

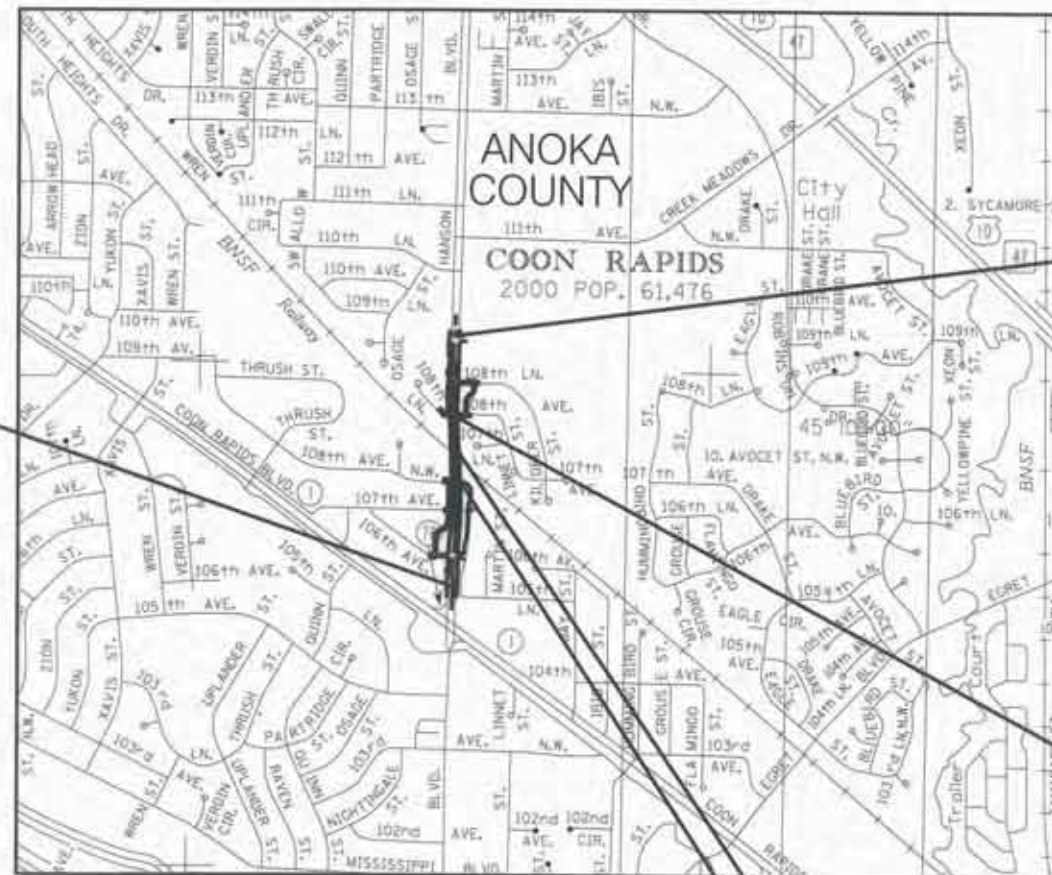
ANOKA COUNTY HIGHWAY DEPARTMENT

ANOKA COUNTY, MINNESOTA

CONSTRUCTION PLAN FOR GRADING, BITUMINOUS SURFACING, CURB AND GUTTER, DRAINAGE, RETAINING WALLS, SIGNALS, LIGHTING,
BRIDGE NO 02588, BRIDGE NO 02589 AND BRIDGE NO 02J49

LOCATED ON CSAH 78 FROM 300 FEET NORTH OF CSAH 1 TO 550 FEET NORTH OF 108TH LANE NW

STATE AID PROJECT NO 002-678-023
STATE AID PROJECT NO 114-020-051
GROSS LENGTH 2765.00 FEET 0.524 MILES
BRIDGES-LENGTH 212.17 FEET 0.040 MILES
EXCEPTIONS-LENGTH FEET MILES
NET LENGTH 2765.00 FEET 0.524 MILES
LENGTH AND DESCRIPTION BASED UPON (NB78)



BEGIN SAP 002-678-023
SAP 114-020-051
NB CSAH 78
STA 101+05.00

END SAP 002-678-023
SAP 114-020-051
NB CSAH 78
STA 128+70.00

BRIDGE NO 02588

BRIDGE NO 02589

BRIDGE NO 02J49

PROJECT LOCATION
COUNTY : ANOKA
DISTRICT : METRO

PLAN SYMBOLS

- STATE LINE
- COUNTY LINE
- TOWNSHIP OR RANGE LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- RIGHT-OF-WAY LINE
- PRESENT RIGHT-OF-WAY LINE
- CONTROL OF ACCESS LINE
- PROPERTY LINE (except Land Lines)
- VACATED PLATTED PROPERTY
- CORPORATE OR CITY LIMITS
- TRUNK HIGHWAY CENTER LINE
- CONC. RETAINING WALL
- RAILROAD
- RAILROAD RIGHT-OF-WAY LINE
- RIVER OR CREEK
- DRY RUN
- DRAINAGE DITCH
- DRAIN TILE
- CULVERT
- DROP INLET
- GUARD RAIL
- BARRIED WIRE FENCE
- WOVEN WIRE FENCE
- CHAIN LINK FENCE
- RAILROAD SNOW FENCE
- STONE WALL OR FENCE
- HEDGE
- RAILROAD CROSSING SIGN
- RAILROAD CROSSING BELL
- ELECTRIC WARNING SIGN
- CROSSING GATE
- WEAVER CORNER
- MAIL BOX
- SPRINGS
- MARSH
- TIMBER
- ORCHARD
- BRUSH
- NURSERY
- CATCH BASIN
- FIRE HYDRANT
- CATTLE GUARD
- OVERPASS (highway Over)
- UNDERPASS (highway Under)
- BRIDGE
- BUILDING (one Story Frame)
- F-FRAME D-CONCRETE
- S-STONE T-TILE
- B-BRICK ST-STUCCO
- IRON PIPE OR ROD
- WARRANTMENT (STONE, CONCRETE, OR METAL)
- ROCKEN HUB
- GRAVEL PIT
- SAND PIT
- BURNED PIT
- ROCK QUARRY

UTILITY SYMBOLS

- POWER POLE LINE
- TELEPHONE OR TELEGRAPH POLE LINE
- JOINT TELEPHONE AND POWER ON POWER POLES
- JOINT TELEPHONE AND POWER ON TELEPHONE POLES
- ANCHOR
- STEEL TOWER
- STREET LIGHT
- PEDESTAL TELEPHONE CABLE TERMINAL
- GAS MAIN
- WATER MAIN
- CONDUIT
- TELEPHONE CABLE IN CONDUIT
- ELECTRIC CABLE IN CONDUIT
- TELEPHONE MANHOLE
- ELECTRIC MANHOLE
- BURIED TELEPHONE CABLE
- BURIED ELECTRIC CABLE
- AERIAL TELEPHONE CABLE
- SEWER (SANITARY)
- SEWER (STORM)
- SEWER MANHOLE
- HANDHOLE

DESIGN DESIGNATION FOR:

R-VALUE 50
ADT (Current Year) 2017 = 13,073
ADT (Future Year) 2037 = 16,807
PAVEMENT DESIGN 10 TON
FUNCTIONAL CLASSIFICATION A MINOR ARTERIAL
NO. OF TRAFFIC LANES 4
NO. OF PARKING LANES 0
ESALS (20) 990,000 (20 YRS.)
Design Speed 40 MPH
Based on Sight Distance STOPPING
Height of eye / Height of Object 3.5' / 2.0'
Design Speed not achieved at: N/A

DESIGN DESIGNATION FOR:

SE TRAIL
Design Speed 20 MPH
Based on Sight Distance STOPPING
Height of eye / Height of Object 4.5' / 0.0'
Design Speed not achieved at: N/A

CSAH 78

R-VALUE 50
ADT (Current Year) 2017 = 13,073
ADT (Future Year) 2037 = 16,807
PAVEMENT DESIGN 10 TON
FUNCTIONAL CLASSIFICATION A MINOR ARTERIAL
NO. OF TRAFFIC LANES 4
NO. OF PARKING LANES 0
ESALS (20) 990,000 (20 YRS.)
Design Speed 40 MPH
Based on Sight Distance STOPPING
Height of eye / Height of Object 3.5' / 2.0'
Design Speed not achieved at: N/A

SE TRAIL

Design Speed 20 MPH
Based on Sight Distance STOPPING
Height of eye / Height of Object 4.5' / 0.0'
Design Speed not achieved at: N/A

PLAN REVISIONS

DATE	SHEET NO.	APPROVED BY

SCALE

INDEX MAP	1000'
GENERAL LAYOUT	150'
PLAN	50'
PROFILE	50' HORIZ 5' VERT
X-SECTION	10' HORIZ 10' VERT

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

SIGNATURE _____
DATE _____ LIC NO _____ PRINT NAME _____

FED PROJ NO STATE FUNDS

GOVERNING SPECIFICATIONS

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION 'STANDARD SPECIFICATIONS FOR CONSTRUCTION' SHALL GOVERN.

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE PLACED IN ACCORDANCE TO THE 'MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES' (MN MUTCD) AND PART VI, 'FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS'.

INDEX

SHEET NO.	SHEET DESCRIPTION
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2	GENERAL LAYOUT
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8	STANDARD PLATES AND INDEX OF TABULATIONS
9	CONSTRUCTION AND SOILS NOTES
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13-24	INPLACE UTILITY TABULATIONS
25-27	TABULATIONS
28-30	PROPOSED SANITARY AND WATER MAIN PLANS
31-60	STANDARD PLAN SHEETS
61-65	MISCELLANEOUS DETAILS
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101-107	PROFILES
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128-130	EROSION CONTROL AND TURF ESTABLISHMENT PLANS
131-136	PAVEMENT MARKING PLANS AND DETAILS
137-144	LIGHTING PLANS AND DETAILS
145-147	SIGNING REMOVAL PLANS
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155-172	TRAFFIC SIGNAL AND INTERCONNECT PLANS
173-174	CONTOUR PLANS
175	CROSS SECTION MATCHLINE LAYOUT PLAN
X1-X48	CROSS SECTIONS
W1-W36	MSE RETAINING WALL PLANS
BA1-BA14	BRIDGE 02J49 PLANS
BB1-BB42	BRIDGE 02588 PLANS
BC1-BC42	BRIDGE 02589 PLANS

THIS PLAN CONTAINS 357 SHEETS



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

SIGNATURE *Ben Robeck*
DATE 7/12/2017 LIC NO 53680 PRINT NAME BENJAMIN P ROBECK

APPROVED *[Signature]* 8/29/17
ANOKA COUNTY ENGINEER

APPROVED *[Signature]* 9/8/17
CITY ENGINEER, CITY OF COON RAPIDS

APPROVED *[Signature]* 12/4/17
DISTRICT STATE AID ENGINEER REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY

APPROVED *[Signature]* 12/4/17
APPROVED FOR STATE AID FUNDING STATE AID ENGINEER

FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL
STATE PROJ NO CHARGE IDENTIFIER

THIS PLAN AND/OR SPECIFICATION WAS PREPARED SPECIFICALLY FOR THIS PROJECT, AND ANY RE-USE OF DETAILS OR SPECIFICATIONS ON OTHER PROJECTS IS NOT INTENDED OR AUTHORIZED BY THE DESIGNER. LIABILITY FOR ANY RE-USE ON OTHER PROJECTS IS THE RESPONSIBILITY OF THE PERSON, AGENCY, OR CORPORATION USING PLAN OR SPECIFICATION DATA FROM THIS PROJECT.

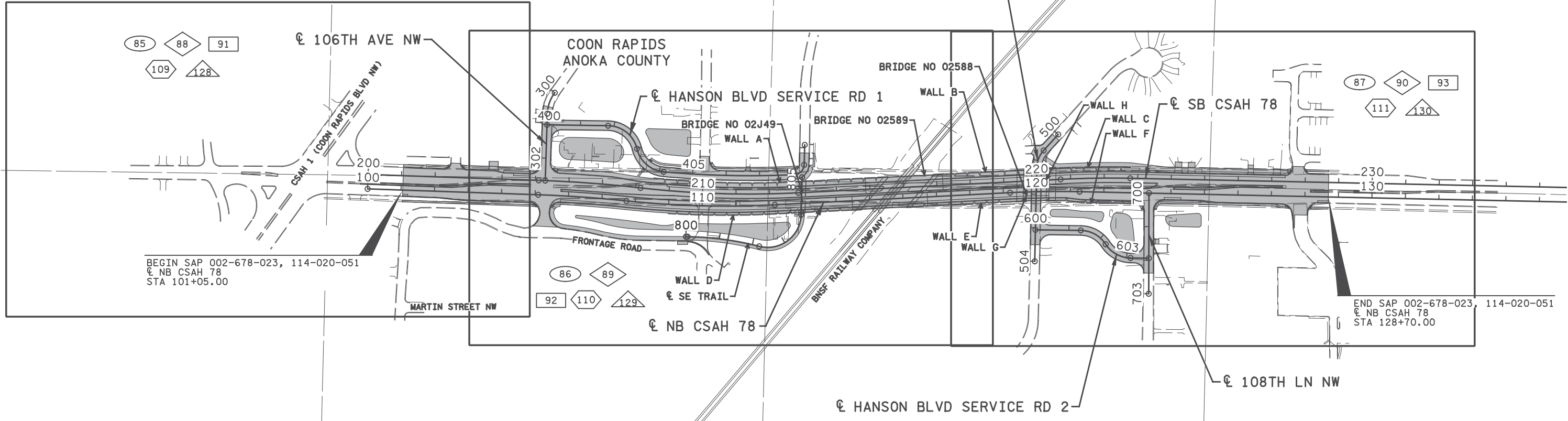
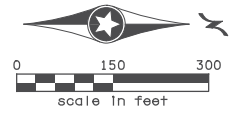
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO GUIDELINES OF CI/ASCE 38-02, ENTITLED 'STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA'.

SAP 002-678-023
SAP 114-020-051

SHEET NO. 1 OF 175 SHEETS

LEGEND

- (XXX) TOPOGRAPHY AND UTILITY PLAN SHEET NO
- ◇(XXX) REMOVAL PLAN SHEET NO
- (XXX) CONSTRUCTION PLAN SHEET NO
- ◇(XXX) DRAINAGE AND SUPERELEVATION PLAN SHEET NO
- △(XXX) EROSION CONTROL AND TURF ESTABLISHMENT PLAN SHEET NO
- INPLACE ROADWAY
- █ PROPOSED CONSTRUCTION



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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date 7/12/2017 License # 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG

DESIGNED BY
T. SMITH

CHECKED BY
B. ROBECK

COMM. NO. 0169140

SRE ENGINEERS
PLANNERS
DESIGNERS

Consulting Group, Inc.

ANOKA COUNTY
GENERAL LAYOUT
CSAH 78 - BNSF GRADE SEPARATION

SHEET
2
OF
175

STATEMENT OF ESTIMATED QUANTITIES

NOTES	TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	① ANOKA COUNTY SAP 002-678-023, 114-020-051		NON - PARTICIPATING	TOTAL ESTIMATED QUANTITIES
						ROADWAY	STORM		
			2011.601	VIBRATION MONITORING	LUMP SUM	1			1
			2021.501	MOBILIZATION	LUMP SUM	1			1
			2031.501	FIELD OFFICE TYPE D	EACH	1			1
(1)			2031.503	FIELD LABORATORY TYPE DX	EACH	1			1
(1)			2051.501	MAINT & RESTORATION OF HAUL ROADS	LUMP SUM	1			1
(1)	L	25R	2101.501	CLEARING	ACRE	1.8			1.8
(1)	L	25R	2101.506	GRUBBING	ACRE	1.8			1.8
(1)	M	25R	2102.502	PAVEMENT MARKING REMOVAL	SQ FT	62			62
(1)	M	25R	2102.502	PAVEMENT MARKING REMOVAL	LIN FT	7310			7310
	K	22-24R	2104.501	REMOVE WATER MAIN	LIN FT	3113			3113
	I	17-19	2104.501	REMOVE SEWER PIPE (STORM)	LIN FT	3450			3450
	J	20-21	2104.501	REMOVE SEWER PIPE (SANITARY)	LIN FT	2784			2784
	W	117-120	2104.501	REMOVE PIPE SEWERS	LIN FT	365			365
	M	25R	2104.501	REMOVE CURB & GUTTER	LIN FT	12530			12530
	M	25R	2104.501	REMOVE RETAINING WALL	LIN FT	70			70
	M	25R	2104.501	REMOVE NON-METALLIC CONDUIT	LIN FT	2860			2860
	M	25R	2104.503	REMOVE CONCRETE WALK	SQ FT	26630			26630
	M	25R	2104.503	REMOVE CONCRETE DRIVEWAY PAVEMENT	SQ FT	2340			2340
	M	25R	2104.503	REMOVE CONCRETE MEDIAN	SQ FT	11260			11260
(1)	M	25R	2104.503	REMOVE BITUMINOUS DRIVEWAY PAVEMENT	SQ FT	1480			1480
(1)	M	25R	2104.505	REMOVE BITUMINOUS PAVEMENT	SQ YD	32035			32035
	M	25R	2104.509	REMOVE LIGHTING UNIT	EACH	9			9
	J	20-21	2104.509	REMOVE MANHOLE	EACH	12			12
	K	22-24R	2104.509	REMOVE HYDRANT	EACH	3			3
	I	17-19	2104.509	REMOVE DRAINAGE STRUCTURE	EACH	52			52
	M	25R	2104.509	REMOVE MARKER	EACH	28			28
	M	25R	2104.509	REMOVE SIGN TYPE C	EACH	121			121
	M	25R	2104.509	REMOVE SIGN TYPE SPECIAL	EACH	8			8
	M	25R	2104.509	REMOVE LIGHT FOUNDATION	EACH	9			9
	M	25R	2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LIN FT	30			30
	M	25R	2104.513	SAWING BIT PAVEMENT (FULL DEPTH)	LIN FT	1555			1555
	Z	151R	2104.523	SALVAGE SIGN TYPE C	EACH	5			5
(1)	A	10R	2105.607	COMMON BORROW SPECIAL (CV)	CU YD	1645			1645
(1)	A	10R	2106.501	EXCAVATION - COMMON (P)	CU YD	36501			36501
(1)	A, GG, HH	10, BA2, W1	2106.521	GRANULAR EMBANKMENT (CV) (P)	CU YD	52346			52346
(1)	A	10R	2106.523	COMMON EMBANKMENT (CV) (P)	CU YD	4532			4532
(1)	A	10R	2106.607	SELECT GRANULAR EMBANKMENT MOD (CV) (P)	CU YD	658			658
(2)			2112.501	SUBGRADE PREPARATION (P)	ROAD STA	39.1			39.1
	N	26R	2211.503	AGGREGATE BASE (CV) CLASS 5 (P)	CU YD	9690			9690
	N	26R	2357.502	BITUMINOUS MATERIAL FOR TACK COAT (P)	GAL	3620			3620
(1)	N	26R	2360.501	TYPE SP 12.5 WEARING COURSE MIX (2,C)	TON	1385			1385
(1)	N	26R	2360.501	TYPE SP 12.5 WEARING COURSE MIX (3,F)	TON	5310			5310
(1)	N	26R	2360.502	TYPE SP 12.5 NON WEAR COURSE MIX (3,B)	TON	4295			4295
ⓑ	FF, GG	BB2, BA2	2401.501	STRUCTURAL CONCRETE (1G52) (P)	CU YD	233			233
ⓑ	EE	BC2	2401.501	STRUCTURAL CONCRETE (1G52) (BR NO 02589) (P)	CU YD	1122			1122
ⓑ	FF, GG, HH	BB2, BA2, W1	2401.501	STRUCTURAL CONCRETE (3B52) (P)	CU YD	1327			1327
ⓑ	EE	BC2	2401.501	STRUCTURAL CONCRETE (3B52) (BR NO 02589) (P)	CU YD	2171			2171
ⓑ	EE, FF, HH	BC2, BB2, W1	2401.513	TYPE MOD P-1 BARRIER CONC (3S52) (P)	LIN FT	2817			2817
ⓑ	EE, FF	BC2, BB2	2401.515	SIDEWALK CONCRETE (3S52) (P)	SQ FT	6952			6952
ⓑ	EE, FF	BC2, BB2	2401.516	RAISED MEDIAN CONCRETE (3S52) (P)	SQ FT	940			940

NOTES:

- (P) PLAN QUANTITY
- (1) SEE SPECIAL PROVISIONS
- (2) SEE TYPICAL SECTIONS, PROFILES, AND CROSS SECTIONS FOR LOCATIONS.
ROAD STATION SHALL INCLUDE FULL WIDTH OF ROADWAY AND ADJACENT WALKS AND TRAILS.

- ① ROADWAY:
10% ANOKA COUNTY
5% CITY OF COON RAPIDS
5% BNSF
30% CTIB
50% LRIP
- ⓑ BRIDGE:
95% ANOKA COUNTY
5% BNSF

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
2	1/12/2018	BR	CT	BR	ADDENDUM 3 - REVISED PAY ITEM FOR REMOVE BITUMINOUS PAVMENT
NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG
 DESIGNED BY
T. SMITH
 CHECKED BY
B. ROBECK
 COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
STATEMENT OF ESTIMATED QUANTITIES
CSAH 78 - BNSF GRADE SEPARATION

SHEET
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OF
175

STATEMENT OF ESTIMATED QUANTITIES

NOTES	TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	ANOKA COUNTY		NON - PARTICIPATING	TOTAL ESTIMATED QUANTITIES
						SAP 002-678-023, 114-020-051	ROADWAY		
	EE, FF, GG	BC2, BB2, BA2	2401.541	REINFORCEMENT BARS (P)	POUND	167630			167630
	EE, FF, GG, HH	BC2, BB2, BA2, W1	2401.541	REINFORCEMENT BARS (EPOXY COATED) (P)	POUND	591770			591770
	FF	BB2	2401.541	REINFORCEMENT BARS (STAINLESS-60KSI) (P)	POUND	950			950
	GG	BA2	2401.601	STRUCTURE EXCAVATION (BR NO 02J49)	LUMP SUM	1			1
	FF	BB2	2401.601	STRUCTURE EXCAVATION (BR NO 02588)	LUMP SUM	1			1
	EE	BC2	2401.601	STRUCTURE EXCAVATION (BR NO 02589)	LUMP SUM	1			1
	EE, FF	BC2, BB2	2401.618	BRIDGE SLAB CONCRETE (3YHPC-S) (P)	SQ FT	19722			19722
	FF, HH	BB2, W1	2402.583	ORNAMENTAL METAL RAILING	LIN FT	2445			2445
	EE	BC2	2402.583	ORNAMENTAL METAL RAILING TYPE SPECIAL 1 (P)	LIN FT	374			374
	EE	BC2	2402.591	EXPANSION JOINT DEVICES TYPE 5 (P)	LIN FT	254			254
	EE, FF	BC2, BB2	2402.595	BEARING ASSEMBLY	EACH	58			58
	EE, FF	BC2, BB2	2404.501	CONCRETE WEARING COURSE (3U17A) (P)	SQ FT	23383			23383
	FF	BB2	2405.502	PRESTRESSED CONCRETE BEAMS 27M (P)	LIN FT	1108			1108
	EE	BC2	2405.502	PRESTRESSED CONCRETE BEAMS MN54 (P)	LIN FT	1824			1824
	EE	BC2	2405.511	DIAPHRAGMS FOR TYPE MN54 PREST BEAMS (P)	LIN FT	175			175
	P	26R	2406.531	EXPANSION JOINTS, DESIGN E8H	LIN FT	360			360
(1)	P	26R	2406.553	BRIDGE APPROACH PANELS (P)	SQ YD	1360			1360
	A	10R	2411.511	STRUCTURE EXCAVATION CLASS U (P)	CU YD	5116			5116
	HH	W1	2411.604	MECHANICALLY STABILIZED EARTH WALL	SQ YD	5242			5242
	EE, FF, GG, HH	BC2, BB2, BA2, W1	2411.618	ANTI-GRAFFITI COATING (P)	SQ FT	24923			24923
	HH	BA2, W1	2411.618	SPECIAL SURFACE FINISH (P)	SQ FT	24073			24073
	EE, FF, HH	BC2, BB2, W1	2411.618	ARCH SURFACE FINISH (SINGLE COLOR) (P)	SQ FT	38131			38131
	EE, FF, HH	BC2, BB2, W1	2411.618	ARCH CONC TEXTURE (ASHLAR STONE) (P)	SQ FT	38131			38131
	GG	BA2	2412.511	12X10 PRECAST CONCRETE BOX CULVERT (P)	LIN FT	98			98
	A	10R	2451.607	STRUCTURAL BACKFILL (P)	CU YD	50804			50804
	FF	BB2	2452.519	C-I-P CONC TEST PILE 40 FT LONG 12"	EACH	4			4
	FF	BB2	2452.519	C-I-P CONC TEST PILE 55 FT LONG 12"	EACH	2			2
	EE	BC2	2452.519	C-I-P CONC TEST PILE 60 FT LONG 16"	EACH	8			8
	EE	BC2	2452.528	PILE ANALYSIS	EACH	8			8
		79R	2452.601	TEMPORARY VERTICAL SHORING	LUMP SUM	1			1
	FF	BB2	2452.603	PILE SLEEVES	LIN FT	655			655
	FF	BB2	2452.603	C-I-P CONCRETE PILING 12"	LIN FT	3570			3570
	EE	BC2	2452.603	C-I-P CONCRETE PILING 16"	LIN FT	10700			10700
		79R	2452.618	STEEL SHEET PILING (PERMANENT)	SQ FT	2780			2780
	GG	BA2	2481.601	MEMBRANE WATERPROOFING SYSTEM	LUMP SUM	1			1
	W	117-120	2501.515	15" RC PIPE APRON	EACH		2		2
	W	117-120	2501.515	18" RC PIPE APRON	EACH		9		9
	W	117-120	2501.515	21" RC PIPE APRON	EACH		2		2
	W	117-120	2501.515	24" RC PIPE APRON	EACH		3		3
	W	117-120	2501.515	30" RC PIPE APRON	EACH		1		1
	W	117-120	2501.602	TRASH GUARD FOR 15" PIPE APRON	EACH		1		1
	W	117-120	2501.602	TRASH GUARD FOR 21" PIPE APRON	EACH		2		2
	W	117-120	2501.602	TRASH GUARD FOR 24" PIPE APRON	EACH		2		2
	W	117-120	2501.602	TRASH GUARD FOR 30" PIPE APRON	EACH		1		1
	EE	BC2	2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	1			1
	HH	W1	2502.521	4" TP PIPE DRAIN	LIN FT	1284			1284
	GG, HH	BA2, W1	2502.541	4" PERF TP PIPE DRAIN	LIN FT	7501			7501
(1)	W	117-120	2503.511	12" CS PIPE SEWER	LIN FT		86		86
(1)	W	117-120	2503.511	18" CS PIPE SEWER	LIN FT		64		64
(1)	W	117-120	2503.511	24" CS PIPE SEWER	LIN FT		215		215


NOTES:
(P) PLAN QUANTITY
(1) SEE SPECIAL PROVISIONS

Ⓐ ROADWAY:
10% ANOKA COUNTY
5% CITY OF COON RAPIDS
5% BNSF
30% CTIB
50% LRIP

Ⓑ BRIDGE:
95% ANOKA COUNTY
5% BNSF

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK

Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051
DRAWN BY S. VANG
DESIGNED BY T. SMITH
CHECKED BY B. ROBECK
COMM. NO. 0169140



ANOKA COUNTY
STATEMENT OF ESTIMATED QUANTITIES
CSAH 78 - BNSF GRADE SEPARATION

SHEET
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OF
175

STATEMENT OF ESTIMATED QUANTITIES

NOTES	TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	ANOKA COUNTY SAP 002-678-023, 114-020-051		NON - PARTICIPATING	TOTAL ESTIMATED QUANTITIES
						ROADWAY	STORM		
(1)	W	117-120	2503.541	15" RC PIPE SEWER DES 3006 CL V	LIN FT		2413		2413
(1)	W	117-120	2503.541	18" RC PIPE SEWER DES 3006	LIN FT		721		721
(1)	W	117-120	2503.541	18" RC PIPE SEWER DES 3006 CL III	LIN FT		222		222
(1)	W	117-120	2503.541	18" RC PIPE SEWER DES 3006 CL IV	LIN FT		416		416
(1)	W	117-120	2503.541	21" RC PIPE SEWER DES 3006	LIN FT		672		672
(1)	W	117-120	2503.541	24" RC PIPE SEWER DES 3006	LIN FT		632		632
(1)	W	117-120	2503.541	30" RC PIPE SEWER DES 3006	LIN FT		119		119
	Q	26R	2503.601	TEMPORARY SANITARY SEWER CONVEYANCE	LUMP SUM	1			1
	W	117-120	2503.602	CONNECT TO EXISTING SANITARY SEWER	EACH	9			9
	W	117-120	2503.602	CONNECT TO EXISTING STORM SEWER	EACH		3		3
	W	117-120	2503.602	CONNECT INTO EXISTING DRAINAGE STRUCTURE	EACH		7		7
	Q	26R	2503.602	12"X4" PVC WYE	EACH	4			4
	J, K	20-21, 22-24R	2503.603	PLUG FILL & ABANDON PIPE SEWER	LIN FT	197			197
	Q	26R	2503.603	4" PVC PIPE SEWER	LIN FT	59			59
	Q	26R	2503.603	8" PVC PIPE SEWER	LIN FT	572			572
	Q	26R	2503.603	12" PVC PIPE SEWER	LIN FT	1900			1900
	Q	26R	2503.603	20" STEEL CASING PIPE	LIN FT	255			255
	Q	26R	2503.603	22" STEEL CASING PIPE	LIN FT	121			121
	Q	26R	2503.603	24" STEEL CASING PIPE	LIN FT	732			732
	Q	26R	2503.603	24" STEEL CASING PIPE (JACKED)	LIN FT	284			284
	W	117-120	2503.603	30" STEEL CASING PIPE	LIN FT		16		16
	Q	26R	2503.603	48" STEEL CASING PIPE	LIN FT	733			733
	Q	26R	2503.603	48" STEEL CASING PIPE (JACKED)	LIN FT	284			284
	Q	26R	2504.601	TEMPORARY WATER SERVICE	LUMP SUM	1			1
	Q	26R	2504.602	WATER SERVICE TAP & HOOKUP	EACH	4			4
	Q	26R	2504.602	CONNECT TO EXISTING WATER MAIN	EACH	9			9
	Q	26R	2504.602	HYDRANT	EACH	3			3
	Q	26R	2504.602	30" BUTTERFLY VALVE & BOX	EACH	4			4
	Q	26R	2504.602	6" GATE VALVE & BOX	EACH	8			8
	Q	26R	2504.602	8" GATE VALVE & BOX	EACH	1			1
	Q	26R	2504.602	30"X6" WET TAP	EACH	1			1
	Q	26R	2504.602	6" MEGALUG	EACH	36			36
	Q	26R	2504.602	8" MEGALUG	EACH	11			11
	Q	26R	2504.602	30" MEGALUG	EACH	18			18
	Q	26R	2504.603	1" PVC PIPE	LIN FT	106			106
	Q	26R	2504.603	6" WATERMAIN DUCTILE IRON CL 52	LIN FT	544			544
	Q	26R	2504.603	8" WATERMAIN DUCTILE IRON CL 52	LIN FT	207			207
	Q	26R	2504.603	30" WATERMAIN HDPE	LIN FT	1013			1013
	Q	26R	2504.603	30" PVC WATERMAIN	LIN FT	878			878
	W	117-120	2504.604	4" POLYSTYRENE INSULATION	SQ YD		14.2		14.2
	Q	26R	2504.608	WATERMAIN FITTINGS	POUND	7610			7610
(1)	Y, W	27R, 117-120	2506.501	CONST DRAINAGE STRUCTURE DESIGN F	LIN FT	188.8	145.8		334.6
(1)	W	117-120	2506.501	CONST DRAINAGE STRUCTURE DESIGN G	LIN FT		48.7		48.7
(1)	W	117-120	2506.501	CONST DRAINAGE STRUCTURE DESIGN H	LIN FT		63.5		63.5
(1)	W	117-120	2506.501	CONST DRAINAGE STRUCTURE DESIGN SD-48	LIN FT		21.7		21.7
(1)	W	117-120	2506.501	CONST DRAINAGE STRUCTURE DESIGN SPEC 1	LIN FT		43.9		43.9
(1)	Y	27R	2506.501	CONST DRAINAGE STRUCTURE DESIGN SPEC 3	LIN FT	35.8			35.8
(1)	W	117-120	2506.501	CONST DRAINAGE STRUCTURE DES 48-4020	LIN FT		61.8		61.8
(1)	W	117-120	2506.501	CONST DRAINAGE STRUCTURE DES 54-4020	LIN FT		37.1		37.1

NOTES:
(1) SEE SPECIAL PROVISIONS

Ⓐ ROADWAY:
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5% BNSF
30% CTIB
50% LRIP

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Ben Robeck
Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG
DESIGNED BY
T. SMITH
CHECKED BY
B. ROBECK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
STATEMENT OF ESTIMATED QUANTITIES
CSAH 78 - BNSF GRADE SEPARATION

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OF
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STATEMENT OF ESTIMATED QUANTITIES


NOTES	TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	ANOKA COUNTY SAP 002-678-023, 114-020-051		NON - PARTICIPATING	TOTAL ESTIMATED QUANTITIES
						ROADWAY	STORM		
(1)	Y, W	27R, 117-120	2506.501	CONST DRAINAGE STRUCTURE DES 60-4020	LIN FT	22.8	7.1		29.9
(1)	Y, W	27R, 117-120	2506.501	CONST DRAINAGE STRUCTURE DES 72-4020	LIN FT	22.3	11.8		34.1
(1)	Y	27R	2506.501	CONST DRAINAGE STRUCTURE DES 84-4020	LIN FT	20.5			20.5
(1)	Y	27R	2506.501	CONST DRAINAGE STRUCTURE DES 120-4020	LIN FT	11.2			11.2
(1)	W	117-120	2506.502	CONST DRAINAGE STRUCTURE DESIGN SPEC 2	EACH		2		2
	Y, V	27R, 108	2506.516	CASTING ASSEMBLY	EACH	18	87		105
	I	17-19	2506.522	ADJUST FRAME & RING CASTING	EACH	3	1		4
	W	117-120	2506.602	CONSTRUCT CONTROL STRUCTURE	EACH		3		3
(1)	W	117-120	2511.501	RANDOM RIPRAP CLASS II	CU YD		40.5		40.5
(1)	W	117-120	2511.501	RANDOM RIPRAP CLASS III	CU YD		6.8		6.8
	W	117-120	2511.515	GEOTEXTILE FILTER TYPE IV	SQ YD		181.3		181.3
(B)	FF	BB2	2514.501	CONCRETE SLOPE PAVING (P)	SQ YD	50			50
	O	25R	2521.501	4" CONCRETE WALK	SQ FT	26475			26475
	O	25R	2521.501	6" CONCRETE WALK	SQ FT	3130			3130
	O	25R	2521.511	2.5" BITUMINOUS WALK	SQ FT	26165			26165
	O	25R	2531.501	CONCRETE CURB & GUTTER DESIGN B618	LIN FT	9145			9145
	O	25R	2531.501	CONCRETE CURB & GUTTER DESIGN B624	LIN FT	5455			5455
	O	25R	2531.618	TRUNCATED DOMES	SQ FT	330			330
(1)	R	27R	2533.507	PORTABLE PRECAST CONC BARRIER DES 8337	LIN FT	2360			2360
(1)	R	27R	2533.508	RELOCATE PORTABLE PRECAST CONC BARRIER DES 8337	LIN FT	250			250
	M	25R	2540.602	RELOCATE MAIL BOX SUPPORT	EACH	7			7
(B)	FF	BB2	2545.509	CONDUIT SYSTEM (LIGHTING) (BR NO 02588)	LUMP SUM	1			1
(B)	FF	BB2	2545.509	CONDUIT SYSTEM (SIGNALS) (BR NO 02588)	LUMP SUM	1			1
(B)	FF	BB2	2545.509	CONDUIT SYSTEM (FUTURE) (BR NO 02588)	LUMP SUM	1			1
(B)	EE	BC2	2545.509	CONDUIT SYSTEM (SIGNALS) (BR NO 02589)	LUMP SUM	1			1
(B)	EE	BC2	2545.509	CONDUIT SYSTEM (FUTURE) (BR NO 02589)	LUMP SUM	1			1
(B)	EE	BC2	2545.509	CONDUIT SYSTEM (LIGHTING) (BR NO 02589)	LUMP SUM	1			1
(B)	GG	BA2	2545.509	CONDUIT SYSTEM (LIGHTING) (BR NO 02J49)	LUMP SUM	1			1
(B)	HH	W1	2545.509	CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	1			1
	DD	137R	2545.511	LIGHTING UNIT TYPE SPECIAL 1	EACH	15			15
	DD	137R	2545.514	UNDERPASS LUMINAIRES TYPE LED	EACH	8			8
	DD	137R	2545.515	LIGHT FOUNDATION DESIGN E MODIFIED	EACH	5			5
	DD	137R	2545.523	2" NON-METALLIC CONDUIT	LIN FT	1817			1817
	DD	137R	2545.531	UNDERGROUND WIRE 1 COND NO 6	LIN FT	23354			23354
	DD	137R	2545.531	UNDERGROUND WIRE 1 COND NO 10	LIN FT	2601			2601
	DD	137R	2545.551	JUNCTION BOX	EACH	6			6
	DD	137R	2545.553	HANDHOLE	EACH	10			10
			2545.601	TEMPORARY LIGHTING SYSTEM	LUMP SUM	1			1
	DD	137R	2545.602	MODIFY FEED POINT	EACH	1			1
	DD	137R	2545.603	0.75" LIQUIDTIGHT FLEXIBLE CONDUIT	LIN FT	235			235
	DD	137R	2545.603	1" LIQUIDTIGHT FLEXIBLE CONDUIT	LIN FT	12			12
	W	117-120	2554.509	GUIDE POST TYPE B	EACH		12		12
(4)	R	27R	2554.615	IMPACT ATTENUATOR	ASSEMBLY	10			10
	R	27R	2554.615	RELOCATE IMPACT ATTENUATOR	ASSEMBLY	2			2
	O	25R	2557.517	VEHICULAR GATE-SINGLE	EACH	1			1
			2563.601	TRAFFIC CONTROL SUPERVISOR	LUMP SUM	1			1

NOTES:
(P) PLAN QUANTITY
(1) SEE SPECIAL PROVISIONS
(4) TEMPORARY IMPACT ATTENUATOR, TEST LEVEL 2

(A) ROADWAY:
10% ANOKA COUNTY
5% CITY OF COON RAPIDS
5% BNSF
30% CTIB
50% LRIP
(B) BRIDGE:
95% ANOKA COUNTY
5% BNSF

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK

Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
DESIGNED BY T. SMITH
CHECKED BY B. ROBECK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
STATEMENT OF ESTIMATED QUANTITIES
CSAH 78 - BNSF GRADE SEPARATION

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175

STATEMENT OF ESTIMATED QUANTITIES


NOTES	TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	UNIT	ANOKA COUNTY		NON - PARTICIPATING	TOTAL ESTIMATED QUANTITIES
						SAP 002-678-023, 114-020-051	ROADWAY		
			2563.601	TRAFFIC CONTROL	LUMP SUM		1		1
	R	27R	2563.602	RAISED PAVEMENT MARKER TEMPORARY	EACH		238		238
	R	27R	2563.602	PORTABLE CONCRETE BARRIER DELINEATOR	EACH		95		95
	R	27R	2563.602	TUBE DELINEATOR	EACH		100		100
			2563.613	TRAFFIC CONTROL SPECIAL 1	UNIT DAY		180		180
	AA	151R	2564.531	SIGN PANELS TYPE SPECIAL	SQ FT			97.5	97.5
	X	151R	2564.531	SIGN PANELS TYPE C	SQ FT		301.4		301.4
	Z	151R	2564.537	INSTALL SIGN TYPE C	EACH		5		5
	CC	151R	2564.550	DELINEATOR TYPE X4-13	EACH		5		5
	CC	151R	2564.552	OBJECT MARKER TYPE X4-2	EACH		6		6
	HH	W1	2564.602	SIGN TYPE C (BRIDGE MOUNTED)	EACH		1		1
(3)			2565.514	TRAFFIC CONTROL INTERCONNECT	LUMP SUM		1		1
(3)			2565.616	REVISE FLASHER SYSTEM	SYSTEM		1		1
(3)			2565.616	REVISE SIGNAL SYSTEM A STAGE 1	SYSTEM		1		1
(3)			2565.616	REVISE SIGNAL SYSTEM A	SYSTEM		1		1
(3)			2565.616	REVISE SIGNAL SYSTEM B	SYSTEM		1		1
	T	27R	2573.502	SILT FENCE, TYPE MS	LIN FT		5580		5580
	T	27R	2573.515	FILTER BERM TYPE 3	LIN FT		262		262
	T	27R	2573.530	STORM DRAIN INLET PROTECTION	EACH		122		122
	T	27R	2573.533	SEDIMENT CONTROL LOG TYPE WOOD CHIP	LIN FT		2335		2335
			2573.535	STABILIZED CONSTRUCTION EXIT	LUMP SUM		1		1
(1)			2573.550	EROSION CONTROL SUPERVISOR	LUMP SUM		1		1
	T	27R	2573.560	CULVERT END CONTROLS	EACH		8		8
	T	27R	2574.508	FERTILIZER TYPE 3	POUND		1220		1220
	T	27R	2574.508	FERTILIZER TYPE 4	POUND		270		270
	A	10R	2574.525	FILTER TOPSOIL BORROW	CU YD		710		710
	A	10R	2574.550	COMPOST GRADE 2	CU YD		317		317
(1)	T	27R	2574.575	SUBSOILING	ACRE		5.9		5.9
	T	27R	2574.576	LIME	POUND		36000		36000
(1)	T	27R	2574.578	SOIL BED PREPARATION	ACRE		5.9		5.9
	T	27R	2575.501	SEEDING	ACRE		5.9		5.9
	T	27R	2575.502	SEED MIXTURE 25-121	POUND		195		195
	T	27R	2575.502	SEED MIXTURE 33-261	POUND		75		75
	T	27R	2575.502	SEED MIXTURE 35-221	POUND		70		70
	W, T	27, 117-120	2575.505	SODDING TYPE LAWN	SQ YD		820	8	828
	T	27R	2575.523	EROSION CONTROL BLANKETS CATEGORY 0	SQ YD		14510		14510
	T	27R	2575.523	EROSION CONTROL BLANKETS CATEGORY 3N	SQ YD		15500		15500
	T	27R	2575.545	WEED SPRAYING	ACRE		3		3
	T	27R	2575.547	WEED SPRAY MIXTURE	GALLON		1.75		1.75
	T	27R	2575.571	RAPID STABILIZATION METHOD 3	M GALLON		3.2		3.2
	R	27R	2581.501	REMOVABLE PREFORM PAVEMENT MARKING TAPE	LIN FT		2940		2940
	R	27R	2582.501	PAVT MSSG PAINT	SQ FT		62		62
	R	27R	2582.501	PAVT MSSG EPOXY	SQ FT		124		124
	S	27R	2582.501	PAVT MSSG PREF THERMO	SQ FT		105		105
	R, S	27R	2582.502	4" SOLID LINE PAINT	LIN FT		7285		7285
	R	27R	2582.502	4" DBLE SOLID LINE PAINT	LIN FT		2640		2640
	R, S	27R	2582.502	4" SOLID LINE EPOXY	LIN FT		21140		21140
	S	27R	2582.502	24" SOLID LINE EPOXY	LIN FT		90		90
	R, S	27R	2582.502	4" BROKEN LINE EPOXY	LIN FT		2205		2205
	S	27R	2582.502	4" DBLE SOLID LINE EPOXY	LIN FT		10		10
	S	27R	2582.503	CROSSWALK PREF THERMO	SQ FT		300		300

NOTES:
 (1) SEE SPECIAL PROVISIONS
 (3) SEE TRAFFIC SIGNAL AND INTERCONNECT PLANS FOR DETAILS

Ⓐ ROADWAY:
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 5% CITY OF COON RAPIDS
 5% BNSF
 30% CTIB
 50% LRIP

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 Print Name: BENJAMIN P ROBECK

 Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO
 002-678-023, 114-020-051

DRAWN BY
 S. VANG
 DESIGNED BY
 T. SMITH
 CHECKED BY
 B. ROBECK
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 STATEMENT OF ESTIMATED QUANTITIES
 CSAH 78 - BNSF GRADE SEPARATION



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

STANDARD PLATES	
PLATE NO.	DESCRIPTION
3000 L	REINFORCED CONCRETE PIPE (5 SHEETS)
3006 G	GASKET JOINT FOR R.C. PIPE (2 SHEETS)
3007 E	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES
3040 F	CORRUGATED METAL PIPE CULVERT (STANDARD 2-2/3" X 1/2" CORRUGATION)
3100 G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3133 D	RIPRAP AT RCP OUTLETS
3145 G	CONCRETE PIPE OR PRECAST BOX CULVERT TIES
3221 C	CORRUGATED STEEL PIPE COUPLING BAND (3 SHEETS)
4005 M	MANHOLE OR CATCH BASIN TYPE A & B CONE SECTIONS PRECAST - DESIGN F
4006 L	MANHOLE OR CATCH BASIN PRECAST - DESIGNS G AND H
4010 H	CONCRETE SHORT CONE & ADJUSTING RING (SECTIONAL CONCRETE)
4011 E	PRECAST CONCRETE BASE
4020 J	MANHOLE OR CATCH BASIN FOR USE WITH OR WITHOUT TRAFFIC LOADS (2 SHEETS)
4022 A	MANHOLE OR CATCH BASIN COVER 3' X 2' OPENING - FOR USE WITH OR WITHOUT TRAFFIC LOADS
4024 A	48" DIA. PRECAST SHALLOW DEPTH CATCH BASIN - DESIGN SD
4026 A	CONCRETE ENCASED CONCRETE ADJUSTING RINGS
4101 D	RING CASTING FOR MANHOLE OR CATCH BASIN
4110 F	COVER CASTING FOR MANHOLE (FOR USE IN ALL TRAFFIC AREAS) - CASTING NO. 715 AND 716
4143 E	STOOL GRATE & CONCRETE FRAME (MEDIAN DRAINS) - CASTING NO. 731
4154 B	CATCH BASIN GRATE CASTING - CASTING NO. 816
4160 D	CURB BOX CASTING FOR CATCH BASIN
4180 J	MANHOLE OR CATCH BASIN STEP
7038 A	DETECTABLE WARNING SURFACE TRUNCATED DOMES
7100 H	CONCRETE CURB AND GUTTER (DESIGN B AND DESIGN V)
7111 J	INSTALLATION OF CATCH BASIN CASTINGS (CONCRETE CURB & GUTTER)
7113 A	CONCRETE APPROACH NOSE DETAIL
8000 J	CHANNELIZERS (3 SHEETS)
8110 E	TRAFFIC SIGNAL BRACKETING (POLE MOUNTED)
8111 E	TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED) (3 SHEETS)
8112 I	PEDESTAL FOUNDATION (TRAFFIC CONTROL SIGNALS)
8129 A	SHIM AND WASHER (TRAFFIC CONTROL SIGNALS AND ROADWAY LIGHTING)
8337 C	TEMPORARY PORTABLE PRECAST CONCRETE BARRIER (TYPE F) (3 SHEETS)
9350 A	MAILBOX SUPPORT (SWING-AWAY TYPE)

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GG	SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE NO. 02J49	BA2
HH	SCHEDULE OF QUANTITIES FOR MSE RETAINING WALLS	W1

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<table border="1"> <thead> <tr> <th>NO</th> <th>DATE</th> <th>BY</th> <th>CKD</th> <th>APPR</th> <th>REVISION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>					NO	DATE	BY	CKD	APPR	REVISION							I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: <u>BENJAMIN P ROBECK</u>  Date <u>6/13/2017</u> License # <u>53680</u>		STATE AID PROJECT NO 002-678-023, 114-020-051 DRAWN BY S. VANG DESIGNED BY T. SMITH CHECKED BY B. ROBECK COMM. NO. 0169140		 ENGINEERS PLANNERS DESIGNERS Consulting Group, Inc.		ANOKA COUNTY STANDARD PLATES AND INDEX OF TABULATIONS CSAH 78 - BNSF GRADE SEPARATION		SHEET 8 OF 175	
NO	DATE	BY	CKD	APPR	REVISION																					

CONSTRUCTION AND SOILS NOTES

GRADING, BASE AND SURFACE

- 1 GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.
- 2 ALL EMBANKMENT FILL MATERIAL SHALL BE GRANULAR, MEETING THE REQUIREMENTS OF SPEC 3149.2.B.1, AND BE PLACED IN ACCORDANCE WITH SPEC 2106 UNLESS NOTED OTHERWISE.
- 3 IN ANY CASE WHERE GRANULAR EMBANKMENTS OR BACKFILL JOIN NON-GRANULAR SOIL EMBANKMENTS OR BACKFILL, PROVIDE A 1V:20H TRANSITION BETWEEN THE CHANGE IN MATERIAL TO PREVENT AN ABRUPT SOILS DIFFERENTIAL. CONSTRUCT THE 1V:20H TRANSITION SUCH THAT THE GRANULAR BACKFILL MATERIAL OVERLAYS THE ADJACENT NON-GRANULAR SOIL BACKFILL.
- 4 WHERE CONNECTING TO THE INPLACE ROADWAYS AT THE TERMINI OF PROPOSED CONSTRUCTION, CUT VERTICALLY TO THE BOTTOM OF THE INPLACE SURFACING OR TO THE BOTTOM OF THE NEW SURFACING, WHICHEVER IS DEEPER. THEN 1V:20H TO THE BOTTOM OF THE RECOMMENDED EXCAVATION, UNLESS OTHERWISE NOTED.
- 5 PROVIDE A FULL-DEPTH SAWCUT WHERE PLACING NEW PAVEMENT NEXT TO IN-PLACE PAVEMENT TO ENSURE A UNIFORM JOINT.
- 6 STRIP SOD AND TOPSOIL FROM AREAS TO BE DISTURBED BY CONSTRUCTION AND REUSE AS SLOPE DRESSING. FOR ESTIMATING PURPOSES, THE DEPTH OF TOPSOIL AVAILABLE IS CONSIDERED TO BE 1 FOOT. TOPSOIL STRIPPING SHALL BE PAID FOR AS EXCAVATION-COMMON.
- 7 EXISTING AGGREGATE BASE MATERIAL MEETING THE REQUIREMENTS OF SPEC 3138 FOR CLASS 5 AGGREGATE BASE SHALL BE REUSED AS PRACTICAL FOR PROPOSED CONSTRUCTION.
- 8 COMPACTION OF THE GRADING AND BASE PORTIONS OF PERMANENT CONSTRUCTION SHALL BE OBTAINED IN ACCORDANCE WITH THE "PENETRATION INDEX" METHOD REQUIREMENTS FOR GRANULAR MATERIALS PER SPEC 3149.2.B.1, AND IN ACCORDANCE WITH THE "SPECIFIED DENSITY" METHOD REQUIREMENTS FOR NON-GRANULAR MATERIALS.
- 9 COMPACTION OF THE GRADING AND BASE PORTIONS OF TEMPORARY WORK SHALL BE OBTAINED IN ACCORDANCE WITH THE "QUALITY COMPACTION" METHOD REQUIREMENTS.
- 10 TR10 TEST ROLLING, IN ACCORDANCE WITH SPEC 2111, WILL BE REQUIRED ON ALL AREAS DESIGNATED FOR SUBGRADE PREPARATION (INCIDENTAL).
- 11 DITCH BOTTOMS, TOE OF FILL, CUT RUNOUTS AND THE TOP EDGE OF THE BACKSLOPES SHALL BE ROUNDED REGARDLESS OF THE SECTIONS SHOWN IN THE TYPICAL SECTIONS AND CROSS SECTIONS.

REMOVALS

- 12 ASSUMED EXISTING PAVEMENT THICKNESSES ARE LISTED BELOW. THE CONTRACTOR SHALL INVESTIGATE AND MAKE THEIR OWN DETERMINATION.
CSAH 78- 8.5 TO 9 INCHES OF BITUMINOUS
LOCAL ROADS- 2 TO 3 INCHES OF BITUMINOUS

TURF ESTABLISHMENT

- 13 PLACE A MINIMUM OF 4 INCHES OF TOPSOIL ON ALL AREAS SCHEDULED FOR PERMANENT TURF ESTABLISHMENT EXCEPT PONDING AND INFILTRATION AREAS (SEE DRAINAGE DETAILS FOR SOIL PLACEMENT IN PONDING AND INFILTRATION AREAS).
 - 14 PERMANENT TURF ESTABLISHMENT REQUIREMENTS ON THIS PROJECT ARE AS FOLLOWS:
 - A. USE SEED MIXTURE 25-121, FERTILIZER TYPE 3 (SLOW RELEASE) ANALYSIS 22-5-10 AT 350 LBS / ACRE ON DESIGNATED AREAS OF PERMANENT TURF ESTABLISHMENT.
 - B. USE SEED MIXTURE 33-261, FERTILIZER TYPE 4 (NATURAL BASED) ANALYSIS 17-10-7 AT 150 LBS / ACRE AT LOCATIONS OF WET PONDS FROM 10' INSIDE THE NORMAL WATER LEVEL TO 10' OUT FROM THE NORMAL WATER LEVEL AND ON DESIGNATED AREAS OF INFILTRATION BASINS.
 - C. USE SEED MIXTURE 35-221, FERTILIZER TYPE 3 (SLOW RELEASE) ANALYSIS 22-5-10 AT 200 LBS / ACRE ON DESIGNATED AREAS OF PERMANENT TURF ESTABLISHMENT. SEED MIXTURE IS USED ON BACKSLOPES, DRY DITCHES, AND AREAS NOT REGULARLY MOWED.
 - D. ON PERMANENT SLOPES FLATTER THAN 1:3 USE EROSION CONTROL BLANKET CATEGORY 0. DO NOT DISK ANCHOR.
 - E. ON PERMANENT SLOPES 1:3 OR STEEPER USE EROSION CONTROL BLANKET CATEGORY 3N. DO NOT DISK ANCHOR.
 - F. PROVIDE COMMERCIAL FERTILIZER TYPE 3 (SLOW RELEASE) ANALYSIS 22-5-10 AT 200 LBS/ ACRE ON ALL AREAS TO BE SODDED.
 - G. ON ALL SEEDED AREAS PERFORM SUBSOILING AND SOIL BED PREP. ON ALL SEEDED AREAS USE LIME AT 3 TONS / ACRE AND WEED SPRAY MIXTURE AT 0.5 GAL / ACRE.
- SEE EROSION CONTROL AND TURF ESTABLISHMENT PLANS FOR SEED TYPE LOCATIONS.

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NO	DATE	BY	CKD	APPR	REVISION														
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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date 6/13/2017 License # 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG
DESIGNED BY
T. SMITH
CHECKED BY
B. ROBECK
COMM. NO. 0169140



**ENGINEERS
PLANNERS
DESIGNERS**


ANOKA COUNTY
CONSTRUCTION AND SOILS NOTES
CSAH 78 - BNSF GRADE SEPARATION

**SHEET
9
OF
175**

EARTHWORK SUMMARY										A
ALIGNMENT	EXCAVATION TOTALS (EV)		EMBANKMENT TOTALS (CV)							
	COMMON CU YD	STRUCTURE CLASS U (4) CU YD	COMMON	GRANULAR CU YD	SELECT GRANULAR MOD (3) CU YD	STRUCTURAL BACKFILL (4) CU YD	COMMON BORROW SPECIAL (3) CU YD	FILTER TOPSOIL BORROW (3) CU YD	COMPOST GRADE 2 (3) CU YD	
			SLOPE DRESSING CU YD							
SAP 002-678-023, 114-020-051										
CSAH 78 (SUBTOTAL A)	3040	1242	377	24946		18284				
CSAH 78 (SUBTOTAL B)	198	966	53	7171		18287				
CSAH 78 (SUBTOTAL C)	1990	362	137	12467		4068				
106TH AVE NW	285		20	59						
HANSON BLVD SERVICE RD 1	972		51	48						
108TH AVE NW	284		34	134						
HANSON BLVD SERVICE RD 2	1030		52	49						
108TH LN NW	202		17	282						
(1) BRIDGE NO. 02589 SOUTH ABUTMENT	9	1149	20	266		4263				
(1) BRIDGE NO. 02589 NORTH ABUTMENT	23	1141	21	460		4894				
(1) BRIDGE NO. 02588 SOUTH ABUTMENT		139		46		590				
(1) BRIDGE NO. 02588 NORTH ABUTMENT		117		47		418				
(2) 106TH WET POND	7582		397	459			1129			
(2) 107TH INFILTRATION BASIN	4792		170	15					113	
(2) TRAIL INFILTRATION AREA	3495		357	3544					204	
(2) SERVICE ROAD INFILTRATION BASIN	2822		91	36	310			355		
(2) SERVICE ROAD WET POND	3733		236	215			516			
(2) 108TH INFILTRATION BASIN	2994		106	156	348			355		
(5) SOUTH TEMP TIE DOWN	304		86							
(5) NORTH TEMP TIE DOWN	2746		2307							
SAP 002-678-023, 114-020-051 TOTAL	36501	5116	4532	50400	658	50804	1645	710	317	

- NOTES:
(1) SEE STANDARD PLAN ON SHEET 43R FOR GRADING DETAIL
(2) VOLUME METHOD
(3) SEE SHEET 124 FOR DRAINAGE DETAIL
(4) SEE MSE RETAINING WALL PLANS FOR DETAILS
(5) ASSUMES TIE DOWN TO BE REMOVED IN ITS ENTIRETY.

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: BENJAMIN P ROBECK <i>Ben Robeck</i> Date: 6/13/2017 License #: 53680	STATE AID PROJECT NO 002-678-023, 114-020-051	DRAWN BY S. VANG DESIGNED BY T. SMITH CHECKED BY B. ROBECK COMM. NO. 0169140	 ENGINEERS PLANNERS DESIGNERS Consulting Group, Inc.	ANOKA COUNTY EARTHWORK SUMMARY AND TABULATIONS CSAH 78 - BNSF GRADE SEPARATION	SHEET 10R OF 175
2	1/12/2018	BR	CT	BR	ADDENDUM 3 - REVISED NOTE 4						
NO	DATE	BY	CKD	APPR	REVISION						

CSAH 78 - EARTHWORK TABULATION						B
STATION	EXCAVATION TOTALS (EV)		EMBANKMENT TOTALS (CV)			
	COMMON	STRUCTURE CLASS U	COMMON	GRANULAR	STRUCTURAL BACKFILL	
			SLOPE DRESSING			
NB CSAH 78	CU YD	CU YD	CU YD	CU YD	CU YD	
101+05.00			10	33		
101+50.00	142					
102+00.00	115		13	56		
102+50.00	67		12	91		
102+60.69	10		2	24		
103+00.00	41		8	133		
103+50.00	65		14	251		
103+74.00	38		7	145		
104+00.00	45		10	178		
104+50.00	99		29	396		
105+00.00	84		25	331		
105+28.78	22		4	109		
105+65.00	99		3	179		
106+00.00	117		6	212		
106+50.00	79		9	304		
107+00.00	85		9	418		
107+50.00	91		9	544		
107+90.00	79		11	573		
108+50.00	185	18	21	1055	40	
109+00.00	194	33	16	1016	116	
109+50.00	180	37	14	1196	212	
110+00.00	109	45	13	1342	310	
110+50.00	92	50	12	1518	445	
111+00.00	139	54	14	1740	650	
111+39.70	117	49	11	1502	708	
112+00.00	195	88	21	2471	1482	
112+50.00	149	88	18	2034	1644	
112+80.00	92	57	8	1152	1181	
112+94.99	43	23	2	562	645	
112+95.99	1	1		24	34	
113+10.03	14			161	356	
113+11.03		1		23	37	
113+50.00	58	51	9	1409	1950	
114+00.00	111	65	19	1739	2924	
114+50.00	69	295	13	1504	3545	
114+73.36	28	287	5	521	2005	
SUBTOTAL (A)	3040	1242	377	24946	18284	
116+95.67						
117+00.00	4	62	1	59	448	
117+50.00	39	365	11	1087	4449	
118+00.00	38	57	10	1498	3648	
118+50.00	39	67	10	1609	3258	
119+00.00	28	85	9	1630	2881	
119+50.00	30	253	10	1209	2994	
119+58.29	20	77	2	79	609	
SUBTOTAL (B)	198	966	53	7171	18287	

CSAH 78 - EARTHWORK TABULATION						B
STATION	EXCAVATION TOTALS (EV)		EMBANKMENT TOTALS (CV)			
	COMMON	STRUCTURE CLASS U	COMMON	GRANULAR	STRUCTURAL BACKFILL	
			SLOPE DRESSING			
NB CSAH 78	CU YD	CU YD	CU YD	CU YD	CU YD	
120+38.13						
120+50.00	13	94	2	204	632	
121+00.00	57	186	8	1711	1524	
121+50.00	74	34	11	1989	944	
122+00.00	95	24	16	2105	541	
122+50.00	96	18	17	1958	302	
122+77.75	47	4	8	949	90	
122+90.81	22	1	4	418	28	
123+00.00	15	1	3	300	7	
123+43.00	76		7	1184		
124+00.00	95		9	951		
124+20.92	21		4	198		
124+60.15	23		5	238		
125+00.00	43		6	110		
125+50.00	112		7	48		
126+00.00	172		5	20		
126+36.93	144		2	9		
126+50.00	53		1	3		
127+00.00	199		5	18		
127+15.32	55		1	4		
127+50.00	118		2	12		
127+85.77	138		1	9		
128+50.00	250		8	18		
128+70.00	72		5	11		
SUBTOTAL (C)	1990	362	137	12467	4068	
TOTAL	5228	2570	567	44584	40639	

106TH AVE NW - EARTHWORK TABULATION				C
STATION	EXCAVATION TOTALS (EV)	EMBANKMENT TOTALS (CV)		
	COMMON	COMMON	GRANULAR	
		SLOPE DRESSING		
106TH AVE NW	CU YD	CU YD	CU YD	
300+46.40				
300+62.50	20	2	7	
300+88.90	66	1	8	
301+00.00	35	1	1	
301+50.00	105	6	12	
302+00.00	51	8	21	
302+12.77	8	2	10	
TOTAL	285	20	59	

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 6/13/2017 License # 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG
DESIGNED BY
T. SMITH
CHECKED BY
B. ROBECK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
EARTHWORK SUMMARY AND TABULATIONS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
11
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175

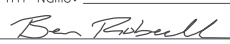

HANSON BLVD SERVICE RD 1 – EARTHWORK TABULATION D			
STATION	EXCAVATION TOTALS (EV)	EMBANKMENT TOTALS (CV)	
	COMMON	COMMON	GRANULAR
		SLOPE DRESSING	
CU YD	CU YD	CU YD	
400+46.89			
401+00.00	182	9	7
401+50.00	173	8	7
402+00.00	158	8	7
402+50.00	141	8	7
403+00.00	142	7	6
403+50.00	115	6	5
403+85.14	61	5	9
TOTAL	972	51	48

HANSON BLVD SERVICE RD 2 – EARTHWORK TABULATION F			
STATION	EXCAVATION TOTALS (EV)	EMBANKMENT TOTALS (CV)	
	COMMON	COMMON	GRANULAR
		SLOPE DRESSING	
CU YD	CU YD	CU YD	
600+45.50			
601+00.00	125	9	11
601+50.00	122	8	10
602+00.00	133	8	11
602+50.00	224	10	8
603+00.00	310	12	6
603+21.20	116	5	3
TOTAL	1030	52	49

108TH AVE NW – EARTHWORK TABULATION E			
STATION	EXCAVATION TOTALS (EV)	EMBANKMENT TOTALS (CV)	
	COMMON	COMMON	GRANULAR
		SLOPE DRESSING	
CU YD	CU YD	CU YD	
500+12.00			
500+48.50	39	6	16
500+79.00	24	2	6
501+00.00	13	2	5
501+50.00	22	6	24
502+00.00	11	2	22
502+50.00	26	5	24
502+75.25	23	3	10
503+00.00	40	2	7
503+50.00	86	6	20
TOTAL	284	34	134

108TH LN NW – EARTHWORK TABULATION G			
STATION	EXCAVATION TOTALS (EV)	EMBANKMENT TOTALS (CV)	
	COMMON	COMMON	GRANULAR
		SLOPE DRESSING	
CU YD	CU YD	CU YD	
700+50.90			
700+60.60	4	1	49
701+00.00	18	5	138
701+44.30	21	4	66
701+80.60	50	1	13
702+00.00	45	1	3
702+38.40	64	5	13
TOTAL	202	17	282

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NO	DATE	BY	CKD	APPR	REVISION																					

EXISTING UTILITIES (ANOKA COUNTY)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	100+00, 79' LT. - 100+23, 72' LT.	BUR SIG WIRE	X			
NB CSAH 78	100+23, 72' LT. - 101+77, 70' LT.	BUR SIG WIRE	X			
NB CSAH 78	100+23, 72' LT.	HANDHOLE	X			
NB CSAH 78	101+77, 71' LT.	HANDHOLE		X		(1)
NB CSAH 78	124+19, 25' RT. - 125+34, 31' RT.	BUR SIG WIRE			X	(1)
NB CSAH 78	124+19, 25' RT.	FLASHING SIGNAL			X	(1)
NB CSAH 78	124+30, 25' RT.	HANDHOLE			X	(1)
NB CSAH 78	125+16, 122' RT.	SIGNAL CABINET	X			
NB CSAH 78	125+31, 27' RT.	HANDHOLE			X	(1)

NOTES:

(1) WORK TO BE DONE BY CONTRACTOR AS NOTED IN REMOVAL PLAN OR TRAFFIC SIGN

EXISTING UTILITIES (BNSF)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	114+91, 21' RT. - 115+51, 61' RT.	BURIED POWER			X	
NB CSAH 78	114+91, 16' RT. - 115+51, 61' RT.	BURIED POWER			X	
NB CSAH 78	115+03, 12' RT.	XING ARM			X	
NB CSAH 78	115+51, 60' RT. - 115+60, 60' RT.	BURIED POWER			X	
NB CSAH 78	115+60, 60' RT.	ELEC METER			X	
NB CSAH 78	115+60, 59' RT. - 116+54, 69' LT.	BURIED POWER			X	
NB CSAH 78	115+60, 59' RT. - 116+48, 26' LT.	BURIED POWER			X	
NB CSAH 78	116+56, 69' LT.	XING ARM			X	

GENERAL NOTES

ALL UTILITY WORK SHOWN ON THESE SHEETS SHALL BE DONE BY OTHERS UNLESS NOTED OTHERWISE.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE GOPHER STATE ONE CALL EXCAVATION NOTICE SYSTEM REQUIRED BY MINNESOTA STATUTE, CHAPTER 216D FOR ALL UNDERGROUND UTILITY LOCATIONS.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR SUBSURFACE UTILITY DATA".

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.

UTILITY OWNERS

THE FOLLOWING LIST SHOWS THE UTILITY COMPANIES INVOLVED WITH THIS PROJECT

ANOKA COUNTY
 BNSF RAILWAY COMPANY
 CENTERPOINT ENERGY MINNESOTA GAS
 CENTURYLINK
 CITY OF COON RAPIDS
 COMCAST CABLE COMMUNICATIONS, INCORPORATED
 CONNEXUS ENERGY
 XCEL ENERGY
 ZAYO GROUP, LLC

EXISTING UTILITIES (CENTERPOINT ENERGY)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	100+00, 218' LT. - 101+01, 368' LT.	6" GAS	X			
NB CSAH 78	100+00, 10' LT. - 104+84, 15' LT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	100+00, 24' RT. - 101+35, 25' RT.	4" GAS	X			
NB CSAH 78	100+00, 6' LT. - 104+84, 9' LT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	100+64, 152' RT. - 101+33, 154' RT.	UNKNOWN GAS	X			
NB CSAH 78	101+32, 58' RT. - 101+32, 0' RT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	101+32, 75' RT. - 101+35, 25' RT.	2" GAS	X			
NB CSAH 78	101+35, 25' RT. - 104+85, 21' RT.	4" GAS			X	
NB CSAH 78	101+64, 79' LT. - 102+48, 177' LT.	UNKNOWN GAS	X			
NB CSAH 78	101+64, 84' LT. - 101+67, 27' RT.	UNKNOWN GAS			X	
NB CSAH 78	101+64, 85' LT. - 103+12, 138' LT.	UNKNOWN GAS	X			
NB CSAH 78	102+42, 197' LT.	GAS METER	X			
NB CSAH 78	103+12, 138' LT.	GAS METER	X			
NB CSAH 78	104+85, 15' LT. - 118+69, 3' RT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	104+85, 9' LT. - 118+69, 3' RT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	104+86, 21' RT. - 108+57, 2' LT.	4" GAS			X	
NB CSAH 78	104+99, 144' LT. - 105+10, 215' LT.	2" GAS	X			
NB CSAH 78	105+09, 146' LT. - 105+11, 104' LT.	2" GAS	X			
NB CSAH 78	105+09, 154' LT. - 105+86, 130' LT.	2" GAS			X	
NB CSAH 78	107+09, 140' LT. - 107+23, 9' RT.	UNKNOWN GAS			X	
NB CSAH 78	107+16, 94' LT. - 107+79, 134' LT.	UNKNOWN GAS			X	
NB CSAH 78	108+57, 2' LT. - 118+67, 39' RT.	6" GAS			X	
NB CSAH 78	108+64, 145' LT.	GAS METER			X	
NB CSAH 78	108+64, 145' LT. - 108+72, 4' LT.	UNKNOWN GAS			X	
NB CSAH 78	109+31, 201' RT. - 109+86, 94' RT.	2" GAS	X			
NB CSAH 78	109+52, 167' LT. - 110+26, 170' LT.	2" GAS			X	
NB CSAH 78	109+83, 38' LT. - 109+84, 0' RT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	110+26, 170' LT. - 110+26, 135' LT.	2" GAS	X			
NB CSAH 78	110+26, 175' LT. - 110+26, 170' LT.	2" GAS	X			
NB CSAH 78	111+86, 1' LT. - 111+89, 120' LT.	UNKNOWN GAS			X	
NB CSAH 78	111+99, 46' RT. - 112+06, 75' RT.	UNKNOWN GAS			X	
NB CSAH 78	112+58, 83' RT. - 112+61, 27' RT.	UNKNOWN GAS			X	
NB CSAH 78	112+78, 60' RT. - 112+82, 4' RT.	UNKNOWN GAS			X	
NB CSAH 78	113+22, 25' LT. - 113+31, 108' LT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	113+26, 7' RT. - 113+34, 110' LT.	2" GAS			X	
NB CSAH 78	113+31, 110' LT. - 113+48, 324' LT.	2" GAS	X			
NB CSAH 78	113+39, 73' RT. - 113+46, 38' RT.	UNKNOWN GAS			X	
NB CSAH 78	113+45, 291' LT. - 113+88, 287' LT.	UNKNOWN GAS	X			
NB CSAH 78	113+88, 287' LT. - 115+05, 262' LT.	UNKNOWN GAS	X			
NB CSAH 78	118+67, 39' RT. - 125+21, 32' RT.	6" GAS			X	
NB CSAH 78	118+69, 3' LT. - 133+07, 7' LT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	118+69, 3' RT. - 133+07, 1' LT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	119+06, 400' RT. - 119+95, 421' RT.	UNKNOWN GAS	X			
NB CSAH 78	119+42, 169' RT. - 120+11, 165' RT.	UNKNOWN GAS	X			
NB CSAH 78	119+43, 127' RT. - 120+13, 125' RT.	UNKNOWN GAS	X			
NB CSAH 78	119+51, 40' RT. - 120+54, 191' LT.	2" GAS			X	
NB CSAH 78	119+90, 437' RT. - 120+13, 125' RT.	2" GAS	X			
NB CSAH 78	119+98, 405' RT. - 120+52, 418' RT.	UNKNOWN GAS	X			
NB CSAH 78	119+99, 8' RT. - 120+21, 140' LT.	UNKNOWN GAS	X			ABANDONED
NB CSAH 78	120+03, 339' RT. - 120+77, 336' RT.	UNKNOWN GAS	X			
NB CSAH 78	120+08, 247' RT. - 120+51, 246' RT.	UNKNOWN GAS	X			
NB CSAH 78	120+11, 169' RT. - 120+23, 170' RT.	UNKNOWN GAS	X			
NB CSAH 78	122+52, 114' RT. - 123+54, 105' RT.	UNKNOWN GAS			X	
NB CSAH 78	122+64, 139' RT. - 123+54, 162' RT.	UNKNOWN GAS			X	
NB CSAH 78	122+74, 234' RT. - 123+56, 239' RT.	UNKNOWN GAS	X			
NB CSAH 78	122+78, 436' RT. - 123+70, 438' RT.	UNKNOWN GAS	X			
NB CSAH 78	122+97, 345' RT. - 123+66, 342' RT.	UNKNOWN GAS	X			
NB CSAH 78	123+05, 77' LT. - 133+05, 75' LT.	2" GAS			X	
NB CSAH 78	123+51, 31' RT. - 123+70, 453' RT.	2" GAS	X			
NB CSAH 78	123+54, 0' RT. - 123+63, 333' RT.	UNKNOWN GAS	X			ABANDONED

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051
 DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



ANOKA COUNTY
 INPLACE UTILITY TABULATIONS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 13 OF 175

EXISTING UTILITIES (CENTERPOINT ENERGY)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	123+54, 101' RT. - 123+94, 109' RT.	UNKNOWN GAS			X	
NB CSAH 78	123+56, 193' RT. - 124+02, 204' RT.	UNKNOWN GAS	X			
NB CSAH 78	123+66, 319' RT. - 124+02, 316' RT.	UNKNOWN GAS	X			
NB CSAH 78	123+66, 338' RT. - 124+05, 338' RT.	UNKNOWN GAS	X			
NB CSAH 78	124+88, 138' LT. - 124+89, 75' LT.	UNKNOWN GAS	X			
NB CSAH 78	125+21, 32' RT. - 129+15, 33' RT.	6" GAS			X	
NB CSAH 78	125+66, 86' LT. - 125+70, 156' LT.	UNKNOWN GAS	X			
NB CSAH 78	126+66, 118' LT. - 126+68, 74' LT.	UNKNOWN GAS	X			
NB CSAH 78	127+89, 148' LT. - 129+62, 151' LT.	UNKNOWN GAS	X			
NB CSAH 78	128+41, 136' LT. - 128+41, 128' LT.	UNKNOWN GAS	X			
NB CSAH 78	128+63, 129' LT. - 128+63, 136' LT.	UNKNOWN GAS	X			
NB CSAH 78	128+89, 129' LT. - 128+89, 137' LT.	UNKNOWN GAS	X			
NB CSAH 78	128+99, 217' RT. - 129+14, 60' RT.	UNKNOWN GAS	X			
NB CSAH 78	129+11, 137' LT. - 129+11, 128' LT.	UNKNOWN GAS	X			
NB CSAH 78	129+14, 31' RT. - 133+08, 30' RT.	6" GAS	X			
NB CSAH 78	129+91, 92' LT. - 129+93, 75' LT.	UNKNOWN GAS	X			
NB CSAH 78	131+05, 130' LT. - 132+07, 133' LT.	UNKNOWN GAS	X			
NB CSAH 78	131+44, 120' LT. - 131+45, 136' LT.	UNKNOWN GAS	X			
NB CSAH 78	131+74, 122' LT. - 131+75, 134' LT.	UNKNOWN GAS	X			
NB CSAH 78	132+06, 75' LT. - 132+07, 108' LT.	UNKNOWN GAS	X			
NB CSAH 78	132+07, 133' LT. - 133+04, 127' LT.	UNKNOWN GAS	X			
NB CSAH 78	132+46, 131' LT. - 132+47, 144' LT.	UNKNOWN GAS	X			
NB CSAH 78	132+93, 127' LT. - 132+94, 136' LT.	UNKNOWN GAS	X			

EXISTING UTILITIES (CENTURYLINK)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	100+00, 196' LT. - 100+93, 337' LT.	BURIED FIBER	X			
NB CSAH 78	100+00, 245' LT. - 100+03, 249' LT.	BURIED TEL				ABANDONED
NB CSAH 78	100+00, 30' RT. - 104+85, 23' RT.	TEL CONDUIT			X	
NB CSAH 78	100+00, 33' RT. - 104+85, 25' RT.	TEL CONDUIT			X	
NB CSAH 78	100+00, 96' LT. - 101+03, 78' LT.	BURIED TEL	X			
NB CSAH 78	101+03, 78' LT.	TEL PED			X	
NB CSAH 78	101+03, 78' LT. - 104+82, 77' LT.	BURIED TEL			X	
NB CSAH 78	104+83, 77' LT. - 108+04, 96' LT.	BURIED TEL			X	
NB CSAH 78	104+86, 23' RT. - 106+16, 19' RT.	TEL CONDUIT			X	
NB CSAH 78	104+86, 25' RT. - 106+16, 19' RT.	TEL CONDUIT			X	
NB CSAH 78	104+93, 35' LT.	TEL MH				ABANDONED
NB CSAH 78	106+16, 19' RT.	TEL MH			X	
NB CSAH 78	106+16, 19' RT. - 114+01, 12' RT.	TEL CONDUIT			X	
NB CSAH 78	106+16, 19' RT. - 114+01, 12' RT.	TEL CONDUIT			X	
NB CSAH 78	109+84, 201' RT. - 114+01, 12' RT.	BURIED TEL			X	
NB CSAH 78	113+59, 86' RT. - 113+92, 27' RT.	BURIED TEL			X	
NB CSAH 78	113+59, 87' RT. - 113+92, 27' RT.	BURIED TEL			X	
NB CSAH 78	113+76, 73' RT. - 113+93, 29' RT.	BURIED TEL			X	
NB CSAH 78	113+77, 74' RT. - 113+94, 34' RT.	BURIED TEL			X	
NB CSAH 78	113+92, 25' RT. - 114+01, 11' RT.	BURIED TEL			X	
NB CSAH 78	113+92, 26' RT.	TEL PED			X	
NB CSAH 78	114+01, 12' RT.	TEL MH			X	
NB CSAH 78	114+01, 12' RT. - 118+67, 40' RT.	TEL CONDUIT			X	
NB CSAH 78	114+01, 12' RT. - 118+67, 41' RT.	TEL CONDUIT			X	
NB CSAH 78	118+42, 157' RT. - 118+66, 42' RT.	BURIED TEL	X			
NB CSAH 78	118+66, 42' RT. - 120+69, 43' RT.	BURIED TEL			X	
NB CSAH 78	118+67, 40' RT. - 120+68, 43' RT.	TEL CONDUIT			X	
NB CSAH 78	118+67, 41' RT. - 120+69, 43' RT.	TEL CONDUIT			X	
NB CSAH 78	120+41, 185' LT. - 120+84, 72' LT.	BURIED TEL			X	
NB CSAH 78	120+42, 185' LT.	TEL PED			X	
NB CSAH 78	120+60, 94' LT. - 122+53, 95' LT.	BURIED TEL			X	
NB CSAH 78	120+68, 43' RT.	TEL MH			X	
NB CSAH 78	120+69, 43' RT. - 126+52, 34' RT.	TEL CONDUIT			X	
NB CSAH 78	120+69, 43' RT. - 126+52, 34' RT.	TEL CONDUIT			X	
NB CSAH 78	121+51, 85' RT. - 125+17, 47' RT.	BURIED TEL			X	
NB CSAH 78	122+28, 135' LT. - 122+53, 95' LT.	BURIED TEL			X	
NB CSAH 78	122+28, 136' LT. - 122+53, 96' LT.	BURIED TEL			X	
NB CSAH 78	122+29, 136' LT. - 122+53, 95' LT.	BURIED TEL			X	
NB CSAH 78	122+30, 136' LT. - 122+53, 96' LT.	BURIED TEL			X	
NB CSAH 78	122+53, 95' LT. - 125+16, 83' LT.	BURIED TEL			X	
NB CSAH 78	122+53, 96' LT.	TEL PED			X	
NB CSAH 78	124+80, 156' LT. - 125+16, 84' LT.	BURIED TEL	X			
NB CSAH 78	124+92, 110' LT. - 125+16, 84' LT.	BURIED TEL	X			
NB CSAH 78	124+92, 110' LT. - 125+16, 84' LT.	BURIED TEL	X			
NB CSAH 78	125+15, 37' RT. - 126+52, 34' RT.	BURIED TEL			X	
NB CSAH 78	125+16, 83' LT.	TEL PED	X			
NB CSAH 78	125+16, 84' LT. - 127+44, 83' LT.	BURIED TEL	X			
NB CSAH 78	125+17, 47' RT.	TEL PED			X	
NB CSAH 78	125+23, 189' RT. - 127+44, 43' RT.	BURIED TEL	X			
NB CSAH 78	126+49, 32' RT. - 126+65, 33' RT.	TEL CONDUIT			X	
NB CSAH 78	126+51, 35' RT.	TEL PED	X			
NB CSAH 78	126+62, 34' RT. - 127+45, 37' RT.	BURIED TEL	X			
NB CSAH 78	126+62, 34' RT. - 132+73, 34' RT.	TEL CONDUIT	X			
NB CSAH 78	126+62, 35' RT.	TEL PED	X			
NB CSAH 78	126+62, 35' RT. - 132+73, 34' RT.	TEL CONDUIT	X			
NB CSAH 78	127+44, 43' RT.	TEL PED	X			
NB CSAH 78	127+44, 43' RT. - 132+73, 34' RT.	BURIED TEL	X			
NB CSAH 78	127+44, 83' LT.	TEL PED	X			
NB CSAH 78	127+44, 84' LT. - 127+46, 110' LT.	BURIED TEL	X			
NB CSAH 78	127+76, 172' LT. - 130+81, 83' LT.	BURIED TEL	X			

EXISTING UTILITIES (CENTURYLINK)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	127+76, 183' LT. - 127+84, 181' LT.	BURIED TEL	X			
NB CSAH 78	127+84, 181' LT.	TEL PED	X			
NB CSAH 78	130+71, 110' LT. - 130+81, 83' LT.	BURIED TEL	X			
NB CSAH 78	130+72, 110' LT. - 130+81, 84' LT.	BURIED TEL	X			
NB CSAH 78	130+81, 83' LT.	TEL PED	X			
NB CSAH 78	130+82, 84' LT. - 131+01, 114' LT.	BURIED TEL	X			
NB CSAH 78	130+82, 84' LT. - 131+59, 130' LT.	BURIED TEL	X			
NB CSAH 78	130+82, 84' LT. - 132+52, 81' LT.	BURIED TEL	X			
NB CSAH 78	131+59, 130' LT.	TEL PED	X			
NB CSAH 78	132+52, 66' LT. - 132+73, 34' RT.	TEL CONDUIT	X			
NB CSAH 78	132+52, 81' LT.	TEL PED	X			
NB CSAH 78	132+52, 82' LT. - 132+56, 127' LT.	BURIED TEL	X			
NB CSAH 78	132+53, 81' LT. - 133+05, 80' LT.	BURIED TEL	X			
NB CSAH 78	132+53, 82' LT. - 132+56, 126' LT.	BURIED TEL	X			
NB CSAH 78	132+53, 82' LT. - 132+56, 127' LT.	BURIED TEL	X			
NB CSAH 78	132+53, 82' LT. - 132+56, 127' LT.	BURIED TEL	X			
NB CSAH 78	132+53, 82' LT. - 132+57, 127' LT.	BURIED TEL	X			
NB CSAH 78	132+53, 82' LT. - 132+57, 127' LT.	BURIED TEL	X			
NB CSAH 78	132+73, 34' RT.	TEL MH	X			
NB CSAH 78	132+88, 34' RT.	TEL MH	X			
NB CSAH 78	132+88, 34' RT. - 133+08, 34' RT.	TEL CONDUIT	X			
NB CSAH 78	132+88, 34' RT. - 133+08, 37' RT.	TEL CONDUIT	X			

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NO	DATE	BY	CKD	APPR	REVISION

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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114+020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 INPLACE UTILITY TABULATIONS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 14 OF 175

EXISTING UTILITIES (ZAYO BANDWIDTH)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	100+00, 95' LT. - 100+94, 85' LT.	BURIED FIBER	X			
NB CSAH 78	100+00, 91' LT. - 100+07, 84' LT.	BURIED FIBER	X			
NB CSAH 78	100+00, 464' LT. - 100+37, 517' LT.	OVERHEAD FIBER	X			
NB CSAH 78	100+07, 84' LT. - 104+82, 75' LT.	BURIED FIBER			X	
NB CSAH 78	100+07, 84' LT.	TEL PED	X			
NB CSAH 78	100+92, 160' RT. - 100+97, 39' RT.	BURIED FIBER	X			
NB CSAH 78	100+94, 85' LT.	TEL PED	X			
NB CSAH 78	100+94, 85' LT. - 101+00, 12' RT.	BURIED FIBER	X			
NB CSAH 78	100+96, 37' RT.	TEL PED	X			
NB CSAH 78	100+96, 37' RT. - 104+86, 35' RT.	BURIED FIBER			X	
NB CSAH 78	104+83, 75' LT. - 110+58, 109' LT.	BURIED FIBER			X	
NB CSAH 78	104+87, 35' RT. - 111+32, 8' RT.	BURIED FIBER			X	
NB CSAH 78	110+58, 109' LT.	TEL PED			X	
NB CSAH 78	110+58, 109' LT. - 118+72, 65' LT.	BURIED FIBER			X	
NB CSAH 78	111+32, 8' RT. - 116+17, 32' RT.	BURIED FIBER			X	
NB CSAH 78	111+32, 8' RT.	TEL PED			X	
NB CSAH 78	116+17, 32' RT. - 118+66, 46' RT.	BURIED FIBER			X	
NB CSAH 78	116+17, 32' RT.	TEL PED			X	
NB CSAH 78	118+66, 46' RT. - 121+36, 46' RT.	BURIED FIBER			X	
NB CSAH 78	118+72, 65' LT. - 119+60, 61' LT.	BURIED FIBER			X	
NB CSAH 78	119+60, 61' LT. - 133+05, 71' LT.	BURIED FIBER			X	
NB CSAH 78	119+60, 61' LT.	TEL PED			X	
NB CSAH 78	121+36, 46' RT. - 125+13, 44' RT.	BURIED FIBER			X	
NB CSAH 78	121+36, 46' RT.	TEL PED			X	
NB CSAH 78	125+13, 42' RT.	TEL PED			X	
NB CSAH 78	125+13, 44' RT. - 128+31, 42' RT.	BURIED FIBER	X			
NB CSAH 78	128+31, 43' RT.	TEL PED	X			
NB CSAH 78	128+32, 43' RT. - 133+08, 43' RT.	BURIED FIBER	X			

EXISTING UTILITIES (COMCAST FIBER)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	100+00, 83' LT. - 104+81, 85' LT.	BURIED FIBER			X	
NB CSAH 78	100+00, 84' LT. - 104+81, 83' LT.	BURIED FIBER			X	
NB CSAH 78	100+00, 463' LT. - 100+37, 517' LT.	OVERHEAD FIBER	X			
NB CSAH 78	104+82, 85' LT. - 105+13, 109' LT.	BURIED FIBER			X	
NB CSAH 78	104+82, 83' LT. - 111+22, 118' LT.	BURIED FIBER			X	
NB CSAH 78	111+22, 118' LT. - 118+67, 37' RT.	BURIED FIBER			X	
NB CSAH 78	111+23, 119' LT.	TEL PED			X	
NB CSAH 78	117+45, 100' LT.	TEL PED			X	
NB CSAH 78	118+67, 37' RT. - 133+08, 30' RT.	BURIED FIBER			X	
NB CSAH 78	125+13, 49' RT. - 133+08, 28' RT.	BURIED FIBER			X	


EXISTING UTILITIES (CITY OF COON RAPIDS)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	116+65, 31' RT. - 118+66, 44' RT.	BUR PWR IN COND			X	(1)
NB CSAH 78	116+66, 23' RT.	LIGHT POLE			X	(1)
NB CSAH 78	117+09, 66' LT.	LIGHT POLE			X	(1)
NB CSAH 78	117+09, 66' LT. - 118+72, 57' LT.	BUR PWR IN COND			X	(1)
NB CSAH 78	118+66, 44' RT. - 120+32, 47' RT.	BUR PWR IN COND			X	(1)
NB CSAH 78	118+72, 57' LT. - 119+56, 56' LT.	BUR PWR IN COND			X	(1)
NB CSAH 78	119+56, 56' LT.	LIGHT POLE			X	(1)
NB CSAH 78	119+56, 56' LT. - 123+91, 67' LT.	BUR PWR IN COND			X	(1)
NB CSAH 78	120+32, 47' RT.	LIGHT POLE			X	(1)
NB CSAH 78	120+33, 46' RT. - 122+35, 40' RT.	BUR PWR IN COND			X	(1)
NB CSAH 78	122+35, 40' RT.	LIGHT POLE			X	(1)
NB CSAH 78	122+36, 40' RT. - 125+86, 37' RT.	BUR PWR IN COND			X	(1)
NB CSAH 78	123+91, 66' LT.	LIGHT POLE			X	(1)
NB CSAH 78	123+92, 67' LT. - 125+25, 65' LT.	BUR PWR IN COND			X	(1)
NB CSAH 78	125+25, 65' LT. - 126+95, 66' LT.	BUR PWR IN COND			X	(1)
NB CSAH 78	125+46, 269' RT.	LIGHT POLE	X			
NB CSAH 78	125+87, 36' RT.	LIGHT POLE	X			
NB CSAH 78	125+88, 36' RT. - 128+21, 36' RT.	BUR PWR IN COND	X			
NB CSAH 78	126+96, 66' LT. - 128+09, 83' LT.	BUR PWR IN COND	X			
NB CSAH 78	126+96, 66' LT.	LIGHT POLE	X			
NB CSAH 78	128+08, 62' LT. - 128+41, 38' RT.	BUR PWR IN COND	X			
NB CSAH 78	128+09, 83' LT. - 129+81, 71' LT.	BUR PWR IN COND	X			
NB CSAH 78	128+41, 38' RT.	LIGHT POLE	X			
NB CSAH 78	128+42, 37' RT. - 131+36, 36' RT.	BUR PWR IN COND	X			
NB CSAH 78	129+81, 71' LT.	LIGHT POLE	X			
NB CSAH 78	129+83, 71' LT. - 132+83, 66' LT.	BUR PWR IN COND	X			
NB CSAH 78	131+36, 37' RT.	LIGHT POLE	X			
NB CSAH 78	131+36, 36' RT. - 133+08, 37' RT.	BUR PWR IN COND	X			
NB CSAH 78	132+83, 66' LT.	LIGHT POLE	X			
NB CSAH 78	132+84, 66' LT. - 133+06, 65' LT.	BUR PWR IN COND	X			

EXISTING UTILITIES (COMCAST TV)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	100+00, 84' LT. - 104+82, 83' LT.	BURIED TV			X	
NB CSAH 78	100+49, 167' RT. - 101+30, 233' RT.	BURIED TV	X			
NB CSAH 78	101+30, 35' RT. - 102+97, 83' LT.	BURIED TV			X	
NB CSAH 78	104+82, 83' LT. - 111+25, 117' LT.	BURIED TV			X	
NB CSAH 78	106+38, 89' LT.	TV PED			X	
NB CSAH 78	106+39, 89' LT. - 112+69, 15' RT.	BURIED TV			X	
NB CSAH 78	111+25, 117' LT.	TV PED			X	
NB CSAH 78	111+25, 116' LT. - 118+67, 37' RT.	BURIED TV			X	
NB CSAH 78	111+44, 175' RT. - 111+69, 31' RT.	BURIED TV			X	
NB CSAH 78	111+59, 9' RT.	TV PED			X	
NB CSAH 78	111+59, 10' RT. - 112+69, 15' RT.	BURIED TV			X	
NB CSAH 78	112+54, 94' RT. - 112+71, 17' RT.	BURIED TV			X	
NB CSAH 78	112+69, 15' RT.	TV PED			X	
NB CSAH 78	118+67, 37' RT. - 127+48, 41' RT.	BURIED TV			X	
NB CSAH 78	119+36, 321' RT. - 119+56, 316' RT.	BURIED TV	X			
NB CSAH 78	119+53, 34' RT. - 120+41, 181' LT.	BURIED TV			X	
NB CSAH 78	119+56, 316' RT.	TV PED	X			
NB CSAH 78	119+56, 317' RT. - 119+68, 252' RT.	BURIED TV	X			
NB CSAH 78	119+56, 316' RT. - 120+12, 319' RT.	BURIED TV	X			
NB CSAH 78	119+62, 313' RT. - 120+11, 319' RT.	BURIED TV	X			
NB CSAH 78	119+67, 169' RT.	TV PED	X			
NB CSAH 78	119+67, 169' RT. - 125+13, 49' RT.	BURIED TV			X	
NB CSAH 78	119+87, 430' RT. - 120+11, 319' RT.	BURIED TV	X			
NB CSAH 78	119+87, 430' RT. - 120+11, 319' RT.	BURIED TV	X			
NB CSAH 78	120+11, 319' RT.	TV PED	X			
NB CSAH 78	120+12, 319' RT. - 120+40, 320' RT.	BURIED TV	X			
NB CSAH 78	120+41, 181' LT.	TV PED			X	
NB CSAH 78	120+41, 181' LT. - 120+55, 184' LT.	BURIED TV			X	
NB CSAH 78	120+46, 187' LT. - 120+49, 190' LT.	BURIED TV			X	
NB CSAH 78	124+83, 142' LT. - 125+13, 84' LT.	BURIED TV	X			
NB CSAH 78	125+13, 84' LT.	TV PED	X			
NB CSAH 78	125+13, 49' RT.	TV PED	X			
NB CSAH 78	125+14, 84' LT. - 126+58, 81' LT.	BURIED TV	X			
NB CSAH 78	125+16, 122' RT. - 125+18, 51' RT.	BURIED TV	X			
NB CSAH 78	125+18, 49' RT.	TV PED	X			
NB CSAH 78	126+06, 99' LT. - 126+58, 81' LT.	BURIED TV	X			
NB CSAH 78	126+59, 82' LT. - 129+78, 84' LT.	BURIED TV	X			
NB CSAH 78	126+59, 82' LT. - 126+70, 123' LT.	BURIED TV	X			
NB CSAH 78	126+59, 82' LT.	TV PED	X			
NB CSAH 78	127+48, 35' RT. - 129+86, 73' LT.	BURIED TV	X			
NB CSAH 78	127+48, 41' RT.	TV PED	X			
NB CSAH 78	129+71, 134' LT. - 129+80, 95' LT.	BURIED TV	X			
NB CSAH 78	129+79, 85' LT. - 129+83, 107' LT.	BURIED TV	X			
NB CSAH 78	129+79, 84' LT.	TV PED	X			
NB CSAH 78	129+79, 84' LT. - 132+50, 81' LT.	BURIED TV	X			
NB CSAH 78	132+42, 146' LT. - 132+49, 81' LT.	BURIED TV	X			
NB CSAH 78	132+50, 81' LT.	TV PED	X			

NOTES:
 (1) WORK TO BE DONE BY CONTRACTOR AS NOTED IN REMOVAL PLAN OR TRAFFIC SIGNAL AND INTERCONNECT PLANS.

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NO	DATE	BY	CKD	APPR	REVISION
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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK

 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO
 002-678-023, 114-020-051

DRAWN BY
 S. VANG
 DESIGNED BY
 T. SMITH
 CHECKED BY
 B. ROBECK
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 INPLACE UTILITY TABULATIONS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 15
 OF
 175

EXISTING UTILITIES (CONNEXUS)						H
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	115+59, 62' RT. - 117+53, 83' LT.	BURIED POWER			X	
NB CSAH 78	117+41, 16' RT. - 118+67, 35' RT.	BURIED POWER			X	
NB CSAH 78	117+41, 16' RT. - 118+67, 34' RT.	BURIED POWER			X	
NB CSAH 78	117+42, 15' RT. - 118+67, 34' RT.	BURIED POWER			X	
NB CSAH 78	117+49, 97' LT. - 117+92, 151' LT.	BURIED POWER			X	
NB CSAH 78	117+49, 95' LT. - 117+56, 94' LT.	BURIED POWER			X	
NB CSAH 78	117+49, 95' LT.	ELEC PED			X	
NB CSAH 78	117+56, 94' LT.	ELEC PED			X	
NB CSAH 78	117+56, 94' LT. - 118+73, 80' LT.	BURIED POWER			X	
NB CSAH 78	118+67, 35' RT. - 119+75, 53' RT.	BURIED POWER			X	
NB CSAH 78	118+67, 34' RT. - 121+55, 48' RT.	BURIED POWER			X	
NB CSAH 78	118+67, 34' RT. - 121+65, 32' RT.	BURIED POWER			X	
NB CSAH 78	118+73, 80' LT. - 119+80, 99' LT.	BURIED POWER			X	
NB CSAH 78	119+09, 236' RT. - 119+51, 231' RT.	BURIED POWER	X			
NB CSAH 78	119+45, 225' RT. - 119+50, 232' RT.	BURIED POWER	X			
NB CSAH 78	119+50, 232' RT. - 120+12, 335' RT.	BURIED POWER	X			
NB CSAH 78	119+50, 231' RT.	ELEC PED	X			
NB CSAH 78	119+50, 231' RT. - 119+62, 154' RT.	BURIED POWER	X			
NB CSAH 78	119+50, 231' RT. - 120+31, 239' RT.	BURIED POWER	X			
NB CSAH 78	119+50, 231' RT. - 120+40, 191' RT.	BURIED POWER	X			
NB CSAH 78	119+79, 83' LT. - 120+21, 136' LT.	BURIED POWER			X	
NB CSAH 78	119+79, 100' LT.	ELEC PED			X	
NB CSAH 78	120+54, 76' LT. - 125+19, 86' LT.	BURIED POWER			X	
NB CSAH 78	121+53, 63' RT. - 121+59, 122' RT.	BURIED POWER			X	
NB CSAH 78	121+55, 36' RT. - 125+22, 44' RT.	BURIED POWER			X	
NB CSAH 78	121+55, 48' RT.	ELEC PED			X	
NB CSAH 78	121+59, 122' RT. - 121+62, 325' RT.	OH POWER			X	
NB CSAH 78	121+59, 122' RT.	POWER POLE			X	
NB CSAH 78	121+62, 325' RT.	POWER POLE	X			
NB CSAH 78	121+65, 32' RT. - 125+23, 44' RT.	BURIED POWER			X	
NB CSAH 78	124+04, 145' LT. - 125+19, 80' LT.	BURIED POWER	X			
NB CSAH 78	124+04, 145' LT.	ELEC METER	X			
NB CSAH 78	124+81, 141' LT. - 125+19, 86' LT.	BURIED POWER	X			
NB CSAH 78	125+15, 78' RT. - 125+22, 48' RT.	BURIED POWER	X			
NB CSAH 78	125+16, 122' RT. - 125+20, 323' RT.	OH POWER	X			
NB CSAH 78	125+16, 122' RT.	POWER POLE	X			
NB CSAH 78	125+16, 102' RT.	GUY WIRE	X			
NB CSAH 78	125+16, 106' RT.	GUY WIRE	X			
NB CSAH 78	125+16, 110' RT.	GUY WIRE	X			
NB CSAH 78	125+17, 228' RT.	POWER POLE	X			
NB CSAH 78	125+19, 190' RT. - 125+32, 330' RT.	BURIED POWER	X			
NB CSAH 78	125+20, 83' LT. - 128+09, 83' LT.	BURIED POWER			X	
NB CSAH 78	125+20, 85' LT. - 127+85, 136' LT.	BURIED POWER	X			
NB CSAH 78	125+20, 85' LT.	ELEC PED	X			
NB CSAH 78	125+20, 86' LT. - 125+59, 166' LT.	BURIED POWER	X			
NB CSAH 78	125+20, 323' RT.	POWER POLE	X			
NB CSAH 78	125+22, 31' RT. - 133+08, 26' RT.	BURIED POWER			X	
NB CSAH 78	125+23, 47' RT.	ELEC PED	X			
NB CSAH 78	127+52, 176' LT. - 127+84, 138' LT.	BURIED POWER	X			
NB CSAH 78	127+78, 172' LT. - 127+88, 235' LT.	BURIED POWER	X			
NB CSAH 78	127+85, 136' LT.	ELEC PED	X			
NB CSAH 78	128+09, 83' LT.	ELEC METER			X	
NB CSAH 78	129+83, 95' LT. - 132+01, 88' LT.	BURIED POWER	X			
NB CSAH 78	129+93, 183' LT.	POWER POLE	X			
NB CSAH 78	129+94, 193' LT.	GUY WIRE	X			
NB CSAH 78	131+76, 106' RT. - 132+24, 44' RT.	BURIED POWER	X			
NB CSAH 78	131+76, 106' RT.	ELEC METER	X			
NB CSAH 78	132+04, 90' LT. - 133+05, 88' LT.	BURIED POWER	X			
NB CSAH 78	132+04, 90' LT. - 132+14, 139' LT.	BURIED POWER	X			
NB CSAH 78	132+04, 90' LT.	ELEC PED	X			
NB CSAH 78	132+24, 44' RT.	ELEC PED	X			
NB CSAH 78	132+25, 44' RT. - 133+08, 26' RT.	BURIED POWER	X			

EXISTING UTILITIES (XCEL ENERGY)					H	
ALIGNMENT	LOCATION STATION AND OFFSET	IN PLACE UTILITY	REMARKS			NOTES
			LEAVE AS IS	ADJUST	RELOCATE	
NB CSAH 78	100+00, 113' LT. - 101+86, 98' LT.	BUR PWR IN COND	X			
NB CSAH 78	100+00, 464' LT. - 100+37, 517' LT.	OH POWER	X			
NB CSAH 78	100+00, 84' LT. - 101+18, 84' LT.	BURIED POWER	X			
NB CSAH 78	100+24, 79' LT.	LIGHT POLE	X			
NB CSAH 78	100+24, 79' LT. - 103+09, 73' LT.	BUR PWR IN COND			X	
NB CSAH 78	100+37, 517' LT.	POWER POLE	X			
NB CSAH 78	100+37, 522' LT.	GUY WIRE	X			
NB CSAH 78	100+50, 150' LT.	LIGHT POLE	X			
NB CSAH 78	100+50, 150' LT. - 102+28, 170' LT.	BUR PWR IN COND	X			
NB CSAH 78	101+04, 322' LT.	LIGHT POLE	X			
NB CSAH 78	101+04, 322' LT. - 101+12, 267' LT.	BUR PWR IN COND	X			
NB CSAH 78	101+18, 84' LT.	ELEC PED	X			
NB CSAH 78	101+18, 84' LT. - 101+38, 234' RT.	BURIED POWER	X			
NB CSAH 78	101+19, 84' LT. - 102+80, 83' LT.	BURIED POWER	X			
NB CSAH 78	101+59, 84' RT.	LIGHT POLE	X			
NB CSAH 78	101+59, 84' RT. - 104+89, 131' RT.	BUR PWR IN COND	X			
NB CSAH 78	101+77, 22' RT.	LIGHT POLE			X	
NB CSAH 78	101+77, 22' RT. - 104+58, 22' RT.	BUR PWR IN COND			X	
NB CSAH 78	101+87, 99' LT.	LIGHT POLE	X			
NB CSAH 78	101+87, 99' LT. - 102+28, 169' LT.	BUR PWR IN COND	X			
NB CSAH 78	102+78, 119' LT. - 102+97, 83' LT.	BURIED POWER			X	
NB CSAH 78	102+97, 83' LT.	POWER POLE			X	
NB CSAH 78	102+97, 83' LT. - 104+76, 232' LT.	OH POWER			X	
NB CSAH 78	102+97, 83' LT. - 104+82, 80' LT.	BURIED POWER			X	
NB CSAH 78	102+98, 228' LT.	GUY WIRE	X			
NB CSAH 78	103+00, 227' LT.	GUY WIRE	X			
NB CSAH 78	103+08, 79' LT. - 104+81, 87' LT.	BUR PWR IN COND			X	
NB CSAH 78	103+10, 73' LT.	LIGHT POLE			X	
NB CSAH 78	103+14, 228' LT.	POWER POLE	X			
NB CSAH 78	104+58, 22' RT. - 104+85, 18' RT.	LIGHT POLE			X	
NB CSAH 78	104+58, 22' RT. - 104+85, 18' RT.	BUR PWR IN COND			X	
NB CSAH 78	104+77, 232' LT. - 109+77, 263' LT.	OH POWER	X			
NB CSAH 78	104+82, 80' LT. - 115+52, 94' LT.	BURIED POWER			X	
NB CSAH 78	104+82, 87' LT. - 105+05, 90' LT.	BUR PWR IN COND			X	
NB CSAH 78	104+86, 18' RT. - 107+66, 2' LT.	BUR PWR IN COND			X	
NB CSAH 78	104+90, 131' RT. - 105+33, 131' RT.	BUR PWR IN COND	X			
NB CSAH 78	105+03, 229' LT. - 105+07, 154' LT.	BURIED POWER	X			
NB CSAH 78	105+05, 233' LT.	POWER POLE	X			
NB CSAH 78	105+05, 90' LT.	ELEC METER			X	
NB CSAH 78	105+05, 90' LT. - 105+88, 80' LT.	BUR PWR IN COND			X	
NB CSAH 78	105+05, 90' LT. - 107+67, 2' LT.	BUR PWR IN COND			X	
NB CSAH 78	105+33, 130' RT.	LIGHT POLE	X			
NB CSAH 78	105+34, 130' RT. - 109+75, 146' RT.	BUR PWR IN COND	X			
NB CSAH 78	105+89, 79' LT.	LIGHT POLE			X	
NB CSAH 78	105+89, 79' LT. - 108+73, 98' LT.	BUR PWR IN COND			X	
NB CSAH 78	106+36, 241' LT.	POWER POLE	X			
NB CSAH 78	107+36, 184' RT. - 112+74, 18' RT.	BURIED POWER			X	
NB CSAH 78	107+67, 2' LT.	LIGHT POLE			X	
NB CSAH 78	107+67, 2' LT. - 110+52, 14' LT.	BUR PWR IN COND			X	
NB CSAH 78	107+92, 255' LT.	POWER POLE	X			
NB CSAH 78	108+74, 98' LT.	LIGHT POLE			X	
NB CSAH 78	108+74, 98' LT. - 112+05, 103' LT.	BUR PWR IN COND			X	
NB CSAH 78	109+76, 146' RT.	LIGHT POLE	X			
NB CSAH 78	109+76, 146' RT. - 110+53, 14' LT.	BUR PWR IN COND			X	
NB CSAH 78	109+77, 248' LT.	GUY WIRE	X			
NB CSAH 78	109+77, 263' LT.	POWER POLE	X			
NB CSAH 78	109+78, 246' LT.	GUY WIRE	X			
NB CSAH 78	110+53, 14' LT.	LIGHT POLE			X	
NB CSAH 78	110+54, 14' LT. - 113+39, 0' RT.	BUR PWR IN COND			X	
NB CSAH 78	112+05, 103' LT.	LIGHT POLE			X	
NB CSAH 78	112+05, 103' LT. - 115+32, 80' LT.	BUR PWR IN COND			X	
NB CSAH 78	112+36, 105' LT. - 115+52, 95' LT.	BURIED POWER			X	
NB CSAH 78	112+54, 100' RT. - 112+74, 18' RT.	BURIED POWER			X	
NB CSAH 78	112+74, 18' RT.	ELEC PED			X	
NB CSAH 78	112+76, 19' RT. - 112+82, 96' RT.	BURIED POWER			X	
NB CSAH 78	113+39, 0' RT.	LIGHT POLE			X	
NB CSAH 78	114+97, 159' LT.	ELEC METER			X	
NB CSAH 78	114+97, 159' LT. - 115+53, 102' LT.	BURIED POWER			X	
NB CSAH 78	115+32, 80' LT.	LIGHT POLE			X	
NB CSAH 78	115+52, 95' LT.	ELEC PED			X	

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
DESIGNED BY T. SMITH
CHECKED BY B. ROBECK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
INPLACE UTILITY TABULATIONS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
16
OF
175

EXISTING DRAINAGE ITEMS											I
ALIGNMENT	LOCATION STATION AND OFFSET	EXISTING ITEM	LEAVE AS IS	REMOVE			ADJUST FRAME & RING CASTING	EXISTING TOP OF CASTING	PROPOSED TOP OF CASTING	NOTES	
				SEWER PIPE (STORM)	PIPE APRON	DRAINAGE STRUCTURE					LN FT
NB CSAH 78	100+00, 163' LT - 100+01, 164' LT	10" UNKNOWN	X								
NB CSAH 78	100+00, 377' LT - 101+39, 577' LT	30" RCP	X								
NB CSAH 78	100+01, 164' LT	CATCH BASIN	X								
NB CSAH 78	101+39, 577' LT	CATCH BASIN	X								
NB CSAH 78	103+10, 79' RT	CATCH BASIN	X								
NB CSAH 78	103+10, 79' RT - 103+14, 52' RT	12" RCP	X								
NB CSAH 78	103+11, 23' LT	CATCH BASIN				1				(1)	
NB CSAH 78	103+11, 23' LT - 103+12, 22' RT	12" RCP		45						(1)	
NB CSAH 78	103+11, 30' LT	CATCH BASIN				1				(1)	
NB CSAH 78	103+11, 30' LT - 103+11, 23' LT	12" RCP		7						(1)	
NB CSAH 78	103+11, 30' LT - 103+11, 69' LT	12" RCP		39						(1)	
NB CSAH 78	103+11, 69' LT	CATCH BASIN				1				(1)	
NB CSAH 78	103+12, 22' RT	CATCH BASIN				1				(1)	
NB CSAH 78	103+12, 22' RT - 103+14, 52' RT	12" RCP	X								
NB CSAH 78	103+12, 22' RT - 104+38, 18' RT	21" RCP		126						(1)	
NB CSAH 78	103+14, 52' RT	CATCH BASIN	X								
NB CSAH 78	104+34, 72' LT	CATCH BASIN				1				(1)	
NB CSAH 78	104+34, 72' LT - 104+35, 30' LT	12" RCP		43						(1)	
NB CSAH 78	104+35, 30' LT	CATCH BASIN				1				(1)	
NB CSAH 78	104+35, 30' LT - 104+38, 18' RT	12" RCP		48						(1)	
NB CSAH 78	104+36, 46' RT	18" RCP			1					(1)(2)	
NB CSAH 78	104+36, 46' RT - 104+38, 18' RT	18" RCP		28						(1)	
NB CSAH 78	104+38, 18' RT	CATCH BASIN				1				(1)	
NB CSAH 78	104+92, 58' RT	18" RCP			1					(1)(2)	
NB CSAH 78	104+92, 58' RT - 105+17, 54' RT	18" RCP		24						(1)	
NB CSAH 78	105+15, 104' LT	CATCH BASIN				1				(1)	
NB CSAH 78	105+15, 104' LT - 105+42, 107' LT	12" RCP		28						(1)	
NB CSAH 78	105+17, 54' RT	CATCH BASIN				1				(1)	
NB CSAH 78	105+17, 54' RT - 105+45, 47' RT	18" RCP		29						(1)	
NB CSAH 78	105+42, 107' LT	CATCH BASIN				1				(1)	
NB CSAH 78	105+42, 107' LT - 105+42, 72' LT	12" RCP		35						(1)	
NB CSAH 78	105+42, 72' LT	STORM MANHOLE				1				(1)	
NB CSAH 78	105+42, 72' LT - 107+64, 86' LT	12" RCP		227						(1)	
NB CSAH 78	105+45, 47' RT	CATCH BASIN				1				(1)	
NB CSAH 78	105+45, 47' RT - 105+69, 57' RT	24" RCP		26						(1)	
NB CSAH 78	105+69, 57' RT	24" RCP			1					(1)(2)	
NB CSAH 78	107+64, 86' LT	CATCH BASIN				1				(1)	
NB CSAH 78	107+64, 86' LT - 107+72, 7' LT	24" RCP		80						(1)	
NB CSAH 78	107+64, 86' LT - 109+49, 97' LT	24" RCP		180						(1)	
NB CSAH 78	107+72, 7' LT	CATCH BASIN				1				(1)	
NB CSAH 78	107+72, 7' LT - 107+76, 47' RT	24" RCP		54						(1)	
NB CSAH 78	107+76, 47' RT	24" RCP			1					(1)(2)	
NB CSAH 78	109+35, 26' RT	12" RCP			1					(1)(2)	
NB CSAH 78	109+35, 26' RT - 109+52, 18' LT	12" RCP		46						(1)	
NB CSAH 78	109+43, 77' RT	12" RCP			1					(1)(2)	
NB CSAH 78	109+43, 77' RT - 109+51, 107' RT	12" RCP		31						(1)	
NB CSAH 78	109+49, 97' LT	CATCH BASIN				1				(1)	
NB CSAH 78	109+49, 97' LT - 109+50, 66' LT	12" RCP		32						(1)	
NB CSAH 78	109+49, 97' LT - 110+19, 100' LT	24" RCP		67						(1)	
NB CSAH 78	109+50, 60' LT	CATCH BASIN				1				(1)	
NB CSAH 78	109+50, 60' LT - 109+52, 18' LT	12" RCP		42						(1)	
NB CSAH 78	109+50, 66' LT	CATCH BASIN				1				(1)	
NB CSAH 78	109+50, 66' LT - 109+50, 60' LT	12" RCP		6						(1)	
NB CSAH 78	109+51, 107' RT	CATCH BASIN				1				(1)	
NB CSAH 78	109+51, 107' RT - 109+52, 134' RT	12" RCP	X								
NB CSAH 78	109+52, 134' RT	CATCH BASIN	X								
NB CSAH 78	109+52, 18' LT	CATCH BASIN				1				(1)	
NB CSAH 78	109+67, 32' RT	18" RCP			1					(1)(2)	
NB CSAH 78	109+67, 32' RT - 109+81, 23' RT	18" RCP		16						(1)	
NB CSAH 78	109+81, 23' RT	STORM MANHOLE				1				(1)	
				SUBTOTAL	1259		20				

NOTES:

- (1) WORK TO BE DONE BY CONTRACTOR AS NOTED IN REMOVAL PLAN OR TRAFFIC SIGNAL AND INTERCONNECT PLANS.
- (2) PIPE APRON REMOVAL INCLUDED IN ADJACENT SEWER PIPE (STORM) REMOVAL.

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: JEREMY NIELSEN

Jeremy Nielsen

Date: 06/17/2011 License #: 45047

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG

DESIGNED BY
T. SMITH

CHECKED BY
B. ROBECK

COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY

INPLACE UTILITY TABULATIONS

CSAH 78 - BNSF GRADE SEPARATION

SHEET
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EXISTING DRAINAGE ITEMS

I

ALIGNMENT	LOCATION STATION AND OFFSET	EXISTING ITEM	LEAVE AS IS	REMOVE			ADJUST FRAME & RING CASTING	EXISTING TOP OF CASTING	PROPOSED TOP OF CASTING	NOTES
				SEWER PIPE (STORM)	PIPE APRON	DRAINAGE STRUCTURE				
				LIN FT	EACH	EACH				
NB CSAH 78	109+81, 23' RT - 110+37, 9' LT	18" RCP		65					(1)	
NB CSAH 78	109+90, 137' LT	CATCH BASIN				1			(1)	
NB CSAH 78	109+90, 137' LT - 110+19, 142' LT	12" RCP		28					(1)	
NB CSAH 78	110+19, 100' LT	STORM MANHOLE				1			(1)	
NB CSAH 78	110+19, 100' LT - 110+19, 142' LT	12" RCP		42					(1)	
NB CSAH 78	110+19, 100' LT - 111+77, 101' LT	12" RCP		153					(1)	
NB CSAH 78	110+19, 142' LT	CATCH BASIN				1			(1)	
NB CSAH 78	110+37, 8' LT	STORM MANHOLE				1			(1)	
NB CSAH 78	110+37, 8' LT - 111+72, 6' LT	18" RCP		135					(1)	
NB CSAH 78	111+72, 16' LT	CATCH BASIN				1			(1)	
NB CSAH 78	111+72, 16' LT - 111+75, 47' LT	12" RCP		31					(1)	
NB CSAH 78	111+72, 6' LT	STORM MANHOLE				1			(1)	
NB CSAH 78	111+72, 6' LT - 113+52, 3' RT	18" RCP		180					(1)	
NB CSAH 78	111+75, 47' LT	CATCH BASIN				1			(1)	
NB CSAH 78	111+75, 47' LT - 111+75, 53' LT	12" RCP		6					(1)	
NB CSAH 78	111+75, 53' LT	CATCH BASIN				1			(1)	
NB CSAH 78	111+75, 53' LT - 111+77, 101' LT	12" RCP		48					(1)	
NB CSAH 78	111+77, 101' LT	CATCH BASIN				1			(1)	
NB CSAH 78	111+77, 101' LT - 111+84, 100' LT	12" RCP		6					(1)	
NB CSAH 78	111+84, 100' LT	CATCH BASIN				1			(1)	
NB CSAH 78	112+98, 132' LT	CATCH BASIN				1			(1)	
NB CSAH 78	112+98, 132' LT - 113+25, 127' LT	12" RCP		28					(1)	
NB CSAH 78	113+24, 92' LT	STORM MANHOLE				1			(1)	
NB CSAH 78	113+24, 92' LT - 113+25, 127' LT	18" RCP		35					(1)	
NB CSAH 78	113+24, 92' LT - 113+59, 89' LT	18" RCP		35					(1)	
NB CSAH 78	113+25, 127' LT	CATCH BASIN				1			(1)	
NB CSAH 78	113+25, 127' LT - 113+43, 290' LT	24" RCP	X							
NB CSAH 78	113+43, 290' LT	STORM MANHOLE	X							
NB CSAH 78	113+43, 290' LT - 113+52, 382' LT	24" RCP	X							
NB CSAH 78	113+43, 290' LT - 114+86, 263' LT	12" RCP	X							
NB CSAH 78	113+52, 382' LT	CATCH BASIN	X							
NB CSAH 78	113+52, 382' LT - 114+23, 622' LT	UNKNOWN RCP	X							
NB CSAH 78	113+52, 4' LT	CATCH BASIN				1			(1)	
NB CSAH 78	113+52, 4' LT - 113+59, 89' LT	18" RCP		86					(1)	
NB CSAH 78	113+52, 4' RT	STORM MANHOLE				1			(1)	
NB CSAH 78	113+52, 4' RT - 113+52, 4' LT	18" RCP		7					(1)	
NB CSAH 78	113+59, 89' LT	CATCH BASIN				1			(1)	
NB CSAH 78	114+23, 622' LT - 114+83, 1000' LT	UNKNOWN RCP	X							
NB CSAH 78	114+86, 263' LT	DROP INLET	X							
NB CSAH 78	117+01, 1000' LT - 118+51, 955' LT	UNKNOWN RCP	X							
NB CSAH 78	118+51, 955' LT	UNKNOWN RCP	X							
NB CSAH 78	119+40, 33' RT	CATCH BASIN				1			(1)	
NB CSAH 78	119+40, 33' RT - 119+47, 15' LT	15" RCP		48					(1)	
NB CSAH 78	119+40, 33' RT - 122+24, 26' RT	15" RCP		281					(1)	
NB CSAH 78	119+47, 15' LT	CATCH BASIN				1			(1)	
NB CSAH 78	119+47, 15' LT - 119+48, 20' LT	15" RCP		6					(1)	
NB CSAH 78	119+48, 20' LT	CATCH BASIN				1			(1)	
NB CSAH 78	119+48, 20' LT - 119+54, 52' LT	15" RCP		32					(1)	
NB CSAH 78	119+54, 52' LT	CATCH BASIN				1			(1)	
NB CSAH 78	119+54, 52' LT - 119+92, 83' LT	12" RCP		50					(1)	
NB CSAH 78	119+92, 83' LT	CATCH BASIN				1			(1)	
NB CSAH 78	122+21, 11' LT	CATCH BASIN				1			(1)	
NB CSAH 78	122+21, 11' LT - 122+24, 26' RT	15" RCP		37					(1)	
NB CSAH 78	122+21, 17' LT	CATCH BASIN				1			(1)	
NB CSAH 78	122+21, 17' LT - 122+21, 11' LT	15" RCP		6					(1)	
NB CSAH 78	122+21, 17' LT - 122+21, 65' LT	15" RCP		48					(1)	
NB CSAH 78	122+21, 65' LT	CATCH BASIN				1			(1)	
NB CSAH 78	122+24, 26' RT	CATCH BASIN				1			(1)	
NB CSAH 78	122+24, 26' RT - 125+91, 23' RT	18" RCP		367					(1)	
NB CSAH 78	125+91, 23' RT	CATCH BASIN				1			(1)	
				SUBTOTAL	1760	26				

NOTES:

(1) WORK TO BE DONE BY CONTRACTOR AS NOTED IN REMOVAL PLAN OR TRAFFIC SIGNAL AND INTERCONNECT PLANS.

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: JEREMY NIELSEN

Jeremy Nielsen

Date: 06/12/2011 License #: 45047

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
DESIGNED BY T. SMITH
CHECKED BY B. ROBECK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
INPLACE UTILITY TABULATIONS
CSAH 78 - BNSF GRADE SEPARATION

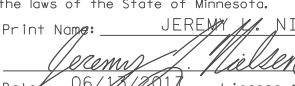

SHEET
18
OF
175

EXISTING DRAINAGE ITEMS										I
ALIGNMENT	LOCATION STATION AND OFFSET	EXISTING ITEM	LEAVE AS IS	REMOVE			ADJUST FRAME & RING CASTING	EXISTING TOP OF CASTING	PROPOSED TOP OF CASTING	NOTES
				SEWER PIPE (STORM)	PIPE APRON	DRAINAGE STRUCTURE				
				LIN FT	EACH	EACH				
NB CSAH 78	125+91, 23' RT - 125+92, 25' LT	15" RCP		48					(1)	
NB CSAH 78	125+91, 23' RT - 128+46, 17' RT	21" RCP		256					(1)	
NB CSAH 78	125+91, 31' LT	CATCH BASIN				1			(1)	
NB CSAH 78	125+91, 31' LT - 125+91, 62' LT	15" RCP		31					(1)	
NB CSAH 78	125+91, 31' LT - 125+92, 25' LT	15" RCP		6					(1)	
NB CSAH 78	125+91, 62' LT	CATCH BASIN				1			(1)	
NB CSAH 78	125+92, 25' LT	CATCH BASIN				1			(1)	
NB CSAH 78	128+16, 68' LT	CATCH BASIN				1			(1)	
NB CSAH 78	128+16, 68' LT - 128+32, 20' LT	15" RCP		50					(1)	
NB CSAH 78	128+32, 20' LT	CATCH BASIN				1			(1)	
NB CSAH 78	128+32, 20' LT - 128+33, 14' LT	15" RCP		6					(1)	
NB CSAH 78	128+33, 14' LT	CATCH BASIN				1			(1)	
NB CSAH 78	128+33, 14' LT - 128+46, 17' RT	15" RCP		34					(1)	
NB CSAH 78	128+46, 17' RT	CATCH BASIN					1	866.22	866.30 (1)	
NB CSAH 78	128+46, 17' RT - 130+89, 17' RT	21" RCP	X							
NB CSAH 78	130+88, 68' LT	CATCH BASIN	X							
NB CSAH 78	130+88, 68' LT - 130+89, 17' RT	15" RCP	X							
NB CSAH 78	130+89, 17' RT	CATCH BASIN	X							
NB CSAH 78	130+89, 17' RT - 133+45, 18' RT	21" RCP	X							
NB CSAH 78	133+45, 18' RT	CATCH BASIN	X							
NB CSAH 78	133+45, 18' RT - 133+56, 25' LT	15" RCP	X							
NB CSAH 78	133+45, 18' RT - 133+88, 18' RT	21" RCP	X							
NB CSAH 78	133+46, 62' LT	CATCH BASIN	X							
NB CSAH 78	133+46, 62' LT - 133+88, 62' LT	15" RCP	X							
NB CSAH 78	133+56, 25' LT	CATCH BASIN	X							
NB CSAH 78	133+88, 18' RT	CATCH BASIN	X							
NB CSAH 78	133+88, 18' RT - 133+88, 31' LT	15" RCP	X							
NB CSAH 78	133+88, 18' RT - 135+57, 23' RT	24" RCP	X							
NB CSAH 78	133+88, 31' LT	CATCH BASIN	X							
NB CSAH 78	133+88, 31' LT - 133+88, 62' LT	15" RCP	X							
NB CSAH 78	133+88, 62' LT	CATCH BASIN	X							
NB CSAH 78	135+57, 24' RT	CATCH BASIN	X							
NB CSAH 78	135+57, 24' RT - 138+05, 15' RT	UNKNOWN RCP	X							
NB CSAH 78	138+05, 15' RT - 138+57, 30' RT	UNKNOWN RCP	X							
NB CSAH 78	138+52, 1000' RT - 138+57, 30' RT	UNKNOWN RCP	X							
SUBTOTAL				431		6	1			
PROJECT TOTALS				3450		52	1			

NOTES:

(1) WORK TO BE DONE BY CONTRACTOR AS NOTED IN REMOVAL PLAN OR TRAFFIC SIGNAL AND INTERCONNECT PLANS.

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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: JEREMY NIELSEN  Date: 06/18/2017 License #: 45047					STATE AID PROJECT NO 002-678-023, 114-020-051		DRAWN BY S. VANG DESIGNED BY T. SMITH CHECKED BY B. ROBECK COMM. NO. 0169140		 ENGINEERS PLANNERS DESIGNERS		ANOKA COUNTY INPLACE UTILITY TABULATIONS CSAH 78 - BNSF GRADE SEPARATION		SHEET 19 OF 175
NO DATE BY CKD APPR REVISION ... \CAD_BIM\1an\9140_tbp03.dgn													

EXISTING SANITARY SEWER

J


ALIGNMENT	LOCATION STATION AND OFFSET	EXISTING ITEM	LEAVE AS IS	REMOVE		PLUG FILL & ABANDON	ADJUST	NOTES	
				MANHOLE	SEWER PIPE (SANITARY)	SEWER PIPE (SANITARY)	FRAME & RING CASTING		
				EACH	LIN FT	LIN FT	EACH		
NB CSAH 78	100+00, 414' LT. - 100+52, 491' LT.	8" VCP SAN	X						
NB CSAH 78	100+00, 222' LT. - 101+04, 375' LT.	8" CIP SAN	X						
NB CSAH 78	100+00, 60' LT. - 100+22, 45' LT.	8" CIP SAN	X						
NB CSAH 78	100+00, 35' LT. - 100+22, 45' LT.	12" VCP SAN	X						
NB CSAH 78	100+22, 45' LT. - 101+27, 48' LT.	12" VCP SAN	X						
NB CSAH 78	100+22, 45' LT.	SAN MH	X						
NB CSAH 78	100+52, 491' LT.	SAN MH	X						
NB CSAH 78	101+04, 375' LT.	SAN MH	X						
NB CSAH 78	101+26, 276' RT. - 101+27, 48' LT.	8" VCP SAN	X						
NB CSAH 78	101+26, 276' RT.	SAN MH	X				1	(2)	
NB CSAH 78	101+27, 48' LT. - 104+82, 55' LT.	12" VCP SAN	X						
NB CSAH 78	101+27, 48' LT.	SAN MH	X						
NB CSAH 78	103+24, 114' LT. - 103+26, 52' LT.	4" UNKNOWN SAN	X						
NB CSAH 78	104+83, 55' LT. - 105+30, 56' LT.	12" VCP SAN	X						
NB CSAH 78	105+27, 276' LT. - 105+30, 56' LT.	8" VCP SAN	X						
NB CSAH 78	105+27, 276' LT.	SAN MH	X						
NB CSAH 78	105+30, 56' LT. - 107+57, 70' LT.	12" VCP SAN			231			(1)	
NB CSAH 78	105+30, 56' LT.	SAN MH		1				(1)	
NB CSAH 78	106+86, 92' LT. - 106+88, 64' LT.	4" UNKNOWN SAN			28			(1)	
NB CSAH 78	107+57, 70' LT. - 110+04, 82' LT.	12" VCP SAN			241			(1)	
NB CSAH 78	107+57, 70' LT.	SAN MH		1				(1)	
NB CSAH 78	107+63, 98' LT. - 107+65, 71' LT.	4" UNKNOWN SAN			27			(1)	
NB CSAH 78	108+31, 103' LT. - 108+33, 76' LT.	4" UNKNOWN SAN			28			(1)	
NB CSAH 78	109+09, 108' LT. - 109+11, 80' LT.	4" UNKNOWN SAN			28			(1)	
NB CSAH 78	110+02, 1' LT.	SAN MH		1				(1)	
NB CSAH 78	110+02, 1' LT. - 110+03, 86' RT.	8" PVC SAN			87			(1)	
NB CSAH 78	110+02, 1' LT. - 110+04, 82' LT.	8" PVC SAN			81			(1)	
NB CSAH 78	110+03, 86' RT. - 110+05, 207' RT.	8" PVC SAN	X						
NB CSAH 78	110+04, 82' LT. - 110+04, 102' LT.	8" VCP SAN			19			(1)	
NB CSAH 78	110+04, 102' LT. - 110+06, 430' LT.	8" VCP SAN	X						
NB CSAH 78	110+04, 82' LT. - 113+08, 70' LT.	12" VCP SAN			298			(1)	
NB CSAH 78	110+04, 82' LT.	SAN MH		1				(1)	
NB CSAH 78	110+05, 207' RT.	SAN MH	X						
NB CSAH 78	110+06, 430' LT.	SAN MH	X						
NB CSAH 78	110+94, 82' LT. - 110+94, 117' LT.	4" UNKNOWN SAN			36			(1)	
NB CSAH 78	110+94, 118' LT. - 110+94, 144' LT.	4" UNKNOWN SAN	X						
NB CSAH 78	111+71, 79' LT. - 111+73, 115' LT.	4" UNKNOWN SAN			36			(1)	
NB CSAH 78	111+73, 115' LT. - 111+74, 140' LT.	4" UNKNOWN SAN	X						
NB CSAH 78	112+75, 2' LT. - 112+80, 12' LT.	4" UNKNOWN SAN			11			(1)	
NB CSAH 78	112+80, 12' LT.	SAN MH		1				(1)	
NB CSAH 78	112+80, 12' LT. - 113+08, 70' LT.	4" UNKNOWN SAN			64			(1)	
NB CSAH 78	112+80, 12' LT. - 112+83, 2' LT.	4" UNKNOWN SAN			11			(1)	
NB CSAH 78	113+08, 70' LT. - 115+17, 57' LT.	12" VCP SAN			210			(1)	
NB CSAH 78	113+08, 70' LT. - 113+10, 93' LT.	12" VCP SAN			23			(1)	
NB CSAH 78	113+08, 70' LT.	SAN MH		1				(1)	
NB CSAH 78	113+10, 93' LT. - 113+32, 367' LT.	10" VCP SAN	X						
NB CSAH 78	113+32, 367' LT.	SAN MH	X						
NB CSAH 78	114+48, 61' LT. - 114+49, 97' LT.	4" UNKNOWN SAN			36			(1)	
NB CSAH 78	114+49, 97' LT. - 114+51, 132' LT.	4" UNKNOWN SAN	X						
NB CSAH 78	115+17, 57' LT. - 115+64, 54' LT.	12" VCP SAN			47			(1)	
NB CSAH 78	115+17, 57' LT.	SAN MH		1				(1)	
NB CSAH 78	115+64, 54' LT. - 116+63, 47' LT.	12" VCP SAN				99		(1)	
NB CSAH 78	116+63, 47' LT. - 117+01, 45' LT.	12" VCP SAN			38			(1)	
NB CSAH 78	117+01, 45' LT. - 118+70, 34' LT.	12" VCP SAN			170			(1)	
NB CSAH 78	117+01, 45' LT.	SAN MH		1				(1)	
NB CSAH 78	118+70, 34' LT. - 120+12, 26' LT.	12" VCP SAN			143			(1)	
NB CSAH 78	119+09, 276' RT. - 119+82, 279' RT.	4" UNKNOWN SAN	X						
NB CSAH 78	119+12, 191' RT. - 119+87, 194' RT.	4" UNKNOWN SAN	X						
NB CSAH 78	119+17, 96' RT. - 119+92, 99' RT.	4" UNKNOWN SAN	X						
NB CSAH 78	119+75, 410' RT. - 119+93, 78' RT.	8" VCP SAN	X						
				SUBTOTAL	8	1893	99	1	

NOTES:

- (1) WORK TO BE DONE BY CONTRACTOR AS NOTED IN REMOVAL PLAN OR TRAFFIC SIGNAL AND INTERCONNECT PLANS.
- (2) INCLUDE INFI-SHIELD OR APPROVED EQUAL ON ALL ADJUSTED CASTINGS. SEE COON RAPIDS STANDARD PLATE SAN-8 ON SHEET 62 FOR DETAIL.

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK

 Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG
 DESIGNED BY
T. SMITH
 CHECKED BY
B. ROBECK
 COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
INPLACE UTILITY TABULATIONS
CSAH 78 - BNSF GRADE SEPARATION


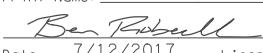
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EXISTING SANITARY SEWER									J
ALIGNMENT	LOCATION STATION AND OFFSET	EXISTING ITEM	LEAVE AS IS	REMOVE		PLUG FILL & ABANDON	ADJUST	NOTES	
				MANHOLE	SEWER PIPE (SANITARY)				
				EACH	LIN FT	SEWER PIPE (SANITARY)	FRAME & RING CASTING		
		LIN FT	EACH						
NB CSAH 78	119+75, 410' RT.	SAN MH	X						
NB CSAH 78	119+83, 276' RT. - 120+63, 274' RT.	4" UNKNOWN SAN	X						
NB CSAH 78	119+87, 191' RT. - 120+57, 192' RT.	4" UNKNOWN SAN	X						
NB CSAH 78	119+93, 78' RT. - 120+12, 26' LT.	12" VCP SAN			106			(1)	
NB CSAH 78	119+93, 78' RT.	SAN MH		1				(1)	
NB CSAH 78	120+12, 26' LT. - 120+33, 133' LT.	12" VCP SAN			109			(1)	
NB CSAH 78	120+12, 26' LT. - 123+35, 26' LT.	12" VCP SAN			324			(1)	
NB CSAH 78	120+12, 26' LT.	SAN MH		1				(1)	
NB CSAH 78	120+33, 133' LT.	SAN MH		1				(1)	
NB CSAH 78	120+33, 133' LT. - 122+38, 375' LT.	8" PVC SAN	X						
NB CSAH 78	122+38, 375' LT.	SAN MH	X						
NB CSAH 78	123+04, 154' RT. - 123+37, 153' RT.	4" UNKNOWN SAN			34			(1)	
NB CSAH 78	123+33, 140' LT. - 123+34, 94' LT.	4" UNKNOWN SAN	X						
NB CSAH 78	123+34, 102' LT. - 123+35, 26' LT.	4" UNKNOWN SAN			76			(1)	
NB CSAH 78	123+35, 26' LT. - 123+98, 26' LT.	12" VCP SAN			63			(1)	
NB CSAH 78	123+35, 26' LT. - 123+37, 126' RT.	12" VCP SAN			152			(1)	
NB CSAH 78	123+35, 26' LT.	SAN MH		1				(1)	
NB CSAH 78	123+37, 126' RT. - 123+39, 250' RT.	8" VCP SAN	X						
NB CSAH 78	123+37, 74' RT. - 123+64, 73' RT.	4" UNKNOWN SAN			27			(1)	
NB CSAH 78	123+39, 250' RT. - 123+43, 454' RT.	8" VCP SAN	X						
NB CSAH 78	123+39, 250' RT.	SAN MH	X						
NB CSAH 78	123+40, 210' RT. - 123+84, 209' RT.	4" UNKNOWN SAN	X						
NB CSAH 78	123+98, 26' LT. - 125+12, 27' LT.	12" VCP SAN	X						
NB CSAH 78	124+82, 69' LT.	SAN MH	X				1	(2)	
NB CSAH 78	124+82, 82' LT. - 124+82, 69' LT.	6" UNKNOWN SAN	X						
NB CSAH 78	124+82, 69' LT. - 125+12, 27' LT.	6" UNKNOWN SAN	X						
NB CSAH 78	125+12, 27' LT. - 129+32, 27' LT.	12" VCP SAN	X						
NB CSAH 78	125+12, 27' LT.	SAN MH	X				1	(2)	
NB CSAH 78	125+96, 159' LT. - 125+99, 27' LT.	4" UNKNOWN SAN	X						
NB CSAH 78	126+95, 149' LT. - 126+97, 27' LT.	UNKNOWN SAN	X						
NB CSAH 78	129+32, 27' LT. - 132+76, 27' LT.	12" VCP SAN	X						
NB CSAH 78	129+32, 27' LT.	SAN MH	X						
NB CSAH 78	130+45, 108' LT. - 130+47, 27' LT.	4" UNKNOWN SAN	X						
NB CSAH 78	130+96, 274' LT.	SAN MH	X						
NB CSAH 78	130+96, 274' LT. - 130+97, 114' LT.	8" PVC SAN	X						
NB CSAH 78	130+97, 114' LT.	SAN MH	X						
NB CSAH 78	130+97, 114' LT. - 133+06, 114' LT.	8" PVC SAN	X						
NB CSAH 78	132+76, 27' LT. - 133+06, 27' LT.	12" VCP SAN	X						
NB CSAH 78	132+76, 27' LT.	SAN MH	X						
				SUBTOTAL	4	891		2	
				PROJECT TOTALS	12	2784	99	3	

NOTES:

- (1) WORK TO BE DONE BY CONTRACTOR AS NOTED IN REMOVAL PLAN OR TRAFFIC SIGNAL AND INTERCONNECT PLANS.
- (2) INCLUDE INFI-SHIELD OR APPROVED EQUAL ON ALL ADJUSTED CASTINGS. SEE COON RAPIDS STANDARD PLATE SAN-8 ON SHEET 62 FOR DETAIL.

