

# MINNESOTA DEPARTMENT OF TRANSPORTATION ANOKA COUNTY CITIES OF ANOKA & RAMSEY

CONSTRUCTION PLAN FOR GRADING, BITUMINOUS SURFACING, MILL & BITUMINOUS OVERLAY, ADA IMPROVEMENTS, SIGNAL REVISIONS, AND MODIFICATION OF BRIDGE 02546

LOCATED ON T.H. 47 BETWEEN 100 FT SOUTH OF COOLIDGE ST NW AND 142ND AVE NW

LOCATED ON CSAH 116 (BUNKER LAKE BLVD) BETWEEN 250 FT EAST OF TOWER POND DR AND 1200 FT EAST OF T.H. 47

TH 47  
S.P. 0206-78

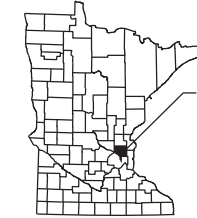
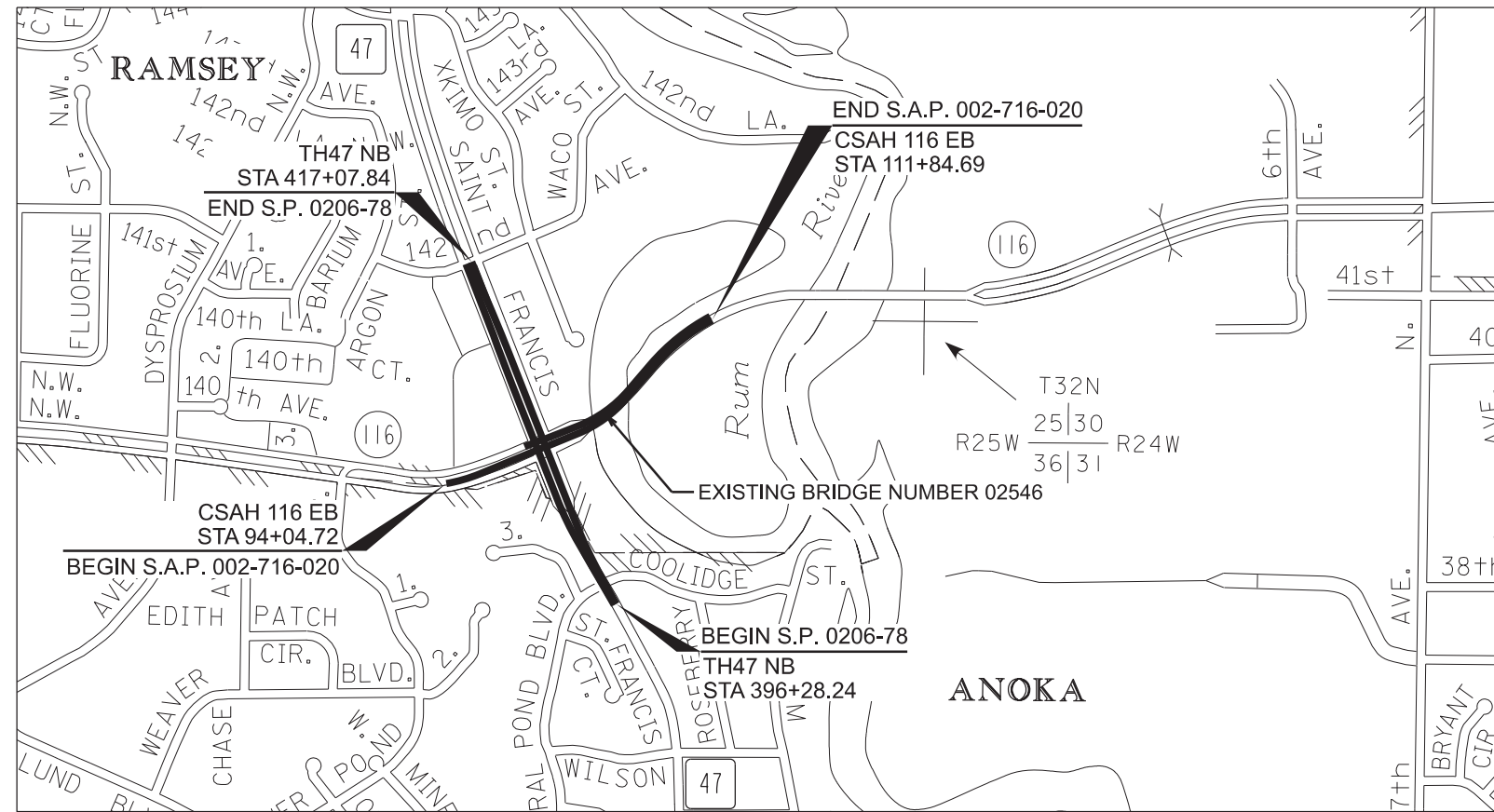
GROSS LENGTH ..... 2079.60 FEET ..... 0.394 MILES  
BRIDGES- LENGTH ..... FEET ..... MILES  
EXCEPTIONS-LENGTH ..... FEET ..... MILES  
NET LENGTH ..... 2079.60 FEET ..... 0.394 MILES  
REF POINT: 022+00.024 TO REF POINT: 022+00.414  
LENGTH BASED ON TH 47 NB ALIGNMENT

CSAH 116  
S.A.P. 002-716-020

GROSS LENGTH ..... 1779.97 FEET ..... 0.337 MILES  
BRIDGES- LENGTH ..... 101.88 FEET ..... 0.019 MILES  
EXCEPTIONS-LENGTH ..... FEET ..... MILES  
NET LENGTH ..... 1779.97 FEET ..... 0.337 MILES  
LENGTH BASED ON CSAH 116 EB ALIGNMENT

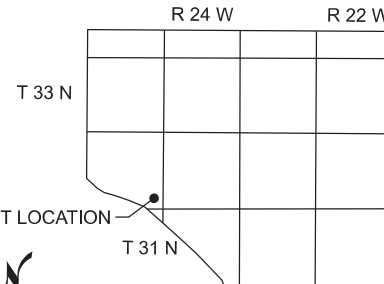
AGREEMENT NO. 1044547

ANOKA COUNTY  
S.P. 0206-78 (TH 47=110)  
STATE FUNDS  
METRO DISTRICT



PROJECT LOCATION  
COUNTY: ANOKA  
DISTRICT: METRO

ANOKA COUNTY  
S25 T32N R25W  
S36 T32N R25W



THIS PLAN CONTAINS 273 SHEETS

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



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

PRINTED NAME: NICHOLAS E. HENTGES, PE.  
LICENSE NUMBER: 44620  
Digitally signed by Nicholas Hentges  
DN: cn=Nicholas Hentges, o=WSB, ou= email=nhentges@wsbeng.com, c=US  
Date: 2020.11.06 14:08:12 -06'00'

APPROVED: ANOKA COUNTY ENGINEER

Joe MacPherson  
Digitally signed by Joe MacPherson  
Date: 2020.11.16 15:09:47 -06'00'

APPROVED: CITY OF ANOKA ENGINEER

Greg Lee  
November 12, 2020

APPROVED: CITY OF RAMSEY ENGINEER

Bruce Westby  
Digitally signed by Bruce Westby  
Date: 2020.11.09 15:21:25 -06'00'

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

Julie Dresel  
Digitally signed by Julie Dresel  
Date: 2020.11.18 08:30:27 -06'00'

STATE AID ENGINEER:  
APPROVED FOR STATE AID FUNDING

Julie Dresel  
Digitally signed by Julie Dresel  
Date: 2020.11.18 08:44:51 -06'00'

APPROVED:  
DISTRICT TRANSPORTATION ENGINEER

Michael Barnes  
Digitally signed by Michael Barnes  
Date: 2020.11.19 09:22:43 -06'00'

TH47 DESIGN DESIGNATION	
R VALUE	= 56
ADT (CURRENT YEAR) 2021	= 23,870
ADT (FUTURE YEAR) 2041	= 29,650
D (DIRECTIONAL DISTR.)	= 50%
T (HEAVY COMMERCIAL)	= 3.9%
SOIL FACTOR	= 3.9%
DESIGN LOAD	10 TON
FUNC. CLASSIFICATION	A MINOR ARTERIAL
NO. OF TRAFFIC LANES	2
DESIGN SPEED	45 MPH
BASED ON	STOPPING SIGHT DISTANCE
HEIGHT OF EYE	3.5 FT.
HEIGHT OF OBJECT	2.0 FT.
DESIGN SPEED NOT ACHIEVED AT:	NA
STA. NA TO STA. NA	NA
SHOULDER WIDTH	11 FT - 13 FT
NO. OF PARKING LANES	0

CSAH 116 DESIGN DESIGNATION	
R VALUE	= 56
ADT (CURRENT YEAR) 2021	= 18,140
ADT (FUTURE YEAR) 2041	= 22,285
D (DIRECTIONAL DISTR.)	= 50%
T (HEAVY COMMERCIAL)	= 3.9%
SOIL FACTOR	= 3.9%
DESIGN LOAD	10 TON
FUNC. CLASSIFICATION	A MINOR ARTERIAL
NO. OF TRAFFIC LANES	4
DESIGN SPEED	50 MPH (W OF TH 47) / 55 MPH (E OF TH 47)
BASED ON	STOPPING SIGHT DISTANCE
HEIGHT OF EYE	3.5 FT.
HEIGHT OF OBJECT	2.0 FT.
DESIGN SPEED NOT ACHIEVED AT:	NA
STA. 1002+11.38 TO STA. 1005+58.19 WB	40 MPH (HORIZ. CURVE)
STA. 1007+50.29 TO STA. 1017+47.12 WB	40 MPH (HORIZ. CURVE)
STA. 101+44.66 TO STA. 105+55.4 EB	40 MPH (HORIZ. CURVE)
STA. 107+70.74 TO STA. 117+41.1 EB	40 MPH (HORIZ. CURVE)
SHOULDER WIDTH	9 FT - 10 FT
NO. OF PARKING LANES	0

BIKE TRAIL DESIGNATION	
DESIGN SPEED (MPH):	20
BASED ON	4.5 FT HEIGHT OF EYE
HEIGHT OF OBJECT	0.0 FT
DESIGN SPEED NOT ACHIEVED AT:	N/A

SCALES

PLAN 1" = 50'

PROFILE 1" = 50'

INDEX MAP 1" = 500'

GENERAL LAYOUT 1" = 150'

PLAN REVISIONS		
DATE	SHEET NO.	APPROVED BY

STATE PROJ NO  
0206-78

CHARGE IDENTIFIER

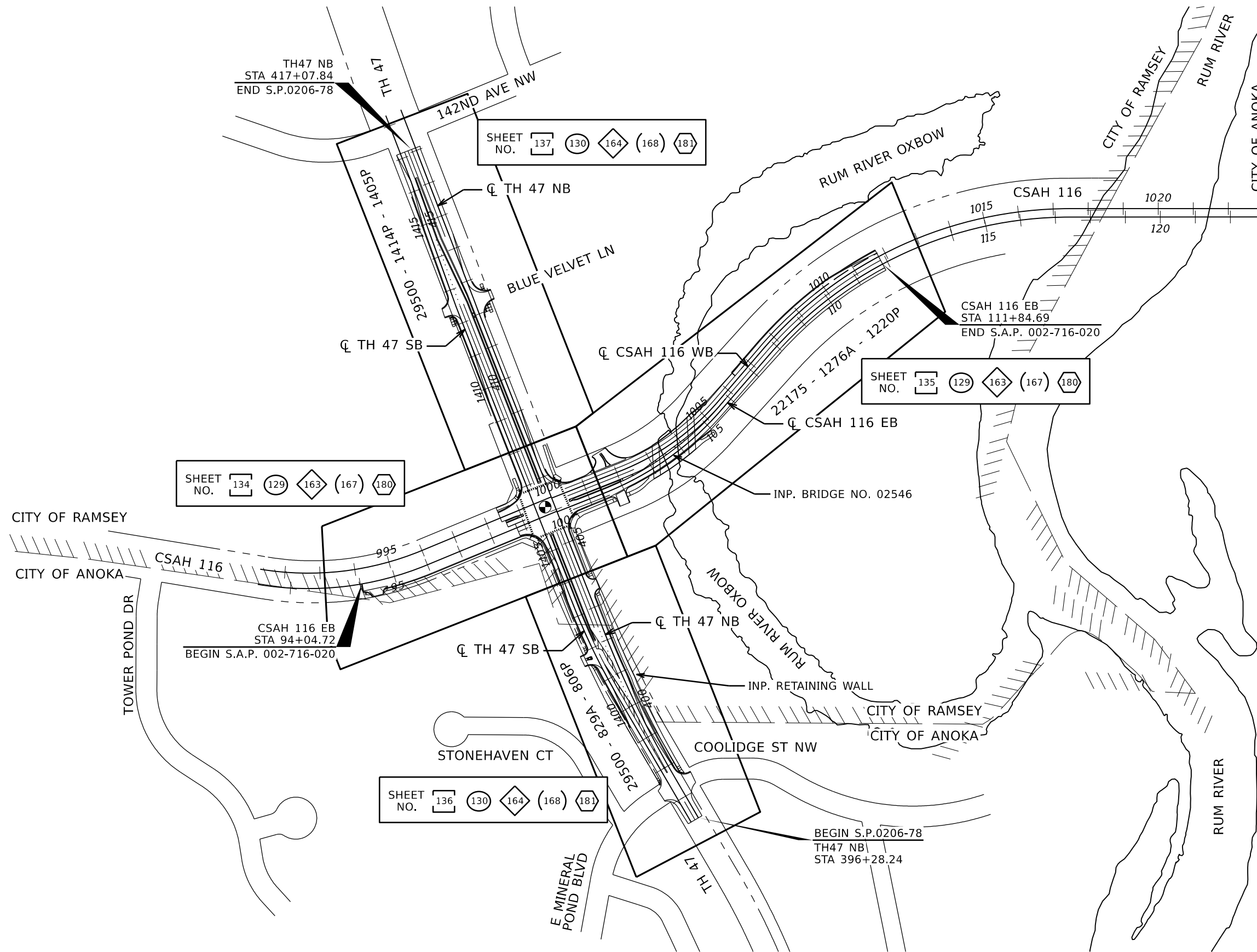
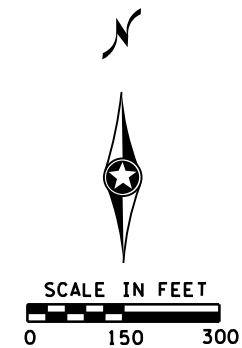
I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: \_\_\_\_\_  
LICENSE # \_\_\_\_\_

S.P. 0206-78 (TH 47=110), S.A.P. 002-716-020

SHEET 1 OF 206 SHEETS

PRINT DATE: 9/18/2020  
PATH & FILENAME: Projects\Minnesota\04652-000\CadPlan\4652-000\_1.sh



SHEET NO. 137 130 164 (168) 181

SHEET NO. 135 129 163 (167) 180

SHEET NO. 134 129 163 (167) 180

SHEET NO. 136 130 164 (168) 181

LEGEND	
SHEET NO.	DESCRIPTION
	PROPOSED SIGNAL SYSTEM
XX	CONSTRUCTION PLAN & PROFILES
XX	MISCELLANEOUS REMOVAL PLAN
XX	EROSION CONTROL & TURF ESTABLISHMENT
(XX)	SIGNING PLANS
XX	PAVEMENT MARKING PLANS

DATE: 8/25/2020 2:03:03 PM  
PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_g101

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 77 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 GENERAL LAYOUT  
 S.P. 0206-78 (TH 77), S.A.P. 002-716-020

SHEET  
 2  
 OF  
 206  
 SHEETS

**STATEMENT OF ESTIMATED QUANTITIES**

TAB ID	SHEET NO.	ITEM	DESCRIPTION	NOTES	UNIT	PROJECT TOTAL	S.P. 0206-78 ROADWAY AND POND OUTLET PIPE	100% COUNTY ROADWAY LOCAL FUNDS TH 47	S.A.P. 002-716-020 S.P. 0206-78 (A)	50% COUNTY 50% ANOKA LOCAL FUNDS TH 47	50% COUNTY 50% RAMSEY LOCAL FUNDS	100% ANOKA LOCAL FUNDS	100% RAMSEY LOCAL FUNDS	69% COUNTY 25% RAMSEY 6% ANOKA STORM SEWER TH 47	100% COUNTY S.A.P. 002-716-020	50% COUNTY S.A.P. 002-716-020 50% RAMSEY LOCAL FUNDS	STORM SEWER S.A.P. 002-716-020
						ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY
		2011.601	AS BUILT		LUMP SUM	1	0.1	0.9									
		2021.501	MOBILIZATION		LUMP SUM	1	0.1	0.4	0.14	0.01	0.02	0.01	0.01	0.07	0.22	0.01	0.04
		2031.502	FIELD OFFICE TYPE D		EACH	1									1		
J	66	2102.503	PAVEMENT MARKING REMOVAL		LIN FT	15778		11789							3989		
H	10	2104.502	REMOVE CASTING		EACH	10		5							5		
G	9	2104.502	REMOVE GATE VALVE & BOX		EACH	1		1									
G	9	2104.502	REMOVE HYDRANT		EACH	1		1									
H	10	2104.502	REMOVE DRAINAGE STRUCTURE		EACH	17		13							4		
	132 - 133	2104.502	REMOVE SIGN TYPE C		EACH	55		36							19		
K	131	2104.502	REMOVE SIGN TYPE D		EACH	3		3									
A	7	2104.502	REMOVE ENERGY ABSORBING TERMINAL		EACH	3									3		
L	131	2104.502	SALVAGE SIGN TYPE D		EACH	4		4									
M	131	2104.502	SALVAGE SIGN TYPE SPECIAL		EACH	7		2							5		
A, J	7, 66	2104.503	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)		LIN FT	8786		5962							2824		
G	9	2104.503	REMOVE WATER MAIN		LIN FT	17		17									
H	9	2104.503	REMOVE SEWER PIPE (STORM)		LIN FT	306		237							69		
A	7	2104.503	REMOVE CONCRETE CURB AND GUTTER		LIN FT	6042		4160							1882		
A	7	2104.503	REMOVE GUARDRAIL - PLATE BEAM		LIN FT	379									379		
A	7	2104.504	REMOVE CONCRETE APPROACH PANEL		SQ YD	430									430		
A	7	2104.504	REMOVE BITUMINOUS DRIVEWAY PAVEMENT		SQ YD	305									305		
A, J	7 / 66	2104.504	REMOVE BITUMINOUS PAVEMENT		SQ YD	6341		4322							2019		
A	7	2104.518	REMOVE BITUMINOUS WALK		SQ FT	10700		8463							2237		
A	7	2104.518	REMOVE CONCRETE WALK		SQ FT	879		802							77		
A	7	2104.518	REMOVE CONCRETE MEDIAN		SQ FT	1157		1037							120		
I	11	2105.507	COMMON EXCAVATION	(P)	CU YD	2791		1920							871		
I	11	2105.507	SUBGRADE EXCAVATION	(P)	CU YD	3054		2198							856		
I	11	2105.507	SELECT GRANULAR BORROW (CV)	(P)	CU YD	3151		2283							868		
		2118.507	AGGREGATE SURFACING (CV) CLASS 2		CU YD	11		11									
		2123.610	STREET SWEEPER (WITH PICKUP BROOM)		HOUR	100		50							50		
		2123.610	1.5 CU YD BACKHOE		HOUR	40		20							20		
		2130.523	WATER		MGAL	40		20							20		
D	8	2211.507	AGGREGATE BASE (CV) CLASS 5	(P)	CU YD	1487		1068					51		368		
D, J	8, 66	2231.509	BITUMINOUS PATCHING MIXTURE		TON	796		544							252		
A	7	2232.504	MILL BITUMINOUS SURFACE (2.0")		SQ YD	17840		15810							2030		
B	7	2301.602	DRILL & GROUT REINF BAR (EPOXY COATED)		EACH	84		69					6		9		
D	8	2360.509	TYPE SP 9.5 WEARING COURSE MIXTURE (2,B)	(2)	TON	233		180							53		
D	8	2360.509	TYPE SP 12.5 NON WEARING COURSE MIXTURE (4,B)	(2)	TON	878		687							191		
D	8	2360.509	TYPE SP 12.5 WEARING COURSE MIXTURE (4,F)	(2)	TON	3861		1967							480		

**NOTES**

- (A) SEE AGREEMENT #1044547 FOR SIGNAL COST SPLIT.
- (2) TACK COAT SHALL BE INCIDENTAL.
- (3) CITY CONTACT FOR WATERMAIN IS BEN NELSON, ANOKA CITY ENGINEER, 763-576-2785.
- (4) INCLUDES QUANTITY FOR CONCRETE MEDIANS.
- (5) TO BE USED AT PEDESTRIAN RAMP AND LANDING LOCATIONS PER MNDOT STANDARD PLAN 5-297.250.
- (6) USED AT THE DIRECTION OF THE ENGINEER.
- (7) AWWA C-153
- (8) MINIMIZE SPACE FOR STORM SEWER INSTALLATION. TRENCH BOX INCIDENTAL.
- (9) SEE SHEET 34 FOR DETAILS.

- (10) SEE SHEET 38 FOR DETAILS.
- (11) SEE TABULATION FOR COLOR.
- (12) 10 FT LINE, 40 FT GAP
- (13) 3 FT LINE, 12 FT GAP
- (14) 2 FT LINE, 6 FT GAP
- (15) SEE TABULATION FOR COLOR AND SIZE.
- (16) 2020 SIGN CODE OM1-2
- (17) 2020 SIGN CODE OM3-R
- (18) 2020 SIGN CODE X4-3
- (P) PLAN QUANTITY

**BASIS OF QUANTITIES**

- BITUMINOUS DENSITY : 113 LB/SQ YD/IN
- TACK COAT BETWEEN BITUMINOUS LIFTS: (INCIDENTAL)
- 0.05 GAL/SQ YD NEW PAVEMENT
- 0.085 GAL/SQ YD MILLED PAVEMENT

DATE: 11/30/2020 3:07:23 PM  
PATH & FILENAME: Projects\Minnesota\014652-000\04652-000\Plan\4652-000.dwg

NO.	DATE	BY	CHK	REVISIONS
1	11/30/2020	AJF	NEH	ADD FIELD OFFICE TYPE D.

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - 44620  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

ESTIMATED QUANTITIES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 3R  
 OF  
 206  
 SHEETS

**STATEMENT OF ESTIMATED QUANTITIES**

TAB ID	SHEET NO.	ITEM	DESCRIPTION	NOTES	UNIT	PROJECT TOTAL	S.P. 0206-78 ROADWAY AND POND OUTLET PIPE	100% COUNTY ROADWAY LOCAL FUNDS TH 47	S.A.P. 002-716-020 S.P. 0206-78 (A)	50% COUNTY 50% ANOKA LOCAL FUNDS TH 47	50% COUNTY 50% RAMSEY LOCAL FUNDS	100% ANOKA LOCAL FUNDS	100% RAMSEY LOCAL FUNDS	69% COUNTY 25% RAMSEY 6% ANOKA STORM SEWER TH 47	100% COUNTY S.A.P. 002-716-020	50% COUNTY S.A.P. 002-716-020 50% RAMSEY LOCAL FUNDS	STORM SEWER S.A.P. 002-716-020
						ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY
C	7	2406.504	BRIDGE APPROACH PANELS		SQ YD	429									429		
C	7	2406.603	EXPANSION JOINTS, DESIGN E8 SPECIAL		LIN FT	200									200		
P	158	2451.507	FINE AGGREGATE BEDDING	(P)	CU YD	272	140							95			37
P	158	2501.502	24" RC PIPE APRON		EACH	1	1										
P	158	2501.602	TRASH GUARD FOR 24" PIPE APRON		EACH	1	1										
		2502.601	IRRIGATION SYSTEM PROVISION		LUMP SUM	1		0.5							0.5		
P	158	2502.503	4" PERF TP PIPE DRAIN		LIN FT	320								320			
P	158	2503.503	12" RC PIPE SEWER DESIGN 3006 CL V	(3)	LIN FT	88								22			66
P	158	2503.503	15" RC PIPE SEWER DESIGN 3006 CL V	(3)	LIN FT	578								466			112
P	158	2503.503	24" RC PIPE SEWER DESIGN 3006	(3)	LIN FT	204	6							172			26
P	158	2503.503	27" RC PIPE SEWER DESIGN 3006 CL IV	(3)	LIN FT	616	616										
P	158	2503.503	28" SPAN RC PIPE-ARCH SEWER CL IIIA	(3)	LIN FT	80	80										
P	158	2503.602	CONNECT TO EXISTING STORM SEWER		EACH	23								16			7
P	158	2503.602	CONNECT INTO EXISTING DRAINAGE STRUCTURE		EACH	7								3			4
P	158	2503.503	10" TP PIPE SEWER		LIN FT	26											26
H	10	2503.603	PLUG FILL & ABANDON PIPE SEWER		LIN FT	76									76		
P	158	2503.604	4" INSULATION		SQ YD	7						7					
G	9	2504.602	CONNECT TO EXISTING WATER MAIN	(3)	EACH	3						3					
G	9	2504.602	HYDRANT	(3)	EACH	1						1					
G	9	2504.602	ADJUST GATE VALVE & BOX	(3)	EACH	6						4	2				
G	9	2504.602	6" GATE VALVE & BOX	(3)	EACH	1						1					
G	9	2504.603	6" WATERMAIN DUCTILE IRON CL 52	(3)	LIN FT	10						10					
G	9	2504.603	16" WATERMAIN DUCTILE IRON CL 52	(3)	LIN FT	17						17					
G	9	2504.604	4" INSULATION	(3)	SQ YD	7						7					
G	9	2504.608	DUCTILE IRON FITTINGS	(3) (7)	POUND	808						808					
O	158	2506.502	CONST DRAINAGE STRUCTURE DESIGN SPEC 1	(8) (9)	EACH	5											5
O	158	2506.502	CONST DRAINAGE STRUCTURE DESIGN SPEC 2	(8) (10)	EACH	1	1										
O	158	2506.502	CASTING ASSEMBLY	(8)	EACH	52	3							27			22
G, O	9, 158	2506.502	ADJUST FRAME RING & CASTING	(8)	EACH	12						5	2	4			1
O	158	2506.503	CONST DRAINAGE STRUCTURE DESIGN G	(8)	LIN FT	8								8			
O	158	2506.503	CONST DRAINAGE STRUCTURE DESIGN H	(8)	LIN FT	44								25			19
O	158	2506.503	CONST DRAINAGE STRUCTURE DES 48-4020	(8)	LIN FT	69								50			19
O	158	2506.503	CONST DRAINAGE STRUCTURE DES 60-4020	(8)	LIN FT	81	39							28			14
O	158	2506.503	CONST DRAINAGE STRUCTURE DES 72-4020	(8)	LIN FT	10											10
O	158	2506.503	RECONSTRUCT DRAINAGE STRUCTURE	(8)	LIN FT	1.5								1.5			
L	158	2511.504	GEOTEXTILE FILTER TYPE 4		SQ YD	13	13										
L	158	2511.507	RANDOM RIPRAP CLASS II		CU YD	3	3										
B	7	2521.518	4" CONCRETE WALK	(4)	SQ FT	12452		7637					3713		1102		
B	7	2521.518	6" CONCRETE WALK	(5)	SQ FT	3651		3293					138		220		
B	7	2531.503	CONCRETE CURB AND GUTTER DESIGN B412		LIN FT	399		36							363		
B	7	2531.503	CONCRETE CURB AND GUTTER DESIGN B418 (MOD)		LIN FT	384									384		
B	7	2531.503	CONCRETE CURB AND GUTTER DESIGN B424		LIN FT	5906		2309		625	1823					1149	

**NOTES**

- |  |   |
|--|---|
| (A) SEE AGREEMENT #1044547 FOR SIGNAL COST SPLIT.  | (10) SEE SHEET 38 FOR DETAILS.          |
| (2) TACK COAT SHALL BE INCIDENTAL.   | (11) SEE TABULATION FOR COLOR.          |
| (3) CITY CONTACT FOR WATERMAIN IS BEN NELSON, ANOKA CITY ENGINEER, 763-576-2785.           | (12) 10 FT LINE, 40 FT GAP              |
| (4) INCLUDES QUANTITY FOR CONCRETE MEDIANS.  | (13) 3 FT LINE, 12 FT GAP               |
| (5) TO BE USED AT PEDESTRIAN RAMP AND LANDING LOCATIONS PER MNDOT STANDARD PLAN 5-297.250. | (14) 2 FT LINE, 6 FT GAP                |
| (6) USED AT THE DIRECTION OF THE ENGINEER.   | (15) SEE TABULATION FOR COLOR AND SIZE. |
| (7) AWWA C-153   | (16) 2020 SIGN CODE OM1-2               |
| (8) MINIMIZE SPACE FOR STORM SEWER INSTALLATION. TRENCH BOX INCIDENTAL.                    | (17) 2020 SIGN CODE OM3-R               |
| (9) SEE SHEET34 FOR DETAILS.   | (18) 2020 SIGN CODE X4-3                |
|  | (P) PLAN QUANTITY                       |

**BASIS OF QUANTITIES**

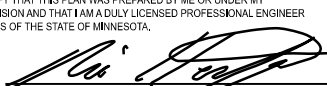
- BITUMINOUS DENSITY : 113 LB/SQ YD/IN
- TACK COAT BETWEEN BITUMINOUS LIFTS: (INCIDENTAL)
  - 0.05 GAL/SQ YD NEW PAVEMENT
  - 0.085 GAL/SQ YD MILLED PAVEMENT

DATE: 1/8/2021 1:58:44 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000.dwg

NO.	DATE	BY	CHK	REVISIONS
1	11/30/2020	AJF	NEH	ADD FIELD OFFICE TYPE D.
2	01/08/2021	AJF	NEH	CORRECTED ITEM ROUNDING.

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

ESTIMATED QUANTITIES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 4R1  
 OF  
 206  
 SHEETS

**STATEMENT OF ESTIMATED QUANTITIES**

TAB ID	SHEET NO.	ITEM	DESCRIPTION	NOTES	UNIT	PROJECT TOTAL	S.P. 0206-78 ROADWAY AND POND OUTLET PIPE	100% COUNTY ROADWAY LOCAL FUNDS TH 47	S.A.P. 002-716-020 S.P. 0206-78 (A)	50% COUNTY 50% ANOKA LOCAL FUNDS TH 47	50% COUNTY 50% RAMSEY LOCAL FUNDS	100% ANOKA LOCAL FUNDS	100% RAMSEY LOCAL FUNDS	69% COUNTY 25% RAMSEY 6% ANOKA STORM SEWER TH 47	100% COUNTY S.A.P. 002-716-020	50% COUNTY S.A.P. 002-716-020 50% RAMSEY LOCAL FUNDS	STORM SEWER S.A.P. 002-716-020
						ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY
B	7	2531.618	TRUNCATED DOMES		SQ FT	282		282									
J	66	2533.503	PORTABLE PRECAST CONC BARRIER DES 8337		LIN FT	1414		940							474		
J	66	2533.503	RELOCATE PORT PRECAST CONC BAR DES 8337		LIN FT	1004		634							370		
L	158	2554.502	GUIDE POST TYPE B		EACH	8	2							3			3
F	8R	2554.502	END TREATMENT - TANGENT TERMINAL		EACH	3									3		
F	8R	2554.503	TRAFFIC BARRIER DESIGN TYPE 31		LIN FT	25									25		
F	8R	2554.503	TRAFFIC BARRIER DESIGN TRANSITION TYPE 31		LIN FT	75									75		
		2563.601	TRAFFIC CONTROL		LUMP SUM	1	0.1	0.4	0.14	0.01	0.02	0.01	0.01	0.07	0.22	0.01	0.04
		2563.601	ALTERNATE PEDESTRIAN ROUTE		LUMP SUM	1	0.1	0.4	0.14	0.01	0.02	0.01	0.01	0.07	0.22	0.01	0.04
J	66	2563.602	RAISED PAVEMENT MARKER TEMPORAY	(11)	EACH	838									838		
J	66	2563.602	PORTABLE CONCRETE BARRIER DELINEATOR		EACH	83		64							19		
J	66	2563.613	PORTABLE CHANGEABLE MESSAGE SIGN		UNIT DAY	64		40							24		
J	66	2563.615	TEMPORARY IMPACT ATTENUATOR		ASSEMBLY	6		4							2		
J	66	2563.615	RELOCATE TEMPORARY IMPACT ATTENUATOR		ASSEMBLY	4		2							2		
L	131	2564.502	INSTALL SIGN TYPE D		EACH	4		4									
T	166	2564.502	DELINEATOR TYPE X4-13	(18)	EACH	2		2									
S	166	2564.502	OBJECT MARKER TYPE X4-2	(16)	EACH	6		3							3		
S	166	2564.502	OBJECT MARKER TYPE X4-4	(17)	EACH	1									1		
Q	165	2564.518	SIGN PANELS TYPE C		SQ FT	463		270							193		
R	166	2564.518	SIGN PANELS TYPE D		SQ FT	32		32									
M	131	2564.602	INSTALL SIGN TYPE SPECIAL		EACH	7		2							5		
		2565.501	EMERGENCY VEHICLE PREEMPTION SYSTEM		LUMP SUM	1			1								
		2565.516	TRAFFIC CONTROL SIGNAL SYSTEM		SYSTEM	1			1								
		2565.616	TEMPORARY SIGNAL SYSTEM		SYSTEM	1			1								
E	8R	2573.502	STORM DRAIN INLET PROTECTION		EACH	86		53							33		
E	8R	2573.502	CULVERT END CONTROLS		EACH	4		2							2		
E	8R	2573.503	SILT FENCE, TYPE MS		LIN FT	2961		848							2113		
		2573.503	SEDIMENT CONTROL LOG TYPE STRAW	(6)	LIN FT	300									300		
E	8R	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER		LIN FT	5907		3016							2891		
I	11	2574.507	COMMON TOPSOIL BORROW		CU YD	377		201							176		
E	8R	2575.504	SODDING TYPE LAWN		SQ YD	5220		3060							2160		
E	8R	2575.504	RAPID STABILIZATION METHOD 4		SQ YD	556									556		
E	8R	2575.523	RAPID STABILIZATION METHOD 3		MGAL	13		8							5		
J	66	2581.503	REMOVABLE PREFORM PAVEMENT MARKING TAPE	(15)	LIN FT	5644									5644		
J	66	2581.603	REMOVABLE PREFORMED PLASTIC MASK (BLACK)		LIN FT	1520									1520		
J	66	2582.503	4" SOLID LINE PAINT	(11)	LIN FT	25779		17904							7875		
J	66	2582.503	4" BROKEN LINE PAINT	(11)	LIN FT	2747									2747		
J	66	2582.503	4" DBLE SOLID LINE PAINT	(11)	LIN FT	7070									7070		
G	179	2582.503	4" SOLID LINE MULTI COMP	(11)	LIN FT	6569									6569		
G	179	2582.503	24" SOLID LINE MULTI COMP	(11)	LIN FT	205									205		
G	179	2582.503	4" BROKEN LINE MULTI COMP	(11)(12)	LIN FT	3430									3430		
G	179	2582.503	4" DBLE SOLID LINE MULTI COMP	(11)	LIN FT	1485									1485		

**NOTES**

- |  |   |
|--|---|
| (A) SEE AGREEMENT #1044547 FOR SIGNAL COST SPLIT.  | (10) SEE SHEET 38 FOR DETAILS.          |
| (2) TACK COAT SHALL BE INCIDENTAL.   | (11) SEE TABULATION FOR COLOR.          |
| (3) CITY CONTACT FOR WATERMAIN IS BEN NELSON, ANOKA CITY ENGINEER, 763-576-2785.           | (12) 10 FT LINE, 40 FT GAP              |
| (4) INCLUDES QUANTITY FOR CONCRETE MEDIANS.  | (13) 3 FT LINE, 12 FT GAP               |
| (5) TO BE USED AT PEDESTRIAN RAMP AND LANDING LOCATIONS PER MNDOT STANDARD PLAN 5-297.250. | (14) 2 FT LINE, 6 FT GAP                |
| (6) USED AT THE DIRECTION OF THE ENGINEER.   | (15) SEE TABULATION FOR COLOR AND SIZE. |
| (7) AWWA C-153   | (16) 2020 SIGN CODE OM1-2               |
| (8) MINIMIZE SPACE FOR STORM SEWER INSTALLATION. TRENCH BOX INCIDENTAL.                    | (17) 2020 SIGN CODE OM3-R               |
| (9) SEE SHEET 34 FOR DETAILS.  | (18) 2020 SIGN CODE X4-3                |
|  | (P) PLAN QUANTITY                       |

**BASIS OF QUANTITIES**

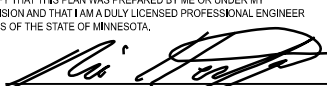
- BITUMINOUS DENSITY : 113 LB/SQ YD/IN
- TACK COAT BETWEEN BITUMINOUS LIFTS: (INCIDENTAL)
  - 0.05 GAL/SQ YD NEW PAVEMENT
  - 0.085 GAL/SQ YD MILLED PAVEMENT



DATE: 1/7/2021 4:01:40 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000.dwg

NO.	DATE	BY	CHK	REVISIONS
1	11/30/2020	AJF	NEH	ADD FIELD OFFICE TYPE D.
2	01/07/2021	AJF	NEH	CORRECTED RAPID STAB. METHOD 4 UNIT AND ORDER.

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**

ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**

**ESTIMATED QUANTITIES**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

**STATEMENT OF ESTIMATED QUANTITIES**

TAB ID	SHEET NO.	ITEM	DESCRIPTION	NOTES	UNIT	PROJECT TOTAL	S.P. 0206-78 ROADWAY AND POND OUTLET PIPE	100% COUNTY ROADWAY LOCAL FUNDS TH 47	S.A.P. 002-716-020 S.P. 0206-78 (A)	50% COUNTY 50% ANOKA LOCAL FUNDS TH 47	50% COUNTY 50% RAMSEY LOCAL FUNDS	100% ANOKA LOCAL FUNDS	100% RAMSEY LOCAL FUNDS	69% COUNTY 25% RAMSEY 6% ANOKA STORM SEWER TH 47	100% COUNTY S.A.P. 002-716-020	50% COUNTY S.A.P. 002-716-020 50% RAMSEY LOCAL FUNDS	STORM SEWER S.A.P. 002-716-020
						ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY	ESTIMATED QUANTITY
G	179	2582.503	4" SOLID LINE MULTI COMP GR IN (WR)	(11)	LIN FT	11033		11033									
G	179	2582.503	8" SOLID LINE MULTI COMP GR IN (WR)	(11)	LIN FT	237		237									
G	179	2582.503	4" DOTTED LINE MULTI COMP GR IN (WR)	(11) (13)	LIN FT	101		101									
G	179	2582.503	4" DBLE LINE MULTI COMP GR IN (WR)	(11)	LIN FT	917		917									
G	179	2582.503	24" SOLID LINE PREF THERMO GR IN	(11)	LIN FT	253		253									
G	179	2582.503	4" DOTTED LINE PREF THERMO GR IN	(11) (14)	LIN FT	72		72									
G	179	2582.518	PAVT MSSG MULTI COMP		SQ FT	155									155		
G	179	2582.518	PAVT MSSG PREF THERMO GR IN		SQ FT	358		358									
G	179	2582.518	CROSSWALK MULTI COMP		SQ FT	768									768		
G	179	2582.518	CROSSWALK PREF THERMO GR IN ESR		SQ FT	672		672									
<b>BRIDGE</b>																	
B2		2021.601	MOBILIZATION BRIDGE		LUMP SUM	1										1	
B2		2401.503	TYPE S (TL-4) 36" BARRIER CONCRETE (3S52)	(P)	LIN FT	143										143	
B2		2401.503	TYPE MOD. S (TL-4) 42" BARRIER CONCRETE (3S52)	(P)	LIN FT	148										148	
B2		2104.503	TYPE CURB BARRIER CONCRETE	(P)	LIN FT	137										137	
B2		2104.507	STRUCTURAL CONCRETE (3B52)	(P)	CU YD	3										3	
B2		5401.508	REINFORCEMENT BARS (EPOXY COATED)	(P)	POUND	30075										30075	
B2		2401.601	STRUCTURE EXCAVATION		LUMP SUM	1										1	
B2		2401.618	BRIDGE SLAB CONCRETE (3YHPC-S)		SQ FT	3836										3836	
B2		2402.503	EXPANSION JOINT DEVICES TYPE 4	(P)	LIN FT	207										207	
B2		2402.503	ORNAMENTAL METAL RAILING	(P)	LIN FT	137										137	
B2		2402.601	DRAINAGE SYSTEM BRIDGE DECK		LUMP SUM	1										1	
B2		2404.618	CONCRETE WEARING COURSE (3U17A) 2.0"		SQ FT	7058										7058	
B2		2411.618	ANTI-GRAFFITI COATING	(P)	SQ FT	3288										3288	
B2		2433.502	ANCH TYPE REINF BARS (TYPE L)	(P)	EACH	34										34	
B2		2433.503	REMOVE CONCRETE BRIDGE BARRIER		LIN FT	298										298	
B2		2433.503	REMOVE ORNAMENTAL METAL RAILING		LIN FT	281										281	
B2		2433.518	REMOVE CONCRETE BRIDGE DECK		SQ FT	3835										3835	
B2		2433.518	REMOVE CONCRETE SIDEWALK		SQ FT	357										357	
B2		2433.518	REMOVE CONCRETE WEARING COURSE		SQ FT	5288										5288	
B2		2433.603	RECONSTRUCT EXPANSION JOINT TYPE A		LIN FT	207										207	
B2		2433.603	REPAIR PAVING BRACKET		LIN FT	10										10	
B2		2433.606	SEAL CRACKS WITH EPOXY BY CHASE METHOD	(P)	GAL	3										3	
B2		2433.618	REMOVE AND PATCH SLAB TYPE A		SQ FT	50										50	
B2		2504.601	WATERMAIN HANGER SYSTEM		LUMP SUM	1										1	
B2		2545.501	CONDUIT SYSTEM (SIGNALS)		LUMP SUM	1										1	
B2		2546.501	CONDUIT SYSTEM (POWER)		LUMP SUM	1										1	
B2		2550.503	1.5" RIGID STEEL CONDUIT		LIN FT	398										398	

**NOTES**

- |  |   |
|--|---|
| (A) SEE AGREEMENT #1044547 FOR SIGNAL COST SPLIT.  | (10) SEE SHEET 38 FOR DETAILS.          |
| (2) TACK COAT SHALL BE INCIDENTAL.   | (11) SEE TABULATION FOR COLOR.          |
| (3) CITY CONTACT FOR WATERMAIN IS BEN NELSON, ANOKA CITY ENGINEER, 763-576-2785.           | (12) 10 FT LINE, 40 FT GAP              |
| (4) INCLUDES QUANTITY FOR CONCRETE MEDIANS.  | (13) 3 FT LINE, 12 FT GAP               |
| (5) TO BE USED AT PEDESTRIAN RAMP AND LANDING LOCATIONS PER MNDOT STANDARD PLAN 5-297.250. | (14) 2 FT LINE, 6 FT GAP                |
| (6) USED AT THE DIRECTION OF THE ENGINEER.   | (15) SEE TABULATION FOR COLOR AND SIZE. |
| (7) AWWA C-153   | (16) 2020 SIGN CODE OM1-2               |
| (8) MINIMIZE SPACE FOR STORM SEWER INSTALLATION. TRENCH BOX INCIDENTAL.                    | (17) 2020 SIGN CODE OM3-R               |
| (9) SEE SHEET 34 FOR DETAILS.  | (18) 2020 SIGN CODE X4-3                |
|  | (P) PLAN QUANTITY                       |

**BASIS OF QUANTITIES**

- BITUMINOUS DENSITY : 113 LB/SQ YD/IN
- TACK COAT BETWEEN BITUMINOUS LIFTS: (INCIDENTAL)
  - 0.05 GAL/SQ YD NEW PAVEMENT
  - 0.085 GAL/SQ YD MILLED PAVEMENT

DATE: 1/6/2021 3:17:48 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000.dwg

NO.	DATE	BY	CHK	REVISIONS
1	11/30/2020	AJF	NEH	ADD FIELD OFFICE TYPE D.
2	01/06/2021	AJF	NEH	CORRECTED ITEM DESCRIPTIONS TO MATCH TABULATION.

Design By: **NEH**

Plan By: **AJF**

Checked By: **NEH**

Approved By: **NEH**

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

CERTIFIED BY: *[Signature]*  
LICENSED PROFESSIONAL ENGINEER - 44620

DATE: 8/25/2020 LICENSE NO. 44620

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**

ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**

**ESTIMATED QUANTITIES**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
6R1  
OF  
206  
SHEETS

REMOVALS TABULATION												A	
LOCATION	REMOVE										SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)	MILL BITUMINOUS SURFACE (2.0")	
	BITUMINOUS PAVEMENT	BITUMINOUS DRIVEWAY PAVEMENT	BITUMINOUS WALK	CONCRETE WALK	CONCRETE MEDIAN	CONCRETE APPROACH PANEL	ENERGY ABSORBING TERMINAL	CONCRETE CURB & GUTTER	GUARDRAIL PLATE BEAM				
	SQ YD	SQ YD	SQ FT	SQ FT	SQ YD	SQ YD	EACH	LIN FT	LIN FT	LIN FT			SQ YD
(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(E)	
S.A.P. 002-716-020													
CSAH 116													
STA 94+04.72 TO STA 100+00	197			77	13			161			255		
STA 100+00 TO STA 111+84.56	1565	305	2237		107	430	3	1721	379		1583	2030	
S.A.P. 002-716-020 SUBTOTAL	1762	305	2237	77	120	430	3	1882	379		1838	2030	
S.P. 0206-78													
TH 47													
STA 396+28.24 TO STA 404+00													5112
STA 404+00 TO STA 408+00													4220
STA 408+00 TO STA 417+07.84													6478
S.P. 0206-78 SUBTOTAL													15810
LOCAL FUNDS													
TH 47													
STA 396+28.24 TO STA 404+00	1291		4749		298			1426			1220		
STA 404+00 TO STA 408+00	1622		3200	691	184			962			1198		
STA 408+00 TO STA 417+07.84	955		514	111	555			1772			2334		
LOCAL SUBTOTAL	3868		8463	802	1037			4160			4752		
PROJECT TOTAL	5630	305	10700	879	1157	430	3	6042	379		6590	2030	17840

NOTES:  
 (A) 100% COUNTY  
 (E) 100% MnDOT

CONCRETE TABULATION											B		
LOCATION	CONCRETE CURB AND GUTTER					4" CONCRETE WALK			6" CONCRETE WALK		DRILL & GROUT REINFORCEMENT BARS (EPOXY COATED)		TRUNCATED DOMES
	DESIGN B412	DESIGN B418 (MOD)	DESIGN B424			SQ FT			SQ FT		EACH		
	LIN FT	LIN FT	LIN FT			SQ FT			SQ FT		EACH		
	(A)	(A)	(A)	(B)	(C)	(A)	(A) (1)	(D)	(A)	(D)	(A)	(D)	
S.A.P. 002-716-020													
CSAH 116													
STA 94+04.72 TO STA 100+00		78			58		167	3469		138		6	
STA 100+00 TO STA 111+84.56	363	306			1091		935		220		9		
S.A.P. 002-716-020 SUBTOTAL	363	384			1149		1102	3469	220	138	9	6	
LOCAL FUNDS													
TH 47													
STA 396+28.24 TO STA 404+00	36		392	625	221		900		831		13		34
STA 404+00 TO STA 408+00			516	639	295		1300	244	1744		37		164
STA 408+00 TO STA 417+07.84			1401	963	156		4986		718		19		84
LOCAL SUBTOTAL	36		2309	625	1823	451	7186	244	3293		69		282
PROJECT TOTAL	399	384		5906			12452		3651		84		282

NOTES:  
 (1) QUANTITY FOR CONCRETE MEDIANS  
 (A) 100% COUNTY  
 (B) 50% COUNTY / 50% CITY OF ANOKA  
 (C) 50% COUNTY / 50% CITY OF RAMSEY  
 (D) 100% CITY OF RAMSEY

APPROACH PANEL TABULATION			C
BRIDGE NO.	PANEL	BRIDGE APPROACH PANELS	EXPANSION JOINT E8 SPECIAL
		SQ YD	LIN FT
02546	EAST	231	105
	WEST	198	95
S.A.P. 002-716-020 TOTAL		429	200
PROJECT TOTAL		429	200

INDEX OF TABULATIONS		
TAB ID	SHEET	DESCRIPTION
A	7	REMOVALS TABULATION
B	7	CONCRETE TABULATION
C	7	APPROACH PANEL TABULATION
D	8	BITUMINOUS & AGGREGATE TABULATION
E	8	EROSION CONTROL & TURF ESTABLISHMENT TABULATION
F	8	TRAFFIC BARRIER TABULATION
G	9	WATERMAIN & SANITARY SEWER TABULATION
H	10	EXISTING STORM SEWER REMOVALS TABULATION
I	11	EARTHWORK SUMMARY
J	66	TRAFFIC CONTROL TABULATION
K	131	REMOVE SIGN TYPE D
L	131	SALVAGE AND INSTALL SIGN TYPE D
M	131	SALVAGE AND INSTALL SIGN TYPE SPECIAL
N	158	CASTING ASSEMBLY SUMMARY
O	158	DRAINAGE STRUCTURE SUMMARY
P	158	STORM SEWER SUMMARY
Q	165	SIGN PANELS TYPE C
R	166	SIGN PANELS TYPE D
S	166	MARKER
T	166	DELINEATOR
U	179	PAVEMENT MARKING TABULATION

DATE: 8/25/2020 2:03:14 PM PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\4652-000\_100.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - 44620  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

TABULATED QUANTITIES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 7  
 OF  
 206  
 SHEETS

BITUMINOUS AND AGGREGATE TABULATION							D
LOCATION	SP 9.5 (3)		SP 12.5 (3)		AGGREGATE BASE (CV) CLASS 5 (2)		BITUMINOUS PATCHING MIXTURE (4)
	WEARING COURSE (SPWEA240B) (6)	WEARING COURSE (SPWEB440F) (1)	WEARING COURSE (SPWEB440F) (5)	NON-WEARING COUSE (SPNWEB430B)			
	TON (A)	TON (A)	TON (A)	TON (A)	CU YD (A) (D)		
S.A.P. 002-716-020							
CSAH 116							
STA 94+04.72 TO STA 100+00		25			13	25	47
STA 100+00 TO STA 111+84.56	53	455			178	343	158
S.A.P. 002-716-020 SUBTOTAL	53	480			191	368	47
S.P. 0206-78							
TH 47							
STA 396+28.24 TO STA 404+00			636				
STA 404+00 TO STA 408+00			525				
STA 408+00 TO STA 417+07.84			806				
S.P. 0206-78 SUBTOTAL			1967				
LOCAL FUNDS							
TH 47							
STA 396+28.24 TO STA 404+00	114	377		202	283	429	75
STA 404+00 TO STA 408+00	62	372		45	279	379	4
STA 408+00 TO STA 417+07.84	4	166		252	125	260	234
LOCAL SUBTOTAL	180	915		499	687	1068	4
PROJECT TOTAL	233		3861		878	1487	635

NOTES

- (1) INCLUDES QUANTITY FOR NEW PAVEMENT SECTIONS AND FOR BITUMINOUS OVERLAY.
  - (2) INCLUDES AGGREGATE UNDER CONCRETE WALK, CONCRETE MEDIANS, BITUMINOUS PAVEMENT, BITUMINOUS TRAIL, CURB & GUTTER, AND DRIVEWAYS.
  - (3) TACK COAT INCIDENTAL.
  - (4) PAVEMENT SECTION SHALL MATCH THAT OF THE INSET DESIGNATED FOR THE ADJACENT ROADWAY, SEE TYPICAL SECTIONS FOR DETAILS.
  - (5) QUANTITY FOR VARIABLE DEPTH OVERLAY.
  - (6) QUANTITY FOR BITUMINOUS TRAIL.
- (A) 100% COUNTY
  - (D) 100% CITY OF RAMSEY
  - (E) 100% MnDOT

EROSION CONTROL & TURF ESTABLISHMENT TABULATION							E
LOCATION	RAPID STABILIZATION METHOD 3	RAPID STABILIZATION METHOD 4	SILT FENCE; TYPE MS	SEDIMENT CONTROL LOG TYPE WOOD FIBER	CULVERT END CONTROLS	STORM DRAIN INLET PROTECTION	SODDING TYPE LAWN
	MGAL	SQ YD	LIN FT	LIN FT	EACH	EACH	SQ YD
S.A.P. 002-716-020							
CSAH 116							
STA 94+04.72 TO STA 100+00	1			579	2	5	199
STA 100+00 TO STA 111+84.56	4	556	2113	2312		28	1961
S.A.P. 002-716-020 SUBTOTAL	5	556	2113	2891	2	33	2160
LOCAL FUNDS							
TH 47							
STA 396+28.24 TO STA 404+00	4		330	965	2	12	1507
STA 404+00 TO STA 408+00	2			539		17	823
STA 408+00 TO STA 417+07.84	2		518	1512		24	730
LOCAL SUBTOTAL	8		848	3016	2	53	3060
PROJECT TOTAL	13	556	2961	5907	4	86	5220

BASIS OF QUANTITIES:

- RAPID STABILIZATION METHOD 3: 6 MGAL/ACRE

TRAFFIC BARRIER TABULATION				F
BRIDGE NO.	CORNER	TRAFFIC BARRIER DESIGN TRANSITION TYPE 31	TRAFFIC BARRIER DESIGN TYPE 31	END TEATMENT TANGENT TERMINAL (7)
		LIN FT	LIN FT	EACH
02546	NORTHEAST	25	12.5	1
	SOUTHEAST	25	12.5	1
	SOUTHWEST	25	12.5	1
S.A.P. 002-716-020 TOTAL		75	38	3
PROJECT TOTAL		75	38	3

NOTES:

- (7) SHALL BE EITHER MSKT OR SOFTSTOP. SEE STANDARD PLANS.

DATE: 1/7/2021 4:02:11 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_1b01.dgn

NO.	DATE	BY	CHK	REVISIONS
1	01/07/2021	AJF	NEH	CORRECT UNIT AND QUANTITY, REMOVE BASIS OF QUANTITY.

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - 44620  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

TABULATED QUANTITIES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 8R  
 OF  
 206  
 SHEETS



WATERMAIN & SANITARY SEWER TABULATION													G	
LOCATION	REMOVE			ADJUST				CONNECT TO EXISTING WATER MAIN	HYDRANT	6" GATE VALVE & BOX	6" WATERMAIN DUCTILE IRON CL 52	16" WATERMAIN DUCTILE IRON CL 52	4" INSULATION	DUCTILE IRON FITTINGS (1)
	HYDRANT	GATE VALVE & BOX	WATERMAIN	FRAME & RING CASTING		GATE VALVE & BOX								
	EACH	EACH	LIN FT	EACH		EACH								
(A)	(A)	(A)	(D)	(F)	(D)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)	(F)
S.A.P. 002-716-020														
CSAH 116														
STA 94+04.72 TO STA 100+00														
STA 100+00 TO STA 111+84.56					2		2							
S.A.P. 002-716-020 SUBTOTAL					2		2							
LOCAL FUNDS														
TH 47														
STA 396+28.24 TO STA 404+00	1	1	27		3		1	1	1	1	10			
STA 404+00 TO STA 408+00						2	1	2				17	7	808
STA 408+00 TO STA 417+07.84				2										
LOCAL SUBTOTAL	1	1	27	2	3	2	2	3	1	1	10	17	7	808
PROJECT TOTAL	1	1	27	7		6		3	1	1	10	17	7	808

NOTES:

- (1) AWWA C-153
- (A) 100% COUNTY
- (D) 100% CITY OF RAMSEY
- (F) 100% CITY OF ANOKA

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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**

Plan By: **AJF**

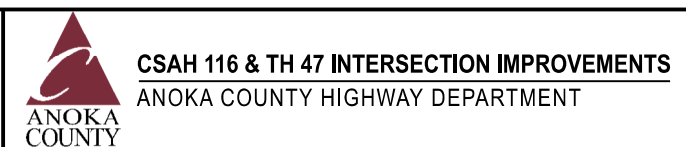
Checked By: **NEH**

Approved By: **NEH**

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CERTIFIED BY: *[Signature]*  
LICENSED PROFESSIONAL ENGINEER - 44620

DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN

TABULATED QUANTITIES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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 OF  
 206  
 SHEETS

**EXISTING STORM SEWER REMOVALS TABULATION**

**H**


EX. STRUCTURE NUMBER	ALIGNMENT	STATION	OFFSET	SIDE	PROP. STRUCTURE NUMBER	DRAINS TO	EX. STRUCTURE TYPE	EX. TAMS PIPE NUMBER	PIPE SIZE	PIPE TYPE	REMOVE SEWER PIPE (STORM)	PLUG FILL & ABANDON PIPE SEWER	REMOVE CASTING	REMOVE DRAINAGE STRUCTURE
											LIN FT	LIN FT	EACH	EACH
6020	TH 47 SB	1405+22	71	RT		2377105	MH	2198689	24"	RCP		76		
2377102	TH 47 SB	1406+92	35	RT	5022	4056404	DI	4056199	24"	RCP				1
4056404	TH 47 NB	406+92	23	RT	5001	2377108	MH	2198687	27"	RCP				1
2324669	TH 47 NB	405+16	13	RT	5019	2324656	CB	2198514	24"	RCP	47			1
2324656	TH 47 NB	405+41	27	LT	5020	2324655	CB	2198513	24"	RCP	6			1
2324655	TH 47 SB	1405+47	21	RT	5021	2324654	CB	2198512	24"	RCP	47			1
2324654	TH 47 SB	1405+10	5	LT	5023	6032	CB	2198511	24"	RCP	10			1
2376983	TH 47 NB	407+68	20	RT	5030	4056404	DI	2271531	18"	RCP	78			1
2324660	TH 47 SB	1397+98	14	LT		2376982	CB	2271528	12"	RCP	7			
2324657	TH 47 SB	1403+07	9	LT	5027	2324658	CB	2198515	12"	RCP	10			1
2324658	TH 47 SB	1403+15	21	RT	5025	2324659	CB	2198516	12"	RCP	7			1
2324659	TH 47 NB	403+11	26	LT		2324667	CB	2198516	12"	RCP			1	
2324665	TH 47 NB	401+55	12	RT		2324666	CB	2198521	18"	RCP			1	
2324667	TH 47 NB	403+15	12	RT		2324668	CB	2198517	18"	RCP			1	
2324668	TH 47 NB	403+20	22	RT		2324669	MH	2198526	24"	RCP	10		1	
2377101	TH 47 SB	1409+08	15	LT	5054	2377100	DI	2198685	15"	RCP	5			1
2377100	TH 47 SB	1409+09	31	RT	5051	2377099	CB	2198684	15"	RCP	6			1
2377099	TH 47 NB	409+02	17	LT	5050	2377098	CB	2198683	15"	RCP	4			1
2377096	TH 47 SB	1413+03	7	LT	5063	2377097	CB	2198680	15"	RCP				1
2377097	TH 47 NB	412+77	17	RT		4056403	CB	4056198	15"	RCP			1	
SUBTOTAL 100% COUNTY LOCAL FUNDS (TH 47)											237	76	5	13
2377103	CSAH 116 EB	98+98	26	LT		2377104	CB	2271575	24"	RCP			1	
2377104	CSAH 116 WB	998+98	14	LT		2377102	CB	2198686	24"	RCP	25		1	
2379532	CSAH 116 WB	1002+09	39	LT		6010	MH		36"	RCP			1	
2377109	CSAH 116 EB	100+41	16	LT	5007	2377106	CB	2271530	12"	RCP	44			1
2377106	CSAH 116 EB	100+65	20	RT	5010	2324669	CB	2198690	12"	RCP				1
2377107	CSAH 116 EB	101+61	18	LT	5008	2379532	CB	2198691	12"	RCP				1
6012	CSAH 116 WB	1005+06	26	LT		6013	CB		15"	RCP			1	
6013	CSAH 116 WB	1006+54	23	LT		6016	CB		15"	RCP			1	
6015	CSAH 116 WB	1008+55	21	LT	5015	6017	CB		12"	RCP				1
SUBTOTAL S.A.P 002-716-020 (CSAH 116)											69		5	4
PROJECT TOTAL											306	76	10	17

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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620




**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

TABULATED QUANTITIES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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EARTHWORK SUMMARY				I
<b>EXCAVATION</b>			<b>AVAILABLE FROM ROADWAY</b>	
COMMON EXCAVATION	2791 CU YD (EV)	1920 CU YD (EV) LOCAL FUNDS ON TH 47	(COMMON EXCAVATION + SUBGRADE EXCAVATION-TOPSOIL EXCAVATION) = TOTAL FROM THE ROADWAY	
		871 CU YD (EV) SAP 002-716-020	2791 CU YD(EV) + 3054 CU YD(EV) - 711 CU YD(EV)	= 5134 CU YD(EV)
			5134 CU YD(EV) / 1.2	= 4278 CU YD(CV)
<b>SUBGRADE EXCAVATION</b>			<b>COMMON MATERIAL BALANCE (EXCLUDING TOPSOIL)</b>	
	3054 CU YD (EV)	2198 CU YD (EV) LOCAL FUNDS ON TH 47	4278 CU YD(CV) - 331 CU YD(CV)	= 3947 CU YD(CV) EXCESS
		856 CU YD (EV) SAP 002-716-020		
<b>TOPSOIL SALVAGE</b>			<b>TOPSOIL BALANCE</b>	
	711 CU YD (EV)	432 CU YD (EV) LOCAL FUNDS ON TH 47	432 CU YD(EV) /1.4	= 309 CU YD(CV)
		279 CU YD (EV) SAP 002-716-020	( 309 CU YD(CV) * 0.5 ) - 298 CU YD(CV)	= 144 CU YD(CV)
<b>EMBANKMENT</b>			<b>AVAILABLE FROM EXCAVATION (LOCAL)</b>	
COMMON EMBANKMENT	331 CU YD (CV)	261 CU YD (CV) LOCAL FUNDS ON TH 47	144 CU YD(CV) *1.4	= 201 CU YD(LV) BORROW
		70 CU YD (CV) SAP 002-716-020		
SELECT GRANULAR BORROW	3151 CU YD (CV)	2283 CU YD (CV) LOCAL FUNDS ON TH 47	<b>AVAILABLE FROM EXCAVATION (SAP 002-716-020)</b>	
		868 CU YD (CV) SAP 002-716-020	279 CU YD(EV) /1.4	= 200 CU YD(CV)
TOPSOIL	524 CU YD (CV)	298 CU YD (CV) LOCAL FUNDS ON TH 47	( 200 CU YD(CV) * 0.5 ) - 226 CU YD(CV)	= 126 CU YD(CV)
		226 CU YD (CV) SAP 002-716-020	126 CU YD(CV) *1.4	= 176 CU YD(LV) BORROW
NOTES				
1. COMMON EXCAVATION PAY ITEM INCLUDES STRIPPED TOPSOIL. DOES NOT INCLUDE PAVEMENT REMOVAL VOLUMES. PAVEMENT THICKNESS VARIES. AVERAGE OF 6.5" INCHES FOR CALCULATION PURPOSES. ACTUAL DEPTHS WILL VARY.			4. 120% SHRINKAGE FACTOR USED FROM EXCAVATED VOLUME (EV) TO COMPACTED VOLUME (CV) FOR COMMON AND SELECT GRANULAR. 140% EXPANSION FACTOR USED FROM COMPACTED VOLUME (CV) TO LOOSE VOLUME (LV) FOR TOPSOIL. 140% SHRINKAGE FACTOR USED FROM EXCAVATED VOLUME (EV) TO COMPACTED VOLUME (CV) FOR TOPSOIL.	
2. COMMON EXCAVATION INCLUDES 4" OF EXISTING TOPSOIL. IT IS ESTIMATED THAT 50% OF THE EXISTING TOPSOIL CAN BE SALVAGED FOR REUSE. NO ADDITIONAL COMPENSATION SHALL BE PAID IF LESS THAN 50% OF EXCAVATED TOPSOIL CAN BE REUSED.				
3. MATERIAL SHALL ONLY BE HAULED OFF OF THE PROJECT SITE WITH THE APPROVAL OF THE ENGINEER. REHANDLING OF ANY MATERIAL, STOCKPILING, REMOVING STOCKPILED MATERIAL NECESSARY TO UTILIZE EXCAVATED MATERIAL FOR EMBANKMENT, SLOPE DRESSING, OR SURCHARGE CONSTRUCTION AND/OR REMOVAL OF MATERIAL FROM THE PROJECT SITE SHALL BE INCIDENTAL AND NO ADDITIONAL COMPENSATION WILL BE MADE.				

<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>CHK</th> <th>REVISIONS</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	NO.	DATE	BY	CHK	REVISIONS						Design By: NEH Plan By: AJF Checked By: NEH Approved By: NEH	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. CERTIFIED BY: <small>LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE</small> DATE: 8/25/2020 LICENSE NO. 44620	 	<b>CSAH 116 &amp; TH 47 INTERSECTION IMPROVEMENTS</b> ANOKA COUNTY HIGHWAY DEPARTMENT	ANOKA COUNTY, MN  <b>EARTHWORK SUMMARY</b> S.P. 0206-78 (TH 47), S.A.P. 002-716-020	SHEET 11 OF 206 SHEETS
NO.	DATE	BY	CHK	REVISIONS												

### EARTH WORK TABULATION

		EXCAVATION			EMBANKMENT		
		TOPSOIL	COMMON	SUBGRADE	TOPSOIL	COMMON	SELECT GRANULAR MATERIAL
STA.	STA.	CU YD (EV)	CU YD (EV)	CU YD (EV)	CU YD (CV)	CU YD (CV)	CU YD (CV)
TH 47 NB							
396+28	- 396+50						
396+50	- 397+00						
397+00	- 397+50						
397+50	- 398+00	7	15	14	6	3	14
398+00	- 398+50	8	8	2	7		2
398+50	- 399+00	8	6		7		
399+00	- 399+50	9	7	1	7		1
399+50	- 400+00	12	16	14	11	2	14
400+00	- 400+50	16	19	18	13	2	18
400+50	- 401+00	30	35	42	26	4	42
401+00	- 401+50	24	71	101	19	4	101
401+50	- 402+00	12	21	146	9	5	147
402+00	- 402+50	19	68	96	16	5	98
402+50	- 403+00	17	65	93	14	7	95
403+00	- 403+50	14	72	105	11	10	108
403+50	- 404+00	11	68	101	8	9	104
404+00	- 404+50	15	66	94	11	8	97
404+50	- 405+00	17	70	100	11	8	103
405+00	- 405+50	17	110	151	10	8	153
405+50	- 406+00	4	57	80		2	80
406+00	- 406+50		48	77			77
406+50	- 407+00	13	77	104	8	5	104
407+00	- 407+50	23	46	59	18	8	62
407+50	- 408+00	18	38	54	14	8	57
408+00	- 408+50	9	35	54	4	8	57
408+50	- 409+00	9	35	54	4	8	57
409+00	- 409+50	8	35	54	4	8	57
409+50	- 410+00	8	35	54	4	8	57
410+00	- 410+50	9	35	54	5	8	57
410+50	- 411+00	10	35	54	5	8	57
411+00	- 411+50	10	34	54	5	8	57
411+50	- 412+00	25	40	58	8	8	61
412+00	- 412+50	12	50	66	6	9	69
412+50	- 413+00	10	52	77	8	12	81
413+00	- 413+50	6	22	32	3	12	37
413+50	- 414+00	5	20	29	2	13	34
414+00	- 414+50	5	21	28	3	14	33
414+50	- 415+00	6	21	27	5	13	32
415+00	- 415+50	5	19	26	5	12	30
415+50	- 416+00	1	13	20	1	10	23
416+00	- 416+50		3	5		4	7
416+50	- 417+00						
417+00	- 417+08						
TH 47 (LOCAL) SUBTOTAL		432	1488	2198	298	261	2283

### EARTH WORK TABULATION


		EXCAVATION			EMBANKMENT		
		TOPSOIL	COMMON	SUBGRADE	TOPSOIL	COMMON	SELECT GRANULAR MATERIAL
STA.	STA.	CU YD (EV)	CU YD (EV)	CU YD (EV)	CU YD (CV)	CU YD (CV)	CU YD (CV)
CSAH 116							
94+05	- 94+50	1	14		1	1	
94+50	- 95+00	6	10		3	1	
95+00	- 95+50	8	5		3		
95+50	- 96+00	8	5		3		
96+00	- 96+50	7	5		2		
96+50	- 97+00	7	5		2		
97+00	- 97+50	7	5		2		
97+50	- 98+00	7	5		2		
98+00	- 98+50	7	7	2	2		2
98+50	- 99+00	12	43	59	5	6	61
99+00	- 99+50						
99+50	- 100+00						
100+00	- 100+50						
100+50	- 101+00	20	55	84	23	8	86
101+00	- 101+50	16	40	60	17	7	63
101+50	- 102+00	6	98	187	5	11	192
102+00	- 102+50	17	69	110	16	6	110
102+50	- 103+00	6	36	44	10	4	44
103+00	- 103+50	12	8	12	9	1	12
103+50	- 104+00						
104+00	- 104+50	1	5	1	2		1
104+50	- 105+00	8	15	12	9	2	12
105+00	- 105+50	5	8	12	3	2	12
105+50	- 106+00						
106+00	- 106+50						
106+50	- 107+00	6	12	22	6	2	22
107+00	- 107+50	11	15	27	10	2	27
107+50	- 108+00	13	15	27	11	2	27
108+00	- 108+50	15	16	27	13	2	27
108+50	- 109+00	15	16	28	13	2	28
109+00	- 109+50	14	16	28	13	2	28
109+50	- 110+00	14	16	28	13	2	28
110+00	- 110+50	10	15	27	8	2	27
110+50	- 111+00	11	13	22	11	2	22
111+00	- 111+50	6	12	22	6	2	22
111+50	- 111+85	3	8	15	3	1	15
S.A.P. 002-716-020 SUBTOTAL		279	592	856	226	70	868
PROJECT TOTAL		711	2080	3054	524	331	3151

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Design By: NEH  
 Plan By: AJF  
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**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT



ANOKA COUNTY, MN

EARTHWORK TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
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OF  
206  
SHEETS

UTILITIES
THE FOLLOWING IS A LIST OF UTILITY COMPANIES INVOLVED IN THIS PROJECT:
ANOKA COUNTY
AMU = ANOKA MUNICIPAL UTILITIES
ARVIG = ARVIG COMMUNICATIONS SYSTEMS
CENTERPOINT = CENTERPOINT ENERGY MINNESOTA GAS
CENTURYLINK
CITY OF ANOKA
CITY OF RAMSEY
COMCAST = COMCAST CABLE, LLC.
CONNEXUS ENERGY
MMPA = MINNESOTA MUNICIPAL POWER AGENCY
VERIZON = MCI COMMUNICATIONS SERVICES, INC.
MNDOT
ZAYO = ZAYO GROUP, LLC

UTILITY CONTACT INFORMATION				
OWNER	CONTACT	OFFICE PHONE	CELL PHONE	EMAIL
Anoka (Water and Sewer), City of	Pete Klinenberg	763-576-2923		Pklingenberg@ci.anoka.mn.us
	Bill Bendiske	612-791-0456		Bbendiske@ci.anoka.mn.us
Anoka Municipal Utilities Electric	Del Vancura			DVancura@ci.anoka.mn.us
Arvig	Curt Olson	320-256-0251	612-503-2718	curtis.olson@arvig.com metroops@arvig.com
CenterPoint Energy	Travis Denzel	612-321-5207	515-451-5130	Travis.Denzel@centerpointenergy.com
CenturyLink	Chuck Daher		612-298-2825	cdaher@terratechllc.net
Comcast	Scott Ruppert	651-493-5127	651-755-2580	Scott_Ruppert@comcast.com
	Chong Vang	651-387-4842		Chong_Vang@comcast.com
Connexus Energy	Mat Rauschendorfer	763-323-4256	763-218-4655	Mat.Rauschendorfer@connexusenergy.com
Great River Energy	Michelle MacMillan	763-445-5984	612-845-1204	mmacmillan@GREnergy.com
Mastec North America	Greg Allen		612-619-9602	greg.allen@verizon.com
MCI				
Minnesota Municipal Power Agency	Sam Meersman	612-252-6516	312-330-7274	Sam.Meersman@avantenergy.com
MnDOT - Signal	Chris Bosak			chris.bosak@state.mn.us
Ramsey, City of	John Nelson	763-433-9861		jnelson@cityoframsey.com
Zayo	Jason Overcamp			jason.overkamp@zayo.com

UTILITY ABBREVIATIONS
T-BUR = BURIED TELEPHONE LINE
T-CON = BURIED TELEPHONE CONDUIT
TV-BUR = BURIED TELEVISION LINE
OHU = OVERHEAD COMMUNICATION LINE
UTILITY POLE = COMMUNICATION OWNED UTILITY POLE
PED = COMMUNICATION PEDESTAL
F/O-BUR = BURIED FIBER OPTIC LINE
F/O-CON = BURIED FIBER OPTIC CONDUIT
GAS = UNDERGROUND GAS MAIN
GASSERVICE = UNDERGROUND GAS SERVICE
HP GASMAIN= HIGH PRESSURE GAS MAIN
P-BUR = BURIED POWER LINE
OHP = OVERHEAD POWER LINE
PP = POWER POLE
LP = LIGHT POLE
SAN LN = BURIED SANITARY SEWER LINE
FM = SANITARY SEWER FORCEMAIN
MH = MANHOLE
HH = HANDHOLE

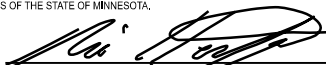
GENERAL NOTES:

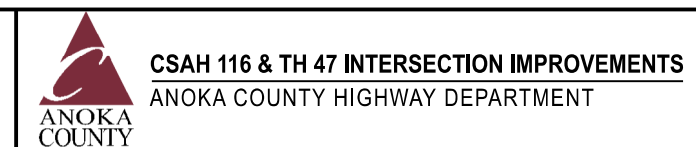
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02 ENTITLED STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH THE UTILITY COMPANIES. CALL GOPHER STATE ONE CALL AT 1-800-252-1166 AT LEAST 48 HOURS PRIOR TO EXCAVATION OR CONSTRUCTION.
- ALL UTILITY WORK SHOWN ON THESE UTILITY PLANS SHALL BE DONE BY OTHERS UNLESS NOTED OTHERWISE. SEE REMARKS COLUMN.
- THE REMARKS COLUMN IS BASED UPON THE BEST INFORMATION AVAILABLE AND MAY NOT REFLECT THE ACTUAL EFFECTS ON THE UTILITIES BY CONSTRUCTION. ACTUAL DETERMINATIONS WILL BE MADE IN THE FIELD DURING CONSTRUCTION.
- SEE SPECIAL PROVISIONS SECTION 1507 (UTILITY PROPERTY SERVICE FOR CONTRACTOR REQUIREMENTS FOR PLACING EMBANKMENT MATERIALS FOR PRIVATE UTILITY RELOCATIONS.
- SEE DRAINAGE PLANS AND PROPOSED UTILITY PLANS FOR ADJUSTMENTS AND REPLACEMENTS OF CITY, COUNTY, AND STATE UTILITIES.
- ALL OVERHEAD POWER LINES ARE DISTRIBUTION UNLESS NOTED OTHERWISE.

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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY: NICHOLAS E. HENTGES, PE LICENSED PROFESSIONAL ENGINEER DATE: 8/25/2020 LICENSE NO. 44620
Plan By: AJF	
Checked By: NEH	
Approved By: NEH	



ANOKA COUNTY, MN	SHEET 13 OF 206 SHEETS
INPLACE UTILITY TABULATION S.P. 0206-78 (TH 47), S.A.P. 002-716-020	

**UTILITY TABULATION - ANOKA MUNICIPAL UTILITIES (POWER)**

ALIGNMENT	STATION TO STATION			OFFSETS			DESCRIPTION	OWNER	ACTION				REMARKS
									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	396+28	TO	396+58	43' LT	TO	44' LT	OHP	AMU				X	
TH 47 NB			396+58			44' LT	PP	AMU				X	
TH 47 NB	396+58	TO	396+28	44' LT	TO	56' LT	P-BUR	AMU				X	
TH 47 NB	396+58	TO	397+10	44' LT	TO	40' RT	P-BUR	OHP				X	
TH 47 NB			397+10			40' RT	LP	AMU				X	
TH 47 NB	396+58	TO	398+34	44' LT	TO	48' LT	OHP	AMU				X	
TH 47 NB			398+34			48' LT	PP	AMU				X	
TH 47 NB	398+34	TO	397+59	48' LT	TO	49' RT	P-BUR	AMU				X	
TH 47 NB			397+59			49' RT	MH	AMU				X	
TH 47 NB	397+59	TO	397+43	49' RT	TO	141' RT	P-BUR	AMU				X	
TH 47 NB			397+43			141' RT	PED	AMU				X	
TH 47 NB	397+43	TO	396+79	141' RT	TO	236' RT	P-BUR	AMU				X	
TH 47 NB	398+34	TO	400+28	48' LT	TO	66' LT	OHP	AMU				X	
TH 47 NB			400+28			66' LT	PP	AMU				X	
TH 47 NB	400+28	TO	400+97	66' LT	TO	229' LT	OHP	AMU				X	
TH 47 NB			400+97			229' LT	PP	AMU				X	
TH 47 NB	400+97	TO	401+64	229' LT	TO	402' LT	OHP	AMU				X	
TH 47 NB			401+64			402' LT	PP	AMU				X	
TH 47 NB (CSAH 116 EB)	401+64	TO	(94+85)	402' LT	TO	377' RT	OHP	AMU				X	
CSAH 116 EB			94+85			377' RT	PP	AMU				X	
CSAH 116 EB	94+85	TO	93+71	377' RT	TO	340' RT	OHP	AMU				X	
CSAH 116 EB			93+71			340' RT	PP	AMU				X	
TH 47 NB	400+28	TO	401+96	66' LT	TO	72' LT	OHP	AMU				X	
TH 47 NB			401+96			72' LT	PP	AMU				X	
TH 47 NB	401+96	TO	403+01	72' LT	TO	83' LT	P-BUR	AMU				X	
TH 47 NB	403+01	TO	403+09	83' LT	TO	273' LT	P-BUR	AMU				X	
TH 47 NB (CSAH 116 EB)	403+09	TO	(96+78)	273' LT	TO	(225' RT)	P-BUR	AMU				X	
CSAH 116 EB			96+78			225' RT	P-BUR	AMU				X	
CSAH 116 EB	95+18	TO	94+90	227' RT	TO	274' RT	P-BUR	AMU				X	
CSAH 116 EB	94+90	TO	93+84	274' RT	TO	256' RT	P-BUR	AMU				X	
CSAH 116 EB	93+84	TO	93+71	256' RT	TO	340' RT	P-BUR	AMU				X	
TH 47 NB	401+96	TO	403+80	72' LT	TO	85' LT	OHP	AMU				X	
TH 47 NB			403+80			85' LT	PP	AMU				X	
TH 47 NB	403+80	TO	404+00	LT	TO	37' RT	OHP	AMU				X	
TH 47 NB			404+00			37' RT	PP	AMU				X	
TH 47 NB	404+00	TO	405+27	37' RT	TO	38' RT	OHP	AMU				X	
TH 47 NB			405+27			38' RT	PP	AMU				X	
TH 47 NB	405+27	TO	405+22	38' RT	TO	207' RT	P-BUR	AMU				X	
TH 47 NB	405+22	TO	403+74	207' RT	TO	216' RT	P-BUR	AMU				X	
TH 47 NB	403+74	TO	401+70	216' RT	TO	253' RT	P-BUR	AMU				X	
TH 47 NB	401+70	TO	400+47	253' RT	TO	249' RT	P-BUR	AMU				X	
TH 47 NB	400+47	TO	399+99	249' RT	TO	224' RT	P-BUR	AMU				X	
TH 47 NB	399+99	TO	400+12	224' RT	TO	112' RT	P-BUR	AMU				X	
TH 47 NB	400+12	TO	401+45	112' RT	TO	88' RT	P-BUR	AMU				X	
TH 47 NB (CSAH 116 EB)	405+27	TO	(102+64)	88' RT	TO	(74' RT)	P-BUR	AMU				X	
CSAH 116 EB			102+64			74' RT	P-BUR	AMU				X	
CSAH 116 EB	104+16	TO	106+91	76' RT	TO	69' RT	P-BUR	AMU				X	
CSAH 116 EB	106+91	TO	109+44	69' RT	TO	71' RT	P-BUR	AMU				X	
CSAH 116 EB	109+44	TO	111+33	71' RT	TO	72' RT	P-BUR	AMU				X	

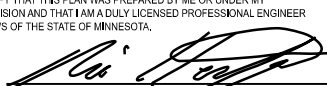
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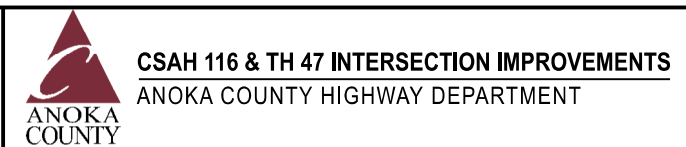
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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SHEETS

**UTILITY TABULATION - ANOKA MUNICIPAL UTILITIES (POWER)**

ALIGNMENT	STATION TO STATION			OFFSETS			DESCRIPTION	OWNER	ACTION				REMARKS
									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
CSAH 116 EB	111+33	TO	114+10	72' RT	TO	72' RT	P-BUR	AMU				X	
CSAH 116 EB	114+10	TO	115+51	72' RT	TO	77' RT	P-BUR	AMU				X	
TH 47 NB	405+27	TO	407+14	38' RT	TO	39' RT	OHP	AMU		X			MAY CONFLICT WITH PROPOSED SIGNAL MAST ARMS.
TH 47 NB			407+15			19' RT	PP	AMU				X	
TH 47 NB (CSAH 116 EB)	407+15	TO	102+42	39' RT	TO	114' LT	P-BUR	AMU	X				ADJUST FOR DRIVEWAY CONSTRUCTION AS NEEDED.
CSAH 116 EB	102+42	TO	102+76	114' LT	TO	173' LT	P-BUR	AMU				X	
CSAH 116 EB			102+76			173' LT	PED	AMU				X	
TH 47 NB	407+14	TO	409+66	39' RT	TO	40' RT	OHP	AMU				X	
TH 47 NB			409+66			40' RT	PP	AMU				X	
TH 47 NB	409+66	TO	412+14	40' RT	TO	42' RT	OHP	AMU				X	
TH 47 NB			412+14			42' RT	PP	AMU		X			RELOCATION MAY BE REQUIRED FOR PROPOSED PED RAMP.
TH 47 NB	412+14	TO	413+41	42' RT	TO	44' RT	OHP	AMU				X	
TH 47 NB			413+41			44' RT	PP	AMU				X	
TH 47 NB	413+41	TO	413+41	44' RT	TO	222' RT	P-BUR	AMU				X	
TH 47 NB	413+41	TO	412+89	222' RT	TO	212' RT	P-BUR	AMU				X	
TH 47 NB	413+41	TO	413+41	222' RT	TO	317' RT	P-BUR	AMU				X	
TH 47 NB	413+41	TO	414+98	317' RT	TO	319' RT	P-BUR	AMU				X	
TH 47 NB	414+98	TO	415+02	319' RT	TO	252' RT	P-BUR	AMU				X	
TH 47 NB	415+02	TO	415+59	252' RT	TO	206' RT	P-BUR	AMU				X	
TH 47 NB	415+02	TO	414+76	252' RT	TO	234' RT	P-BUR	AMU				X	
TH 47 NB	413+41	TO	411+88	317' RT	TO	316' RT	P-BUR	AMU				X	
TH 47 NB	411+88	TO	411+89	316' RT	TO	288' RT	P-BUR	AMU				X	
TH 47 NB	411+89	TO	411+33	288' RT	TO	237' RT	P-BUR	AMU				X	
TH 47 NB	411+89	TO	412+21	288' RT	TO	249' RT	P-BUR	AMU				X	
TH 47 NB	412+21	TO	412+14	249' RT	TO	42' RT	P-BUR	AMU				X	
TH 47 NB	412+14	TO	412+06	42' RT	TO	85' LT	P-BUR	AMU				X	
TH 47 NB	412+06	TO	412+29	85' LT	TO	261' LT	P-BUR	AMU				X	
TH 47 NB	412+29	TO	412+30	261' LT	TO	270' LT	P-BUR	AMU				X	
TH 47 NB	412+29	TO	412+52	261' LT	TO	261' LT	P-BUR	AMU				X	
TH 47 NB	412+52	TO	41253	261' LT	TO	77' LT	P-BUR	AMU				X	
TH 47 NB	41253	TO	412+06	77' LT	TO	85' LT	P-BUR	AMU				X	
TH 47 NB	412+06	TO	409+27	85' LT	TO	79' LT	P-BUR	AMU				X	
TH 47 NB	409+27	TO	409+40	79' LT	TO	344' LT	P-BUR	AMU				X	
TH 47 NB	409+40	TO	411+31	344' LT	TO	238' LT	P-BUR	AMU				X	
TH 47 NB	409+40	TO	410+00	344' LT	TO	240' LT	P-BUR	AMU				X	
CSAH 116 EB (TH 47 NB)	96+62 (409+40)	TO	96+09	352' LT (344' LT)	TO	285' LT	P-BUR	AMU				X	
CSAH 116 EB	96+09	TO	96+89	285' LT	TO	269' LT	P-BUR	AMU				X	
CSAH 116 EB	96+09	TO	95+62	269' LT	TO	238' LT	P-BUR	AMU				X	
CSAH 116 EB	95+62	TO	95+54	238' LT	TO	80' LT	P-BUR	AMU				X	
CSAH 116 EB			95+54			80' LT	PP	AMU				X	
CSAH 116 EB	95+54	TO	93+68	80' LT	TO	81' LT	OHP	AMU				X	
CSAH 116 EB			93+68			81' LT	PP	AMU				X	
CSAH 116 EB	93+68	TO	94+02	81' LT	TO	86' RT	OHP	AMU				X	
CSAH 116 EB			94+02			86' RT	PP	AMU				X	
CSAH 116 EB	94+02	TO	93+85	86' RT	TO	206' RT	OHP	AMU				X	
CSAH 116 EB			93+85			206' RT	PP	AMU				X	
CSAH 116 EB	93+85	TO	93+71	206' RT	TO	340' RT	OHP	AMU				X	
CSAH 116 EB	93+68	TO	92+90	81' LT	TO	95' LT	OHP	AMU				X	
CSAH 116 EB			92+90			95' LT	PP	AMU				X	

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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - 44620  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
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 OF  
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 SHEETS

**UTILITY TABULATION - ANOKA MUNICIPAL UTILITIES (POWER)**

ALIGNMENT	STATION TO STATION		OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS
							ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
CSAH 116 EB	92+90	TO 91+35	95' LT	TO 98' LT	OHP	AMU				X	
CSAH 116 EB		91+35		98' LT	PP	AMU				X	

**UTILITY TABULATION - ARVIG**

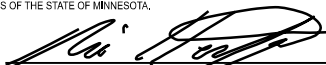
ALIGNMENT	STATION TO STATION		OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS
							ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	396+28	TO 397+82	19' RT	TO 18' RT	F/O-BUR	ARVIG				X	
TH 47 NB	397+82	TO 399+43	18' RT	TO 19' RT	F/O-BUR	ARVIG				X	
TH 47 NB	399+43	TO 401+17	19' RT	TO 18' RT	F/O-BUR	ARVIG				X	
TH 47 NB	401+17	TO 405+29	18' RT	TO 22' RT	F/O-BUR	ARVIG				X	
TH 47 NB	405+29	TO 405+37	22' RT	TO 41' RT	F/O-BUR	ARVIG				X	
TH 47 NB		405+37		41' RT	HH	ARVIG	X				ADJUST FOR GRADING.
TH 47 NB	405+37	TO 405+45	41' RT	TO 22' RT	F/O-BUR	ARVIG				X	
TH 47 NB	405+45	TO 417+16	22' RT	TO 23' RT	F/O-BUR	ARVIG	X				ADJUST FOR PROPOSED STORM SEWER NEAR STA 406+00.
CSAH 116 EB	91+06	TO 91+40	39' RT	TO 42' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	91+40	TO 93+00	42' RT	TO 42' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	93+00	TO 94+79	42' RT	TO 41' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	94+79	TO 96+52	41' RT	TO 32' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	96+52	TO 96+66	32' RT	TO 37' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB		96+66		37' RT	HH	ARVIG	X				ADJUST FOR GRADING.
CSAH 116 EB	96+66	TO 98+93	37' RT	TO 42' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	98+93	TO 99+07	42' RT	TO 36' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	99+07	TO 100+47	36' RT	TO 31' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	100+47	TO 102+85	31' RT	TO 33' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	102+85	TO 104+07	33' RT	TO 45' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	104+07	TO 105+91	45' RT	TO 37' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	105+91	TO 108+31	37' RT	TO 38' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	108+31	TO 109+87	38' RT	TO 36' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	109+87	TO 111+97	36' RT	TO 41' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	111+97	TO 114+14	41' RT	TO 43' RT	F/O-BUR	ARVIG				X	
CSAH 116 EB	114+14	TO 115+61	43' RT	TO 39' RT	F/O-BUR	ARVIG				X	

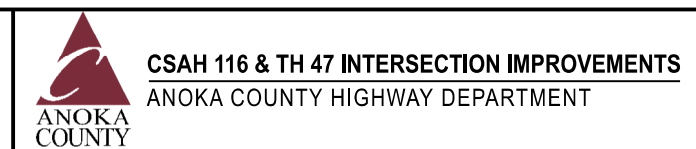
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 16 OF 206 SHEETS



**UTILITY TABULATION - CENTERPOINT ENERGY**

ALIGNMENT	STATION TO STATION			OFFSETS			DESCRIPTION	OWNER	ACTION				REMARKS
									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	396+88	TO	397+29	281' LT	TO	216' LT	GAS	CENTERPOINT				X	
TH 47 NB			397+29			216' LT	TEE	CENTERPOINT				X	
TH 47 NB	397+29	TO	397+47	216' LT	TO	164' LT	GAS	CENTERPOINT				X	
TH 47 NB	397+47	TO	397+56	164' LT	TO	120' LT	GAS	CENTERPOINT				X	
TH 47 NB	397+56	TO	397+58	120' LT	TO	85' LT	GAS	CENTERPOINT				X	
TH 47 NB			397+58			85' LT	PLUG	CENTERPOINT				X	
TH 47 NB	397+29	TO	397+73	216' LT	TO	221' LT	GAS	CENTERPOINT				X	
TH 47 NB	397+73	TO	399+03	221' LT	TO	223' LT	GAS	CENTERPOINT				X	
TH 47 NB	396+28	TO	397+12	37' LT	TO	37' LT	GAS	CENTERPOINT				X	
TH 47 NB			397+12			37' LT	TEE	CENTERPOINT				X	
TH 47 NB	397+12	TO	397+16	37' LT	TO	6' RT	GAS	CENTERPOINT				X	
TH 47 NB	397+16	TO	397+21	6' RT	TO	38' RT	GAS	CENTERPOINT				X	
TH 47 NB			397+21			38' RT	VALVE	CENTERPOINT	X				ADJUST FOR MILL & OVERLAY BITUMINOUS SURFACE.
TH 47 NB	397+21	TO	396+95	38' RT	TO	120' RT	GAS	CENTERPOINT				X	
TH 47 NB	396+95	TO	396+56	120' RT	TO	190' RT	GAS	CENTERPOINT				X	
TH 47 NB	397+12	TO	397+19	37' LT	TO	37' LT	GAS	CENTERPOINT				X	
TH 47 NB	397+19	TO	397+19	37' LT	TO	44' LT	GAS	CENTERPOINT				X	
TH 47 NB	397+19	TO	401+96	44' LT	TO	72' LT	GAS	CENTERPOINT	X				ADJUST FOR PROPOSED STORM SEWER.
TH 47 NB	401+96	TO	401+96	72' LT	TO	68' LT	GAS	CENTERPOINT				X	
TH 47 NB			401+96			68' LT	TEE	CENTERPOINT				X	
TH 47 NB	401+96	TO	403+37	68' LT	TO	76' LT	GAS	CENTERPOINT				X	
TH 47 NB	403+37	TO	405+05	76' LT	TO	74' LT	GAS	CENTERPOINT				X	
TH 47 NB (CSAH 116 EB)	405+05	TO	405+53 (98+78)	74' LT	TO	121' LT (39' RT)	GAS	CENTERPOINT				X	
CSAH 116 EB	98+78	TO	95+13	39' RT	TO	32' RT	GAS	CENTERPOINT				X	
CSAH 116 EB			95+13			32' RT	TEE	CENTERPOINT				X	
CSAH 116 EB	95+13	TO	95+04	32' RT	TO	32' RT	GAS	CENTERPOINT				X	
CSAH 116 EB			95+04			32' RT	PLUG	CENTERPOINT				X	
CSAH 116 EB	95+13	TO	95+14	32' RT	TO	40' RT	GAS	CENTERPOINT				X	
CSAH 116 EB	95+14	TO	94+70	40' RT	TO	40' RT	GAS	CENTERPOINT				X	
CSAH 116 EB	94+70	TO	94+05	40' RT	TO	38' RT	GAS	CENTERPOINT				X	
CSAH 116 EB	94+05	TO	93+43	38' RT	TO	38' RT	GAS	CENTERPOINT				X	
CSAH 116 EB	93+43	TO	92+32	38' RT	TO	36' RT	GAS	CENTERPOINT				X	
CSAH 116 EB	92+32	TO	91+22	36' RT	TO	34' RT	GAS	CENTERPOINT				X	
CSAH 116 EB	91+22	TO	91+06	34' RT	TO	33' RT	GAS	CENTERPOINT				X	
TH 47 NB	401+96	TO	401+96	68' LT	TO	62' LT	GAS	CENTERPOINT				X	
TH 47 NB	401+96	TO	403+24	62' LT	TO	69' LT	GAS	CENTERPOINT		X			RELOCATE AWAY FROM CURB LINE.
TH 47 NB			403+24			69' LT	TEE	CENTERPOINT				X	
TH 47 NB	403+24	TO	403+25	69' LT	TO	84' LT	GAS	CENTERPOINT				X	
TH 47 NB			403+25			84' LT	PLUG	CENTERPOINT				X	
TH 47 NB	403+24	TO	407+04	69' LT	TO	56' LT	GAS	CENTERPOINT				X	
TH 47 NB			407+04			56' LT	VALVE	CENTERPOINT	X				ADJUST FOR MILL & OVERLAY BITUMINOUS SURFACE.
TH 47 NB	407+04	TO	407+06	56' LT	TO	56' LT	GAS	CENTERPOINT				X	
TH 47 NB			407+06			56' LT	TEE	CENTERPOINT				X	
TH 47 NB	407+06	TO	407+07	56' LT	TO	56' LT	GAS	CENTERPOINT				X	
TH 47 NB			407+07			56' LT	VALVE	CENTERPOINT	X				ADJUST FOR MILL & OVERLAY BITUMINOUS SURFACE.
TH 47 NB	407+07	TO	412+75	56' LT	TO	68' LT	GAS	CENTERPOINT		X			RELOCATE FOR PROPOSED STORM SEWER.
TH 47 NB	412+75	TO	416+64	68' LT	TO	66' LT	GAS	CENTERPOINT		X			RELOCATE FOR PROPOSED STORM SEWER.
TH 47 NB	416+64	TO	416+96	66' LT	TO	67' LT	GAS	CENTERPOINT				X	
TH 47 NB	416+96	TO	417+23	67' LT	TO	69' LT	GAS	CENTERPOINT				X	

CONTINUED ON SHEET 18

DATE: 8/25/2020 2:31:29 PM  
PATH & FILENAME: Projects\Minnesota\04652-000\04652-000\Plan\4652-000\_e.rvt

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 17  
 OF  
 206  
 SHEETS

**UTILITY TABULATION - CENTERPOINT ENERGY**

ALIGNMENT	STATION TO STATION			OFFSETS			DESCRIPTION	OWNER	ACTION				REMARKS
									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	417+23			69' LT			TEE	CENTERPOINT				X	
TH 47 NB	417+23	TO	418+00	69' LT	TO	70' LT	GAS	CENTERPOINT				X	
TH 47 NB	418+00	TO	418+25	70' LT	TO	68' LT	GAS	CENTERPOINT				X	
TH 47 NB	417+23	TO	417+24	69' LT	TO	56' LT	GAS	CENTERPOINT				X	
TH 47 NB	417+24			56' LT			VALVE	CENTERPOINT				X	
TH 47 NB	417+24	TO	417+32	56' LT	TO	43' RT	GAS	CENTERPOINT				X	
TH 47 NB	417+32	TO	417+40	43' RT	TO	57' RT	GAS	CENTERPOINT				X	
TH 47 NB	417+40	TO	417+50	57' RT	TO	340' RT	GAS	CENTERPOINT				X	
TH 47 NB (CSAH 116 EB)	407+06	TO	(102+35)	56' LT	TO	(92' LT)	GAS	CENTERPOINT				X	
CSAH 116 EB	102+35	TO	103+05	92' LT	TO	41' LT	GAS	CENTERPOINT				X	
CSAH 116 EB	103+05	TO	103+63	41' LT	TO	33' LT	GAS	CENTERPOINT		X			SUSPENDED FROM BRIDGE. REMOVE DURING CONSTRUCTION.
CSAH 116 EB	103+63	TO	104+56	33' LT	TO	36' LT	GAS	CENTERPOINT		X			SUSPENDED FROM BRIDGE. REMOVE DURING CONSTRUCTION.
CSAH 116 EB	104+56	TO	105+36	36' LT	TO	36' LT	GAS	CENTERPOINT		X			SUSPENDED FROM BRIDGE. REMOVE DURING CONSTRUCTION.
CSAH 116 EB	105+36	TO	105+72	36' LT	TO	71' LT	GAS	CENTERPOINT				X	
CSAH 116 EB	105+72	TO	107+62	71' LT	TO	66' LT	GAS	CENTERPOINT				X	
CSAH 116 EB	107+62	TO	108+62	66' LT	TO	63' LT	GAS	CENTERPOINT				X	
CSAH 116 EB	108+62	TO	109+73	63' LT	TO	64' LT	GAS	CENTERPOINT				X	
CSAH 116 EB	109+73	TO	111+45	64' LT	TO	69' LT	GAS	CENTERPOINT				X	
CSAH 116 EB	111+45	TO	112+45	69' LT	TO	65' LT	GAS	CENTERPOINT				X	
CSAH 116 EB	112+45	TO	113+05	65' LT	TO	67' LT	GAS	CENTERPOINT				X	

**UTILITY TABULATION - CENTURYLINK**

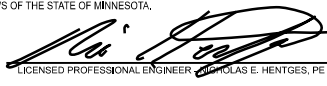
ALIGNMENT	STATION TO STATION			OFFSETS			DESCRIPTION	OWNER	ACTION				REMARKS
									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	396+28	TO	400+18	45' LT	TO	70' LT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	400+18	TO	402+42	70' LT	TO	81' LT	F/O-BUR	CENTURYLINK	X				ADJUST FOR PROPOSED STORM SEWER.
TH 47 NB	402+42	TO	402+89	81' LT	TO	81' LT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	402+89			81' LT			HH	CENTURYLINK	X				ADJUST FOR GRADING.
TH 47 NB	402+89	TO	406+75	81' LT	TO	85' LT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	406+75			85' LT			HH			X			RELOCATE FOR PEDESTRIAN RAMP.
TH 47 NB (CSAH 116 EB)	406+75	TO	(98+74)	85' LT	TO	(79' LT)	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	98+74	TO	95+49	79' LT	TO	80' LT	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	95+49	TO	94+88	80' LT	TO	83' LT	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	94+88	TO	94+39	83' LT	TO	82' LT	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	94+39	TO	94+09	82' LT	TO	88' LT	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	94+09	TO	92+53	88' LT	TO	290' LT	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	94+88	TO	94+01	83' LT	TO	38' RT	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	94+01	TO	93+14	38' RT	TO	38' RT	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	93+14	TO	91+99	38' RT	TO	36' RT	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	91+99	TO	91+22	36' RT	TO	34' RT	F/O-BUR	CENTURYLINK				X	
CSAH 116 EB	91+22	TO	91+06	34' RT	TO	34' RT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	418+25	TO	418+07	248' LT	TO	200' LT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	418+07	TO	417+92	200' LT	TO	128' LT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	417+92	TO	418+00	128' LT	TO	82' LT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	418+00	TO	418+10	82' LT	TO	56' RT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	418+10	TO	418+25	56' RT	TO	56' RT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	418+00	TO	418+22	82' LT	TO	75' LT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	418+22	TO	418+25	75' LT	TO	85' LT	F/O-BUR	CENTURYLINK				X	

DATE: 8/25/2020 2:03:30 PM PATH & FILENAME: Projects\Minnesota\04652-000\04652-000\Plan\4652-000\_e.rvt

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



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 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 18  
 OF  
 206  
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**UTILITY TABULATION - CENTURYLINK**

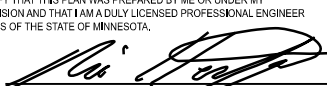
ALIGNMENT	STATION TO STATION		OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS
							ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	418+25	TO 418+25	85' LT	TO 101' LT	F/O-BUR	CENTURYLINK				X	
TH 47 NB	418+25	TO 418+14	101' LT	TO 111' LT	F/O-BUR	CENTURYLINK				X	
TH 47 NB		418+14		111' LT	CABINET	CENTURYLINK				X	
TH 47 NB	396+28	TO 399+47	38' RT	TO 36' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	399+47	TO 399+79	36' RT	TO 46' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	399+79	TO 403+00	46' RT	TO 33' RT	T-BUR	CENTURYLINK				X	
TH 47 NB		403+00		33' RT	PED	CENTURYLINK	X				ADJUST FOR GRADING.
TH 47 NB	403+00	TO 405+14	33' RT	TO 27' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	405+14	TO 405+58	27' RT	TO 64' RT	T-BUR	CENTURYLINK				X	
TH 47 NB		405+58		64' RT	HH	CENTURYLINK	X				ADJUST FOR GRADING.
TH 47 NB	403+00	TO 403+09	33' RT	TO 49' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	403+09	TO 402+95	49' RT	TO 85' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+95	TO 402+14	85' RT	TO 96' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+14	TO 402+16	96' RT	TO 110' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	403+09	TO 403+86	49' RT	TO 47' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	403+86	TO 404+40	47' RT	TO 129' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	404+40	TO 404+78	129' RT	TO 129' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	404+78	TO 404+78	129' RT	TO 167' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	396+28	TO 397+63	42' RT	TO 47' LT	T-BUR	CENTURYLINK	X				ADJUST FOR PROPOSED STORM SEWER.
TH 47 NB	397+63	TO 397+75	47' LT	TO 54' LT	T-BUR	CENTURYLINK				X	
TH 47 NB		397+75		54' LT	PED	CENTURYLINK	X				ADJUST FOR GRADING.
TH 47 NB	397+75	TO 397+64	54' LT	TO 152' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	397+64	TO 397+41	152' LT	TO 219' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	397+41	TO 398+79	219' LT	TO 222' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	397+75	TO 397+86	54' LT	TO 47' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	397+86	TO 399+67	47' LT	TO 60' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	399+67	TO 402+49	60' LT	TO 71' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+49	TO 402+81	71' LT	TO 71' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+81	TO 402+90	71' LT	TO 75' LT	T-BUR	CENTURYLINK				X	
TH 47 NB		402+90		75' LT	PED	CENTURYLINK	X				ADJUST FOR GRADING.
TH 47 NB	403+00	TO 402+90	33' RT	TO 75' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+90	TO 402+84	75' LT	TO 94' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+84	TO 402+44	94' LT	TO 90' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+44	TO 402+37	90' LT	TO 160' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+90	TO 403+02	75' LT	TO 167' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+90	TO 402+96	75' LT	TO 71' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	402+96	TO 405+30	71' LT	TO 70' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	405+30	TO 405+48	70' LT	TO 103' LT	T-BUR	CENTURYLINK				X	
TH 47 NB		405+48		103' LT	PED	CENTURYLINK	X				ADJUST FOR GRADING.
TH 47 NB	405+48	TO 405+58	103' LT	TO 64' RT	T-BUR	CENTURYLINK	X				ADJUST FOR PROPOSED STORM SEWER.
TH 47 NB	405+58	TO 407+19	64' RT	TO 48' RT	T-BUR	CENTURYLINK	X				ADJUST FOR PROPOSED STORM SEWER.
TH 47 NB	407+19	TO 407+67	48' RT	TO 49' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	407+67	TO 408+17	49' RT	TO 68' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	407+64	TO 409+07	49' RT	TO 50' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	409+07	TO 409+13	50' RT	TO 67' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	405+48	TO 405+58	103' LT	TO 69' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	405+58	TO 406+92	69' LT	TO 69' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	405+48	TO 406+64	103' LT	TO 124' LT	T-BUR	CENTURYLINK				X	
TH 47 NB		406+64		124' LT	MH	CENTURYLINK	X				ADJUST TO MATCH TRAIL GRADE.

DATE: 8/25/2020 2:31:31 PM  
PATH & FILENAME: Projects\Minnesota\014652-000\000\Plan\4652-000\_e01

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



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 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 19 OF 206 SHEETS

**UTILITY TABULATION - CENTURYLINK**

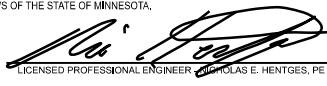
ALIGNMENT	STATION TO STATION			OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS	
								ADJUST	RELOCATE	REMOVE	LEAVE AS IS		
TH 47 NB	406+64	TO	406+92	124' LT	TO	69' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	406+92	TO	408+17	69' LT	TO	68' LT	T-BUR	CENTURYLINK		X			RELOCATE AWAY FROM CURB LINE.
TH 47 NB	408+17	TO	409+13	68' LT	TO	67' LT	T-BUR	CENTURYLINK		X			RELOCATE AWAY FROM CURB LINE.
TH 47 NB	409+13	TO	409+69	67' LT	TO	67' LT	T-BUR	CENTURYLINK		X			RELOCATE AWAY FROM CURB LINE.
TH 47 NB	409+69	TO	412+15	67' LT	TO	35' LT	T-BUR	CENTURYLINK		X			RELOCATE AWAY FROM CURB LINE.
TH 47 NB	412+15	TO	412+02	35' LT	TO	37' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	409+69	TO	409+69	67' LT	TO	35' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	409+69	TO	412+08	35' RT	TO	37' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	412+08	TO	417+93	37' RT	TO	39' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+93	TO	418+25	39' RT	TO	39' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+93	TO	417+94	39' RT	TO	80' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+94	TO	417+99	80' RT	TO	300' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+94	TO	417+33	80' RT	TO	80' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+33	TO	417+37	80' RT	TO	318' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+93	TO	417+91	39' RT	TO	69' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+91	TO	418+14	69' LT	TO	111' LT	T-BUR	CENTURYLINK				X	
TH 47 NB		418+14			111' LT		CABINET	CENTURYLINK				X	
TH 47 NB	418+14	TO	417+95	111' LT	TO	130' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+95	TO	418+04	130' LT	TO	183' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	418+04	TO	418+25	183' LT	TO	239' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	418+14	TO	418+18	111' LT	TO	83' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	418+18	TO	418+01	83' LT	TO	76' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	418+01	TO	416+97	76' LT	TO	78' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	416+97	TO	417+03	78' LT	TO	145' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+03	TO	416+95	145' LT	TO	146' LT	T-BUR	CENTURYLINK				X	
TH 47 NB	417+37	TO	414+96	318' RT	TO	318' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	414+96	TO	415+00	318' RT	TO	103' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	415+00	TO	413+45	103' RT	TO	105' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	413+45	TO	413+45	105' RT	TO	127' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	414+96	TO	409+97	318' RT	TO	316' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	409+97	TO	408+38	316' RT	TO	266' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	408+38	TO	407+92	266' RT	TO	262' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	407+92	TO	407+70	262' RT	TO	236' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	407+70	TO	407+11	236' RT	TO	227' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	407+11	TO	407+11	227' RT	TO	148' RT	T-BUR	CENTURYLINK				X	
TH 47 NB	407+11	TO	407+69	148' RT	TO	148' RT	T-BUR	CENTURYLINK				X	
TH 47 NB (CSAH 116 EB)	402+90	TO	(97+03)	75' LT	TO	(137' RT)	T-BUR	CENTURYLINK				X	
CSAH 116 EB	97+03	TO	95+63	137' RT	TO	29' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB		95+63			29' RT		HH	CENTURYLINK		X			RELOCATE AWAY FROM SIDEWALK.
CSAH 116 EB	95+63	TO	97+66	29' RT	TO	29' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB		97+66			29' RT		HH	CENTURYLINK		X			RELOCATE AWAY FROM SIDEWALK.
CSAH 116 EB	97+66	TO	97+03	29' RT	TO	137' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB (TH 47 NB)	97+66	TO	(405+48)	137' RT	TO	(103' LT)	T-BUR	CENTURYLINK				X	
CSAH 116 EB	95+63	TO	95+69	29' RT	TO	70' LT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	95+69	TO	98+71	70' LT	TO	63' LT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	98+71	TO	(406+64)	63' LT	TO	(124' LT)	T-BUR	CENTURYLINK				X	
CSAH 116 EB	95+69	TO	94+89	70' LT	TO	66' LT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	94+89	TO	92+51	66' LT	TO	69' LT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	92+51	TO	91+06	69' LT	TO	67' LT	T-BUR	CENTURYLINK				X	

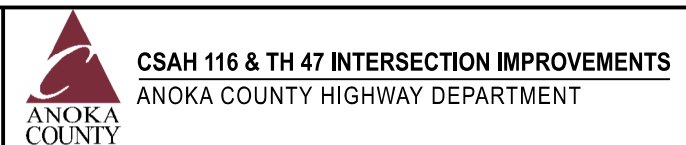
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PATH & FILENAME: Projects\Minnesota\04652-000\Coord\Plan\4652-000\_e01

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ALIGNMENT	STATION TO STATION		OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS
							ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
CSAH 116 EB	95+63	TO 94+07	29' RT	TO 40' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB		94+07		40' RT	MH	CENTURYLINK				X	
CSAH 116 EB	94+07	TO 93+99	40' RT	TO 42' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB		93+99		42' RT	PED	CENTURYLINK				X	
CSAH 116 EB	93+99	TO 94+03	42' RT	TO 50' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	94+03	TO 95+01	50' RT	TO 48' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	95+01	TO 95+04	48' RT	TO 105' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	94+03	TO 93+91	42' RT	TO 49' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	93+91	TO 93+19	49' RT	TO 47' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	93+19	TO 93+08	47' RT	TO 116' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	93+99	TO 93+14	42' RT	TO 40' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	93+14	TO 92+09	40' RT	TO 38' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	92+09	TO 91+45	38' RT	TO 37' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	91+45	TO 91+06	37' RT	TO 37' RT	T-BUR	CENTURYLINK				X	
CSAH 116 EB	94+07	TO 94+83	40' RT	TO 71' LT	T-CON	CENTURYLINK				X	
CSAH 116 EB	94+83	TO 96+11	71' LT	TO 69' LT	T-CON	CENTURYLINK				X	
CSAH 116 EB	96+11	TO 98+77	69' LT	TO 72' LT	T-CON	CENTURYLINK				X	
CSAH 116 EB (TH 47 NB)	98+77	TO 99+29 (407+10)	72' LT	TO 117' LT (74' LT)	T-CON	CENTURYLINK				X	
TH 47 NB	407+10	TO 416+99	74' LT	TO 69' LT	T-CON	CENTURYLINK				X	
TH 47 NB	416+99	TO 418+25	69' LT	TO 75' LT	T-CON	CENTURYLINK				X	

**UTILITY TABULATION - COMCAST**

ALIGNMENT	STATION TO STATION		OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS
							ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	396+28	TO 396+99	37' LT	TO 38' LT	F/O-BUR	COMCAST				X	
TH 47 NB	396+99	TO 396+90	38' LT	TO 149' LT	T-BUR	COMCAST				X	
TH 47 NB	396+90	TO 396+56	149' LT	TO 229' LT	T-BUR	COMCAST				X	
TH 47 NB	398+80	TO 398+72	223' LT	TO 181' LT	T-BUR	COMCAST				X	
TH 47 NB	398+72	TO 397+52	181' LT	TO 176' LT	T-BUR	COMCAST				X	
TH 47 NB	397+52	TO 397+62	176' LT	TO 132' LT	T-BUR	COMCAST				X	
TH 47 NB	397+62	TO 397+72	132' LT	TO 57' LT	T-BUR	COMCAST				X	
TH 47 NB	397+72	TO 398+72	57' LT	TO 58' LT	T-BUR	COMCAST				X	
TH 47 NB	398+72	TO 398+69	58' LT	TO 32' RT	T-BUR	COMCAST				X	
TH 47 NB	398+69	TO 397+64	32' RT	TO 33' RT	T-BUR	COMCAST				X	
TH 47 NB	397+64	TO 397+61	33' RT	TO 72' RT	T-BUR	COMCAST				X	
TH 47 NB	397+61	TO 397+49	72' RT	TO 124' RT	T-BUR	COMCAST				X	
TH 47 NB	397+49	TO 397+49	124' RT	TO 124' RT	T-BUR	COMCAST				X	
TH 47 NB	400+12	TO 399+73	188' RT	TO 183' RT	T-BUR	COMCAST				X	
TH 47 NB	399+73	TO 399+91	183' RT	TO 52' RT	T-BUR	COMCAST				X	
TH 47 NB	399+91	TO 403+12	52' RT	TO 30' RT	T-BUR	COMCAST				X	
TH 47 NB	403+12	TO 403+35	30' RT	TO 54' RT	T-BUR	COMCAST				X	
TH 47 NB	403+35	TO 403+37	54' RT	TO 190' RT	T-BUR	COMCAST				X	
TH 47 NB	403+12	TO 402+00	30' RT	TO 63' LT	T-BUR	COMCAST	X				ADJUST FOR PROPOSED STORM SEWER.
TH 47 NB	402+00	TO 405+16	63' LT	TO 75' LT	T-BUR	COMCAST		X			RELOCATE AWAY FROM PROPOSED CURB LINE.
TH 47 NB (CSAH 116 EB)	405+16	TO 405+48 (98+96)	75' LT	TO 130' LT (44' RT)	T-BUR	COMCAST				X	
CSAH 116 EB	98+96	TO 95+48	44' RT	TO 33' RT	T-BUR	COMCAST				X	
CSAH 116 EB	95+48	TO 95+37	33' RT	TO 80' LT	T-BUR	COMCAST				X	
CSAH 116 EB	95+37	TO 94+31	80' LT	TO 79' LT	T-BUR	COMCAST				X	

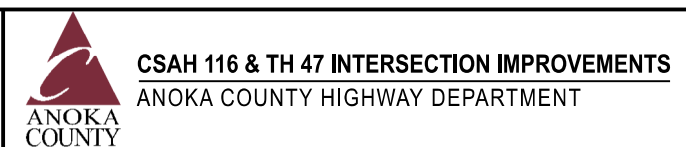
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 21 OF 206 SHEETS

**UTILITY TABULATION - COMCAST**

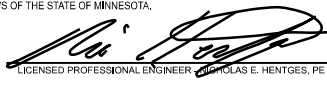
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									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
CSAH 116 EB	94+31	TO	95+03	79' LT	TO	306' LT	T-BUR	COMCAST				X	
CSAH 116 EB	91+06	TO	91+64	70' LT	TO	68' LT	F/O-BUR	COMCAST				X	
CSAH 116 EB	91+64	TO	92+95	68' LT	TO	69' LT	F/O-BUR	COMCAST				X	
CSAH 116 EB	92+95	TO	93+70	69' LT	TO	39' RT	F/O-BUR	COMCAST				X	
CSAH 116 EB	93+70	TO	94+30	39' RT	TO	39' RT	F/O-BUR	COMCAST				X	
CSAH 116 EB	94+30	TO	94+34	39' RT	TO	103' RT	T-BUR	COMCAST				X	
CSAH 116 EB	94+34	TO	95+04	103' RT	TO	141' RT	T-BUR	COMCAST				X	
CSAH 116 EB	95+04	TO	95+13	141' RT	TO	223' RT	T-BUR	COMCAST				X	
CSAH 116 EB	95+13	TO	95+94	223' RT	TO	222' RT	T-BUR	COMCAST				X	
CSAH 116 EB	91+06	TO	91+63	79' LT	TO	77' LT	F/O-CON	COMCAST				X	
CSAH 116 EB	91+63	TO	92+72	77' LT	TO	78' LT	F/O-CON	COMCAST				X	
CSAH 116 EB	92+72	TO	93+78	78' LT	TO	75' LT	F/O-CON	COMCAST				X	
CSAH 116 EB	93+78	TO	92+80	75' LT	TO	215' LT	F/O-CON	COMCAST				X	
TH 47 NB	396+28	TO	399+94	48' LT	TO	59' LT	F/O-CON	COMCAST				X	
TH 47 NB	399+94	TO	400+15	59' LT	TO	70' LT	F/O-CON	COMCAST				X	
TH 47 NB	400+15	TO	405+13	70' LT	TO	89' LT	F/O-CON	COMCAST				X	
TH 47 NB	405+13	TO	405+40	89' LT	TO	112' LT	F/O-CON	COMCAST				X	
TH 47 NB	405+40	TO	406+93	112' LT	TO	96' LT	F/O-CON	COMCAST				X	
TH 47 NB	406+93	TO	408+73	96' LT	TO	94' LT	F/O-CON	COMCAST				X	
TH 47 NB	408+73	TO	409+01	94' LT	TO	79' LT	F/O-CON	COMCAST				X	
TH 47 NB	409+01	TO	412+22	79' LT	TO	76' LT	F/O-CON	COMCAST				X	
TH 47 NB	412+22	TO	415+47	76' LT	TO	70' LT	T-CON	COMCAST				X	
TH 47 NB	415+47	TO	417+34	70' LT	TO	70' LT	T-CON	COMCAST				X	
TH 47 NB	417+34	TO	418+00	70' LT	TO	100' LT	T-CON	COMCAST				X	
TH 47 NB	418+00	TO	418+25	100' LT	TO	99' LT	T-CON	COMCAST				X	
TH 47 NB	418+25	TO	417+84	53' RT	TO	52' RT	T-CON	COMCAST				X	
TH 47 NB	417+84	TO	412+56	52' RT	TO	51' RT	T-CON	COMCAST				X	
TH 47 NB (CSAH 116 EB)	412+56	TO	407+05 (100+49)	51' RT	TO	49' RT (112' LT)	T-CON	COMCAST				X	
CSAH 116 EB	100+49	TO	102+98	112' LT	TO	99' LT	T-CON	COMCAST				X	
CSAH 116 EB	102+98	TO	104+27	99' LT	TO	109' LT	T-CON	COMCAST				X	
CSAH 116 EB	104+27	TO	106+44	109' LT	TO	107' LT	T-CON	COMCAST				X	
CSAH 116 EB	106+44	TO	107+75	107' LT	TO	104' LT	T-CON	COMCAST				X	
CSAH 116 EB	107+75	TO	108+52	104' LT	TO	105' LT	T-CON	COMCAST				X	
CSAH 116 EB	108+52	TO	109+58	105' LT	TO	104' LT	T-CON	COMCAST				X	
CSAH 116 EB	109+58	TO	110+84	104' LT	TO	104' LT	T-CON	COMCAST				X	
CSAH 116 EB	110+84	TO	112+19	104' LT	TO	105' LT	T-CON	COMCAST				X	
CSAH 116 EB	112+19	TO	112+75	105' LT	TO	108' LT	T-CON	COMCAST				X	
CSAH 116 EB	112+75	TO	113+82	108' LT	TO	104' LT	T-CON	COMCAST				X	
CSAH 116 EB	113+82	TO	115+39	104' LT	TO	103' LT	T-CON	COMCAST				X	
TH 47 NB	396+28	TO	397+63	40' LT	TO	41' LT	TV-BUR	COMCAST				X	
TH 47 NB	397+63	TO	397+44	41' LT	TO	178' LT	TV-BUR	COMCAST				X	
TH 47 NB	397+44	TO	398+71	178' LT	TO	183' LT	TV-BUR	COMCAST				X	
TH 47 NB	397+63	TO	397+59	41' LT	TO	61' RT	TV-BUR	COMCAST				X	
TH 47 NB	397+59	TO	397+38	61' RT	TO	140' RT	TV-BUR	COMCAST				X	
TH 47 NB	397+38	TO	396+85	140' RT	TO	232' RT	TV-BUR	COMCAST				X	
TH 47 NB	397+63	TO	400+01	41' LT	TO	52' LT	TV-BUR	COMCAST				X	
TH 47 NB	400+01	TO	400+16	52' LT	TO	67' LT	TV-BUR	COMCAST				X	
TH 47 NB	400+16	TO	402+18	67' LT	TO	69' LT	TV-BUR	COMCAST				X	
TH 47 NB	402+18	TO	402+22	69' LT	TO	144' LT	TV-BUR	COMCAST				X	


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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

**UTILITY TABULATION - COMCAST**

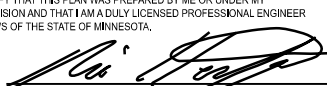
ALIGNMENT	STATION TO STATION			OFFSETS			DESCRIPTION	OWNER	ACTION				REMARKS
									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	402+22	TO	402+00	144' LT	TO	176' LT	TV-BUR	COMCAST				X	
TH 47 NB	402+18	TO	403+42	69' LT	TO	40' RT	TV-BUR	COMCAST	X				ADJUST FOR PROPOSED STORM SEWER.
TH 47 NB	403+42	TO	403+45	40' RT	TO	186' RT	TV-BUR	COMCAST				X	
TH 47 NB	403+45	TO	403+99	186' RT	TO	177' RT	TV-BUR	COMCAST				X	
TH 47 NB	402+18	TO	405+13	69' LT	TO	83' LT	TV-BUR	COMCAST				X	
TH 47 NB (CSAH 116 EB)	405+13	TO	405+41 (98+92)	83' LT	TO	107' LT (51' RT)	TV-BUR	COMCAST				X	
CSAH 116 EB	98+92	TO	95+57	51' RT	TO	39' RT	TV-BUR	COMCAST				X	
CSAH 116 EB	95+57	TO	95+48	39' RT	TO	71' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	95+48	TO	94+25	71' LT	TO	72' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	94+25	TO	94+07	72' LT	TO	49' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	94+07	TO	95+00	49' LT	TO	50' RT	TV-BUR	COMCAST				X	
CSAH 116 EB	95+00	TO	95+16	50' RT	TO	217' RT	TV-BUR	COMCAST				X	
CSAH 116 EB	94+25	TO	95+01	72' LT	TO	314' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	94+25	TO	93+64	72' LT	TO	71' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	93+64	TO	92+70	71' LT	TO	76' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	92+70	TO	92+16	76' LT	TO	162' RT	TV-BUR	COMCAST				X	
CSAH 116 EB	92+70	TO	91+77	76' LT	TO	72' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	91+77	TO	91+06	72' LT	TO	75' LT	TV-BUR	COMCAST				X	
TH 47 NB	405+41	TO	406+99	107' LT	TO	88' LT	TV-BUR	COMCAST				X	
TH 47 NB	406+99	TO	408+70	88' LT	TO	87' LT	TV-BUR	COMCAST				X	
TH 47 NB	408+70	TO	408+95	87' LT	TO	71' LT	TV-BUR	COMCAST				X	
TH 47 NB	408+95	TO	412+75	71' LT	TO	68' LT	TV-BUR	COMCAST				X	
TH 47 NB	412+75	TO	412+59	68' LT	TO	134' LT	TV-BUR	COMCAST				X	
TH 47 NB	412+59	TO	412+51	134' LT	TO	332' LT	TV-BUR	COMCAST				X	
TH 47 NB	412+75	TO	417+33	68' LT	TO	67' LT	TV-BUR	COMCAST				X	
TH 47 NB	417+33	TO	418+03	67' LT	TO	97' LT	TV-BUR	COMCAST				X	
TH 47 NB	418+03	TO	418+25	97' LT	TO	96' LT	TV-BUR	COMCAST				X	
TH 47 NB	418+25	TO	417+34	46' RT	TO	44' RT	TV-BUR	COMCAST				X	
TH 47 NB (CSAH 116 EB)	417+34	TO	407+00 (100+43)	44' RT	TO	42' RT (108' LT)	TV-BUR	COMCAST				X	
CSAH 116 EB			100+43			108' LT	HH	COMCAST	X				ADJUST FOR GRADING.
CSAH 116 EB	100+43	TO	103+05	108' LT	TO	92' LT	TV-BUR	COMCAST	X				ADJUST FOR DRIVEWAY CONSTRUCTION AS NEEDED.
CSAH 116 EB	103+05	TO	103+96	92' LT	TO	100' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	103+96	TO	106+13	100' LT	TO	98' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	106+13	TO	107+73	98' LT	TO	98' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	107+73	TO	109+29	98' LT	TO	94' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	109+29	TO	111+03	94' LT	TO	97' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	111+03	TO	112+69	97' LT	TO	103' LT	TV-BUR	COMCAST				X	
CSAH 116 EB	112+69	TO	114+58	103' LT	TO	95' LT	TV-BUR	COMCAST				X	

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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**

**INPLACE UTILITY TABULATION**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
23  
OF  
206  
SHEETS

**UTILITY TABULATION - CONNEXUS ENERGY**

ALIGNMENT	STATION TO STATION			OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS	
								ADJUST	RELOCATE	REMOVE	LEAVE AS IS		
TH 47 NB	417+78	TO	417+49	273' LT	TO	164' LT	P-BUR	CONNEXUS				X	
TH 47 NB	417+49	TO	418+20	164' LT	TO	145' LT	P-BUR	CONNEXUS				X	
TH 47 NB	418+20	TO	418+25	145' LT	TO	151' LT	P-BUR	CONNEXUS				X	
TH 47 NB	418+25	TO	417+25	37' RT	TO	40' RT	P-BUR	CONNEXUS				X	
TH 47 NB			417+25			40' RT	MH	CONNEXUS				X	
TH 47 NB	417+25	TO	417+31	40' RT	TO	172' LT	P-BUR	CONNEXUS				X	
TH 47 NB	417+31	TO	416+25	172' LT	TO	178' LT	P-BUR	CONNEXUS				X	
TH 47 NB	417+25	TO	417+32	40' RT	TO	63' RT	P-BUR	CONNEXUS				X	
TH 47 NB	417+32	TO	417+39	63' RT	TO	332' RT	P-BUR	CONNEXUS				X	
TH 47 NB	415+25	TO	417+16	40' RT	TO	62' RT	P-BUR	CONNEXUS				X	
TH 47 NB	417+16	TO	416+39	62' RT	TO	36' RT	P-BUR	CONNEXUS				X	
TH 47 NB	416+39	TO	416+10	36' RT	TO	115' RT	P-BUR	CONNEXUS				X	
TH 47 NB (CSAH 116 EB)	417+25	TO	407+04 (100+33)	40' RT	TO	33' RT (111' LT)	P-BUR	CONNEXUS				X	
CSAH 116 EB	100+33	TO	102+54	111' LT	TO	104' LT	P-BUR	CONNEXUS	X				ADJUST FOR DRIVEWAY CONSTRUCTION AS NEEDED.
CSAH 116 EB	102+54	TO	103+09	104' LT	TO	49' LT	P-BUR	CONNEXUS				X	
CSAH 116 EB	103+09	TO	103+33	49' LT	TO	40' LT	P-BUR	CONNEXUS				X	
CSAH 116 EB	103+33	TO	104+14	40' LT	TO	39' LT	P-BUR	CONNEXUS		X			SUSPENDED FROM BRIDGE. REMOVE DURING CONSTRUCTION.
CSAH 116 EB	104+14	TO	104+95	39' LT	TO	41' LT	P-BUR	CONNEXUS		X			SUSPENDED FROM BRIDGE. REMOVE DURING CONSTRUCTION.
CSAH 116 EB	104+95	TO	105+30	41' LT	TO	103' LT	P-BUR	CONNEXUS				X	
CSAH 116 EB	105+30	TO	107+72	103' LT	TO	93' LT	P-BUR	CONNEXUS				X	
CSAH 116 EB	107+72	TO	108+64	93' LT	TO	93' LT	P-BUR	CONNEXUS				X	
CSAH 116 EB	108+64	TO	110+53	93' LT	TO	94' LT	P-BUR	CONNEXUS				X	
CSAH 116 EB	110+53	TO	111+92	94' LT	TO	100' LT	P-BUR	CONNEXUS				X	
CSAH 116 EB	111+92	TO	113+40	100' LT	TO	96' LT	P-BUR	CONNEXUS				X	
CSAH 116 EB	113+40	TO	114+94	96' LT	TO	94' LT	P-BUR	CONNEXUS				X	

**UTILITY TABULATION - MINNESOTA MUNICIPAL POWER AGENCY (POWER TRANSMISSION)**

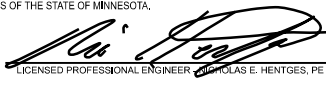
ALIGNMENT	STATION TO STATION			OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS	
								ADJUST	RELOCATE	REMOVE	LEAVE AS IS		
CSAH 116 EB	91+06	TO	91+91	51' RT	TO	56' RT	OHP	MMPA				X	115-kV
CSAH 116 EB			91+91			56' RT	PP	MMPA				X	115-kV
CSAH 116 EB	91+91	TO	93+81	56' RT	TO	64' RT	OHP	MMPA				X	115-kV
CSAH 116 EB			93+81			64' RT	PP	MMPA				X	115-kV
CSAH 116 EB	93+81	TO	96+25	64' RT	TO	49' RT	OHP	MMPA				X	115-kV
CSAH 116 EB			96+25			49' RT	PP	MMPA				X	115-kV
CSAH 116 EB	96+25	TO	98+82	49' RT	TO	66' RT	OHP	MMPA				X	115-kV
CSAH 116 EB			98+82			66' RT	PP	MMPA				X	115-kV
CSAH 116 EB	98+82	TO	102+02	66' RT	TO	87' RT	OHP	MMPA				X	115-kV
CSAH 116 EB			102+02			87' RT	PP	MMPA				X	115-kV
CSAH 116 EB	102+02	TO	102+66	87' RT	TO	125' LT	OHP	MMPA				X	115-kV
CSAH 116 EB			102+66			125' LT	PP	MMPA				X	115-kV
CSAH 116 EB	102+66	TO	109+06	125' LT	TO	115' LT	OHP	MMPA				X	115-kV
CSAH 116 EB			109+06			115' LT	PP	MMPA				X	115-kV
CSAH 116 EB	109+06	TO	111+77	115' LT	TO	134' LT	OHP	MMPA				X	115-kV
CSAH 116 EB			111+77			134' LT	PP	MMPA				X	115-kV
CSAH 116 EB	111+77	TO	114+65	134' LT	TO	120' LT	OHP	MMPA				X	115-kV
CSAH 116 EB			114+65			120' LT	PP	MMPA				X	115-kV
CSAH 116 EB	114+65	TO	114+76	120' LT	TO	106' RT	OHP	MMPA				X	115-kV
CSAH 116 EB			114+76			106' RT	PP	MMPA				X	115-kV

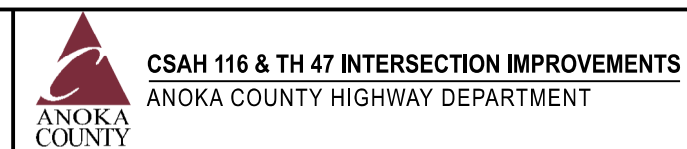
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN

**INPLACE UTILITY TABULATION**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
24  
OF  
206  
SHEETS



**UTILITY TABULATION - VERIZON**

ALIGNMENT	STATION TO STATION			OFFSETS			DESCRIPTION	OWNER	ACTION				REMARKS
									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	417+36	TO	407+11	40' RT	TO	35' RT	F/O-BUR	VERIZON				X	
TH 47 NB	407+11	TO	407+04	35' RT	TO	48' RT	F/O-BUR	VERIZON				X	
TH 47 NB (CSAH 116 EB)	407+04 (100+48)			48' RT (111' LT)			HH	VERIZON				X	
CSAH 116 EB	100+48	TO	102+11	111' LT	TO	108' LT	F/O-BUR	VERIZON				X	
CSAH 116 EB	102+11	TO	103+43	108' LT	TO	103' LT	F/O-BUR	VERIZON				X	
CSAH 116 EB	103+43	TO	104+76	103' LT	TO	104' LT	F/O-BUR	VERIZON				X	
CSAH 116 EB	104+76	TO	108+37	104' LT	TO	86' LT	F/O-BUR	VERIZON				X	
CSAH 116 EB	108+37	TO	109+94	86' LT	TO	86' LT	F/O-BUR	VERIZON				X	
CSAH 116 EB	109+94	TO	111+24	86' LT	TO	86' LT	F/O-BUR	VERIZON				X	
CSAH 116 EB	111+24	TO	112+87	86' LT	TO	86' LT	F/O-BUR	VERIZON				X	
CSAH 116 EB	112+87	TO	114+11	86' LT	TO	86' LT	F/O-BUR	VERIZON				X	

**UTILITY TABULATION - ZAYO**

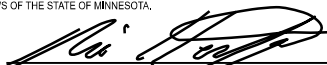
ALIGNMENT	STATION TO STATION			OFFSETS			DESCRIPTION	OWNER	ACTION				REMARKS
									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
CSAH 116 EB	91+06	TO	91+82	34' RT	TO	37' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	91+82	TO	92+97	37' RT	TO	47' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB (TH 47 NB)	92+97	TO	(407+03)	47' RT	TO	(240' LT)	F/O-BUR	ZAYO				X	
CSAH 116 EB	92+97	TO	94+12	47' RT	TO	40' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	94+12	TO	94+99	40' RT	TO	39' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	94+99	TO	95+88	39' RT	TO	39' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	95+88	TO	98+95	39' RT	TO	48' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	98+95			48' RT			HH	ZAYO				X	
CSAH 116 EB	98+95	TO	102+55	48' RT	TO	39' RT	F/O-BUR	ZAYO	X				ADJUST FOR PROPOSED STORM SEWER.
CSAH 116 EB	102+55	TO	104+42	39' RT	TO	50' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	104+42	TO	107+25	50' RT	TO	46' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	107+25	TO	109+45	46' RT	TO	44' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	109+45	TO	111+88	44' RT	TO	43' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	111+88	TO	114+87	43' RT	TO	41' RT	F/O-BUR	ZAYO				X	
CSAH 116 EB	98+95	TO	99+04	48' RT	TO	86' LT	F/O-BUR	ZAYO				X	
CSAH 116 EB	99+04	TO	99+27	86' LT	TO	124' LT	F/O-BUR	ZAYO				X	
CSAH 116 EB	91+16	TO	92+12	74' LT	TO	72' LT	F/O-BUR	ZAYO				X	
CSAH 116 EB	92+12	TO	93+91	72' LT	TO	65' LT	F/O-BUR	ZAYO				X	
CSAH 116 EB	93+91	TO	95+45	65' LT	TO	65' LT	F/O-BUR	ZAYO				X	
CSAH 116 EB	95+45	TO	97+68	65' LT	TO	64' LT	F/O-BUR	ZAYO				X	
CSAH 116 EB	97+68	TO	98+73	64' LT	TO	63' LT	F/O-BUR	ZAYO				X	
CSAH 116 EB	98+73	TO	99+13	63' LT	TO	80' LT	F/O-BUR	ZAYO				X	
CSAH 116 EB (TH 47 NB)	99+13 (406+72)			80' LT (89' LT)			HH	ZAYO		X			RELOCATE AWAY FROM PROPOSED PEDESTRIAN RAMP.
TH 47 NB	406+72	TO	406+94	89' LT	TO	76' LT	F/O-BUR	ZAYO				X	
TH 47 NB	406+94	TO	407+16	76' LT	TO	75' LT	F/O-BUR	ZAYO				X	
TH 47 NB	407+16	TO	417+33	75' LT	TO	69' LT	F/O-BUR	ZAYO				X	
TH 47 NB	417+33	TO	418+03	69' LT	TO	92' LT	F/O-BUR	ZAYO				X	
TH 47 NB	418+03	TO	418+25	92' LT	TO	91' LT	F/O-BUR	ZAYO				X	

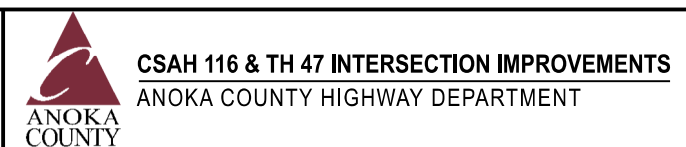
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
25  
OF  
206  
SHEETS

THE WORK PRESENTED ON SHEETS 26 TO 28 SHALL BE DONE BY THE CONTRACTOR AS LISTED BELOW AND IN THE SIGNAL PLANS.

**UTILITY TABULATION - SIGNAL INTERCONNECT**

ALIGNMENT	STATION TO STATION		OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS
							ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
CSAH 116 EB	93+53		18' RT		LOOP	ACHD				X	
CSAH 116 EB	93+53	TO 94+81	18' RT TO 29' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	94+81		29' RT		HH	ACHD		X			RELOCATE FOR PROPOSED SIDEWALK.
CSAH 116 EB	94+04		8' RT		LOOP	ACHD				X	D4-1
CSAH 116 EB	94+04	TO 94+81	8' RT TO 29' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	94+04		3' LT		LOOP	ACHD				X	D4-1
CSAH 116 EB	94+04	TO 94+81	3' LT TO 29' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	94+81	TO 96+41	29' RT TO 34' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	96+41		34' RT		HH	ACHD		X			RELOCATE FOR PROPOSED SIDEWALK.
CSAH 116 EB	96+41	TO 97+64	34' RT TO 32' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	97+64		32' RT		HH	ACHD		X			RELOCATE FOR PROPOSED SIDEWALK.
CSAH 116 EB	97+64	TO 98+98	32' RT TO 33' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	98+98		33' RT		HH	ACHD		X			RELOCATE FOR PROPOSED SIDEWALK.
CSAH 116 EB	98+98	TO 99+23	33' RT TO 57' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	99+23		57' RT		SIG POLE	ACHD			X		SEE SIGNAL PLANS.
CSAH 116 EB	98+98	TO 98+97	33' RT TO 26' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	98+97	TO 99+00	26' RT TO 25' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	99+00		25' RT		LOOP	ACHD				X	D4-2
CSAH 116 EB	98+97	TO 98+88	26' RT TO 9' RT		SIG-BUR	ACHD				X	
CSAH 116 EB	98+88		9' RT		LOOP	ACHD				X	D4-3
CSAH 116 EB	98+97	TO 98+96	26' RT TO 25' LT		SIG-BUR	ACHD				X	
CSAH 116 EB	98+96	TO 98+89	25' LT TO 6' LT		SIG-BUR	ACHD				X	
CSAH 116 EB	98+89		6' LT		LOOP	ACHD				X	D4-4
CSAH 116 EB	98+96	TO 98+64	25' LT TO 19' LT		SIG-BUR	ACHD				X	
CSAH 116 EB	98+64		19' LT		LOOP	ACHD				X	D7-1
CSAH 116 EB	98+96	TO 99+00	25' LT TO 21' LT		SIG-BUR	ACHD				X	
CSAH 116 EB	99+00		21' LT		LOOP	ACHD				X	D7-2
CSAH 116 EB	98+96	TO 98+96	25' LT TO 28' LT		SIG-BUR	ACHD		X			RELOCATE FOR PULLED BACK MEDIAN. SEE SIGNAL PLANS.
CSAH 116 EB	98+96	TO 98+98	25' LT TO 79' LT		SIG-BUR	ACHD				X	
CSAH 116 EB	98+98		79' LT		HH	ACHD		X			RELOCATE FOR PROPOSED TRAIL.
CSAH 116 EB	98+98	TO 99+27	79' LT TO 97' LT		SIG-BUR	ACHD				X	
CSAH 116 EB (TH 47 NB)	99+27 (406+89)		97' LT (75' LT)		HH	ACHD		X			RELOCATE FOR PEDESTRIAN RAMP.
CSAH 116 EB	99+27	TO 99+20	97' LT TO 76' LT		SIG-BUR	ACHD				X	
CSAH 116 EB	99+20		76' LT		SIG POLE	ACHD			X		SEE SIGNAL PLANS
TH 47 NB	406+89	TO 408+13	75' LT TO 65' LT		SIG-BUR	MNDOT		X			RELOCATE FOR PROPOSED ROADWAY.
TH 47 NB	408+13		35' LT		HH	MNDOT		X			RELOCATE FOR PROPOSED ROADWAY.
TH 47 NB	408+13	TO 408+11	35' LT TO 44' LT		SIG-BUR	MNDOT			X		REMOVE, LOOP AN HH TO BE RELOCATED.
TH 47 NB	408+11		44' LT		LOOP	MNDOT			X		D6-2, NO LONGER IN CENTER OF THRU LANE.
TH 47 NB	408+13	TO 409+56	65' LT TO 65' LT		SIG-BUR	MNDOT		X			RELOCATE FOR PROPOSED ROADWAY.
TH 47 NB	409+56		65' LT		HH	MNDOT		X			RELOCATE FOR PROPOSED ROADWAY.
TH 47 NB	409+56	TO 409+64	65' LT TO 45' LT		SIG-BUR	MNDOT			X		REMOVE, LOOP AND HH TO BE RELOCATED.
TH 47 NB	409+64		45' LT		LOOP	MNDOT			X		D6-1, NO LONGER IN CENTER OF LANE.
TH 47 NB	406+89	TO 406+89	75' LT TO 24' LT		SIG-BUR	MNDOT				X	
TH 47 NB	406+89	TO 407+04	24' LT TO 29' LT		SIG-BUR	MNDOT				X	
TH 47 NB	407+04		29' LT		LOOP	MNDOT			X		D1-4, NO LONGER IN CENTER OF LANE.
TH 47 NB	406+89	TO 406+79	24' LT TO 29' LT		SIG-BUR	MNDOT				X	
TH 47 NB	406+79		29' LT		LOOP	MNDOT			X		D1-2, LOCATED IN PROPOSED INTERSECTION.

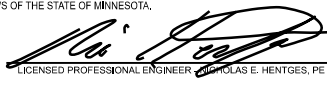
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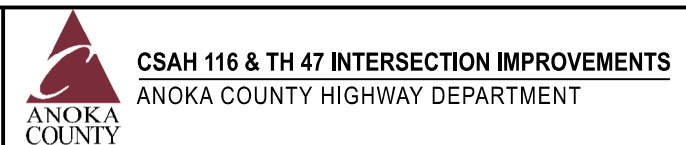
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Design By: NEH  
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INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 26  
 OF  
 206  
 SHEETS

**UTILITY TABULATION - SIGNAL INTERCONNECT**

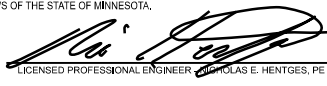
ALIGNMENT	STATION TO STATION			OFFSETS			DESCRIPTION	OWNER	ACTION				REMARKS
									ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	406+89	TO	406+89	24' LT	TO	20' LT	SIG-BUR	MNDOT					
TH 47 NB			406+89			20' LT	HH	MNDOT		X			RELOCATE, LOCATED IN PROPOSED MEDIAN NOSE.
TH 47 NB	406+89	TO	406+93	20' LT	TO	31' RT	SIG-BUR	MNDOT				X	
TH 47 NB			406+93			31' RT	HH	MNDOT		X			RELOCATE FOR PROPOSED TRAIL.
TH 47 NB	406+93	TO	406+91	31' RT	TO	49' RT	SIG-BUR	MNDOT				X	
TH 47 NB			406+91			49' RT	CABINET	MNDOT				X	
TH 47 NB	406+91	TO	406+86	50' RT	TO	64' RT	SIG-BUR	MNDOT				X	CONNECT CABINET TO GROUND MOUNTED TRANSFORMER.
TH 47 NB	406+91	TO	406+72	50' RT	TO	49' RT	SIG-BUR	MNDOT				X	
TH 47 NB			406+72			49' RT	HH	MNDOT		X			RELOCATE FOR POPOSED PEDESTRIAN RAMP LANDING.
TH 47 NB	406+72	TO	406+84	49' RT	TO	31' RT	SIG-BUR	MNDOT			X		REMOVE, HH AND SIGNAL POLE TO BE RELOCATED.
TH 47 NB			406+84			31' RT	SIG POLE	MNDOT			X		SEE SIGNAL PLANS.
TH 47 NB	406+72	TO	406+66	49' RT	TO	49' RT	SIG-BUR	MNDOT					
TH 47 NB	406+66	TO	406+60	49' RT	TO	45' RT	SIG-BUR	MNDOT			X		LOOP CONNECTING TO BE REMOVED.
TH 47 NB			406+60			45' RT	LOOP	MNDOT			X		D8-4, NO LONGER IN CENTER OF LANE.
TH 47 NB	406+66	TO	406+59	49' RT	TO	51' RT	SIG-BUR	MNDOT			x		LOOP CONNECTING TO BE REMOVED.
TH 47 NB			406+59			51' RT	LOOP	MNDOT			X		D8-4, NO LONGER IN CENTER OF LANE.
TH 47 NB	406+66	TO	406+47	49' RT	TO	54' RT	SIG-BUR	MNDOT			X		LOOP CONNECTING TO BE REMOVED.
TH 47 NB			406+47			54' RT	LOOP	MNDOT			X		D8-2, NO LONGER IN CENTER OF LANE.
TH 47 NB	406+66	TO	406+35	49' RT	TO	54' RT	SIG-BUR	MNDOT			X		LOOP CONNECTING TO BE REMOVED.
TH 47 NB			406+35			54' RT	LOOP	MNDOT			X		D8-3, NO LONGER IN CENTER OF LANE.
TH 47 NB	406+66	TO	406+15	49' RT	TO	51' RT	SIG-BUR	MNDOT				X	
TH 47 NB	406+15	TO	406+20	51' RT	TO	77' RT	SIG-BUR	MNDOT				X	
TH 47 NB			406+20			77' RT	LOOP	MNDOT				X	D3-1
TH 47 NB	406+15	TO	406+18	51' RT	TO	41' RT	SIG-BUR	MNDOT			X		LOOP CONNECTING TO BE REMOVED.
TH 47 NB			406+18			41' RT	LOOP	MNDOT			X		D3-2, LOCATED IN INTERSECTION.
TH 47 NB	406+15	TO	406+10	51' RT	TO	51' RT	SIG-BUR	MNDOT				X	
TH 47 NB			406+10			51' RT	HH	MNDOT	X				FROM RAISED MEDIAN TO PAINTED MEDIAN.
TH 47 NB	406+10	TO	405+61	51' RT	TO	51' RT	SIG-BUR	MNDOT				X	
TH 47 NB			405+61			51' RT	HH	MNDOT		X			RELOCATE FOR PROPOSED PEDESTRIAN RAMP LANDING.
TH 47 NB	405+61	TO	405+58	51' RT	TO	36' RT	SIG-BUR	MNDOT				X	
TH 47 NB			405+58			36' RT	SIG POLE	MNDOT			X		SEE SIGNAL PLANS.
TH 47 NB	405+61	TO	405+24	51' RT	TO	19' RT	SIG-BUR	MNDOT				X	
TH 47 NB			405+24			19' RT	HH	MNDOT	X				ADJUST FOR PROPOSED TRAIL AND BLVD GRADE.
TH 47 NB	405+24	TO	405+22	19' RT	TO	27' LT	SIG-BUR	MNDOT				X	
TH 47 NB	405+22	TO	405+39	27' LT	TO	20' LT	SIG-BUR	MNDOT				X	
TH 47 NB			405+39			20' LT	LOOP	MNDOT				X	D5-2, LOCATED IN PROPOSED CROSSWALK.
TH 47 NB	405+22	TO	405+06	27' LT	TO	19' LT	SIG-BUR	MNDOT				X	
TH 47 NB			405+06			19' LT	LOOP	MNDOT				X	D5-1
TH 47 NB	405+22	TO	405+22	27' LT	TO	30' LT	SIG-BUR	MNDOT				X	
TH 47 NB			405+22			30' LT	HH	MNDOT		X			RELOCATE TO NEW MEDIAN, LOCATED IN TURN LANE.
TH 47 NB	405+24	TO	403+97	19' RT	TO	17' RT	SIG-BUR	MNDOT				X	
TH 47 NB			403+97			17' RT	HH	MNDOT	X				ADJUST FOR PROPOSED TRAIL AND BLVD GRADE.
TH 47 NB	403+93	TO	404+11	17' RT	TO	6' LT	SIG-BUR	MNDOT				X	
TH 47 NB			404+11			6' LT	LOOP	MNDOT				X	D2-2
TH 47 NB	403+97	TO	403+27	17' RT	TO	17' RT	SIG-BUR	MNDOT				X	
TH 47 NB			403+27			17' RT	HH	MNDOT	X				ADJUST FOR PROPOSED TRAIL AND BLVD GRADE.
TH 47 NB	403+27	TO	402+51	17' RT	TO	17' RT	SIG-BUR	MNDOT				X	
TH 47 NB			402+51			17' RT	HH	MNDOT	X				ADJUST FOR PROPOSED TRAIL AND BLVD GRADE.

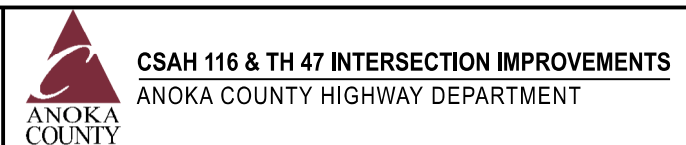
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Design By: NEH  
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SHEET 27 OF 206 SHEETS

**UTILITY TABULATION - SIGNAL INTERCONNECT**

ALIGNMENT	STATION TO STATION		OFFSETS		DESCRIPTION	OWNER	ACTION				REMARKS
							ADJUST	RELOCATE	REMOVE	LEAVE AS IS	
TH 47 NB	402+51	TO 402+39	17' RT	TO 1' LT	SIG-BUR	MNDOT				X	
TH 47 NB		402+39		1' LT	LOOP	MNDOT				X	D2-1
TH 47 NB (CSAH 116 EB)	406+72	TO (101+32)	49' RT	TO (77' LT)	SIG-BUR	MNDOT				X	
CSAH 116 EB		101+32		77' LT	HH	ACHD	X				ADJUST FOR GRADING.
CSAH 116 EB	101+31	TO 102+83	77' LT	TO 72' LT	SIG-BUR	ACHD				X	
CSAH 116 EB	102+83	TO 103+24	72' LT	TO 59' LT	SIG-BUR	ACHD				X	
CSAH 116 EB		103+24		59' LT	HH	ACHD	X				ADJUST FOR GRADING.
CSAH 116 EB	103+24	TO 105+25	59' LT	TO 58' LT	SIG-BUR	ACHD			X		REMOVE FOR BRIDGE CONSTRUCTION. SEE SIGNAL PLANS.
CSAH 116 EB		105+25		58' LT	HH	ACHD	X				ADJUST FOR GRADING.
CSAH 116 EB	105+25	TO 105+40	58' LT	TO 41' LT	SIG-BUR	ACHD				X	
CSAH 116 EB		105+40		41' LT	LOOP	ACHD				X	D8-1, LOCATED IN PREVIOUS THRU LANE, PROPOSED TURN LANE.
CSAH 116 EB	105+25	TO 105+40	58' LT	TO 29' LT	SIG-BUR	ACHD				X	
CSAH 116 EB		105+40		29' LT	LOOP	ACHD				X	D8-1, LOCATED IN PROPOSED THRU LANE.

SIGNAL INTERCONNECT GENERAL NOTES:

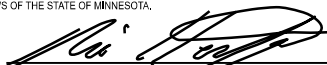
- SEE SIGNAL PLAN FOR MORE DETAILS.

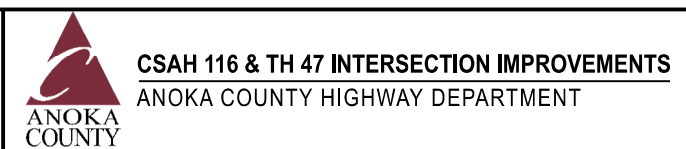
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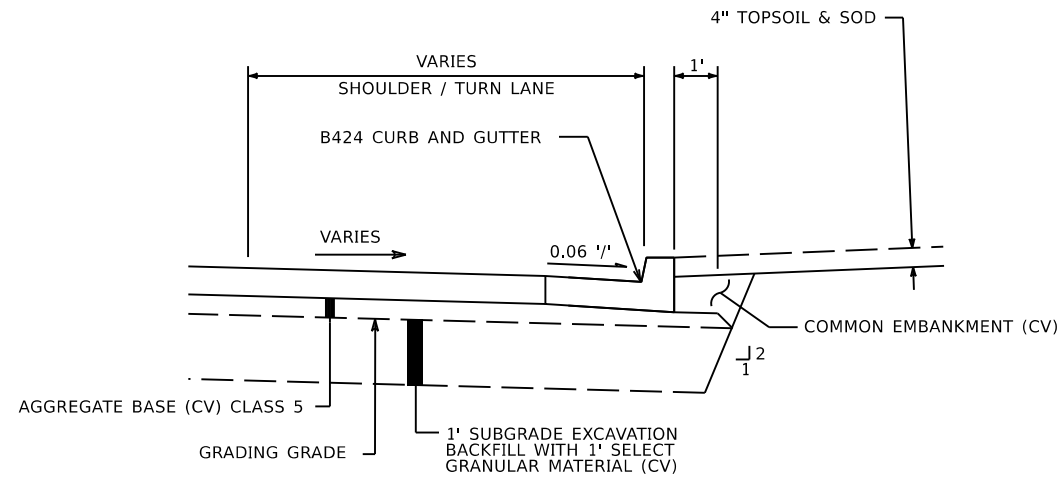
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 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



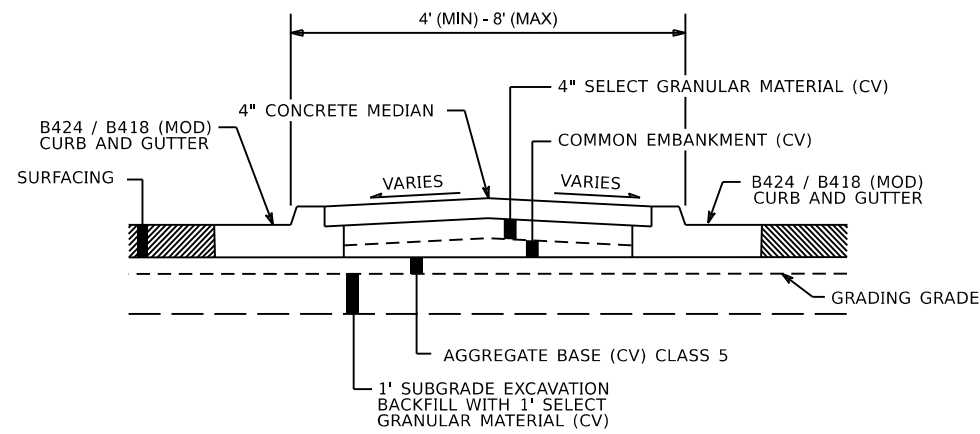
ANOKA COUNTY, MN

INPLACE UTILITY TABULATION  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

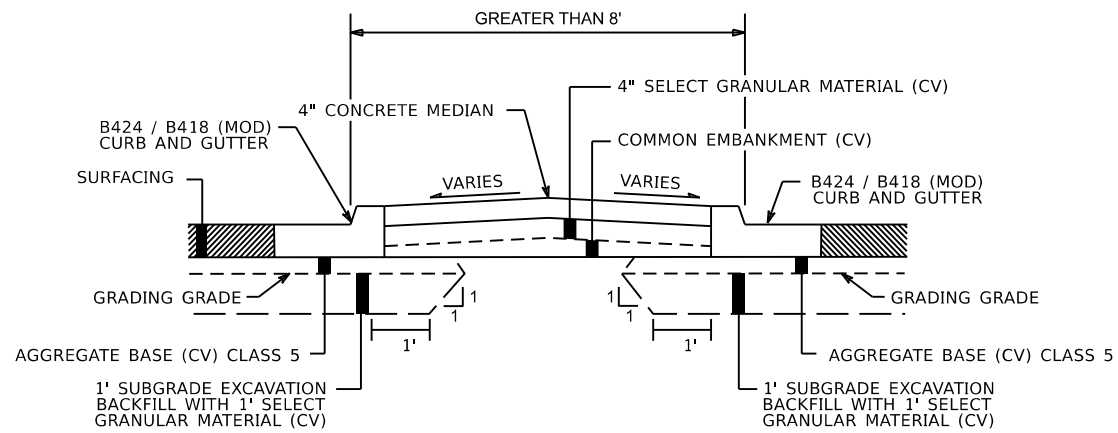
SHEET  
28  
OF  
206  
SHEETS



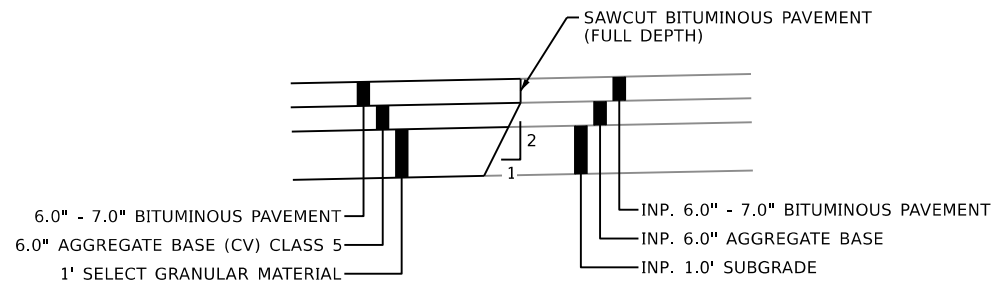
**DETAIL A**  
CONCRETE CURB & GUTTER



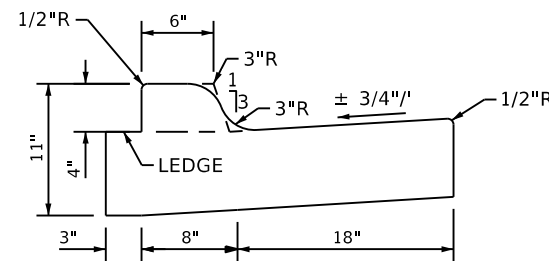
**DETAIL B**  
CONCRETE MEDIAN 4' - 8'



**DETAIL C**  
CONCRETE MEDIAN GREATER THAN 8'

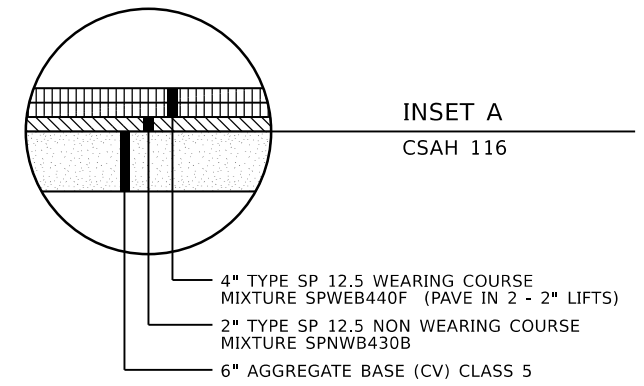


**DETAIL D**  
SUBGRADE ADJACENT TO EXISTING PAVEMENT

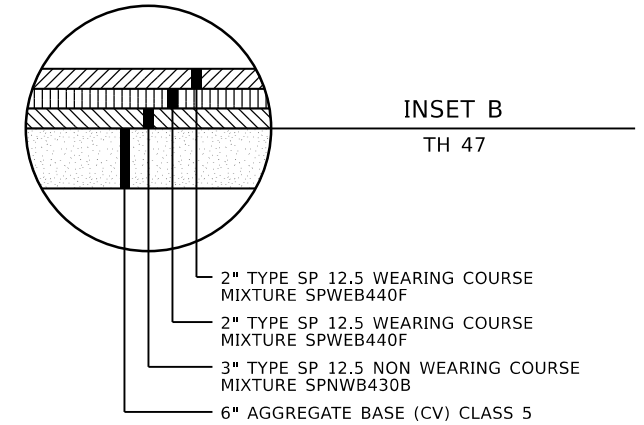


PAID AS CONCRETE CURB & GUTTER DESIGN B418 (MOD)  
SHALL BE USED FOR CSAH 116 MEDIANS

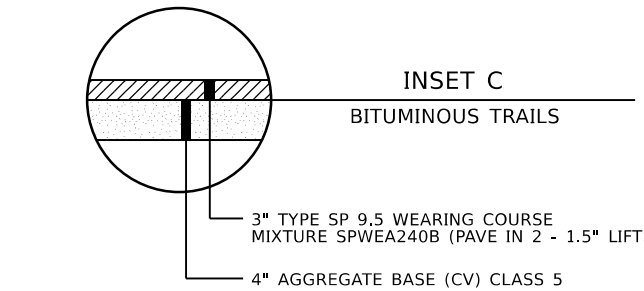
**B418 MODIFIED CURB & GUTTER**  
(NO VARIANCES ALLOWED)



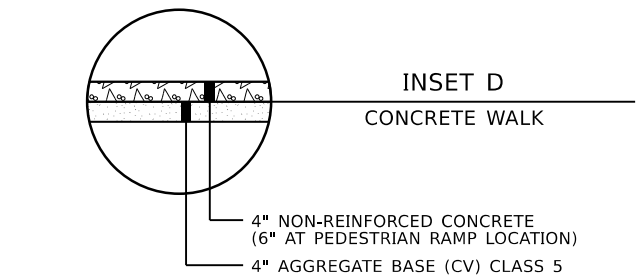
**INSET A**  
CSAH 116



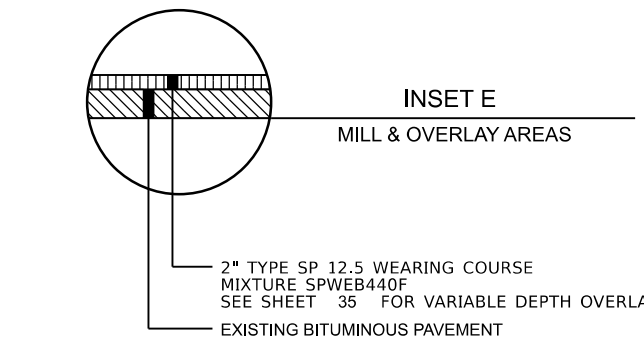
**INSET B**  
TH 47



**INSET C**  
BITUMINOUS TRAILS



**INSET D**  
CONCRETE WALK



**INSET E**  
MILL & OVERLAY AREAS

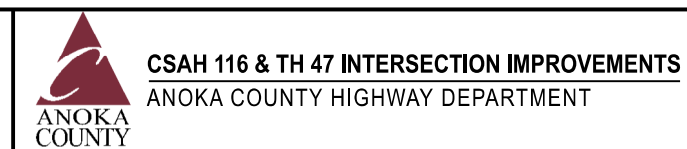
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
Plan By: **AJF**  
Checked By: **NEH**  
Approved By: **NEH**

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

CERTIFIED BY: *[Signature]*  
LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
DATE: 8/25/2020 LICENSE NO. 44620



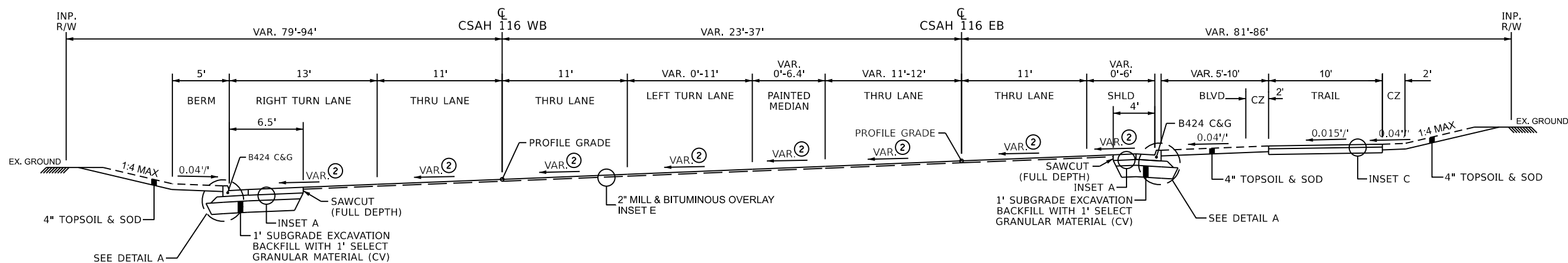
ANOKA COUNTY, MN

TYPICAL SECTIONS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
29  
OF  
206  
SHEETS

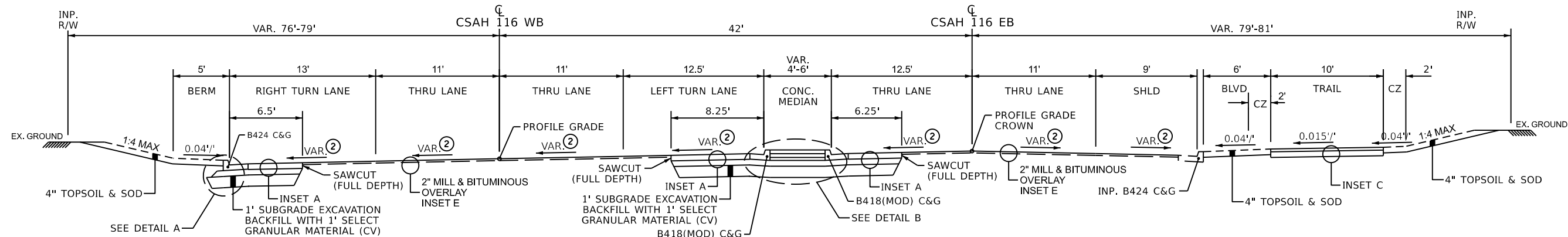
**CSAH 116 - TYPICAL 3**

EB STA 102+09 TO EB STA 103+02.49  
EB STA 104+51.72 TO EB STA 105+91 ①



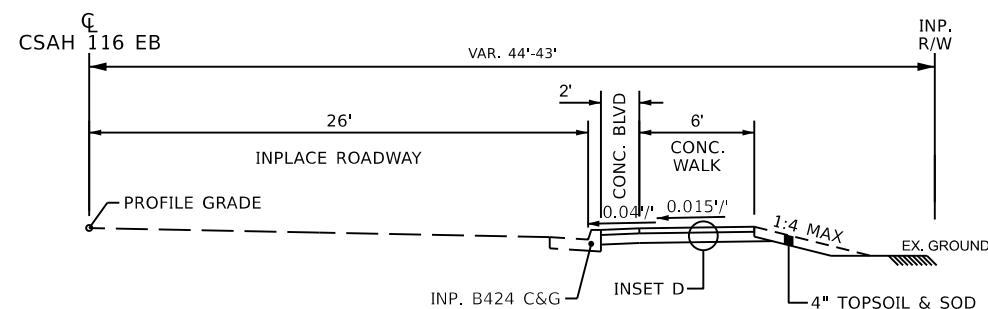
**CSAH 116 - TYPICAL 2**

EB STA 100+61 TO EB STA 102+09



**CSAH 116 - TYPICAL 1**

EB STA 94+04.72 TO EB STA 99+25



**GENERAL NOTES**

- UNLESS OTHERWISE SPECIFIED, THE SUBGRADE CROSS SLOPE WILL BE THE SAME AS THE FINISHED GRADE.
- ALL UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE ROADWAY. THIS MATERIAL MAY BE PLACED ON DITCH BOTTOMS, BACK SLOPES, OR OUTSIDE A 1:1 SLOPE DOWN FROM THE OUTSIDE OF BITUMINOUS TRAIL AND/OR WALK PI.
- ALL EMBANKMENT MATERIAL SHALL BE APPROVED BY THE ENGINEER. ALL CONCRETE AND BITUMINOUS REMOVAL MATERIALS NOT APPROVED FOR USE ON SITE MUST BE DISPOSED OF OFF-SITE. REMOVAL AND DISPOSAL OF EXCESS MATERIAL SHALL BE INCIDENTAL.
- ALL EXISTING TOPSOIL SHALL BE SALVAGED AND 4" MINIMUM PLACED ON ALL AREAS DISTURBED BY CONSTRUCTION AND SHALL BE INCIDENTAL.
- SEE SHEET 29 FOR INSETS AND DETAILS.

**NOTES**

- ① BRIDGE 02546 FROM EB STA 103+02.49 TO EB STA 104+51.72. SEE BRIDGE PLANS.
- ② SEE SUPERELEVATION PLANS.

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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
Plan By: **AJF**  
Checked By: **NEH**  
Approved By: **NEH**

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

CERTIFIED BY: *[Signature]*  
LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
DATE: 8/25/2020 LICENSE NO. 44620

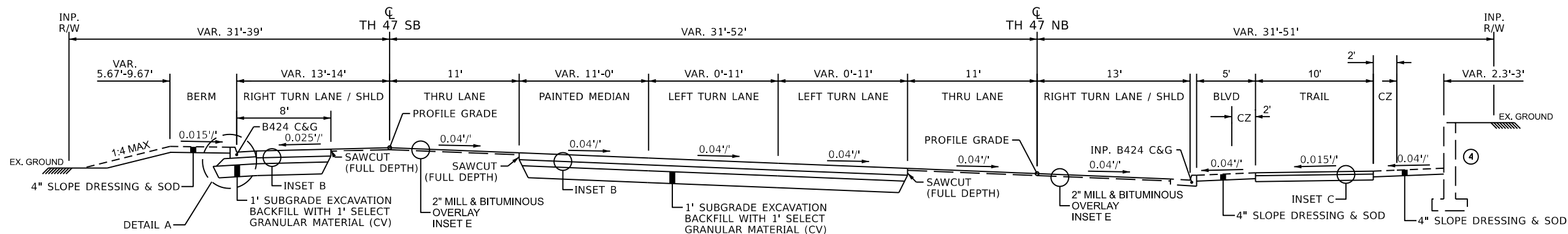


**ANOKA COUNTY HIGHWAY DEPARTMENT**  
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS

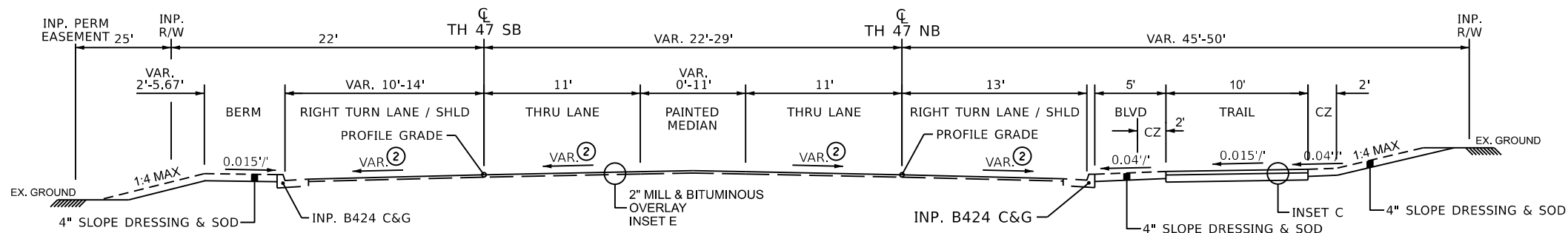
**ANOKA COUNTY, MN**  
TYPICAL SECTIONS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
30  
OF  
206  
SHEETS

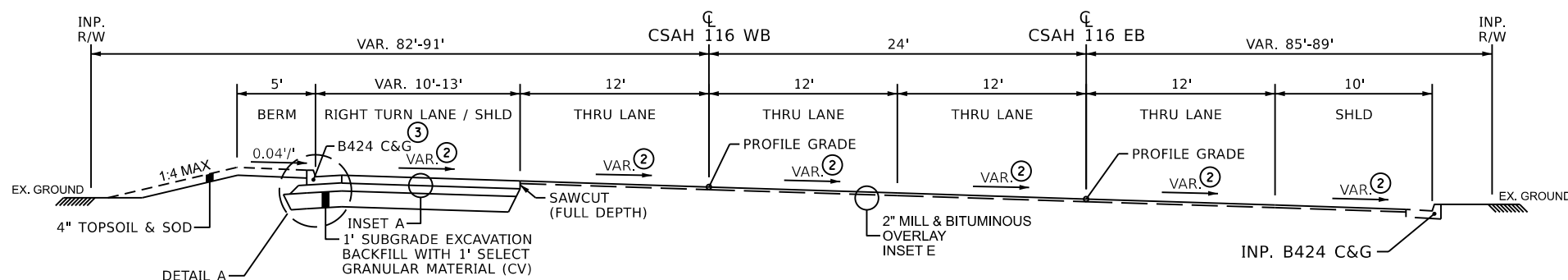
TH 47 - TYPICAL 2  
NB STA 399+99 TO NB STA 402+11



TH 47 - TYPICAL 1  
NB STA 396+28.24 TO NB STA 399+99



CSAH 116 - TYPICAL 4  
EB STA 105+91 TO EB STA 111+84.69



- GENERAL NOTES**
- UNLESS OTHERWISE SPECIFIED, THE SUBGRADE CROSS SLOPE WILL BE THE SAME AS THE FINISHED GRADE.
  - ALL UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE ROADWAY. THIS MATERIAL MAY BE PLACED ON DITCH BOTTOMS, BACK SLOPES, OR OUTSIDE A 1:1 SLOPE DOWN FROM THE OUTSIDE OF BITUMINOUS TRAIL AND/OR WALK PI.
  - ALL EMBANKMENT MATERIAL SHALL BE APPROVED BY THE ENGINEER. ALL CONCRETE AND BITUMINOUS REMOVAL MATERIALS NOT APPROVED FOR USE ON SITE MUST BE DISPOSED OF OFF-SITE. REMOVAL AND DISPOSAL OF EXCESS MATERIAL SHALL BE INCIDENTAL.
  - ALL EXISTING TOPSOIL SHALL BE SALVAGED AND 4" MINIMUM PLACED ON ALL AREAS DISTURBED BY CONSTRUCTION AND SHALL BE INCIDENTAL.
  - SEE SHEET 29 FOR INSETS AND DETAILS.
- NOTES**
- ② SEE SUPERELEVATION PLANS.
  - ③ 13' TURN LANE BEGINS AT EB STA 110+19.10
  - ④ INPLACE RETAINING WALL FROM NB STA 399+83.48 TO NB STA 403+84.78.

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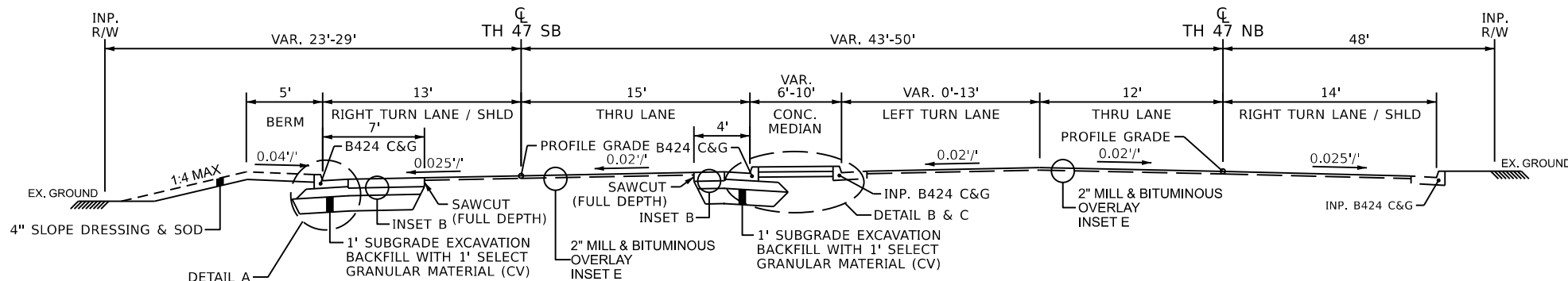
Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - 44620, NICOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

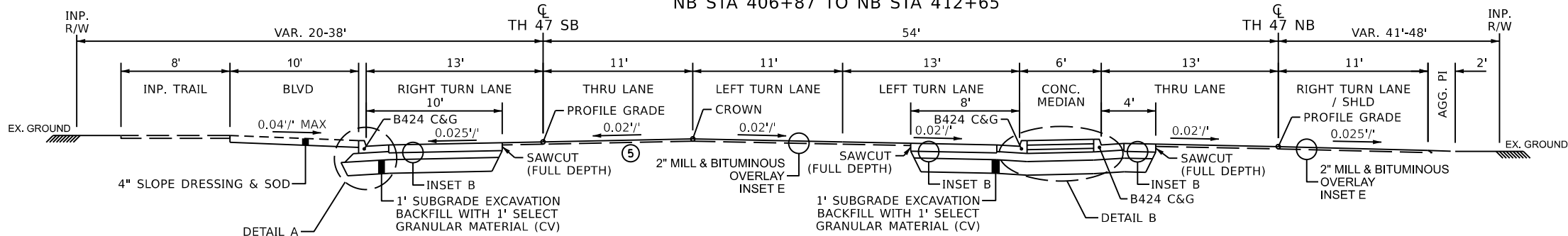
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TH 47 - TYPICAL 5  
NB STA 412+65 TO NB STA 417+07.84

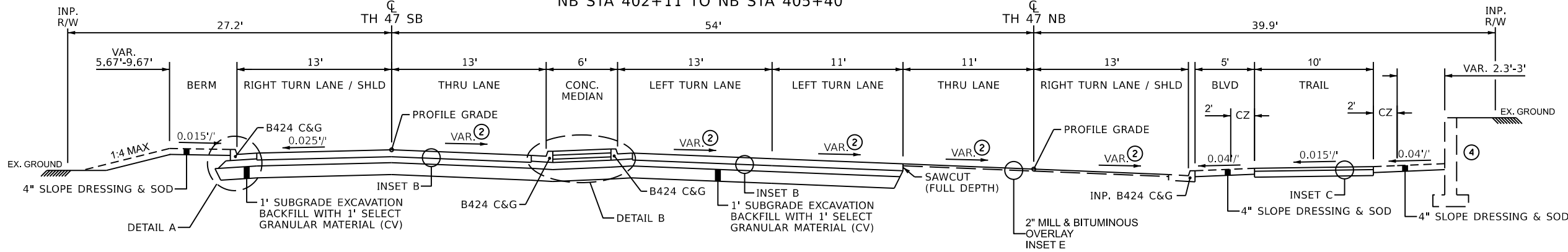


- GENERAL NOTES**
- UNLESS OTHERWISE SPECIFIED, THE SUBGRADE CROSS SLOPE WILL BE THE SAME AS THE FINISHED GRADE.
  - ALL UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE ROADWAY. THIS MATERIAL MAY BE PLACED ON DITCH BOTTOMS, BACK SLOPES, OR OUTSIDE A 1:1 SLOPE DOWN FROM THE OUTSIDE OF BITUMINOUS TRAIL AND/OR WALK PI.
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  - ALL EXISTING TOPSOIL SHALL BE SALVAGED AND 4" MINIMUM PLACED ON ALL AREAS DISTURBED BY CONSTRUCTION AND SHALL BE INCIDENTAL.
  - SEE SHEET 29 FOR INSETS AND DETAILS.
- NOTES**
- SEE SUPERELEVATION PLAN.
  - INPLACE RETAINING WALL FROM NB STA 399+83.48 TO NB STA 403+84.78.
  - SEE SHEET 35 FOR CROWN SHIFT AND VARIABLE DEPTH OVERLAY DETAIL.

TH 47 - TYPICAL 4  
NB STA 406+87 TO NB STA 412+65



TH 47 - TYPICAL 3  
NB STA 402+11 TO NB STA 405+40



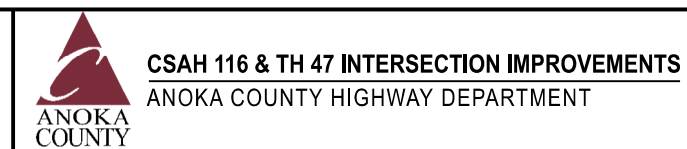
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Design By: NEH  
Plan By: AJF  
Checked By: NEH  
Approved By: NEH

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DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN

TYPICAL SECTIONS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
32  
OF  
206  
SHEETS



## CONSTRUCTION AND SOIL NOTES

1. SUITABLE GRADING MATERIAL ON THIS PROJECT, WHETHER OBTAINED LOCALLY OR FROM BORROW, SHALL CONSIST OF ALL SOILS EXCEPT THOSE SOILS LISTED IN NOTE BELOW. ALL SUITABLE GRADING MATERIAL SHOULD BE EITHER A UNIFORM SOIL TYPE OR SUFFICIENTLY MIXED AND BLENDED TO BE UNIFORM.
2. UNSUITABLE SOILS ARE DEFINED AS MARL, SILT, SILTY LOAM, PEAT, MUCK, TOPSOIL, AND OTHER ORGANIC SOILS WHICH DO NOT MEET, OR ARE NOT MANUFACTURED TO MEET, ANY OF THE ABOVE DEFINED CATEGORIES, AND ARE THEREFORE NOT REUSABLE. UNSUITABLE MATERIAL MAY NOT BE PLACED WITHIN A 1(V):1.5(H) SLOPE DOWNWARD AND OUTWARD FROM THE GRADING EMBANKMENT PI OR ABOVE THE ELEVATION OF THE SELECT GRANULAR SUBGRADE CORRECTION MATERIAL.
3. SELECT GRANULAR EMBANKMENT MOD 10% MATERIAL SHALL MEET THE REQUIREMENTS OF SPEC 3149 MODIFIED TO LESS THAN 10% PASSING THE 200 SIEVE.
4. OBTAIN COMPACTION ON PERMANENT GRADING PORTIONS OF CONSTRUCTION IN ACCORDANCE WITH THE "SPECIFIED DENSITY METHOD" REQUIREMENTS.
5. OBTAIN COMPACTION ON GRADING PORTIONS OF CONSTRUCTION IN ACCORDANCE WITH THE "QUALITY COMPACTION METHOD" REQUIREMENTS.
6. OBTAIN COMPACTION ON TRAIL & WALKWAY PORTIONS OF CONSTRUCTION IN ACCORDANCE WITH THE "QUALITY COMPACTION METHOD" REQUIREMENTS.
7. THE BOTTOM OF ALL EXCAVATION SHALL BE COMPACTED WITH A MINIMUM OF FOUR PASSES WITH AN APPROVED ROLLER. (INCIDENTAL)
8. IN ANY PROPOSED WIDENING CONSTRUCTION, THE CONTRACTOR SHALL STRIVE TO SUBSTANTIALLY MATCH THE SOILS INPLACE BELOW THE PROPOSED SUBCUT.
9. IN ANY CASE WHERE GRANULAR EMBANKMENTS OR BACKFILL JOIN PLASTIC SOIL EMBANKMENTS OR BACKFILL A 1(V):20(H) TAPER SHALL BE CONSTRUCTED SO THAT THE GRANULAR SOIL OVERLAYS THE PLASTIC SOIL.
10. AS A PRECAUTIONARY MEASURE FROM A SAFETY STANDPOINT, TRAFFIC LANES TO BE USED DURING CONSTRUCTION MUST BE DELINEATED TO KEEP VEHICLES A SAFE DISTANCE AWAY FROM THE ADJACENT EXCAVATIONS. THE DELINEATION SHOULD COINCIDE WITH POINTS ESTABLISHED BY PROJECTING A 1(V):2(H) OR FLATTER SLOPE BETWEEN THE EDGE OF THE TRAFFIC SURFACE AND THE BOTTOM OF THE EXCAVATION.
11. WHERE CONNECTING TO INPLACE ROADWAYS AT THE TERMINI OF PROPOSED NEW CONSTRUCTION, CUT VERTICALLY TO THE BOTTOM OF THE INPLACE SURFACING, THEN AT A 1(V):20(H) TAPER TO THE BOTTOM OF THE RECOMMENDED SUBGRADE EXCAVATION.
12. PROVIDE A UNIFORM TACK COAT BETWEEN ALL BITUMINOUS LAYERS AND PRIOR TO PLACING ANY BITUMINOUS MIXTURES ON EXISTING PAVEMENT. THE BITUMINOUS TACK COAT MATERIAL SHALL BE APPLIED AT A UNIFORM RATE OF 0.05 GAL/SQ YD BETWEEN BITUMINOUS LAYERS AND 0.07 TO 0.10 GAL/SQ YD ON CONCRETE OR MILLED BITUMINOUS SURFACES PRIOR TO BEING OVERLAID. PLACEMENT OF TACK COAT SHALL BE IN ACCORDANCE WITH SPECIFICATION 2357. PLACEMENT OF TACK COAT SHALL BE INCIDENTAL.
13. TEMPORARY EROSION CONTROL - TEMPORARY EROSION CONTROL DEVICES AND THEIR SUGGESTED LOCATIONS HAVE BEEN SHOWN IN THE PLANS ALONG WITH PAY ITEMS FOR THEIR USE. THIS DOES NOT HOWEVER RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO CONDUCT CONSTRUCTION IN A MANNER THAT WILL CONTROL EROSION. RESPONSIBILITY FOR CONTROLLING EROSION AND MAINTENANCE OF EROSION CONTROL IS AS SET IN MN/DOT SPECIFICATION 1717, 1803, 2101, 2105, 2573, 2575, AND IS AMENDED BY THE SPECIAL PROVISIONS.
14. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE OWNERS THE REMOVAL AND REINSTALLATION OF ALL MISCELLANEOUS STRUCTURES WITHIN THE PROJECT LIMITS, SUCH AS BUS BENCHES, PRIVATE SIGNS, GARBAGE PICKUPS, MAILBOXES, ETC. (INCIDENTAL)
15. THE CONTRACTOR SHALL NOTIFY THE ANOKA COUNTY SURVEYOR AND MN/DOT SURVEYOR PRIOR TO DISTURBANCE OF ANY MONUMENTATION.
16. UNSUITABLE GRADING MATERIAL MAY BE PLACED OUTSIDE OF A 1(V):1.5(H) SLOPE EXTENDING DOWNWARD AND OUTWARD FROM THE BERM PI UNLESS OTHERWISE SHOWN IN THE CROSS SECTION.
17. THE CONSTRUCTION LIMITS AS SHOWN IN THE PLANS REPRESENT THE POINT OF INTERSECTION BETWEEN THE REQUIRED FILL OR CUT SLOPE AND THE EXISTING GROUND LINE AS DEPICTED IN THE CROSS SECTIONS. THE CONSTRUCTION LIMITS DO NOT INCLUDE AREAS REQUIRED FOR SLOPE ROUNDING.
18. DO NOT USE A NUCLEAR GAUGE TO DETERMINE DENSITY OR MOISTURE CONTENT FOR QUALITY ASSURANCE OR VERIFICATION TESTING FOR ANY MATERIALS MEETING MN/DOT 2105, 2106, 2112, 2211, 2212, 2215, 2118, 2221, 2331, 2451, 2502, OR 2511. USE OF A NUCLEAR GAUGE FOR QUALITY CONTROL TESTING IS ALLOWED ACCORDING TO THE GRADING & BASE MANUAL.

## GENERAL NOTES

1. EXCAVATION FOR PROPOSED SIDEWALK AND TRAIL CONSTRUCTION SHALL BE PAID AS COMMON EXCAVATION AND SUBGRADE EXCAVATION.
2. REMOVE OR CONTROL ALL NOXIOUS WEEDS LOCATED IN AREAS WHERE TURF OR OTHER VEGETATION WILL BE DISTURBED. DISTURBANCE OF TURF INCLUDES FOOT AND VEHICLE TRAFFIC, EQUIPMENT MOVING, AND MATERIAL STORAGE ATOP PLANTS. PLACE FENCE OR OTHER SUITABLE, IMPENETRABLE BARRIER AROUND THE PERIMETER OF AREAS WITH NOXIOUS WEEDS THAT ARE NOT SUBJECT TO DISTURBANCE TO ENSURE THOSE AREAS REMAIN UNDISTURBED (INCIDENTAL) AND THUS DO NOT NEED TO BE TREATED. ALL NOXIOUS WEEDS DISTURBED ARE TO BE REMOVED AND TREATED IN ACCORDANCE WITH MINNESOTA DEPARTMENT OF AGRICULTURE RECOMMENDATIONS (INCIDENTAL). NOXIOUS WEEDS IDENTIFIED WITHIN IN THE PROJECT AREA ARE REED CANARY GRASS AND COMMON BUCKTHORN.

THE FOLLOWING STANDARD PLATES AS APPROVED BY THE FHWA SHALL APPLY ON THIS PROJECT.

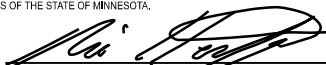
### MNDOT STANDARD PLATES

PLATE NO.	DESCRIPTION
3000M	REINFORCED CONCRETE PIPE (6 SHEETS)
3006H	GASKET JOINT FOR R.C. PIPE (2 SHEETS)
3007F	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES
3014K	REINFORCED CONCRETE PIPE ARCH (2 SHEETS)
3100G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3145G	CONCRETE PIPE OR PRECAST BOX CULVERT TIES
4006L	MANHOLE OR CATCH BASIN PRECAST - DESIGNS G AND H
4011E	PRECAST CONCRETE BASE
4020J	MANHOLE OR CATCH BASIN (FOR USE WITH OR WITHOUT TRAFFIC LOADS) (2 SHEETS)
4022A	MANHOLE OR CATCH BASIN COVER (3 FT. X 2 FT. OPENING)
4101D	RING CASTING FOR MANHOLE OR CATCH BASIN
4110F	COVER CASTING FOR MANHOLE (FOR USE IN ALL TRAFFIC AREAS) - CASTING NO. 715 AND 716
4129G	CATCH BASIN FRAME CASTING (FOR SQUARE GRATE) - CASTING NO. 802A
4132G	CATCH BASIN FRAME CASTING (FOR SQUARE GRATE) - CASTING NO. 805
4143E	STOOL GRATE & CONCRETE FRAME (MEDIAN DRAINS) - CASTING NO. 731
4154B	CATCH BASIN GRATE CASTING - CASTING NO. 816
4180J	MANHOLE OR CATCH BASIN STEP
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 - TYPE A, B, C (3 SHEETS)
8150C	INSTALLATION OF CULVERT MARKERS
8318C	GUARDRAIL ANCHORAGE PLATE FOR BRIDGES AND BCT'S
8350A	THRIE BEAM ANCHORAGE PLATE
8352B	THRIE BEAM WEDGE PLATE FOR SINGLE SLOPE BARRIER
8357A	THRIE BEAM GUARDRAIL
8360B	GUARDRAIL POST LENGTH MARKING
8361A	GUARDRAIL STEEL POST (3 SHEETS)
8369A	GUARDRAIL BLOCKOUT (2 SHEETS)

SEE SHEET 187 FOR ADDITIONAL STANDARD PLATES.

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Design By:	NEH	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.   CERTIFIED BY: _____ LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE DATE: 8/25/2020 LICENSE NO. 44620
Plan By:	AJF	
Checked By:	NEH	
Approved By:	NEH	



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

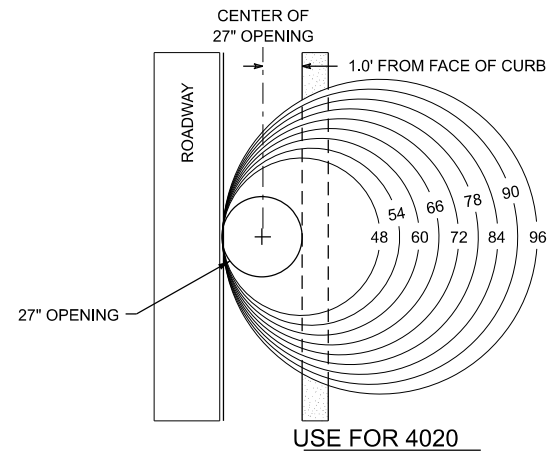
CONSTRUCTION NOTES & STANDARD PLATES  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
33  
OF  
206  
SHEETS

TABLE A

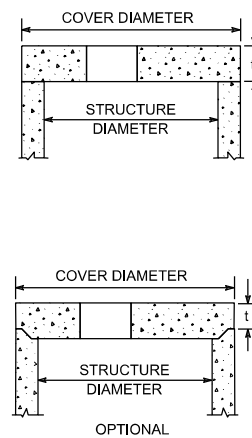
4020 DIAMETER	*OFFSET FEET
48"	0.79
54"	1.08
60"	1.29
66"	1.58
72"	1.79
78"	2.08
84"	2.29
90"	2.58
96"	2.88
102"	3.17
108"	3.29
120"	3.79

WHERE THE 4020 DIAMETER CONFLICTS WITH OTHER STRUCTURES OR UTILITIES, ROTATE THE STRUCTURE 180 DEGREES TO PROVIDE CLEARANCE. THIS MAY BE ADJUSTED IN THE FIELD.  
\* OFFSET IS FROM CENTER OF STRUCTURE TO CENTER OF OPENING.



- THE FOLLOWING PLACEMENT LOCATIONS SHALL BE USED WITH CONCRETE CURB AND GUTTER.
- THE CENTER OF GRATE STATION AND OFFSET LOCATION IS GIVEN IN THE DRAINAGE TABULATION
  - THE OFFSET FROM THE CENTER OF STRUCTURE TO THE CENTER OF GRATE IS GIVEN IN TABLE "A" TO THE LEFT FOR 4020 STRUCTURES. OFFSET FOR 4005 STRUCTURES IS 0.9 FT.
  - THE CENTER OF OPENING IS 1.0' TOWARD THE ROADWAY FROM THE FACE OF CURB.
  - THE STRUCTURES THAT HAVE STEPS SHALL BE LOCATED ON THE ROADSIDE OF THE 27" OPENING AND MUST BE EASILY ACCESSIBLE. THE STEP LOCATION MAY NEED TO BE ADJUSTED IF THERE IS A LARGE PIPE DIRECTLY BELOW THE OPENING.

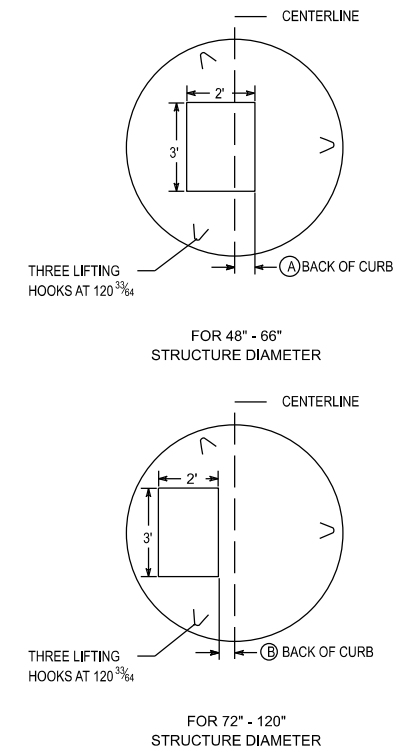
**4020 TOP SLAB STRUCTURE LOCATION**  
NO SCALE



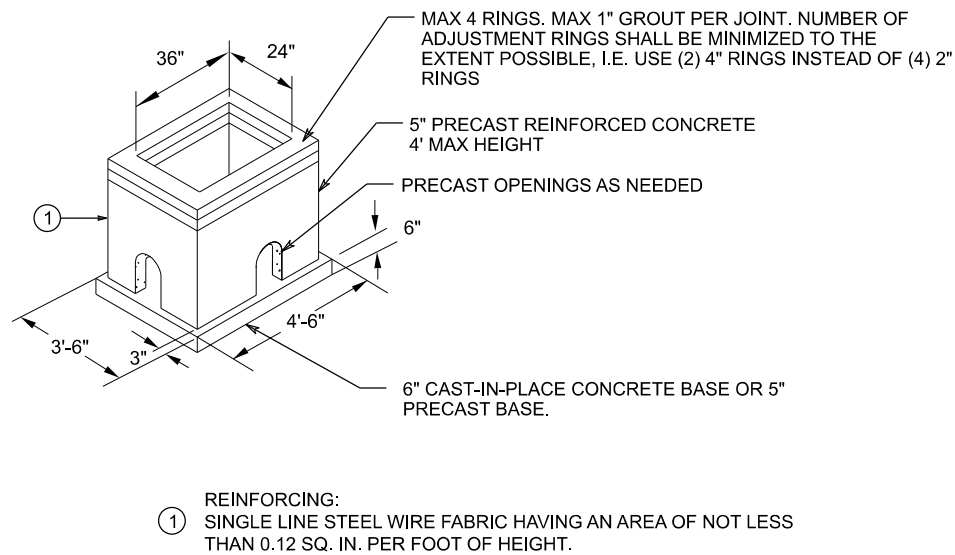
MANHOLE TOP SLAB WITH OFF-SET 2'X3' HOLE

STRUCTURE DIAMETER (IN)	COVER DIAMETER (IN)	MINIMUM t (IN)	A (IN)	B (IN)	WEIGHT OF COVER (LBS)
48	58	6.0	9.0		930
54	65	8.0	6.0		1710
60	72	8.0	3.0		2230
66	79	8.0	0.0		2810
72	86	8.0		3.0	3440
78	93	8.0		6.0	4120
84	100	8.0		9.0	4860
90	108	8.0		12.0	5760
96	114	8.0		15.0	6490
102	120	8.0		18.0	7260
108	126	12.0		21.0	12100
120	144	12.0		24.0	16100

**RECTANGULAR OPENING LOCATION**  
NO SCALE

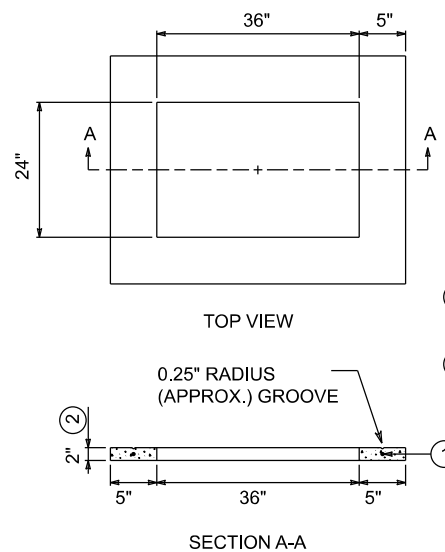


**4022 TOP SLAB WITH RECTANGULAR OPENING**  
NO SCALE



- NOTES:
- NO LIFT HOLES ARE ALLOWED.
  - GROUT STRUCTURE BOTTOM TO SLOPE TOWARDS OUTLET PIPE INVERT.

**CONSTRUCT DRAINAGE STRUCTURE DESIGN SPEC 1**  
NO SCALE

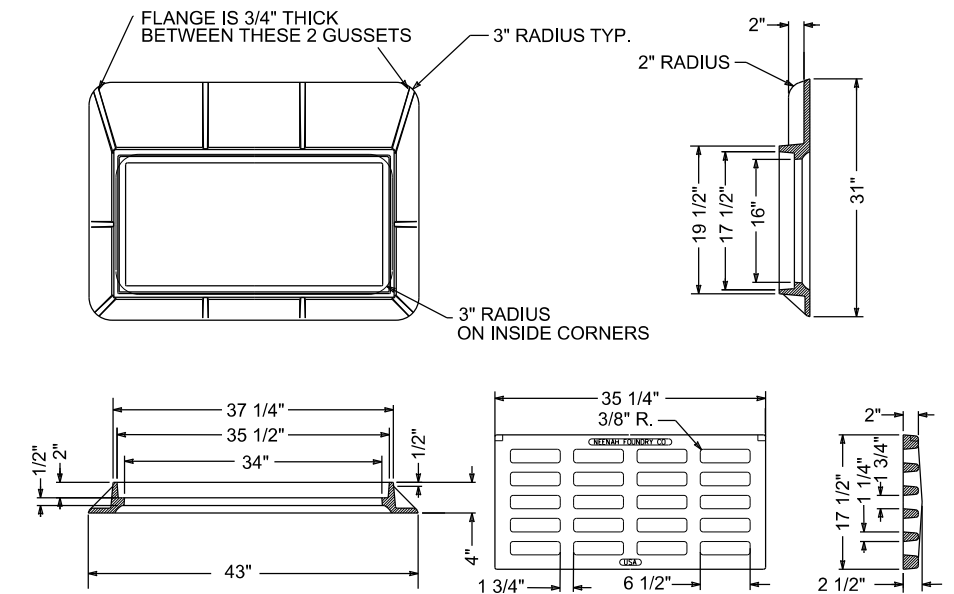


- REINFORCING: A SINGLE RECTANGLE OF 8 GAGE STEEL WIRE.
- VARIABLE THICKNESS, 2" MINIMUM TO 6" MAXIMUM.

NOTES:

- ON CONSTRUCTION OF NEW DRAINAGE STRUCTURES, THE NUMBER OF ADJUSTING RINGS USED PER CATCH BASIN SHALL BE LIMITED TO PROVIDE A MAXIMUM THICKNESS OF 6" INCLUDING MORTAR THICKNESS (6" RING IS NOT ALLOWED ON NEW CONSTRUCTION).
- CONCRETE RINGS MUST BE ENCASED IN MORTAR, SEE MNDOT STANDARD PLATE 4026.
- CONCRETE ADJUSTMENT RINGS ARE INCLUSIVE TO DRAINAGE STRUCTURE PAY ITEM.

**2' X 3' CONCRETE ADJUSTMENT RINGS**  
NO SCALE



**RECTANGULAR CASTING ASSEMBLY (TYPE C-1)**  
NO SCALE

DATE: 8/25/2020 2:03:51 PM PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\4652-000\_ded01.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
Plan By: MJS  
Checked By: LGR  
Approved By: EAE

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

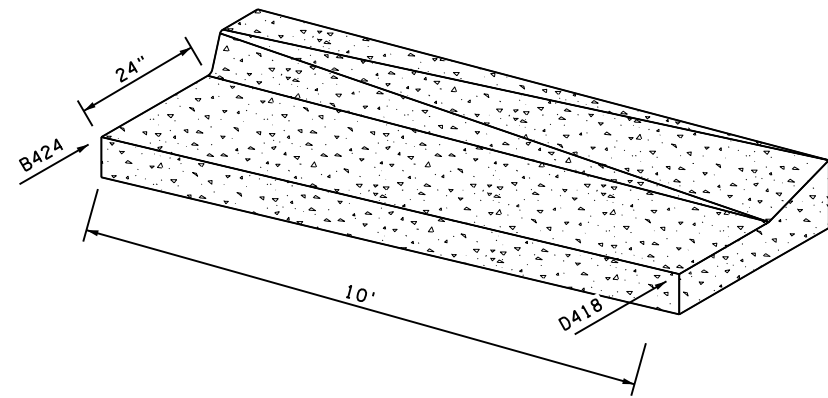
CERTIFIED BY: *[Signature]*  
LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
DATE: 8/25/2020 LICENSE NO. 44235



ANOKA COUNTY, MN

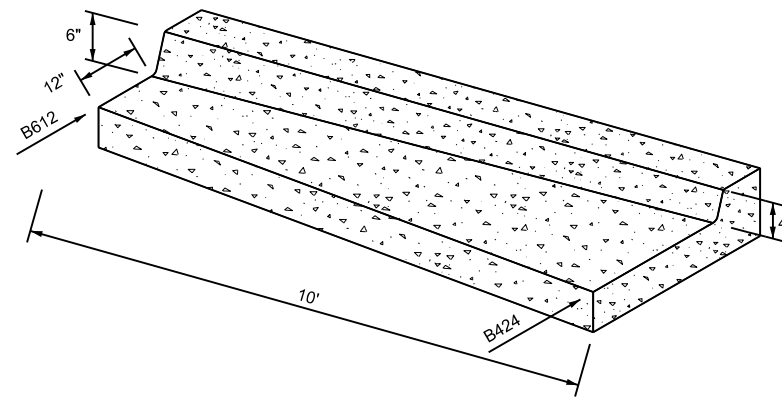
MISCELLANEOUS DETAILS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 34 OF 206 SHEETS



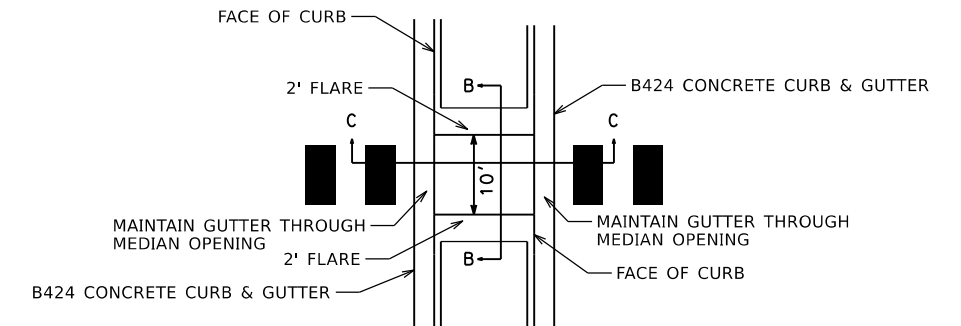
FOR OTHER DIMENSIONS SEE STANDARD PLATE NO. 7100H AND NO. 7102K  
 PAYMENT SHALL BE MADE AS B424 C&G BY THE FOOT

**B424 TO D418 CURB & GUTTER TRANSITION TAPER**  
 NOT TO SCALE

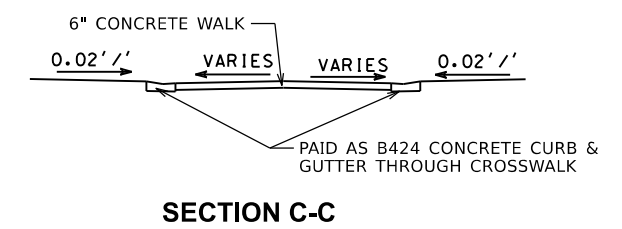
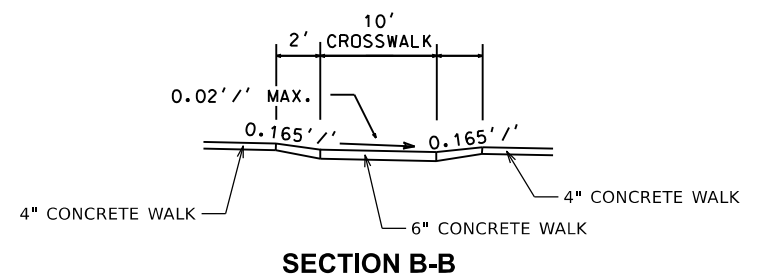
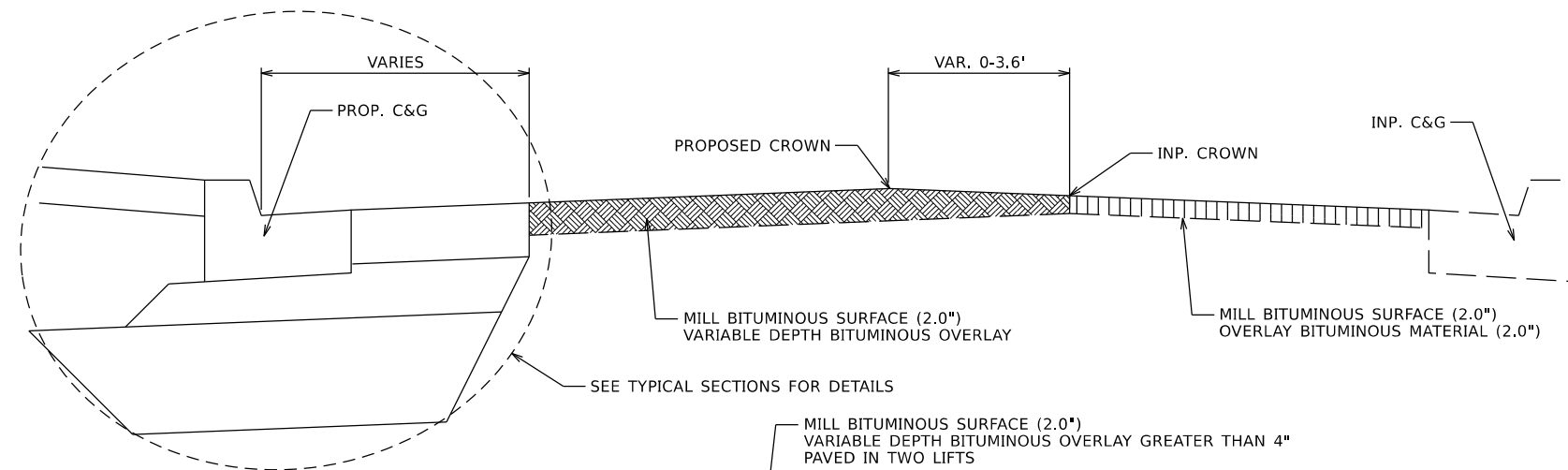


FOR OTHER DIMENSIONS SEE STANDARD PLATE NO. 7100H  
 PAYMENT SHALL BE MADE AS B424 C&G BY THE FOOT

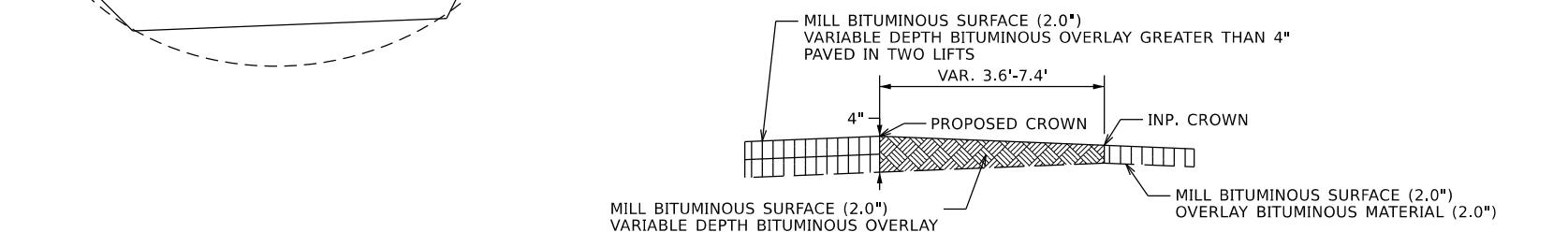
**B424 TO B612 CURB & GUTTER TRANSITION TAPER**  
 NOT TO SCALE



NOTES:  
 1. CROSSING TO BE PAID AS 6" CONCRETE WALK.



**DEPRESSED MEDIAN PEDESTRIAN REFUGE AT CROSSWALK**  
 NOT TO SCALE



**DETAIL A**

VARIABLE DEPTH BITUMINOUS OVERLAY

IF THE VARIABLE DEPTH OVERLAY IS GREATER THAN 4 IN. THE PAVEMENT SHALL BE PLACED IN 2 LIFTS. SEE DETAIL A.

PAYMENT SHALL BE MADE AS TYPE SP 12.5 WEARING COURSE MIXTURE (4,F) BY THE TON

**VARIABLE DEPTH BITUMINOUS OVERLAY**

NOT TO SCALE

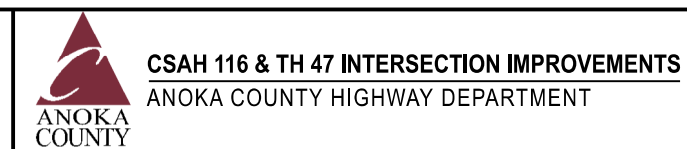
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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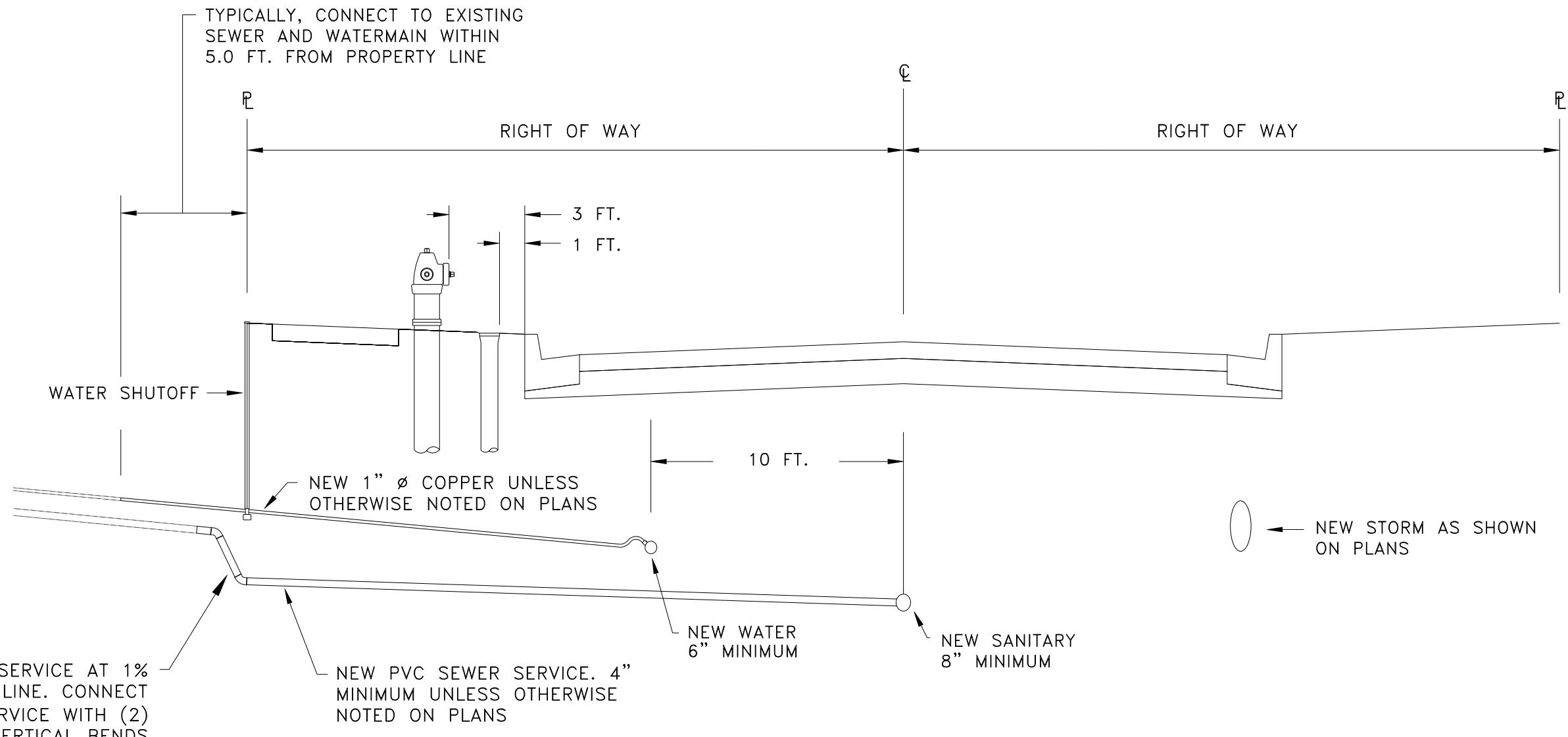
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN

MISCELLANEOUS DETAILS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 35  
 OF  
 206  
 SHEETS



EXTEND NEW SANITARY SERVICE AT 1% GRADE TO PROPERTY LINE. CONNECT TO EXISTING SEWER SERVICE WITH (2) 45° PVC VERTICAL BENDS

NEW PVC SEWER SERVICE. 4" MINIMUM UNLESS OTHERWISE NOTED ON PLANS

### CITY OF ANOKA STANDARD UTILITY LOCATION

- SANITARY SEWER – ON ROAD CENTERLINE
- WATERMAIN – 10 FT. NORTH OR EAST
- STORM SEWER – SOUTH OR WEST OF CENTERLINE
- SIDEWALK – REPLACE EXISTING WITHIN PROJECT LIMITS

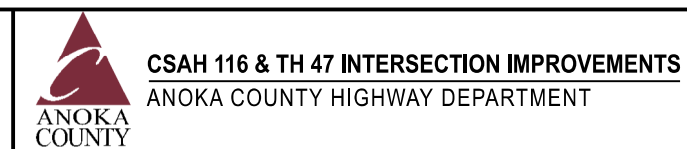
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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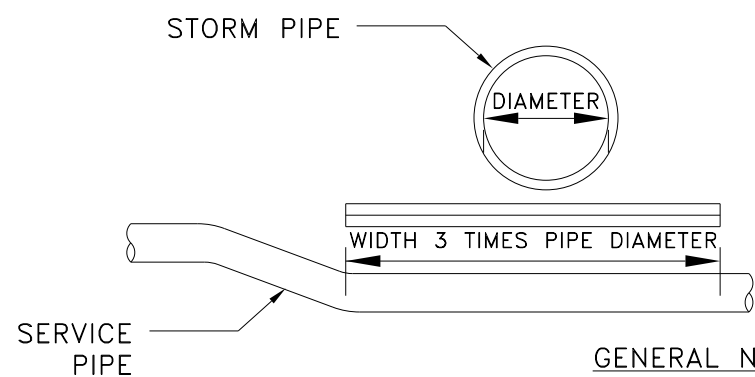
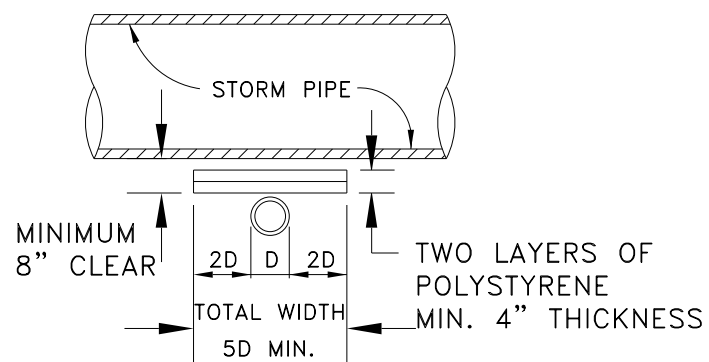
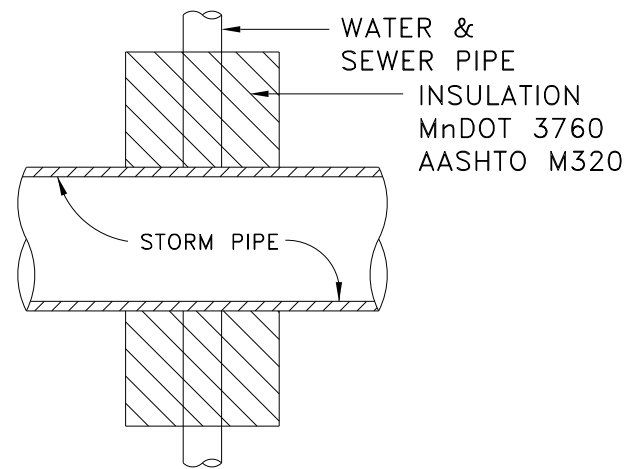
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
 DATE: **8/25/2020** LICENSE NO. **44620**



**ANOKA COUNTY, MN**

MISCELLANEOUS DETAILS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

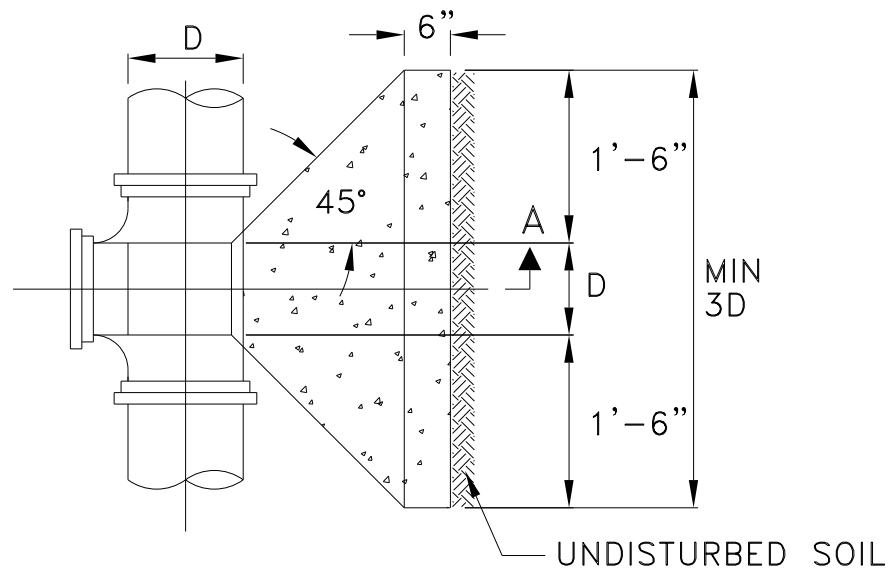
SHEET  
36  
OF  
206  
SHEETS



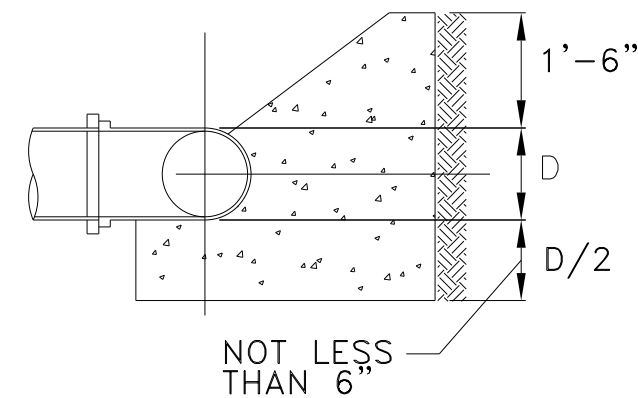
GENERAL NOTE  
 LOWER EXISTING  
 SERVICE IF LESS  
 THAN 8" CLEAR  
 LOWER TO 12"  
 CLEAR & INSULATE

**PIPE CROSSING INSULATION**

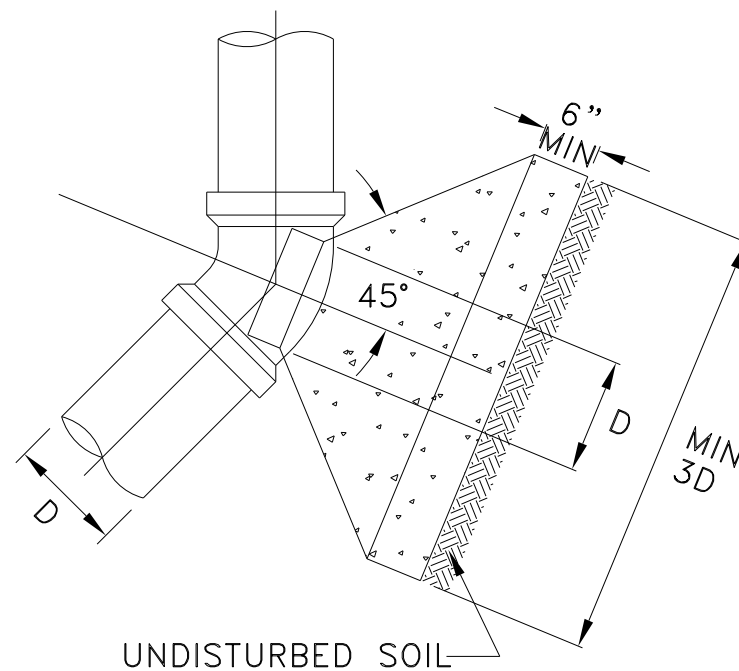
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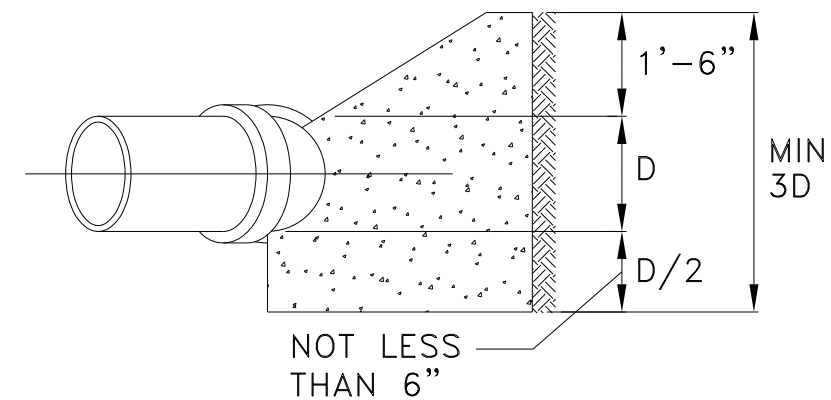
**PLAN TEE**



**SECTION TEE**



**PLAN 45° OR 22.5° BEND**



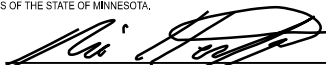
**SECTION 45° OR 22.5° BEND**

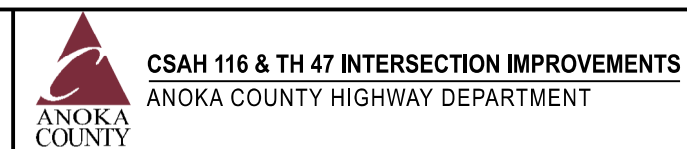
**WATER MAIN THRUST BLOCKING DETAIL**

NO SCALE

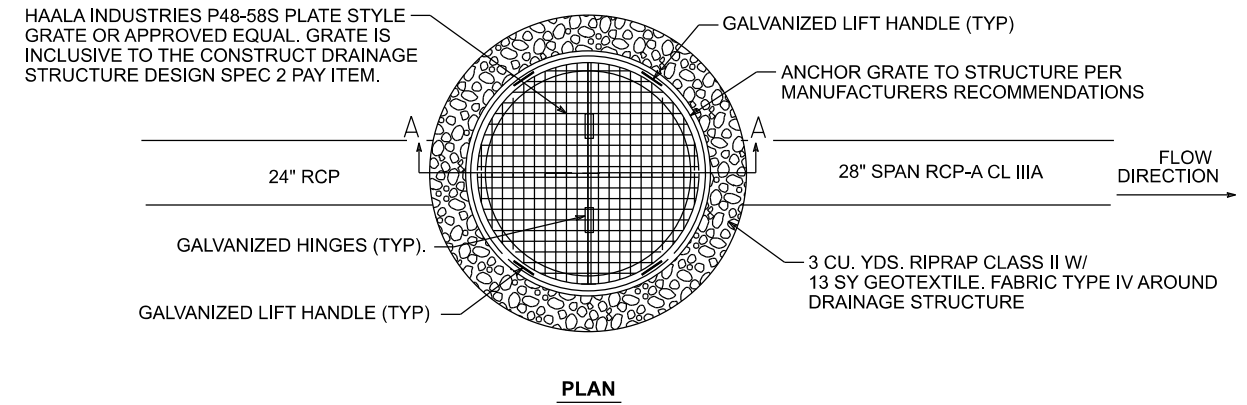
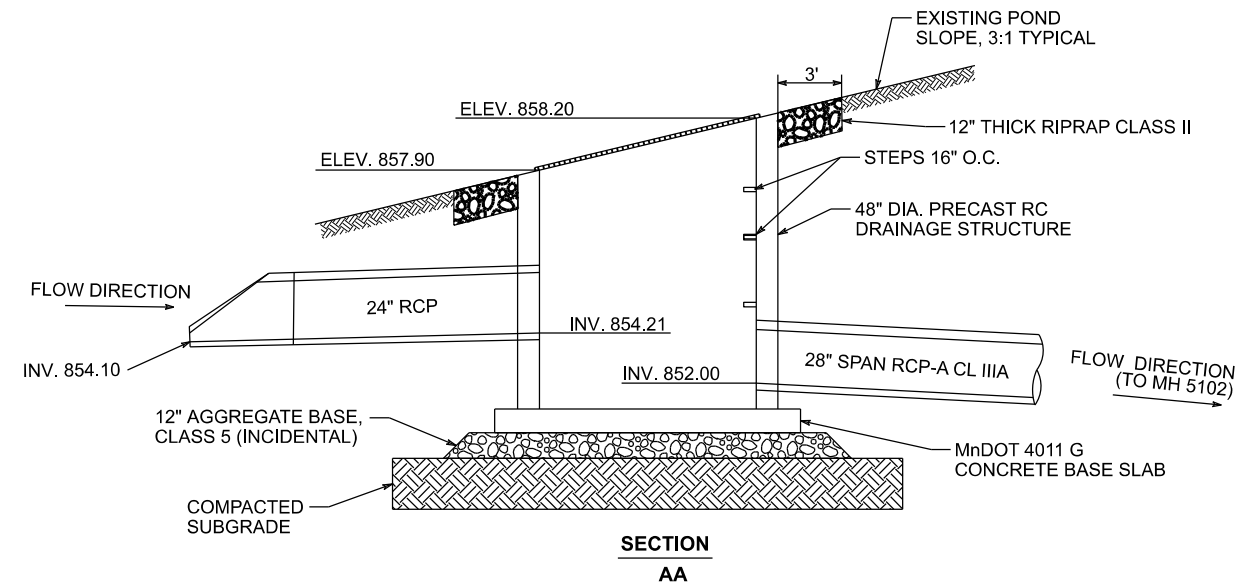
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NO.	DATE	BY	CHK	REVISIONS

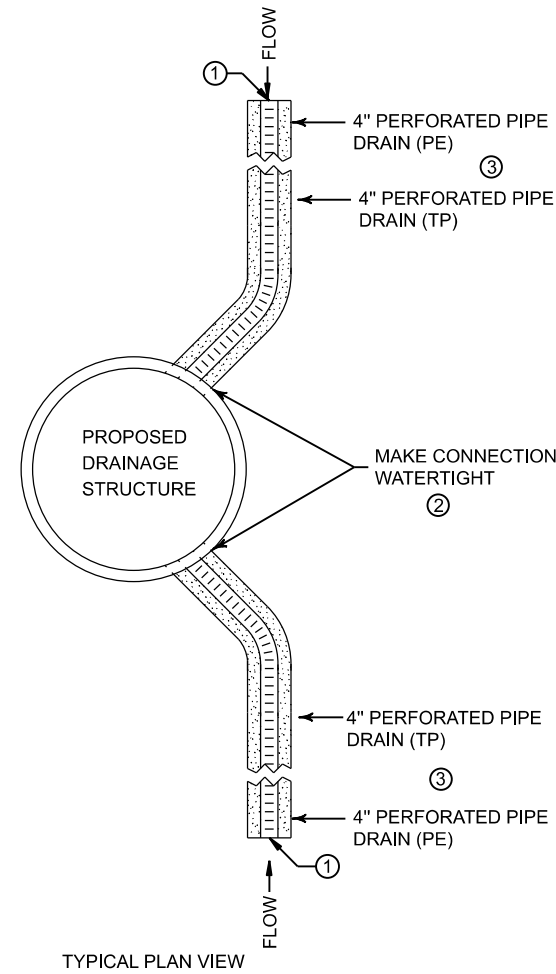
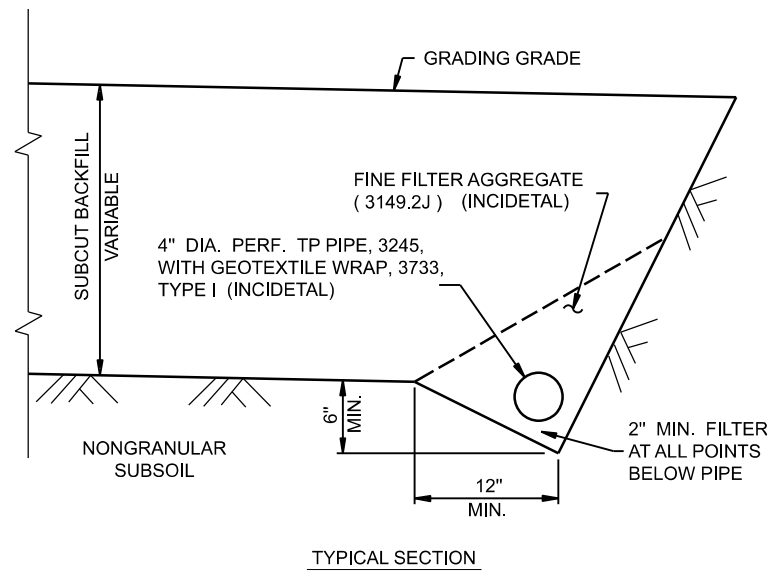
Design By: NEH	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY: NICHOLAS E. HENTGES, PE LICENSED PROFESSIONAL ENGINEER DATE: 8/25/2020 LICENSE NO. 44620
Plan By: AJF	
Checked By: NEH	
Approved By: NEH	



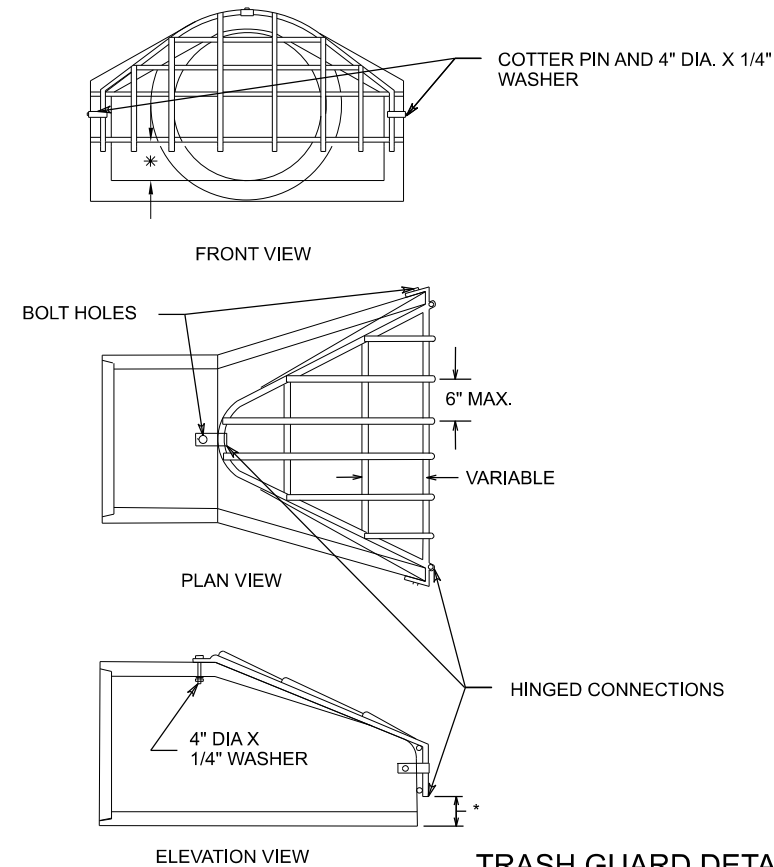
ANOKA COUNTY, MN	SHEET 37 OF 206 SHEETS
MISCELLANEOUS DETAILS S.P. 0206-78 (TH 47), S.A.P. 002-716-020	



**CONSTRUCT DRAINAGE STRUCTURE DESIGN SPEC 2 (STRUCTURE NO. 5101)**  
NO SCALE



**SUBSURFACE DRAINAGE DETAIL (4" PERF PIPE DRAIN)**  
NO SCALE



- NOTES:**
- AFTER FABRICATION - HOT DIP GALVANIZE PER MNDOT 3392 OR ASTM-A153 OR ELECTROPLATE PER ASTM-A164 USE STANDARD CARBON STRUCTURAL STEEL.
  - NUTS AND BOLTS ARE TO BE GALVANIZED.

- \* INLET PIPES**
- 6" MIN OPENING FOR ROUND PIPE SIZES 21" AND SMALLER
  - 8" MIN OPENING FOR ROUND PIPE SIZES 24" AND GREATER

	PIPE SIZE	HOLE DIA. REQ'D	BOLT DIA.	BAR SIZE
ROUND	12"-24"	3/4"	5/8"	5/8"

- NOTES:**
- THE UPSTREAM ENDS OF THE PERFORATED TUBING SHALL BE CAPPED AS APPROVED BY THE PROJECT ENGINEER, AND CAPS SHALL BE INCLUDED IN THE PRICE OF 4" PERFORATED TP PIPE DRAIN.
  - DETAILS OF CONNECTION TO BE APPROVED BY THE ENGINEER. PAYMENT FOR CONNECTION SHALL BE INCIDENTAL.
  - TP PIPE DRAIN TO BE USED WITHIN 10' FEET OF CONNECTION. ALL PIPE DRAIN TO BE PAID FOR AS 4" PERFORATED TP PIPE DRAIN REGARDLESS OF TYPE.
  - PERFORATED PIPE DRAIN TO EXTEND 200 FEET (TYP.) EACH DIRECTION FROM LOW POINT. CONNECTION TO BE MADE TO LOW POINT DRAINAGE STRUCTURES.

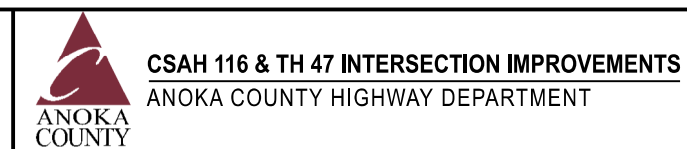
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
 DATE: 8/25/2020 LICENSE NO. 41235



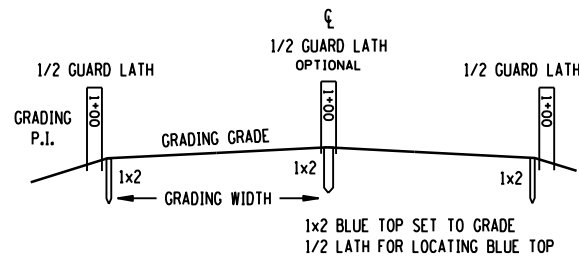
**ANOKA COUNTY, MN**

**MISCELLANEOUS DETAILS**  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

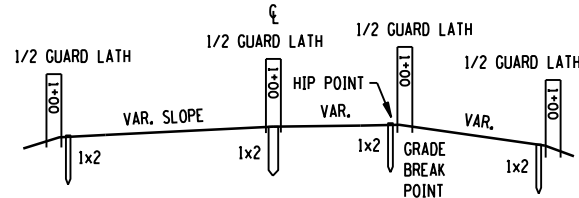
SHEET  
38  
OF  
206  
SHEETS

### BLUE TOPS

#### NORMAL SECTION

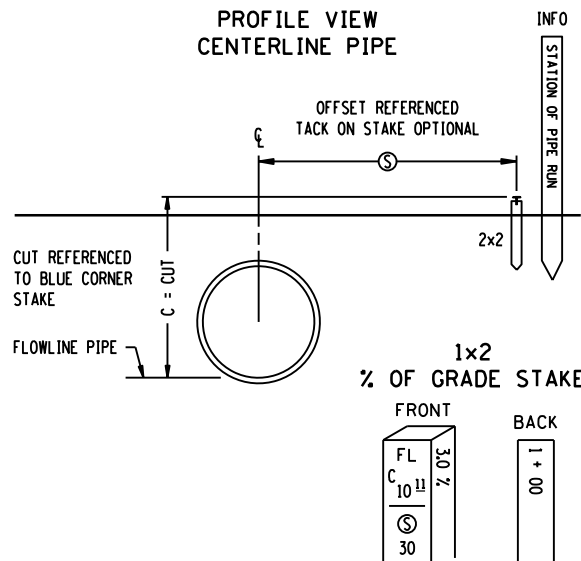


#### TRANSITION SECTION



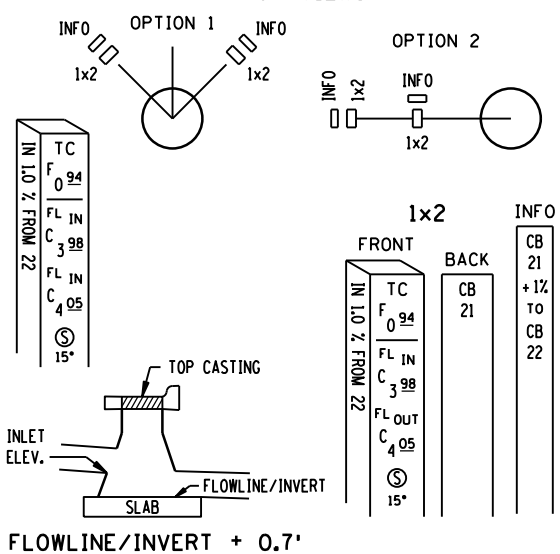
### PIPE STAKING

#### PROFILE VIEW CENTERLINE PIPE

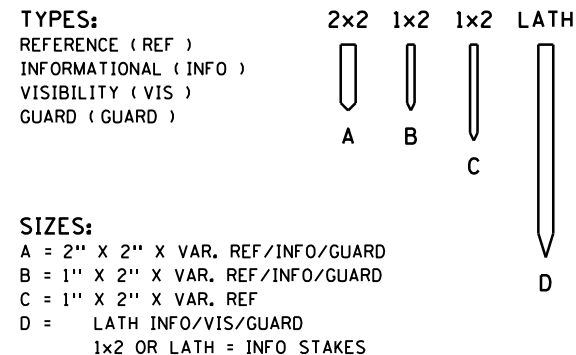


### CATCH BASIN OR MANHOLE (CB/MH)

#### TOP VIEWS



### STANDARD STAKES

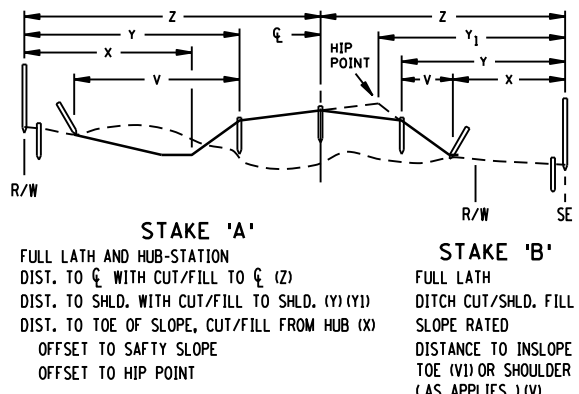


### ABBREVIATIONS

- BBL = BARREL (PIPE)
- B.C. = BACK CURB
- C & G = CURB & GUTTER
- C = CUT
- CAP = CORR. ALUM. PIPE
- CB = CATCH BASIN
- CL & GR = CLEAR & GRUB
- CMP = CORR. METAL PIPE
- COR = CORNER
- CR = CROWN
- CSP = CORR. STEEL PIPE
- CC = DITCH CUT
- D.E. = DRAINAGE EASEMENT
- DI = DROP INLET
- EB = EASTBOUND
- E.M. = EDGE BITUMINOUS MAT
- E.S. = EDGE CONCRETE SLAB
- F = FILL
- FF = FRONT FACE OR TOP CURB
- FL = FLOW LINE
- FL IN = FLOWLINE INLET
- FL OUT = FLOWLINE OUTLET
- GR = GRADE
- GW = GRADING WIDTH
- HH = HANDHOLE
- HP = HIP POINT
- LT = LEFT
- MH = MANHOLE
- NB = NORTHBOUND
- ⊕ = OFFSET
- PAR = PARCEL
- % = PERCENT GRADE
- P.E. = PERM. EASEMENT
- RAD = RADIUS POINT
- RCP = REINF. CONC. PIPE
- RP = REFERENCE POINT
- RSC = REINF. SECT. CONC.
- RT = RIGHT
- R/W = RIGHT OF WAY
- SB = SOUTHBOUND
- SCP = SECT. CONC. PIPE
- SH = SHOULDER
- TC = TOP CASTING
- T.E. = TEMP. EASEMENT
- 3:1 = SLOPE (EXAMPLE)
- WB = WESTBOUND
- WP = WORKING POINTS

### SLOPE STAKES

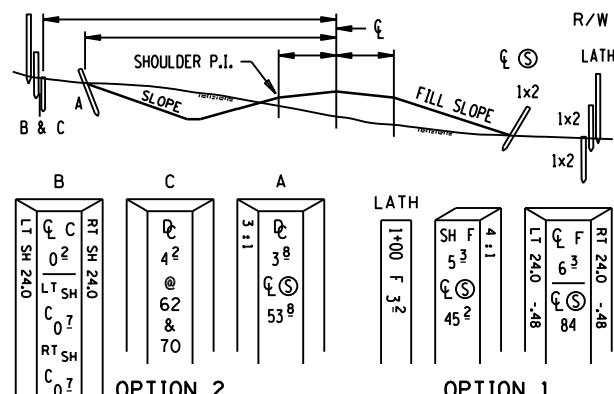
#### SINGLE ROADWAY - EXAMPLE 'A'



NOTE:  
BLUE TOPS REQUIRED ON CL AND BOTH SHOULDERS AT MINIMUM  
ALL CULVERTS TO BE STAKED  
MINIMUM DATA TO BE PROVIDED  
STAKE TO BOTTOM OF TOPSOIL

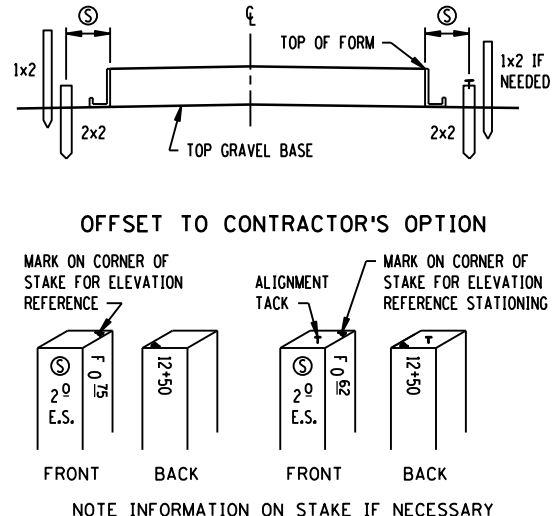
### SLOPE STAKES

#### SINGLE ROADWAY - EXAMPLE 'B'



NOTES: ALL SLOPE STAKE REFERENCE DISTANCES GIVEN FROM CL.  
STAKE TO BOTTOM OF TOP SOIL.  
KEY STAKES: BLUE TOP SET AT R/W BOUNDARY LT. & RT.  
MAY BE EXCEPTIONS TO SETTING STAKE ON R/W.

### CONCRETE PAVING STATIONARY FORM



NOTE INFORMATION ON STAKE IF NECESSARY

### RECOMMENDED STAKING INTERVALS

FIGURE A

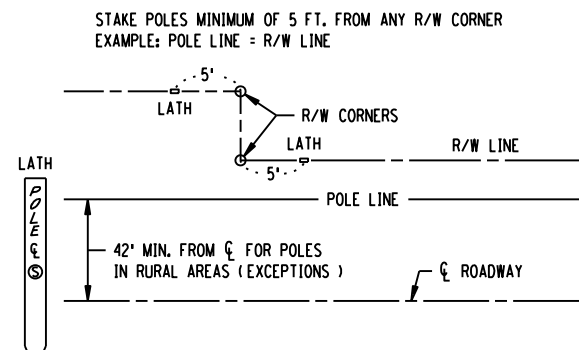
	SLOPE STAKES	SUB GRADE B.T.	CLASS MATERIAL B.T.	CONC PAVT	CL & GR LIMITS	MUCK EXC.	R/W	TEMP. EASE.	STAKING INTERVALS	
									HORIZONTAL	VERTICAL
TANGENT	100	100	100	50	50	ALL CORNERS	100	ALL CORNERS	ALL CORNERS	
HORIZ. CURVE										
0 - 3'	100	100	100	50	50	ALL CORNERS	100	ALL CORNERS	ALL CORNERS	
OVER 3' -	100	50	50	25	25	ALL CORNERS	100	ALL CORNERS	ALL CORNERS	
VERT. CURVE										
'M' 100' CHORD	100	100	100	50	50					
0 - .25										
'M' OVER .25	100	50	50	25	25					
TRAN.		50	50							

### STAKING TOLERANCES ( FEET )

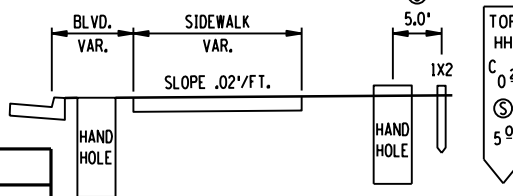
	HORIZONTAL	VERTICAL
CONSTRUCTION LIMITS	± 1.5	
CLEARING & GRUBBING	2.0	
SLOPES STAKES	2.0	± 0.2
KEY STAKES	0.2	0.03
DRAINAGE STAKES	0.05	0.05
CURB & GUTTER	0.07	0.03
PAVING	0.05	0.03
ALIGNMENT	0.07	
UTILITY	0.10	0.05
STRUCTURAL	0.02	0.02
GUARD RAIL	0.5	
BUILDINGS	0.04	
O.H. SIGNS	0.05	0.05
MUCK EXCAVATION LIMITS	2.0	
R/W B-POINTS	0.10	
NOISE WALLS	1.0	0.5

THE TOLERANCES ARE RELATIVE TO PROJECT DATUM

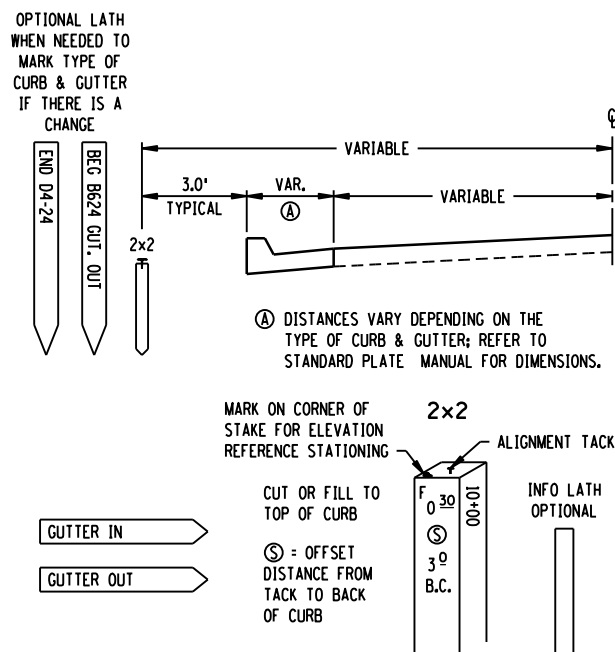
### UTILITY (UTIL)



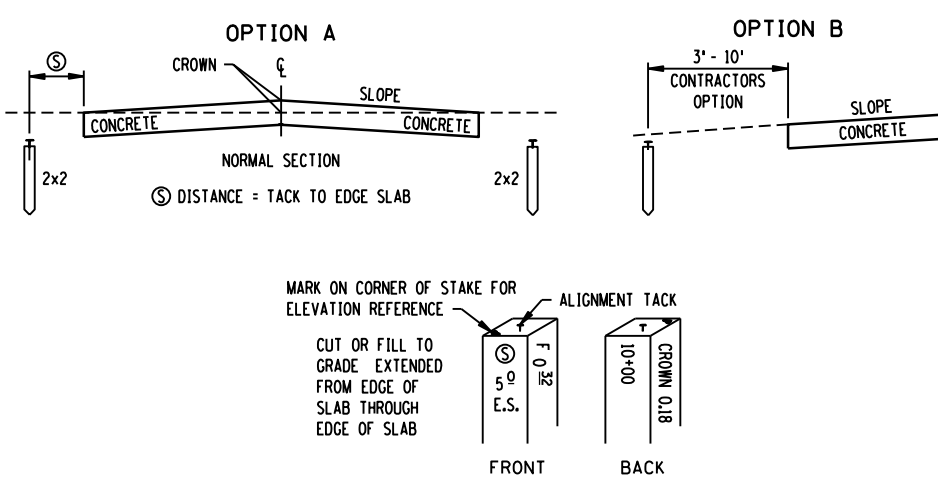
### PULL BOX OR HAND HOLE



### CURB & GUTTER (CURB)



### CONCRETE PAVING - SLIP FORM



### DISCLAIMER

THESE STAKING INFORMATION SHEETS ARE FOR INFORMATION PURPOSES ONLY. STAKING PROCEDURES VARY AND MAY BE SUBJECT TO CHANGE DURING CONSTRUCTION BY CIRCUMSTANCES AND/OR AGREEMENTS BETWEEN SURVEY CREW AND CONTRACTOR.

