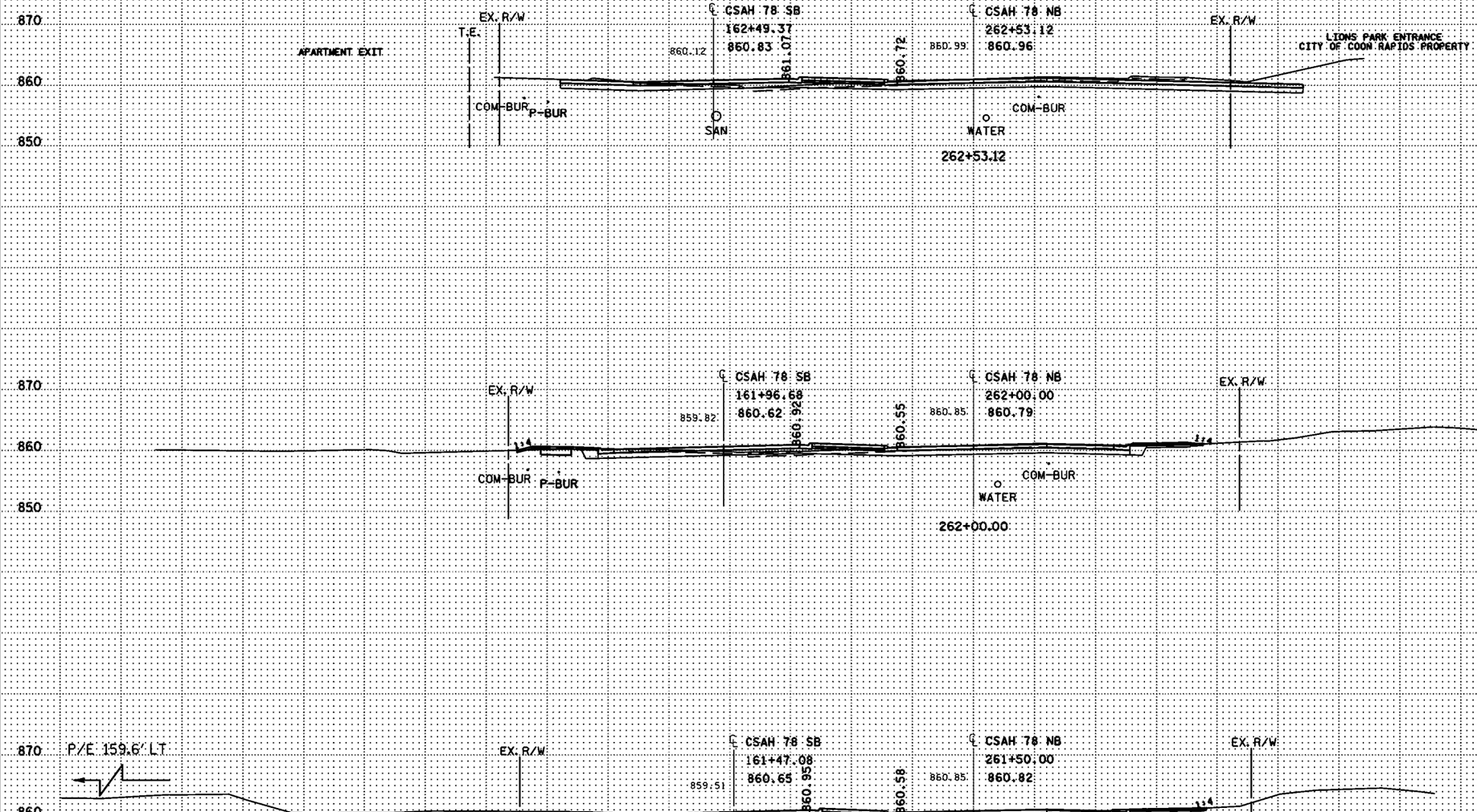






CSAH78_Mainline_XS.dgn
3:24:48 PM
11/22/2019
CSAH78_pentable.tbl

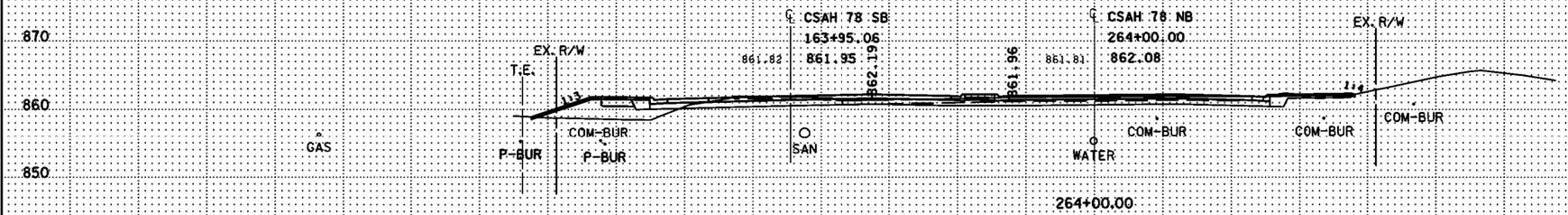
STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 205 OF 230 SHEETS