11:26:32-AM
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					I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.		STATE AID PROJECT NO 002-678-023, 114-020-051		DRAWN BY S. VANG				ANOKA COUNTY INPLACE UTILITY TABULATIONS CSAH 78 - BNSF GRADE SEPARATION		SHEET 21 OF 175	
					Print Name: BENJAMIN P ROBECK				DESIGNED BY T. SMITH							
					 Date: 7/12/2017 License #: 53680				CHECKED BY B. ROBECK							
									COMM. NO. 0169140							

EXISTING WATERMAIN								K
ALIGNMENT	LOCATION STATION AND OFFSET	EXISTING ITEM	LEAVE AS IS	REMOVE			PLUG, FILL & ABANDON	NOTES
				WATERMAIN LIN FT	GATE VALVE & BOX EACH	HYDRANT EACH	WATERMAIN LIN FT	
NB CSAH 78	100+00, 70' LT. - 100+05, 70' LT.	30" DIP WM	X					
NB CSAH 78	100+00, 231' LT. - 101+25, 413' LT.	6" CIP WM	X					
NB CSAH 78	100+00, 66' LT. - 100+05, 70' LT.	6" CIP WM	X					
NB CSAH 78	100+05, 70' LT.	WATERMAIN VALVE	X					
NB CSAH 78	100+11, 66' LT. - 104+82, 66' LT.	30" DIP WM	X					
NB CSAH 78	100+15, 75' LT.	WATERMAIN VALVE	X					
NB CSAH 78	100+15, 75' LT. - 102+40, 156' LT.	6" DIP WM	X					
NB CSAH 78	100+45, 127' LT. - 100+47, 145' LT.	6" DIP WM	X					
NB CSAH 78	100+47, 144' LT.	WATERMAIN VALVE	X					
NB CSAH 78	100+47, 147' LT.	HYDRANT	X					
NB CSAH 78	101+16, 310' RT. - 101+21, 58' LT.	8" CIP WM	X					
NB CSAH 78	101+17, 310' RT.	WATERMAIN VALVE	X					
NB CSAH 78	101+20, 12' LT.	WATERMAIN VALVE	X					
NB CSAH 78	101+25, 413' LT.	WATERMAIN VALVE	X					
NB CSAH 78	102+37, 163' LT. - 102+48, 156' LT.	6" DIP WM	X					
NB CSAH 78	102+45, 156' LT.	WATERMAIN VALVE	X					
NB CSAH 78	102+48, 156' LT.	HYDRANT	X					
NB CSAH 78	103+10, 82' LT.	WATERMAIN VALVE	X					
NB CSAH 78	103+10, 82' LT. - 103+18, 64' LT.	1" WM SERVICE	X					
NB CSAH 78	103+10, 82' LT. - 103+14, 114' LT.	1" WM SERVICE	X					
NB CSAH 78	104+46, 84' LT.	WATERMAIN VALVE	X					
NB CSAH 78	104+83, 66' LT. - 105+26, 67' LT.	30" DIP WM	X					
NB CSAH 78	105+04, 85' LT. - 105+20, 82' LT.	6" DIP WM	X					
NB CSAH 78	105+04, 85' LT.	HYDRANT	X					
NB CSAH 78	105+18, 233' LT. - 105+22, 82' LT.	6" CIP WM	X					
NB CSAH 78	105+20, 82' LT.	WATERMAIN VALVE	X					
NB CSAH 78	105+26, 67' LT. - 106+99, 76' LT.	30" DIP WM		176				(1)
NB CSAH 78	106+85, 92' LT.	WATERMAIN VALVE			1			(1)
NB CSAH 78	106+85, 92' LT. - 106+87, 75' LT.	1" WM SERVICE		17				(1)
NB CSAH 78	106+99, 76' LT. - 115+72, 62' LT.	30" DIP WM		863				(1)
NB CSAH 78	107+62, 98' LT.	WATERMAIN VALVE			1			(1)
NB CSAH 78	107+62, 98' LT. - 107+63, 81' LT.	1" WM SERVICE		17				(1)
NB CSAH 78	108+30, 103' LT.	WATERMAIN VALVE			1			(1)
NB CSAH 78	108+30, 103' LT. - 108+31, 86' LT.	1" WM SERVICE		17				(1)
NB CSAH 78	109+08, 107' LT.	WATERMAIN VALVE			1			(1)
NB CSAH 78	109+08, 107' LT. - 109+09, 90' LT.	1" WM SERVICE		17				(1)
NB CSAH 78	109+83, 126' LT.	WATERMAIN VALVE			1			(1)
NB CSAH 78	109+83, 128' LT.	HYDRANT				1		(1)
NB CSAH 78	109+83, 126' LT. - 109+94, 114' LT.	1" WM SERVICE		19				(1)
NB CSAH 78	109+84, 188' RT.	HYDRANT	X					
NB CSAH 78	109+84, 188' RT. - 110+15, 174' RT.	8" DIP WM	X					
NB CSAH 78	109+91, 94' LT. - 109+94, 122' LT.	6" CIP WM		29				(1)
NB CSAH 78	109+94, 122' LT. - 109+95, 129' LT.	6" CIP WM		7				(1)
NB CSAH 78	109+94, 208' LT. - 109+95, 149' LT.	6" CIP WM	X					
NB CSAH 78	109+94, 114' LT.	WATERMAIN VALVE			1			(1)
NB CSAH 78	110+13, 92' LT. - 110+14, 115' RT.	8" DIP WM		207				(1)
NB CSAH 78	110+14, 90' LT.	WATERMAIN VALVE			1			(1)
NB CSAH 78	110+92, 93' LT. - 110+93, 118' LT.	1" WM SERVICE		25				(1)
NB CSAH 78	110+93, 119' LT.	WATERMAIN VALVE	X					
NB CSAH 78	110+93, 118' LT. - 110+93, 119' LT.	1" WM SERVICE	X					
NB CSAH 78	110+93, 119' LT. - 110+93, 144' LT.	1" WM SERVICE	X					
NB CSAH 78	111+71, 91' LT. - 111+72, 115' LT.	1" WM SERVICE		24				(1)
NB CSAH 78	111+72, 115' LT.	WATERMAIN VALVE	X					
NB CSAH 78	111+72, 115' LT. - 111+72, 140' LT.	1" WM SERVICE	X					
NB CSAH 78	112+33, 33' RT. - 112+34, 9' RT.	1" WM SERVICE	X					
NB CSAH 78	112+34, 9' RT.	WATERMAIN VALVE	X					
NB CSAH 78	112+34, 9' RT. - 112+39, 85' LT.	1" WM SERVICE		94				(1)
NB CSAH 78	112+84, 6' LT. - 112+94, 82' LT.	6" CIP WM		76				(1)
NB CSAH 78	112+86, 114' LT. - 113+01, 95' LT.	6" DIP WM		29				(1)
NB CSAH 78	112+86, 114' LT.	HYDRANT				1		(1)
				SUBTOTAL	1617		2	

NOTES:

- (1) WORK TO BE DONE BY CONTRACTOR AS NOTED IN REMOVAL PLAN OR TRAFFIC SIGNAL AND INTERCONNECT PLANS.
- (2) REMOVE GATE VALVE AND BOX INCLUDED IN ADJACENT WATER MAIN PIPE REMOVAL.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO
 002-678-023, 114-020-051

DRAWN BY
 S. VANG
 DESIGNED BY
 T. SMITH
 CHECKED BY
 B. ROBECK
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 INPLACE UTILITY TABULATIONS
 CSAH 78 - BNSF GRADE SEPARATION

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NO	DATE	BY	CKD	APPR	REVISION

EXISTING WATERMAIN								K	
ALIGNMENT	LOCATION STATION AND OFFSET	EXISTING ITEM	LEAVE AS IS	REMOVE			PLUG, FILL & ABANDON	NOTES	
				WATERMAIN	GATE VALVE & BOX	HYDRANT			
				LIN FT	EACH	EACH	WATERMAIN LIN FT		
NB CSAH 78	112+87, 100' LT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	112+94, 82' LT. - 113+01, 95' LT.	6" CIP WM		15				(1)	
NB CSAH 78	113+01, 95' LT. - 113+02, 103' LT.	6" CIP WM		9				(1)	
NB CSAH 78	113+01, 95' LT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	113+02, 103' LT. - 113+04, 122' LT.	6" CIP WM		19				(1)	
NB CSAH 78	113+04, 122' LT. - 113+05, 138' LT.	6" CIP WM		15				(1)	
NB CSAH 78	113+05, 138' LT. - 113+29, 384' LT.	6" CIP WM	X						
NB CSAH 78	113+11, 37' RT. - 113+12, 14' RT.	1" WM SERVICE	X						
NB CSAH 78	113+12, 14' RT.	WATERMAIN VALVE	X						
NB CSAH 78	113+12, 14' RT. - 113+17, 80' LT.	1" WM SERVICE		94				(1)	
NB CSAH 78	114+66, 69' LT. - 114+67, 96' LT.	1" WM SERVICE		27				(1)	
NB CSAH 78	114+67, 97' LT.	WATERMAIN VALVE	X						
NB CSAH 78	114+67, 96' LT. - 114+69, 133' LT.	1" WM SERVICE	X						
NB CSAH 78	115+72, 62' LT. - 116+70, 54' LT.	30" DIP WM				98		(1)	
NB CSAH 78	116+70, 54' LT. - 118+71, 41' LT.	30" DIP WM		201				(1)	
NB CSAH 78	118+71, 41' LT. - 123+71, 37' LT.	30" DIP WM		503				(1)	
NB CSAH 78	119+09, 275' RT. - 119+75, 278' RT.	1" WM SERVICE	X						
NB CSAH 78	119+12, 190' RT. - 119+78, 192' RT.	1" WM SERVICE	X						
NB CSAH 78	119+17, 95' RT. - 119+82, 97' RT.	1" WM SERVICE	X						
NB CSAH 78	119+52, 277' RT.	WATERMAIN VALVE	X						
NB CSAH 78	119+57, 192' RT.	WATERMAIN VALVE	X						
NB CSAH 78	119+59, 322' RT.	HYDRANT	X						
NB CSAH 78	119+60, 322' RT. - 119+79, 321' RT.	6" DIP WM	X						
NB CSAH 78	119+63, 322' RT.	WATERMAIN VALVE	X						
NB CSAH 78	119+63, 97' RT.	WATERMAIN VALVE	X						
NB CSAH 78	119+75, 254' RT. - 119+84, 63' RT.	6" CIP WM	X						
NB CSAH 78	119+77, 354' RT. - 120+63, 273' RT.	1" WM SERVICE	X						
NB CSAH 78	119+78, 189' RT. - 120+57, 191' RT.	1" WM SERVICE	X						
NB CSAH 78	119+84, 63' RT. - 119+88, 35' LT.	6" CIP WM		98				(1)	
NB CSAH 78	119+88, 35' LT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	120+18, 274' RT.	WATERMAIN VALVE	X						
NB CSAH 78	120+22, 191' RT.	WATERMAIN VALVE	X						
NB CSAH 78	120+34, 108' LT. - 120+40, 36' LT.	8" CIP WM		73				(1)	
NB CSAH 78	120+34, 108' LT. - 120+41, 118' LT.	8" CIP WM	X						
NB CSAH 78	120+37, 124' LT. - 120+67, 165' LT.	8" CIP WM	X						
NB CSAH 78	120+39, 38' LT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	120+41, 118' LT.	WATERMAIN VALVE	X						
NB CSAH 78	120+43, 118' LT.	HYDRANT	X						
NB CSAH 78	120+85, 56' RT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	120+85, 56' RT. - 120+87, 35' LT.	1" WM SERVICE		91				(1)	
NB CSAH 78	123+04, 153' RT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	123+04, 153' RT. - 123+27, 152' RT.	1" WM SERVICE		23				(1)	
NB CSAH 78	123+09, 100' RT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	123+09, 100' RT. - 123+26, 99' RT.	1" WM SERVICE		16				(1)	
NB CSAH 78	123+13, 45' RT.	HYDRANT				1		(1)	
NB CSAH 78	123+13, 45' RT. - 123+26, 45' RT.	1" WM SERVICE		13				(1)	
NB CSAH 78	123+15, 45' RT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	123+15, 366' RT.	WATERMAIN VALVE	X						
NB CSAH 78	123+15, 366' RT. - 123+32, 365' RT.	1" WM SERVICE	X						
NB CSAH 78	123+25, 36' LT. - 123+26, 64' RT.	6" CIP WM		100				(1)	
NB CSAH 78	123+25, 22' RT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	123+26, 89' RT. - 123+27, 136' RT.	6" CIP WM		72				(1)	
NB CSAH 78	123+26, 73' RT. - 123+64, 73' RT.	1" WM SERVICE		38				(1)	
NB CSAH 78	123+27, 136' RT. - 123+32, 397' RT.	6" CIP WM	X						
NB CSAH 78	123+29, 209' RT. - 123+71, 207' RT.	1" WM SERVICE	X						
NB CSAH 78	123+39, 98' LT.	WATERMAIN VALVE	X						
NB CSAH 78	123+39, 140' LT. - 123+39, 101' LT.	1" WM SERVICE	X						
NB CSAH 78	123+42, 81' LT. - 123+48, 36' LT.	1" WM SERVICE		45				(1)	
NB CSAH 78	123+64, 73' RT.	WATERMAIN VALVE			1			(1)	
NB CSAH 78	123+71, 37' LT. - 123+95, 37' LT.	30" DIP WM		24				(1)	
				SUBTOTAL	1476		1	98	

NOTES:

- (1) WORK TO BE DONE BY CONTRACTOR AS NOTED IN REMOVAL PLAN OR TRAFFIC SIGNAL AND INTERCONNECT PLANS.
- (2) REMOVE GATE VALVE AND BOX INCLUDED IN ADJACENT WATER MAIN PIPE REMOVAL.

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG
DESIGNED BY
T. SMITH
CHECKED BY
B. ROBECK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
INPLACE UTILITY TABULATIONS
CSAH 78 - BNSF GRADE SEPARATION


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EXISTING WATERMAIN								K
ALIGNMENT	LOCATION STATION AND OFFSET	EXISTING ITEM	LEAVE AS IS	REMOVE			PLUG, FILL & ABANDON	NOTES
				WATERMAIN LIN FT	GATE VALVE & BOX EACH	HYDRANT EACH	WATERMAIN LIN FT	
NB CSAH 78	123+71, 207' RT.	WATERMAIN VALVE	X					
NB CSAH 78	123+78, 37' LT. - 123+78, 17' LT.	6" DIP WM		20				(1)
NB CSAH 78	123+95, 37' LT. - 124+25, 37' LT.	30" DIP WM	X					
NB CSAH 78	124+25, 37' LT. - 129+17, 39' LT.	30" DIP WM	X					
NB CSAH 78	124+49, 82' LT.	WATERMAIN VALVE	X					
NB CSAH 78	124+49, 82' LT. - 124+50, 36' LT.	1" WM SERVICE	X					
NB CSAH 78	125+97, 159' LT. - 125+99, 81' LT.	1" WM SERVICE	X					
NB CSAH 78	125+99, 81' LT.	WATERMAIN VALVE	X					
NB CSAH 78	125+99, 81' LT. - 126+06, 38' LT.	1" WM SERVICE	X					
NB CSAH 78	126+96, 149' LT. - 126+98, 39' LT.	1" WM SERVICE	X					
NB CSAH 78	126+97, 82' LT.	WATERMAIN VALVE	X					
NB CSAH 78	127+59, 56' RT. - 127+91, 57' RT.	6" DIP WM	X					
NB CSAH 78	127+59, 56' RT.	HYDRANT	X					
NB CSAH 78	127+61, 56' RT.	WATERMAIN VALVE	X					
NB CSAH 78	127+61, 223' LT. - 129+22, 102' LT.	6" DIP WM	X					
NB CSAH 78	127+68, 114' RT. - 127+93, 104' RT.	8" DIP WM	X					
NB CSAH 78	127+83, 232' LT.	HYDRANT	X					
NB CSAH 78	127+88, 35' LT.	WATERMAIN VALVE	X					
NB CSAH 78	129+17, 39' LT. - 129+19, 52' LT.	6" DIP WM	X					
NB CSAH 78	129+17, 39' LT. - 133+06, 39' LT.	30" PCCP WM	X					
NB CSAH 78	129+19, 52' LT.	WATERMAIN VALVE	X					
NB CSAH 78	129+19, 60' LT.	WATERMAIN VALVE	X					
NB CSAH 78	129+19, 52' LT. - 129+36, 72' LT.	6" DIP WM	X					
NB CSAH 78	129+36, 72' LT.	HYDRANT	X					
NB CSAH 78	130+48, 108' LT. - 130+49, 39' LT.	1" WM SERVICE	X					
NB CSAH 78	130+86, 107' LT. - 133+05, 104' LT.	6" DIP WM	X					
NB CSAH 78	132+32, 111' LT. - 132+33, 140' LT.	6" DIP WM	X					
NB CSAH 78	132+70, 69' LT. - 132+71, 39' LT.	6" DIP WM	X					
NB CSAH 78	132+70, 69' LT.	HYDRANT	X					
NB CSAH 78	132+71, 51' LT.	WATERMAIN VALVE	X					
SUBTOTAL				20				
PROJECT TOTALS				3113		3	98	

NOTES:

- (1) REMOVAL OF INTERIM WATER MAIN. SEE PROPOSED SANITARY AND WATER MAIN PLANS AS WELL AS STAGING PLANS FOR DETAILS.

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.	STATE AID PROJECT NO 002-678-023, 114-020-051	DRAWN BY S. VANG	 ENGINEERS PLANNERS DESIGNERS	ANOKA COUNTY INPLACE UTILITY TABULATIONS CSAH 78 - BNSF GRADE SEPARATION	SHEET 24R OF 175
NO	DATE	BY	CKD	APPR	REVISION	Print Name: BENJAMIN P ROBECK <i>Ben Robeck</i> Date: 7/12/2017 License #: 53680	CHECKED BY B. ROBECK	COMM. NO. 0169140			

CURB & GUTTER, WALKS, AND GATES								0
ALIGNMENT	STATION TO STATION	4" CONCRETE WALK SQ FT	6" CONCRETE WALK SQ FT	(0-2) 2.5" BITUMINOUS WALK SQ FT	CONCRETE CURB & GUTTER DESIGN B618 LIN FT	CONCRETE CURB & GUTTER DESIGN B624 LIN FT	TRUNCATED DOMES SQ FT	(0-1) VEHICULAR GATE-SINGLE EACH
106TH AVE NW	300+46 - 302+15				350			
108TH AVE NW	500+48 - 503+51			230	710			
108TH LN NW	700+53 - 702+38	10	50		340			
NB CSAH 78	101+05 - 115+67	13350	1340	7940	3030	3050	140	
NB CSAH 78	115+67 - 128+70	10555	1000	8885	2275	2405	140	1
HANSON BLVD SERV RD 1	400+45 - 408+74	2560	740	120	1750		50	
HANSON BLVD SERV RD 2	600+45 - 603+22				570			
SE TRAIL	105+95 - 113+02			8990	120			
PROJECT TOTALS		26475	3130	26165	9145	5455	330	1

NOTES:

(0-1) SEE MISCELLANEOUS DETAILS (COON RAPIDS STR-21).

(0-2) MIX TYPE SPWEA230C

CLEARING AND GRUBBING				L
ALIGNMENT	STATION TO STATION	(L-1) CLEARING ACRE	(L-1) GRUBBING ACRE	
108TH AVE NW	500+48 - 503+51	0.2	0.2	
NB CSAH 78	101+05 - 115+67	0.3	0.3	
NB CSAH 78	115+67 - 128+70	1	1	
HANSON BLVD SERV RD 1	400+45 - 408+74	0.1	0.1	
SE TRAIL	105+95 - 113+02	0.2	0.2	
PROJECT TOTALS		1.8	1.8	

NOTES:

(L-1) INCLUDES INDIVIDUAL TREES PAID FOR AS 0.05 ACRE PER TREE

REMOVALS, SAWING AND RELOCATES													M
ALIGNMENT	STATION TO STATION	(M-4) PAVEMENT MARKING REMOVAL LIN FT	(M-4) PAVEMENT MARKING REMOVAL SQ FT	REMOVE CURB & GUTTER LIN FT	(M-1) REMOVE RETAINING WALL LIN FT	REMOVE NON-METALLIC CONDUIT LIN FT	REMOVE CONCRETE WALK SQ FT	REMOVE CONCRETE DRIVEWAY PAVEMENT SQ FT	REMOVE CONCRETE MEDIAN SQ FT	REMOVE BITUMINOUS DRIVEWAY PAVEMENT SQ FT	(M-2) REMOVE BITUMINOUS PAVEMENT SQ YD	(M-3) REMOVE LIGHTING UNIT EACH	
106TH AVE NW	300+46 - 302+15			350				70		410	560		
108TH AVE NW	500+48 - 503+51			520			260			270	1610	1	
108TH LN NW	700+53 - 702+38			390			30	160			580		
NB CSAH 78	101+05 - 115+67	4105	62	5560			11830	880	6460	430	13565		
NB CSAH 78	115+67 - 128+70	3205		4850	70	2860	11860	1090	4800	370	13600	8	
HANSON BLVD SERV RD 1	400+45 - 408+74			610			2480	140			1740		
SE TRAIL	105+95 - 113+02			250			170				380		
PROJECT TOTALS		7310	62	12530	70	2860	26630	2340	11260	1480	32035	9	

NOTES:

(M-1) HEIGHTS RANGE FROM 1 FT TO 3 FT

(M-2) INCLUDES REMOVALS OF TEMPORARY PAVEMENT

(M-3) SEE REMOVAL PLANS AND INPLACE UTILITY TABULATIONS FOR LOCATIONS.

(M-4) INCLUDES REMOVALS FOR STAGING

REMOVALS, SAWING AND RELOCATES									M
ALIGNMENT	STATION TO STATION	REMOVE MARKER EACH	REMOVE SIGN TYPE C EACH	REMOVE SIGN TYPE SPECIAL EACH	(M-3) REMOVE LIGHT FOUNDATION EACH	SAWING CONCRETE PAVEMENT (FULL DEPTH) LIN FT	SAWING BIT PAVEMENT (FULL DEPTH) LIN FT	RELOCATE MAIL BOX SUPPORT EACH	
106TH AVE NW	300+46 - 302+15						30	1	
108TH AVE NW	500+48 - 503+51		8	1	1		90	1	
108TH LN NW	700+53 - 702+38			2			30	1	
NB CSAH 78	101+05 - 115+67	14	53	3		10	500	2	
NB CSAH 78	115+67 - 128+70	14	50	2	8	20	715	2	
HANSON BLVD SERV RD 1	400+45 - 408+74		8	2			60		
SE TRAIL	105+95 - 113+02						130		
PROJECT TOTALS		28	121	8	9	30	1555	7	

NOTES:

(M-3) SEE REMOVAL PLANS AND INPLACE UTILITY TABULATIONS FOR LOCATIONS.

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
2	1/12/2018	BR	CT	BR	ADDENDUM 3 - REVISED PAY ITEM FOR REMOVE BITUMINOUS PAVMENT
NO	DATE	BY	CKD	APPR	REVISION
... \CAD_BIM\plan\9140_fb02.dgn					

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO
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DRAWN BY
S. VANG
DESIGNED BY
T. SMITH
CHECKED BY
B. ROBECK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
TABULATIONS
CSAH 78 - BNSF GRADE SEPARATION

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AGGREGATE AND BITUMINOUS SUMMARY						N
ALIGNMENT	STATION TO STATION	AGGREGATE BASE (CV) CLASS 5 CU YD	(N-1)	(N-2) (N-5)	(N-1) (N-3)	(N-1) (N-4)
			BITUMINOUS MATERIAL FOR TACK COAT GAL	TYPE SP 12.5 WEARING COURSE MIX (2,C) TON	TYPE SP 12.5 WEARING COURSE MIX (3,F) TON	TYPE SP 12.5 NON WEAR COURSE MIX (3,B) TON
106TH AVE NW	300+46 - 302+15	150	50	150		
108TH AVE NW	500+48 - 503+51	280	90	260		
108TH LN NW	700+53 - 702+38	160	50	160		
NB CSAH 78	101+05 - 115+67	4070	1645	10	2810	2150
NB CSAH 78	115+67 - 128+70	3120	1280	20	2190	1685
HANSON BLVD SERV RD 1	400+45 - 408+74	660	195	590		
HANSON BLVD SERV RD 2	600+45 - 603+22	190	60	180		
SE TRAIL	105+95 - 113+02	140		15		
SOUTH TEMP TIE DOWN	105+77 - 108+03	230	90		90	135
NORTH TEMP TIE DOWN	119+40 - 123+23	690	160		220	325
PROJECT TOTALS		9690	3620	1385	5310	4295

BRIDGE APPROACH PANELS				P
ALIGNMENT	STATION TO STATION	EXPANSION JOINTS, DESIGN E8H LIN FT	BRIDGE APPROACH PANELS	
			SQ YD	
NB CSAH 78	101+05 - 115+67	90	470	
NB CSAH 78	115+67 - 128+70	270	890	
PROJECT TOTALS		360	1360	

NOTES:

- (N-1) QUANTITY BASED ON 0.07 GAL/SQ YD.
- (N-2) MIX TYPE SPWEB240C
- (N-3) MIX TYPE SPWEB340F
- (N-4) MIX TYPE SPNWB330B
- (N-5) INCLUDES DRIVEWAY QUANTITIES. SEE MISCELLANEOUS DETAILS AND TYPICAL SECTION PAVEMENT INSETS FOR DETAILS.

SANITARY SEWER AND WATER MAIN														Q
ALIGNMENT	STATION TO STATION	CONNECT TO EXISTING SANITARY SEWER EACH	12"x4" PVC WYE	4" PVC PIPE SEWER	8" PVC PIPE SEWER	12" PVC PIPE SEWER	20" STEEL CASING PIPE	22" STEEL CASING PIPE	24" STEEL CASING PIPE	24" STEEL CASING PIPE (JACKED)	48" STEEL CASING PIPE	48" STEEL CASING PIPE (JACKED)	(Q-1) WATER SERVICE TAP & HOOKUP EACH	CONNECT TO EXISTING WATER MAIN EACH
			EACH	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT
108TH AVE NW	500+48 - 503+51	2			207	74				75		75		2
108TH LN NW	700+53 - 702+38	1			82									1
NB CSAH 78	101+05 - 115+67	1	1	10	107	567	255	106	125	174	126	174	1	1
NB CSAH 78	115+67 - 128+70	2	1	18	94	711			461	110	460	110	1	2
HANSON BLVD SERV RD 1	400+45 - 408+74	2	2	31	27	548		12	71		72		2	2
SE TRAIL	105+95 - 113+02	1			55			3						1
PROJECT TOTALS		9	4	59	572	1900	255	121	732	284	733	284	4	9

NOTES:

- (Q-1) SEE MISCELLANEOUS DETAILS (COON RAPIDS WM-2).

SANITARY SEWER AND WATER MAIN																Q
ALIGNMENT	STATION TO STATION	(Q-2)	(Q-3)	6" GATE VALVE & BOX	8" GATE VALVE & BOX	30"x6" WET TAP	6" MEGALUG	8" MEGALUG	30" MEGALUG	(Q-4) 1" PVC PIPE	(Q-4) 6" WATERMAIN DUCTILE IRON CL 52	(Q-4) 8" WATERMAIN DUCTILE IRON CL 52	(Q-4) 30" WATERMAIN HDPE	(Q-4) 30" PVC WATERMAIN	WATERMAIN FITTINGS	
		HYDRANT EACH	30" BUTTERFLY VALVE & BOX EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	POUND
108TH AVE NW	500+48 - 503+51		1	2			3				171		74		1431	
108TH LN NW	700+53 - 702+38	1		2			10				103				97	
NB CSAH 78	101+05 - 115+67		2				3		2	19		106	300	276	600	
NB CSAH 78	115+67 - 128+70		1			1	7		12	36	112		569	140	2163	
HANSON BLVD SERV RD 1	400+45 - 408+74	2		4			13	1	4	51	158	17	70	462	2871	
SE TRAIL	105+95 - 113+02				1			10				84			448	
PROJECT TOTALS		3	4	8	1	1	36	11	18	106	544	207	1013	878	7610	

NOTES:

- (Q-2) SEE MISCELLANEOUS DETAILS (COON RAPIDS WM-1).
- (Q-3) BOX NOT REQUIRED FOR VALVES LOCATED INSIDE MANHOLES.
- (Q-4) WATER MAIN SIZE IS A MEASURE OF THE MINIMUM INSIDE DIAMETER.

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



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ANOKA COUNTY
 TABULATIONS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
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TRAFFIC CONTROL AND STAGING

R

ALIGNMENT	STATION TO STATION	PORTABLE PRECAST CONC BARRIER DES 8337 LIN FT	RELOCATE PORTABLE PRECAST CONC BARRIER DES 8337 LIN FT	IMPACT ATTENUATOR ASSEMBLY	RELOCATE IMPACT ATTENUATOR ASSEMBLY	(R-1)	(R-1)	(R-1)	(R-2)	PAVT MSSG PAINT SQ FT	PAVT MSSG EPOXY SQ FT	4" SOLID LINE PAINT LIN FT	4" DBLE SOLID LINE PAINT LIN FT	4" SOLID LINE EPOXY LIN FT	4" BROKEN LINE EPOXY LIN FT
						RAISED PAVEMENT MARKER TEMPORARY EACH	PORTABLE CONCRETE BARRIER DELINEATOR EACH	TUBE DELINEATOR EACH	REMOVABLE PREFORM PAVEMENT MARKING TAPE LIN FT						
108TH AVE NW	500+48 - 503+51											80			
NB CSAH 78	101+05 - 115+67	1062		4		40	43	53	720	62		2570	1240	2995	500
NB CSAH 78	115+67 - 128+70	1298	250	6	2	192	52	42	2220	124	1965	1270	2995	615	
HANSON BLVD SERV RD 1	400+45 - 408+74					6		5			280	130			
SE TRAIL	105+95 - 113+02										400				
PROJECT TOTALS		2360	250	10	2	238	95	100	2940	62	124	5295	2640	5990	1115

NOTES:
 (R-1) SEE STAGING AND TRAFFIC CONTROL NOTES FOR SPACING REQUIREMENTS.
 (R-2) QUANTITY BASED ON 4" STRIPE WIDTH.

SANITARY SEWER AND WATER MAIN MANHOLES (Y-1) Y

MH NO.	ALIGNMENT NAME	STATION	OFFSET	NEW STRUCTURE CONSTRUCTION (Y-4)			
				DESIGN	PAY HEIGHT LIN FT	CASTING ASSEMBLY TYPE	STEPS REQ'D
MH1	NB CSAH 78	105+30	56.5' LT	F	17.7	A-7D	Y
MH2	NB CSAH 78	108+14	109.6' LT	F	16.9	A-7D	Y
MH3	NB CSAH 78	110+04	101.7' LT	SPEC 3	16.4	A-7D	Y (Y-2)
MH4	NB CSAH 78	113+10	92.9' LT	F	16.0	A-7D	Y
MH5	NB CSAH 78	113+99	88.0' LT	F	17.7	A-7D	Y
MH6	NB CSAH 78	114+49	88.0' LT	F	18.4	A-7D	Y
MH7	NB CSAH 78	117+50	88.0' LT	F	19.5	A-7D	Y
MH8	NB CSAH 78	120+04	89.7' LT	F	10.1	A-7D	Y
	COMBINED STRUCTURE - SEE ABOVE			84-4020	9.3	A-7D	Y
MH9	NB CSAH 78	123+02	109.5' LT	F	21.5	A-7D	Y
MH10	NB CSAH 78	123+98	26.3' LT	60-4020	22.8	A-7D	Y (Y-5)
MH11	NB CSAH 78	110+03	86.3' RT	F	12.0	A-7D	Y
MH12	NB CSAH 78	120+05	100.9' LT	SPEC 3	19.4	A-7D	Y (Y-2)
MH13	NB CSAH 78	119+93	77.9' LT	F	19.1	A-7D	Y
MH14	NB CSAH 78	123+37	126.0' RT	F	19.9	A-7D	Y
MH15	NB CSAH 78	113+01	83.4' LT	72-4020	11.2	A-7D	Y (Y-3)
MH16	NB CSAH 78	114+66	78.0' LT	84-4020	11.2	A-7D	Y (Y-3)
MH17	NB CSAH 78	119+94	79.0' LT	120-4020	11.2	A-7D	Y (Y-3)
MH18	NB CSAH 78	120+30	80.2' LT	72-4020	11.2	A-7D	Y (Y-3)

NOTES:
 (Y-1) SEE PROPOSED SANITARY AND WATER MAIN PLANS FOR LOCATIONS.
 (Y-2) SEE MISCELLANEOUS DETAILS (COON RAPIDS SAN-5).
 (Y-3) COVERS SHALL BE LETTERED "WATER".
 (Y-4) ALL SANITARY PIPE TO MANHOLE CONNECTIONS AND WATER MAIN PIPE OR SERVICE PIPE WITHOUT CASING TO MANHOLE CONNECTIONS SHALL UTILIZE CAST IN PLACE RUBBER BOOT. SEE SPECIAL PROVISIONS.
 (Y-5) PROVIDE TEMPORARY CONNECTION AS SHOWN ON STAGING PLANS. PLACE TEMPORARY CAP ON FUTURE 12" PVC UPSTREAM STUB (INCIDENTAL). STAGE 3 CONNECTION TO STUB PAID FOR AS CONNECT TO EXISTING SANITARY SEWER. CONSTRUCT WATER TIGHT BULKHEAD FOR TEMPORARY OPENING AFTER EXISTING UPSTREAM 12" PVC IS NO LONGER IN SERVICE.

PERMANENT PAVEMENT MARKINGS S

ALIGNMENT	STATION TO STATION	PAVT MSSG PREF THERMO SQ FT	4" SOLID LINE PAINT LIN FT	4" SOLID LINE EPOXY LIN FT	24" SOLID LINE EPOXY LIN FT	4" BROKEN LINE EPOXY LIN FT	4" DBLE SOLID LINE EPOXY LIN FT	CROSSWALK PREF THERMO SQ FT
NB CSAH 78	101+05 - 115+67	90	1310	9180	60	600		300
NB CSAH 78	115+67 - 128+70	15	680	5660	30	460	10	
HANSON BLVD SERV RD 2	600+45 - 603+22			310				
PROJECT TOTALS		105	1990	15150	90	1090	10	300

EROSION CONTROL AND TURF ESTABLISHMENT T

ALIGNMENT	STATION TO STATION	SILT FENCE, TYPE MS LIN FT	FILTER BERM TYPE 3 LIN FT	STORM DRAIN INLET PROTECTION EACH	SEDIMENT CONTROL LOG TYPE WOOD CHIP LIN FT	CULVERT END CONTROLS EACH	(T-1)	(T-1)	SUBSOILING ACRE
							FERTILIZER TYPE 3 POUND	FERTILIZER TYPE 4 POUND	
106TH AVE NW	300+46 - 302+15	110		4			30	10	0.2
108TH AVE	500+48 - 503+51	160		5	15		50	5	0.2
108TH LN	700+53 - 702+38	90	41	3	225	2	50	10	0.3
NB CSAH 78	101+05 - 115+67	1650	18	47	125	3	360	15	1.3
NB CSAH 78	115+67 - 128+70	2400	17	41	215		370	40	1.4
HANSON BLVD SERV RD 1	400+45 - 408+74	770	81	15	380	2	170	60	1
HANSON BLVD SERV RD 2	600+45 - 603+22		27	4	175		60	20	0.4
SE TRAIL	105+95 - 113+02	400	78	3	1200	1	130	110	1.1
PROJECT TOTALS		5580	262	122	2335	8	1220	270	5.9

NOTES:
 (T-1) SEE CONSTRUCTION AND SOILS NOTES FOR FERTILIZER ANALYSIS.

EROSION CONTROL AND TURF ESTABLISHMENT T

ALIGNMENT	STATION TO STATION	LIME POUND	SOIL BED PREPARATION ACRE	SEEDING ACRE	SEED MIXTURE 25-121 POUND	SEED MIXTURE 33-261 POUND	SEED MIXTURE 35-221 POUND	SODDING TYPE LAWN SQ YD	EROSION CONTROL BLANKETS CATEGORY 0 SQ YD	EROSION CONTROL BLANKETS CATEGORY 3N SQ YD	WEED SPRAYING ACRE	WEED SPRAY MIXTURE GALLON	RAPID STABILIZATION METHOD 3 M GALLON
108TH AVE	500+48 - 503+51	1200	0.2	0.2	10		5		940	40	0.1	0.1	
108TH LN	700+53 - 702+38	1800	0.3	0.3	10	5	5		950	540	0.1	0.1	
NB CSAH 78	101+05 - 115+67	7800	1.3	1.3	50	5	15	210	3960	2580	0.7	0.4	1.0
NB CSAH 78	115+67 - 128+70	8400	1.4	1.4	60	10	10	570	5220	1640	0.7	0.4	2.1
HANSON BLVD SERV RD 1	400+45 - 408+74	6000	1	1	30	20	10	40	810	4240	0.5	0.3	
HANSON BLVD SERV RD 2	600+45 - 603+22	2400	0.4	0.4	10	5	5		840	1210	0.2	0.1	0.1
SE TRAIL	105+95 - 113+02	7200	1.1	1.1	15	25	15		1090	4960	0.6	0.3	
PROJECT TOTALS		36000	5.9	5.9	195	75	70	820	14510	15500	3	1.75	3.2

1 1/9/2018 CP TS BR ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140

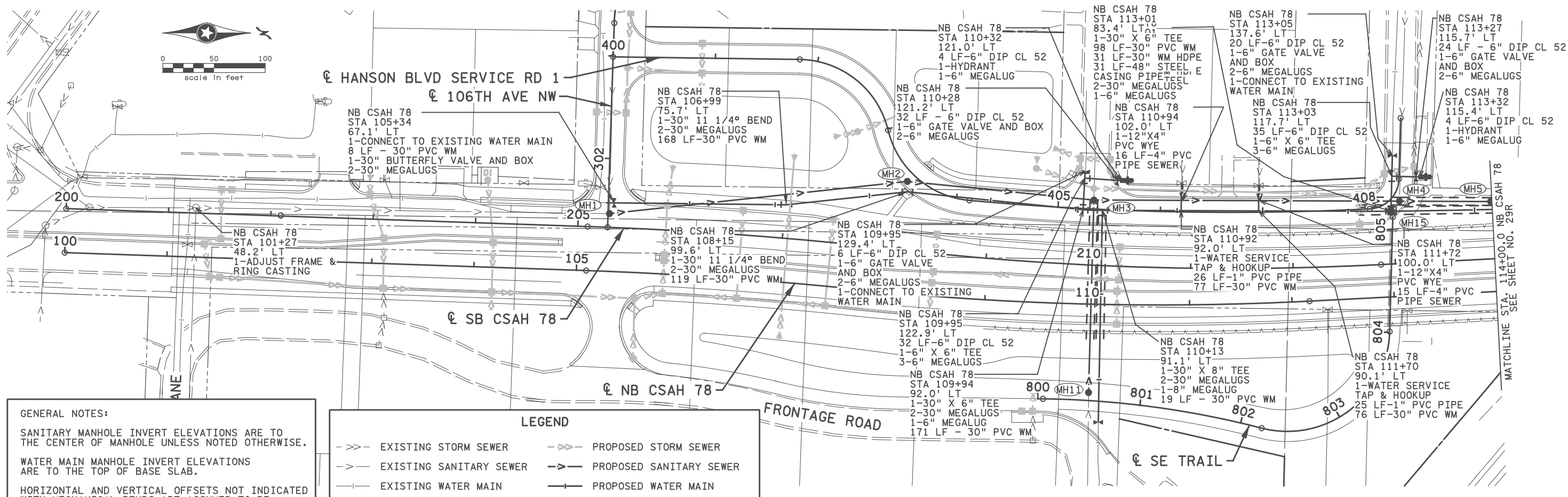
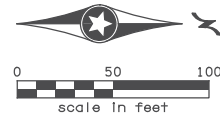


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GENERAL NOTES:

SANITARY MANHOLE INVERT ELEVATIONS ARE TO THE CENTER OF MANHOLE UNLESS NOTED OTHERWISE.

WATER MAIN MANHOLE INVERT ELEVATIONS ARE TO THE TOP OF BASE SLAB.

HORIZONTAL AND VERTICAL OFFSETS NOT INDICATED WITH MECHANICAL BENDS ARE ASSUMED TO BE ACHIEVED WITH JOINT AND MATERIAL DEFLECTIONS AS ALLOWED BY THE MANUFACTURER AND WITHIN THE BOUNDS OF THE INDUSTRY STANDARD.

TRACER WIRE REQUIRED ON ALL PLASTIC, PVC, OR HDPE WATER MAIN. (INCIDENTAL)

SEE SHEETS 61, 62 AND 65 FOR DETAILS REGARDING WATER MAIN AND SANITARY MANHOLES.

MAINTAIN 10' HORIZONTAL SEPARATION BETWEEN WATER MAIN AND ALL SEWERS UNLESS OTHERWISE NOTED.

MAINTAIN 24" VERTICAL SEPARATION BETWEEN WATERMAIN AND ALL SEWERS.

MAINTAIN 7.5' MINIMUM GROUND COVER ON ALL WATERMAIN.

ALL HDPE WATERMAIN SHALL BE FUSED.

WATERMAIN SIZES ARE A MEASURE OF THE MINIMUM INSIDE DIAMETER.

LEGEND

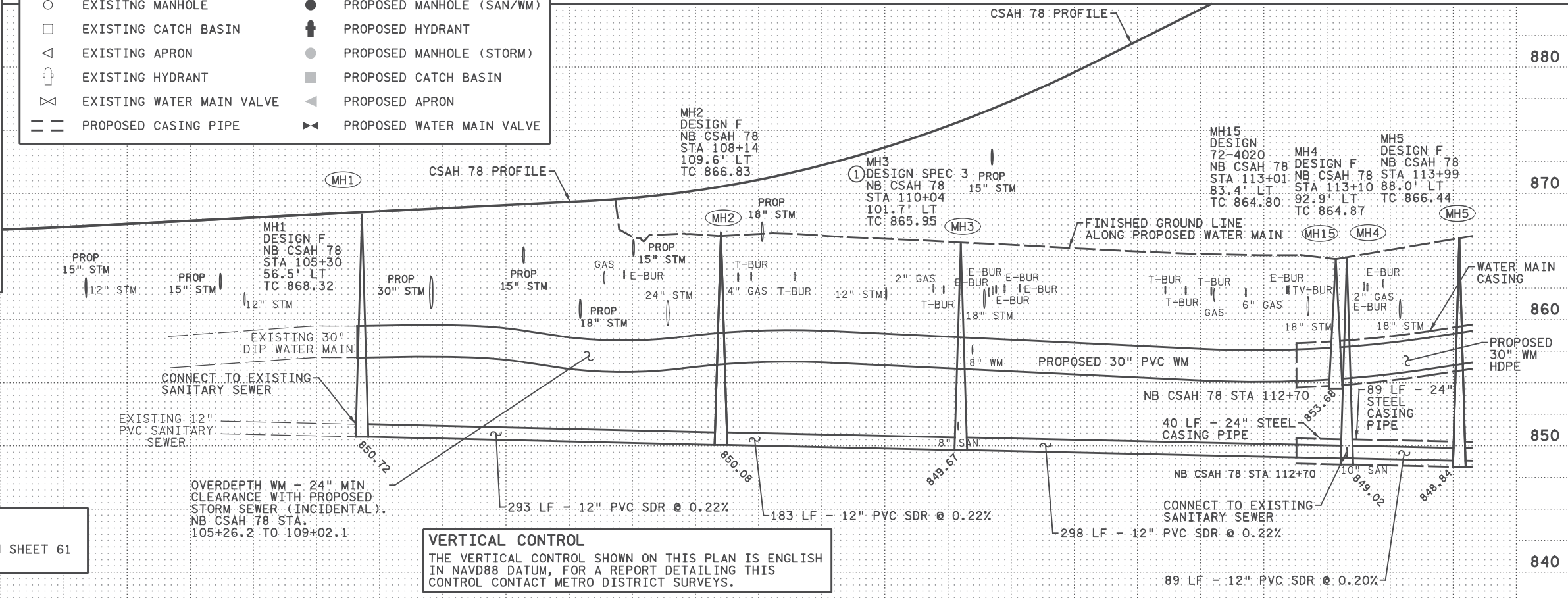
- - -	EXISTING STORM SEWER	- - -	PROPOSED STORM SEWER
- > -	EXISTING SANITARY SEWER	- > -	PROPOSED SANITARY SEWER
- -	EXISTING WATER MAIN	- -	PROPOSED WATER MAIN
○	EXISTING MANHOLE	●	PROPOSED MANHOLE (SAN/WM)
□	EXISTING CATCH BASIN	⬆	PROPOSED HYDRANT
△	EXISTING APRON	●	PROPOSED MANHOLE (STORM)
⊕	EXISTING HYDRANT	■	PROPOSED CATCH BASIN
⊗	EXISTING WATER MAIN VALVE	◀	PROPOSED APRON
==	PROPOSED CASING PIPE	⊗	PROPOSED WATER MAIN VALVE

NOTES:

① OUTSIDE DROP MANHOLE - SEE DETAIL ON SHEET 61

VERTICAL CONTROL

THE VERTICAL CONTROL SHOWN ON THIS PLAN IS ENGLISH IN NAVD88 DATUM, FOR A REPORT DETAILING THIS CONTROL CONTACT METRO DISTRICT SURVEYS.



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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION

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Ben Robeck

Date: 7/12/2017 License #: 53680

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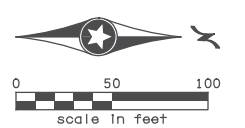
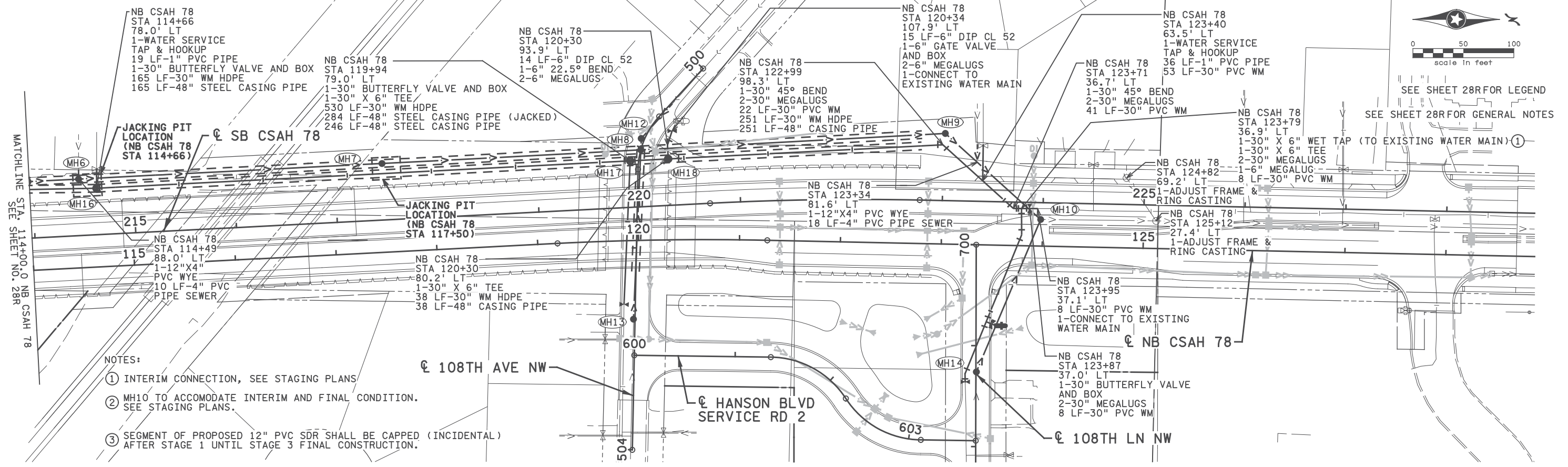
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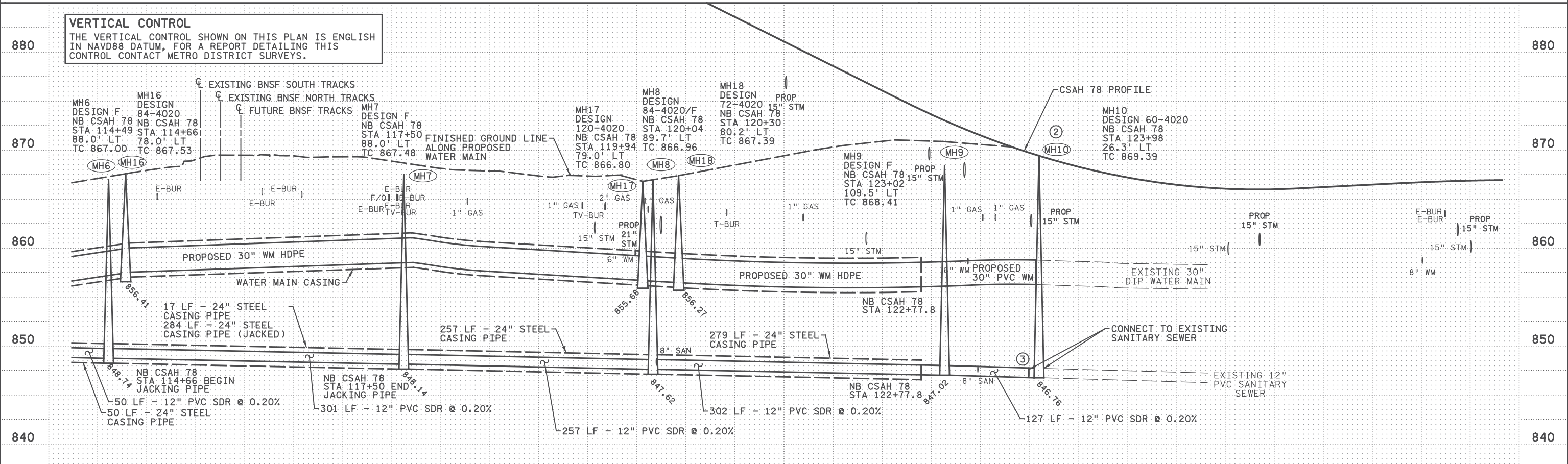
ANOKA COUNTY
 PROPOSED SANITARY AND WATER MAIN PLANS
 CSAH 78 - BNSF GRADE SEPARATION

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 OF
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SEE SHEET 28R FOR LEGEND
SEE SHEET 28R FOR GENERAL NOTES

VERTICAL CONTROL
THE VERTICAL CONTROL SHOWN ON THIS PLAN IS ENGLISH IN NAVD88 DATUM, FOR A REPORT DETAILING THIS CONTROL CONTACT METRO DISTRICT SURVEYS.



1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION

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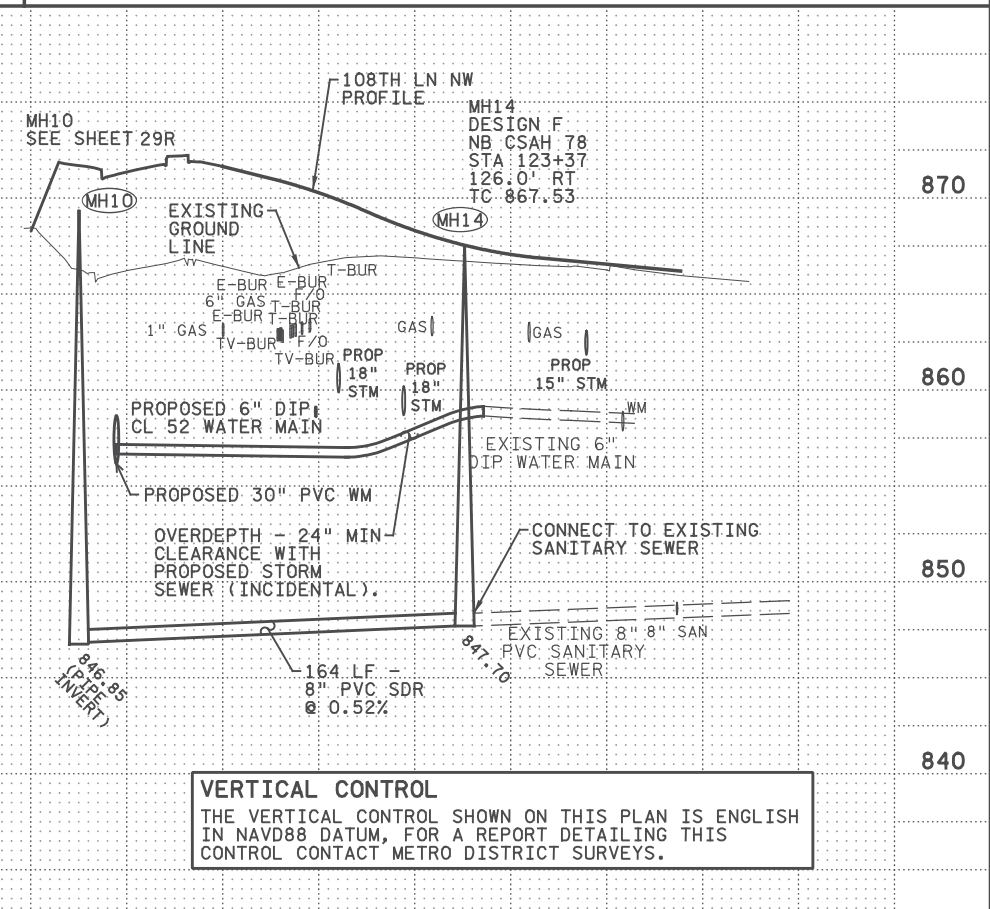
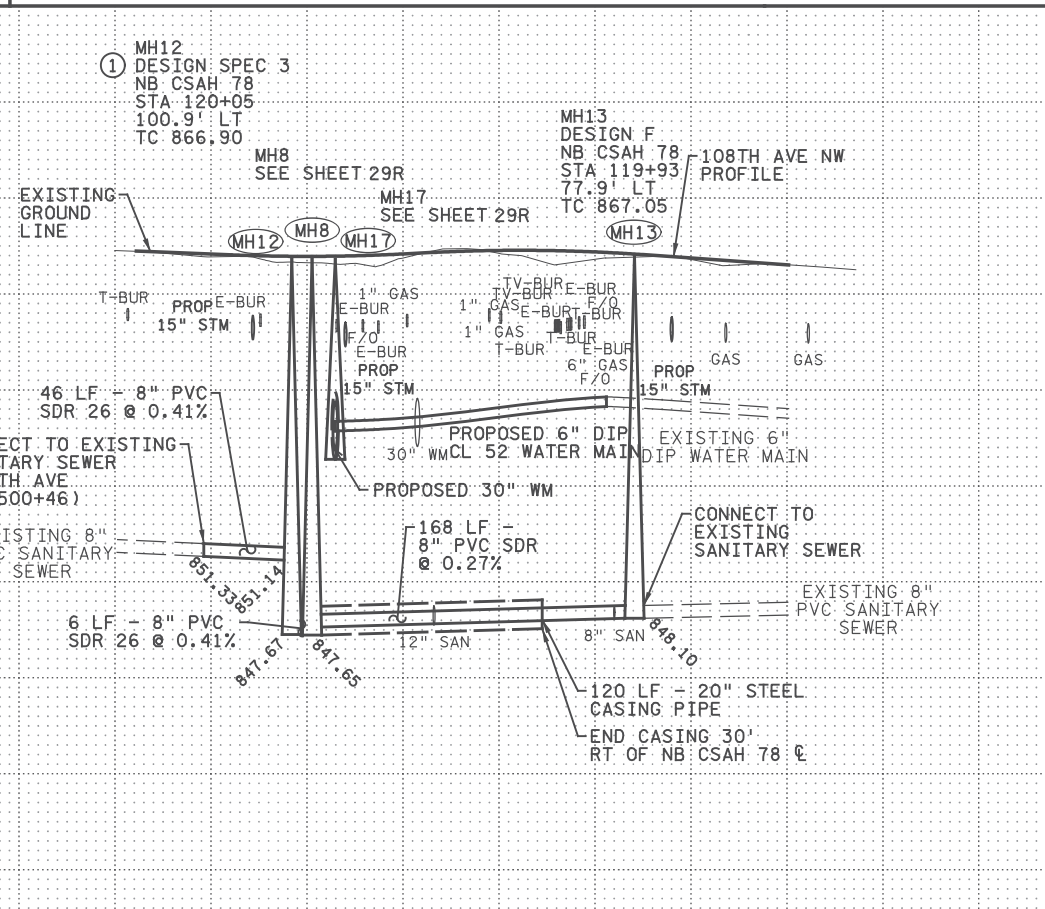
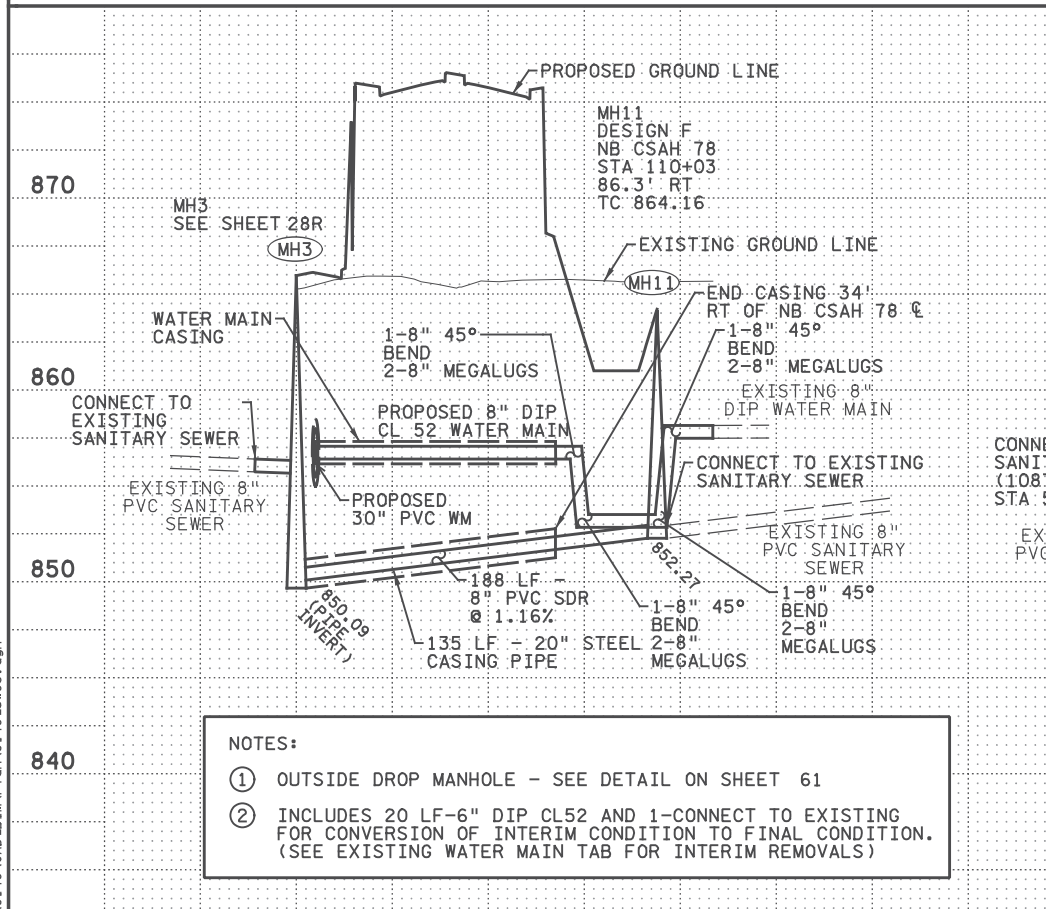
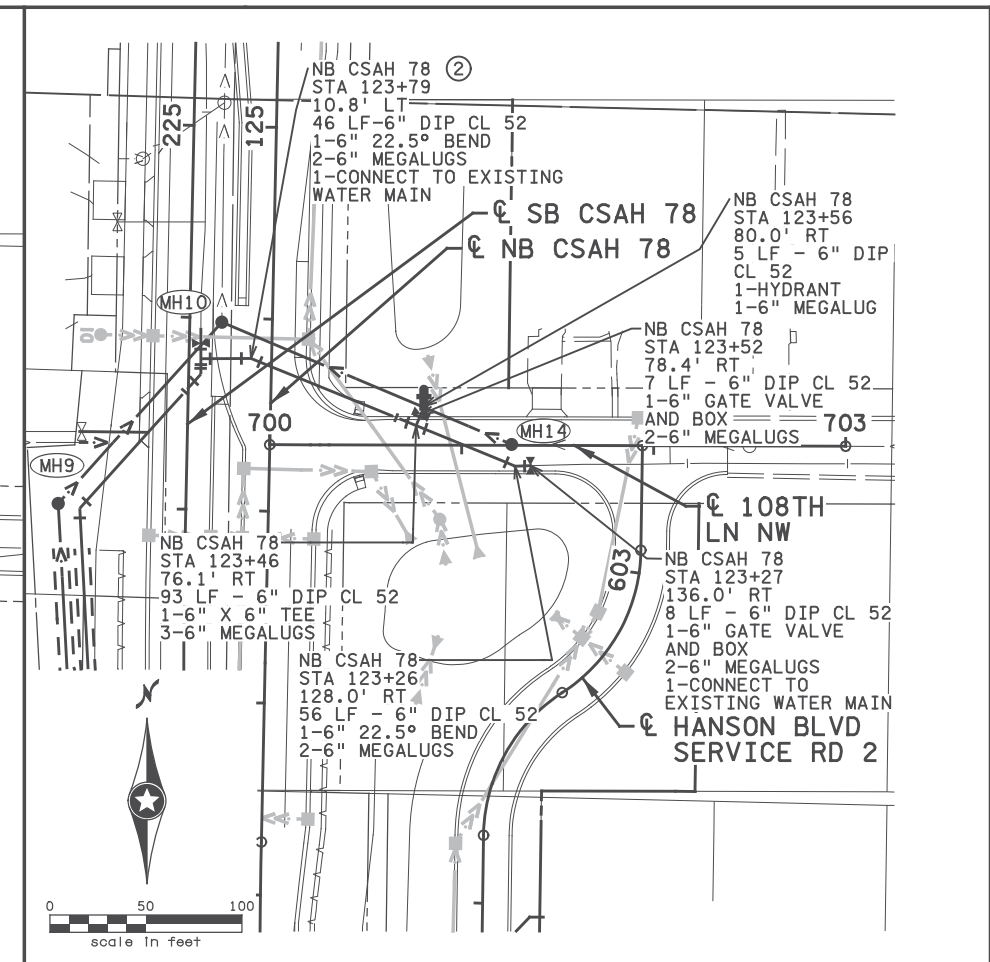
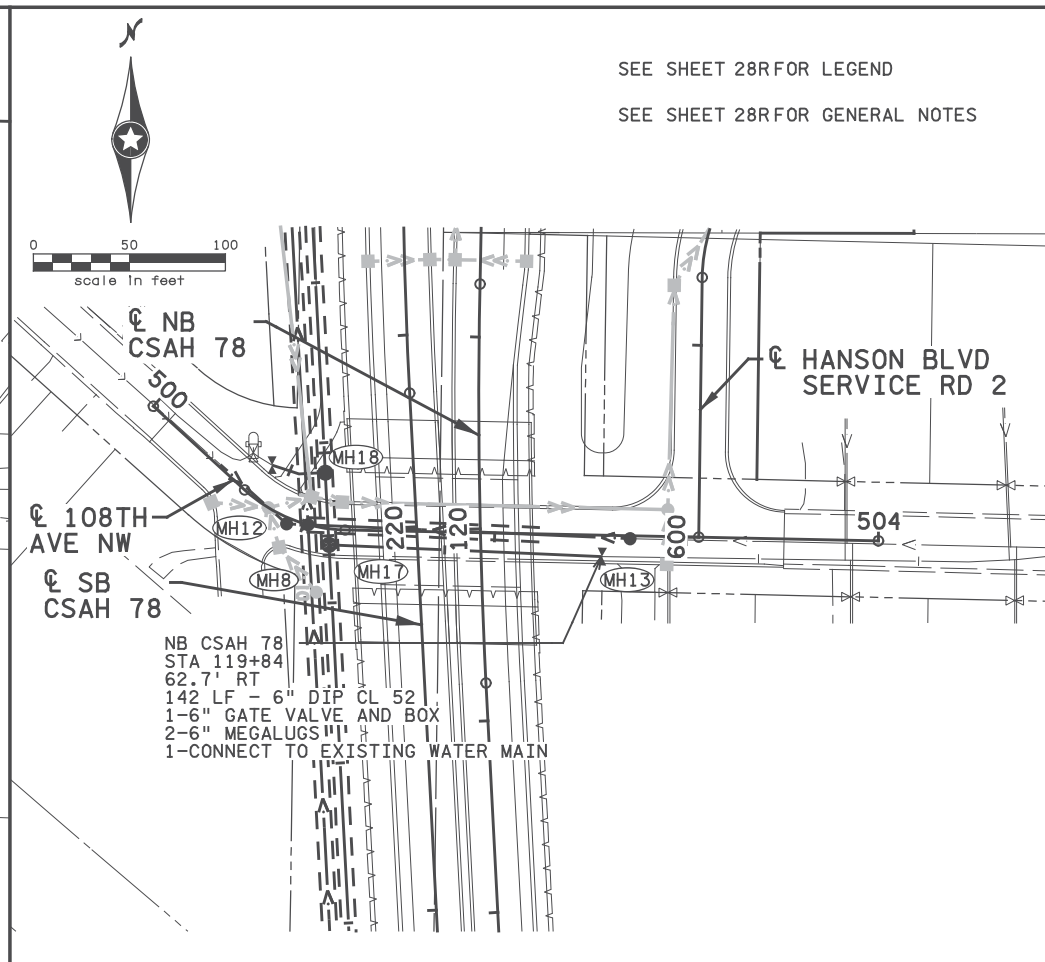
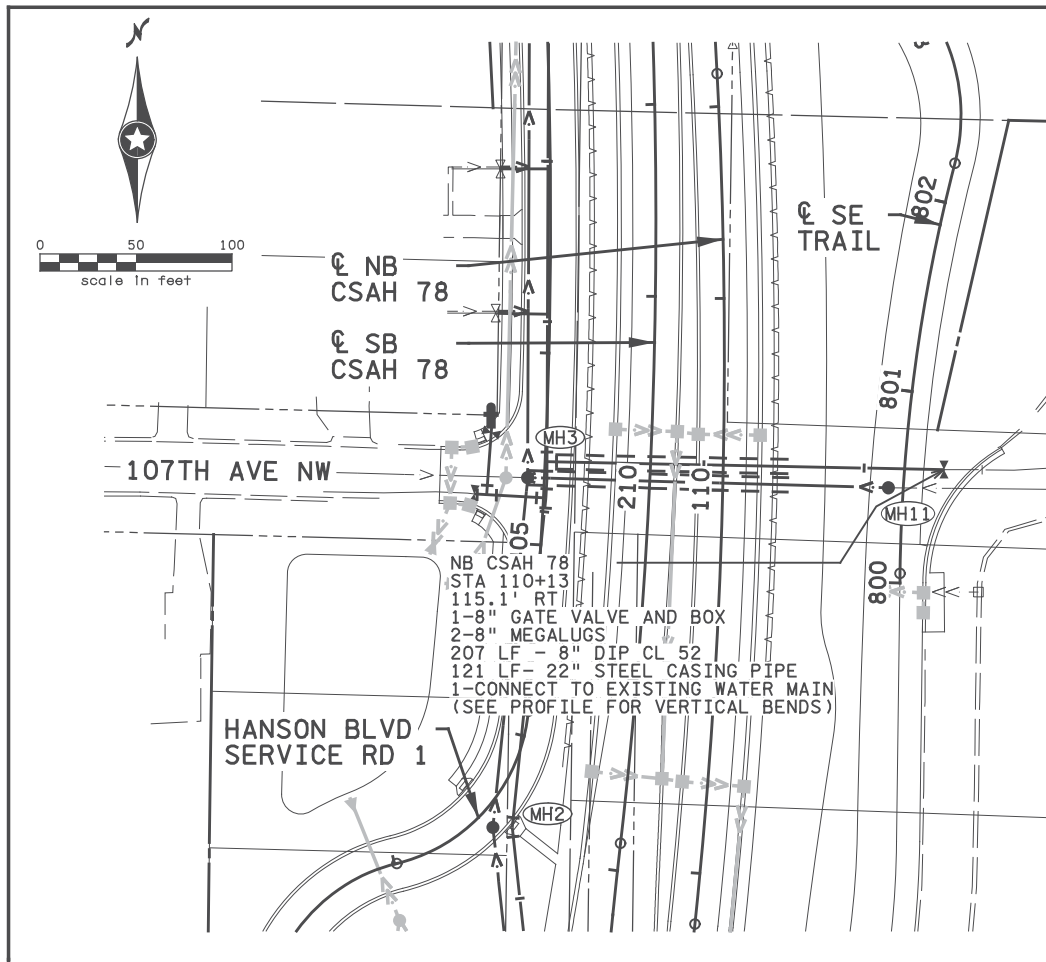
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CSAH 78 - BNSF GRADE SEPARATION

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NOTES:

- ① OUTSIDE DROP MANHOLE - SEE DETAIL ON SHEET 61
- ② INCLUDES 20 LF-6" DIP CL52 AND 1-CONNECT TO EXISTING FOR CONVERSION OF INTERIM CONDITION TO FINAL CONDITION. (SEE EXISTING WATER MAIN TAB FOR INTERIM REMOVALS)

VERTICAL CONTROL
 THE VERTICAL CONTROL SHOWN ON THIS PLAN IS ENGLISH IN NAVD88 DATUM, FOR A REPORT DETAILING THIS CONTROL CONTACT METRO DISTRICT SURVEYS.

1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
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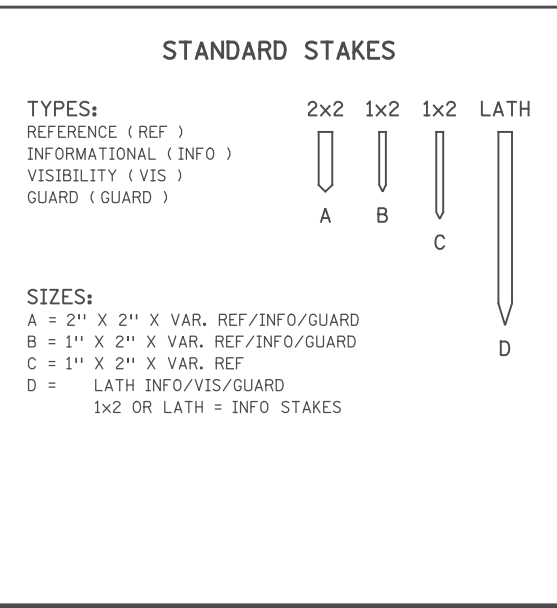
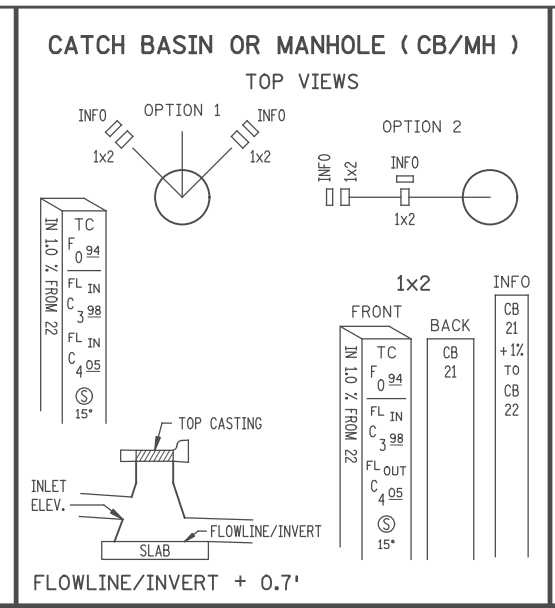
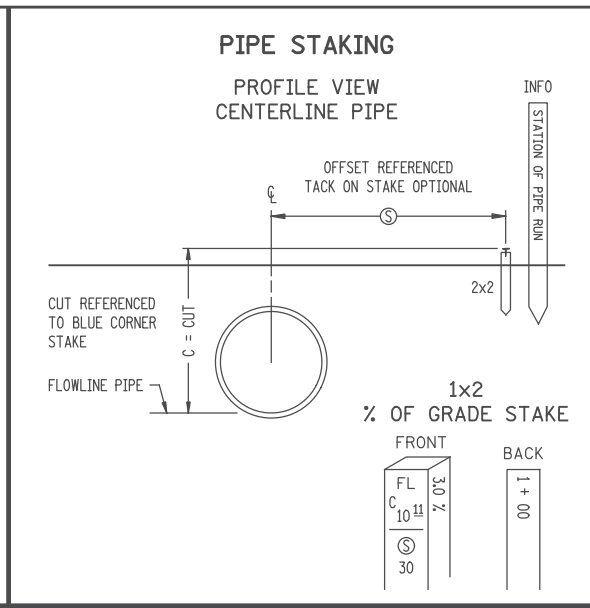
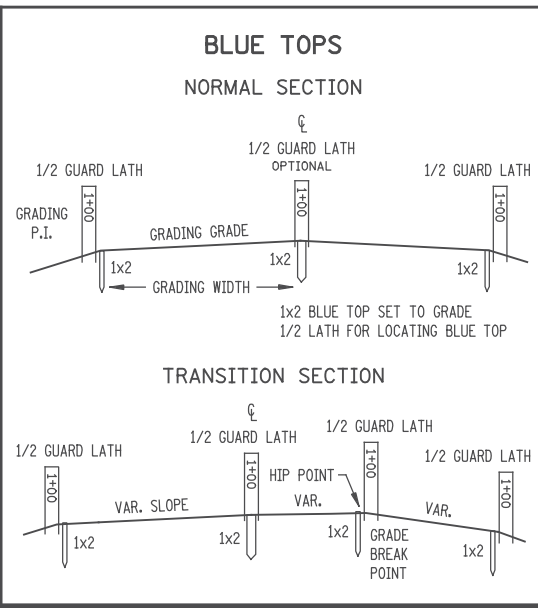
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 Date: 7/12/2017 License #: 53680

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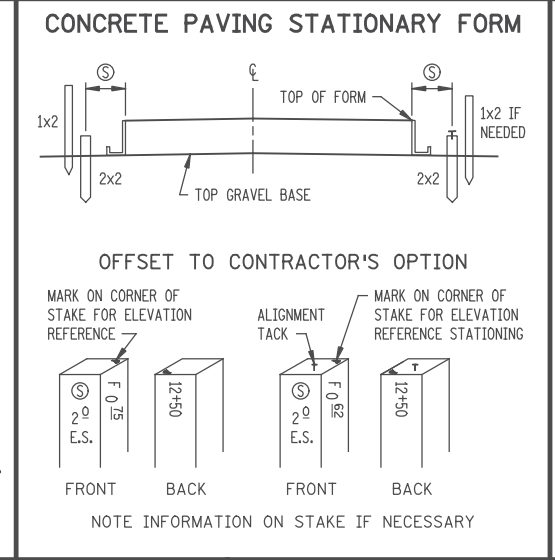
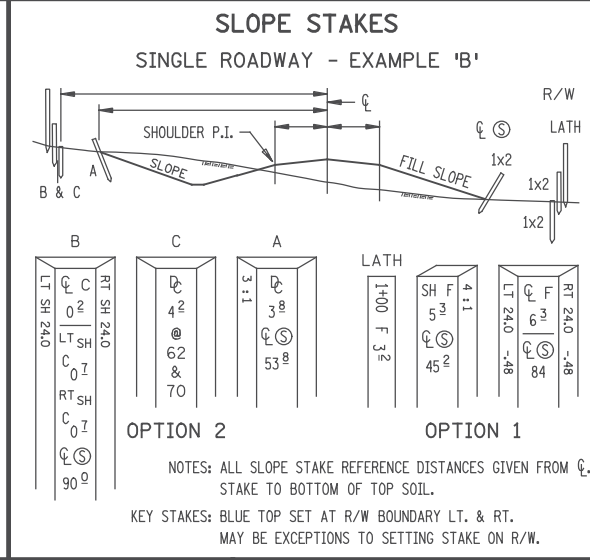
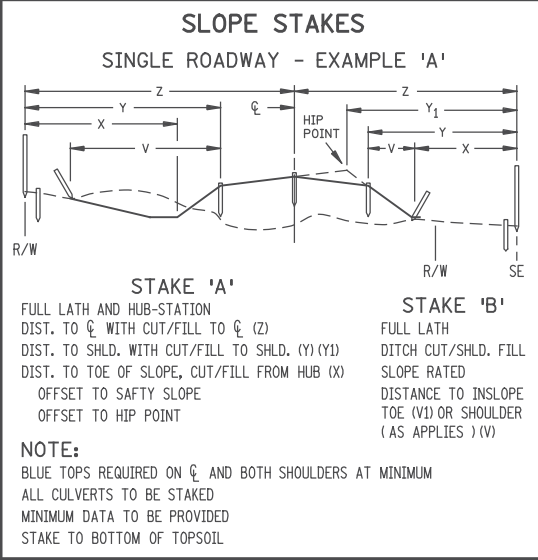
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 CSAH 78 - BNSF GRADE SEPARATION
 SHEET 30R OF 175

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ABBREVIATIONS

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



RECOMMENDED STAKING INTERVALS

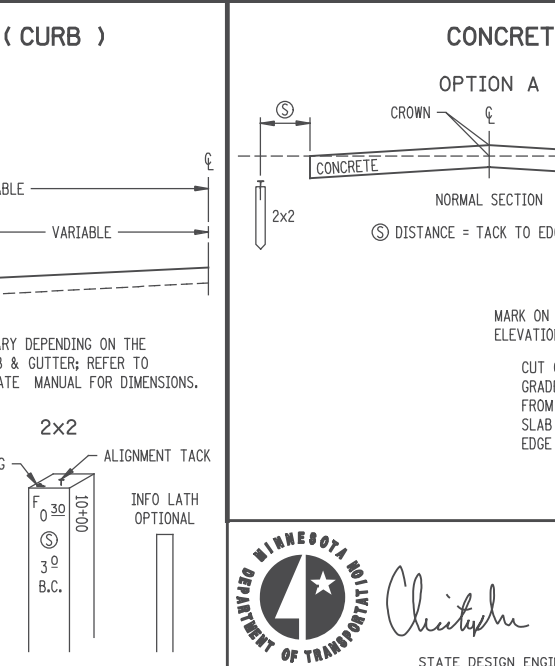
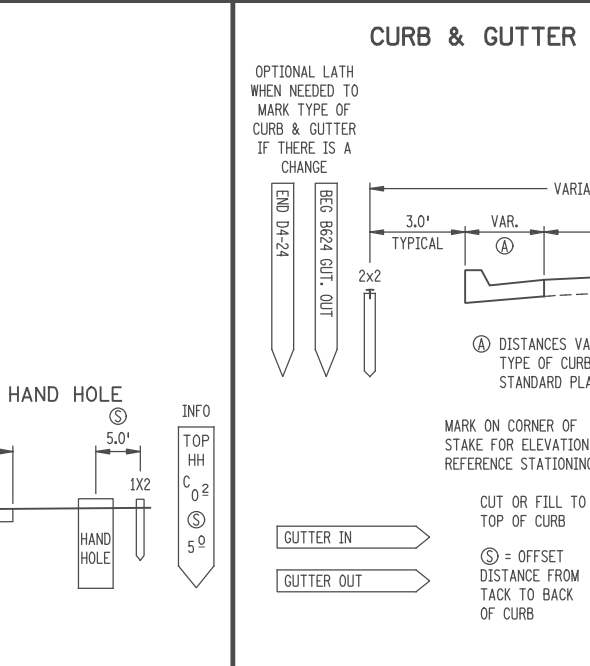
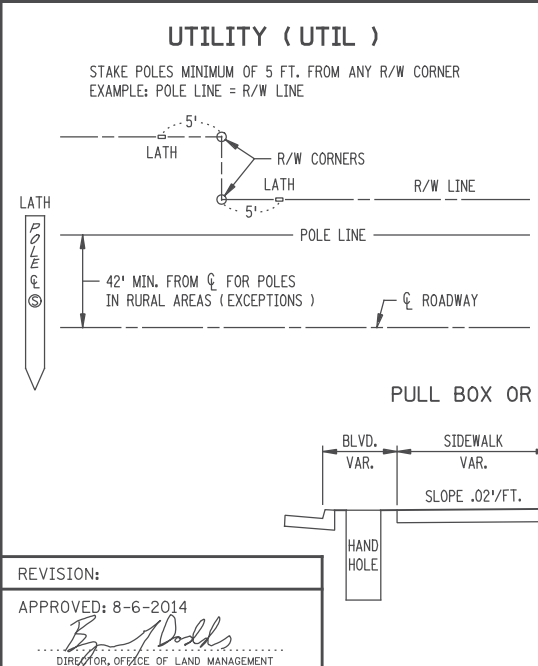
FIGURE A

	SLOPE STAKES	SUB GRADE B.T.	CLASS MATERIAL B.T.	CONC PAVT	C & G	CL & GR LIMITS	MUCK EXC.	R/W	TEMP. EASE.
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 0 - .25	100	100	100	50	50				
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



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.

REVISED:

APPROVED: 8-6-2014
STATE DESIGN ENGINEER

STAKING INFORMATION SHEET

STANDARD PLAN 5-297.115 1 OF 2

NO	DATE	BY	CKD	APPR	REVISION

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STATE AID PROJECT NO 002-678-023, 114-020-051	DRAWN BY	DESIGNED BY	CHECKED BY	COMM. NO. 0169140
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MINNESOTA DEPARTMENT OF TRANSPORTATION

APPROVED: 8-6-2014
STATE DESIGN ENGINEER

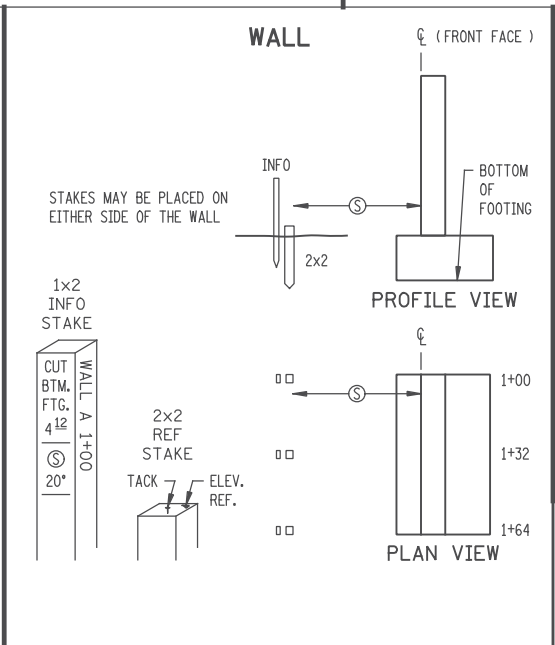
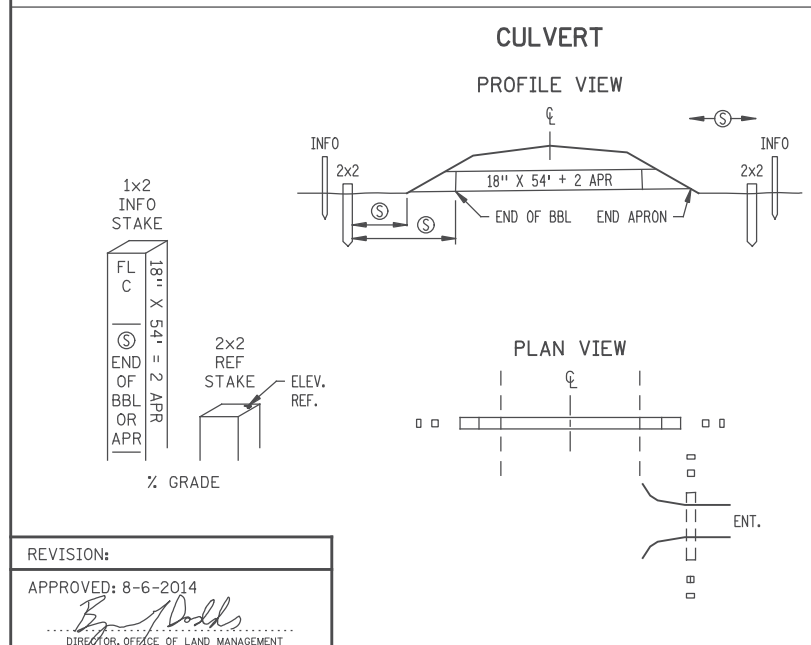
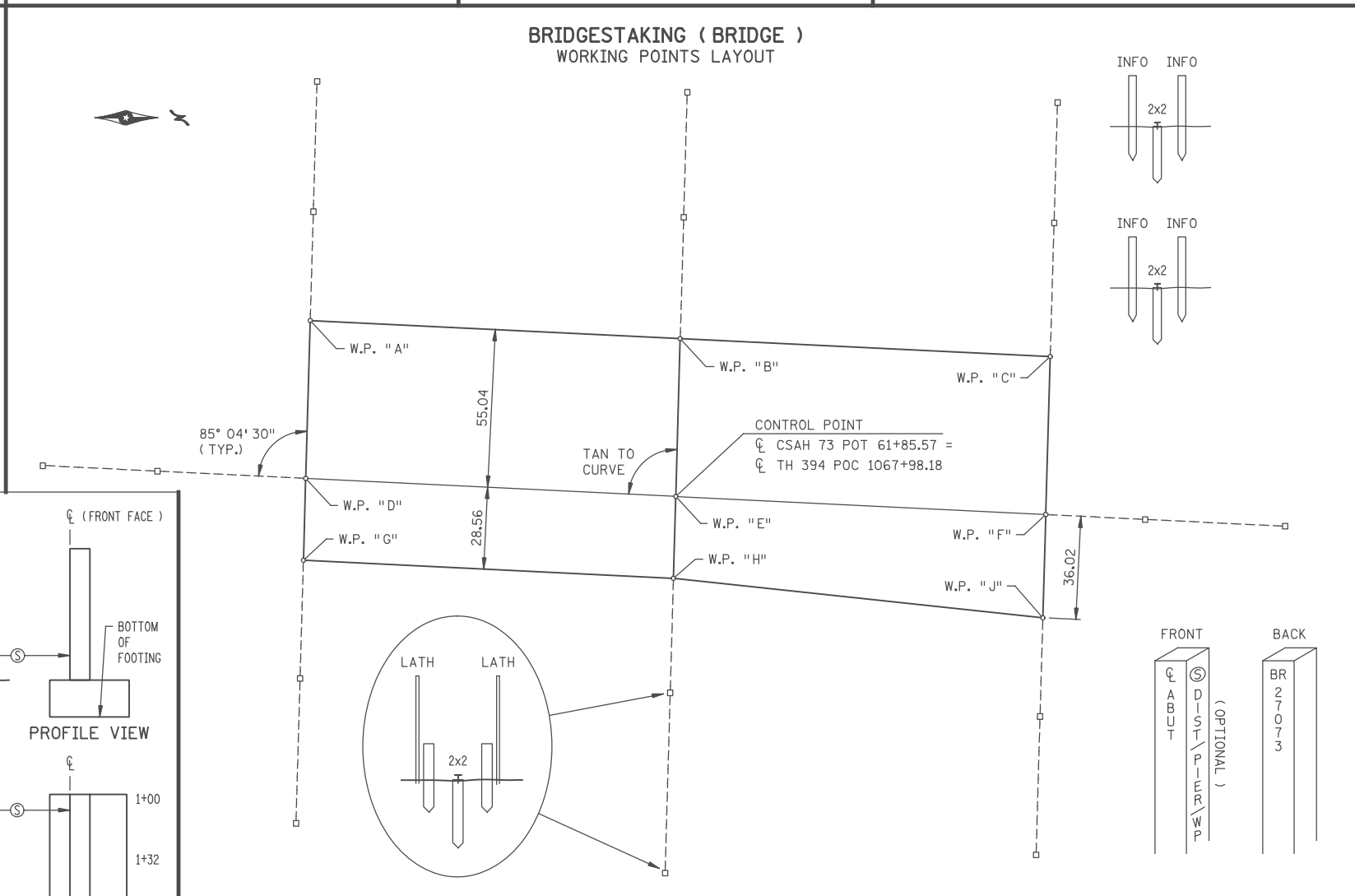
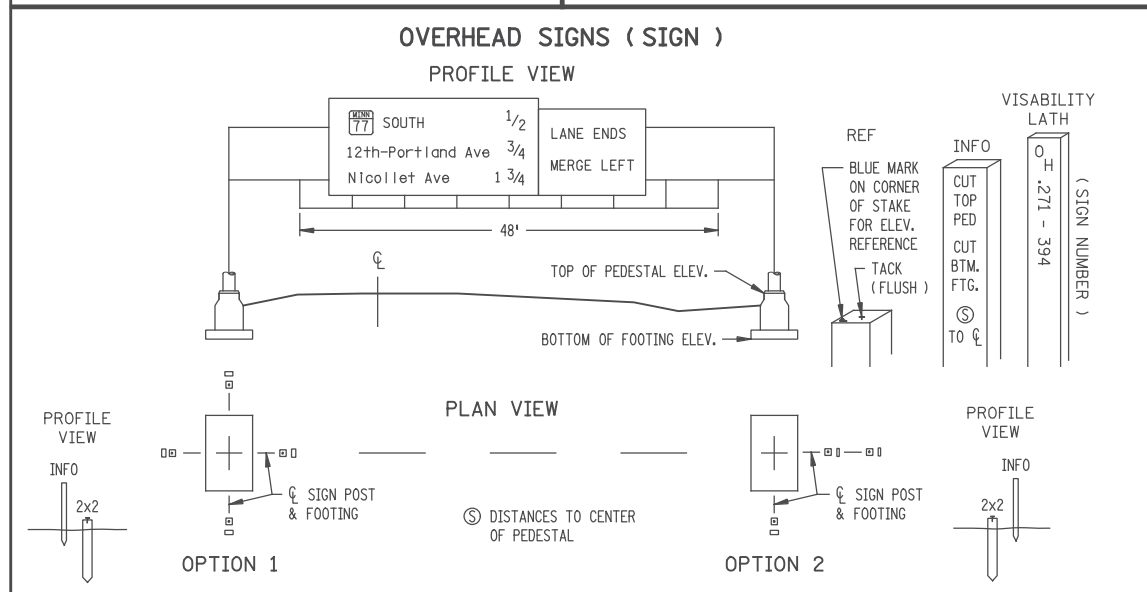
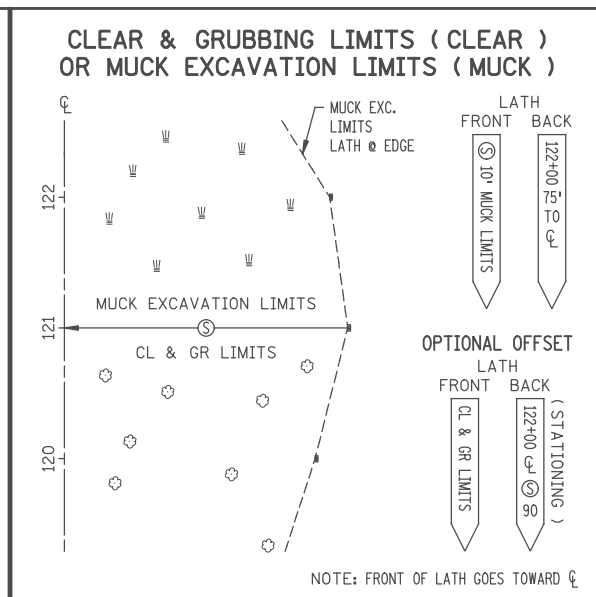
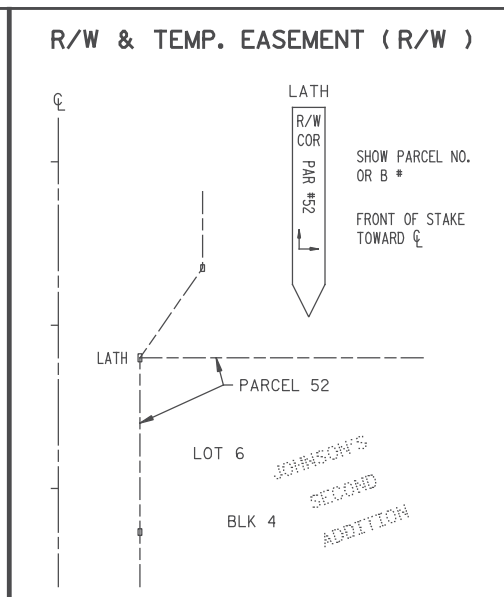
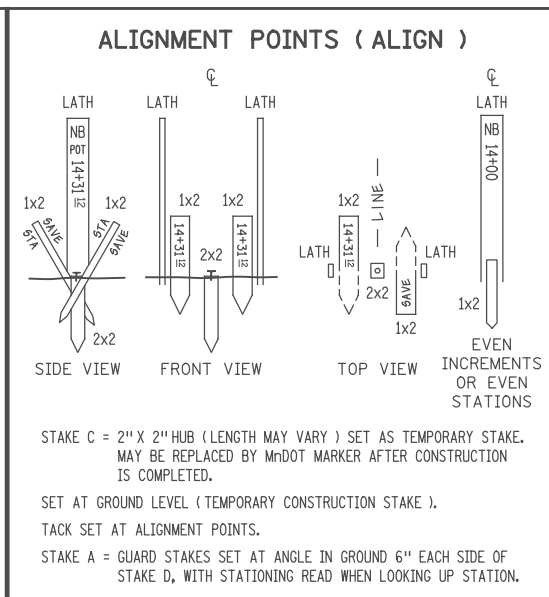
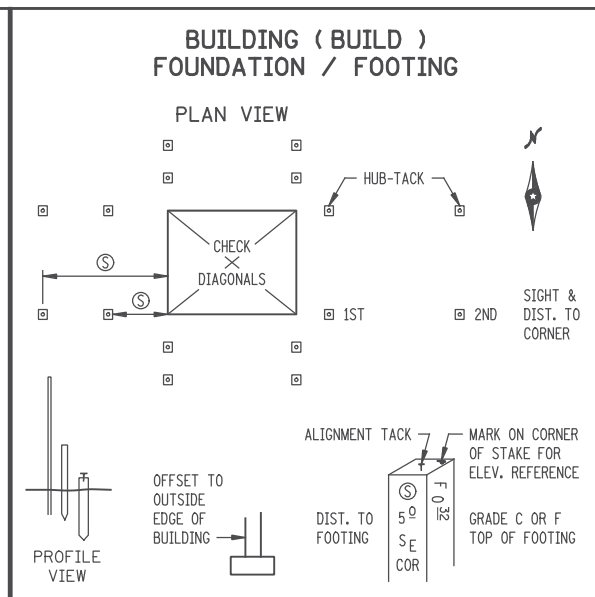
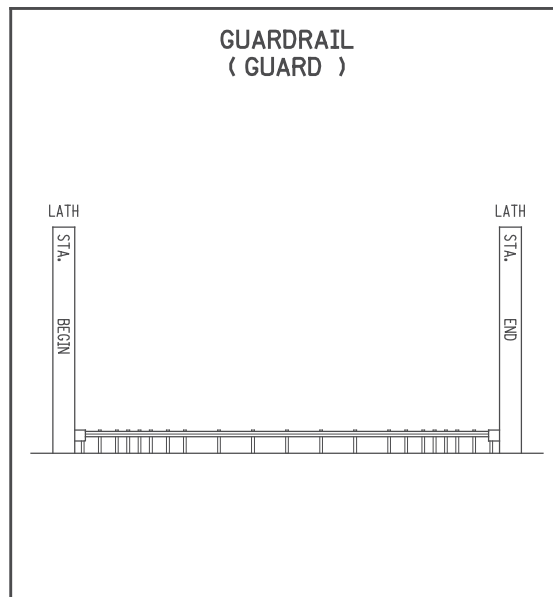
ENGINEERS PLANNERS DESIGNERS

Consulting Group, Inc.

ANOKA COUNTY
STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION

SHEET 31 OF 175

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REVISION:

APPROVED: 8-6-2014

Ben Dolts
DIRECTOR, OFFICE OF LAND MANAGEMENT

REVISED:

APPROVED: 8-6-2014

Christine Ky
STATE DESIGN ENGINEER

STAKING INFORMATION SHEET

STANDARD PLAN 5-297.115 2 OF 2

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STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY

DESIGNED BY

CHECKED BY

COMM. NO. 0169140

Consulting Group, Inc.

ANOKA COUNTY
STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
32
OF
175

NOTES:

- * ① SEE STANDARD PLAN 5-297.231 FOR DRAINAGE DETAILS AND ADDITIONAL REQUIREMENTS.
- * ② B6 CURB DESIGN SHOWN. SEE STANDARD PLATES FOR CURB DETAILS.
- * ③ E8 QUANTITY SHALL BE PAID FOR SEPARATELY, MEASURED FROM BACK OF CURB TO BACK OF CURB. * MEDIAN CURB TO BACK FACE OF CONCRETE BARRIER.
- * ④ TO ACCOMMODATE GUARDRAIL CONNECTION AND CRASH TEST REQUIREMENTS THE CONCRETE BARRIER MUST EXTEND 10'-8" MINIMUM ONTO THE APPROACH PANEL. FOR PARALLEL WINGWALLS THE BARRIER MUST EXTEND 10'-8" MINIMUM ON TO THE APPROACH PANEL OR TO THE END OF THE WINGWALL, WHICH EVER IS LONGER. REFER TO BRIDGE PLAN FOR BARRIER REINFORCEMENT AND PAYMENT.
- * ⑤ SEE GRADING PLANS FOR PAVEMENT AND SHOULDER WIDTHS AND CONFIGURATION.
- * ⑥ WHEN SKEW IS OVER 45°, THE JOINT SHALL BE PERPENDICULAR TO GUTTER FOR 1' (TYP.).
- * ⑦ APPROACH PANEL LENGTHS ARE MEASURED ALONG CENTERLINE. PANEL SIZE AND REQUIREMENTS FOR TRANSVERSE AND LONGITUDINAL JOINTS ARE SHOWN ON STANDARD PLANS 5-297.228 AND 5-297.229. MAXIMUM PANEL LENGTH OF 20'-0" FOR UP TO 40° SKEWS, 15'-0" FOR SKEWS OVER 40°.
- * ⑧ FOR CONCRETE PAVEMENT, SEE STANDARD PLAN 5-297.227 FOR LUG REQUIREMENTS.
- * ⑨ HANDHOLE FOR CONDUIT SYSTEM. SEE INTERCONNECT PLANS FOR DETAILS.

GENERAL NOTES:

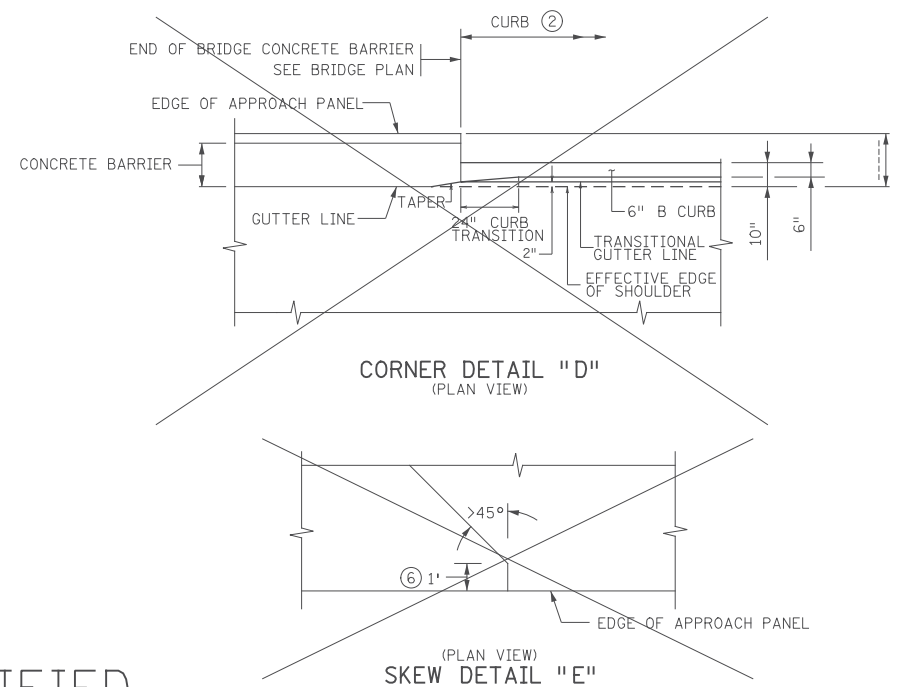
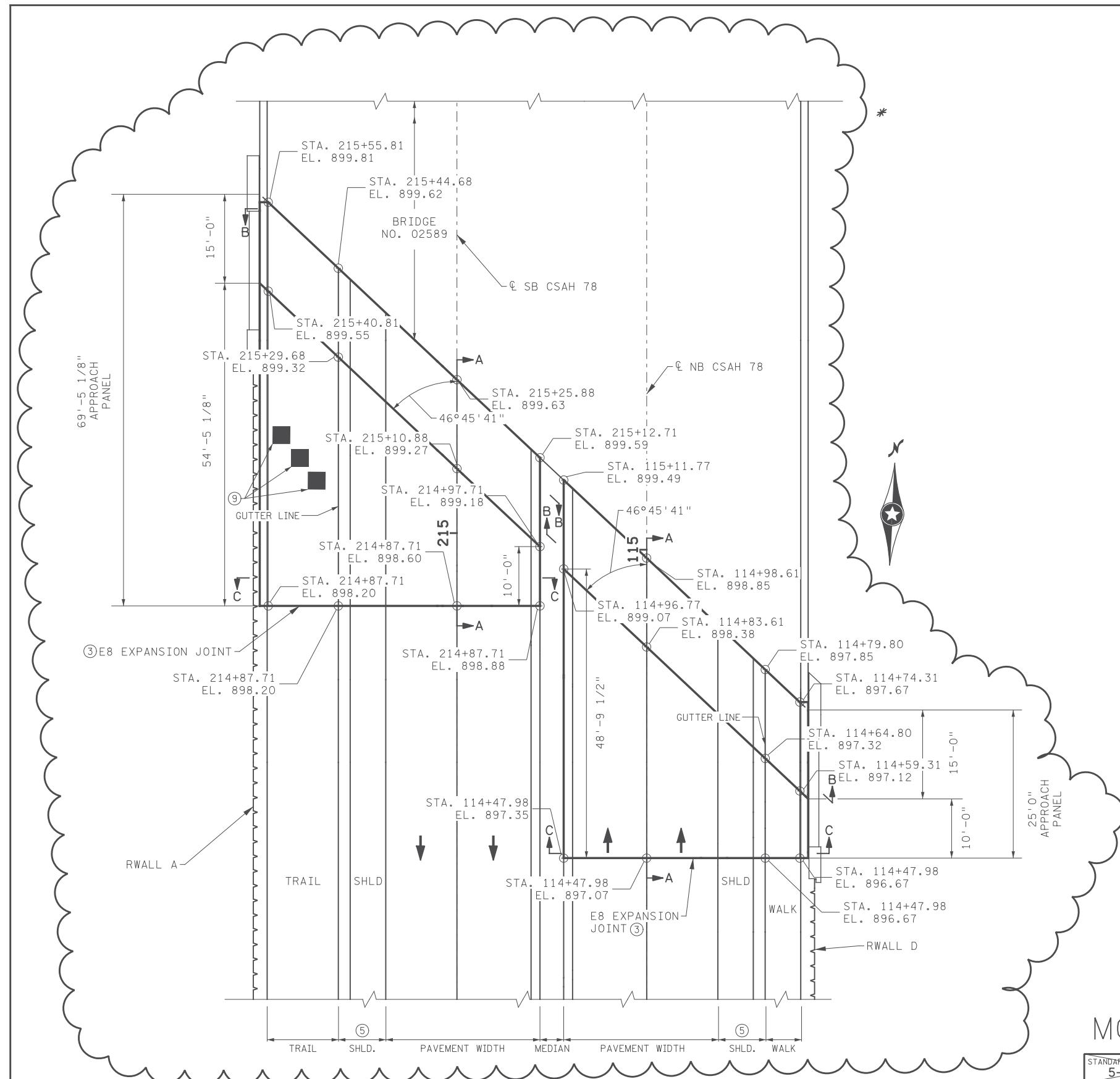
SECTION A-A IS SHOWN ON STANDARD PLAN 5-297.227. SECTIONS B-B AND C-C ARE SHOWN ON STANDARD PLAN 5-297.225 AND SHOW THE STATION AND ELEVATION AT END LOCATIONS ON THE APPROACH PANEL.

A CONCRETE SILL IS REQUIRED BENEATH EXPANSION JOINT TYPE E8. EXTEND THE EXPANSION JOINT AND THE SILL ALONG THE FULL WIDTH OF THE TRAFFIC LANES, SHOULDERS AND CURB. ENSURE THAT SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT. CONCRETE SILL AND CURBING, IF REQUIRED, ARE INCLUDED IN THE APPROACH PANEL PAY ITEM.

REFER TO STANDARD PLAN 5-297.694 (1 OF 5) AND (4 OF 5) FOR ADDITIONAL CURB TRANSITION INFORMATION.

GENERAL DRAINAGE DETAILS ARE SHOWN ON BRIDGE APPROACH PANEL DRAINAGE DETAILS, STANDARD PLAN 5-297.231. ADDITIONAL CATCH BASIN DETAILS ARE SHOWN ON DRAINAGE PLAN SHEETS.

REFER TO SPEC. 2406 FOR ADDITIONAL INFORMATION.



APPROACH PANEL PLAN

* DENOTES MODIFICATIONS FROM STANDARD PLAN

MODIFIED

BRIDGE NO. 02589 (SOUTH ABUTMENT)

STANDARD PLAN SHEET NO. 5-297.224 (2 OF 2)	TITLE: BRIDGE APPROACH PANEL LAYOUT (TYPE-S CONCRETE BARRIER ON APPROACH PANEL)
STANDARD APPROVED: AUGUST 22, 2016	STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

CERTIFIED BY: _____
LICENSED PROFESSIONAL ENGINEER DATE _____
PRINTED NAME: _____ LIC. NO. _____

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Ben Robeck
Date: 6/13/2017 License #: 53680

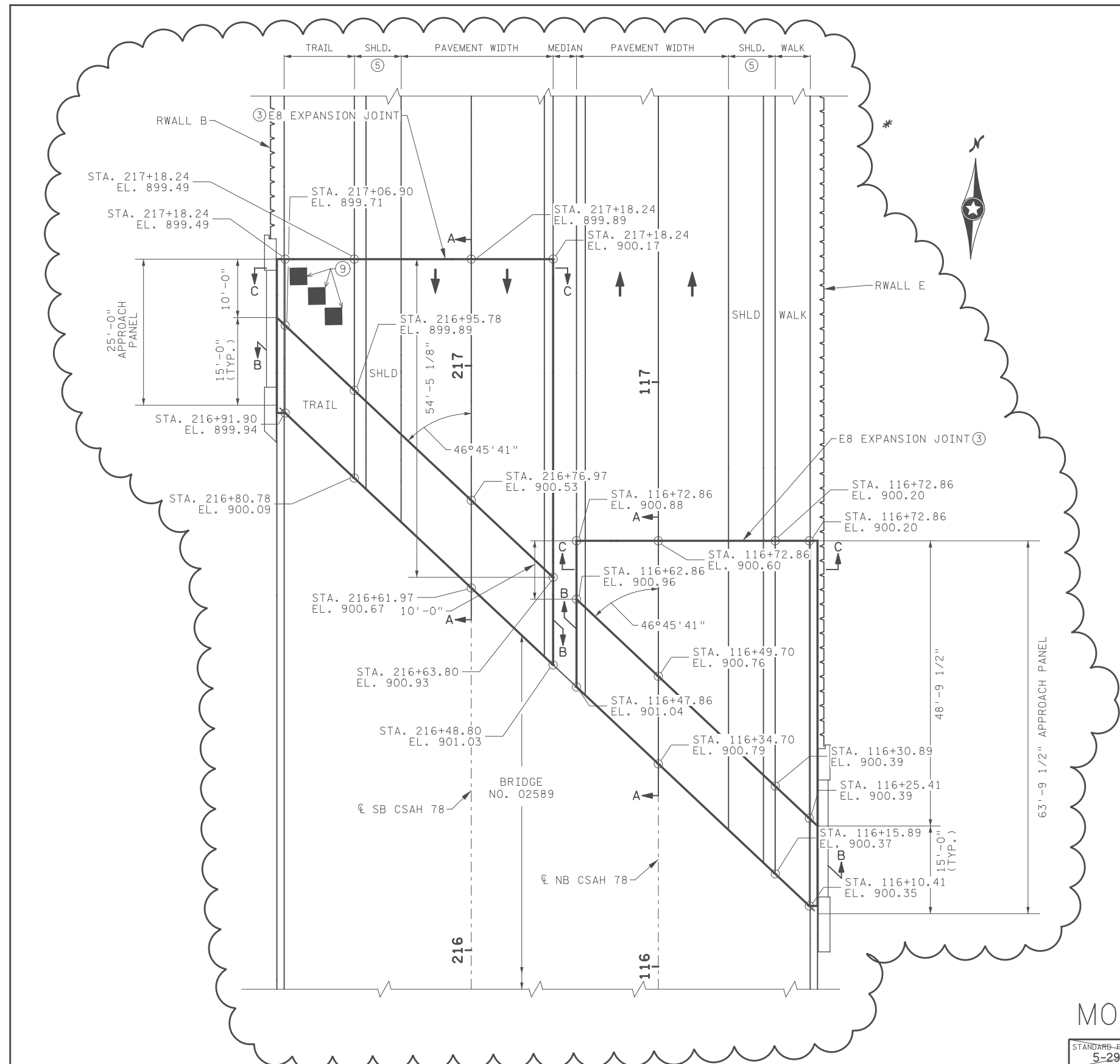
STATE AID PROJECT NO. 002-678-023, 114-020-051
DRAWN BY S. VANG
DESIGNED BY M. HARDEGGER
CHECKED BY B. ROBECK
COMM. NO. 0169140



ANOKA COUNTY
STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION
SHEET 33 OF 175

NO	DATE	BY	CKD	APPR	REVISION

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- NOTES:**
- * ① SEE STANDARD PLAN 5-297.231 FOR DRAINAGE DETAILS AND ADDITIONAL REQUIREMENTS.
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 - * ⑥ WHEN SKEW IS OVER 45°, THE JOINT SHALL BE PERPENDICULAR TO GUTTER FOR 1' (TYP.).
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GENERAL NOTES:

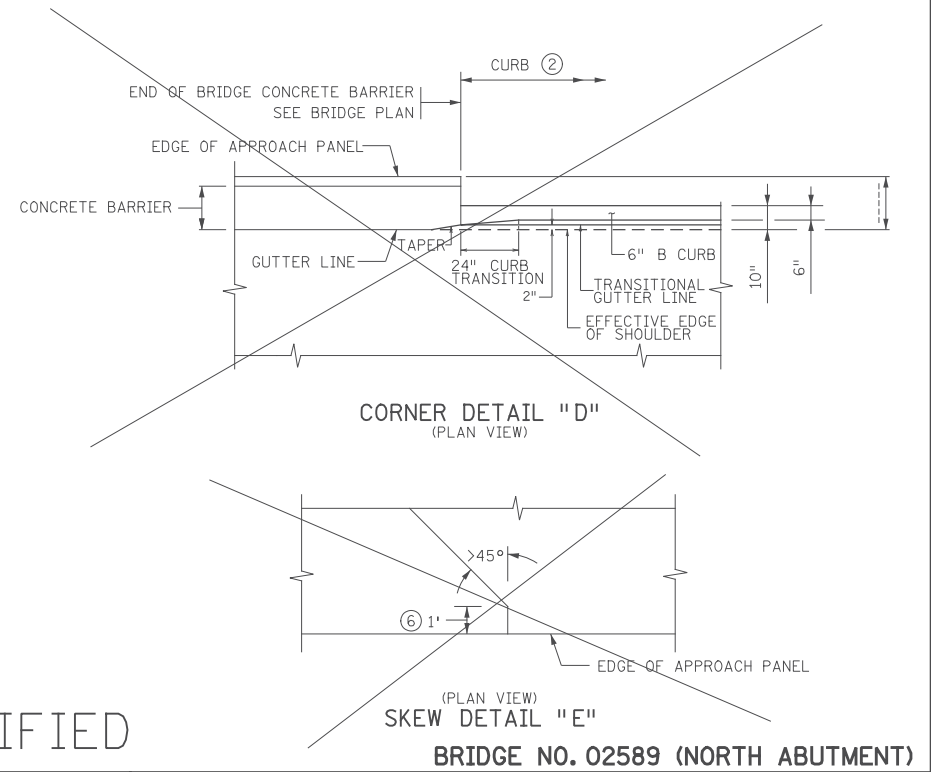
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REFER TO STANDARD PLAN 5-297.694 (1 OF 5) AND (4 OF 5) FOR ADDITIONAL CURB TRANSITION INFORMATION.

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REFER TO SPEC. 2406 FOR ADDITIONAL INFORMATION.



MODIFIED

APPROACH PANEL PLAN * DENOTES MODIFICATIONS FROM STANDARD PLAN

STANDARD PLAN SHEET NO. 5-297.224 (2 OF 2)	TITLE: BRIDGE APPROACH PANEL LAYOUT (TYPE-S CONCRETE BARRIER ON APPROACH PANEL)
STANDARD APPROVED: AUGUST 22, 2016	STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

CERTIFIED BY: _____
LICENSING PROFESSIONAL ENGINEER DATE _____
PRINTED NAME: _____ LIC. NO. _____

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Ben Robeck
Date: 6/13/2017 License #: 53680

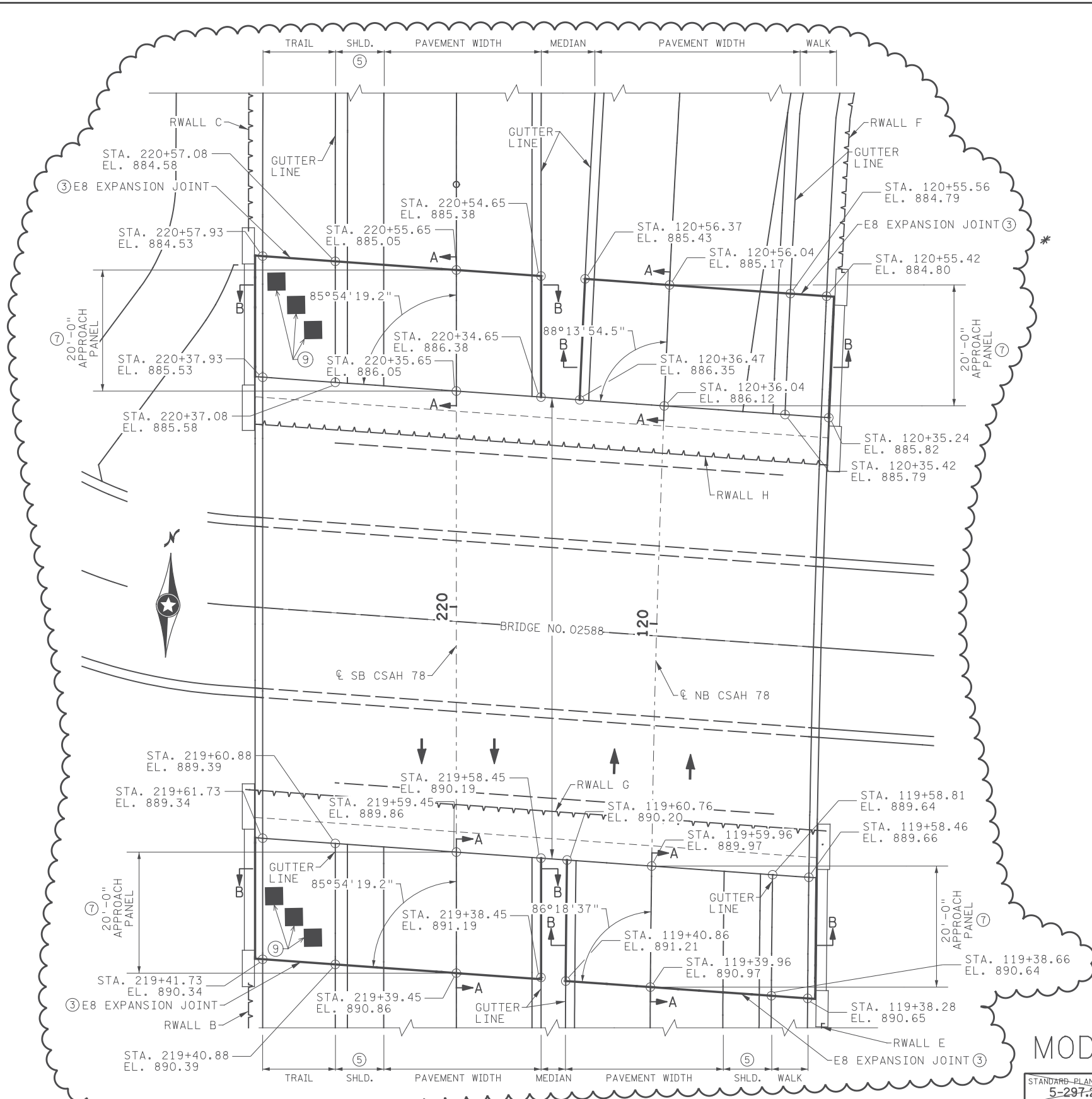
STATE AID PROJECT NO. 002-678-023, 114-020-051
DRAWN BY S. VANG
DESIGNED BY M. HARDEGGER
CHECKED BY B. ROBECK
COMM. NO. 0169140



ANOKA COUNTY
STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION
SHEET 34 OF 175

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NO	DATE	BY	CKD	APPR	REVISION



- NOTES:**
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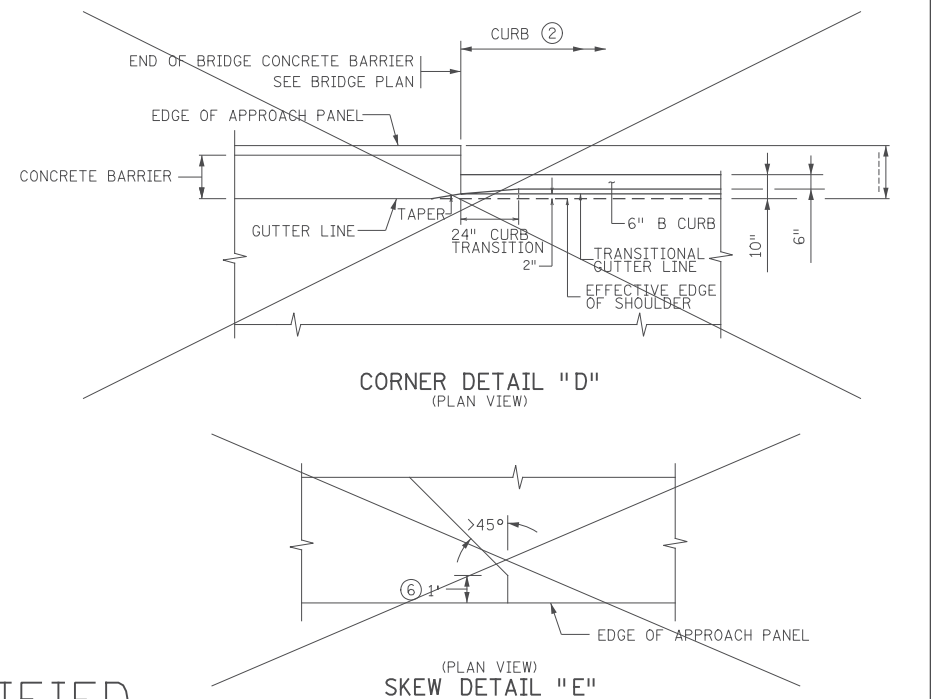
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REFER TO SPEC. 2406 FOR ADDITIONAL INFORMATION.



APPROACH PANEL PLAN * DENOTES MODIFICATIONS FROM STANDARD PLAN

MODIFIED

BRIDGE NO. 02588

STANDARD PLAN SHEET NO. 5-297.224 (2 OF 2)	TITLE: BRIDGE APPROACH PANEL LAYOUT (TYPE-S CONCRETE BARRIER ON APPROACH PANEL)
STANDARD APPROVED: AUGUST 22, 2016	STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

CERTIFIED BY: _____
 LICENSED PROFESSIONAL ENGINEER DATE _____
 PRINTED NAME: _____ LIC. NO. _____

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO.
002-678-023, 114-020-051
 DRAWN BY S. VANG
 DESIGNED BY M. HARDEGGER
 CHECKED BY B. ROBECK
 COMM. NO. 0169140

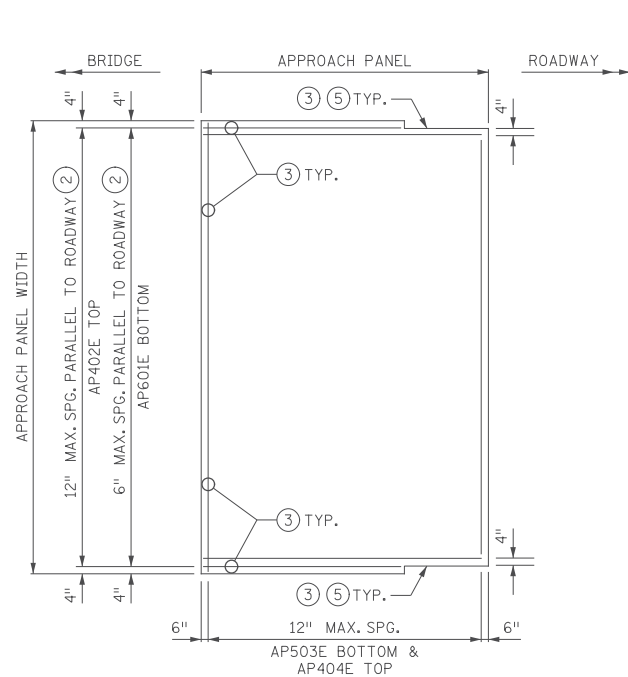


ANOKA COUNTY
 STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION
 SHEET 35 OF 175

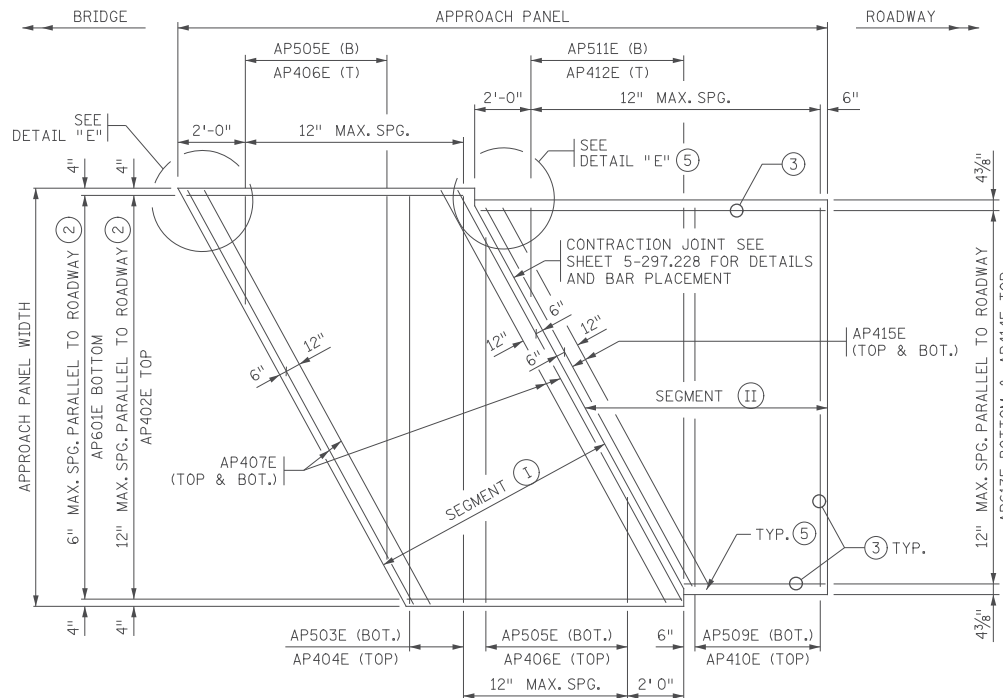
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NO	DATE	BY	CKD	APPR	REVISION

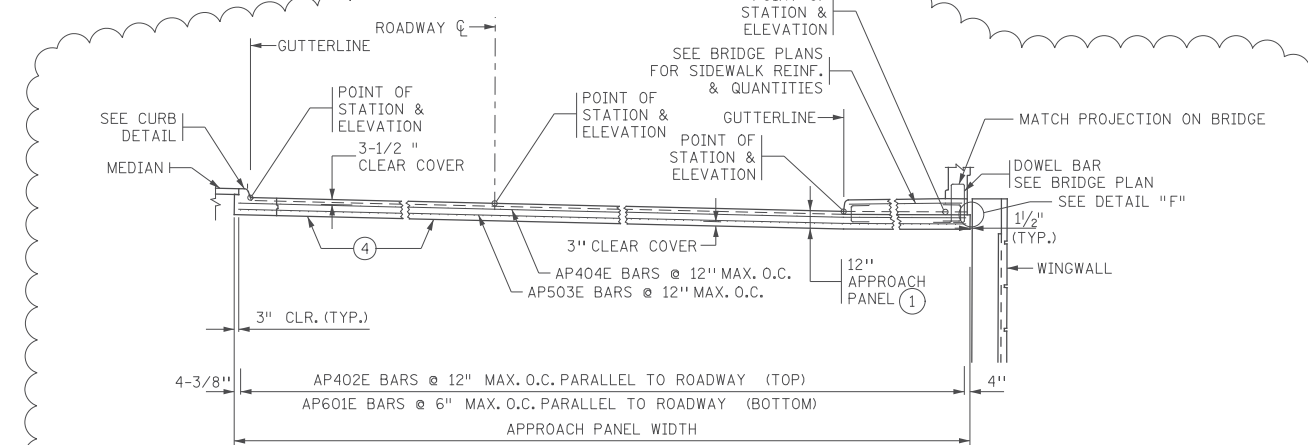
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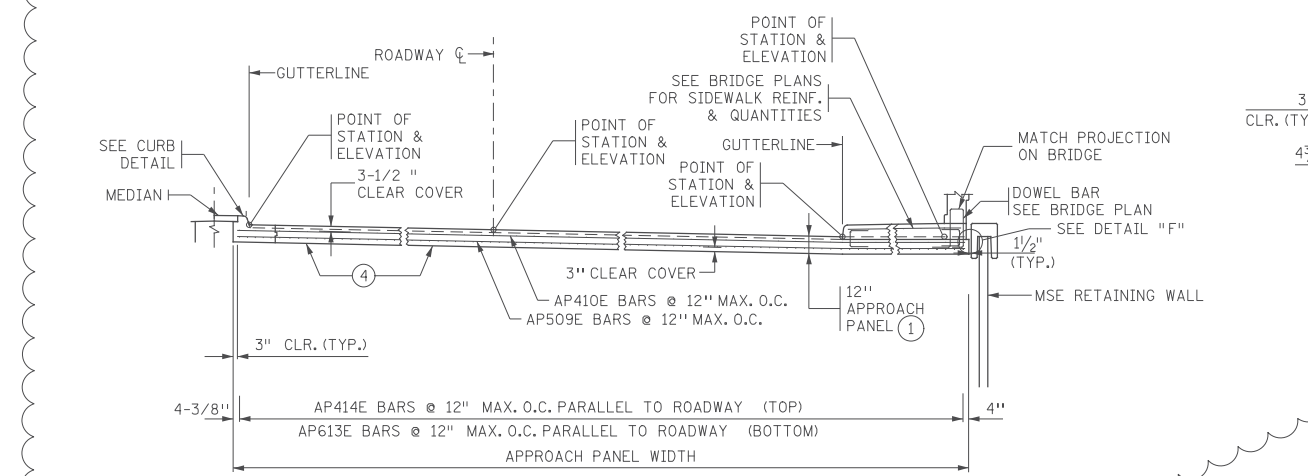
APPROACH PANEL REINFORCEMENT
SQUARE TO 10° SKEWS



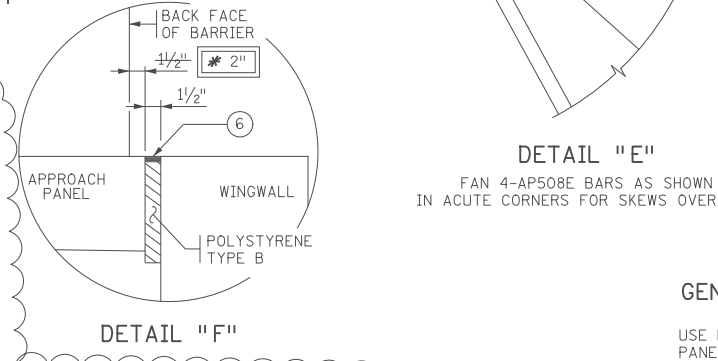
APPROACH PANEL REINFORCEMENT
OVER 10° SKEWS



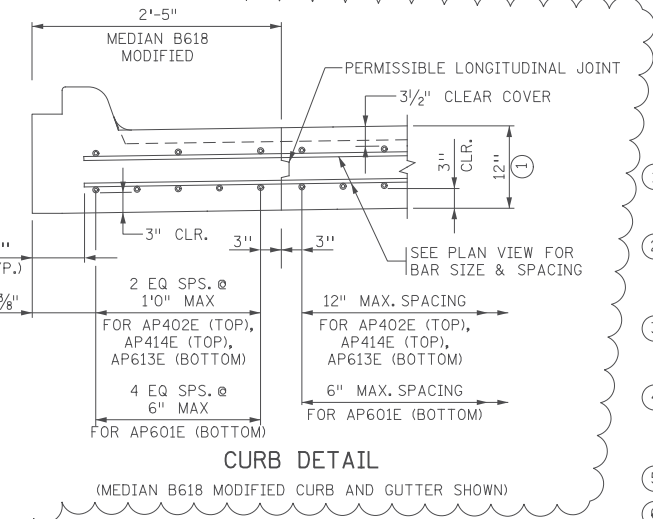
TRANSVERSE SECTION B-B



TRANSVERSE SECTION C-C



DETAIL "E"
FAN 4-AP508E BARS AS SHOWN
IN ACUTE CORNERS FOR SKEWS OVER 30°.



CURB DETAIL
(MEDIAN B618 MODIFIED CURB AND GUTTER SHOWN)

MODIFIED

ESTIMATED REINFORCEMENT QUANTITY FOR BRIDGE APPROACH PANELS		
TYPE	LOCATION	ESTIMATED WEIGHT
PANEL (SQ. TO 10°)	BRIDGE TO END OF APPROACH PANEL	48.5 LB./SQ. YD.
PANEL SEGMENT ① (OVER 10°)	BRIDGE TO CONTRACTION JOINT	48.5 LB./SQ. YD.
PANEL SEGMENT ② (OVER 10°)	CONTRACTION JOINT TO END OF APPROACH PANEL	35.0 LB./SQ. YD.
SILL	SILL (IF REQUIRED)	14.0 LB./LIN FT.

NOTES:
TRANSVERSE BARS IN BOTH PANEL SEGMENTS ARE PERPENDICULAR TO ROADWAY CENTERLINE EXCEPT AP407E ARE PARALLEL TO SKEW IN SEGMENT ① AND AP415E ARE PARALLEL TO SKEW IN SEGMENT ②.
LONGITUDINAL BARS IN BOTH PANEL SEGMENTS ARE PARALLEL TO ROADWAY CENTERLINE.

BILL OF REINFORCEMENT FOR BRIDGE APPROACH PANELS
CONTRACTOR IS REQUIRED TO COMPLETE THE BILL OF REINFORCEMENT TABLE AND PREPARE SHOP DRAWINGS INCLUDING CURB TRANSITIONS AND ALL DETAILS NECESSARY TO CONSTRUCT THE PANEL. SUBMIT THEM TO THE PROJECT ENGINEER AT LEAST 3 WEEKS BEFORE REBAR FABRICATION.

BAR	NO.	LENGTH	SHAPE	LOCATION
AP601E		'-	---	BOTTOM LONGITUDINAL
AP402E		'-	---	TOP LONGITUDINAL
AP503E		'-	---	BOTTOM TRANSVERSE
AP404E		'-	---	TOP TRANSVERSE
AP505E	SER. OF	'- TO	---	BOTTOM TRANSVERSE
AP406E	SER. OF	'- TO	---	TOP TRANSVERSE
AP407E		'-	---	TOP & BOTTOM EDGE
AP508E		8'-0	---	TOP CORNER - FAN
AP509E		'-	---	BOTTOM TRANSVERSE
AP410E		'-	---	TOP TRANSVERSE
AP511E	SER. OF	'- TO	---	BOTTOM TRANSVERSE
AP412E	SER. OF	'- TO	---	TOP TRANSVERSE
AP613E	SER. OF	'- TO	---	BOTTOM LONGITUDINAL
AP414E	SER. OF	'- TO	---	TOP LONGITUDINAL
AP415E		'-	---	TOP & BOTTOM EDGE
AP616E		5'-0	---	C2H-D JOINT

- GENERAL NOTES:**
- USE EPOXY COATED GRADE 60 REINFORCEMENT PER SPEC. 3301 IN APPROACH PANEL, CONCRETE SILL, AND CURB TRANSITION. EPOXY COAT BARS MARKED WITH THE SUFFIX "E" IN ACCORDANCE WITH SPEC. 3301.
 - FOR VARIABLE ROADWAY WIDTHS, VARY THE LAP LENGTH OF THE REINFORCEMENT.
 - MINIMUM REINFORCEMENT LAP LENGTHS ARE AS FOLLOWS: NO. 4 BAR = 1'-11", NO. 5 BAR = 2'-5", NO. 6 BAR = 2'-10".
 - ALL LAP SPLICES SHALL BE STAGGERED SUCH THAT NO MORE THAN 50% OF REBAR IS SPLICED AT THE SAME LOCATION.
 - 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 SPACING ONLY FOR B6 INTEGRANT CURB. SEE CURB DETAIL FOR SPACING FOR USING B624 CURB AND GUTTER.
 - ③ EXTEND AND/OR CUT REINFORCING AS NECESSARY TO ACCOMMODATE CURB TRANSITION IF PRESENT. REINFORCEMENT MUST EXTEND INTO CURB AS SHOWN IN TRANSVERSE SECTIONS B-B AND C-C.
 - ④ 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.
 - ⑤ SEE STANDARD PLAN 5-297.224 FOR CURB TRANSITION LOCATION.
 - ⑥ SEAL WITH SELF-LEVELING SILICONE PER SPEC. 3722.