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PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_spr01

REVISION:  
APPROVED: 8-6-2014  
Director, Office of Land Management



STANDARD PLAN 5-297.115

1 OF 2

STATE DESIGN ENGINEER

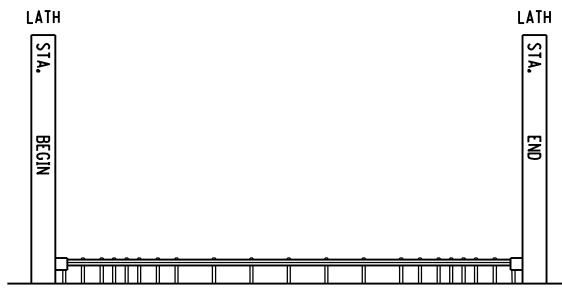
APPROVED: 8-6-2014  
REVISED:

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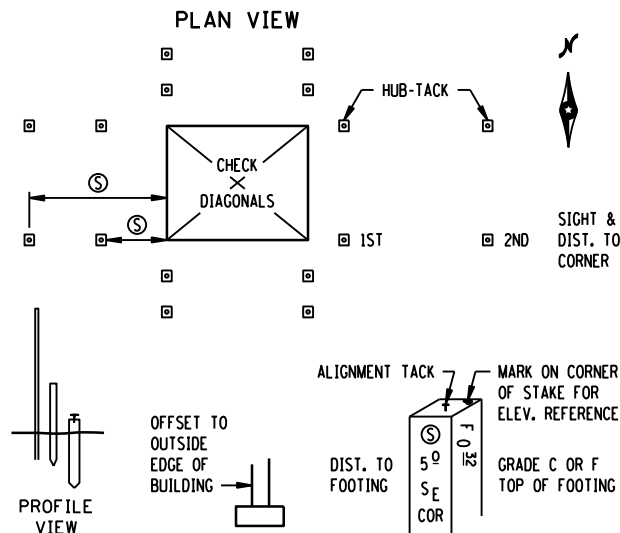
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 39 OF 206 SHEETS

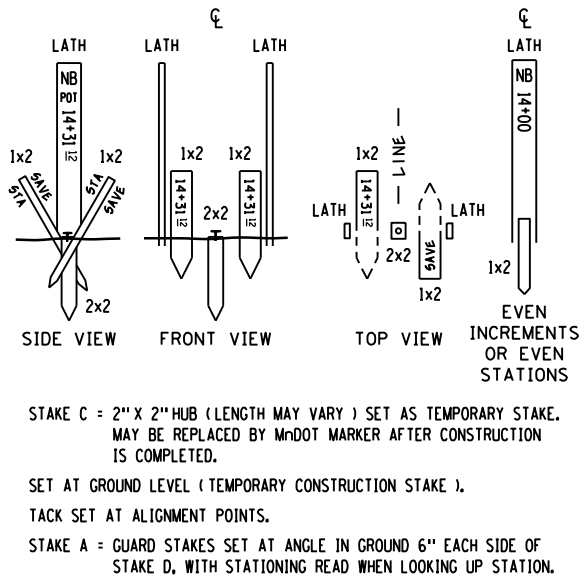
**GUARDRAIL ( GUARD )**



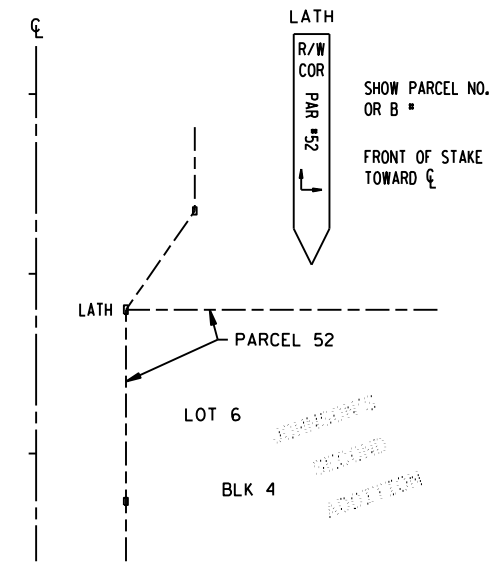
**BUILDING ( BUILD )  
FOUNDATION / FOOTING**



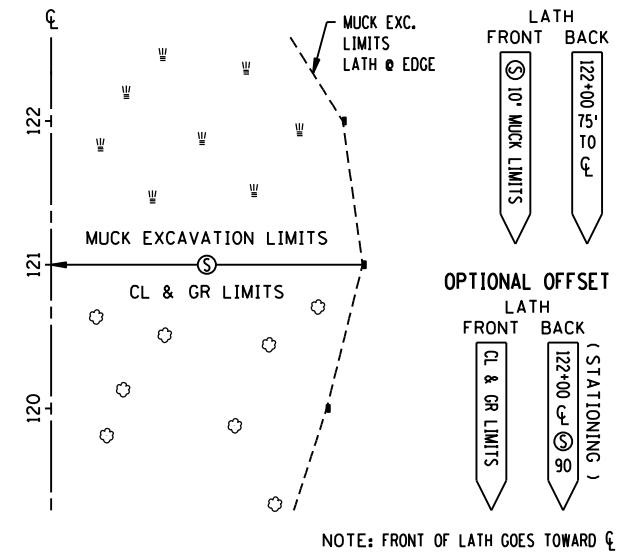
**ALIGNMENT POINTS ( ALIGN )**



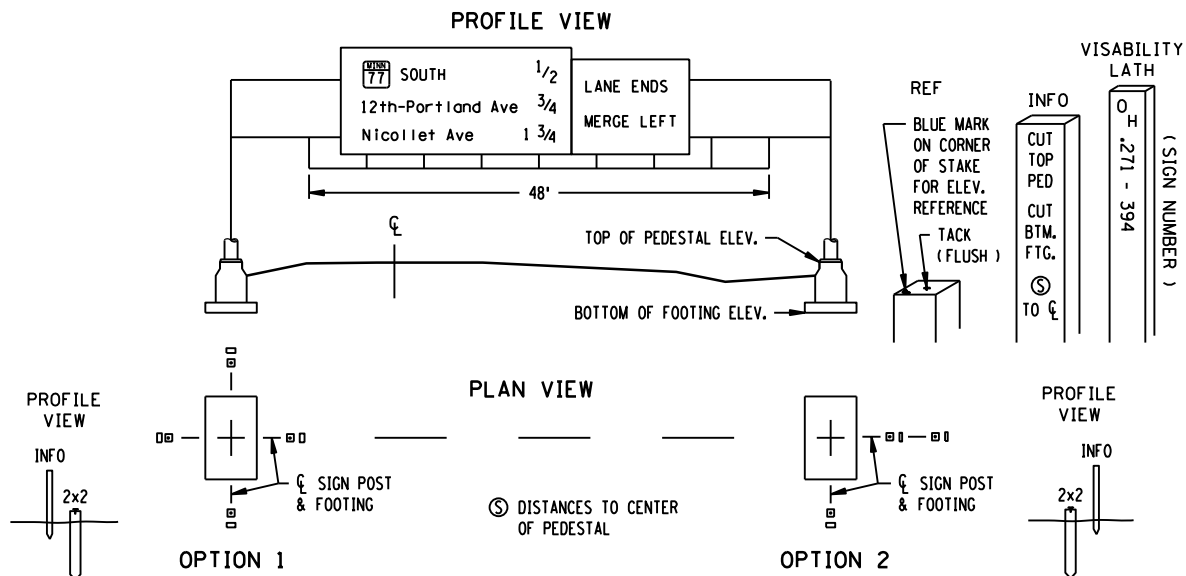
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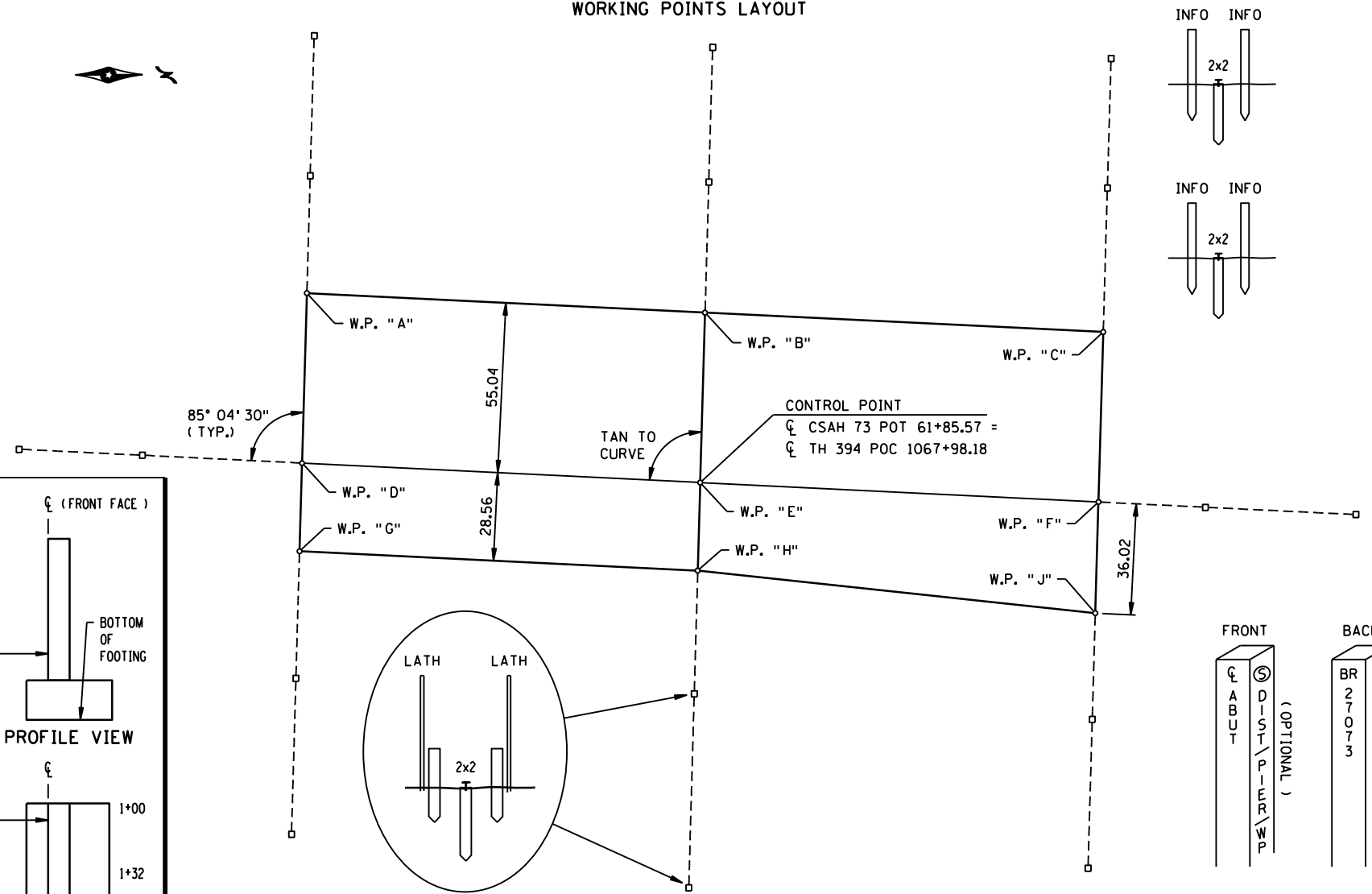
**CLEAR & GRUBBING LIMITS ( CLEAR )  
OR MUCK EXCAVATION LIMITS ( MUCK )**



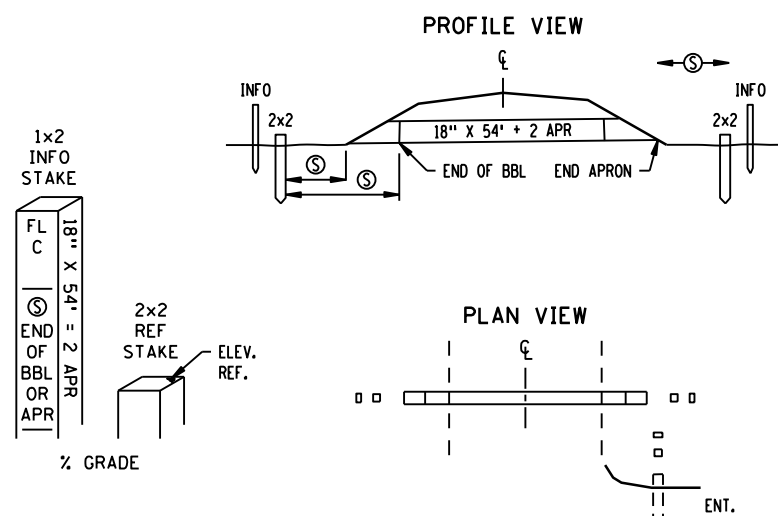
**OVERHEAD SIGNS ( SIGN )**



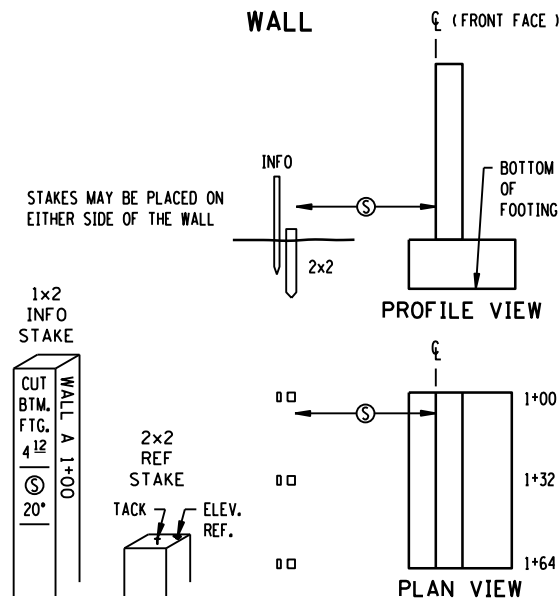
**BRIDGESTAKING ( BRIDGE )  
WORKING POINTS LAYOUT**



**CULVERT**



**WALL**



REVISION:  
APPROVED: 8-6-2014  
*By [Signature]*  
DIRECTOR, OFFICE OF LAND MANAGEMENT



STANDARD PLAN 5-297.115

2 OF 2

APPROVED: 8-6-2014  
REVISED:

*Christopher Ry*  
STATE DESIGN ENGINEER

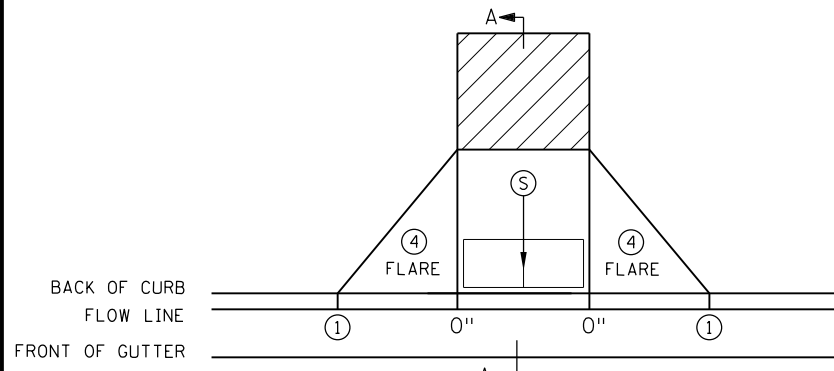
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

**STAKING INFORMATION SHEET**

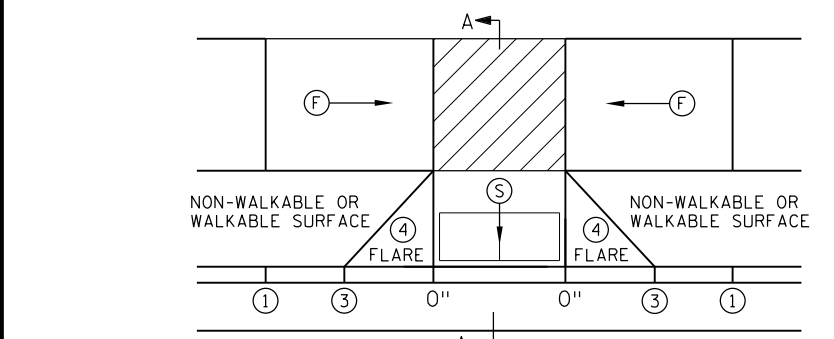
SHEET 40 OF 206 SHEETS

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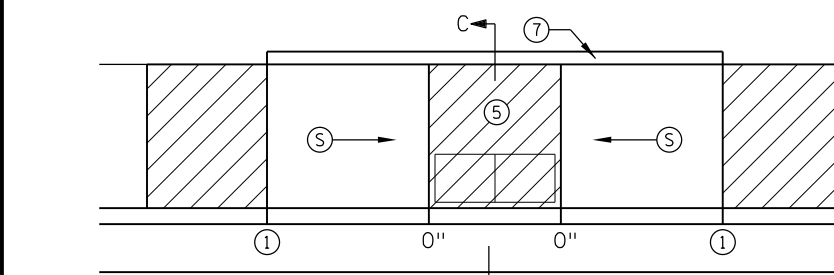




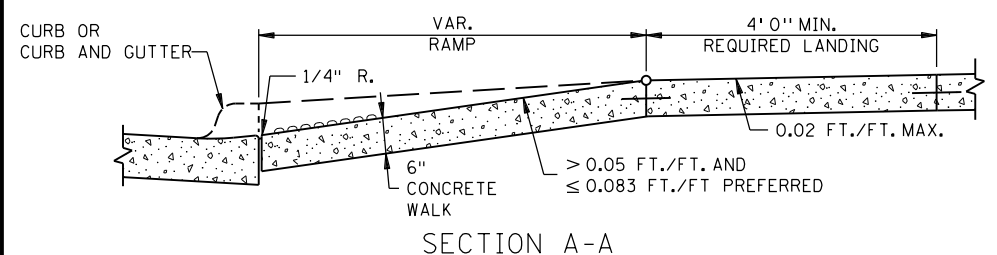
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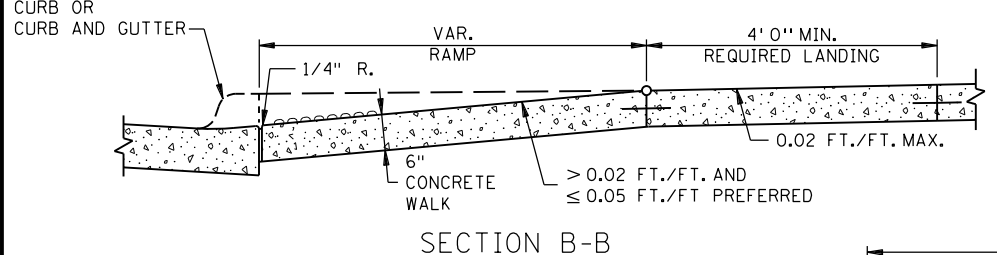
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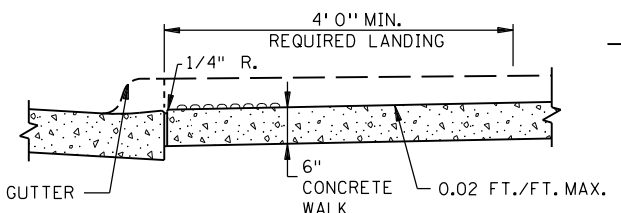
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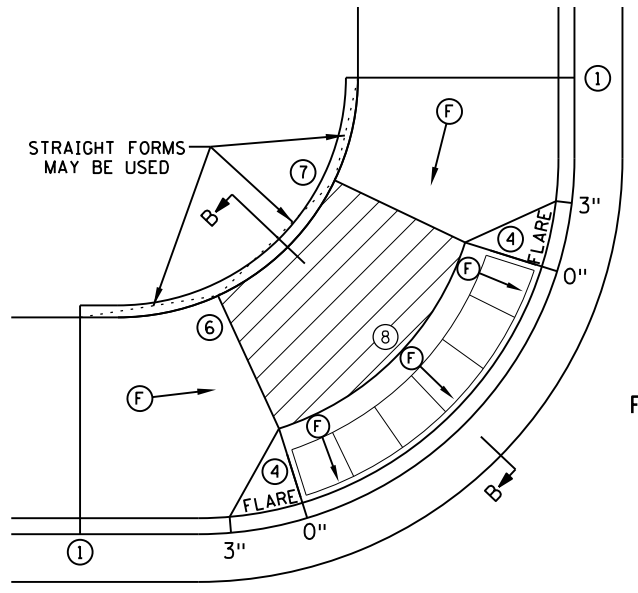
SECTION A-A  
PERPENDICULAR/TIERED/DIAGONAL



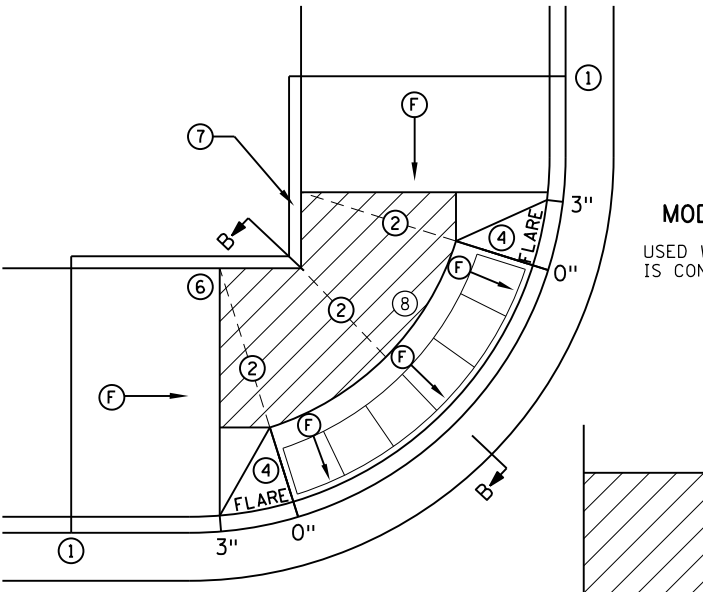
SECTION B-B  
FAN



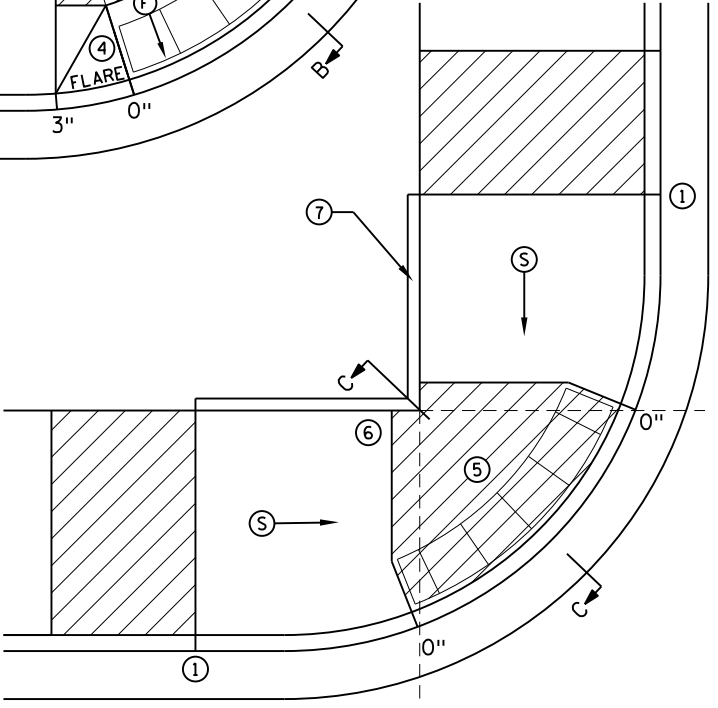
SECTION C-C  
PARALLEL/DEPRESSED CORNER



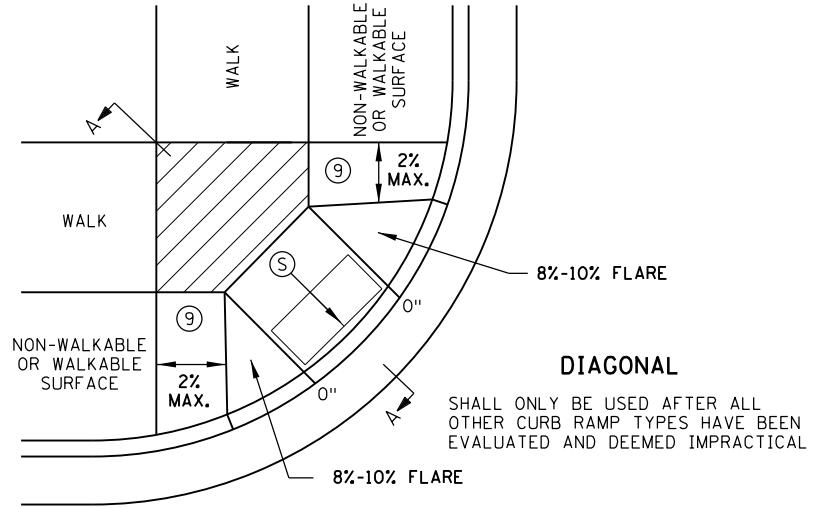
FAN ⑩



MODIFIED FAN ⑩  
USED WHEN RIGHT-OF-WAY IS CONSTRAINED



DEPRESSED CORNER



DIAGONAL

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.

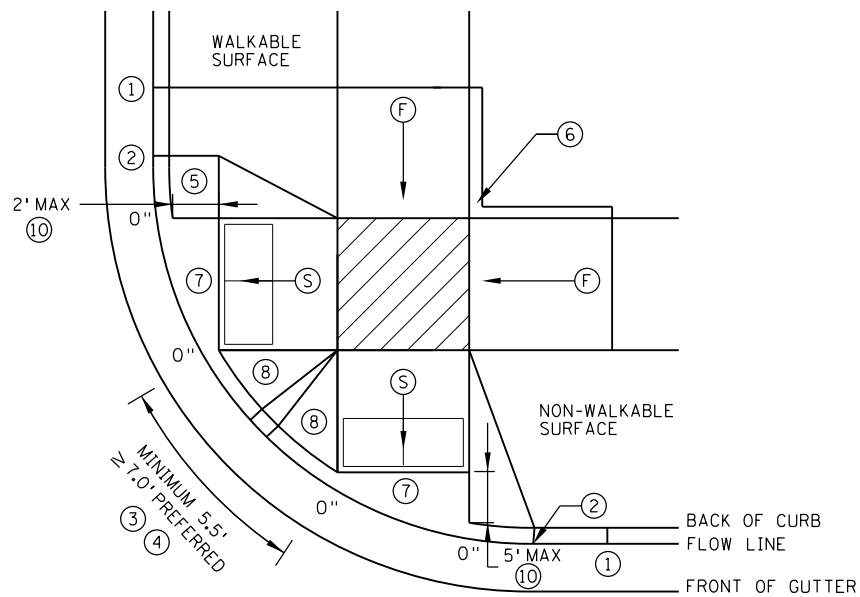
LEGEND	
(S)	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.
(F)	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.
(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 PAR.
X"	CURB HEIGHT

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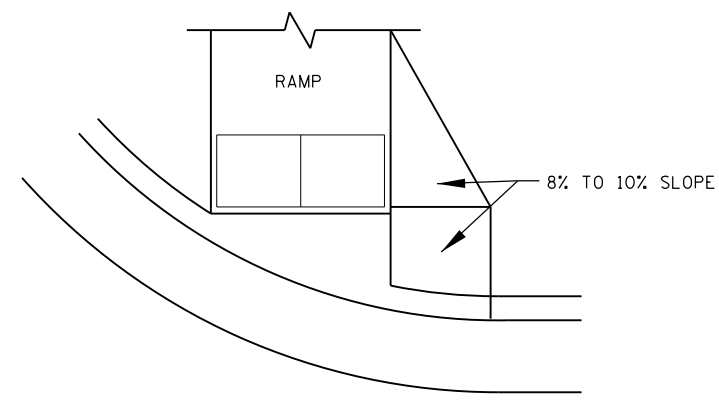
REVISION:  
APPROVED: JANUARY 23, 2017  
OPERATIONS ENGINEER

**m** MINNESOTA DEPARTMENT OF TRANSPORTATION  
STANDARD PLAN 5-297.250 1 OF 6  
APPROVED: 1-23-2017  
REVISOR:  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

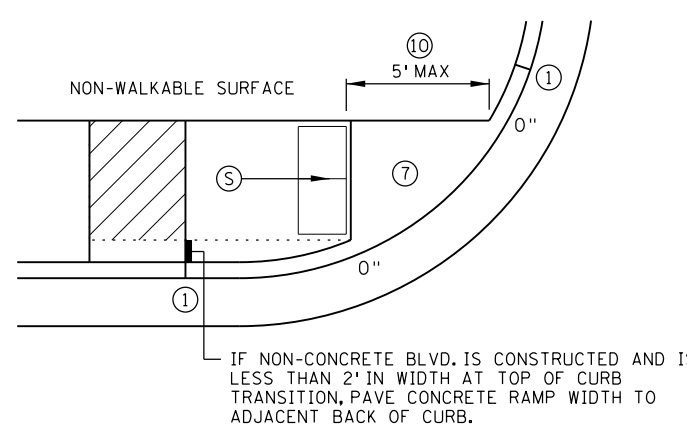
PEDESTRIAN CURB RAMP DETAILS



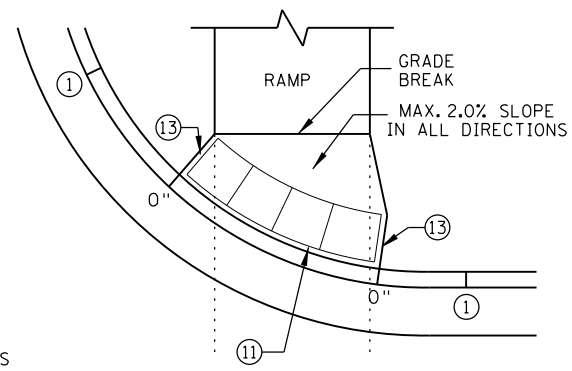
COMBINED DIRECTIONAL ⑨



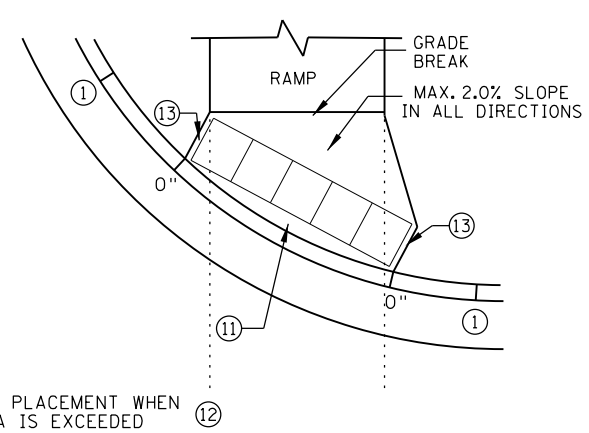
DIRECTIONAL RAMP WALKABLE FLARE



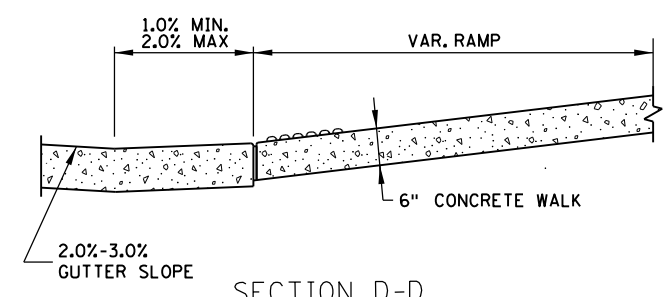
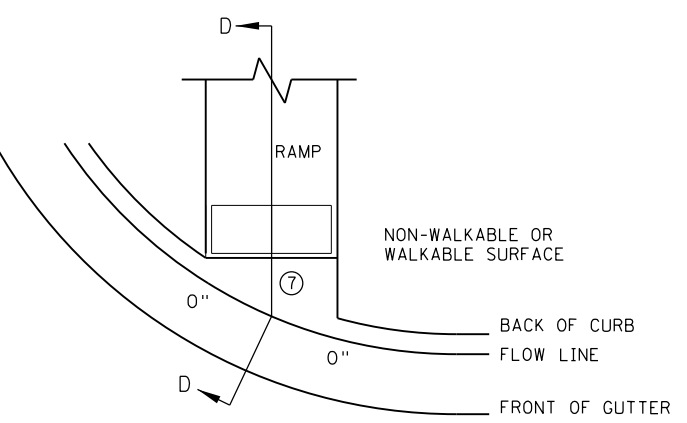
STANDARD ONE-WAY DIRECTIONAL ⑨



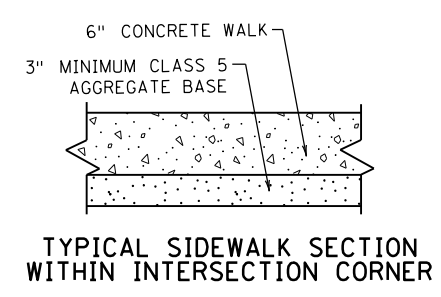
ONE-WAY DIRECTIONAL WITH DETECTABLE WARNING AT BACK OF CURB



DETECTABLE WARNING PLACEMENT WHEN SETBACK CRITERIA IS EXCEEDED ⑫



SECTION D-D



TYPICAL SIDEWALK SECTION WITHIN INTERSECTION CORNER

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.

**LEGEND**

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

- ⑤ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.
- ⑥ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.
- ⑦ LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PARS.
- X" CURB HEIGHT

CURB FOR DIRECTIONAL RAMPS ⑭

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REVISION:

APPROVED: JANUARY 23, 2017

*[Signature]*  
OPERATIONS ENGINEER

**m** MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250 2 OF 6

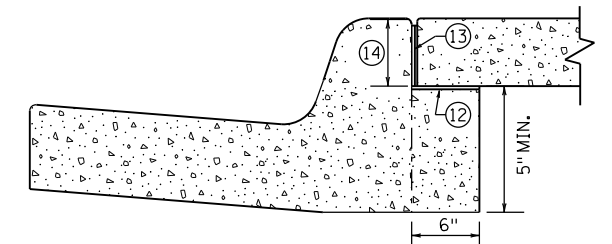
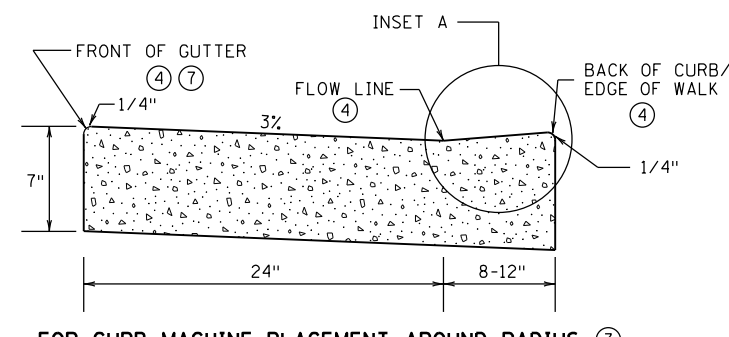
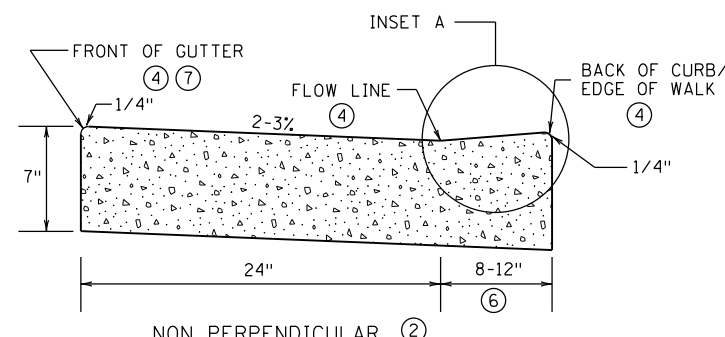
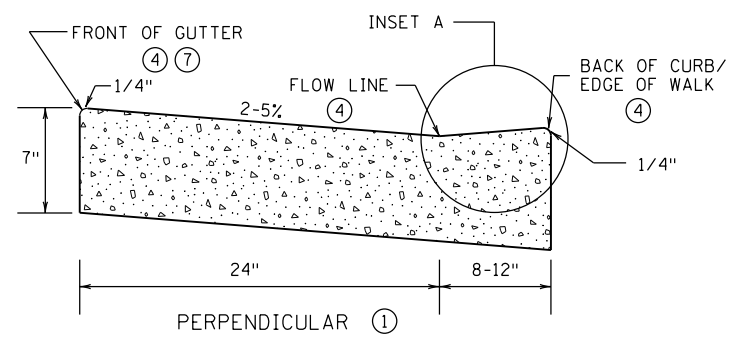
APPROVED: 1-23-2017  
REVISOR:

*[Signature]*  
STATE DESIGN ENGINEER

**PEDESTRIAN CURB RAMP DETAILS**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

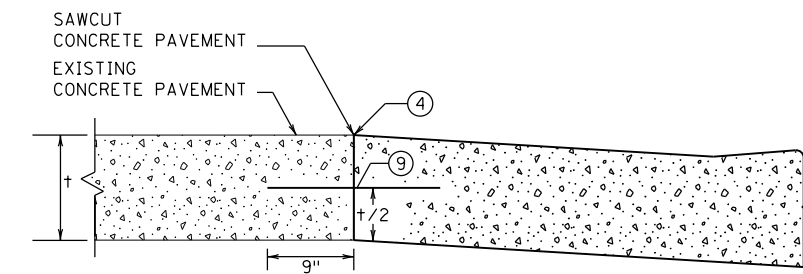
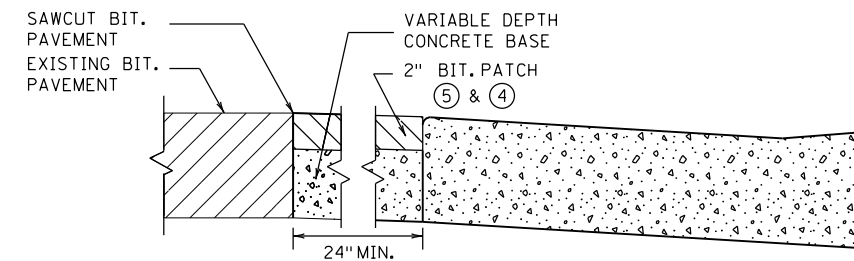
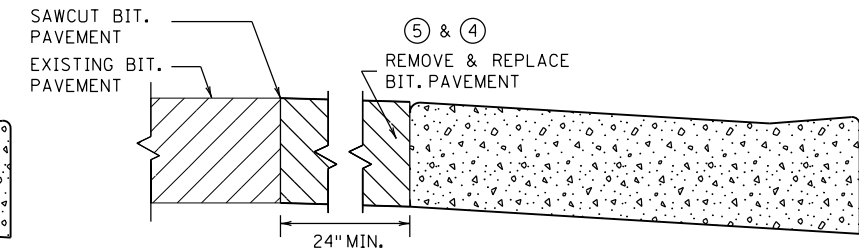
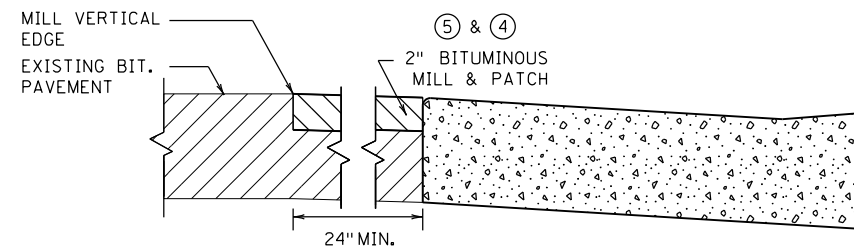
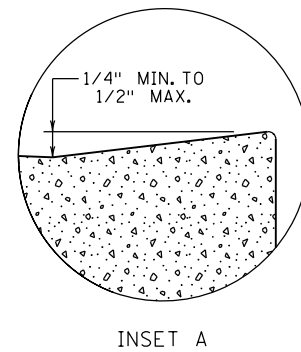
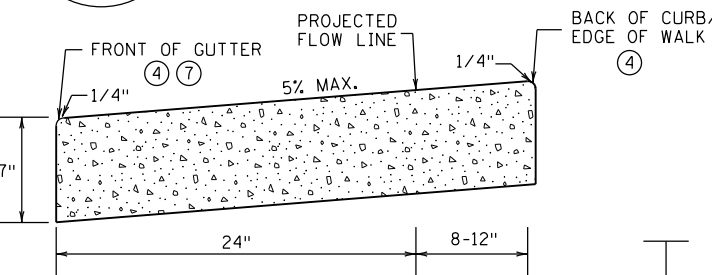
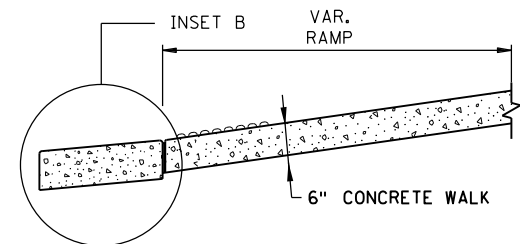
SHEET 42 OF 206 SHEETS



OPTIONAL SILL CURB WHEN SIDEWALK IS AT BACK OF CURB

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

PEDESTRIAN ACCESS ROUTE CURB & GUTTER DETAIL



ONLY ALLOWED PER ENGINEER'S APPROVAL

PAVEMENT TREATMENT OPTIONS IN FRONT OF CURB & GUTTER

FOR USE ON CURB RAMP RETROFITS

NOTES:

POSITIVE FLOW LINE DRAINAGE SHALL BE MAINTAINED THROUGH THE PEDESTRIAN ACCESS ROUTE (PAR) AT A 2% MAXIMUM. NO PONDING SHALL BE PRESENT IN THE PAR.

ANY VERTICAL LIP THAT OCCURS AT THE FLOW LINE SHALL NOT BE GREATER THAN 1/4 INCH.

① FOR USE AT CURB CUTS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: PERPENDICULAR, TIERED PERPENDICULAR, PARALLEL, AND DIAGONAL RAMP.

② FOR USE AT CURB RAMP 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 RAMP.

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\"/>

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\"/>

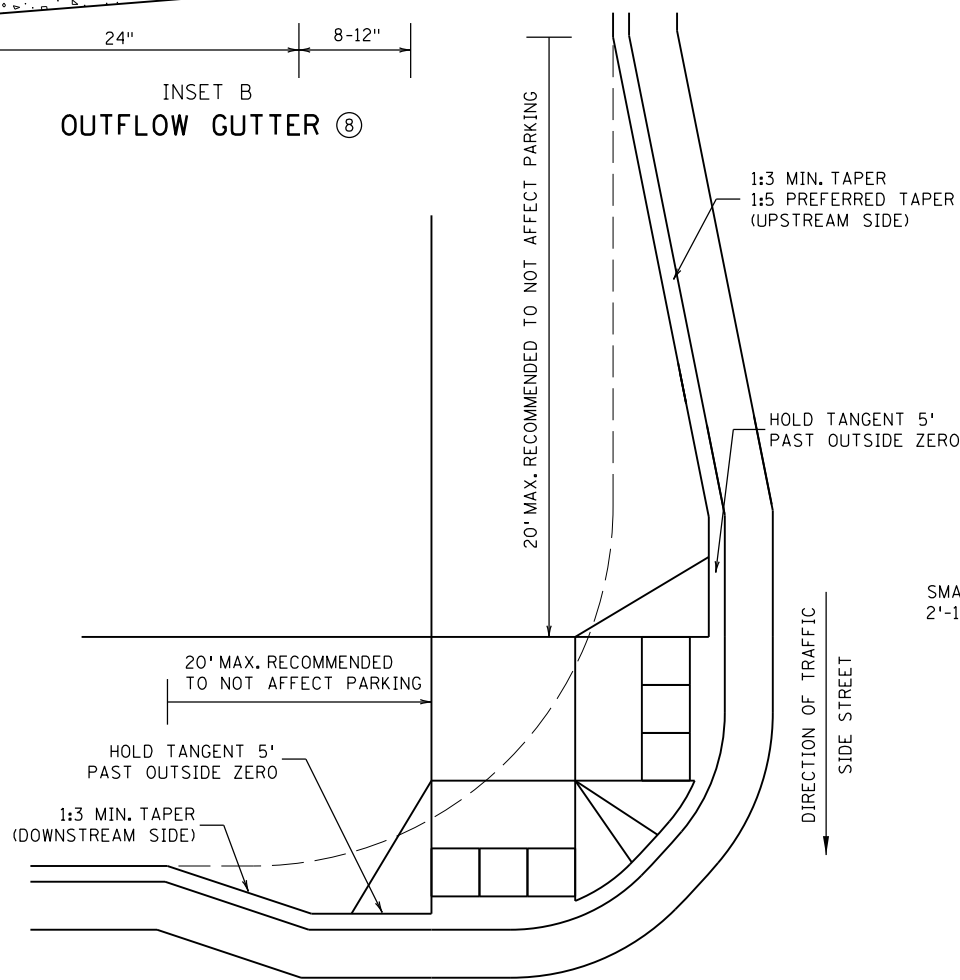
⑩ HELPS PROVIDE TWO SEPARATE RAMPS, REDUCES THE DOME SETBACK LENGTH AND MINIMIZES DIRECTIONAL CURB. THIS RADIUS DESIGN CLOSELY FOLLOWS THE TURNING VEHICLE PATH WHILE OPTIMIZING CURB RAMP LENGTH.

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.

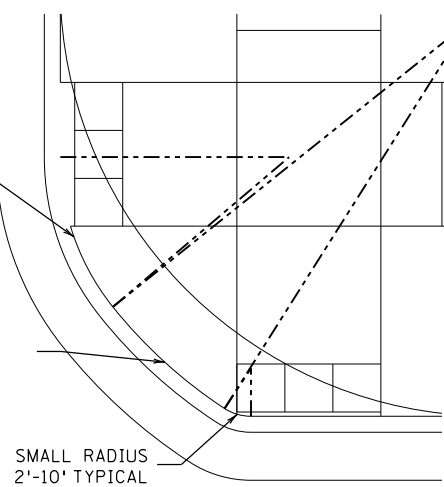
⑫ PLACE BOND BREAKER BETWEEN WALK AND TOP OF SILL.

⑬ 1/2\"/>

⑭ DIMENSION TO BE SAME AS SIDEWALK THICKNESS, 4\"/>



ADA CURB EXTENSION WITH COMPOUND RADIUS (BUMP OUT) ⑪



COMBINED DIRECTIONAL (COMPOUND RADIUS) ⑫

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STANDARD PLAN 5-297.250 3 OF 6

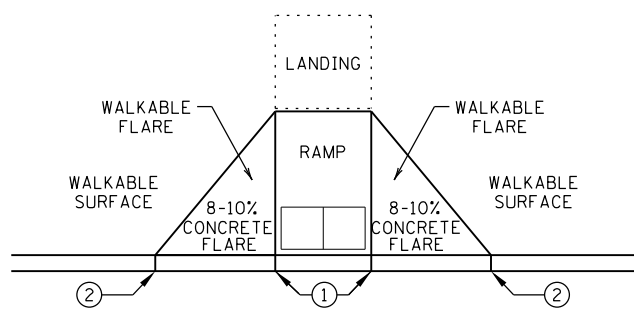
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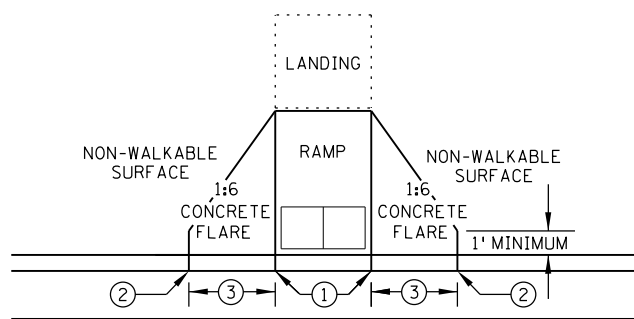
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PEDESTRIAN CURB RAMP DETAILS

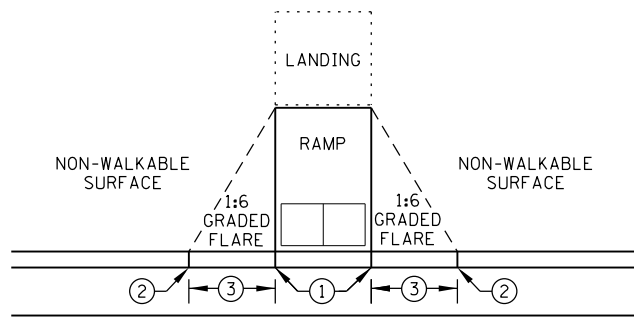
SHEET 43 OF 206 SHEETS



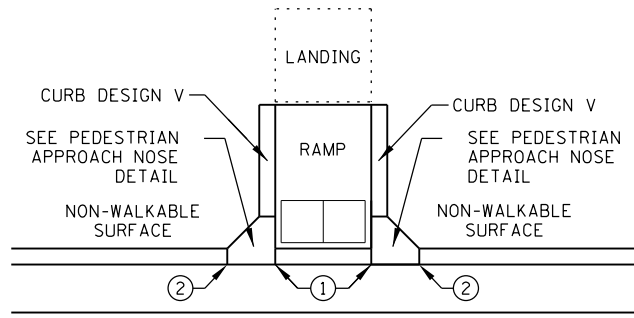
PAVED FLARES  
ADJACENT TO WALKABLE SURFACE



PAVED FLARES  
ADJACENT TO NON-WALKABLE SURFACE

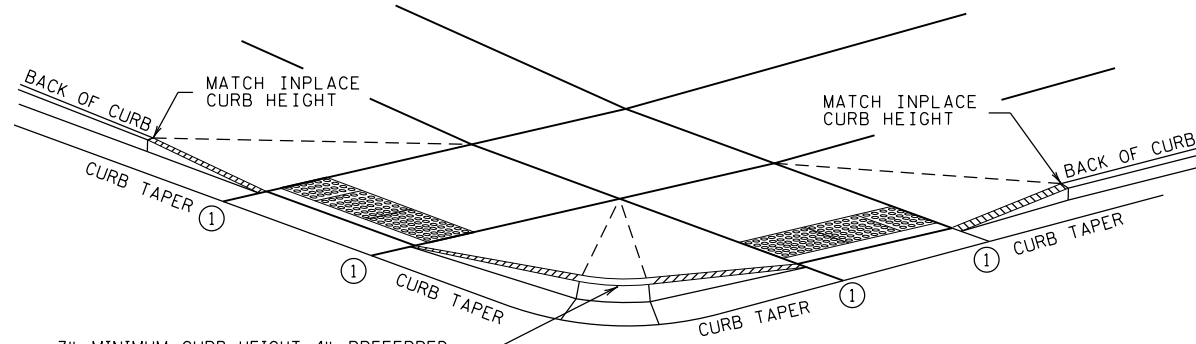


GRADED FLARES



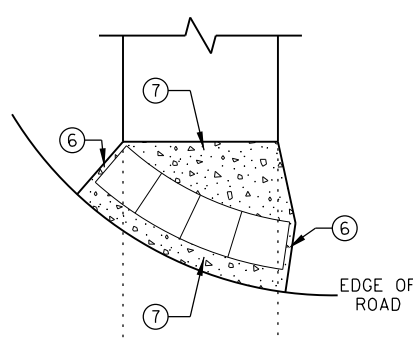
RETURNED CURB ⑤

TYPICAL SIDE TREATMENT OPTIONS ④ ⑪

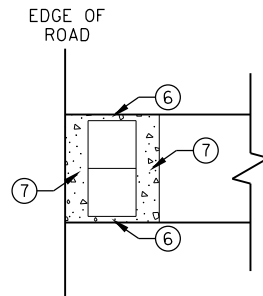


3" MINIMUM CURB HEIGHT, 4" PREFERRED  
(MEASURED AT FRONT FACE OF CURB)  
FOR A MIN. 6" LENGTH (MEASURED ALONG FLOW LINE)

DETECTABLE EDGE WITH ⑧  
CURB AND GUTTER

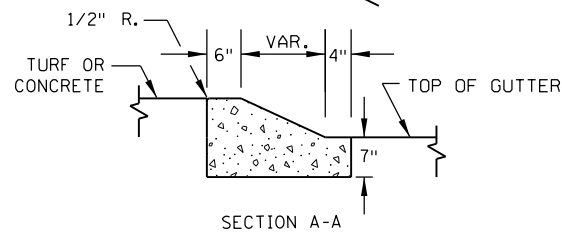
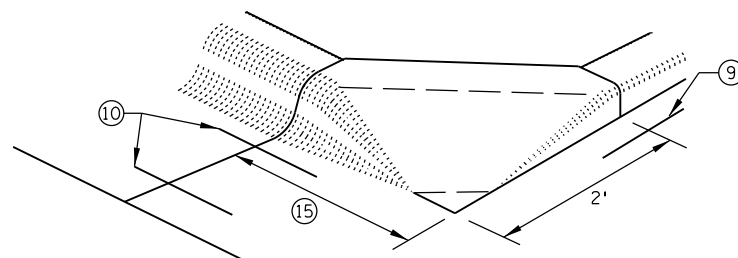


RADIAL DETECTABLE WARNING

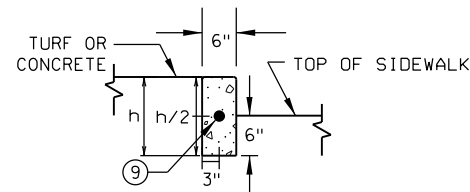


RECTANGULAR DETECTABLE WARNING

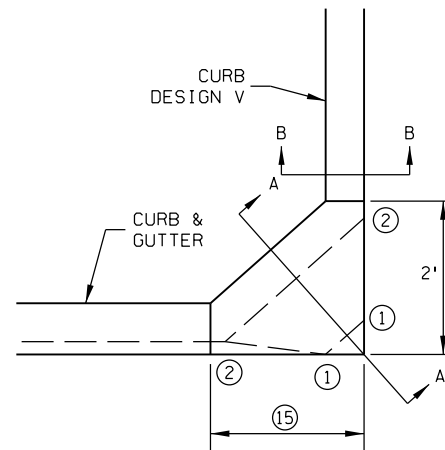
DETECTABLE EDGE WITHOUT CURB AND GUTTER



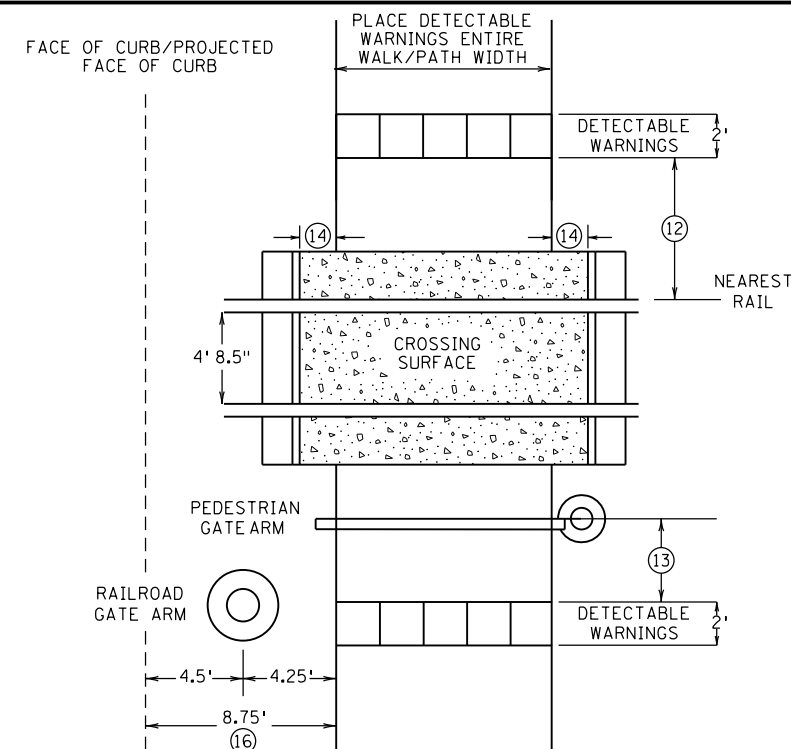
SECTION A-A



SECTION B-B



PEDESTRIAN APPROACH  
NOSE DETAIL  
(FOR RETURNED CURB  
SIDE TREATMENT)



RAILROAD CROSSING  
PLAN VIEW

NOTES:

- 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 RAMP 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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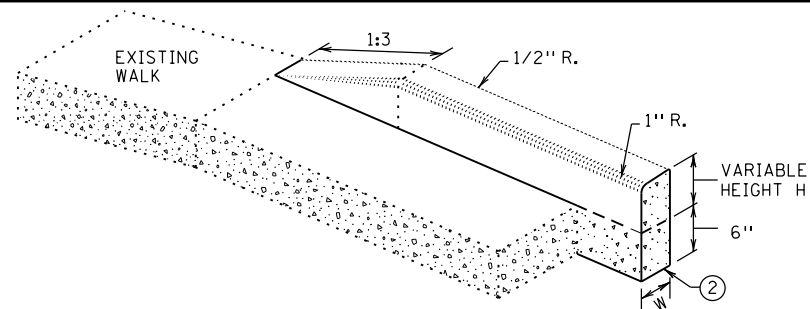


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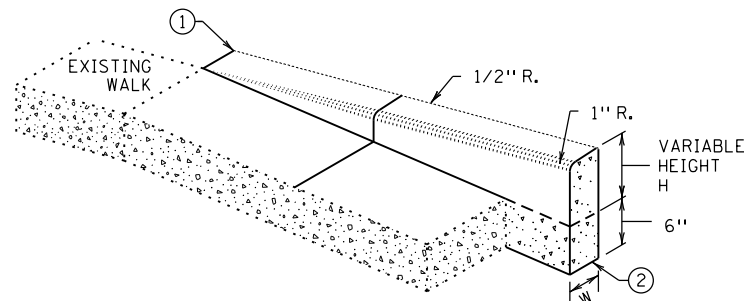
PEDESTRIAN CURB RAMP DETAILS

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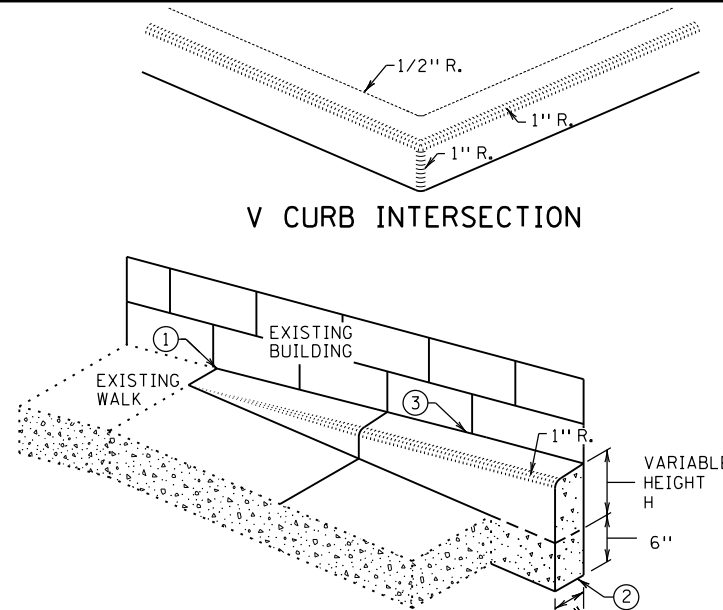
SHEET 44 OF 206 SHEETS



V CURB ADJACENT TO LANDSCAPE  
CURB WITHIN SIDEWALK LIMITS



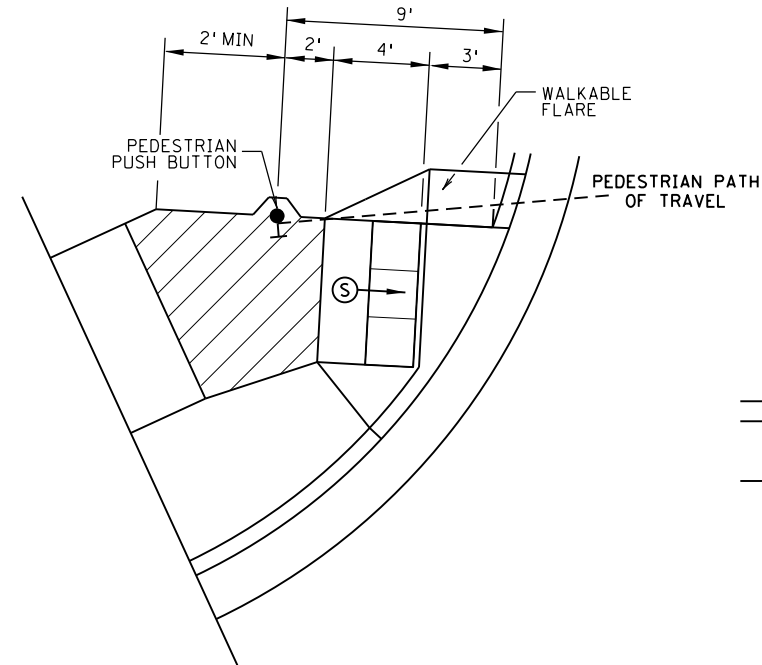
V CURB ADJACENT TO LANDSCAPE  
CURB OUTSIDE SIDEWALK LIMITS



V CURB INTERSECTION

V CURB ADJACENT TO BUILDING  
OR BARRIER

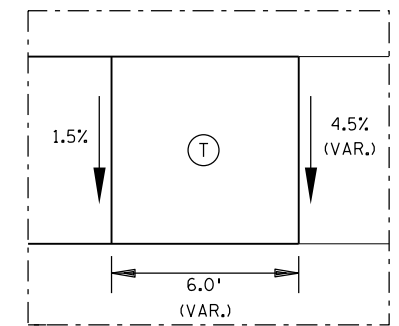
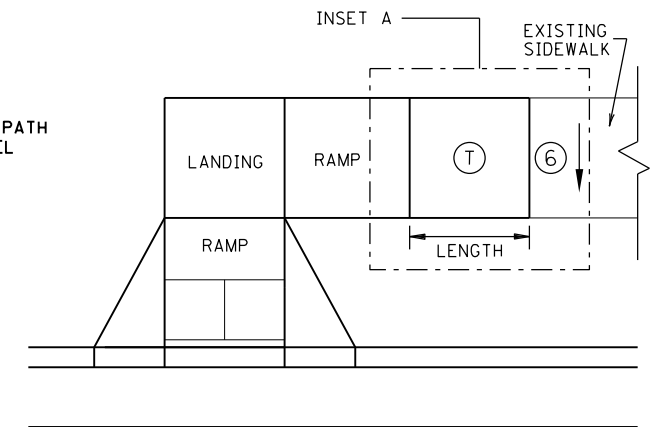
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
< 6"	4"
≥ 6"	6"



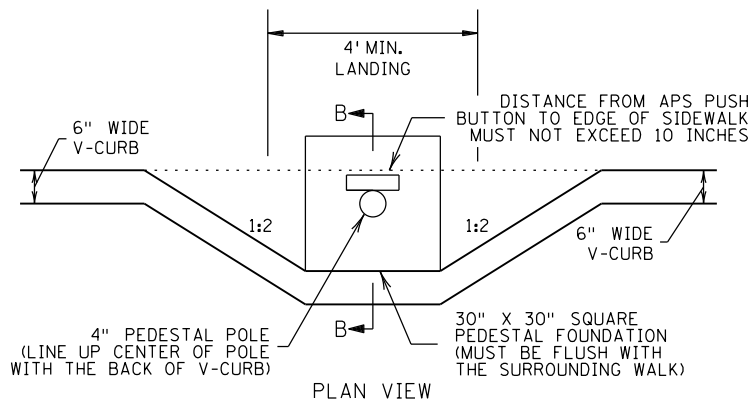
SEMI-DIRECTIONAL RAMP (3,4,9)

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

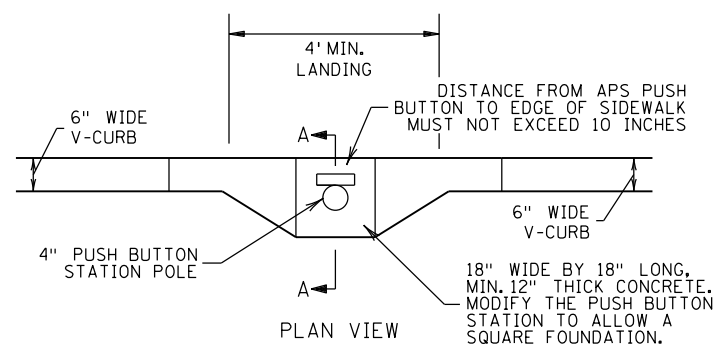
PRIMARYLY USED FOR APS APPLICATIONS  
WHERE THE PAR DOES NOT CONTINUE PAST  
THE PUSH BUTTON (DEAD-END SIDEWALK)



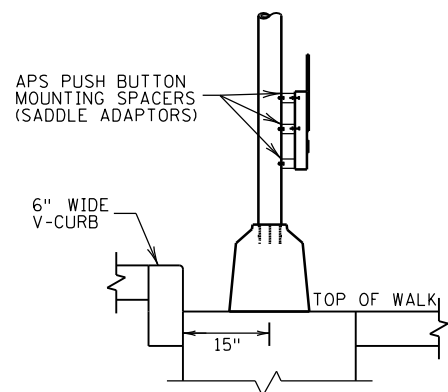
TRANSITION PANEL (4,5)



PLAN VIEW

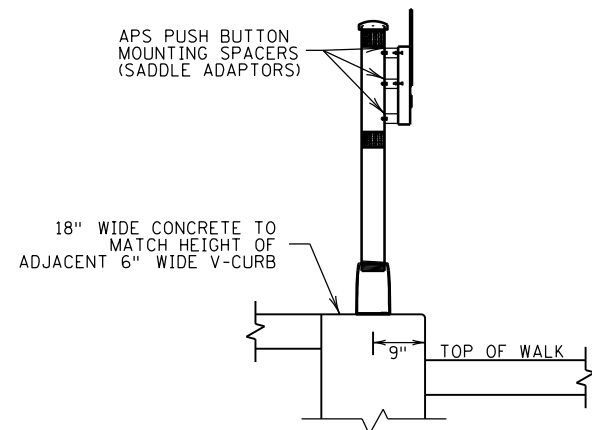


PLAN VIEW



SECTION B-B

SIGNAL PEDESTAL & PUSH BUTTON (V-CURB)



SECTION A-A

PUSH BUTTON STATION (V-CURB)

NOTES:

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

ALL V CURB CONTRACTION JOINTS SHALL MATCH CONCRETE WALK JOINTS.

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

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

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

(1) END TAPERS AT TRANSITION SECTION SHALL MATCH INPLACE SIDEWALK GRADES.

(2) ALL V CURB SHALL MATCH BOTTOM OF ADJACENT WALK.

(3) 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.

(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%.

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

(T) TRANSITION PANEL(S) - TO BE USED FOR TRANSITIONING THE CROSS-SLOPE OF A RAMP TO THE EXISTING WALK CROSS-SLOPE. RATE OF TRANSITION SHOULD BE 0.5% PER 1 LINEAR FOOT OF WALK. SEE THIS SHEET FOR ADDITIONAL INFORMATION.

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PEDESTRIAN CURB RAMP DETAILS

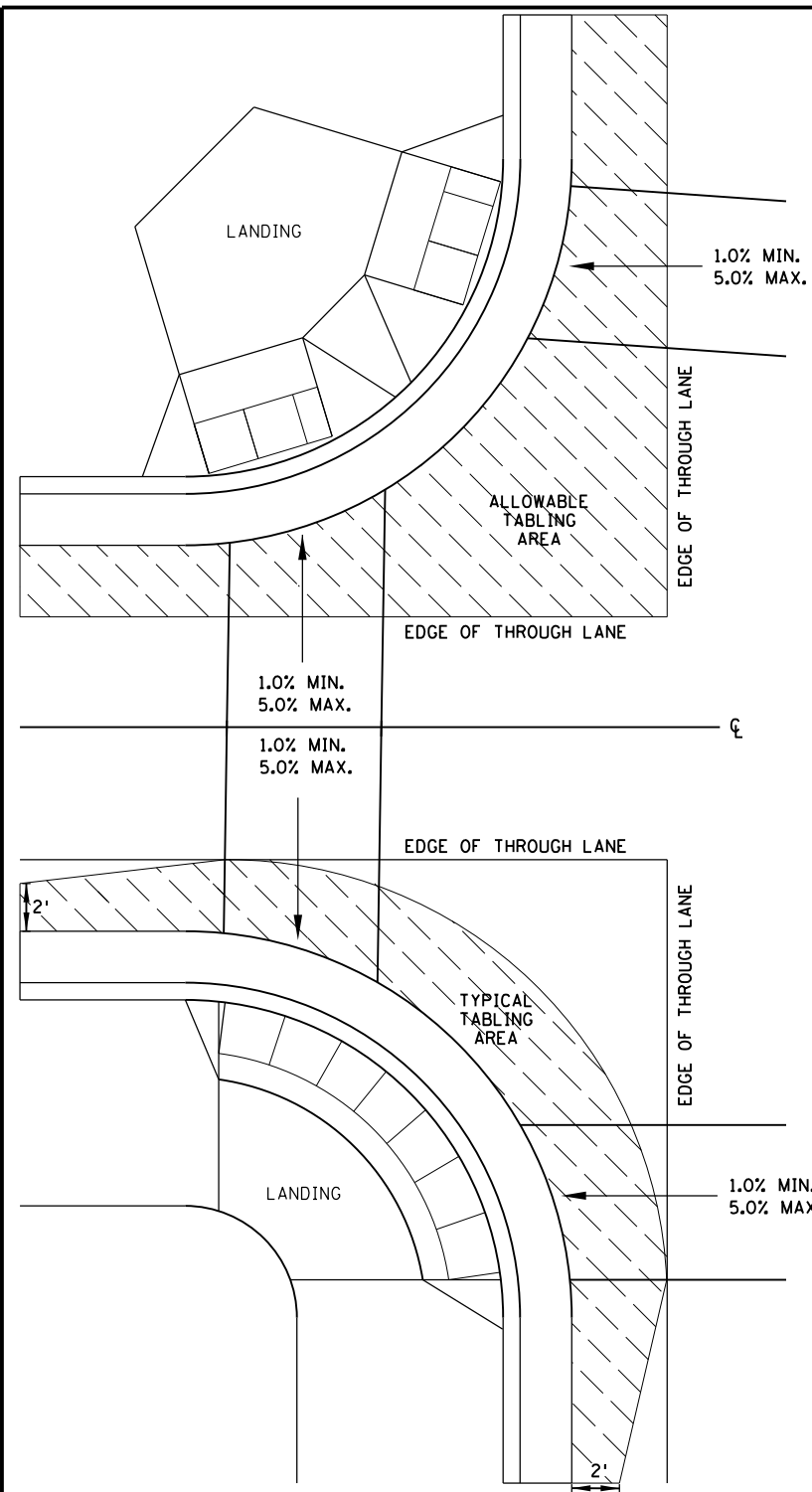
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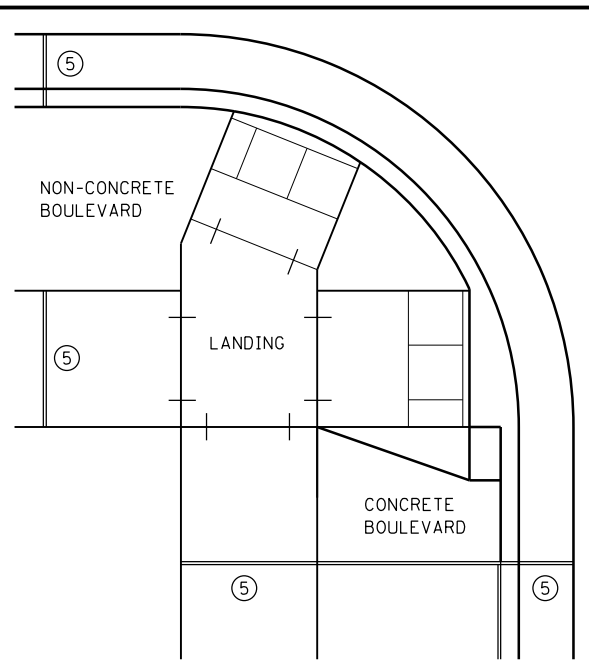
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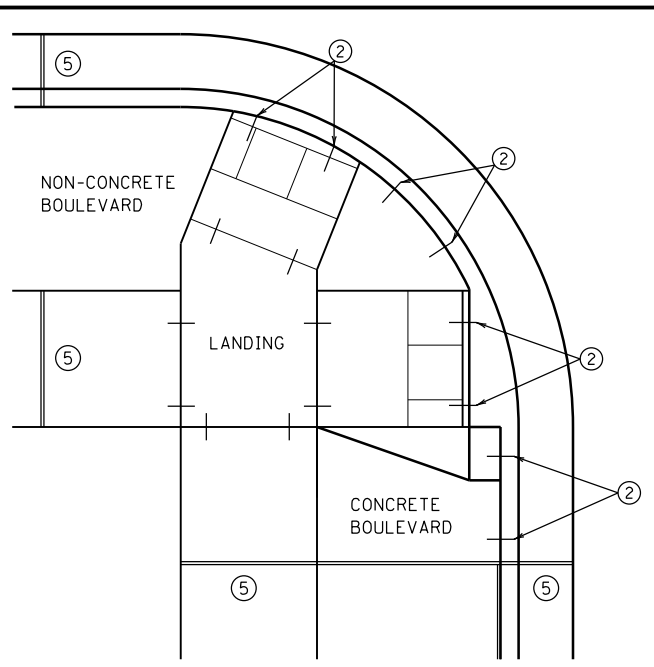
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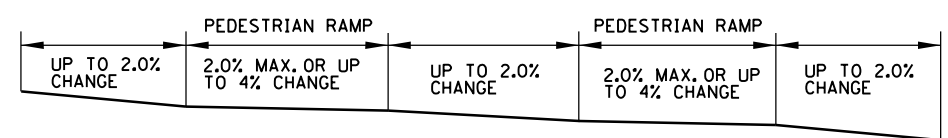
**CURB LINE AND ROAD CROSSING ADJUSTMENTS**



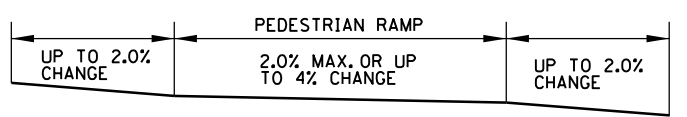
**EXPANSION MATERIAL PLACEMENT FOR CONCRETE AND BITUMINOUS ROADWAYS**



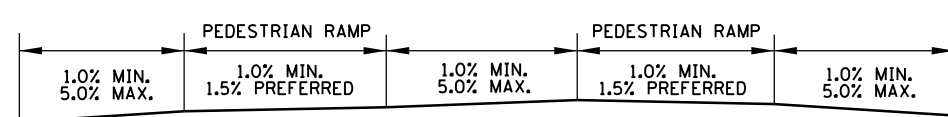
**OPTIONAL CURB LINE REINFORCEMENT PLACEMENT ON BITUMINOUS ROADWAYS**



**FLOW LINE PROFILE "TABLE" - TWIN PERPENDICULARS**



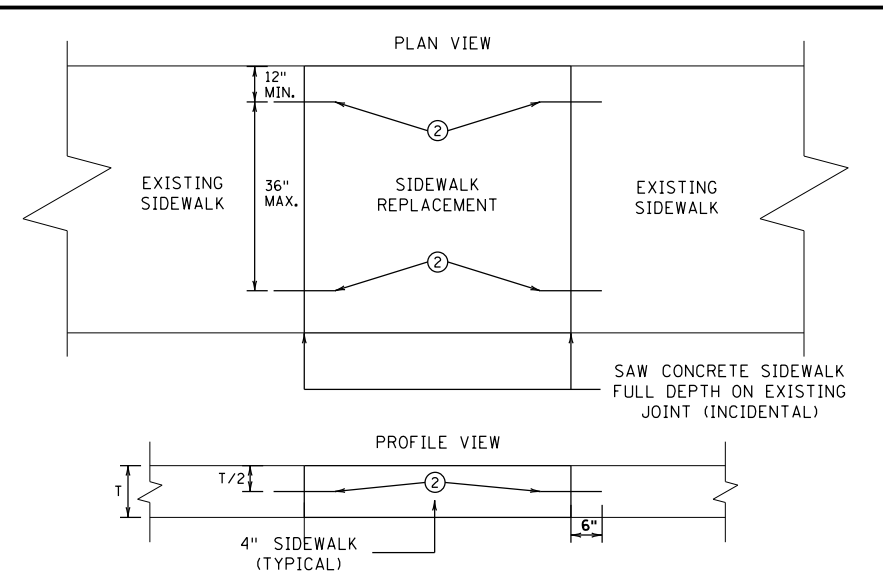
**FLOW LINE PROFILE "TABLE" - FAN**



**FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS**

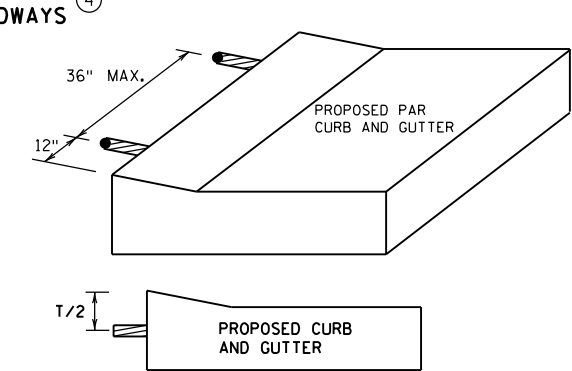


**FLOW LINE PROFILE RAISE - FAN**

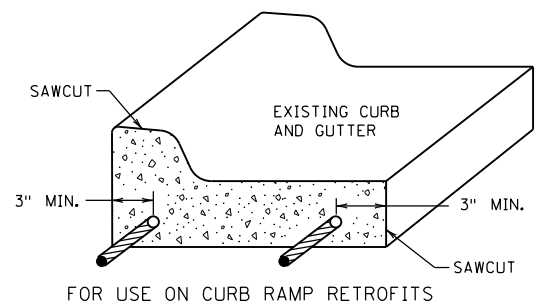


**OPTIONAL SIDEWALK REINFORCEMENT**

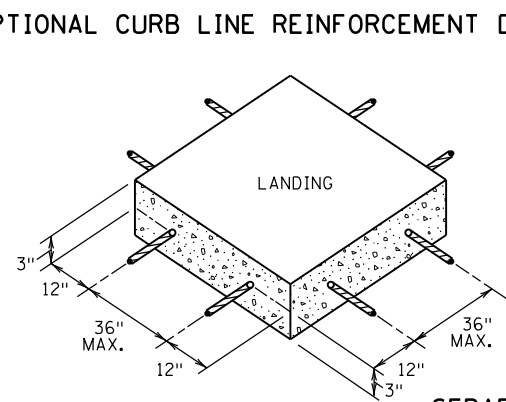
SIDEWALK REINFORCEMENT TO BE USED ONLY WHEN SPECIFIED IN THE PLAN.



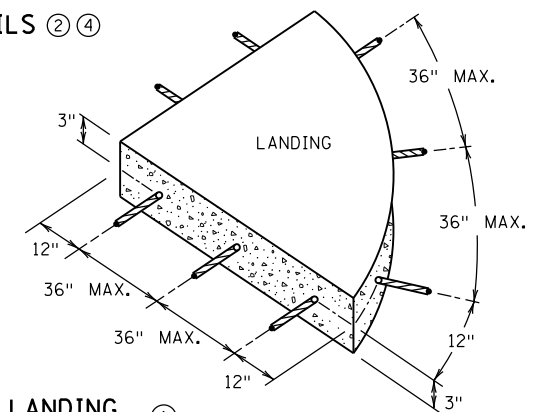
**OPTIONAL CURB LINE REINFORCEMENT DETAILS**



**CURB AND GUTTER REINFORCEMENT**



**SEPARATE LANDING POUR REINFORCEMENT**



"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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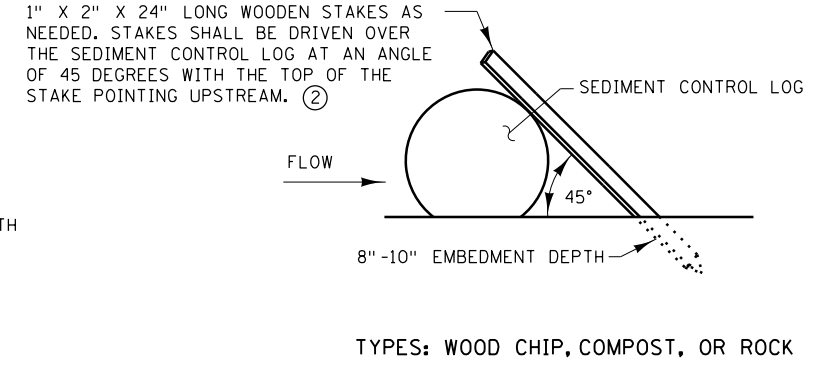
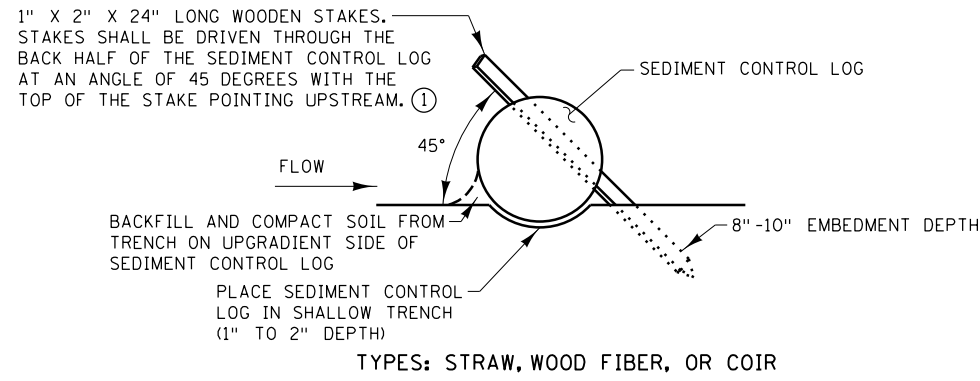


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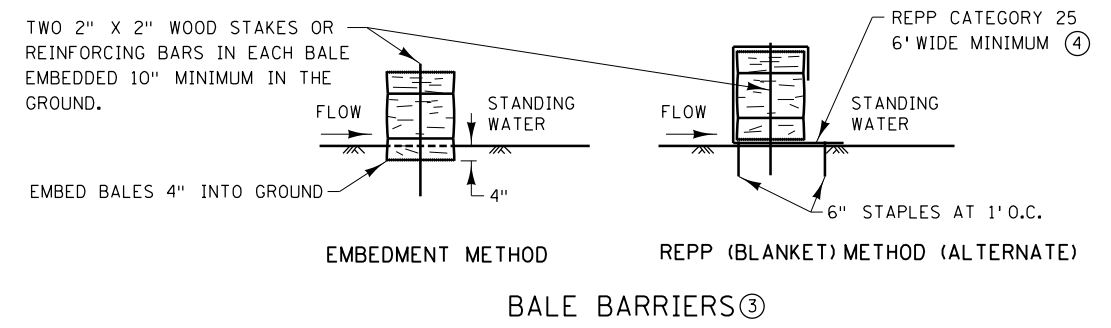
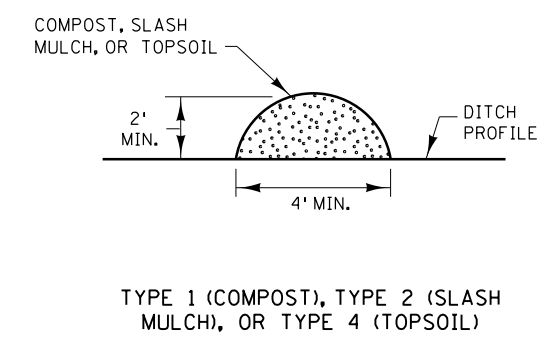
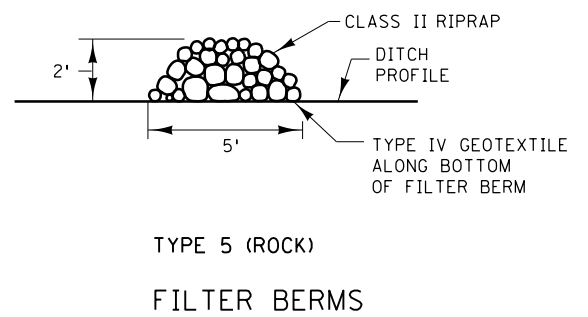
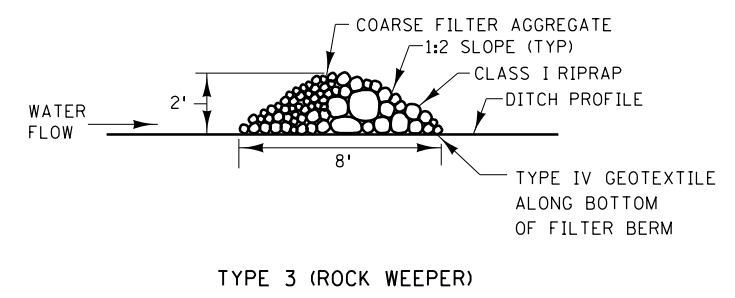
**PEDESTRIAN CURB RAMP DETAILS**

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SEDIMENT CONTROL LOGS



NOTES:

- REPP = ROLLED EROSION PREVENTION PRODUCT.
- SEE SPECS. 2573, 3149, 3874, 3882, 3885, 3886, AND 3897.
- ① SPACE BETWEEN STAKES SHALL BE A MAXIMUM OF 1' FOR DITCH CHECKS OR 2' FOR OTHER APPLICATIONS.
- ② PLACE STAKES AS NEEDED TO PREVENT MOVEMENT OF SEDIMENT CONTROL LOGS PLACED ON SLOPES OR AS NEEDED DUE TO OTHER FACTORS. STAKES SHALL BE INCIDENTAL.
- ③ TO BE USED FOR CRITICAL PERIMETER CONTROL AREAS WHERE STANDING WATER OCCURS (6" MAXIMUM DEPTH). BALES SHALL CONSIST OF TYPE 1 MULCH OF APPROXIMATELY 14" X 18" X 36" LONG. BALES SHALL BE PLACED ON EDGE AND BUTTED TIGHT TO ADJACENT BALES.
- ④ INSTEAD OF TRENCHING, PLACE BALE ON THE REPP (BLANKET) AND WRAP BLANKET AROUND THE BALE. PLACE STAKE THROUGH BALE AND BLANKET.

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*Marni Karnowski*

MARNI KARNOWSKI  
CHIEF ENVIRONMENTAL OFFICER

**m** MINNESOTA  
DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 2 OF 8

*Tom Styrbicki*

THOMAS STYRBICKI  
STATE DESIGN ENGINEER

APPROVED: 1-8-2020  
REVISED:

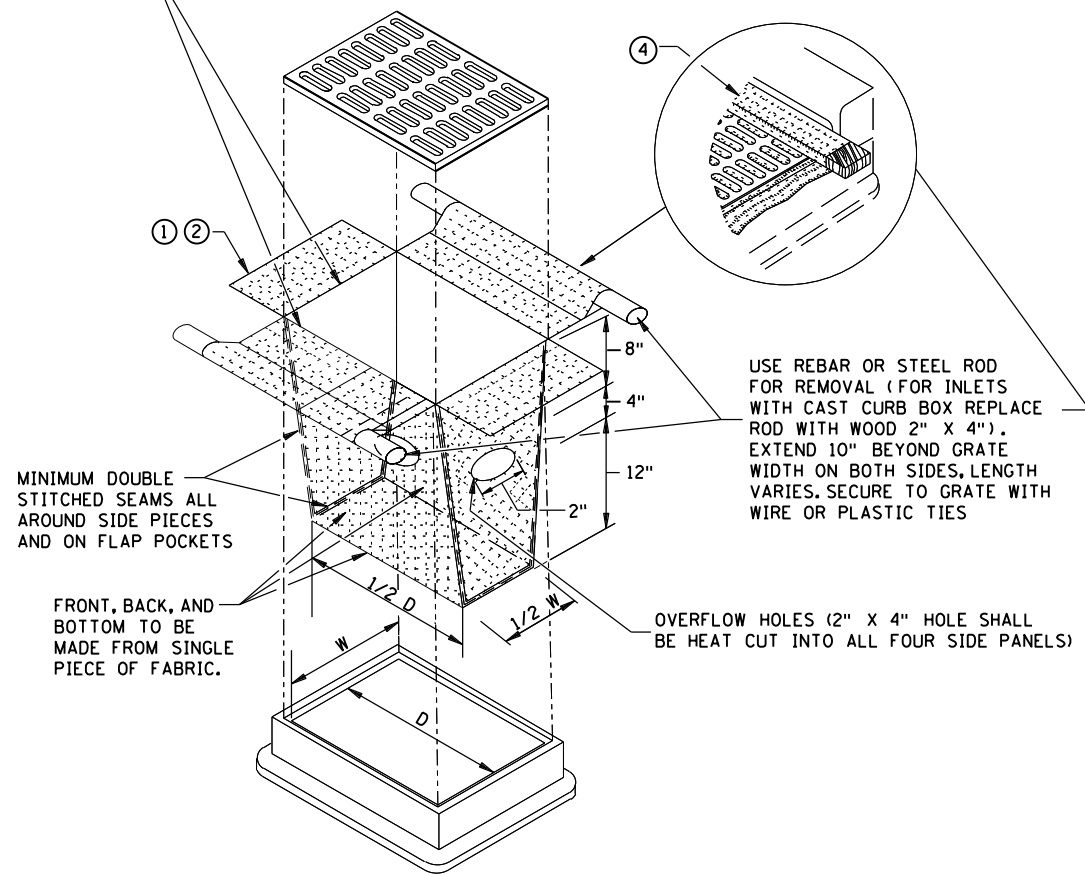
**TEMPORARY SEDIMENT CONTROL**

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

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

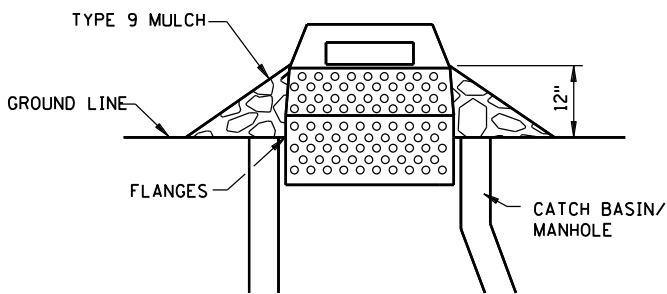
SHEET 47 OF 206 SHEETS

INLET SPECIFICATIONS AS PER THE PLAN  
DIMENSION LENGTH AND WIDTH TO MATCH  
FLAP POCKET



**FILTER BAG INSERT ③**

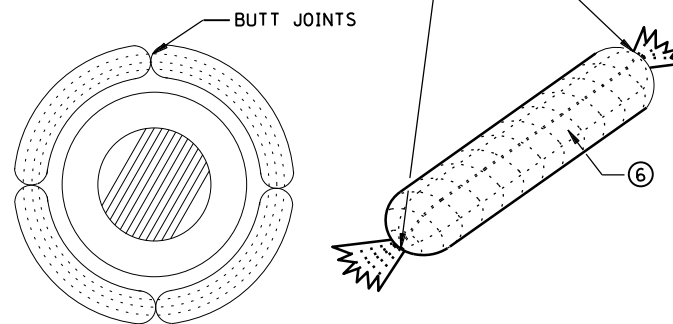
(CAN BE INSTALLED IN ANY INLET TYPE  
WITH OR WITHOUT A CURB BOX)



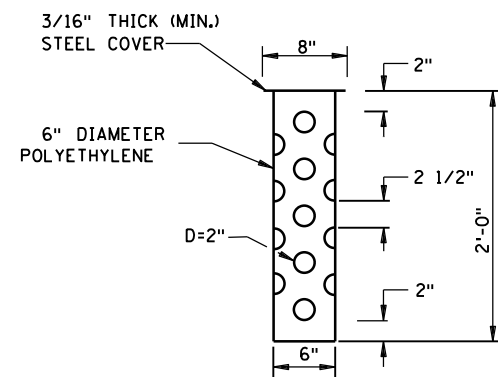
**SEDIMENT CONTROL INLET HAT**

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.

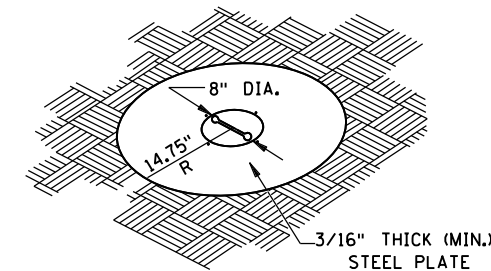
ENDS SECURELY CLOSED TO  
PREVENT LOSS OF OPEN GRADED  
AGGREGATE FILL. SECURED WITH  
50 PSI. ZIP TIE.



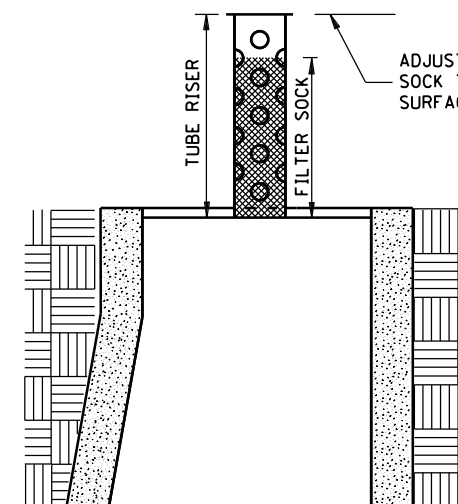
**ROCK LOG/COMPOST LOG**



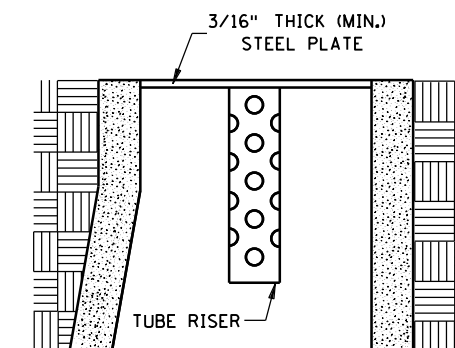
**TUBE RISER**



**PERSPECTIVE VIEW**

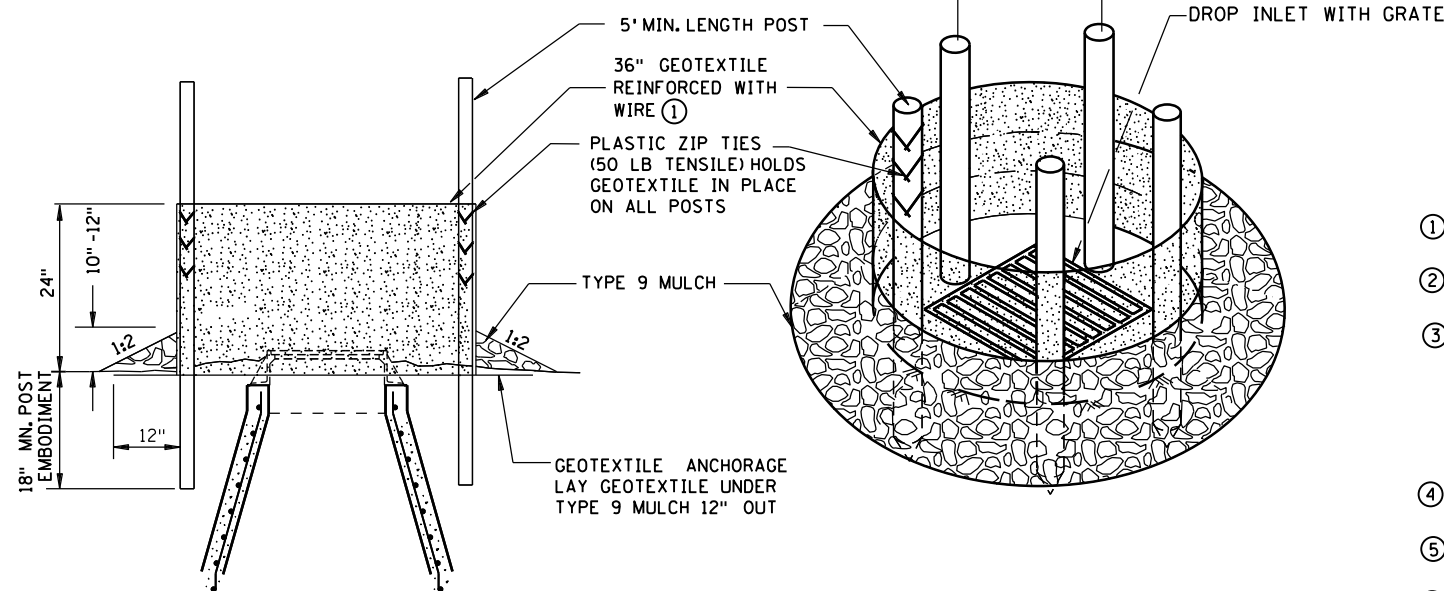


**SECTION  
(UP POSITION)**



**SECTION  
(DOWN POSITION)**

**POP-UP HEAD**



**SILT FENCE RING AND ROCK FILTER BERM**  
USE WHERE INLET DRAINS IN AN AREA WITH SLOPES AT 1:3 OR LESS

**NOTES:**

- SEE SPECS. 2573, 3137, & 3886.
- DEVICES MUST BE ADJUSTED ACCORDINGLY AS TO NOT CAUSE FLOODING ON ROADWAY THAT WOULD IMPEED TRAFFIC FLOW.
- ① ALL GEOTEXTILE USED FOR INLET PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886.
- ② FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED SHALL EXTEND A MINIMUM OF 10 INCHES AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- ③ INSTALLATION NOTES:  
DO NOT PLACE FILTER BAG INSERT IN INLETS SHALLOWER THAN 30 INCHES, MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. THE PLACED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE OF 3 INCHES BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES. WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3 INCH SIDE CLEARANCE.
- ④ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2 INCH X 4 INCH OR USE A ROCK SOCK OR SAND BAGS IN PLACE OF THE FLAP POCKETS.
- ⑤ SOCK HEIGHT MUST NOT BE SO HIGH AS TO SLOW DOWN WATER FILTRATION TO CAUSE FLOODING OF THE ROADWAY.
- ⑥ GEOTEXTILE SOCK BETWEEN 4-10 FEET LONG AND 4-6 INCH DIAMETER. SEAM TO BE JOINED BY TWO ROWS OF STITCHING WITH A PLASTIC MESH BACKING OR PROVIDE A HEAT BONDED SEAM (OR APPROVED EQUIVALENT). FILL ROCK LOG WITH OPEN GRADED AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF COARSE AGGREGATE CONFORMING TO SPEC. 3137 TABLE 3137-1; CA-3 GRADATION.

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REVISION:
APPROVED: 2-28-2017
<i>[Signature]</i> CHIEF ENVIRONMENTAL OFFICER



STANDARD PLAN 5-297.405

4 OF 8

*[Signature]*  
STATE DESIGN ENGINEER

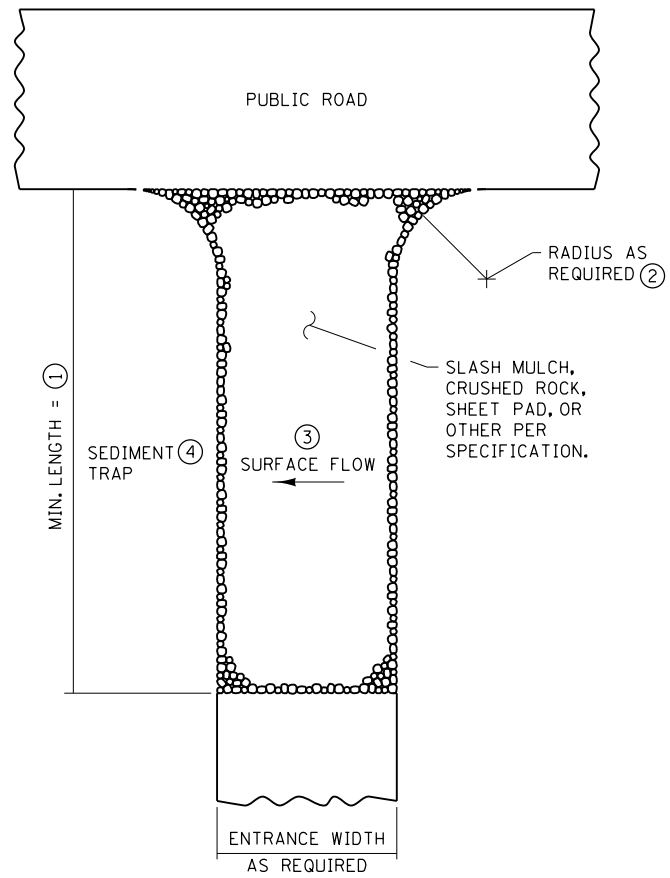
APPROVED: 2-28-2017  
REVISED:

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

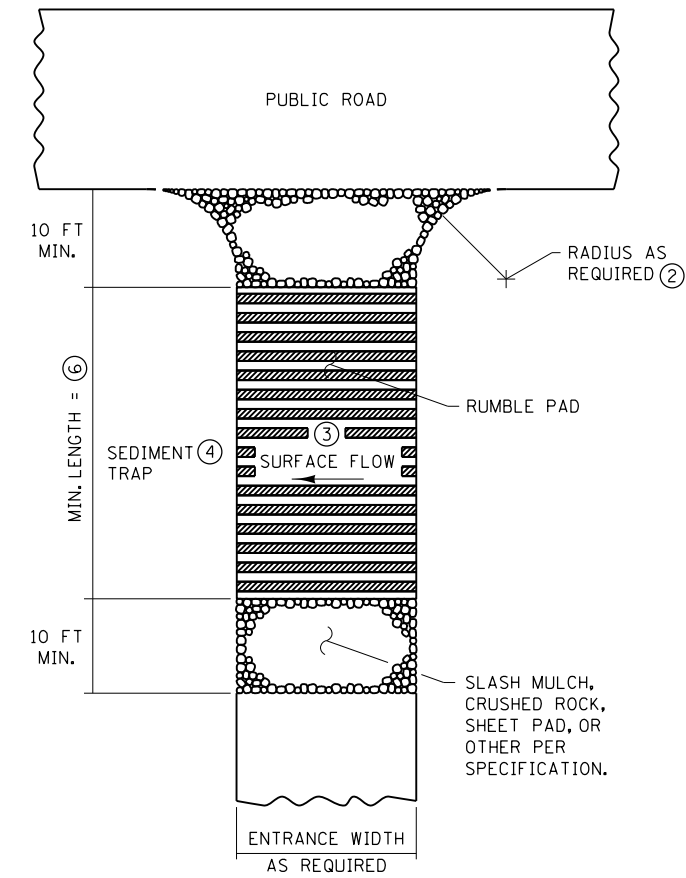
**TEMPORARY SEDIMENT CONTROL  
STORM DRAIN INLET PROTECTION**

SHEET 48 OF 206 SHEETS

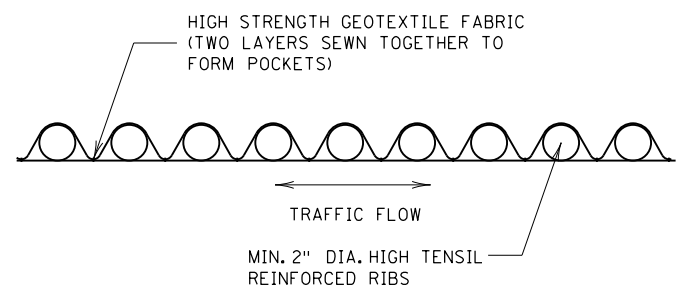
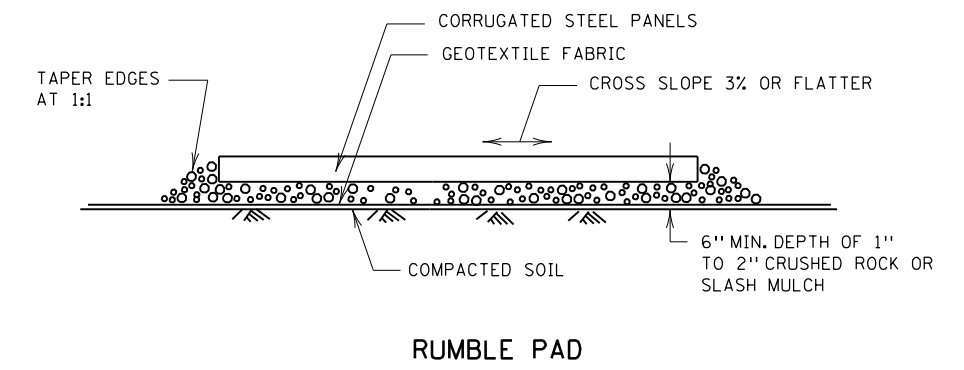




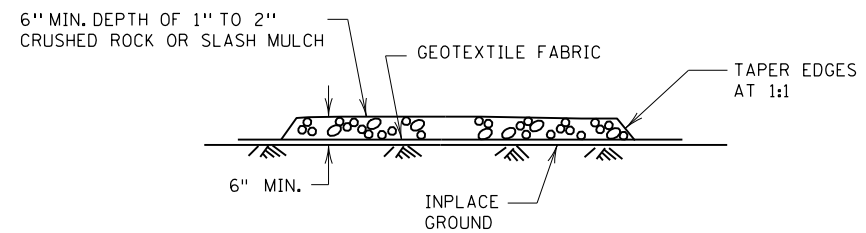
SLASH MULCH, CRUSHED ROCK, OR SHEET PAD CONSTRUCTION EXIT ⑤⑦



RUMBLE PAD CONSTRUCTION EXIT ⑤⑦



SHEET PAD



SLASH MULCH OR CRUSHED ROCK

**NOTES:**

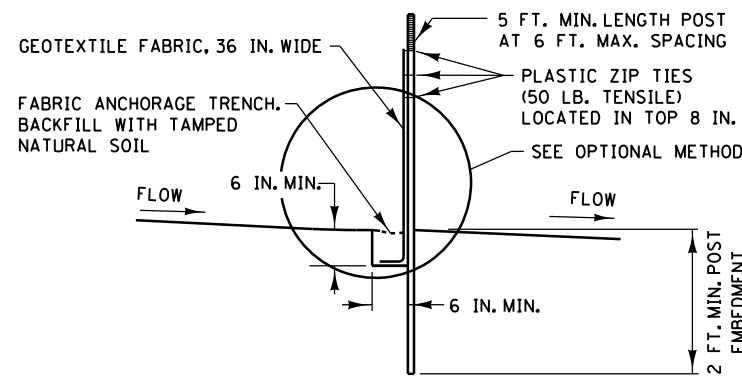
- SEE SPECS. 2573 & 3882.
- ① MINIMUM LENGTH SHALL BE THE GREATER OF 50 FEET OR A LENGTH SUFFICIENT TO ALLOW A MINIMUM OF 5 TIRE ROTATIONS ON THE PROVIDED PAD. MINIMUM LENGTH SHALL BE CALCULATED USING THE LARGEST TIRE WHICH WILL BE USED IN TYPICAL OPERATIONS.
- ② PROVIDE RADIUS OR WIDEN PAD SUFFICIENTLY TO PREVENT VEHICLE TIRES FROM TRACKING OFF OF PAD WHEN LEAVING SITE.
- ③ IF RUNOFF FROM DISTURBED AREAS FLOWS TOWARD CONSTRUCTION EXITS, PREVENT RUNOFF FROM DRAINING DIRECTLY TO PUBLIC ROAD OVER CONSTRUCTION EXIT BY CROWNING THE EXIT OR SLOPING TO ONE SIDE. IF SURFACE GRADING IS INSUFFICIENT, PROVIDE OTHER MEANS OF INTERCEPTING RUNOFF.
- ④ IF RUNOFF FROM CONSTRUCTION EXITS WILL DRAIN OFF OF PROJECT SITE, PROVIDE SEDIMENT TRAP WITH STABILIZED OVERFLOW.
- ⑤ IF A TIRE WASH OFF IS REQUIRED THE CONSTRUCTION EXITS SHALL BE GRADED TO DRAIN THE WASH WATER TO A SEDIMENT TRAP.
- ⑥ MINIMUM LENGTH OF RUMBLE PAD SHALL BE 20 FEET, OR AS REQUIRED TO REMOVE SEDIMENT FROM TIRES. IF SIGNIFICANT SEDIMENT IS TRACKED FROM THE SITE, THE RUMBLE PAD SHALL BE LENGTHENED OR THE DESIGN MODIFIED TO PROVIDE ADDITIONAL VIBRATION. WASH-OFF LENGTH SHALL BE AS REQUIRED TO EFFECTIVELY REMOVE CONSTRUCTION SEDIMENT FROM VEHICLE TIRES.
- ⑦ MAINTENANCE OF CONSTRUCTION EXITS SHALL OCCUR WHEN THE EFFECTIVENESS OF SEDIMENT REMOVAL HAS BEEN REDUCED. MAINTENANCE SHALL CONSIST OF REMOVING SEDIMENT AND CLEANING THE MATERIALS OR PLACING ADDITIONAL MATERIAL (SLASH MULCH OR CRUSHED ROCK) OVER SEDIMENT FILLED MATERIAL TO RESTORE EFFECTIVENESS.

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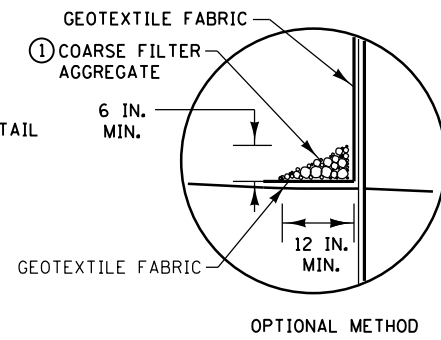
REVISION:  
APPROVED: 2-28-2017  
*[Signature]*  
CHIEF ENVIRONMENTAL OFFICER

	STANDARD PLAN 5-297.405	5 OF 8
	APPROVED: 2-28-2017 REVISION: <i>[Signature]</i> STATE DESIGN ENGINEER	

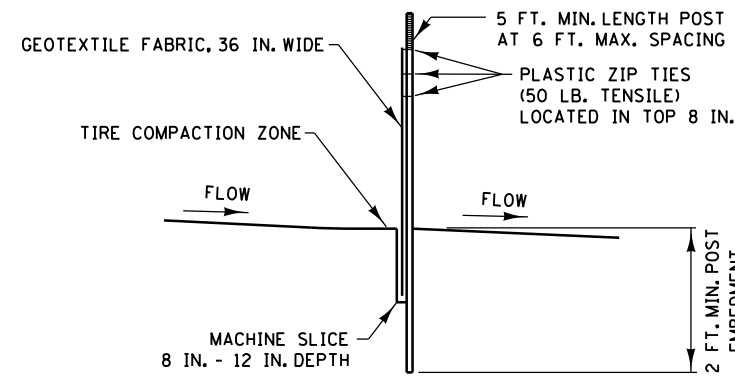
<b>TEMPORARY SEDIMENT CONTROL</b> <b>STABILIZED CONSTRUCTION EXIT</b>	
S.P. 0206-78 (TH 47), S.A.P. 002-716-020	SHEET 49 OF 206 SHEETS



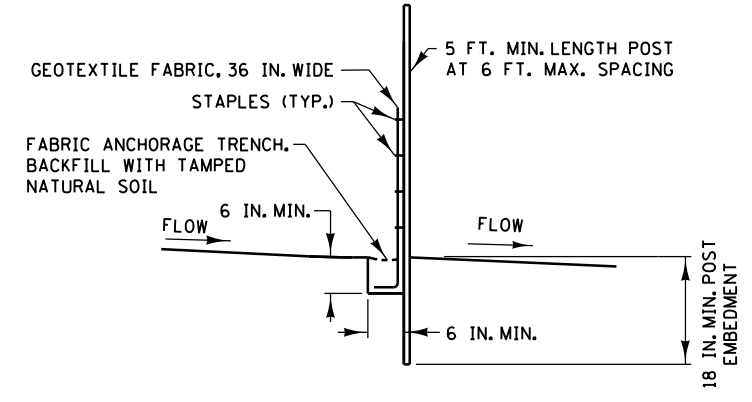
**SILTS FENCE TYPE HI ②  
(HAND INSTALLED)**



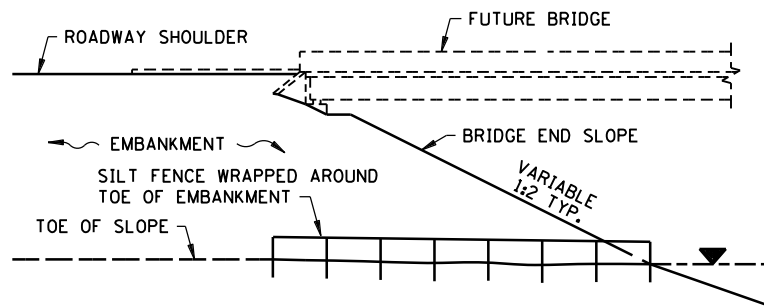
OPTIONAL METHOD



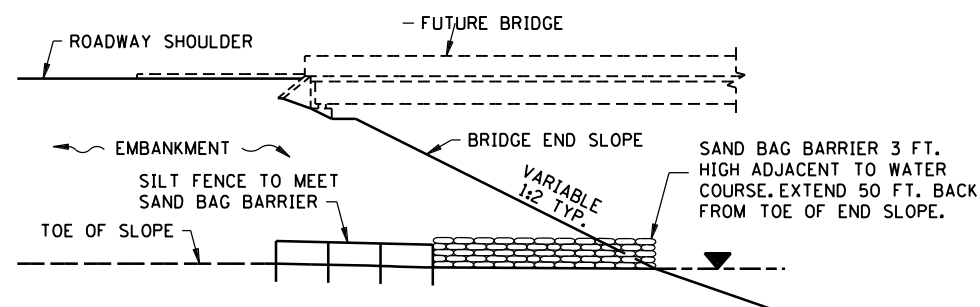
**SILTS FENCE TYPE MS ②  
(MACHINE SLICED)**



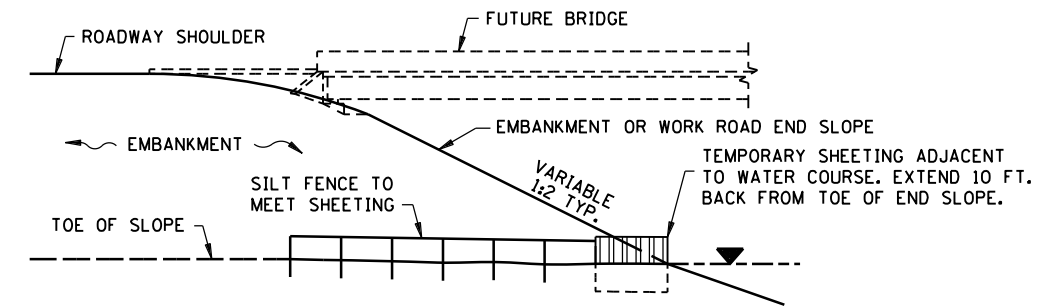
**SILTS FENCE TYPE PA ③  
(PREASSEMBLED)**



**SILTS FENCE ONLY ④**

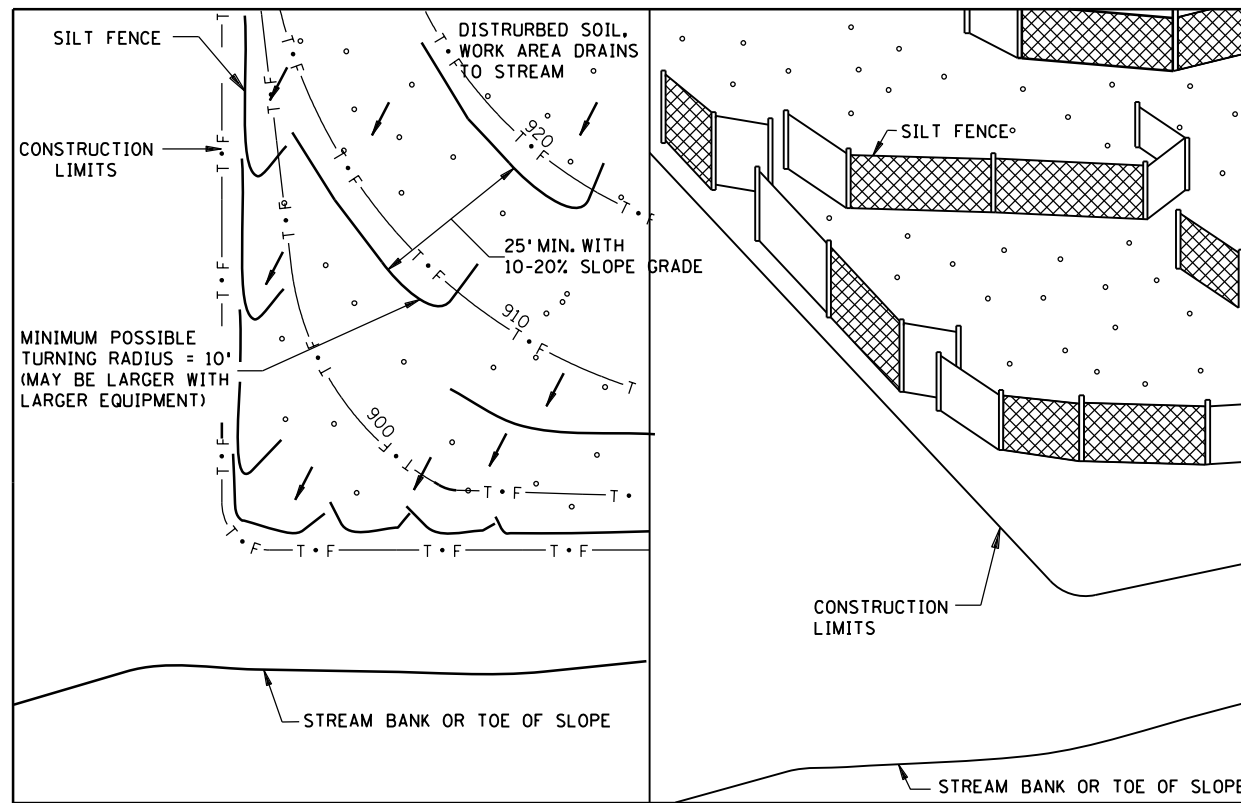


**SILTS FENCE WITH SAND BAGS ⑤**



**SILTS FENCE WITH SHEETING ⑥**

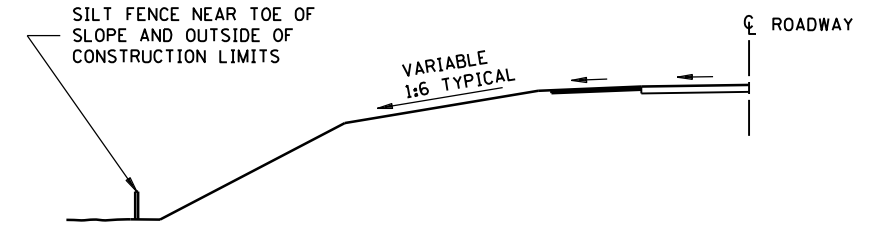
**INSTALLATION AT BRIDGE EMBANKMENT ADJACENT TO WATER**



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.

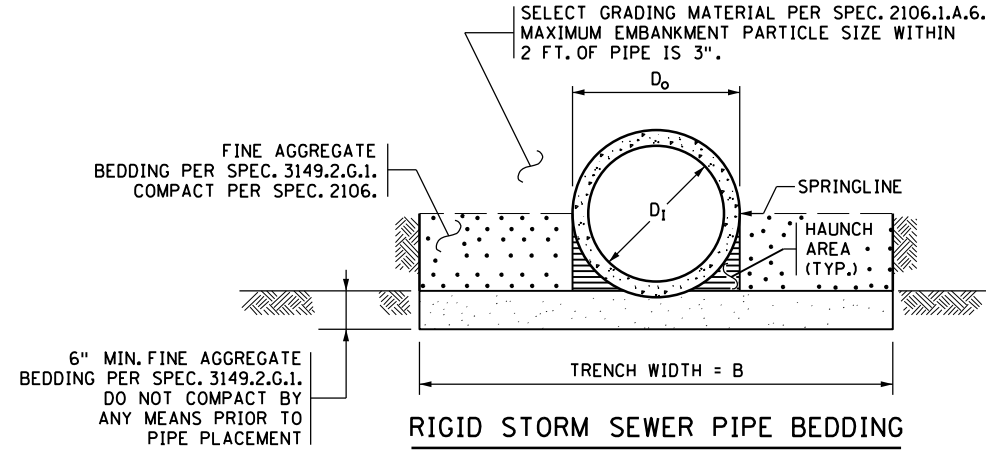
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REVISION:  
APPROVED: 2-28-2017  
*[Signature]*  
CHIEF ENVIRONMENTAL OFFICER

	STANDARD PLAN 5-297.405	6 OF 8
	APPROVED: 2-28-2017 REVISION: <i>[Signature]</i> STATE DESIGN ENGINEER	

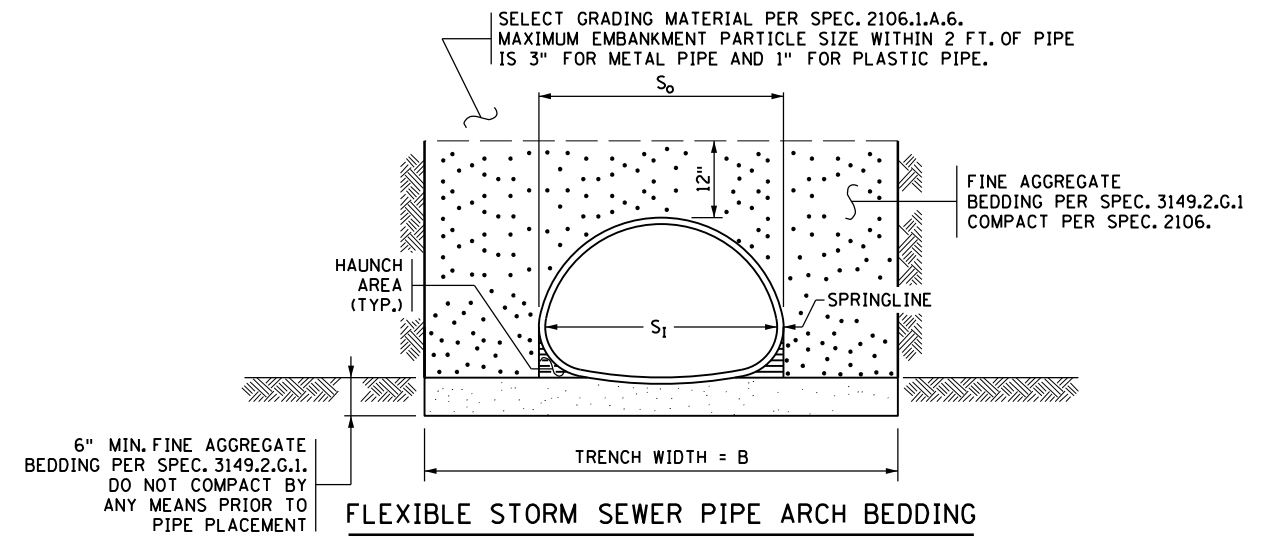
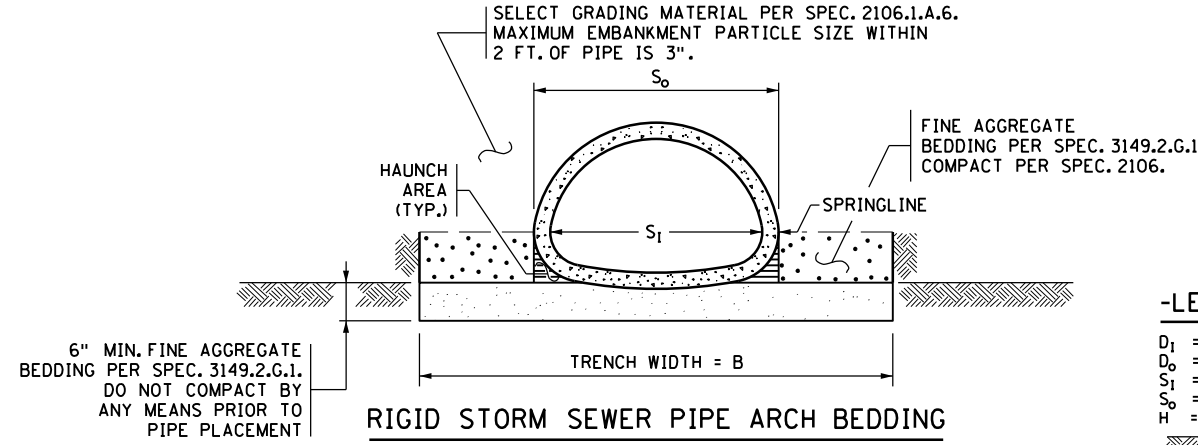
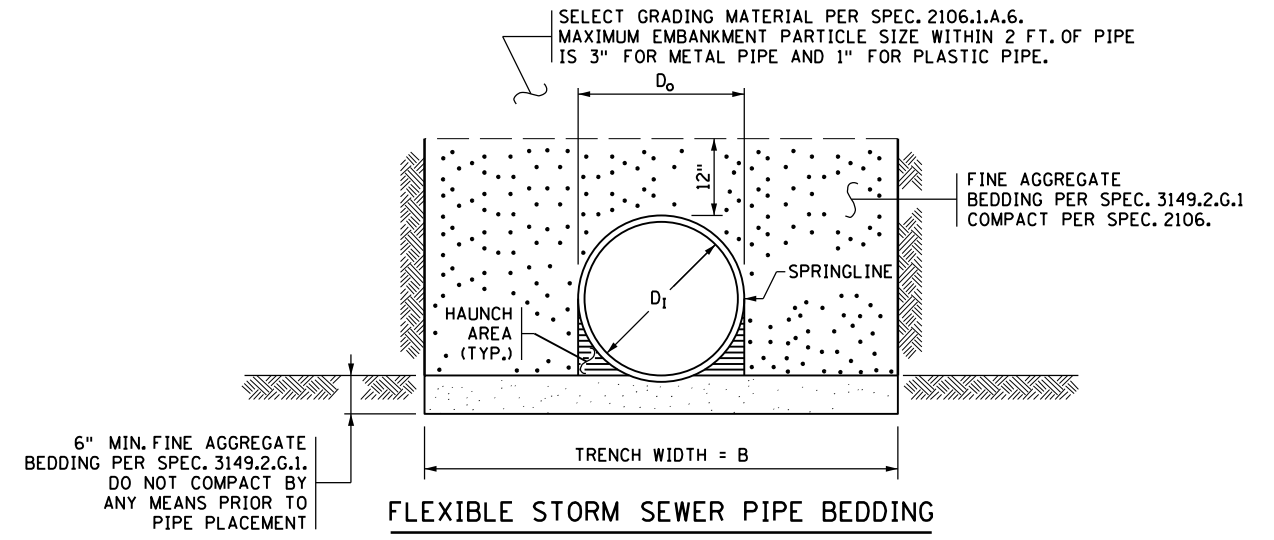
<b>TEMPORARY SEDIMENT CONTROL</b> <b>SILTS FENCE</b>
S.P. 0206-78 (TH 47), S.A.P. 002-716-020 SHEET 50 OF 206 SHEETS

DATE: 8/25/2020 2:04:13 PM  
PATH & FILENAME: Projects\Minnesota\04652-000\04652-000\_spr01



TRENCH BASE WIDTH ①②	
PIPE DIA. D <sub>1</sub> OR S <sub>1</sub>	TRENCH WIDTH B
< 42"	D <sub>0</sub> + 24"
42" TO 54"	1.5 × D <sub>0</sub>
> 54"	D <sub>0</sub> + 36"

PLASTIC PIPE WITH H > 10 FT. ①②	
PIPE DIA.	TRENCH WIDTH (FEET)
12"	5'-2"
15"	5'-6"
18"	5'-9"
24"	6'-6"
30"	8'-0"
36"	9'-6"
42"	11'-0"
48"	12'-6"



**-LEGEND-**

D<sub>1</sub> = INSIDE DIAMETER OF ROUND PIPE (INCHES).  
D<sub>0</sub> = OUTSIDE DIAMETER OF ROUND PIPE (INCHES).  
S<sub>1</sub> = INSIDE SPAN OF PIPE-ARCH (INCHES).  
S<sub>0</sub> = OUTSIDE SPAN OF PIPE-ARCH (INCHES).  
H = FILL COVER HEIGHT OVER PIPE (FEET).

= UNDISTURBED SOIL  
 = COMPACTED BEDDING  
 = LOOSE BEDDING, COMPACTED AFTER PIPE PLACEMENT

**CONSTRUCTION SEQUENCE**

1. LOOSELY PLACE 6" OF FINE AGGREGATE BEDDING MATERIAL TO GRADE. DO NOT COMPACT PRIOR TO PIPE PLACEMENT.
2. FOR PIPES WITH BELL, REMOVE MATERIAL IN BELL AREA PRIOR TO PLACEMENT.
3. FURNISH AND INSTALL PIPE TO GRADE.
4. AFTER PLACEMENT OF THE PIPE, PLACE ADDITIONAL FINE AGGREGATE BEDDING AND COMPACT THE FULL LENGTH ON BOTH SIDES OF THE PIPE UNDERNEATH THE HAUNCH AREA BY FIRST SHOVEL SLICING (MANUALLY SHOVE THE BLADE END OF SHOVEL AT AN ANGLE DOWN THE ENTIRE LENGTH OF HAUNCH UNDER THE PIPE), THEN COMPACT THE HAUNCH AT AN ANGLE USING A POWERED MECHANICAL OR PNEUMATIC DEVICE (I.E. POLE TAMPER, JUMPING JACK, OR SIMILAR).
5. COMPACT THE REMAINING MATERIAL OUTSIDE THE HAUNCH AREA TO THE REQUIREMENTS OF SPEC. 2106 ENSURING THAT THE ENTIRE LENGTH OF PIPE IS SUPPORTED UNIFORMLY BY BEDDING.
6. PLACE AND COMPACT BACKFILL EVENLY AND SIMULTANEOUSLY IN 6" LIFTS ON EACH SIDE OF THE PIPE UP TO THE SPRINGLINE FOR RIGID PIPE AND 12" ABOVE THE TOP OF THE PIPE FOR FLEXIBLE PIPE WHEN COMPACTED.
7. COMPLETE REMAINING BACKFILL.

**NOTES**

- EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.
- PIPE SIZE IS BASED ON THE NOMINAL INSIDE DIAMETER OR SPAN.
- PROTECT ALL PIPE DURING CONSTRUCTION PER SPEC. 2503.
- WHEN RIPRAP IS REQUIRED AT THE APRON END, SEE STANDARD PLATE OR PLAN FOR RIPRAP INSTALLATION AND QUANTITIES. FOR APRONS WITHOUT RIPRAP PLACE 6" MIN. FINE AGGREGATE BEDDING UNDER APRONS. USE A TRENCH WIDTH EQUAL TO THE PIPE TRENCH WIDTH.
- \* FINE AGGREGATE BEDDING INCLUDING THE COST OF EXCAVATION, PLACEMENT AND COMPACTION IS INCLUDED IN THE CONTRACT UNIT PRICE OF THE RELEVANT STORM SEWER PAY ITEM. **FINE AGGREGATE BEDDING** \*
- EXCAVATION AND BACKFILL WITH SELECT GRADING MATERIAL ARE NOT TABULATED SEPARATELY BUT ARE INCLUDED IN THE CONTRACT UNIT PRICE OF THE RELEVANT STORM SEWER PAY ITEM.
- RIGID PIPE INCLUDES CONCRETE, FLEXIBLE PIPE INCLUDES METAL, AND PLASTIC MATERIALS SUCH AS CORRUGATED POLYPROPYLENE (PP), CORRUGATED POLYETHYLENE (CP) AND POLYVINYL CHLORIDE (PVC).
- ① MODIFY TRENCH WIDTH & SLOPE AS NECESSARY TO COMPLY WITH OSHA REQUIREMENTS.
- ② USE PLASTIC PIPE TABLE FOR TRENCH WIDTHS WHEN FILL HEIGHT IS GREATER THAN 10 FT.

\* DENOTES MODIFICATION FROM STANDARD PLAN

REVISION:  
APPROVED: JANUARY 18, 2019  
*Kevin Weston*  
STATE BRIDGE ENGINEER

Design By: AJF  
Plan By: AJF  
Checked By: NEH  
Approved By: NEH

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

CERTIFIED BY: *Nicholas E. Hentges*  
LICENSED PROFESSIONAL ENGINEER NICHOLAS E. HENTGES, PE  
DATE: 8/25/2020 LICENSE NO. 44620

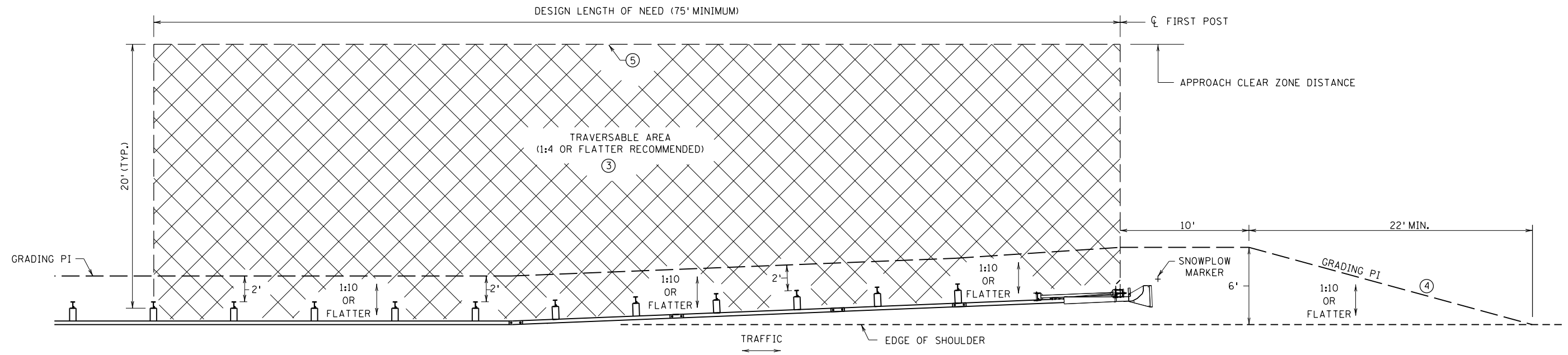


STANDARD PLAN 5-297.442 1 OF 1  
APPROVED: 01-18-2019  
REVISI  
*Tom S...*  
STATE DESIGN ENGINEER

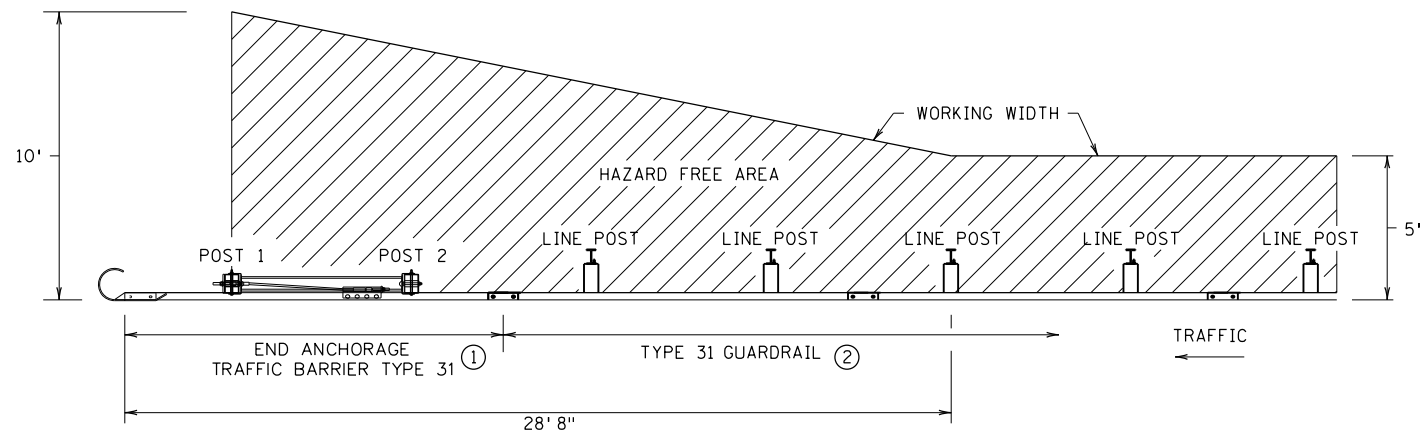
**STANDARD STORM SEWER BEDDING FOR RIGID AND FLEXIBLE PIPE**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 51 OF 206 SHEETS

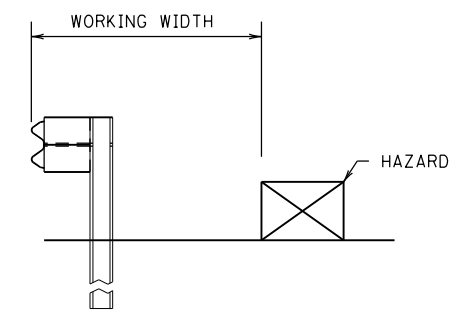


END TERMINAL  
GRADING REQUIREMENTS/HAZARD FREE AREA  
(PROPRIETARY SYSTEM SHOWN)



TYPE 31 END ANCHORAGE  
STANDARD POST SPACING  
TRAILING END HAZARD FREE AREA

ESTIMATED WORKING WIDTH FOR TYPE 31 GUARDRAIL	
STANDARD POST (6' 3'') SPACING	5' 0''
STANDARD POST (6' 3'') SPACING 9' POST AT 1:2 BREAKLINE	5' 5''
HALF POST (3' 1/2'') SPACING	3' 7''
QUARTER POST (1' 6 3/4'') SPACING	3' 0''



BARRIER LOCATION / WORKING WIDTH

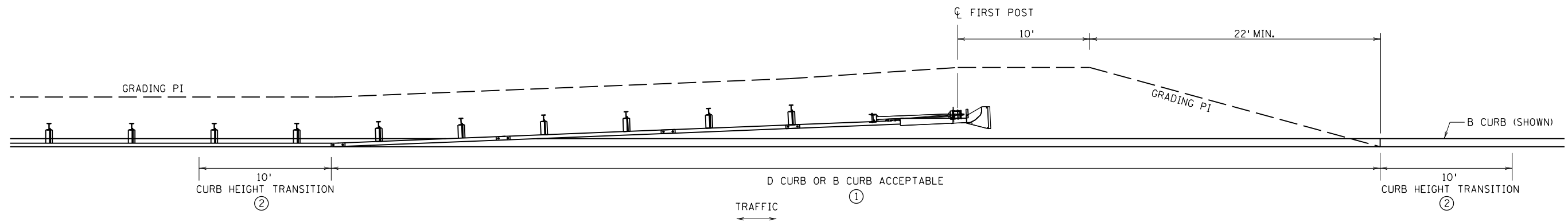
- NOTES:
- ① SEE STANDARD PLAN 5-297.692.
  - ② SEE STANDARD PLAN 5-297.690.
  - ③ THIS AREA FREE OF FIXED OBJECTS. SLOPES BETWEEN 1:3 AND 1:4 PERMITTED WHEN 1:4 OR FLATTER IS NOT POSSIBLE. FOR SLOPES STEEPER THAN 1:3 THE AREA IMMEDIATELY BEHIND AND BEYOND THE END TERMINAL SHOULD, AT LEAST, BE SIMILAR IN CROSS SECTION TO THE UNSHIELDED ROADSIDE AREA UPSTREAM OF THE END TERMINAL.
  - ④ GRADING PLATFORM SHALL TRANSITION SMOOTHLY TO EXISTING SIDE SLOPE SO THE ENTIRE ROADSIDE APPROACH TO THE BARRIER REMAINS TRAVERSABLE, AS WELL AS THE AREA IMMEDIATELY BEHIND IT.
  - ⑤ GRADUALLY BLEND SLOPE FROM TRAVERSABLE AREA TO STEEP EXISTING SLOPE (WHEN SLOPE IS STEEPER THAN 1:6).

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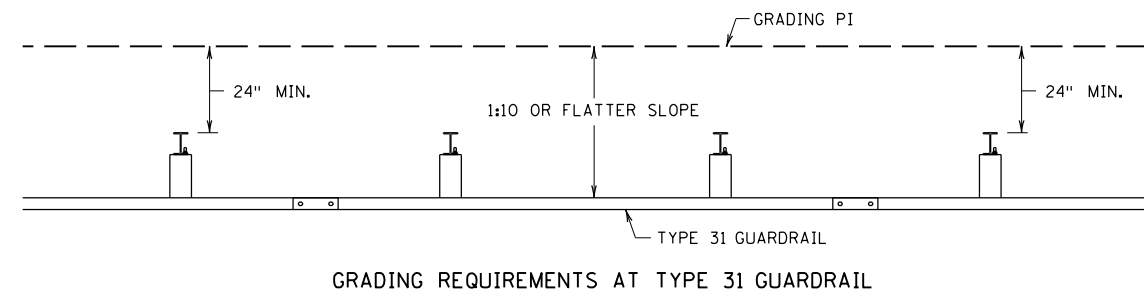
REVISION:  
APPROVED: APRIL 23, 2020  
*Nancy Youn*  
NANCY YOU  
DESIGN SUPPORT DIRECTOR  
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

**m** MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
STANDARD PLAN 5-297.601  
1 OF 4  
APPROVED: 4-23-2020  
REVISED:  
*Tom Styrbicki*  
THOMAS STYRBICKI  
STATE DESIGN ENGINEER

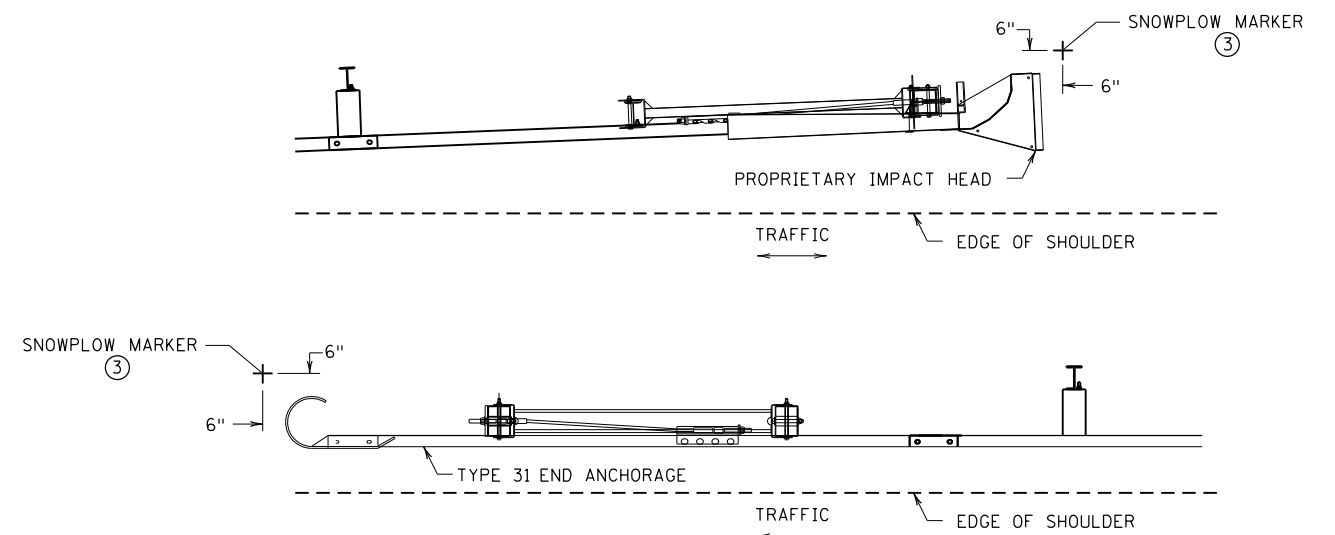
**GUARDRAIL / END TREATMENTS  
MISCELLANEOUS DETAILS**  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020  
SHEET 52 OF 206 SHEETS



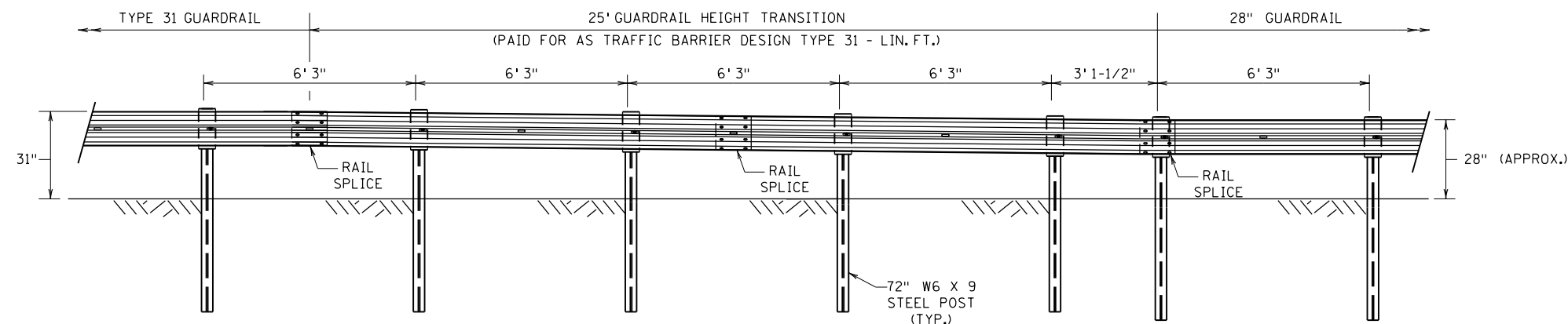
INPLACE CURB AT END TERMINAL



GRADING REQUIREMENTS AT TYPE 31 GUARDRAIL



SNOWPLOW MARKER LOCATION AT END TERMINAL/END ANCHORAGE



TYPE 31 W-BEAM GUARDRAIL HEIGHT TRANSITION TO 28" ④

NOTES:

- ① IF INPLACE CURB IS OVER 4" HEIGHT, MILL TO 3" HEIGHT.
- ② REQUIRED IF ADJACENT CURB HEIGHT IS GREATER THAN 4".
- ③ SNOWPLOW MARKER (X3-5) WITH A SQUARE-TUBE THREE-WALL SIGN BASE PER STANDARD PLAN 5-297.721. TOP OF POST SHALL BE 3' ABOVE THE HEIGHT OF THE END TERMINAL/END ANCHORAGE. PLACE MARKER AT BOTH ENDS OF GUARDRAIL RUN.
- ④ USE ONLY WHEN CONNECTING TO GUARDRAIL TYPES 8338 AND 8307.

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REVISION:

APPROVED: APRIL 23, 2020

*Nancy Younkin, P.E.*  
NANCY YOUNKIN  
DESIGN SUPPORT DIRECTOR  
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

**m** MINNESOTA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.601 2 OF 4

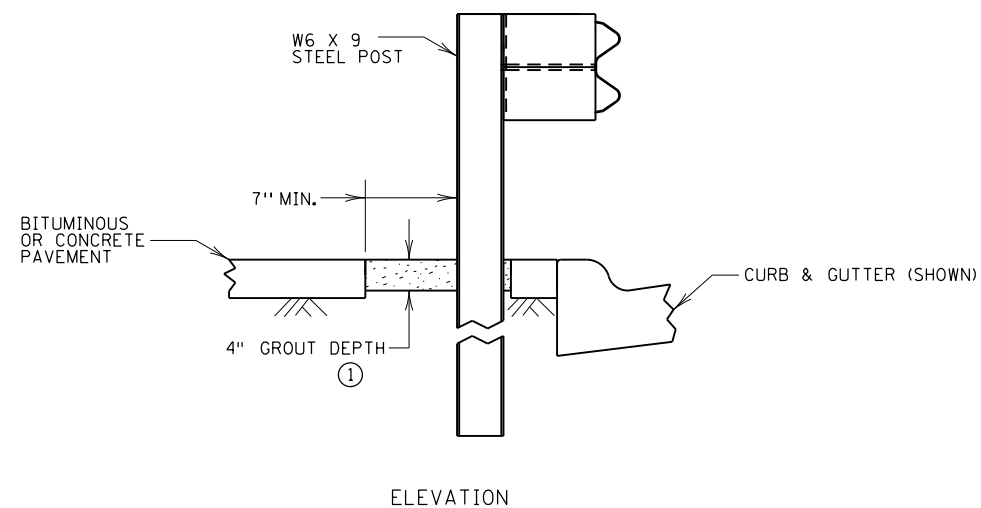
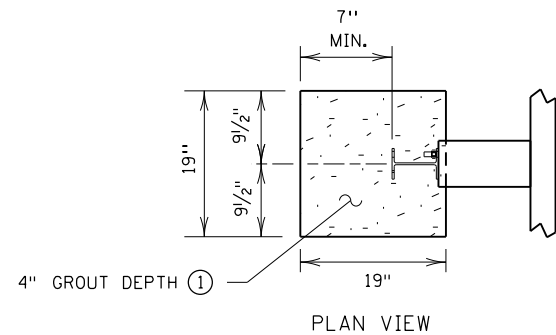
*Thomas Styrbicki*  
THOMAS STYRBICKI  
STATE DESIGN ENGINEER

APPROVED: 4-23-2020  
REVISED:

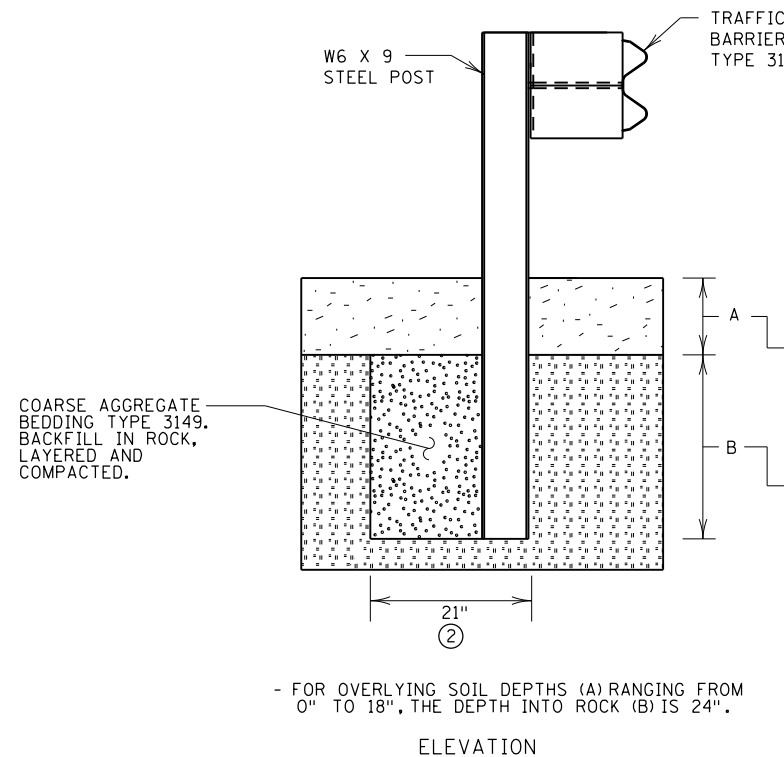
**GUARDRAIL / END TREATMENTS  
MISCELLANEOUS DETAILS**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 53 OF 206 SHEETS

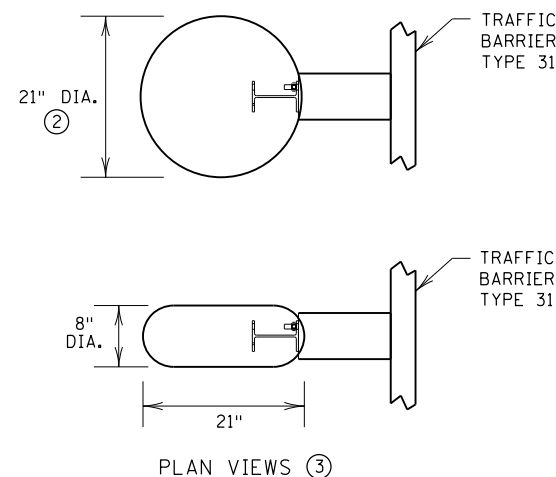


POST LEAVE-OUT FOR TRAFFIC BARRIER TYPE 31

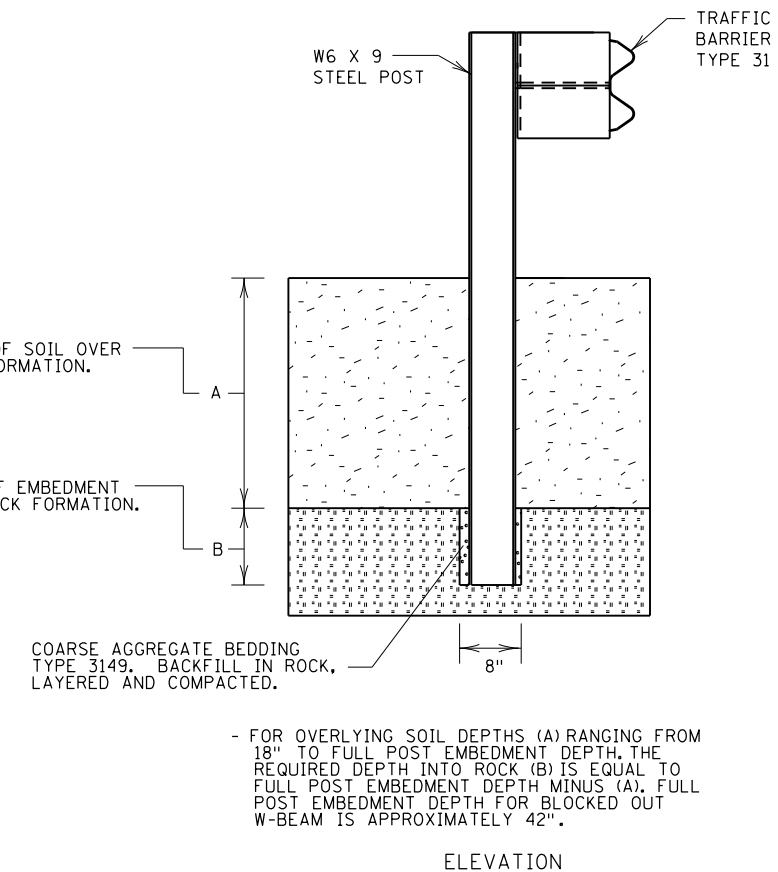


- FOR OVERLYING SOIL DEPTHS (A) RANGING FROM 0" TO 18", THE DEPTH INTO ROCK (B) IS 24".

ELEVATION

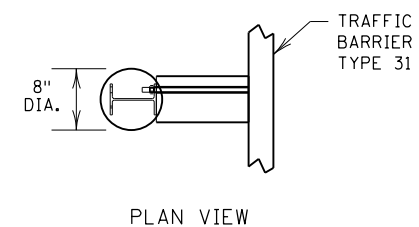


GUARDRAIL POST IN ROCK 0" TO 18" OVERLYING SOIL DEPTH (POST HOLE IN ROCK SPECIAL)



- FOR OVERLYING SOIL DEPTHS (A) RANGING FROM 18" TO FULL POST EMBEDMENT DEPTH, THE REQUIRED DEPTH INTO ROCK (B) IS EQUAL TO FULL POST EMBEDMENT DEPTH MINUS (A). FULL POST EMBEDMENT DEPTH FOR BLOCKED OUT W-BEAM IS APPROXIMATELY 42".

ELEVATION



GUARDRAIL POST IN ROCK 18" OR GREATER OVERLYING SOIL DEPTH (POST HOLE IN ROCK)

NOTES:

- ① GROUT IS ONE PART TYPE 1A CEMENT, 14 PARTS SAND, AND 5 PARTS WATER, BY VOLUME.
- ② 24" DIAMETER ACCEPTABLE.
- ③ EITHER HOLE CONFIGURATION (CIRCULAR OR ELONGATED) ACCEPTABLE.

DATE: 8/25/2020 2:04:44 PM  
 PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_spr01

REVISION:  
 APPROVED: APRIL 23, 2020  
  
 NANCY YOO  
 DESIGN SUPPORT DIRECTOR  
 OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

MINNESOTA  
 DEPARTMENT  
 OF  
 TRANSPORTATION

STANDARD PLAN 5-297.601

4 OF 4

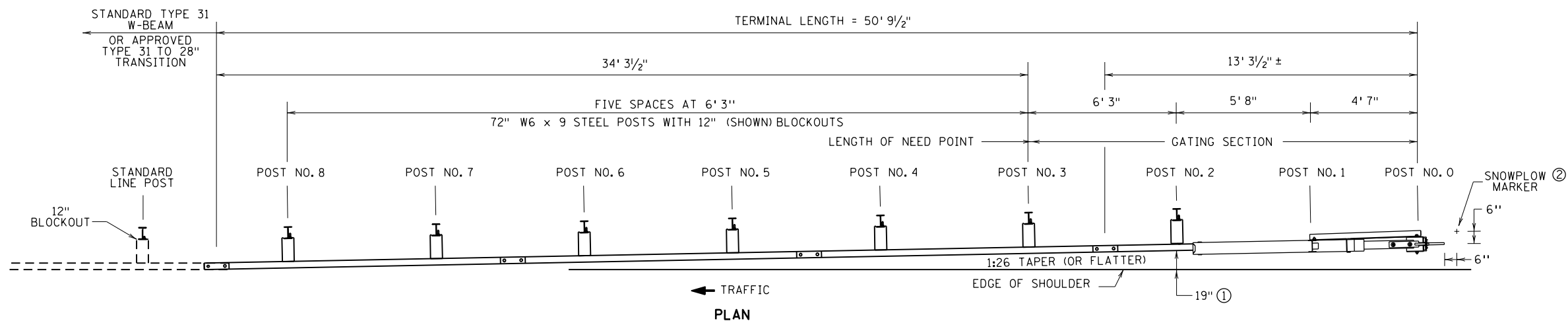
THOMAS STYRBICKI  
 STATE DESIGN ENGINEER

APPROVED: 4-23-2020  
 REVISED:

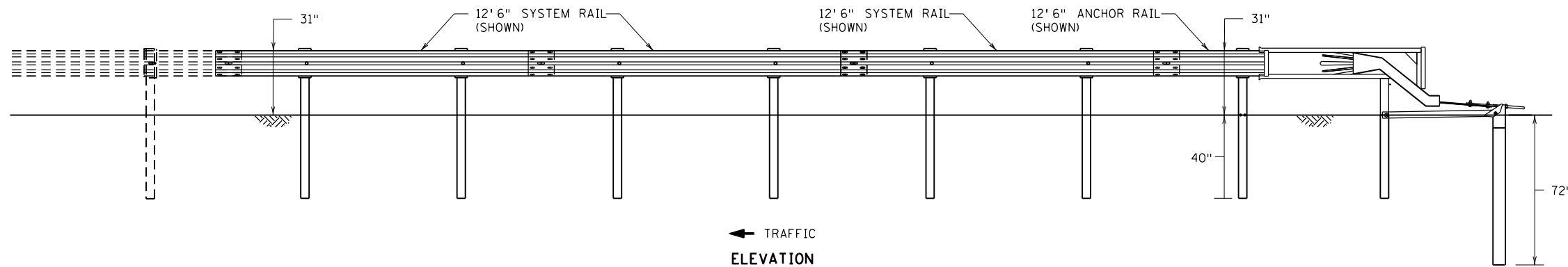
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

GUARDRAIL / END TREATMENTS  
 MISCELLANEOUS DETAILS

SHEET 54 OF 206 SHEETS



PLAN



ELEVATION

**SOFTSTOP  
(TRINITY HIGHWAY PRODUCTS)**

**NOTES:**

THIS IS A PROPRIETARY ITEM AS PER SPEC. 1703.

THESE DETAILS ARE FOR DESIGN GUIDANCE INFORMATION ONLY. CHECK WITH MANUFACTURER FOR CURRENT DETAILS AND INSTALLATION INSTRUCTIONS.

ALL TERMINAL RAIL MUST BE STRAIGHT. CURVED TERMINAL RAIL IS NOT ALLOWED.

ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS, AND BEARING PLATES SHALL BE GALVANIZED PER MnDOT SPEC. 3392.

POSTS 1 AND 2 ARE PROPRIETARY STEEL YIELDING TERMINAL POSTS.

POST 0 IS A PROPRIETARY ANCHOR POST.

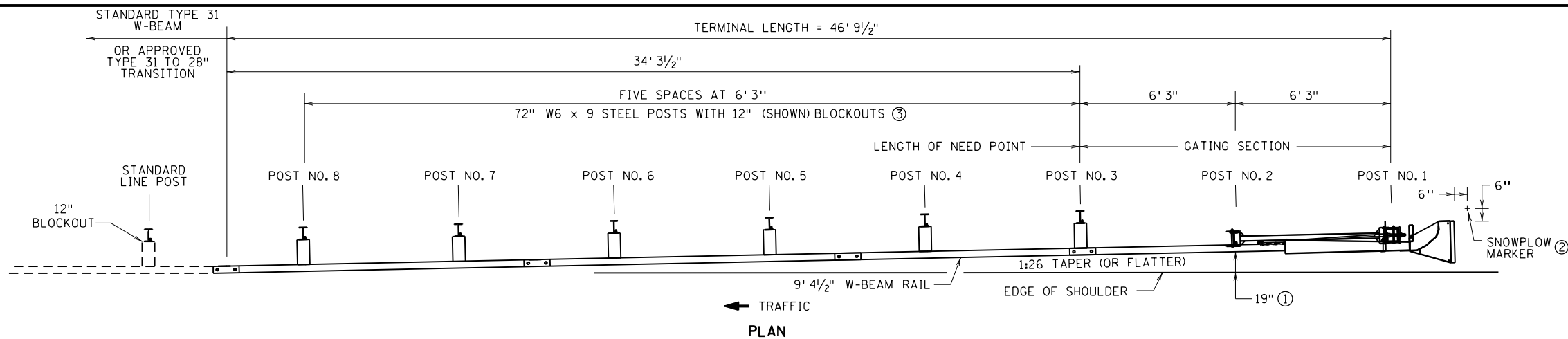
POSTS 2 - 8, 8" BLOCKOUTS ACCEPTABLE.

OPTIONAL 25' ANCHOR RAIL AND 25' SYSTEM RAIL ACCEPTABLE.

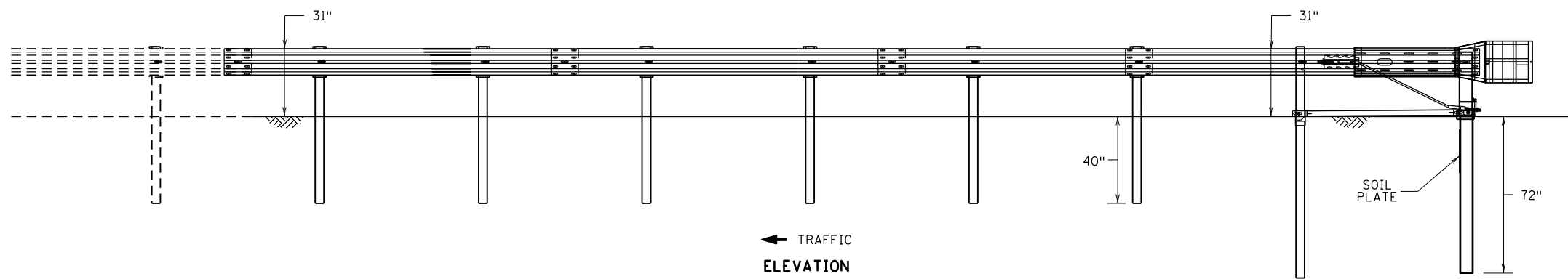
END TERMINAL TO FOLLOW A STRAIGHT TAPER.

① LESSER OFFSET ALLOWED WITH APPROVAL OF THE ENGINEER.

② SEE STANDARD PLAN 5-297.601.



PLAN



ELEVATION

**MSKT  
(ROAD SYSTEMS INC.)**

**NOTES:**

THIS IS A PROPRIETARY ITEM AS PER SPEC. 1703.

THESE DETAILS ARE FOR DESIGN GUIDANCE INFORMATION ONLY. CHECK WITH MANUFACTURER FOR CURRENT DETAILS AND INSTALLATION INSTRUCTIONS.

ALL TERMINAL RAIL MUST BE STRAIGHT. CURVED TERMINAL RAIL IS NOT ALLOWED.

ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS, AND BEARING PLATES SHALL BE GALVANIZED PER MnDOT SPEC. 3392.

POSTS 1 AND 2 ARE PROPRIETARY HINGED POSTS.

THE RAIL IS DESIGNED TO EXIT THE IMPACT HEAD ON THE BACK SIDE OF THE TERMINAL.

END TERMINAL TO FOLLOW A STRAIGHT TAPER.

① LESSER OFFSET ALLOWED WITH APPROVAL OF THE ENGINEER.

② SEE STANDARD PLAN 5-297.601.

③ 8" BLOCKOUTS ARE ACCEPTABLE.

DATE: 8/25/2020 2:04:44 PM PATH & FILENAME: Projects\MnDOT\4652-000\CadPlan\4652-000\_spr01

REVISION:  
APPROVED: APRIL 28, 2020  
*Nancy Younkers*  
NANCY YOUNKERS  
DESIGN SUPPORT DIRECTOR  
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

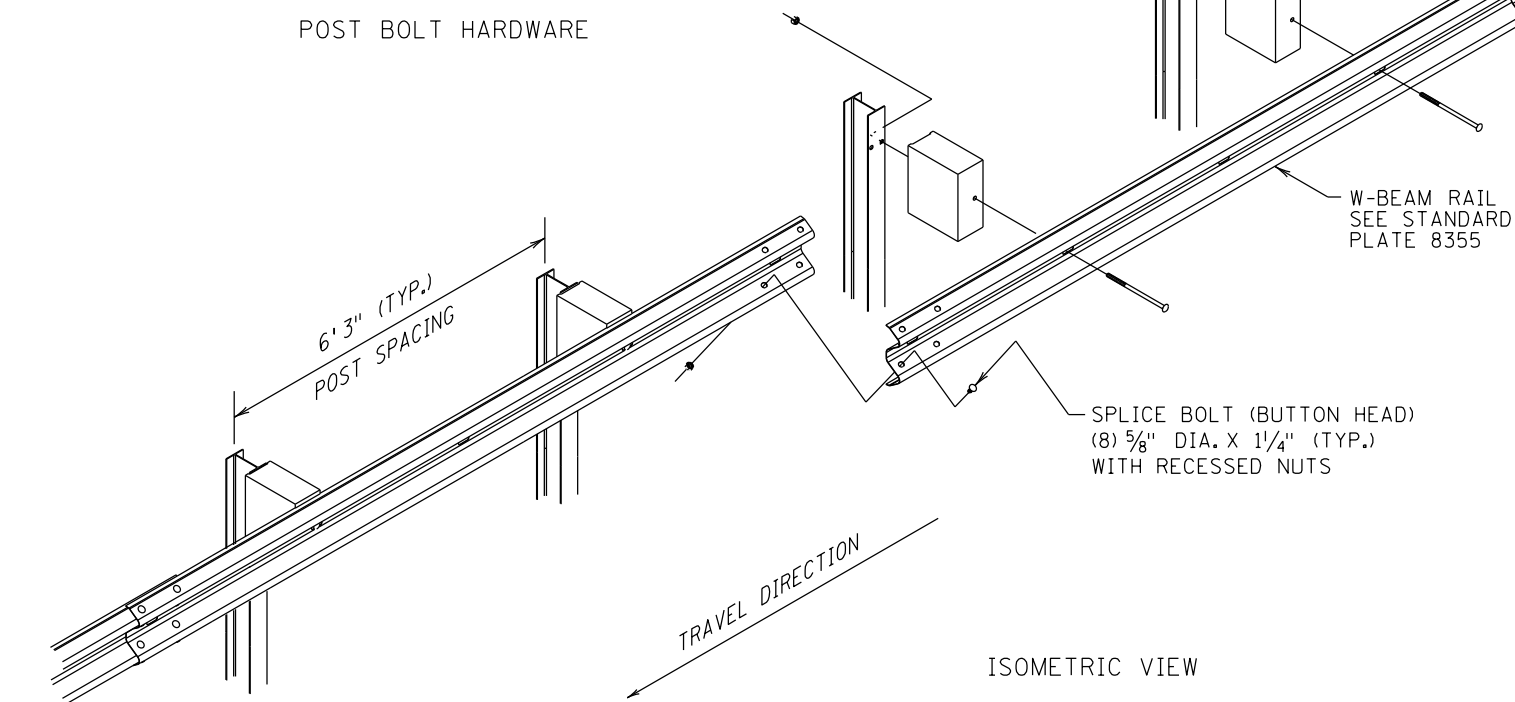
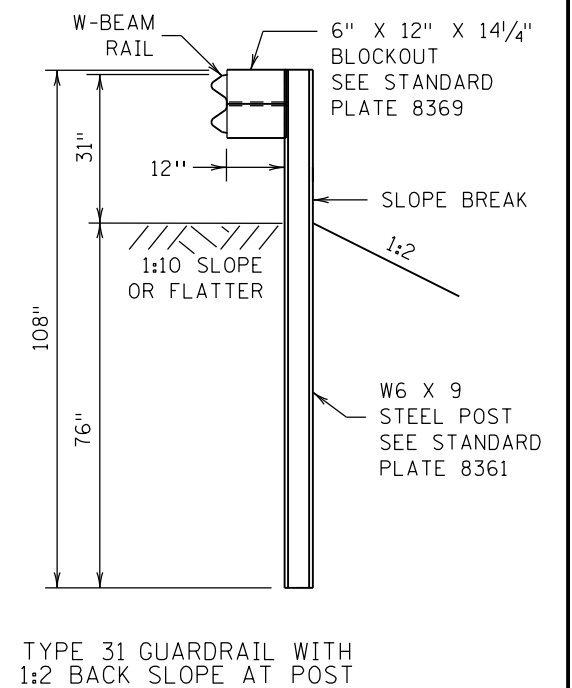
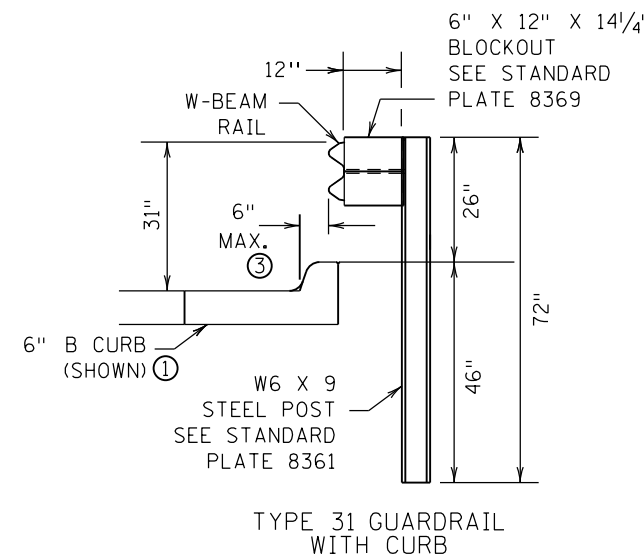
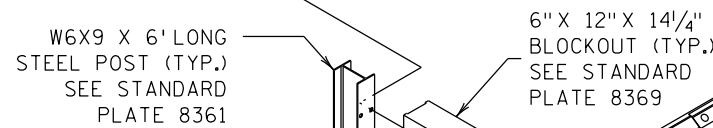
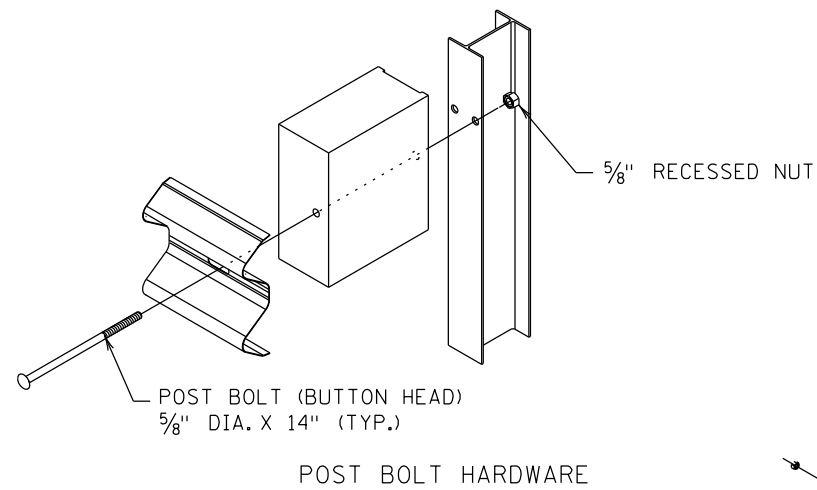
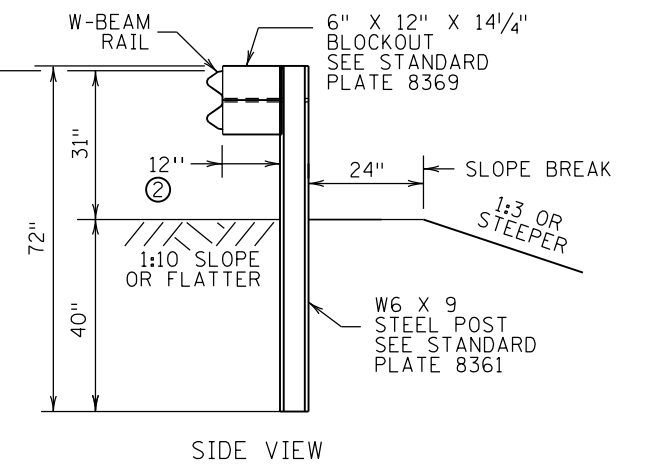
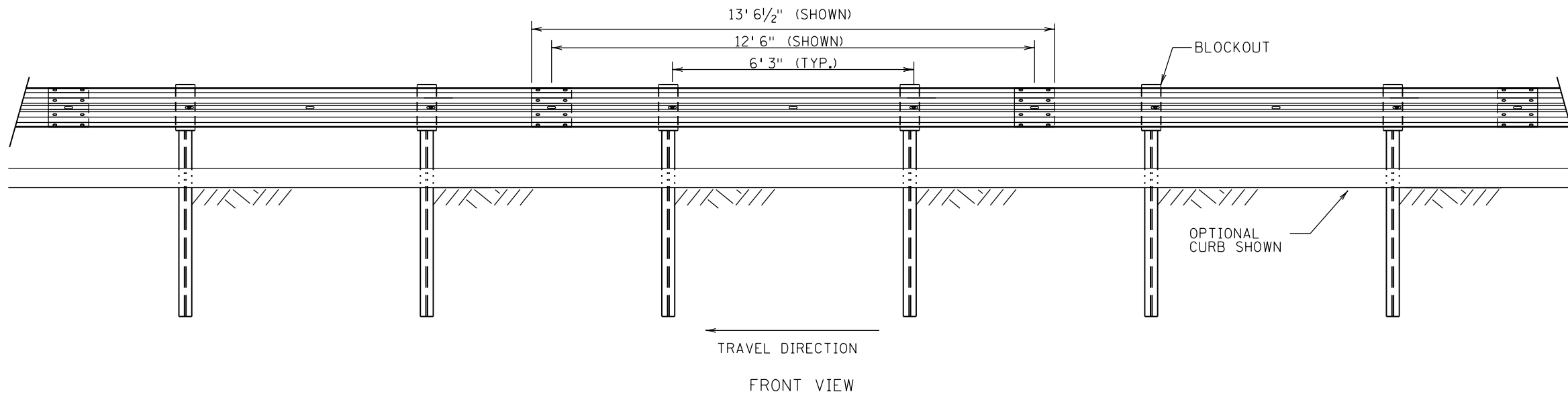


STANDARD PLAN 5-297.612 1 OF 1  
*Tom Styrbicki*  
THOMAS STYRBICKI  
STATE DESIGN ENGINEER  
APPROVED: 4-28-2020  
REVISED:

**PROPRIETARY END TERMINAL - TANGENT  
FOR TYPE 31 GUARDRAIL**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 55 OF 206 SHEETS



NOTES:

GUARDRAIL IS PLACED ON SLOPES 1:10 OR FLATTER WITH SLOPE EXTENDING A MINIMUM 24" BEHIND POST TO SLOPE BREAK POINT.

ALL RAIL AND HARDWARE COMPONENTS PER AASHTO SPEC. M 180

① B CURB OR D CURB ACCEPTABLE.

② MAXIMUM OF 24" MAY BE USED WHERE UNDERGROUND POST OBSTRUCTIONS ARE ENCOUNTERED.

③ 0" TO 6" MAXIMUM.

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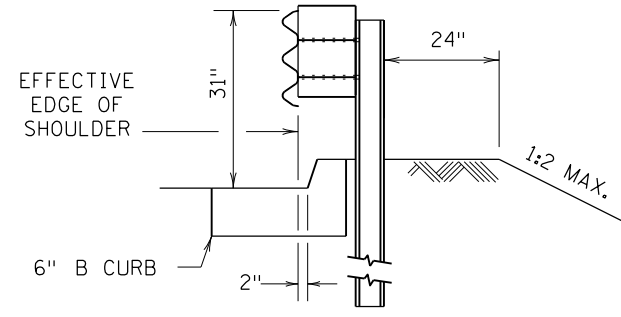
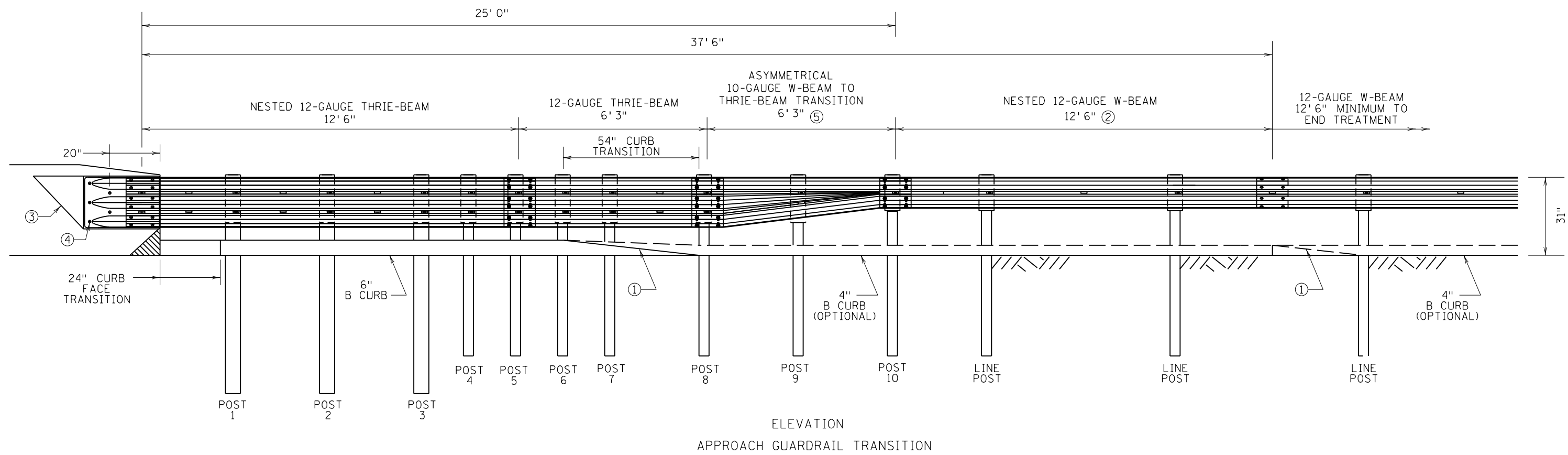
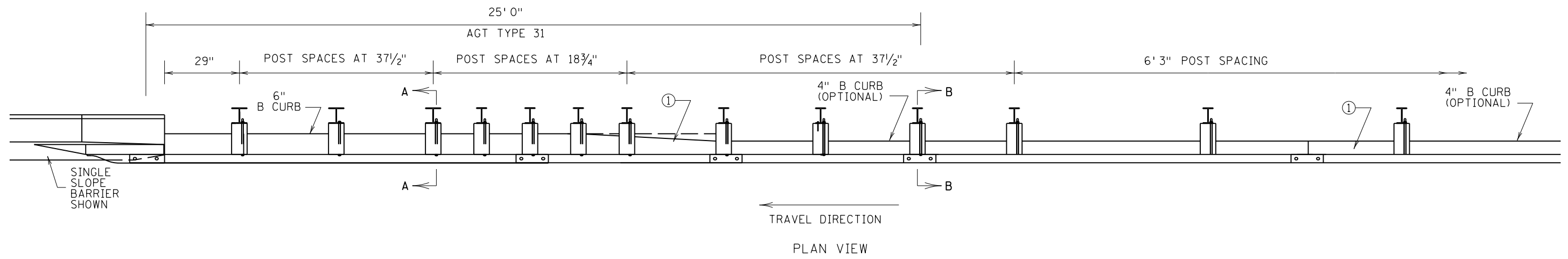
REVISION:  
APPROVED: MARCH 6, 2020  
*Nancy Youn*  
NANCY YOU  
DESIGN SUPPORT DIRECTOR  
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT



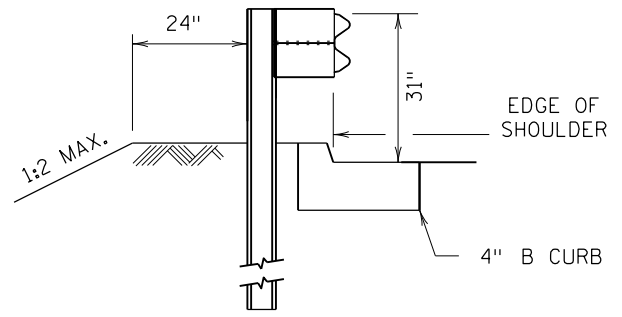
STANDARD PLAN 5-297.690 1 OF 1  
*Tom Styrbicki*  
THOMAS STYRBICKI  
STATE DESIGN ENGINEER  
APPROVED: 3-6-2020  
REVISED:

TRAFFIC BARRIER TYPE 31  
ASSEMBLY DETAILS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020  
SHEET 56 OF 206 SHEETS





SECTION A-A  
(THRIE-BEAM/AGT) ⑥



SECTION B-B  
(THRIE-BEAM/AGT)

TRANSITION POST/BLOCK SIZING		
POST #	STEEL POST SIZE	BLOCKOUT SIZE
1-3	84" - W6 x 15	6 x 12 x 19"
4-9	72" - W6 x 9	6 x 12 x 19"
10	72" - W6 x 9	6 x 12 x 14 1/4"

- NOTES:
- GUARDRAIL BEAM AND HARDWARE PER AASHTO SPEC. M 180. REFER TO APPROACH PANEL PLANS FOR LOCATION OF E8 JOINT.
  - ① CURB TRANSITION, NO CHANGE IN CURB DESIGN CAN OCCUR BETWEEN POST 8 AND 37'-6" UPSTREAM FROM THE BARRIER ANCHORAGE PLATE.
  - ② THIS ADDED COMPONENT IS INCIDENTAL.
  - ③ SINGLE SLOPE CONNECTION WEDGE PLATE (STANDARD PLATE 8352), INCIDENTAL.
  - ④ THRIE-BEAM ANCHORAGE PLATE (STANDARD PLATE 8350), INCIDENTAL.
  - ⑤ SEE STANDARD PLATE 8356.
  - ⑥ SEE CURB DETAILS ON SHEET 4 OF 5.

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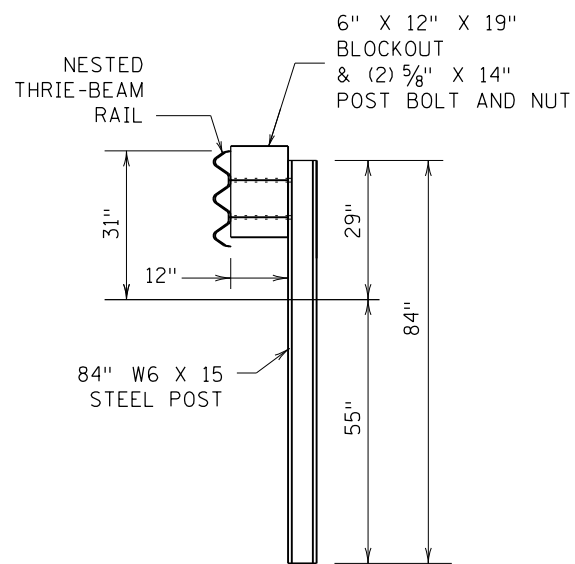
REVISION:  
APPROVED: JULY 1, 2019  
*Nancy Youn*  
NANCY YOU  
DESIGN SUPPORT DIRECTOR  
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT



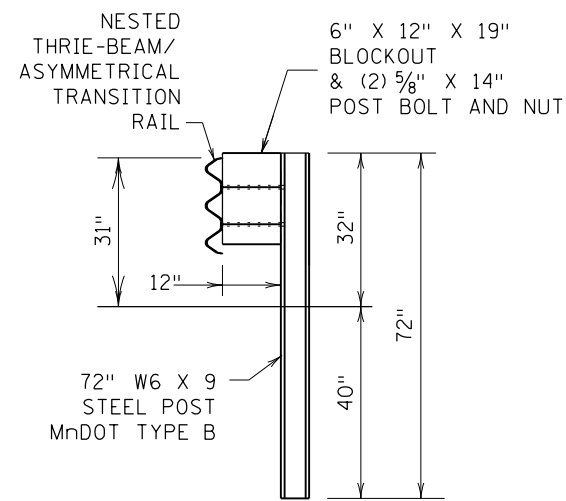
STANDARD PLAN 5-297.694  
1 OF 5  
APPROVED: 7-1-2019  
REVISOR:  
*Tom Styrbicki*  
THOMAS STYRBICKI  
STATE DESIGN ENGINEER

APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31  
ASSEMBLY DETAILS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020  
SHEET 57 OF 206 SHEETS

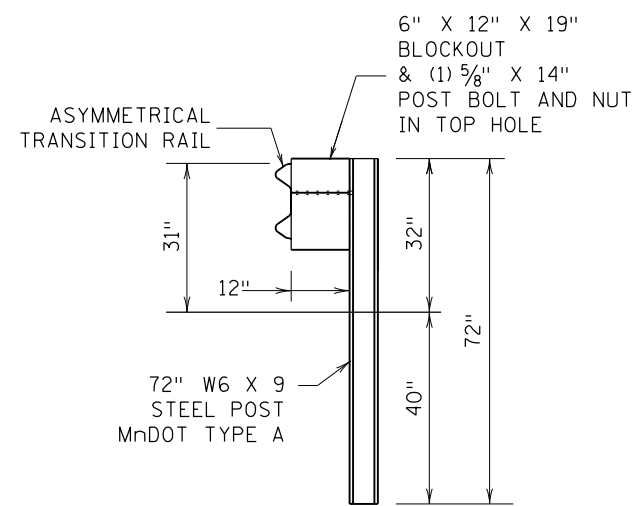
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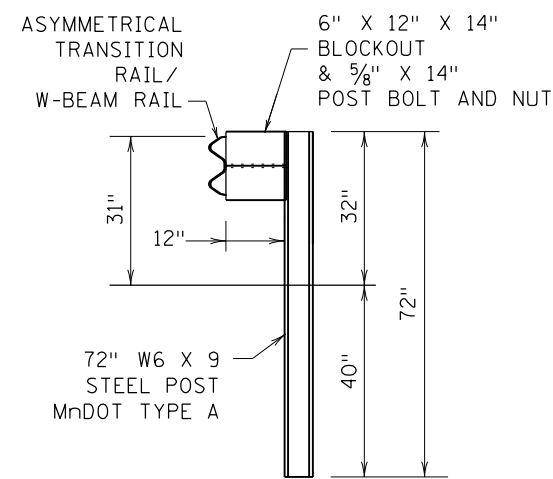
POSTS 1-3



POSTS 4-8

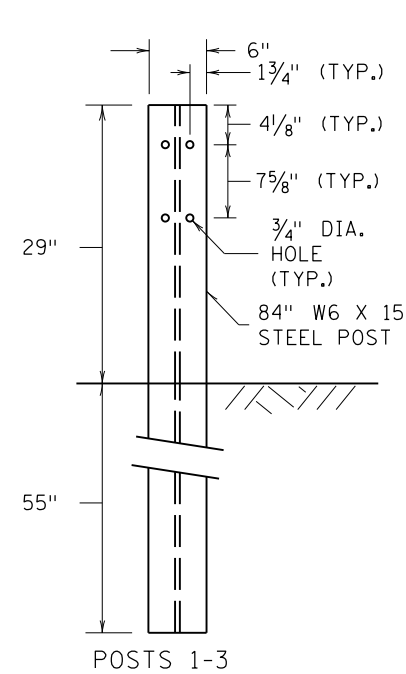


POST 9

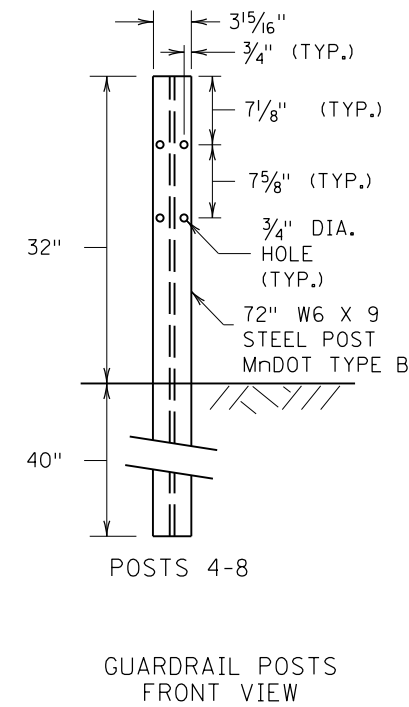


POST 10

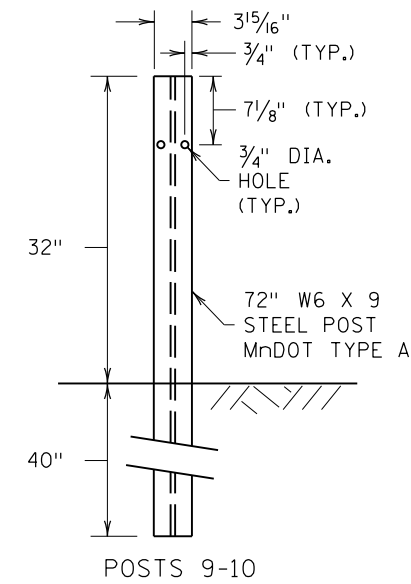
GUARDRAIL POSTS WITH BLOCKOUT AND RAIL



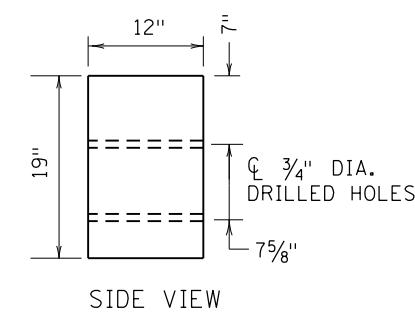
POSTS 1-3



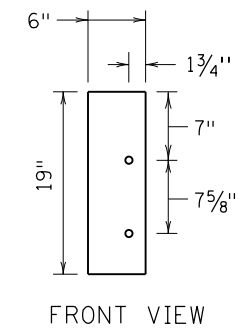
POSTS 4-8  
GUARDRAIL POSTS FRONT VIEW



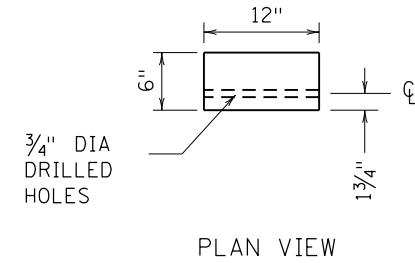
POSTS 9-10



SIDE VIEW

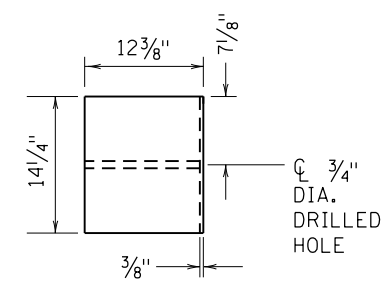


FRONT VIEW

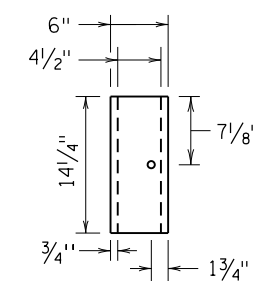


PLAN VIEW

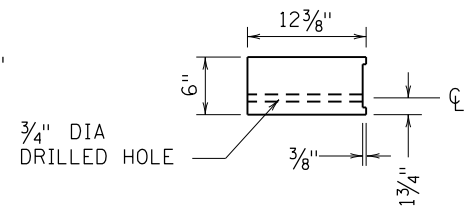
BLOCKOUT POSTS 1-9  
(6" x 12" x 19" WITH DOUBLE OFFSET POST BOLT HOLES)



SIDE VIEW



FRONT VIEW  
BLOCKOUT POST 10



PLAN VIEW

(6" x 12" x 14 1/4" WITH SINGLE OFFSET POST BOLT HOLE)

NOTES:  
ALL GUARDRAIL HARDWARE PER AASHTO SPEC. M 180.  
GUARDRAIL STEEL POSTS, SEE STANDARD PLATE 8361.  
GUARDRAIL BLOCKOUTS, SEE STANDARD PLATE 8369.

REVISION:  
APPROVED: JULY 1, 2019  
*Nancy Youn*  
NANCY YOU  
DESIGN SUPPORT DIRECTOR  
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

**m**  
MINNESOTA  
DEPARTMENT  
OF  
TRANSPORTATION

STANDARD PLAN 5-297.694

2 OF 5

*Tom Styrbicki*  
THOMAS STYRBICKI  
STATE DESIGN ENGINEER

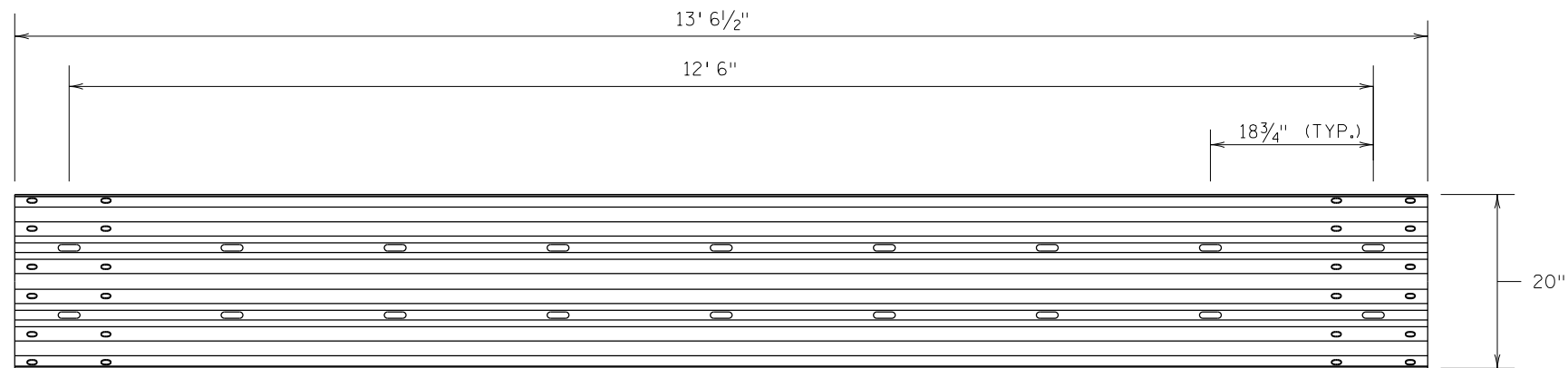
APPROVED: 7-1-2019  
REVISED:

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

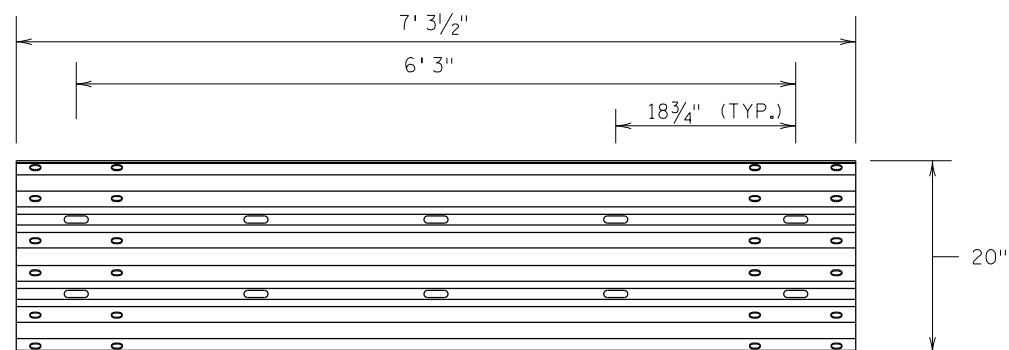
APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31

COMPONENT DETAILS

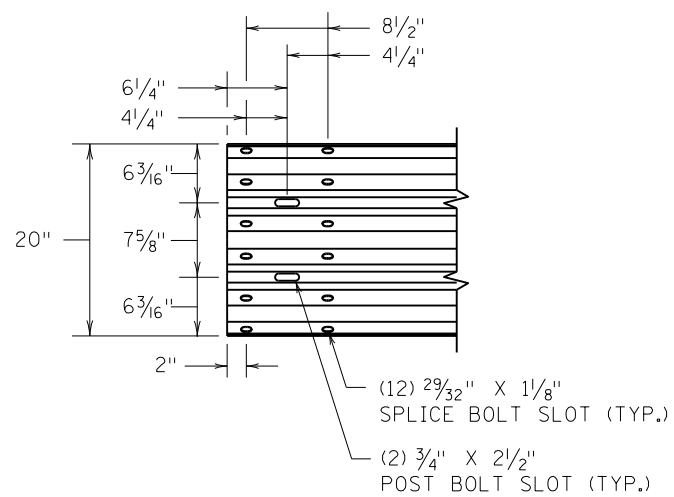
SHEET 58 OF 206 SHEETS



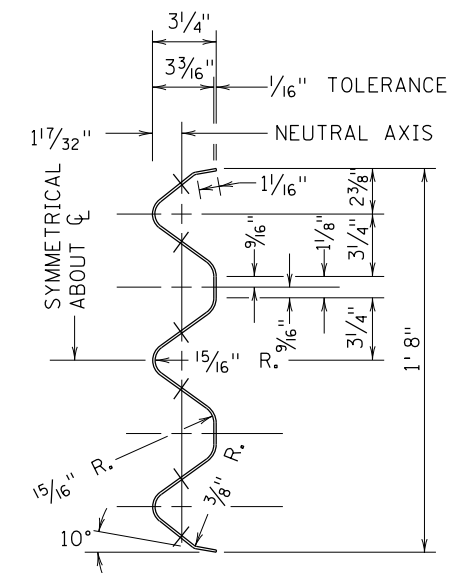
12' 6" THRIE-BEAM RAIL



6' 3" THRIE-BEAM RAIL



THRIE-BEAM RAIL  
SPLICE BOLT/POST BOLT DETAIL



THRU SECTION

NOTE:  
SEE STANDARD PLATE 8357.

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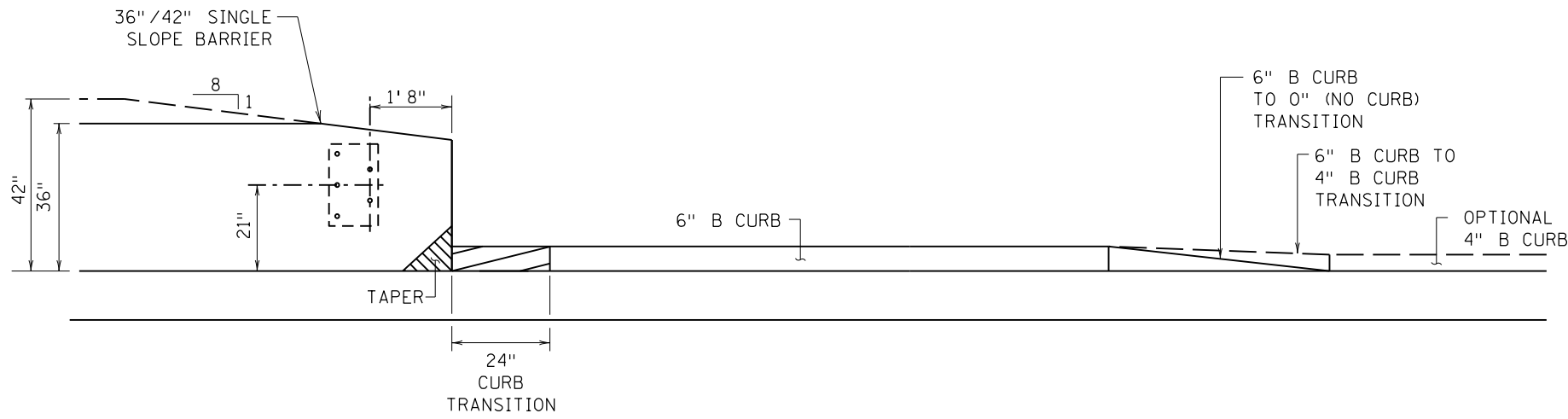
REVISION:  
APPROVED: JULY 1, 2019  
*Nancy Younkin, Inc.*  
NANCY YOUNKIN  
DESIGN SUPPORT DIRECTOR  
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

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DEPARTMENT  
OF  
TRANSPORTATION

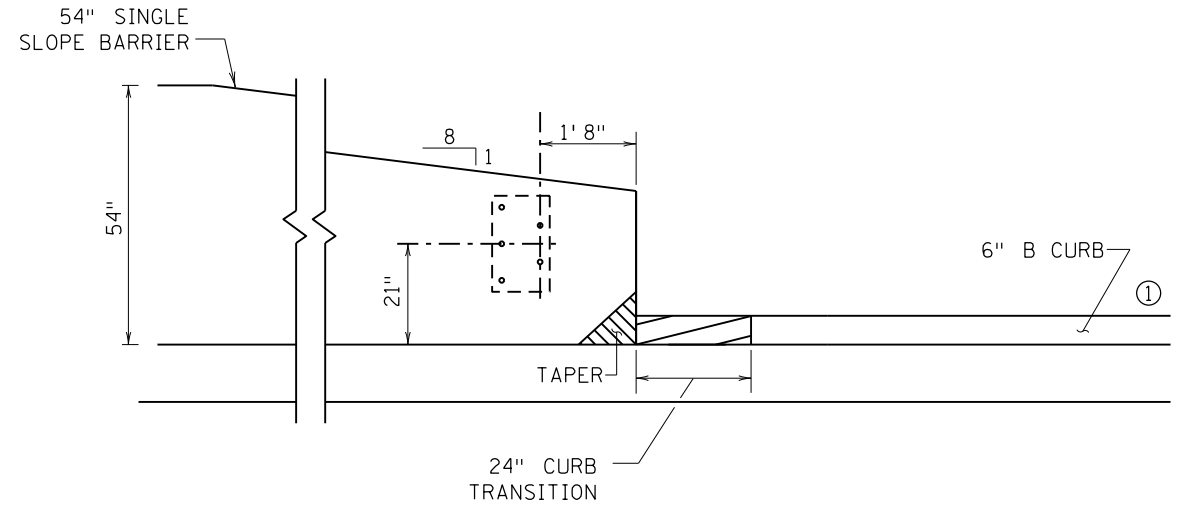
STANDARD PLAN 5-297.694  
3 OF 5  
*Tom Styrbicki*  
THOMAS STYRBICKI  
STATE DESIGN ENGINEER

APPROVED: 7-1-2019  
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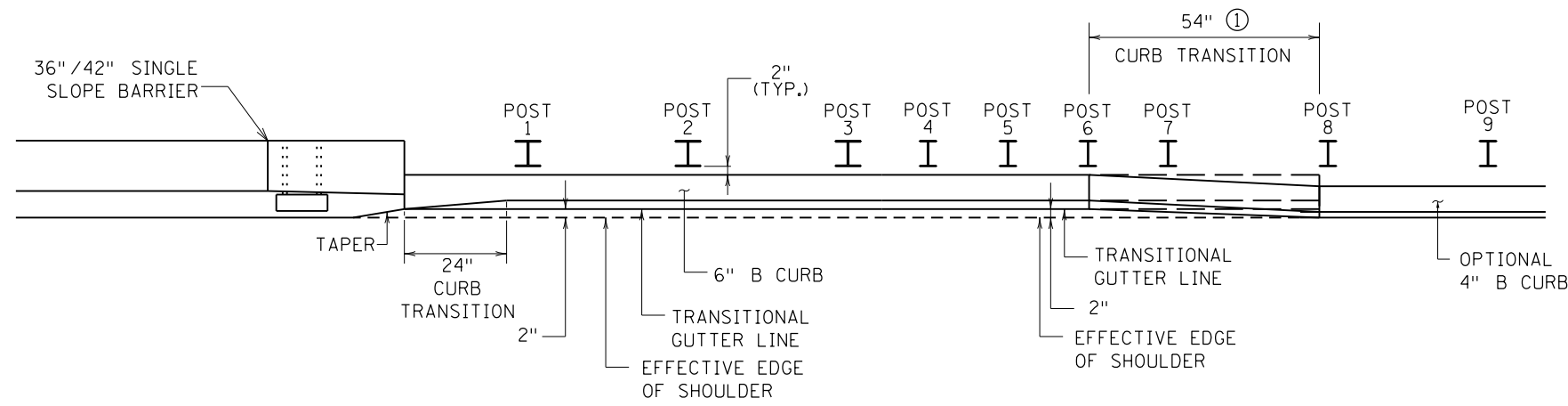
APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31  
THRIE-BEAM RAIL DETAILS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020  
SHEET 59 OF 206 SHEETS



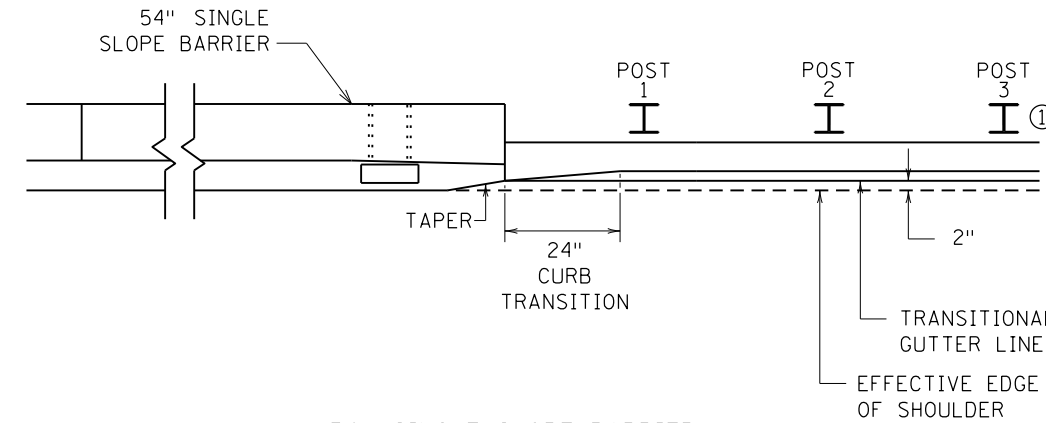
36" / 42" SINGLE SLOPE BARRIER  
FRONT VIEW



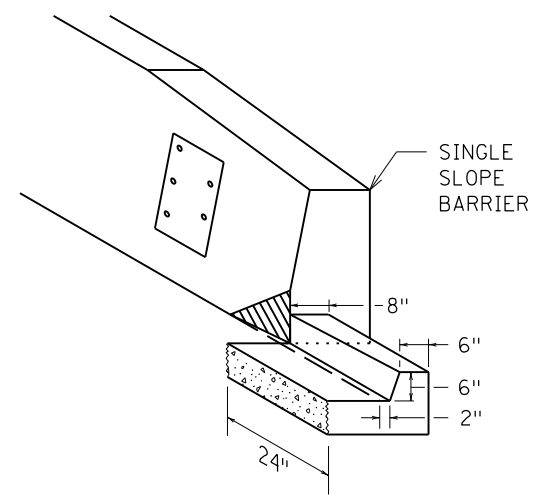
54" SINGLE SLOPE BARRIER  
FRONT VIEW



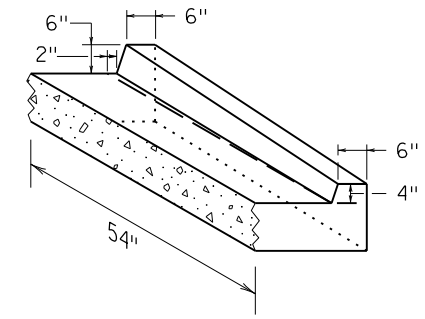
36" / 42" SINGLE SLOPE BARRIER  
PLAN VIEW



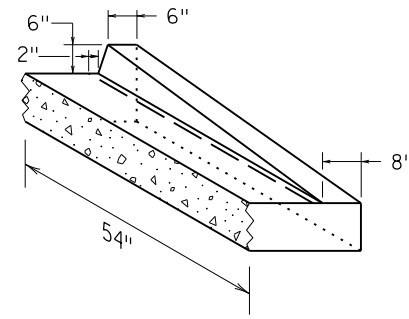
54" SINGLE SLOPE BARRIER  
PLAN VIEW



24" CURB TRANSITION FROM  
VERTICAL FACE TO 6" B CURB  
(SINGLE SLOPE BARRIER)



54" CURB TRANSITION FROM ①  
6" B CURB TO 4" B CURB



54" CURB TRANSITION FROM ①  
6" B CURB TO 0" -NO CURB

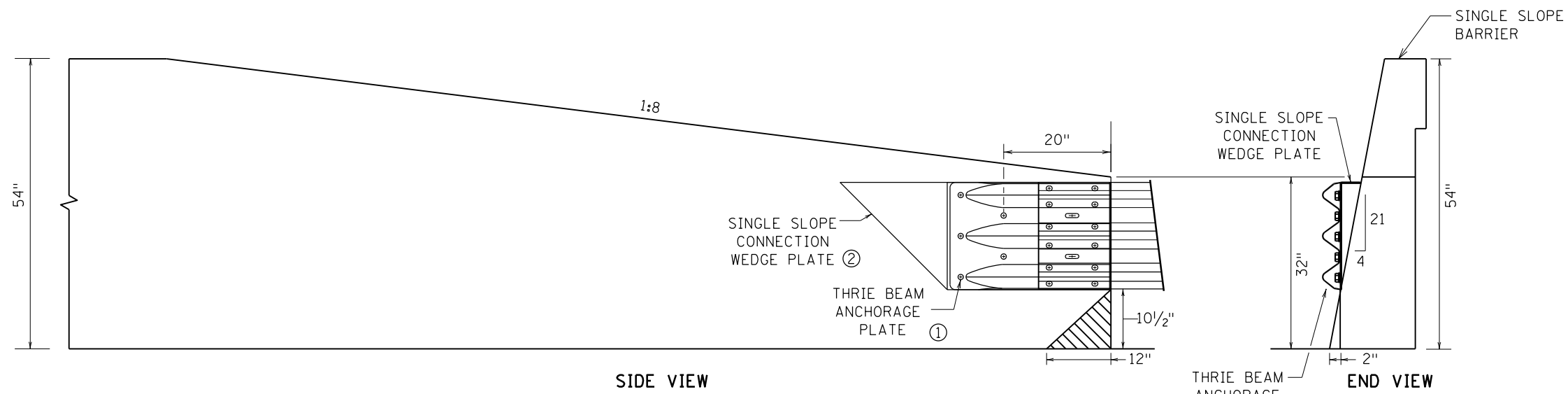
NOTES:  
36", 42", AND 54" SINGLE SLOPE BARRIERS AVAILABLE.  
REFER TO BRIDGE PLAN FOR END OF BRIDGE LOCATION.  
① FOR ALL SINGLE SLOPE BARRIER HEIGHTS, 54" CURB  
TRANSITION LOCATION IS BETWEEN POSTS 6 AND  
POST 8.

DATE: 8/25/2020 2:04:45 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_spr01

REVISION:  
APPROVED: JULY 1, 2019  
*Nancy Youn*  
NANCY YOU  
DESIGN SUPPORT DIRECTOR  
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

**m** MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
STANDARD PLAN 5-297.694  
4 OF 5  
APPROVED: 7-1-2019  
REVISED:  
*Tom Styrbicki*  
THOMAS STYRBICKI  
STATE DESIGN ENGINEER  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

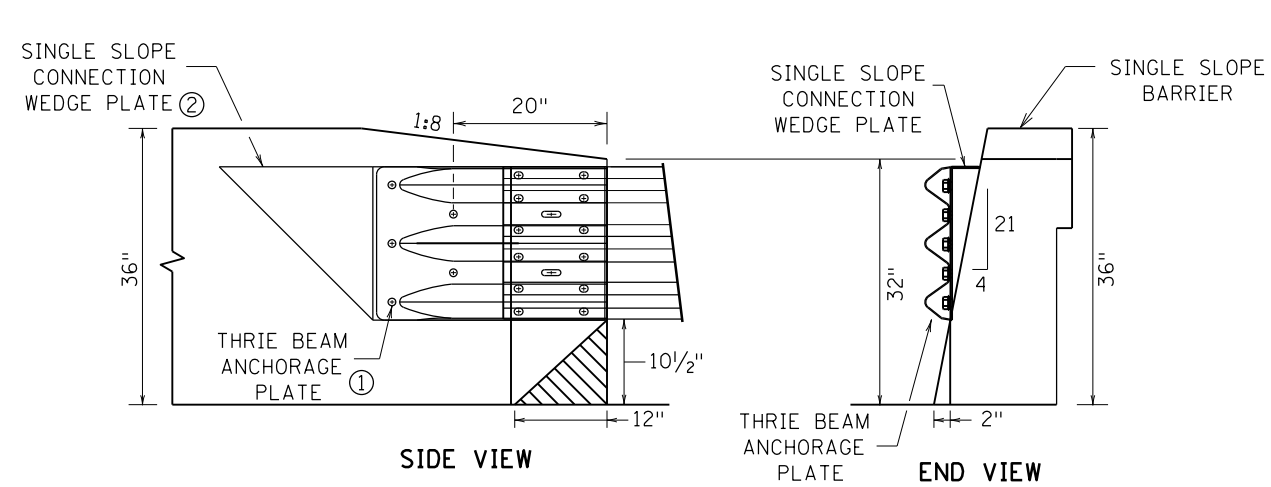
**APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31**  
**CURB DETAILS AT SINGLE SLOPE BARRIER**  
SHEET 60 OF 206 SHEETS



SIDE VIEW

54" BARRIER

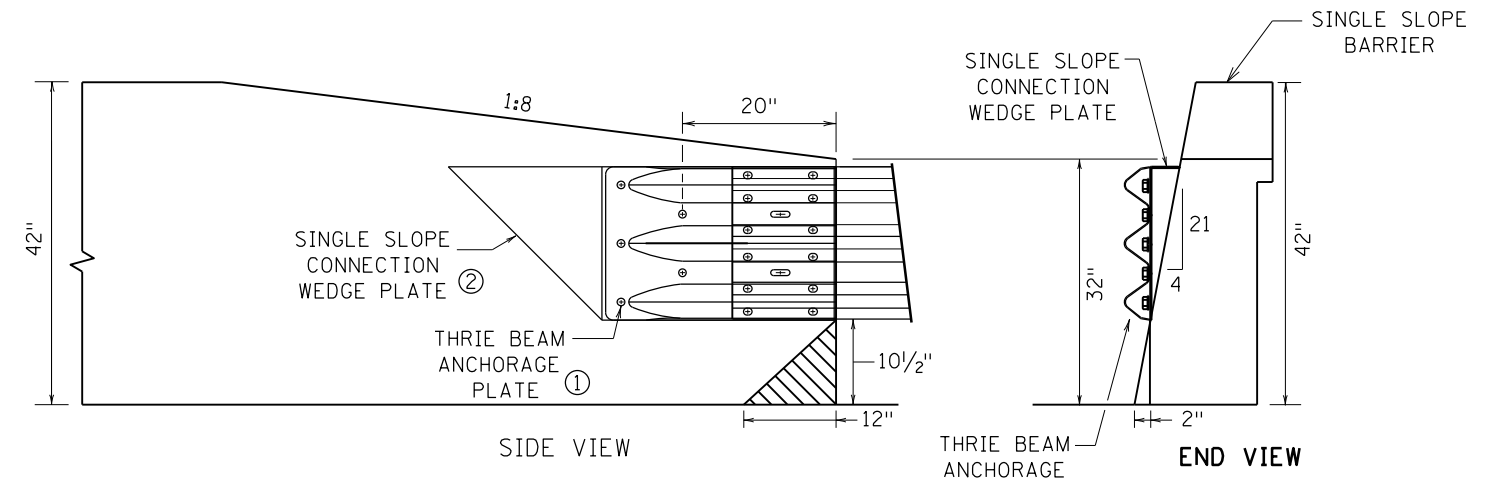
END VIEW



SIDE VIEW

36" BARRIER

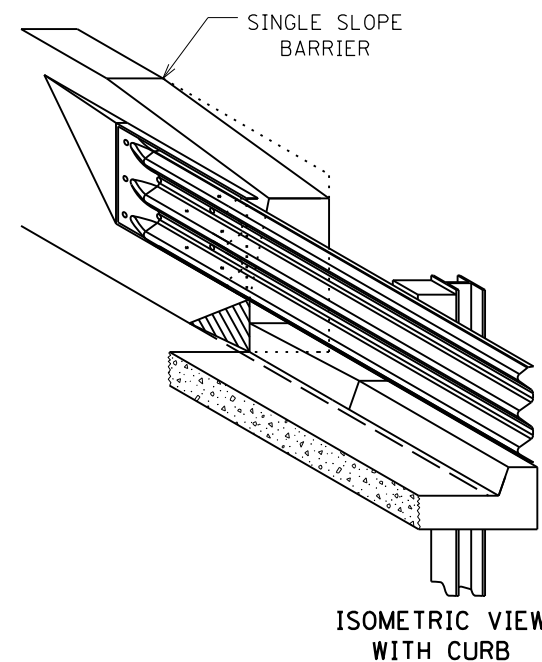
END VIEW



SIDE VIEW

42" BARRIER

END VIEW



NOTES:  
REFER TO BRIDGE APPROACH PANEL PLAN FOR ADDITIONAL INFORMATION.

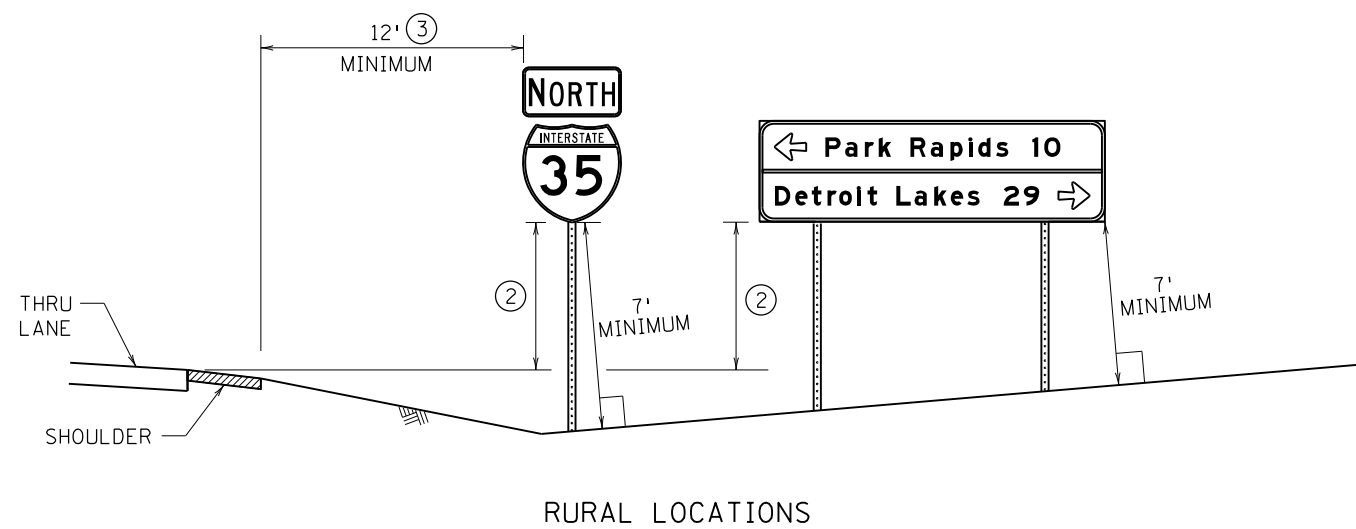
- ① SEE STANDARD PLATE 8350.
- ② SEE STANDARD PLATE 8352.

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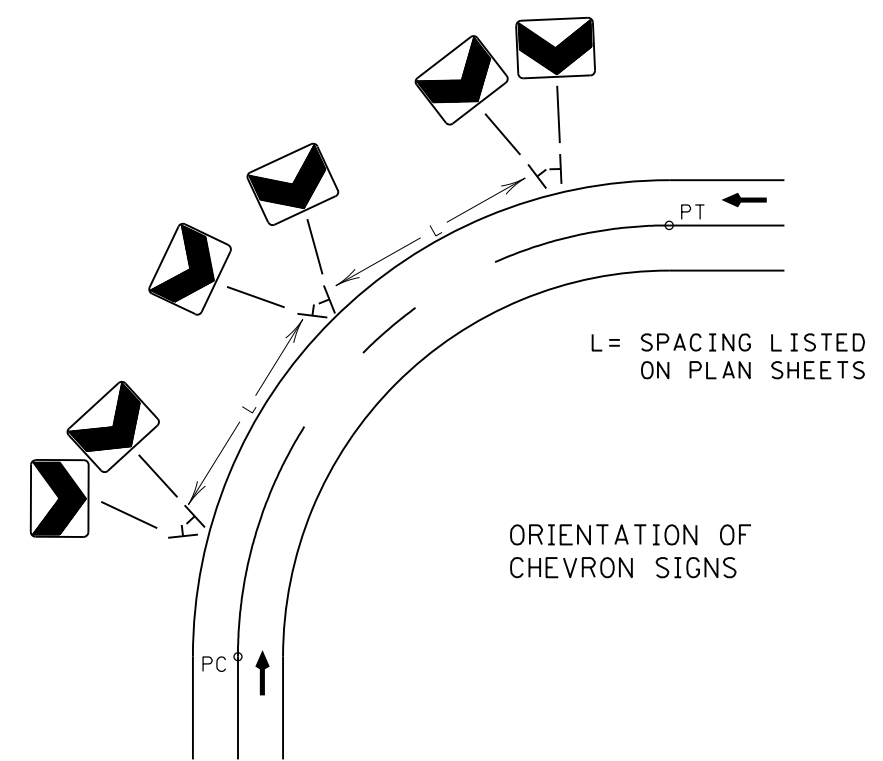
REVISION:  
APPROVED: JULY 1, 2019  
*Nancy Youn*  
NANCY YOU  
DESIGN SUPPORT DIRECTOR  
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

**m** MINNESOTA DEPARTMENT OF TRANSPORTATION  
STANDARD PLAN 5-297.694 5 OF 5  
APPROVED: 7-1-2019  
REVISOR:  
*Tom Styrbicki*  
THOMAS STYRBICKI  
STATE DESIGN ENGINEER  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

**APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31**  
**CONNECTION TO SINGLE SLOPE BARRIER**  
SHEET 61 OF 206 SHEETS



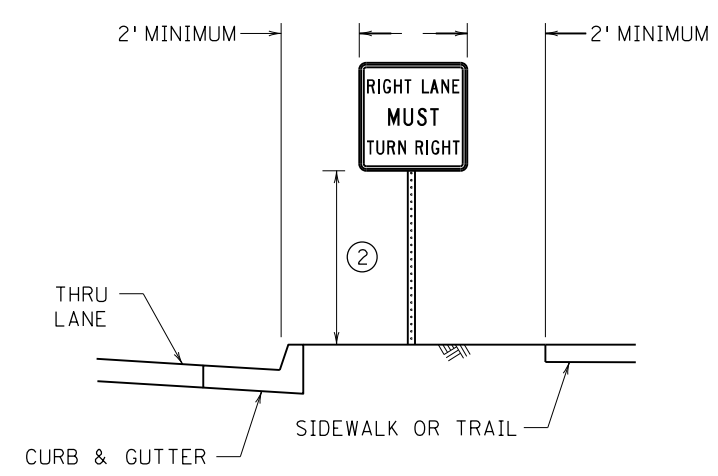
RURAL LOCATIONS



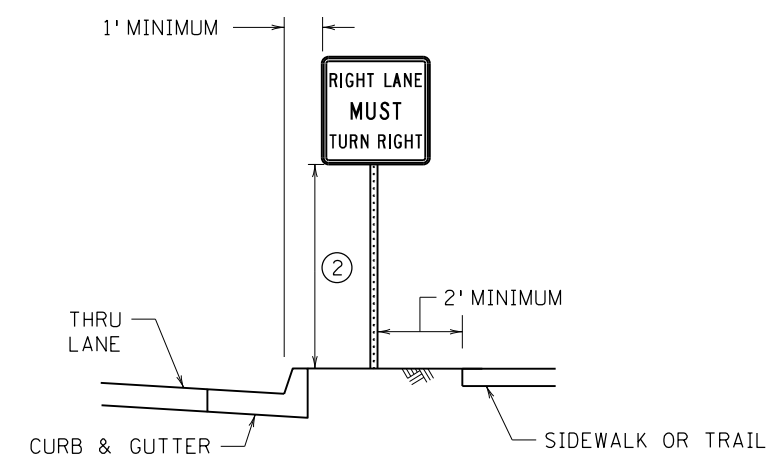
ORIENTATION OF CHEVRON SIGNS

NOTES:

- URBAN LOCATIONS ARE PAVEMENT SECTIONS WITH CURB AND GUTTER.
  - RURAL LOCATIONS ARE PAVEMENT SECTIONS WITHOUT CURB AND GUTTER.
  - SIGNS SHALL BE PLACED AND ORIENTED APPROXIMATELY AS SHOWN IN THE PLAN, AT RIGHT ANGLES TO THE DIRECTION OF, AND FACING, THE TRAFFIC THEY ARE INTENDED TO SERVE, UNLESS OTHERWISE SPECIFIED. TO AVOID SPECULAR GLARE, TURN SIGNS APPROXIMATELY THREE DEGREES AWAY FROM APPROACHING TRAFFIC.
  - IF A SIGN NEEDS TO BE REPOSITIONED FROM THE PROPOSED PLAN LOCATION IN ORDER TO AVOID CONFLICTS WITH UTILITIES OR OBSTACLES, CONTACT THE PROJECT ENGINEER.
  - SIGN FACES SHALL BE MOUNTED PLUMB.
  - LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND/OR LEFT SIDE INSTALLATION.
  - SIGNS SHALL NOT BE ERECTED OR CONSTRUCTED SO AS TO CAUSE ANY PORTION OF THE SIGN TO BE WITHIN 8.5' OF THE CENTERLINE OF A RAILROAD TRACK.
  - SIGNS SHALL BE PLACED SUCH THAT OBSTACLES DO NOT BLOCK THEM FROM BEING VIEWED BY THE APPROACHING TRAFFIC.
  - SIGNS SHALL BE PLACED A MINIMUM OF 10' FROM THE NEAREST OBSTACLE. OBSTACLES MAY INCLUDE, BUT ARE NOT LIMITED TO, LIGHT POLES, TREES, SIGNS, AND BUILDINGS. SIGNS MAY BE PLACED CLOSER TO SIGNS IN TIGHT AREAS, BUT NO MORE THAN TWO POSTS IN A 7' DIAMETER CIRCLE.
- ① TO BE USED ONLY WHEN BOULEVARD IS TOO NARROW TO OBTAIN ADEQUATE URBAN LOCATION SIGN OFFSETS.
  - ② ALL SIGN MOUNTING HEIGHTS ARE MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE TOP OF THE CURB, OR IN ABSENCE OF CURB, TO THE NEAR EDGE OF THE THRU-LANE PAVEMENT. SEE SIGN TABULATIONS.
  - ③ MINIMUM MAY BE REDUCED TO 6' FROM SHOULDER AND 12' FROM THRU LANE IF SITE CONDITIONS PROHIBIT A 12' OFFSET FROM SHOULDER. IF ADEQUATE RIGHT OF WAY IS NOT AVAILABLE TO PLACE SIGN AT REDUCED MINIMUM, SIGN SHALL BE PLACED SUCH THAT PANEL EDGE IS 1' FROM RIGHT OF WAY AND NEAR PANEL EDGE IS AT LEAST 2' FROM EDGE OF SHOULDER.



URBAN LOCATIONS



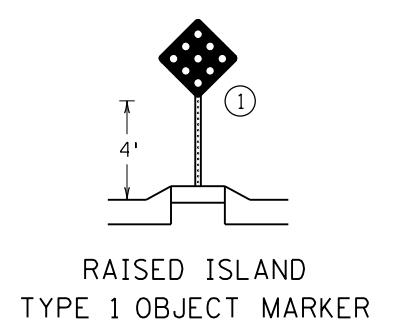
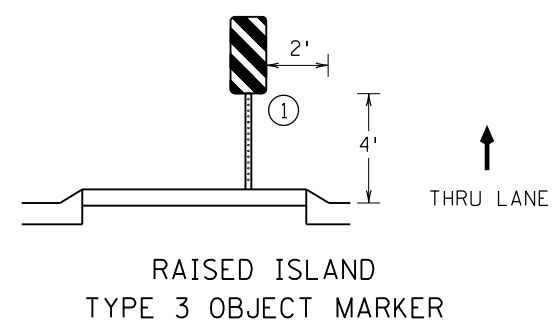
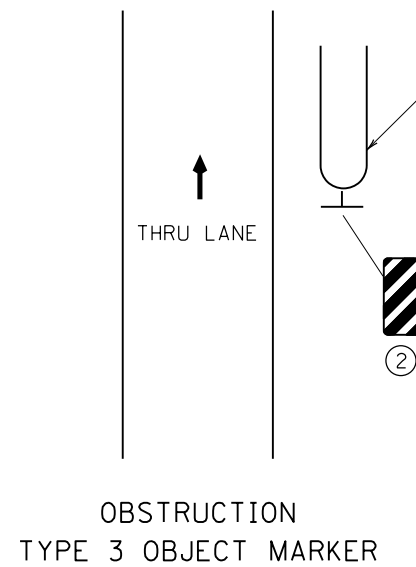
NARROW URBAN LOCATIONS ①

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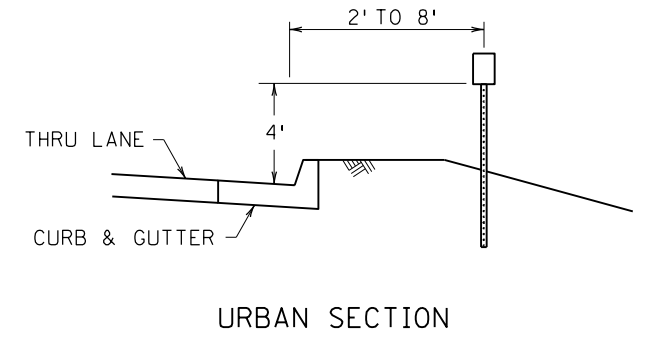
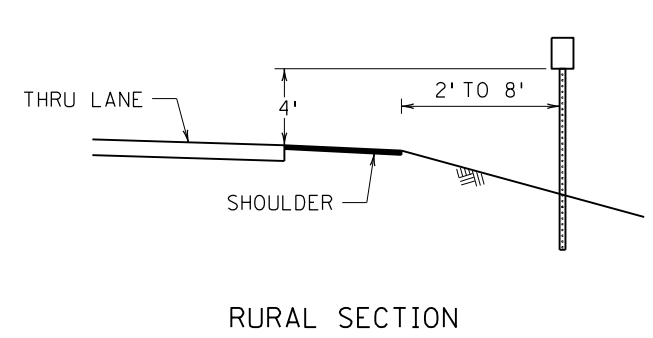
REVISION:  
 APPROVED: OCTOBER 16, 2019  
  
 BRIAN SORENSON  
 STATE TRAFFIC ENGINEER

**m** MINNESOTA  
 DEPARTMENT OF TRANSPORTATION  
 STANDARD PLAN 5-297.701  
 1 OF 1  
 Peter A Harff  
 PETER A. HARFF  
 STATE DESIGN ENGINEER  
 APPROVED: 10-16-2019  
 REVISED:

**STANDARD SIGN PLACEMENT  
 TYPE C & D**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020  
 SHEET 62 OF 206 SHEETS



MARKER TYPICAL PLACEMENT



DELINEATOR TYPICAL PLACEMENT

NOTES:

- ① MARKER SHOULD BE PLACED AS CLOSE TO THE BEGINNING OF MEDIAN AS POSSIBLE.
- ② THE EDGE OF THE OBJECT MARKER THAT IS CLOSEST TO THE ROAD USER SHALL BE PLACED IN LINE WITH THE CLOSEST EDGE OF THE OBSTRUCTION. STRIPES SHALL BE ANGLED DOWNWARD TOWARDS THE SIDE TRAFFIC IS TO PASS THE OBSTRUCTION.

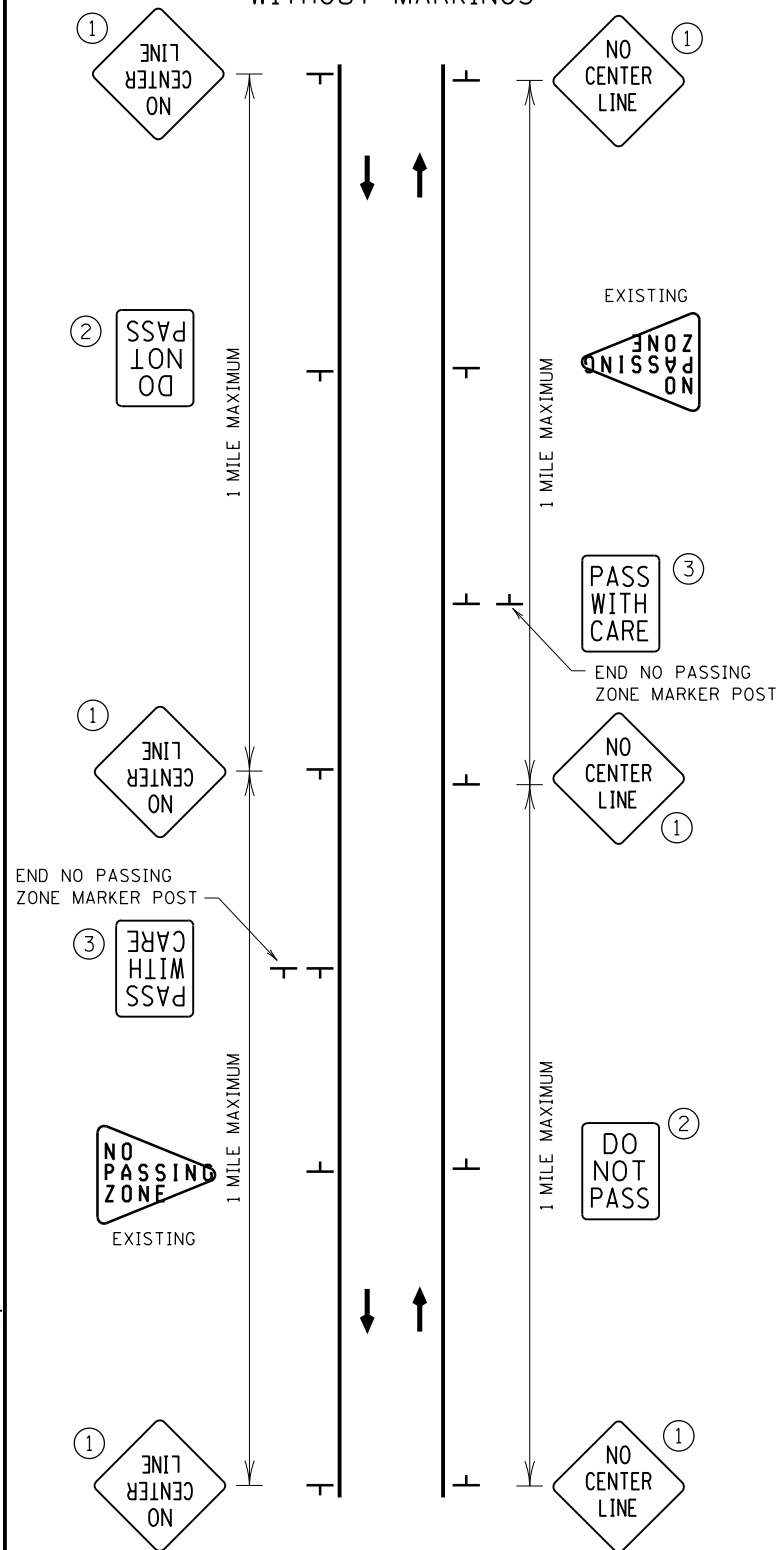
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REVISION:
APPROVED: OCTOBER 16, 2019
<i>Brian Sorenson</i> BRIAN SORENSON STATE TRAFFIC ENGINEER

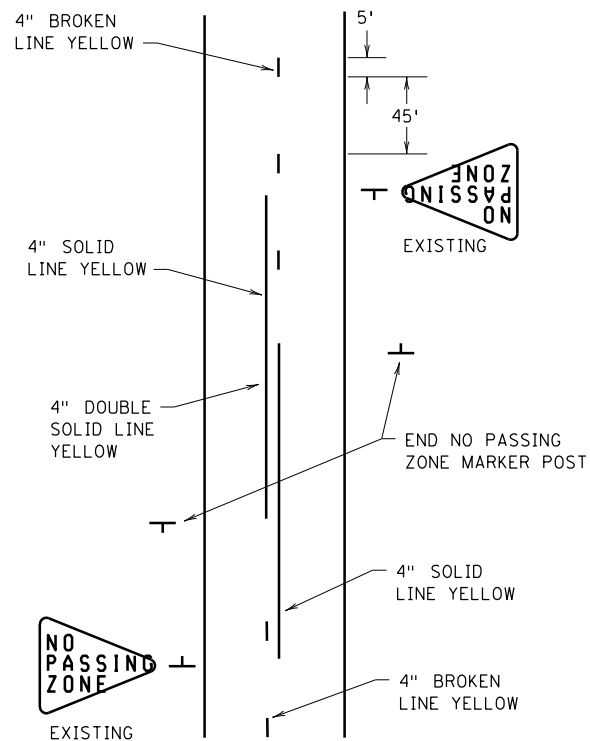
	STANDARD PLAN 5-297.702	1 OF 1
	<i>Peter A. Harff</i> PETER A. HARFF STATE DESIGN ENGINEER	
APPROVED: 10-16-2019		REVISED:
S.P. 0206-78 (TH 47), S.A.P. 002-716-020		

DELINEATOR AND MARKER PLACEMENT
SHEET 63 OF 206 SHEETS

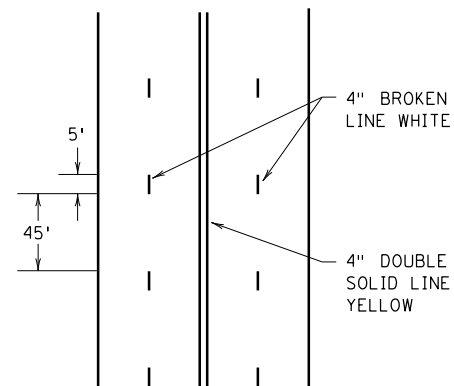
TWO-LANE, TWO-WAY  
LESS THAN 400 ADT  
WITHOUT MARKINGS



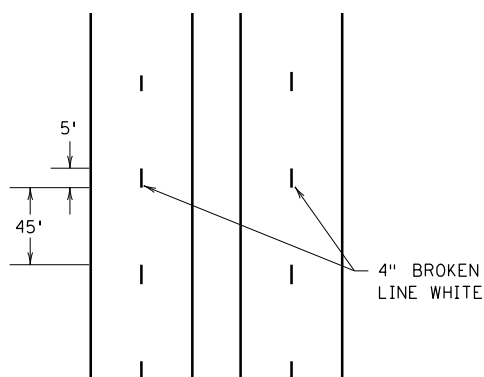
TWO-LANE, TWO-WAY



MULTI-LANE, UNDIVIDED



MULTI-LANE, DIVIDED



GENERAL NOTES:

SEE MnDOT SPEC. 2580 (INTERIM PAVEMENT MARKING).

DO NOT OPEN ANY ROADWAY SEGMENT TO TRAFFIC UNLESS THE FOLLOWING MARKINGS (INTERIM OR PERMANENT) ARE IN PLACE: CENTERLINE MARKINGS (INCLUDING NO PASSING ZONES), FLUSH MEDIANS (EXCLUDING CROSSHATCHING), AND LANE LINE (INCLUDING TURN AND AUXILIARY LANE LINES). THIS REQUIREMENT IS WAIVED FOR TANGENT ROAD SEGMENTS LESS THAN 350' IN LENGTH AND CURVED ROAD SEGMENTS WITH DEGREES OF CURVE GREATER THAN 6 DEGREES FOR LESS THAN 50' IN LENGTH.

PLACE INTERIM BROKEN LINE PAVEMENT MARKINGS AT THE SAME CYCLE LENGTH AS FINAL PAVEMENT MARKINGS WITH A MINIMUM LENGTH OF 5 FEET; IF FINAL PAVEMENT MARKING PLAN IS NOT PROVIDED, THE CYCLE LENGTH SHALL BE 50'. PLACE INTERIM DOTTED LINE PAVEMENT MARKINGS AT THE SAME CYCLE LENGTH AND LINE LENGTH AS SHOWN IN THE PLAN; IF FINAL PAVEMENT MARKING PLAN IS NOT PROVIDED, THE CYCLE LENGTH SHALL BE 15' WITH A LINE LENGTH OF 3'.

FOR NO PASSING ZONE LOCATIONS, REFER TO THE SIGNING OR PAVEMENT MARKING PLAN; IF NEITHER IS PROVIDED, FOLLOW INPLACE NO PASSING ZONES.

WHEN PERMANENT PAVEMENT MARKINGS ARE TO BE MULTI-COMPONENT LIQUID AND PAINT IS USED FOR THE INTERIM MARKINGS, PLACE A 10 MIL THICK LAYER OF PAINT. REMOVAL OF THE 10 MIL LAYER OF PAINT IS NOT REQUIRED PRIOR TO PLACING THE MULTI-COMPONENT LIQUID. IF THE LAYER OF PAINT IS GREATER THAN 10 MIL, REMOVE THE PAINT PRIOR TO PLACING THE MULTI-COMPONENT LIQUID.

PLACE INTERIM MARKINGS ON THE FINAL PERMANENT PAVEMENT SURFACE SUCH THAT THEY WILL BE FULLY COVERED BY THE PERMANENT PAVEMENT MARKINGS.

INTERIM PAVEMENT MARKINGS SHOULD NOT BE LEFT INPLACE FOR MORE THAN 14 CALENDAR DAYS UNLESS THEY MEET THE REQUIREMENTS OF PERMANENT OR TEMPORARY MARKINGS.

USING SIGNING IN LIEU OF INTERIM PAVEMENT MARKINGS ON TWO-LANE, TWO-WAY ROADWAYS

ON ROADS WITH AN AVERAGE DAILY TRAFFIC (ADT) OF LESS THAN 400 VEHICLES, THE SIGNS AS SHOWN MAY BE USED IN LIEU OF PAVEMENT MARKINGS FOR UP TO 14 CALENDAR DAYS OR AS DIRECTED BY THE ENGINEER.

- PLACE A "NO CENTER LINE" SIGN (W8-12, BLACK ON ORANGE) FOR EACH DIRECTION OF TRAVEL. PLACE ADDITIONAL SIGNS AT MAJOR INTERSECTIONS OR ONE MILE INCREMENTS, WHICHEVER IS LESS.
- IF NOT ALREADY INPLACE, PLACE A "DO NOT PASS" SIGN (R4-1) OPPOSITE OF EACH INPLACE "NO PASSING ZONE" SIGN (W14-3).
- PLACE A "PASS WITH CARE" SIGN (R4-2) AT THE END OF EACH NO PASSING ZONE, ADJACENT TO THE END OF NO PASSING ZONE MARKER POST.

USING TEMPORARY RAISED PAVEMENT MARKERS (TRPMS) AS INTERIM PAVEMENT MARKING

WHEN USING TRPMS AS INTERIM PAVEMENT MARKINGS, FOLLOW THE REQUIREMENTS BELOW UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

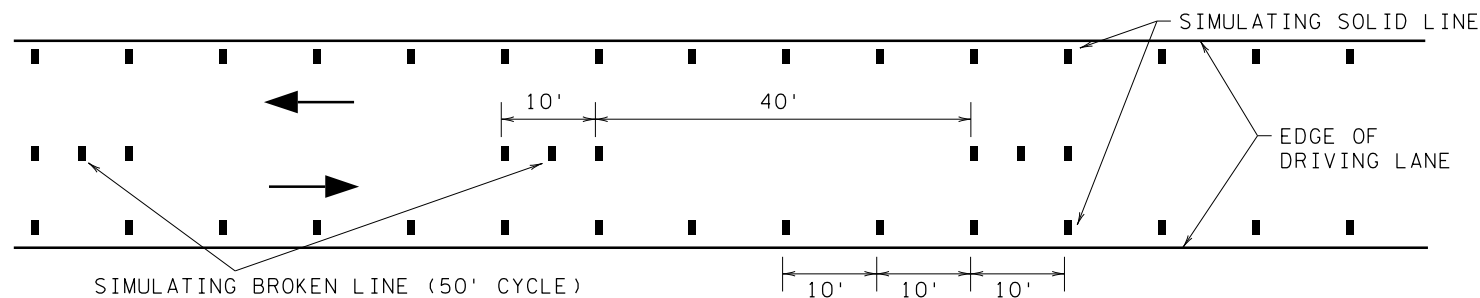
USE DOUBLE-SIDED TRPMS ON TWO-LANE, TWO-WAY ROADS.

BROKEN LINE: USE 3 TRPMS PER 10' BROKEN LINE, 5' SPACING WITH A 40' GAP.

SOLID LINE: USE CONTINUOUS TRPMS; 10' SPACING FOR TANGENTS AND CURVES UNDER 6 DEGREES; 5' SPACING FOR CURVES  $\geq 6$  DEGREES, GRADES  $> 5$  PERCENT, OR CONCRETE PAVEMENTS.

DOUBLE SOLID LINE: USE TWO CONTINUOUS TRPMS 4" APART, 10' SPACING ON TANGENTS AND CURVES UNDER 6 DEGREES; 5' SPACING FOR CURVES  $\geq 6$  DEGREES, GRADES  $> 5$  PERCENT, OR CONCRETE PAVEMENTS.

SIMULATING A SOLID LINE AND A BROKEN LINE (50' CYCLE) WITH TRPMS



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REVISION:  
APPROVED: OCTOBER 10, 2019  
*Brian Sorenson*  
BRIAN SORENSON  
STATE TRAFFIC ENGINEER

**m** MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
STANDARD PLAN 5-297.801  
1 OF 1  
*Peter A. Harff*  
PETER A. HARFF  
STATE DESIGN ENGINEER  
APPROVED: 10-10-2019  
REVISED:

INTERIM PAVEMENT MARKINGS AND SIGNING

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 64 OF 206 SHEETS



**NOTES & GUIDELINES**

**GENERAL INFORMATION:**

- ALL DISTANCES ARE APPROXIMATE.

**SIGNING:**

- ALL TEMPORARY SIGNS ARE REQUIRED TO BE CRASHWORTHY PER THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE 2016 (MASH-2016). TEMPORARY SIGN STRUCTURES THAT ARE CRASHWORTHY UNDER THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 (NCHRP-350) MAY BE USED PROVIDED THE DEVICES WERE ACQUIRED BY THE CONTRACTOR PRIOR TO DECEMBER 31ST, 2019. THE MINNESOTA TYPE "C" AND "D" BRACED LEG U-CHANNEL (KNEE BRACE) SIGN SUPPORT IS ONLY ALLOWED ON THE ANOKA COUNTY HIGHWAY SYSTEM
- THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE FINAL SIGNS TO ASSURE THAT THE FINAL SIGNS ARE PLACED AS NEEDED, OR PROVIDE TEMPORARY SIGNING UNTIL THE FINAL SIGNING IS PLACED.
- WHEN MULTIPLE GROUND MOUNTED SIGN STRUCTURES ARE PLACED ADJACENT TO EACH OTHER THERE SHOULD BE NO MORE THAN 2 POSTS WITHIN 84" OF EACH OTHER. WHEN THIS SPACING CAN NOT BE MAINTAINED, THEN SIGN STRUCTURES SHALL BE OFFSET, AND STAGGERED WITH A MINIMUM OF 4' BETWEEN SIGN STRUCTURES.
- WHEN A SIGN OR BARRICADE IS ORIENTED SUCH THAT VISIBILITY TO ROAD USERS INCLUDING BIKE AND PEDESTRIANS IS REDUCED ENOUGH TO CAUSE A HAZARD, DELINEATE THE SIGN/BARRICADE WITH APPROPRIATE DEVICES.
- TEMPORARY SIGNS SHALL BE PLACED SUCH THAT OBSTACLES DO NOT BLOCK THEM FROM BEING VIEWED BY APPROACHING ROAD USERS. OBSTACLES MAY INCLUDE, BUT ARE NOT LIMITED TO, LIGHT POLES, TREES, SIGNS, AND BUILDINGS.
- TEMPORARY SIGNS SHALL BE PLACED AND ORIENTED APPROXIMATELY AS SHOWN IN THE PLAN, AT RIGHT ANGLES TO DIRECTION OF AND FACING THE TRAFFIC THEY ARE INTENDED TO SERVE, UNLESS OTHERWISE SPECIFIED.
- LONGITUDINAL DROPOFFS SHALL BE SIGNED AS SHOWN IN THE "MINNESOTA TEMPORARY TRAFFIC CONTROL FIELD MANUAL" PAGES (6K-aj) THRU (6K-al) UNLESS OTHERWISE SPECIFIED IN THESE PLANS.
- AFTER REMOVAL OF SIGN AND/OR SIGN BASE, BACKFILL, COMPACT, AND LEVEL SOIL TO MATCH SURROUNDING SOIL.

**PAVEMENT MARKING:**

- MASK OR REMOVE ANY CONFLICTING PAVEMENT MARKINGS AS DIRECTED BY THE ENGINEER.
- ALL TEMPORARY PAVEMENT MARKINGS SHALL BE WET REFLECTIVE. ALL PAVEMENT MARKINGS IN TAPERS AND TRANSITIONS SHALL BE 6" IN WIDTH.
- SEE 2582 IN THE SPECIAL PROVISIONS FOR PAVEMENT MARKING SPOTTING RESPONSIBILITIES.

**BARRIERS & DELINEATIONS:**

- PLACE AND MAINTAIN TEMPORARY BARRIER DELINEATORS ANY TIME TRAFFIC IS WITHIN 10' OF BARRIER. DELINEATORS WILL EACH HAVE A MINIMUM OF 24 SQ. IN. OF RETROREFLECTIVE SURFACE ON BOTH SIDES PLACED AT 25' SPACING ON TOP OF THE BARRIER. IN THE ENGINEER OR PLAN REQUIRES SIDE MOUNTED TEMPORARY BARRIER DELINEATORS, THEY WILL HAVE A MINIMUM OF 12 SQ. IN. OF RETROREFLECTIVE SURFACE AREA AND BE PLACED AT 12.5' SPACING. IN A SMALLER APPROVED BARRIER DELINEATOR IS USED IT SHALL BE A MINIMUM OF 6 SQ. IN. OF RETROREFLECTIVE SURFACE AREA AND BE PLACED ON BOTH SIDES AT 6.25' SPACING. TEMPORARY BARRIER DELINEATOR COLOR SHALL MATCH APPLICABLE PAVEMENT MARKING.

**CONSTRUCTION INFORMATION SIGNING:**

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

PLACE THE G20-X1 CLOSURE NOTICE SIGN(S) 7 DAYS PRIOR TO THE PLANNED CLOSURE DATE.

PLACE G20-X2 ADVANCE NOTICE SIGNING 14 DAYS PRIOR TO THE WORK STARTING DATE. ONCE WORK BEGINS, COVER THE START DATE LEGEND WITH SUGGESTED PLAQUE CONTAINED IN THIS PLAN. IF NO ALTERNATE MESSAGE IS SUGGESTED OR IF DIRECTED BY THE ENGINEER, DISPLAY THE CORRECT ESTIMATED FINISH DATE, MONTH, OR SEASON.

IF CONSTRUCTION INFORMATION SIGNING IS NO LONGER VISIBLE TO THE MOTORING PUBLIC ONCE WORK BEGINS, MOVE SAID SIGNING TO A SITE IN ADVANCE OF THE WORK ZONE OR CLOSURE AS DIRECTED BY THE PLAN OR ENGINEER.

**STANDARD PLANS**

NO.	DATE	BY	CHK	REVISIONS
5-297.801				INTERIM PAVEMENT MARKINGS AND SIGNING

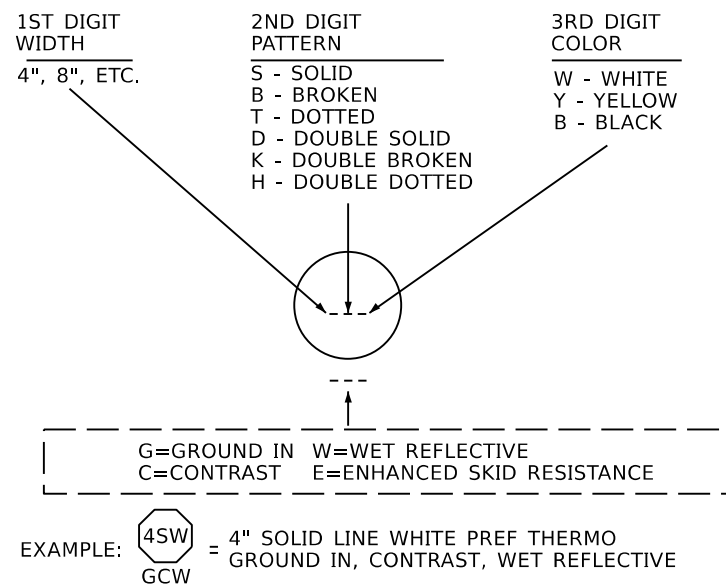
**PAVEMENT MARKING SYMBOLS AND MATERIALS LEGEND**

- SOLID LINE PAVEMENT MARKING WITH TEMPORARY RAISED PAVEMENT MARKERS AT 10' SPACES
- BROKEN LINE - 50' CYCLE (10' LINE, 40' GAP) 40' CYCLE ON CSAH 116 (10' LINE, 30' GAP)
- DOTTED LINE - 15' CYCLE (3' LINE, 12' GAP), UNLESS SHOWN OTHERWISE IN THE PLAN

- CROSSWALK BLOCK
- PAVEMENT MESSAGE (LEFT ARROW)

**STRIPING KEY**

- CIRCLE-MULTI COMP
- BOX-PREF TAPE
- TRIANGLE-PAINT
- OCTAGON-PREF THERMO
- PENTAGON-REMOVABLE PREFORMED PLASTIC MARKING



**TRAFFIC CONTROL INDEX**

SHEET NO.	DESCRIPTION
65	GENERAL NOTES / LEGEND
66	TRAFFIC CONTROL TABULATION
67	SIGN TABULATION
68	SIGN DETAILS
69 - 72	TYPICAL SECTIONS
73	TEMPORARY SQUARE TUBE GROUND MOUNTED SIGN PLACEMENT (TRUNK HIGHWAY)
74	NCHRP 350 COMPLIANT GROUND MOUNTED TEMPORARY SIGN INSTALLATION DETAILS (TRUNK HIGHWAY)
75	TEMPORARY SIGN COVERING AND MODIFICATION (TRUNK HIGHWAY)
76	ANOKA COUNTY HIGHWAY DEPARTMENT SIGN DETAILS
77	ANOKA COUNTY HIGHWAY DEPARTMENT SIGN PLACEMENT
78	ANOKA COUNTY HIGHWAY DEPARTMENT TEMPORARY SIGN COVERING
79 - 82	ALTERNATE PEDESTRIAN ROUTES AND DEVICES
83	ADVANCED WARNING SIGN PLACEMENT
84 - 85	TRAFFIC DETOURS
86 - 88	PEDESTRIAN & BIKE DETOURS
89 - 93	STAGE 0 TRAFFIC CONTROL
94 - 99	STAGE 1 TRAFFIC CONTROL
100 - 101	STAGE 1 PEDESTRIAN DETAILS
102 - 108	STAGE 2 TRAFFIC CONTROL
109 - 114	STAGE 3 TRAFFIC CONTROL
115 - 120	STAGE 4 TRAFFIC CONTROL

**TRAFFIC CONTROL DEVICES & SYMBOLS LEGEND**

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	AREA CLOSED TO TRAFFIC / WORK AREA		TYPE A FLASHING WARNING LIGHT
	CONSTRUCTION UNDER TRAFFIC		FLASHING ARROW BOARD TYPE C = (4' X 8' UNLESS OTHERWISE NOTED)
	CONSTRUCTION UNDER WEEKEND CLOSURE		PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
	TRAFFIC CONTROL SIGN		PORTABLE PRECAST CONC BARRIER DES 8337 WITH DELINEATORS AT 25' SPACES
	TYPE III BARRICADE =		TEMPORARY IMPACT ATTENUATOR
	DRUM-LIKE CHANNELIZER (TYPE B) =		

UPDATED 04/24/2020 SEE SHEETS 39 - 62 FOR STANDARD PLAN SHEETS.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY:   
 NICHOLAS E. HENTGES, PE  
 LICENSED PROFESSIONAL ENGINEER  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 GENERAL NOTES / LEGEND  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 65  
 OF  
 206  
 SHEETS

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TRAFFIC CONTROL TABULATION											J
CONSTRUCTION STAGE	SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH) LIN FT	REMOVE BITUMINOUS PAVEMENT SQ YD	TEMPORARY BITUMINOUS PAVEMENT (1) TON	PORTABLE PRECAST CONCRETE BARRIER DES 8337 (2) LIN FT	PPCB DELINEATOR		TEMPORARY IMPACT ATTENUATOR (2) ASSEMBLY	RELOCATE		PORTABLE CHANGEABLE MESSAGE SIGN (2) UNIT DAY	PAVEMENT MARKING REMOVAL LIN FT
					WHITE EACH	YELLOW EACH		TEMPORARY IMPACT ATTENUATOR ASSEMBLY	PORTABLE PRECAST CONCRETE BARRIER DES 8337 LIN FT		
S.A.P. 002-716-020											
CSAH 116											
STAGE 0	493		58							14	
STAGE 1				474	19		2				1741
STAGE 2								2	370	10	695
STAGE 3	493	257									1553
STAGE 4											
S.A.P. 002-716-020 SUBTOTAL	986	257	58	474	19		2	2	370	24	3989
LOCAL FUNDS											
TH 47											
STAGE 0	605		103								840
STAGE 1				530	22		2				2584
STAGE 2				410		42	2	2	634		4399
STAGE 3	605	454								40	3966
STAGE 4											
LOCAL SUBTOTAL	1210	454	103	940	22	42	4	2	634	40	11789
PROJECT TOTAL	2196	711	161	1414		83	6	4	1004	64	15778

TRAFFIC CONTROL TABULATION											J
CONSTRUCTION STAGE	RAISED PAVEMENT MARKER (3)(2)		REMOVABLE PREFORMED PLASTIC MASK (BLACK) LIN FT	REMOVABLE PREFORMED PLASTIC MARKING TAPE (2)			PAINT				
	WHITE EACH	YELLOW EACH		4" SOLID LINE		4" DBLE SOLID LINE	4" SOLID LINE		4" DBLE SOLID LINE	4" BROKEN LINE (4)	
				WHITE LIN FT	YELLOW LIN FT	YELLOW LIN FT	WHITE LIN FT	YELLOW LIN FT	YELLOW LIN FT	WHITE LIN FT	
S.A.P. 002-716-020											
CSAH 116											
STAGE 0		77	150						1580	543	
STAGE 1	166	45	1150	2070			2173			1530	
STAGE 2		490	110	1300		200	1425			1365	
STAGE 3		60	110	1140	600	334	1725			2232	470
STAGE 4							972			1400	2277
S.A.P. 002-716-020 SUBTOTAL	166	672	1520	4510	600	534	6295	1580	7070	2747	
LOCAL FUNDS											
TH 47											
STAGE 0							816	1167			
STAGE 1							2660	784			
STAGE 2							3700	3212			
STAGE 3							3403	2162			
STAGE 4											
LOCAL SUBTOTAL							10579	7325			
PROJECT TOTAL		838	1520		5644		25779	7070		2747	

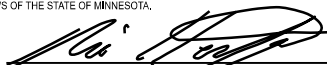
- NOTES:  
(1) 4" WEARING COURSE. PAID AS BITUMINOUS PATCHING MIXTURE, TACK COAT INCIDENTAL  
(2) REMOVAL INCIDENTAL.  
(3) 10' SPACES  
(4) 10' LINE, 30' GAP

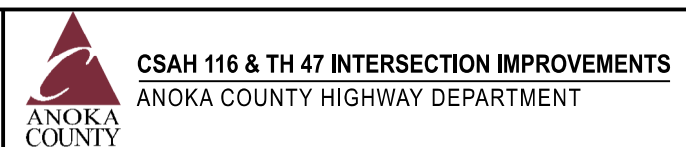
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
Plan By: MJS  
Checked By: LGR  
Approved By: EAE

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

CERTIFIED BY:   
LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
TABULATION  
CONSTRUCTION STAGING & TRAFFIC CONTROL  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
66  
OF  
206  
SHEETS

DATE: 8/25/2020 2:51:54 PM PATH & FILENAME: Projects\Minnesota\04652-000\CadPlan\4652-000\_cs-tabulations.dgn

<b>"R" SERIES</b>			
SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (WxH)
	R1-1	WHITE ON RED	30 X 30
	R3-4	BLACK AND RED ON WHITE	36 X 36
	R3-5 (L/R) (LEFT SHOWN)	BLACK ON WHITE	30 X 36
	R3-6	BLACK ON WHITE	30 X 36
	R3-7 (R/L)	BLACK ON WHITE	30 X 36
	R3-7 (MOD) (R/L)	BLACK ON WHITE	30 X 36
	R3-8AB	BLACK ON WHITE	36 X 30
	R3-8ACA	BLACK ON WHITE	54 X 30
	R3-30ABCA	BLACK ON WHITE	60 X 30
	R4-7	BLACK ON WHITE	12 X 18 24 X 30
	R5-1	RED ON WHITE	36 X 36
	R6-1 (R/L) (RIGHT SHOWN)	RED ON WHITE	36 X 12 54 X 18
	R9-9	BLACK ON WHITE	30 X 18
	R9-9a	BLACK ON WHITE	24 X 18
	R9-11a (R/L) (LEFT SHOWN)	BLACK ON WHITE	24 X 12
	R11-2R	BLACK ON WHITE	48 X 30
	R11-3a	BLACK ON WHITE	60 X 30

<b>"W" SERIES</b>			
SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (WxH)
	W1-6 (R)	BLACK ON ORANGE	48 X 24
	W1-4 (R/L) (RIGHT SHOWN)	BLACK ON ORANGE	48 X 48
	W4-2 (R/L) (RIGHT SHOWN)	BLACK ON ORANGE	48 X 48
	W6-3	BLACK ON ORANGE	36 X 36
	W8-1	BLACK ON ORANGE	30 X 30 36 X 36
	W8-1M	BLACK ON ORANGE	36 X 36
	W8-2	BLACK ON ORANGE	30 X 30 36 X 36
	W8-8	BLACK ON ORANGE	36 X 36
	W8-23	BLACK ON ORANGE	36 X 36
	W12-1	BLACK ON ORANGE	30 X 30 36 X 36
	W13-1P	BLACK ON ORANGE	30 X 30
	W16-3P	BLACK ON ORANGE	18 X 12
	W16-7P (R/L) (RIGHT SHOWN)	BLACK ON ORANGE	24 X 12 30 X 18
	W20-1	BLACK ON ORANGE	48 X 48
	W20-2	BLACK ON ORANGE	48 X 48
	W20-3	BLACK ON ORANGE	48 X 48
	W20-3M	BLACK ON ORANGE	18 X 18

<b>"W" SERIES</b>			
SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (WxH)
	W21-X5 (R/L) (RIGHT SHOWN)	BLACK ON ORANGE	48 X 48
	W21-X3P	BLACK ON ORANGE	18 X 18
	W24-1 (R/L) (RIGHT SHOWN)	BLACK ON ORANGE	36 X 36

<b>"G" SERIES</b>			
SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (WxH)
	G20-2a	BLACK ON ORANGE	48 X 24
	G20-X6 (R)	BLACK ON ORANGE	36 X 24 48 X 36
	G20-X9 (R/L) (RIGHT SHOWN)	BLACK ON ORANGE	30 X 36

<b>"M" SERIES</b>			
SIGN	SIGN NO.	COLOR	SIZE (IN. X IN.) (WxH)
	M1-5M	GOLD AND WHITE ON BLUE	24 X 24
	M1-6M	WHITE AND YELLOW ON BLUE	22.5 X 18
	M3-1	WHITE ON BLUE	24 X 12
	M3-2	WHITE ON BLUE	24 X 12
	M4-6	BLACK ON WHITE	24 X 12
	M4-8	BLACK ON ORANGE	24 X 12
	M4-8a	BLACK ON ORANGE	24 X 18
	M4-9ma (R/L/T) (RIGHT SHOWN)	BLACK ON ORANGE	18 X 12
	M4-10 (R)	BLACK ON ORANGE	48 X 18
	M5-1 (R/L) (RIGHT SHOWN)	WHITE ON BLUE	21 X 15
	M5-2 (R)	WHITE ON BLUE	21 X 15
	M6-1 (R/L) (RIGHT SHOWN)	WHITE ON BLUE	21 X 15
	M6-2 (R)	WHITE ON BLUE	21 X 15
	M6-3	WHITE ON BLUE	21 X 15

**GENERAL NOTES:**

- SIGN STRUCTURE TABULATIONS INDICATE SQUARE TUBE GROUND MOUNTED SIGN STRUCTURES THAT ARE MASH-16 COMPLIANT. USE PRODUCTS FROM THE BASES FOR SQUARE TUBE SIGN STRUCTURES APPROVED/QUALIFIED PRODUCTS LIST FOR THE INDICATED SQUARE TUBE RISER POST SIZE. PLACE PER THE MANUFACTURER'S SPECIFICATIONS.
- ALUMINUM STRINGERS SHALL BE USED FOR SIGN 36 INCHES AND WIDER. SEE MANUFACTURER'S SPECIFICATIONS FOR SQUARE TUBE MOUNTING DETAILS. STRINGERS ON SINGLE POST ASSEMBLIES ARE REQUIRED TO BE AT LEAST 9 INCHES IN FROM THE EDGE OF THE SIGN.
- UNLESS OTHERWISE INDICATED, USE 2-1/2 INCH RISER POSTS FOR GROUND MOUNTED SIGN STRUCTURES.