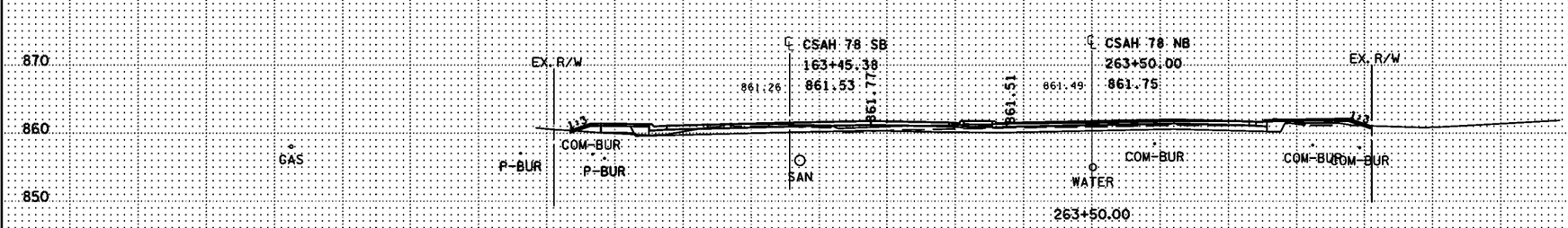


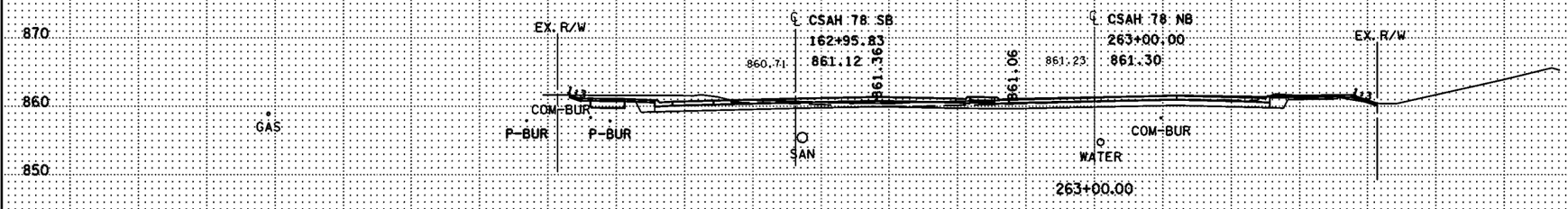
STA. 261+50.00 -262+53.12

CSAH78_Mainline_YSdgn
3:24:22 PM
11/22/2019
CSAH78_pentable1bl

STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 206 OF 230 SHEETS



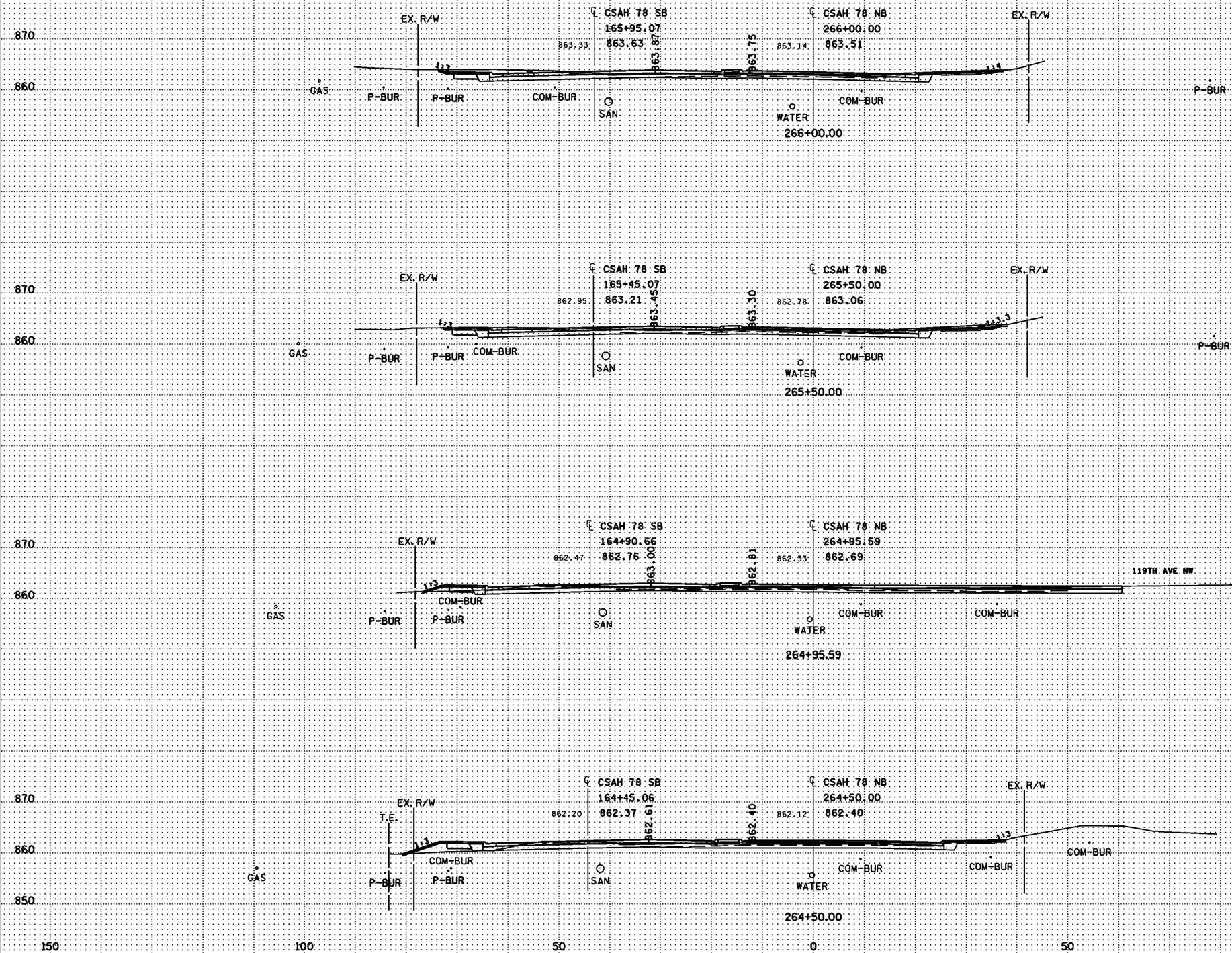




150 100 50 0 50 100 150

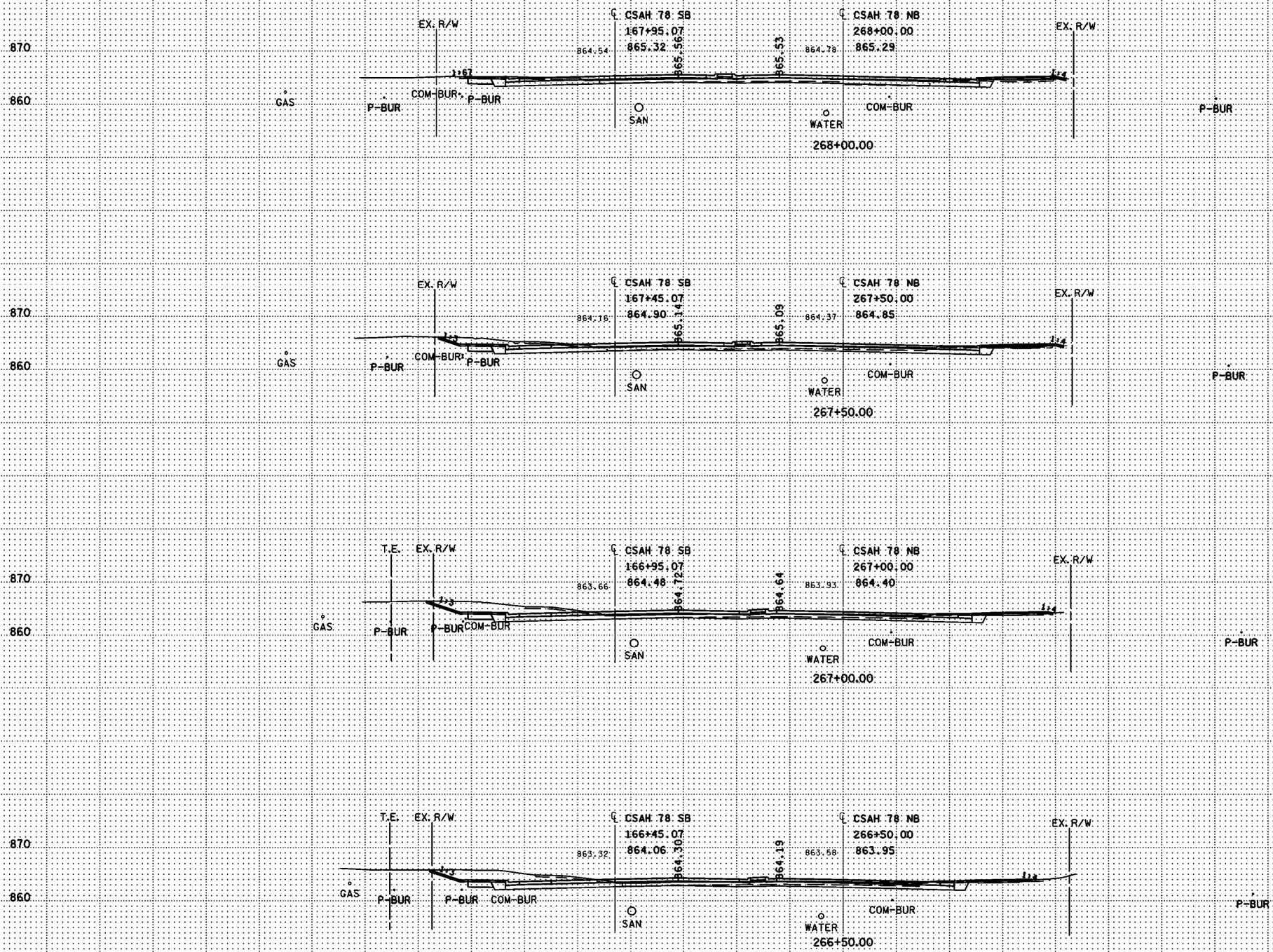
STA. 263+00.00 -264+00.00

CSAH78_Mainline_XS.dgn
3:24:26 PM
11/2/2009
CSAH78_pentable.tbl



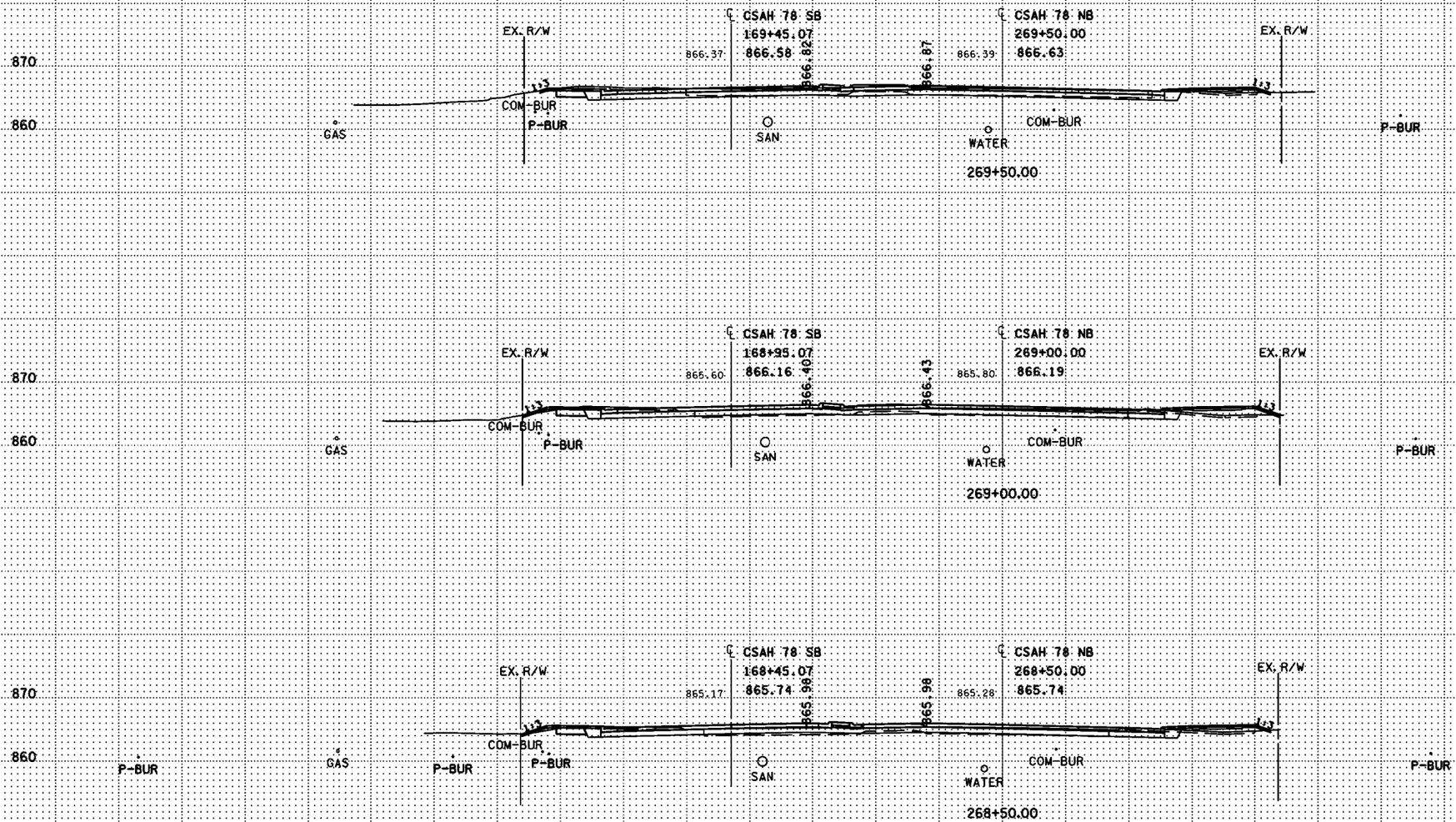
STA. 264+50.00 -266+00.00

CSAH78_Mainline_XSdgn
3:24:31 PM
11/22/2019
CSAH78_pentable1bl



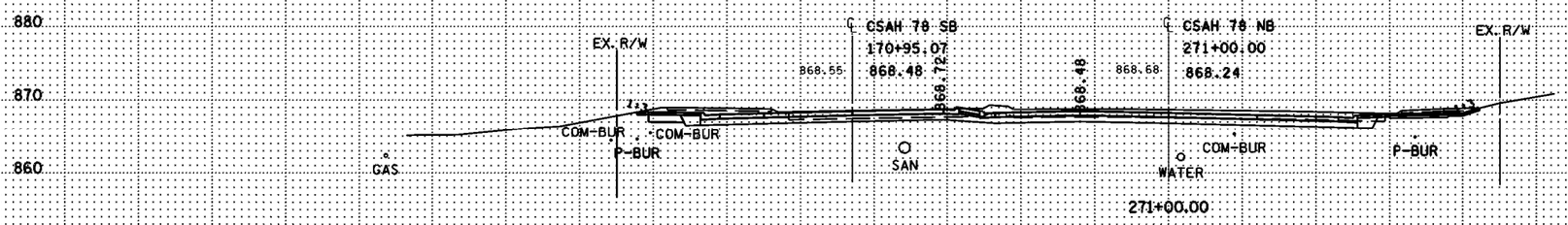
CSAH78_Mainline_YSdgn
3:24:36 PM
11/22/2009
CSAH78_pentableltl

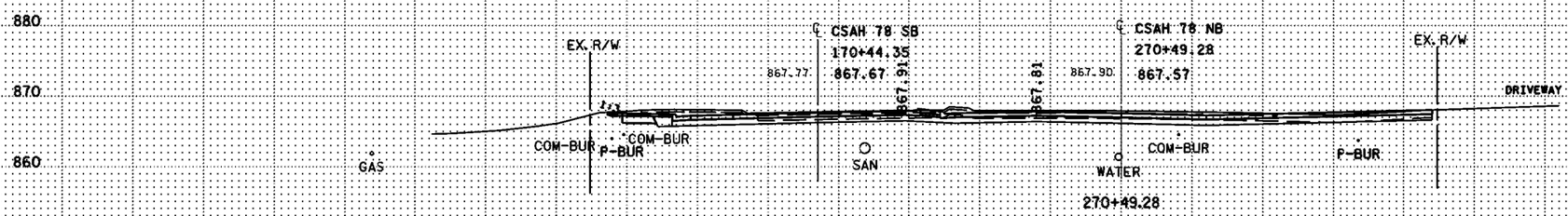
STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 209 OF 230 SHEETS