STANDARD PLAN SHEET NO. 5-297.225 (2 OF 2)	TITLE: BRIDGE APPROACH PANEL REINFORCEMENT DETAILS (TYPE S CONCRETE BARRIER ON APPROACH PANEL)
STANDARD APPROVED: AUGUST 22, 2016	STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

* DENOTES MODIFICATIONS FROM STANDARD PLAN

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Date: 6/13/2017 License #: 53680

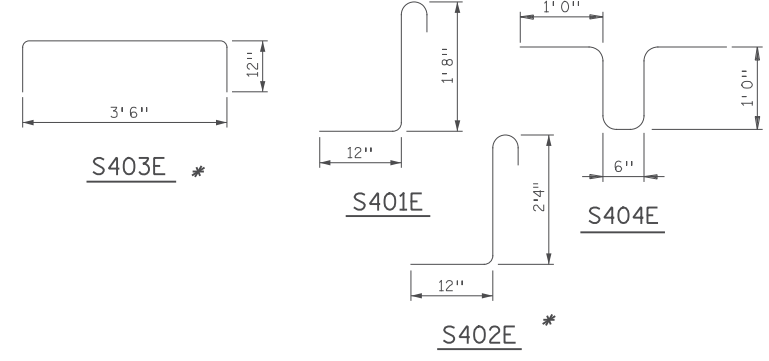
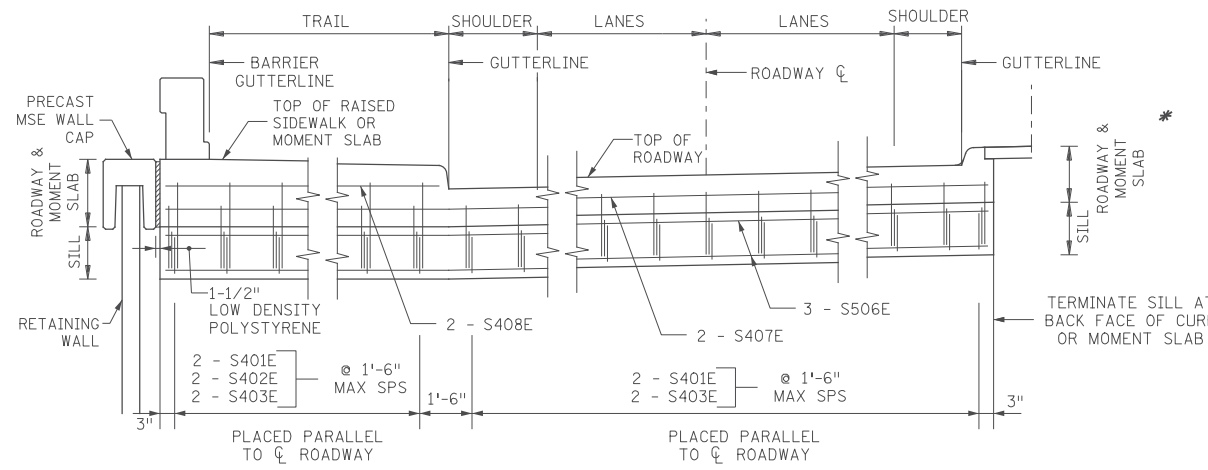
STATE AID PROJECT NO. 002-678-023, 114-020-051
DRAWN BY S. VANG
DESIGNED BY M. HARDEGGER
CHECKED BY B. ROBECK
COMM. NO. 0169140



ANOKA COUNTY
STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION
SHEET 36 OF 175

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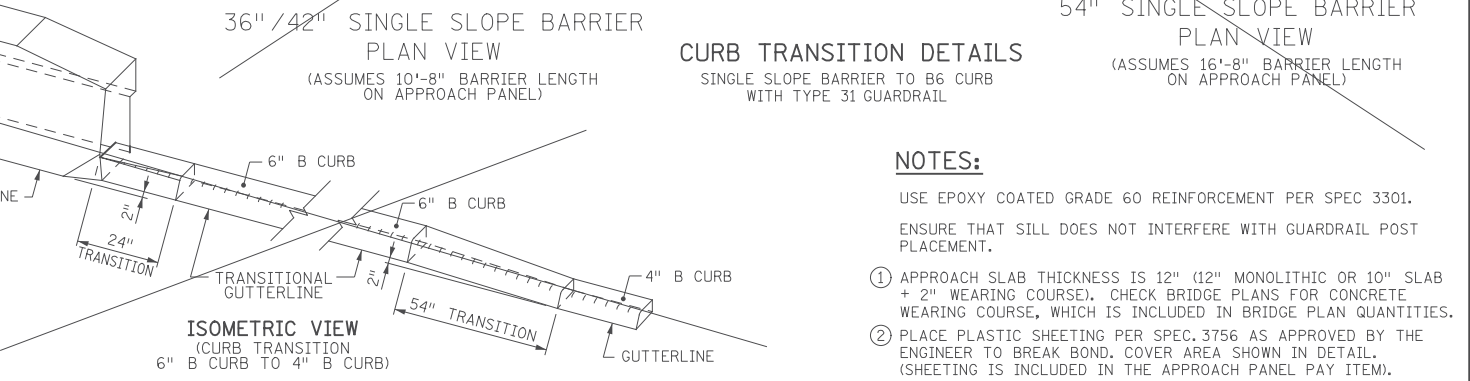
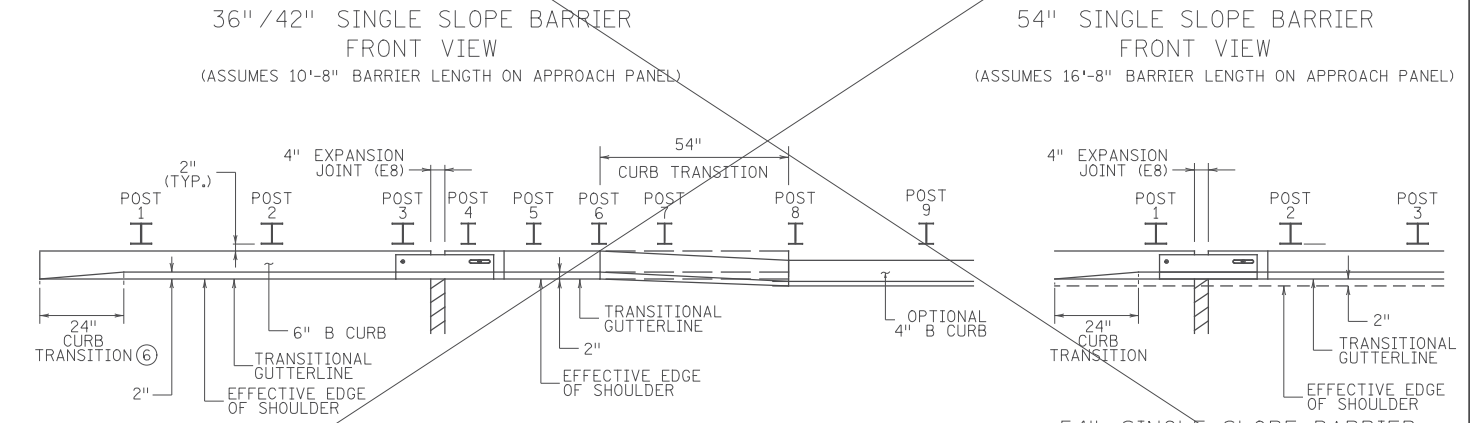
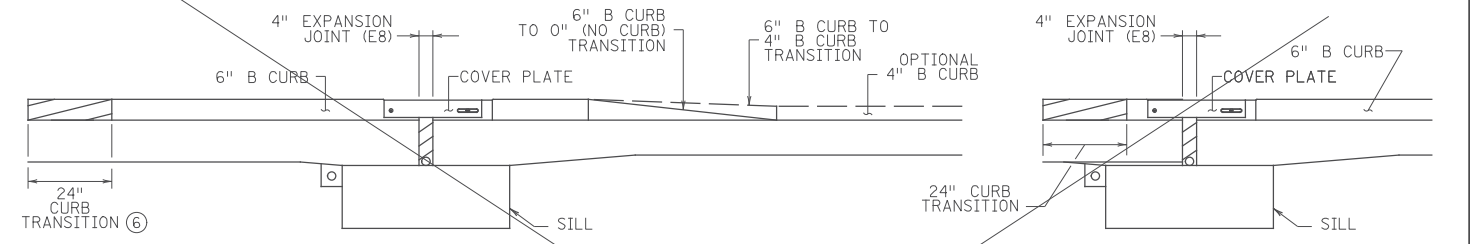
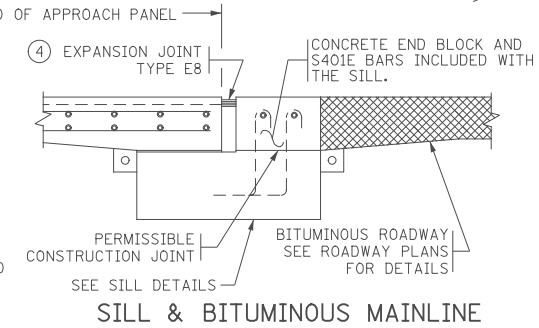
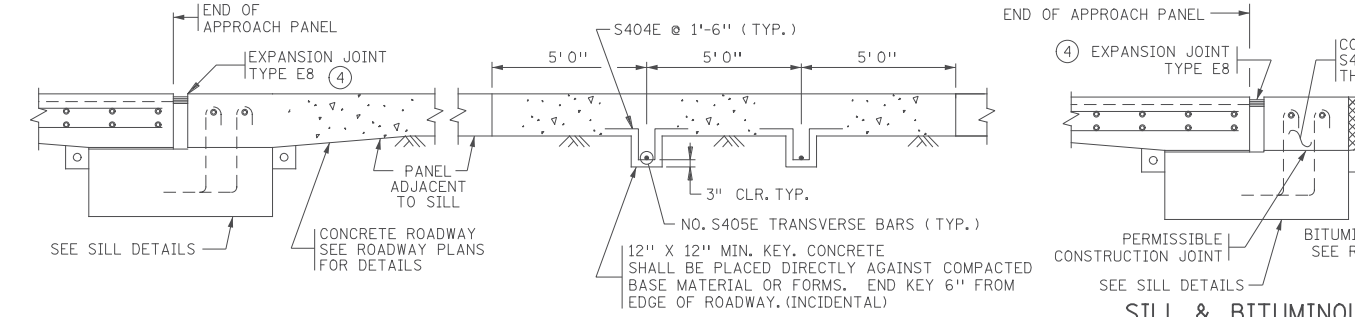
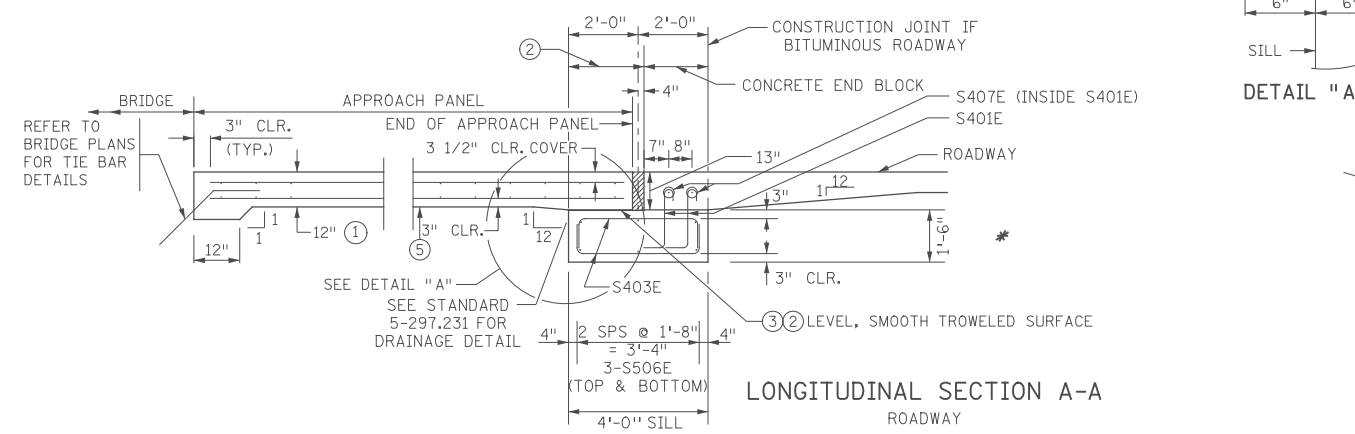
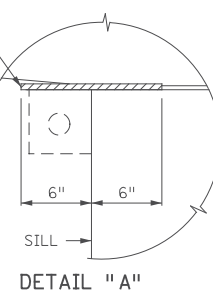
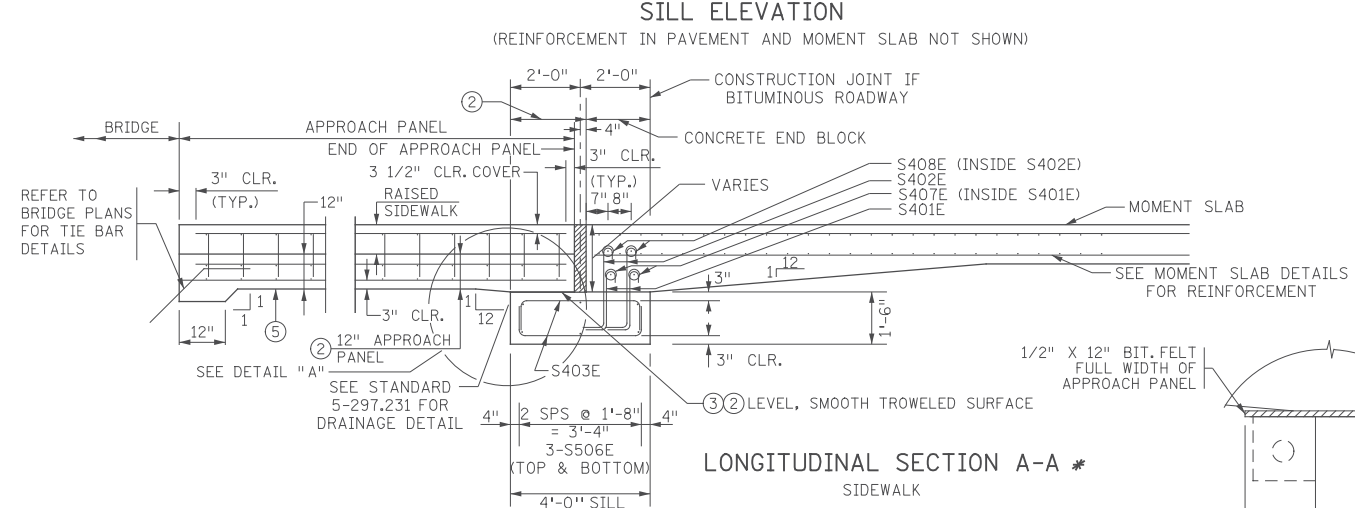


BILL OF REINFORCEMENT FOR CONCRETE SILL

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
S401E	3' 2"	[Symbol]	SILL VERTICAL
S402E	3' 10"	[Symbol]	SILL VERTICAL
S403E	5' 6"	[Symbol]	SILL TIE
S404E	4' 6"	[Symbol]	KEY TIE
S405E	' "	[Symbol]	KEY HORIZONTAL
S506E	' "	[Symbol]	SILL HORIZONTAL
S407E	' "	[Symbol]	END BLOCK HORIZONTAL
S408E	' "	[Symbol]	END BLOCK HORIZONTAL

* MINIMUM REINFORCEMENT LAP LENGTHS ARE AS FOLLOWS:
 NO. 4 BAR = 1'-11", NO. 5 BAR = 2'-5".



- NOTES:**
- USE EPOXY COATED GRADE 60 REINFORCEMENT PER SPEC 3301.
 - ENSURE THAT SILL DOES NOT INTERFERE WITH GUARDRAIL POST PLACEMENT.
 - 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 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).
 - ③ REQUIRED CONSTRUCTION JOINT.
 - ④ SEE STANDARD PLANS 5-297.222 & 5-297.224 FOR TYPE OF EXPANSION JOINT. DETAILS OF EXPANSION JOINT TYPE E8 ARE SHOWN ON STANDARD PLAN 5-297.223.
 - ⑤ 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.

STANDARD PLAN SHEET NO. 5-297.227 (2 OF 2) TITLE: BRIDGE APPROACH PANEL MISCELLANEOUS DETAILS (TYPE S CONCRETE BARRIER)

STANDARD APPROVED: AUGUST 22, 2016

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

* DENOTES MODIFICATIONS FROM STANDARD PLAN MODIFIED

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Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO. 002-678-023, 114-020-051

DRAWN BY S. VANG

DESIGNED BY M. HARDEGGER

CHECKED BY B. ROBECK

COMM. NO. 0169140



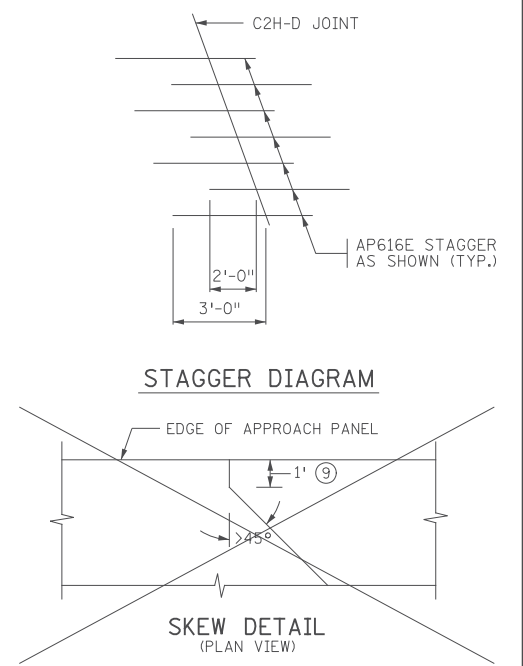
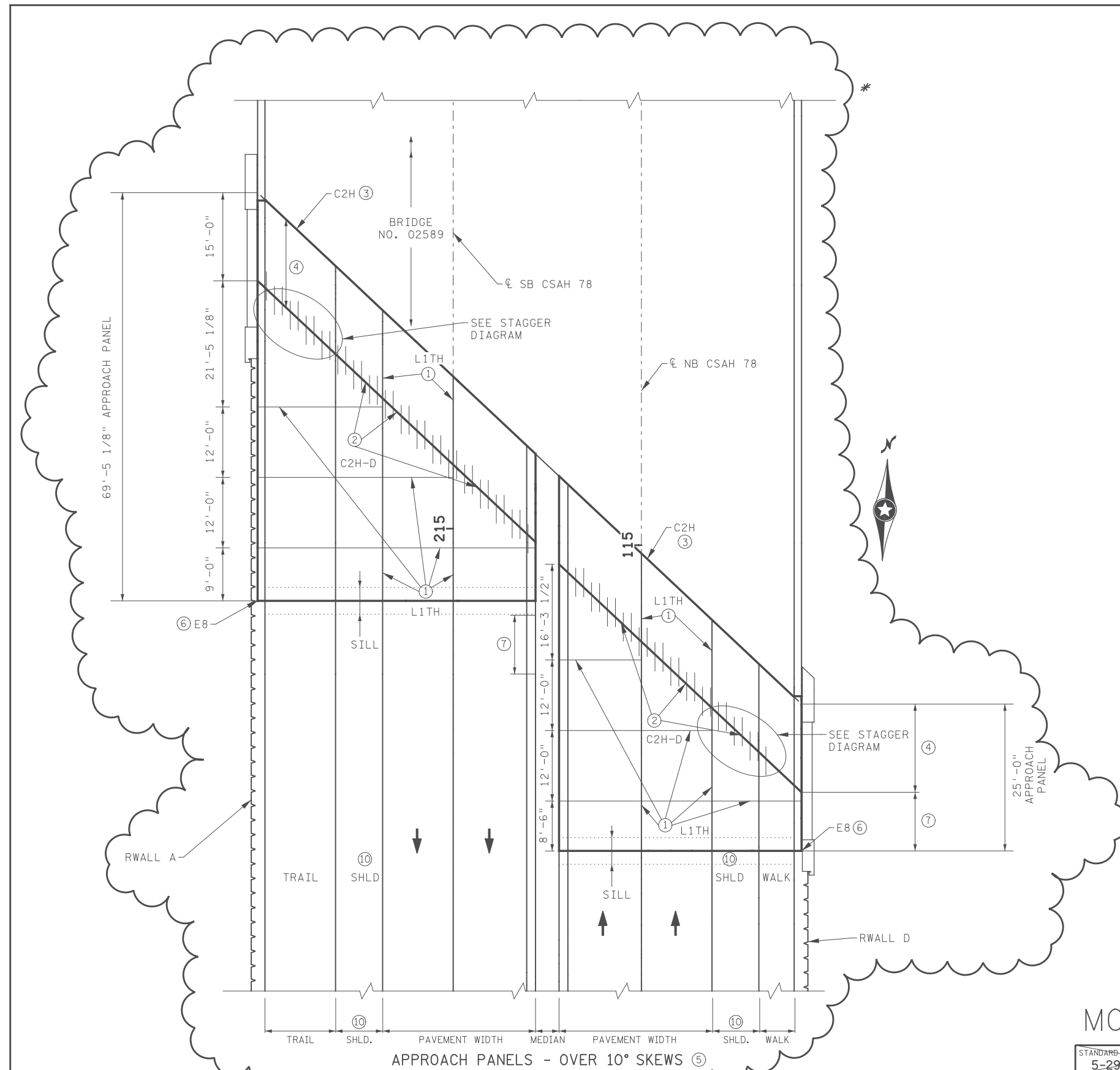
ANOKA COUNTY STANDARD PLAN SHEETS CSAH 78 - BNSF GRADE SEPARATION SHEET 37 OF 175

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NO	DATE	BY	CKD	APPR	REVISION

APPROACH PANEL JOINT LAYOUT NOTES:

- ① L1TH LONGITUDINAL JOINT, SEE STANDARD PLAN 5-297.229 FOR REINFORCEMENT LAP LENGTH REQUIREMENTS FOR STAGED CONSTRUCTION.
 - ② PERMISSIBLE CONSTRUCTION JOINT. USE JOINT TYPE C2H-D WITH AP616E BARS AT 12-INCH SPACING AT MID DEPTH OF THE 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" DIMENSIONS AS SHOWN ON THE PLAN. THE C2H-D JOINT AND AP616E BARS ARE REQUIRED ON ALL PANELS WITH A SKEW OVER 10 DEGREES.
 - ③ C2H CONTRACTION JOINT.
 - ④ MAXIMUM PANEL LENGTH MEASURED ALONG CENTERLINE OF 20'-0" FOR UP TO 40° SKEWS, 15'-0" FOR SKEWS OVER 40°.
 - ⑤ ALL JOINTS SHALL BE SAWCUT. SAWCUTS SHALL BE MADE WHILE THE CONCRETE IS STILL GREEN. WHEN A CONCRETE WEARING COURSE IS SPECIFIED, THE JOINTS SHALL BE SAWN THROUGH BOTH THE WEARING COURSE AND THE UNDERLYING APPROACH SLAB IN A SINGLE OPERATION.
 - ⑥ E8 JOINT REQUIRED IN CURB ADJACENT TO E8 JOINT. E8 QUANTITY SHALL BE PAID FOR SEPARATELY, MEASURED FROM BACK OF CURB TO BACK OF CURB.
- * MEDIAN CURB TO BACK FACE OF CONCRETE BARRIER.
- ⑦ 10'-0" MINIMUM.
 - * ⑧ SEE STANDARD PLANS 5-297.229 OR 5-297.231 FOR JOINT DETAIL FOR CONCRETE BARRIER ON WINGWALL.
 - * ⑨ WHEN SKEW IS OVER 45°, THE JOINT SHALL BE PERPENDICULAR TO GUTTER FOR 1' (TYP.).
 - ⑩ SEE GRADING PLAN FOR PAVEMENT AND SHOULDER WIDTHS AND CONFIGURATION.



MODIFIED

STANDARD PLAN SHEET NO. 5-297-228 (2 OF 2)	TITLE: BRIDGE NO. 02589 (SOUTH ABUTMENT) BRIDGE APPROACH PANEL JOINT LAYOUT (TYPE S CONCRETE BARRIER)
STANDARD APPROVED: AUGUST 22, 2016	STATE PROJ. NO. (TH) SHEET NO. OF SHEETS

* DENOTES MODIFICATIONS FROM STANDARD PLAN

CERTIFIED BY: _____
 LICENSED PROFESSIONAL ENGINEER DATE: _____
 PRINTED NAME: _____ LIC. NO.: _____

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 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License # 53680

STATE AID PROJECT NO. 002-678-023, 114-020-051
 DRAWN BY S. VANG
 DESIGNED BY M. HARDEGGER
 CHECKED BY B. ROBECK
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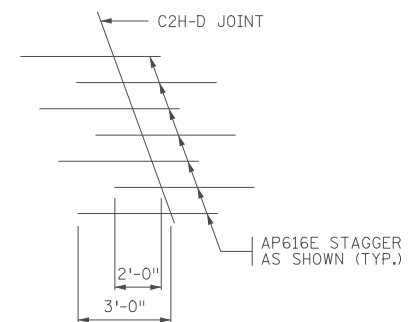
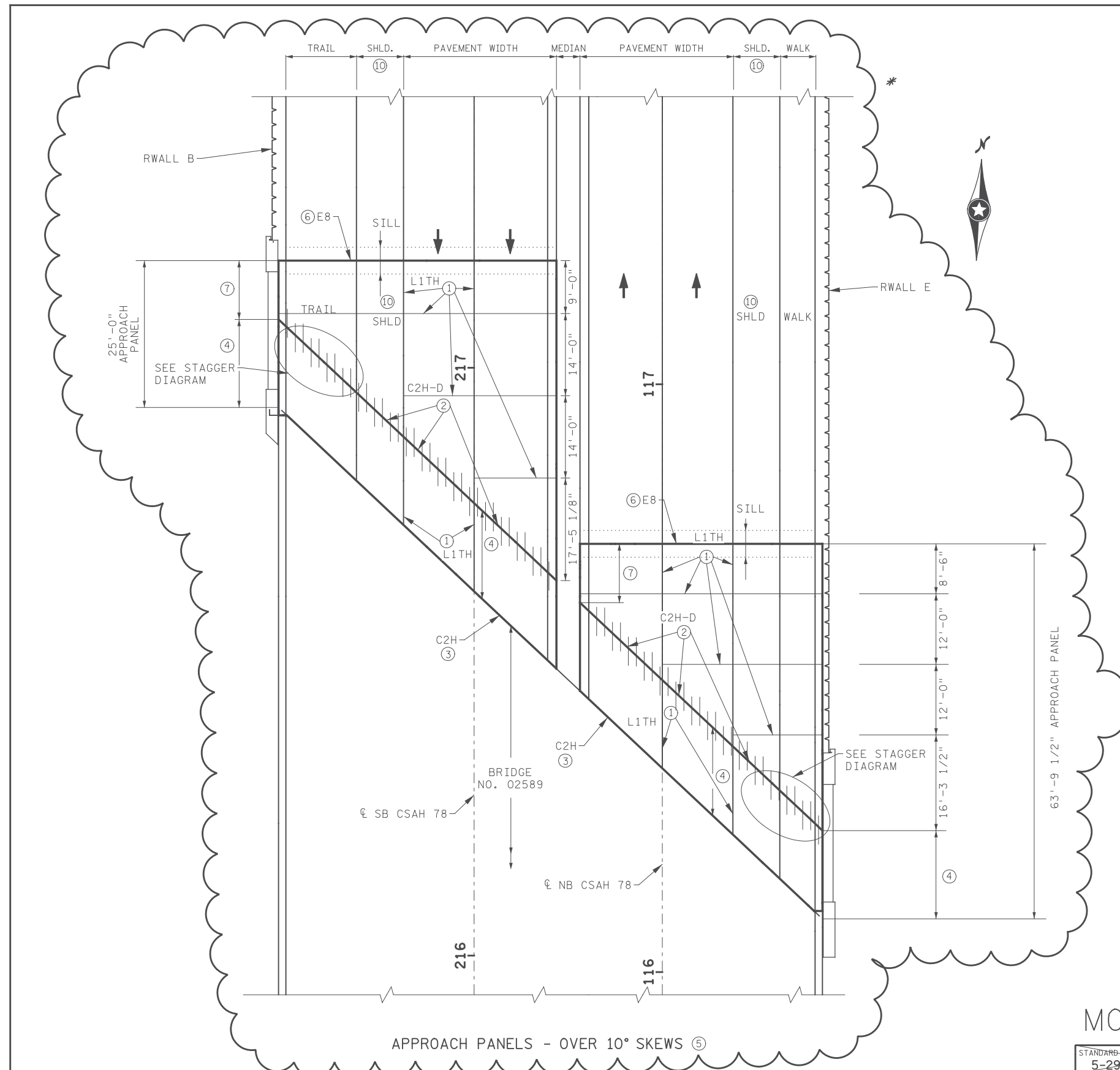
ANOKA COUNTY
 STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION
 SHEET 38 OF 175

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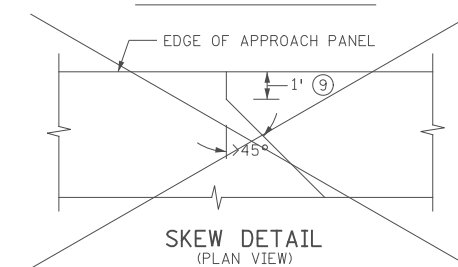
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- ② PERMISSIBLE CONSTRUCTION JOINT. USE JOINT TYPE C2H-D WITH AP616E BARS AT 12-INCH SPACING AT MID DEPTH OF THE SLAB, PARALLEL TO THE CENTERLINE OF THE ROADWAY. AP616E BARS ARE 5'-0" LONG. PLACE THE BAR WITH 2'-0" ON ONE SIDE OF THE JOINT AND 3'-0" ON THE OPPOSITE SIDE OF THE JOINT. ALTERNATE THE 2'-0" AND 3'-0" DIMENSIONS AS SHOWN ON THE PLAN. THE C2H-D JOINT AND AP616E BARS ARE REQUIRED ON ALL PANELS WITH A SKEW OVER 10 DEGREES.
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STAGGER DIAGRAM



APPROACH PANELS - OVER 10° SKEWS ⑤

MODIFIED

BRIDGE NO. 02589 (NORTH ABUTMENT)

STANDARD PLAN SHEET NO. 5-297.228 (2 OF 2)

TITLE:

BRIDGE APPROACH PANEL JOINT LAYOUT (TYPE S CONCRETE BARRIER)

STANDARD APPROVED: AUGUST 22, 2016

STATE PROJ. NO.

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ENGINEERS PLANNERS DESIGNERS

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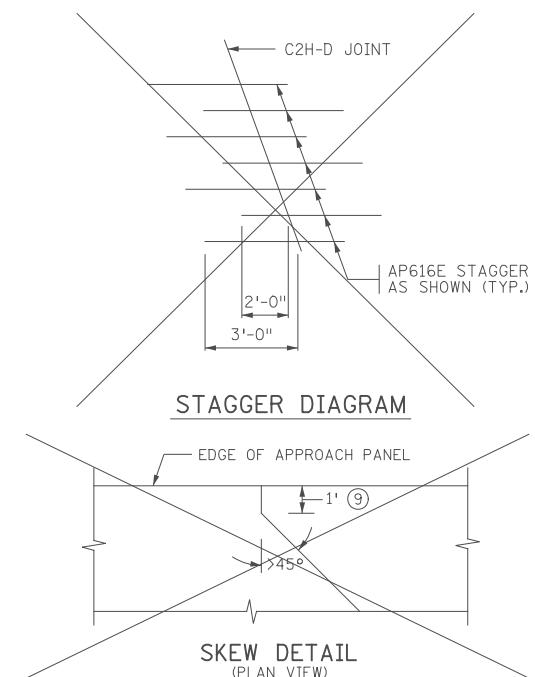
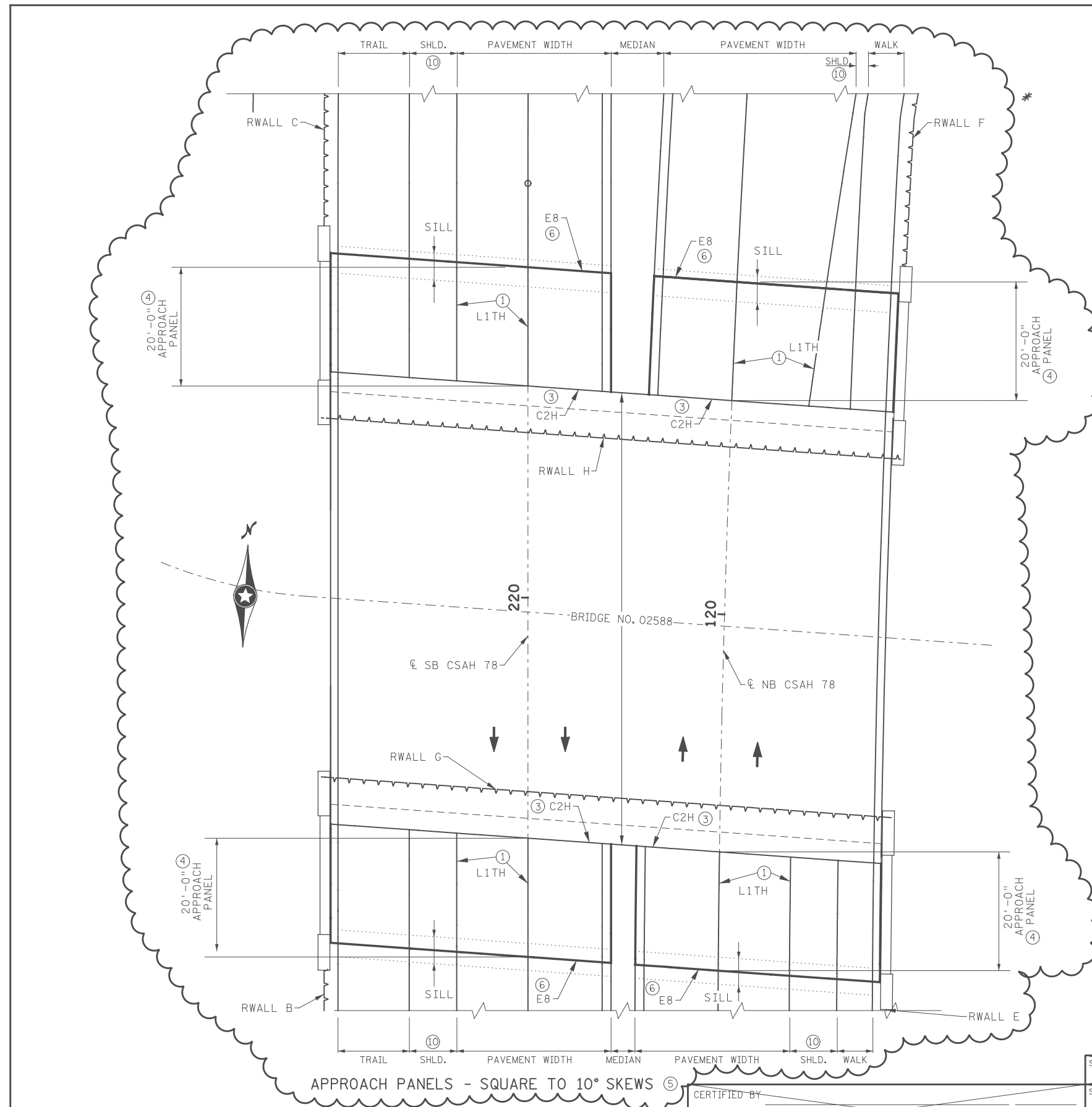
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APPROACH PANEL JOINT LAYOUT NOTES:

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 - * ⑨ WHEN SKEW IS OVER 45°, THE JOINT SHALL BE PERPENDICULAR TO GUTTER FOR 1'(TYP).
 - ⑩ SEE GRADING PLAN FOR PAVEMENT AND SHOULDER WIDTHS AND CONFIGURATION.



MODIFIED

BRIDGE NO. 02588

STANDARD PLAN SHEET NO. 5-297-228 (2 OF 2)

TITLE:

BRIDGE APPROACH PANEL JOINT LAYOUT (TYPE S CONCRETE BARRIER)

STANDARD APPROVED: AUGUST 22, 2016

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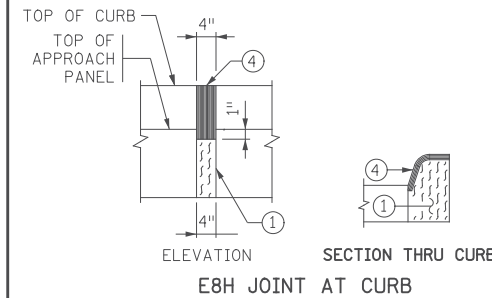
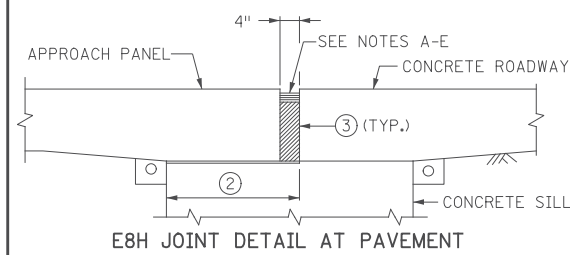
ENGINEERS PLANNERS DESIGNERS

ANOKA COUNTY
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 CSAH 78 - BNSF GRADE SEPARATION

SHEET 40 OF 175

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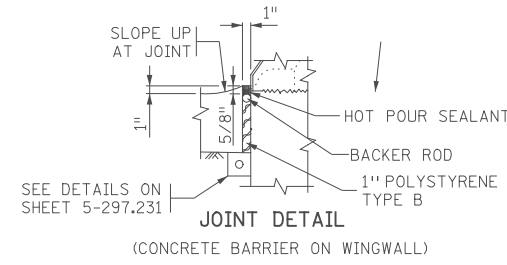
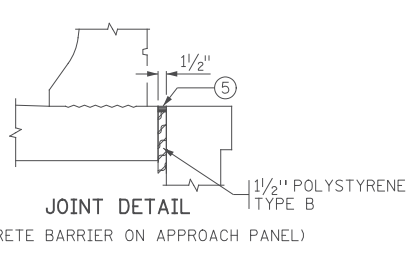
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EXPANSION JOINT NOTES:

- 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



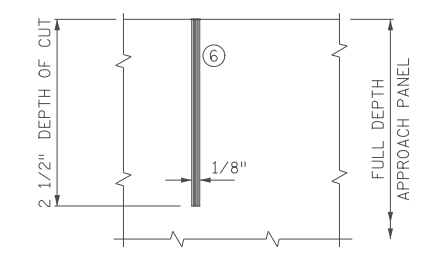
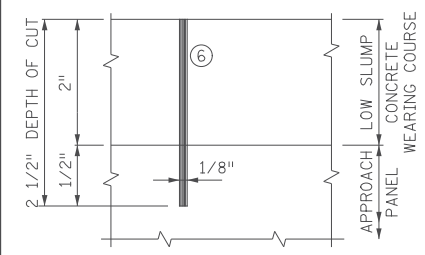
E8H PRESSURE RELIEF JOINT MATERIAL INSTALLATION INSTRUCTIONS:

- 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.

JOINT NOTES:

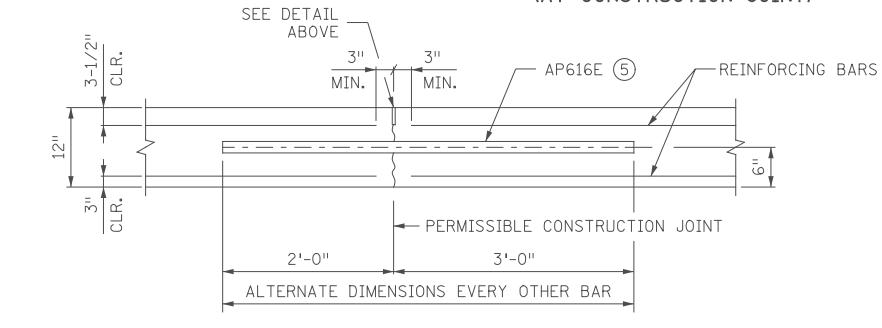
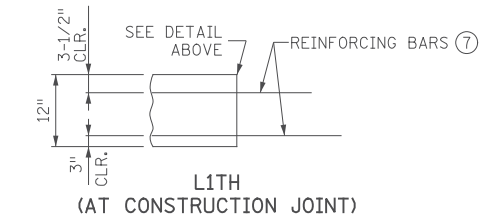
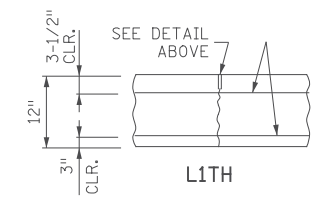
- ⑤ PERMISSIBLE CONSTRUCTION JOINT. AP616E BARS AT 12-INCH SPACING AT MID DEPTH OF SLAB, PARALLEL TO THE CENTERLINE OF THE ROADWAY. AP616E BARS ARE 5'-0" LONG. PLACE THE BAR WITH 2'-0" ON ONE SIDE OF THE JOINT AND 3'-0" ON THE OPPOSITE SIDE OF THE JOINT. ALTERNATE THE 2'-0" AND 3'-0" DIMENSION AS SHOWN 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.

JOINT DETAILS



C2H & L1TH WITH CONCRETE WEARING COURSE ⑥ (SAWED & SEALED PER SPEC. 3725)

C2H & L1TH WITHOUT CONCRETE WEARING COURSE ⑥ (SAWED & SEALED PER SPEC. 3725)



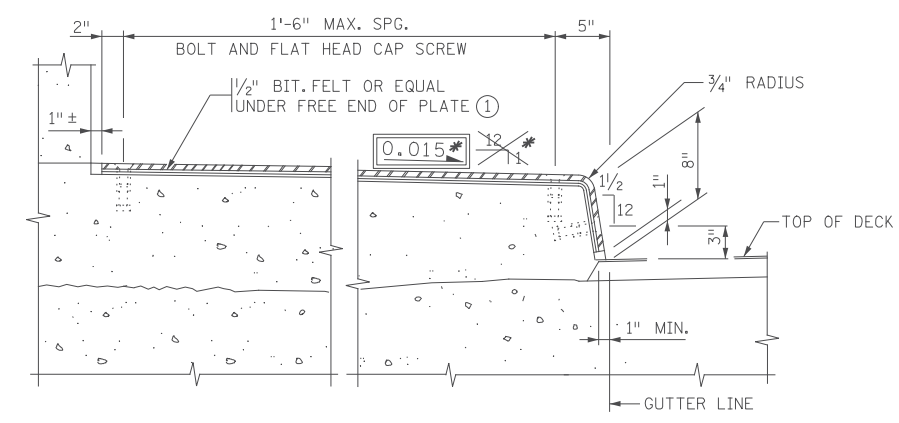
SECTION AT C2H-D JOINT ⑤

SIDEWALK COVER PLATE

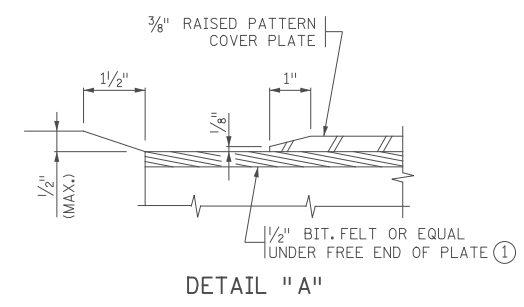
GENERAL NOTES:

- 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.

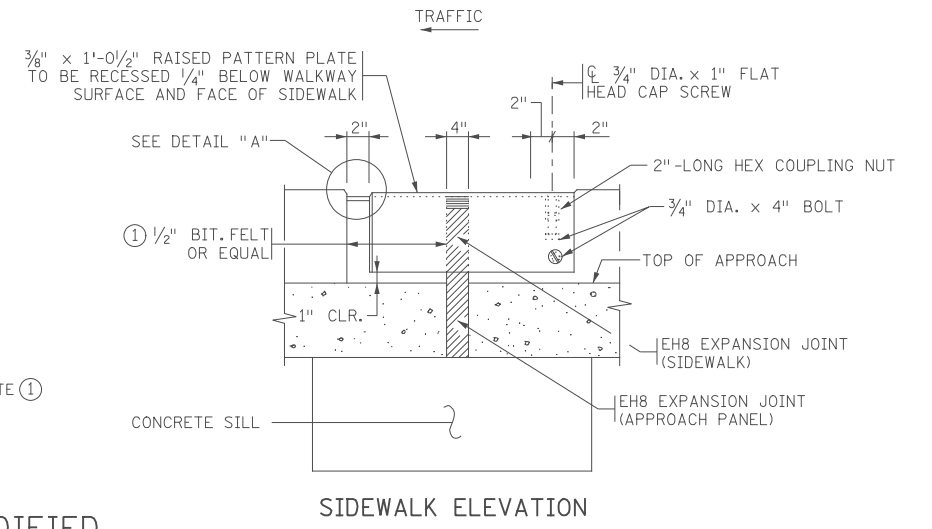
- ① USE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OR SCRAPS SECURED TOGETHER IS PROHIBITED.



SECTION THROUGH SIDEWALK



DETAIL "A"



SIDEWALK ELEVATION

MODIFIED

* DENOTES MODIFICATIONS FROM STANDARD PLAN

STANDARD PLAN SHEET NO. 5-297.229	TITLE: BRIDGE APPROACH PANEL JOINT DETAILS
STANDARD APPROVED: DECEMBER 20, 2011	

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

SRH ENGINEERS PLANNERS DESIGNERS
Consulting Group, Inc.

ANOKA COUNTY
STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION

SHEET 41 OF 175

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Ben Robeck
Date: 6/13/2017 License #: 53680

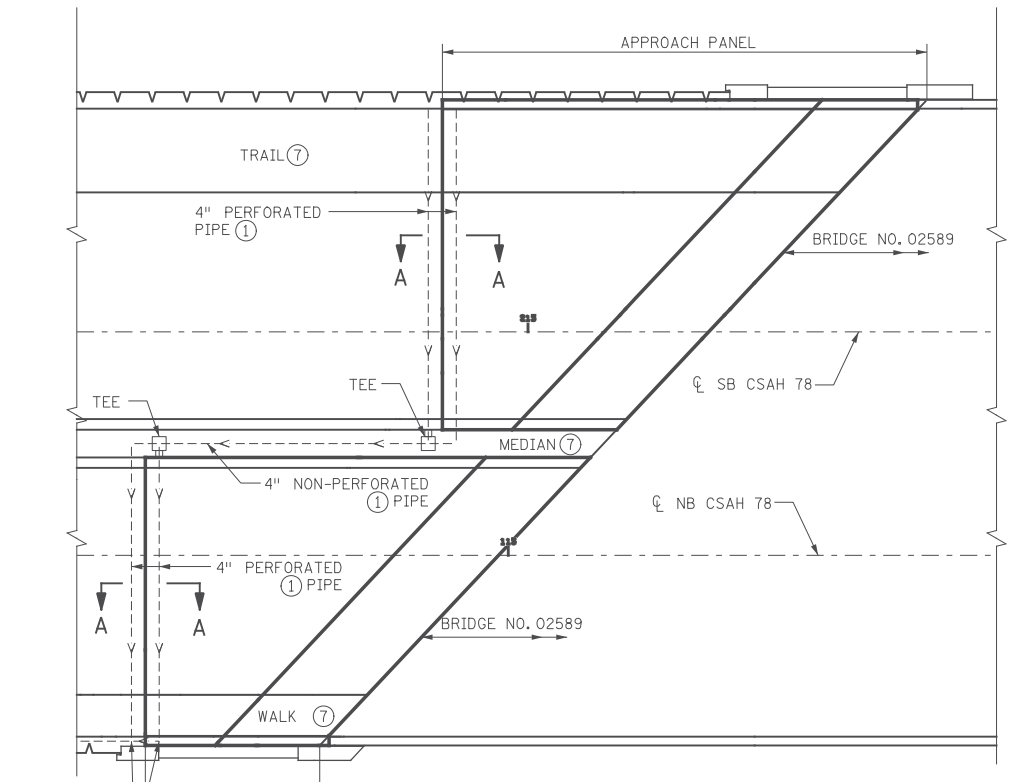
STATE AID PROJECT NO. 002-678-023, 114-020-051

DRAWN BY S. VANG
DESIGNED BY M. HARDEGGER
CHECKED BY B. ROBECK
COMM. NO. 0169140

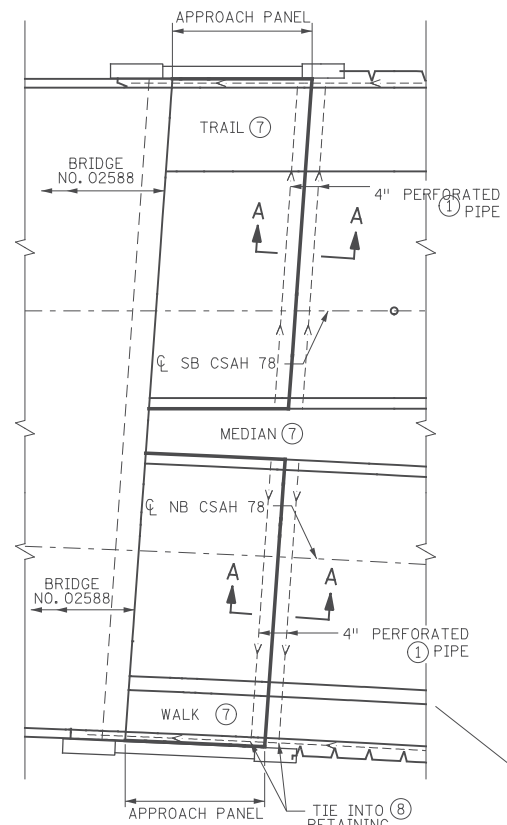
REVISION DATE 3-22-2013

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NO	DATE	BY	CKD	APPR	REVISION

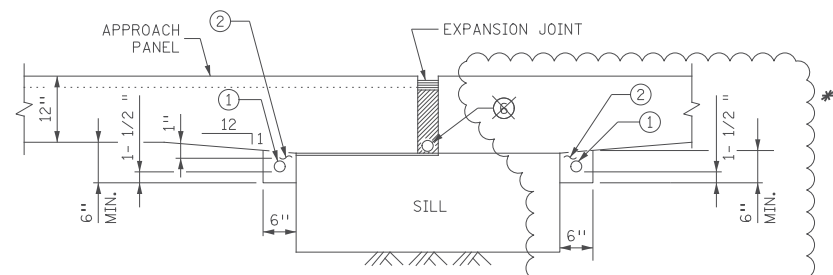


⑧ TIE INTO RETAINING WALL DRAINAGE SYSTEM, SEE RETAINING WALL PLANS

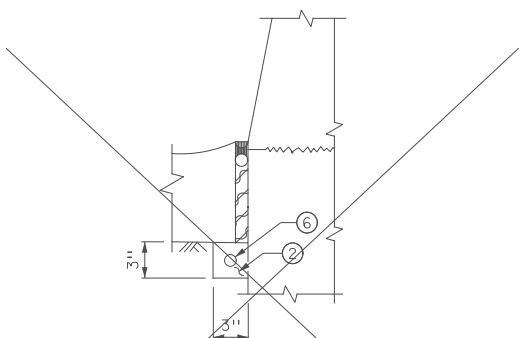


TIE INTO ⑧ RETAINING WALL DRAINAGE SYSTEM, SEE RETAINING WALL PLANS

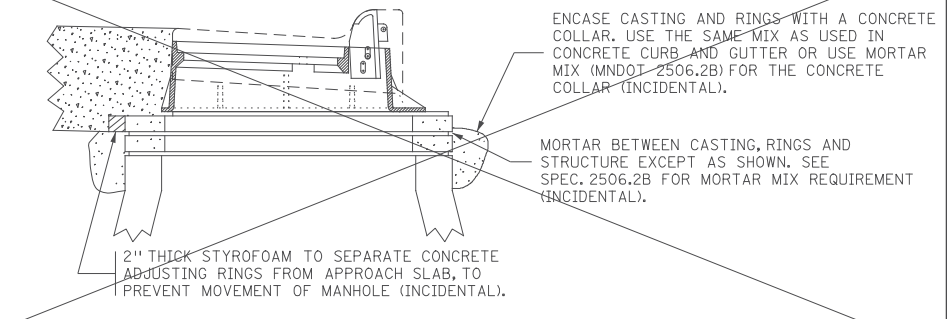
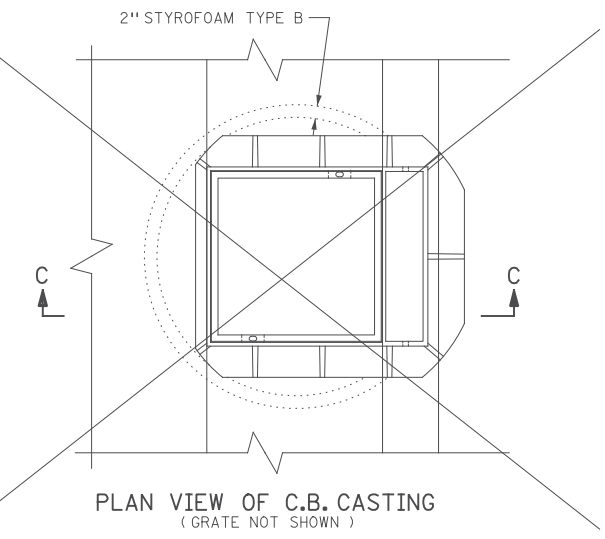
- NOTES:
- ① 4-INCH NOMINAL DIAMETER THERMOPLASTIC PIPE, AS PER ASTM D1785M, SCHEDULE 40, SLOPE PIPE TO DITCH. WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER SPEC. 3733. 1/8 INCH PER 12 INCH MINIMUM SLOPE. FURNISHING AND INSTALLING THE DRAIN SYSTEM IS INCIDENTAL.
 - ② BACKFILL WITH FINE AGGREGATE (MNDOT 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.
 - ⑧ TEE AND VERTICAL 4" NON-PERFORATED PIPE REQUIRED AT CONNECTION TO RETAINING WALL DRAINAGE SYSTEM



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

MODIFIED

STANDARD PLAN SHEET NO. 5-297-231 (2 OF 2)	TITLE: BRIDGE APPROACH PANEL DRAINAGE DETAILS (TYPE S CONCRETE BARRIER)
STANDARD APPROVED: AUGUST 22, 2016	
STATE PROJ. NO. (TH)	SHEET NO. OF SHEETS

* DENOTES MODIFICATIONS FROM STANDARD PLAN

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Ben Robeck
Date 6/13/2017 License # 53680

STATE AID PROJECT NO 002-678-023, 114-020-051
DRAWN BY S. VANG
DESIGNED BY M. HARDEGGER
CHECKED BY B. ROBECK
COMM. NO. 0169140

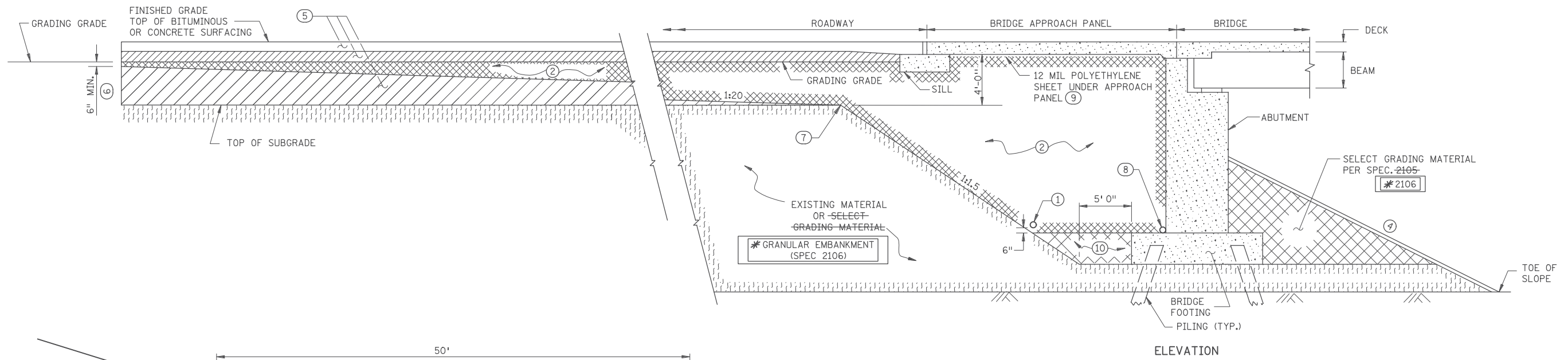
SRF ENGINEERS PLANNERS DESIGNERS
Consulting Group, Inc.

ANOKA COUNTY
STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION

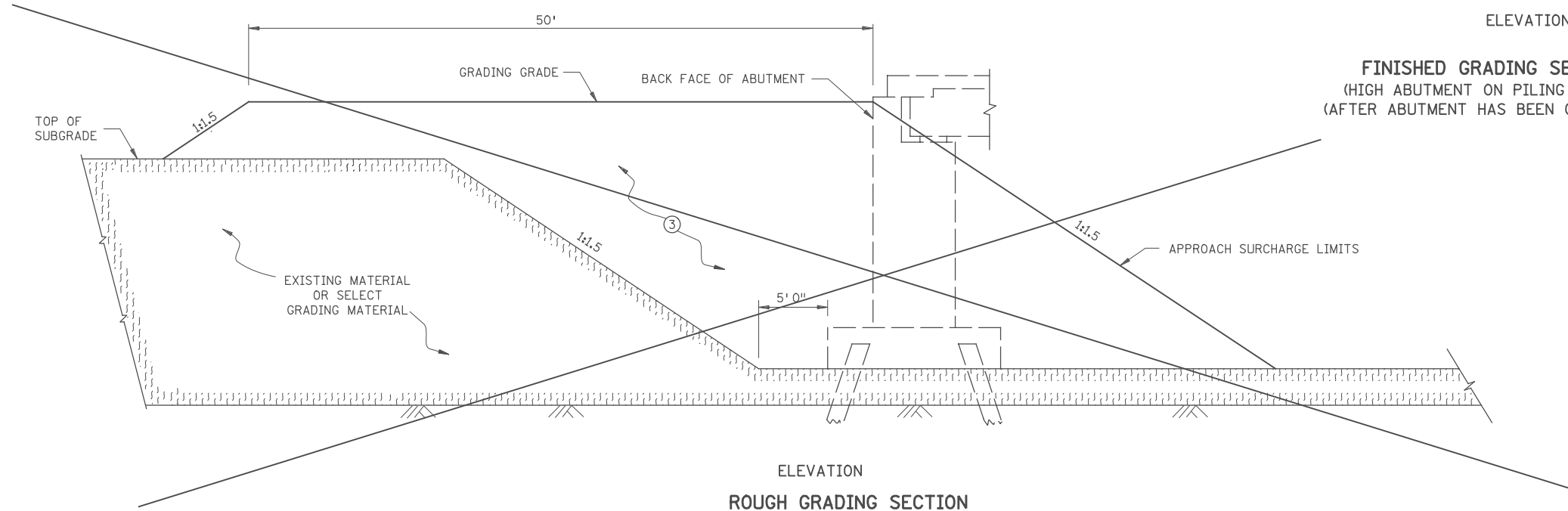
SHEET 42 OF 175

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NO	DATE	BY	CKD	APPR	REVISION



FINISHED GRADING SECTION
(HIGH ABUTMENT ON PILING SHOWN)
(AFTER ABUTMENT HAS BEEN CONSTRUCTED)



ROUGH GRADING SECTION
(PRIOR TO ABUTMENT CONSTRUCTION)

NOTES:

- ① SUBSURFACE PIPE DRAIN. SEE GRADING PLAN FOR DETAILS. FURNISH AND INSTALL IF SHOWN IN GRADING PLAN.
- ② QUANTITY OF SELECT GRANULAR MATERIAL MODIFIED 10% (SPEC. 3149.2B4) IS BASED ON DIMENSIONS SHOWN, AND PAYMENT IS BASED ON THIS QUANTITY. SEE GRADING PLAN FOR QUANTITY. IF THE CONTRACTOR CHOOSES TO INCREASE DIMENSIONS IN ORDER TO FACILITATE CONSTRUCTION OPERATIONS, ANY QUANTITY INCREASES SHALL BE CONSIDERED INCIDENTAL.
- * ③ PLACE ABUTMENT APPROACH SURCHARGE MATERIAL PRIOR TO ABUTMENT CONSTRUCTION. AFTER COMPLETION OF SURCHARGE WAITING PERIOD, REMOVE SURCHARGE AND EXISTING MATERIAL OR SELECT GRADING MATERIAL TO THE LIMITS SHOWN IN "ROUGH GRADING SECTION" ABOVE, PRIOR TO ABUTMENT CONSTRUCTION. SEE BRIDGE PLANS AND SPECIAL PROVISIONS FOR ABUTMENT APPROACH SURCHARGE REQUIREMENT AND PAYMENTS.
- ④ SEE BRIDGE PLANS FOR SLOPE AND SLOPE PROTECTION.
- ⑤ SEE GRADING PLANS FOR TYPE OF MATERIAL.
- ⑥ GRADING TO BE SQUARED OFF ON SKEWED BRIDGES.
- ⑦ TOP OF 1:1.5 SLOPE (FORMS A LINE PARALLEL TO END OF BRIDGE).
- ⑧ SUBSURFACE PIPE DRAIN. FURNISH AND INSTALL AT TOP OF BRIDGE FOOTING IF BRIDGE DETAIL B910 IS INCLUDED ON BRIDGE PLAN.
- ⑨ IF THE APPROACH PANEL IS TIED TO THE ABUTMENT WITH REINFORCEMENT BARS, PLACE 12 MIL POLYETHYLENE SHEETING (OR TWO LAYERS OF 6 MIL) UNDER THE LIMITS OF THE APPROACH PANEL TO ALLOW THE PANEL TO MOVE LONGITUDINALLY ON THE GRADE. SHEETING IS INCIDENTAL.
- ⑩ SELECT GRADING MATERIAL (SPEC. 2105) SHALL BE COMPACTED AND MEET THE MOISTURE REQUIREMENTS OF 2105, SELECT GRANULAR MATERIAL MODIFIED 10% (SPEC. 3149.2B4) MAY BE USED IN LIEU OF SELECT GRADING MATERIAL AS PER SPEC. 2105.

REVISION:
APPROVED: 7-15-2014
Ben Robeck
DIRECTOR, OFFICE OF MATERIALS AND ROAD RESEARCH

* DENOTES MODIFICATIONS FROM STANDARD PLAN

MINNESOTA
DEPARTMENT OF TRANSPORTATION
STATE DESIGN ENGINEER
APPROVED: 7-15-2014
Christopher

BRIDGE ABUTMENT APPROACH TREATMENT FOR ABUTMENT ON FOOTING
STANDARD PLAN 5-297.233 1 OF 2

NO	DATE	BY	CKD	APPR	REVISION
1	1/12/2018	BR	CT	BR	ADDENDUM 3 - REMOVED REFERENCE TO STRUCTURE EXCAVATION CLASS U IN NOTE 2

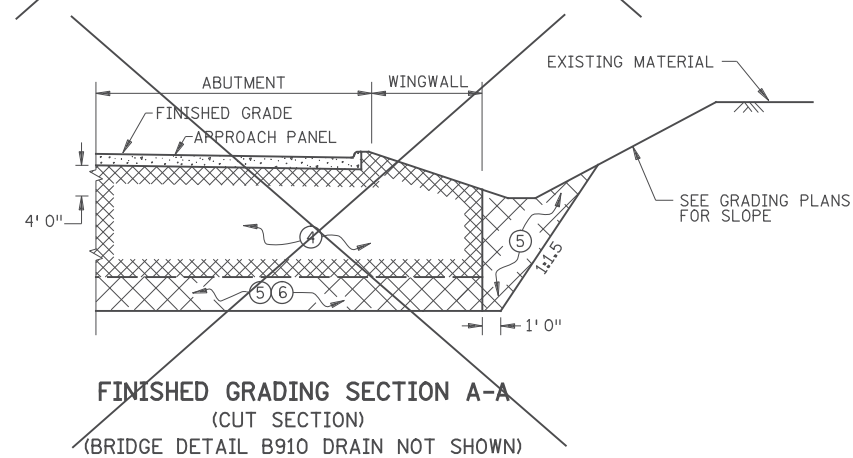
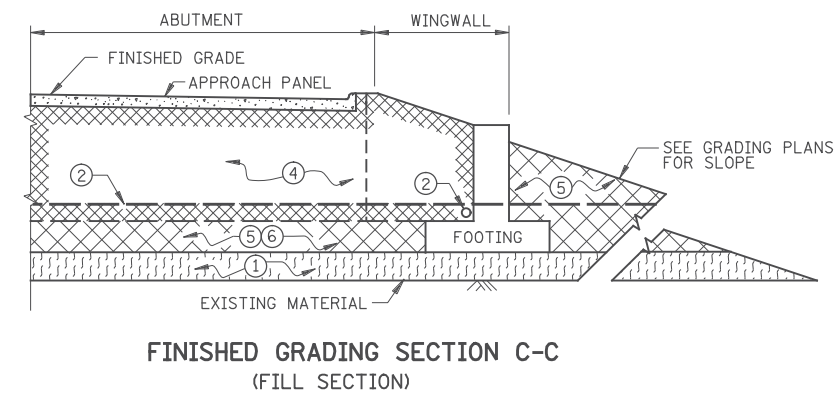
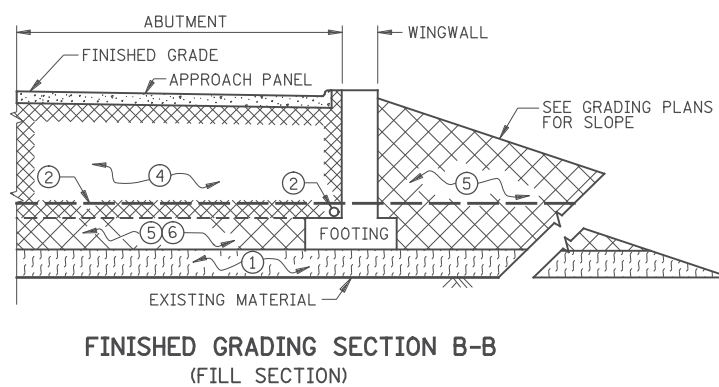
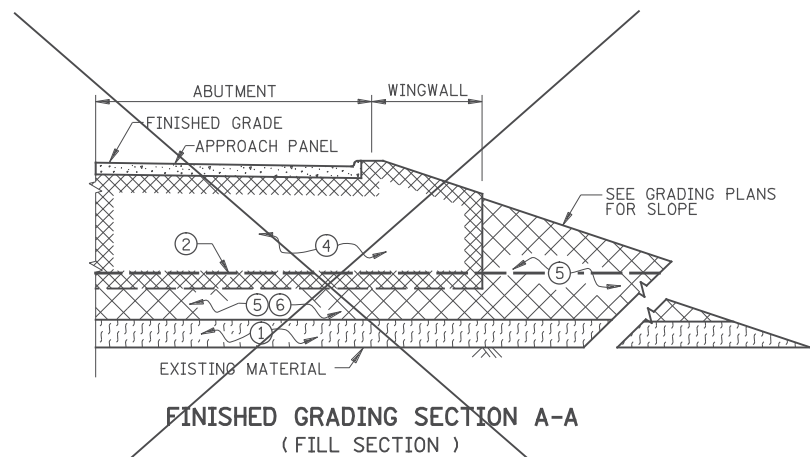
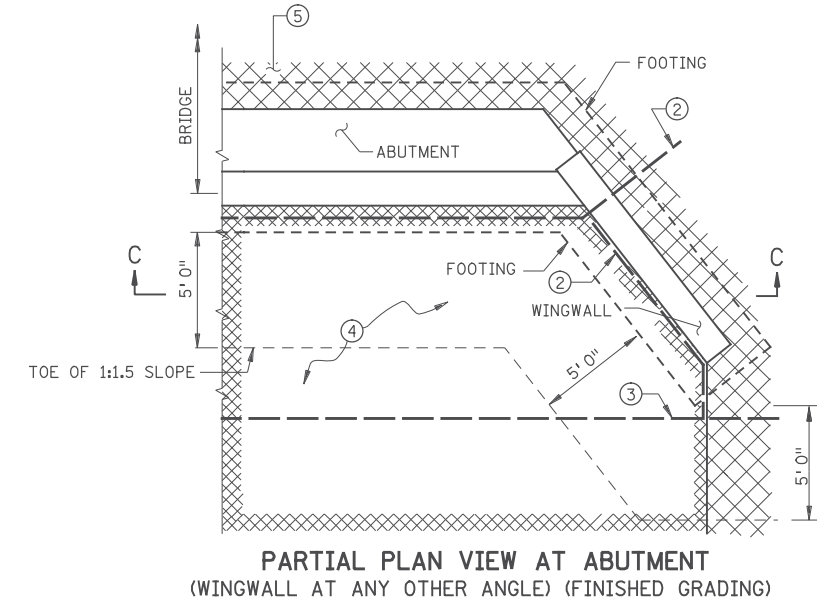
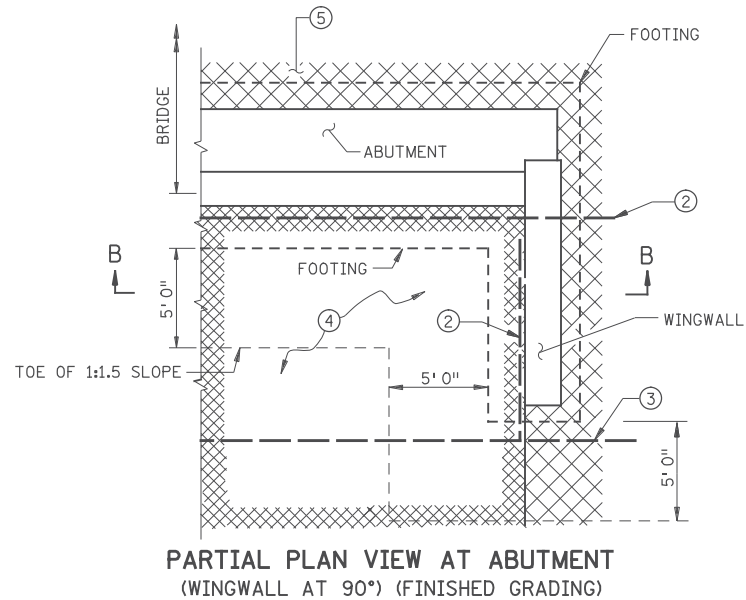
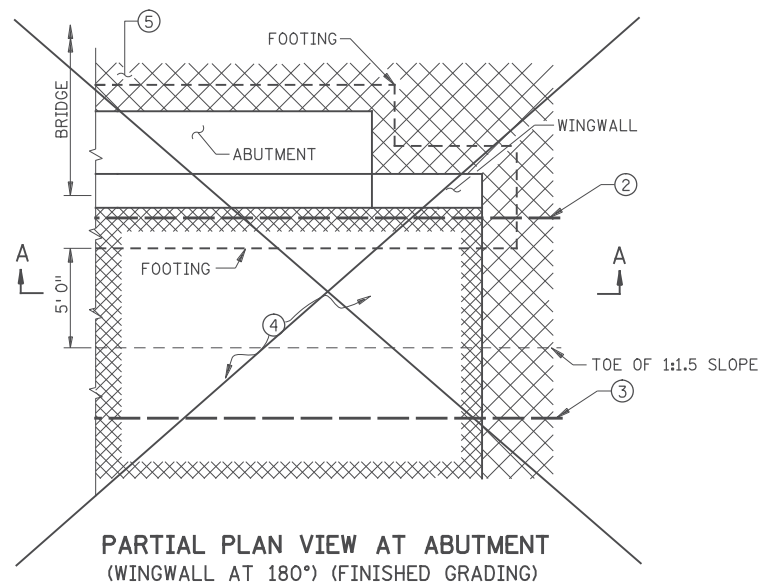
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Ben Robeck
Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051
DRAWN BY S. VANG
DESIGNED BY T. SMITH
CHECKED BY B. ROBECK
COMM. NO. 0169140



ANOKA COUNTY
STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION
SHEET 43R OF 175

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NOTES:

- ① EXISTING MATERIAL OR ~~SELECT GRADING MATERIAL (SPEC. 2105).~~ **GRANULAR EMBANKMENT (SPEC. 2106)**
- ② SUBSURFACE PIPE DRAIN, FURNISH AND INSTALL AT TOP OF BRIDGE FOOTING IF BRIDGE DETAIL B910 IS INCLUDED ON BRIDGE PLAN.
- ③ SUBSURFACE PIPE DRAIN. SEE GRADING PLAN FOR DETAILS. FURNISH AND INSTALL IF SHOWN IN GRADING PLAN. **STRUCTURAL BACKFILL (SPEC. 3149.2D.2)**
- ④ QUANTITY OF ~~SELECT GRANULAR MATERIAL MODIFIED 10% (SPEC. 3149.2B4)~~ IS BASED ON DIMENSIONS SHOWN, AND PAYMENT IS BASED ON THIS QUANTITY. SEE GRADING PLAN FOR QUANTITY. IF THE CONTRACTOR CHOOSES TO INCREASE DIMENSIONS IN ORDER TO FACILITATE CONSTRUCTION OPERATIONS, ANY QUANTITY INCREASES SHALL BE CONSIDERED INCIDENTAL.
- GRANULAR EMBANKMENT (SPEC. 2106)**
- ⑤ ~~SELECT GRADING MATERIAL (SPEC. 2105).~~ **GRANULAR EMBANKMENT (SPEC. 2106)**
- ⑥ MATERIAL SHALL MEET THE COMPACTION AND MOISTURE CONTENT REQUIREMENTS OF SPEC. 2105. ~~SELECT GRANULAR MATERIAL MODIFIED 10% (SPEC. 3149.2B4) MAY BE USED IN LIEU OF SELECT GRADING MATERIAL (SPEC. 2105).~~ **GRANULAR EMBANKMENT (SPEC. 2106)**

REVISION:
 APPROVED: 7-15-2014
 [Signature]
 DIRECTOR, OFFICE OF MATERIALS AND ROAD RESEARCH

* DENOTES MODIFICATIONS FROM STANDARD PLAN

MODIFIED
 DEPARTMENT OF TRANSPORTATION
 STATE DESIGN ENGINEER
 [Signature]
 APPROVED: 7-15-2014

BRIDGE ABUTMENT APPROACH TREATMENT FOR ABUTMENT ON FOOTING
 STANDARD PLAN 5-297.233 2 OF 2

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
 [Signature]
 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
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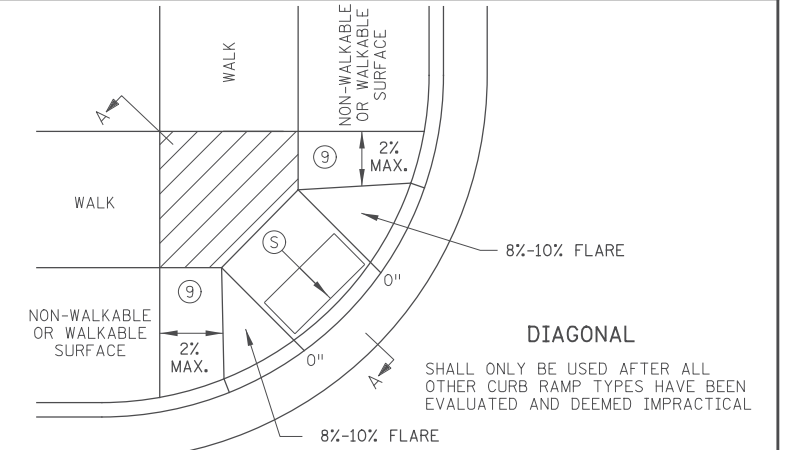
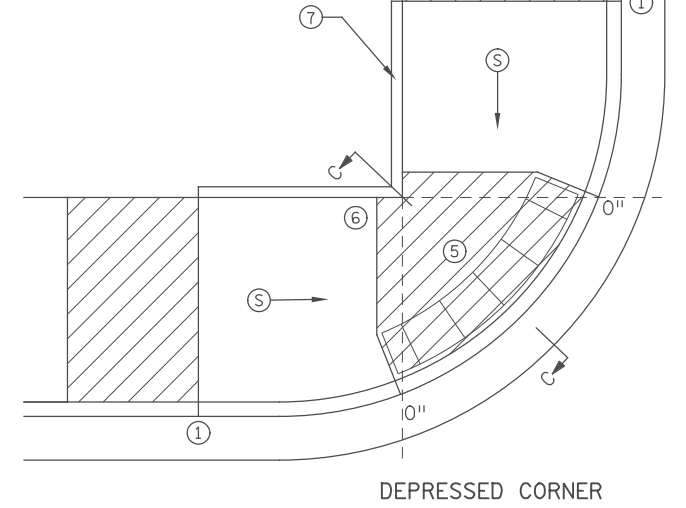
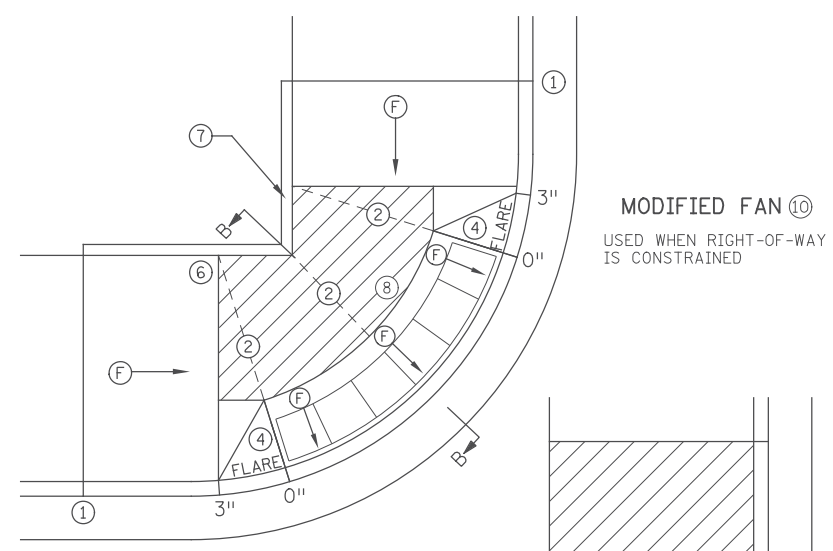
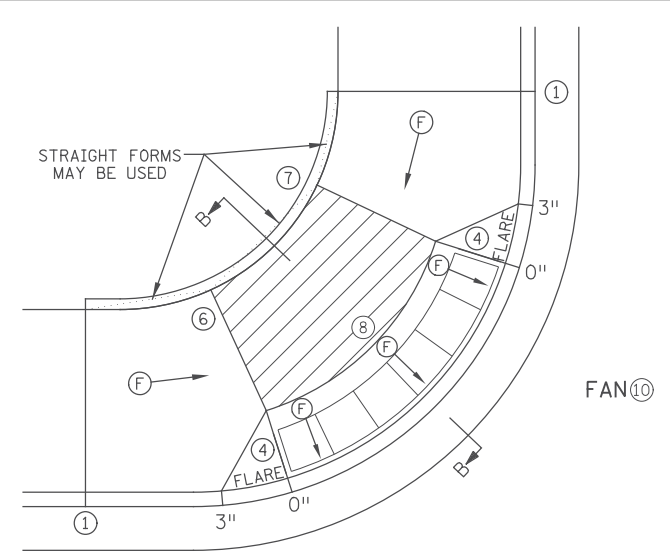
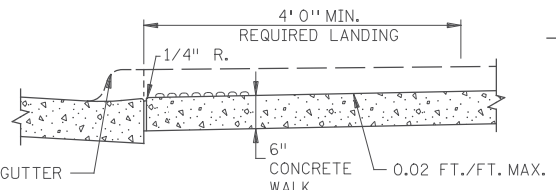
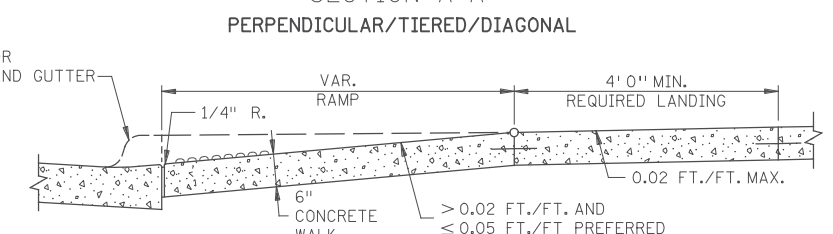
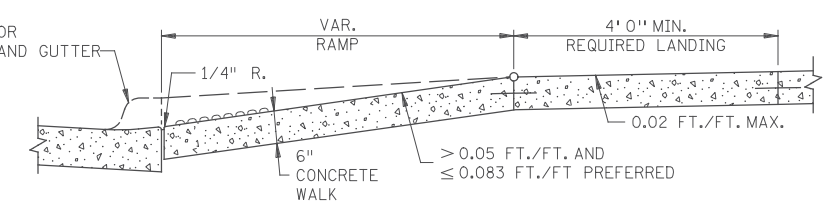
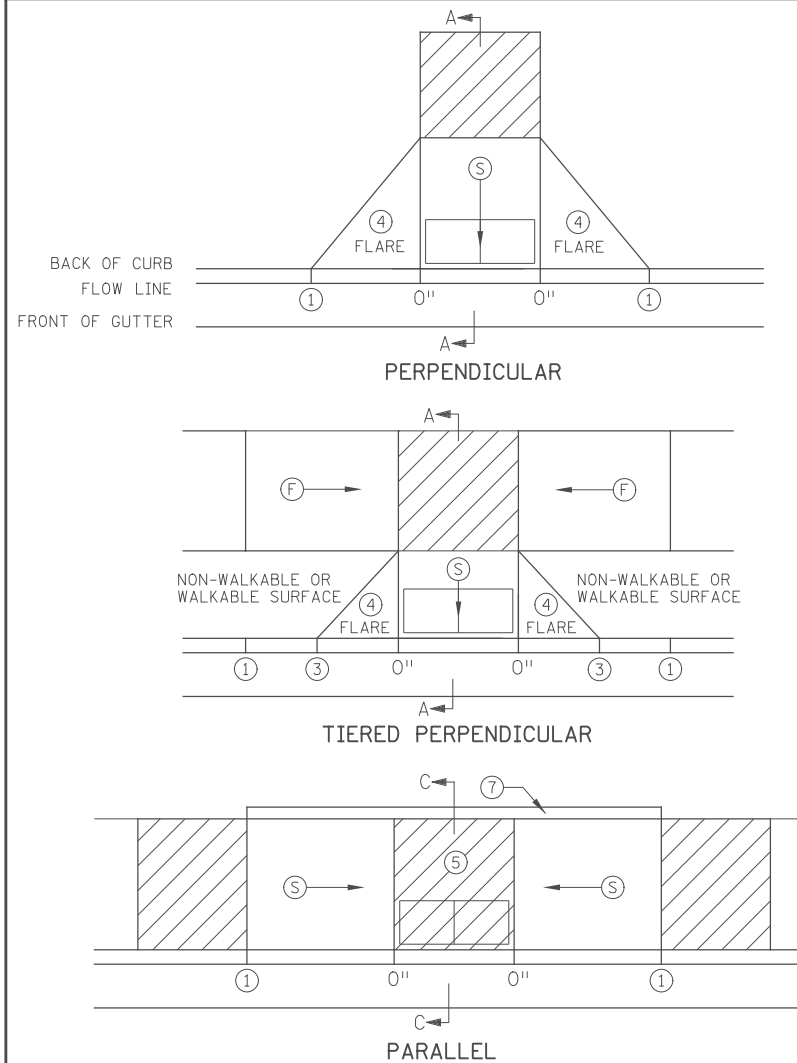


ENGINEERS PLANNERS DESIGNERS

ANOKA COUNTY
 STANDARD PLAN SHEETS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 44 OF 175

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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

REVISION:

APPROVED: JANUARY 23, 2017

OPERATIONS ENGINEER

REVISOR:

APPROVED: 1-23-2017

STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250

1 OF 6

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NO	DATE	BY	CKD	APPR	REVISION

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY

DESIGNED BY

CHECKED BY

COMM. NO. 0169140

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

SRF ENGINEERS PLANNERS DESIGNERS

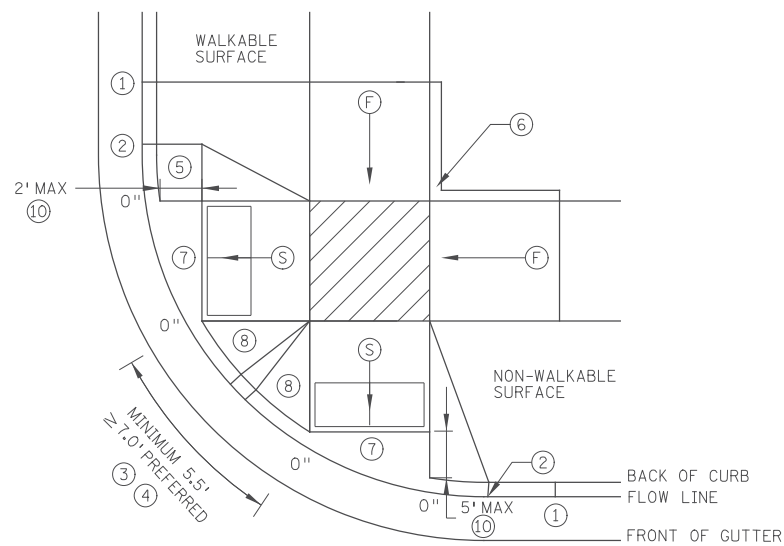
Consulting Group, Inc.

ANOKA COUNTY

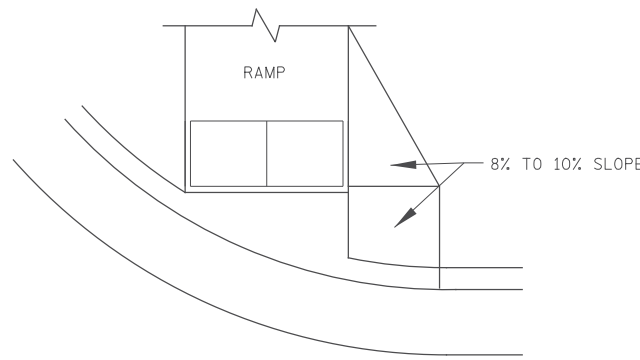
STANDARD PLAN SHEETS

CSAH 78 - BNSF GRADE SEPARATION

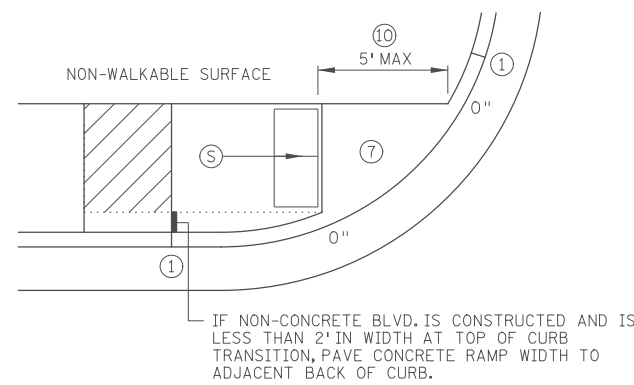
SHEET 45 OF 175



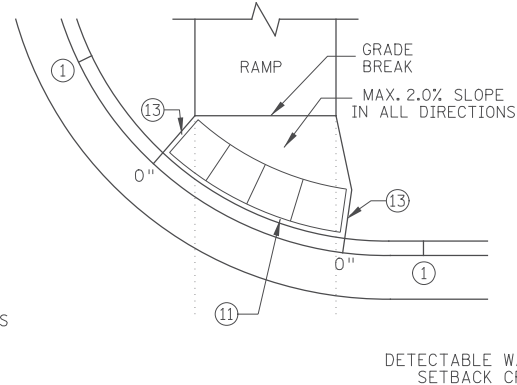
COMBINED DIRECTIONAL ⑨



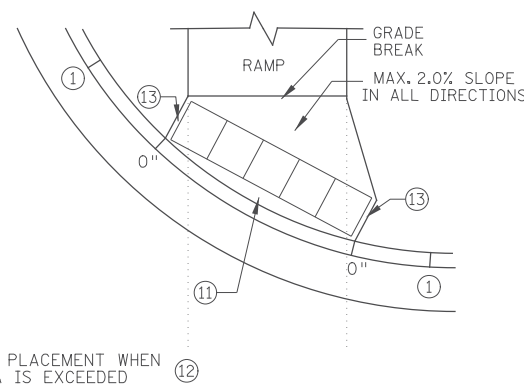
DIRECTIONAL RAMP WALKABLE FLARE



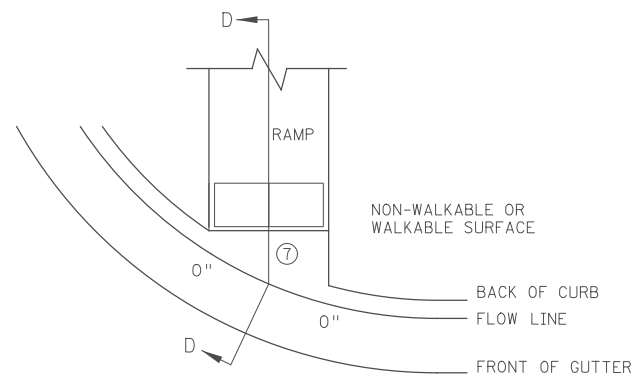
STANDARD ONE-WAY DIRECTIONAL ⑨



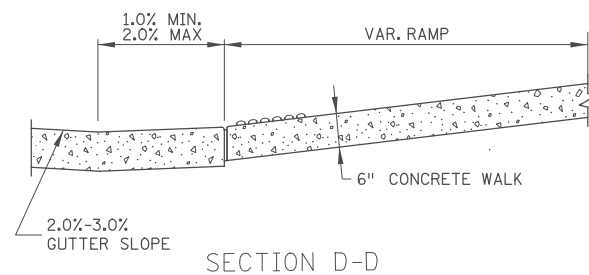
ONE-WAY DIRECTIONAL WITH DETECTABLE WARNING AT BACK OF CURB



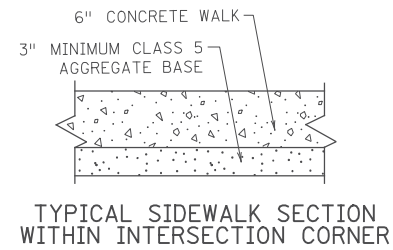
DETECTABLE WARNING PLACEMENT WHEN SETBACK CRITERIA IS EXCEEDED ⑫



CURB FOR DIRECTIONAL RAMPS ⑭



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

REVISION:
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APPROVED: *[Signature]* 1-23-2017
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PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250 2 OF 6

NO	DATE	BY	CKD	APPR	REVISION

STATE AID PROJECT NO 002-678-023, 114-020-051	DRAWN BY
	DESIGNED BY
	CHECKED BY
	COMM. NO. 0169140

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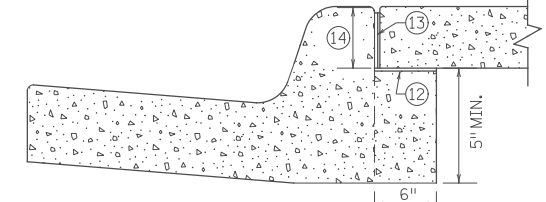
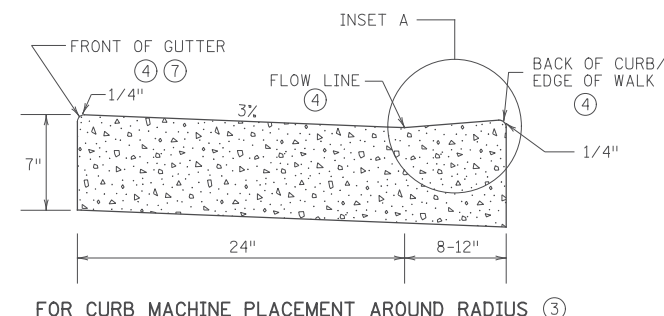
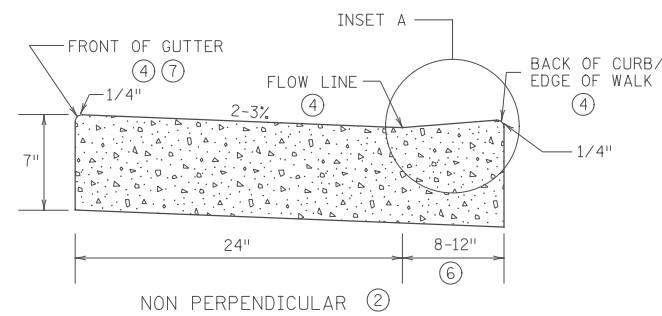
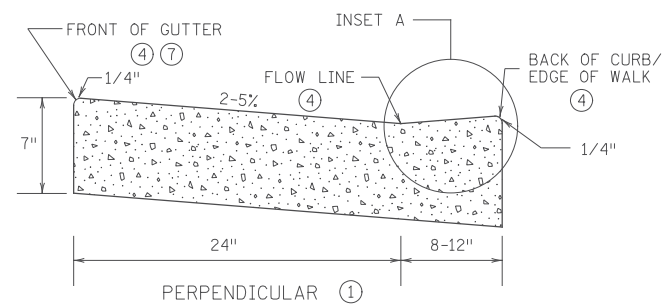
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STANDARD PLAN SHEETS

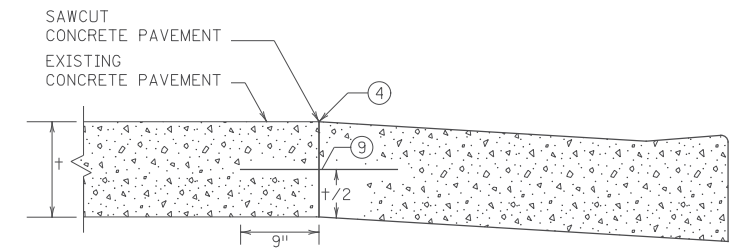
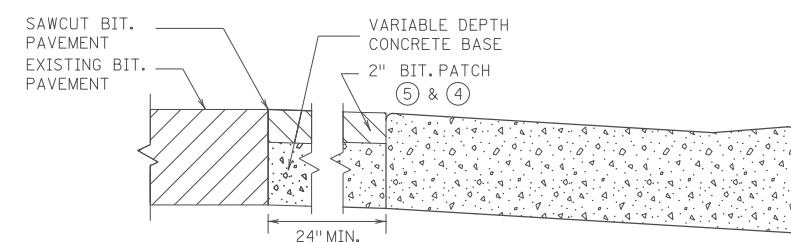
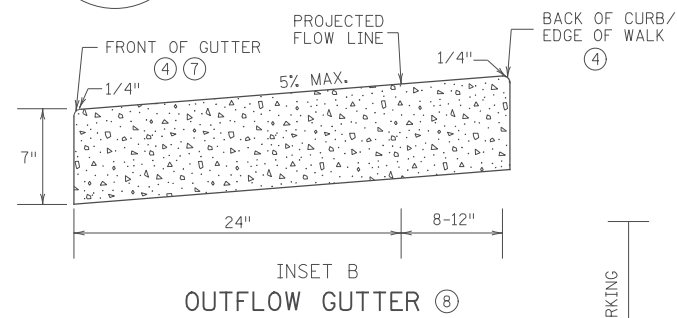
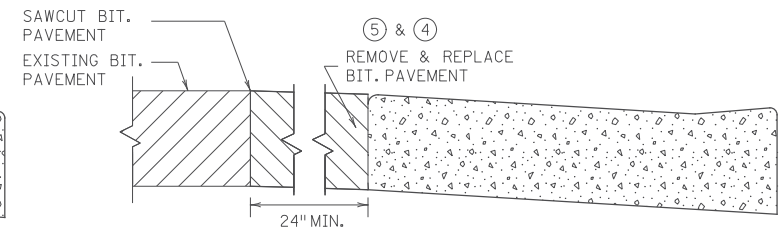
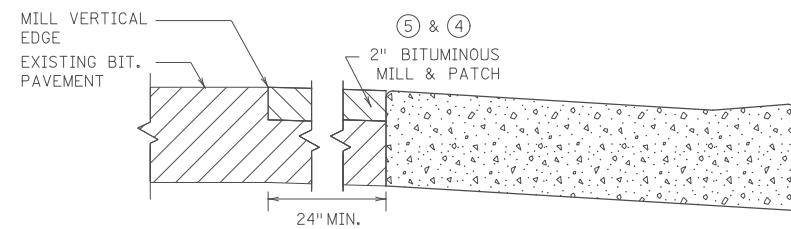
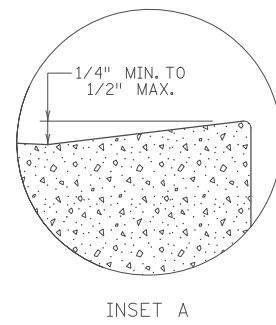
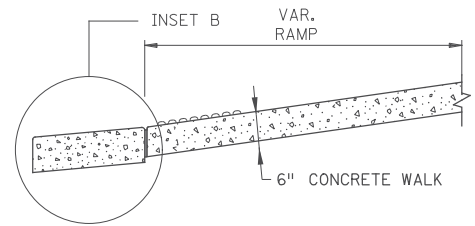
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SHEET 46 OF 175

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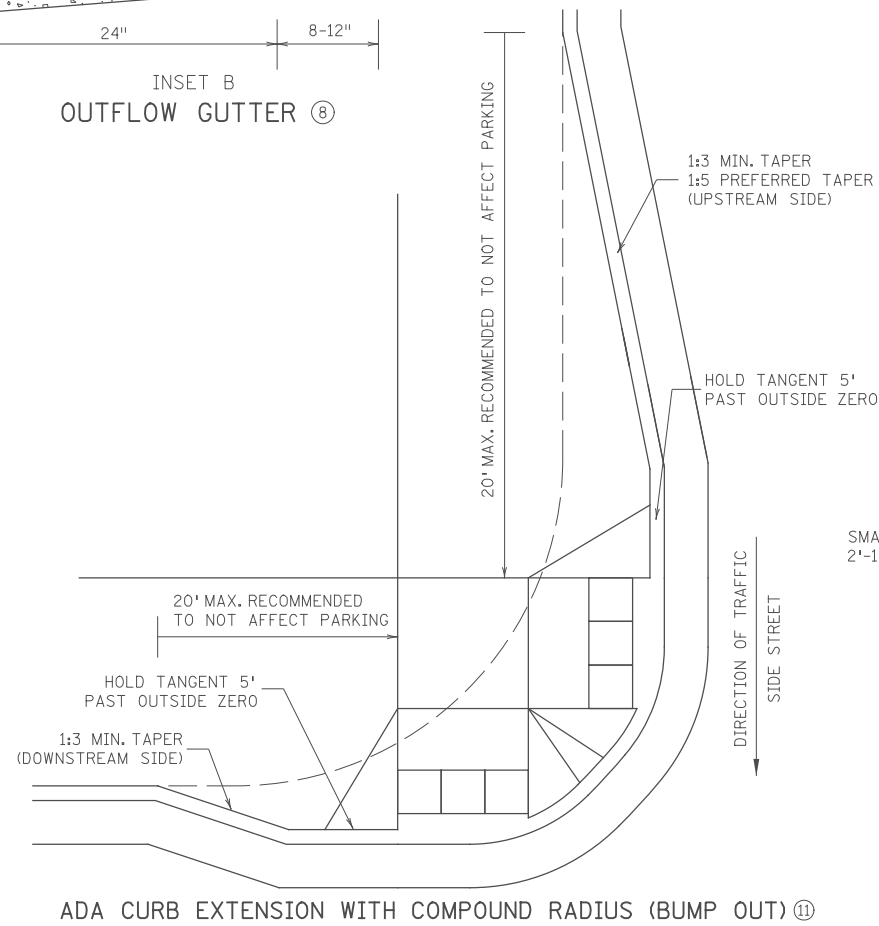


PEDESTRIAN ACCESS ROUTE CURB & GUTTER DETAIL

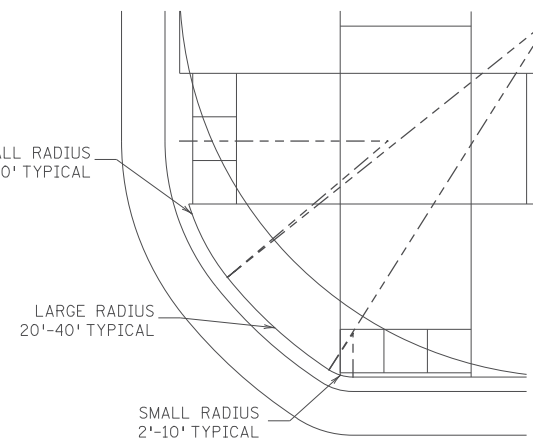


ONLY ALLOWED PER ENGINEER'S APPROVAL

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



COMBINED DIRECTIONAL (COMPOUND RADIUS)



NOTES:

- POSITIVE FLOW LINE DRAINAGE SHALL BE MAINTAINED THROUGH THE PEDESTRIAN ACCESS ROUTE (PAR) AT A 2% MAXIMUM. NO PONDING SHALL BE PRESENT IN THE PAR.
- ANY VERTICAL LIP THAT OCCURS AT THE FLOW LINE SHALL NOT BE GREATER THAN 1/4 INCH.
- ① FOR USE AT CURB CUTS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: PERPENDICULAR, TIERED PERPENDICULAR, PARALLEL, AND DIAGONAL RAMPS.
- ② FOR USE AT CURB RAMPS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED NON PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: FANS & DEPRESSED CORNERS.
- ③ BEGIN GUTTER SLOPE TRANSITION 10' OUTSIDE OF ALL CURB RAMPS.
- ④ THERE SHALL BE NO VERTICAL DISCONTINUITIES GREATER THAN 1/4".
- ⑤ ELEVATION CHANGE TAKES PLACE FROM THE EXISTING TO NEW FRONT OF GUTTER. PATCH IS USED TO MATCH THE NEW GUTTER FACE INTO THE EXISTING ROADWAY.
- ⑥ VARIABLE WIDTH FOR DIRECTIONAL CURB APPLICATIONS. SEE SHEET 2 FOR DIRECTIONAL CURB SLOPE REQUIREMENTS.
- ⑦ TOP FRONT OF GUTTER SHALL BE CONSTRUCTED FLUSH WITH PROPOSED ADJACENT PAVEMENT ELEVATION. TOP 1.5" OF THE GUTTER FACE MUST BE A FORMED EDGE. PAR GUTTER SHALL NOT BE OVERLAID.
- ⑧ SHOULD BE USED AT VERTICALLY CONSTRAINED AREAS WHEN AT A DRAINAGE HIGH POINT OR SUPER ELEVATED ROADWAY SEGMENTS.
- ⑨ DRILL AND GROUT NO. 4 EPOXY-COATED 18" LONG TIE BARS AT 30" CENTER TO CENTER INTO EXISTING CONCRETE PAVEMENT 1' MINIMUM FROM ALL JOINTS.
- ⑩ HELPS PROVIDE TWO SEPARATE RAMPS, REDUCES THE DOME SETBACK LENGTH AND MINIMIZES DIRECTIONAL CURB. THIS RADIUS DESIGN CLOSELY FOLLOWS THE TURNING VEHICLE PATH WHILE OPTIMIZING CURB RAMP LENGTH.
- ⑪ CURB EXTENSIONS SHOULD BE USED IN VERTICALLY CONSTRAINED AREAS, USUALLY IN DOWNTOWN ROADWAY SEGMENTS WHERE ON-STREET PARKING IS AVAILABLE. CURB EXTENSIONS SHOULD BE CONSIDERED FOR APS INTERSECTIONS WHERE SPACE IS LIMITED. PUSH BUTTONS MUST MEET APS CRITERIA AS DESCRIBED IN THE PUSH BUTTON LOCATION DETAIL SHEET.
- ⑫ PLACE BOND BREAKER BETWEEN WALK AND TOP OF SILL.
- ⑬ 1/2" PREFORMED JOINT FILLER PER MNDOT SPEC. 3702.
- ⑭ DIMENSION TO BE SAME AS SIDEWALK THICKNESS, 4" MIN.

REVISION:
APPROVED: JANUARY 23, 2017
OPERATIONS ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

STATE DESIGN ENGINEER

APPROVED: 1-23-2017

PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250 3 OF 6

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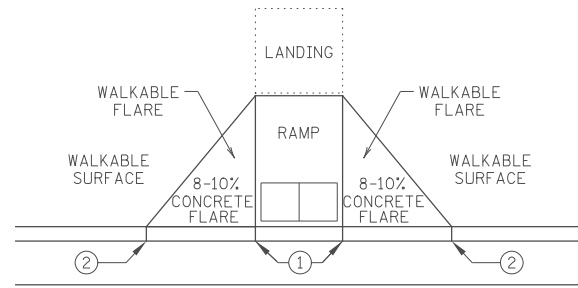
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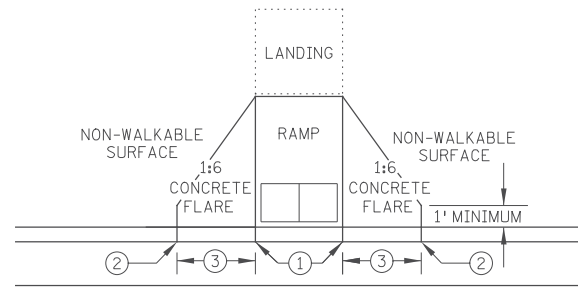
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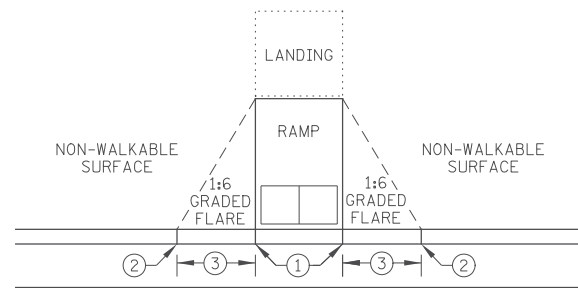
SHEET 47 OF 175



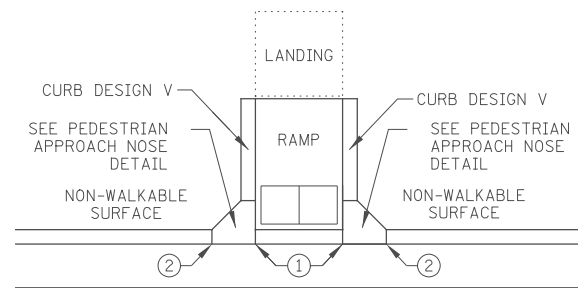
PAVED FLARES
ADJACENT TO WALKABLE SURFACE



PAVED FLARES
ADJACENT TO NON-WALKABLE SURFACE

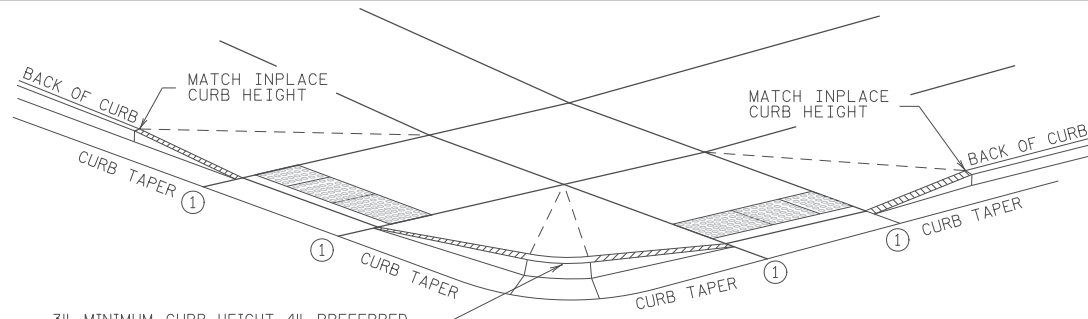


GRADED FLARES



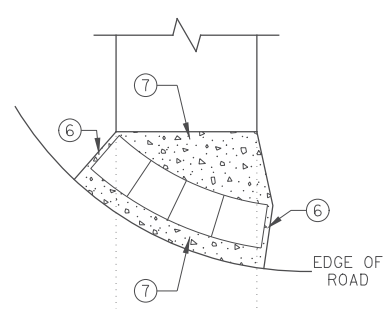
RETURNED CURB ⑤

TYPICAL SIDE TREATMENT OPTIONS ④ ⑪

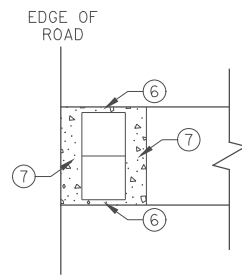


3" MINIMUM CURB HEIGHT, 4" PREFERRED
(MEASURED AT FRONT FACE OF CURB)
FOR A MIN. 6" LENGTH (MEASURED ALONG FLOW LINE)

DETECTABLE EDGE WITH ⑧
CURB AND GUTTER

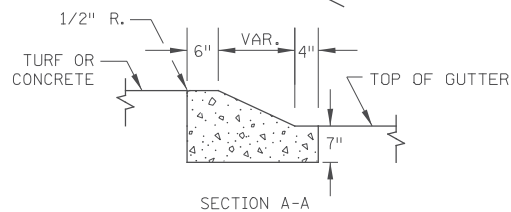
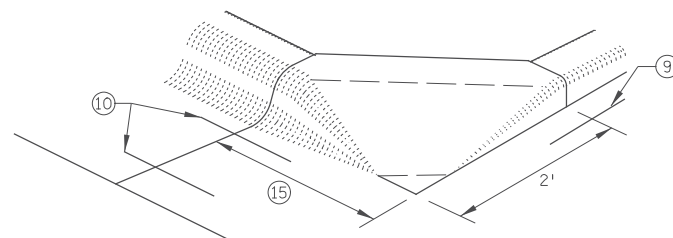


RADIAL DETECTABLE WARNING

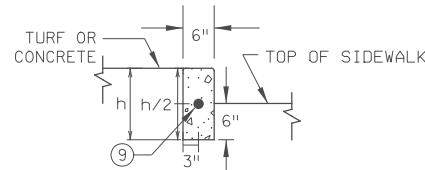


RECTANGULAR DETECTABLE WARNING

DETECTABLE EDGE WITHOUT CURB AND GUTTER

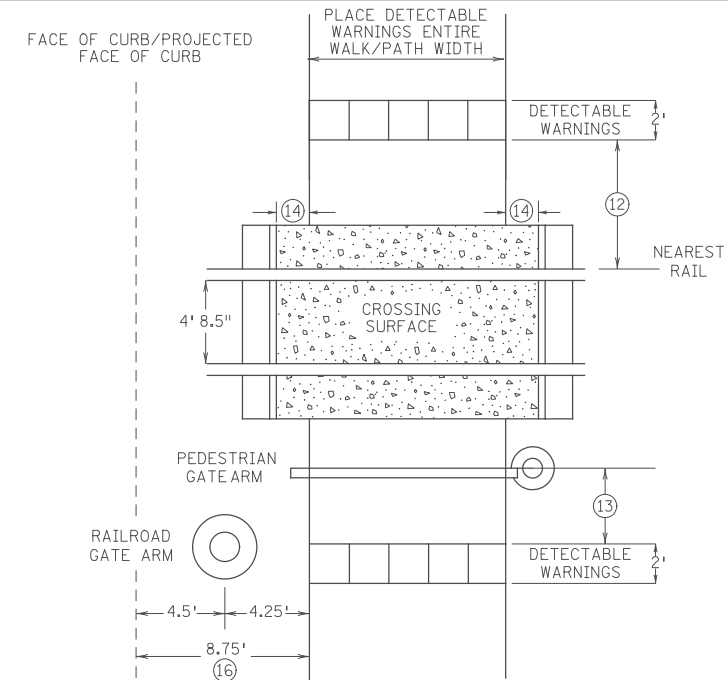


SECTION A-A



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 RAMPS FROM THE BACK OF CURB.
- ① 0" CURB HEIGHT.
 - ② FULL CURB HEIGHT.
 - ③ 2' FOR 4" HIGH CURB AND 3' FOR 6" HIGH CURB.
 - ④ SIDE TREATMENTS ARE APPLICABLE TO ALL RAMP TYPES AND SHOULD BE IMPLEMENTED AS NEEDED AS FIELD CONDITIONS DICTATE. THE ENGINEER SHALL DETERMINE THE RAMP SIDE TREATMENTS BASED ON MAINTENANCE OF BOTH ROADWAY AND SIDEWALK, ADJACENT PROPERTY CONSIDERATIONS, AND MITIGATING CONSTRUCTION IMPACTS.
 - ⑤ TYPICALLY USED FOR MEDIANS AND ISLANDS.
 - ⑥ WHEN NO CONCRETE FLARES ARE PROPOSED, THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE EDGE OF ROADWAY. MAINTAIN 3" MAX. BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.
 - ⑦ IF NO CURB AND GUTTER IS PLACED IN RURAL SECTIONS, DETECTABLE WARNINGS SHALL BE PLACED 1' FROM THE EDGE OF BITUMINOUS ROADWAY AND/OR BITUMINOUS SHARED-USE PATH TO PROVIDE VISUAL CONTRAST.
 - ⑧ ALL CONSTRUCTED CURBS MUST HAVE A CONTINUOUS DETECTABLE EDGE FOR THE VISUALLY IMPAIRED. THIS DETECTABLE EDGE REQUIRES DETECTABLE WARNINGS WHEREVER THERE IS ZERO-INCH HIGH CURB. CURB TAPERS ARE CONSIDERED A DETECTABLE EDGE WHEN THE TAPER STARTS WITHIN 3" OF THE EDGE OF THE DETECTABLE WARNINGS AND UNIFORMLY RISES TO A 3-INCH MINIMUM CURB HEIGHT. ANY CURB NOT PART OF A CURB TAPER AND LESS THAN 3 INCHES IN HEIGHT IS NOT CONSIDERED A DETECTABLE EDGE AND THEREFORE IS NOT COMPLIANT WITH ACCESSIBILITY STANDARDS.
 - ⑨ DRILL AND GROUT 1 - NO. 4 12" LONG REINFORCEMENT BAR (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE V CURB.
 - ⑩ DRILL AND GROUT 2 - NO. 4 12" LONG REINFORCEMENT BARS (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE CURB AND GUTTER.
 - ⑪ SIDE TREATMENT EXAMPLES SHOWN ARE WHEN THE INITIAL LANDING IS APPROXIMATELY LEVEL WITH THE FULL HEIGHT CURB (I.E. 6' LONG RAMP FOR 6" HIGH CURB). WHEN THE INITIAL LANDING IS MORE THAN 1" BELOW FULL HEIGHT CURB REFER TO SHEETS 1 & 2 TO MODIFY THE CURB HEIGHT TAPERS AND MAINTAIN POSITIVE BOULEVARD DRAINAGE.
 - ⑫ NEAREST EDGE OF DETECTABLE WARNING SURFACES SHALL BE PLACED 12' MINIMUM TO 15' MAXIMUM FROM THE NEAREST RAIL. FOR SKEWED RAILWAYS IN NO INSTANCE SHALL THE DETECTABLE WARNING BE CLOSER THAN 12' MEASURED PERPENDICULAR TO THE NEAREST RAIL.
 - ⑬ WHEN PEDESTRIAN GATES ARE PROVIDED, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE SIDE OF THE GATES OPPOSITE THE RAIL, 2' FROM THE APPROACHING SIDE OF THE GATE ARM. THIS CRITERIA GOVERNS OVER NOTE ⑫.
 - ⑭ CROSSING SURFACE SHALL EXTEND 2' MINIMUM PAST THE OUTSIDE EDGE OF WALK OR SHARED-USE PATH.
 - ⑮ 3' FOR MEDIANS AND SPLITTER ISLANDS. NOSE CAN BE REDUCED TO 2' ON FREE RIGHT ISLANDS.
 - ⑯ SIDEWALK TO BE PLACED 8.75' MIN. FROM THE FACE OF CURB/PROJECTED FACE OF CURB. THIS ENSURES MIN. CLEARANCE BETWEEN THE SIDEWALK AND GATE ARM COUNTERWEIGHT SUPPORTS.

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APPROVED: JANUARY 23, 2017
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1-23-2017

PEDESTRIAN CURB RAMP DETAILS	
STANDARD PLAN 5-297.250	4 OF 6

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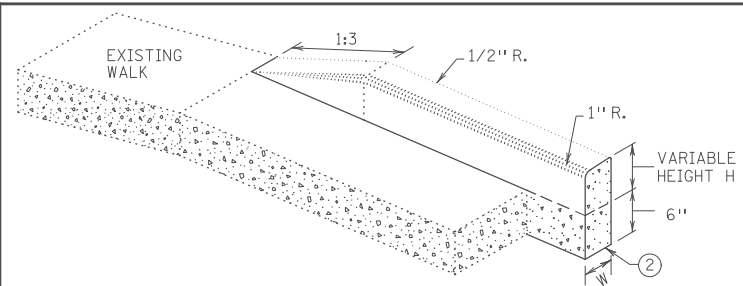
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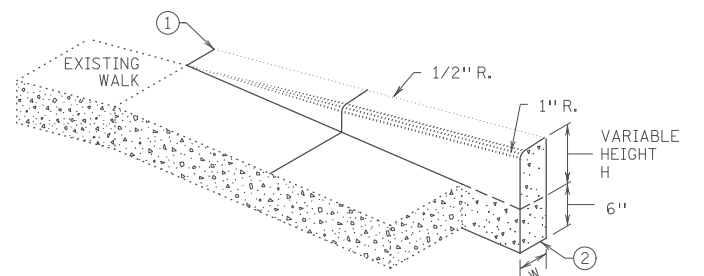
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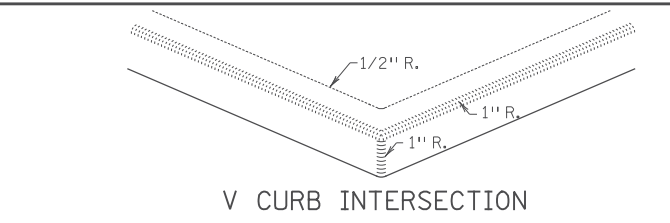
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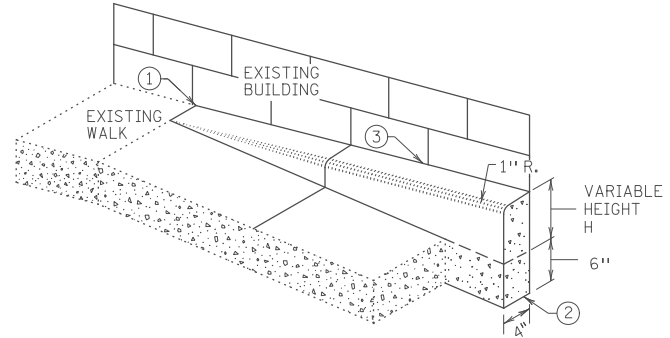
V CURB ADJACENT TO LANDSCAPE
CURB WITHIN SIDEWALK LIMITS



V CURB ADJACENT TO LANDSCAPE
CURB OUTSIDE SIDEWALK LIMITS

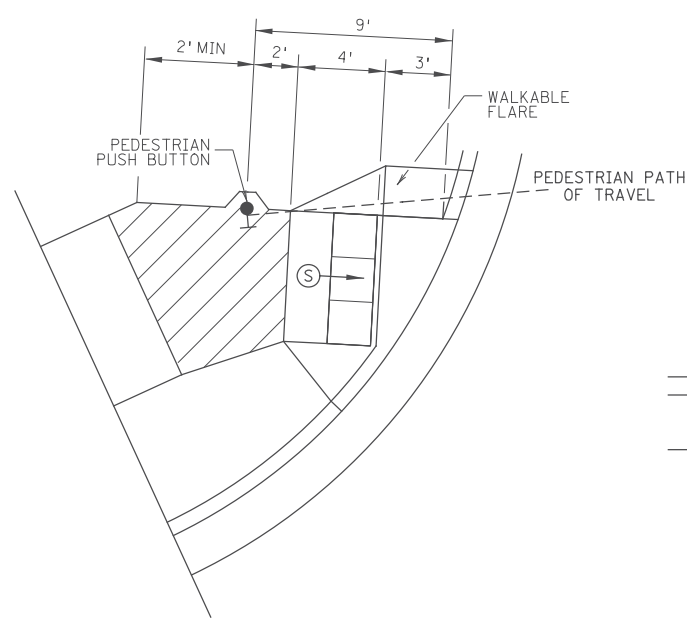


V CURB INTERSECTION



V CURB ADJACENT TO BUILDING
OR BARRIER

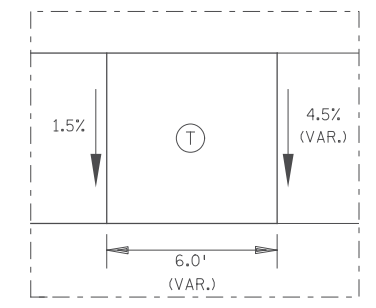
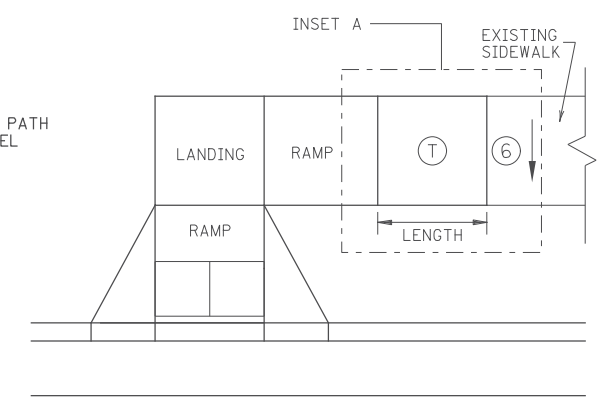
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
< 6"	4"
≥ 6"	6"



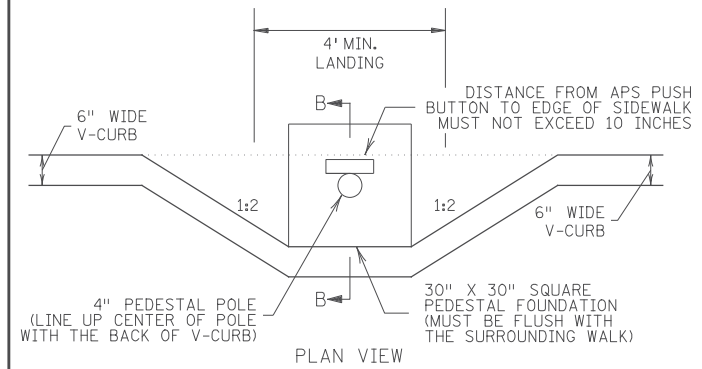
SEMI-DIRECTIONAL RAMP (3,4,9)

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

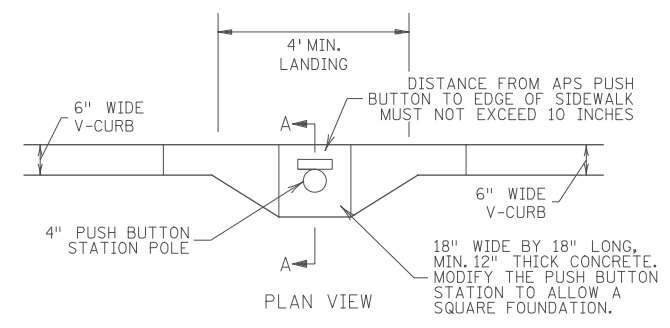
PRIMARYLY USED FOR APS APPLICATIONS
WHERE THE PAR DOES NOT CONTINUE PAST
THE PUSH BUTTON (DEAD-END SIDEWALK)



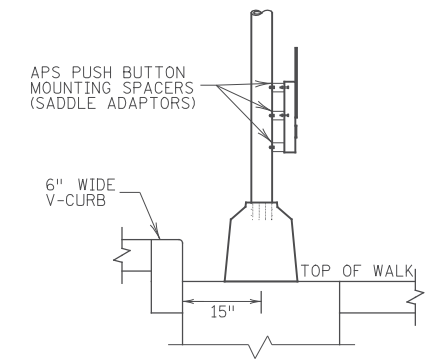
TRANSITION PANEL (4,5)



PLAN VIEW

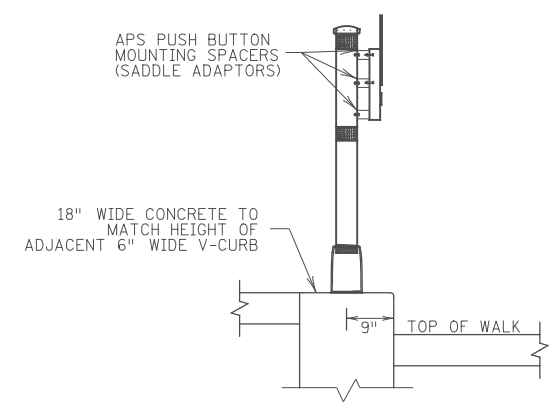


PLAN VIEW



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 PANEL(S) ARE TO ONLY BE USED AFTER THE RAMP, OR IF NEEDED, LANDING ARE AT THE FULL CURB HEIGHT (TYPICAL SECTION).
- ⑥ EXISTING CROSS SLOPE GREATER THAN 2.0%.

LEGEND

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

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

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

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

REVISION:				
NO	DATE	BY	CKD	APPR

APPROVED: JANUARY 23, 2017

OPERATIONS ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

REVISOR:

APPROVED: 1-23-2017

STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250 5 OF 6

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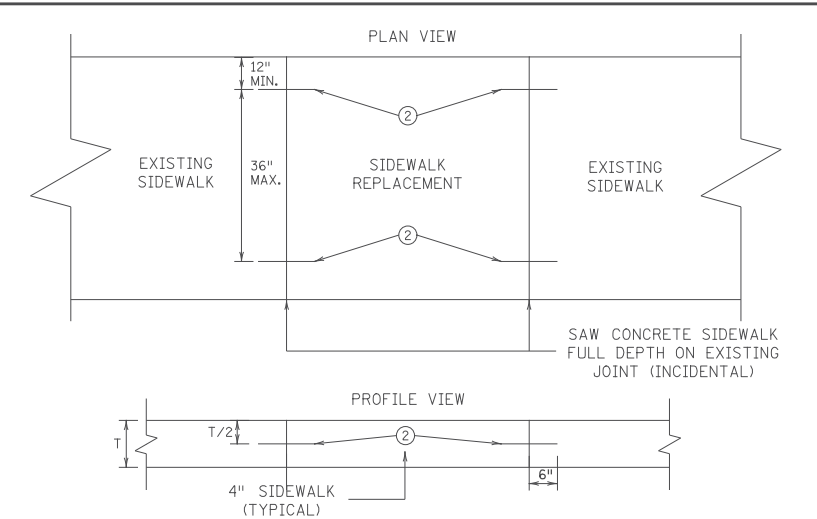
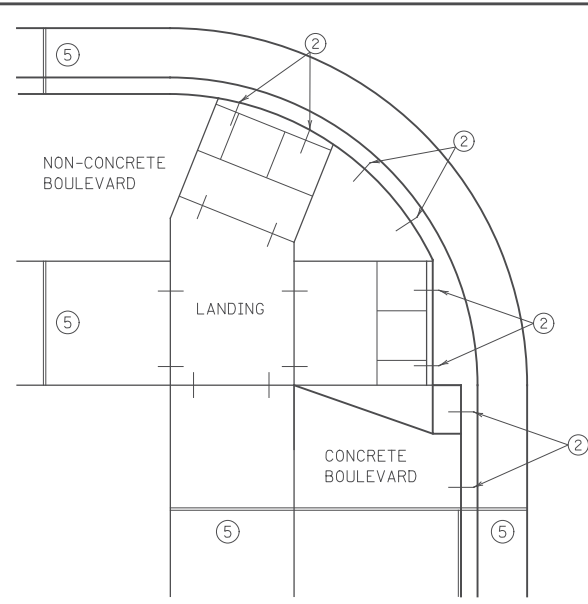
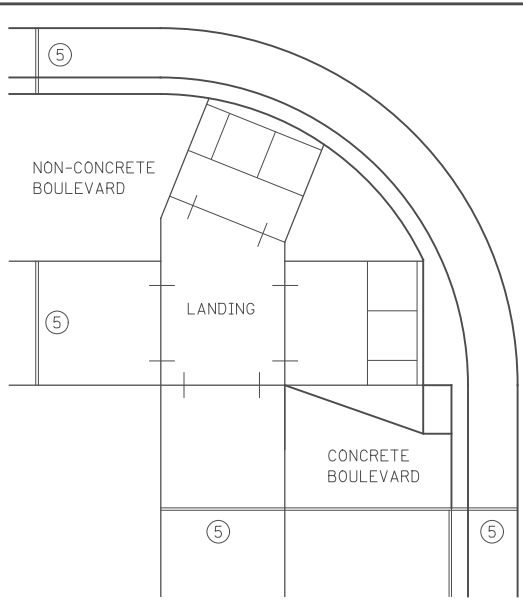
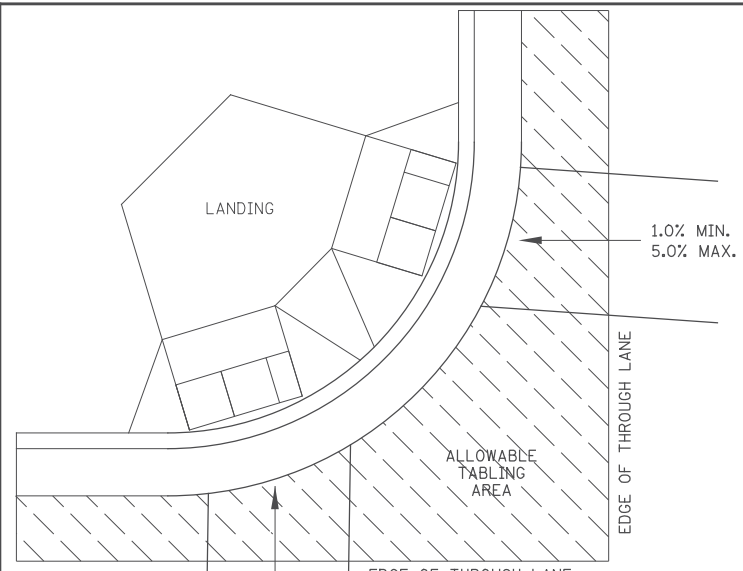
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	COMM. NO. 0169140

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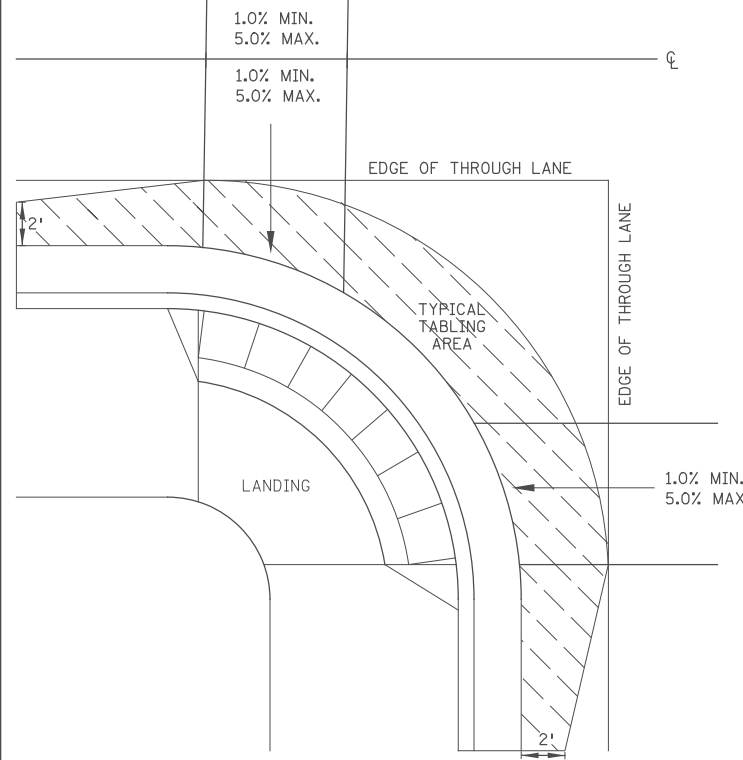
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SHEET
49
OF
175



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



EXPANSION MATERIAL PLACEMENT FOR CONCRETE AND BITUMINOUS ROADWAYS

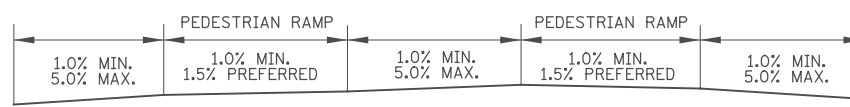
OPTIONAL CURB LINE REINFORCEMENT PLACEMENT ON BITUMINOUS ROADWAYS ④



FLOW LINE PROFILE "TABLE" - TWIN PERPENDICULARS



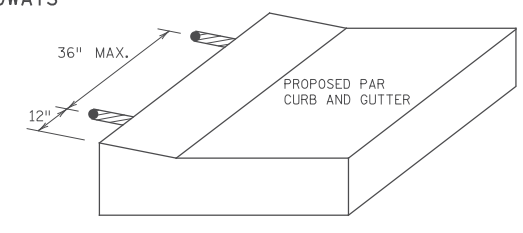
FLOW LINE PROFILE "TABLE" - FAN



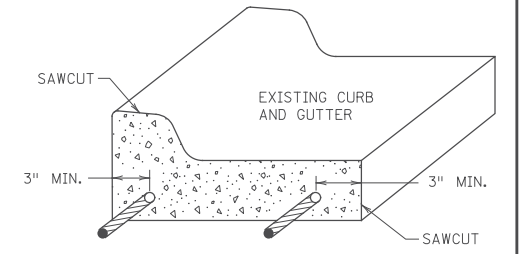
FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS



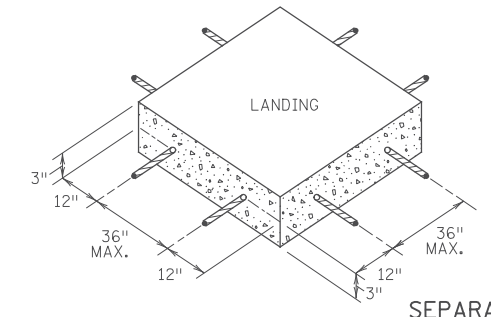
FLOW LINE PROFILE RAISE - FAN



OPTIONAL CURB LINE REINFORCEMENT DETAILS ② ④



CURB AND GUTTER REINFORCEMENT ③



SEPARATE LANDING POUR REINFORCEMENT ①

CURB LINE AND ROAD CROSSING ADJUSTMENTS

"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.

REVISION:
APPROVED: JANUARY 23, 2017
<i>[Signature]</i> OPERATIONS ENGINEER

MINNESOTA DEPARTMENT OF TRANSPORTATION

REVISED:

APPROVED: *[Signature]*
STATE DESIGN ENGINEER

1-23-2017

PEDESTRIAN CURB RAMP DETAILS

STANDARD PLAN 5-297.250 6 OF 6

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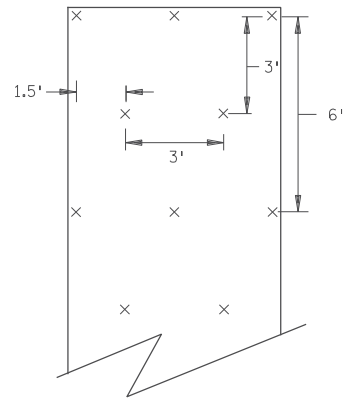
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	COMM. NO. 0169140

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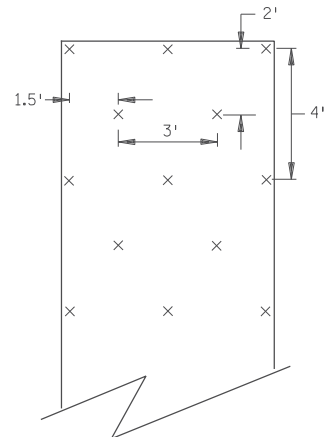
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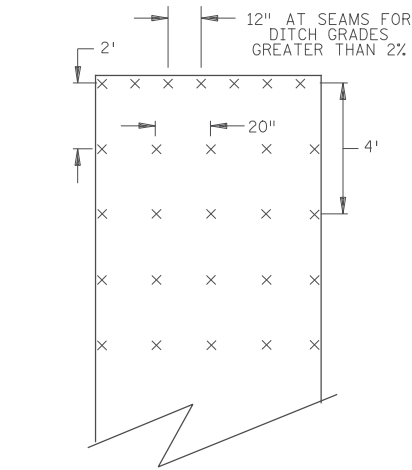
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SLOPES FLATTER THAN 1:2
(120 STAPLES PER 100 SQ YD)

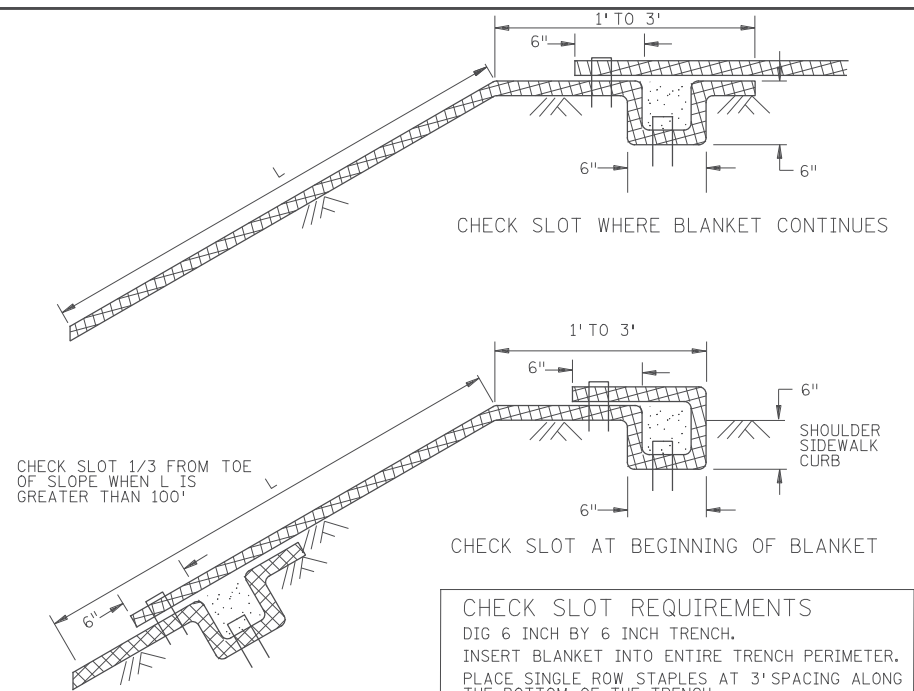


SLOPES 1:2 TO 1:1
(170 STAPLES PER 100 SQ YD)

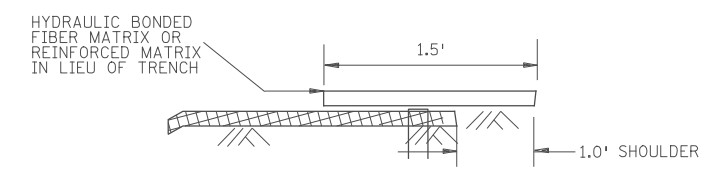


CHANNEL AND DITCH APPLICATIONS
(350 STAPLES PER 100 SQ YD)

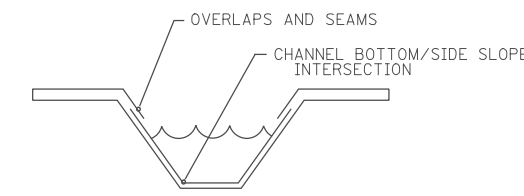
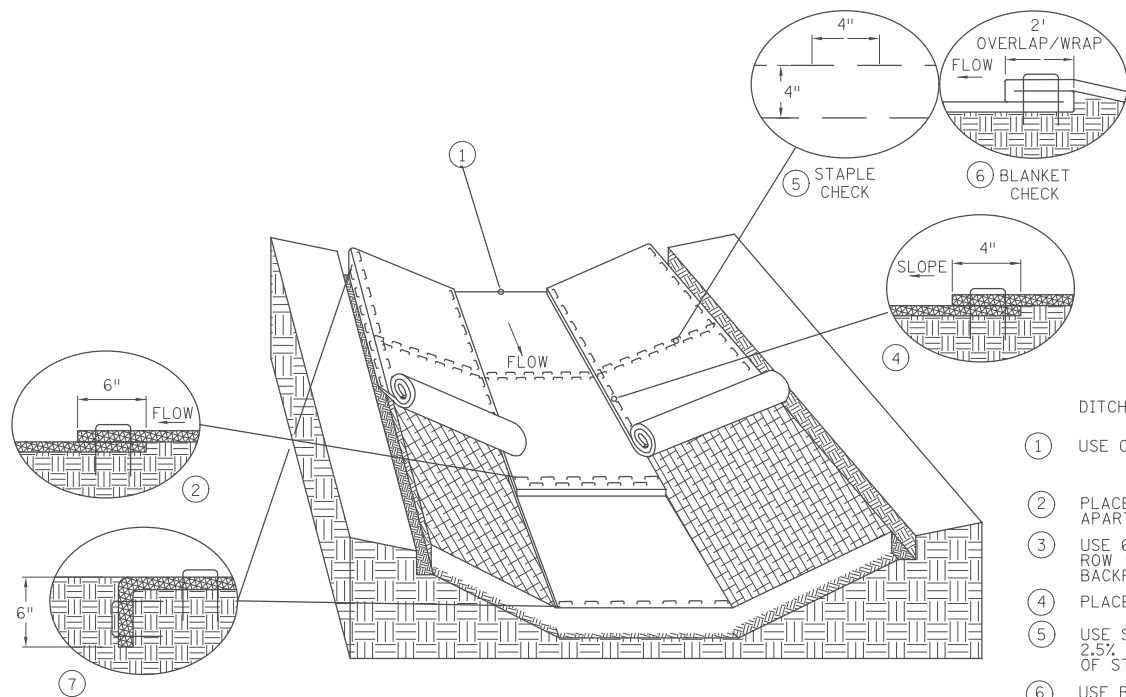
BLANKET STAPLE PATTERN



CHECK SLOT REQUIREMENTS
DIG 6 INCH BY 6 INCH TRENCH.
INSERT BLANKET INTO ENTIRE TRENCH PERIMETER.
PLACE SINGLE ROW STAPLES AT 3' SPACING ALONG THE BOTTOM OF THE TRENCH.
BACKFILL TRENCH WITH SOIL AND TAMP.
PLACE SINGLE ROW STAPLES AT 3' SPACING ON OVERLAP.

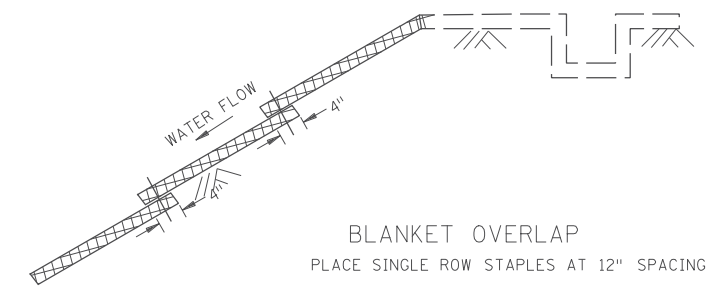


CHECK SLOT ALTERNATIVE
PLACE SINGLE ROW STAPLES AT 12" SPACING
CHECK SLOT DETAILS



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

DITCH BLANKET STAPLE DETAIL



GENERAL BLANKET INSTALLATION REQUIREMENTS
PREPARE SOIL AS PER SPECIFICATION 2574.
LAY PARALLEL OR PERPENDICULAR TO THE DIRECTION OF WATER FLOW.
OVERLAP ADJACENT STRIP EDGES A MINIMUM OF 4 INCHES.
OVERLAP BLANKET 6" (MIN.) AT EACH END. OVERLAP BOTTOM END OF UPPER BLANKET OVER TOP END OF LOWER BLANKET. STAPLE ALONG OVERLAP EVERY 1.5'.
THE UPPERMOST BLANKET OF ALL SLOPE APPLICATIONS MUST START IN A CHECK SLOT. IF SLOPE LENGTH (L) IS 100' OR GREATER, INSERT BLANKET INTO A CHECK SLOT 1/3 FROM THE BOTTOM OF THE SLOPE.