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



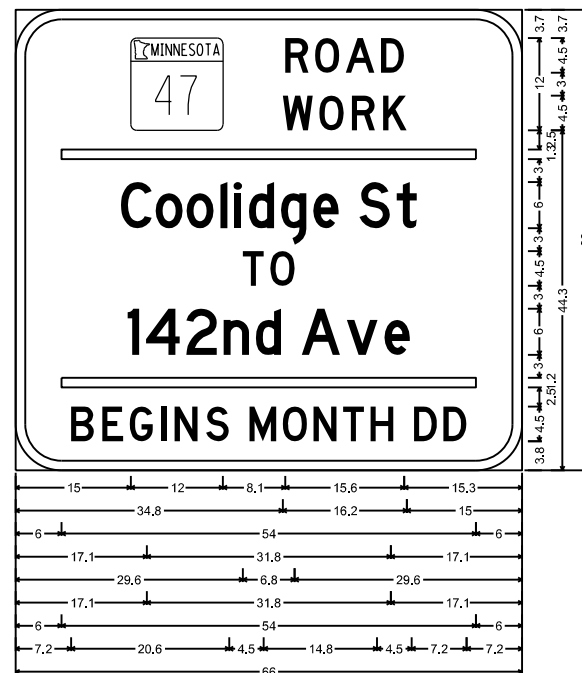
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

SIGN TABULATION  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

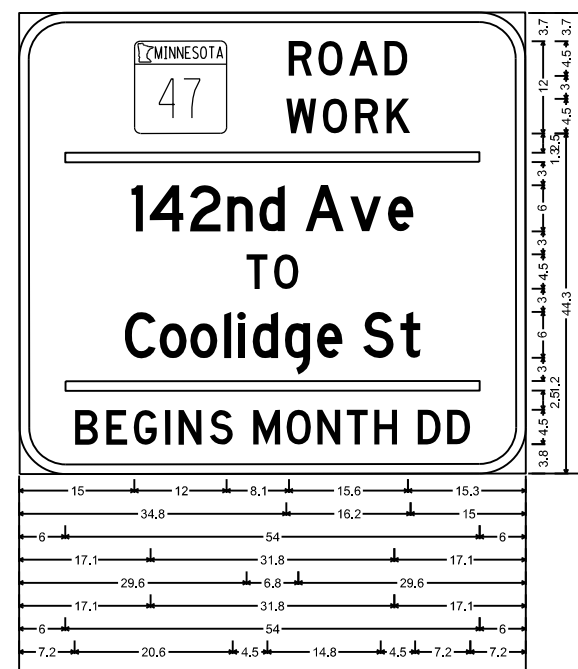
SHEET 67 OF 206 SHEETS

TC-1A



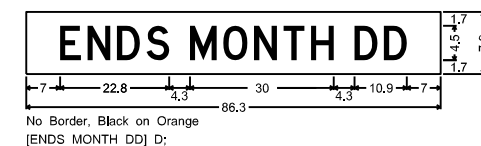
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 Rounded Rectangle 1.0" Radius; [ROAD] D; [WORK] D; [Coolidge St] D; [TO] D;  
 [142nd Ave] D; [BEGINS] D; [MONTH DD] D;

TC-1B



Identifier : G20-X2(A)  
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 Rounded Rectangle 1.0" Radius; [ROAD] D; [WORK] D; [142nd Ave] D; [TO] D;  
 [Coolidge St] D; [BEGINS] D; [MONTH DD] D;

TC-1C

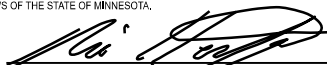


No Border, Black on Orange  
 [ENDS MONTH DD] D;

NOTE: ALL SIGN DIMENSIONS ARE IN INCHES.

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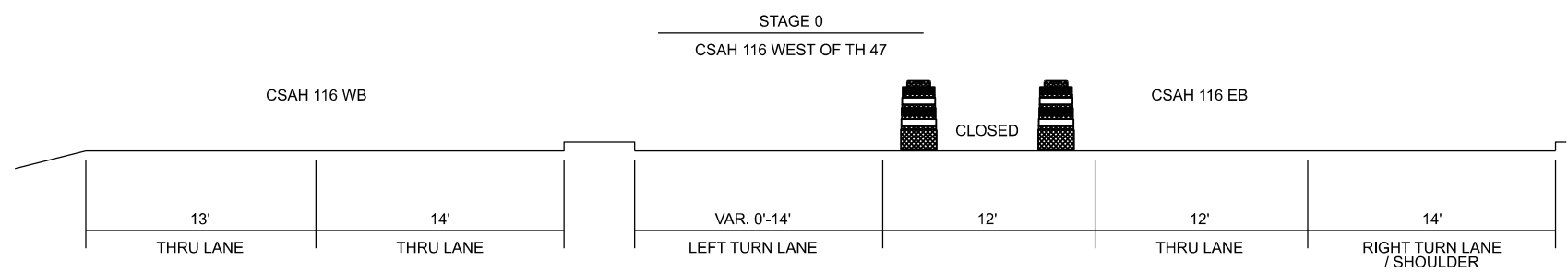
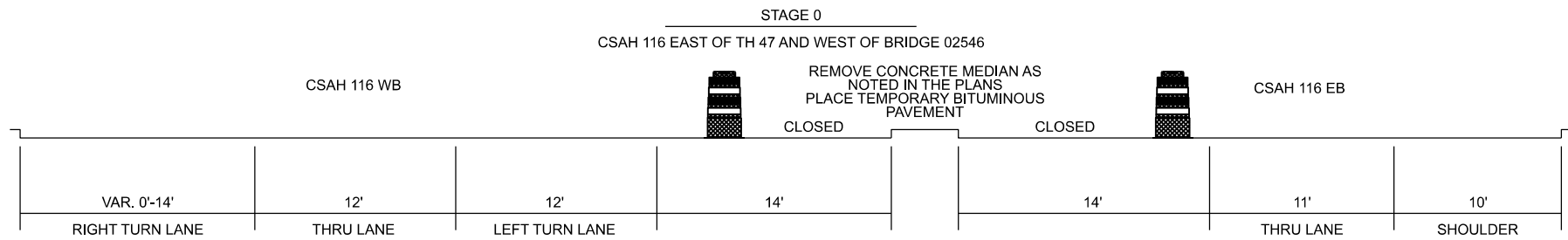
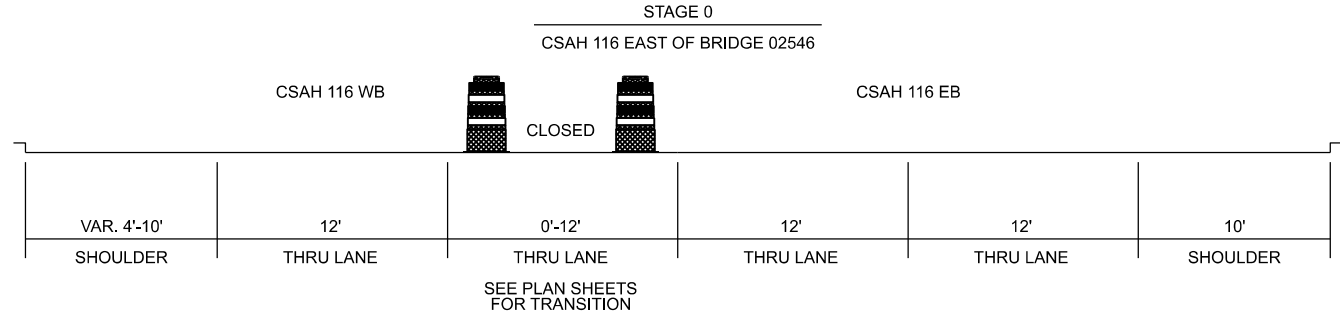
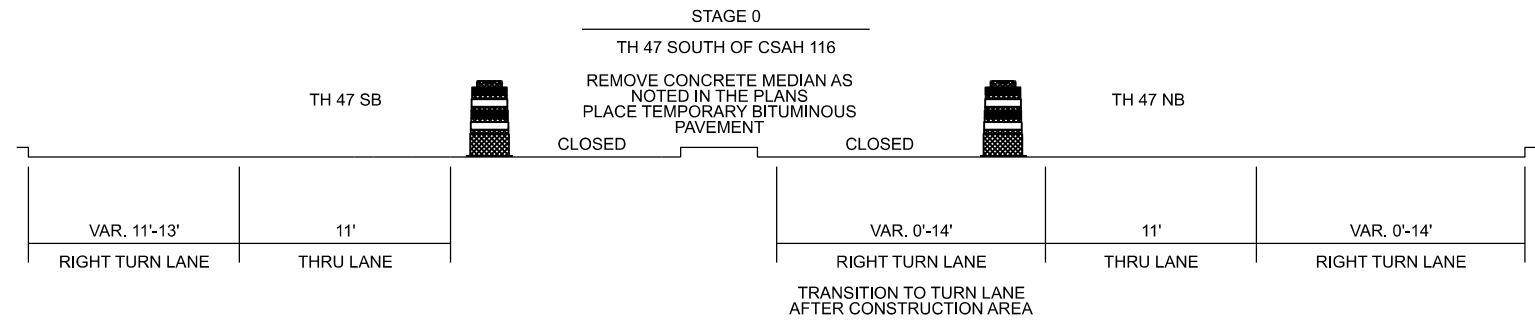
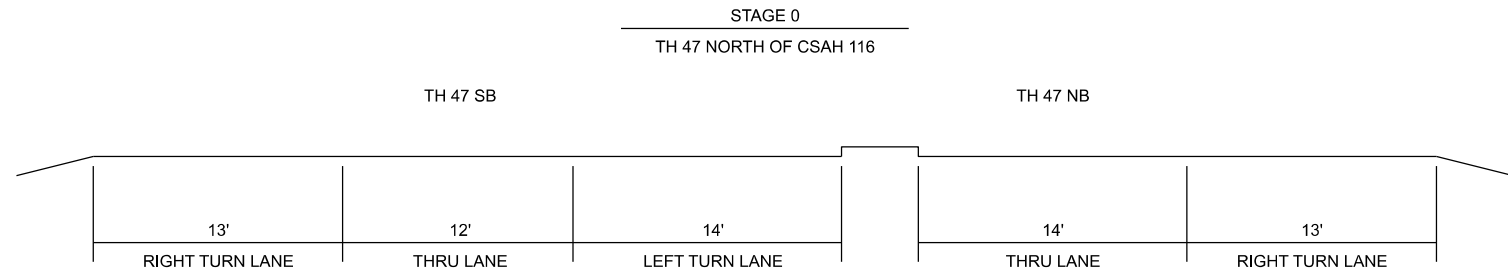
NO.	DATE	BY	CHK	REVISIONS

Design By: MJS	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.   CERTIFIED BY: NICHOLAS E. HENTGES, PE LICENSED PROFESSIONAL ENGINEER
Plan By: MJS	
Checked By: LGR	
Approved By: EAE	
DATE: 8/25/2020	LICENSE NO. 44620



ANOKA COUNTY, MN  
 SIGN DETAILS  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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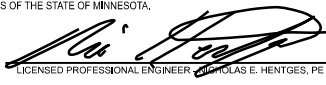


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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

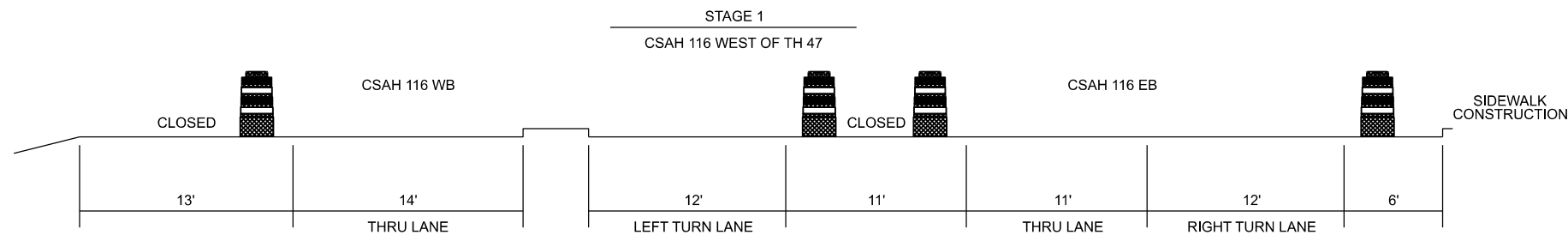
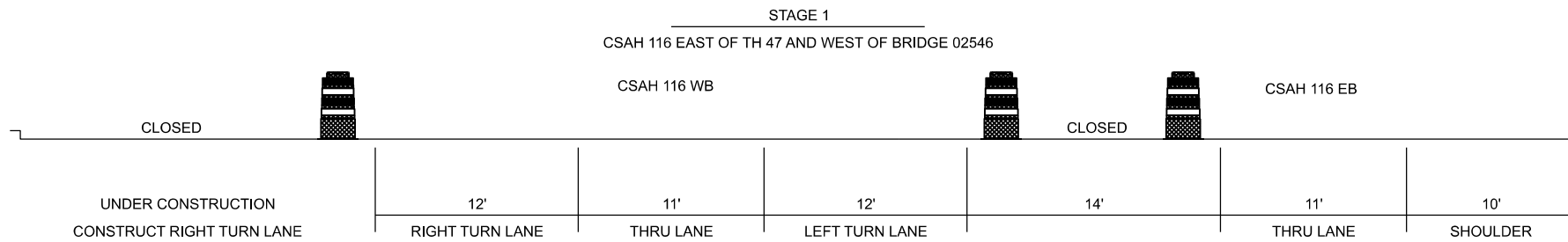
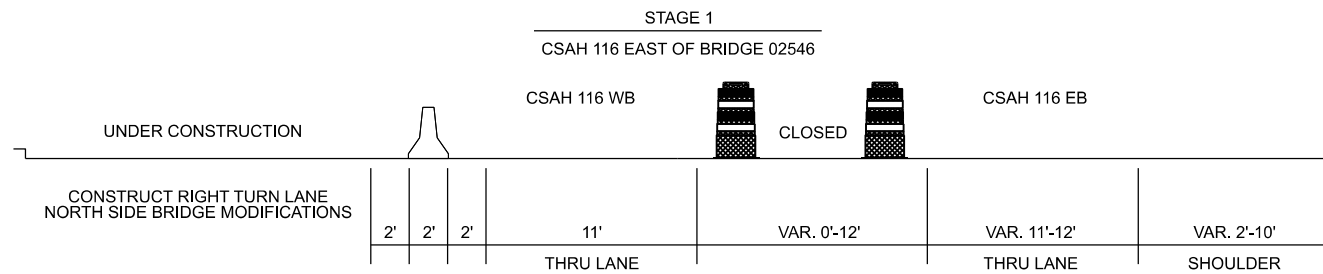
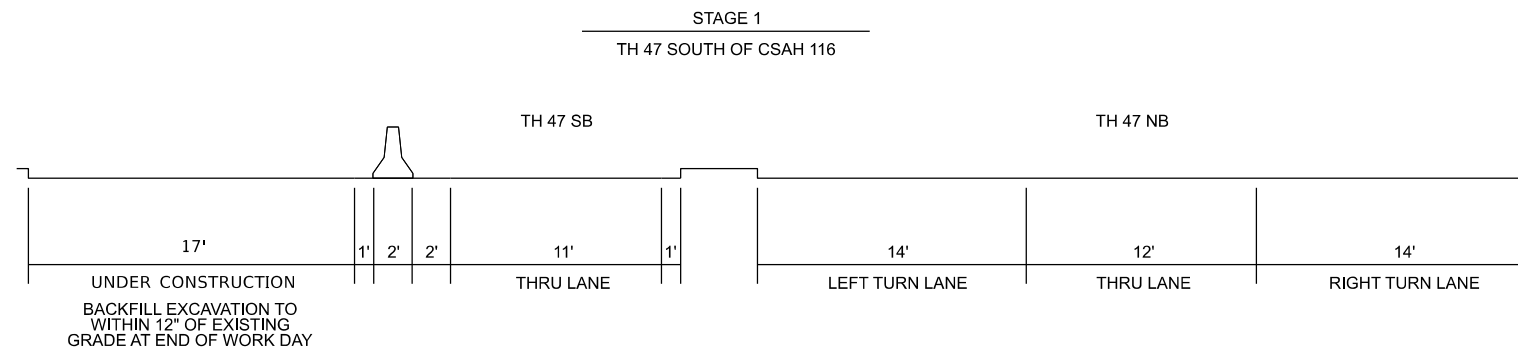
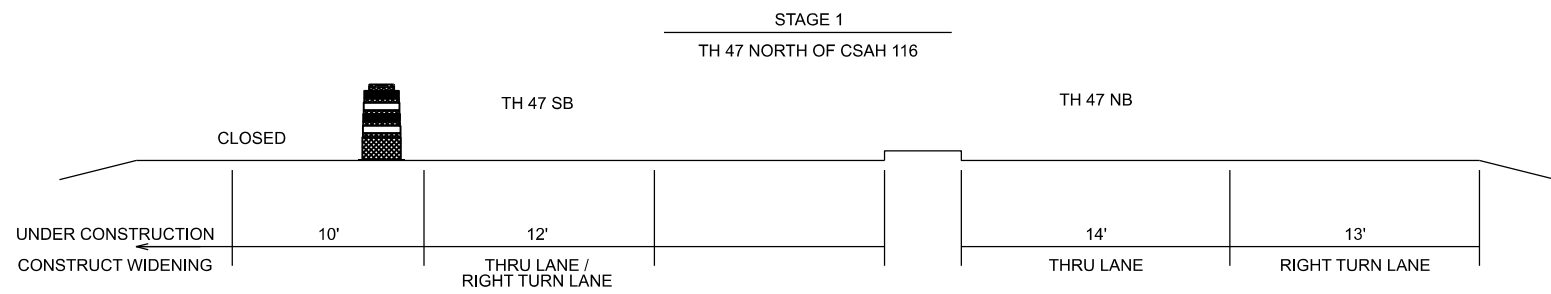
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 STAGE 0 - TYPICAL SECTIONS  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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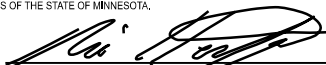


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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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CERTIFIED BY:   
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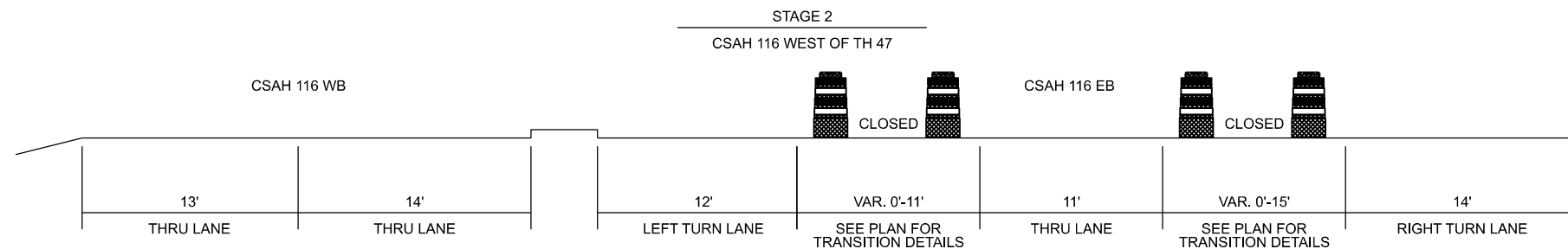
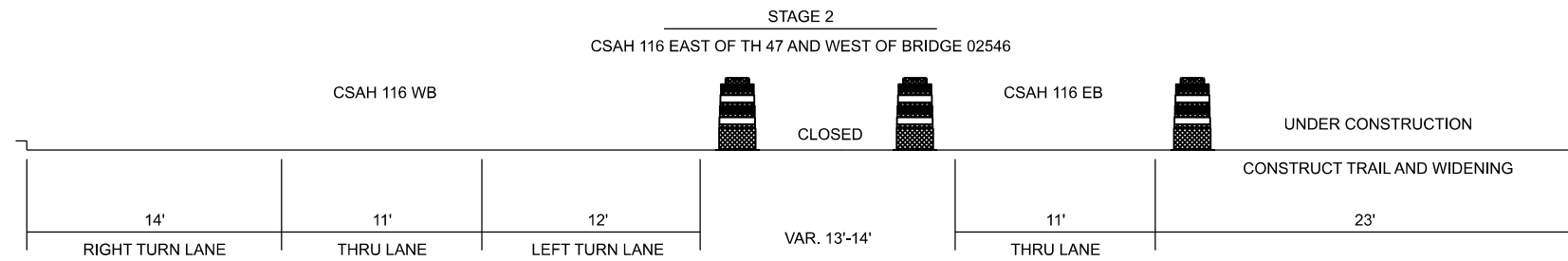
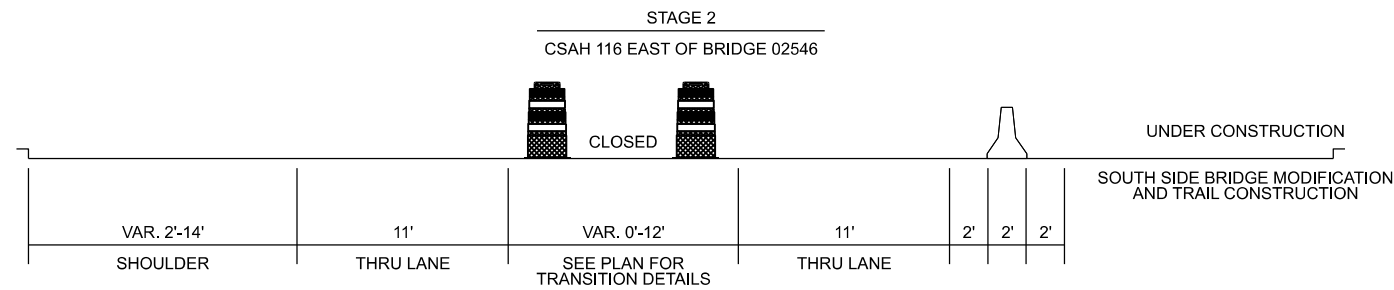
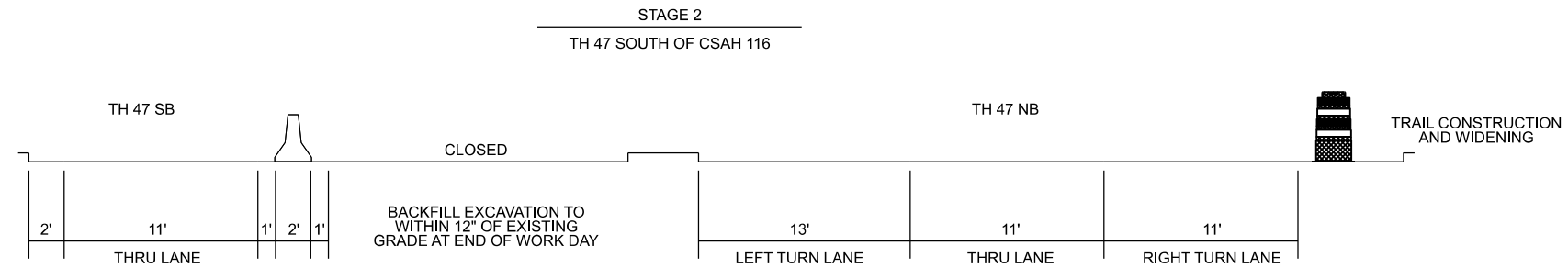
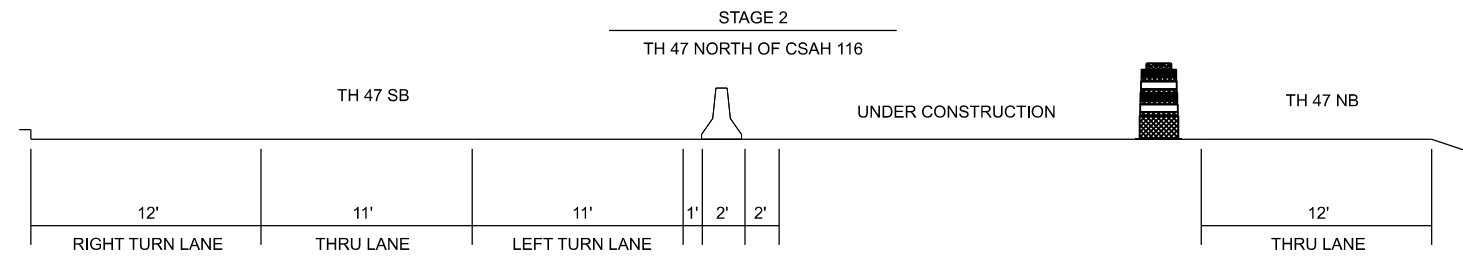


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 STAGE 1 - TYPICAL SECTIONS  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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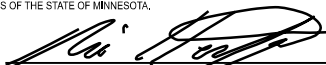
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Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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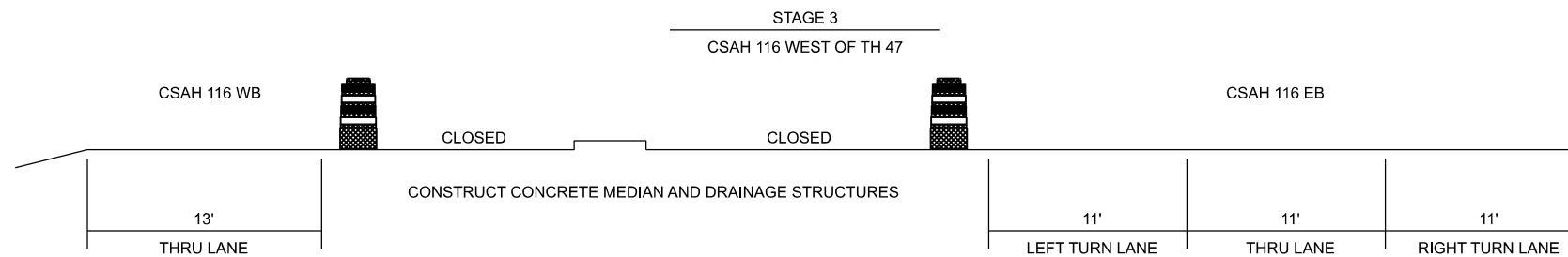
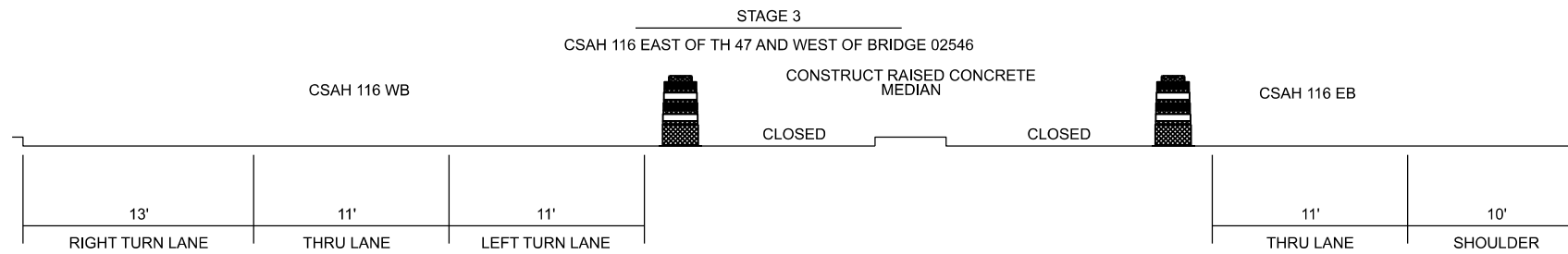
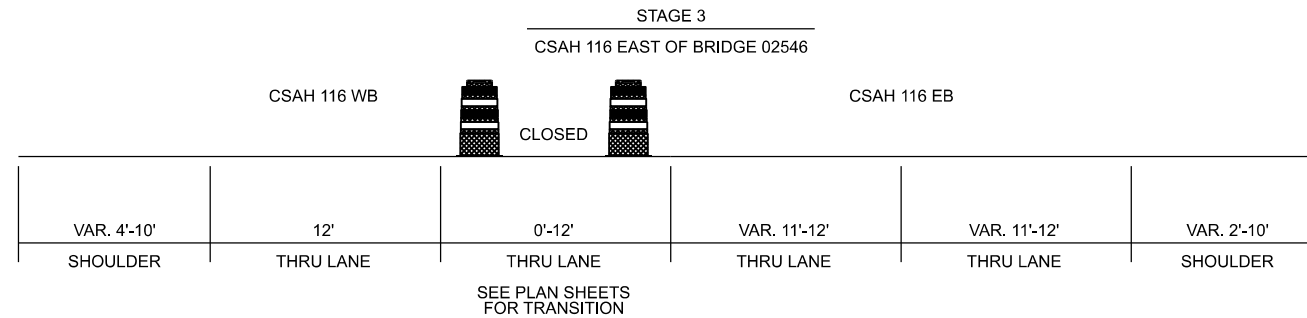
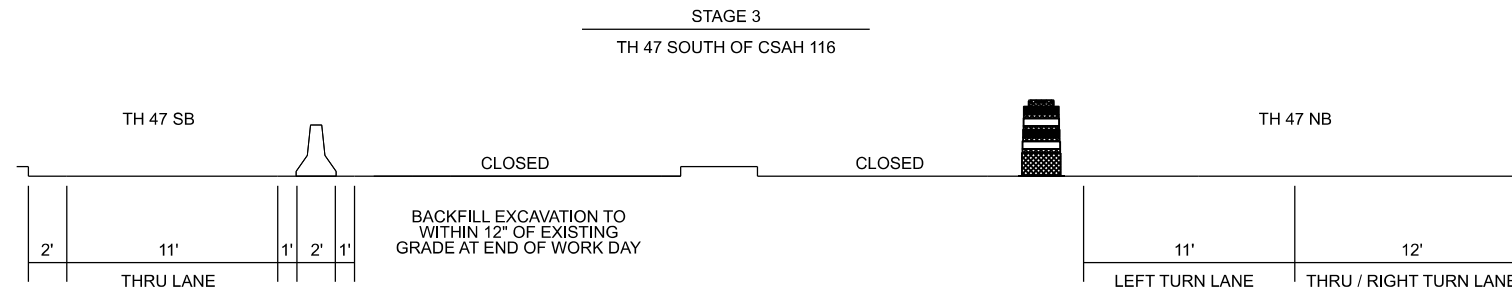
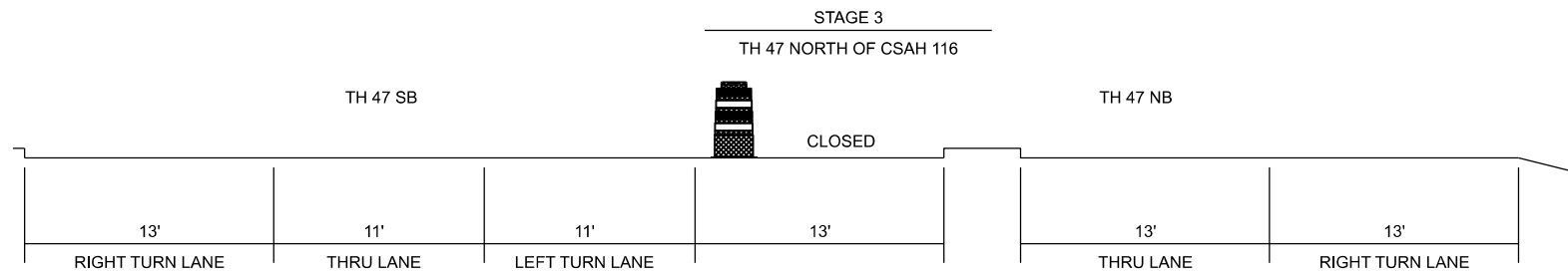
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 STAGE 2 - TYPICAL SECTIONS  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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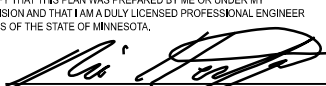


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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
Plan By: MJS  
Checked By: LGR  
Approved By: EAE

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

CERTIFIED BY:   
NICHOLAS E. HENTGES, PE  
DATE: 8/25/2020      LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
STAGE 3 - TYPICAL SECTIONS  
CONSTRUCTION STAGING & TRAFFIC CONTROL  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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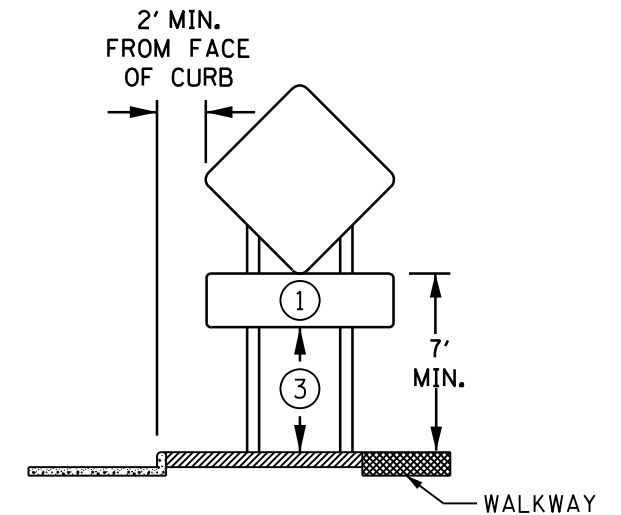
**GENERAL NOTES;**

1. GROUND MOUNTED SQUARE TUBE SIGN STRUCTURES PLACED WITHIN 50' OF THE RADIUS END OF AN INTERSECTION SHALL BE PLACED ON ONE 2 INCH OR 2-1/2 INCH POST.
2. FOR 2 INCH SQUARE TUBE RISER POST IN SOIL, USE FIN BASE PLACED PER MANUFACTURER'S SPECIFICATIONS. USE A 2 INCH X 2 INCH PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST. PLACE 3/8 INCH STAINLESS STEEL BOLT THROUGH THE 5TH HOLE DOWN FROM THE TOP OF THE BASE. RISER POST SHALL REST ON THE BOLT.
3. FOR 2-1/2 INCH SQUARE TUBE RISER POST IN SOIL, USE SLIP BASE PLACED PER MANUFACTURER'S SPECIFICATIONS USING A 10 GAUGE , 2-1/2 INCH X 2-1/2 INCH PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST WITH A 10 GAUGE 2-3/16 INCH X 2-3/16 INCH PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE INTERNAL INSERT.

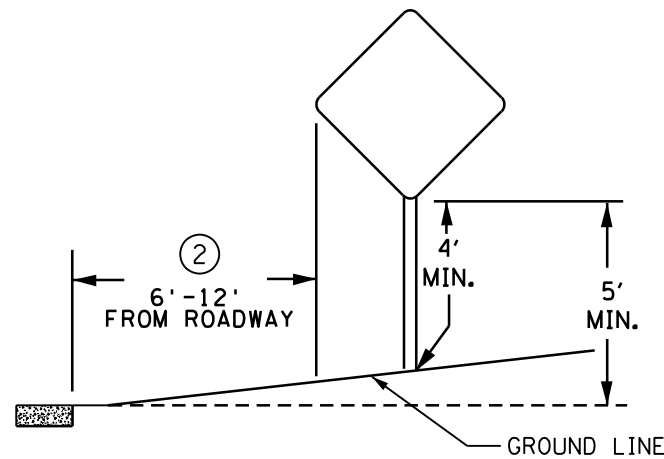
**SPECIFIC NOTES;**

- ① IF ANY PART OF A SIGN OR SIGN ASSEMBLY EXTENDS MORE THAN 4" INTO THE PEDESTRIAN FACILITY, THE MINIMUM HEIGHT TO BOTTOM OF THE SIGN OR SIGN ASSEMBLY SHALL BE 7'.
- ② 6' - 12' FROM EDGE OF ROADWAY, MUST BE A MINIMUM OF 6' FROM EDGE OF PAVED SHOULDER (WHEN PRESENT).
- ③ IF GROUND MOUNTED TEMPORARY SIGN OR SIGN ASSEMBLY IS PLACED ON 2-1/2 INCH SQUARE TUBE RISER POST(S), THE MINIMUM CLEARANCE FROM THE GROUND LINE TO THE BOTTOM OF THE LOWEST SIGN ON THE ASSEMBLY SHALL BE 7', OR AS SHOWN IN DETAIL, WHICHEVER IS GREATER.
- ④ 5' MINIMUM IN RURAL, 7' MINIMUM IN BUSINESS, COMMERCIAL, OR RESIDENTIAL AREAS.

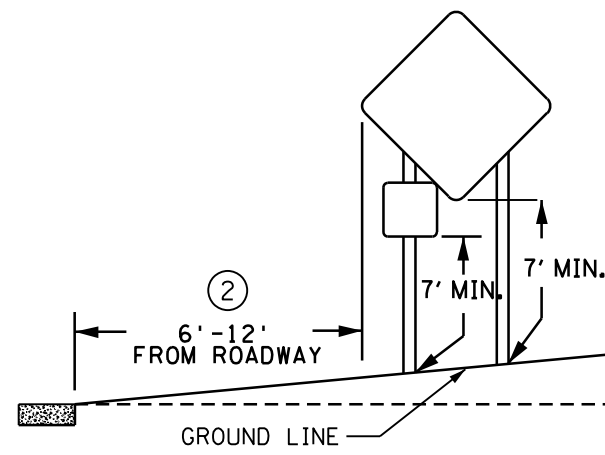
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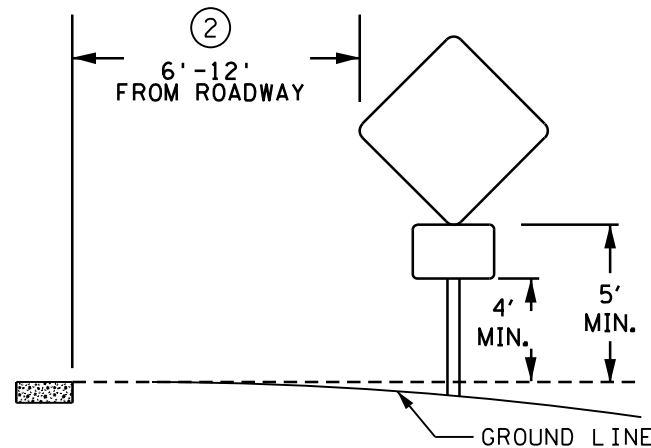
**BUSINESS, COMMERCIAL, OR RESIDENTIAL AREA**



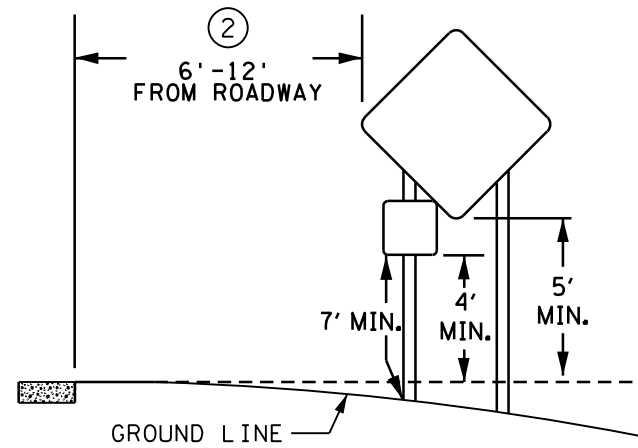
**TYPICAL RURAL DESIGN AND 2 INCH RISER POST**



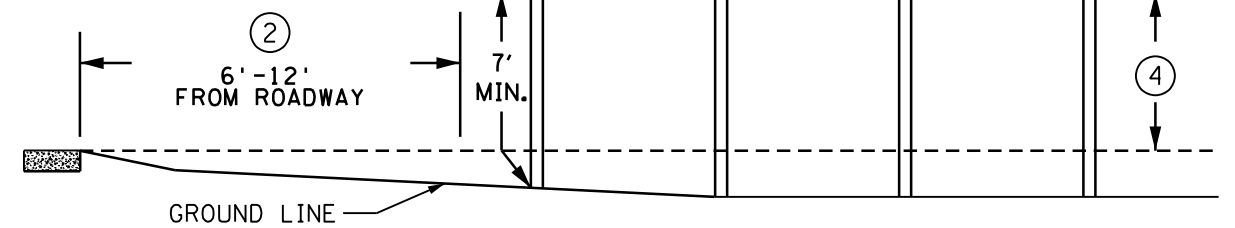
**TYPICAL RURAL DESIGN WITH SUPPLEMENTAL PLAQUE AND 2-1/2 INCH RISER POST**



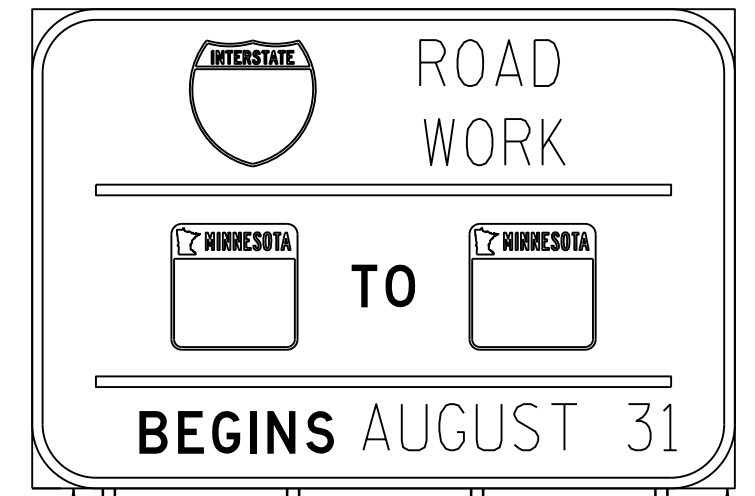
**TYPICAL RURAL DESIGN WITH SUPPLEMENTAL PLAQUE AND 2 INCH RISER POST**



**TYPICAL RURAL DESIGN 2-1/2 INCH RISER POST**



**TYPICAL G20-X2 DESIGN**

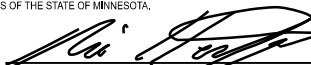


**TEMPORARY SQUARE TUBE GROUND MOUNTED SIGN PLACEMENT (TRUNK HIGHWAY)**

PUBLISHED BY OTE 12/30/2019

DATE: 8/25/2020 2:52:00 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_cs\_details.dgn

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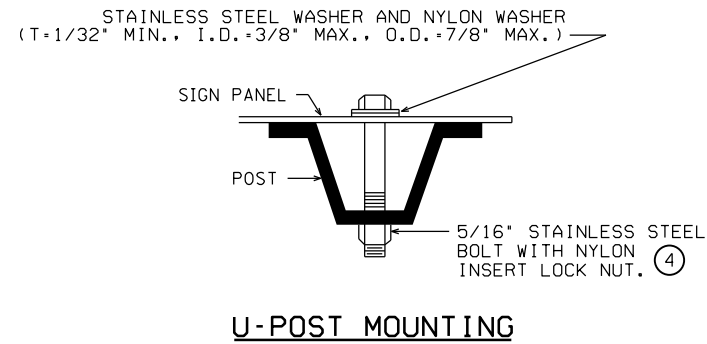
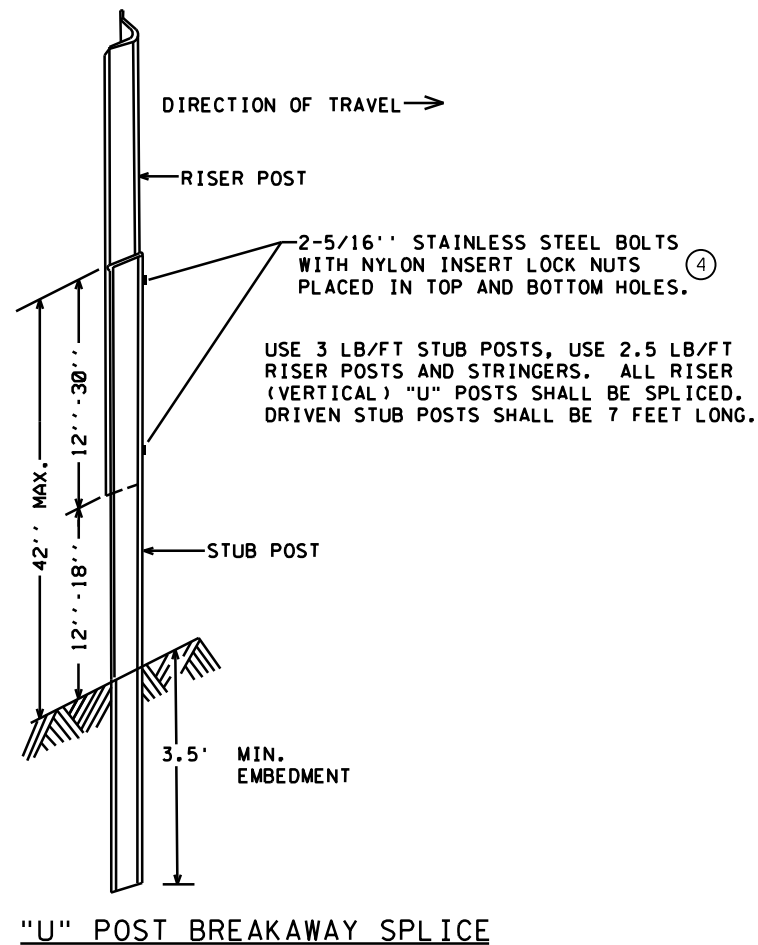
Design By: NEH	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY: NICHOLAS E. HENTGES, PE LICENSED PROFESSIONAL ENGINEER DATE: 8/25/2020 LICENSE NO. 44620
Plan By: AJF	
Checked By: NEH	
Approved By: NEH	



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 DETAILS (TRUNK HIGHWAY)  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 73 OF 206 SHEETS



**GENERAL NOTES:**

1. SIGNS TO BE PLACED ON DRIVEN U-POSTS SHALL BE PLACED IN ACCORDANCE WITH TABLE 1. 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 OFFSET, AND STAGGERED WITH A MIN OF 4' BETWEEN THE SIGN STRUCTURES. SIGN PANELS SHALL BE PLACED ON SIGN STRUCTURES TO MEET THE 5' MIN DEPICTED ON THE TYPICAL RURAL DESIGN DETAIL, AND THE 7' MIN DEPICTED ON THE TYPICAL BUSINESS, COMMERCIAL, OR RESIDENTIAL AREA DESIGN DETAIL ON THIS SHEET.
2. ANY SIGN PANEL LARGER THAN WHAT IS LISTED ON TABLE 1 SHALL BE INSTALLED ON SQUARE TUBE.
3. SEE MnDOT STANDARD SIGNS AND MARKINGS MANUAL FOR PUNCHING HOLES.
4. A 48" X 48" WARNING SIGN INSTALLED ON TWO U-CHANNEL POSTS MAY BE SUPPLEMENTED WITH UP TO ONE 24" X 12" CARDINAL DIRECTION PLAQUE AND ONE 30" X 24" ROUTE MARKER, PROVIDED SUPPLEMENTAL SIGNS ARE MOUNTED IN THE UPPER TRAFFIC SIDE CORNER OF THE WARNING SIGN(S).

**SPECIFIC NOTES:**

- (1) FOR TEMPORARY CONSTRUCTION SIGN FRAMING, THE CONTRACTOR MAY USE GRADE 5 ZINC PLATED BOLTS IN LIEU OF STAINLESS STEEL BOLTS FOR ALL BOLTED CONNECTIONS

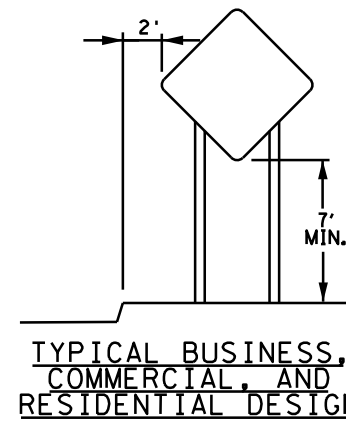
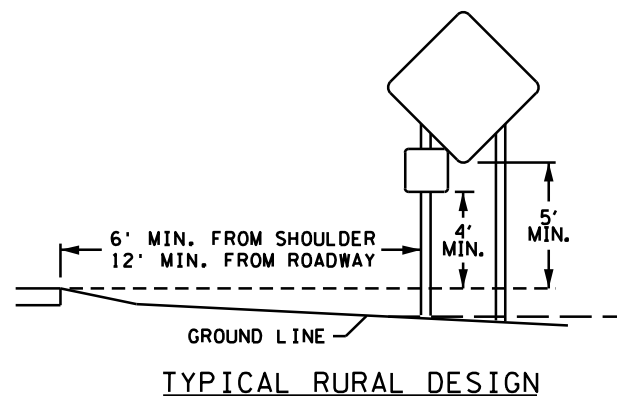
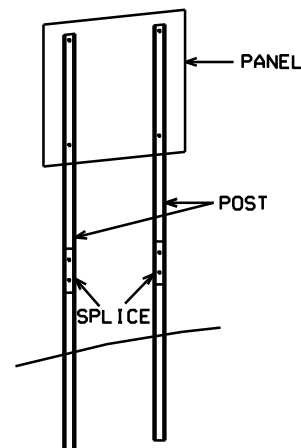


TABLE 1

HEIGHT IN INCHES	WIDTH IN INCHES													
	12	18	24	30	36	42	48	54	60	66	72	78	84	90
12	1	1	1	1	1	1	1	1	1	2/42	2/42	2/42	2/48	2/54
18	1	1	1	1	1	1	1	1	2/42	2/42	2/42	2/42	2/48	2/54
24	1	1	1	1	1	1	2/30	2/36	2/42	2/42	2/42	2/42	2/48	2/54
30	1	1	1	1	1	2/24	2/30	2/36	2/42	2/42	2/42	2/42	2/48	2/54
36	1	1	1	1	2/18	2/24	2/30	2/36	2/42	2/42	2/42			
42	1	1	1	2/12	2/18	2/24	2/30	2/36	2/42	2/42				
48	1	1	1	2/12	2/18	2/24	2/30	2/36	2/42					
54	1	1	2/12	2/12	2/18	2/24	2/30							
60	1	1	2/12	2/12	2/18	2/24								
66			2/12	2/12	2/18									
72			2/12	2/12										
78			2/12	2/12										
84			2/12											
90			2/12											

NUMBER OF POST(S)/SPACING

REQUIRES SQUARE TUBE POSTS



DATE: 8/25/2020 2:52:00 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_cs\_details.dgn

PUBLISHED BY OTE 04/24/2020

NCHRP 350 COMPLIANT GROUND MOUNTED TEMPORARY SIGN INSTALLATION DETAILS (TRUNK HIGHWAY)

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH

Plan By: AJF

Checked By: NEH

Approved By: NEH

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

CERTIFIED BY: *Michael E. Hentges*

LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE

DATE: 8/25/2020 LICENSE NO. 44620



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

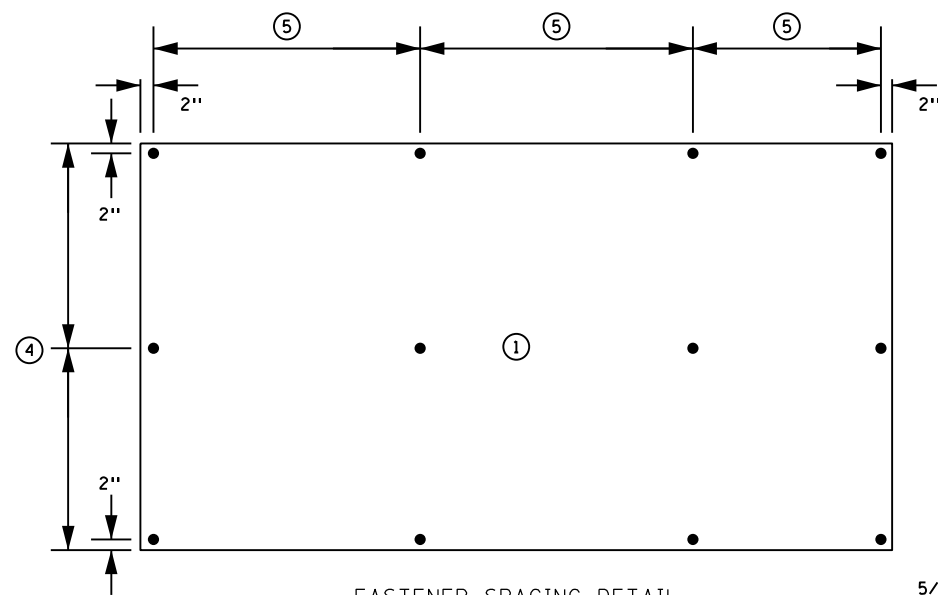
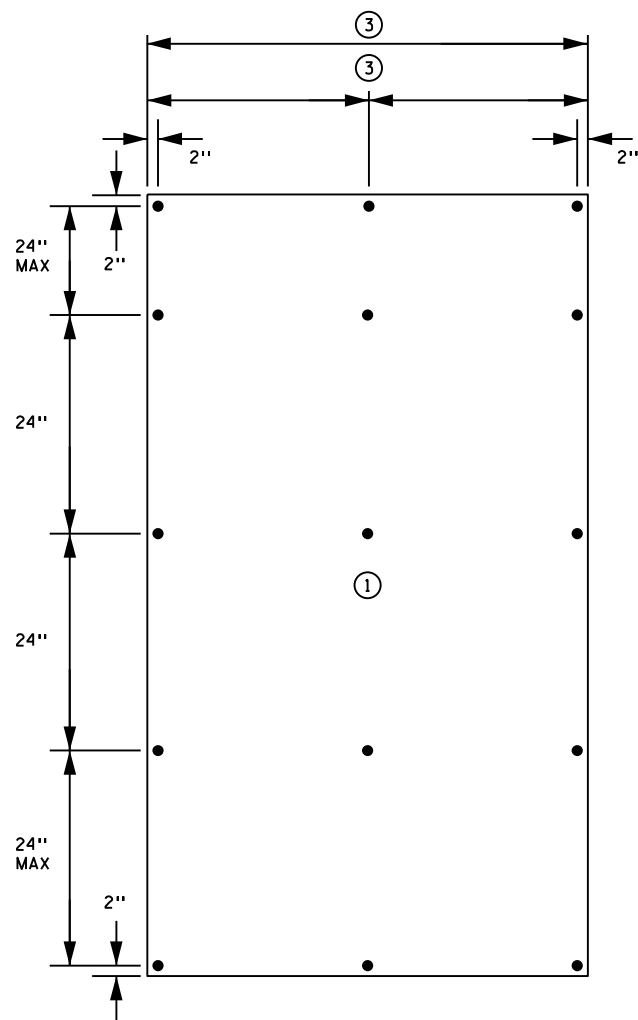
DETAILS (TRUNK HIGHWAY)

CONSTRUCTION STAGING & TRAFFIC CONTROL

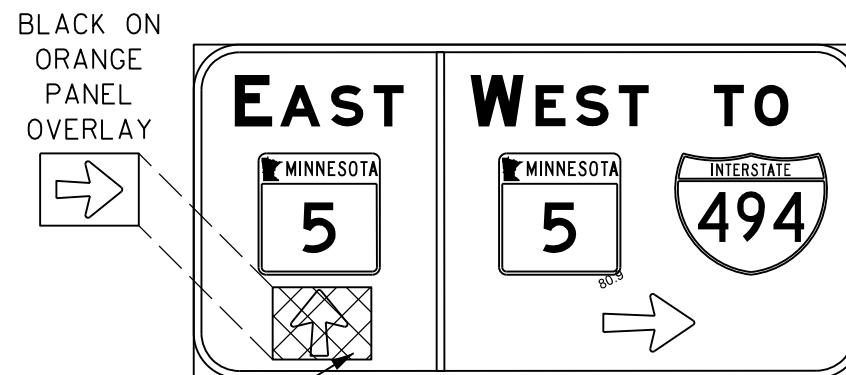
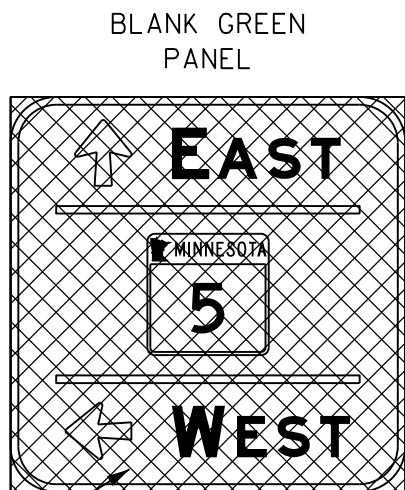
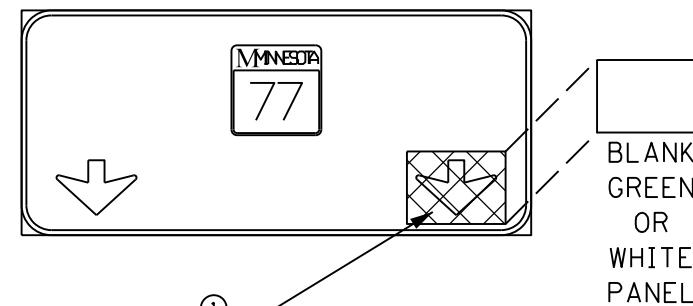
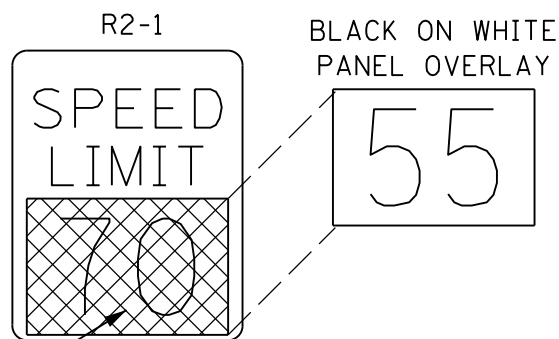
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 74 OF 206 SHEETS

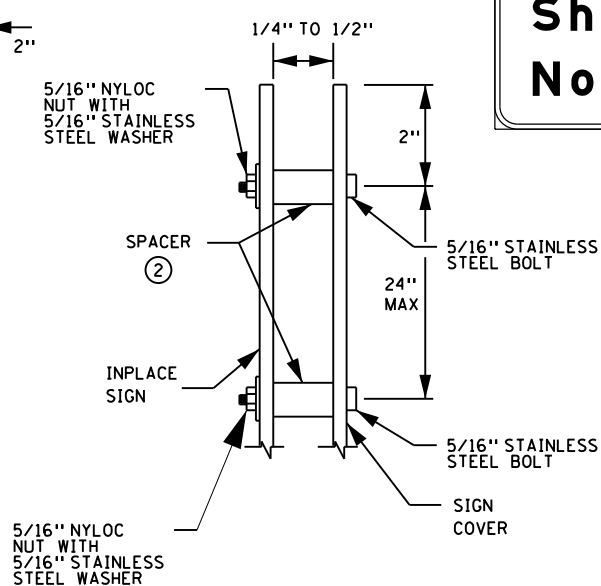
EASTENER SPACING DETAIL  
HORIZONTAL PLACEMENT



EASTENER SPACING DETAIL  
VERTICAL PLACEMENT



SPACER DETAIL



GENERAL NOTES:

- SIGN COVER PANELS ARE USED TO COVER AN ENTIRE INPLACE SIGN PANEL OR A PORTION THEREOF TO REMOVE OR MODIFY THE SIGN MESSAGE. THEY HAVE NO ADDITIONAL MESSAGE PRINTED ON THEM. SIGN COVER PANELS SHALL BE MADE OF A RIGID MATERIAL (SHEET ALUMINUM, PLYWOOD, CORRUGATED PLASTIC, OR OTHER MATERIAL AS APPROVED BY THE ENGINEER). SIGN COVER PANELS SHALL BE THE SAME COLOR AS THE BACKGROUND COLOR OF THE INPLACE SIGN PANEL AND SHALL COVER THE ENTIRE SIGN PANEL OR MESSAGE ELEMENT.
- SIGN PANEL OVERLAYS ARE USED TO MODIFY THE MESSAGE OF AN INPLACE SIGN PANEL. THEY INCLUDE A SIGN MESSAGE. SIGN PANEL OVERLAYS SHALL BE MADE OF SHEET ALUMINUM WITH THE APPROPRIATE SHEETING MATERIAL AS SPECIFIED ON THE MNDOT SHEETING FOR RIGID PERMANENT SIGNS, DELINEATORS, AND MARKERS APL OR THE MNDOT SHEETING FOR RIGID TEMPORARY WORK ZONE SIGNS APL. SIGN PANEL OVERLAY MESSAGES SHALL BE BLACK ON FLUORESCENT ORANGE, EXCEPT ON REGULATORY SIGNS WHICH SHALL BE THE PROPER COLOR ON A WHITE BACKGROUND. THE MESSAGE SHALL FOLLOW THE REQUIREMENTS OF THE MNDOT STANDARD SIGNS AND MARKINGS MANUAL OR THE FHWA STANDARD HIGHWAY SIGNS MANUAL (AND SUPPLEMENTS). THE SIGN PANEL OVERLAY SHALL FULLY COVER THE MESSAGE ELEMENT(S) BEING MODIFIED.
- MINIMIZE DAMAGE TO THE INPLACE SIGN PANEL. DO NOT APPLY TAPE TO THE INPLACE SIGN SHEETING.
- SPACERS SHALL BE A MATERIAL THAT WILL NOT HARM THE INPLACE SIGN SHEETING FACE (SUCH AS PLASTIC OR RUBBER).
- ATTACH SIGN COVER PANEL OR PANEL OVERLAY USING HARDWARE SHOWN IN THE SPACER DETAIL.
- IF SHEET METAL SCREWS ARE USED TO PLACE CORRUGATED PLASTIC AS A SIGN COVER PANEL, PLACE FENDER WASHERS BETWEEN THE SCREW HEADS AND THE CORRUGATED PLASTIC. REMOVE ALL COVERING MATERIAL, MOUNTING HARDWARE, AND FASTENERS WHEN SIGN COVER PANEL OR PANEL OVERLAY IS REMOVED.
- NO HANDLE OR OTHER LIFTING DEVICE SHALL BE LEFT ATTACHED TO ANY SIGN COVER PANEL AFTER PLACEMENT.

SPECIFIC NOTES:

- THE SIGN COVER PANEL OR PANEL OVERLAY SHALL FULLY COVER THE MESSAGE BEING COVERED OR MODIFIED.
- INSTALL SIGN COVER PANELS AND PANEL OVERLAYS WITH SPACERS THAT PROVIDE A SPACING OF 1/4 IN TO 1/2 IN BETWEEN THE COVER MATERIAL AND THE INPLACE SIGN. THE SPACERS SHALL HAVE AN OUTSIDE DIAMETER BETWEEN 3/8 IN TO 7/8 IN. EACH FASTENER REQUIRES A SPACER.
- IF THE SIGN COVER PANEL OR PANEL OVERLAY IS GREATER THAN 48 IN WIDE, THE FASTENER SPACING SHALL BE NO GREATER THAN 24 IN. IF THE SIGN COVER PANEL OR PANEL OVERLAY IS LESS THAN 24 IN WIDE, DO NOT INSTALL A CENTER FASTENER (UNLESS REQUIRED BY SPECIFIC NOTE 4).
- VERTICAL SPACING FOR FASTENERS IS 50% OF THE SIGN COVER PANEL OR PANEL OVERLAY. IF THE SIGN COVER PANEL OR PANEL OVERLAY IS LESS THAN 24 IN HIGH, DO NOT INSTALL A CENTER FASTENER (UNLESS REQUIRED PER SPECIFIC NOTE 5).
- HORIZONTAL SPACING FOR FASTENERS SHALL NOT BE LESS THAN 15 IN NOR MORE THAN 24 IN.

ASSEMBLY STEPS

- DRILL 11/32 IN HOLES ON THE SIGN COVER PANEL OR PANEL OVERLAY IN ACCORDANCE WITH THE FASTENER SPACING DETAILS.
- ATTACH PLASTIC SPACERS TO SIGN COVER PANEL OR PANEL OVERLAY WITH DOUBLE FACED TAPE, CENTERED BEHIND EACH DRILLED HOLE.
- POSITION THE COVER OR OVERLAY MATERIAL OVER THE SIGN OR MESSAGE TO BE MODIFIED.
- DRILL ALL THE OUTSIDE HOLES THROUGH THE INPLACE SIGN PANEL AND ATTACH THE COVER OR OVERLAY MATERIAL WITH APPROPRIATE FASTENERS.
- DRILL ALL THE INNER HOLES THROUGH THE INPLACE SIGN PANEL AND ATTACH WITH APPROPRIATE FASTENERS.

PUBLISHED BY OTE 04/24/2020

TEMPORARY SIGN COVERING AND MODIFICATION (TRUNK HIGHWAY)

DATE: 8/25/2020 2:52:00 PM PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\4652-000\_cs\_details.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

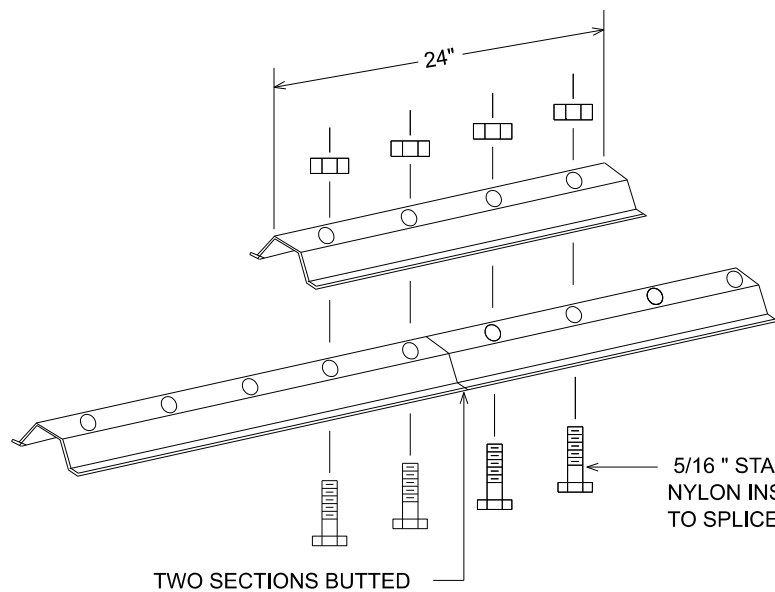
CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER  
 DATE: 8/25/2020 LICENSE NO. 44620



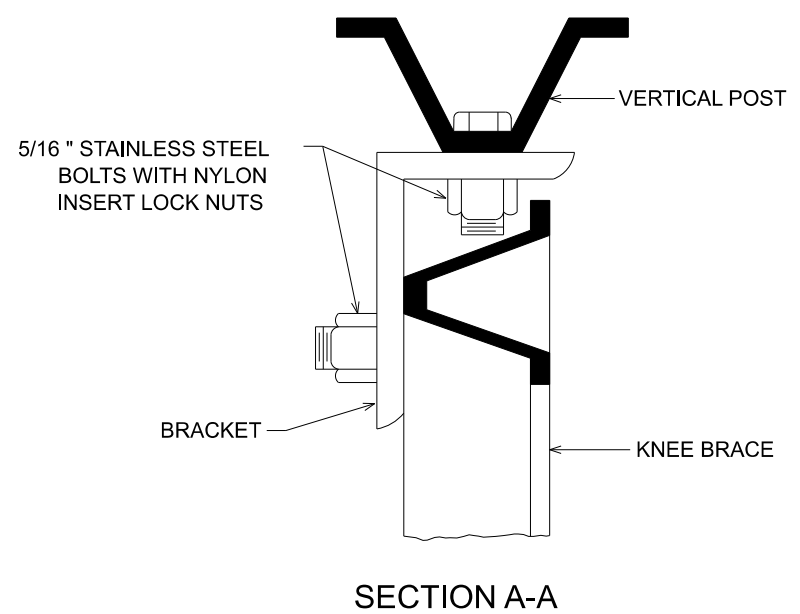
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 DETAILS (TRUNK HIGHWAY)  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

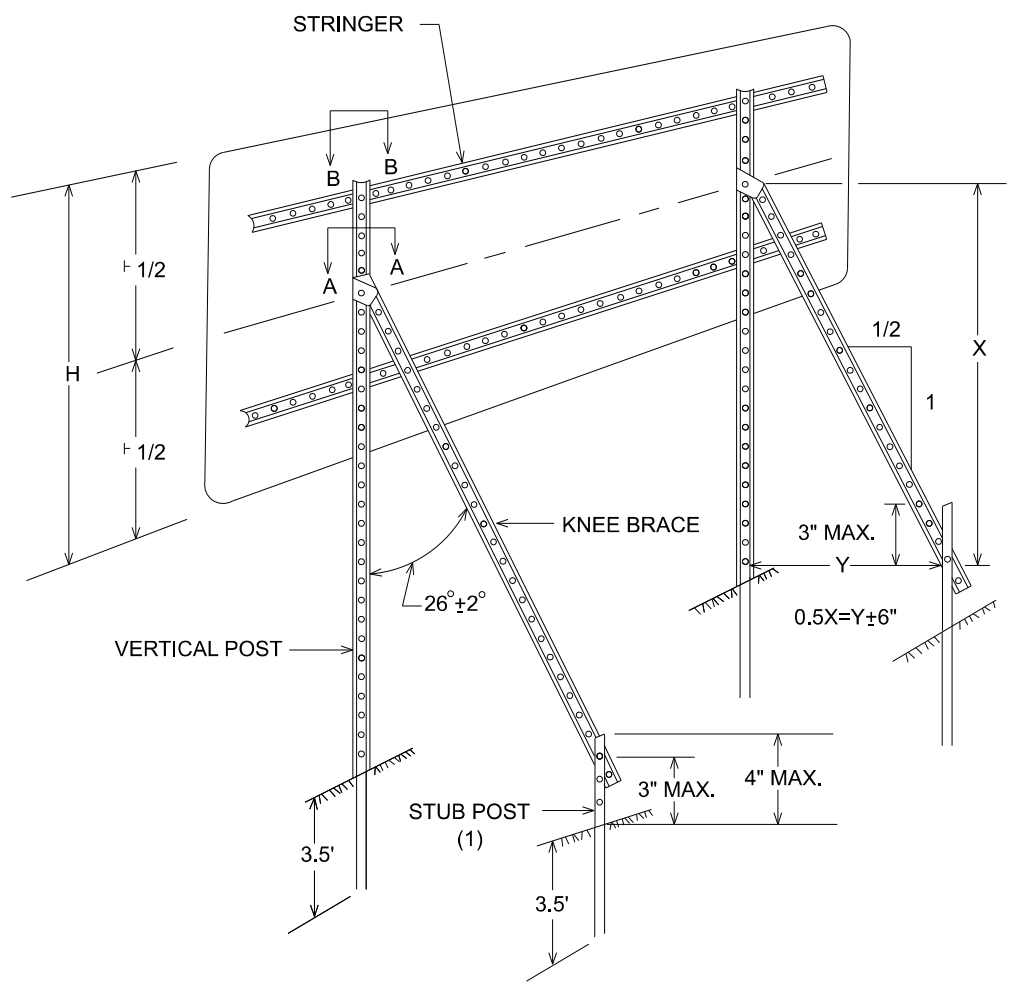
SHEET  
 75  
 OF  
 206  
 SHEETS



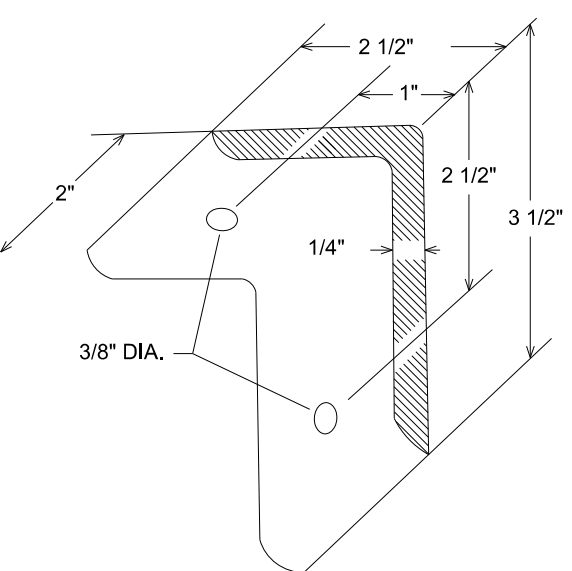
**LATERAL BRACE OR STRINGER  
SPLICE DETAIL (EXPLODED VIEW)**



**SECTION A-A**

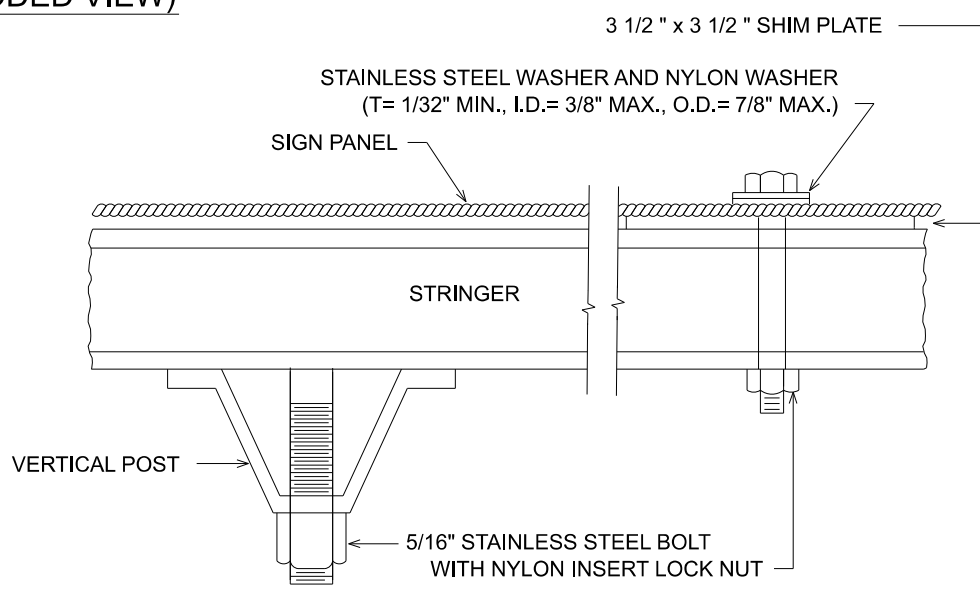


**TYPICAL "A-FRAME" INSTALLATION  
TYPE "D" SIGNS**

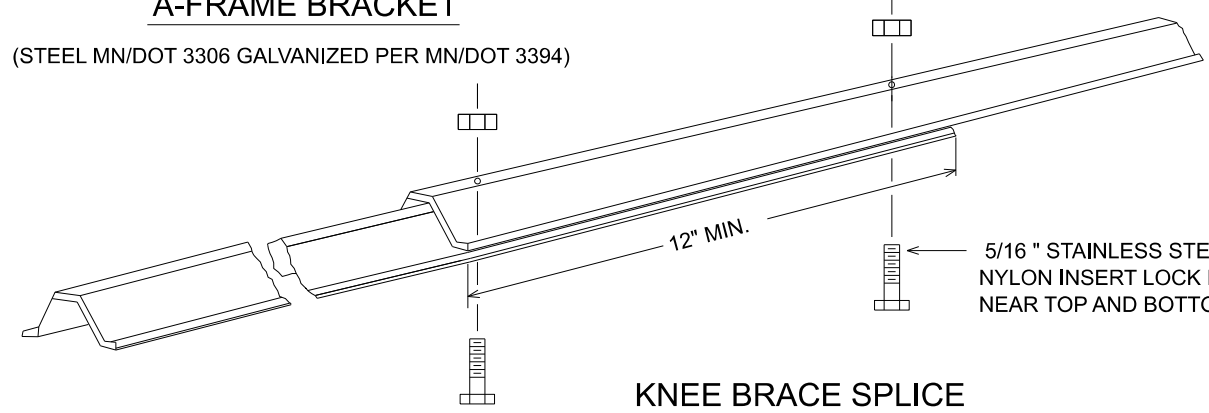


**A-FRAME BRACKET**

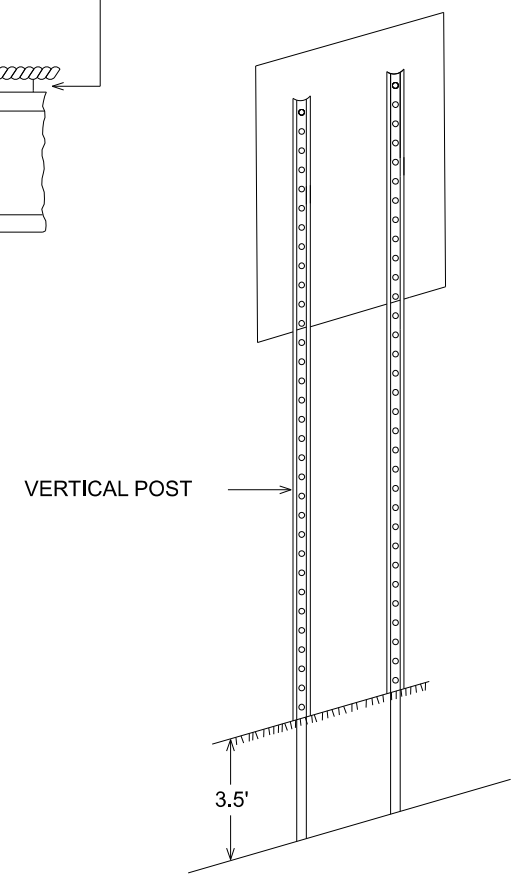
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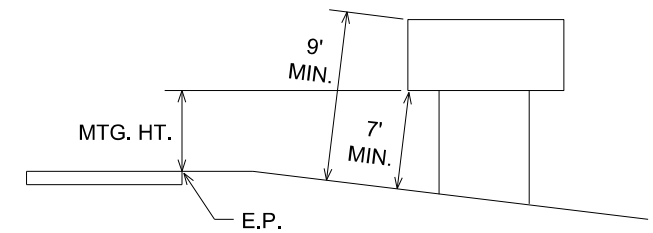
**SECTION B-B**



**KNEE BRACE SPLICE**



**TYPICAL INSTALLATION 36" AND LARGER  
TYPE "C" SIGNS**



**TYPICAL MOUNTING**

(1) OFFSET STUB POST 1' TOWARD ROADWAY  
RELATIVE TO VERTICAL POST.

**TYPE C & D SIGN  
STRUCTURAL DETAILS**

**ANOKA COUNTY HIGHWAY DEPARTMENT SIGN DETAILS**

DATE: 8/25/2020 2:52:01 PM  
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
Plan By: AJF  
Checked By: NEH  
Approved By: NEH

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CERTIFIED BY: *Michael E. Hentges*  
MICHAEL E. HENTGES, PE  
DATE: 8/25/2020 LICENSE NO. 44620

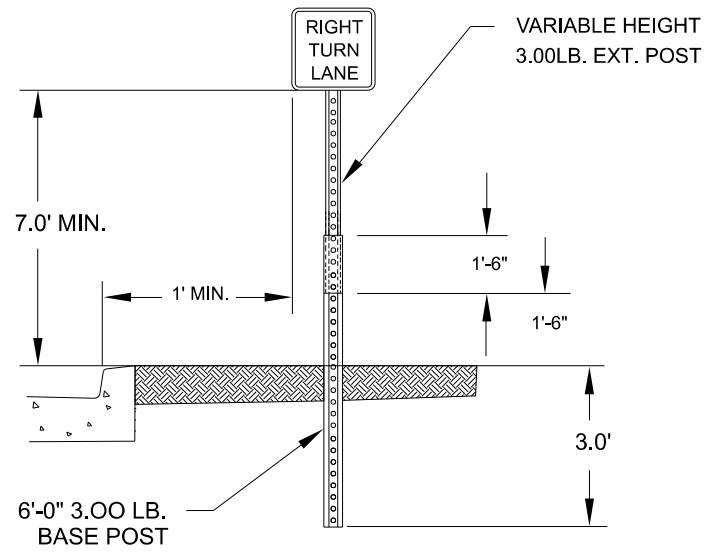


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

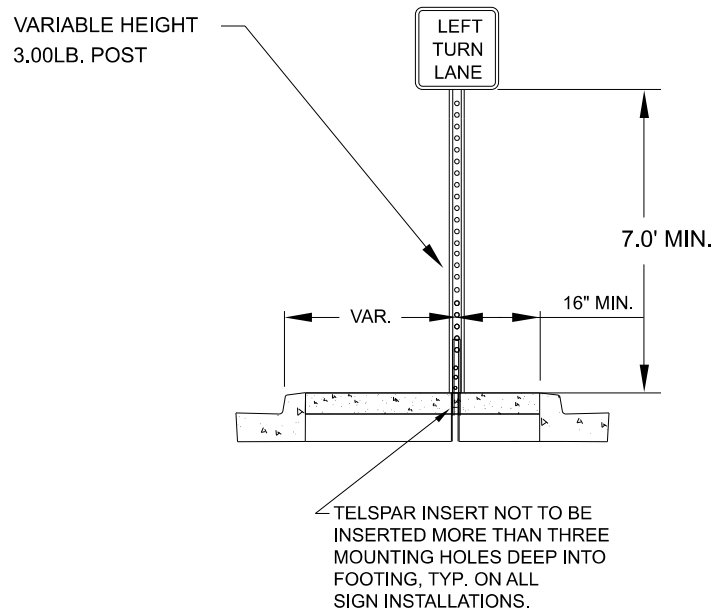
ANOKA COUNTY, MN  
DETAILS (ACHD)  
CONSTRUCTION STAGING & TRAFFIC CONTROL  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
76  
OF  
206  
SHEETS

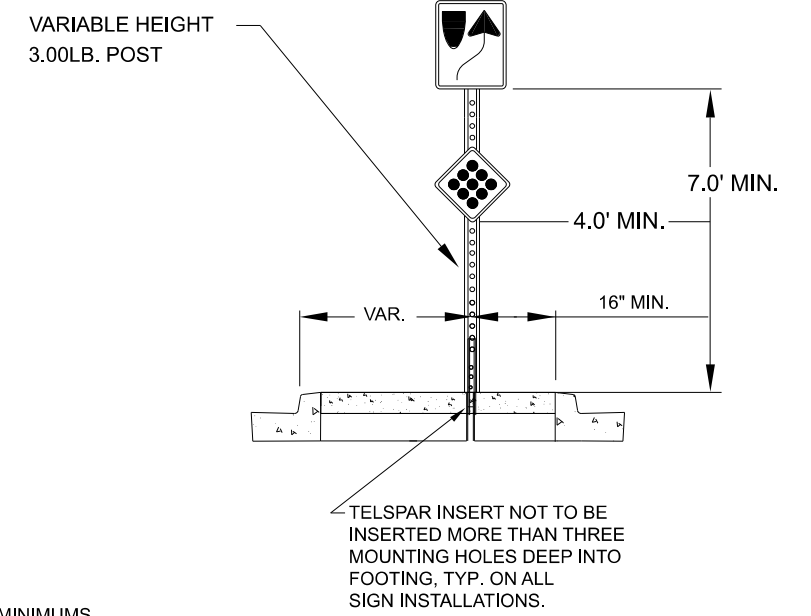
GROUND POST MOUNT SIGN  
INSTALLATION TYPICAL



ISLAND MOUNT BREAK-AWAY SIGN  
INSTALLATION TYPICAL



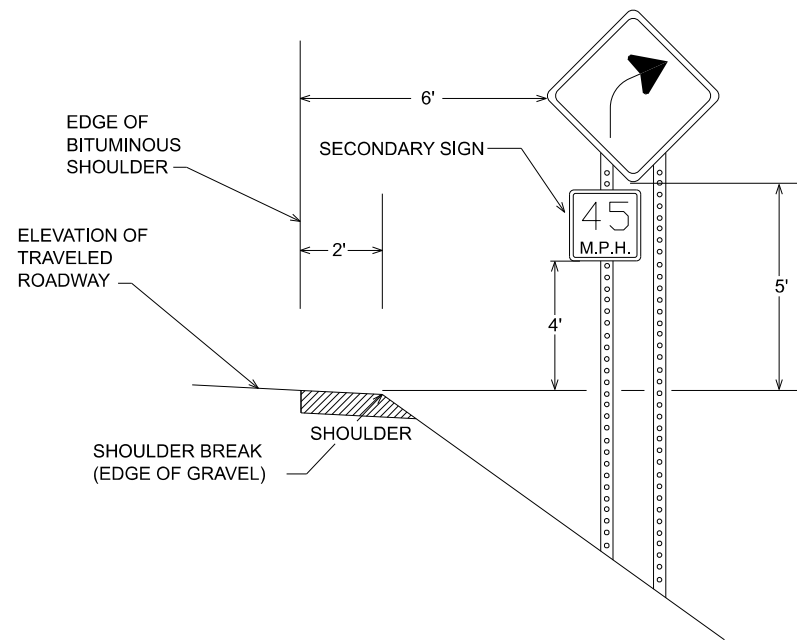
ISLAND MOUNT BREAK-AWAY SIGN  
INSTALLATION TYPICAL  
KEEP RIGHT/CLUSTER



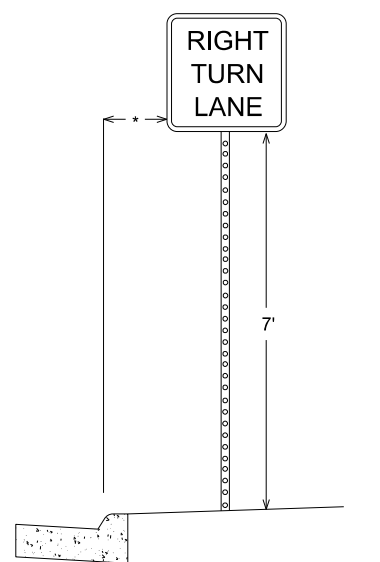
NOTES:

- ALL DIMENSIONS ARE MINIMUMS
- MAINTAIN A CLEAR DISTANCE OF 2' BETWEEN SIGNS AND BITUMINOUS TRAIL
- 7' SIGN CLEARANCE IF A CLEAR DISTANCE OF 2' BETWEEN SIGNS AND BITUMINOUS TRAIL CANNOT BE MAINTAINED

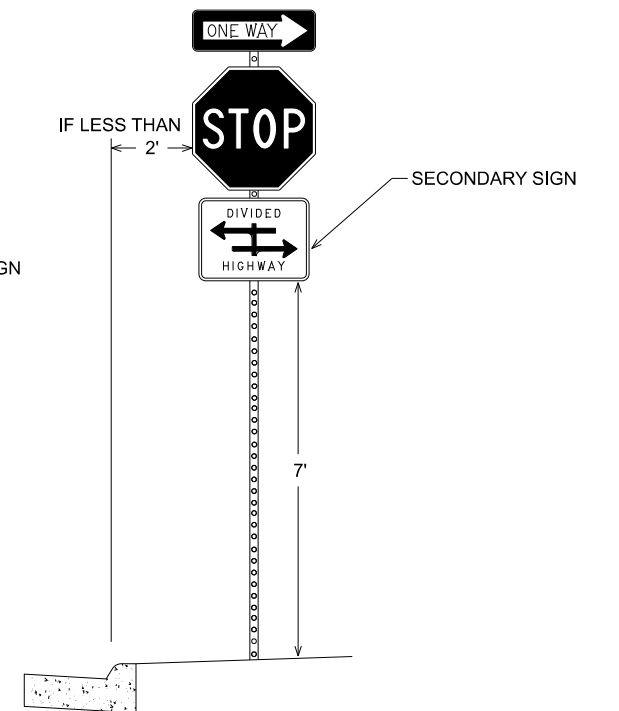
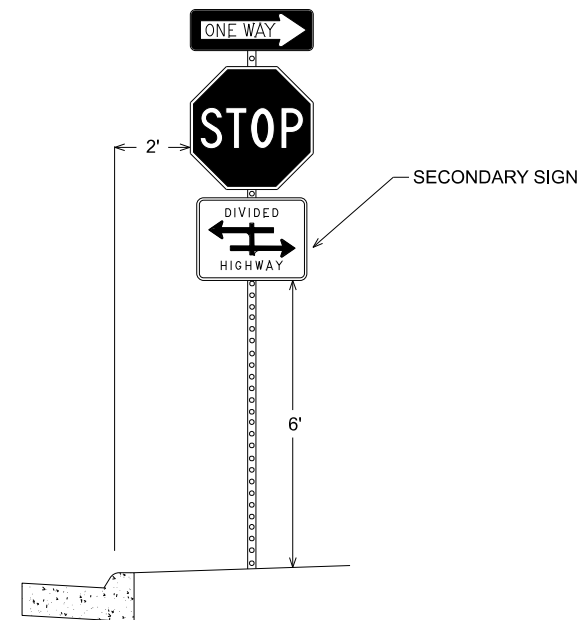
TYPICAL SIGN PLACEMENT  
(RURAL)



TYPICAL SIGN PLACEMENT  
(URBAN)



\* 2' - NARROW BOULEVARD (< 8' WIDE)  
6' - WIDE BOULEVARD



ANOKA COUNTY HIGHWAY DEPARTMENT SIGN PLACEMENT

DATE: 8/25/2020 2:52:01 PM  
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 DETAILS (ACHD)  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 77  
 OF  
 206  
 SHEETS

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:

A RIGID OPAQUE PANEL OVERLAY. THE OVERLAY PANEL SHOULD BE APPROXIMATELY THE SAME SIZE AS THE SIGN PANEL SUCH THAT THE SIGN MESSAGE IS COMPLETELY COVERED

HOOKS OR PREFORMED STRAPS EXTEND OVER TOP EDGE(S) OF SIGN PANEL

INPLACE SIGN

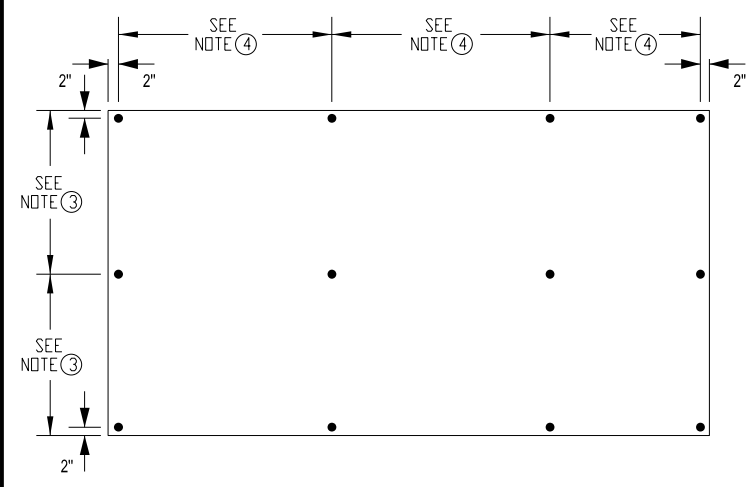
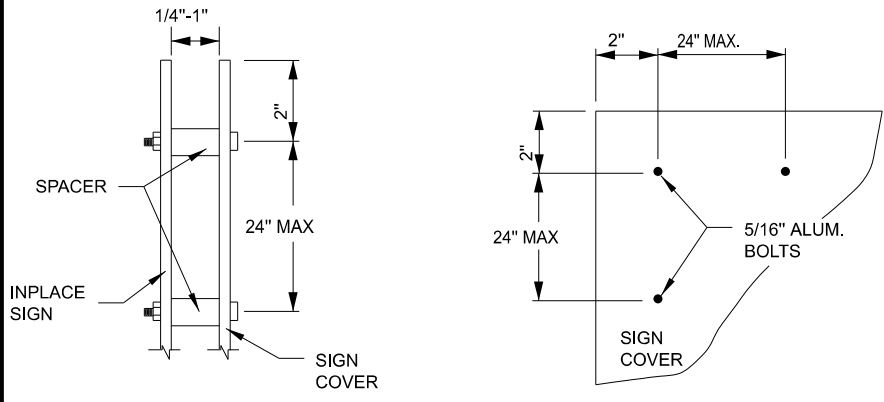
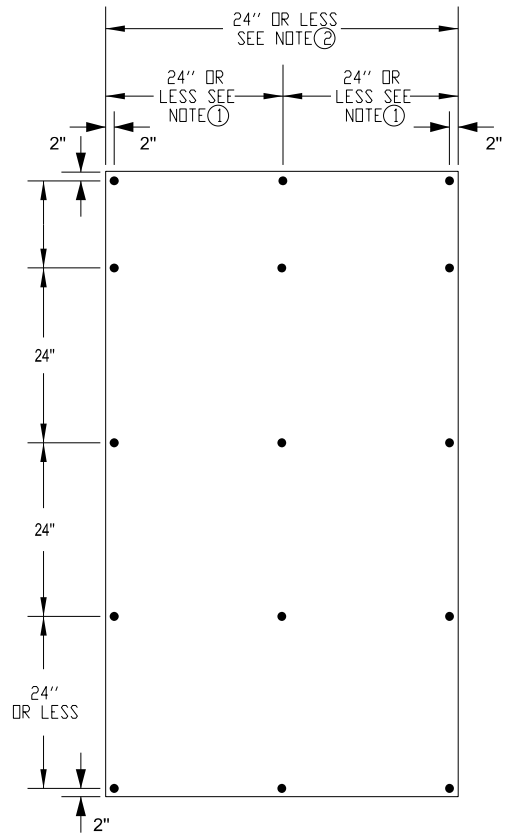
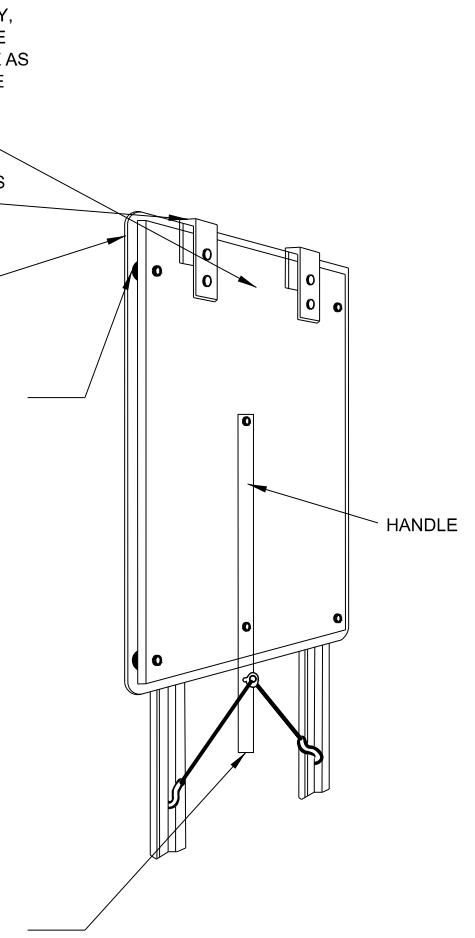
A SPACER IS REQUIRED IN ALL 4 CORNERS TO PROVIDE AIR FLOW GAP BETWEEN THE SIGN FACE AND OVERLAY PANEL

SPACERS SHALL ALLOW BETWEEN 1/4" TO 1" GAP AND BE A MATERIAL THAT WILL NOT HARM THE SIGN SHEETING FACE

ALL FASTENERS (SUCH AS BOLTS, HOOKS OR SCREWS) SHALL NOT TOUCH THE SIGN SHEETING FACE

THE OVERLAY PANEL SHALL BE ATTACHED TO THE SIGN STRUCTURE SUCH THAT IT WILL NOT MOVE DUE TO WIND

BOTTOM OF HANDLE SHALL BE SECURED TO PREVENT MOVEMENT. BOLT ON HANDLE SHALL BE ATTACHED TO OVERLAY PANEL AS TO NOT DAMAGE INPLACE SIGN PANEL.

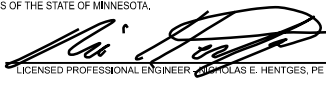


ACHD REFERENCE DATE: 01/26/2018

ANOKA COUNTY HIGHWAY DEPARTMENT TEMPORARY SIGN COVERING

DATE: 8/25/2020 2:52:01 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_cs\_details.dgn

NO.	DATE	BY	CHK	REVISIONS

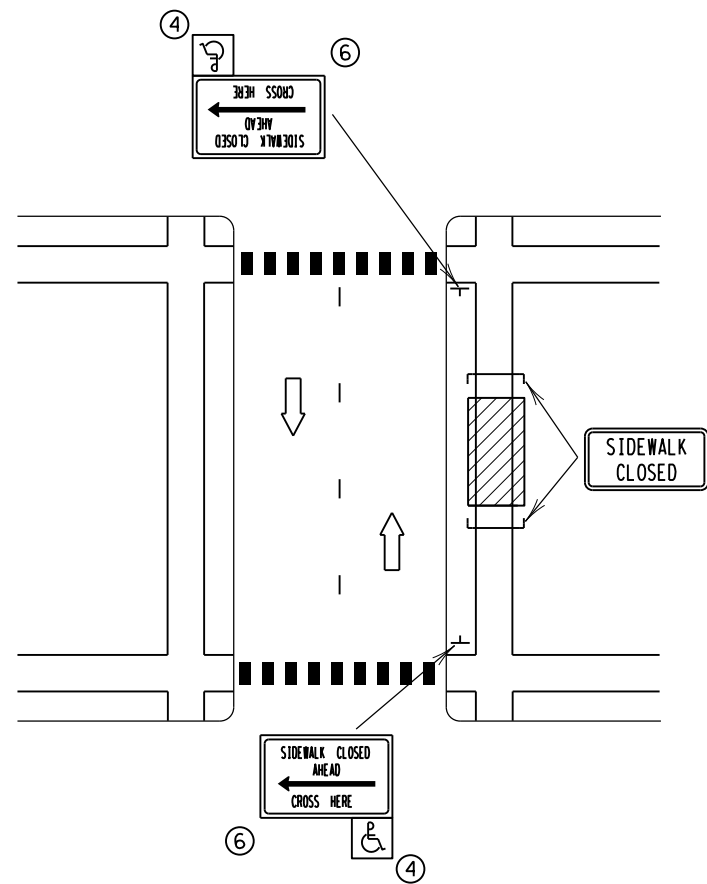
Design By: <b>NEH</b>	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY:  LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE DATE: 8/25/2020 LICENSE NO. 44620
Plan By: <b>AJF</b>	
Checked By: <b>NEH</b>	
Approved By: <b>NEH</b>	



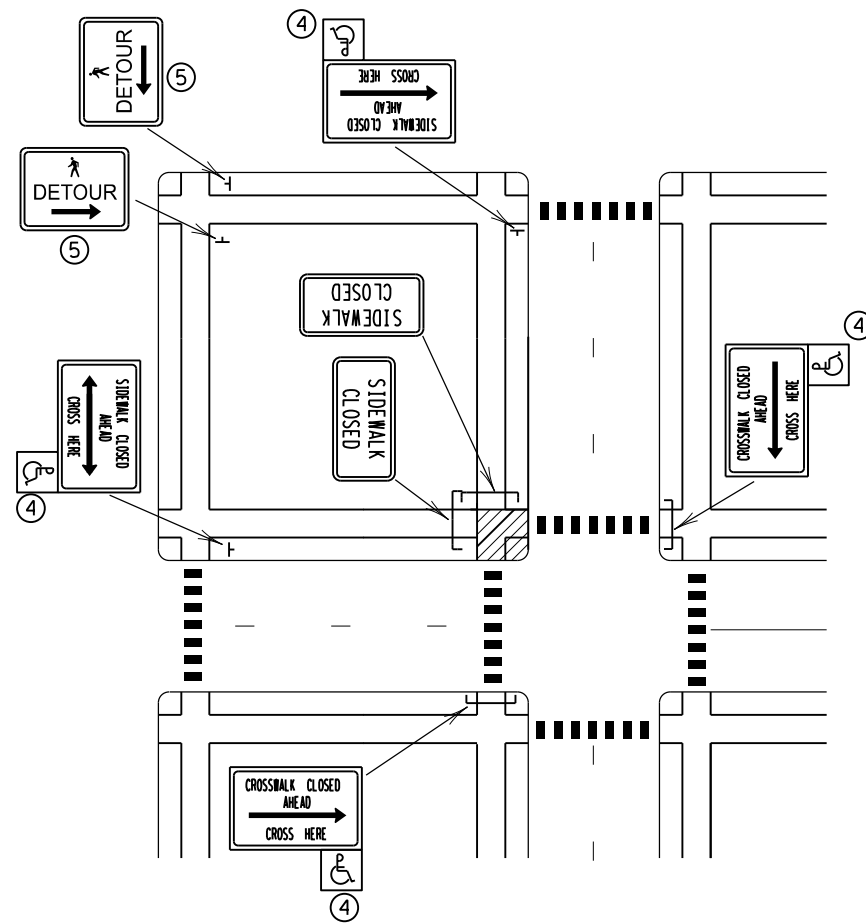
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
DETAILS (ACHD)  
CONSTRUCTION STAGING & TRAFFIC CONTROL  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

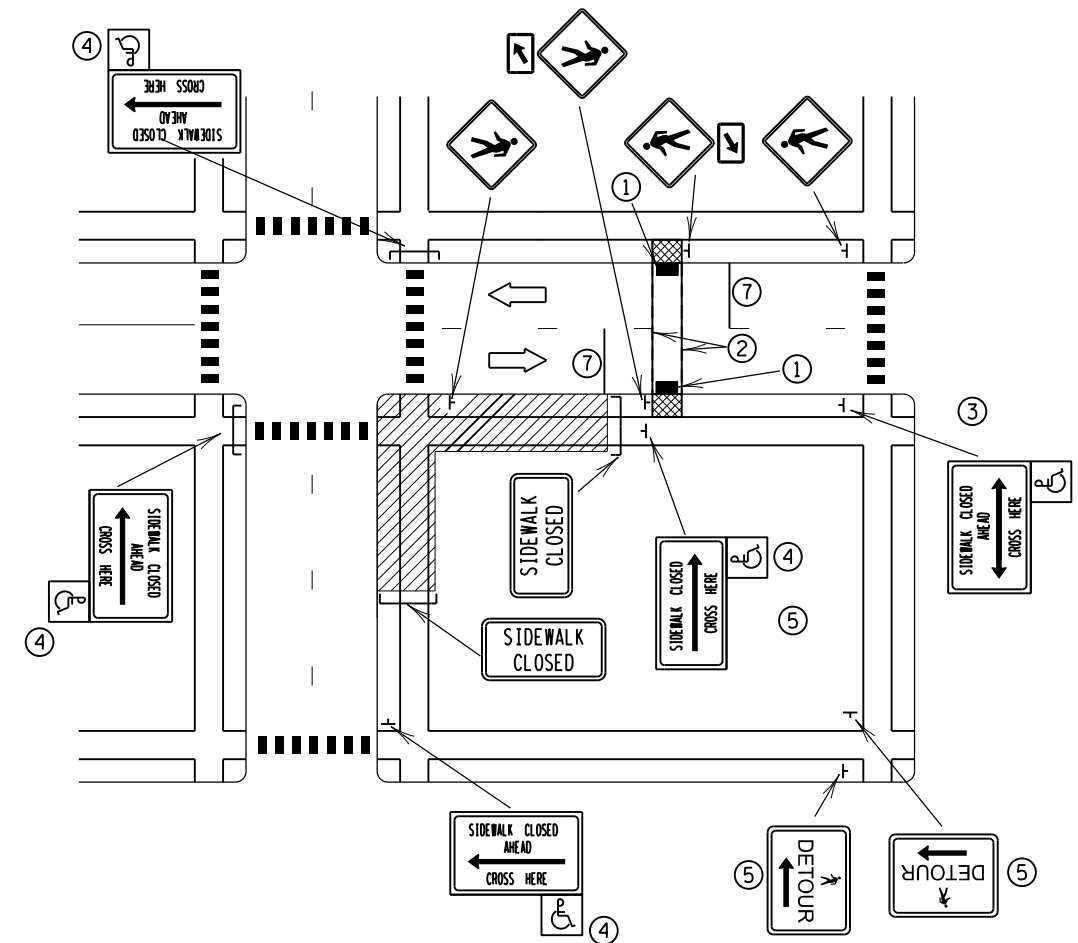
SHEET 78 OF 206 SHEETS



OTHER SIDE OF STREET DETOUR  
(FOR MID-BLOCK CLOSURE)



ONE QUADRANT CLOSED



OTHER SIDE OF STREET DETOUR OR DETOUR WITH  
TRAILBLAZING SIGNS (FOR CORNER SIDEWALK  
CLOSURE WITH OPTIONAL TEMPORARY CROSSWALK)

**GENERAL NOTES:**

WHEN CLOSING OR RELOCATING CROSSWALKS OR SIDEWALKS, PROVIDE DETECTABLE TEMPORARY FACILITIES AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH EXISTING PEDESTRIAN FACILITIES. THE MINIMUM TEMPORARY WALKWAY WIDTH SHOULD BE THE WIDTH OF THE EXISTING FACILITY. IF THE EXISTING FACILITY HAS A WIDTH OF GREATER THAN 60", THE WIDTH OF THE TEMPORARY FACILITY MAY BE 60". IF THE WIDTH OF THE DETOUR IS LESS THAN 60", THEN A 60" BY 60" PASSING SPACE IS REQUIRED EVERY 200 FT.

TEMPORARY TRAFFIC CONTROL DEVICES FOR PEDESTRIANS ARE SHOWN. OTHER TRAILBLAZING SIGNS OR DEVICES MAY BE NEEDED FOR ADEQUATE ROUTING. STAGE WORK, AS NECESSARY, TO PROVIDE AN ALTERNATE PEDESTRIAN ROUTE (APR) AT ALL TIMES.

PROVIDE A SMOOTH, CONTINUOUS, HARD SURFACE THROUGH THE LENGTH OF THE APR. PROVIDE A FIRM, STABLE, FREE-DRAINING, AND NON-SLIP TEMPORARY WALKWAY SURFACE, REGARDLESS OF WEATHER CONDITIONS. THE TEMPORARY WALKWAY SURFACE SHALL BE SUPPORTED BY A SOLID BASE TO COVER SHORT SEGMENTS OF ROUGH, SOFT, OR UNEVEN GROUND. THE TEMPORARY WALKWAY SURFACE WILL ALLOW NORMAL USAGE OF WHEELCHAIRS, WALKERS, STROLLERS, AND OTHER MOBILITY DEVICES. CONCRETE, BITUMINOUS, STEEL, RUBBER, WOOD (3/4" OR THICKER), AND PLASTIC ARE ACCEPTABLE SURFACE MATERIALS FOR THE TEMPORARY WALKWAY SURFACE. GRAVEL, MILLINGS, OR OTHER UNEVEN SURFACES ARE NOT ACCEPTABLE SURFACE MATERIALS.

ANY PEDESTRIAN TRAFFIC SIGNALS CONTROLLING CLOSED CROSSWALKS SHALL BE COVERED OR DEACTIVATED.

POST MOUNTED SIGNS LOCATED ADJACENT TO A SIDEWALK SHALL HAVE A 7' MINIMUM CLEARANCE FROM THE BOTTOM OF THE SIGN TO THE SIDEWALK SURFACE.

ANY PORTABLE SIGN OR BARRICADE PLACED OR STORED IN A PEDESTRIAN WALKWAY THAT COULD BE A HAZARD TO A VISUALLY IMPAIRED PEDESTRIAN SHALL HAVE A DETECTABLE EDGE TO GUIDE THE PEDESTRIAN AROUND THE HAZARD. MINIMIZE DISRUPTION TO PEDESTRIANS TO THE MAXIMUM EXTENT FEASIBLE BY PROVIDING AN APR IN THE FOLLOWING ORDER OF PREFERENCE:

1. PROVIDE THE APR ON THE SAME SIDE OF THE STREET AS THE DISRUPTED ROUTE UTILIZING BYPASSES.
2. WHERE IT IS NOT FEASIBLE TO PROVIDE A SAME SIDE APR, PROVIDE A DETOUR ON THE OTHER SIDE OF THE STREET.
3. WHERE IT IS NOT FEASIBLE TO PROVIDE AN APR ON THE OTHER SIDE OF THE ROADWAY, PROVIDE AN APR DETOUR WITH TRAILBLAZING SIGNS.

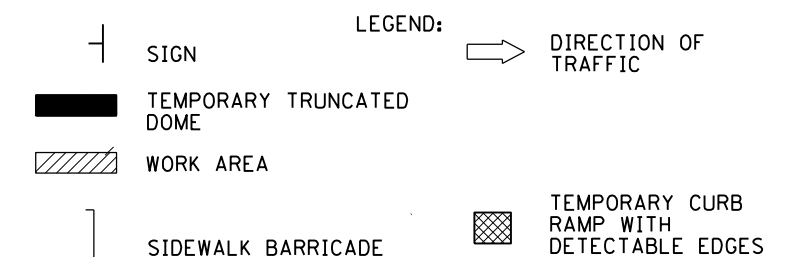
IF NOT ALREADY LIT, LIGHTING SHOULD BE CONSIDERED AT MID-BLOCK CROSSINGS IN ORDER TO ILLUMINATE PEDESTRIANS.

**SPECIFIC NOTES:**

- ① TEMPORARY CURB RAMPS WITH DETECTABLE WARNINGS.
- ② TEMPORARY PAVEMENT MARKINGS FOR CROSSWALKS MAY USE CROSSWALK BLOCKS OR TWO TRANSVERSE LINES. TWO STRIPS OF 18" PREFORMED MARKING MATERIAL MAY BE USED TO FORM 36" WIDE CROSSWALK BLOCKS.
- ④ THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SHOULD BE DISPLAYED WHEN ANY WALKWAY THROUGH A WORK ZONE HAS BEEN DETERMINED TO BE FULLY ACCESSIBLE. THE SYMBOL OF ACCESSIBILITY SHALL NOT BE DISPLAYED IF PERSONS WITH DISABILITIES SHOULD NOT USE THE PRIMARY TEMPORARY PEDESTRIAN DETOUR.

- ⑤ PEDESTRIAN DETOUR TRAILBLAZING SIGNS SHOULD BE USED IF THE PEDESTRIAN DETOUR IS LOCATED SOMEPLACE OTHER THAN ACROSS THE STREET FROM THE SIDEWALK CLOSURE.

- ⑦ STOP BAR SHOULD BE LOCATED 20' TO 50' PRIOR TO THE CROSSWALK. RESTRICT PARKING BETWEEN THE STOP BAR AND THE CROSSWALK. ON TWO-WAY ROADWAYS, RESTRICT PARKING BOTH PRIOR TO AND AFTER THE CROSSWALK FOR BOTH DIRECTIONS.



PUBLISHED BY OTE 04/24/2020

MODIFIED FOR ACHD 08/13/2020

**ALTERNATE PEDESTRIAN ROUTE (APR) LAYOUTS-DETOURS**

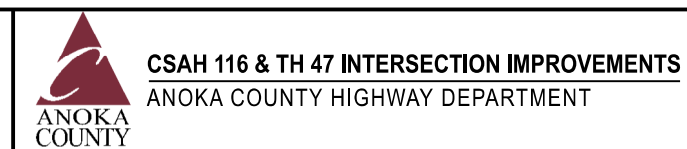
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

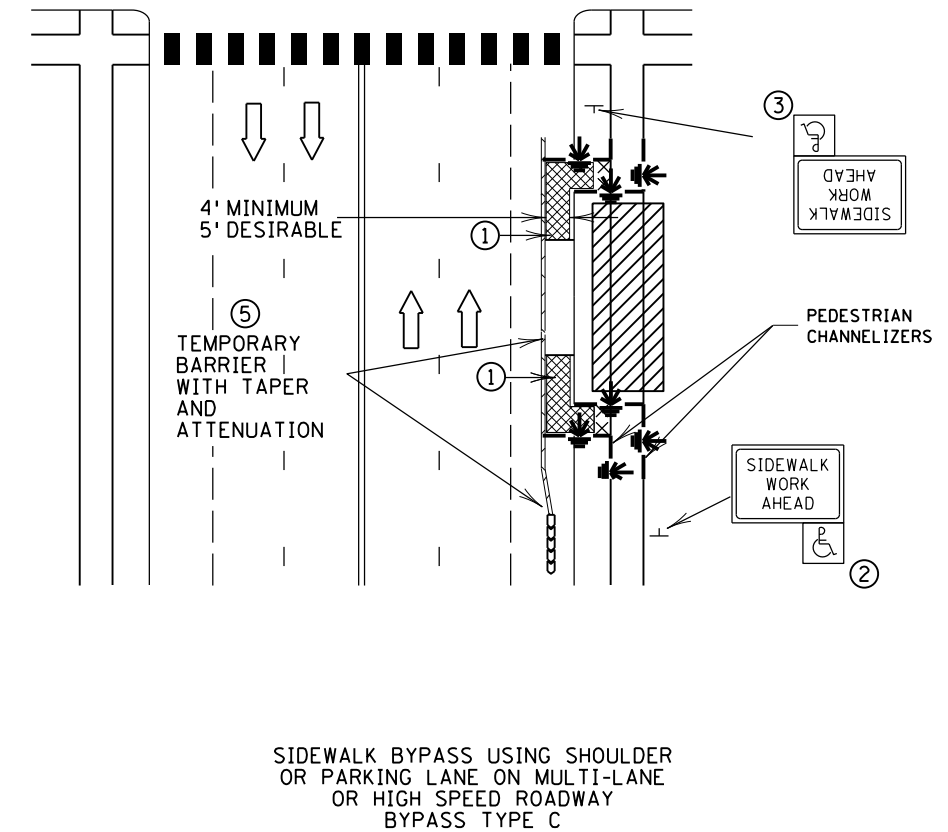
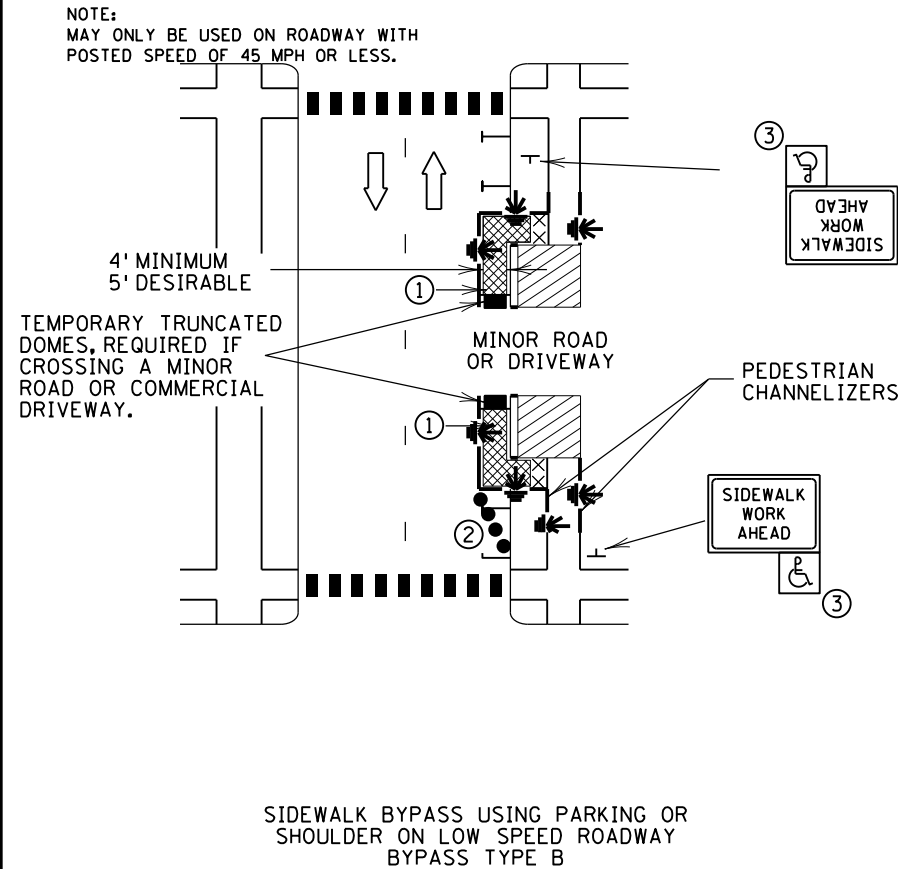
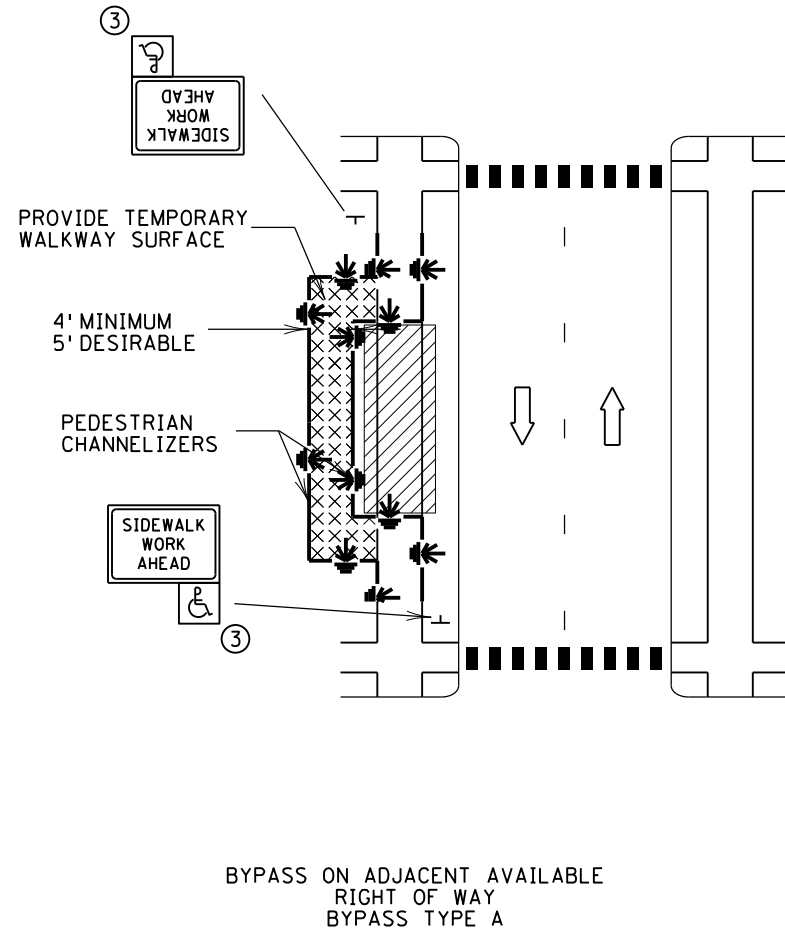
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 ALTERNATE PEDESTRIAN ROUTE DETAILS  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 79 OF 206 SHEETS



**GENERAL NOTES:**

WHEN CLOSING OR RELOCATING CROSSWALKS OR SIDEWALKS, PROVIDE DETECTABLE TEMPORARY FACILITIES AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH EXISTING PEDESTRIAN FACILITIES. THE ALTERNATE PEDESTRIAN ROUTE (APR) MUST REMAIN OPEN AT ALL TIMES.

TEMPORARY TRAFFIC CONTROL DEVICES FOR PEDESTRIANS ARE SHOWN. OTHER DEVICES MAY BE NECESSARY TO CONTROL VEHICULAR TRAFFIC. STAGE WORK, AS NECESSARY, TO PROVIDE AN ALTERNATE PEDESTRIAN ROUTE (APR) AT ALL TIMES. FOR ROADWAYS WITH NO AVAILABLE DETOURS,

PROVIDE A SMOOTH, CONTINUOUS, HARD SURFACE THROUGH THE LENGTH OF THE APR. PROVIDE A FIRM, STABLE, FREE-DRAINING, AND NON-SLIP TEMPORARY WALKWAY SURFACE, REGARDLESS OF WEATHER CONDITIONS. THE TEMPORARY WALKWAY SURFACE SHALL BE SUPPORTED BY A SOLID BASE TO COVER SHORT SEGMENTS OF ROUGH, SOFT, OR UNEVEN GROUND. THE TEMPORARY WALKWAY SURFACE WILL ALLOW NORMAL USAGE OF WHEELCHAIRS, WALKERS, STROLLERS, AND OTHER MOBILITY DEVICES. CONCRETE, BITUMINOUS, STEEL, RUBBER, WOOD (3/4" OR THICKER), AND PLASTIC ARE ACCEPTABLE SURFACE MATERIALS FOR THE TEMPORARY WALKWAY SURFACE. GRAVEL, MILLINGS, OR OTHER UNEVEN SURFACES ARE NOT ACCEPTABLE SURFACE MATERIALS.

IF A 60" PEDESTRIAN WALKWAY WIDTH ISN'T PROVIDED FOR THE ROUTE, THEN A 60" BY 60" PASSING SPACE IS REQUIRED EVERY 200'. THE MINIMUM WIDTH OF THE WALKWAY IS 48".

ANY PEDESTRIAN TRAFFIC SIGNALS CONTROLLING CLOSED CROSSWALKS SHALL BE COVERED OR DEACTIVATED.

POST MOUNTED SIGNS LOCATED ADJACENT TO A SIDEWALK SHALL HAVE A 7' MINIMUM CLEARANCE FROM THE BOTTOM OF THE LOWEST SIGN TO THE SIDEWALK SURFACE.

ANY PORTABLE SIGN OR BARRICADE PLACED OR STORED IN A PEDESTRIAN WALKWAY THAT COULD BE A HAZARD TO A VISUALLY IMPAIRED PEDESTRIAN SHALL HAVE A DETECTABLE EDGE TO GUIDE THE PEDESTRIAN AROUND THE HAZARD.

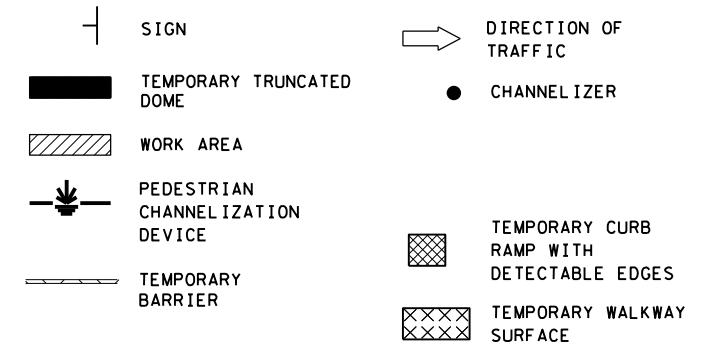
MINIMIZE DISRUPTION TO PEDESTRIANS TO THE MAXIMUM EXTENT FEASIBLE BY PROVIDING AN APR IN THE FOLLOWING ORDER OF PREFERENCE:

1. PROVIDE THE APR ON THE SAME SIDE OF THE STREET AS THE DISRUPTED ROUTE UTILIZING BYPASSES.
2. WHERE IT IS NOT FEASIBLE TO PROVIDE A SAME SIDE APR, PROVIDE A DETOUR ON THE OTHER SIDE OF THE STREET.
3. WHERE IT IS NOT FEASIBLE TO PROVIDE AN APR ON THE OTHER SIDE OF THE ROADWAY, PROVIDE AN APR DETOUR WITH TRAILBLAZING SIGNS.

**SPECIFIC NOTES:**

- ① TEMPORARY CURB RAMPS.
- ② 5 DEVICE TAPER 25' LONG, RECOMMENDED WHEN THE CLOSED AREA WAS USED AS AN INTERMITTENT TRAFFIC LANE OR BYPASS LANE.
- ③ THE INTERNATIONAL SYMBOL OF ACCESSIBILITY SHOULD BE DISPLAYED WHEN ANY WALKWAY THROUGH A WORK ZONE HAS BEEN DETERMINED TO BE FULLY ACCESSIBLE. THE SYMBOL OF ACCESSIBILITY SHALL NOT BE DISPLAYED IF PERSONS WITH DISABILITIES SHOULD NOT USE THE PRIMARY TEMPORARY PEDESTRIAN DETOUR.
- ⑤ SEE THE MnDOT TEMPORARY BARRIER GUIDANCE MANUAL DECEMBER 2018 FOR GUIDANCE ON PLACEMENT AND USAGE OF TEMPORARY BARRIER.

**LEGEND:**



PUBLISHED BY OTE 04/24/2020

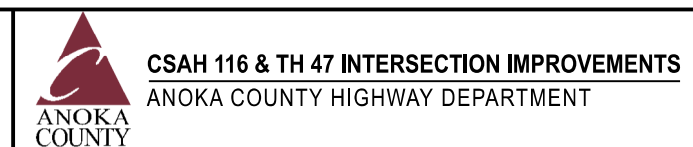
MODIFIED FOR ACHD 08/13/2020

**ALTERNATE PEDESTRIAN ROUTE (APR) LAYOUTS-BYPASSES**

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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY: <i>Michael E. Hentges</i> LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE DATE: 8/25/2020 LICENSE NO. 44620
Plan By: MJS	
Checked By: LGR	
Approved By: EAE	



ANOKA COUNTY, MN	SHEET 80 OF 206 SHEETS
ALTERNATE PEDESTRIAN ROUTE DETAILS	
CONSTRUCTION STAGING & TRAFFIC CONTROL S.P. 0206-78 (TH 47), S.A.P. 002-716-020	



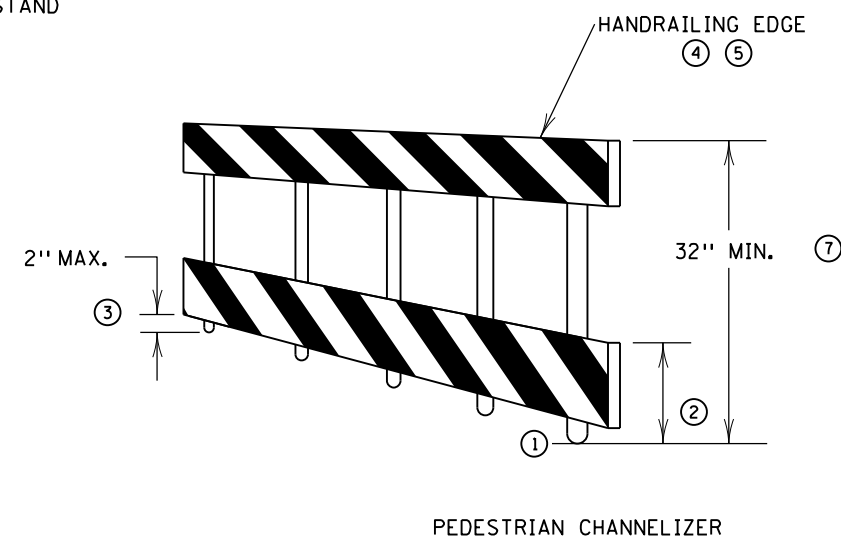
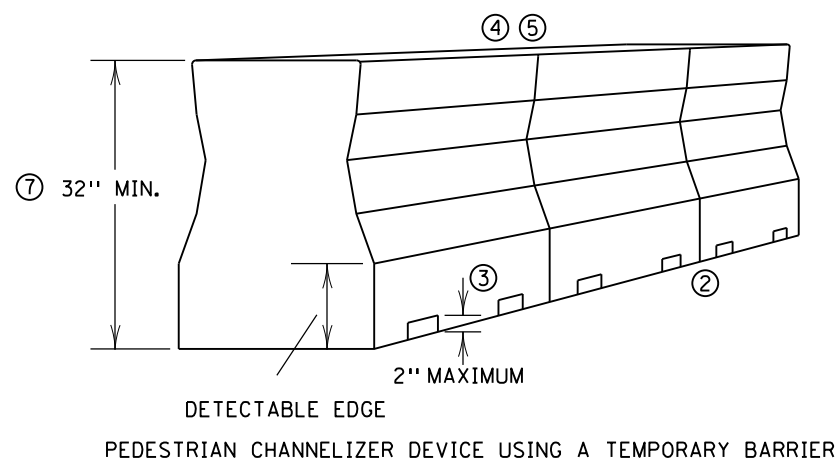
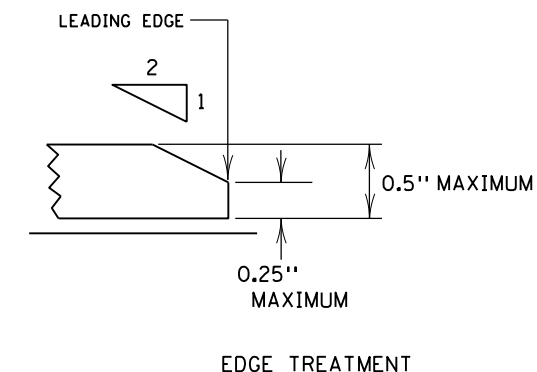
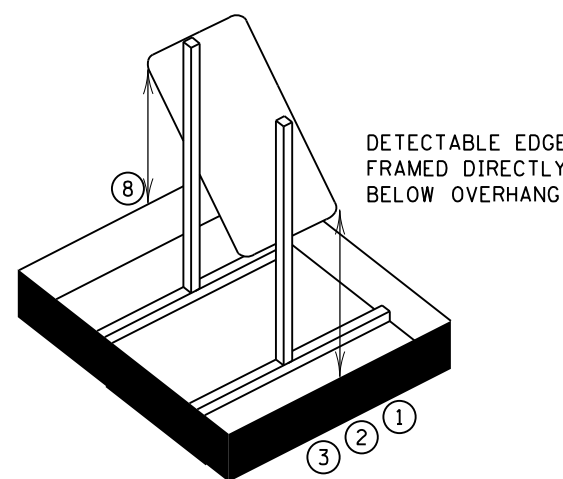
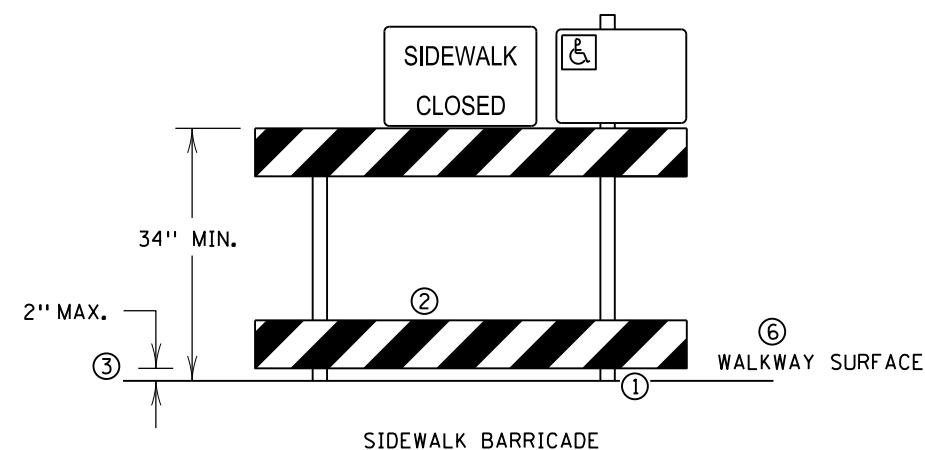
# CHANNELIZERS, SIDEWALK BARRICADES, AND PORTABLE STANDS

## GENERAL NOTES:

1. RAILINGS OR OTHER OBJECTS MAY PROTRUDE A MAXIMUM OF 4" INTO THE WALKWAY CLEAR SPACE WHEN LOCATED A MINIMUM OF 27" ABOVE THE WALKWAY SURFACE.
2. WHEN TEMPORARY BARRIER IS USED AS A PEDESTRIAN CHANNELIZER IT SHALL MEET CRASHWORTHY REQUIREMENTS.
3. WHEN USED, SIDEWALK BARRICADES SHALL BE PLACED ACROSS THE ENTIRE WIDTH OF THE WALKWAY SURFACE.
4. ALL DEVICES USED TO CHANNELIZE PEDESTRIAN FLOW SHOULD INTERLOCK SUCH THAT GAPS DO NOT ALLOW PEDESTRIANS TO STRAY FROM THE CHANNELIZED PATH.

## SPECIFIC NOTES:

- ① ANY TRIPPING HAZARD IN THE WALKWAY NEEDS A DETECTABLE EDGE. BALLAST SHALL BE LOCATED BEHIND THE DETECTABLE EDGE OR INTERNAL TO THE DEVICE. ANY SUPPORT ON THE FRONT OF THE DEVICE SHOULD NOT EXTEND INTO THE 48" MINIMUM WALKWAY CLEAR SPACE. ANY SUPPORT THAT EXTENDS INTO THE WALKWAY SHALL NOT EXCEED 0.5" HEIGHT ABOVE THE WALKWAY SURFACE; IF GREATER THAN 0.25", BEVEL AS SHOWN IN THE EDGE TREATMENT DETAIL.
- ② DETECTABLE EDGES SHALL BE CONTINUOUS AND 6" MINIMUM ABOVE THE WALKWAY SURFACE AND HAVE COLOR MARKINGS CONTRASTING WITH THE WALKWAY SURFACE. THE DETECTABLE EDGE AROUND A PORTABLE SIGN STAND SHOULD BE PLACED IN THE WALKWAY AREA IN WHICH THE SIGN POSES A HAZARD TO A VISUALLY IMPAIRED PEDESTRIAN.
- ③ DEVICES AND DETECTABLE EDGES SHALL NOT BLOCK WATER DRAINAGE FROM THE WALKWAY. A GAP HEIGHT OR OPENING FROM THE WALKWAY SURFACE UP TO A MAXIMUM OF 2" IS ALLOWED FOR DRAINAGE PURPOSES.
- ④ WHEN HAND GUIDANCE IS REQUIRED, THE TOP RAIL OR TOP SURFACE SHALL:
  - BE IN A VERTICAL PLANE PERPENDICULAR TO THE WALKWAY ABOVE THE DETECTABLE EDGE,
  - BE CONTINUOUS AT A HEIGHT OF 34 TO 38" ABOVE THE WALKWAY SURFACE, AND
  - BE SUPPORTED WITH MINIMAL INTERFERENCE TO THE PEDESTRIAN'S HANDS OR FINGERS.
- ⑤ ALL DEVICES SHALL BE FREE OF SHARP OR ROUGH EDGES, AND FASTENERS (BOLTS) SHALL BE ROUNDED TO PREVENT HARM TO HANDS, ARMS OR CLOTHING OF PEDESTRIANS.
- ⑥ TEMPORARY WALKWAY SURFACES SHALL BE FIRM, STABLE, FREE-DRAINING AND NON-SLIP REGARDLESS OF WEATHER CONDITIONS. TEMPORARY WALKWAY SURFACES SHALL ALLOW NORMAL USAGE OF WHEELCHAIRS, WALKERS, STROLLERS, OR OTHER MOBILITY DEVICES. CONCRETE, BITUMINOUS, STEEL, RUBBER, WOOD (3/4" OR THICKER), AND PLASTIC ARE ACCEPTABLE SURFACE MATERIALS FOR A TEMPORARY WALKWAY SURFACE. GRAVEL, MILLINGS, OR OTHER UNEVEN SURFACES ARE NOT ACCEPTABLE SURFACE MATERIALS.
- ⑦ LONGITUDINAL CHANNELIZING DEVICES FOR PEDESTRIANS SHALL BE 32" HIGH OR GREATER.
- ⑧ AN EDGE OF THE FRAMING MAY BE REMOVED IF IT IS NOT NEEDED FOR PED GUIDANCE. STABILITY OF THE DETECTABLE EDGE SHOULD BE MAINTAINED.




PUBLISHED BY OTE 04/24/2020

MODIFIED FOR ACHD 08/13/2020

TEMPORARY PEDESTRIAN ACCESS ROUTE (TPAR) DEVICES

DATE: 8/25/2020 2:52:04 PM PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\4652-000\_cs\_per\_detail.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY:  LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE DATE: 8/25/2020 LICENSE NO. 44620
Plan By: MJS	
Checked By: LGR	
Approved By: EAE	



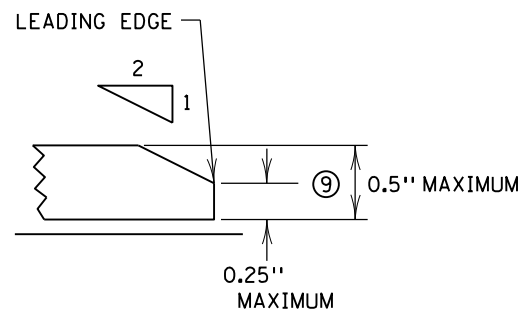
ANOKA COUNTY, MN  
 TEMPORARY PEDESTRIAN ACCESS ROUTE DEVICES  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 81 OF 206 SHEETS

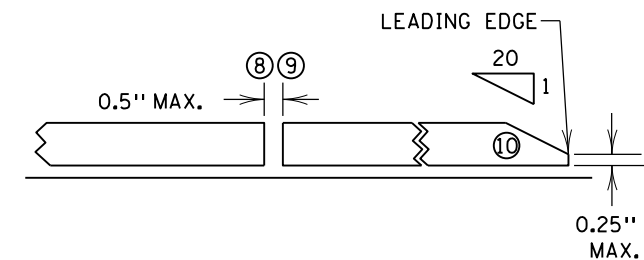
# TEMPORARY CURB RAMPS AND WALKWAY SURFACES

**SPECIFIC NOTES:**

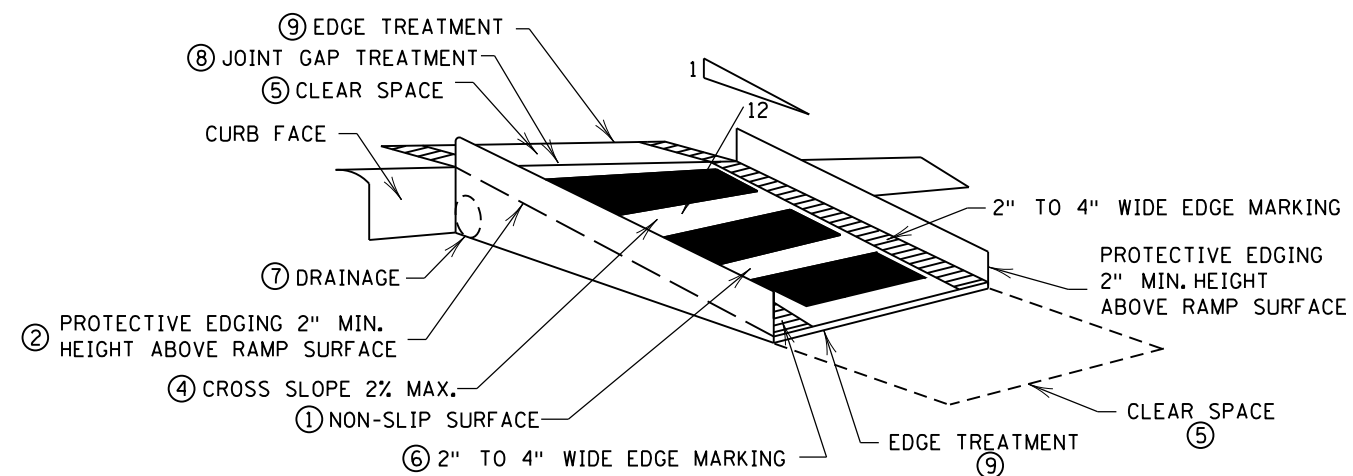
- ① CURB RAMPS SHALL BE 48" MIN. WIDTH WITH A FIRM, STABLE AND SLIP RESISTANT SURFACE.
- ② PROTECTIVE EDGING WITH A 2" MIN. HEIGHT SHALL BE PLACED WHEN A CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6" OR GREATER OR HAS A SIDE APRON SLOPE STEEPER THAN 1:3. PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3" OR MORE.
- ③ DETECTABLE EDGING WITH 6" MIN. HEIGHT AND CONTRASTING COLOR SHALL BE PLACED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
- ④ CURB RAMPS AND LANDINGS SHALL HAVE A 2% MAX. CROSS SLOPE.
- ⑤ CLEAR SPACE OF 48" X 48" MIN. SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
- ⑥ THE CURB RAMP WALKWAY EDGE SHALL BE MARKED WITH A CONTRASTING COLOR, 2" TO 4" WIDE MARKING. THE MARKING IS OPTIONAL WHERE COLOR CONTRASTING EDGING IS USED.
- ⑦ WATER FLOW IN THE GUTTER SYSTEM SHALL NOT BE IMPEDED.
- ⑧ LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 1/2" WIDTH.
- ⑨ CHANGES BETWEEN SURFACE HEIGHTS SHALL NOT EXCEED 1/2". LATERAL EDGES SHOULD BE VERTICAL UP TO 1/4" HIGH, AND BEVELED AT 1:2 BETWEEN 1/4" AND 1/2" HEIGHT.
- ⑩ THE TEMPORARY WALKWAY SURFACE MAY HAVE A THICKNESS GREATER THAN 0.5". IF THE THICKNESS OF THE TEMPORARY WALKWAY SURFACE IS LESS THAN OR EQUAL TO 0.5", THE BEVEL MAY BE 1:2.



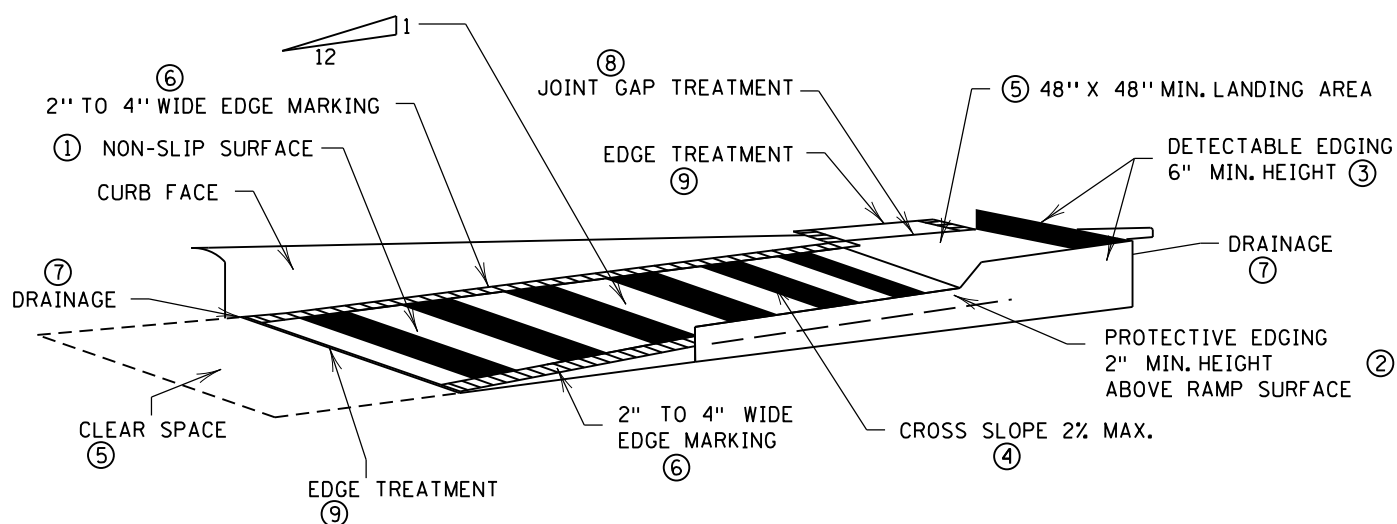
EDGE TREATMENT



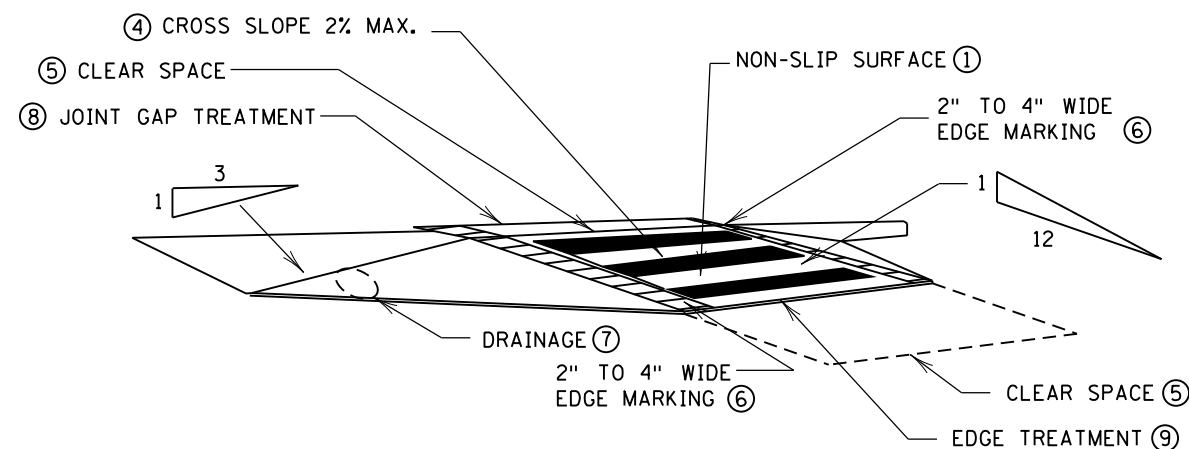
TEMPORARY WALKWAY SURFACE



TEMPORARY CURB RAMP PERPENDICULAR TO CURB SHOWN WITH PROTECTIVE EDGE



TEMPORARY CURB RAMP PARALLEL TO CURB



TEMPORARY CURB RAMP PERPENDICULAR TO CURB SHOWN WITH SIDE APRON

## TEMPORARY PEDESTRIAN ACCESS ROUTE (TPAR) DEVICES

PUBLISHED BY OTE 04/24/2020

DATE: 8/25/2020 2:52:05 PM PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\04652-000\_cs\_per\_details.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

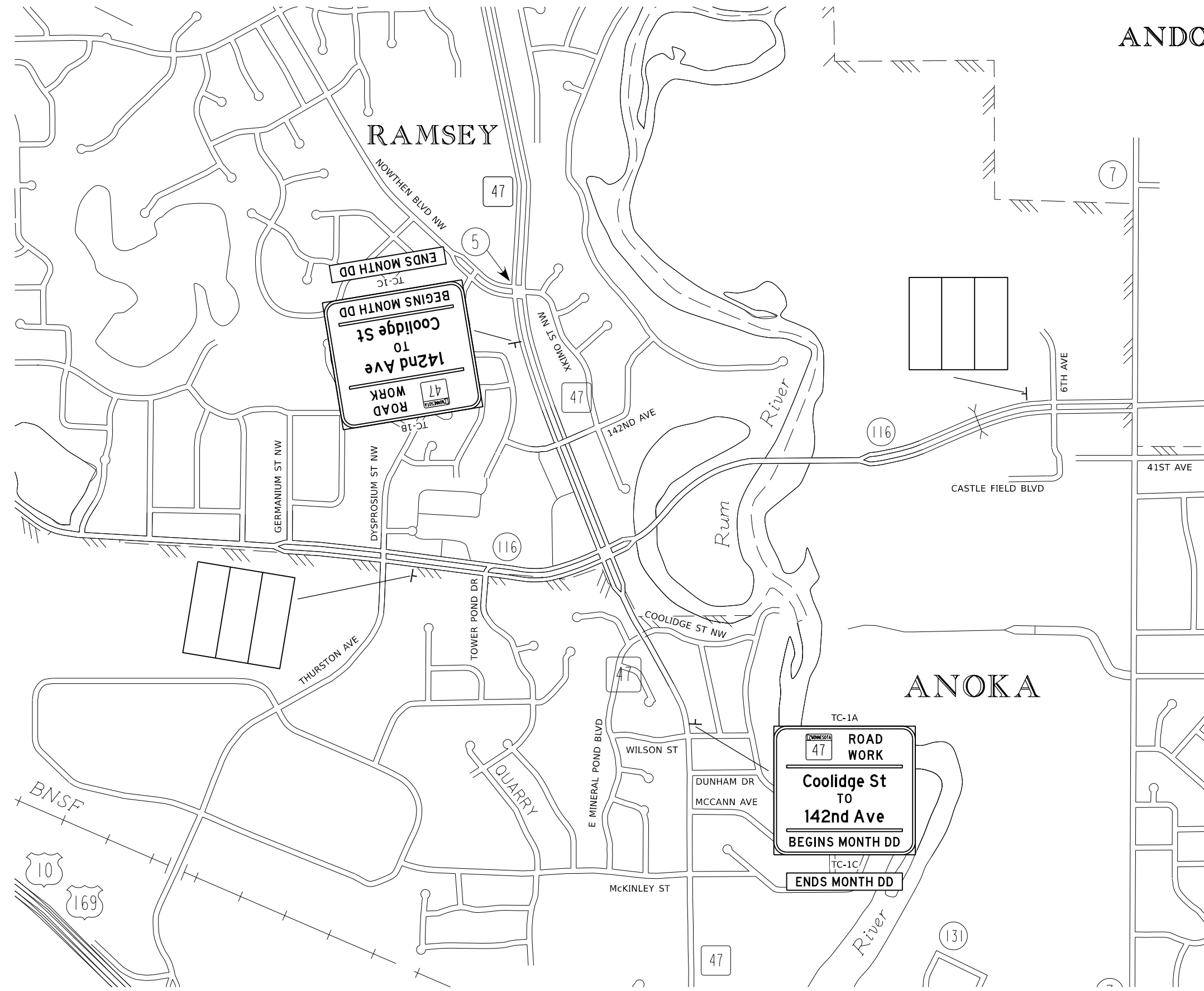
TEMPORARY PEDESTRIAN ACCESS ROUTE DEVICES  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 82  
 OF  
 206  
 SHEETS

ANDOVER

RAMSEY

ANOKA



GENERAL NOTES

1. INPLACE SIGNS WHICH CONFLICT WITH THIS PLAN SHALL BE SALVAGED FOR LATER REINSTALLATION OR COVERED.
  2. ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM AND BE PLACED IN ACCORDANCE TO THE MN MUTCD AND PART VI, THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS, AND MnDOT STANDARD SIGNS MANUAL.
  3. SIGNING MUST BE PLACED ON POSTS MOUNTED IN THE GROUND. TEMPORARY H STANDS WILL NOT BE ALLOWED.
  4. ALL SIGN POSTS SHALL BE REMOVED AND THE SURROUNDING GROUND RETURNED TO ITS ORIGINAL CONDITION WHEN THE CONSTRUCTION IS COMPLETED.
  5. SEE SIGN DETAILS AND SPECIAL PROVISIONS FOR CONSTRUCTION SITE SIGNING TO BE DONE BY THE CONTRACTOR, ALL TRAFFIC CONTROL AND SIGNING SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE CONSIDERED UNDER THE TRAFFIC CONTROL PAY ITEM, UNIT LUMP SUM.
  6. SIGN PANELS ARE IN ENGLISH UNITS.
  7. PLACE SIGNS 7 DAYS IN ADVANCE OF CONSTRUCTION. AFTER CONSTRUCTION BEGINS, USE PLAQUE TC-1C TO COVER "BEGINS MONTH DAY" ON SIGNS TC-1A, TC-1B.
  8. PLACE TWO PHASE PORTABLE CHANGEABLE MESSAGE SIGNS 7 DAYS IN ADVANCE OF CONSTRUCTION, REMOVE ONCE CONSTRUCTION BEGINS. PHASING SHALL BE AS FOLLOWS:
- CSAH 116  
ROAD  
WORK


BEGINS  
MM/DD
9. ALL SIGN LOCATIONS WILL BE AT THE DISCRETION OF THE ENGINEER.

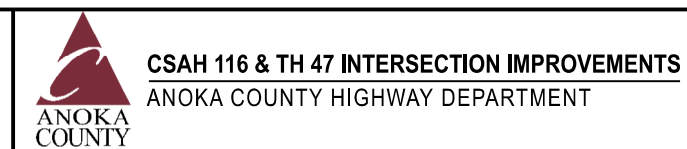
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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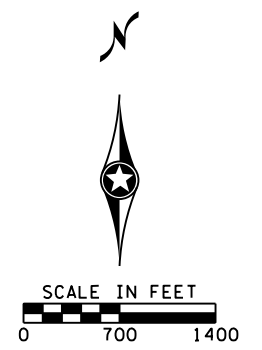
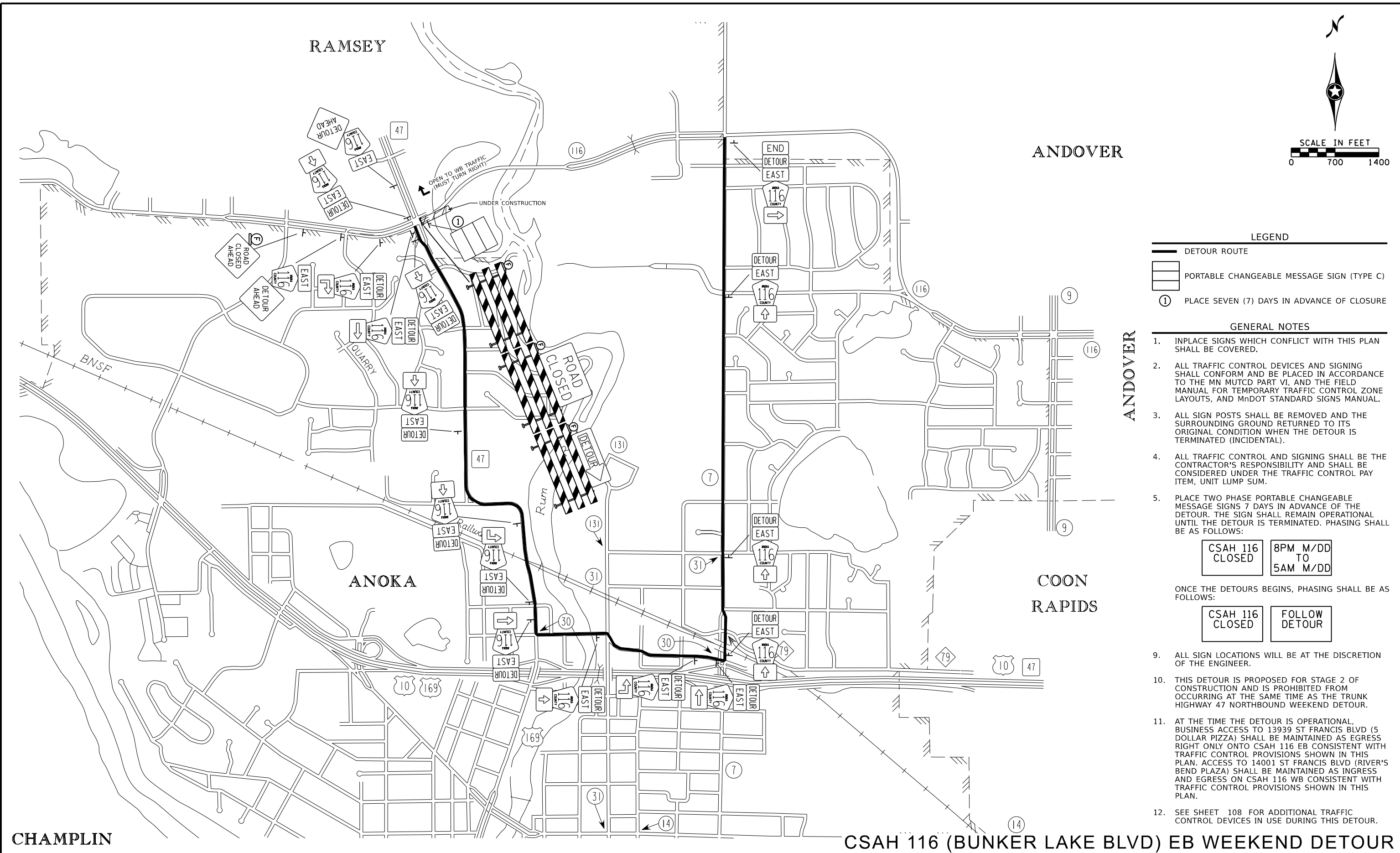
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 ADVANCED WARNING SIGN PLACEMENT  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 83  
 OF  
 206  
 SHEETS

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- LEGEND**
- DETOUR ROUTE
  - PORTABLE CHANGEABLE MESSAGE SIGN (TYPE C)
  - PLACE SEVEN (7) DAYS IN ADVANCE OF CLOSURE

- GENERAL NOTES**
1. INPLACE SIGNS WHICH CONFLICT WITH THIS PLAN SHALL BE COVERED.
  2. ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM AND BE PLACED IN ACCORDANCE TO THE MN MUTCD PART VI, AND THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS, AND MnDOT STANDARD SIGNS MANUAL.
  3. ALL SIGN POSTS SHALL BE REMOVED AND THE SURROUNDING GROUND RETURNED TO ITS ORIGINAL CONDITION WHEN THE DETOUR IS TERMINATED (INCIDENTAL).
  4. ALL TRAFFIC CONTROL AND SIGNING SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE CONSIDERED UNDER THE TRAFFIC CONTROL PAY ITEM, UNIT LUMP SUM.
  5. PLACE TWO PHASE PORTABLE CHANGEABLE MESSAGE SIGNS 7 DAYS IN ADVANCE OF THE DETOUR. THE SIGN SHALL REMAIN OPERATIONAL UNTIL THE DETOUR IS TERMINATED. PHASING SHALL BE AS FOLLOWS:

CSAH 116 CLOSED 8PM M/DD TO 5AM M/DD

ONCE THE DETOURS BEGINS, PHASING SHALL BE AS FOLLOWS:

CSAH 116 CLOSED FOLLOW DETOUR

9. ALL SIGN LOCATIONS WILL BE AT THE DISCRETION OF THE ENGINEER.
10. THIS DETOUR IS PROPOSED FOR STAGE 2 OF CONSTRUCTION AND IS PROHIBITED FROM OCCURRING AT THE SAME TIME AS THE TRUNK HIGHWAY 47 NORTHBOUND WEEKEND DETOUR.
11. AT THE TIME THE DETOUR IS OPERATIONAL, BUSINESS ACCESS TO 13939 ST FRANCIS BLVD (5 DOLLAR PIZZA) SHALL BE MAINTAINED AS EGRESS RIGHT ONLY ONTO CSAH 116 EB CONSISTENT WITH TRAFFIC CONTROL PROVISIONS SHOWN IN THIS PLAN. ACCESS TO 14001 ST FRANCIS BLVD (RIVER'S BEND PLAZA) SHALL BE MAINTAINED AS INGRESS AND EGRESS ON CSAH 116 WB CONSISTENT WITH TRAFFIC CONTROL PROVISIONS SHOWN IN THIS PLAN.
12. SEE SHEET 108 FOR ADDITIONAL TRAFFIC CONTROL DEVICES IN USE DURING THIS DETOUR.

CHAMPLIN

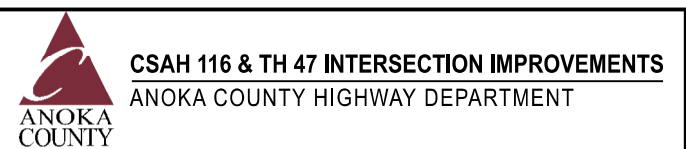
CSAH 116 (BUNKER LAKE BLVD) EB WEEKEND DETOUR

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

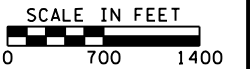


ANOKA COUNTY, MN  
 DETOUR PLAN - STAGE 2  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 84 OF 206 SHEETS

RAMSEY

ANDOVER



LEGEND

- DETOUR ROUTE
- PORTABLE CHANGEABLE MESSAGE SIGN (TYPE C)
- PLACE SEVEN (7) DAYS IN ADVANCE OF CLOSURE

GENERAL NOTES

1. INPLACE SIGNS WHICH CONFLICT WITH THIS PLAN SHALL BE COVERED.
2. ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM AND BE PLACED IN ACCORDANCE TO THE MN MUTCD PART VI, AND THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS, AND MNDOT STANDARD SIGNS MANUAL.
3. ALL SIGN POSTS SHALL BE REMOVED AND THE SURROUNDING GROUND RETURNED TO ITS ORIGINAL CONDITION WHEN THE DETOUR IS TERMINATED (INCIDENTAL).
4. ALL TRAFFIC CONTROL AND SIGNING SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE CONSIDERED UNDER THE TRAFFIC CONTROL PAY ITEM, UNIT LUMP SUM.
5. PLACE TWO PHASE PORTABLE CHANGEABLE MESSAGE SIGNS 7 DAYS IN ADVANCE OF THE DETOUR. THE SIGN SHALL REMAIN OPERATIONAL UNTIL THE DETOUR IS TERMINATED. PHASING SHALL BE AS FOLLOWS:
 

TH 47 AT BUNKER CLOSED	8PM M/DD TO 5AM M/DD
------------------------	----------------------

ONCE THE DETOUR BEGINS, PHASING SHALL BE AS FOLLOWS:

TH 47 AT BUNKER CLOSED	FOLLOW DETOUR
------------------------	---------------
9. THE TWO PHASE PORTABLE CHANGEABLE MESSAGE SIGN PLACED NEAR THE INTERSECTION OF TRUNK HIGHWAY 47 AND E MINERAL POND BLVD SHALL BE PLACED 7 DAYS IN ADVANCE OF THE DETOUR AND HAVE THE FOLLOWING PHASING:
 

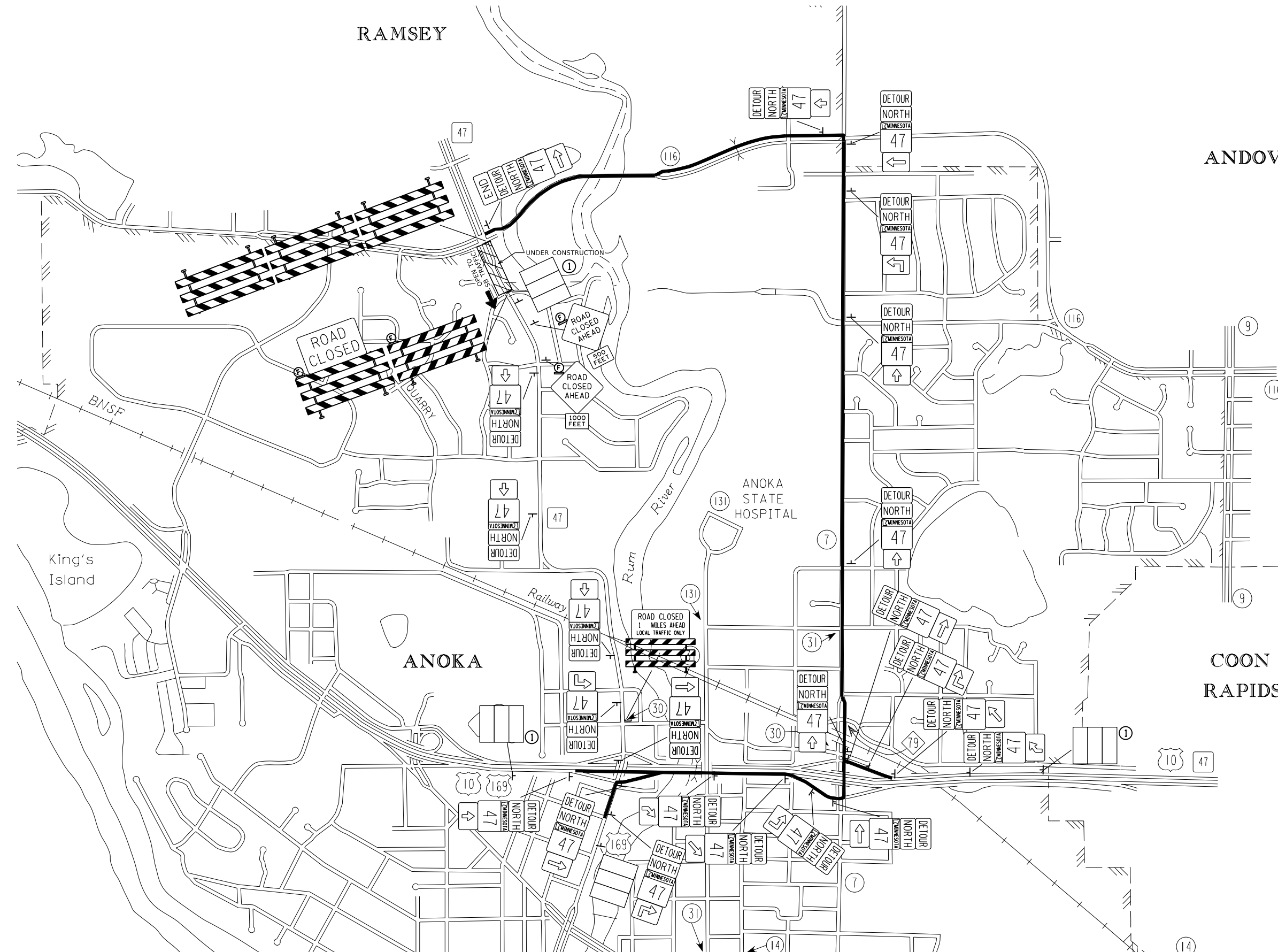
TH 47 CLOSED	8PM M/DD TO 5AM M/DD
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ONCE THE DETOUR BEGINS, PHASING SHALL BE AS FOLLOWS:

TH 47 CLOSED	FOLLOW DETOUR
--------------	---------------
10. ALL SIGN LOCATIONS WILL BE AT THE DISCRETION OF THE ENGINEER.
11. THIS DETOUR IS PROPOSED FOR STAGE 3 OF CONSTRUCTION AND IS PROHIBITED FROM OCCURRING AT THE SAME TIME AS THE CSAH 116 EASTBOUNT WEEKEND DETOUR.

ANDOVER

COON RAPIDS



CHAMPLIN

TRUNK HIGHWAY 47 (ST FRANCIS BLVD) NB WEEKEND DETOUR

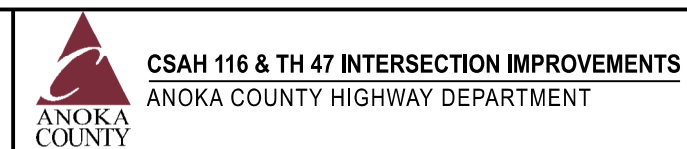
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

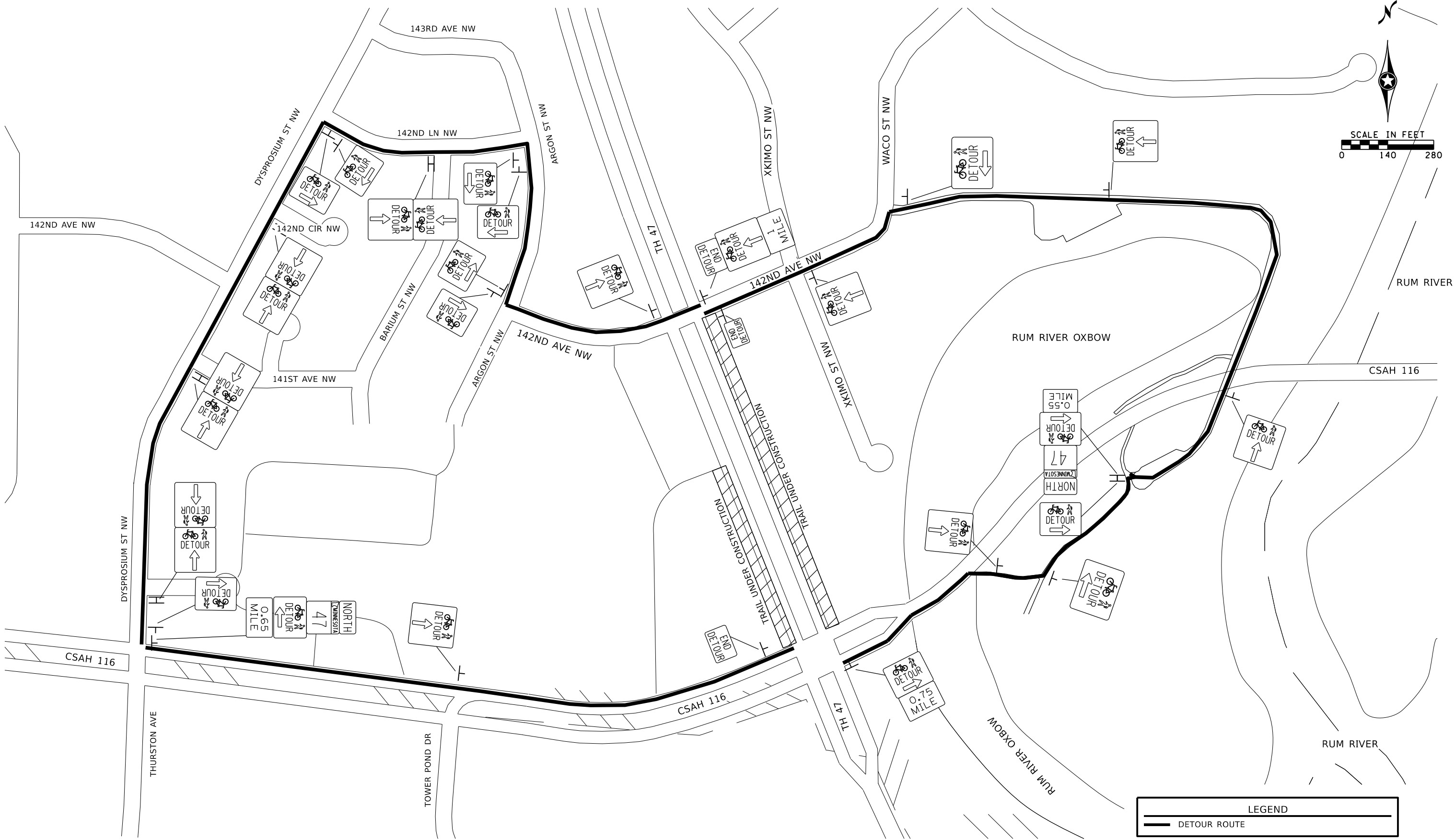
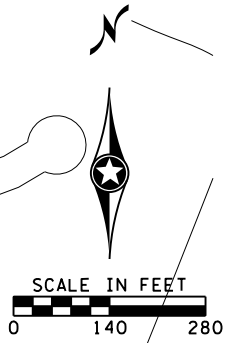
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 DETOUR PLAN - STAGE 3  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 85  
 OF  
 206  
 SHEETS



**STAGE 1 PEDESTRIAN & BIKE DETOUR**

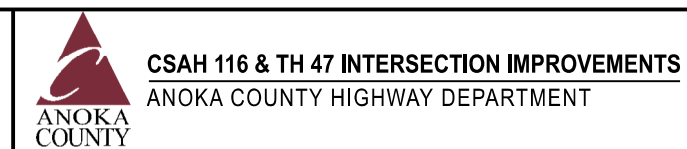
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

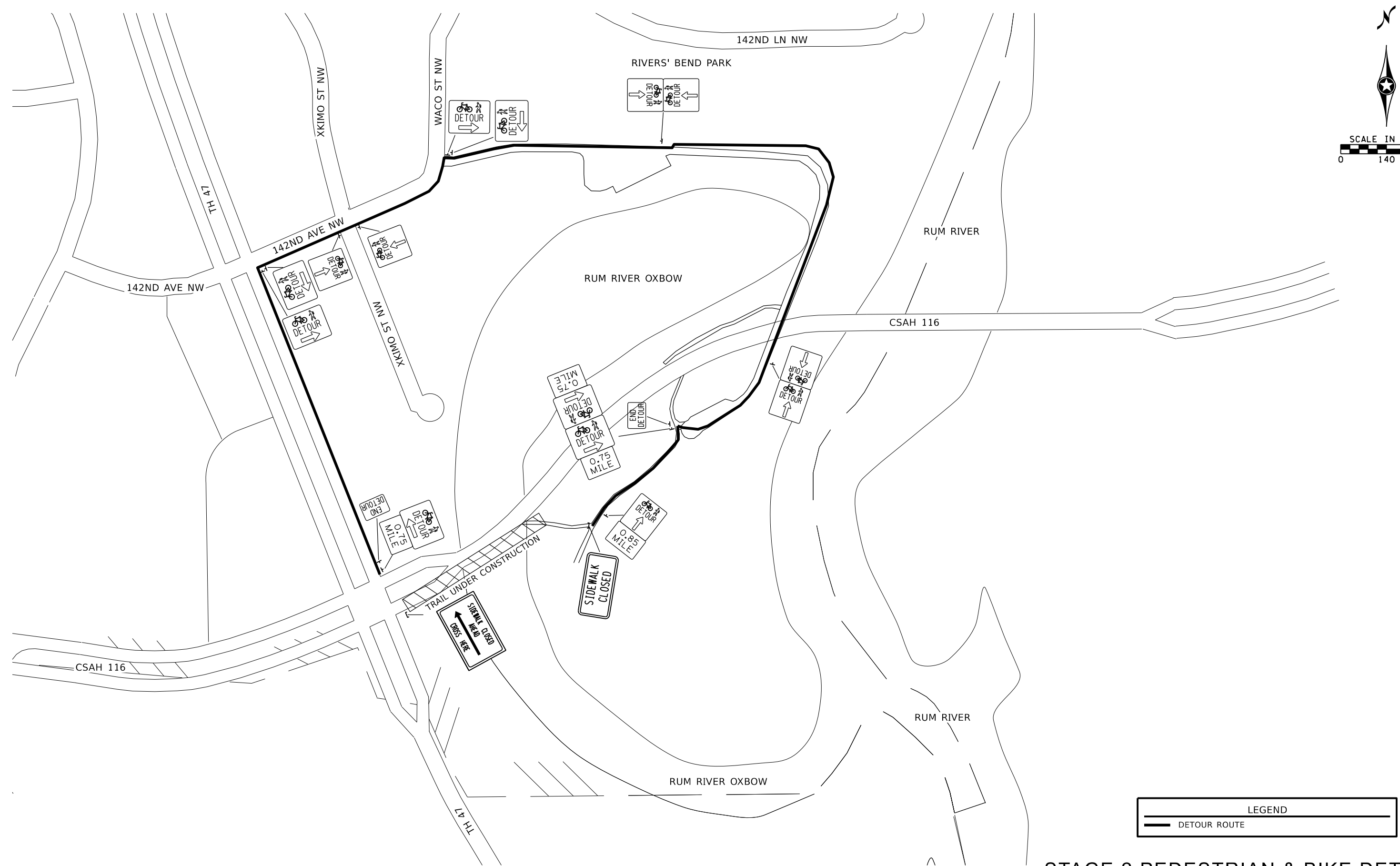
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CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 PEDESTRIAN & BIKE DETOUR - STAGE 1  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
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 OF  
 206  
 SHEETS



**LEGEND**  
 ————— DETOUR ROUTE

**STAGE 2 PEDESTRIAN & BIKE DETOUR**

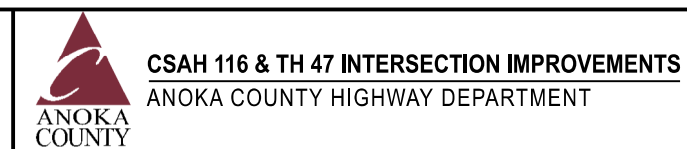
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

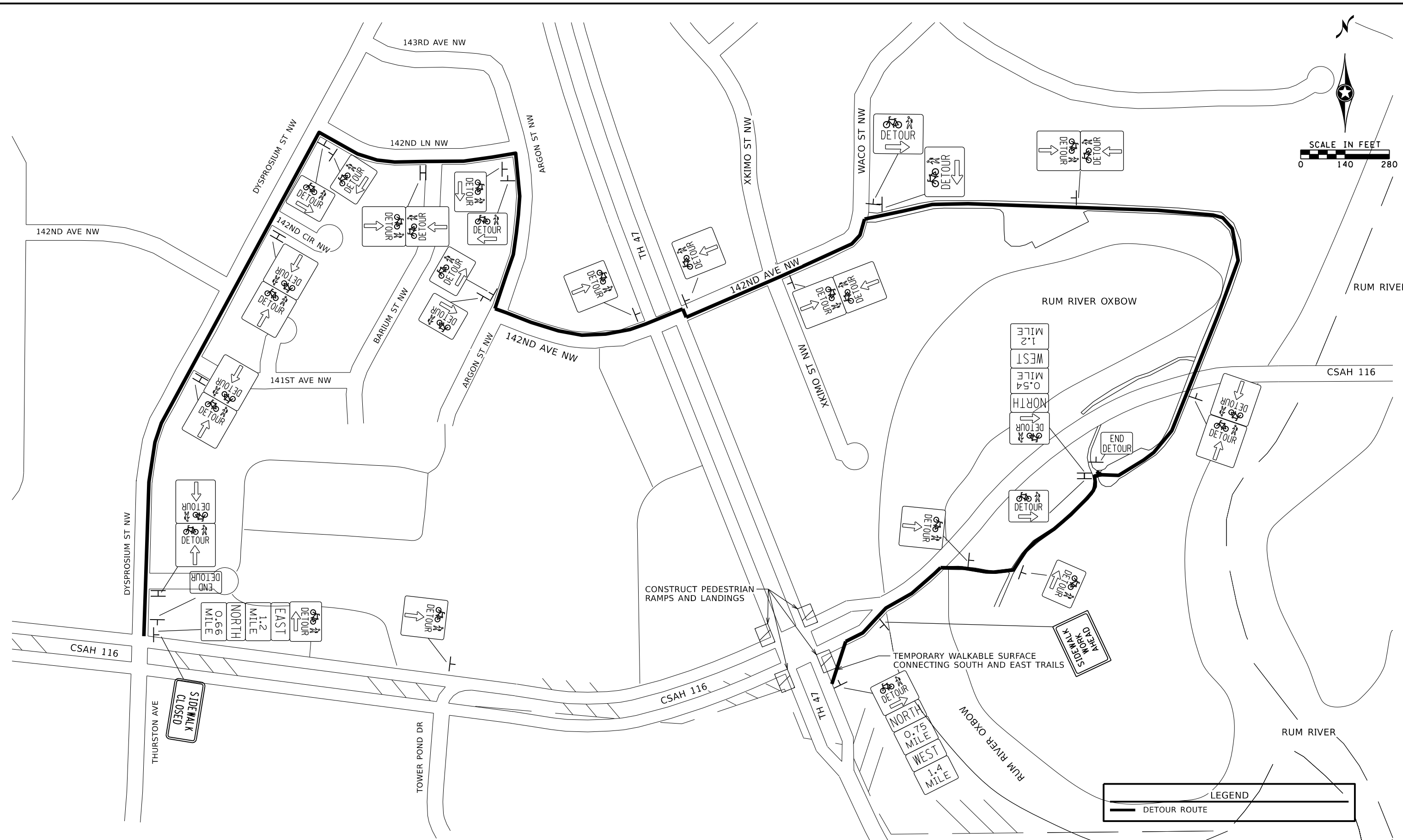
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 PEDESTRIAN & BIKE DETOUR - STAGE 2  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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LEGEND	
	DETOUR ROUTE

### STAGE 4 PEDESTRIAN & BIKE DETOUR

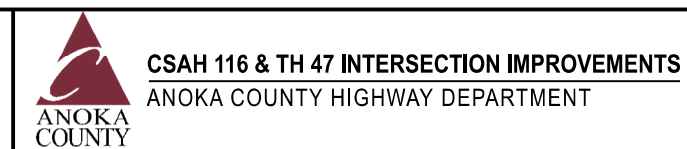
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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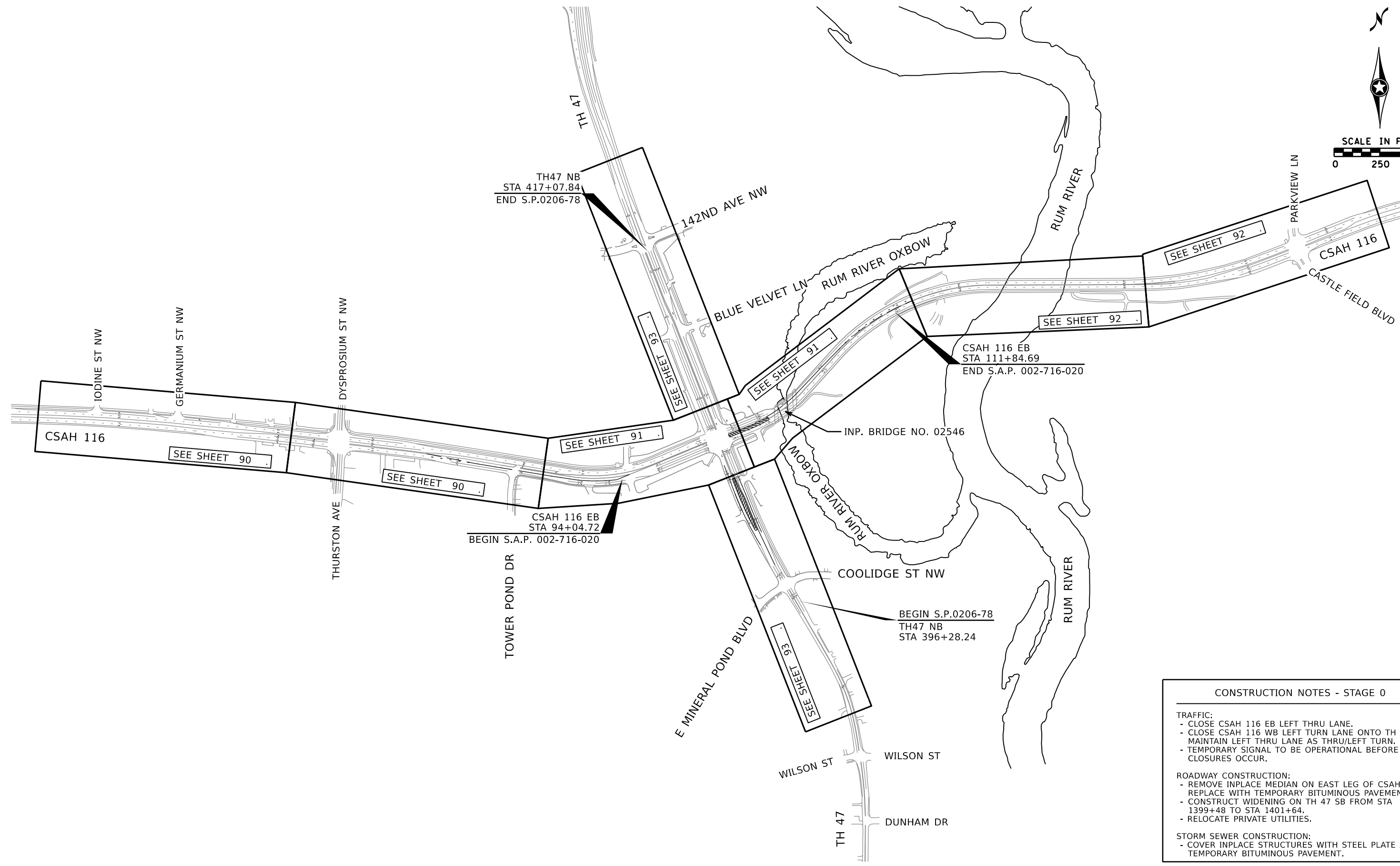
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 PEDESTRIAN & BIKE DETOUR - STAGE 4  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 88  
 OF  
 206  
 SHEETS





**CONSTRUCTION NOTES - STAGE 0**

**TRAFFIC:**

- CLOSE CSAH 116 EB LEFT THRU LANE.
- CLOSE CSAH 116 WB LEFT TURN LANE ONTO TH 47 SB.
- MAINTAIN LEFT THRU LANE AS THRU/LEFT TURN.
- TEMPORARY SIGNAL TO BE OPERATIONAL BEFORE LANE CLOSURES OCCUR.

**ROADWAY CONSTRUCTION:**

- REMOVE INPLACE MEDIAN ON EAST LEG OF CSAH 116.
- REPLACE WITH TEMPORARY BITUMINOUS PAVEMENT.
- CONSTRUCT WIDENING ON TH 47 SB FROM STA 1399+48 TO STA 1401+64.
- RELOCATE PRIVATE UTILITIES.

**STORM SEWER CONSTRUCTION:**

- COVER INPLACE STRUCTURES WITH STEEL PLATE AND TEMPORARY BITUMINOUS PAVEMENT.

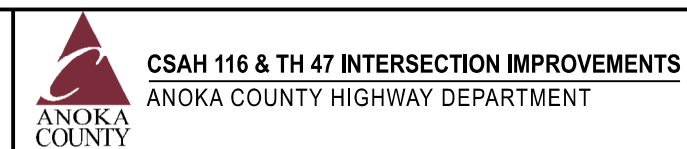
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

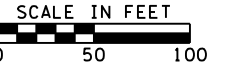
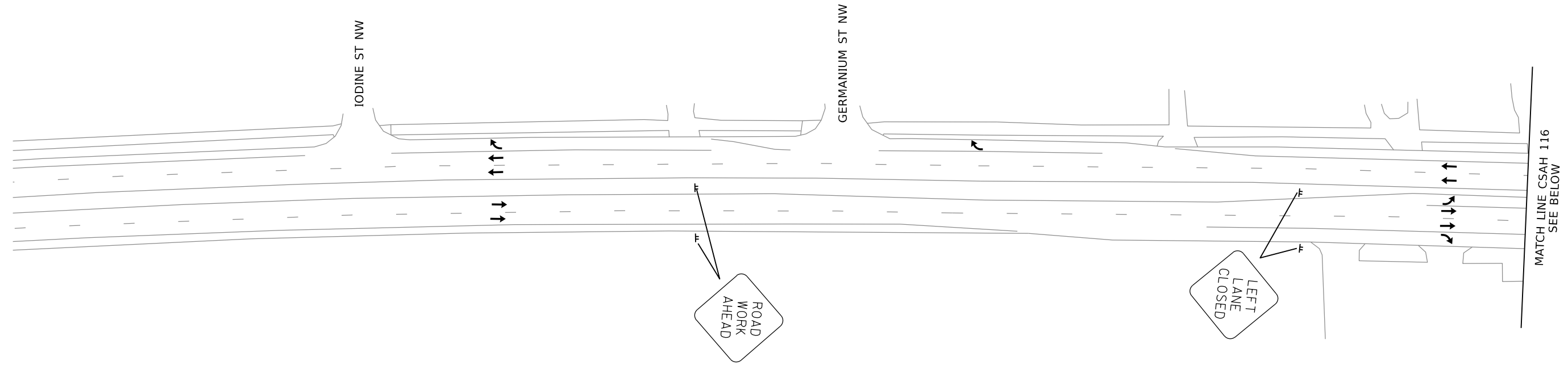
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 STAGE 0 - GENERAL LAYOUT  
 CONSTRUCTION STAGING  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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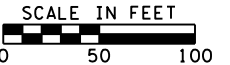
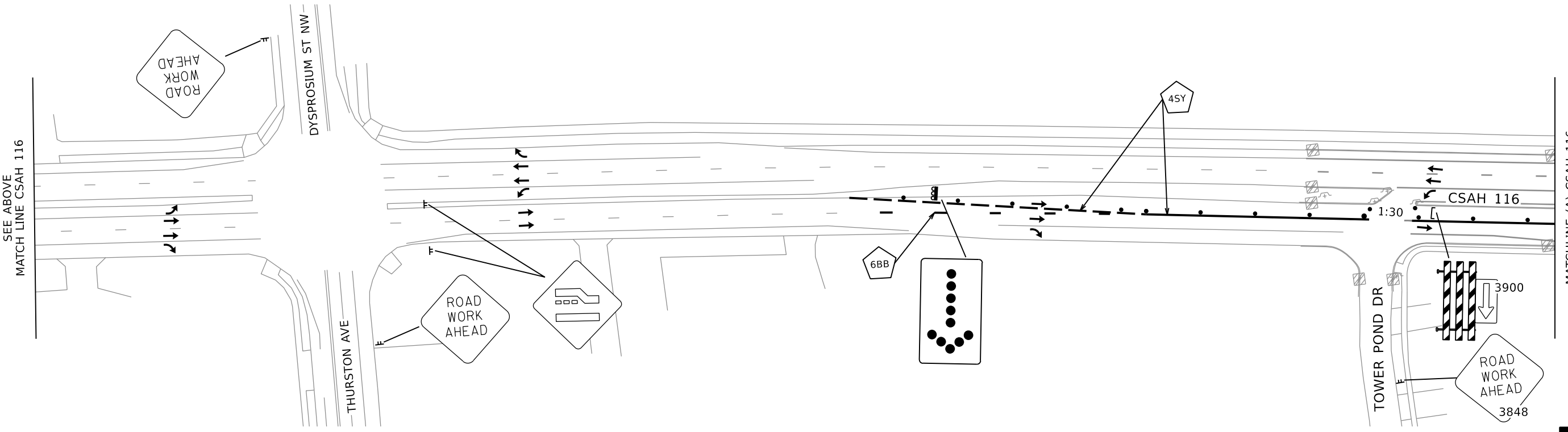
# CSAH 116 (BUNKER LAKE BLVD)



**LEGEND**

- UNDER CONSTRUCTION - CLOSED
- TRAFFIC DIRECTION

# CSAH 116 (BUNKER LAKE BLVD)



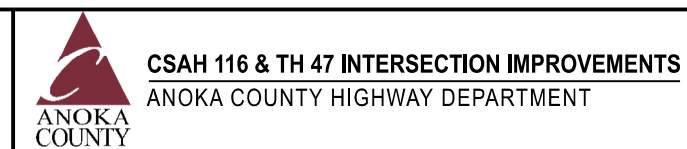
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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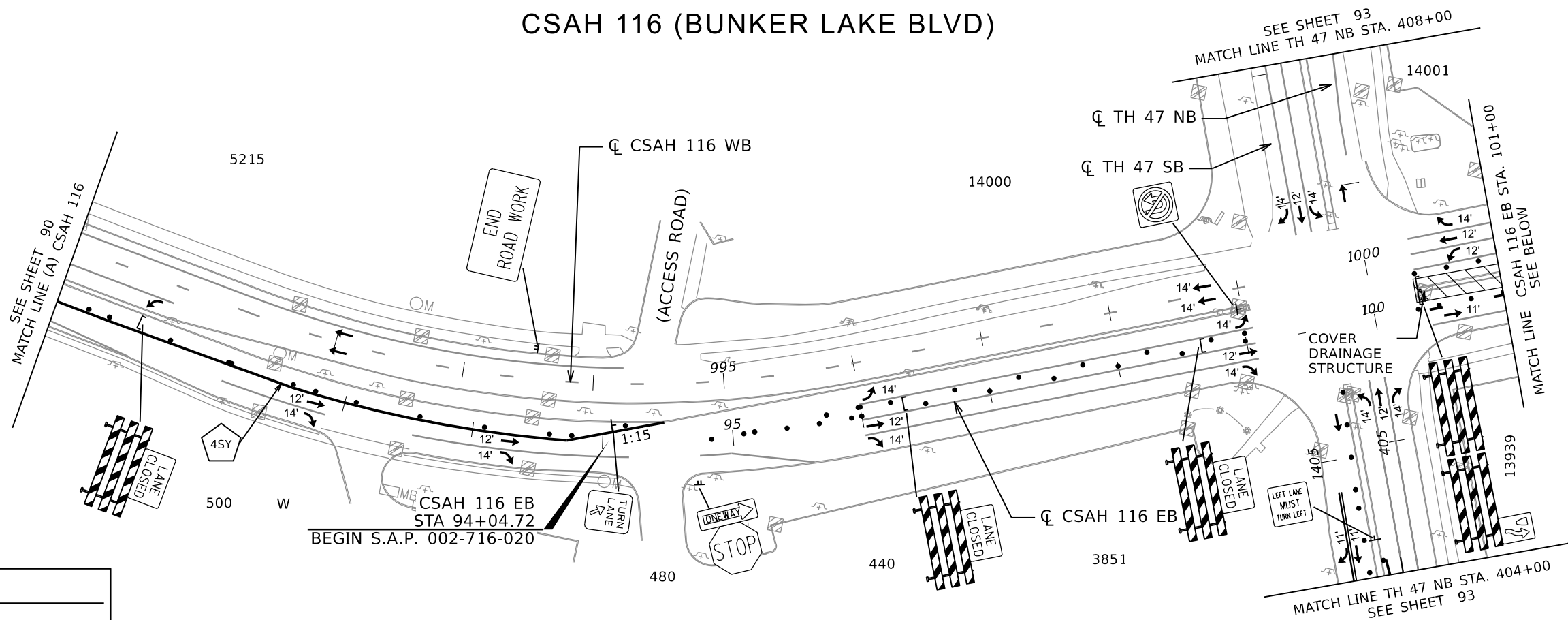
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 STAGE 0  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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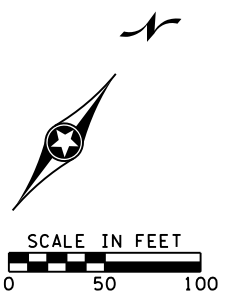
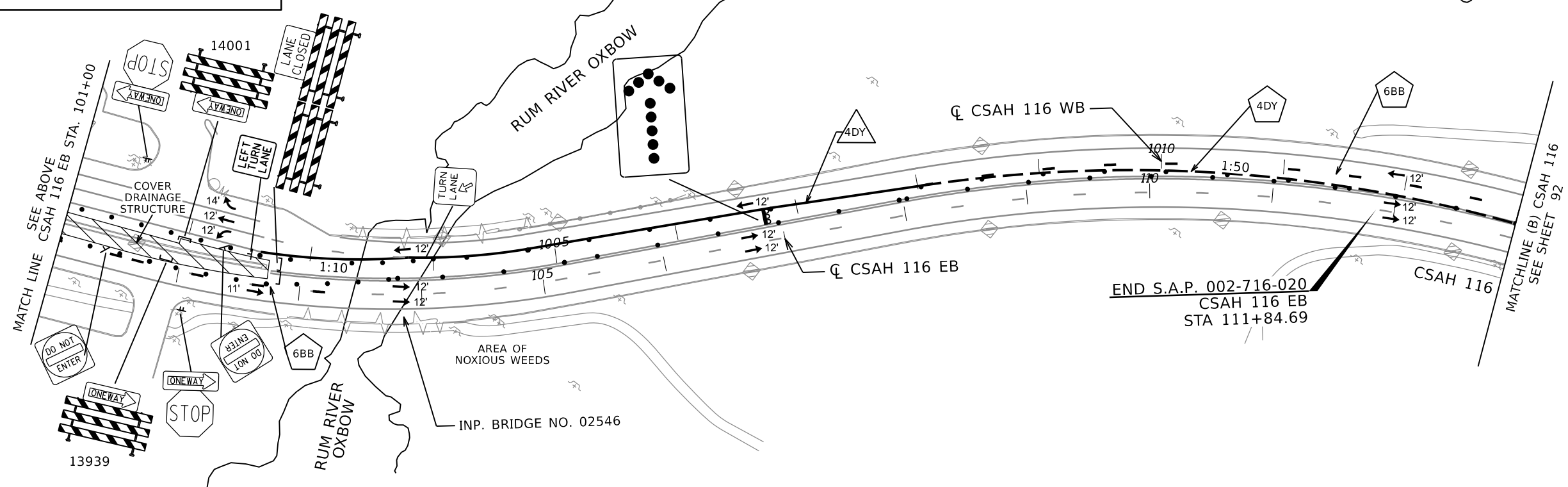
# CSAH 116 (BUNKER LAKE BLVD)



**LEGEND**

- UNDER CONSTRUCTION - CLOSED
- TRAFFIC DIRECTION

# CSAH 116 (BUNKER LAKE BLVD)



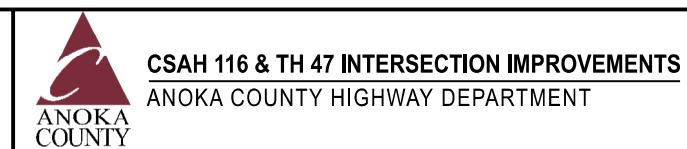
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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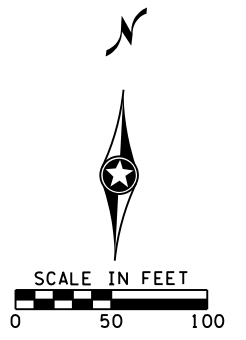
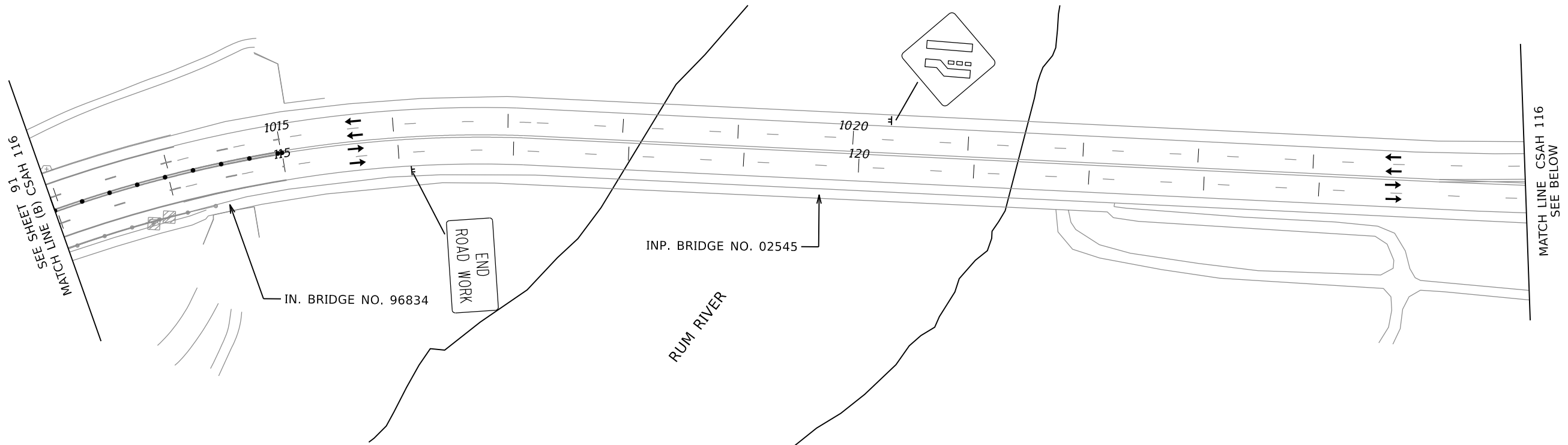
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 STAGE 0  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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CSAH 116 (BUNKER LAKE BLVD)

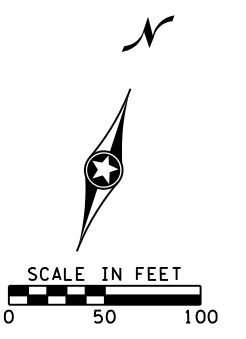
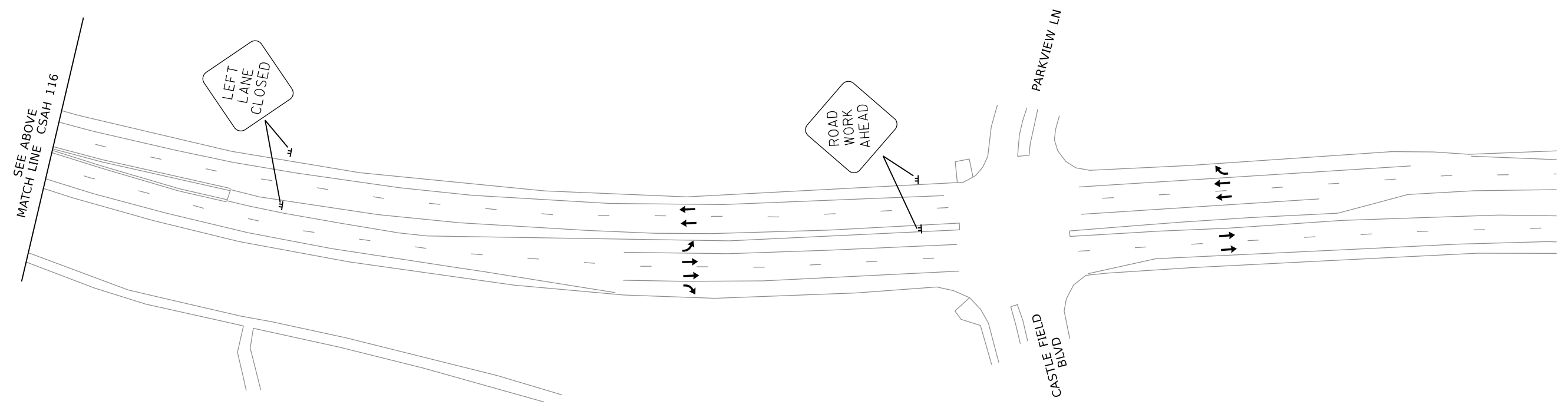


**LEGEND**

UNDER CONSTRUCTION - CLOSED

TRAFFIC DIRECTION

CSAH 116 (BUNKER LAKE BLVD)



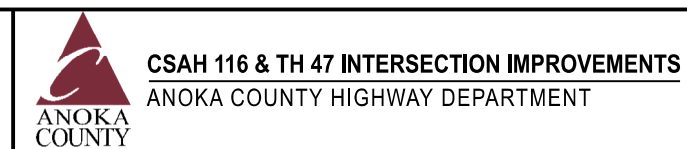
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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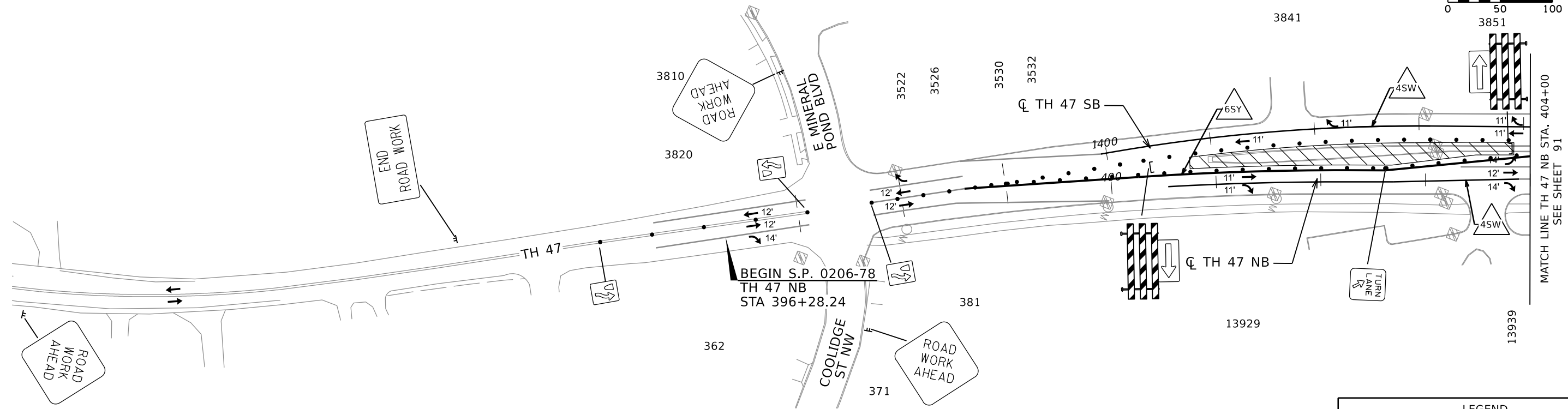
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 STAGE 0  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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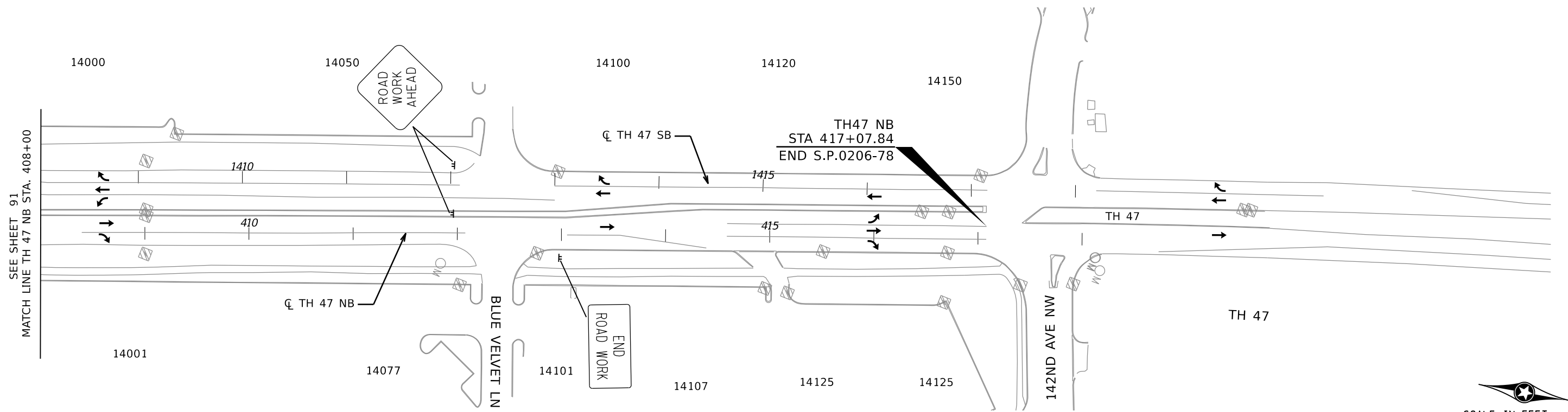
# TRUNK HIGHWAY 47



**LEGEND**

- UNDER CONSTRUCTION - CLOSED
- TRAFFIC FLOW, 11 FT MIN. LANE
- LANE CLOSED

# TRUNK HIGHWAY 47



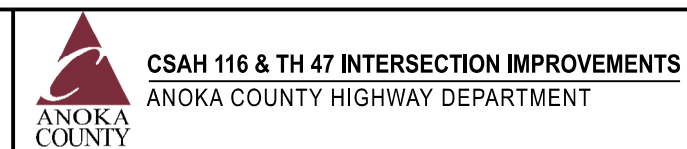
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
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 Approved By: **NEH**

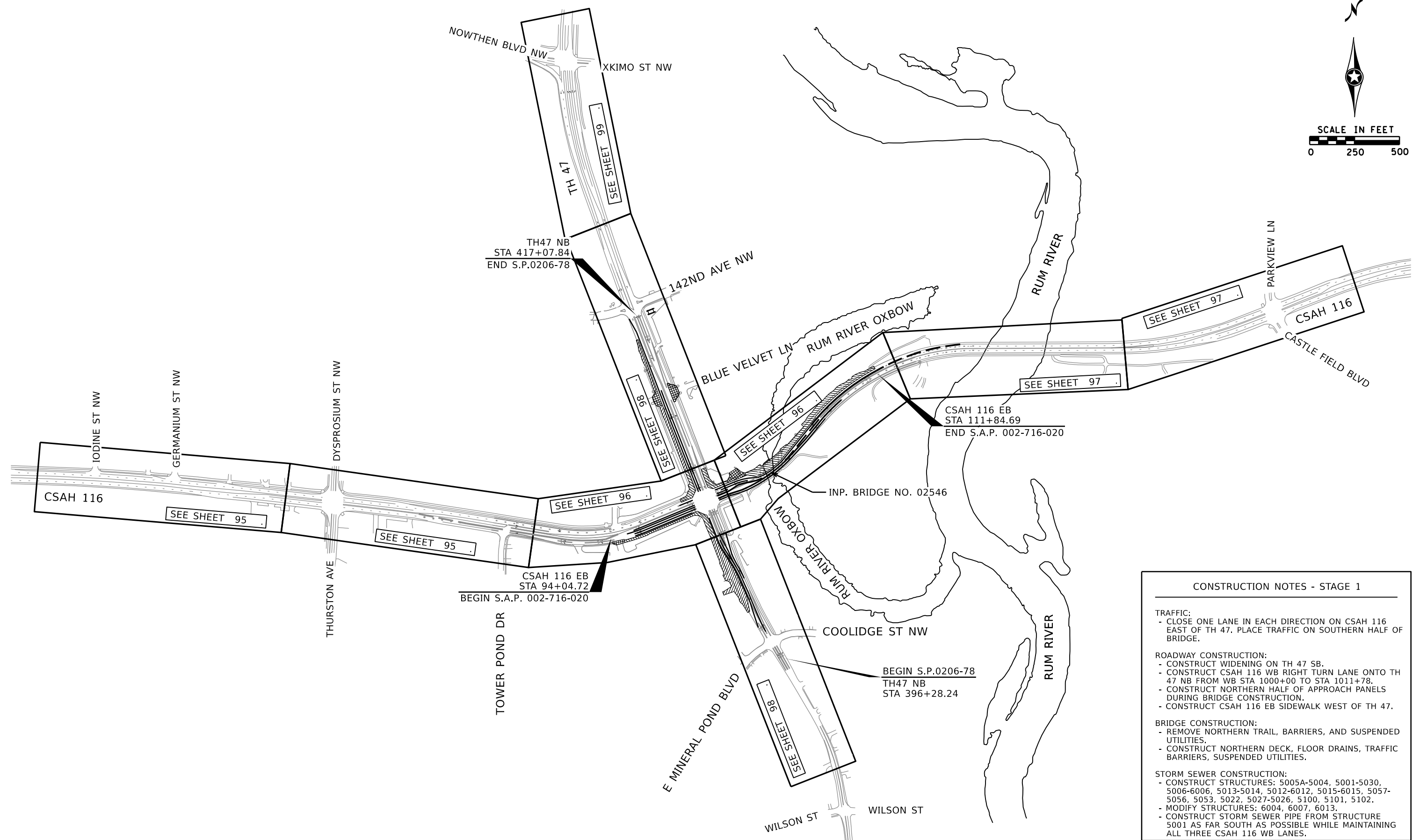
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CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 STAGE 0  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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 OF  
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 SHEETS



**CONSTRUCTION NOTES - STAGE 1**

**TRAFFIC:**

- CLOSE ONE LANE IN EACH DIRECTION ON CSAH 116 EAST OF TH 47. PLACE TRAFFIC ON SOUTHERN HALF OF BRIDGE.

**ROADWAY CONSTRUCTION:**

- CONSTRUCT WIDENING ON TH 47 SB.
- CONSTRUCT CSAH 116 WB RIGHT TURN LANE ONTO TH 47 NB FROM WB STA 1000+00 TO STA 1011+78.
- CONSTRUCT NORTHERN HALF OF APPROACH PANELS DURING BRIDGE CONSTRUCTION.
- CONSTRUCT CSAH 116 EB SIDEWALK WEST OF TH 47.

**BRIDGE CONSTRUCTION:**

- REMOVE NORTHERN TRAIL, BARRIERS, AND SUSPENDED UTILITIES.
- CONSTRUCT NORTHERN DECK, FLOOR DRAINS, TRAFFIC BARRIERS, SUSPENDED UTILITIES.

**STORM SEWER CONSTRUCTION:**

- CONSTRUCT STRUCTURES: 5005A-5004, 5001-5030, 5006-6006, 5013-5014, 5012-6012, 5015-6015, 5057-5056, 5053, 5022, 5027-5026, 5100, 5101, 5102.
- MODIFY STRUCTURES: 6004, 6007, 6013.
- CONSTRUCT STORM SEWER PIPE FROM STRUCTURE 5001 AS FAR SOUTH AS POSSIBLE WHILE MAINTAINING ALL THREE CSAH 116 WB LANES.

DATE: 8/25/2020 2:53:10 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_cst-0.dgn

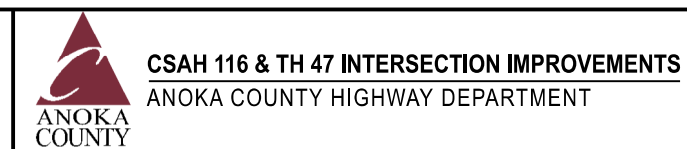
NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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CERTIFIED BY: *Thomas E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER 44620, THOMAS E. HENTGES, PE

DATE: 8/25/2020 LICENSE NO. 44620



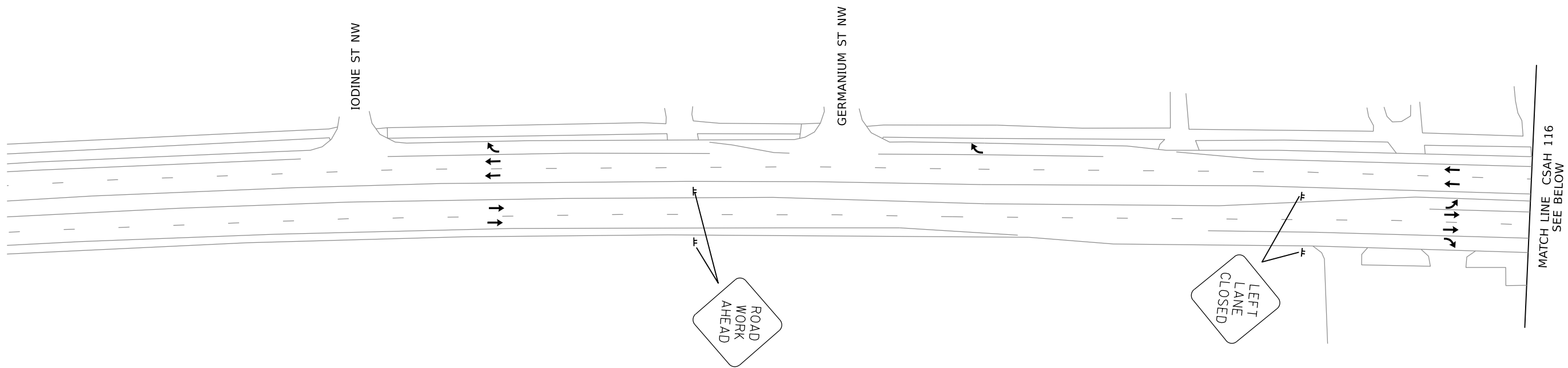
**ANOKA COUNTY, MN**

**STAGE 1 - GENERAL LAYOUT  
CONSTRUCTION STAGING**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

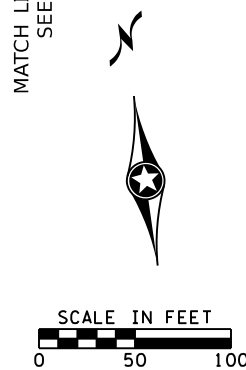
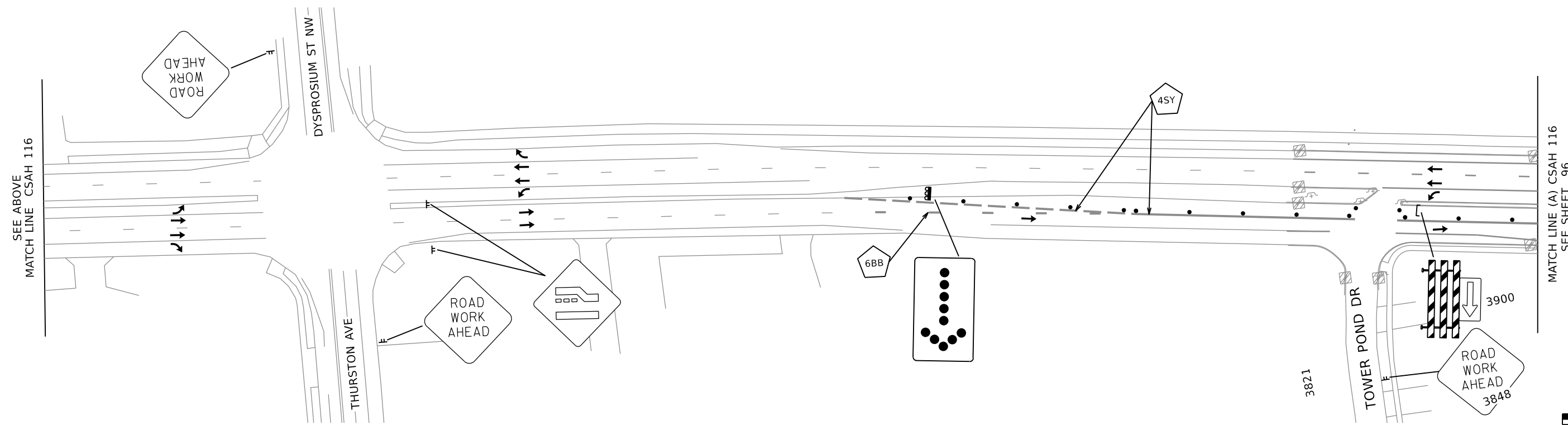
SHEET  
94  
OF  
206  
SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



LEGEND	
→	TRAFFIC DIRECTION

# CSAH 116 (BUNKER LAKE BLVD)



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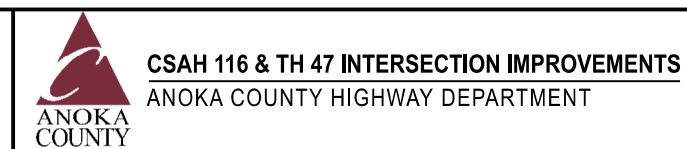
NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

DATE: 8/25/2020 LICENSE NO. 44620

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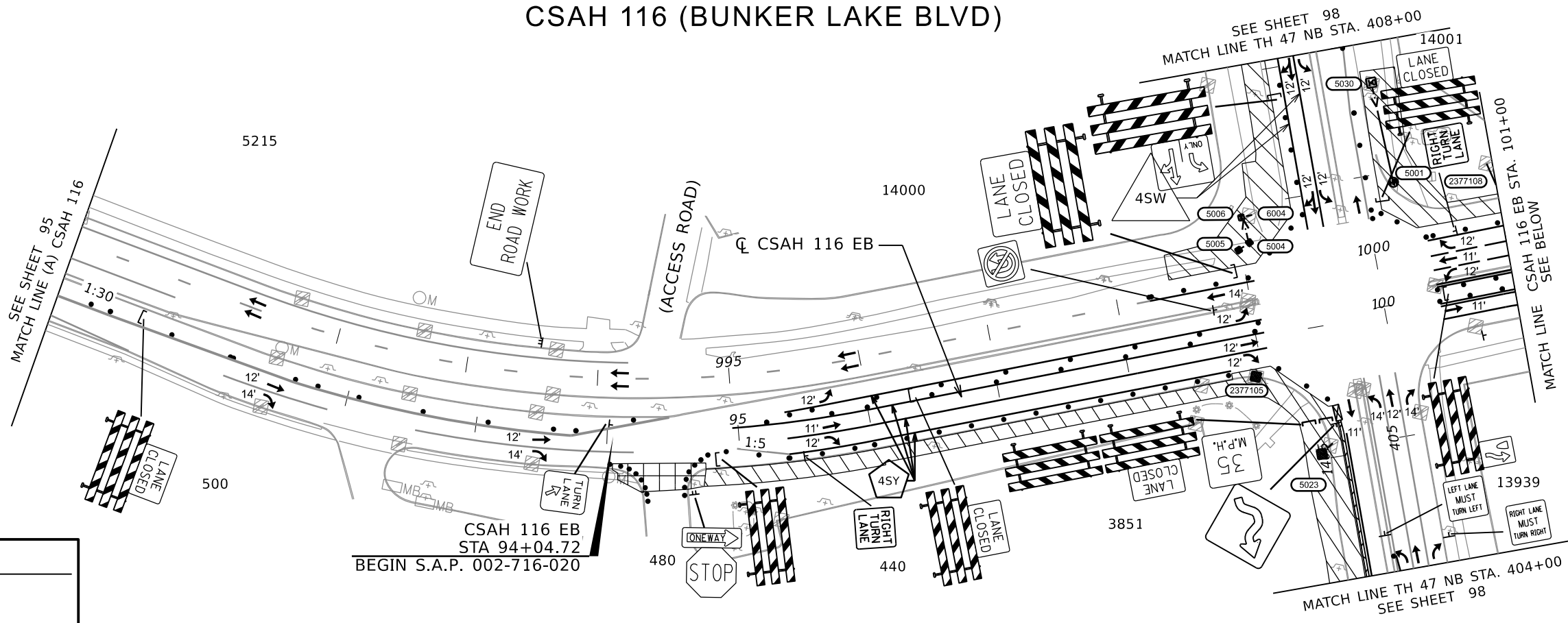
CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE



ANOKA COUNTY, MN  
 STAGE 1  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 95  
 OF  
 206  
 SHEETS

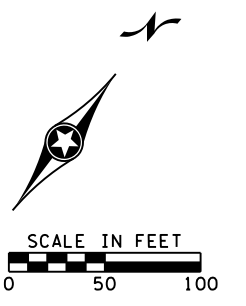
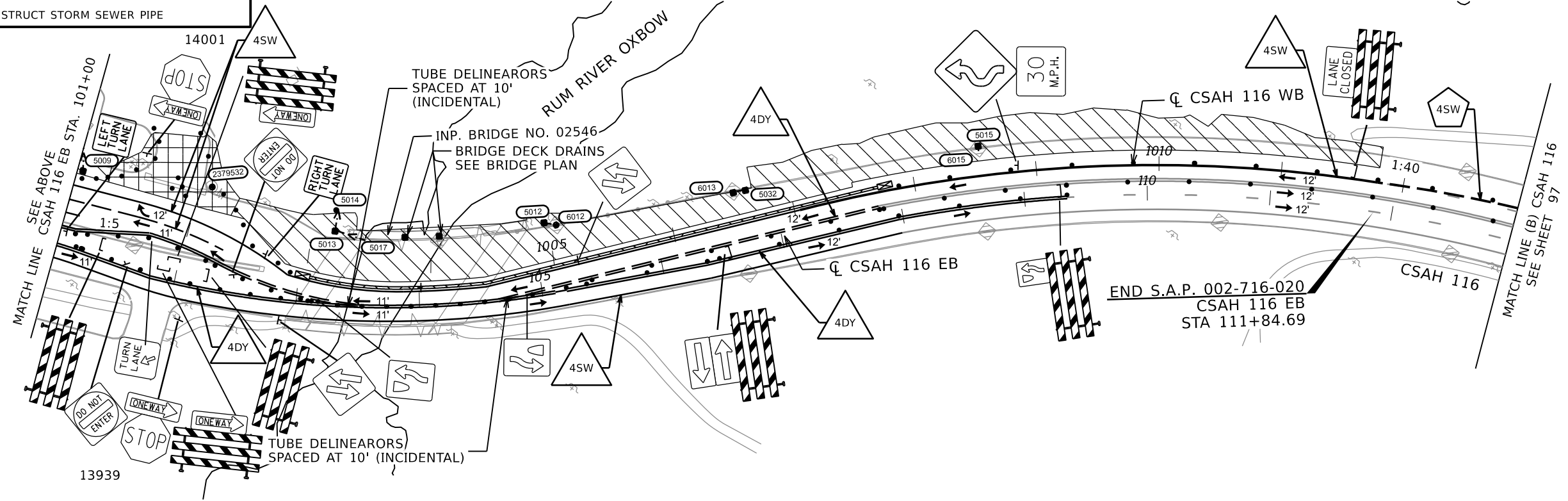
# CSAH 116 (BUNKER LAKE BLVD)



**LEGEND**

- UNDER CONSTRUCTION - CLOSED
- CONSTRUCT UNDER TRAFFIC
- TRAFFIC DIRECTION
- CONSTRUCT / ADJUST DRAINAGE STRUCTURE
- CONSTRUCT STORM SEWER PIPE

# CSAH 116 (BUNKER LAKE BLVD)



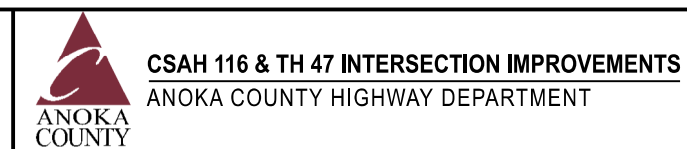
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Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

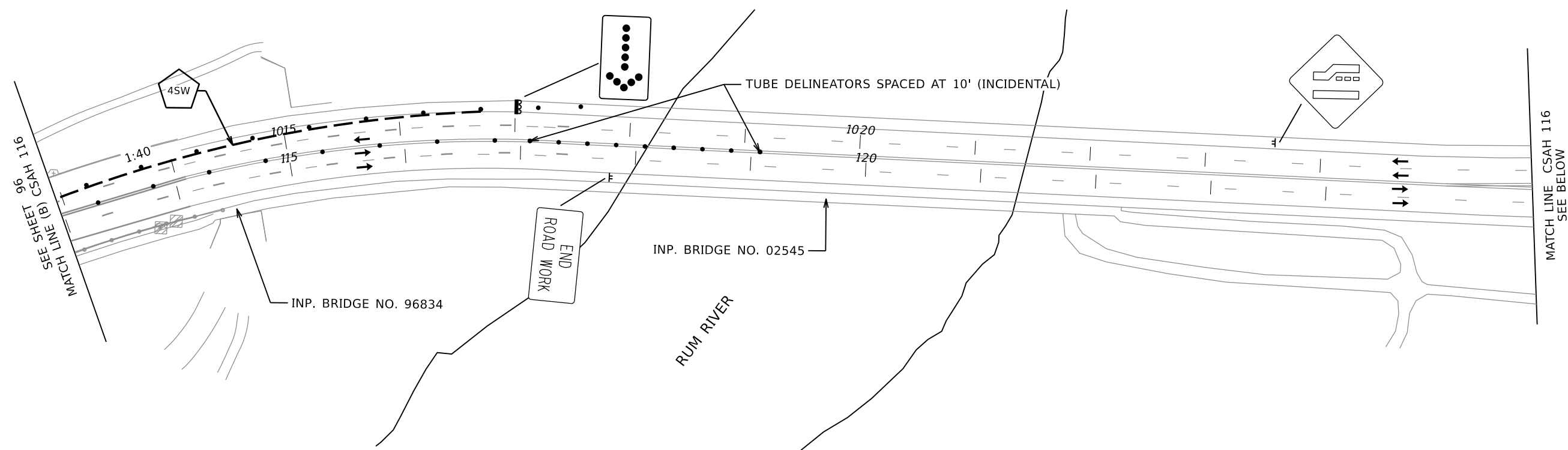


ANOKA COUNTY, MN  
 STAGE 1  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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 OF  
 206  
 SHEETS



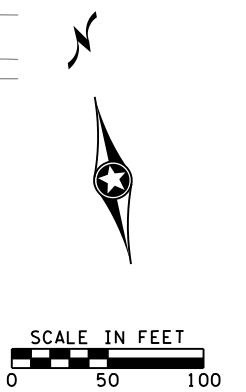
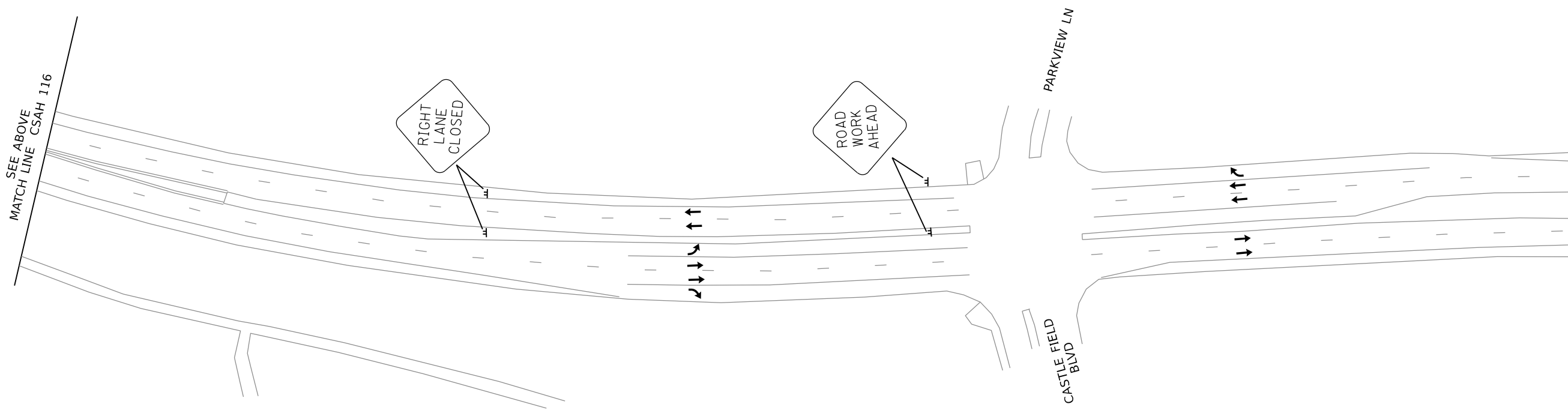
CSAH 116 (BUNKER LAKE BLVD)



LEGEND

→ TRAFFIC DIRECTION

CSAH 116 (BUNKER LAKE BLVD)



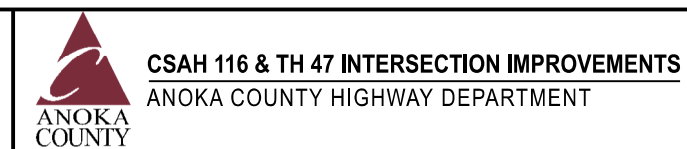
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 Checked By: NEH  
 Approved By: NEH

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 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

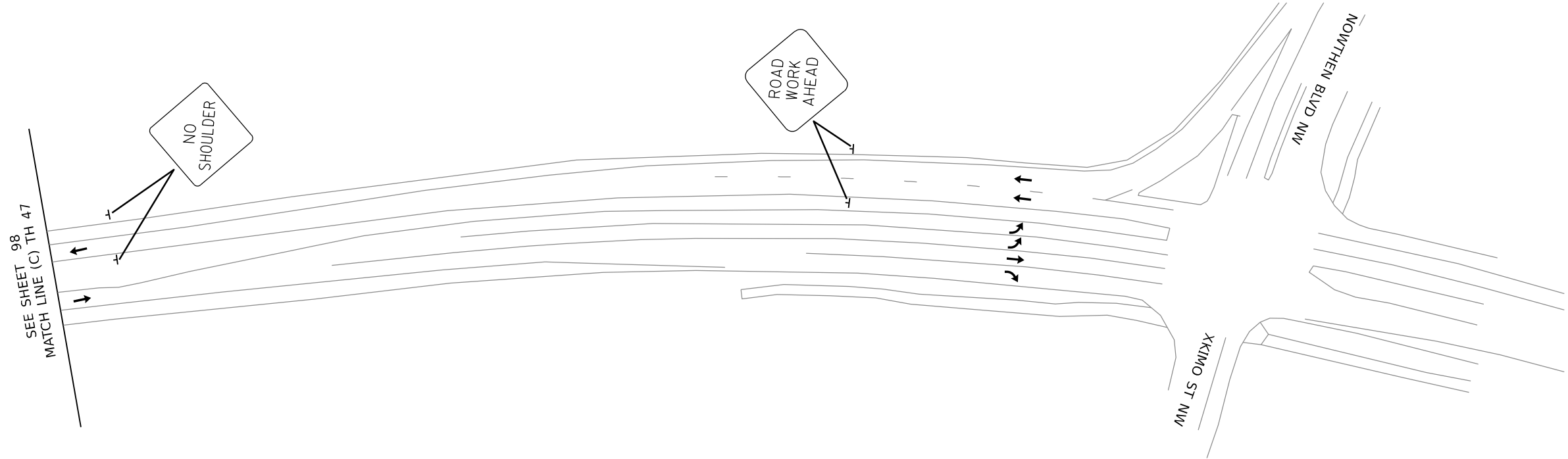
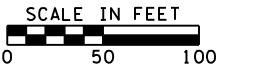


ANOKA COUNTY, MN  
 STAGE 1  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 97 OF 206 SHEETS



# TRUNK HIGHWAY 47



LEGEND	
→	TRAFFIC DIRECTION

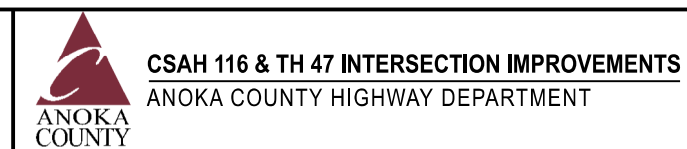
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 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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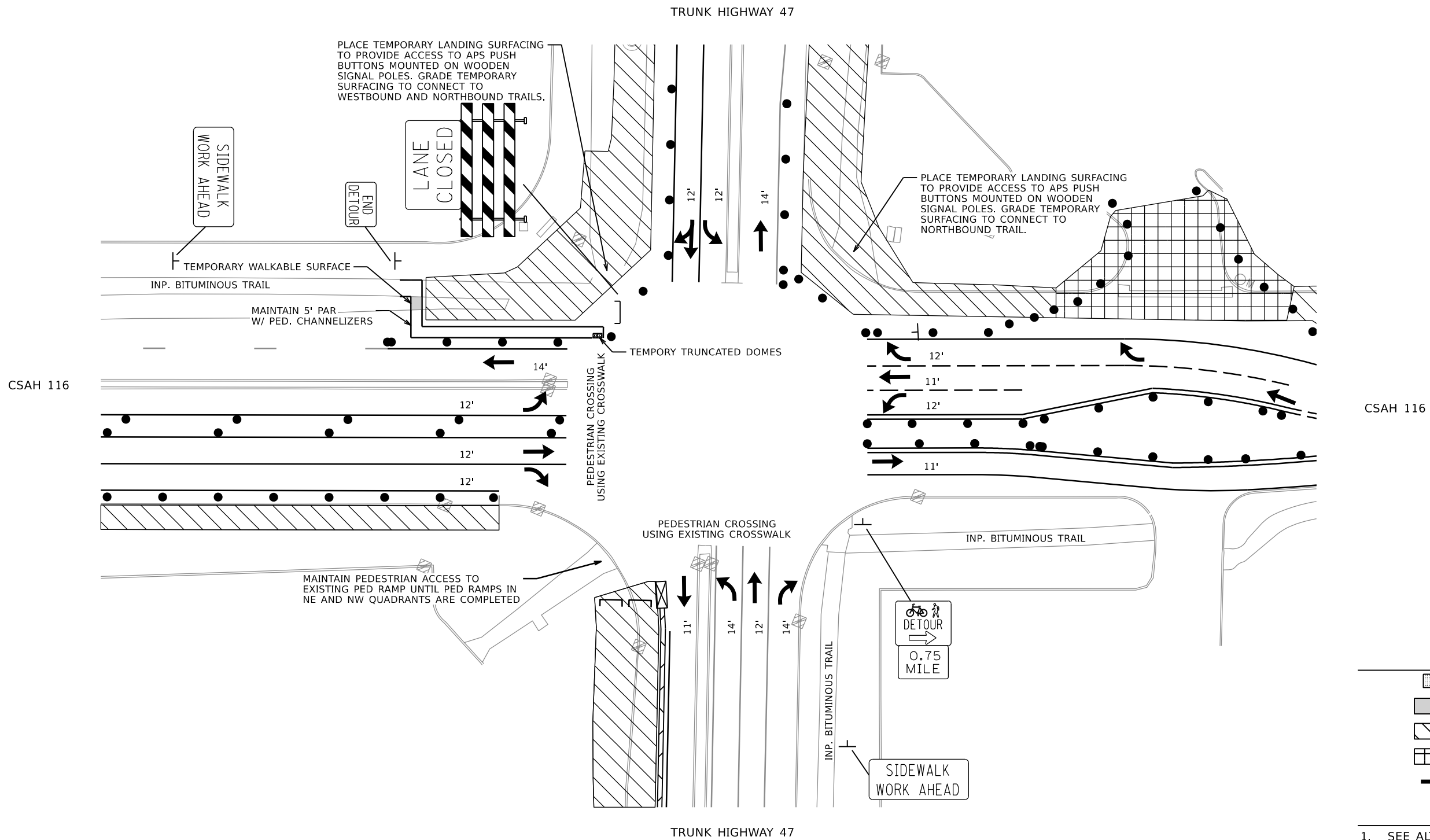
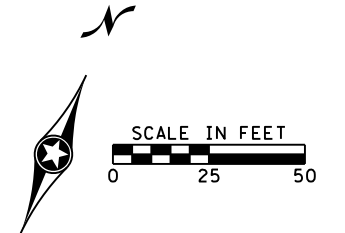
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 STAGE 1  
**CONSTRUCTION STAGING & TRAFFIC CONTROL**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 99  
 OF  
 206  
 SHEETS

# CSAH 116 (BUNKER LAKE BLVD) & TRUNK HIGHWAY 47 PEDESTRIAN DETAILS



PLACE TEMPORARY LANDING SURFACING TO PROVIDE ACCESS TO APS PUSH BUTTONS MOUNTED ON WOODEN SIGNAL POLES. GRADE TEMPORARY SURFACING TO CONNECT TO WESTBOUND AND NORTHBOUND TRAILS.

PLACE TEMPORARY LANDING SURFACING TO PROVIDE ACCESS TO APS PUSH BUTTONS MOUNTED ON WOODEN SIGNAL POLES. GRADE TEMPORARY SURFACING TO CONNECT TO NORTHBOUND TRAIL.

MAINTAIN PEDESTRIAN ACCESS TO EXISTING PED RAMP UNTIL PED RAMPS IN NE AND NW QUADRANTS ARE COMPLETED

### LEGEND

- TEMPORARY TRUNCATED DOMES
- TEMPORARY WALKABLE SURFACE
- UNDER CONSTRUCTION - CLOSED
- CONSTRUCTION UNDER TRAFFIC
- TRAFFIC DIRECTION

### GENERAL NOTES

1. SEE ALTERNATE PEDESTRIAN ROUTE (APR) LAYOUTS ON SHEET 79 - 80 .
2. SEE TEMPORARY PEDESTRIAN ACCESS ROUTE (TPAR) DEVICES ON SHEETS 81 - 82 .
3. SEE SHEET 86 FOR PEDESTRIAN DETOUR ACTIVE IN THIS STAGE.
4. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

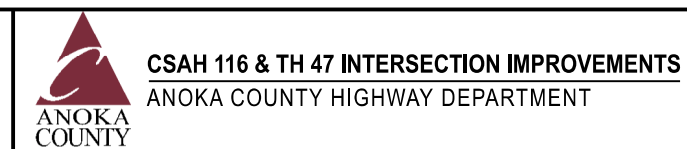
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
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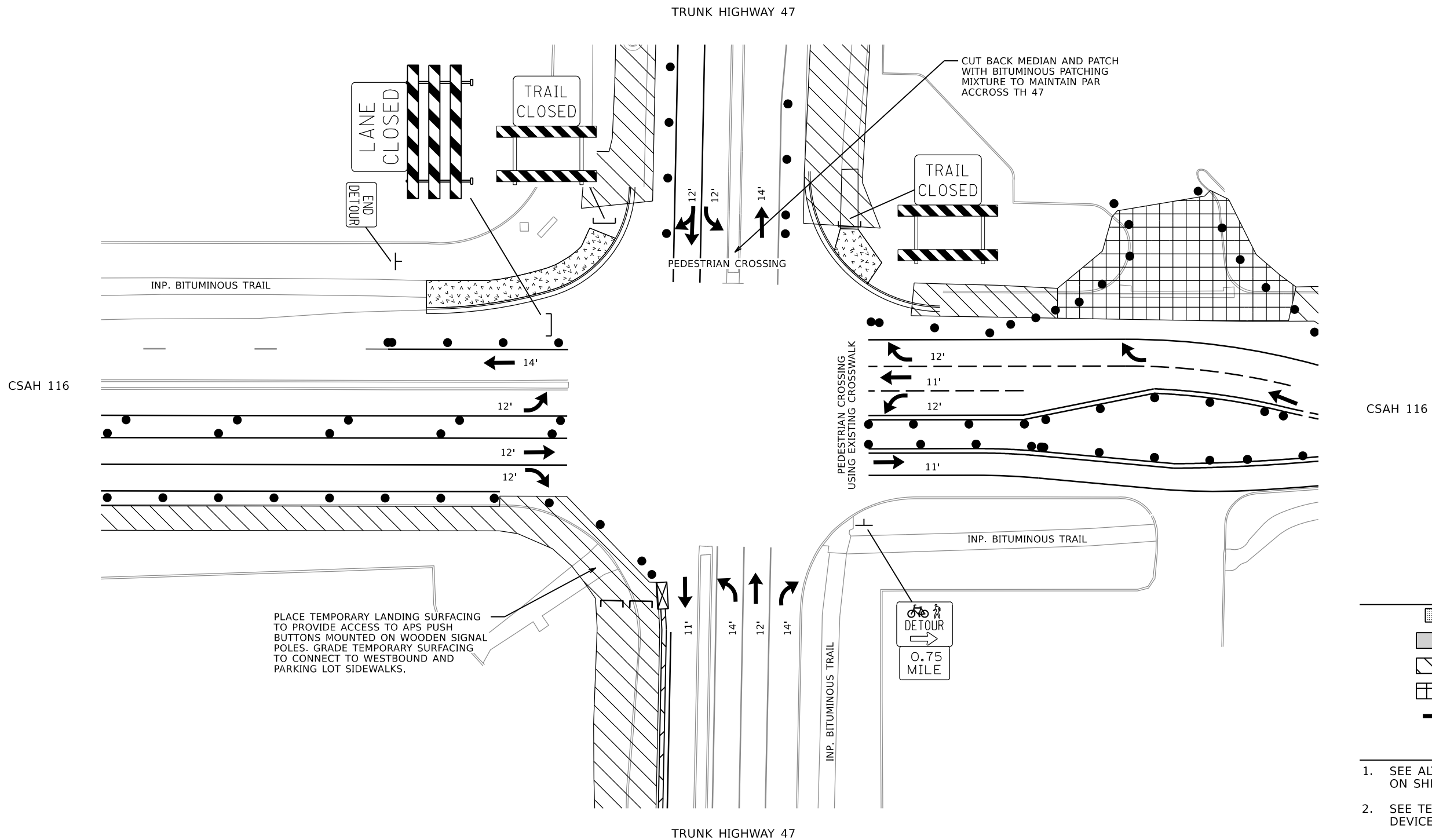
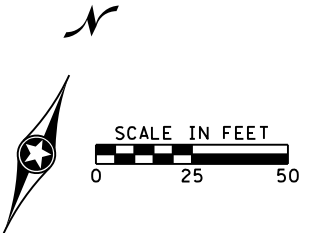
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 STAGE 1 - PEDESTRIAN PHASE 1  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
100  
OF  
206  
SHEETS

# CSAH 116 (BUNKER LAKE BLVD) & TRUNK HIGHWAY 47 PEDESTRIAN DETAILS



### LEGEND

- TEMPORARY TRUNCATED DOMES
- TEMPORARY WALKABLE SURFACE
- UNDER CONSTRUCTION - CLOSED
- CONSTRUCTION UNDER TRAFFIC
- TRAFFIC DIRECTION

### GENERAL NOTES

1. SEE ALTERNATE PEDESTRIAN ROUTE (APR) LAYOUTS ON SHEET 79 - 80 .
2. SEE TEMPORARY PEDESTRIAN ACCESS ROUTE (TPAR) DEVICES ON SHEETS 81 - 82 .
3. SEE SHEET 86 FOR PEDESTRIAN DETOUR ACTIVE IN THIS STAGE.
4. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
5. NORTHEAST AND NORTHWEST QUADRANT PEDESTRIAN FACILITIES MUST BE COMPLETED PRIOR TO BEGINNING CONSTRUCTION ON THE SOUTHWEST QUADRANT PEDESTRIAN RAMP.

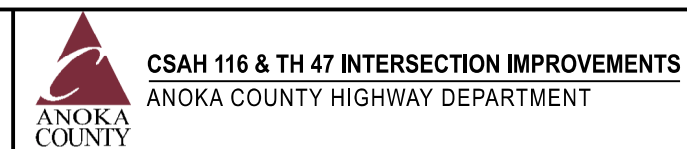
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 Plan By: **AJF**  
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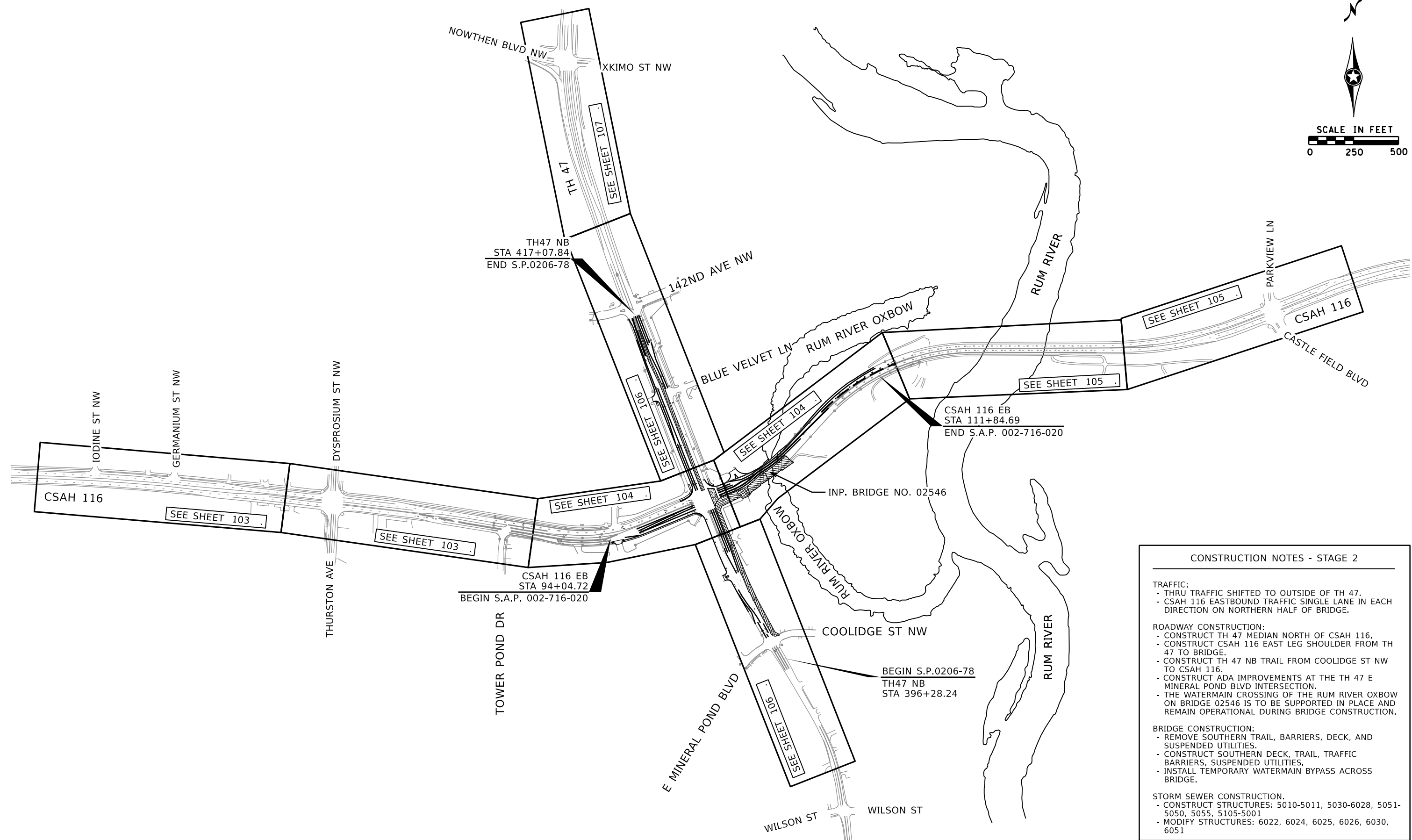
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CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 STAGE 1 - PEDESTRIAN PHASE 2  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
101  
OF  
206  
SHEETS



**CONSTRUCTION NOTES - STAGE 2**

**TRAFFIC:**

- THRU TRAFFIC SHIFTED TO OUTSIDE OF TH 47.
- CSAH 116 EASTBOUND TRAFFIC SINGLE LANE IN EACH DIRECTION ON NORTHERN HALF OF BRIDGE.

**ROADWAY CONSTRUCTION:**

- CONSTRUCT TH 47 MEDIAN NORTH OF CSAH 116.
- CONSTRUCT CSAH 116 EAST LEG SHOULDER FROM TH 47 TO BRIDGE.
- CONSTRUCT TH 47 NB TRAIL FROM COOLIDGE ST NW TO CSAH 116.
- CONSTRUCT ADA IMPROVEMENTS AT THE TH 47 E MINERAL POND BLVD INTERSECTION.
- THE WATERMAIN CROSSING OF THE RUM RIVER OXBOW ON BRIDGE 02546 IS TO BE SUPPORTED IN PLACE AND REMAIN OPERATIONAL DURING BRIDGE CONSTRUCTION.

**BRIDGE CONSTRUCTION:**

- REMOVE SOUTHERN TRAIL, BARRIERS, DECK, AND SUSPENDED UTILITIES.
- CONSTRUCT SOUTHERN DECK, TRAIL, TRAFFIC BARRIERS, SUSPENDED UTILITIES.
- INSTALL TEMPORARY WATERMAIN BYPASS ACROSS BRIDGE.