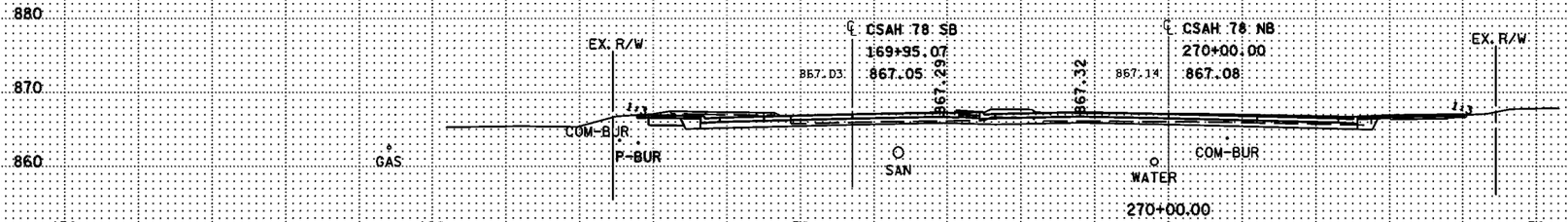


CSAH78_Mainline_XSdgn
3:24:40 PM
11/22/2019
CSAH78_pentable1bl

STA. 268+50.00 -269+50.00



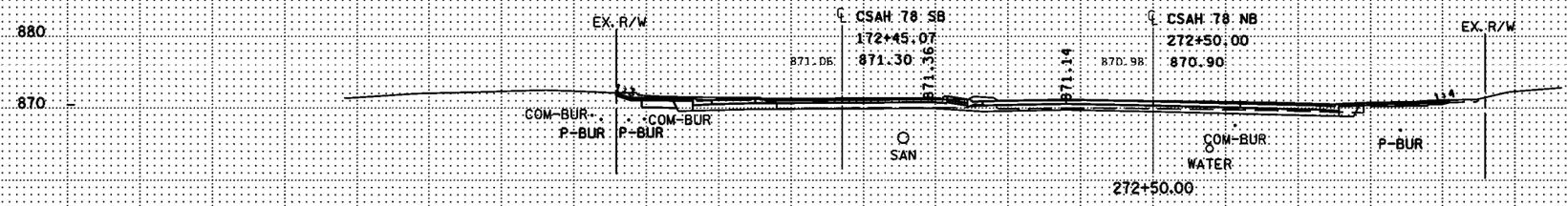


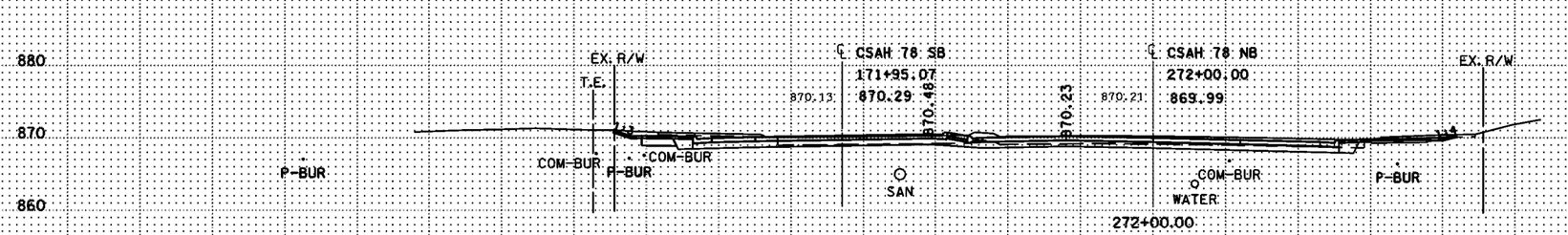


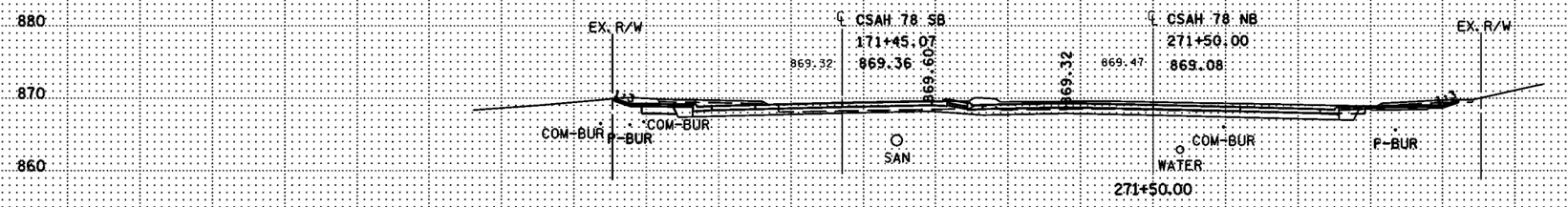
150 100 50 0 50 100 150

STA. 270+00.00 -271+00.00

CSAH78_Mainline_YSdgn
3:24:44 PM
11/22/2019
CSAH78_pentable1bl





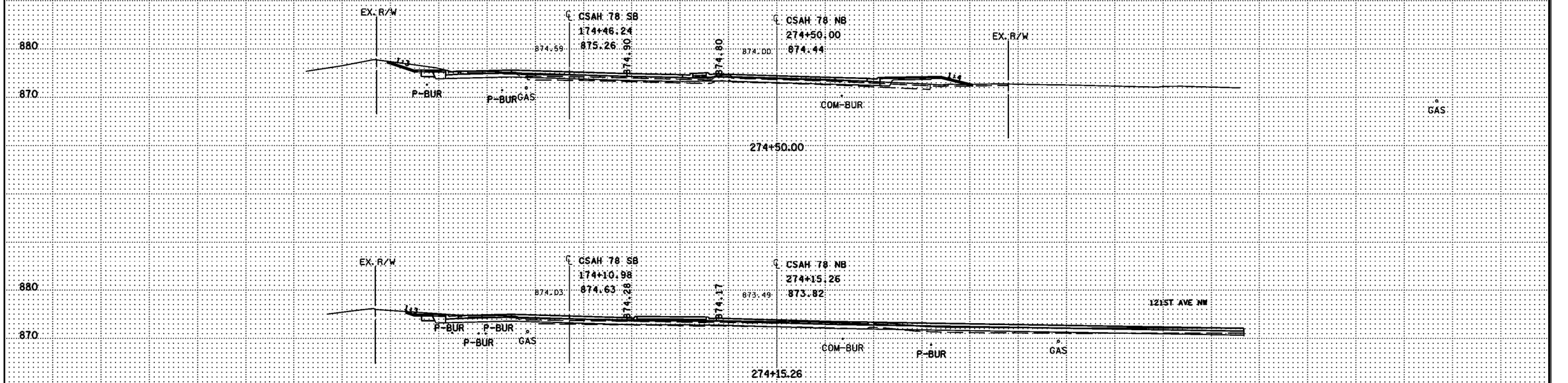


150 100 50 0 50 100 150

STA. 271+50.00 -272+50.00

CSAH78_Mainline_XSdgn
3:24:49 PM
11/22/2019
CSAH78_pentable1bl

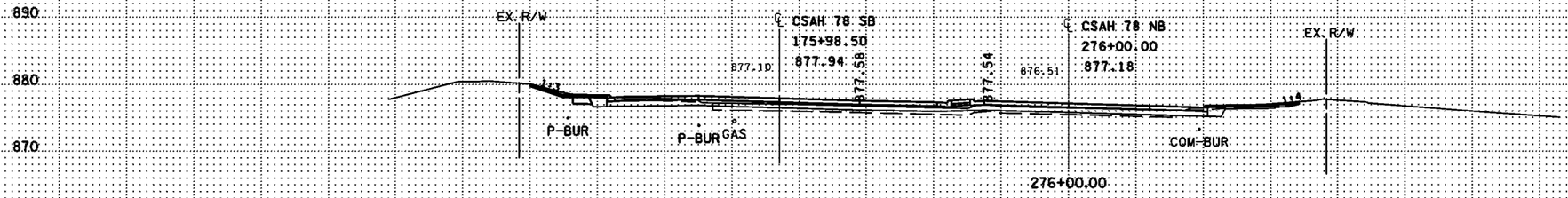
STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 212 OF 230 SHEETS

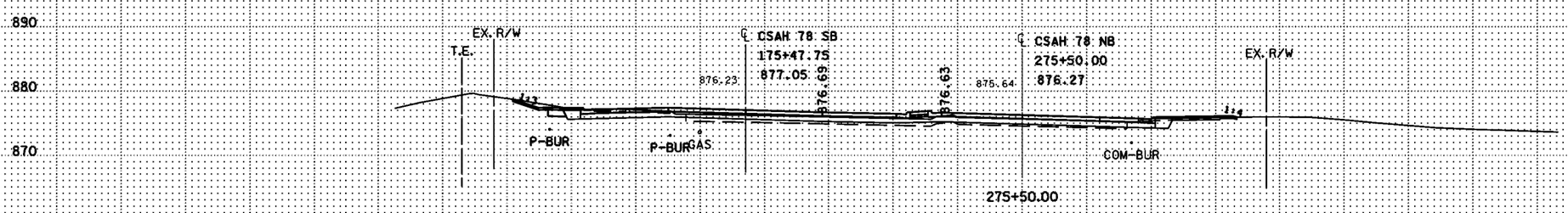


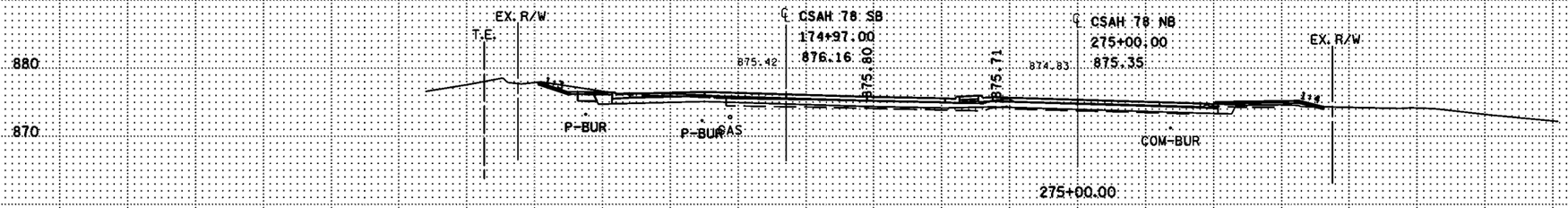
CSAH78_Mainline_XSdgn
3:24:53 PM
11/22/2019
CSAH78_pentabletbl