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

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

PERMANENT EROSION CONTROL
BLANKET STAPLE PATTERN FOR SLOPES
STANDARD PLAN 5-297.404 3 OF 3

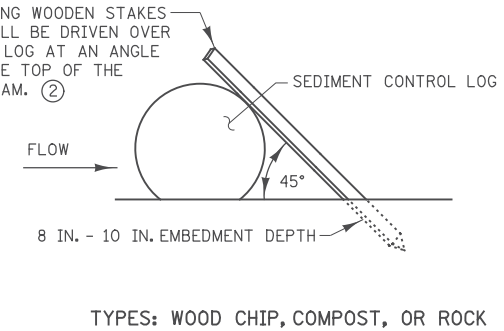
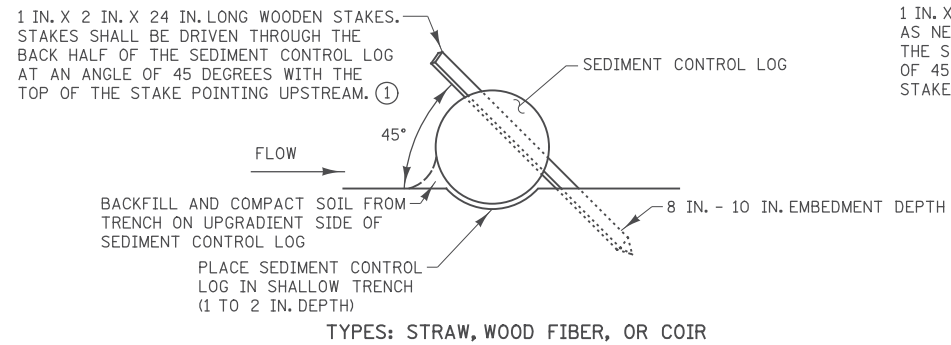
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COMM. NO. 0169140

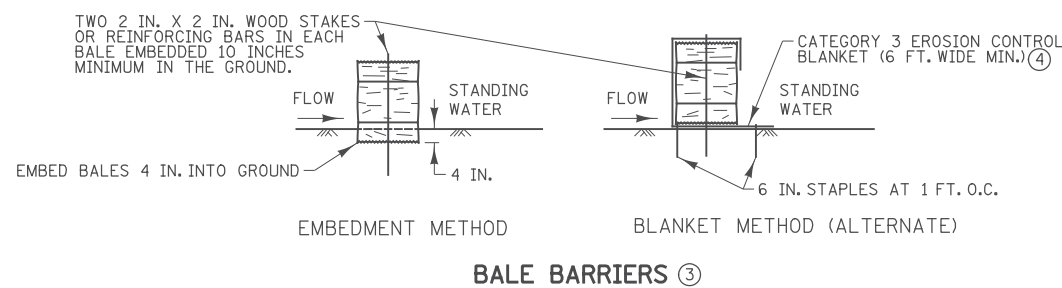
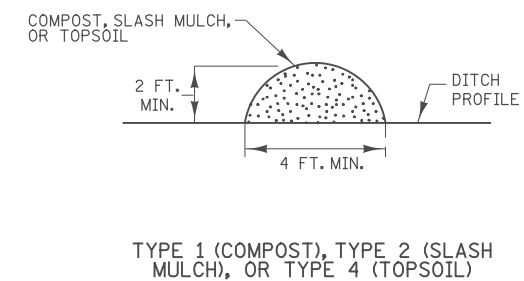
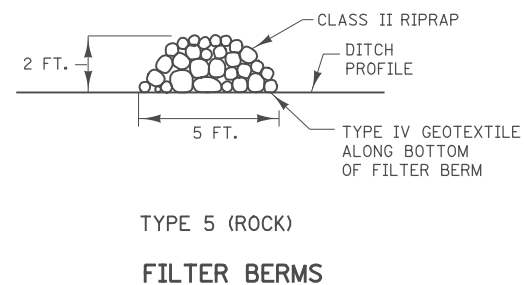
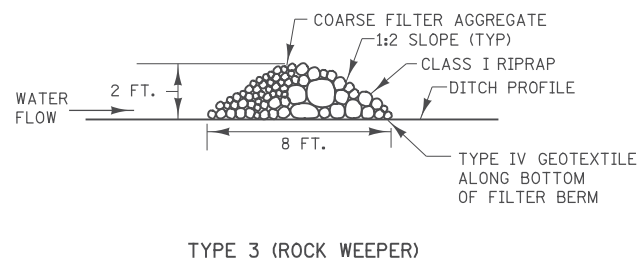
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STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION
SHEET 53 OF 175

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SEDIMENT CONTROL LOGS



NOTES:

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

REVISION:

APPROVED: 2-28-2017

[Signature]
CHIEF ENVIRONMENTAL OFFICER

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MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISOR:

[Signature]
STATE DESIGN ENGINEER

APPROVED:
2-28-2017

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

STANDARD PLAN 5-297.405

2 OF 8

STATE AID PROJECT NO. 002-678-023, 114-020-051

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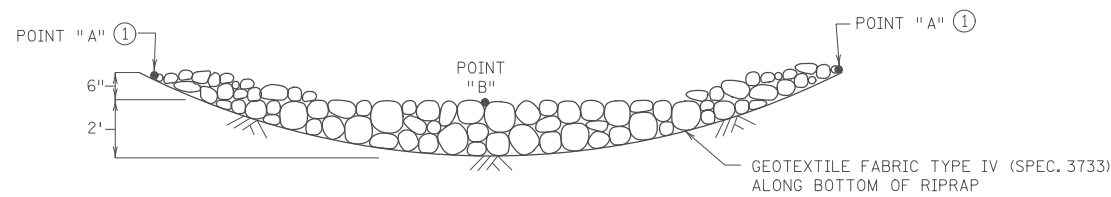
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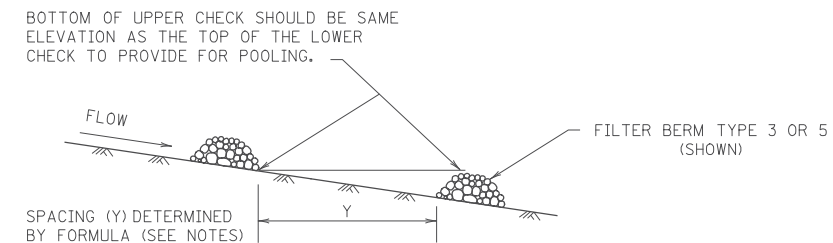
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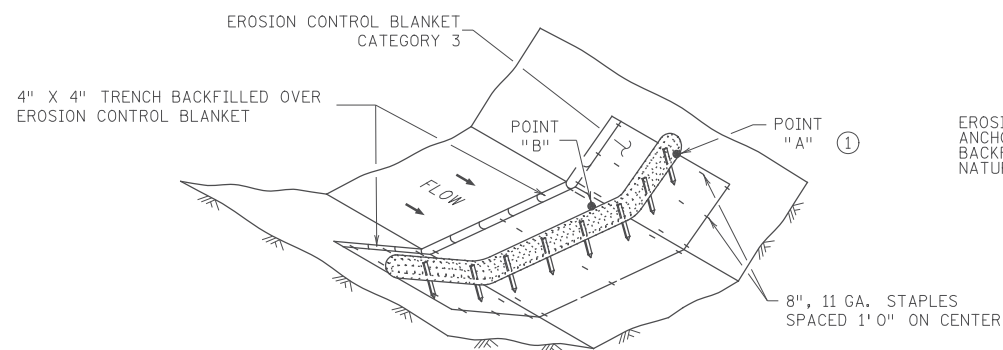
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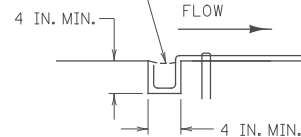
ROCK DITCH CHECKS
 FILTER BERMS TYPE 3 (ROCK WEEPER) OR FILTER TYPE 5 (ROCK) ②③
 (FOR USE ON ROUGH GRADED AREAS)



DITCH CHECK SPACING
 (FOR ALL FILTER BERM TYPES)



EROSION CONTROL BLANKET ANCHOR TRENCH, BACKFILL WITH TAMPED NATURAL SOIL.



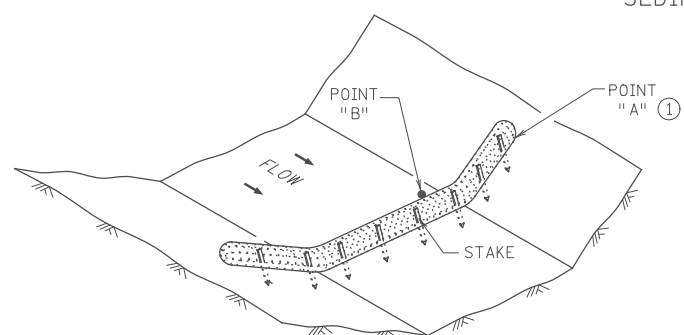
1 IN. X 2 IN. X 24 IN. LONG WOODEN STAKES AT 1 FT. MAXIMUM SPACING. STAKES SHALL BE DRIVEN THROUGH THE BACK HALF OF THE SEDIMENT CONTROL LOG AT AN ANGLE OF 45 DEGREES WITH THE TOP OF THE STAKE POINTING UPSTREAM.

SEDIMENT CONTROL LOG TYPE WOOD FIBER

EROSION CONTROL BLANKET CATEGORY 3 (8 FT. MIN. WIDTH)

STAPLE BLANKET IN ROWS WITH 6 IN. STAPLES AT 18 IN. MAX. SPACING WITHIN ROWS AND 2 FT. MAX. SPACING BETWEEN ROWS. LEADING AND TRAILING EDGE SHALL BE STAPLED APPROX. 6 IN. FROM EDGE (TYP.)

SEDIMENT CONTROL LOG TYPE BLANKET SYSTEM ④



SEDIMENT CONTROL LOG TYPE WOOD FIBER, OR TYPE COMPOST ⑤
 (FOR USE ON ROUGH GRADED AREAS)

NOTES:

SEE SPECS. 2573, 3601, 3733, 3885, 3886 & 3889.

FOR DITCH CHECKS, PLACE SEDIMENT CONTROL LOG PERPENDICULAR TO FLOW AND IN A CRESCENT SHAPE WITH THE ENDS FACING UPSTREAM.

APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\% \text{ CHANNEL SLOPE}} \times 100$$

- ① POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.
- ② PERMANENT ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE ARE TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.
- ③ DITCH GRADE 3% - 5%, MAX. FLOW VELOCITY 12 FT./SEC..
- ④ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 4.5 FT./SEC..
- ⑤ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 1.5 FT./SEC..

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



APPROVED: *[Signature]*
 STATE DESIGN ENGINEER

REVISID:
 APPROVED:
 2-28-2017

TEMPORARY SEDIMENT CONTROL
 DITCH CHECK
 STANDARD PLAN 5-297.405 3 OF 8

STATE AID PROJECT NO
 002-678-023, 114-020-051

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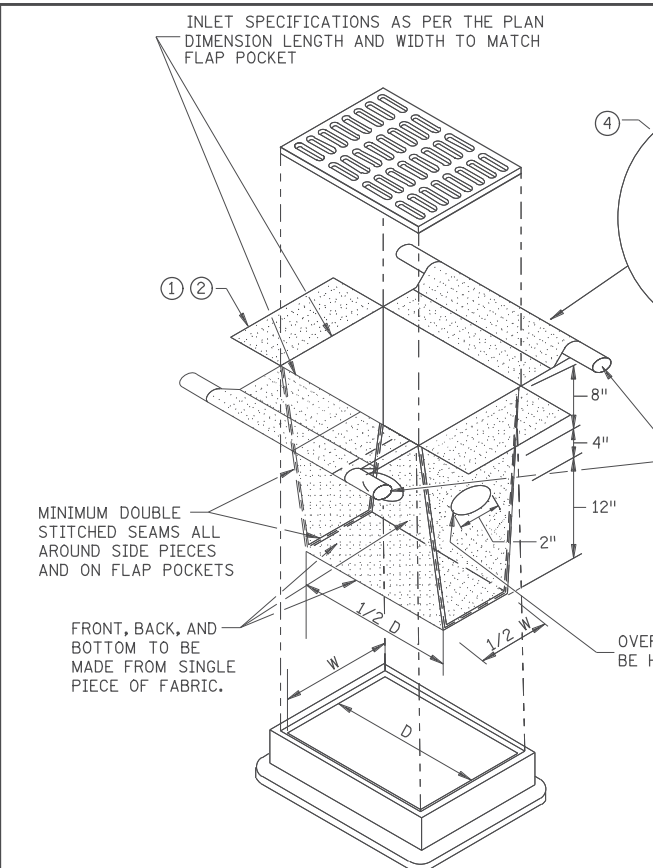


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 STANDARD PLAN SHEETS
 CSAH 78 - BNSF GRADE SEPARATION

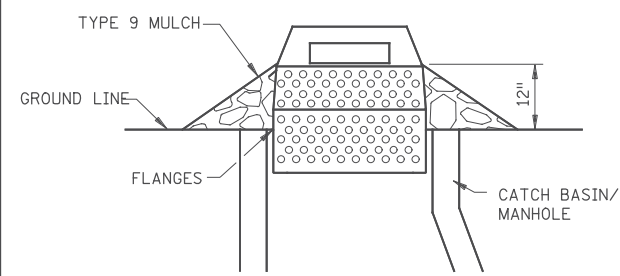
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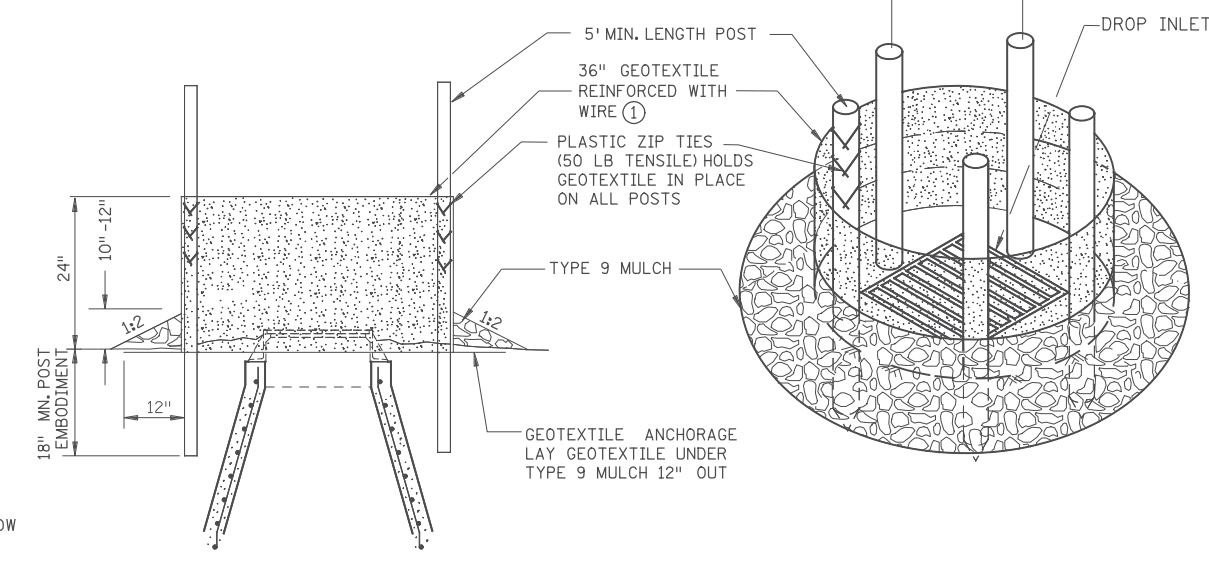


FILTER BAG INSERT ③
(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX)

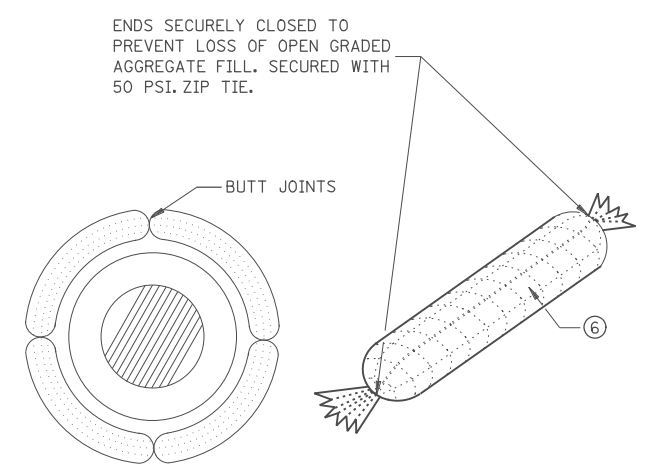


SEDIMENT CONTROL INLET HAT

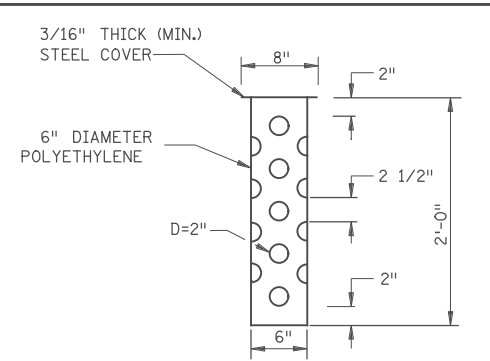
NOTE:
THE SEDIMENT CONTROL BARRIER SHALL BE A METAL OR PLASTIC/POLYETHYLENE RISER SIZED TO FIT INSIDE THE CATCH BASIN/MANHOLE; HAVE PERFORATIONS TO ALLOW FOR WATER INFILTRATION; HAVE AN OVERFLOW OPENING, FLANGES AND A LID/COVER.



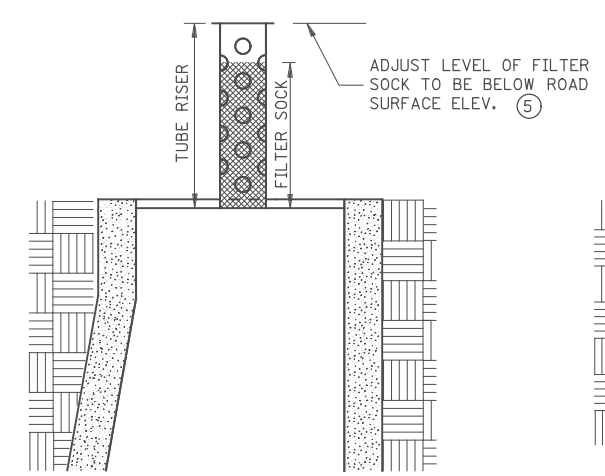
SILT FENCE RING AND ROCK FILTER BERM
USE WHERE INLET DRAINS IN AN AREA WITH SLOPES AT 1:3 OR LESS



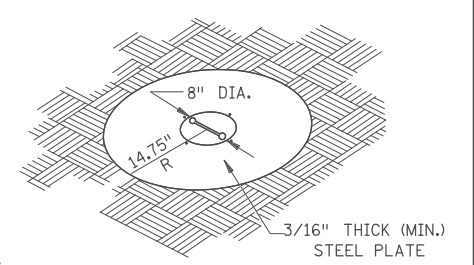
ROCK LOG/COMPOST LOG



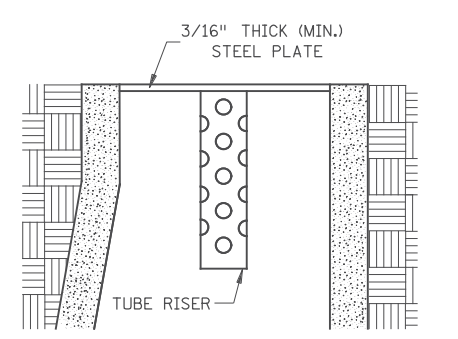
TUBE RISER



SECTION (UP POSITION)

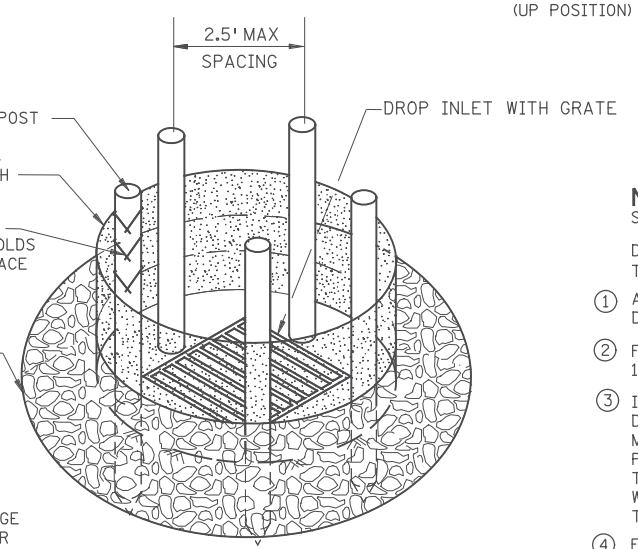


PERSPECTIVE VIEW



SECTION (DOWN POSITION)

POP-UP HEAD



NOTES:

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

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

MINNESOTA
DEPARTMENT OF TRANSPORTATION

[Signature]
STATE DESIGN ENGINEER

REVISED:

APPROVED: 2-28-2017

TEMPORARY SEDIMENT CONTROL
STORM DRAIN INLET PROTECTION

STANDARD PLAN 5-297.405 4 OF 8

NO	DATE	BY	CKD	APPR	REVISION

STATE AID PROJECT NO. 002-678-023, 114-020-051

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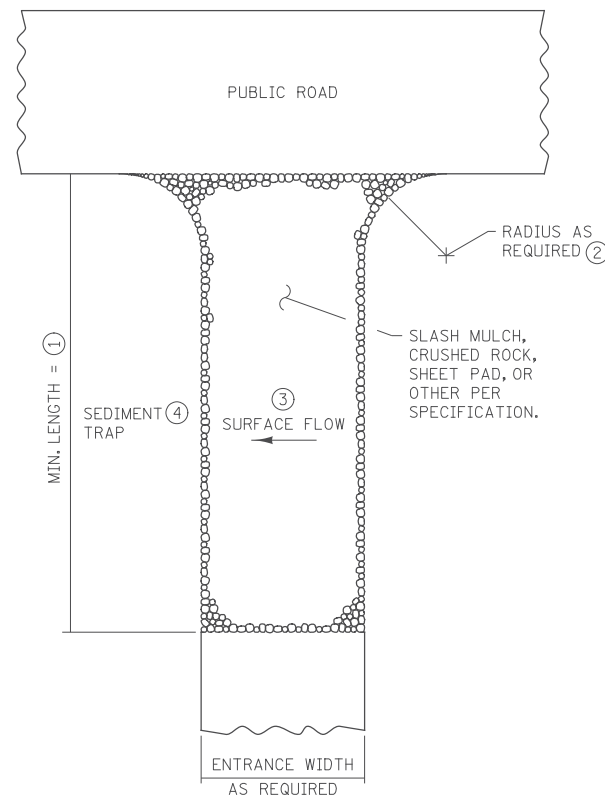
COMM. NO. 0169140

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ENGINEERS PLANNERS DESIGNERS
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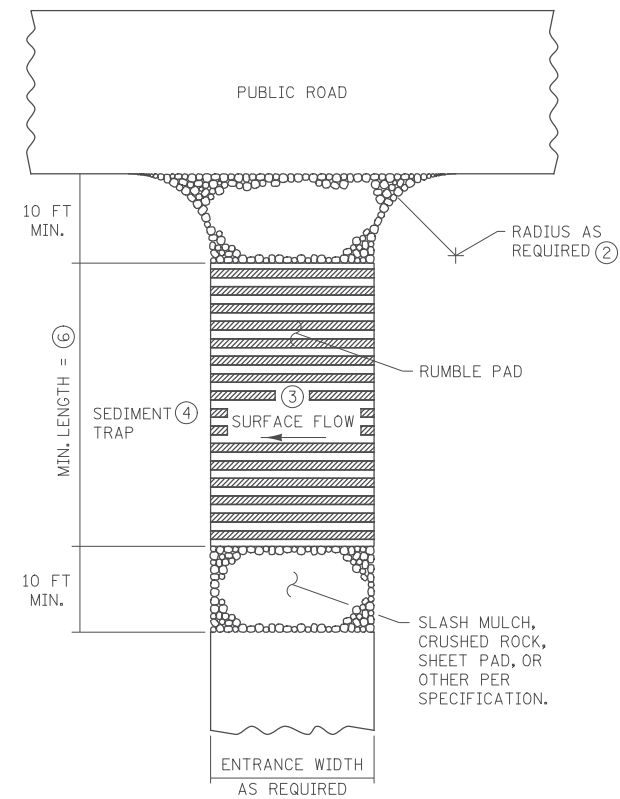
ANOKA COUNTY
STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION

SHEET 56 OF 175

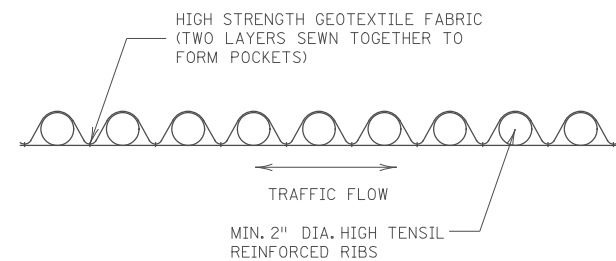
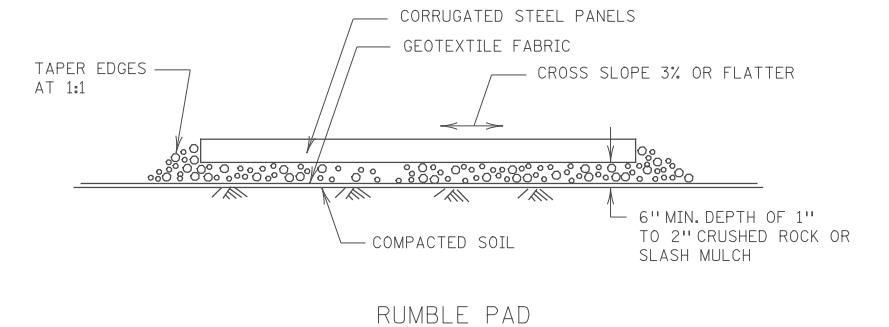
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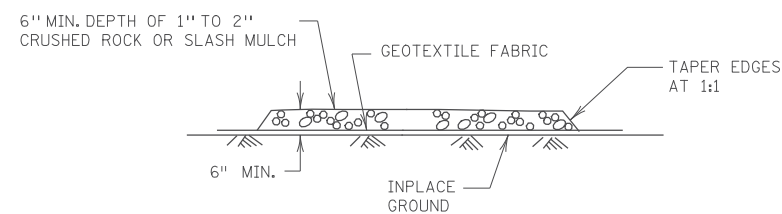
SLASH MULCH, CRUSHED ROCK, OR SHEET PAD CONSTRUCTION EXIT (5)(7)



RUMBLE PAD CONSTRUCTION EXIT (5)(7)



SHEET PAD



SLASH MULCH OR CRUSHED ROCK

NOTES:

SEE SPECS. 2573 & 3882.

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

REVISION:
 APPROVED: 2-28-2017

 CHIEF ENVIRONMENTAL OFFICER

mn MINNESOTA DEPARTMENT OF TRANSPORTATION

 STATE DESIGN ENGINEER
 REVISED:
 APPROVED: 2-28-2017

TEMPORARY SEDIMENT CONTROL
 STABILIZED CONSTRUCTION EXIT
 STANDARD PLAN 5-297.405 5 OF 8

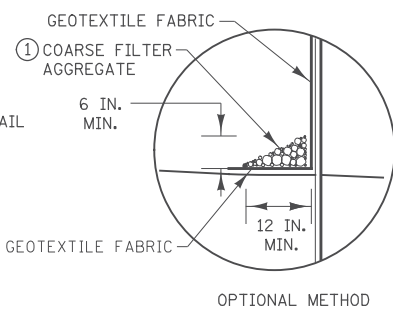
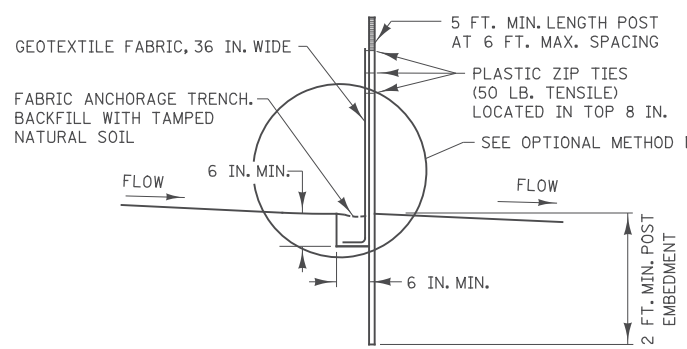
NO	DATE	BY	CKD	APPR	REVISION

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 COMM. NO. 0169140

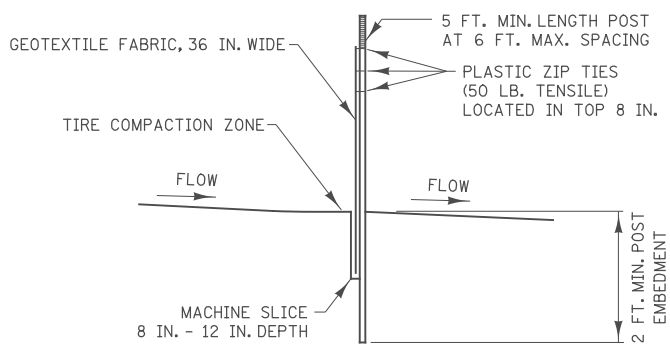
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 SHEET 57 OF 175

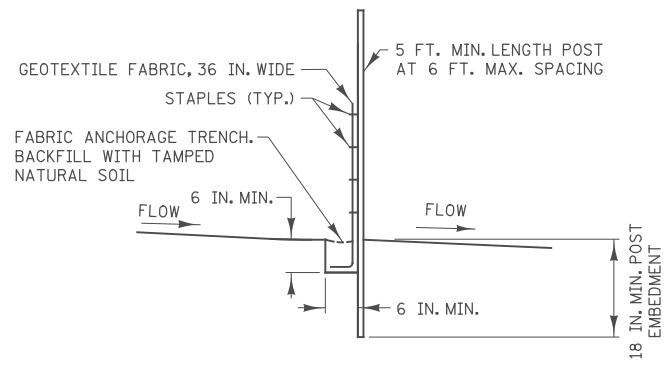
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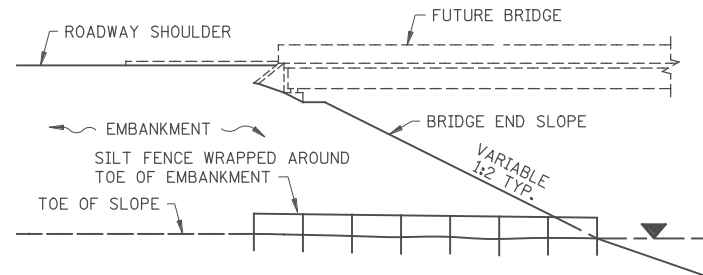
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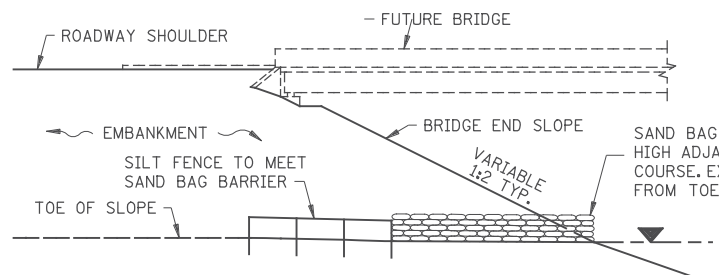
**SILT FENCE TYPE MS ②
(MACHINE SLICED)**



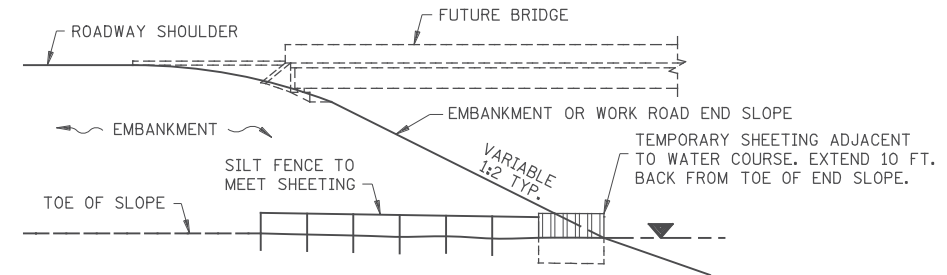
**SILT FENCE TYPE PA ③
(PREASSEMBLED)**



SILT FENCE ONLY ④

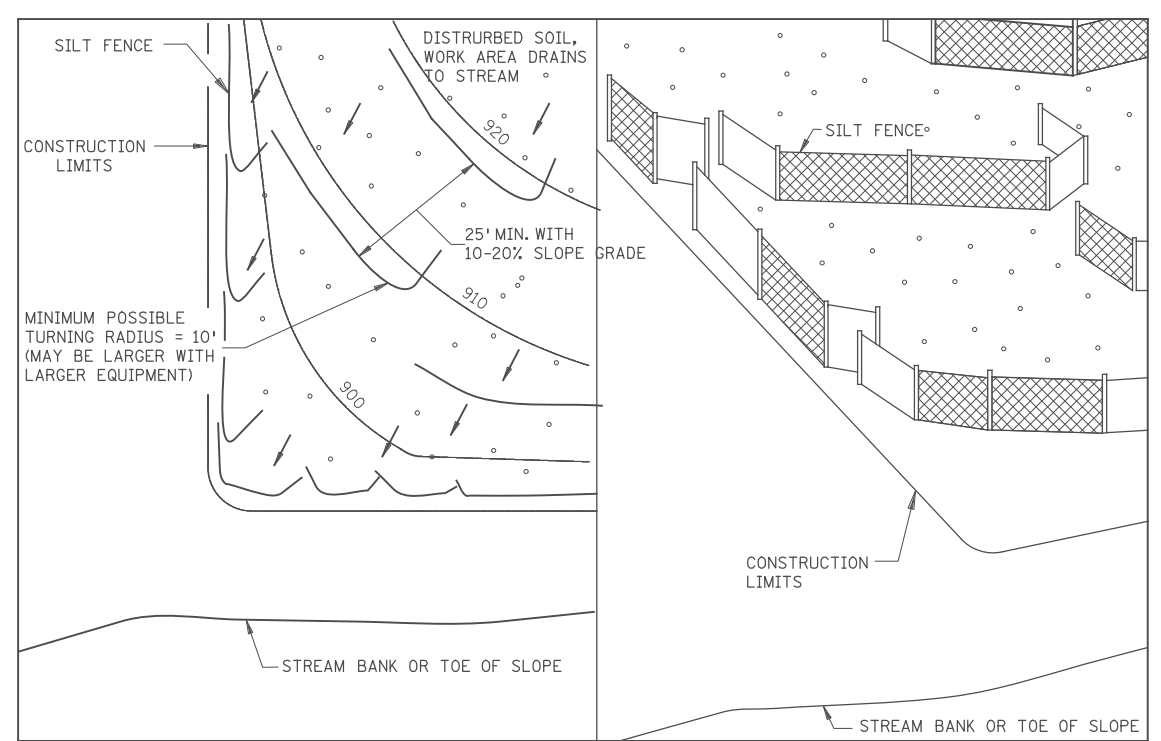


SILT FENCE WITH SAND BAGS ⑤



SILT FENCE WITH SHEETING ⑥

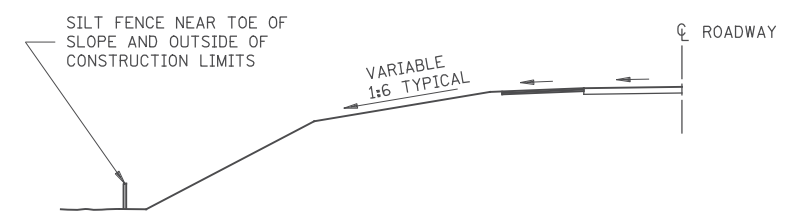
INSTALLATION AT BRIDGE EMBANKMENT ADJACENT TO WATER



PLAN VIEW

PERSPECTIVE VIEW

J-HOOK INSTALLATION



LOCATION AT TOE OF ROADWAY EMBANKMENT

NOTES:

- SEE SPECS. 2573, 3149 & 3886.
- ① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.
- ② TO PROTECT AREAS FROM SHEET FLOW, MAXIMUM CONTRIBUTING AREA: 1 ACRE.
- ③ TO PROTECT AREAS FROM SHEET FLOW, MAXIMUM CONTRIBUTING AREA: 0.25 ACRE.
- ④ WATER COURSE FLOW VELOCITY: STANDING. CONTRIBUTING SLOPE AREA: 1/2 ACRE.
- ⑤ WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC. CONTRIBUTING SLOPE AREA: 1 ACRE.
- ⑥ WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC. CONTRIBUTING SLOPE AREA: 3 ACRES.

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

MINNESOTA
DEPARTMENT OF TRANSPORTATION

[Signature]
STATE DESIGN ENGINEER

REVISED:

APPROVED: 2-28-2017

**TEMPORARY SEDIMENT CONTROL
SILT FENCE**

STANDARD PLAN 5-297.405

6 OF 8

NO	DATE	BY	CKD	APPR	REVISION

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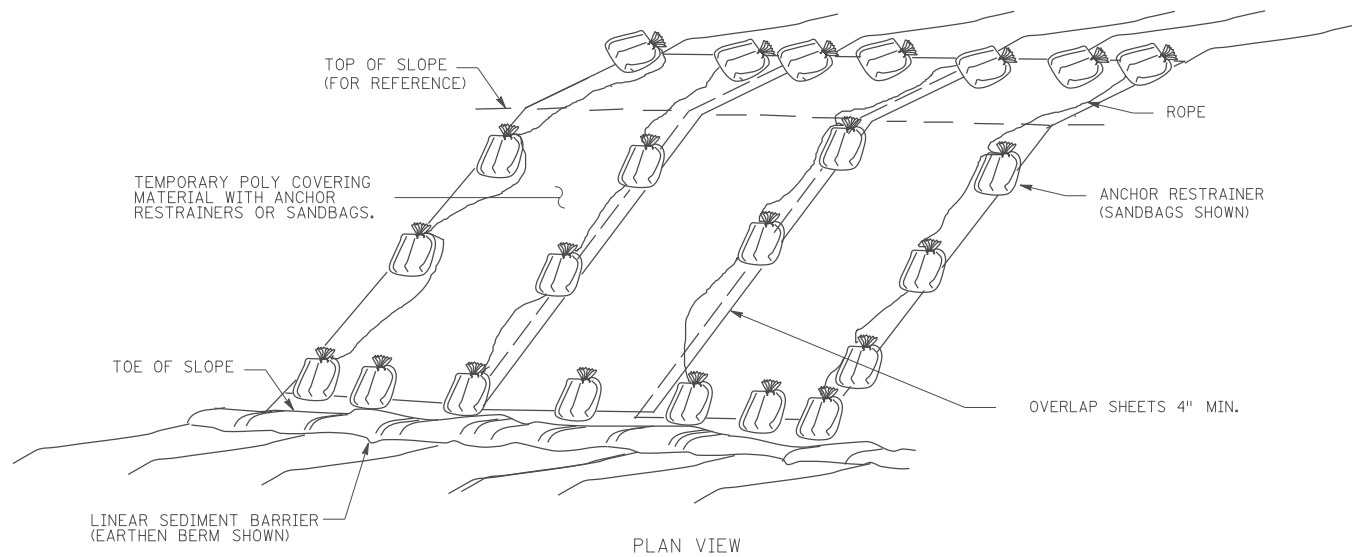
ANOKA COUNTY

STANDARD PLAN SHEETS

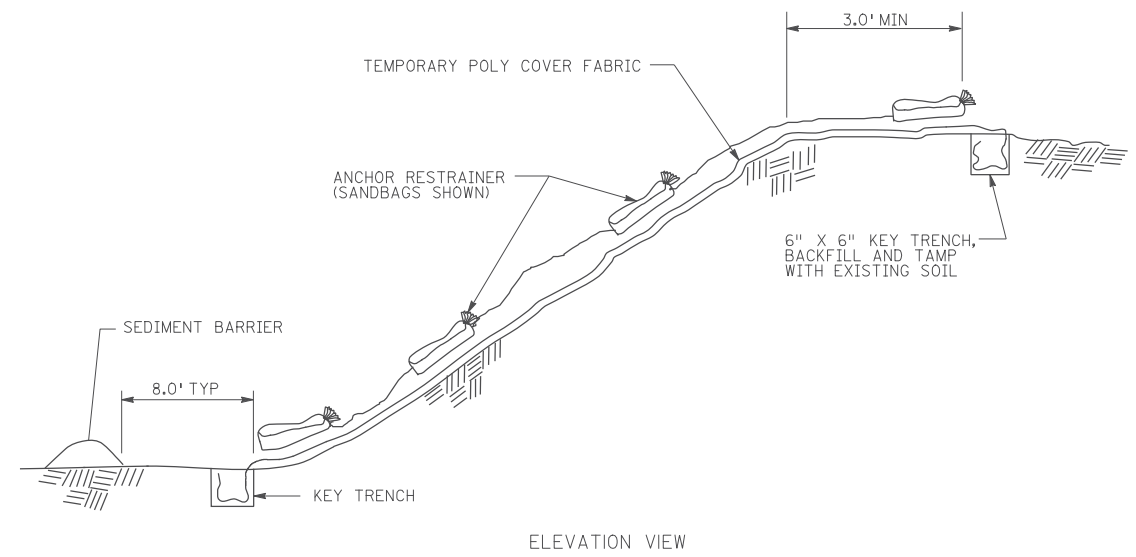
CSAH 78 - BNSF GRADE SEPARATION

SHEET 58 OF 175

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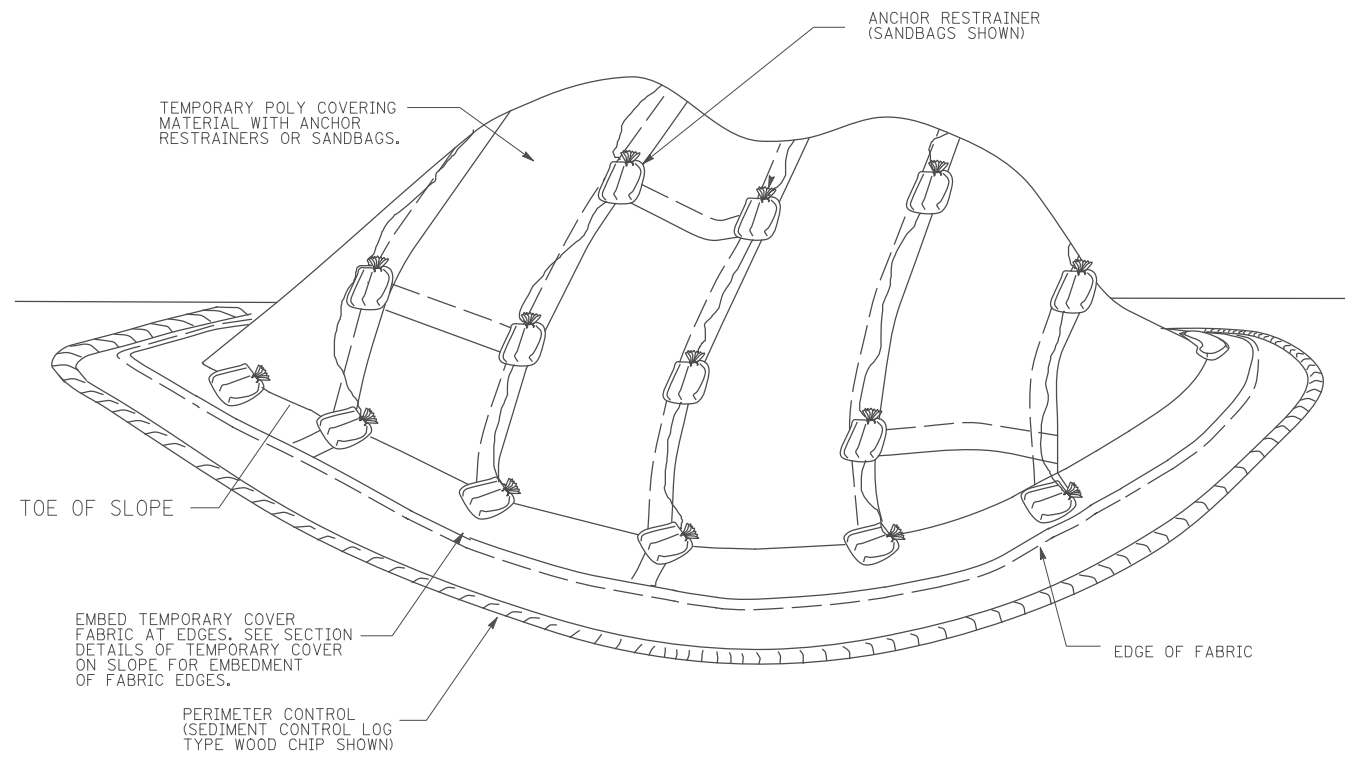


PLAN VIEW

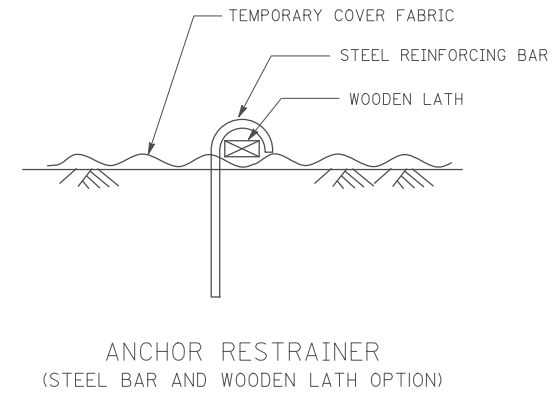


ELEVATION VIEW

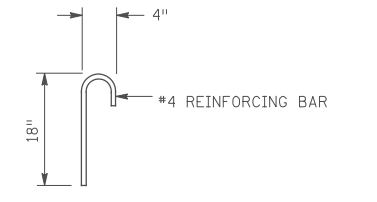
TEMPORARY POLY COVER ON SLOPE



TEMPORARY POLY COVER ON STOCKPILE



ANCHOR RESTRAINER (STEEL BAR AND WOODEN LATH OPTION)



STEEL REINFORCING BAR DETAIL

NOTES
 ANCHOR RESTRAINERS: TYPE, QUANTITY, AND SPACING ARE INCIDENTAL TO POLY COVER. PROVIDE ON CORNERS AND SEAMS OF POLY COVER MATERIAL TO KEEP FROM BLOWING OFF. NO MINIMUM SPACING REQUIRED.
 PERIMETER CONTROL: USE SEDIMENT CONTROL LOGS TYPE WOOD CHIP OR COMPOST, INCIDENTAL.

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


 DEPARTMENT OF TRANSPORTATION
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 REVISIONS: 2-28-2017
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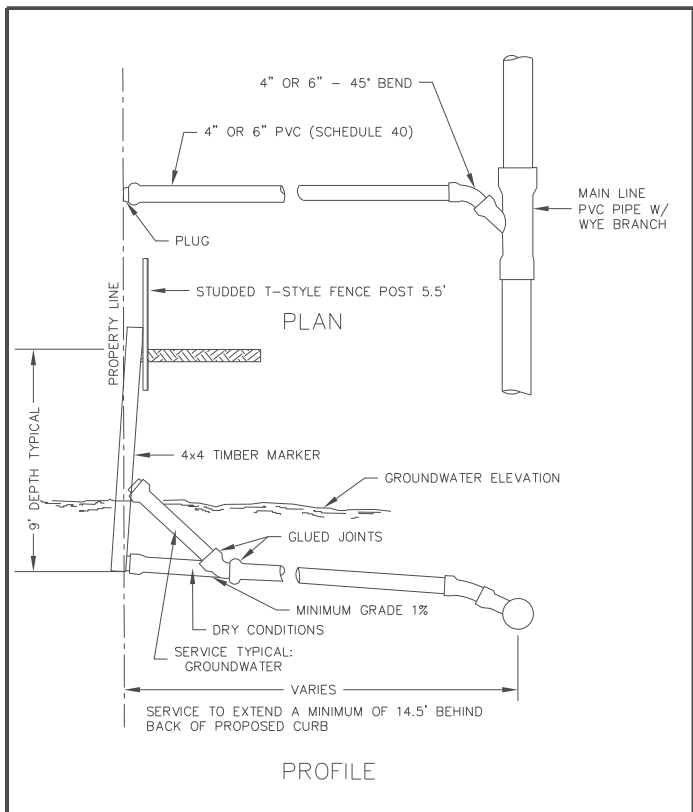
TEMPORARY EROSION CONTROL
 TEMPORARY POLY COVERINGS
STANDARD PLAN 5-297.409 1 OF 1

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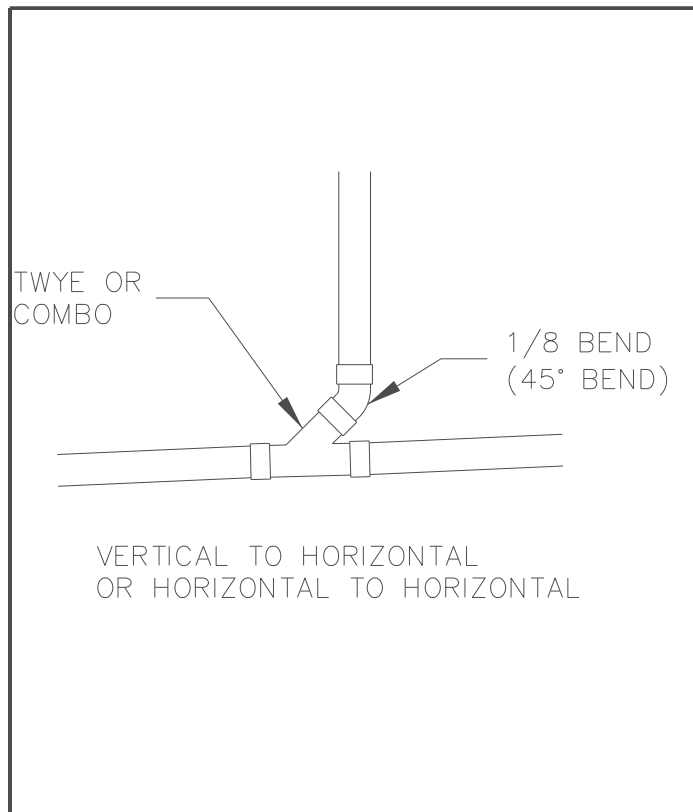
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 DESIGNED BY: *[Signature]*
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 COMM. NO. 0169140


ANOKA COUNTY
 STANDARD PLAN SHEETS
CSAH 78 - BNSF GRADE SEPARATION
 SHEET 60 OF 175

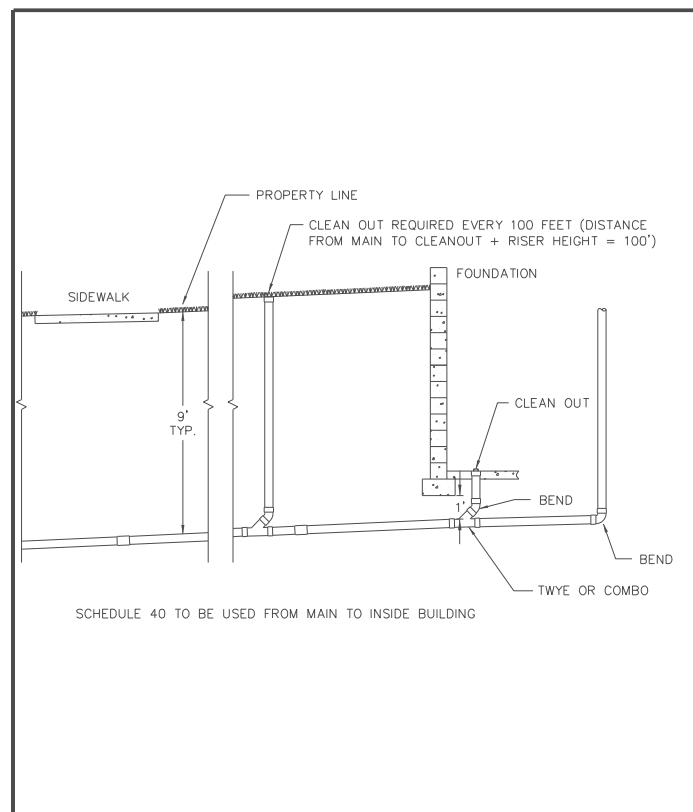
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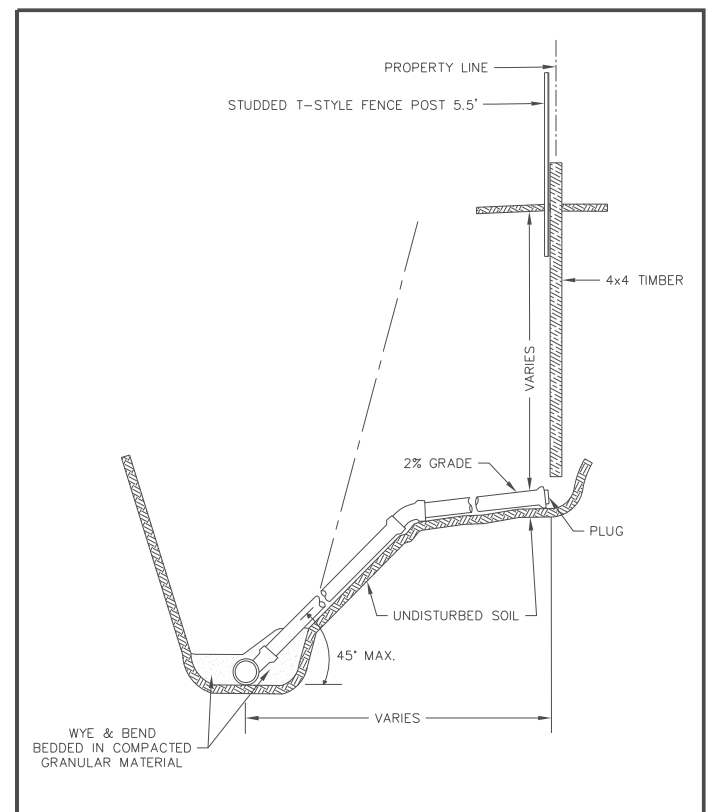
COON RAPIDS Minnesota
TYPICAL SEWER SERVICE
 DRAWN: A.S.W. DATE: 12/16/2014 SCALE: PLATE NO. SAN-1



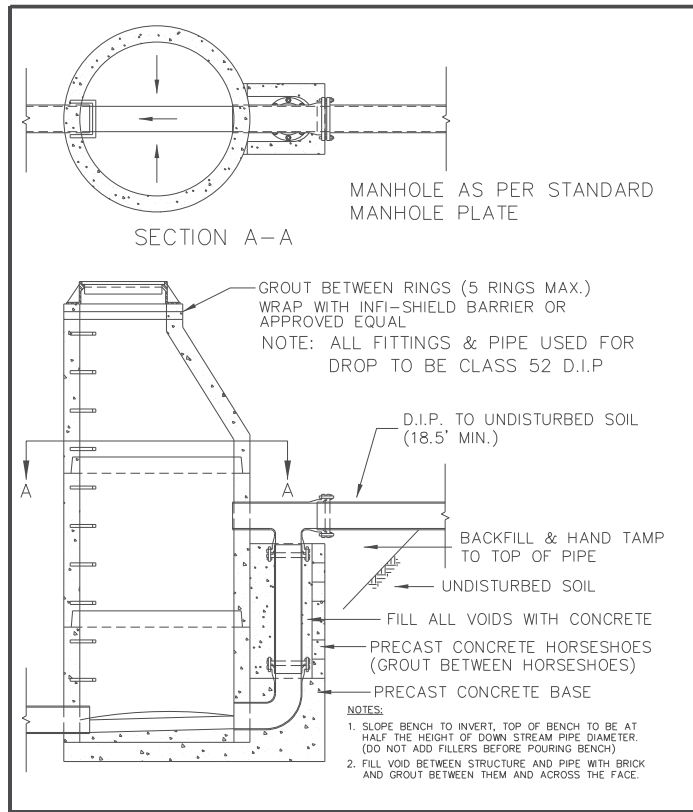
COON RAPIDS Minnesota
SANITARY SEWER PIPE WITH A CHANGE IN DIRECTION
 DRAWN: R.L.S. DATE: 2/8/2005 SCALE: PLATE NO. SAN-2



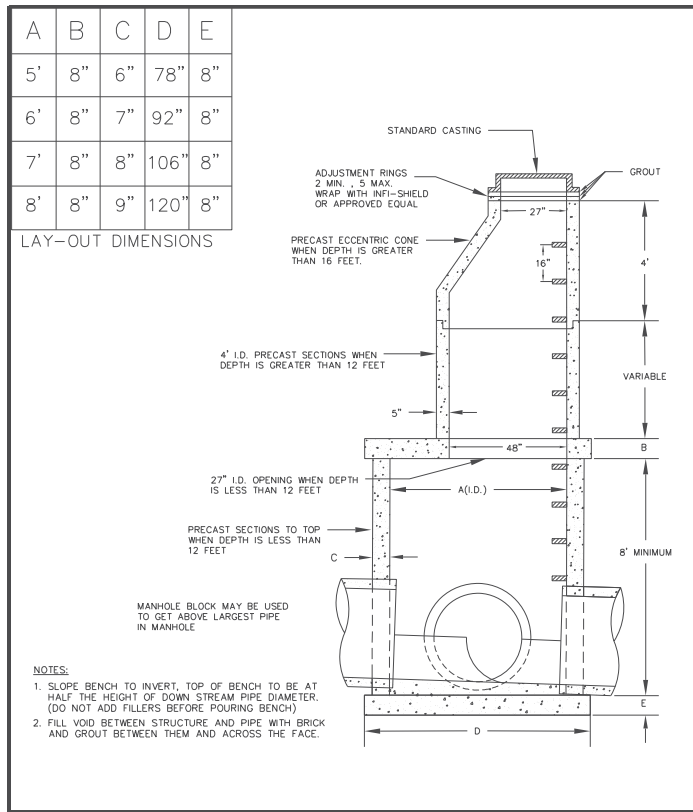
COON RAPIDS Minnesota
SANITARY SEWER SERVICE FROM PROPERTY LINE TO INSIDE BUILDING
 DRAWN: R.L.S. DATE: 1/31/2005 SCALE: NONE PLATE NO. SAN-3



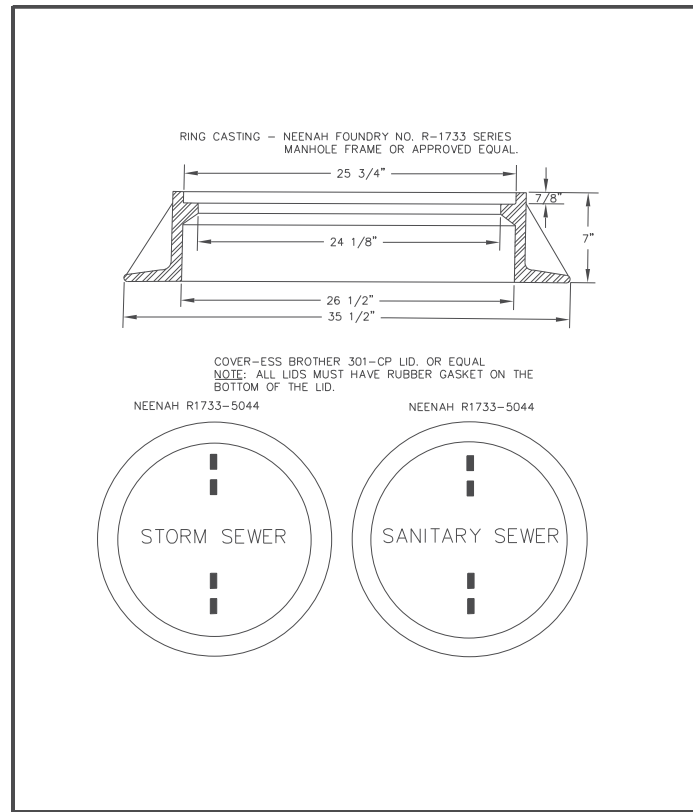
COON RAPIDS Minnesota
TYPICAL SEWER SERVICE WITH RISER
 DRAWN: A.S.W. DATE: 12/16/2014 SCALE: PLATE NO. SAN-4



COON RAPIDS Minnesota
STANDARD DROP MANHOLE
 DRAWN: R.L.S. DATE: 1/11/2005 SCALE: NONE PLATE NO. SAN-5



COON RAPIDS Minnesota
LARGE DIAMETER MANHOLE
 DRAWN: A.S.W. DATE: 12/15/2014 SCALE: PLATE NO. SAN-6



COON RAPIDS Minnesota
STANDARD MANHOLE CASTINGS
 DRAWN: A.S.W. DATE: 2/13/2015 SCALE: NONE PLATE NO. SAN-7

NOTES:
 ① PAID FOR AS CONST DRAINAGE STRUCTURE DESIGN SPEC 3

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License #: 53680

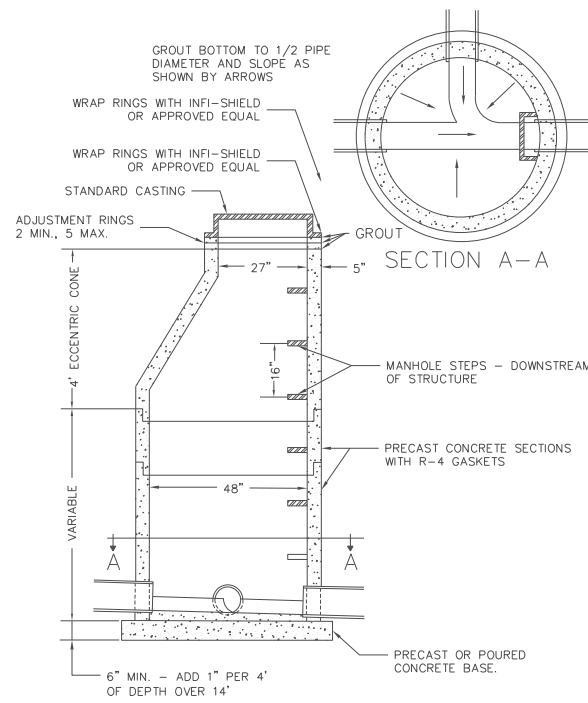
STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



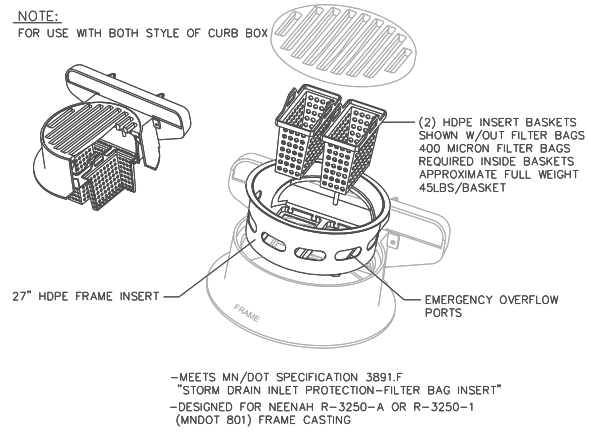
ANOKA COUNTY
 MISCELLANEOUS DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 61 OF 175



STANDARD MANHOLE

DRAWN: A.S.W. DATE: 1/14/2014 SCALE: PLATE NO. SAN-8



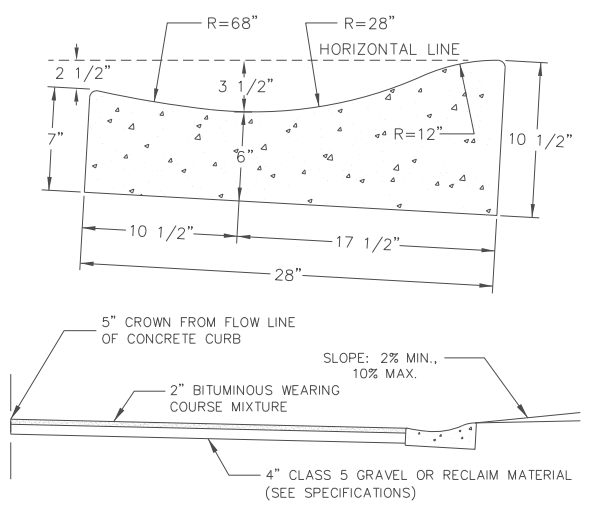
-MEETS MN/DOT SPECIFICATION 3891.F "STORM DRAIN INLET PROTECTION-FILTER BAG INSERT"
 -DESIGNED FOR NEENAH R-3250-A OR R-3250-1 (MNDOT 801) FRAME CASTING

FILTER AREA	5.65 FT ²
OVERFLOW AREA	0.42 FT ²
MAXIMUM OVERFLOW RATE (Ø 7" HEAD)	1.99 CFS
MAXIMUM OVERFLOW RATE (Ø 13" HEAD)	2.79 CFS
BASKET WEIGHT (EMPTY)	1 LB
BASKET WEIGHT (FULL-APPROX.)	45 LBS

- GENERAL NOTES:
1. PRODUCT DESIGN DOES NOT INTERFERE WITH LOAD BEARING CAPACITY OF FRAMES.
 2. MADE OF UV RESISTANT MATERIAL.
 3. DURABLE ECO-FRIENDLY HDPE PROVIDES A LIGHTWEIGHT AND STRONG PRODUCT THAT CAN EASILY BE RE-USED NEXT PROJECT.
 4. FLOW RATES COMPARE TO OR EXCEED FLOW RATES OF COMMONLY USED GRATES.
 5. BASKET DESIGN PROVIDES LARGER FILTER AREA AND PROVIDES EASY CLEANING, REDUCING OVERFLOW INSTANCES AND SEDIMENT LOAD ON THE SEWER SYSTEM.
 6. DESIGNED TO FIT NEENAH R-3250-1 (Mndot 801).

INFRASAFE 27" DIA. INLET PROTECTION DEVICE

DRAWN: R.L.S. DATE: 4/6/2010 SCALE: NONE PLATE NO. EC-1



NOTE: SURMOUNTABLE CURB TAKES 0.0566 CU. YDS. PER. LIN. FOOT OR 17.8 LIN. FEET PER CU. YD.

SURMOUNTABLE CURB DETAIL AND TYPICAL STREET SECTION

DRAWN: R.L.S. DATE: 2/10/2005 SCALE: NONE PLATE NO. STR-3

NOTES:
 ① PAID FOR UNDER CONST DRAINAGE STRUCTURE DESIGN F

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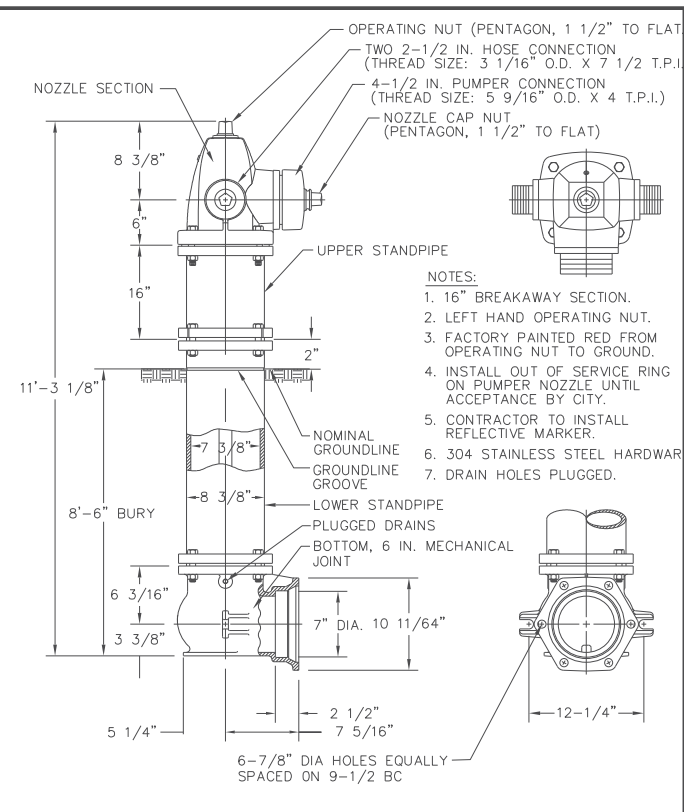
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051
 DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140

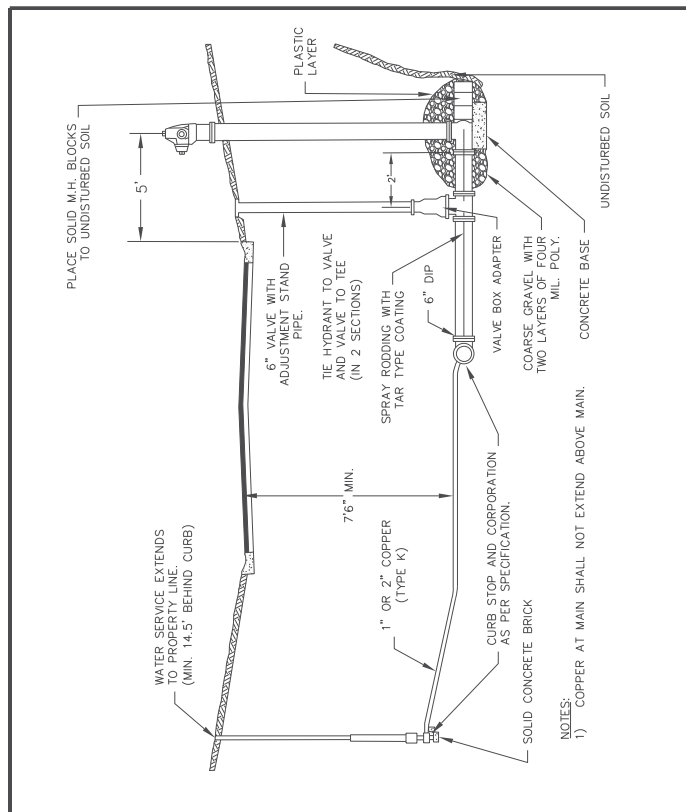


ANOKA COUNTY
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 CSAH 78 - BNSF GRADE SEPARATION

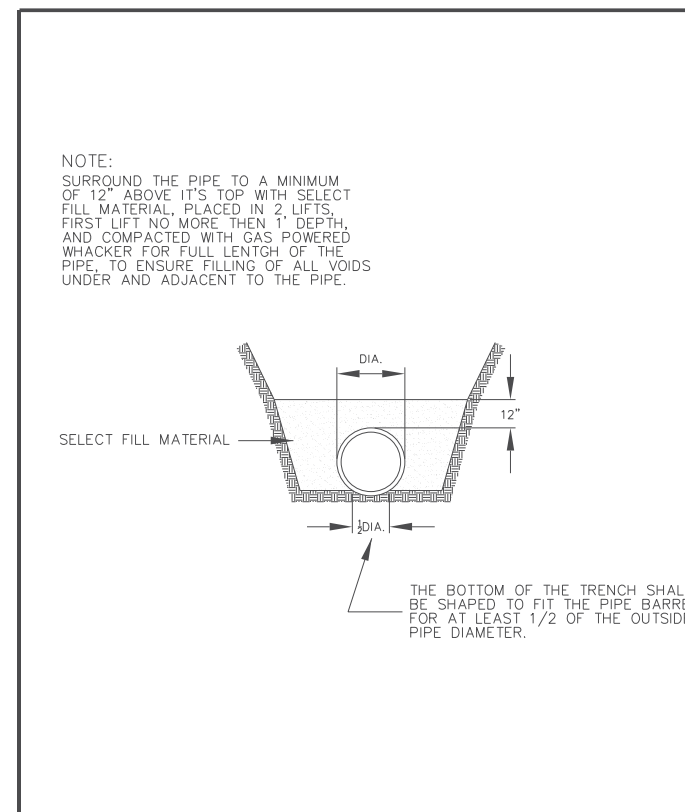
SHEET 62 OF 175



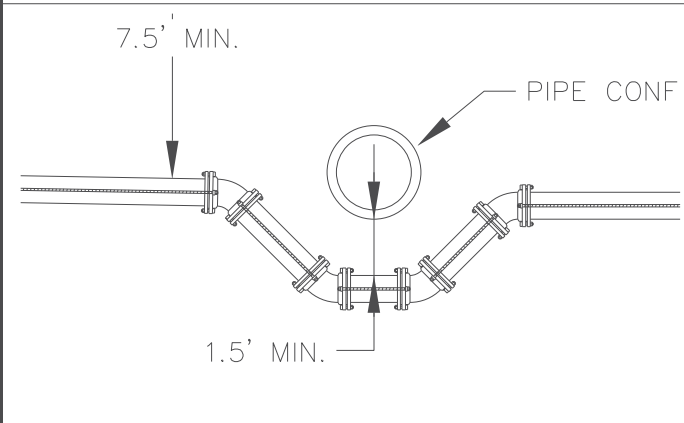
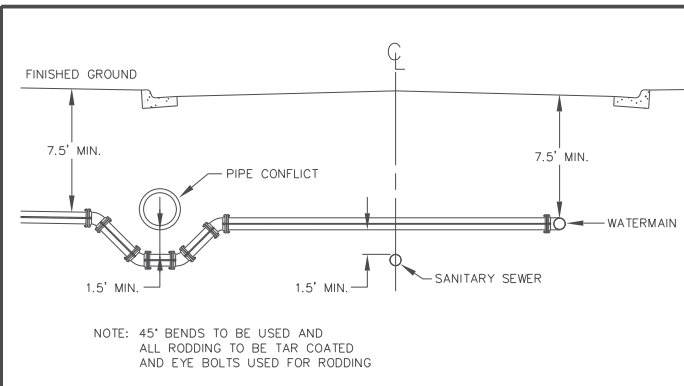
COON RAPIDS HYDRANT DETAIL
WB67 PACER 8'-6" BURY
DRAWN: R.L.S. DATE: 2/9/2010 SCALE: NONE PLATE NO: WM-1



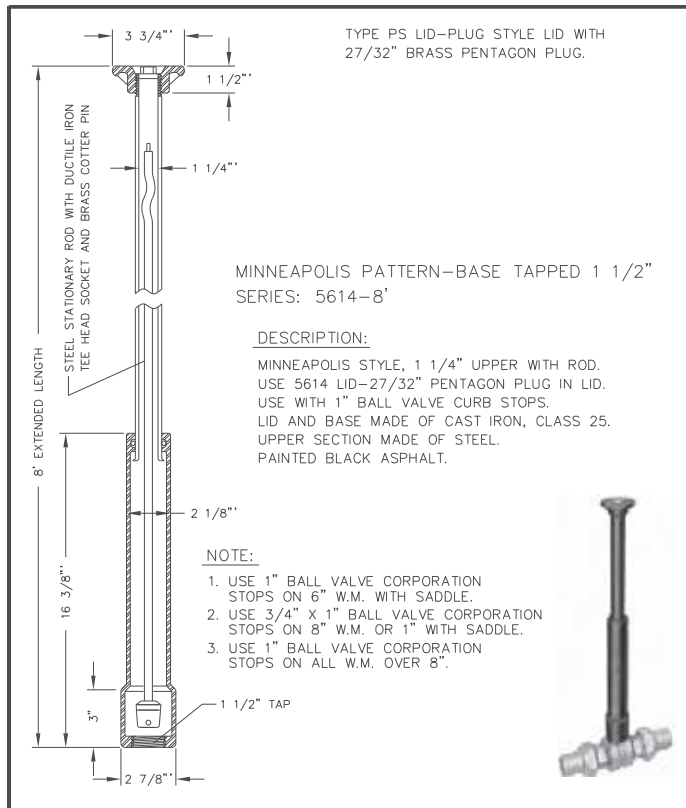
COON RAPIDS TYPICAL HYDRANT & WATER SERVICE LAYOUT FOR NEW CONSTRUCTION
DRAWN: A.S.W. DATE: 12/16/2014 SCALE: NONE PLATE NO: WM-3



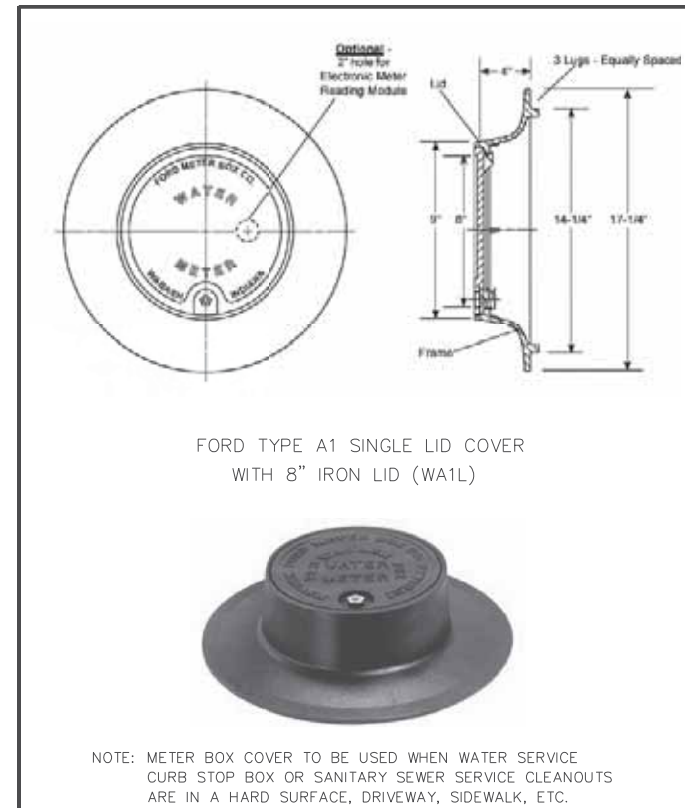
COON RAPIDS CLASS C PIPE BEDDING
DRAWN: R.L.S. DATE: 1/12/2005 SCALE: NONE PLATE NO: WM-5



COON RAPIDS VERTICAL BENDS DETAIL
DRAWN: R.L.S. DATE: 3/14/2005 SCALE: NONE PLATE NO: WM-6



COON RAPIDS CURB STOP BOX WITH ROD
DRAWN: R.L.S. DATE: 4/23/2014 SCALE: NONE PLATE NO: WM-4



COON RAPIDS METER BOX COVER
DRAWN: R.L.S. DATE: 3/10/2010 SCALE: NONE PLATE NO: WM-7

- NOTES:
① 1" PVC SHALL BE USED INSTEAD OF 1" COPPER PIPE TYPE K
② CURB STOP AND CORPORATION PAID FOR UNDER WATER SERVICE TAP & HOOK UP

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Ben Robeck
Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051
DRAWN BY S. VANG
DESIGNED BY T. SMITH
CHECKED BY B. ROBECK
COMM. NO. 0169140

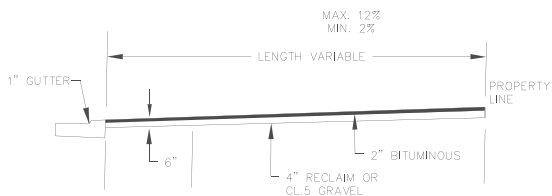
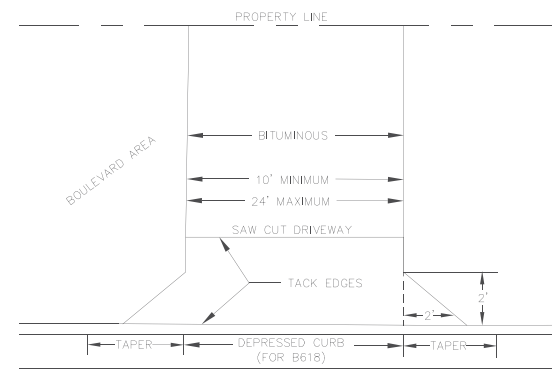


ANOKA COUNTY
MISCELLANEOUS DETAILS
CSAH 78 - BNSF GRADE SEPARATION

SHEET 63 OF 175

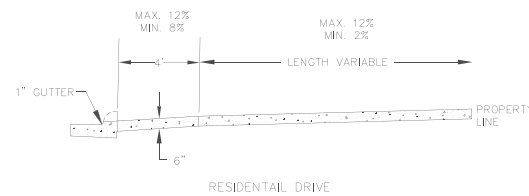
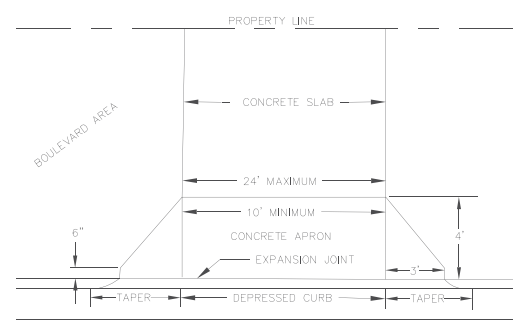
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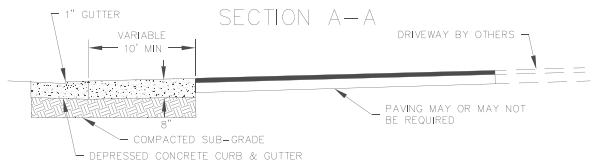
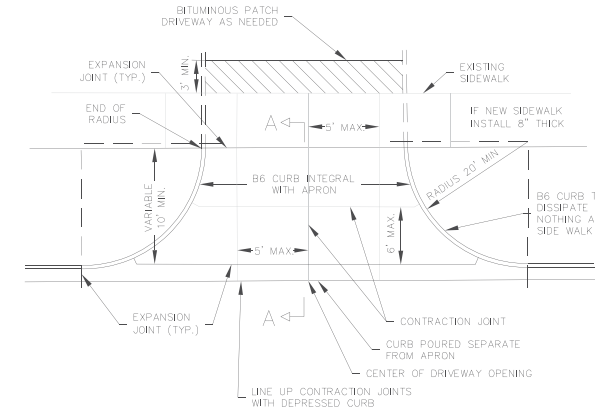
BITUMINOUS DRIVEWAY DETAIL FOR STREET RECONSTRUCTION

DRAWN: A.S.W. DATE: 2/11/2014 SCALE: PLATE NO. STR-7



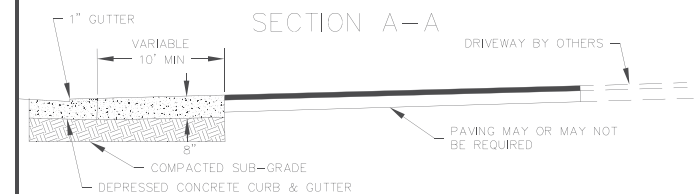
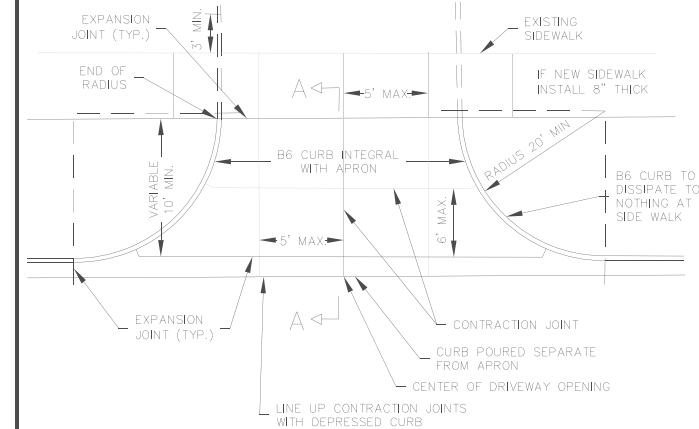
CONCRETE DRIVEWAY DETAIL FOR STREET RECONSTRUCTION

DRAWN: A.S.W. DATE: 12/15/2014 SCALE: PLATE NO. STR-8



COMMERCIAL DRIVEWAY FOR STREET RECONSTRUCTION

DRAWN: A.S.W. DATE: 12/15/2014 SCALE: PLATE NO. STR-9



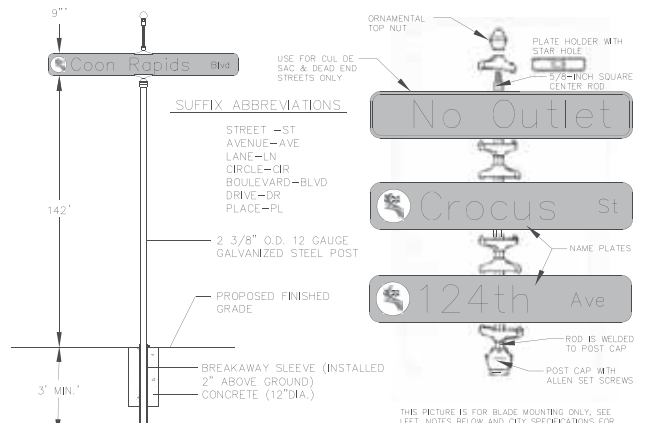
COMMERCIAL DRIVEWAY

DRAWN: A.S.W. DATE: 12/15/2014 SCALE: PLATE NO. STR-10



STREET SIGN LOGO

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

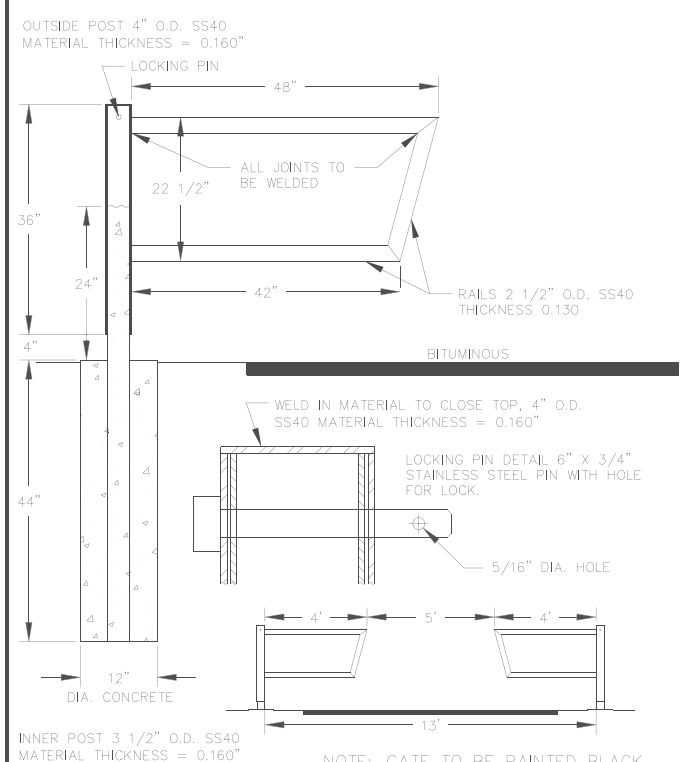


- NOTES:
1. SIGN BLADE SIZE IS 9" FOR 40 MPH AND LESS, 12" FOR 45 MPH AND GREATER, ARE MADE OUT OF .050" THICK ALUMINUM AND HAVE ROUNDED CORNERS.
 2. BLADE LENGTH SHALL BE 24" MIN. OR AS NECESSARY TO FIT NAME AND LOGO.
 3. BLADES SHALL BE SINGLE FACED AND FASTENED TOGETHER WITH STAINLESS STEEL BOLTS WITH NYLON INSERT LOCK NUTS.
 4. LETTER SIZE IS 6" UPPER CASE & 4-5" LOWER CASE FOR STREET NAME ON 9" BLADES, 8" UPPER CASE & 6" LOWER CASE FOR STREET NAME ON 12" BLADES, 3" UPPER CASE & 2.5" LOWER CASE FOR SUFFIX ON 9" & 12" BLADES.
 5. THE FONT TO USE FOR LETTERING IS SERIES 9.
 6. WHITE DIAMOND GRADE SHEETING, MANDOT GREEN BACKGROUND FOR PUBLIC STREETS, MANDOT BLUE BACKGROUND FOR PRIVATE STREETS, EC FILM OVERLAY WITH LOGO AND NO BORDER.
 7. THE CITY LOGO WILL PRECEDE THE STREET NAME ON BLADE.
 8. STREET NAMES SHALL BE SPELLED COMPLETELY EXCEPT FOR SUFFIXES.
 9. SIGN BRACKETS SHALL BE LYLE SIGNS NO. E-450.
 10. SIGN POST SHALL BE 2 3/8" O.D. X 12" LONG GALVANIZED ROUND TUBE AND INSTALLED WITH BREAKAWAY SLEEVE BY CONCRETE.
 11. A SIGN PLAN SHOWING SIGN COLORS, SIZES AND LETTERING MUST BE SUBMITTED TO THE CITY FOR REVIEW AND APPROVAL.
 12. SEE CITY SPECIFICATIONS FOR MORE DETAILS ON MATERIALS AND LAYOUT.



STREET SIGN INSTALLATION

DRAWN: R.L.S. DATE: 1/28/2018 SCALE: NONE PLATE NO. STR-13



GATE DETAIL FOR TRAILS AND FIRE LANES

DRAWN: R.L.S. DATE: 3/24/2017 SCALE: NONE PLATE NO. STR-21

- NOTES:
- ① SEE TYPICAL SECTIONS INSETS FOR PAVEMENT TYPE
 - ② PAID FOR UNDER VEHICULAR GATE-SINGLE
 - ③ PAID FOR UNDER SIGN PANELS TYPE SPECIAL

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO. 002-678-023, 114-020-051

DRAWN BY S. VANG
DESIGNED BY T. SMITH
CHECKED BY B. ROBECK
COMM. NO. 0169140



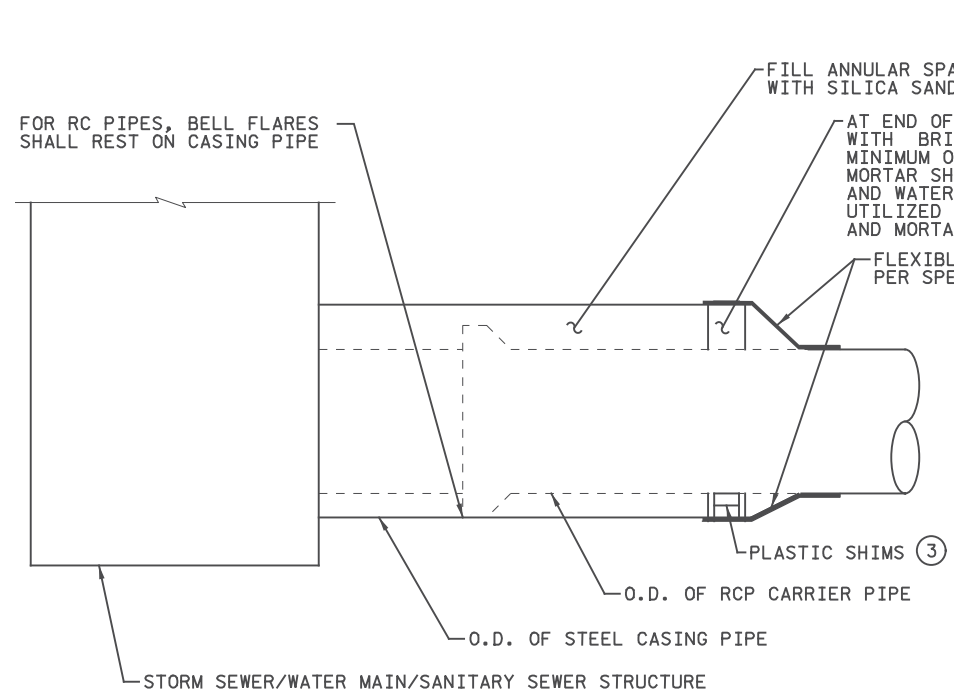
ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
MISCELLANEOUS DETAILS
CSAH 78 - BNSF GRADE SEPARATION

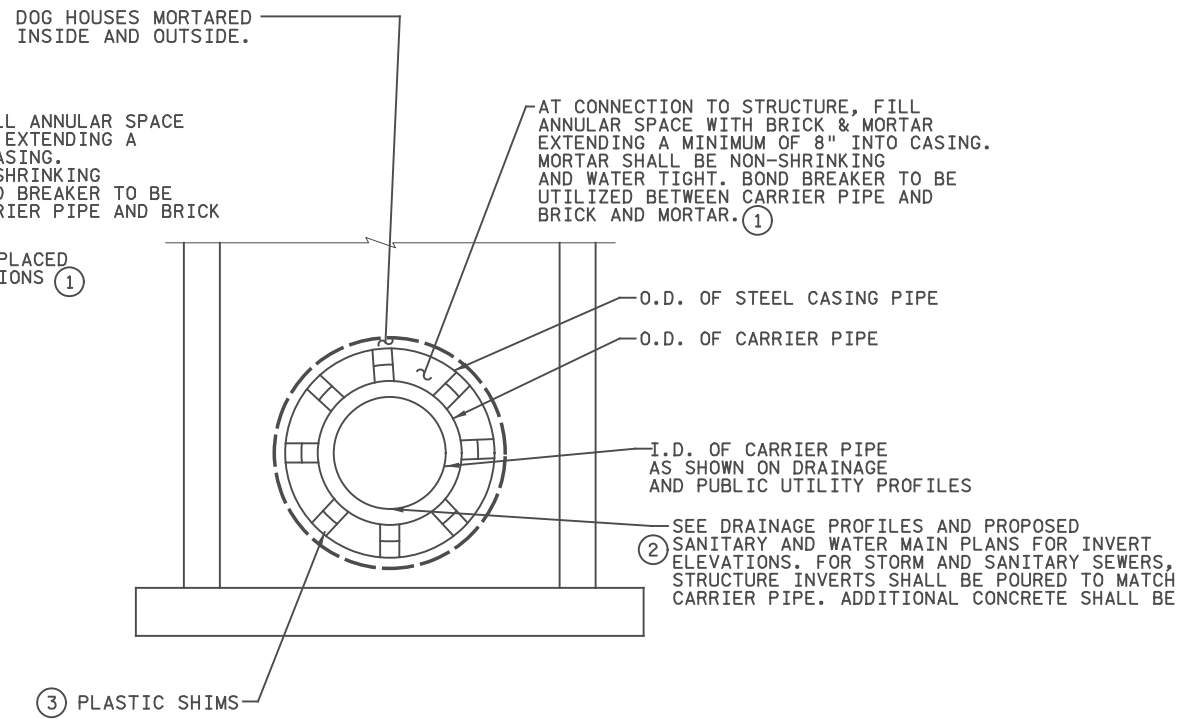
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NO	DATE	BY	CKD	APPR	REVISION



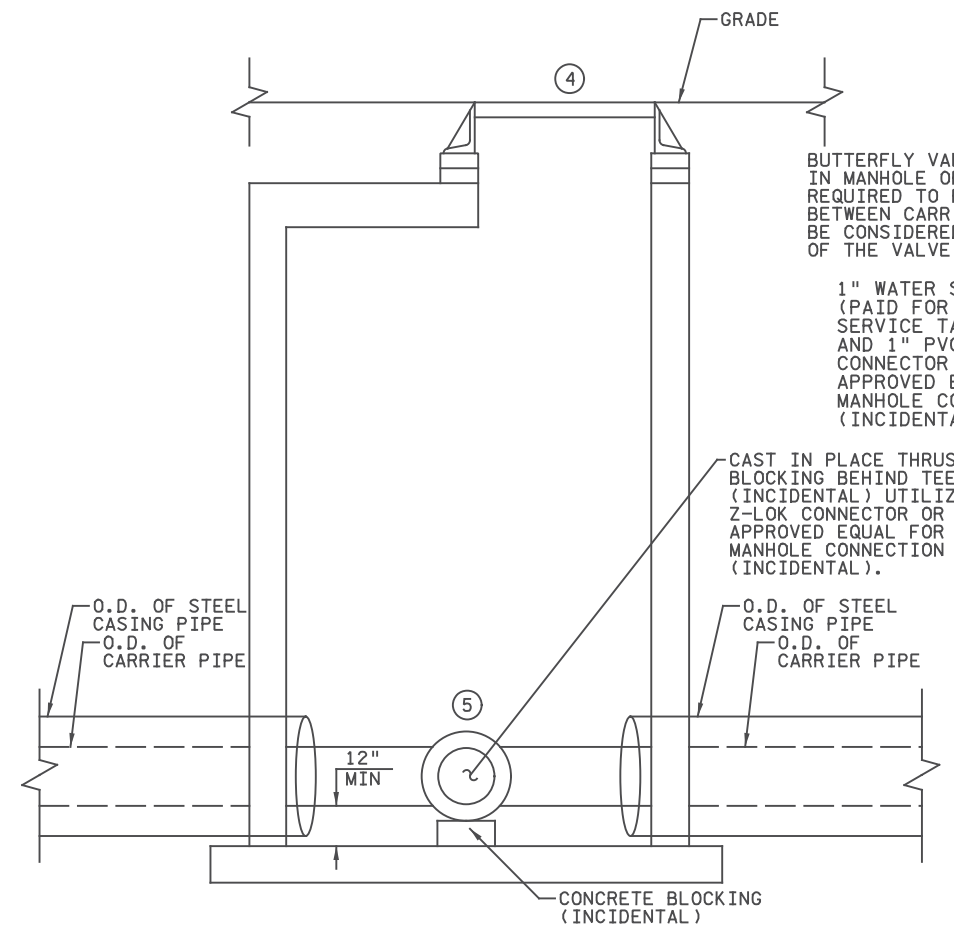
CASING AND CASING END SEAL DETAIL
NOT TO SCALE



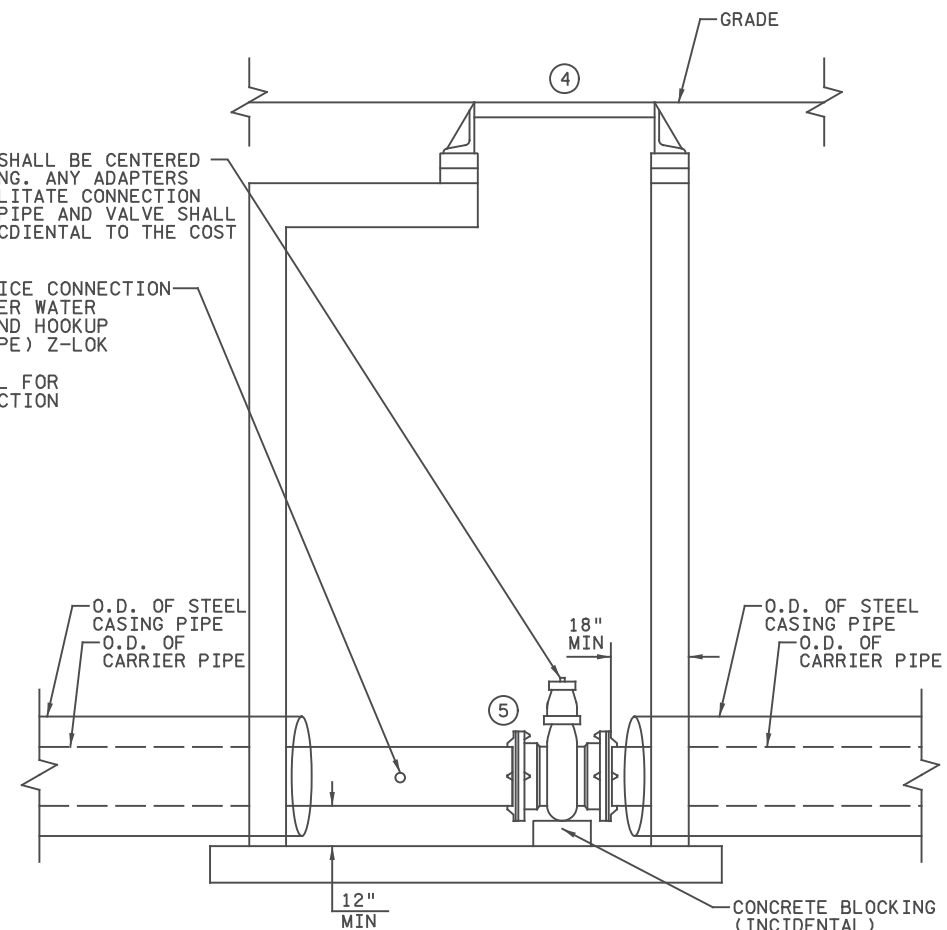
DETAIL OF CONNECTION OF CASIED PIPE TO STRUCTURE
NOT TO SCALE

NOTES:

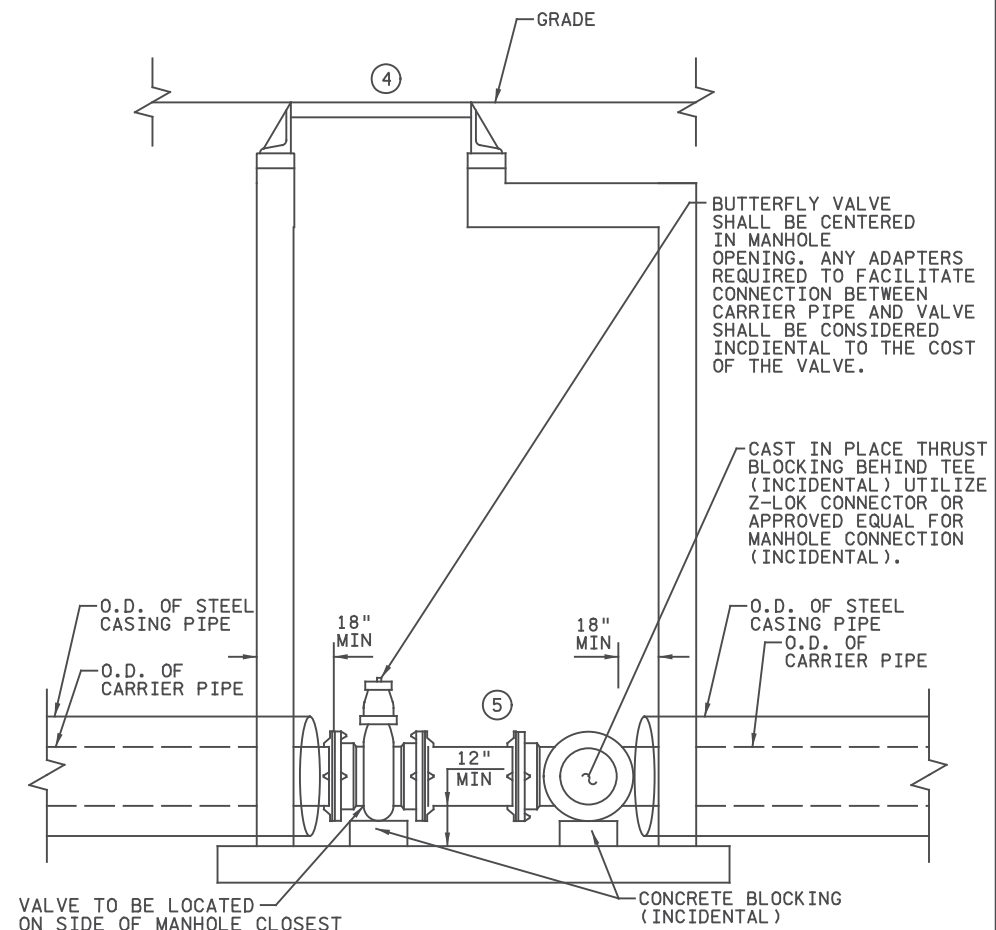
- ① END SEAL, SILICA SAND, BRICK & MORTAR, BOND BREAKER, SHIMS, AND SPACERS ARE INCIDENTAL.
- ② PAY HEIGHT FOR STRUCTURES WITH CASIED OUTLET PIPE IS INCREASED BY 9" FOR SANITARY SEWER AND 6" FOR STORM SEWER FOR EXTRA DEPTH TO ACCOMODATE CASING.
- ③ SANITARY AND WATER MAIN SHALL USE SPACERS.
- ④ SHOP DRAWINGS INCLUDING MANUFACTURER FITTING DIMENSIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- ⑤ ALL FITTINGS LOCATED WITHIN PROPOSED WATER MAIN MANHOLES SHALL BE FLANGED AND SUITABLE FOR ABOVE GROUND APPLICATIONS.



WATER MAIN MANHOLE DETAIL 1
WATER MAIN MANHOLES 15 AND 18
NOT TO SCALE



WATER MAIN MANHOLE DETAIL 2
WATER MAIN MANHOLE 16
NOT TO SCALE



WATER MAIN MANHOLE DETAIL 3
WATER MAIN MANHOLE 17
NOT TO SCALE

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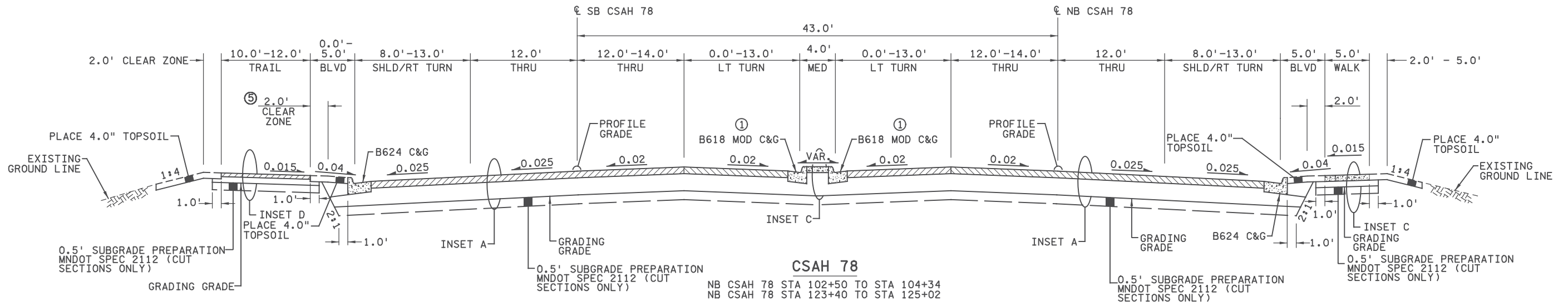
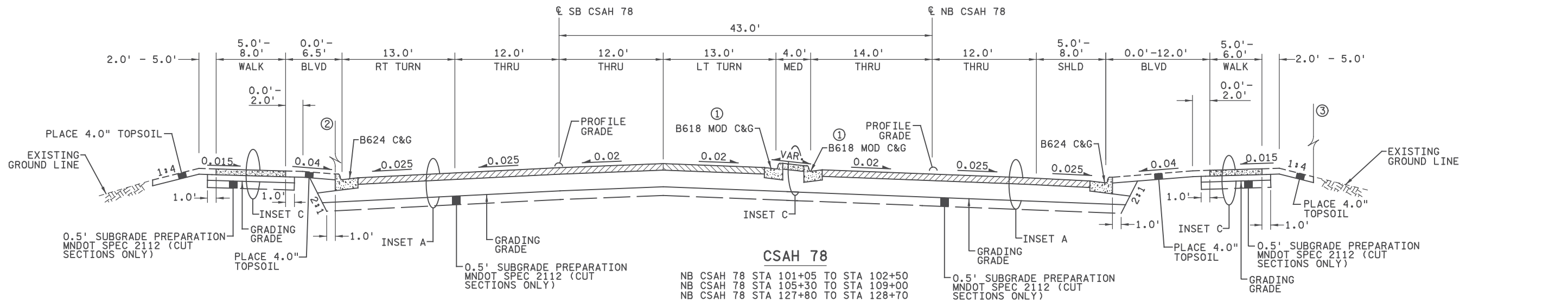
1	1/12/2018	BR	CT	BR	ADDENDUM 3 - REVISED GATE VALVE REFERENCE TO BUTTERFLY VALVE
2	1/16/2018	BR	CT	BR	ADDENDUM 4 - NOTED ADAPTERS INCIDENTAL TO VALVE
NO	DATE	BY	CKD	APPR	REVISION
... \CAD_BIM\1an\9140_dd04.dgn					

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Print Name: BENJAMIN P ROBECK
Ben Robeck
Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051
DRAWN BY S. VANG
DESIGNED BY T. SMITH
CHECKED BY B. ROBECK
COMM. NO. 0169140



ANOKA COUNTY
MISCELLANEOUS DETAILS
CSAH 78 - BNSF GRADE SEPARATION
CASING PIPE/MANHOLE DETAILS



GENERAL NOTES:

SEE SHEET 70 FOR PAVEMENT INSETS AND DETAILS.

DIMENSIONS AT CURB AND BARRIER ARE TO FACE UNLESS NOTED OTHERWISE.

ALL CROSS SLOPES ARE FT PER FT.

SEE SUPERELEVATION PLANS FOR SUPERELEVATION TRANSITIONS.

RETAINING WALLS SHOWN FOR INFORMATION ONLY. SEE RETAINING WALL PLANS FOR WALL AND BARRIER DETAILS.

SEE CONTOUR PLANS AND CROSS SECTIONS FOR SPECIFIC GRADING.

SEE TOPOGRAPHY AND UTILITY PLANS FOR SPECIFIC RIGHT-OF-WAY AND EASEMENT INFORMATION.

A 1.5' CLEAR ZONE MEASURED FROM THE FACE OF CURB SHALL BE MAINTAINED FOR CSAH 78 AND ALL LOCAL ROADS. ADDITIONAL TRAIL CLEAR ZONES ARE NOTED.

TOPSOIL PAID FOR AS COMMON EMBANKMENT. ALL OTHER EMBANKMENT PAID FOR AS GRANULAR EMBANKMENT UNLESS OTHERWISE NOTED.

NOTES:

① SEE MEDIAN B618 MODIFIED CURB & GUTTER ON SHEET 70

② SEE DETAIL A ON SHEET 69

③ SEE DETAIL B ON SHEET 69

⑤ SEE SHEET 135 FOR TRAIL STRIPING DETAIL

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Ben Robeck

Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
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T. SMITH

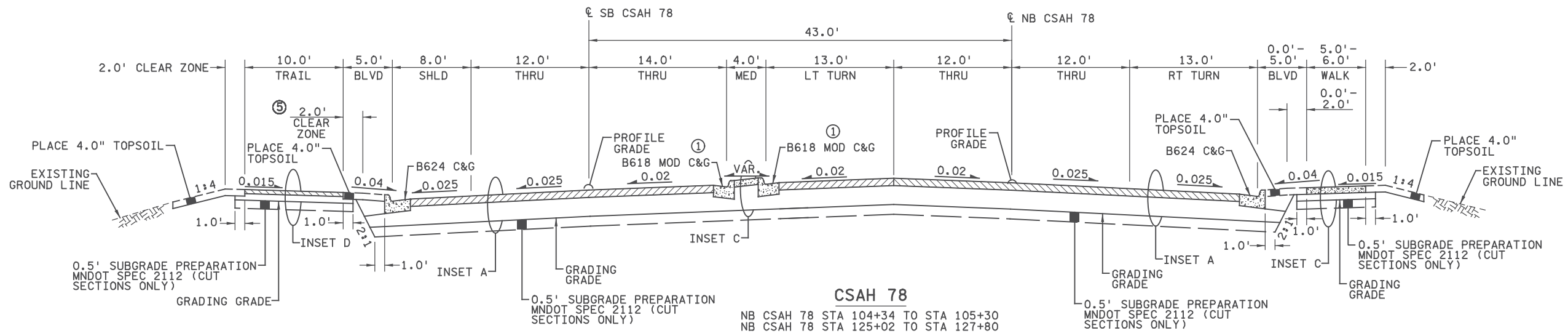
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B. ROBECK

COMM. NO. 0169140



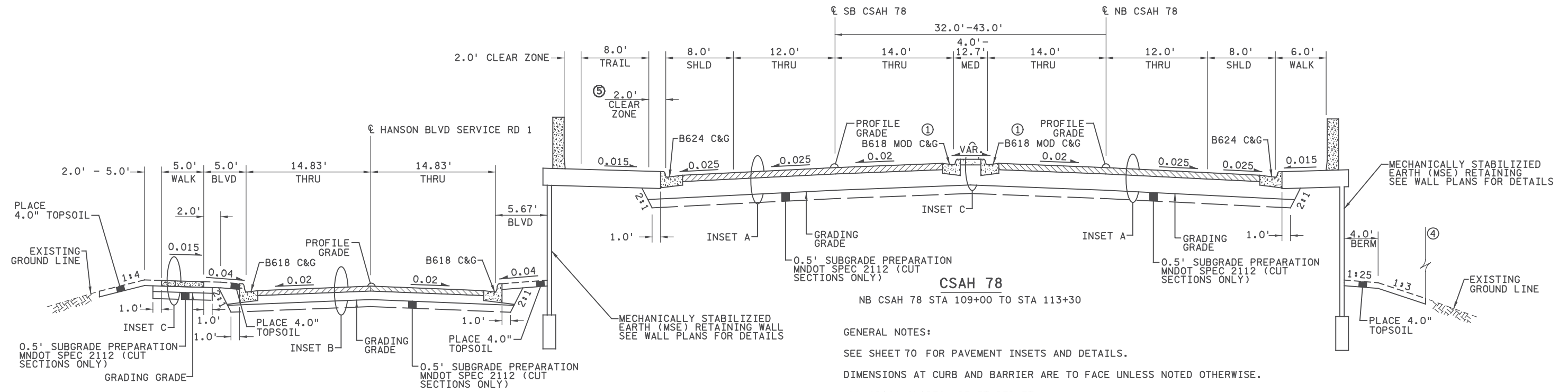
ANOKA COUNTY
TYPICAL SECTIONS
CSAH 78 - BNSF GRADE SEPARATION

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OF
175



CSAH 78

NB CSAH 78 STA 104+34 TO STA 105+30
 NB CSAH 78 STA 125+02 TO STA 127+80



HANSON BLVD SERVICE RD 1

HANSON SERVICE ROAD 1 STA 403+91 TO STA 408+84

CSAH 78

NB CSAH 78 STA 109+00 TO STA 113+30

GENERAL NOTES:

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- SEE CONTOUR PLANS AND CROSS SECTIONS FOR SPECIFIC GRADING.
- SEE TOPOGRAPHY AND UTILITY PLANS FOR SPECIFIC RIGHT-OF-WAY AND EASEMENT INFORMATION.
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NOTES:

- ① SEE MEDIAN B618 MODIFIED CURB & GUTTER ON SHEET 70
- ④ SEE DETAIL C ON SHEET 69
- ⑤ SEE SHEET 135 FOR TRAIL STRIPING DETAIL

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Ben Robeck
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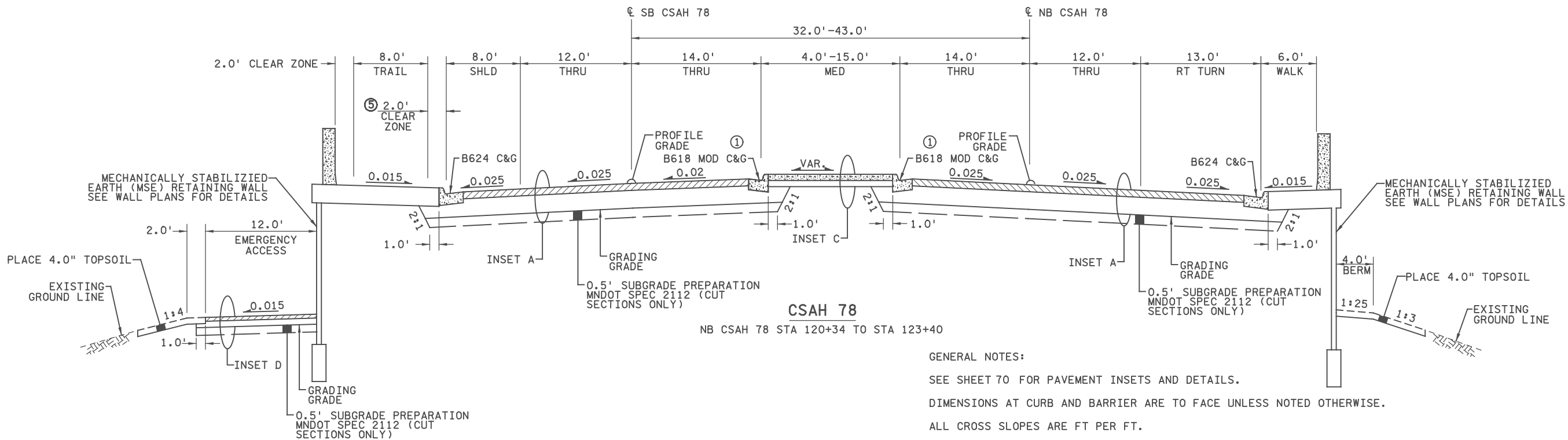
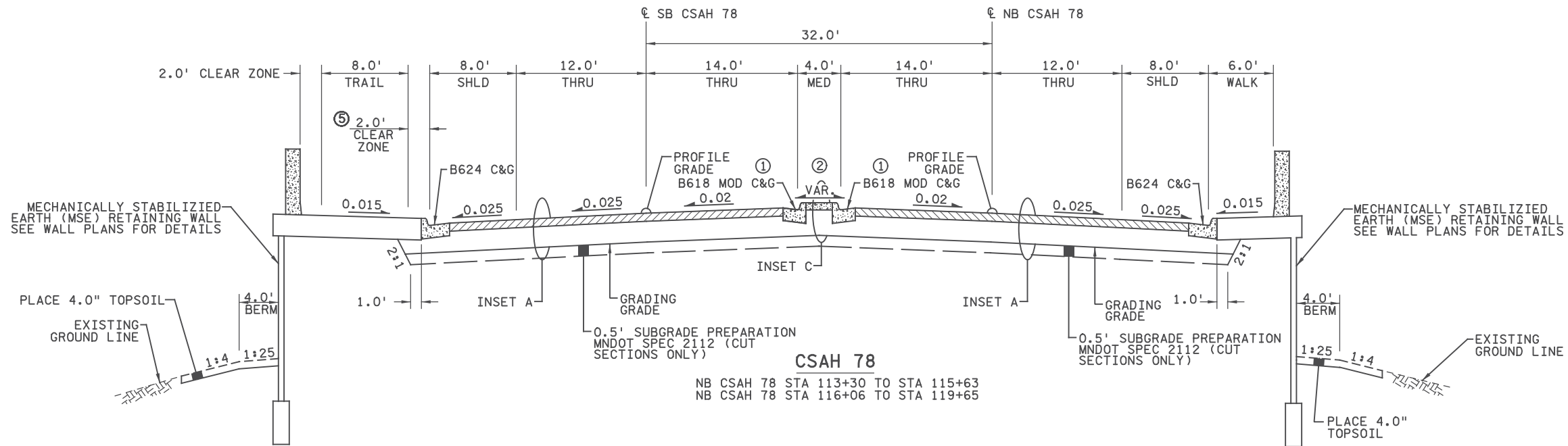
STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



ANOKA COUNTY
 TYPICAL SECTIONS
CSAH 78 - BNSF GRADE SEPARATION

SHEET 67 OF 175



GENERAL NOTES:

SEE SHEET 70 FOR PAVEMENT INSETS AND DETAILS.

DIMENSIONS AT CURB AND BARRIER ARE TO FACE UNLESS NOTED OTHERWISE.

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TOPSOIL PAID FOR AS COMMON EMBANKMENT. ALL OTHER EMBANKMENT PAID FOR AS GRANULAR EMBANKMENT UNLESS OTHERWISE NOTED.

- NOTES:**
- ① SEE MEDIAN B618 MODIFIED CURB & GUTTER ON SHEET 70
 - ② MEDIAN GUTTER SLOPE TO MATCH ROAD SLOPE BETWEEN BR NO 02589 AND BR NO 02588
 - ⑤ SEE SHEET 135 FOR TRAIL STRIPING DETAIL

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Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

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COMM. NO. 0169140

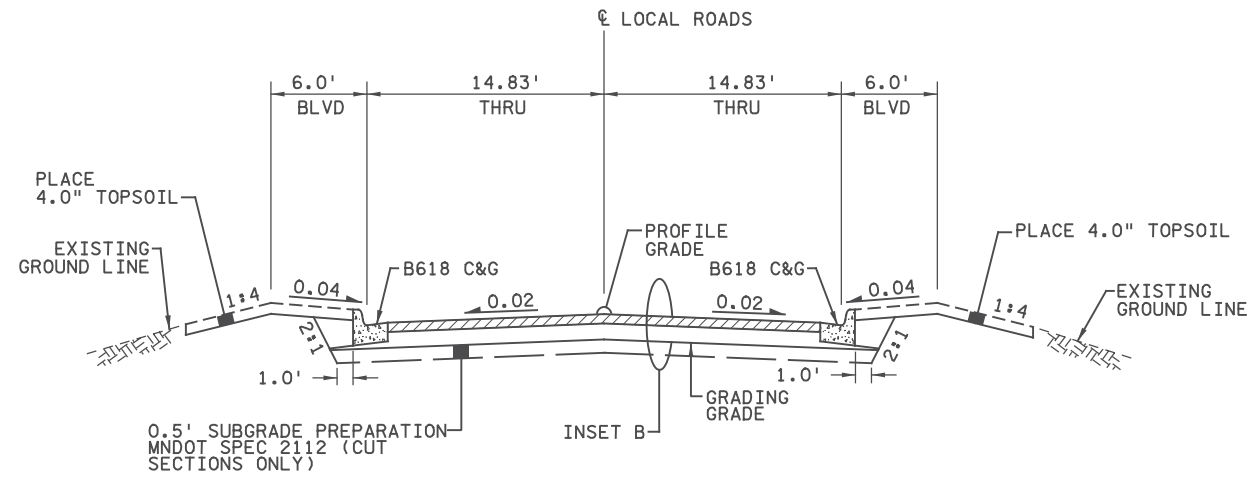


ANOKA COUNTY
TYPICAL SECTIONS
CSAH 78 - BNSF GRADE SEPARATION

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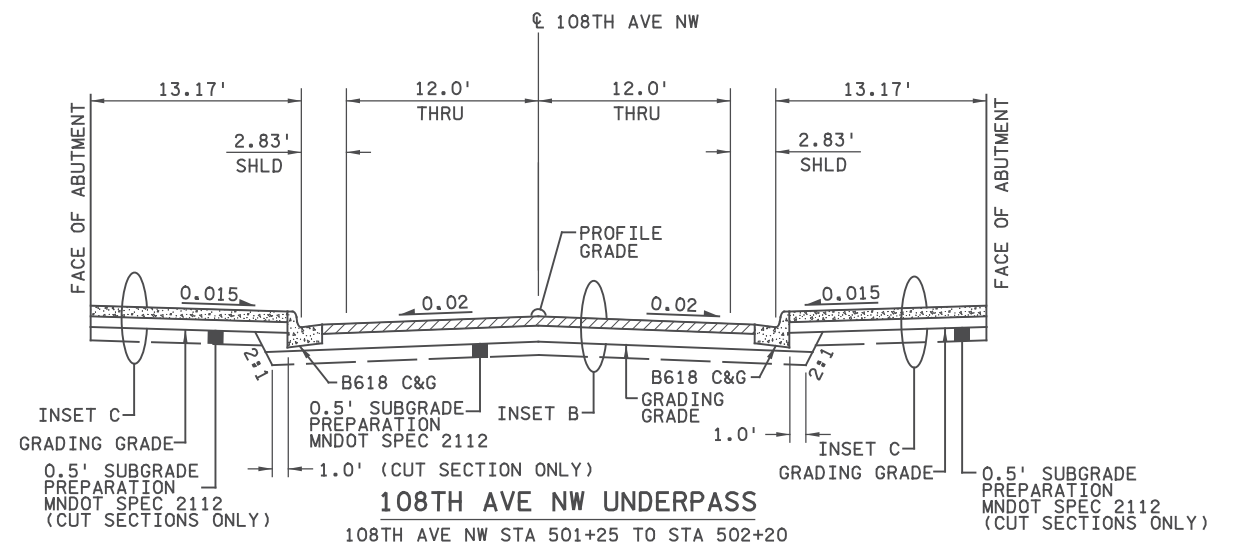
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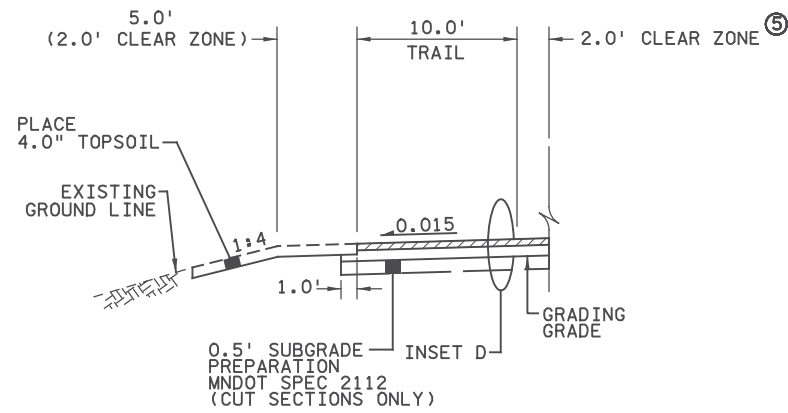
LOCAL ROADS

106TH AVE NW STA 300+46 TO STA 302+29
 HANSON BLVD SERVICE RD 1 STA 400+44 TO STA 408+84
 108TH AVE N STA 500+11 TO STA 501+25
 108TH AVE NW STA 502+20 TO STA 503+51
 HANSON BLVD SERVICE RD 2 STA 600+45 TO STA 603+22
 108TH LN NW STA 700+54 TO STA 702+39



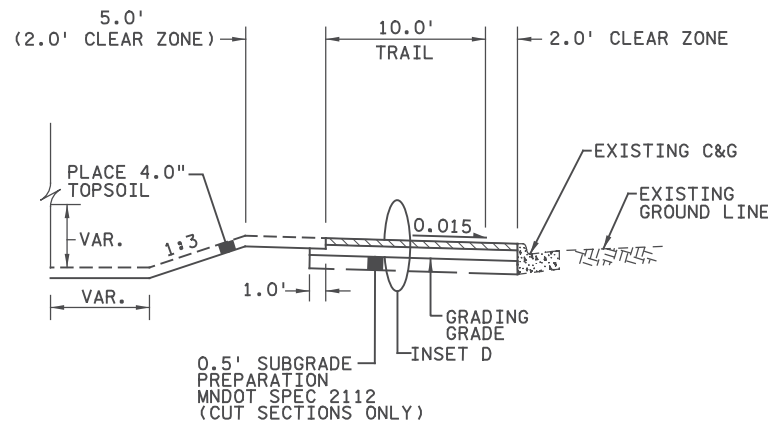
108TH AVE NW UNDERPASS

108TH AVE NW STA 501+25 TO STA 502+20



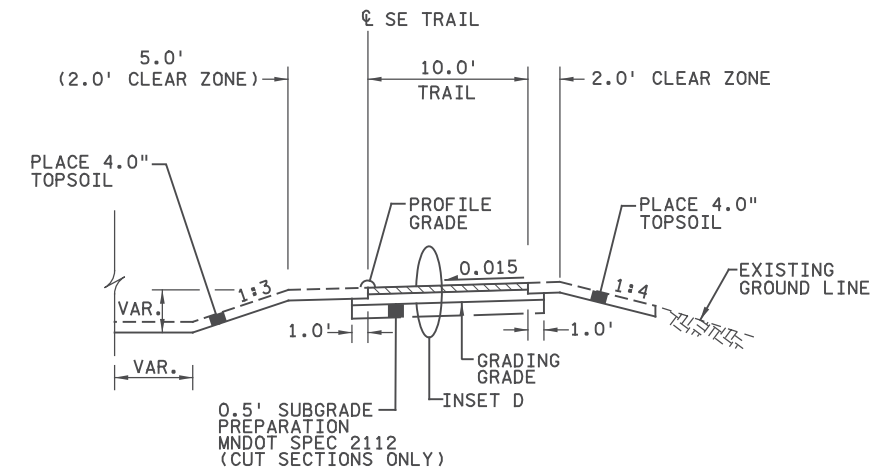
DETAIL A

NB CSAH 78 STA 105+30 TO STA 108+91



DETAIL B

NB CSAH 78 STA 105+76 TO STA 109+00



DETAIL C

NB CSAH 78 STA 109+00 TO STA 113+04

NOTES:
 ⑤ SEE SHEET 135 FOR TRAIL STRIPING DETAIL

GENERAL NOTES:
 SEE SHEET 70 FOR PAVEMENT INSETS AND DETAILS.
 DIMENSIONS AT CURB AND BARRIER ARE TO FACE UNLESS NOTED OTHERWISE.
 ALL CROSS SLOPES ARE FT PER FT.
 SEE SUPERELEVATION PLANS FOR SUPERELEVATION TRANSITIONS.
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 TOPSOIL PAID FOR AS COMMON EMBANKMENT. ALL OTHER EMBANKMENT PAID FOR AS GRANULAR EMBANKMENT UNLESS OTHERWISE NOTED.

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Ben Robeck
 Date: 6/13/2017 License #: 53680

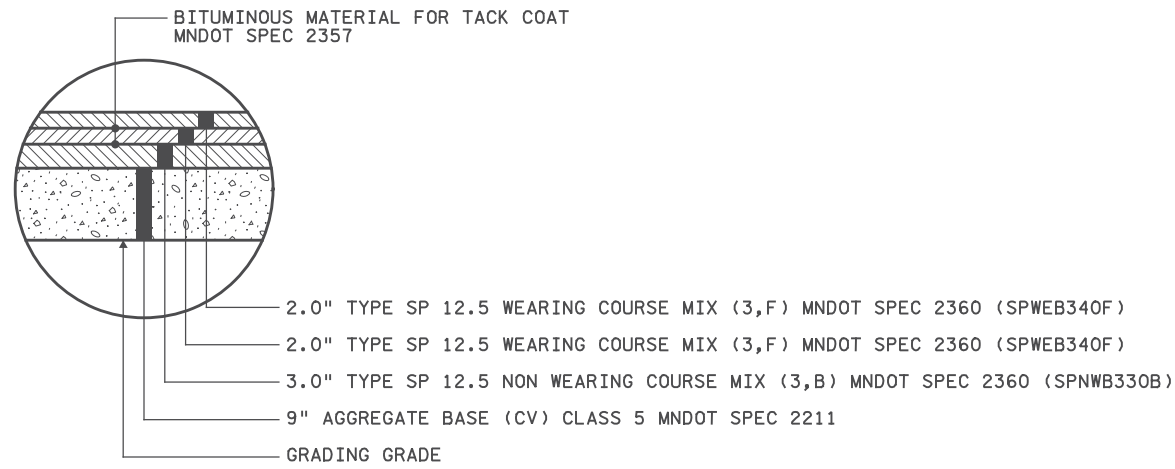
STATE AID PROJECT NO 002-678-023, 114-020-051
 DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



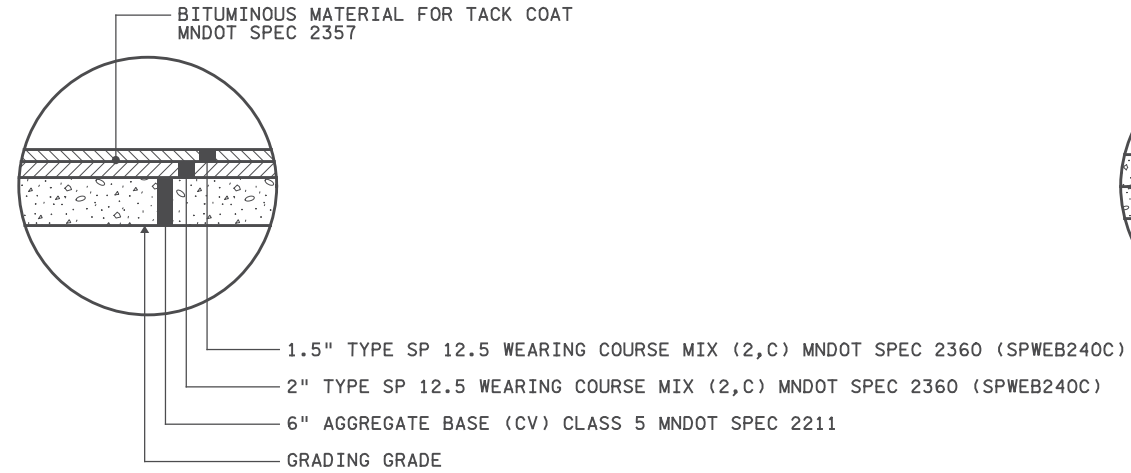
ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 TYPICAL SECTIONS
 CSAH 78 - BNSF GRADE SEPARATION

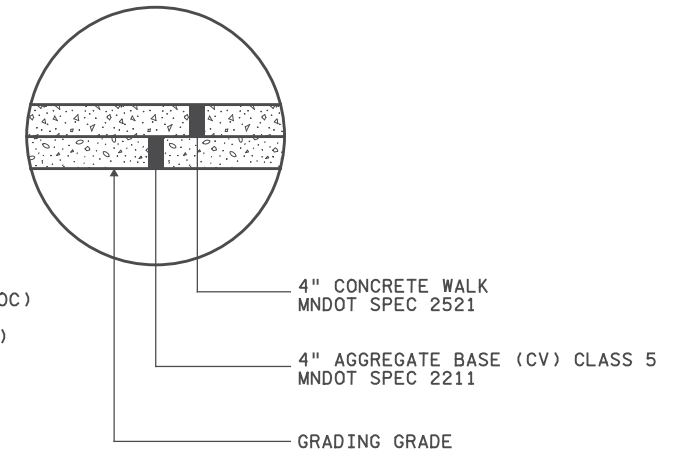
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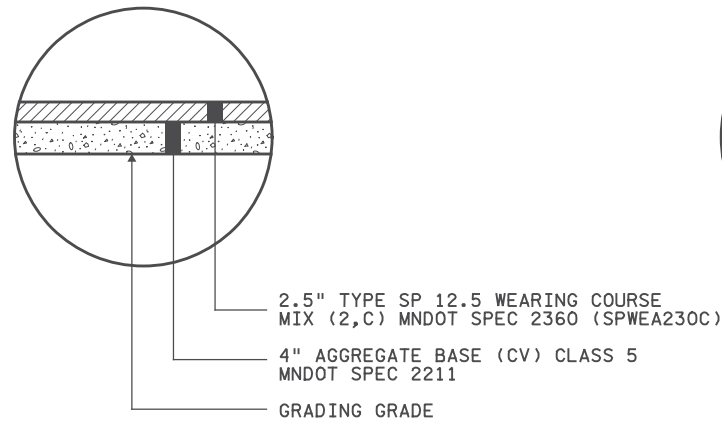
INSET A
CSAH 78



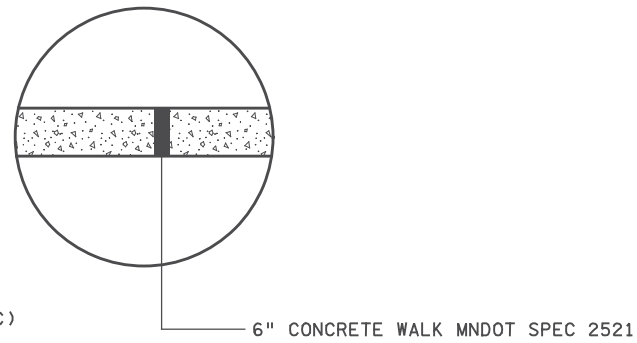
INSET B
LOCAL ROADS



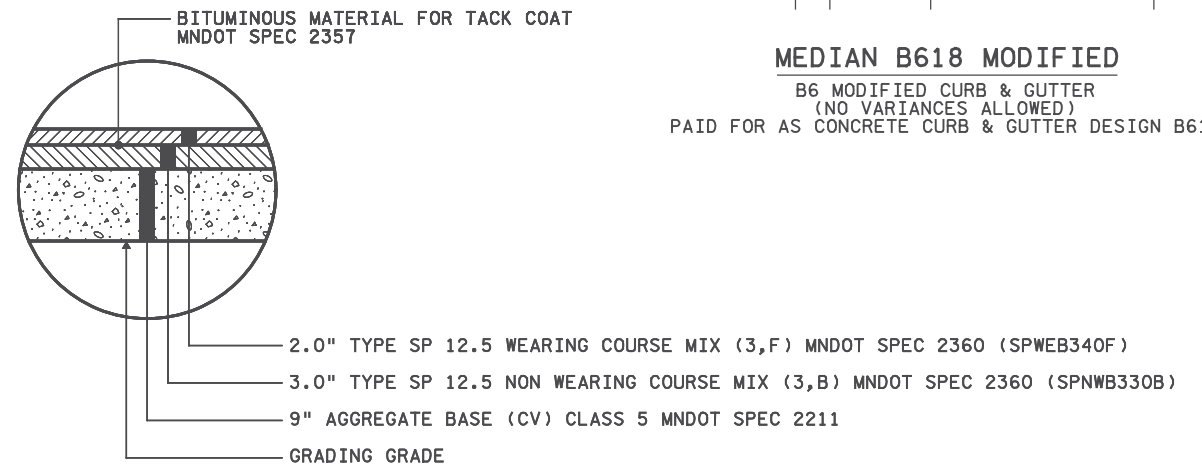
INSET C
WALKS



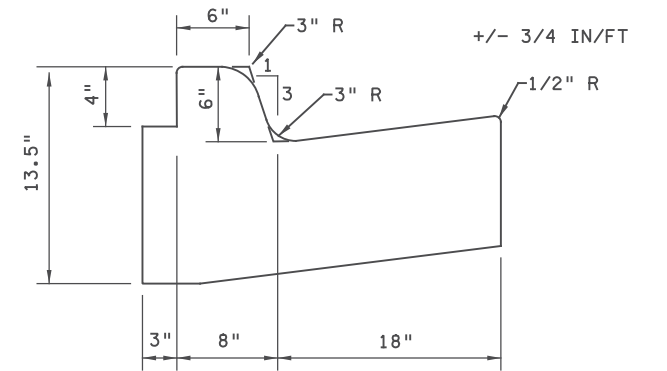
INSET D
TRAILS/EMERGENCY ACCESS/BITUMINOUS DRIVEWAYS



INSET E
CONCRETE DRIVEWAYS



INSET F
TEMPORARY PAVEMENT



MEDIAN B618 MODIFIED
B6 MODIFIED CURB & GUTTER
(NO VARIANCES ALLOWED)
PAID FOR AS CONCRETE CURB & GUTTER DESIGN B618

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION
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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Ben Robeck
Date: 6/13/2017 License # 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG
DESIGNED BY
T. SMITH
CHECKED BY
B. ROBECK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
TYPICAL SECTIONS
CSAH 78 - BNSF GRADE SEPARATION

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STAGING AND TRAFFIC CONTROL NOTES

GENERAL NOTES

1. THE CONTRACTOR SHALL FURNISH, PLACE, AND MAINTAIN THE DEVICES IN THIS TRAFFIC CONTROL PLAN UNLESS OTHERWISE NOTED.
2. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE PLACED IN ACCORDANCE WITH THE CURRENT "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MN MUTCD) AND PART VI, "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".
3. FIELD CONDITIONS MAY REQUIRE MODIFICATIONS OF THIS LAYOUT AS DEEMED NECESSARY BY THE ENGINEER.
4. IF THE CONTRACTOR DECIDES TO PERFORM THE CONSTRUCTION WORK IN A SEQUENCE OTHER THAN WHAT IS SHOWN IN THE STAGING AND TRAFFIC CONTROL PLANS, THE CONTRACTOR SHALL PROVIDE COMPLETE REVISED TRAFFIC CONTROL PLANS TO BE APPROVED BY THE ENGINEER.
5. ALL DISTANCES ARE APPROXIMATE.
6. ALL TEMPORARY TRAFFIC THRU LANES SHALL BE A MINIMUM OF 11 FEET IN WIDTH UNLESS NOTED OTHERWISE.
7. REFLECTORIZED TUBE DELINEATORS SHALL HAVE A 50 FT SPACING UNLESS PLACED WITHIN 200 FT OF AN INTERSECTION WHERE SPACING SHALL BE REDUCED TO 25 FT.
8. THE CONTRACTOR SHALL MAINTAIN A 1 FOOT MINIMUM CLEAR DISTANCE BETWEEN THE EDGE OF THE TRAVEL LANE AND THE NEAREST EDGE OF ANY ADJACENT TRAFFIC CONTROL DEVICES INCLUDING DRUMS, BARRICADES, BARRIERS, AND TUBE DELINEATORS UNLESS OTHERWISE NOTED.
9. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AND BUILDING ENTRANCES THAT ARE TO REMAIN OPEN AT ALL TIMES TO THE SATISFACTION OF THE ENGINEER (INCIDENTAL).
10. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY WORK AREAS NEAR TRAFFIC IN ACCORDANCE WITH THE MN MUTCD.
11. THE CONTRACTOR SHALL PROVIDE QUALIFIED FLAGGERS WITH TWO-WAY RADIOS AT ALL TIMES WHEN CONTRACTOR OPERATIONS REQUIRE ONE-LANE/TWO-WAY OPERATION OR WHEN, IN THE OPINION OF THE ENGINEER, ONE-LANE/TWO-WAY OPERATIONS ARE APPROPRIATE DUE TO SAFETY CONCERNS. FLAGGERS AND FLAGGING OPERATIONS SHALL BE INCIDENTAL.
12. IN ALL WORK AREAS NOTED "CONSTRUCTION UNDER TRAFFIC" THE CONTRACTOR SHALL UTILIZE ADDITIONAL TRAFFIC CONTROL DEVICES AS NECESSARY AND IN ACCORDANCE WITH THE MN MUTCD TO MAINTAIN A SAFE AND UNDERSTANDABLE FLOW OF TRAFFIC TO THE SATISFACTION OF THE ENGINEER (INCIDENTAL).
13. THE ACTUAL NUMBER OF BARRICADES AT EACH LOCATION REQUIRED MAY VARY DEPENDING UPON THE SIZE OF BARRICADES USED, THE WIDTH OF THE ROAD CLOSURE AND THE MOVEMENT OF LOCAL CONSTRUCTION TRAFFIC.
14. THE CONTRACTOR SHALL MAKE DAILY INSPECTIONS OF THE TRAFFIC CONTROL DEVICES, AS STATED IN THE SPECIAL PROVISIONS. DAILY INSPECTIONS SHALL CONTINUE EVEN AFTER CONSTRUCTION WORK STOPS FOR WINTER SUSPENSION.

BARRIER DELINEATION

1. PORTABLE PRECAST CONCRETE BARRIER SHALL HAVE TOP MOUNTED DELINEATORS WITH A MINIMUM OF 24 SQ IN OF REFLECTIVE SURFACE AREA AND SHALL BE PLACED WITH A 25' SPACING. BARRIER DELINEATORS SHALL BE PAID FOR UNDER THE APPROPRIATE BID ITEM.