**STORM SEWER CONSTRUCTION.**

- CONSTRUCT STRUCTURES: 5010-5011, 5030-6028, 5051-5050, 5055, 5105-5001
- MODIFY STRUCTURES: 6022, 6024, 6025, 6026, 6030, 6051

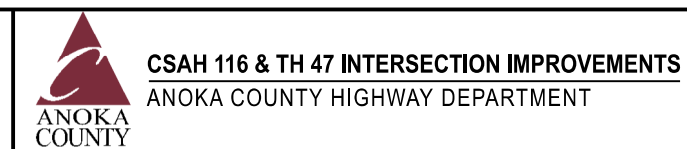
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 Checked By: NEH  
 Approved By: NEH

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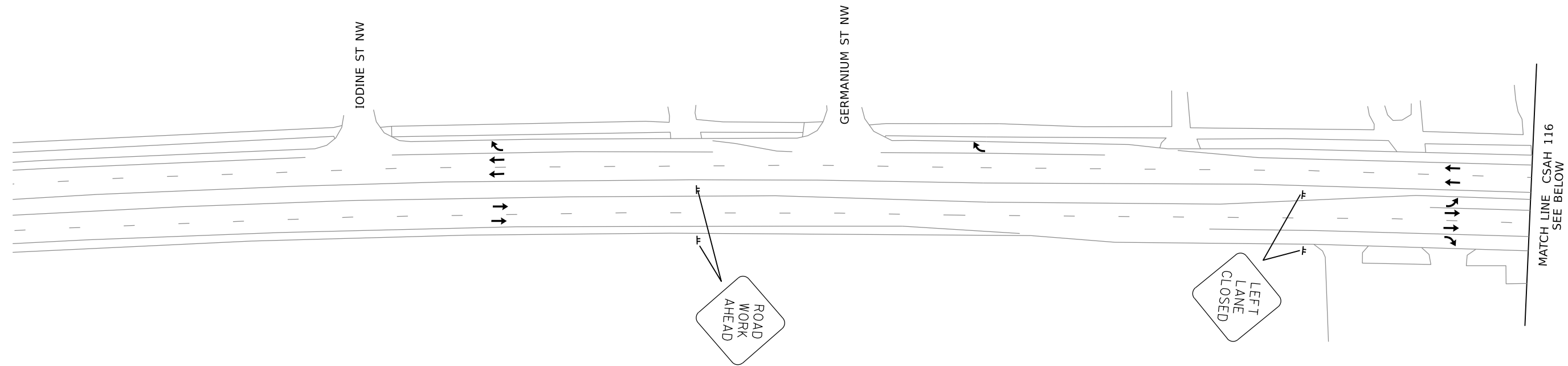
CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
**STAGE 2 - GENERAL LAYOUT**  
**CONSTRUCTION STAGING**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
102  
OF  
206  
SHEETS

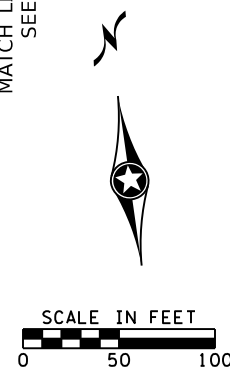
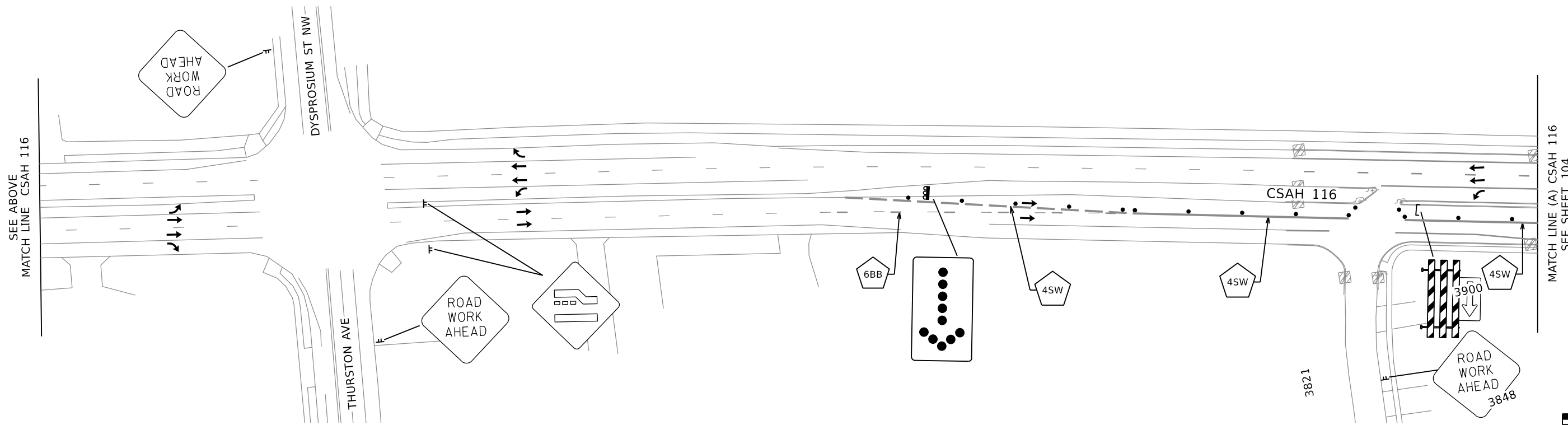
# CSAH 116 (BUNKER LAKE BLVD)



## LEGEND

→ TRAFFIC DIRECTION

# CSAH 116 (BUNKER LAKE BLVD)



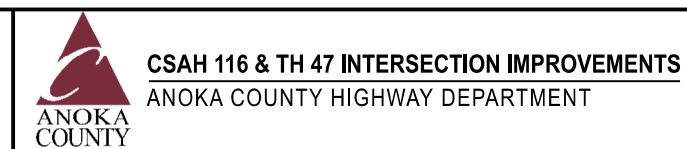
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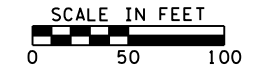
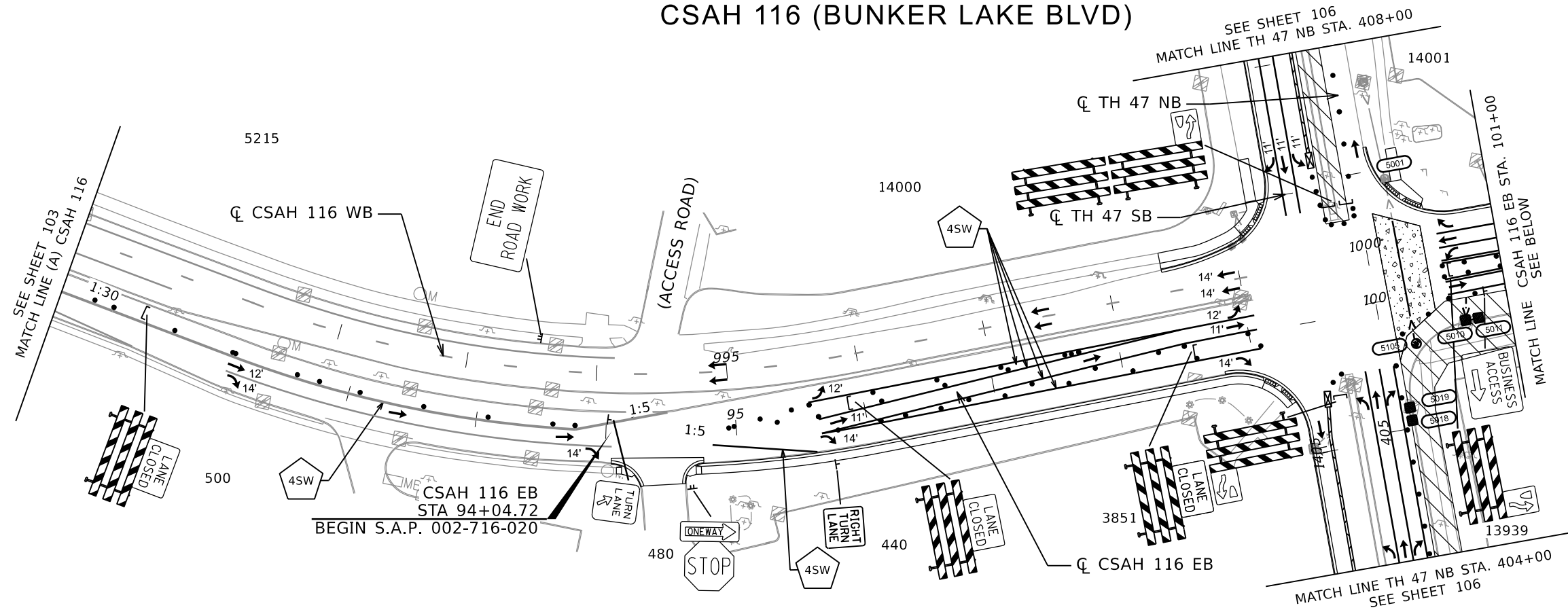
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 STAGE 2  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

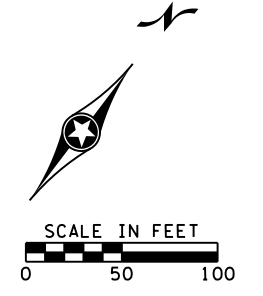
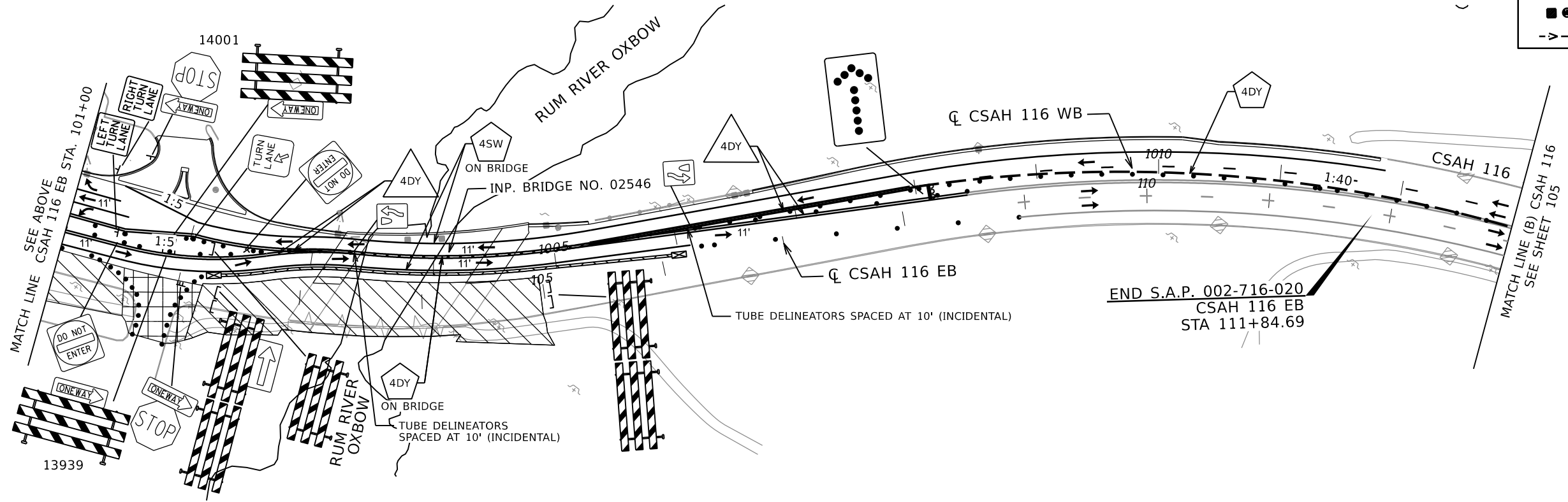
SHEET  
 103  
 OF  
 206  
 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



LEGEND	
	UNDER CONSTRUCTION - CLOSED
	CONSTRUCT UNDER TRAFFIC
	CONSTRUCTION UNDER WEEKEND CLOSURE SEE SHEET 84 FOR DETOUR.
	TRAFFIC DIRECTION
	CONSTRUCT/MODIFY DRAINAGE STRUCTURE
	CONSTRUCT STORM SEWER PIPE

# CSAH 116 (BUNKER LAKE BLVD)



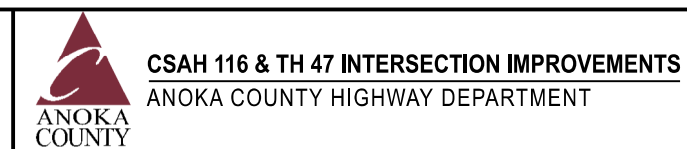
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NO.	DATE	BY	CHK	REVISIONS

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 Checked By: NEH  
 Approved By: NEH

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CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

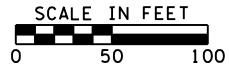
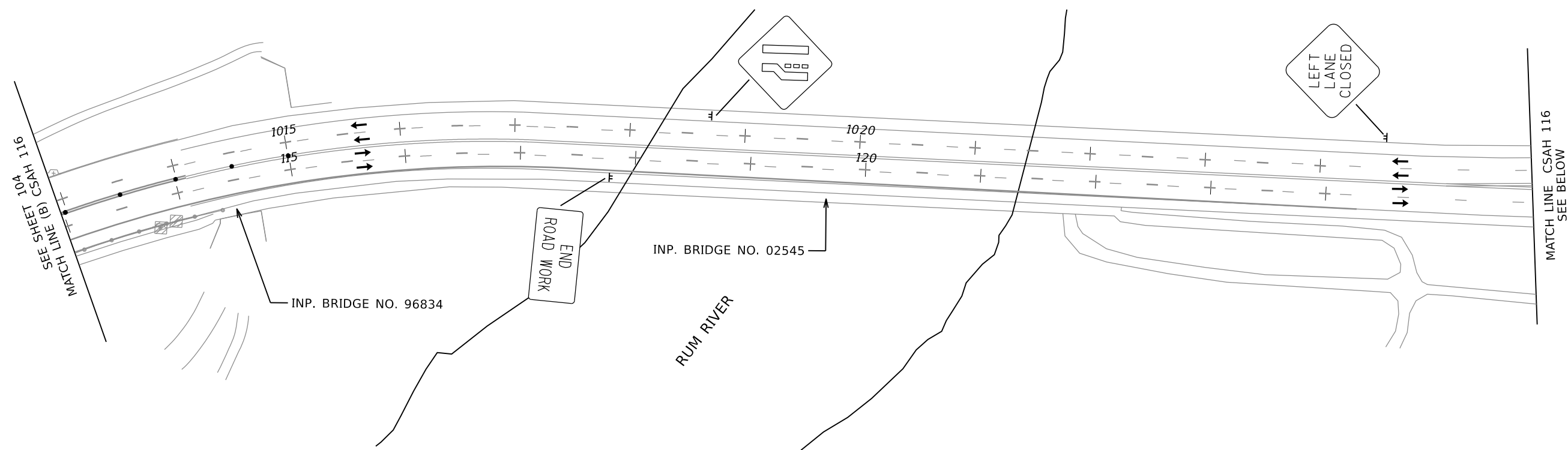


ANOKA COUNTY, MN  
 STAGE 2  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 104  
 OF  
 206  
 SHEETS



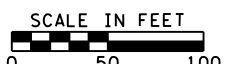
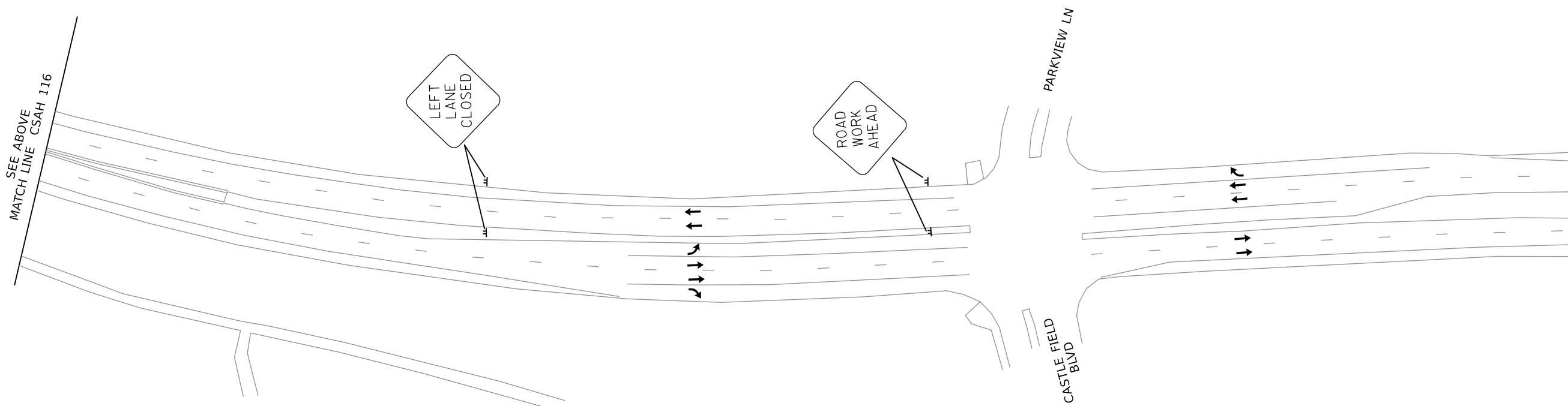
CSAH 116 (BUNKER LAKE BLVD)



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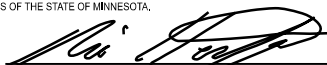

→	TRAFFIC DIRECTION
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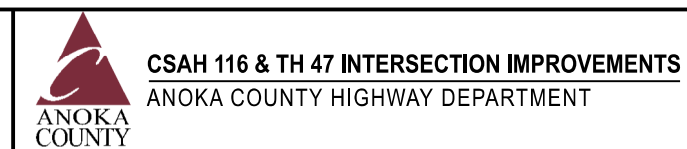
CSAH 116 (BUNKER LAKE BLVD)



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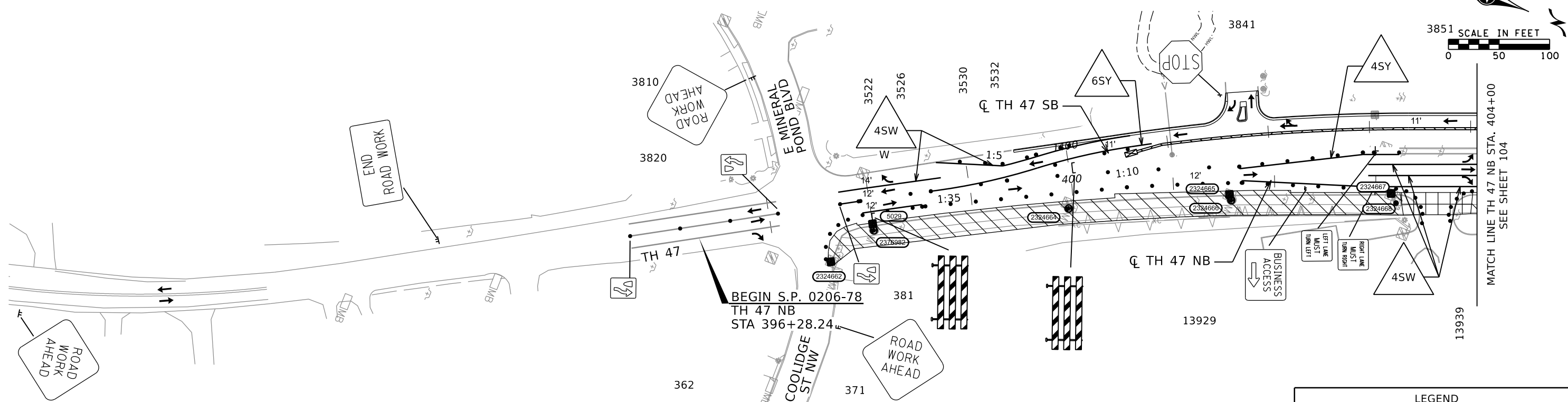
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Plan By:	AJF	
Checked By:	NEH	
Approved By:	NEH	



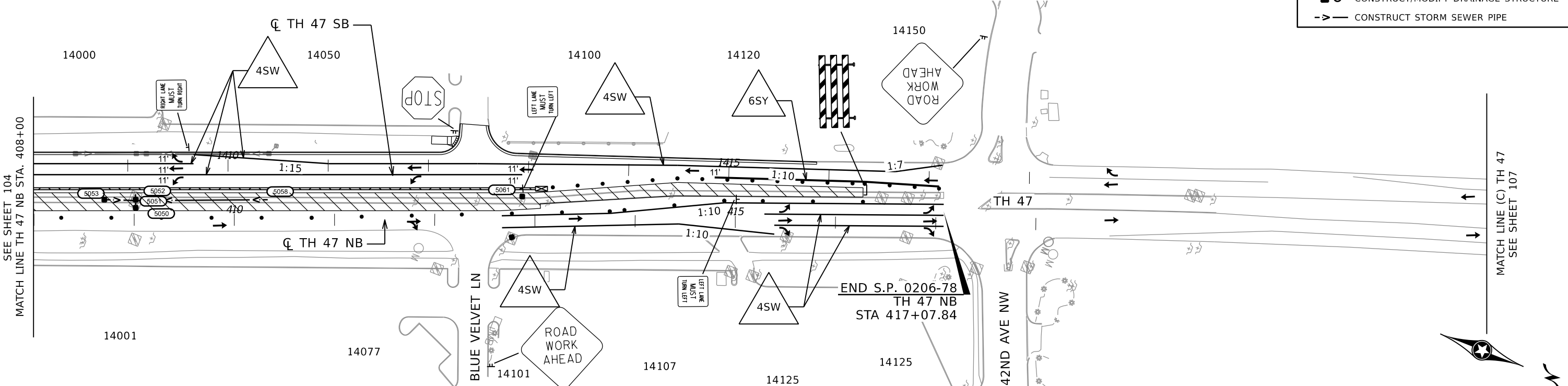
ANOKA COUNTY, MN  
 STAGE 2  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 105  
 OF  
 206  
 SHEETS

# TRUNK HIGHWAY 47



# TRUNK HIGHWAY 47



LEGEND	
	UNDER CONSTRUCTION - CLOSED
	CONSTRUCT UNDER TRAFFIC
	TRAFFIC DIRECTION
	CONSTRUCT/MODIFY DRAINAGE STRUCTURE
	CONSTRUCT STORM SEWER PIPE

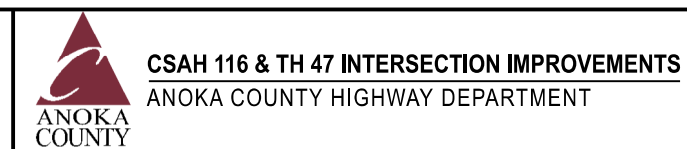
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Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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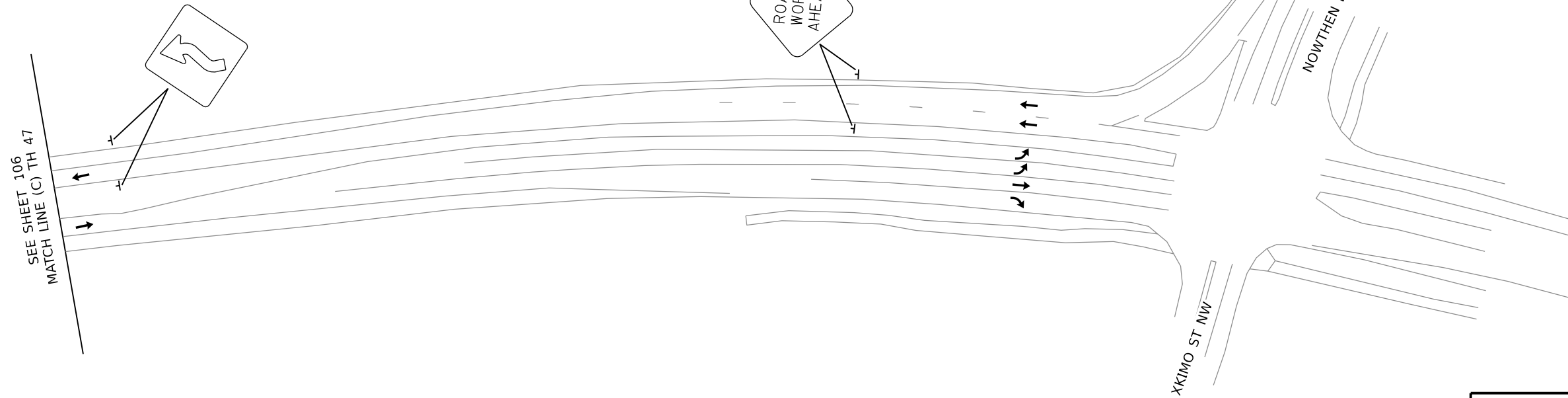
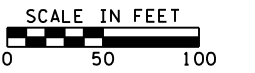
CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 STAGE 2  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 106  
 OF  
 206  
 SHEETS

# TRUNK HIGHWAY 47



LEGEND	
→	TRAFFIC DIRECTION

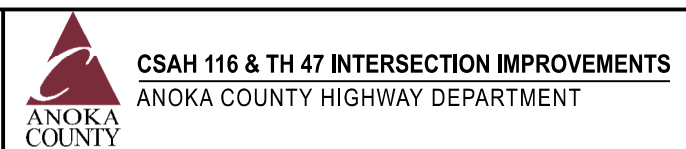
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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

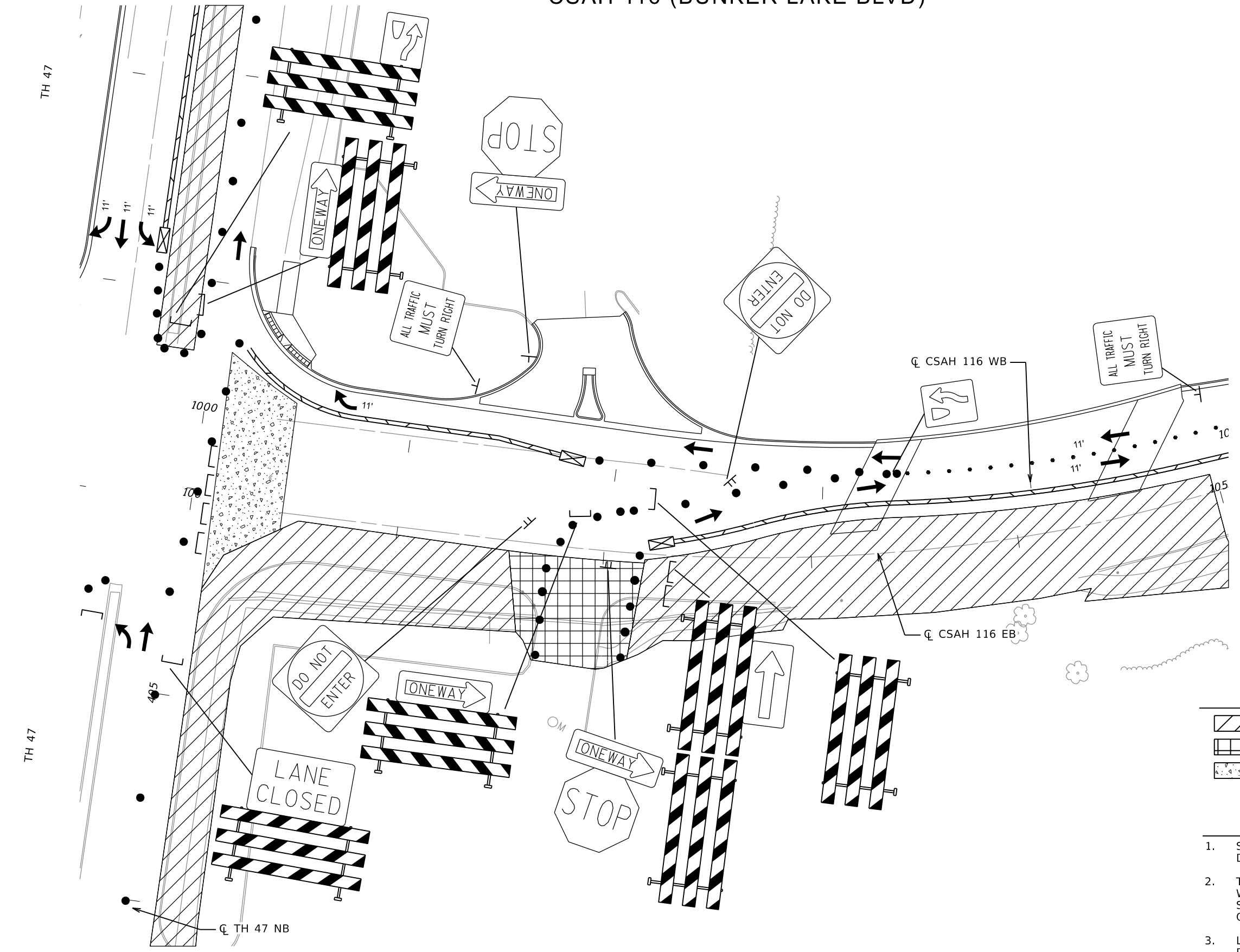
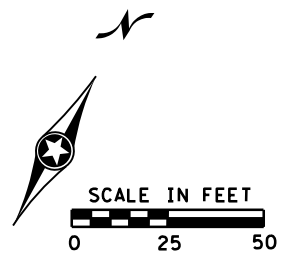
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 STAGE 2  
**CONSTRUCTION STAGING & TRAFFIC CONTROL**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
107  
OF  
206  
SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



**LEGEND**

	UNDER CONSTRUCTION - CLOSED
	CONSTRUCT UNDER TRAFFIC
	CONSTRUCTION UNDER WEEKEND CLOSURE

TRAFFIC DIRECTION

- GENERAL NOTES**
- SEE SHEET 84 FOR DETOUR AND ADDITIONAL DETOUR RELATED SIGNING.
  - THIS SHEET SHOWS ADDITIONAL SIGNING FOR THE WEEKEND CLOSURE OF CSAH 116 EASTBOUND. SEE SHEET 115 - 120 FOR STAGE 4 TRAFFIC CONTROL ALSO ACTIVE DURING THIS DETOUR.
  - LANE WIDTHS SHOWN ARE IN ADDITION TO REQUIRED CLEAR ZONES.

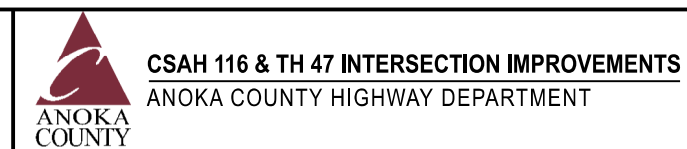
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NO.	DATE	BY	CHK	REVISIONS

Design By: \_\_\_\_\_  
 Plan By: \_\_\_\_\_  
 Checked By: \_\_\_\_\_  
 Approved By: \_\_\_\_\_

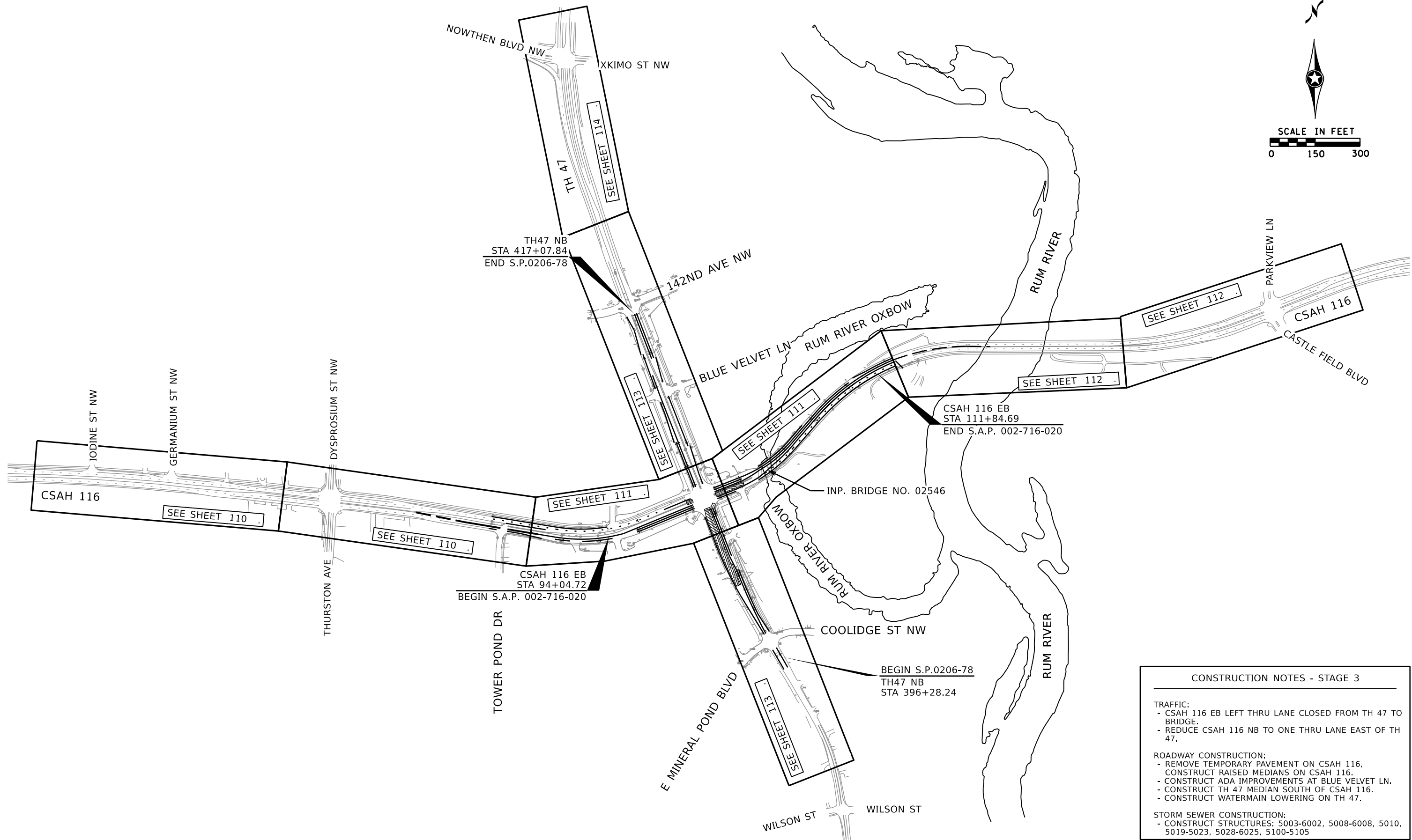
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

CERTIFIED BY: \_\_\_\_\_  
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
 DATE: 8/25/2020 LICENSE NO. \_\_\_\_\_



**ANOKA COUNTY, MN**  
 STAGE 2 - DETOUR SIGNING DETAILS  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 108 OF 206 SHEETS



**CONSTRUCTION NOTES - STAGE 3**

**TRAFFIC:**

- CSAH 116 EB LEFT THRU LANE CLOSED FROM TH 47 TO BRIDGE.
- REDUCE CSAH 116 NB TO ONE THRU LANE EAST OF TH 47.

**ROADWAY CONSTRUCTION:**

- REMOVE TEMPORARY PAVEMENT ON CSAH 116.
- CONSTRUCT RAISED MEDIANS ON CSAH 116.
- CONSTRUCT ADA IMPROVEMENTS AT BLUE VELVET LN.
- CONSTRUCT TH 47 MEDIAN SOUTH OF CSAH 116.
- CONSTRUCT WATERMAIN LOWERING ON TH 47.

**STORM SEWER CONSTRUCTION:**

- CONSTRUCT STRUCTURES: 5003-6002, 5008-6008, 5010, 5019-5023, 5028-6025, 5100-5105

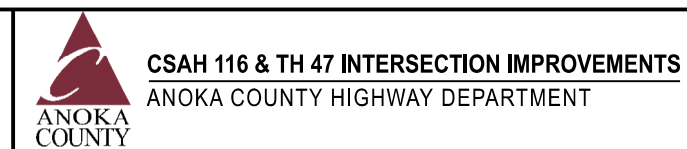
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



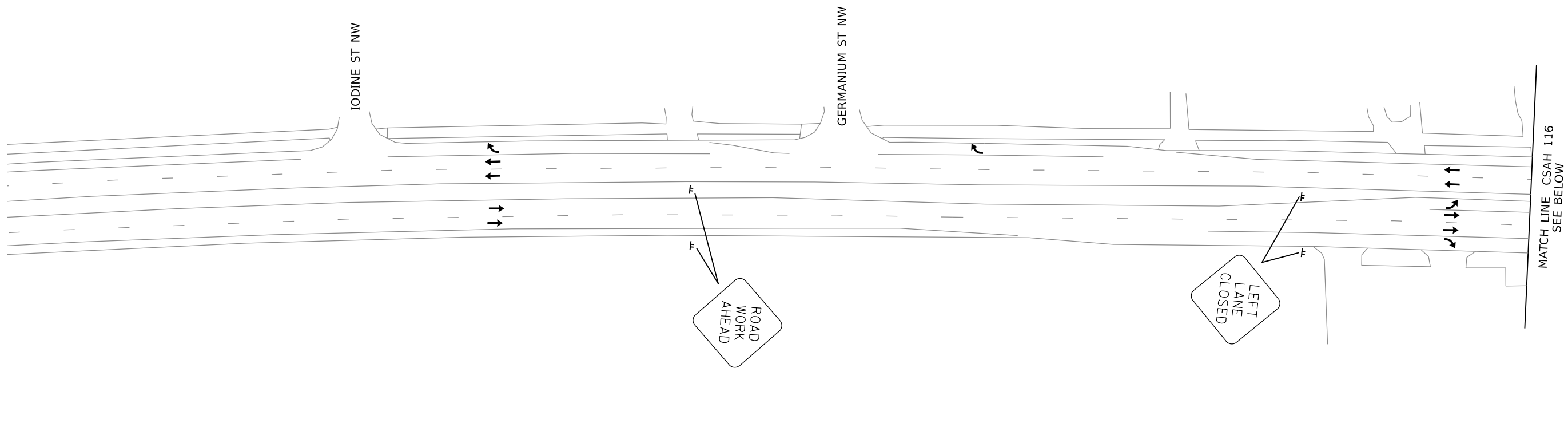
**ANOKA COUNTY, MN**

**STAGE 3 - GENERAL LAYOUT  
CONSTRUCTION STAGING**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
109  
OF  
206  
SHEETS

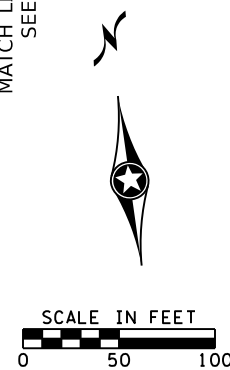
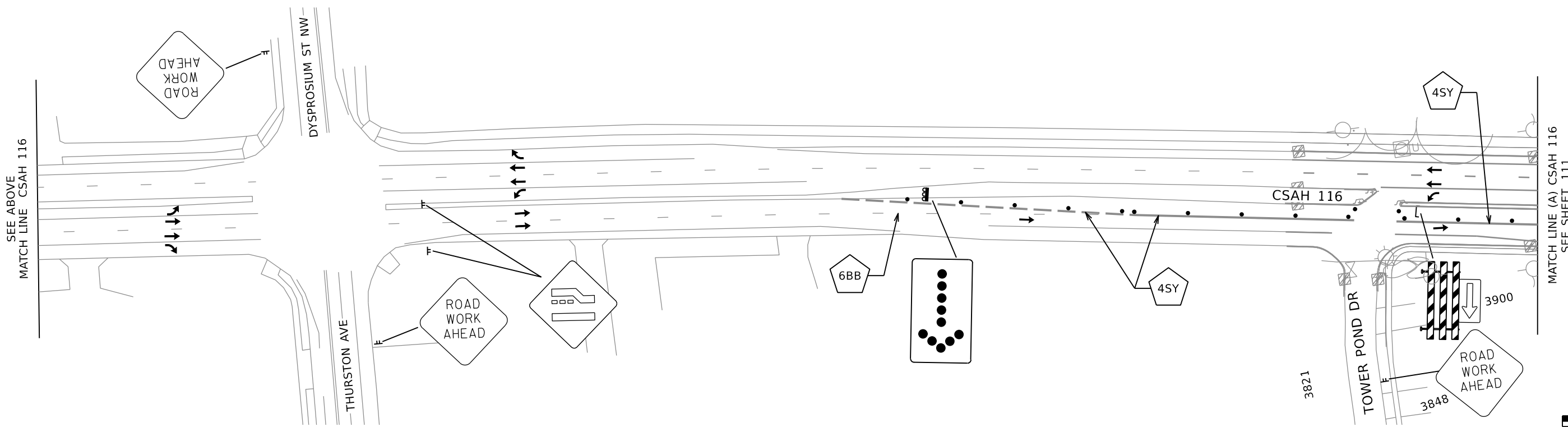
# CSAH 116 (BUNKER LAKE BLVD)



## LEGEND

→ TRAFFIC DIRECTION

# CSAH 116 (BUNKER LAKE BLVD)



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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

DATE: 8/25/2020 LICENSE NO. 44620

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

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE



**ANOKA COUNTY**

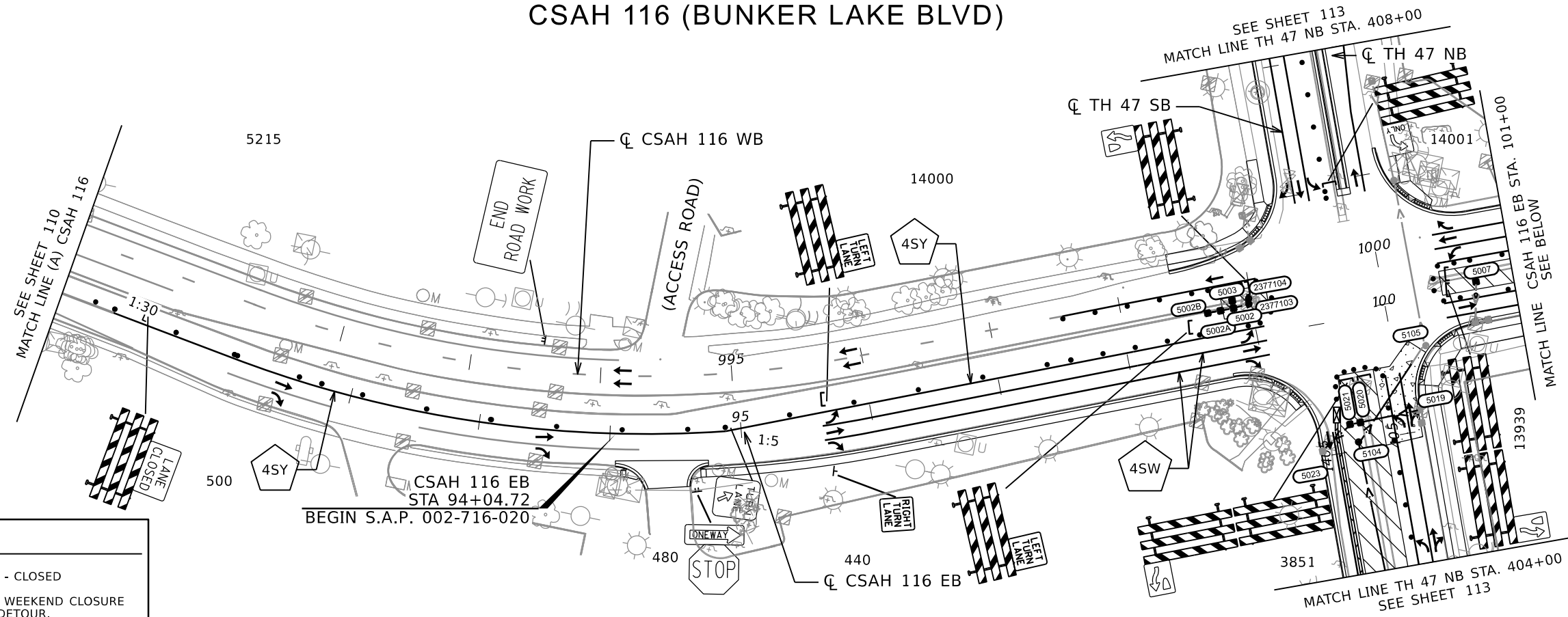
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**

**STAGE 3**  
**CONSTRUCTION STAGING & TRAFFIC CONTROL**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

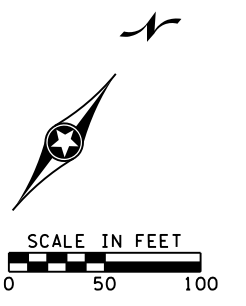
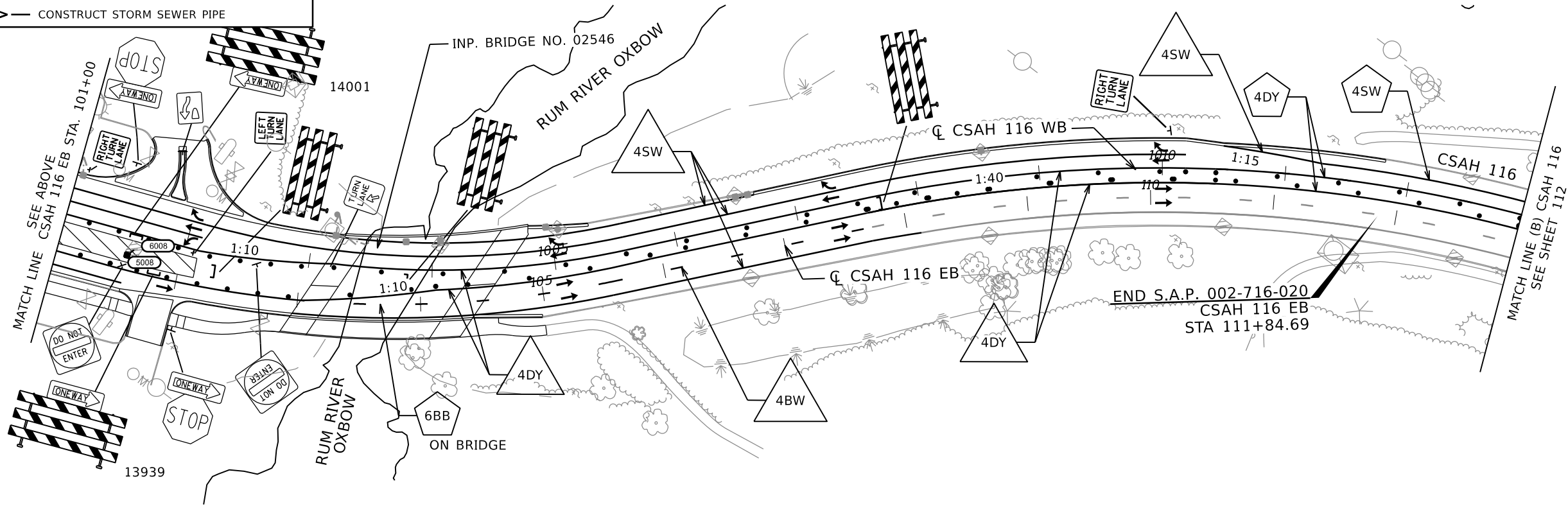
SHEET  
 110  
 OF  
 206  
 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



LEGEND	
	UNDER CONSTRUCTION - CLOSED
	CONSTRUCTION UNDER WEEKEND CLOSURE SEE SHEET 85 FOR DETOUR.
	TRAFFIC DIRECTION
	CONSTRUCT/MODIFY DRAINAGE STRUCTURE
	CONSTRUCT STORM SEWER PIPE

# CSAH 116 (BUNKER LAKE BLVD)



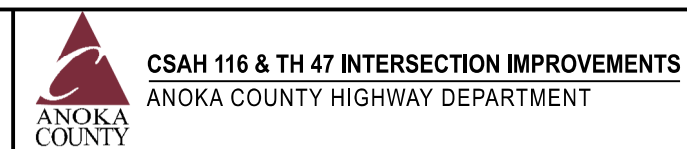
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

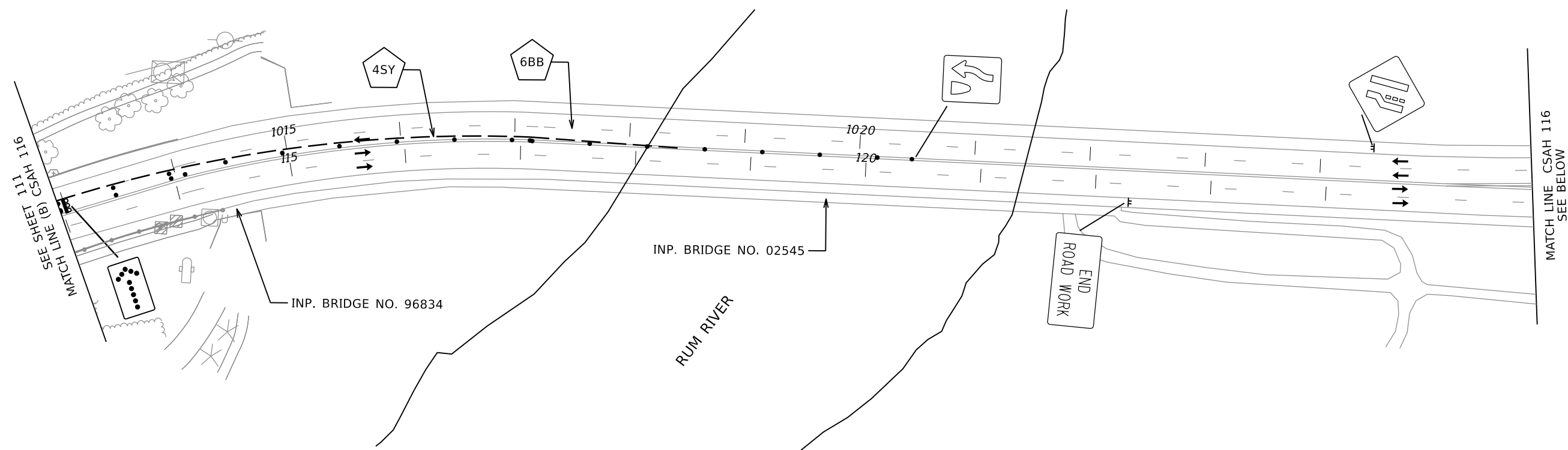
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 STAGE 3  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 111  
 OF  
 206  
 SHEETS

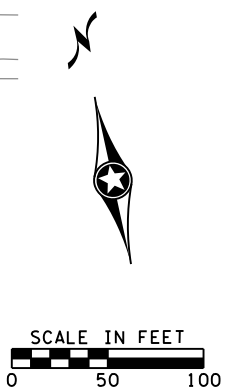
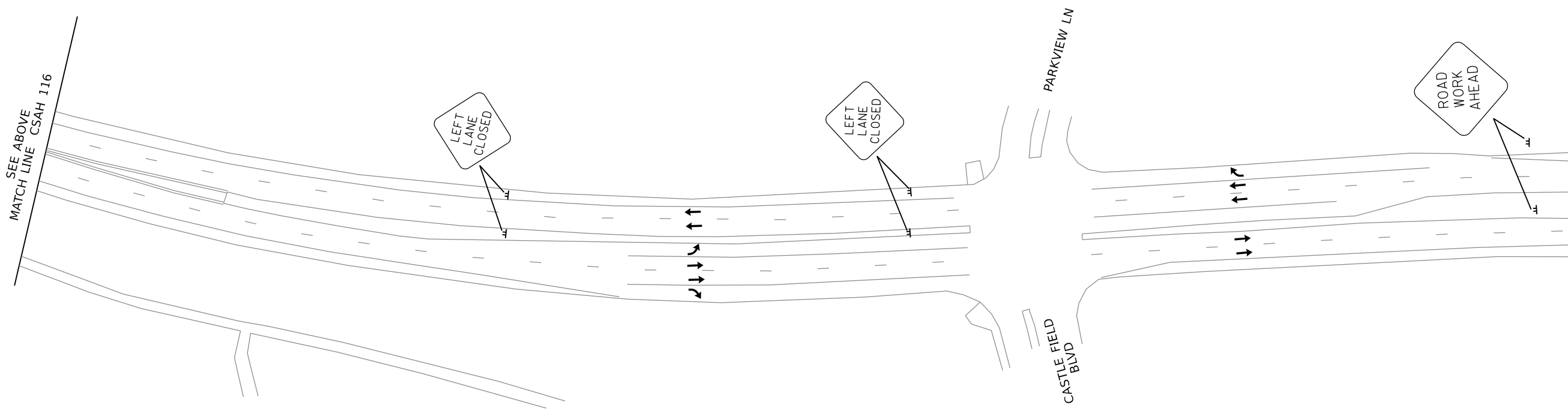
CSAH 116 (BUNKER LAKE BLVD)



LEGEND

→ TRAFFIC DIRECTION

CSAH 116 (BUNKER LAKE BLVD)



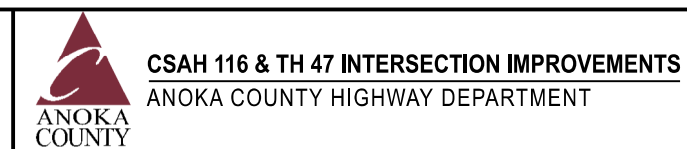
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

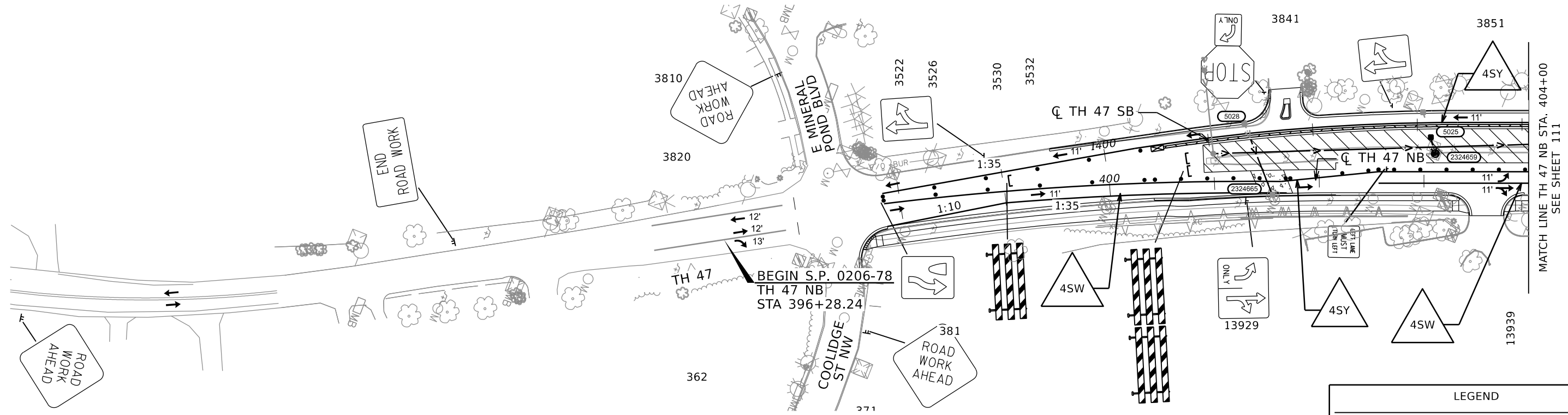


ANOKA COUNTY, MN  
 STAGE 3  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 112 OF 206 SHEETS



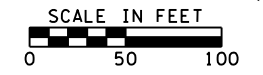
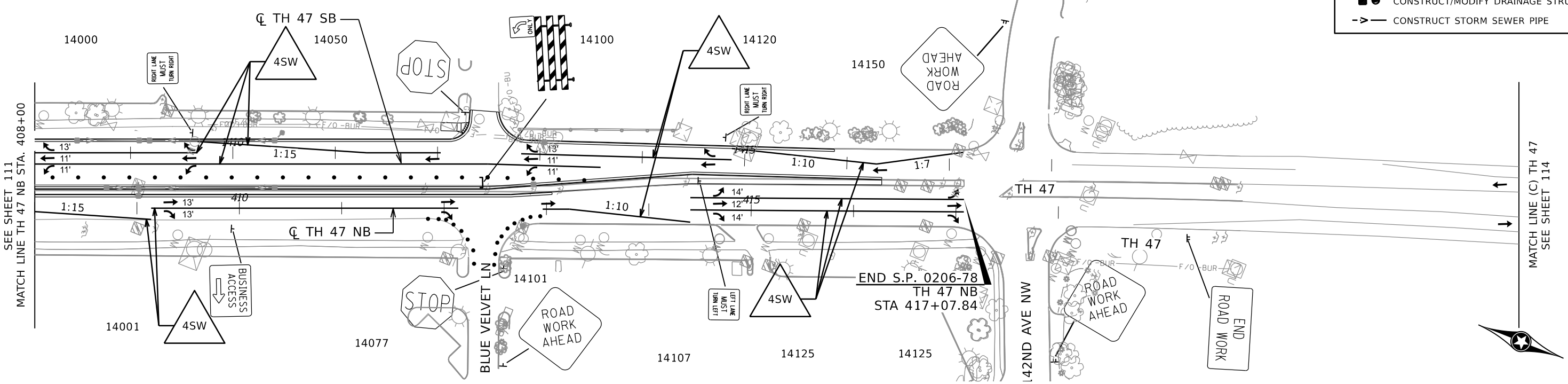
# TRUNK HIGHWAY 47



**LEGEND**

- UNDER CONSTRUCTION - CLOSED
- CONSTRUCT UNDER TRAFFIC
- CONSTRUCTION UNDER NIGHT CLOSURE SEE SHEET 85 FOR DETOUR.
- TRAFFIC DIRECTION
- CONSTRUCT/MODIFY DRAINAGE STRUCTURE
- CONSTRUCT STORM SEWER PIPE

# TRUNK HIGHWAY 47



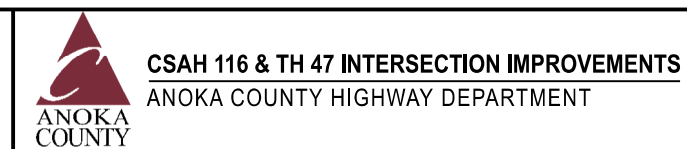
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

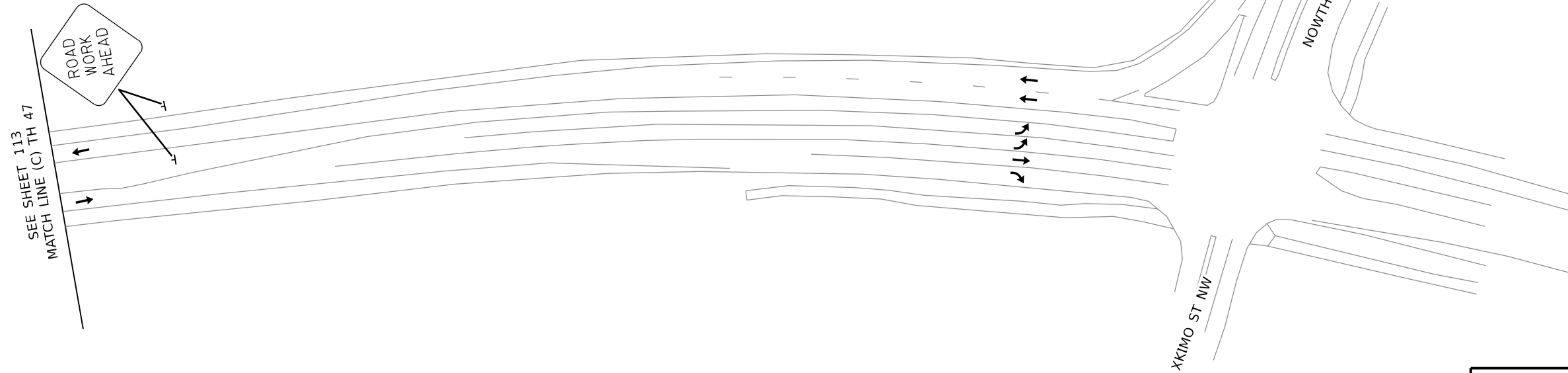
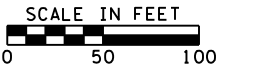
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 STAGE 3  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 113  
 OF  
 206  
 SHEETS

# TRUNK HIGHWAY 47



LEGEND	
→	TRAFFIC DIRECTION

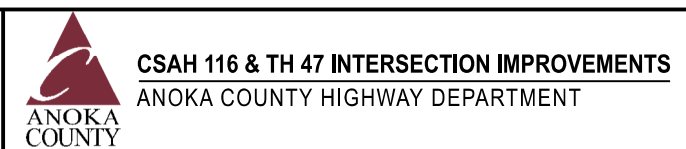
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

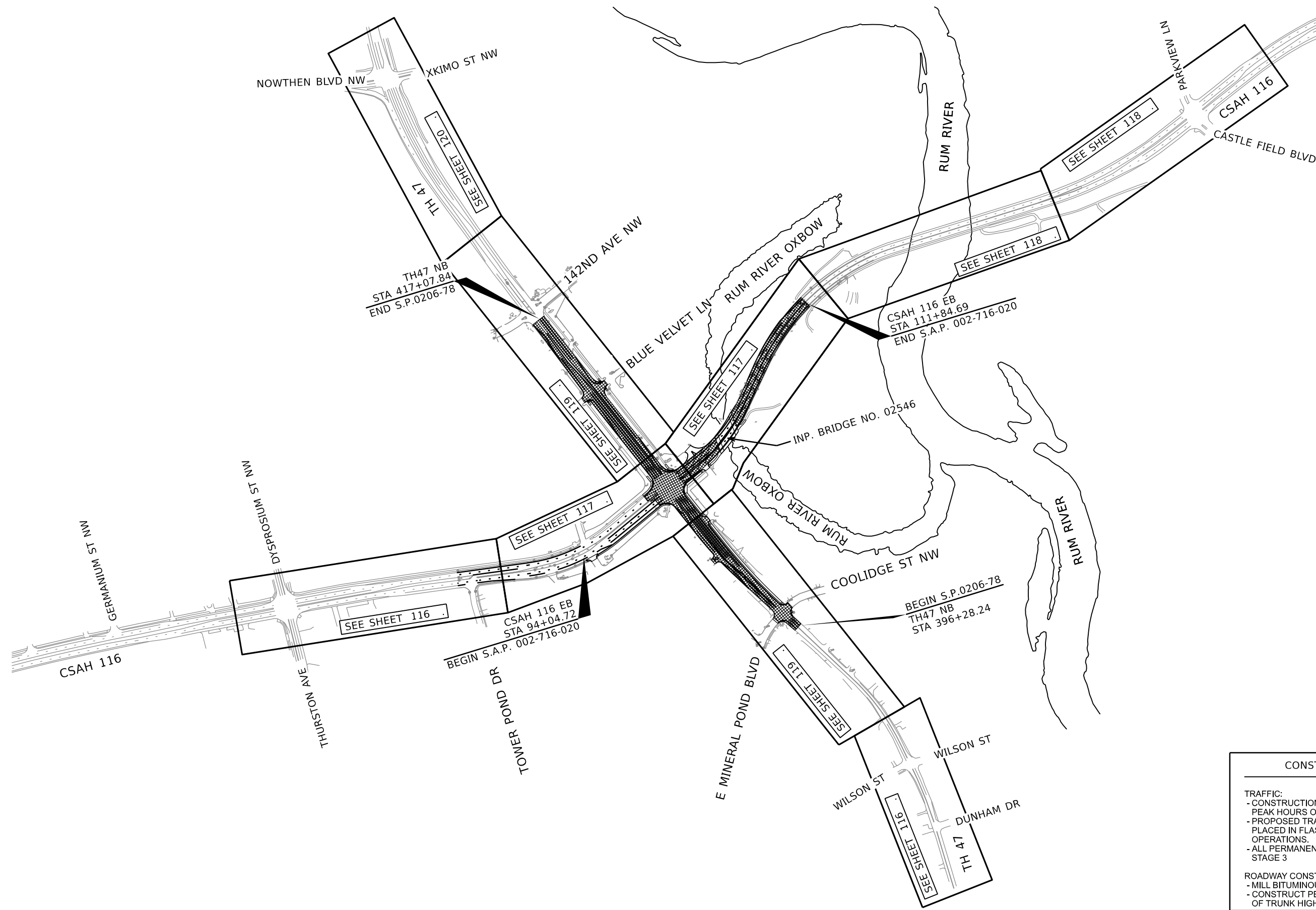
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 STAGE 3  
**CONSTRUCTION STAGING & TRAFFIC CONTROL**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
114  
OF  
206  
SHEETS



**CONSTRUCTION NOTES - STAGE 4**

**TRAFFIC:**

- CONSTRUCTION OPERATIONS TO TAKE PLACE DURING OFF PEAK HOURS OR AS APPROVED BY THE ENGINEER.
- PROPOSED TRAFFIC SIGNAL TO BE OPERATIONAL AND PLACED IN FLASHING RED PRIOR TO ALL CONSTRUCTION OPERATIONS.
- ALL PERMANENT SIGNING TO BE IN PLACE FOLLOWING STAGE 3

**ROADWAY CONSTRUCTION:**

- MILL BITUMINOUS SURFACE, PAVE FINAL BITUMINOUS LIFT.
- CONSTRUCT PEDESTRIAN FACILITIES AT THE INTERSECTION OF TRUNK HIGHWAY 47 AND CSAH 116.

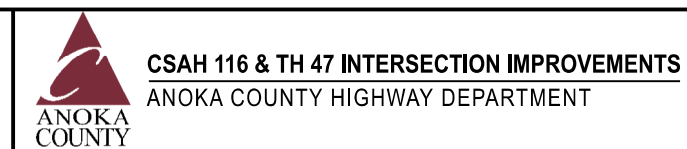
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *Nicolas E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - NICOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



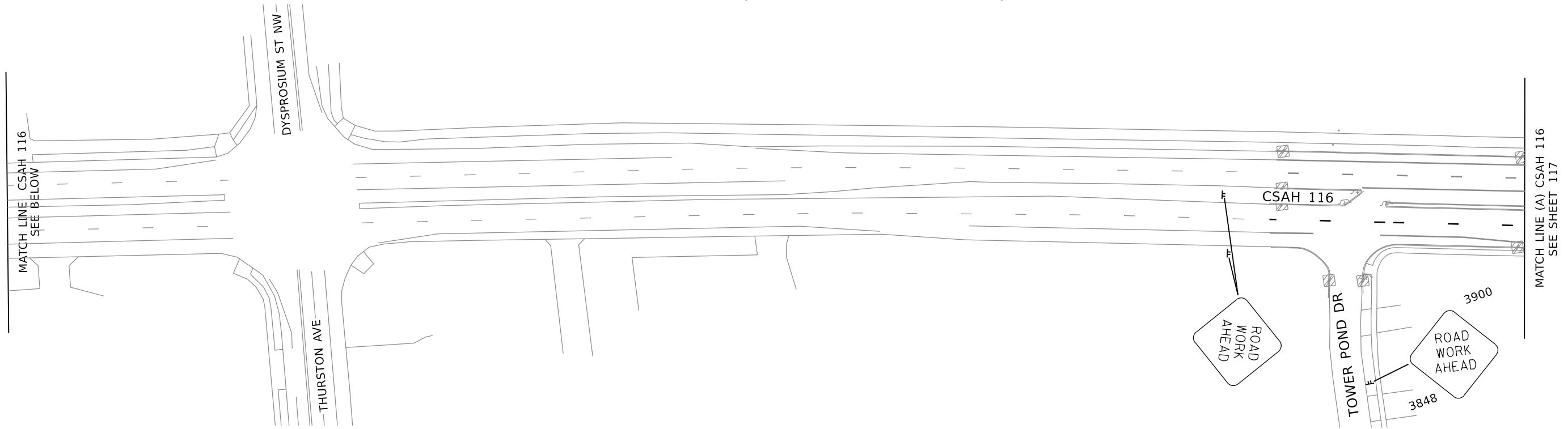
**ANOKA COUNTY, MN**

**STAGE 4 - GENERAL LAYOUT  
CONSTRUCTION STAGING**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
115  
OF  
206  
SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



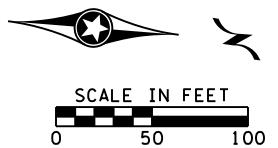
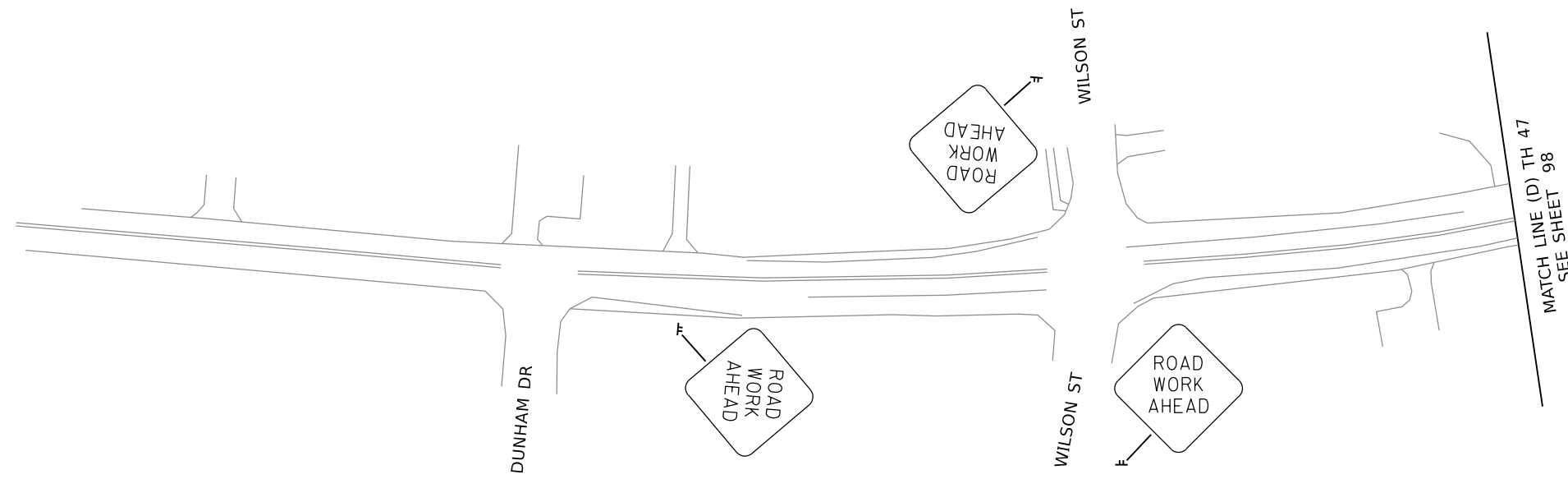
**LEGEND**

→ TRAFFIC DIRECTION

**GENERAL NOTES**

1. PERMANENT SIGNING TO BE IN PLACE FOLLOWING STAGE 3.

# TRUNK HIGHWAY 47



DATE: 8/25/2020 2:55:07 PM  
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**

Plan By: **AJF**

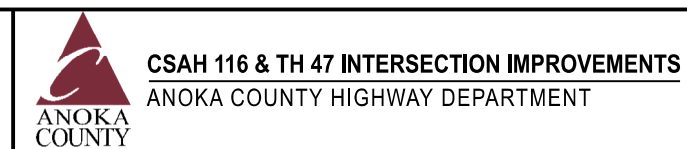
Checked By: **NEH**

Approved By: **NEH**

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

CERTIFIED BY: *[Signature]*  
LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE

DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**

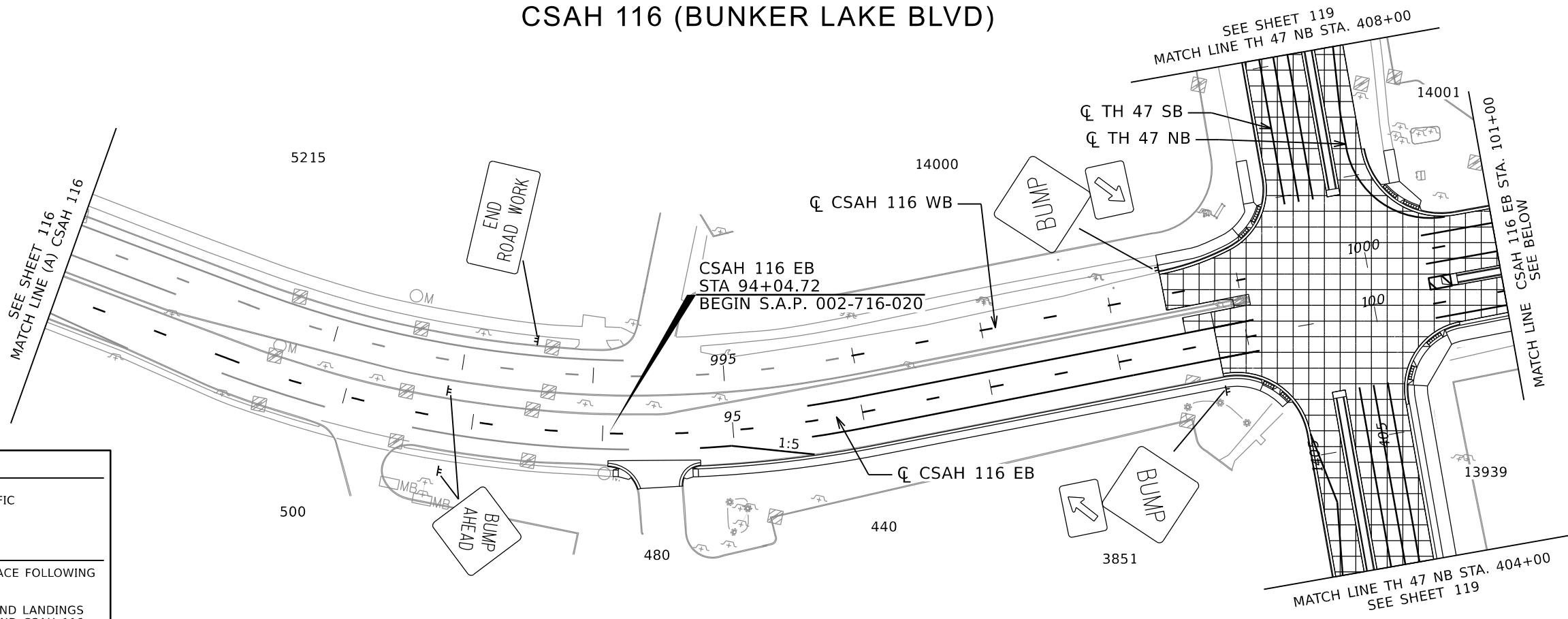
STAGE 4

CONSTRUCTION STAGING & TRAFFIC CONTROL

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 116 OF 206 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



**LEGEND**

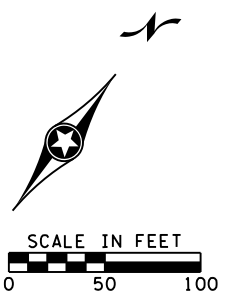
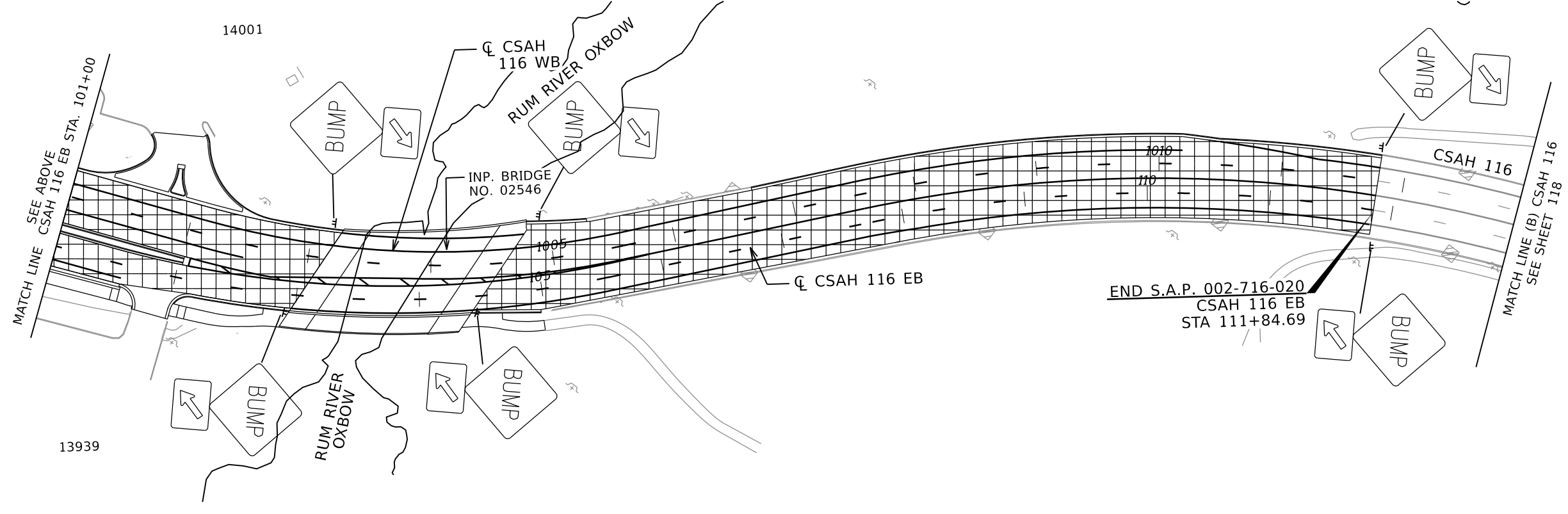
CONSTRUCTION UNDER TRAFFIC

TRAFFIC DIRECTION

**GENERAL NOTES**

- PERMANENT SIGNING TO BE IN PLACE FOLLOWING STAGE 3.
- CONSTRUCT PEDESTRIAN RAMPS AND LANDINGS AT THE INTERSECTION OF TH 47 AND CSAH 116. SEE SHEET 88 FOR PEDESTRIAN DETOUR AND ADDITIONAL DETAILS.

# CSAH 116 (BUNKER LAKE BLVD)



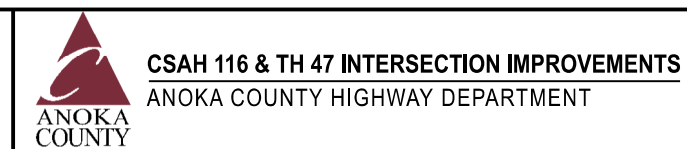
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

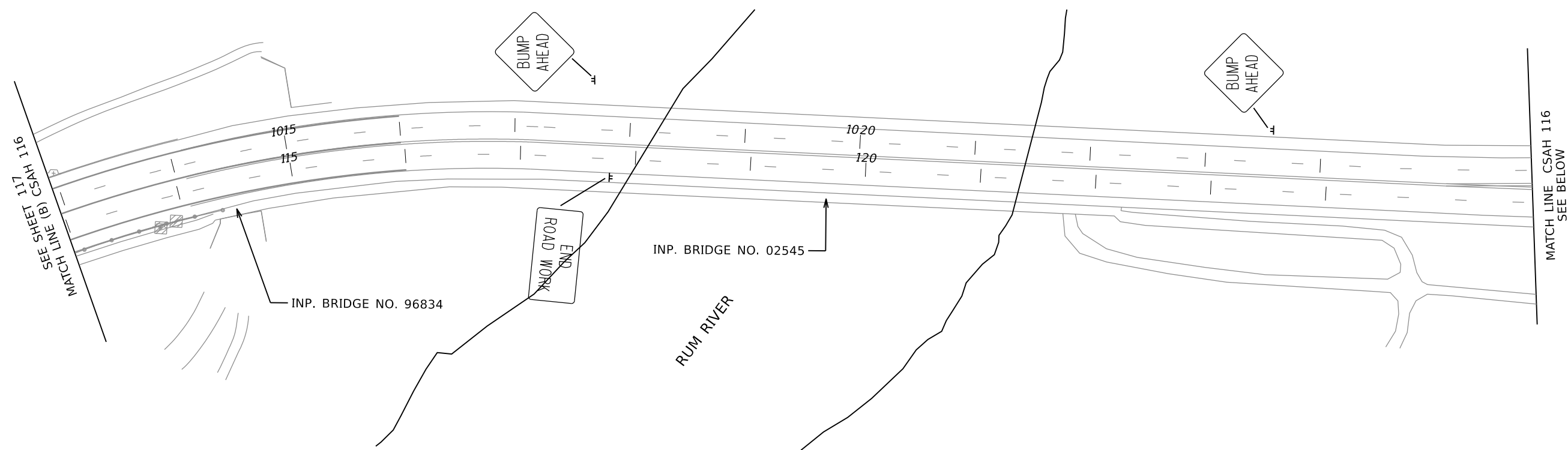
CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



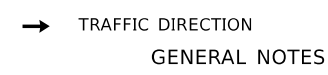
ANOKA COUNTY, MN  
 STAGE 4  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 117 OF 206 SHEETS

CSAH 116 (BUNKER LAKE BLVD)

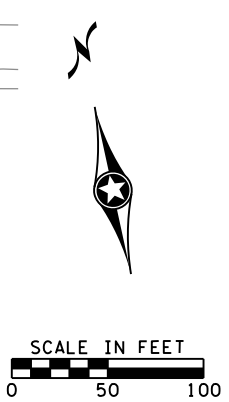
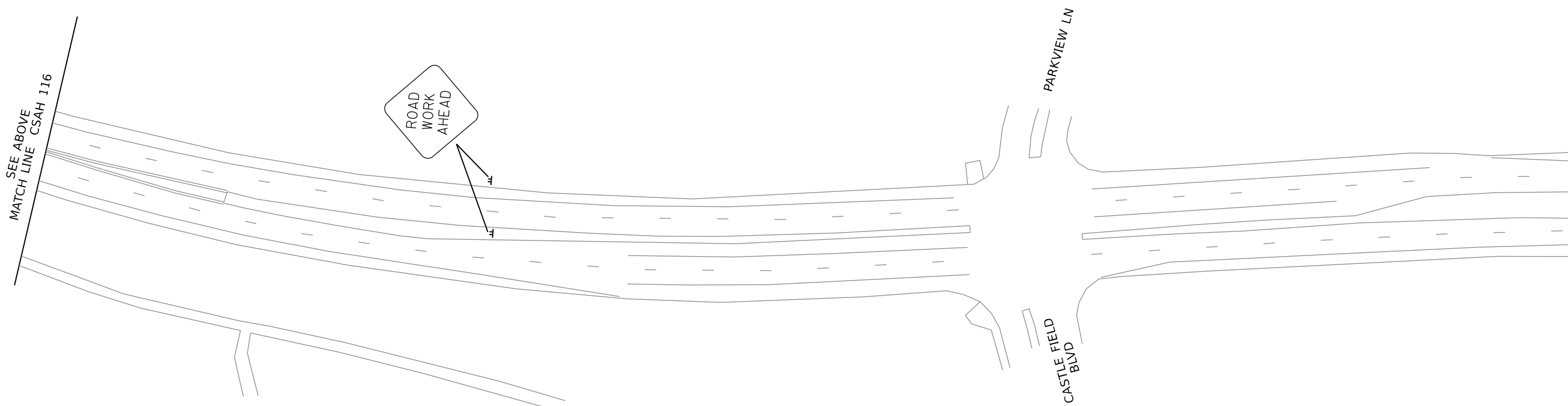


LEGEND



- 1. PERMANENT SIGNING TO BE IN PLACE FOLLOWING STAGE 3.

CSAH 116 (BUNKER LAKE BLVD)



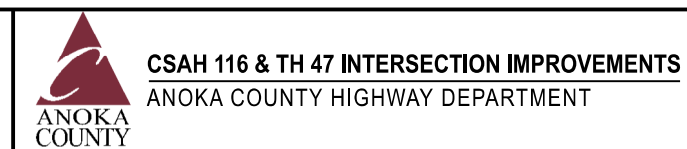
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

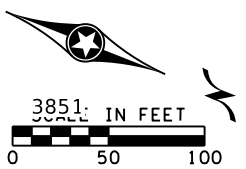
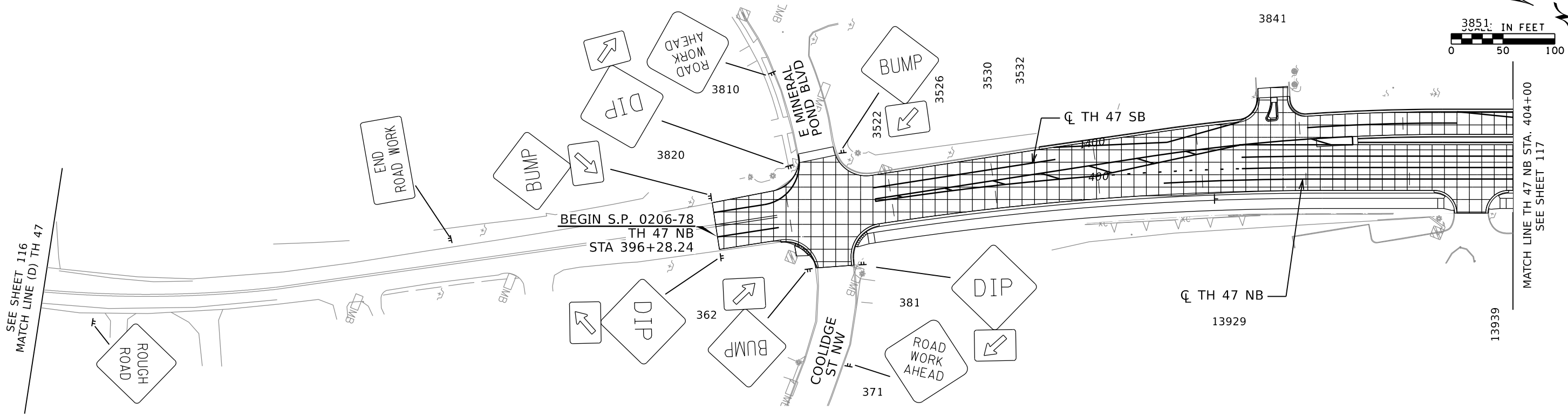
CERTIFIED BY: *NEH*  
 LICENSED PROFESSIONAL ENGINEER - 44620  
 DATE: 8/25/2020 LICENSE NO. 44620



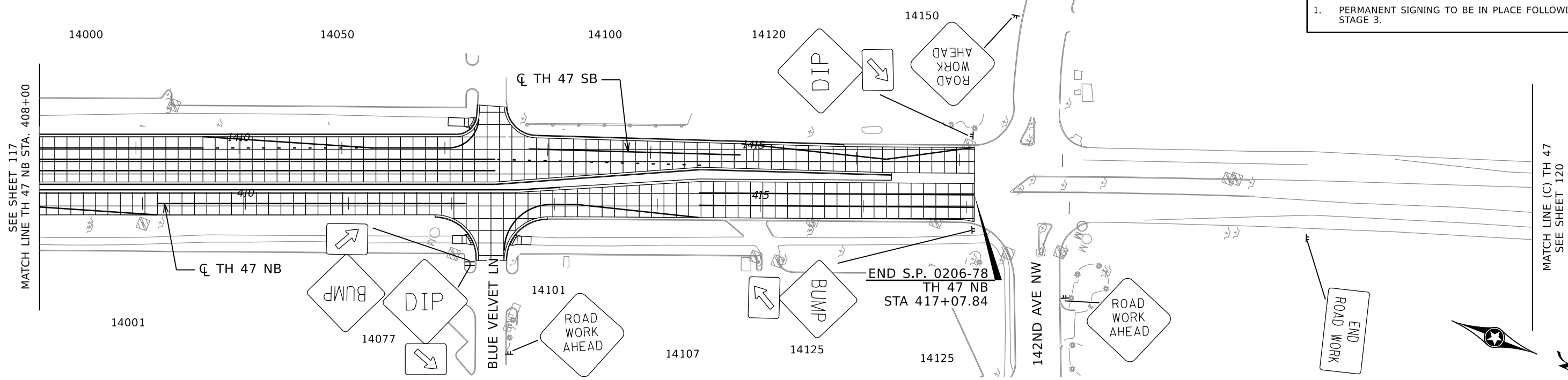
ANOKA COUNTY, MN  
 STAGE 4  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 118  
 OF  
 206  
 SHEETS

# TRUNK HIGHWAY 47



# TRUNK HIGHWAY 47



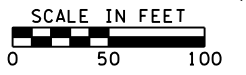
**LEGEND**

CONSTRUCTION UNDER TRAFFIC

TRAFFIC DIRECTION

**GENERAL NOTES**

1. PERMANENT SIGNING TO BE IN PLACE FOLLOWING STAGE 3.



DATE: 8/25/2020 2:55:22 PM  
PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\4652-000\_cs4-2.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**

Plan By: **AJF**

Checked By: **NEH**

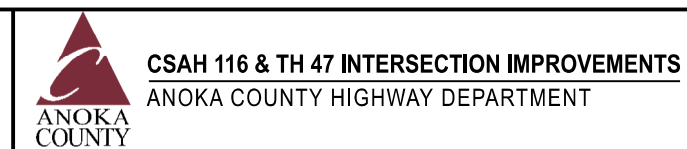
Approved By: **NEH**

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

CERTIFIED BY: **NICHOLAS E. HENTGES, PE**

LICENSED PROFESSIONAL ENGINEER

DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**

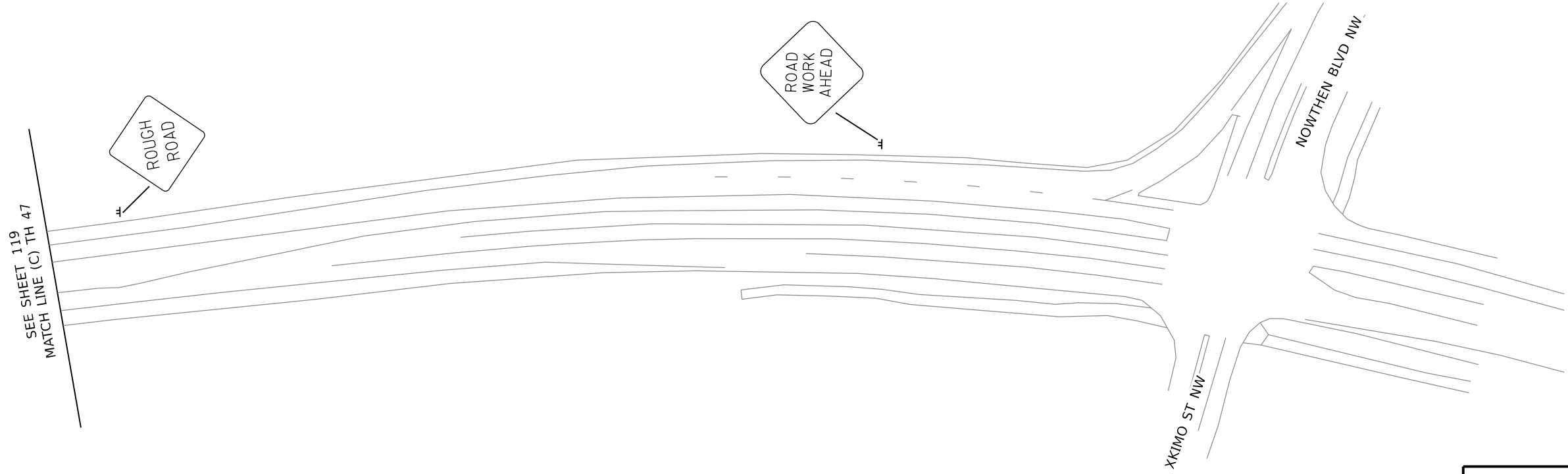
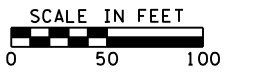
STAGE 4

CONSTRUCTION STAGING & TRAFFIC CONTROL

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 119 OF 206 SHEETS

# TRUNK HIGHWAY 47



SEE SHEET 119  
MATCH LINE (C) TH 47

ROUGH  
ROAD

ROAD  
WORK  
AHEAD

XKIMO ST NW

NOWTHEN BLVD NW

### LEGEND

→ TRAFFIC DIRECTION

### GENERAL NOTES

- PERMANENT SIGNING TO BE IN PLACE FOLLOWING STAGE 3.

DATE: 8/25/2020 2:55:26 PM  
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER **NICHOLAS E. HENTGES, PE**

DATE: 8/25/2020 LICENSE NO. 44620

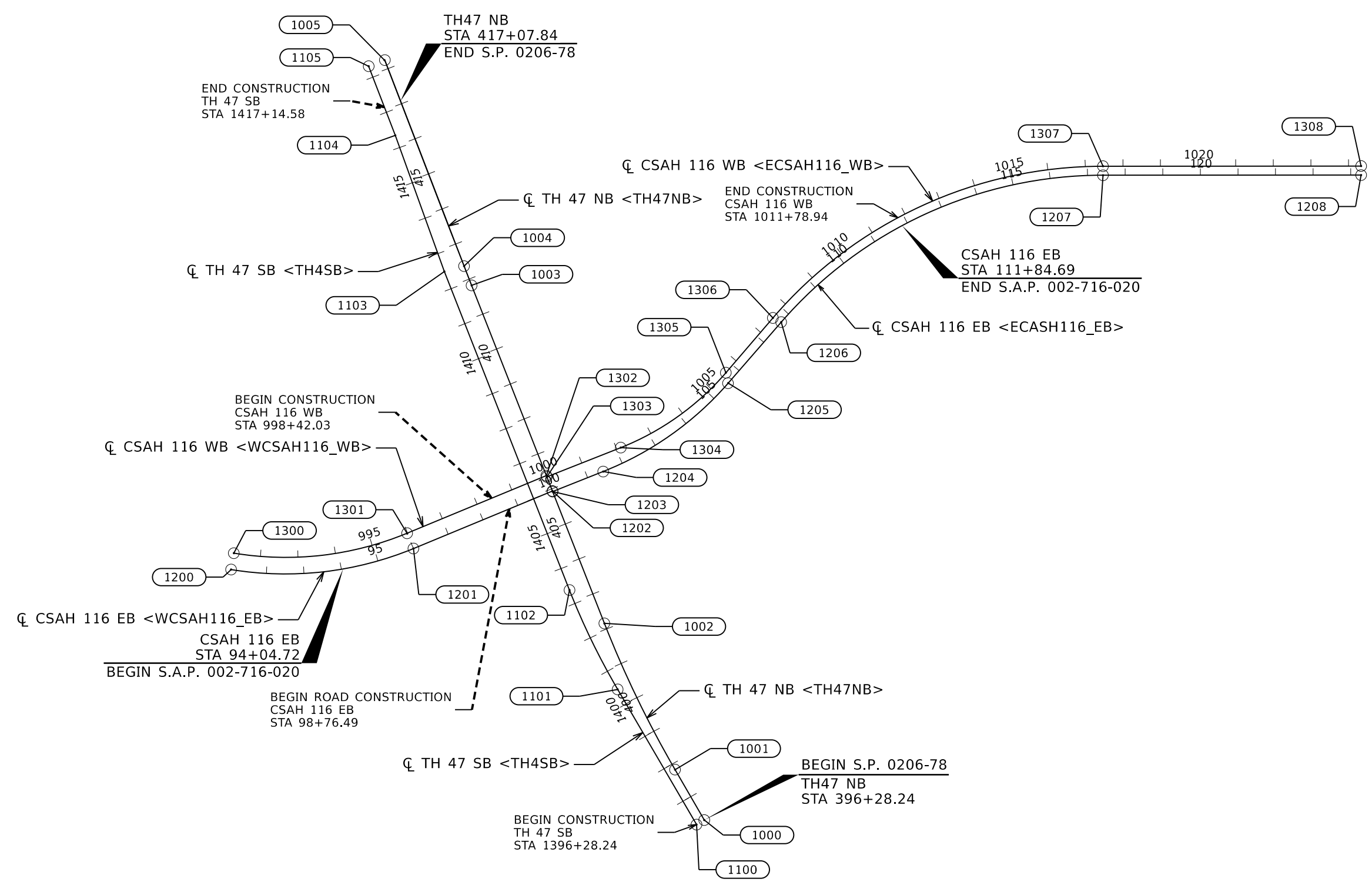


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 STAGE 4  
 CONSTRUCTION STAGING & TRAFFIC CONTROL  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 120  
 OF  
 206  
 SHEETS





THE HORIZONTAL CONTROL FOR THIS PLAN IS ANOKA COUNTY COORDINATES NAD 83 (96 ADJUSTMENT).  
 VERTICAL CONTROL FOR THIS PLAN IS NAVD 88.

LEGEND	
(XXXX)	POINT NUMBER (POINT DETAILS FOUND ON ALIGNMENT TABULATION SHEETS)
<XXXX>	INDICATES GEOPAK ALIGNMENT NAME

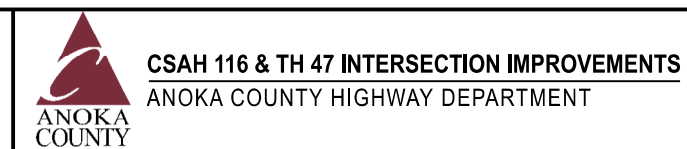
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



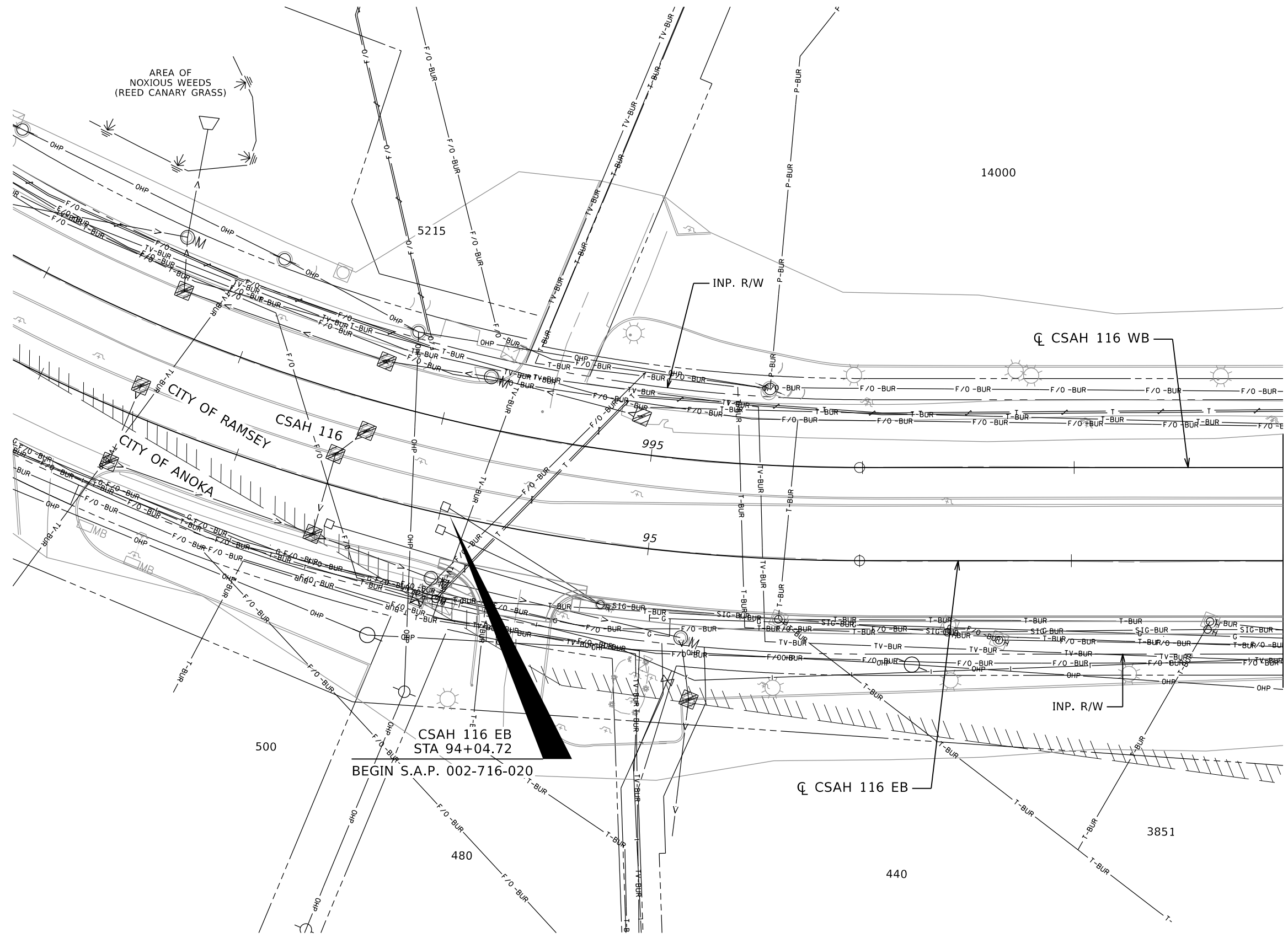
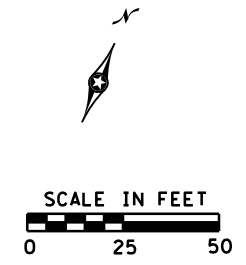
ANOKA COUNTY, MN

ALIGNMENT PLAN & TABULATIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 121  
 OF  
 206  
 SHEETS



# CSAH 116 (BUNKER LAKE BLVD)



**GENERAL NOTES**

- THE EXISTING SUBSURFACE UTILITY INFORMATION IS QUALITY LEVEL D IN ACCORDANCE TO THE GUIDELINE OF CI/ASCE 38-02.
- UTILITIES ARE SHOWN AT APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL DETERMINE THE ACTUAL LOCATION OF ALL BURIED UTILITIES IN THE FIELD.
- SEE INPLACE UTILITY TABULATIONS FOR MORE DETAILS.

**LEGEND**

- T-BUR- BURIED TELEPHONE LINE
- TV-BUR- BURIED TELEVISION LINE
- OH- OVERHEAD UTILITY LINE
- F/O-BUR- BURIED FIBER OPTIC LINE
- P-BUR- BURIED POWER LINE
- F/O- UTILITY IN CONDUIT
- OHP- OVERHEAD POWER LINE
- SIG-BUR- BURIED SIGNAL LINE
- G- UNDERGROUND GAS MAIN/SERVICE
- S- SANITARY SEWER LINE
- SS- STORM SEWER LINE
- FM- FORCEMAIN
- WM- WATERMAIN
- U- UTILITY PEDESTAL
- HH- HANDHOLE
- PUP- POWER/UTILITY POLE
- LP- LIGHT POLE
- C- CABINET
- V- VALVE (GAS)
- M- MANHOLE
- CB- CATCH BASIN
- CA- CONCRETE APRON
- H- HYDRANT
- VW- VALVE (WATER)
- VG- VALVE (GAS)
- V- VEGETATION
- IS- INPLACE STRUCTURE
- GR- EXISTING GUARD RAIL
- AES- AREA OF ENVIRONMENTAL SENSITIVITY
- B- BOLLARD
- RW- RETAINING WALL
- EF- EXISTING FENCE
- ISS- INPLACE SIGNAL SYSTEM

MATCH LINE CSAH 116 EB STA. 98+00 SEE SHEET 127

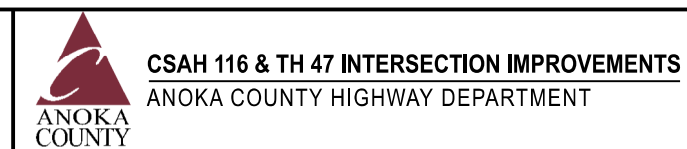
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

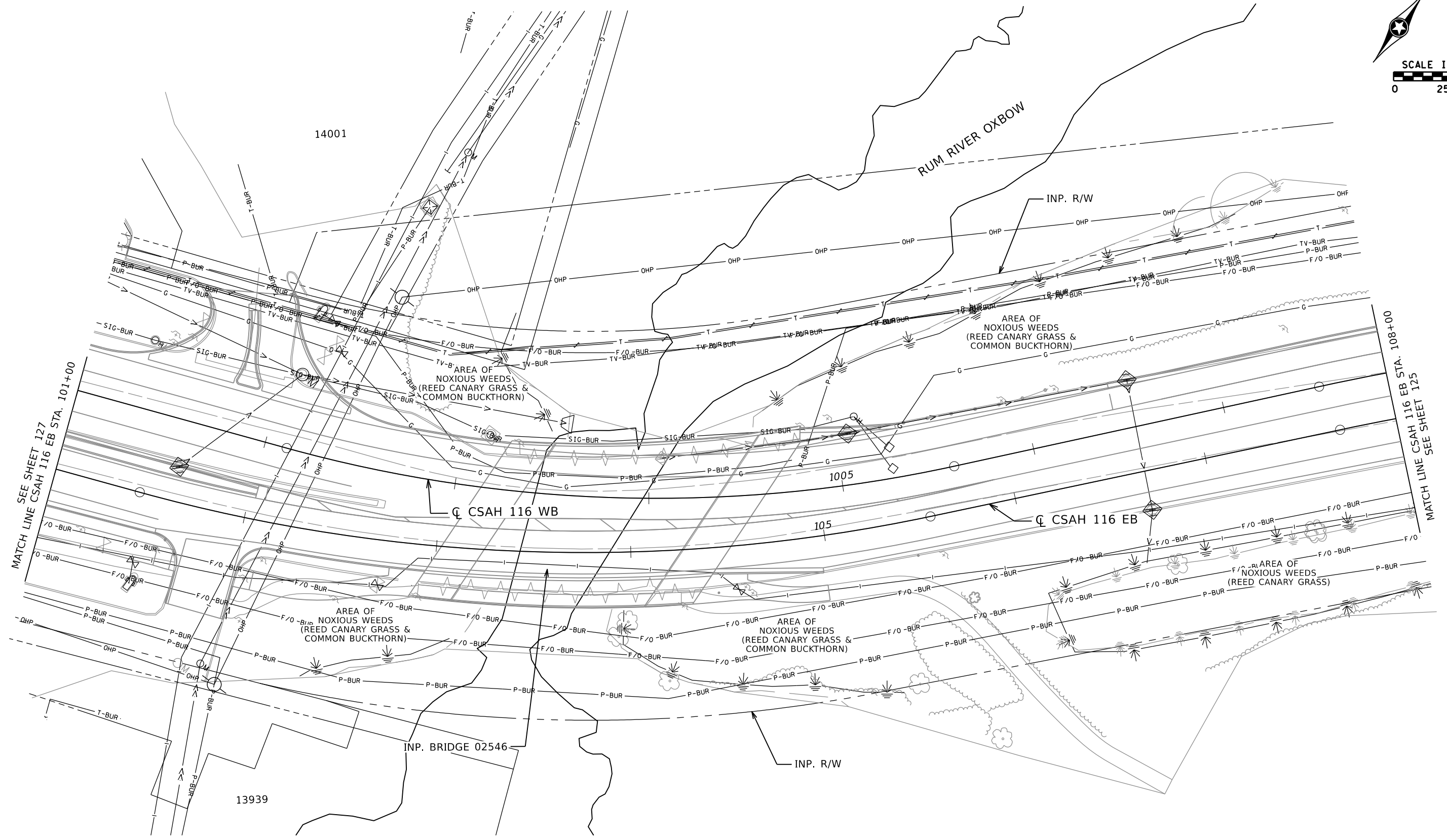
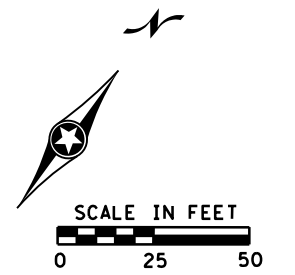
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - NICOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 CSAH 116  
 INPLACE UTILITY & TOPOGRAPHY PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 123 OF 206 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



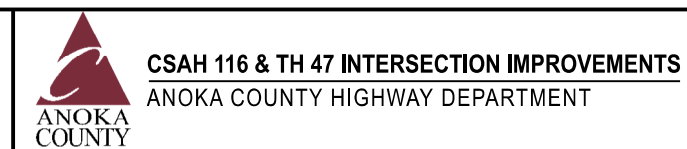
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

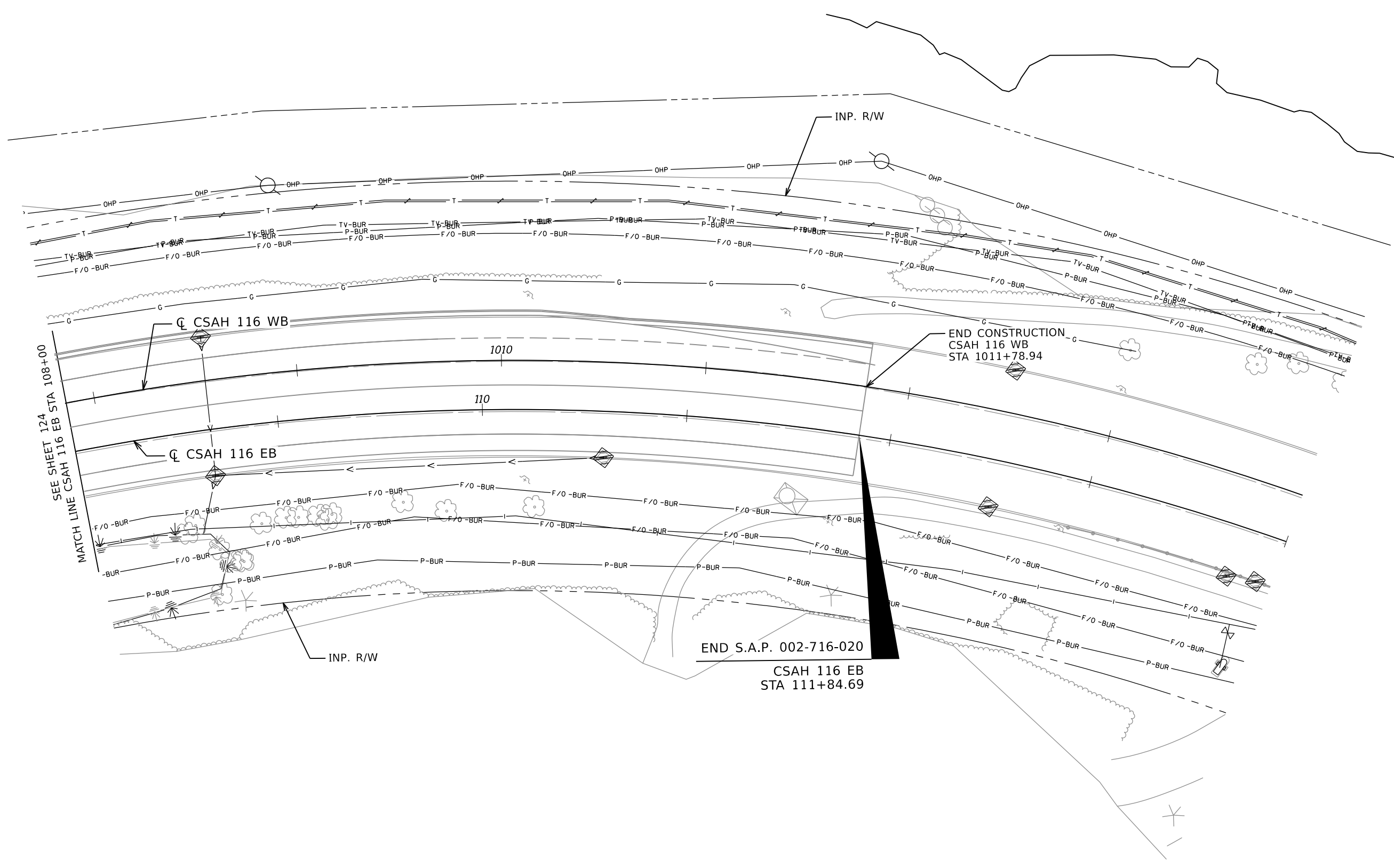
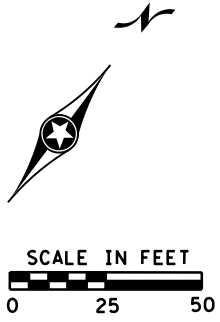
CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 CSAH 116  
 INPLACE UTILITY & TOPOGRAPHY PLANS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 124  
 OF  
 206  
 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



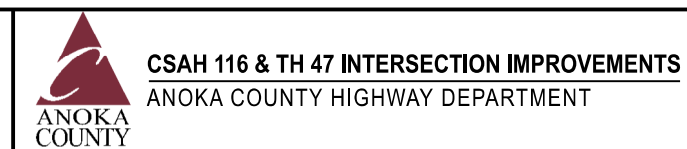
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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

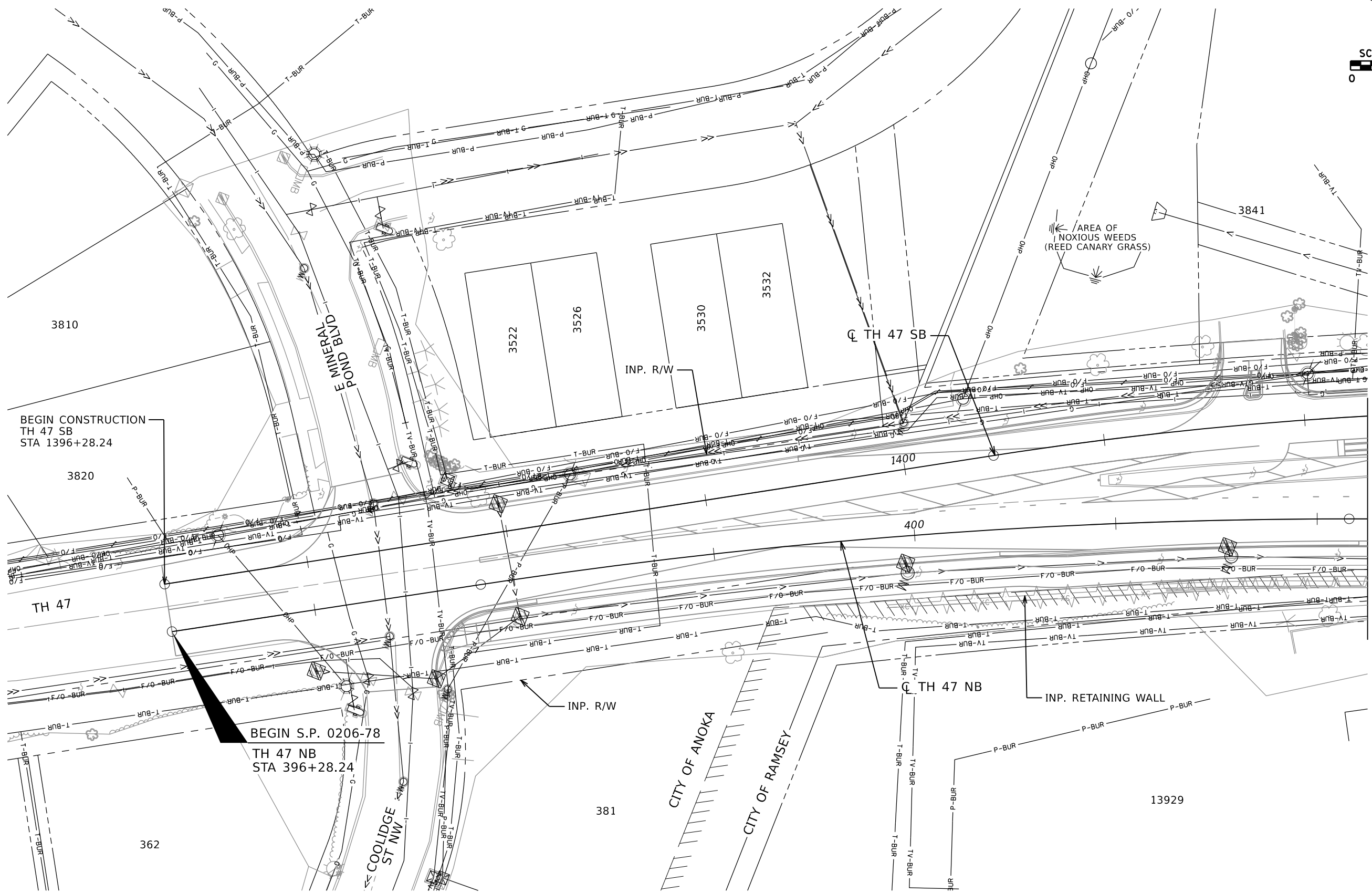
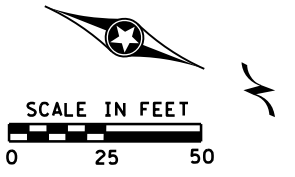
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 CSAH 116  
 INPLACE UTILITY & TOPOGRAPHY PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 125  
 OF  
 206  
 SHEETS

# TRUNK HIGHWAY 47



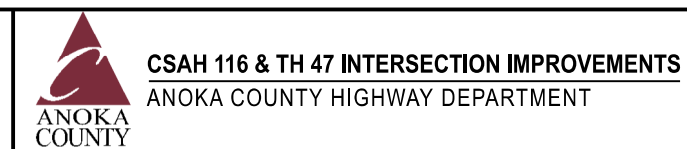
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

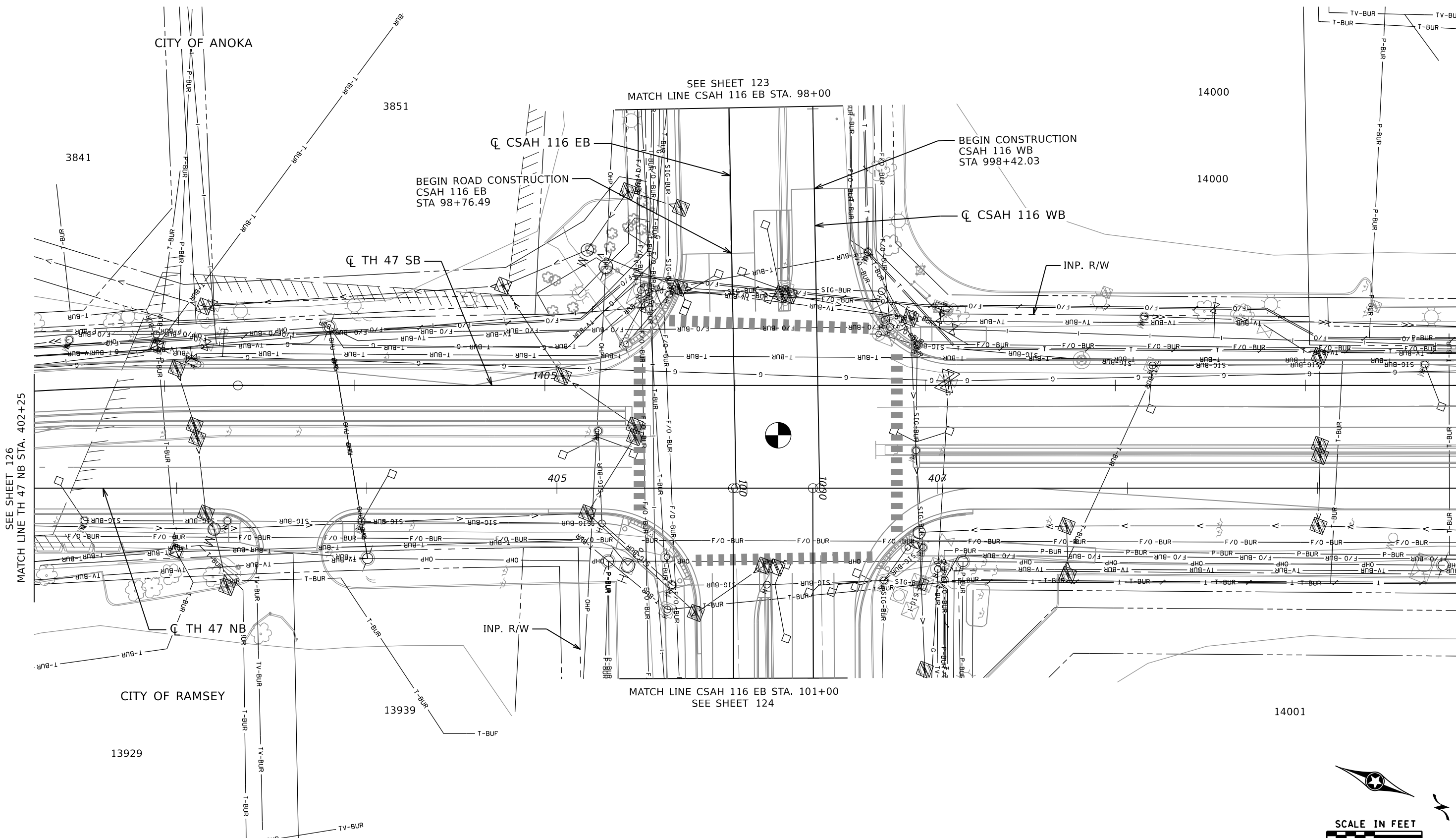
CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
 INPLACE UTILITY & TOPOGRAPHY PLANS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 126 OF 206 SHEETS

# TRUNK HIGHWAY 47



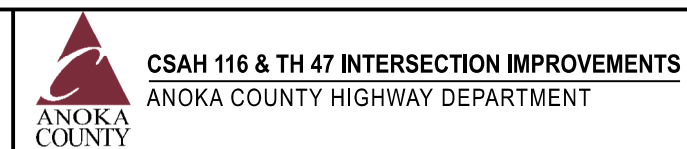
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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

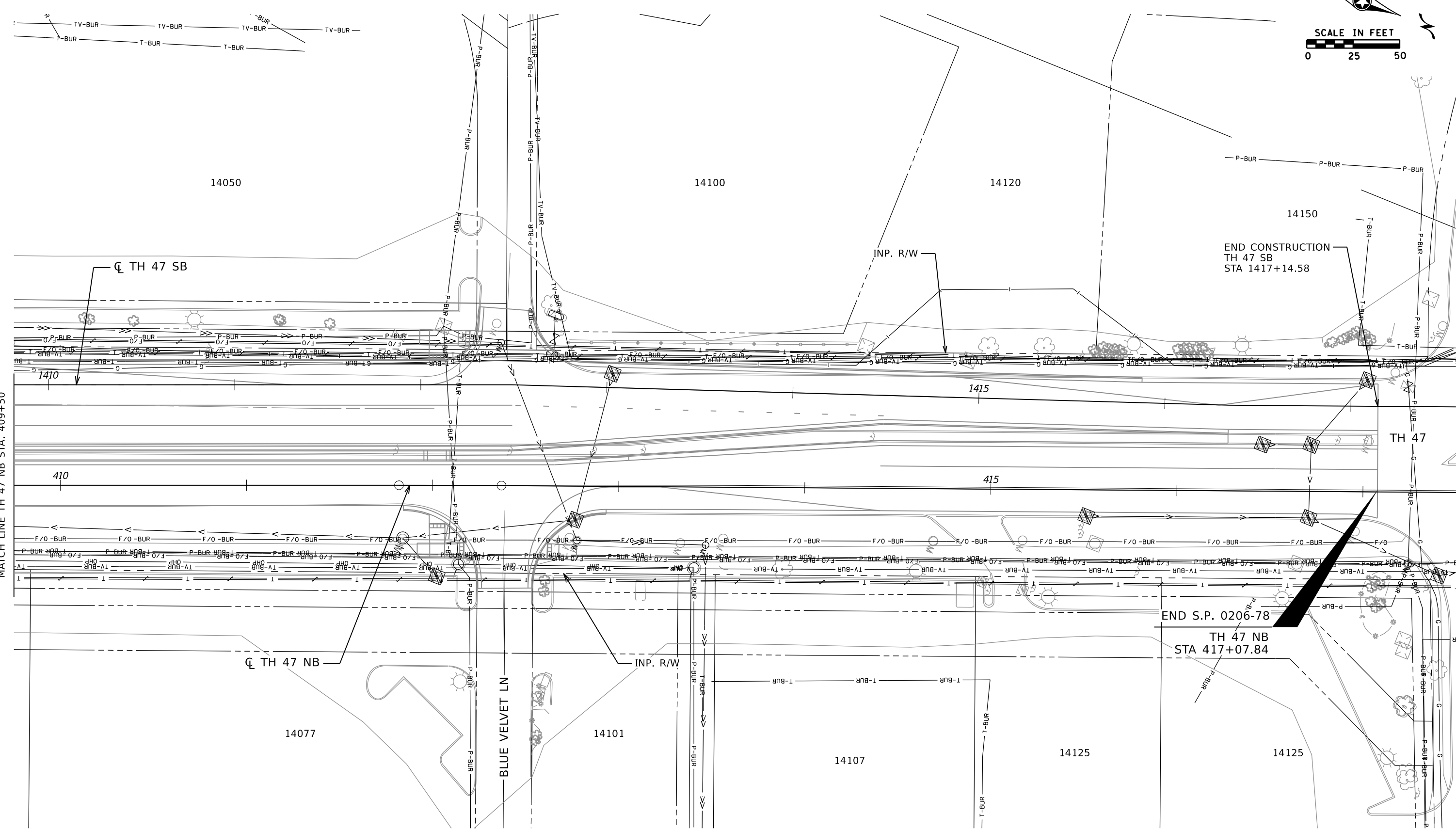
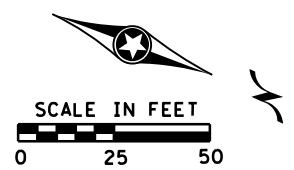
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**  
 TRUNK HIGHWAY 47  
 INPLACE UTILITY & TOPOGRAPHY PLANS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 127  
 OF  
 206  
 SHEETS

# TRUNK HIGHWAY 47



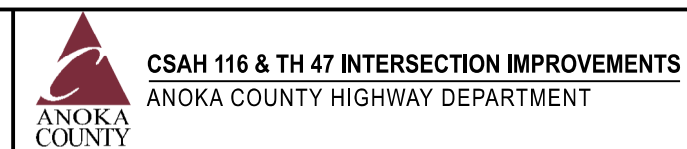
SEE SHEET 127  
MATCH LINE TH 47 NB STA. 409+50

DATE: 8/25/2020 2:09:46 PM  
PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_1406.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 CERTIFIED BY: *[Signature]*  
LICENSED PROFESSIONAL ENGINEER - 44620  
 DATE: 8/25/2020 LICENSE NO. 44620



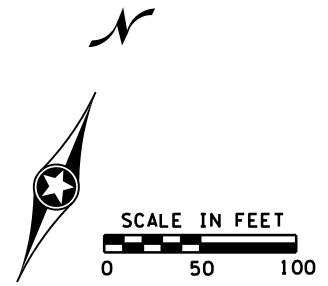
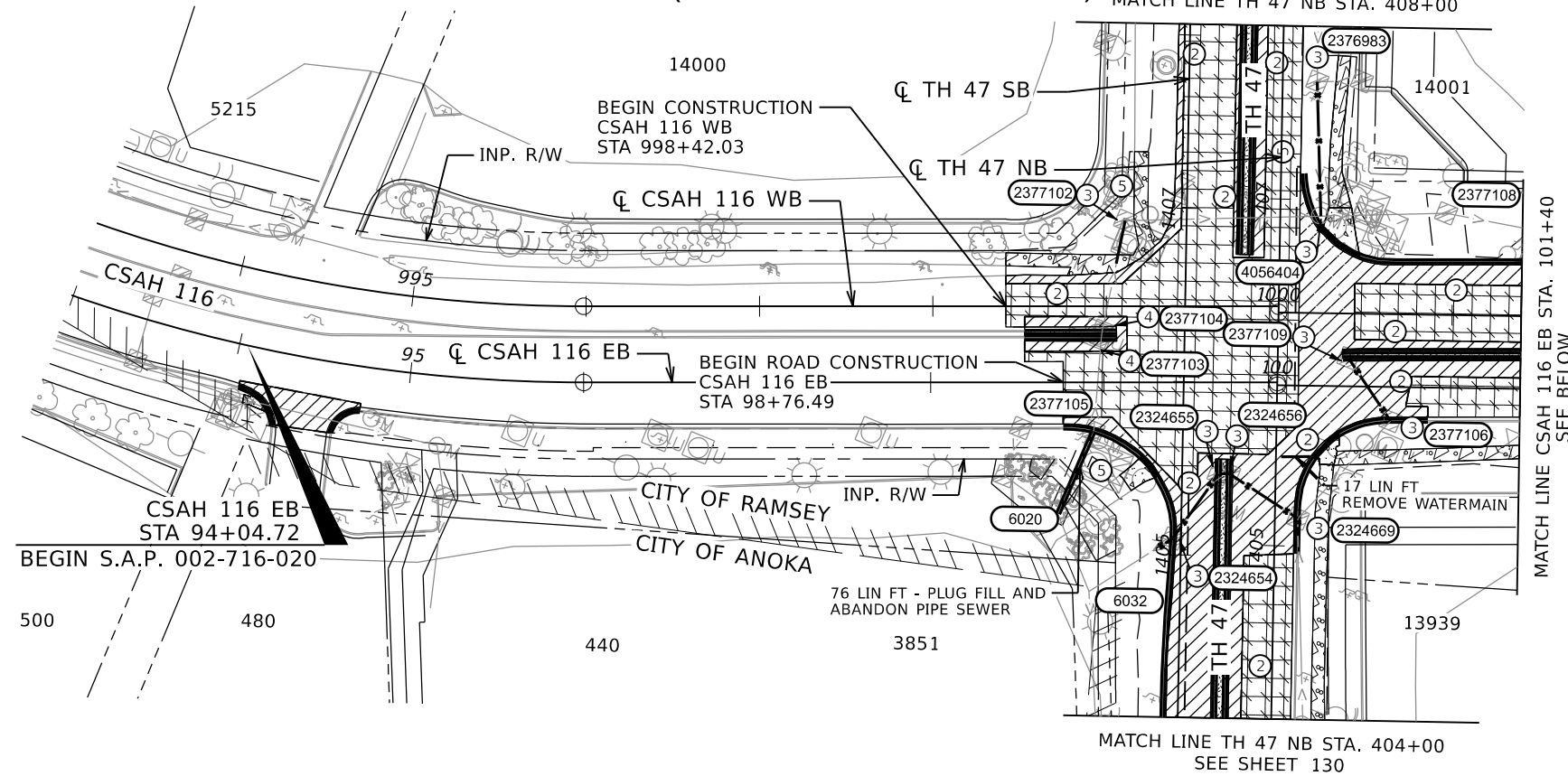
ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
 INPLACE TOPOGRAPHY & UTILITY PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 128  
 OF  
 206  
 SHEETS



# CSAH 116 (BUNKER LAKE BLVD)

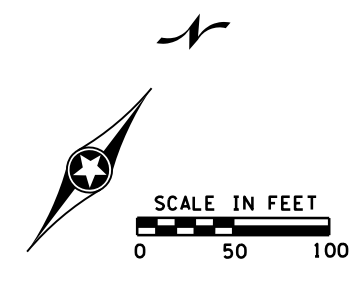
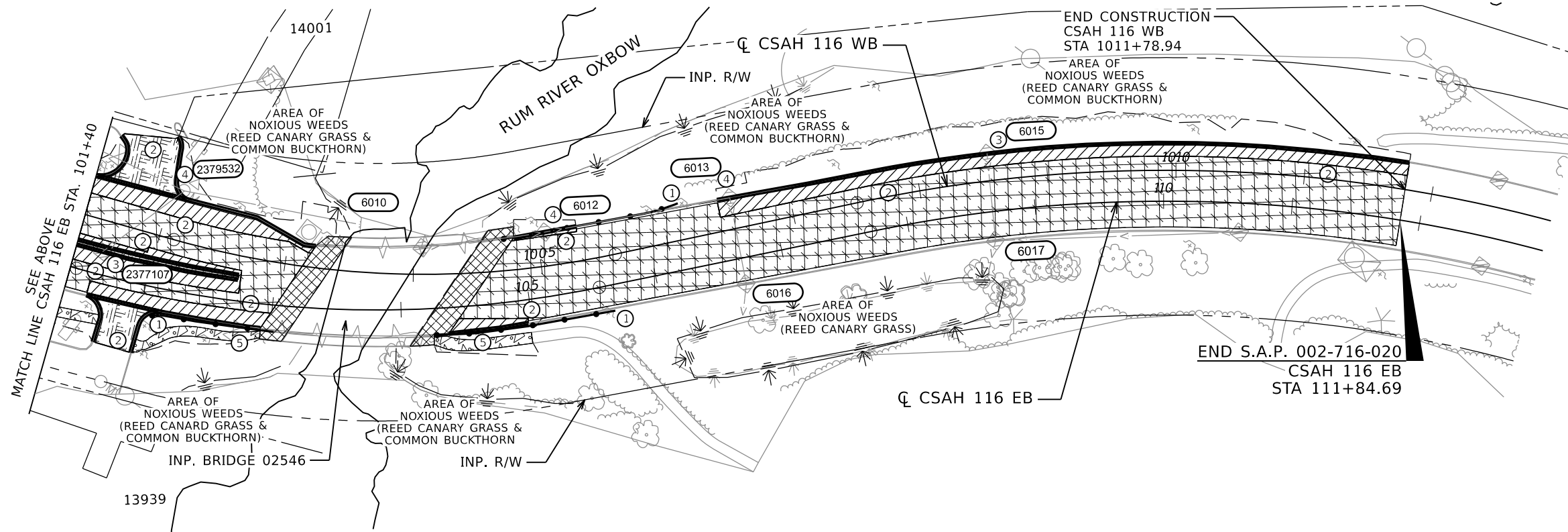
SEE SHEET 130  
MATCH LINE TH 47 NB STA. 408+00



LEGEND	
	MILL BITUMINOUS SURFACE (2.0")
	REMOVE BITUMINOUS PAVEMENT
	REMOVE BITUMINOUS DRIVEWAY PAVEMENT
	REMOVE BITUMINOUS WALK
	REMOVE CONCRETE WALK
	REMOVE CONCRETE MEDIAN
	REMOVE CONCRETE APPROACH PANEL
	REMOVE ENERGY ABSORBING TERMINAL
	SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
	REMOVE DRAINAGE STRUCTURE
	REMOVE CASTING
	ADJUST GAVE VALVE & BOX
	REMOVE CONCRETE CURB & GUTTER
	REMOVE GUARDRAIL PLATE BEAM
	REMOVE PIPE SEWER
	CONSTRUCTION LIMITS
	INPLACE RIGHT OF WAY
	INPLACE EASEMENT
	EXISTING STORM SEWER STRUCTURE ID

- GENERAL NOTES**
1. REMOVAL OF ALL AGGREGATE SURFACING REGARDLESS OF THICKNESS SHALL BE INCLUDED IN COMMON EXCAVATION.
  2. ALL REMOVAL ITEMS SHALL BE DISPOSED OF OFF THE PROJECT SITE. (INCIDENTAL)
  3. SAWCUTTING FOR CONCRETE CURB & GUTTER, CONCRETE WALK, AND BITUMINOUS WALK SHALL BE INCIDENTAL.
  4. INPLACE BITUMINOUS PAVEMENT THICKNESS 6" - 10". NO ADDITIONAL PAYMENT FOR EXTRA THICKNESS.

# CSAH 116 (BUNKER LAKE BLVD)



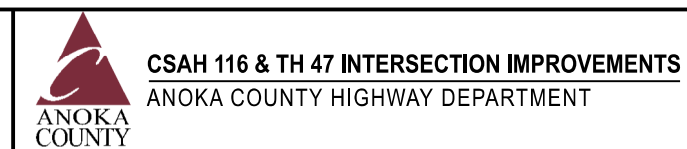
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

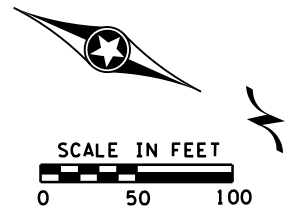
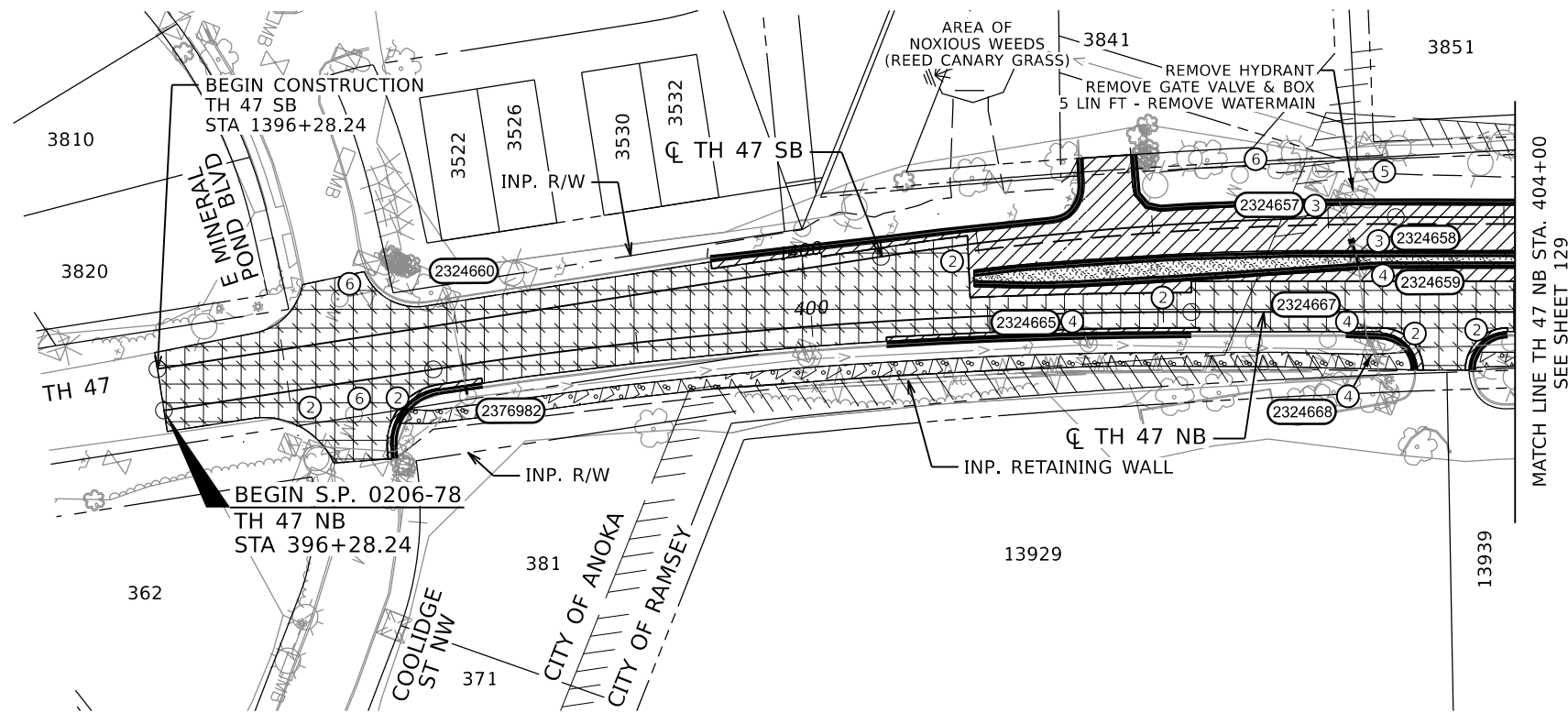
CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 CSAH 116  
 MISCELLANEOUS REMOVAL PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
129  
OF  
206  
SHEETS

# TRUNK HIGHWAY 47



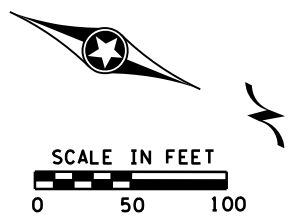
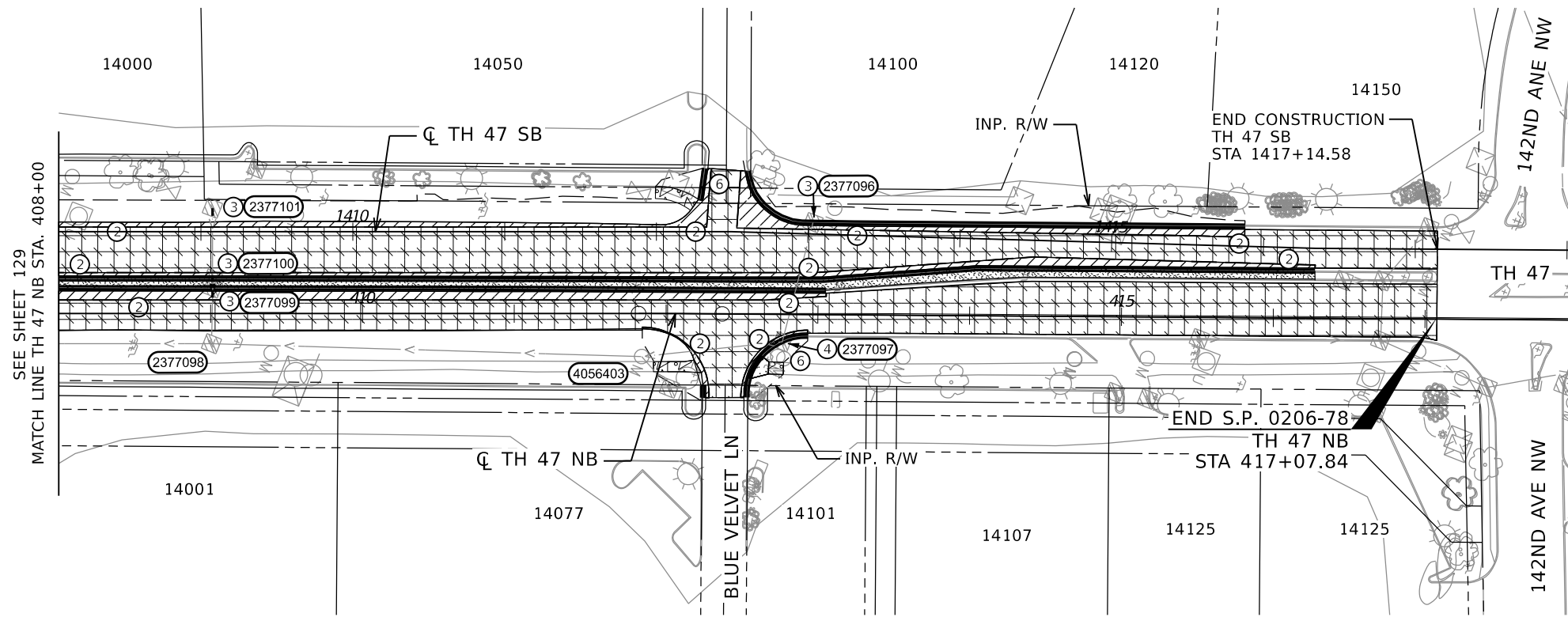
**LEGEND**

- MILL BITUMINOUS SURFACE (2.0")
- REMOVE BITUMINOUS PAVEMENT
- REMOVE BITUMINOUS DRIVEWAY PAVEMENT
- REMOVE BITUMINOUS WALK
- REMOVE CONCRETE WALK
- REMOVE CONCRETE MEDIAN
- REMOVE CONCRETE APPROACH PANEL
- REMOVE ENERGY ABSORBING TERMINAL
- SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
- REMOVE DRAINAGE STRUCTURE
- REMOVE CASTING
- ADJUST GAVE VALVE & BOX
- REMOVE CONCRETE CURB & GUTTER
- REMOVE GUARDRAIL PLATE BEAM
- REMOVE PIPE SEWER
- CONSTRUCTION LIMITS
- INPLACE RIGHT OF WAY
- INPLACE EASEMENT
- EXISTING STORM SEWER STRUCTURE ID

**GENERAL NOTES**

1. REMOVAL OF ALL AGGREGATE SURFACING REGARDLESS OF THICKNESS SHALL BE INCLUDED IN COMMON EXCAVATION.
2. ALL REMOVAL ITEMS SHALL BE DISPOSED OF OFF THE PROJECT SITE. (INCIDENTAL)
3. SAWCUTTING FOR CONCRETE CURB & GUTTER, CONCRETE WALK, AND BITUMINOUS WALK SHALL BE INCIDENTAL.
4. INPLACE BITUMINOUS PAVEMENT THICKNESS 6" - 10". NO ADDITIONAL PAYMENT FOR EXTRA THICKNESS.

# TRUNK HIGHWAY 47



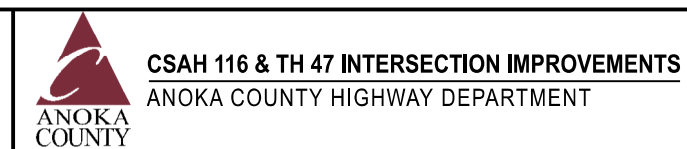
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**

TRUNK HIGHWAY 47  
 MISCELLANEOUS REMOVAL PLAN  
 S.P. 0206-78 (TH 47)

SHEET 130 OF 206 SHEETS

REMOVE SIGN TYPE D							K
SIGN NO	GROUP TOTAL		TOTAL QTY	POSTS		PANEL	PANEL LEGEND
	A	B		NO & TYPE (2)	KNEE BRACES QTY	SIZE (1)	
	EACH	EACH				INCH	
D-101		1	1	1-SQ		42 x 48	
D-102		1	1	2-U	1	60 x 24	
D-103		1	1	2-U	2	48 x 24	
<b>GROUP TOTAL</b>		<b>3</b>					
<b>PROJECT TOTAL</b>		<b>3</b>					

SPECIFIC NOTE:  
 (1) SIZES ARE APPROXIMATE  
 (2) POST TYPE ABBREVIATIONS (SQ = SQUARE TUBE, R = ROUND POST, U = U CHANNEL)  
 GROUP A = 100% COUNTY (S.A.P. 002-716-020)  
 GROUP B = 100% COUNTY (LOCAL FUNDS)

SALVAGE AND INSTALL SIGN TYPE D											L	
SIGN NO	GROUP		TOTAL SIGN QTY	PANEL LEGEND	PANEL		MTG HT (1) FEET	NEW POSTS/MOUNTING				SURFACE TYPE
	A	B			SIZE INCH	AREA SQ FT		NUMBER OF POSTS	POST TYPE (2)	POST SPACING	RISER POST SIZE INCHES	
	EACH	EACH										
D-201		1	1		126 x 60	52.50	7	2	SQ	66	2.5	SOIL
D-202		1	1		78 x 36	19.50	7	2	SQ	42	2.5	SOIL
D-203		2	2		42 x 48	14.00	7	1	SQ		2.5	SOIL
<b>GROUP TOTAL</b>		<b>4</b>										
<b>PROJECT TOTAL</b>		<b>4</b>										

SPECIFIC NOTES:  
 (1) MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE)  
 (2) POST TYPE ABBREVIATIONS (SQ = SQUARE TUBE, R = ROUND POST, U = U CHANNEL).  
 GROUP A = 100% COUNTY (S.A.P. 002-716-020)  
 GROUP B = 100% COUNTY (LOCAL FUNDS)  
 GENERAL NOTES:  
 1. FOR 2-1/2" RISER POST IN SOIL USE RECOVERABLE SLIP BASE PLACED PER MANUFACTURER'S SPECIFICATIONS USING A 10 GAUGE, 2-1/2" X 2-1/2" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST WITH A 10 GAUGE 2-3/16" X 2-3/16" X 8" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE POST INTERNAL INSERT.  
 2. ALUMINUM STRINGERS SHALL BE USED FOR SIGNS 36" AND WIDER. SEE SQUARE TUBE SIGN MOUNTING DETAILS.

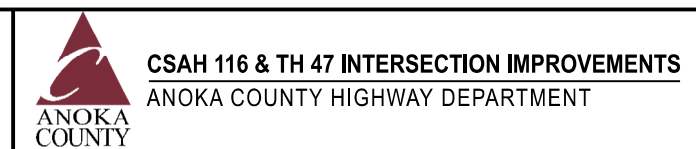
SALVAGE & INSTALL SIGN TYPE SPECIAL						M
SIGN NO	GROUP		TOTAL QTY	MTG HT (1) FEET	PANEL LEGEND	
	A	B				
	EACH	EACH				
X-201	1		1	7	NO PARKING ON ANY CITY STREET...	
X-202	4		4	7	NO JUMPING FROM BRIDGE	
X-203		1	1	7	ST FRANCIS BLVD	
X-204		1	1	4	COOLIDGE ST	
					YELLOW RIBBON CITY	
<b>GROUP TOTAL</b>	<b>5</b>	<b>2</b>				
<b>PROJECT TOTAL</b>		<b>7</b>				

SPECIFIC NOTE:  
 (1) MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE)  
 GROUP A = 100% COUNTY (S.A.P. 002-716-020)  
 GROUP B = 100% COUNTY (LOCAL FUNDS)  
 GENERAL NOTE:  
 1. SEE DIVISION ST SPECIAL PROVISIONS FOR STREET NAME SIGN S&I SPECIFICATIONS.

DATE: 8/25/2020 2:40:08 PM PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\4652-000\_sgn\_rem00.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MF  
 Plan By: MF  
 Checked By: ES  
 Approved By: SD  
 I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 CERTIFIED BY:   
 DATE: 8/25/2020 LICENSE NO. 40945

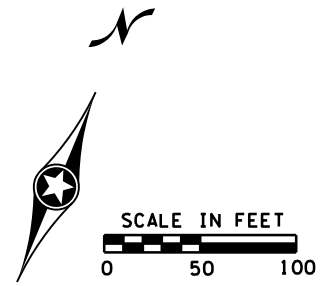
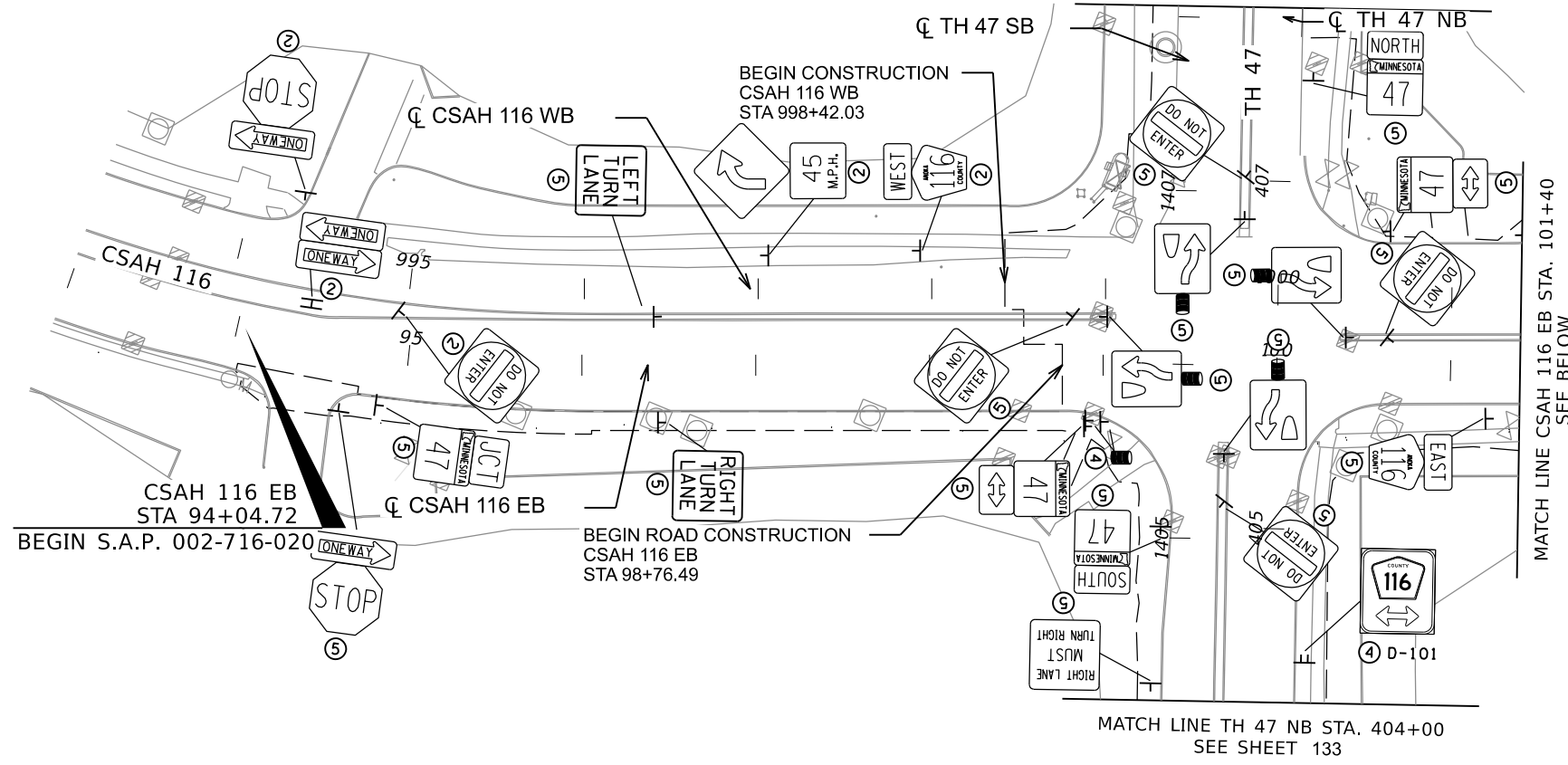


ANOKA COUNTY, MN  
 TABULATION  
 SIGN REMOVAL PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 131 OF 206 SHEETS

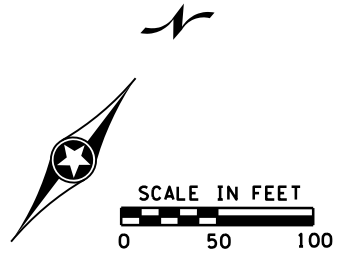
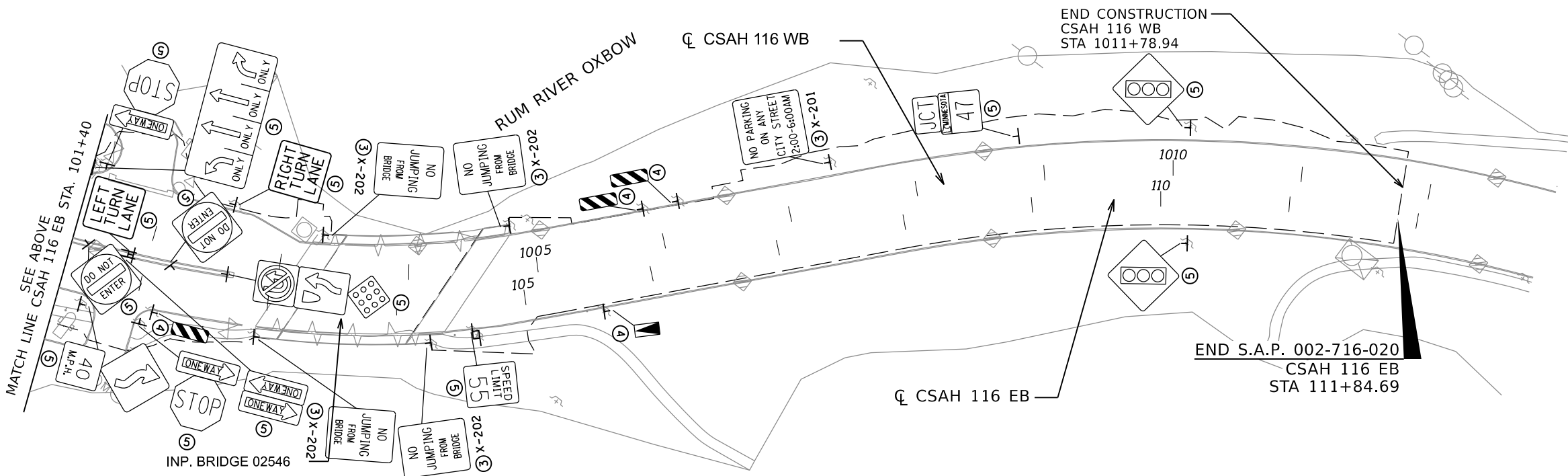
# CSAH 116 (BUNKER LAKE BLVD)

SEE SHEET 133  
MATCH LINE TH 47 NB STA. 408+00



LEGEND	
②	INPLACE
③	SALVAGE
④	REMOVE
⑤	REMOVE SIGN TYPE C

# CSAH 116 (BUNKER LAKE BLVD)



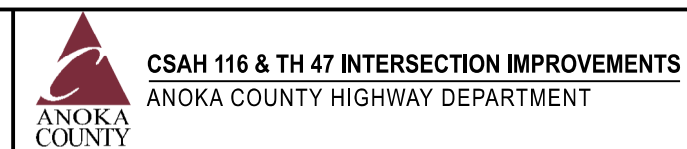
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NO.	DATE	BY	CHK	REVISIONS

Design By: MF  
 Plan By: MF  
 Checked By: ES  
 Approved By: SD

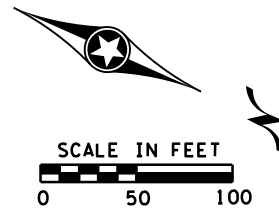
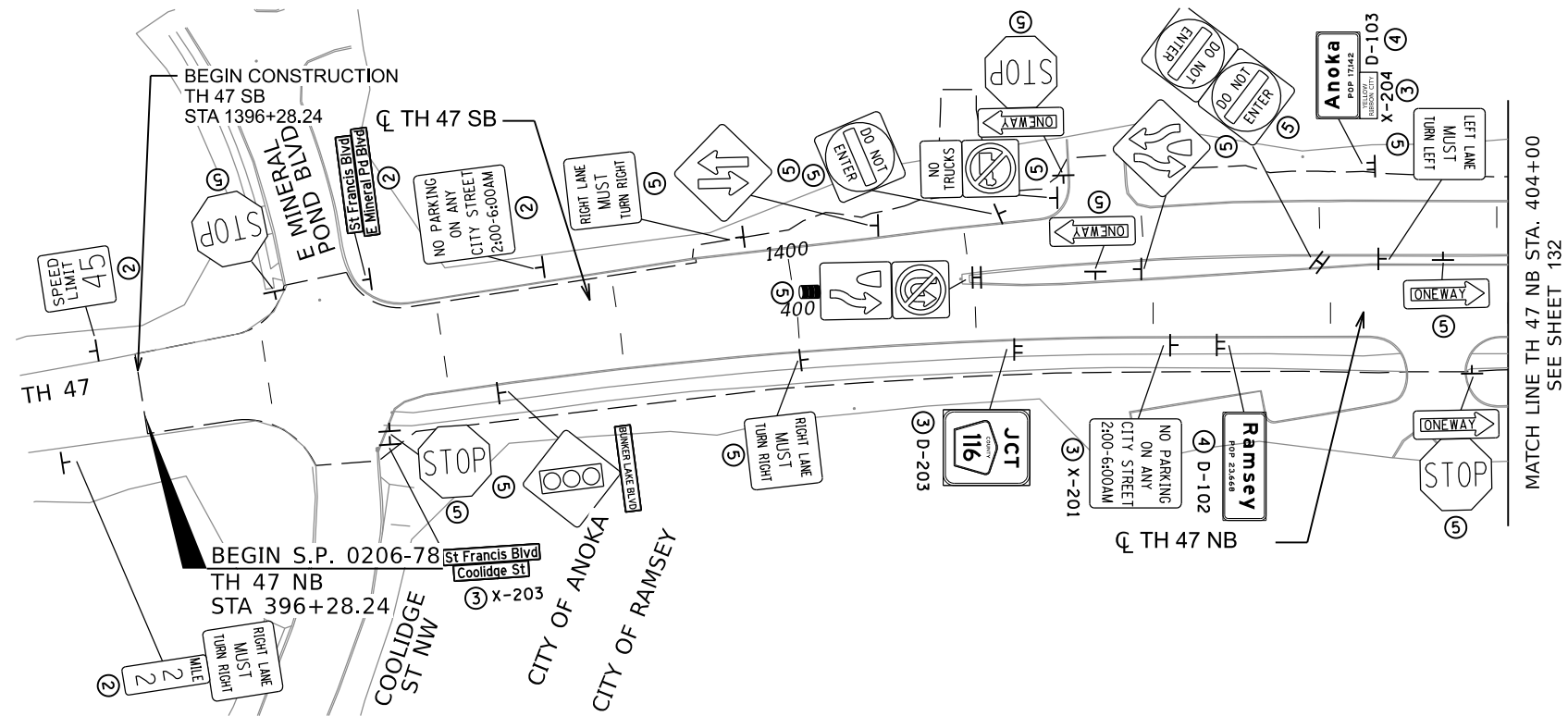
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

CERTIFIED BY: *Sam Palmer*  
 DATE: 8/25/2020 LICENSE NO. 40245



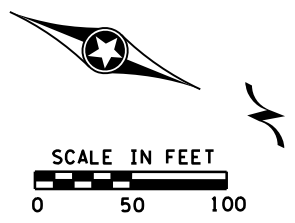
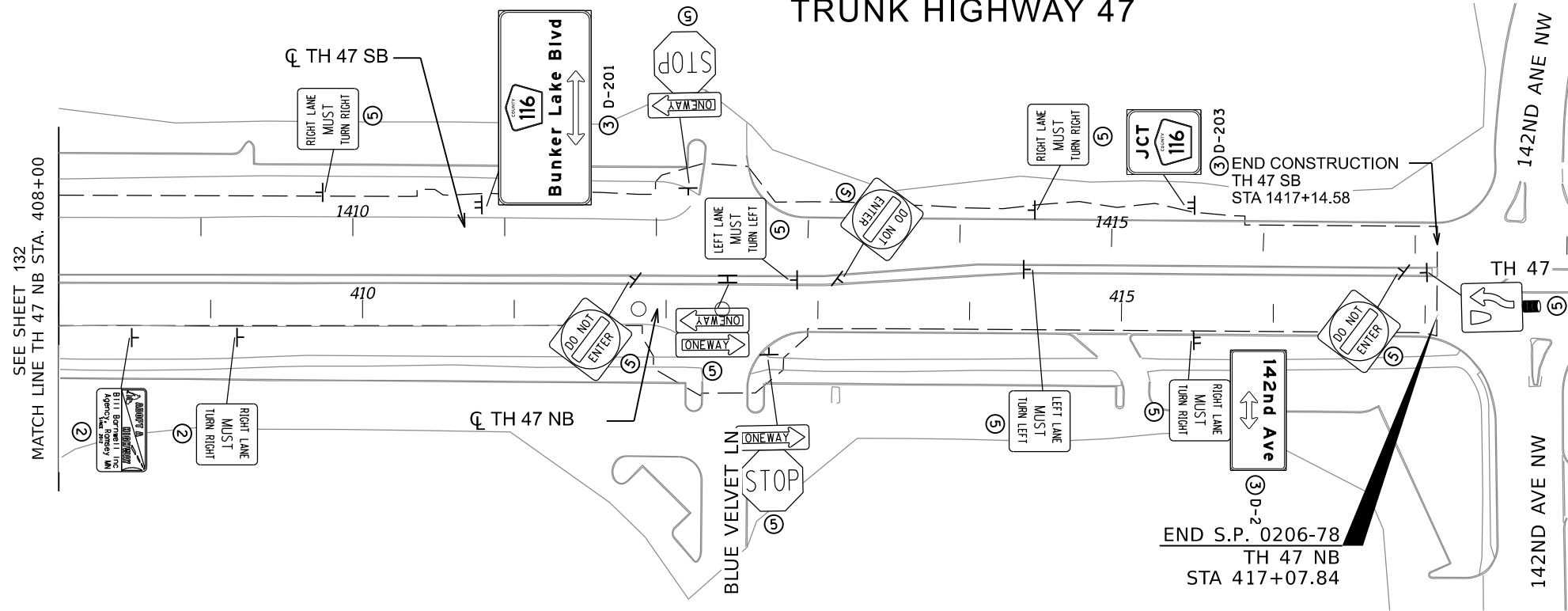
ANOKA COUNTY, MN		SHEET 132 OF 206 SHEETS
CSAH 116 SIGN REMOVAL PLAN S.P. 0206-78 (TH 47), S.A.P. 002-716-020		

# TRUNK HIGHWAY 47



LEGEND	
②	INPLACE
③	SALVAGE
④	REMOVE
⑤	REMOVE SIGN TYPE C

# TRUNK HIGHWAY 47



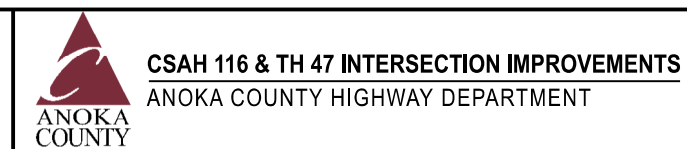
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NO.	DATE	BY	CHK	REVISIONS

Design By: MF  
 Plan By: MF  
 Checked By: ES  
 Approved By: SD

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

CERTIFIED BY: *Sam Palmer*  
 DATE: 8/25/2020 LICENSE NO. 40945

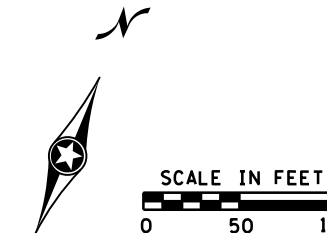
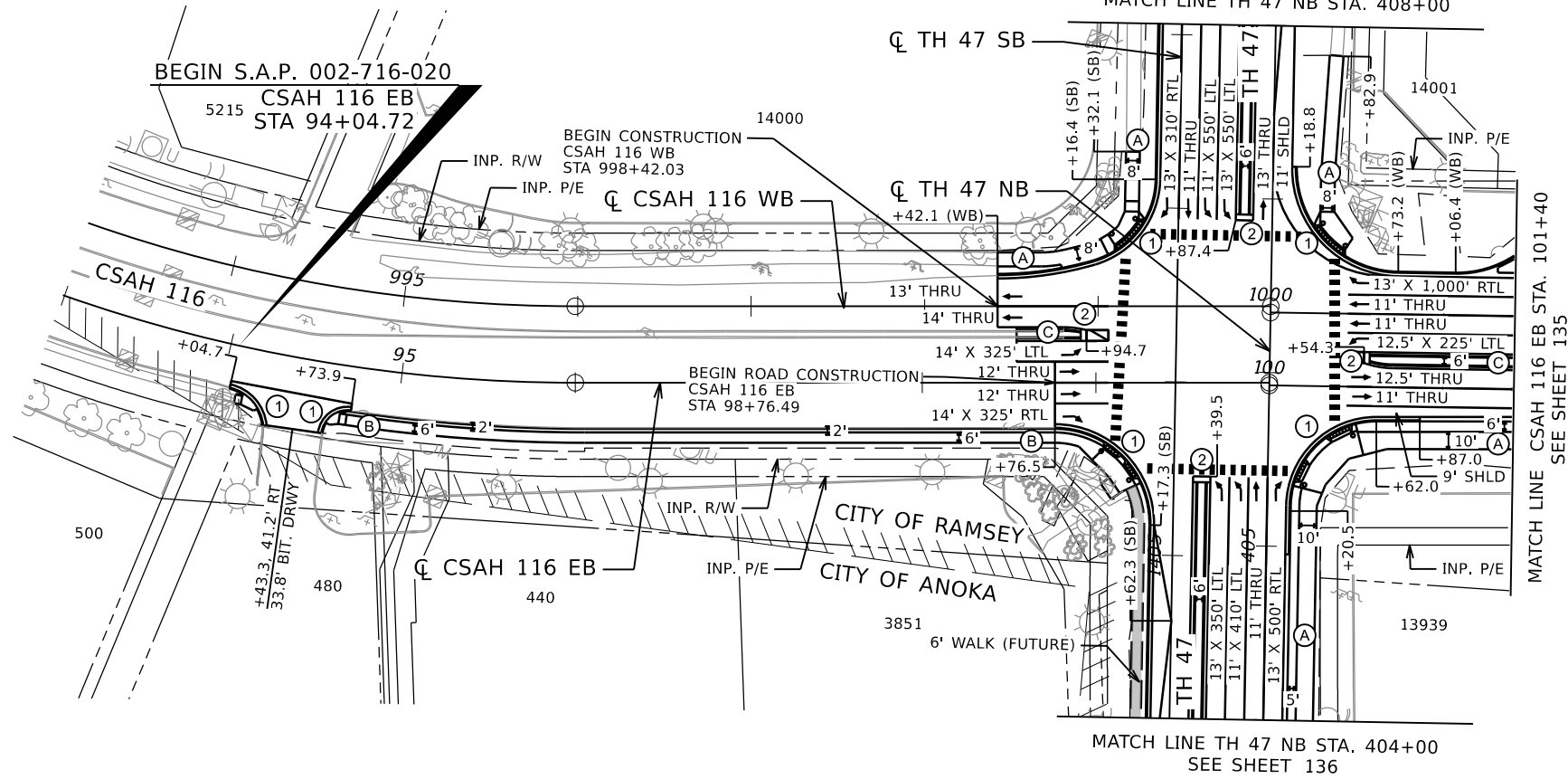


ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
 SIGN REMOVAL PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 133  
 OF  
 206  
 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)

SEE SHEET 137  
MATCH LINE TH 47 NB STA. 408+00



### LEGEND

- ① CONSTRUCT CONCRETE PEDESTRIAN CURB RAMP. SEE STANDARD PLANS AND INTERSECTION DETAILS.
- ② CONSTRUCT CONCRETE MEDIAN NOSE PER STANDARD PLATE 7113
- ③ CURB TRANSITION SEE MISCELLANEOUS DETAILS
- ④ BEGIN GUARDRAIL, END TREATMENT SHALL BE TANGENT TERMINAL (SOFTSTOP OF MSKT, SEE STANDARD PLAN 5-297.612)
- ⑤ 25' DESIGN SPECIAL. SEE STANDARD PLANS FOR APPROACH GUARDRAIL TRANSITION

- (A) 3" BITUMINOUS TRAIL
- (B) 4" CONCRETE WALK (OR MEDIAN)
- (C) B418 (MOD.) CONC. CURB & GUTTER
- (D) B412 CONC. CURB & GUTTER

➔ DIRECTION OF TRAFFIC

--- CONSTRUCTION LIMITS

- - - INPLACE R/W

- - - INPLACE EASEMENT

—●— TRAFFIC BARRIER TYPE 31 GUARDRAIL

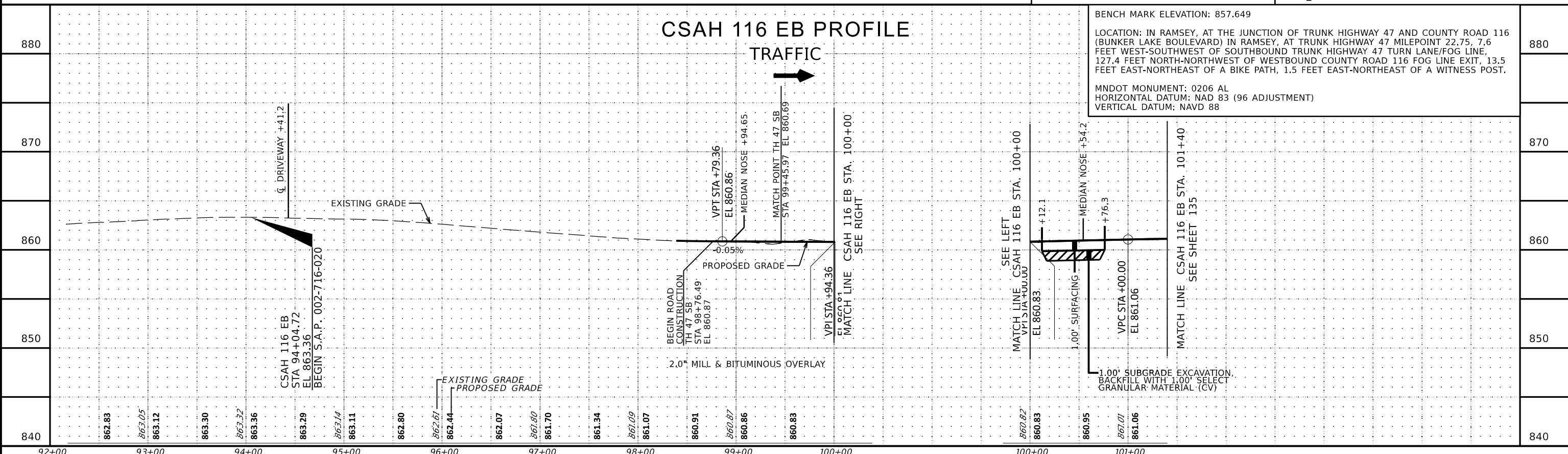
🌿 AREA OF ENVIRONMENTAL SENSITIVITY

### GENERAL NOTES

- ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED. BOULEVARD DIMENSIONS ARE TO BACK OF CURB.
- SEE INTERSECTION DETAILS FOR ADDITIONAL INFORMATION ON ROADWAY INTERSECTIONS AND DRIVEWAYS.
- ALL CURB AND GUTTER IS DESIGN B424 UNLESS OTHERWISE SPECIFIED.
- ALL MEASUREMENTS AND CALL OUTS ON TH 47 ARE FROM TH 47 NB UNLESS OTHERWISE NOTED. ALL MEASUREMENTS AND CALL OUTS ON CSAH 116 ARE FROM CSAH 116 EB UNLESS OTHERWISE NOTED.

## CSAH 116 EB PROFILE

TRAFFIC ➔



BENCH MARK ELEVATION: 857.649

LOCATION: IN RAMSEY, AT THE JUNCTION OF TRUNK HIGHWAY 47 AND COUNTY ROAD 116 (BUNKER LAKE BOULEVARD) IN RAMSEY, AT TRUNK HIGHWAY 47 MILEPOINT 22.75, 7.6 FEET WEST-SOUTHWEST OF SOUTHBOUND TRUNK HIGHWAY 47 TURN LANE/FOG LINE, 127.4 FEET NORTH-NORTHWEST OF WESTBOUND COUNTY ROAD 116 FOG LINE EXIT, 13.5 FEET EAST-NORTHEAST OF A BIKE PATH, 1.5 FEET EAST-NORTHEAST OF A WITNESS POST.

MNDOT MONUMENT: 0206 AL  
HORIZONTAL DATUM: NAD 83 (96 ADJUSTMENT)  
VERTICAL DATUM: NAVD 88

DATE: 8/25/2020 2:40:26 PM  
PATH & FILENAME: Projects\Minnesota\014652-000\cadd\plan\4652-000\_cp01

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
Plan By: AJF  
Checked By: NEH  
Approved By: NEH

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

CERTIFIED BY: *Michael E. Hentges*  
MICHAEL E. HENTGES, PE  
DATE: 8/25/2020 LICENSE NO. 44620

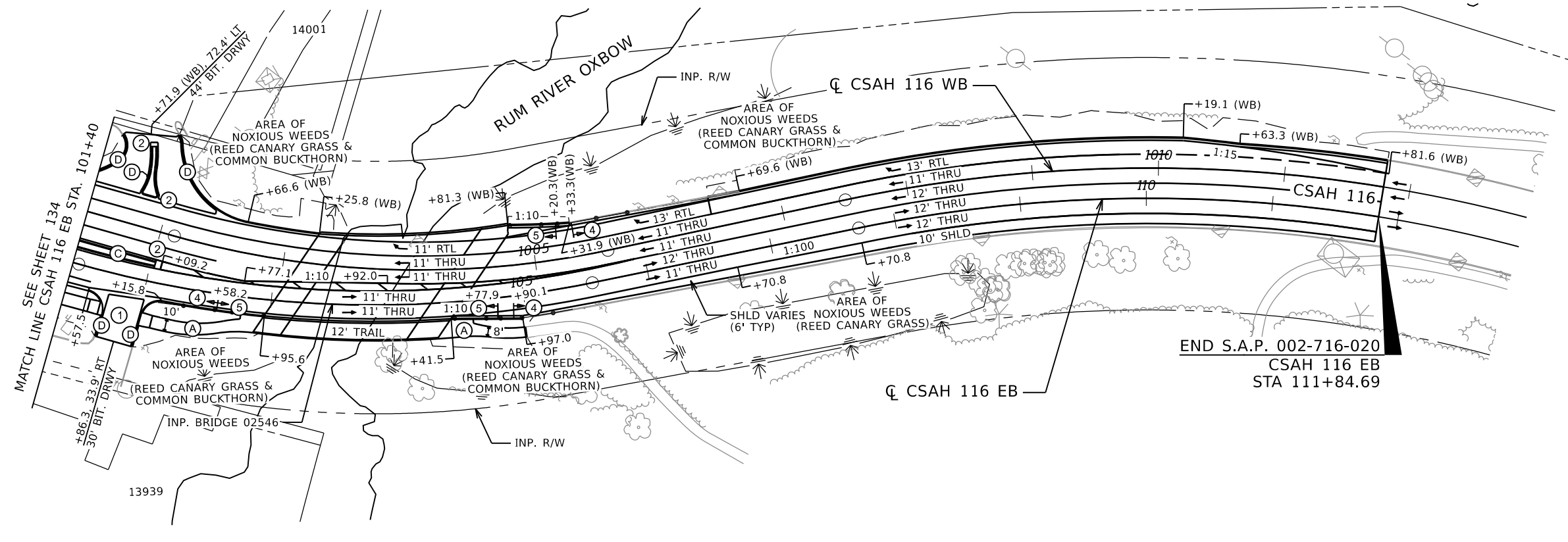
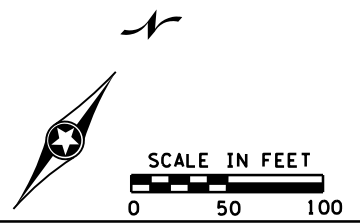


**ANOKA COUNTY**  
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
CSAH 116 EB  
CONSTRUCTION PLAN & PROFILES  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

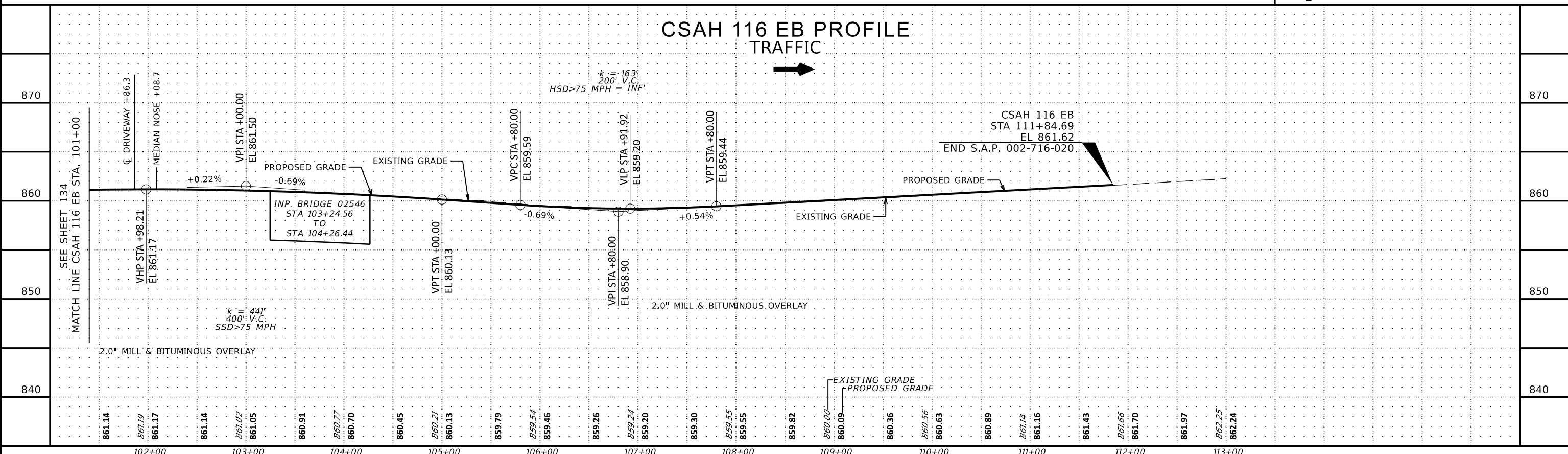
SHEET  
134  
OF  
206  
SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



- LEGEND**
- ① CONSTRUCT CONCRETE PEDESTRIAN CURB RAMP. SEE STANDARD PLANS AND INTERSECTION DETAILS.
  - ② CONSTRUCT CONCRETE MEDIAN NOSE PER STANDARD PLATE 7113
  - ③ CURB TRANSITION SEE MISCELLANEOUS DETAILS
  - ④ BEGIN GUARDRAIL, END TREATMENT SHALL BE TANGENT TERMINAL (SOFTSTOP OF MSKT, SEE STANDARD PLAN 5-297.612)
  - ⑤ 25' DESIGN SPECIAL. SEE STANDARD PLANS FOR APPROACH GUARDRAIL TRANSITION
  - (A) 3" BITUMINOUS TRAIL
  - (B) 4" CONCRETE WALK (OR MEDIAN)
  - (C) B418 (MOD.) CONC. CURB & GUTTER
  - (D) B412 CONC. CURB & GUTTER
- ➔ DIRECTION OF TRAFFIC
- CONSTRUCTION LIMITS
- - - INPLACE R/W
- - - INPLACE EASEMENT
- TRAFFIC BARRIER TYPE 31 GUARDRAIL
- 🌿 AREA OF ENVIRONMENTAL SENSITIVITY

## CSAH 116 EB PROFILE TRAFFIC



DATE: 8/25/2020 2:40:40 PM PATH & FILENAME: Projects\Minnesota\014652-000\cadd\plan\4652-000\_cp02

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

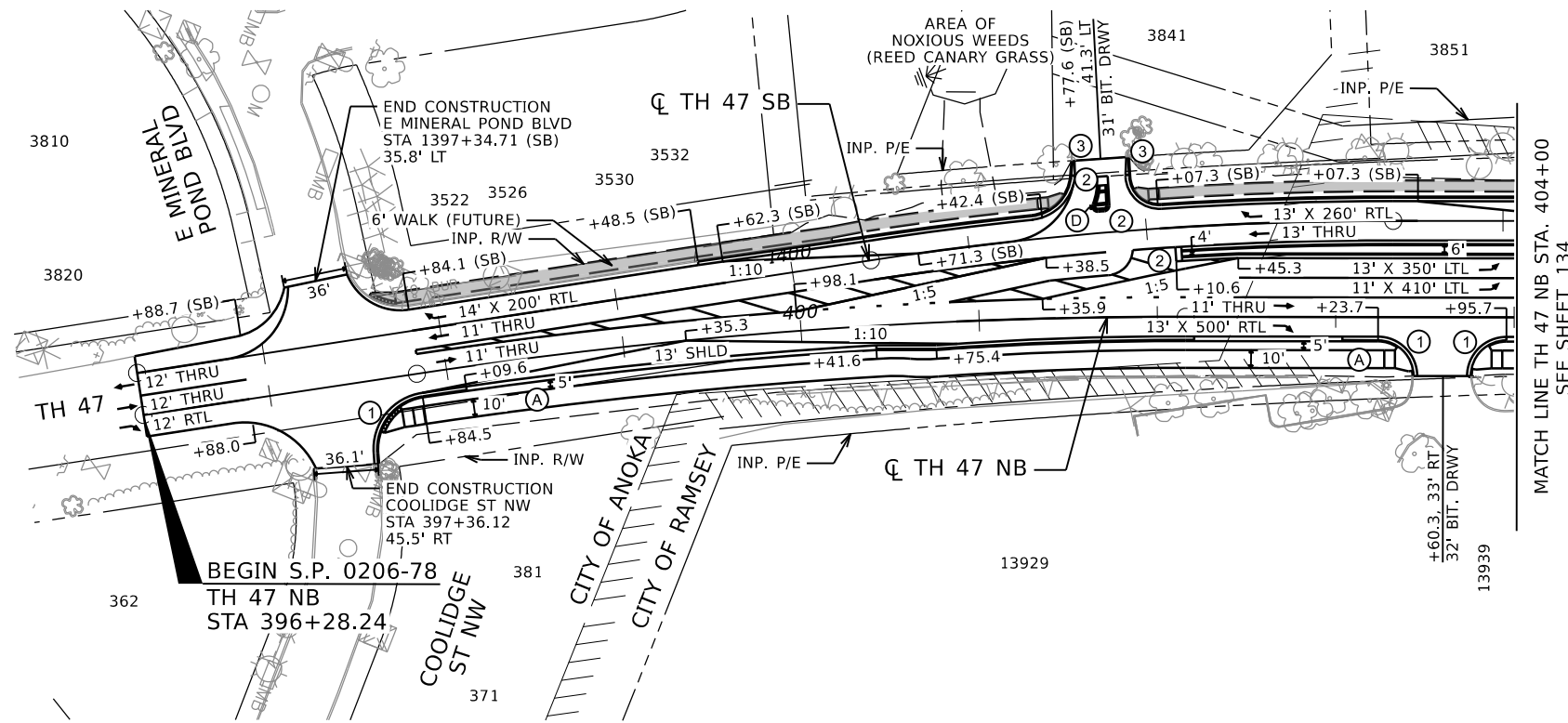
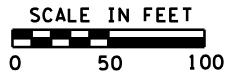


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 CSAH 116 EB  
 CONSTRUCTION PLAN & PROFILES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 135 OF 206 SHEETS

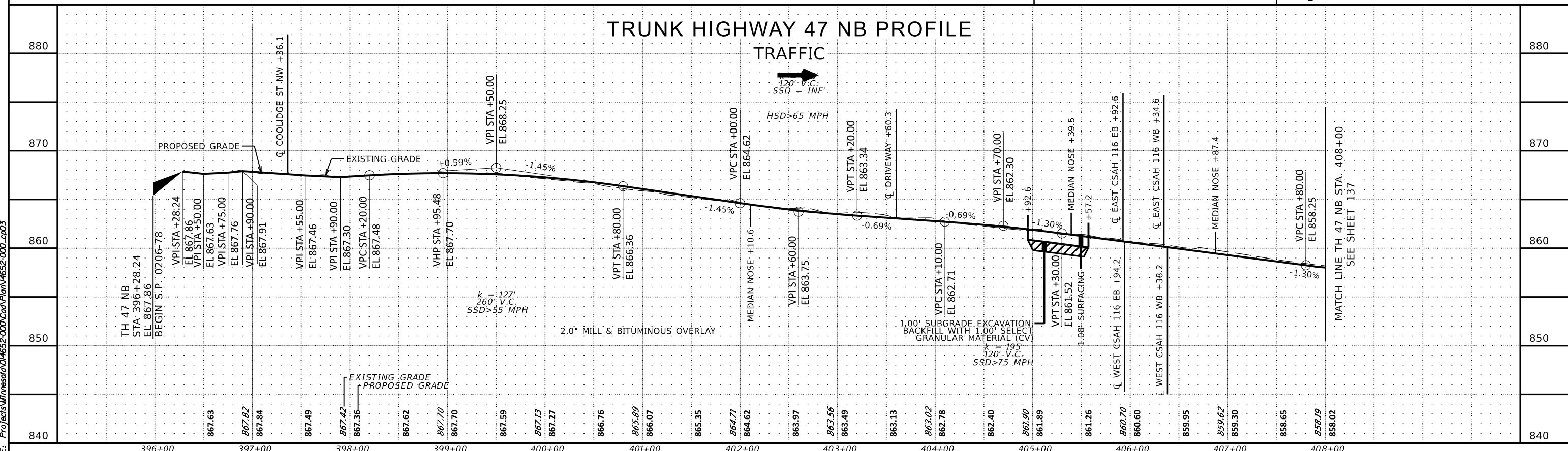
# TRUNK HIGHWAY 47



- ### GENERAL NOTES
1. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED. BOULEVARD DIMENSIONS ARE TO BACK OF CURB.
  2. SEE INTERSECTION DETAILS FOR ADDITIONAL INFORMATION ON ROADWAY INTERSECTIONS AND DRIVEWAYS.
  3. ALL CURB AND GUTTER IS DESIGN B424 UNLESS OTHERWISE SPECIFIED.
  4. ALL MEASUREMENTS AND CALL OUTS ON TH 47 ARE FROM TH 47 NB UNLESS OTHERWISE NOTED. ALL MEASUREMENTS AND CALL OUTS ON CSAH 116 ARE FROM CSAH 116 EB UNLESS OTHERWISE NOTED.

- ### LEGEND
- ① CONSTRUCT CONCRETE PEDESTRIAN CURB RAMP. SEE STANDARD PLANS AND INTERSECTION DETAILS.
  - ② CONSTRUCT CONCRETE MEDIAN NOSE PER STANDARD PLATE 7113
  - ③ CURB TRANSITION SEE MISCELLANEOUS DETAILS
  - ④ BEGIN GUARDRAIL, END TREATMENT SHALL BE TANGENT TERMINAL (SOFTSTOP OF MSKT, SEE STANDARD PLAN 5-297.612)
  - ⑤ 25' DESIGN SPECIAL. SEE STANDARD PLANS FOR APPROACH GUARDRAIL TRANSITION
- (A) 3" BITUMINOUS TRAIL
  - (B) 4" CONCRETE WALK (OR MEDIAN)
  - (C) B418 (MOD.) CONC. CURB & GUTTER
  - (D) B412 CONC. CURB & GUTTER
- ➔ DIRECTION OF TRAFFIC
  - - - CONSTRUCTION LIMITS
  - - - INPLACE R/W
  - - - INPLACE EASEMENT
  - TRAFFIC BARRIER TYPE 31 GUARDRAIL
  - \*— AREA OF ENVIRONMENTAL SENSITIVITY

## TRUNK HIGHWAY 47 NB PROFILE



DATE: 8/25/2020 2:40:52 PM PATH & FILENAME: Projects\Minnesota\014652-000\cadd\plan\4652-000\_gp03

NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER  
 DATE: 8/25/2020 LICENSE NO. 44620

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

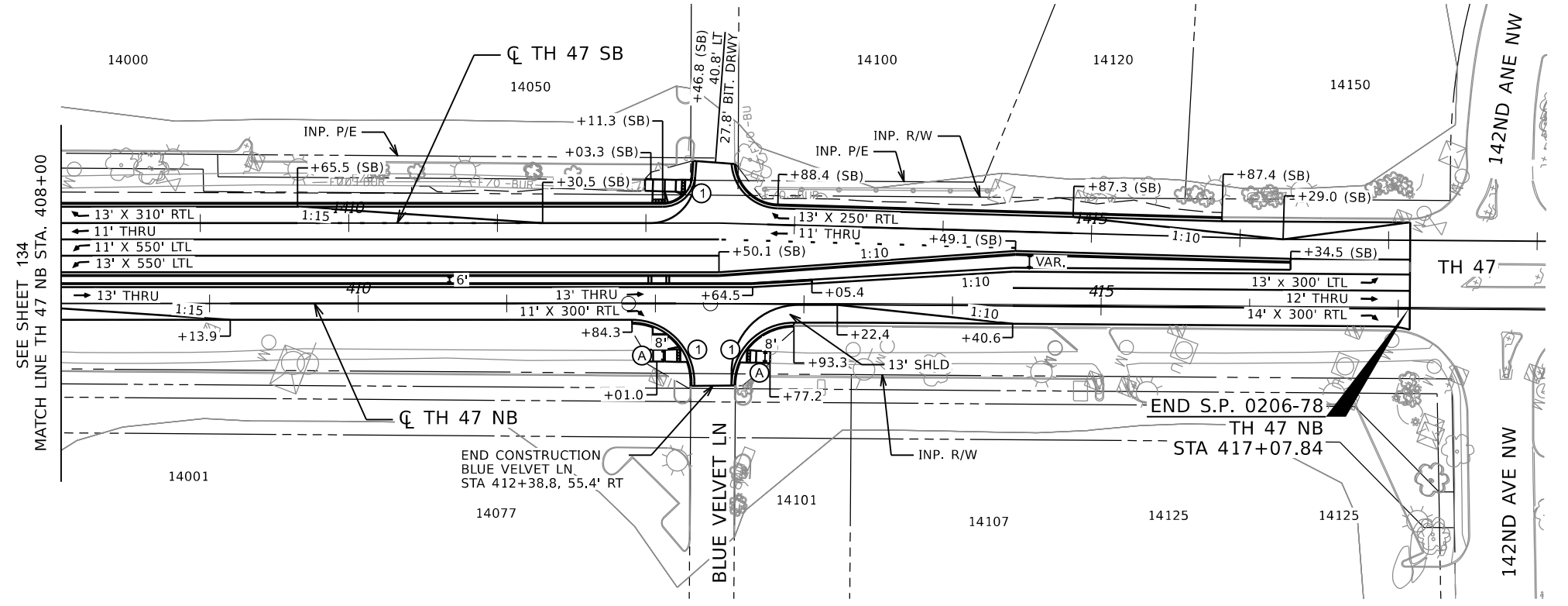
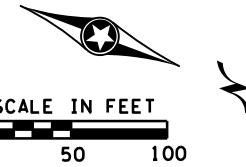
**ANOKA COUNTY, MN**

**TRUNK HIGHWAY 47 NB**  
**CONSTRUCTION PLAN & PROFILES**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
136  
OF  
206  
SHEETS



# TRUNK HIGHWAY 47



**LEGEND**

- ① CONSTRUCT CONCRETE PEDESTRIAN CURB RAMP. SEE STANDARD PLANS AND INTERSECTION DETAILS.
- ② CONSTRUCT CONCRETE MEDIAN NOSE PER STANDARD PLATE 7113
- ③ CURB TRANSITION SEE MISCELLANEOUS DETAILS
- ④ BEGIN GUARDRAIL, END TREATMENT SHALL BE TANGENT TERMINAL (SOFTSTOP OF MSKT, SEE STANDARD PLAN 5-297.612)
- ⑤ 25' DESIGN SPECIAL. SEE STANDARD PLANS FOR APPROACH GUARDRAIL TRANSITION
- (A) 3" BITUMINOUS TRAIL
- (B) 4" CONCRETE WALK (OR MEDIAN)
- (C) B418 (MOD.) CONC. CURB & GUTTER
- (D) B412 CONC. CURB & GUTTER

➔ DIRECTION OF TRAFFIC

--- CONSTRUCTION LIMITS

- - - INPLACE R/W

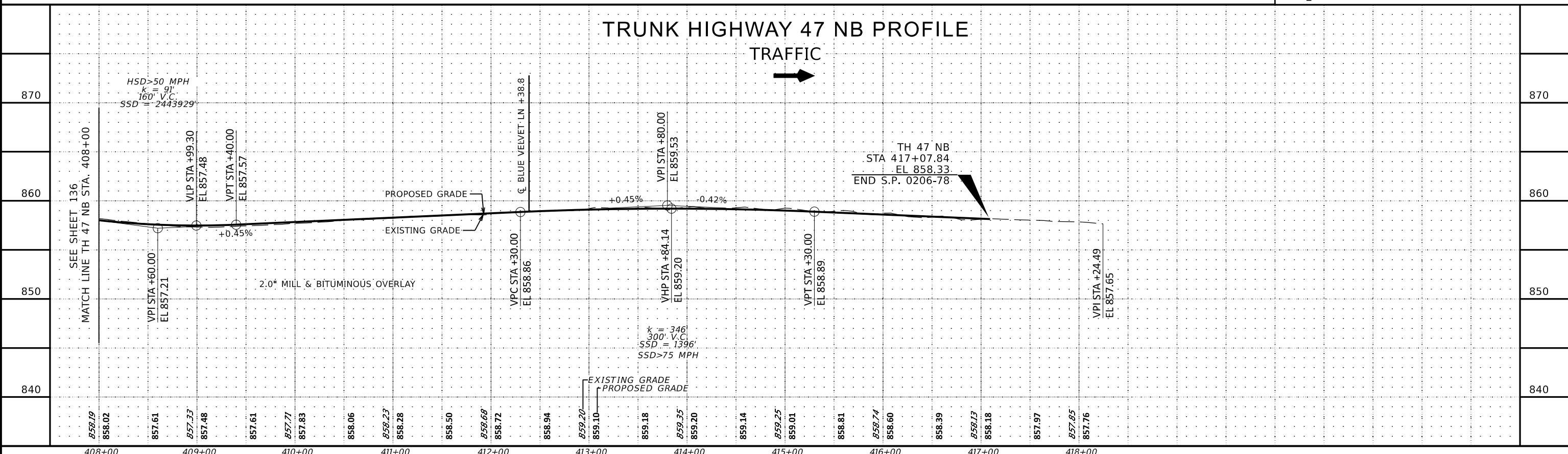
- - - INPLACE EASEMENT

—●— TRAFFIC BARRIER TYPE 31 GUARDRAIL

☄ AREA OF ENVIRONMENTAL SENSITIVITY

## TRUNK HIGHWAY 47 NB PROFILE

TRAFFIC ➔



DATE: 8/25/2020 2:10:05 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_cp04

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - NICOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

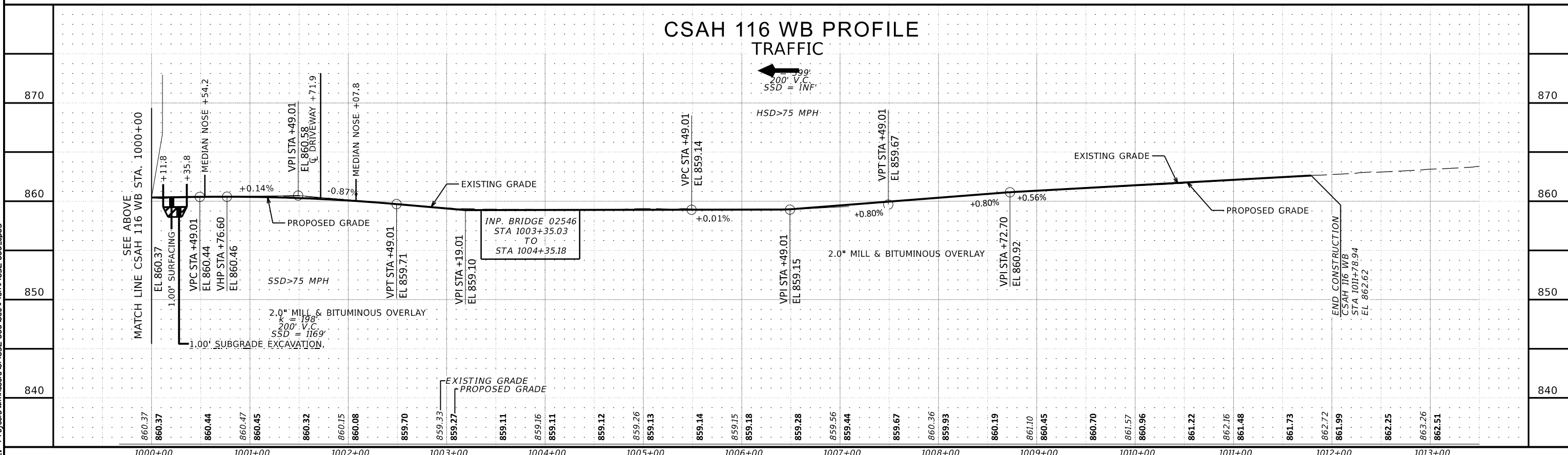
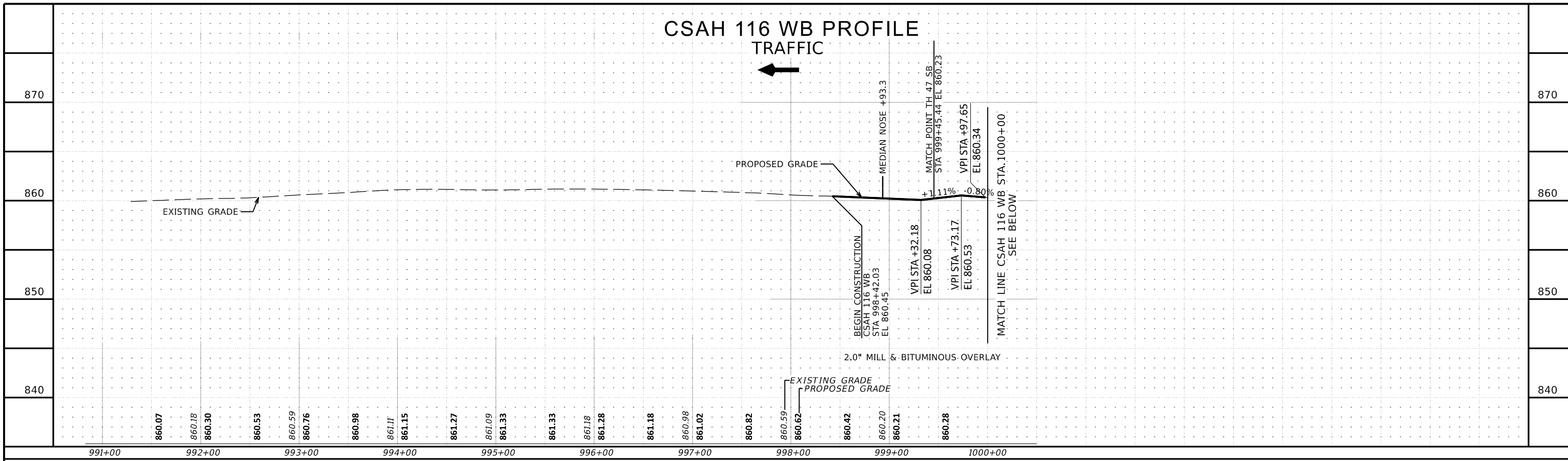


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47 NB  
 CONSTRUCTION PLAN & PROFILES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 137 OF 206 SHEETS

DATE: 8/25/2020 2:14 PM  
 PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_cp05



NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

DATE: 8/25/2020 LICENSE NO. 44620

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

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE



**ANOKA COUNTY**

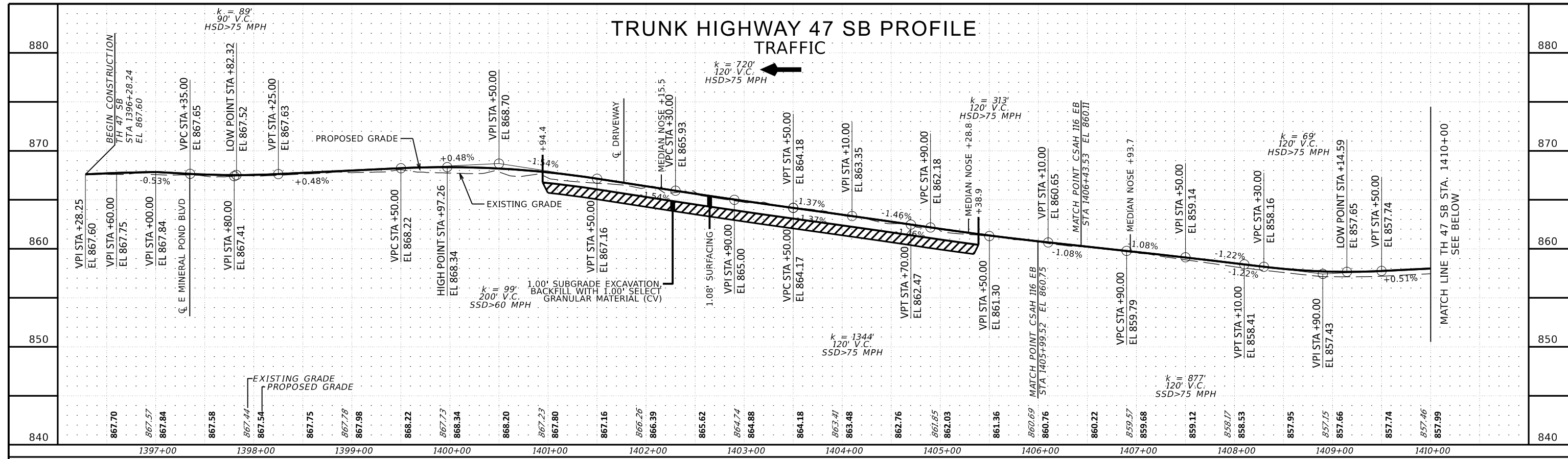
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**

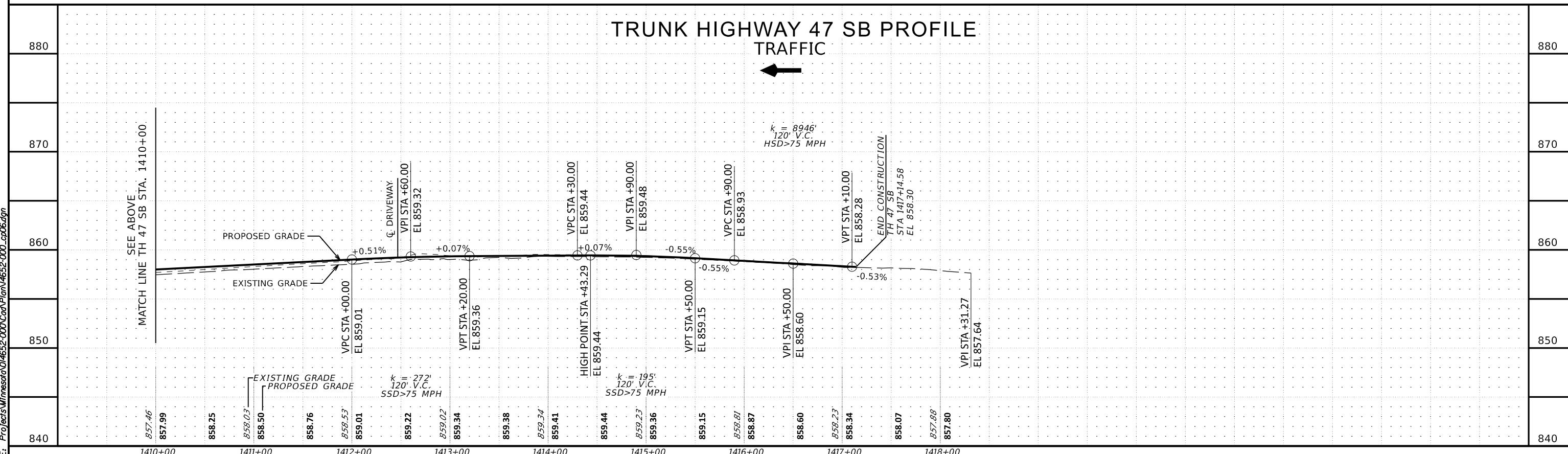
CSAH 116 WB  
 CONSTRUCTION PLAN & PROFILES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 138  
 OF  
 206  
 SHEETS

# TRUNK HIGHWAY 47 SB PROFILE TRAFFIC



# TRUNK HIGHWAY 47 SB PROFILE TRAFFIC



DATE: 8/25/2020 2:41:23 PM  
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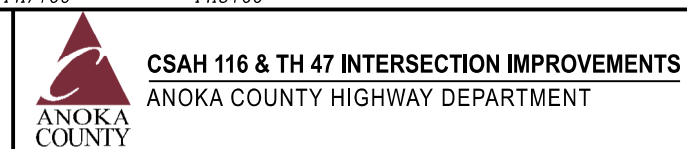
NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

DATE: 8/25/2020 LICENSE NO. 44620

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

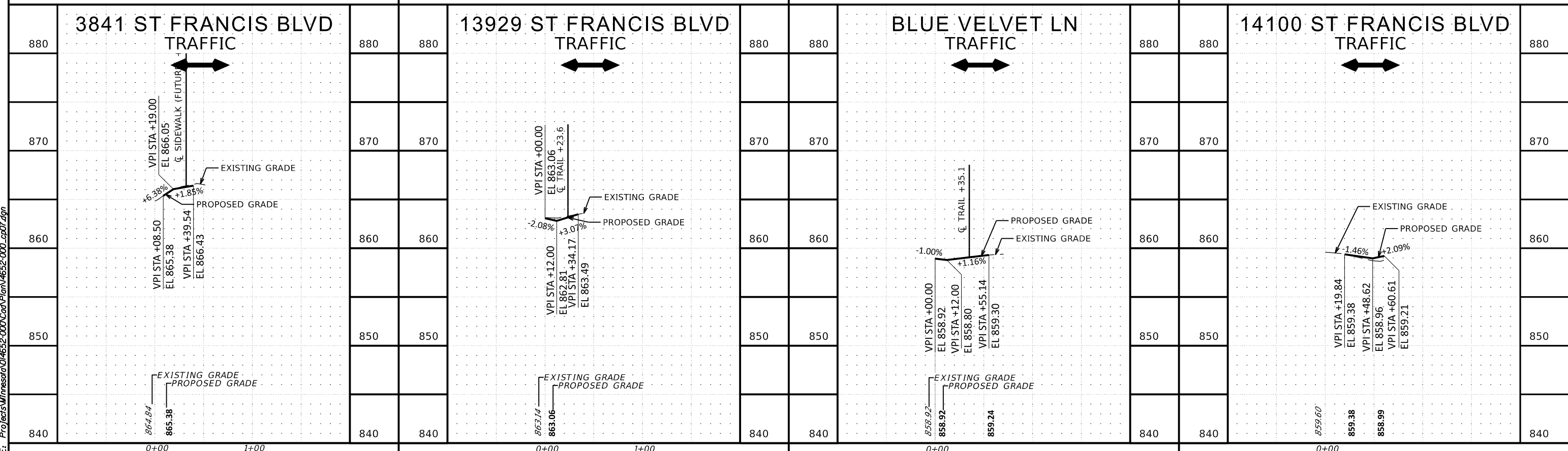
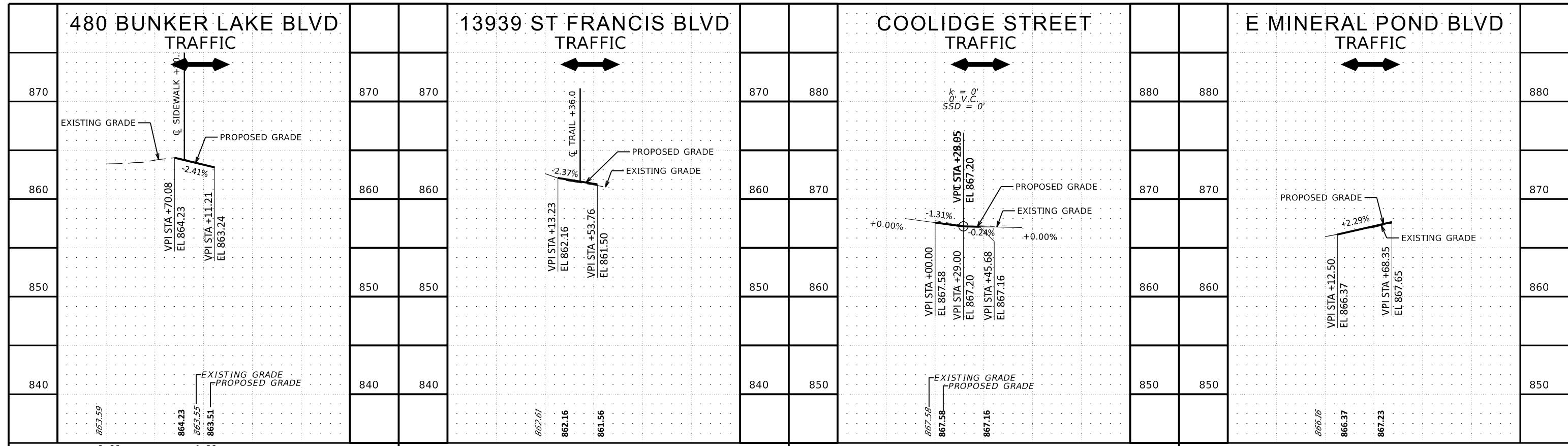
CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE



ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47 SB  
 CONSTRUCTION PLAN & PROFILES  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 139 OF 206 SHEETS

DATE: 8/25/2020 2:41:32 PM  
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

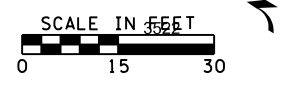
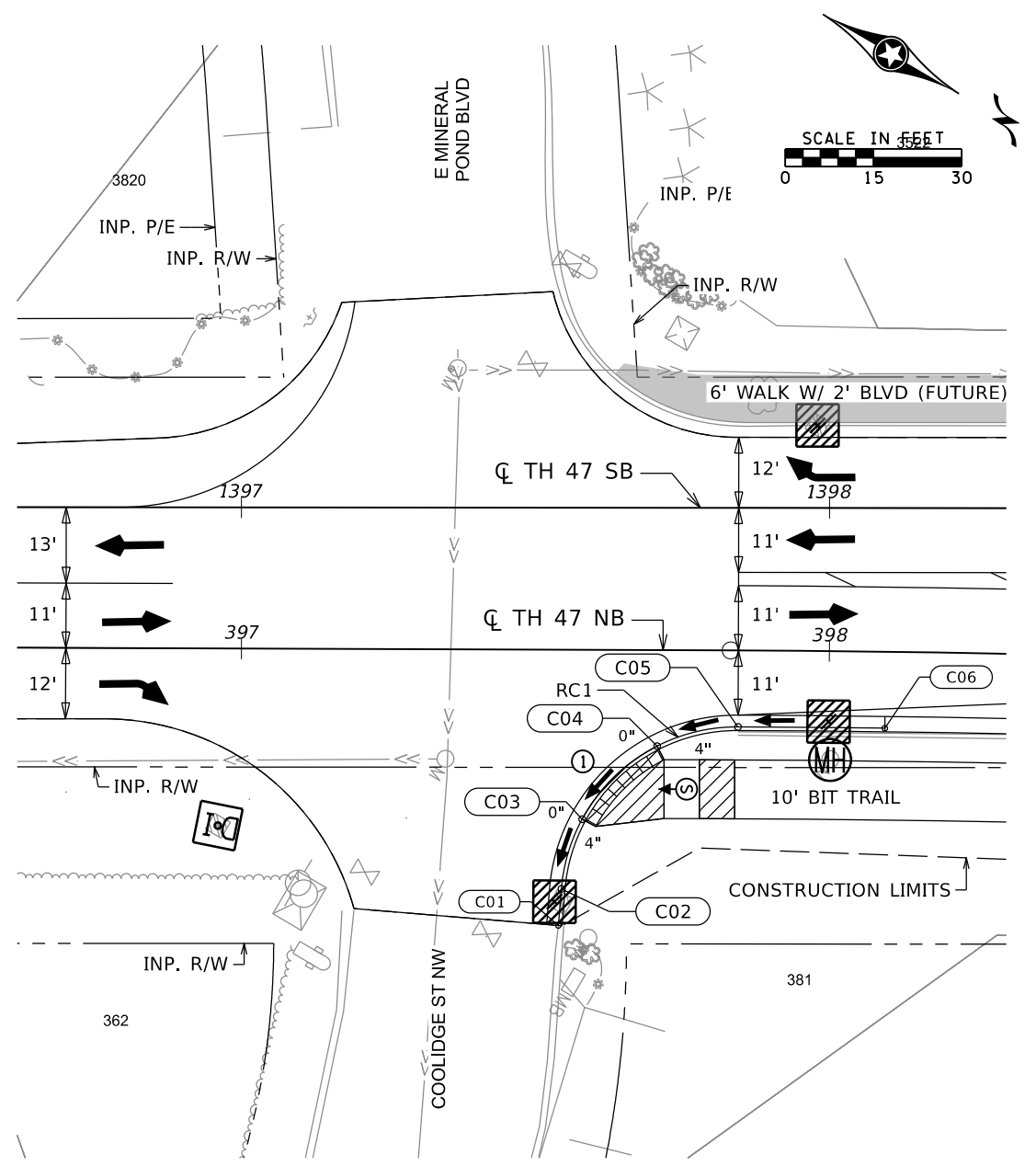
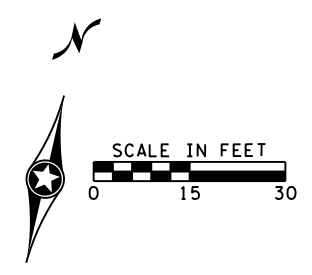
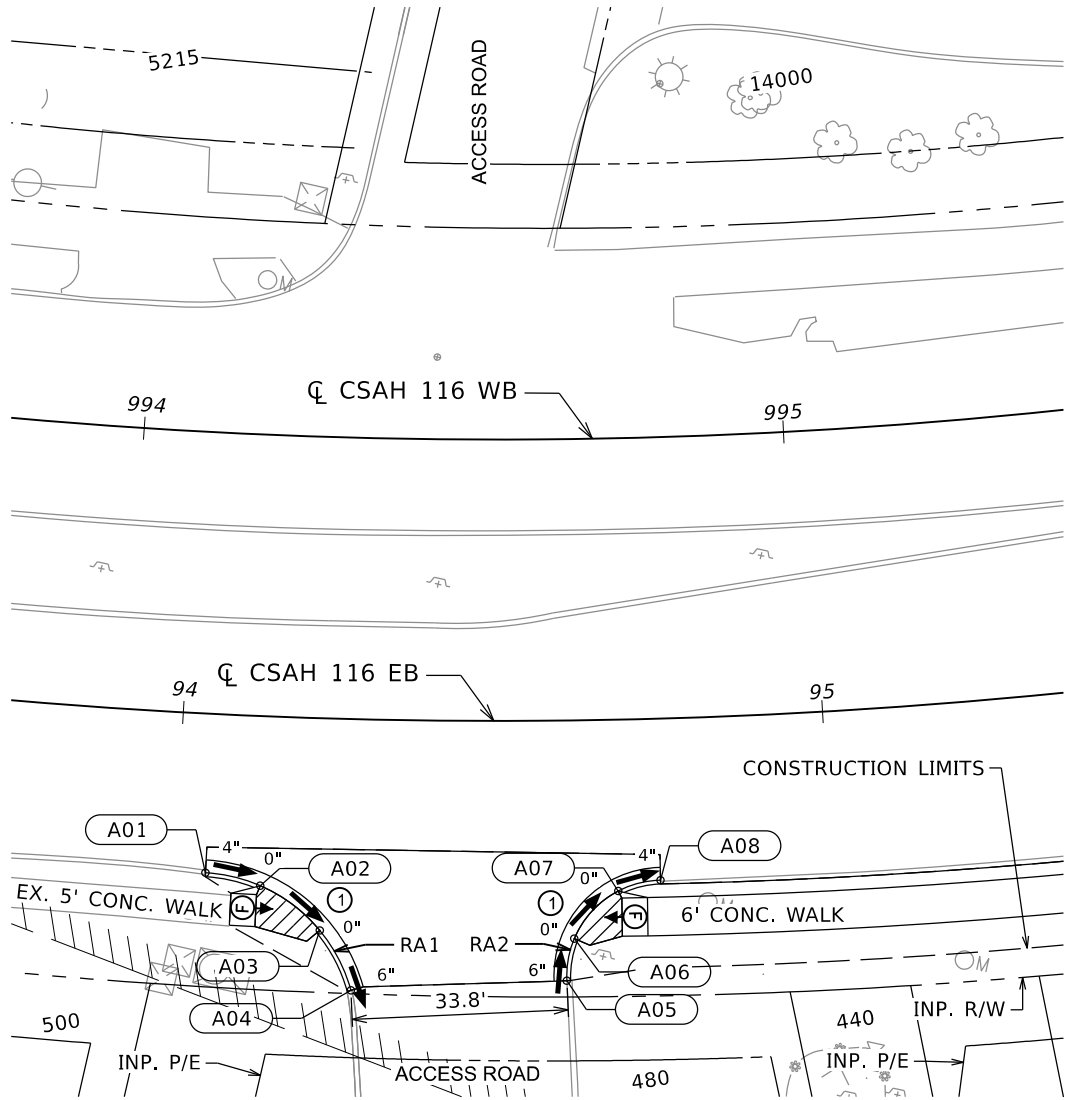
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

**wsb**

**ANOKA COUNTY**

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

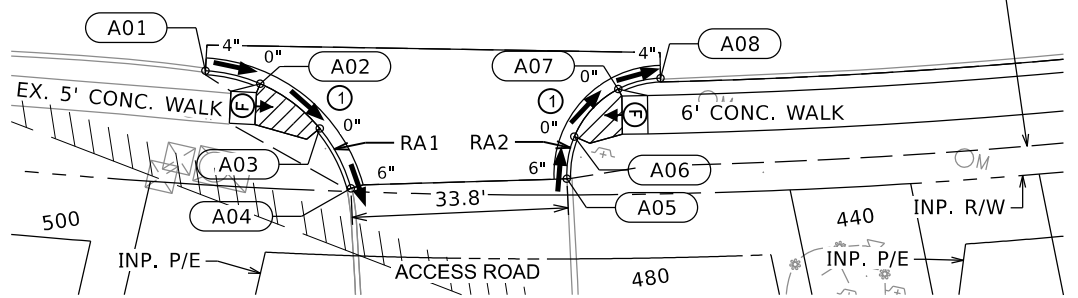


**LEGEND**

- XX CONTROL POINTS AT GUTTER FLOW LINE
- TRUNCATED DOMES (SEE STANDARD PLATE 7036)
- CATCH BASIN
- MH MANHOLE
- 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% MIN. AND 8.3% MAX. IN THE DIRECTIONS 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%.
- DRAINAGE FLOW ARROW
- 1 PEDESTRIAN CURB RAMP, SEE STANDARD PLANS
- 2 CONCRETE MEDIAN NOSE DESIGN 7113

**GENERAL NOTES**

- MAINTAIN A MINIMUM 5' WIDE PEDESTRIAN ACCESS ROUTE OBSTRUCTION TO OBSTRUCTION AND/OR OBSTRUCTION TO FAR EDGE OF WALK.
- THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL NOT EXCEED 0.020 FT/FT.
- PROVIDE A SAWCUT (INCIDENTAL) AT ALL CONCRETE WALK AND BITUMINOUS TRAIL REMOVAL LIMITS.
- ALL CURB RAMPS AND LANDING AREAS SHALL BE 6" CONCRETE WALKS ON 4" AGGREGATE BASE CLASS 5.
- LANDINGS SHALL BE CONNECTED TO EXISTING SIDEWALKS MAINTAINING A 5' WIDE (MINIMUM) PEDESTRIAN ACCESS ROUTE WITH A CROSS SLOPE THAT DOES NOT EXCEED 0.020 FT/FT AND A RUNNING SLOPE THAT DOES NOT EXCEED 0.050 FT/FT.



CURB FLOW POINTS			
POINT NO.	NORTHING	EASTING	ELEVATION
A01	168880.717	465908.97	864.37
A02	168880.635	465917.78	864.36
A03	168875.869	465928.407	864.36
A04	168867.81	465935.216	864.35
A05	168876.738	465967.802	864.00
A06	168883.404	465967.489	863.88
A07	168892.19	465972.545	863.68
A08	168895.308	465978.612	863.55
RADIUS NO.	NORTHING	EASTING	RADIUS
RA1	168856.068	465913.145	25'R
RA2	168880.757	465982.254	15'R

CURB FLOW POINTS			
POINT NO.	NORTHING	EASTING	ELEVATION
C01	168369.4738	466842.8248	866.27
C02	168366.7812	466837.2135	866.36
C03	168363.844	466825.1986	866.56
C04	168368.5777	466808.0363	866.85
C05	168378.7964	466798.2728	867.08
C06	168400.4709	466785.8496	867.13
RADIUS NO.	NORTHING	EASTING	RADIUS
RC1	168393.8285	466824.235	30'R

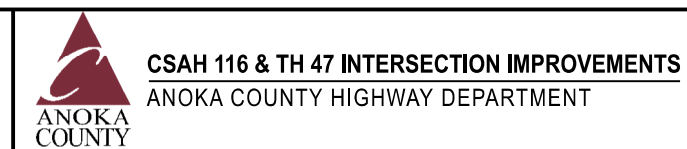
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NO.	DATE	BY	CHK	REVISIONS

Design By: **NEH**  
 Plan By: **AJF**  
 Checked By: **NEH**  
 Approved By: **NEH**

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

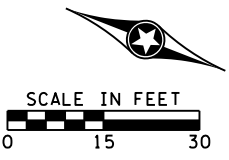
CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - **NICHOLAS E. HENTGES, PE**  
 DATE: 8/25/2020 LICENSE NO. 44620



**ANOKA COUNTY, MN**

**INTERSECTION DETAILS**  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

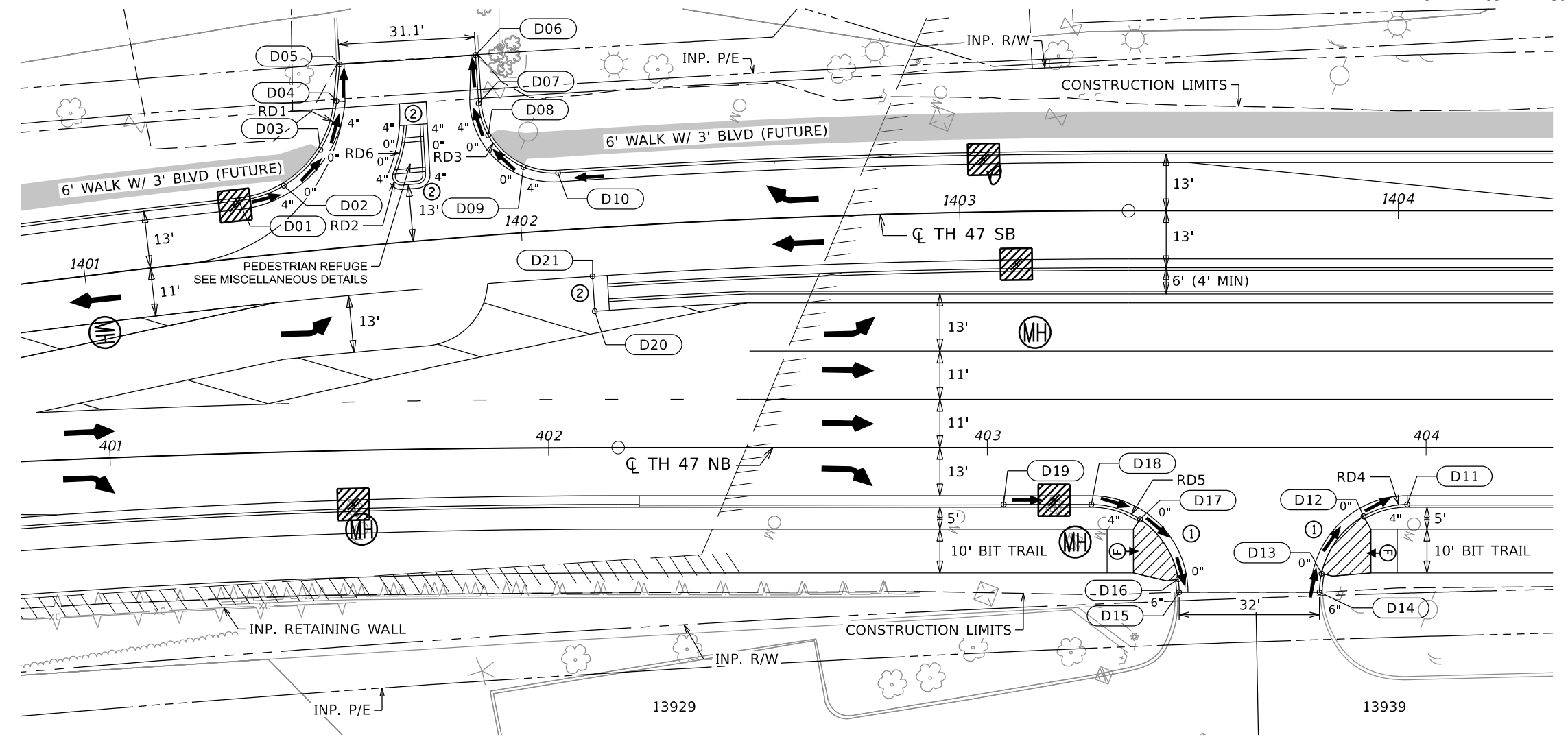
SHEET  
141  
OF  
206  
SHEETS



CURB FLOW POINTS			
POINT NO.	NORTHING	EASTING	ELEVATION
D01	168659.317	466578.998	867.48
D02	168667.631	466572.011	867.32
D03	168672.36	466561.354	867.15
D04	168674.731	466549.677	867.81
D05	168669.341	466541.663	866.02
D06	168697.417	466528.334	865.05
D07	168702.091	466538.331	865.42
D08	168706.796	466544.345	865.67
D09	168716.925	466548.121	865.84
D10	168724.762	466546.497	865.96
D11	168932.555	466546.102	862.79
D12	168924.235	466552.242	863.05
D13	168920.124	466567.913	863.46
D14	168921.251	466572.029	863.56
D15	168891.467	466583.728	863.03
D16	168890.173	466581.042	863.05
D17	168877.084	466571.493	863.17
D18	168865.539	466572.425	863.24
D19	168846.924	466579.736	863.33
D20	168744.071	466572.773	865.71
D21	168740.673	466565.531	865.71

RADIUS POINTS			
RADIUS NO.	NORTHING	EASTING	RADIUS
RD1	168647.774	466556.822	25'R
RD2	168691.773	466560.259	2'R
RD3	168717.491	466531.13	17'R
RD4	168939.867	466564.718	20'R
RD5	168872.851	466591.04	20'R
RD6	168653.773	466560.149	36'R



LEGEND		GENERAL NOTES
	CONTROL POINTS AT GUTTER FLOW LINE	<ul style="list-style-type: none"> <li>- MAINTAIN A MINIMUM 5' WIDE PEDESTRIAN ACCESS ROUTE OBSTRUCTION TO OBSTRUCTION AND/OR OBSTRUCTION TO FAR EDGE OF WALK.</li> <li>- THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL NOT EXCEED 0.020 FT/FT.</li> <li>- PROVIDE A SAWCUT (INCIDENTAL) AT ALL CONCRETE WALK AND BITUMINOUS TRAIL REMOVAL LIMITS.</li> <li>- ALL CURB RAMP AND LANDING AREAS SHALL BE 6" CONCRETE WALKS ON 4" AGGREGATE BASE CLASS 5.</li> <li>- LANDINGS SHALL BE CONNECTED TO EXISTING SIDEWALKS MAINTAINING A 5' WIDE (MINIMUM) PEDESTRIAN ACCESS ROUTE WITH A CROSS SLOPE THAT DOES NOT EXCEED 0.020 FT/FT AND A RUNNING SLOPE THAT DOES NOT EXCEED 0.050 FT/FT.</li> </ul>
	TRUNCATED DOMES (SEE STANDARD PLATE 7036)	
	CATCH BASIN	
	CURB HEIGHT	
	LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS.	
	DRAINAGE FLOW ARROW	
	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MIN. AND 8.3% MAX. IN THE DIRECTIONS SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.	
	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.	
	PEDESTRIAN CURB RAMP, SEE STANDARD PLANS	
	CONCRETE MEDIAN NOSE DESIGN 7113	

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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

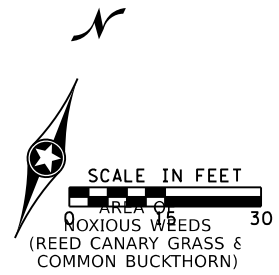
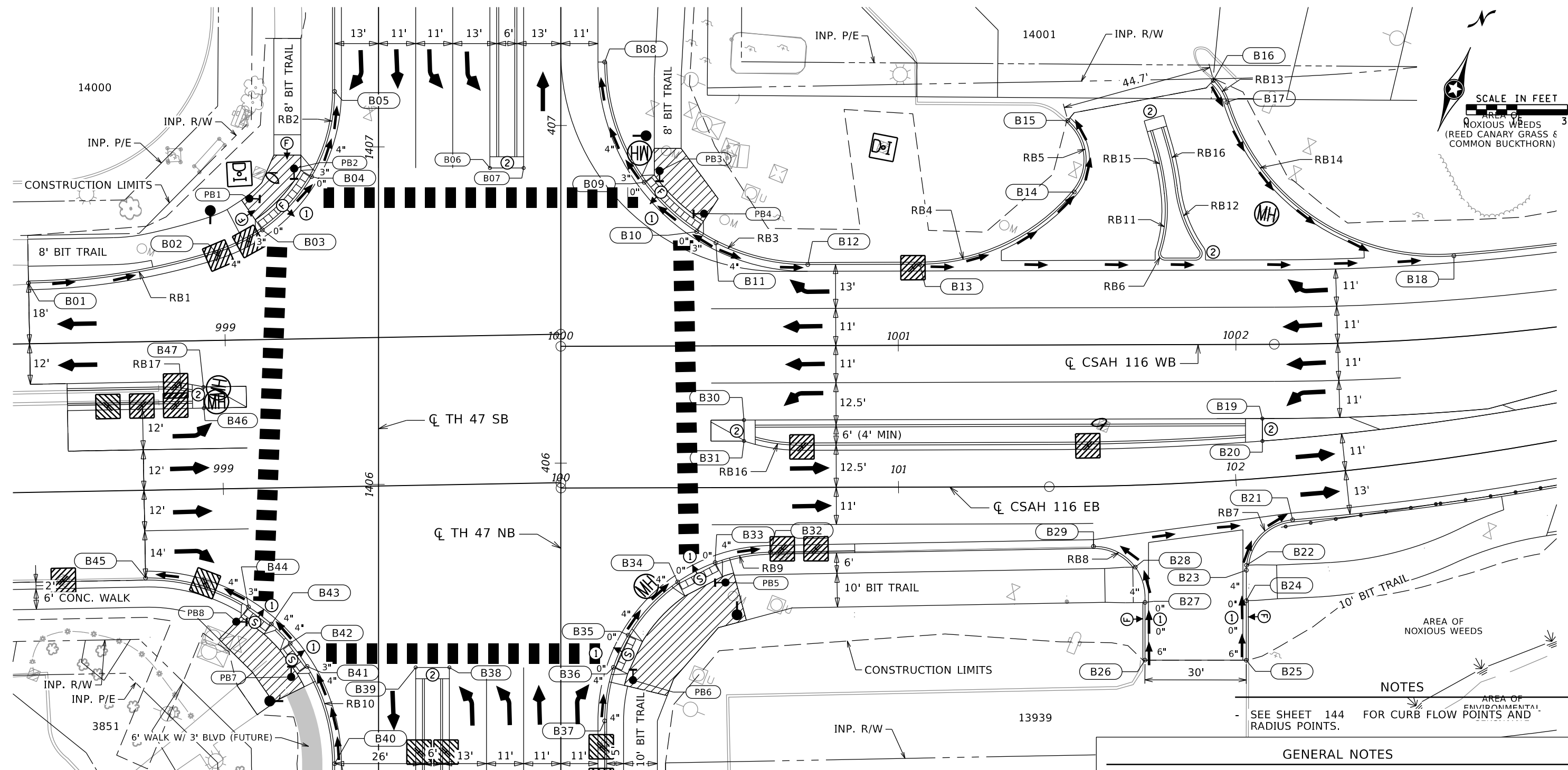
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

INTERSECTION DETAILS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 142 OF 206 SHEETS

DATE: 8/25/2020 2:42:25 PM  
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**LEGEND**

- |  |   |  |
|--|---|--|
| CONTROL POINTS AT GUTTER FLOW LINE   | INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MIN. AND 8.3% MAX. IN THE DIRECTIONS SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.     | DRAINAGE FLOW ARROW                      |
| TRUNCATED DOMES (SEE STANDARD PLATE 7036)                                    | 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%. | PEDESTRIAN CURB RAMP, SEE STANDARD PLANS |
| CATCH BASIN  | MANHOLE   | CONCRETE MEDIAN NOSE DESIGN 7113         |
| CURB HEIGHT  |   | PROPOSED SIGNAL POLE                     |
| LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. |   | PEDESTRIAN PUSH BUTTON STATION           |

**GENERAL NOTES**

- MAINTAIN A MINIMUM 5' WIDE PEDESTRIAN ACCESS ROUTE OBSTRUCTION TO OBSTRUCTION AND/OR OBSTRUCTION TO FAR EDGE OF WALK.
- THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL NOT EXCEED 0.020 FT/FT.
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**NOTES**  
 - SEE SHEET 144 FOR CURB FLOW POINTS AND RADIUS POINTS.

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

DATE: 8/25/2020 2:42 PM PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\4652-000\_1d04

### CURB FLOW POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
B01	169109.94	466293.044	860.10
B02	169138.698	466341.538	859.73
B03	169149.911	466351.781	859.63
B04	169169.935	466359.574	859.49
B05	169195.915	466356.71	859.32
B06	169191.628	466407.815	859.73
B07	169195.284	466417.122	859.57
B08	169233.278	466427.984	859.07
B09	169204.408	466411.911	859.87
B10	169196.45	466471.713	860.19
B11	169195.473	466478.254	860.29
B12	169199.429	466505.923	860.01
B13	169211.639	466536.752	859.99
B14	169248.302	466571.53	859.50
B15	169267.332	466561.997	859.27
B16	169294.103	466597.781	859.67
B17	169289.567	466603.893	859.56
B18	169271.816	466683.121	858.34
B19	169206.2	466647.945	859.10
B20	169200.022	466650.392	860.71
B21	169181.56	466667.256	860.66
B22	169164.065	466659.47	861.35
B23	169162.65	466659.944	861.37
B24	169154.254	466663.23	861.51
B25	169137.826	466669.66	862.10
B26	169126.892	466641.723	862.21
B27	169142.805	466635.495	862.00
B28	169151.475	466628.985	861.83
B29	169152.669	466615.219	861.21
B30	169149.652	466505.163	860.89
B31	169143.887	466507.447	860.68
B32	169116.09	466526.771	859.87
B33	169107.235	466512.638	860.32
B34	169097.822	466504.413	860.51
B35	169077.801	466496.511	860.83
B36	169067.316	466495.946	860.99
B37	169051.692	466499.298	861.42
B38	169049.54	466450.732	861.61
B39	169045.885	466441.424	861.46
B40	169010.575	466429.507	861.51
B41	169034.417	466411.383	861.18
B42	169038.987	466404.216	861.08
B43	169042.206	466396.975	860.99
B44	169044.463	466388.78	860.90
B45	169041.287	466357.282	860.55
B46	169094.433	466354.944	860.38
B47	169100.216	466352.551	860.51

### RADIUS POINTS

RADIUS NO.	NORTHING	EASTING	RADIUS
RB1	169292.889	466217.324	198'R
RB2	169177.635	466310.171	50'R
RB3	169255.214	466483.83	60'R
RB4	169267.423	466514.659	60'R
RB5	169253.082	466557.313	15'R
RB6	169241.216	466603.285	2'R
RB7	169168.117	466673.912	15'R
RB8	169138.808	466620.952	15'R
RB9	169069.885	466545.88	50'R
RB10	168990.468	466378.315	55'R
RB11	169238.597	466561.367	40'R
RB12	169279.572	466634.702	40'R
RB13	169280.184	466592.197	15'R
RB14	169330.228	466654.605	65'R
RB15	169223.554	466529.708	75'R
RB15	169223.554	466529.708	79'R
RB16	169165.332	466505.084	50'R
RB17	169049.161	466359.309	50'R

### CURB FLOW POINTS

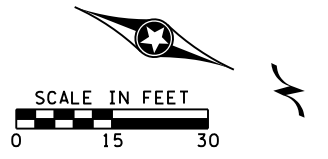
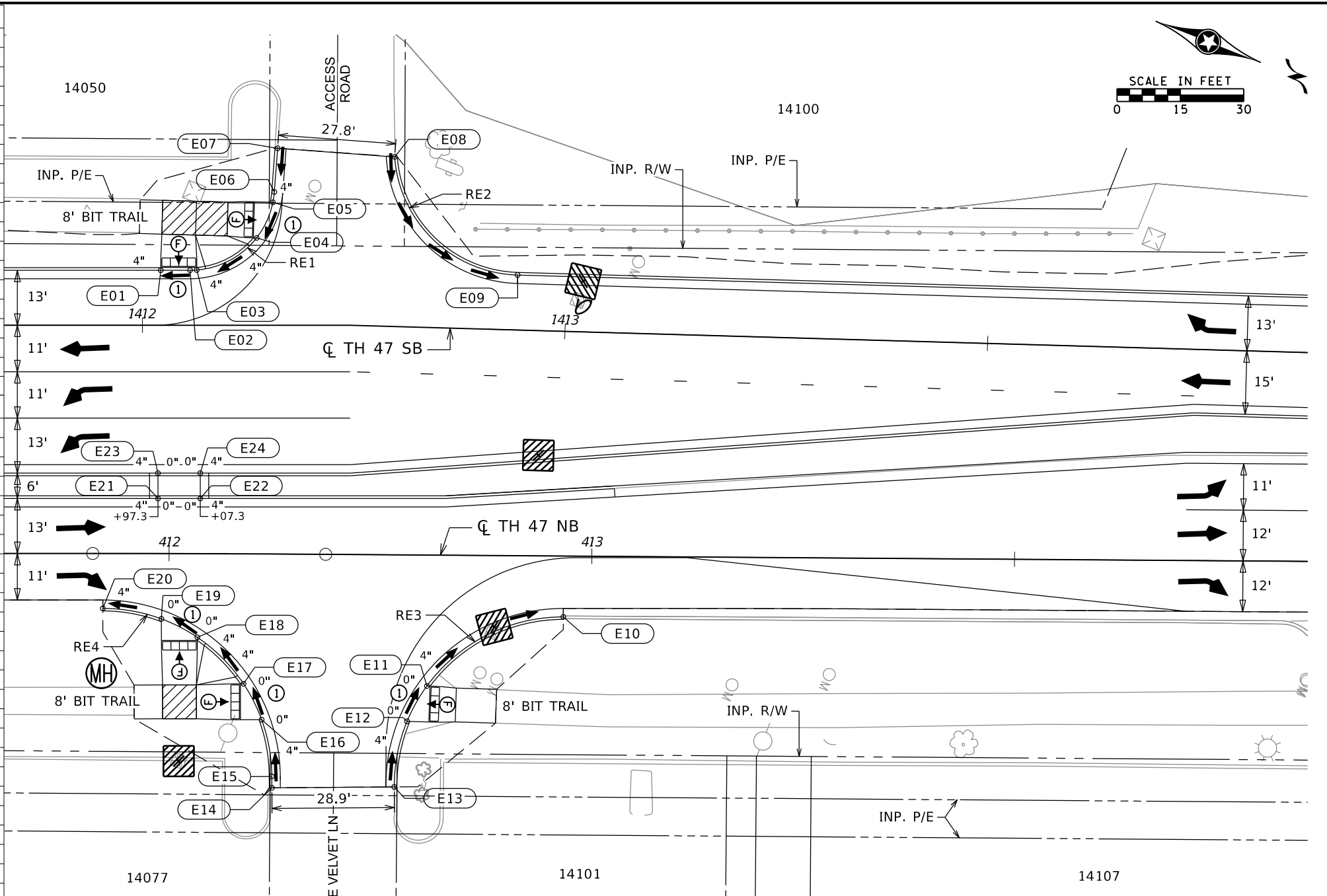
POINT NO.	NORTHING	EASTING	ELEVATION
E01	169650.078	466178.323	858.75
E02	169656.523	466175.792	858.78
E03	169657.967	466175.158	858.79
E04	169668.379	466162.885	859.01
E05	169668.9	466153.659	859.15
E06	169668.315	466151.255	859.18
E07	169665.245	466141.351	859.42
E08	169691.782	466133.126	859.50
E09	169729.06	466148.513	859.23
E10	169768.696	466219.831	858.94
E11	169744.641	466246.865	859.02
E12	169743.326	466256.353	859.05
E13	169746.184	466271.927	859.08
E14	169719.313	466282.683	858.90
E15	469718.307	466280.17	858.88
E16	169711.165	466268.57	858.76
E17	169704.066	466262.235	858.68
E18	169689.88	466255.995	858.54
E19	469680.366	466255.043	858.46
E20	169666.548	466257.804	858.36
E21	169669.209	466228.825	858.92
E22	169678.517	466225.169	858.96
E23	169667.006	466223.244	858.80
E24	169676.314	466219.588	858.85











### RADIUS POINTS

RADIUS NO.	NORTHING	EASTING	RADIUS
RE1	169649.212	466157.176	20'R
RE2	169718.896	466120.287	30'R
RE3	169783.32	466257.062	40'R
RE4	169681.172	466295.035	40'R

### SIGNAL CONTROL POINTS

POINT NO.	NORTHING	EASTING	DISTANCE TO FRONT OF LANDING (FT)	DISTANCE TO BACK OF LANDING (FT)
PB1	169157.146	466344.794	6.1	1.0
PB2	169170.279	466353.886	2.0	7.1
PB3	169209.21	466454.928	2.0	9.1
PB4	169202.236	466471.784	2.0	6.1
PB5	169102.859	466517.653	2.0	12.4
PB6	169065.927	466502.724	2.1	11.1
PB7	169029.758	466408.154	2.0	8.6
PB8	16939.0754	466387.01	2.0	7.3



LEGEND		GENERAL NOTES
	CONTROL POINTS AT GUTTER FLOW LINE	<ul style="list-style-type: none"> <li>- MAINTAIN A MINIMUM 5' WIDE PEDESTRIAN ACCESS ROUTE OBSTRUCTION TO OBSTRUCTION AND/OR OBSTRUCTION TO FAR EDGE OF WALK.</li> <li>- THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL NOT EXCEED 0.020 FT/FT.</li> <li>- PROVIDE A SAWCUT (INCIDENTAL) AT ALL CONCRETE WALK AND BITUMINOUS TRAIL REMOVAL LIMITS.</li> <li>- ALL CURB RAMPS AND LANDING AREAS SHALL BE 6" CONCRETE WALKS ON 4" AGGREGATE BASE CLASS 5.</li> <li>- LANDINGS SHALL BE CONNECTED TO EXISTING SIDEWALKS MAINTAINING A 5' WIDE (MINIMUM) PEDESTRIAN ACCESS ROUTE WITH A CROSS SLOPE THAT DOES NOT EXCEED 0.020 FT/FT AND A RUNNING SLOPE THAT DOES NOT EXCEED 0.050 FT/FT.</li> </ul>
	TRUNCATED DOMES (SEE STANDARD PLATE 7036)	
	CATCH BASIN	
	CURB HEIGHT	
	LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS.	
	DRAINAGE FLOW ARROW	
	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MIN. AND 8.3% MAX. IN THE DIRECTIONS SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.	
	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.	
	PEDESTRIAN CURB RAMP, SEE STANDARD PLANS	
	CONCRETE MEDIAN NOSE DESIGN 7113	

NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

DATE: 8/25/2020 LICENSE NO. 44620

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

CERTIFIED BY: [Signature] LICENSED PROFESSIONAL ENGINEER [Name]




**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**

ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**

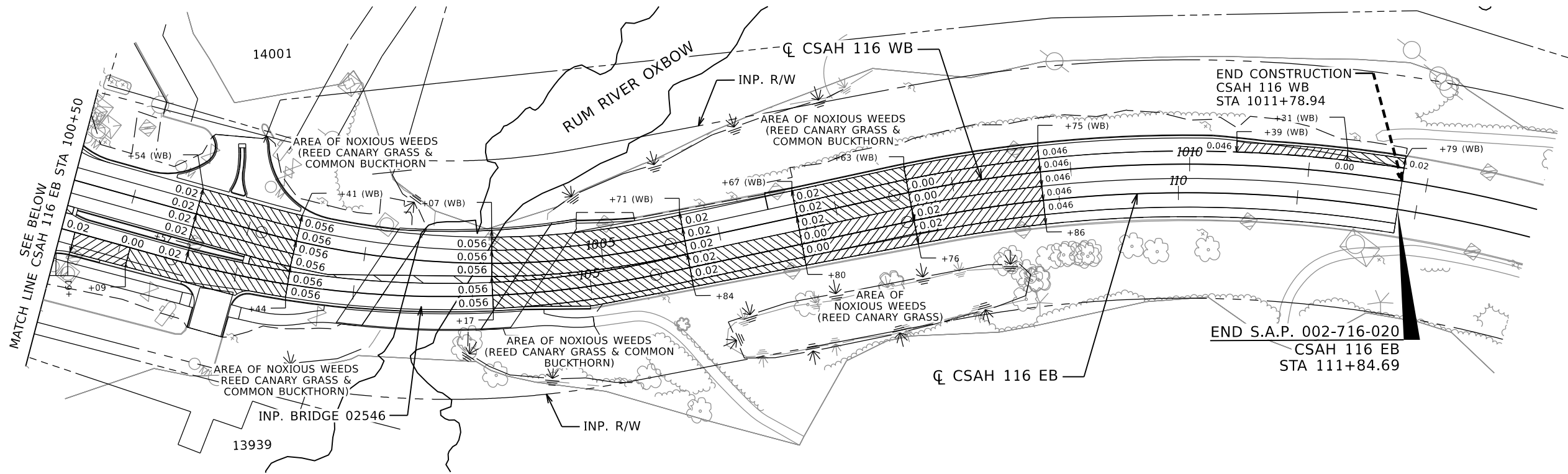
**INTERSECTION DETAILS**

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
144  
OF  
206  
SHEETS

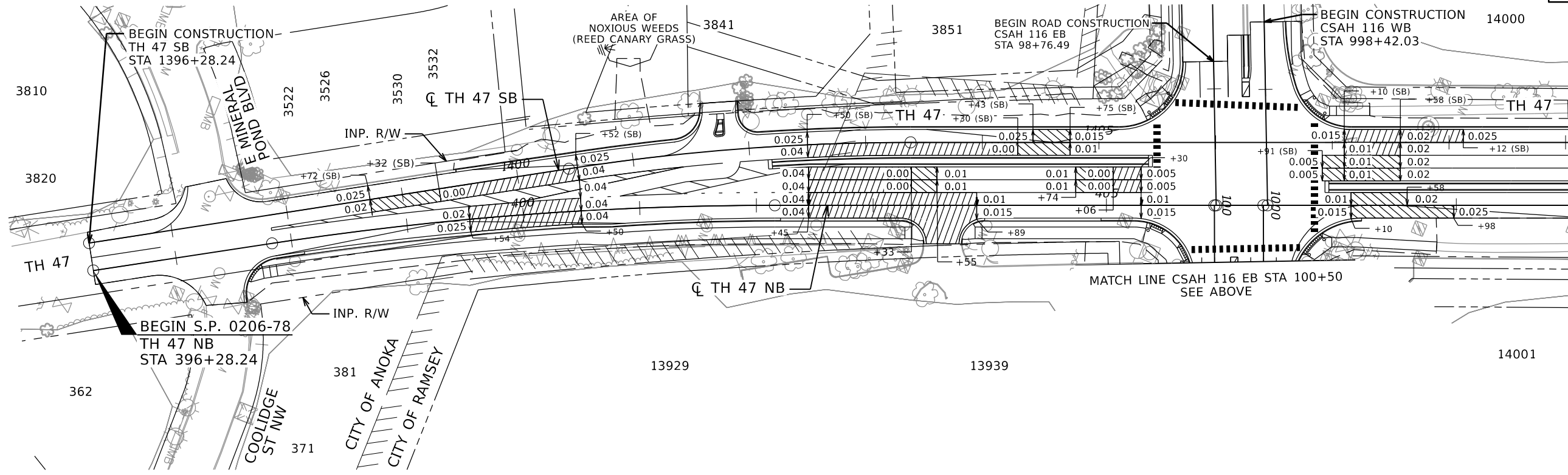


# CSAH 116 (BUNKER LAKE BLVD)



LEGEND	
	SLOPE TRANSITION (FT/FT)
	PAVEMENT SLOPE

# TRUNK HIGHWAY 47



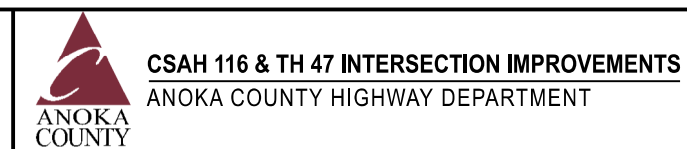
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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620

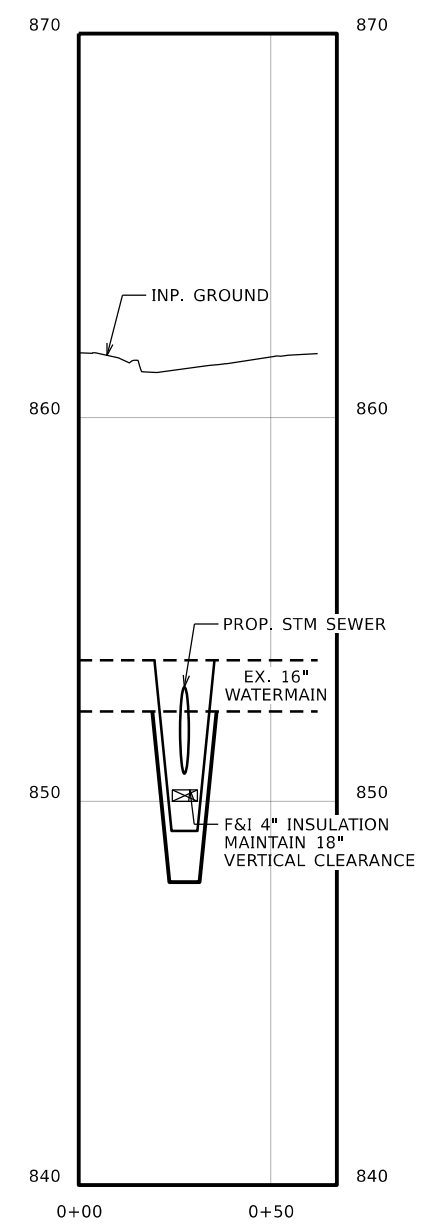
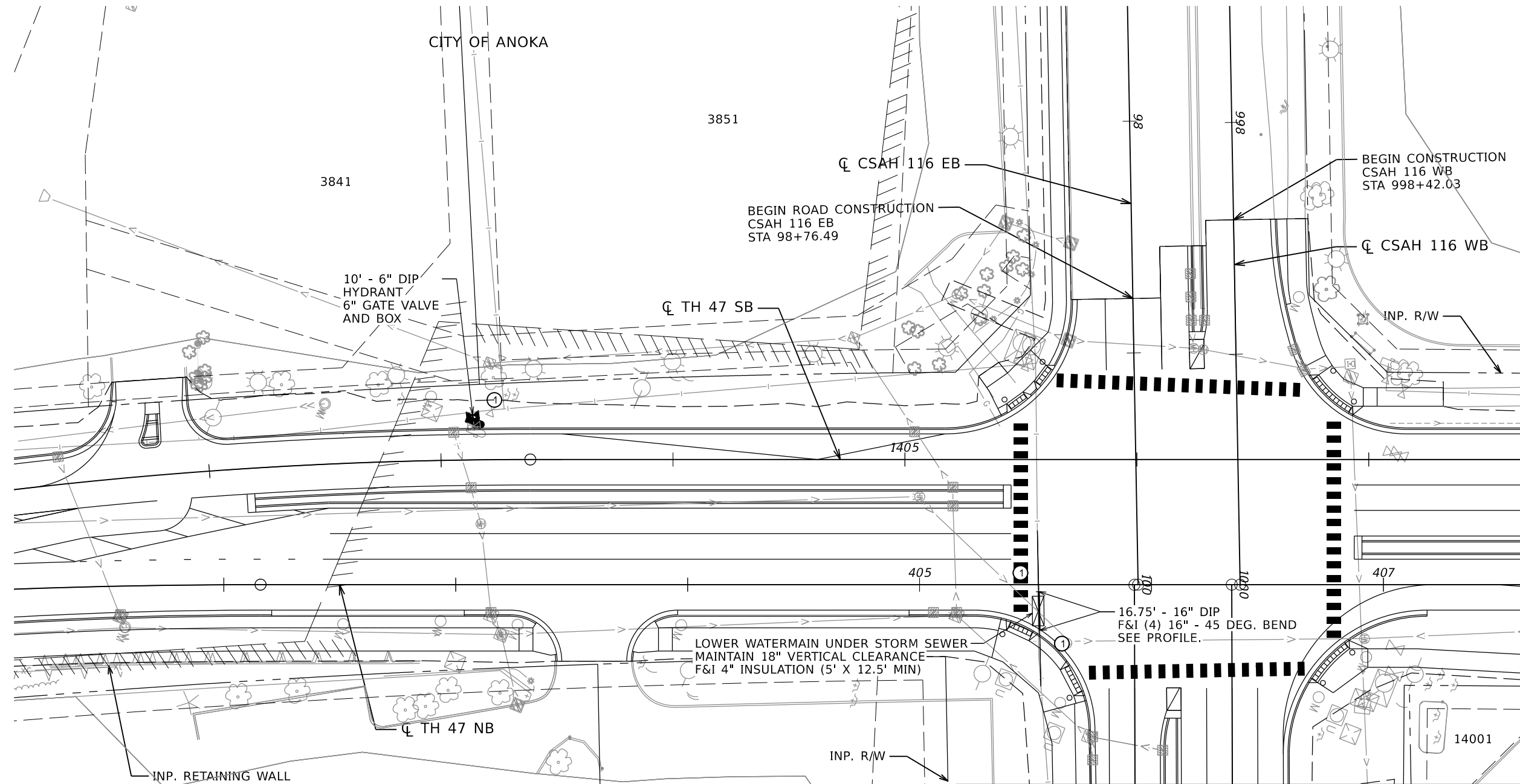
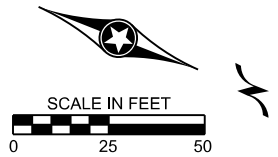


ANOKA COUNTY, MN

**SUPERELEVATION PLAN**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 145  
 OF  
 206  
 SHEETS

# TRUNK HIGHWAY 47



LEGEND		GENERAL NOTES	
①	CONNECT TO EXISTING WATERMAIN	1.	ALL WORK REQUIRING WATER SHUTTOFF SHALL BE COMPLETED DURING NON-BUSINESS HOURS. THE CONTRACTOR SHALL DETERMINE THESE HOURS.
—	PROPOSED WATERMAIN	2.	ALL OPERATION OF THE WATER SYSTEM SHALL BE BY CITY STAFF ONLY. NOTICE SHALL BE PROVIDED TO THE CITY OF ANOKA A MINIMUM OF 48 HOURS IN ADVANCE OF SHUT OFF.
->	PROPOSED STORM SEWER (REFERENCE ONLY)	3.	CONTRACTOR SHALL PLACE WATERMAIN WITH A MINIMUM COVER OF 7.5' FROM PROPOSED GRADE TO TOP OF PIPE.
⊠	INSULATION OVER WATERMAIN	4.	NEW WATERMAIN SHALL NOT BE PLACED INTO SERVICE UNTIL ALL TESTING IS COMPLETED AND ACCEPTED.
		5.	SEE MISCELLANEOUS DETAILS FOR WATERMAIN LOWERING DETAIL.

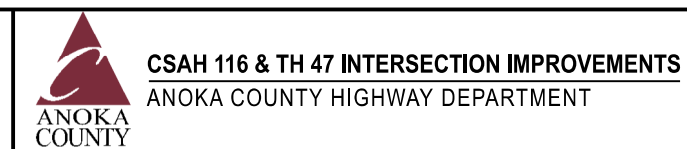
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY: *Michael E. Hentges*  
 LICENSED PROFESSIONAL ENGINEER - MICHAEL E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
 WATERMAIN PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 146 OF 206 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



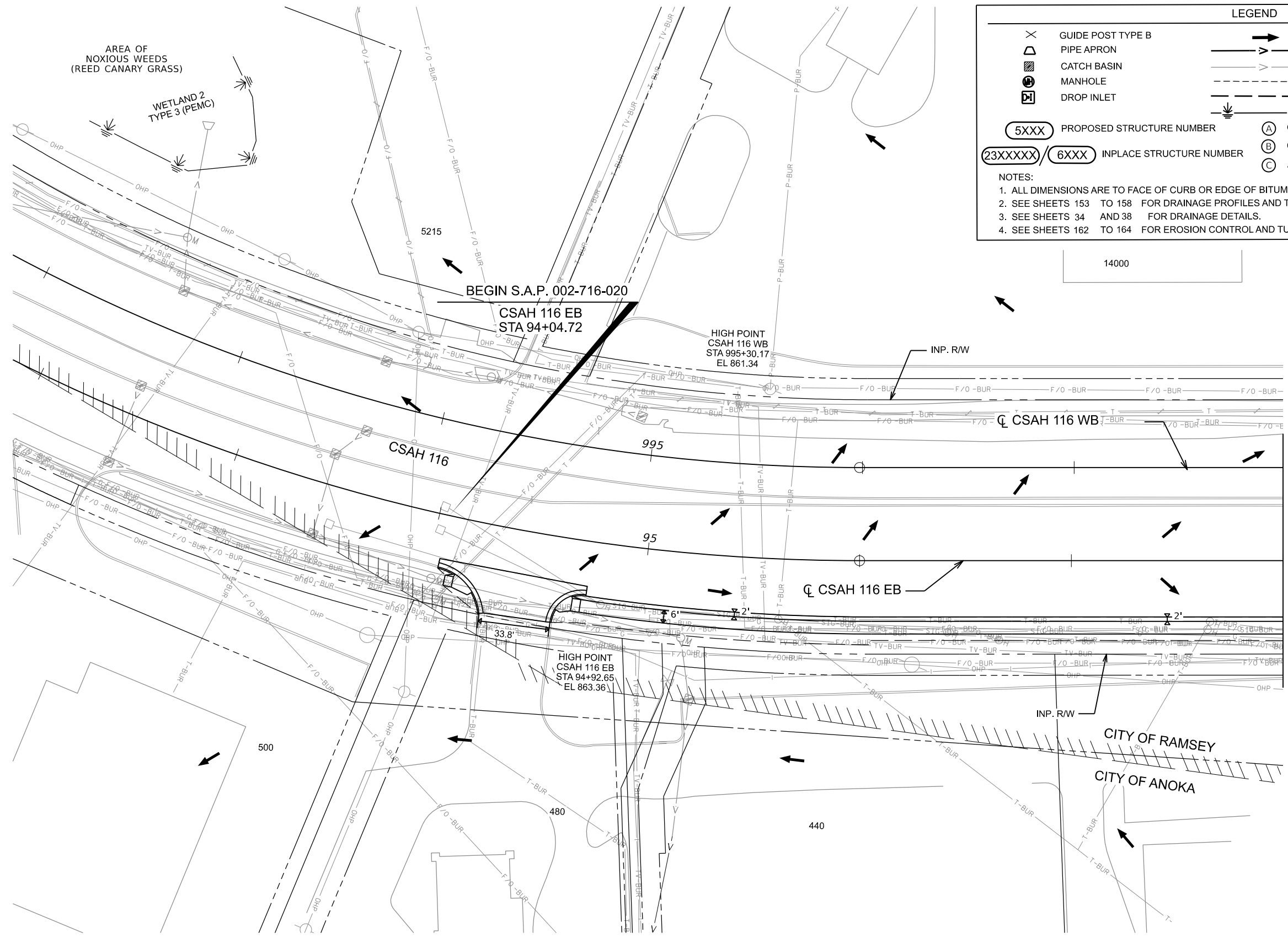
**LEGEND**

- ✕ GUIDE POST TYPE B
- △ PIPE APRON
- ▨ CATCH BASIN
- ⊙ MANHOLE
- ⊞ DROP INLET
- SURFACE FLOW DIRECTION
- v — STORM SEWER PIPE
- - - v - - - INPLACE STORM SEWER
- - - v - - - 4" PERF PE PIPE DRAIN
- - - - - CONSTRUCTION LIMITS
- ⊞ AREA OF ENVIRONMENTAL SENSITIVITY
- (A) CONNECT TO EXISTING STORM SEWER
- (B) CONNECT INTO EXISTING DRAINAGE STRUCTURE
- (C) ADJUST FRAME AND RING CASTING

5XXX PROPOSED STRUCTURE NUMBER  
 23XXXXX / 6XXX INPLACE STRUCTURE NUMBER

**NOTES:**

- ALL DIMENSIONS ARE TO FACE OF CURB OR EDGE OF BITUMINOUS UNLESS OTHERWISE NOTED.
- SEE SHEETS 153 TO 158 FOR DRAINAGE PROFILES AND TABULATIONS.
- SEE SHEETS 34 AND 38 FOR DRAINAGE DETAILS.
- SEE SHEETS 162 TO 164 FOR EROSION CONTROL AND TURF ESTABLISHMENT PLANS.