STA.273+18.11 –274+50.00

STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 213 OF 230 SHEETS





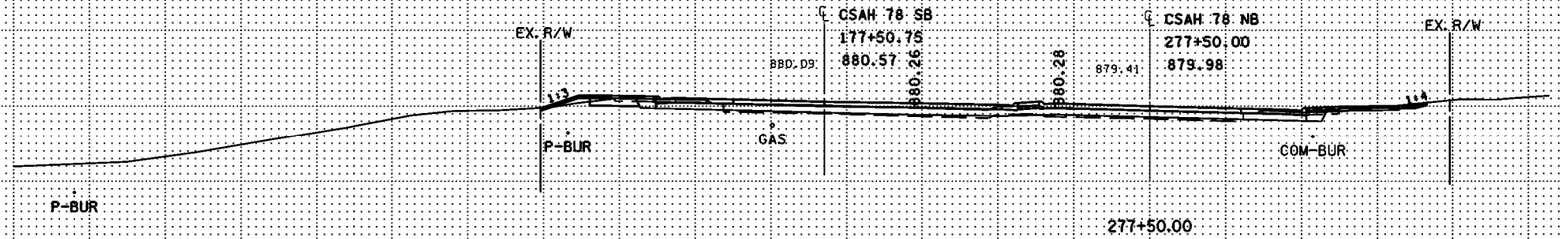


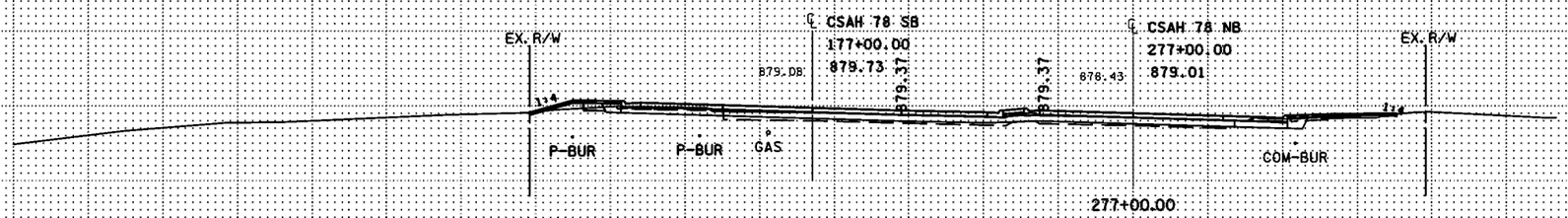
150 100 50 0 50 100 150

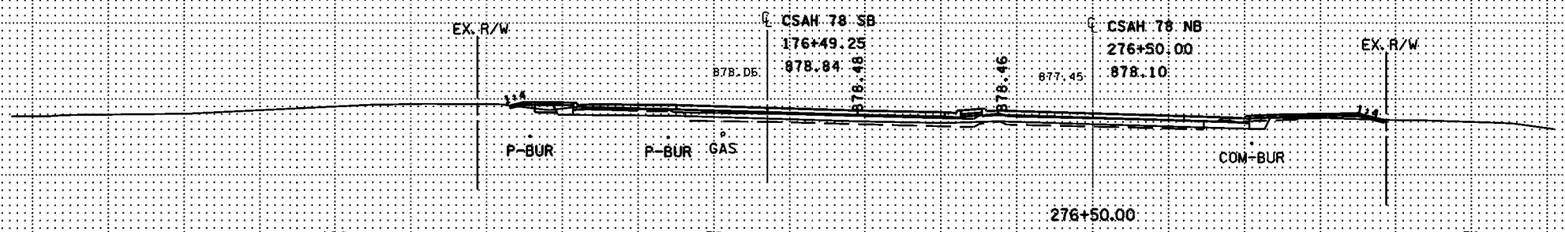
STA. 275+00.00 -276+00.00

CSAH78_Mainline_YSdgn
3:24:58 PM
11/22/2019
CSAH78_pentabletbl

STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 214 OF 230 SHEETS



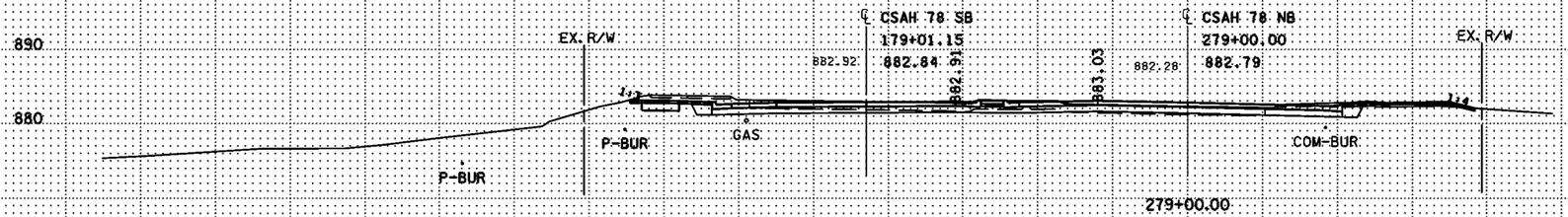


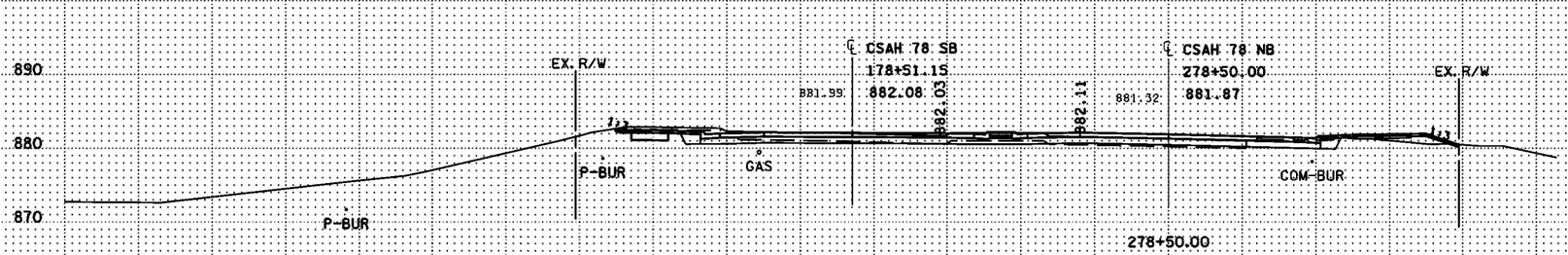


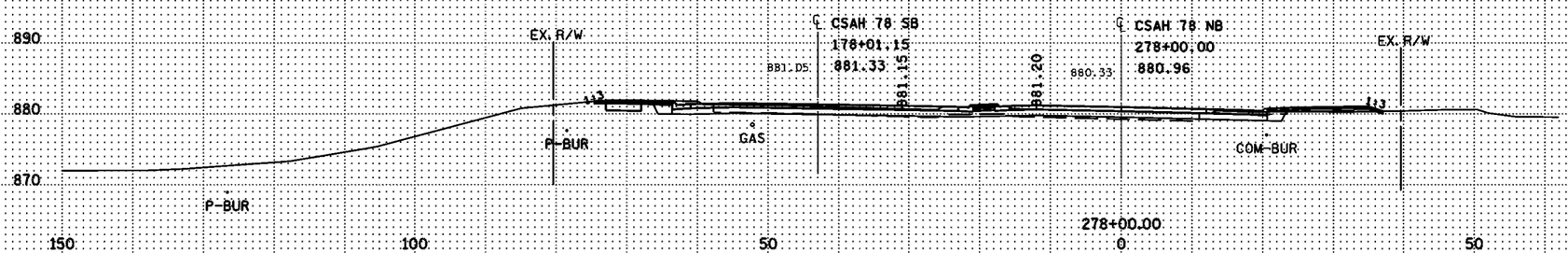
STA. 276+50.00 -277+50.00

CSAH78_Mainline_XSdgn
3:25:02 PM
11/22/2019
CSAH78_pentableIbl

STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 215 OF 230 SHEETS



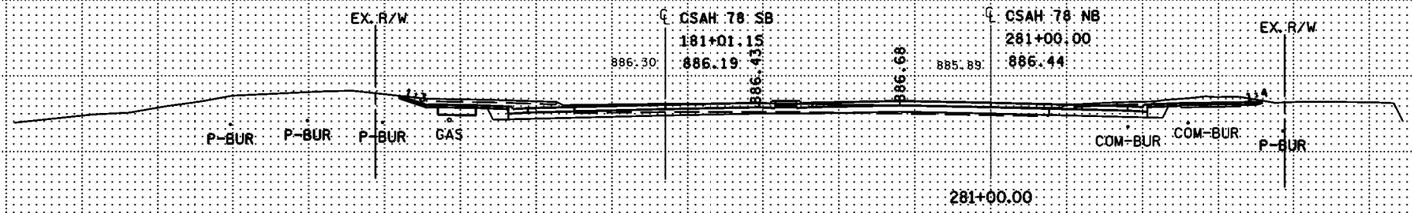


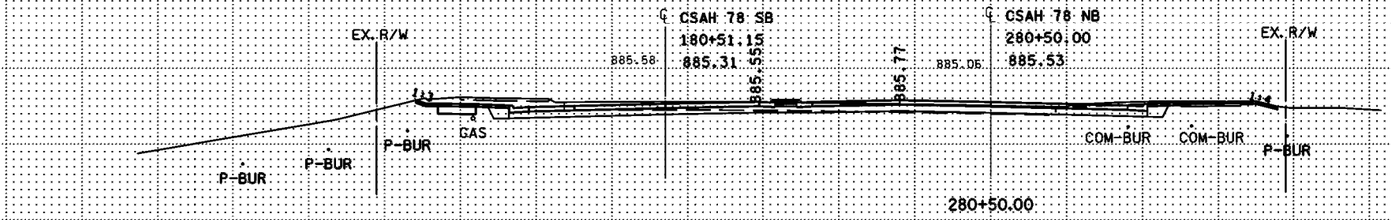


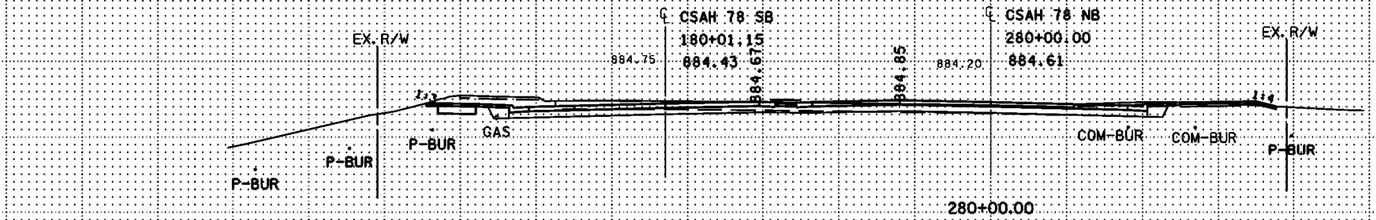
STA. 278+00.00 -279+00.00

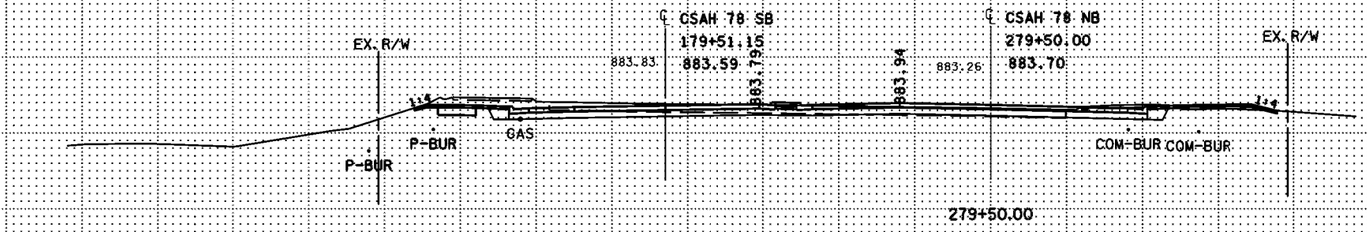
CSAH78_Mainline_XS.dgn
1:250.06 PW
11/22/2019
CSAH78_pentable.tbl

STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 216 OF 230 SHEETS







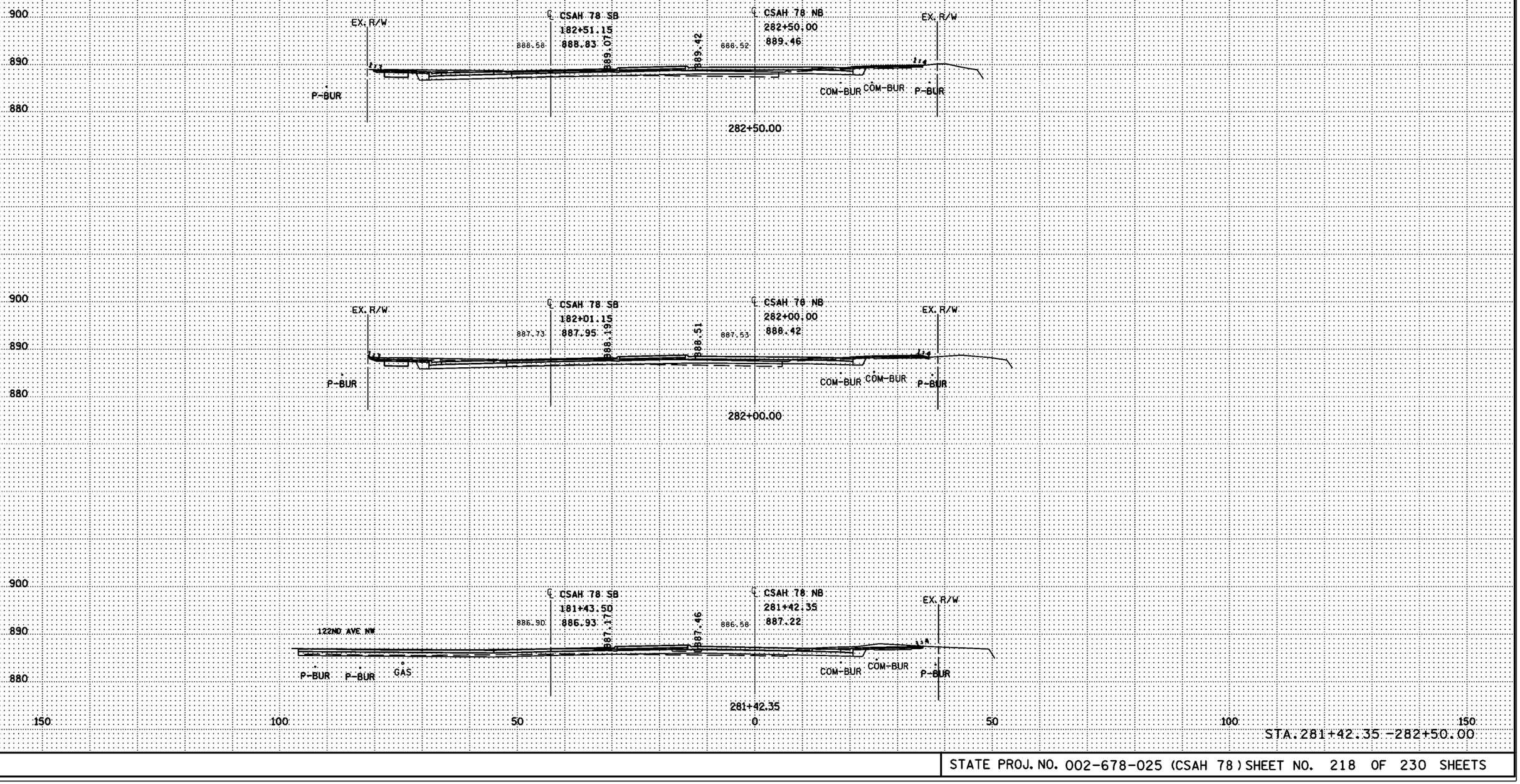


150 100 50 0 50 100 150

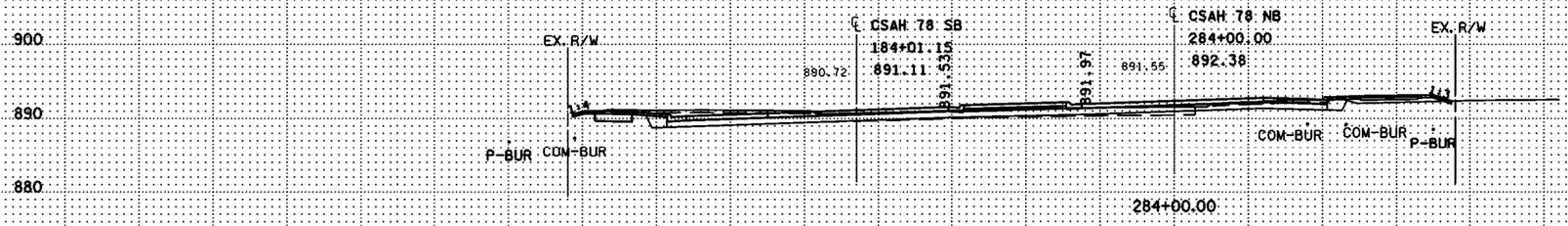
STA. 279+50.00 -281+00.00

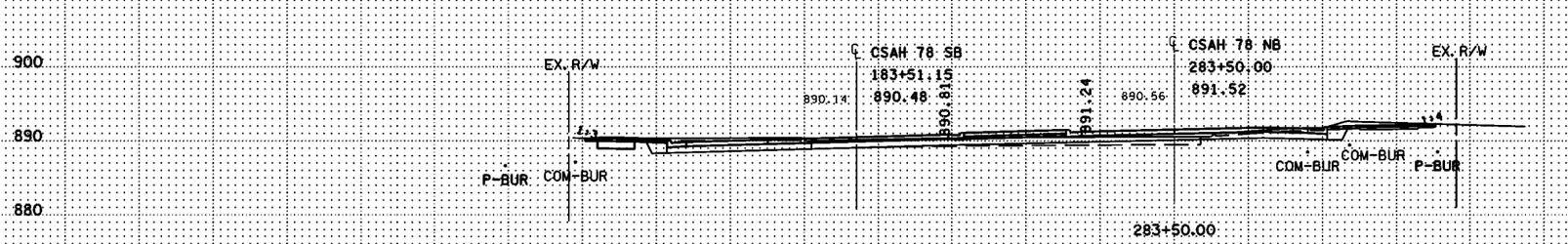
CSAH78_Mainline_XSdgn
3:25:11 PM
11/22/2009
CSAH78_pentabletbl

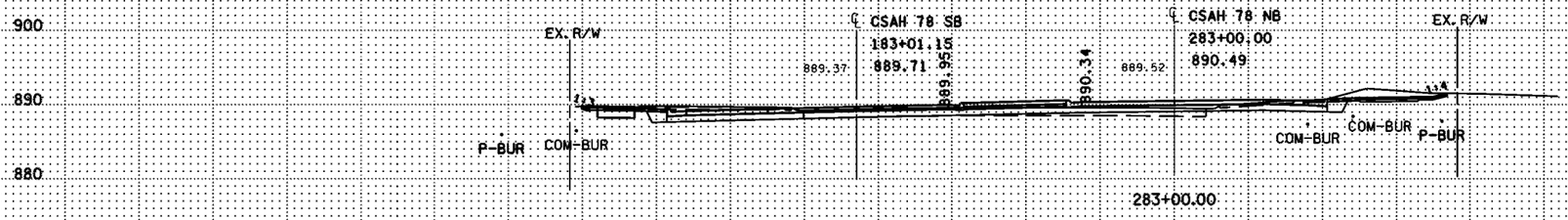
STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 217 OF 230 SHEETS