TEMPORARY AND PERMANENT PAVEMENT

1. SEE TYPICAL SECTION INSETS ON SHEET 70R FOR TEMPORARY PAVEMENT DESIGN DETAILS.
2. FINAL WEAR COURSE LIFT FOR ALL PROPOSED ROADWAYS SHALL NOT BE PLACED UNTIL AFTER STAGE 3 IS COMPLETED.

SIGNING

1. AS APPROPRIATE, THE CONTRACTOR SHALL REMOVE, SALVAGE, OR COVER ALL EXISTING SIGNING THAT CONFLICTS WITH THIS TRAFFIC CONTROL PLAN TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL RESTORE ALL APPROPRIATE ORIGINAL SIGNING AFTER APPROVAL BY THE ENGINEER. REMOVAL AND SALVAGE OF SIGNS SHALL BE PAID FOR UNDER THE APPROPRIATE BID ITEM. COVERING AND UNCOVERING OF SIGNS SHALL BE INCIDENTAL.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY EXTRA SIGNING NEEDED TO FACILITATE TRAFFIC SWITCHES OR FOR TRANSITIONING TRAFFIC FROM ONE STAGE TO ANOTHER (INCIDENTAL).
3. THE CONTRACTOR SHALL COORDINATE THE PLACEMENT OF THE PERMANENT SIGNS TO ASSURE THAT THE PERMANENT SIGNS ARE PLACED AS NEEDED, OR SHALL PROVIDE TEMPORARY SIGNING UNTIL THE PERMANENT SIGNING IS PLACED (INCIDENTAL).
4. STREET IDENTIFICATION SIGNAGE SHALL BE MAINTAINED AT ALL TIMES. SIGNS LOCATED AT THE INTERSECTIONS SHALL BE MAINTAINED INPLACE OR BY TEMPORARY PLACEMENT (INCIDENTAL).
5. WHEN SIGNS ARE PLACED, THEY SHALL BE MOUNTED ON POSTS DRIVEN INTO THE GROUND AT THE PROPER HEIGHT AND LATERAL OFFSET AS DETAILED IN THE MN MUTCD. IF THIS IS NOT POSSIBLE, THEY WILL BE MOUNTED ON PORTABLE SUPPORTS AS APPROVED BY THE ENGINEER. WHEN THE SIGNS ARE REMOVED, THE SIGN POSTS SHALL ALSO BE REMOVED AS SOON AS POSSIBLE.
6. ALL ORANGE SIGNS SHALL BE MADE OF "HIGH PERFORMANCE FLUORESCENT SIGN SHEETING."
7. LONGITUDINAL DROPOFFS SHALL BE SIGNED AS SHOWN IN THE "TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS" FIELD MANUAL, UNLESS OTHERWISE SPECIFIED IN THESE PLANS (INCIDENTAL).
8. R11-4 (ROAD CLOSED BEGINNING XXX XX) SIGNS SHALL BE PLACED A MINIMUM OF TEN CALENDAR DAYS PRIOR TO ROAD CLOSURE, AS SHOWN IN THE STAGING AND TRAFFIC CONTROL PLANS.
9. G20-X2 (ADV WORK ZONE LOCATION) SIGNS SHALL BE PLACED A MINIMUM OF 14 CALENDAR DAYS PRIOR TO ROAD CLOSURE, AS SHOWN IN THE STAGING AND TRAFFIC CONTROL PLANS.
10. IN PLACE SIGNING SHALL BE UTILIZED AS PRACTICAL TO MEET THE REQUIREMENTS OF THE THE STAGING PLANS.

TEMPORARY PAVEMENT MARKING

1. THE CONTRACTOR SHALL REMOVE ALL EXISTING OR TEMPORARY PAVEMENT MARKINGS WHICH CONFLICT WITH THE MARKINGS SHOWN IN A PARTICULAR STAGE, TO THE SATISFACTION OF THE ENGINEER. REMOVAL OF TEMPORARY PAVEMENT MARKINGS, REMOVABLE PREFORMED PAVEMENT MARKINGS, AND CONFLICTING EXISTING PAVEMENT MARKINGS SHALL BE PAID FOR UNDER THE APPROPRIATE BID ITEM.
2. THE CONTRACTOR SHALL NOT PLACE PAINTED TEMPORARY PAVEMENT MARKINGS ON PERMANENT FINAL SURFACING (OR ON OTHER SURFACING WHICH WILL NOT ULTIMATELY BE REPLACED OR COVERED BY PLANNED CONSTRUCTION) UNLESS THE TEMPORARY MARKINGS ARE IN THE SAME LOCATION AS THE PERMANENT MARKINGS.
3. THE CONTRACTOR SHALL MATCH ALL TEMPORARY PAVEMENT MARKINGS TO EXISTING STRIPING.
4. TEMPORARY PAVEMENT MARKINGS TO REMAIN IN PLACE OVER THE WINTER SUSPENSION SHALL BE EPOXY.
5. THE CONTRACTOR SHALL UTILIZE EXISTING PAVEMENT MARKINGS, AS PRACTICAL, AND AS NOTED TO MEET THE REQUIREMENTS OF THE STAGING PLANS.

TEMPORARY EROSION CONTROL AND TEMPORARY DRAINAGE

1. ESTABLISH PERMANENT EROSION CONTROL AND TURF ESTABLISHMENT MEASURES AS SOON AS FEASIBLE.
2. ESTABLISH TEMPORARY EROSION CONTROL AND TURF ESTABLISHMENT AS NECESSARY ACCORDING TO THE STORM WATER POLLUTION PREVENTION PLAN AND AS SHOWN IN THE STAGING PLANS.
3. PARTIAL REMOVAL OF EXISTING DRAINAGE STRUCTURES OR PARTIAL CONSTRUCTION OF PROPOSED DRAINAGE STRUCTURES MAY BE NEEDED TO MAINTAIN DRAINAGE THROUGHOUT THE PROJECT. ANY STRUCTURE THAT WILL BE TEMPORARILY BURIED SHALL HAVE ALL OPENINGS COVERED SOIL TIGHT WITH A STEEL PLATE. NO ADDITIONAL COMPENSATION WILL BE MADE FOR PARTIAL REMOVAL, PARTIAL CONSTRUCTION OR TEMPORARY COVERS.

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: <u>BENJAMIN P ROBECK</u> <i>Ben Robeck</i> Date <u>6/13/2017</u> License # <u>53680</u>	STATE AID PROJECT NO 002-678-023, 114-020-051	DRAWN BY S. VANG DESIGNED BY T. SMITH CHECKED BY B. ROBECK COMM. NO. 0169140	ENGINEERS PLANNERS DESIGNERS	ANOKA COUNTY STAGING AND TRAFFIC CONTROL PLANS CSAH 78 - BNSF GRADE SEPARATION STAGING AND TRAFFIC CONTROL NOTES	SHEET 71R OF 175
NO	DATE	BY	CKD	APPR	REVISION						

TRAFFIC CONTROL SIGN TABULATION U			
SIGN LEGEND	SIGN DESIGNATION	SIZE (IN)	SIGN COLOR
	W21-X5R	48 X 48	BLACK ON ORANGE
	W1-4L	48 X 48	BLACK ON ORANGE
	R3-7	36 X 36	BLACK ON WHITE
	R3-30AB	54 X 48	BLACK ON WHITE
	R6-1R	54 X 18	BLACK ON WHITE
	R6-1L	54 X 18	BLACK ON WHITE
	R3-4	36 X 36	BLACK ON RED ON WHITE
	R3-7	36 X 36	BLACK ON WHITE
	R3-7	36 X 36	BLACK ON WHITE
	W10-1	48 DIA.	BLACK ON WHITE
	R5-1	48 X 48	RED ON WHITE
	W20-X3L	48 X 48	BLACK ON ORANGE
	W4-2R	48 X 48	BLACK ON ORANGE
	R11-3A	60 X 30	BLACK ON WHITE

THIS LEGEND APPLIES TO ALL TRAFFIC CONTROL & STAGING PLAN SHEETS

STRIPING KEY

TRIANGLE - PAINT
 CIRCLE - REMOVABLE PREFORMED PAVEMENT MARKING TAPE
 SQUARE - EPOXY PAINT

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

EXAMPLE: **4SW** = 4" SOLID LINE WHITE - PAINT

TRAFFIC CONTROL SIGN TABULATION U			
SIGN LEGEND	SIGN DESIGNATION	SIZE (IN)	SIGN COLOR
	W1-4R	48 X 48	BLACK ON ORANGE
	W8-1	48 X 48	BLACK ON YELLOW
	W8-1A	48 X 48	BLACK ON YELLOW
	W14-1	36 X 36	BLACK ON YELLOW
	W10-9P	30 X 24	BLACK ON YELLOW
	W20-2	48 X 48	BLACK ON ORANGE
	M4-10L	48 X 18	BLACK ON ORANGE
	M4-6	24 X 12	BLACK ON ORANGE
	M4-10R	48 X 18	BLACK ON ORANGE

TRAFFIC CONTROL SIGN TABULATION U			
SIGN LEGEND	SIGN DESIGNATION	SIZE (IN)	SIGN COLOR
	R3-3	36 X 36	BLACK ON WHITE
	TYPE 'A'	FLASHER	AMBER
	TYPE III		ORANGE ON WHITE
	R1-1	30 X 30	WHITE ON RED
	R11-4	60 X 30	BLACK ON WHITE
	R9-9	30 X 18	BLACK ON WHITE
	R11-2	48 X 30	BLACK ON WHITE
	G20-2A	48 X 24	BLACK ON ORANGE
	W1-6L	48 X 24	BLACK ON ORANGE
	W1-6R	48 X 24	BLACK ON ORANGE
	R3-2	36 X 36	BLACK ON WHITE
	W4-2L	48 X 48	BLACK ON ORANGE
	W6-4	12 X 18	BLACK ON ORANGE
	W20-X3R	48 X 48	BLACK ON ORANGE
	W20-1	48 X 48	BLACK ON ORANGE
	R8-8	24 X 30	BLACK ON WHITE

TRAFFIC CONTROL SIGN TABULATION U			
SIGN LEGEND	SIGN DESIGNATION	SIZE (IN)	SIGN COLOR
	W20-100P	42 X 24	BLACK ON ORANGE
	W20-3	48 X 48	BLACK ON ORANGE
	W21-X5R	48 X 48	BLACK ON ORANGE
	M1-6	24 X 24	WHITE AND YELLOW ON BLUE
	M3-1A	24 X 12	BLACK ON ORANGE
	M3-3	24 X 12	BLACK ON ORANGE
	M4-8	24 X 12	BLACK ON ORANGE
	M5-1L	21 X 15	BLACK ON ORANGE
	M5-1R	21 X 15	BLACK ON ORANGE
	M6-1L	21 X 15	BLACK ON ORANGE
	M6-1R	21 X 15	BLACK ON ORANGE
	M6-3	21 X 15	BLACK ON ORANGE
	G20-X1	72 X 60	BLACK ON ORANGE
	W13-1P	30 X 30	BLACK ON ORANGE
	D3-1	VAR X 12	BLACK ON ORANGE
	R4-7	12 X 18 24 X 30	BLACK ON WHITE

NOTES:
 ① KEEP RIGHT SIGNAGE SHALL BE MOUNTED TO TUBE DELINEATOR, AS APPLICABLE AND APPROVED BY THE ENGINEER.
 ② UTILIZE EXISTING SIGN.

1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 STAGING AND TRAFFIC CONTROL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 STRIPING KEY AND TRAFFIC CONTROL SIGN TABULATION

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STAGING NARRATIVE

STAGE 1

CONSTRUCTION

1. CONSTRUCT ROUGH GRADING ON EAST SIDE OF NB CSAH 78 FOR PRIVATE UTILITY RELOCATIONS. CONTRACTOR SHALL COORDINATE WITH UTILITY OWNERS.
2. CONSTRUCT TEMPORARY DRAINAGE AND PAVEMENT CONNECTIONS.
3. CONSTRUCT NB CSAH 78 FROM STA 101+05 TO STA 105+77 AND FROM STA 123+18 TO STA 128+70.
4. CONSTRUCT 106TH AVE NW.
5. CONSTRUCT HANSON BLVD SERVICE RD 1 FROM STA 400+00 TO STA 403+00.
6. CONSTRUCT 106TH WET POND.
7. CONSTRUCT 107TH INFILTRATION BASIN.
8. CONSTRUCT HANSON BLVD SERVICE RD 2.
9. CONSTRUCT 108TH LN NW.
10. CONSTRUCT SERVICE ROAD WET POND.
11. CONSTRUCT 108TH INFILTRATION BASIN.
12. CONSTRUCT SANITARY SEWER AND WATER MAIN CONNECTIONS AT 108TH LN NW.

TRAFFIC

1. UTILIZE TEMPORARY LANE CLOSURES AS NECESSARY FOR TEMPORARY PAVEMENT CONSTRUCTION.
2. REVISE SIGNAL AT INTERSECTION OF CSAH 78 AND CSAH 1 FOR STAGE 1 TEMPORARY CONFIGURATION (RESTORE TO PERMANENT CONDITION PRIOR TO STAGE 2).
3. SHIFT TRAFFIC TO STAGE 1 CONFIGURATION ON EXISTING SB CSAH 78 LANES.
4. EXISTING BNSF CROSSING CONTROL TO BE UTILIZED DURING STAGE 1.
5. TEMPORARY WEEKEND CLOSURE MAY BE USED TO CONSTRUCT SANITARY SEWER AND WATER MAIN CONNECTIONS AT 108TH LN NW.

STAGE 2

CONSTRUCTION

1. CONSTRUCT NB CSAH 78 - SOUTH TEMP TIE DOWN.
2. CONSTRUCT NB CSAH 78 - NORTH TEMP TIE DOWN.

TRAFFIC

1. UPON COMPLETION OF NB CSAH 78 TEMP TIE DOWNS, SHIFT TRAFFIC TO STAGE 2 CONFIGURATION.
2. EXISTING BNSF CROSSING CONTROL TO BE UTILIZED DURING STAGE 2.

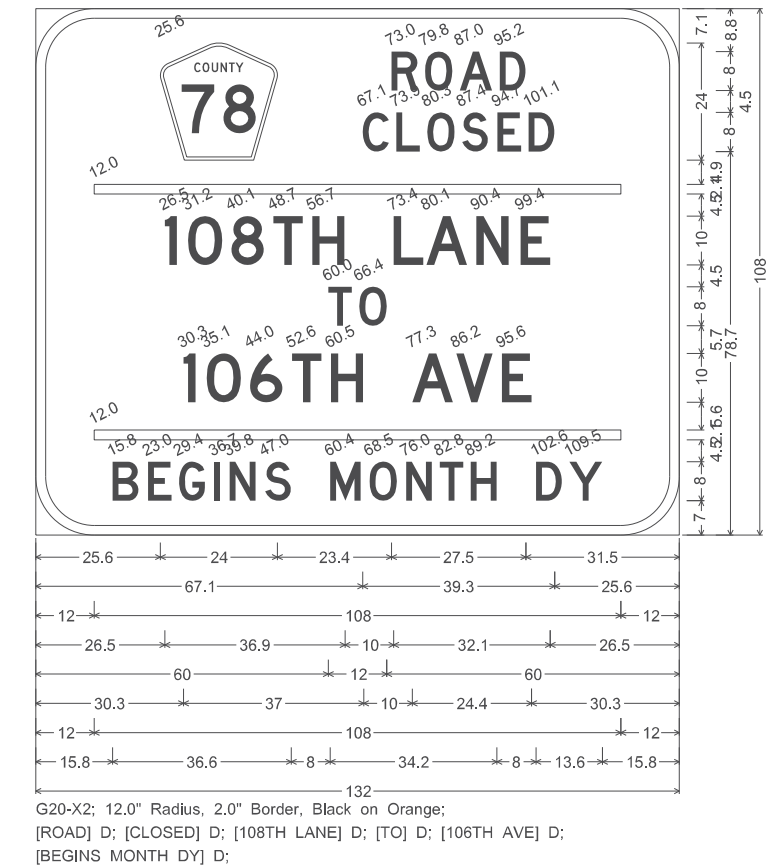
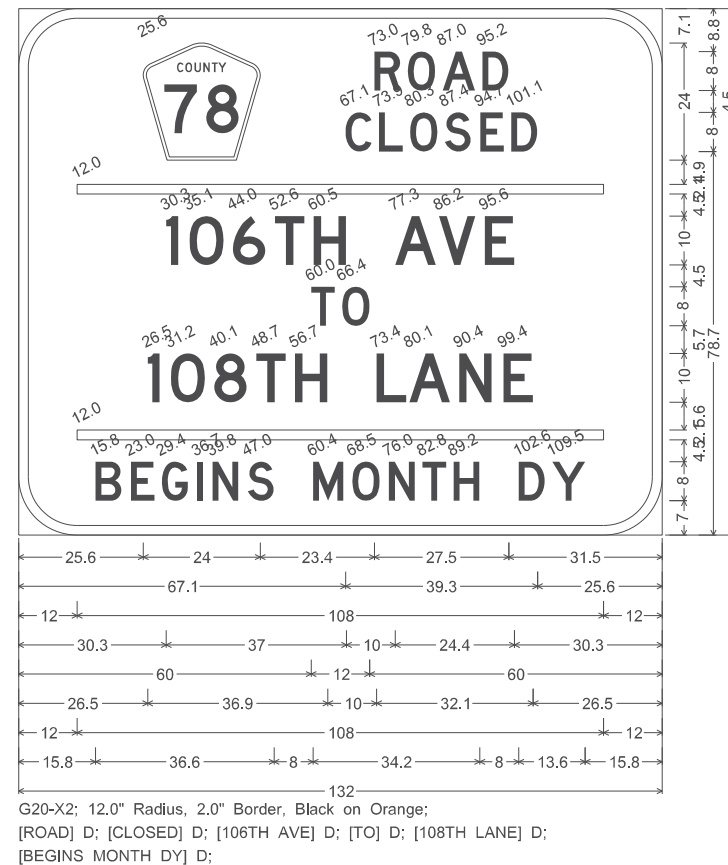
STAGE 3

CONSTRUCTION

1. PLACE PERMANENT SHEET PILE AND TEMPORARY VERTICAL SHORING.
2. CONSTRUCT PROPOSED SANITARY AND WATERMAIN INCLUDING JACKING UNDER BNSF RAILROAD.
3. CONSTRUCT BRIDGE NO 02589 OVER BNSF RAILROAD.
4. CONSTRUCT WALLS G AND H.
5. CONSTRUCT BRIDGE NO 02588 OVER 108TH AVE NW.
6. CONSTRUCT TRAIL BOX CULVERT BRIDGE NO 02J49 UNDER CSAH 78.
7. CONSTRUCT WALLS A, B, C, D, E, AND F.
8. CONSTRUCT SERVICE ROAD INFILTRATION BASIN.
9. CONSTRUCT NB CSAH 78 FROM STA 105+77 TO STA 122+91.
10. CONSTRUCT SB CSAH 78 FROM STA 201+05 TO STA 228+69.
11. CONSTRUCT SE TRAIL.
12. CONSTRUCT TRAIL INFILTRATION AREA.
13. CONSTRUCT HANSON BLVD SERVICE RD 1 FROM STA 403+00 TO STA 408+84.
14. CONSTRUCT 108TH AVE NW.

TRAFFIC

1. SHIFT TRAFFIC TO STAGE 3 CONFIGURATION ON NB CSAH 78 LANES AND IMPLEMENT STAGE 3 DETOUR ROUTE. SEE DETOUR PLAN FOR DETAILS.
2. CONSTRUCT SB CSAH 78 AT INTERSECTIONS WITH CVS ENTRANCE, 106TH AVE NW, AND TOWNHOME ENTRANCE UNDER TRAFFIC. FLAGGING OPERATIONS SHALL BE UTILIZED AS NECESSARY (INCIDENTAL).
3. 108TH AVE NW SHALL BE CONSTRUCTED UNDER TRAFFIC. THE CONTRACTOR SHALL CLEARLY MARK AND SAFELY ROUTE 108TH AVE NW TRAFFIC THROUGH THE WORKSITE WHEN CONSTRUCTION ACTIVITIES PRECLUDE TRAFFIC FROM SAFELY NAVIGATING ALONG THE PROPOSED 108TH AVE NW ROADWAY.



STAGE 4

CONSTRUCTION

1. CONSTRUCT REMAINING MEDIAN SEGMENTS OMITTED IN PREVIOUS STAGES FOR BUSINESS ACCESS AND CROSSOVERS.
2. PLACE FINAL WEARING COURSE MIX ON ALL PROPOSED ROADWAYS.

TRAFFIC

1. SHIFT TRAFFIC TO FINAL, PERMANENT CONFIGURATION.
2. UTILIZE TEMPORARY LANE CLOSURES AS NECESSARY FOR MEDIAN CONSTRUCTION AND PAVING OPERATIONS.

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NO	DATE	BY	CKD	APPR	REVISION
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 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License #: 53680

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 DESIGNED BY T. SMITH
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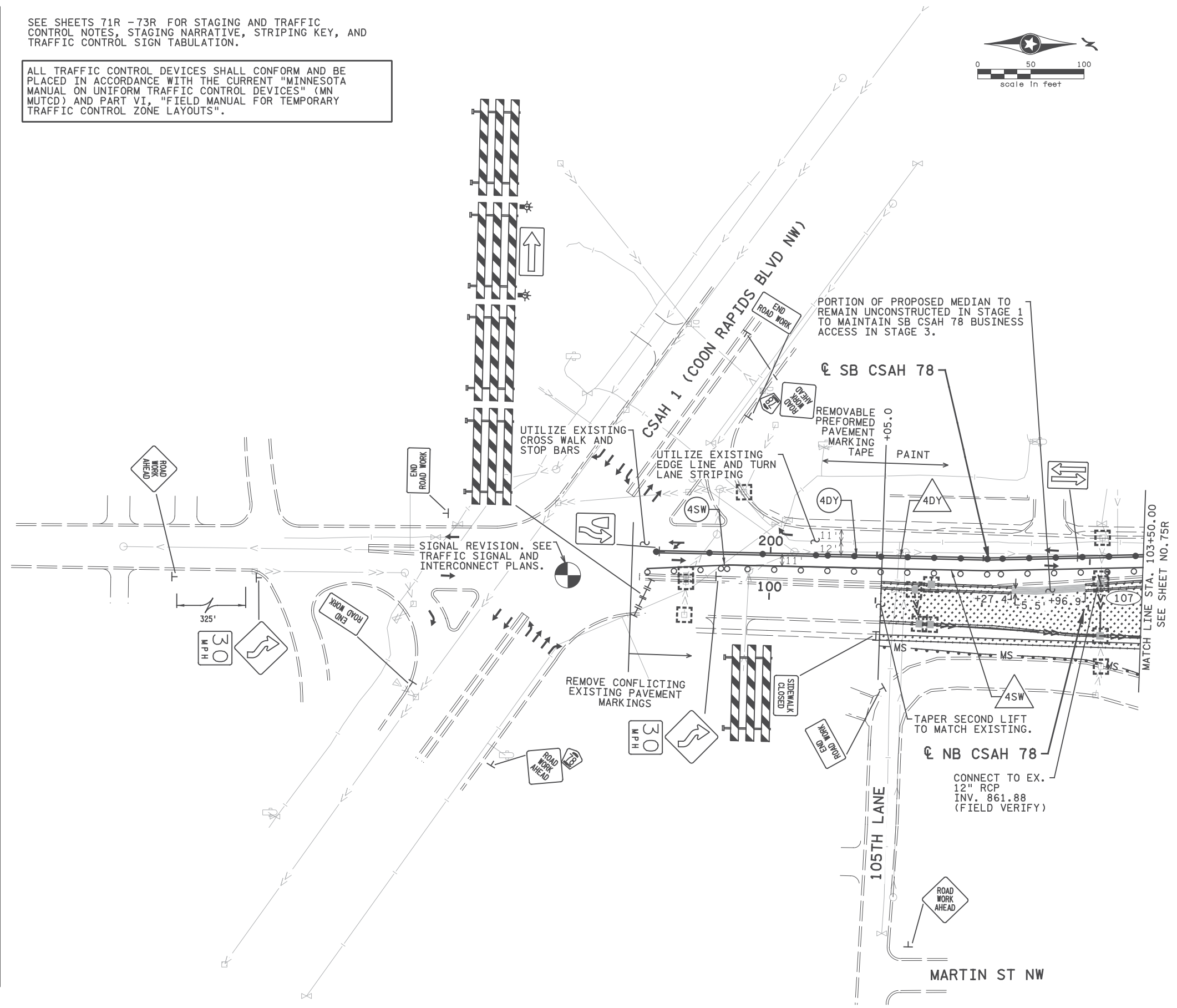
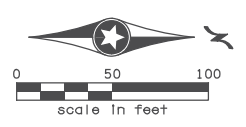
ANOKA COUNTY
 STAGING AND TRAFFIC CONTROL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 STAGING NARRATIVE AND STAGING SIGN DETAILS

SHEET
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LEGEND	
	PERMANENT CONSTRUCTION
	CONSTRUCTION UNDER TRAFFIC
	TEMPORARY PAVEMENT
	REFLECTIVE PLASTIC DRUM
	REFLECTIVE TUBE DELINEATOR
	TYPE "C" SIGN
	TYPE III BARRICADE
	LOW INTENSITY FLASHER, TYPE A
	TEMPORARY RAISED PAVEMENT MARKERS (10' SPACING)
	TRAFFIC LOCATION AND DIRECTION
	PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337
	IMPACT ATTENUATOR (40 MPH)
	RAPID STABILIZATION METHOD 3
	SILT FENCE, TYPE MS
	BIOROLL
	INLET PROTECTION
	INLET PROTECTION FROM PREVIOUS STAGE
	CULVERT END CONTROLS
	PROPOSED WATERMAIN BUILT THIS STAGE
	PROPOSED WATERMAIN BUILT PREVIOUS STAGE
	EXISTING WATERMAIN
	PROPOSED SANITARY SEWER BUILT THIS STAGE
	PROPOSED SANITARY SEWER BUILT PREVIOUS STAGE
	EXISTING SANITARY SEWER
	PROPOSED STORM SEWER BUILT THIS STAGE
	PROPOSED STORM SEWER BUILT PREVIOUS STAGE
	EXISTING STORM SEWER
	EXISTING MANHOLE
	PROPOSED MANHOLE
	EXISTING CATCH BASIN
	PROPOSED CATCH BASIN
	EXISTING APRON
	PROPOSED APRON
	EXISTING GATE VALVE & BOX
	EXISTING HYDRANT
	PROPOSED GATE VALVE & BOX
	PROPOSED HYDRANT
	STORM SEWER STRUCTURE NO.

SEE SHEETS 71R - 73R FOR STAGING AND TRAFFIC CONTROL NOTES, STAGING NARRATIVE, STRIPING KEY, AND TRAFFIC CONTROL SIGN TABULATION.

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE PLACED IN ACCORDANCE WITH THE CURRENT "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MN MUTCD) AND PART VI, "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".



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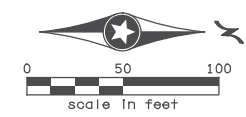
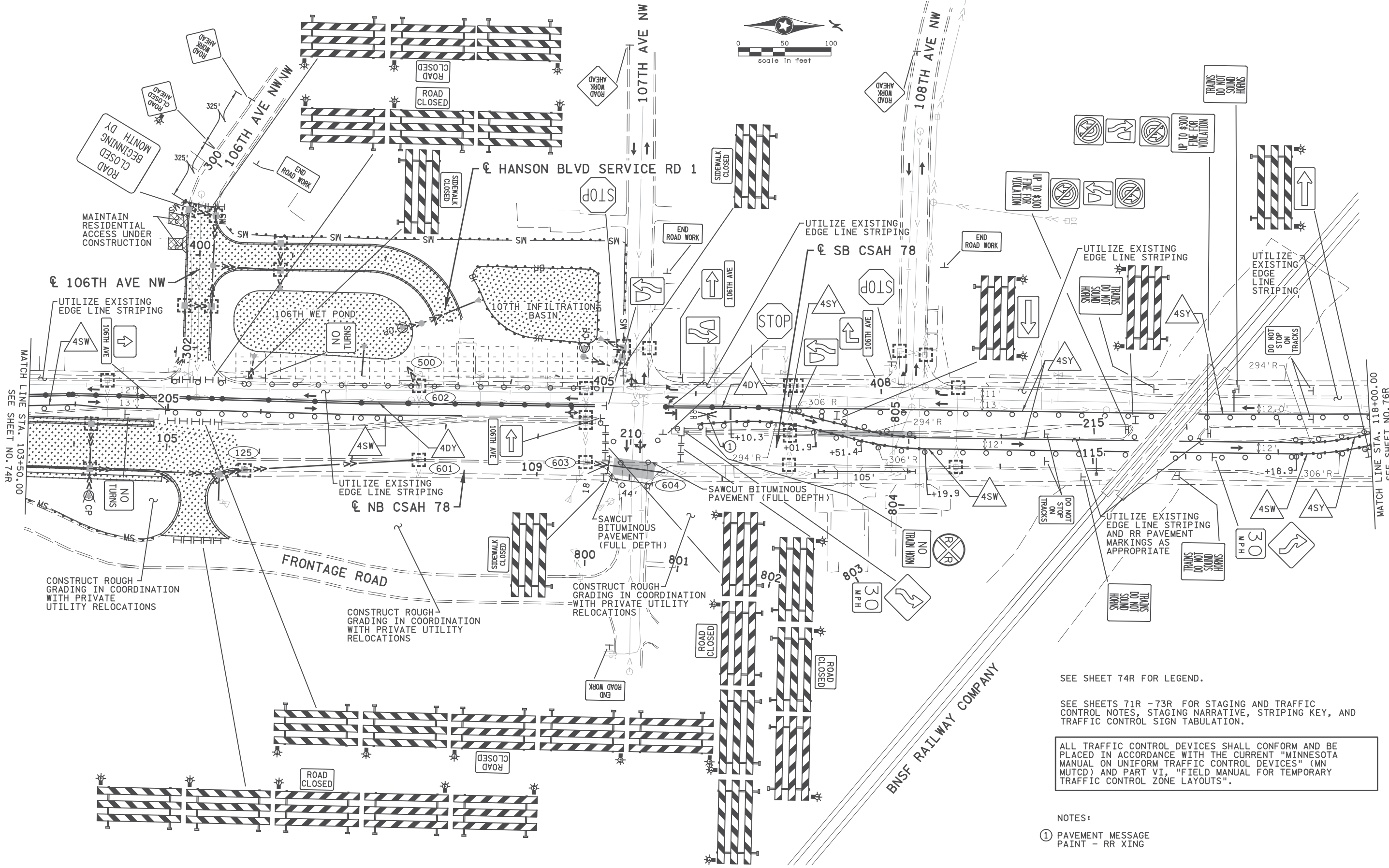
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ANOKA COUNTY
 STAGING AND TRAFFIC CONTROL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 STAGE 1

SHEET 74R OF 175



SEE SHEET 74R FOR LEGEND.

SEE SHEETS 71R - 73R FOR STAGING AND TRAFFIC CONTROL NOTES, STAGING NARRATIVE, STRIPING KEY, AND TRAFFIC CONTROL SIGN TABULATION.

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NOTES:

- ① PAVEMENT MESSAGE PAINT - RR XING

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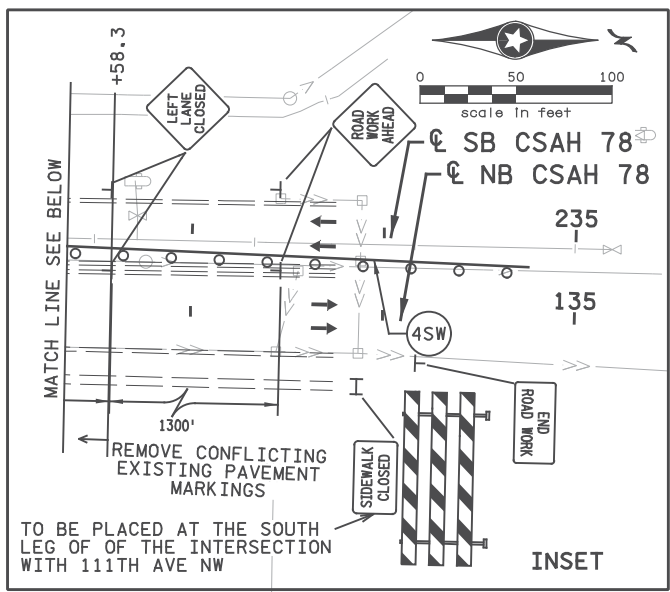
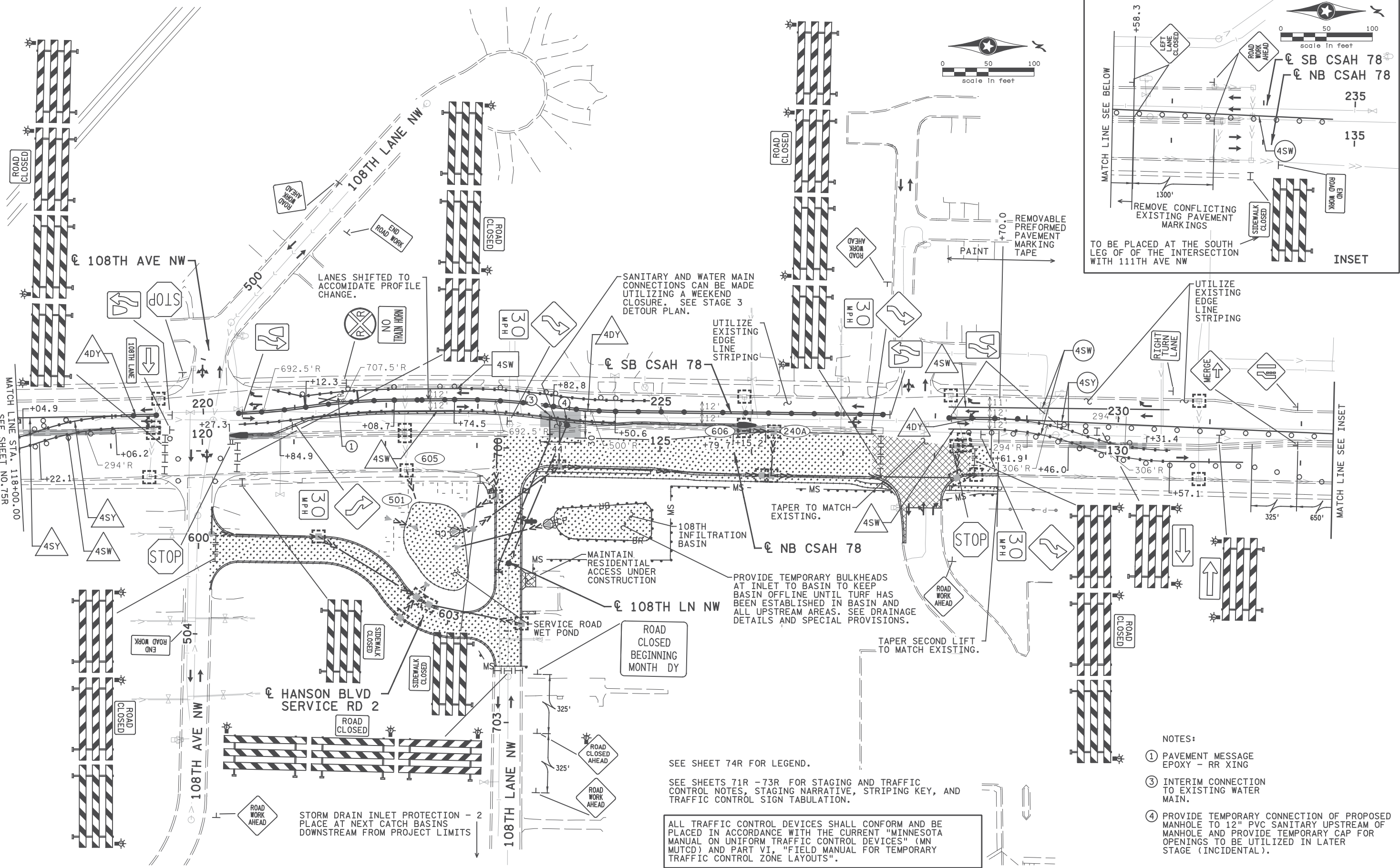
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ANOKA COUNTY
 STAGING AND TRAFFIC CONTROL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 STAGE 1

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SEE SHEET 74R FOR LEGEND.

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- NOTES:
- ① PAVEMENT MESSAGE EPOXY - RR XING
 - ③ INTERIM CONNECTION TO EXISTING WATER MAIN.
 - ④ PROVIDE TEMPORARY CONNECTION OF PROPOSED MANHOLE TO 12" PVC SANITARY UPSTREAM OF MANHOLE AND PROVIDE TEMPORARY CAP FOR OPENINGS TO BE UTILIZED IN LATER STAGE (INCIDENTAL).

1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
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Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 7/12/2017 License #: 53680

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002-678-023, 114-020-051

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T. SMITH
CHECKED BY
B. ROBECK
COMM. NO. 0169140



ANOKA COUNTY
STAGING AND TRAFFIC CONTROL PLANS
CSAH 78 - BNSF GRADE SEPARATION
STAGE 1

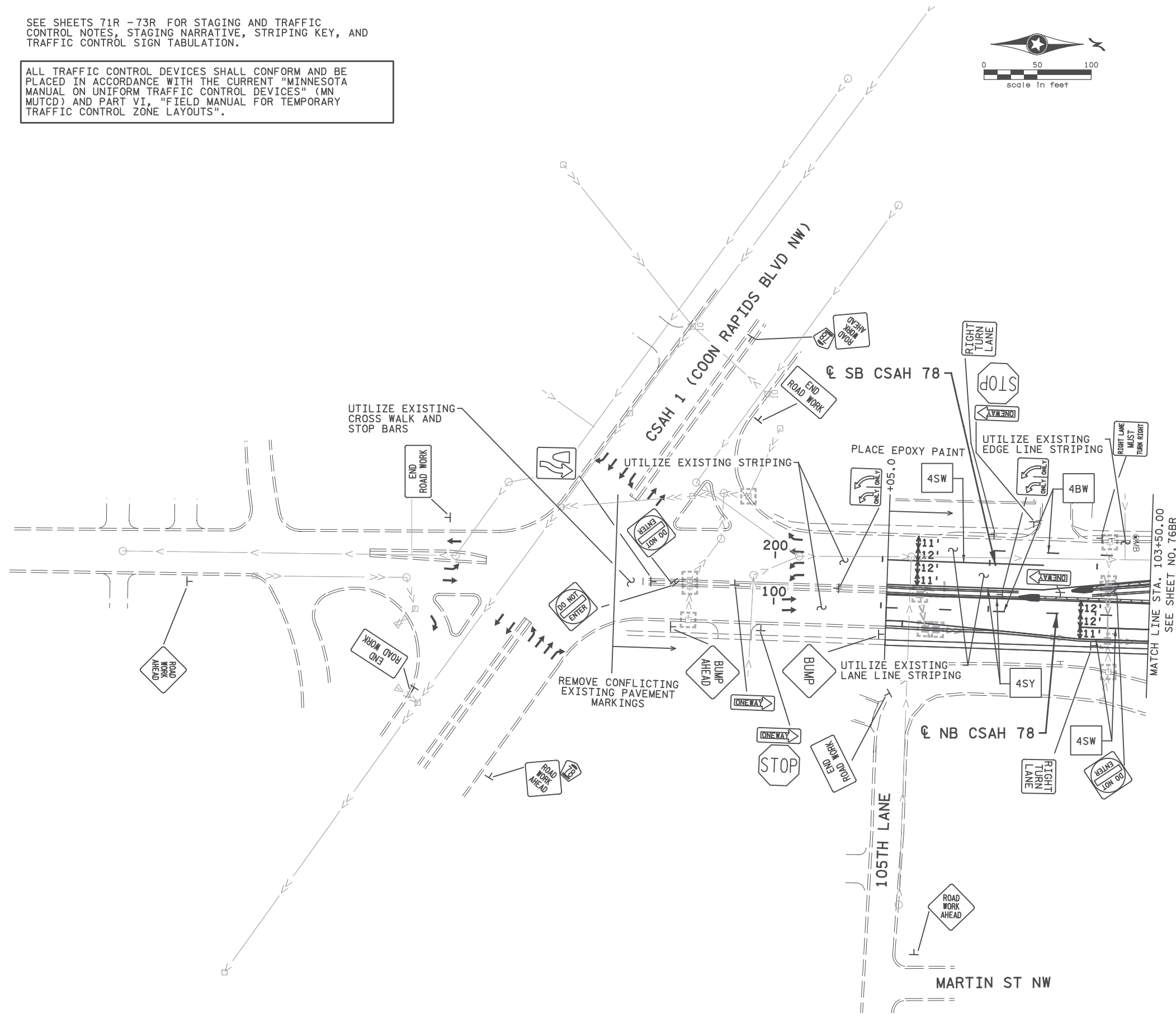
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LEGEND	
	PERMANENT CONSTRUCTION
	CONSTRUCTION UNDER TRAFFIC
	TEMPORARY PAVEMENT
	REFLECTIVE PLASTIC DRUM
	REFLECTIVE TUBE DELINEATOR
	TYPE "C" SIGN
	TYPE III BARRICADE
	LOW INTENSITY FLASHER, TYPE A
	TEMPORARY RAISED PAVEMENT MARKERS (10' SPACING)
	TRAFFIC LOCATION AND DIRECTION
	PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337
	IMPACT ATTENUATOR (40 MPH)
	RAPID STABILIZATION METHOD 3
	SILT FENCE, TYPE MS
	BIOROLL
	INLET PROTECTION
	INLET PROTECTION FROM PREVIOUS STAGE
	CULVERT END CONTROLS
	PROPOSED WATERMAIN BUILT THIS STAGE
	PROPOSED WATERMAIN BUILT PREVIOUS STAGE
	EXISTING WATERMAIN
	PROPOSED SANITARY SEWER BUILT THIS STAGE
	PROPOSED SANITARY SEWER BUILT PREVIOUS STAGE
	EXISTING SANITARY SEWER
	PROPOSED STORM SEWER BUILT THIS STAGE
	PROPOSED STORM SEWER BUILT PREVIOUS STAGE
	EXISTING STORM SEWER
	EXISTING MANHOLE
	PROPOSED MANHOLE
	EXISTING CATCH BASIN
	PROPOSED CATCH BASIN
	EXISTING APRON
	PROPOSED APRON
	EXISTING GATE VALVE & BOX
	PROPOSED GATE VALVE & BOX
	EXISTING HYDRANT
	PROPOSED HYDRANT
	STORM SEWER STRUCTURE NO.

SEE SHEETS 71R -73R FOR STAGING AND TRAFFIC CONTROL NOTES, STAGING NARRATIVE, STRIPING KEY, AND TRAFFIC CONTROL SIGN TABULATION.

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM AND BE PLACED IN ACCORDANCE WITH THE CURRENT "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MN MUTCD) AND PART VI, "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".



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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION
... \CAD_BIMV\lan\9140_tca101.dgn					

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 1/9/2018 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

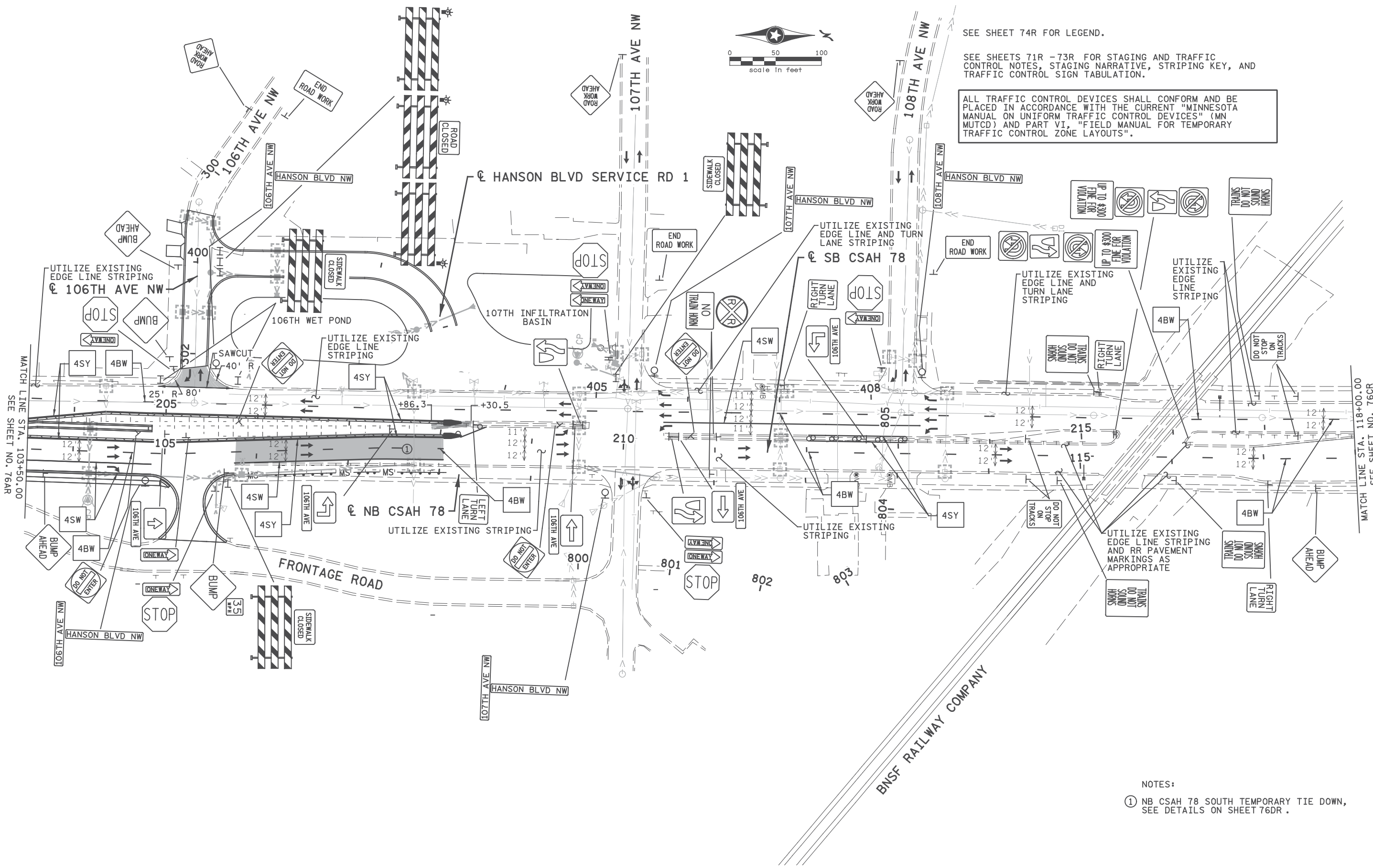
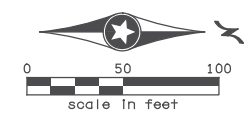
ANOKA COUNTY
 STAGING AND TRAFFIC CONTROL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 STAGE 2

SHEET
 76AR
 OF
 175

SEE SHEET 74R FOR LEGEND.

SEE SHEETS 71R - 73R FOR STAGING AND TRAFFIC CONTROL NOTES, STAGING NARRATIVE, STRIPING KEY, AND TRAFFIC CONTROL SIGN TABULATION.

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MATCH LINE STA. 103+50.00
SEE SHEET NO. 76AR

MATCH LINE STA. 118+00.00
SEE SHEET NO. 76CR

- NOTES:
- ① NB CSAH 78 SOUTH TEMPORARY TIE DOWN, SEE DETAILS ON SHEET 76DR.

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
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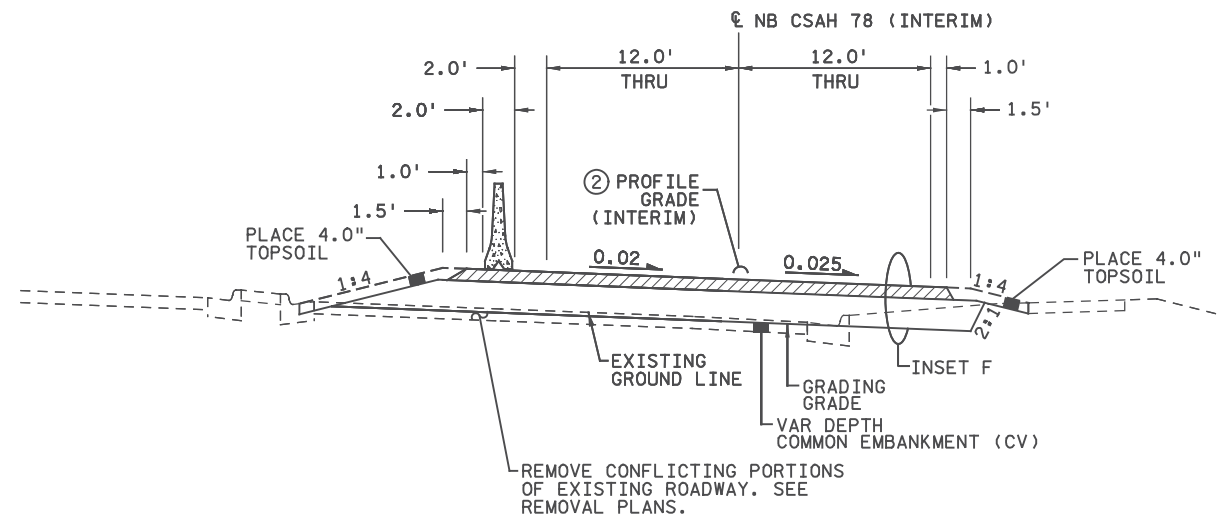
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S. VANG
DESIGNED BY
T. SMITH
CHECKED BY
B. ROBECK
COMM. NO. 0169140



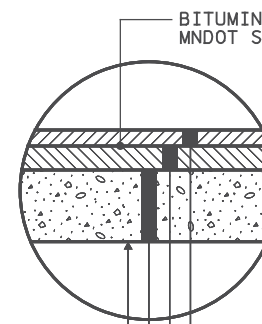
ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
STAGING AND TRAFFIC CONTROL PLANS
CSAH 78 - BNSF GRADE SEPARATION
STAGE 2

SHEET
76BR
OF
175



NB CSAH 78 - SOUTH TEMP TIE DOWN

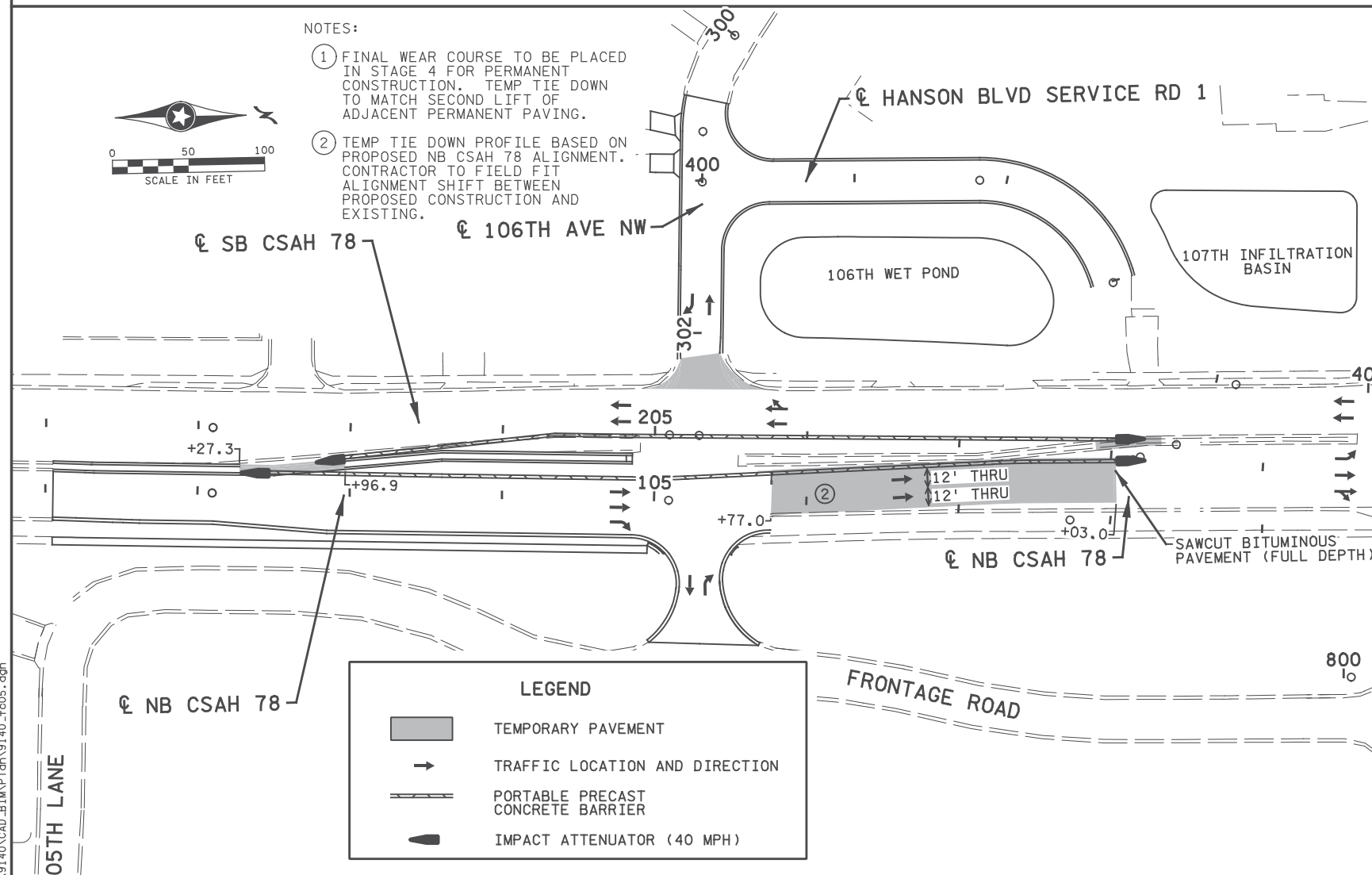


- BITUMINOUS MATERIAL FOR TACK COAT
MNDOT SPEC 2357
- 2.0" TYPE SP 12.5 WEARING COURSE MIX (3,F) MNDOT SPEC 2360 (SPWEB340F)
- 3.0" TYPE SP 12.5 NON WEARING COURSE MIX (3,B) MNDOT SPEC 2360 (SPNBW330B)
- 9" AGGREGATE BASE (CV) CLASS 5 MNDOT SPEC 2211
- GRADING GRADE

INSET F
TEMPORARY PAVEMENT

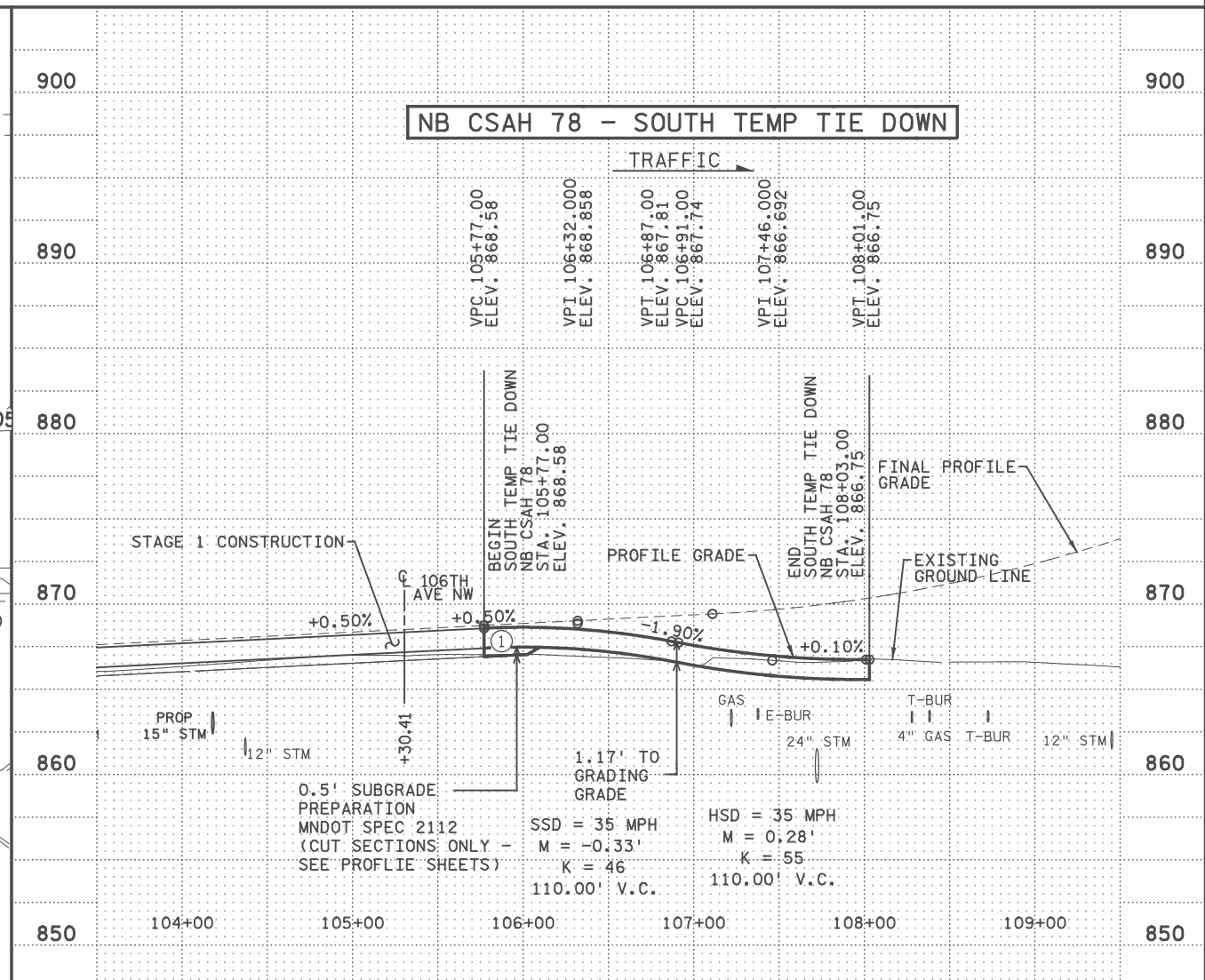
NOTES:

- ① FINAL WEAR COURSE TO BE PLACED IN STAGE 4 FOR PERMANENT CONSTRUCTION. TEMP TIE DOWN TO MATCH SECOND LIFT OF ADJACENT PERMANENT PAVING.
- ② TEMP TIE DOWN PROFILE BASED ON PROPOSED NB CSAH 78 ALIGNMENT. CONTRACTOR TO FIELD FIT ALIGNMENT SHIFT BETWEEN PROPOSED CONSTRUCTION AND EXISTING.



LEGEND

- TEMPORARY PAVEMENT
- TRAFFIC LOCATION AND DIRECTION
- PORTABLE PRECAST CONCRETE BARRIER
- IMPACT ATTENUATOR (40 MPH)



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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION
...

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Ben Robeck

Date: 1/9/2018 License #: 53680

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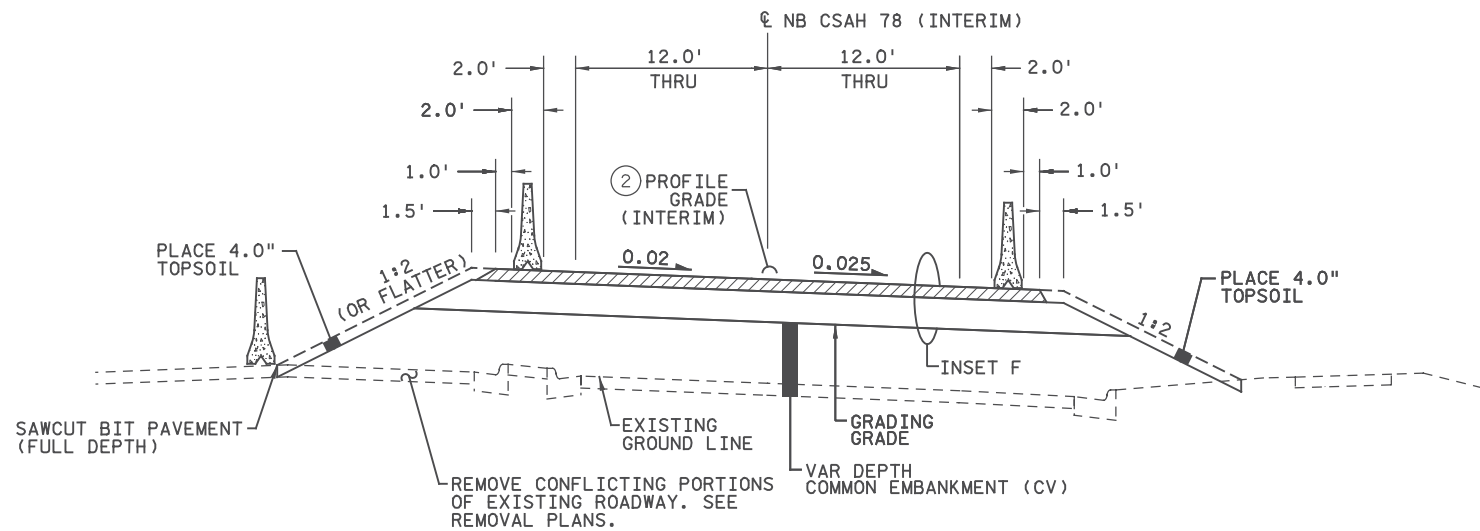
SRF ENGINEERS
PLANNERS
DESIGNERS

Consulting Group, Inc.

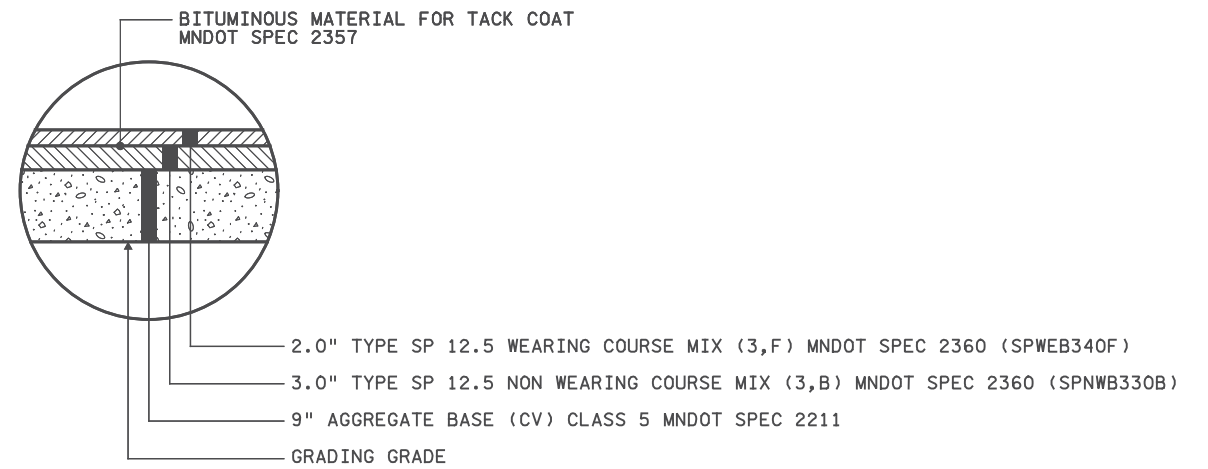
ANOKA COUNTY

STAGING AND TRAFFIC CONTROL PLANS
CSAH 78 - BNSF GRADE SEPARATION
NB CSAH 78 - SOUTH TEMP TIE DOWN

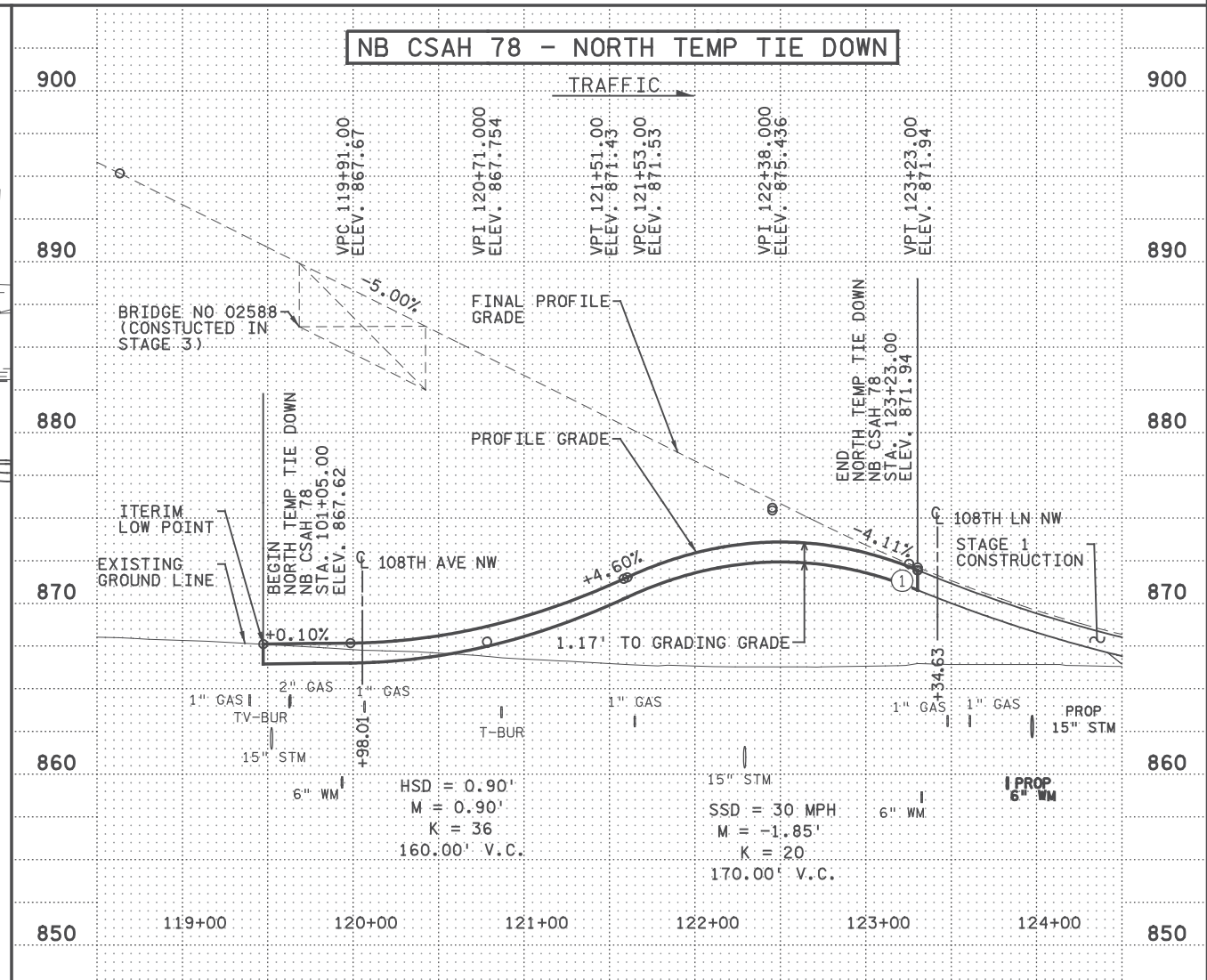
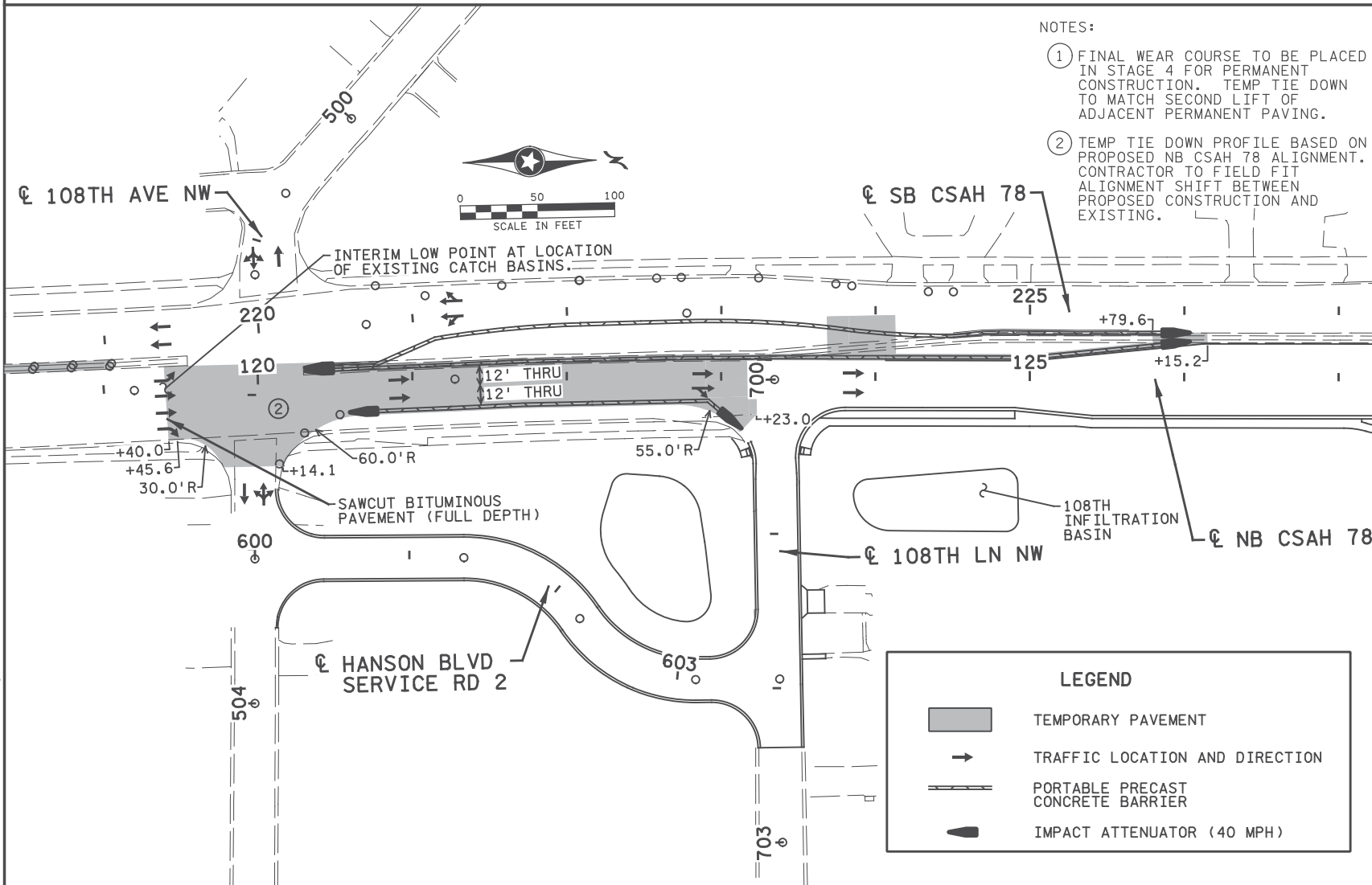
SHEET
76DR
OF
175



NB CSAH 78 - NORTH TEMP TIE DOWN



INSET F
TEMPORARY PAVEMENT



1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
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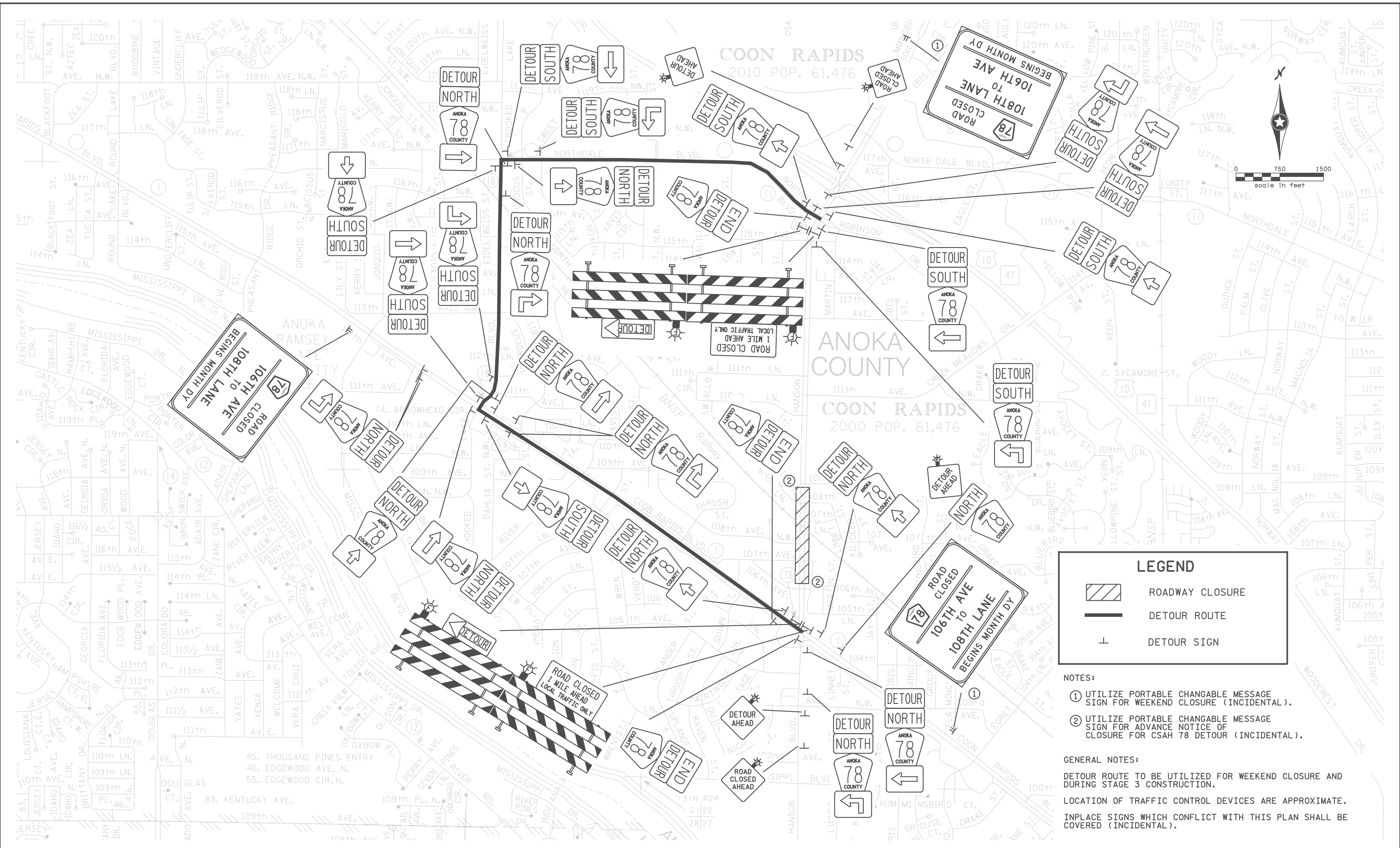
ANOKA COUNTY

ENGINEERS
PLANNERS
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STAGING AND TRAFFIC CONTROL PLANS
CSAH 78 - BNSF GRADE SEPARATION
NB CSAH 78 - NORTH TEMP TIE DOWN

SHEET 76ER OF 175

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LEGEND

- ROADWAY CLOSURE
- DETOUR ROUTE
- DETOUR SIGN

NOTES:

- ① UTILIZE PORTABLE CHANGABLE MESSAGE SIGN FOR WEEKEND CLOSURE (INCIDENTAL).
- ② UTILIZE PORTABLE CHANGABLE MESSAGE SIGN FOR ADVANCE NOTICE OF CLOSURE FOR CSAH 78 DETOUR (INCIDENTAL).

GENERAL NOTES:

DETOUR ROUTE TO BE UTILIZED FOR WEEKEND CLOSURE AND DURING STAGE 3 CONSTRUCTION.

LOCATION OF TRAFFIC CONTROL DEVICES ARE APPROXIMATE.

INPLACE SIGNS WHICH CONFLICT WITH THIS PLAN SHALL BE COVERED (INCIDENTAL).

1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION

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Date: 6/13/2017 License #: 53680

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CHECKED BY B. ROBECK

COMM. NO. 0169140



ANOKA COUNTY

STAGING AND TRAFFIC CONTROL PLANS

CSAH 78 - BNSF GRADE SEPARATION

STAGE 3 DETOUR PLAN

SHEET






































77R

OF

175

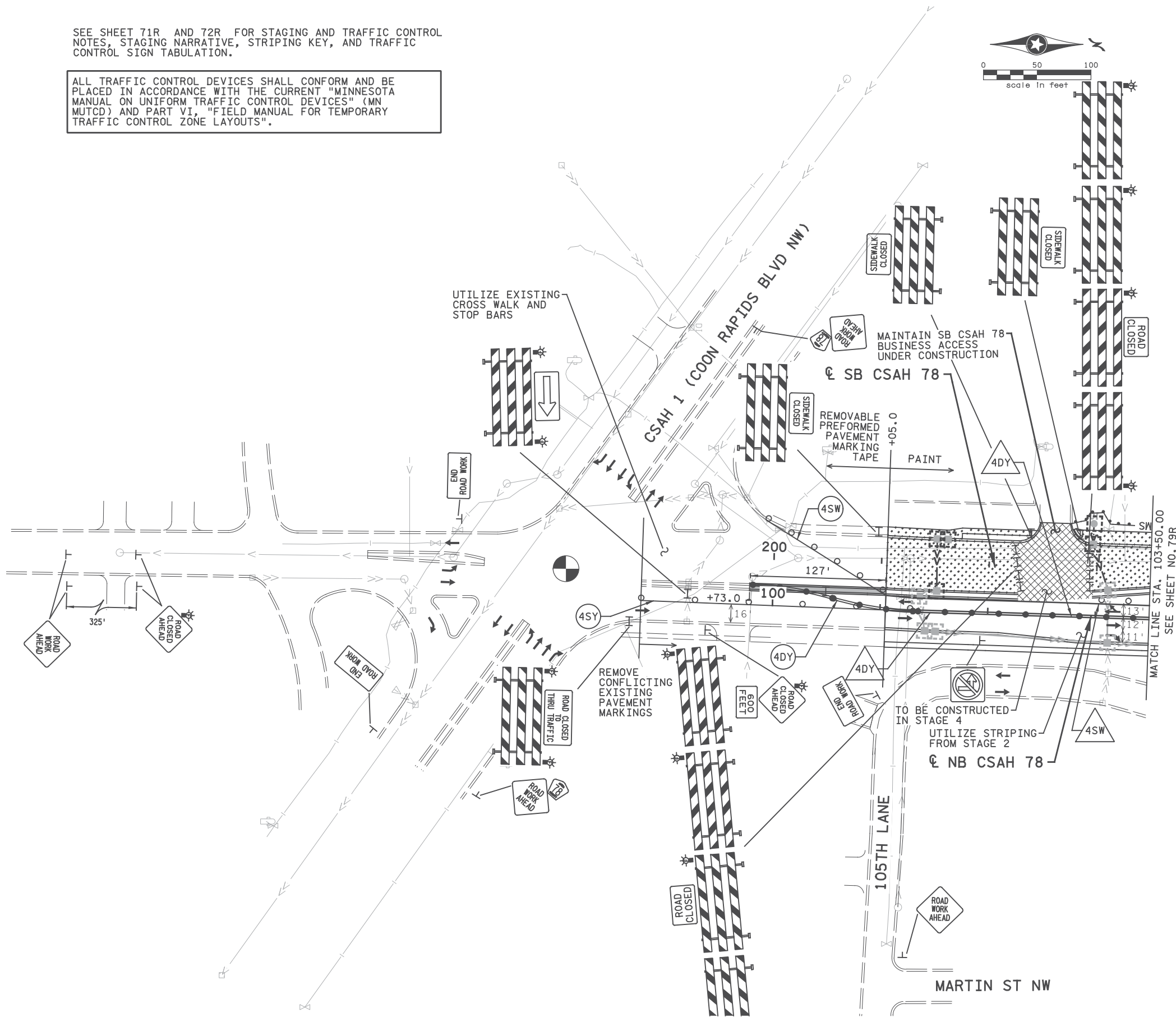
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LEGEND

-  PERMANENT CONSTRUCTION
-  CONSTRUCTION UNDER TRAFFIC
-  TEMPORARY PAVEMENT
-  REFLECTIVE PLASTIC DRUM
-  REFLECTIVE TUBE DELINEATOR
-  TYPE "C" SIGN
-  TYPE III BARRICADE
-  LOW INTENSITY FLASHER, TYPE A
-  TEMPORARY RAISED PAVEMENT MARKERS (10' SPACING)
-  TRAFFIC LOCATION AND DIRECTION
-  PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337
-  IMPACT ATTENUATOR (40 MPH)
-  RAPID STABILIZATION METHOD 3
-  SILT FENCE, TYPE MS
-  BIOROLL
-  INLET PROTECTION
-  INLET PROTECTION FROM PREVIOUS STAGE
-  CULVERT END CONTROLS
-  PROPOSED WATERMAIN BUILT THIS STAGE
-  PROPOSED WATERMAIN BUILT PREVIOUS STAGE
-  EXISTING WATERMAIN
-  PROPOSED SANITARY SEWER BUILT THIS STAGE
-  PROPOSED SANITARY SEWER BUILT PREVIOUS STAGE
-  EXISTING SANITARY SEWER
-  PROPOSED STORM SEWER BUILT THIS STAGE
-  PROPOSED STORM SEWER BUILT PREVIOUS STAGE
-  EXISTING STORM SEWER
-  EXISTING MANHOLE
-  PROPOSED MANHOLE
-  EXISTING CATCH BASIN
-  PROPOSED CATCH BASIN
-  EXISTING APRON
-  PROPOSED APRON
-  EXISTING GATE VALVE & BOX
-  EXISTING HYDRANT
-  PROPOSED GATE VALVE & BOX
-  PROPOSED HYDRANT

SEE SHEET 71R AND 72R FOR STAGING AND TRAFFIC CONTROL NOTES, STAGING NARRATIVE, STRIPING KEY, AND TRAFFIC CONTROL SIGN TABULATION.

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION

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Ben Robeck

Date: 6/13/2017 License #: 53680

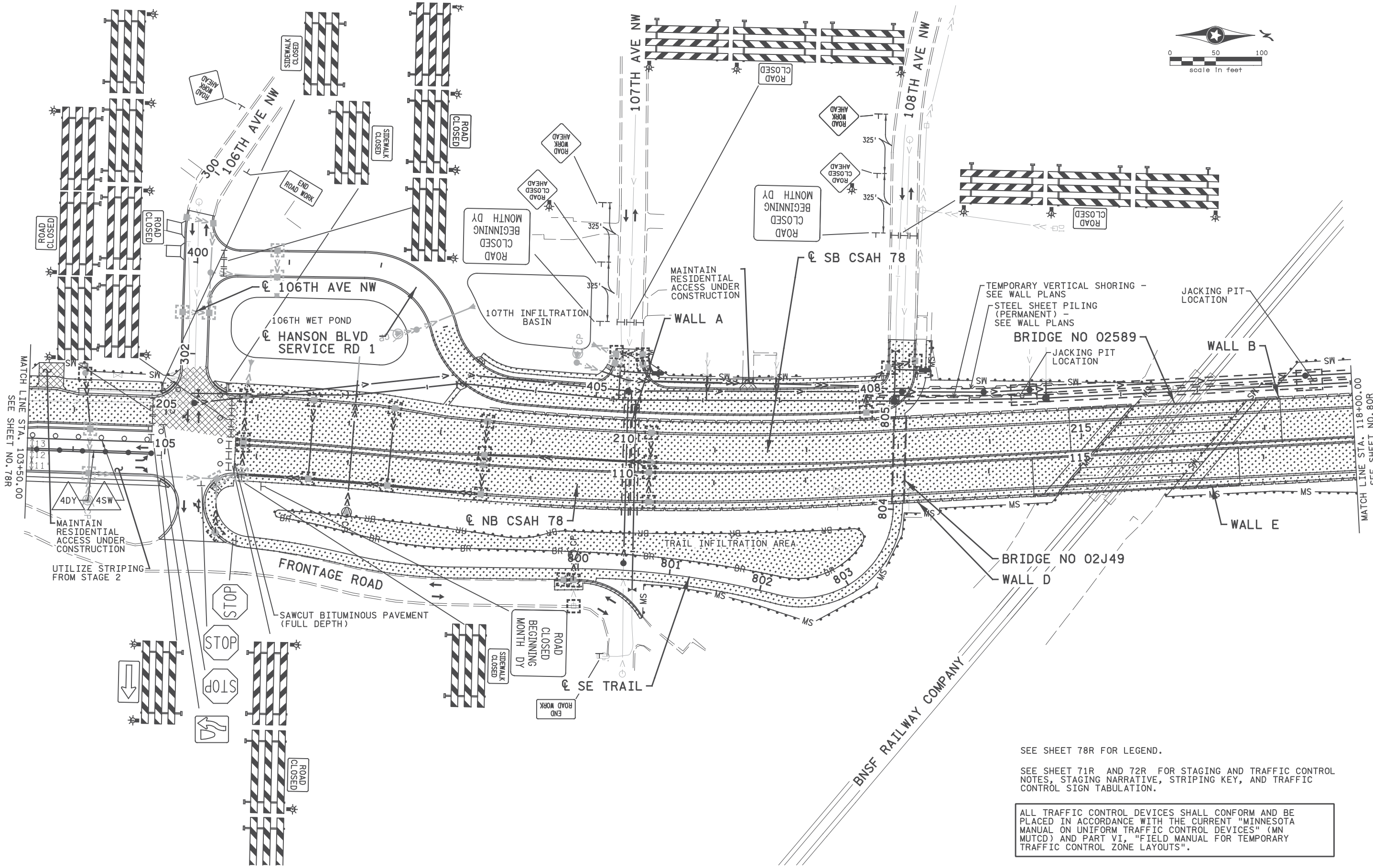
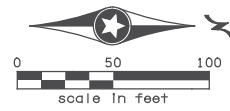
STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
DESIGNED BY T. SMITH
CHECKED BY B. ROBECK
COMM. NO. 0169140



ANOKA COUNTY
STAGING AND TRAFFIC CONTROL PLANS
CSAH 78 - BNSF GRADE SEPARATION
STAGE 3

SHEET 78R OF 175



MATCH LINE STA. 103+50.00
SEE SHEET NO. 78R

MATCH LINE STA. 118+00.00
SEE SHEET NO. 80R

SEE SHEET 78R FOR LEGEND.
SEE SHEET 71R AND 72R FOR STAGING AND TRAFFIC CONTROL NOTES, STAGING NARRATIVE, STRIPING KEY, AND TRAFFIC CONTROL SIGN TABULATION.

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ANOKA COUNTY
STAGING AND TRAFFIC CONTROL PLANS
CSAH 78 - BNSF GRADE SEPARATION
STAGE 3

SHEET 79R OF 175

SIGN DATA

SIGNS TO BE PLACED ON DRIVEN U-POSTS SHALL BE PLACED IN ACCORDANCE WITH TABLE 1 OR 2 BELOW. IF THE TTC PLAN PLACES POST MOUNTED TEMPORARY SIGNS ADJACENT TO EXISTING STRUCTURES THERE SHALL BE NO MORE THAN TWO U-POST WITHIN 84 INCHES OF EACH OTHER ALIGNED IN THE SAME PLANE SO AS NOT TO COMPROMISE THAT STRUCTURE'S AND THE NEW DEVICE'S CRASHWORTHINESS. IF IT IS NOT POSSIBLE TO MAINTAIN THIS SPACING THEN THE POST MOUNTED TEMPORARY SIGNS SHALL BE PLACED A MIN OF 4' BEYOND THE IN PLACE STRUCTURES. SIGN PANELS SHALL BE PLACED ON SIGN STRUCTURES TO MEET THE 5' MIN DEPICTED ON THE TYPICAL RURAL DESIGN DETAIL, THE 7' MIN DEPICTED ON THE TYPICAL URBAN DESIGN DETAIL, AND THE 9' MIN DEPICTED ON THE TYPICAL MOUNTING DETAIL ON THIS SHEET.

STANDARD CONSTRUCTION SIGNS IN MNDOT STANDARD SIGNS AND MARKINGS MANUAL

TABLE 1

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

GENERAL NOTES:

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

TABLE 2

SPECIAL DESIGN CONSTRUCTION SIGNS

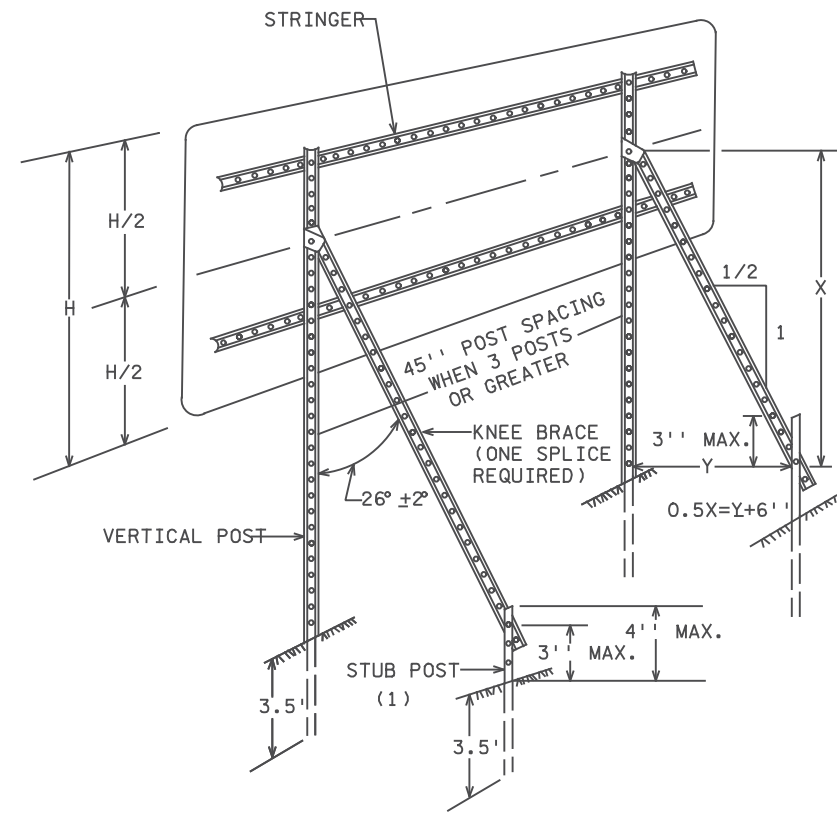
PANEL SIZE		POSTS			
LENGTH (IN.)	HEIGHT (IN.)	NO. & TYPE	SPACING (IN.)	KNEE BRACES QUANT.	LENGTH (FT.)
54 - 96	78	2-U	42	2	20
102 - 138	78	3-U	45	3	20
144 - 180	78	4-U	45	4	20

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

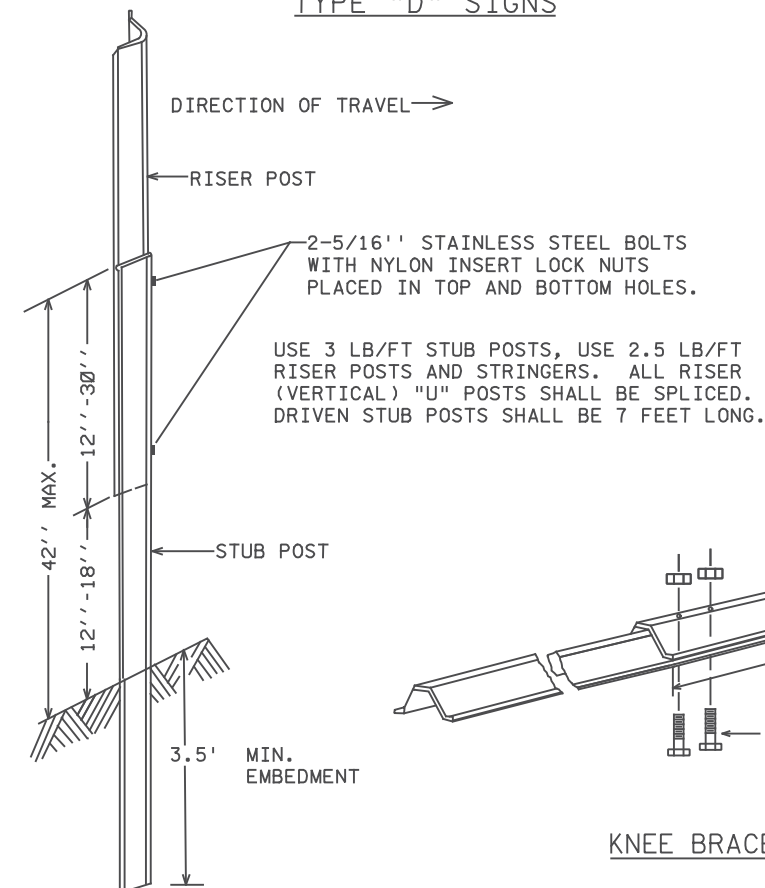
NOTES: FOR TEMPORARY CONSTRUCTION SIGN FRAMING, THE CONTRACTOR MAY USE GRADE 5 ZINC PLATED BOLTS FOR ALL BOLTED CONNECTIONS, EXCEPT FOR THE KNEE BRACE CONNECTION TO THE REAR STUB POST, WHICH SHALL UTILIZE A 5/16 INCH STAINLESS STEEL BOLT AND NYLON INSERT LOCK NUT. ADDITIONAL SIGN FRAMING DETAILS CAN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

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

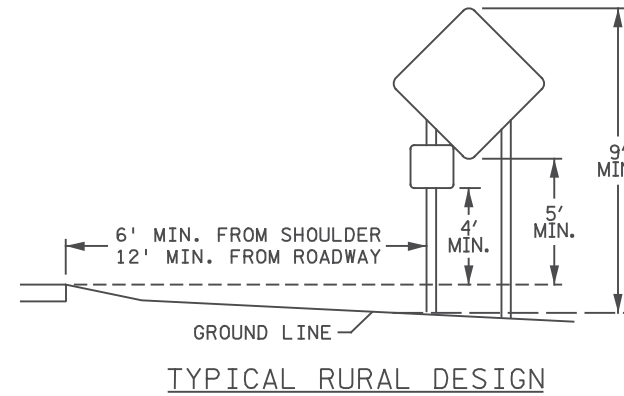
TYPICAL TEMPORARY SIGN FRAMING AND INSTALLATION DETAILS



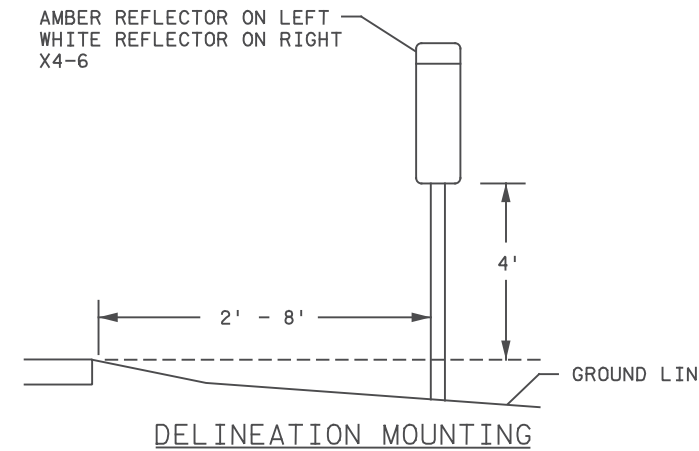
TYPICAL "A-FRAME" INSTALLATION TYPE "D" SIGNS



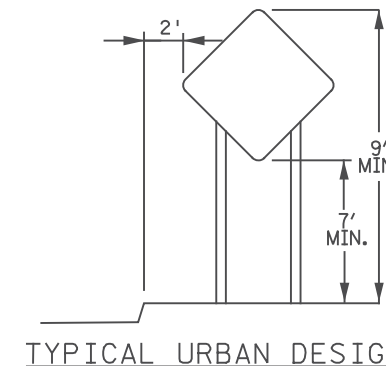
"U" POST BREAKAWAY SPLICE



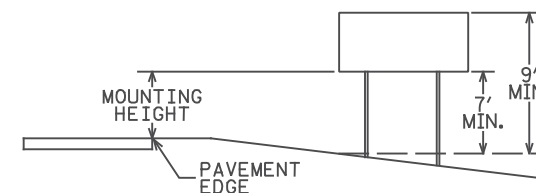
TYPICAL RURAL DESIGN



DELINEATION MOUNTING

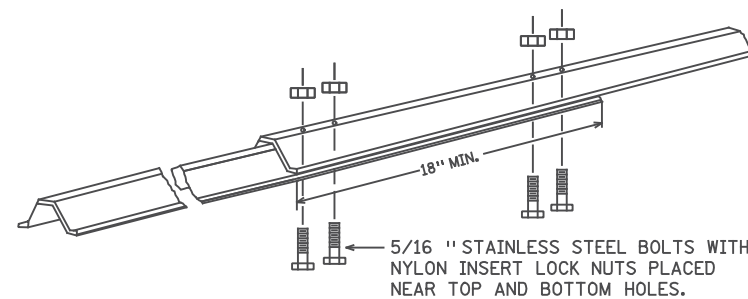


TYPICAL URBAN DESIGN



TYPICAL MOUNTING

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

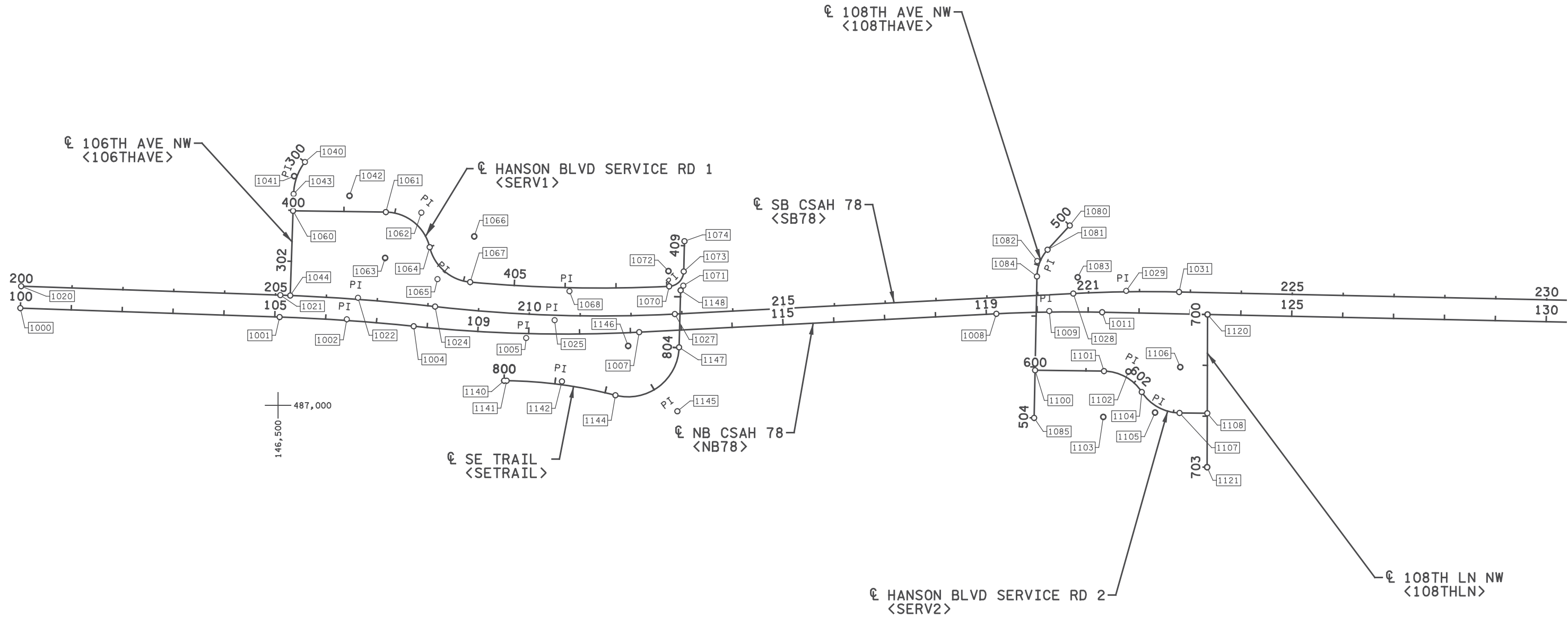
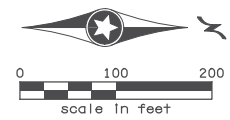


KNEE BRACE STRUCTURAL SPLICE

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486,000
147,000

486,000
148,500



487,000
146,500

487,500
146,000

487,500
148,000

NOTES:
 [XXXX] DENOTES ALIGNMENT POINT NUMBERS (SEE ALIGNMENT TABULATIONS)
 <XXXX> INDICATES GEOPAK ALIGNMENT NAMES

HORIZONTAL CONTROL
 HORIZONTAL CONTROL BASED ON ANOKA COUNTY COORDINATE SYSTEM, NAD 83 (1996 ADJ)

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NO	DATE	BY	CKD	APPR	REVISION

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 T. SMITH
 CHECKED BY
 B. ROBECK
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 ALIGNMENT PLANS AND TABULATIONS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 82
 OF
 175

ALIGNMENT TABULATION

POINT NUMBER	POINT	STATION	CIRCULAR CURVE DATA					COORDINATES		AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	
			SPIRAL CURVE DATA							
ANGLE (Θs)	DEGREE	ST	LT	LS						
☪ NB CSAH 78 <NB78>										
1000	POT	☪ NB CSAH 78 100+00.000						486,808.8867	145,993.8404	
1001	PC	105+09.563						486,826.4194	146,503.1015	1° 58' 18.42"
1002	PI	106+41.620	3° 57' 36.49" RT	1° 30' 00.00"	3,819.719'	132.057'	264.009'	486,830.9631	146,635.0805	PI
1003	CC							490,643.8763	146,371.6752	
1004	PRC	107+73.572						486,844.6108	146,766.4305	5° 55' 54.91"
1005	PI	109+95.815	8° 52' 19.11" LT	2° 00' 00.00"	2,864.789'	222.244'	443.599'	486,867.5789	146,987.4840	PI
1006	CC							483,995.1616	147,062.4969	
1007	PT	112+17.171						486,856.1798	147,209.4351	357° 03' 35.81"
1008	PC	119+19.716						486,820.1454	147,911.0562	357° 03' 35.81"
1009	PI	120+23.697	4° 09' 26.71" RT	2° 00' 00.00"	2,864.789'	103.981'	207.871'	486,814.8121	148,014.9004	PI
1010	CC							489,681.1636	148,057.9944	
1011	PT	121+27.587						486,817.0213	148,118.8580	1° 13' 02.51"
1012	POT	☪ NB CSAH 78 144+09.936						486,865.5107	150,400.6916	

☪ SB CSAH 78 <SB78>										
1020	POT	☪ SB CSAH 78 200+00.000						486,765.9122	145,995.3200	
1021	PC	205+09.563						486,783.4448	146,504.5810	1° 58' 18.42"
1022	PI	206+62.057	4° 31' 17.58" RT	1° 28' 59.89"	3,862.719'	152.494'	304.830'	486,788.6918	146,656.9849	PI
1023	CC							490,643.8763	146,371.6752	
1024	PRC	208+14.393						486,805.9370	146,808.5009	6° 29' 36.00"
1025	PI	210+50.762	9° 26' 00.20" LT	2° 00' 00.00"	2,864.789'	236.369'	471.669'	486,832.6674	147,043.3534	PI
1026	CC							483,959.5256	147,132.4730	
1027	PT	212+86.062						486,820.5437	147,279.4112	357° 03' 35.81"
1028	PC	220+69.788						486,780.3456	148,062.1055	357° 03' 35.81"
1029	PI	221+73.769	4° 09' 26.71" RT	2° 00' 00.00"	2,864.789'	103.981'	207.871'	486,775.0123	148,165.9497	PI
1030	CC							489,641.3637	148,209.0437	
1031	PT	222+77.659						486,777.2214	148,269.9074	1° 13' 02.51"
1032	POT	☪ SB CSAH 78 244+09.838						486,822.5204	150,401.6052	

☪ 106TH AVE NW <106THAVE>										
1040	PC	☪ 106TH AVE NW 300+00.000						486,521.9323	146,552.6951	127° 06' 09.49"
1041	PI	300+34.937	35° 14' 26.20" LT	52° 05' 13.46"	110.000'	34.937'	67.657'	486,549.7965	146,531.6196	PI
1042	CC							486,588.2892	146,640.4263	
1043	PT	300+67.657						486,584.7150	146,530.4844	91° 51' 43.29"
1044	POT	☪ 106TH AVE NW 302+67.210						486,784.1623	146,524.0004	

ALIGNMENT TABULATION

POINT NUMBER	POINT	STATION	CIRCULAR CURVE DATA					COORDINATES		AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	
			SPIRAL CURVE DATA							
ANGLE (Θs)	DEGREE	ST	LT	LS						
☪ HANSON BLVD SERVICE RD 1 <SERV1>										
1060	POT	☪ HANSON BLVD SERVICE RD 1 400+00.000						486,617.8794	146,529.4062	
1061	PC	401+82.284						486,620.3822	146,711.6728	0° 47' 12.15"
1062	PI	402+52.192	75° 40' 37.48" RT	63° 39' 43.12"	90.000'	69.908'	118.873'	486,621.3421	146,781.5744	PI
1063	CC							486,710.3738	146,710.4371	
1064	PRC	403+01.157						486,689.3084	146,797.9371	76° 27' 49.63"
1065	PI	403+65.653	71° 15' 10.11" LT	63° 39' 43.12"	90.000'	64.496'	111.924'	486,752.0132	146,813.0331	PI
1066	CC							486,668.2430	146,885.4371	
1067	PCC	404+13.081						486,757.8710	146,877.2630	5° 12' 39.52"
1068	PI	406+09.092	7° 58' 49.91" LT	2° 02' 20.49"	2,809.959'	196.012'	391.389'	486,775.6735	147,072.4646	PI
1069	CC							483,959.5255	147,132.4730	
1070	PCC	408+04.470						486,766.2024	147,268.2474	357° 13' 49.61"
1071	PI	408+32.286	85° 40' 25.25" LT	190° 59' 09.35"	30.000'	27.816'	44.859'	486,764.8583	147,296.0310	PI
1072	CC							486,736.2374	147,266.7978	
1073	PT	408+49.329						486,737.0524	147,296.7867	271° 33' 24.36"
1074	POT	☪ HANSON BLVD SERVICE RD 1 409+08.861						486,677.5425	147,298.4041	

☪ 108TH AVE NW <108THAVE>										
1080	POT	☪ 108TH AVE NW 500+00.000						486,646.7960	148,055.1802	
1081	PC	500+64.420						486,694.3165	148,011.6858	132° 28' 01.58"
1082	PI	500+94.580	41° 18' 44.94" LT	71° 37' 11.01"	80.000'	30.160'	57.683'	486,716.5643	147,991.3230	PI
1083	CC							486,748.3299	148,070.6990	
1084	PT	501+22.103						486,746.7178	147,990.7153	91° 09' 16.64"
1085	POT	☪ 108TH AVE NW 504+00.000						487,024.5582	147,985.1155	

☪ HANSON BLVD SERVICE RD 2 <SERV2>										
1100	POT	☪ HANSON BLVD SERVICE RD 2 600+00.000						486,930.9085	147,987.0030	
1101	PC	601+35.373						486,932.7672	148,122.3635	0° 47' 12.15"
1102	PI	601+83.478	56° 14' 55.21" RT	63° 39' 43.12"	90.000'	48.105'	88.355'	486,933.4276	148,170.4636	PI
1103	CC							487,022.7587	148,121.1278	
1104	PRC	602+23.728						486,973.7878	148,196.6384	57° 02' 07.36"
1105	PI	602+71.833	56° 14' 55.21" LT	63° 39' 43.12"	90.000'	48.105'	88.355'	487,014.1479	148,222.8131	PI
1106	CC							486,924.8169	148,272.1490	
1107	PT	603+12.084						487,014.8084	148,270.9133	0° 47' 12.15"
1108	POT	☪ HANSON BLVD SERVICE RD 2 603+66.531						487,015.5560	148,325.3554	

☪ 108TH LN NW <108THLN>										
1120	POT	☪ 108TH LN NW 700+00.000						486,821.4199	148,325.8506	
1121	POT	☪ 108TH LN NW 703+00.000						487,121.4189	148,325.0854	

GENERAL NOTES:
 SEE RETAINING WALL PLANS FOR WALL ALIGNMENT INFORMATION.
 <XXXX> INDICATES GEOPAK ALIGNMENT NAME.

NOTES:
 ① ALIGNMENT POINT IS NOT SHOWN ON ALIGNMENT PLAN VIEW.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



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ANOKA COUNTY
 ALIGNMENT PLANS AND TABULATIONS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 83 OF 175

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NO	DATE	BY	CKD	APPR	REVISION

ALIGNMENT TABULATION

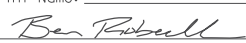
POINT NUMBER	POINT	STATION	CIRCULAR CURVE DATA					COORDINATES		AZIMUTH	
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y		
			SPIRAL CURVE DATA								
ANGLE (Θ_s)	DEGREE	ST	LT	LS							
⊕ SE TRAIL <SETRAIL>											
1140	POT	⊕ SE TRAIL 800+00.000							486,951.4636	146,944.1064	
1141	PC	800+05.000							486,951.5279	146,949.1060	0° 44' 09.81"
1142	PI	801+13.554	13° 45' 18.20" RT	6° 21' 58.31"	900.000'	108.554'	216.064'	486,952.9224	147,057.6509	PI	
1143	CC							487,851.4536	146,937.5444		
1144	PRC	802+21.064						486,980.0858	147,162.7512	14° 29' 28.01"	
1145	PI	803+46.633	102° 56' 03.65" LT	57° 17' 44.81"	100.000'	125.569'	179.654'	487,011.5070	147,284.3259	PI	
1146	CC							486,883.2671	147,187.7742		
1147	PT	804+00.718						486,885.9839	147,287.7373	271° 33' 24.36"	
1148	POT	⊕ SE TRAIL 805+12.629						486,774.1148	147,290.7776		

①

GENERAL NOTES:
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 <XXXX> INDICATES GEOPAK ALIGNMENT NAME.
 NOTES:
 ① ALIGNMENT POINT IS NOT SHOWN ON ALIGNMENT PLAN VIEW.

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 Date 6/13/2017 License # 53680

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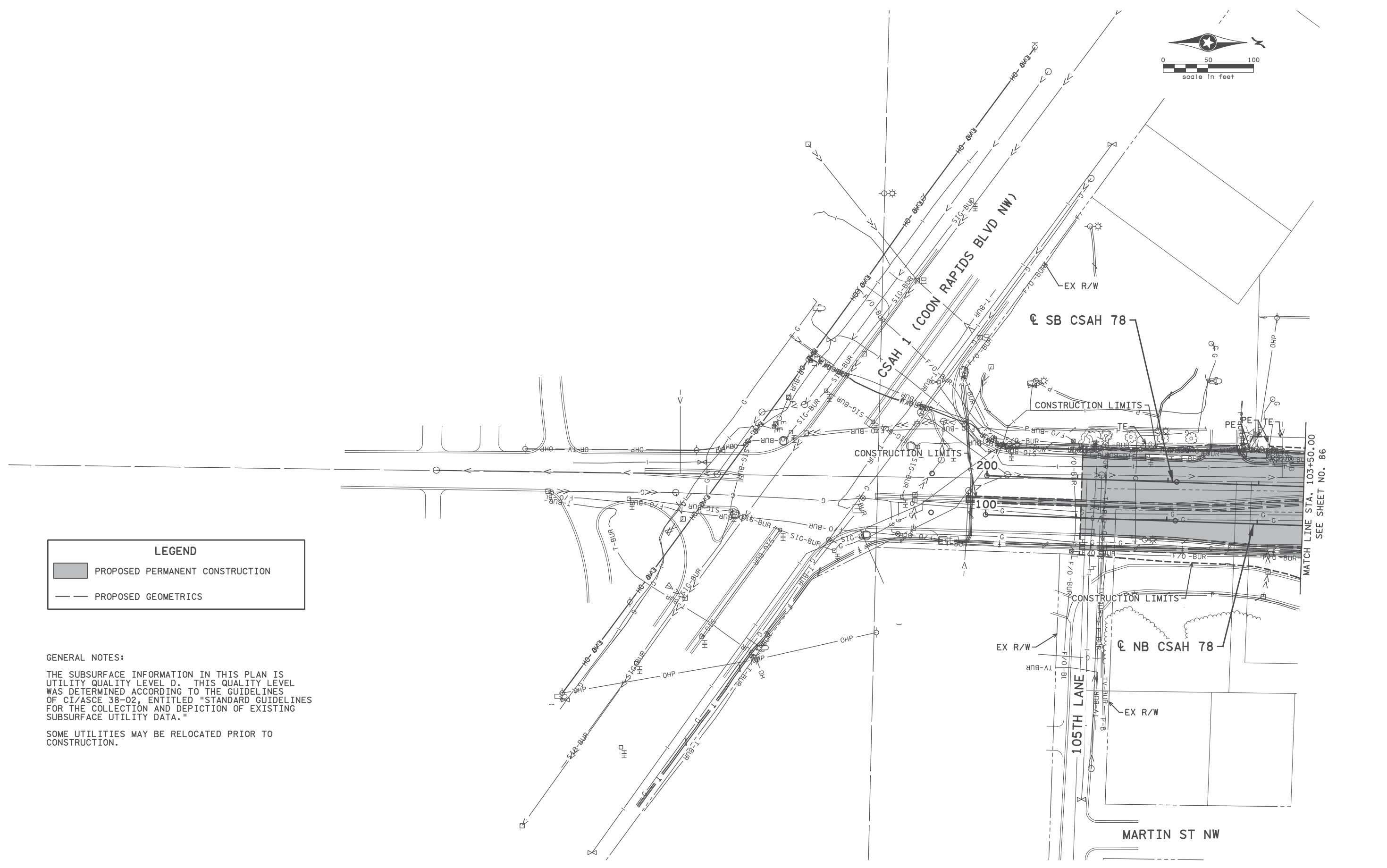
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 DESIGNED BY T. SMITH
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 COMM. NO. 0169140



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ANOKA COUNTY
 ALIGNMENT PLANS AND TABULATIONS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 84 OF 175



LEGEND	
	PROPOSED PERMANENT CONSTRUCTION
	PROPOSED GEOMETRICS

GENERAL NOTES:
 THE SUBSURFACE INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."
 SOME UTILITIES MAY BE RELOCATED PRIOR TO CONSTRUCTION.

MATCH LINE STA. 103+50.00
SEE SHEET NO. 86

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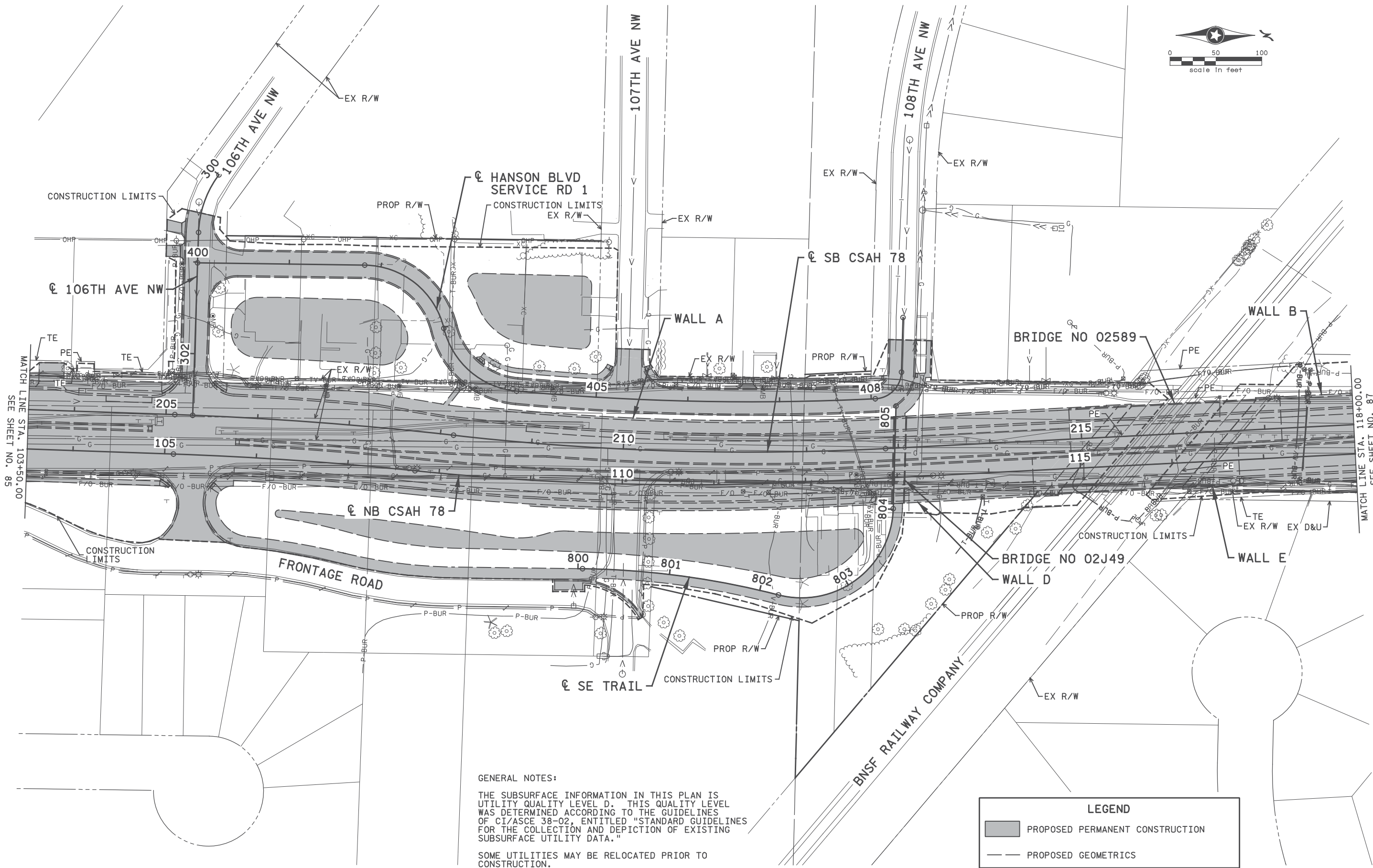
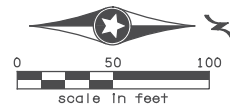
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ANOKA COUNTY
 TOPOGRAPHY AND UTILITY PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 85 OF 175



GENERAL NOTES:

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SOME UTILITIES MAY BE RELOCATED PRIOR TO CONSTRUCTION.

LEGEND	
	PROPOSED PERMANENT CONSTRUCTION
	PROPOSED GEOMETRICS

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Ben Robeck

Date: 6/13/2017 License #: 53680

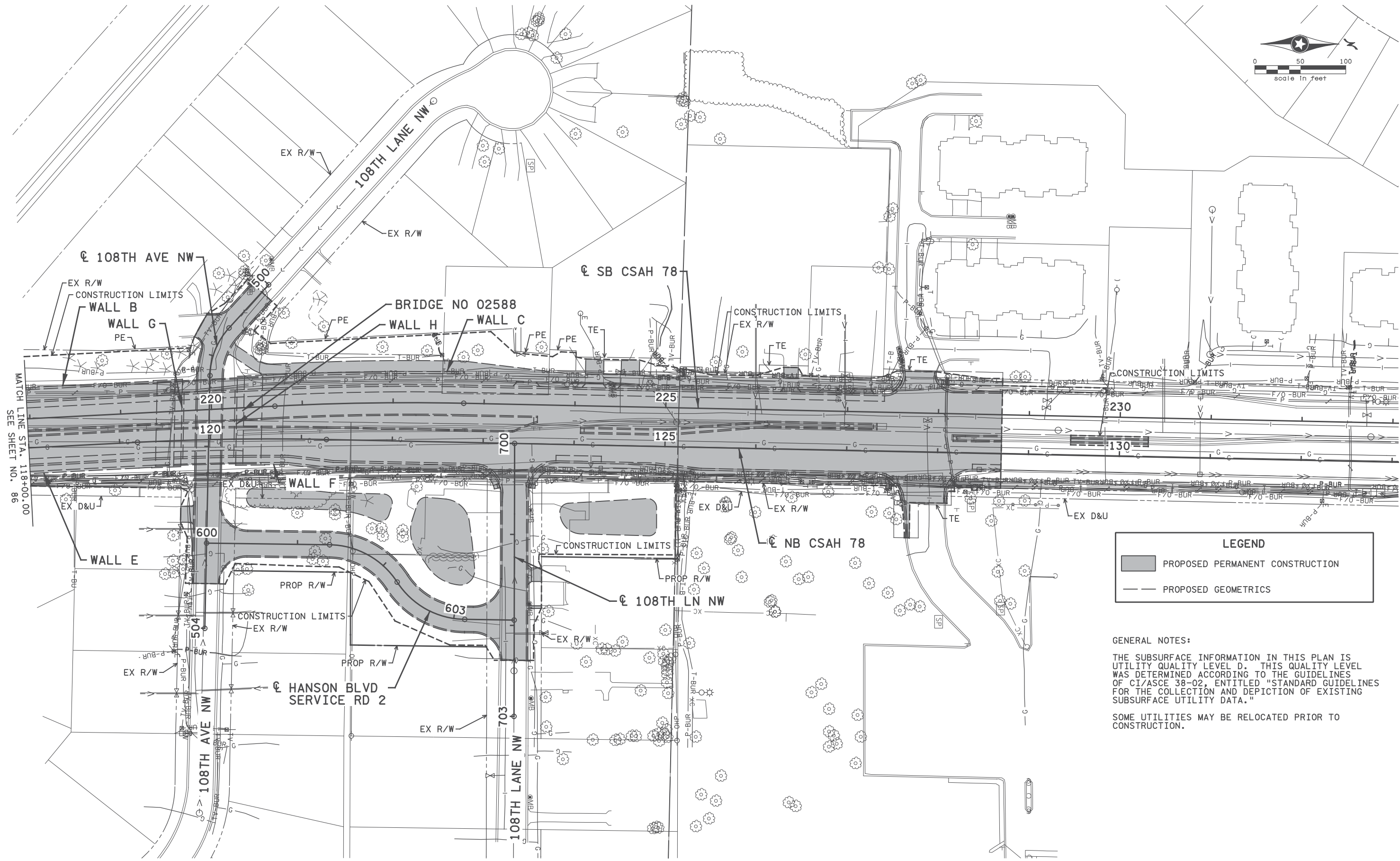
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 COMM. NO. 0169140



ANOKA COUNTY
 TOPOGRAPHY AND UTILITY PLANS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
86
OF
175



MATCH LINE STA. 118+00.00
SEE SHEET NO. 86

LEGEND

- PROPOSED PERMANENT CONSTRUCTION
- PROPOSED GEOMETRICS

GENERAL NOTES:

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TOPOGRAPHY AND UTILITY PLANS
CSAH 78 - BNSF GRADE SEPARATION

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175



LEGEND

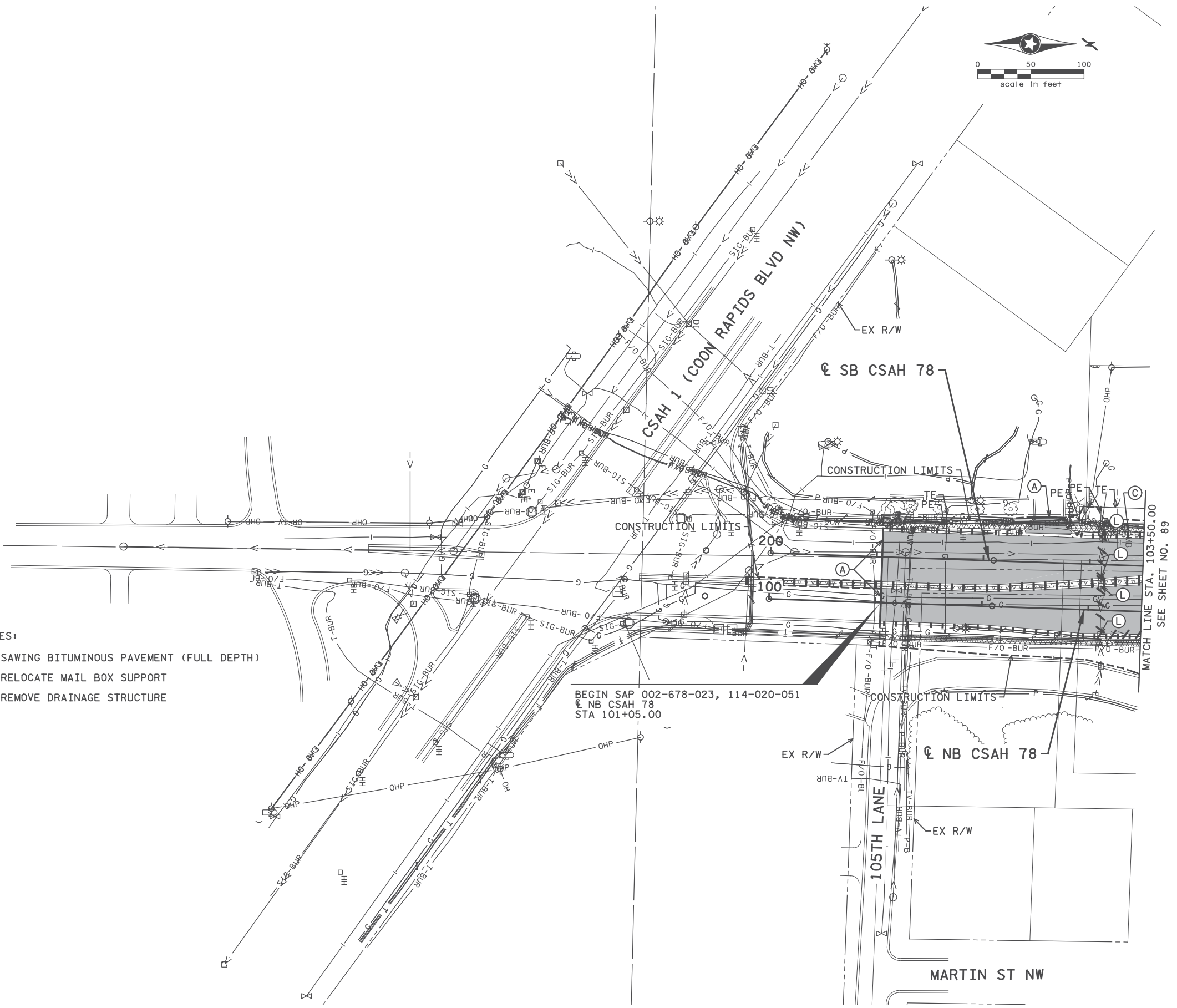
	REMOVE CURB AND GUTTER
	REMOVE BITUMINOUS PAVEMENT
	REMOVE CONCRETE WALK
	REMOVE BITUMINOUS WALK
	REMOVE CONCRETE MEDIAN
	REMOVE BITUMINOUS DRIVEWAY PAVEMENT
	REMOVE CONCRETE DRIVEWAY PAVEMENT
	CLEAR AND GRUB (ACRE)
	CLEAR AND GRUB (1 TREE = 0.05 ACRE)
	REMOVE SEWER PIPE (STORM)
	REMOVE SEWER PIPE (SANITARY)
	REMOVE WATER MAIN

- NOTES:**
- (A) SAWING BITUMINOUS PAVEMENT (FULL DEPTH)
 - (C) RELOCATE MAIL BOX SUPPORT
 - (L) REMOVE DRAINAGE STRUCTURE

GENERAL NOTES:

PROTECT ALL TREES THAT ARE NOT MARKED FOR REMOVAL. NO TREE REMOVAL SHALL OCCUR WITHOUT APPROVAL.

SEE SIGN REMOVAL PLANS FOR SIGN REMOVALS.



BEGIN SAP 002-678-023, 114-020-051
 NB CSAH 78
 STA 101+05.00

MATCH LINE STA. 103+50.00
 SEE SHEET NO. 89

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Ben Robeck

Date: 7/12/2017 License #: 53680

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 002-678-023, 114-020-051

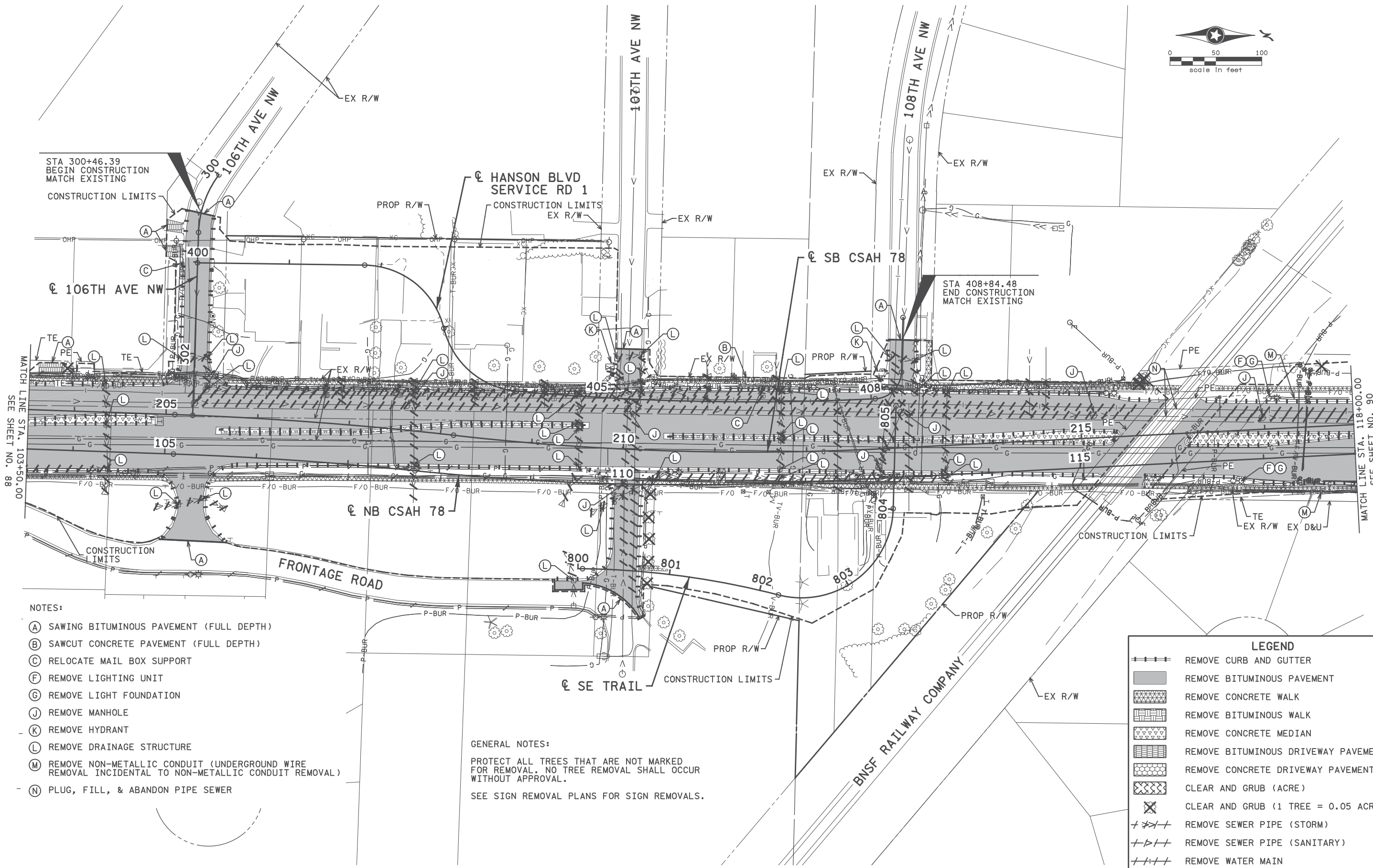
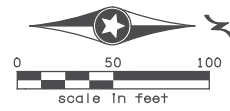
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ANOKA COUNTY
 REMOVAL PLANS
 CSAH 78 - BNSF GRADE SEPARATION

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 OF
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MATCH LINE STA. 103+50.00
SEE SHEET NO. 88

MATCH LINE STA. 118+00.00
SEE SHEET NO. 90

NOTES:

- (A) SAWING BITUMINOUS PAVEMENT (FULL DEPTH)
- (B) SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
- (C) RELOCATE MAIL BOX SUPPORT
- (F) REMOVE LIGHTING UNIT
- (G) REMOVE LIGHT FOUNDATION
- (J) REMOVE MANHOLE
- (K) REMOVE HYDRANT
- (L) REMOVE DRAINAGE STRUCTURE
- (M) REMOVE NON-METALLIC CONDUIT (UNDERGROUND WIRE REMOVAL INCIDENTAL TO NON-METALLIC CONDUIT REMOVAL)
- (N) PLUG, FILL, & ABANDON PIPE SEWER

GENERAL NOTES:

PROTECT ALL TREES THAT ARE NOT MARKED FOR REMOVAL. NO TREE REMOVAL SHALL OCCUR WITHOUT APPROVAL.
SEE SIGN REMOVAL PLANS FOR SIGN REMOVALS.

LEGEND	
	REMOVE CURB AND GUTTER
	REMOVE BITUMINOUS PAVEMENT
	REMOVE CONCRETE WALK
	REMOVE BITUMINOUS WALK
	REMOVE CONCRETE MEDIAN
	REMOVE BITUMINOUS DRIVEWAY PAVEMENT
	REMOVE CONCRETE DRIVEWAY PAVEMENT
	CLEAR AND GRUB (ACRE)
	CLEAR AND GRUB (1 TREE = 0.05 ACRE)
	REMOVE SEWER PIPE (STORM)
	REMOVE SEWER PIPE (SANITARY)
	REMOVE WATER MAIN

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Ben Robeck
Date: 7/12/2017 License #: 53680

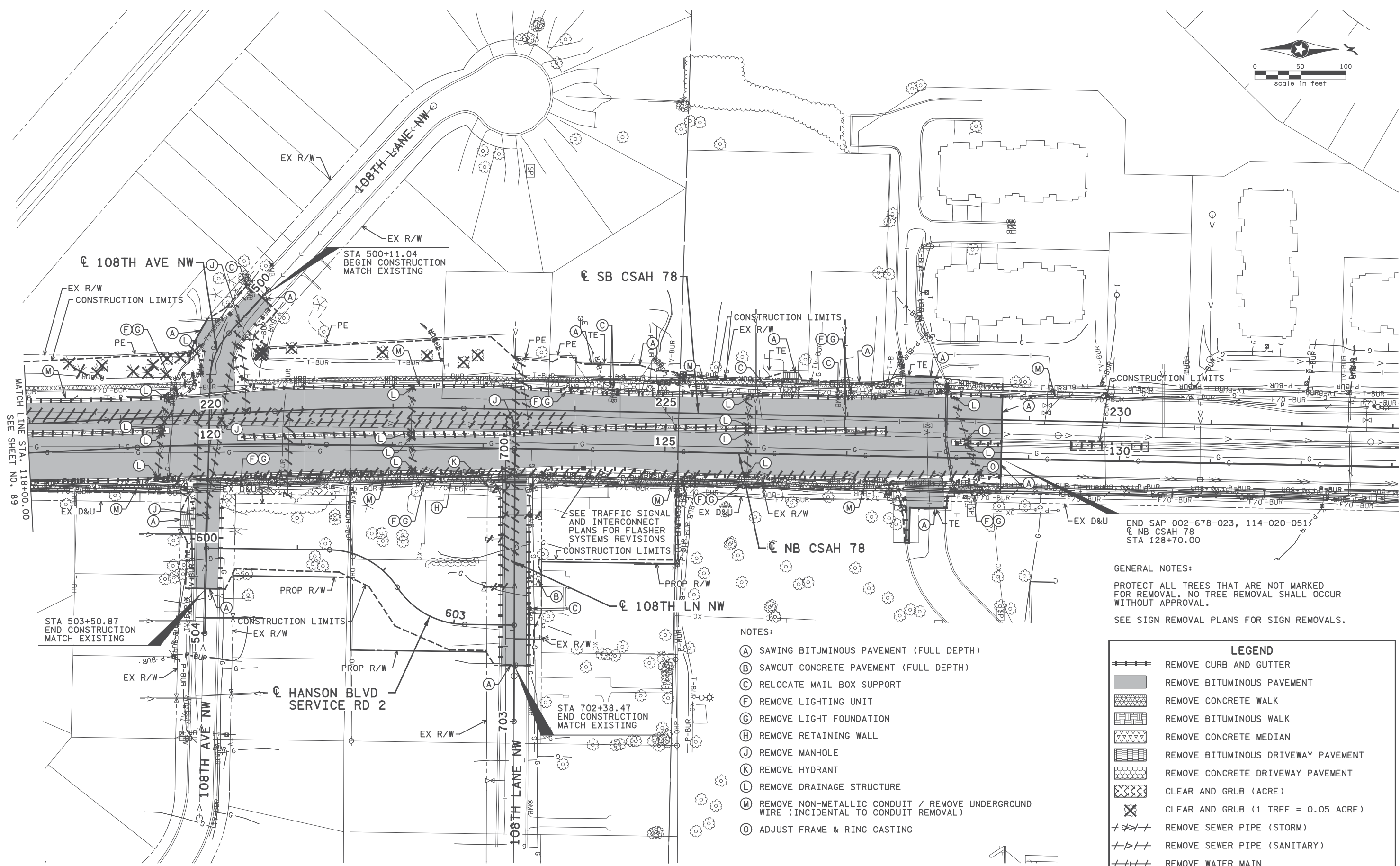
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ANOKA COUNTY
REMOVAL PLANS
CSAH 78 - BNSF GRADE SEPARATION

SHEET 89 OF 175



GENERAL NOTES:
 PROTECT ALL TREES THAT ARE NOT MARKED FOR REMOVAL. NO TREE REMOVAL SHALL OCCUR WITHOUT APPROVAL.
 SEE SIGN REMOVAL PLANS FOR SIGN REMOVALS.

- NOTES:
- (A) SAWING BITUMINOUS PAVEMENT (FULL DEPTH)
 - (B) SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
 - (C) RELOCATE MAIL BOX SUPPORT
 - (F) REMOVE LIGHTING UNIT
 - (G) REMOVE LIGHT FOUNDATION
 - (H) REMOVE RETAINING WALL
 - (J) REMOVE MANHOLE
 - (K) REMOVE HYDRANT
 - (L) REMOVE DRAINAGE STRUCTURE
 - (M) REMOVE NON-METALLIC CONDUIT / REMOVE UNDERGROUND WIRE (INCIDENTAL TO CONDUIT REMOVAL)
 - (O) ADJUST FRAME & RING CASTING

LEGEND	
	REMOVE CURB AND GUTTER
	REMOVE BITUMINOUS PAVEMENT
	REMOVE CONCRETE WALK
	REMOVE BITUMINOUS WALK
	REMOVE CONCRETE MEDIAN
	REMOVE BITUMINOUS DRIVEWAY PAVEMENT
	REMOVE CONCRETE DRIVEWAY PAVEMENT
	CLEAR AND GRUB (ACRE)
	CLEAR AND GRUB (1 TREE = 0.05 ACRE)
	REMOVE SEWER PIPE (STORM)
	REMOVE SEWER PIPE (SANITARY)
	REMOVE WATER MAIN

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Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO
 002-678-023, 114-020-051

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CHECKED BY
 B. ROBECK

COMM. NO. 0169140



ANOKA COUNTY
 REMOVAL PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 90
 OF
 175



LEGEND	
	EXISTING ROADWAYS
	PROPOSED CONSTRUCTION
	DIRECTION OF TRAFFIC
	RETAINING WALL

GENERAL NOTES:

ROADWAY DIMENSIONS ARE TO FACE OF CURB/BARRIER UNLESS NOTED OTHERWISE.