MATCH LINE CSAH 116 EB STA. 98+00  
SEE SHEET 151

DATE: 8/25/2020 2:31:3 PM  
PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000.dpd

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
 DATE: 8/25/2020 LICENSE NO. 41235



**ANOKA COUNTY**

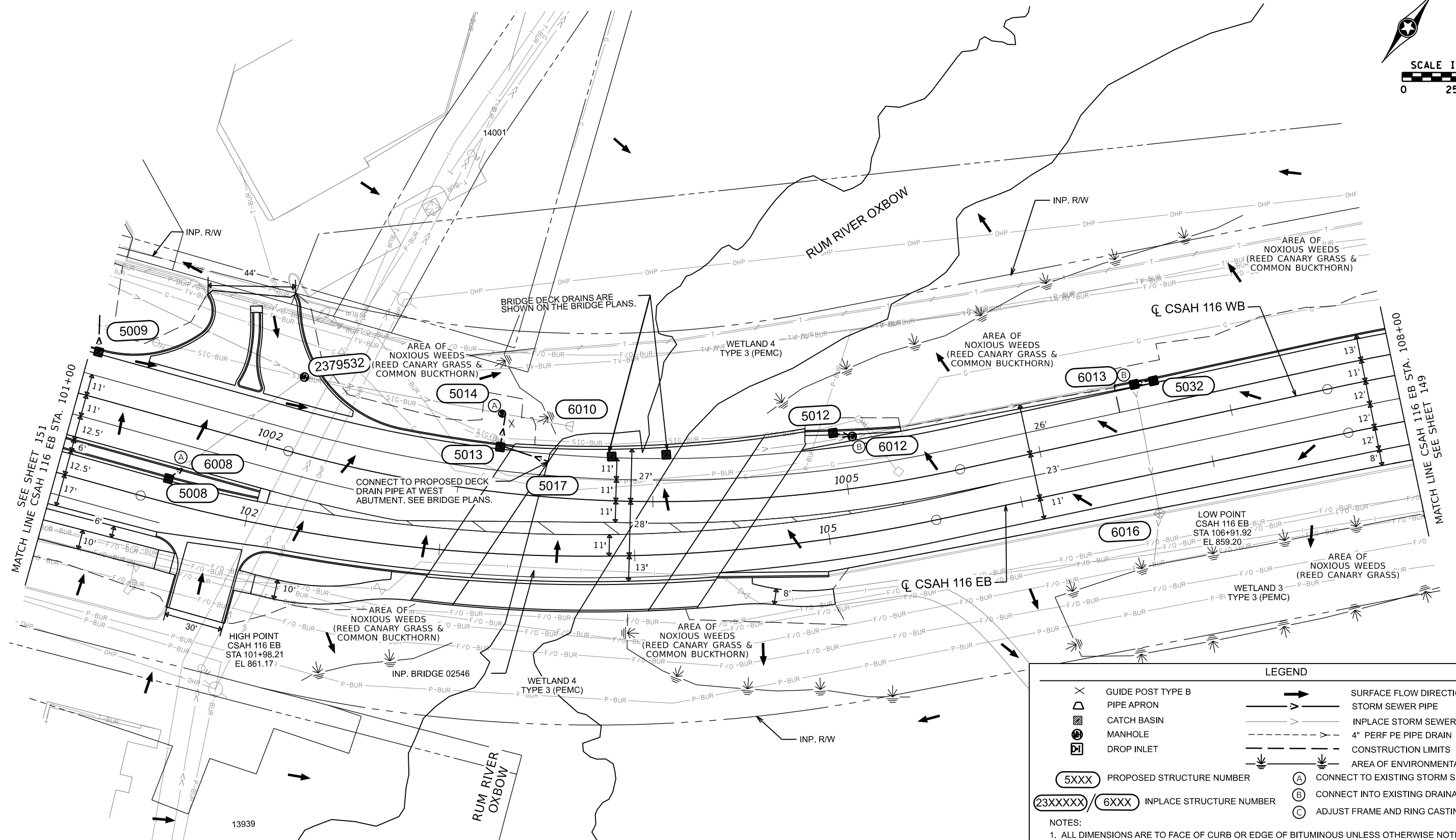
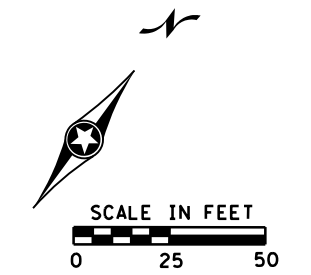
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

CSAH 116  
 DRAINAGE PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 147  
 OF  
 206  
 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



**LEGEND**

✕	GUIDE POST TYPE B	→	SURFACE FLOW DIRECTION
△	PIPE APRON	—	STORM SEWER PIPE
▨	CATCH BASIN	—	INPLACE STORM SEWER
⊙	MANHOLE	—	4" PERF PE PIPE DRAIN
⊞	DROP INLET	---	CONSTRUCTION LIMITS
5XXX	PROPOSED STRUCTURE NUMBER	⊞	AREA OF ENVIRONMENTAL SENSITIVITY
23XXXXX / 6XXX	INPLACE STRUCTURE NUMBER	(A)	CONNECT TO EXISTING STORM SEWER
		(B)	CONNECT INTO EXISTING DRAINAGE STRUCTURE
		(C)	ADJUST FRAME AND RING CASTING

**NOTES:**

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- SEE SHEETS 34 AND 38 FOR DRAINAGE DETAILS.
- SEE SHEETS 162 TO 164 FOR EROSION CONTROL AND TURF ESTABLISHMENT PLANS.

DATE: 8/25/2020 2:13:23 PM PATH & FILENAME: Projects\Minnesota\014652-000\CadPlan\4652-000\_dp02.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
 DATE: 8/25/2020 LICENSE NO. 41235

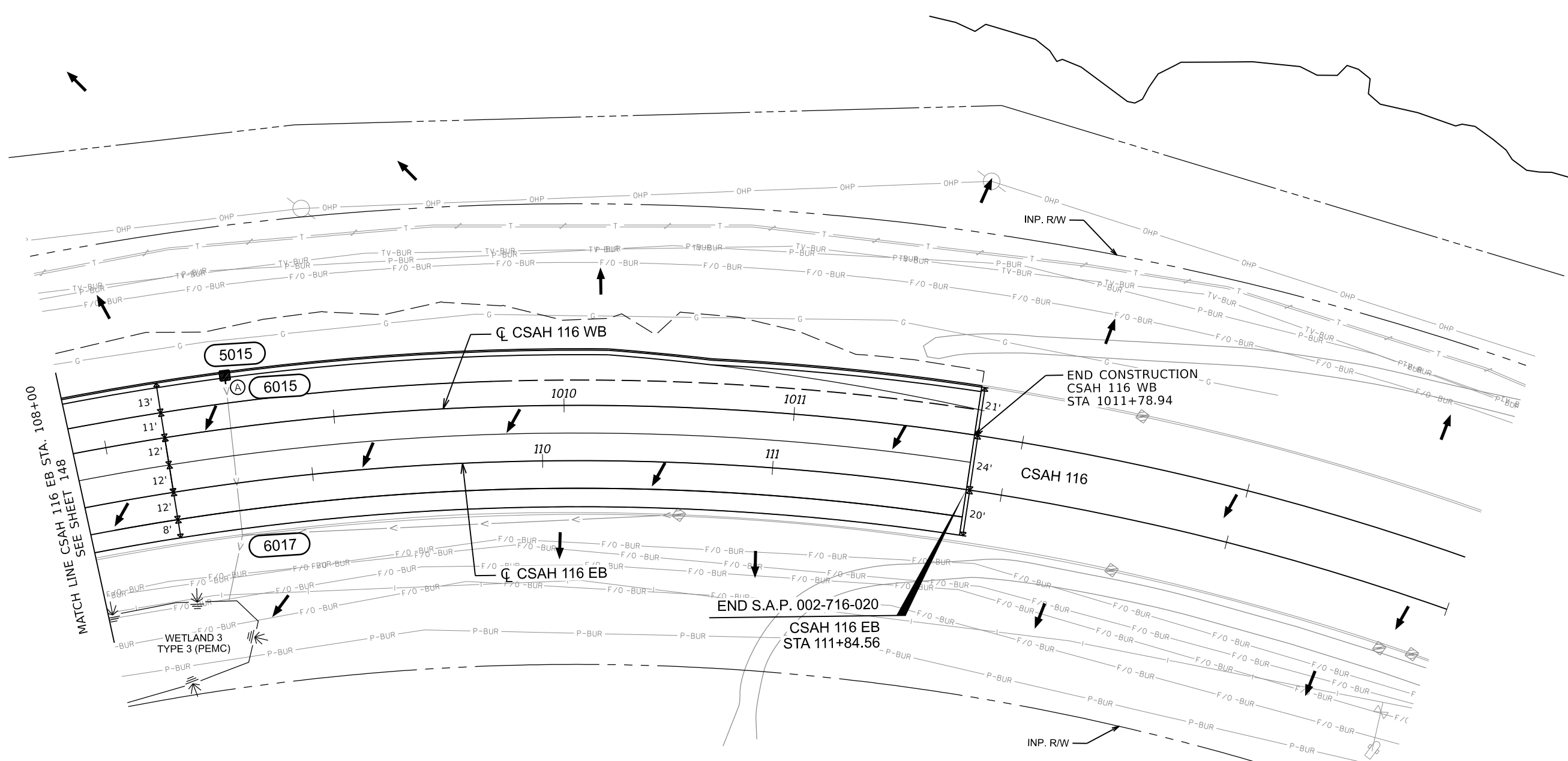


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 CSAH 116  
 DRAINAGE PLANS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 148  
 OF  
 206  
 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)



MATCH LINE CSAH 116 EB STA. 108+00  
SEE SHEET 148

END CONSTRUCTION  
CSAH 116 WB  
STA 1011+78.94

END S.A.P. 002-716-020

CSAH 116 EB  
STA 111+84.56

**LEGEND**

	GUIDE POST TYPE B		SURFACE FLOW DIRECTION
	PIPE APRON		STORM SEWER PIPE
	CATCH BASIN		INPLACE STORM SEWER
	MANHOLE		4" PERF PE PIPE DRAIN
	DROP INLET		CONSTRUCTION LIMITS
	AREA OF ENVIRONMENTAL SENSITIVITY		CONNECT TO EXISTING STORM SEWER
	CONNECT INTO EXISTING DRAINAGE STRUCTURE		ADJUST FRAME AND RING CASTING

PROPOSED STRUCTURE NUMBER  
 INPLACE STRUCTURE NUMBER

**NOTES:**

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- SEE SHEETS 153 TO 158 FOR DRAINAGE PROFILES AND TABULATIONS.
- SEE SHEETS 34 AND 38 FOR DRAINAGE DETAILS.
- SEE SHEETS 162 TO 164 FOR EROSION CONTROL AND TURF ESTABLISHMENT PLANS.

DATE: 8/25/2020 2:13:32 PM  
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
 DATE: 8/25/2020 LICENSE NO. 41235

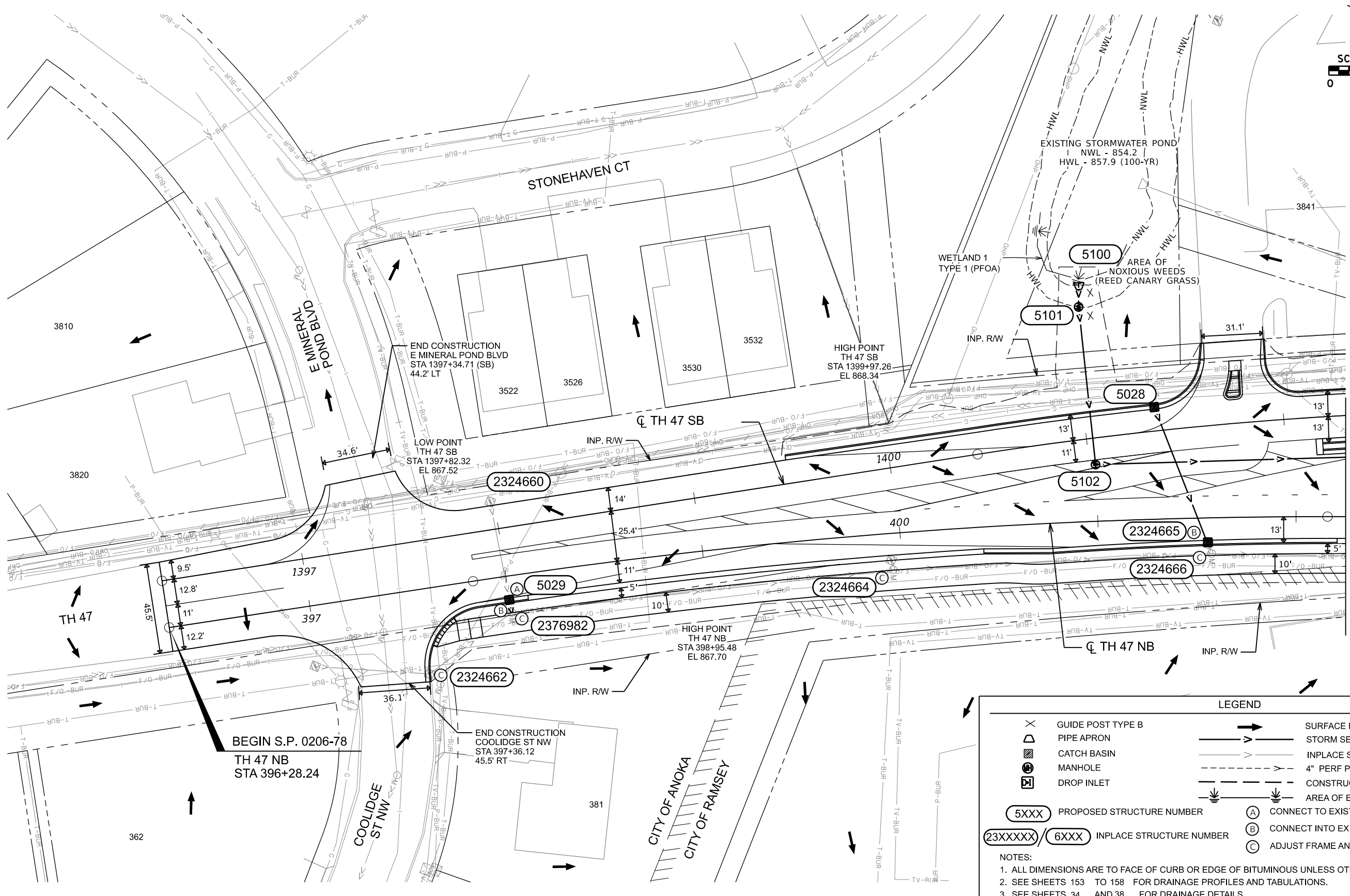
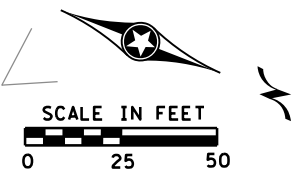


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 CSAH 116  
 DRAINAGE PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 149  
 OF  
 206  
 SHEETS

# TRUNK HIGHWAY 47



**LEGEND**

- ✕ GUIDE POST TYPE B
- △ PIPE APRON
- ▨ CATCH BASIN
- ⊙ MANHOLE
- ⊞ DROP INLET
- 5XXX PROPOSED STRUCTURE NUMBER
- 23XXXXX / 6XXX INPLACE STRUCTURE NUMBER
- SURFACE FLOW DIRECTION
- > STORM SEWER PIPE
- - -> INPLACE STORM SEWER
- - -> 4" PERF PE PIPE DRAIN
- - -> CONSTRUCTION LIMITS
- ▨ AREA OF ENVIRONMENTAL SENSITIVITY
- (A) CONNECT TO EXISTING STORM SEWER
- (B) CONNECT INTO EXISTING DRAINAGE STRUCTURE
- (C) ADJUST FRAME AND RING CASTING

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- SEE SHEETS 34 AND 38 FOR DRAINAGE DETAILS.
- SEE SHEETS 162 TO 164 FOR EROSION CONTROL AND TURF ESTABLISHMENT PLANS.

DATE: 8/25/2020 2:13:42 PM PATH & FILENAME: Projects\Minnesota\014652-000\CadPlan\4652-000\_dp04.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
 DATE: 8/25/2020 LICENSE NO. 41235

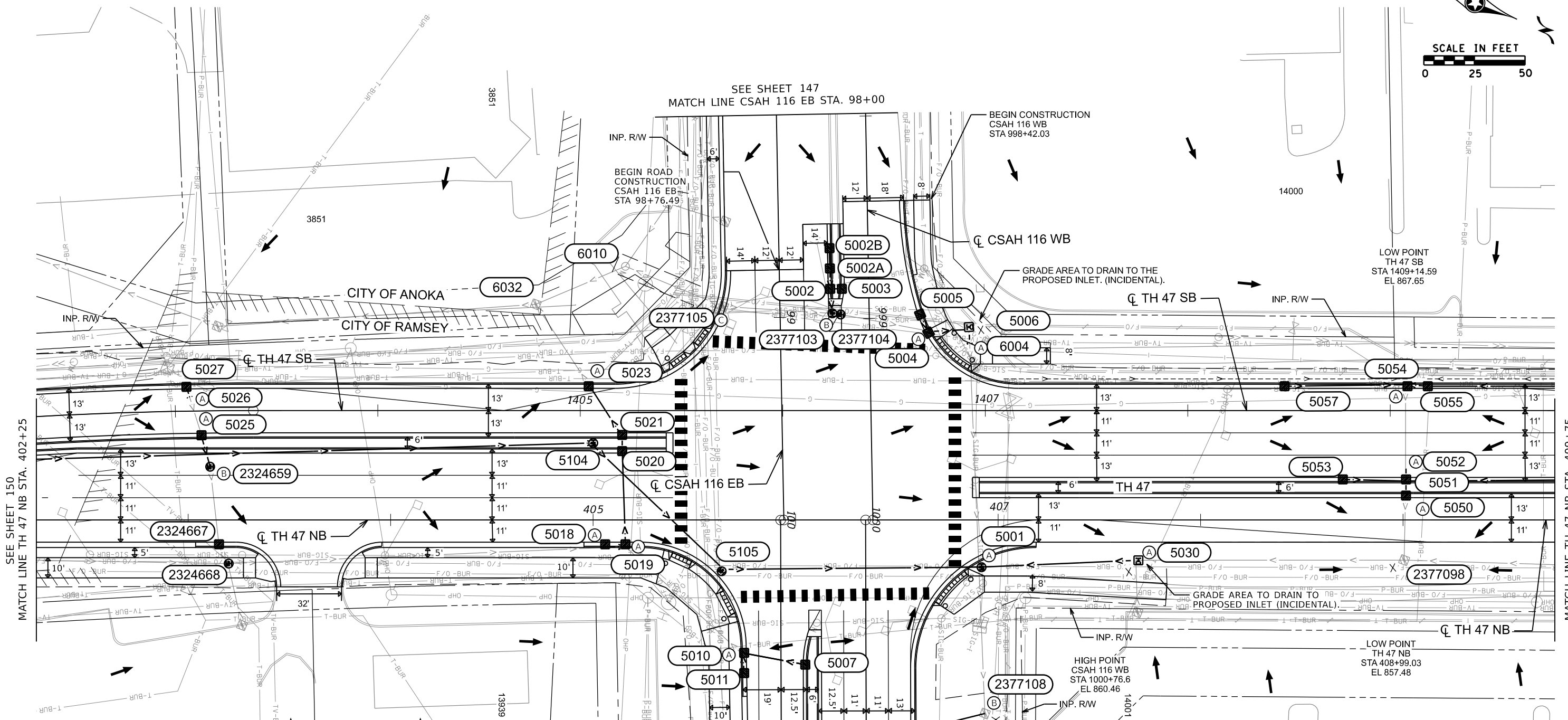
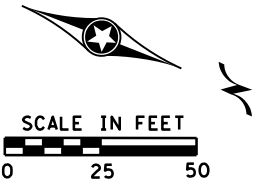


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
 DRAINAGE PLANS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 150 OF 206 SHEETS

# TRUNK HIGHWAY 47



SEE SHEET 150  
MATCH LINE TH 47 NB STA. 402+25

MATCH LINE TH 47 NB STA. 409+75  
SEE SHEET 152

MATCH LINE CSAH 116 EB STA. 101+00  
SEE SHEET 148

**LEGEND**

	GUIDE POST TYPE B		SURFACE FLOW DIRECTION
	PIPE APRON		STORM SEWER PIPE
	CATCH BASIN		INPLACE STORM SEWER
	MANHOLE		4" PERF PE PIPE DRAIN
	DROP INLET		CONSTRUCTION LIMITS
	5XXX PROPOSED STRUCTURE NUMBER		AREA OF ENVIRONMENTAL SENSITIVITY
	23XXXXX/6XXX INPLACE STRUCTURE NUMBER		(A) CONNECT TO EXISTING STORM SEWER
			(B) CONNECT INTO EXISTING DRAINAGE STRUCTURE
			(C) ADJUST FRAME AND RING CASTING

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- SEE SHEETS 34 AND 38 FOR DRAINAGE DETAILS.
- SEE SHEETS 162 TO 164 FOR EROSION CONTROL AND TURF ESTABLISHMENT PLANS.

DATE: 8/25/2020 2:13:52 PM  
PATH & FILENAME: Projects\Minnesota\04652-000\Coord\Plan\4652-000\_dpl05.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
Plan By: MJS  
Checked By: LGR  
Approved By: EAE

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CERTIFIED BY:   
LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
DATE: 8/25/2020 LICENSE NO. 41235

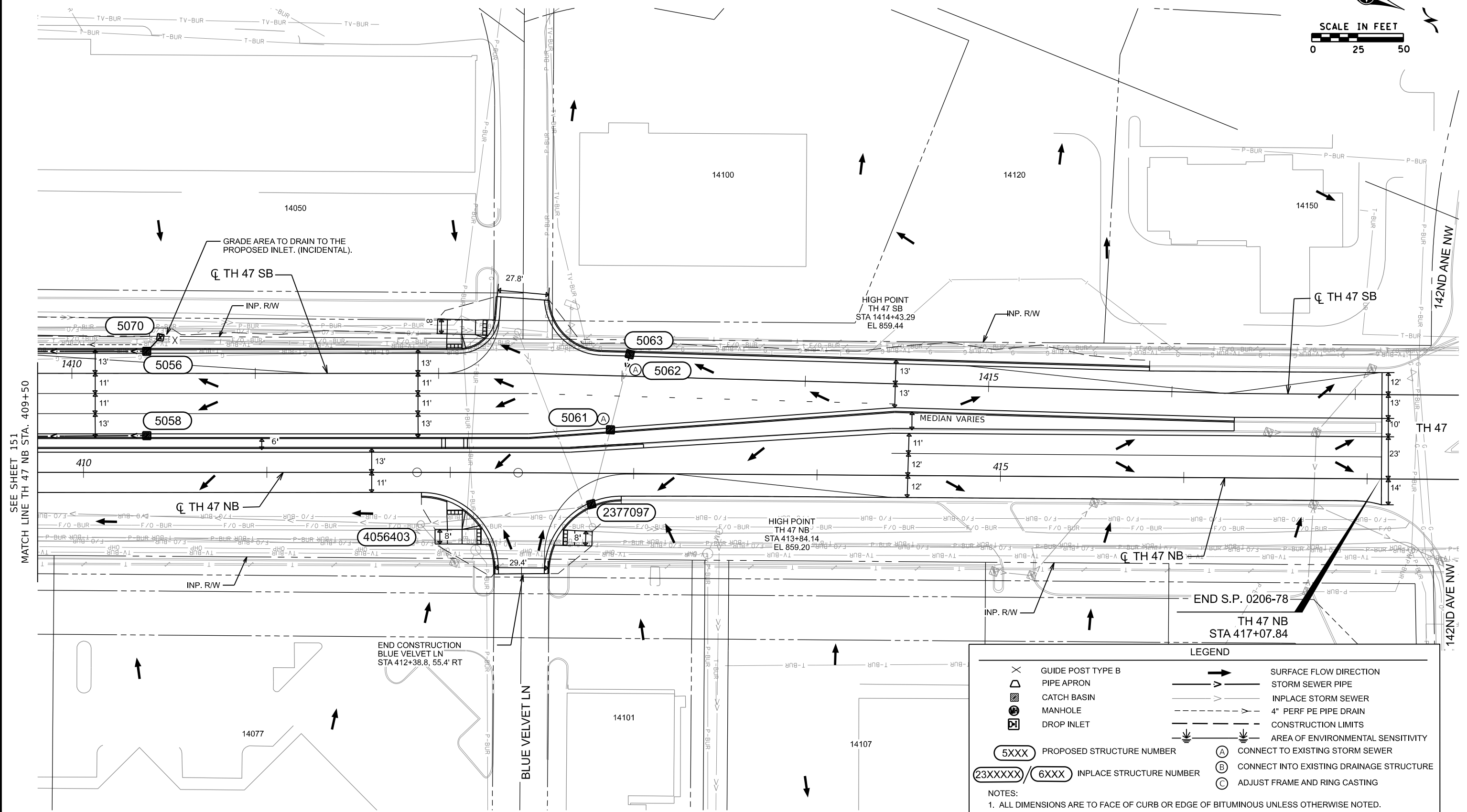
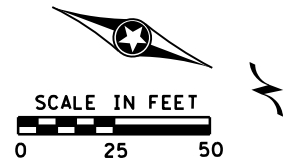


**ANOKA COUNTY**  
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
TRUNK HIGHWAY 47  
DRAINAGE PLANS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
151  
OF  
206  
SHEETS

# TRUNK HIGHWAY 47



**LEGEND**

	GUIDE POST TYPE B		SURFACE FLOW DIRECTION
	PIPE APRON		STORM SEWER PIPE
	CATCH BASIN		INPLACE STORM SEWER
	MANHOLE		4" PERF PE PIPE DRAIN
	DROP INLET		CONSTRUCTION LIMITS
	AREA OF ENVIRONMENTAL SENSITIVITY		CONNECT TO EXISTING STORM SEWER
	CONNECT INTO EXISTING DRAINAGE STRUCTURE		ADJUST FRAME AND RING CASTING

PROPOSED STRUCTURE NUMBER  
 INPLACE STRUCTURE NUMBER

**NOTES:**

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- SEE SHEETS 153 TO 158 FOR DRAINAGE PROFILES AND TABULATIONS.
- SEE SHEETS 34 AND 38 FOR DRAINAGE DETAILS.
- SEE SHEETS 162 TO 164 FOR EROSION CONTROL AND TURF ESTABLISHMENT PLANS.

DATE: 8/25/2020 2:40:3 PM  
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
 DATE: 8/25/2020 LICENSE NO. 41235



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
 DRAINAGE PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 152  
 OF  
 206  
 SHEETS



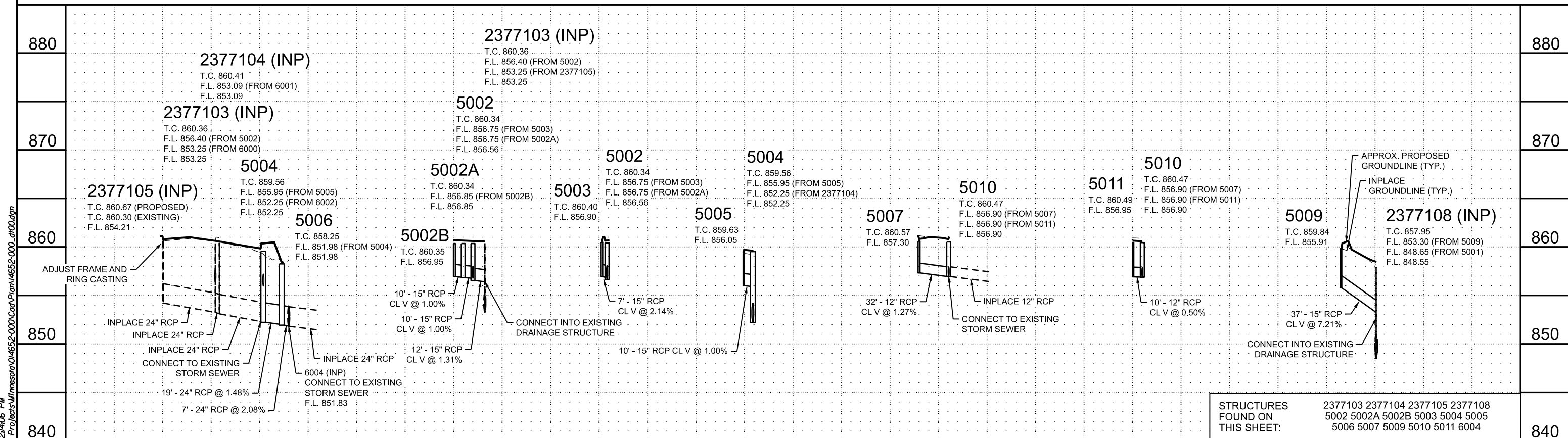
**DRAINAGE TABULATION (THIS SHEET ONLY)**

STRUCTURE NO.	STRUCTURE LOCATION			COORDINATES		DRAINAGE STRUCTURES					TOP OF CASTING ELEV.	OUTLET ELEV.	INLET ELEV.	CONNECT TO EXISTING STORM SEWER	CONNECT INTO EXISTING DRAINAGE STRUCTURE	12" RCP CL V	15" RCP CL V	24" RCP CL II	FINE AGGREGATE BEDDING (CV)	GUIDE POSTS TYPE B EACH	REMARKS								
	FLOWS FROM	FLOWS TO	ALIGN.	STATION	OFFSET	X	Y	TYPE	PAY HEIGHT													CASTING ASSEMBLY TYPE	ADJUST FRAME & RING CASTING EACH						
									SPEC 1 EACH	H LIN FT														48-4020 LIN FT	60-4020 LIN FT				
2377105	2377103	WCSAH116_EB	98+94.11	27.8' RT	466374.26	169046.32	CB						1																
2377103	2377104	WCSAH116_EB	98+98.47	25.8' LT	466357.77	169097.58	MH					A - 7D		860.36	853.25	853.09													
2377104	5004	WCSAH116_WB	998+97.76	14.1' RT	466356.78	169101.61	MH					A - 7D		860.41	853.09	852.30													
5004	5006	WCSAH116_WB	999+07.54	29.1' LT	466349.29	169145.28						B - 9		859.56															
I 5004	5006	WCSAH116_WB	999+06.94	30.3' LT	466348.29	169146.10	CB				7.3				852.21	852.02				1		19	4						
5006	6004	TH47SB	1406+91.97	41.2' LT	466339.36	169162.85						M - 11		858.25															
I 5006	6004	TH47SB	1406+92.04	39.9' LT	466340.54	169163.38	CB				6.4				851.93	851.83						7	2	1					
6004		TH47SB	1406+92.33	32.7' LT	466347.18	169166.31									851.83					1									
5002B	5002A	WCSAH116_EB	98+66.27	25.0' LT	466328.34	169084.50	CB	1				C-1		860.35	856.95	856.85								10					
5002A	5002	WCSAH116_EB	98+76.28	25.0' LT	466337.59	169088.33	CB	1				C-1		860.34	856.85	856.77									10				
5002	2377103	WCSAH116_EB	98+86.33	25.0' LT	466346.87	169092.17						C-1		860.34												12			
I 5002	2377103	WCSAH116_EB	98+86.33	24.2' LT	466347.17	169091.44	CB				3.8				856.53	856.40										1			
5003	5002	WCSAH116_WB	998+85.12	13.3' RT	466344.78	169097.53	CB	1				C-1		860.40	856.90	856.80											7		
5005	5004	WCSAH116_WB	998+98.43	25.1' LT	466342.40	169138.09	CB				3.5				859.63	856.04	855.98										10		
5007	5010	ECSAH116_EB	100+71.43	12.0' LT	466524.06	169148.53	CB	1				C-1		860.57	857.30	856.93										32		4	
5010	5019	ECSAH116_EB	100+65.53	18.2' RT	466529.69	169118.29						B - 5		860.47															
I 5010	5019	ECSAH116_EB	100+65.53	19.0' RT	466529.98	169117.56	CB				3.5				856.89	856.61												1	
5011	5010	ECSAH116_EB	100+75.51	18.2' RT	466538.97	169121.97	CB				3.5				860.49	856.94	856.91											10	
5009	2377108	ECSAH116_WB	1001+04.41	23.0' LT	466535.26	169209.97	CB				3.9				859.84	855.83	853.30											37	
2377108		ECSAH116_WB	1000+95.73	58.6' LT	466514.07	169239.90	CB								848.55														5
<b>TOTAL</b>								<b>4</b>	<b>10.9</b>	<b>7.3</b>	<b>13.7</b>		<b>1</b>						<b>3</b>	<b>2</b>	<b>42</b>	<b>86</b>	<b>26</b>	<b>22</b>	<b>2</b>				

- GENERAL NOTES:**
- STATIONS, OFFSETS, AND ELEVATIONS ARE GIVEN TO:
    - END OF ALL CONCRETE APRONS.
    - CENTER OF CASTING FOR ALL STORM STRUCTURES.
    - FOR STRUCTURES WITH A 4020 TOP SLAB, THE SECOND LINE (INDICATED WITH AN "I") LISTS THE STA. AND OFFSET TO THE CENTER OF STRUCTURE.
  - ALL PIPE LENGTHS EXCLUDE APRONS.
  - PAY HEIGHTS ARE FROM BOTTOM OF CASTING TO INVERT, PLUS 0.7'. ADJUSTMENT RINGS INCIDENTAL.

- STEPS ARE REQUIRED WHEN THE STRUCTURE PAY HEIGHT IS 4' OR GREATER.
- FLOWLINE (F.L.) ELEVATIONS ON PROFILES ARE AT CENTER OF STRUCTURE.
- INLET/OUTLET ELEVATIONS LISTED IN THE TABULATION ARE THE INVERT ELEVATION OF THE PIPE AT THE INSIDE EDGE OF STRUCTURE.
- RC PIPE IS DES 3006 GASKET JOINT PIPE. ALL RC PIPE IS CL II UNLESS OTHERWISE NOTED.
- FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE SHEET NO 158.
- CONTRACTOR FIELD VERIFY ALL INVERTS WHEN CONNECTING TO EXISTING PIPES AND STRUCTURES. ADJUST INVERTS TO ALLOW POSITIVE FLOW.
- TIE LAST THREE (3) JOINTS AT APRON END. FURNISHING AND INSTALLING PIPE TIES SHALL BE INCIDENTAL.

**NOTES:**  
(C) - C-1 CASTING IS INCLUSIVE TO DES SPEC 1 STRUCTURE.



DATE: 8/25/2020 2:406 PM PATH & FILENAME: Projects\Minnesota\04652-000\cadd\plan\4652-000\_drf00.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: **MJS**  
 Plan By: **MJS**  
 Checked By: **LGR**  
 Approved By: **EAE**

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

CERTIFIED BY:   
 LICENSE # PROFESSIONAL ENGINEER - EARTH EVANS, PE  
 DATE: 8/25/2020 LICENSE NO. 44235

**wsb**

**ANOKA COUNTY**

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

### DRAINAGE TABULATION (THIS SHEET ONLY)

STRUCTURE NO.		STRUCTURE LOCATION			COORDINATES		TYPE	DRAINAGE STRUCTURES				TOP OF CASTING ELEV.	OUTLET ELEV.	INLET ELEV.	CONNECT TO EXISTING STORM SEWER EACH	CONNECT INTO EXISTING DRAINAGE STRUCTURE EACH	10" TP PIPE SDR-35 LIN FT	12" RCP CL V LIN FT	15" RCP CL V LIN FT	FINE AGGREGATE BEDDING (CV) CU YD	GUIDE POSTS TYPE B EACH	REMARKS				
FROM	TO	ALIGN.	STATION	OFFSET	X	Y		PAY HEIGHT															CASTING ASSEMBLY TYPE			
								SPEC 1 EACH	H LIN FT	48-4020 LIN FT	72-4020 LIN FT															
5008	6008	ECSAH116_EB	101+56.29	12.0' LT	466602.77	169179.79	CB	1				C-1	860.75	856.92	856.82	1				9						C
6008	2379532	ECSAH116_WB	1001+61.43	23.0' RT	466605.22	169188.20								856.82	856.00											
2379532	5014	ECSAH116_WB	1002+09.23	38.7' LT	466626.96	169263.12	MH					A - 7D	859.05	847.00	846.30											
5017	5013	ECSAH116_WB	1003+45.04	18.1' LT	466752.47	169303.79											26						9			G, H
5013	5014	ECSAH116_WB	1003+19.00	23.0' LT	466727.95	169294.62						B - 5	857.71	851.56	851.48							16		2		
15013	5014	ECSAH116_WB	1003+19.00	23.8' LT	466727.55	169295.3	CB			6.1																
5014	6010	ECSAH116_WB	1003+17.89	40.0' LT	466718.88	169308.97						A - 7D	855.69												1	
15014	6010	ECSAH116_WB	1003+19.79	40.0' LT	466720.43	169309.87	MH				9.5				846.26	846.02	2									D
5012	6012	ECSAH116_WB	1004+96.05	29.4' LT	466859.80	169403.00	CB		3.7			B - 9	857.93	854.18	854.04				1			10		1		
6012		ECSAH116_WB	1005+05.95	26.3' LT	466868.72	169407.52	MH					A - 7D	858.25	851.45												
5015	6015	ECSAH116_WB	1008+55.21	23.0' LT	467103.78	169665.99						B - 9	861.07													
15015	6015	ECSAH116_WB	1008+55.21	23.8' LT	467103.23	169666.56	CB			5.5				855.50	855.47	1							5		1	
6015	6017	ECSAH116_WB	1008+55.14	19.0' LT	467106.49	169663.11								855.47	853.59											
5032	6013	ECSAH116_WB	1006+64.37	23.1' LT	466974.46	169522.95	CB		3.9			B - 9	858.71	854.76	854.67								10		1	
6013		ECSAH116_WB	1006+54.37	23.4' LT	466967.73	169515.54	CB					B - 9	858.68	850.98												
<b>TOTAL</b>								<b>1</b>	<b>7.6</b>	<b>11.6</b>	<b>9.5</b>						<b>4</b>	<b>2</b>	<b>26</b>	<b>24</b>	<b>26</b>	<b>15</b>	<b>1</b>			

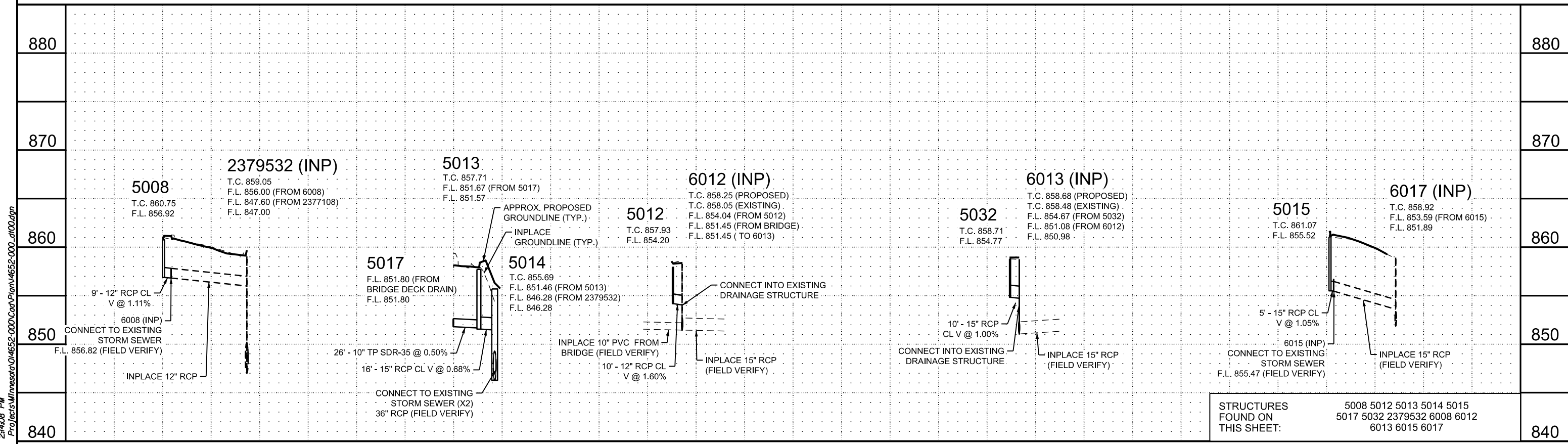
**GENERAL NOTES:**

- STATIONS, OFFSETS, AND ELEVATIONS ARE GIVEN TO:
  - END OF ALL CONCRETE APRONS.
  - CENTER OF CASTING FOR ALL STORM STRUCTURES.
  - FOR STRUCTURES WITH A 4020 TOP SLAB, THE SECOND LINE (INDICATED WITH AN "I") LISTS THE STA. AND OFFSET TO THE CENTER OF STRUCTURE.
- ALL PIPE LENGTHS EXCLUDE APRONS.
- PAY HEIGHTS ARE FROM BOTTOM OF CASTING TO INVERT, PLUS 0.7'. ADJUSTMENT RINGS INCIDENTAL.
- STEPS ARE REQUIRED WHEN THE STRUCTURE PAY HEIGHT IS 4' OR GREATER.
- FLOWLINE (F.L.) ELEVATIONS ON PROFILES ARE AT CENTER OF STRUCTURE.

- INLET/OUTLET ELEVATIONS LISTED IN THE TABULATION ARE THE INVERT ELEVATION OF THE PIPE AT THE INSIDE EDGE OF STRUCTURE.
- RC PIPE IS DES 3006 GASKET JOINT PIPE. ALL RC PIPE IS CL II UNLESS OTHERWISE NOTED.
- FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE SHEET NO 158.
- CONTRACTOR FIELD VERIFY ALL INVERTS WHEN CONNECTING TO EXISTING PIPES AND STRUCTURES, ADJUST INVERTS TO ALLOW POSITIVE FLOW.
- TIE LAST THREE (3) JOINTS AT APRON END. FURNISHING AND INSTALLING PIPE TIES SHALL BE INCIDENTAL.

**NOTES:**

- (C) - C-1 CASTING IS INCLUSIVE TO DES SPEC 1 STRUCTURE.
- (D) - CONSTRUCT DRAINAGE STRUCTURE OVER EXISTING STORM PIPE. FIELD VERIFY PIPE ALIGNMENT AND INVERT ELEVATION.
- (G) - CONNECT TO BRIDGE DECK DRAIN OUTLET PIPE AT THE WEST ABUTMENT WALL. REFER TO BRIDGE PLANS.
- (H) - CONSTRUCT WATERTIGHT CONNECTION BETWEEN PVC PIPE AND CONCRETE DRAINAGE STRUCTURE. REFER TO MNDOT STANDARD PLAN 5-297.442 FOR FLEXIBLE PIPE BEDDING.



DATE: 8/25/2020 2:408 PM PATH & FILENAME: Projects\MnDOT\4652-000\4652-000.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

DATE: 8/25/2020 LICENSE NO. 41235

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

CERTIFIED BY: [Signature]  
 LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**

**DRAINAGE PROFILES AND TABULATIONS**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 154 OF 206 SHEETS

**DRAINAGE TABULATION (THIS SHEET ONLY)**

STRUCTURE NO.		STRUCTURE LOCATION			COORDINATES		DRAINAGE STRUCTURES					CASTING ASSEMBLY TYPE	ADJUST FRAME & RING CASTING EACH	TOP OF CASTING ELEV.	OUTLET ELEV.	INLET ELEV.	CONNECT TO EXISTING STORM SEWER EACH	CONNECT INTO EXISTING DRAINAGE STRUCTURE EACH	12" RCP CL V LIN FT	15" RCP CL V LIN FT	24" RCP CL II LIN FT	FINE AGGREGATE BEDDING (CV) CU YD	REMARKS		
FLOWS FROM	FLOWS TO	ALIGN.	STATION	OFFSET	X	Y	TYPE	PAY HEIGHT																RECONSTRUCT DRN STRC LIN FT	
								G LIN FT	H LIN FT	48-4020 LIN FT	60-4020 LIN FT														
5018	5019	TH47NB	405+05.98	12.0' RT	466504.86	169034.82																		B - 9	
I 5018	5019	TH47NB	405+05.98	13.3' RT	466506.06	169035.29	CB				5.3				856.11	856.08	1				10	2			
5019	5020	TH47NB	405+15.97	12.0' RT	466501.21	169044.12						B - 9		861.35											
I 5019	5020	TH47NB	405+15.97	13.3' RT	466502.41	169044.60	CB				5.3				855.98	855.43	1				48	9			
5020	5021	TH47NB	405+14.38	34.0' LT	466458.97	169025.83						B - 9		861.66											
I 5020	5021	TH47NB	405+14.38	34.8' RT	466458.23	169025.54	CB				6.2				855.37	855.34					6	1			
5021	5023	TH47SB	1405+20.71	12.0' RT	466451.52	169022.91						B - 9		861.69											
I 5021	5023	TH47SB	1405+20.71	12.8' RT	466452.26	169023.20	CB				6.3				855.28	854.89					30	5			
5023	6032	TH47SB	1405+04.15	12.0' LT	466435.24	168998.72						B - 9		861.65											
I 5023	6032	TH47SB	1405+04.15	12.8' LT	466434.50	168998.43	CB				6.8				854.75	854.48	1								
5026	5026	TH47SB	1403+05.67	12.0' LT	466508.14	168813.89			4.1			B - 9		864.35	860.14	860.08	1				6		1		
5026	5025	TH47SB	1403+07.21	6.7' LT	466512.42	168817.34						B - 9		864.25	860.08	859.92	1								
5025	2324659	TH47SB	1403+12.77	12.0' RT	466527.64	168829.58	CB	4.3				B - 9		864.25	859.88	859.77	1	1			16		2		
2324659	2324667	TH47NB	403+10.86	26.3' LT	466540.58	168839.23	MH					A - 7D		863.45	859.62	859.26									
2324667	2324668	TH47NB	403+15.20	12.0' RT	466574.61	168857.25	CB					B - 9		862.83	859.26	858.64									
2324668	5018	TH47NB	403+20.01	21.6' RT	466581.73	168865.22	MH					A - 7D		863.48	857.54	856.15									
5028	2324665	TH47SB	1401+35.69	12.0' LT	466580.35	168658.89	CB			3.1		B - 9		866.93	863.75	860.33				1		73		10	
2324665	2324666	TH47NB	401+55.22	12.3' RT	466633.90	168708.95	CB					B - 9		864.65	858.93	858.66									
2324666	2324668	TH47NB	401+56.99	18.0' RT	466638.48	168712.76	MH						1	865.20	858.61	857.84									
2324664	2324666	TH47NB	399+95.11	18.4' RT	466704.84	168566.27	MH						1	867.36	859.72	858.66								F	
5029	2376982	TH47NB	397+99.99	12.0' RT	466789.72	168391.65	CB				5.4		B - 9		866.91	861.43	861.31	1			1		6		1
2376982	2324664	TH47NB	398+00.30	18.5' RT	466795.22	168395.15	MH						1	867.48	860.81	859.77									
2324662	2376982	TH47NB	397+53.41	42.9' RT	466839.69	168366.86	CB						1	866.17	861.06	860.85								F	
<b>TOTAL</b>								<b>4.3</b>	<b>7.2</b>	<b>24.7</b>	<b>10.6</b>	<b>1.5</b>		<b>4</b>				<b>6</b>	<b>3</b>	<b>22</b>	<b>79</b>	<b>94</b>	<b>31</b>		

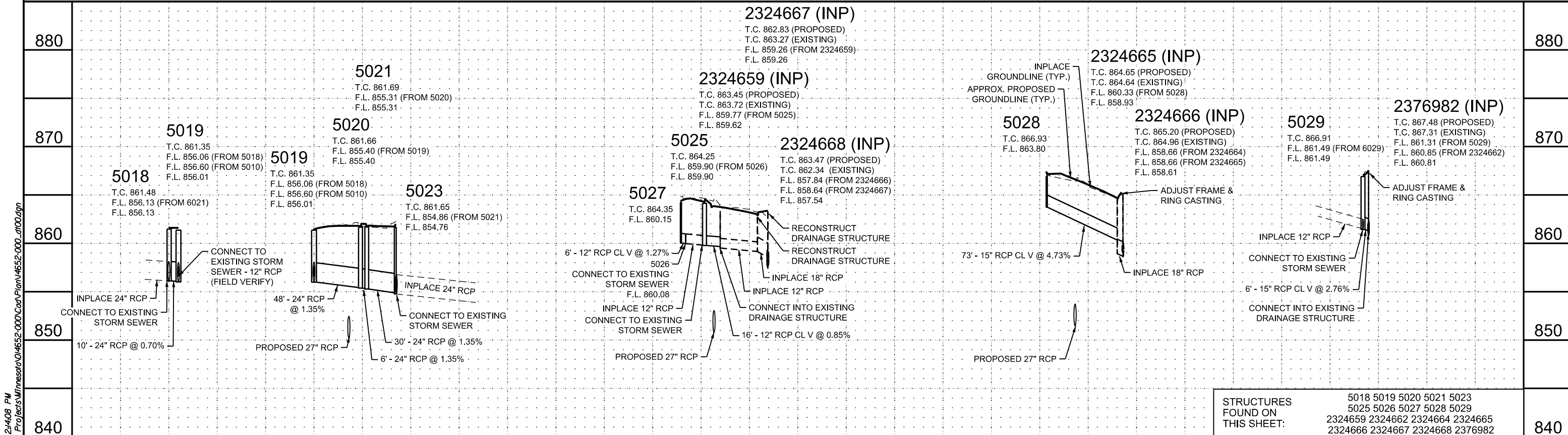
**GENERAL NOTES:**

- STATIONS, OFFSETS, AND ELEVATIONS ARE GIVEN TO:  
 -END OF ALL CONCRETE APRONS.  
 -CENTER OF CASTING FOR ALL STORM STRUCTURES.  
 -FOR STRUCTURES WITH A 4020 TOP SLAB, THE SECOND LINE (INDICATED WITH AN "I") LISTS THE STA. AND OFFSET TO THE CENTER OF STRUCTURE.

- ALL PIPE LENGTHS EXCLUDE APRONS.
- FLOWLINE (F.L.) ELEVATIONS ON PROFILES ARE AT CENTER OF STRUCTURE.
- INLET/OUTLET ELEVATIONS LISTED IN THE TABULATION ARE THE INVERT ELEVATION OF THE PIPE AT THE INSIDE EDGE OF STRUCTURE.
- PAY HEIGHTS ARE FROM BOTTOM OF CASTING TO INVERT, PLUS 0.7' ADJUSTMENT RINGS INCIDENTAL.
- STEPS ARE REQUIRED WHEN THE STRUCTURE PAY HEIGHT IS 4' OR GREATER.

- FLOWLINE (F.L.) ELEVATIONS ON PROFILES AND INLET/OUTLET ELEVATIONS ON TABULATIONS ARE AT CENTER OF STRUCTURE.
- RC PIPE IS DES 3006 GASKET JOINT PIPE. ALL RC PIPE IS CL II UNLESS OTHERWISE NOTED.
- FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE SHEET NO. 158.
- CONTRACTOR FIELD VERIFY ALL INVERTS WHEN CONNECTING TO EXISTING PIPES AND STRUCTURES. ADJUST INVERTS TO ALLOW POSITIVE FLOW.
- TIE LAST THREE (3) JOINTS AT APRON END. FURNISHING AND INSTALLING PIPE TIES SHALL BE INCIDENTAL.

NOTES:  
(F) - DRAINAGE STRUCTURES ARE NOT SHOWN IN THE PROFILE.



DATE: 8/25/2020 2:408 PM PROJECT: Minnesota 014652-000 Cadd/Plan/4652-000.dwg

NO.	DATE	BY	CHK	REVISIONS

Design By: **MJS**  
 Plan By: **MJS**  
 Checked By: **LGR**  
 Approved By: **EAE**

DATE: 8/25/2020 LICENSE NO. 41235

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

CERTIFIED BY: *[Signature]*  
 LICENSE: PROFESSIONAL ENGINEER - EARTH EVANS, PE

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

SHEET 155 OF 206 SHEETS

DRAINAGE PROFILES AND TABULATIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

DRAINAGE TABULATION (THIS SHEET ONLY)

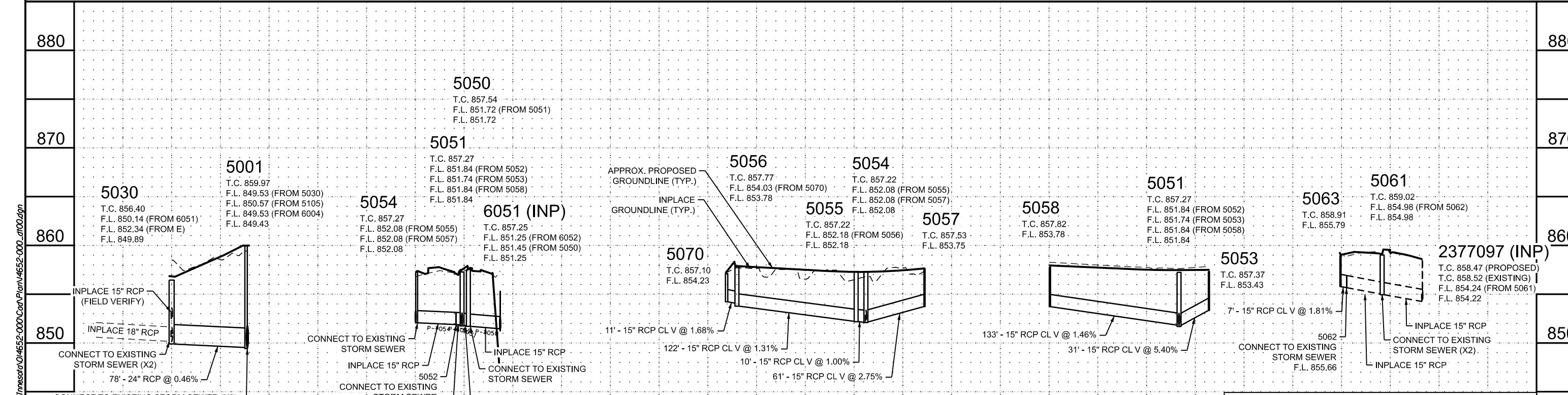
Table with columns: STRUCTURE NO., STRUCTURE LOCATION, COORDINATES, DRAINAGE STRUCTURES, CASTING ASSEMBLY TYPE, TOP OF CASTING ELEV., OUTLET ELEV., INLET ELEV., CONNECT TO EXISTING STORM SEWER, 15" RCP CL V, 24" RCP CL II, 4" PERF TP PIPE DRAIN, FINE AGGREGATE BEDDING (CV), GUIDE POSTS TYPE B, REMARKS. Includes a total row at the bottom.

GENERAL NOTES: - STATIONS, OFFSETS, AND ELEVATIONS ARE GIVEN TO: - END OF ALL CONCRETE APRONS. - CENTER OF CASTING FOR ALL STORM STRUCTURES. - FOR STRUCTURES WITH A 4020 TOP SLAB, THE SECOND LINE (INDICATED WITH AN "I") LISTS THE STA. AND OFFSET TO THE CENTER OF STRUCTURE. - ALL PIPE LENGTHS EXCLUDE APRONS.

- FLOWLINE (F.L.) ELEVATIONS ON PROFILES ARE AT CENTER OF STRUCTURE. - INLET/OUTLET ELEVATIONS LISTED IN THE TABULATION ARE THE INVERT ELEVATION OF THE PIPE AT THE INSIDE EDGE OF STRUCTURE. - PAY HEIGHTS ARE FROM BOTTOM OF CASTING TO INVERT, PLUS 0.7'. ADJUSTMENT RINGS INCIDENTAL. - STEPS ARE REQUIRED WHEN THE STRUCTURE PAY HEIGHT IS 4' OR GREATER. - FLOWLINE (F.L.) ELEVATIONS ON PROFILES AND INLET/OUTLET ELEVATIONS ON TABULATIONS ARE AT CENTER OF STRUCTURE.

- RC PIPE IS DES 3006 GASKET JOINT PIPE. ALL RC PIPE IS CL II UNLESS OTHERWISE NOTED. - FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE SHEET NO. 158. - CONTRACTOR FIELD VERIFY ALL INVERTS WHEN CONNECTING TO EXISTING PIPES AND STRUCTURES. ADJUST INVERTS TO ALLOW POSITIVE FLOW. - TIE LAST THREE (3) JOINTS AT APRON END. FURNISHING AND INSTALLING PIPE TIES SHALL BE INCIDENTAL.

NOTES: (E) - 4" PE PIPE DRAIN WALL CONNECTION, INCIDENTAL.



STRUCTURES FOUND ON THIS SHEET: 5001 5030 5050 5051 5052 5053 5054 5055 5056 5057 5058 5061 5062 5063 5070 2377097

Table with columns: NO., DATE, BY, CHK, REVISIONS. Includes Design By: MJS, Checked By: LGR, Approved By: EAE, and a certification statement from Earth Evans, PE.

Logos for wsb and ANOKA COUNTY. Text: CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS ANOKA COUNTY HIGHWAY DEPARTMENT

DATE: 8/25/2020 2:40:09 PM PATH & FILENAME: Projects\Minnesota\04652-000\Coord\Plan\4652-000.dwg

**DRAINAGE TABULATION (THIS SHEET ONLY)**

STRUCTURE NO.		STRUCTURE LOCATION			COORDINATES		DRAINAGE STRUCTURES			TOP OF CASTING ELEV.	OUTLET ELEV.	INLET ELEV.	24" RCP CL II LIN FT	27" RCP CL IV LIN FT	28" RCP-A CL IIIA LIN FT	APRON EACH	TRASH GUARD EACH	APRON TYPE	RIPRAP CLASS II CU YD	GEOTEXTILE FILTER TYPE IV SQ YD	FINE AGGREGATE BEDDING (CV) CU YD	GUIDE POSTS TYPE B EACH	REMARKS	
FLOWS FROM	FLOWS TO	ALIGN.	STATION	OFFSET	X	Y	TYPE	PAY HEIGHT																CASTING ASSEMBLY TYPE
								SPEC 2 EACH	60-4020 LIN FT															
5100	5101	TH47SB	1401+05.67	78.7' LT	466535.88	168600.47	APR																A	
5101	5102	TH47SB	1401+04.20	66.6' LT	466547.24	168604.90	OCS	1		C-2	857.90	852.00	851.61					3	13	16	1		B	
5102	5104	TH47SB	1401+02.94	13.4' RT	466618.11	168641.91				A-7D	867.18			80										
I 5102	5104	TH47SB	1401+04.24	13.4' RT	466617.54	168643.07	MH		15.7		851.59	850.29		399						78				
5104	5105	TH47SB	1405+06.36	16.1' RT	466460.55	169011.03				A-7D	862.40													
I 5104	5105	TH47SB	1405+05.07	16.1' RT	466461.22	169009.83	MH		12.2		850.27	849.99		91						19				
5105	5001	TH47NB	405+63.50	25.3' RT	466496.22	169093.23				A-7D	860.74													
I 5105	5001	TH47NB	405+64.42	24.4' RT	466495.03	169093.75	MH		10.9		849.97	849.58		126						25				
<b>TOTAL</b>														<b>6</b>	<b>616</b>	<b>80</b>	<b>1</b>	<b>1</b>		<b>3</b>	<b>13</b>	<b>140</b>	<b>2</b>	

**GENERAL NOTES:**

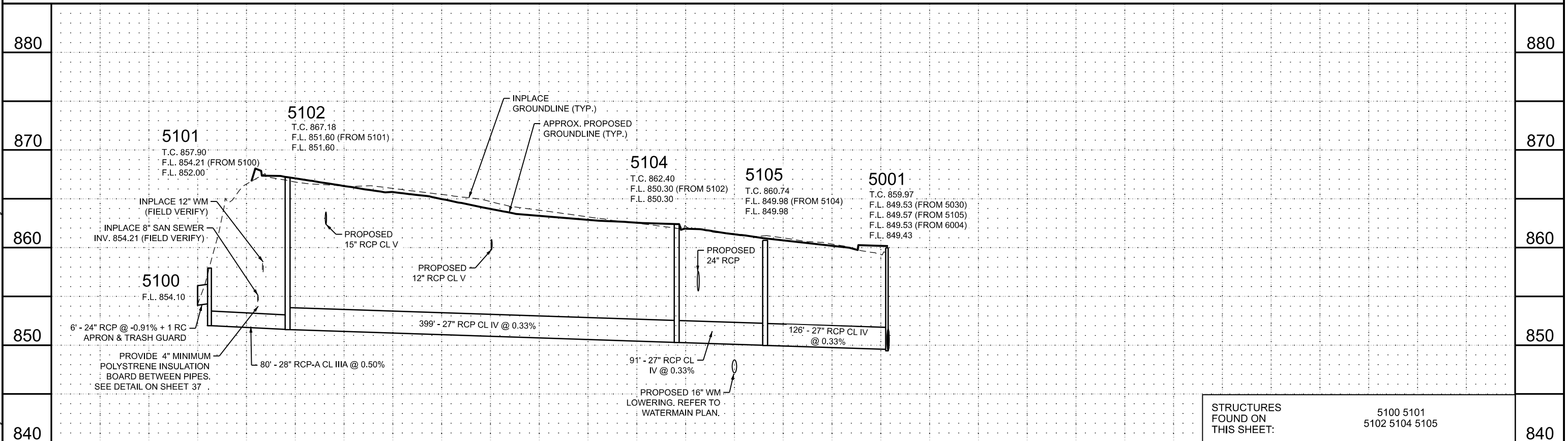
- STATIONS, OFFSETS, AND ELEVATIONS ARE GIVEN TO:  
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- STEPS ARE REQUIRED WHEN THE STRUCTURE PAY HEIGHT IS 4' OR GREATER.
- FLOWLINE (F.L.) ELEVATIONS ON PROFILES ARE AT CENTER OF STRUCTURE.

- INLET/OUTLET ELEVATIONS LISTED IN THE TABULATION ARE THE INVERT ELEVATION OF THE PIPE AT THE INSIDE EDGE OF STRUCTURE.
- RC PIPE IS DES 3006 GASKET JOINT PIPE. ALL RC PIPE IS CL II UNLESS OTHERWISE NOTED.
- FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE SHEET NO 158.
- CONTRACTOR FIELD VERIFY ALL INVERTS WHEN CONNECTING TO EXISTING PIPES AND STRUCTURES. ADJUST INVERTS TO ALLOW POSITIVE FLOW.
- TIE LAST THREE (3) JOINTS AT APRON END. FURNISHING AND INSTALLING PIPE TIES SHALL BE INCIDENTAL.

**NOTES:**

- (A) - TIE ALL JOINTS (INCIDENTAL).
- (B) - DES SPEC 2 - OUTLET CONTROL STRUCTURE 5101. C-2 CASTING IS INCLUSIVE TO DES SPEC 2 STRUCTURE. SEE SHEET 38 FOR DETAIL.

DATE: 8/25/2020 2:40 PM PATH & FILENAME: Projects\Minnesota\014652-000\000\Plan\4652-000.dwg



NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
 DATE: 8/25/2020 LICENSE NO. 41235



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

DRAINAGE PROFILES AND TABULATIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 157  
 OF  
 206  
 SHEETS

CASTING ASSEMBLY SUMMARY									N
ASSEMBLY	RING OR FRAME	COVER OR GRATE	CURB BOX	STANDARD PLATE NUMBER	USE	S.P. 0206-78	S.A.P.022-716-020	POND OUTLET PIPE (S.P. 0206-78)	TOTALS
B - 5	802A	816	823	4129 4154 4160	CATCH BASIN	5	3		8
B - 9	805	816		4132 4154	CATCH BASIN	17	7		24
M - 11	ROUND CONC	731		4143 4143	CATCH BASIN	2	1		3
A - 7D	700-7	715		4101 4110	MANHOLE	3	5	3	11
C - 1	NEENAH FOUNDRY R-3067-C W/ TYPE "C" GRATE OR EQUIVALENT SEE DETAIL ON SHEET 34						6		6
<b>TOTAL</b>						<b>27</b>	<b>22</b>	<b>3</b>	<b>52</b>
C - 2	HAALA INDUSTRIES PS48-58S PLATE STYLE CASTING OR EQUIVALENT SEE DETAIL ON SHEET 38 INCLUSIVE TO CONSTRUCT DRAINAGE STRC DESIGN SPEC 2							1	

DRAINAGE STRUCTURE SUMMARY										O
ITEM	UNIT	QUANTITIES FROM SHEET NO. BY FUNDING SOURCE								TOTALS
		S.P. 0206-78		S.A.P.022-716-020			POND OUTLET PIPE (S.P. 0206-78)			
		155	156	153	154	157	157	157	157	
CONST DRAINAGE STRUCTURE DESIGN G	LIN FT	4.3	4	8						8
CONST DRAINAGE STRUCTURE DESIGN H	LIN FT	7.2	17.7	25	10.9	7.6	19			44
CONST DRAINAGE STRUCTURE DES 48-4020	LIN FT	24.7	25.3	50	7.3	11.6	19			69
CONST DRAINAGE STRUCTURE DES 60-4020	LIN FT	10.6	17.3	28	13.7		14	38.8	39	81
CONST DRAINAGE STRUCTURE DES 72-4020	LIN FT					9.5	10			10
CONST DRAINAGE STRUCTURE DESIGN SPEC 1	EACH				4	1	5			5
CONST DRAINAGE STRUCTURE DESIGN SPEC 2	EACH							1	1	1
RECONSTRUCT DRAINAGE STRUCTURE	LIN FT	1.5		1.5						1.5
CASTING ASSEMBLY	EACH	13	14	27	13	9	22	3	3	52
ADJUST FRAME & RING CASTING	EACH	4		4	1		1			5


STORM SEWER SUMMARY										P
ITEM	UNIT	QUANTITIES FROM SHEET NO. BY FUNDING SOURCE								TOTALS
		S.P. 0206-78			S.A.P.022-716-020			POND OUTLET PIPE (S.P. 0206-78)		
		155	156	157	153	154	157	157	157	
12" RC PIPE SEWER DESIGN 3006 CLASS V	LIN FT	22		22	42	24	66			88
15" RC PIPE SEWER DESIGN 3006 CLASS V	LIN FT	79	387	466	86	26	112			578
24" RC PIPE SEWER DESIGN 3006	LIN FT	94	78	172	26		26	6	6	204
27" RC PIPE SEWER DESIGN 3006 CLASS IV	LIN FT							616	616	616
28" SPAN RC PIPE-ARCH SEWER CLASS IIIA	LIN FT							80	80	80
4" PERFORATED TP PIPE DRAIN	LIN FT		320	320						320
10" TP PIPE SEWER	LIN FT					26	26			26
4" INSULATION	SQ YD							7	7	7
24" RC PIPE APRON	EACH							1	1	1
TRASH GUARD FOR 24" PIPE APRON	EACH							1	1	1
CONNECT TO EXISTING STORM SEWER	EACH	6	10	16	3	4	7			23
CONNECT INTO EXISTING DRAINAGE STRUCTURE	EACH	3		3	2	2	4			7
RANDOM RIPRAP CLASS II	CU YD							3	3	3
GEOTEXTILE FILTER TYPE IV	SQ YD							13	13	13
FINE AGGREGATE BEDDING (CV)	CU YD	31	64	95	22	15	37	140	140	272
GUIDE POST TYPE B	EACH		3	3	2	1	3	2	2	8

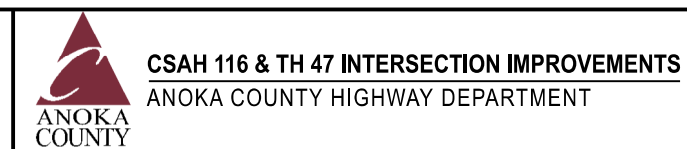
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NO.	DATE	BY	CHK	REVISIONS

Design By: MJS  
 Plan By: MJS  
 Checked By: LGR  
 Approved By: EAE

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

CERTIFIED BY:   
 LICENSED PROFESSIONAL ENGINEER - EARTH EVANS, PE  
 DATE: 8/25/2020 LICENSE NO. 41235



ANOKA COUNTY, MN

DRAINAGE TABULATIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 158  
 OF  
 206  
 SHEETS

**STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE**

**PROJECT NAME:** ANOKA COUNTY CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
**PROJECT NUMBER:** SAP 002-716-020; SP 0206-78 WSB 014652-000  
**PROJECT LOCATION:** STREET: CSAH 116 & TH 47 CITY: ANOKA & RAMSEY COUNTY: ANOKA  
STATE: MINNESOTA ZIP: 55303 LATITUDE/LONGITUDE: 45.2248/-93.3970

**THE PLANNED SCOPE OF THE PROJECT INCLUDES:**  
THE PROJECT TAKES PLACE IN ANOKA CITY AND RAMSEY CITY (ANOKA COUNTY, MN). ANOKA COUNTY HIGHWAY DEPARTMENT IS PROPOSING TO RECONSTRUCT THE ROADWAY, REGRADE, INSTALL ADA IMPROVEMENTS, SIGNAL REVISIONS, STORM SEWER CHANGES, AND MODIFY BRIDGE 02546.

TENTATIVE CONSTRUCTION SCHEDULE (OPERATOR SHOULD PROVIDE ESTIMATED CONSTRUCTION SCHEDULE TO THE ENGINEER)	
CONSTRUCTION ACTIVITIES:	ESTIMATED DATES OF SOIL DISTURBANCE ACTIVITIES:
TEMPORARY SEDIMENT CONTROL BMPs & REMOVALS	APR - MAY 2021
GRADING & UTILITY WORK	JUN - AUG 2021
CURB, PAVEMENT, BRIDGE MODIFICATIONS	SEPT - OCT 2021
FINAL STABILIZATION	NOV 2021

**PROJECT PERSONNEL AND TRAINING**

**SWPPP DEVELOPER:**  
WSB (ZACH KOLSUM)  
701 XENIA AVE S, SUITE 300  
GOLDEN VALLEY, MN 55416  
612-201-6809/ZKOLSUM@WSBENG.COM

CONTRACTOR TO PROVIDE CERTIFICATION OF EROSION CONTROL OFFICER AND ANY OTHER CREW MEMBERS WHO WILL WORK ON THE IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs BEFORE, DURING, AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA. PROVIDE PROOF OF CERTIFICATION AT THE PRECONSTRUCTION MEETING. WORK WILL NOT BE ALLOWED TO COMMENCE UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT ENGINEER.

**CHAIN OF RESPONSIBILITY**

ANOKA COUNTY AND THE CONTRACTOR ARE CO-PERMITTEES FOR THE NPDES CONSTRUCTION GENERAL PERMIT. THE CONTRACTOR IS RESPONSIBLE TO COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION PERMIT AT ALL TIMES UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA.

NAME	COMPANY	TITLE	PHONE
NICHOLAS DOBDA	ANOKA COUNTY	(PROJECT ENGINEER) OWNER CONTACT	763-324-3118

**AGENCY CONTACTS**

ORGANIZATION	CONTACT NAME	PHONE
MPCA (EMERGENCY) 24 HOUR	STATE DUTY OFFICER	1-800-422-0798
MPCA	SABINA VADNAIS	651-757-2596

**LOCATION OF SWPPP REQUIREMENTS**

THE REQUIRED SWPPP ELEMENTS MAY BE LOCATED IN MANY PLACES WITHIN THE PLAN SET AS WELL AS IN THE SPECIAL PROVISIONS, PROJECT MANUAL, MNDOT SPEC BOOK, OR ON FILE WITH THE PROJECT OWNER.

DESCRIPTION	LOCATION
TEMPORARY/PERMANENT EROSION CONTROL MEASURES	162-164
DIRECTION OF FLOW	147-152
CONSTRUCTION NOTES & STANDARD PLATES	33
DRAINAGE PLAN & CONSTRUCTION PLAN	147-152 & 134-140
BMP TABULATION	8
STORMWATER CALCULATIONS	DRAINAGE REPORT & HYDRAULIC REPORT. AVAILABLE UPON REQUEST

**RECEIVING WATER**

A SPECIAL AND IMPAIRED WATERS SEARCH WAS COMPLETED USING THE MPCA SEARCH ENGINE ON 04/15/2020. BASED ON THIS REVIEW, THE FOLLOWING SPECIAL/IMPAIRED WATERS ARE LOCATED WITHIN ONE MILE OF, AND DOWNSTREAM OF, ANY PROJECT DISCHARGE POINTS. PARTS 23.9 OF THE NPDES PERMIT APPLY.

WATERBODY	IMPAIRMENT (S)
RUM RIVER OXBOW (SCENIC OR RECREATIONAL RIVER SEGMENT)	MERCURY (NON-CONSTRUCTION RELATED)
NWI (R2UBH)	N/A
NWI (PEM1F)	N/A
NWI (PEM1F)	N/A
NEI (PEM1CX)	N/A

**AREAS OF ENVIRONMENTAL SENSITIVITY (AES) AND INFESTED WATERS**

IN ADDITION TO THE LIST OF SPECIAL AND IMPAIRED WATERS, THE CONTRACTOR SHALL BE AWARE THAT THERE ARE EXISTING STORMWATER FACILITIES AND WETLANDS IN ADDITION TO RUM RIVER WITHIN AND NEAR THE PROJECT BOUNDARY. THERE IS A MAP OF KNOWN NATURAL RESOURCES ON THE LAST PAGE OF THE SWPPP NARRATIVE. AREAS OF ENVIRONMENTAL SENSITIVITY ARE ALSO CALLED OUT ON THE PLAN SHEETS.

**SOIL TYPES**

A PROJECT WIDE GEOTECHNICAL REPORT WAS COMPLETED DURING THE DESIGN PHASE. ALLUVIAL DEPOSITS ARE PREDOMINATING ALONG MOST OF THE ALIGNMENT CONSISTING OF SAND AND GRAVELLY SAND SOILS. THE TOPSOIL CONSISTS CHIEFLY OF SILTY SAND WITH ORGANIC FINES. THE FILL CONSISTED MOSTLY OF SAND WITH SILT AND SILTY SAND. ADDITIONAL SOIL INFORMATION CAN BE FOUND IN THE GEOTECHNICAL REPORT, LOCATED WITHIN THE PROJECT SPECIFICATIONS. SOIL CLASSIFICATIONS FOR HIGHLY ERODIBLE LAND (HEL), POTENTIALLY HIGHLY ERODIBLE LAND (PHEL), AND NOT HIGHLY ERODIBLE LAND (NHEL) SOILS CAN BE FOUND ON FIGURE 1. SWPPP RESOURCE MAP.

NATIVE TOPSOIL WILL BE STRIPPED; IF MATERIAL NEEDS TO BE STOCKPILED, APPROPRIATE ACTION WILL TAKE PLACE TO ENSURE THE STOCKPILES HAVE ALL PROPER BMPs IN PLACE ACCORDING TO THIS SWPPP AND THE NPDES PERMIT.

**ENVIRONMENTAL REVIEW**

NO FORMAL ENVIRONMENTAL REVIEW WAS REQUIRED FOR THIS PROJECT.

**WETLANDS:** MITIGATION MEASURES ARE NOT REQUIRED AS THERE WILL NOT BE WETLAND IMPACTS FROM THE PROJECT. ALL WETLAND AREAS WILL BE PROTECTED WITH PERIMETER CONTROL AND A 50' NATURAL BUFFER (IF INFEASIBLE, REDUNDANT PERIMETER CONTROL MEASURES), INCLUDED AREAS THAT ARE PERMITTED TO BE FILLED AND/OR EXCAVATED UNTIL WORK IN THE PERMITTED AREAS ARE NECESSARY. REDUNDANT BMP MEASURES MUST BE PLACED 5' FROM THE INITIAL PERIMETER CONTROL MEASURE WITH A STABILIZED BUFFER STRIP BETWEEN THE BMPs.

**THREATENED/ENDANGERED SPECIES:** ANOKA COUNTY LISTS THE NORTHERN LONG-EARED BAT AS THREATENED/ENDANGERED SPECIES WITHIN THE COUNTY. BASED ON THE CONSTRUCTION ACTIVITIES, IT IS DETERMINED THAT THE PROJECT WILL HAVE NO EFFECT ON THIS SPECIES OR ITS HABITAT. HOWEVER, IF THIS SPECIES IS FOUND, CONTRACTOR TO STOP WORK IMMEDIATELY FOR FURTHER INVESTIGATION.

**DRINKING WATER/WELLS:** ACCORDING TO THE MDH, THE PROJECT IS LOCATED MOSTLY WITHIN THE RAMSEY EAST DWSMA AND ADJACENT TO TWO WELLS: GERALD OLSON 45.2224/-93.3982, ROGER RAAUM 45.2230/-93.3950. WELL LOCATIONS ARE TO BE VERIFIED IN THE FIELD, AND PROTECTED TO THE MAXIMUM EXTENT WHERE DEEMED NECESSARY FROM FIELD VERIFICATION. ALL HAZARDOUS MATERIALS ARE TO BE STORED PROPERLY ON SITE AND IF A SPILL OCCURS, IT IS TO BE CLEANED UP AND DISPOSED OF IMMEDIATELY.

**CONTAMINATED PROPERTIES:** THE MPCA'S "WHAT'S IN MY NEIGHBORHOOD" DATABASE WAS REVIEWED ON 04/17/2020 THE RESULTS OF THIS REVIEW SHOW FIVE (5) KNOWN MINIMAL QUANTITY HAZARDOUS WASTE GENERATORS LOCATED WITHIN/ADJACENT TO THE PROJECT ALIGNMENT: ID 22165, ID 34330, ID 38300, ID 91922, ID 144316. TWO (2) KNOWN ABOVEGROUND TANK STORAGE SITES LOCATED WITHIN/ADJACENT TO THE PROJECT LOCATION: ID 108904, 100154. ONE (1) KNOWN TANK STORAGE LOCATION LOCATED ADJACENT TO THE PROJECT: ID 29715. TWO (2) BROWNFIELD SITES LOCATED WITHIN/ADJACENT TO THE PROJECT: ID 194326, 191178. THREE (3) PAST PETROLEUM REMEDIATION LEAK SITES SHOWN WITHIN/ADJACENT TO THE PROJECT: ID 118201, 38300, ID 22165. THE DEPTH OF THE FULL RECONSTRUCTION HAS THE POTENTIAL TO UNEARTH ANY CONTAMINATED SOIL, CONTAMINATED WATER, AND/OR REGULATED WASTE FROM SOME OF THESE SITES (ID 29715, ID 108904, ID 107235). REFER TO MNDOT SPEC 1717.1.A. FOR POTENTIAL INDICATORS OF CONTAMINATED MATERIALS AND REGULATED WASTE. IF CONTAMINATED MATERIAL, CONTAMINATED WATER, AND/OR REGULATED MATERIALS ARE FOUND, CREWS ARE TO STOP WORK IMMEDIATELY FOR FURTHER INVESTIGATION/TESTING.

**FLOOD CONTINGENCY PLAN:** A MINOR PORTION OF THE PROJECT NEAR THE BRIDGE IS CONSIDERED TO BE A REGULATORY FLOODWAY (ZONE ZE). THE PROJECT ENGINEER MAY REQUIRE A PREVENTATIVE FLOOD CONTINGENCY PLAN FOR SPECIFIC PROJECT ACTIVITIES AND AREAS IF SEASONAL PRECIPITATION POSSES A POTENTIAL RISK OF FLOODING WORK AREAS WITHIN THE PROJECT LIMITS. THIS PLAN SHALL BE SUBMITTED BY THE OPERATOR TO THE PROJECT ENGINEER FOR APPROVAL A MINIMUM OF 72 HOURS PRIOR TO THE SCHEDULED WORK AND/OR DURING ACTIVE WORK WITHIN THE AREA OF POTENTIAL RISK OF FLOODING. NO WORK CAN COMMENCE IN THE AREA UNTIL WRITTEN APPROVAL HAS BEEN GRANTED BY THE PROJECT ENGINEER.

**FISH EXCLUSION DATES:** OPERATOR IS PROHIBITED FROM CONDUCTING IN-WATER WORK DURING THE FISH SPAWNING AND MIGRATION DATES OF APRIL 15 TO JUNE 30 FOR NON-TROUT WATERS. IF WORK MUST BE CONDUCTING DURING THIS TIMEFRAME, CONTRACTOR SHALL CONTACT THE LOCAL DNR FISHERIES MANAGER FOR WRITTEN APPROVAL PRIOR TO CONDUCTING THE IN-STREAM WORK. EXPOSED SOILS WITHIN 200' OF THE WATER'S EDGE, AND THAT DRAIN TO THESE WATERS, MUST RECEIVE STABILIZATION MEASURES IMMEDIATELY AND WITHIN 24 HOURS DURING THE RESTRICTION PERIOD.

**AQUATIC INVASIVE SPECIES:** ALL IN-STREAM, IN-WATER, AND DEWATERING EQUIPMENT SHALL BE DECONTAMINATED OF ALL AQUATIC PLANTS AND PROHIBITED INVASIVE SPECIES PRIOR TO USING WITHIN SURFACE WATERS ON-SITE AND TRANSPORTING OFF-SITE. ALL DECONTAMINATION ACTIVITIES SHALL MEET THE CHAPTER 1 STANDARDS OF THE MINNESOTA DNR'S BEST PRACTICES MANUAL FOR MEETING DNR GENERAL PUBLIC WATERS WORK PERMIT GP 2004-0001.

**LAND FEATURE CHANGES**

TOTAL AREA TO BE DISTURBED = 7.22 ACRES  
IMPERVIOUS AREA: PRE-CONSTRUCTION = 6.03 ACRES/POST-CONSTRUCTION = 6.32 ACRES  
NET INCREASE OF IMPERVIOUS AREA = 0.29 ACRES

**LONG TERM MAINTENANCE AND OPERATION:**

THE NPDES PERMANENT STORMWATER TREATMENT SYSTEM (PART 15.1) IS NOT REQUIRED BECAUSE THE NET NEW IMPERVIOUS AREA CREATED BY THE PROJECT IS LESS THAN ONE ACRE.

**STABILIZATION TIME FRAMES**

AREA	TIME FRAME	NOTES
EXPOSED AREAS	IMMEDIATELY AND NO LATER THAN 7 DAYS OF BEING UNWORKED	1, 4, 5

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NO.	DATE	BY	CHK	REVISIONS

Design By: NEH  
Plan By: AJF  
Checked By: NEH  
Approved By: NEH

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

CERTIFIED BY: *Nicholas E. Hentges*  
LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

**STORM WATER POLLUTION PREVENTION PLAN**  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
159  
OF  
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SHEETS

LAST 200 LINEAL FEET OF DRAINAGE DITCH/SWALE	WITHIN 24 HOURS OF CONNECTION TO SURFACE WATER/PROPERTY EDGE	1, 2, 3
REMAINING PORTIONS OF DRAINAGE DITCH OR SWALE	7 DAYS	1, 3
PIPE AND CULVERT OUTLETS	24 HOURS	
STOCKPILES	7 DAYS	1

- INITIATE STABILIZATION IMMEDIATELY WHEN CONSTRUCTION HAS TEMPORARILY OR PERMANENTLY CEASED ON ANY PORTION OF THE SITE. COMPLETE STABILIZATION WITHIN THE TIME FRAME LISTED. IN MANY INSTANCES THIS WILL REQUIRE STABILIZATION TO OCCUR MORE THAN ONCE DURING THE COURSE OF THE PROJECT. TEMPORARY SOIL STOCKPILES WITHOUT SIGNIFICANT CLAY OR SILT AND STOCKPILED AND CONSTRUCTED ROAD BASE ARE EXEMPT FROM THE STABILIZATION REQUIREMENT.
- STABILIZE WETTED PERIMETER OF DITCH (I.E. WHERE THE DITCH GETS WET).
- APPLICATION OF MULCH, HYDROMULCH, TACKIFIER AND POLYACRYLAMIDE ARE NOT ACCEPTABLE STABILIZATION METHODS IN THESE AREAS.
- STABILIZE ALL AREAS OF THE SITE PRIOR TO THE ONSET OF WINTER. ANY WORK STILL BEING PERFORMED WILL BE MULCHED OR BLANKETED WITHIN THE TIME FRAMES IN THE NPDES PERMIT.
- KEEP DITCHES AND EXPOSED SOILS IN AN EVEN ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES, HYDROMULCHES, AND BLANKETS.

**SITE INSPECTION AND MAINTENANCE**

THE EROSION CONTROL OFFICER IS TO INSPECT THE ENTIRE CONSTRUCTION SITE AT LEAST ONCE EVERY SEVEN (7) DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. THE OPERATOR SHALL PROVIDE A RAINFALL GAUGE ON-SITE AT VARIOUS MILE INTERVALS ALONG THE ALIGNMENT. INSPECT ALL TEMPORARY AND PERMANENT PROJECT BMPS UNTIL THE SITE HAS UNDERGONE FINAL STABILIZATION AND THE NOT HAS BEEN SUBMITTED. INSPECT SURFACE WATER INCLUDING DRAINAGE DITCHES FOR SIGNS OF EROSION AND SEDIMENT DEPOSITION. INSPECT CONSTRUCTION SITE VEHICLE EXIT LOCATIONS FOR EVIDENCE OF TRACKING ONTO PAVED SURFACES. INSPECT SURROUNDING PROPERTIES FOR EVIDENCE OF OFF-SITE SEDIMENT ACCUMULATION. ALL INSPECTIONS AND MAINTENANCE CONDUCTED MUST BE RECORDED IN WRITING BY THE OPERATOR AND RETAINED WITH THE SWPPP. SUBMIT INSPECTION REPORTS IN A FORMAT THAT IS ACCEPTABLE TO THE PROJECT ENGINEER. RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY SHALL INCLUDE:

- DATE, TIME, AND NAME OF PERSON(S) CONDUCTING INSPECTIONS;
- FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS;
- CORRECTIVE ACTIONS TAKEN (INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES); INCLUDING DOCUMENTATION/PHOTOS OF IMPLEMENTED BMPS INTENDED TO CORRECT A PROBLEM BUT FAILED.
- DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCHES IN 24 HOURS;
- DOCUMENTATION OF CHANGES MADE TO THE SWPPP.

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

- REPAIR, REPLACE, OR SUPPLEMENT PERIMETER CONTROL DEVICES WHEN THEY BECOME NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT OF THE DEVICE. COMPLETE REPAIRS BY THE END OF THE NEXT BUSINESS DAY FOLLOWING DISCOVERY.
- REPAIR OR REPLACE INLET PROTECTION DEVICES WHEN THEY BECOME NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT AND/OR DEPTH OF THE DEVICE.
- REMOVE ALL DELTAS AND SEDIMENT DEPOSITED IN SURFACE WATERS INCLUDING DRAINAGE WAYS, CATCH BASINS, AND OTHER DRAINAGE SYSTEMS. STABILIZE ANY AREAS THAT ARE DISTURBED BY SEDIMENT REMOVAL OPERATIONS. SEDIMENT REMOVAL AND STABILIZATION MUST BE COMPLETED WITHIN 7 DAYS OF DISCOVERY.
- REMOVE TRACKED SEDIMENT FROM PAVED SURFACES BOTH ON AND OFF SITE WITHIN ONE (1) CALENDAR DAY OF DISCOVERY. STREET SWEEPING MAY HAVE TO OCCUR MORE OFTEN TO MINIMIZE OFF SITE IMPACTS. LIGHTLY WET THE PAVEMENT PRIOR TO SWEEPING.
- MAINTAIN ALL BMPS UNTIL WORK HAS BEEN COMPLETED, SITE HAS GONE UNDER FINAL STABILIZATION, AND THE NOT HAS BEEN SUBMITTED TO THE MPCA.

**CONSTRUCTION ACTIVITY REQUIREMENTS: EROSION/SEDIMENT CONTROL, PROCEDURES, & MAINTENANCE STANDARDS**

- AMEND THE SWPPP AND DOCUMENT ALL CHANGES TO THE SWPPP AND ASSOCIATED PLAN SHEETS IN A TIMELY MANNER. SWPPP AMENDMENTS AND SITE PLANS WILL BE PREPARED BY THE OPERATOR AND SUBMITTED TO THE OWNER FOR REVIEW AND WRITTEN APPROVAL BY THE PROJECT OWNER (OR DESIGNATED REPRESENTATIVE). STORE THE SWPPP AND ALL AMENDMENTS ON SITE AT ALL TIMES.
- PREPARE AND SUBMIT A SITE MANAGEMENT PLAN FOR THE ENGINEER'S ACCEPTANCE FOR STAGING/STOCKPILE MANAGEMENT AREAS, CONCRETE MANAGEMENT, CONCRETE SLURRY APPLICATION AREAS, FUGITIVE DUST CONTROL PLAN, SPILL CONTAINMENT PLAN, HAZARDOUS MATERIAL MANIFEST & MANAGEMENT PLAN, WETLAND MANAGEMENT PLAN, VEGETATION PRESERVATION & MAINTENANCE PLAN, WORK IN AND NEAR AREAS OF ENVIRONMENTAL SENSITIVITY, AREAS IDENTIFIED IN THE PLANS AS "SITE MANAGEMENT PLAN AREA", ANY WORK THAT WILL REQUIRE DEWATERING, ANY ADDITIONAL PLANS LISTED IN THE PROJECT SPECIFICATIONS, AND AS REQUIRED BY THE ENGINEER. SUBMIT ALL SITE MANAGEMENT PLANS TO THE ENGINEER IN WRITING. ALLOW A MINIMUM OF 7 DAYS FOR PROJECT ENGINEER TO REVIEW AND ACCEPT SITE MANAGEMENT PLAN SUBMITTALS. WORK WILL NOT BE ALLOWED TO COMMENCE IF A SITE MANAGEMENT PLAN IS REQUIRED UNTIL ACCEPTANCE HAS BEEN GRANTED BY THE ENGINEER. THERE WILL BE NO EXTRA TIME ADDED TO THE CONTRACT DUE TO THE UNTIMELY SUBMITTAL.
- THE PROJECT'S CONSTRUCTION PHASING AND STAGING IS DEFINED BY THE "CONSTRUCTION STAGING & TRAFFIC CONTROL PLAN" AND PROJECT SPECIFICATIONS.
- BURNING OF ANY MATERIAL IS NOT ALLOWED WITHIN PROJECT BOUNDARY.
- DO NOT DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS. DELINEATE AREAS NOT TO BE DISTURBED AND WETLANDS (EVEN AREAS THAT ARE PERMITTED FOR CONSTRUCTION) PRIOR TO STARTING GROUND DISTURBING ACTIVITIES. IF IT BECOMES NECESSARY TO DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS, OBTAIN WRITTEN PERMISSION FROM THE PROJECT ENGINEER PRIOR TO PROCEEDING. PRESERVE ALL NATURAL BUFFERS SHOWN ON THE PLANS.
- ROUTE STORMWATER AROUND UNSTABILIZED AREAS OF THE SITE WHENEVER FEASIBLE. PROVIDE EROSION CONTROL AND VELOCITY DISSIPATION DEVICES AS NEEDED TO KEEP CHANNELS FROM ERODING AND TO PREVENT NUISANCE CONDITIONS AT THE OUTLET.
- DIRECT DISCHARGE FROM BMPS TO VEGETATED AREAS WHENEVER FEASIBLE. PROVIDE VELOCITY DISSIPATION DEVICES AS NEEDED TO PREVENT EROSION.
- LOCATE PERIMETER CONTROL ON THE CONTOUR TO CAPTURE OVERLAND, LOW-VELOCITY SHEET FLOWS DOWN GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS. PLACE J-HOOKS AT A MAXIMUM OF 100-FOOT INTERVALS.

- ALL STOCKPILES MUST HAVE PERIMETER SEDIMENT CONTROLS IMPLEMENTED AND MAINTAINED AT ALL TIMES. PILES CANNOT BE PLACED IN BUFFER AREAS OR SURFACE WATERS, INCLUDING STORMWATER CONVEYANCES SUCH AS CURB AND GUTTER SYSTEMS, OR CONDUITS AND DITCHES UNLESS THERE IS A BYPASS IN PLACE TO PREVENT STORMWATER RUN-ON INTO THE STOCKPILE.
- STEEP SLOPES MAY BE TEMPORARILY CREATED DURING GRADING OPERATIONS. STABILIZATION OF STEEP SLOPES (3:1 OR GREATER) SHALL BE PROPERLY CAT-TRACKED AND STABILIZED PER THE EROSION CONTROL PLAN. LONG SLOPES CAN BE BROKEN UP WITH SEDIMENT CONTROL LOGS IF EROSION IS EVIDENT.
- DITCH CHECKS WILL BE PLACED AS INDICATED ON THE PLANS DURING ALL PHASES OF CONSTRUCTION.
- ALL STORM DRAIN INLETS, THAT RECEIVE PROJECT STORMWATER, MUST BE PROTECTED BY APPROPRIATE BMPS DURING CONSTRUCTION UNTIL ALL SOURCES WITH POTENTIAL FOR DISCHARGING TO THE INLET HAVE BEEN STABILIZED. INLET PROTECTION MAY BE REMOVED FOR A PARTICULAR INLET IF A SPECIFIC SAFETY CONCERN (STREET FLOODING/FREEZING) HAS BEEN IDENTIFIED AND THE PERMITTEE(S) HAS RECEIVED WRITTEN CORRESPONDENCE FROM THE JURISDICTIONAL AUTHORITY VERIFYING THE NEED FOR REMOVAL. WRITTEN CORRESPONDENCE MUST BE DOCUMENTED IN THE SWPPP.
- SILT FENCE IS NOT AN ACCEPTABLE CATCH BASIN INLET PROTECTION BMP. CONTACTOR SHALL CLEAN, REMOVE AND DISPOSE OF SEDIMENT, AND/OR REPLACE STORM DRAIN INLET PROTECTION ON A ROUTINE BASIS TO ENSURE THE DEVICE IS FULLY FUNCTIONAL PRIOR TO THE NEXT FORECASTED PRECIPITATION EVENT (30% OR GREATER).
- DISCHARGE TURBID OR SEDIMENT LADEN WATER TO TEMPORARY SEDIMENT BASINS WHENEVER FEASIBLE. IN THE EVENT THAT IT IS NOT FEASIBLE TO DISCHARGE THE SEDIMENT LADEN WATER TO A TEMPORARY SEDIMENT BASIN, THE WATER MUST BE TREATED SO THAT IT DOES NOT CAUSE A NUISANCE CONDITION IN THE RECEIVING WATERS OR TO DOWNSTREAM LANDOWNERS. CLEAN OUT ALL PERMANENT STORMWATER BASINS REGARDLESS OF WHETHER USED AS TEMPORARY SEDIMENT BASINS/TRAPS TO THE DESIGN CAPACITY AFTER COMPLETING ALL UP-GRADIENT LAND DISTURBING ACTIVITY. USE A SKIMMER DEVICE FOR BASIN DRAINING.
- PROVIDE STABILIZATION IN ANY TRENCHES CUT FOR DEWATERING OR SITE DRAINING PURPOSES.
- THE CONTRACTOR SHALL SUBMIT A DEWATERING PLAN AND NARRATIVE TO THE PROJECT ENGINEER FOR APPROVAL 7 DAYS PRIOR TO UNDERTAKING THESE ACTIVITIES. DEWATERING PLAN MUST INCLUDE BMP'S TO PREVENT SEDIMENT TRANSPORT, EROSION, AND ADVERSE IMPACTS TO DOWNSTREAM RECEIVING WATERS. THE DEWATERING PLAN MUST ALSO INCLUDE ANY SPECIFIC CHEMICAL TREATMENTS (FLOC, POLYMERS, ETC.) THAT WILL BE USED. THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ANY PERMIT NECESSARY FOR THESE ACTIVITIES; THE DEWATERING PLAN AND DNR APPROPRIATIONS PERMIT WILL BECOME PART OF THE SWPPP.

**TEMPORARY & PERMANENT EROSION CONTROL BMPS**

**SEED MIX:** SEED MIX SHALL BE USED IN CONSTRUCTION AND REVEGETATION PROJECTS IN ORDER TO ENHANCE SOIL NUTRIENT AVAILABILITY AND BIOLOGICAL SOIL STRUCTURE, ENCOURAGE NATIVE PLANT SUCCESSION, REDUCE EROSION, AND DISCOURAGE INVASIVE PLANT SPECIES. INOCULATION OF SOILS WITH MYCORRHIZAL FUNGI OR THE PRESENCE OF PRE-EXISTING SOIL MICROBES IS ESSENTIAL FOR THE STABILIZATION OF ADVERSE SOILS, ESTABLISHMENT OF NATIVE GRASSES, AND THE EXCLUSION OF NON-NATIVE "ANNUALS" AND NOXIOUS WEEDS.

**HECP TYPE 3884.2.B.3 HYDRAULIC EROSION CONTROL PRODUCTS ARE SOIL STABILIZATION (EROSION CONTROL) TECHNIQUES WHERE FIBER MULCH IS APPLIED TO THE EXPOSED AND DISTURBED SOIL SURFACE. THE FIBER IS APPLIED HYDRAULICALLY, IN A SLURRY, PRODUCED BY MIXING FIBER, WATER AND A BINDING AGENT TOGETHER IN A MECHANICAL HYDRO-SEEDER. WOOD FIBER IS WIDELY USED BUT OTHER FIBERS CAN INCLUDE PAPER, STRAW, COIR, CORN, ETC. THE EFFECTIVENESS OF THESE HECP IS DEPENDENT ON:**

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

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

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

**RAPID STABILIZATION METHOD #3:** THIS WORK SHALL CONSIST OF OPERATIONS NECESSARY TO RAPIDLY STABILIZE SMALL CRITICAL AREAS WITHIN 200 FEET OF SURFACE WATERS, TO PREVENT OFF SITE SEDIMENTATION AND OR TO COMPLY WITH PERMIT REQUIREMENTS. THIS FORM OF RAPID STABILIZATION EMPLOYS SFM, SEED MIX 22-111, AND FERTILIZER TYPE 3. THIS METHOD SHALL BE USED ON SLOPES LESS THAN 3:1. INSTALL PER MNDOT SPECIFICATION 2575.3.M.1.C.

**RAPID STABILIZATION METHOD #4:** THIS METHOD SHALL CONSIST OF CATEGORY 20/25 EROSION CONTROL BLANKET (NATURAL NET ONLY) IN COMBINATION WITH MNDOT SEED MIX 22-111 (2 LBS PER 100 SQ. YD.) AND TYPE 3 SLOW RELEASE FERTILIZER (8 LBS PER 100 SQ. YD.). THIS IS AN ACCEPTABLE BMP FOR DISTURBED AREAS ADJACENT TO ENVIRONMENTALLY SENSITIVE AREAS, SURFACE WATERS, AND WITHIN THE LAST 200 FEET OF DITCH BOTTOMS.

**TEMPORARY & PERMANENT SEDIMENT CONTROL BMPS**

**SEDIMENT CONTROL LOGS:** SEDIMENT CONTROL LOGS ARE MANUFACTURED FROM STRAW, WOOD EXCELSIOR, COCONUT FIBERS, AND/OR OTHER MATERIALS THAT ARE BOUND WITH POLYPROPYLENE OR BIODEGRADABLE NETTING INTO TIGHT TUBULAR ROLLS. FIBER ROLLS CONTROL THREE TYPES OF EROSIONAL PROCESSES; EROSION CONTROL, RUN OFF CONTROL, AND SEDIMENT CONTROL. SEDIMENT CONTROL LOGS CAN BE USED FOR THE FOLLOWING:

- SLOPE INTERRUPTERS TO REDUCE EROSION ON NEWLY CONSTRUCTED SLOPES
- TEMPORARY DITCH CHECKS TO REDUCE RUNOFF VELOCITIES IN DRAINAGE CHANNELS
- SEDIMENT CONTROL BARRIERS FOR SMALL DISTURBED SOIL AREAS SUCH AS STOCKPILES, DISCRETE SLOPES, OR INDIVIDUAL LOTS

**MACHINE SLICED SILT FENCE:** A SILT FENCE IS A TEMPORARY SEDIMENT BARRIER CONSISTING OF FILTER FABRIC ENTRENCHED INTO THE SOIL AND ATTACHED TO SUPPORTING POSTS. SILT FENCE IS INTENDED TO BE INSTALLED WHERE SEDIMENT-LADEN WATER CAN POND, THUS ALLOWING THE SEDIMENT TO FALL OUT OF SUSPENSION AND SEPARATE FROM THE RUNOFF. SILT FENCE INSTALLED WITH A TRENCHER OR BY SLICING IS THE MOST EFFECTIVE INSTALLATION METHOD TO ENSURE AGAINST COMMON SILT FENCE FAILURES. THE BMP WILL BE CLEANED OUT OR REPLACED WHEN THE SEDIMENT REACHES 1/2 THE HEIGHT OF THE FENCE.

**STABILIZED CONSTRUCTION EXIT:** TEMPORARY CONSTRUCTION EXITS ARE CONSTRUCTED AT THE EGRESS POINT FROM THE CONSTRUCTION AREA ONTO A PAVED ROAD. A STABILIZED CONSTRUCTION EXIT IS A TRACKING CONTROL BMP INTENDED TO PREVENT TRACKING OF SOIL

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Plan By: AJF

Checked By: NEH

Approved By: NEH

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CERTIFIED BY: *Nick Hentges*  
LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE

DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN	SHEET 160 OF 206 SHEETS
STORM WATER POLLUTION PREVENTION PLAN S.P. 0206-78 (TH 47), S.A.P. 002-716-020	



FROM THE CONSTRUCTION SITE BY EQUIPMENT AND VEHICLES. THE EXITS ARE CONSTRUCTED OF LARGE ANGULAR ROCK, STEEL RIBS (RUMBLE STRIPS), OR TRACK PADS INTENDED TO KNOCK THE MUD OFF THE TIRES BEFORE TRAVELING ONTO THE ROADWAY.

**CHEMICAL TREATMENTS:** OPERATOR MUST AMEND THE SWPPP TO INCLUDE THE INTENDED USES AND LOCATIONS OF FLOCCULANTS, POLYMERS, AND OTHER SEDIMENTATION TREATMENT CHEMICALS. CHEMICAL TREATMENTS MUST BE IN COMPLIANCE WITH PART 9.18.

**DUST CONTROL:** OPERATOR WILL COMPLY WITH STATE RULE 7011.0150 ON DUST PREVENTION REQUIREMENTS. DUST FROM THE SITE WILL BE CONTROLLED BY INCREASED STREET SWEEPING AND/OR USING A MOBILE PRESSURE-TYPE DISTRIBUTOR TRUCK TO APPLY POTABLE WATER TO DISTURBED AREAS. THE MOBILE UNIT WILL APPLY WATER AT A RATE NECESSARY TO PREVENT RUNOFF AND PONDING.

**POLLUTION PREVENTION MANAGEMENT**

POTENTIAL SOURCES OF POLLUTANTS FROM CONSTRUCTION ACTIVITIES INCLUDE, BUT NOT LIMITED TO:

1. SEDIMENT AND FUGITIVE DUST GENERATED FROM CLEARING AND GRUBBING, IMPORT/EXPORT OPERATIONS, REMOVALS/COMPACTION, MASS/FINE GRADING, EXCAVATIONS, TRENCHING, TOPSOIL STRIPING STOCKPILING, WET/DRY PAVEMENT CUTTING, STREET CONSTRUCTION.
2. BASIC/ACIDIC PH LEVELS FROM CURB AND GUTTER, MANHOLE STRUCTURES, SIDEWALKS, DRIVEWAY APRONS, BRIDGE ABUTMENTS, WET/DRY PAVEMENT CUTTING, MASONRY WASHOUT/CLEANOUT.
3. EXCESS NUTRIENTS FROM LANDSCAPING INSTALLATIONS, SOIL ADDITIVES, FERTILIZATION, MULCHING.
4. HYDROCARBONS FROM STREET CONSTRUCTION, DEMOLITION/REMOVALS, WET/DRY PAVEMENT CUTTING.

OPERATOR WILL COMPLY WITH ALL OF THE POLLUTION PREVENTION AND MANAGEMENT MEASURES IDENTIFIED IN THE NPDES-CSW PERMIT, PART 12.1. STORAGE AND DISPOSAL OF CONSTRUCTION AND HAZARDOUS WASTES MUST BE IN COMPLIANCE WITH MPCA REGULATIONS.

- A. POSITION AND STAKE DOWN ALL PORTABLE TOILETS SO THEY CANNOT BE TIPPED OR KNOCKED OVER. SUPPLY ADEQUATE SECONDARY CONTAINMENT.
- B. SECONDARY CONTAINMENT IS NEEDED AROUND ALL STATIONARY EQUIPMENT (GENERATORS, PUMPS, LIGHT PLANTS, ETC.) PROVIDE CONTAINMENT FOR ALL HAZARDOUS MATERIALS AND TOXIC WASTE.
- C. NO ENGINE DEGREASING IS ALLOWED ON SITE.
- D. VEHICLE AND EQUIPMENT WASHING TO OCCUR IN DESIGNATED AREA AS DETERMINED BY THE CONTRACTOR SUBMITTAL OF A MANAGEMENT PLAN FOR THESE ACTIVITIES.
- E. PROPERLY CLEAN UP AND REPORT ALL SPILLS AS REQUIRED BY THE MPCA AND MNDOT SPECIFICATIONS.
- F. PROVIDE A SPILL KIT AT EACH WORK LOCATION ON THE SITE.
- G. PROVIDE A SECURE STORAGE AREA WITH RESTRICTED ACCESS FOR ALL HAZARDOUS MATERIALS AND TOXIC WASTE. RETURN ALL HAZARDOUS MATERIALS AND TOXIC WASTE TO THE DESIGNATED STORAGE AREA AT THE END OF THE BUSINESS DAY UNLESS INFEASIBLE. STORE ALL HAZARDOUS MATERIALS AND TOXIC WASTE (INCLUDING BUT NOT LIMITED TO OIL, DIESEL FUEL, GASOLINE, HYDRAULIC FLUIDS, PAINT, PETROLEUM BASED PRODUCTS, WOOD PRESERVATIVES, ADDITIVES, CURING COMPOUNDS, AND ACIDS) IN SEALED CONTAINERS WITH SECONDARY CONTAINMENT. CLEAN UP SPILLS IMMEDIATELY.
- H. SLURRY FROM CONCRETE OPERATIONS MUST BE VACUUMED UP IMMEDIATELY. NO CONCRETE WASHOUT SHALL COME IN CONTACT WITH THE GROUND AND MUST BE PROPERLY DISPOSED OF.
- I. A SIGN MUST BE INSTALLED ADJACENT TO EACH CONCRETE WASHOUT FACILITY.
- J. CREATE AND FOLLOW A WRITTEN DISPOSAL PLAN FOR ALL WASTE MATERIALS. INCLUDE IN THE PLAN HOW THE MATERIAL WILL BE DISPOSED OF AND THE LOCATION OF THE DISPOSAL SITE. SUBMIT PLAN TO THE ENGINEER PRIOR TO CONSTRUCTION.
- K. USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT DISCHARGE OR PLACEMENT OF BITUMINOUS GRINDINGS, CUTTINGS, MILLINGS, AND OTHER BITUMINOUS WASTES FROM AREAS OF EXISTING OR FUTURE VEGETATED SOILS AND FROM ALL WATER CONVEYANCE SYSTEMS, INCLUDING INLETS, DITCHES AND CURB FLOW LINES.

**FINAL STABILIZATION**

FINAL STABILIZATION IS ACHIEVED WHEN NPDES CGP PARTS 13.1-13.7 (AS APPLICABLE) ARE COMPLETED PRIOR TO SUBMISSION OF THE NOTICE OF TERMINATION (NOT) TO MPCA.

1. ALL AREAS MUST BE STABILIZED WITH A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70%.
2. ALL TEMPORARY SEDIMENT CONTROL BMP MEASURES MUST BE REMOVED PRIOR TO SUBMITTING PERMIT NOT.

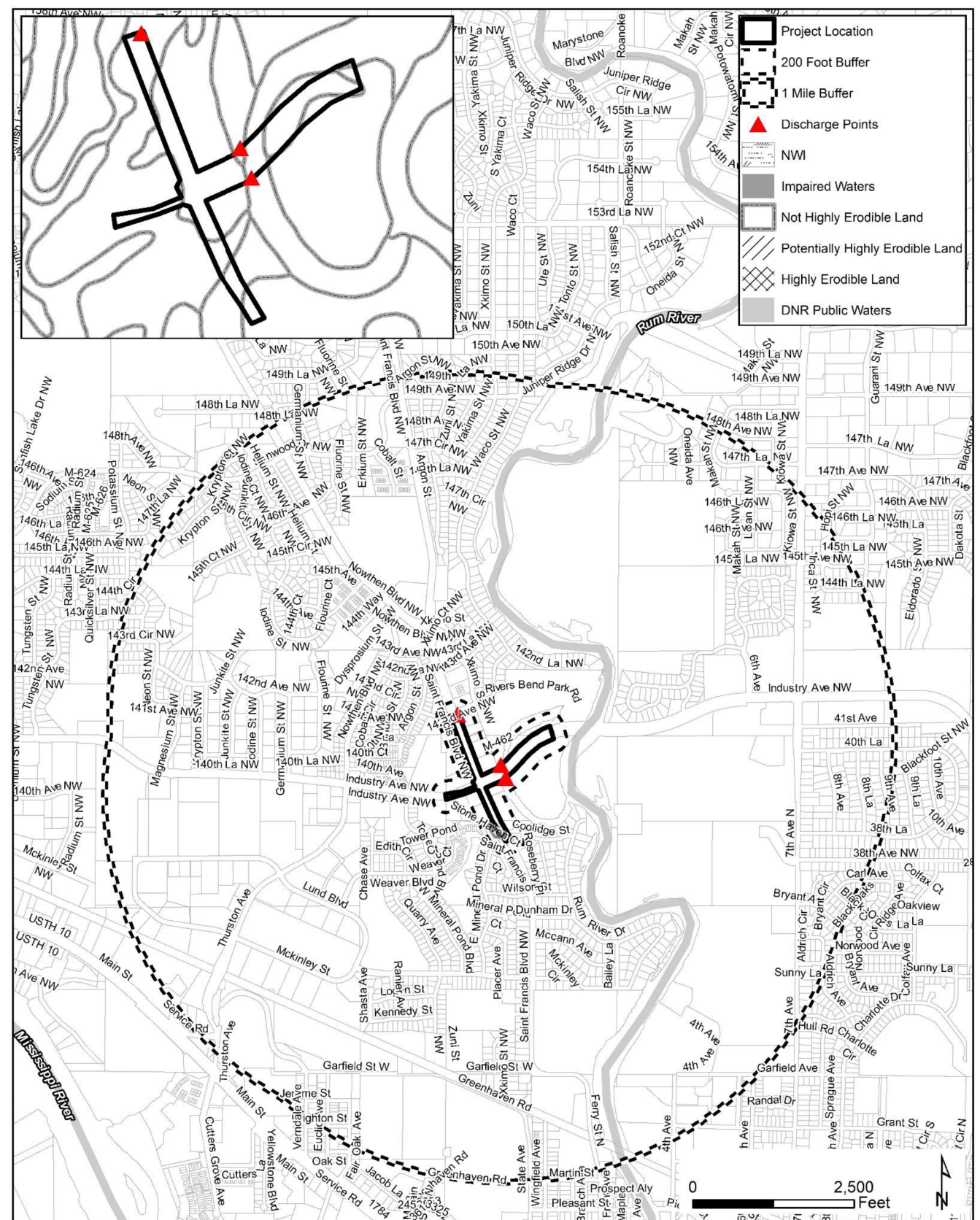


Figure 1. SWPPP Resource Map

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 Plan By: AJF  
 Checked By: NEH  
 Approved By: NEH

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CERTIFIED BY: *[Signature]*  
 LICENSED PROFESSIONAL ENGINEER - 2008045 E. HENTGES, PE  
 DATE: 8/25/2020 LICENSE NO. 44620



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

**STORM WATER POLLUTION PREVENTION PLAN**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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NOTES

1. SILT FENCE SHALL FOLLOW, AS CLOSE AS POSSIBLE, TO A SINGLE CONTOUR. IF SEDIMENT DEPOSITS IN WATERS OF THE STATE, THE MATERIAL MUST BE REMOVED WITHIN SEVEN (7) DAYS.
2. ALL EXPOSED SOILS, NOT COVERED WITH PERMANENT STABILIZATION WITHIN 7 DAYS OF COMPLETION OF CONSTRUCTION ACTIVITY, SHALL BE COVERED WITH RAPID STABILIZATION METHOD 3.
3. ALL DISTURBED SOILS NOT DESIGNATED BY SPECIAL TEMPORARY TREATMENT SHALL BE COVERED WITH RAPID STABILIZATION METHOD 3.
4. ALL AREAS DISTURBED BY THE CONTRACTOR OUTSIDE THE CONSTRUCTION LIMITS SHALL BE RESTORED AT THE CONTRACTORS EXPENSE.
5. A STABILIZED CONSTRUCTION EXIT WILL BE PLACED AT ALL EXITS ON THE PROJECT SITE IN ACCORDANCE WITH THE STORM WATER POLLUTION PREVENTION PLAN AND THE APPROVED STANDARD DETAILS.
6. ALL STREETS, TRAILS, AND SIDEWALKS IN AND ADJACENT TO THE PROJECT SHALL REMAIN CLEAN AND PASSABLE AT ALL TIMES. STREETS, SIDEWALKS, AND TRAILS TO BE SWEEP FREE OF DEBRIS AT THE END OF EACH WORK DAY, OR AS OFTEN AS NEEDED TO ENSURE PUBLIC SAFETY.
7. INLET PROTECTION WILL BE PLACED AT ALL CATCH BASIN OR DROP INLETS WITHIN THE PROJECT AREA PER MNDOT STANDARD PLANS.
8. STABILIZATION OF DISTURBED AREAS SHALL BE DONE AS SOON AS POSSIBLE AND ESTABLISH PERMANENT TURF WHENEVER POSSIBLE.
9. SEDIMENT CONTROL MUST BE IN PLACE AND APPROVED BY THE ENGINEER BEFORE ANY PHASE OF CONSTRUCTION MAY BEGIN.
10. IN THE EVENT THAT PERMANENT STABILIZATION CANNOT BE IMPLEMENTED WITHIN 7 DAYS AFTER CONSTRUCTION ACTIVITY IN THE DISTURBED AREA HAS CEASED, TEMPORARY STABILIZATION BMPs MUST BE SCHEDULED TO OCCUR WITHIN THAT 7 DAY TIME FRAME. (EXCEPT AS INDICATED IN NOTE 11).
11. IN THE EVENT THAT DEWATERING OPERATIONS NEED TO OCCUR, A DEWATERING PLAN MUST BE SUBMITTED AND APPROVED BY THE ENGINEER BEFORE ANY OPERATIONS TAKE PLACE. THE PLAN MUST BE DEVELOPED IN ACCORDANCE WITH SWPPP GUIDELINES.
12. TEMPORARY STABILIZATION MEASURES SHALL BE EMPLOYED WITHIN 200 FEET OF THE NORMAL WETTED PERIMETER OF ALL DISCHARGE POINTS WITHIN 24 HOURS. MULCH IS NOT AN APPROVED MEASURE. OR, A SEDIMENT TRAP MUST BE INSTALLED PER THE APPROVED STANDARD DETAILS WITHIN 24 HOURS OF CONNECTING THE UTILITIES.
13. ADDITIONAL EROSION AND SEDIMENT CONTROL MAY BE ADDED DURING ANY PHASE OF CONSTRUCTION AS DIRECTED BY THE ENGINEER.
14. STOCKPILES MAY NOT BE PLACED WITHIN ANY DRAINAGE OR CURB LINE UNLESS PROPER BYPASS IS INSTALLED PRIOR TO STOCKPILE PLACEMENT.
15. SLURRY FROM CONCRETE OPERATIONS MUST BE VACUUMED UP IMMEDIATELY. NO CONCRETE WASHOUT SHALL COME IN CONTACT WITH THE GROUND AND MUST BE PROPERLY DISPOSED OF.
16. ALL HAZARDOUS MATERIALS MUST BE KEPT UNDER COVER AND WITHIN PROPER CONTAINMENT WHEN NOT IN USE.
17. CONTRACTOR TO BE RESPONSIBLE FOR ALL SEDIMENT AND EROSION CONTROL MAINTENANCE.
18. THE CONTRACTOR SHALL AMEND THE SWPPP AND EROSION CONTROL PLAN SHEETS TO SHOW LOCATIONS OF STOCKPILES, EQUIPMENT / MATERIAL STAGING AREAS, AND DESIGNATED CONCRETE WASHOUT AREA.

LEGEND - EROSION CONTROL

- SILT FENCE; TYPE MS
- SEDIMENT CONTROL LOG TYPE WOOD FIBER
- STORM DRAIN INLET PROTECTION
- CULVERT END CONTROLS
- SURFACE DRAINAGE DIRECTION
- STABILIZED CONSTRUCTION EXIT



TEMPORARY:  
RAPID STABILIZATION METHOD 3

PERMANENT:  
SODDING TYPE LAWN  
FERTILIZER TYPE 3 (200 LBS/ACRE)



TEMPORARY:  
RAPID STABILIZATION METHOD 4

PERMANENT:  
SODDING TYPE LAWN  
FERTILIZER TYPE 3 (200 LBS/ACRE)

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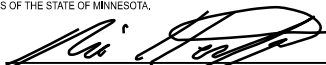
Design By: **NEH**

Plan By: **AJF**

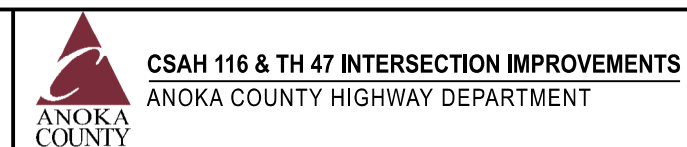
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Approved By: **NEH**

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CERTIFIED BY:   
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ANOKA COUNTY, MN

NOTES & LEGEND

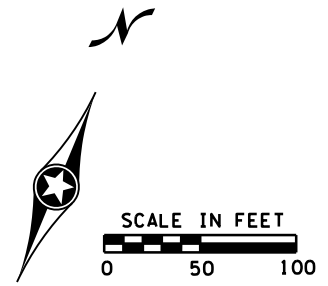
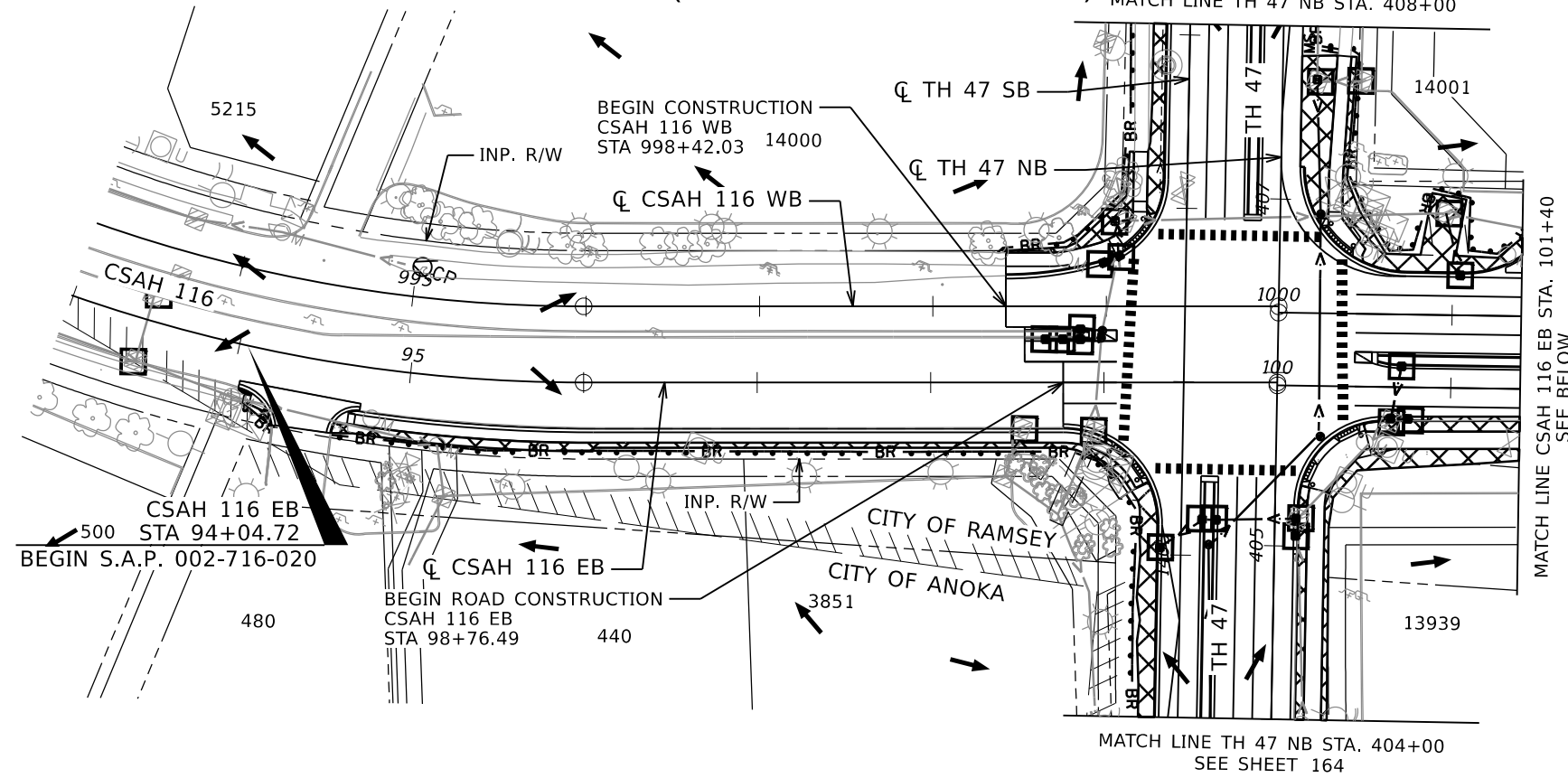
EROSION CONTROL & TURF ESTABLISHMENT

S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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# CSAH 116 (BUNKER LAKE BLVD)

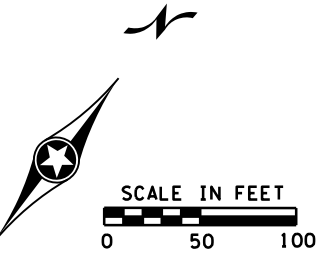
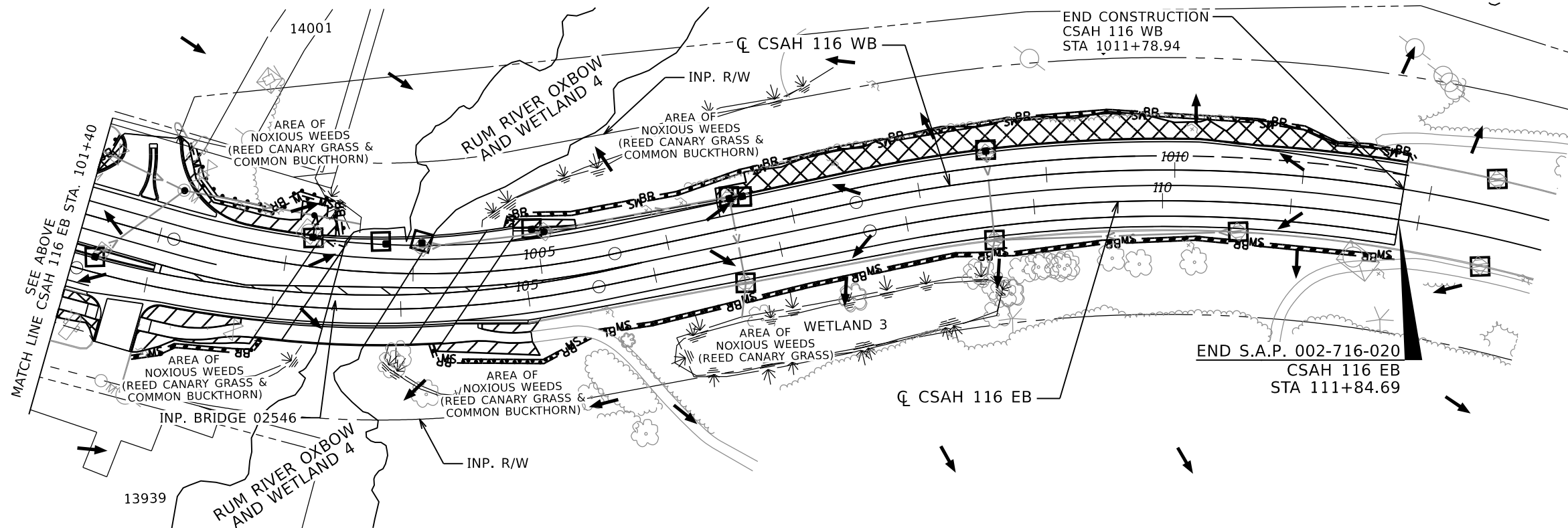
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### LEGEND

- MS SILT FENCE; TYPE MS
- BR SEDIMENT CONTROL LOG TYPE WOOD FIBER
- STORM DRAIN INLET PROTECTION
- CPC CULVERT END CONTROLS
- SURFACE DRAINAGE DIRECTION
- STABILIZED CONSTRUCTION EXIT
- TEMPORARY: RAPID STABILIZATION METHOD 3
- TEMPORARY: RAPID STABILIZATION METHOD 4
- PERMANENT: SODDING TYPE LAWN FERTILIZER TYPE 3 (200 LBS/ACRE)
- PERMANENT: SODDING TYPE LAWN FERTILIZER TYPE 3 (200 LBS/ACRE)

# CSAH 116 (BUNKER LAKE BLVD)



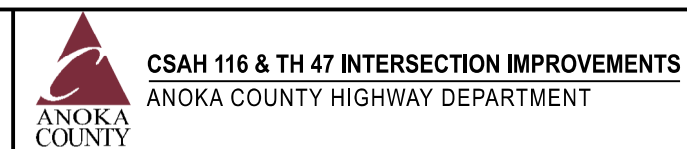
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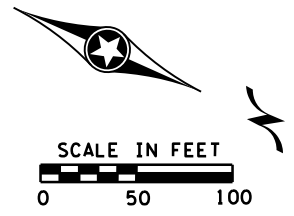
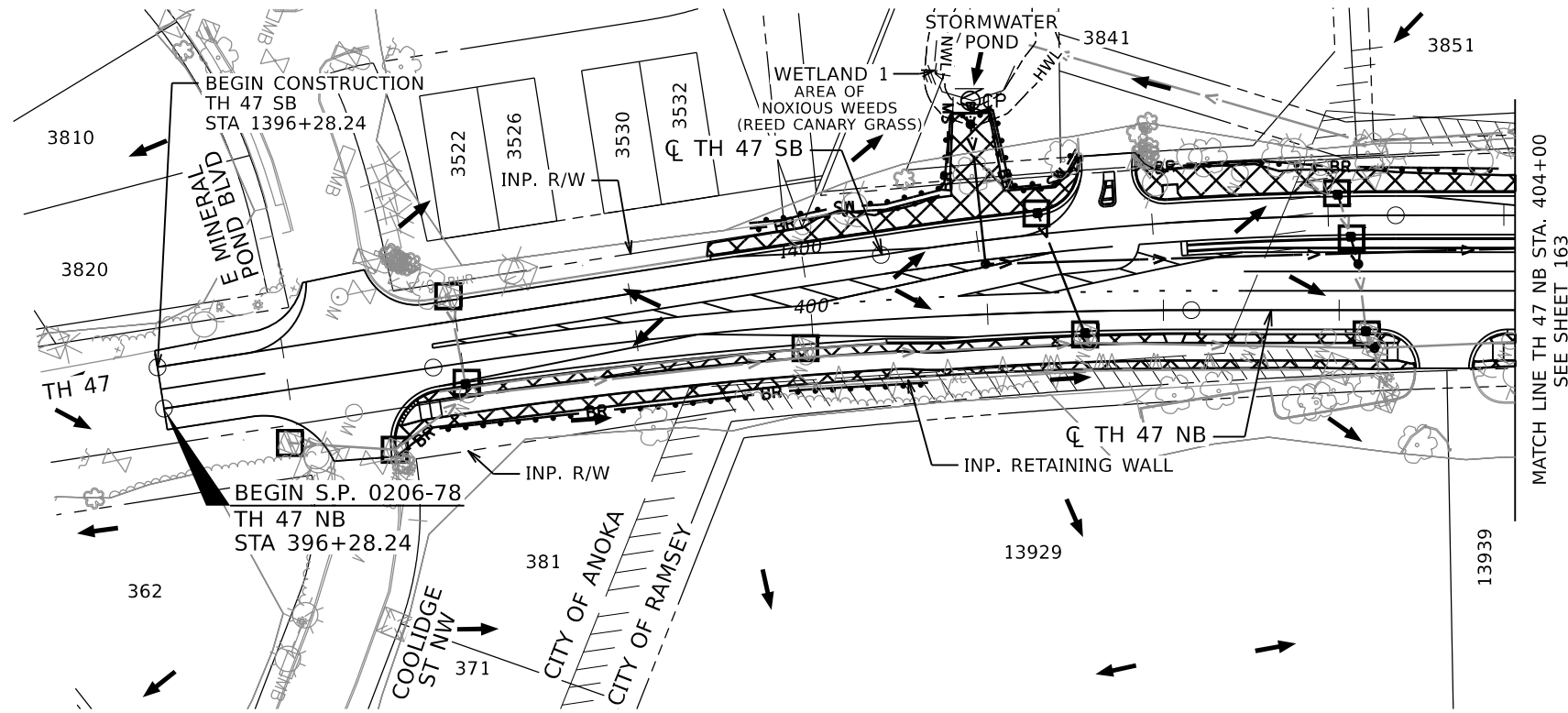
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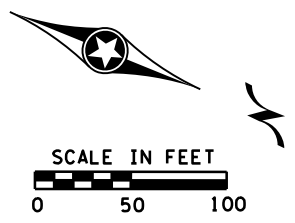
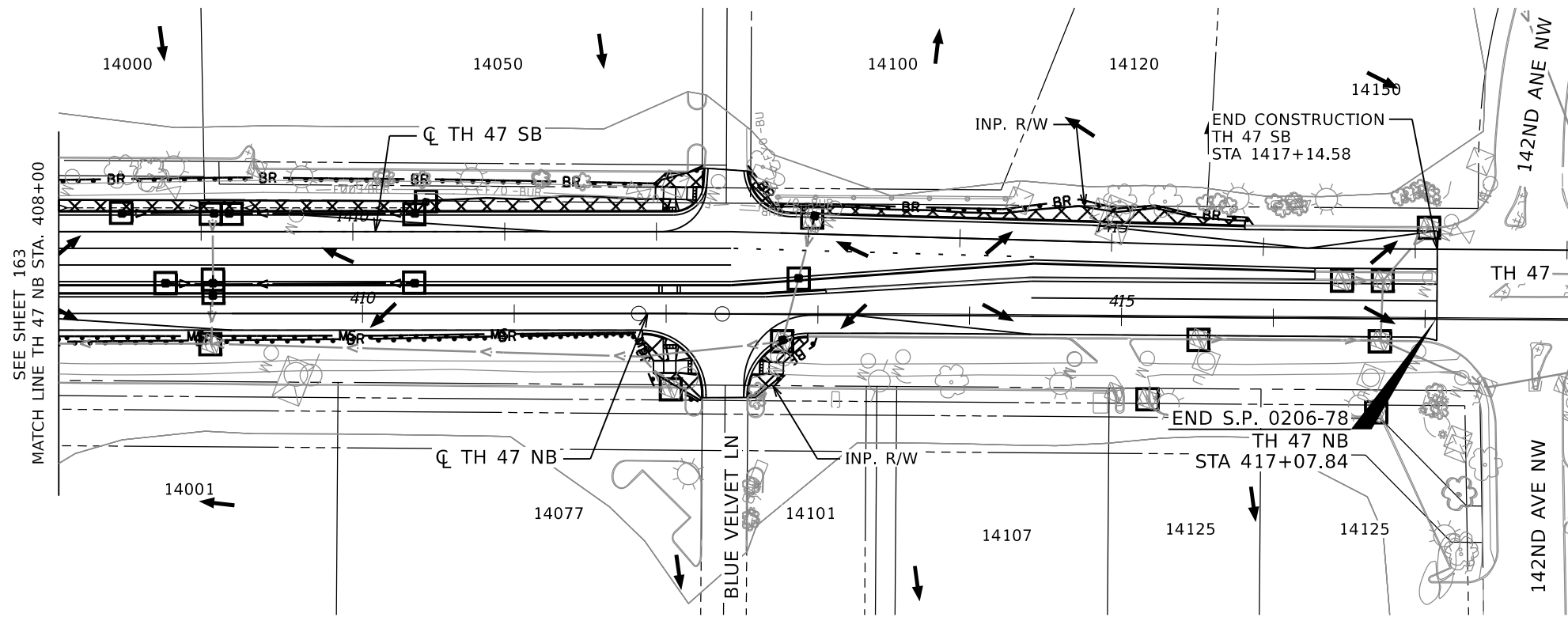
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# TRUNK HIGHWAY 47



LEGEND	
	SILT FENCE; TYPE MS
	SEDIMENT CONTROL LOG TYPE WOOD FIBER
	STORM DRAIN INLET PROTECTION
	CULVERT END CONTROLS
	SURFACE DRAINAGE DIRECTION
	STABILIZED CONSTRUCTION EXIT
	TEMPORARY: RAPID STABILIZATION METHOD 3
	PERMANENT: SODDING TYPE LAWN FERTILIZER TYPE 3 (200 LBS/ACRE)
	TEMPORARY: RAPID STABILIZATION METHOD 4
	PERMANENT: SODDING TYPE LAWN FERTILIZER TYPE 3 (200 LBS/ACRE)

# TRUNK HIGHWAY 47



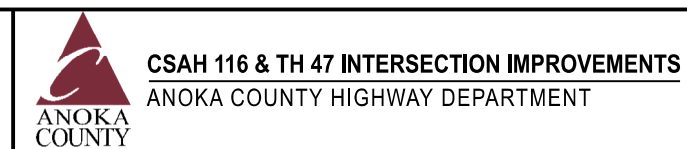
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 Approved By: NEH

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 LICENSED PROFESSIONAL ENGINEER - NICHOLAS E. HENTGES, PE  
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ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
 EROSION CONTROL & TURF ESTABLISHMENT  
 S.P. 0206-78 (TH 47)

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SIGN PANELS TYPE C													Q	
SIGN NO	GROUP		TOTAL SIGN QTY	CODE NO	PANEL LEGEND	PANEL		MTG HT (3) FEET	POSTS/MOUNTING			GROUP AREA		TOTAL AREA
	A (1) EACH	B (2) EACH				SIZE	AREA		NUMBER OF POSTS	POST TYPE (4)	RISER POST SIZE INCHES	SURFACE TYPE	A	
						INCH	SQ FT					SQ FT	SQ FT	
C-2	3		3	R6-1R	ONE WAY RIGHT	36 x 12	3.00	7	2	U		SOIL	9.00	9.00
				R1-1	STOP	36 x 36	9.00						27.00	27.00
C-3	2		2	M1-5M	MINNESOTA 47	24 x 24	4.00	7	1	U		SOIL	8.00	8.00
				M6-4	DOUBLE ARROW (BLUE)	21 x 15	2.19						4.38	4.38
(5) C-4	1		1	R3-7L (MOD)	LEFT TURN LANE	36 x 36	9.00	7	1	U		CONCRETE	9.00	9.00
(5) C-5	2		2	R3-7R (MOD)	RIGHT TURN LANE	36 x 36	9.00	7	1	U		SOIL	18.00	18.00
(5) C-6	4		4	R5-1	DO NOT ENTER	36 x 36	9.00	7	1	U		CONCRETE	36.00	36.00
(5) C-7	2		2	R4-7	KEEP RIGHT	24 x 30	5.00	7	1	U		CONCRETE	10.00	10.00
C-8	1	1	1	M3-3	SOUTH (BLUE)	24 x 12	2.00	7	1	SQ	2	SOIL		2.00
				M1-5M	MINNESOTA 47	24 x 24	4.00						4.00	4.00
(5) C-9	4		4	R3-8AB	LEFT ONLY, LEFT ONLY	36 x 30	7.50	7	1	SQ	2	CONCRETE	30.00	30.00
C-10	1		1	M3-2	EAST (BLUE)	24 x 12	2.00	7	1	U		SOIL	2.00	2.00
				M1-6M	ANOKA COUNTY 116	24 x 24	4.00						4.00	4.00
C-11	1	1	1	M3-1	NORTH (BLUE)	24 x 12	2.00	7	1	SQ	2	SOIL		2.00
				M1-5M	MINNESOTA 47	24 x 24	4.00						4.00	4.00
C-12	1		1	R3-8ACA	LEFT ONLY, THRU ONLY, RIGHT ONLY	54 x 30	11.25	7	2	U		SOIL	11.25	11.25
C-13	2		2	W3-3	SIGNAL AHEAD	36 x 36	9.00	7	2	U		SOIL	18.00	18.00
C-14	1		1	R2-1	SPEED LIMIT 55	30 x 36	7.50	7	1	U		SOIL	7.50	7.50
(5) C-15	1		1	R3-4	NO U-TURN	24 x 24	4.00	7	1	U	2	CONCRETE	4.00	4.00
				R4-7	KEEP RIGHT	24 x 30	5.00						5.00	5.00
(5) C-16	1		1	R6-1R	ONE WAY RIGHT	36 x 12	3.00	7	1	U		CONCRETE	3.00	3.00
				R6-1R	ONE WAY RIGHT	36 x 12	3.00						3.00	3.00
C-17	1		1	W1-4L	REVERSE CURVE LEFT	36 x 36	9.00	7	1	U		SOIL	9.00	9.00
				W13-1P	40 MPH ADVISORY SPEED	24 x 24	4.00						4.00	4.00
C-18	2		2	R1-1	STOP	36 x 36	9.00	7	1	SQ	2	SOIL		18.00
C-19	5		5	R3-7R	RIGHT LANE MUST TURN RIGHT	30 x 30	6.25	7	1	SQ	2	SOIL		31.25
C-20	1		1	R3-8ABCA	LT ONLY, LT ONLY, THRU ONLY, RT ONLY	66 x 30	13.75	7	2	SQ	2.5	SOIL		13.75
C-21	2		2	R2-1	SPEED LIMIT 45	24 x 30	5.00	7	1	SQ	2	SOIL		10.00
C-22	1	1	1	R6-1R	ONE WAY RIGHT	36 x 12	3.00	7	1	SQ	2.5	SOIL		3.00
				R1-1	STOP	36 x 36	9.00						9.00	9.00
				R3-7M(R)	ALL TRAFFIC MUST TURN RIGHT	30 x 30	6.25						6.25	6.25
(5) C-23	3		3	R4-7	KEEP RIGHT	24 x 30	5.00	7	1	SQ	2	CONCRETE		15.00
(5) C-24	4		4	R5-1	DO NOT ENTER	30 x 30	6.25	7	1	SQ	2	CONCRETE		25.00
(5) C-25	1		1	R6-1R	ONE WAY RIGHT	36 x 12	3.00	7	1	SQ	2	CONCRETE		3.00
C-26	3	3	3	R6-1R	ONE WAY RIGHT	36 x 12	3.00	7	1	SQ	2.5	SOIL		9.00
				R1-1	STOP	36 x 36	9.00						27.00	27.00
C-28	1		1	R3-7L	LEFT LANE MUST TURN LEFT	30 x 30	6.25	7	1	SQ	2	CONCRETE		6.25
(5) C-29	1	1	1	R6-1R	ONE WAY RIGHT	36 x 12	3.00	7	1	SQ	2	CONCRETE		3.00
				R6-1R	ONE WAY RIGHT	36 x 12	3.00						3.00	3.00
(5) C-30	2		2	R5-1	DO NOT ENTER	36 x 36	9.00	7	1	SQ	2	CONCRETE		18.00
(5) C-31	2		2	R4-7	KEEP RIGHT	24 x 30	5.00	7	1	SQ	2	CONCRETE		10.00
C-32	2		2	R10-15M	RIGHT TURN STOP FOR PEDESTRIANS	30 x 30	6.25	7	1	SQ	2	SOIL		12.50
(9) C-33	1	1	1	D11-1	BIKE ROUTE	24 x 18	3.00	7		SQ				3.00
				M6-3	THRU ARROW (GREEN)	12 x 9	0.75	7		SQ				0.75
(9) C-34	1		1	M6-1	RIGHT ARROW (GREEN)	12 x 9	0.75	7		SQ				0.75
(9) C-35	1		1	M6-4	DOUBLE ARROW (GREEN)	12 x 9	0.75	7		SQ				0.75
<b>GROUP TOTAL</b>												193	270	
<b>PROJECT TOTAL</b>												<b>463</b>		

SPECIFIC NOTES:

- SEE ANOKA COUNTY HIGHWAY DEPARTMENT SIGNING DETAILS.
- SEE MNDOT SIGNING DETAILS.
- MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE)
- POST TYPE ABBREVIATIONS (SQ = SQUARE TUBE, R = ROUND POST, U = U CHANNEL).
- MOUNT IN CONCRETE.
- MOUNT X4-2 BELOW.
- MOUNT X4-13Y BELOW.
- MOUNT BACK TO BACK.
- MOUNT BELOW SIGN TYPE D.


GROUP A = 100% COUNTY (S.A.P. 002-716-020)  
 GROUP B = 100% COUNTY (LOCAL FUNDS)

GENERAL NOTES:

- FOR STANDARD SIGN DESIGNS AND PUNCHING CODES SEE THE 2020 MINNESOTA STANDARD SIGNS AND MARKINGS MANUAL.
- USE 1-3/4" RISER POST WITH SQUARE TUBE THREE WALL BASE. SEE STANDARD PLAN 5-297.721.
- FOR 2 INCH RISER POST ON CONCRETE USE RECOVERABLE SHEAR BOLT BASE PLACED PER MANUFACTURER'S SPECIFICATIONS. USE A 12 GAUGE, 2" X 2" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST WITH A 12 GAUGE, 1-3/4" X 1-3/4" X 36" PRE-PUNCHED GALVANIZED STEEL, SQUARE TUBE POST INTERNAL INSERT.
- FOR 2 INCH RISER POST IN SOIL USE NON RECOVERABLE FIN BASE PLACED PER MANUFACTURER'S SPECIFICATIONS. USE A 12 GAUGE, 2" X 2" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST. PLACE 3/8" STAINLESS STEEL BOLT THROUGH THE 5TH HOLE DOWN FROM THE TOP OF THE BASE. RISER POST SHALL REST ON THE BOLT.
- FOR 2-1/2" RISER POST IN SOIL USE RECOVERABLE SLIP BASE PLACED PER MANUFACTURER'S SPECIFICATIONS USING A 10 GAUGE, 2-1/2" X 2-1/2" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST WITH A 10 GAUGE 2-3/16" X 2-3/16" X 8" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE POST INTERNAL INSERT.
- ALUMINUM STRINGERS SHALL BE USED FOR SIGNS 36" AND WIDER. SEE SQUARE TUBE SIGN MOUNTING DETAILS.


DATE: 8/25/2020 2:45:33 PM  
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NO.	DATE	BY	CHK	REVISIONS

Design By:	MF	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY:	
Plan By:	MF		
Checked By:	ES		
Approved By:	SD		
		DATE: 8/25/2020	LICENSE NO: 40945



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT



ANOKA COUNTY, MN  
 TABULATION  
 SIGNING PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

DATE: 8/25/2020 2:45:33 PM  
PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_sgn00.dgn

SIGN PANELS TYPE D													R			
SIGN NO	GROUP			TOTAL SIGN QTY	PANEL LEGEND	PANEL		MTG HT (1)	POSTS/MOUNTING				GROUP AREA		TOTAL AREA	
	A	B (3)	EACH			SIZE	AREA		NUMBER OF POSTS	POST TYPE (2)	POST SPACING	RISER POST SIZE INCHES	SURFACE TYPE	A		B
	EACH	EACH	EACH			INCH	SQ.FT							SQ.FT		SQ.FT
D-1		1	1		42 x 48	14.00	7	1	SQ		2.5	SOIL		14.00	14.00	
D-2		1	1		60 x 24	10.00	7	1	SQ		2.5	SOIL		10.00	10.00	
D-3		1	1		48 x 24	8.00	7	1	SQ		2	SOIL		8.00	8.00	
<b>GROUP TOTAL</b>														<b>32</b>		
<b>PROJECT TOTAL</b>														<b>32</b>		

**SPECIFIC NOTES:**

- (1) MOUNTING HEIGHT IS MINIMUM (WITH A +6 INCH TOLERANCE)
- (2) POST TYPE ABBREVIATIONS (SQ = SQUARE TUBE, R = ROUND POST, U = U CHANNEL).
- (3) SEE MNDOT SIGNING DETAILS.

GROUP A = 100% COUNTY (S.A.P. 002-716-020)  
GROUP B = 100% COUNTY (LOCAL FUNDS)

**GENERAL NOTES:**

- 1. FOR 2 INCH RISER POST IN SOIL USE NON RECOVERABLE FIN BASE PLACED PER MANUFACTURER'S SPECIFICATIONS. USE A 12 GAUGE, 2" X 2" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST. PLACE 3/8" STAINLESS STEEL BOLT THROUGH THE 5TH HOLE DOWN FROM THE TOP OF THE BASE. RISER POST SHALL REST ON THE BOLT.
- 2. FOR 2-1/2" RISER POST IN SOIL USE RECOVERABLE SLIP BASE PLACED PER MANUFACTURER'S SPECIFICATIONS USING A 10 GAUGE, 2-1/2" X 2-1/2" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE RISER POST WITH A 10 GAUGE 2-3/16" X 2-3/16" X 8" PRE-PUNCHED, GALVANIZED STEEL, SQUARE TUBE POST INTERNAL INSERT.
- 3. ALUMINUM STRINGERS SHALL BE USED FOR SIGNS 36" AND WIDER. SEE SQUARE TUBE SIGN MOUNTING DETAILS.
- 4. SEE SIGNING PANEL LAYOUT SHEET FOR PANEL DESIGNS.

MARKER				S
CODE NO	SIZE INCH	COLOR	QUANTITY EACH	
(1) OM1-2	18 x 18	YELLOW ON BLACK	6	
OM3-R	12 x 36	BLACK ON YELLOW	1	
<b>TOTAL QUANTITIES</b>				
CODE NO	GROUP A EACH	GROUP B EACH	PROJECT TOTAL EACH	
OM1-2	3	3	6	
OM3-R	1		1	

**SPECIFIC NOTES:**

- (1) MOUNTED BELOW TYPE C SIGNS.
- (2) PAID AS OBJECT MARKER TYPE X4-2.
- (3) PAID AS OBJECT MARKER TYPE X4-4.

GROUP A = 100% COUNTY (S.A.P. 002-716-020)  
GROUP B = 100% COUNTY (LOCAL FUNDS)

**GENERAL NOTES:**

- 1. FOR STANDARD SIGN DESIGNS AND PUNCHING CODES SEE THE 2020 MINNESOTA STANDARD SIGNS AND MARKINGS MANUAL.
- 2. SEE STANDARD PLAN 5-297.702 FOR PLACEMENT.

DELINEATOR					T
CODE NO	QUANTITY EACH				PROJECT TOTAL
	COLOR		GROUP TOTAL		
	WHITE	YELLOW	A	B	
X4-3		2		2	2

**SPECIFIC NOTES:**

- (1) MOUNTED BELOW TYPE C SIGNS.
- (2) PAID AS DELINEATOR TYPE X4-13.

GROUP A = 100% COUNTY (S.A.P. 002-716-020)  
GROUP B = 100% COUNTY (LOCAL FUNDS)

**GENERAL NOTES:**

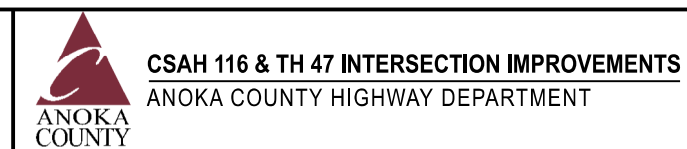
- 1. FOR STANDARD SIGN DESIGNS AND PUNCHING CODES SEE THE 2020 MINNESOTA STANDARD SIGNS AND MARKINGS MANUAL.
- 2. SEE STANDARD PLAN 5-297.702 FOR PLACEMENT.

NO.	DATE	BY	CHK	REVISIONS

Design By: MF  
Plan By: MF  
Checked By: ES  
Approved By: SD

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

CERTIFIED BY:   
DATE: 8/25/2020 LICENSE NO. 40945

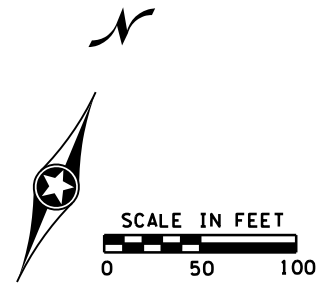
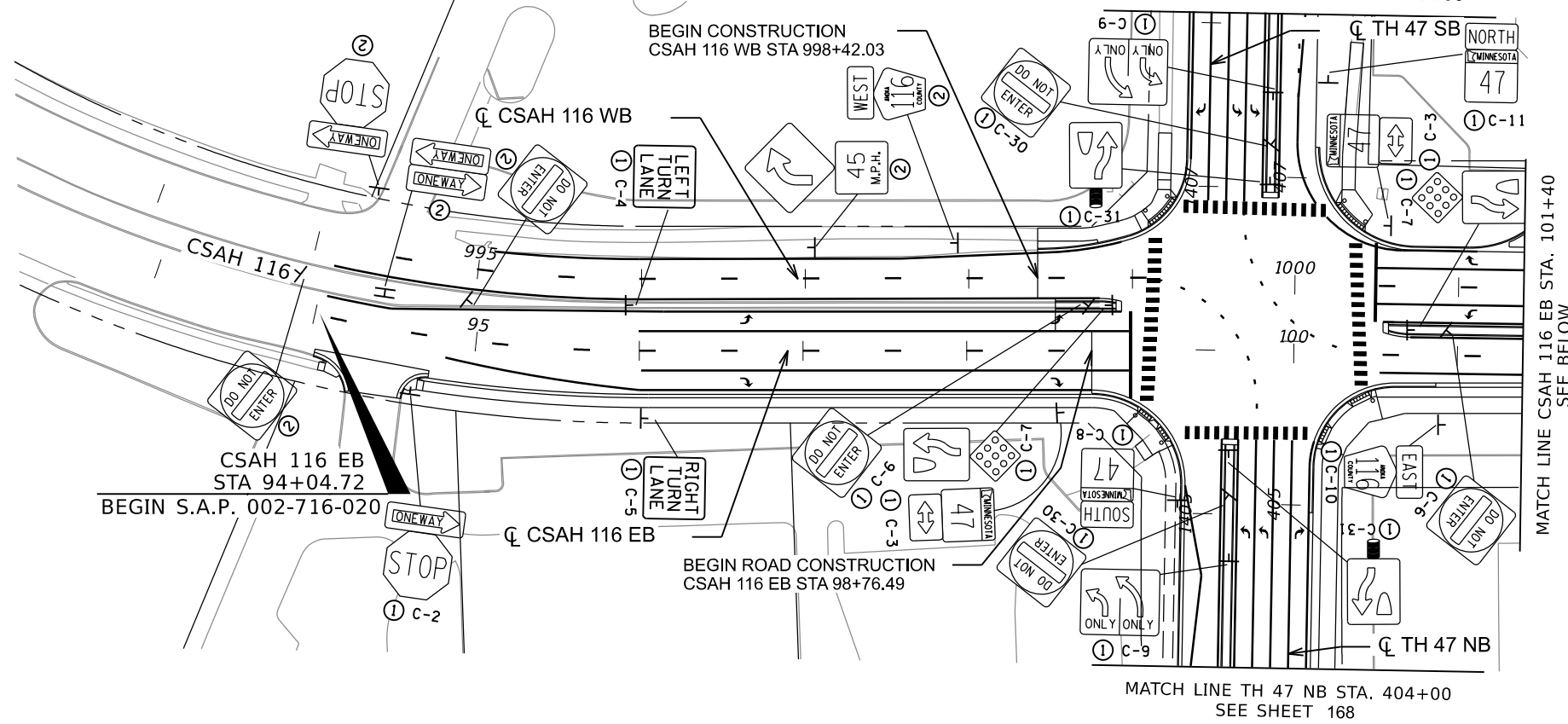


ANOKA COUNTY, MN  
TABULATION  
**SIGNING PLAN**  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 166 OF 206 SHEETS

# CSAH 116 (BUNKER LAKE BLVD)

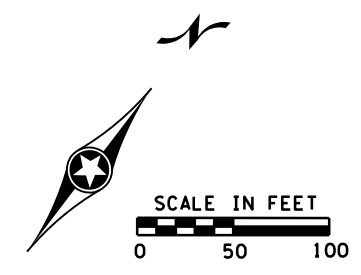
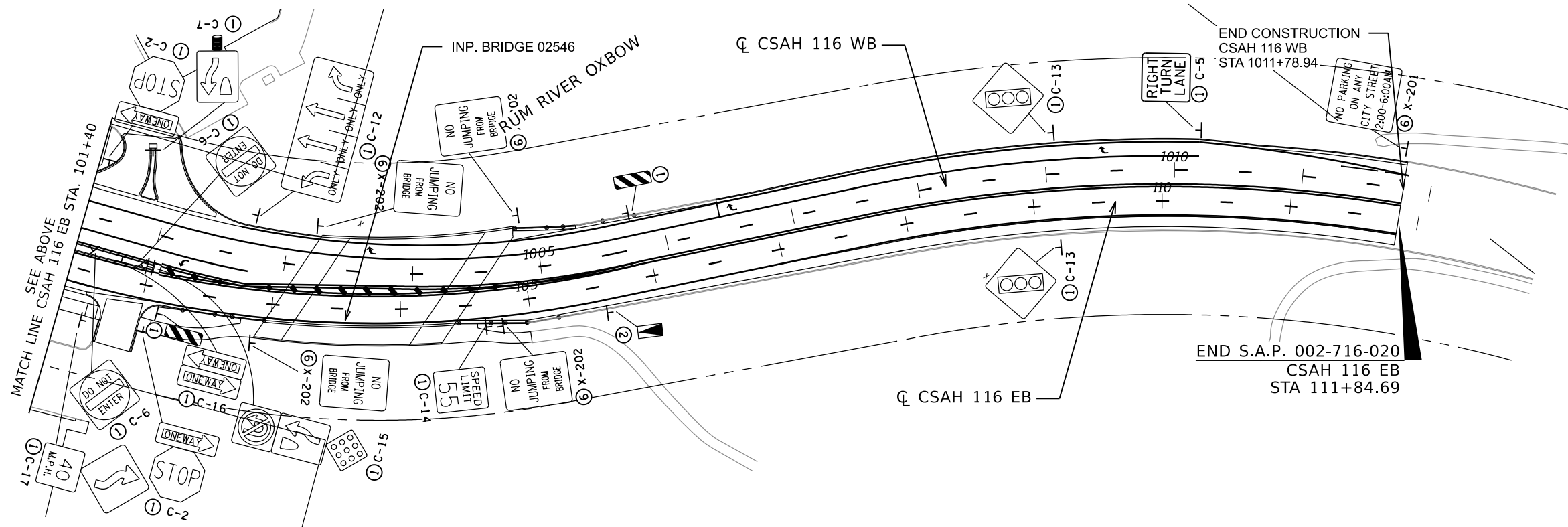
SEE SHEET 168  
MATCH LINE TH 47 NB STA. 408+00



LEGEND	
①	FURNISH & INSTALL
②	INPLACE TO REMAIN
⑥	INSTALL

# CSAH 116 (BUNKER LAKE BLVD)

MATCH LINE TH 47 NB STA. 404+00  
SEE SHEET 168



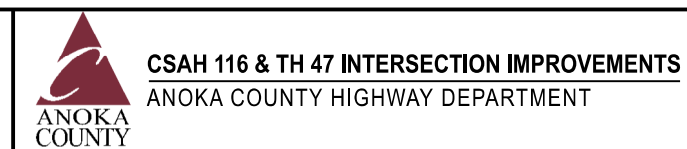
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NO.	DATE	BY	CHK	REVISIONS

Design By: MF  
Plan By: MF  
Checked By: ES  
Approved By: SD

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

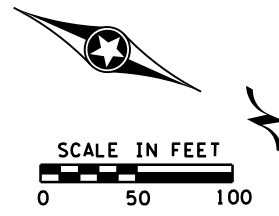
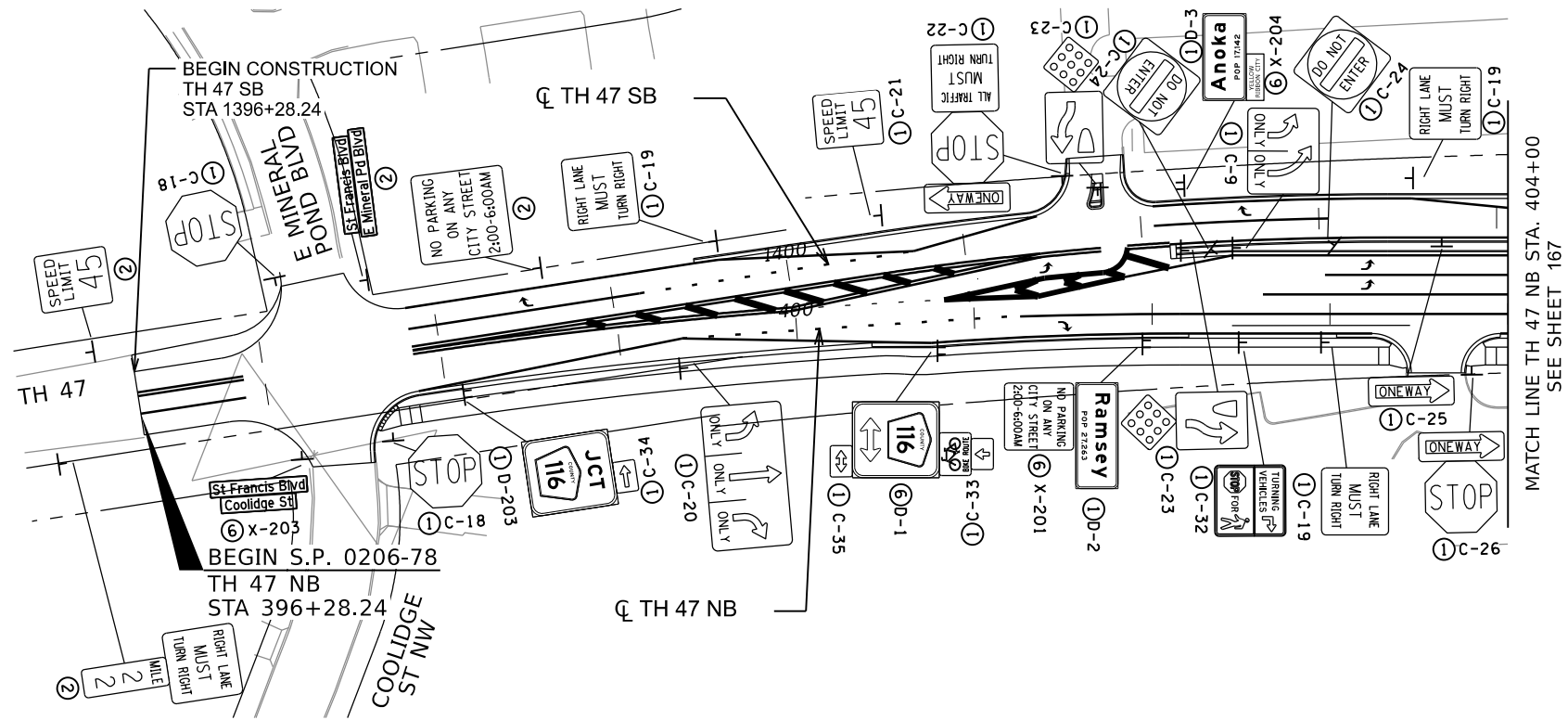
CERTIFIED BY: *Sam Palmer*  
DATE: 8/25/2020 LICENSE NO. 40245



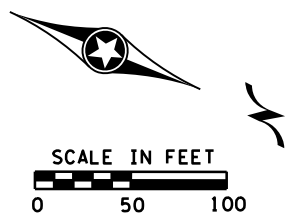
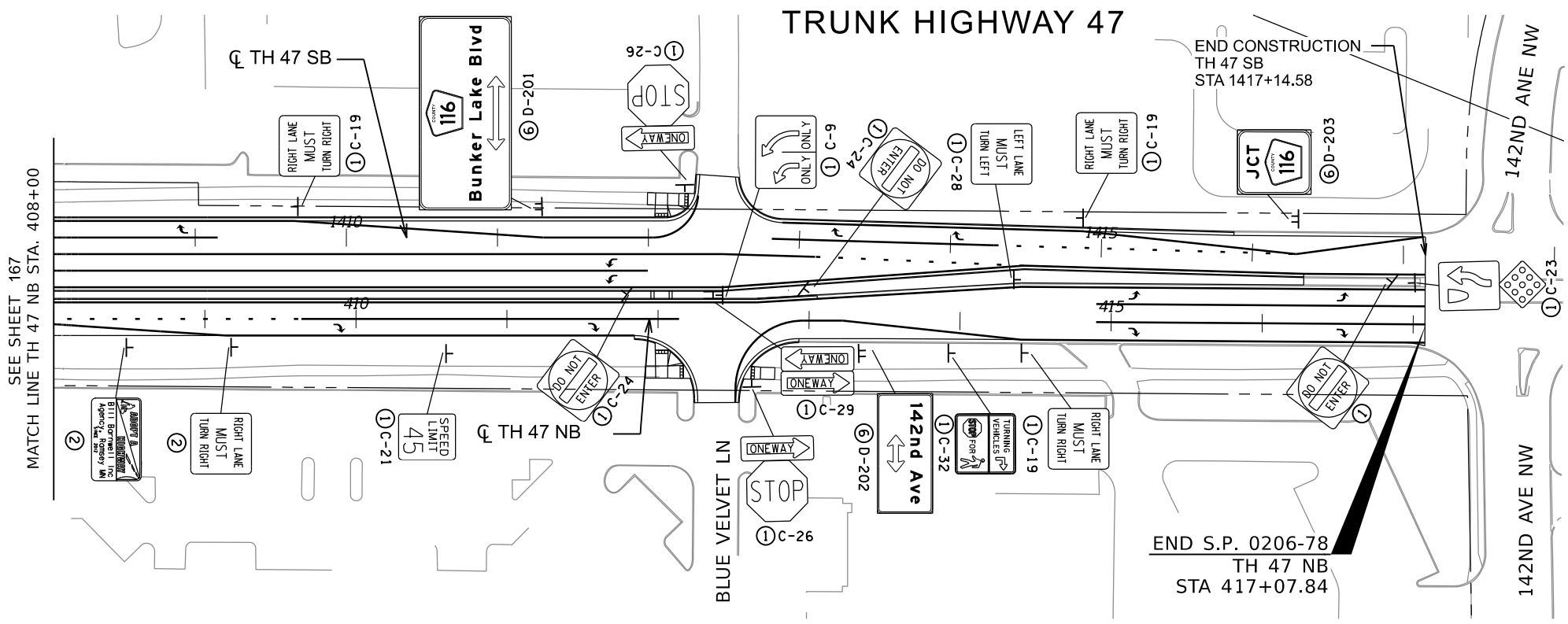
ANOKA COUNTY, MN  
CSAH 116  
SIGNING PLAN  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
167  
OF  
206  
SHEETS

# TRUNK HIGHWAY 47



LEGEND	
①	FURNISH & INSTALL
②	INPLACE TO REMAIN
⑥	INSTALL



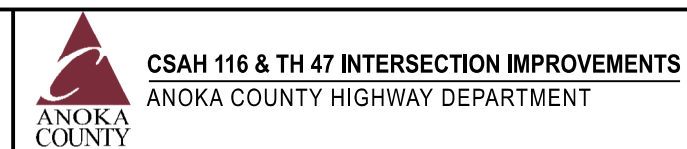
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NO.	DATE	BY	CHK	REVISIONS

Design By: MF  
 Plan By: MF  
 Checked By: ES  
 Approved By: SD

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

CERTIFIED BY: *Sam Palmer*  
 DATE: 8/25/2020 LICENSE NO. 40945

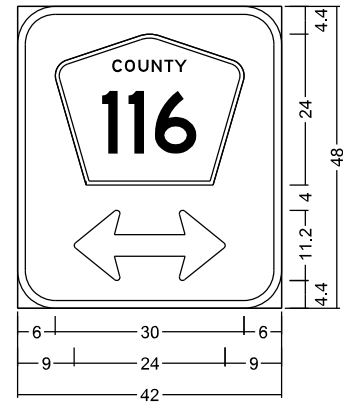


ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
 SIGNING PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

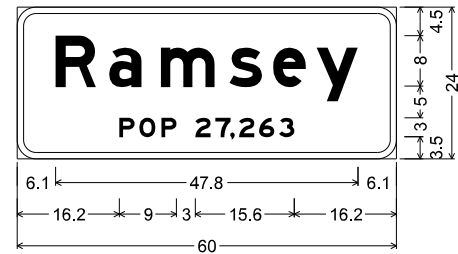
SHEET 168 OF 206 SHEETS



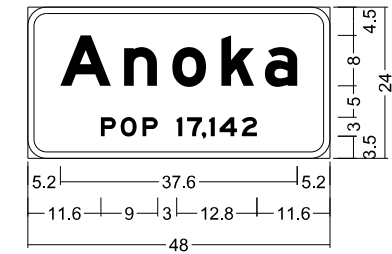
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6.0" Radius, 1.3" Border, White on, Green;  
Pentagonal County 116 M1-6a;  
Double Headed Arrow 5 - 24.0" 0';



12-3\_60x24;  
1.0" Border, White on, Green;  
"Ramsey", E Mod; "POP", E Mod;  
"27,263", E Mod;



12-3\_48x24;  
1.0" Border, White on, Green;  
"Anoka", E Mod; "POP", E Mod;  
"17,142", E Mod;

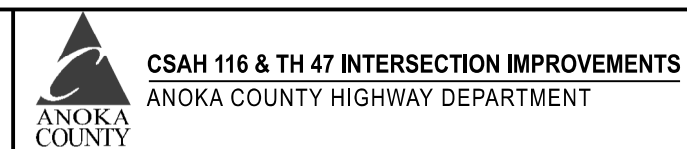
ALL DIMENSIONS ARE IN INCHES.

NO.	DATE	BY	CHK	REVISIONS

Design By: MF  
Plan By: MF  
Checked By: ES  
Approved By: SD

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

CERTIFIED BY: *Sam Palmrose*  
DATE: 8/25/2020 LICENSE NO. 40945



ANOKA COUNTY, MN  
SIGN PANEL DETAILS  
SIGNING PLAN  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

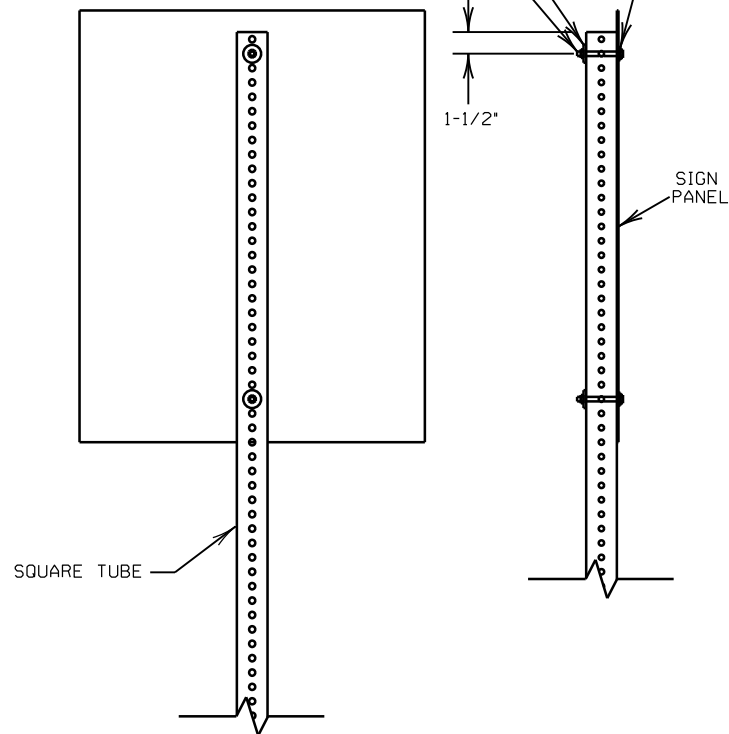
SHEET 169 OF 206 SHEETS

FOR SIGNS ON TH 47:

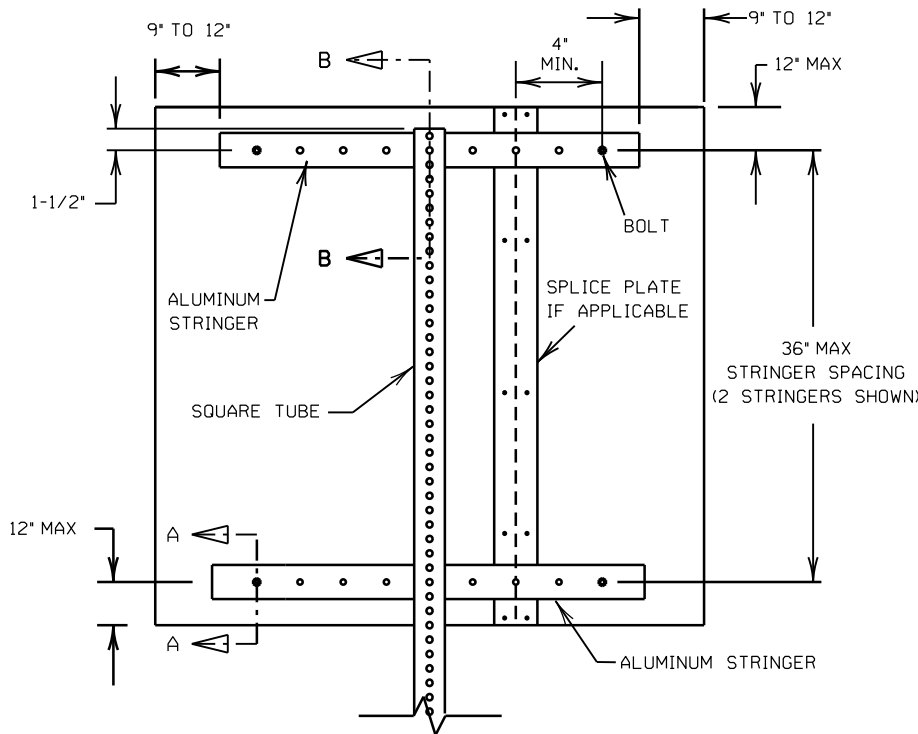
STAINLESS STEEL WASHER AND NYLON WASHER  
(T=1/32" MIN, I.D.=3/8" MAX, O.D.=7/8" MAX)

TWO 1-1/4" X 0.065" THICK  
ZINC COATED STEEL  
FENDER WASHERS

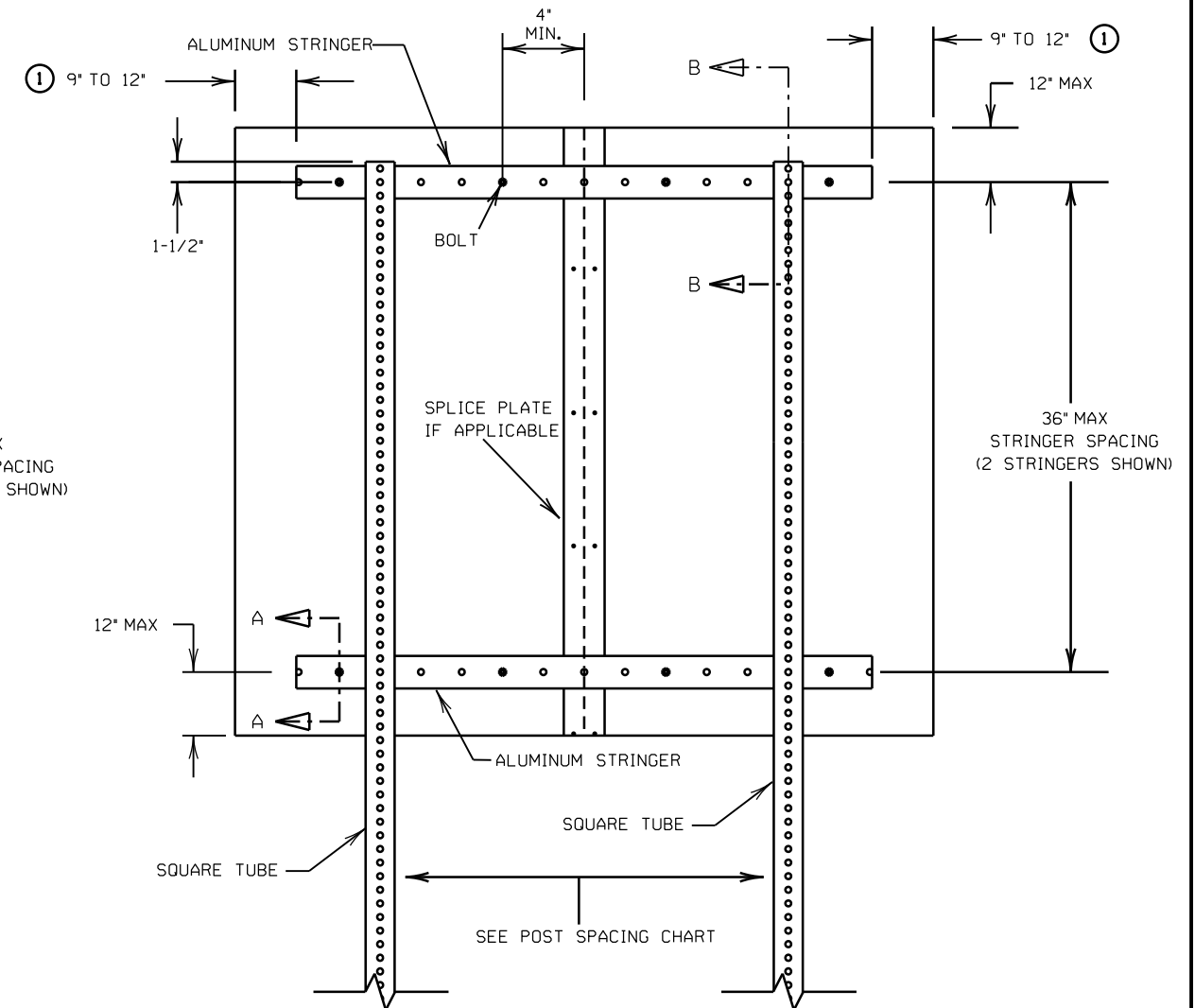
5/16" STAINLESS STEEL BOLT  
WITH ZINC COATED STEEL  
NYLON INSERT LOCK-NUT



FOR SIGN PANELS UP TO 30" WIDE



FOR SIGN PANELS 36" WIDE  
OR GREATER ON ONE POST



FOR SIGN PANELS ON TWO OR MORE POSTS

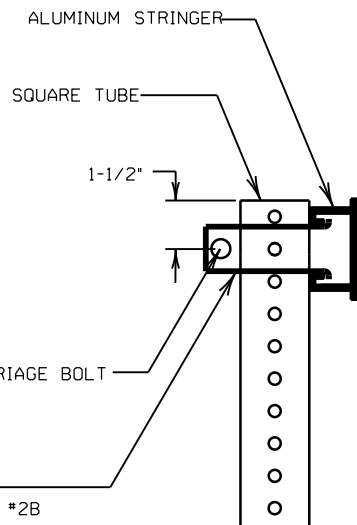
① IF POST SPACING REQUIRES PLACEMENT OF A POST WITHIN THIS AREA, EXTEND STRINGERS AS NEEDED TO ACCOMMODATE THE STRINGER TO POST CLAMP.

STAINLESS STEEL WASHER  
AND NYLON WASHER  
(T= 1/32 " MIN, I.D.= 3/8 " MAX, O.D.= 7/8 " MAX)

5/16" STAINLESS  
STEEL BOLT WITH ZINC  
COATED STEEL NYLON  
INSERT LOCK-NUT

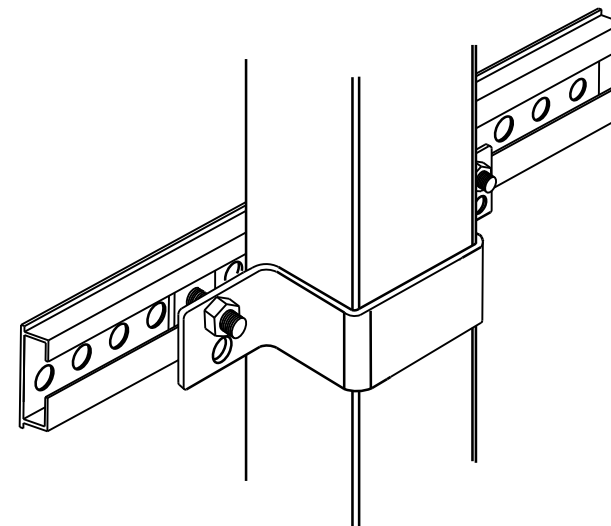
ALUMINUM STRINGER

VIEW A-A

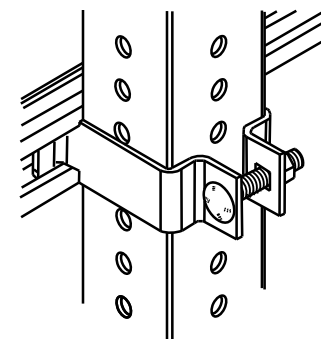


VIEW B-B

CLAMP  
11GA TYPE 304, \*2B  
FINISHED STAINLESS STEEL  
WITH 3/8"-16X2" CARRIAGE BOLT  
AND SERRATED FLANGE NUT.



CLAMP DETAIL  
4" SQUARE TUBE



CLAMP DETAIL  
2" AND 2 1/2" SQUARE TUBE

STAINLESS STEEL WASHER  
AND NYLON WASHER  
(T= 1/32 " MIN, I.D.= 3/8 " MAX, O.D.= 7/8 " MAX)

SIGN PANEL

SQUARE TUBE

BACK TO BACK  
SIGN MOUNTING WITH STRINGERS

STAINLESS STEEL WASHER  
AND NYLON WASHER  
(T= 1/32 " MIN, I.D.= 3/8 " MAX, O.D.= 7/8 " MAX)

5/16" STAINLESS  
STEEL BOLT WITH  
ZINC COATED STEEL  
NYLON INSERT LOCK-NUT

SIGN PANEL

NOTES:

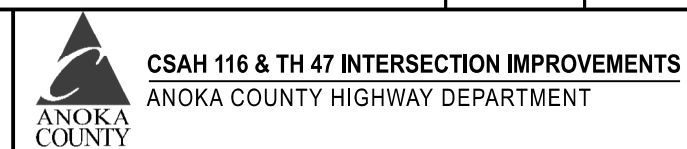
1. BOLT SIGN PANELS TO STRINGERS OR RISER POSTS AT NO GREATER THAN 24 INCH SPACING. SEE THE MNDOT STANDARD SIGNS AND MARKINGS MANUAL FOR MOUNTING HOLES (PUNCH CODES) INFORMATION.
2. STRINGERS SHALL BE CENTERED ON SIGN PANEL.

SQUARE TUBE  
SIGN MOUNTING DETAILS

DATE: 8/25/2020 2:46:52 PM  
PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_sgnrdr.dgn

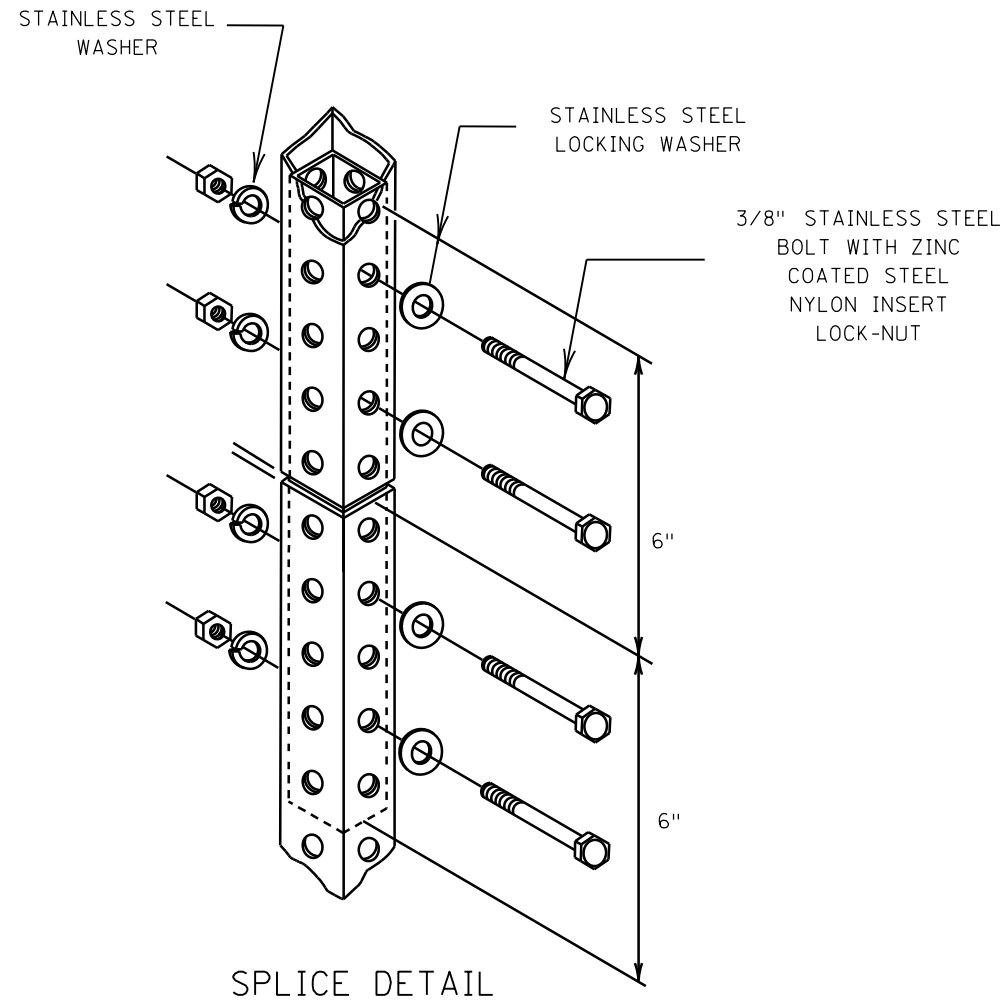
NO.	DATE	BY	CHK	REVISIONS

Design By:	MF	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Plan By:	MF	
Checked By:	ES	
Approved By:	SD	
DATE:	8/25/2020	



ANOKA COUNTY, MN	SHEET 170 OF 206 SHEETS
TH 47 (MNDOT) MOUNTING DETAILS SIGNING PLAN	
S.P. 0206-78 (TH 47), S.A.P. 002-716-020	

FOR SIGNS ON TH 47:



SPLICE DETAIL

NO MORE THAN ONE SPLICE PER POST.

WHEN USED MUST BE PLACED AT LEAST 8 FEET ABOVE GROUND. THE PREFERRED PLACEMENT LOCATION IS BEHIND THE SIGN PANEL.

INTERIOR POST STUD SHALL BE ONE SIZE SMALLER FOR A TIGHT FIT. IF RISER POST IS 2-1/2", INTERIOR POST IS 2-3/16". IF RISER POST IS 2", INTERIOR POST IS 1-3/4".

PANEL WIDTH (IN)	SQUARE TUBE POST SPACING							
	2 POSTS (IN)	3 POSTS (IN)	4 POSTS (IN)	5 POSTS (IN)	6 POSTS (IN)	7 POSTS (IN)	8 POSTS (IN)	
24	12							
30	12							
36	12							
42	18							
48	24							
54	30							
60	36							
66	36							
72	42							
78	42							
84	48							
90	48	42						
96	48	42						
102	54	42						
108	54	42						
114	60	42						
120	60	48						
126	66	48						
132	66	48	42					
138	72	48	42					
144	72	48	42					
150	78	54	42					
156	78	54	42					
162	84	54	42					
168	84	60	48					
174	90	60	48	42				
180	90	60	48	42				
186	96	66	48	42				
192	96	66	48	42				
198	102	66	54	42				
204	102	72	54	42				
210	108	72	54	42				
216	108	72	54	48	42			
222	114	78	60	48	42			
228	114	78	60	48	42			
234	120	78	60	48	42			
240	120	84	60	48	42			
246		84	66	54	42			
252		84	66	54	42			
258		90	66	54	42	42		
264		90	66	54	48	42		
270		90	72	54	48	42		
276		96	72	60	48	42		
282		96	72	60	48	42		
288		96	72	60	48	42		
294		102	78	60	54	42		
300		102	78	60	54	42	42	
306		102	78	66	54	42	42	
312		108	78	66	54	48	42	
318		108	84	66	54	48	42	
324		108	84	66	54	48	42	
330		114	84	66	60	48	42	
336		114	84	72	60	48	42	

DISTANCES ARE CENTER-TO-CENTER OF POSTS

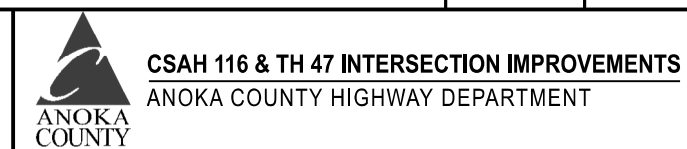
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NO.	DATE	BY	CHK	REVISIONS

Design By: MF  
 Plan By: MF  
 Checked By: ES  
 Approved By: SD

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

CERTIFIED BY: *Sam Palmer*  
 DATE: 8/25/2020 LICENSE NO. 40945



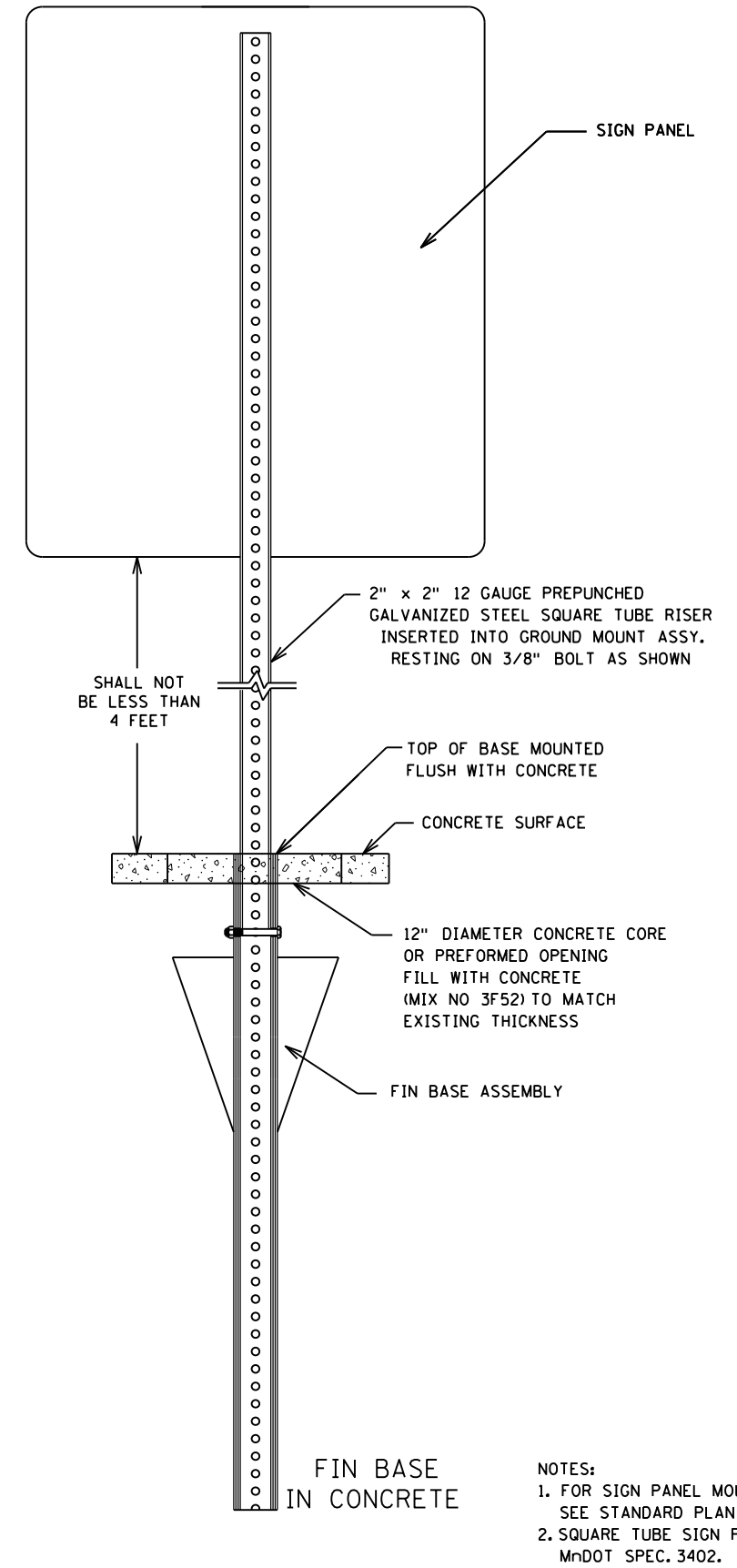
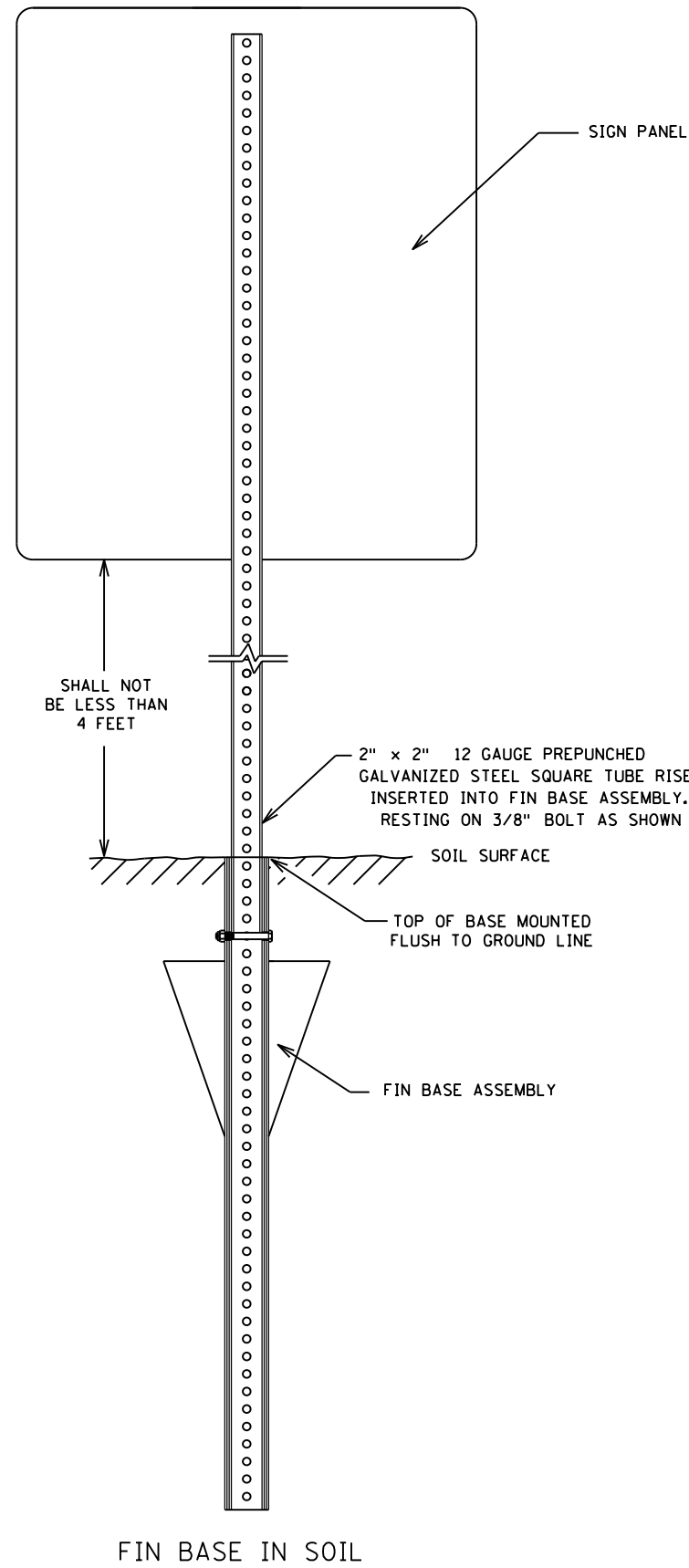
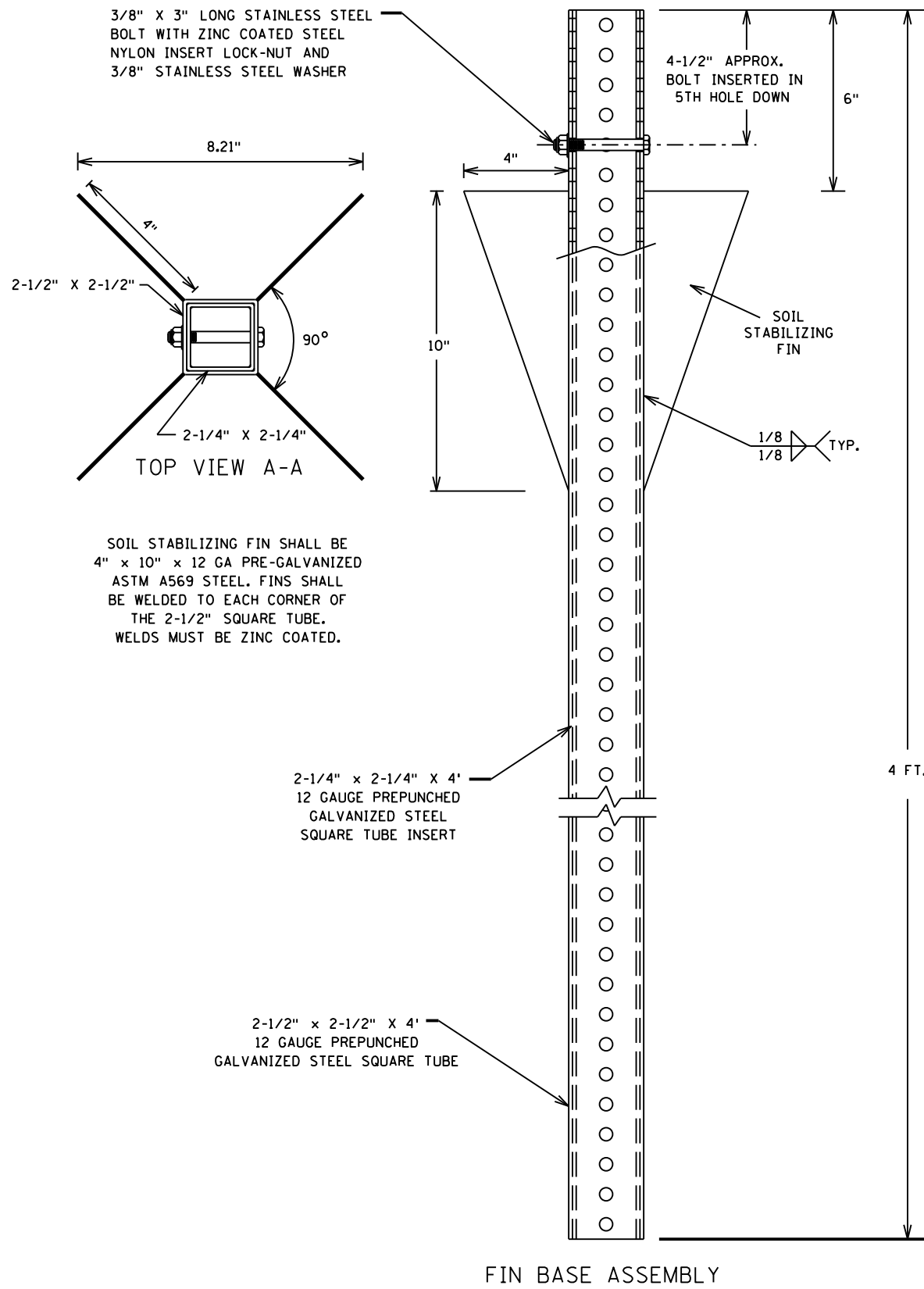
**SQUARE TUBE  
SIGN MOUNTING DETAILS**

ANOKA COUNTY, MN  
 TH 47 (MNDOT) MOUNTING DETAILS  
 SIGNING PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
171  
OF  
206  
SHEETS



FOR SIGNS ON TH 47:



- NOTES:
1. FOR SIGN PANEL MOUNTING DETAILS SEE STANDARD PLAN 5-297.720.
  2. SQUARE TUBE SIGN POSTS PER MnDOT SPEC. 3402.

**SQUARE TUBE FIN BASE**

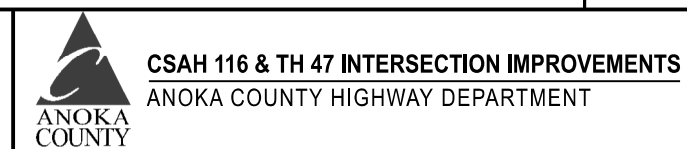
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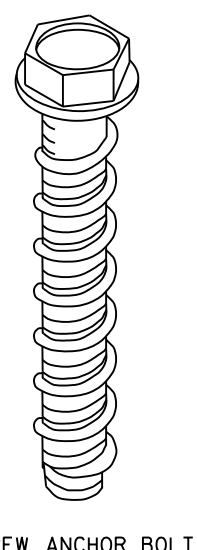
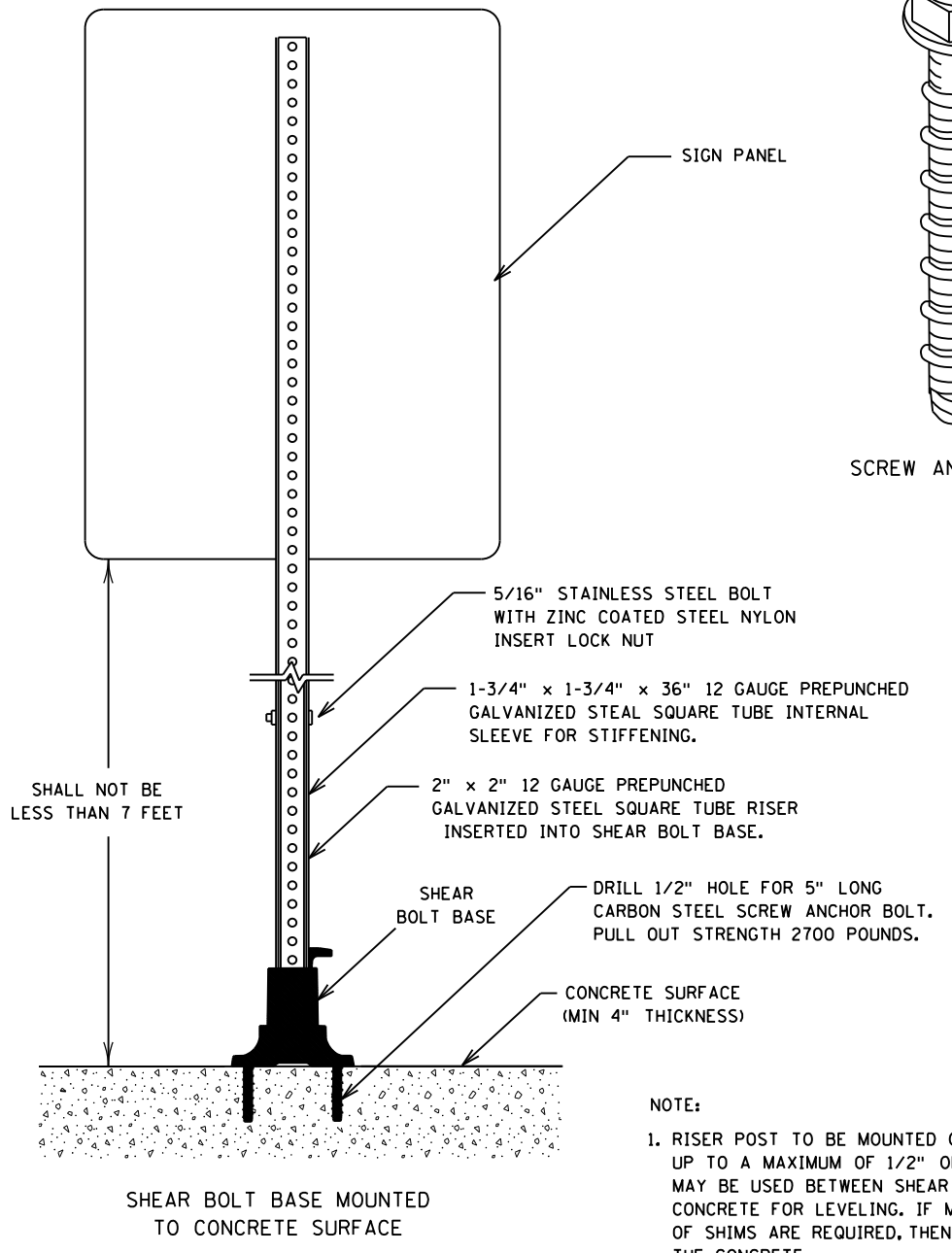
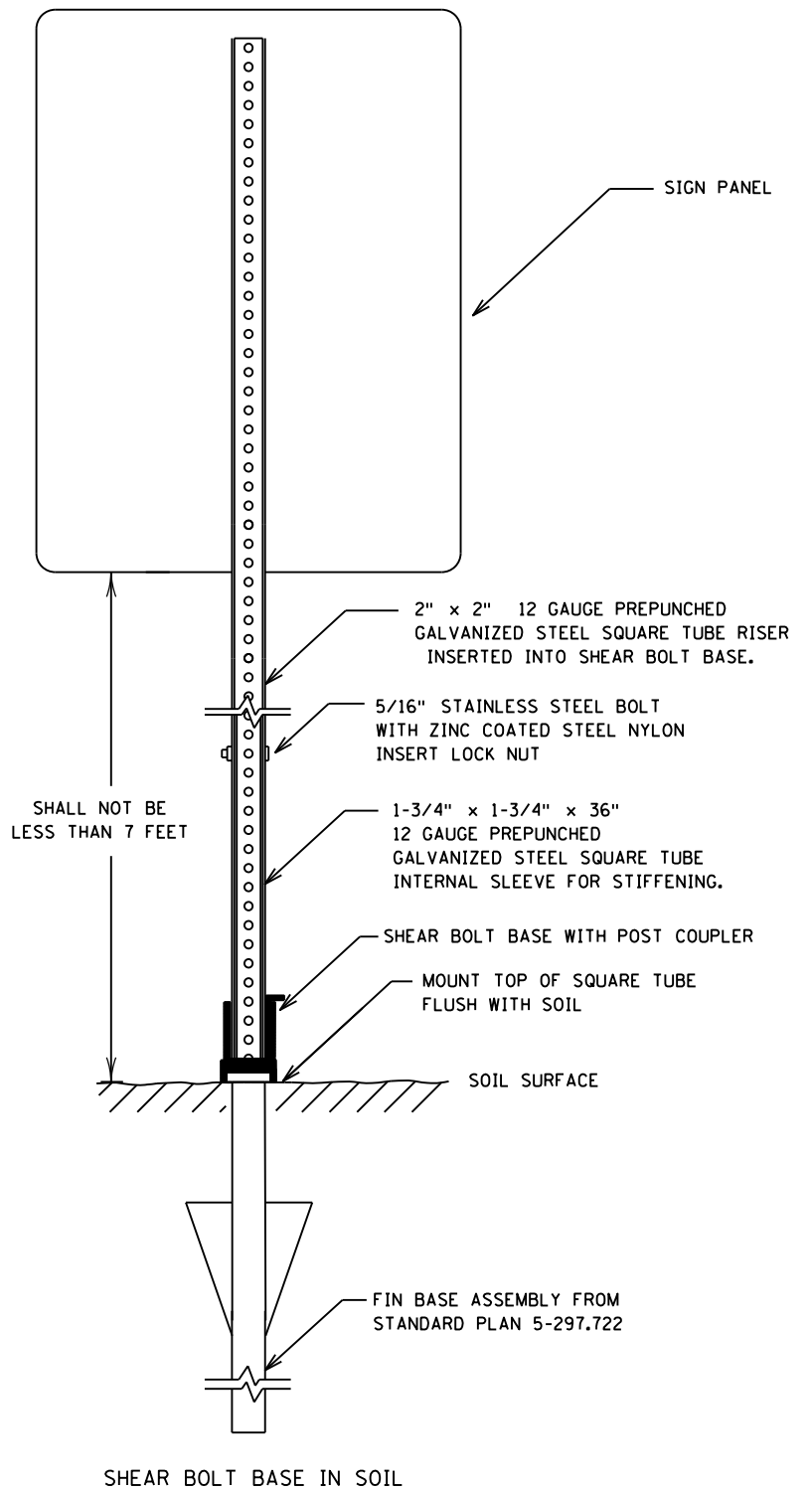
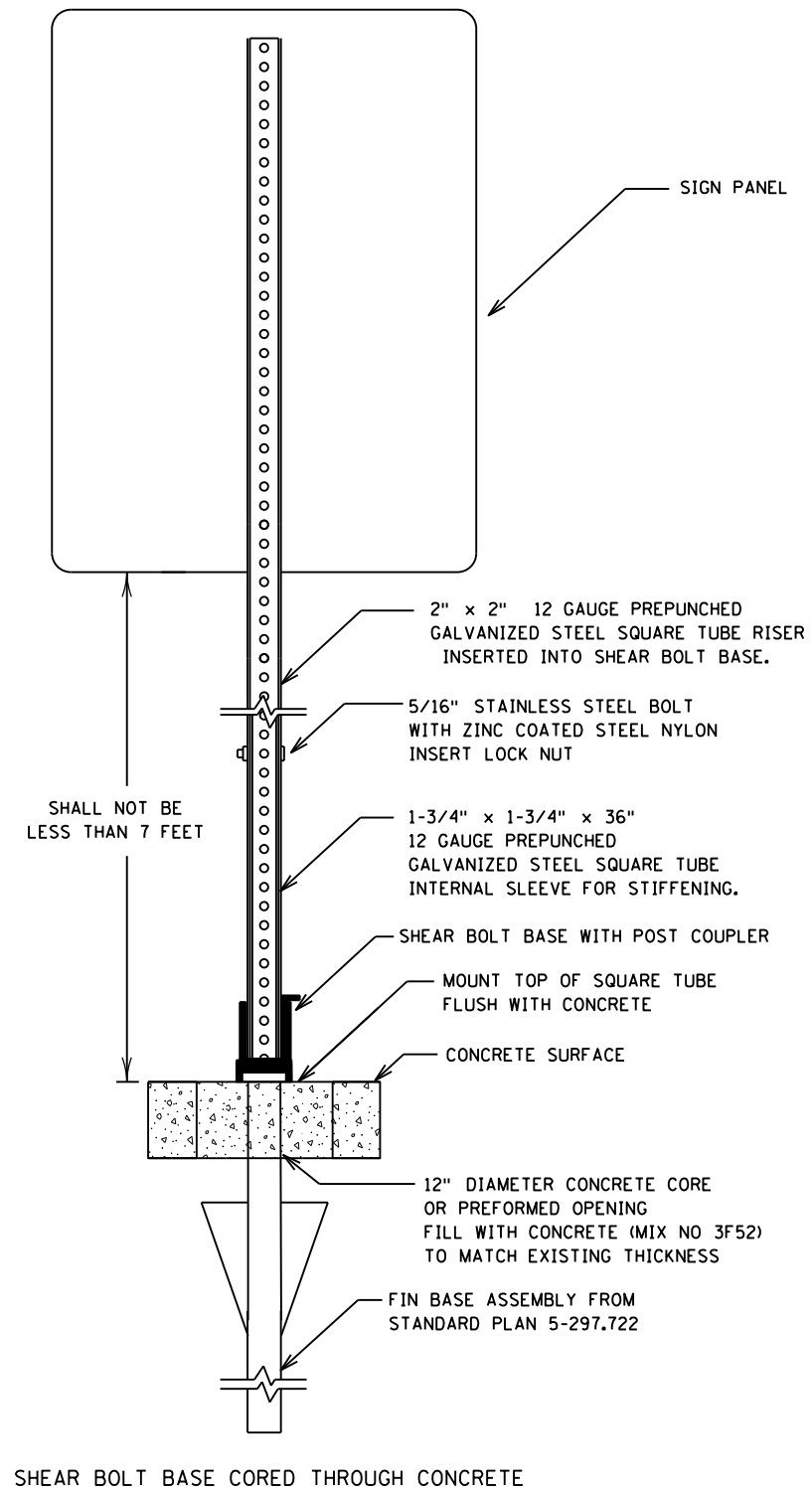
CERTIFIED BY: *Sam Palmer*  
 DATE: 8/25/2020 LICENSE NO. 40945



ANOKA COUNTY, MN  
 TH 47 (MNDOT) MOUNTING DETAILS  
 SIGNING PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 173 OF 206 SHEETS

FOR SIGNS ON TH 47:



- NOTE:
1. RISER POST TO BE MOUNTED CLOSE TO PLUMB. UP TO A MAXIMUM OF 1/2" OF SHIM WASHERS MAY BE USED BETWEEN SHEAR BOLT BASE AND CONCRETE FOR LEVELING. IF MORE THAN 1/2" OF SHIMS ARE REQUIRED, THEN CORE THROUGH THE CONCRETE.
  2. INSTALLATION OF SHEAR BOLT BASE SHALL BE NO EARLIER THAN 3 DAYS AFTER CONCRETE IS PLACED.
  3. FOR SHEAR BOLT BASE USE APPROVED PRODUCT FROM MNDOT APPROVED PRODUCTS LIST, PRODUCT SHALL BE MODIFIED AS SHOWN.
  4. USE ANTI SEIZE ON THE SHEAR BOLT CONNECTIONS.
  5. FOR SIGN PANEL MOUNTING DETAILS SEE STANDARD PLAN 5-297.720.
  6. SQUARE TUBE SIGN POSTS PER MNDOT SPEC. 3402.

**SQUARE TUBE SHEAR BOLT BASE**

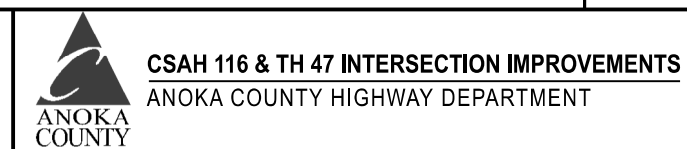
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Design By: MF  
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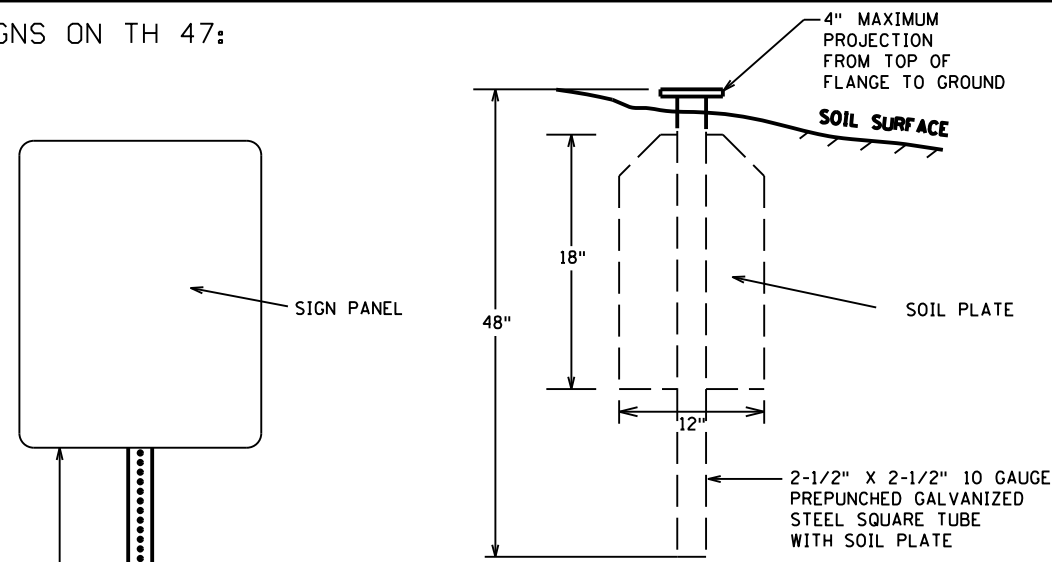
CERTIFIED BY: *Sam Palmer*  
 DATE: 8/25/2020 LICENSE NO. 40945



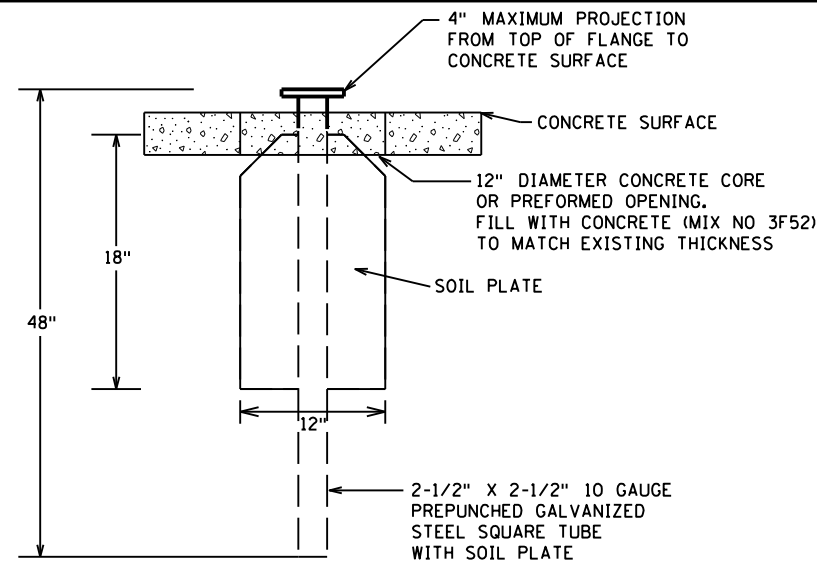
ANOKA COUNTY, MN  
 TH 47 (MNDOT) MOUNTING DETAILS  
 SIGNING PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 174  
 OF  
 206  
 SHEETS

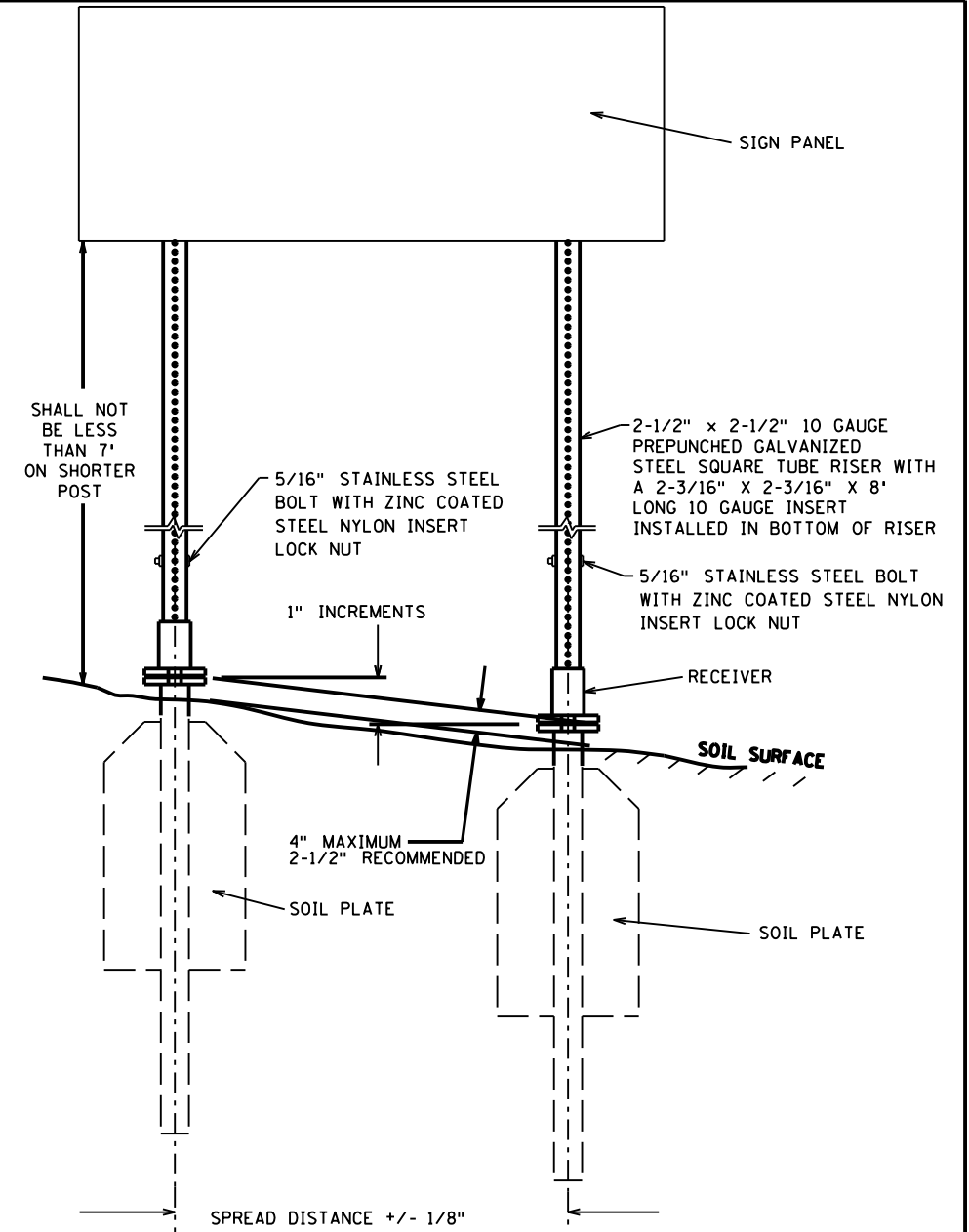
FOR SIGNS ON TH 47:



SLIP BASE IN SOIL DETAIL

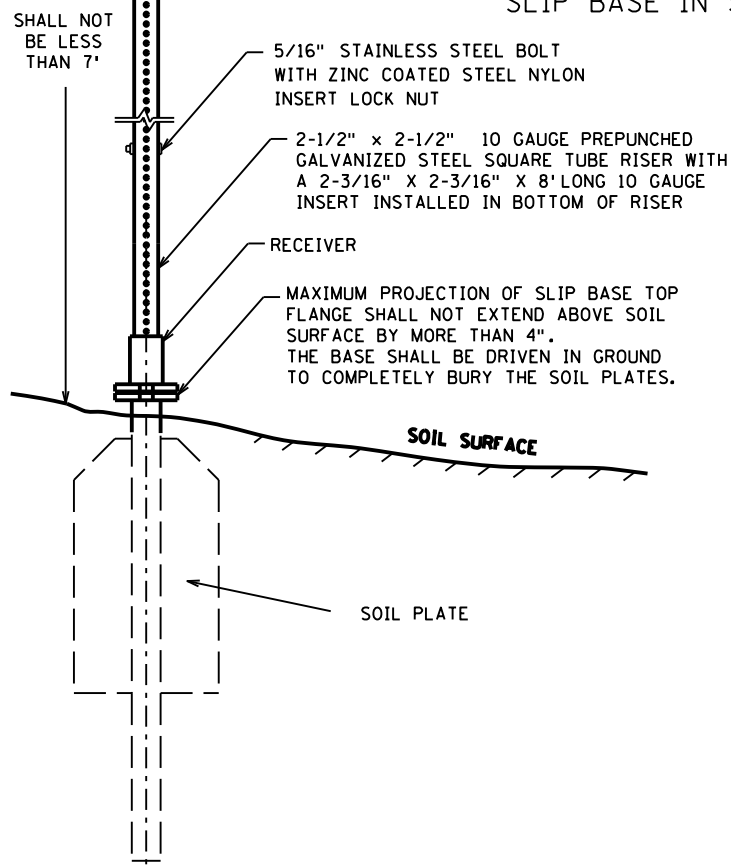


SLIP BASE CORED THROUGH CONCRETE DETAIL

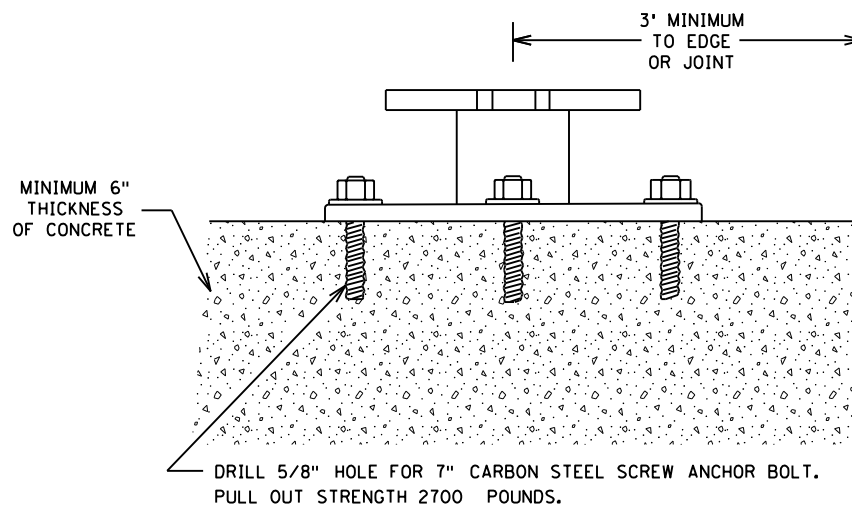


FOR MULTIPLE POST APPLICATIONS, ENSURE SOIL PLATES ARE COMPLETELY BURIED, IF SOIL SURFACE IS NOT LEVEL THE BASES SHALL BE DRIVEN IN UNTIL BASES ARE OFFSET IN 1 INCH INCREMENTS. THE BASES SHALL BE TRUE AND SQUARE WITH ONE ANOTHER TO ENSURE PROPER UNRESTRICTED INSERTION OF STEEL TUBE RISERS. SIGN PANELS SHALL BE MOUNTED LEVEL.

MULTIPLE POST SLIP BASE DETAIL

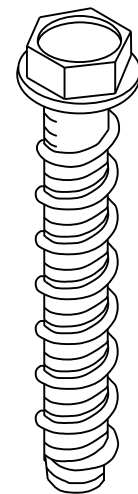


SLIP BASE  
(TYPICAL PLACEMENT IN SOIL SHOWN)



THE MINIMUM CONCRETE SURFACE REQUIRED FOR MOUNTING THE SLIP BASE IS 6 FEET BY 6 FEET.

SLIP BASE MOUNTED TO CONCRETE SURFACE DETAIL



SCREW ANCHOR BOLT

NOTES:

1. FOR SLIP BASE USE APPROVED PRODUCT FROM MNDOT APPROVED PRODUCTS LIST. PRODUCTS SHALL BE MODIFIED AS SHOWN.
2. RISER POST TO BE MOUNTED CLOSE TO PLUMB. UP TO A MAXIMUM OF 1/2" OF SHIM WASHERS MAY BE USED BETWEEN SLIP BASE AND CONCRETE FOR LEVELING.
3. 1/16" THICK LEVELING SHIMS MAY BE USED TO PLUMB TOP HALF. SHIMS NEED TO BE PLACED UNDER TEFLON COATED SLIP WASHER MAXIMUM OF 2 SHIMS PER NOTCH POINT.
4. FOR SIGN PANEL MOUNTING DETAILS SEE STANDARD PLAN 5-297.720.
5. SQUARE TUBE SIGN POST PER MNDOT SPEC. 3402.

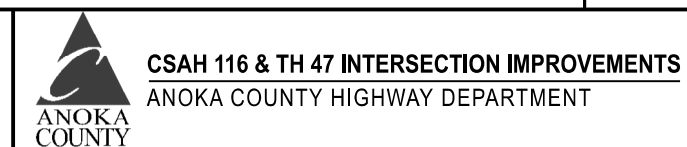
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Design By: MF  
 Plan By: MF  
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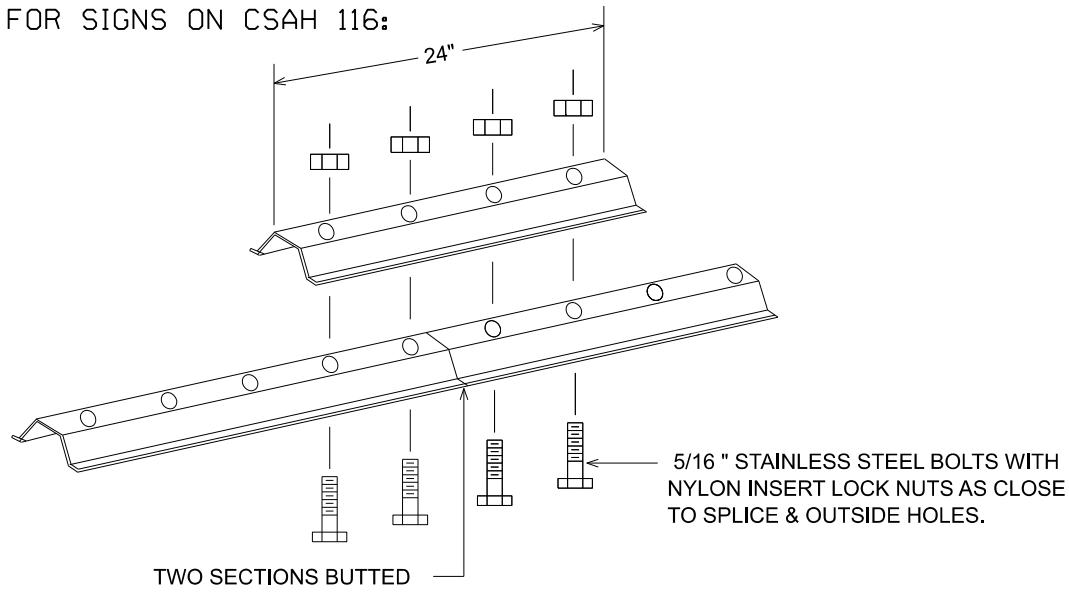


**SQUARE TUBE  
SLIP BASE**

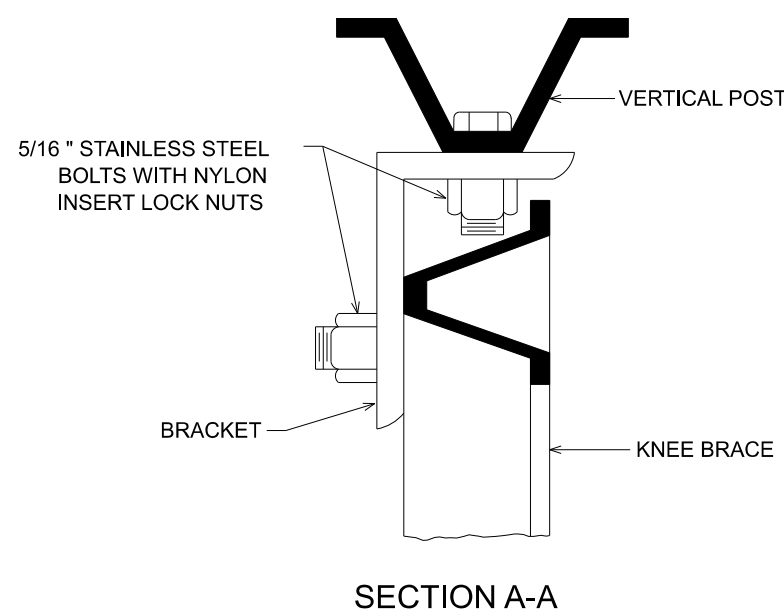
ANOKA COUNTY, MN  
 TH 47 (MNDOT) MOUNTING DETAILS  
 SIGNING PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
175  
OF  
206  
SHEETS

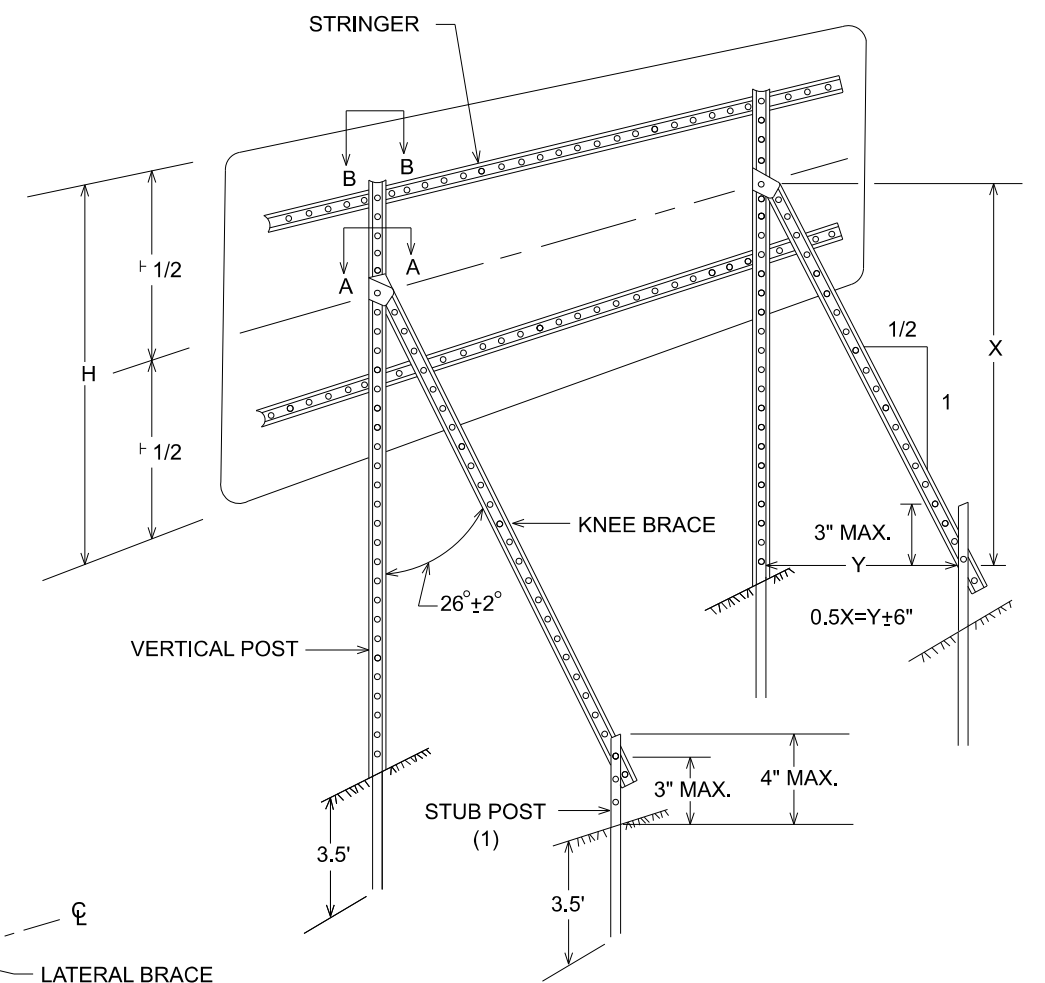
FOR SIGNS ON CSAH 116:



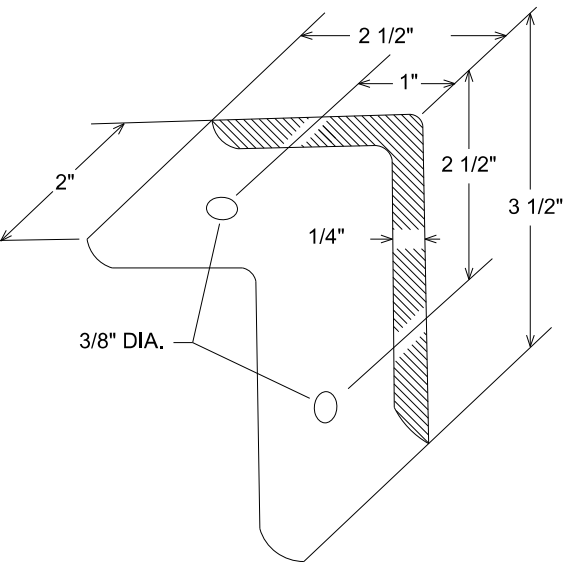
**LATERAL BRACE OR STRINGER  
SPLICE DETAIL (EXPLODED VIEW)**



**SECTION A-A**

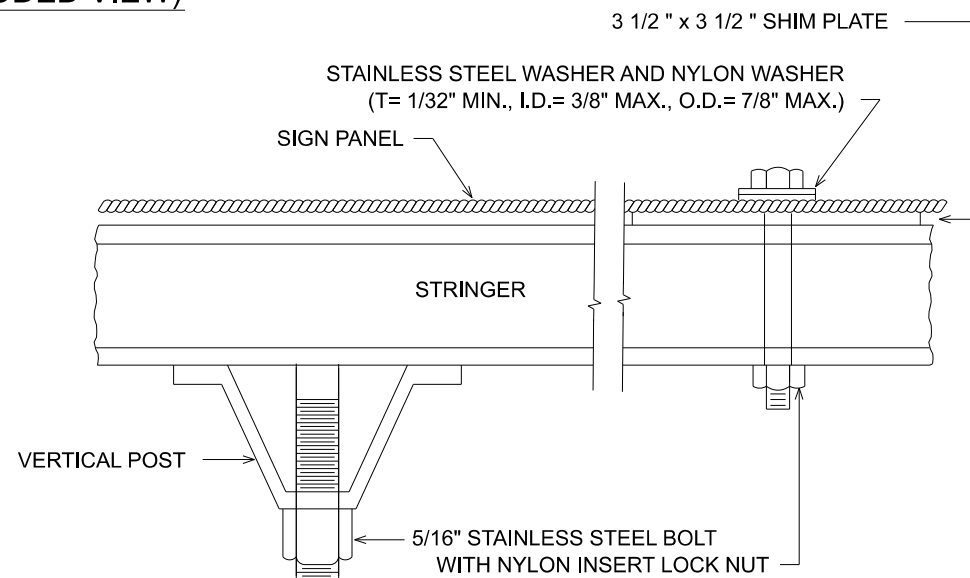


**TYPICAL "A-FRAME" INSTALLATION  
TYPE "D" SIGNS**

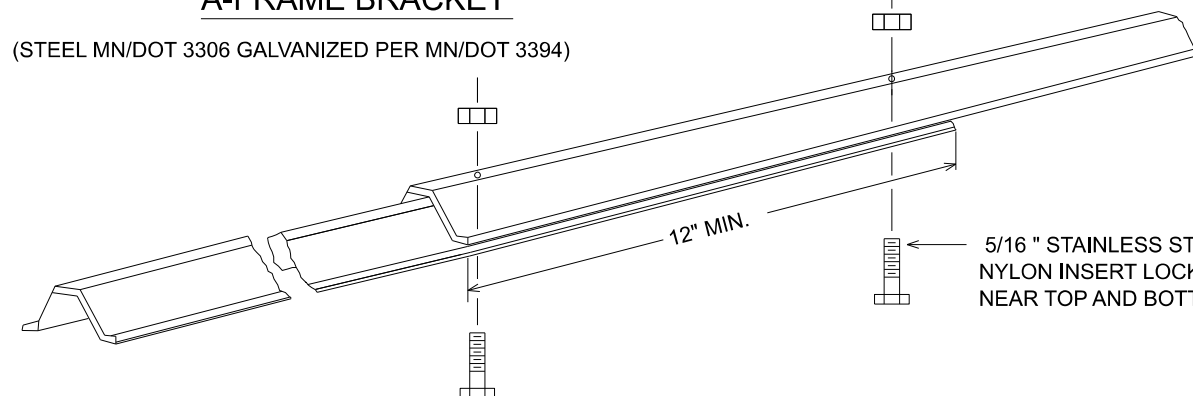


**A-FRAME BRACKET**

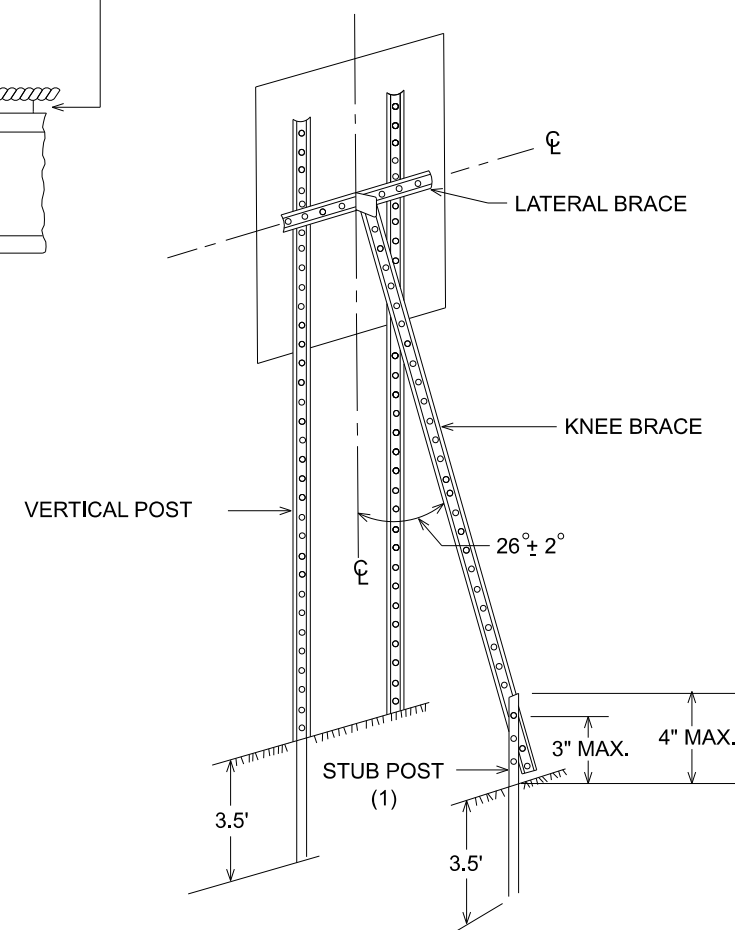
(STEEL MN/DOT 3306 GALVANIZED PER MN/DOT 3394)



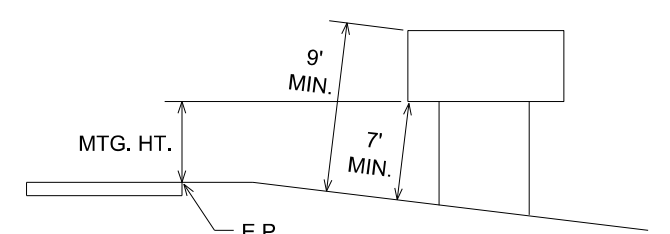
**SECTION B-B**



**KNEE BRACE SPLICE**



**TYPICAL "A-FRAME" INSTALLATION  
TYPE "C" SIGNS**



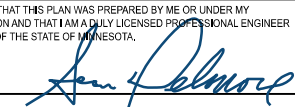
**TYPICAL MOUNTING**

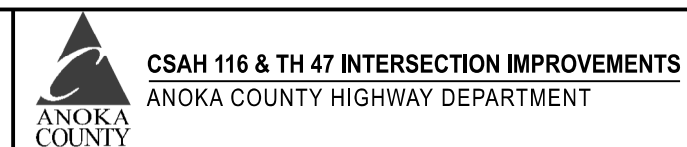
(1) OFFSET STUB POST 1' TOWARD ROADWAY  
RELATIVE TO VERTICAL POST.

**TYPE C & D SIGN  
STRUCTURAL DETAILS**

DATE: 8/25/2020 2:46:55 PM PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\4652-000\_sprdet.dgn

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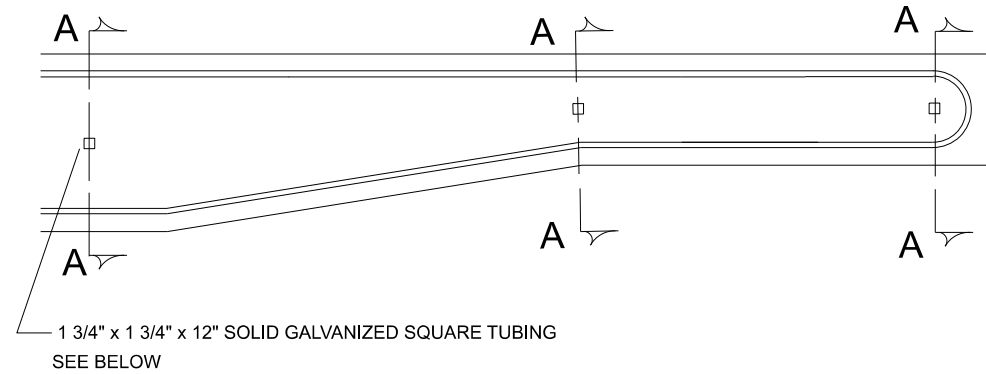
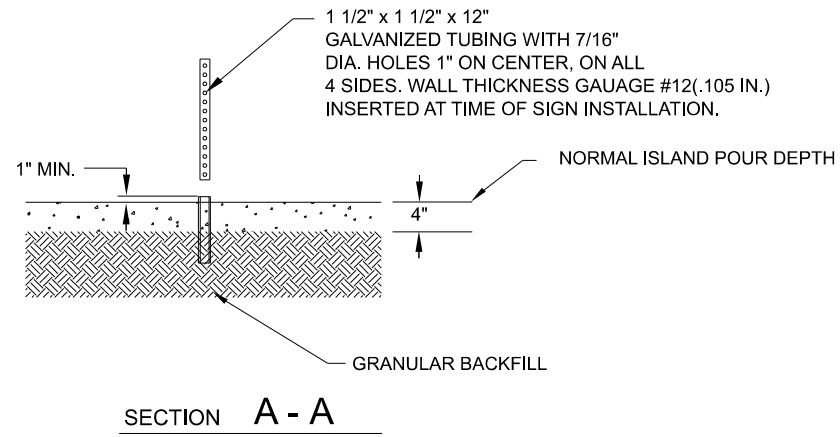
Design By:	MF	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY:
Plan By:	MF	
Checked By:	ES	
Approved By:	SD	
DATE:	8/25/2020	



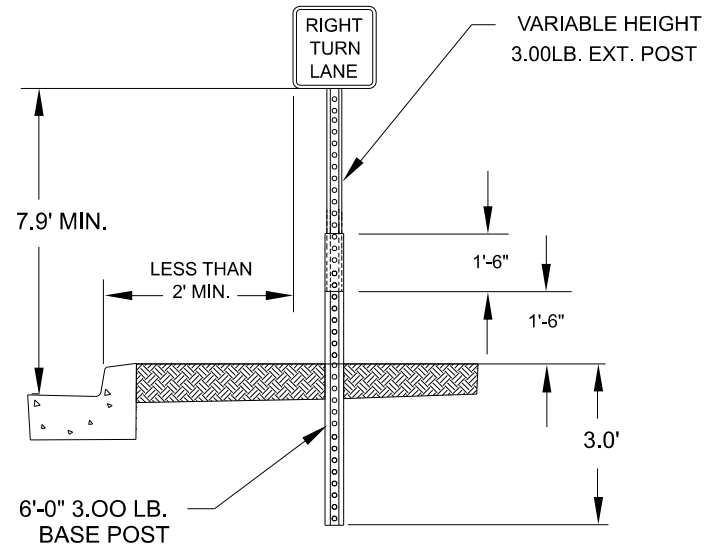
ANOKA COUNTY, MN	SHEET 176 OF 206 SHEETS
CSAH 116 (ACHD) MOUNTING DETAILS SIGNING PLAN	
S.P. 0206-78 (TH 47), S.A.P. 002-716-020	



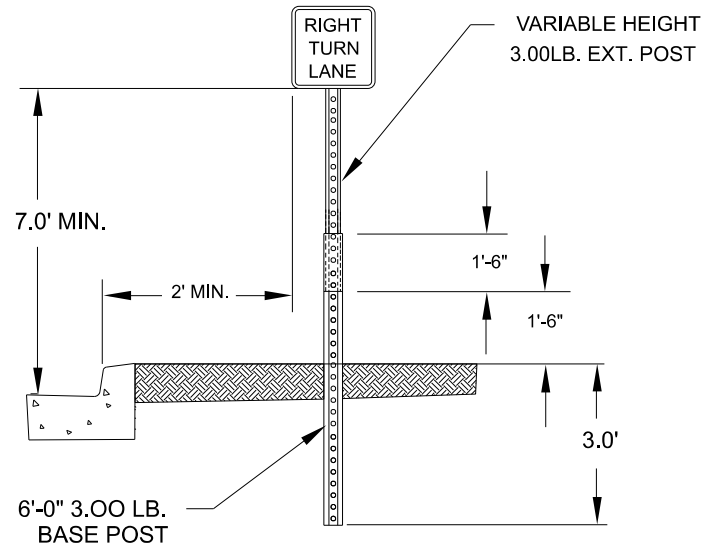
FOR SIGNS ON CSAH 116:



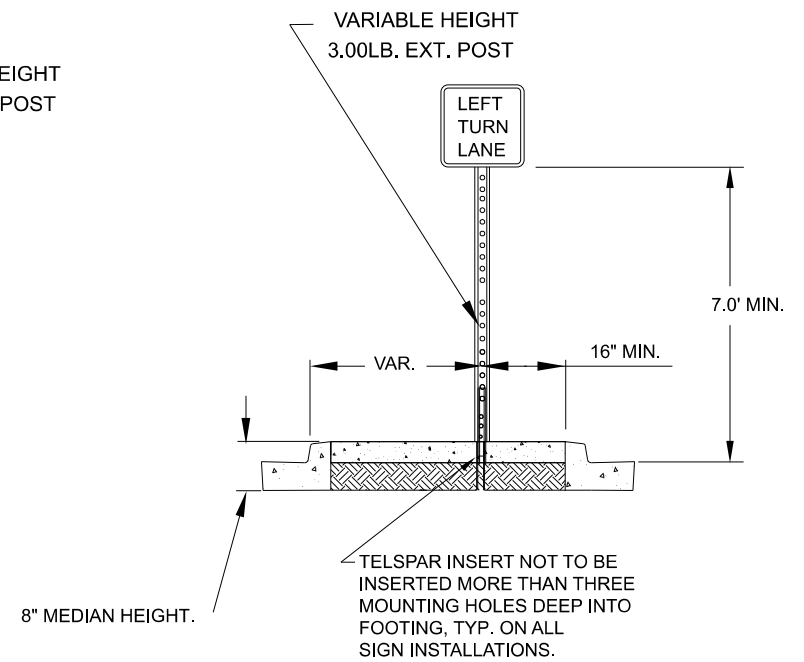
GROUND POST MOUNT SIGN  
INSTALLATION TYPICAL  
FOR AREAS LESS THAN THE 2' MIN



GROUND POST MOUNT SIGN  
INSTALLATION TYPICAL



ISLAND MOUNT BREAK-AWAY SIGN  
INSTALLATION TYPICAL



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DATE: 8/25/2020 LICENSE NO. 40945

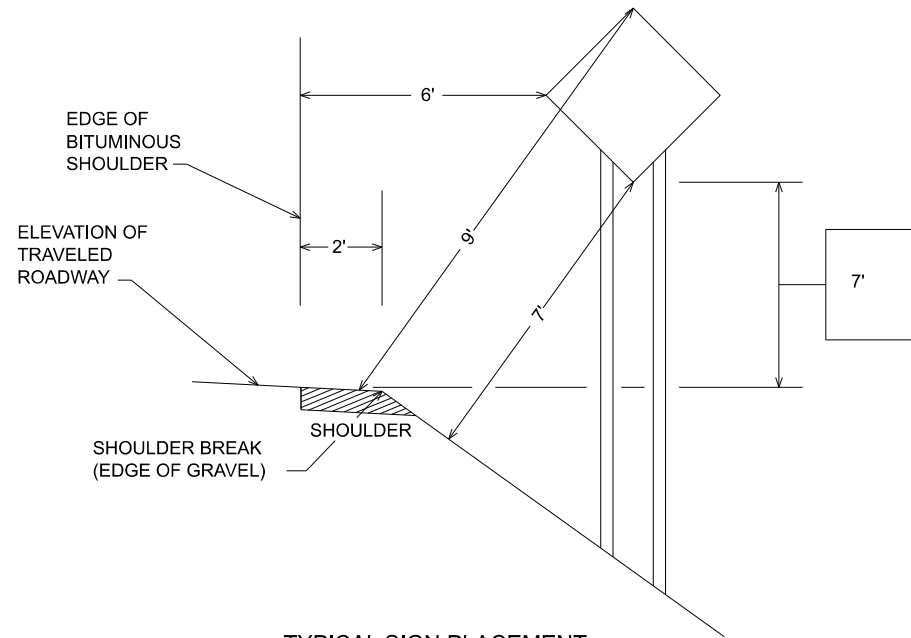


ANOKA COUNTY, MN  
CSAH 116 (ACHD) MOUNTING DETAILS  
SIGNING PLAN  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
177  
OF  
206  
SHEETS

FOR SIGNS ON CSAH 116:

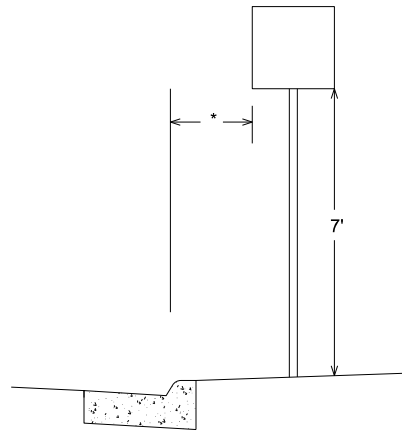
RURAL



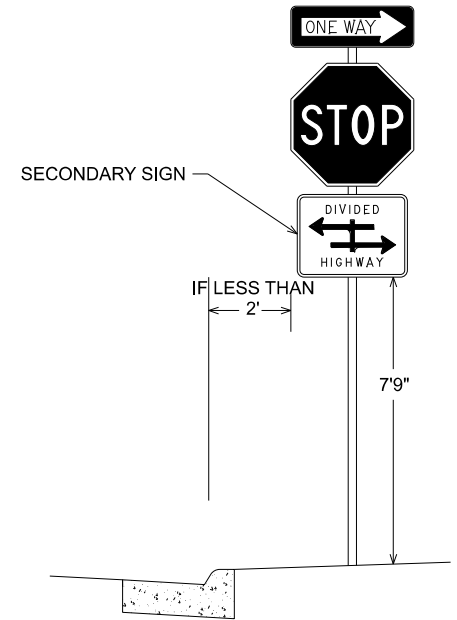
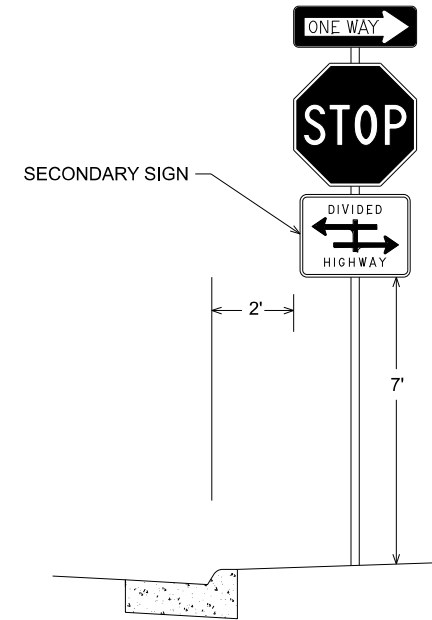
TYPICAL SIGN PLACEMENT

URBAN

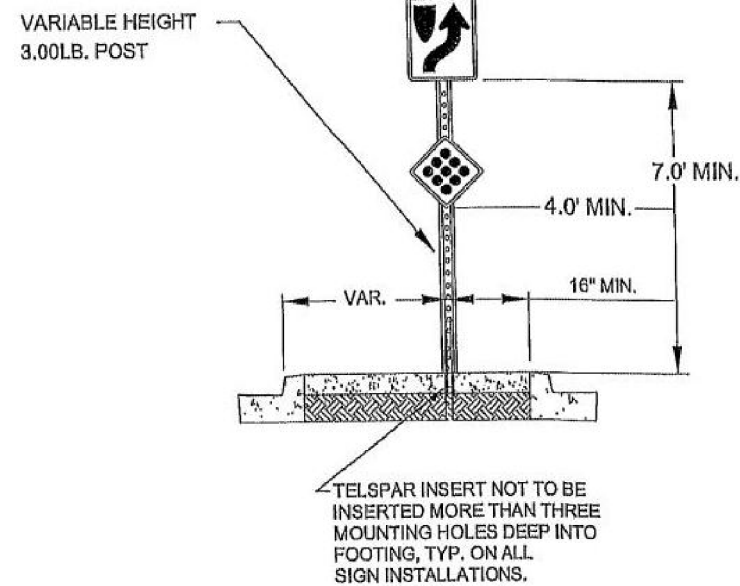
- 2' - NARROW BOULEVARD (< 8' WIDE)
- 6' - WIDE BOULEVARD



TYPICAL SIGN PLACEMENT



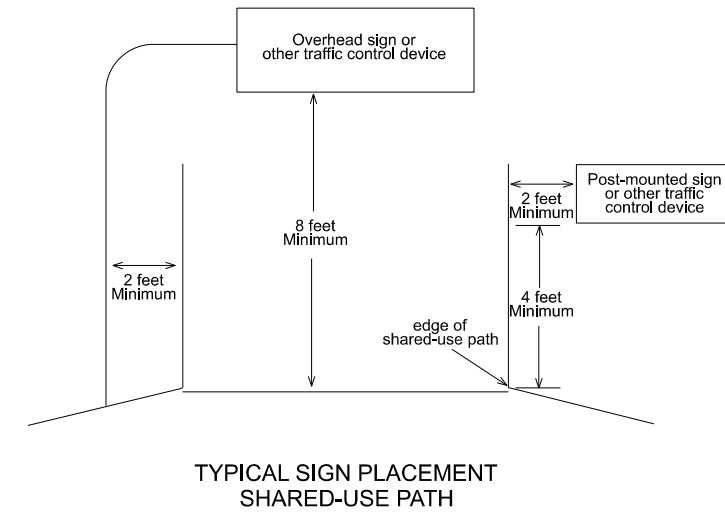
ISLAND MOUNT BREAK-AWAY SIGN  
SIGN INSTALLATION TYPICAL  
KEEP RIGHT/CLUSTER



TELSPAR INSERT NOT TO BE INSERTED MORE THAN THREE MOUNTING HOLES DEEP INTO FOOTING, TYP. ON ALL SIGN INSTALLATIONS.

NOTE:

- ALL DIMENSIONS ARE MINIMUMS
- MAINTAIN 2' CLEAR FROM SIGNS TO BITUMINOUS TRAIL



TYPICAL SIGN PLACEMENT  
SHARED-USE PATH

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 Checked By: ES  
 Approved By: SD

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CERTIFIED BY: *Sam Palmer*  
 DATE: 8/25/2020 LICENSE NO. 40945



ANOKA COUNTY, MN  
 CSAH 116 (ACHD) MOUNTING DETAILS  
 SIGNING PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 178 OF 206 SHEETS

## PERMANENT PAVEMENT MARKING PLAN NOTES AND GUIDELINES

### GENERAL INFORMATION:

THE ENGINEER'S INVOLVEMENT IN THE APPLICATION OF THE MATERIAL SHALL BE LIMITED TO FIELD CONSULTATION AND INSPECTION. ANOKA COUNTY HIGHWAY DEPARTMENT 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 A 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 ONE-HALF FOOT 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.

### MULTI COMPONENT (MULTI COMP):

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. NEW PORTLAND CEMENT CONCRETE SURFACES SHALL BE SANDBLAST CLEANED TO REMOVE ANY SURFACE TREATMENT AND/OR LAITANCE ON LOW SPEED (SPEED LIMIT 35 MPH OR LESS) URBAN PORTLAND CEMENT CONCRETE ROADWAYS. SANDBLAST CLEANING SHALL BE USED FOR ALL MULTI COMP PAVEMENT MARKINGS.

THE MULTI COMP MARKING APPLICATION SHALL IMMEDIATELY FOLLOW THE PAVEMENT CLEANING. GLASS BEADS SHALL BE APPLIED IMMEDIATELY AFTER APPLICATION OF THE MULTI COMP LINE TO PROVIDE AN IMMEDIATE NO-TRACK SYSTEM.