CSAH78_Mainline_XSdgn
3:25:5 PM
11/22/2009
CSAH78_pentabletN

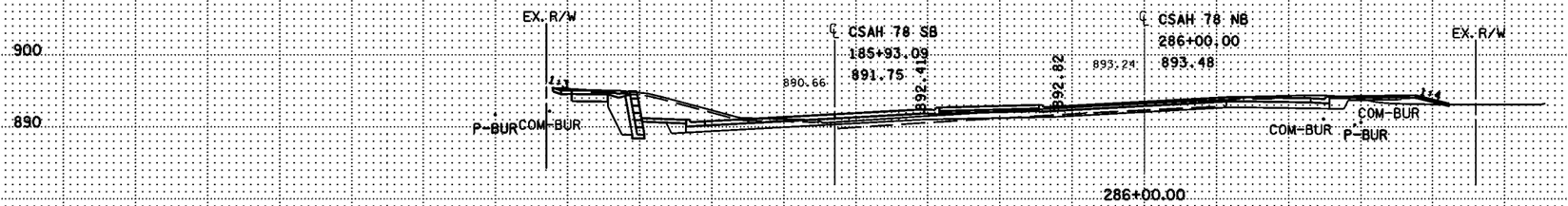


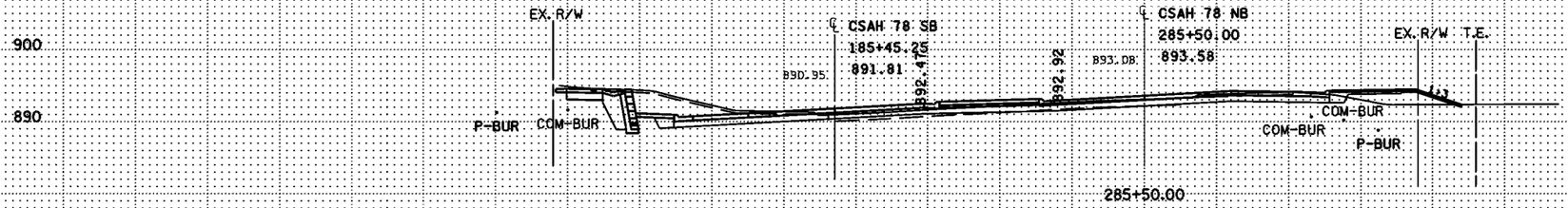


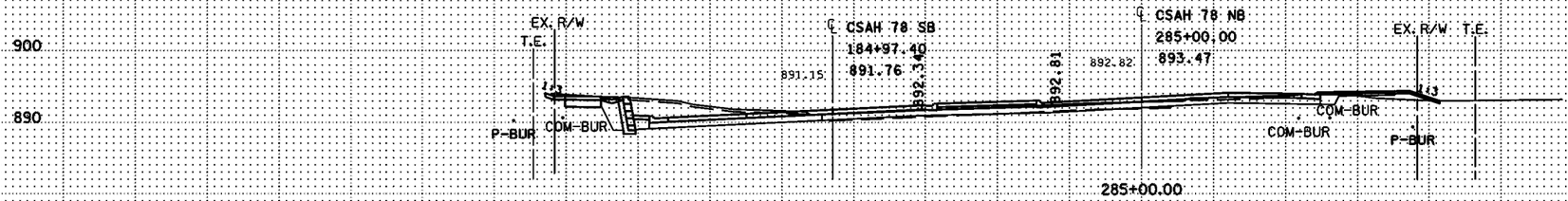


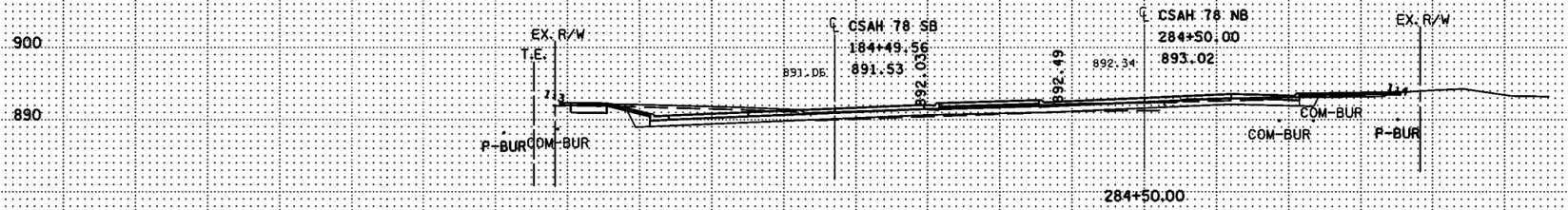
STA. 283+00.00 -284+00.00

CSAH78_Mainline_XSdgn
3:25:27 PM
11/22/2019
CSAH78_pentableUN





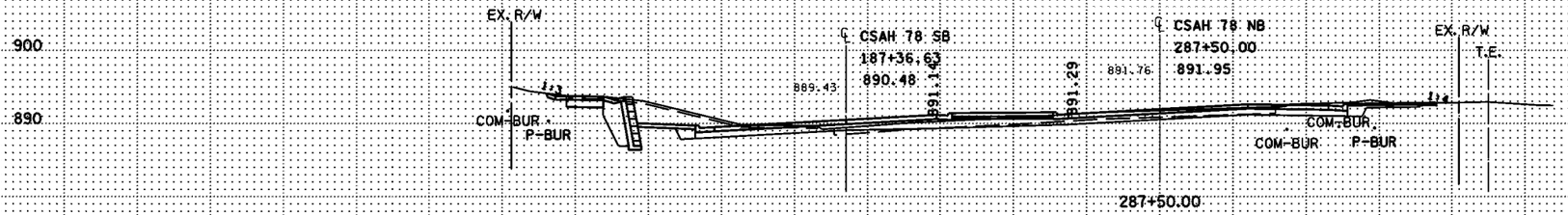


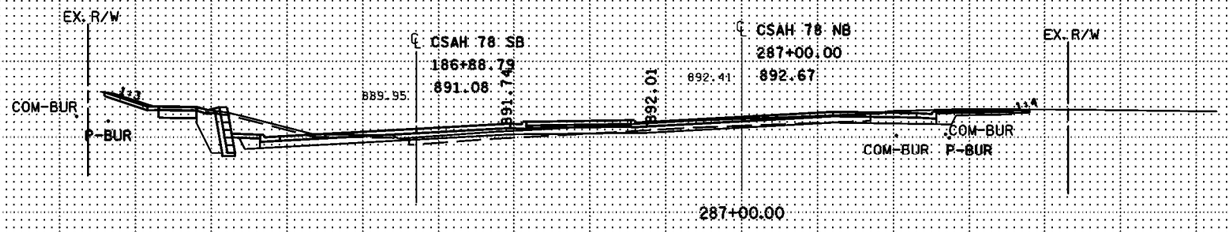


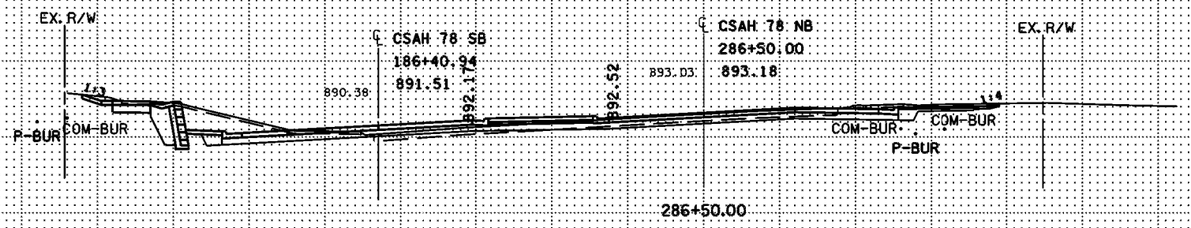
150 100 50 0 50 100 150

STA. 284+50.00 -286+00.00

CSAH78_Mainline_XS.dgn
2:25:15 PM
12/08/2009
CSAH78_pentable.tbl



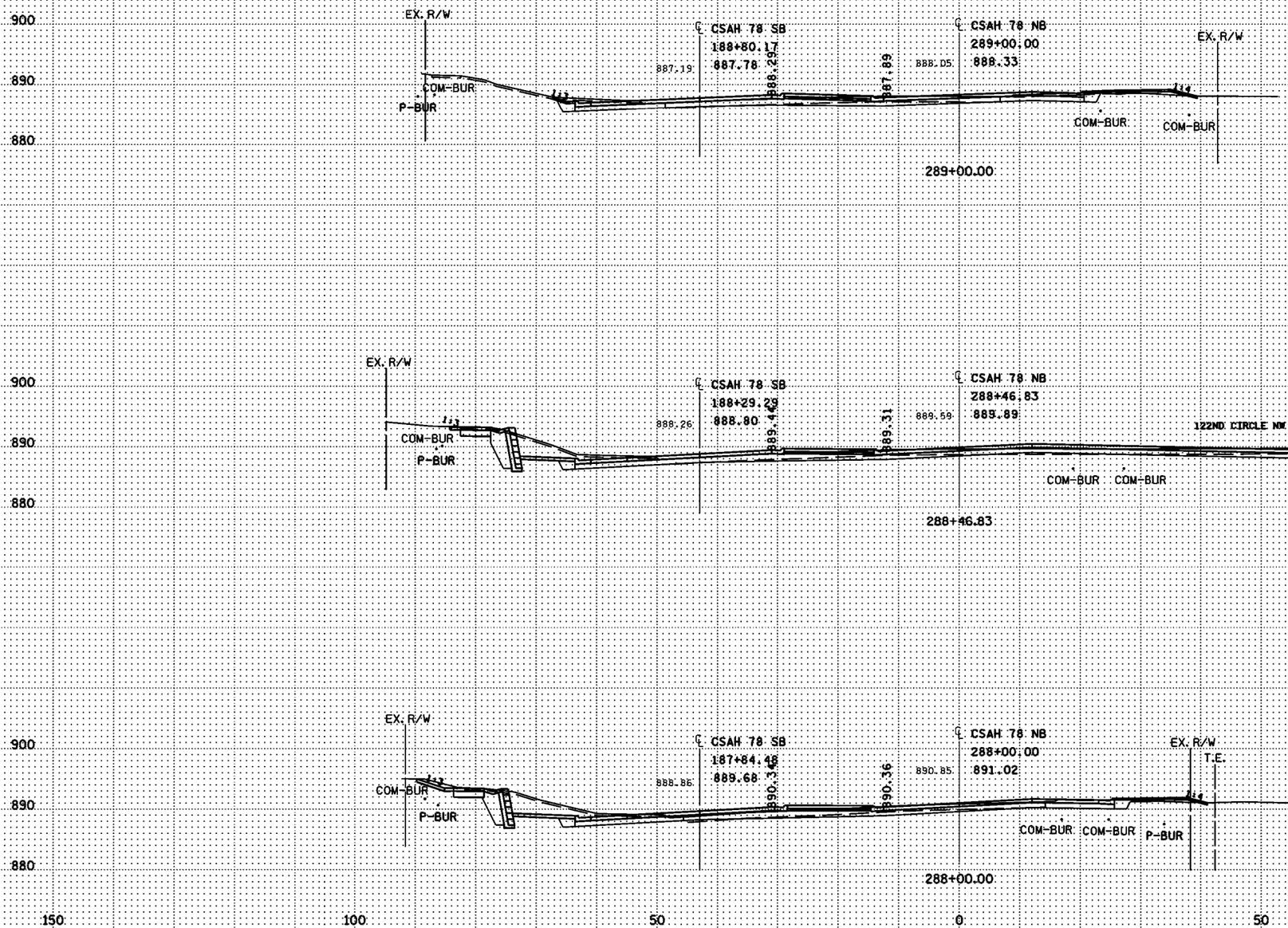




150 100 50 0 50 100 150

STA. 286+50.00 -287+50.00

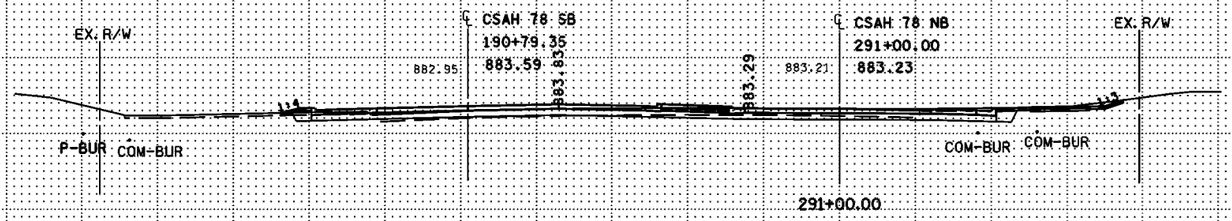
CSAH78_Mainline_XS.dgn
2:25:27 PM
12/08/2009
CSAH78_pentable.tbl