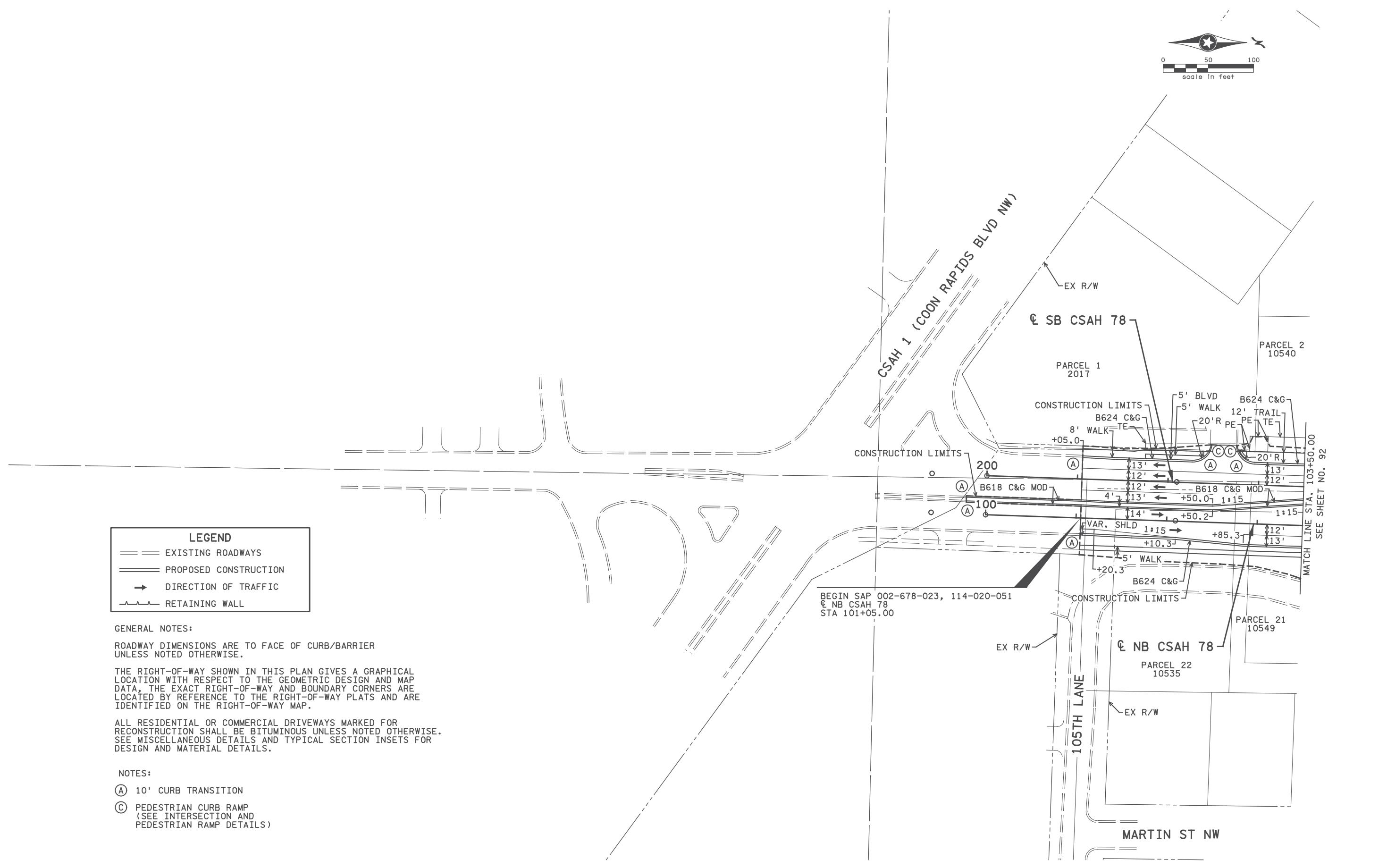
THE RIGHT-OF-WAY SHOWN IN THIS PLAN GIVES A GRAPHICAL LOCATION WITH RESPECT TO THE GEOMETRIC DESIGN AND MAP DATA, THE EXACT RIGHT-OF-WAY AND BOUNDARY CORNERS ARE LOCATED BY REFERENCE TO THE RIGHT-OF-WAY PLATS AND ARE IDENTIFIED ON THE RIGHT-OF-WAY MAP.

ALL RESIDENTIAL OR COMMERCIAL DRIVEWAYS MARKED FOR RECONSTRUCTION SHALL BE BITUMINOUS UNLESS NOTED OTHERWISE. SEE MISCELLANEOUS DETAILS AND TYPICAL SECTION INSETS FOR DESIGN AND MATERIAL DETAILS.

NOTES:

(A) 10' CURB TRANSITION

(C) PEDESTRIAN CURB RAMP (SEE INTERSECTION AND PEDESTRIAN RAMP DETAILS)



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Date: 6/13/2017 License #: 53680

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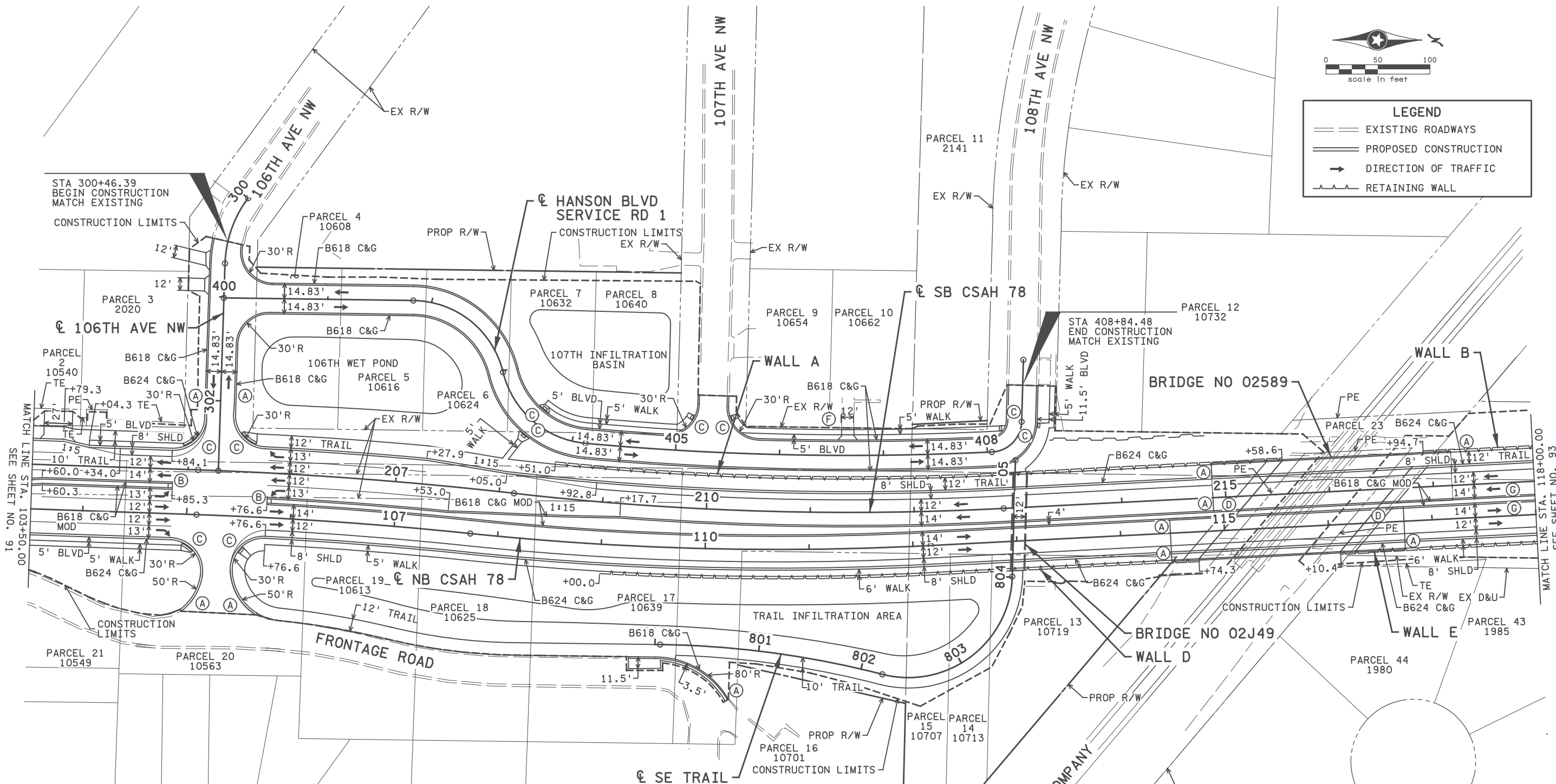
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CONSTRUCTION PLANS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
91
OF
175



LEGEND	
	EXISTING ROADWAYS
	PROPOSED CONSTRUCTION
	DIRECTION OF TRAFFIC
	RETAINING WALL



- NOTES:
- (A) 10' CURB TRANSITION
 - (B) CONCRETE APPROACH NOSE DETAIL (MNDOT STD PLATE 7113)
 - (C) PEDESTRIAN CURB RAMP (SEE INTERSECTION AND PEDESTRIAN RAMP DETAILS)
 - (D) BRIDGE APPROACH PANEL (SEE STD PLAN SHEETS)
 - (F) CONCRETE DRIVEWAY
 - (G) MEDIAN GUTTER SLOPE TO MATCH ROAD SLOPE BETWEEN BR NO 02589 AND BR NO 02588

GENERAL NOTES:

ROADWAY DIMENSIONS ARE TO FACE OF CURB/BARRIER UNLESS NOTED OTHERWISE.

THE RIGHT-OF-WAY SHOWN IN THIS PLAN GIVES A GRAPHICAL LOCATION WITH RESPECT TO THE GEOMETRIC DESIGN AND MAP DATA, THE EXACT RIGHT-OF-WAY AND BOUNDARY CORNERS ARE LOCATED BY REFERENCE TO THE RIGHT-OF-WAY PLATS AND ARE IDENTIFIED ON THE RIGHT-OF-WAY MAP.

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NO	DATE	BY	CKD	APPR	REVISION

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Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

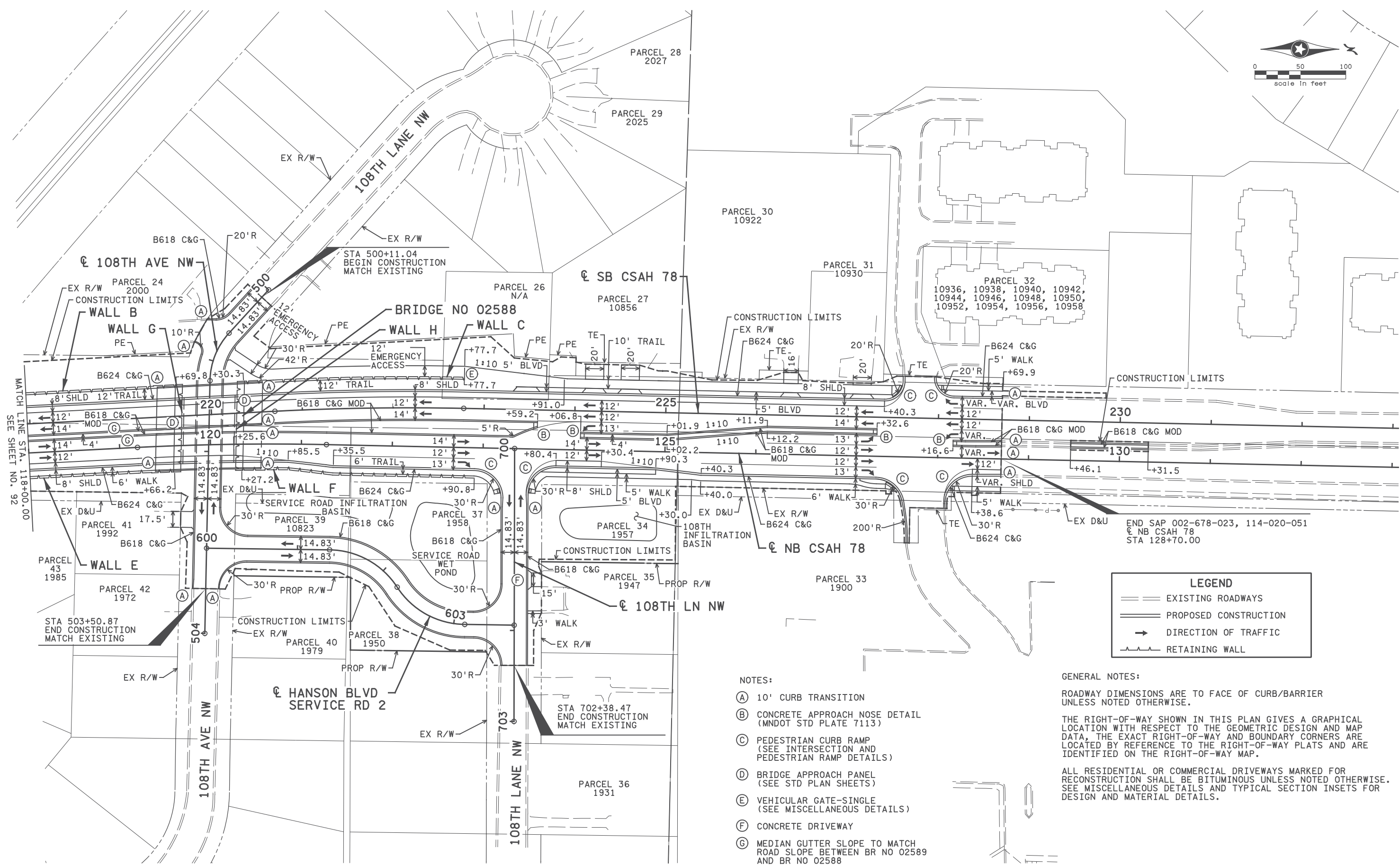
DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 CONSTRUCTION PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
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 OF
 175



LEGEND

- EXISTING ROADWAYS
- PROPOSED CONSTRUCTION
- DIRECTION OF TRAFFIC
- RETAINING WALL

- NOTES:**
- (A) 10' CURB TRANSITION
 - (B) CONCRETE APPROACH NOSE DETAIL (MNDOT STD PLATE 7113)
 - (C) PEDESTRIAN CURB RAMP (SEE INTERSECTION AND PEDESTRIAN RAMP DETAILS)
 - (D) BRIDGE APPROACH PANEL (SEE STD PLAN SHEETS)
 - (E) VEHICULAR GATE-SINGLE (SEE MISCELLANEOUS DETAILS)
 - (F) CONCRETE DRIVEWAY
 - (G) MEDIAN GUTTER SLOPE TO MATCH ROAD SLOPE BETWEEN BR NO 02589 AND BR NO 02588

GENERAL NOTES:

ROADWAY DIMENSIONS ARE TO FACE OF CURB/BARRIER UNLESS NOTED OTHERWISE.

THE RIGHT-OF-WAY SHOWN IN THIS PLAN GIVES A GRAPHICAL LOCATION WITH RESPECT TO THE GEOMETRIC DESIGN AND MAP DATA, THE EXACT RIGHT-OF-WAY AND BOUNDARY CORNERS ARE LOCATED BY REFERENCE TO THE RIGHT-OF-WAY PLATS AND ARE IDENTIFIED ON THE RIGHT-OF-WAY MAP.

ALL RESIDENTIAL OR COMMERCIAL DRIVEWAYS MARKED FOR RECONSTRUCTION SHALL BE BITUMINOUS UNLESS NOTED OTHERWISE. SEE MISCELLANEOUS DETAILS AND TYPICAL SECTION INSETS FOR DESIGN AND MATERIAL DETAILS.

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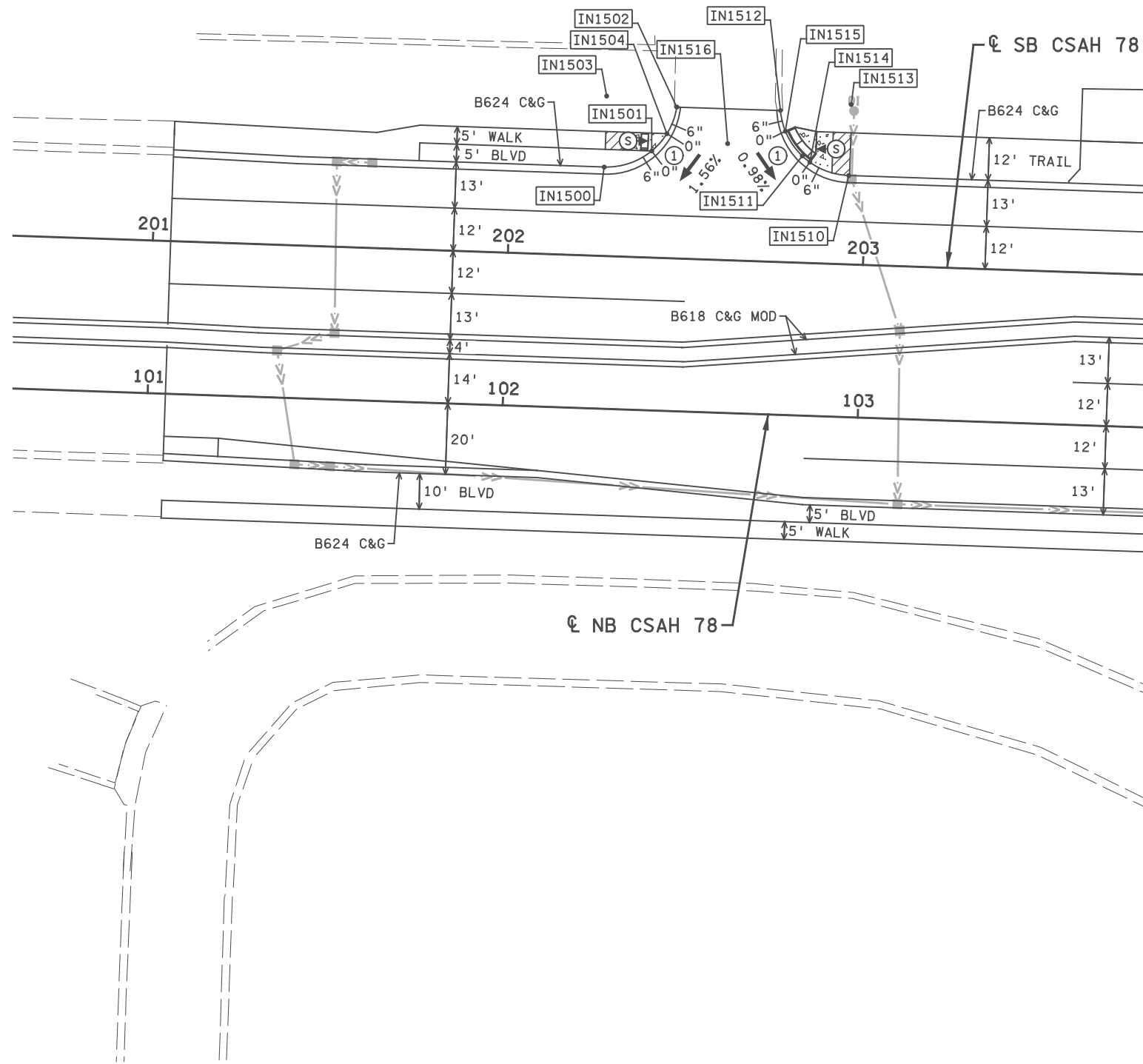
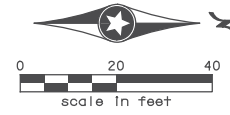
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ANOKA COUNTY
 CONSTRUCTION PLANS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
 93
 OF
 175



POINT NO.	ELEV. OR RADIUS	ALIGNMENT	STATION	OFFSET
IN1500	EL. 866.54	SB CSAH 78	202+26.25	25.00' LT.
IN1501	EL. 866.77	SB CSAH 78	202+39.48	30.00' LT.
IN1502	EL. 867.00	SB CSAH 78	202+46.11	42.58' LT.
IN1503	20.0' R.	SB CSAH 78	202+26.25	45.00' LT.
IN1504	EL. 866.87	SB CSAH 78	202+43.57	35.00' LT.
IN1510	EL. 866.79	SB CSAH 78	202+95.14	25.00' LT.
IN1511	EL. 866.93	SB CSAH 78	202+81.86	30.04' LT.
IN1512	EL. 867.07	SB CSAH 78	202+75.28	42.62' LT.
IN1513	20.0' R.	SB CSAH 78	202+95.14	45.00' LT.
IN1514	EL. 866.90	SB CSAH 78	202+84.06	28.35' LT.
IN1515	EL. 867.01	SB CSAH 78	202+76.88	36.84' LT.
IN1516	EL. 866.97	SB CSAH 78	202+60.75	32.80' LT.

LEGEND

- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
- ▲ PROPOSED APRON
- DI ○ PROPOSED DROP INLET
- <<— PROPOSED STORM SEWER
- INXXXX CONTROL POINTS AT GUTTER FLOW LINE OR CENTER OF RADIUS
- X" CURB HEIGHT
- ▨ LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
- Ⓢ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- Ⓣ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- ▭ TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- ➔ DRAINAGE FLOW ARROW
- ▨ 6" CONCRETE WALK

GENERAL NOTES:

OFFSETS, ELEVATIONS, AND RADIUS LENGTHS ARE TO FLOWLINE OF GUTTER, UNLESS NOTED OTHERWISE AND DO NOT INCLUDE DRAINAGE STRUCTURE SUMPS.

SEE STANDARD PLAN SHEET 45 TO 50 FOR ADDITIONAL PEDESTRIAN RAMP DETAILS.

LANDING AREAS SHALL BE 6" CONCRETE WALK

NOTES:

- ① GUTTER SLOPE SHALL BE 2% OR LESS
- ② 0" CURB HEIGHT

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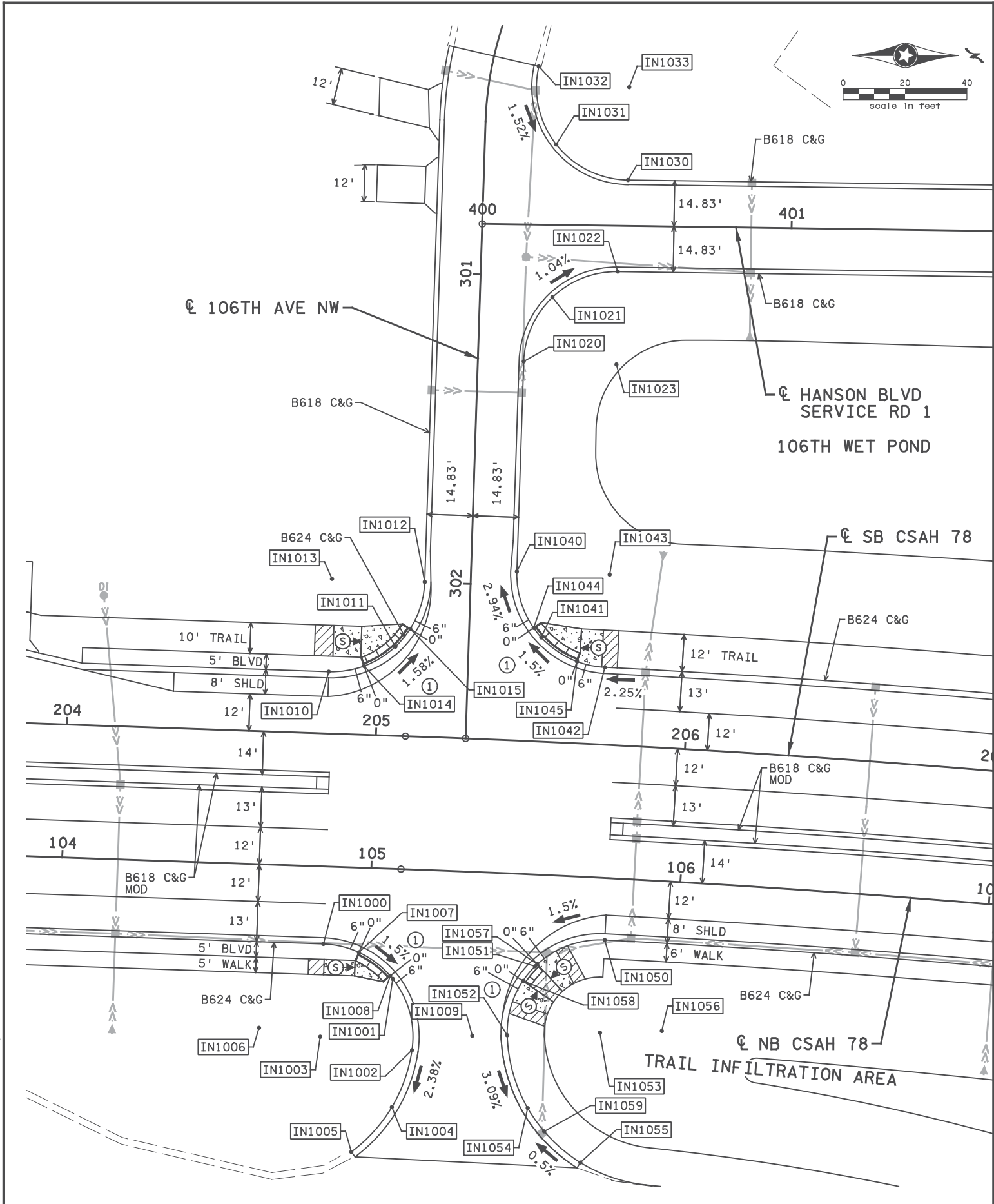
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ANOKA COUNTY
 INTERSECTION AND PEDESTRIAN RAMP DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 94 OF 175



POINT NO.	ELEV. OR RADIUS	ALIGNMENT	STATION	OFFSET
IN1000	EL. 867.60	NB CSAH 78	104+85.35	25.00' RT.
IN1001	EL. 867.13	NB CSAH 78	105+08.16	35.52' RT.
IN1002	EL. 866.53	NB CSAH 78	105+15.25	58.30' RT.
IN1003	30.0' R.	NB CSAH 78	104+85.35	55.00' RT.
IN1004	EL. 866.06	NB CSAH 78	105+09.27	76.92' RT.
IN1005	EL. 865.59	NB CSAH 78	104+96.68	91.86' RT.
IN1006	50.0' R.	NB CSAH 78	104+65.47	52.80' RT.
IN1007	EL. 867.33	NB CSAH 78	104+96.89	27.31' RT.
IN1008	EL. 867.14	NB CSAH 78	105+07.30	34.55' RT.
IN1009	EL. 867.37	NB CSAH 78	105+34.81	52.93' RT.
IN1010	EL. 867.86	SB CSAH 78	204+84.07	20.00' LT.
IN1011	EL. 867.48	SB CSAH 78	205+05.30	28.81' RT.
IN1012	EL. 867.11	106TH AVE	302+17.07	14.83' RT.
IN1013	30.0' R.	SB CSAH 78	204+84.07	50.00' LT.
IN1014	EL. 867.67	SB CSAH 78	204+95.38	22.21' RT.
IN1015	EL. 867.36	SB CSAH 78	205+09.90	34.74' RT.
IN1020	EL. 866.45	106TH AVE	301+44.84	14.83' LT.
IN1021	EL. 866.20	106TH AVE	301+23.82	23.42' LT.
IN1022	EL. 865.96	HANSON BLVD SERVICE RD 1	400+44.00	14.83' RT.
IN1023	30.0' R.	HANSON BLVD SERVICE RD 1	400+44.00	44.83' RT.
IN1030	EL. 866.05	HANSON BLVD SERVICE RD 1	400+46.89	14.83' LT.
IN1031	EL. 866.45	106TH AVE	300+74.42	23.06' LT.
IN1032	EL. 866.86	106TH AVE	300+46.39	14.83' LT.
IN1033	30.0' R.	HANSON BLVD SERVICE RD 1	400+46.89	44.83' LT.
IN1040	EL. 867.13	106TH AVE	302+12.77	14.83' LT.
IN1041	EL. 867.76	SB CSAH 78	205+51.99	33.65' LT.
IN1042	EL. 868.18	SB CSAH 78	205+72.82	25.00' LT.
IN1043	30.0' R.	SB CSAH 78	205+72.82	55.00' LT.
IN1044	EL. 867.70	SB CSAH 78	205+49.38	36.63' LT.
IN1045	EL. 867.97	SB CSAH 78	205+63.80	26.42' LT.
IN1050	EL. 868.18	NB CSAH 78	105+76.56	20.00' RT.
IN1051	EL. 867.80	NB CSAH 78	105+55.01	28.91' RT.
IN1052	EL. 867.14	NB CSAH 78	105+46.24	52.27' RT.
IN1053	30.0' R.	NB CSAH 78	105+76.56	50.00' RT.
IN1054	EL. 866.38	NB CSAH 78	105+54.07	75.49' RT.
IN1055	EL. 866.17	NB CSAH 78	105+72.31	92.22' RT.
IN1056	50.0' R.	NB CSAH 78	105+96.76	48.35' RT.
IN1057	EL. 867.82	NB CSAH 78	105+55.01	28.91' RT.
IN1058	EL. 867.71	NB CSAH 78	105+50.59	34.50' RT.
IN1059	EL. 866.09	NB CSAH 78	105+59.85	82.77' RT.

LEGEND

- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
- ▲ PROPOSED APRON
- DI ○ PROPOSED DROP INLET
- PROPOSED STORM SEWER
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- X" CURB HEIGHT
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- ▭ TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- ➔ DRAINAGE FLOW ARROW
- ▨ 6" CONCRETE WALK

- NOTES:**
- ① GUTTER SLOPE SHALL BE 2% OR LESS
 - ② 0" CURB HEIGHT

GENERAL NOTES:

OFFSETS, ELEVATIONS, AND RADIUS LENGTHS ARE TO FLOWLINE OF GUTTER, UNLESS NOTED OTHERWISE AND DO NOT INCLUDE DRAINAGE STRUCTURE SUMPS.

SEE STANDARD PLAN SHEET 45 TO 50 FOR ADDITIONAL PEDESTRIAN RAMP DETAILS.

LANDING AREAS SHALL BE 6" CONCRETE WALK

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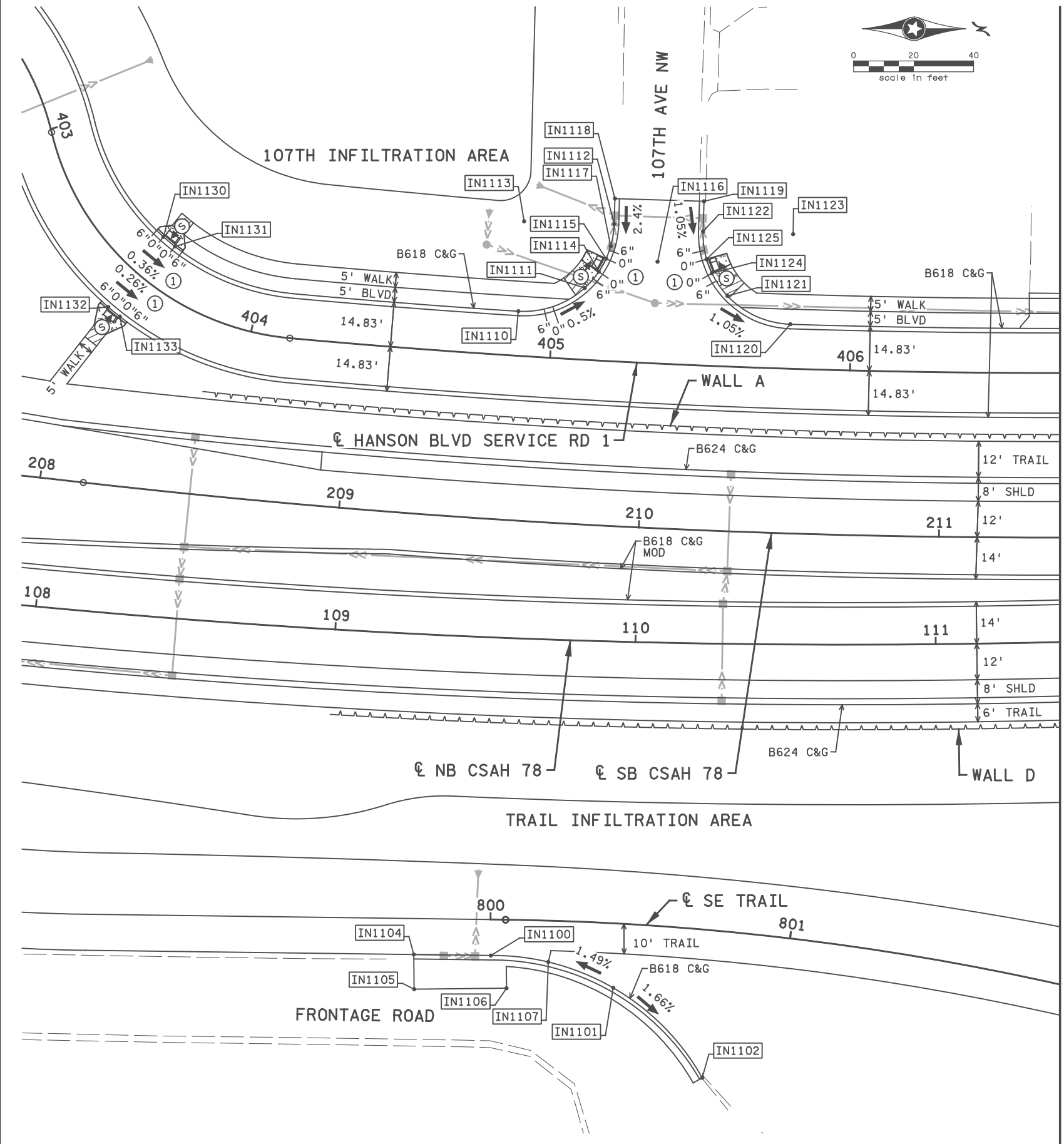
DRAWN BY S. VANG
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 CHECKED BY B. ROBECK
 COMM. NO. 0169140



ANOKA COUNTY

INTERSECTION AND PEDESTRIAN RAMP DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 95
 OF
 175



POINT NO.	ELEV. OR RADIUS	ALIGNMENT	STATION	OFFSET
IN1100	EL. 864.87	NB CSAH 78	109+56.07	105.87' RT.
IN1101	EL. 865.51	SE TRAIL	800+42.05	21.48' RT.
IN1102	EL. 864.80	SE TRAIL	800+75.07	49.25' RT.
IN1103	80.0' R.	SE TRAIL	800+05.00	91.98' RT.
IN1104	EL. 865.16	NB CSAH 78	109+31.34	106.67' RT.
IN1105	EL. 865.31	NB CSAH 78	109+31.99	118.19' RT.
IN1106	EL. 865.52	SE TRAIL	800+05.63	22.83' RT.
IN1107	EL. 865.16	SE TRAIL	800+19.64	13.79' RT.
IN1110	EL. 866.00	HANSON BLVD SERVICE RD 1	404+88.46	14.83' LT.
IN1111	EL. 865.88	HANSON BLVD SERVICE RD 1	405+10.21	23.89' LT.
IN1112	EL. 865.98	HANSON BLVD SERVICE RD 1	405+18.94	45.65' LT.
IN1113	30.0' R.	HANSON BLVD SERVICE RD 1	404+88.46	44.83' LT.
IN1114	EL. 865.84	HANSON BLVD SERVICE RD 1	405+14.62	29.54' LT.
IN1115	EL. 865.82	HANSON BLVD SERVICE RD 1	405+16.85	34.02' LT.
IN1116	EL. 866.24	HANSON BLVD SERVICE RD 1	405+34.22	33.89' LT.
IN1117	EL. 865.80	HANSON BLVD SERVICE RD 1	405+18.17	38.25' LT.
IN1118	EL. 866.15	HANSON BLVD SERVICE RD 1	405+18.75	54.16' LT.
IN1119	EL. 866.15	HANSON BLVD SERVICE RD 1	405+48.99	54.65' LT.
IN1120	EL. 865.55	HANSON BLVD SERVICE RD 1	405+79.59	14.83' LT.
IN1121	EL. 865.78	HANSON BLVD SERVICE RD 1	405+58.20	23.53' LT.
IN1122	EL. 866.01	HANSON BLVD SERVICE RD 1	405+49.11	44.65' LT.
IN1123	30.0' R.	HANSON BLVD SERVICE RD 1	405+79.59	44.83' LT.
IN1124	EL. 865.89	HANSON BLVD SERVICE RD 1	405+52.68	30.86' LT.
IN1125	EL. 865.95	HANSON BLVD SERVICE RD 1	405+50.69	35.44' LT.
IN1130	EL. 866.64	HANSON BLVD SERVICE RD 1	403+55.34	14.83' LT.
IN1131	EL. 866.63	HANSON BLVD SERVICE RD 1	403+61.34	14.83' LT.
IN1132	EL. 866.64	HANSON BLVD SERVICE RD 1	403+57.04	14.83' RT.
IN1133	EL. 866.63	HANSON BLVD SERVICE RD 1	403+61.34	14.83' RT.

LEGEND

- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
- ▲ PROPOSED APRON
- ⊙ PROPOSED DROP INLET
- PROPOSED STORM SEWER
- INXXXX CONTROL POINTS AT GUTTER FLOW LINE OR CENTER OF RADIUS
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- ▭ TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- ➔ DRAINAGE FLOW ARROW
- ▨ 6" CONCRETE WALK

GENERAL NOTES:

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SEE STANDARD PLAN SHEET 45 TO 50 FOR ADDITIONAL PEDESTRIAN RAMP DETAILS.

LANDING AREAS SHALL BE 6" CONCRETE WALK

NOTES:

- ① GUTTER SLOPE SHALL BE 2% OR LESS
- ② 0" CURB HEIGHT
- ③ OUTSIDE OF WINDOW VIEW

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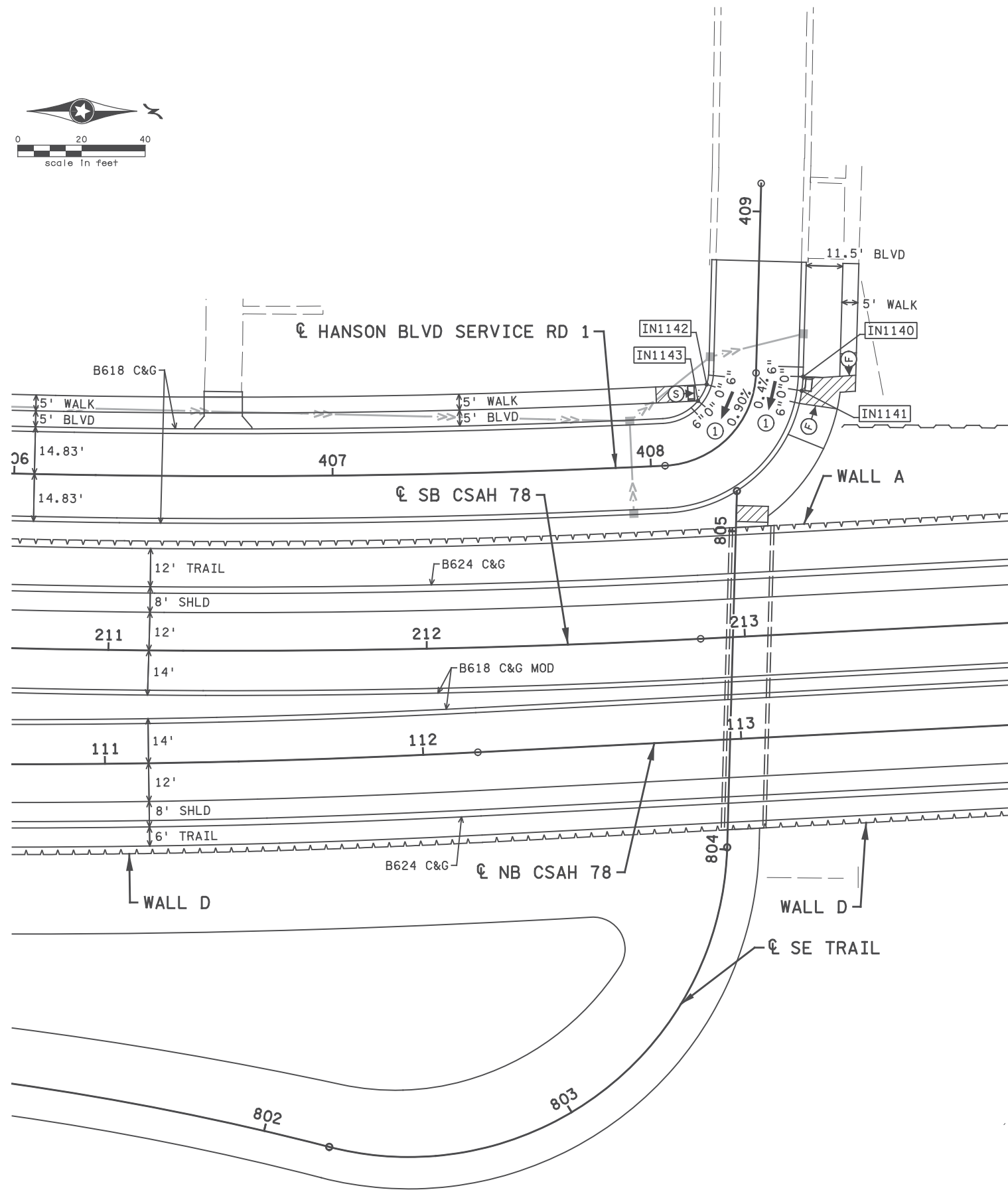
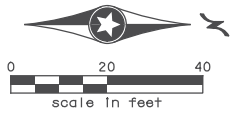
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ANOKA COUNTY

INTERSECTION AND PEDESTRIAN RAMP DETAILS
CSAH 78 - BNSF GRADE SEPARATION

SHEET 96 OF 175



POINT NO.	ELEV. OR RADIUS	ALIGNMENT	STATION	OFFSET
② IN1140	EL. 864.76	HANSON BLVD SERVICE RD 1	408+48.81	14.83' RT.
② IN1141	EL. 864.71	HANSON BLVD SERVICE RD 1	408+45.82	14.83' RT.
② IN1142	EL. 864.72	HANSON BLVD SERVICE RD 1	408+41.24	14.83' LT.
② IN1143	EL. 864.66	HANSON BLVD SERVICE RD 1	408+29.61	14.83' LT.

LEGEND

- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
- ▲ PROPOSED APRON
- DI PROPOSED DROP INLET
- PROPOSED STORM SEWER
- INXXXX CONTROL POINTS AT GUTTER FLOW LINE OR CENTER OF RADIUS
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- ▭ TRUNCATED DOMES (SEE STANDARD PLATE 7038)
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GENERAL NOTES:

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SEE STANDARD PLAN SHEET 45 TO 50 FOR ADDITIONAL PEDESTRIAN RAMP DETAILS.

LANDING AREAS SHALL BE 6" CONCRETE WALK

NOTES:

- ① GUTTER SLOPE SHALL BE 2% OR LESS
- ② 0' CURB HEIGHT

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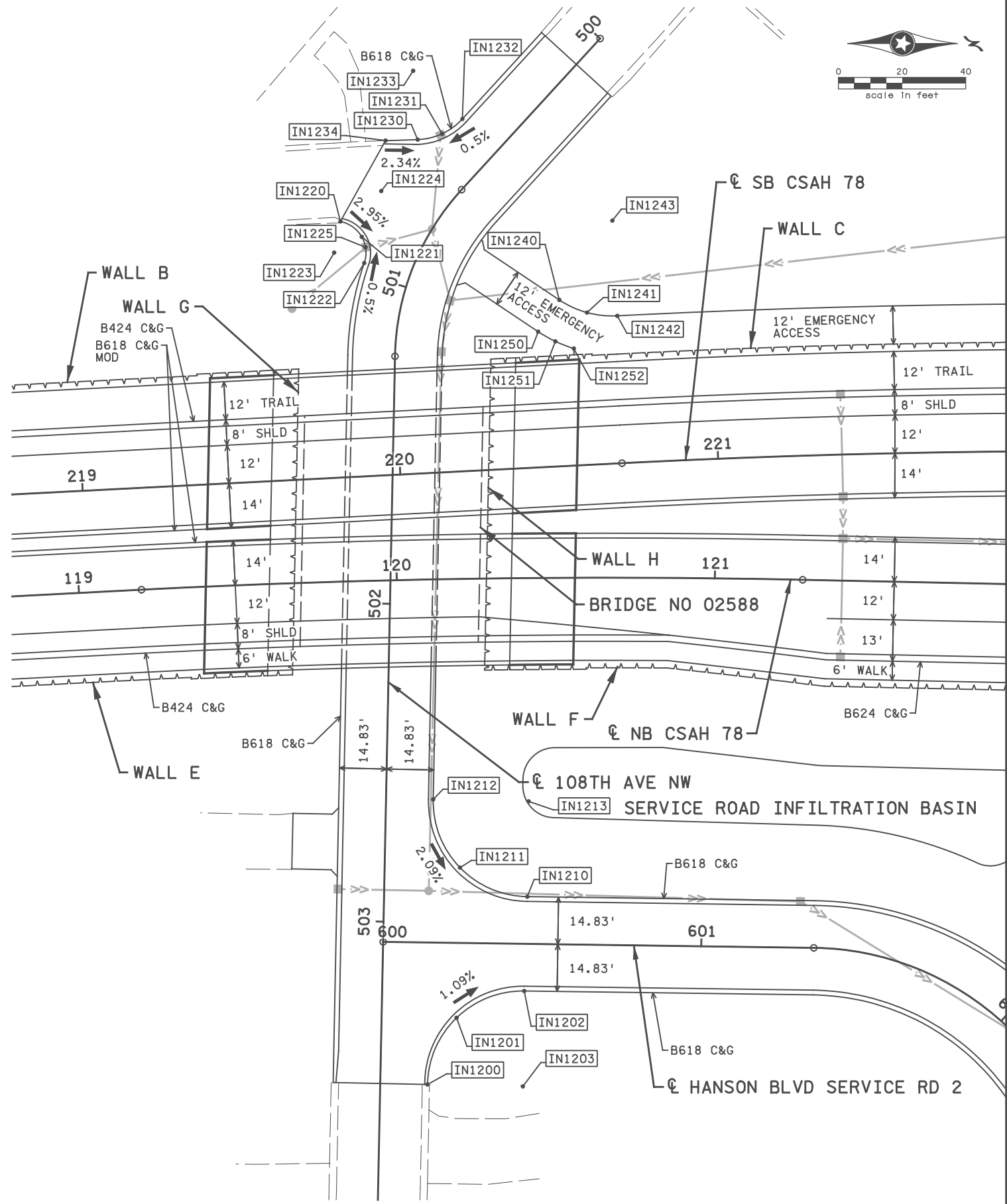
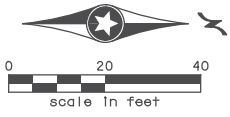
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SHEET 97 OF 175



POINT NO.	ELEV. OR RADIUS	ALIGNMENT	STATION	OFFSET
IN1200	EL. 866.28	108TH AVE	503+50.87	14.83' LT.
IN1201	EL. 866.03	108TH AVE	503+29.73	23.55' LT.
IN1202	EL. 865.77	HANSON BLVD SERVICE ROAD 2	600+44.54	14.83' RT.
IN1203	30.0' R.	HANSON BLVD SERVICE ROAD 2	600+44.54	44.83' RT.
IN1210	EL. 865.77	HANSON BLVD SERVICE ROAD 2	600+45.12	14.83' LT.
IN1211	EL. 866.27	108TH AVE	502+82.49	23.69' LT.
IN1212	EL. 866.76	108TH AVE	502+61.21	14.83' LT.
IN1213	30.0' R.	HANSON BLVD SERVICE ROAD 2	600+45.12	44.83' LT.
IN1220	EL. 867.10	108TH AVE	500+89.70	26.61' RT.
IN1221	EL. 866.73	108TH AVE	500+91.03	18.53' RT.
IN1222	EL. 866.60	108TH AVE	500+97.15	14.83' RT.
IN1223	10.0' R.	108TH AVE	500+97.15	24.83' RT.
IN1224	EL. 867.00	108TH AVE	500+78.44	19.87' RT.
IN1225	EL. 866.58	108TH AVE	500+93.14	16.19' RT.
IN1230	EL. 866.88	108TH AVE	500+62.16	20.83' RT.
IN1231	EL. 866.69	108TH AVE	500+55.62	16.39' RT.
IN1232	EL. 866.73	108TH AVE	500+47.88	14.83' RT.
IN1233	20.0' R.	108TH AVE	500+47.15	36.48' RT.
IN1234	EL. 867.11	108TH AVE	500+68.00	28.17' RT.
IN1240	EL. 867.22	108TH AVE	500+75.82	45.73' LT.
IN1241	EL. 867.53	108TH AVE	500+70.63	55.10' LT.
IN1242	EL. 867.79	108TH AVE	500+60.70	62.88' LT.
IN1243	30.0' R.	108TH AVE	500+39.63	41.52' LT.
IN1250	EL. 867.39	108TH AVE	501+02.85	43.80' LT.
IN1251	EL. 867.66	108TH AVE	501+06.98	49.78' LT.
IN1252	EL. 867.68	108TH AVE	501+10.22	55.90' LT.

LEGEND

- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
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- DI PROPOSED DROP INLET
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- ▭ TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- ➔ DRAINAGE FLOW ARROW
- ▭ 6" CONCRETE WALK

GENERAL NOTES:

OFFSETS, ELEVATIONS, AND RADIUS LENGTHS ARE TO FLOWLINE OF GUTTER, UNLESS NOTED OTHERWISE AND DO NOT INCLUDE DRAINAGE STRUCTURE SUMPS.

SEE STANDARD PLAN SHEET 45 TO 50 FOR ADDITIONAL PEDESTRIAN RAMP DETAILS.

LANDING AREAS SHALL BE 6" CONCRETE WALK

NOTES:

- ① GUTTER SLOPE SHALL BE 2% OR LESS
- ② 0' CURB HEIGHT

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG

DESIGNED BY T. SMITH

CHECKED BY B. ROBECK

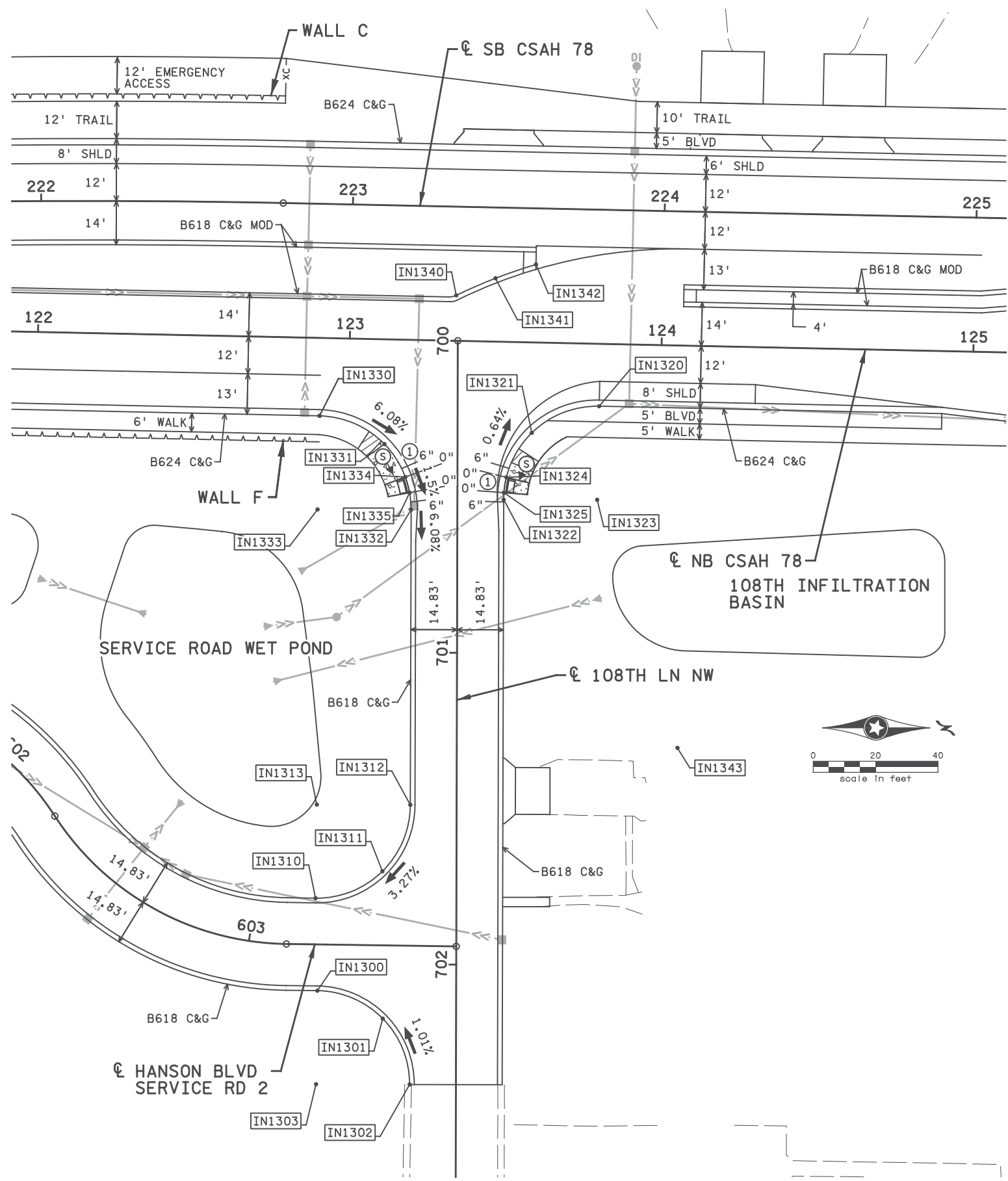
COMM. NO. 0169140



ANOKA COUNTY

INTERSECTION AND PEDESTRIAN RAMP DETAILS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
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OF
175



POINT NO.	ELEV. OR RADIUS	ALIGNMENT	STATION	OFFSET
IN1300	EL. 865.13	HANSON BLVD SERVICE ROAD 2	603+22.20	14.83' RT.
IN1301	EL. 865.36	HANSON BLVD SERVICE ROAD 2	603+43.29	23.50' RT.
IN1302	EL. 865.60	108TH LN	702+38.47	14.83' RT.
IN1303	30.0' R.	HANSON BLVD SERVICE ROAD 2	603+22.20	44.83' RT.
IN1310	EL. 865.11	HANSON BLVD SERVICE ROAD 2	603+21.20	14.83' LT.
IN1311	EL. 865.89	HANSON BLVD SERVICE ROAD 2	603+42.53	23.74' LT.
IN1312	EL. 866.67	108TH LN	701+48.80	14.83' RT.
IN1313	30.0' R.	HANSON BLVD SERVICE ROAD 2	603+21.20	44.83' LT.
IN1320	EL. 869.46	NB CSAH 78	123+80.40	20.00' RT.
IN1321	EL. 869.61	108TH LN	700+29.44	23.82' LT.
IN1322	EL. 869.77	108TH LN	700+50.85	14.83' LT.
IN1323	30.0' R.	108TH LN	700+50.85	44.83' LT.
IN1324	EL. 869.72	108TH LN	700+43.72	15.69' LT.
IN1325	EL. 869.75	108TH LN	700+48.65	14.91' LT.
IN1330	EL. 872.81	NB CSAH 78	122+90.82	25.00' RT.
IN1331	EL. 872.14	108TH LN	700+33.16	23.42' RT.
IN1332	EL. 870.35	108TH LN	700+54.17	14.83' RT.
IN1333	30.0' R.	108TH LN	700+54.17	44.83' RT.
IN1334	EL. 870.70	108TH LN	700+43.73	16.71' RT.
IN1335	EL. 870.62	108TH LN	700+48.73	15.33' RT.
IN1340	EL. 871.83	NB CSAH 78	123+33.83	14.56' LT.
IN1341	EL. 871.47	NB CSAH 78	123+46.28	20.32' LT.
IN1342	EL. 871.09	NB CSAH 78	123+59.18	25.00' LT.
IN1343	161.5' R.	NB CSAH 78	124+07.82	129.00' RT.

LEGEND

- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
- ▲ PROPOSED APRON
- DI PROPOSED DROP INLET
- PROPOSED STORM SEWER
- INXXXX CONTROL POINTS AT GUTTER FLOW LINE OR CENTER OF RADIUS
- X" CURB HEIGHT
- ▨ LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
- Ⓢ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- Ⓣ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- ▭ TRUNCATED DOMES (SEE STANDARD PLATE 7038)
- ➔ DRAINAGE FLOW ARROW
- ▨ 6" CONCRETE WALK

GENERAL NOTES:

OFFSETS, ELEVATIONS, AND RADIUS LENGTHS ARE TO FLOWLINE OF GUTTER, UNLESS NOTED OTHERWISE AND DO NOT INCLUDE DRAINAGE STRUCTURE SUMPS.

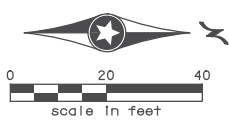
SEE STANDARD PLAN SHEET 45 TO 50 FOR ADDITIONAL PEDESTRIAN RAMP DETAILS.

LANDING AREAS SHALL BE 6" CONCRETE WALK

NOTES:

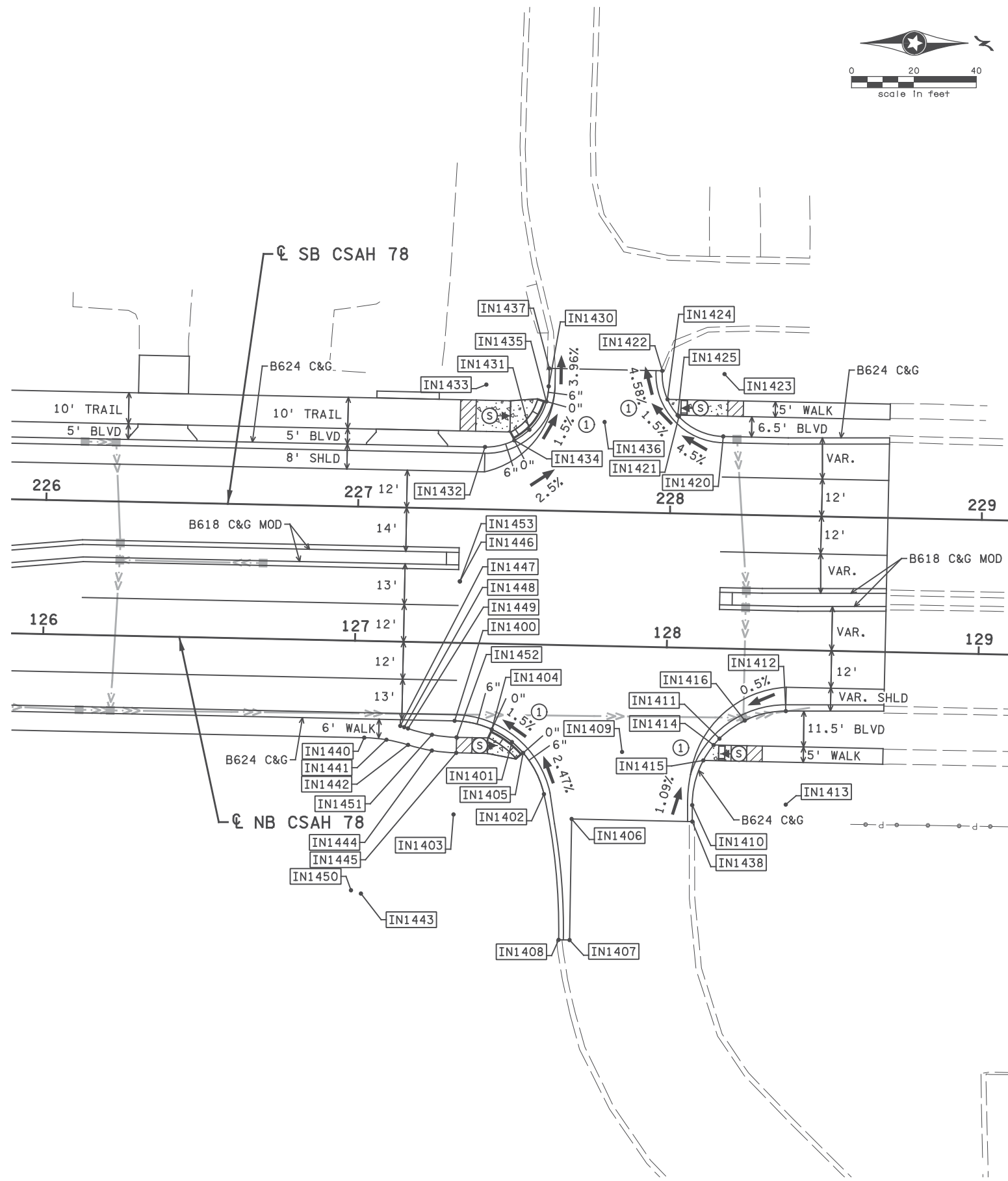
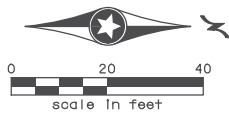
① GUTTER SLOPE SHALL BE 2% OR LESS

② 0" CURB HEIGHT



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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: BENJAMIN P ROBECK <i>Ben Robeck</i> Date: 6/13/2017 License #: 53680					STATE AID PROJECT NO 002-678-023, 114-020-051 DRAWN BY S. VANG DESIGNED BY T. SMITH CHECKED BY B. ROBECK COMM. NO. 0169140		ANOKA COUNTY INTERSECTION AND PEDESTRIAN RAMP DETAILS CSAH 78 - BNSF GRADE SEPARATION INTERSECTION DETAILS		SHEET 99 OF 175
NO	DATE	BY	CKD	APPR	REVISION				
...					...				



POINT NO.	ELEV. OR RADIUS	ALIGNMENT	STATION	OFFSET
② IN1400	EL. 865.75	NB CSAH 78	127+32.74	25.00' RT.
IN1401	EL. 866.06	NB CSAH 78	127+50.99	31.41' RT.
IN1402	EL. 866.49	NB CSAH 78	127+61.60	47.89' RT.
IN1403	30.0' R.	NB CSAH 78	127+32.74	55.00' RT.
② IN1404	EL. 865.75	NB CSAH 78	127+32.49	25.00' RT.
② IN1405	EL. 866.02	NB CSAH 78	127+49.81	30.52' RT.
IN1406	EL. 866.99	NB CSAH 78	127+70.64	55.64' RT.
IN1407	EL. 866.80	NB CSAH 78	127+70.80	94.47' RT.
IN1408	EL. 866.70	NB CSAH 78	127+67.30	94.49' RT.
IN1409	EL. 866.66	NB CSAH 78	127+86.35	33.83' RT.
IN1410	EL. 866.62	NB CSAH 78	128+09.20	50.41' RT.
IN1411	EL. 866.37	NB CSAH 78	128+17.49	28.89' RT.
IN1412	EL. 866.32	NB CSAH 78	128+38.59	19.61' RT.
IN1413	30.0' R.	NB CSAH 78	128+39.19	49.60' RT.
② IN1414	EL. 866.40	NB CSAH 78	128+15.65	31.00' RT.
② IN1415	EL. 866.46	NB CSAH 78	128+12.45	36.00' RT.
IN1416	EL. 866.25	NB CSAH 78	128+25.49	22.91' RT.
IN1420	EL. 865.88	SB CSAH 78	228+16.53	25.00' LT.
IN1421	EL. 865.16	SB CSAH 78	228+02.18	31.07' LT.
IN1422	EL. 864.61	SB CSAH 78	227+96.54	45.60' LT.
IN1423	20.0' R.	SB CSAH 78	228+16.53	45.00' LT.
② IN1424	EL. 865.04	SB CSAH 78	227+98.43	36.50' LT.
② IN1425	EL. 865.13	SB CSAH 78	228+01.78	31.50' LT.
IN1430	EL. 864.97	SB CSAH 78	227+60.25	39.87' LT.
② IN1431	EL. 865.33	SB CSAH 78	227+54.35	25.81' LT.
IN1432	EL. 865.66	SB CSAH 78	227+40.25	20.00' LT.
IN1433	20.0' R.	SB CSAH 78	227+40.25	40.00' LT.
② IN1434	EL. 865.42	SB CSAH 78	227+49.60	22.32' LT.
② IN1435	EL. 865.17	SB CSAH 78	227+59.62	35.00' LT.
IN1436	EL. 865.49	SB CSAH 78	227+78.41	28.81' LT.
IN1437	EL. 864.74	SB CSAH 78	227+60.29	45.62' LT.
IN1438	EL. 866.68	NB CSAH 78	128+09.34	55.66' RT.
IN1440	EL. 866.18	NB CSAH 78	127+03.60	31.00' RT.
IN1441	EL. 866.23	NB CSAH 78	127+10.72	31.51' RT.
IN1442	EL. 866.31	NB CSAH 78	127+17.69	33.03' RT.
IN1443	50.0' R.	NB CSAH 78	127+03.60	81.00' RT.
IN1444	EL. 866.41	NB CSAH 78	127+25.36	34.70' RT.
IN1445	EL. 866.46	NB CSAH 78	127+33.19	35.26' RT.
IN1446	55.0' R.	NB CSAH 78	127+33.19	19.74' LT.
IN1447	EL. 866.18	NB CSAH 78	127+15.09	27.00' RT.
IN1448	EL. 866.21	NB CSAH 78	127+16.33	27.36' RT.
IN1449	EL. 866.23	NB CSAH 78	127+17.57	27.75' RT.
IN1450	55.0' R.	NB CSAH 78	127+00.39	80.00' RT.
IN1451	EL. 866.33	NB CSAH 78	127+25.28	29.63' RT.
IN1452	EL. 866.38	NB CSAH 78	127+33.19	30.26' RT.
IN1453	50.0' R.	NB CSAH 78	127+33.19	19.74' LT.

LEGEND

- PROPOSED CATCH BASIN
- PROPOSED MANHOLE
- ▲ PROPOSED APRON
- ⊙ PROPOSED DROP INLET
- PROPOSED STORM SEWER
- INXXXX CONTROL POINTS AT GUTTER FLOW LINE OR CENTER OF RADIUS
- X" CURB HEIGHT
- ▨ LANDING AREA - 4' X 4' MIN. DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS
- Ⓢ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
- Ⓣ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%
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- ➔ DRAINAGE FLOW ARROW
- ▨ 6" CONCRETE WALK

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SEE STANDARD PLAN SHEET 45 TO 50 FOR ADDITIONAL PEDESTRIAN RAMP DETAILS.

LANDING AREAS SHALL BE 6" CONCRETE WALK

NOTES:

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② 0' CURB HEIGHT

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NO	DATE	BY	CKD	APPR	REVISION

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Print Name: BENJAMIN P ROBECK

Ben Robeck

Date: 7/12/2017 License #: 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



ANOKA COUNTY

INTERSECTION AND PEDESTRIAN RAMP DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

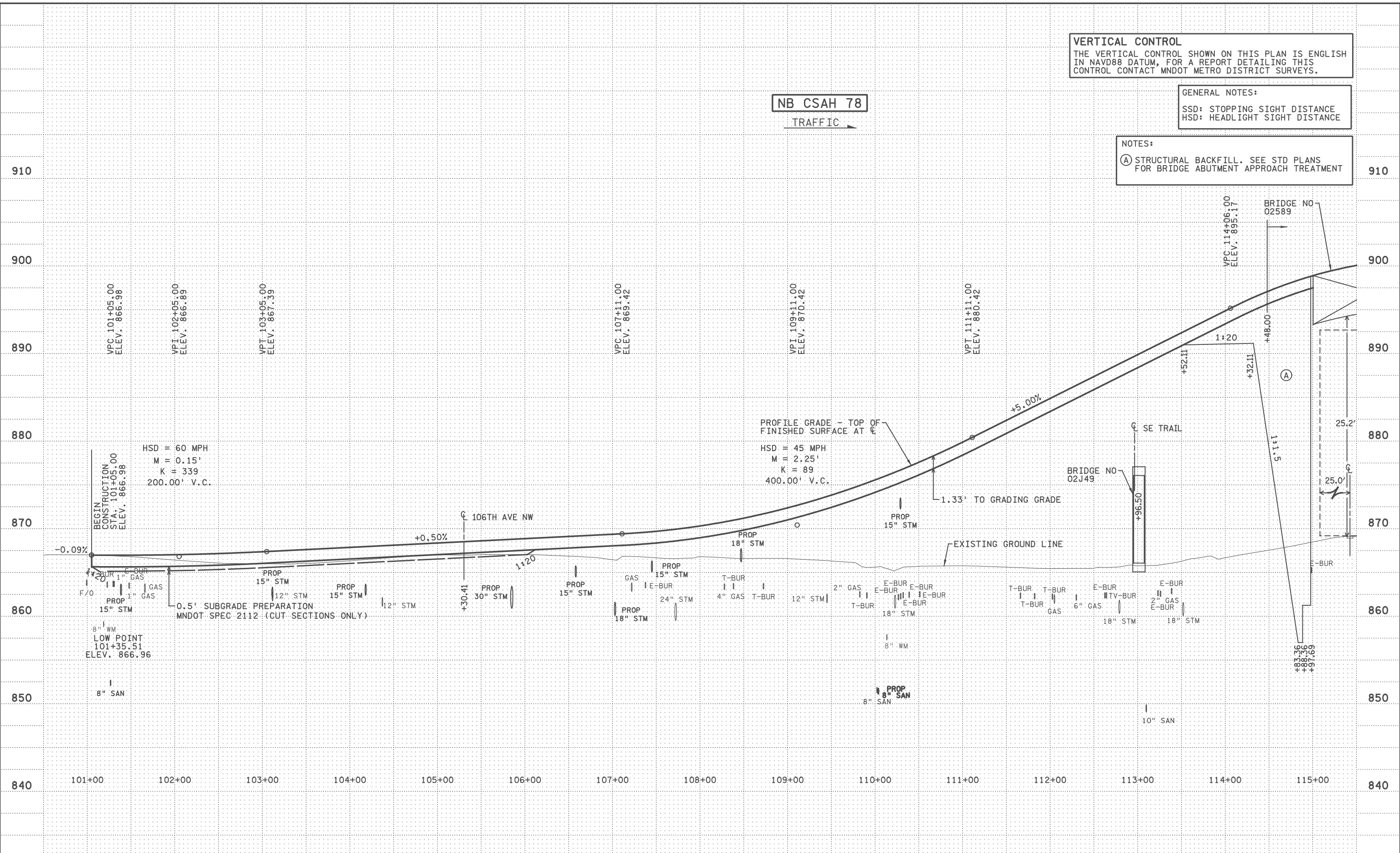
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VERTICAL CONTROL
 THE VERTICAL CONTROL SHOWN ON THIS PLAN IS ENGLISH IN NAVD88 DATUM, FOR A REPORT DETAILING THIS CONTROL CONTACT MNDOT METRO DISTRICT SURVEYS.

GENERAL NOTES:
 SSD: STOPPING SIGHT DISTANCE
 HSD: HEADLIGHT SIGHT DISTANCE

NOTES:
 (A) STRUCTURAL BACKFILL. SEE STD PLANS FOR BRIDGE ABUTMENT APPROACH TREATMENT

NB CSAH 78
 TRAFFIC →



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Ben Robeck
 Date: 6/13/2017 License #: 53680

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 T. SMITH
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 PLANNERS
 DESIGNERS

ANOKA COUNTY
 PROFILES
 CSAH 78 - BNSF GRADE SEPARATION

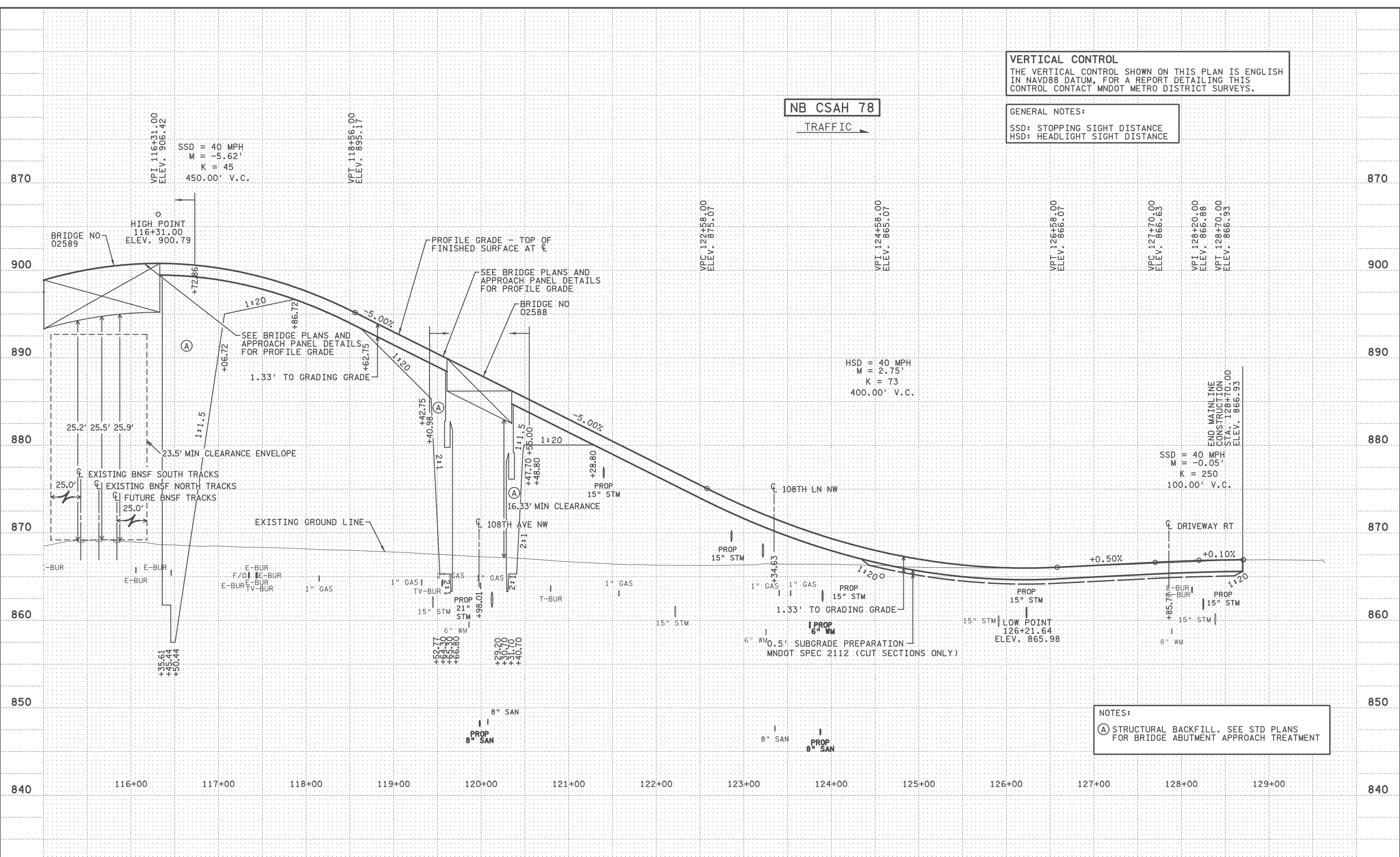
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VERTICAL CONTROL
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 CONTROL CONTACT MNDOT METRO DISTRICT SURVEYS.

GENERAL NOTES:
 SSD: STOPPING SIGHT DISTANCE
 HSD: HEADLIGHT SIGHT DISTANCE

NB CSAH 78

TRAFFIC →



NOTES:
 (A) STRUCTURAL BACKFILL. SEE STD PLANS
 FOR BRIDGE ABUTMENT APPROACH TREATMENT

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Ben Robeck
 Date: 6/13/2017 License #: 53680

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 002-678-023, 114-020-051

DRAWN BY
 S. VANG
 DESIGNED BY
 T. SMITH
 CHECKED BY
 B. ROBECK
 COMM. NO. 0169140



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ANOKA COUNTY
 PROFILES
 CSAH 78 - BNSF GRADE SEPARATION

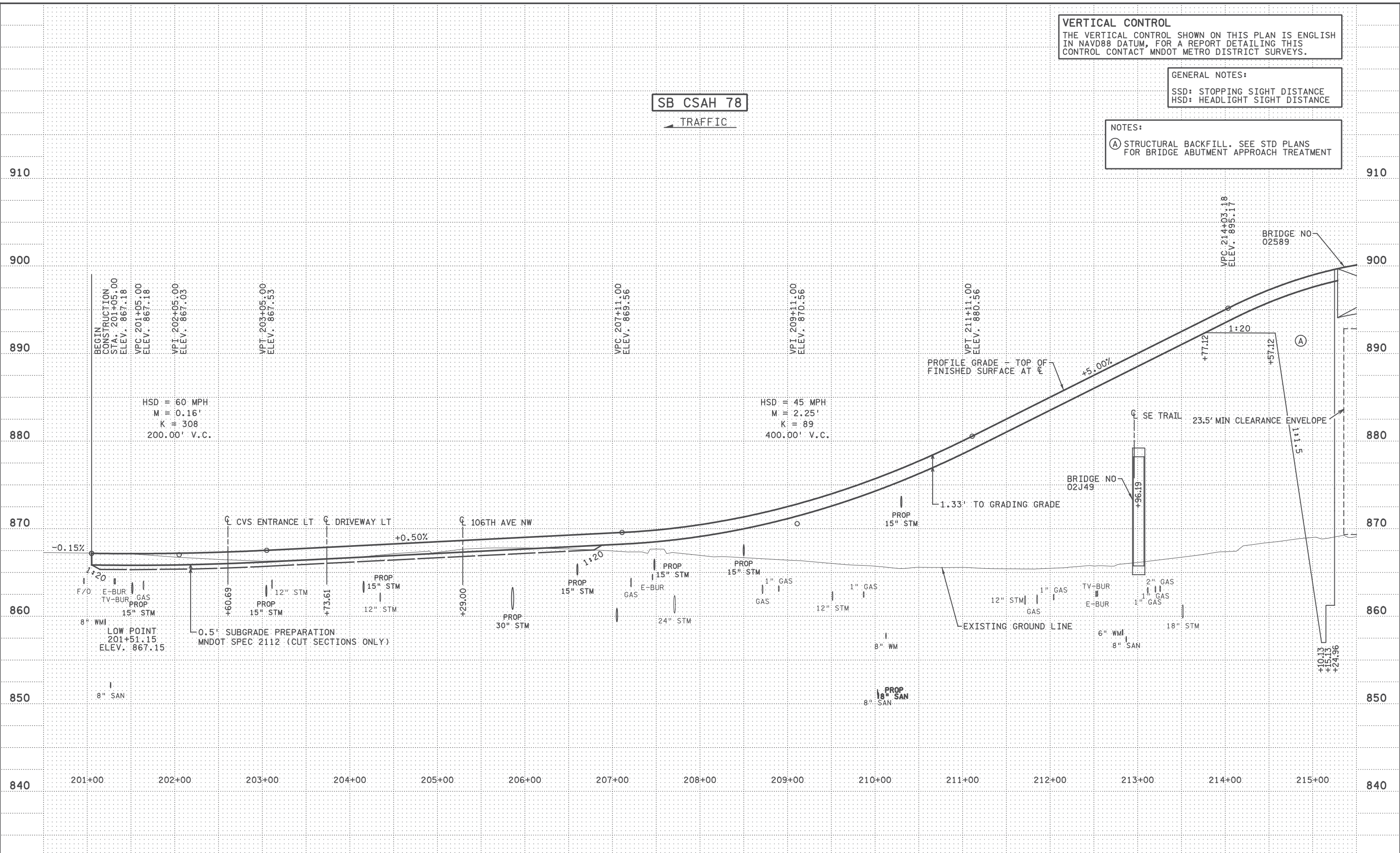
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VERTICAL CONTROL
 THE VERTICAL CONTROL SHOWN ON THIS PLAN IS ENGLISH IN NAVD88 DATUM, FOR A REPORT DETAILING THIS CONTROL CONTACT MNDOT METRO DISTRICT SURVEYS.

GENERAL NOTES:
 SSD: STOPPING SIGHT DISTANCE
 HSD: HEADLIGHT SIGHT DISTANCE

NOTES:
 (A) STRUCTURAL BACKFILL. SEE STD PLANS FOR BRIDGE ABUTMENT APPROACH TREATMENT

SB CSAH 78
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 Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO
 002-678-023, 114-020-051

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 S. VANG
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 T. SMITH
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 PLANNERS
 DESIGNERS

ANOKA COUNTY
 PROFILES
 CSAH 78 - BNSF GRADE SEPARATION

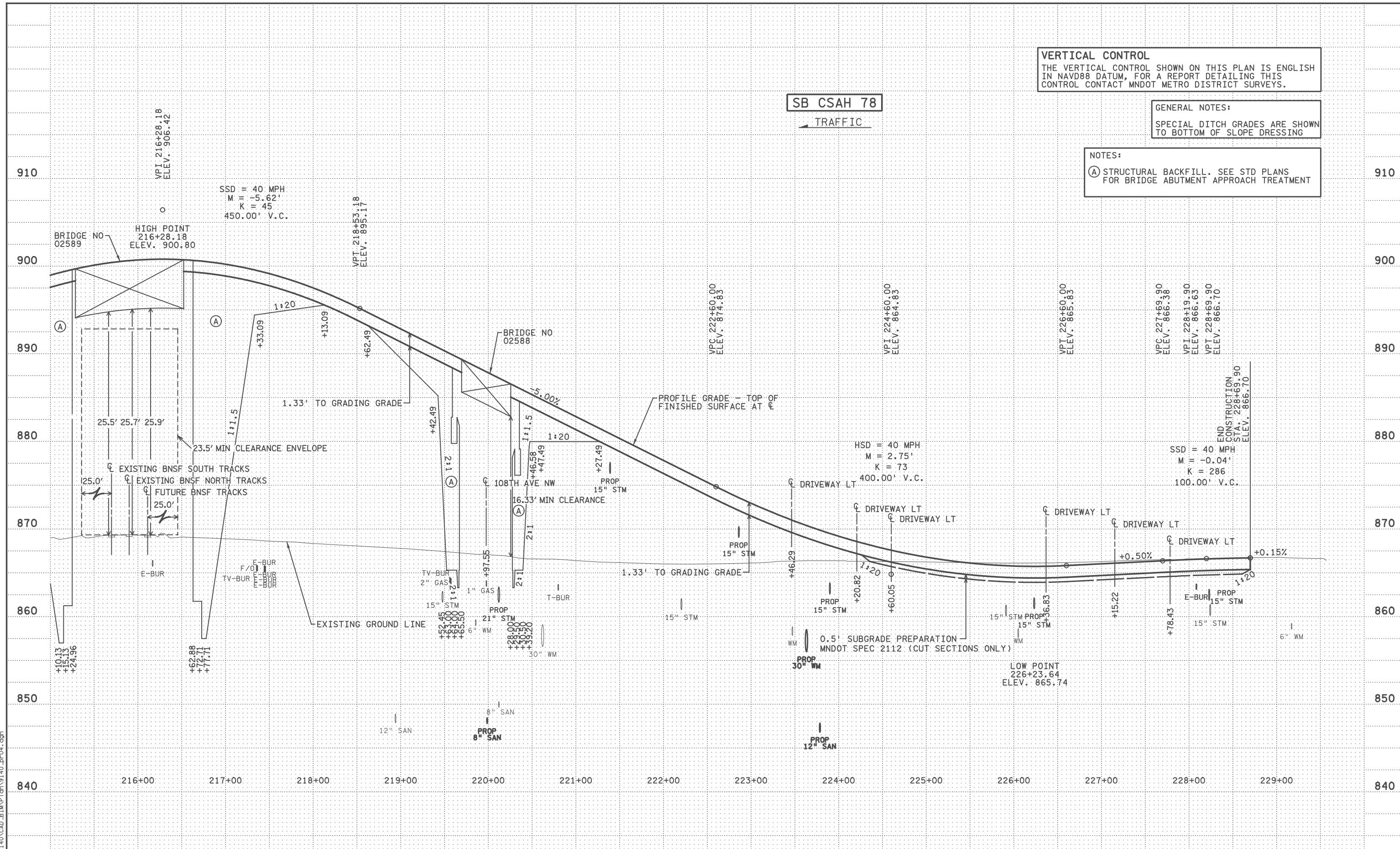
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VERTICAL CONTROL
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 IN NAVD88 DATUM, FOR A REPORT DETAILING THIS
 CONTROL CONTACT MNDOT METRO DISTRICT SURVEYS.

GENERAL NOTES:
 SPECIAL DITCH GRADES ARE SHOWN
 TO BOTTOM OF SLOPE DRESSING

NOTES:
 (A) STRUCTURAL BACKFILL. SEE STD PLANS
 FOR BRIDGE ABUTMENT APPROACH TREATMENT

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Ben Robeck
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ANOKA COUNTY
 PROFILES
 CSAH 78 - BNSF GRADE SEPARATION

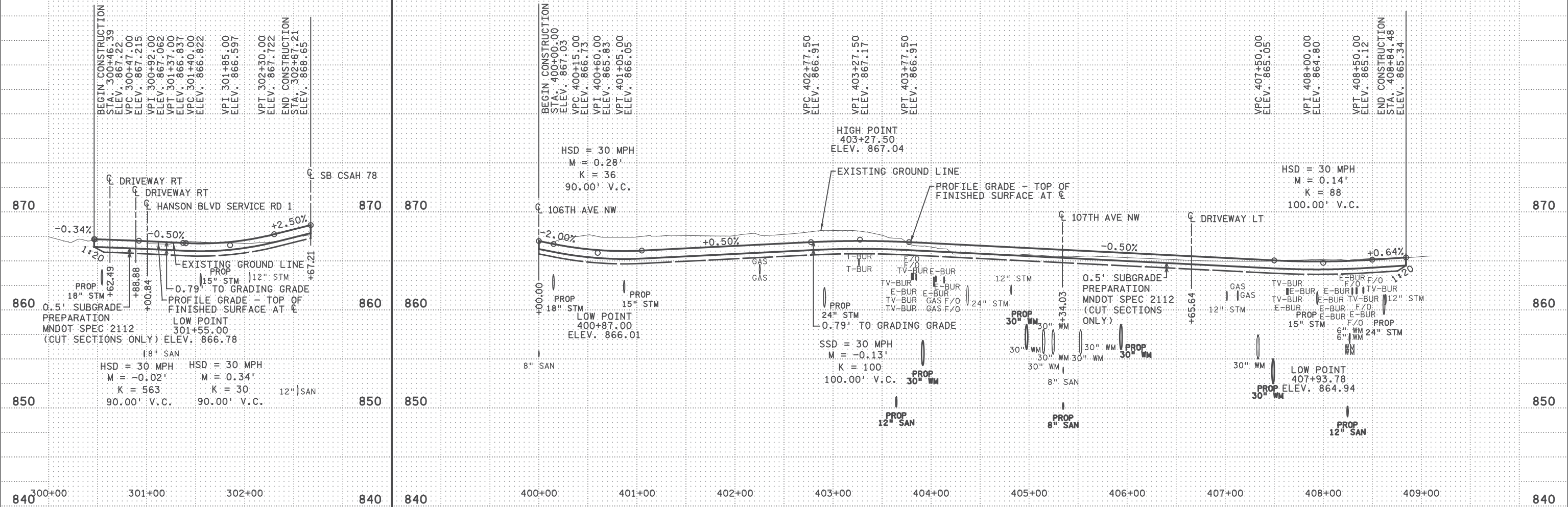
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106TH AVE NW

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HANSON BLVD SERVICE RD 1

TRAFFIC



VERTICAL CONTROL
 THE VERTICAL CONTROL SHOWN ON THIS PLAN IS ENGLISH IN NAVD88 DATUM, FOR A REPORT DETAILING THIS CONTROL CONTACT MNDOT METRO DISTRICT SURVEYS.

GENERAL NOTES:
 SSD: STOPPING SIGHT DISTANCE
 HSD: HEADLIGHT SIGHT DISTANCE

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NO	DATE	BY	CKD	APPR	REVISION

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 Date: 6/13/2017 License #: 53680

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 DESIGNERS

ANOKA COUNTY
 PROFILES
 CSAH 78 - BNSF GRADE SEPARATION

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 OF
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108TH AVE NW

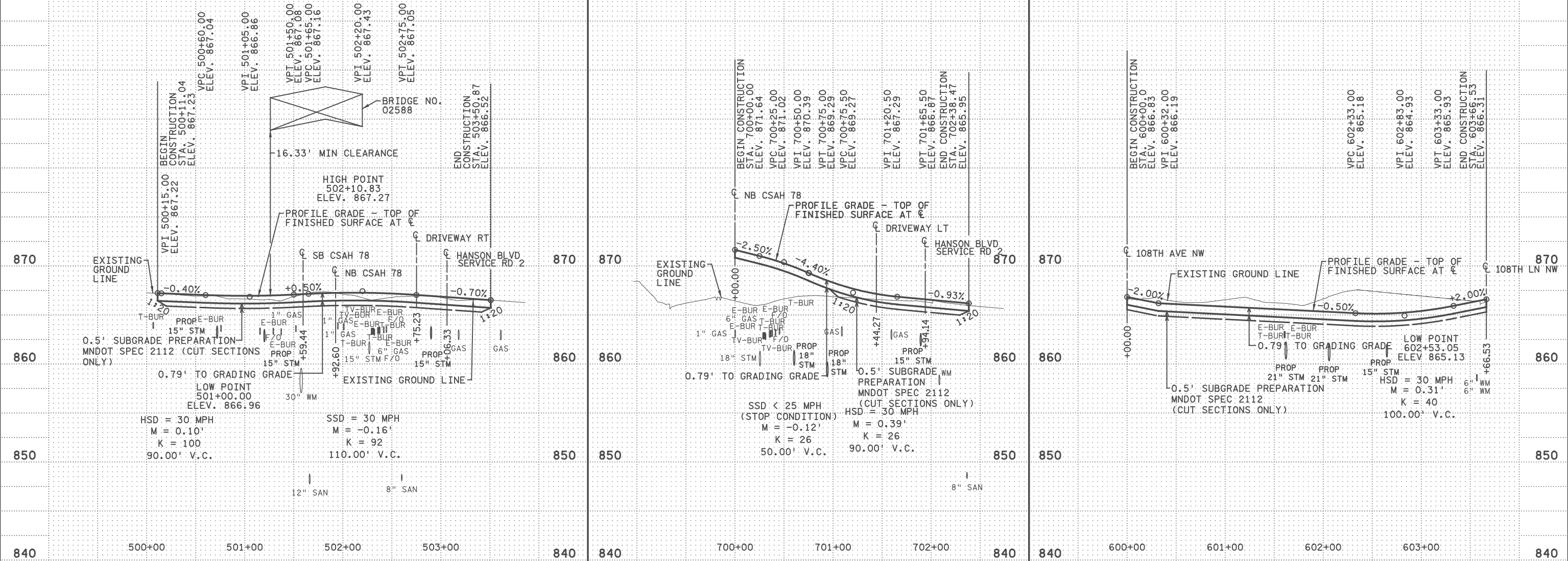
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108TH LN NW

TRAFFIC

HANSON BLVD SERVICE RD 2

TRAFFIC



VERTICAL CONTROL
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GENERAL NOTES:
 SSD: STOPPING SIGHT DISTANCE
 HSD: HEADLIGHT SIGHT DISTANCE

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 Date: 6/13/2017 License #: 53680

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 DRAWN BY S. VANG
 DESIGNED BY T. SMITH
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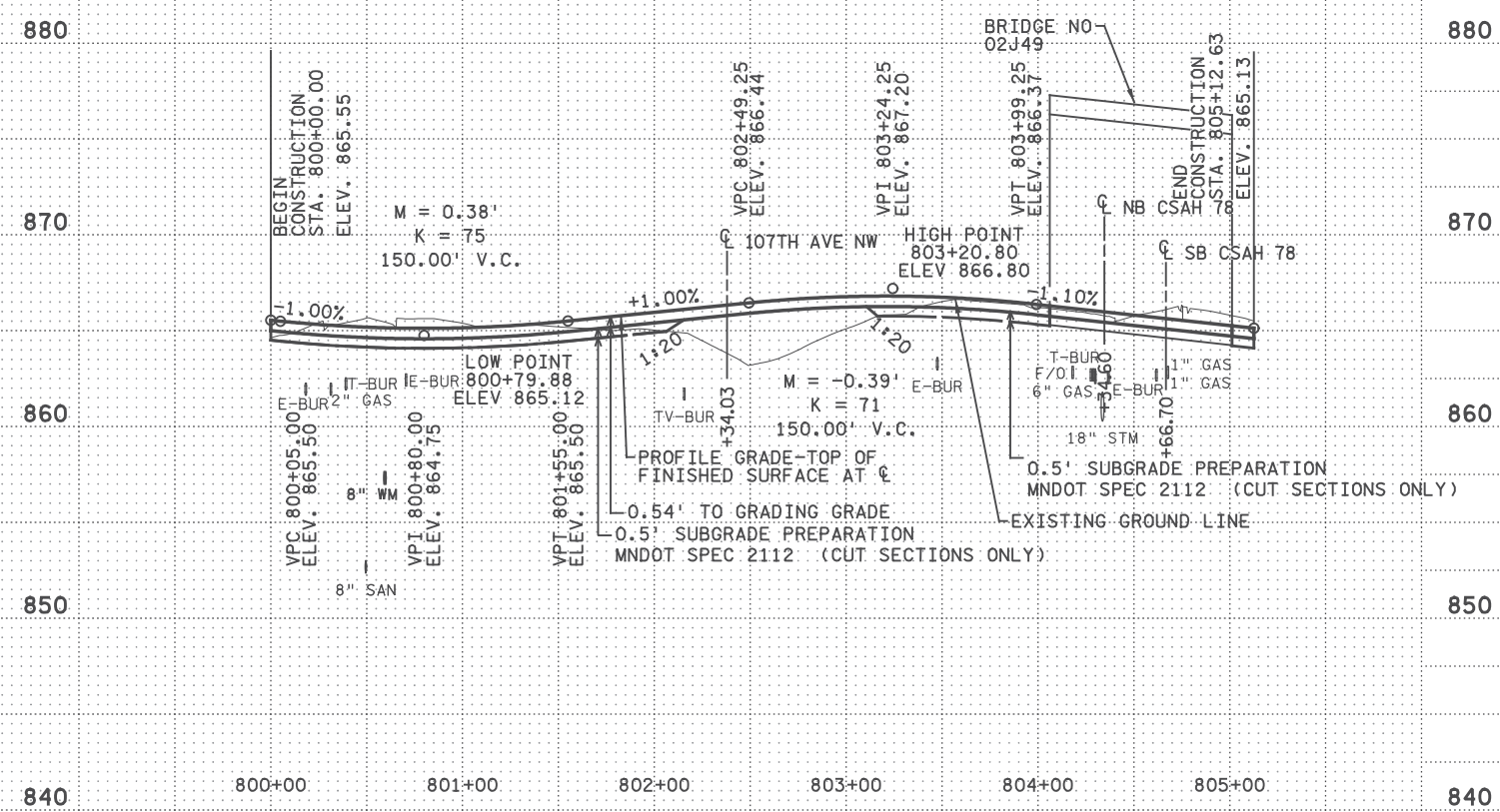


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 PROFILES
 CSAH 78 - BNSF GRADE SEPARATION

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VERTICAL CONTROL
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GENERAL NOTES:
SSD: STOPPING SIGHT DISTANCE
HSD: HEADLIGHT SIGHT DISTANCE

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ANOKA COUNTY
PROFILES
CSAH 78 - BNSF GRADE SEPARATION

SHEET
107
OF
175

WATER RESOURCES NOTES

THE FOLLOWING NOTES GIVE INFORMATION ABOUT CRITICAL FEATURES AND ELEVATIONS FOR THE DRAINAGE ON THIS PROJECT:

1. CHANGING THE FLOW DIRECTION SHOWN ON THE PLANS COULD HAVE ADVERSE EFFECTS OFF THE PROJECT CORRIDOR. DIRECTION CHANGES SHOULD BE REVIEWED WITH THE WATER RESOURCES ENGINEER. SEE SWPPP SHEETS FOR CONTACT INFORMATION.

2. STRUCTURE DESIGNS

DRAINAGE STRUCTURES SHALL BE PER MNDOT STANDARD STRUCTURE DESIGNS UNLESS NOTED OTHERWISE. DRAINAGE CASTINGS ALONG CSAH 78 SHALL BE MNDOT AND ANOKA COUNTY STANDARD ASSEMBLIES. DRAINAGE CASTINGS ELSEWHERE ON THE PROJECT SHALL BE CITY OF COON RAPIDS STANDARD ASSEMBLIES.

SPECIAL STRUCTURES

STRUCTURES 144 AND 158 - WATER QUALITY MANHOLES PRIOR TO INFILTRATION AREAS. MANHOLES WILL PROVIDE SKIMMING AND SEDIMENTATION BY MEANS OF A SUMP, WATER QUALITY BAFFLE(S) AND A SKIMMING BAFFLE.

STRUCTURE 151- OUTLET CONTROL STRUCTURE FOR 106TH WET POND. THIS STRUCTURE PROVIDES SKIMMING AND RATE CONTROL VIA A SUBMERGED PIPE AND A WEIR. THE WEIR ELEVATION CONTROLS THE WATER ELEVATION HELD IN THE TRAIL INFILTRATION AREA AND WET POND. ALL WATER ABOVE THE INFILTRATION BASIN BOTTOM / WET POND NWL AND BELOW THE WEIR TOP WILL BE INFILTRATED.

STRUCTURE 161- OUTLET CONTROL STRUCTURE FOR 107TH INFILTRATION BASIN. THIS STRUCTURE PROVIDES RATE CONTROL VIA A PIPE AND A WEIR. THE WEIR ELEVATION CONTROLS THE WATER ELEVATION HELD IN THE INFILTRATION BASIN. ALL WATER ABOVE THE INFILTRATION BASIN BOTTOM AND BELOW THE WEIR TOP WILL BE INFILTRATED.

STRUCTURE 231- OUTLET CONTROL STRUCTURE FOR SERVICE ROAD WET POND. THIS STRUCTURE PROVIDES SKIMMING AND RATE CONTROL VIA A SUBMERGED PIPE AND A WEIR WITH AN ORIFICE. THE ORIFICE ELEVATION CONTROLS THE WATER ELEVATION HELD IN THE WET POND, 108TH INFILTRATION BASIN AND SERVICE ROAD INFILTRATION BASIN. ALL WATER ABOVE THE INFILTRATION BASIN BOTTOMS / WET POND NWL AND BELOW THE ORIFICE WILL BE INFILTRATED.

3. PONDING AREAS

THE SYSTEM ALSO INCLUDES THE PONDING AREAS FOR STORMWATER TREATMENT LISTED BELOW. SEE THE DRAINAGE PLANS AND CONTOUR PLANS FOR LOCATIONS.

POND NAME	LOCATION	BOTTOM ELEV.	NORMAL WATER LEVEL	NWL CONTROL	HIGH WATER LEVEL	POND FUNCTION
106TH WET POND	BETWEEN CSAH 78, 106TH AVE NW, AND HANSON SERVICE ROAD 1	857.0	861.0	WEIR TOP IN STR. NO. 151	865.6	SEDIMENT RATE CONTROL SKIMMING
TRAIL INFILTRATION AREA	BETWEEN CSAH 78 AND FRONTAGE ROAD NORTH OF 106TH	861.0	N/A	N/A	865.3	RATE CONTROL INFILTRATION
107TH INFILTRATION BASIN	SOUTH OF 107TH AVE AND WEST OF HANSON SERVICE ROAD 1	860.0	N/A	N/A	865.7	RATE CONTROL INFILTRATION
SERVICE ROAD WET POND	BETWEEN 108TH LN NW, 108TH AVE NW, AND HANSON SERVICE ROAD 2	856.0	860.0	WEIR TOP IN STR. NO. 231	862.6	SEDIMENT RATE CONTROL SKIMMING
SERVICE ROAD INFILTRATION BASIN	BETWEEN 108TH LN NW, 108TH AVE NW, AND HANSON SERVICE ROAD 2	860.0	N/A	N/A	862.5	RATE CONTROL INFILTRATION
108TH INFILTRATION BASIN	EAST OF CSAH 78 AND NORTH OF 108TH LN NW	860.0	N/A	N/A	862.6	RATE CONTROL INFILTRATION

4. THE FOLLOWING CONSTRUCTION PERMITS APPLY TO THE PROJECT

NPDES CONSTRUCTION PERMIT
COON CREEK WATERSHED DISTRICT

5. REFER TO THE PERMIT APPLICATIONS AND PERMITS FOR SPECIAL CONDITIONS.

EXISTING STORM SEWER REMOVAL

IT IS THE INTENT OF THE DRAINAGE DESIGN TO FACILITATE REMOVAL OF THE MAJORITY OF EXISTING STORM SEWER UNDER NEW PAVEMENT AS SHOWN IN THE EXISTING DRAINAGE TABULATION.


DRAINAGE CASTING ASSEMBLIES SUMMARY						V
ASSEMBLY	RING OR FRAME CASTING	COVER OR GRATE CASTING (A)	CURB BOX	STANDARD PLATE NO.	QUANTITY (EACH)	REMARKS
A - 7D	700-7			4101	4	MANHOLE
		715		4110		
B - 5	(B)		N/A	(B)	11	LOW POINT CATCH BASIN
		816		4154		
			823A	4160		
B - 9	(C)			(C)	21	CATCH BASIN
		816		4154		
			N/A			
M - 11	ROUND CONC			4143	5	DROP INLET
		731		4143		
			N/A			
C - 1	(D)			(D)	26	CITY OF COON RAPIDS CATCH BASIN
		(D)		(D)		
			(D)	(D)		
C - 2	(E)			(E)	20	ANOKA COUNTY MEDIAN CATCH BASIN
		(E)		(E)		
			N/A			
PROJECT TOTALS:					87	

NOTES:

- (A) USE BENT BOLT WITH 816 GRATE.
- (B) NEENAH R-3250-DVSP OR APPROVED EQUAL PER ANOKA COUNTY STANDARDS.
- (C) NEENAH R-3250-EVSP OR APPROVED EQUAL PER ANOKA COUNTY STANDARDS.
- (D) NEENAH R-3067-L OR APPROVED EQUAL PER CITY OF COON RAPIDS STANDARDS.
- (E) NEENAH R-3448-C OR APPROVED EQUAL PER ANOKA COUNTY STANDARDS.

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1	1/9/2018	ZT	JN	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: JEREMY NIELSEN

 Date: 06/12/2017 License #: 45047

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG
 DESIGNED BY
Z. THELEN
 CHECKED BY
K. LACHOWITZER
 COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
WATER RESOURCES NOTES
CSAH 78 - BNSF GRADE SEPARATION

SHEET
108R
OF
175



GENERAL NOTES:

SEE CONTOUR PLANS FOR PROPOSED AND EXISTING CONTOURS AT PROPOSED POND LOCATIONS.

SEE RETAINING WALL AND BRIDGE PLANS FOR LOCATIONS WHERE WALL OR BRIDGE DRAINAGE SYSTEMS CONNECT TO DRAINAGE STRUCTURES.

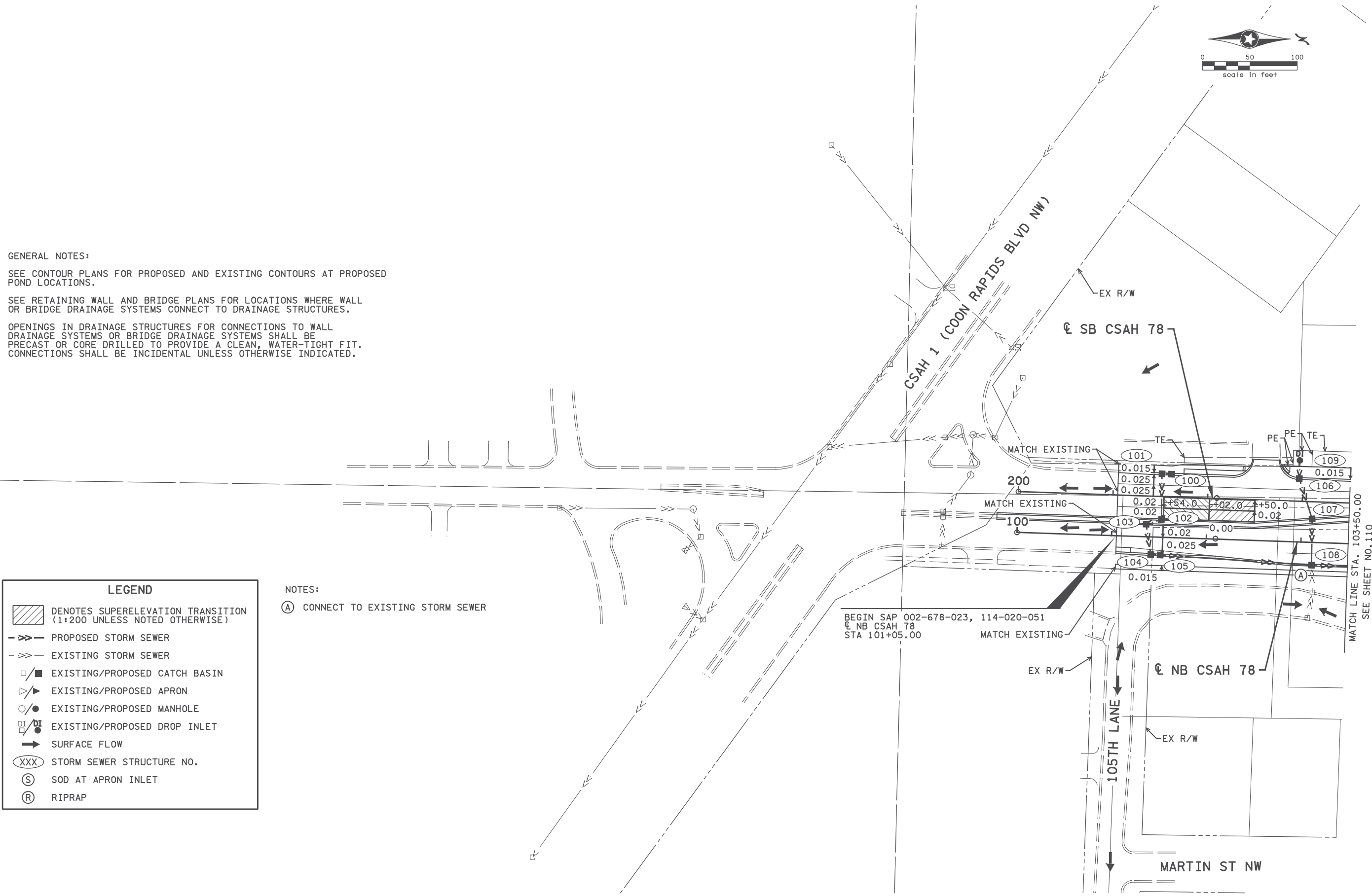
OPENINGS IN DRAINAGE STRUCTURES FOR CONNECTIONS TO WALL DRAINAGE SYSTEMS OR BRIDGE DRAINAGE SYSTEMS SHALL BE PRECAST OR CORE DRILLED TO PROVIDE A CLEAN, WATER-TIGHT FIT. CONNECTIONS SHALL BE INCIDENTAL UNLESS OTHERWISE INDICATED.

LEGEND

- DENOTES SUPERELEVATION TRANSITION (1:200 UNLESS NOTED OTHERWISE)
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- EXISTING/PROPOSED CATCH BASIN
- EXISTING/PROPOSED APRON
- EXISTING/PROPOSED MANHOLE
- EXISTING/PROPOSED DROP INLET
- SURFACE FLOW
- STORM SEWER STRUCTURE NO.
- SOD AT APRON INLET
- RIPRAP

NOTES:

(A) CONNECT TO EXISTING STORM SEWER



BEGIN SAP 002-678-023, 114-020-051
 NB CSAH 78
 STA 101+05.00

MATCH LINE STA. 103+50.00
 SEE SHEET NO. 110

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Jeremy Nielsen

Date: 06/18/2017 License # 45047

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 S. VANG

DESIGNED BY
 Z. THELEN

CHECKED BY
 K. LACHOWITZER

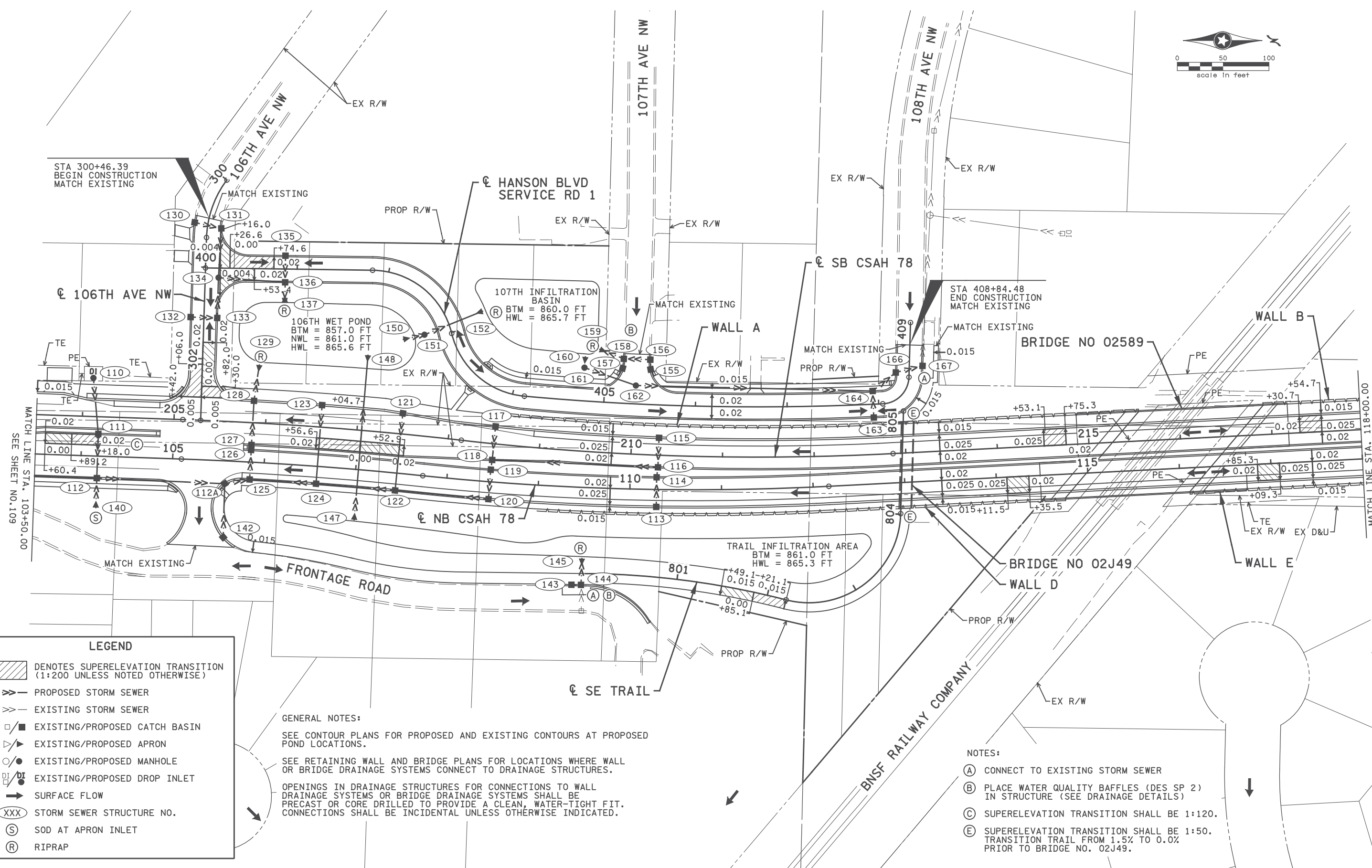
COMM. NO. 0169140



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 PLANNERS
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ANOKA COUNTY
 DRAINAGE AND SUPERELEVATION PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 109
 OF
 175



LEGEND

- DENOTES SUPERELEVATION TRANSITION (1:200 UNLESS NOTED OTHERWISE)
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- EXISTING/PROPOSED CATCH BASIN
- EXISTING/PROPOSED APRON
- EXISTING/PROPOSED MANHOLE
- EXISTING/PROPOSED DROP INLET
- SURFACE FLOW
- STORM SEWER STRUCTURE NO.
- SOD AT APRON INLET
- RIPRAP

GENERAL NOTES:

SEE CONTOUR PLANS FOR PROPOSED AND EXISTING CONTOURS AT PROPOSED POND LOCATIONS.

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NOTES:

- (A) CONNECT TO EXISTING STORM SEWER
- (B) PLACE WATER QUALITY BAFFLES (DES SP 2) IN STRUCTURE (SEE DRAINAGE DETAILS)
- (C) SUPERELEVATION TRANSITION SHALL BE 1:120.
- (E) SUPERELEVATION TRANSITION SHALL BE 1:50. TRANSITION TRAIL FROM 1.5% TO 0.0% PRIOR TO BRIDGE NO. 02J49.

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Jeremy Nielsen

Date: 06/17/2017 License # 45047

STATE AID PROJECT NO. 002-678-023, 114-020-051

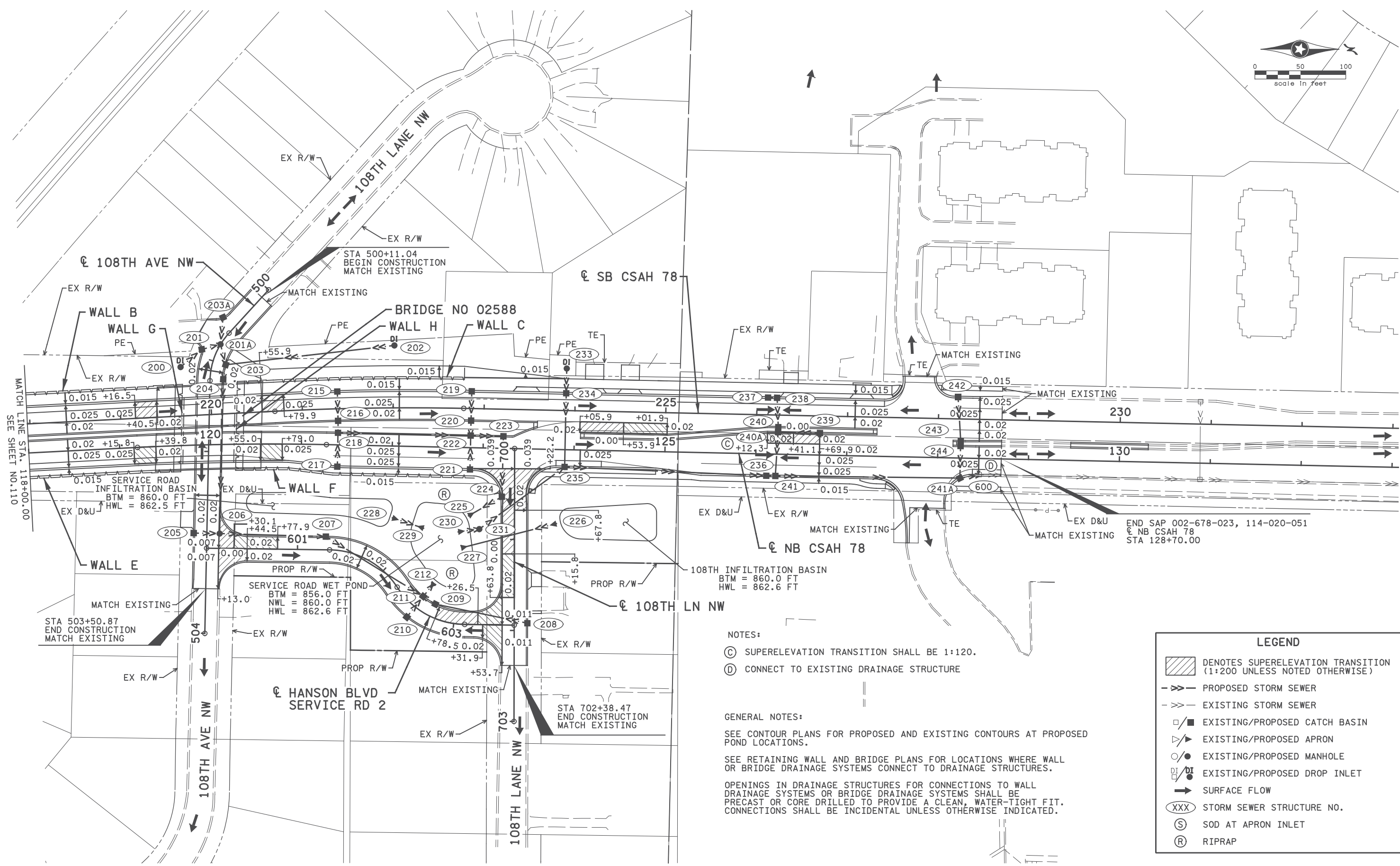
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 CHECKED BY K. LACHOWITZER
 COMM. NO. 0169140



ANOKA COUNTY

DRAINAGE AND SUPERELEVATION PLANS
CSAH 78 - BNSF GRADE SEPARATION

SHEET 110 OF 175



- NOTES:
- (C) SUPERELEVATION TRANSITION SHALL BE 1:120.
 - (D) CONNECT TO EXISTING DRAINAGE STRUCTURE

GENERAL NOTES:

SEE CONTOUR PLANS FOR PROPOSED AND EXISTING CONTOURS AT PROPOSED POND LOCATIONS.

SEE RETAINING WALL AND BRIDGE PLANS FOR LOCATIONS WHERE WALL OR BRIDGE DRAINAGE SYSTEMS CONNECT TO DRAINAGE STRUCTURES.

OPENINGS IN DRAINAGE STRUCTURES FOR CONNECTIONS TO WALL DRAINAGE SYSTEMS OR BRIDGE DRAINAGE SYSTEMS SHALL BE PRECAST OR CORE DRILLED TO PROVIDE A CLEAN, WATER-TIGHT FIT. CONNECTIONS SHALL BE INCIDENTAL UNLESS OTHERWISE INDICATED.

LEGEND

- DENOTES SUPERELEVATION TRANSITION (1:200 UNLESS NOTED OTHERWISE)
- PROPOSED STORM SEWER
- EXISTING STORM SEWER
- EXISTING/PROPOSED CATCH BASIN
- EXISTING/PROPOSED APRON
- EXISTING/PROPOSED MANHOLE
- EXISTING/PROPOSED DROP INLET
- SURFACE FLOW
- STORM SEWER STRUCTURE NO.
- SOD AT APRON INLET
- RIPRAP

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Print Name: JEREMY V. NIELSEN

Jeremy V. Nielsen

Date: 06/17/17 License #: 45047

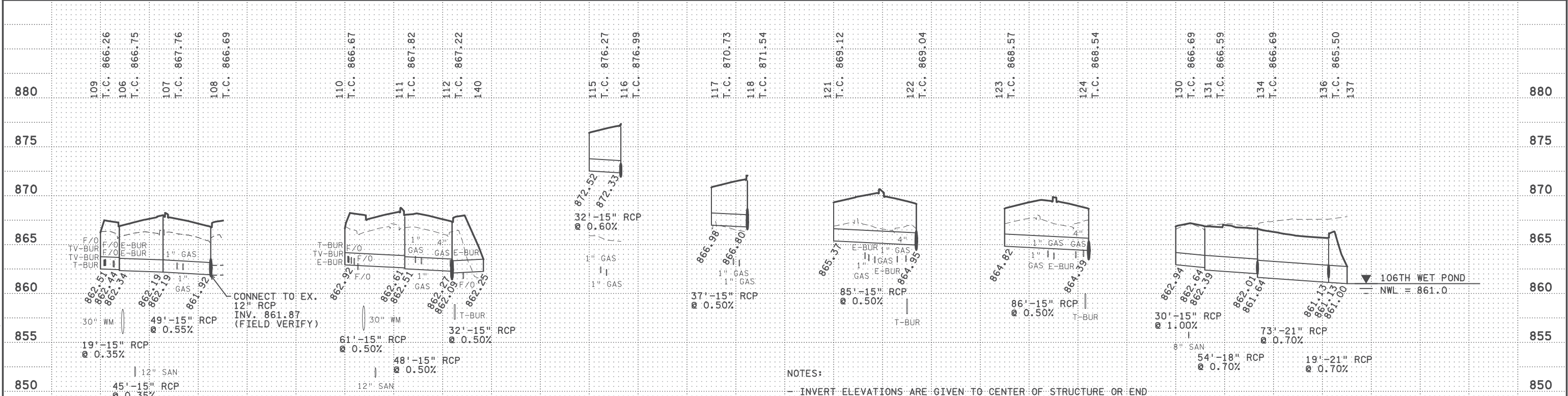
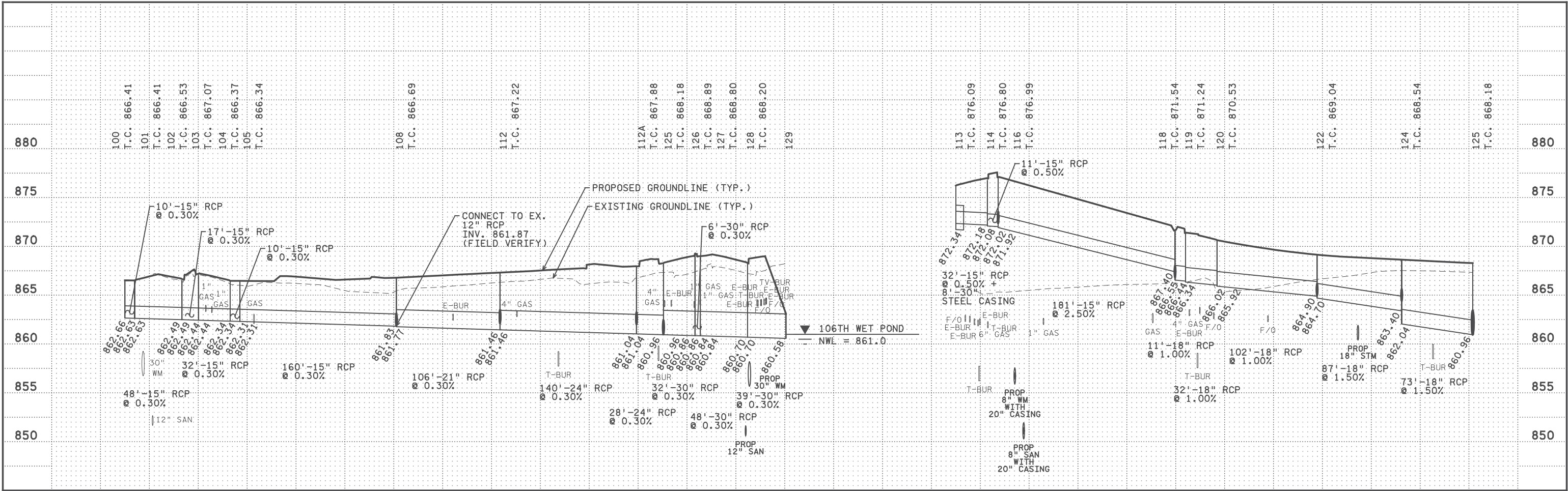
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 DESIGNED BY Z. THELEN
 CHECKED BY K. LACHOWITZER
 COMM. NO. 0169140



ANOKA COUNTY
 DRAINAGE AND SUPERELEVATION PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 111 OF 175



- NOTES:
- INVERT ELEVATIONS ARE GIVEN TO CENTER OF STRUCTURE OR END OF APRON (END OF PIPE IF NO APRON).
 - TOP OF CASTING ELEVATIONS ARE TO CENTER OF CASTING ASSEMBLY.
 - APRON LENGTH INCLUDED IN LENGTH OF PIPE IN PROFILES (SEE DRAINAGE TABULATION FOR PAY LENGTH OF PIPE).
 - ALL RC PIPES 12" - 15" ARE CL V.
 - ALL RC PIPES 18" AND LARGER ARE CL II UNLESS OTHERWISE NOTED.

STRUCTURES ON THIS SHEET							
100	105	110	115	120	125	130	140
101	106	111	116	121	126	131	
102	107	112	117	122	127	134	
103	108	113	118	123	128	136	
104	109	114	119	124	129	137	

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Z. THELEN

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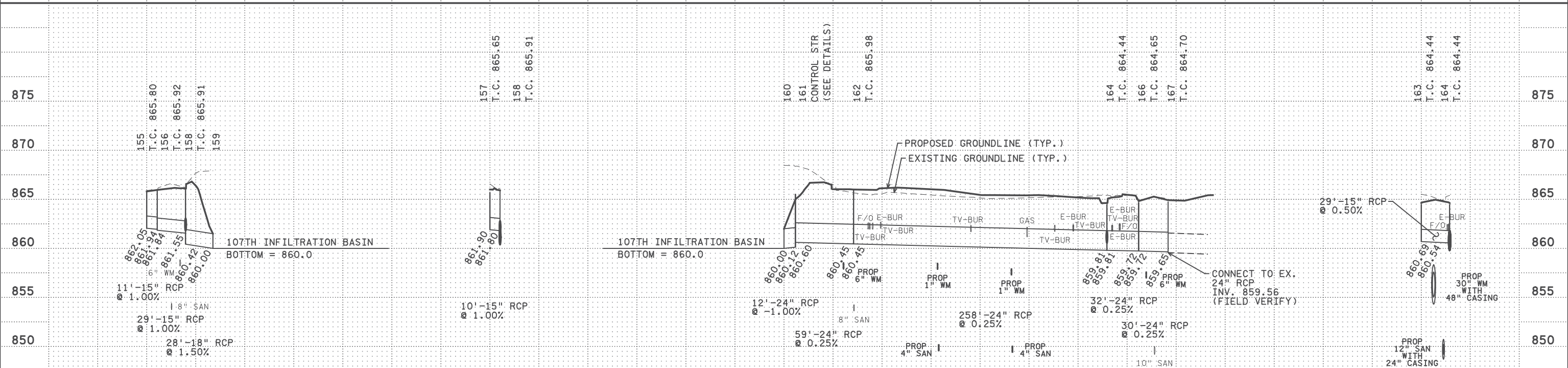
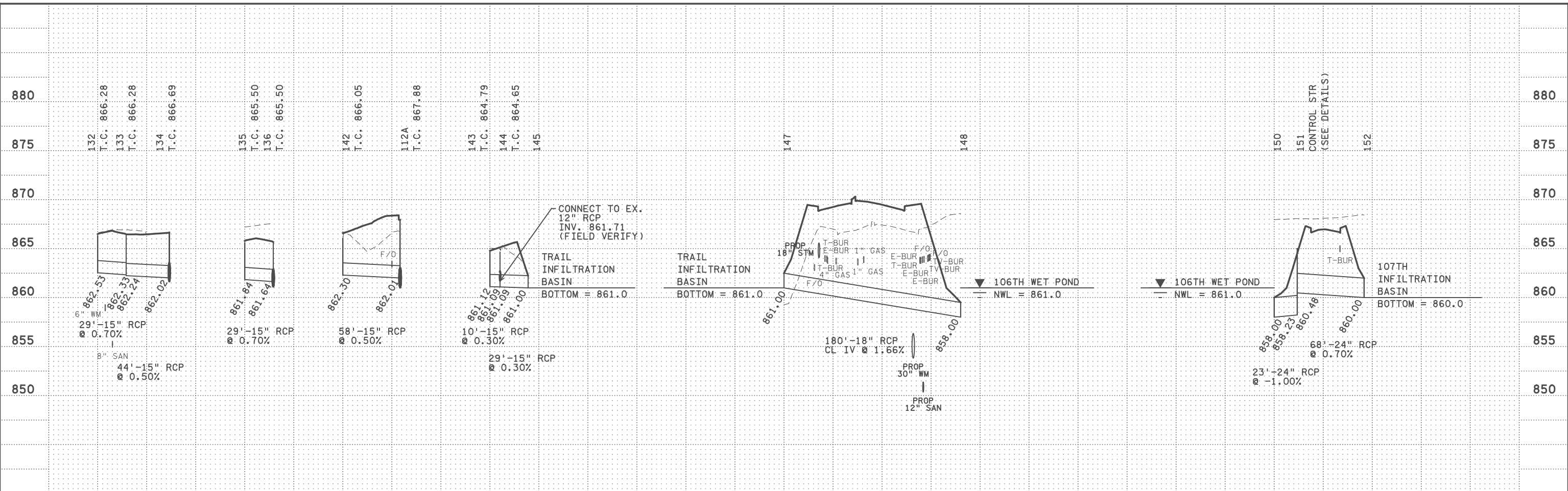
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DESIGNERS

ANOKA COUNTY
DRAINAGE PROFILES
CSAH 78 - BNSF GRADE SEPARATION

SHEET
112
OF
175



- NOTES:
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STRUCTURES ON THIS SHEET						
112A	136	147	155	160	166	
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133	143	150	157	162		
134	144	151	158	163		
135	145	152	159	164		

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Jeremy Nielsen

Date: 06/17/2017 License #: 45047

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Z. THELEN

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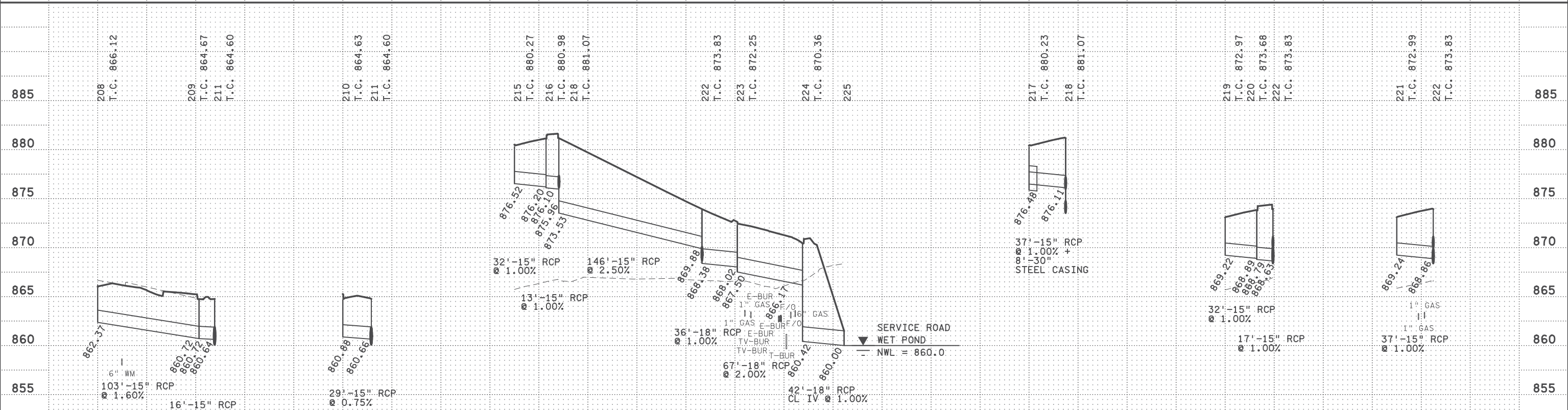
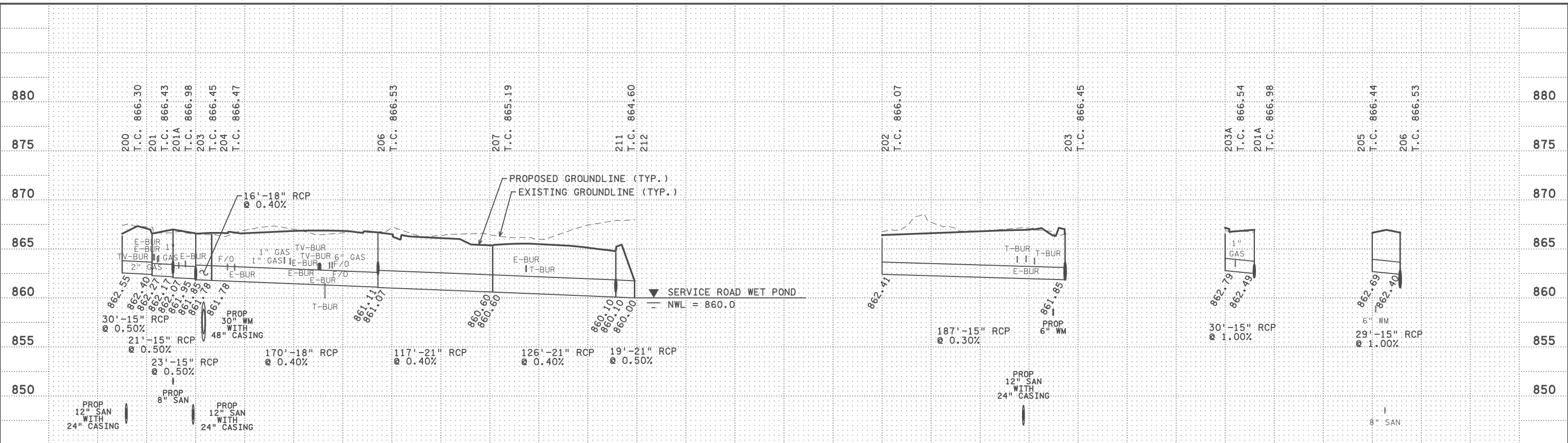
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ANOKA COUNTY
DRAINAGE PROFILES
CSAH 78 - BNSF GRADE SEPARATION

SHEET
113
OF
175



NOTES:

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STRUCTURES ON THIS SHEET					
200	203A	208	215	220	225
201	204	209	216	221	
201A	205	210	217	222	
202	206	211	218	223	
203	207	212	219	224	

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Z. THELEN

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COMM. NO. 0169140

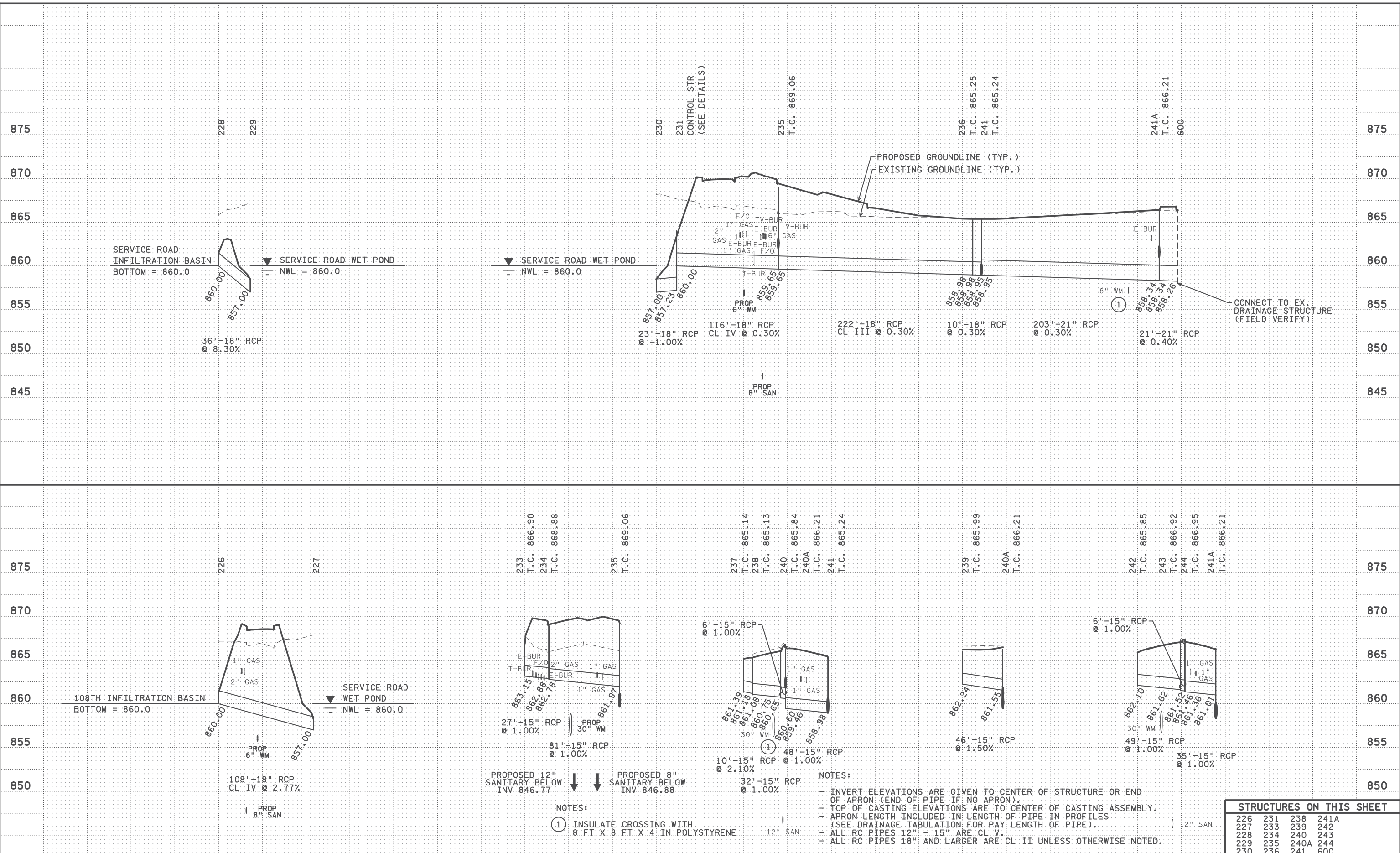


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ANOKA COUNTY
DRAINAGE PROFILES
CSAH 78 - BNSF GRADE SEPARATION

SHEET
114
OF
175

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NOTES:
 ① INSULATE CROSSING WITH 8 FT X 8 FT X 4 IN. POLYSTYRENE

NOTES:
 - INVERT ELEVATIONS ARE GIVEN TO CENTER OF STRUCTURE OR END OF APRON (END OF PIPE IF NO APRON).
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STRUCTURES ON THIS SHEET				
226	231	238	241A	
227	233	239	242	
228	234	240	243	
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230	236	241	600	

NO	DATE	BY	CKD	APPR	REVISION

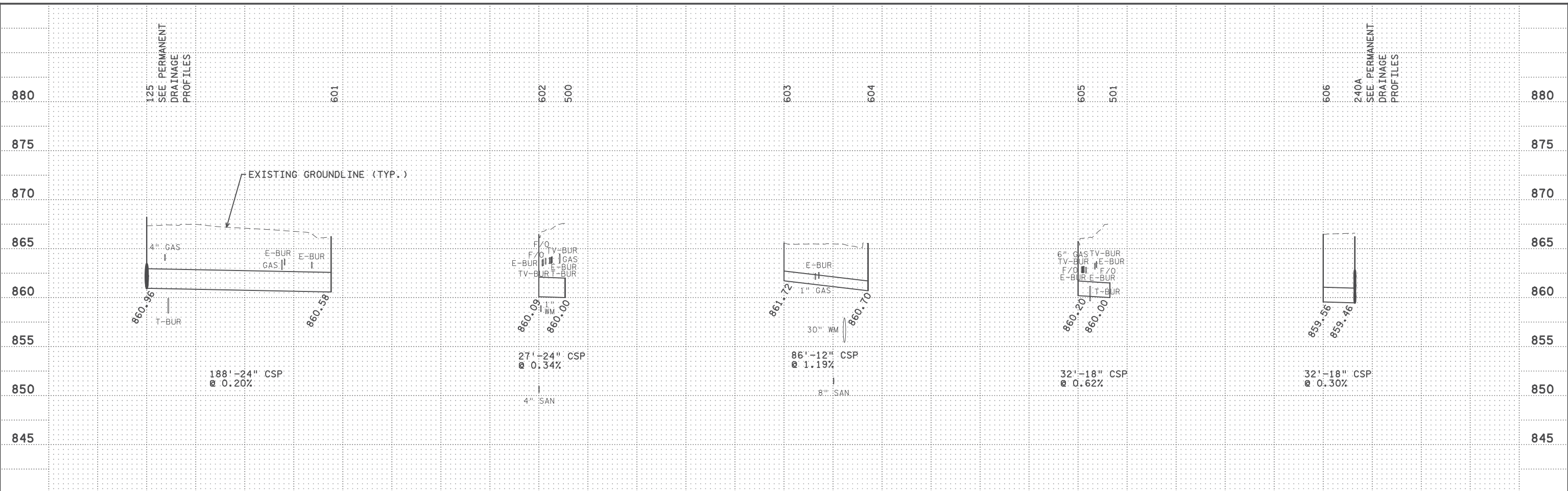
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 Date: 06/18/2017 License #: 45047

STATE AID PROJECT NO 002-678-023, 114-020-051
 DRAWN BY S. VANG
 DESIGNED BY Z. THELEN
 CHECKED BY K. LACHOWITZER
 COMM. NO. 0169140



ANOKA COUNTY
 DRAINAGE PROFILES
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 115 OF 175



125
SEE PERMANENT
DRAINAGE
PROFILES

240A
SEE PERMANENT
DRAINAGE
PROFILES

EXISTING GROUNDLINE (TYP.)