A MULTI COMP LINE SHALL BE APPLIED WITH A MINIMUM THICKNESS OF 20 MILS (WET) AND 4" WIDE. GLASS BEADS SHALL BE APPLIED AT A MINIMUM RATE OF 25LBS POUNDS PER GALLON RATE SUFFICIENT TO ACHIEVE AN ACCEPTABLE NO-TRACK SYSTEM.

OPERATIONS SHALL BE CONDUCTED ONLY WHEN THE ROAD PAVEMENT SURFACE TEMPERATURES ARE 50 DEGREES FAHRENHEIT OR GREATER.

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

### PREFORMED THERMOPLASTIC:

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.

### PAINT:

AT THE TIME OF APPLYING THE MARKING MATERIAL, THE APPLICATION AREA SHALL BE FREE OF CONTAMINATION. THE CONTRACTOR SHALL CLEAN THE ROADWAY SURFACE PRIOR TO THE LINE APPLICATION IN A MANNER AND TO THE EXTENT REQUIRED BY THE ENGINEER.

GLASS BEADS SHALL BE APPLIED IMMEDIATELY AFTER APPLICATION OF THE PAINT LINE.

EXCEPT WHEN USED AS A TEMPORARY MARKING, PAVEMENT MARKINGS SHALL ONLY BE APPLIED IN SEASONABLE WEATHER WHEN AIR TEMPERATURE IS 50 DEGREES FAHRENHEIT OR HIGHER AND SHALL NOT BE APPLIED WHEN THE WIND OR OTHER CONDITIONS CAUSE A FILD OR DUST TO BE DEPOSITED ON THE PAVEMENT SURFACE AFTER CLEANING AND BEFORE THE MARKING MATERIAL CAN BE APPLIED.

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.

### PAVEMENT MARKING TABULATION

LOCATION	MULTI-COMPONENT GROUND-IN (WR)								PREF THERMO GR IN			J			
	4" SOLID LINE		4" DOTTED LINE (3)		4" DOUBLE SOLID LINE		8" SOLID LINE		24" SOLID LINE		4" DOTTED LINE (2)		PAVEMENT MESSAGE	CROSSWALK ENHANCED SKID RESISTANCE	
	WHITE	YELLOW	WHITE	YELLOW	WHITE	WHITE	YELLOW	WHITE	LEFT ARROW	RIGHT ARROW	SQ FT				SQ FT
	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	SQ FT	SQ FT					
LOCAL FUNDS															
TH 47															
STA 396+28.24 TO STA 404+00	2448	448	101	917	237	71	182		47	47					
STA 404+00 TO STA 408+00	1369	557						72	62	31			672		
STA 408+00 TO STA 417+07.84	4212	1999							62	109					
LOCAL SUBTOTAL	8029	3004	101	917	237	71	182	72	171	187			672		
PROJECT SUBTOTAL	8029	3004	101	917	237	71	182	72	171	187			672		
PROJECT TOTAL	11033		101	917	237		253	72	358				672		

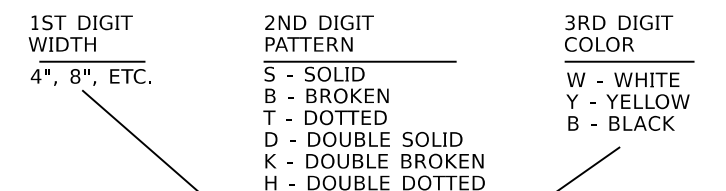
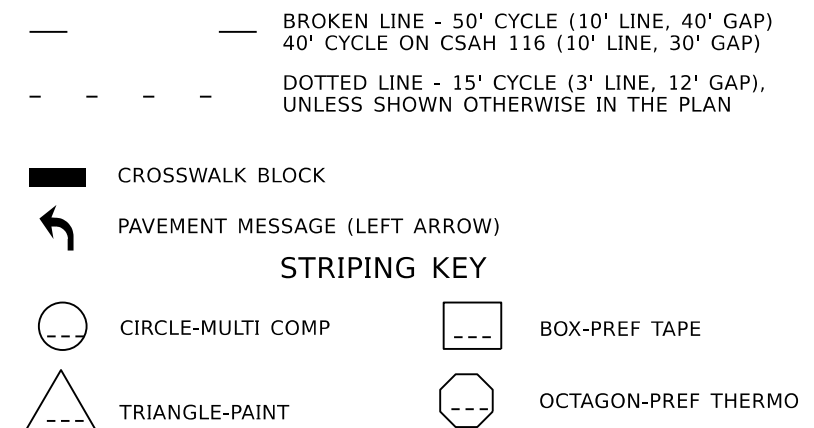
### PAVEMENT MARKING TABULATION

LOCATION	MULTI-COMPONENT						PAVEMENT MESSAGE		CROSSWALK
	4" SOLID LINE		24" SOLID LINE		4" BROKEN LINE (1)		4" DOUBLE SOLID LINE		
	WHITE	YELLOW	WHITE	YELLOW	WHITE	YELLOW	LEFT ARROW	RIGHT ARROW	
	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	SQ FT	SQ FT	
S.A.P. 002-716-020									
CSAH 116									
STA 94+04.72 TO STA 100+00	1517	1052	59		1014		31	31	408
STA 100+00 TO STA 111+84.56	3679	321	54	92	2416	1485	31	62	360
S.A.P. 002-716-020 SUBTOTAL	5196	1373	113	92	3430	1485	62	93	768
PROJECT SUBTOTAL	5196	1373	113	92	3430	1485	62	93	768
PROJECT TOTAL	6569		205	92	3430	1485	155		768

#### NOTES:

- (1) 10' LINE, 40' GAP
- (2) 2' LINE, 6' GAP
- (3) 3' LINE, 12' GAP

### PAVEMENT MARKING SYMBOLS AND MATERIALS LEGEND



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

EXAMPLE: 45W = 4" SOLID LINE WHITE PREF THERMO  
GCW = GROUND IN, CONTRAST, WET REFLECTIVE

DATE: 8/25/2020 2:17:00 PM PATH & FILENAME: Projects\Minnesota\04652-000\Cad\Plan\4652-000\_000.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MF  
Plan By: MF  
Checked By: ES  
Approved By: SD

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

CERTIFIED BY: *Sam Palmer*  
DATE: 8/25/2020 LICENSE NO. 40945



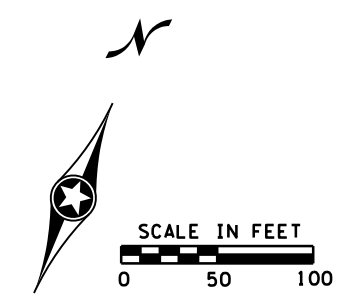
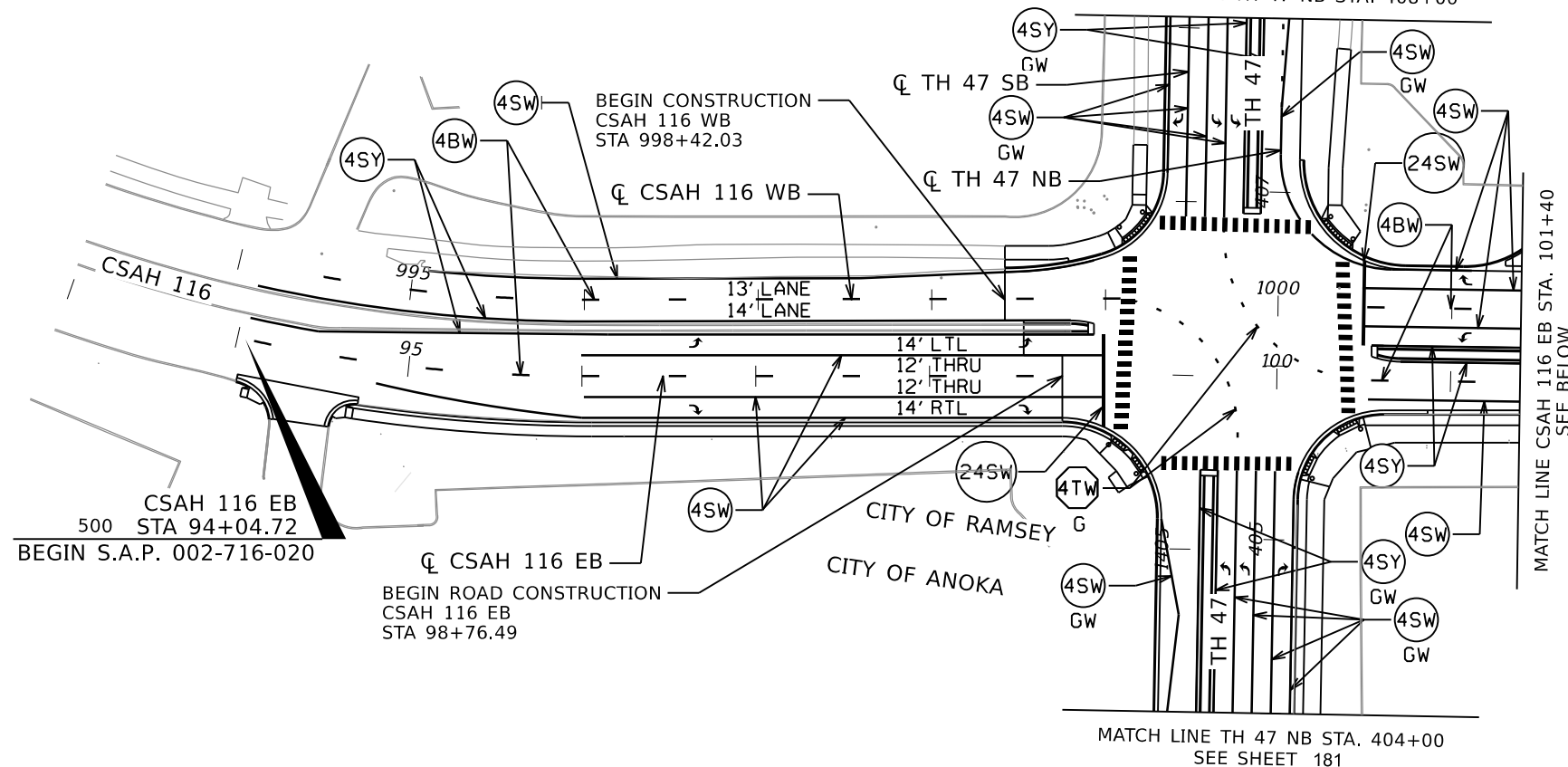
**ANOKA COUNTY**  
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
NOTES / TABULATION  
PAVEMENT MARKING PLAN  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

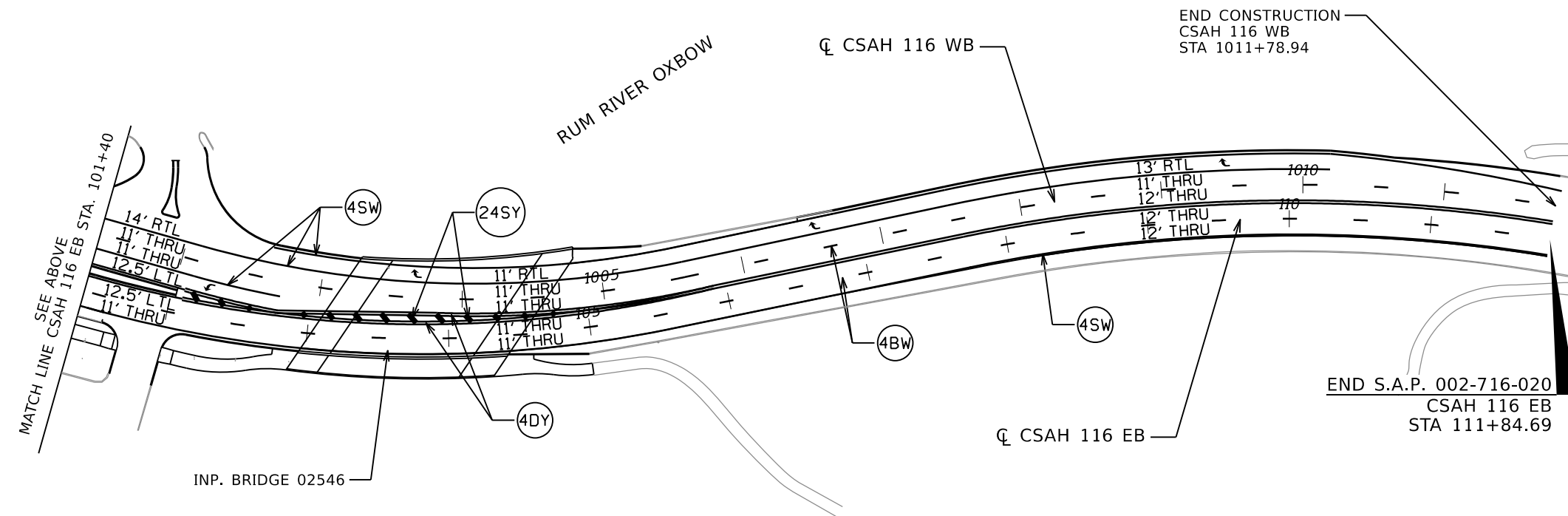
SHEET  
179  
OF  
206  
SHEETS

# CSAH 116 (BUNKER LAKE BLVD)

SEE SHEET 181  
MATCH LINE TH 47 NB STA. 408+00



# CSAH 116 (BUNKER LAKE BLVD)



### STRIPING KEY

- CIRCLE - MULTI COMP
- OCTAGON - PREF THERMO
- CROSSWALK - PREF THERMO GR IN (TH 47) - MULTI COMP (CSAH 116)
- ARROWS - PREF THERMO GR IN (TH 47) - MULTI COMP (CSAH 116)

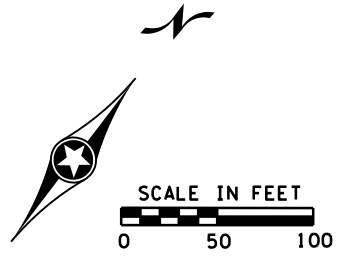
1ST DIGIT WIDTH 4", 8", ETC.	MULTI COMP 3RD DIGIT COLOR W = WHITE Y = YELLOW B = BLACK
2ND DIGIT PATTERN S = SOLID B = BROKEN D = DOUBLE T = DOTTED	

G = GROUND IN  
W = WET REFLECTIVE

EXAMPLE: = 4" SOLID LINE WHITE - MULTI COMP  
GW - GROUND IN, WET REFLECTIVE

### GENERAL NOTES

- CAT TRACKS MUST BE INSTALLED SO THE OPPOSING LEFT TURN PATHS NO NOT CONFLICT. VERIFY PLACEMENT WITH MNDOT.
- ALL DIMENSIONS ARE TO FACE OF CURB OR EDGE OF BITUMINOUS UNLESS OTHERWISE NOTED.



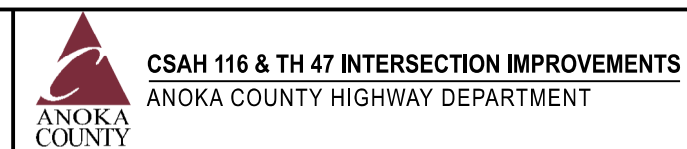
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NO.	DATE	BY	CHK	REVISIONS

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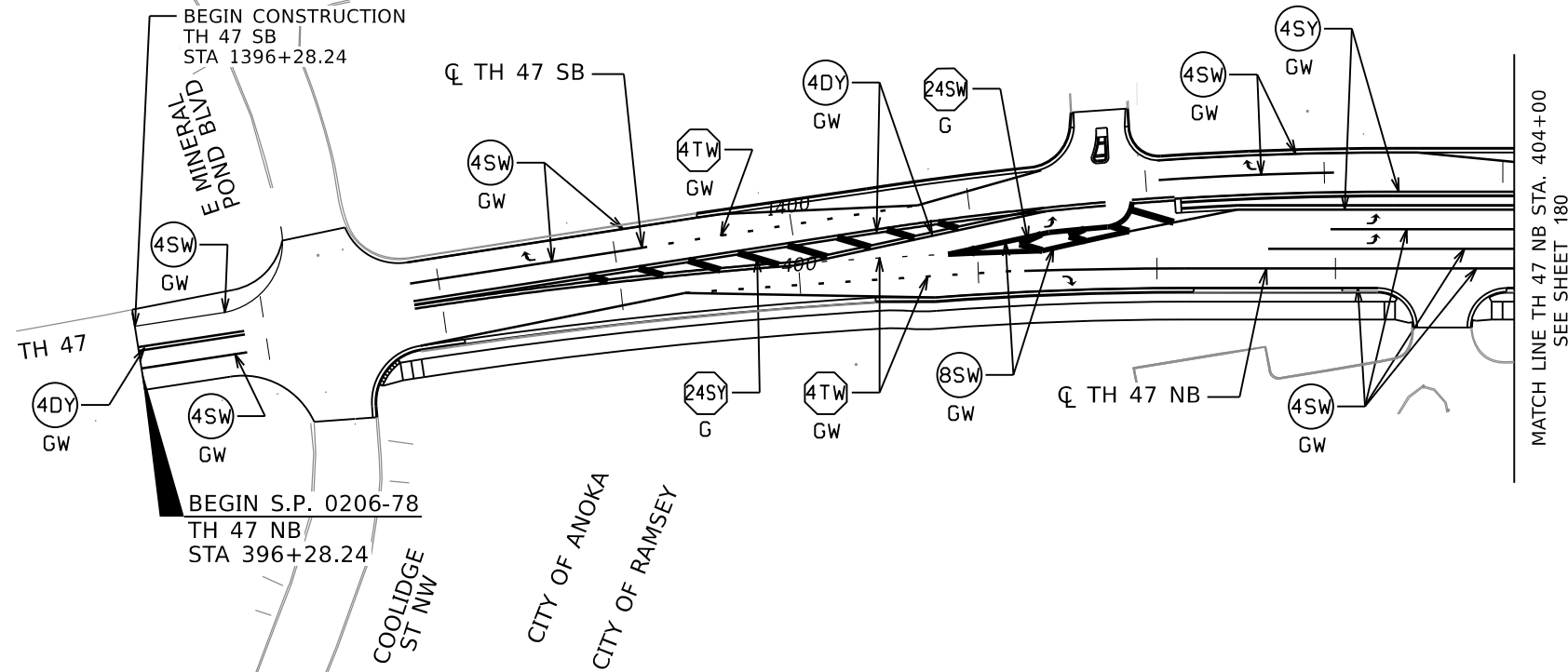
CERTIFIED BY: *Sam Palmer*  
 DATE: 8/25/2020 LICENSE NO. 40945



ANOKA COUNTY, MN  
 CSAH 116  
 PAVEMENT MARKING PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
180  
OF  
206  
SHEETS

# TRUNK HIGHWAY 47



**STRIPING KEY**

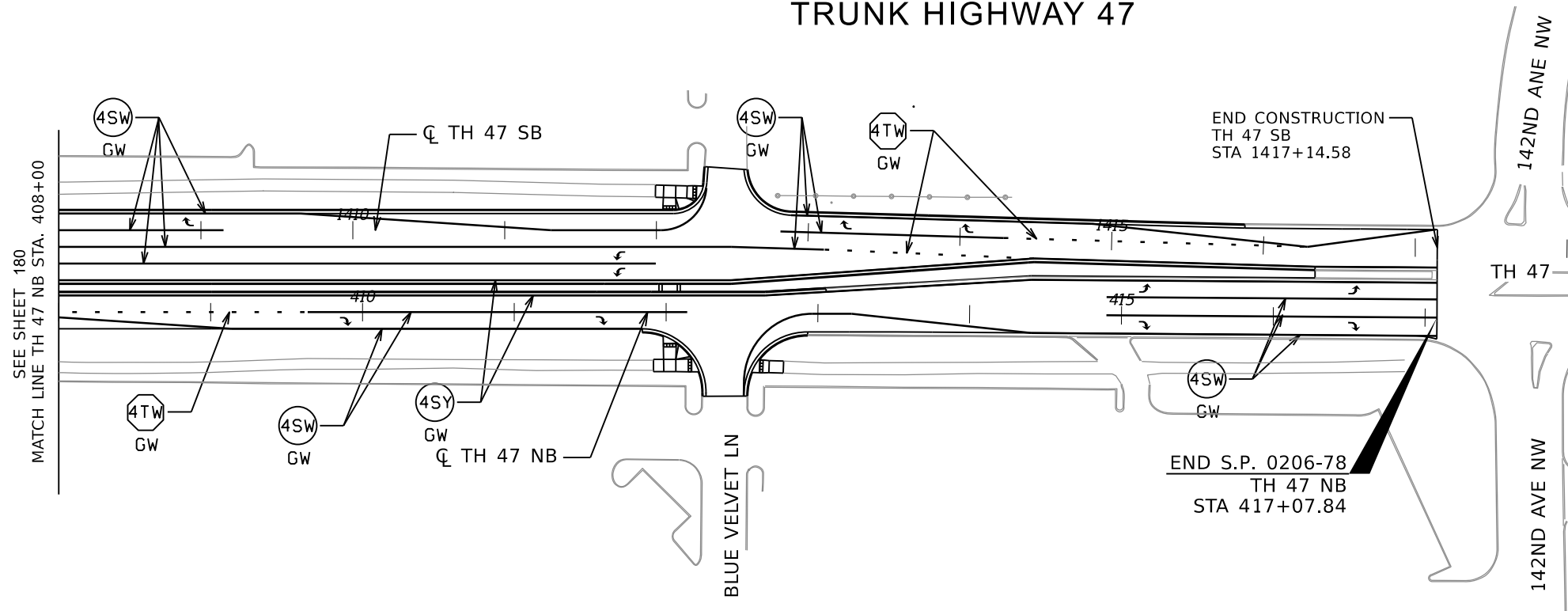
- CIRCLE - MULTI COMP
- OCTAGON - PREF THERMO
- CROSSWALK - PREF THERMO GR IN (TH 47) - MULTI COMP (CSAH 116)
- ARROWS - PREF THERMO GR IN (TH 47) - MULTI COMP (CSAH 116)

**EXAMPLE:** = 4" SOLID LINE WHITE - MULTI COMP  
 - GROUND IN, WET REFLECTIVE

**GENERAL NOTES**

- CAT TRACKS MUST BE INSTALLED SO THE OPPOSING LEFT TURN PATHS DO NOT CONFLICT. VERIFY PLACEMENT WITH MNDOT.
- ALL DIMENSIONS ARE TO FACE OF CURB OR EDGE OF BITUMINOUS UNLESS OTHERWISE NOTED.

# TRUNK HIGHWAY 47



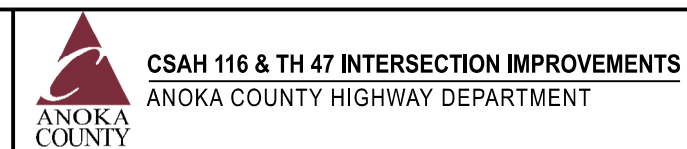
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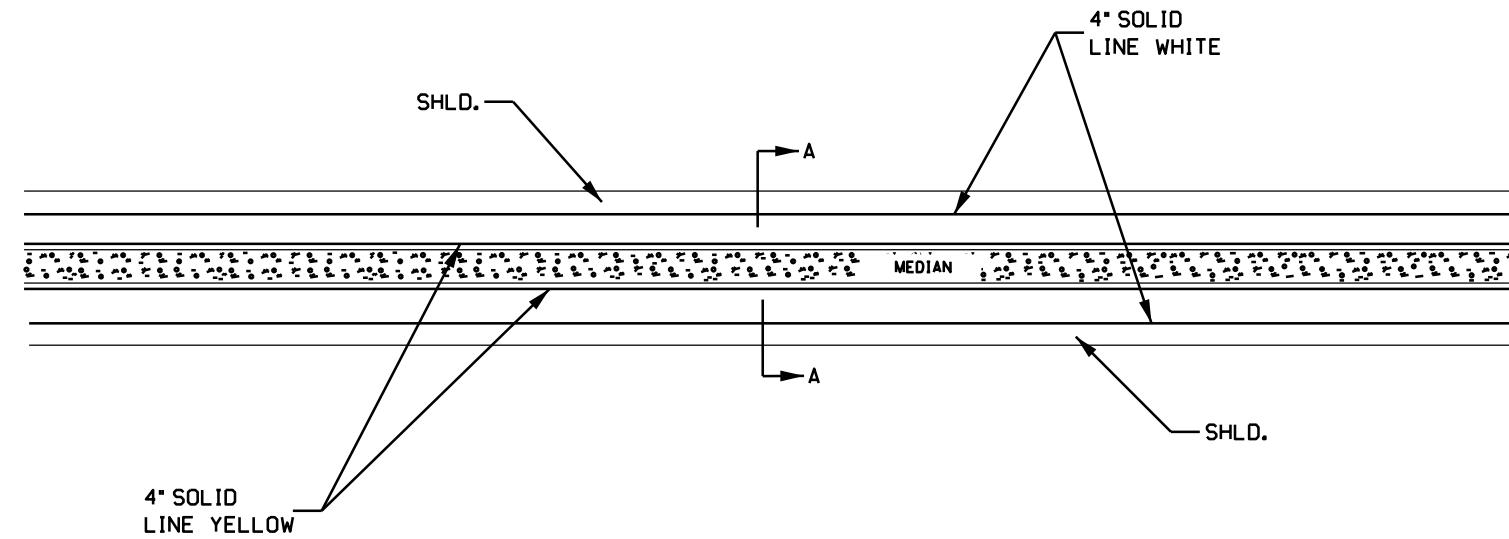
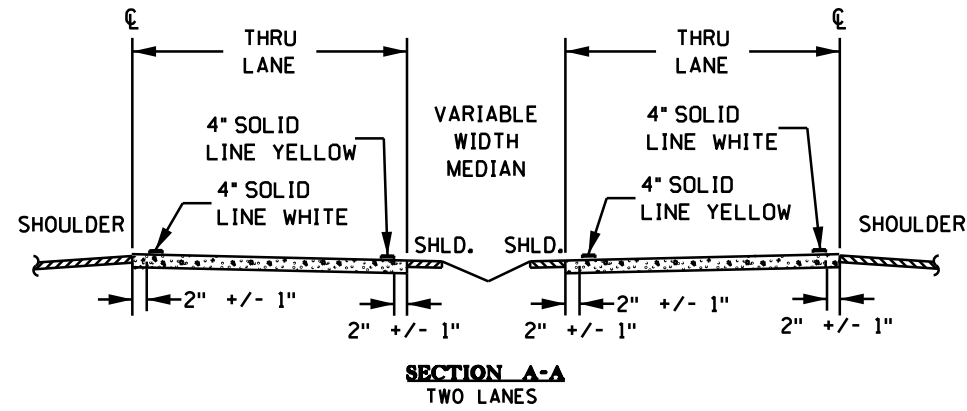
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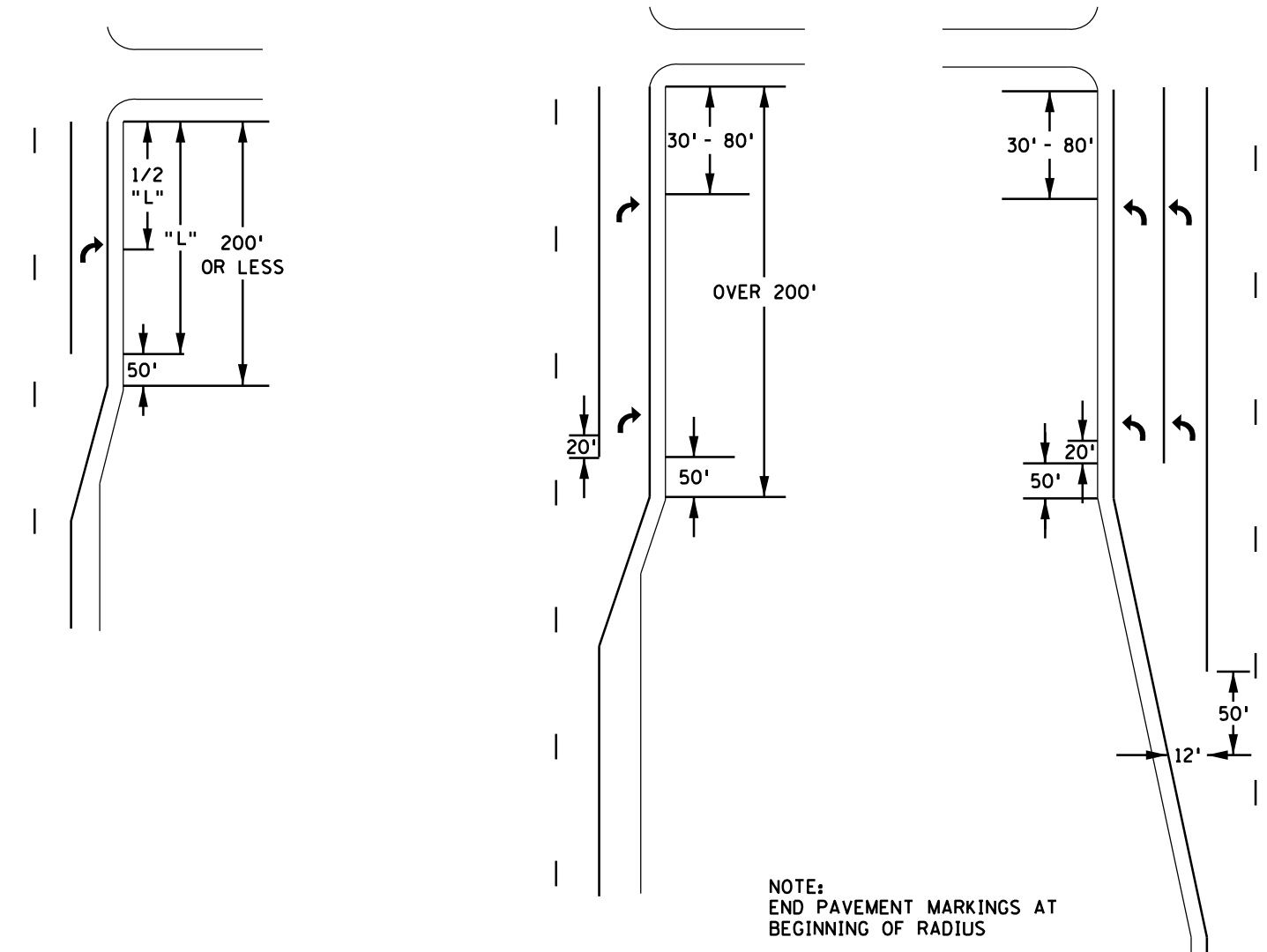
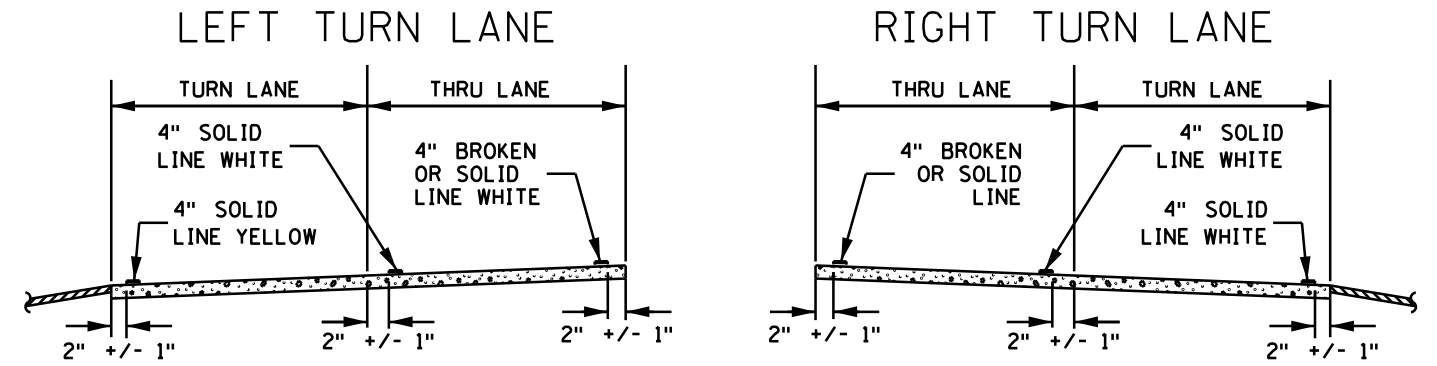
ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
 PAVEMENT MARKING PLAN  
 S.P. 0206-78 (TH 47)

SHEET  
 181  
 OF  
 206  
 SHEETS

FOR PAVEMENT MARKINGS ON TH 47:  
TWO-LANE DIVIDED



FOR PAVEMENT MARKINGS ON TH 47:  
TURN LANE WITH ARROW MESSAGE



DATE: 8/25/2020 2:18:46 PM PATH & FILENAME: Projects\Minnesota\014652-000\Cad\Plan\4652-000\_lane.dgn

PUBLISHED BY OTE: 20 NOV 2015 MODIFIED: 01 JUN 2020

PUBLISHED BY OTE: 6 APR 2018

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CERTIFIED BY: *Sam Palmrose*  
DATE: 8/25/2020 LICENSE NO. 40945



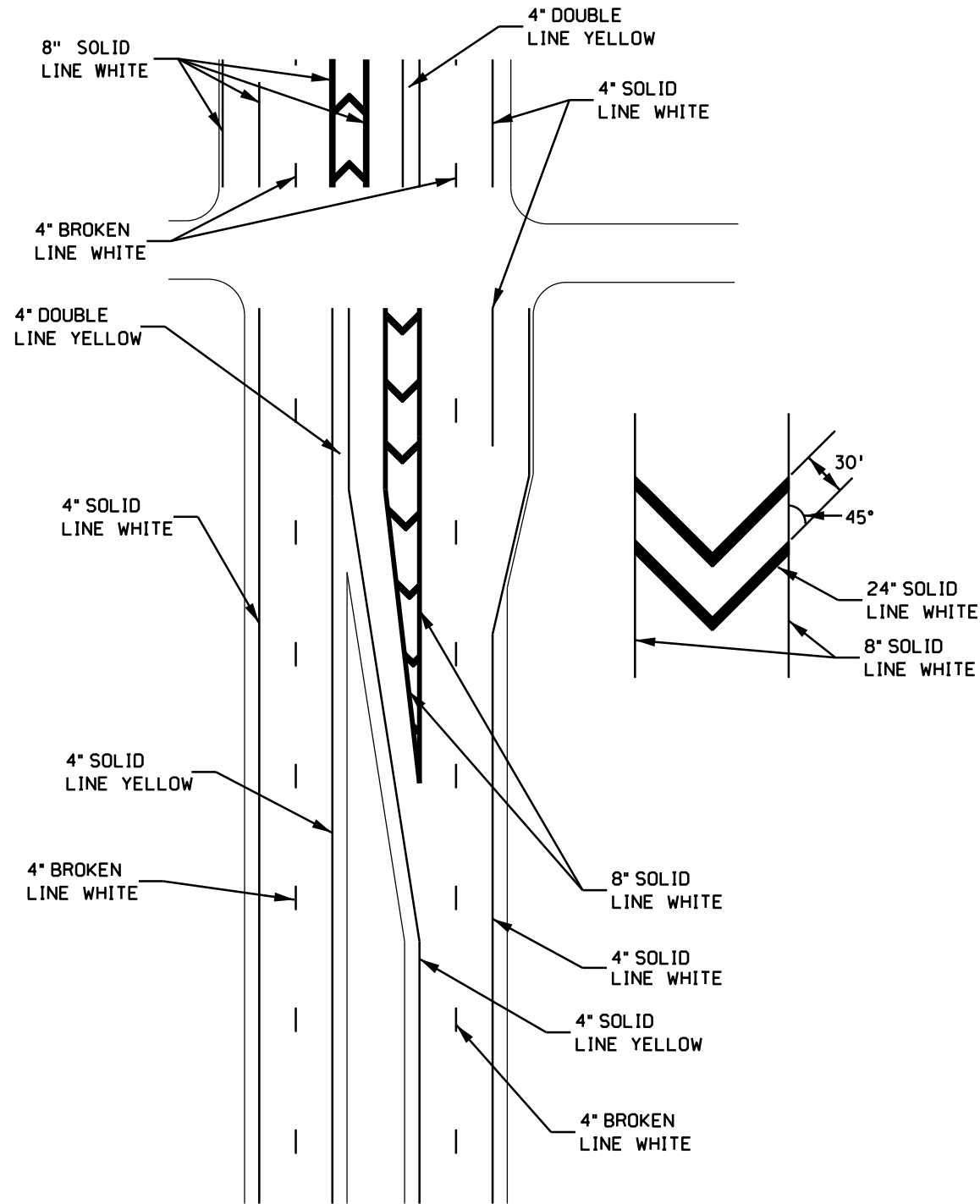
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
TH 47 (MNDOT) DETAILS  
PAVEMENT MARKING PLAN  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
182  
OF  
206  
SHEETS

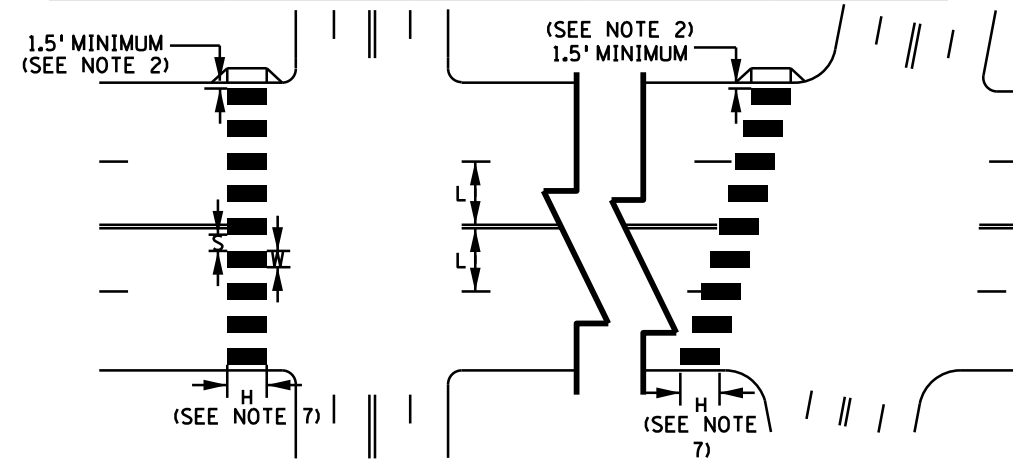
FOR PAVEMENT MARKINGS ON TH 47:  
CHANNELIZED LEFT TURN LANE

NOTE:  
END PAVEMENT MARKINGS AT BEGINNING OF RADIUS



FOR PAVEMENT MARKINGS ON TH 47:  
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 OTE: 20 NOV 2015

PUBLISHED BY OTE: 14 OCT 2016

DATE: 8/25/2020 2:48:47 PM  
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Approved By: SD

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CERTIFIED BY: *Sam Palmer*  
DATE: 8/25/2020 LICENSE NO. 40945



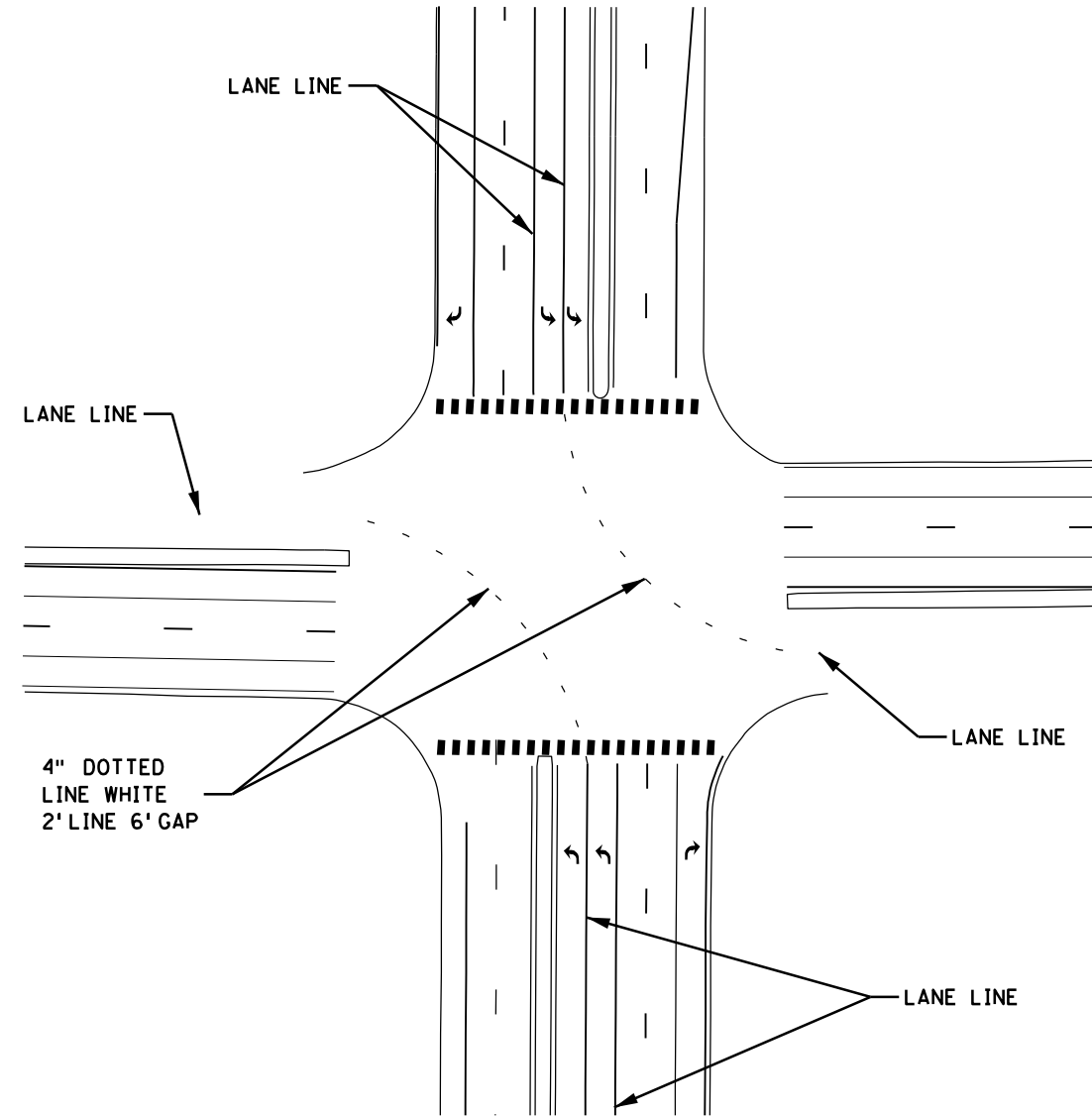
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
TH 47 (MNDOT) DETAILS  
PAVEMENT MARKING PLAN  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
183  
OF  
206  
SHEETS

FOR PAVEMENT MARKINGS ON TH 47:

### DOUBLE LEFT TURN LANE LINE EXTENSIONS THRU INTERSECTIONS



**NOTE:**  
CAT TRACKS MUST BE INSTALLED  
SO THE OPPOSING LEFT TURN  
PATHS DO NOT CONFLICT. VERIFY  
LOCATIONS WITH MNDOT.

PUBLISHED BY OTE: 27 MAR 2020

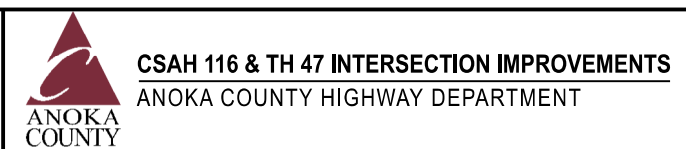
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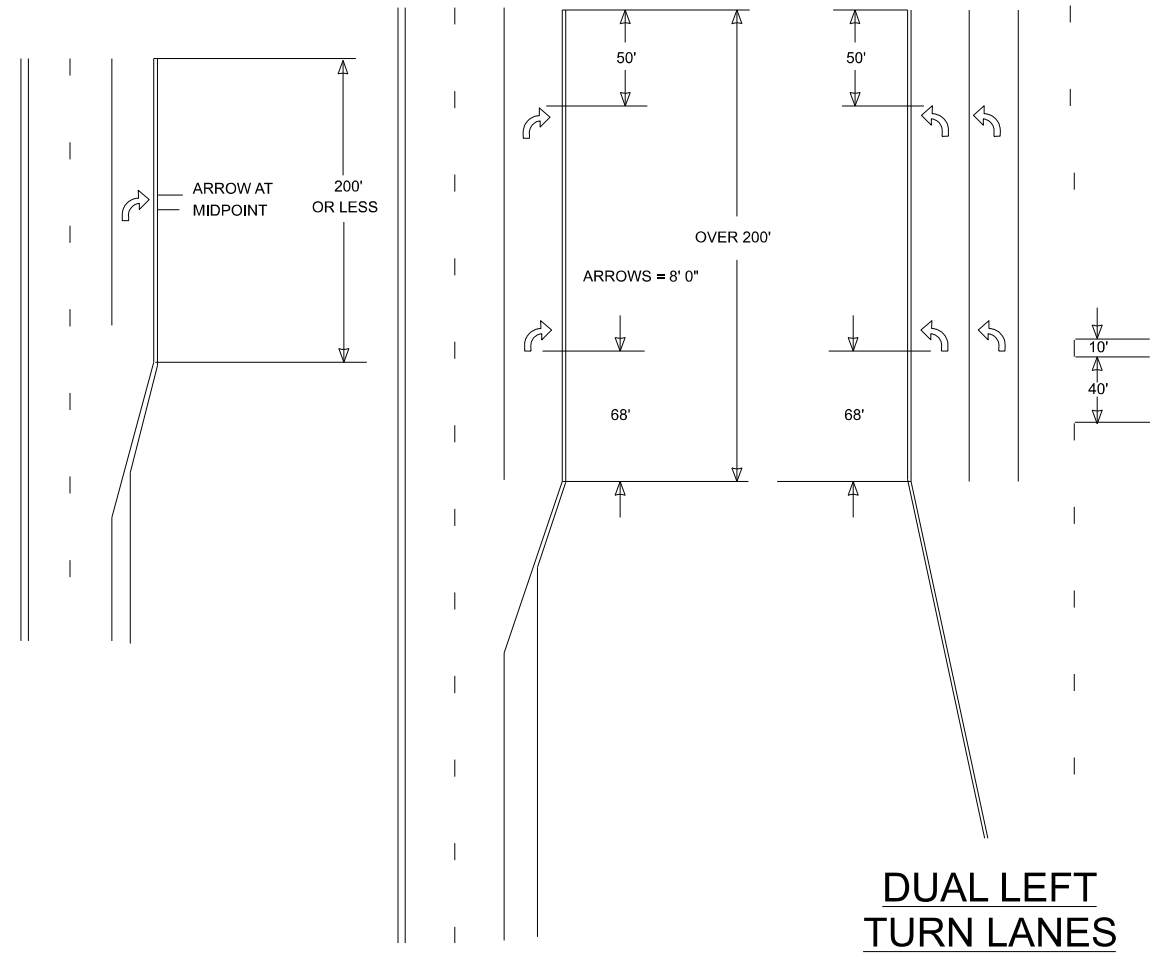
ANOKA COUNTY, MN  
TH 47 (MNDOT) DETAILS  
PAVEMENT MARKING PLAN  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
184  
OF  
206  
SHEETS

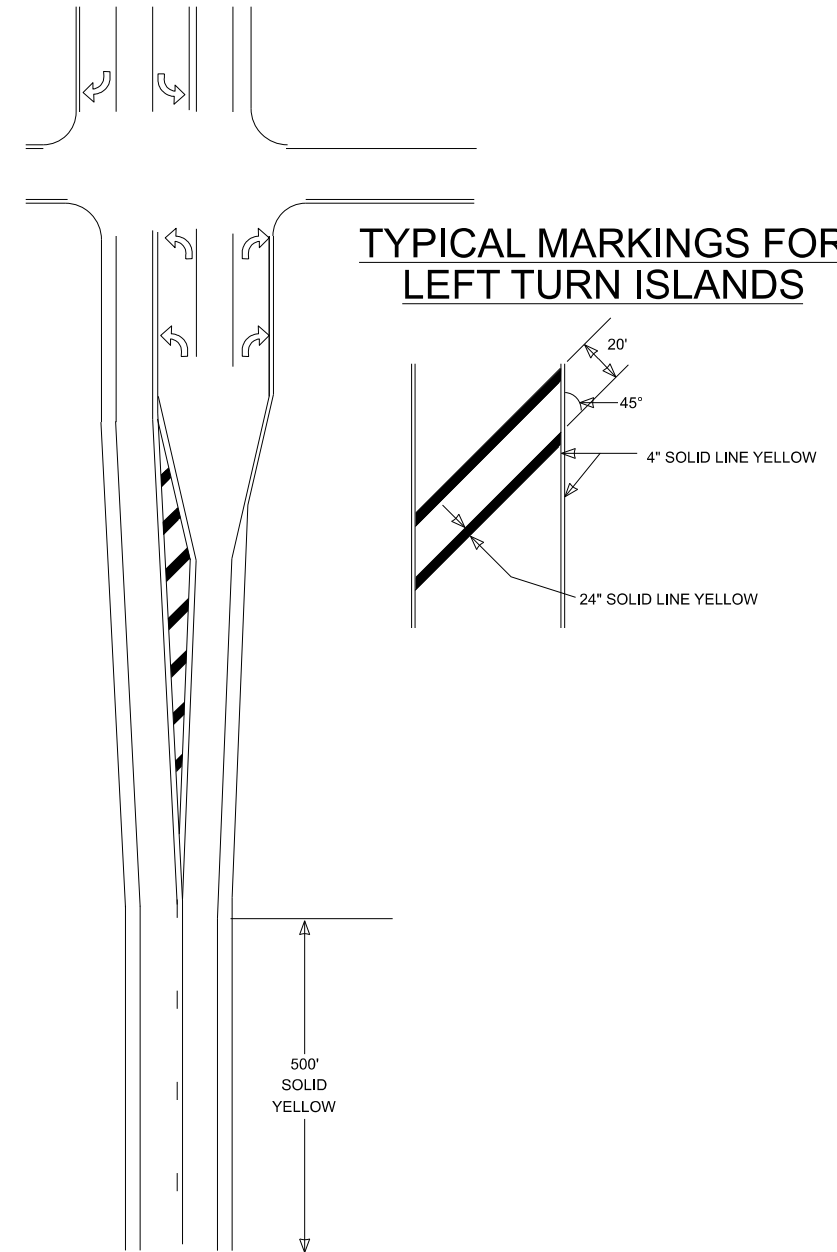


FOR PAVEMENT MARKINGS ON CSAH 116:

**TYPICAL MESSAGE PLACEMENT FOR TURN LANES**



**TYPICAL MARKINGS FOR LEFT TURN ISLANDS**



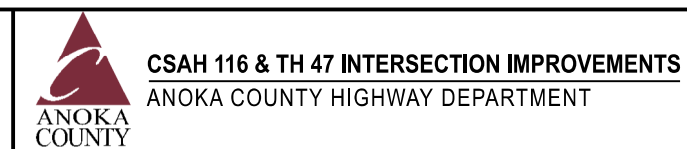
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NO.	DATE	BY	CHK	REVISIONS

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Checked By: ES  
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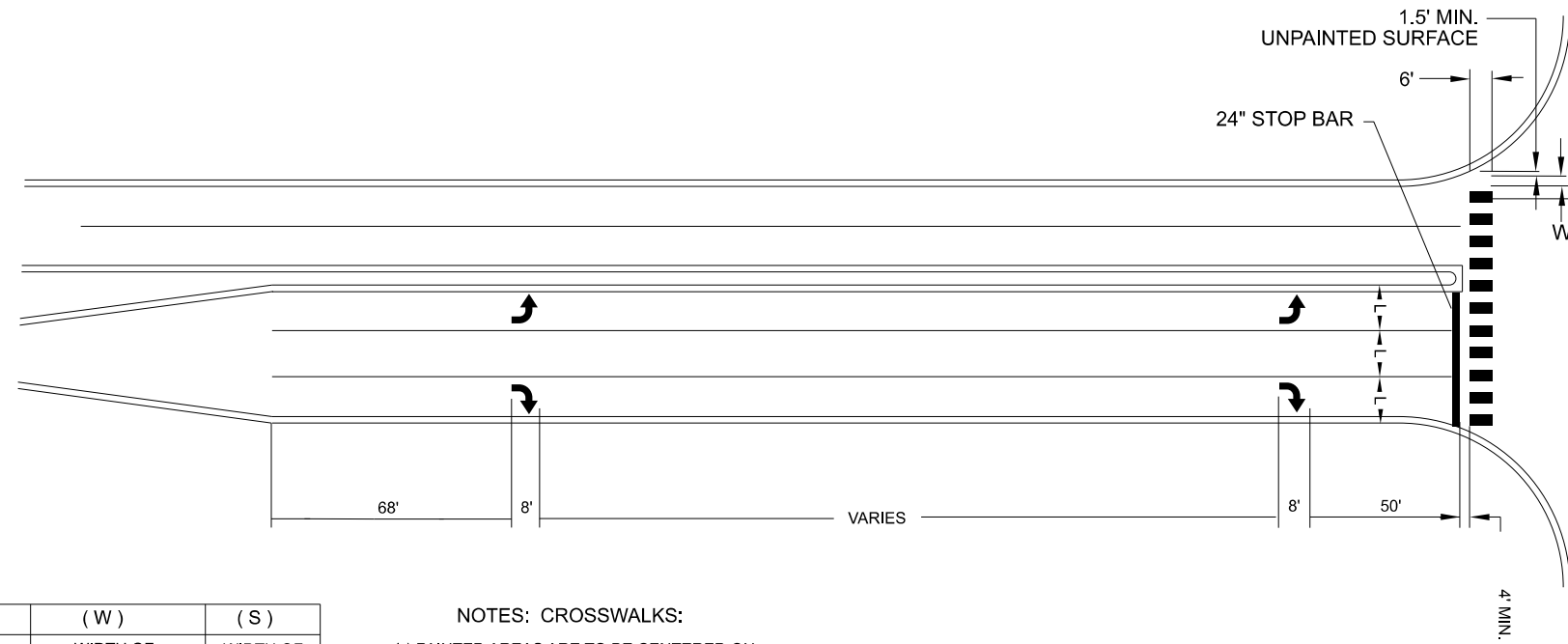
CERTIFIED BY: *Sam Palmrose*  
DATE: 8/25/2020 LICENSE NO. 40945



ANOKA COUNTY, MN  
CSAH 116 (ACHD) DETAILS  
PAVEMENT MARKING PLAN  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
185  
OF  
206  
SHEETS

### MARKINGS FOR PEDESTRIAN CROSSWALKS



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

**NOTES: CROSSWALKS:**

- 1.) PAINTED AREAS ARE TO BE CENTERED ON CENTER AND LANE LINES, EVEN IF INTERSECTION IS NOT ALIGNED.
- 2.) LOCATION OF ZEBRA CROSSWALKS AND STOP BARS, SIGNAL LOOPS AND PED RAMPS ARE APPROXIMATE. FINAL LOCATIONS ARE TO BE DETERMINED AND FIELD VERIFIED DURING CONSTRUCTION BY THE FIELD ENGR.
- 3.) ZEBRA CROSSWALKS ARE TO BE PARALLEL TO THE DRIVING LANE OR LANES, EVEN IF THE STREET IS ON AN ANGLE TO THE INTERSECTION.
- 4.) A MIN. OF 1.5' (450mm) CLEAR DISTANCE MUST BE LEFT ADJACENT TO THE CURB. IF LAST PAINTED AREA FALLS INTO THIS AREA, IT MUST BE OMITTED.
- 5.) ON TWO LANE STREETS, USE SPACING SHOWN FOR AN 11' (3.3mm) INSIDE LANE.

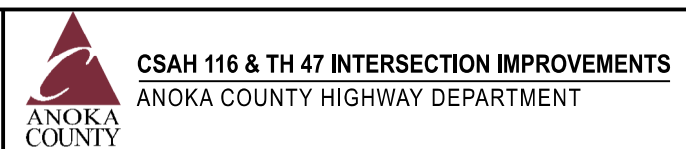
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CERTIFIED BY: *Sam Palmer*  
 DATE: 8/25/2020 LICENSE NO. 40945



ANOKA COUNTY, MN  
 CSAH 116 (ACHD) DETAILS  
 PAVEMENT MARKING PLAN  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 186 OF 206 SHEETS

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### ABBREVIATIONS

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

### SYMBOLS

■	HANDHOLE
⊖	E.O.G CONNECTION
←	EVP CONFIRMATORY LIGHT
↔	EVP DETECTOR
↔←	EVP DETECTOR AND CONFIRMATORY LIGHT
●	SPLICE
Ⓢ	FIBER OPTIC SPLICE VAULT
Ⓟ	PULL VAULT
△	LUMINAIRE NO.
③	SIGNAL BASE NO.
Ⓢ-2	SIGNAL HEAD NO./FLASHER HEAD NO.
Ⓢ	BARREL MOUNT BASE NO.
Ⓢ	WOOD POLE NO.
Ⓢ	TELEVISION CAMERA (CCTV)
Ⓢ	VIDEO DETECTION

FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL

### STANDARD PLATES - SIGNAL SYSTEMS

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

PLATE NO.	DESCRIPTION	PLATE NO.	DESCRIPTION
▶ 8111	E TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED)	▶ 8122	F PEDESTAL AND PEDESTAL BASE
▶ 8112	I PEDESTAL FOUNDATION	▶ 8123	G POLE AND MAST ARM
▶ 8119	C GROUND MOUNTED CABINET FOUNDATION	▶ 8126	L POLE FOUNDATION (PA90 AND PA100)
		▶ 8129	A SHIM AND WASHER
		▶ 8132	B PREFORMED RIGID PVC CONDUIT LOOP DETECTOR

▶ STANDARD PLATES APPLICABLE TO THIS PROJECT

NO.	DATE	BY	CHK	REVISIONS

Design By: MS  
 Plan By: ES  
 Checked By: SD  
 Approved By: SD

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

CERTIFIED BY: *Sean Delmore*  
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
 DATE: 8/25/2020 LICENSE NO. 40945



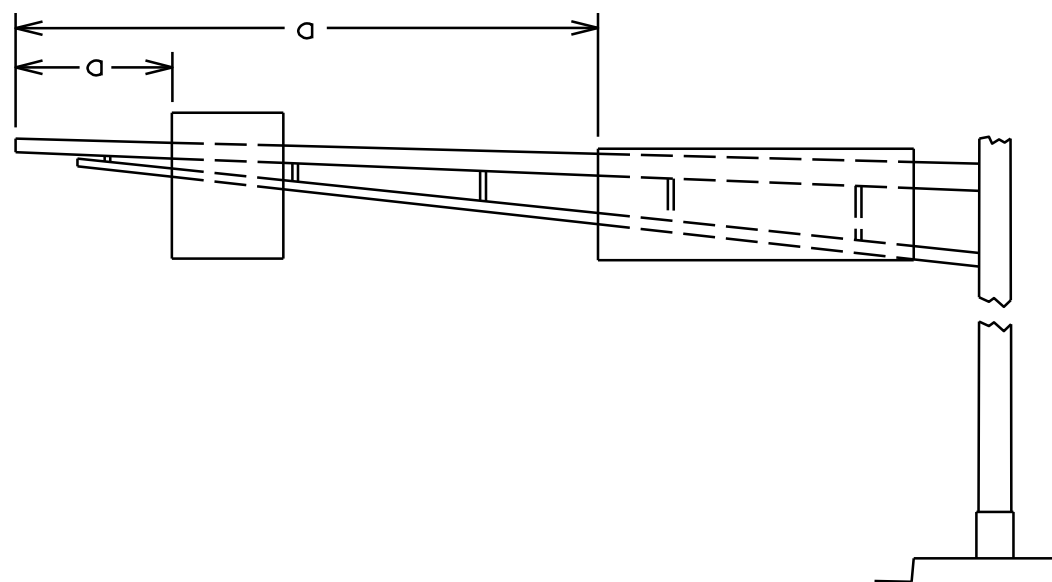
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 ABBREVIATIONS, STANDARD PLATES  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

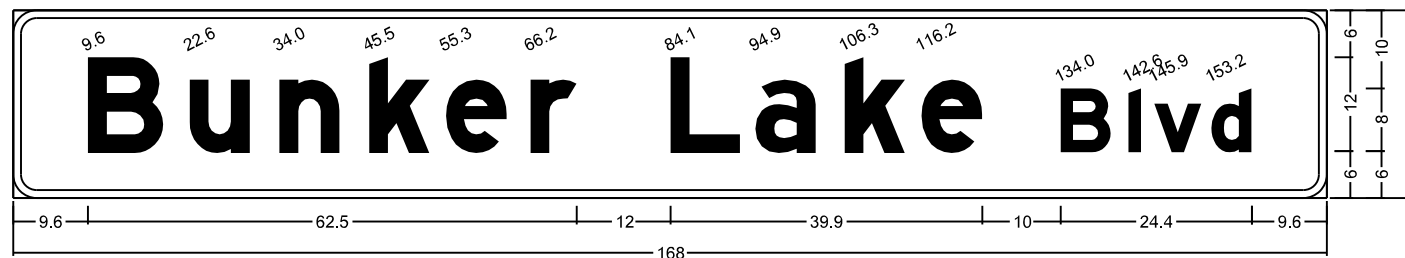
SHEET  
 187  
 OF  
 206  
 SHEETS

**SIGN DETAILS**

**MAST ARM SIGN LOCATION**

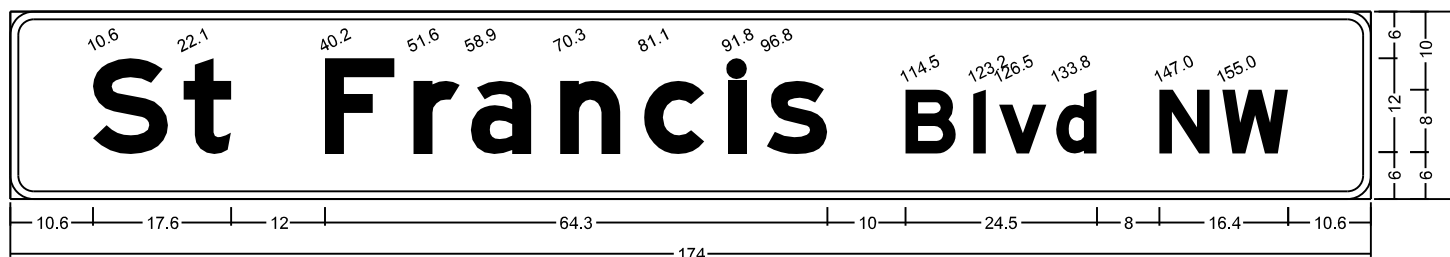


**D-1**



3.0" Radius, 1.0" Border, White on, Green;  
"Bunker Lake Blvd", E Mod 80% spacing;

**D-2**



3.0" Radius, 1.0" Border, White on, Green;  
"St Francis Blvd NW", E Mod 80% spacing;

SIGN PANEL TYPE OVERLAY						
CODE NO	QTY	SIZE		AREA	TOTAL	LEGEND
		INCH	INCH	SQ FT	SQ FT	
M1-5b	1	24	x 24	5.00	10.00	MN 47
M1-5b	1	24	x 24	5.00	10.00	MN 47

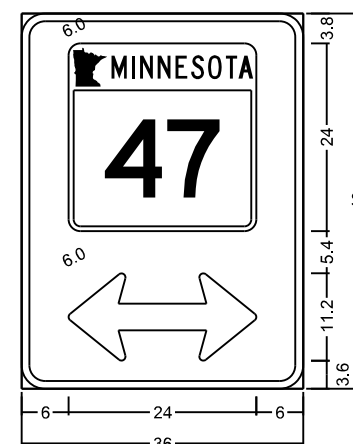
MAST ARM MOUNTED SIGNS										
SIGN NO	POLE NO	QTY	a	PANEL				MOUNTING STIFFENERS		PANEL LEGEND
				SIZE		AREA	TOTAL AREA	NUMBER	SPACING	
				FEET	INCH	SQ FT	SQ FT			
D-1	1	1	37.50	168	x 24	28.00	28.00	4	36	BUNKER LAKE BLVD
D-1	4	1	33.50	168	x 24	28.00	28.00	4	36	BUNKER LAKE BLVD
D-2	3	1	38.00	174	x 24	29.00	29.00	4	36	ST FRANCIS BLVD NW
D-2	6	1	38.00	174	x 24	29.00	29.00	4	36	ST FRANCIS BLVD NW
D-3	3	1	14.00	36	x 48	12.00	12.00	2	24	TH 47 (DUAL ARROW)
D-3	6	1	14.00	36	x 48	12.00	12.00	2	24	TH 47 (DUAL ARROW)
R10-X12	1	1	0	42	x 48	14.00	14.00	2	30	LEFT TURN YIELD ON FLASHING YELLOW ARROW
R10-X12	3	1	0	42	x 48	14.00	14.00	2	30	LEFT TURN YIELD ON FLASHING YELLOW ARROW
R10-X12	4	1	0	42	x 48	14.00	14.00	2	30	LEFT TURN YIELD ON FLASHING YELLOW ARROW
R10-X12	6	1	0	42	x 48	14.00	14.00	2	30	LEFT TURN YIELD ON FLASHING YELLOW ARROW

(1) SPACING BETWEEN STIFFENERS SHALL NOT EXCEED 36 INCHES AND SHALL BE UNIFORMLY SPACED. SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL.

**GENERAL NOTES:**

- CORNERS OF STANDARD SIGN PANELS WITH MARGINS SHALL BE TRIMMED.
- FOR STRUCTURAL DETAILS OF MAST ARM MOUNTED SIGNS SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL.
- FOR TYPE D STRINGER AND PANEL JOINT DETAILS SEE MNDOT STANDARD SIGNS AND MARKINGS MANUAL.
- THE MAST ARM MOUNTED SIGNS ARE INCLUDED IN THE TRAFFIC CONTROL SIGNAL SYSTEM PAY ITEM.
- AT INTERSECTIONS WITH MEDIAN WIDTHS LESS THAN 30', ONE WAY (R6-1) SIGNS SHALL NOT BE PLACED AS PART OF THE SIGNALS PLAN.

**D-3**



3.0" Radius, 1.0" Border, White on, Green;  
State Highway 47 M1-5b;  
Double Headed Arrow 5 - 24.0" 0';

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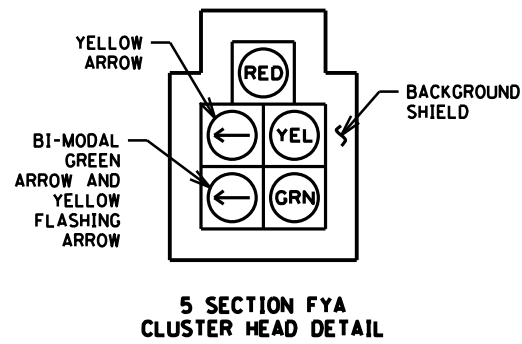
NO.	DATE	BY	CHK	REVISIONS

Design By: MS	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  CERTIFIED BY: SEAN DELMORE LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE DATE: 8/25/2020 LICENSE NO. 40945
Plan By: ES	
Checked By: SD	
Approved By: SD	

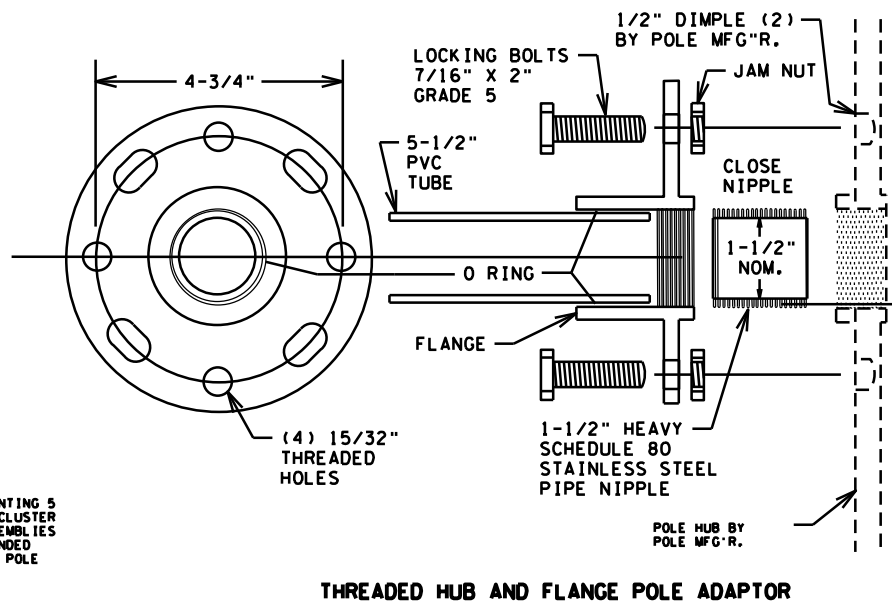


ANOKA COUNTY, MN
SIGN DETAILS
TRAFFIC CONTROL SIGNAL SYSTEM
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

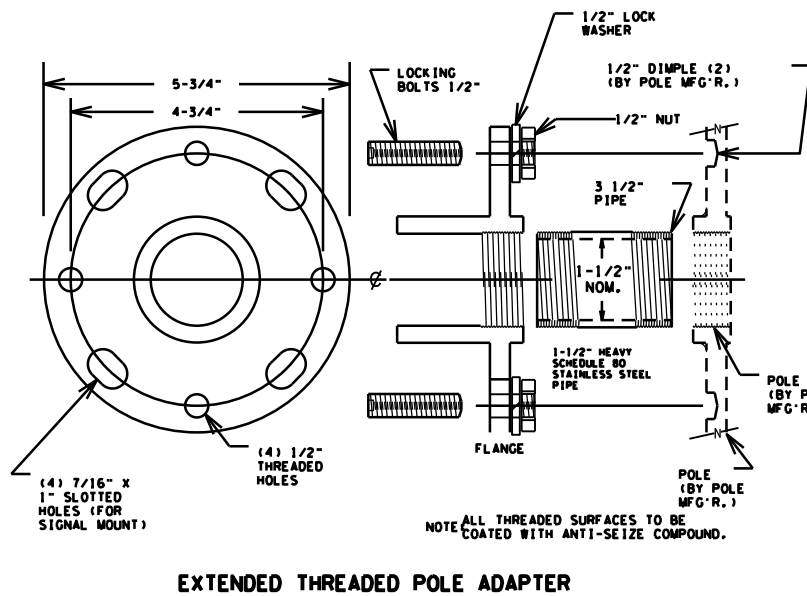
SHEET 188 OF 206 SHEETS



5 SECTION FYA CLUSTER HEAD DETAIL

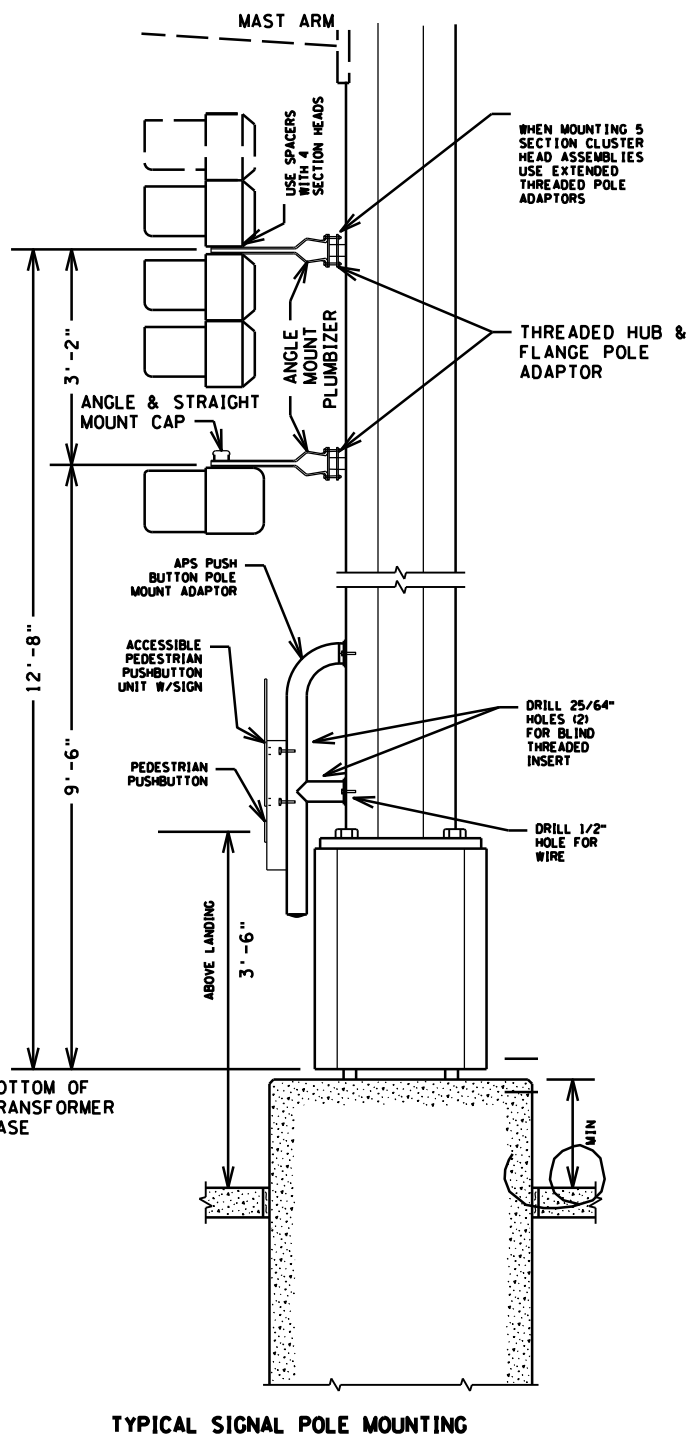


THREADED HUB AND FLANGE POLE ADAPTOR



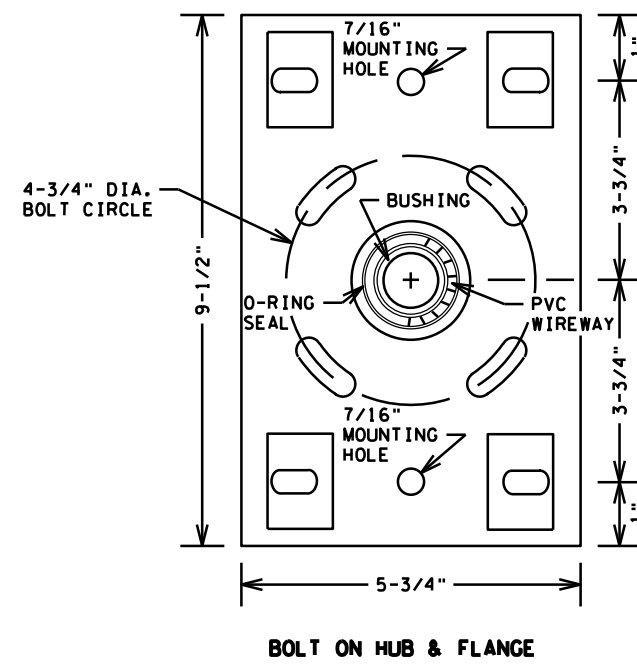
EXTENDED THREADED POLE ADAPTOR

- 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.

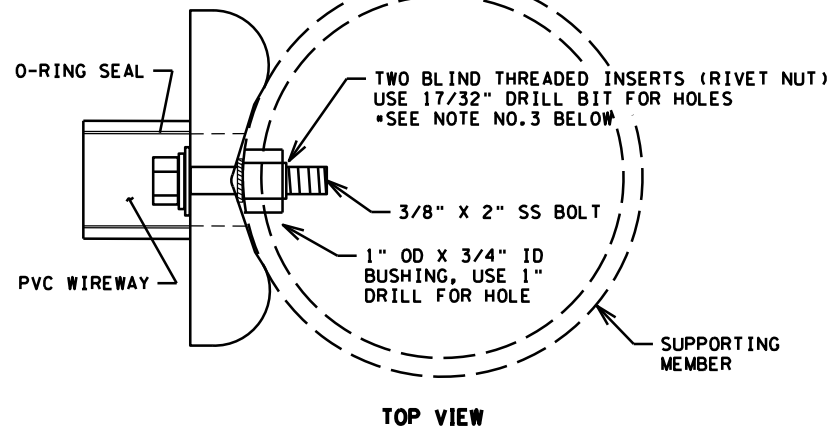


TYPICAL SIGNAL POLE MOUNTING

NOT TO SCALE



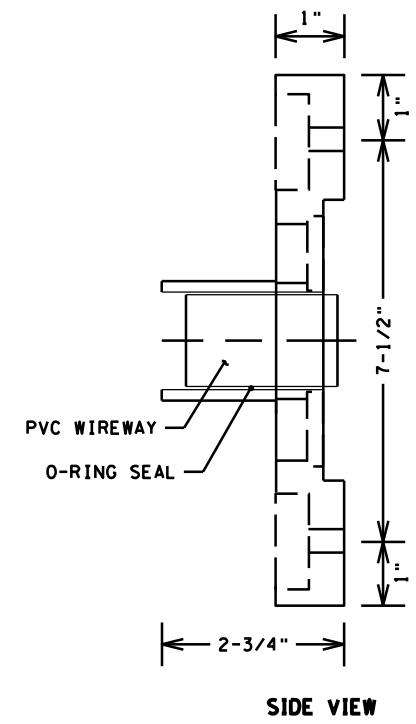
BOLT ON HUB & FLANGE



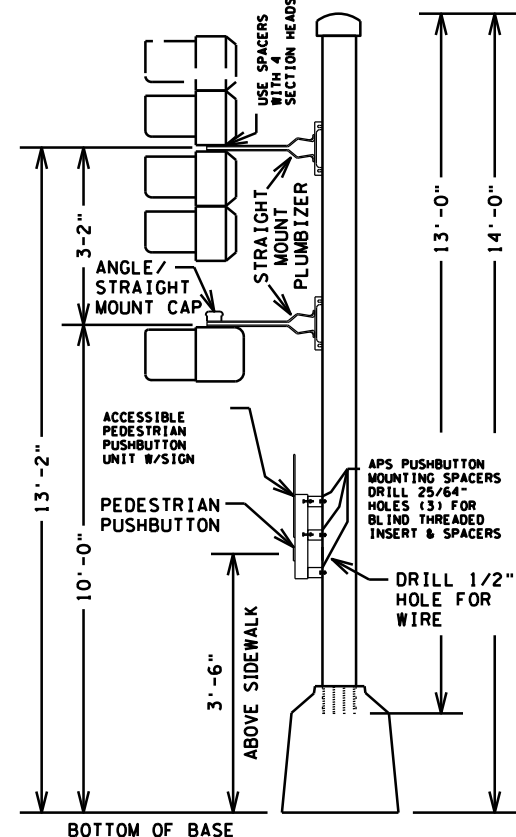
TOP VIEW



- 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.



SIDE VIEW



TYPICAL PEDESTAL MOUNTING

NOT TO SCALE

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Plan By:	ES	
Checked By:	SD	
Approved By:	SD	

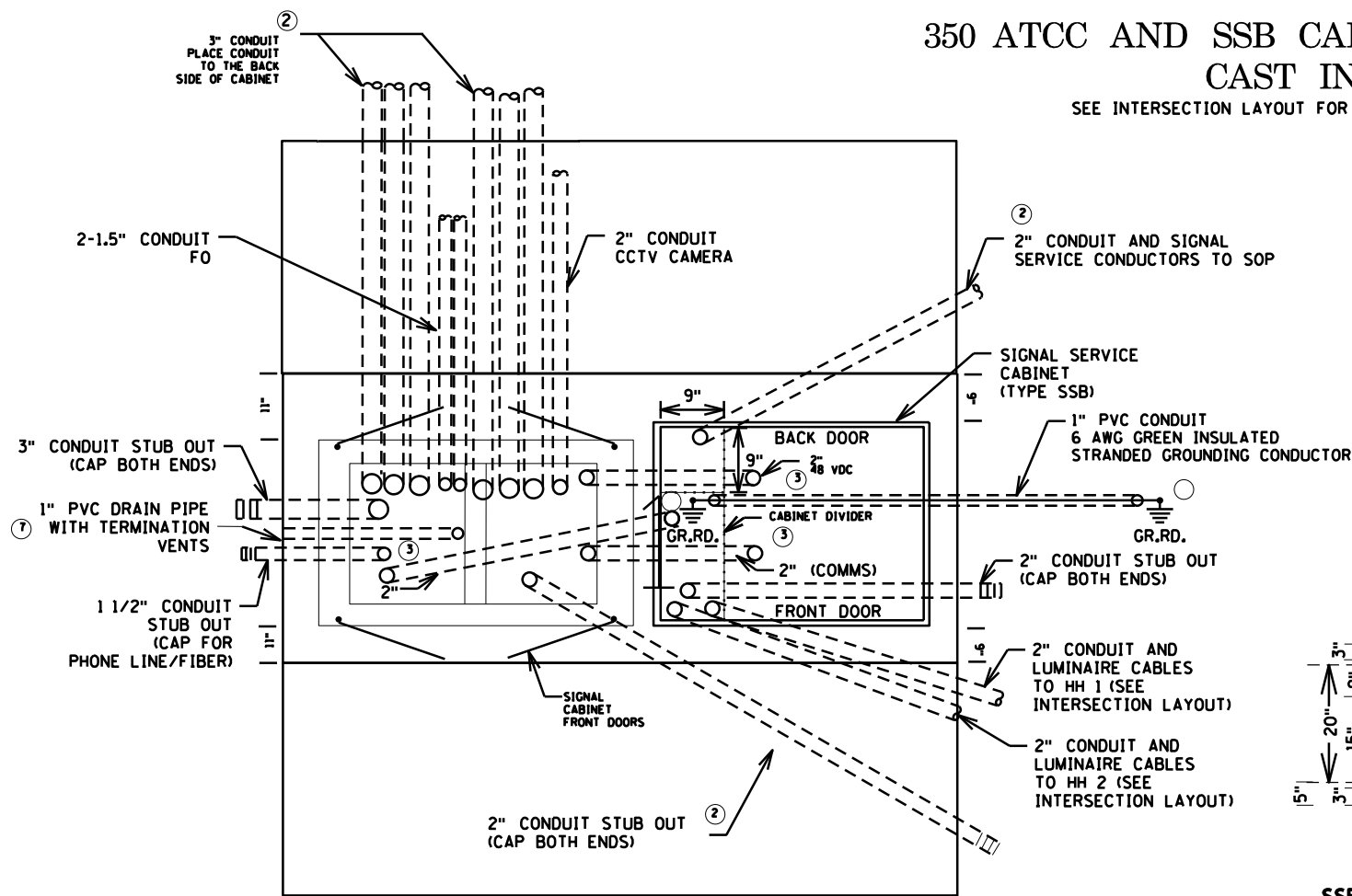


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

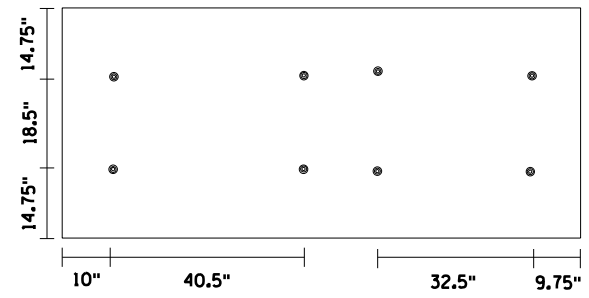
ANOKA COUNTY, MN  
 POLE/PEDESTAL MOUNTING DETAILS  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

# 350 ATCC AND SSB CABINET EQUIPMENT PAD CAST IN-PLACE

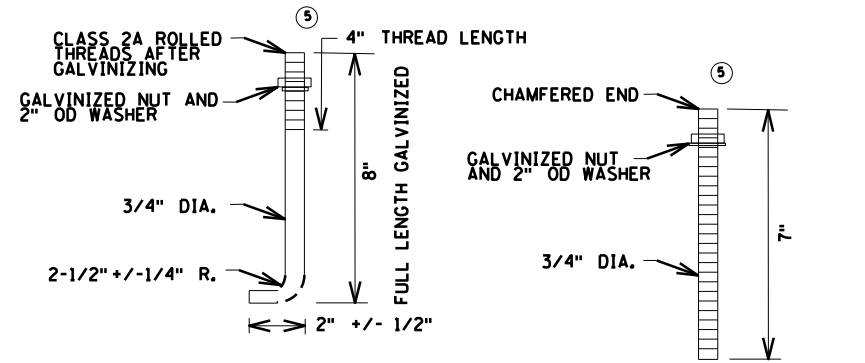
SEE INTERSECTION LAYOUT FOR CABLE INFORMATION (NOT TO SCALE)



**PLAN VIEW**



**ANCHOR ROD LOCATION DETAIL**

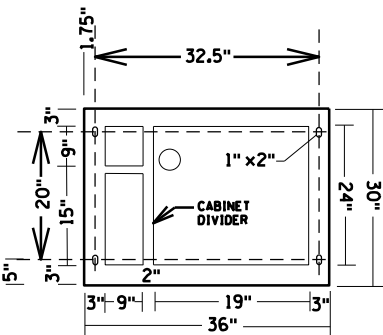


**WET CAST ANCHOR ROD DETAIL**

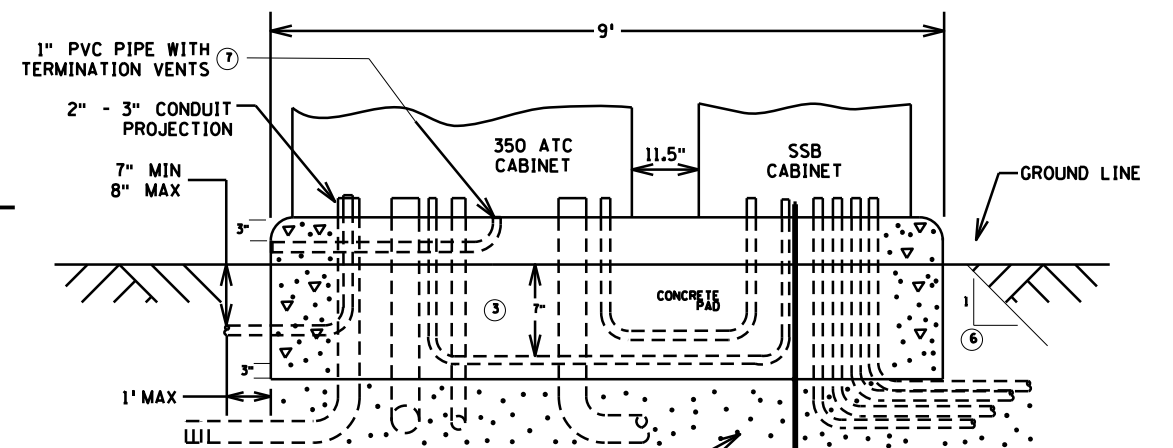
**EPOXY ADHESIVE ANCHOR ROD DETAIL**

(SPEC. 3385 TYPE A OR TYPE B AND GALVANIZED IN ACCORDANCE WITH SPEC. 3392)

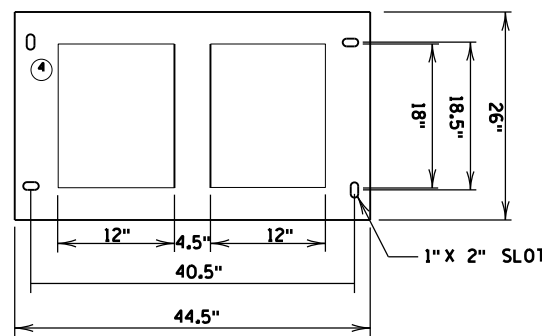
(SPEC. 3385 TYPE A OR TYPE B AND GALVANIZED IN ACCORDANCE WITH SPEC. 3392)



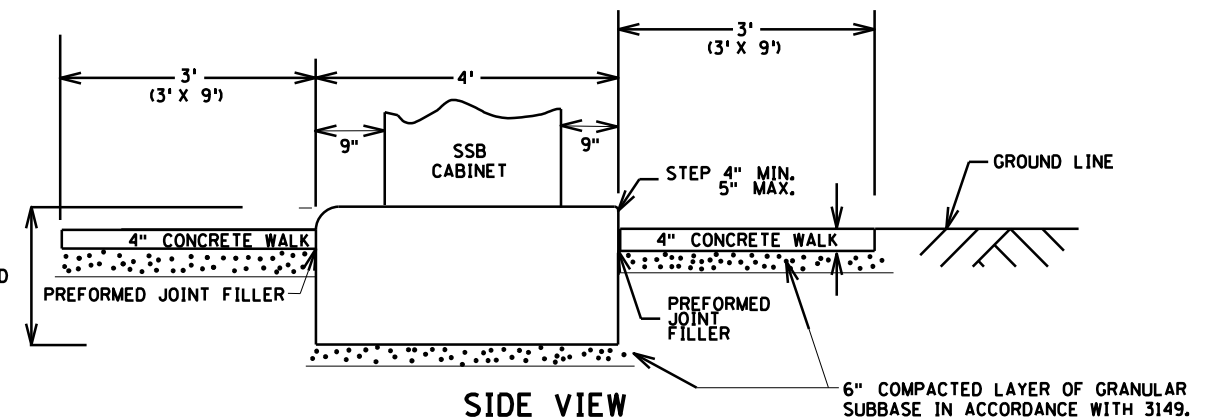
**SSB CABINET BASE TEMPLATE**



**FRONT VIEW**



**350 CABINET BASE TEMPLATE**



**SIDE VIEW**

**NOTES:**

FOR THE EQUIPMENT PAD USE CONCRETE MIX 3G52 WITH APPROVED NON-METALLIC FIBERS FOR REINFORCEMENT LISTED ON MnDOT'S APPROVED/QUALIFIED PRODUCTS LIST UNDER CONCRETE "NONMETALLIC FIBERS". ADD FIBERS TO THE CONCRETE MIX IN ACCORDANCE WITH THE NON-METALLIC FIBERS MANUFACTURERS INSTRUCTIONS AND CONTRACT DOCUMENTS.

FOR CONCRETE WALK USE CONCRETE MIX 3G52. 3G52 CONCRETE MIX WITH NON-METALLIC FIBERS MAY BE USED FOR THE CONCRETE WALK AND POLE FOUNDATIONS. DO NOT USE NON-METALLIC FIBERS AS A SUBSTITUTE FOR THE REQUIRED REINFORCEMENT IN ACCORDANCE WITH THE POLE FOUNDATION STANDARD PLATES.

① PLACE A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH THE GROUNDING ELECTRODE SYSTEM DETAIL ON SHEET 3 OF STANDARD PLATE NUMBER 8106 EXCEPT FURNISH AND INSTALL 10 FOOT LONG GROUND ROD ELECTRODES, 6 AWG GREEN INSULATED COPPER CONDUCTOR AND EXOTHERMIC WELDED CONNECTIONS.

② CONDUIT SIZE, QUANTITY AND DIRECTION MAY VARY. FURNISH AND INSTALL CONDUITS AS SPECIFIED ON THE INTERSECTION LAYOUT PLAN SHEET.

③ ENSURE THE CONDUITS FULLY ENCASED IN CONCRETE FROM ONE CABINET TO THE OTHER ARE PLACED AT THE CORRECT DEPTH AND LOCATION TO AVOID INTERFERENCE WITH THE INSTALLATION OF THE ANCHOR RODS.

④ USE TEMPLATES WITH THE DIMENSIONS SHOWN INCLUDING OPENINGS, DIVIDERS, ANCHOR ROD HOLES AS A GUIDE TO ENSURE PROPER PLACEMENT OF THE CABINETS, CONDUITS AND ANCHOR RODS. 350 BASE OPENINGS FOR TEMPLATE ARE SMALLER THAN THE ACTUAL BASE OPENINGS.

⑤ PLACE ANCHORS 1 3/4 INCHES - 2 1/4 INCHES ANCHOR ROD PROJECTION ABOVE THE CONCRETE PAD. FURNISH AND INSTALL ANCHOR RODS SHOWN IN THE ANCHOR ROD DETAIL FOR WET CASTING ANCHORS IN WET CONCRETE. FURNISH AND INSTALL ANCHOR RODS SHOWN IN THE ANCHOR ROD DETAIL FOR EPOXY ADHESIVE IF USING ADHESIVE ANCHORS. INSERT ANCHOR RODS IN 7/8 INCH DIAMETER DRILLED HOLES, 5 INCHES DEEP WITH AN APPROVED EPOXY ADHESIVE LISTED ON MnDOT'S APPROVED/QUALIFIED PRODUCTS LIST (ACCESSIBLE PEDESTRIAN SIGNAL PUSH BUTTON BASE ADHESIVE ANCHORING). DO NOT USE MECHANICAL OR CONCRETE WEDGE ANCHORS.

⑥ IF THE SITE CONDITIONS REQUIRE THE PAD TO BE PLACED WITHIN A SLOPE, INCREASE THE THICKNESS OF THE PAD BY 6 INCHES. SHAPE THE TERRAIN AROUND THE PAD FOR POSITIVE DRAINAGE.

⑦ FURNISH AND INSTALL A DRAIN IN THE PAD USING 1 INCH PVC SCH. 40 PIPE FOR PLUMBING. PLACE PVC TERMINATION VENT SCREEN DESIGNED FOR PVC PIPE AT EACH END OF THE PIPE. PROVIDE PVC TERMINATION VENTS WITH A STAINLESS STEEL SCREEN. ENSURE THE TERMINATION VENT SCREEN AND PIPE ARE FLUSH WITH THE TOP AND SIDE OF THE PAD AND PROTECT FROM CONCRETE INTRUSION BEFORE CONCRETE PLACEMENT OPERATIONS.

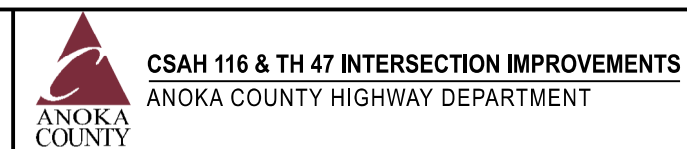
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NO.	DATE	BY	CHK	REVISIONS

Design By: MS  
 Plan By: ES  
 Checked By: SD  
 Approved By: SD

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CERTIFIED BY: *Sean Delmore*  
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
 DATE: 8/25/2020 LICENSE NO. 40945

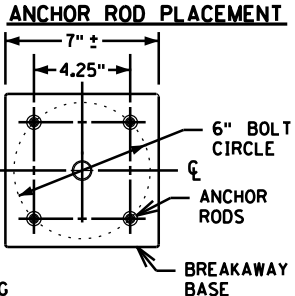
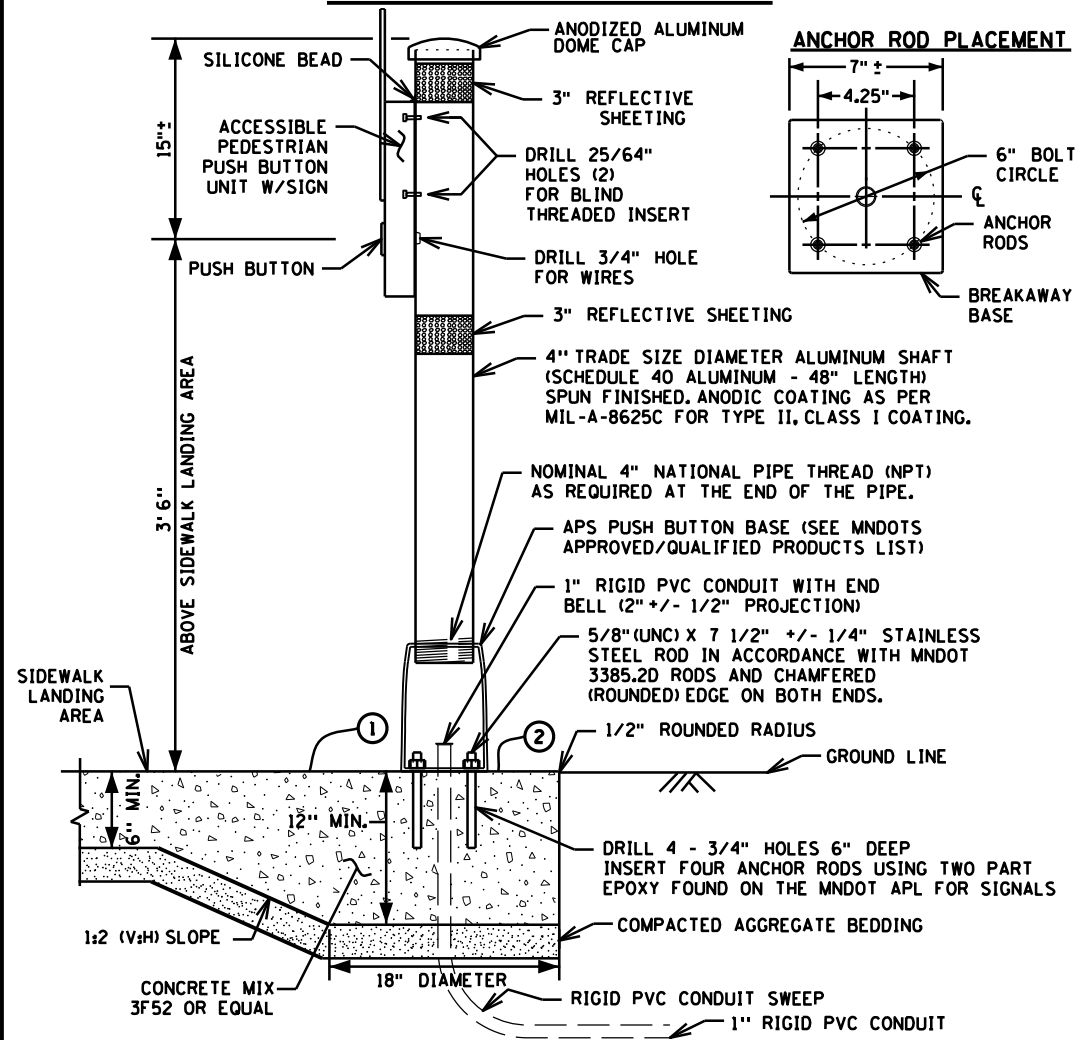


ANOKA COUNTY, MN

350 ATCC AND SSB CABINET EQUIPMENT PAD  
TRAFFIC CONTROL SIGNAL SYSTEM  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 190 OF 206 SHEETS

### APS PUSH BUTTON STATION



**NOTES:**

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

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

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

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

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

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

APPLY A BEAD OF 100% SILICONE SEALANT ALONG THE TOP OF THE PUSH BUTTON UNIT WHERE IT COMES IN CONTACT WITH THE 4" SHAFT.

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

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

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

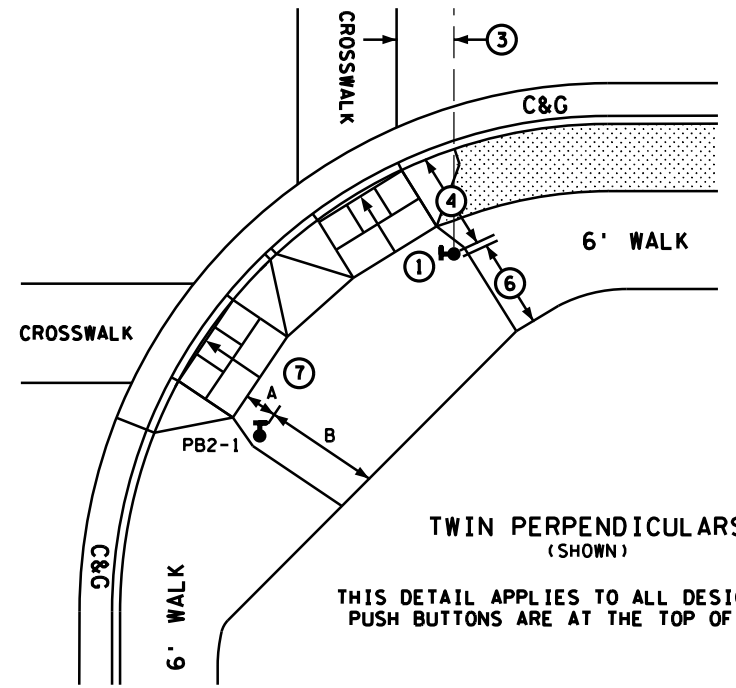
② ENSURE CONCRETE CONTROL JOINTS AND EDGE OF CONCRETE WALK ARE A MINIMUM 9" FROM THE CENTER OF THE PUSH BUTTON FOUNDATION.

### TYPICAL APS PEDESTRIAN PUSH BUTTON LOCATION

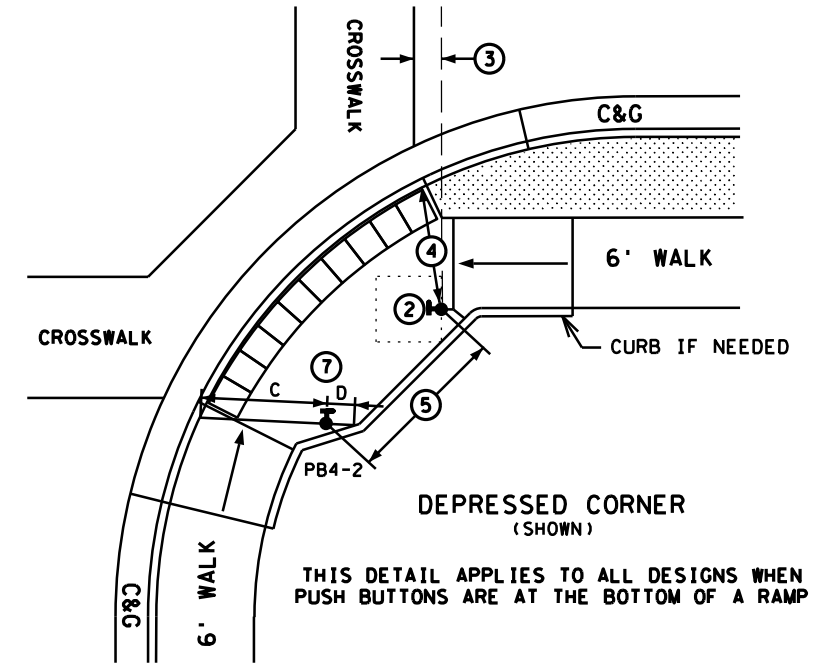
THIS IS A GENERAL DETAIL INTENDED TO SHOW THE REQUIREMENTS OF APS PUSH BUTTON LOCATION. FOR PROJECT SPECIFIC INFORMATION REGARDING PEDESTRIAN RAMP LAYOUT AND PUSH BUTTON LOCATIONS, SEE THE PLAN.

#### SUPPLEMENTAL GUIDANCE FOR CONSTRUCTING COMPLIANT APS PUSH BUTTONS:

- ① THE FACE OF THE BUTTON SHALL BE PARALLEL WITH THE OUTSIDE EDGE OF CROSSWALK.
- ② A MINIMUM 4 FT X 4 FT LANDING AREA SHALL BE PROVIDED ADJACENT TO EACH BUTTON, WITH A 2 PERCENT MAXIMUM SLOPE IN ALL DIRECTIONS.
- ③ BUTTONS SHALL BE WITHIN 5 FT OF THE OUTSIDE EDGE OF THE CROSSWALK.
- ④ BUTTONS SHALL BE BETWEEN 1.5 FT AND 10 FT FROM THE BACK OF CURB OR EDGE OF ROADWAY, MEASURED IN THE DIRECTION OF TRAVEL. STANDALONE PUSH BUTTON STATIONS SHOULD BE 4' MINIMUM FROM THE BACK OF CURB TO AVOID KNOCKDOWNS.
- ⑤ BUTTONS SHALL BE AT LEAST 10 FT APART.
- ⑥ PROVIDE A MAINTENANCE ACCESS ROUTE (MAR) WHEREVER POSSIBLE FOR SNOW REMOVAL PURPOSES. A MAR REQUIRES A 6 FT MINIMUM CLEAR DISTANCE BETWEEN A PUSH BUTTON AND ANY OBSTRUCTIONS, INCLUDING BUILDINGS, V-CURB, ELECTRICAL FOUNDATIONS, SIGNAL CABINETS, OR ANOTHER PUSH BUTTON.
- ⑦ BUTTON SHOULD BE 2 FT MINIMUM FROM RAMP GRADE BREAK AND BACK OF WALK.

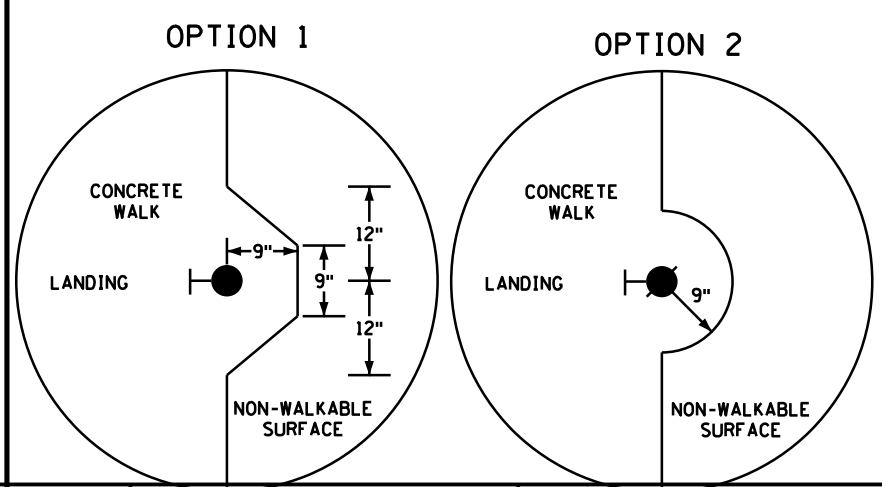


TWIN PERPENDICULARS (SHOWN)  
THIS DETAIL APPLIES TO ALL DESIGNS WHEN PUSH BUTTONS ARE AT THE TOP OF A RAMP



DEPRESSED CORNER (SHOWN)  
THIS DETAIL APPLIES TO ALL DESIGNS WHEN PUSH BUTTONS ARE AT THE BOTTOM OF A RAMP

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



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

- A - DISTANCE MEASURED FROM THE PUSH BUTTON TO THE FRONT OF LANDING/TOP OF RAMP
- B - CLEAR DISTANCE MEASURED FROM THE PUSH BUTTON TO THE BACK OF LANDING/EDGE OF WALK
- C - CLEAR DISTANCE MEASURED FROM THE PUSH BUTTON TO THE OUTSIDE EDGE OF DOMES IN THE DIRECTION OF TRAVEL
- D - CLEAR DISTANCE FROM THE PUSH BUTTON TO THE BACK OF LANDING MEASURED IN THE OPPOSITE DIRECTION OF TRAVEL

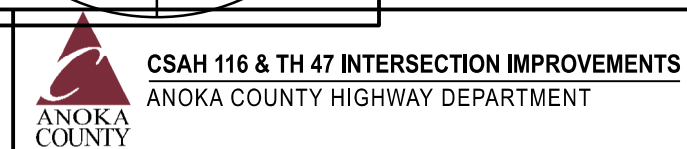
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NO.	DATE	BY	CHK	REVISIONS

Design By: MS  
 Plan By: ES  
 Checked By: SD  
 Approved By: SD

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 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
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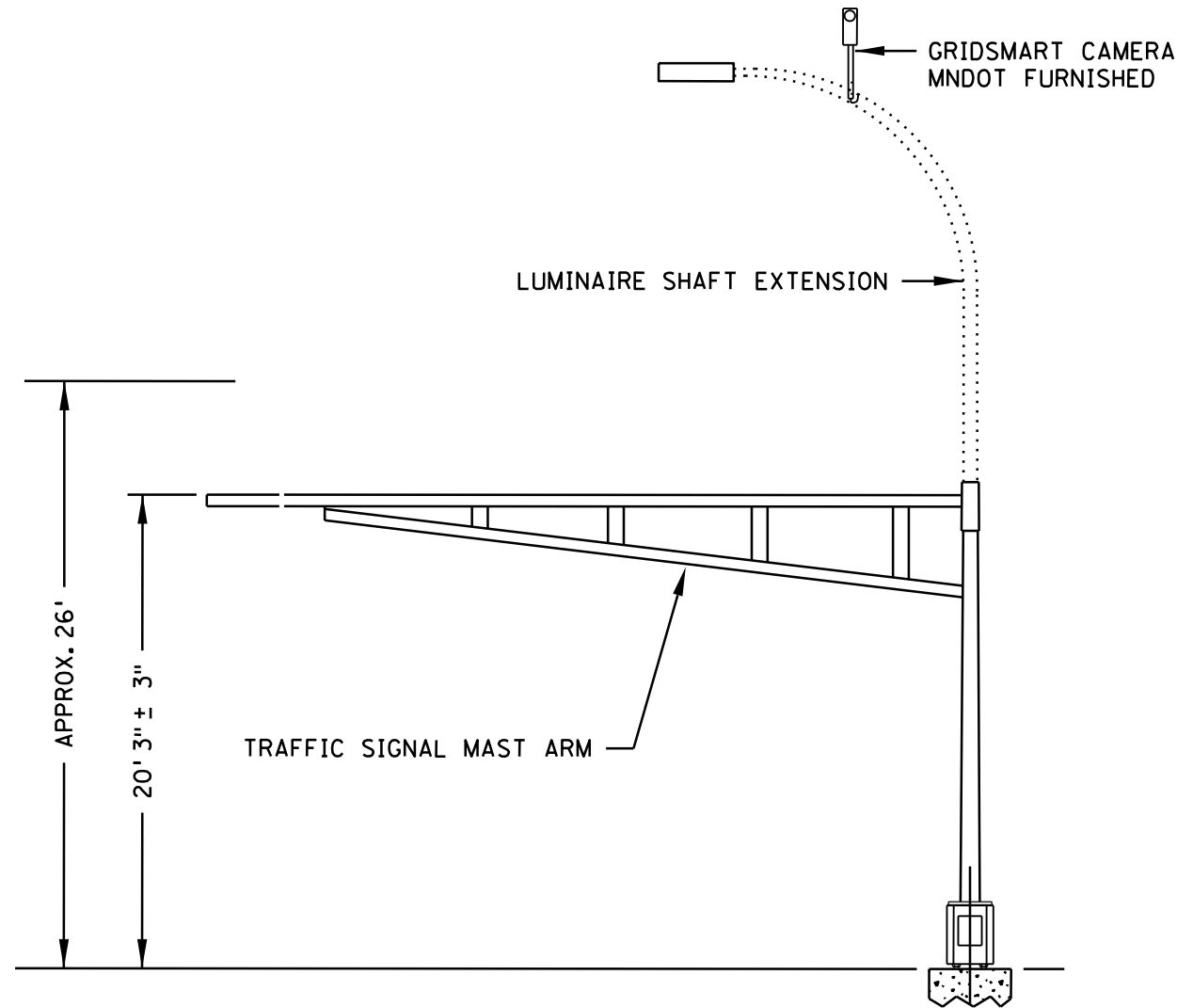


ANOKA COUNTY, MN  
 APS PUSH BUTTON STATION DETAIL  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 191 OF 206 SHEETS

**TYPICAL MAST ARM CAMERA MOUNTING DETAILS**

EXACT LOCATION FOR GRIDSMART CAMERA INSTALLATION  
MUST BE FIELD VERIFIED BY MNDOT TRAFFIC OFFICE

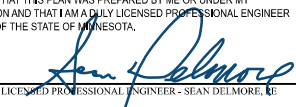


**NOTES:**

- 1) CONTRACTOR MUST NOTIFY MNDOT TRAFFIC OFFICE PRIOR TO INSTALLATION. MNDOT WILL VERIFY LOCATION OF MOUNTING ON LUMINAIRE EXTENSION.
- 2) CONTRACTOR SHALL INSTALL ALL MNDOT FURNISHED PRODUCT FOR A COMPLETE GRIDSMART INSTALLATION. (INCIDENTAL TO TRAFFIC CONTROL SIGNAL SYSTEM LUMP SUMP PAYMENT.)

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NO.	DATE	BY	CHK	REVISIONS

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Plan By:	ES	
Checked By:	SD	
Approved By:	SD	



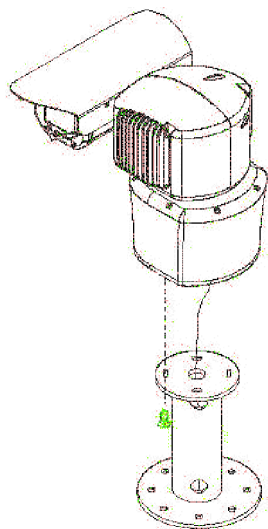
ANOKA COUNTY, MN  
TYPICAL MAST ARM CAMERA MOUNTING DETAILS  
TRAFFIC CONTROL SIGNAL SYSTEM  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 192 OF 206 SHEETS



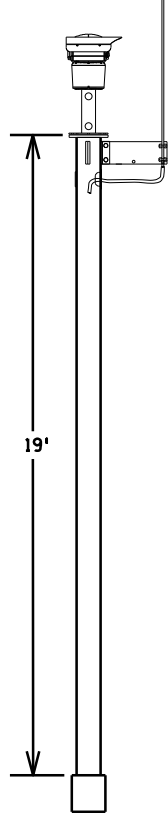
**ISOMETRIC VIEW- CAMERA & MOUNT**

(STATE FURNISHED)



**X-400 CAMERA EXTENSION**

(USED WHEN A LUMINAIRE IS NOT REQUIRED)



THE TYPICAL D40-9 LUMINAIRE EXTENSION IS NOT USED WHEN THE X6-350/CAM 400 EXTENSION IS REQUIRED

F&I LUMINAIRE/ CAMERA EXTENSION (GALVANIZED, UN-PAINTED). (INCLUDES: LIGHTNING ROD PLATE, AND LIGHTNING ROD.

F&I BRAIDED GROUND, GROUND ROD, CLAMP #230 AND ANY OTHER MISC. ITEMS REQUIRED)

**X6-350/CAM 400 EXTENSION**

INSTALL CAMERA & MOUNT (STATE FURNISHED)

LIGHTNING ROD & LIGHTNING ROD PLATE

7/16" BRAIDED GROUND CONDUCTOR (32 STRAND-17 GAUGE COPPER) (INSIDE MAST ARM POLE)

3" x 5" ACCESS OPENING W/COVER PLATE

35' MTG HT FROM GROUND

19'

13'-9"

**CAMERA & MOUNT AT TOP OF EXTENSION**

IP CAMERA (STATE FURNISHED)

GROUND WIRE

10" CAMERA MOUNT (STATE FURNISHED)

F&I MOUNTING BOLTS W/ANTI-SEIZE  
 (4) 5/16" x 1-1/4" STAINLESS STEEL BOLTS  
 (4) 5/16" STAINLESS STEEL NUTS  
 (8) 5/16" STAINLESS STEEL FLAT WASHERS  
 (3) 5/16" STAINLESS STEEL LOCK WASHERS  
 (1) 5/16" STAINLESS STEEL INTERNAL TOOTH LOCK WASHER

1" TO 3/4" REDUCER (MPT X FPT)  
 3/4" CORD GRIP (CABLE RANGE DOWN TO 0.25")

IN TOP OF LUMINAIRE/ CAMERA EXTENSION

CAT 5E CABLE 600V RATED

7/16" BRAIDED GROUND CONDUCTOR (32 STRAND-17 GAUGE COPPER)

- F&I CAT 5E (600V RATED) (WITH THE PROPER TERMINATIONS) FROM THE TOP OF THE POLE TO THE SIGNAL CABINET. (NOT TO EXCEED 300' LENGTH)
- F&I 7/16" BRAIDED GROUND CONDUCTOR (32 STRAND 17 GAUGE COPPER) FROM LIGHTNING ROD TO THE GROUND ROD IN HANDHOLE

7/16" BRAIDED GROUND CONDUCTOR (32 STRAND 17 GAUGE COPPER)

HANDHOLE (SEE LAYOUT)

CLAMP #230 (SEE APL TMS/ITS GROUNDING)

5/8" x 15' GROUND ROD

REQUIRED CABLE TERMINATION:  
 COM CABLE- CAT 5E (600V RATED)  
 -RJ-45 (T-568B)

F/I CAT 5E (600V RATED) (TO CAMERA AT THE TOP OF THE POLE)

CONDUITS (SEE LAYOUT)

HANDHOLE

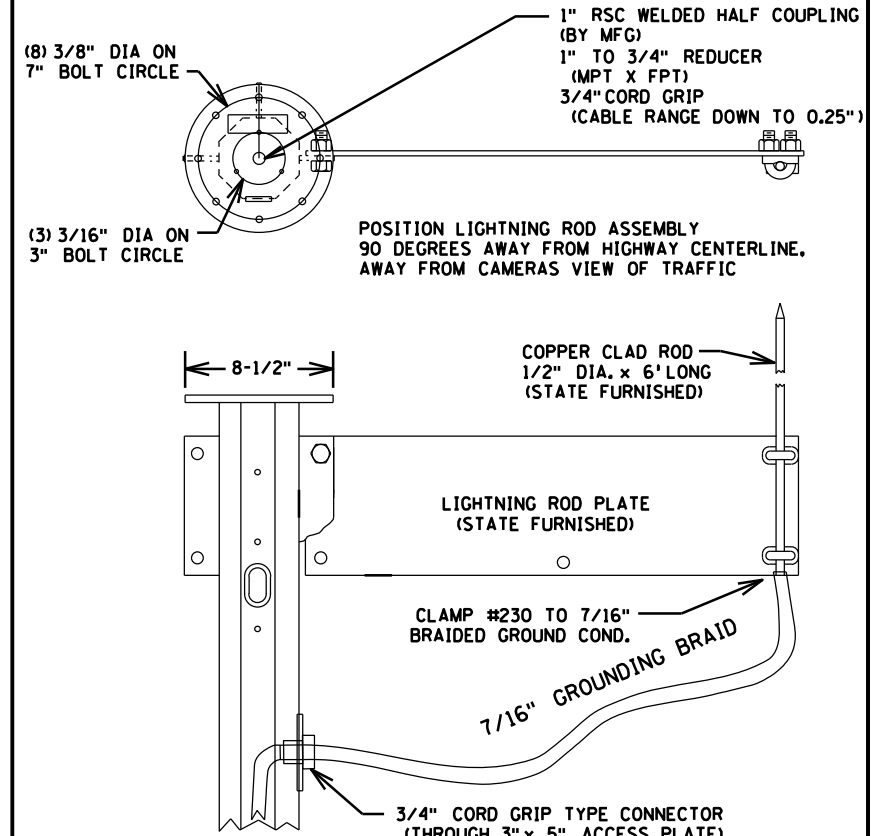
PROPOSED SIGNAL CONTROL CABINET (STATE FURNISHED OR INPLACE)

STATE FURNISHED & INSTALLED:  
 CAMERA POWER OVER ETHERNET (POE) INJECTOR  
 PATCH CORDS  
 SIGNAL CONTROLLER  
 MMU  
 ETHERNET SWITCH

CONDUIT W/6-SM F/O PIGTAIL SEE TMS PLAN

CORE DRILL FOR CONDUIT WHERE REQUIRED

**EXTENSION TOP & LIGHTNING PROTECTION DETAIL**



- NOTES:**
- 1) FURNISH & INSTALL 7/16" BRAIDED GROUND CONDUCTOR INSIDE MAST ARM POLE AND THROUGH INPLACE CONDUIT TO CLOSEST HANDHOLE (SEE LAYOUT).
  - 2) CONTRACTOR SHALL CLAMP #230 7/16" BRAIDED GROUND WIRE TO GROUND ROD IN HANDHOLE.
  - 3) NO SPLICES ALLOWED IN 7/16" BRAIDED GROUND WIRE.
  - 4) CONTRACTOR SHALL CUT A 3/4 INCH KNOCK OUT HOLE IN THE INSPECTION PLATE NEAR THE CAMERA AND PLACE A 3/4 INCH CORD GRIP TYPE FITTING TO RUN THE 7/16 INCH BRAIDED GROUND CONDUCTOR INTO THE POLE.

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Design By: MS  
 Plan By: ES  
 Checked By: SD  
 Approved By: SD

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CERTIFIED BY: *Sean Delmore*  
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
 DATE: 8/25/2020 LICENSE NO. 40945



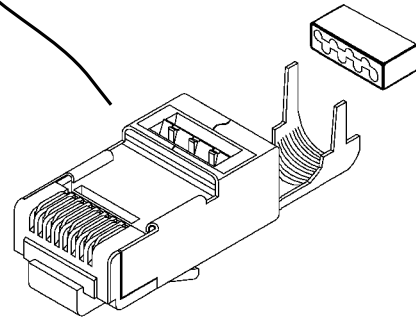
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 CCTV CAMERA MOUNTING DETAIL  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 193 OF 206 SHEETS

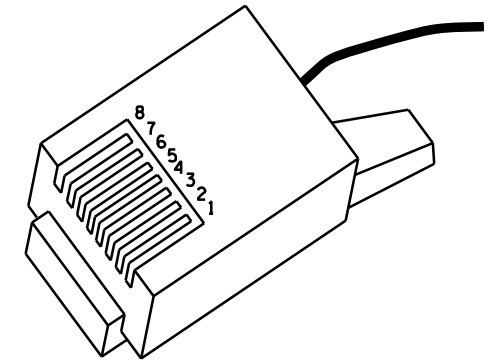
**CAT 5E (600V RATED) CABLE TERMINATION**

F&I RJ45 CABLE TERMINATION - FOR HIGH SPEED APPLICATION. CAT 6 SHIELDED MODULAR PLUG, RJ45 (8 CONDUCTOR), GOLD PLATED CONTACTS, AND MUST ACCEPT CABLES WITH DIAMETERS UP TO 0.310 INCHES. MUST MEET OR EXCEED CATEGORY 6 ANSI/EIA 568-C.2 L-COM PART NO. TSP8048C5S MEETS THESE REQUIREMENTS

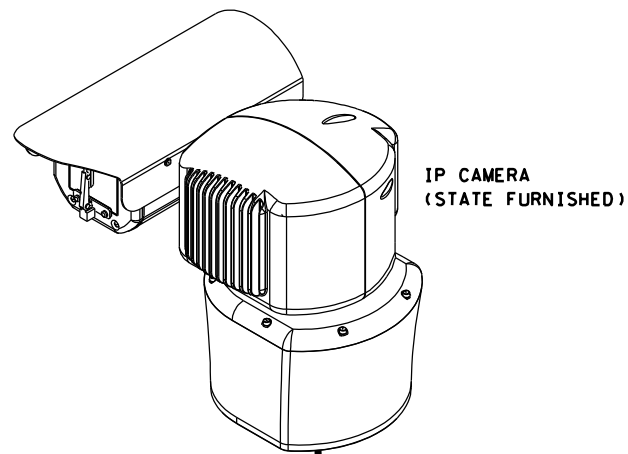


**WATERPROOF SHIELDED RJ-45 (MALE TO MALE) INLINE COUPLER/ADAPTOR**

I.P. RATING: IP67  
 CONTACT MATERIAL: COPPER ALLOY  
 CONTACT PLATING: GOLD  
 HOUSING MATERIAL: NYLON  
 AMPHENOL PART NO. RDP-00BFFA-SLM7001 &  
 VPI PART NO. CAT5E-WTP-FF  
 MEET THESE REQUIREMENTS

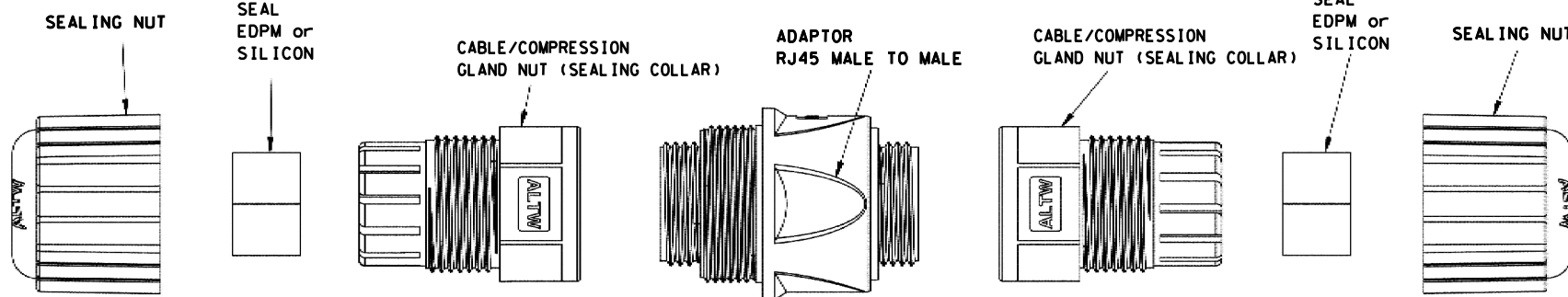


1	2	3	4	5	6	7	8
WHITE/ORANGE	ORANGE	WHITE/GREEN	BLUE	WHITE/BLUE	GREEN	WHITE/BROWN	BROWN
CAT 6 RJ-45 PLUG							
T-568B							



IP CAMERA  
(STATE FURNISHED)

FACTORY INSTALLED 20" PIGTAIL  
WITH CONNECTOR (RJ-45 PLUG)



F&I RJ-45 IN-LINE COUPLER/ADAPTER (MALE PLUG TO MALE PLUG) SHALL MEET IP-67 REQUIREMENTS SEE DETAIL ABOVE FOR MORE INFORMATION.

F&I RJ45 CABLE TERMINATION (CONNECTOR) SEE DETAIL ABOVE FOR MORE INFORMATION.

F&I RJ45 CABLE TERMINATION (CONNECTOR) SEE DETAIL ABOVE FOR MORE INFORMATION.

ETHERNET CABLE 4/PR  
 RJ-45 PLUG (T-568B)  
 (SUPPLIED WITH CAMERA)



F&I ETHERNET CABLE IN ACCORDANCE WITH 3815.2C.6.d (CAT 5E 600V RATED), BETWEEN THE SIGNAL CONTROL CABINET AND THE TOP OF THE SIGNAL POLE. TERMINATE THE ENDS OF THE CABLE WITH RJ-45 (T-568B) CONNECTORS. ALL FIELD TERMINATIONS/CONNECTORS SHALL BE INSTALLED AS RECOMMENDED BY THE MANUFACTURER, AND USING THE SPECIFIED INSTALLATION TOOL(S).

CONNECTORS LOCATED AT THE TOP OF THE SIGNAL POLE (IN CAMERA MOUNT)

CONNECTOR LOCATED IN THE SIGNAL CABINET

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 LICENSE NO. 40945



**ANOKA COUNTY**

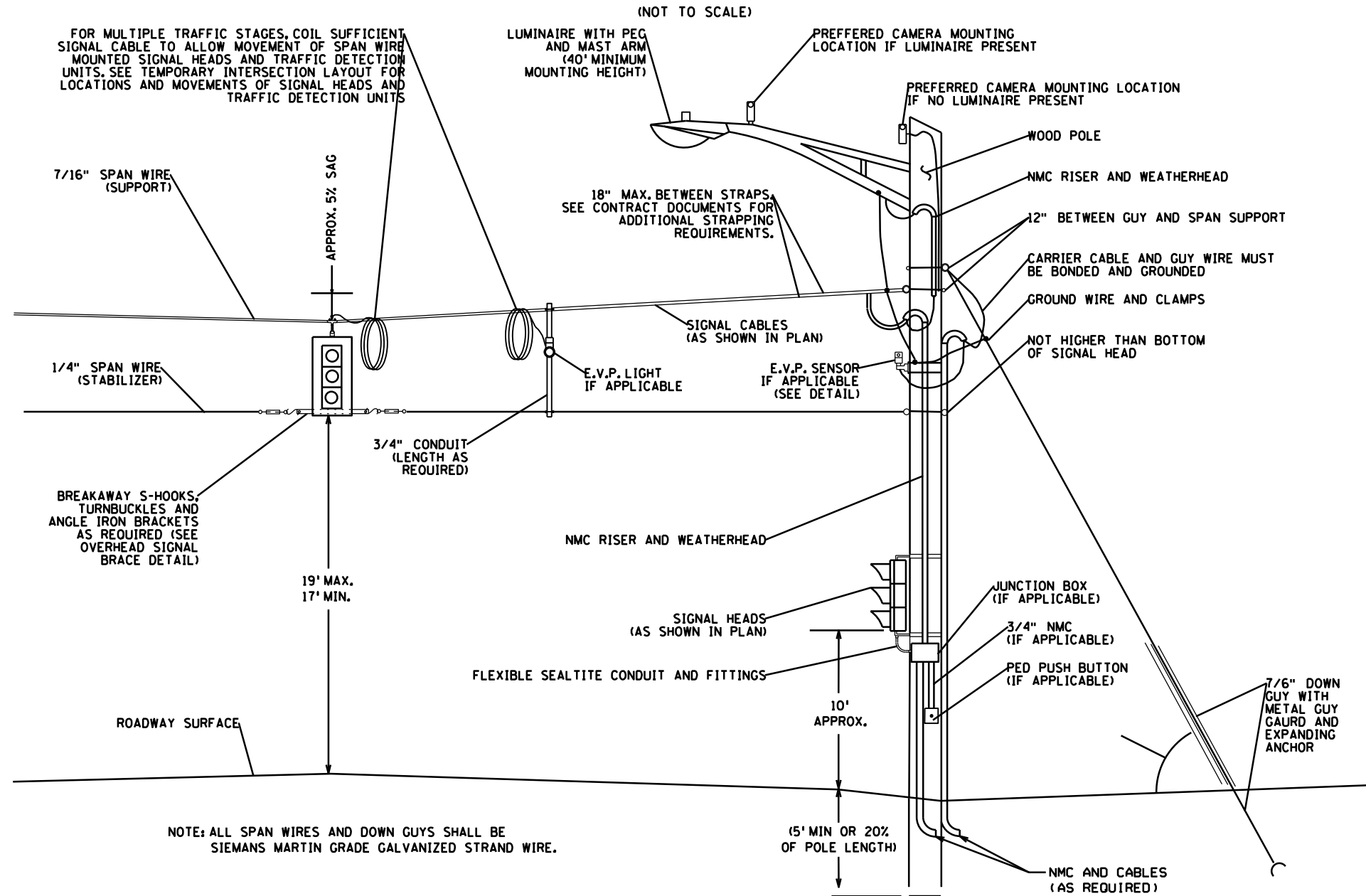
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**

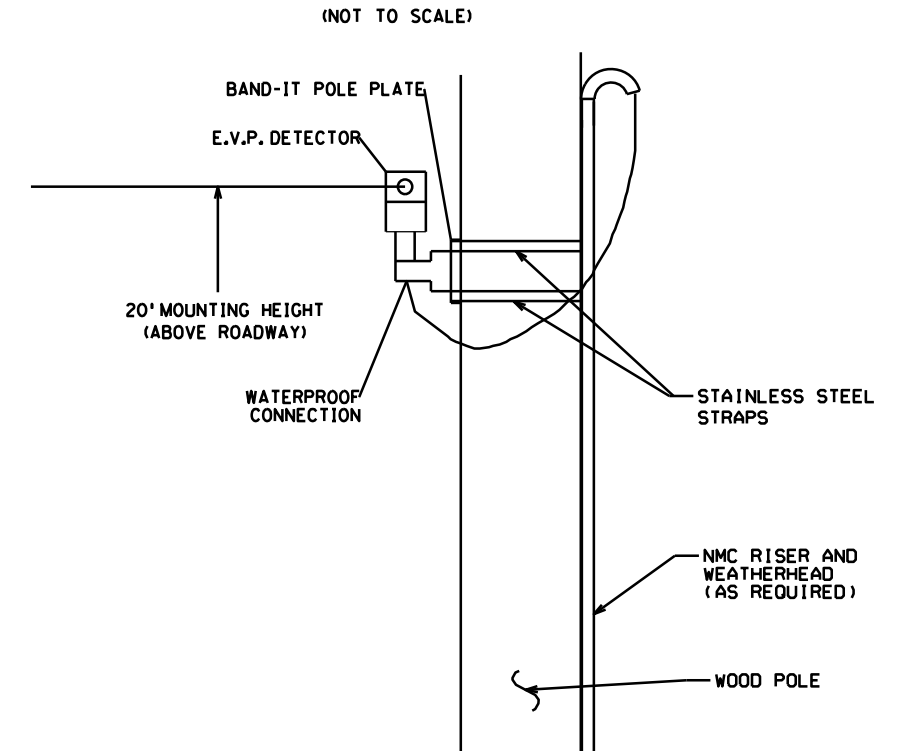
CCTV CAMERA DETAIL  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 194  
 OF  
 206  
 SHEETS

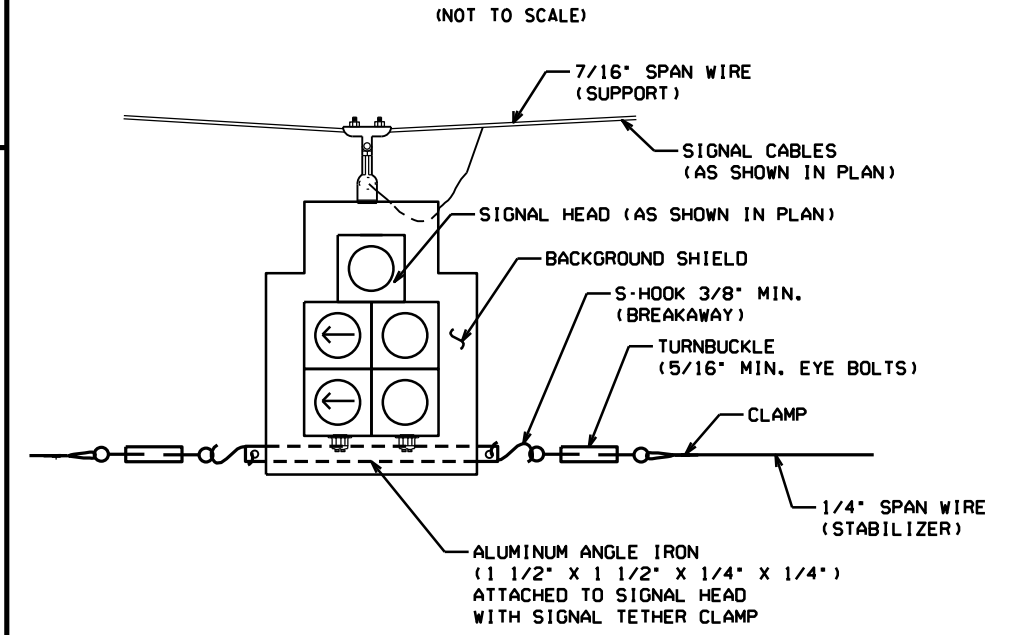
**TYPICAL WOOD POLE AND SPAN WIRE MOUNTED TRAFFIC SIGNALS**



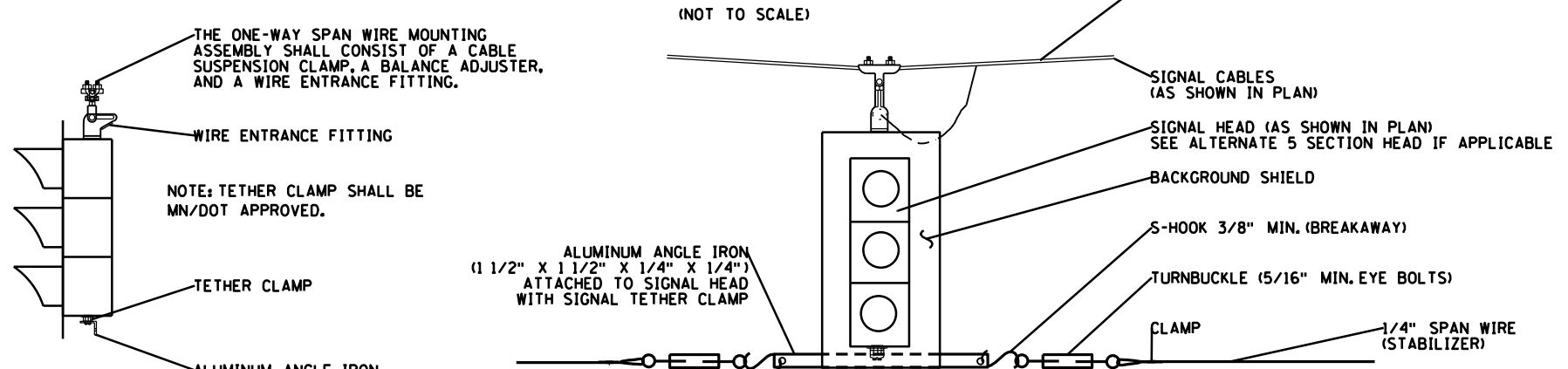
**E.V.P. OR TRAFFIC DETECTOR WOOD POLE MOUNT**



**5 SECTION HEAD OVERHEAD SIGNAL BRACE DETAIL**



**OVERHEAD SIGNAL BRACE DETAIL**



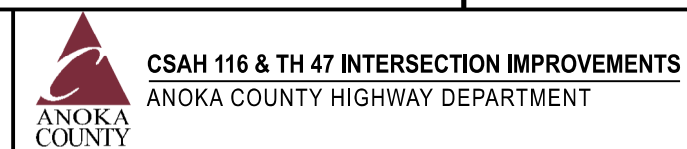
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CERTIFIED BY: *Sean Delmore*  
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
 DATE: 8/25/2020 LICENSE NO. 40945



ANOKA COUNTY, MN

TYPICAL WOOD POLE AND SPAN WIRE MOUNTED TRAFFIC SIGNALS TRAFFIC CONTROL SIGNAL SYSTEM S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 195 OF 206 SHEETS

- NOTES:
- CONDUIT SHALL BE SCHEDULE 80 PVC OR SCHEDULE 80 HDPE.
  - ENSURE THE EXACT LOCATION OF THE HANDHOLES, POLES AND TEMPORARY CABINET BASE ARE VERIFIED IN THE FIELD BY TRAFFIC PERSONNEL.
  - THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE TRAFFIC SIGNAL SYSTEM.
  - THE CONTRACTOR SHALL LOCATE AND VERIFY INPLACE UTILITIES PRIOR TO COMMENCING WORK.
  - REMOVAL OF THE EXISTING SIGNAL SYSTEM IS INCIDENTAL.
  - THE CONTRACTOR SHALL MAINTAIN PED PUSH BUTTONS DURING ALL STAGES OF CONSTRUCTION. IF PUSH BUTTONS NEED TO BE MOUNTED ON SEPARATE POLES DURING CONSTRUCTION, IT IS INCIDENTAL TO THE TEMPORARY TRAFFIC CONTROL SIGNAL PAY ITEM.
  - MOVEMENT OF HEADS AND DETECTORS FOR EACH STAGE OR PHASE OF CONSTRUCTION SHALL BE COMPLETED BY THE CONTRACTOR. COIL A SUFFICIENT LENGTH OF CABLE AT ALL SPAN WIRE MOUNTED SIGNAL FACES, EVP DETECTORS AND INDICATOR LIGHTS TO COORDINATE STAGING SHIFTS. THIS IS INCLUDED IN THE TEMPORARY SIGNAL PAY ITEM.
  - SEE DETAIL SHEET FOR WOOD POLE AND SPAN WIRE MOUNTING DETAILS. ALL NEW CONDUIT SHALL BE PVC - SCHEDULE 80 OR HDPE SCHEDULE 80 AND CARRY 1-1/2 6 INSULATED GROUNDING CONDUCTOR AS SHOWN IN PLAN.
  - ALL WIRES LISTED ARE AWG (AMERICAN WIRE GAUGE).
  - CONDUIT SIZES ARE NOMINAL DIAMETER.
  - SEE SPECIAL PROVISIONS FOR FURNISHED MATERIALS.
  - CONTRACTOR SHALL INSTALL GRIDSART CAMERA ON POLE. LOCATION SHALL BE FIELD VERIFIED BY MNDOR TRAFFIC PERSONAL.

- (A) EQUIPMENT PAD  
SERVICE CABINET  
CONTROLLER AND CABINET  
CONTROLLER CABINET:
- 3" CONDUIT  
8-4/C 14  
4-6/C 14  
2-3/C 14 (EVP)  
2-3/C 20 (EVP)  
4-2/C 14  
1-CAT-5 (MNDOT FURNISHED)  
1-1/2 6 INS. GR.
- 3" CONDUIT:  
8-4/C 14  
4-6/C 14  
2-3/C 14 (EVP)  
2-3/C 20 (EVP)  
4-2/C 14  
1-1/2 6 INS. GR.
- CONTROLLER CABINET TO HH 2:  
2" CONDUIT  
3-1/C 6

- (B) INPLACE WOOD POLE SOP:  
F&I:  
2" CONDUIT FROM HH 2:  
3-1/C 6  
2" CONDUIT FROM HH 2 TO SERVICE CABINET:  
3-1/C 6  
FROM HH 2 TO ABOVE SPAN WIRE ON POLE 1  
2" CONDUIT  
4-3/C 14 (LUM)

- (WP 3)  
45' WOOD POLE  
2-DOWN GUYS, GUARDS AND ANCHORS  
2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
2-PED PUSHBUTTONS AND SIGNS  
1-ONE WAY EVP DETECTOR (PHASE 4 & 7) POLE MOUNTED  
15' MAST ARM AND LUMINAIRE LED  
METAL JUNCTION BOX WITH TERMINAL BLOCK:  
3" CONDUIT  
3-4/C 14  
1-1/2 6  
1-3/C 20 (EVP)  
2-2/C 14  
1-1/2 6 INS. GR.  
1" CONDUIT RISER AND WEATHERHEAD ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

- (WP 2)  
45' WOOD POLE  
2-DOWN GUYS, GUARDS AND ANCHORS  
2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
2-PED PUSHBUTTONS AND SIGNS  
1-ONE WAY EVP DETECTOR (PHASE 2 & 5) POLE MOUNTED  
15' MAST ARM AND LUMINAIRE LED  
METAL JUNCTION BOX WITH TERMINAL BLOCK:  
3" CONDUIT  
3-4/C 14  
1-6/C 14  
1-3/C 20 (EVP)  
2-2/C 14  
1-1/2 6 INS. GR.  
1" CONDUIT RISER AND WEATHERHEAD ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

- (WP 1)  
45' WOOD POLE  
2-DOWN GUYS, GUARDS AND ANCHORS  
2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
2-PED PUSHBUTTONS AND SIGNS  
1-ONE WAY EVP DETECTOR (PHASES 3 & 8) POLE MOUNTED  
1-GRIDSART CAMERA (MNDOT FURNISHED)  
15' MAST ARM AND LUMINAIRE LED  
METAL JUNCTION BOX WITH TERMINAL BLOCK:  
3" CONDUIT RISER AND WEATHERHEAD FROM HH 1 TO SPAN WIRES WITH:  
8-4/C 14  
4-6/C 14  
2-3/C 14 (EVP)  
2-3/C 20 (EVP)  
1-CAT-5 (MNDOT FURNISHED)  
4-2/C 14

- 1-7/16" SPAN WIRE  
1-1/4" SPAN WIRE  
3-4/C 14  
2-6/C 14  
1-3/C 14 (LUM)  
1-3/C 20 (EVP)  
2-2/C 14  
1-1/2 6 INS. GR.

- 1-7/16" SPAN WIRE  
1-1/4" SPAN WIRE  
4-4/C 14  
2-6/C 14  
1-3/C 14 (LUM)  
1-3/C 20 (EVP)  
2-2/C 14  
1-1/2 6 INS. GR.

- 1-7/16" SPAN WIRE  
1-1/4" SPAN WIRE  
7-4/C 14  
3-6/C 14  
2-3/C 14 (LUM)  
1-3/C 14 (EVP)  
2-3/C 20 (EVP)  
4-2/C 14  
1-1/2 6 INS. GR.

- 1-7/16" SPAN WIRE  
1-1/4" SPAN WIRE  
7-4/C 14  
4-6/C 14  
2-3/C 14 (LUM)  
1-3/C 14 (EVP)  
2-3/C 20 (EVP)  
4-2/C 14  
1-1/2 6 INS. GR.

- 1-7/16" SPAN WIRE  
1-1/4" SPAN WIRE  
7-4/C 14  
4-6/C 14  
2-3/C 14 (LUM)  
2-3/C 14 (EVP)  
2-3/C 20 (EVP)  
4-2/C 14  
1-1/2 6 INS. GR.

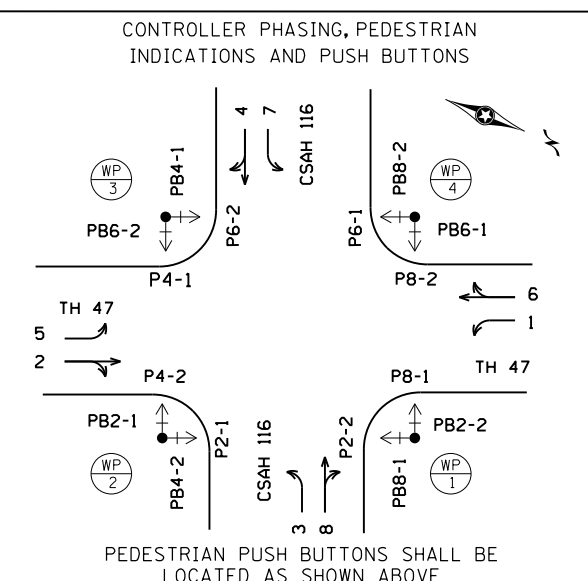
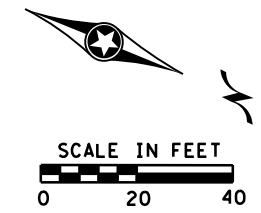
- 1-7/16" SPAN WIRE  
1-1/4" SPAN WIRE  
8-4/C 14  
4-6/C 14  
2-3/C 14 (LUM)  
2-3/C 14 (EVP)  
2-3/C 20 (EVP)  
4-2/C 14  
1-1/2 6 INS. GR.

- 1-7/16" SPAN WIRE  
1-1/4" SPAN WIRE  
5-4/C 14  
3-6/C 14  
1-3/C 14 (LUM)  
2-3/C 14 (EVP)  
1-3/C 20 (EVP)  
2-2/C 14  
1-1/2 6 INS. GR.

- 1-7/16" SPAN WIRE  
1-1/4" SPAN WIRE  
5-4/C 14  
3-6/C 14  
1-3/C 14 (LUM)  
2-3/C 14 (EVP)  
1-3/C 20 (EVP)  
2-2/C 14  
1-1/2 6 INS. GR.

- 1-7/16" SPAN WIRE  
1-1/4" SPAN WIRE  
5-4/C 14  
3-6/C 14  
1-3/C 14 (LUM)  
2-3/C 14 (EVP)  
1-3/C 20 (EVP)  
2-2/C 14  
1-1/2 6 INS. GR.

- (WP 4)  
45' WOOD POLE  
2-DOWN GUYS, GUARDS AND ANCHORS  
2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
2-PED PUSHBUTTONS AND SIGNS  
1-ONE WAY EVP DETECTOR (PHASE 1 & 6) POLE MOUNTED  
15' MAST ARM AND LUMINAIRE LED  
METAL JUNCTION BOX WITH TERMINAL BLOCK:  
3" CONDUIT  
3-4/C 14  
1-6/C 14  
1-3/C 20 (EVP)  
2-2/C 14  
1-1/2 6 INS. GR.  
1" CONDUIT RISER AND WEATHERHEAD ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)



**SIGNAL SYSTEM OPERATION**

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE, WITH PHASES 1, 3, 5 AND 7 BEING FYA BY TIME OF DAY.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

GRIDSART CAMERA

NUMBER	PHASE	LOCATION
V-1	ALL	WP 1

SIGNAL FACE CHART

FACE	R	Y	G	FYA
1-1, 1-2	←	←	←	←
2-1, 2-2	●	●	●	●
3-1, 3-2	←	←	←	←
4-1, 4-2	●	●	●	●
5-1, 5-2	←	←	←	←
6-1, 6-2	●	●	●	●
7-1, 7-2	←	←	←	←
8-1, 8-2	●	●	●	●

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

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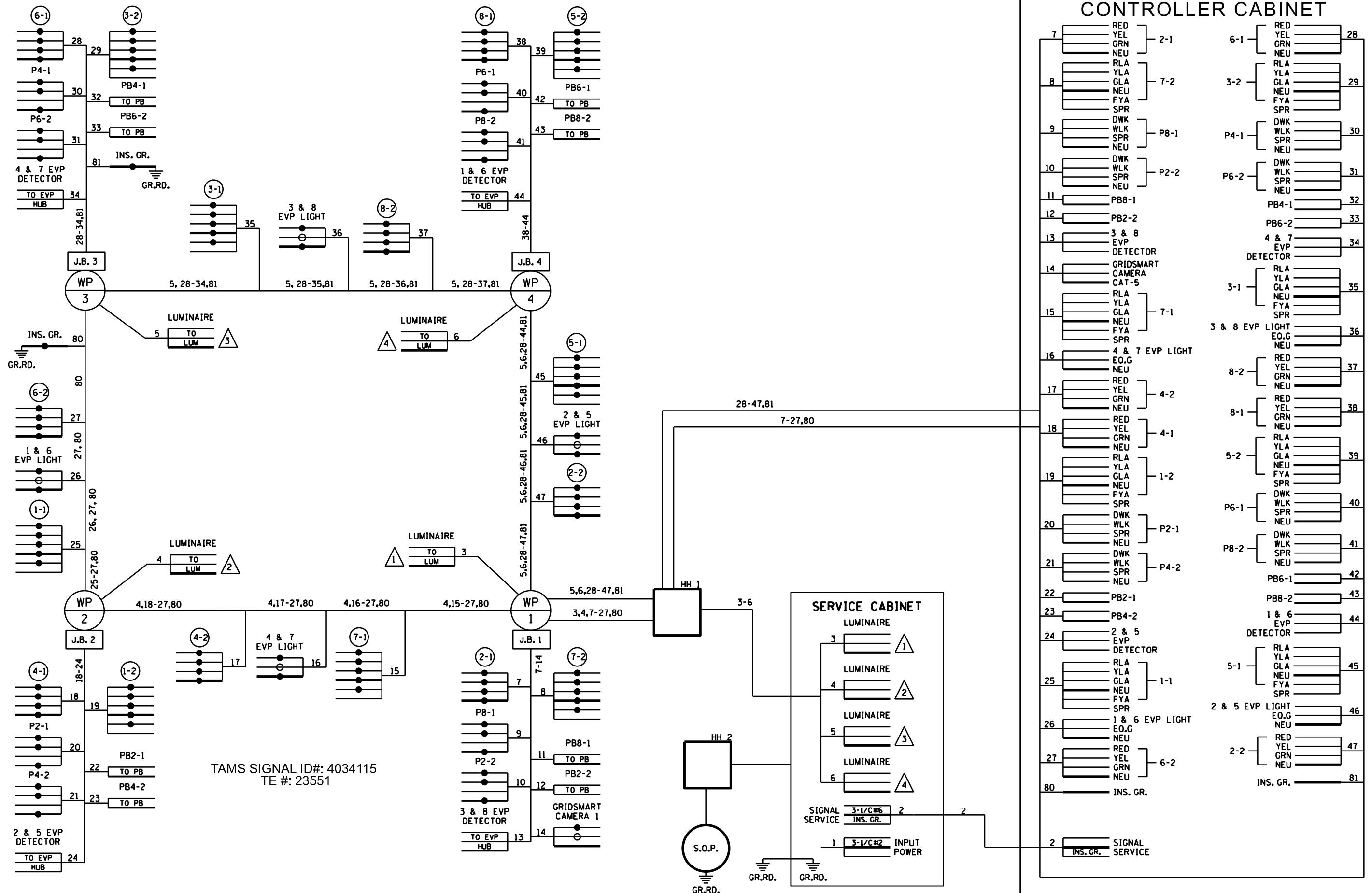


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
TEMPORARY TH 47 & CSAH 116-STAGE 1  
TRAFFIC CONTROL SIGNAL SYSTEM  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
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OF  
206  
SHEETS

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**ANOKA COUNTY**  
 CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 TEMPORARY TH 47 & CSAH 116 WIRING DIAGRAM  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 197  
 OF  
 206  
 SHEETS

**NOTES:**

1. THE CONTRACTOR SHALL MAINTAIN PED PUSH BUTTONS DURING ALL STAGES OF CONSTRUCTION. IF PUSH BUTTONS NEED TO BE MOUNTED ON SEPARATE POLES DURING CONSTRUCTION, IT IS INCIDENTAL TO THE TEMPORARY TRAFFIC CONTROL SIGNAL PAY ITEM.
2. MOVEMENT OF HEADS AND DETECTORS FOR EACH STAGE OR PHASE OF CONSTRUCTION SHALL BE COMPLETED BY THE CONTRACTOR. COIL A SUFFICIENT LENGTH OF CABLE AT ALL SPAN WIRE MOUNTED SIGNAL FACES, EVP DETECTORS AND INDICATOR LIGHTS TO COORDINATE STAGING SHIFTS. THIS IS INCLUDED IN THE TEMPORARY SIGNAL PAY ITEM.

**WP 3**  
 45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASE 4 & 7) POLE MOUNTED  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT  
 3-4/C 14  
 1-1/C 6  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

**WP 4**  
 45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASE 1 & 6) POLE MOUNTED  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT  
 3-4/C 14  
 1-6/C 14  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

**(A) EQUIPMENT PAD**  
 SERVICE CABINET  
 CONTROLLER AND CABINET  
 CONTROLLER CABINET:  
 3" CONDUIT  
 8-4/C 14  
 4-6/C 14  
 2-3/C 14 (EVP)  
 2-3/C 20 (EVP)  
 4-2/C 14  
 1-CAT-5  
 (MNDOT FURNISHED)  
 1-1/C 6 INS. GR.

3" CONDUIT:  
 8-4/C 14  
 4-6/C 14  
 2-3/C 14 (EVP)  
 2-3/C 20 (EVP)  
 4-2/C 14  
 1-1/C 6 INS. GR.

CONTROLLER CABINET TO HH 2:  
 2" CONDUIT  
 3-1/C 6

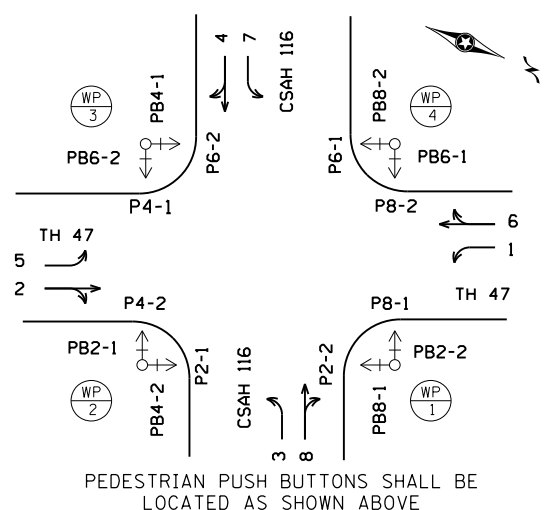
**(B) INPLACE WOOD POLE SOP:**  
 F&I:  
 2" CONDUIT FROM HH 2:  
 3-1/C 6  
 2" CONDUIT FROM HH 2 TO  
 SERVICE CABINET:  
 3-1/C 6  
 FROM HH 2 TO ABOVE SPAN WIRE ON POLE 1  
 2" CONDUIT  
 4-3/C 14 (LUM)

**WP 2**  
 45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASE 2 & 5) POLE MOUNTED  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT  
 3-4/C 14  
 1-6/C 14  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

**WP 1**  
 45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASES 3 & 8)  
 POLE MOUNTED  
 1-GRIDSMA RT CAMERA (MNDOT FURNISHED)  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT RISER AND WEATHERHEAD FROM  
 HH 1 TO SPAN WIRES WITH:  
 8-4/C 14  
 4-6/C 14  
 2-3/C 14 (EVP)  
 2-3/C 20 (EVP)  
 1-CAT-5  
 (MNDOT FURNISHED)  
 4-2/C 14

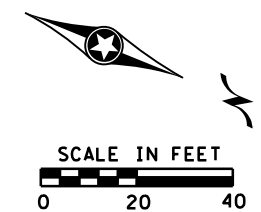
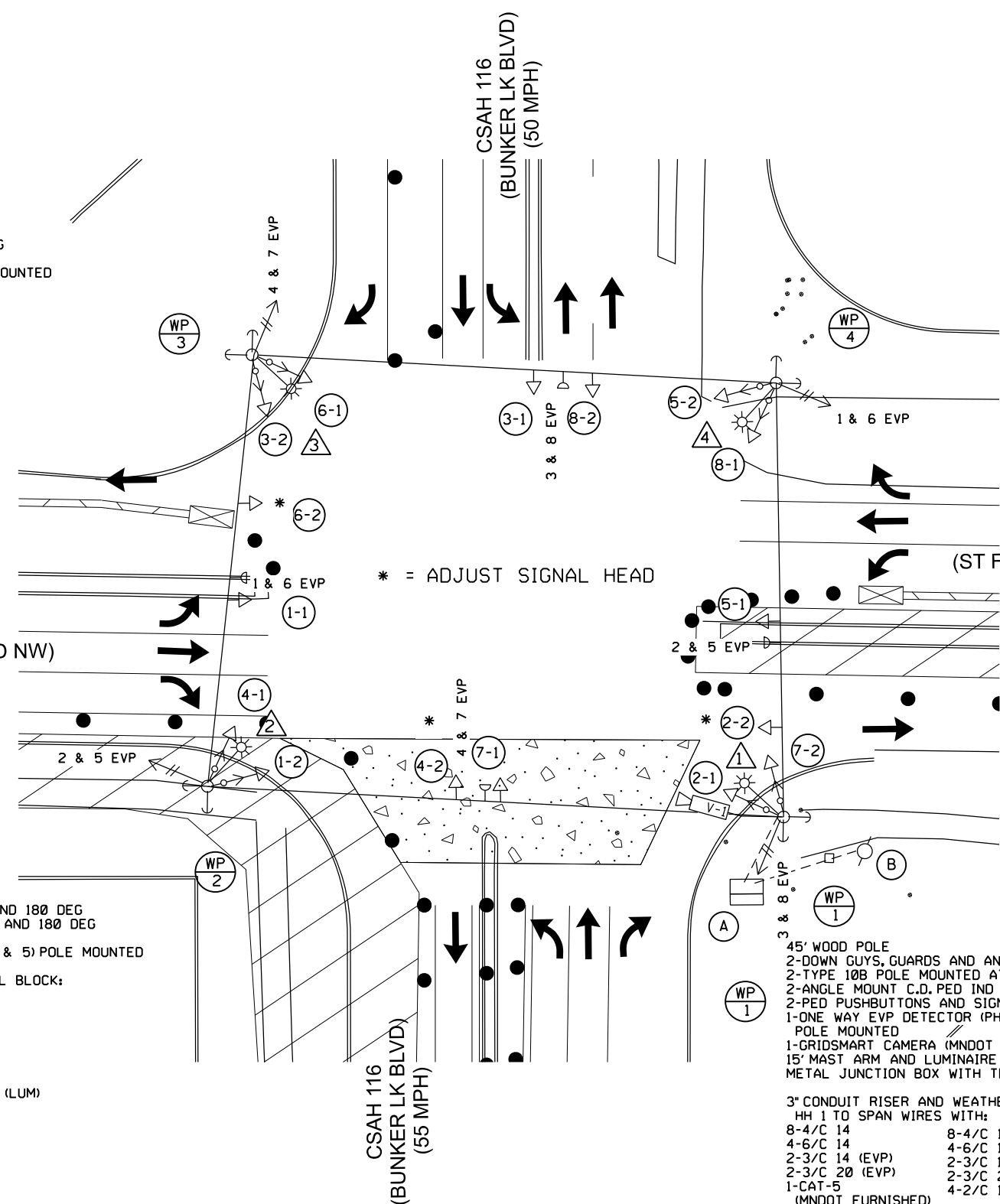
3" CONDUIT ABOVE JUNCTION BOX WITH:  
 3-4/C 14  
 1-6/C 14  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-CAT-5  
 (MNDOT FURNISHED)  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

**CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS**



**SIGNAL SYSTEM OPERATION**

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE, WITH PHASES 1,3,5 AND 7 BEING FYA BY TIME OF DAY.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.



TAMS SIGNAL ID #: 4034115  
 TE#: 23551

GRIDSMA RT CAMERA		
NUMBER	PHASE	LOCATION
V-1	ALL	WP 1

SIGNAL FACE CHART				
FACE	R	Y	G	FYA
1-1, 1-2	←	←	←	←
2-1, 2-2	○	○	○	
3-1, 3-2	←	←	←	←
4-1, 4-2	○	○	○	
5-1, 5-2	←	←	←	←
6-1, 6-2	○	○	○	
7-1, 7-2	←	←	←	←
8-1, 8-2	○	○	○	

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

DATE: 8/25/2020 2:19:47 PM PATH & FILENAME: Projects\Minnesota\014652-000\CadPlan\4652-000\_sil2.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MS  
 Plan By: ES  
 Checked By: SD  
 Approved By: SD

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

CERTIFIED BY: *Sean Delmore*  
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
 DATE: 8/25/2020 LICENSE NO. 40945



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 TEMPORARY TH 47 & CSAH 116 -STAGE 2  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 198  
 OF  
 206  
 SHEETS

**NOTES:**

1. THE CONTRACTOR SHALL MAINTAIN PED PUSH BUTTONS DURING ALL STAGES OF CONSTRUCTION. IF PUSH BUTTONS NEED TO BE MOUNTED ON SEPARATE POLES DURING CONSTRUCTION, IT IS INCIDENTAL TO THE TEMPORARY TRAFFIC CONTROL SIGNAL PAY ITEM.
2. MOVEMENT OF HEADS AND DETECTORS FOR EACH STAGE OR PHASE OF CONSTRUCTION SHALL BE COMPLETED BY THE CONTRACTOR. COIL A SUFFICIENT LENGTH OF CABLE AT ALL SPAN WIRE MOUNTED SIGNAL FACES, EVP DETECTORS AND INDICATOR LIGHTS TO COORDINATE STAGING SHIFTS. THIS IS INCLUDED IN THE TEMPORARY SIGNAL PAY ITEM.

45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASE 4 & 7) POLE MOUNTED  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT  
 3-4/C 14  
 1-1/C 6  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

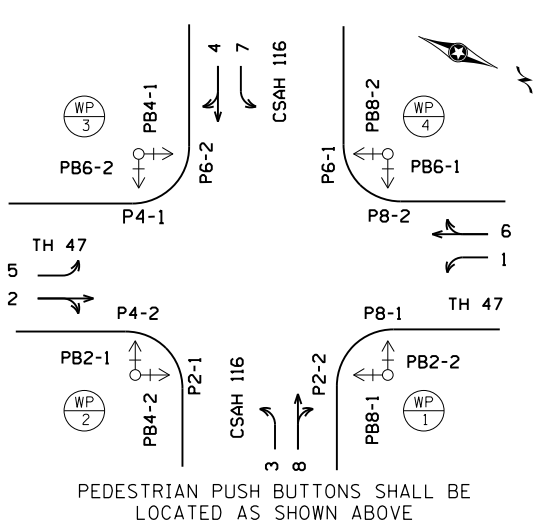
45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASE 1 & 6) POLE MOUNTED  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT  
 3-4/C 14  
 1-6/C 14  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

**(A) EQUIPMENT PAD**  
 SERVICE CABINET  
 CONTROLLER AND CABINET  
 CONTROLLER CABINET:  
 3" CONDUIT:  
 8-4/C 14  
 4-6/C 14  
 2-3/C 14 (EVP)  
 2-3/C 20 (EVP)  
 4-2/C 14  
 1-CAT-5  
 (MNDOT FURNISHED)  
 1-1/C 6 INS. GR.  
 CONTROLLER CABINET TO HH 2:  
 2" CONDUIT  
 3-1/C 6

**(B) INPLACE WOOD POLE SOP:**  
 F&I:  
 2" CONDUIT FROM HH 2:  
 3-1/C 6  
 2" CONDUIT FROM HH 2 TO  
 SERVICE CABINET:  
 3-1/C 6  
 FROM HH 2 TO ABOVE SPAN WIRE ON POLE 1  
 2" CONDUIT  
 4-3/C 14 (LUM)

45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASE 2 & 5) POLE MOUNTED  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT  
 3-4/C 14  
 1-6/C 14  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

**CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS**



**SIGNAL SYSTEM OPERATION**

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE, WITH PHASES 1,3,5 AND 7 BEING FYA BY TIME OF DAY.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

TH 47  
 (ST FRANCIS BLVD NW)  
 (45 MPH)

TH 47  
 (ST FRANCIS BLVD NW)  
 (45 MPH)

CSAH 116  
 (BUNKER LK BLVD)  
 (55 MPH)

CSAH 116  
 (BUNKER LK BLVD)  
 (50 MPH)

\* = ADJUST SIGNAL HEAD



SCALE IN FEET  
 0 20 40

TAMS SIGNAL ID #: 4034115  
 TE#: 23551

GRIDSMA RT CAMERA		
NUMBER	PHASE	LOCATION
V-1	ALL	WP 1

SIGNAL FACE CHART				
FACE	R	Y	G	FYA
1-1, 1-2	←	←	←	←
2-1, 2-2	○	○	○	
3-1, 3-2	←	←	←	←
4-1, 4-2	○	○	○	
5-1, 5-2	←	←	←	←
6-1, 6-2	○	○	○	
7-1, 7-2	←	←	←	←
8-1, 8-2	○	○	○	

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

DATE: 8/25/2020 2:49:54 PM PATH & FILENAME: Projects\MnDOT\04652-000\CadPlan\4652-000\_sil3.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MS  
 Plan By: ES  
 Checked By: SD  
 Approved By: SD

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

CERTIFIED BY: *Sean Delmore*  
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
 DATE: 8/25/2020 LICENSE NO. 40945



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 TEMPORARY TH 47 & CSAH 116 -STAGE 3  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 199  
 OF  
 206  
 SHEETS

**NOTES:**

1. THE CONTRACTOR SHALL MAINTAIN PED PUSH BUTTONS DURING ALL STAGES OF CONSTRUCTION. IF PUSH BUTTONS NEED TO BE MOUNTED ON SEPARATE POLES DURING CONSTRUCTION, IT IS INCIDENTAL TO THE TEMPORARY TRAFFIC CONTROL SIGNAL PAY ITEM.
2. MOVEMENT OF HEADS AND DETECTORS FOR EACH STAGE OR PHASE OF CONSTRUCTION SHALL BE COMPLETED BY THE CONTRACTOR. COIL A SUFFICIENT LENGTH OF CABLE AT ALL SPAN WIRE MOUNTED SIGNAL FACES, EVP DETECTORS AND INDICATOR LIGHTS TO COORDINATE STAGING SHIFTS. THIS IS INCLUDED IN THE TEMPORARY SIGNAL PAY ITEM.
3. COMPLETE STAGE 4 UNDER TRAFFIC.

45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASE 4 & 7) POLE MOUNTED  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT  
 3-4/C 14  
 1-1/C 6  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASE 1 & 6) POLE MOUNTED  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT  
 3-4/C 14  
 1-6/C 14  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

**(A) EQUIPMENT PAD**  
 SERVICE CABINET  
 CONTROLLER AND CABINET  
 CONTROLLER CABINET:  
 3" CONDUIT  
 8-4/C 14  
 4-6/C 14  
 2-3/C 14 (EVP)  
 2-3/C 20 (EVP)  
 4-2/C 14  
 1-CAT-5  
 (MNDOT FURNISHED)  
 1-1/C 6 INS. GR.

3" CONDUIT:  
 8-4/C 14  
 4-6/C 14  
 2-3/C 14 (EVP)  
 2-3/C 20 (EVP)  
 4-2/C 14  
 1-1/C 6 INS. GR.

CONTROLLER CABINET TO HH 2:  
 2" CONDUIT  
 3-1/C 6

**(B) INPLACE WOOD POLE SOP:**  
 F&I:  
 2" CONDUIT FROM HH 2:  
 3-1/C 6  
 2" CONDUIT FROM HH 2 TO  
 SERVICE CABINET:  
 3-1/C 6  
 FROM HH 2 TO ABOVE SPAN WIRE ON POLE 1  
 2" CONDUIT  
 4-3/C 14 (LUM)

45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASE 2 & 5) POLE MOUNTED  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT  
 3-4/C 14  
 1-6/C 14  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

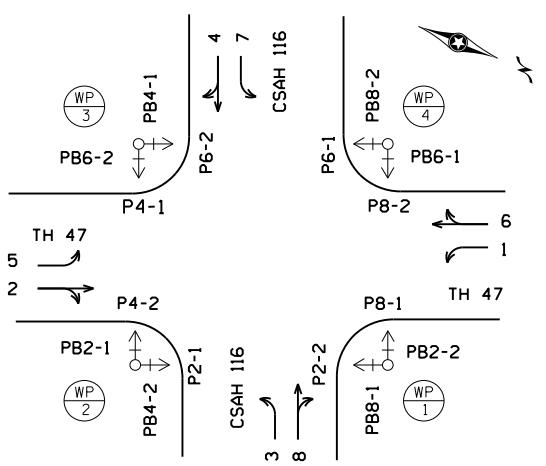
45' WOOD POLE  
 2-DOWN GUYS, GUARDS AND ANCHORS  
 2-TYPE 10B POLE MOUNTED AT 90 AND 180 DEG  
 2-ANGLE MOUNT C.D. PED IND AT 90 AND 180 DEG  
 2-PED PUSHBUTTONS AND SIGNS  
 1-ONE WAY EVP DETECTOR (PHASES 3 & 8)  
 POLE MOUNTED  
 1-GRIDSMArt CAMERA (MNDOT FURNISHED)  
 15' MAST ARM AND LUMINAIRE LED  
 METAL JUNCTION BOX WITH TERMINAL BLOCK:  
 3" CONDUIT RISER AND WEATHERHEAD FROM  
 HH 1 TO SPAN WIRES WITH:  
 8-4/C 14  
 4-6/C 14  
 2-3/C 14 (EVP)  
 2-3/C 20 (EVP)  
 1-CAT-5  
 (MNDOT FURNISHED)  
 4-2/C 14

3" CONDUIT ABOVE JUNCTION BOX WITH:  
 3-4/C 14  
 1-6/C 14  
 1-3/C 20 (EVP)  
 2-2/C 14  
 1-CAT-5  
 (MNDOT FURNISHED)  
 1-1/C 6 INS. GR.  
 1" CONDUIT RISER AND WEATHERHEAD  
 ABOVE SPAN WIRE WITH: 1-3/C 14 (LUM)

**SIGNAL SYSTEM OPERATION**

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE, WITH PHASES 1,3,5 AND 7 BEING FYA BY TIME OF DAY.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

**CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS**



PEDESTRIAN PUSH BUTTONS SHALL BE LOCATED AS SHOWN ABOVE

DATE: 8/25/2020 2:20:00 PM PATH & FILENAME: Projects\Minnesota\014652-000\Coord\Plan\4652-000\_sil4.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MS  
 Plan By: ES  
 Checked By: SD  
 Approved By: SD

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

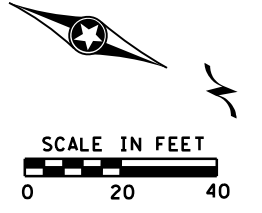
CERTIFIED BY: *Sean Delmore*  
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
 DATE: 8/25/2020 LICENSE NO. 40945



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 TEMPORARY TH 47 & CSAH 116 -STAGE 4  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 200  
 OF  
 206  
 SHEETS



TAMS SIGNAL ID #: 4034115  
 TE#: 23551

GRIDSMArt CAMERA		
NUMBER	PHASE	LOCATION
V-1	ALL	WP 1

SIGNAL FACE CHART				
FACE	R	Y	G	FYA
1-1, 1-2	◀	◀	◀	◀
2-1, 2-2	○	○	○	○
3-1, 3-2	◀	◀	◀	◀
4-1, 4-2	○	○	○	○
5-1, 5-2	◀	◀	◀	◀
6-1, 6-2	○	○	○	○
7-1, 7-2	◀	◀	◀	◀
8-1, 8-2	○	○	○	○

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



- NOTES:
- SEE SPECIAL PROVISIONS FOR DEPARTMENT FURNISHED MATERIALS.
  - THE EXACT LOCATION OF HANDHOLES, POLES, PEDESTAL POLES, DETECTORS, AND PUSH BUTTON STATIONS, SHALL BE VERIFIED IN THE FIELD BY TRAFFIC OFFICE PERSONNEL.
  - THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE CONNECTION OF THE POWER FOR THE TRAFFIC SIGNAL.
  - FOR TYPE D SIGNS SEE DETAIL SHEET. ALL SIGNS REQUIRED ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL SIGNAL SYSTEM PAY ITEM.
  - PAVEMENT MARKINGS ARE INCLUDED IN PAVEMENT MARKING PLAN.
  - CONSTRUCTION OF PEDESTRIAN CURB RAMPS ARE PART OF THE CONSTRUCTION PLAN AND ARE NOT INCLUDED IN PAYMENT FOR THE SIGNAL SYSTEM.
  - THIS PLAN SPECIFIES CONDUIT SIZES, TYPES, AND GENERAL LOCATIONS. THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD. CONDUITS UNDER THE ROADWAYS MAY REQUIRE BORING.
  - ALL NEW CONDUIT SHALL BE PVC - SCHEDULE 80 OR HDPE SCHEDULE 80 AND SHALL CARRY 1/C#6 GREEN INSULATED GROUNDING CONDUCTOR AS SHOWN IN THE PLAN.
  - ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
  - ALL SIGNAL INDICATION BACKGROUND SHIELDS SHALL HAVE A 2" REFLECTIVE BORDER ON THEM. ALL BACKGROUND SHIELDS WILL ALSO HAVE CURVED EDGES.

PED PB STATION  
1-APS PB AND SIGN  
(RT ARROW) (PB6-2)  
EXTEND INTO HH 9:  
1-2/C 14  
1-1/C 6 INS. GR.

PED PB STATION  
1-APS PB AND SIGN  
(LT ARROW) (PB4-1)  
EXTEND INTO HH 8:  
1-2/C 14  
1-1/C 6 INS. GR.

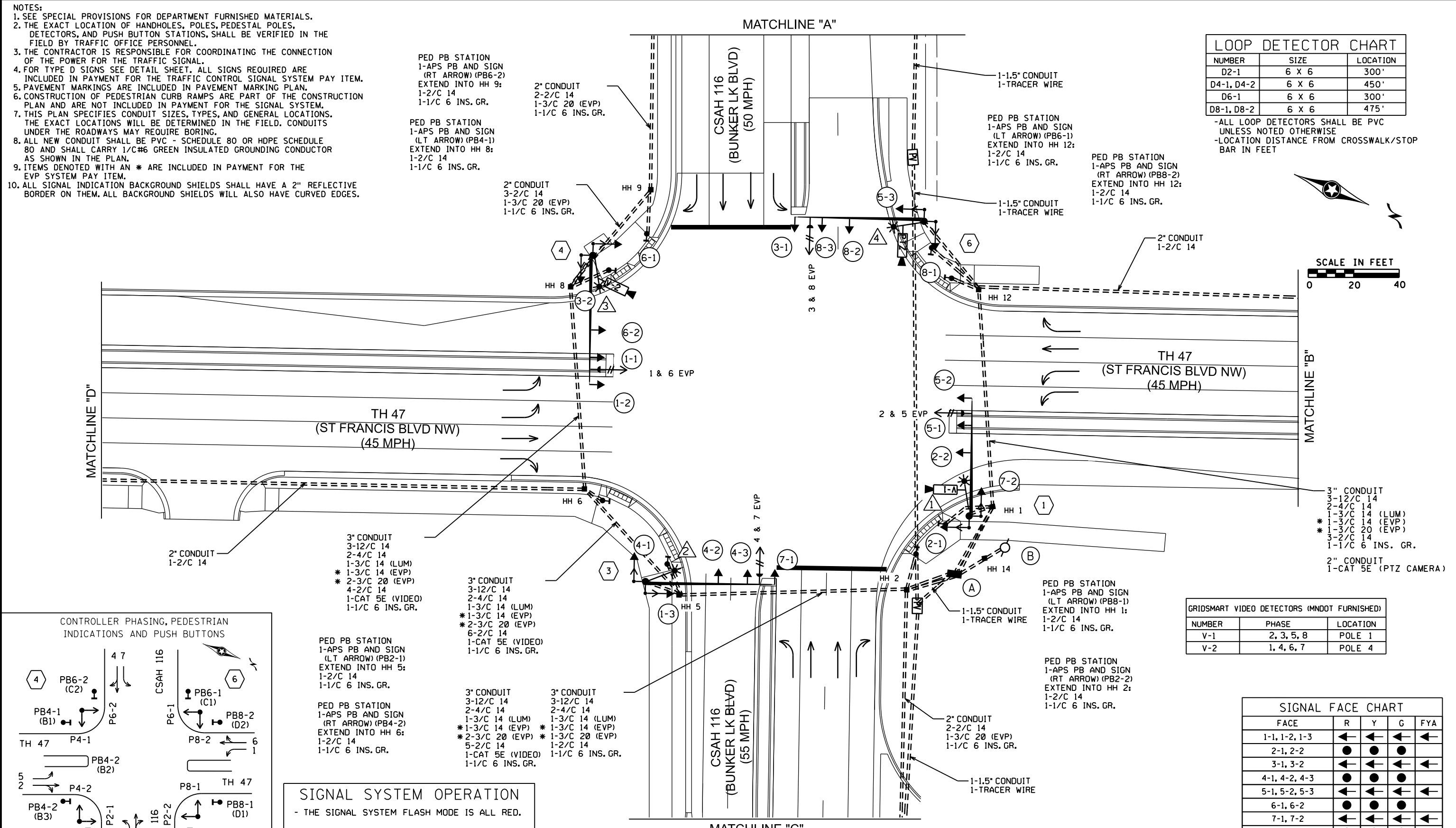
2" CONDUIT  
3-2/C 14  
1-3/C 20 (EVP)  
1-1/C 6 INS. GR.

PED PB STATION  
1-APS PB AND SIGN  
(LT ARROW) (PB6-1)  
EXTEND INTO HH 12:  
1-2/C 14  
1-1/C 6 INS. GR.

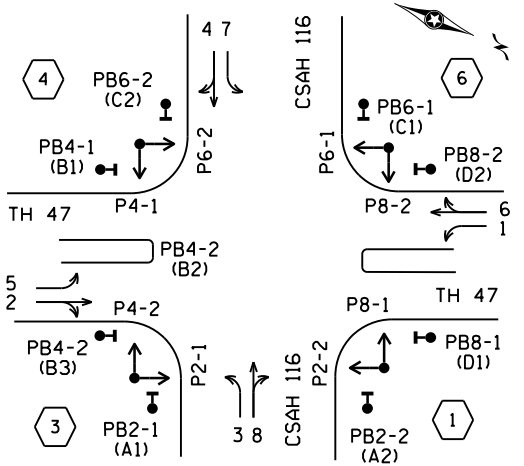
PED PB STATION  
1-APS PB AND SIGN  
(RT ARROW) (PB8-2)  
EXTEND INTO HH 12:  
1-2/C 14  
1-1/C 6 INS. GR.

LOOP DETECTOR CHART		
NUMBER	SIZE	LOCATION
D2-1	6 X 6	300'
D4-1, D4-2	6 X 6	450'
D6-1	6 X 6	300'
D8-1, D8-2	6 X 6	475'

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



CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



PED PB STATION  
1-APS PB AND SIGN  
(LT ARROW) (PB2-1)  
EXTEND INTO HH 5:  
1-2/C 14  
1-1/C 6 INS. GR.

PED PB STATION  
1-APS PB AND SIGN  
(RT ARROW) (PB4-2)  
EXTEND INTO HH 6:  
1-2/C 14  
1-1/C 6 INS. GR.

3" CONDUIT  
3-12/C 14  
2-4/C 14  
1-3/C 14 (LUM)  
\* 1-3/C 14 (EVP)  
\* 2-3/C 20 (EVP)  
1-CAT 5E (VIDEO)  
1-1/C 6 INS. GR.

3" CONDUIT  
3-12/C 14  
2-4/C 14  
1-3/C 14 (LUM)  
\* 1-3/C 14 (EVP)  
\* 2-3/C 20 (EVP)  
1-CAT 5E (VIDEO)  
1-1/C 6 INS. GR.

3" CONDUIT  
3-12/C 14  
2-4/C 14  
1-3/C 14 (LUM)  
\* 1-3/C 14 (EVP)  
\* 2-3/C 20 (EVP)  
1-CAT 5E (VIDEO)  
1-1/C 6 INS. GR.

PED PB STATION  
1-APS PB AND SIGN  
(LT ARROW) (PB8-1)  
EXTEND INTO HH 1:  
1-2/C 14  
1-1/C 6 INS. GR.

PED PB STATION  
1-APS PB AND SIGN  
(RT ARROW) (PB2-2)  
EXTEND INTO HH 2:  
1-2/C 14  
1-1/C 6 INS. GR.

GRIDSART VIDEO DETECTORS (MNDOT FURNISHED)		
NUMBER	PHASE	LOCATION
V-1	2, 3, 5, 8	POLE 1
V-2	1, 4, 6, 7	POLE 4

SIGNAL FACE CHART				
FACE	R	Y	G	FYA
1-1, 1-2, 1-3	←	←	←	←
2-1, 2-2	●	●	●	
3-1, 3-2	←	←	←	←
4-1, 4-2, 4-3	●	●	●	
5-1, 5-2, 5-3	←	←	←	←
6-1, 6-2	●	●	●	
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

SIGNAL SYSTEM OPERATION

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 8 PHASE, WITH PHASES 1,3,5 AND 7 BEING BY TIME OF DAY.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

TAMS SIGNAL ID #: 1736055

DATE: 8/25/2020 2:20:06 PM PATH & FILENAME: Projects\Mnstate\014652-000\Cad\Plan\4652-000\_sil5.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MS  
Plan By: ES  
Checked By: SD  
Approved By: SD

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

CERTIFIED BY: *Sean Delmore*  
LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
DATE: 8/25/2020 LICENSE NO. 40945

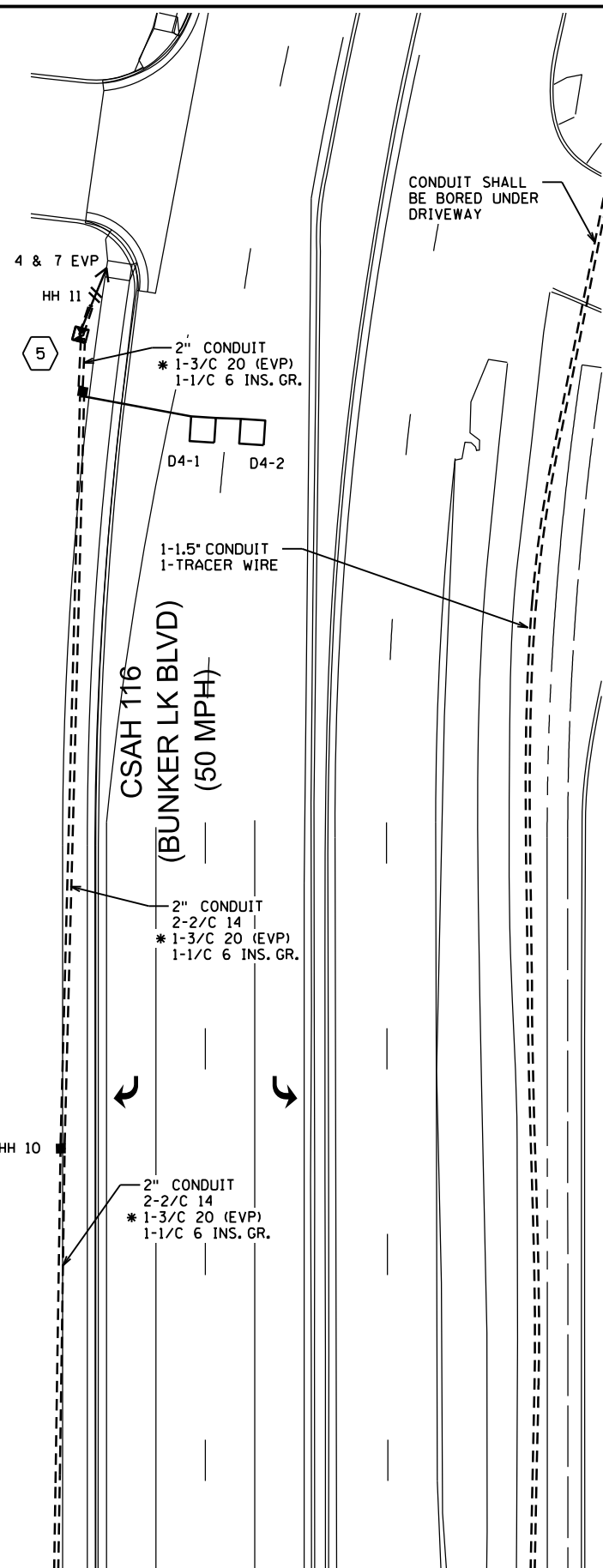


**ANOKA COUNTY**  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
TH 47 & CSAH 116 INTERSECTION LAYOUT  
TRAFFIC CONTROL SIGNAL SYSTEM  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

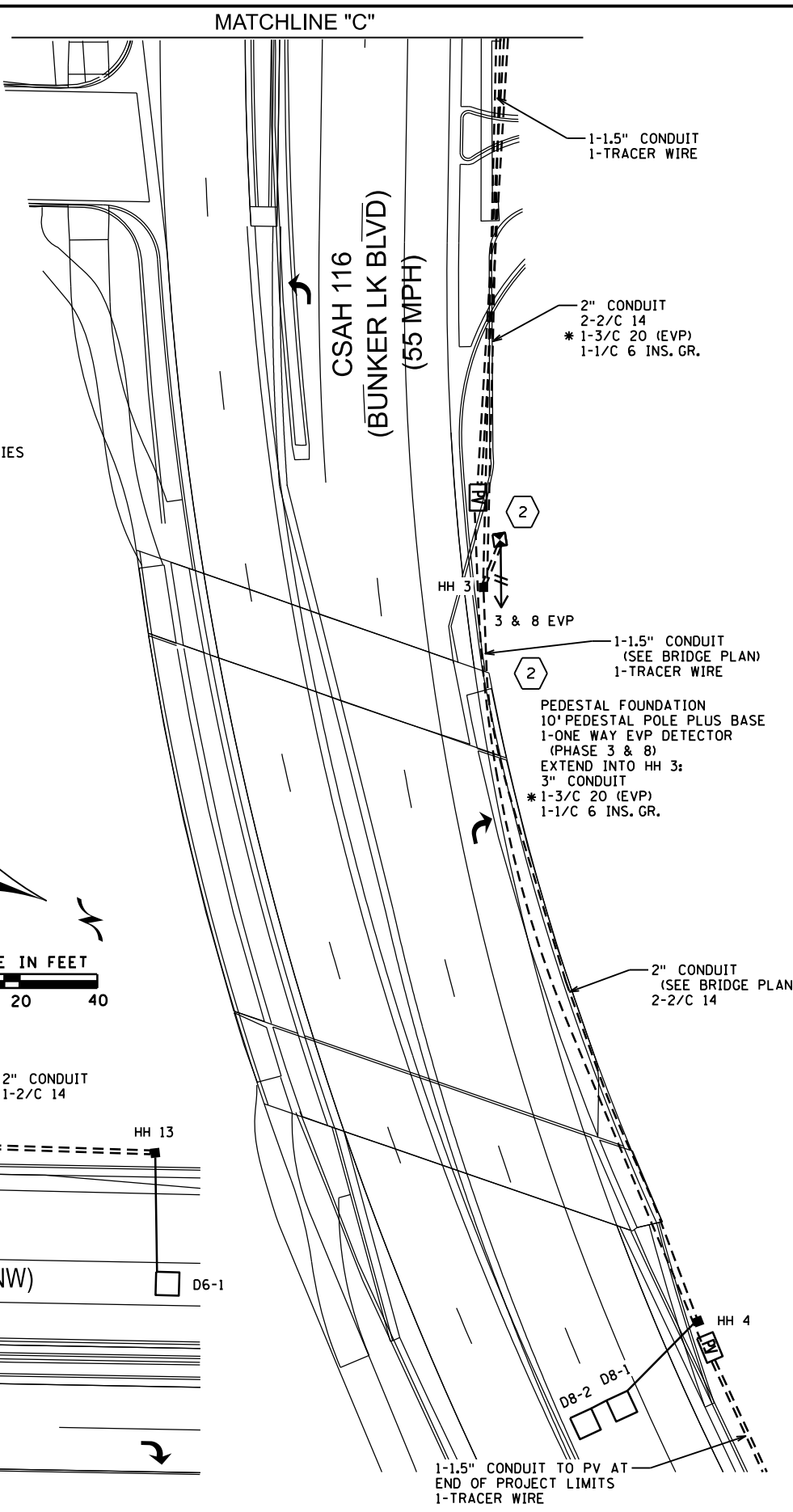
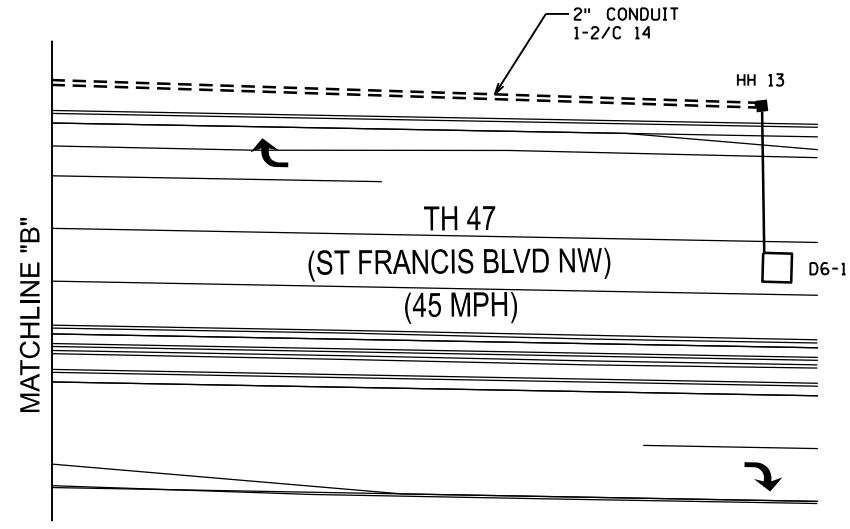
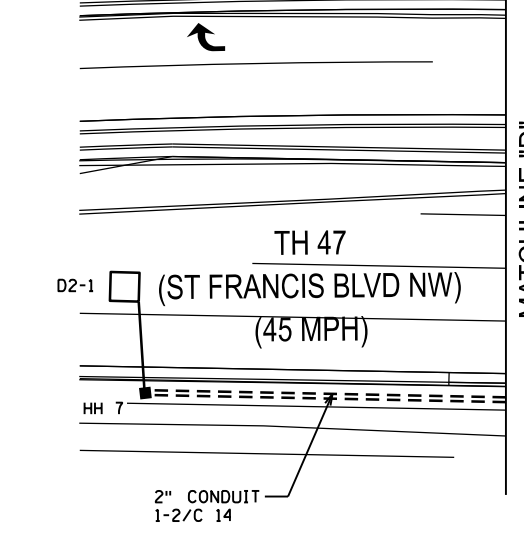
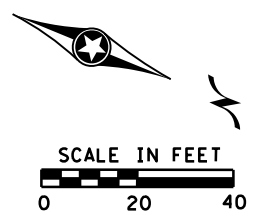
SHEET  
201  
OF  
206  
SHEETS

MATCHLINE "C"



- 1 PA100 POLE FOUNDATION  
TYPE PA100-A-50-D40-9 (DAVIT AT 350 DEG)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
2-STRAIGHT MOUNT SIGNAL OVERHEAD AT 11' AND 23'  
2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG  
2-ANGLE MOUNT C. D. PED INDS AT 90 AND 180 DEG  
LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)  
1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 2 & 5)  
1-VIDEO CAMERA (MOUNTED ON LUMINAIRE EXTENSION)  
1-R10-X12 SIGN ADJACENT TO SIGNAL HEAD (5-2)  
TYPE D SIGNS-SEE MAST ARM SIGNING SHEET  
EXTEND INTO HH 1:  
3" CONDUIT  
3-12/C 14  
2-4/C 14  
1-3/C 14 (LUM)  
\* 1-3/C 14 (EVP)  
\* 1-3/C 20 (EVP)  
1-CAT 5E (VIDEO)  
1-1/C 6 INS. GR.
- 3 PA100 POLE FOUNDATION  
TYPE PA100-A-55-D40-9 (DAVIT AT 350 DEG)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
2-STRAIGHT MOUNT OVERHEAD AT 11' AND 23'  
2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG  
2-ANGLE MOUNT C. D. PED INDS AT 90 AND 180 DEG  
1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASE 4 & 7)  
LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)  
1-INJECTOR INSTALLED IN T-BASE (MNDOT FURNISHED)  
1-R10-X12 SIGN ADJACENT TO SIGNAL HEAD (7-1)  
TYPE D SIGNS-SEE MAST ARM SIGNING SHEET  
EXTEND INTO HH 5:  
3" CONDUIT  
3-12/C 14  
2-4/C 14  
1-3/C 14 (LUM)  
\* 1-3/C 14 (EVP)  
\* 1-3/C 20 (EVP)  
1-1/C 6 INS. GR.
- 4 PA100 POLE FOUNDATION  
TYPE PA100-A-55-D40-9 (DAVIT AT 350 DEG)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
2-STRAIGHT MOUNT OVERHEAD AT 11' AND 23'  
2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG  
2-ANGLE MOUNT C. D. PED INDS AT 90 AND 180 DEG  
1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASES 1 & 6)  
LUMINAIRE-LED (FOR 40' MOUNTING HEIGHT)  
1-VIDEO CAMERA (MOUNTED ON LUMINAIRE EXTENSION)  
1-R10-X12 SIGN ADJACENT TO SIGNAL HEAD (1-2)  
TYPE D SIGNS-SEE MAST ARM SIGNING SHEET  
EXTEND INTO HH 8:  
3" CONDUIT  
3-12/C 14  
2-4/C 14  
1-3/C 14 (LUM)  
\* 1-3/C 14 (EVP)  
\* 1-3/C 20 (EVP)  
1-CAT 5E (VIDEO)  
1-1/C 6 INS. GR.
- 5 PEDESTAL FOUNDATION  
10' PEDESTAL POLE PLUS BASE  
1-ONE WAY EVP DETECTOR (PHASE 4 & 7)  
EXTEND INTO HH 11:  
3" CONDUIT  
\* 1-3/C 20 (EVP)  
1-1/C 6 INS. GR.
- 6 PA100 POLE FOUNDATION  
TYPE PA100-A-55-X6-350/CAM 400 (DAVIT AT 350 DEG)  
1-ANGLE MOUNT SIGNAL OVERHEAD AT 0'  
2-STRAIGHT MOUNT OVERHEAD AT 11' AND 23'  
2-ANGLE MOUNT SIGNALS AT 90 AND 180 DEG  
2-ANGLE MOUNT C. D. PED INDS AT 90 AND 180 DEG  
1-ONE WAY EVP DETECTOR AND CONFIRMATORY LIGHT (PHASE 3 & 8)  
LUMINAIRE-LED  
1-PTZ CAMERA AND EQUIPMENT (MNDOT FURNISHED)  
1-R10-X12 SIGN ADJACENT TO SIGNAL HEAD (3-1)  
TYPE D SIGNS-SEE MAST ARM SIGNING SHEET  
EXTEND INTO HH 12:  
3" CONDUIT  
3-12/C 14  
2-4/C 14  
1-3/C 14 (LUM)  
\* 1-3/C 14 (EVP)  
\* 1-3/C 20 (EVP)  
1-CAT 5E (PTZ CAMERA)  
1-1/C 6 INS. GR.

- A EQUIPMENT PAD (SEE DETAIL SHEET)  
SERVICE CABINET (SSB) BATTERY BACKUP SYSTEM AND BATTERIES  
CONTROLLER AND CABINET  
3" CONDUIT TO HH 1:  
3-12/C 14  
2-4/C 14  
\* 1-3/C 14 (EVP)  
\* 1-3/C 20 (EVP)  
3-2/C 14  
1-CAT 5E (VIDEO)  
1-1/C 6 INS. GR.  
3" CONDUIT TO HH 1:  
3-12/C 14  
2-4/C 14  
\* 1-3/C 14 (EVP)  
\* 1-3/C 20 (EVP)  
1-2/C 14
- 3" CONDUIT TO HH 2:  
3-12/C 14  
2-4/C 14  
\* 1-3/C 14 (EVP)  
\* 2-3/C 20 (EVP)  
6-2/C 14  
1-CAT 5E (VIDEO)  
1-1/C 6 INS. GR.  
3" CONDUIT TO HH 2:  
3-12/C 14  
2-4/C 14  
\* 1-3/C 14 (EVP)  
\* 2-3/C 20 (EVP)  
4-2/C 14
- 2" CONDUIT TO HH 1:  
1-CAT 5E (PTZ CAMERA)
- GROUND WIRE AND GROUND ROD - MIN 8' OUT FROM PAD  
2-2" AND 1-3" CONDUIT STUBBED OUT (CAPPED BOTH ENDS)  
1-2" CONDUIT TO PV-1  
1-FO PIGTAIL (6SM)  
CABINET TO SERVICE CABINET:  
2" CONDUIT  
3-1/C 6  
SERVICE CABINET TO SOP:  
2" CONDUIT  
3-1/C 2  
SERVICE CABINET TO HH 1:  
2" CONDUIT  
2-3/C 14 (LUM)  
SERVICE CABINET TO HH 2:  
2" CONDUIT  
2-3/C 14 (LUM)  
SERVICE CABINET TO EXTERNAL GR. RD.:  
1" CONDUIT  
1-1/C 6 INS. GR.  
(SEE EQUIPMENT PAD LAYOUT)



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NO.	DATE	BY	CHK	REVISIONS

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 Plan By: ES  
 Checked By: SD  
 Approved By: SD

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CERTIFIED BY: *Sean Delmore*  
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
 DATE: 8/25/2020 LICENSE NO. 40945

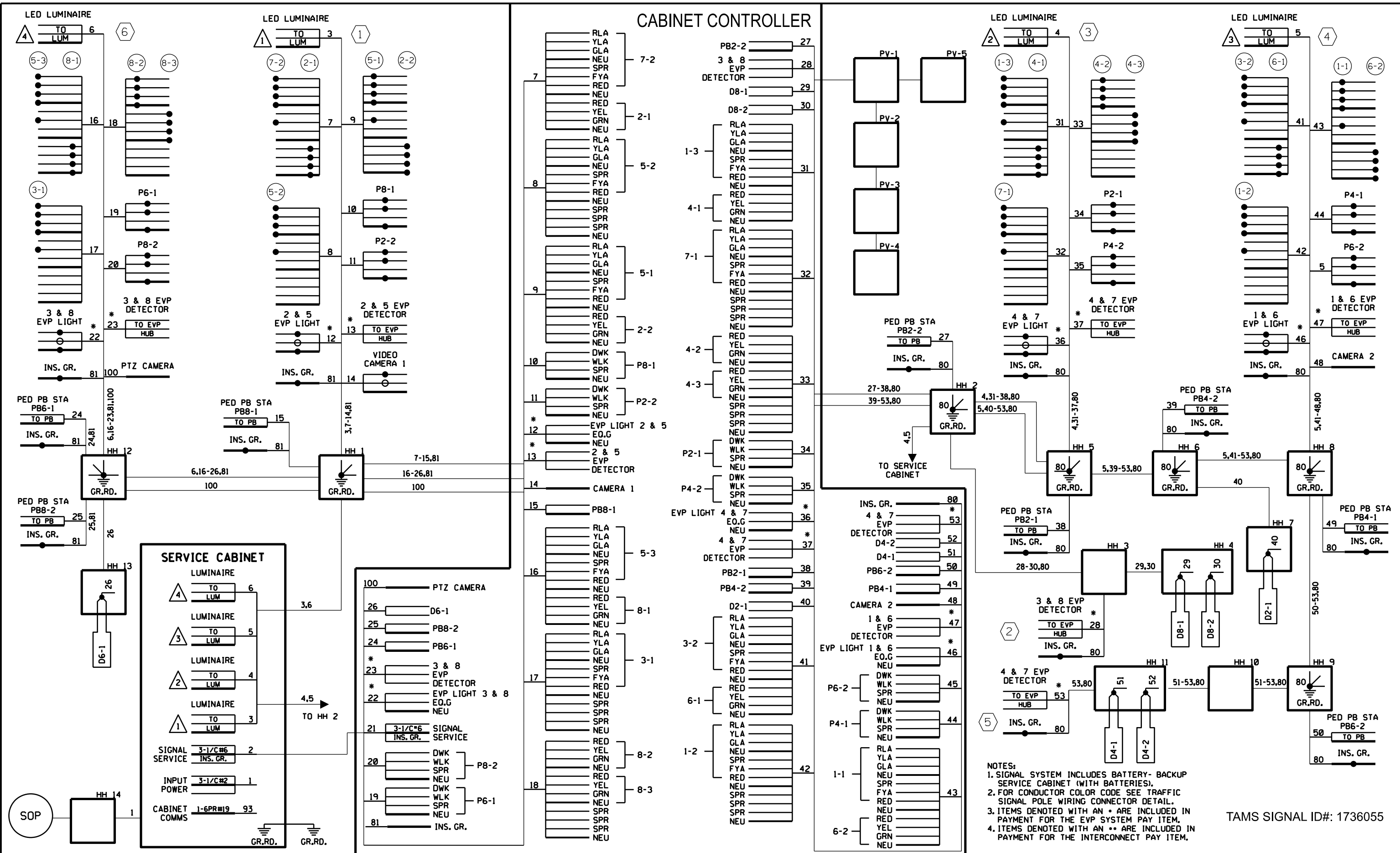


**ANOKA COUNTY**  
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 TH 47 & CSAH 116 - MATCHLINES  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 202  
 OF  
 206  
 SHEETS

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- NOTES:
1. SIGNAL SYSTEM INCLUDES BATTERY- BACKUP SERVICE CABINET (WITH BATTERIES).
  2. FOR CONDUCTOR COLOR CODE SEE TRAFFIC SIGNAL POLE WIRING CONNECTOR DETAIL.
  3. ITEMS DENOTED WITH AN \* ARE INCLUDED IN PAYMENT FOR THE EVP SYSTEM PAY ITEM.
  4. ITEMS DENOTED WITH AN \*\* ARE INCLUDED IN PAYMENT FOR THE INTERCONNECT PAY ITEM.

TAMS SIGNAL ID#: 1736055

NO.	DATE	BY	CHK	REVISIONS

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 Approved By: SD

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CERTIFIED BY: *Sean Delmore*  
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 DATE: 8/25/2020 LICENSE NO. 40945

**wsb**

**ANOKA COUNTY**

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**

**TH 47 & CSAH 116 WIRING DIAGRAM**  
**TRAFFIC CONTROL SIGNAL SYSTEM**  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

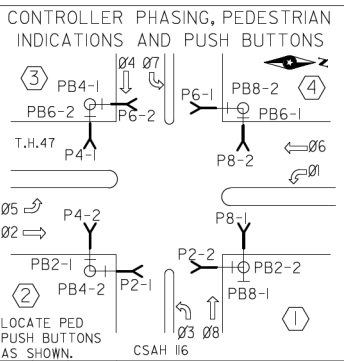
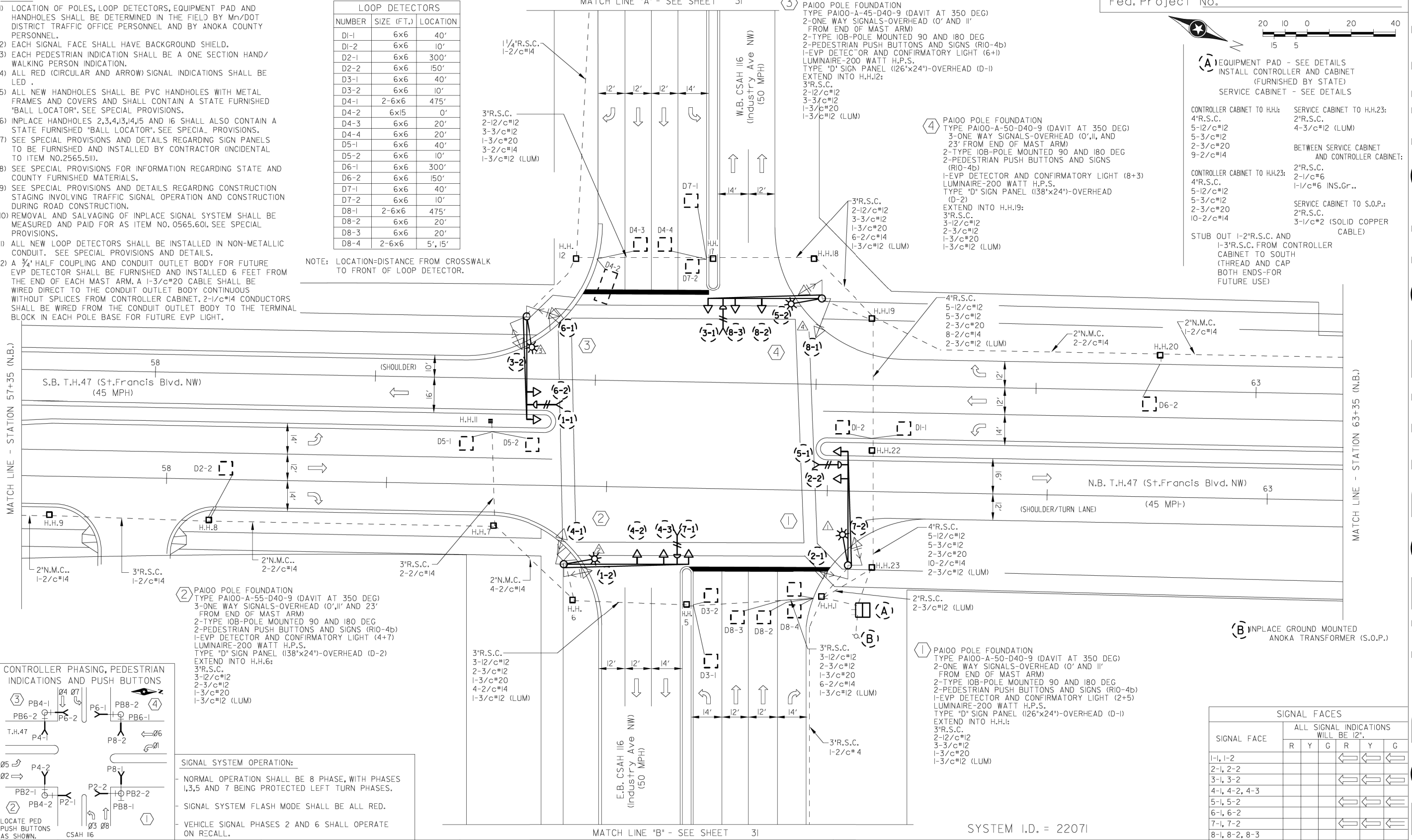
SHEET 203 OF 206 SHEETS

NOTES:

- LOCATION OF POLES, LOOP DETECTORS, EQUIPMENT PAD AND HANDHOLES SHALL BE DETERMINED IN THE FIELD BY Mn/DOT DISTRICT TRAFFIC OFFICE PERSONNEL AND BY ANOKA COUNTY PERSONNEL.
- EACH SIGNAL FACE SHALL HAVE BACKGROUND SHIELD.
- EACH PEDESTRIAN INDICATION SHALL BE A ONE SECTION HAND/WALKING PERSON INDICATION.
- ALL RED (CIRCULAR AND ARROW) SIGNAL INDICATIONS SHALL BE LED.
- ALL NEW HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS AND SHALL CONTAIN A STATE FURNISHED "BALL LOCATOR". SEE SPECIAL PROVISIONS.
- INPLACE HANDHOLES 2,3,4,13,14,15 AND 16 SHALL ALSO CONTAIN A STATE FURNISHED "BALL LOCATOR". SEE SPECIAL PROVISIONS.
- SEE SPECIAL PROVISIONS AND DETAILS REGARDING SIGN PANELS TO BE FURNISHED AND INSTALLED BY CONTRACTOR (INCIDENTAL TO ITEM NO.2565.5II).
- SEE SPECIAL PROVISIONS FOR INFORMATION REGARDING STATE AND COUNTY FURNISHED MATERIALS.
- SEE SPECIAL PROVISIONS AND DETAILS REGARDING CONSTRUCTION STAGING INVOLVING TRAFFIC SIGNAL OPERATION AND CONSTRUCTION DURING ROAD CONSTRUCTION.
- REMOVAL AND SALVAGING OF INPLACE SIGNAL SYSTEM SHALL BE MEASURED AND PAID FOR AS ITEM NO. 0565.60I. SEE SPECIAL PROVISIONS.
- ALL NEW LOOP DETECTORS SHALL BE INSTALLED IN NON-METALLIC CONDUIT. SEE SPECIAL PROVISIONS AND DETAILS.
- A 3/4" HALF COUPLING AND CONDUIT OUTLET BODY FOR FUTURE EVP DETECTOR SHALL BE FURNISHED AND INSTALLED 6 FEET FROM THE END OF EACH MAST ARM. A 1-3/c#20 CABLE SHALL BE WIRED DIRECT TO THE CONDUIT OUTLET BODY CONTINUOUS WITHOUT SPLICES FROM CONTROLLER CABINET. 2-1/c#14 CONDUCTORS SHALL BE WIRED FROM THE CONDUIT OUTLET BODY TO THE TERMINAL BLOCK IN EACH POLE BASE FOR FUTURE EVP LIGHT.

LOOP DETECTORS		
NUMBER	SIZE (FT.)	LOCATION
D1-1	6x6	40'
D1-2	6x6	10'
D2-1	6x6	300'
D2-2	6x6	150'
D3-1	6x6	40'
D3-2	6x6	10'
D4-1	2-6x6	475'
D4-2	6x15	0'
D4-3	6x6	20'
D4-4	6x6	20'
D5-1	6x6	40'
D5-2	6x6	10'
D6-1	6x6	300'
D6-2	6x6	150'
D7-1	6x6	40'
D7-2	6x6	10'
D8-1	2-6x6	475'
D8-2	6x6	20'
D8-3	6x6	20'
D8-4	2-6x6	5', 15'

NOTE: LOCATION=DISTANCE FROM CROSSWALK TO FRONT OF LOOP DETECTOR.



**SIGNAL SYSTEM OPERATION:**

- NORMAL OPERATION SHALL BE 8 PHASE, WITH PHASES 1,3,5 AND 7 BEING PROTECTED LEFT TURN PHASES.
- SIGNAL SYSTEM FLASH MODE SHALL BE ALL RED.
- VEHICLE SIGNAL PHASES 2 AND 6 SHALL OPERATE ON RECALL.

SIGNAL FACE	ALL SIGNAL INDICATIONS WILL BE 12"					
	R	Y	G	R	Y	G
1-1, 1-2						
2-1, 2-2						
3-1, 3-2						
4-1, 4-2, 4-3						
5-1, 5-2						
6-1, 6-2						
7-1, 7-2						
8-1, 8-2, 8-3						



- (A) EQUIPMENT PAD - SEE DETAILS  
INSTALL CONTROLLER AND CABINET (FURNISHED BY STATE)  
SERVICE CABINET - SEE DETAILS
- CONTROLLER CABINET TO H.H.1: 4'R.S.C., 5-12/c#12, 5-3/c#12, 2-3/c#20, 9-2/c#14  
SERVICE CABINET TO H.H.23: 2'R.S.C., 4-3/c#12 (LUM)
- CONTROLLER CABINET TO H.H.23: 4'R.S.C., 5-12/c#12, 5-3/c#12, 2-3/c#20, 9-2/c#14  
BETWEEN SERVICE CABINET AND CONTROLLER CABINET: 2'R.S.C., 2-1/c#6, 1-1/c#6 INS.Gr..
- CONTROLLER CABINET TO H.H.19: 4'R.S.C., 5-12/c#12, 5-3/c#12, 2-3/c#20, 10-2/c#14  
SERVICE CABINET TO S.O.P.: 2'R.S.C., 3-1/c#2 (SOLID COPPER CABLE)
- STUB OUT 1-2'R.S.C. AND 1-3'R.S.C. FROM CONTROLLER CABINET TO SOUTH (THREAD AND CAP BOTH ENDS-FOR FUTURE USE)

DATE: 8/25/2020 2:20:45 PM PATH & FILENAME: Projects\Minnesota\04652-000\ConPlan\4652-000-silB.dgn

NO.	DATE	BY	CHK	REVISIONS

Design By: MS  
Plan By: ES  
Checked By: SD  
Approved By: SD

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CERTIFIED BY: *Sean Delmore*  
LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE  
DATE: 8/25/2020 LICENSE NO. 40945



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
TH 47 & CSAH 116 "FOR INFORMATION ONLY"  
TRAFFIC CONTROL SIGNAL SYSTEM  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET 204 OF 206 SHEETS

FOR INFORMATION ONLY

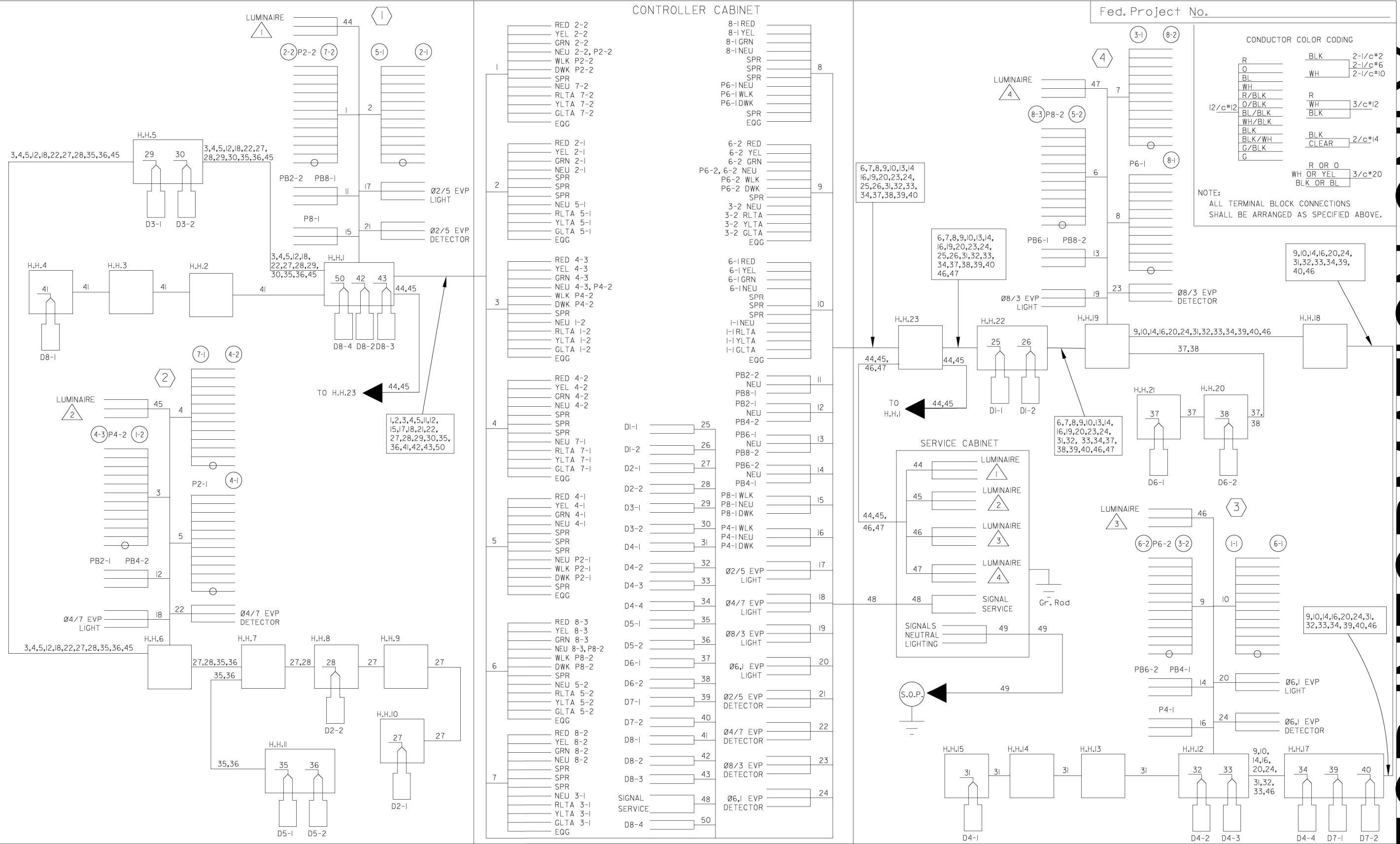
FOR INFORMATION ONLY

Fed. Project No.

CONDUCTOR COLOR CODING

R	BLK	2-1/c#2
O	WH	2-1/c#6
BL	WH	2-1/c#10
WH	R	
R/BLK	R	
O/BLK	WH	3/c#12
BL/BLK	BLK	
WH/BLK	BLK	
BLK	BLK	
BLK/WH	BLK	2/c#14
C/BLK	CLEAR	
G		
R OR O	WH OR YEL	3/c#20
BLK OR BL		

NOTE:  
ALL TERMINAL BLOCK CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.



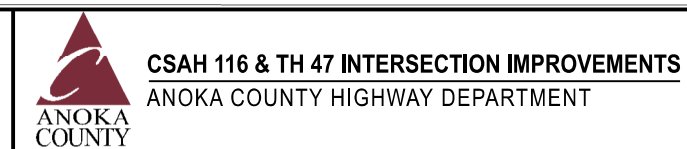
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NO.	DATE	BY	CHK	REVISIONS

Design By: MS  
 Plan By: ES  
 Checked By: SD  
 Approved By: SD

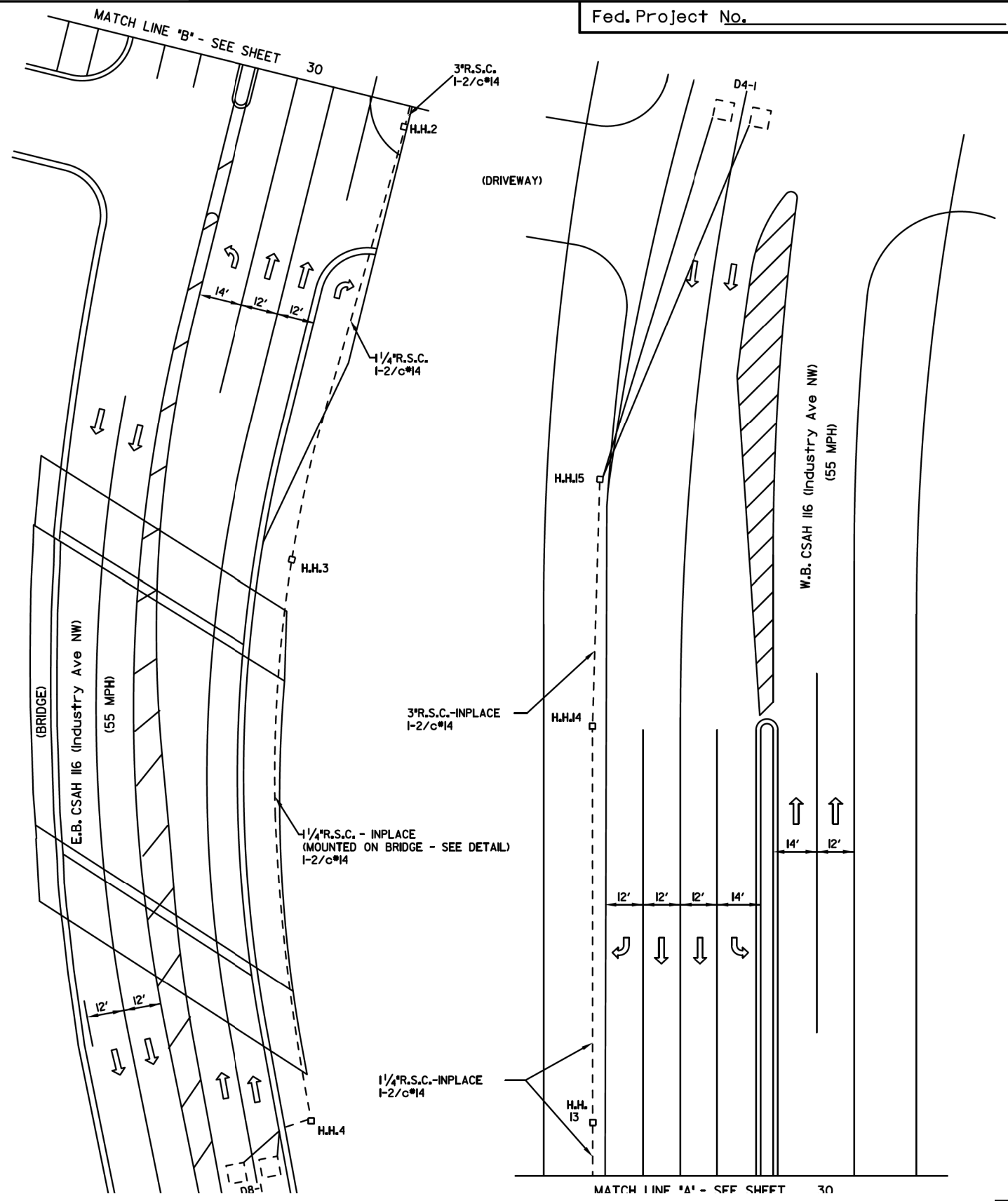
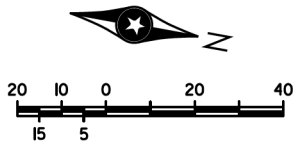
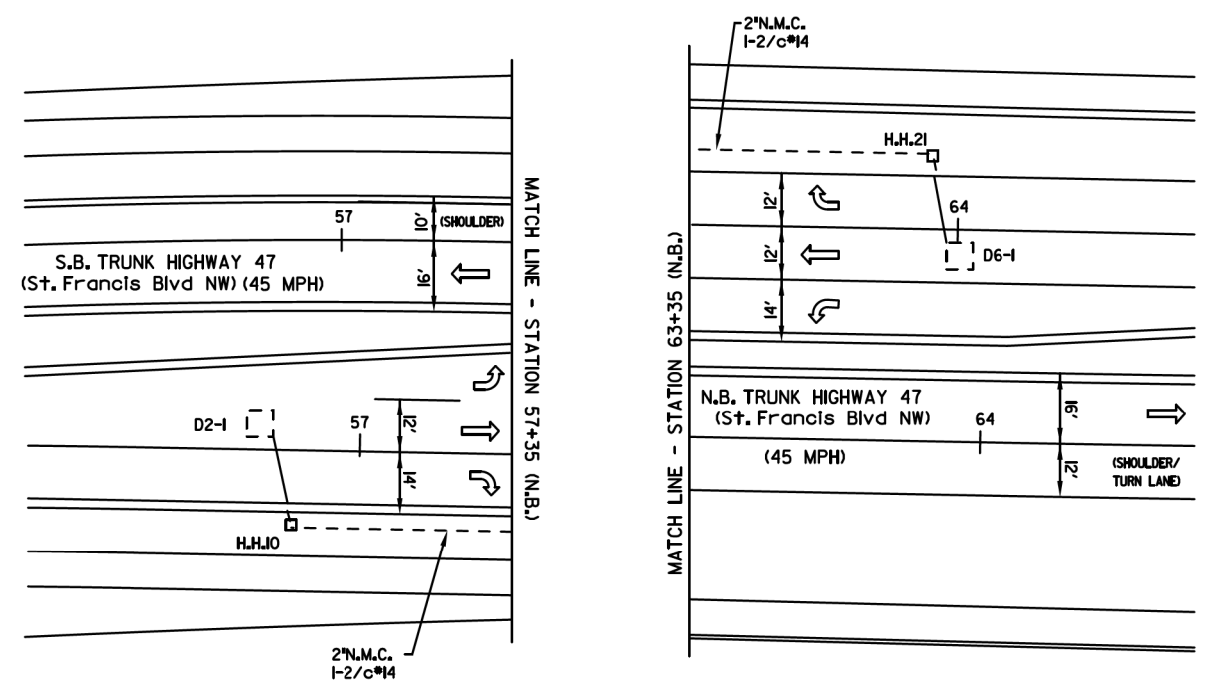
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 DATE: 8/25/2020 LICENSE NO. 40945



ANOKA COUNTY, MN  
 TH 47 & CSAH 116 "FOR INFORMATION ONLY"  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 205  
 OF  
 206  
 SHEETS



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NO.	BY	DATE	REVISIONS

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**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 TH 47 & CSAH 116 "FOR INFORMATION ONLY"  
 TRAFFIC CONTROL SIGNAL SYSTEM  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

SHEET  
 206  
 OF  
 206  
 SHEETS

DESIGN DATA

DESIGNED IN ACCORDANCE WITH 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS HL-93 LIVE LOADS

MATERIAL DESIGN PROPERTIES: REINFORCED CONCRETE: f'c = 4 KSI CONCRETE fy = 60 KSI PLAIN AND EPOXY COATED BARS fy = 75 KSI STAINLESS STEEL BARS n = 8 FOR REINFORCEMENT BARS

DESIGN SPEED: OVER = 55 MPH (A) UNDER = NA MPH DECK AREA = 9158 SQUARE FEET

HL 93 LRFB BRIDGE INVENTORY RATING FACTOR RF = 0.79 BRIDGE OPERATING RATING FACTOR RF = 1.02

LIST OF SHEETS

Table with 2 columns: NO., DESCRIPTION. Lists sheets B1 through B52 with their respective descriptions.

NOTES:

(A) DESIGN EXCEPTION HAS BEEN APPROVED FOR A 40 MPH DESIGN SPEED FROM STA. 1002+11.38 TO 1005+58.19 WB AND 101+44.66 TO 105+55.40 EB.

SEE CONSTRUCTION PLAN FOR TREATMENT OF INPLACE UTILITIES AND SIGNS.

ALL ORIGINAL DIMENSIONS ARE TAKEN FROM THE ORIGINAL PLANS. CONTRACTOR SHALL VERIFY DIMENSIONS IN THE FIELD.

TRAFFIC TO BE DETOURED DURING CONSTRUCTION, SEE CONSTRUCTION STAGING PLAN.

SEE SHEET B2 FOR ADDITIONAL NOTES.

ANOKA COUNTY MINNESOTA DEPARTMENT OF TRANSPORTATION

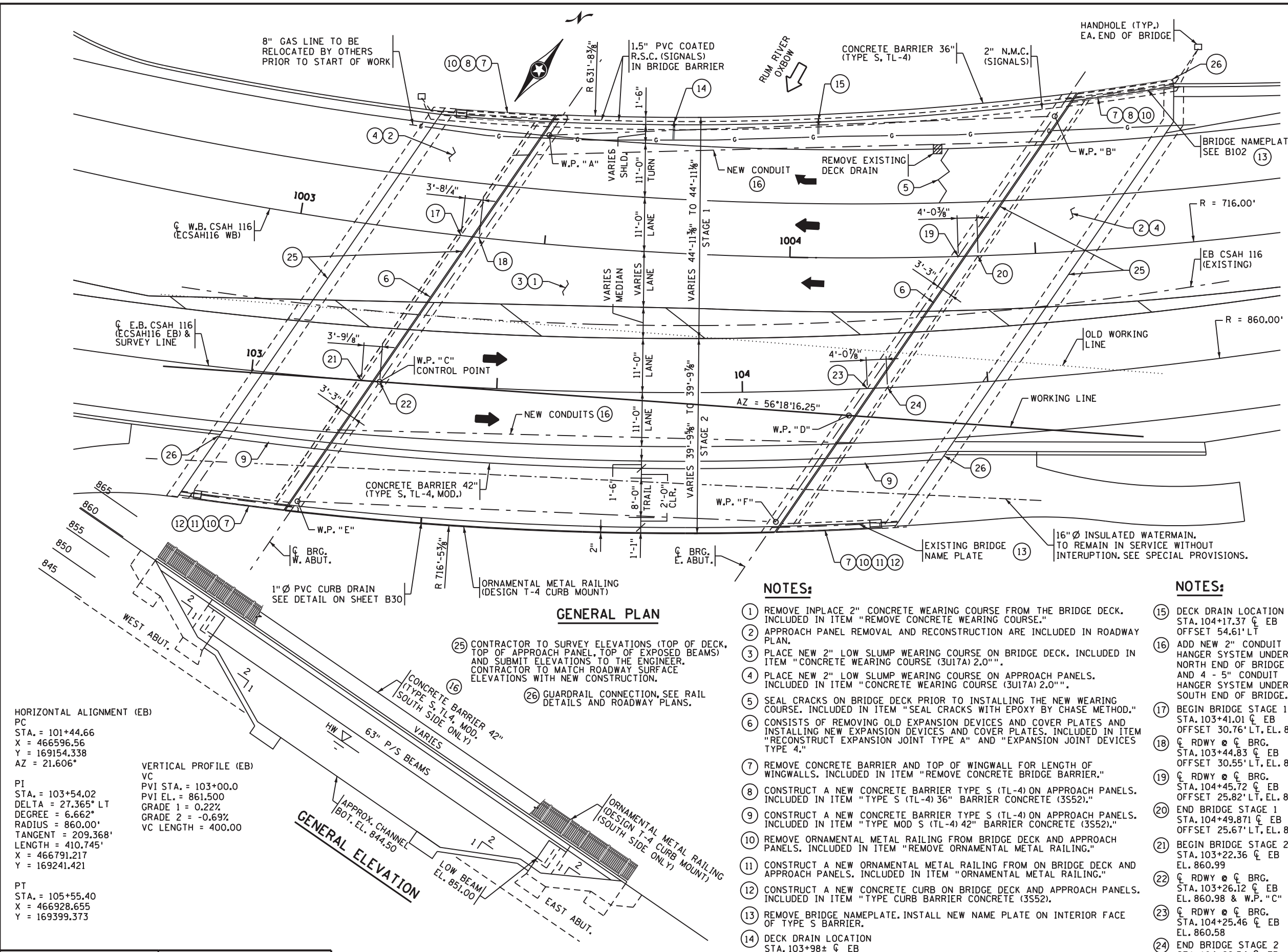
BRIDGE NO. 02546

CSAH 116 OVER THE RUM RIVER 100' PRESTRESSED BEAM OXBOW SPAN - 68'-4" ROADWAY 30° SKEW, 8" - 30'-0" CURVE SPAN IDENTIFICATION NO. 501

SEC. 36 TWP. 032N R. 25W CITY OF RAMSEY ANOKA COUNTY

APPROVED: Joe MacPherson ANOKA COUNTY ENGINEER DATE

APPROVED: Kevin Western STATE BRIDGE ENGINEER DATE



HORIZONTAL ALIGNMENT (EB) PC STA. = 101+44.66 X = 466596.56 Y = 169154.338 AZ = 21.606°

VERTICAL PROFILE (EB) VC PVI STA. = 103+00.0 PVI EL. = 861.500 GRADE 1 = 0.22% GRADE 2 = -0.69% VC LENGTH = 400.00

PT STA. = 105+55.40 X = 466928.655 Y = 169399.373

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

Table with columns: NO, DATE, BY, CHK, REVISIONS. Contains revision history.

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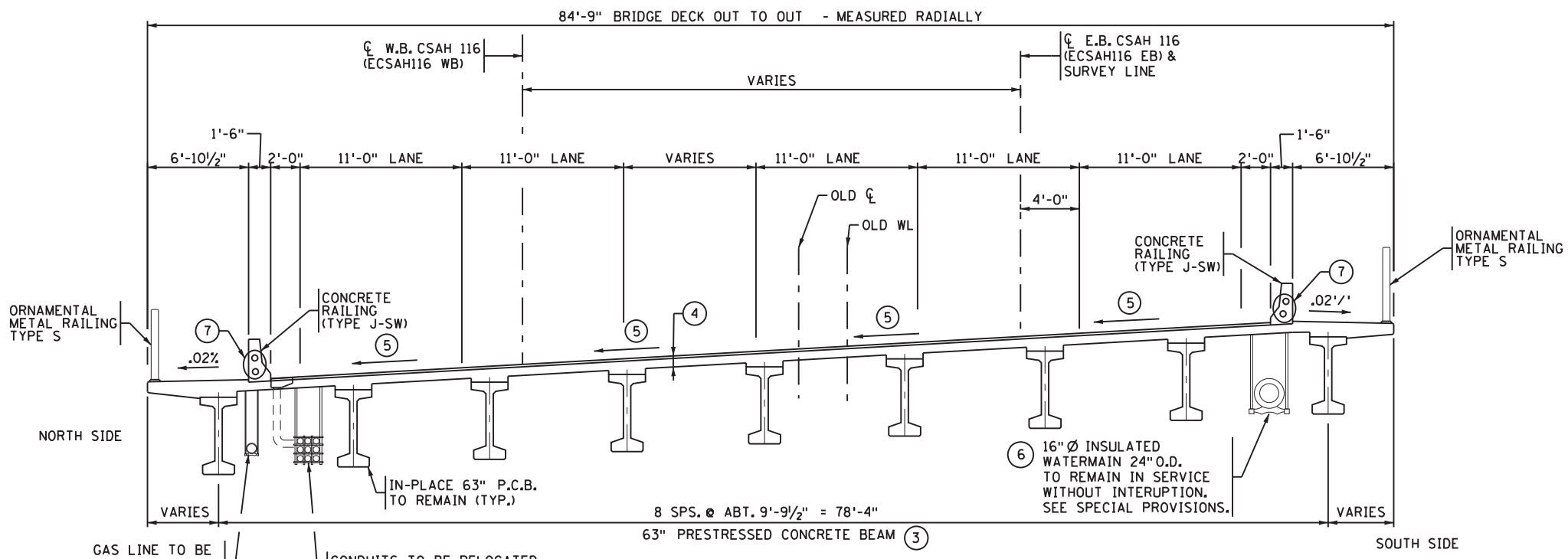


CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS ANOKA COUNTY HIGHWAY DEPARTMENT

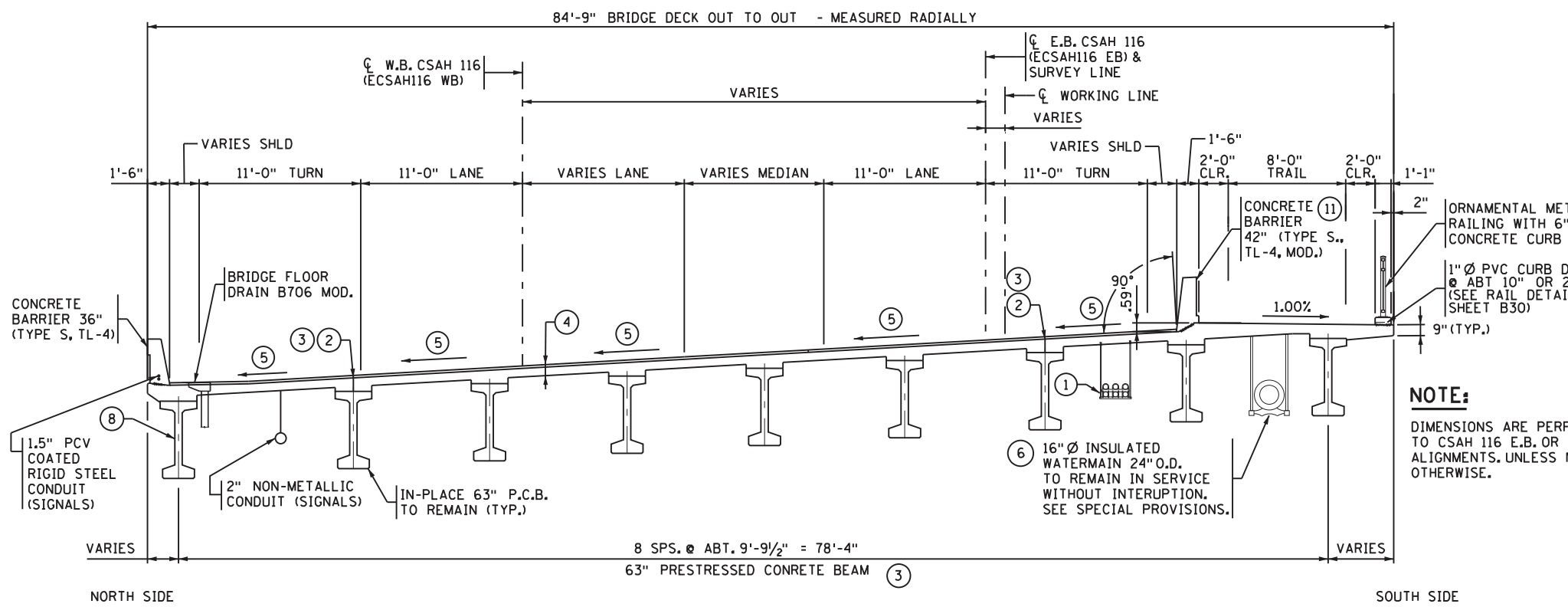
TITLE: GENERAL PLAN AND ELEVATION

DES: JLB DR: SWH CHK: CBO CHK: CBO Sheet B1 of B52 Sheets Bridge No. 02546

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**EXISTING TRANSVERSE SECTION**



**PROPOSED TRANSVERSE SECTION**

SCHEDULE OF QUANTITIES			
ITEM NO.	ITEM	UNIT	QUANTITY
2021.601	MOBILIZATION BRIDGE	LUMP SUM	1
2401.503	TYPE S (TL-4) 36" BARRIER CONCRETE (3S52)	LIN. FT.	143 (P)
2401.503	TYPE MOD. S (TL-4) 42" BARRIER CONCRETE (3S52)	LIN. FT.	148 (P)
2401.503	TYPE CURB BARRIER CONCRETE (3S52)	LIN. FT.	137 (P)
2401.507	STRUCTURAL CONCRETE (3B52)	CU. YD.	3 (P)
2401.508	REINFORCEMENT BARS (EPOXY COATED)	POUND	30,075 (P)
2401.601	STRUCTURE EXCAVATION	LUMP SUM	1
2401.618	BRIDGE SLAB CONCRETE (3YHPC-S)	SQ. FT.	3,836
2402.503	EXPANSION JOINT DEVICES TYPE 4	LIN. FT.	207 (P)
2402.503	ORNAMENTAL METAL RAILING	LIN. FT.	137 (P)
2402.601	DRAINAGE SYSTEM BRIDGE DECK	LUMP SUM	1
2404.618	CONCRETE WEARING COURSE (3U17A) 2.0"	SQ. FT.	7,058
2411.618	ANTI-GRAFFITI COATING	SQ. FT.	3,288 (P)
2433.502	ANCH TYPE REINF BARS (TYPE L)	EACH	34(P)
2433.503	REMOVE CONCRETE BRIDGE BARRIER	LIN. FT.	298
2433.503	REMOVE ORNAMENTAL METAL RAILING	LIN. FT.	281
2433.518	REMOVE CONCRETE BRIDGE DECK	SQ. FT.	3,835
2433.518	REMOVE CONCRETE SIDEWALK	SQ. FT.	357
2433.518	REMOVE CONCRETE WEARING COURSE	SQ. FT.	5,288
2433.603	RECONSTRUCT EXPANSION JOINT TYPE A	LIN. FT.	207 (P)
2433.603	REPAIR PAVING BRACKET	LIN. FT.	10
2433.606	SEAL CRACKS WITH EPOXY BY CHASE METHOD	GAL	3
2433.618	REMOVE AND PATCH SLAB TYPE A	SQ. FT.	50
2504.601	WATERMAIN HANGER SYSTEM	LUMP SUM	1
2545.501	CONDUIT SYSTEM (SIGNALS)	LUMP SUM	1
2545.501	CONDUIT SYSTEM (POWER)	LUMP SUM	1
2550.503	1.5" RIGID STEEL CONDUIT	LIN. FT.	398

**CONSTRUCTION NOTES:**

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

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS. BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

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

UTILITY LOCATIONS ARE APPROXIMATE AND ARE FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL VERIFY LOCATIONS PRIOR TO CONSTRUCTION.

SEE SPECIAL PROVISIONS FOR ALL XXXX.6XX SERIES PAY ITEMS FOR ADDITIONAL REQUIREMENTS.

NO CUTTING WILL BE PERMITTED UNTIL THE CUTTING LIMITS HAVE BEEN OUTLINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. REMOVAL AND RECONSTRUCTION SHALL CONFORM TO SPEC. 2433.

THE CONTRACTOR SHALL MAKE FIELD MEASUREMENTS AS NECESSARY PRIOR TO FABRICATION OF THE EXPANSION JOINT DEVICES AND COVER PLATES TO ASSURE PROPER FIT IN THE FINAL WORK.

APPROVED BONDING GROUT TO BE APPLIED TO ALL SURFACES BETWEEN NEW AND INPLACE CONCRETE.

**NOTES:**

- ① INSTALL 4 - 5" DIAMETER CONDUITS WITH HANGER SYSTEM (ANOKA MUNICIPAL UTILITIES-POWER).
- ② DO NOT DAMAGE EXISTING BEAMS AND DECK REINFORCEMENT DURING PARTIAL DECK REMOVAL.
- ③ ONCE DECK IS REMOVED, SURVEY TOP OF BEAM ELEVATION AT 1/10 POINTS AND REPORT ELEVATIONS TO ENGINEER FOR STOOl HEIGHT ADJUSTMENTS PRIOR TO DECK FORMING. CONTRACTOR TO SURVEY ELEVATIONS (TOP OF DECK, TOP OF APPROACH PANEL, TOP OF EXPOSED BEAMS) AND SUBMIT ELEVATIONS TO THE ENGINEER. CONTRACTOR TO MATCH ROADWAY SURFACE ELEVATIONS WITH NEW CONSTRUCTION.
- ④ 9" DECK (7" STRUCTURAL SLAB PLUS 2" WEARING COURSE).
- ⑤ VARIES TO 0.056'/' MAX. SEE SHEET B3.
- ⑥ INCLUDED IN ITEM "WATERMAIN HANGER SYSTEM".
- ⑦ EXISTING UTILITIES TO BE RELOCATED BY OTHERS PRIOR TO START OF WORK.
- ⑧ BEAM UNALIGNED WITH EXISTING SECTION FOR CLARITY.
- ⑨ INCLUDES 2 FLOOR DRAINS TYPE B706 MOD.
- ⑩ PVC COATED

**NOTE:**

DIMENSIONS ARE PERPENDICULAR TO CSAH 116 E.B. OR W.B. ALIGNMENTS, UNLESS NOTED OTHERWISE.

**NOTE:**

DIMENSIONS ARE PERPENDICULAR TO CSAH 116 E.B. OR W.B. ALIGNMENTS, UNLESS NOTED OTHERWISE.

⑪ BACK FACE OF BARRIER PLUMB, SEE BARRIER SHEET B28.

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO.	DATE	BY	CHK	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.

*Carl Osberg*  
 LICENSED PROFESSIONAL ENGINEER: CARL OSBERG, PE  
 DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **TRANSVERSE SECTIONS AND SCHEDULE OF QUANTITIES**

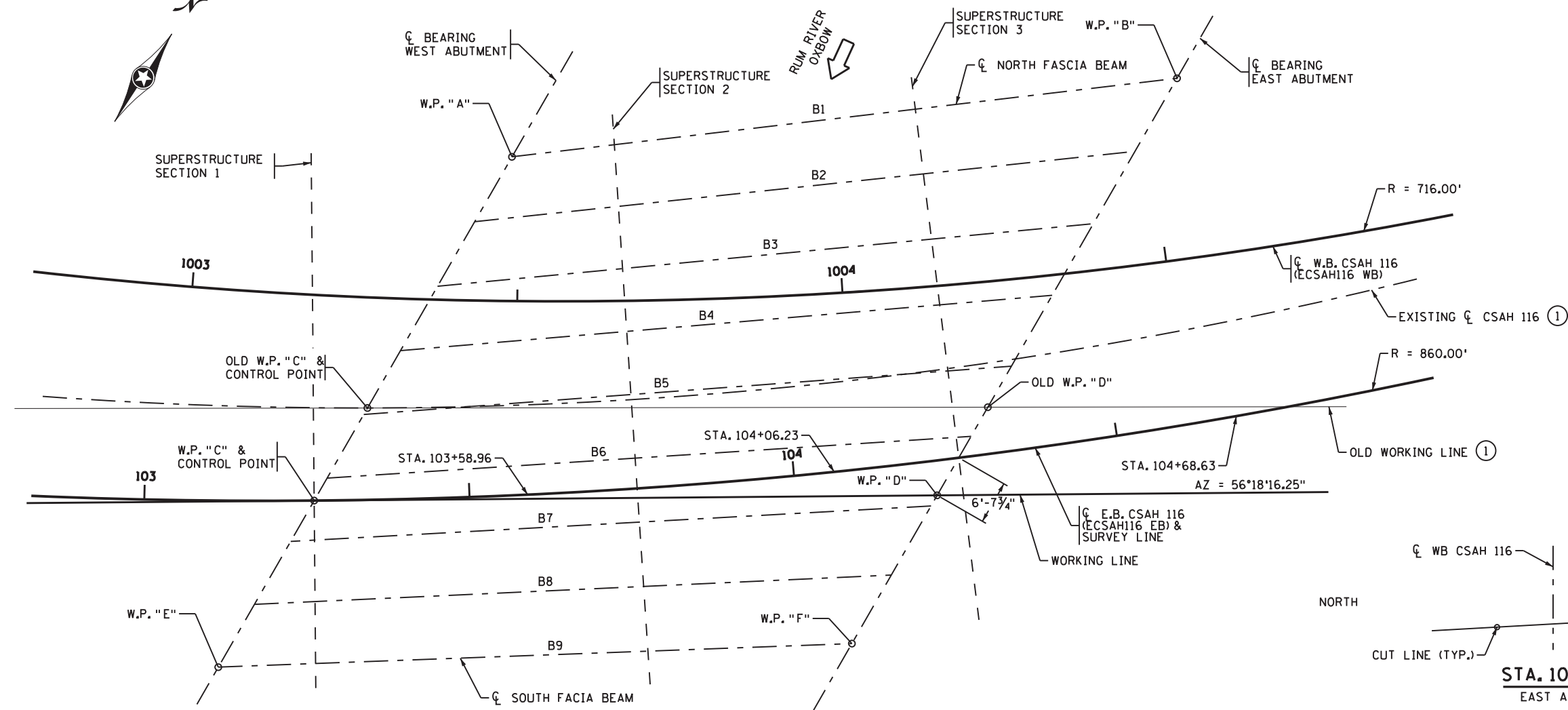
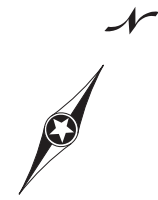
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 CHK: CBO CHK: CBO

Sheet B2 of B52 Sheets

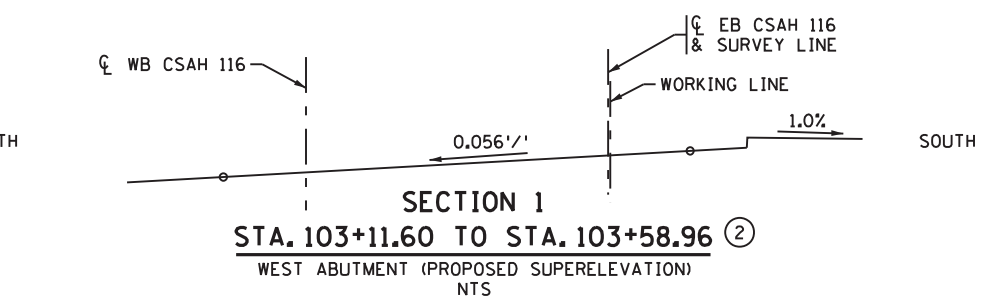
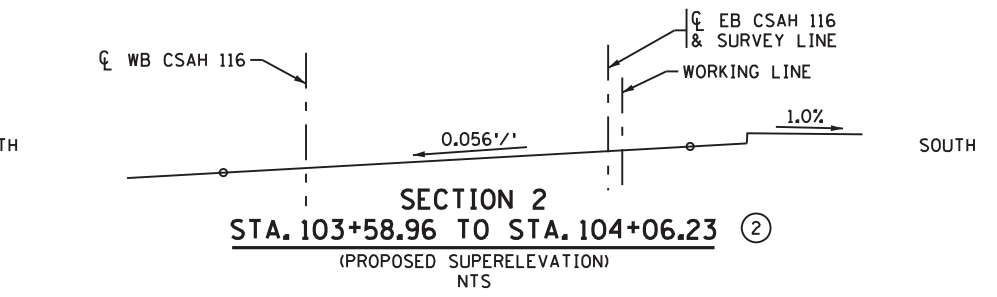
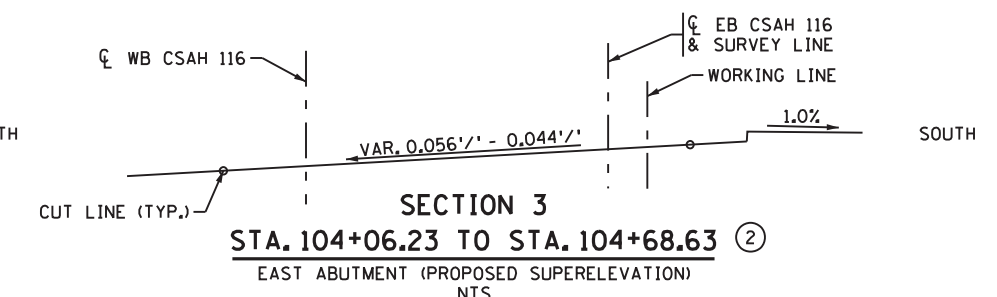
Bridge No. 02546

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- NOTES:**
- ALL PLAN DIMENSIONS ARE TAKEN FROM THE ORIGINAL PLANS. CONTRACTOR SHALL VERIFY DIMENSIONS IN THE FIELD.
  - OLD WORKING LINE AND CSAH 116 CL FROM EXISTING PLANS ARE NOT USED. SEE SUPERELEVATION PLAN.
  - SUPERELEVATIONS ARE SHOWN PERPENDICULAR TO THE SURVEY LINE. SEE SHEET 145 OF THE ROADWAY PLANS FOR SUPERELEVATION PLAN.
  - FIELD VERIFY EXISTING ELEVATIONS.
  - TOP OF DECK ELEVATIONS ARE AT TOP OF WEARING COURSE OR TOP OF SIDEWALK.



**TOP OF ROADWAY TO BRIDGE SEAT PROPOSED WEST ABUT.**

	BEAM B1	BEAM B2	BEAM B3	BEAM B4	BEAM B5	BEAM B6	BEAM B7	BEAM B8	BEAM B9
SLAB	9"	9"	9"	9"	9"	9"	9"	9"	9"
STOOL	7.49"	6.05"	5.04"	6.14"	4.73"	4.50"	4.36"	7.46"	3.86"
BEAM	63"	63"	63"	63"	63"	63"	63"	63"	63"
BEARING	4.38"	4.38"	4.38"	4.38"	4.38"	4.38"	4.38"	4.38"	4.38"
TOTAL	6.99'	6.87'	6.78'	6.88'	6.76'	6.74'	6.73'	6.99'	6.69'

**TOP OF ROADWAY TO BRIDGE SEAT (EXIST.) (3)**

	BEAM B1	BEAM B2	BEAM B3	BEAM B4	BEAMS B5-B9
SLAB	9"	9"	9"	9"	9"
STOOL	7 3/8"	6 3/4"	5 13/16"	4 15/16"	3 5/8"
BEAM	63"	63"	63"	63"	63"
BEARING	4 3/8"	4 3/8"	4 3/8"	4 3/8"	4 3/8"
TOTAL	6'-11 3/4"	6'-11 1/8"	6'-10 3/16"	6'-9 5/16"	6'-8"

**TOP OF ROADWAY TO BRIDGE SEAT PROPOSED EAST ABUT.**

	BEAM B1	BEAM B2	BEAM B3	BEAM B4	BEAM B5	BEAM B6	BEAM B7	BEAM B8	BEAM B9
SLAB	9"	9"	9"	9"	9"	9"	9"	9"	9"
STOOL	8.24"	8.16"	7.21"	6.03"	4.52"	4.49"	4.34"	7.62"	4.23"
BEAM	63"	63"	63"	63"	63"	63"	63"	63"	63"
BEARING	4.38"	4.38"	4.38"	4.38"	4.38"	4.38"	4.38"	4.38"	4.38"
TOTAL	7.05'	7.04'	6.97'	6.87'	6.74'	6.74'	6.73'	7.00'	6.72'

DIMENSIONS BETWEEN WORKING POINTS					EXISTING ELEVATIONS					PROPOSED ELEVATIONS							
POINT	STATION	X-COORD	Y-COORD		A	B	C	D	E	F	TOP OF DECK (3)	TOP OF DECK TO BRIDGE SEAT (3)	BRIDGE SEAT (3)	TOP OF DECK (4)	TOP OF DECK TO BRIDGE SEAT	BRIDGE SEAT	POINT
A	103+58.96	466753.509	169309.239		102.93	60.94	83.52		91.23		857.95	6.98	850.97	857.97	6.99	850.97	A
B	104+68.63	466832.424	169375.324			147.65	73.92	172.92			857.94	6.98	850.96	858.01	7.05	850.96	B
C	103+26.12	466757.002	169248.395					29.54	85.52					860.98			C
D	104+21.49	466836.675	169301.522					113.61	26.28					860.30			D
E	103+11.60	466758.694	169218.908						97.45		862.05	6.67	855.38	862.06	6.69	855.38	E
F	104+06.23	466838.186	169275.283								861.72	6.67	855.05	861.76	6.72	855.05	F

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	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.

*Carlson*  
 LICENSED PROFESSIONAL ENGINEER: CARLSON, PE  
 DATE: 11/10/2020 REG NO: 42732

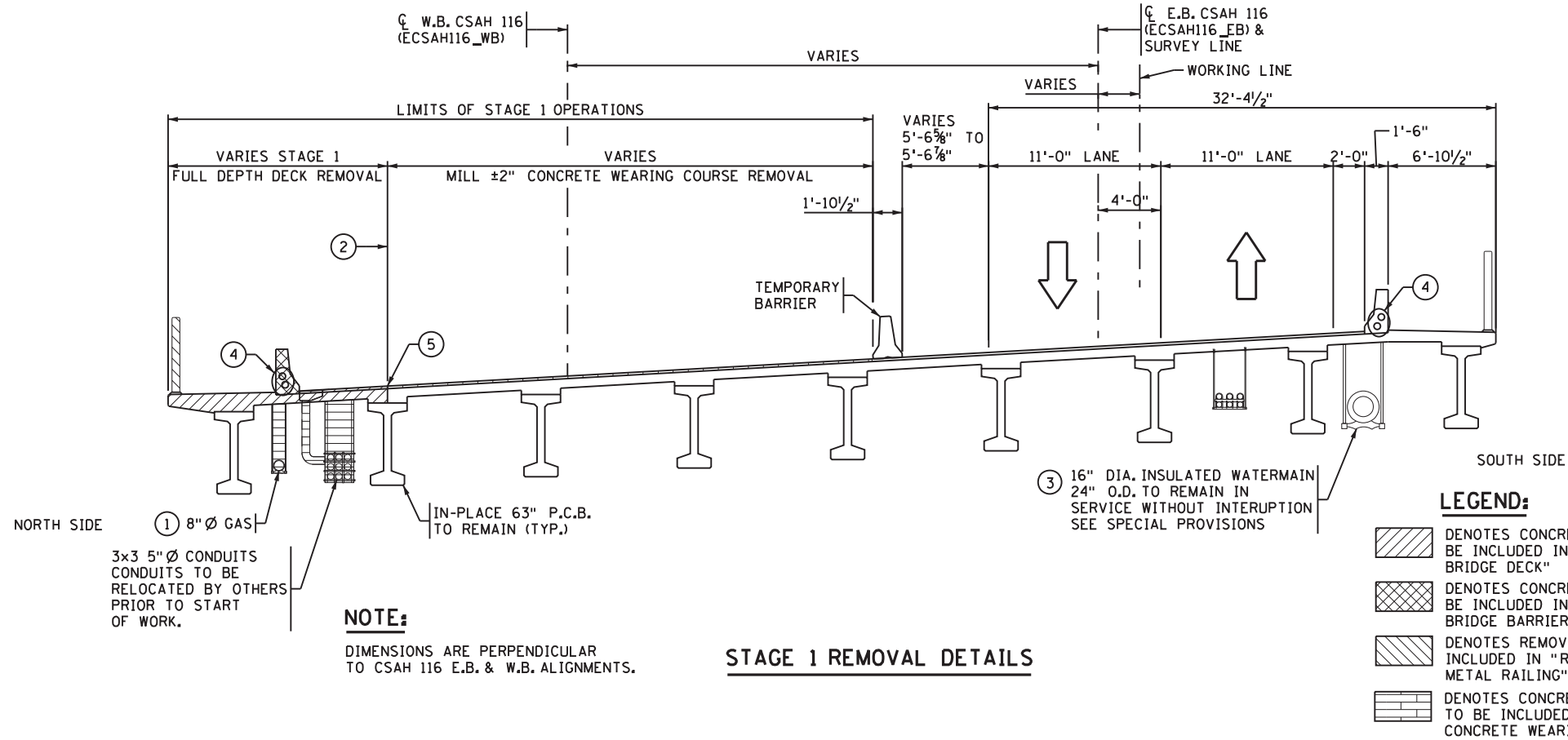
**wsb** ANOKA COUNTY  
 CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **BRIDGE LAYOUT**

DES: JLB DR: SWH  
 CHK: CBO CHK: CBO  
 Sheet B3 of B52 Sheets

Bridge No. 02546

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**NOTE:**  
DIMENSIONS ARE PERPENDICULAR TO CSAH 116 E.B. & W.B. ALIGNMENTS.