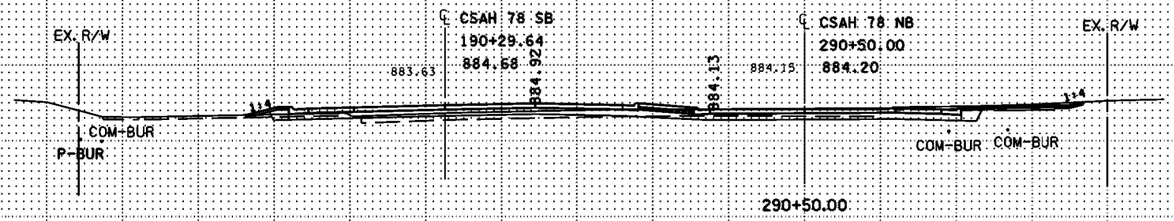


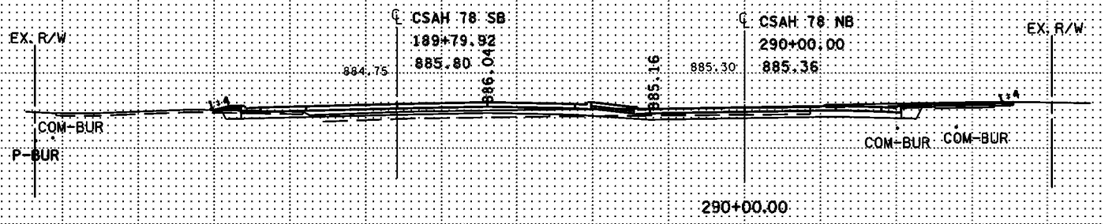
STA. 288+00.00 -289+00.00

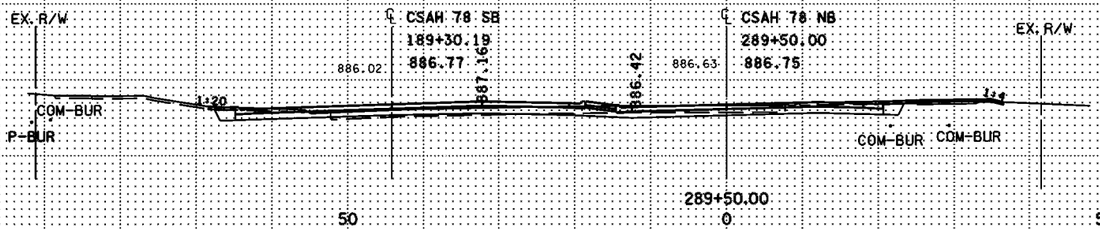
CSAH78_Mainline_XS.dgn
2:25:24 PM
12/06/2019
CSAH78_pentable.tbl

STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 222 OF 230 SHEETS







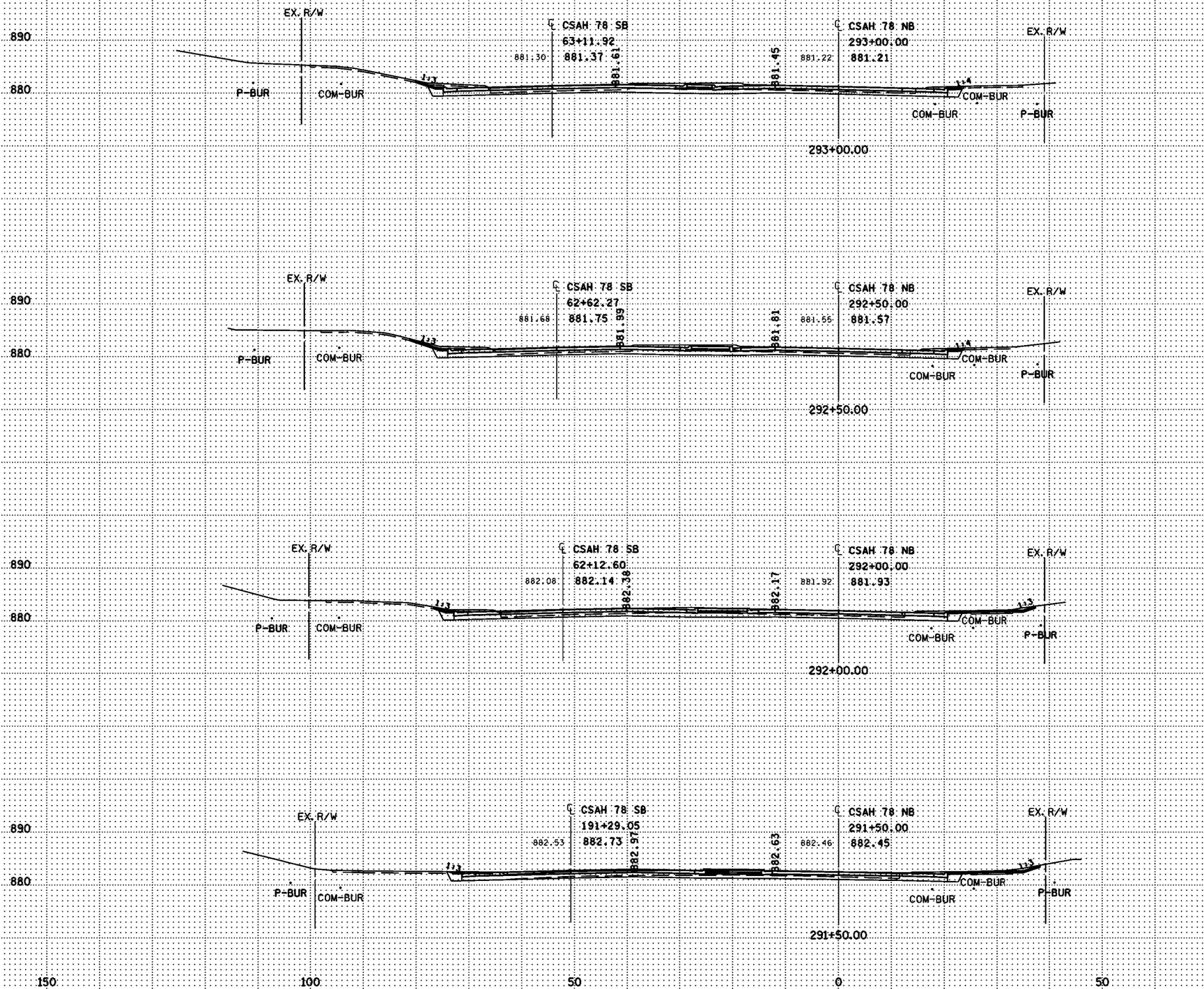


150 100 50 0 50 100 150

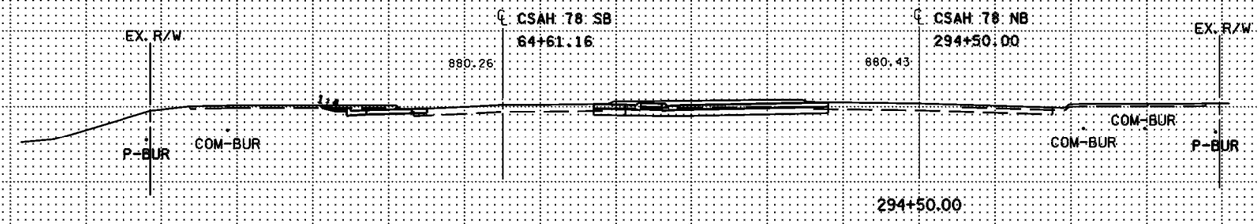
STA. 289+50.00 -291+00.00

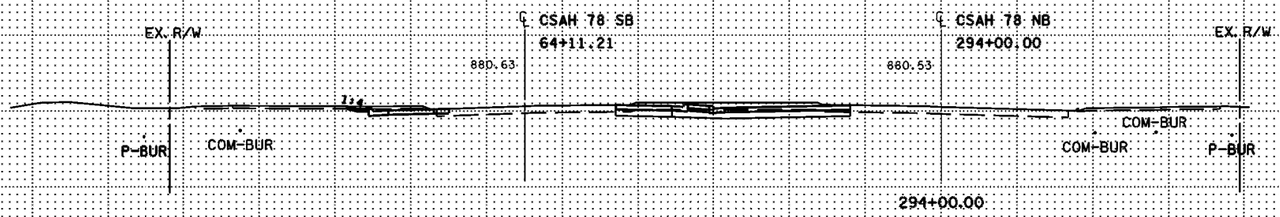
CSAH78_Mainline_XS.dgn
3:25:37 PM
11/22/2009
CSAH78_pentable.tbl

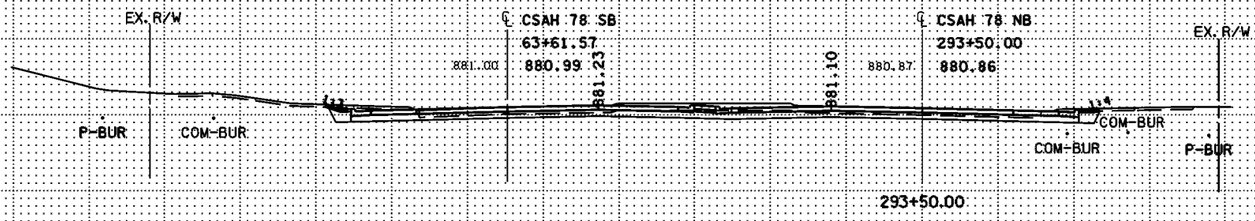
STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 223 OF 230 SHEETS