- NOTES:
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STRUCTURES ON THIS SHEET	
125	602
240A	603
500	604
501	605
601	606

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Jeremy Nielsen

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S. VANG

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Z. THELEN

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COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
TEMPORARY DRAINAGE PROFILES
CSAH 78 - BNSF GRADE SEPARATION

SHEET
116
OF
175

FLOWS FROM STR. OR APRON INLET POINT NO.	DRAINAGE TABULATION																								W				
	STRUCTURE LOCATION			FLOWS TO STR. OR APRON OUTLET POINT NO.	NEW STRUCTURE CONSTRUCTION				RC PIPE (DESIGN 3006)						STEEL CASING PIPE (C)						SOD	RIPRAP (D)				GUIDE POST TYPE B	NOTES		
	ALIGNMENT NAME	STATION	OFFSET FT		DESIGN	PAY HEIGHT LIN FT	CASTING ASSEMBLY TYPE (A)	STEPS REQ'D (B)	15" CLV		18" CLII		21" CLII		24" CLII		30" CLII		30"		TYPE LAWN SQ YD	CLASS II CU YD	CLASS III CU YD	GEO TEXTILE FILTER SQ YD					
				L.F.					APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.						APR	L.F.	APR	L.F.
100	SB CSAH 78	201+61.00	24.00 L	101	H	3.7	B - 5																						
101	SB CSAH 78	201+51.00	24.00 L	102	SD-48	3.7	B - 5																						
102	SB CSAH 78	201+52.00	24.25 R	103	G	4.2	C - 2	Y																					
103	NB CSAH 78	101+36.00	13.25 L	104	G	4.8	C - 2	Y																					
104	NB CSAH 78	101+42.00	18.60 R	105	G	4.0	B - 5	Y																					
105	NB CSAH 78	101+52.00	18.80 R	108	G	4.0	B - 5	Y																					
106	SB CSAH 78	202+96.00	24.00 L	107	G	4.3	B - 5	Y																					
107	SB CSAH 78	203+11.00	18.15 R	108	F	6.1	C - 2	Y																			(M)		
108	NB CSAH 78	103+12.00	24.00 R	112	G	4.8	B - 9	Y					106														(E)		
109	SB CSAH 78	202+96.00	43.20 L	106	H	3.8	M - 11																						
110	SB CSAH 78	204+10.55	42.11 L	111	H	3.8	M - 11																						
111	NB CSAH 78	104+18.00	24.25 L	112	F	5.4	C - 2	Y																					
112	NB CSAH 78	104+18.00	24.00 R	112A	F	5.7	B - 9	Y																					
112A	NB CSAH 78	105+58.00	25.04 R	125	F	6.8	B - 9	Y					140																
113	NB CSAH 78	110+29.00	19.00 R	114	SD-48	4.2	B - 9																				(I) (J)		
114	NB CSAH 78	110+29.00	13.25 L	116	G	4.9	C - 2	Y																					
115	SB CSAH 78	210+30.00	19.00 L	116	H	3.7	B - 9																						
116	SB CSAH 78	210+30.00	13.25 R	118	F	5.2	C - 2	Y																					
117	SB CSAH 78	208+50.00	19.00 L	118	H	3.7	B - 9																						
118	SB CSAH 78	208+50.00	17.77 R	119	F	5.1	C - 2	Y																					
119	NB CSAH 78	108+47.00	13.25 L	120	F	5.0	C - 2	Y					11																
120	NB CSAH 78	108+47.00	19.00 R	122	G	4.5	B - 9	Y					102																
121	SB CSAH 78	207+48.00	22.58 L	122	H	3.7	B - 9																						
122	NB CSAH 78	107+45.00	19.00 R	124	G	4.3	B - 9	Y																					
123	SB CSAH 78	206+60.00	24.00 L	124	H	3.7	B - 9																						
124	NB CSAH 78	106+58.00	19.00 R	125	F	6.4	B - 9	Y																					
125	NB CSAH 78	105+85.00	19.00 R	126	60-4020	7.1	B - 9	Y																					
126	NB CSAH 78	105+85.00	13.25 L	127	54-4020	8.2	C - 2	Y																					
127	SB CSAH 78	205+85.85	24.25 R	128	54-4020	8.1	C - 2	Y																					
128	SB CSAH 78	205+86.00	24.00 L	129	54-4020	7.4	B - 9	Y																					
129	SB CSAH 78	205+89.64	63.23 L		APRON																								
130	106TH AVE NW	300+53.50	14.50 R	131	DES SP 1	4.0	C - 1																				(F) (H)		
131	106TH AVE NW	300+55.49	15.21 L	134	48-4020	4.5	C - 1	Y																					
STORM SEWER SUBTOTAL THIS SHEET									993	359	106	168	119	1	8									9.0		37.4	1		

GENERAL NOTES:

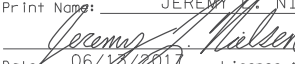

STA., OFFSETS, AND COORDINATES ARE GIVEN TO THE END OF APRON OR CENTER OF CASTING ASSEMBLY CASTING SUMP = 0.10 FT FOR CATCH BASIN CASTINGS EXCEPT C - 1 CASTINGS (SUMP = 0.17 FT), AND DROP INLET CASTINGS (SUMP = 0.20 FT). SUMP HAS BEEN INCLUDED IN TOP OF CASTING ELEVATIONS.
 ROTATE STRUCTURES SUCH THAT MAJORITY OF STRUCTURE IS BEHIND CURB LINE UNLESS DIRECTED BY THE ENGINEER OR ALTERNATE ROTATION IS REQUIRED TO AVOID CONFLICTS (SEE DRAINAGE DETAILS).
 SEE APPLICABLE MNDOT STANDARD PLATES FOR DETAILS OF DRAINAGE STRUCTURE DESIGN, EXCEPT AS NOTED BELOW.
 STRUCTURE DESIGN SD-48 SHALL BE CONSTRUCTED IN ACCORDANCE WITH MNDOT STD. PLATE 4024 WITH THE FOLLOWING EXCEPTIONS:
 STRUCTURE DIAMETER SHALL BE 48 IN. FOR SD-48 AND DEPTH SHALL BE AS REQUIRED IN THE DRAINAGE TABULATION
 WALL AND BASE SLAB THICKNESS AND ALL REINFORCEMENT SHALL BE IN ACCORDANCE WITH MNDOT STD. PLATE 4020.
 ALL DESIGN F STRUCTURES SHALL UTILIZE A TYPE B CONE.
 DES SP 1 (DESIGN SPECIAL 1) SHALL BE A 2 FT X 3 FT RECTANGULAR CATCH BASIN (SEE DRAINAGE DETAILS).
 SEE DRAINAGE DETAILS FOR DES SP 2 (DESIGN SPECIAL 2).
 CTRL STR (CONTROL STRUCTURES) ARE POND OUTLET CONTROL STRUCTURES. SEE DRAINAGE DETAILS.

SEE WATER RESOURCES NOTES FOR CASTING KEY AND SUMMARY TABULATION.

PAYMENT FOR CULVERT PIPES MADE UNDER ITEM 2503.

- (A) STRUCTURES WITH CASTING ASSEMBLY C - 1 AND FLAT TOP SLABS (XX-4020 OR SD-XX) SHALL HAVE 2 FT X 3 FT OPENING PER MNDOT STD. PLATE 4022 (INCIDENTAL). TOP SLAB THICKNESS AND REINFORCEMENT SHALL BE PER MNDOT STD. PLATE 4020.
- (B) STEPS REQUIRED WHEN DEPTH FROM TOP OF CASTING TO STRUCTURE INVERT IS GREATER THAN 4 FT.
- (C) TIE ALL JOINTS INSIDE OF CASING. TIED JOINTS SHALL BE INCIDENTAL. INVERT ELEVATIONS LISTED ARE FOR RCP. SEE MISCELLANEOUS DETAILS FOR ADDITIONAL REQUIREMENTS.
- (D) RIPRAP QUANTITY ASSUMES RIPRAP UTILIZED UNDER APRONS (INSTEAD OF GRANULAR FILTER) UNLESS NOTED OTHERWISE. GRANULAR FILTER MAY BE SUBSTITUTED FOR THE RIPRAP UNDER THE APRON PER MNDOT STANDARD PLATE 3133. IF GRANULAR FILTER IS SUBSTITUTED IT SHALL BE PAID FOR AS RIPRAP OF THE CLASS INDICATED AT THAT LOCATION. GEOTEXTILE FILTER SHALL BE TYPE IV AT ALL RIPRAP LOCATIONS.
- (E) BUILD OVER EXISTING PIPE OR CONNECT TO EXISTING PIPE. PIPE TO PIPE CONNECTIONS SHALL BE MADE AT AN EXISTING PIPE JOINT. FIELD VERIFY LOCATION AND ELEVATION.
- (F) TIE ALL JOINTS FOR CULVERTS AND LAST 3 JOINTS FOR STORM SEWER RUNS CONTAINING APRONS. TIED JOINTS SHALL BE INCIDENTAL.
- (G) INSULATE ALL CROSSINGS HAVING LESS THAN 2 FT OF CLEARANCE TO WATERMAIN OR 1 FT OF CLEARANCE TO SANITARY SEWER OR STORM SEWER WITH 8 FT X 8 FT X 4 IN POLYSTYRENE INSULATION.
- (H) FURNISH AND INSTALL TRASH GUARD WITH APRON. SEE DRAINAGE DETAILS.
- (I) EXTEND CASING PIPE INTO STRUCTURE (SEE MISCELLANEOUS DETAILS). ADDITIONAL 6 INCHES INCLUDED IN PAY HEIGHT.
- (J) STRUCTURE LOCATION MAY BE SHIFTED PARALLEL TO WALL (5 FT MAX) TO COORDINATE WITH WALL PANEL JOINTS, WITH THE APPROVAL OF THE ENGINEER.
- (K) PLACE WATER QUALITY BAFFLES (DES SP 2) IN STRUCTURE. WATER QUALITY BAFFLE AND SKIMMER BAFFLE PAID FOR AS DESIGN SPECIAL 2. STRUCTURE AND CASTING PAID FOR SEPARATELY (PAY HEIGHT INCLUDES 6FT SUMP BELOW LOWEST PIPE INVERT). SEE DRAINAGE DETAILS AND SPECIAL PROVISIONS.
- (L) CONNECT INTO EXISTING DRAINAGE STRUCTURE. FIELD VERIFY LOCATION AND ELEVATION.
- (M) CONNECT TO EXISTING PIPE FOR TEMPORARY DRAINAGE. PAY HEIGHT INCLUDES EXTRA DEPTH REQUIRED FOR TEMPORARY CONNECTION. BULKHEAD TEMPORARY OPENING AND FILL INVERT WITH CONCRETE (3Y43) TO PERMANENT PIPE ELEVATION WHEN CONNECTION TO PERMANENT PIPE OCCURS. BULKHEADS, FILLING INVERT, AND CONNECTING TO PERMANENT PIPE SHALL BE CONSIDERED INCIDENTAL. FIELD VERIFY LOCATION AND ELEVATION.

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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: JEREMY NIELSEN  Date: 06/17/2011 License #: 45047					STATE AID PROJECT NO 002-678-023, 114-020-051		DRAWN BY S. VANG DESIGNED BY Z. THELEN CHECKED BY K. LACHOWITZ COMM. NO. 0169140		 ENGINEERS PLANNERS DESIGNERS			ANOKA COUNTY DRAINAGE TABULATION CSAH 78 - BNSF GRADE SEPARATION			SHEET 117 OF 175			
NO	DATE	BY	CKD	APPR	REVISION									... \CAD_BIM\PI\an\9140_d\01.dgn				

DRAINAGE TABULATION

W

FLOWS FROM STR. OR APRON INLET POINT NO.	STRUCTURE LOCATION			FLOWS TO STR. OR APRON OUTLET POINT NO.	NEW STRUCTURE CONSTRUCTION																				RIPRAP (D)					GUIDE POST TYPE B EACH	NOTES
					RC PIPE (DESIGN 3006)				SOD	CLASS II CU YD	CLASS III CU YD	GEO TEXTILE FILTER SQ YD																			
					15" CLV		18" CLII		18" CLIV				21" CLII		24" CLII		TYPE LAWN SQ YD														
					L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR		L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR		
132	106TH AVE NW	301+55.00	14.50 R	133	DES SP 1	4.0	C - 1																								
133	106TH AVE NW	301+55.00	14.50 L	134	48-4020	4.3	C - 1	Y																							
134	106TH AVE NW	301+11.00	14.50 L	136	F	5.2	A - 7D	Y					73																		
135	HANSON BLVD SERVICE RD 1	400+87.00	14.50 L	136	DES SP 1	3.9	C - 1																								
136	HANSON BLVD SERVICE RD 1	400+87.00	14.50 R	137	SD-48	4.7	C - 1	Y						13																	
137	HANSON BLVD SERVICE RD 1	400+87.00	33.43 R		APRON																										
140	NB CSAH 78	104+18.00	56.20 R	112	APRON																										
142	NB CSAH 78	105+59.10	83.45 R	112A	H	3.7	B - 5																								
143	NB CSAH 78	109+41.00	106.66 R	144	DES SP 1	4.0	C - 1																								
144	NB CSAH 78	109+51.00	106.35 R	145	48-4020	9.8	C - 1																								
145	NB CSAH 78	109+50.92	77.71 R		APRON																										
147	NB CSAH 78	107+03.00	54.94 R	148	APRON																										
148	SB CSAH 78	207+05.00	82.23 L		APRON																										
150	HANSON BLVD SERVICE RD 1	402+86.81	52.23 R	151	APRON																										
151	HANSON BLVD SERVICE RD 1	402+93.00	28.97 R	152	CTRL STR																										
152	HANSON BLVD SERVICE RD 1	402+90.23	39.23 L		APRON																										
155	HANSON BLVD SERVICE RD 1	405+49.50	38.43 L	156	DES SP 1	4.0	C - 1																								
156	HANSON BLVD SERVICE RD 1	405+48.72	49.00 L	158	48-4020	4.4	C - 1	Y																							
157	HANSON BLVD SERVICE RD 1	405+18.50	38.18 L	158	DES SP 1	4.0	C - 1																								
158	HANSON BLVD SERVICE RD 1	405+19.21	48.52 L	159	72-4020	11.8	C - 1	Y																							
159	HANSON BLVD SERVICE RD 1	404+92.18	57.23 L		APRON																										
160	HANSON BLVD SERVICE RD 1	404+76.53	47.95 L	161	APRON																										
161	HANSON BLVD SERVICE RD 1	404+76.35	36.26 L	162	CTRL STR																										
162	HANSON BLVD SERVICE RD 1	405+34.03	20.07 L	164	F	5.6	A - 7D	Y																							
163	HANSON BLVD SERVICE RD 1	407+94.00	14.50 R	164	DES SP 1	4.0	C - 1																								
164	HANSON BLVD SERVICE RD 1	407+94.00	14.50 L	166	SD-48	4.9	C - 1	Y																							
166	HANSON BLVD SERVICE RD 1	408+54.00	14.50 L	167	48-4020	5.2	C - 1	Y																							
167	HANSON BLVD SERVICE RD 1	408+62.00	14.50 R		48-4020	5.4	C - 1	Y																							
200	108TH AVE NW	501+12.00	33.59 R	201	H	3.8	M - 11																								
201	108TH AVE NW	500+93.00	15.97 R	201A	48-4020	4.4	C - 1	Y																							
201A	108TH AVE NW	500+80.00	0.00 L	203	F	5.0	A - 7D	Y																							
202	SB CSAH 78	222+01.71	68.64 L	203	H	3.7	M - 11																								
203	108TH AVE NW	501+00.00	14.50 L	204	48-4020	4.9	C - 1	Y																							
STORM SEWER SUBTOTAL THIS SHEET										559	2	38	1	168	2	86	1	464	3							8	19.6	6.8	97.4	7	

GENERAL NOTES:

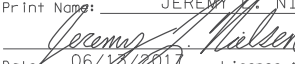

STA., OFFSETS, AND COORDINATES ARE GIVEN TO THE END OF APRON OR CENTER OF CASTING ASSEMBLY
 CASTING SUMP = 0.10 FT FOR CATCH BASIN CASTINGS EXCEPT C - 1 CASTINGS (SUMP = 0.17 FT), AND DROP INLET CASTINGS (SUMP = 0.20 FT). SUMP HAS BEEN INCLUDED IN TOP OF CASTING ELEVATIONS.
 ROTATE STRUCTURES SUCH THAT MAJORITY OF STRUCTURE IS BEHIND CURB LINE UNLESS DIRECTED BY THE ENGINEER OR ALTERNATE ROTATION IS REQUIRED TO AVOID CONFLICTS (SEE DRAINAGE DETAILS).
 SEE APPLICABLE MNDOT STANDARD PLATES FOR DETAILS OF DRAINAGE STRUCTURE DESIGN, EXCEPT AS NOTED BELOW.
 STRUCTURE DESIGN SD-48 SHALL BE CONSTRUCTED IN ACCORDANCE WITH MNDOT STD. PLATE 4024 WITH THE FOLLOWING EXCEPTIONS:
 STRUCTURE DIAMETER SHALL BE 48 IN. FOR SD-48 AND DEPTH SHALL BE AS REQUIRED IN THE DRAINAGE TABULATION
 WALL AND BASE SLAB THICKNESS AND ALL REINFORCEMENT SHALL BE IN ACCORDANCE WITH MNDOT STD. PLATE 4020.
 ALL DESIGN F STRUCTURES SHALL UTILIZE A TYPE B CONE.
 DES SP 1 (DESIGN SPECIAL 1) SHALL BE A 2 FT X 3 FT RECTANGULAR CATCH BASIN (SEE DRAINAGE DETAILS).
 SEE DRAINAGE DETAILS FOR DES SP 2 (DESIGN SPECIAL 2).
 CTRL STR (CONTROL STRUCTURES) ARE POND OUTLET CONTROL STRUCTURES. SEE DRAINAGE DETAILS.

SEE WATER RESOURCES NOTES FOR CASTING KEY AND SUMMARY TABULATION.

PAYMENT FOR CULVERT PIPES MADE UNDER ITEM 2503.

- (A) STRUCTURES WITH CASTING ASSEMBLY C - 1 AND FLAT TOP SLABS (XX-4020 OR SD-XX) SHALL HAVE 2 FT X 3 FT OPENING PER MNDOT STD. PLATE 4022 (INCIDENTAL). TOP SLAB THICKNESS AND REINFORCEMENT SHALL BE PER MNDOT STD. PLATE 4020.
- (B) STEPS REQUIRED WHEN DEPTH FROM TOP OF CASTING TO STRUCTURE INVERT IS GREATER THAN 4 FT.
- (C) TIE ALL JOINTS INSIDE OF CASING. TIED JOINTS SHALL BE INCIDENTAL. INVERT ELEVATIONS LISTED ARE FOR RCP. SEE MISCELLANEOUS DETAILS FOR ADDITIONAL REQUIREMENTS.
- (D) RIPRAP QUANTITY ASSUMES RIPRAP UTILIZED UNDER APRONS (INSTEAD OF GRANULAR FILTER) UNLESS NOTED OTHERWISE. GRANULAR FILTER MAY BE SUBSTITUTED FOR THE RIPRAP UNDER THE APRON PER MNDOT STANDARD PLATE 3133. IF GRANULAR FILTER IS SUBSTITUTED IT SHALL BE PAID FOR AS RIPRAP OF THE CLASS INDICATED AT THAT LOCATION. GEOTEXTILE FILTER SHALL BE TYPE IV AT ALL RIPRAP LOCATIONS.
- (E) BUILD OVER EXISTING PIPE OR CONNECT TO EXISTING PIPE. PIPE TO PIPE CONNECTIONS SHALL BE MADE AT AN EXISTING PIPE JOINT. FIELD VERIFY LOCATION AND ELEVATION.
- (F) TIE ALL JOINTS FOR CULVERTS AND LAST 3 JOINTS FOR STORM SEWER RUNS CONTAINING APRONS. TIED JOINTS SHALL BE INCIDENTAL.
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- (H) FURNISH AND INSTALL TRASH GUARD WITH APRON. SEE DRAINAGE DETAILS.
- (I) EXTEND CASING PIPE INTO STRUCTURE (SEE MISCELLANEOUS DETAILS). ADDITIONAL 6 INCHES INCLUDED IN PAY HEIGHT.
- (J) STRUCTURE LOCATION MAY BE SHIFTED PARALLEL TO WALL (5 FT MAX) TO COORDINATE WITH WALL PANEL JOINTS, WITH THE APPROVAL OF THE ENGINEER.
- (K) PLACE WATER QUALITY BAFFLES (DES SP 2) IN STRUCTURE. WATER QUALITY BAFFLE AND SKIMMER BAFFLE PAID FOR AS DESIGN SPECIAL 2. STRUCTURE AND CASTING PAID FOR SEPARATELY (PAY HEIGHT INCLUDES 6FT SUMP BELOW LOWEST PIPE INVERT). SEE DRAINAGE DETAILS AND SPECIAL PROVISIONS.
- (L) CONNECT INTO EXISTING DRAINAGE STRUCTURE. FIELD VERIFY LOCATION AND ELEVATION.
- (M) CONNECT TO EXISTING PIPE FOR TEMPORARY DRAINAGE. PAY HEIGHT INCLUDES EXTRA DEPTH REQUIRED FOR TEMPORARY CONNECTION. BULKHEAD TEMPORARY OPENING AND FILL INVERT WITH CONCRETE (3Y43) TO PERMANENT PIPE ELEVATION WHEN CONNECTION TO PERMANENT PIPE OCCURS. BULKHEADS, FILLING INVERT, AND CONNECTING TO PERMANENT PIPE SHALL BE CONSIDERED INCIDENTAL. FIELD VERIFY LOCATION AND ELEVATION.

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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: JEREMY M. NIELSEN  Date: 06/12/2017 License #: 45047				STATE AID PROJECT NO 002-678-023, 114-020-051 DRAWN BY S. VANG DESIGNED BY Z. THELEN CHECKED BY K. LACHOWITZER COMM. NO. 0169140		 ENGINEERS PLANNERS DESIGNERS		ANOKA COUNTY DRAINAGE TABULATION CSAH 78 - BNSF GRADE SEPARATION			SHEET 118 OF 175
NO DATE BY CKD APPR REVISION											

FLOWS FROM STR. OR APRON INLET POINT NO.	DRAINAGE TABULATION																								W			
	STRUCTURE LOCATION			FLOWS TO STR. OR APRON OUTLET POINT NO.	NEW STRUCTURE CONSTRUCTION				RC PIPE (DESIGN 3006)						STEEL CASING PIPE (C)						SOD		RIPRAP (D)			GUIDE POST TYPE B	NOTES	
	ALIGNMENT NAME	STATION	OFFSET FT		DESIGN	PAY HEIGHT LIN FT	CASTING ASSEMBLY TYPE (A)	STEPS REQ'D (B)	15" CLV		18" CLII		18" CLIII		18" CLIV		21" CLII		30"		TYPE LAWN	CLASS II	CLASS III	GEO TEXTILE FILTER				CLASS III
	POINT NO.							L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	L.F.	APR	SQ YD	CU YD	CU YD		SQ YD	EACH	
203A	108TH AVE NW	500+56.21	16.43 R	201A	DES SP 1	4.0	C - 1		30																			
204	108TH AVE NW	501+20.00	14.50 L	206	48-4020	5.0	C - 1	Y		170																		
205	108TH AVE NW	502+90.00	14.50 R	206	DES SP 1	4.0	C - 1		29																			
206	108TH AVE NW	502+90.00	14.00 L	207	54-4020	5.6	A - 7D	Y									117											
207	HANSON BLVD SERVICE RD 2	601+31.00	14.50 L	211	48-4020	4.9	C - 1	Y									126											
208	108TH LN NW	701+92.00	14.50 L	209	DES SP 1	4.0	C - 1		103																			
209	HANSON BLVD SERVICE RD 2	602+72.00	14.50 L	211	48-4020	4.2	C - 1		16																			
210	HANSON BLVD SERVICE RD 2	602+53.00	14.50 R	211	DES SP 1	4.0	C - 1		29																			
211	HANSON BLVD SERVICE RD 2	602+53.00	14.50 L	212	48-4020	4.8	C - 1	Y																				
212	HANSON BLVD SERVICE RD 2	602+53.37	33.71 L		APRON																	5.1		24.1	1 (F) (H)			
215	SB CSAH 78	221+39.00	19.00 L	216	H	3.7	B - 9		32																			
216	SB CSAH 78	221+39.00	13.25 R	218	F	5.0	C - 2	Y	13																			
217	NB CSAH 78	121+40.00	24.00 R	218	SD-48	4.2	B - 9		37										8						(I) (J)			
218	NB CSAH 78	121+40.00	13.25 L	222	F	7.7	C - 2	Y	146																			
219	SB CSAH 78	222+86.00	19.00 L	220	H	3.7	B - 9		32																			
220	SB CSAH 78	222+86.00	13.25 R	222	F	5.0	C - 2	Y	17																			
221	NB CSAH 78	122+86.00	24.00 R	222	H	3.7	B - 9		37																			
222	NB CSAH 78	122+86.00	13.25 L	223	F	5.6	C - 2	Y		36																		
223	NB CSAH 78	123+22.00	13.25 L	224	G	4.9	C - 2	Y		67																		
224	108TH LN NW	700+53.00	13.85 R	225	F	9.9	B - 9	Y						36														
225	108TH LN NW	700+74.14	50.51 R		APRON										1								4.6		22.4 1 (F)			
226	108TH LN NW	700+82.39	46.14 L	227	APRON									96	1										1 (F)			
227	108TH LN NW	701+09.38	58.61 R		APRON										1										1 (F)			
228	NB CSAH 78	122+01.77	79.01 R	229	APRON								24	1											1 (F)			
229	NB CSAH 78	122+36.34	89.66 R		APRON									1											1 (F)			
230	108TH LN NW	700+91.75	61.86 R	231	APRON																				1 (F)			
231	108TH LN NW	700+88.64	38.63 R	235	CTRL STR																		2.2					
233	SB CSAH 78	223+90.00	46.26 L	234	H	3.8	M - 11		27																			
234	SB CSAH 78	223+90.00	19.00 L	235	F	6.0	B - 9	Y	81																			
235	NB CSAH 78	123+90.00	19.00 R	236	F	9.3	B - 9	Y																				
236	NB CSAH 78	126+12.00	24.00 R	241	F	6.2	B - 5	Y			10																	
237	SB CSAH 78	226+12.00	19.00 L	238	H	3.7	B - 5		10																			
238	SB CSAH 78	226+22.00	19.00 L	240	G	4.0	B - 5	Y	32																(G)			
STORM SEWER SUBTOTAL THIS SHEET										671		324	3	222		248	3	256	1	8				11.9		46.5	4	

GENERAL NOTES:

STA., OFFSETS, AND COORDINATES ARE GIVEN TO THE END OF APRON OR CENTER OF CASTING ASSEMBLY CASTING SUMP = 0.10 FT FOR CATCH BASIN CASTINGS EXCEPT C - 1 CASTINGS (SUMP = 0.17 FT), AND DROP INLET CASTINGS (SUMP = 0.20 FT). SUMP HAS BEEN INCLUDED IN TOP OF CASTING ELEVATIONS. ROTATE STRUCTURES SUCH THAT MAJORITY OF STRUCTURE IS BEHIND CURB LINE UNLESS DIRECTED BY THE ENGINEER OR ALTERNATE ROTATION IS REQUIRED TO AVOID CONFLICTS (SEE DRAINAGE DETAILS).

SEE APPLICABLE MNDOT STANDARD PLATES FOR DETAILS OF DRAINAGE STRUCTURE DESIGN, EXCEPT AS NOTED BELOW. STRUCTURE DESIGN SD-48 SHALL BE CONSTRUCTED IN ACCORDANCE WITH MNDOT STD. PLATE 4024 WITH THE FOLLOWING EXCEPTIONS: STRUCTURE DIAMETER SHALL BE 48 IN. FOR SD-48 AND DEPTH SHALL BE AS REQUIRED IN THE DRAINAGE TABULATION WALL AND BASE SLAB THICKNESS AND ALL REINFORCEMENT SHALL BE IN ACCORDANCE WITH MNDOT STD. PLATE 4020. ALL DESIGN F STRUCTURES SHALL UTILIZE A TYPE B CONE. DES SP 1 (DESIGN SPECIAL 1) SHALL BE A 2 FT X 3 FT RECTANGULAR CATCH BASIN (SEE DRAINAGE DETAILS). SEE DRAINAGE DETAILS FOR DES SP 2 (DESIGN SPECIAL 2). CTRL STR (CONTROL STRUCTURES) ARE POND OUTLET CONTROL STRUCTURES. SEE DRAINAGE DETAILS.

SEE WATER RESOURCES NOTES FOR CASTING KEY AND SUMMARY TABULATION.

PAYMENT FOR CULVERT PIPES MADE UNDER ITEM 2503.

- (A) STRUCTURES WITH CASTING ASSEMBLY C - 1 AND FLAT TOP SLABS (XX-4020 OR SD-XX) SHALL HAVE 2 FT x 3 FT OPENING PER MNDOT STD. PLATE 4022 (INCIDENTAL). TOP SLAB THICKNESS AND REINFORCEMENT SHALL BE PER MNDOT STD. PLATE 4020.
- (B) STEPS REQUIRED WHEN DEPTH FROM TOP OF CASTING TO STRUCTURE INVERT IS GREATER THAN 4 FT.
- (C) TIE ALL JOINTS INSIDE OF CASING. TIED JOINTS SHALL BE INCIDENTAL. INVERT ELEVATIONS LISTED ARE FOR RCP. SEE MISCELLANEOUS DETAILS FOR ADDITIONAL REQUIREMENTS.
- (D) RIPRAP QUANTITY ASSUMES RIPRAP UTILIZED UNDER APRONS (INSTEAD OF GRANULAR FILTER) UNLESS NOTED OTHERWISE. GRANULAR FILTER MAY BE SUBSTITUTED FOR THE RIPRAP UNDER THE APRON PER MNDOT STANDARD PLATE 3133. IF GRANULAR FILTER IS SUBSTITUTED IT SHALL BE PAID FOR AS RIPRAP OF THE CLASS INDICATED AT THAT LOCATION. GEOTEXTILE FILTER SHALL BE TYPE IV AT ALL RIPRAP LOCATIONS.
- (E) BUILD OVER EXISTING PIPE OR CONNECT TO EXISTING PIPE. PIPE TO PIPE CONNECTIONS SHALL BE MADE AT AN EXISTING PIPE JOINT. FIELD VERIFY LOCATION AND ELEVATION.
- (F) TIE ALL JOINTS FOR CULVERTS AND LAST 3 JOINTS FOR STORM SEWER RUNS CONTAINING APRONS. TIED JOINTS SHALL BE INCIDENTAL.
- (G) INSULATE ALL CROSSINGS HAVING LESS THAN 2 FT OF CLEARANCE TO WATERMAIN OR 1 FT OF CLEARANCE TO SANITARY SEWER OR STORM SEWER WITH 8 FT x 8 FT x 4 IN POLYSTYRENE INSULATION.
- (H) FURNISH AND INSTALL TRASH GUARD WITH APRON. SEE DRAINAGE DETAILS.
- (I) EXTEND CASING PIPE INTO STRUCTURE (SEE MISCELLANEOUS DETAILS). ADDITIONAL 6 INCHES INCLUDED IN PAY HEIGHT.
- (J) STRUCTURE LOCATION MAY BE SHIFTED PARALLEL TO WALL (5 FT MAX) TO COORDINATE WITH WALL PANEL JOINTS, WITH THE APPROVAL OF THE ENGINEER.
- (K) PLACE WATER QUALITY BAFFLES (DES SP 2) IN STRUCTURE. WATER QUALITY BAFFLE AND SKIMMER BAFFLE PAID FOR AS DESIGN SPECIAL 2. STRUCTURE AND CASTING PAID FOR SEPARATELY (PAY HEIGHT INCLUDES 6FT SUMP BELOW LOWEST PIPE INVERT). SEE DRAINAGE DETAILS AND SPECIAL PROVISIONS.
- (L) CONNECT INTO EXISTING DRAINAGE STRUCTURE. FIELD VERIFY LOCATION AND ELEVATION.
- (M) CONNECT TO EXISTING PIPE FOR TEMPORARY DRAINAGE. PAY HEIGHT INCLUDES EXTRA DEPTH REQUIRED FOR TEMPORARY CONNECTION. BULKHEAD TEMPORARY OPENING AND FILL INVERT WITH CONCRETE (3Y43) TO PERMANENT PIPE ELEVATION WHEN CONNECTION TO PERMANENT PIPE OCCURS. BULKHEADS, FILLING INVERT, AND CONNECTING TO PERMANENT PIPE SHALL BE CONSIDERED INCIDENTAL. FIELD VERIFY LOCATION AND ELEVATION.

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: JEREMY A. NIELSEN

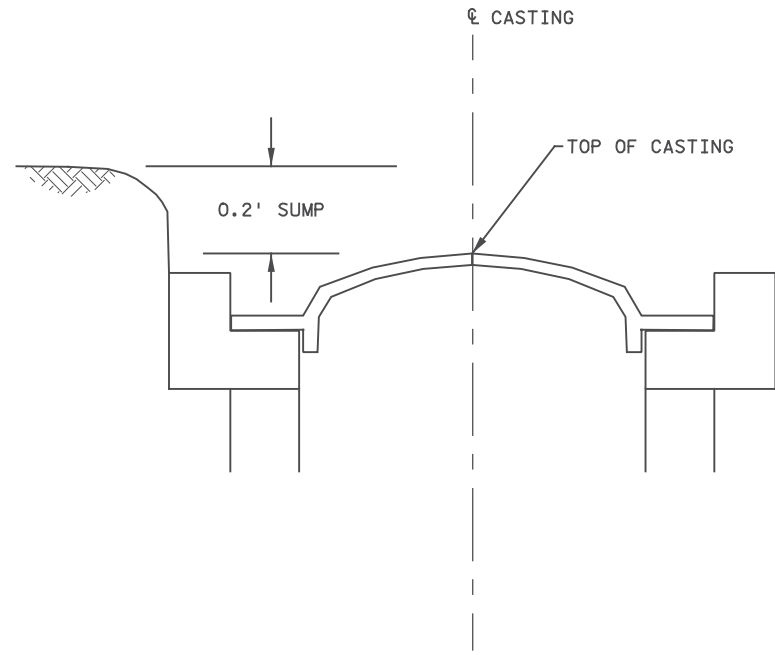
Date: 06/17/2011 License #: 45047

STATE AID PROJECT NO. 002-678-023, 114-020-051

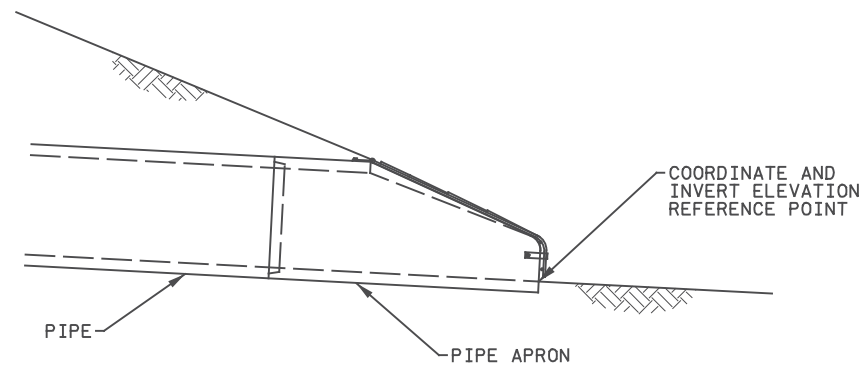
DRAWN BY S. VANG
DESIGNED BY Z. THELEN
CHECKED BY K. LACHOWITZER
COMM. NO. 0169140



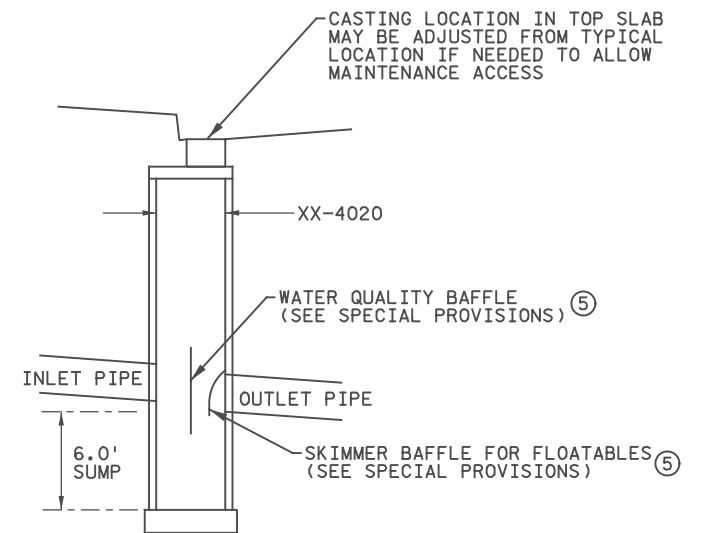
ANOKA COUNTY
DRAINAGE TABULATION
CSAH 78 - BNSF GRADE SEPARATION



STAKING DETAIL: CASTING ASSEMBLY M-11
NOT TO SCALE

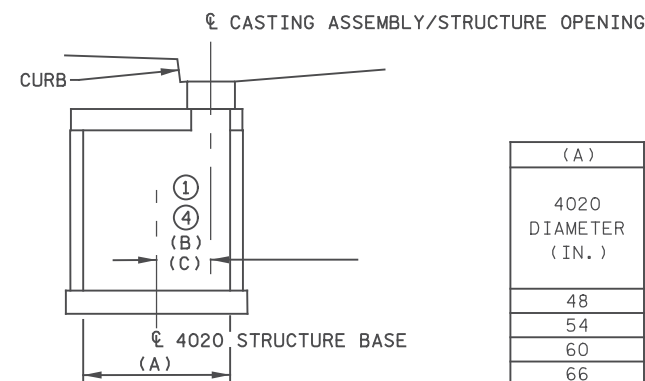


STAKING DETAIL: PIPE APRONS
NOT TO SCALE



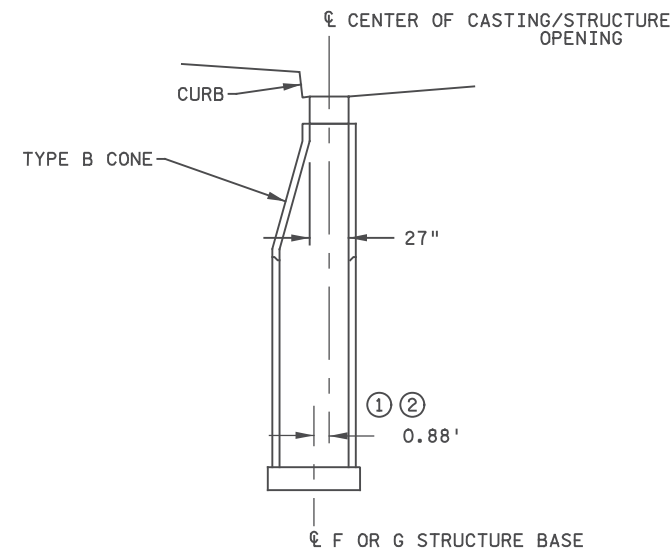
NOTES:
⑤ WATER QUALITY BAFFLE AND SKIMMER BAFFLE SHALL BE PAID FOR AS CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 2. DRAINAGE STRUCTURE, CASTING AND PIPE SHALL BE PAID FOR UNDER OTHER ITEMS. SEE SPECIAL PROVISIONS.

DESIGN SPECIAL 2: WATER QUALITY BAFFLES
NOT TO SCALE



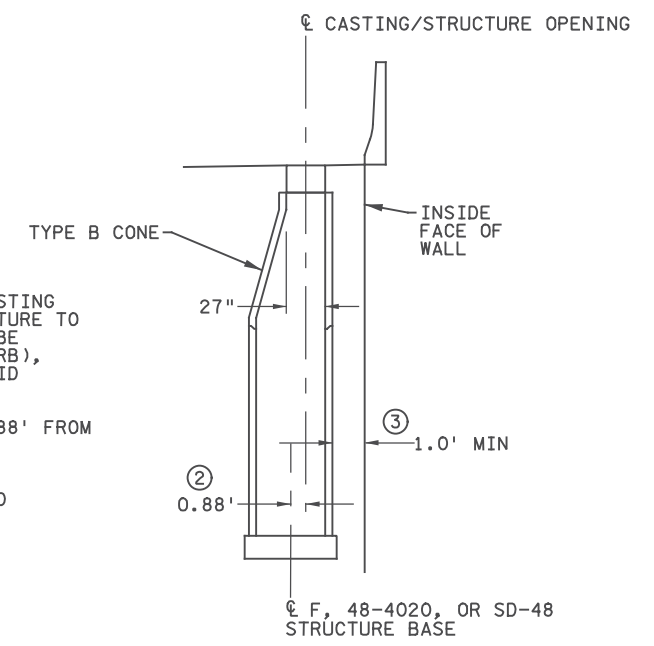
(A)	(B)	(C)
4020 DIAMETER (IN.)	OFFSET FOR 27-IN. OPENING (FT.)	OFFSET FOR 24-IN. x 36-IN. OPENING (FT.)
48	0.79	0.25
54	1.08	0.54
60	1.29	0.83
66	1.58	1.13
72	1.79	1.42
78	2.08	1.71
84	2.29	2.00
90	2.58	2.29
96	2.87	2.58
102	3.16	2.88
108	3.29	3.08
120	3.79	3.67

STAKING DETAIL: DESIGN XX-4020 OR SD-XX STRUCTURE
NOT TO SCALE



STAKING DETAIL: F OR G STRUCTURE AT CURB AND GUTTER
NOT TO SCALE

NOTES:
① IN TYPICAL LOCATIONS WHERE CASTING IS IN CURB LINE, ROTATE STRUCTURE TO ALLOW AS MUCH AS POSSIBLE TO BE OUTSIDE OF ROADWAY (BEHIND CURB), OR ROTATE AS NECESSARY TO AVOID CONFLICTS.
② LOCATE CENTER OF STRUCTURE 0.88' FROM CENTER OF STRUCTURE OPENING.
③ ROTATE STRUCTURE TO MAXIMIZE DISTANCE BETWEEN STRUCTURE AND RETAINING WALL.
④ LOCATE CENTER OF STRUCTURE OFFSET FROM CENTER OF STRUCTURE OPENING BY DISTANCE INDICATED IN TABLE.



STAKING DETAIL: F, 48-4020, OR SD-48 STRUCTURE AT RETAINING WALLS
NOT TO SCALE

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Print Name: JEREMY NIELSEN

Jeremy Nielsen

Date: 06/18/2017 License #: 45047

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG

DESIGNED BY Z. THELEN

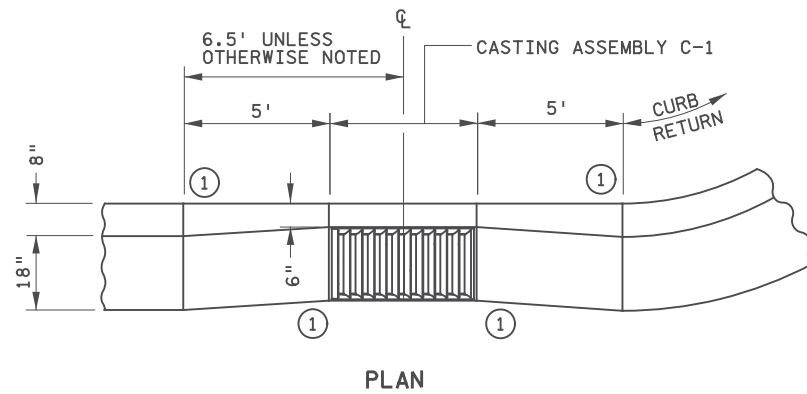
CHECKED BY K. LACHOWITZER

COMM. NO. 0169140



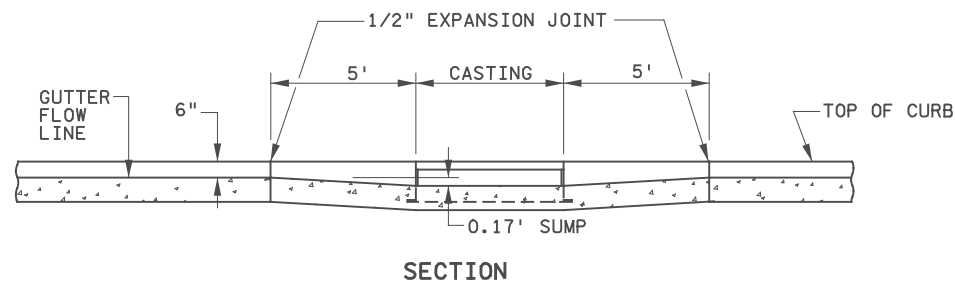
ANOKA COUNTY
DRAINAGE DETAILS
CSAH 78 - BNSF GRADE SEPARATION
STAKING DETAILS/DESIGN SPECIAL 2

SHEET 121 OF 175

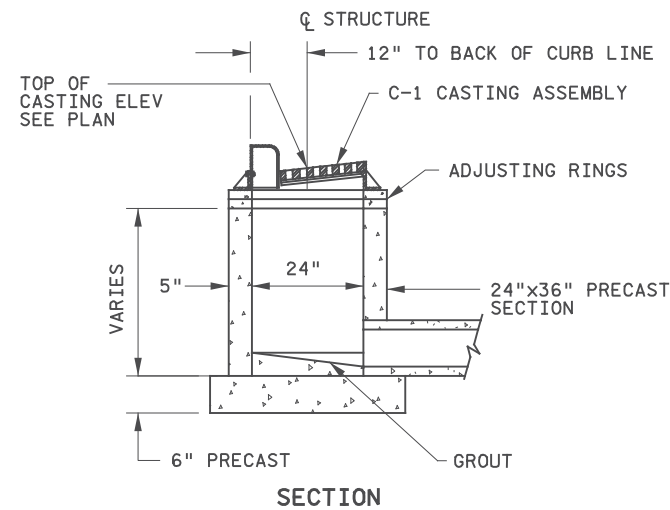
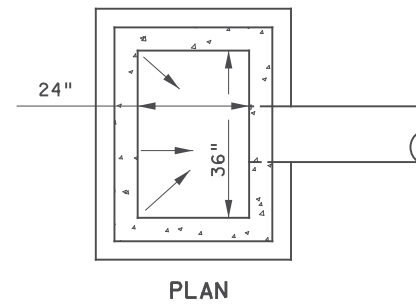


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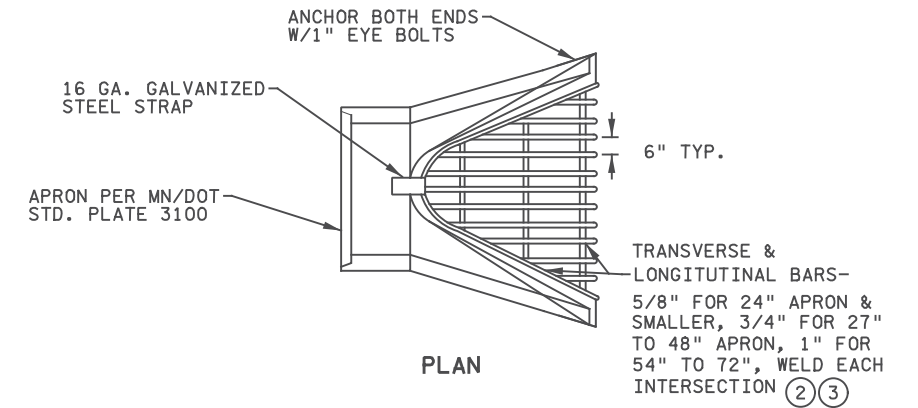
- ① TAPER CONC. CURB & GUTTER TO MATCH CASTING.



C-1 CASTING INSTALLATION FOR B618 C&G
NOT TO SCALE

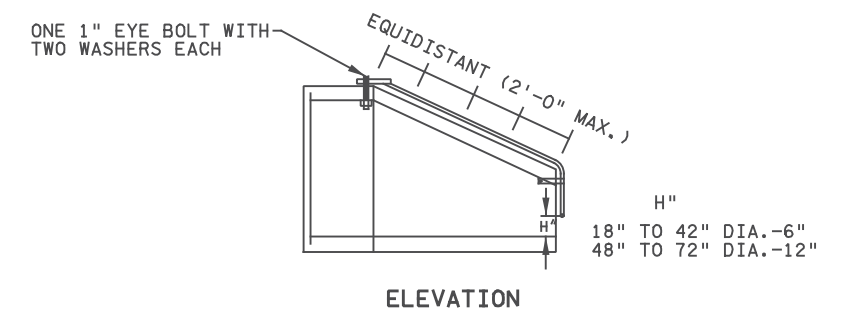


DRAINAGE STRUCTURE - DESIGN SPECIAL 1
NOT TO SCALE



NOTES:

- ② ENTIRE HEAVY DUTY TRASH GUARD ASSEMBLY TO BE HOT-DIP GALVANIZED AFTER FABRICATION.
- ③ SIZE OF TRASH GUARD VARIABLE DEPENDENT ON SIZE OF FLARED END SECTION.



TRASH GUARD FOR CONCRETE APRON ②③
NOT TO SCALE

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 Print Name: JEREMY NIELSEN
Jeremy Nielsen
 Date: 06/18/2017 License # 45047

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG
 DESIGNED BY
Z. THELEN
 CHECKED BY
K. LACHOWITZER
 COMM. NO. 0169140

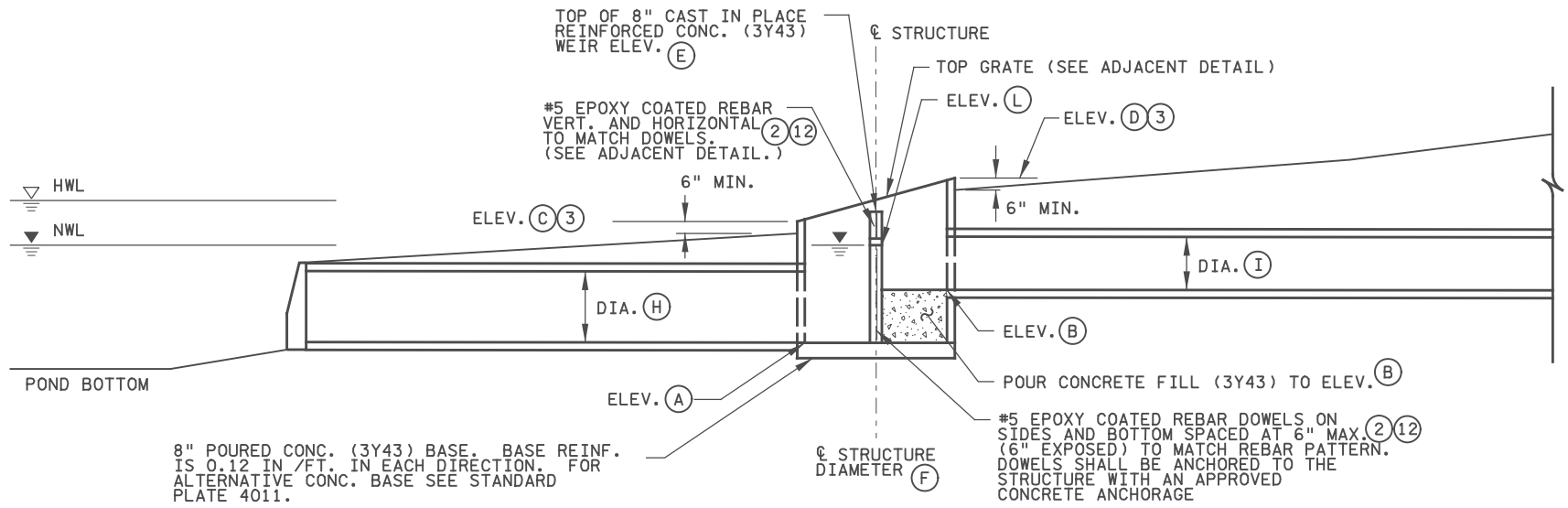


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DESIGNERS

ANOKA COUNTY
DRAINAGE DETAILS
CSAH 78 - BNSF GRADE SEPARATION
DES SP 1/CB INSTALLATION/TRASH GUARD

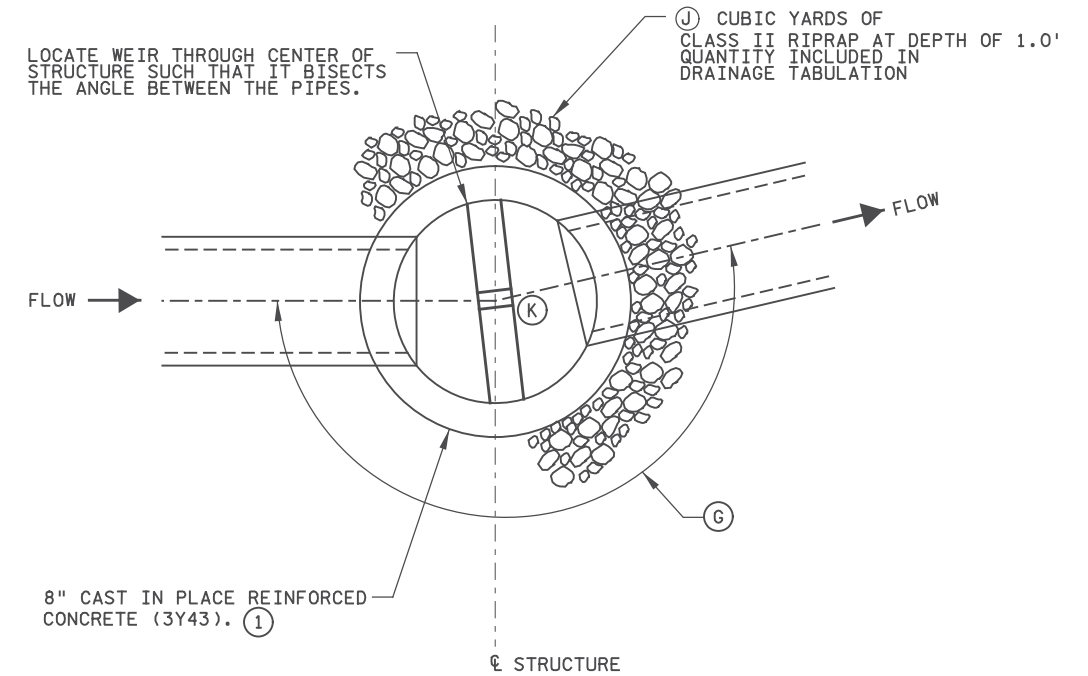
SHEET
122
OF
175

STRUCTURE	POND	NWL	BOTTOM	HWL	ELEV. (A)	ELEV. (B)	ELEV. (C)	ELEV. (D)	ELEV. (E)	DIA. (IN) (F)	ANGLE (DEG) (G)	DIA. (IN) (H)	DIA. (IN) (I)	VOL. (CY) (J)	ORIFICE DIA. (IN) (K)	ORIFICE ELEV. (L)	NOTES
151	106TH WET POND	861.0	857.0	865.6	858.23	860.48	864.00	866.00	861.80	72	190	24	24	2.2	6	(14) 861.00	
161	107TH INFILTRATION BASIN	NA	860.0	865.7	860.12	860.60	864.50	866.50	862.55	72	256	24	24	2.2	6	(14) 860.00	(13)
231	SERVICE ROAD WET POND	860.0	856.0	862.6	857.23	860.00	863.00	865.00	862.00	72	209	18	18	2.2	6 & 6	(14) 860.00 & 861.00	



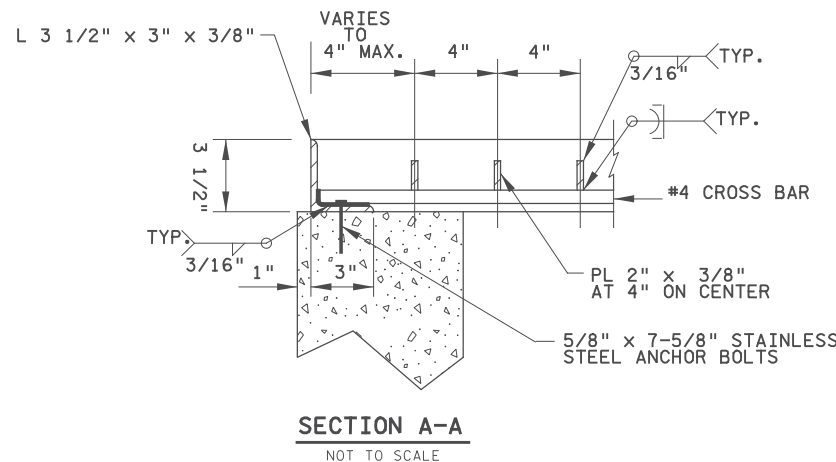
5 POND OUTLET STRUCTURE - CONSTRUCT CONTROL STRUCTURES

NOT TO SCALE



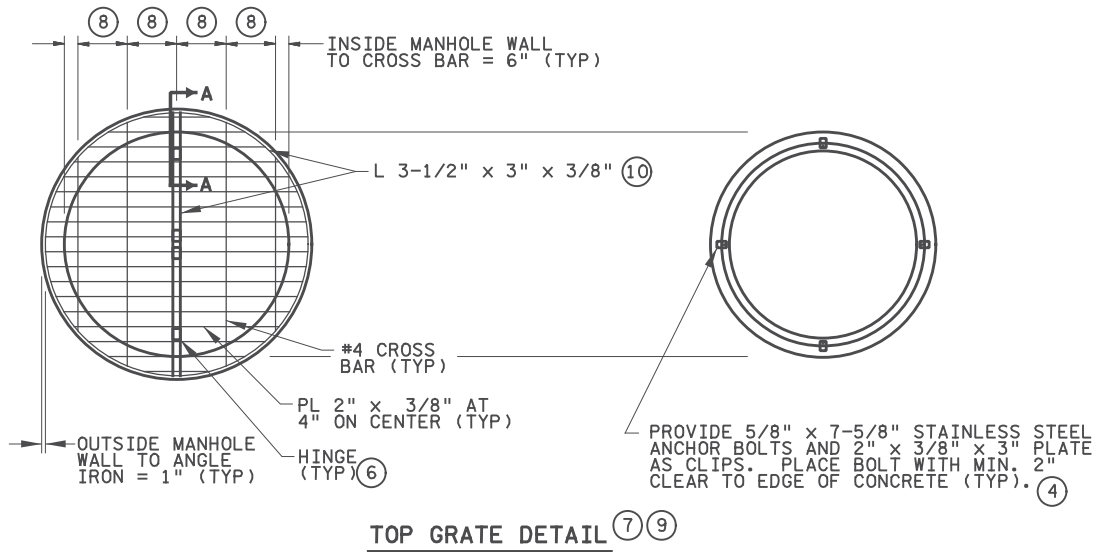
OUTLET STRUCTURE PLAN VIEW AND RIPRAP DETAIL

NOT TO SCALE



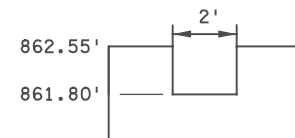
SECTION A-A

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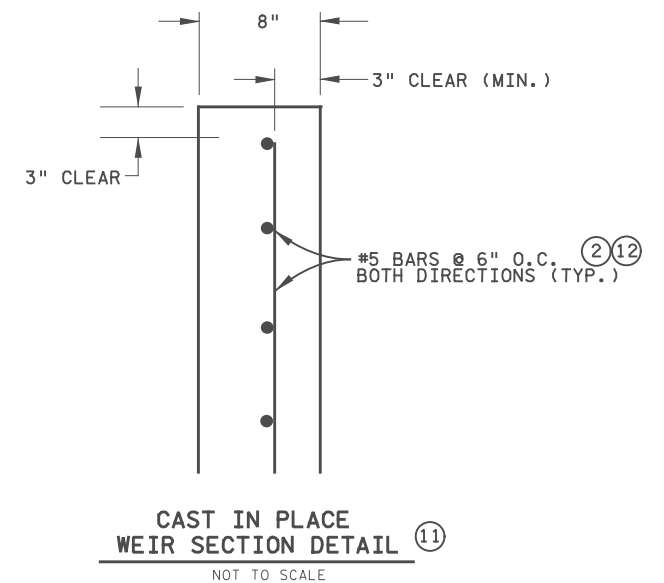
TOP GRATE DETAIL

NOT TO SCALE



SLOTTED WEIR SECTION

NOT TO SCALE



CAST IN PLACE WEIR SECTION DETAIL

NOT TO SCALE

NOTES:

- WALL CONSTRUCTION MAY BE CLASS II PRECAST RC PIPE. SEE STANDARD PLATE 3000.
- ALL REBAR SIZES ARE ENGLISH UNLESS OTHERWISE NOTED.
- ELEVATION (C) OCCURS IN LINE WITH THE CENTERLINE OF PIPE (H). ELEVATION (D) OCCURS DIRECTLY ACROSS STRUCTURE FROM (C). ELEVATIONS (C) AND (D) ARE AT INSIDE EDGE OF MANHOLE.
- BOLTS AND NUTS SHALL MEET THE REQUIREMENTS OF A.S.T.M. A307. MATERIALS FOR BASE PLATES AND ANCHOR BOLTS ASSEMBLIES SHALL CONFORM TO STRUCTURAL STEEL (WELDABLE A36).
- PAYMENT FOR DRAINAGE DESIGN SPECIAL 2 PER EACH WILL INCLUDE ALL MATERIALS, DETAILS AND WORK REQUIRED TO CONSTRUCT THE DRAINAGE STRUCTURE AS DETAILED ON THIS SHEET, EXCEPT THE RC PIPE, APRON AND RIPRAP, WHICH WILL BE PAID FOR SEPARATELY.
- GRATE SHALL BE CONSTRUCTED IN TWO PIECES, WITH MINIMUM OF THREE HINGES TO PROVIDE ACCESS.
- HOT DIP GALVANIZE GRATES AFTER FABRICATION.

- 12" MAX., 8" MIN. SPACING BETWEEN CROSS BARS. CROSS BARS MUST BE EVENLY SPACED AND MUST ALLOW FOR PLACEMENT OF HINGES AT CENTER OF GRATE.
- CONTRACTOR TO PROVIDE GRATE AS SHOWN OR ENGINEER PRE-APPROVED EQUAL.
- ANGLE AROUND CIRCUMFERENCE MAY BE FABRICATED FROM FLAT BARS RESULTING IN EQUIVALENT SIZE.
- WEIR MUST BE CAST IN PLACE. PRE-CAST WEIR WILL NOT BE ALLOWED AS AN ALTERNATE.
- ADJUST REBAR LOCATIONS AT ORIFICE.
- SEE SLOTTED WEIR SECTION.
- PLACE THREADED CAP AT NWL ELEVATION FOR WET PONDS OR OUTLET PIPE ELEVATION FOR INFILTRATION BASINS. PLACE CAP AFTER TURF HAS BEEN ESTABLISHED IN UPSTREAM INFILTRATION BASIN.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: JEREMY NIELSEN
 Date: 06/12/2017 License #: 45047

STATE AID PROJECT NO. 002-678-023, 114-020-051
 DRAWN BY S. VANG
 DESIGNED BY Z. THELEN
 CHECKED BY K. LACHOWITZER
 COMM. NO. 0169140

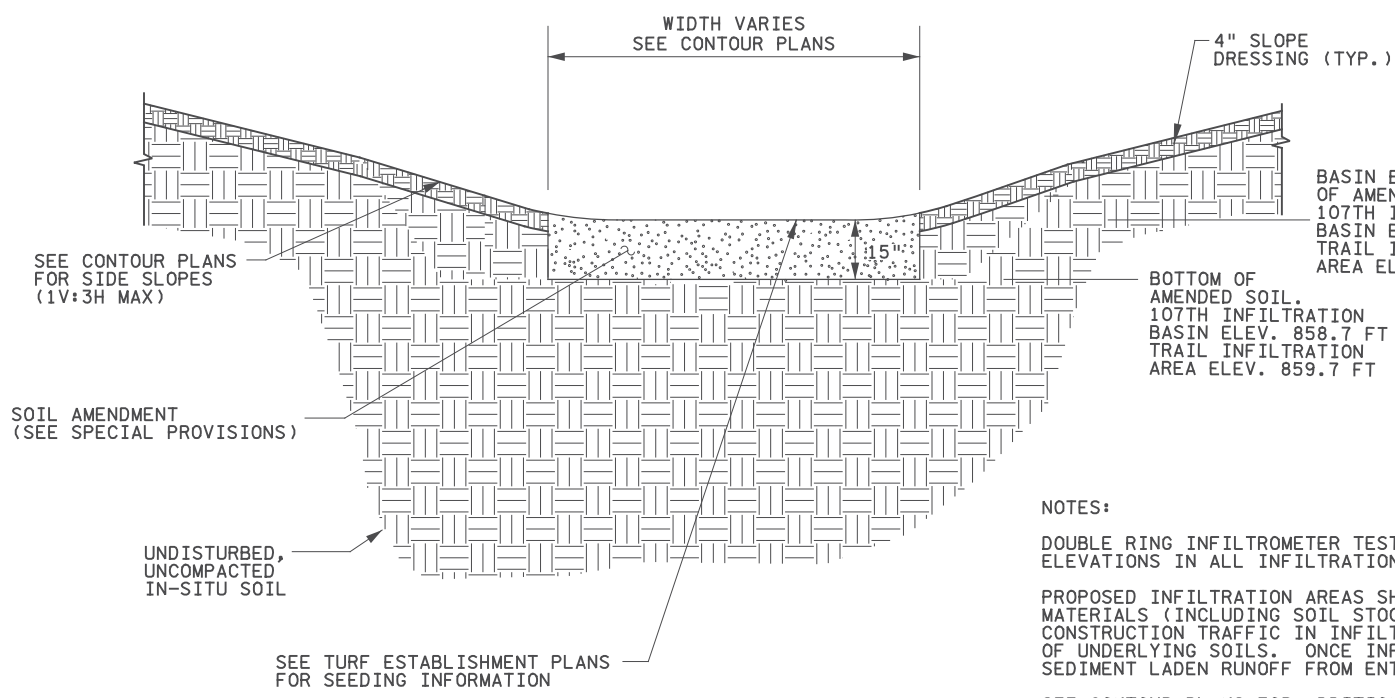


ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 DRAINAGE DETAILS
 CSAH 78 - BNSF GRADE SEPARATION
 OUTLET CONTROL STRUCTURES

SHEET
 123
 OF
 175

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SEE CONTOUR PLANS FOR SIDE SLOPES (1V:3H MAX)

SOIL AMENDMENT (SEE SPECIAL PROVISIONS)

UNDISTURBED, UNCOMPACTED IN-SITU SOIL

SEE TURF ESTABLISHMENT PLANS FOR SEEDING INFORMATION

BASIN BOTTOM / TOP OF AMENDED SOIL. 107TH INFILTRATION BASIN ELEV. 860.0 FT TRAIL INFILTRATION AREA ELEV. 861.0 FT

BOTTOM OF AMENDED SOIL. 107TH INFILTRATION BASIN ELEV. 858.7 FT TRAIL INFILTRATION AREA ELEV. 859.7 FT

FILTER TOPSOIL BORROW (70% SAND, 30% COMPOST, SEE SPECIAL PROVISIONS)

1V: 3H MAX SIDE SLOPE

1V: 1H SLOPE (TYPICAL OF ALL SIDES)

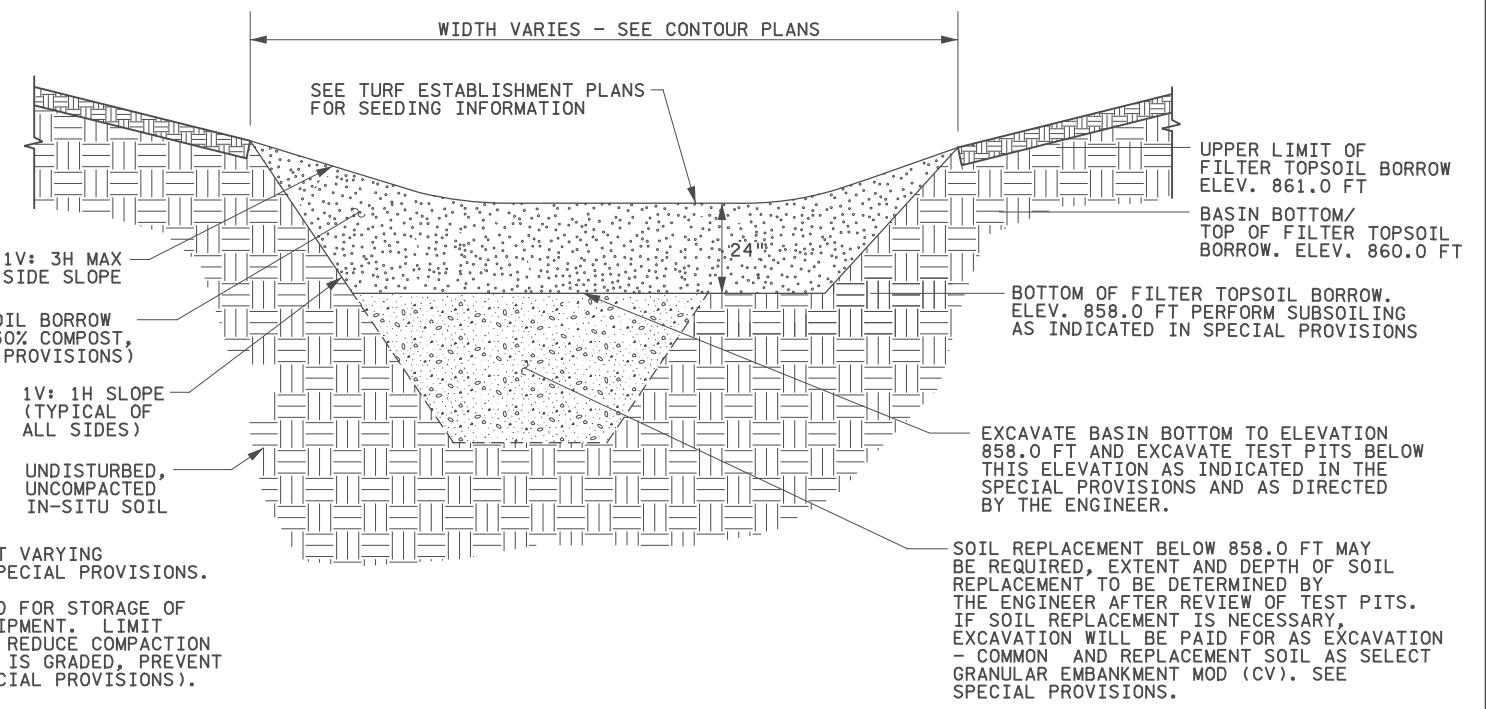
UNDISTURBED, UNCOMPACTED IN-SITU SOIL

NOTES:

DOUBLE RING INFILTRMETER TESTING REQUIRED AT VARYING ELEVATIONS IN ALL INFILTRATION BASINS. SEE SPECIAL PROVISIONS.
 PROPOSED INFILTRATION AREAS SHALL NOT BE USED FOR STORAGE OF MATERIALS (INCLUDING SOIL STOCKPILES) OR EQUIPMENT. LIMIT CONSTRUCTION TRAFFIC IN INFILTRATION AREA TO REDUCE COMPACTION OF UNDERLYING SOILS. ONCE INFILTRATION AREA IS GRADED, PREVENT SEDIMENT LADEN RUNOFF FROM ENTERING (SEE SPECIAL PROVISIONS).
 SEE CONTOUR PLANS FOR ADDITIONAL INFORMATION.

107TH INFILTRATION BASIN & TRAIL INFILTRATION AREA SOIL AMENDMENT TYPICAL SECTION

NOT TO SCALE



SEE TURF ESTABLISHMENT PLANS FOR SEEDING INFORMATION

UPPER LIMIT OF FILTER TOPSOIL BORROW ELEV. 861.0 FT

BASIN BOTTOM / TOP OF FILTER TOPSOIL BORROW. ELEV. 860.0 FT

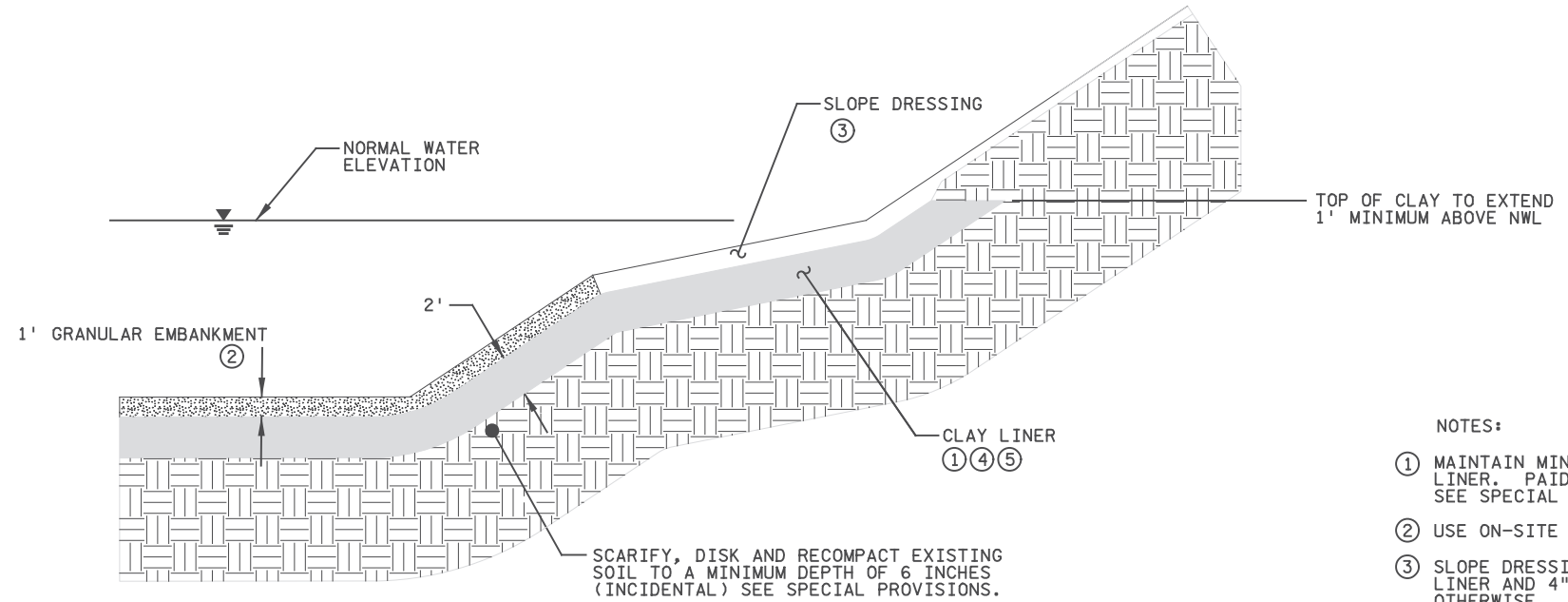
BOTTOM OF FILTER TOPSOIL BORROW. ELEV. 858.0 FT PERFORM SUBSOILING AS INDICATED IN SPECIAL PROVISIONS

EXCAVATE BASIN BOTTOM TO ELEVATION 858.0 FT AND EXCAVATE TEST PITS BELOW THIS ELEVATION AS INDICATED IN THE SPECIAL PROVISIONS AND AS DIRECTED BY THE ENGINEER.

SOIL REPLACEMENT BELOW 858.0 FT MAY BE REQUIRED, EXTENT AND DEPTH OF SOIL REPLACEMENT TO BE DETERMINED BY THE ENGINEER AFTER REVIEW OF TEST PITS. IF SOIL REPLACEMENT IS NECESSARY, EXCAVATION WILL BE PAID FOR AS EXCAVATION - COMMON AND REPLACEMENT SOIL AS SELECT GRANULAR EMBANKMENT MOD (CV). SEE SPECIAL PROVISIONS.

SERVICE ROAD INFILTRATION BASIN & 108TH INFILTRATION BASIN SOIL REPLACEMENT TYPICAL SECTION

NOT TO SCALE



NOTES:

- ① MAINTAIN MINIMUM 2.0 FT THICKNESS OF CLAY FOR POND LINER. PAID FOR AS 2105 COMMON BORROW SPECIAL (CV). SEE SPECIAL PROVISIONS.
- ② USE ON-SITE GRANULAR MATERIAL AS DIRECTED BY ENGINEER
- ③ SLOPE DRESSING THICKNESS SHALL BE 1' WHEN PLACED OVER CLAY LINER AND 4" WHEN PLACED IN ADJACENT AREAS UNLESS NOTED OTHERWISE.
- ④ LINER SHALL BE CONSTRUCTED IN A CONTINUOUS OPERATION WITH NO JOINTS, INCLUDING THE AREA UNDER PIPE APRONS.
- ⑤ AT APRON ENDS WHERE RIPRAP IS REQUIRED, GRANULAR FILTER / RIPRAP UNDER APRON MAY BE OMITTED. 2 FT. MINIMUM THICKNESS OF CLAY MUST BE MAINTAINED UNDER / AROUND APRONS UP TO THE ELEVATION INDICATED.

CLAY LINER - POND SOIL PROFILE

NOT TO SCALE

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 Print Name: JEREMY NIELSEN
 Date: 06/17/2011 License #: 45047

STATE AID PROJECT NO 002-678-023, 114-020-051
 DRAWN BY S. VANG
 DESIGNED BY Z. THELEN
 CHECKED BY K. LACHOWITZER
 COMM. NO. 0169140



ANOKA COUNTY
 DRAINAGE DETAILS
 CSAH 78 - BNSF GRADE SEPARATION
 CLAY LINER / INFILTRATION BASINS

SHEET 124 OF 175

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE (SHEET 1 OF 3)

PROJECT DESCRIPTION/LOCATION AND SCOPE

SEE COVER SHEET FOR LOCATION MAP, PROJECT NUMBERS AND DESCRIPTION OF PROJECT SCOPE. PERMANENT STORMWATER BEST MANAGEMENT PRACTICES (BMPs) UTILIZED ON THE PROJECT INCLUDE WET SEDIMENTATION BASINS, INFILTRATION BASINS AND SUMP MANHOLES.

SPECIAL AND IMPAIRED WATERS

THE FOLLOWING SPECIAL/IMPAIRED WATERS ARE LOCATED WITHIN ONE MILE OF THE PROJECT LIMITS AND RECEIVE RUNOFF FROM THE PROJECT SITE.

COON CREEK IS IMPAIRED FOR AQUATIC MACROINVERTEBRATE BIOASSESSMENTS (CONSTRUCTION RELATED PARAMETER) AND HAS AN APPROVED TMDL.

THE MISSISSIPPI RIVER IS IMPAIRED FOR MERCURY AND PCB IN FISH TISSUE. THESE INPAIRMENTS ARE NON-CONSTRUCTION RELATED.

ENVIRONMENTALLY SENSITIVE AREAS

THERE ARE NO KNOWN ENVIRONMENTALLY SENSITIVE AREAS ADJACENT TO THE PROJECT SITE. IF ANY ARE ENCOUNTERED DURING CONSTRUCTION, THEY WILL BE TREATED AS SUCH.

LONG TERM MAINTENANCE AND OPERATION

MAINTENANCE STAFF FROM ANOKA COUNTY AND THE CITY OF COON RAPIDS ARE RESPONSIBLE FOR THE LONG TERM MAINTENANCE AND OPERATION OF THE PERMANENT STORMWATER SYSTEMS DIVIDED ACCORDING TO THE OWNERSHIP OF THE RIGHT OF WAY (ALL BMPs WILL BE MAINTAINED BY THE CITY OF COON RAPIDS). ANOKA COUNTY AND THE CITY OF COON RAPIDS EACH HAVE AN MS4 SWPPP THAT IS AVAILABLE ONLINE OR UPON REQUEST.

SWPPP DEVELOPMENT AND MAINTENANCE

THIS SWPPP WAS PREPARED BY PERSONNEL WHO ARE CERTIFIED IN THE DESIGN OF CONSTRUCTION SWPPPS. COPIES OF THE CERTIFICATIONS ARE AVAILABLE UPON REQUEST.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A CERTIFIED EROSION AND SEDIMENT CONTROL SUPERVISOR WHO SHALL BE RESPONSIBLE FOR FINALIZING, CERTIFYING, AND MAINTAINING THE SWPPP DOCUMENT AND OVERSEEING THE IMPLEMENTATION OF THE SWPPP. SEE PAGE 2 OF THE SWPPP NARRATIVE FOR ADDITIONAL REQUIREMENTS.

SWPPP AMENDMENTS

THE SWPPP SHALL BE AMENDED WHEN:

- A. THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE, WEATHER OR SEASON HAVING A SIGNIFICANT EFFECT ON DISCHARGE OF POLLUTANTS.
 - B. INSPECTIONS INDICATE THE SWPPP IS NOT EFFECTIVE.
 - C. A WATER QUALITY STANDARD CHANGES AND THE MPCA DETERMINES THE SWPPP SHALL BE AMENDED TO COMPLY.
- A DESCRIPTION OF ANY CHANGE TO THE SWPPP, ALONG WITH THE DATE AND NAME OF THE REVISION SHALL BE RECORDED AND INCLUDED WITH THE SWPPP AND RETAINED ON SITE. THE OWNER SHALL RETAIN ALL RECORDS AFTER COMPLETION OF THE PROJECT.

SITE PLANS

THE CONTRACTOR SHALL PREPARE AND SUBMIT A SITE MANAGEMENT PLAN FOR CONCRETE MANAGEMENT, CONCRETE SLURRY APPLICATION AREAS, WORK IN AND NEAR AREAS OF ENVIRONMENTAL SENSITIVITY, DEWATERING AREAS, AREAS IDENTIFIED AS "SITE MANAGEMENT PLAN AREAS" AND AS REQUESTED BY THE PROJECT ENGINEER. SUBMIT ALL SITE MANAGEMENT PLANS IN WRITING AND ALLOW A MINIMUM OF 7 DAYS FOR REVIEW BY THE PROJECT ENGINEER. WORK SHALL NOT BE ALLOWED TO COMMENCE IF A SITE MANAGEMENT PLAN IS REQUIRED UNTIL ACCEPTANCE HAS BEEN GRANTED BY THE PROJECT ENGINEER.

ENVIRONMENTAL REVIEW

THE REQUIREMENTS OF COON CREEK WATERSHED DISTRICT AND THE CITY OF COON RAPIDS ARE SATISFIED BY THE PERMANENT BMPs LISTED ABOVE AND THE TEMPORARY MEASURES INCLUDED. THERE ARE NO ADDITIONAL STORMWATER MITIGATION MEASURES REQUIRED AS A RESULT OF AN ENVIRONMENTAL, ARCHAEOLOGICAL OR AGENCY REVIEW.

DRINKING WATER SOURCE MANAGEMENT AREA (DWSMA) AND KARST REGIONS

THE PROJECT IS IN A MODERATELY VULNERABLE DWSMA BUT IS OUTSIDE THE EMERGENCY RESPONSE AREA. PER THE CITY OF COON RAPIDS AND THE COON CREEK WATERSHED DISTRICT INFILTRATION IS PERMISSIBLE IF RUNOFF IS PRETREATED.

SOIL TYPES

SOIL TYPES ENCOUNTERED IMMEDIATELY BENEATH THE TOPSOIL OR ROADWAY SECTIONS CAN PREDOMINANTLY BE CHARACTERIZED AS LOAMY SAND.

LAND FEATURE CHANGES

TOTAL DISTURBED AREA: 13.7 ACRES
 TOTAL EXISTING IMPERVIOUS SURFACE AREA: 8.1 ACRES
 TOTAL PROPOSED IMPERVIOUS SURFACE AREA: 8.3 ACRES
 TOTAL PROPOSED NET CHANGE IN IMPERVIOUS SURFACE AREA: 0.2 ACRES

PROJECT CONTACTS

THE OWNER AND CONTRACTOR ARE RESPONSIBLE FOR THE IMPLEMENTATION OF THE SWPPP AND INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs BEFORE, DURING AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION HAS BEEN FILED.

ORGANIZATION	CONTACT NAME	PHONE
CITY OF COON RAPIDS	MARK HANSEN	763-767-6465
ANOKA COUNTY	JASON ORCUTT	763-862-4258
MINNESOTA POLLUTION CONTROL AGENCY	BRANDON DAHL	651-757-2279
COON CREEK WATERSHED DISTRICT	TIM KELLY	763-755-0975
SRF WATER RESOURCES	JEREMY NIELSEN	763-475-0010

MPCA DUTY OFFICER 24 HOUR EMERGENCY NOTIFICATION: 651-649-5451
 800-422-0798

LOCATION OF SWPPP REQUIREMENTS

THE REQUIRED SWPPP ELEMENTS MAY BE LOCATED IN MANY PLACES WITHIN THE PLAN SET AS WELL AS IN THE SPECIAL PROVISIONS, MNDOT SPEC BOOK (2016 EDITION), CONSTRUCTION DIARIES OR ON FILE WITH THE PROJECT OWNER. THE NOTES AND TABLE BELOW ARE INTENDED TO BE A QUICK REFERENCE FOR THE CONTRACTOR AND PROJECT ENGINEER TO USE IN THE FIELD. THERE MAY BE ADDITIONAL REQUIRED SWPPP ELEMENTS INCLUDED ON THE PROJECT THAT ARE NOT LISTED ON THIS SHEET. IN ADDITION, THE MINNESOTA NPDES/SDS CONSTRUCTION STORMWATER PERMIT SHOULD BE REVIEWED AND CONSULTED BY THE EROSION AND SEDIMENT CONTROL SUPERVISOR.

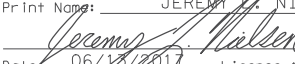

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

DESCRIPTION	LOCATION
TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND STAGING	SHEET NOS. 71 TO 81
PERMANENT EROSION AND SEDIMENT CONTROL MEASURES	SHEET NOS. 128 TO 130
DIRECTION OF FLOW	SHEET NOS. 109 TO 111
FINAL STABILIZATION	SHEET NOS. 128 TO 130
SOILS AND CONSTRUCTION NOTES	SHEET NOS. 9
DRAINAGE STRUCTURES	SHEET NOS. 109 TO 111
DRAINAGE TABULATION	SHEET NOS. 117 TO 120
STORM SEWER PROFILE SHEETS	SHEET NOS. 112 TO 116
STORM SEWER TABULATION	SHEET NOS. 117 TO 120
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EROSION CONTROL TABULATION	SHEET NOS. 27
TURF ESTABLISHMENT TABULATION	SHEET NOS. 27
STATEMENT OF ESTIMATED QUANTITIES	SHEET NOS. 3 TO 5
WATER RESOURCES NOTES	SHEET NOS. 108

SITE MAPS AND DESIGN CALCULATIONS

IN ADDITION TO WHAT IS LOCATED WITHIN THIS PLAN, SITE MAPS AND BMP DESIGN CALCULATIONS ARE AVAILABLE UPON REQUEST. PLEASE CONTACT THE PROJECT ENGINEER WITH ANY QUESTIONS REGARDING THE SITE MAPS OR CALCULATIONS.

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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: JEREMY NIELSEN  Date: 06/18/2017 License #: 45047					STATE AID PROJECT NO 002-678-023, 114-020-051	DRAWN BY S. VANG DESIGNED BY Z. THELEN CHECKED BY K. LACHOWITZER COMM. NO. 0169140	 ENGINEERS PLANNERS DESIGNERS	ANOKA COUNTY STORM WATER POLLUTION PREVENTION PLAN CSAH 78 - BNSF GRADE SEPARATION	SHEET 125 OF 175	
NO	DATE	BY	CKD	APPR	REVISION					
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STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE (SHEET 2 OF 3)

GENERAL SWPPP NOTES FOR CONSTRUCTION ACTIVITY

1. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION STORMWATER PERMIT AT ALL TIMES UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA (FORM IS AVAILABLE FROM MPCA WEBSITE). THE CONTRACTOR SHALL DEVELOP A CHAIN OF COMMAND WITH ALL OPERATORS ON THE SITE TO ENSURE THAT THE SWPPP SHALL BE IMPLEMENTED AND STAY IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE, THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION, AND THE NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED TO THE MPCA.
2. THE CONTRACTOR SHALL PREPARE A WRITTEN, NOT ORAL, WEEKLY SCHEDULE OF PROPOSED EROSION CONTROL ACTIVITIES FOR THE PROJECT ENGINEER'S APPROVAL AS PER MNDOT SPEC. 1717.2C.
3. BURNING OF ANY MATERIAL IS NOT ALLOWED WITHIN PROJECT BOUNDARY.
4. THE CONTRACTOR SHALL PLACE STABILIZED CONSTRUCTION EXITS, AS NECESSARY, TO PREVENT TRACKING OF SEDIMENT ONTO PAVED SURFACES AND IN COMPLIANCE WITH PART IV.C. OF THE NPDES PERMIT. STABILIZED CONSTRUCTION EXITS SHALL BE SUFFICIENTLY SIZED AND MAINTAINED TO PREVENT TRACK OUT.
5. ALL TOPSOIL IN DISTURBED AREAS SHALL BE REMOVED AND STOCKPILED FOR LATER PLACEMENT. AVOID COMPACTION AS MUCH AS IS FEASIBLE IN ALL AREAS WHERE COMPACTION IS NOT REQUIRED FOR CONSTRUCTION. COMPACTION SHALL BE AVOIDED IN ALL AREAS DESIGNATED FOR INFILTRATION.
6. DO NOT DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS. DELINEATE AREAS NOT TO BE DISTURBED PRIOR TO STARTING GROUND DISTURBING ACTIVITIES. IF IT BECOMES NECESSARY TO DISTURB AREAS OUTSIDE OF THE CONSTRUCTION LIMITS OBTAIN WRITTEN PERMISSION PRIOR TO PROCEEDING. PRESERVE ALL BUFFERS (IF ANY) SHOWN ON THE PLANS.
7. DIRECT DISCHARGES FROM BMPS TO VEGETATED AREAS AND ROUTE STORMWATER AROUND UNSTABILIZED AREAS OF THE SITE WHENEVER POSSIBLE. PROVIDE EROSION CONTROL AND VELOCITY DISSIPATION DEVICES AS NEEDED TO PREVENT EROSION AND NUISANCE CONDITIONS.
8. PROVIDE STABILIZATION IN ANY TRENCHES CUT FOR DEWATERING OR SITE DRAINING PURPOSES.
9. TEMPORARY DEWATERING ACTIVITIES MAY BE REQUIRED. THEREFORE, IT IS POSSIBLE THAT A PERMIT FOR THE TEMPORARY APPROPRIATION OF WATERS OF THE STATE FROM MNDNR SHALL BE REQUIRED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THIS PERMIT (FORMS ARE AVAILABLE FROM THE MNDNR WEBSITE). ALL TEMPORARY DEWATERING SHALL BE DISCHARGED TO AN APPROVED LOCATION FOR TREATMENT PRIOR TO DISCHARGE TO THE RECEIVING WATER. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT SITE MANAGEMENT PLANS TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK ACCORDING TO SPEC 1717.2D. TEMPORARY DEWATERING SHALL BE INCIDENTAL.
10. BASIN DRAINING ACTIVITIES OF TURBID OR SEDIMENT LADEN WATER SHALL BE DISCHARGED TO TEMPORARY SEDIMENT BASINS WHENEVER POSSIBLE. IN THE EVENT THAT IT IS NOT POSSIBLE TO DISCHARGE THE SEDIMENT LADEN WATER TO A TEMPORARY SEDIMENT BASIN THE WATER SHALL BE TREATED SO THAT IT DOES NOT CAUSE A NUISANCE CONDITION IN THE RECEIVING WATERS OR TO DOWNSTREAM LANDOWNERS.
11. IT IS NOT ANTICIPATED THAT POLYMERS, FLOCCULANTS OR OTHER SEDIMENTATION TREATMENT CHEMICALS SHALL BE USED. HOWEVER, IF THE USE OF SUCH CHEMICALS BECOMES NECESSARY TO COMPLY WITH PERMIT REQUIREMENTS, IT SHALL BE IN ACCORDANCE WITH PART IV.C.10. OF THE CONSTRUCTION GENERAL PERMIT.

POLLUTION PREVENTION NOTES

1. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS REGARDING POLLUTION PREVENTION MANAGEMENT DURING CONSTRUCTION, WHICH SHALL INCLUDE, BUT NOT BE LIMITED TO, PROVIDING THE FOLLOWING (ITEMS LISTED ARE INCIDENTAL):
 - A. WASHOUT AREAS FOR CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS FOR USE BY ALL SUBCONTRACTORS AND MATERIAL TESTING PERSONNEL. LOCATION OF WASHOUT AREAS SHALL BE IDENTIFIED BY SIGNAGE AND SHALL BE AT LEAST 200 FT FROM SITE MANAGEMENT PLAN REQUIREMENT AREAS (IF APPLICABLE) OR ENVIRONMENTALLY SENSITIVE AREAS, AND UTILIZE A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER THAT PREVENTS RUNOFF ONTO ADJACENT SOILS. AN ENGINEERED COLLECTION SYSTEM CAN ALSO BE USED IF IT IS APPROVED BY THE PROJECT ENGINEER.
 - B. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE PROJECT ENGINEER FOR A CHEMICAL STORAGE AREA AND SHALL DESIGNATE AN AREA FOR FUELING AND MINOR MAINTENANCE OF CONSTRUCTION VEHICLES (INCLUDING WASHING) WITH MEANS TO CAPTURE ANY FUEL SPILLS. RUNOFF SHALL BE CONTAINED IN A TEMPORARY SEDIMENT BASIN OR OTHER EFFECTIVE CONTROL AND ALL WASTE GENERATED SHALL BE PROPERLY DISPOSED OF. NO ENGINE DEGREASING IS ALLOWED ON SITE.
 - C. SOLID WASTE COLLECTION AND REMOVAL
 - D. SECONDARY CONTAINMENT FOR STORAGE OF HAZARDOUS MATERIALS
 - E. SECURED HAZARDOUS WASTE STORAGE CONTAINERS
 - F. CHEMICAL SPILL KITS (SHALL BE PROVIDED AT EACH LOCATION WHERE CHEMICALS ARE USED OR STORED AND ANY LOCATION WHERE VEHICLES ARE FUELED OR MAINTAINED).
 - G. PORTABLE RESTROOM FACILITIES THAT ARE ANCHORED TO PREVENT TIPPING
2. CHEMICALS SHALL BE KEPT IN A SECURE STORAGE AREA WITH RESTRICTED ACCESS IN SEALED CONTAINERS WHEN NOT IN USE. RETURN ALL CHEMICALS TO THE DESIGNATED STORAGE AREA BY THE END OF THE DAY UNLESS INFEASIBLE. CHEMICAL STORAGE CONTAINERS SHALL HAVE SECONDARY CONTAINMENT WHEN BEING USED OR STORED ON THE PROJECT SITE, AND PRODUCTS OR CHEMICALS THAT MAY LEACH POLLUTANTS SHALL BE UNDER COVER (PLASTIC SHEETING OR TEMPORARY ROOF). CHEMICAL SPILLS OF ANY KIND (OIL, FUEL, FERTILIZER, ETC.) SHALL BE CLEANED UP AND REMOVED FROM THE SITE IMMEDIATELY. THE CONTRACTOR SHALL HAVE A SPILL KIT ON SITE AT ALL TIMES.

POLLUTION PREVENTION NOTES (CONT.)

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CREATING AND FOLLOWING A WRITTEN DISPOSAL PLAN FOR ALL HAZARDOUS WASTE MATERIALS. THE PLAN SHALL INCLUDE HOW THE MATERIAL SHALL BE DISPOSED OF AND THE LOCATION OF THE DISPOSAL SITE AND SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO WORK ON SITE. LEAKS, SPILLS, OR OTHER RELEASES SHALL BE RESPONDED TO IN ACCORDANCE WITH MPCA SPILL CONTAINMENT AND REMEDIAL ACTION PROCEDURES.
4. THE CONTRACTOR SHALL 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 ALL WATER CONVEYANCE SYSTEMS, INCLUDING INLETS, DITCHES AND CURB FLOW LINES.
5. THE CONTRACTOR SHALL USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT CONCRETE DUST, PARTICLES, SAW CUT SLURRY, PLANING WASTE AND OTHER CONCRETE WASTES FROM LEAVING PUBLIC RIGHT OF WAY, DEPOSITING IN EXISTING OR FUTURE VEGETATED AREAS OR ENTERING STORMWATER CONVEYANCE SYSTEM INCLUDING INLETS AND CURB FLOW LINES. ONSITE RELEASE OF CONCRETE SLURRY IS PERMISSIBLE IF MINNESOTA POLLUTION CONTROL GUIDANCE FOR ROAD CONSTRUCTION CONCRETE SLURRY AND THE REQUIREMENTS OF THE SPECIAL PROVISIONS ARE FOLLOWED.

EROSION CONTROL SUPERVISOR, INSPECTIONS AND MAINTENANCE NOTES

1. IN ACCORDANCE WITH SPEC. 2573.3 A1, THE CONTRACTOR SHALL PROVIDE A CERTIFIED EROSION CONTROL SUPERVISOR IN GOOD STANDING WHO IS KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BMPS. PROVIDE PROOF OF CERTIFICATION (UNIVERSITY OF MINNESOTA - CONSTRUCTION SITE MANAGEMENT) AT THE PRECONSTRUCTION MEETING. WORK SHALL NOT BE ALLOWED TO COMMENCE UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED.
2. THE EROSION CONTROL SUPERVISOR SHALL WORK WITH THE PROJECT ENGINEER TO OVERSEE THE IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA.
3. THE EROSION CONTROL SUPERVISOR IS RESPONSIBLE FOR COMPLYING WITH ALL THE INSPECTION AND MAINTENANCE REQUIREMENTS STATED IN THE NPDES PERMIT PART IV. E. INSPECTIONS OF THE ENTIRE CONSTRUCTION SITE SHALL OCCUR A MINIMUM OF ONCE EVERY SEVEN DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS (IN NO CASE SHALL THE TIME BETWEEN INSPECTIONS EXCEED 7 DAYS). RAINFALL AMOUNTS SHALL BE OBTAINED USING A PROPERLY MAINTAINED RAIN GAUGE ONSITE OR BY A WEATHER STATION THAT IS WITHIN ONE MILE. THE EROSION CONTROL SUPERVISOR SHALL THOROUGHLY INSPECT ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPS TO ENSURE INTEGRITY AND EFFECTIVENESS OF EACH BMP.
4. ALL INSPECTIONS AND MAINTENANCE CONDUCTED DURING CONSTRUCTION SHALL BE RECORDED IN WRITING WITHIN 24 HOURS AND THESE RECORDS SHALL BE RETAINED WITH THE SWPPP. INSPECTION REPORTS SHALL BE SUBMITTED TO THE PROJECT ENGINEER AND SWPPP DESIGNER IN A FORMAT APPROVED BY THE ENGINEER. INSPECTION RECORDS SHALL INCLUDE:
 - A. DATE AND TIME OF INSPECTIONS;
 - B. NAME OF PERSONS CONDUCTING INSPECTIONS;
 - C. FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS;
 - D. CORRECTIVE ACTIONS TAKEN INCLUDING DATES, TIMES, AND THE PARTY COMPLETING MAINTENANCE ACTIVITIES;
 - E. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCH IN 24 HOURS;
 - F. LOCATION, DESCRIPTION AND PHOTO OF ANY DISCHARGES OFF THE PROJECT SITE.
 - G. DOCUMENTS AND CHANGES MADE TO THE SWPPP.
5. THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING INSPECTION AND MAINTENANCE REQUIREMENTS (INSPECTIONS MAY BE REDUCED UNDER CERTAIN CONDITIONS AS COVER IS ESTABLISHED AND CONDITIONS CHANGE AS DESCRIBED IN PART IV. E OF THE NPDES PERMIT):
 - A. SILT FENCE SHALL BE REPAIRED, REPLACED OR SUPPLEMENTED WHEN IT BECOMES NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT OF THE SILT FENCE. REPAIRS SHALL BE MADE WITHIN 24 HOURS OF DISCOVERY.
 - B. INLET PROTECTION DEVICES SHOULD BE REPAIRED WHEN THEY BECOME NONFUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT AND/OR DEPTH OF THE DEVICE.
 - C. TEMPORARY SEDIMENT BASINS, IF REQUIRED, SHALL HAVE THE SEDIMENT REMOVED ONCE THE SEDIMENT HAS REACHED 1/2 THE STORAGE VOLUME WITHIN 72 HOURS OF DISCOVERY.
 - D. REMOVE ANY SEDIMENT DEPOSITED IN SURFACE WATERS. SEDIMENT SHALL BE REMOVED AND ANY AREA DISTURBED BY THE REMOVAL RESTABILIZED WITHIN 7 DAYS OF DISCOVERY. A SITE MANAGEMENT PLAN IS REQUIRED FOR WORK IN ANY SURFACE WATER AND APPROPRIATE AUTHORITIES SHALL BE CONTACTED PRIOR TO COMMENCING WORK.
 - E. TRACKED SEDIMENT SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY OF TRACKING ONTO PAVED SURFACES.
 - F. ALL OTHER NONFUNCTIONAL BMPS SHALL BE REPAIRED, REPLACED, OR SUPPLEMENTED WITHIN 24 HOURS OF DISCOVERY.
 - G. REINSTALL AS QUICKLY AS POSSIBLE ANY BMP REMOVED TO ACCOMMODATE SHORT TERM ACTIVITIES.
 - H. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL BMPS UNTIL WORK HAS BEEN COMPLETED, SITE HAS GONE UNDER FINAL STABILIZATION, AND THE NOTICE OF TERMINATION HAS BEEN SUBMITTED TO THE MPCA IN ACCORDANCE WITH PART II.C OF THE CONSTRUCTION GENERAL PERMIT. SEDIMENT REMOVAL AND MAINTENANCE OF BMPS IS INCIDENTAL.
6. CLEAN OUT ALL PERMANENT STORMWATER BASINS REGARDLESS OF WHETHER USED AS A TEMPORARY SEDIMENT BASIN OR SEDIMENT TRAP TO THE DESIGN CAPACITY AFTER ALL UPGRADIENT LAND DISTURBING ACTIVITY IS COMPLETED.

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

Print Name: JEREMY NIELSEN

Jeremy Nielsen

Date: 06/12/2011 License #: 45047

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG
DESIGNED BY Z. THELEN
CHECKED BY K. LACHOWITZER
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
STORM WATER POLLUTION PREVENTION PLAN
CSAH 78 - BNSF GRADE SEPARATION

SHEET
126
OF
175

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE (SHEET 3 OF 3)

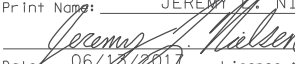

STABILIZATION AND SEDIMENT CONTROL NOTES

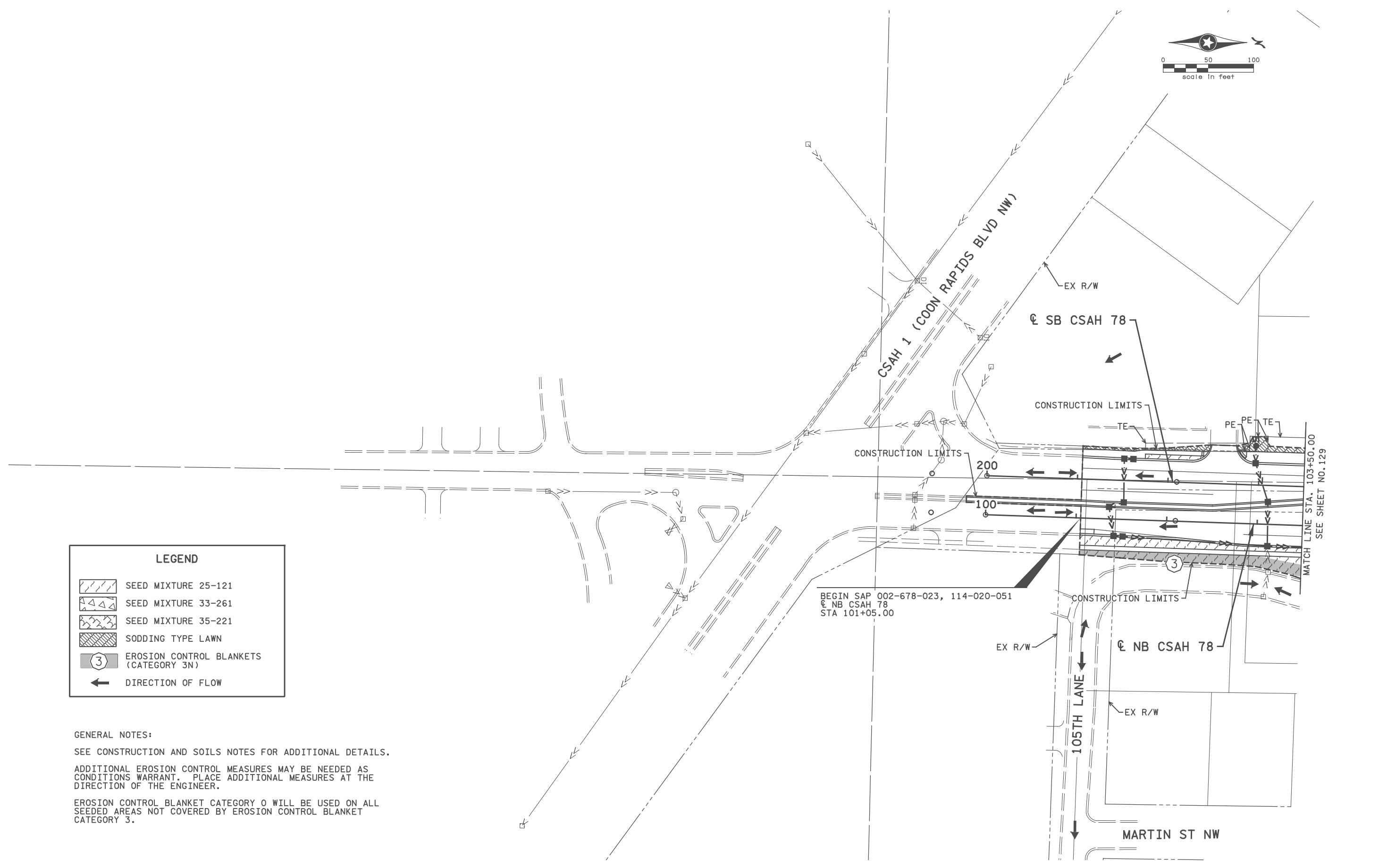
STABILIZATION AND SEDIMENT CONTROL NOTES (CONT.)

1. THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs SHALL BE PLACED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ONSITE. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY REMOVAL WORK AND/OR GROUND DISTURBING ACTIVITIES AND SHALL BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION HAS BEEN ELIMINATED. IF SEDIMENT CONTROLS ARE OVERLOADED (BASED ON FREQUENT FAILURE OR EXCESSIVE MAINTENANCE), ADDITIONAL UPGRADIENT OR REDUNDANT BMPs SHALL BE PLACED.
2. SEDIMENT CONTROL DEVICES SHALL BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN. SEDIMENT CONTROL DEVICES INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
 - A. PERIMETER CONTROL SHALL BE LOCATED ON THE CONTOUR TO CAPTURE OVERLAND, LOW-VELOCITY SHEET FLOWS DOWN GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS. THE BMP SHALL BE J-HOOKED AT A MAXIMUM OF 100 FOOT INTERVALS AND EACH SECTION SHALL CONTAIN NO MORE THAN 1/4 ACRE OF DRAINAGE AREA.
 - B. SEDIMENT DAMAGE FROM STOCKPILES SHALL BE MINIMIZED BY PLACING A ROW OF SUPER DUTY SILT FENCE A MINIMUM 5 FEET FROM THE TOE. IF THERE IS NOT ADEQUATE PROJECT AREA TO PLACE THE SILT FENCE MORE THAN 5 FEET FROM THE TOE OF THE SLOPE, THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE TO THE PROJECT ENGINEER FOR APPROVAL.
 - C. DITCH CHECKS (IF REQUIRED) SHALL BE PLACED AS INDICATED ON THE PLANS DURING ALL PHASES OF CONSTRUCTION.
 1. TEMPORARY DITCH CHECKS (IF REQUIRED) SHALL CONSIST OF USING ROCK DITCH CHECKS, BIOLOGS AND ROCK WEEPERS IN FRONT OF CULVERT INLETS. IN LIEU OF REMOVING TEMPORARY DITCH CHECKS, THE ROCK MAY BE PUSHED INTO THE GROUND.
 2. FILTER LOGS (IF REQUIRED) SHALL BE PLACED DURING PERMANENT TURF ESTABLISHMENT AT THE INTERVALS IDENTIFIED IN THE PLAN.
 - D. FLOTATION SILT CURTAIN MAY BE USED AS PERIMETER CONTROL BUT ONLY FOR WORK ON THE SHORELINE OR BELOW THE WATERLINE. IMMEDIATELY AFTER THE CONSTRUCTION IN THE AREA IS COMPLETE, AN UPLAND BMP SHALL BE PLACED IF EXPOSED SOILS CONTINUE TO DRAIN TO THE SURFACE WATER.
 - E. TEMPORARY SEDIMENT BASINS ARE REQUIRED WHERE TEN OR MORE ACRES DRAIN TO A COMMON LOCATION (FIVE IF DRAINING TO A SPECIAL OR IMPAIRED WATER).
 1. BASIN VOLUME SHALL BE A MINIMUM OF 1,800 CUBIC FEET PER ACRE OF DRAINAGE AREA TO THE BASIN (3,600 CUBIC FEET PER ACRE IF NO CALCULATIONS ARE PERFORMED)
 2. OUTLET SHALL ALLOW COMPLETE DRAWDOWN FOR MAINTENANCE AND A STABILIZED OVERFLOW. THE OUTLET SHALL WITHDRAW WATER FROM THE SURFACE EXCEPT DURING FROZEN CONDITIONS.
 3. IF A TEMPORARY BASIN OF THE REQUIRED SIZE IS INFEASIBLE THE REASONS SHALL BE DOCUMENTED IN THE SWPPP AND ALTERNATE BMPs SHALL BE PLACED.
3. PRESERVE A NATURAL BUFFER OF AT LEAST 50 FEET (100 FEET IF WITHIN 1 MILE OF AND DRAINS TO A SPECIAL OR IMPAIRED WATER) BETWEEN DISTURBED AREAS AND FLOWS TO A SURFACE WATER (NOT REQUIRED AT DITCHES OR STORMWATER CONVEYANCE CHANNELS, STORM DRAIN INLETS OR SEDIMENT BASINS). IF A BUFFER IS INFEASIBLE, PROVIDE AS LARGE A BUFFER AS POSSIBLE AND REDUNDANT SEDIMENT CONTROLS.
4. STORM SEWER INLETS SHALL BE PROTECTED AT ALL TIMES WITH THE APPROPRIATE INLET PROTECTION FOR EACH SPECIFIC PHASE OF CONSTRUCTION. PROVIDE INLET PROTECTION DEVICES WITH EMERGENCY OVERFLOW CAPABILITIES. SILT FENCE PLACED IN THE INLET GRATE IS NOT AN ACCEPTABLE INLET PROTECTION BMP FOR GRADING OPERATIONS (THIS BMP SHALL BE ACCEPTED ONLY FOR SHORT INTERVALS DURING MILLING OR PAVING OPERATIONS). INLET PROTECTION DEVICES MAY NEED TO BE PLACED MULTIPLE TIMES IN THE SAME LOCATION OVER THE LIFE OF THE CONTRACT. INLET PROTECTION DEVICES SHALL BE PAID FOR ONCE PER INLET REGARDLESS OF THE NUMBER OF TIMES THE BMP IS PLACED. ALL STORM SEWER INLET PROTECTION DEVICES SHALL BE KEPT IN GOOD FUNCTIONAL CONDITION AT ALL TIMES. IF THE PROJECT ENGINEER DEEMS AN INLET PROTECTION DEVICE TO BE NONFUNCTIONAL, IN POOR CONDITION, INEFFECTIVE OR NOT APPROPRIATE FOR THE CURRENT CONSTRUCTION ACTIVITIES IT SHALL BE REPLACED WITH A SUITABLE ALTERNATIVE AT NO COST TO THE OWNER.

5. PAVEMENT SURFACES SHALL BE SWEEPED WITHIN 24 HOURS OF DISCOVERY OF SEDIMENT OR TRACKING ONTO PAVEMENT THAT DRAINS TO CURB, INLETS, DITCHES OR PONDS. PAVEMENT SHALL BE LIGHTLY WETTED PRIOR TO SWEEPING. THIS WORK IS INCIDENTAL.
6. OUTLETS INTO SURFACE WATERS SHALL BE STABILIZED WITH ENERGY DISSIPATION WITHIN 24 HOURS OF BEING CONSTRUCTED.
7. DITCHES AND EXPOSED SOILS SHALL BE KEPT IN AN EVEN ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES AND BLANKETS.
8. INITIATE STABILIZATION OF ALL EXPOSED SOIL AND STOCKPILE AREAS IMMEDIATELY AFTER CONSTRUCTION ACTIVITY ON THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. TEMPORARY OR PERMANENT STABILIZATION SHALL BE COMPLETED WITHIN NO MORE THAN 7 DAYS. ALL EXPOSED SOIL WITHIN 200 LINEAL FEET OF AND DRAINING TO A PUBLIC WATER WITH "WORK IN WATER RESTRICTIONS" AND DURING SPECIFIED FISH SPAWNING TIME FRAMES, SHALL BE STABILIZED WITHIN 24 HOURS. IN MANY INSTANCES, THIS SHALL REQUIRE STABILIZATION TO OCCUR MORE THAN ONCE DURING ROUGH GRADING. RAPID STABILIZATION METHOD 3 SHALL BE USED TO PROVIDE TEMPORARY COVER IN THESE AREAS AS APPROPRIATE. SUBSTITUTE SEED MIXTURE 21-112 OR 21-111 FOR THE SPECIFIED SEED MIXTURE AS APPROPRIATE FOR THE SEASON. SEE PERMIT SECTION IV.B. FOR EXCEPTIONS.
9. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH THAT DRAINS WATER FROM THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE CONSTRUCTION SITE, SHALL BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE OR POINT OF DISCHARGE TO ANY SURFACE WATER. STABILIZATION SHALL OCCUR WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER, EXISTING GUTTER, STORM SEWER INLET, DRAINAGE DITCH, OR OTHER STORMWATER CONVEYANCE SYSTEM ACCORDING TO SPEC 1717.2. RAPID STABILIZATION METHOD 4 SHALL BE USED TO STABILIZE THESE AREAS (SUBSTITUTE SEED MIXTURE 21-112 OR 21-111 FOR THE SPECIFIED SEED MIXTURE AS APPROPRIATE FOR THE SEASON). THE REMAINDER OF THE DITCH SHALL BE STABILIZED WITHIN 7 DAYS OF CONNECTING TO THE SURFACE WATER. PERMANENT EROSION CONTROL BLANKET OR RAPID STABILIZATION METHOD 4 (SUBSTITUTE SEED MIXTURE 21-112 OR 21-111 FOR THE SPECIFIED SEED MIXTURE AS APPROPRIATE FOR THE SEASON) SHALL BE USED TO STABILIZE THESE AREAS. DISC ANCHORED MULCH AND HYDRAULIC SOIL STABILIZERS ARE NOT ALLOWED TO BE USED FOR DITCH STABILIZATION.
10. ALL EXPOSED SOIL AREAS SHALL BE STABILIZED PRIOR TO THE ONSET OF WINTER. ANY WORK STILL BEING PERFORMED SHALL BE SNOW MULCHED, SEEDED, OR BLANKETED WITHIN THE TIME FRAMES LISTED IN THE MPCAS GENERAL NPDES CONSTRUCTION STORMWATER PERMIT.
11. ALL TOPSOIL BERMS SHALL BE STABILIZED AS FOLLOWS:
 - A. BETWEEN APRIL 1 - AUGUST 31, SEED WITH SEED MIXTURE 21-111
 - B. BETWEEN SEPTEMBER 1 AND MARCH 31, SEED WITH SEED MIXTURE 21-112 AND TOP WITH RAPID STABILIZATION 2.
12. TILLING FOR BEDS OR TREE HOLES SHALL BE PLANTED AND MULCHED WITH WOODCHIP WITHIN 7 DAYS OR STRAW MULCHED UNTIL PLANTING OPERATIONS CAN BE COMPLETED. FILTER LOGS SHALL BE PLACED, AS NEEDED, TO TRAP SEDIMENT ON THE LOWER EDGE OF BEDS OR TREE HOLES. FILTER LOGS SHALL BE LEFT TO PHOTO DEGRADE.

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					I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: <u>JEREMY M. NIELSEN</u>  Date: <u>06/12/2017</u> License # <u>45047</u>		STATE AID PROJECT NO 002-678-023, 114-020-051 DRAWN BY S. VANG DESIGNED BY Z. THELEN CHECKED BY K. LACHOWITZER COMM. NO. 0169140		ANOKA COUNTY STORM WATER POLLUTION PREVENTION PLAN CSAH 78 - BNSF GRADE SEPARATION		SHEET 127 OF 175
NO DATE BY CKD APPR REVISION							 ENGINEERS PLANNERS DESIGNERS				
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LEGEND

	SEED MIXTURE 25-121
	SEED MIXTURE 33-261
	SEED MIXTURE 35-221
	SODDING TYPE LAWN
	EROSION CONTROL BLANKETS (CATEGORY 3N)
	DIRECTION OF FLOW

GENERAL NOTES:

SEE CONSTRUCTION AND SOILS NOTES FOR ADDITIONAL DETAILS.

ADDITIONAL EROSION CONTROL MEASURES MAY BE NEEDED AS CONDITIONS WARRANT. PLACE ADDITIONAL MEASURES AT THE DIRECTION OF THE ENGINEER.

EROSION CONTROL BLANKET CATEGORY 0 WILL BE USED ON ALL SEEDED AREAS NOT COVERED BY EROSION CONTROL BLANKET CATEGORY 3.

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date 6/13/2017 License # 53680

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG

DESIGNED BY T. SMITH

CHECKED BY B. ROBECK

COMM. NO. 0169140

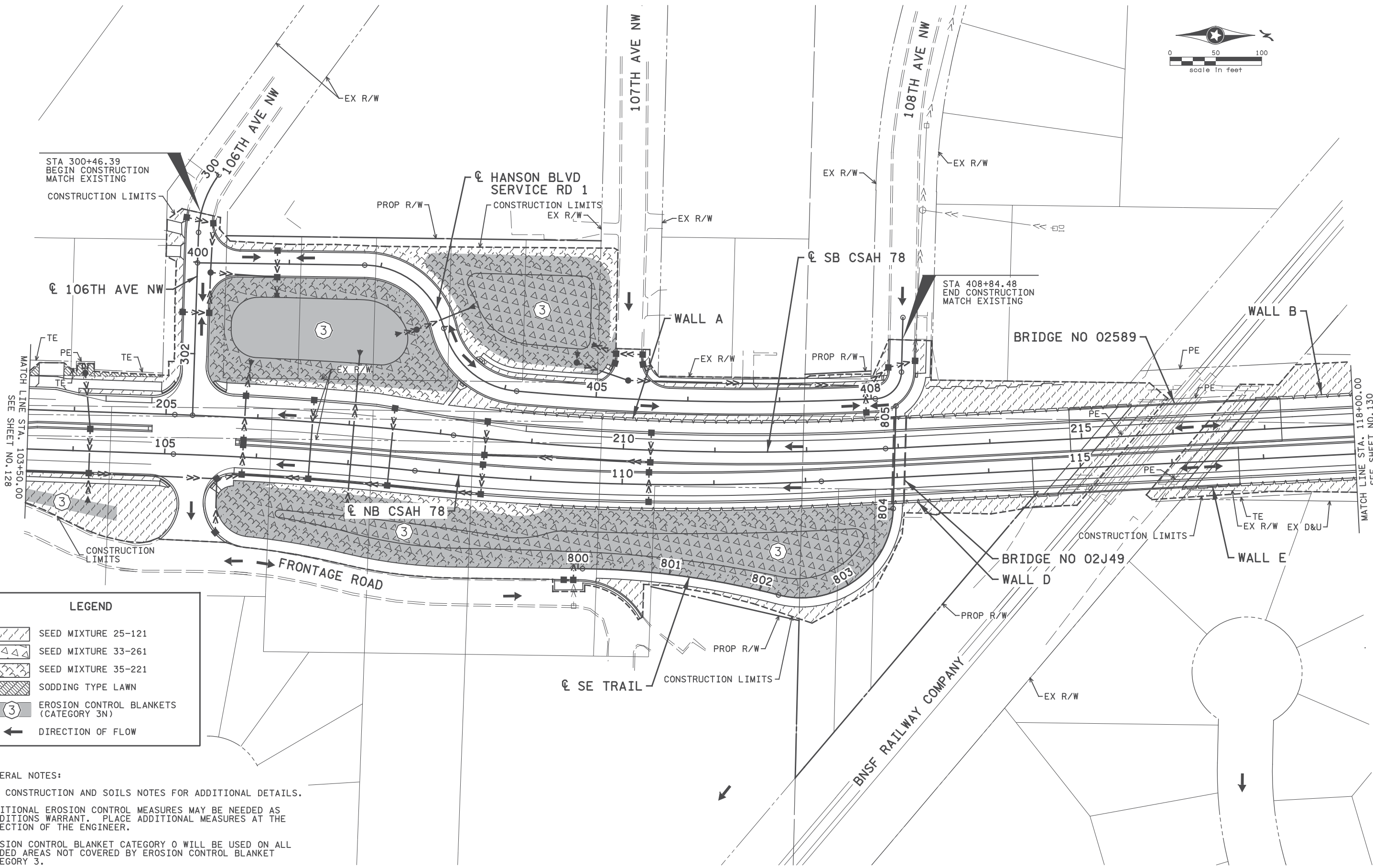


ANOKA COUNTY

EROSION CONTROL AND TURF ESTABLISHMENT PLANS

CSAH 78 - BNSF GRADE SEPARATION

SHEET 128 OF 175



LEGEND

	SEED MIXTURE 25-121
	SEED MIXTURE 33-261
	SEED MIXTURE 35-221
	SODDING TYPE LAWN
	EROSION CONTROL BLANKETS (CATEGORY 3N)
	DIRECTION OF FLOW

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 ADDITIONAL EROSION CONTROL MEASURES MAY BE NEEDED AS CONDITIONS WARRANT. PLACE ADDITIONAL MEASURES AT THE DIRECTION OF THE ENGINEER.
 EROSION CONTROL BLANKET CATEGORY 0 WILL BE USED ON ALL SEEDED AREAS NOT COVERED BY EROSION CONTROL BLANKET CATEGORY 3.

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 Print Name: BENJAMIN P ROBECK
Ben Robeck
 Date: 7/12/2017 License #: 53680

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 002-678-023, 114-020-051

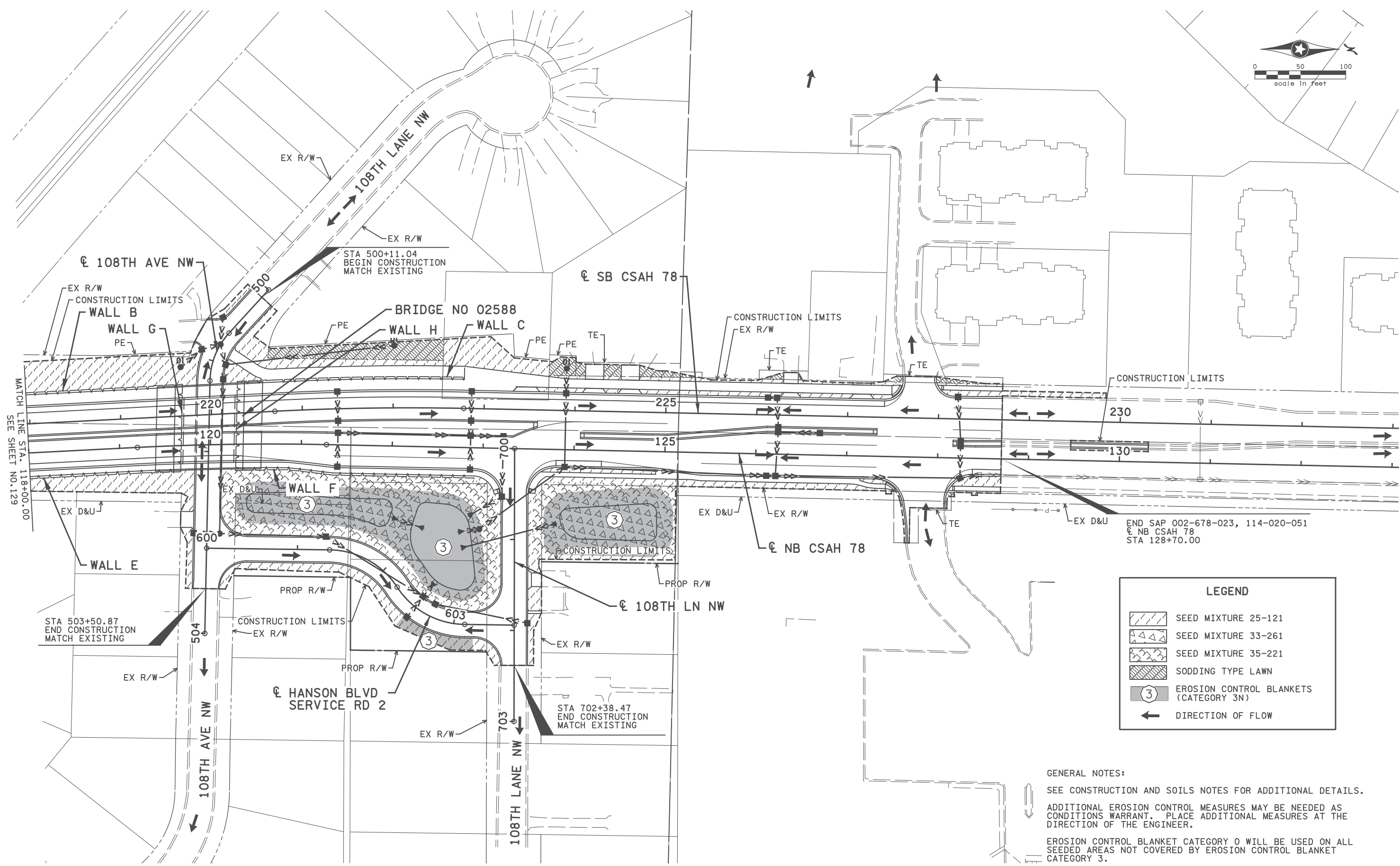
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 S. VANG
 DESIGNED BY
 T. SMITH
 CHECKED BY
 B. ROBECK
 COMM. NO. 0169140



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 PLANNERS
 DESIGNERS

ANOKA COUNTY
 EROSION CONTROL AND TURF ESTABLISHMENT PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 129
 OF
 175



LEGEND	
	SEED MIXTURE 25-121
	SEED MIXTURE 33-261
	SEED MIXTURE 35-221
	SODDING TYPE LAWN
	EROSION CONTROL BLANKETS (CATEGORY 3N)
	DIRECTION OF FLOW

GENERAL NOTES:
 SEE CONSTRUCTION AND SOILS NOTES FOR ADDITIONAL DETAILS.
 ADDITIONAL EROSION CONTROL MEASURES MAY BE NEEDED AS CONDITIONS WARRANT. PLACE ADDITIONAL MEASURES AT THE DIRECTION OF THE ENGINEER.
 EROSION CONTROL BLANKET CATEGORY 0 WILL BE USED ON ALL SEEDED AREAS NOT COVERED BY EROSION CONTROL BLANKET CATEGORY 3.

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 DRAWN BY S. VANG
 DESIGNED BY T. SMITH
 CHECKED BY B. ROBECK
 COMM. NO. 0169140



ANOKA COUNTY
 EROSION CONTROL AND TURF ESTABLISHMENT PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 130 OF 175

PERMANENT PAVEMENT MARKING PLAN

NOTES & GUIDELINES

GENERAL INFORMATION:

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

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

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

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

APPLY ALL PAVEMENT MARKINGS AS RECOMMENDED BY THE MATERIAL MANUFACTURER.

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

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

PAINT:

GLASS BEADS SHALL BE APPLIED AT A RATE OF AT LEAST 8 LBS/GAL. IMMEDIATELY AFTER APPLICATION OF THE PAINT LINE.

PAVEMENT MARKINGS SHALL ONLY BE APPLIED IN SEASONABLE WEATHER WHEN AIR AND PAVEMENT SURFACE TEMPERATURES IS 50°F OR HIGHER AND SHALL NOT BE APPLIED WHEN THE WIND OR OTHER CONDITIONS CAUSE A FILM OF DUST TO BE DEPOSITED ON THE PAVEMENT SURFACE AFTER CLEANING AND BEFORE THE MARKING MATERIAL CAN BE APPLIED.

EPOXY:

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 TREATMENTS AND/OR LAITANCE.

THE EPOXY MARKING APPLICATION SHALL IMMEDIATELY FOLLOW THE PAVEMENT CLEANING. GLASS BEADS SHALL BE APPLIED IMMEDIATELY AFTER APPLICATION OF THE EPOXY RESIN LINE.

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

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

PREFORMED MARKINGS:

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

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

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

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

SYMBOLS & MATERIALS LEGEND

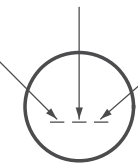
— BROKEN LINE-50' CYCLE (10' LINE, 40' GAP)
 - - - DOTTED LINE-15' CYCLE (3' LINE, 12' GAP, UNLESS SHOWN OTHER WISE IN THE PLAN)

■ CROSSWALK BLOCK
 ↶ PAVEMENT MESSAGE (LEFT ARROW)

STRIPING KEY

○--- CIRCLE-EPOXY □--- SQUARE-PREF TAPE
 △--- TRIANGLE-PAINT ⬡--- OCTAGON-PREF THERMO

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



EXAMPLE: (4SW) = 4" SOLID LINE WHITE EPOXY

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Ben Robeck
 Date: 6/13/2017 License #: 53680

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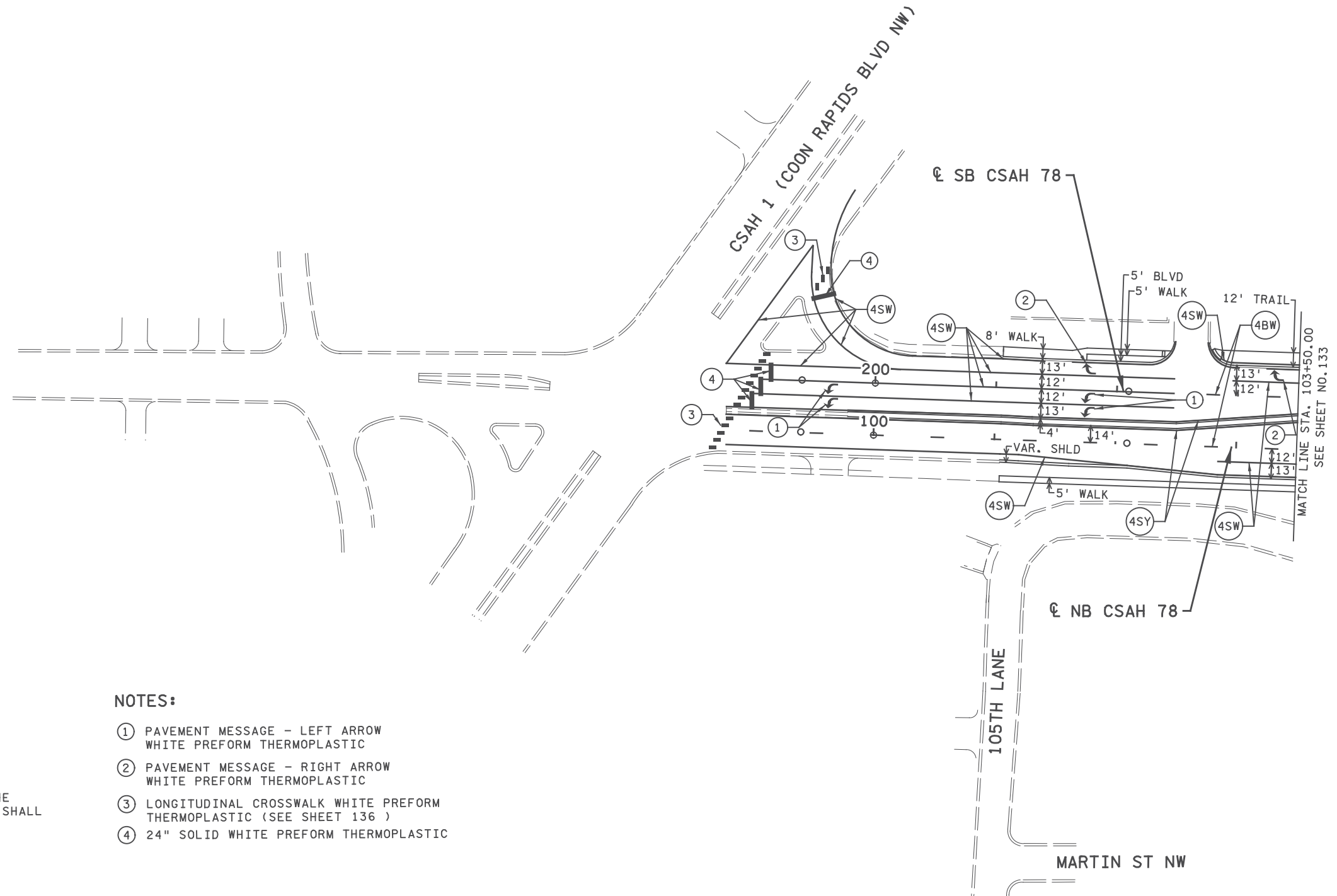
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 DESIGNED BY
 T. SMITH
 CHECKED BY
 B. ROBECK
 COMM. NO. 0169140



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ANOKA COUNTY
 PAVEMENT MARKING PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 PAVEMENT MARKING TITLE SHEET

SHEET
 131
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GENERAL NOTES:

CENTERLINE ALIGNMENT NOT SHOWN FOR CLARITY.
 MATCH EXISTING PAVEMENT MARKINGS AT THE PROJECT LIMITS AS DIRECTED BY THE ENGINEER.
 ALL CONFLICTING PAVEMENT MARKINGS IDENTIFIED BY THE ENGINEER SHALL BE REMOVED. THE METHOD OF REMOVAL SHALL BE APPROVED BY THE FIELD ENGINEER.