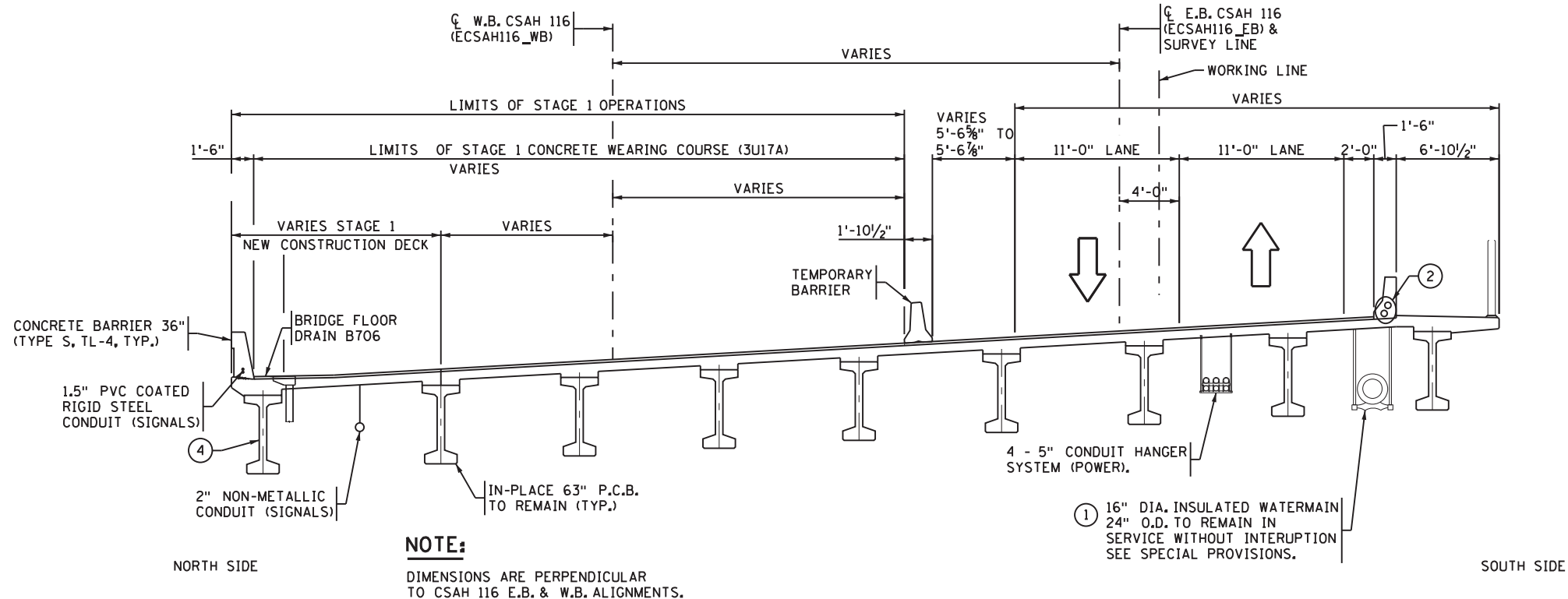
**STAGE 1 REMOVAL DETAILS**

**LEGEND:**

- DENOTES CONCRETE REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE DECK"
- DENOTES CONCRETE REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE BARRIER"
- DENOTES REMOVAL AREA TO BE INCLUDED IN "REMOVE ORNAMENTAL METAL RAILING"
- DENOTES CONCRETE AREA REMOVAL TO BE INCLUDED IN "REMOVAL CONCRETE WEARING COURSE".

**REMOVAL OPERATIONS:**

- INSTALL TEMPORARY PRECAST BARRIER AS SHOWN. BARRIER LOCATED ON BRIDGE DECK SHALL NOT BE ANCHORED. SEE ROADWAY PLANS FOR QUANTITIES. SHIFT TRAFFIC TO THE SOUTH PORTION OF THE EXISTING BRIDGE.
- SAWCUT BRIDGE DECK AS SHOWN.
- SAWCUT END DIAPHRAGM AT TOP OF BEAM (±) AS SHOWN IN "SECTION B-B" OF "STAGE 1 REMOVAL DETAILS" SHEET.
- SAWCUT NORTH WINGWALLS TO ELEVATIONS SHOWN IN ELEVATION VIEWS "STAGE 1 REMOVAL DETAILS" SHEET.
- MILL ±2" INPLACE CONCRETE DECK FROM NORTH GUTTER LINE OF TEMPORARY BARRIER TO PROPOSED SAWCUT LINE ON NORTH SIDE OF BRIDGE DECK.
- REMOVE NORTH CONCRETE BARRIER.
- REMOVE NORTH METAL RAILING.
- REMOVE DECK DRAIN SYSTEM.
- REMOVE PORTION OF CONCRETE BRIDGE DECK. (FULL DEPTH)
- REMOVE PORTION OF CONCRETE WINGWALLS.
- ENGINEER TO SOUND BRIDGE DECK. CONTRACTOR TO REMOVE PORTIONS OF SLAB AS OUTLINED IN SPECIAL PROVISIONS.
- ① GAS LINE TO BE RELOCATED BY OTHERS PRIOR TO REMOVALS.
- ② SAWCUT IN BRIDGE DECK @ C BEAM.
- ③ INCLUDED IN ITEM "WATERMAIN HANGER SYSTEM".
- ④ EXISTING UTILITIES TO BE RELOCATED BY OTHERS PRIOR TO START OF WORK.
- ⑤ SALVAGE AND REPAIR EXISTING TRANSVERSE DECK REINFORCEMENT, SEE SUPERSTRUCTURE DETAILS.



**NOTE:**  
DIMENSIONS ARE PERPENDICULAR TO CSAH 116 E.B. & W.B. ALIGNMENTS.

**STAGE 1 CONSTRUCTION DETAILS**

**CONSTRUCTION OPERATIONS:**

- CONSTRUCT STAGE 1 CONCRETE BRIDGE DECK.
- CONSTRUCT STAGE 1 APPROACH PANELS.
- PERFORM ANY NECESSARY DECK REPAIRS IDENTIFIED DURING REMOVAL OPERATIONS. SEE SPECIAL PROVISIONS.
- SEAL ANY BRIDGE DECK CRACKS USING THE EPOXY BY CHASE METHOD. SEE SPECIAL PROVISIONS.
- CONSTRUCT CONCRETE BARRIER (TYPE S, TL-4) ON BRIDGE DECK AND APPROACH PANEL.
- PLACE CONCRETE WEARING COARSE (3U17A) BETWEEN CONCRETE BARRIER (TYPE S, TL4) AND TEMPORARY BARRIER.
- CONSTRUCT NEW FLOOR DRAIN SYSTEM.
- ① INCLUDED IN ITEM "WATERMAIN HANGER SYSTEM".
- ② EXISTING UTILITIES TO BE RELOCATED BY OTHERS PRIOR TO START OF WORK.
- ③ INCLUDED IN "CONDUIT SYSTEM (POWER)".
- ④ BEAM UNALIGNED WITH REMOVAL DETAILS FOR CLARITY.

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	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.  
  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

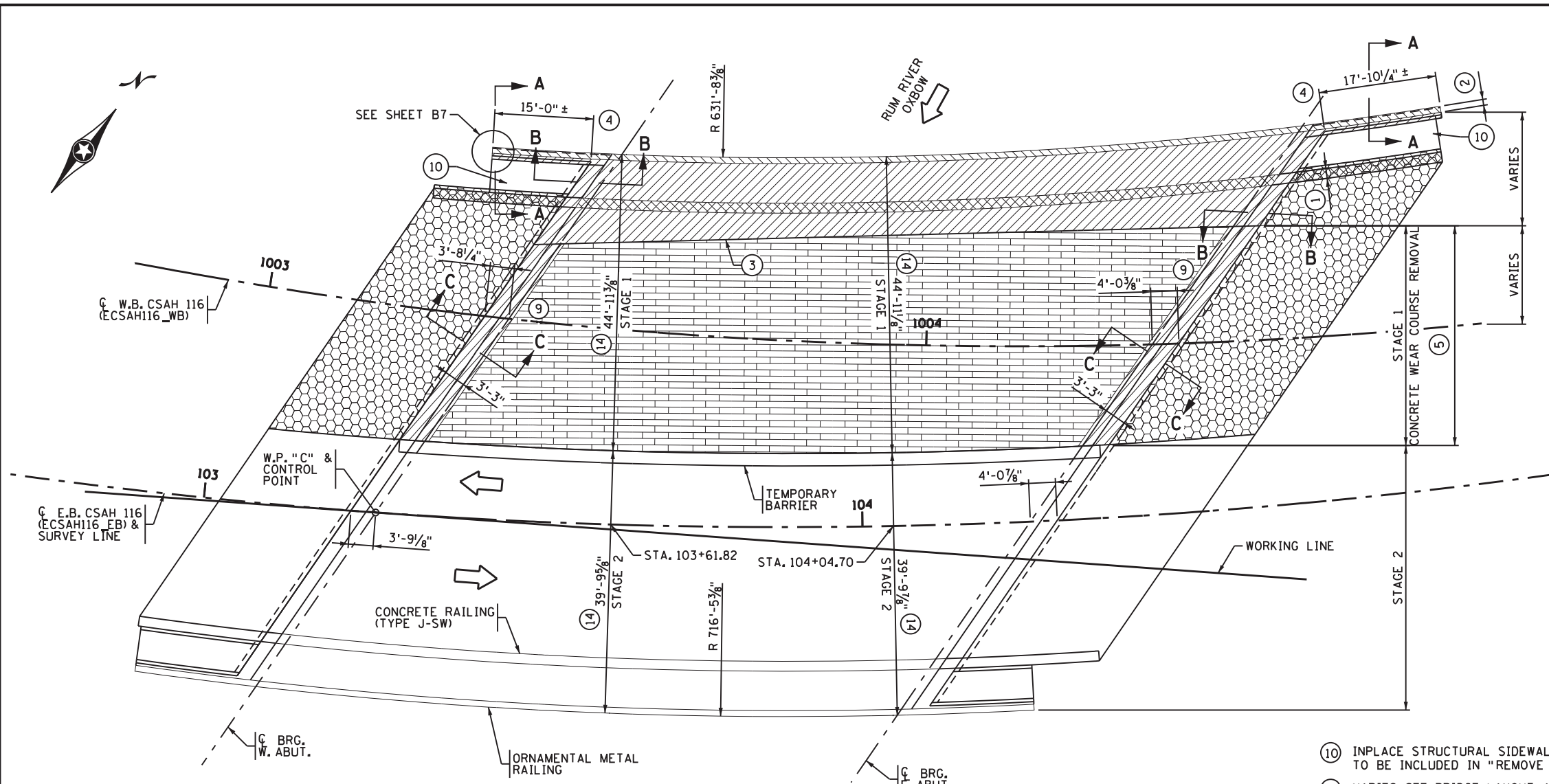
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STAGE 1 DETAILS - 1

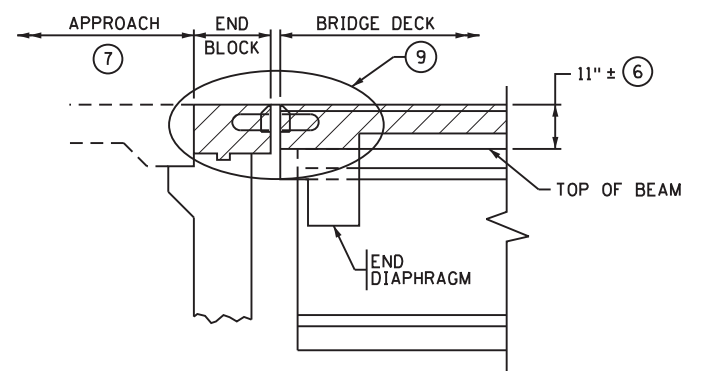
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Sheet B4 of B52 Sheets

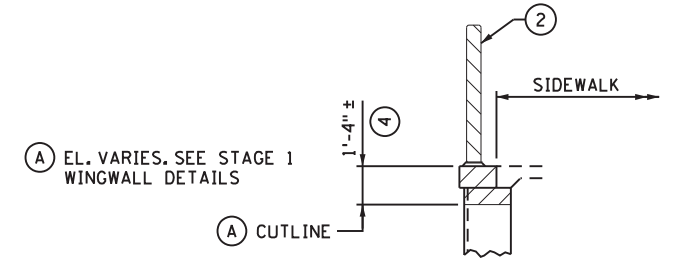
Bridge No.  
 02546



**REMOVAL PLAN**



**SECTION B-B**



**SECTION A-A**

**NOTES:**

THE INPLACE DIMENSIONS SHOWN ARE TAKEN FROM THE 1989 PLAN SET FOR BRIDGE 02546 AND SHALL BE FIELD VERIFIED BEFORE CONSTRUCTION BEGINS.

NO CUTTING WILL BE PERMITTED UNTIL CUTTING LIMITS HAVE BEEN OUTLINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. REMOVAL AND RECONSTRUCTION SHALL CONFORM TO SPEC 2433.

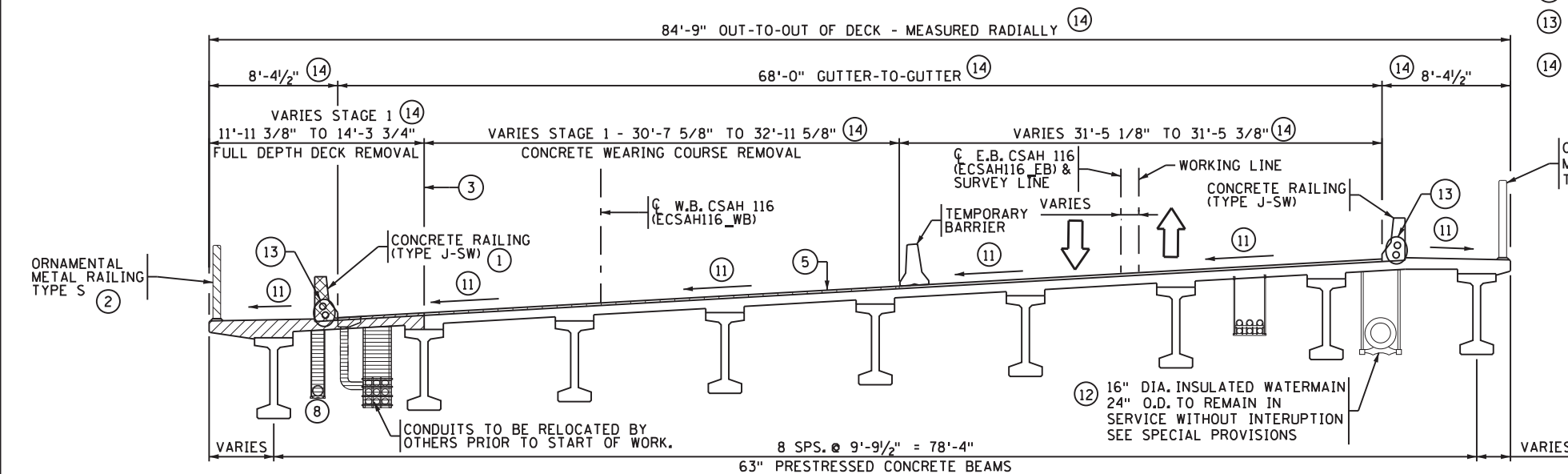
- ① INPLACE CONCRETE BARRIER TYPE J-SW TO BE REMOVED, TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE BARRIER"
- ② INPLACE ORNAMENTAL METAL RAILING TO BE REMOVED, INCLUDED IN ITEM "REMOVE ORNAMENTAL METAL RAILING"
- ③ STAGE 1 SAWCUT AT C NORTH FIRST INTERIOR BEAM. CLEAN, STRAIGHTEN AND REPAIR WITH APPROVED EPOXY TRANSVERSE BARS THAT ARE TO REMAIN IN PLACE AND BARS THAT ARE TO BE CUT AS SHOWN ON DECK REINF. PLAN. SURVEY TOP OF BEAM ELEVATION AT 1/10 POINTS AND REPORT ELEVATIONS TO ENGINEER FOR STOOL HEIGHT ADJUSTMENTS PRIOR TO DECK FORMING.
- ④ STAGE 1 SAWCUT AND REMOVE INPLACE WINGWALLS TO ELEVATIONS SHOWN FOR CONSTRUCTION OF PROPOSED APPROACH PANELS. REBAR TO BE CUT AND REPAIRED WITH APPROVED EPOXY, TO BE INCLUDED IN ITEM "REMOVE CONCRETE BRIDGE BARRIER".
- ⑤ MILL ±2" INPLACE CONCRETE DECK FROM SOUTH TEMPORARY GUTTERLINE TO PROPOSED SAWCUT LINE ON ±CENTER OF BRIDGE DECK. TO BE INCLUDED IN PRICE BID FOR "REMOVE CONCRETE WEARING COURSE".
- ⑥ STAGE 1 SAWCUT IN END DIAPHRAGM TO BE IN SAME HORIZONTAL PLANE AS TOP OF THE BEAM AS SHOWN IN SECTION B-B FOR THE FULL WIDTH OF STAGE 1 DECK REMOVAL. DIAPHRAGM REINFORCEMENT TO REMAIN IN PLACE. CLEAN AND STRAIGHTEN.
- ⑦ SEE ROADWAY PLANS FOR STAGED REMOVAL LIMITS.
- ⑧ GAS LINE TO BE RELOCATED BY OTHERS PRIOR TO REMOVALS.
- ⑨ FOR REMOVAL AND EXPANSION JOINT REPLACEMENT DETAILS SEE SECTION C-C ON SHEET B6

- ⑩ INPLACE STRUCTURAL SIDEWALK TO BE REMOVED, TO BE INCLUDED IN "REMOVE CONCRETE SIDEWALK".
- ⑪ VARIES. SEE BRIDGE LAYOUT AND SUPERSTRUCTURE DETAILS.
- ⑫ INCLUDED IN ITEM "WATERMAIN HANGER SYSTEM".
- ⑬ EXISTING UTILITIES TO BE RELOCATED BY OTHERS PRIOR TO START OF WORK.
- ⑭ PERPENDICULAR TO SURVEY LINE.

SEE SHEET B6 FOR SECTION C-C

**LEGEND:**

- DENOTES CONCRETE REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE DECK"
- DENOTES CONCRETE REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE BARRIER"
- DENOTES REMOVAL AREA TO BE INCLUDED IN "REMOVE ORNAMENTAL METAL RAILING"
- DENOTES REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE APPROACH PANEL"
- DENOTES CONCRETE AREA REMOVAL TO BE INCLUDED IN "REMOVE CONCRETE WEARING COURSE".



**TRANSVERSE SECTION**

S.P. 0206-78 (TH 47)    S.A.P. 002-716-020

NO.	DATE	BY	CHK	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.

*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020    REG NO.: 42732

**wsb**    **ANOKA COUNTY**

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

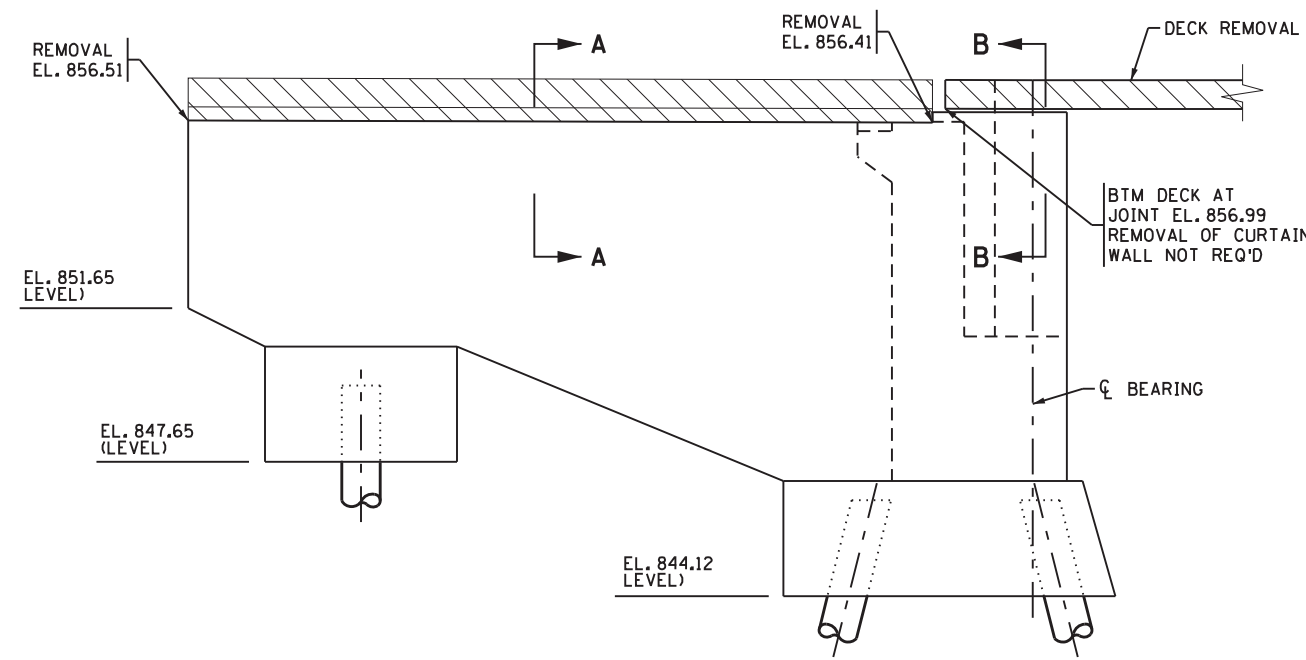
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CHK: CBO	CHK: CBO

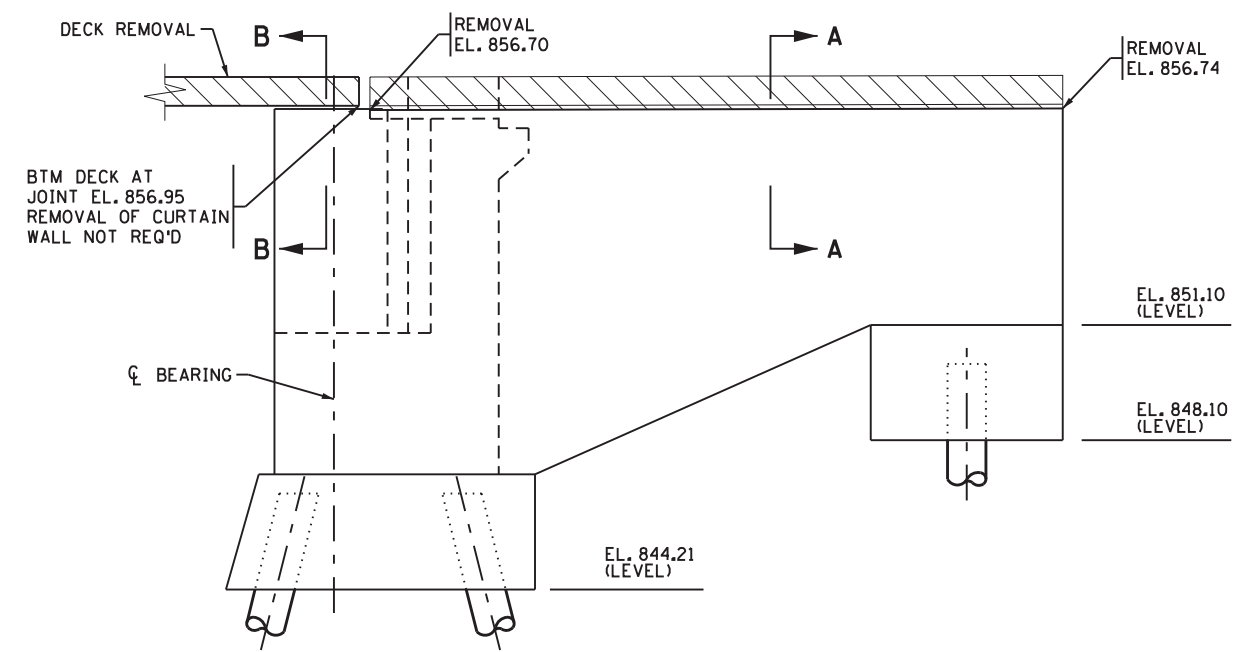
Sheet B5 of B52 Sheets

Bridge No. **02546**

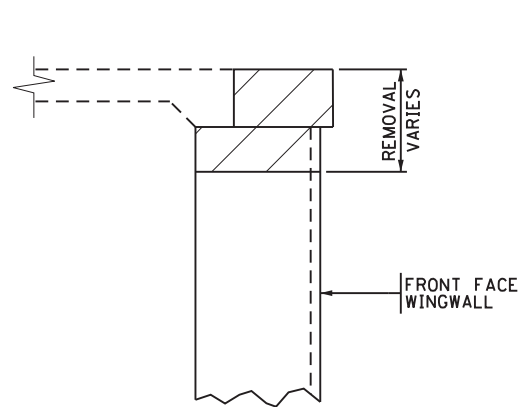
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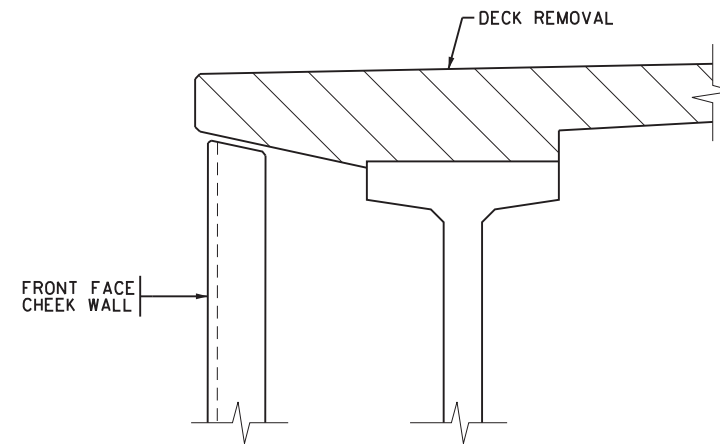
**NORTHEAST WINGWALL - ELEVATION**



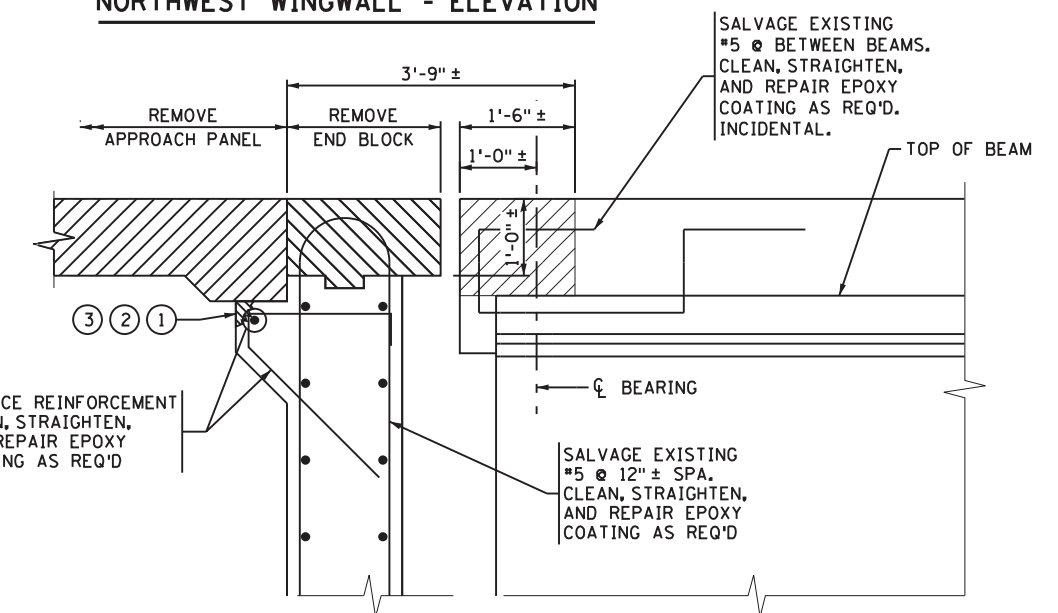
**NORTHWEST WINGWALL - ELEVATION**



**SECTION A-A**  
(ORNAMENTAL RAILING NOT SHOWN FOR CLARITY)



**SECTION B-B**



**SECTION C-C**  
(SEE SHEET B5)

**NOTES:**

- ① REMOVE ANY DETERIORATED AREAS OF PAVING BRACKET TO SOUND CONCRETE IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
- ② REPLACE REMOVED CONCRETE WITH CONCRETE MIX NO. 3B52. COAT SURFACE OF EXISTING CONCRETE WITH BONDING GROUT PER SPECIAL PROVISIONS PRIOR TO CASTING.
- ③ INCLUDED IN ITEM "REPAIR PAVING BRACKET".

**S.P. 0206-78 (TH 47) S.A.P. 002-716-020**

NO	DATE	BY	CHK	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.

*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE:

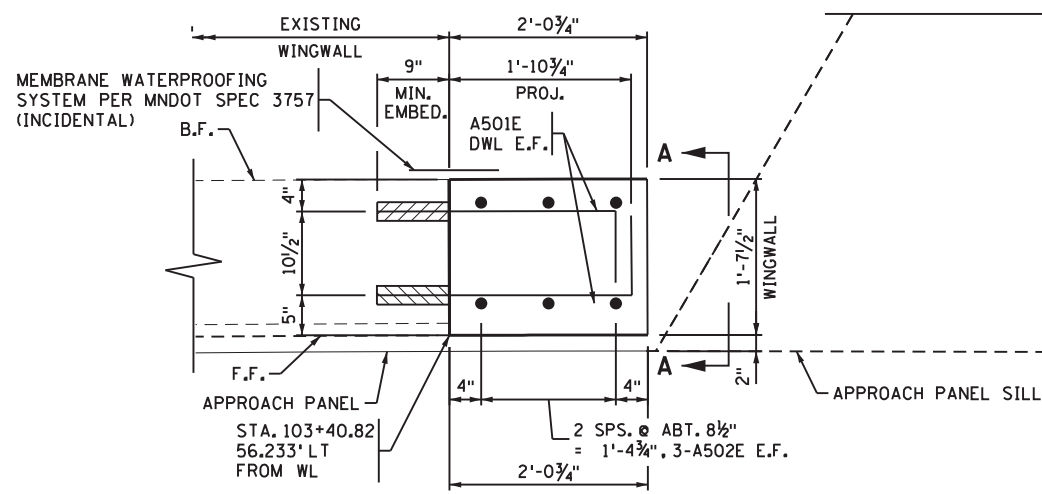
**STAGE 1 DETAILS - 3**

DES: JLB DR: SWH

CHK: CBO CHK: CBO

Sheet B6 of B52 Sheets

Bridge No.  
02546

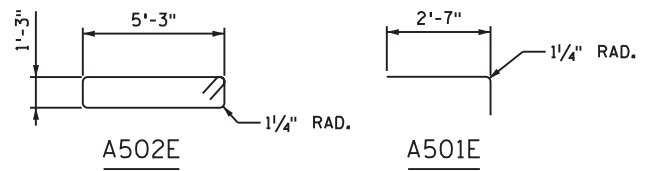


**PLAN**  
NORTHWEST WINGWALL

STRUCTURAL BACKFILL (MNDOT SPEC. 3149.2.D.2, INCIDENTAL). COMPACT BACKFILL TO SPECIFIED DENSITY METHOD, MNDOT SPEC. 2105.3.F.1 (INCIDENTAL).

BILL OF REINFORCEMENT FOR NORTHWEST WINGWALL				
BAR	NO.	LENGTH	SHAPE	LOCATION
A501E	12	3'-7"		END STRUT DOWEL HORIZ. E.F.
A502E	3	13'-11"		WALL VERTICAL

(A) NOT INCLUDED IN WEIGHT OF EPOXY REBAR. INCLUDED IN PRICE BID FOR "ANCH TYPE REINF BARS (TYPE L)."

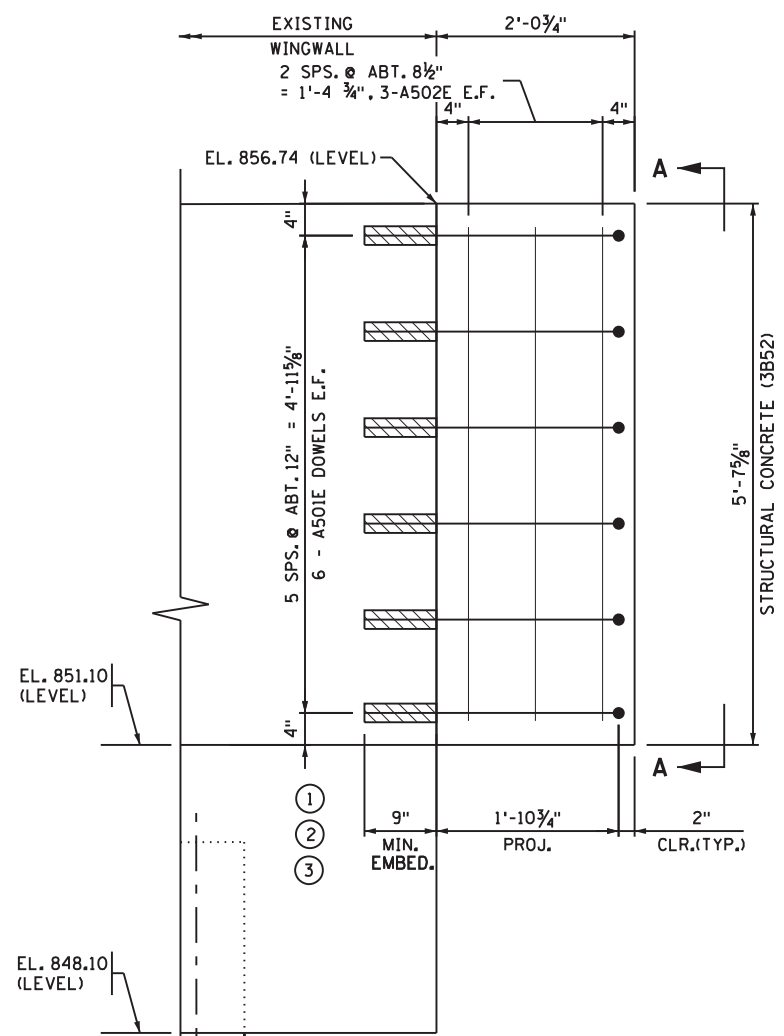


SCHEDULE OF QUANTITIES FOR NORTHWEST WINGWALL		
STRUCTURAL CONCRETE (3B52)	1	CU YD
REINFORCEMENT BARS (EPOXY COATED)	45	POUND
ANCH TYPE REBAR (TYPE L)	12	EACH
ANTI GRAFFITI COATING	12	SQ. FT.
SPECIAL SURFACE FINISH	12	SQ. FT.

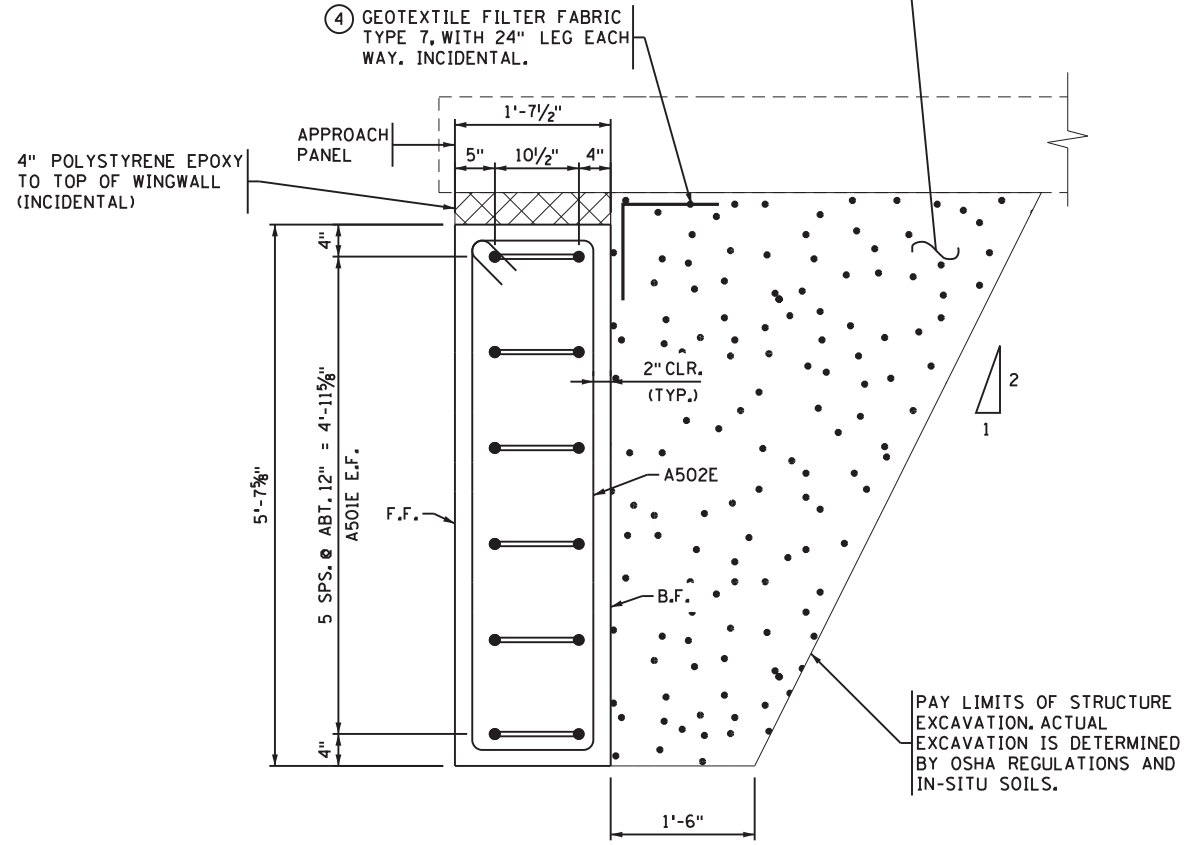
**NOTES:**

- DRILLING AND CLEANING OPERATIONS PRIOR TO PLACEMENT OF ALL POST-INSTALLED ANCHORAGES SHALL BE COMPLETE PRIOR TO INSTALLATION OF ANY POST-INSTALLED ANCHORAGE.
- PLACEMENT OF FORMWORK, REINFORCEMENT, AND CONCRETE SHALL NOT COMMENCE UNTIL ALL POST-INSTALLED ANCHORAGES HAVE REACHED FULL DESIGN STRENGTH. SEE MANUFACTURER'S SPECIFICATIONS.
- ANCH TYPE REINFORCING BARS (TYPE L). PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 9" REGARDLESS OF CHARACTERISTIC BOND STRENGTH. DRILL THROUGH REINFORCEMENT IF ENCOUNTERED TO ACHIEVE MINIMUM EMBEDMENT. PROOF LOAD TO 14.7 KIPS. DRILL HOLE 1/8" LARGER THAN ANCHORAGE REBAR OR PER MANUFACTURER'S RECOMMENDATIONS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
- FIT HORIZONTAL LEG DIRECTLY UNDER BOTTOM OF SLAB. NW WINGWALL DOES NOT NEED EXTENSION OR MODIFICATION.

E.F. = EACH FACE  
F.F. = FRONT FACE  
B.F. = BACK FACE



**ELEVATION**  
NW WINGWALL



**VIEW A-A**  
NW WINGWALL

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO.	DATE	BY	CHK	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.  
*Carlos Berg*  
LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

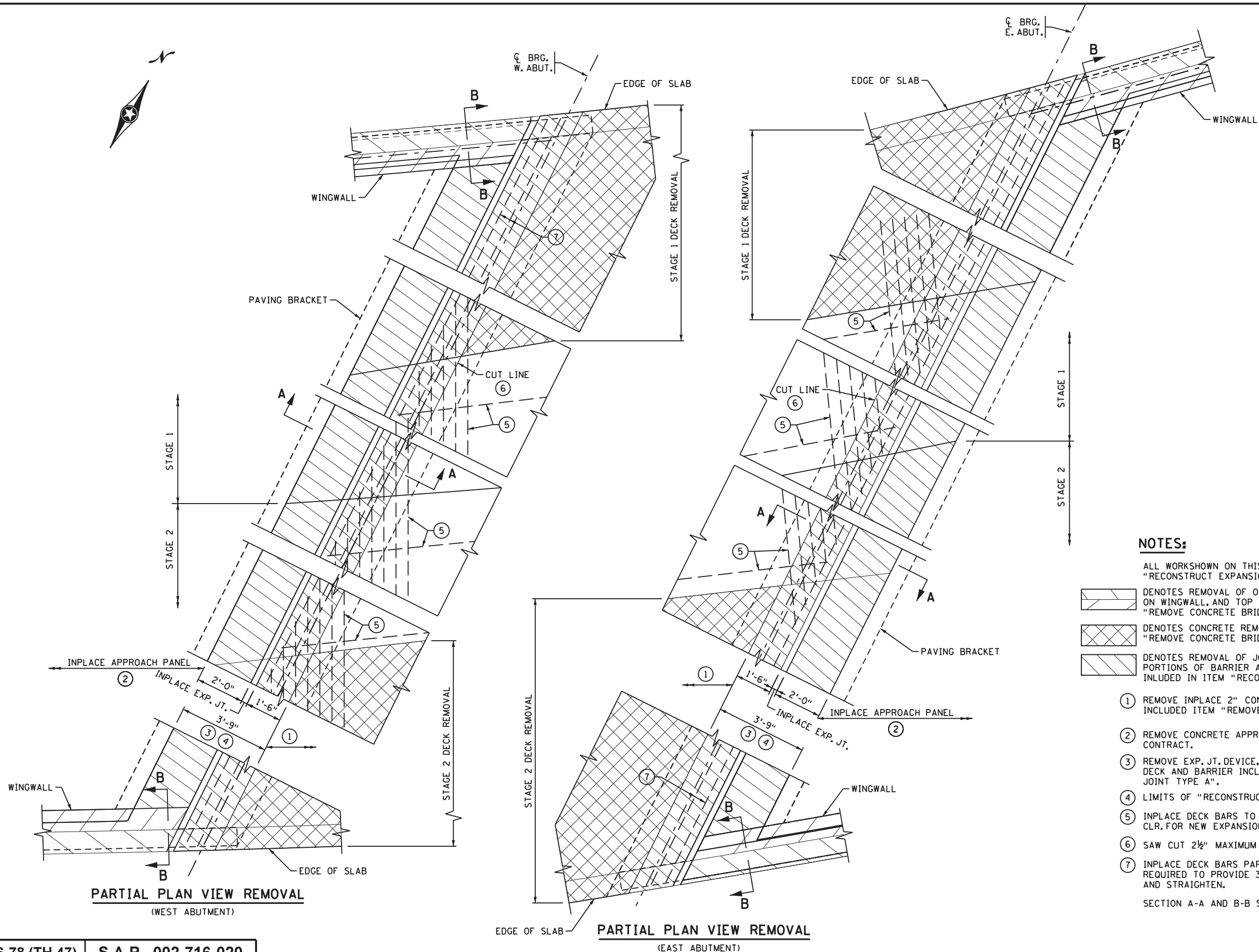
TITLE:  
**STAGE 1 DETAILS - 4**  
**(NW WW EXTENSION)**

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

Sheet B7 of B52 Sheets

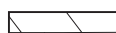


Bridge No.  
02546

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**NOTES:**

ALL WORKSHOWN ON THIS SHEET TO BE INCLUDED IN ITEM "RECONSTRUCT EXPANSION JOINT TYPE A" EXCEPT AS SHOWN.

-  DENOTES REMOVAL OF ORNAMENTAL METAL RAILING TYPE S ON WINGWALL, AND TOP OF WINGWALL, INCLUDED IN ITEM "REMOVE CONCRETE BRIDGE BARRIER".
-  DENOTES CONCRETE REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE DECK".
-  DENOTES REMOVAL OF JOINT MATERIAL, PORTIONS OF DECK, PORTIONS OF BARRIER AND PORTIONS OF WEARING COURSE, INCLUDED IN ITEM "RECONSTRUCT EXPANSION JOINT TYPE A".

- ① REMOVE INPLACE 2" CONCRETE WEARING COURSE ON BRIDGE DECK. INCLUDED ITEM "REMOVE CONCRETE WEARING COURSE".
- ② REMOVE CONCRETE APPROACH PANEL UNDER ROADWAY PORTION OF CONTRACT.
- ③ REMOVE EXP. JT. DEVICE, GLAND COVER PLATE, PORTION OF DECK AND BARRIER INCLUDED IN ITEM "RECONSTRUCT EXPANSION JOINT TYPE A".
- ④ LIMITS OF "RECONSTRUCT EXPANSION JOINT TYPE A".
- ⑤ INPLACE DECK BARS TO REMAIN. CUT IF NECESSARY TO ALLOW 2" CLR. FOR NEW EXPANSION JOINT DEVICE. CLEAN AND STRAIGHTEN.
- ⑥ SAW CUT 2½" MAXIMUM PRIOR TO REMOVING.
- ⑦ INPLACE DECK BARS PARALLEL TO EXPANSION JOINT TO BE CUT AS REQUIRED TO PROVIDE 3'-7" PROJECTION FROM GUTTERLINE, CLEAN AND STRAIGHTEN.

SECTION A-A AND B-B SEE SHEET B9

**S.P. 0206-78 (TH 47)**    **S.A.P. 002-716-020**

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020    REG NO: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

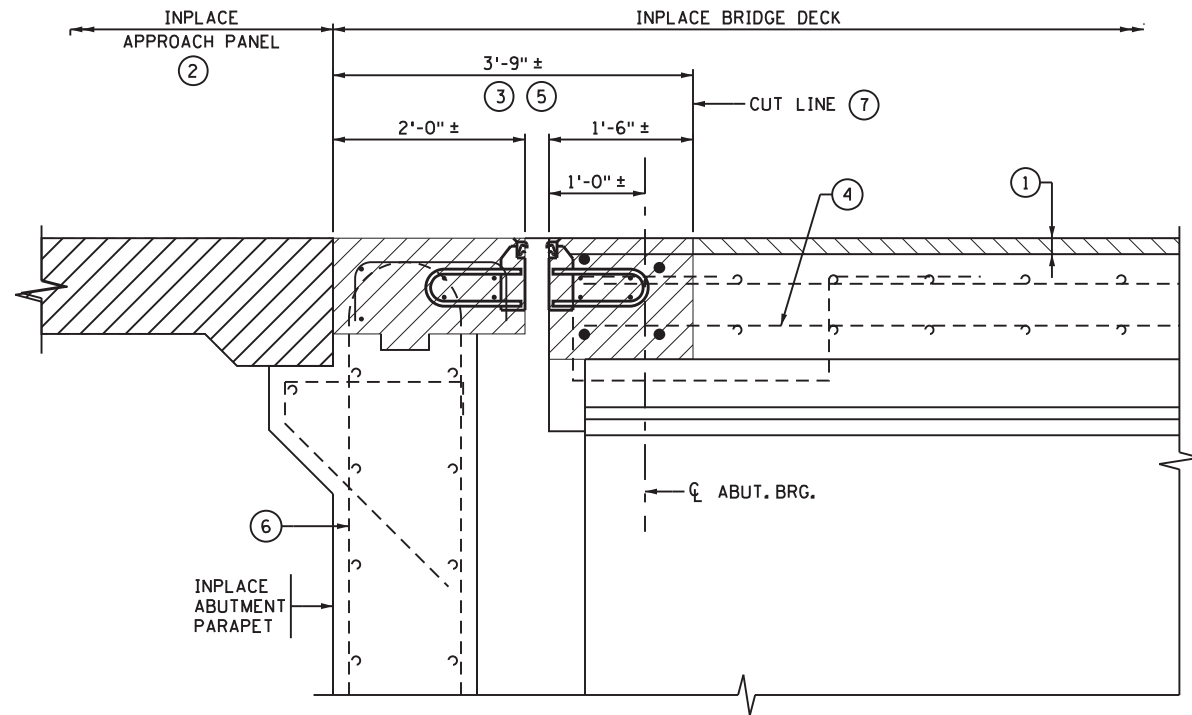
TITLE: **JOINT REMOVAL DETAILS - 1**

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

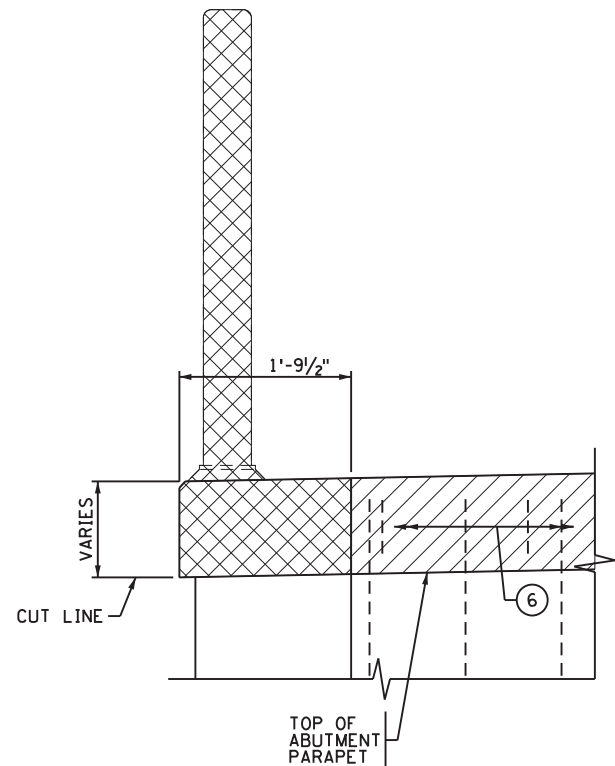
Sheet B8 of B52 Sheets

Bridge No. **02546**

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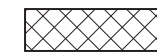
SECTION A-A



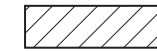
SECTION B-B

**NOTES:**

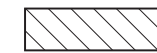
ALL WORK SHOWN ON THIS SHEET TO BE INCLUDED IN ITEM "RECONSTRUCT EXPANSION JOINT TYPE A" EXCEPT AS NOTED.



DENOTES REMOVAL OF ORNAMENTAL METAL RAILING ON WINGWALL, AND TOP OF WINGWALL. INCLUDED IN ITEM "REMOVE CONCRETE BRIDGE BARRIER".



DENOTES REMOVAL OF JOINT MATERIAL, PORTIONS OF DECK, PORTIONS OF BARRIER AND PORTIONS OF WEARING COURSE. INCLUDED IN ITEM "RECONSTRUCT EXPANSION JOINT TYPE A".



DENOTES REMOVAL OF INPLACE 2" CONCRETE WEARING COURSE FROM THE ROADWAY OF THE ENTIRE BRIDGE DECK. INCLUDED IN ITEM "REMOVE CONCRETE WEARING COURSE".

SECTIONS A-A AND B-B LOCATIONS SEE SHEET B8

- (1) REMOVE INPLACE 2" CONCRETE WEARING COURSE ON BRIDGE DECK. INCLUDED IN ITEM "REMOVE CONCRETE WEARING COURSE".
- (2) CONCRETE APPROACH PANELS TO BE REMOVED UNDER ROADWAY PORTION OF CONTRACT.
- (3) REMOVAL OF EXP. JT. DEVICE, GLAND, EXP COVER PLATE AND PORTION OF DECK INCLUDED IN ITEM "RECONSTRUCT EXPANSION JOINT TYPE A".
- (4) INPLACE DECK LONGITUDINAL BARS TO REMAIN. CUT IF NECESSARY TO ALLOW 2" CLR. FOR NEW EXPANSION DEVICE. CLEAN AND STRAIGHTEN.
- (5) LIMITS OF "RECONSTRUCT EXPANSION JOINT TYPE A".
- (6) INPLACE BACK FACE VERTICAL AND TOP LEGS OF THE PARAPET BARS TO REMAIN, FRONT FACE VERTICAL LEG TO BE REMOVED. CLEAN AND STRAIGHTEN.
- (7) SAWCUT 1" PRIOR TO REMOVING.

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S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*

LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732

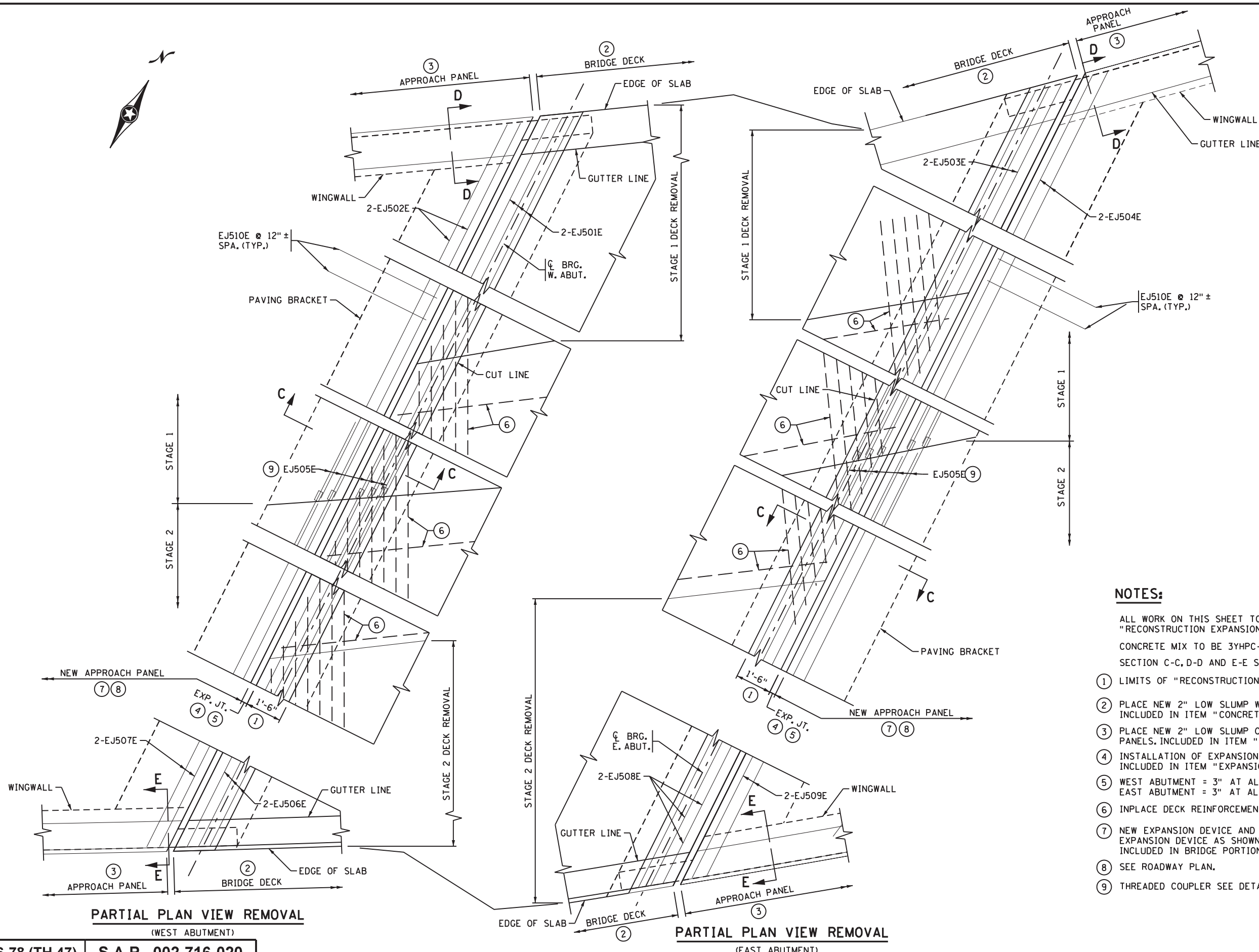


CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **JOINT REMOVAL DETAILS - 2**

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO
Sheet B9 of B52 Sheets	

Bridge No. 02546



**NOTES:**

- ALL WORK ON THIS SHEET TO BE INCLUDED IN ITEM "RECONSTRUCTION EXPANSION JOINT TYPE A" EXCEPT AS NOTED.
- CONCRETE MIX TO BE 3YHPC-S.
- SECTION C-C, D-D AND E-E SEE SHEET B11
- ① LIMITS OF "RECONSTRUCTION EXPANSION JOINT TYPE A".
- ② PLACE NEW 2" LOW SLUMP WEARING COURSE ON BRIDGE DECK. INCLUDED IN ITEM "CONCRETE WEARING COURSE (3U17A) 2.0"."
- ③ PLACE NEW 2" LOW SLUMP CONCRETE WEARING COURSE ON APPROACH PANELS. INCLUDED IN ITEM "CONCRETE WEARING COURSE (3U17A) 2.0".
- ④ INSTALLATION OF EXPANSION JOINTS AND COVER PLATES ARE INCLUDED IN ITEM "EXPANSION JOINT DEVICES TYPE A".
- ⑤ WEST ABUTMENT = 3" AT ALL TEMPS. EAST ABUTMENT = 3" AT ALL TEMPS.
- ⑥ INPLACE DECK REINFORCEMENT.
- ⑦ NEW EXPANSION DEVICE AND REINFORCEMENT ADJACENT TO THE EXPANSION DEVICE AS SHOWN IN THE APPROACH PANELS ARE INCLUDED IN BRIDGE PORTION OF CONTRACT.
- ⑧ SEE ROADWAY PLAN.
- ⑨ THREADED COUPLER SEE DETAIL ON SHEET B11

**PARTIAL PLAN VIEW REMOVAL**

(WEST ABUTMENT)

**PARTIAL PLAN VIEW REMOVAL**

(EAST ABUTMENT)

**S.P. 0206-78 (TH 47) S.A.P. 002-716-020**

NO.	DATE	BY	CHK	REVISIONS

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*Carl S. Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARL S. BERG, PE  
 DATE: 11/10/2020 REG. NO.: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **JOINT RECONSTRUCT DETAILS - 1**

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

Sheet B10 of B52 Sheets

Bridge No. **02546**

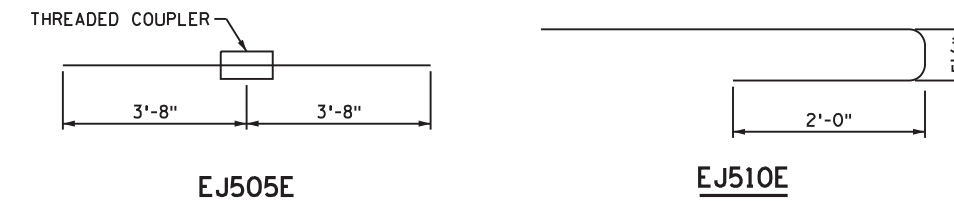
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**⑥ BILL OF REINFORCEMENT FOR RECONSTRUCT EXPANSION JOINT**

BAR	NO.	LENGTH	SHAPE	LOCATION
(A) EJ501E	12	29'-0"	—	END BLOCK - LONGIT. T & B STAGE 1
(B) EJ502E	8	29'-0"	—	APPROACH - LONGIT. T & B STAGE 1
(A) EJ503E	12	30'-7"	—	END BLOCK - LONGIT. T & B STAGE 1
(B) EJ504E	8	30'-7"	—	APPROACH - LONGIT. T & B STAGE 1
(C) EJ505E	20	7'-4"	—	APPROACH & END BLOCK COUPLERS
(A) EJ506E	6	44'-8"	—	END BLOCK - LONGIT. T & B STAGE 2
(B) EJ507E	4	44'-8"	—	APPROACH - LONGIT. T & B STAGE 2
(A) EJ508E	6	48'-9"	—	END BLOCK - LONGIT. T & B STAGE 2
(B) EJ509E	4	48'-9"	—	APPROACH - LONGIT. T & B STAGE 2
EJ510E	164	7'-6"	—	APPROACH PANEL TIES

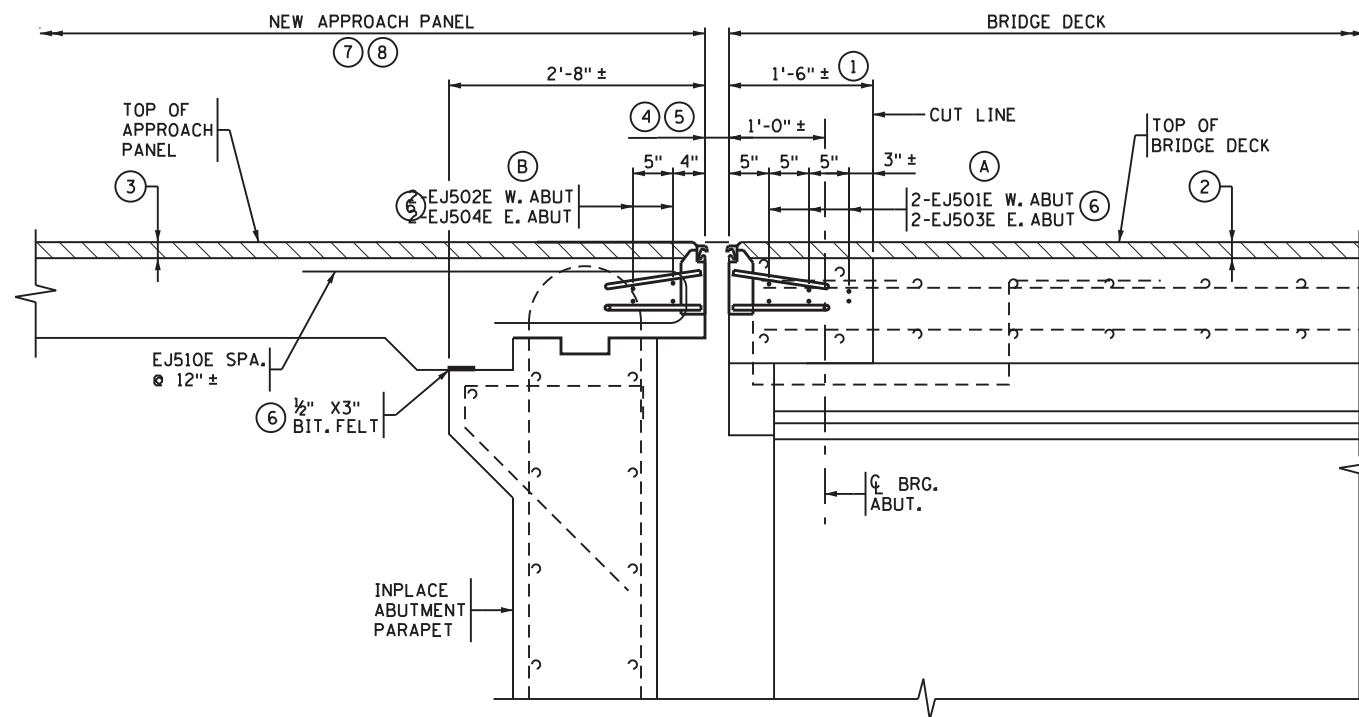
(C) EJ505E NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS" OR "REINFORCEMENT BARS (EPOXY COATED)" (INCIDENTAL). 3'-6" MINIMUM LAP EACH SIDE OF COUPLER.



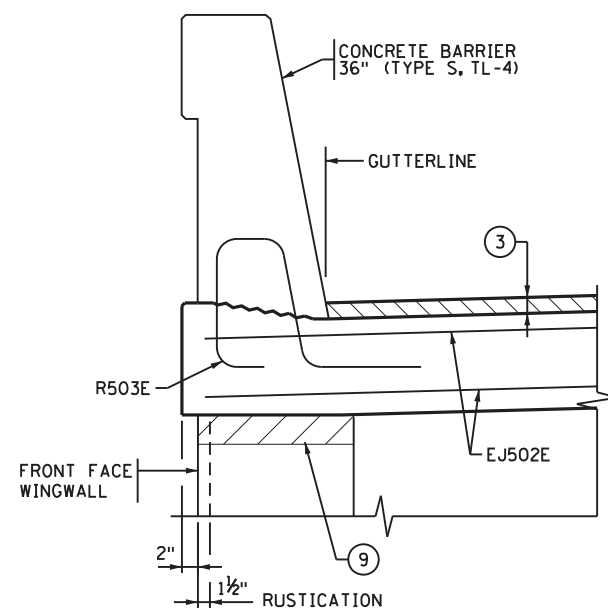
**NOTES:**

HATCHED AREAS INDICATE NEW CONCRETE WEARING COURSE.  
 ALL WORK SHOWN ON THIS SHEET TO BE INCLUDED IN ITEM "RECONSTRUCT EXPANSION JOINT TYPE A" EXCEPT AS NOTED.  
 DIMENSIONS SHOWN ARE FOR EXPANSION JOINT OPENING AT 90°.  
 SECTIONS C-C, D-D AND E-E LOCATIONS SEE SHEET B10

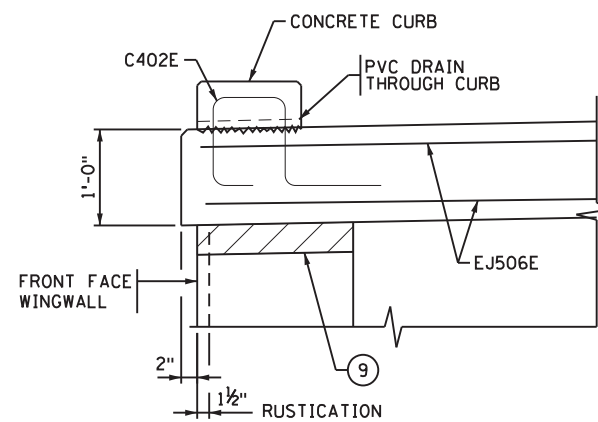
- ① LIMITS OF "RECONSTRUCT EXPANSION JOINT TYPE A".
- ② PLACE 2" CONCRETE WEARING COURSE ON BRIDGE DECK. INCLUDED IN ITEM "CONCRETE WEARING COURSE (3U17A) 2.0"
- ③ PLACE NEW 2" LOW SLUMP CONCRETE WEARING COURSE ON APPROACH PANELS. INCLUDED IN ITEM "CONCRETE WEARING COURSE (3U17A) 2.0"
- ④ INSTALLATION OF EXPANSION JOINTS AND COVER PLATES ARE INCLUDED IN ITEM "EXPANSION JOINT DEVICES TYPE A".
- ⑤ WEST ABUTMENT = 3"  
EAST ABUTMENT = 3"
- ⑥ INCLUDED IN ITEM "RECONSTRUCT EXPANSION JOINT TYPE A".
- ⑦ NEW EXPANSION DEVICE AND REINFORCEMENT ADJACENT TO THE EXPANSION DEVICE AS SHOWN IN THE APPROACH PANELS ARE INCLUDED IN BRIDGE PORTION OF CONTRACT.
- ⑧ SEE ROADWAY PLAN.
- ⑨ 4" POLYSTYRENE TYPE B, EPOXY TO TOP OF WW (INCIDENTAL).  
T = TOP  
B = BOTTOM



**SECTION C-C**



**SECTION D-D**



**SECTION E-E**

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO.	DATE	BY	CHK	REVISIONS

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 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



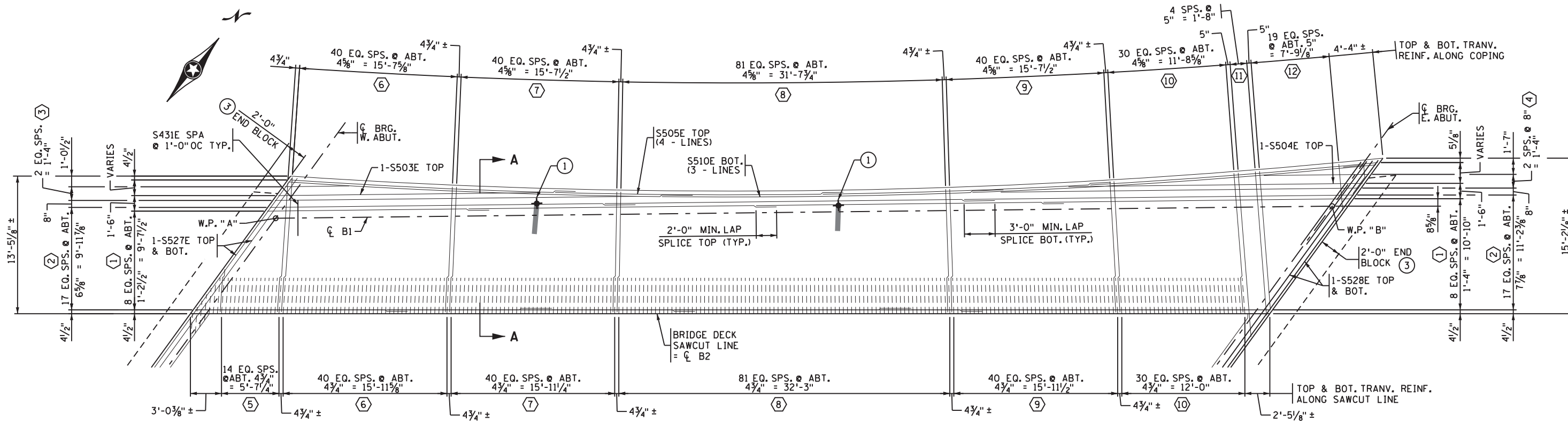
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **JOINT RECONSTRUCT DETAILS - 2**

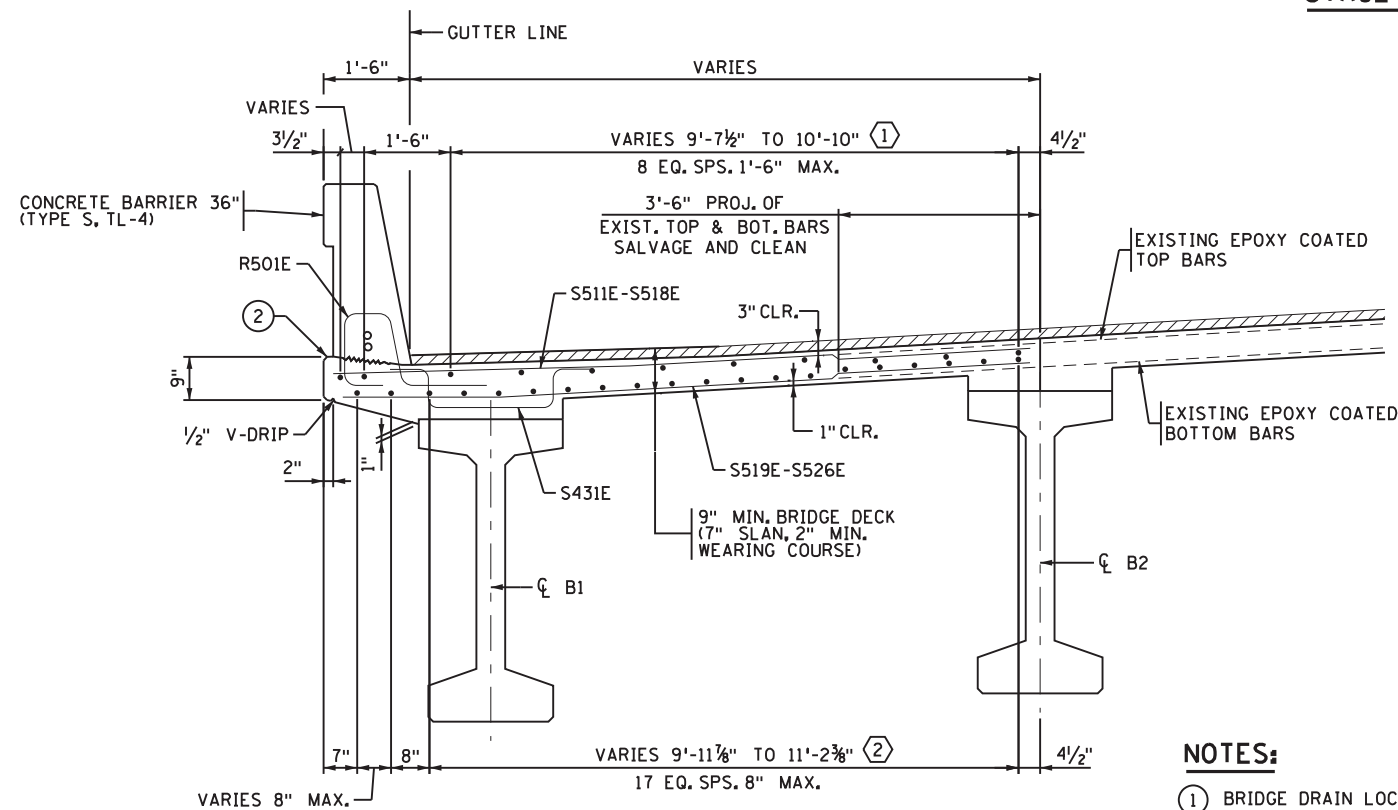
DES: JLB DR: SWH  
 CHK: CBO CHK: CBO

Sheet B11 of B52 Sheets

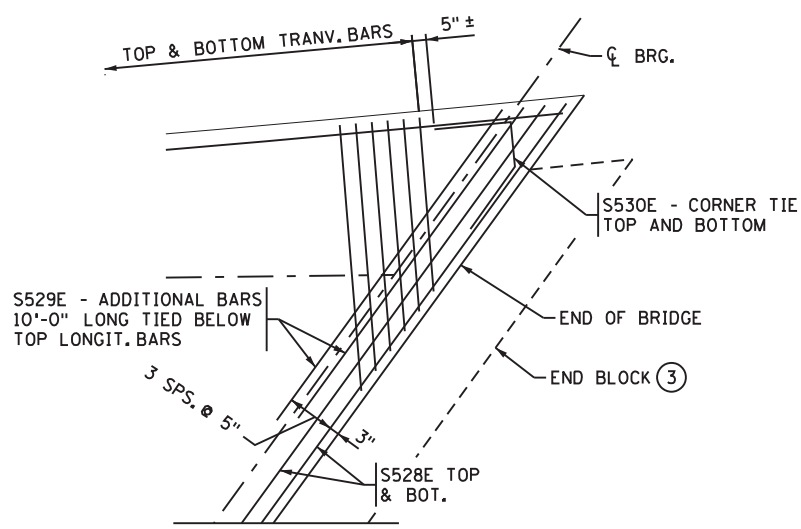
Bridge No. 02546



**STAGE 1 DECK REINFORCEMENT**



**SECTION A-A**



**N.E. CORNER DETAIL**

**BAR CALL-OUTS:**

- ① 9-S501E (T) (3-LINES) W/ 9-S502E (T) @ 8 EQ. SPS. ALTERNATE PLACEMENT OF BARS TO STAGGER SPLICES.
- ② 18-S506E (B) (3-LINES) W/ 18-S507E (B) @ 18 EQ. SPS. ALTERNATE PLACEMENT OF BARS TO STAGGER SPLICES.
- ③ 1 SERIES OF 3-S508E (B)
- ④ 1 SERIES OF 3-S509E (B)
- ⑤ 1 SERIES OF 15-S511E (T) & 15-S519E (B)
- ⑥ 1 SERIES OF 41-S512E (T) & 41-S520E (B)
- ⑦ 1 SERIES OF 41-S513E (T) & 41-S521E (B)
- ⑧ 82-S514E (T) & 82-S522E (B)
- ⑨ 1 SERIES OF 41-S515E (T) & 41-S523E (B)
- ⑩ 1 SERIES OF 31-S516E (T) & 31-S524E (B)
- ⑪ 1 SERIES OF 5-S517E (T) & 5-S525E (B)
- ⑫ 1 SERIES OF 20-S518E (T) & 20-S526E (B)
- ⑬ 3'-0" MIN. LAP

**NOTES:**

- ① BRIDGE DRAIN LOCATIONS. BEND AND CUT BARS AS NECESSARY. MAINTAIN 2" CLEAR. REPAIR EPOXY COATING AS NECESSARY (INCIDENTAL).
  - ② SEE END DETAIL "A" SHEET B13
  - ③ END BLOCK TO BE REMOVED.
- (T) = TOP  
(B) = BOTTOM

**NOTES:**

- ① BRIDGE DRAIN LOCATIONS. BEND AND CUT BARS AS NECESSARY. MAINTAIN 2" CLEAR. REPAIR EPOXY COATING AS NECESSARY (INCIDENTAL).
- ② SEE END DETAIL "A" SHEET B13
- ③ END BLOCK TO BE REMOVED.

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	REVISIONS

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*Carl Osberg*  
 LICENSED PROFESSIONAL ENGINEER: CARL OSBERG, PE  
 DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

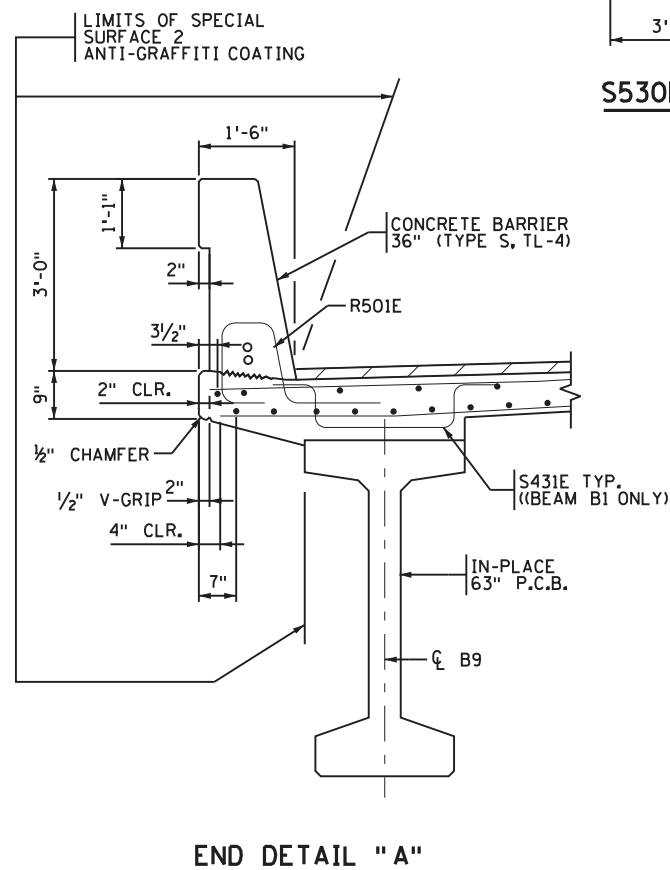
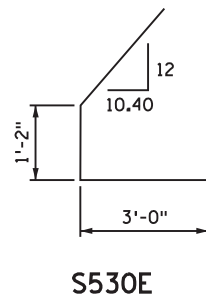
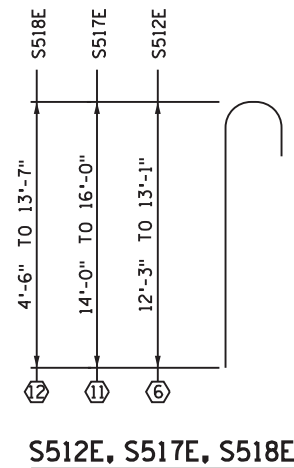
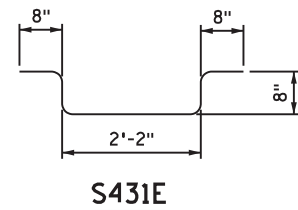
TITLE: **STAGE 1 SUPERSTRUCTURE DETAILS - 1**

DES: JLB DR: SWH  
 CHK: CBO CHK: CBO

Sheet B12 of B52 Sheets

Bridge No. 02546

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**BILL OF REINFORCEMENT - SUPERSTRUCTURE**

BAR	NO.	LENGTH	SHAPE	LOCATION
S501E	27	30'-0"	—	SLAB - TOP LONGIT.
S502E	9	(A)	—	SLAB - TOP LONGIT.
S503E	1	25'-6"	—	SLAB - TOP LONGIT.
S504E	1	28'-8"	—	SLAB - TOP LONGIT.
S505E	4	28'-1"	—	SLAB - TOP LONGIT.
S506E	36	38'-0"	—	SLAB - BOTTOM LONGIT.
S507E	18	(B)	—	SLAB - BOTTOM LONGIT.
S508E	3	(C)	—	SLAB - BOTTOM LONGIT.
S509E	3	(D)	—	SLAB - BOTTOM LONGIT.
S510E	3	37'-3"	—	SLAB - BOTTOM LONGIT.
S511E	15	(E)	—	SLAB - TOP TRANSV.
S512E	41	(F)	—	SLAB - TOP TRANSV.
S513E	41	(G)	—	SLAB - TOP TRANSV.
S514E	82	11'-8"	—	SLAB - TOP TRANSV.
S515E	31	(H)	—	SLAB - TOP TRANSV.
S516E	5	(I)	—	SLAB - TOP TRANSV.
S517E	31	(J)	—	SLAB - TOP TRANSV.
S518E	20	(K)	—	SLAB - TOP TRANSV.
S519E	15	(L)	—	SLAB - BOTTOM TRANSV.
S520E	41	(M)	—	SLAB - BOTTOM TRANSV.
S521E	41	(N)	—	SLAB - BOTTOM TRANSV.
S522E	82	11'-8"	—	SLAB - BOTTOM TRANSV.
S523E	41	(O)	—	SLAB - BOTTOM TRANSV.
S524E	31	(P)	—	SLAB - BOTTOM TRANSV.
S525E	5	(Q)	—	SLAB - BOTTOM TRANSV.
S526E	20	(R)	—	SLAB - BOTTOM TRANSV.
S527E	4	19'-5"	—	END OF DECK - TRANSV.
S528E	4	21'-6"	—	END OF DECK - TRANSV.
S529E	2	10'-0"	—	END OF DECK - TRANSV.
S530E	2	7'-2"	—	DECK CORNER TIE
S431E	60	4'-10"	—	BEAM HAT

- (A) 1 SERIES OF 9 BARS - (20'-9" TO 21'-8")
- (B) 1 SERIES OF 18 BARS - (36'-9" TO 37'-0")
- (C) 1 SERIES OF 3 BARS - (6'-3" TO 35'-6")
- (D) 1 SERIES OF 3 BARS - (10'-3" TO 34'-11")
- (E) 1 SERIES OF 15 BARS - (4'-1" TO 12'-7")
- (F) 1 SERIES OF 41 BARS - (13'-2" TO 14'-0")
- (G) 1 SERIES OF 41 BARS - (11'-9" TO 12'-3")
- (H) 1 SERIES OF 41 BARS - (12'-0" TO 12'-9")
- (I) 1 SERIES OF 31 BARS - (12'-9" TO 13'-7")
- (J) 1 SERIES OF 5 BARS - (14'-11" TO 17'-9")
- (K) 1 SERIES OF 20 BARS - (5'-3" TO 14'-6")
- (L) 1 SERIES OF 15 BARS - (4'-1" TO 12'-7")
- (M) 1 SERIES OF 41 BARS - (12'-1" TO 12'-11")
- (N) 1 SERIES OF 41 BARS - (11'-7" TO 12'-0")
- (O) 1 SERIES OF 41 BARS - (11'-10" TO 12'-7")
- (P) 1 SERIES OF 31 BARS - (12'-7" TO 13'-5")
- (Q) 1 SERIES OF 5 BARS - (13'-10" TO 15'-10")
- (R) 1 SERIES OF 20 BARS - (4'-5" TO 13'-6")

**SUMMARY OF QUANTITIES - SUPERSTRUCTURE**

BRIDGE SLAB CONCRETE (3YHPC-S)	1416	SQ. FT.
TYPE S (TL-4) 36" BARRIER CONCRETE (3S52)	143	LIN. FT.
REINFORCEMENT BARS (EPOXY COATED)	10835	POUND
BRIDGE NAME PLATE	1	EACH
ANTI-GRAFFITI COATING	1120	SQ. FT.
CONDUIT SYSTEM (SIGNALS)	1	LIN. FT.
DRAINAGE SYSTEM BRIDGE DECK	1	LUMP SUM
1.5" PVC COATED RIGID STEEL CONDUIT	398	LIN. FT.

- (1) INCLUDES SLAB, AND BARRIER AND JOINT REINFORCEMENT
- (2) TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS
- (3) INCLUDES RAILING ON APPROACH PANELS

**NOTES:**

- (1) SEE SHEET B12
- (4) EXPECTED QUANTITY, FINAL QUANTITY TO BE REVISED IN THE FIELD AS NECESSARY ONCE REQUIRED LOCATIONS ARE DETERMINED.

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**S.P. 0206-78 (TH 47) S.A.P. 002-716-020**

NO.	DATE	BY	CHK	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.

*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



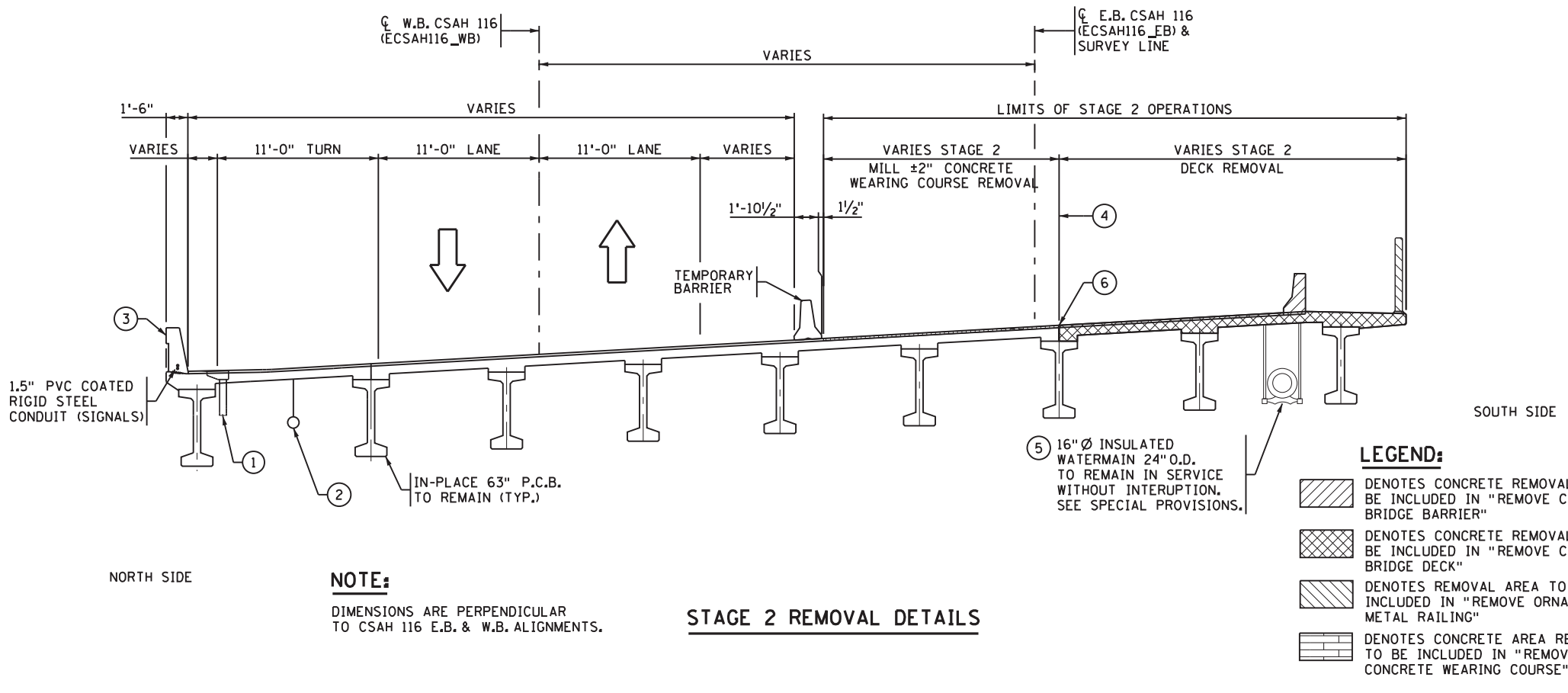
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **STAGE 1 SUPERSTRUCTURE DETAILS - 2**

DES: JLB DR: SWH  
 CHK: CBO CHK: CBO

Sheet B13 of B52 Sheets

Bridge No. **02546**

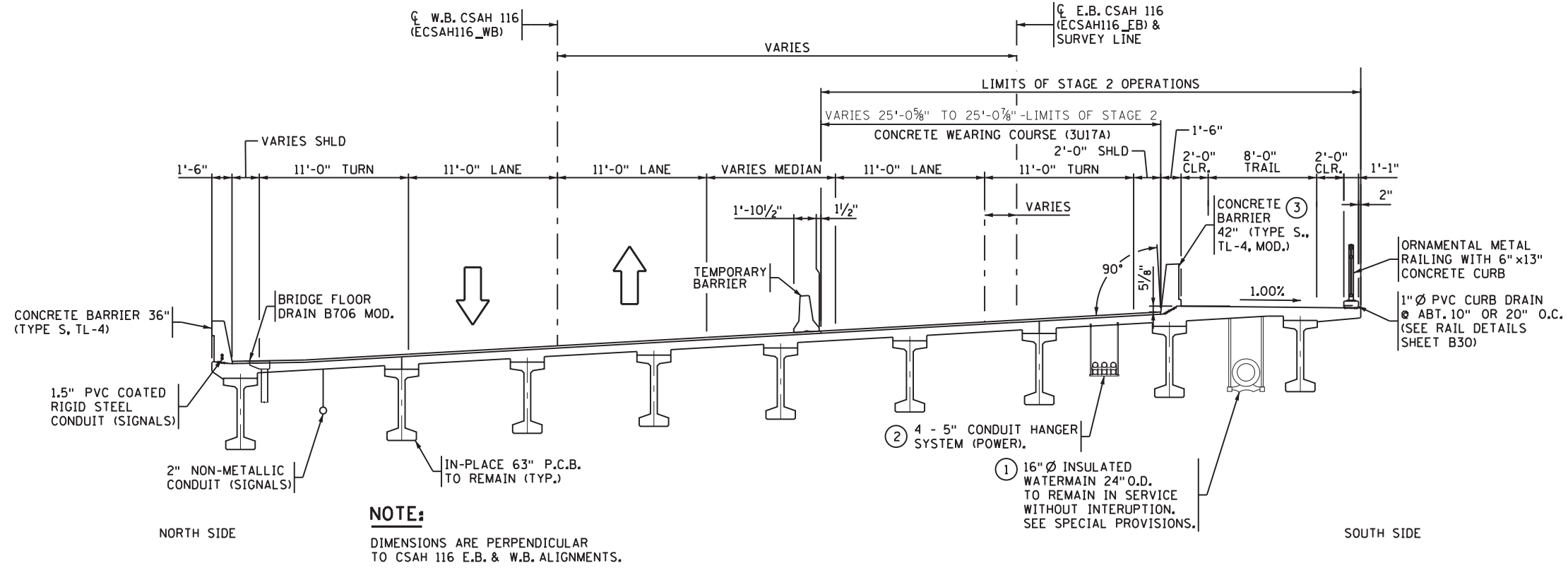


**NOTE:**  
DIMENSIONS ARE PERPENDICULAR TO CSAH 116 E.B. & W.B. ALIGNMENTS.

**STAGE 2 REMOVAL DETAILS**

- LEGEND:**
- DENOTES CONCRETE REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE BARRIER"
  - DENOTES CONCRETE REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE DECK"
  - DENOTES REMOVAL AREA TO BE INCLUDED IN "REMOVE ORNAMENTAL METAL RAILING"
  - DENOTES CONCRETE AREA REMOVAL TO BE INCLUDED IN "REMOVE CONCRETE WEARING COURSE"

- REMOVAL OPERATIONS:**
- MOVE TEMPORARY PRECAST BARRIER AS SHOWN. BARRIER LOCATED ON BRIDGE DECK SHALL NOT BE ANCHORED. SEE ROADWAY PLANS FOR QUANTITIES. SHIFT TRAFFIC TO THE NORTH PORTION OF THE RECONSTRUCTED/RECONFIGURED BRIDGE.
  - MILL ±2" INPLACE CONCRETE DECK FROM NORTH GUTTER LINE OF TEMPORARY BARRIER TO PROPOSED SAWCUT LINE ON SOUTH SIDE OF BRIDGE DECK.
  - SAWCUT BRIDGE DECK AS SHOWN.
  - SAWCUT END DIAPHRAGM AT TOP OF BEAM (±) AS SHOWN IN "SECTION B-B" OF "REMOVAL DETAILS" SHEET.
  - SAWCUT SOUTH WINGWALLS TO ELEVATIONS SHOWN IN "ELEVATION VIEWS" OF "STAGE 2 REMOVAL DETAILS" SHEET.
  - REMOVE SOUTH CONCRETE BARRIER.
  - REMOVE SOUTH METAL RAILING.
  - REMOVE PORTION OF CONCRETE BRIDGE DECK.
  - REMOVE PORTION OF CONCRETE WINGWALLS.
  - ENGINEER TO SOUND BRIDGE DECK. CONTRACTOR TO REMOVE PORTIONS OF SLAB AS OUTLINED IN SPECIAL PROVISIONS.
- ① BRIDGE FLOOR DRAIN B706
  - ② 2" NON-METALLIC CONDUIT (SIGNALS)
  - ③ CONCRETE BARRIER 36" (TYPE S, TL-4)
  - ④ SAWCUT IN BRIDGE DECK @  $\phi$  BEAM.
  - ⑤ INCLUDED IN PAY ITEM "WATERMAIN HANGER SYSTEM".
  - ⑥ SALVAGE AND REPAIR EXISTING TRANSVERSE DECK REINFORCEMENT. SEE SUPERSTRUCTURE DETAILS.



**NOTE:**  
DIMENSIONS ARE PERPENDICULAR TO CSAH 116 E.B. & W.B. ALIGNMENTS.

**STAGE 2 CONSTRUCTION DETAILS**

- CONSTRUCTION OPERATIONS:**
- SURVEY TOP OF BEAM ELEVATION AT 1/10 POINTS AND REPORT ELEVATIONS TO ENGINEER FOR STOOB HEIGHT ADJUSTMENTS PRIOR TO DECK FORMING.
  - CONSTRUCT STAGE 2 CONCRETE BRIDGE DECK.
  - CONSTRUCT STAGE 2 APPROACH PANELS.
  - PERFORM ANY NECESSARY DECK REPAIRS IDENTIFIED DURING REMOVAL OPERATIONS. SEE SPECIAL PROVISIONS.
  - SEAL ANY BRIDGE DECK CRACKS USING THE EPOXY BY CHASE METHOD. SEE SPECIAL PROVISIONS.
  - CONSTRUCT CONCRETE BARRIER (TYPE S, TL-4, MOD.) ON BRIDGE DECK AND APPROACH PANEL.
  - CONSTRUCT ORNAMENTAL METAL RAILING WITH 6"x13" CURB ON BRIDGE DECK AND APPROACH PANEL.
  - PLACE CONCRETE WEARING COURSE (3U17A) BETWEEN CONCRETE BARRIER (TYPE S, TL-4, MOD.) TEMPORARY BARRIER.
  - REMOVE TEMPORARY BARRIER.
  - OPEN BRIDGE TO TRAFFIC.
- ① INCLUDED IN PAY ITEM "WATERMAIN HANGER SYSTEM".
  - ② INCLUDED IN PAY ITEM "CONDUIT SYSTEM (POWER)".
  - ③ BACK FACE PLUMB, SEE BARRIER SHEET B28.

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732

**wsb** **ANOKA COUNTY**

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

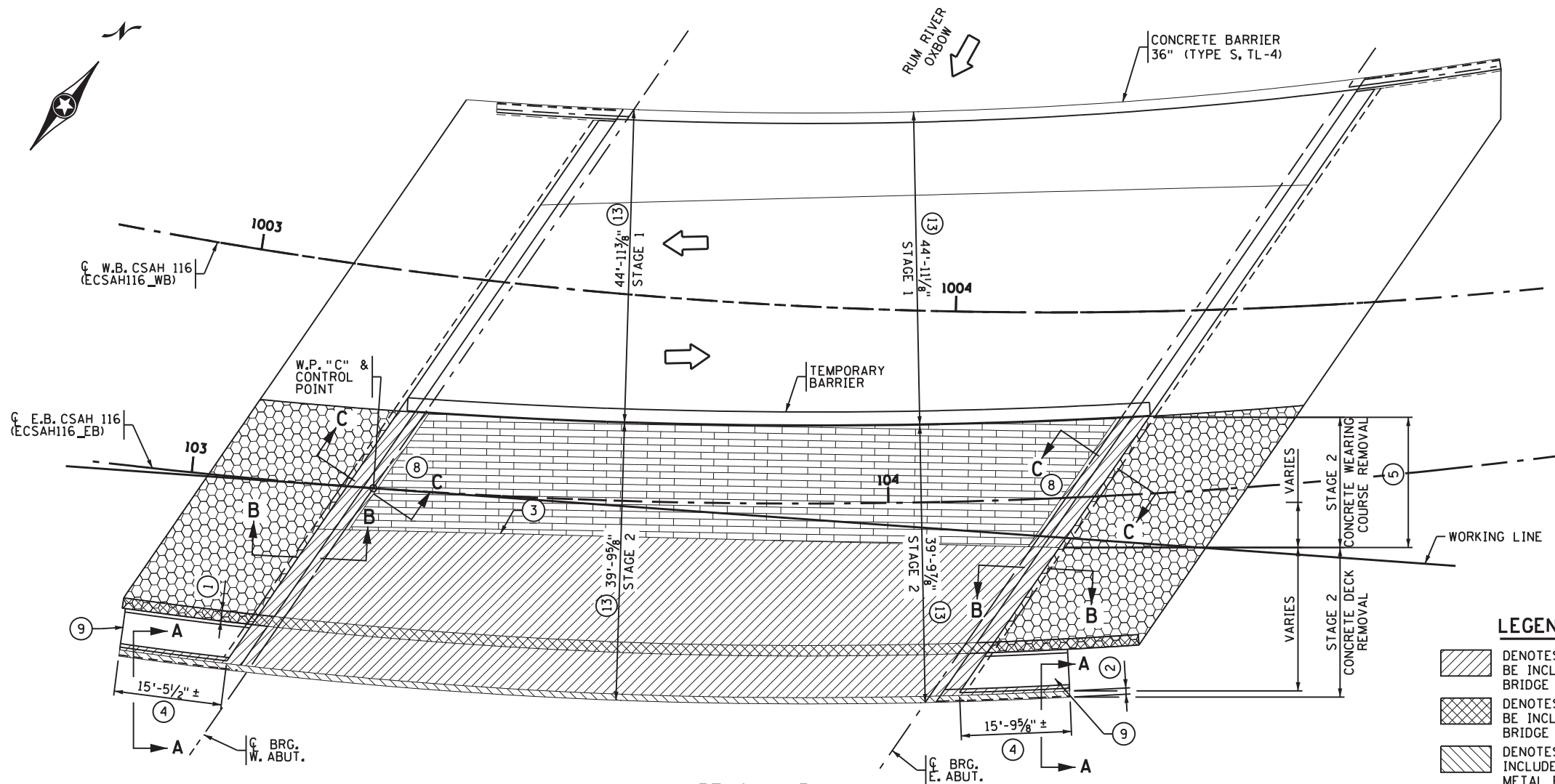
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CHK: CBO	CHK: CBO

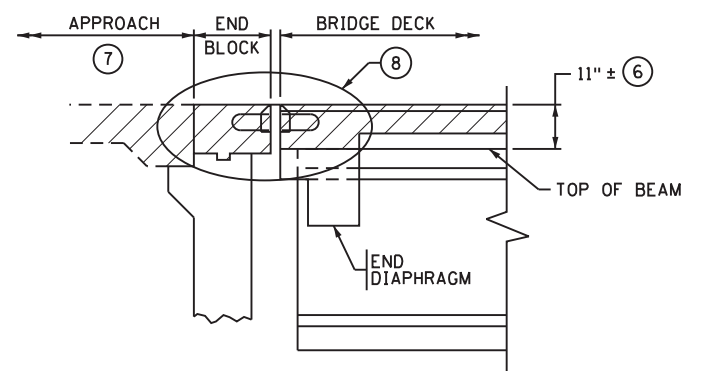
Sheet B14 of B52 Sheets

Bridge No. **02546**

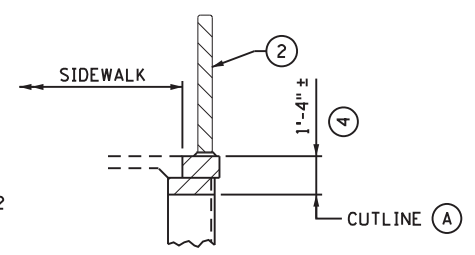
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**REMOVAL PLAN**



**SECTION B-B**



**SECTION A-A**

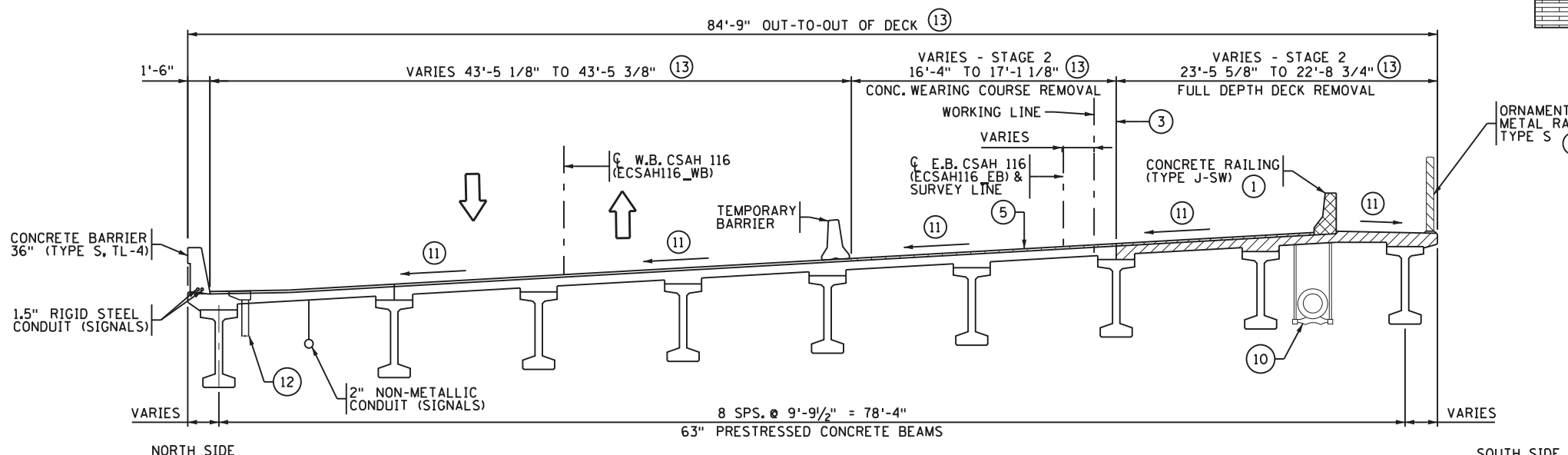
(A) EL. VARIES. SEE STAGE 2 WINGWALL DETAILS.

**LEGEND:**

- DENOTES CONCRETE REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE DECK"
- DENOTES CONCRETE REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE BARRIER"
- DENOTES REMOVAL AREA TO BE INCLUDED IN "REMOVE ORNAMENTAL METAL RAILING"
- DENOTES REMOVAL AREA TO BE INCLUDED IN "REMOVE CONCRETE APPROACH PANEL"
- DENOTES CONCRETE AREA REMOVAL TO BE INCLUDED IN "REMOVE CONCRETE WEARING COURSE".

**NOTES:**

- THE INPLACE DIMENSIONS POINTS SHOWN ARE TAKEN FROM THE 1989 PLAN SET FOR BRIDGE 02546 AND SHALL BE FIELD VERIFIED BEFORE CONSTRUCTION BEGINS.
- NO CUTTING WILL BE PERMITTED UNTIL CUTTING LIMITS HAVE BEEN OUTLINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. REMOVAL AND RECONSTRUCTION SHALL CONFORM TO SPEC 2433.
- 1 INPLACE CONCRETE BARRIER TYPE J-SW TO BE REMOVED. TO BE INCLUDED IN "REMOVE CONCRETE BRIDGE BARRIER"
  - 2 INPLACE ORNAMENTAL METAL RAILING TO BE REMOVED. INCLUDED IN ITEM "REMOVE ORNAMENTAL METAL RAILING"
  - 3 STAGE 2 SAWCUT AT C SOUTH SECOND INTERIOR BEAM. CLEAN, STRAIGHTEN AND REPAIR WITH APPROVED EPOXY TRANSVERSE BARS THAT ARE TO REMAIN IN PLACE AND BARS THAT ARE TO BE CUT AS SHOWN ON DECK REINF. PLAN.
  - 4 STAGE 2 SAWCUT AND REMOVE INPLACE WINGWALLS TO ELEVATIONS SHOWN FOR CONSTRUCTION OF PROPOSED APPROACH PANELS. REBAR TO BE CUT AND REPAIRED WITH APPROVED EPOXY. TO BE INCLUDED IN ITEM "REMOVE CONCRETE BRIDGE BARRIER".
  - 5 MOVE TEMPORARY BARRIER NORTH TO EDGE OF STAGE 1
  - 6 MILL ±2" INPLACE CONCRETE DECK FROM SOUTH GUTTERLINE TO PROPOSED SAWCUT LINE ON ±CENTER OF BRIDGE DECK. TO BE INCLUDED IN PRICE BID FOR "REMOVE CONCRETE WEARING COURSE".
  - 7 STAGE 2 SAWCUT IN END DIAPHRAGM TO BE IN SAME HORIZONTAL PLANE AS TOP OF THE BEAM AS SHOWN IN SECTION B-B FOR THE FULL WIDTH OF STAGE 2 DECK REMOVAL. DIAPHRAGM REINFORCEMENT TO REMAIN IN PLACE. CLEAN AND STRAIGHTEN.
  - 8 SEE ROADWAY PLANS FOR STAGED REMOVAL LIMITS.
  - 9 FOR ADDITIONAL REMOVAL AND RESTORATION INFORMATION SEE SECTION C-C ON SHEET B16
  - 10 INPLACE STRUCTURAL SIDEWALK TO BE REMOVED. TO BE INCLUDED IN "REMOVE CONCRETE SIDEWALK".



**TRANSVERSE SECTION**

- 10 16" DIA. INSULATED WATERMAIN 24" O.D. TO REMAIN IN SERVICE WITHOUT INTERRUPTION. SEE SPECIAL PROVISIONS. INCLUDED IN PAY ITEM "WATERMAIN HANGER SYSTEM".
  - 11 VARIES. SEE SHEET B3.
  - 12 BRIDGE FLOOR DRAIN B706.
  - 13 PERPENDICULAR TO SURVEY LINE.
- SURVEY TOP OF BEAM AND DECK ELEVATION AT 1/10 POINTS AND REPORT ELEVATIONS TO ENGINEER FOR STOOl HEIGHT ADJUSTMENTS PRIOR TO DECK FORMING.

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

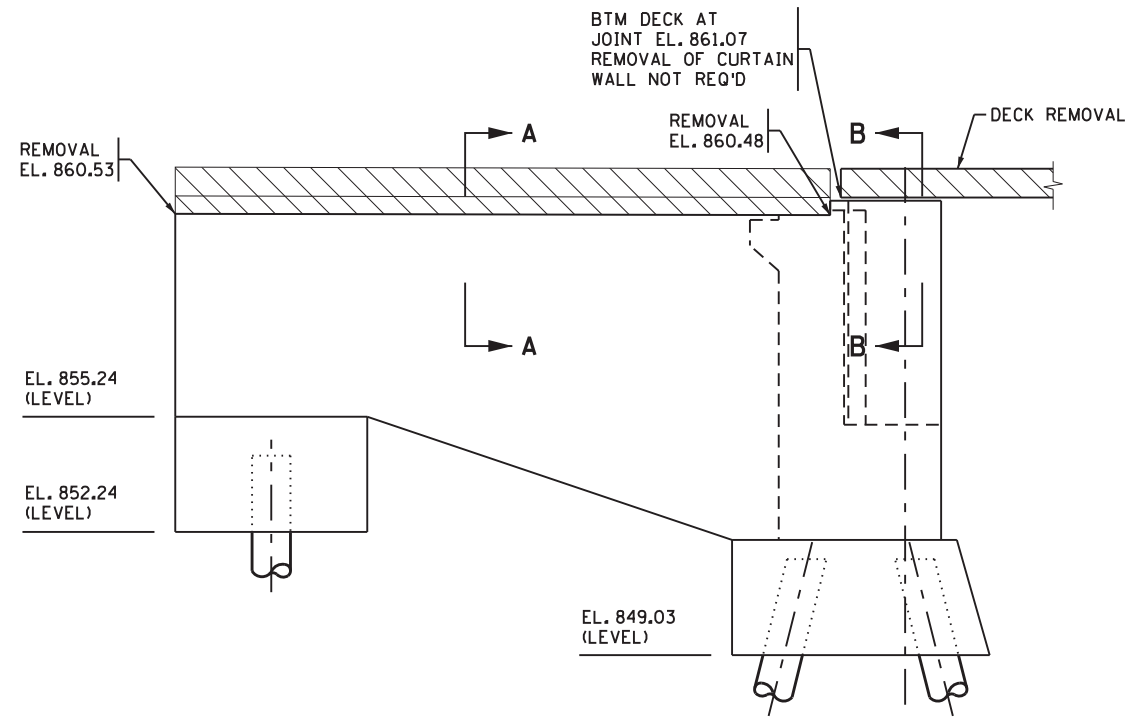
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CHK: CBO	CHK: CBO

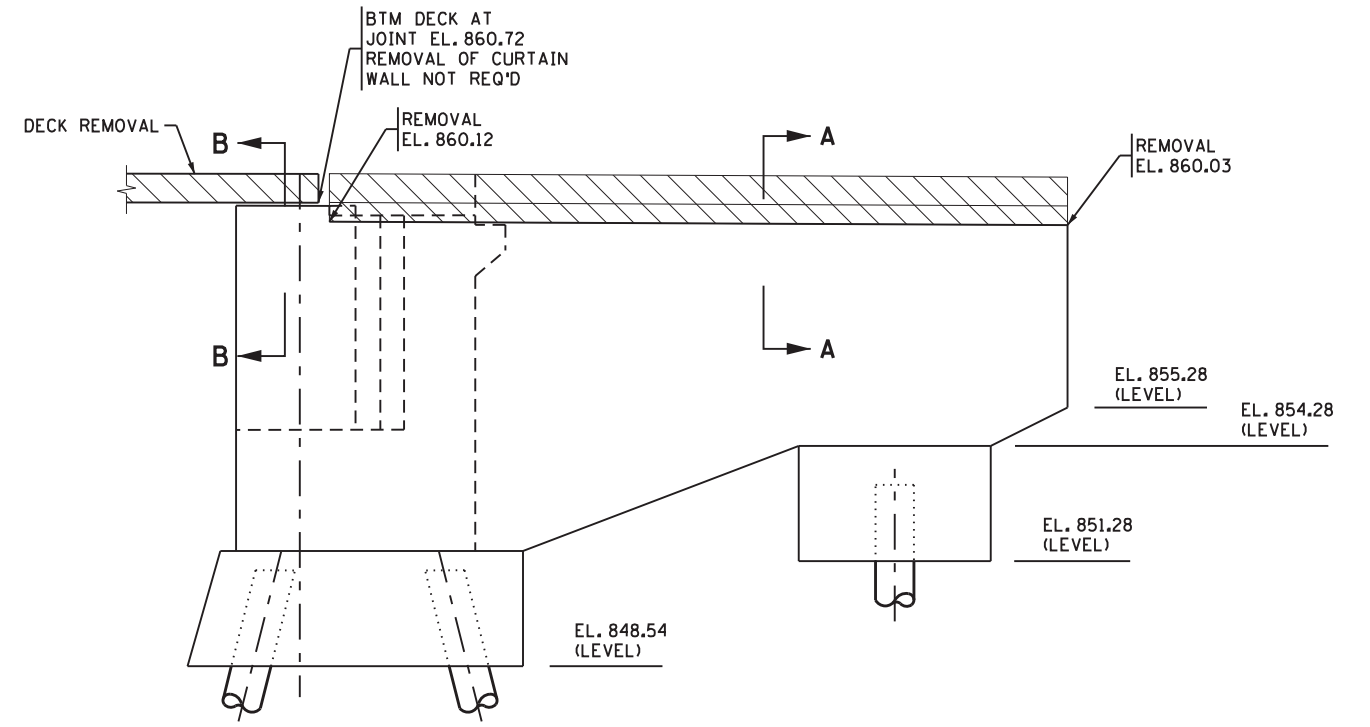
Sheet B15 of B52 Sheets

Bridge No. 02546

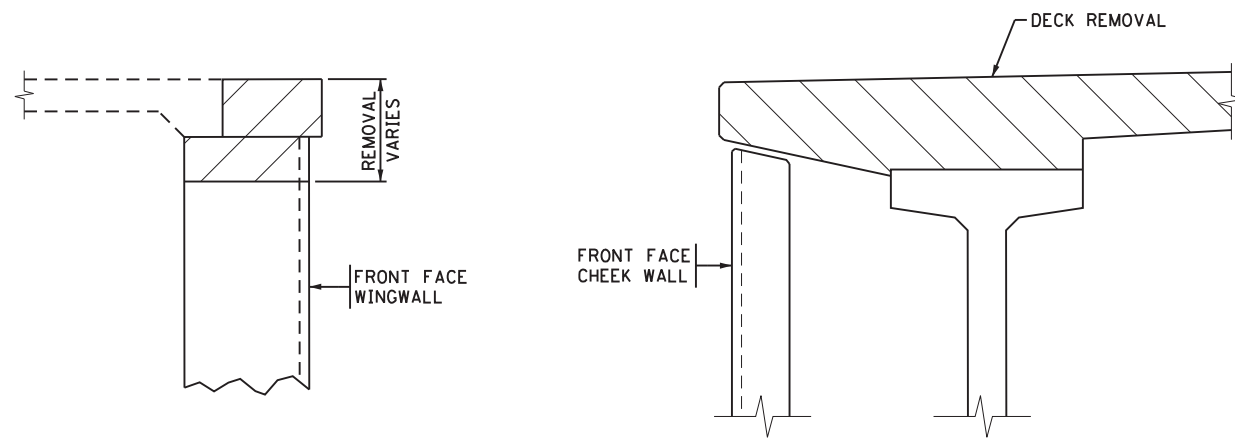
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**SOUTHWEST WINGWALL - ELEVATION**

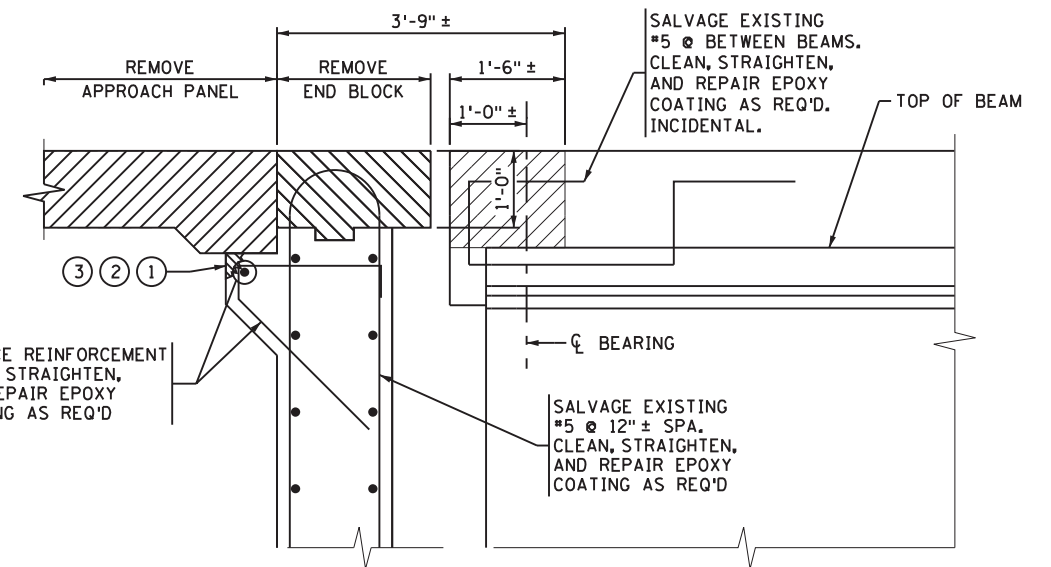


**SOUTHEAST WINGWALL - ELEVATION**



**SECTION A-A**  
(ORNAMENTAL RAILING NOT SHOWN FOR CLARITY)

**SECTION B-B**



**SECTION C-C**  
(SEE SHEET B15)

**NOTES:**

- ① REMOVE ANY DETERIORATED AREAS OF PAVING BRACKET TO SOUND CONCRETE IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
- ② REPLACE REMOVED CONCRETE WITH CONCRETE MIX NO. 3B52. COAT SURFACE OF EXISTING CONCRETE WITH BONDING GROUT PER SPECIAL PROVISIONS PRIOR TO CASTING.
- ③ INCLUDED IN ITEM "REPAIR PAVING BRACKET".

**S.P. 0206-78 (TH 47)**    **S.A.P. 002-716-020**

NO	DATE	BY	CHK	REVISIONS

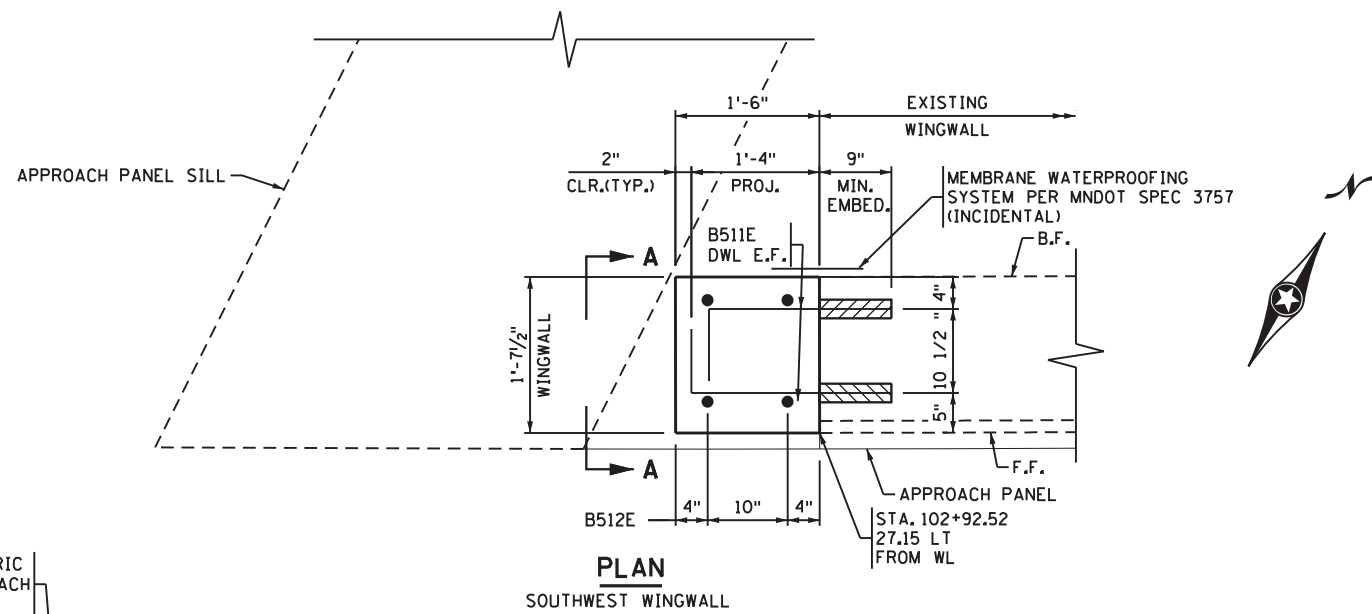
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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020    REG NO: 42732



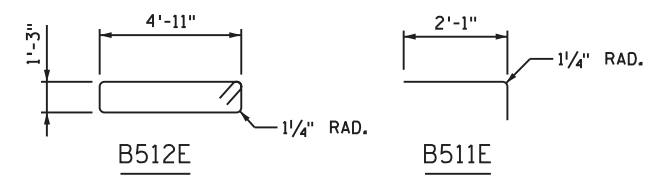
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE:	<b>STAGE 2 DETAILS - 3</b>	DES: JLB	DR: SWH	Bridge No. <b>02546</b>
		CHK: CBO	CHK: CBO	
Sheet B16 of B52 Sheets				



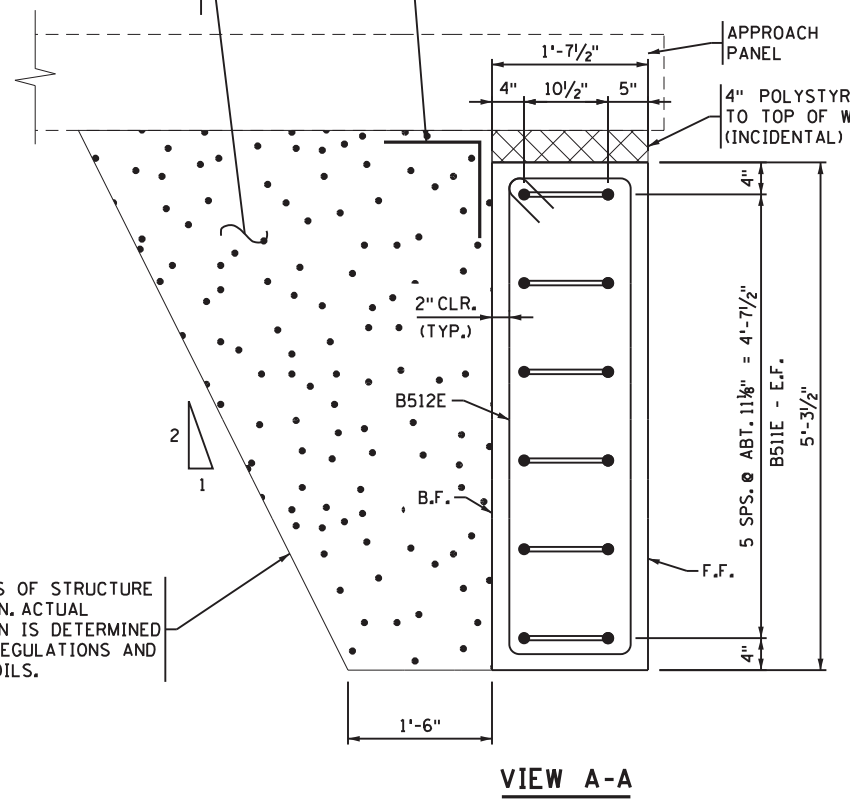
BILL OF REINFORCEMENT FOR SOUTHWEST WINGWALL				
BAR	NO.	LENGTH	SHAPE	LOCATION
B511E	12	3'-1"		END STRUT DOWEL HORIZ. E.F.
B512E	2	13'-3"		WALL VERTICAL

① NOT INCLUDED IN WEIGHT OF EPOXY REBAR. INCLUDED IN PRICE BID FOR "ANCH TYPE REINF BARS (TYPE L)."

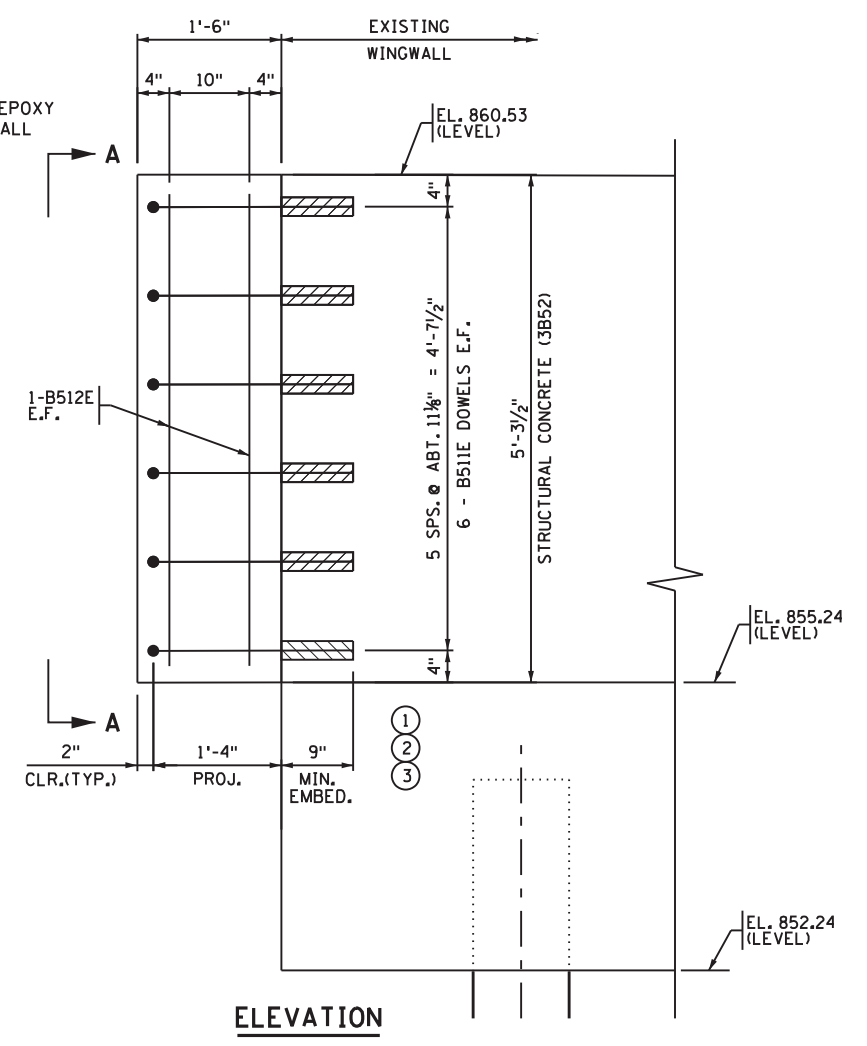


④ GEOTEXTILE FILTER FABRIC TYPE 7, WITH 24" LEG EACH WAY. INCIDENTAL.

STRUCTURAL BACKFILL (MNDOT SPEC. 3149.2.D.2, INCIDENTAL). COMPACT BACKFILL TO SPECIFIED DENSITY METHOD, MNDOT SPEC. 2105.3.F.1 (INCIDENTAL).



PAY LIMITS OF STRUCTURE EXCAVATION. ACTUAL EXCAVATION IS DETERMINED BY OSHA REGULATIONS AND IN-SITU SOILS.



SCHEDULE OF QUANTITIES FOR SOUTHWEST WINGWALL		
STRUCTURAL CONCRETE (3B52)	1	CU YD
REINFORCEMENT BARS (EPOXY COATED)	30	POUND
ANCH TYPE REBAR (TYPE L)	12	EACH
ANTI GRAFFITI COATING	8	SQ. FT.
SPECIAL SURFACE FINISH	8	SQ. FT.

**NOTES:**

- DRILLING AND CLEANING OPERATIONS PRIOR TO PLACEMENT OF ALL POST-INSTALLED ANCHORAGES SHALL BE COMPLETE PRIOR TO INSTALLATION OF ANY POST-INSTALLED ANCHORAGE.
- PLACEMENT OF FORMWORK, REINFORCEMENT, AND CONCRETE SHALL NOT COMMENCE UNTIL ALL POST-INSTALLED ANCHORAGES HAVE REACHED FULL DESIGN STRENGTH. SEE MANUFACTURES SPECIFICATIONS.
- ANCH TYPE REINF BARS (TYPE L). PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 9" REGARDLESS OF CHARACTERISTIC BOND STRENGTH. DRILL THROUGH REINFORCEMENT IF ENCOUNTERED TO ACHIEVE MINIMUM EMBEDMENT. PROOF LOAD TO 14.7 KIPS. DRILL HOLE 1/8" LARGER THAN ANCHORAGE REBAR OR PER MANUFACTURE'S RECOMMENDATIONS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
- FIT HORIZONTAL LEG DIRECTLY UNDER BOTTOM OF SLAB.

E.F. = EACH FACE  
F.F. = FRONT FACE  
B.F. = BACK FACE

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S.P. 0206-78 (TH 47) S.A.P. 002-716-020

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*Carlo*

LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732



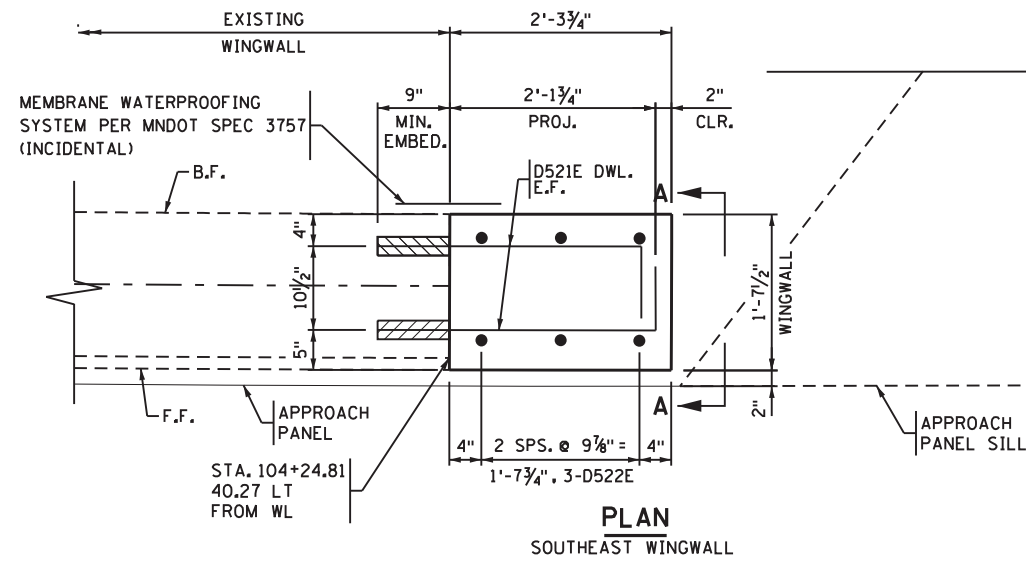
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **STAGE 2 DETAILS - 4 (SW WW EXTENSION)**

DES: JLB DR: SWH  
CHK: CBO CHK: CBO

Sheet B17 of B52 Sheets

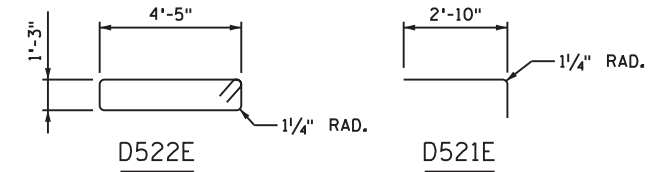
Bridge No. 02546



STRUCTURAL BACKFILL (MNDOT SPEC. 3149.2.D.2, INCIDENTAL). COMPACT BACKFILL TO SPECIFIED DENSITY METHOD, MNDOT SPEC. 2105.3.F.1 (INCIDENTAL).

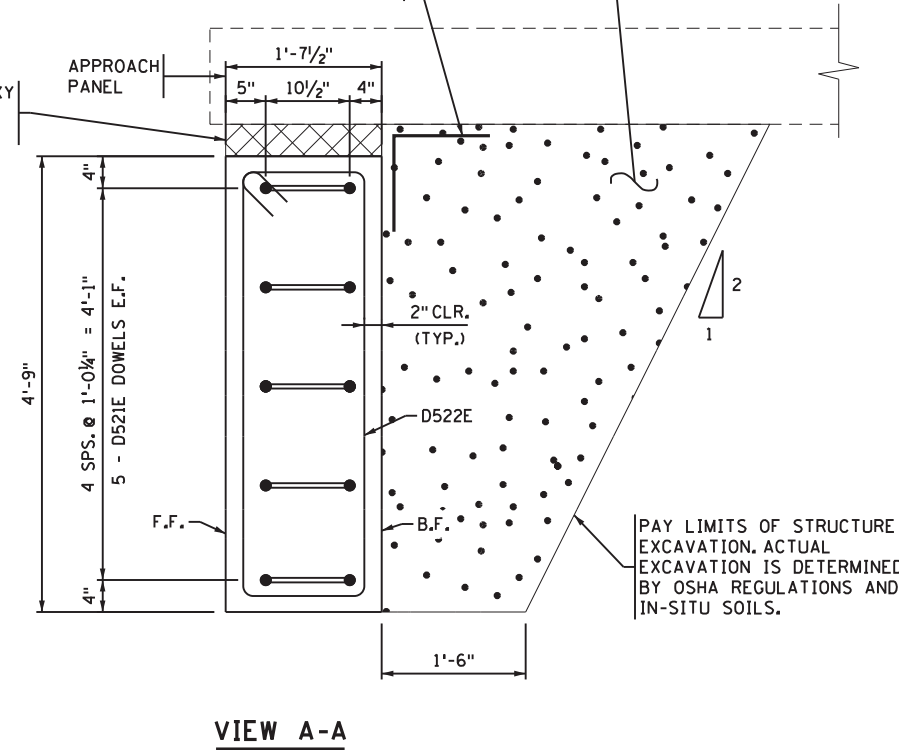
BILL OF REINFORCEMENT FOR SOUTHEAST WINGWALL				
BAR	NO.	LENGTH	SHAPE	LOCATION
D521E	10	3'-10"		END STRUT DOWEL HORIZ. E.F.
D522E	3	12'-3"		WALL VERTICAL

① NOT INCLUDED IN WEIGHT OF EPOXY REBAR. INCLUDED IN PRICE BID FOR "ANCH TYPE REINF BARS (TYPE L)."



④ GEOTEXTILE FILTER FABRIC TYPE 7, WITH 24" LEG EACH WAY. INCIDENTAL.

4" POLYSTYRENE EPOXY TO TOP OF WINGWALL (INCIDENTAL)

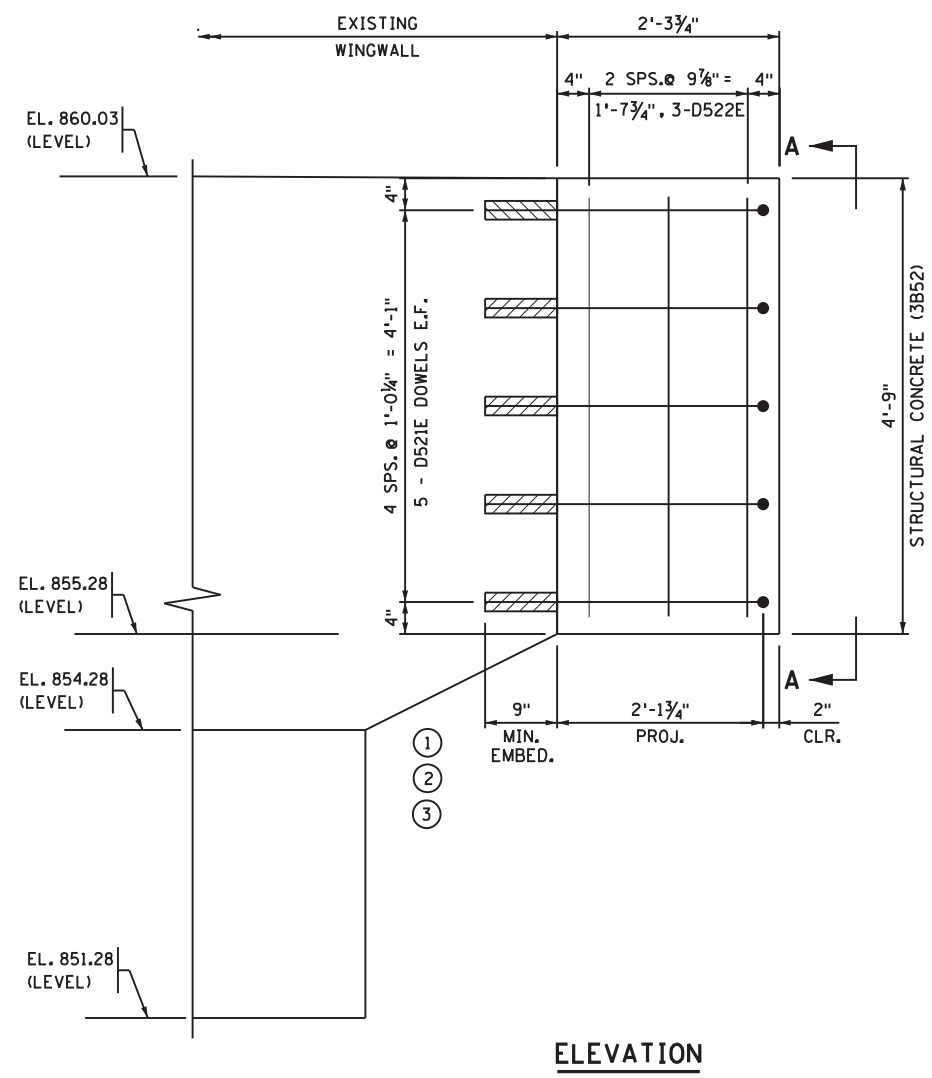


SCHEDULE OF QUANTITIES FOR SOUTHEAST WINGWALL		
STRUCTURAL CONCRETE (3B52)	1	CU YD
REINFORCEMENT BARS (EPOXY COATED)	40	POUND
ANCH TYPE REBAR (TYPE L)	10	EACH
ANTI GARFFITI COATING	11	SQ. FT.
SPECIAL SURFACE FINISH	11	SQ. FT.

**NOTES:**

- ① DRILLING AND CLEANING OPERATIONS PRIOR TO PLACEMENT OF ALL POST-INSTALLED ANCHORAGES SHALL BE COMPLETE PRIOR TO INSTALLATION OF ANY POST-INSTALLED ANCHORAGE.
- ② PLACEMENT OF FORMWORK, REINFORCEMENT, AND CONCRETE SHALL NOT COMMENCE UNTIL ALL POST-INSTALLED ANCHORAGES HAVE REACHED FULL DESIGN STRENGTH. SEE MANUFACTURES SPECIFICATIONS.
- ③ ANCH TYPE REINF BARS (TYPE L). PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 9" REGARDLESS OF CHARACTERISTIC BOND STRENGTH. DRILL THROUGH REINFORCEMENT IF ENCOUNTERED TO ACHIEVE MINIMUM EMBEDMENT. PROOF LOAD TO 14.7 KIPS. DRILL HOLE 1/8" LARGER THAN ANCHORAGE REBAR OR PER MANUFACTURE'S RECOMMENDATIONS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
- ④ FIT HORIZONTAL LEG DIRECTLY UNDER BOTTOM OF SLAB.

E.F. = EACH FACE  
F.F. = FRONT FACE  
B.F. = BACK FACE



S.P. 0206-78 (TH 47) S.A.P. 002-716-020

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*Carl Osberg*

LICENSED PROFESSIONAL ENGINEER: CARL OSBERG, PE  
DATE: 11/10/2020 REG NO.: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE:  
**STAGE 2 DETAILS - 5  
(SE WW EXTENSION)**

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

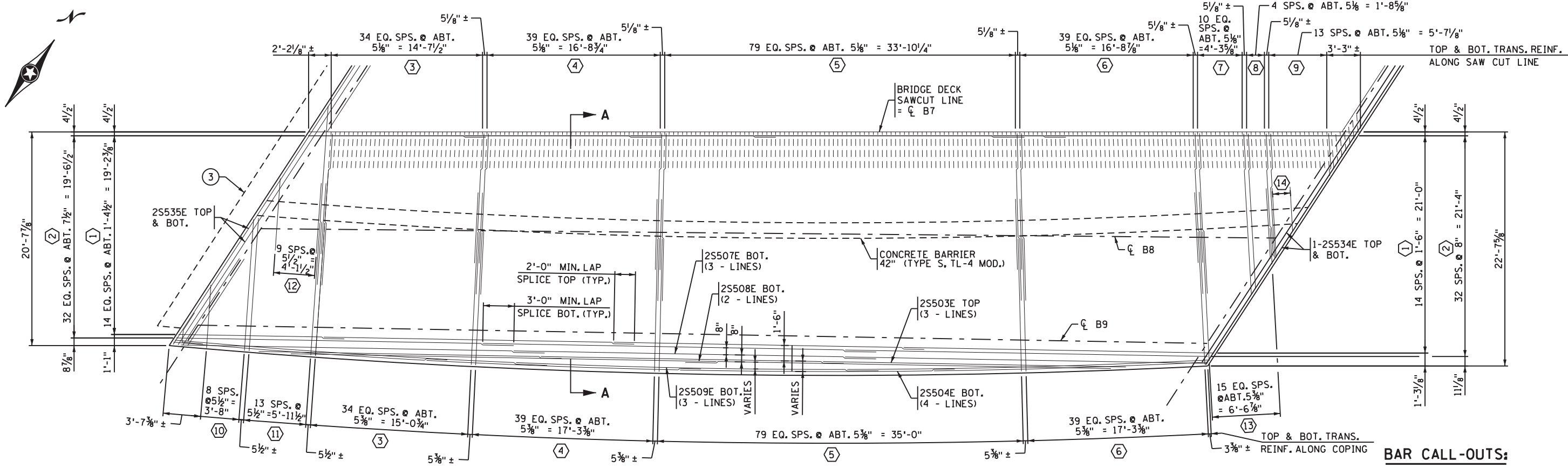
Sheet B18 of B52 Sheets

Bridge No.  
02546

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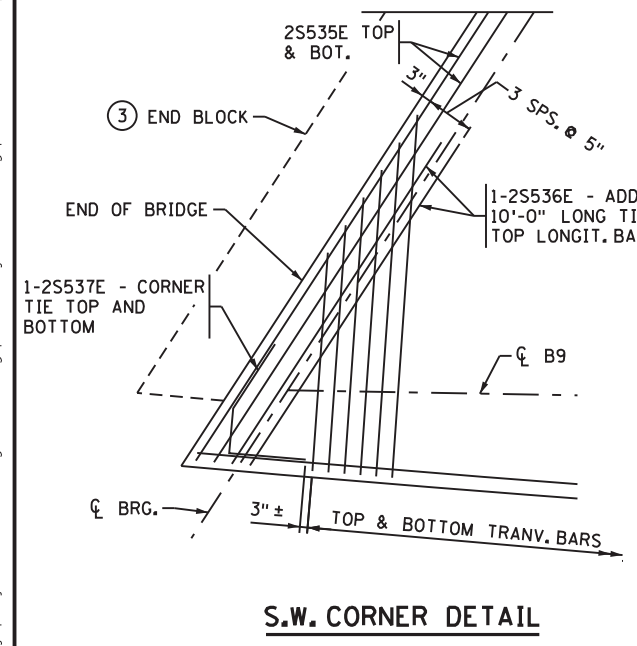
### STAGE 2 DECK REINFORCEMENT

#### BAR CALL-OUTS:

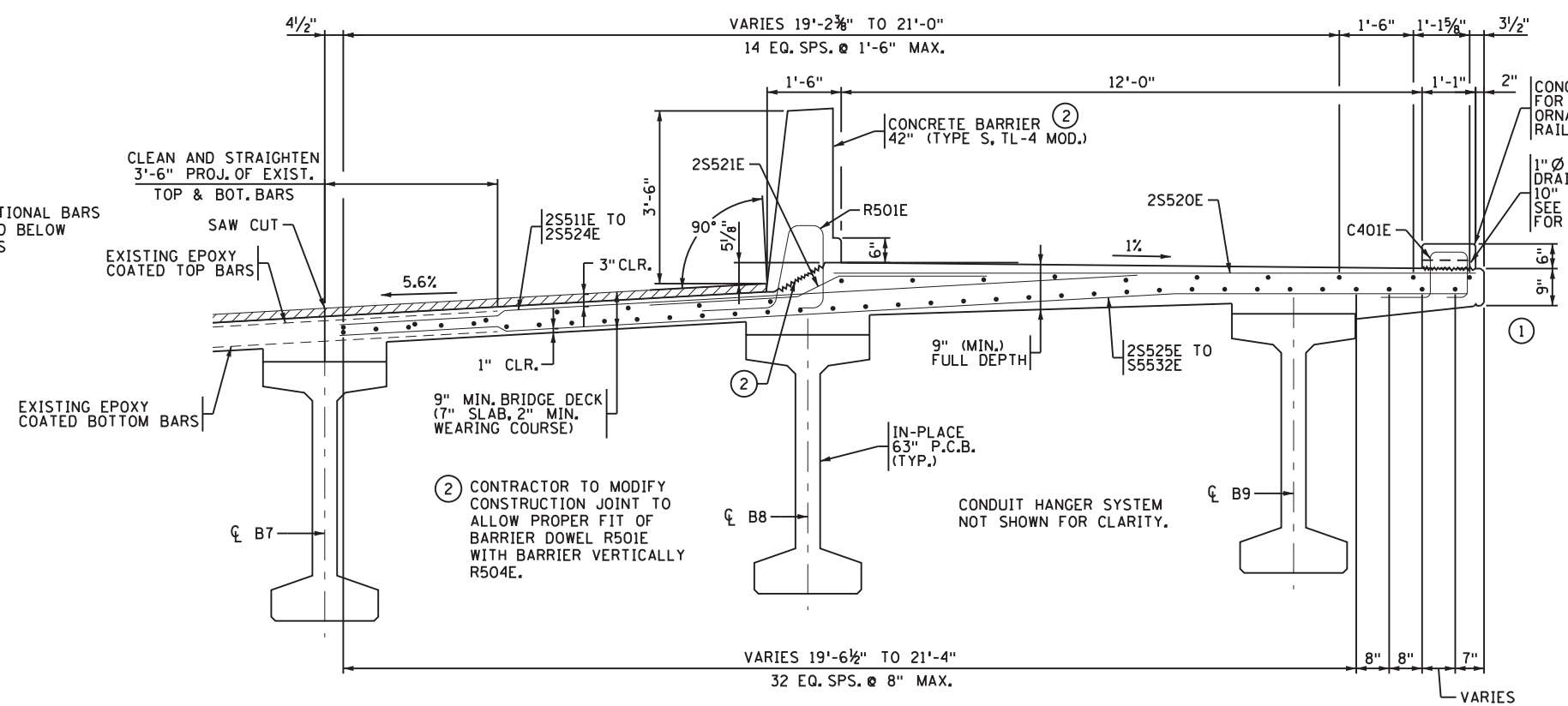
- ① 15-2S501E (T) (3-LINES) W/ 15-2S502E (T) @ 14 EQ. SPS. ALTERNATE PLACEMENT OF BARS TO STAGGER SPLICES.
- ② 33-2S505E (B) (2-LINES) W/ 33-2S506E (B) @ 32 EQ. SPS. ALTERNATE PLACEMENT OF BARS TO STAGGER SPLICES.
- ③ 1 SERIES OF 35-2S511E (T), 35-2S520E (T), 35-2S521E (T) & 1 SERIES OF 35 2S525E (B)
- ④ 1 SERIES OF 40-2S512E (T), 40-2S520E (T), 40-2S521E (T) & 1 SERIES OF 40 2S526E (B)
- ⑤ 80-2S513E (T), 80-2S520E (T), 80-2S521E (T) & 80 2S527E (B)
- ⑥ 1 SERIES OF 40-2S514E (T), 40-2S520E (T), 40-2S519E (T) & 1 SERIES OF 40 2S528E (B)
- ⑦ 11-2S515E (T), 1 SERIES OF 11-2S529E (B)
- ⑧ 1 SERIES OF 5-2S516E (T), 1 SERIES OF 5-2S530E (B)
- ⑨ 1 SERIES OF 14-2S517E (T) & 1 SERIES OF 14-2S531E (B)
- ⑩ 1 SERIES OF 9-2S518E (T) & 9-2S532E (B)
- ⑪ 14-2S519E (T) & 1 SERIES OF 14-2S533E (B)
- ⑫ 1 SERIES OF 10-2S522E (T) & 10 2S521E, SPS W/ 2S533E
- ⑬ 1 SERIES OF 16-2S523E (T), 16-2S521E SPA. W/ 2S515E & 2S516E
- ⑭ 1 SERIES OF 5-2S524E (T) SPA. W/ 2S517E

#### NOTES:

- ① END DETAIL "A" SEE SHEET B20
  - ② BACK FACE PLUMB, SEE BARRIER SHEET B28.
  - ③ END BLOCK TO BE REMOVED.
- (T) = TOP  
(B) = BOTTOM



#### S.W. CORNER DETAIL



#### SECTION A-A

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	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.

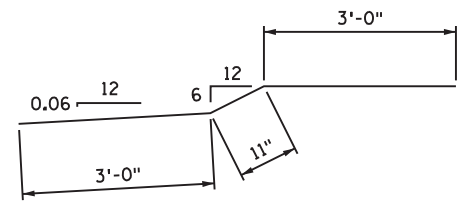
*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732

**wsb** ANOKA COUNTY

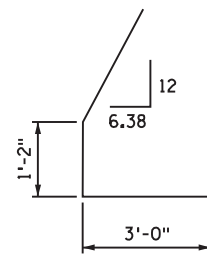
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **STAGE 2 SUPERSTRUCTURE DETAILS - 1**

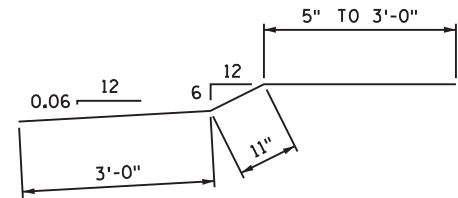
DES: JLB	DR: SWH	Bridge No. 02546
CHK: CBO	CHK: CBO	
Sheet B19 of B52 Sheets		



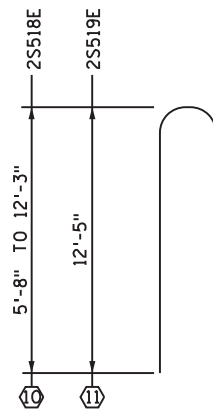
2S521E



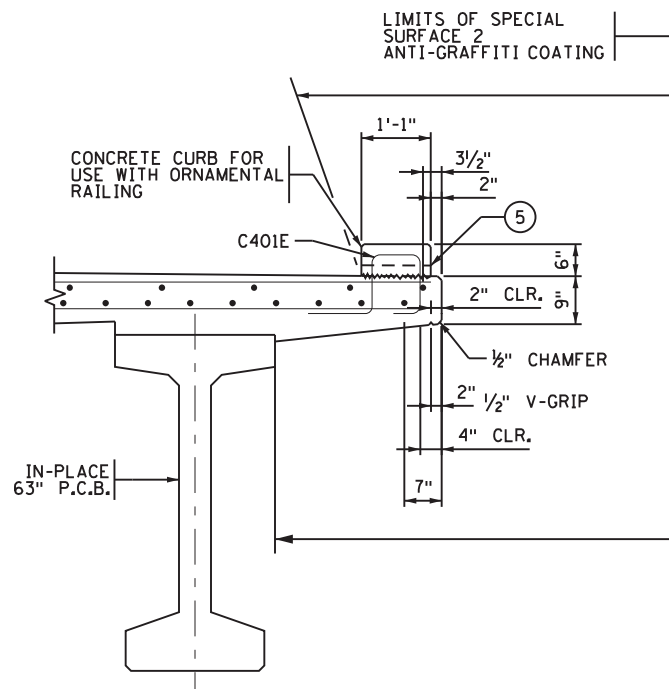
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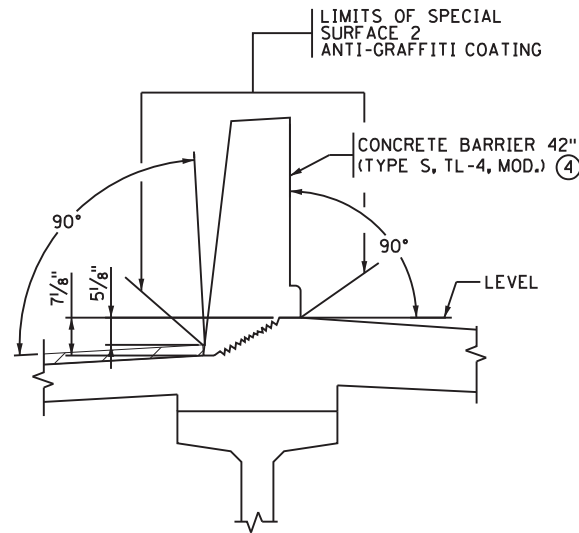
2S524E



2S518E, 2S519E



END DETAIL "A"



BARRIER DETAIL

BILL OF REINFORCEMENT - SUPERSTRUCTURE

BAR	NO.	LENGTH	SHAPE	LOCATION
2S501E	45	30'-0"	(A)	SLAB - TOP LONGIT.
2S502E	15	(A)	---	SLAB - TOP LONGIT.
2S503E	3	29'-3"	---	SLAB - TOP LONGIT.
2S504E	4	26'-6"	---	SLAB - TOP LONGIT.
2S505E	66	36'-6"	---	SLAB - BOTTOM LONGIT.
2S506E	33	(B)	---	SLAB - BOTTOM LONGIT.
2S507E	3	35'-0"	---	SLAB - BOTTOM LONGIT.
2S508E	2	41'-1"	---	SLAB - BOTTOM LONGIT.
2S509E	3	35'-6"	---	SLAB - BOTTOM LONGIT.
-	-	-	-	-
2S511E	35	(C)	---	SLAB - TOP TRANSV.
2S512E	40	(D)	---	SLAB - TOP TRANSV.
2S513E	80	16'-2"	---	SLAB - TOP TRANSV.
2S514E	40	(E)	---	SLAB - TOP TRANSV.
2S515E	11	15'-2"	---	SLAB - TOP TRANSV.
2S516E	5	12'-2"	---	SLAB - TOP TRANSV.
2S517E	14	(F)	---	SLAB - TOP TRANSV.
2S518E	9	(G)	---	SLAB - TOP TRANSV.
2S519E	14	13'-4"	(C)	SLAB - TOP TRANSV.
2S520E	195	13'-0"	---	SLAB - TOP TRANSV.
2S521E	181	6'-11"	---	SLAB - TOP TRANSV.
2S522E	10	(H)	---	SLAB - TOP TRANSV.
2S523E	16	(I)	---	SLAB - TOP TRANSV.
2S524E	5	(J)	---	SLAB - TOP TRANSV.
2S525E	35	(K)	---	SLAB - BOTTOM TRANSV.
2S526E	40	(L)	---	SLAB - BOTTOM TRANSV.
2S527E	80	22'-2"	---	SLAB - BOTTOM TRANSV.
2S528E	40	(M)	---	SLAB - BOTTOM TRANSV.
2S529E	11	(N)	---	SLAB - BOTTOM TRANSV.
2S530E	5	(O)	---	SLAB - BOTTOM TRANSV.
2S531E	14	(P)	---	SLAB - BOTTOM TRANSV.
2S532E	9	(Q)	---	SLAB - BOTTOM TRANSV.
2S533E	14	(R)	---	END OF DECK - TRANSV.
2S534E	4	19'-5"	---	END OF DECK - TRANSV.
2S535E	4	21'-6"	---	END OF DECK - TRANSV.
2S536E	2	10'-0"	---	END OF DECK - TRANSV.
2S537E	2	7'-2"	---	DECK CORNER TIE

- (A) 1 SERIES OF 15 BARS - (16'-0" TO 17'-2")
- (B) 1 SERIES OF 33 BARS - (32'-7" TO 34'-2")
- (C) 1 SERIES OF 35 BARS - (14'-8" TO 15'-7")
- (D) 1 SERIES OF 40 BARS - (15'-7" TO 16'-2")
- (E) 1 SERIES OF 40 BARS - (15'-6" TO 16'-2")
- (F) 1 SERIES OF 41 BARS - (3'-8" TO 11'-7")
- (G) 1 SERIES OF 9 BARS - (6'-7" TO 13'-2")
- (H) 1 SERIES OF 10 BARS - (10'-0" TO 17'-3")
- (I) 1 SERIES OF 16 BARS - 3'-6" TO 12'-6"
- (J) 1 SERIES OF 5 BARS - (4'-4" TO 6'-11")
- (K) 1 SERIES OF 35 BARS - (21'-4" TO 22'-2")
- (L) 1 SERIES OF 40 BARS - (22'-2" TO 22'-10")
- (M) 1 SERIES OF 40 BARS - (22'-2" TO 22'-10")
- (N) 1 SERIES OF 11 BARS - (15'-8" TO 21'-11")
- (O) 1 SERIES OF 5 BARS - (12'-7" TO 15'-0")
- (P) 1 SERIES OF 14 BARS - (4'-1" TO 11'-11")
- (Q) 1 SERIES OF 9 BARS - (5'-11" TO 12'-6")
- (R) 1 SERIES OF 14 BARS - (12'-8" TO 23'-11")

SUMMARY OF QUANTITIES - SUPERSTRUCTURE

BRIDGE SLAB CONCRETE (3YHPC-S)	2419	SQ. FT.
TYPE MOD. S (TL-4) 42" BARRIER CONCRETE (32S52)	148	LIN. FT.
TYPE CURB BARRIER CONCRETE (32S52)	137	LIN. FT.
ORNAMENTAL METAL RAILING	137	LIN. FT.
REINFORCEMENT BARS (EPOXY COATED)	17955	POUND
BRIDGE NAME PLATE	1	EACH
ANTI-GRAFFITI COATING	1903	SQ. FT.
WATERMAIN HANGER SYSTEM	1	LUMP SUM

- (1) INCLUDES SLAB, BARRIER, AND CURB REINFORCEMENT
- (2) TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS
- (3) INCLUDES RAILING ON APPROACH PANELS
- (4) BACK FACE PLUMB, SEE BARRIER SHEET B28.
- (5) 1" Ø PVC CURB DRAIN @ ABT. 10" OR 20" O.C. SEE DETAILS ON SHEET B30.

NOTES:

- (1) SEE SHEET B19

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S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO.	DATE	BY	CHK	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.

*Carl S. Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732

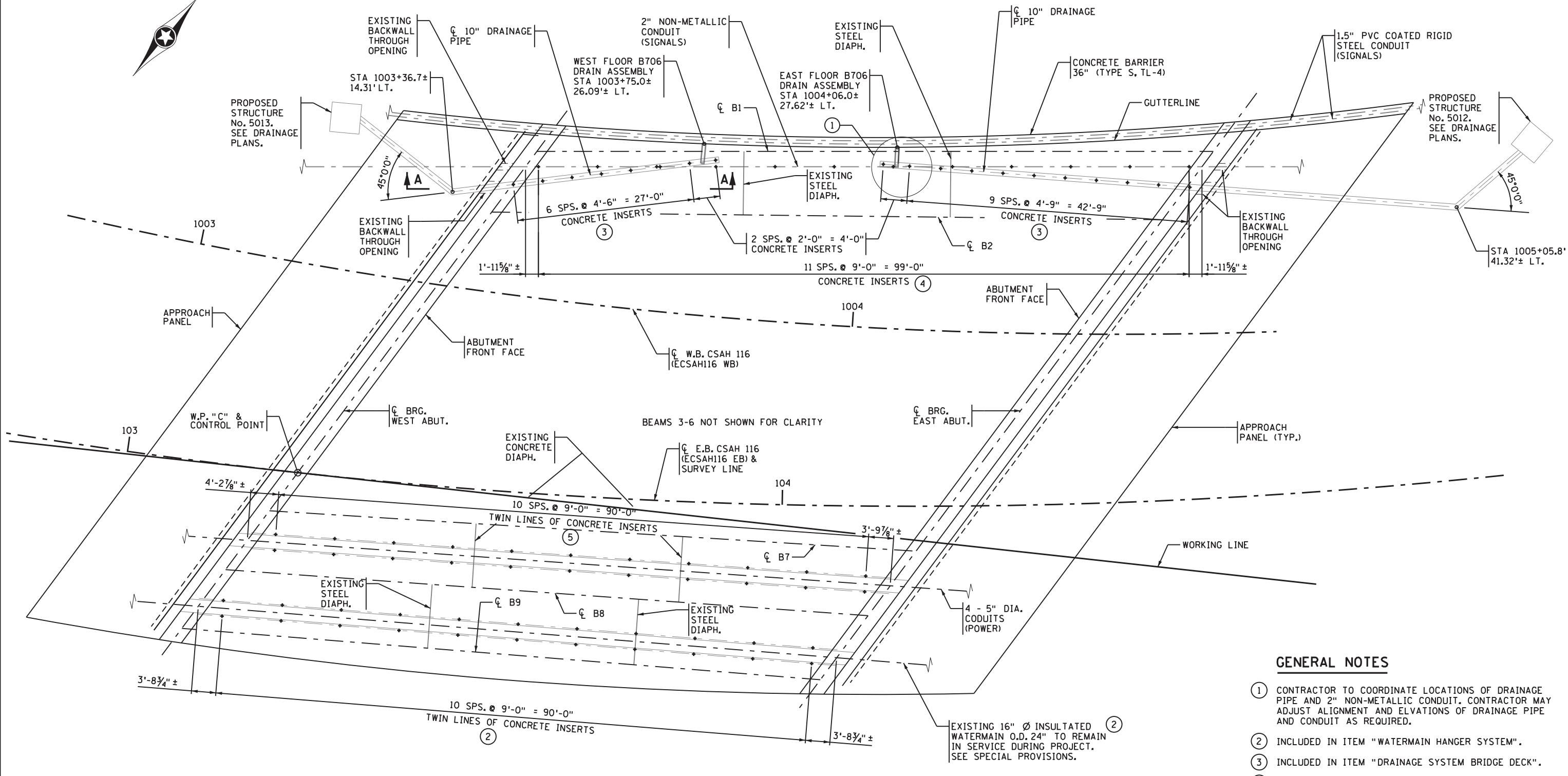


CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: STAGE 2 SUPERSTRUCTURE DETAILS - 2

DES: JLB DR: SWH  
 CHK: CBO CHK: CBO  
 Sheet B20 of B52 Sheets

Bridge No. 02546



**PLAN**

**GENERAL NOTES**

- ① CONTRACTOR TO COORDINATE LOCATIONS OF DRAINAGE PIPE AND 2" NON-METALLIC CONDUIT. CONTRACTOR MAY ADJUST ALIGNMENT AND ELEVATIONS OF DRAINAGE PIPE AND CONDUIT AS REQUIRED.
  - ② INCLUDED IN ITEM "WATERMAIN HANGER SYSTEM".
  - ③ INCLUDED IN ITEM "DRAINAGE SYSTEM BRIDGE DECK".
  - ④ INCLUDED IN ITEM "CONDUIT SYSTEM (SIGNALS)".
  - ⑤ INCLUDED IN ITEM "CONDUIT SYSTEM (POWER)".
- SEE SHEET B22 FOR SECTION A-A.

**S.P. 0206-78 (TH 47)      S.A.P. 002-716-020**

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020      REG NO.: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **CONDUIT PLAN**

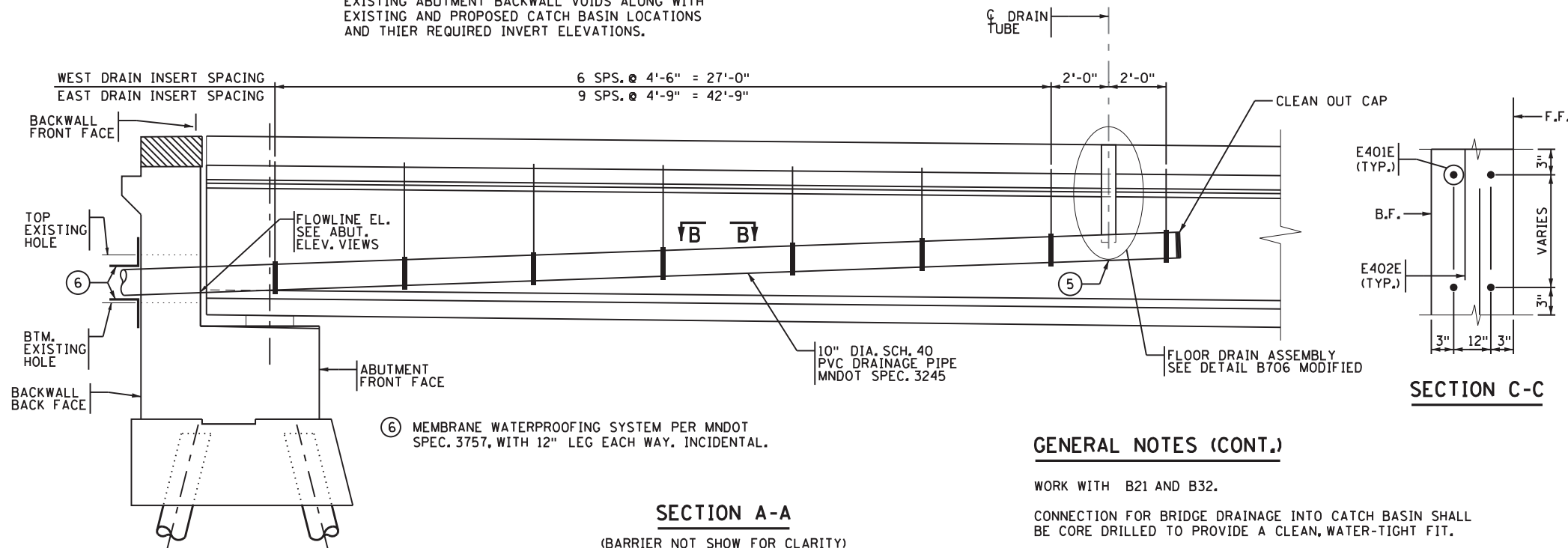
DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

Sheet B21 of B52 Sheets

Bridge No. **02546**

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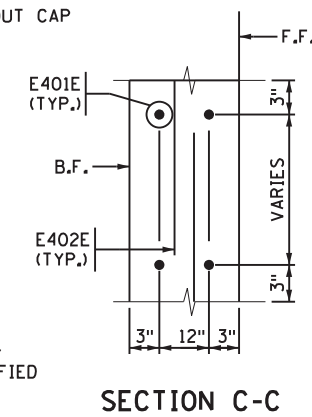
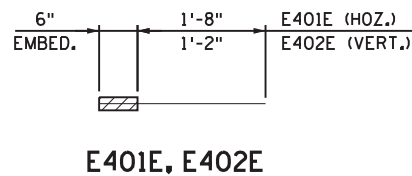
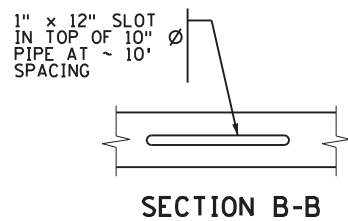
⑤ INVERT ELEVATION VARIES AT EACH DRAIN LOCATION AND SHALL BE SET AFTER FIELD VERIFICATION OF EXISTING ABUTMENT BACKWALL VOIDS ALONG WITH EXISTING AND PROPOSED CATCH BASIN LOCATIONS AND THEIR REQUIRED INVERT ELEVATIONS.



⑥ MEMBRANE WATERPROOFING SYSTEM PER MNDOT SPEC. 3757, WITH 12" LEG EACH WAY. INCIDENTAL.

**SECTION A-A**

(BARRIER NOT SHOW FOR CLARITY)



**SECTION C-C**

**GENERAL NOTES (CONT.)**

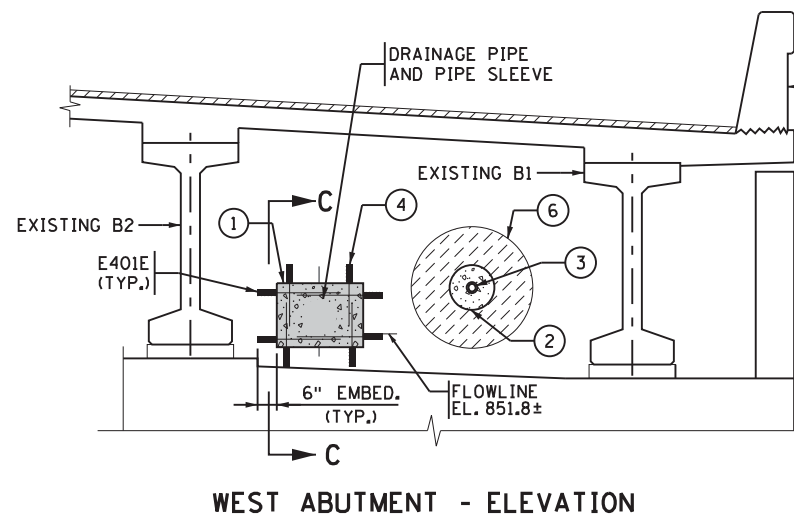
- WORK WITH B21 AND B32.
- CONNECTION FOR BRIDGE DRAINAGE INTO CATCH BASIN SHALL BE CORE DRILLED TO PROVIDE A CLEAN, WATER-TIGHT FIT.
- CATCH BASINS INCLUDED IN GRADING PORTION OF CONTRACT.
- PIPE HANGER ASSEMBLIES SHALL BE ABLE TO ACCOMMODATE ANTICIPATED LONGITUDINAL AND VERTICAL MOVEMENTS OF PIPE AND SUPERSTRUCTURE.
- PIPE CLAMPS SHALL COMPLY WITH SPEC. 3313, TYPE I.
- TURNBUCKLES SHALL COMPLY WITH A.S.T.M. A235 CLASS A MINIMUM REQUIREMENTS.
- GALVANIZE BOLTS, NUTS, WASHERS, TURNBUCKLES, RODS, EYE BOLTS, AND INSERTS AS PER SPEC. 3392. GALVANIZE OTHER MATERIAL AS PER SPEC. 3394 AFTER FABRICATION.
- PIPE SLEEVES SHALL COMPLY WITH SPEC. 3362.

SCHEDULE OF QUANTITIES FOR DRAINAGE SYSTEM BRIDGE DECK	
FLOOR DRAIN ASSEMBLY	2 UNITS
HANGER ASSEMBLY	19 UNITS
10" DIA. SCH. 40 PVC PIPE	160 LIN. FT.
10" 45° ELBOW	2 UNITS
CONNECT TO CATCH BASIN	2 UNITS
ANCH TYPE REBAR (TYPE L)	32 EACH

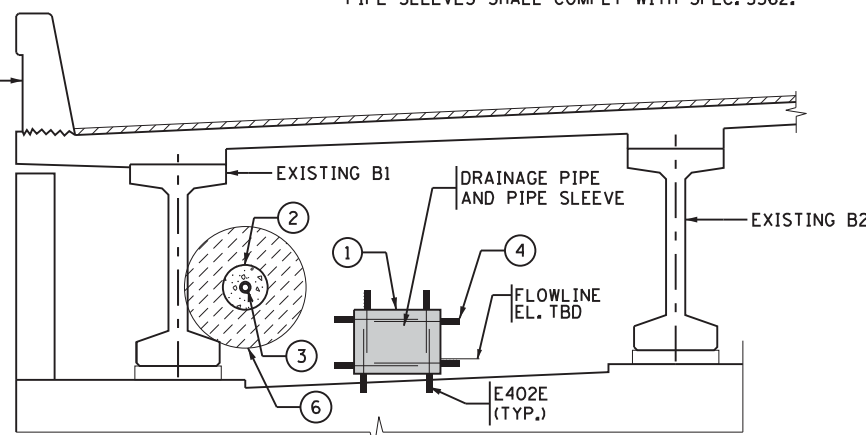
ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR "DRAINAGE SYSTEM BRIDGE DECK."

**GENERAL NOTES**

- ALL STEEL SHALL COMPLY WITH MNDOT SPEC 3306.
- WORKMANSHIP AND FABRICATION PER MNDOT SPEC. 2471.
- GRATE BOLTS TO FRAME SHALL BE STAINLESS STEEL PER MNDOT SPEC. 3312.
- BLAST CLEAN FRAME AND GRATE AFTER FABRICATION.
- ALL PIPE AND FITTINGS TO BE FURNISHED PER MNDOT SPEC. 3245. ALL PIPE SHALL BE UNPERFORATED.
- THE DECK FLOOR DRAIN SHALL BE ADEQUATELY BRACED AND SUPPORTED DURING CONSTRUCTION SUCH THAT THE FINAL POSITION AND GRADE OF THE CASTING ARE CORRECT PER THESE PLANS.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER SHOWING COMPLETE DETAILS OF THE DRAINAGE SYSTEM INCLUDING, BUT NOT LIMITED TO, ALL ITEMS DETAILED ON DRAINAGE DETAIL DRAWINGS.



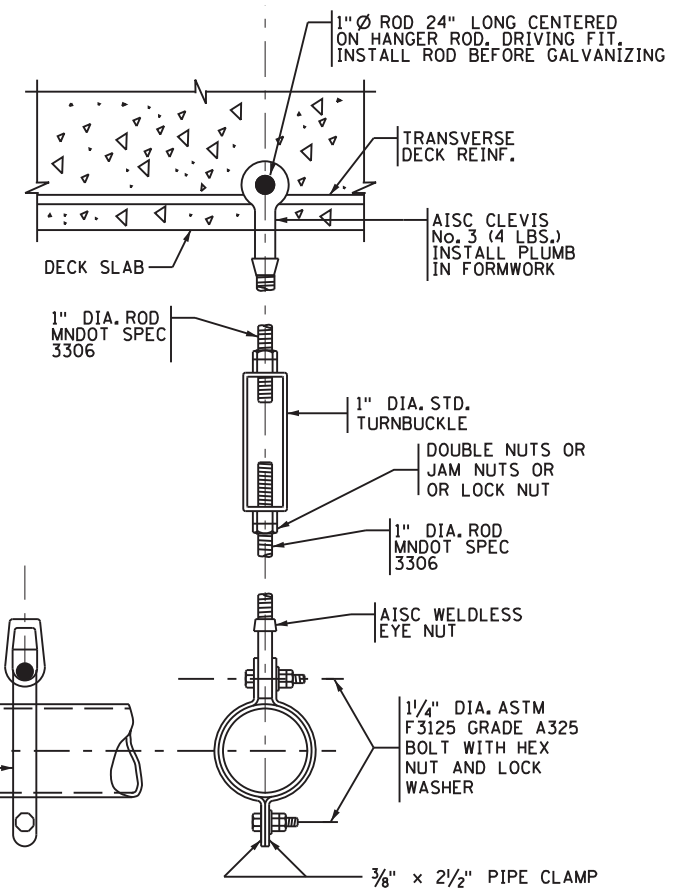
**WEST ABUTMENT - ELEVATION**



**EAST ABUTMENT - ELEVATION**

- ① EXISTING HOLE FROM IN-PLACE CONDUITS. CONDUITS TO BE REMOVED BY OTHERS PRIOR TO START OF WORK. AFTER DRAINAGE PIPE PLACEMENT, FILL VOID WITH APPROVED NON-SHRINK GROUT (INCIDENTAL).
- ② EXISTING HOLE FROM IN-PLACE GAS LINE. GAS LINE TO BE REMOVED BY OTHERS PRIOR TO START OF WORK. AFTER CONDUIT PLACEMENT, FILL VOID WITH APPROVED NON-SHRINK GROUT (INCIDENTAL).
- ③ 2.0" NON-METALLIC CONDUIT (SIGNALS). ELEVATION VARIES. SEE SHEET B32.

- ④ ANCH TYPE REINF BARS (TYPE L). PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 6" REGARDLESS OF CHARACTERISTIC BOND STRENGTH. DRILL THROUGH REINFORCEMENT IF ENCOUNTERED TO ACHIEVE MINIMUM EMBEDMENT. DRILL HOLE 1/8" LARGER THAN ANCHORAGE REBAR OR PER MANUFACTURE'S RECOMMENDATIONS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS. PROVIDE 2" CLEAR TO ALL SURROUNDING SURFACES. 8-E401E & 8-E402E REQ'D FOR EACH CONDUIT VOID. INCIDENTAL.



**DRAIN PIPE HANGER ASSEMBLY**

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **DRAINAGE SYSTEM DETAILS**

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO
Sheet B22 of B52 Sheets	

Bridge No. 02546

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**SCHEDULE OF QUANTITIES FOR CONDUIT SYSTEM "POWER"**

5" DIA. SCH. 40 PVC PIPE	440	LIN. FT.
ANCH TYPE REBAR	32	EACH

ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (POWER)."

SEE SHEET B32 FOR ADDITIONAL INFORMATION.

**GENERAL NOTES**

ALL STEEL SHALL COMPLY WITH MNDOT SPEC 3306.

WORKMANSHIP AND FABRICATION PER MNDOT SPEC. 2471.

ALL PIPE AND FITTINGS TO BE FURNISHED PER MNDOT SPEC. 3245. ALL PIPE SHALL BE UNPERFORATED.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER SHOWING COMPLETE DETAILS OF THE DRAINAGE SYSTEM INCLUDING, BUT NOT LIMITED TO, ALL ITEMS DETAILED ON DRAINAGE DETAIL DRAWINGS.

WORK WITH SHEET B21 AND B32

PIPE HANGER ASSEMBLIES SHALL BE ABLE TO ACCOMODATE ANTICIPATED LONGITUDINAL AND VERTICAL MOVEMENTS OF PIPE AND SUPERSTRUCTURE.

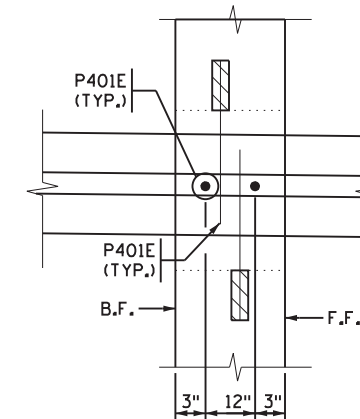
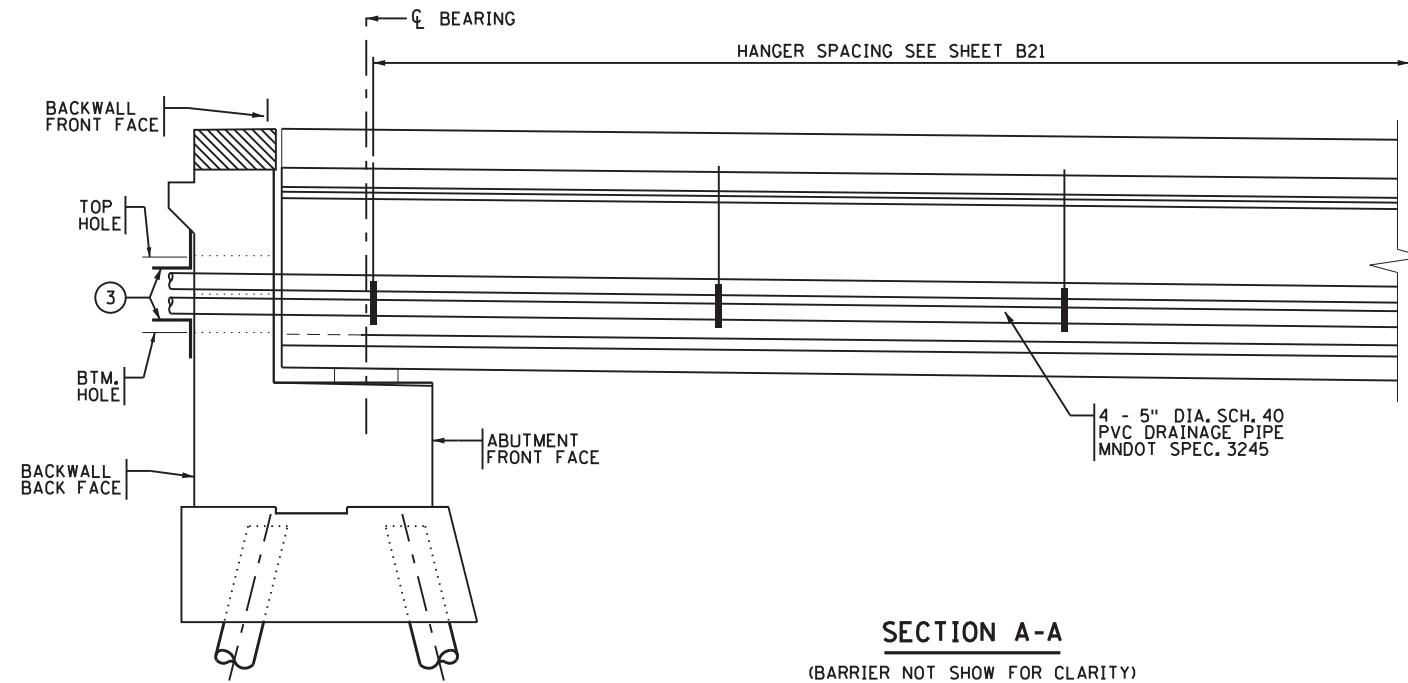
PIPE CLAMPS SHALL COMPLY WITH SPEC. 3313, TYPE I.

TURNBUCKLES SHALL COMPLY WITH A.S.T.M. A235 CLASS A MINIMUM REQUIREMENTS.

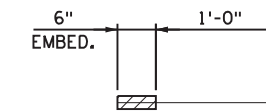
GALVANIZE BOLTS, NUTS, WASHERS, TURNBUCKLES, RODS, EYE BOLTS, AND INSERTS AS PER SPEC. 3392. GALVANIZE OTHER MATERIAL AS PER SPEC. 3394 AFTER FABRICATION.

PIPE SLEEVES SHALL COMPLY WITH SPEC. 3362.

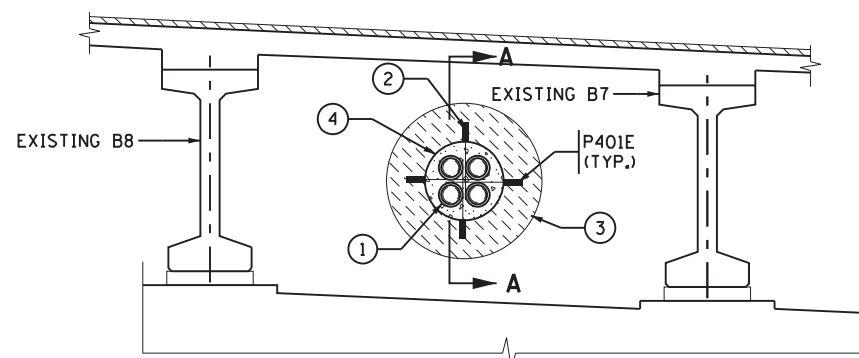
- ① 5.0" NON-METALLIC CONDUIT (POWER), ELEVATION VARIES. SEE SHEET B32.
- ② ANCH TYPE REINF BARS (TYPE L). PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 6" REGARDLESS OF CHARACTERISTIC BOND STRENGTH. DRILL THROUGH REINFORCEMENT IF ENCOUNTERED TO ACHIEVE MINIMUM EMBEDMENT. DRILL HOLE 1/8" LARGER THAN ANCHORAGE REBAR OR PER MANUFACTURE'S RECOMMENDATIONS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS. PROVIDE 2" CLEAR TO ALL SURROUNDING SURFACES. 8-E401E & 8-E402E REQ'D FOR EACH CONDUIT VOID. INCIDENTAL.
- ③ MEMBRANE WATERPROOFING SYSTEM PER MNDOT SPEC. 3757, WITH 12" LEG EACH WAY. INCIDENTAL.
- ④ IDENTIFY LOCATION OF EXISTING REINFORCEMENT. SUBMIT DRILLING PLAN TO ENGINEER FOR APPROVAL. CORE DRILL THROUGH ABUTMENT TO AVOID CUTTING REINFORCEMENT.



**SECTION A-A**

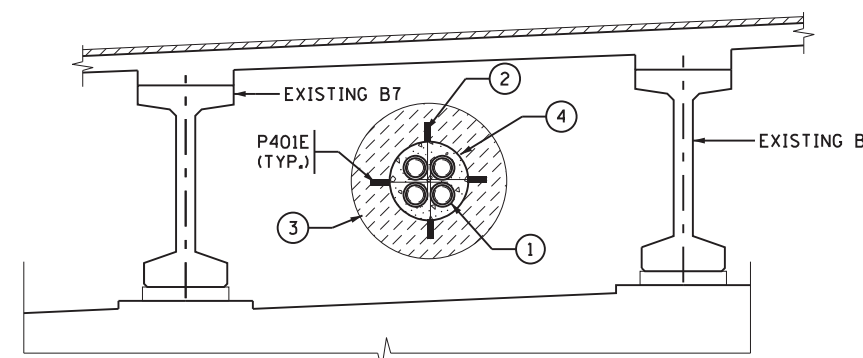


**P401E**



**WEST ABUTMENT - ELEVATION**

**NORTH SIDE**



**EAST ABUTMENT - ELEVATION**

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **POWER SYSTEM DETAILS**

DES: JLB DR: SWH  
 CHK: CBO CHK: CBO  
 Sheet B23 of B52 Sheets

Bridge No. 02546

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**SCHEDULE OF QUANTITIES FOR  
WATERMAIN HANGER SYSTEM**

WATERMAIN HANGER SYSTEM	1	LUMP SUM
-------------------------	---	----------

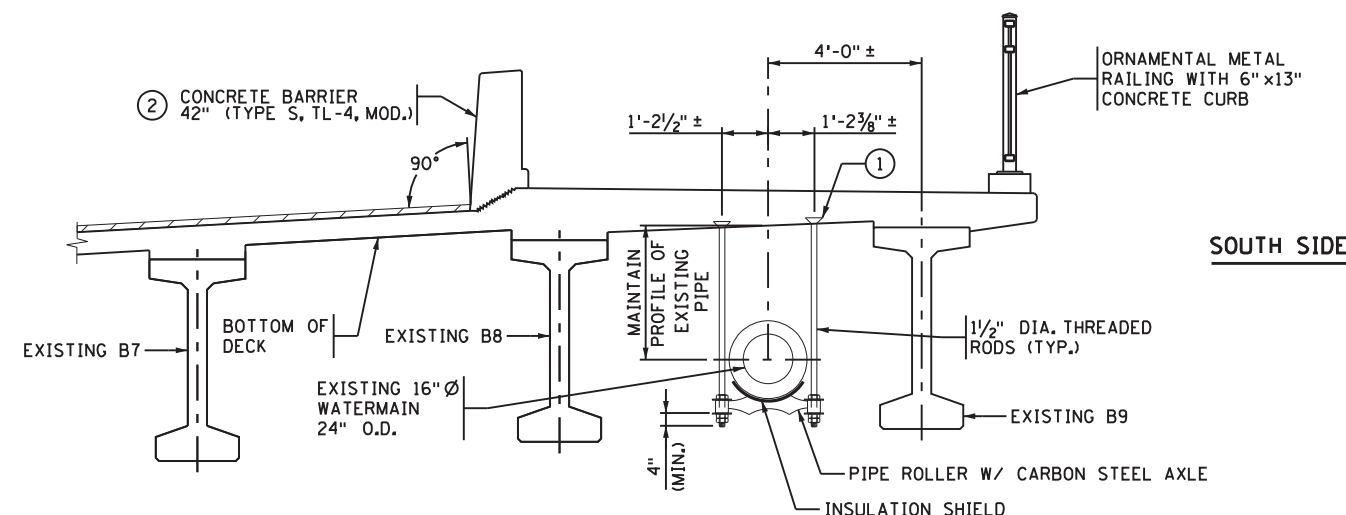


**WATERMAIN HANGER SYSTEM - EXISTING**

(LOOKING EAST)

**NOTE:**

DIMENSIONS ARE PERPENDICULAR TO CSAH 116 E.B. & W.B. ALIGNMENTS.



**WATERMAIN HANGER SYSTEM - PROPOSED**

EACH HANGER ASSEMBLY SHALL CONSIST OF 1/2" DIA. CONCRETE INSERTS, 1/2" DIA. THREADED RODS, NUTS, WASHERS, INSULATION SHIELD, AND PIPE ROLLER

**GENERAL NOTES**

SEE SHEET B21 AND B32 FOR MORE INFORMATION.

WATERMAIN TO REMAIN IN SERVICE DURING ENTIRE PROJECT LENGTH.

PIPE HANGER ASSEMBLIES SHALL BE ABLE TO ACCOMODATE ANTICIPATED LONGITUDINAL AND VERTICAL MOVEMENTS OF PIPE AND SUPERSTRUCTURE.

RODS SHALL COMPLY WITH MNDOT SPEC 3313, TYPE I.

CONCRETE INSERTS SHALL BE APPROVED TYPE MALLEABLE IRON. MATERIAL PER MNDOT SPEC. 3324 AND SHALL MEET ASTM A47 FOR GRADE REQUIREMENTS. TAP AFTER GALVANIZING.

GALVANIZE BOLTS, NUTS, WASHERS, RODS, AND INSERTS PER MNDOT SPEC. 3392. GALVANIZE OTHER MATERIAL AS PER SPEC. 3394 AFTER FABRICATION.

ALL STEEL SHALL COMPLY WITH MNDOT SPEC 3306.

WORKMANSHIP AND FABRICATION PER MNDOT SPEC. 2471.

CONTRACTOR SHALL DESIGN TEMPORARY SHORING OF EXISTING WATERMAIN, SEE SPECIAL PROVISIONS.

CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER SHOWING COMPLETE DETAILS OF THE TEMPORARY SHORING AND HANGER SYSTEM INCLUDING, BUT NOT LIMITED TO, ALL ITEMS DETAILED ON WATERMAIN HANGER SYSTEM DETAIL.

REMOVED HARDWARE OF EXISTING WATERMAIN HANGER SYSTEM SHALL NOT BE SALVAGED. REMOVED HARDWARE TO BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF PROPERLY (INCIDENTAL).

ITEM 2504.601 "WATERMAIN HANGER SYSTEM" IS TO INCLUDE ALL OTHER ITEMS SHOWN FOR THE SUPPORT SYSTEM IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

- ① 1/2" DIA. THREADED DECK INSERTS (TYP.)
- ② BACK FACE PLUMB, SEE BARRIER SHEET B28.

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	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.  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

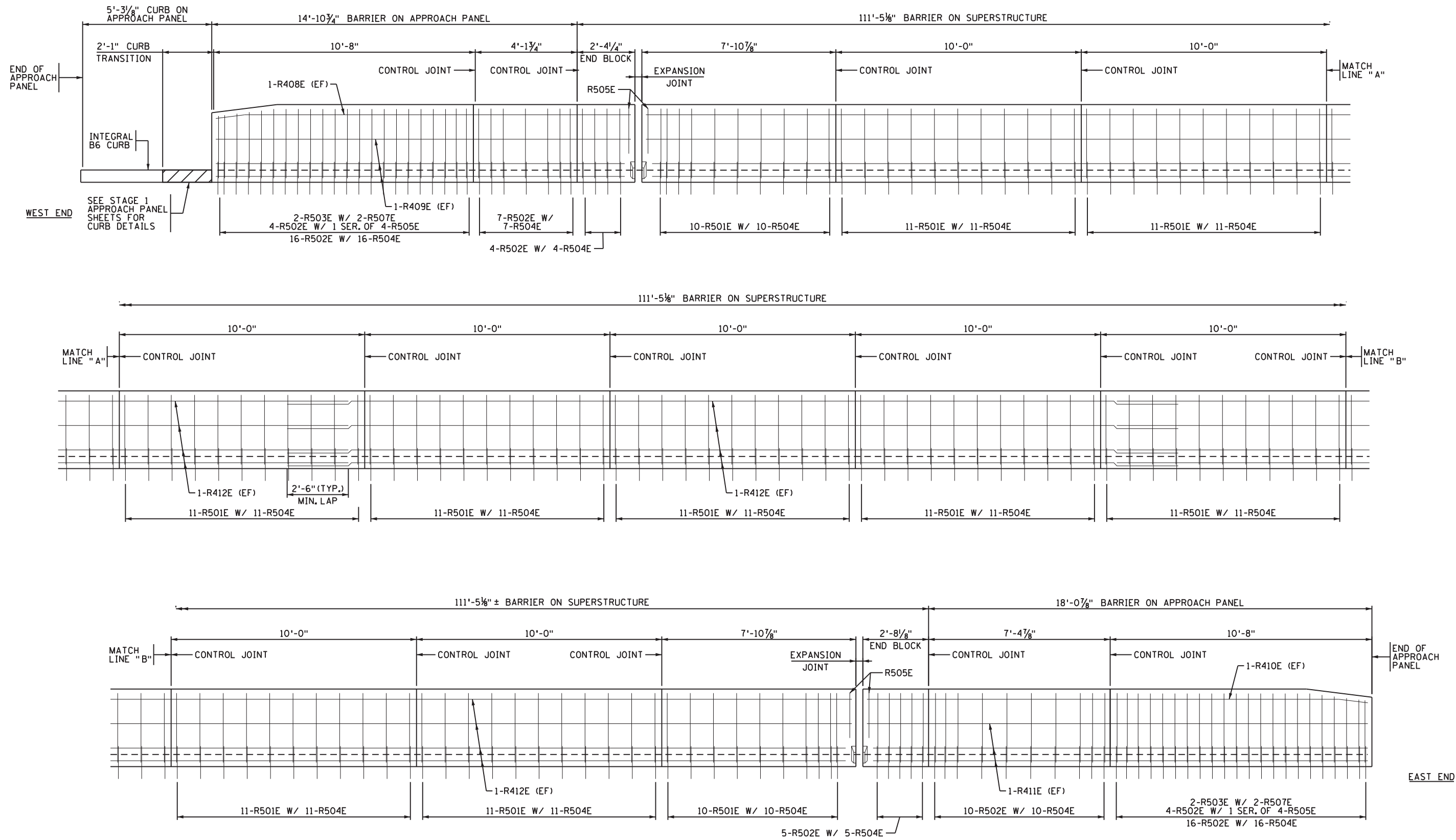
TITLE:

**WATERMAIN  
HANGER SYSTEM**

DES: JLB DR: SWH  
 CHK: CBO CHK: CBO

Sheet B24 of B52 Sheets

Bridge No.  
02546



**NORTH BARRIER TYPE S ELEVATION** ①  
(INSIDE ELEVATION OF BARRIER)

**NOTES:**  
① FOR ADDITIONAL INFORMATION ON THE S BARRIER DETAILS SEE "CONCRETE BARRIER 36" (TYPE S, TL-4)" SHEET.

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO.	DATE	BY	CHK	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.

*Carlos Berg*  
LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732

**wsb** **ANOKA COUNTY**

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

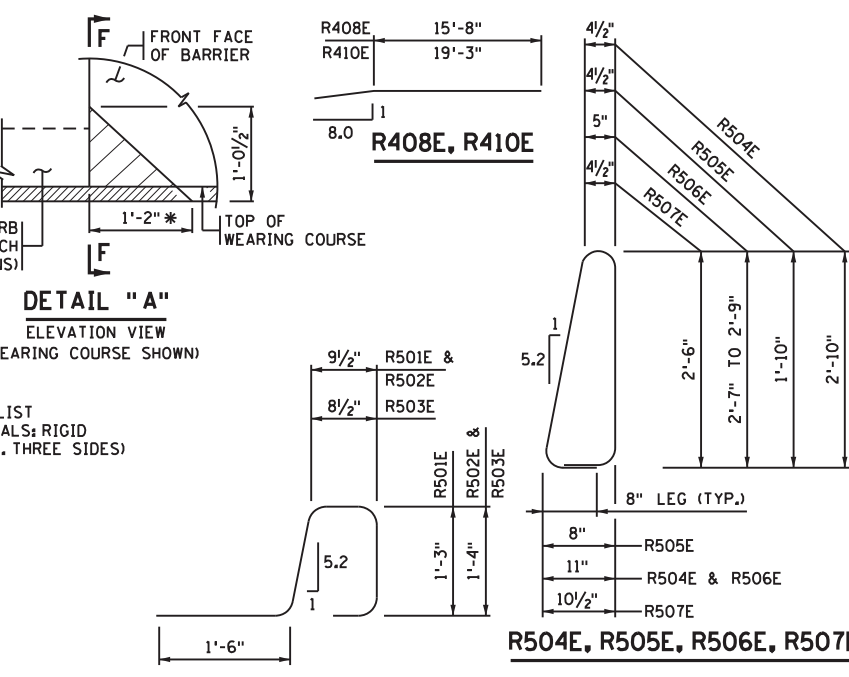
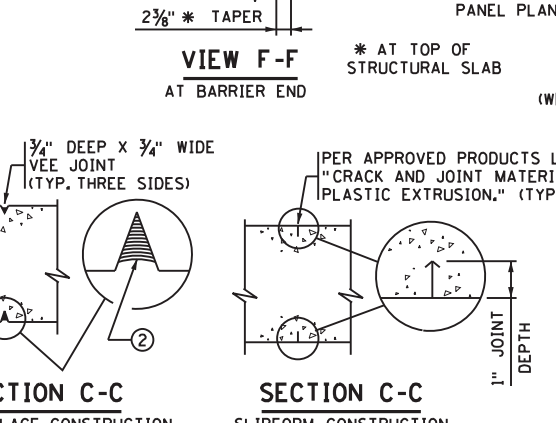
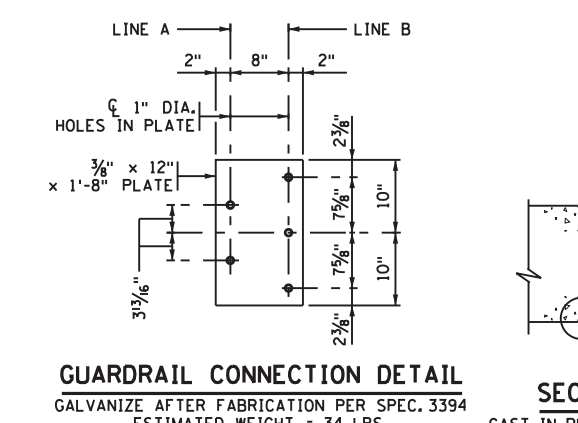
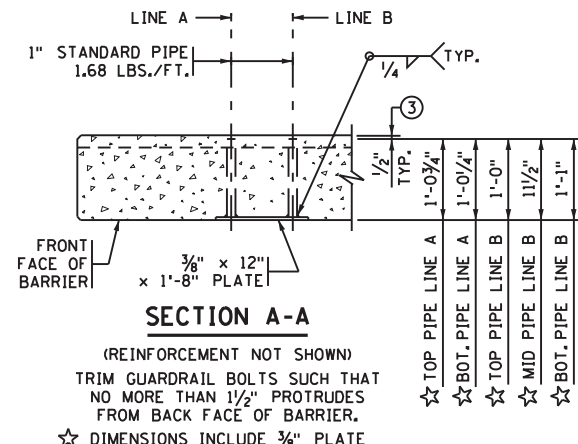
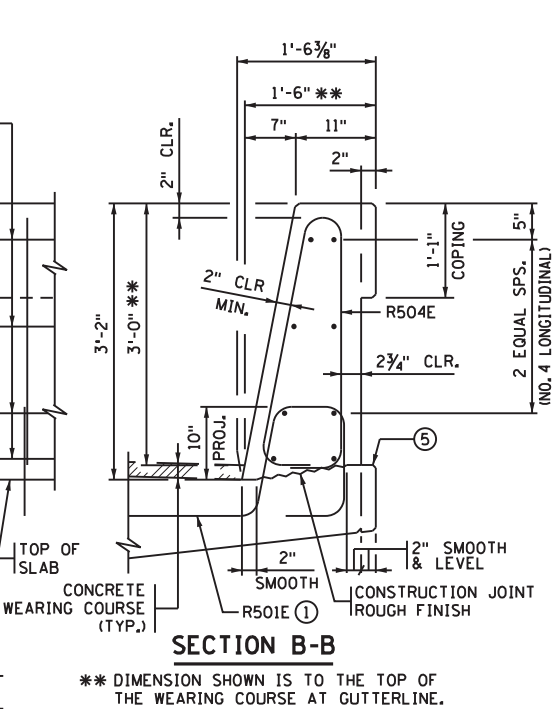
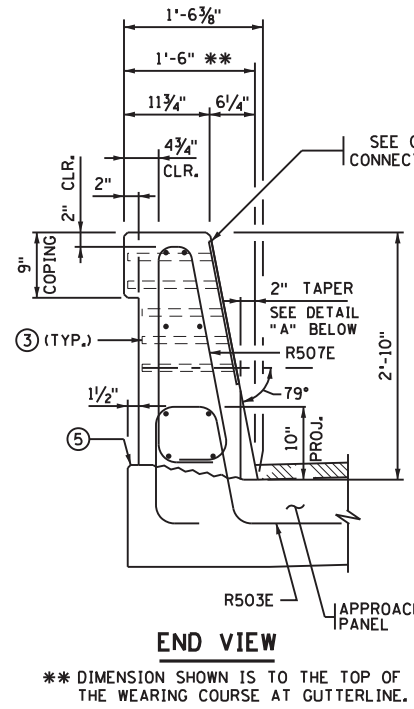
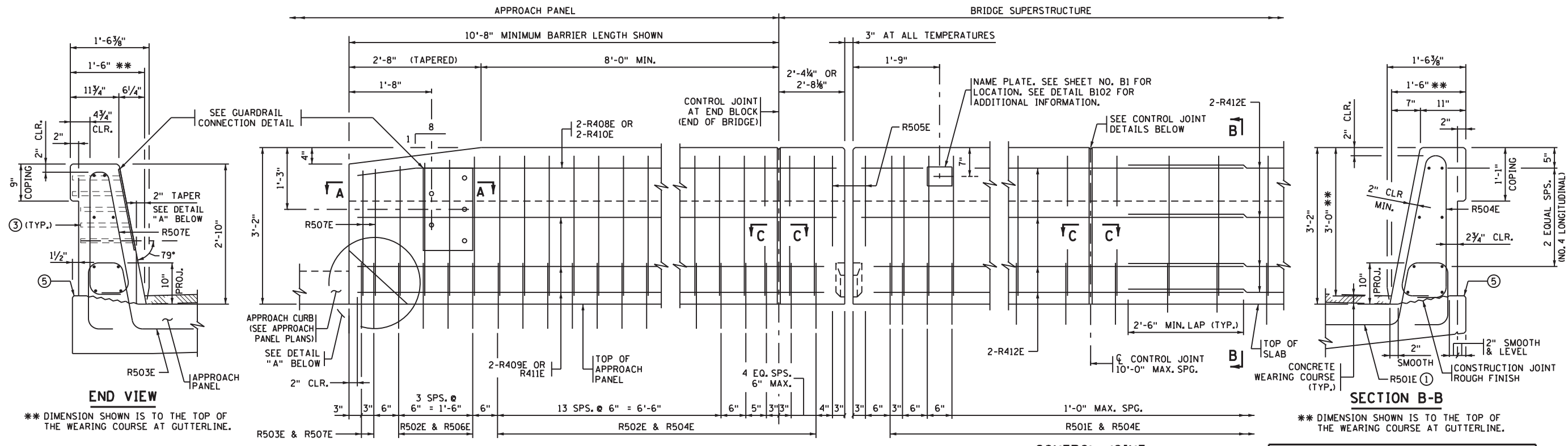
TITLE: **STAGE 1 NORTH BARRIER ELEVATION**

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

Sheet B25 of B52 Sheets

Bridge No. 02546

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**INSIDE ELEVATION OF BARRIER**

CONCRETE WEARING COURSE NOT SHOWN

**BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.**

BILL OF REINFORCEMENT FOR BARRIER				
BAR NO.	LENGTH	SHAPE	LOCATION	
R501E	117	5'-4"		BARRIER DOWEL
R502E	68	5'-6"		BARRIER DOWEL
R503E	4	5'-5"		BARRIER DOWEL
R504E	175	7'-5"		BARRIER VERTICAL
R505E	8	5'-5"		BARRIER VERTICAL
R506E	2 SER. OF 4	6'-11" TO 7'-3"		BARRIER VERTICAL
R507E	4	6'-9"		BARRIER VERTICAL
R408E	2	16'-10"		BARRIER LONGIT.
R409E	6	16'-10"		BARRIER LONGIT.
R410E	2	20'-5"		BARRIER LONGIT.
R411E	6	20'-5"		BARRIER LONGIT.
R412E	24	37'-8"		BARRIER LONGIT.

- GENERAL NOTES**
- MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE ENDS OF THE BARRIER.
  - CONCRETE BARRIER = 513 LBS./FT. (0.127 CU. YDS./FT.)
  - FINISH ALL EDGES OF BARRIER WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
  - SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
  - GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306.
  - GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO BARRIER.
  - BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
  - ① PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN DECK.
  - ② JOINT SEALANT PER MNDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
  - ③ REMOVE CONCRETE FROM PIPE ENDS AFTER SLIPFORMING OR FORM REMOVAL.
  - ④ REFER TO "WATERPROOF EXPANSION DEVICE" STANDARD PLANS FOR COVER PLATE DETAILS.
  - ⑤ MATCH GUTTERLINE ELEVATION.

FOR SLIPFORM CONSTRUCTION, IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH STRAIGHT GROOVE USING A TROWEL. INSERT RIGID PLASTIC EXTRUSION INTO GROOVE TO A DEPTH 1/8" BELOW THE SURFACE. FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.

REVISION: MAY 10, 2017

APPROVED: AUGUST 24, 2016

*Kevin Westlund*  
STATE BRIDGE ENGINEER

S.P. 0206-78 (TH 47)      S.A.P. 002-716-020

NO.	DATE	BY	CHK	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.

*Carl Osberg*  
LICENSED PROFESSIONAL ENGINEER: CARL OSBERG, PE  
DATE: 11/10/2020      REG NO: 42732

**wsb**      **ANOKA COUNTY**

CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **CONCRETE BARRIER 36" (TYPE S, TL-4)**

PARAPET ABUTMENT WITH GUARDRAIL CONNECTION (WITH 2" CONCRETE WEARING COURSE)

DES: JLB      DR: SWH  
CHK: CBO      CHK: CBO

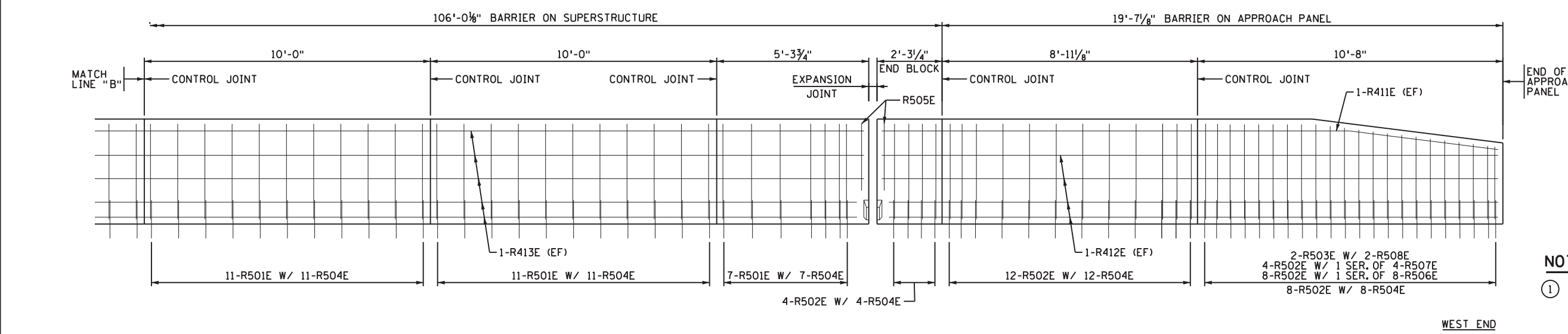
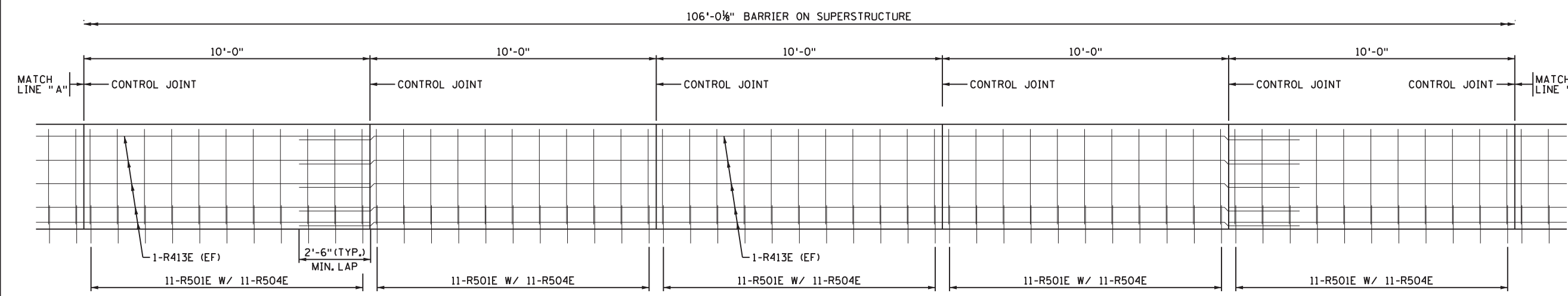
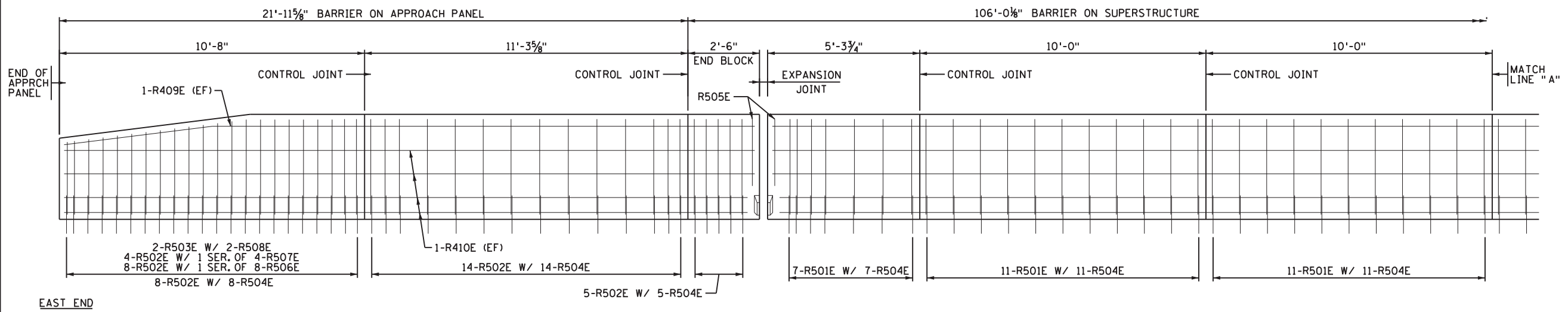
FIG. 5-397.139(B)

Bridge No. 02546

Sheet B26 of B52 Sheets

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**NOTES:**  
 ① FOR ADDITIONAL INFORMATION ON THE MOD. S BARRIER DETAILS SEE "CONCRETE BARRIER 42" (TYPE S, TL-4, MOD.) SHEET B28

**SOUTH BARRIER TYPE S ELEVATION ①**  
 (INSIDE ELEVATION OF BARRIER)

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	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.  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



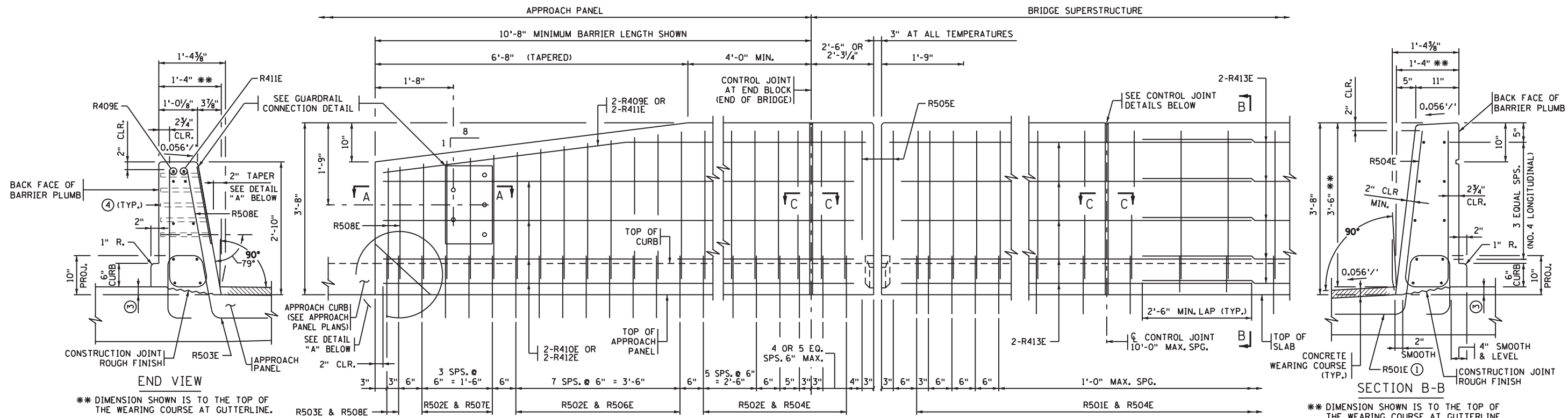
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **STAGE 2 SOUTH BARRIER ELEVATION**

DES: JLB DR: SWH  
 CHK: CBO CHK: CBO  
 Sheet B27 of B52 Sheets

Bridge No. 02546

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\*\* DIMENSION SHOWN IS TO THE TOP OF THE WEARING COURSE AT GUTTERLINE.

\*\* DIMENSION SHOWN IS TO THE TOP OF THE WEARING COURSE AT GUTTERLINE.

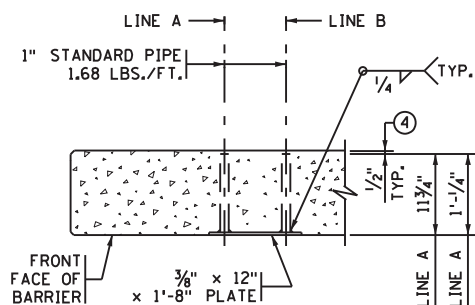
EXPANSION JOINT ⑤  
EXPANSION DEVICE NOT SHOWN

CONTROL JOINT

INSIDE ELEVATION OF BARRIER

CONCRETE WEARING COURSE NOT SHOWN

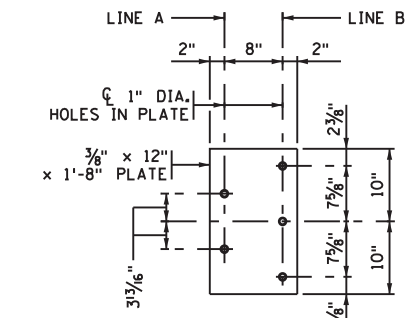
BARRIER MEETS NCHRP 350 TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.



SECTION A-A

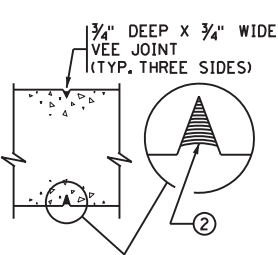
(REINFORCEMENT NOT SHOWN)  
TRIM GUARDRAIL BOLTS SUCH THAT NO MORE THAN 1/2" PROTRUDES FROM BACK FACE OF BARRIER.  
☆ DIMENSIONS INCLUDE 3/8" PLATE

- ☆ TOP PIPE LINE A
- ☆ BOT. PIPE LINE A
- ☆ TOP PIPE LINE B
- ☆ MID PIPE LINE B
- ☆ BOT. PIPE LINE B

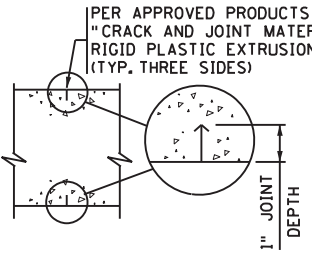


GUARDRAIL CONNECTION DETAIL  
GALVANIZE AFTER FABRICATION PER SPEC. 3394  
ESTIMATED WEIGHT = 34 LBS.

BARRIER RUSTICATION

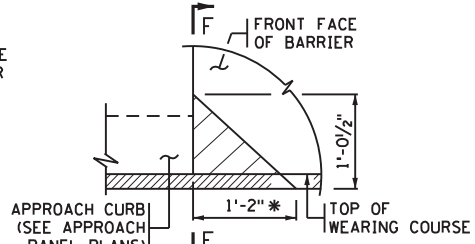


SECTION C-C  
CAST-IN-PLACE CONSTRUCTION

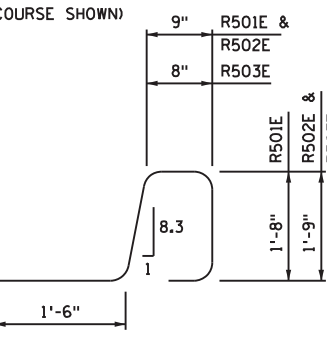


SECTION C-C  
SLIPFORM CONSTRUCTION

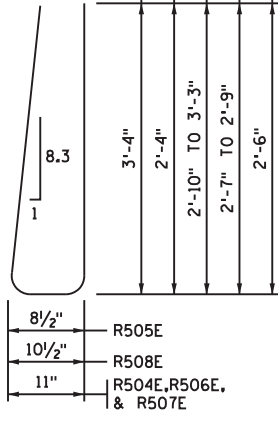
CONTROL JOINT DETAILS  
FOR SLIPFORM CONSTRUCTION: IMMEDIATELY AFTER CONCRETE IS PLACED AND WHILE IT IS STILL WET, CREATE A ONE INCH STRAIGHT GROOVE USING A TROWEL. INSERT RIGID PLASTIC EXTRUSION INTO GROOVE TO A DEPTH 1/8" BELOW THE SURFACE; FINISH OVER GROOVE COMPLETELY HIDING THE EXTRUSION.



DETAIL "A"  
ELEVATION VIEW  
(WEARING COURSE SHOWN)



R501E, R502E, R503E



R504E, R505E, R506E, R507E, R508E

GENERAL NOTES

- MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE ENDS OF THE BARRIER.
- CONCRETE BARRIER = 556 LBS./FT. (0.137 CU. YDS./FT.)
- FINISH ALL EDGES OF BARRIER WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
- SPACE CONTROL JOINTS AT 10 FT. MAXIMUM. REFER TO SUPERSTRUCTURE SHEET FOR SPECIFIC SPACING INFORMATION.
- GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306.
- GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO BARRIER.
- BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
- ① PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN DECK.
- ② JOINT SEALANT PER MNDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
- ③ DIMENSIONS TO BE DETERMINED BASED ON THE BRIDGE DECK SLOPE.
- ④ REMOVE CONCRETE FROM PIPE ENDS AFTER SLIPFORMING OR FORM REMOVAL.
- ⑤ REFER TO "WATERPROOF EXPANSION DEVICE" STANDARD PLANS FOR COVER PLATE DETAILS.

BILL OF REINFORCEMENT FOR BARRIER				
BAR	NO.	LENGTH	SHAPE	LOCATION
R501E	113	6'-2"		BARRIER DOWEL
R502E	67	6'-4"		BARRIER DOWEL
R503E	4	6'-3"		BARRIER DOWEL
R504E	164	7'-6"		BARRIER VERTICAL
R505E	4	5'-4"		BARRIER VERTICAL
R506E	2 SER. OF 8	6'-7" TO 7'-5"		BARRIER VERTICAL
R507E	2 SER. OF 4	6'-1" TO 6'-5"		BARRIER VERTICAL
R508E	4	5'-10"		BARRIER VERTICAL
R409E	2	24'-2"		BARRIER LONGIT.
R410E	8	24'-2"		BARRIER LONGIT.
R411E	2	21'-6"		BARRIER LONGIT.
R412E	8	21'-6"		BARRIER LONGIT.
R413E	30	36'-0"		BARRIER LONGIT.

REVISION: MAY 10, 2017

APPROVED: AUGUST 24, 2016

Kevin Westlund  
STATE BRIDGE ENGINEER

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO.	DATE	BY	CHK	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.  
CARLOS BERG, PE  
LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

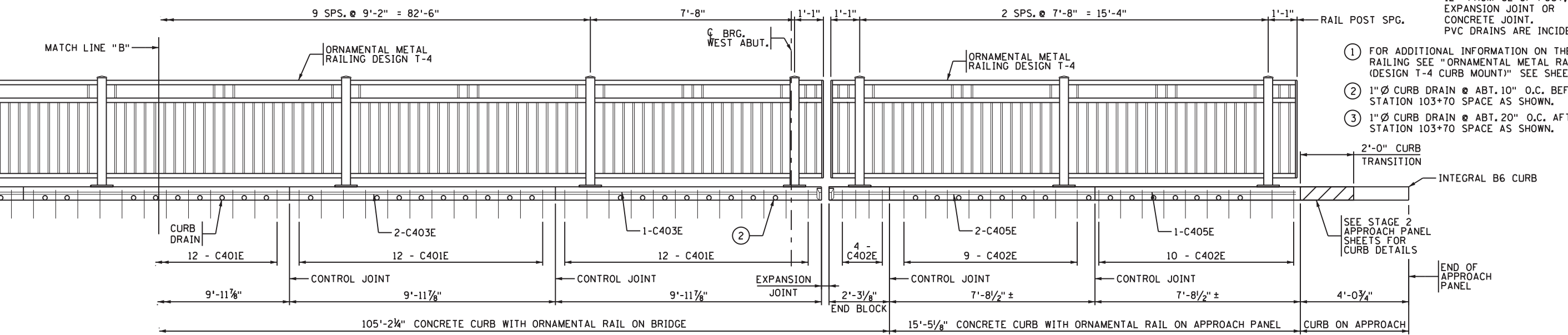
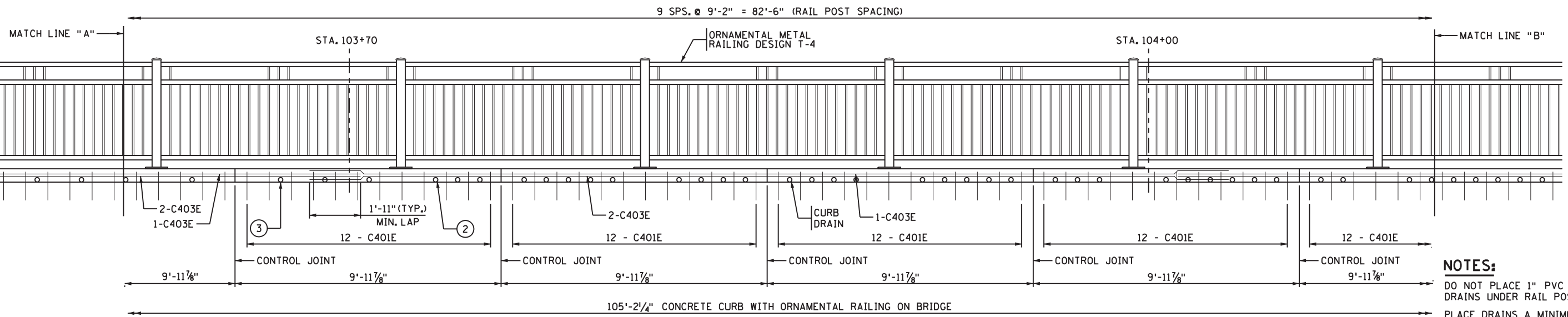
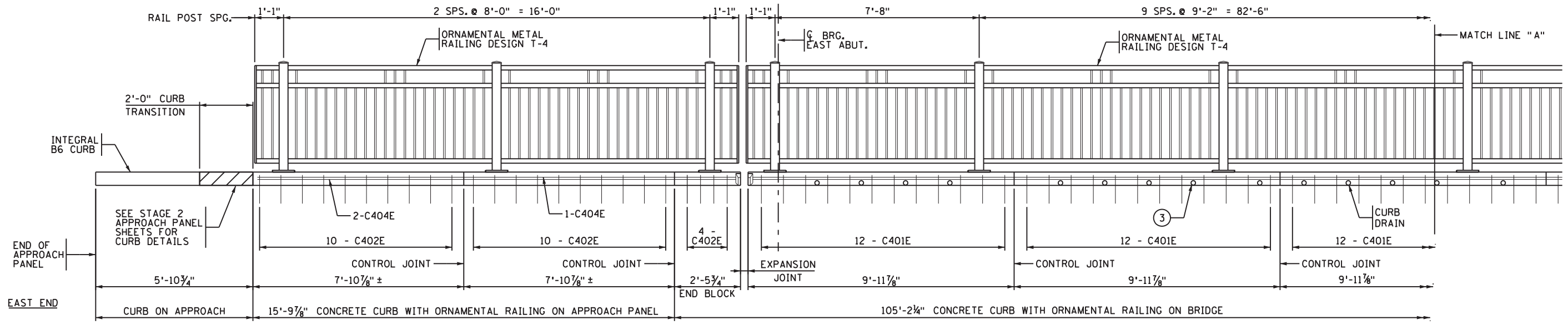
TITLE:  
CONCRETE BARRIER 42" (TYPE S, TL-4, MOD.)

DES: JLB DR: SWH  
CHK: CBO CHK: CBO  
Sheet B28 of B52 Sheets

Bridge No. 02546

FIG. 5-397.141(D) MOD.

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- NOTES:**
- DO NOT PLACE 1" PVC CURB DRAINS UNDER RAIL POSTS.
  - PLACE DRAINS A MINIMUM OF 12" FROM CL OF POST, EXPANSION JOINT OR CONCRETE JOINT. PVC DRAINS ARE INCIDENTAL.
  - ① FOR ADDITIONAL INFORMATION ON THE RAILING SEE "ORNAMENTAL METAL RAILING (DESIGN T-4 CURB MOUNT)" SEE SHEET B31
  - ② 1" Ø CURB DRAIN @ ABT. 10" O.C. BEFORE STATION 103+70 SPACE AS SHOWN.
  - ③ 1" Ø CURB DRAIN @ ABT. 20" O.C. AFTER STATION 103+70 SPACE AS SHOWN.

**SOUTH ORNAMENTAL RAIL ELEVATION**  
(INSIDE ELEVATION OF RAIL)

**S.P. 0206-78 (TH 47) S.A.P. 002-716-020**

NO	DATE	BY	CHK	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.

*Carlos Berg*

LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732

**wsb** ANOKA COUNTY

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

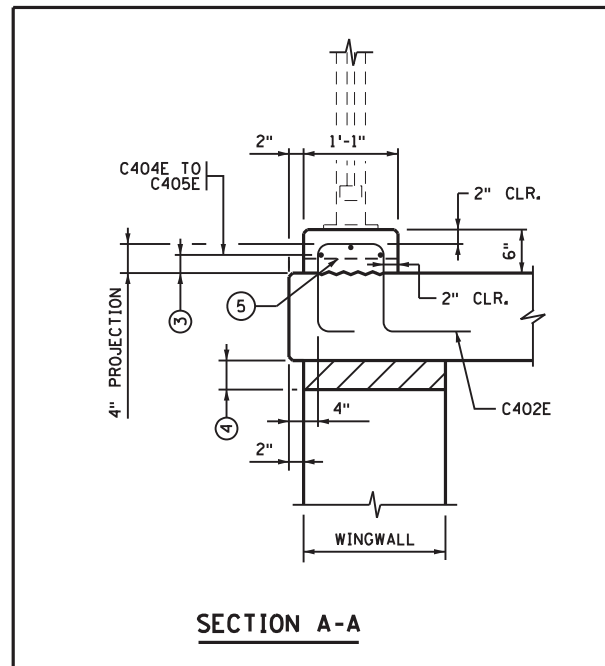
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DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

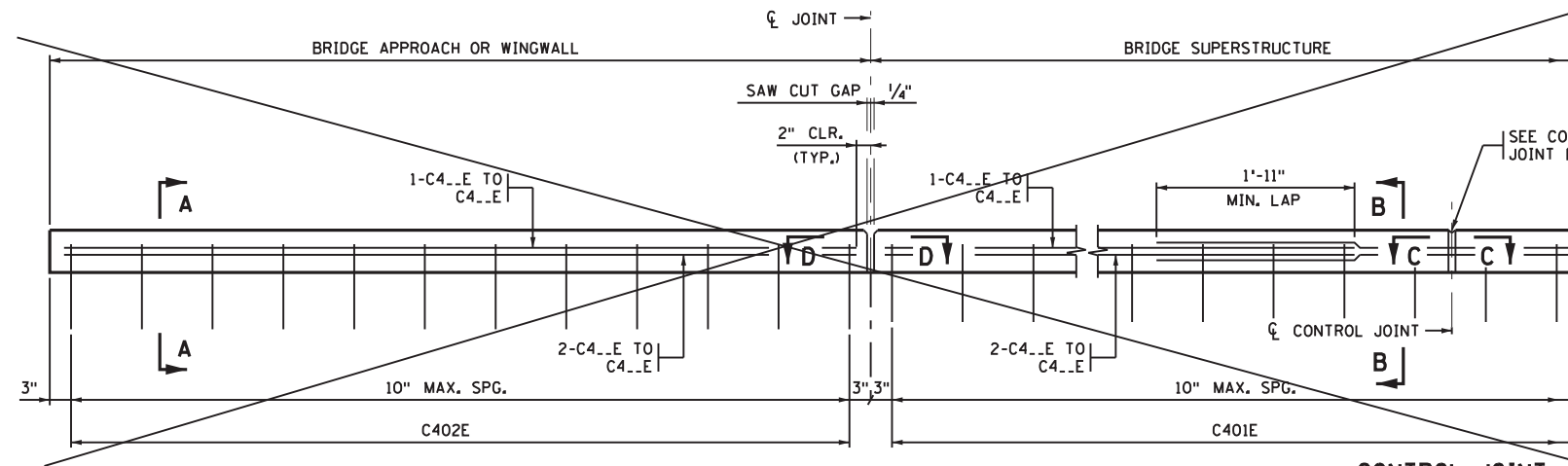
Sheet B29 of B52 Sheets

Bridge No. **02546**

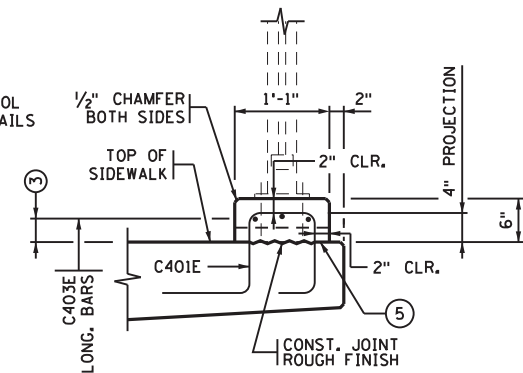
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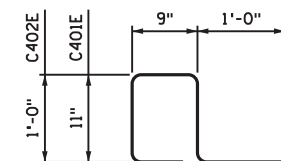
SECTION A-A



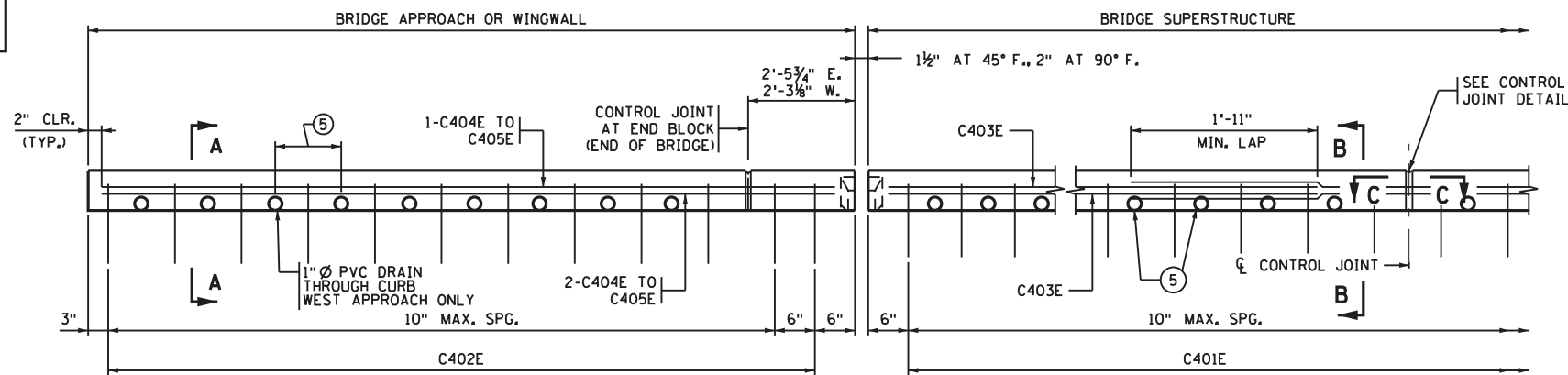
JOINT AT ABUTMENT  
INTEGRAL OR SEMI-INTEGRAL ABUTMENT  
(SEE ABUTMENT TYPE TABLE BELOW)  
INSIDE ELEVATION OF CONCRETE CURB



SECTION B-B

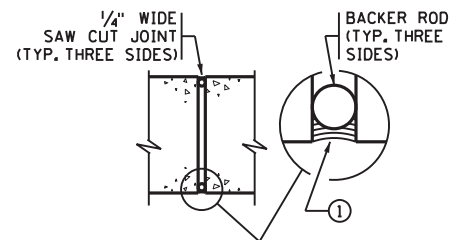


C401E, C402E

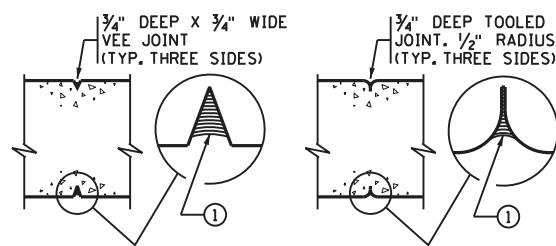


JOINT AT ABUTMENT  
PARAPET ABUTMENT (SEE ABUTMENT TYPE TABLE BELOW)  
(USE ONLY WITH STRIP SEAL EXPANSION DEVICE)  
(EXPANSION DEVICE NOT SHOWN)  
INSIDE ELEVATION OF CONCRETE CURB

BILL OF REINFORCEMENT FOR CURB				
BAR	NO.	LENGTH	SHAPE	LOCATION
C401E	120	4'-2"		CURB BASE VERTICAL
C402E	47	4'-4"		CURB BASE VERTICAL
C403E	9	34'-8"		CURB BASE LONGIT.
C404E	3	17'-11"		CURB BASE LONGIT.
C405E	3	17'-4"		CURB BASE LONGIT.



SECTION D-D



SECTION C-C  
CONTRACTOR OPTION 1  
SECTION C-C  
CONTRACTOR OPTION 2  
CONTROL JOINT DETAILS

WHEN USING SLIP FORM METHOD TO PLACE THE CONCRETE, CUT JOINT 3 INCHES DEEP USING MARGIN TROWEL OR SIMILAR MEANS IMMEDIATELY AFTER CONCRETE PLACEMENT (TYP. THREE SIDES)

CURB DOES NOT MEET CRASH TEST REQUIREMENTS OF NCHRP REPORT 350 OR MASH

ABUTMENT TYPE	
INTEGRAL OR SEMI-INTEGRAL ABUTMENT	<input type="checkbox"/>
PARAPET ABUTMENT	<input checked="" type="checkbox"/>

GENERAL NOTES

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

MEASURE PAYMENT LENGTH BETWEEN THE OUTSIDE ENDS OF THE CONCRETE CURB.

CONCRETE CURB = 81 LBS./FT. (0.020 CU. YDS./FT.)

FINISH ALL EDGES OF CURB WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONTROL JOINTS ON SUPERSTRUCTURE, APPROACH AND WINGWALL IS 10 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

CONCRETE CURB QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

- JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
- REFER TO STANDARD FIGURE 5-397.632 FOR COVER PLATE DETAILS.
- PLACE TOP OF CURB BARS 3" MIN ABOVE DECK SURFACE. AVOID INTERFERENCE WITH RAIL ANCHORAGES.
- 4" LOW DENSITY POLYSTYRENE ON TOP OF WINGWALL.
- 1" Ø PVC CURB DRAIN @ ABT. 10" O.C. UP TO STA. 103+70, @ ABT. 20" O.C. AFTER STATION 103+70.

MODIFIED:  
SECTION A-A POLYSTYRENE NOTE.  
ADDED 1" PVC CURB DRAIN.

REVISION: 08-24-2016

APPROVED: NOVEMBER 6, 2013

*Nancy Dubenberger*  
STATE BRIDGE ENGINEER

S.P. 0206-78 (TH 47)

S.A.P. 002-716-020

NO.	DATE	BY	CHK	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.  
*Carlos Berg*  
LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO.: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: CONCRETE CURB FOR USE WITH ORNAMENTAL RAILING

DES: JLB DR: SWH  
CHK: CBO CHK: CBO

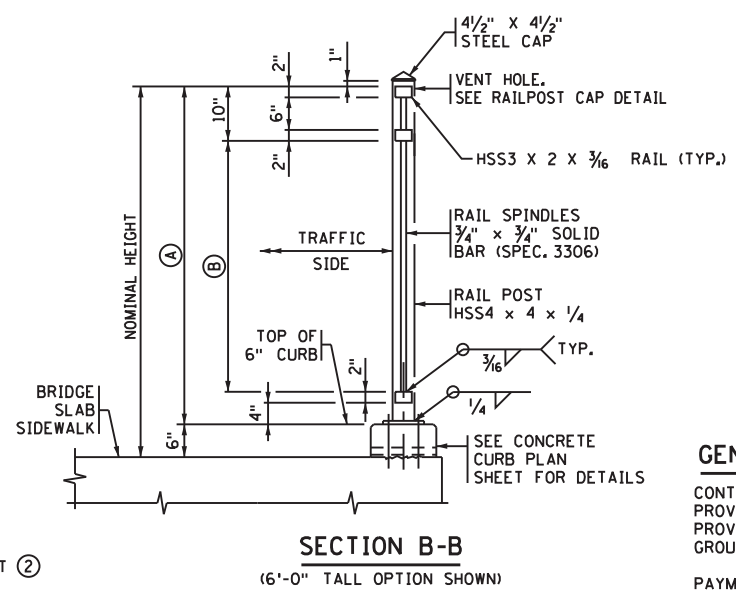
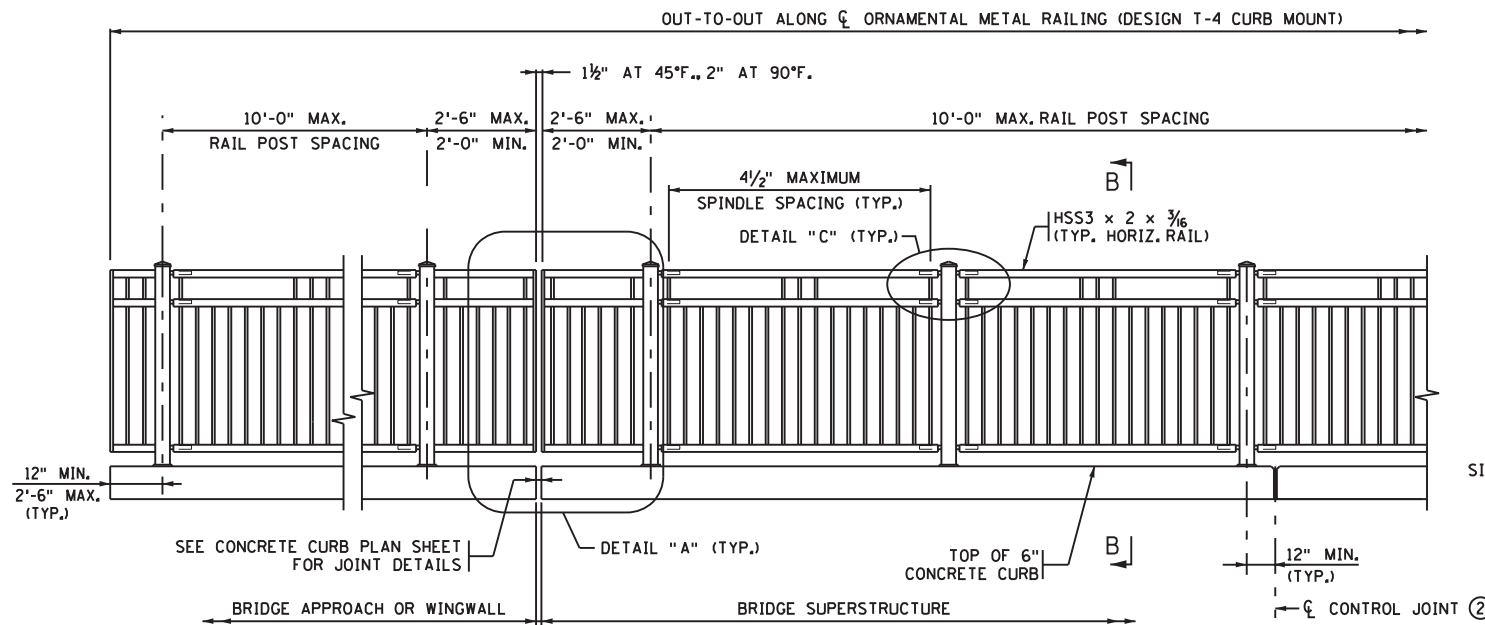
Sheet B30 of B52 Sheets

Bridge No. 02546

FIG. 5-397.167 MOD.

11/10/2020 1:57:34 PM c:\users\shill\appdata\local\benhtley\project\wise\workingdir\project\wise\benhtley.com\dms04755\CBO02546-det104.dgn

RAILING HEIGHT TABLE		
NOMINAL HEIGHT	(A)	(B)
4'-6"	4'-0"	2'-8"
6'-0"	5'-6"	4'-2"
8'-0"	7'-6"	6'-2"



**GENERAL NOTES**

CONTINUOUSLY GROUND ALL METAL RAILINGS; SEE THE SPECIAL PROVISIONS, REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.

PAYMENT LENGTH SHALL BE MEASURED AS THE OUT TO OUT LENGTH ALONG THE CENTERLINE OF THE RAILING BETWEEN THE OUTSIDE ENDS, WITH DEDUCTIONS FOR THE LENGTH OF CONCRETE POSTS, IF PRESENT.

PROVIDE A500, GRADE B STRUCTURAL STEEL TUBING (HSS) IN THE RAIL CONFORMING TO SPEC. 3361. PROVIDE ALL OTHER STEEL IN ACCORDANCE WITH SPEC. 3306.

GALVANIZE BOLTS, NUTS, WASHERS AND ANCHORS IN ACCORDANCE WITH SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL IN ACCORDANCE WITH SPEC. 3394, AFTER FABRICATION.

SEE SPECIAL PROVISIONS FOR COATING TO BE APPLIED TO METAL RAILING.

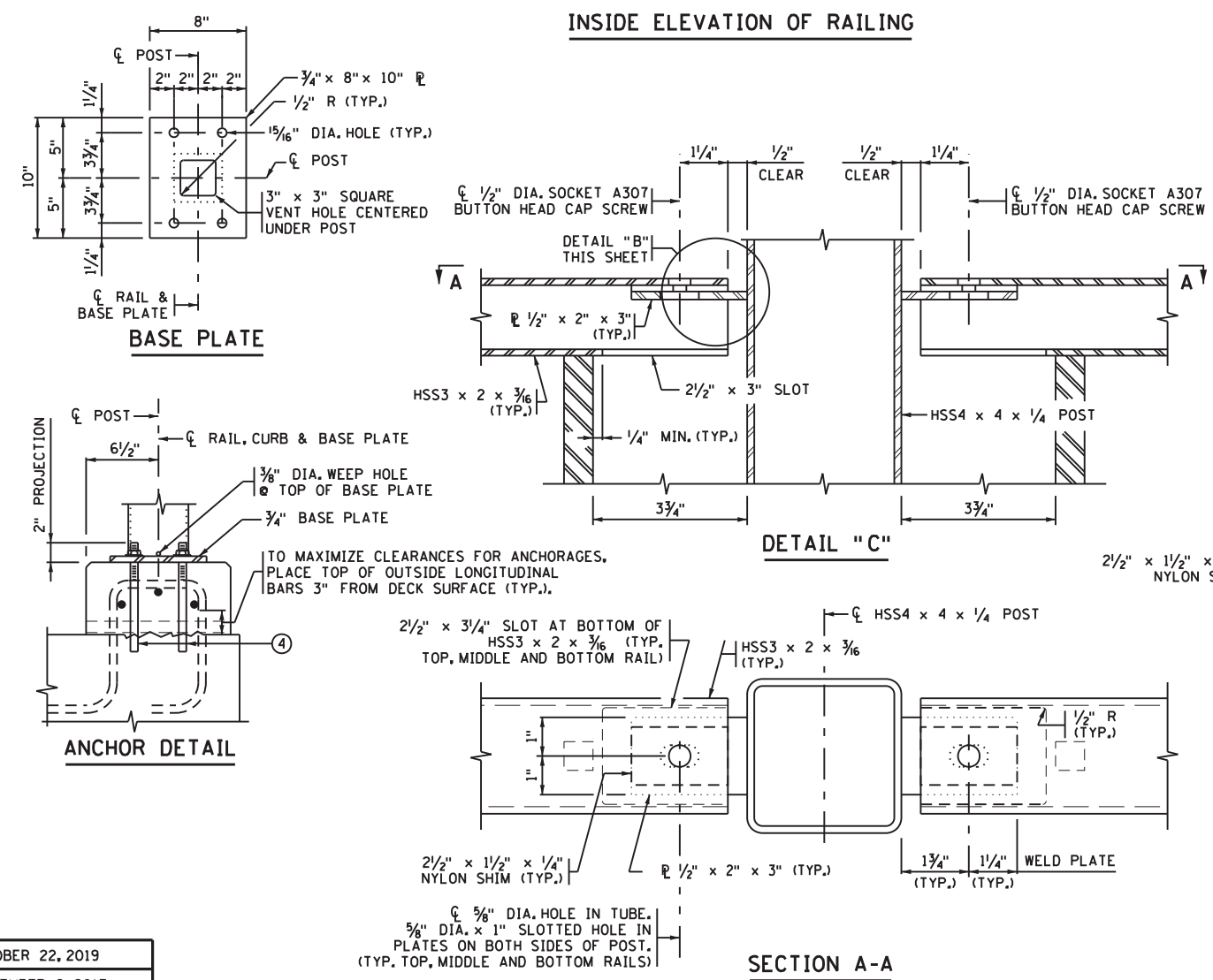
INSTALL RAIL POSTS AND SPINDLES PLUMB.

CURVE HORIZONTAL RAILS WHERE APPLICABLE AND PLACE RAILS PARALLEL TO THE EDGE OF SIDEWALK PROFILE.

SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET.

DRILL 1/2" DIA. MAX. VENT HOLES ON THE UNDERSIDE OF RAIL TUBES AS NECESSARY TO FACILITATE GALVANIZING.

- DRILL VENT HOLE IN THE RAIL POST WITHIN 2" OF THE UNDERSIDE OF THE CAP, ON THE NON-TRAFFIC SIDE OF THE POST AS NECESSARY TO FACILITATE GALVANIZING. MAXIMUM HOLE SIZE IS 1/2" DIA.
- SEE CONCRETE CURB PLAN SHEET FOR CONTROL JOINT SPACING AND DETAILS.
- PROVIDE A PYRAMID TOP STYLE STEEL CAP WELDED TO TOP OF POST WITH A SURFACE FINISH OF 1000 MICRO-INCH, OR SMOOTHER, PRIOR TO GALVANIZING.
- ADHESIVE ANCHORAGE WITH 5/8" DIA. ANCHOR ROD IN ACCORDANCE WITH SPEC. 3385, TYPE A WITH HEX NUT AND WASHER. PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 8" REGARDLESS OF CHARACTERISTIC BOND STRENGTH, DRILL THROUGH REINFORCEMENT (IF ENCOUNTERED) TO ACHIEVE MINIMUM EMBEDMENT. ENSURE HEX NUT IS IN CONTACT WITH THE ADJACENT SURFACE AND TORQUE TO 60 FT-LBS UNLESS A HIGHER TORQUE IS RECOMMENDED BY THE MANUFACTURER. PROOF LOAD TO 8.8 KIPS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.



REVISION: OCTOBER 22, 2019

APPROVED: NOVEMBER 6, 2013

*Nancy Dubenberger*  
STATE BRIDGE ENGINEER

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732

wsb ANOKA COUNTY

CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: ORNAMENTAL METAL RAILING (DESIGN T-4 CURB MOUNT)

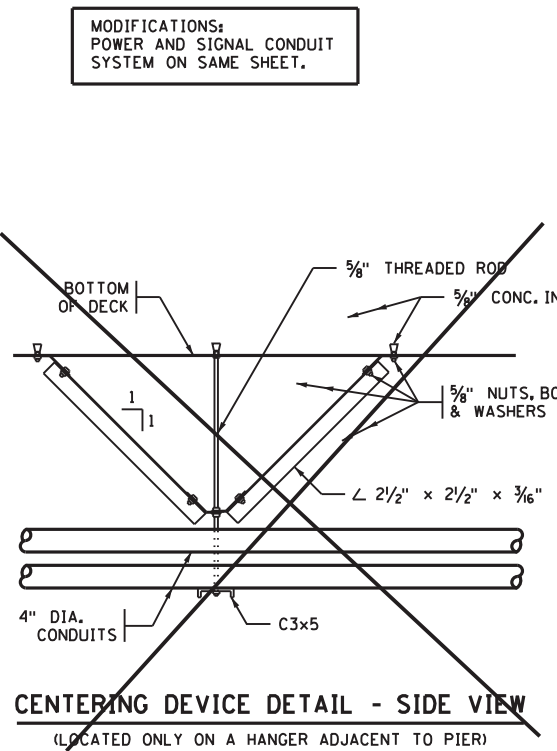
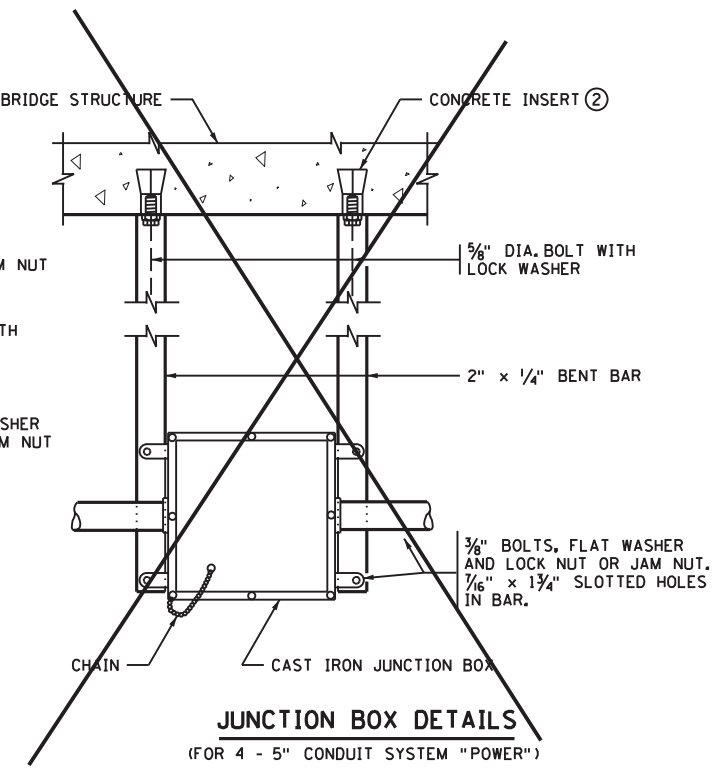
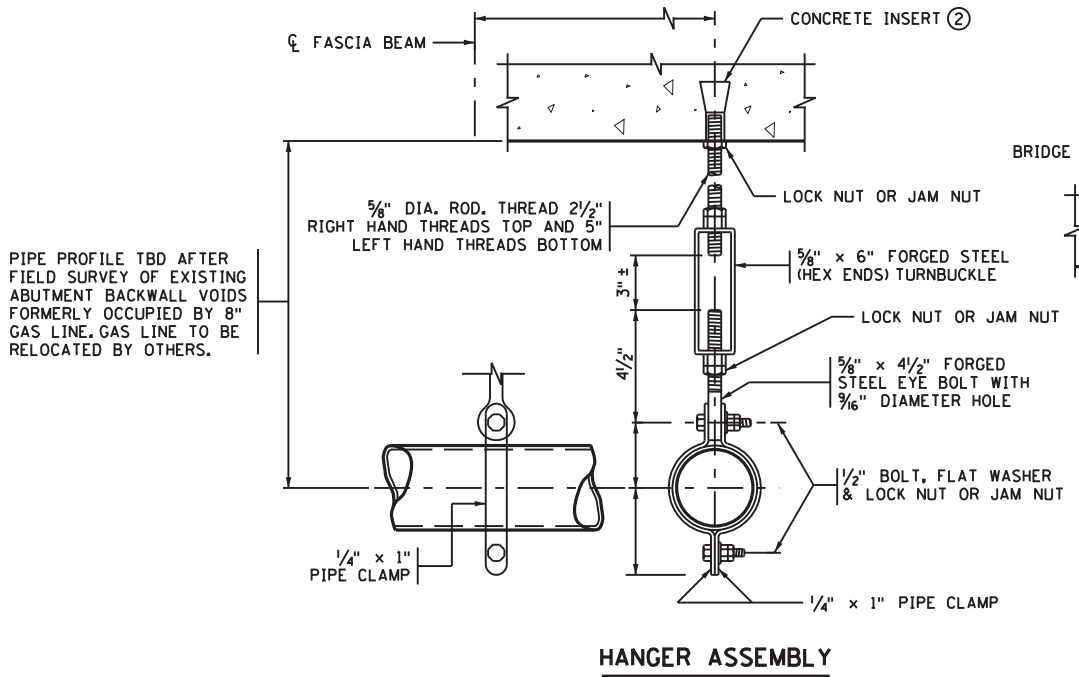
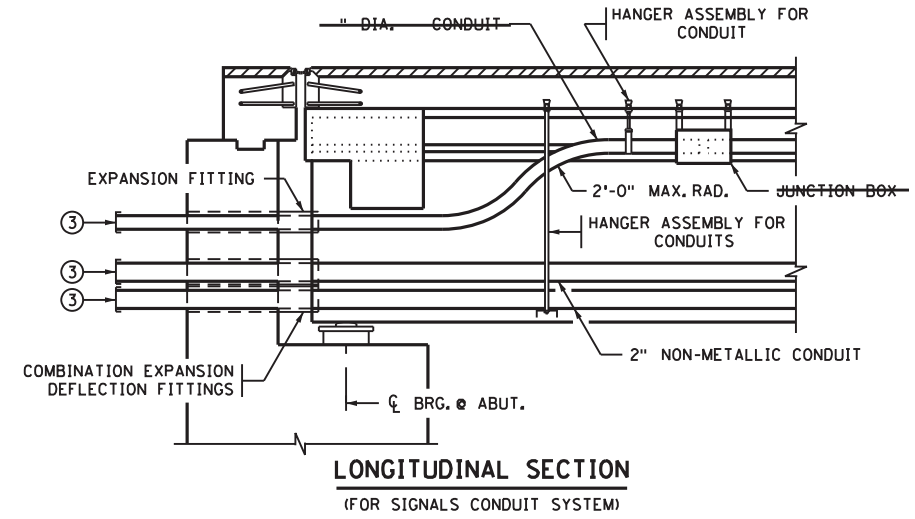
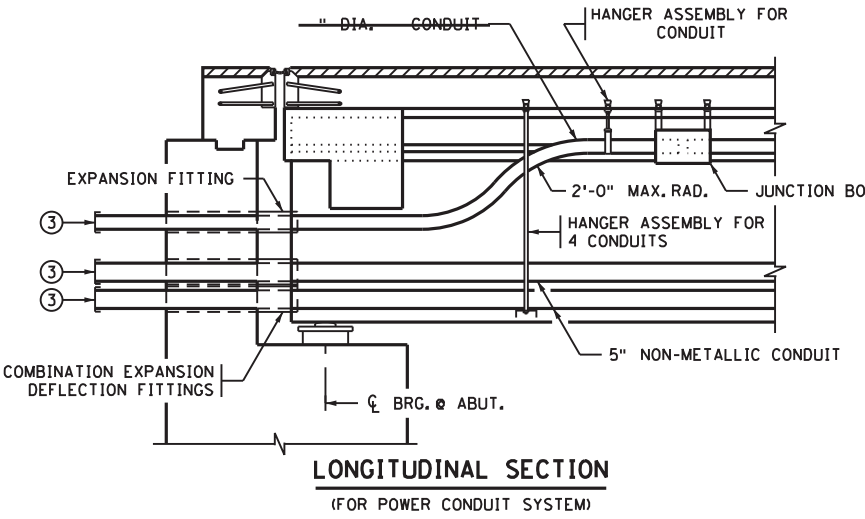
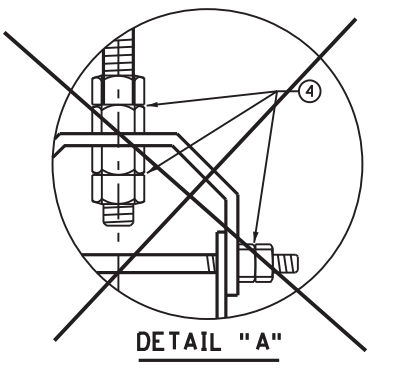
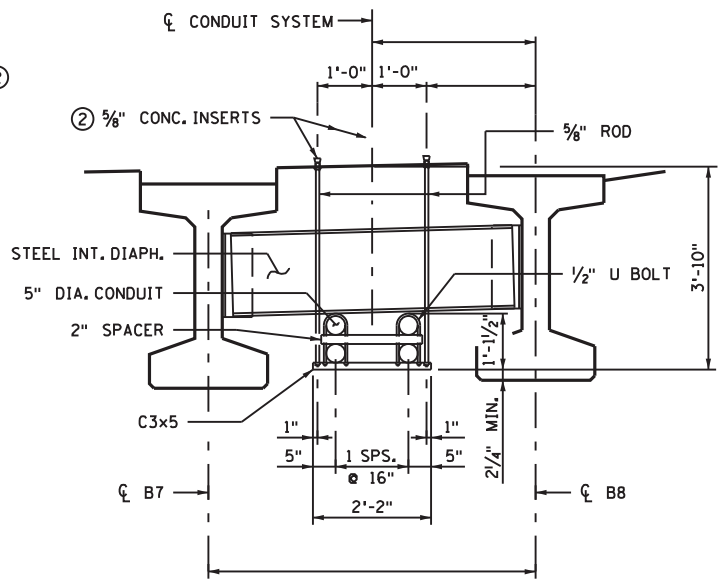
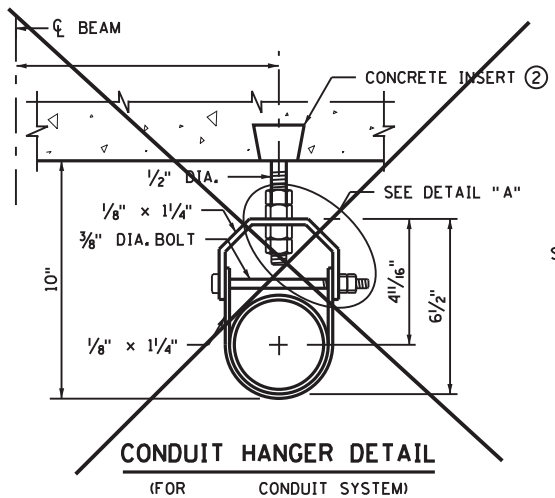
DES: JLB DR: SWH  
CHK: CBO CHK: CBO

Sheet B31 of B52 Sheets

FIG. 5-397.163 MOD.