CSAH78_Mainline_XS.dgn
3:25:42 PM
11/22/2019
CSAH78_pentabletbl

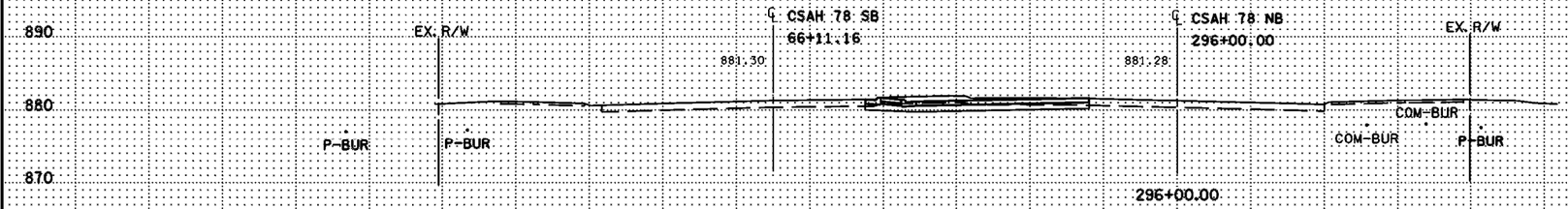


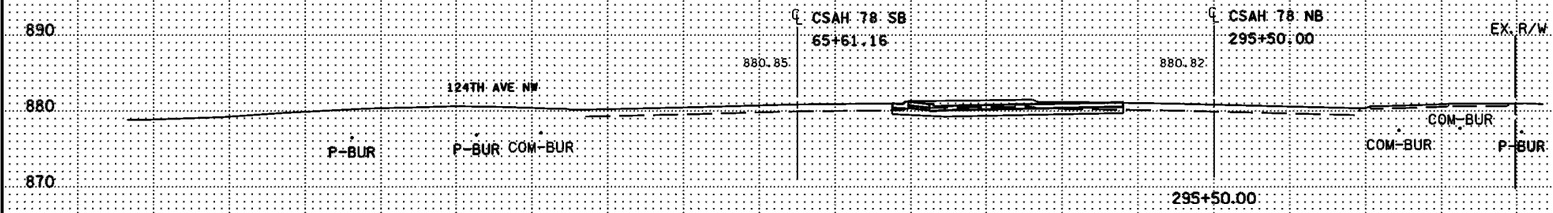


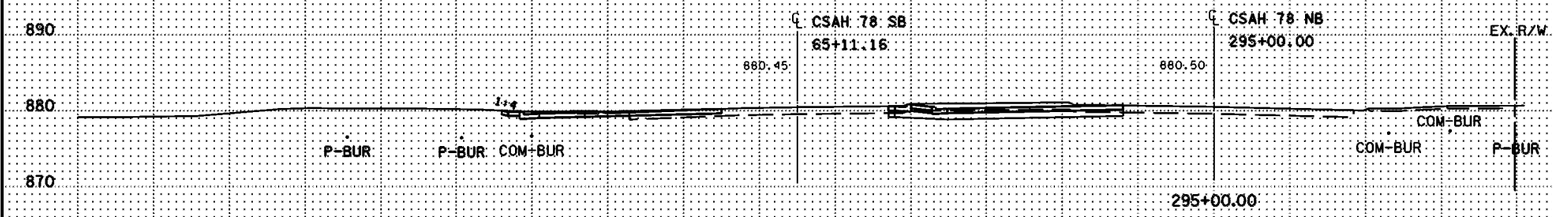


STA. 293+50.00 -294+50.00

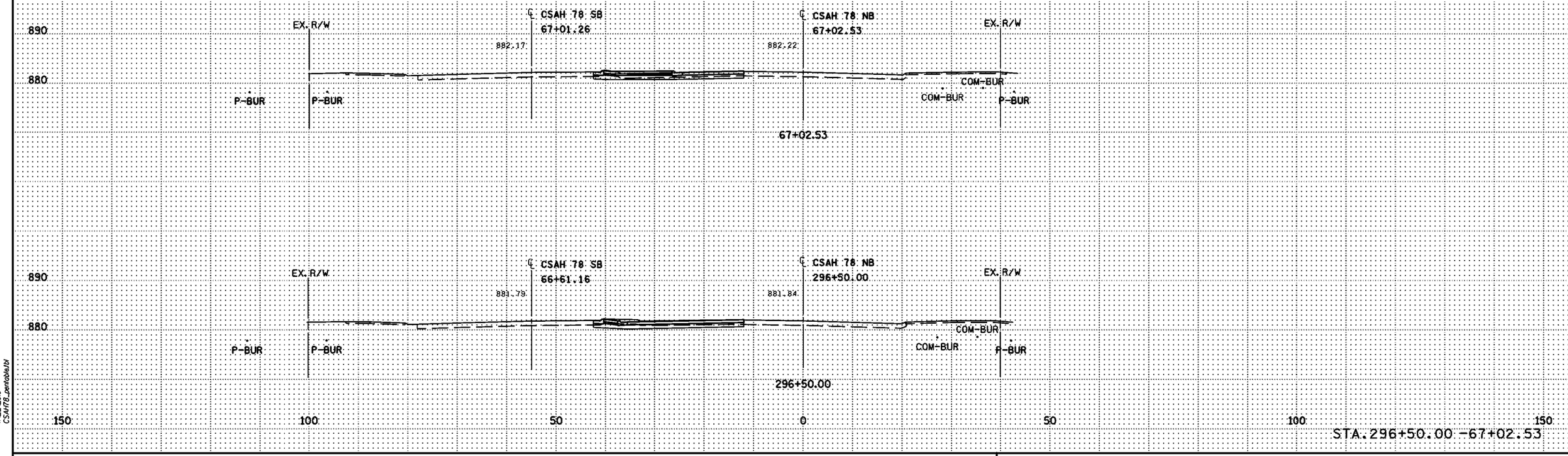
CSAH78_Mainline_XS.dgn
3:25:46 PM
11/22/2019
CSAH78_pentable.tbl







CSAH78_Mainline_1Sdgn
3:25:50 PM
11/22/2019
CSAH78_pentable.tbl



CSAH78_Mainline_1S.dgn
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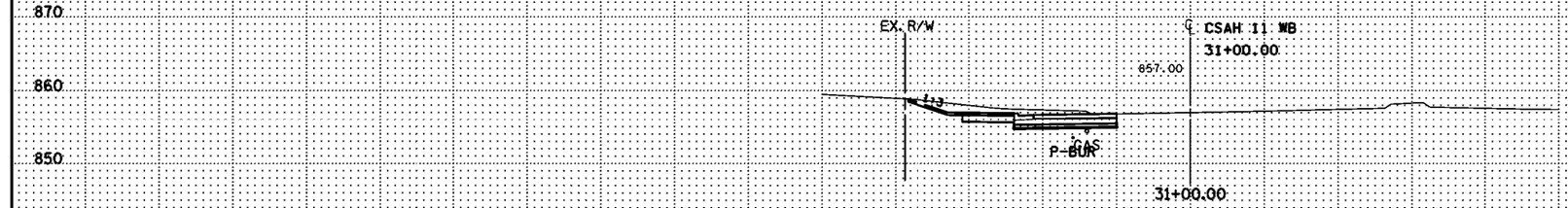
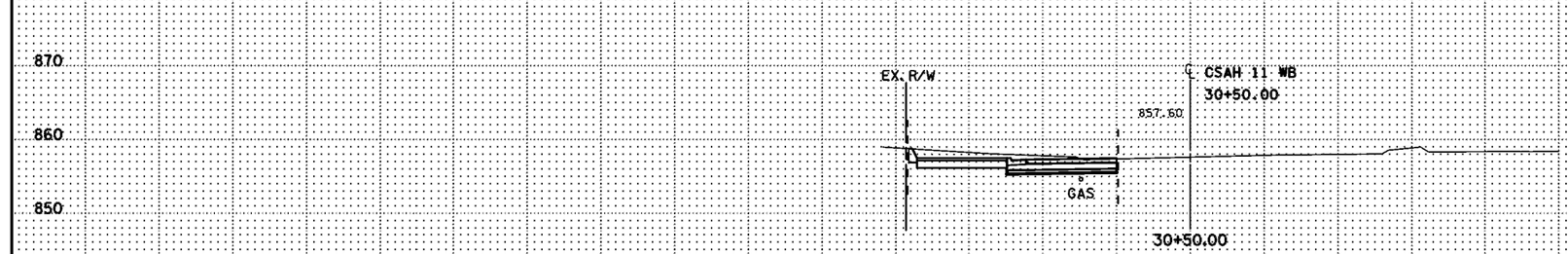
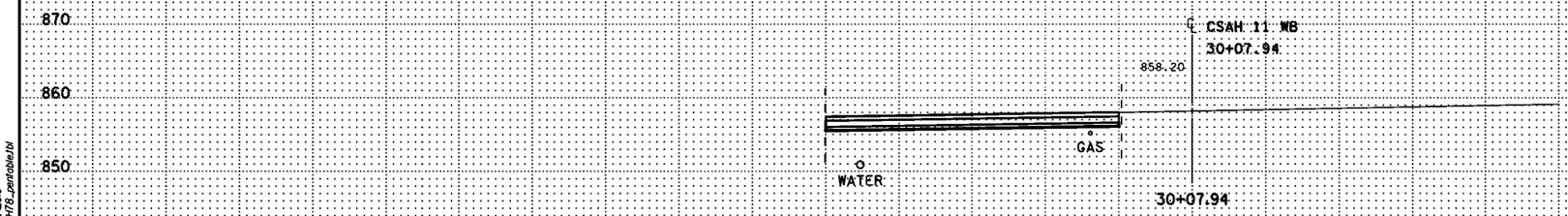
11/2/2009
CSAH78_pentable.tbl







150 100 50 0 50 100 150

STA. 30+07.94 -31+00.00

CSAH78_Northside_XS.dgn
3:25:58 PM
11/22/2019
CSAH78_pentable1bl

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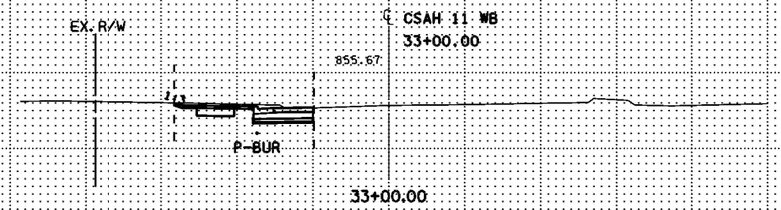
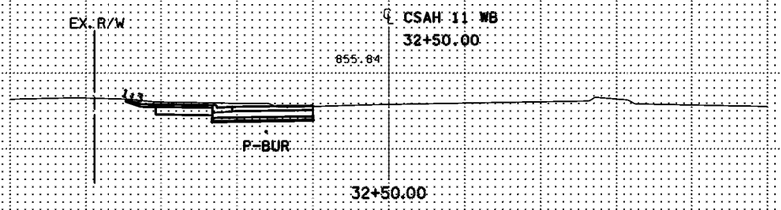
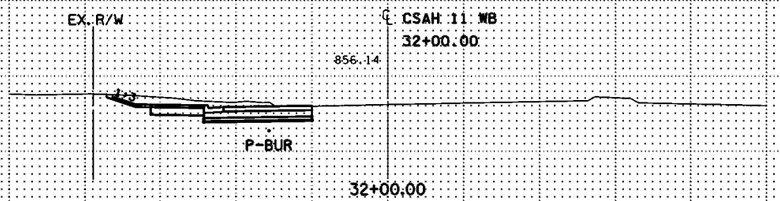
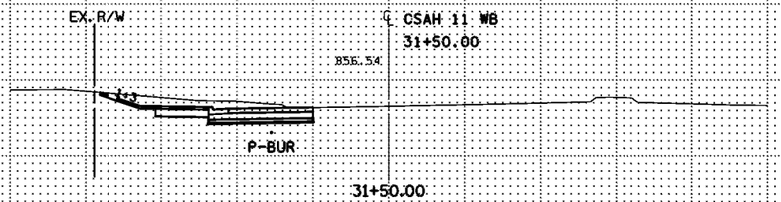




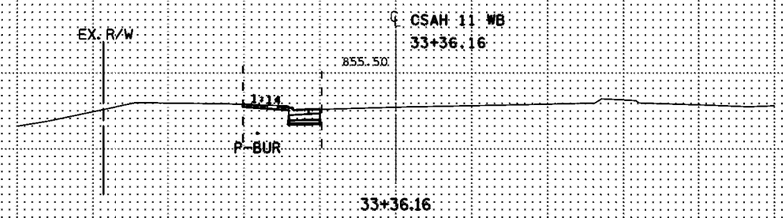




860
850
860
850
860
850
150
100
50
0
50
100
150

STA. 31+50.00 -33+00.00

CSAH78_Northdale_XS.dgn
3:26:00 PM
11/22/2019
CSAH78_pentable1bl



860

850

150 100 50 0 50 100 150

STA. 33+36.16 -33+36.16

CSAH78_Northdale...XS.dgn
3:26:01 PM
11/22/2019
CSAH78_pentable1bl

STATE PROJ. NO. 002-678-025 (CSAH 78) SHEET NO. 230 OF 230 SHEETS