Bridge No. 02546

MODIFIED: CURB BARS 3" ABOVE DECK.



**SUMMARY OF QUANTITIES FOR CONDUIT SYSTEM (POWER)**

PRECAST HAND HOLES (STD. PLATE 8117)	UNITS
HANGER ASSEMBLY	12 UNITS
4" x 4" CAST IRON JCT. BOX & SUPPORTS	8 UNITS
CONDUIT CAP	8 UNITS
DRAINAGE TEE	UNITS
COMBINATION EXPANSION/DEFLECTION FITTING	8 UNITS
5" SCHED 40 CONDUIT	420 LIN. FT.
6" PIPE SLEEVE	8 UNITS
5" NON-METALLIC CONDUIT	420 LIN. FT.

**SUMMARY OF QUANTITIES FOR CONDUIT SYSTEM (SIGNALS)**

PRECAST HAND HOLES (STD. PLATE 8117)	UNITS
HANGER ASSEMBLY	12 UNITS
4" x 4" CAST IRON JCT. BOX & SUPPORTS	UNITS
CONDUIT CAP	2 UNITS
DRAINAGE TEE	UNITS
COMBINATION EXPANSION/DEFLECTION FITTING	2 UNITS
3" RIGID STEEL CONDUIT	LIN. FT.
3" PIPE SLEEVE	2 UNITS
2" NON-METALLIC CONDUIT	210 LIN. FT.

ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (POWER)".

ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (SIGNALS)".

SEE SHEETS B1, B21 AND B23 FOR LOCATION AND DETAILS.

MODIFICATIONS: POWER AND SIGNAL CONDUIT SYSTEM ON SAME SHEET.

**GENERAL NOTES**

- RODS, EYE BOLTS AND PIPE CLAMPS SHALL COMPLY WITH SPEC. 3313, TYPE I.
- TURNBUCKLES AND EYE BOLTS SHALL COMPLY WITH A.S.T.M. A235 CLASS A MINIMUM REQUIREMENTS.
- FLAT BARS AND ANCHORAGES SHALL COMPLY WITH SPEC. 3306.
- CONCRETE INSERTS SHALL BE APPROVED TYPE MALLEABLE IRON, MATERIAL AS PER SPEC. 3324, GRADE 35018, TAP AFTER GALVANIZING.
- GALVANIZE BOLTS, NUTS, WASHERS, TURNBUCKLES, RODS, EYE BOLTS, AND INSERTS AS PER SPEC. 3392. GALVANIZE OTHER MATERIAL AS PER SPEC. 3394 AFTER FABRICATION.
- PIPE SLEEVES SHALL COMPLY WITH SPEC. 3362.
- SPACE INSERTS AT 10'-0" MAXIMUM CENTERS.
- CAP ENDS.
- DOUBLE NUTS OR JAM NUTS OR LOCK NUT.
- WORK WITH SHEET B22

REVISION: 05-24-2012  
 APPROVED: SEPTEMBER 26, 2003  
 S.P. 0206-78 (TH 47)      S.A.P. 002-716-020

EACH HANGER ASSEMBLY SHALL CONSIST OF CONCRETE INSERT, 5/8" DIA. ROD, PIPE CLAMPS, NUTS, BOLTS, WASHERS, TURNBUCKLE AND EYE BOLT

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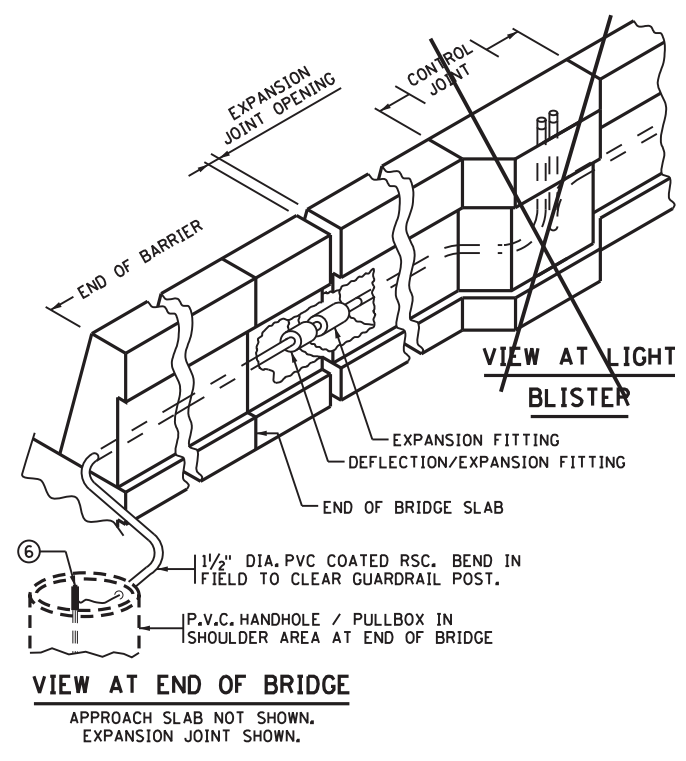
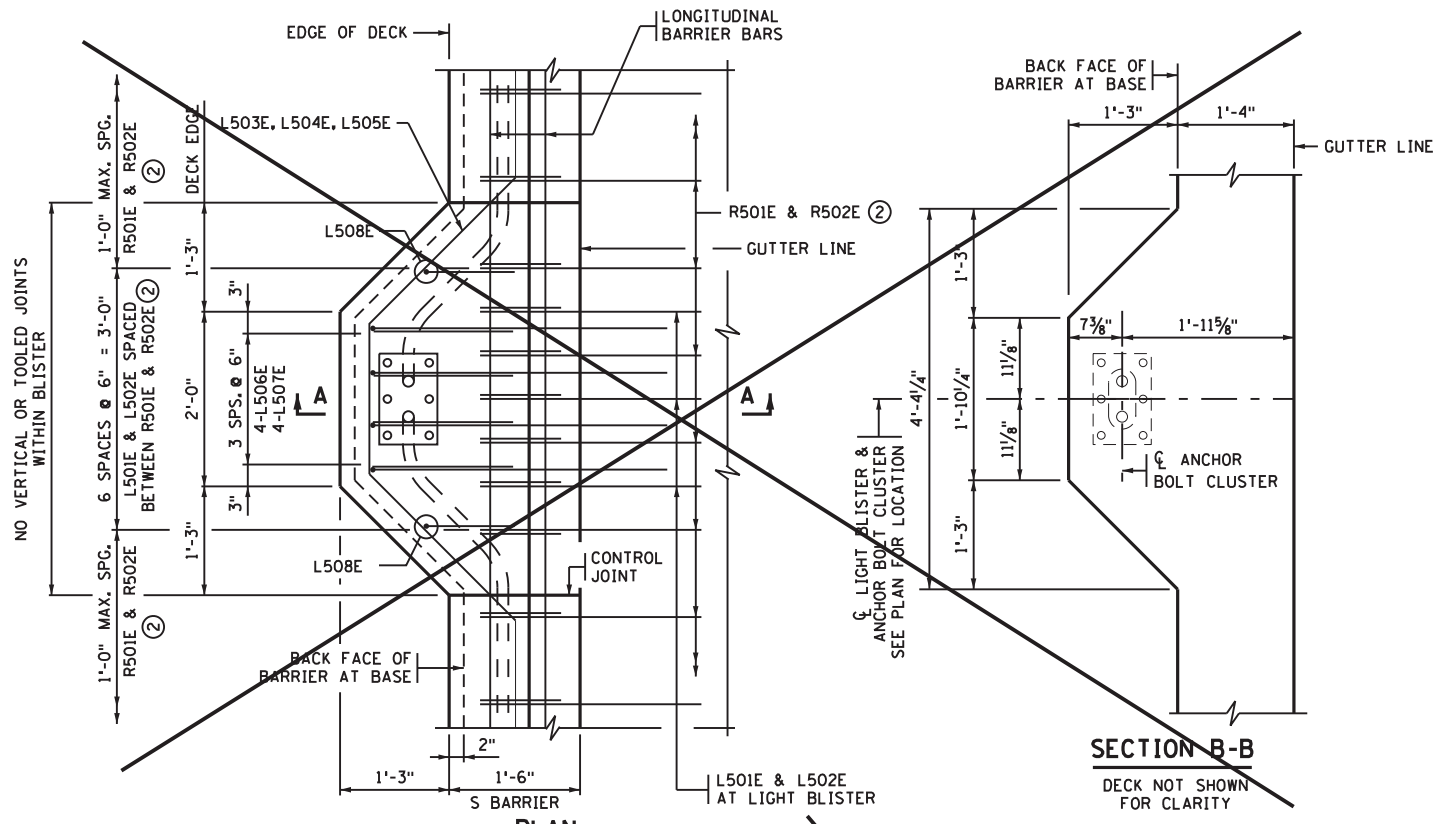
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732

wsb ANOKA COUNTY  
 CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

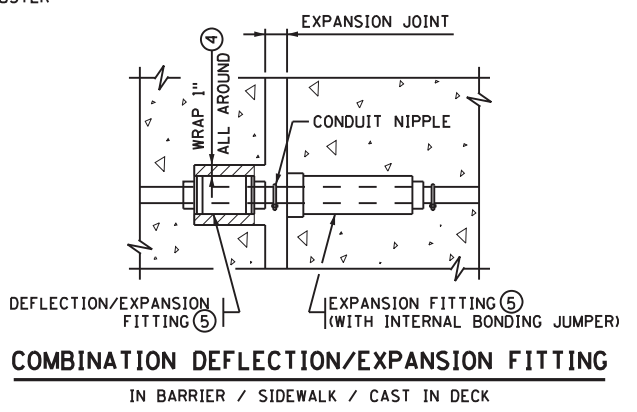
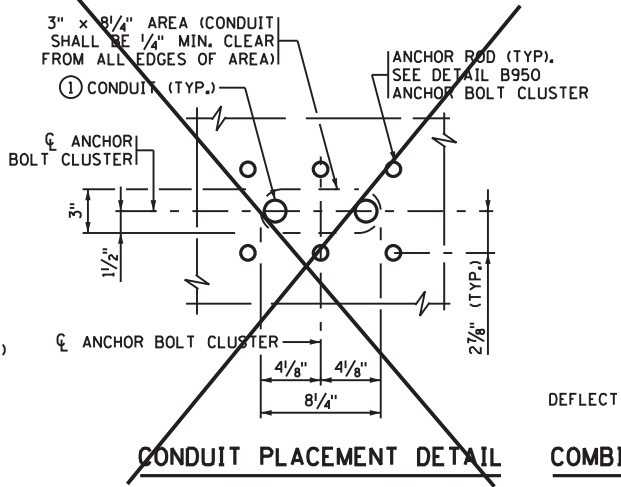
TITLE: CONDUIT SYSTEM FOR POWER & SIGNALS

DES: JLB DR: SWH  
 CHK: CBO CHK: CBO  
 Sheet B32 of B52 Sheets  
 Bridge No. 02546

FIG. 5-397.402 MOD.



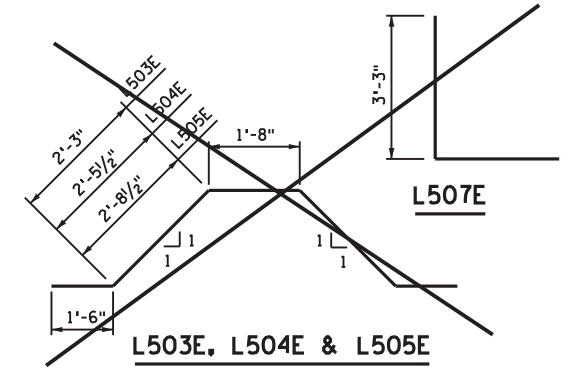
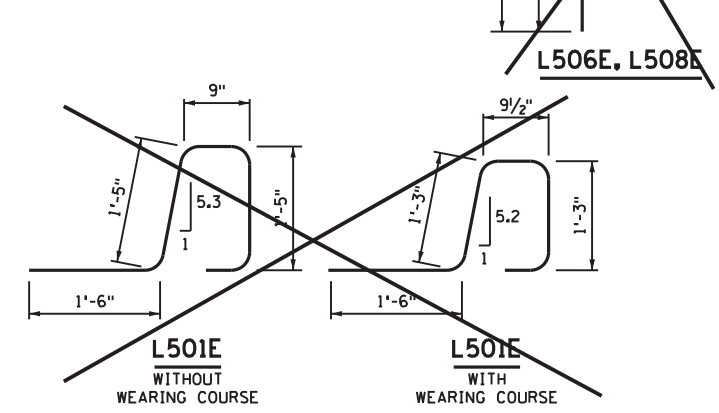
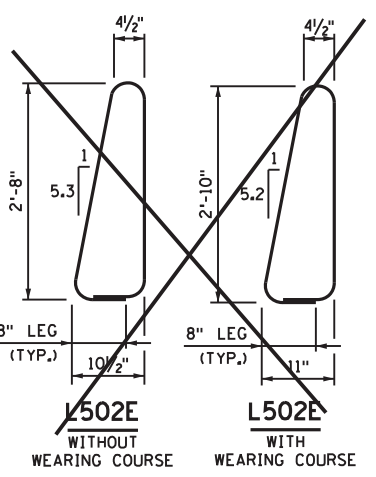
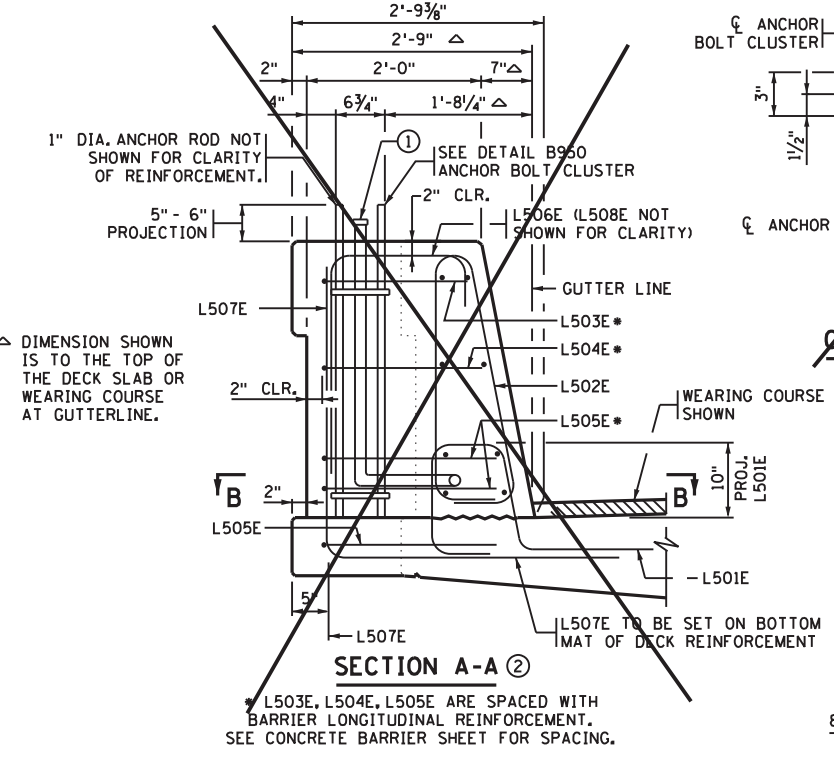
- GENERAL NOTES**
- BOND AND GROUND THE CONDUIT SYSTEM (SIGNALS) IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF SPEC. 2545.3.R.
- ADDITIONAL BARRIER AND DECK CONCRETE REQUIRED TO CONSTRUCT THE LIGHT POLE ANCHORAGE IS INCIDENTAL TO THE CONCRETE BARRIER AND DECK CONCRETE PAY ITEMS, RESPECTIVELY.
- ANCHOR BOLT CLUSTER IS INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM"
- EXTEND THE 1/2" DIA. PVC COATED RIGID STEEL CONDUIT 3" ABOVE THE BARRIER AND INSTALL CAP.
  - SEE CONCRETE BARRIER SHEETS FOR TYPICAL BARRIER REINFORCEMENT. WEIGHT OF REINFORCEMENT IS INCLUDED IN PRICE BID FOR "REINFORCEMENT BARS (EPOXY COATED)".
  - BAR SHOWN ARE FOR ONE LIGHT BLISTER.
  - WRAP PER SPEC. 2565.3.D.7.
  - PROVIDE COMBINATION DEFLECTION/EXPANSION FITTING PER SPEC. 3839.
  - PLACE GROUND ROD IN EACH HANDHOLE WITH EXOTHERMIC WELD FROM ROD TO WIRE.



**BILL OF REINFORCEMENT FOR BARRIER AT ONE LIGHT POLE**

BAR NO.	LENGTH	SHAPE	LOCATION
L501E 3			BARRIER DOWEL
L502E 3			BARRIER VERTICAL
L503E 1	9'-2"		LONGITUDINAL TIE
L504E 1	9'-8"		LONGITUDINAL TIE
L505E 3	10'-2"		LONGITUDINAL TIE
L506E 4	5'-2"		VERTICAL TIE
L507E 4	6'-8"		VERTICAL DOWEL
L508E 2	4'-4"		VERTICAL TIE

TOTAL REINFORCEMENT PER LIGHT POLE LOCATION IS 150 LBS.



REVISION:

APPROVED: AUGUST 24, 2016

*Kevin Westlund*  
STATE BRIDGE ENGINEER

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO.	DATE	BY	CHK	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.

*Carl Osberg*  
LICENSED PROFESSIONAL ENGINEER: CARL OSBERG, PE  
DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: CONDUIT SYSTEM SIGNALS

DES: JLB DR: SWH  
CHK: CBO CHK: CBO

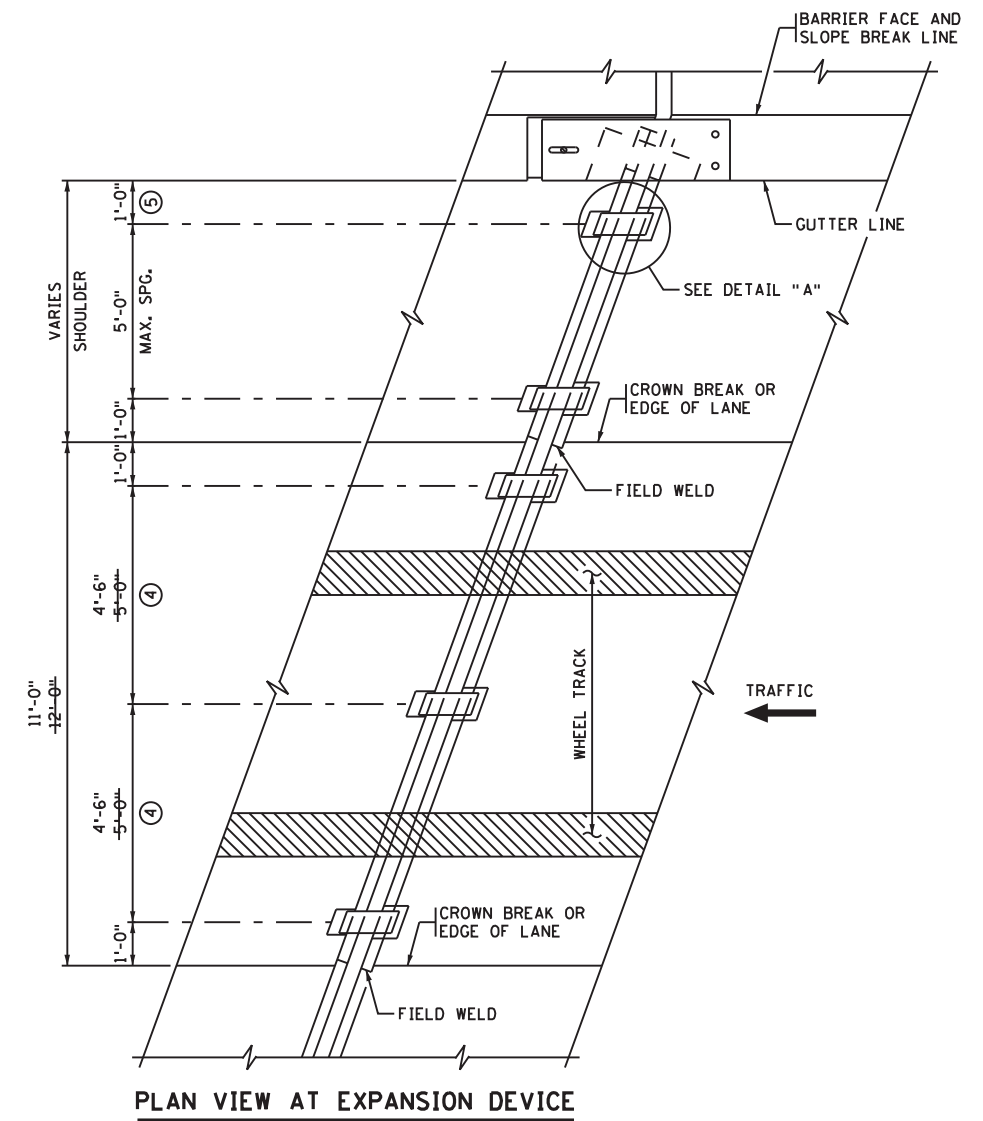
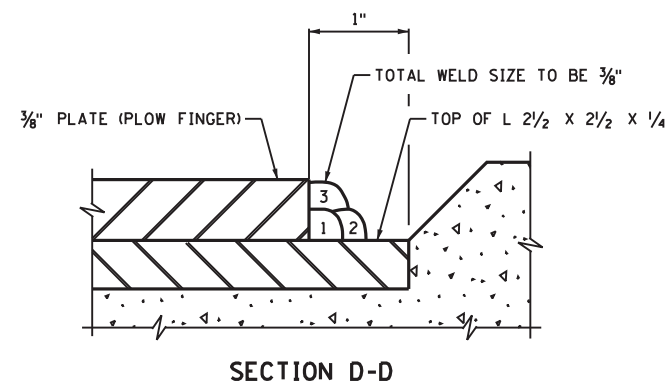
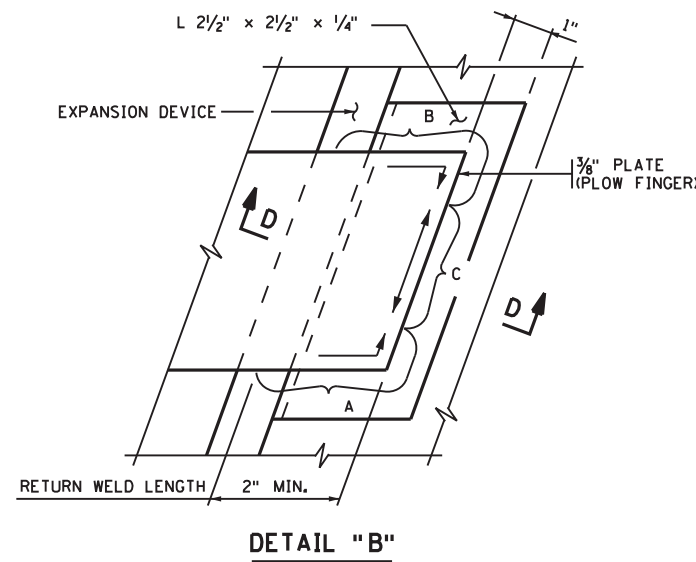
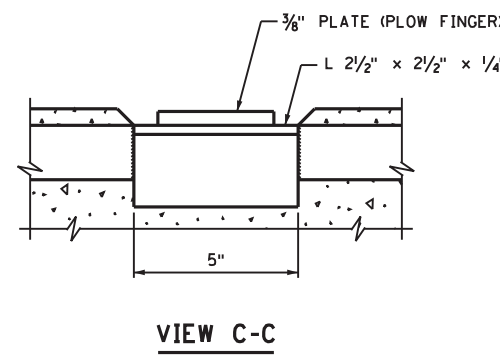
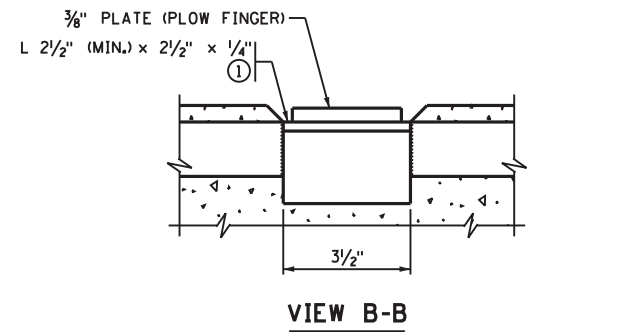
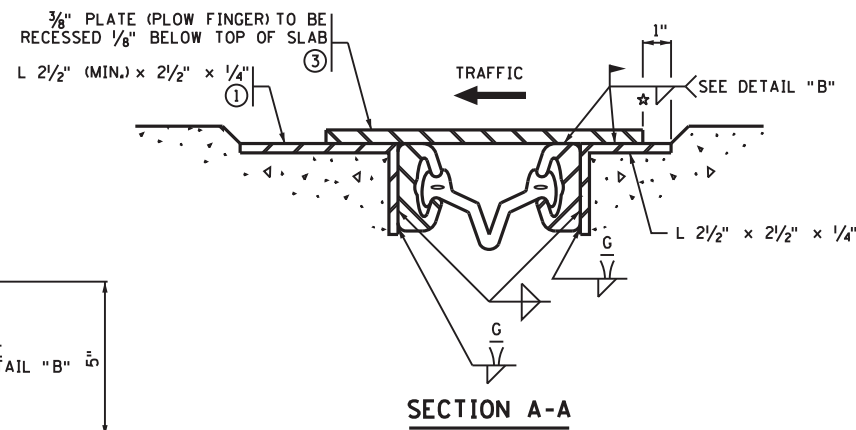
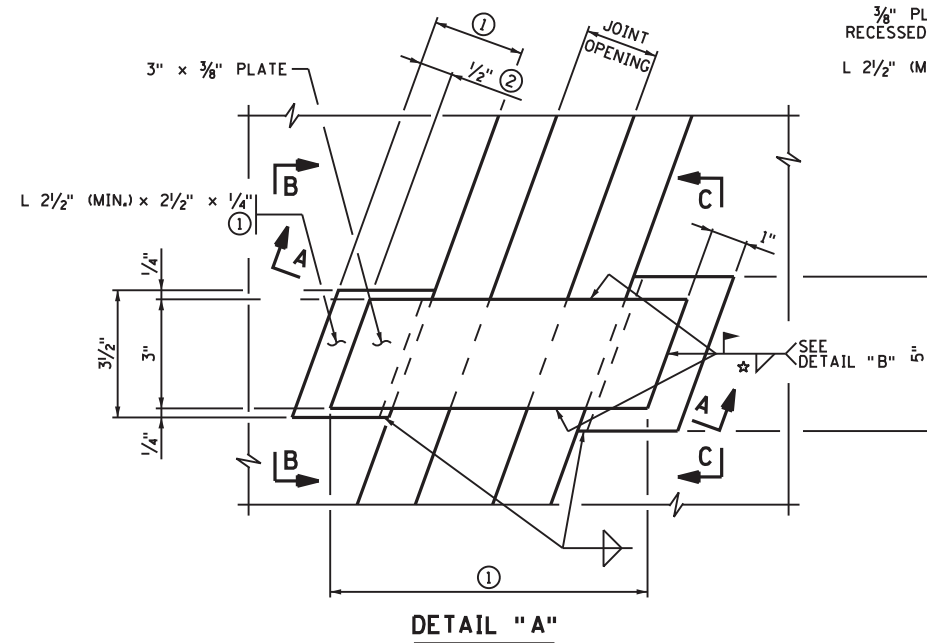
Bridge No. 02546

Sheet B33 of B52 Sheets

36" TYPE S CONCRETE BARRIER BLISTER, WITH OR WITHOUT WEARING COURSE

FIG. 5-397.406(B)

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☆ WELDING PROCEDURE FOR PLOW FINGERS

- I. ALL WELDING SHALL BE DONE WITH 1/8" DIAMETER LOW HYDROGEN SMAW ELECTRODES TYPE E7016 OR E7018.
- II. PRIOR TO WELDING, REMOVE THE GALVANIZED COATING IN THE WELD AREA BY GRINDING.
- III. WELD PASS ONE IN AREAS A AND B FIRST, THEN AREA C, FOLLOW WITH PASSES TWO AND THREE IN SAME ORDER, AS SHOWN IN DETAIL "B".
- IV. REMOVE ALL WELD SLAG AND OTHER RESIDUE BETWEEN PASSES.
- V. ALLOW AT LEAST 5 MINUTES COOLING TIME BETWEEN EACH OF THE NINE WELDING PASSES.

GENERAL NOTES

- DO NOT GALVANIZE PLOW FINGERS.
- ① VARIES WITH SKEW AND EXPANSION OPENING.
  - ② MINIMUM IN CLOSED POSITION.
  - ③ EVERY SNOW PLOW FINGER SHALL HAVE FULL AND DIRECT BEARING ON THE PLATE THAT IS LOCATED UNDER THE MOVEMENT SIDE OF THE FINGER. NO CLICKING NOISE WILL BE ALLOWED.
  - ④ MODIFY IF LANE WIDTH DIFFERS FROM 12 FT.
  - ⑤ OMIT LAST PLOW FINGER ON DEVICE WITH CURVED END.

MODIFIED:  
PROTECTION PLATE SPACING  
MODIFIED FOR 11'-0" LANES.

REVISION: 11-06-2013

APPROVED: SEPTEMBER 26, 2003

*Samuel S. Johnson*  
STATE BRIDGE ENGINEER

S.P. 0206-78 (TH 47)

S.A.P. 002-716-020

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **WATERPROOF EXPANSION DEVICE SNOW PLOW PROTECTION**

DES: JLB DR: SWH  
CHK: CBO CHK: CBO

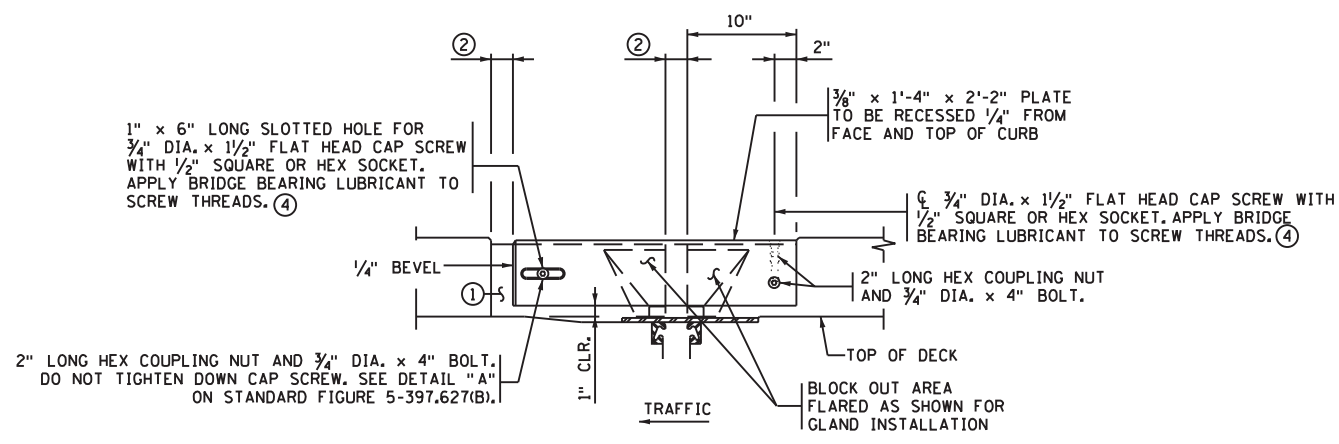
Sheet B34 of B52 Sheets

Bridge No. 02546

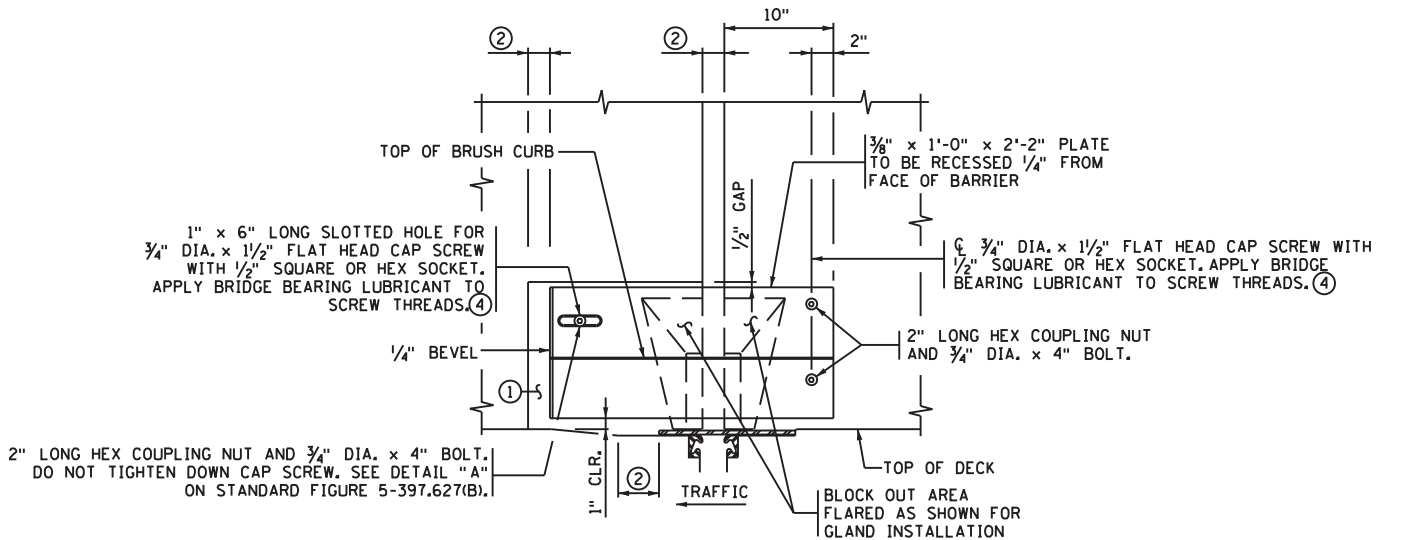
(USE ON SKEWS OVER 15° AND LESS THAN 50°)

FIG. 5-397.628 MOD.

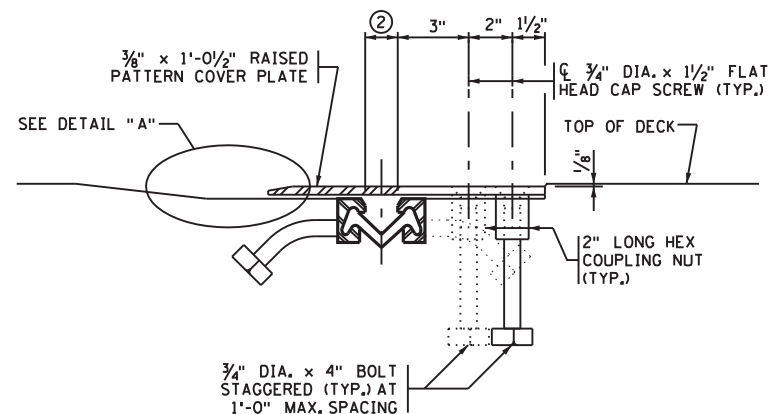




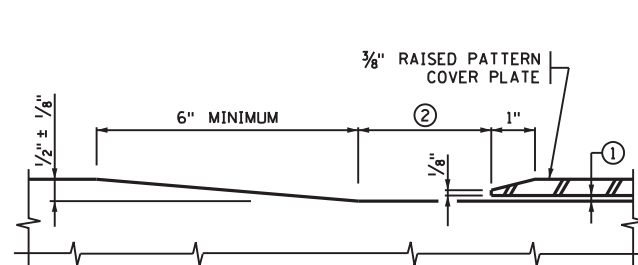
**INSIDE ELEVATION OF CONCRETE CURB**



**OUTSIDE ELEVATION OF S BARRIER  
(BACK OF TYPE S BARRIER)**



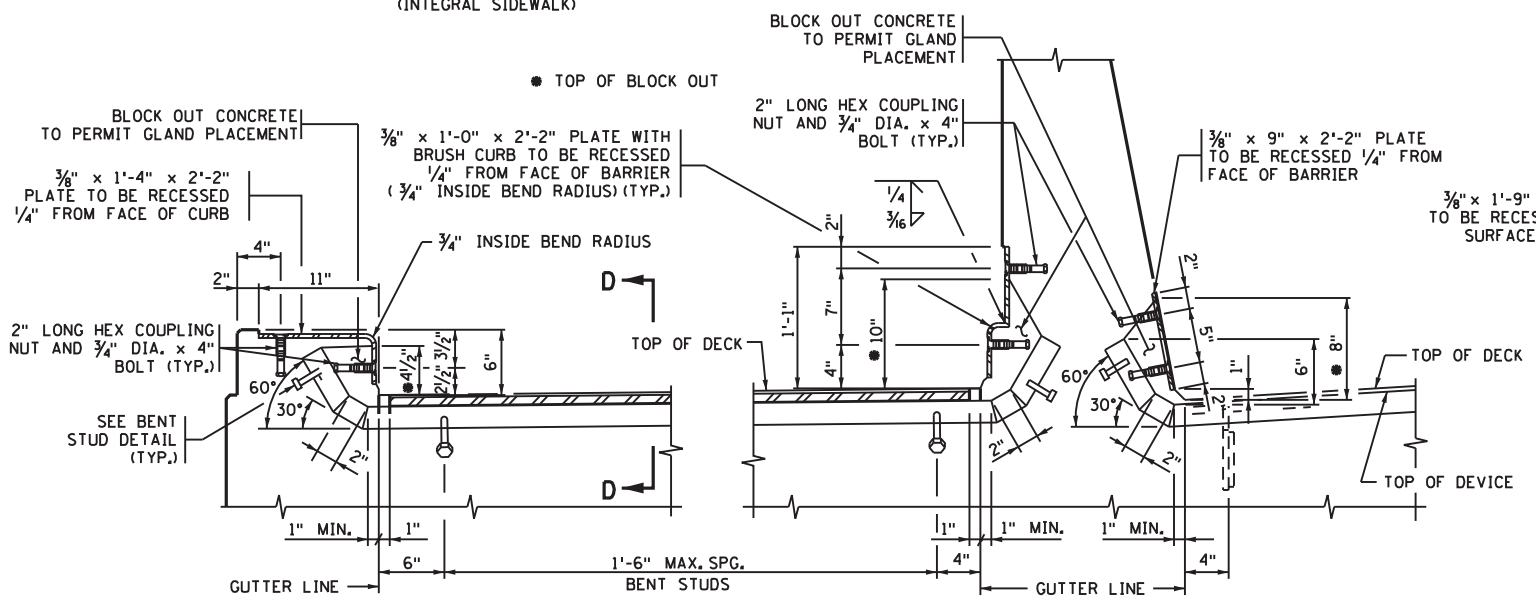
**SECTION D-D (INTEGRAL SIDEWALK)**



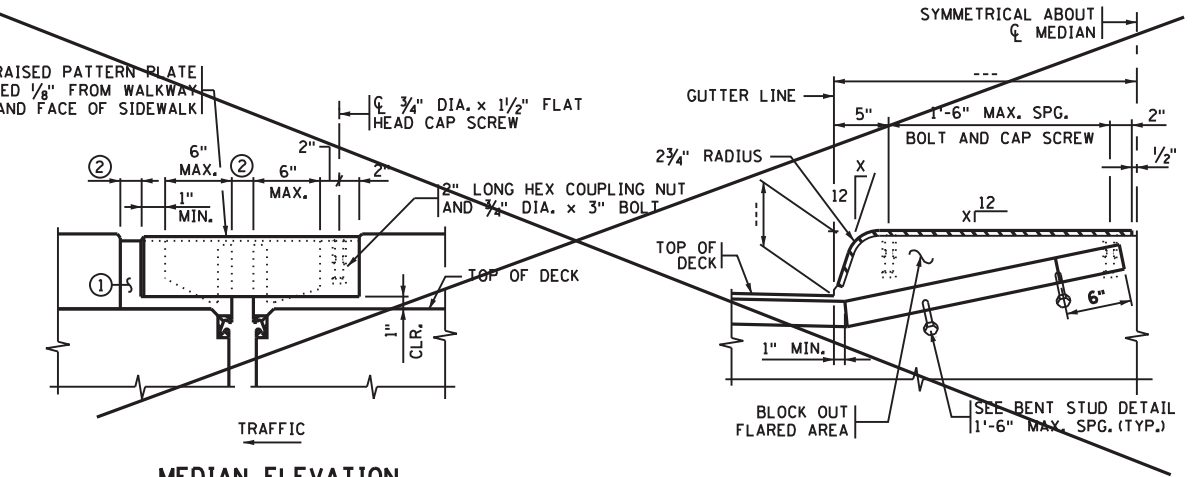
**DETAIL "A"**

**GENERAL NOTES**

- SEE OTHER WATERPROOF EXPANSION DEVICE SHEET FOR ADDITIONAL DETAILS AND NOTES.
- TRANSVERSE DECK REINFORCEMENT MAY BE SHIFTED THE MINIMUM DISTANCE REQUIRED FOR EXPANSION DEVICE PLACEMENT.
- 3/4" DIA. X 1/2" FLAT HEAD CAP SCREW WITH 1/2" SQUARE OR HEX SOCKET PER SPEC 3391. COUNTERSINK CAP SCREWS 1/16" FROM TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT TO SCREW THREADS.
- ① PROVIDE SMOOTH CONCRETE FINISH BENEATH PLATE WITH 0" MIN. TO 1/8" MAX. GAP BETWEEN CONCRETE AND UNDERSIDE OF PLATE. PROVIDE BOND BREAKER (DUCT TAPE, ETC.) TO UNDERSIDE OF COVER PLATE.
- ② SEE NOTE ② ON OTHER WATERPROOF EXPANSION DEVICE SHEET.
- ③ DIMENSIONS SHOWN ARE REQUIRED TO COMPLY WITH A.D.A. STANDARDS.
- ④ LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE GREASE.



**SECTION THROUGH BARRIER AND CURB - INTEGRAL SIDEWALK**



**MEDIAN ELEVATION**

**MEDIAN SECTION**

REVISION: OCTOBER 22, 2019

APPROVED: AUGUST 24, 2016

*Kevin Westlund*  
STATE BRIDGE ENGINEER

S.P. 0206-78 (TH 47)

S.A.P. 002-716-020

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*Carl Osberg*  
LICENSED PROFESSIONAL ENGINEER: CARL OSBERG, PE  
DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE:  
**WATERPROOF EXPANSION DEVICE**

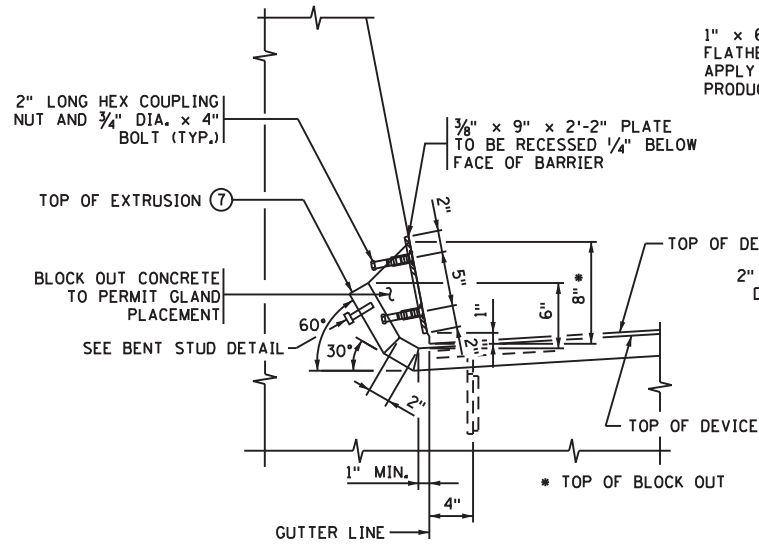
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CHK: CBO CHK: CBO

Sheet B35 of B52 Sheets

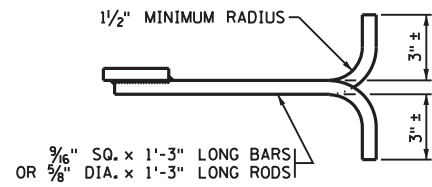
Bridge No.  
02546

FIG. 5-397.632(B)

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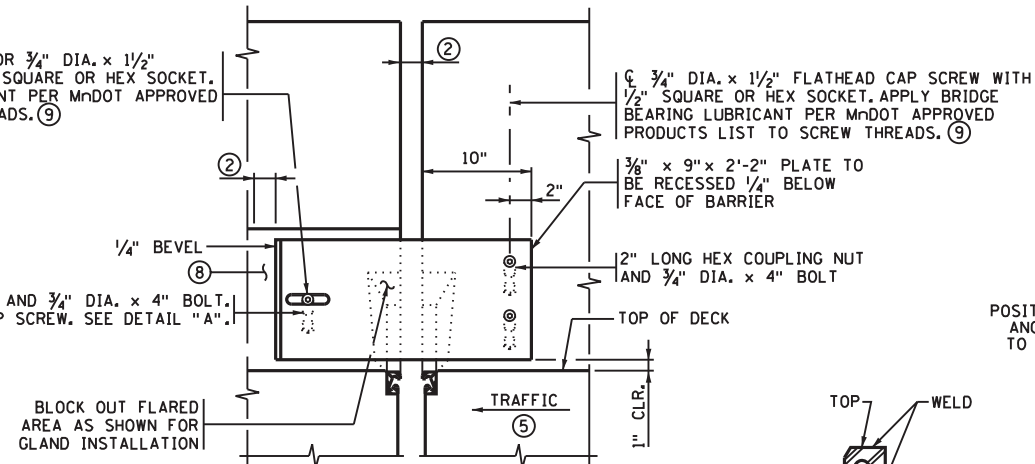


**SECTION THROUGH BARRIER**  
TYPE S BARRIER

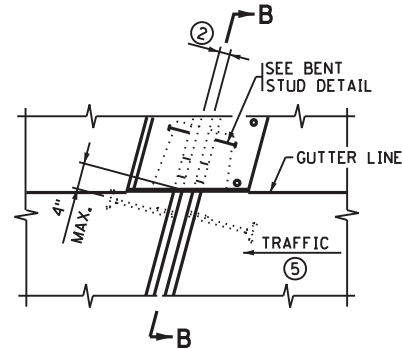


**BAR-ROD DETAIL**

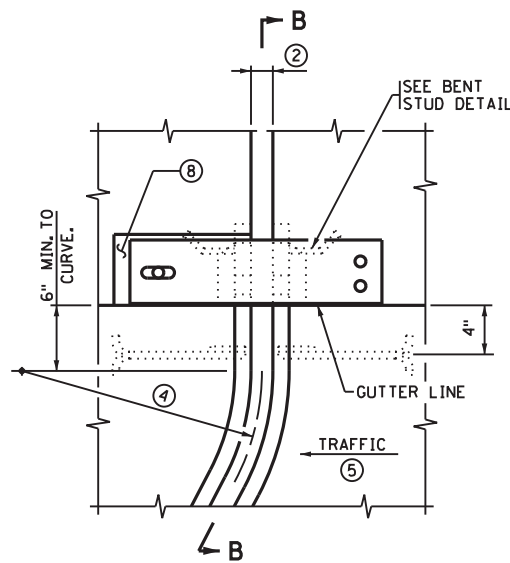
1" x 6" LONG SLOTTED HOLE FOR 3/4" DIA. x 1/2" FLATHEAD CAP SCREW WITH 1/2" SQUARE OR HEX SOCKET. APPLY BRIDGE BEARING LUBRICANT PER MnDOT APPROVED PRODUCTS LIST TO SCREW THREADS. (9)



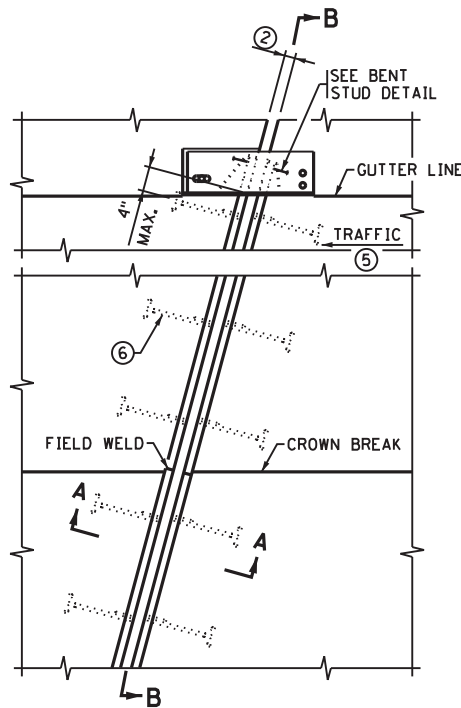
**BARRIER ELEVATION**



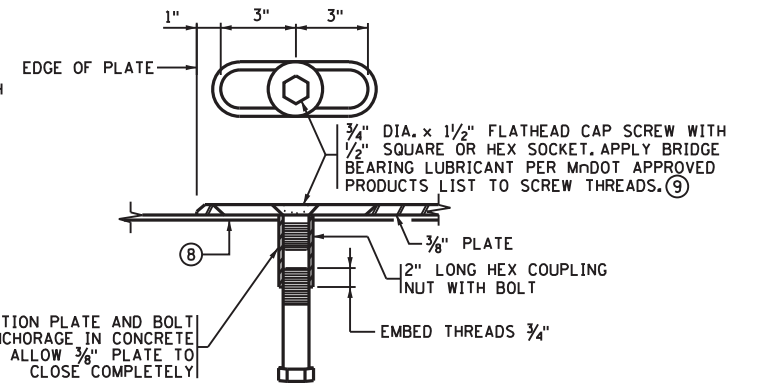
**PLAN VIEW @ EXPANSION DEVICE**  
MEDIAN OR SIDEWALK ALTERNATE



**PLAN VIEW @ EXPANSION DEVICE**  
WITH CURVED DEVICE ALTERNATE



**PLAN VIEW @ EXPANSION DEVICE**  
WITH STRAIGHT DEVICE

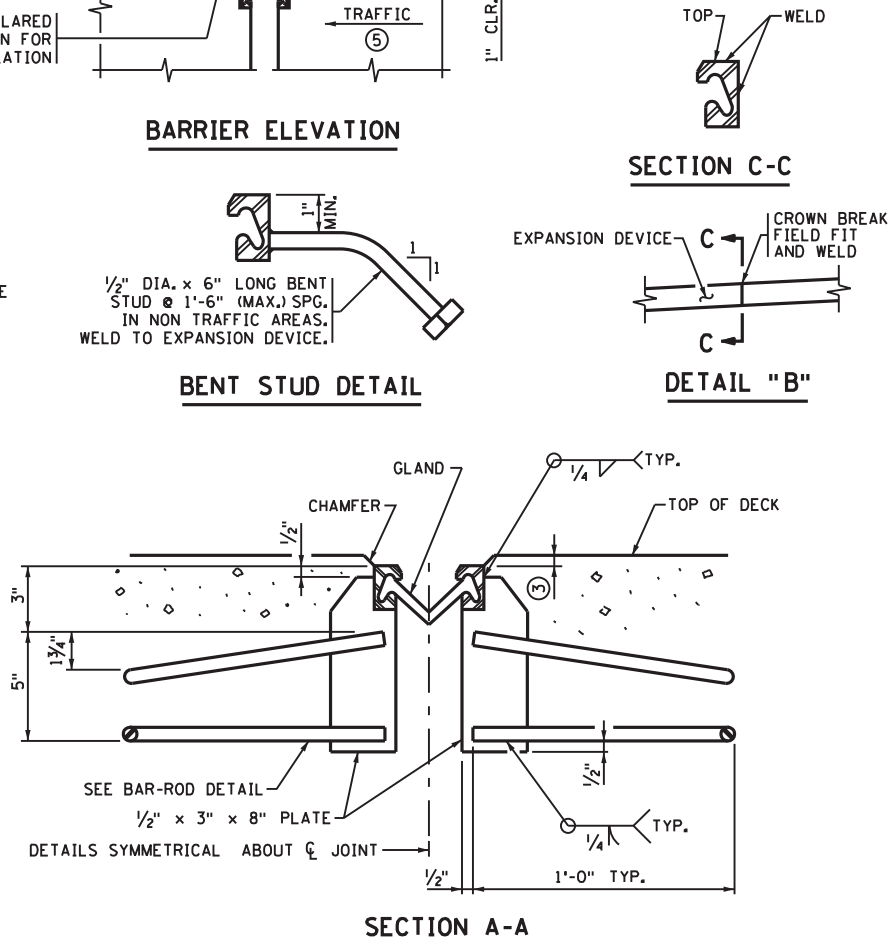


**DETAIL "A"**

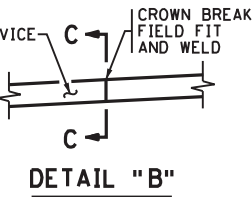
**GENERAL NOTES**

- GALVANIZE STRUCTURAL STEEL AFTER FABRICATION PER SPEC. 3394. GALVANIZE FASTENERS PER SPEC. 3392.
- LOCATE JOINTS IN EXTRUSION AT BREAKS IN TRANSVERSE PROFILE AND AS OTHERWISE REQUIRED, WITH CLOSE FIT, WELDED JOINTS. REPAIR AFTER WELDING PER SPEC. 2471.3.L.
- PROVIDE STRUCTURAL STEEL PER SPEC. 3306 OR SPEC. 3309.
- STRAIGHTEN EXPANSION DEVICE TO A TOLERANCE OF 1/8" IN 10 FT.
- 3/4" DIA. X 1/2" FLATHEAD CAP SCREW WITH 1/2" SQUARE OR HEX SOCKET PER SPEC 3391. COUNTERSINK CAP SCREWS 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT PER MnDOT APPROVED PRODUCTS LIST TO SCREW THREADS. (9)
- PAYMENT LENGTH IS BASED ON THE HORIZONTAL DISTANCE BETWEEN THE OUTSIDE EDGES OF THE DECK MEASURED ALONG THE CENTERLINE OF JOINT.

- (1) DIMENSIONS ARE ALONG CENTERLINE OF JOINT.
- (2) 2 1/2" AT 45° F; 3" AT 90° F.
- (3) 1/2" (5/8" MAX.) WHEN SNOWPLOW FINGERS ARE USED. SNOWPLOW FINGERS ARE REQUIRED FOR SKEWS OVER 15° AND LESS THAN 50°.
- (4) VARIES 18" TO 24"
- (5) SEE SHEET NO. B1 FOR DIRECTION OF TRAFFIC.
- (6) PLACE BAR-ROD NORMAL TO JOINT ON NEW BRIDGES AND JOINT REPLACEMENTS. ON JOINT REPLACEMENTS WHEN SKEW IS OVER 15° AND LESS THAN 50° BEND RODS PARALLEL TO CL ROADWAY.
- (7) EXTEND GLAND 1" MIN. BEYOND THE TOP OF THE EXTRUSION.
- (8) PROVIDE SMOOTH CONCRETE FINISH BENEATH PLATE WITH 0" MIN. TO 1/8" MAX. GAP BETWEEN CONCRETE AND UNDERSIDE OF PLATE. PROVIDE BOND BREAKER (DUCT TAPE, ETC.) TO UNDERSIDE OF COVER PLATE.
- (9) LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE GREASE.

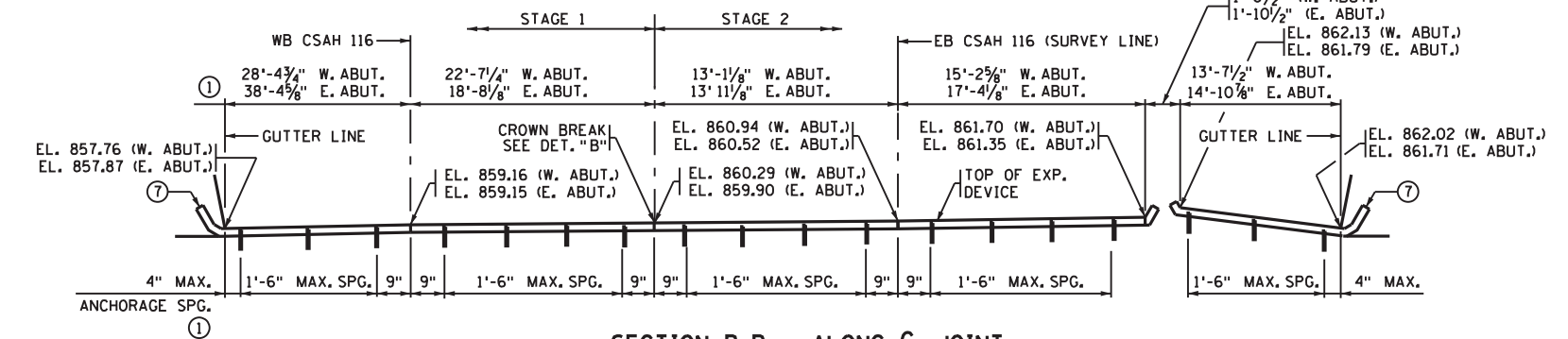


**SECTION C-C**



**DETAIL "B"**

**SECTION A-A**



**SECTION B-B ~ ALONG CL JOINT**

ELEVATIONS SHOWN ARE 1/8" BELOW TOP OF SLAB @ CL JOINT  
ELEVATIONS SHOWN ARE 1/2" BELOW TOP OF WEARING COURSE OR SIDEWALK @ CL JOINT

REVISION: FEBRUARY 22, 2018  
APPROVED: AUGUST 24, 2016  
*Kevin Westlund*  
STATE BRIDGE ENGINEER

**S.P. 0206-78 (TH 47)**    **S.A.P. 002-716-020**

NO	DATE	BY	CHK	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.  
*Carl Osberg*  
LICENSED PROFESSIONAL ENGINEER: CARL OSBERG, PE  
DATE: 11/10/2020    REG NO: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

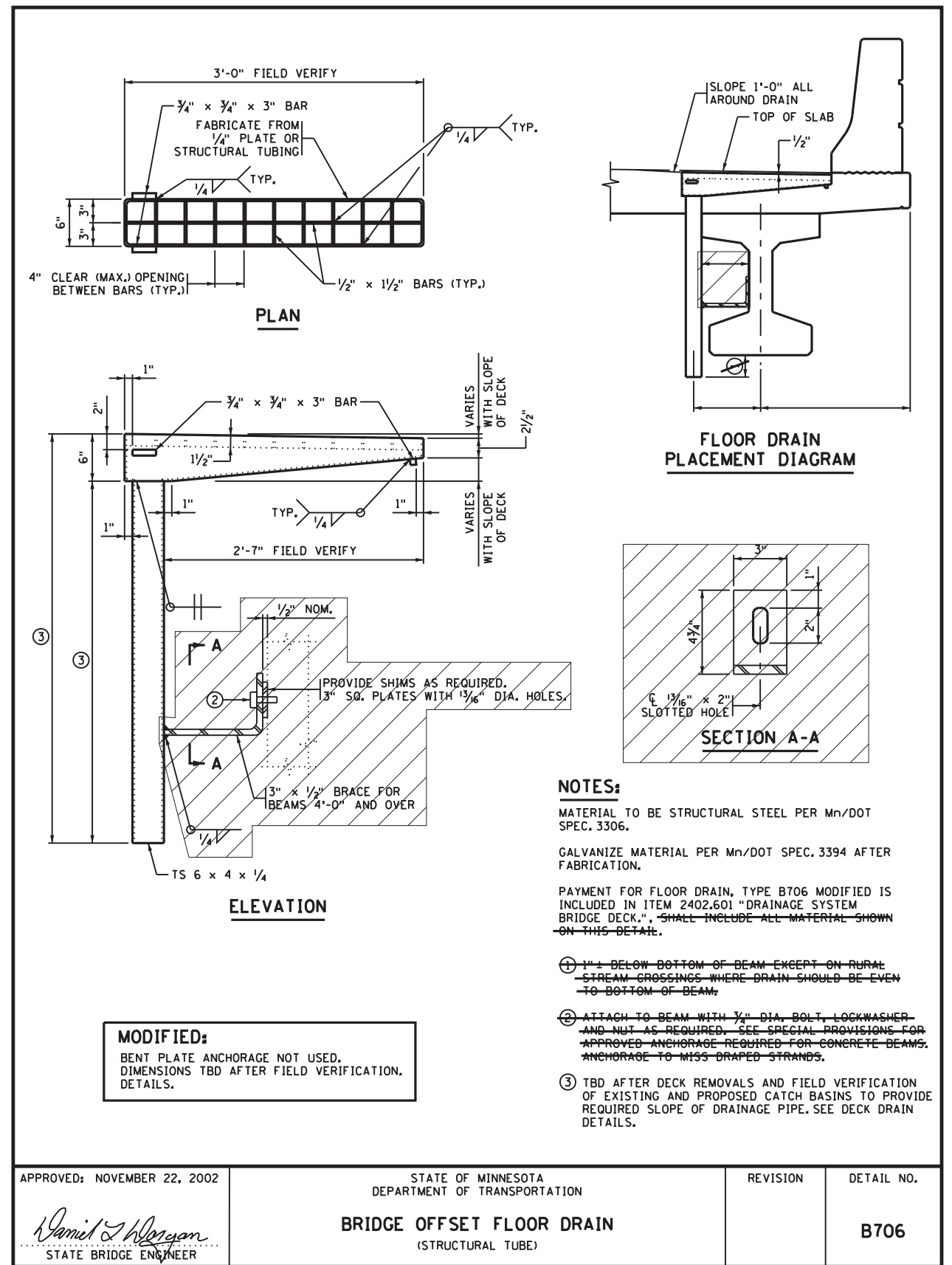
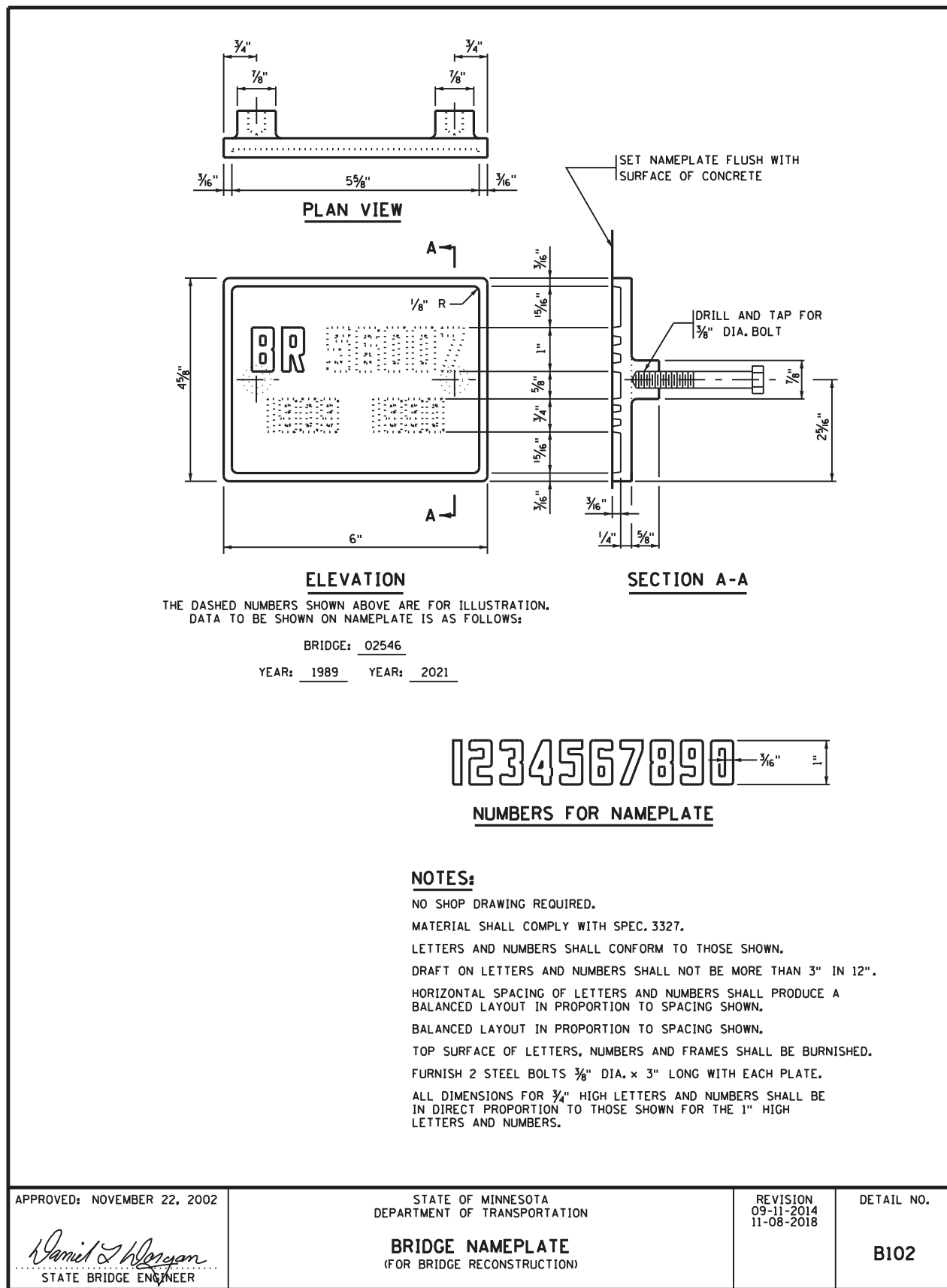
TITLE: **WATERPROOF EXPANSION DEVICE**  
(WITH TYPE S BARRIER)

DES: JLB    DR: SWH  
CHK: CBO    CHK: CBO

Sheet B36 of B52 Sheets

Bridge No. 02546

FIG. 5-397.627(B)



S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	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.

*Carl S. Berg*  
LICENSED PROFESSIONAL ENGINEER: CARL S. BERG, PE  
DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

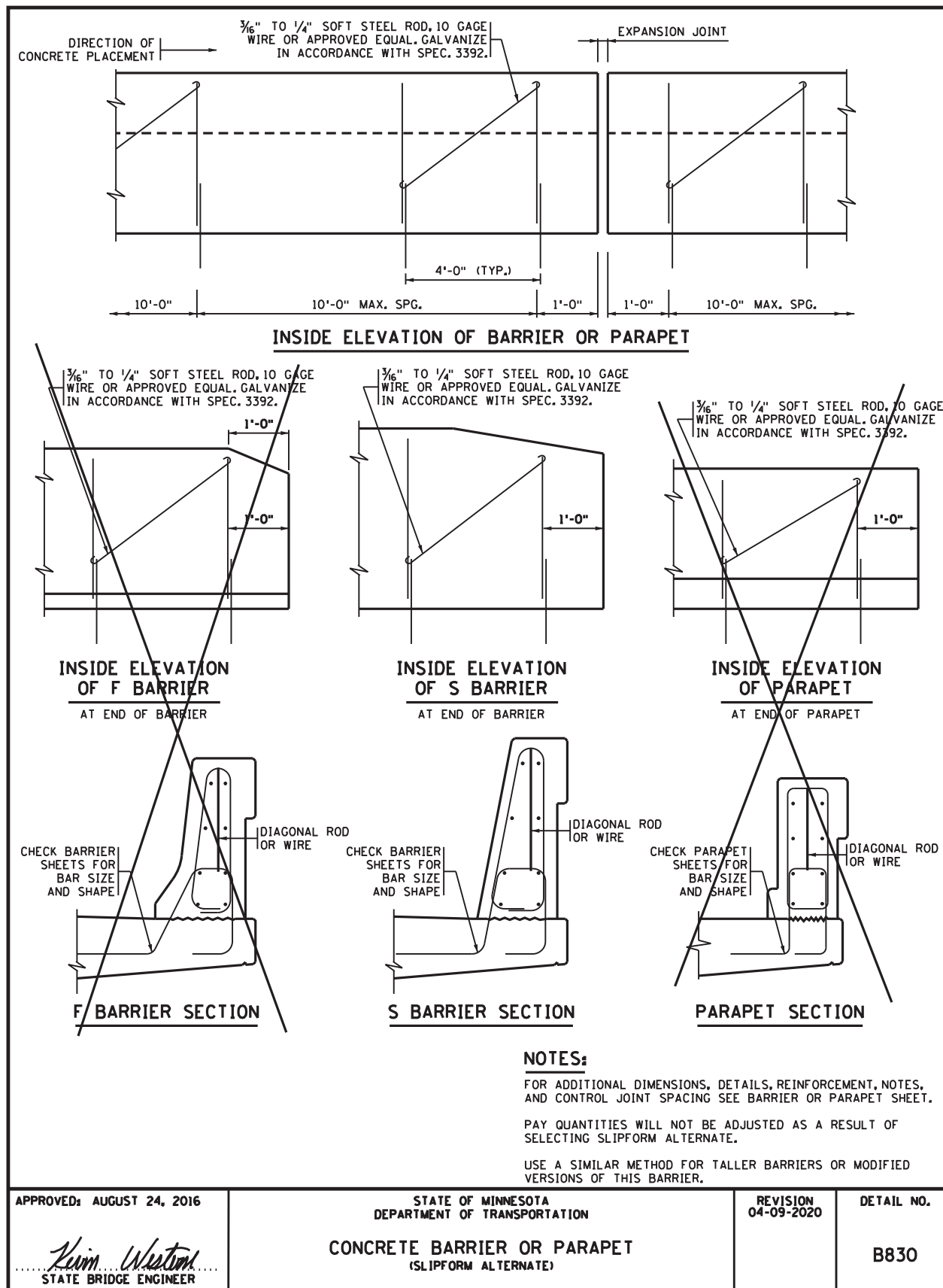
TITLE:

BRIDGE DETAILS - 1

DES: JLB DR: SWH  
CHK: CBO CHK: CBO

Sheet B37 of B52 Sheets

Bridge No.  
02546



11/10/2020 1:58:14 PM c:\users\shill\appdata\local\benhiley\project\wise\workingdir\wsbeng-pw-bentley.com\dms04755\CBR02546-det01.dgn

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*

LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732

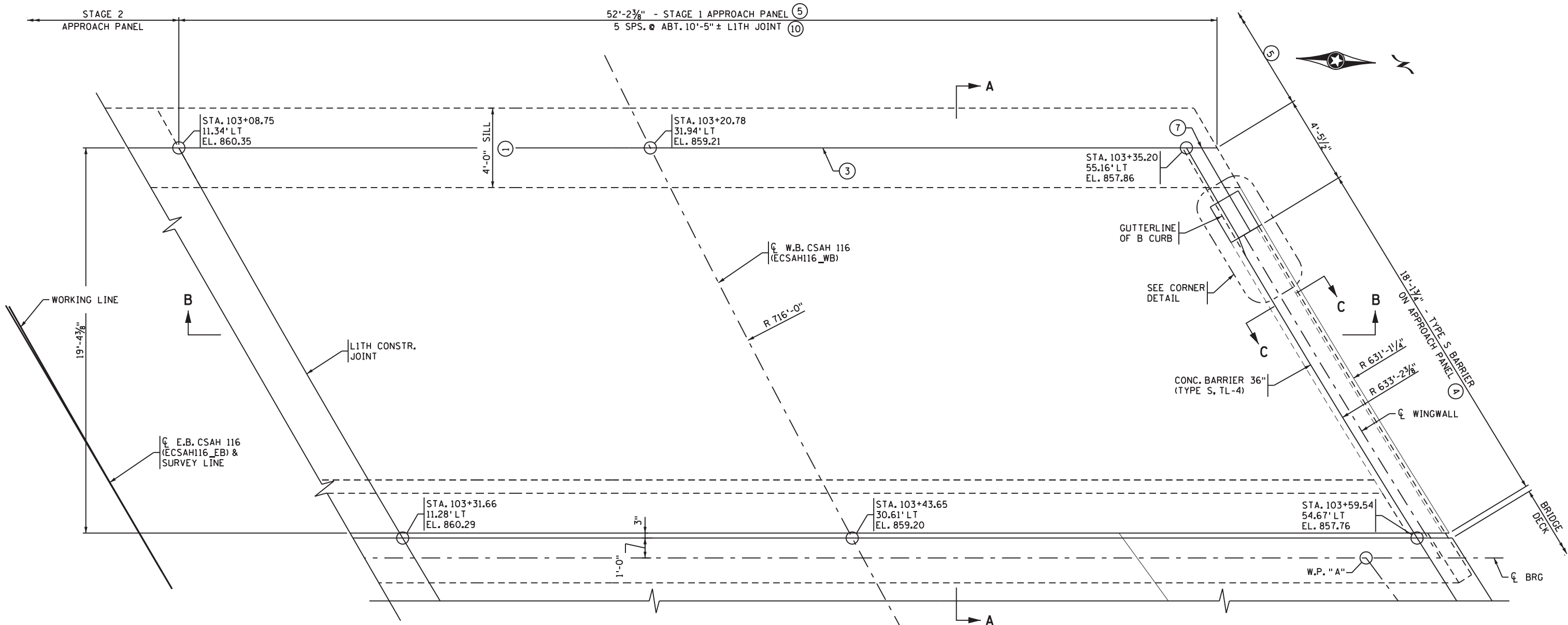


CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: BRIDGE DETAILS - 2

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO
Sheet B38 of B52 Sheets	

Bridge No. 02546



**NOTES:**

- ① SEE APPROACH PANEL DRAINAGE DETAILS FOR DRAINAGE DETAILS AT SILL.
- ② SEE STANDARD PLATES FOR ADDITIONAL INFORMATION ON INTEGRAL 6" CURB.
- ③ E8 EXPANSION JOINT. SEE APPROACH PANEL JOINT DETAILS SHEET FOR ADDITIONAL INFORMATION.
- ④ REFER TO BARRIER SHEETS FOR BARRIER REINFORCEMENT TO BE PLACED IN APPROACH PANEL.
- ⑤ SEE ROADWAY PLANS FOR PAVEMENT AND SHOULDER WIDTHS AND CONFIGURATIONS.
- ⑥ CURB TRANSITIONS FROM VERTICAL FACE AT END OF BARRIER TO 6" B CURB.
- ⑦ E8 JOINT REQUIRED IN CURB ADJACENT TO E8 JOINT. SEE APPR. PANEL JOINT DTLS. SHT. FOR ADD'T'L INFO.
- ⑧ 4" TYPE B LOW DENSITY POLYSTYRENE ON TOP OF WINGWALL.
- ⑨ GEOTEXTILE FILTER FABRIC TYPE 7 WITH 24" LEGS.

**GENERAL NOTES:**

CONTRACTOR TO SURVEY ELEVATIONS (TOP OF DECK AND TOP OF APPROACH PANEL) AND SUBMIT ELEVATIONS TO THE ENGINEER. CONTRACTOR TO MATCH ROADWAY SURFACE ELEVATIONS WITH NEW CONSTRUCTION.

FOR LITH, C2H AND C2H-D JOINT DETAILS SEE APPROACH PANEL JOINT DETAIL SHEET.

ALL JOINTS SHALL BE SAWCUT. SAWCUTS SHALL BE MADE WHILE THE CONCRETE IS STILL GREEN AND WITHOUT RAVELING THE CONCRETE. THE JOINTS SHALL BE SAWN THROUGH BOTH THE WEARING COURSE AND THE UNDERLYING APPROACH SLAB IN A SINGLE OPERATION.

FOR SECTION A-A AND CURB TRANSITION DETAILS, SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS SEE SHEET B48.

FOR SECTION B-B SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS SEE SHEET B47.

CONCRETE SILL, CURBING AND ALL MATERIALS REQUIRED TO CONSTRUCT THE SILL ARE INCIDENTAL TO ITEM "BRIDGE APPROACH PANELS".

ENSURE THAT CONCRETE SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT.

**GENERAL NOTES (CONT.):**

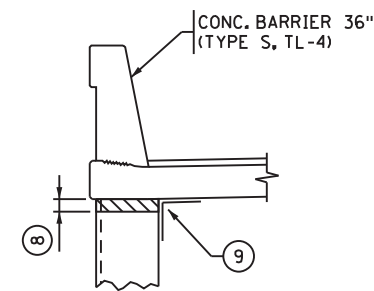
REFER TO STANDARD PLANS 5-297.694 (1 OF 5) AND (4 OF 5) FOR ADDITIONAL CURB TRANSITION DETAILS.

REFER TO SPEC. 2406 FOR ADDITIONAL INFORMATION.

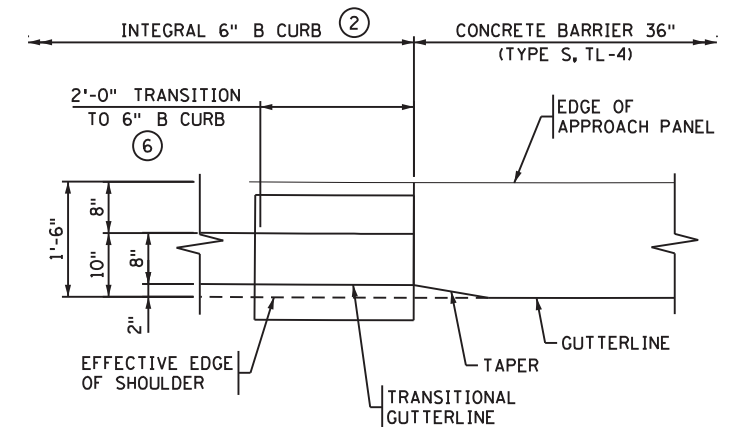
PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. INCIDENTAL TO ITEM "BRIDGE APPROACH PANELS".

⑩ SEE STANDARD PLAN 5-297.229 FOR REINFORCEMENT LAP LENGTH REQUIREMENTS FOR STAGED CONSTRUCTION.

**STAGE 1 WEST APPROACH PANEL LAYOUT**



**SECTION C-C**



**CORNER DETAIL**

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

NO	DATE	BY	CHK	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.

*Carlos Berg*

LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732



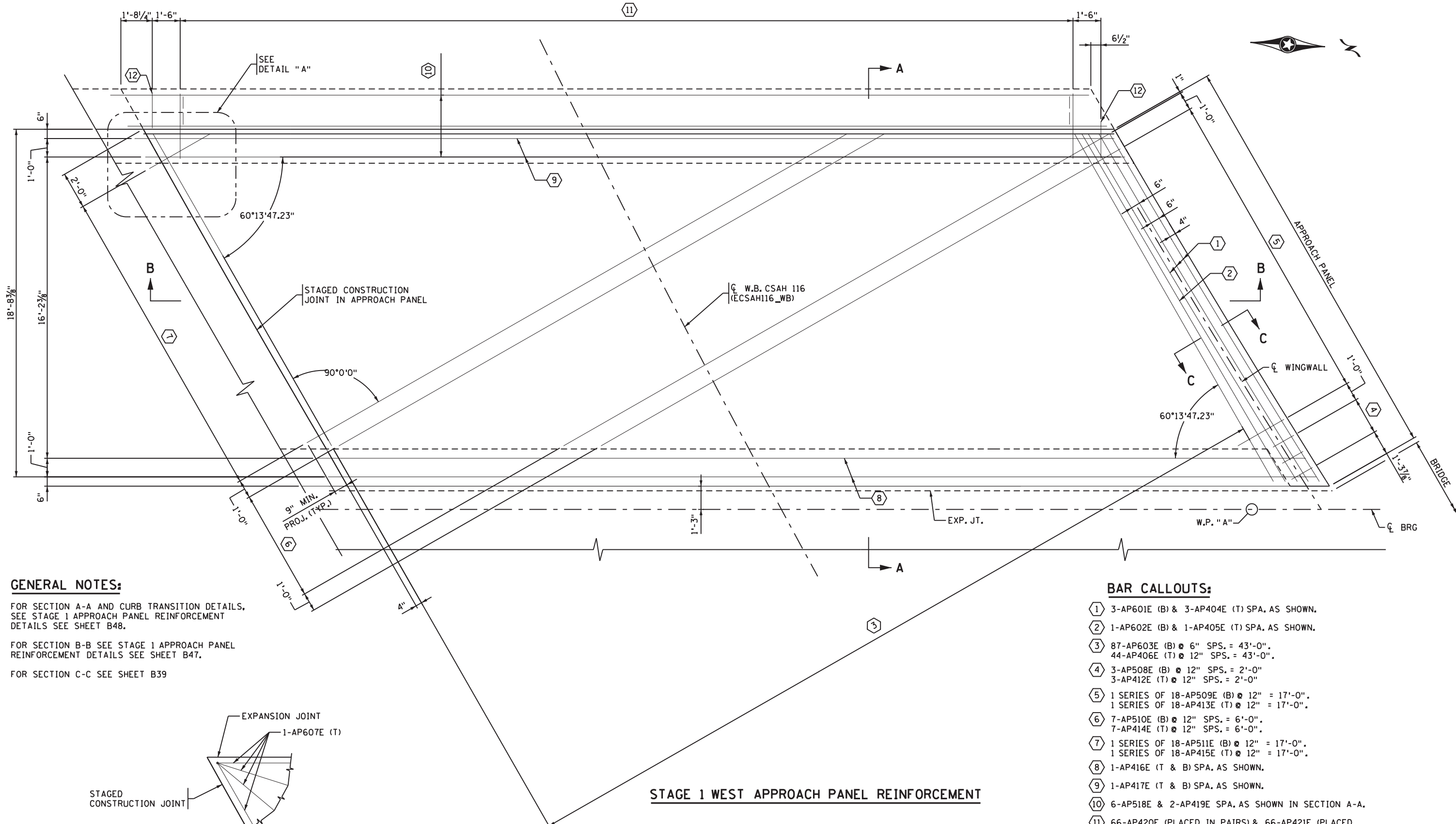
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE:  
**STAGE 1 APPROACH PANEL - WEST**

DES: JLB DR: SWH  
CHK: CBO CHK: CBO

Sheet B39 of B52 Sheets

Bridge No.  
02546

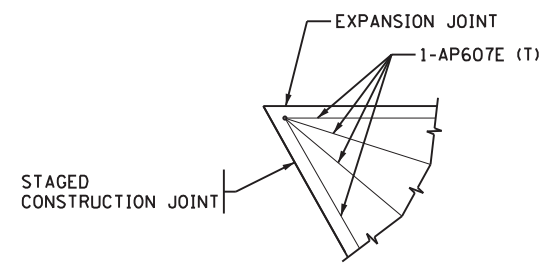


**GENERAL NOTES:**

FOR SECTION A-A AND CURB TRANSITION DETAILS, SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS SEE SHEET B48.

FOR SECTION B-B SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS SEE SHEET B47.

FOR SECTION C-C SEE SHEET B39



**DETAIL "A"**

**BAR CALLOUTS:**

- ① 3-AP601E (B) & 3-AP404E (T) SPA, AS SHOWN.
- ② 1-AP602E (B) & 1-AP405E (T) SPA, AS SHOWN.
- ③ 87-AP603E (B) @ 6" SPS. = 43'-0".  
44-AP406E (T) @ 12" SPS. = 43'-0".
- ④ 3-AP508E (B) @ 12" SPS. = 2'-0"  
3-AP412E (T) @ 12" SPS. = 2'-0"
- ⑤ 1 SERIES OF 18-AP509E (B) @ 12" = 17'-0".  
1 SERIES OF 18-AP413E (T) @ 12" = 17'-0".
- ⑥ 7-AP510E (B) @ 12" SPS. = 6'-0".  
7-AP414E (T) @ 12" SPS. = 6'-0".
- ⑦ 1 SERIES OF 18-AP511E (B) @ 12" = 17'-0".  
1 SERIES OF 18-AP415E (T) @ 12" = 17'-0".
- ⑧ 1-AP416E (T & B) SPA, AS SHOWN.
- ⑨ 1-AP417E (T & B) SPA, AS SHOWN.
- ⑩ 6-AP518E & 2-AP419E SPA, AS SHOWN IN SECTION A-A.
- ⑪ 66-AP420E (PLACED IN PAIRS) & 66-AP421E (PLACED IN PAIRS) @ 1'-6" SPA. = 48'-0", SEE SECTION A-A FOR ADDITIONAL PLACEMENT INFO.
- ⑫ 2-AP422E (PLACE IN PAIRS) AS SHOWN.

**STAGE 1 WEST APPROACH PANEL REINFORCEMENT**

<b>S.P. 0206-78 (TH 47)</b>		<b>S.A.P. 002-716-020</b>	
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NO	DATE	BY	CHK	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.

*Carlos Berg*

LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

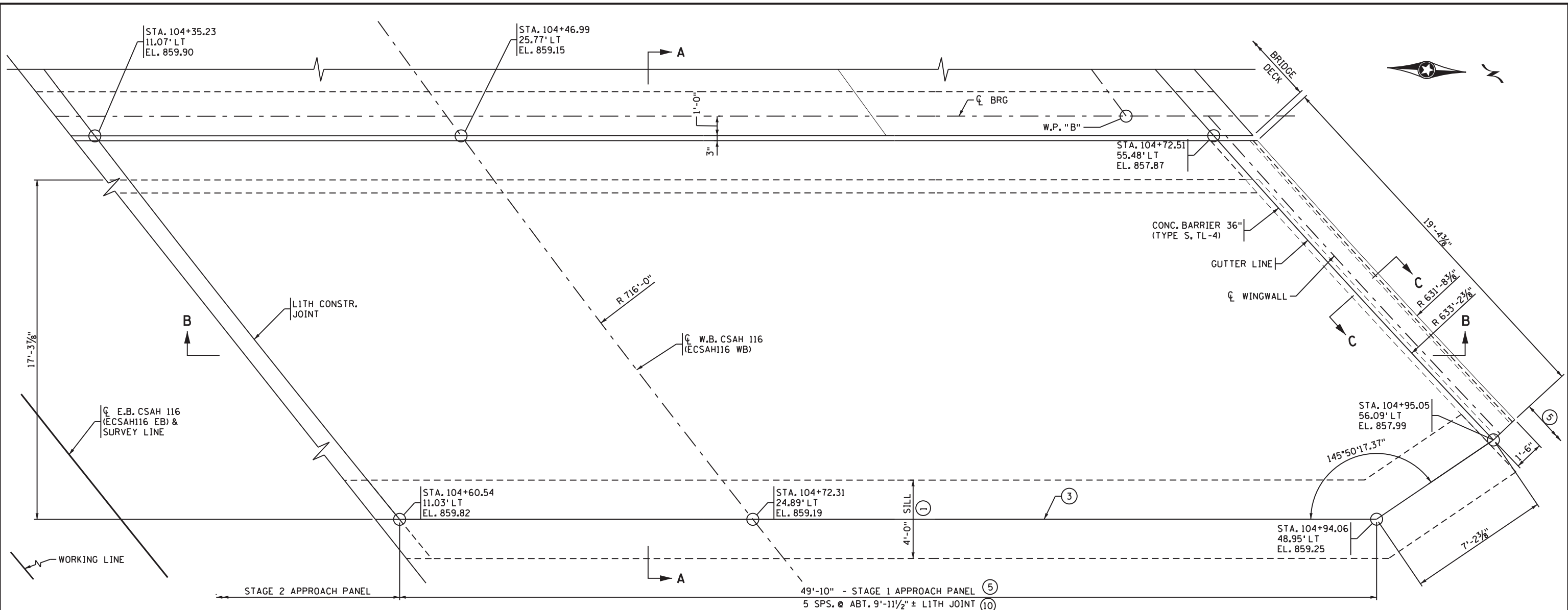
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DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

Sheet B40 of B52 Sheets

Bridge No. **02546**

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**STAGE 1 EAST APPROACH PANEL LAYOUT**

**NOTES:**

- ① SEE APPROACH PANEL DRAINAGE DETAILS FOR DRAINAGE DETAILS AT SILL.
- ② SEE STANDARD PLATES FOR ADDITIONAL INFORMATION ON INTEGRAL 6" CURB.
- ③ E8 EXPANSION JOINT. SEE APPROACH PANEL JOINT DETAILS SHEET FOR ADDITIONAL INFORMATION.
- ④ REFER TO BARRIER SHEETS FOR BARRIER REINFORCEMENT TO BE PLACED IN APPROACH PANEL.
- ⑤ SEE ROADWAY PLANS FOR PAVEMENT AND SHOULDER WIDTHS AND CONFIGURATIONS.
- ⑥ CURB TRANSITIONS FROM VERTICAL FACE AT END OF BARRIER TO 6" B CURB.
- ⑦ E8 JOINT REQUIRED IN CURB ADJACENT TO E8 JOINT. SEE APPR. PANEL JOINT DTLS. SHT. FOR ADD'L INFO.
- ⑧ 4" TYPE B LOW DENSITY POLYSTYRENE ON TOP OF WINGWALL.
- ⑨ GEOTEXTILE FILTER FABRIC TYPE 7 WITH 24"

**GENERAL NOTES:**

CONTRACTOR TO SURVEY ELEVATIONS (TOP OF DECK AND TOP OF APPROACH PANEL) AND SUBMIT ELEVATIONS TO THE ENGINEER. CONTRACTOR TO MATCH ROADWAY SURFACE ELEVATIONS WITH NEW CONSTRUCTION.

FOR LITH, C2H AND C2H-D JOINT DETAILS SEE APPROACH PANEL JOINT DETAIL SHEET.

ALL JOINTS SHALL BE SAWCUT. SAWCUTS SHALL BE MADE WHILE THE CONCRETE IS STILL GREEN AND WITHOUT RAVELING THE CONCRETE. THE JOINTS SHALL BE SAWN THROUGH BOTH THE WEARING COURSE AND THE UNDERLYING APPROACH SLAB IN A SINGLE OPERATION.

FOR SECTION A-A AND CURB TRANSITION DETAILS, SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS SEE SHEET B48.

FOR SECTION B-B SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS SEE SHEET B47.

CONCRETE SILL, CURBING AND ALL MATERIALS REQUIRED TO CONSTRUCT THE SILL ARE INCIDENTAL TO ITEM "BRIDGE APPROACH PANELS".

ENSURE THAT CONCRETE SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT.

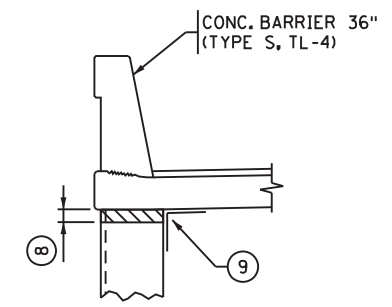
**GENERAL NOTES (CONT.):**

REFER TO STANDARD PLANS 5-297.694 (1 OF 5) AND (4 OF 5) FOR ADDITIONAL CURB TRANSITION DETAILS.

REFER TO SPEC. 2406 FOR ADDITIONAL INFORMATION.

PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. INCIDENTAL TO ITEM "BRIDGE APPROACH PANELS".

⑩ SEE STANDARD PLAN 5-297.229 FOR REINFORCEMENT LAP LENGTH REQUIREMENTS FOR STAGED CONSTRUCTION.



**SECTION C-C**

**S.P. 0206-78 (TH 47)      S.A.P. 002-716-020**

NO	DATE	BY	CHK	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.

*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020      REG NO: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **STAGE 1 APPROACH PANEL - EAST**

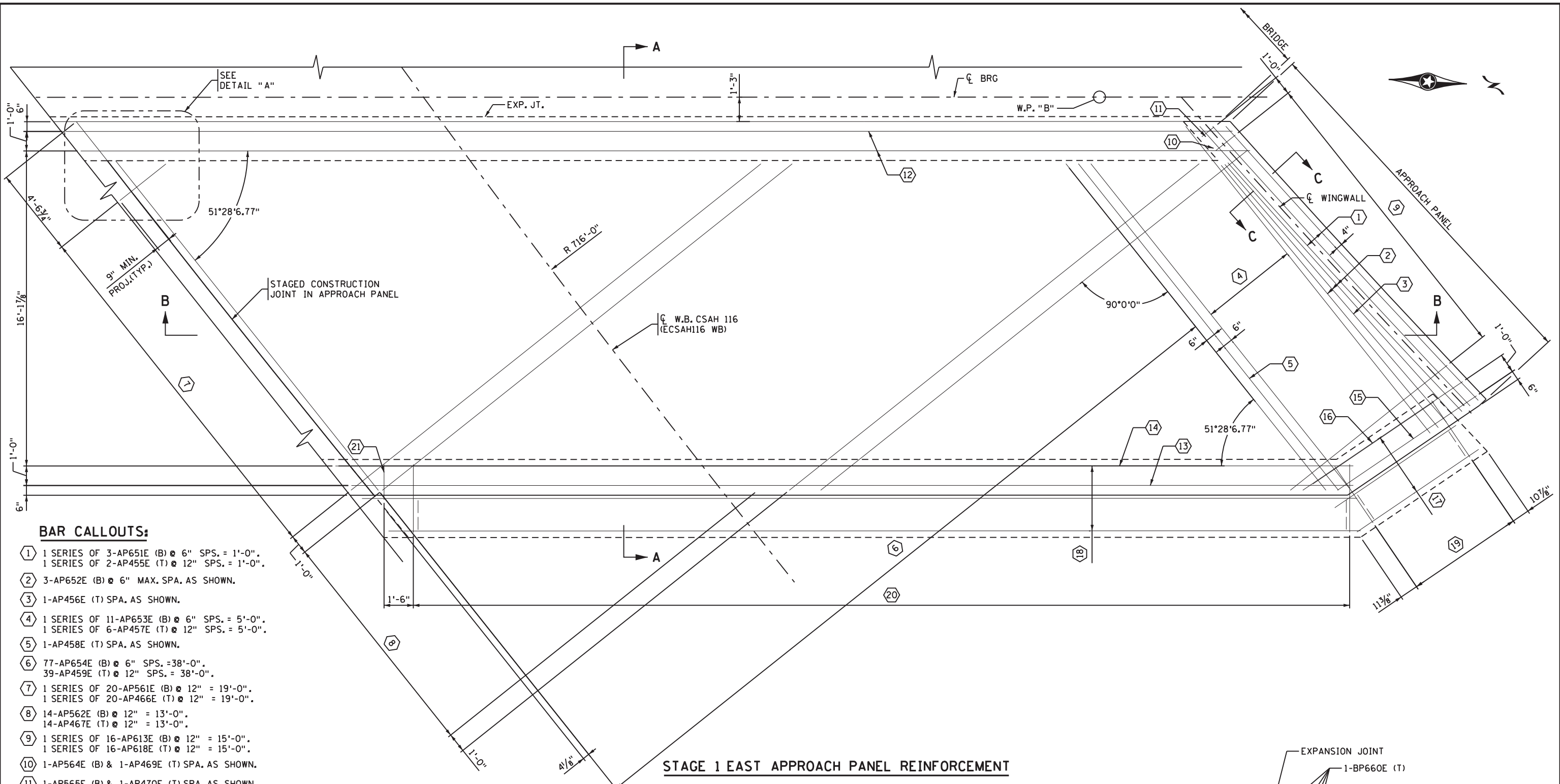
DES: JLB      DR: SWH  
 CHK: CBO      CHK: CBO

Sheet B41 of B52 Sheets

Bridge No. **02546**

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**BAR CALLOUTS:**

- ① 1 SERIES OF 3-AP651E (B) @ 6" SPS. = 1'-0",  
1 SERIES OF 2-AP455E (T) @ 12" SPS. = 1'-0".
- ② 3-AP652E (B) @ 6" MAX. SPA. AS SHOWN.
- ③ 1-AP456E (T) SPA. AS SHOWN.
- ④ 1 SERIES OF 11-AP653E (B) @ 6" SPS. = 5'-0",  
1 SERIES OF 6-AP457E (T) @ 12" SPS. = 5'-0".
- ⑤ 1-AP458E (T) SPA. AS SHOWN.
- ⑥ 77-AP654E (B) @ 6" SPS. = 38'-0",  
39-AP459E (T) @ 12" SPS. = 38'-0".
- ⑦ 1 SERIES OF 20-AP561E (B) @ 12" = 19'-0",  
1 SERIES OF 20-AP466E (T) @ 12" = 19'-0".
- ⑧ 14-AP562E (B) @ 12" = 13'-0",  
14-AP467E (T) @ 12" = 13'-0".
- ⑨ 1 SERIES OF 16-AP613E (B) @ 12" = 15'-0",  
1 SERIES OF 16-AP618E (T) @ 12" = 15'-0".
- ⑩ 1-AP564E (B) & 1-AP469E (T) SPA. AS SHOWN.
- ⑪ 1-AP565E (B) & 1-AP470E (T) SPA. AS SHOWN.
- ⑫ 1-AP471E (T & B) SPA. AS SHOWN.
- ⑬ 1-AP472E (T & B) SPA. AS SHOWN.
- ⑭ 1-AP473E (T & B) SPA. AS SHOWN.
- ⑮ 1-AP474E (T & B) SPA. AS SHOWN.
- ⑯ 1-AP475E (T & B) SPA. AS SHOWN.
- ⑰ 6-AP576E & 2-AP478E SPA. AS SHOWN IN SECTION A-A.
- ⑱ 2 SERIES OF 3-AP577E SPA. AS SHOWN IN SECTION A-A.  
1 SERIES OF 2-AP479E SPA. AS SHOWN IN SECTION A-A

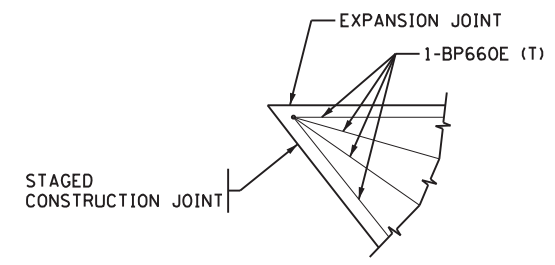
**BAR CALLOUTS CONT.:**

- ⑲ 10-AP480E (PLACED IN PAIRS) & 10-AP481E (PLACED IN PAIRS) @ 1'-6" SPA. = 6'-0", SEE SECTION A-A FOR ADDITIONAL PLACEMENT INFO.
- ⑳ 66-AP480E (PLACED IN PAIRS) & 66-AP481E (PLACED IN PAIRS) @ 1'-6" SPA. = 48'-0", SEE SECTION A-A FOR ADDITIONAL PLACEMENT INFO.
- ㉑ 2-AP482E (PLACE IN PAIRS) AS SHOWN.

**STAGE 1 EAST APPROACH PANEL REINFORCEMENT**

**GENERAL NOTES:**

FOR SECTION A-A AND CURB TRANSITION DETAILS, SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS SEE SHEET B48.  
FOR SECTION B-B SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS SEE SHEET B47.  
FOR SECTION C-C SEE SHEET B41.



**DETAIL "A"**

**S.P. 0206-78 (TH 47) S.A.P. 002-716-020**

NO	DATE	BY	CHK	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.  
*Carlos Berg*  
LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732



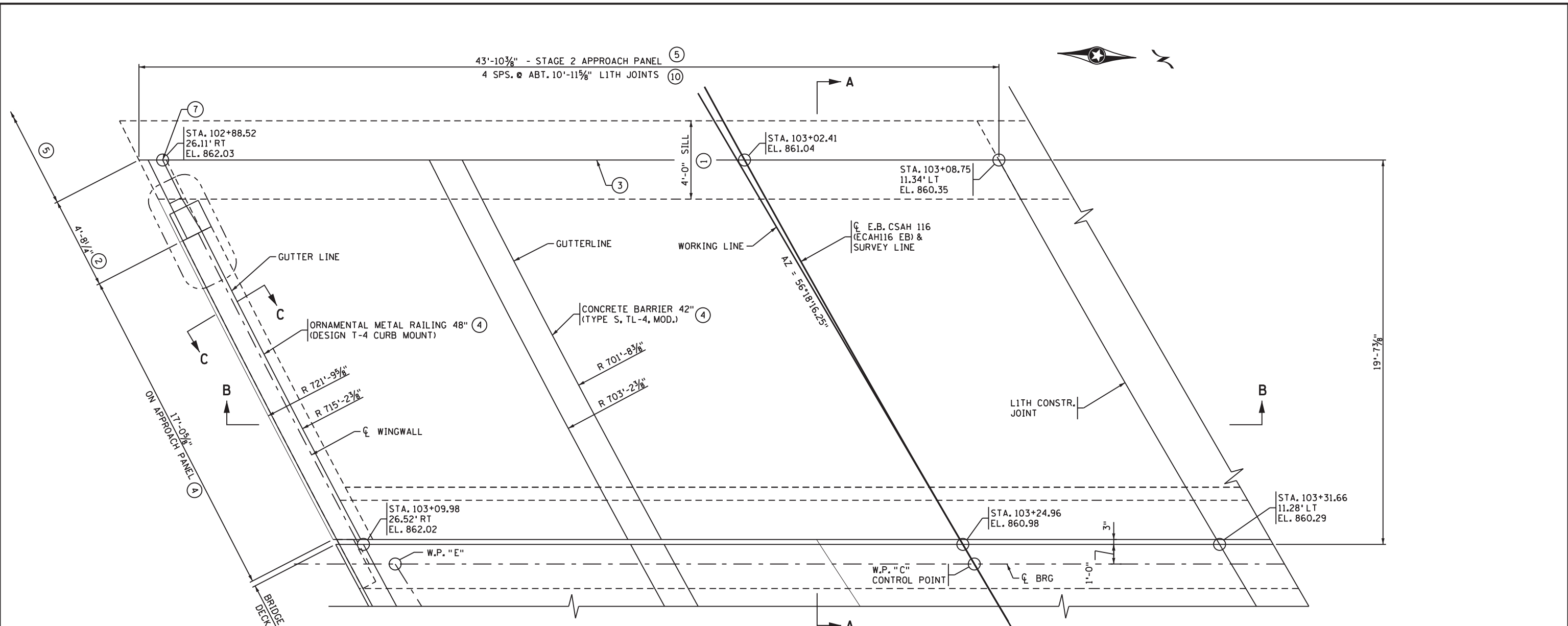
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **STAGE 1 APPROACH PANEL - EAST REINFORCEMENT**

DES: JLB DR: SWH  
CHK: CBO CHK: CBO  
Sheet B42 of B52 Sheets

Bridge No. 02546





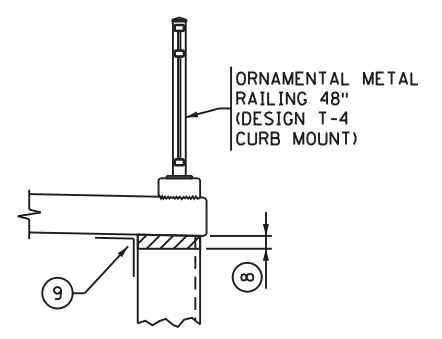
**GENERAL NOTES:**

- CONTRACTOR TO SURVEY ELEVATIONS (TOP OF DECK AND TOP OF APPROACH PANEL) AND SUBMIT ELEVATIONS TO THE ENGINEER. CONTRACTOR TO MATCH ROADWAY SURFACE ELEVATIONS WITH NEW CONSTRUCTION.
- FOR L1TH, C2H AND C2H-D JOINT DETAILS SEE APPROACH PANEL JOINT DETAIL SHEET.
- ALL JOINTS SHALL BE SAWCUT. SAWCUTS SHALL BE MADE WHILE THE CONCRETE IS STILL GREEN AND WITHOUT RAVELING THE CONCRETE. THE JOINTS SHALL BE SAWN THROUGH BOTH THE WEARING COURSE AND THE UNDERLYING APPROACH SLAB IN A SINGLE OPERATION.
- FOR SECTION A-A AND CURB TRANSITION DETAILS, SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS. SEE SHEET B48.
- FOR SECTION B-B SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS. SEE SHEET B47.
- CONCRETE SILL, CURBING AND ALL MATERIALS REQUIRED TO CONSTRUCT THE SILL ARE INCIDENTAL TO ITEM "BRIDGE APPROACH PANELS".
- ENSURE THAT CONCRETE SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT.

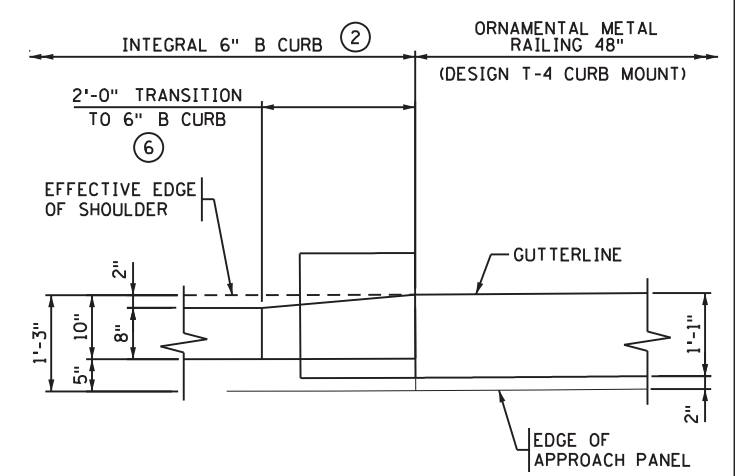
**STAGE 2 WEST APPROACH PANEL LAYOUT**

**GENERAL NOTES (CONT.):**

- REFER TO STANDARD PLANS 5-297.694 (1 OF 5) AND (4 OF 5) FOR ADDITIONAL CURB TRANSITION DETAILS.
- REFER TO SPEC. 2406 FOR ADDITIONAL INFORMATION.
- PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. INCIDENTAL TO ITEM "BRIDGE APPROACH PANELS".
- SEE STANDARD PLAN 5-297.229 FOR REINFORCEMENT LAP LENGTH REQUIREMENTS FOR STAGED CONSTRUCTION.



**SECTION C-C**



**CORNER DETAIL**

**NOTES:**

- SEE APPROACH PANEL DRAINAGE DETAILS FOR DRAINAGE DETAILS AT SILL.
- SEE STANDARD PLATES FOR ADDITIONAL INFORMATION ON INTEGRAL 6" B CURB.
- E8 EXPANSION JOINT. SEE APPROACH PANEL JOINT DETAILS SHEET FOR ADDITIONAL INFORMATION.
- REFER TO BARRIER SHEETS FOR BARRIER REINFORCEMENT TO BE PLACED IN APPROACH PANEL.
- SEE ROADWAY PLANS FOR PAVEMENT AND SHOULDER WIDTHS AND CONFIGURATIONS.
- CURB TRANSITIONS FROM VERTICAL FACE AT END OF BARRIER TO 6" B CURB.
- E8 JOINT REQUIRED IN CURB ADJACENT TO E8 JOINT. SEE APPR. PANEL JOINT DTLS. SHT. FOR ADD'L INFO.
- 4" TYPE B LOW DENSITY POLYSTYRENE ON TOP OF WINGWALL.
- GEOTEXTILE FILTER FABRIC TYPE 7 WITH 24"

<b>S.P. 0206-78 (TH 47)</b>		<b>S.A.P. 002-716-020</b>	
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NO	DATE	BY	CHK	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.

*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

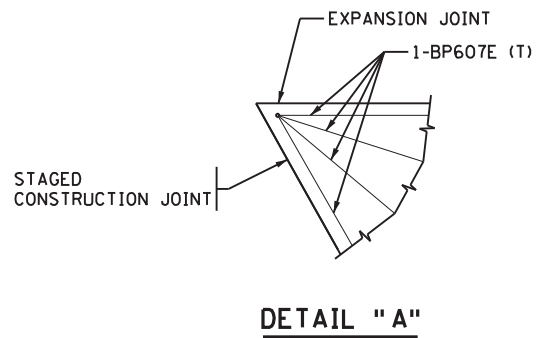
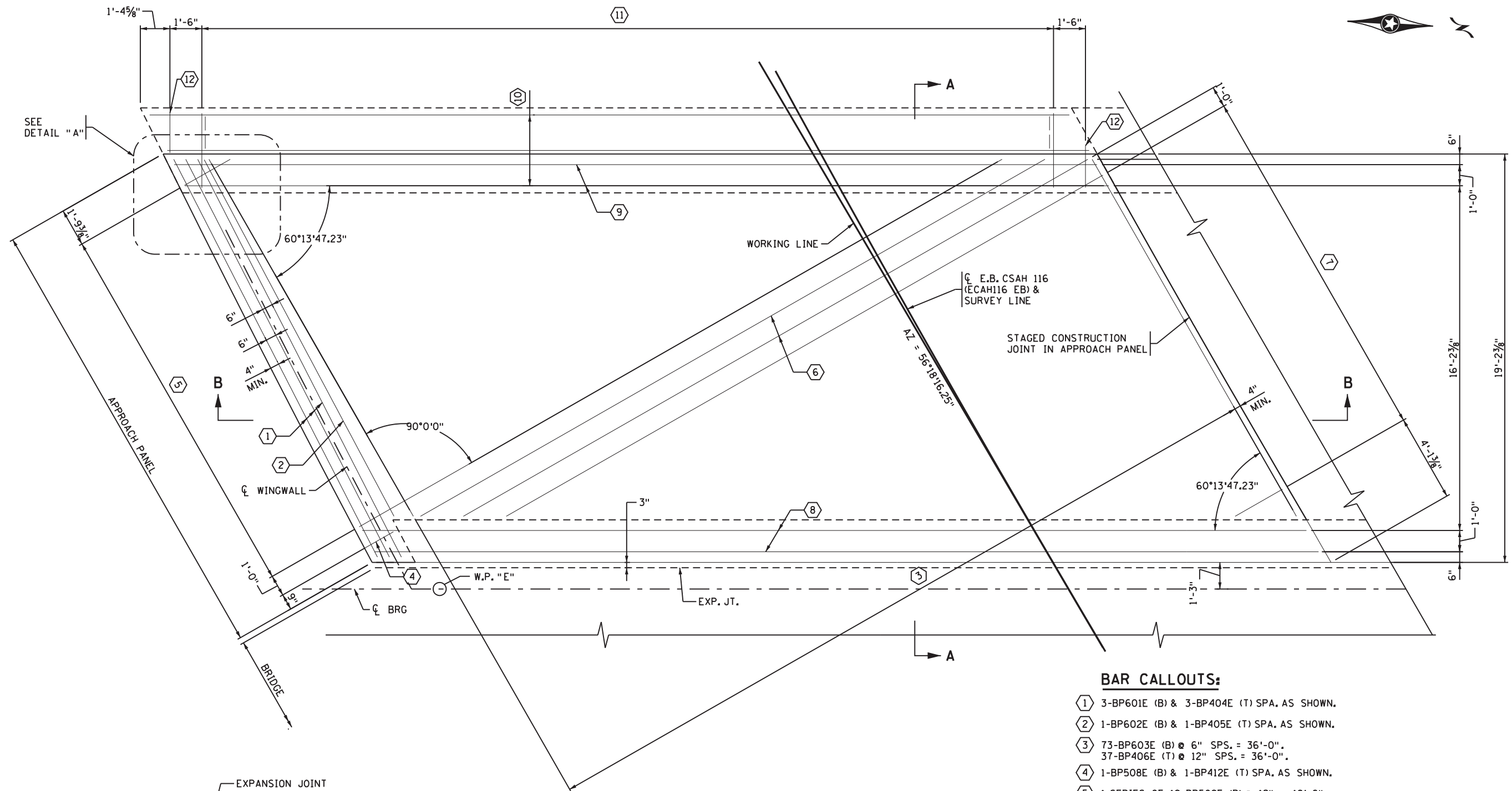
TITLE: **STAGE 2 APPROACH PANEL - WEST**

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

Sheet B43 of B52 Sheets

Bridge No. **02546**

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**STAGE 2 WEST APPROACH PANEL REINFORCEMENT**

**GENERAL NOTES:**

FOR SECTION A-A AND CURB TRANSITION DETAILS, SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS. SEE SHEET B48.  
 FOR SECTION B-B SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS. SEE SHEET B47.

**BAR CALLOUTS:**

- ① 3-BP601E (B) & 3-BP404E (T) SPA, AS SHOWN.
- ② 1-BP602E (B) & 1-BP405E (T) SPA, AS SHOWN.
- ③ 73-BP603E (B) @ 6" SPS. = 36'-0".  
37-BP406E (T) @ 12" SPS. = 36'-0".
- ④ 1-BP508E (B) & 1-BP412E (T) SPA, AS SHOWN.
- ⑤ 1 SERIES OF 19-BP509E (B) @ 12" = 18'-0".  
1 SERIES OF 19-BP413E (T) @ 12" = 18'-0".
- ⑥ 2-BP510E (B) @ 12" SPS. = 1'-0".  
2-BP414E (T) @ 12" SPS. = 1'-0".
- ⑦ 1 SERIES OF 18-BP511E (B) @ 12" = 17'-0".  
1 SERIES OF 18-BP415E (T) @ 12" = 17'-0".
- ⑧ 2-BP416E (T & B) SPA, AS SHOWN.
- ⑨ 2-BP417E (T & B) SPA, AS SHOWN.
- ⑩ 6-BP518E & 2-BP419E SPA, AS SHOWN IN SECTION A-A.
- ⑪ 66-BP420E (PLACED IN PAIRS) & 66-BP421E (PLACED IN PAIRS) @ ABT. 1'-5 3/4" SPA. = 40'-0". SEE SECTION A-A FOR ADDITIONAL PLACEMENT INFO.
- ⑫ 2-BP422E (PLACE IN PAIRS) AS SHOWN.

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**S.P. 0206-78 (TH 47)      S.A.P. 002-716-020**

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020      REG NO: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

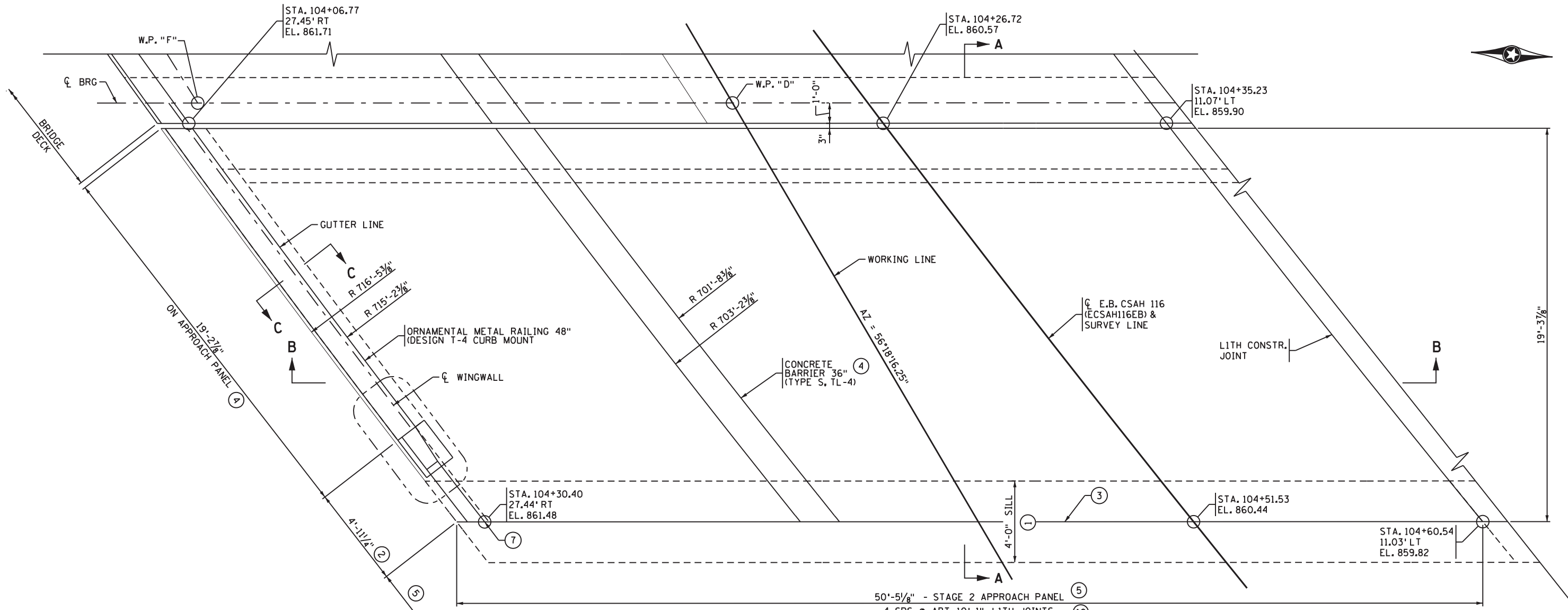
TITLE: **STAGE 2 APPROACH PANEL - WEST REINFORCEMENT**

DES: JLB      DR: SWH  
 CHK: CBO      CHK: CBO

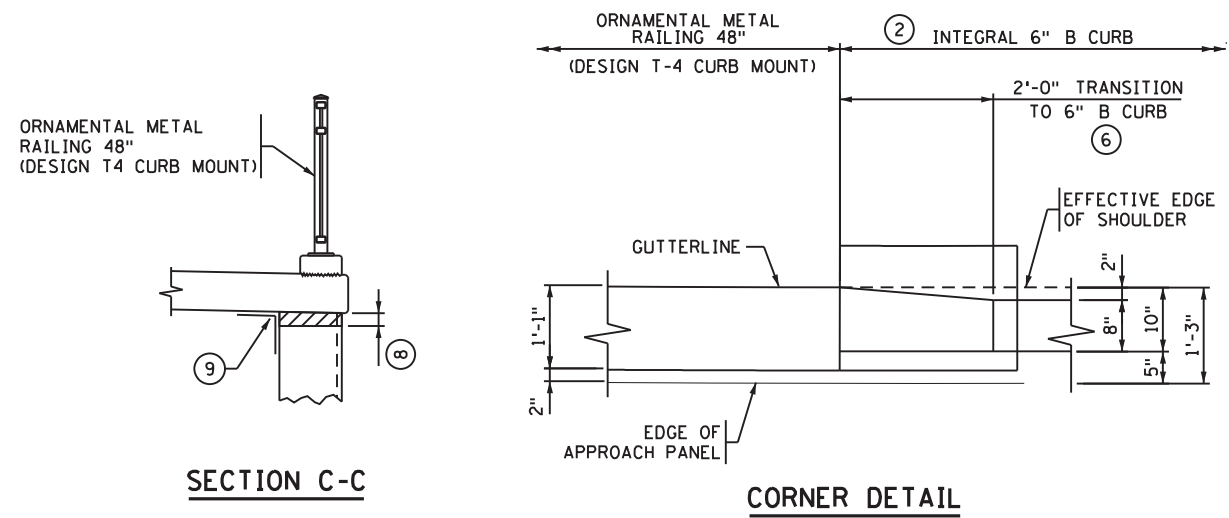
Sheet B44 of B52 Sheets

Bridge No. 02546

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**STAGE 2 EAST APPROACH PANEL LAYOUT**



**NOTES:**

- ① SEE APPROACH PANEL DRAINAGE DETAILS FOR DRAINAGE DETAILS AT SILL.
- ② SEE STANDARD PLATES FOR ADDITIONAL INFORMATION ON INTEGRAL 6" CURB.
- ③ E8 EXPANSION JOINT. SEE APPROACH PANEL JOINT DETAILS SHEET FOR ADDITIONAL INFORMATION.
- ④ REFER TO BARRIER SHEETS FOR BARRIER REINFORCEMENT TO BE PLACED IN APPROACH PANEL.
- ⑤ SEE ROADWAY PLANS FOR PAVEMENT AND SHOULDER WIDTHS AND CONFIGURATIONS.
- ⑥ CURB TRANSITIONS FROM VERTICAL FACE AT END OF BARRIER TO 6" B CURB.
- ⑦ E8 JOINT REQUIRED IN CURB ADJACENT TO E8 JOINT. SEE APPR. PANEL JOINT DTLS. SHT. FOR ADD'L INFO.
- ⑧ 4" TYPE B LOW DENSITY POLYSTYRENE ON TOP OF WINGWALL.
- ⑨ GEOTEXTILE FILTER FABRIC TYPE 7 WITH 24" LEGS
- ⑩ SEE STANDARD PLAN 5-297.229 FOR REINFORCEMENT LAP LENGTH REQUIREMENTS FOR STAGED CONSTRUCTION.

**GENERAL NOTES:**

CONTRACTOR TO SURVEY ELEVATIONS (TOP OF DECK AND TOP OF APPROACH PANEL) AND SUBMIT ELEVATIONS TO THE ENGINEER. CONTRACTOR TO MATCH ROADWAY SURFACE ELEVATIONS WITH NEW CONSTRUCTION.

FOR L1TH, C2H AND C2H-D JOINT DETAILS SEE APPROACH PANEL JOINT DETAIL SHEET.

ALL JOINTS SHALL BE SAWCUT. SAWCUTS SHALL BE MADE WHILE THE CONCRETE IS STILL GREEN AND WITHOUT RAVELING THE CONCRETE. THE JOINTS SHALL BE SAWN THROUGH BOTH THE WEARING COURSE AND THE UNDERLYING APPROACH SLAB IN A SINGLE OPERATION.

FOR SECTION A-A AND CURB TRANSITION DETAILS, SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS. SEE SHEET B48.

FOR SECTION B-B SEE STAGE 1 APPROACH PANEL REINFORCEMENT DETAILS. SEE SHEET B47.

CONCRETE SILL, CURBING AND ALL MATERIALS REQUIRED TO CONSTRUCT THE SILL ARE INCIDENTAL TO ITEM "BRIDGE APPROACH PANELS".

ENSURE THAT CONCRETE SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT.

**GENERAL NOTES (CONT.):**

REFER TO STANDARD PLANS 5-297.694 (1 OF 5) AND (4 OF 5) FOR ADDITIONAL CURB TRANSITION DETAILS.

REFER TO SPEC. 2406 FOR ADDITIONAL INFORMATION.

PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. INCIDENTAL TO ITEM "BRIDGE APPROACH PANELS".

**S.P. 0206-78 (TH 47) S.A.P. 002-716-020**

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732

**wsb** **ANOKA COUNTY**

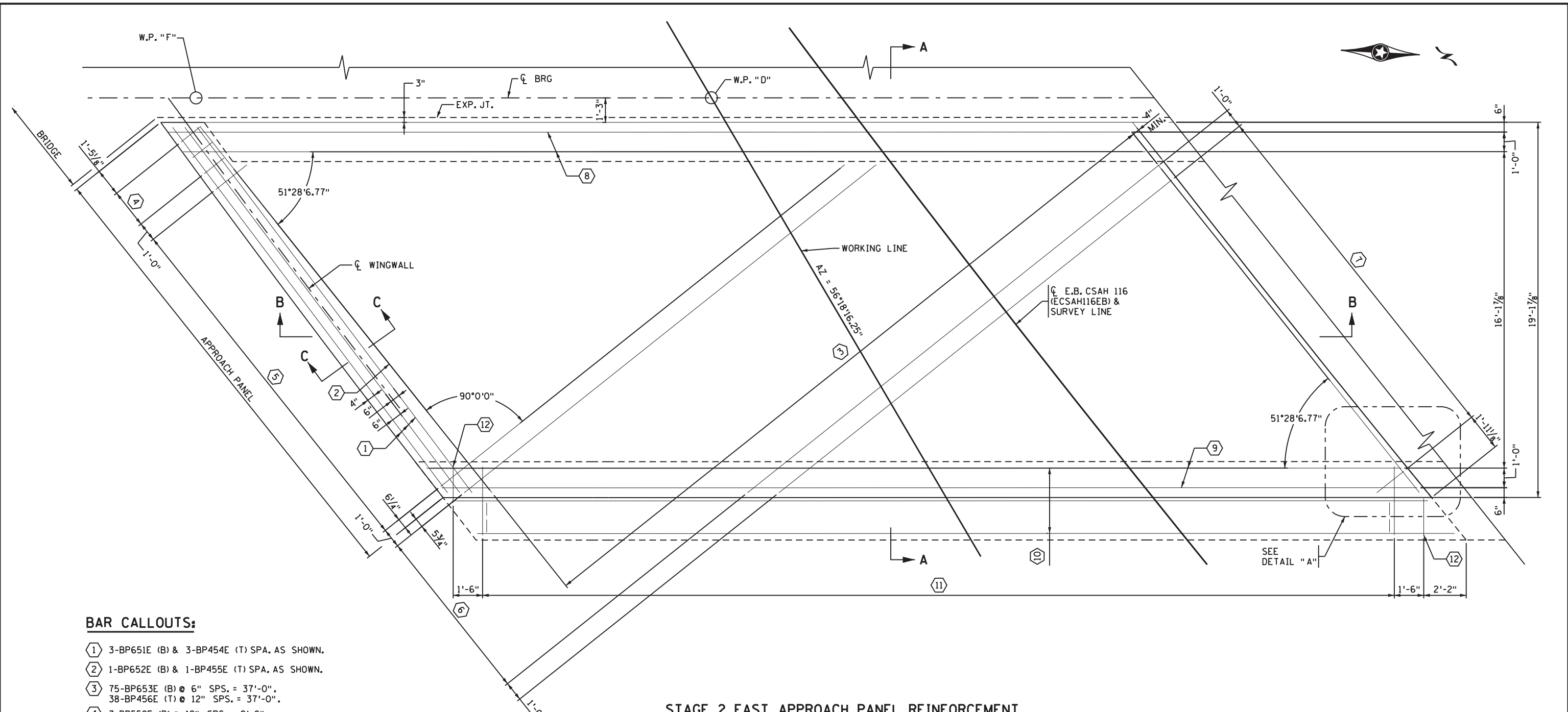
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **STAGE 2 APPROACH PANEL - EAST**

DES: JLB	DR: SWH
CHK: CBO	CHK: CBO

Sheet B45 of B52 Sheets

Bridge No. **02546**



**BAR CALLOUTS:**

- ① 3-BP651E (B) & 3-BP454E (T) SPA, AS SHOWN.
- ② 1-BP652E (B) & 1-BP455E (T) SPA, AS SHOWN.
- ③ 75-BP653E (B) @ 6" SPS, = 37'-0",  
38-BP456E (T) @ 12" SPS, = 37'-0".
- ④ 3-BP558E (B) @ 12" SPS, = 2'-0",  
3-BP462E (T) @ 12" SPS, = 2'-0".
- ⑤ 1 SERIES OF 20-BP559E (B) @ 12" = 19'-0",  
1 SERIES OF 20-BP463E (T) @ 12" = 19'-0".
- ⑥ 10-BP560E (B) @ 12" SPS, = 9'-0",  
10-BP464E (T) @ 12" SPS, = 9'-0".
- ⑦ 1 SERIES OF 20-BP561E (B) @ 12" = 19'-0",  
1 SERIES OF 20-BP465E (T) @ 12" = 19'-0".
- ⑧ 2-BP466E (T & B) SPA, AS SHOWN.
- ⑨ 2-BP467E (T & B) SPA, AS SHOWN.
- ⑩ 6-BP568E & 2-BP469E SPA, AS SHOWN IN SECTION A-A.
- ⑪ 64-BP470E (PLACED IN PAIRS) & 64-BP471E (PLACED  
IN PAIRS) @ 1'-6" SPA, = 46'-6", SEE SECTION A-A FOR  
ADDITIONAL PLACEMENT INFO.
- ⑫ 2-BP472E (PLACE IN PAIRS) AS SHOWN.

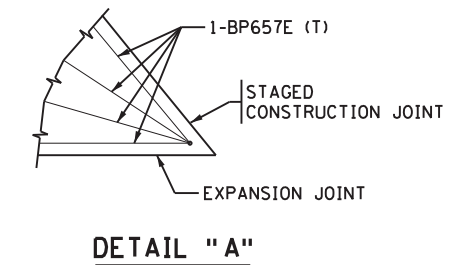
**STAGE 2 EAST APPROACH PANEL REINFORCEMENT**

**GENERAL NOTES:**

FOR SECTION A-A AND CURB TRANSITION DETAILS,  
SEE STAGE 1 APPROACH PANEL REINFORCEMENT  
DETAILS, SEE SHEET B48.

FOR SECTION B-B SEE STAGE 1 APPROACH PANEL  
REINFORCEMENT DETAILS, SEE SHEET B47.

FOR SECTION C-C SEE SHEET B45.



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S.P. 0206-78 (TH 47)	S.A.P. 002-716-020
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NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*  
 LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
 DATE: 11/10/2020 REG NO: 42732



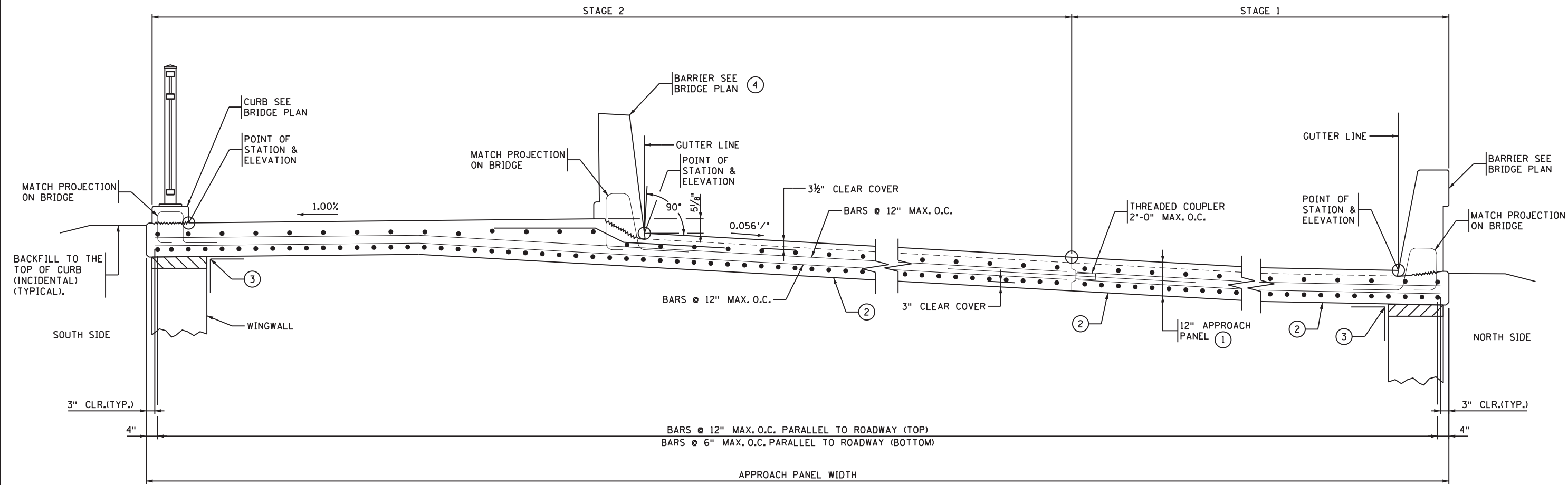
CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
 ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **STAGE 2 APPROACH  
 PANEL - EAST  
 REINFORCEMENT**

DES: JLB DR: SWH  
 CHK: CBO CHK: CBO  
**Sheet B46 of B52 Sheets**

**Bridge No.  
 02546**

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**TRANSVERSE SECTION B-B**  
REFER TO BRIDGE PLANS FOR END OF BARRIER LOCATIONS.

**GENERAL NOTES:**

- CONTRACTOR TO SURVEY ELEVATIONS (TOP OF DECK AND TOP OF APPROACH PANEL) AND SUBMIT ELEVATIONS TO THE ENGINEER. CONTRACTOR TO MATCH ROADWAY SURFACE ELEVATIONS WITH NEW CONSTRUCTION.
- ① APPROACH SLAB THICKNESS IS 12" (12" MONOLITHIC OR 10" SLAB + 2" WEARING COURSE). CHECK BRIDGE PLANS FOR CONCRETE WEARING COURSE, WHICH IS INCLUDED IN BRIDGE PLAN QUANTITIES.
- ② IF THE APPROACH PANEL IS TIED TO THE BRIDGE ABUTMENT WITH REINFORCEMENT BARS, PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF 6 MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM.
- ③ GEOTEXTILE FILTER FABRIC TYPE 7 WITH 24" LEGS, INCIDENTAL.
- ④ SEE BARRIER SHEET. FF OF BARRIER TO BE 90 DEG. TO WEARING COURSE. BF OF BARRIER TO BE PLUMB.

**S.P. 0206-78 (TH 47)**      **S.A.P. 002-716-020**

NO	DATE	BY	CHK	REVISIONS

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*Carlos Berg*

LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020      REG NO: 42732



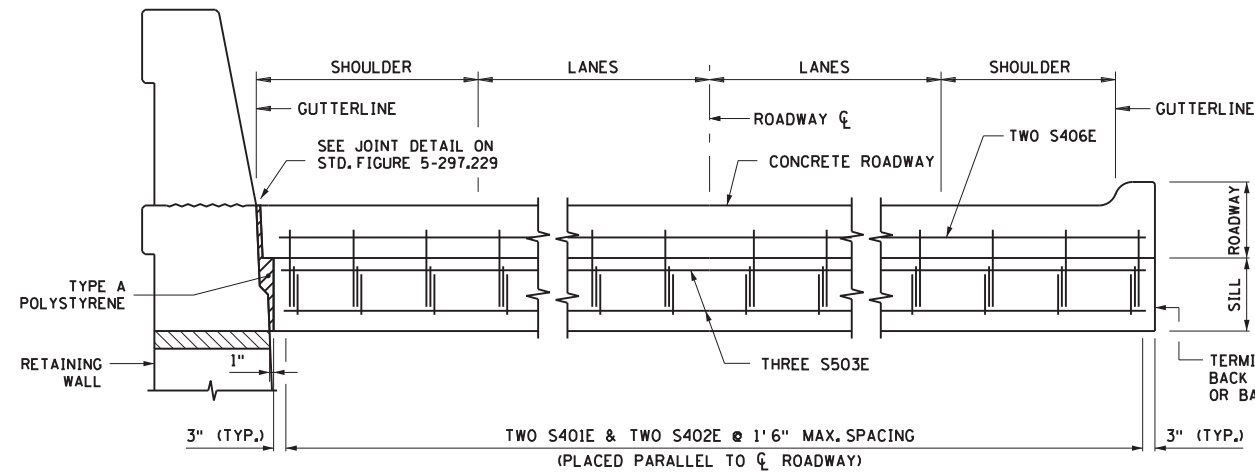
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: **BRIDGE APPROACH PANEL REINFORCEMENT DETAILS**

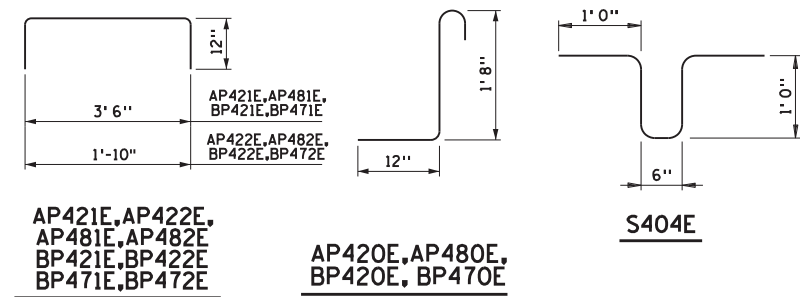
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CHK: CBO      CHK: CBO

**Sheet B47 of B52 Sheets**

**Bridge No. 02546**

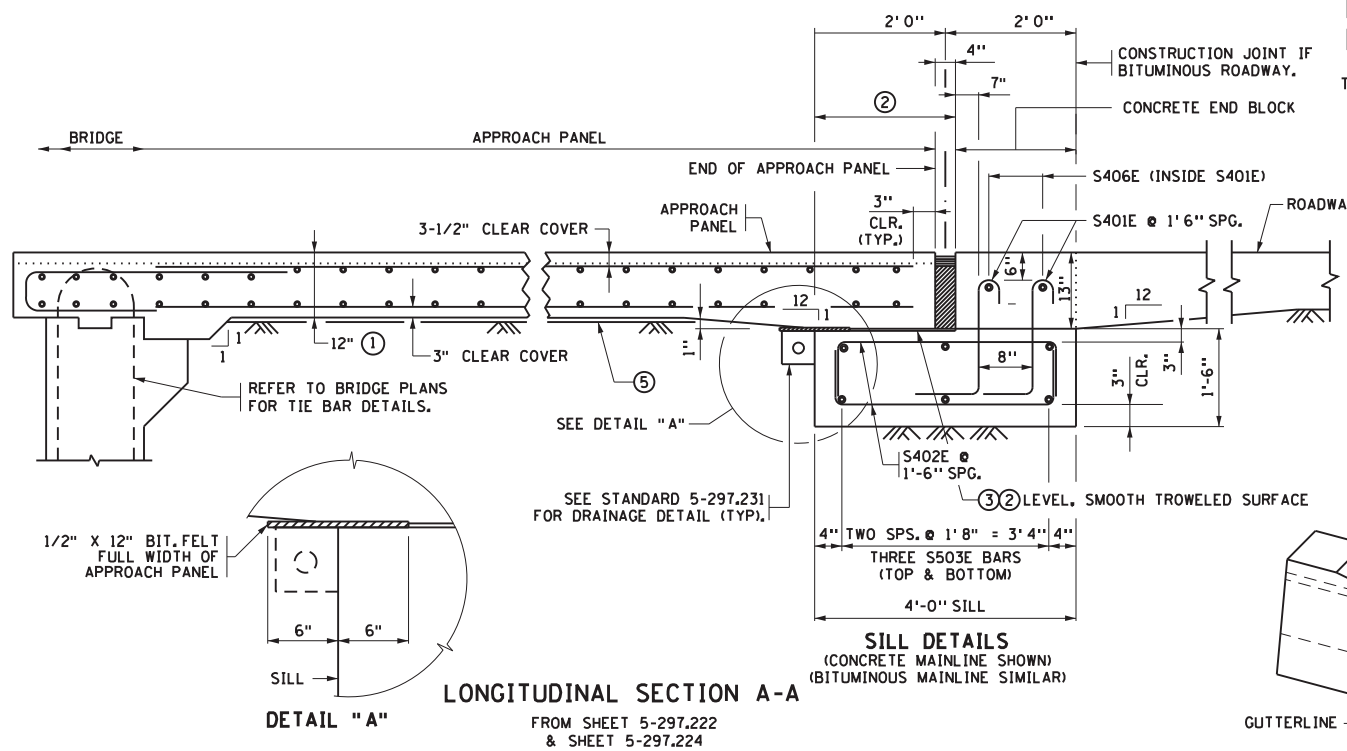


**SILL ELEVATION**  
(REINFORCEMENT IN PAVEMENT NOT SHOWN)

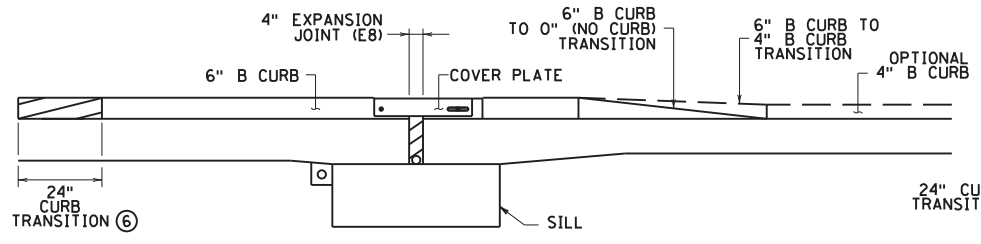


BILL OF REINFORCEMENT FOR CONCRETE SILL				
CONTRACTOR IS REQUIRED TO COMPLETE THE BILL OF REINFORCEMENT TABLE AND PREPARE SHOP DRAWINGS AND SUBMIT THEM TO THE PROJECT ENGINEER AT LEAST 3 WEEKS BEFORE REBAR FABRICATION.				
BAR	NO.	LENGTH	SHAPE	LOCATION
S4XXE		3'-2"	U	SILL VERTICAL
S4XXE		5'-6"	U	SILL TIE
* S503E		'	U	SILL HORIZONTAL
S404E		4'-6"	U	KEY TIE
* S4XXE		'	U	KEY HORIZONTAL
* S4XXE		'	U	END BLOCK HORIZONTAL

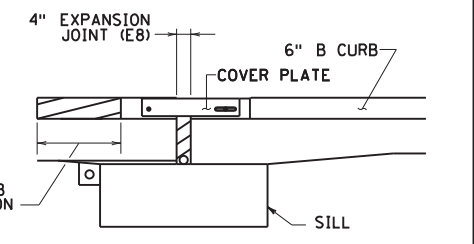
\* MINIMUM REINFORCEMENT LAP LENGTHS ARE AS FOLLOWS:  
NO. 4 BAR = 1'-11", NO. 5 BAR = 2'-5".



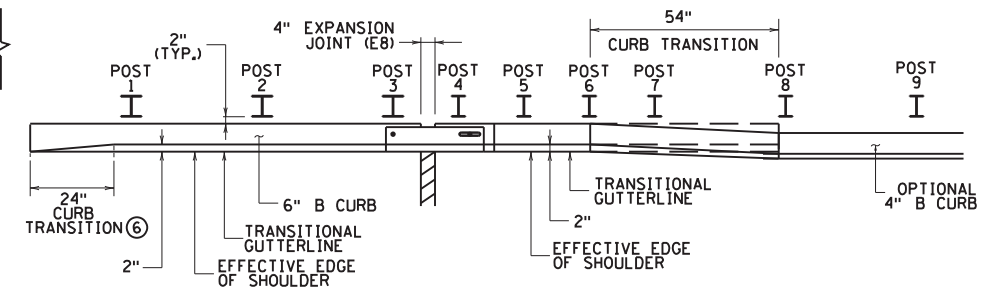
**LONGITUDINAL SECTION A-A**  
FROM SHEET 5-297.222 & SHEET 5-297.224



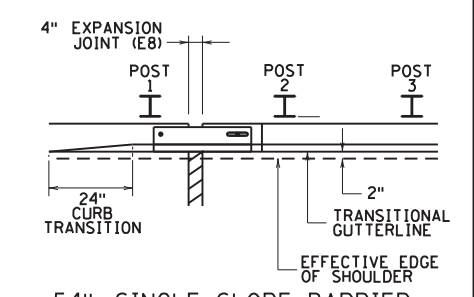
**36"/42" SINGLE SLOPE BARRIER FRONT VIEW**  
(ASSUMES 10'-8" BARRIER LENGTH ON APPROACH PANEL)



**54" SINGLE SLOPE BARRIER FRONT VIEW**  
(ASSUMES 16'-8" BARRIER LENGTH ON APPROACH PANEL)

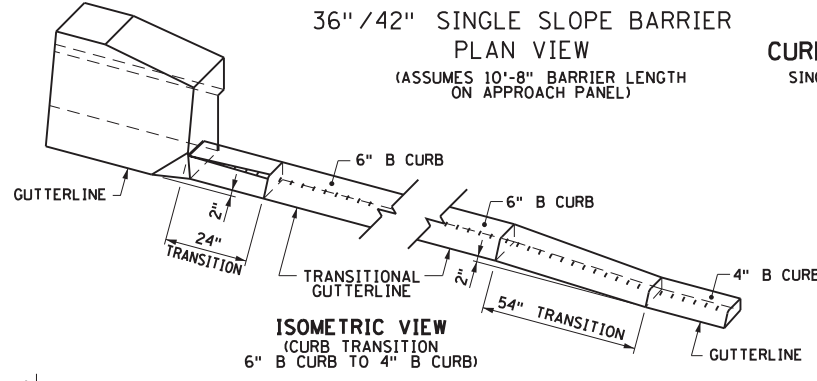


**36"/42" SINGLE SLOPE BARRIER PLAN VIEW**  
(ASSUMES 10'-8" BARRIER LENGTH ON APPROACH PANEL)

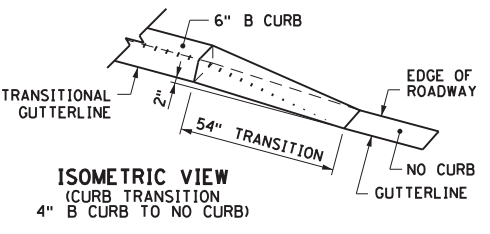


**54" SINGLE SLOPE BARRIER PLAN VIEW**  
(ASSUMES 16'-8" BARRIER LENGTH ON APPROACH PANEL)

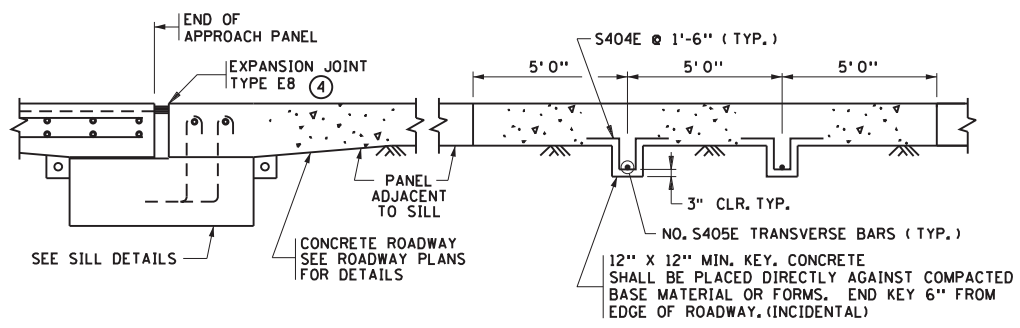
**CURB TRANSITION DETAILS**  
SINGLE SLOPE BARRIER TO B6 CURB WITH TYPE 31 GUARDRAIL



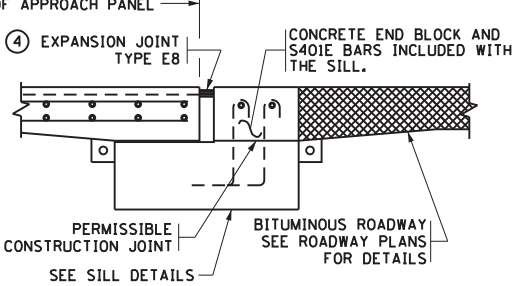
**ISOMETRIC VIEW (CURB TRANSITION 6" B CURB TO 4" B CURB)**



**ISOMETRIC VIEW (CURB TRANSITION 4" B CURB TO NO CURB)**



**SILL & CONCRETE MAINLINE**



**SILL & BITUMINOUS MAINLINE**

MODIFICATION:  
ABUTMENT END MODIFIED FOR REHABILITATION OF BRIDGE.

- NOTES:**
- USE EPOXY COATED GRADE 60 REINFORCEMENT PER SPEC 3301.
  - ENSURE THAT SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT.
  - APPROACH SLAB THICKNESS IS 12" (12" MONOLITHIC OR 10" SLAB + 2" WEARING COURSE). CHECK BRIDGE PLANS FOR CONCRETE WEARING COURSE, WHICH IS INCLUDED IN BRIDGE PLAN QUANTITIES.
  - PLACE PLASTIC SHEETING PER SPEC. 3756 AS APPROVED BY THE ENGINEER TO BREAK BOND. COVER AREA SHOWN IN DETAIL. (SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM).
  - REQUIRED CONSTRUCTION JOINT.
  - SEE STANDARD PLANS 5-297.222 & 5-297.224 FOR TYPE OF EXPANSION JOINT. DETAILS OF EXPANSION JOINT TYPE EB ARE SHOWN ON STANDARD PLAN 5-297.229.
  - IF THE APPROACH PANEL IS TIED TO THE BRIDGE ABUTMENT WITH REINFORCEMENT BARS, PLACE 12 MIL POLYETHYLENE SHEETING (OR 2 LAYERS OF 6 MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. SHEETING IS INCLUDED IN THE APPROACH PANEL PAY ITEM.
  - CURB TRANSITIONS FROM VERTICAL FACE AT END OF BARRIER TO 6" B CURB OVER 24" LENGTH.

S.P. 0206-78 (TH 47) S.A.P. 002-716-020

MOD. STANDARD PLAN SHEET NO. 5-297.227 (2 OF 2)  
STANDARD APPROVED: AUGUST 22, 2016

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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732



CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE: BRIDGE APPROACH PANEL MISCELLANEOUS DETAILS (TYPE S CONCRETE BARRIER)

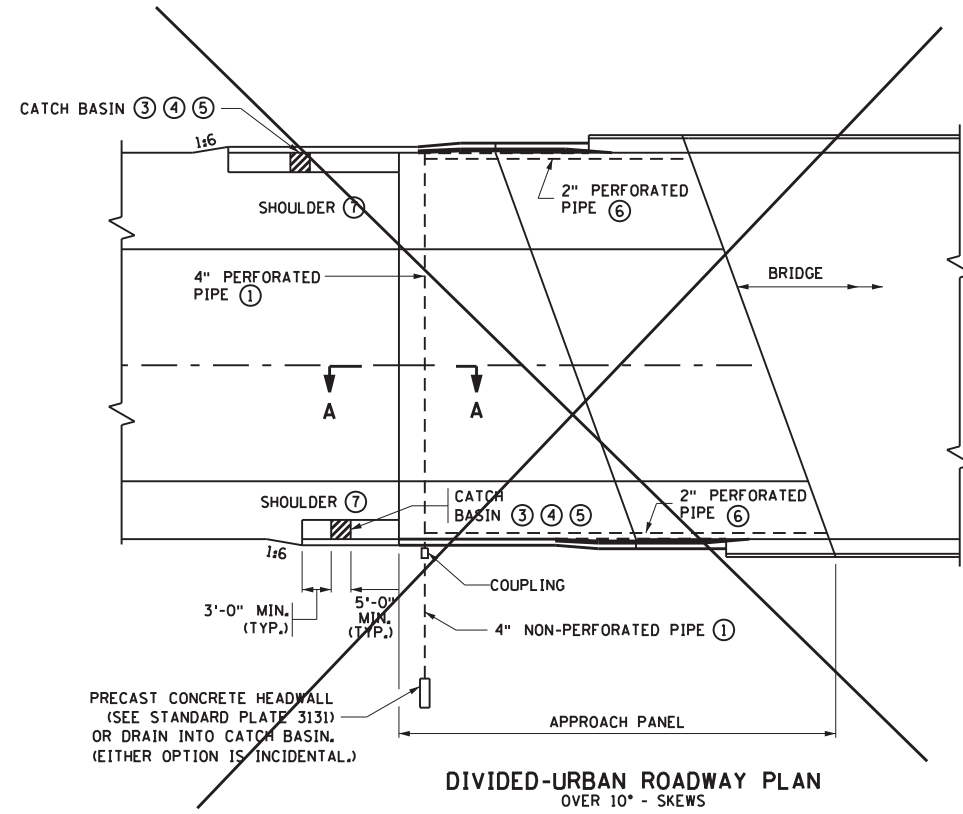
DES: JLB DR: SWH  
CHK: CBO CHK: CBO

Sheet B48 of B52 Sheets

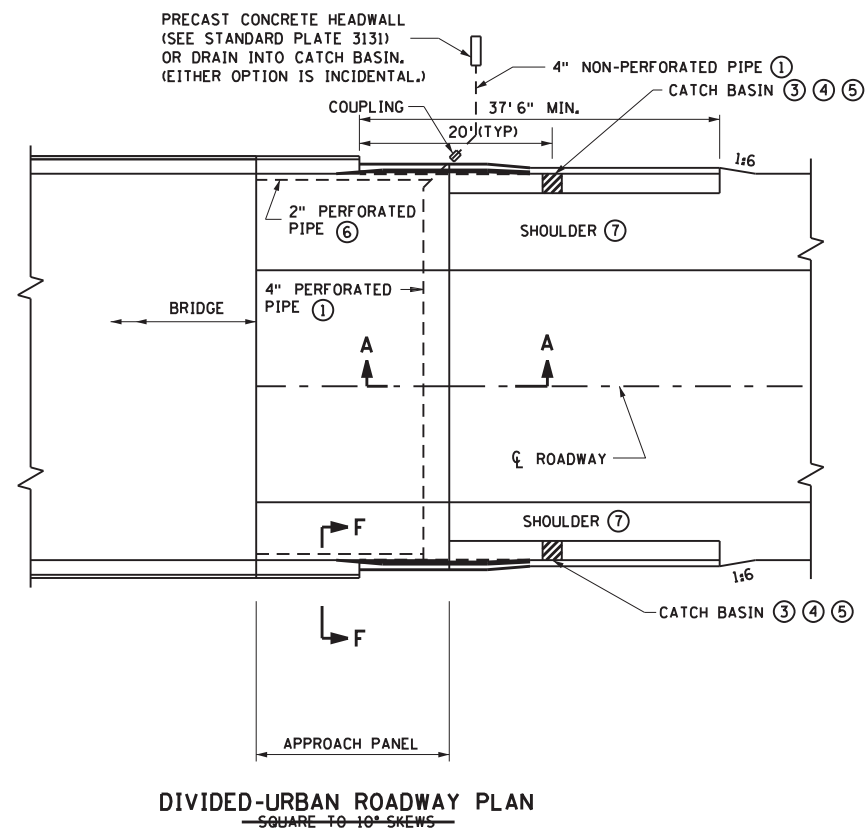
Bridge No. 02546

**NOTES:**

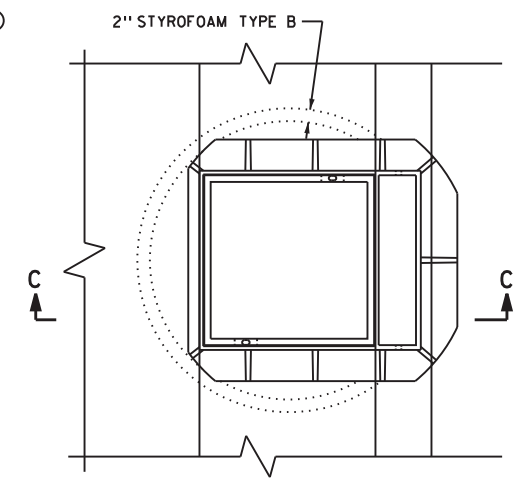
- ① 4-INCH NOMINAL DIAMETER THERMOPLASTIC PIPE, AS PER ASTM D1785M, SCHEDULE 40. SLOPE PIPE TO DITCH. WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER SPEC. 3733. 1/8 INCH PER 12 INCH MINIMUM SLOPE. FURNISHING AND INSTALLING THE DRAIN SYSTEM IS INCIDENTAL.
- ② BACKFILL WITH FINE AGGREGATE (MNDOT 3149) MODIFIED TO 0-3% PASSING A NO. 200 SIEVE (INCIDENTAL).
- ③ SEE ROADWAY PLAN FOR ADDITIONAL CATCH BASIN DETAILS.
- ④ LOCATE BETWEEN GUARDRAIL POST OR AS DETERMINED BY THE DESIGNER.
- ⑤ REFER TO THE DRAINAGE PLAN TO DETERMINE WHETHER A FLUME OR A CATCH BASIN REQUIRED.
- ⑥ 2-INCH NOMINAL DIAMETER THERMOPLASTIC PIPE, AS PER ASTM D1785M, SCHEDULE 40. SLOPE PIPE TO DITCH. WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER SPEC. 3733. 1/8 INCH PER 12 INCH MINIMUM SLOPE. FURNISHING AND INSTALLING THE DRAIN SYSTEM IS INCIDENTAL.
- ⑦ SEE GRADING PLANS FOR PAVEMENT AND SHOULDER WIDTHS AND CONFIGURATION.



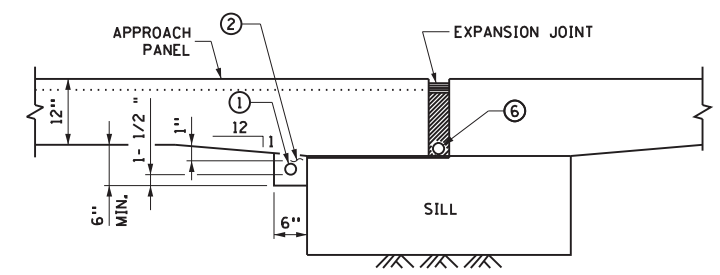
**DIVIDED-URBAN ROADWAY PLAN**  
OVER 10° - SKEWS



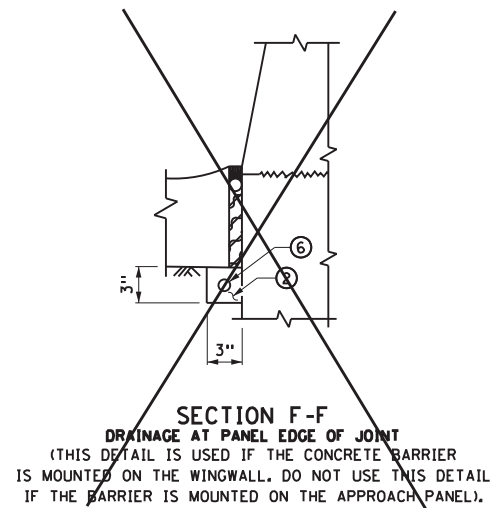
**DIVIDED-URBAN ROADWAY PLAN**  
— SQUARE TO 10° SKEWS —



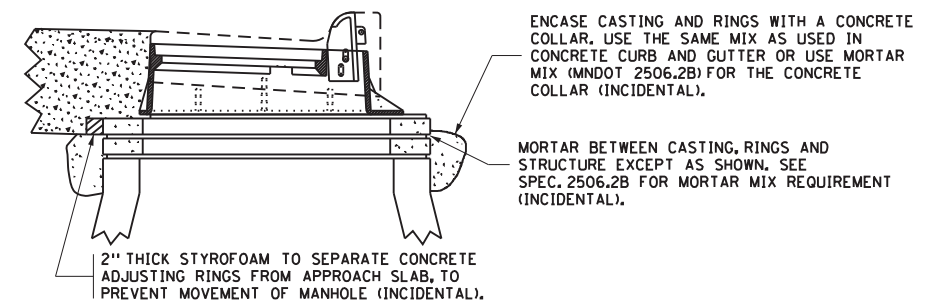
**PLAN VIEW OF C.B. CASTING**  
(GRATE NOT SHOWN)



**SECTION A-A**  
DRAINAGE AT EXPANSION JOINT DETAIL



**SECTION F-F**  
DRAINAGE AT PANEL EDGE OF JOINT  
(THIS DETAIL IS USED IF THE CONCRETE BARRIER IS MOUNTED ON THE WINGWALL. DO NOT USE THIS DETAIL IF THE BARRIER IS MOUNTED ON THE APPROACH PANEL.)



**SECTION C-C**

ENCASE CASTING AND RINGS WITH A CONCRETE COLLAR. USE THE SAME MIX AS USED IN CONCRETE CURB AND GUTTER OR USE MORTAR MIX (MNDOT 2506.2B) FOR THE CONCRETE COLLAR (INCIDENTAL).

MORTAR BETWEEN CASTING, RINGS AND STRUCTURE EXCEPT AS SHOWN, SEE SPEC. 2506.2B FOR MORTAR MIX REQUIREMENT (INCIDENTAL).

2" THICK STYROFOAM TO SEPARATE CONCRETE ADJUSTING RINGS FROM APPROACH SLAB, TO PREVENT MOVEMENT OF MANHOLE (INCIDENTAL).

STANDARD PLAN SHEET NO. <b>5-297.231 (2 OF 2)</b>	<b>MODIFIED:</b> REMOVED SKEW NOTE FROM DIVIDED-URBAN ROADWAY PLAN
STANDARD APPROVED: AUGUST 22, 2016	
<b>S.P. 0206-78 (TH 47)</b>	<b>S.A.P. 002-716-020</b>

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.

*Carlos Berg*  
LICENSED PROFESSIONAL ENGINEER: CARLOS BERG, PE  
DATE: 11/10/2020 REG NO: 42732

**wsb** ANOKA COUNTY

**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

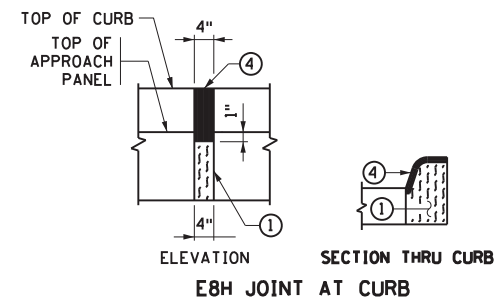
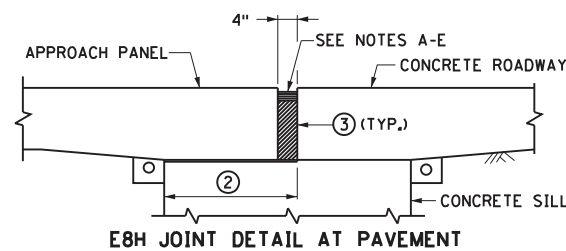
TITLE: **BRIDGE APPROACH PANEL DRAINAGE DETAILS**

DES: JLB DR: SWH  
CHK: CBO CHK: CBO

Sheet B49 of B52 Sheets

Bridge No. 02546

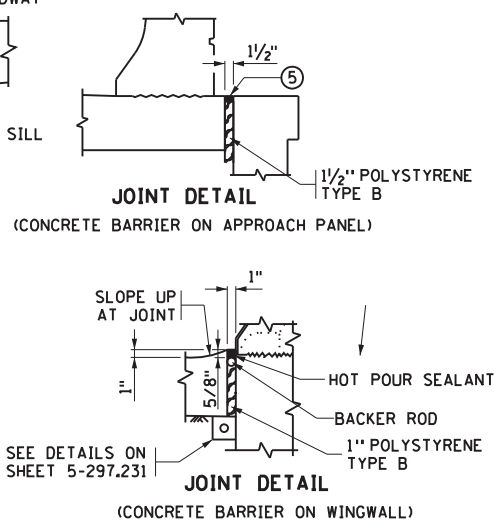
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**EXPANSION JOINT NOTES:**

- ① PREFORMED JOINT FILLER MATERIAL, SPEC. 3702.
- ② PLACE PLASTIC SHEETING SPEC. 3756 AS APPROVED BY THE ENGINEER TO BREAK BOND. COVER AREA SHOWN IN DETAIL. SEE SILL DETAILS ON STANDARD PLAN 5-297.227.
- ③ THE JOINT FACES SHALL BE CLEANED AND DRIED BY SANDBLASTING AND AIR BLASTING PRIOR TO SEALING THE JOINT.
- ④ HOT POUR JOINT SEALER SPEC. 3725. TOP OF SEALER FLUSH TO 1/8 INCH BELOW TOP OF PAVEMENT SURFACE. MAKE TOP OF SEALER FOR CURB SECTION E8H JOINTS FLUSH WITH SURFACE (+ 1/8 INCH OR - 1/8 INCH).
- ⑤ SEAL WITH SELF-LEVELING SILICONE PER MNDOT 3722.

**EXPANSION JOINTS**



**E8H PRESSURE RELIEF JOINT MATERIAL INSTALLATION INSTRUCTIONS:**

SEE MNDOT APPROVED/QUALIFIED PRODUCTS LIST.

FURNISH AND INSTALL JOINT MATERIAL IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE FOLLOWING:

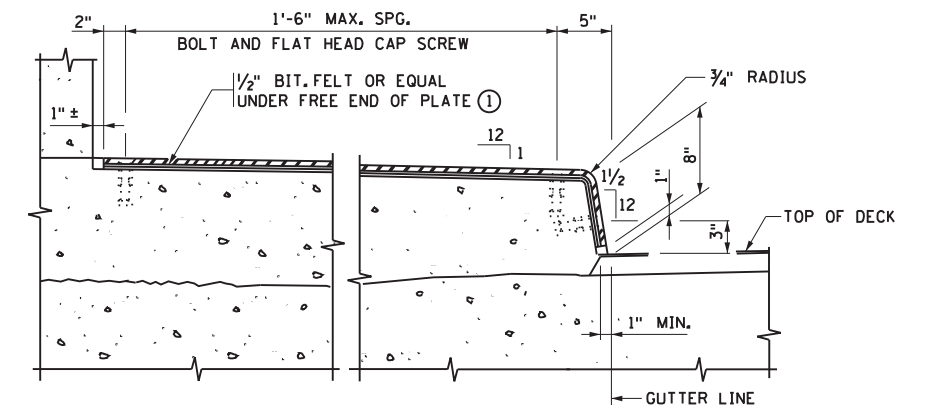
- (A) EXPANSION JOINT FILLER MATERIALS USED FOR A 4 INCH PRESSURE RELIEF JOINT CONSISTS OF A PREFORMED FOAM PRODUCT HAVING MINIMUM DIMENSIONS OF 4.5 INCHES IN WIDTH (MAY BE LAMINATED) AND 8 INCHES IN DEPTH, AND A MINIMUM LENGTH OF 10 FEET. WHEN THE CONCRETE DEPTH IS GREATER THAN THE DEPTH OF THE PRESSURE RELIEF MATERIAL, FILL THE VOID BELOW THE MATERIAL WITH POLYSTYRENE. FURNISH AND INSTALL THE JOINT MATERIAL UNDER COMPRESSION WITH A LUBRICANT ADHESIVE APPLIED TO THE CONCRETE CONTACT SURFACES.
- (B) SAW OR FORM THE JOINTS 4 INCHES WIDE BY THE FULL-DEPTH OF THE PANEL. INSPECT TO ASSURE THAT THE INSIDE WALLS OF THE JOINT HAVE BEEN SANDBLASTED, ARE DRY, SMOOTH AND FREE OF DEBRIS AND LOOSE PARTICLES. APPLY TAPE TO THE TOP 1 INCH OF THE INSIDE WALLS TO PREVENT THE LUBRICANT ADHESIVE FROM CONTAMINATING THE CONCRETE BONDING SURFACES OF THE SUBSEQUENTLY PLACED HOT POUR JOINT SEALER.
- (C) PAINT THE INSIDE WALLS OF THE JOINT WITH LUBRICANT ADHESIVE AT THE RATE OF 1 GALLON PER 50 LINEAL FEET OF JOINT.
- (D) PINCH THE BOTTOM OF THE MATERIAL TOGETHER AND PUSH IT DOWN INTO THE JOINT. WALK THE MATERIAL DOWN INTO THE JOINT; USE A SLEDGEHAMMER AND A 2 X 4 IF NECESSARY. APPLY LUBRICANT ADHESIVE TO THE ENDS OF THE PREFORMED FOAM MATERIAL WHEN BUTTING TWO PIECES TOGETHER.
- (E) FURNISH AND INSTALL THE FOAM RELIEF JOINT MATERIAL TO A DEPTH OF APPROXIMATELY 7/8 INCH BELOW THE FINISHED CONCRETE SURFACE. AFTER INSTALLATION, REMOVE THE TAPE AND FILL THE VOID ON TOP OF THE FOAM MATERIAL WITH APPROXIMATELY 1/2 INCH OF HOT POUR JOINT SEALER (MNDOT 3723 OR 3725) TO A LEVEL OF 3/8 INCH +/- 1/4 INCH BELOW THE FINISHED CONCRETE SURFACE. THE HOT POUR JOINT SEALER SHOULD ONLY SLIGHTLY MELT INTO THE FOAM JOINT MATERIAL (TO PREVENT EXCESSIVE MELTING OF THE JOINT MATERIAL, PLACE THE HOT POUR SEALER AT THE LOWER END OF THE TEMPERATURE SPECIFICATION). CHECK FOR CORRECT TEMPERATURE BY PLACING HOT POUR SEALER ON A SAMPLE OF WASTE FOAM MATERIAL.

**SIDEWALK COVER PLATE**

**GENERAL NOTES:**

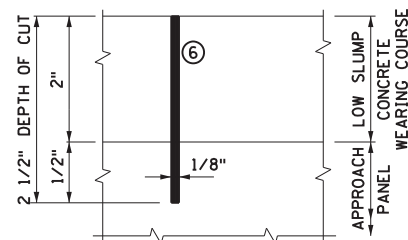
- GALVANIZE STRUCTURAL STEEL AFTER FABRICATION PER Mn/DOT SPEC. 3394
- GALVANIZE FASTENERS PER Mn/DOT SPEC. 3392.
- STRUCTURAL STEEL SHALL COMPLY WITH Mn/DOT SPEC. 3306 OR Mn/DOT SPEC. 3309.
- SHOP DRAWING SUBMITTALS REQUIRED PER Mn/DOT SPEC. 2471.
- CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE.
- FURNISHING AND INSTALLING SIDEWALK COVER PLATE IS INCIDENTAL.

- ① USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.

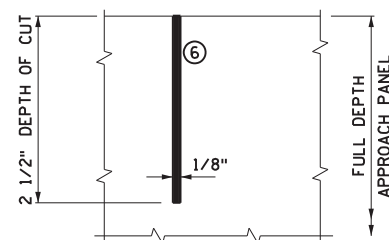


**SECTION THROUGH SIDEWALK**

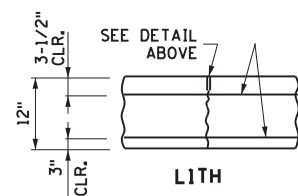
**JOINT DETAILS**



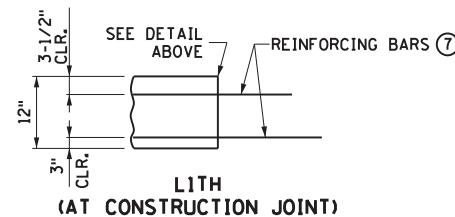
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(SAWED & SEALED PER SPEC. 3725)



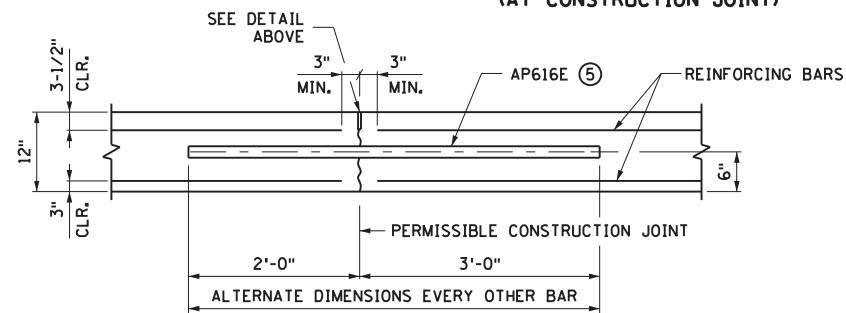
**C2H & L1TH WITHOUT CONCRETE WEARING COURSE ⑥**  
(SAWED & SEALED PER SPEC. 3725)



**LITH**



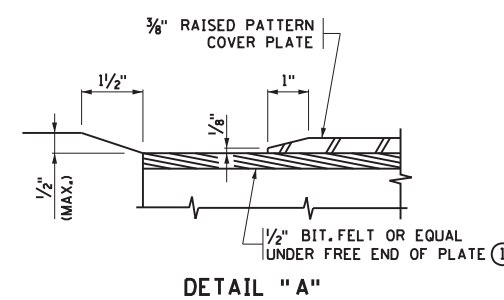
**LITH (AT CONSTRUCTION JOINT)**



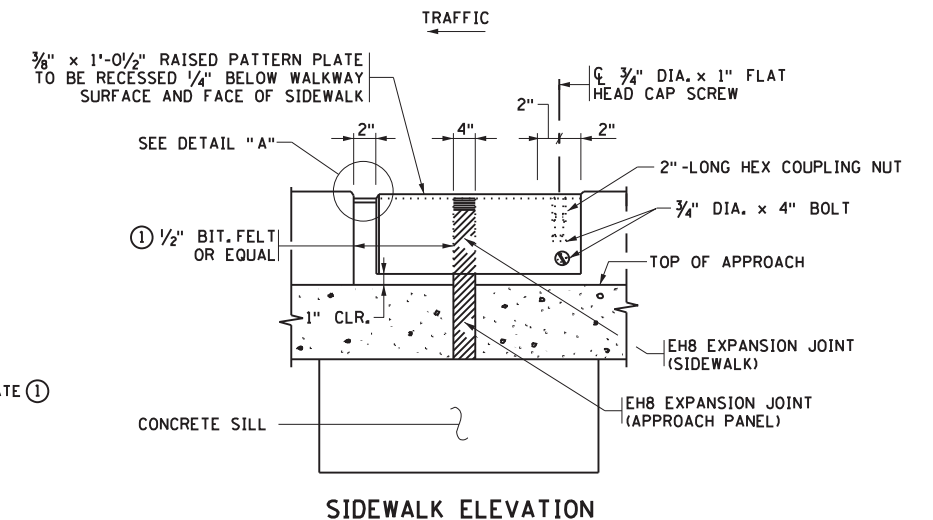
**SECTION AT C2H-D JOINT ⑤**

**JOINT NOTES:**

- ⑤ PERMISSIBLE CONSTRUCTION JOINT. AP616E BARS AT 12-INCH SPACING AT MID DEPTH OF SLAB, PARALLEL TO THE CENTERLINE OF THE ROADWAY. AP616E BARS ARE 5'-0" LONG. PLACE THE BAR WITH 2'-0" ON ONE SIDE OF THE JOINT AND 3'-0" ON THE OPPOSITE SIDE OF THE JOINT. ALTERNATE THE 2'-0" AND 3'-0" DIMENSION AS SHOWN ON THE PLAN.
- ⑥ CLEAN AND DRY FULLY CURED JOINT FACES BY SANDBLASTING PRIOR TO SEALING THE JOINT.
- ⑦ WHEN CONSTRUCTING A L1TH JOINT UNDER STAGED CONSTRUCTION, EXTEND NO. 4 BARS 1'-8" AND NO. 5 BARS 2'-1" PAST THE EDGE OF THE FIRST CONCRETE POUR. CONSTRUCT L1TH JOINT ACCORDING TO DETAIL SHOWN AFTER ADJACENT POUR IS COMPLETE.



**DETAIL "A"**



**SIDEWALK ELEVATION**

STANDARD PLAN SHEET NO.  
**5-297.229**

STANDARD APPROVED:  
**DECEMBER 20, 2011**

REVISION DATE  
**3-22-2013**

**S.P. 0206-78 (TH 47)**

**S.A.P. 002-716-020**

NO.	DATE	BY	CHK	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.

*Carl S. Berg*

LICENSED PROFESSIONAL ENGINEER: CARL S. BERG, PE  
DATE: 11/10/2020 REG NO: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

TITLE:  
**BRIDGE APPROACH PANEL JOINT LAYOUT**

DES: JLB DR: SWH  
CHK: CBO CHK: CBO  
**Sheet B50 of B52 Sheets**

**Bridge No. 02546**



**BILL OF REINFORCEMENT FOR  
WEST APPROACH PANEL - STAGE 1**

BAR	NO.	LENGTH	SHAPE	LOCATION
AP601E	3	2'-10"	———	SLAB - BOT. LONGIT.
AP602E	1	19'-4"	———	SLAB - BOT. LONGIT.
AP603E	87	19'-2"	———	SLAB - BOT. LONGIT.
AP404E	3	21'-10"	———	SLAB - TOP LONGIT.
AP405E	1	19'-4"	———	SLAB - TOP LONGIT.
AP406E	44	19'-2"	———	SLAB - TOP LONGIT.
AP607E	4	10'-0"	———	SLAB - TOP CORNER
AP508E	3	1'-3"	———	SLAB - BOT. TRANSV.
AP509E	1	(A)	———	SLAB - BOT. TRANSV.
AP510E	7	33'-7"	———	SLAB - BOT. TRANSV.
AP511E	1	(B)	———	SLAB - BOT. TRANSV.
AP412E	3	1'-3"	———	SLAB - BOT. TRANSV.
AP413E	1	(C)	———	SLAB - TOP TRANSV.
AP414E	7	33'-7"	———	SLAB - TOP TRANSV.
AP415E	1	(D)	———	SLAB - TOP TRANSV.
AP416E	4	53'-1"	———	SLAB - TOP AND BOT. TRANSV.
AP417E	4	52'-8"	———	END BLOCK HORIZONTAL
AP518E	6	52'-7"	———	END BLOCK HORIZONTAL
AP419E	2	52'-7"	———	END BLOCK HORIZONTAL
AP420E	66	3'-2"	———	SILL VERTICAL
AP421E	66	5'-6"	———	SILL TIE
AP422E	4	3'-10"	———	SILL TIE

- (A) 1 SERIES OF 18 BARS (2'-7" TO 32'-0") (AP509E)
- (B) 1 SERIES OF 18 BARS (3'-9" TO 33'-5") (AP511E)
- (C) 1 SERIES OF 18 BARS (2'-7" TO 32'-0") (AP413E)
- (D) 1 SERIES OF 18 BARS (3'-9" TO 33'-5") (AP415E)

**BILL OF REINFORCEMENT FOR  
WEST APPROACH PANEL - STAGE 2**

BAR	NO.	LENGTH	SHAPE	LOCATION
BP601E	3	21'-0"	———	SLAB - BOT. LONGIT.
BP602E	1	18'-10"	———	SLAB - BOT. LONGIT.
BP603E	73	19'-2"	———	SLAB - BOT. LONGIT.
BP404E	3	21'-0"	———	SLAB - TOP LONGIT.
BP405E	1	18'-10"	———	SLAB - TOP LONGIT.
BP406E	37	19'-2"	———	SLAB - TOP LONGIT.
BP607E	4	10'-0"	———	SLAB - TOP CORNER
BP508E	1	1'-3"	———	SLAB - BOT. TRANSV.
BP509E	19	(A)	———	SLAB - BOT. TRANSV.
BP510E	2	33'-7"	———	SLAB - BOT. TRANSV.
BP511E	18	(B)	———	SLAB - BOT. TRANSV.
BP412E	1	1'-3"	———	SLAB - TOP TRANSV.
BP413E	19	(C)	———	SLAB - TOP TRANSV.
BP414E	2	33'-7"	———	SLAB - TOP TRANSV.
BP415E	18	(D)	———	SLAB - TOP TRANSV.
BP416E	4	44'-4"	———	SLAB - TOP AND BOT. TRANSV.
BP417E	4	43'-4"	———	END BLOCK HORIZ.
BP518E	6	43'-4"	———	END BLOCK HORIZ.
BP419E	2	43'-4"	———	END BLOCK HORIZ.
BP420E	66	3'-2"	———	SILL VERTICAL
BP421E	66	5'-6"	———	SILL TIE
BP422E	2	3'-10"	———	SILL TIE

- (A) 1 SERIES OF 19 BARS (2'-5" TO 34'-9") (BP509E)
- (B) 1 SERIES OF 18 BARS (2'-4" TO 32'-1") (BP511E)
- (C) 1 SERIES OF 19 BARS (2'-5" TO 34'-9") (BP413E)
- (D) 1 SERIES OF 18 BARS (2'-4" TO 32'-1") (BP415E)

**BILL OF REINFORCEMENT FOR  
EAST APPROACH PANEL - STAGE 1**

BAR	NO.	LENGTH	SHAPE	LOCATION
AP651E	3	(A)	———	SLAB - BOT. LONGIT.
AP652E	3	17'-5"	———	SLAB - BOT. LONGIT.
AP653E	11	(B)	———	SLAB - BOT. LONGIT.
AP654E	77	21'-3"	———	SLAB - BOT. LONGIT.
AP455E	2	(C)	———	SLAB - TOP LONGIT.
AP456E	1	17'-5"	———	SLAB - TOP LONGIT.
AP457E	6	(D)	———	SLAB - TOP LONGIT.
AP458E	1	21'-3"	———	SLAB - TOP LONGIT.
AP459E	39	21'-3"	———	SLAB - TOP LONGIT.
AP660E	4	10'-0"	———	SLAB - TOP CORNER
AP561E	20	(E)	———	SLAB - BOT. TRANSV.
AP562E	14	26'-8"	———	SLAB - BOT. TRANSV.
AP563E	16	(F)	———	SLAB - BOT. TRANSV.
AP564E	1	1'-3"	———	SLAB - BOT. TRANSV.
AP565E	1	0'-9"	———	SLAB - BOT. TRANSV.
AP466E	20	(G)	———	SLAB - TOP TRANSV.
AP467E	4	26'-8"	———	SLAB - TOP TRANSV.
AP468E	16	(H)	———	SLAB - TOP TRANSV.
AP469E	1	1'-3"	———	SLAB - TOP TRANSV.
AP470E	1	0'-9"	———	SLAB - TOP TRANSV.
AP471E	4	59'-11"	———	SLAB - TOP AND BOT. TRANSV.
AP472E	2	51'-4"	———	SLAB - TOP AND BOT. TRANSV.
AP473E	2	52'-2"	———	SLAB - TOP AND BOT. TRANSV.
AP474E	1	8'-6"	———	END BLOCK HORIZ.
AP475E	1	9'-10"	———	END BLOCK HORIZ.
AP576E	6	7'-6"	———	SILL HORIZ.
AP577E	6	(I)	———	END BLOCK HORIZ.
AP478E	2	7'-6"	———	END BLOCK HORIZ.
AP479E	2	(J)	———	SILL HORIZ.
AP480E	66	3'-2"	———	SILL VERT.
AP481E	66	5'-6"	———	SILL TIE
AP482E	2	3'-10"	———	SILL TIE

- (A) 1 SERIES OF 3 BARS (19'-1" TO 19'-11") (AP651E)
- (B) 1 SERIES OF 11 BARS (17'-7" TO 21'-1") (AP653E)
- (C) 1 SERIES OF 2 BARS (19'-1" TO 19'-11") (AP455E)
- (D) 1 SERIES OF 6 BARS (17'-6" TO 21'-1") (AP457E)
- (E) 1 SERIES OF 20 BARS (2'-10" TO 26'-8") (AP561E)
- (F) 1 SERIES OF 16 BARS (10'-3" TO 28'-0") (AP563E)
- (G) 1 SERIES OF 20 BARS (2'-10" TO 26'-8") (AP466E)
- (H) 1 SERIES OF 16 BARS (10'-3" TO 28'-0") (AP468E)
- (I) 2 SERIES OF 3 BARS (49'-10" TO 52'-6") (AP577E)
- (J) 1 SERIES OF 2 BARS (49'-10" TO 52'-6") (AP479E)

**NOTES:**

BAR BEND DETAILS SEE SHEET B48.

**BILL OF REINFORCEMENT FOR  
EAST APPROACH PANEL - STAGE 2**

BAR	NO.	LENGTH	SHAPE	LOCATION
BP651E	3	23'-4"	———	SLAB - BOT. LONGIT.
BP652E	1	21'-4"	———	SLAB - BOT. LONGIT.
BP653E	75	21'-3"	———	SLAB - BOT. LONGIT.
BP454E	3	23'-4"	———	SLAB - TOP LONGIT.
BP455E	1	21'-4"	———	SLAB - TOP LONGIT.
BP456E	38	21'-3"	———	SLAB - TOP LONGIT.
BP657E	4	10'-0"	———	SLAB - TOP CORNER
BP558E	3	1'-3"	———	SLAB - BOT. TRANSV.
BP559E	1	(A)	———	SLAB - BOT. TRANSV.
BP560E	10	26'-8"	———	SLAB - BOT. TRANSV.
BP561E	1	B	———	SLAB - BOT. TRANSV.
BP462E	3	1'-3"	———	SLAB - TOP TRANSV.
BP463E	1	(C)	———	SLAB - TOP TRANSV.
BP464E	10	26'-8"	———	SLAB - TOP TRANSV.
BP465E	1	(D)	———	SLAB - TOP TRANSV.
BP466E	4	49'-1"	———	SLAB - TOP AND BOT. TRANSV.
BP467E	4	49'-8"	———	END BLOCK HORIZ.
BP568E	6	49'-9"	———	END BLOCK HORIZ.
BP469E	2	49'-9"	———	END BLOCK HORIZ.
BP470E	64	3'-2"	———	SILL VERTICAL
BP471E	64	5'-6"	———	SILL TIE
BP472E	12	3'-10"	———	SILL TIE

- (A) 1 SERIES OF 20 BARS (1'-10" TO 26'-2") (BP509E)
- (B) 1 SERIES OF 20 BARS (1'-9" TO 25'-6") (BP511E)
- (C) 1 SERIES OF 20 BARS (1'-10" TO 26'-2") (BP413E)
- (D) 1 SERIES OF 20 BARS (1'-9" TO 25'-6") (BP415E)

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**S.P. 0206-78 (TH 47) S.A.P. 002-716-020**

NO.	DATE	BY	CHK	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.

*Carl S. Berg*

LICENSED PROFESSIONAL ENGINEER: CARL S. BERG, PE  
DATE: 11/10/2020 REG NO: 42732



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

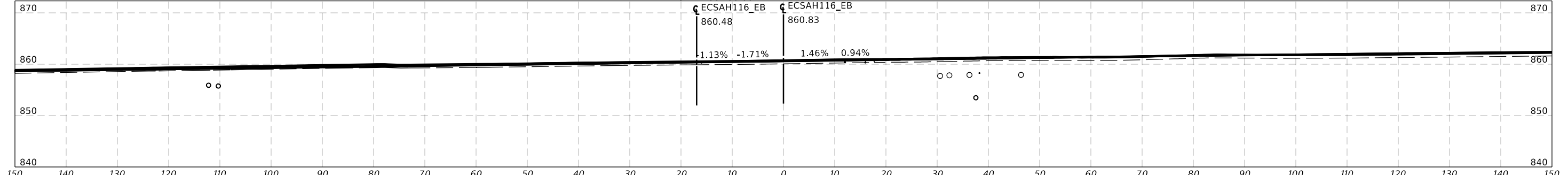
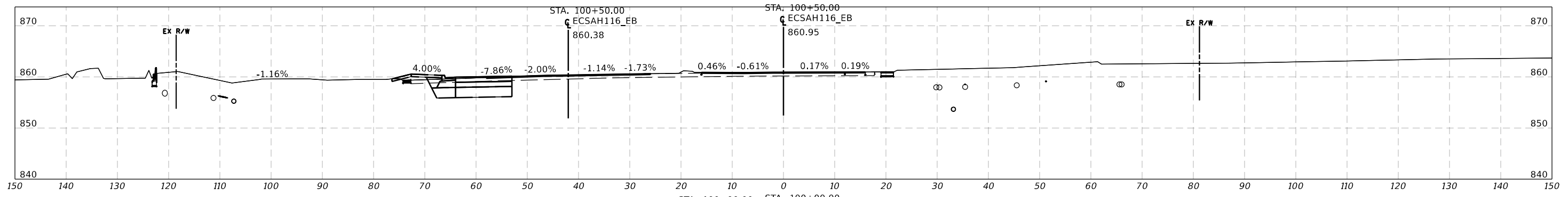
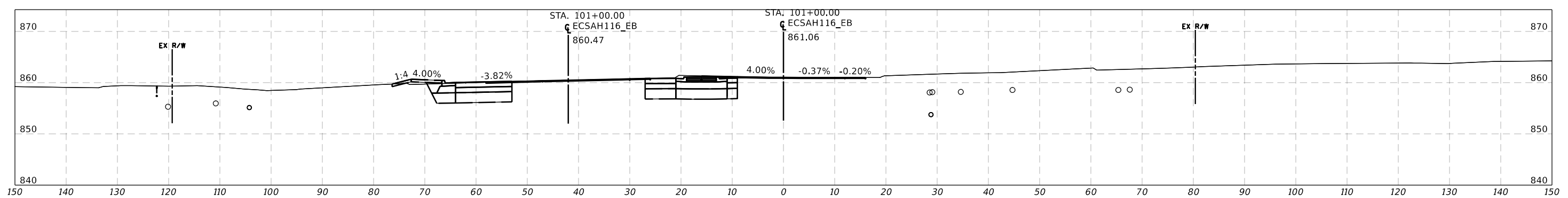
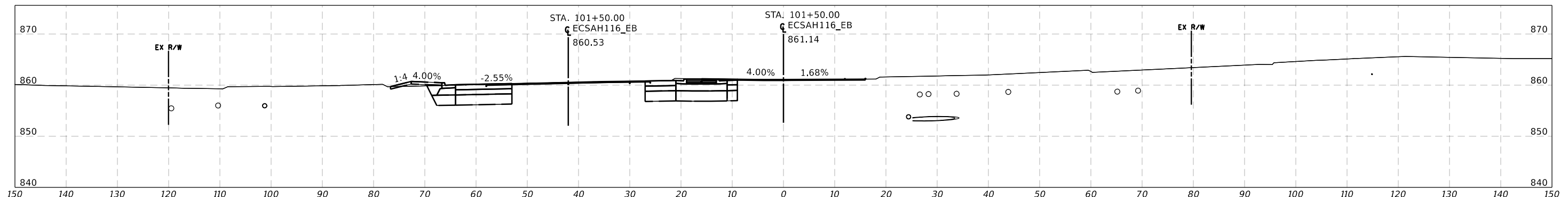
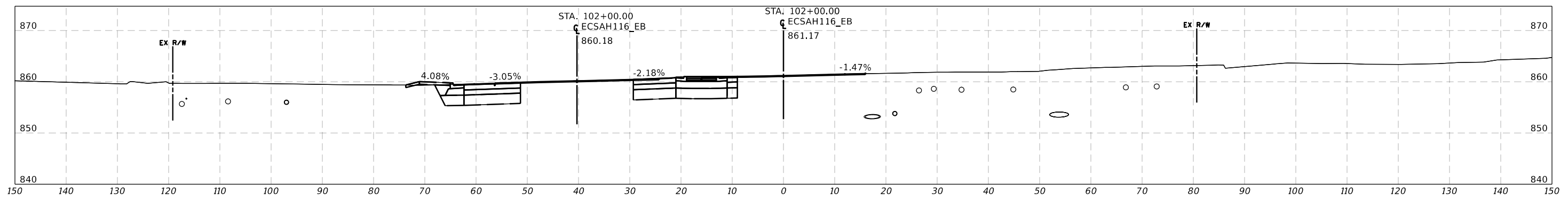
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**BRIDGE APPROACH PANEL  
BAR LIST**

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CHK: CBO CHK: CBO  
**Sheet B51 of B52 Sheets**

**Bridge No.  
02546**



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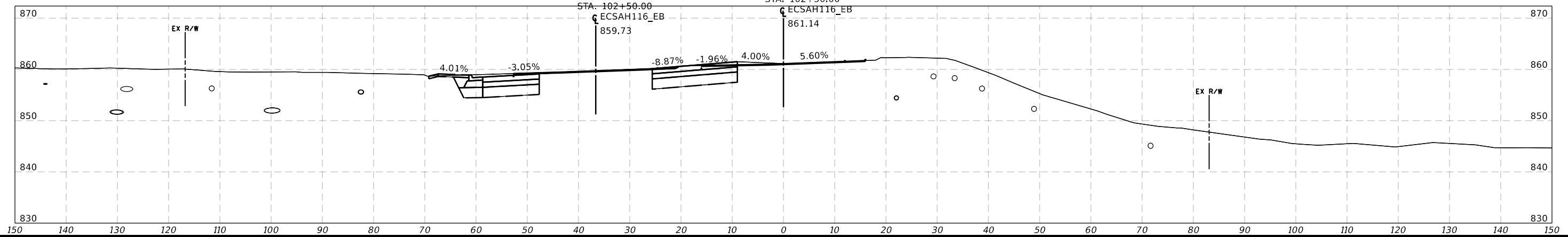
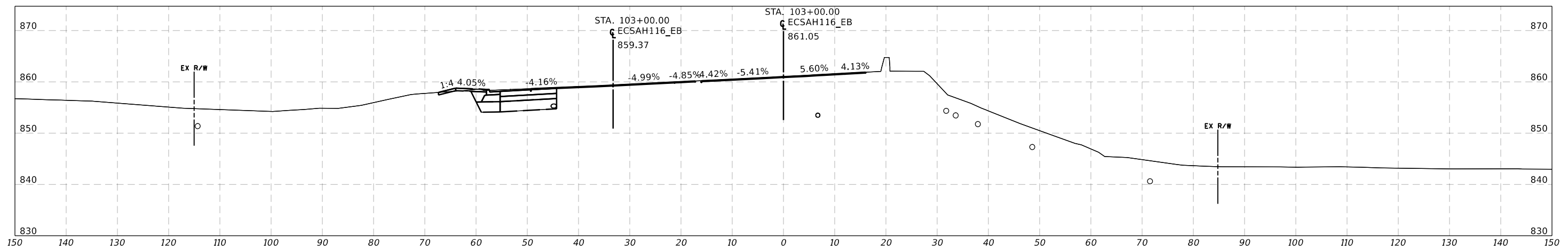
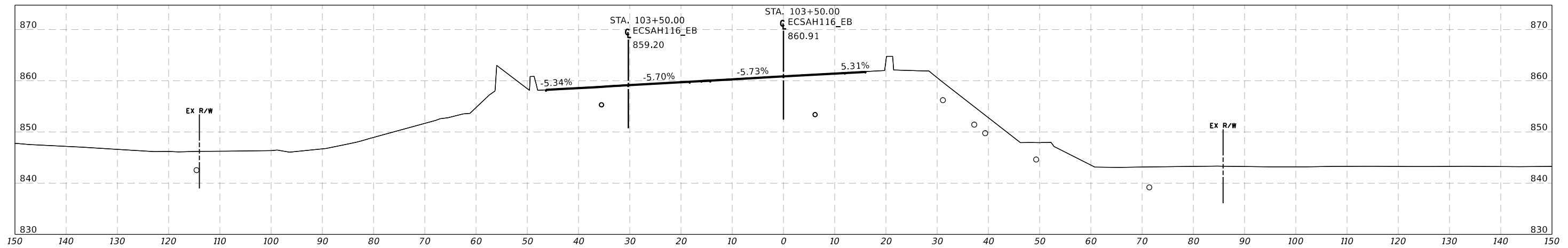
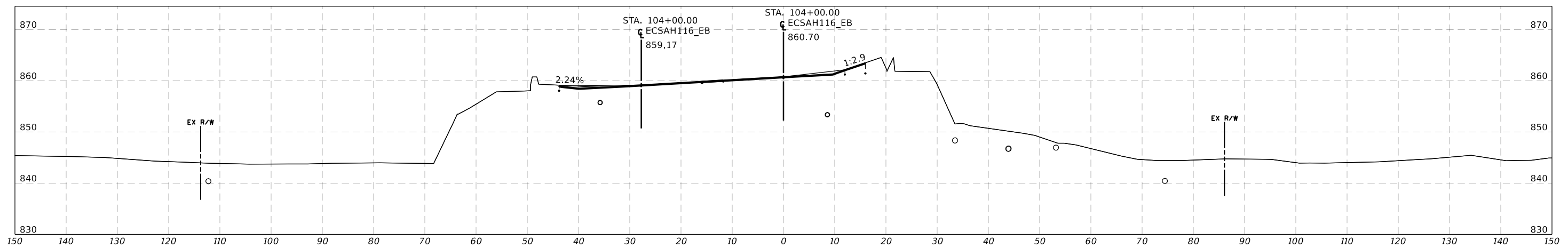
NO.	DATE	BY	CHK	REVISIONS



**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
 CSAH 116  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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NO.	DATE	BY	CHK	REVISIONS

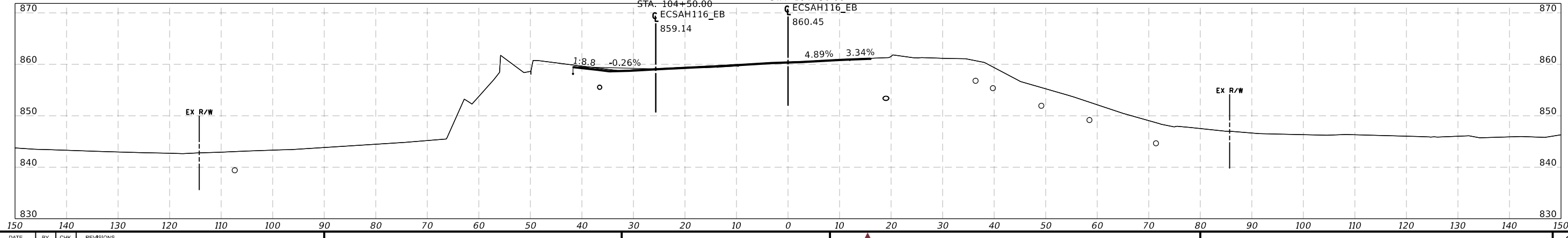
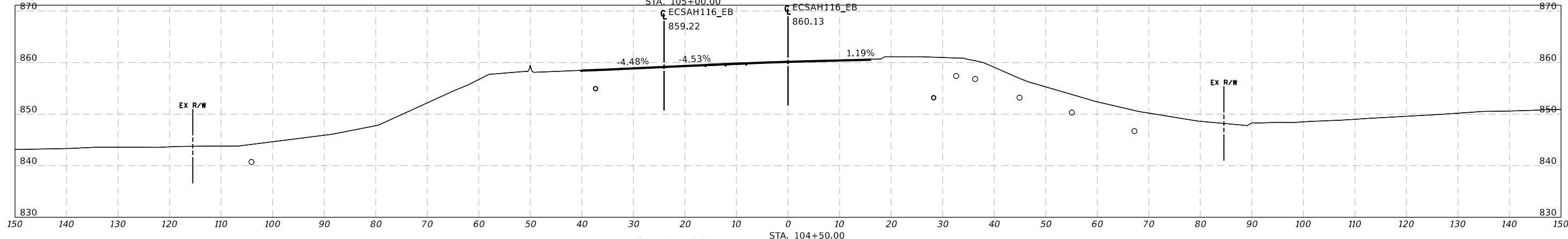
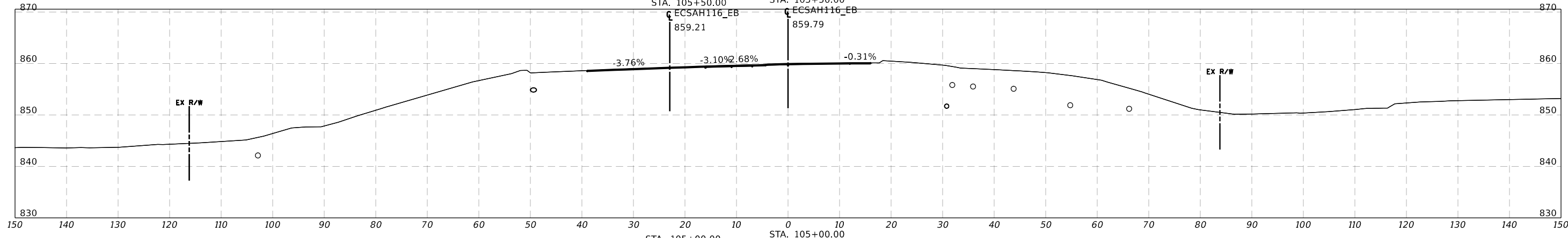
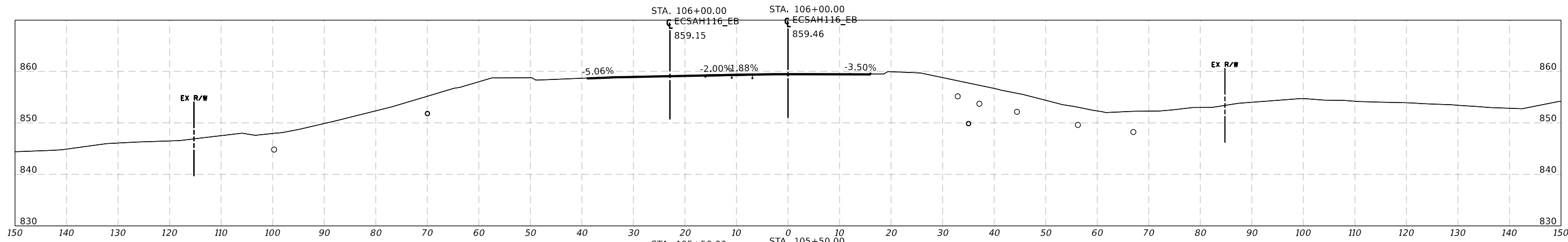


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN  
CSAH 116  
CROSS SECTIONS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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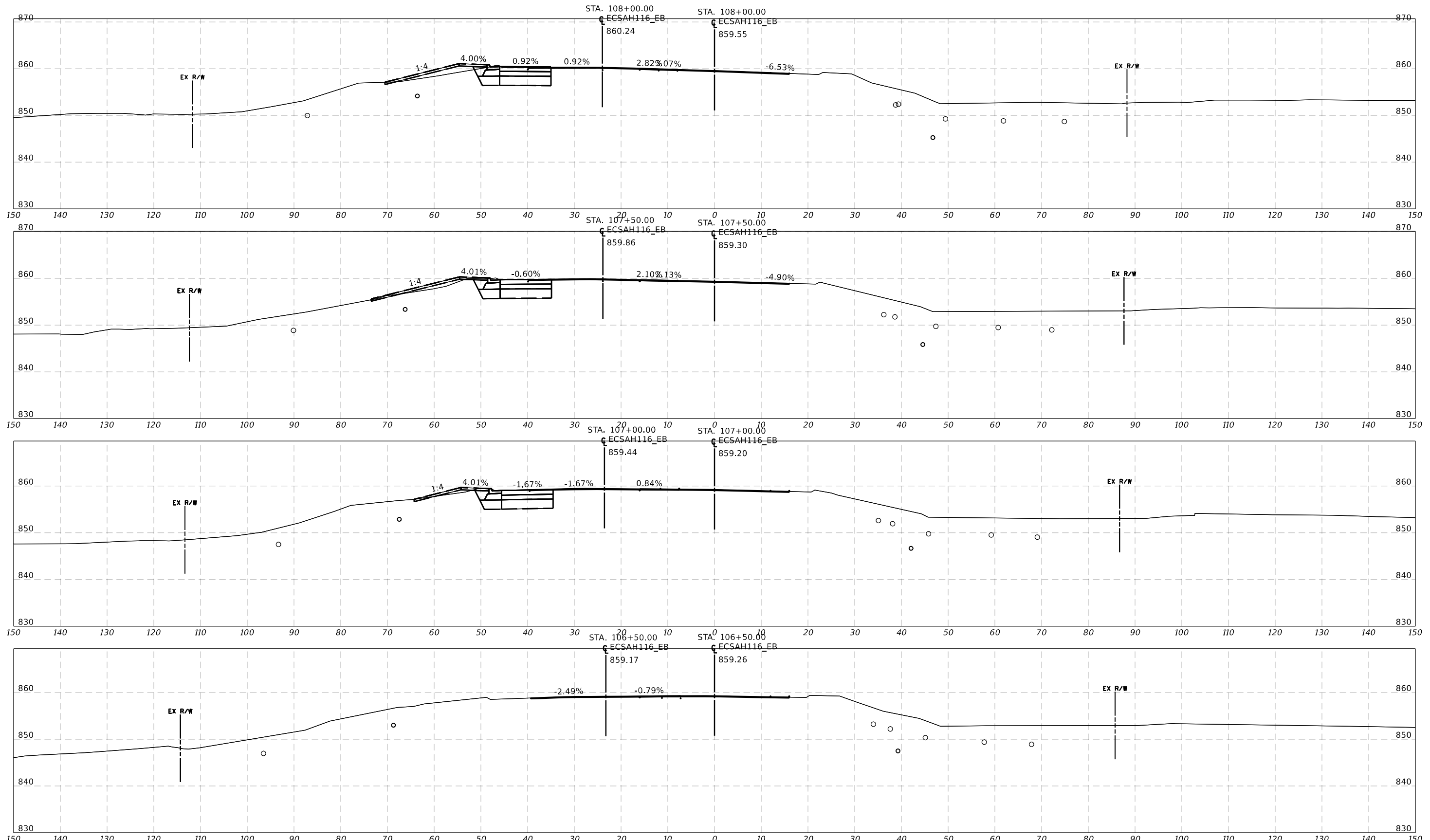
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MN

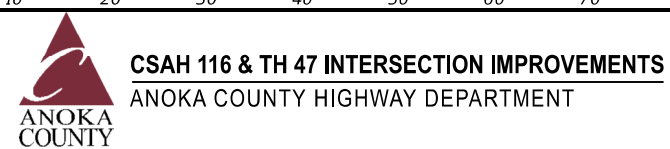
CSAH 116  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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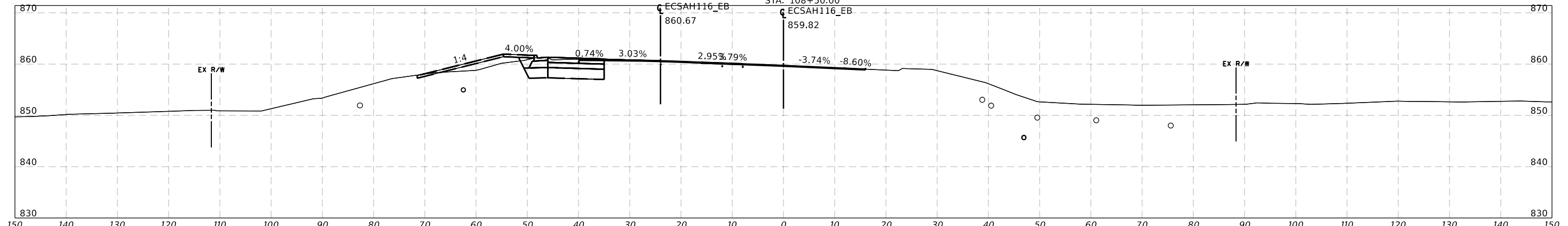
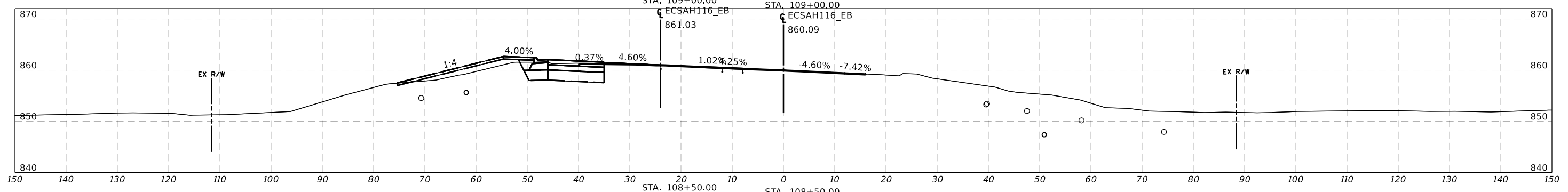
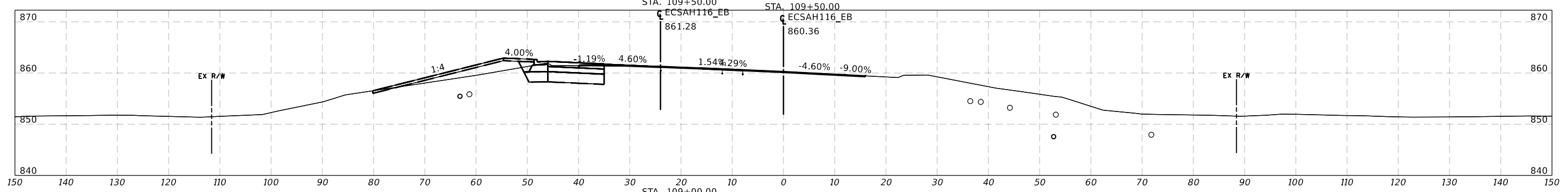
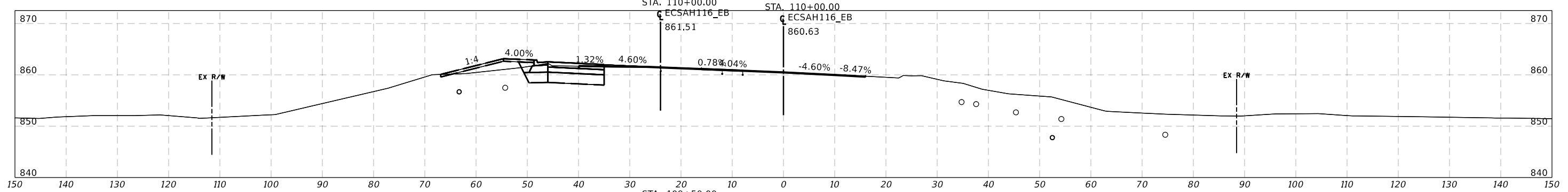
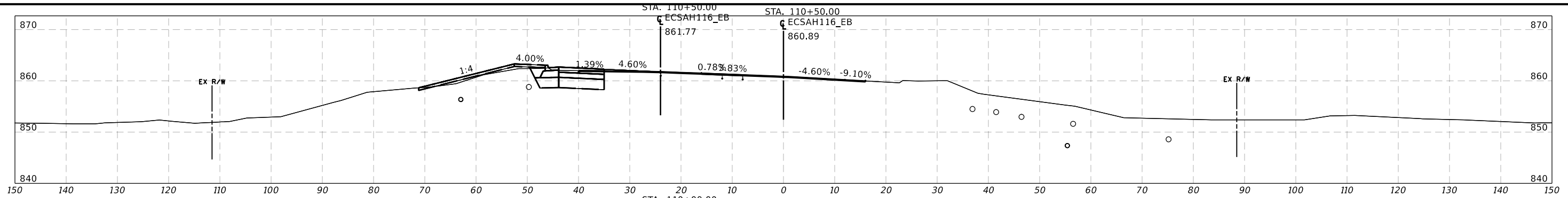
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ANOKA COUNTY, MN  
 CSAH 116  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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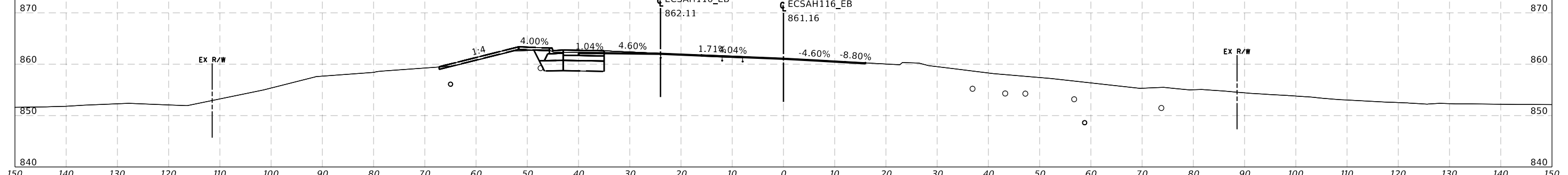
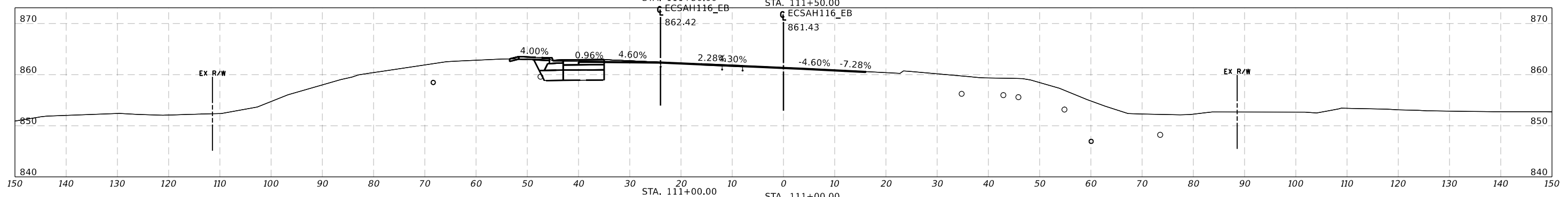
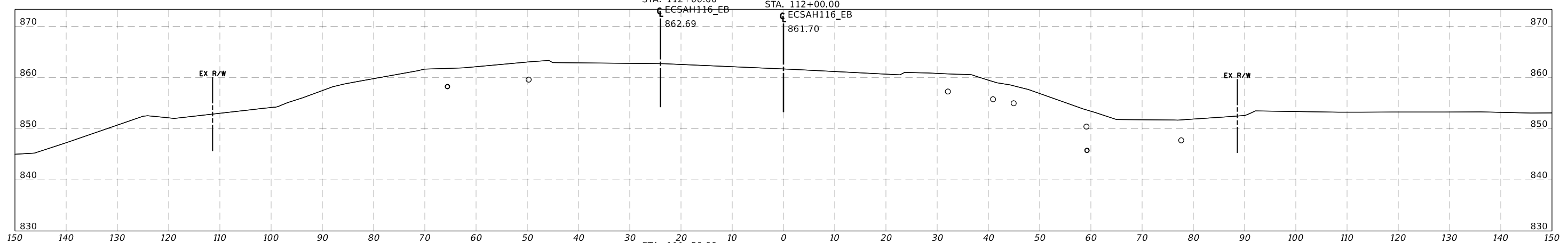
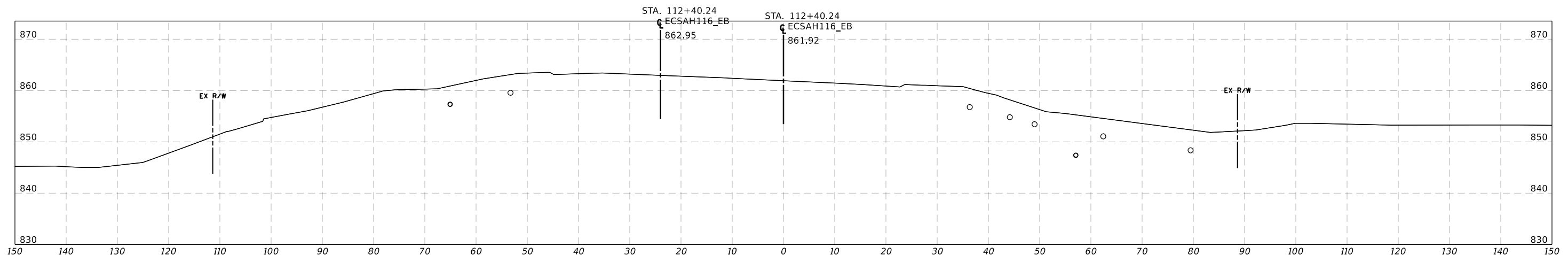


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 CSAH 116  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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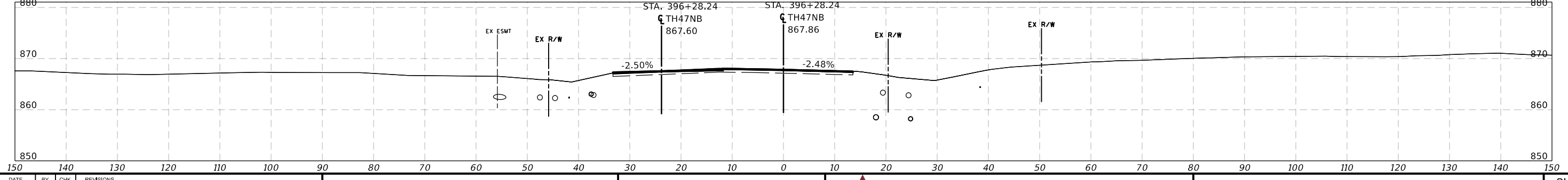
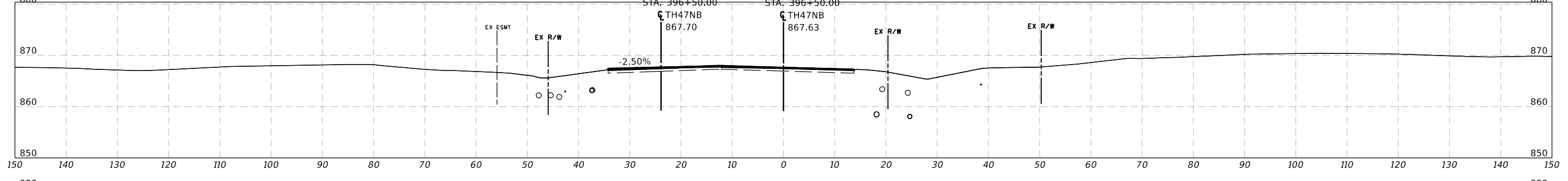
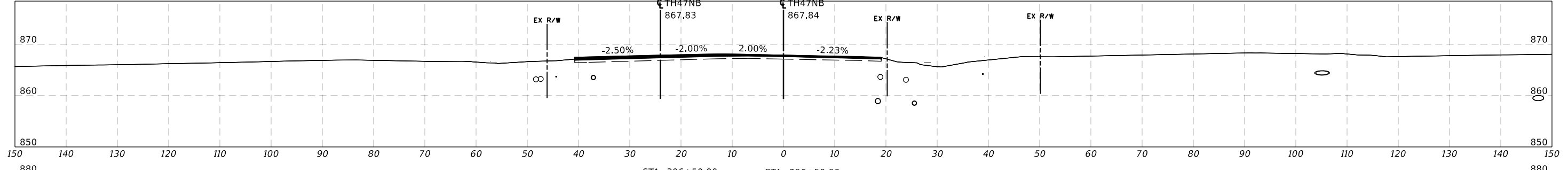
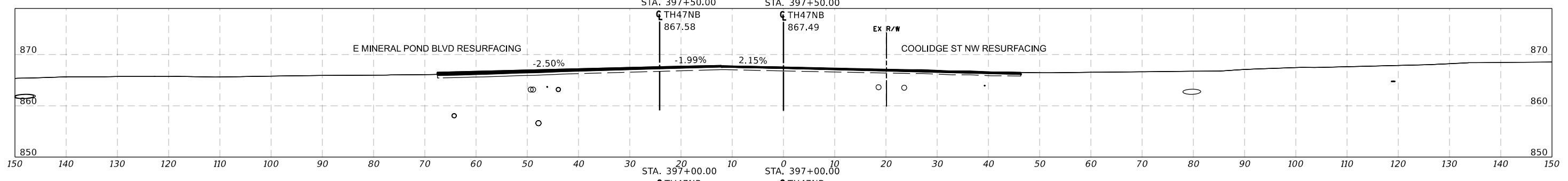
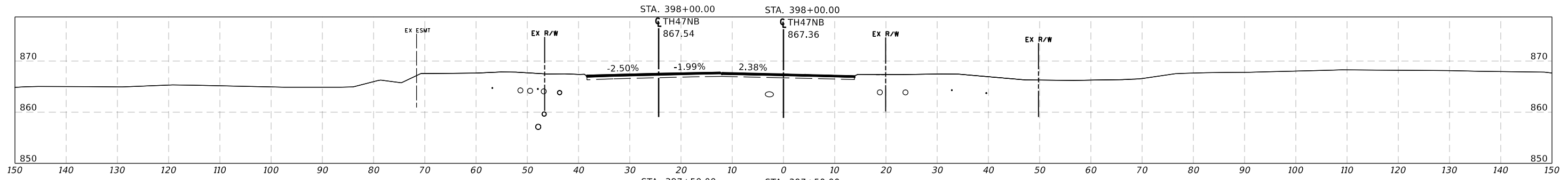
**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 CSAH 116  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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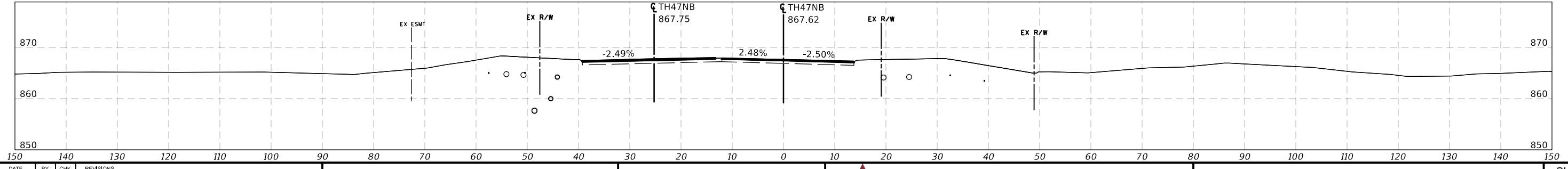
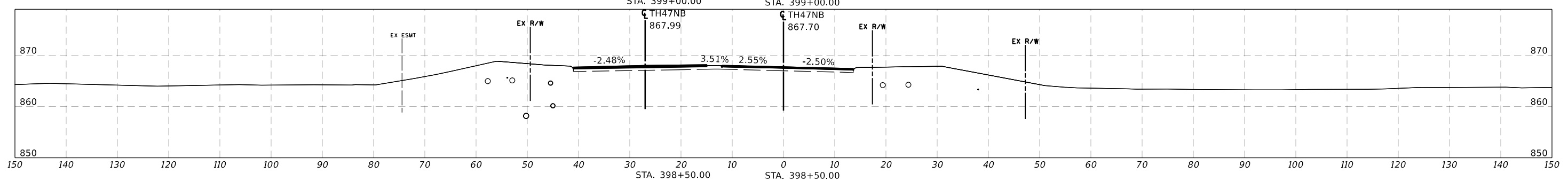
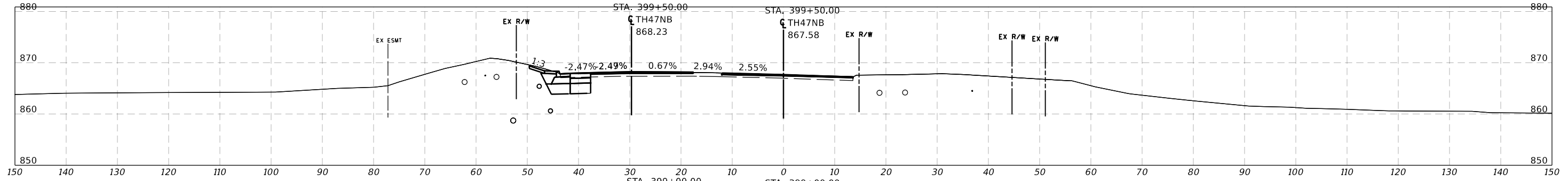
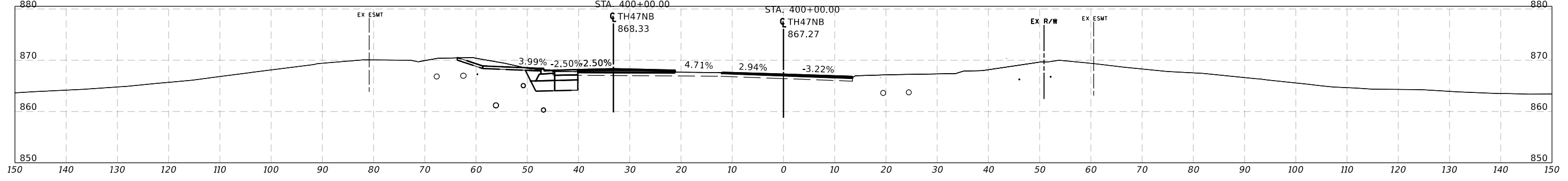
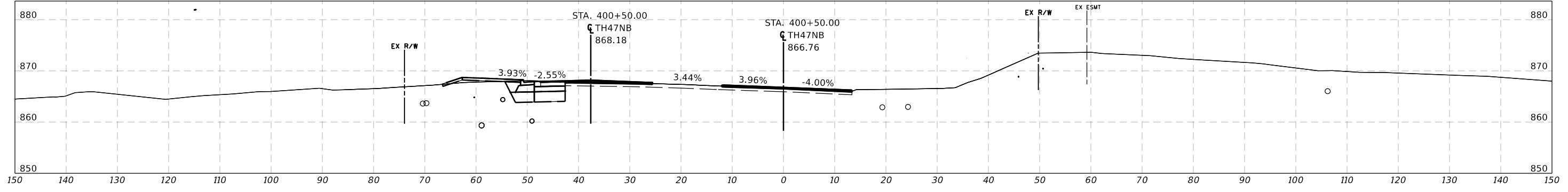


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 TRUNK HIGHWAY 47  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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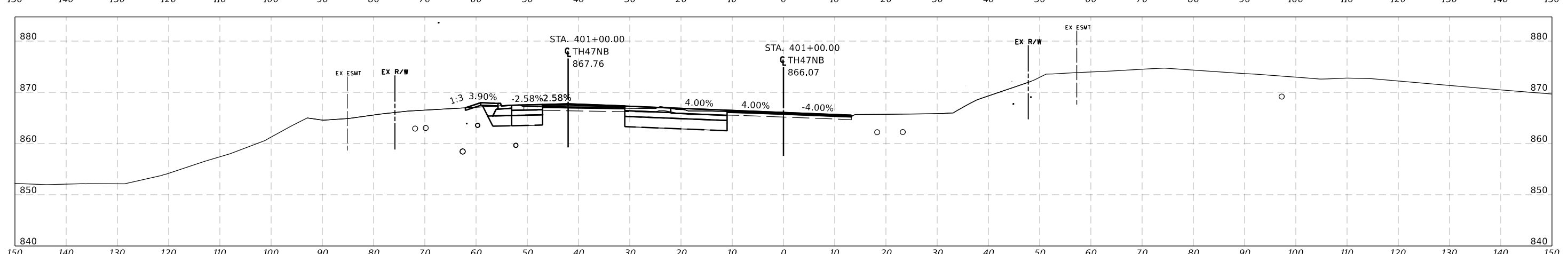
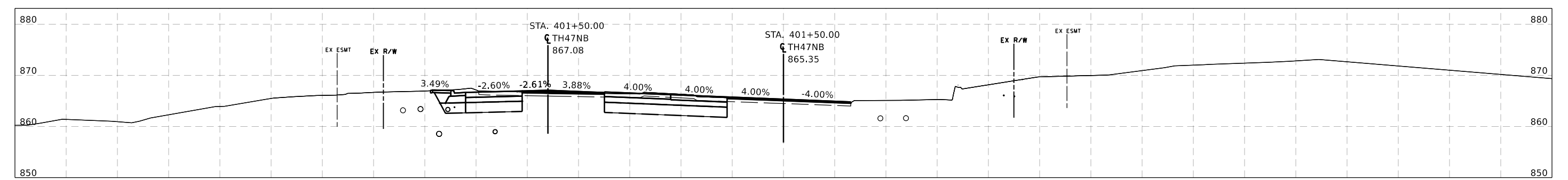
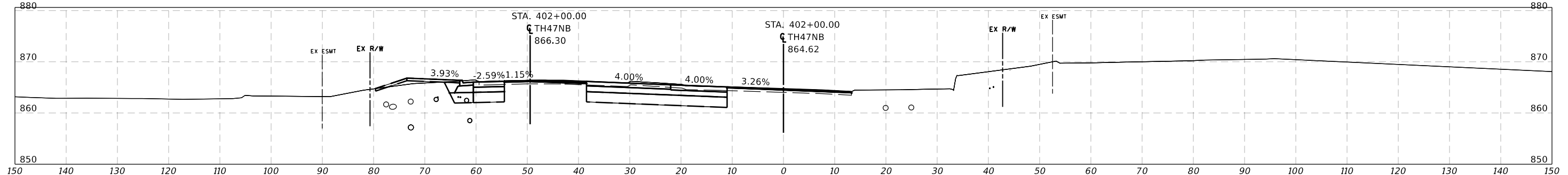
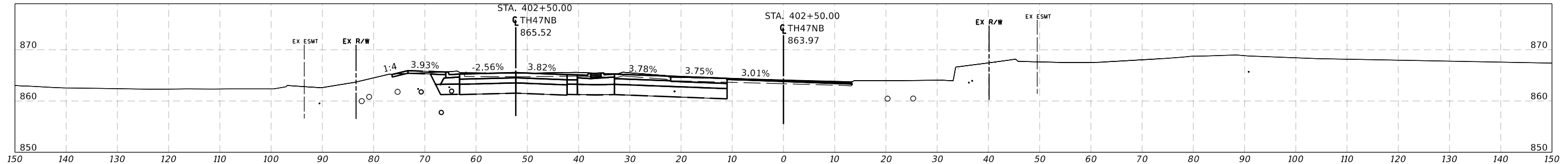
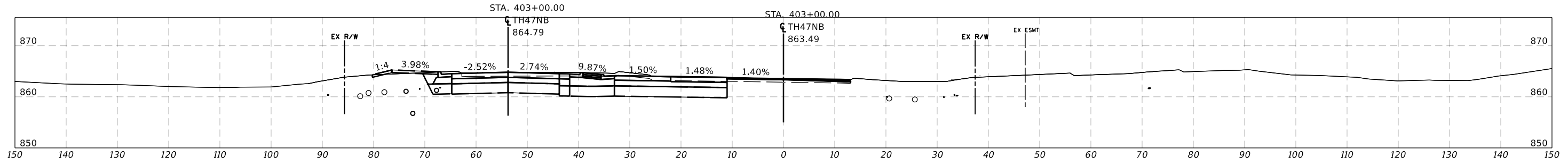


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 TRUNK HIGHWAY 47  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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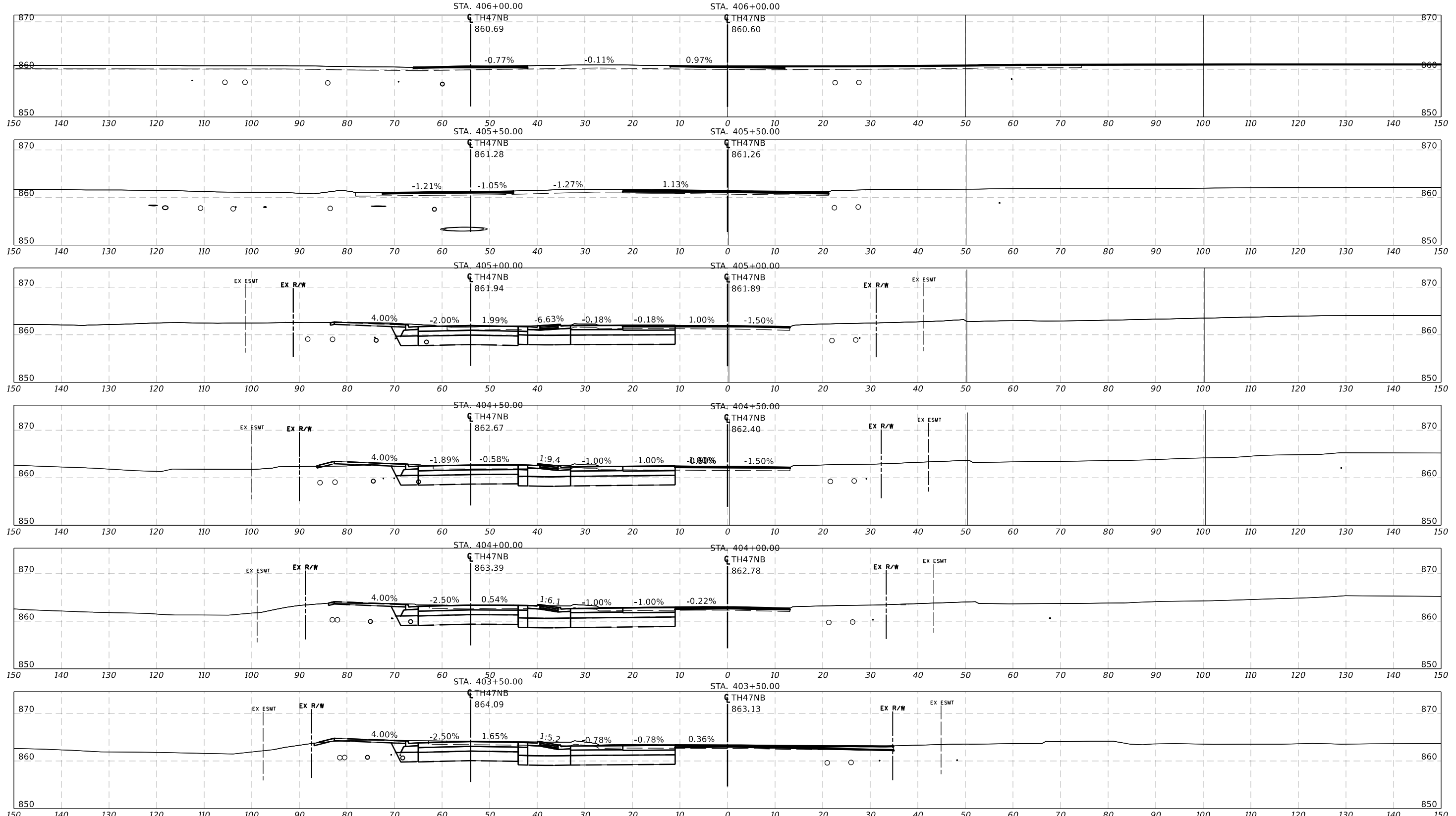


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 TRUNK HIGHWAY 47  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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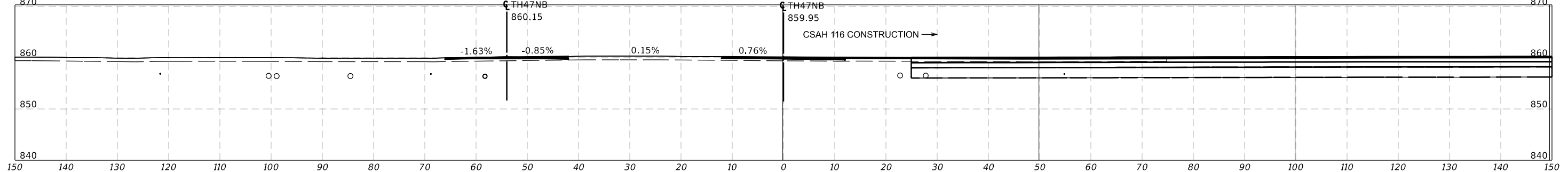
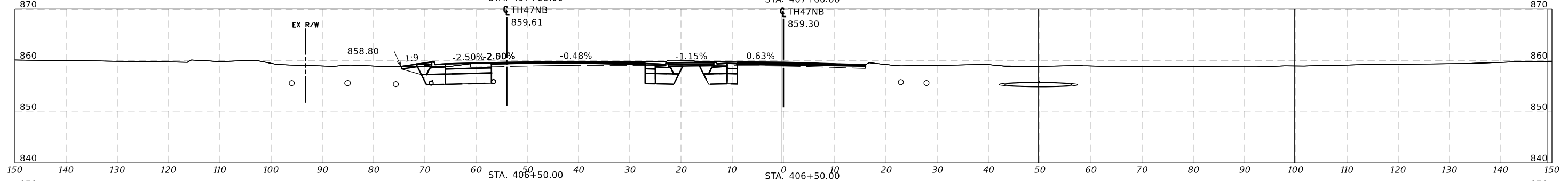
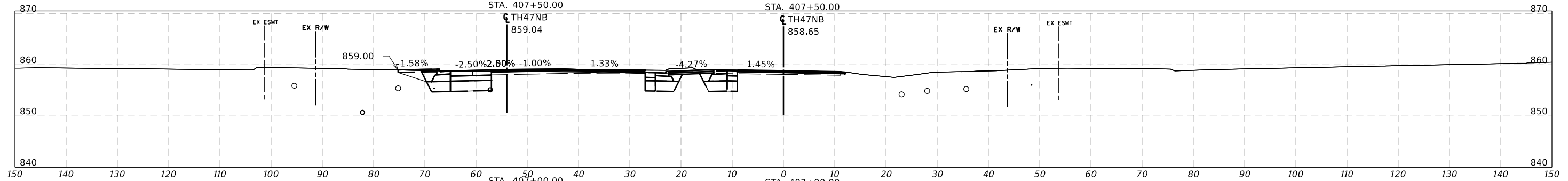
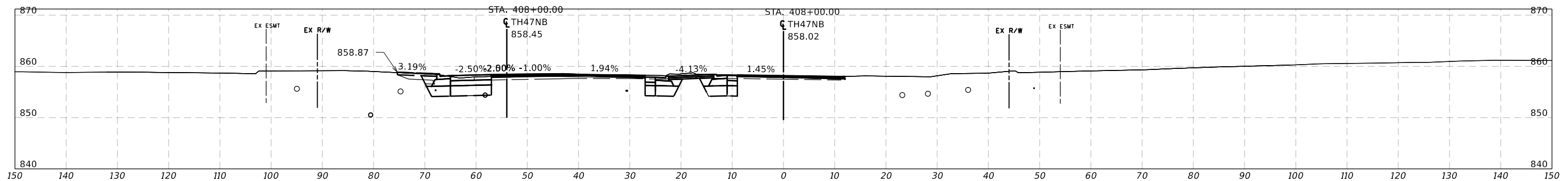
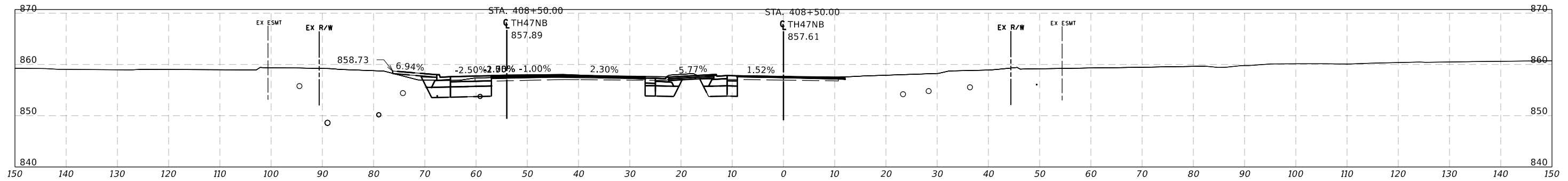
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**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

**ANOKA COUNTY, MN**  
 TRUNK HIGHWAY 47  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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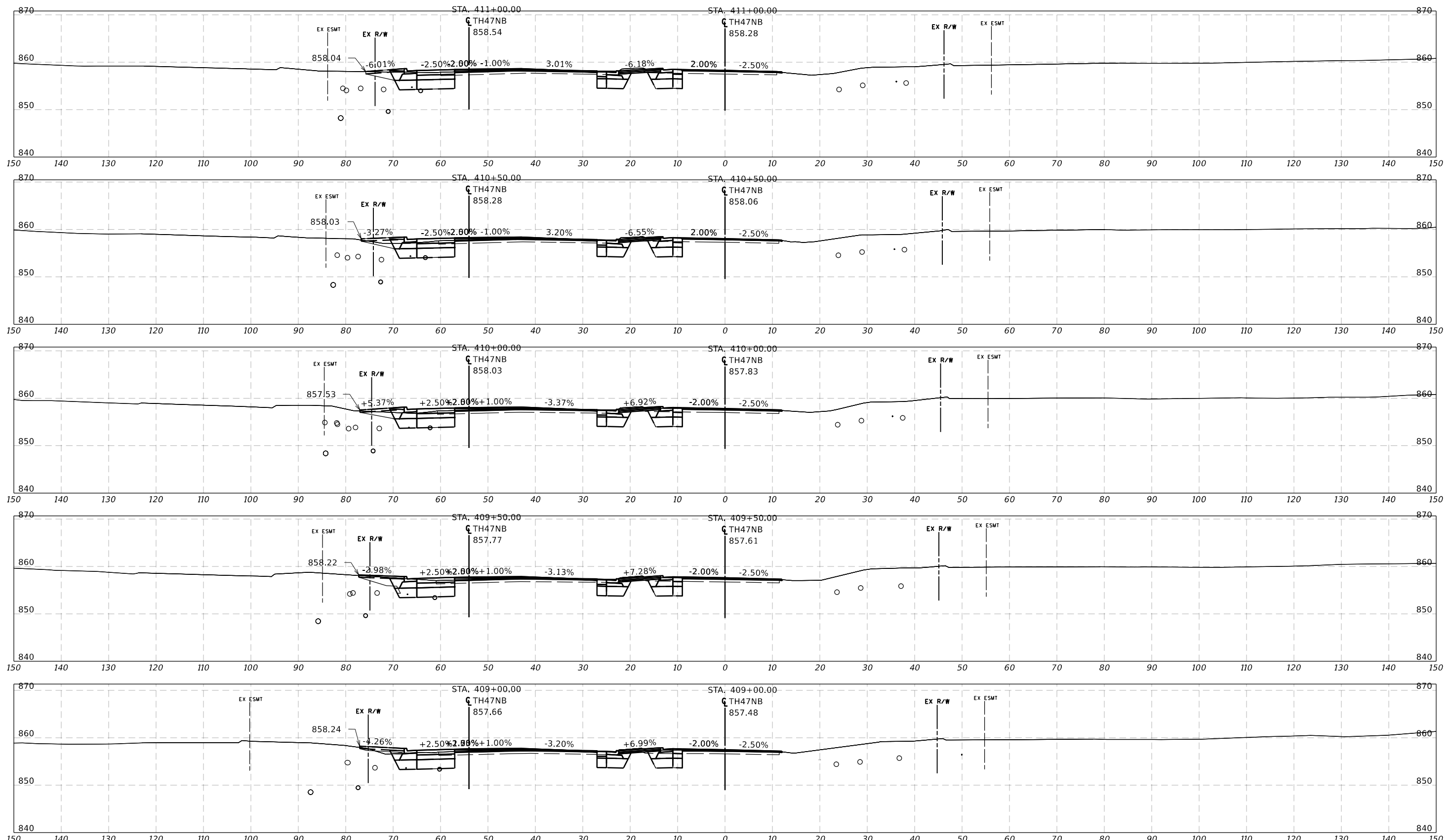


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
ANOKA COUNTY HIGHWAY DEPARTMENT

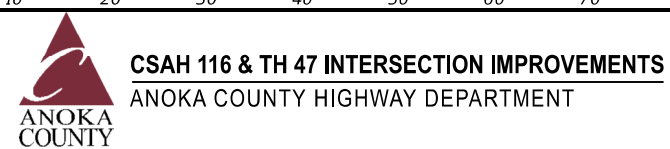
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TRUNK HIGHWAY 47  
CROSS SECTIONS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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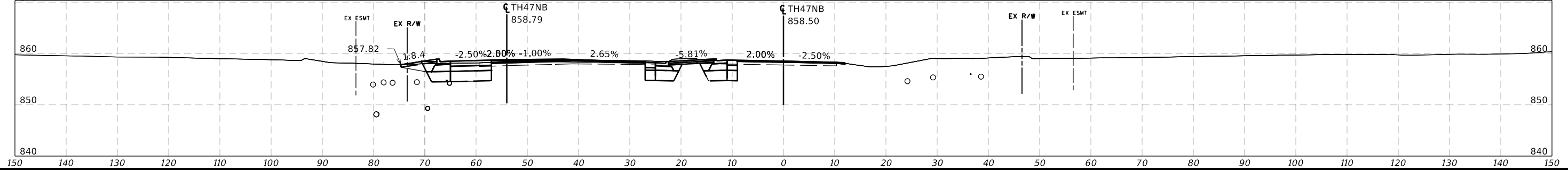
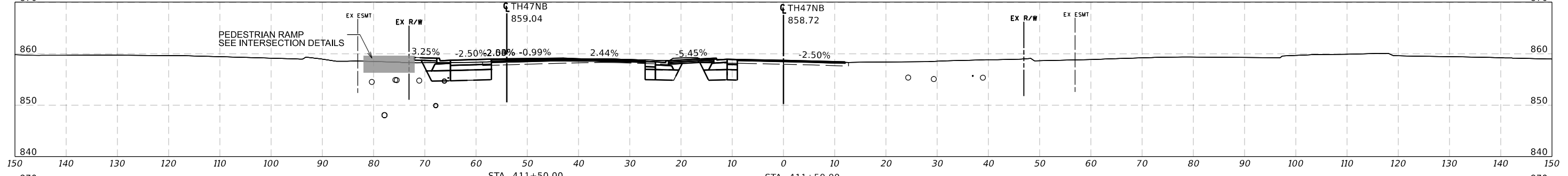
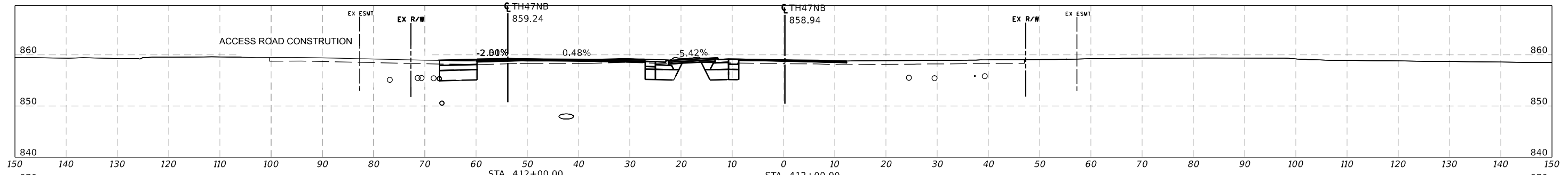
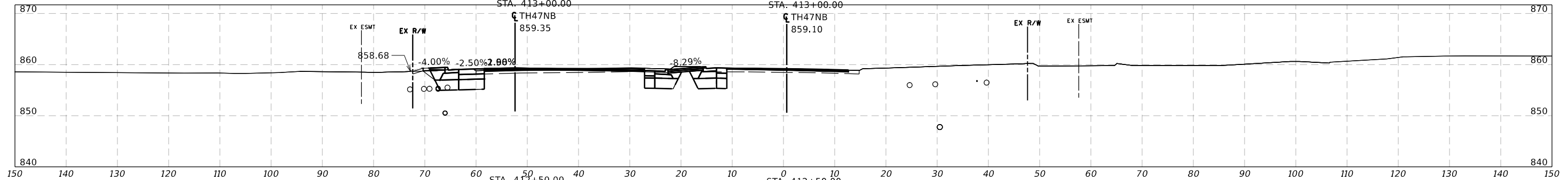
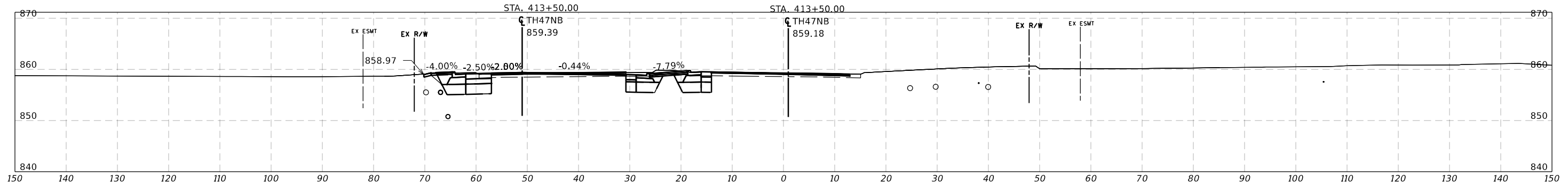
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ANOKA COUNTY, MN  
TRUNK HIGHWAY 47  
CROSS SECTIONS  
S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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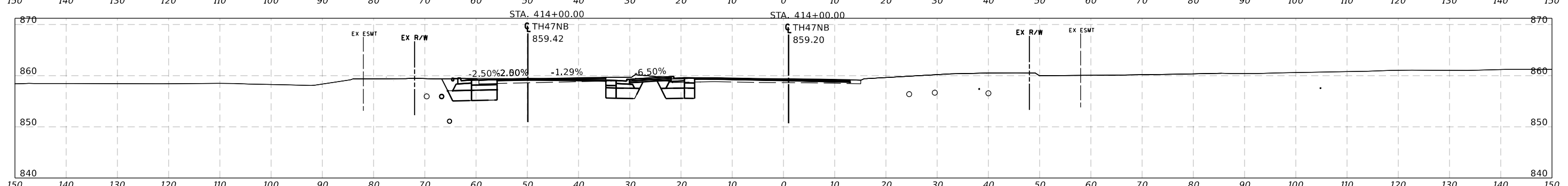
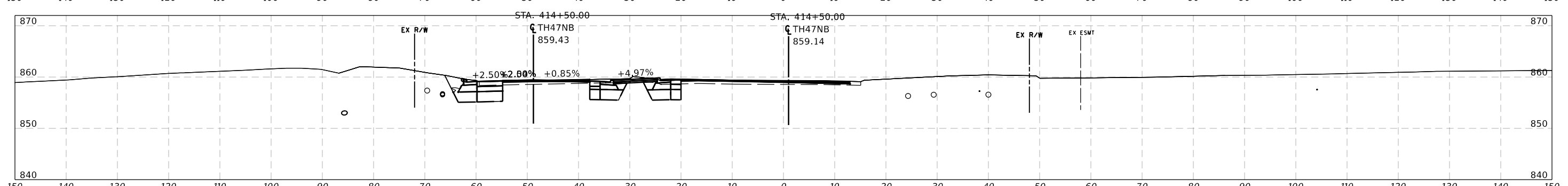
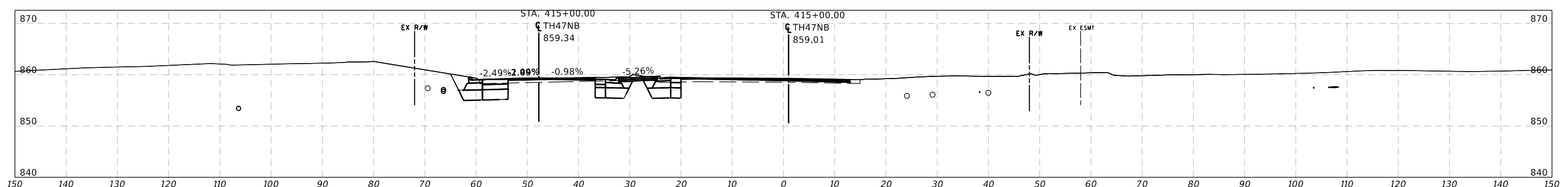
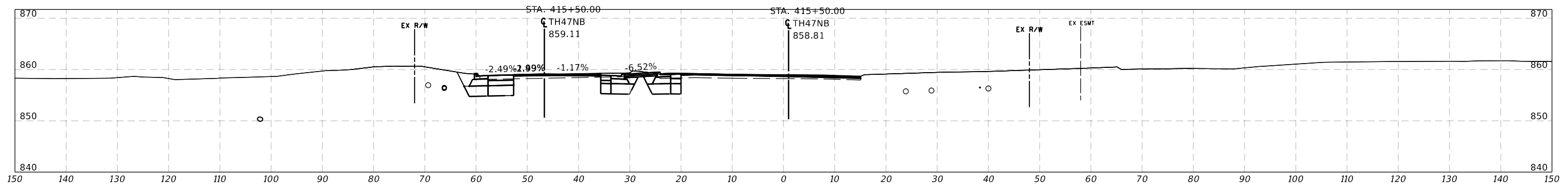
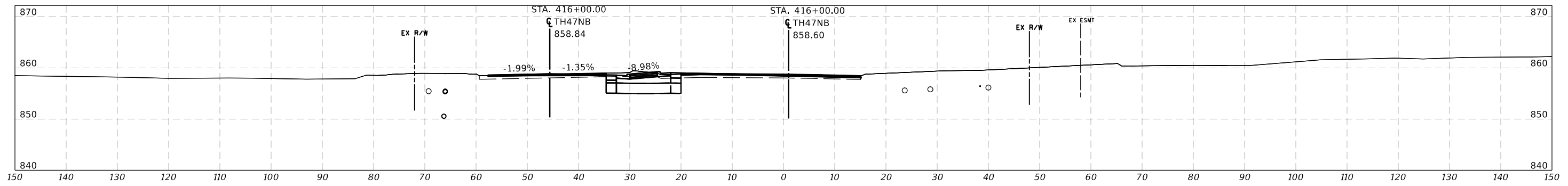


**CSAH 116 & TH 47 INTERSECTION IMPROVEMENTS**  
 ANOKA COUNTY HIGHWAY DEPARTMENT

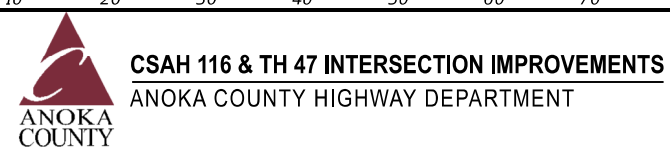
**ANOKA COUNTY, MN**  
 TRUNK HIGHWAY 47  
 CROSS SECTIONS  
 S.P. 0206-78 (TH 47), S.A.P. 002-716-020

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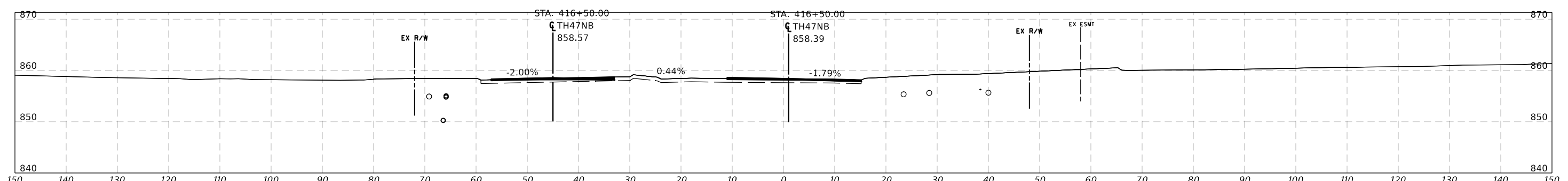
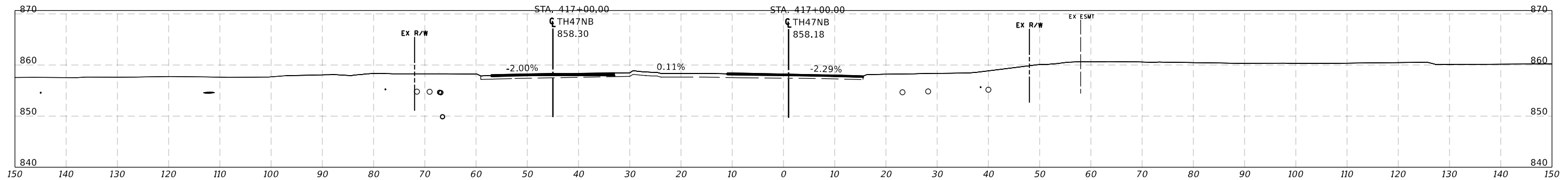
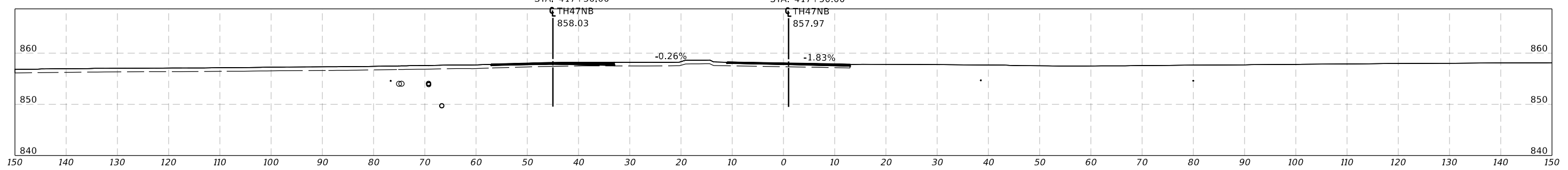
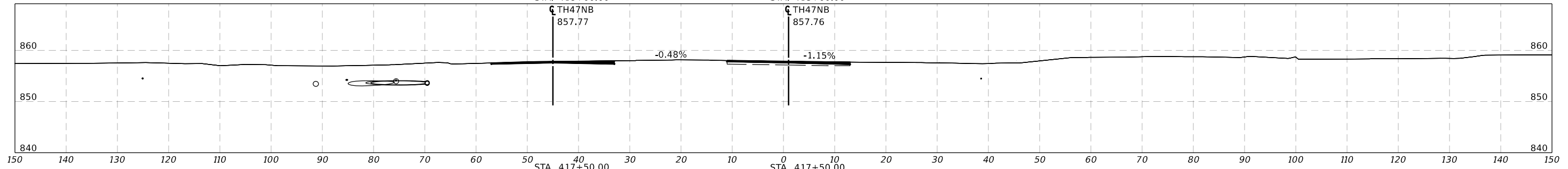
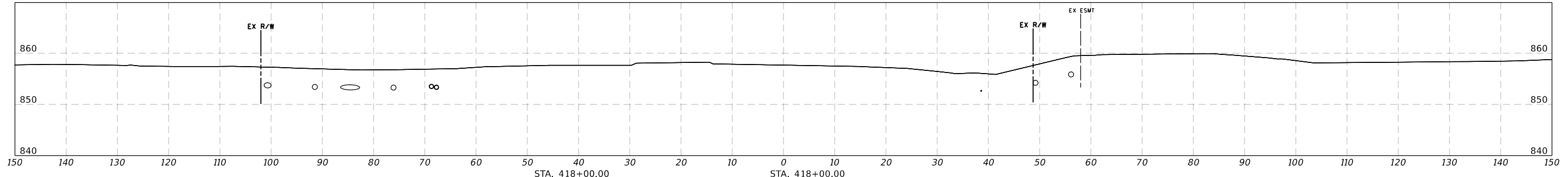


ANOKA COUNTY, MN  
 TRUNK HIGHWAY 47  
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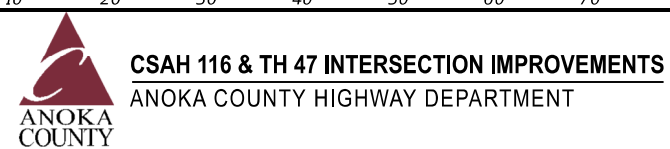
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**ANOKA COUNTY, MN**  
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