NOTES:

- ① PAVEMENT MESSAGE - LEFT ARROW
WHITE PREFORM THERMOPLASTIC
- ② PAVEMENT MESSAGE - RIGHT ARROW
WHITE PREFORM THERMOPLASTIC
- ③ LONGITUDINAL CROSSWALK WHITE PREFORM THERMOPLASTIC (SEE SHEET 136)
- ④ 24" SOLID WHITE PREFORM THERMOPLASTIC

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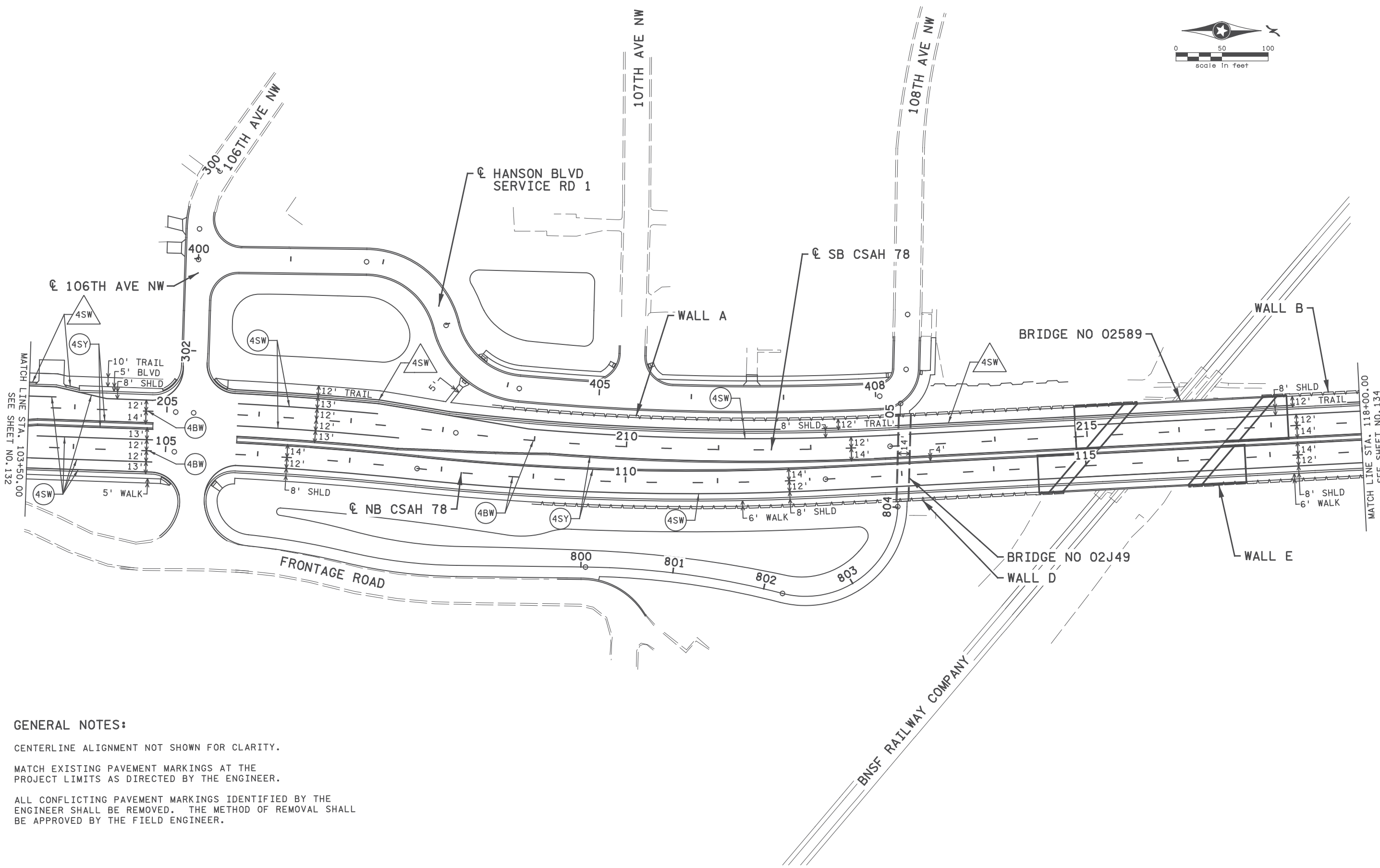
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 PAVEMENT MARKING PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
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 OF
 175



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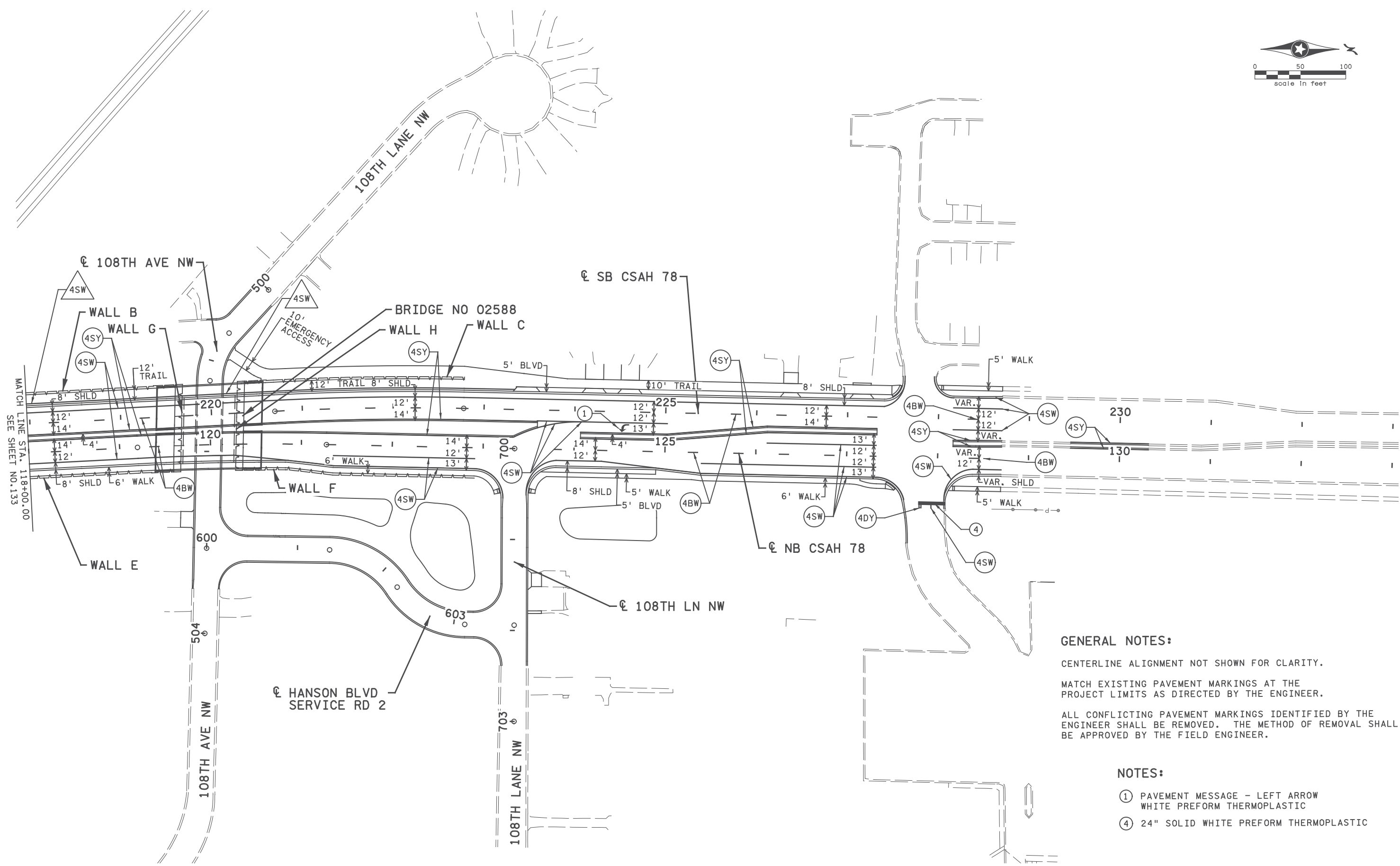
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 PAVEMENT MARKING PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 133
 OF
 175



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- NOTES:**
- ① PAVEMENT MESSAGE - LEFT ARROW WHITE PREFORM THERMOPLASTIC
 - ④ 24" SOLID WHITE PREFORM THERMOPLASTIC

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Ben Robeck

Date: 7/12/2017 License #: 53680

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DESIGNED BY T. SMITH

CHECKED BY B. ROBECK

COMM. NO. 0169140



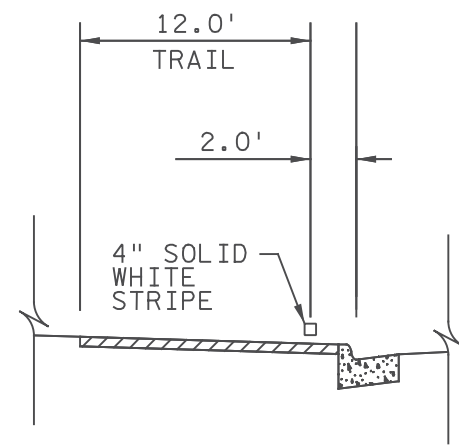
ANOKA COUNTY

PAVEMENT MARKING PLANS

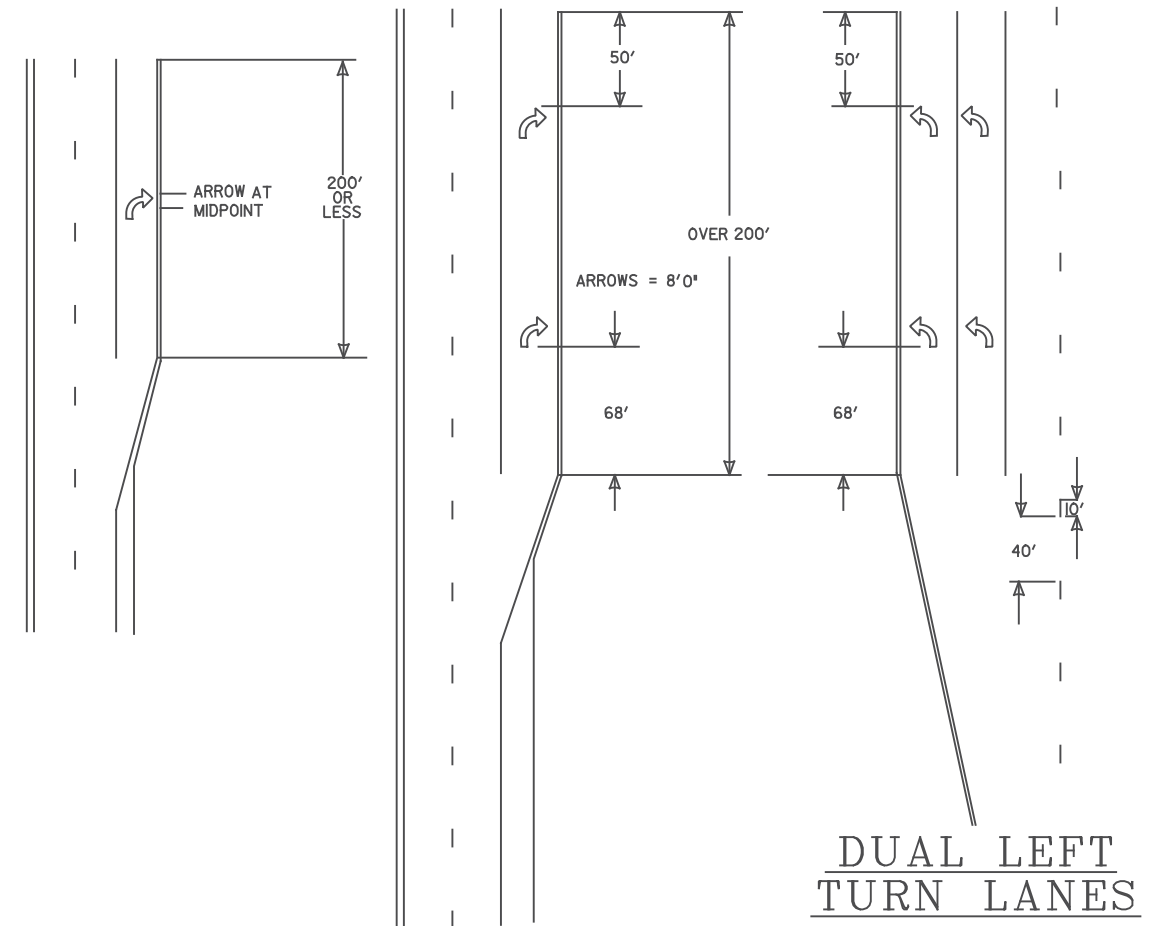
CSAH 78 - BNSF GRADE SEPARATION

SHEET 134 OF 175

TYPICAL MESSAGE PLACEMENT FOR TURN LANES



TRAIL STRIPING DETAIL



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Ben Robeck

Date 6/13/2017 License # 53680

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S. VANG

DESIGNED BY
T. SMITH

CHECKED BY
B. ROBECK

COMM. NO. 0169140

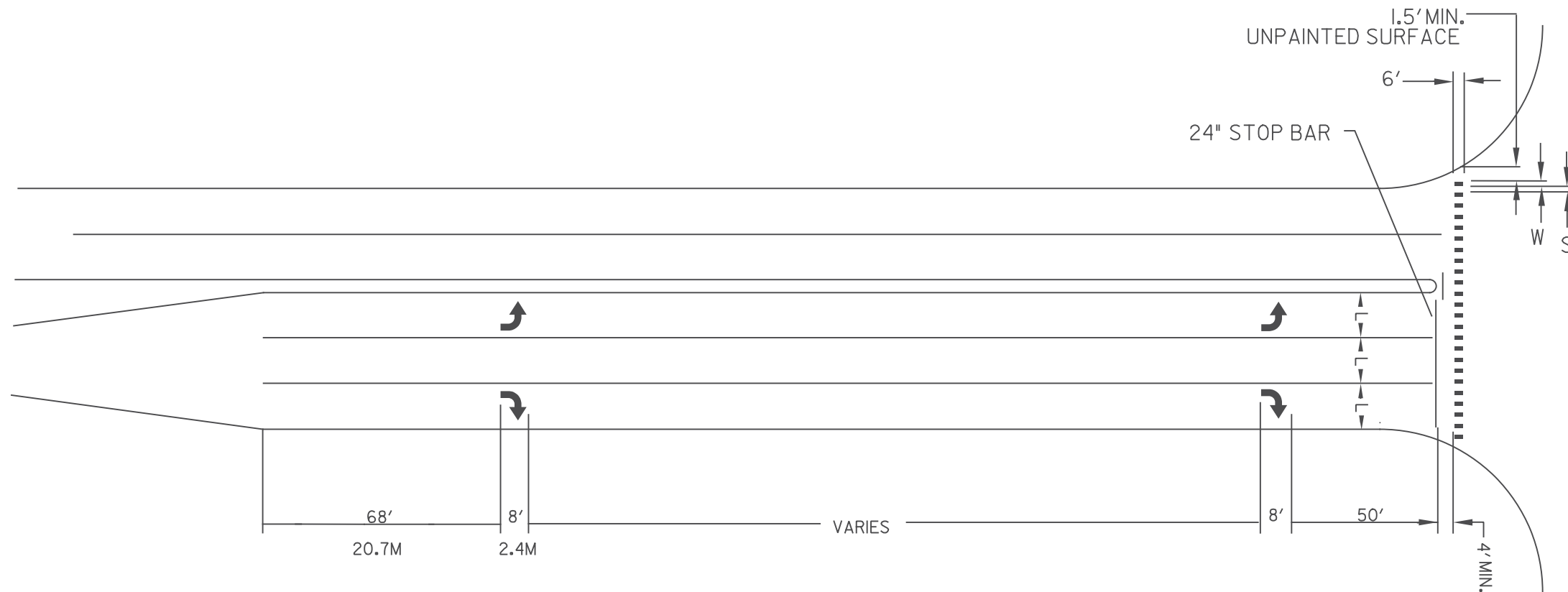


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CSAH 78 - BNSF GRADE SEPARATION

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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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PAVEMENT MARKING DETAILS
CSAH 78 - BNSF GRADE SEPARATION

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LEGEND	
	LIGHTING UNIT TYPE SPECIAL 1
	LIGHTING UNIT FURNISHED & INSTALLED BY OTHERS
	UNDERPASS LUMINAIRE TYPE LED
	HANDHOLE
	JUNCTION BOX
=====	2" NON-METALLIC CONDUIT UNLESS NOTED OTHERWISE
-----	CONDUIT F&I IN BRIDGE OR RETAINING WALL PLANS, UNLESS NOTED OTHERWISE
	INPLACE LIGHTING UNIT
	INPLACE FEED POINT CABINET


LIGHTING TABULATION				DD
NOTES	ITEM DESCRIPTION	UNIT	TOTAL	
	LIGHTING UNIT TYPE SPECIAL 1	EACH	15	
	UNDERPASS LUMINAIRES TYPE LED	EACH	8	
	LIGHT FOUNDATION DESIGN E MOD	EACH	5	
	2" NON-METALLIC CONDUIT	LIN FT	1817	
	UNDERGROUND WIRE 1 COND NO 6	LIN FT	23354	
	UNDERGROUND WIRE 1 COND NO 10	LIN FT	2601	
	JUNCTION BOX	EACH	6	
	HANDHOLE	EACH	10	
	MODIFY FEED POINT	EACH	1	
	0.75" LIQUIDTIGHT FLEXIBLE CONDUIT	LIN FT	235	
	1" LIQUIDTIGHT FLEXIBLE CONDUIT	LIN FT	12	

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1	1/9/2018	TR	SM	SM	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION

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Print Name: STEVE MCHENRY



Date 06/13/2017 License # 46710

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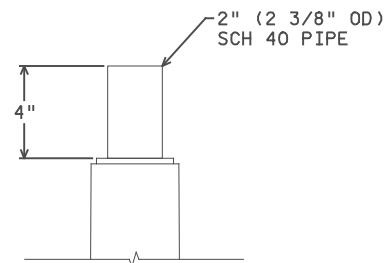
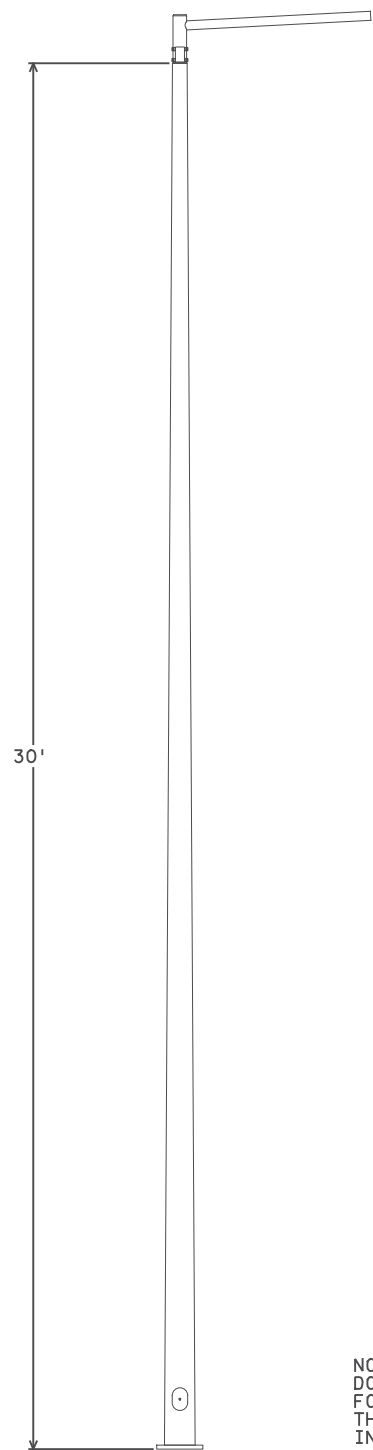
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T. RICHARDSON
DESIGNED BY
T. RICHARDSON
CHECKED BY
S. MCHENRY
COMM. NO. 0169140



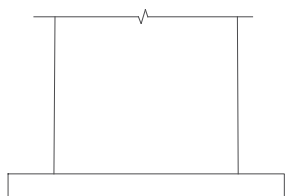
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ANOKA COUNTY
LIGHTING PLANS AND DETAILS
CSAH 78 - BNSF GRADE SEPARATION

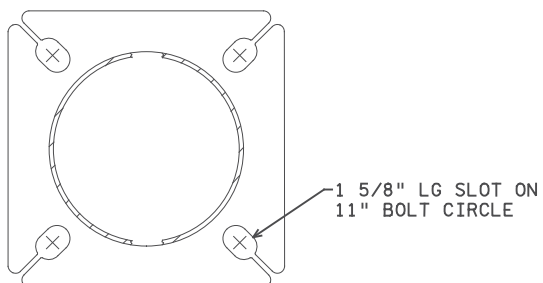
SHEET
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OF
175



POLE TOP

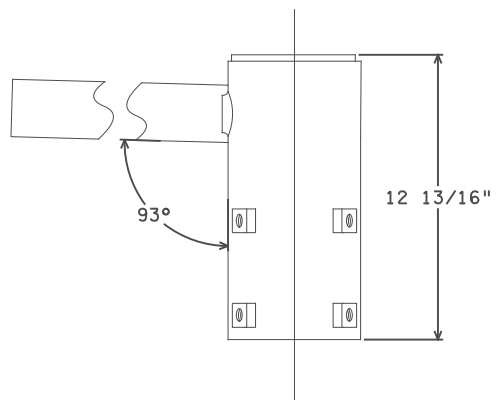


POLE BASE

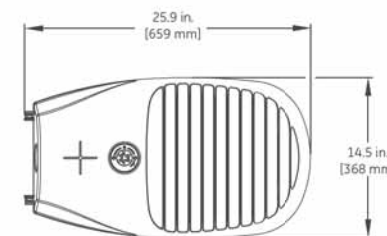
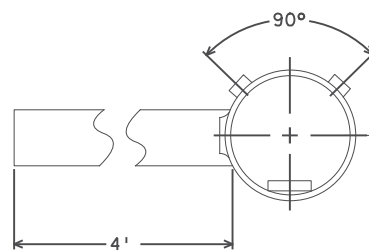


NOTE:
DO NOT GROUT BETWEEN THE BASE PLATE AND FOUNDATION. AIR MUST BE ALLOWED TO FLOW THROUGH THE POLE TO PREVENT MOISTURE INSIDE THE POLE.

LIGHT STANDARD



SPOKE ARM SR19-4 DETAIL

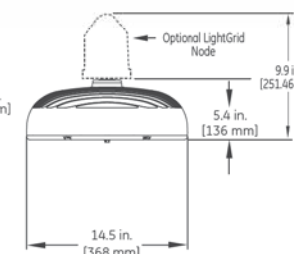
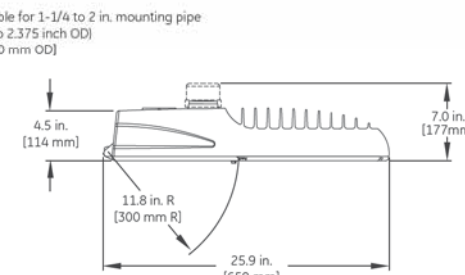


SIDE VIEW

LUMINAIRE



BACK VIEW



FRONT VIEW

LIGHTING UNIT TYPE SPECIAL 1

SEE DIVISION SL SPECIAL PROVISIONS FOR LIGHT STANDARD, ARM, AND LUMINAIRE INFORMATION

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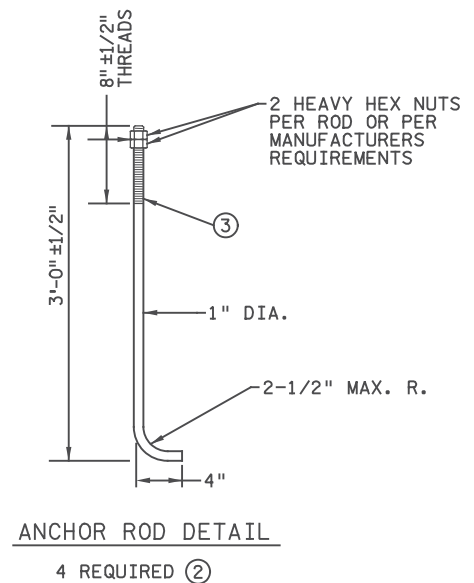
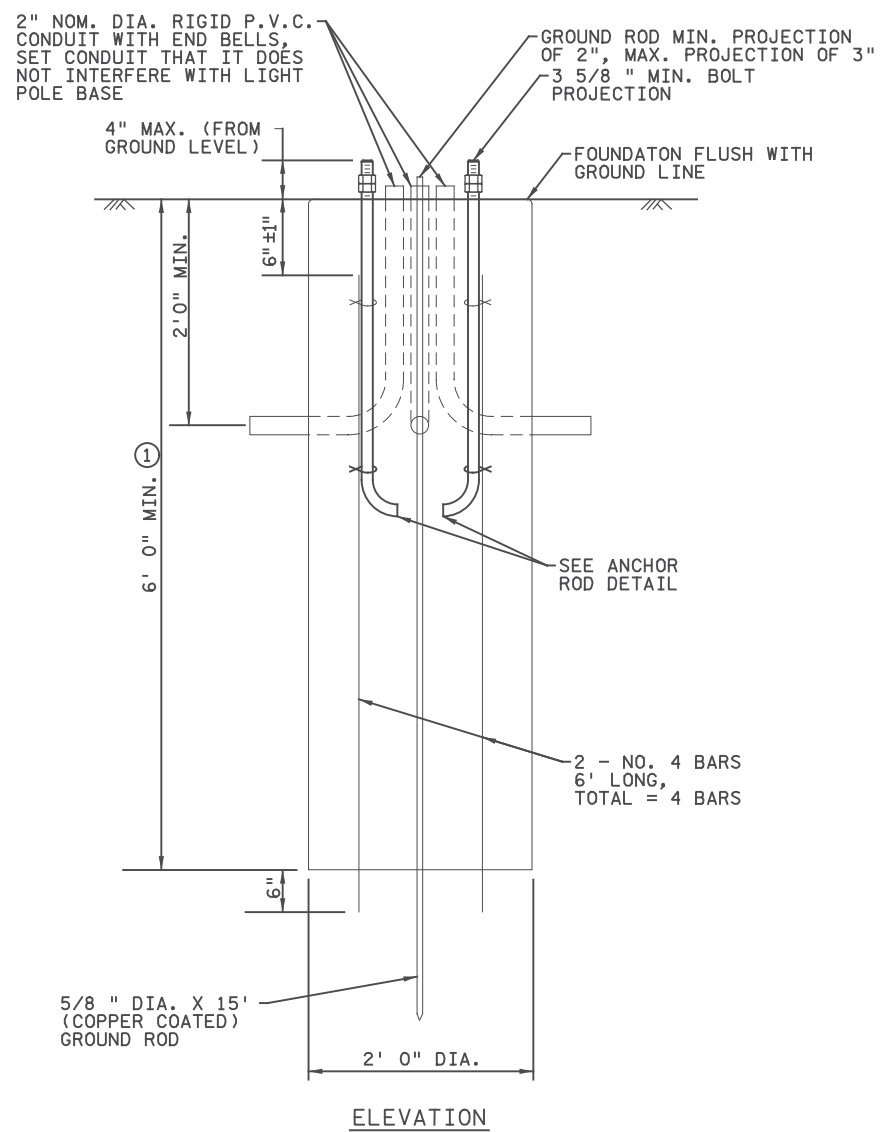
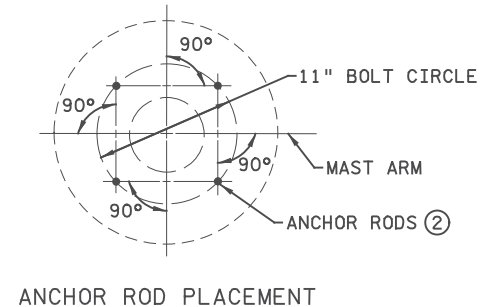
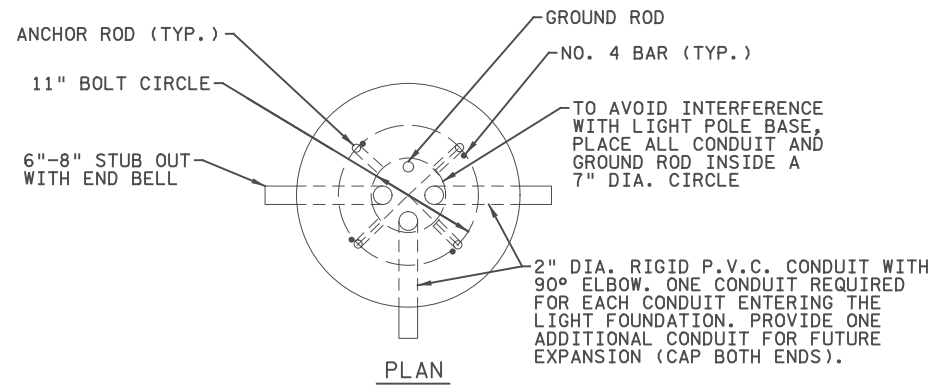
DRAWN BY T. RICHARDSON
 DESIGNED BY T. RICHARDSON
 CHECKED BY S. MCHENRY
 COMM. NO. 0169140



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 LIGHTING DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 138 OF 175



- LIGHT FOUNDATION TO BE MODIFIED AS FOLLOWS:
1. BOLT CIRCLE MODIFIED TO MATCH POLE MANUFACTURERS SPECIFICATIONS.
 2. VERIFY ANCHOR ROD REQUIREMENTS WITH POLE MANUFACTURER BEFORE POURING FOUNDATION. ANCHOR BOLTS SHALL BE PER MANUFACTURER SPECIFICATIONS.
 3. CONCRETE FOR ALL FOUNDATIONS (LIGHT FOUNDATIONS) SHALL BE SMOOTH FLAT AND LEVEL. NO MORE THAN 0.25 INCHES OF VARIABILITY COMPENSATED BY STAINLESS STEEL SHIM WASHERS WILL BE ALLOWED.

- NOTES:
- CONCRETE SHALL BE MIX NO. 3G52.
- FOUNDATIONS MAY BE CONSTRUCTED IN AUGURED HOLES UNLESS THE NATURAL SOILS WILL NOT STAND OPEN, IN WHICH CASE FORMING WILL BE REQUIRED. FORMING MAY BE INDICATED IN PLANS OR AS DIRECTED BY FIELD ENGINEER.
- OPEN END OF CONDUITS SHALL BE SEALED WITH AN APPROVED SEALING COMPOUND.
- RIGID P.V.C. CONDUIT PER SPEC. 3803 WITH BELL ENDS SHALL BE PROJECTED A MINIMUM 1/4" TO A MAXIMUM 1" ABOVE THE FOUNDATION BEFORE MORTAR IS PLACED AND SHALL BE THE SIZE AND NUMBER SHOWN IN THE PLAN.
- A RIGID TEMPLATE SHALL BE PROVIDED FOR ANCHOR ROD AND CONDUIT PLACEMENT AND SHALL BE LEFT IN PLACE UNTIL THE CONCRETE HAS SET.
- ANTI-SEIZE COMPOUND THAT MEETS MIL-PRF-907E SPEC. SHALL BE APPLIED WITH A BRUSH TO ALL THREADS.
- ALL BACK FILLING AND EXCAVATION AROUND FOUNDATION MUST BE IN ACCORDANCE WITH 2451 AND 2545.3.
- AN ALTERNATE PRECAST FOUNDATION MAY BE USED WITH THE ENGINEERS APPROVAL.
- ① THE DEPTH OF THE FOUNDATION MAY VARY IN THE PLANS OR SPECIAL PROVISIONS.
 - ② ANCHOR RODS, NUTS AND WASHERS PER SPEC. 3385, TYPE B, SHALL BE PLACED AT RIGHT ANGLES TO THE DIRECTION OF THE MAST ARM. GALVANIZE THE TOP 1 FT. OF THE ANCHOR ROD AND NUTS PER SPEC. 3392, AND PER POLE MANUFACTURERS REQUIREMENTS.
 - ③ WRAP THREADS OF ANCHOR RODS ABOVE THE BOTTOM NUT WITH VINYL ELECTRICAL TAPE TO AVOID CONTAMINATION DURING CONCRETE POURING. WRAP THREADS OF ANCHOR RODS WITH 3 LAYERS OF VINYL ELECTRICAL TAPE 2" BELOW THE BOTTOM NUTS.

LIGHT FOUNDATION DESIGN E MODIFIED
CAST IN PLACE
(NOT TO SCALE)

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: STEVE MCHENRY
Steve Mchenry
Date: 06/13/2017 License #: 46710

STATE AID PROJECT NO 002-678-023, 114-020-051
DRAWN BY T. RICHARDSON
DESIGNED BY T. RICHARDSON
CHECKED BY S. MCHENRY
COMM. NO. 0169140

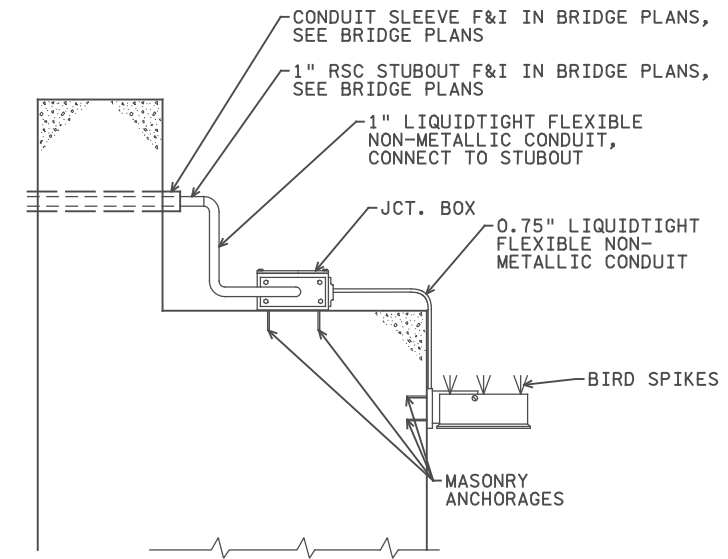
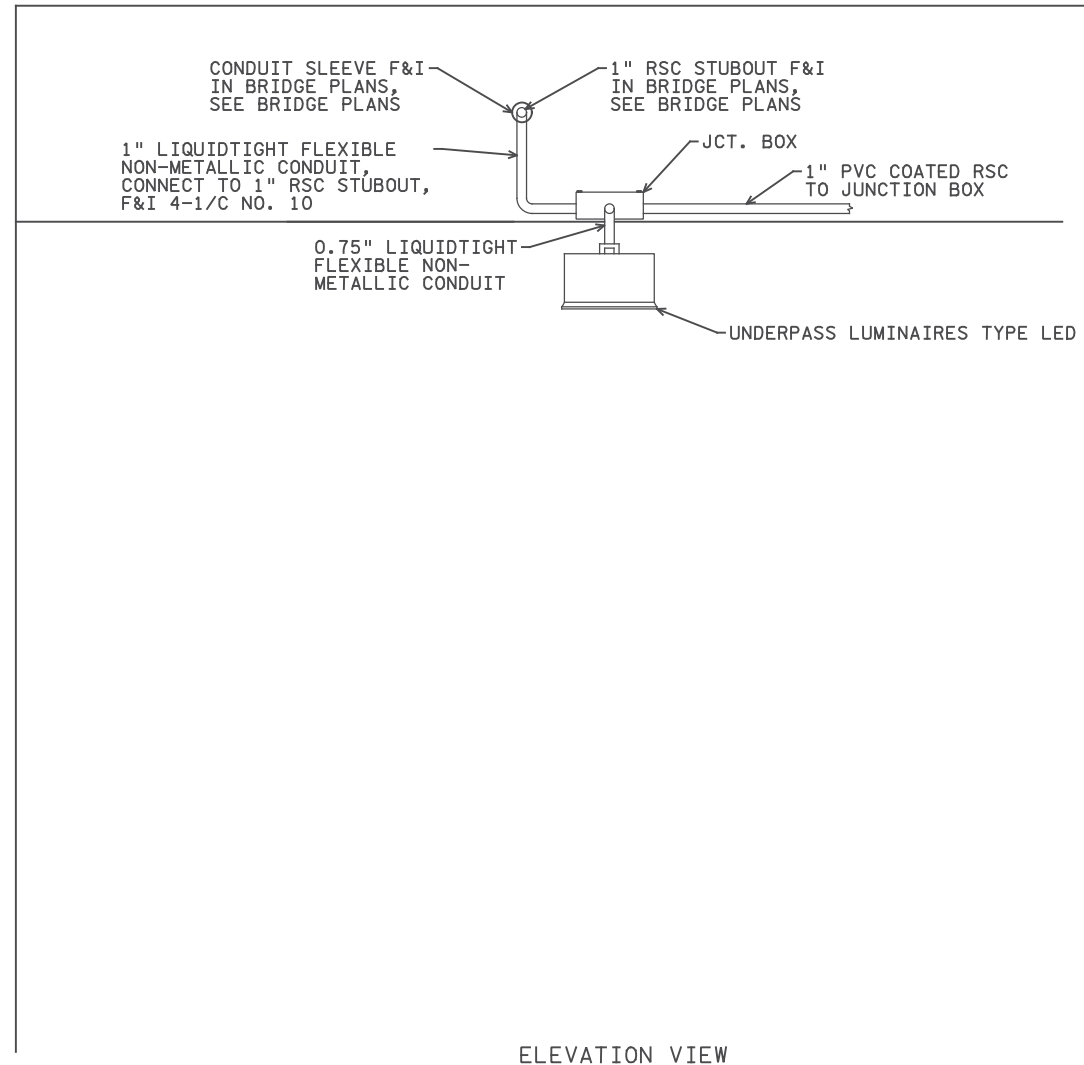


ANOKA COUNTY
LIGHTING PLANS AND DETAILS
CSAH 78 - BNSF GRADE SEPARATION

SHEET 139 OF 175

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NO	DATE	BY	CKD	APPR	REVISION



SECTION VIEW

- NOTES:
1. PLACE JUNCTION BOXES IN ACCORDANCE WITH 3838.
 2. FASTEN PVC COATED RIGID STEEL CONDUIT WITH STAINLESS STEEL TWO HOLE STRAPS APPROXIMATELY 5'-0" ON CENTER.
 3. FASTEN STRAPS, UNDERPASS LUMINAIRES AND JUNCTION BOXES TO CONCRETE WITH STAINLESS STEEL MASONRY ANCHORAGES OR POWDER ACTIVATED STUDS.
 4. SEE BRIDGE PLANS FOR LUMINAIRE MOUNTING HEIGHT AND LOCATION.

TYPICAL UNDERPASS LUMINAIRES TYPE LED DETAIL
AT RAILROAD BRIDGE 02589 ABUTMENT

(NOT TO SCALE)

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NO	DATE	BY	CKD	APPR	REVISION

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Date 06/13/2017 License # 46710

STATE AID PROJECT NO
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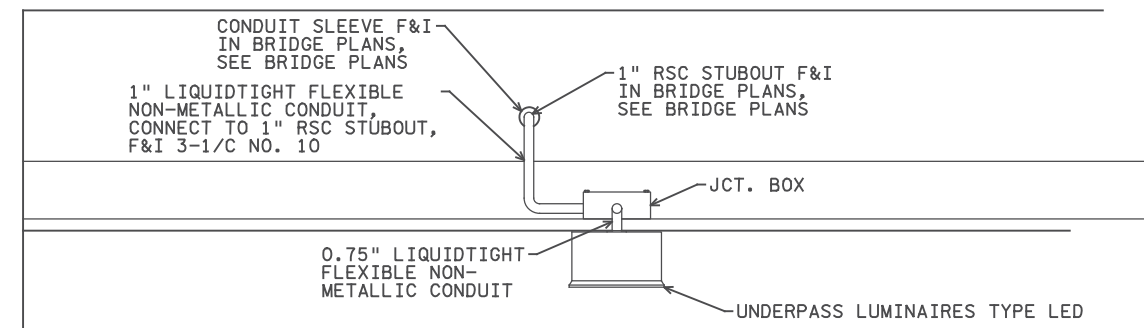
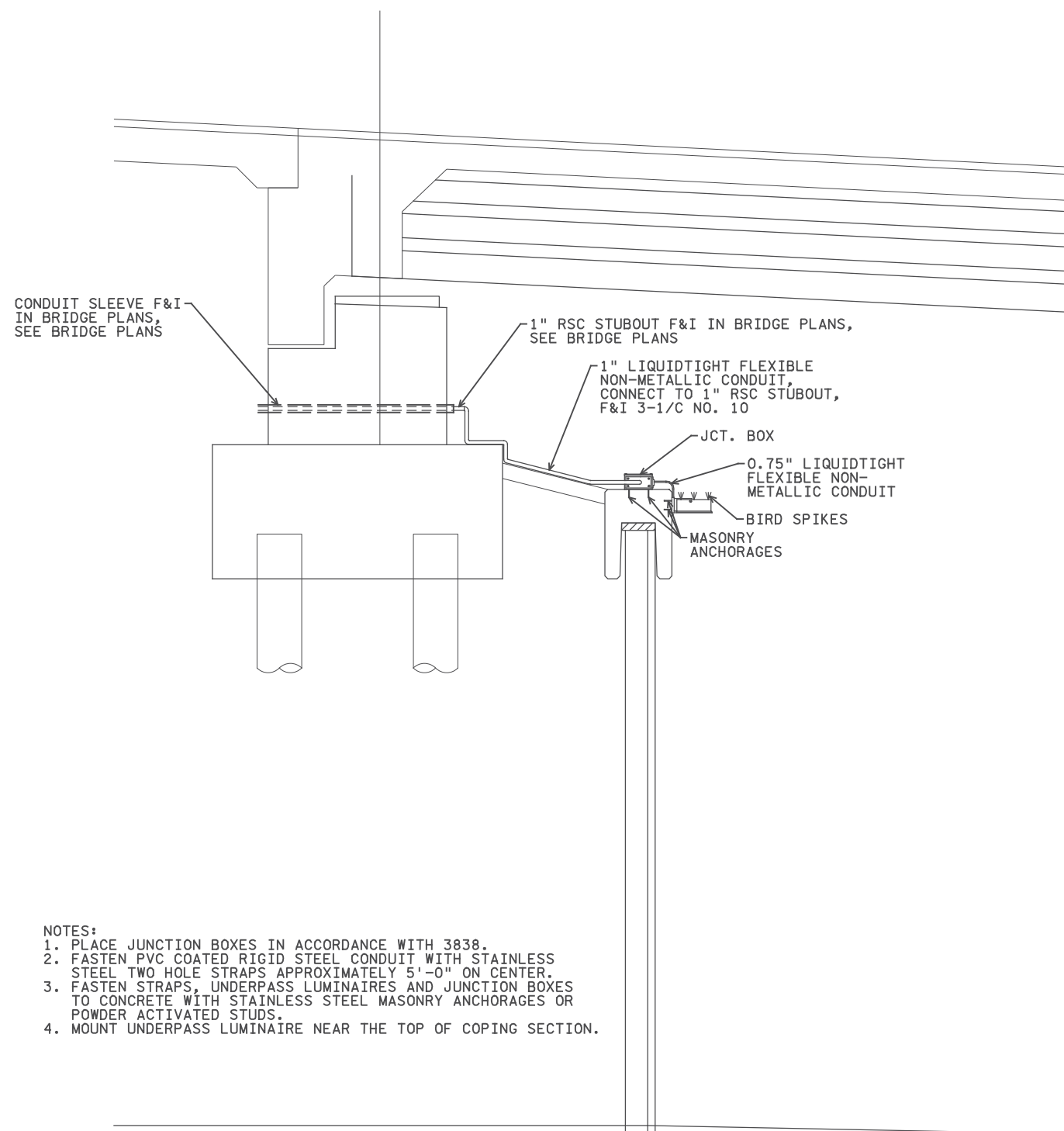
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ANOKA COUNTY
LIGHTING PLANS AND DETAILS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
140
OF
175



- NOTES:
1. PLACE JUNCTION BOXES IN ACCORDANCE WITH 3838.
 2. FASTEN PVC COATED RIGID STEEL CONDUIT WITH STAINLESS STEEL TWO HOLE STRAPS APPROXIMATELY 5'-0" ON CENTER.
 3. FASTEN STRAPS, UNDERPASS LUMINAIRES AND JUNCTION BOXES TO CONCRETE WITH STAINLESS STEEL MASONRY ANCHORAGES OR POWDER ACTIVATED STUDS.
 4. MOUNT UNDERPASS LUMINAIRE NEAR THE TOP OF COPING SECTION.

SECTION VIEW

ELEVATION VIEW

TYPICAL UNDERPASS LUMINAIRES TYPE LED DETAIL FOR RETAINING WALLS G AND H

(NOT TO SCALE)

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NO	DATE	BY	CKD	APPR	REVISION

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COMM. NO. 0169140



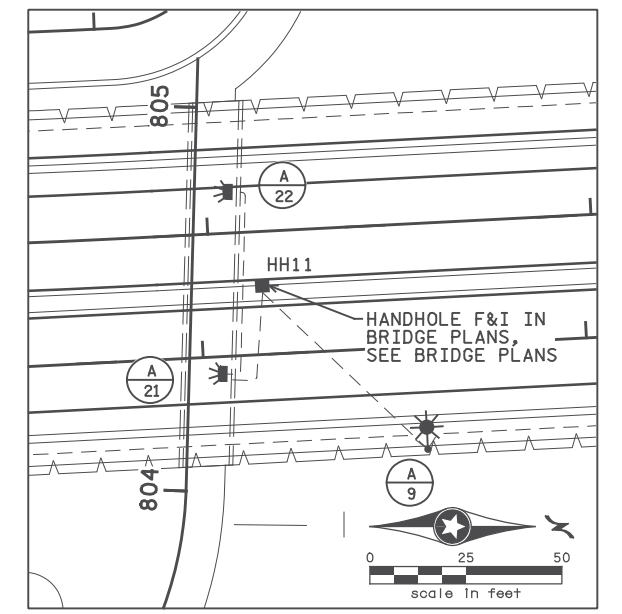
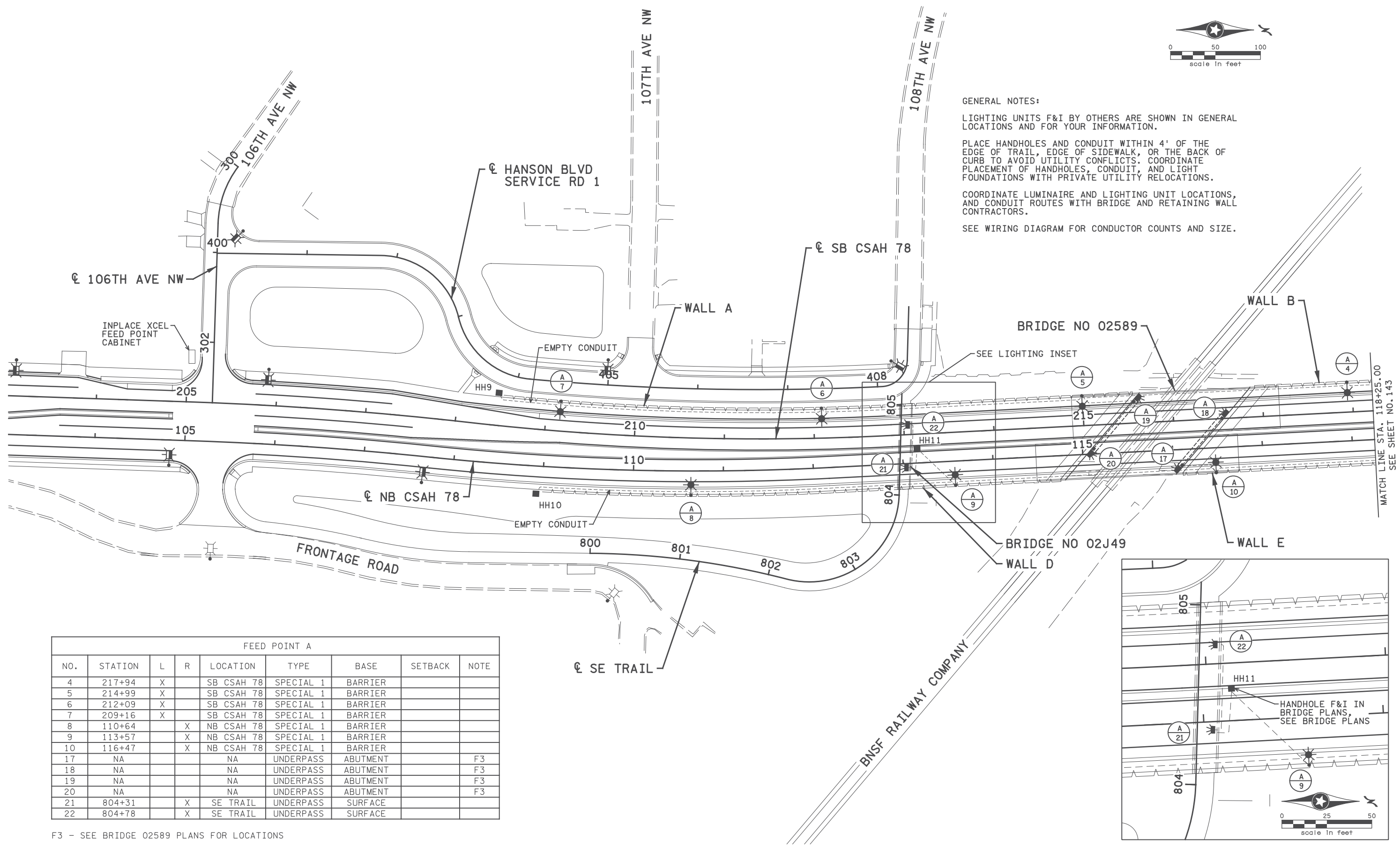
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ANOKA COUNTY
LIGHTING PLANS AND DETAILS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
141
OF
175



GENERAL NOTES:
 LIGHTING UNITS F&I BY OTHERS ARE SHOWN IN GENERAL LOCATIONS AND FOR YOUR INFORMATION.
 PLACE HANDHOLES AND CONDUIT WITHIN 4' OF THE EDGE OF TRAIL, EDGE OF SIDEWALK, OR THE BACK OF CURB TO AVOID UTILITY CONFLICTS. COORDINATE PLACEMENT OF HANDHOLES, CONDUIT, AND LIGHT FOUNDATIONS WITH PRIVATE UTILITY RELOCATIONS.
 COORDINATE LUMINAIRE AND LIGHTING UNIT LOCATIONS, AND CONDUIT ROUTES WITH BRIDGE AND RETAINING WALL CONTRACTORS.
 SEE WIRING DIAGRAM FOR CONDUCTOR COUNTS AND SIZE.



FEED POINT A								
NO.	STATION	L	R	LOCATION	TYPE	BASE	SETBACK	NOTE
4	217+94	X		SB CSAH 78	SPECIAL 1	BARRIER		
5	214+99	X		SB CSAH 78	SPECIAL 1	BARRIER		
6	212+09	X		SB CSAH 78	SPECIAL 1	BARRIER		
7	209+16	X		SB CSAH 78	SPECIAL 1	BARRIER		
8	110+64		X	NB CSAH 78	SPECIAL 1	BARRIER		
9	113+57		X	NB CSAH 78	SPECIAL 1	BARRIER		
10	116+47		X	NB CSAH 78	SPECIAL 1	BARRIER		
17	NA			NA	UNDERPASS	ABUTMENT		F3
18	NA			NA	UNDERPASS	ABUTMENT		F3
19	NA			NA	UNDERPASS	ABUTMENT		F3
20	NA			NA	UNDERPASS	ABUTMENT		F3
21	804+31		X	SE TRAIL	UNDERPASS	SURFACE		
22	804+78		X	SE TRAIL	UNDERPASS	SURFACE		

F3 - SEE BRIDGE 02589 PLANS FOR LOCATIONS

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1	1/9/2018	TR	SM	SM	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION
...

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 Print Name: STEVE MCHENRY
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STATE AID PROJECT NO 002-678-023, 114-020-051
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 DESIGNED BY T. RICHARDSON
 CHECKED BY S. MCHENRY
 COMM. NO. 0169140

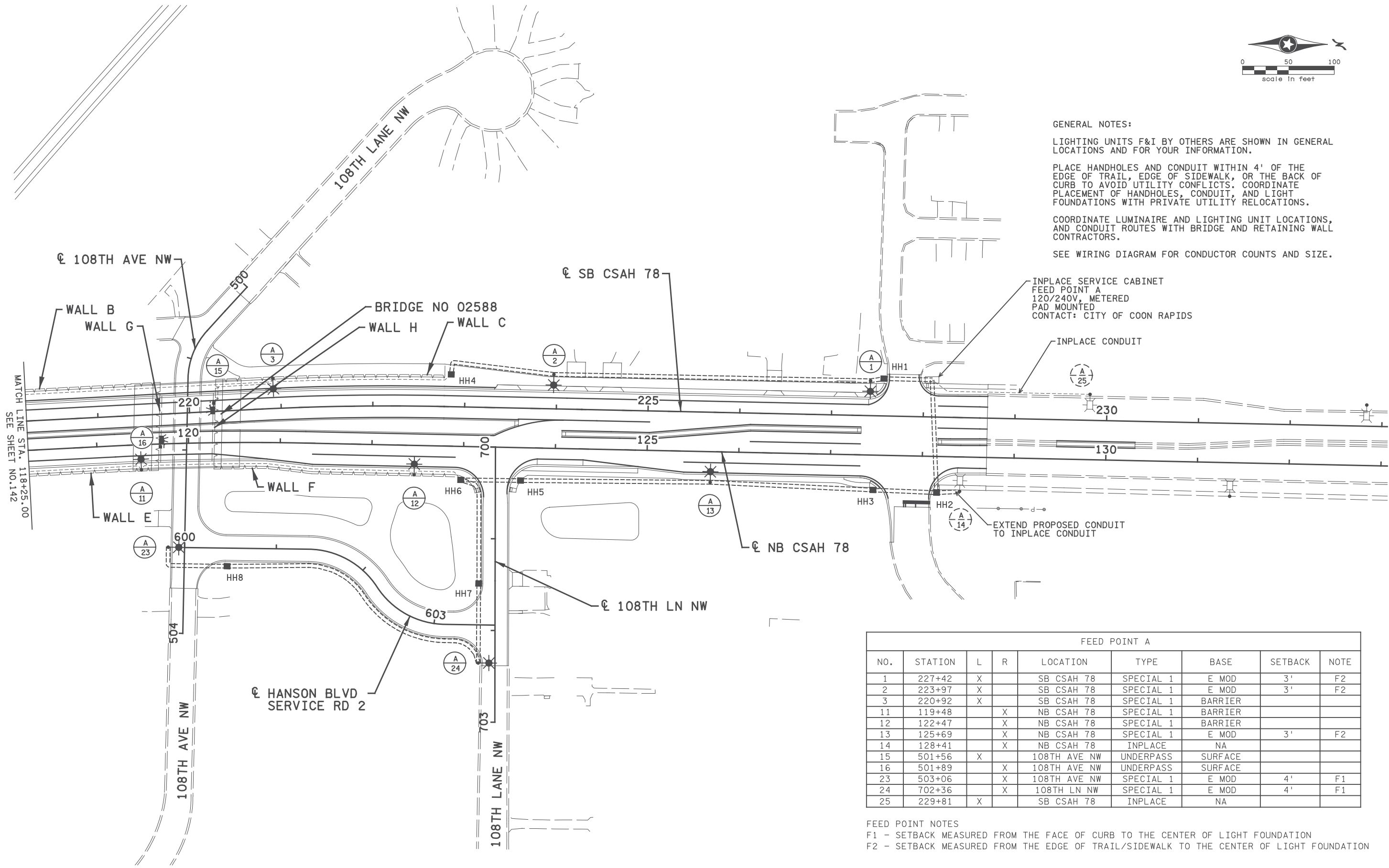


ANOKA COUNTY
 LIGHTING PLANS AND DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 142R OF 175



GENERAL NOTES:
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 PLACE HANDHOLES AND CONDUIT WITHIN 4' OF THE EDGE OF TRAIL, EDGE OF SIDEWALK, OR THE BACK OF CURB TO AVOID UTILITY CONFLICTS. COORDINATE PLACEMENT OF HANDHOLES, CONDUIT, AND LIGHT FOUNDATIONS WITH PRIVATE UTILITY RELOCATIONS.
 COORDINATE LUMINAIRE AND LIGHTING UNIT LOCATIONS, AND CONDUIT ROUTES WITH BRIDGE AND RETAINING WALL CONTRACTORS.
 SEE WIRING DIAGRAM FOR CONDUCTOR COUNTS AND SIZE.



INPLACE SERVICE CABINET
 FEED POINT A
 120/240V, METERED
 PAD MOUNTED
 CONTACT: CITY OF COON RAPIDS

EXTEND PROPOSED CONDUIT
 TO INPLACE CONDUIT

FEED POINT A								
NO.	STATION	L	R	LOCATION	TYPE	BASE	SETBACK	NOTE
1	227+42	X		SB CSAH 78	SPECIAL 1	E MOD	3'	F2
2	223+97	X		SB CSAH 78	SPECIAL 1	E MOD	3'	F2
3	220+92	X		SB CSAH 78	SPECIAL 1	BARRIER		
11	119+48		X	NB CSAH 78	SPECIAL 1	BARRIER		
12	122+47		X	NB CSAH 78	SPECIAL 1	BARRIER		
13	125+69		X	NB CSAH 78	SPECIAL 1	E MOD	3'	F2
14	128+41		X	NB CSAH 78	INPLACE	NA		
15	501+56	X		108TH AVE NW	UNDERPASS	SURFACE		
16	501+89		X	108TH AVE NW	UNDERPASS	SURFACE		
23	503+06		X	108TH AVE NW	SPECIAL 1	E MOD	4'	F1
24	702+36		X	108TH LN NW	SPECIAL 1	E MOD	4'	F1
25	229+81	X		SB CSAH 78	INPLACE	NA		

FEED POINT NOTES
 F1 - SETBACK MEASURED FROM THE FACE OF CURB TO THE CENTER OF LIGHT FOUNDATION
 F2 - SETBACK MEASURED FROM THE EDGE OF TRAIL/SIDEWALK TO THE CENTER OF LIGHT FOUNDATION

3:47:58 PM
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NO	DATE	BY	CKD	APPR	REVISION

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STATE AID PROJECT NO
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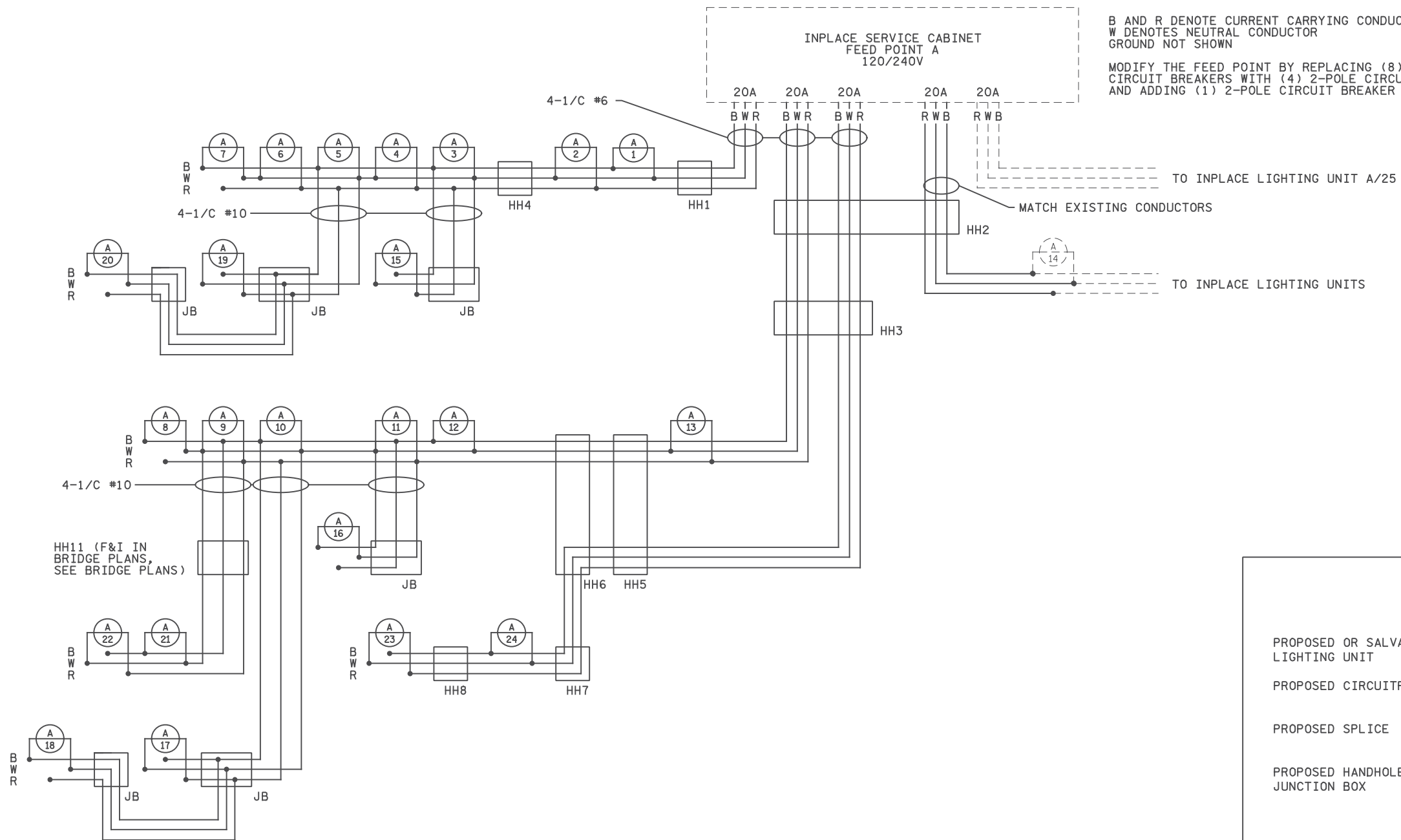
DRAWN BY
 T. RICHARDSON
 DESIGNED BY
 T. RICHARDSON
 CHECKED BY
 S. MCHENRY
 COMM. NO. 0169140



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ANOKA COUNTY
 LIGHTING PLANS AND DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

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 175



B AND R DENOTE CURRENT CARRYING CONDUCTORS
 W DENOTES NEUTRAL CONDUCTOR
 GROUND NOT SHOWN

MODIFY THE FEED POINT BY REPLACING (8) SINGLE-POLE
 CIRCUIT BREAKERS WITH (4) 2-POLE CIRCUIT BREAKERS,
 AND ADDING (1) 2-POLE CIRCUIT BREAKER

TO INPLACE LIGHTING UNIT A/25

MATCH EXISTING CONDUCTORS

TO INPLACE LIGHTING UNITS

LEGEND

PROPOSED OR SALVAGED
 LIGHTING UNIT



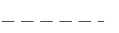
INPLACE LIGHTING UNIT



PROPOSED CIRCUITRY



INPLACE CIRCUITRY



PROPOSED SPLICE



INPLACE SPLICE



PROPOSED HANDHOLE OR
 JUNCTION BOX



INPLACE HANDHOLE OR
 JUNCTION BOX



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NO	DATE	BY	CKD	APPR	REVISION

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STATE AID PROJECT NO
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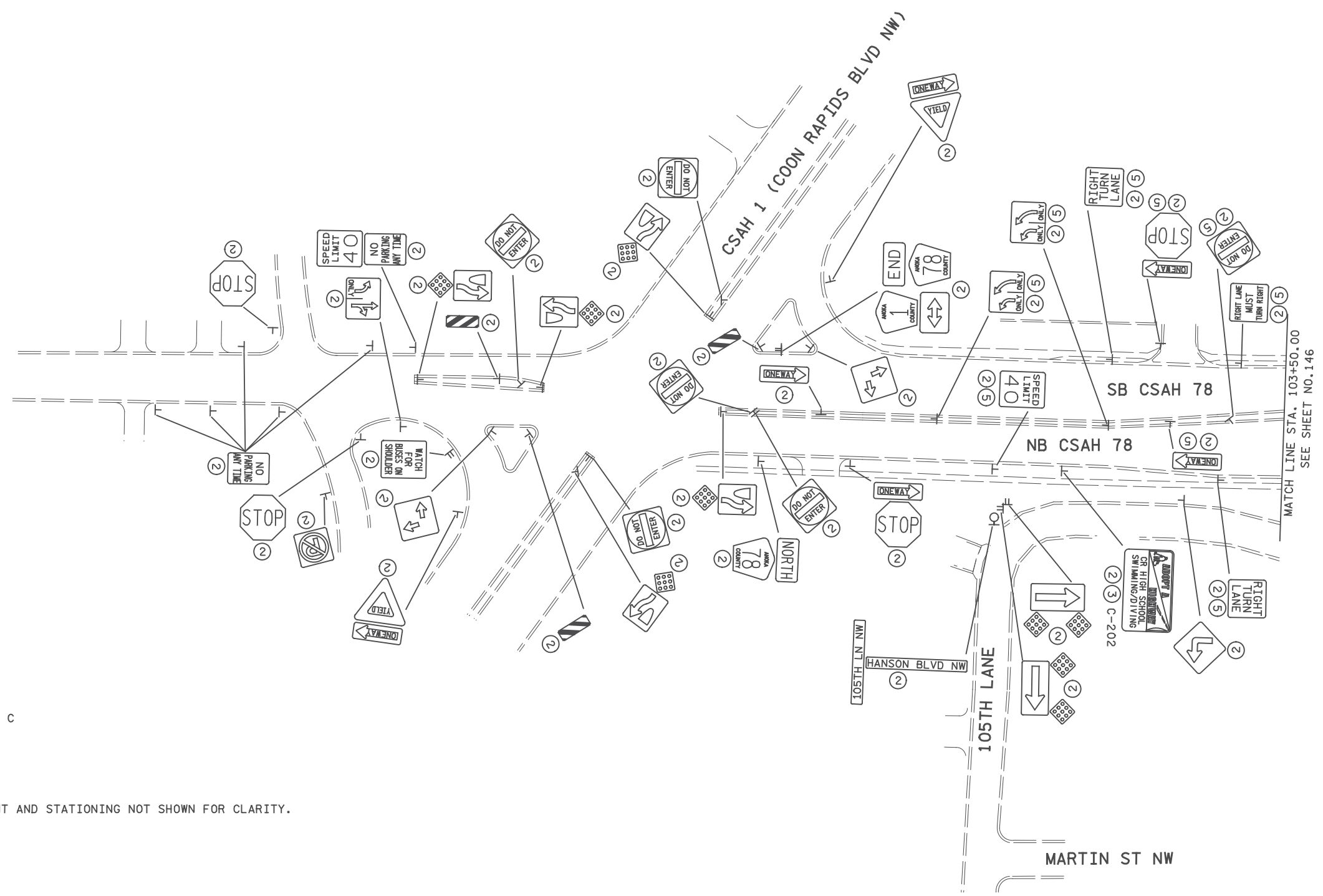
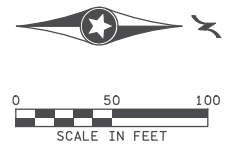
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 DESIGNED BY
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ANOKA COUNTY
 LIGHTING PLANS AND DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 144
 OF
 175



- NOTES:**
- ② INPLACE
 - ③ SALVAGE
 - ⑤ REMOVE SIGN TYPE C

GENERAL NOTES:
CENTERLINE ALIGNMENT AND STATIONING NOT SHOWN FOR CLARITY.

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date 6/13/2017 License # 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG

DESIGNED BY
T. SMITH

CHECKED BY
B. ROBECK

COMM. NO. 0169140

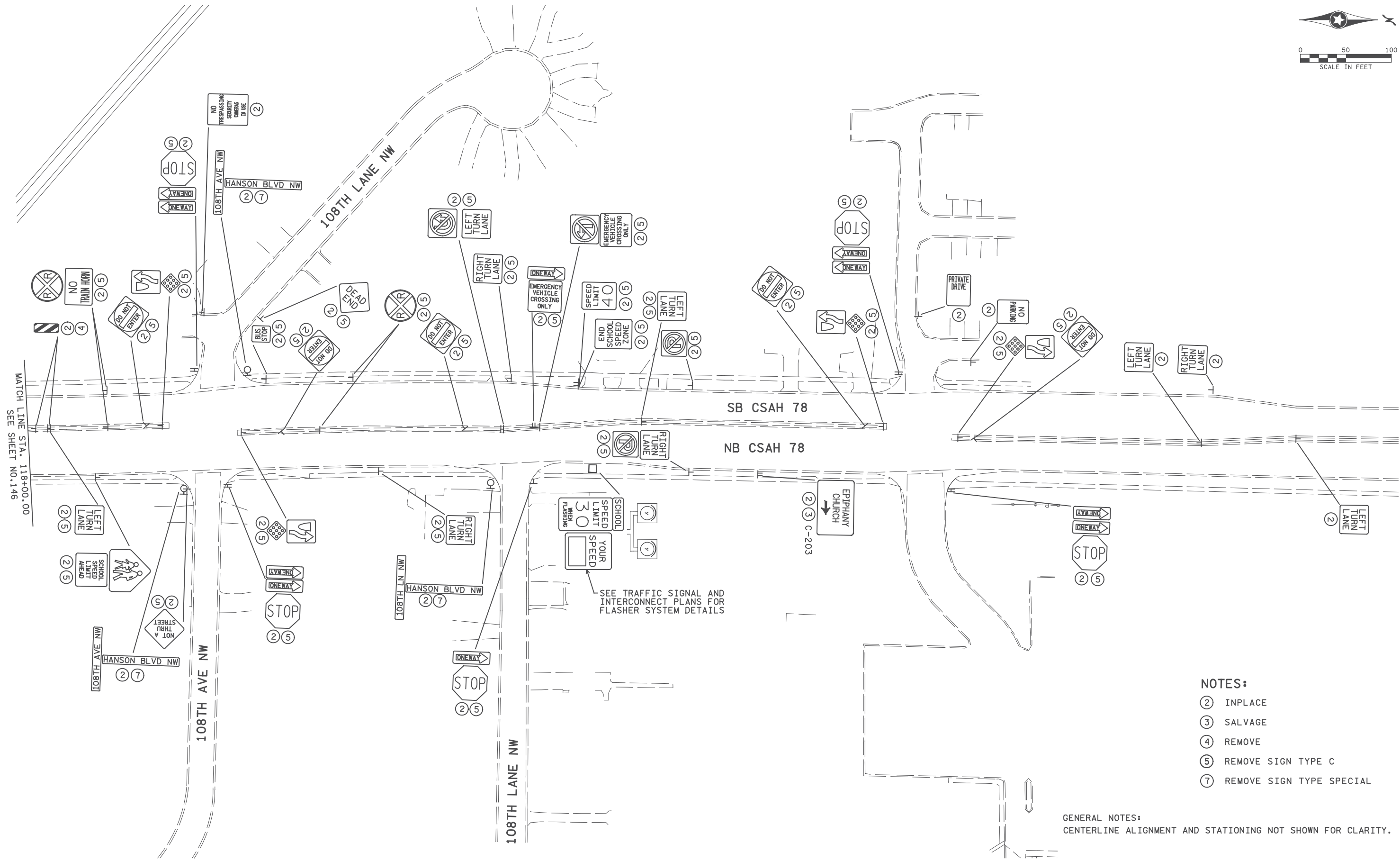


ANOKA COUNTY
SIGNING REMOVAL PLANS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
145
OF
175



0 50 100
SCALE IN FEET



- NOTES:**
- ② INPLACE
 - ③ SALVAGE
 - ④ REMOVE
 - ⑤ REMOVE SIGN TYPE C
 - ⑦ REMOVE SIGN TYPE SPECIAL

GENERAL NOTES:
CENTERLINE ALIGNMENT AND STATIONING NOT SHOWN FOR CLARITY.

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NO	DATE	BY	CKD	APPR	REVISION

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CHECKED BY
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COMM. NO. 0169140



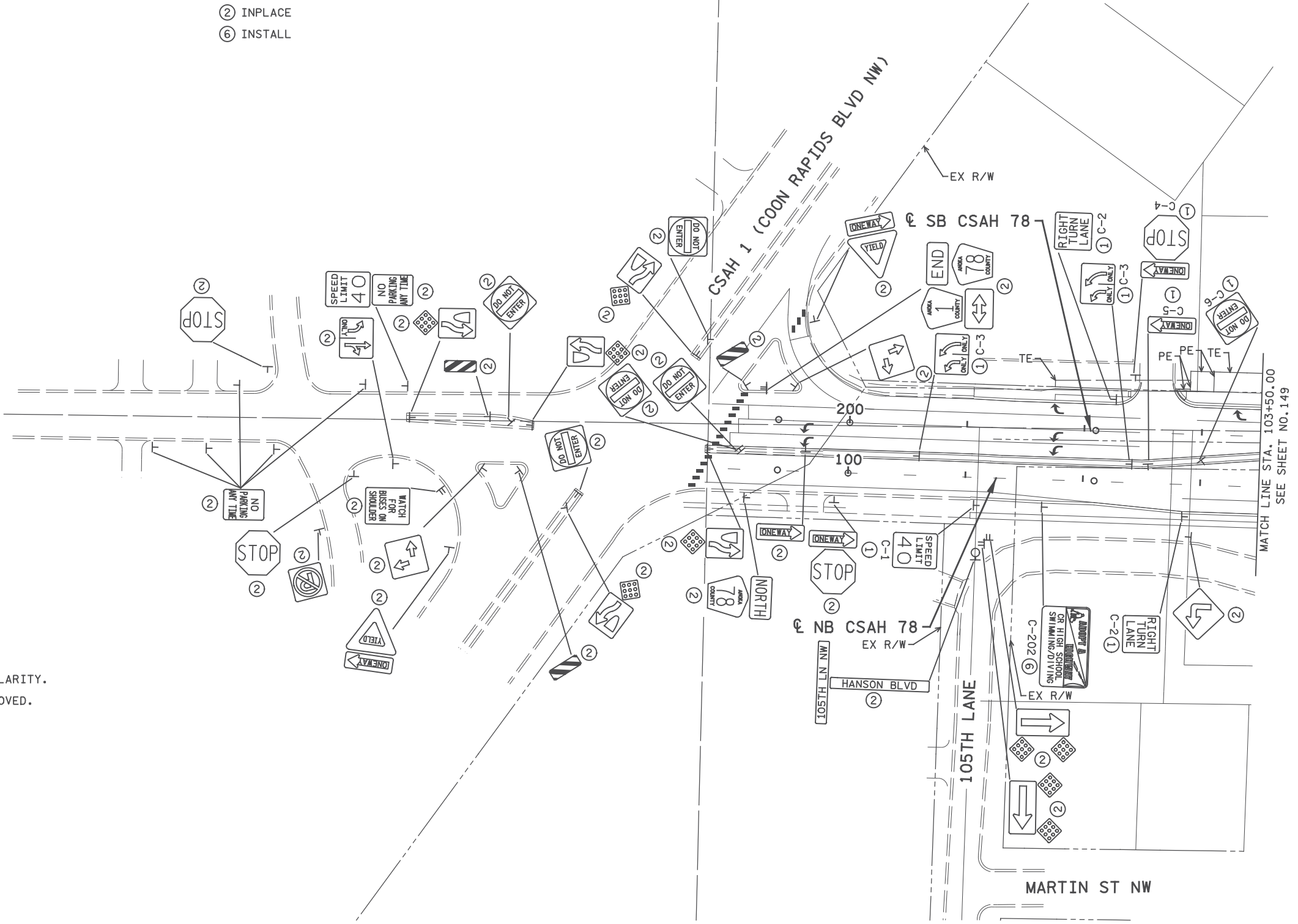
ANOKA COUNTY
SIGNING REMOVAL PLANS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
147
OF
175



- NOTES:
- ① FURNISH AND INSTALL
 - ② INPLACE
 - ⑥ INSTALL

GENERAL NOTES:
 CENTERLINE ALIGNMENT NOT SHOWN FOR CLARITY.
 ALL CONFLICTING SIGNING SHALL BE REMOVED.



MATCH LINE STA. 103+50.00
SEE SHEET NO. 149

3:11:53 PM
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NO	DATE	BY	CKD	APPR	REVISION

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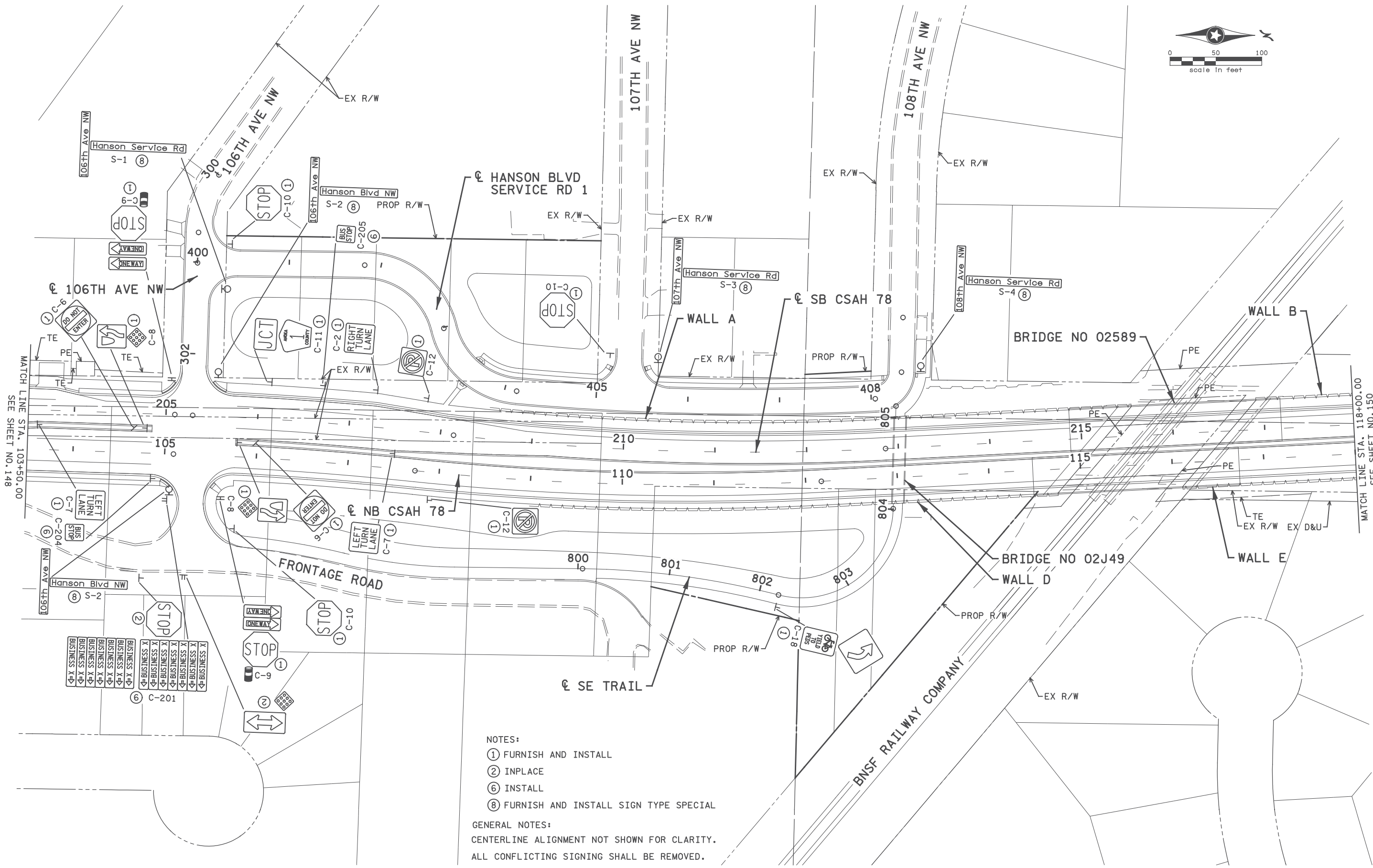
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 SIGNING PLANS AND DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 148
 OF
 175



MATCH LINE STA. 103+50.00
SEE SHEET NO. 148

MATCH LINE STA. 118+00.00
SEE SHEET NO. 150

NOTES:
 ① FURNISH AND INSTALL
 ② INPLACE
 ⑥ INSTALL
 ⑧ FURNISH AND INSTALL SIGN TYPE SPECIAL

GENERAL NOTES:
 CENTERLINE ALIGNMENT NOT SHOWN FOR CLARITY.
 ALL CONFLICTING SIGNING SHALL BE REMOVED.

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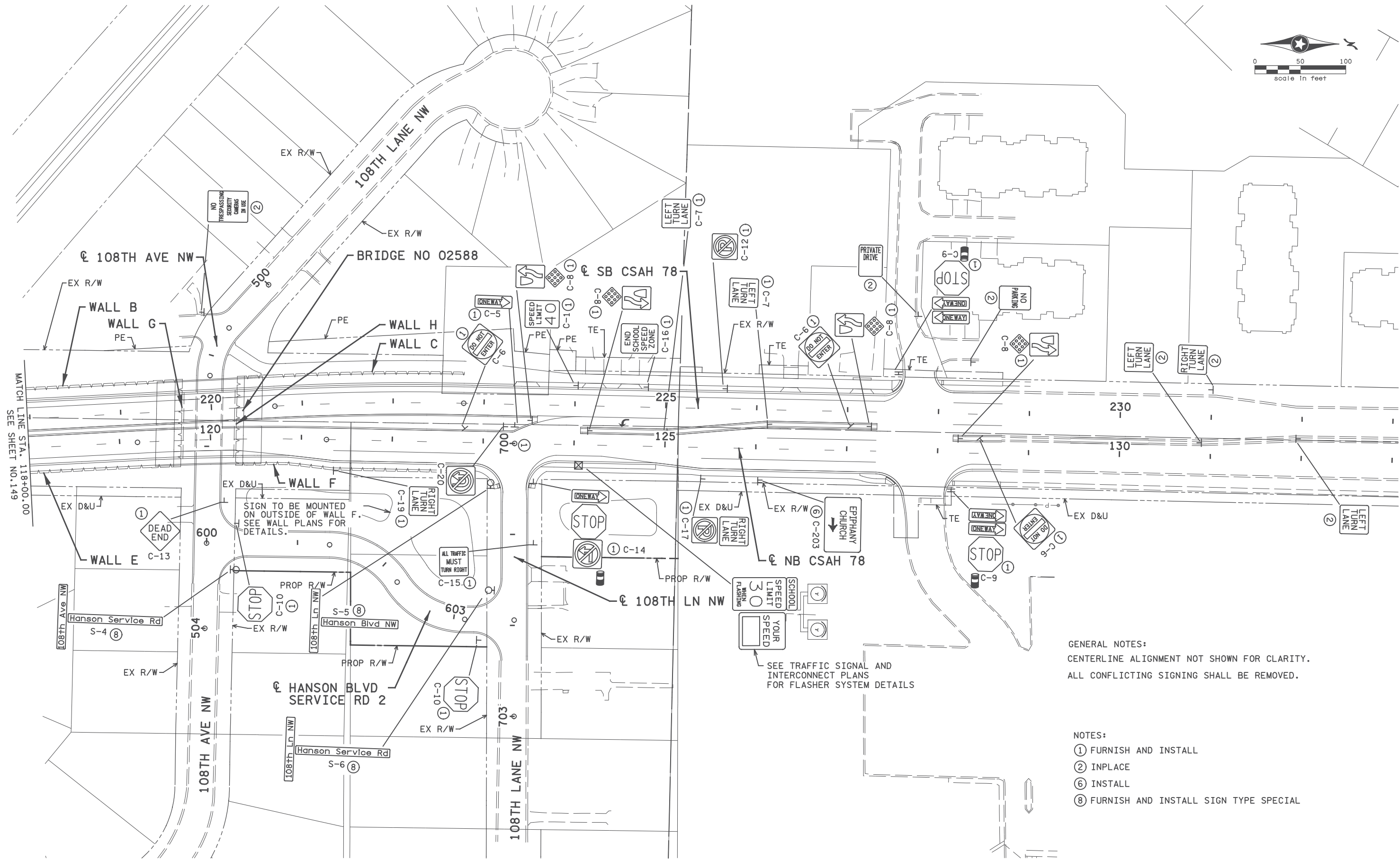
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 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 149
 OF
 175



GENERAL NOTES:
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- NOTES:
- ① FURNISH AND INSTALL
 - ② INPLACE
 - ⑥ INSTALL
 - ⑧ FURNISH AND INSTALL SIGN TYPE SPECIAL

SEE TRAFFIC SIGNAL AND INTERCONNECT PLANS FOR FLASHER SYSTEM DETAILS

SIGN TO BE MOUNTED ON OUTSIDE OF WALL F. SEE WALL PLANS FOR DETAILS.

MATCH LINE STA. 118+00.00 SEE SHEET NO. 149

1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
---	----------	----	----	----	--

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ANOKA COUNTY
 SIGNING PLANS AND DETAILS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET 150R OF 175

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SIGN PANELS TYPE SPECIAL											AA
SIGN NO	QTY	POSTS		MTG HT	PANEL						
		NO & TYPE	LENGTH		SIZE	AREA	TOTAL AREA	CODE NO	LEGEND (3)		
										FEET	FEET
S-1	1	1-0	12	9	40	x	9	2.50	2.50	S-1	106th Ave NW
					40	x	9	2.50	2.50	S-1	106th Ave NW
					64	x	9	4.00	4.00	S-2	Hanson Service Rd
					64	x	9	4.00	4.00	S-2	Hanson Service Rd
S-2	2	1-0	12	9	40	x	9	2.50	5.00	S-1	106th Ave NW
					40	x	9	2.50	5.00	S-1	106th Ave NW
					48	x	9	3.00	6.00	S-3	Hanson Blvd NW
					48	x	9	3.00	6.00	S-3	Hanson Blvd NW
S-3	1	1-0	12	9	40	x	9	2.50	2.50	S-4	107th Ave NW
					40	x	9	2.50	2.50	S-4	107th Ave NW
					64	x	9	4.00	4.00	S-2	Hanson Service Rd
					64	x	9	4.00	4.00	S-2	Hanson Service Rd
S-4	2	1-0	12	9	40	x	9	2.50	5.00	S-5	108th Ave NW
					40	x	9	2.50	5.00	S-5	108th Ave NW
					64	x	9	4.00	8.00	S-2	Hanson Service Rd
					64	x	9	4.00	8.00	S-2	Hanson Service Rd
S-5	1	1-0	12	9	38	x	9	2.38	2.38	S-6	108th Ln NW
					38	x	9	2.38	2.38	S-6	108th Ln NW
					48	x	9	3.00	3.00	S-3	Hanson Blvd NW
					48	x	9	3.00	3.00	S-3	Hanson Blvd NW
S-6	1	1-0	12	9	38	x	9	2.38	2.38	S-6	108th Ln NW
					38	x	9	2.38	2.38	S-6	108th Ln NW
					64	x	9	4.00	4.00	S-2	Hanson Service Rd
					64	x	9	4.00	4.00	S-2	Hanson Service Rd
TOTAL								97.5			

SIGN PANELS TYPE C										X
SIGN NO	QTY	POSTS		MTG HT (1)	PANEL					
		NO & TYPE	LENGTH		SIZE	AREA	TOTAL AREA	CODE NO	LEGEND	
										FEET
C-1	2	1-U	13	7	24 x 30	5.00	10.00	R2-1	SPEED LIMIT 40	
C-2	3	1-U	13	7	30 x 30	6.25	18.75	R3-X1	RIGHT TURN LANE	
(4) C-3	2	1-ST	11	7	36 x 30	7.50	15.00	R3-8AB	LEFT TURN ONLY (TWO LANES)	
C-4	1	1-U	16	7	30 x 30	6.25	6.25	R1-1	STOP	
(4) C-5	2	1-ST	9	7	36 x 12	3.00	6.00	R6-1R	ONE WAY (RIGHT)	
(4) C-6	6	1-ST	11	7	30 x 30	6.25	37.50	R5-1	DO NOT ENTER	
(4) C-7	4	1-ST	11	7	30 x 30	6.25	25.00	R3-X2	LEFT TURN LANE	
(4) C-8	6	1-ST	11	7	24 x 30	5.00	30.00	R4-7	KEEP RIGHT	
				4	18 x 18 (2)			X4-2	TYPE 1 OBJECT MARKER	(2)
(2) C-9	4	1-U	17	7	30 x 30	6.25	25.00	R1-1	STOP	
					36 x 12	3.00	12.00	R6-1R	ONE WAY (RIGHT)	(3)
					36 x 12	3.00	12.00	R6-1L	ONE WAY (LEFT)	(3)
C-10	5	1-U	13	7	30 x 30	6.25	31.25	R1-1	STOP	
C-11	1	1-U	16	7	21 x 15	2.19	2.19	M2-1a	JCT	
C-12	3	1-U	13	7	24 x 24	4.00	4.00	M1-6	ANOKA COUNTY 1	
C-13	1	1-U	13	7	30 x 30	6.25	6.25	R8-3	NO PARKING	
					24 x 24	4.00	4.00	W14-1	DEAD END	
(2) C-14	1	1-U	18	7	30 x 30	6.25	6.25	R1-1	STOP	
					36 x 12	3.00	3.00	R6-1L	ONE WAY (RIGHT)	
					24 x 24	4.00	4.00	R3-2	NO LEFT TURN	
C-15	1	1-U	14	7	36 x 36	9.00	9.00	R3-7AR	ALL TRAFFIC MUST TURN RIGHT	
C-16	1	1-U	15	7	24 x 30	5.00	5.00	R2-7a	END SCHOOL SPEED ZONE	
C-17	1	1-U	17	7	30 x 30	6.25	6.25	R3-X1	RIGHT TURN LANE	
					24 x 24	4.00	4.00	R8-3a	NO PARKING	
C-18	1	1-U	14	7	18 x 18	2.25	2.25	W1-2L	CURVE LEFT	
					12 x 18	1.50	1.50	R9-6	YIELD TO PEDS	
(5) C-19	1	1-0	14	8	30 x 30	6.25	(6)	R3-X1	RIGHT TURN LANE	
(4) C-20	1	1-ST	13	7	24 x 24	4.00	4.00	R3-4	NO U-TURN	
TOTAL								301.4		

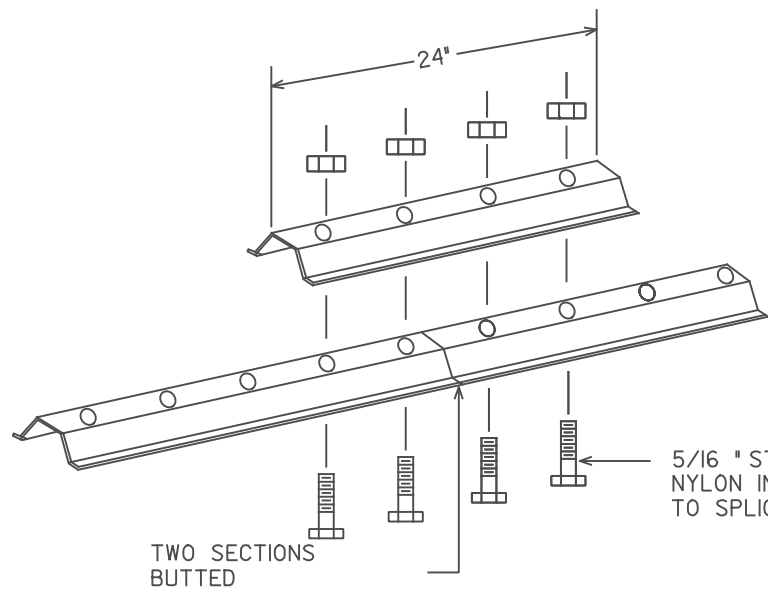
- GENERAL NOTES:
- POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.
 - SEE SHEETS 148 TO 150R FOR SIGN PLACEMENT DETAILS.
 - SEE SHEET 152 FOR STRUCTURAL DETAILS.
 - SEE MNDOT STANDARD SIGNS AND MARKING MANUAL FOR PUNCHING CODE AND DETAILED DRAWINGS OF TYPE C SIGN PANELS.

- SPECIFIC NOTES:
- MOUNTING HEIGHT IS MINIMUM. SEE SHEET 152 - 154 FOR TYPICAL MOUNTING.
 - SEE DELINEATORS AND MARKERS TABULATION.
 - MOUNT BACK TO BACK.
 - MOUNT IN CONCRETE, SEE SHEET 153R FOR DETAIL.
 - SIGN LOCATED ADJACENT TO NB CSAH 78, JUST NORTH OF BR. NO. 02588, SHALL BE MOUNTED ON THE OUTSIDE OF WALL F. SEE WALL PLANS FOR DETAILS.
 - QUANTITY PAID FOR AS "SIGN TYPE C (BRIDGE MOUNTED)".

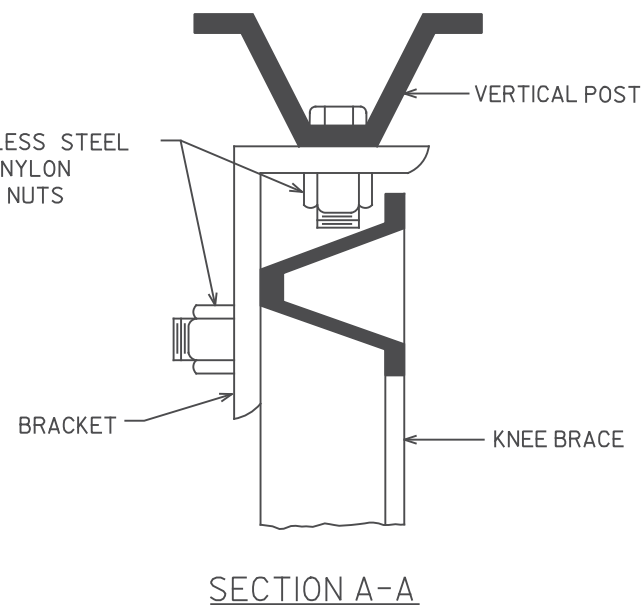
DELINEATORS AND MARKERS			CC
TYPE	LOCATION	QUANTITY	
X4-13 (WHITE)	SIGN PANELS TYPE C-9	4	
X4-13 (WHITE)	SIGN PANELS TYPE C-14	1	
X4-2 (OM1-1)	SIGN PANELS TYPE C-8	6	
TOTAL		11	

SALVAGE AND INSTALL SIGN TYPE C			Z
SGN NO	SALVAGE SIGN TYPE C	INSTALL SIGN TYPE C	
	EACH	EACH	
C-201	1	1	
C-202	1	1	
C-203	1	1	
C-204	1	1	
C-205	1	1	
PROJECT TOTALS	5	5	

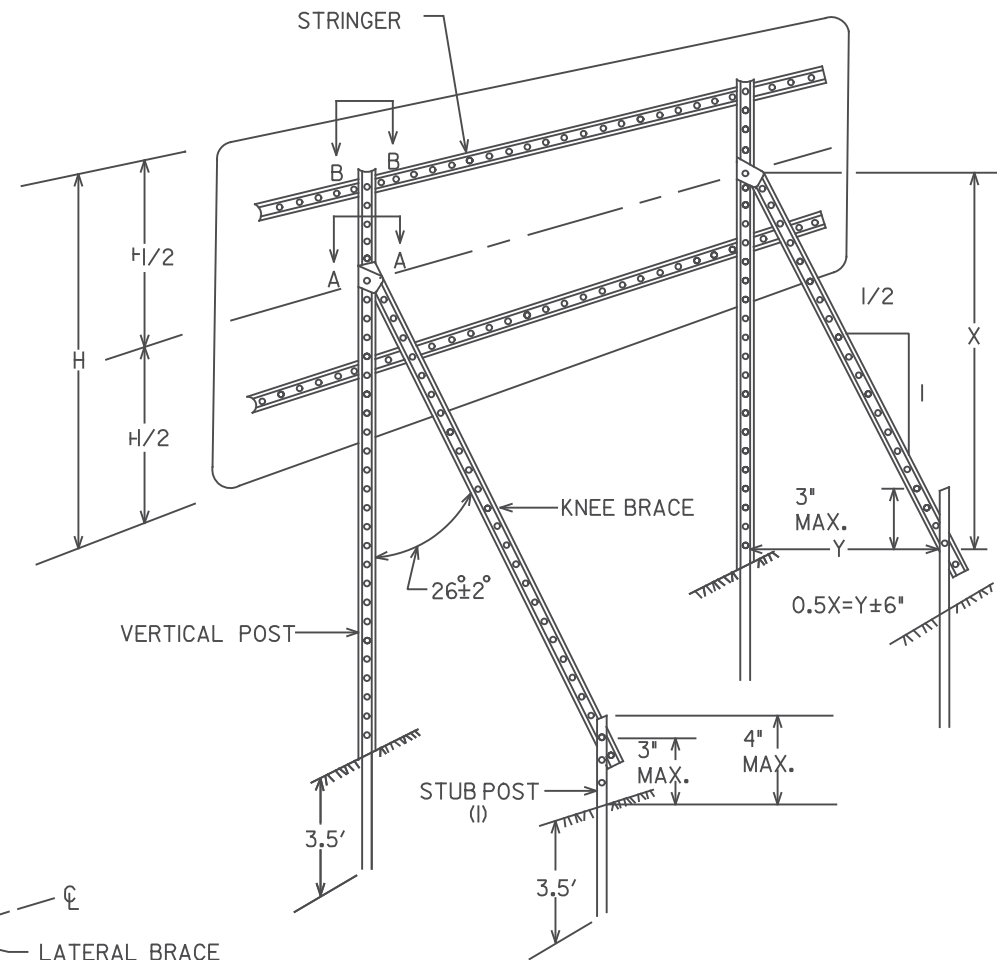
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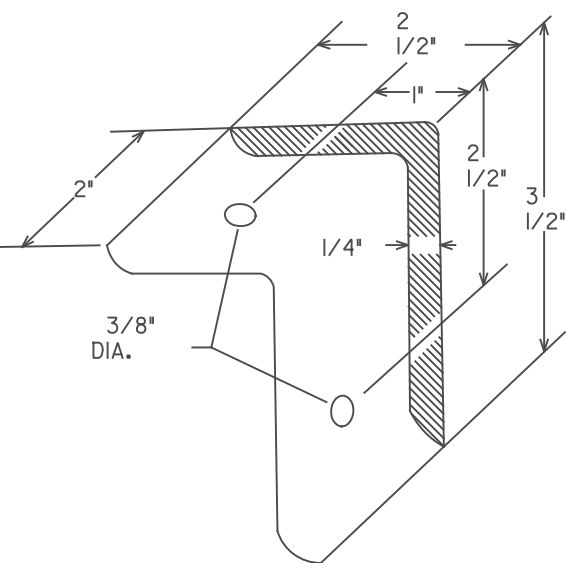
LATERAL BRACE OR STRINGER
SPLICE DETAIL (EXPLODED VIEW)



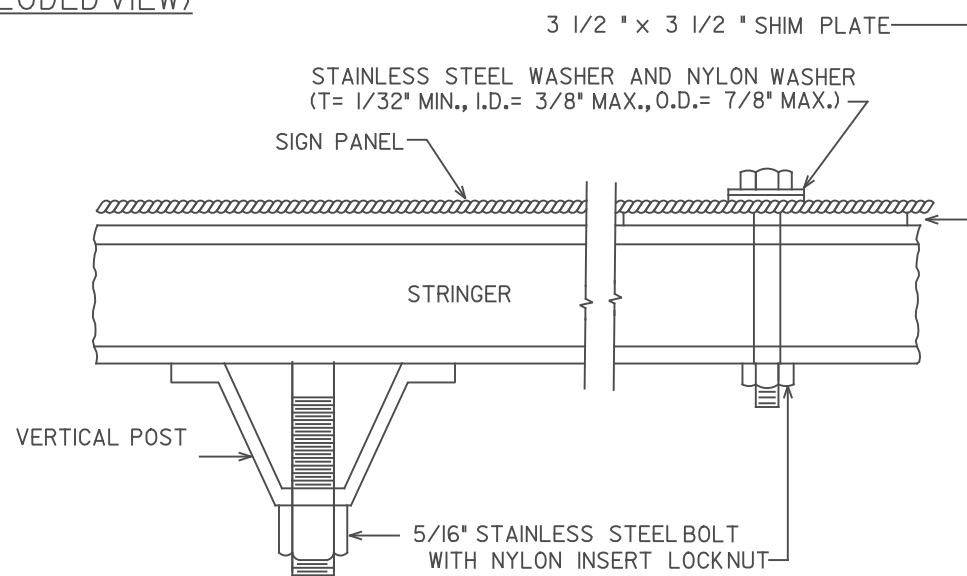
SECTION A-A



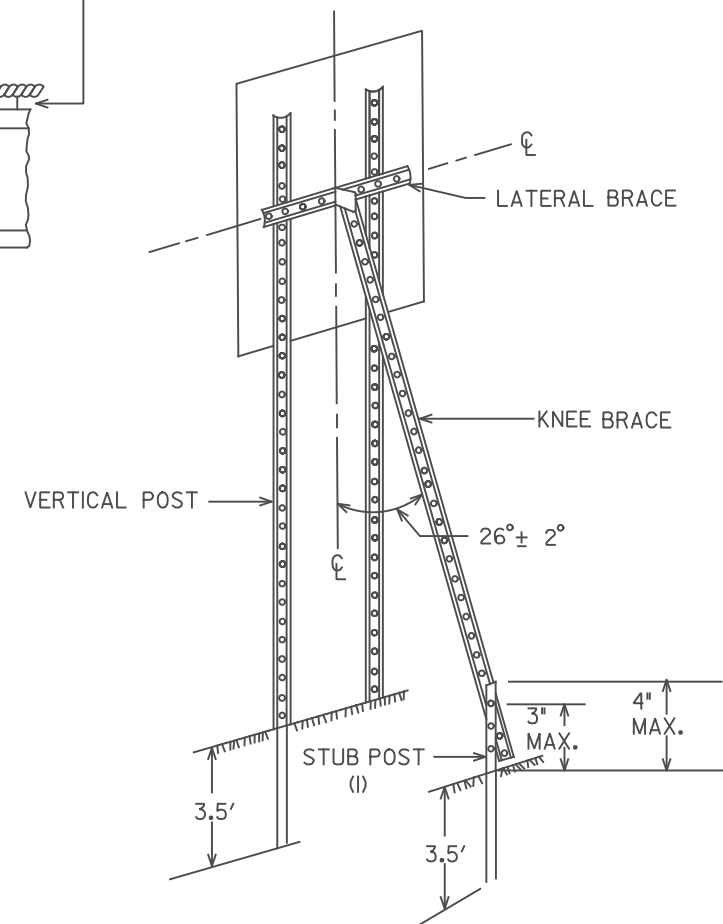
TYPICAL "A-FRAME" INSTALLATION
TYPE "D" SIGNS



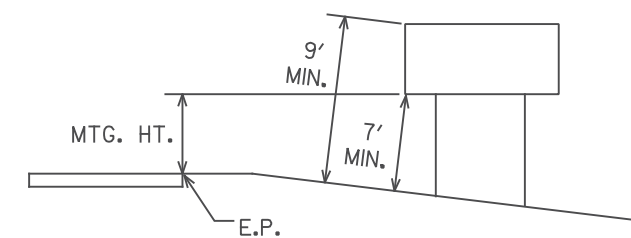
A-FRAME BRACKET
(STEEL MN/DOT 3306 GALVANIZED PER MN/DOT 3394)



SECTION B-B



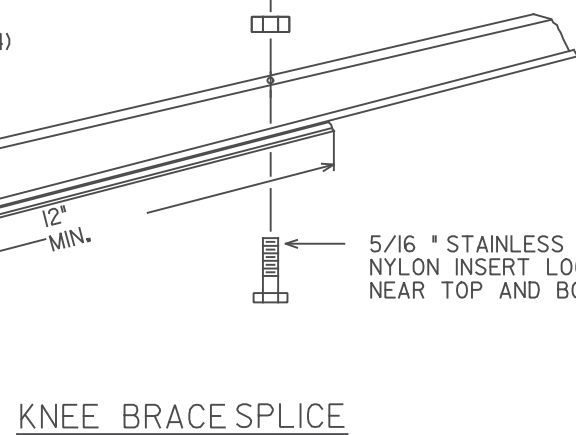
TYPICAL "A-FRAME" INSTALLATION
TYPE "C" SIGNS



TYPICAL MOUNTING

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

TYPE C & D SIGN
STRUCTURAL DETAILS



KNEE BRACE SPLICE

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: BENJAMIN P ROBECK
Ben Robeck
Date: 6/13/2017 License #: 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

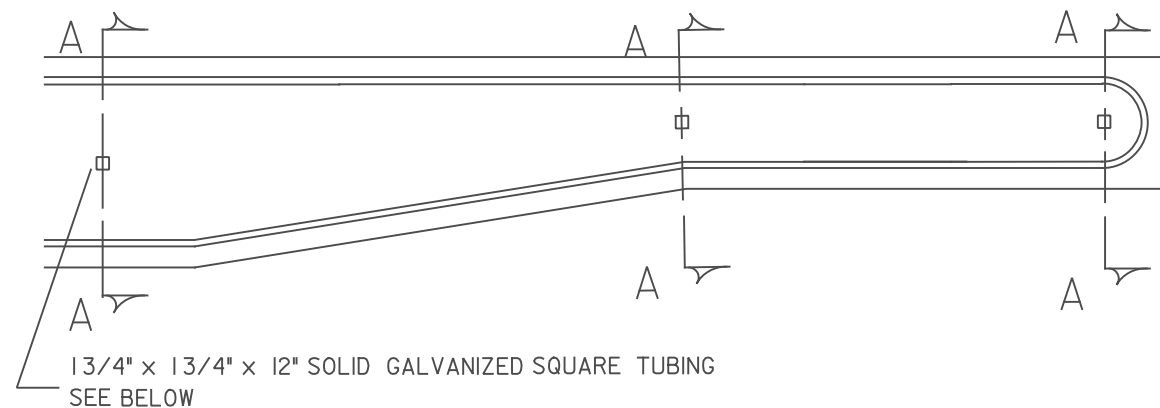
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S. VANG
DESIGNED BY
T. SMITH
CHECKED BY
B. ROBECK
COMM. NO. 0169140



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PLANNERS
DESIGNERS

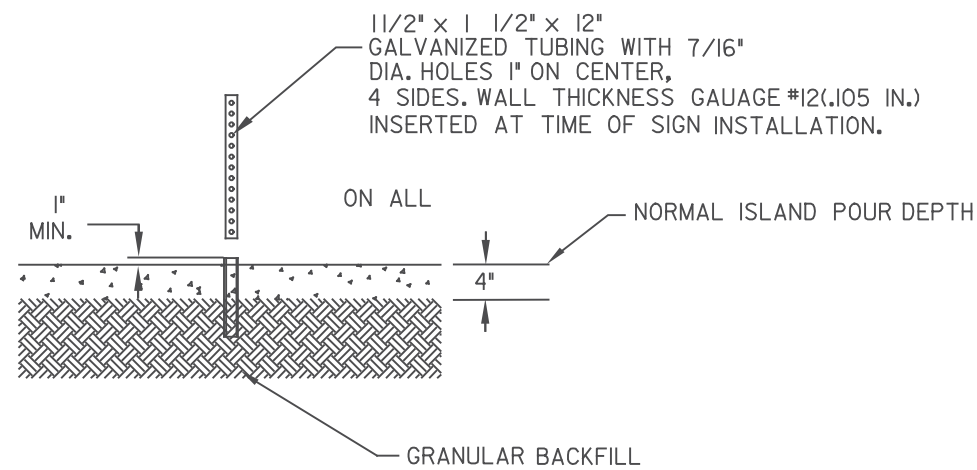
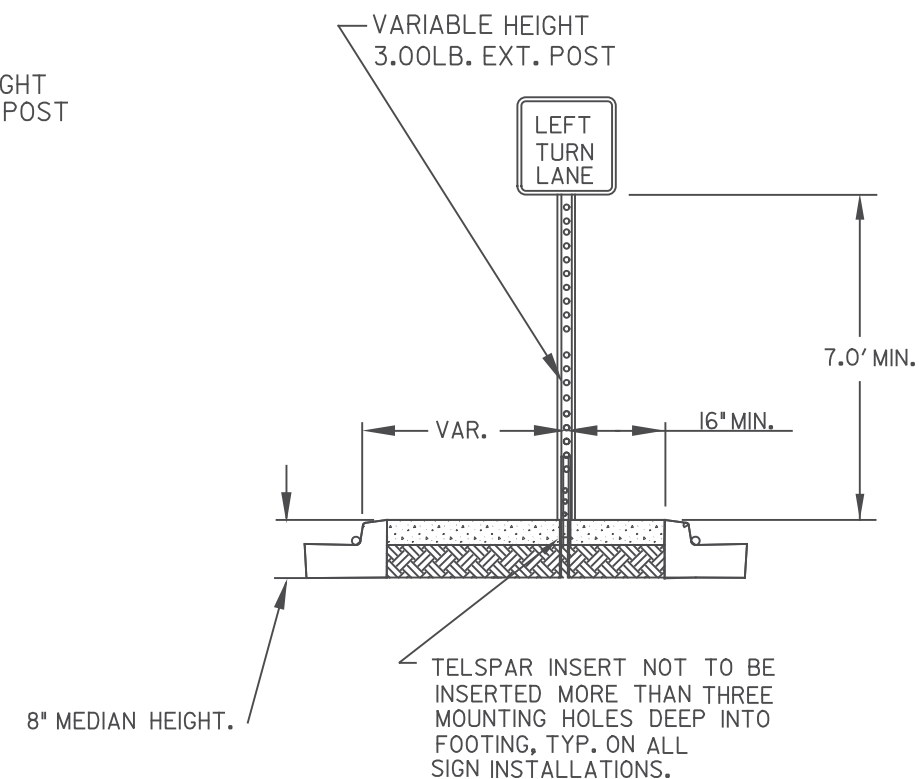
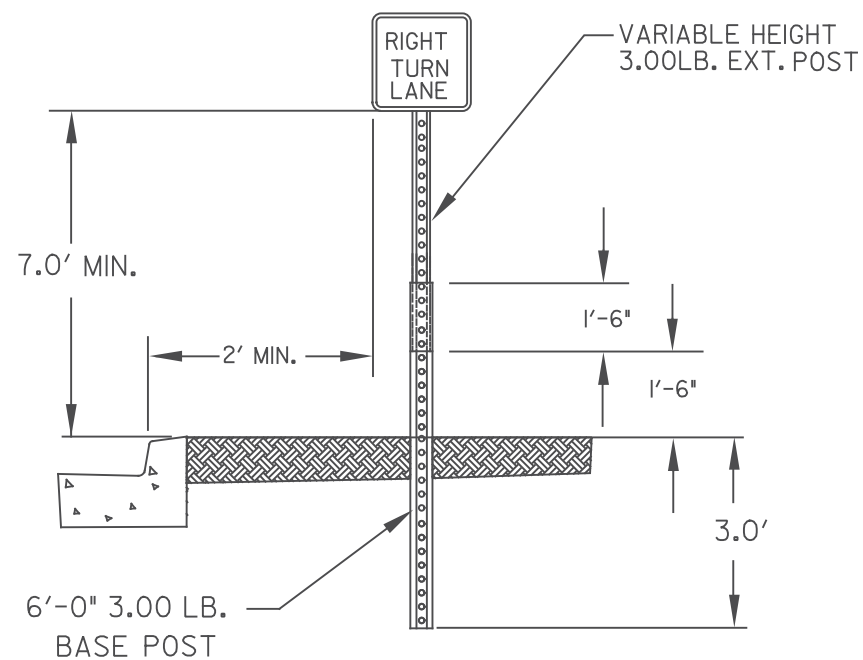
ANOKA COUNTY
SIGNING PLANS AND DETAILS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
152
OF
175



GROUND POST MOUNT SIGN
INSTALLATION TYPICAL

ISLAND MOUNT BREAK-AWAY SIGN
INSTALLATION TYPICAL



SECTION A - A

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1	1/9/2018	CP	TS	BR	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION
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Ben Robeck
Date: 6/13/2017 License #: 53680

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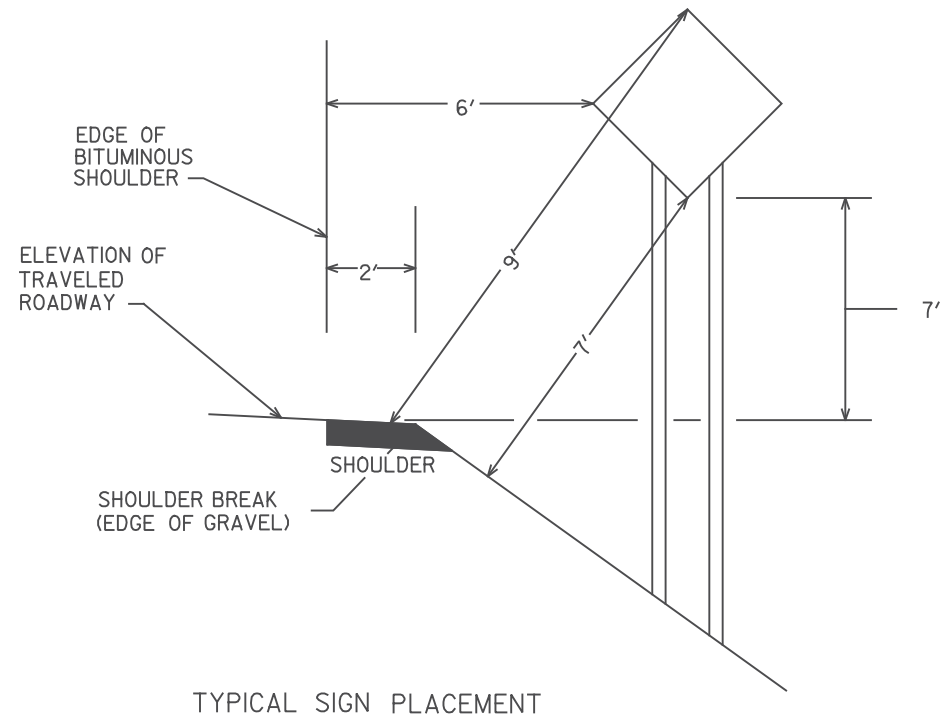


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ANOKA COUNTY
SIGNING PLANS AND DETAILS
CSAH 78 - BNSF GRADE SEPARATION

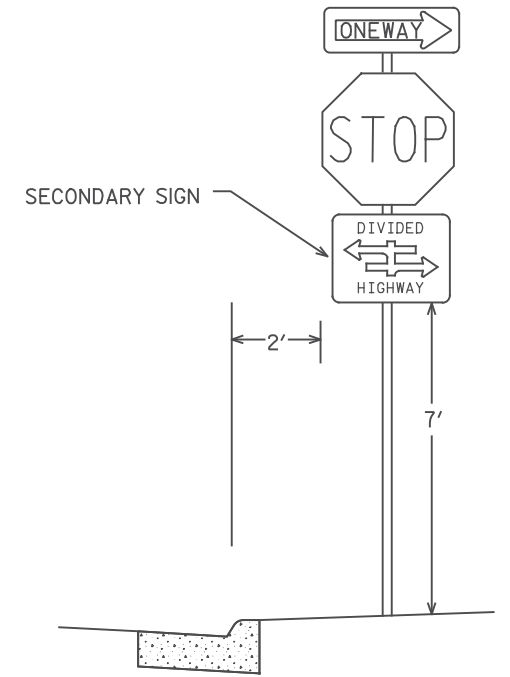
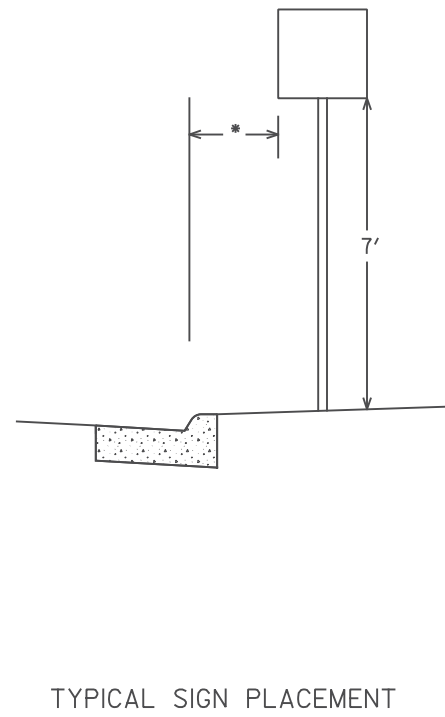
SHEET
153R
OF
175

RURAL



URBAN

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



- NOTE:
- ALL DIMENSIONS ARE MINIMUMS
 - MAINTAIN 2' CLEAR FROM SIGNS TO BITUMINOUS TRAIL

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Ben Robeck

Date: 6/13/2017 License #: 53680

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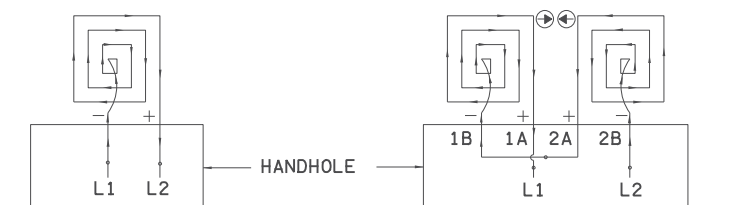
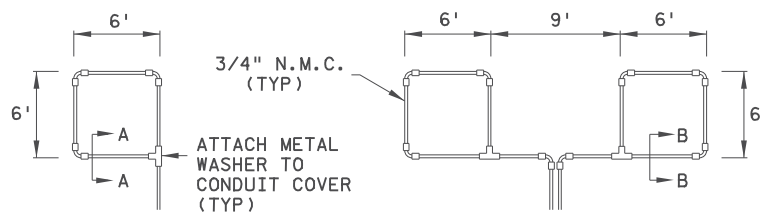
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ANOKA COUNTY

SIGNING PLANS AND DETAILS

CSAH 78 - BNSF GRADE SEPARATION

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154
OF
175

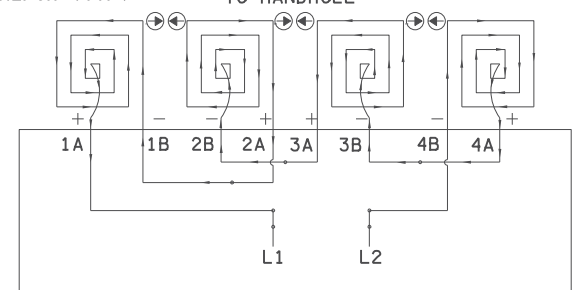
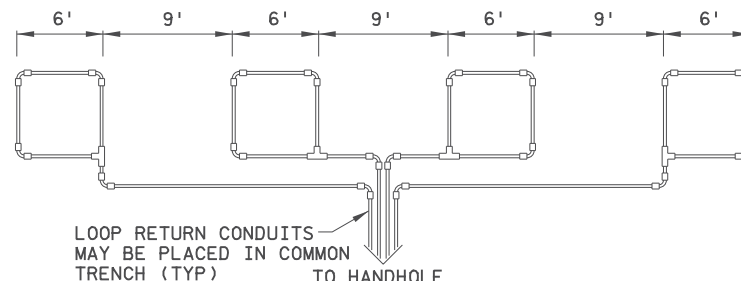


**LOOP DETECTOR
DETAIL 'A'**
(LOOP PHASING FOR
SINGLE CONNECTION)

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

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

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

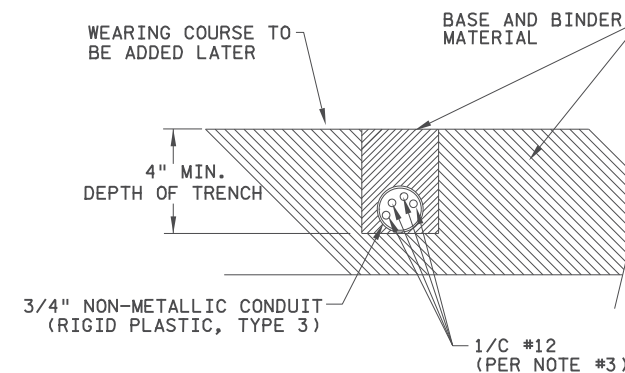


LOOP CONNECTIONS SHALL BE LABELED AND SPLICED
IN THE HANDHOLE AS FOLLOWS:

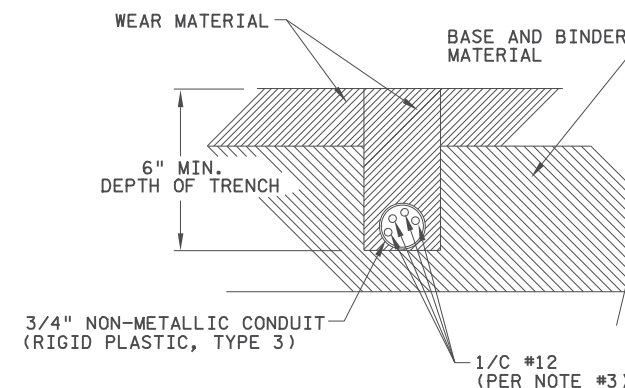
L1 TO 1A 3B TO 4A
1B TO 2A 4B TO L2
2B TO 3A

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

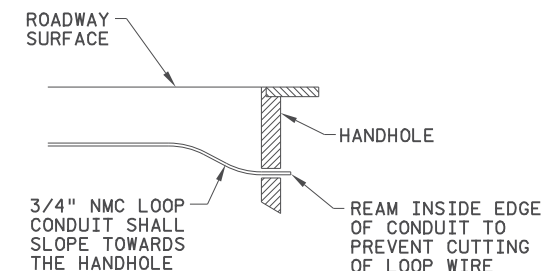
**LOOP DETECTOR
DETAIL 'C'**
(LOOP PHASING FOR
SERIES CONNECTION)



SECTION A-A
DETAIL FOR LOOP INSTALLATION
IN NEW ROADWAY



SECTION B-B
DETAIL FOR LOOP INSTALLATION
IN EXISTING ROADWAY



DRAINAGE DETAIL

LOOP DETECTOR WIRING

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

LEGEND OF SYMBOLS

CONTROLLER AND SERVICE EQUIP. NO.'s	(A)
SIGNAL BASE NO.	(1)
SIGNAL FACE NO.	(2)
LUMINAIRE NO.	(3)
CONTROLLER AND CABINET	(4)
CONTROLLER AND CABINET - IN PLACE	(5)
HANDHOLE	(6)
HANDHOLE - IN PLACE	(7)
RIGID STEEL CONDUIT (RSC)	(8)
RIGID STEEL CONDUIT (RSC) - IN PLACE	(9)
SIGNAL FACE WITH BACKGROUND SHIELD	(10)
SIGNAL FACE W/O BACKGROUND SHIELD	(11)
SIGNAL FACE - IN PLACE	(12)
PEDESTRIAN INDICATORS	(13)
PEDESTRIAN INDICATORS - IN PLACE	(14)
PEDESTRIAN PUSH BUTTONS ON PEDESTAL OR POLE	(15)
PEDESTRIAN PUSH BUTTON STATION	(16)
TRAFFIC SIGNAL PEDESTAL	(17)
TRAFFIC SIGNAL PEDESTAL - INPLACE	(18)
TRAFFIC SIGNAL POLE AND MAST ARM	(19)
TRAFFIC SIGNAL POLE AND MAST ARM - IN PLACE	(20)
STREET LIGHT POLE AND LUMINAIRE	(21)
STREET LIGHT POLE AND LUMINAIRE - IN PLACE	(22)
MAST ARM AND LUMINAIRE	(23)
MAST ARM AND LUMINAIRE - INPLACE	(24)
WOOD POLE	(25)
WOOD POLE - IN PLACE	(26)
SOURCE OF POWER	(27)
RAILROAD SIGNAL - IN PLACE	(28)
RIGHT OF WAY LINE	(29)
CENTERLINE	(30)
EDGE OF ROADWAY	(31)
SHOULDERLINE	(32)
CURB LINE	(33)
STOP BAR	(34)
EMERGENCY VEHICLE PREEMPTION DETECTOR	(35)

ABBREVIATIONS

3-1(EG)	SIGNAL HEAD PHASE "3" - NO. "1"	P2-1(EG)	PED INDICATION PHASE "2" - NO. "1"
BR. GR.	BARE GROUND	PB	PUSH BUTTON
CH. SW.	CHECK SWITCH	PB2-1(EG)	PUSH BUTTON PHASE "2" - NO. "1"
CLR	CLEAR	PEC	PHOTOELECTRIC CELL
D2-1(EG)	DETECTOR PHASE "2" - NO. "1"	PED	PEDESTRIAN
DWK	DON'T WALK	R	RED
EQG	EQUIPMENT GROUND	R&S	REMOVE AND SALVAGE
EVP	EMERGENCY VEHICLE PRE-EMPTION	RLTA	RED LEFT TURN ARROW
F&I	FURNISH AND INSTALL	RRTA	RED RIGHT TURN ARROW
FL	FLASH/FLASHING	RSC	RIGID STEEL CONDUIT
G	GREEN	SOP	SOURCE OF POWER
GLTA	GREEN LEFT TURN ARROW	SPR	SPARE
GRN	GREEN	ST. LHT	STREET LIGHT
GR. R	GROUND ROD	STA	STATION
GRTA	GREEN RIGHT TURN ARROW	SW	SWITCH
GTHA	GREEN THRU ARROW	SWD	SWITCHED
HH	HANDHOLE	S&R	SALVAGE AND REINSTALL
HPS	HIGH PRESSURE SODIUM	TDW	TELEPHONE DROP WIRE
JB	JUNCTION BOX	WLK	WALK
LUM	LUMINAIRE	YEL	YELLOW
NEU	NEUTRAL	YLTA	YELLOW LEFT TURN ARROW
NMC	NONMETALLIC CONDUIT	YRTA	YELLOW RIGHT TURN ARROW
		YTHA	YELLOW THRU ARROW

CONDUCTOR COLOR CODE

R	RED
O	ORANGE
BL	BLUE
WH	WHITE
R/BLK	RED WITH BLACK TRACER
O/BLK	ORANGE WITH BLACK TRACER
BL/BLK	BLUE WITH BLACK TRACER
WH/BLK	WHITE WITH BLACK TRACER
BLK	BLACK
BLK/WH	BLACK WITH WHITE TRACER
G/BLK	GREEN WITH BLACK TRACER
G	GREEN

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NO	DATE	BY	CKD	APPR	REVISION

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Print Name: SCOTT C. POSKA
Date: 6/14/2017 License #: 47068

STATE AID PROJECT NO. 002-678-023, 114-020-051

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DESIGNED BY M. BRESSLER
CHECKED BY S. POSKA
COMM. NO. 0169140



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PLANNERS
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ANOKA COUNTY
TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
DETAILS/LEGEND AND ABBREVIATIONS

SHEET
155
OF
175

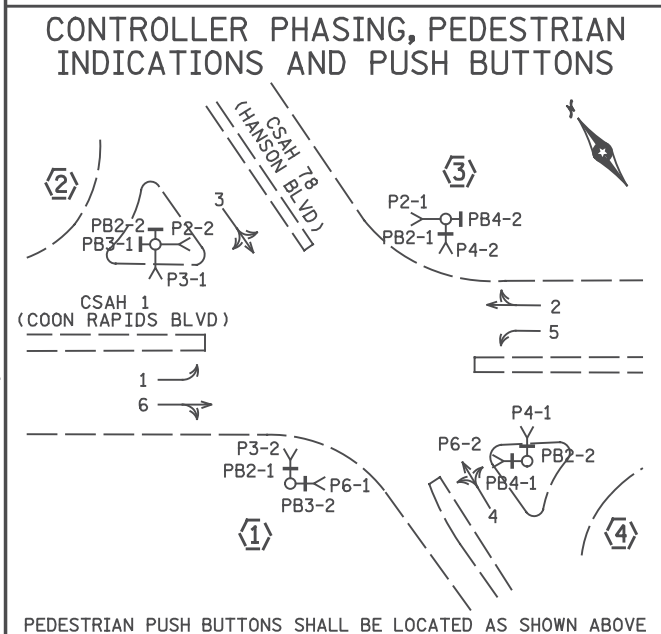
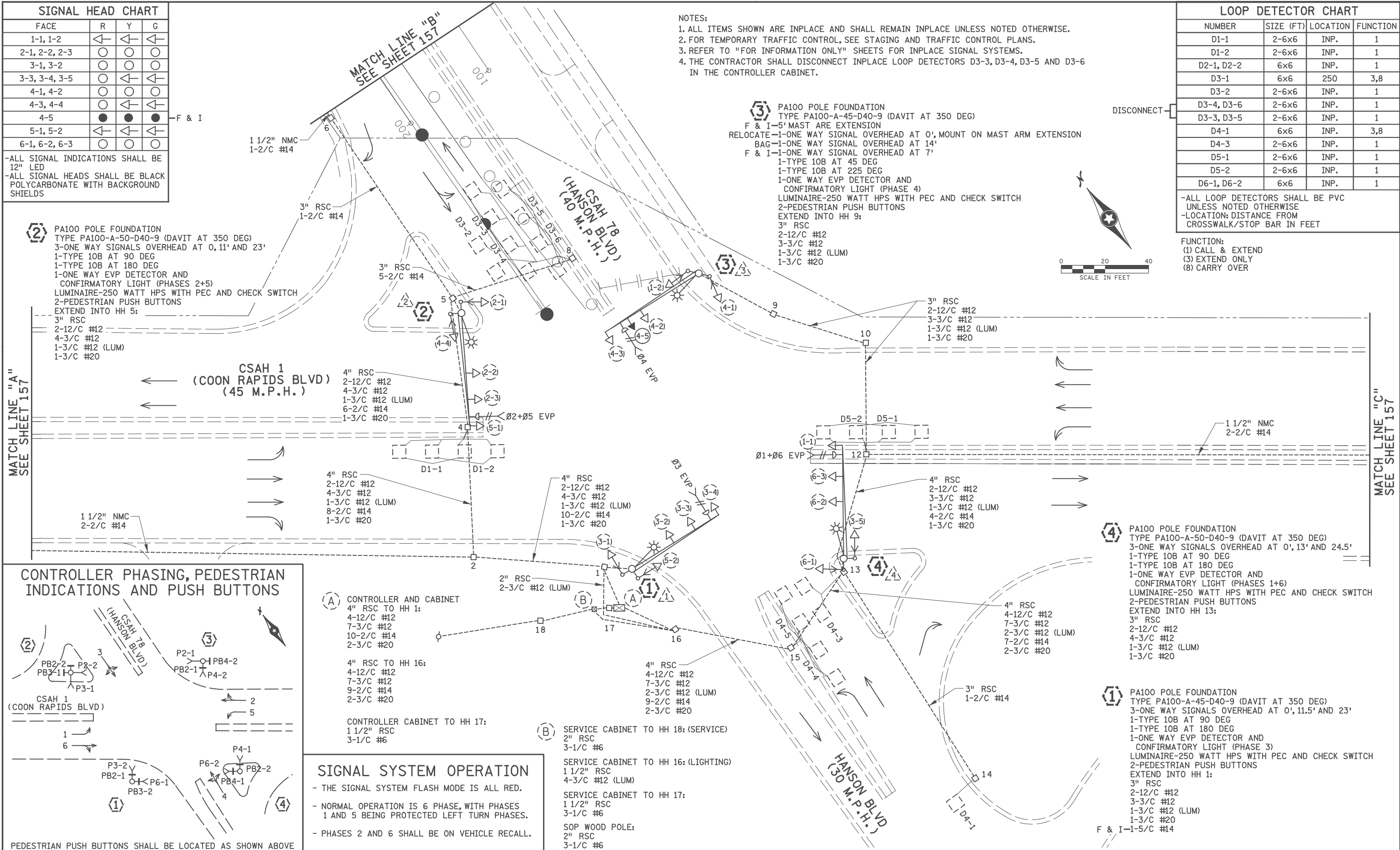
SIGNAL HEAD CHART			
FACE	R	Y	G
1-1, 1-2	◀	◀	◀
2-1, 2-2, 2-3	○	○	○
3-1, 3-2	○	○	○
3-3, 3-4, 3-5	○	◀	◀
4-1, 4-2	○	○	○
4-3, 4-4	○	◀	◀
4-5	●	●	●
5-1, 5-2	◀	◀	◀
6-1, 6-2, 6-3	○	○	○

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

LOOP DETECTOR CHART			
NUMBER	SIZE (FT)	LOCATION	FUNCTION
D1-1	2-6x6	INP.	1
D1-2	2-6x6	INP.	1
D2-1, D2-2	6x6	INP.	1
D3-1	6x6	250	3,8
D3-2	2-6x6	INP.	1
D3-4, D3-6	2-6x6	INP.	1
D3-3, D3-5	2-6x6	INP.	1
D4-1	6x6	INP.	3,8
D4-3	2-6x6	INP.	1
D5-1	2-6x6	INP.	1
D5-2	2-6x6	INP.	1
D6-1, D6-2	6x6	INP.	1

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

- NOTES:
1. ALL ITEMS SHOWN ARE INPLACE AND SHALL REMAIN INPLACE UNLESS NOTED OTHERWISE.
 2. FOR TEMPORARY TRAFFIC CONTROL, SEE STAGING AND TRAFFIC CONTROL PLANS.
 3. REFER TO "FOR INFORMATION ONLY" SHEETS FOR INPLACE SIGNAL SYSTEMS.
 4. THE CONTRACTOR SHALL DISCONNECT INPLACE LOOP DETECTORS D3-3, D3-4, D3-5 AND D3-6 IN THE CONTROLLER CABINET.



- (A) CONTROLLER AND CABINET
4" RSC TO HH 1:
4-12/C #12
7-3/C #12
10-2/C #14
2-3/C #20
- 4" RSC TO HH 16:
4-12/C #12
7-3/C #12
9-2/C #14
2-3/C #20
- CONTROLLER CABINET TO HH 17:
1 1/2" RSC
3-1/C #6

- ### SIGNAL SYSTEM OPERATION
- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
 - NORMAL OPERATION IS 6 PHASE, WITH PHASES 1 AND 5 BEING PROTECTED LEFT TURN PHASES.
 - PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.
- (B) SERVICE CABINET TO HH 18: (SERVICE)
2" RSC
3-1/C #6
- SERVICE CABINET TO HH 16: (LIGHTING)
1 1/2" RSC
4-3/C #12 (LUM)
- SERVICE CABINET TO HH 17:
1 1/2" RSC
3-1/C #6
- SOP WOOD POLE:
2" RSC
3-1/C #6

NO	DATE	BY	CKD	APPR	REVISION

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Print Name: SCOTT C. POSKA

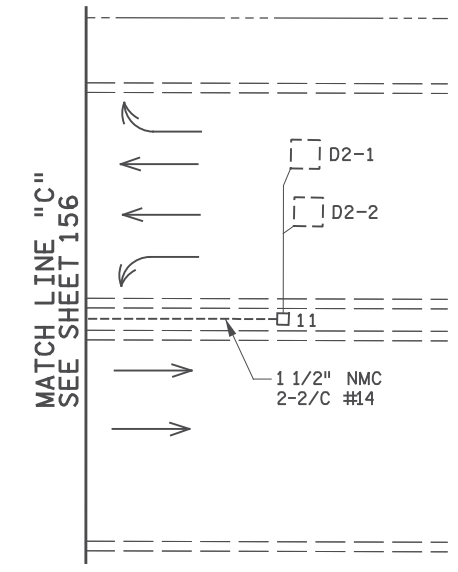
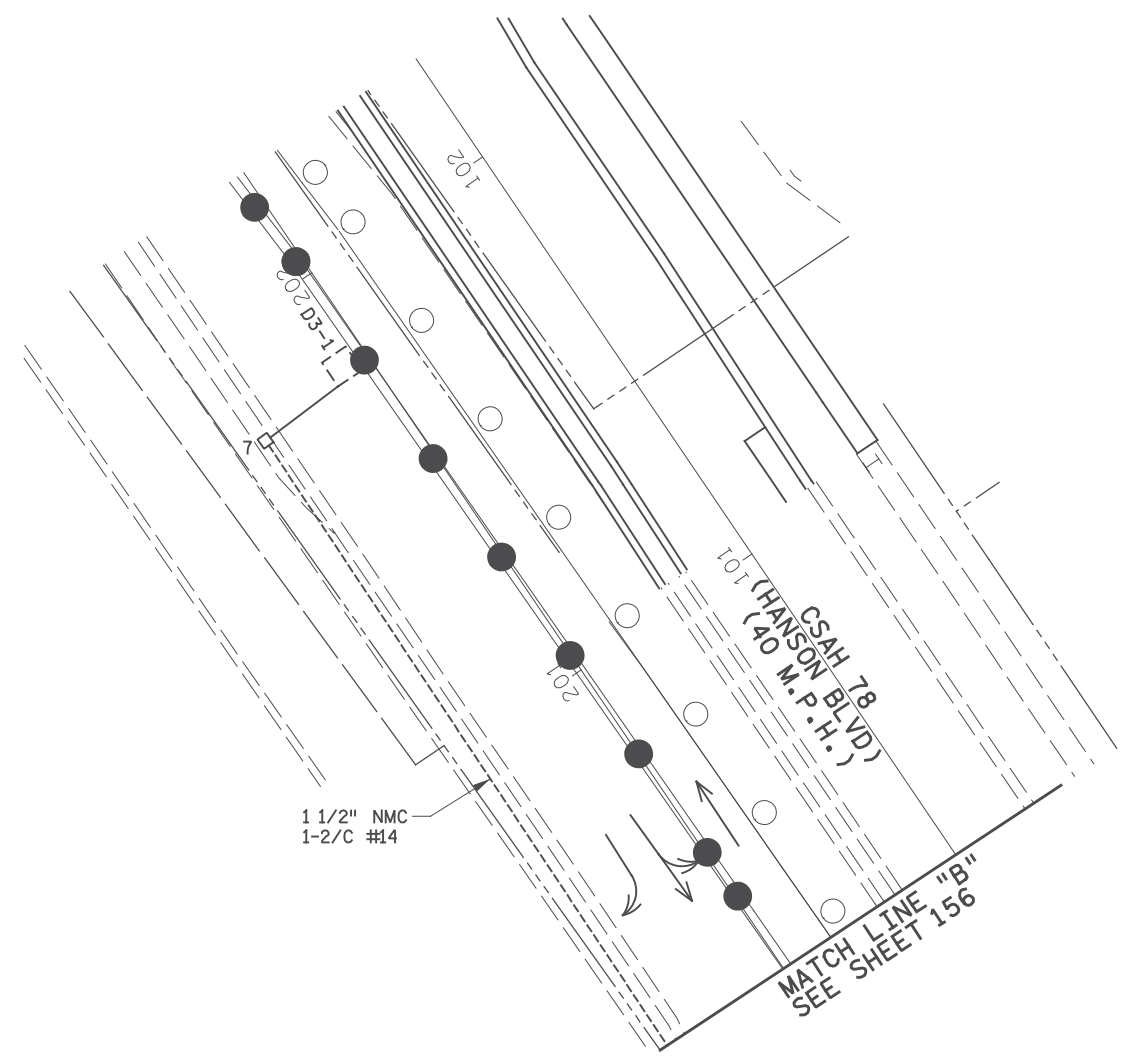
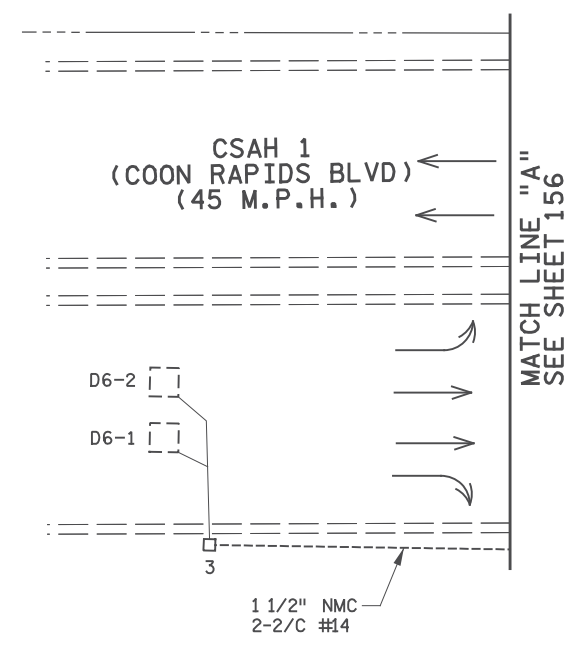
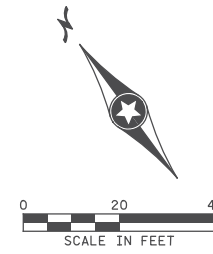
Date: 6/14/2017 License #: 47068

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DESIGNED BY M. BRESSLER
CHECKED BY S. POSKA
COMM. NO. 0169140

SRF ENGINEERS PLANNERS DESIGNERS
Consulting Group, Inc.

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- NOTES:
1. ALL ITEMS SHOWN ARE INPLACE AND SHALL REMAIN INPLACE UNLESS NOTED OTHERWISE.
 2. FOR PAVEMENT MARKINGS, SEE SIGNING AND STRIPING PLANS.
 3. REFER TO "FOR INFORMATION ONLY" SHEETS FOR INPLACE SIGNAL SYSTEMS THAT SHALL BE MODIFIED. THESE SIGNAL MODIFICATIONS ARE INCLUDED IN PAYMENT FOR THE REVISE SIGNAL SYSTEM "A" PAY ITEM.

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SCOTT C. POSKA

Date: 6/14/2017 License #: 47068

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 M. BRESSLER
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 COMM. NO. 0169140

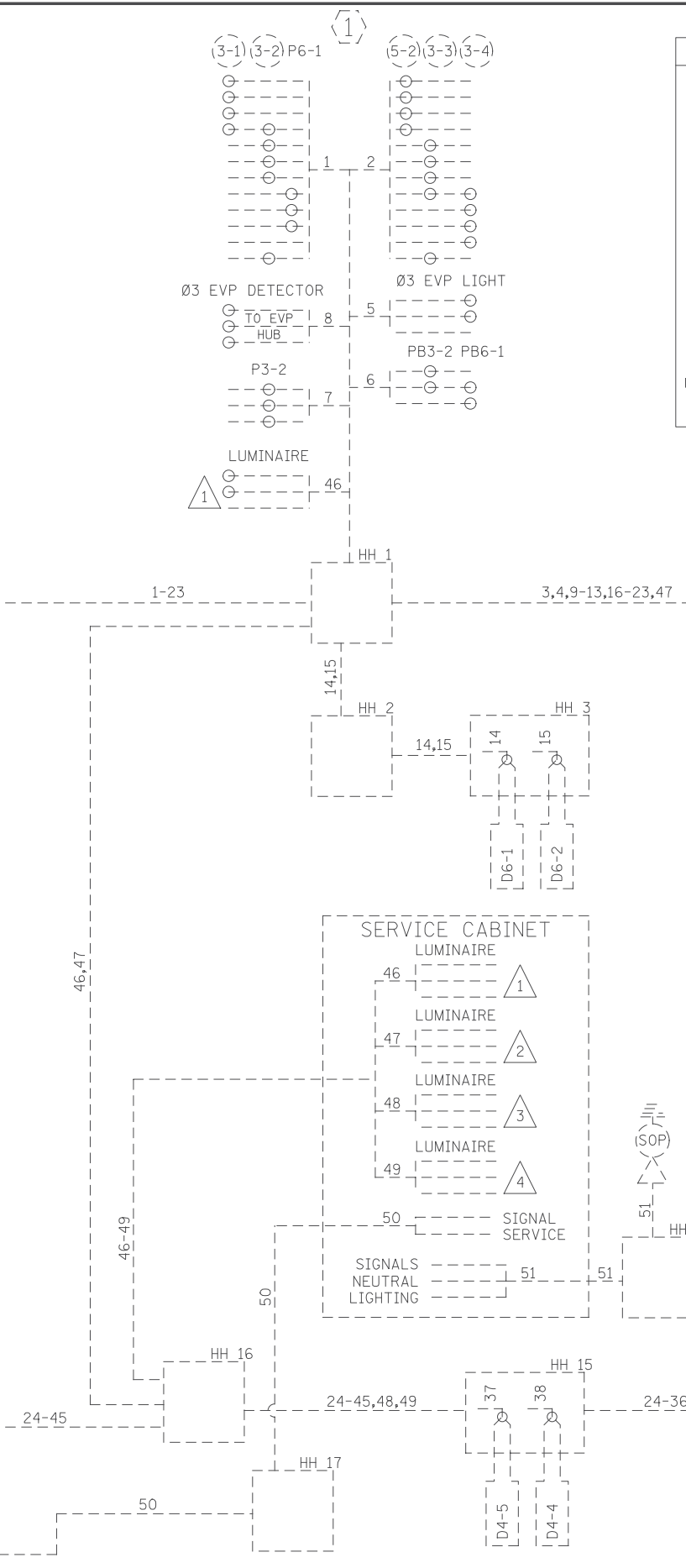
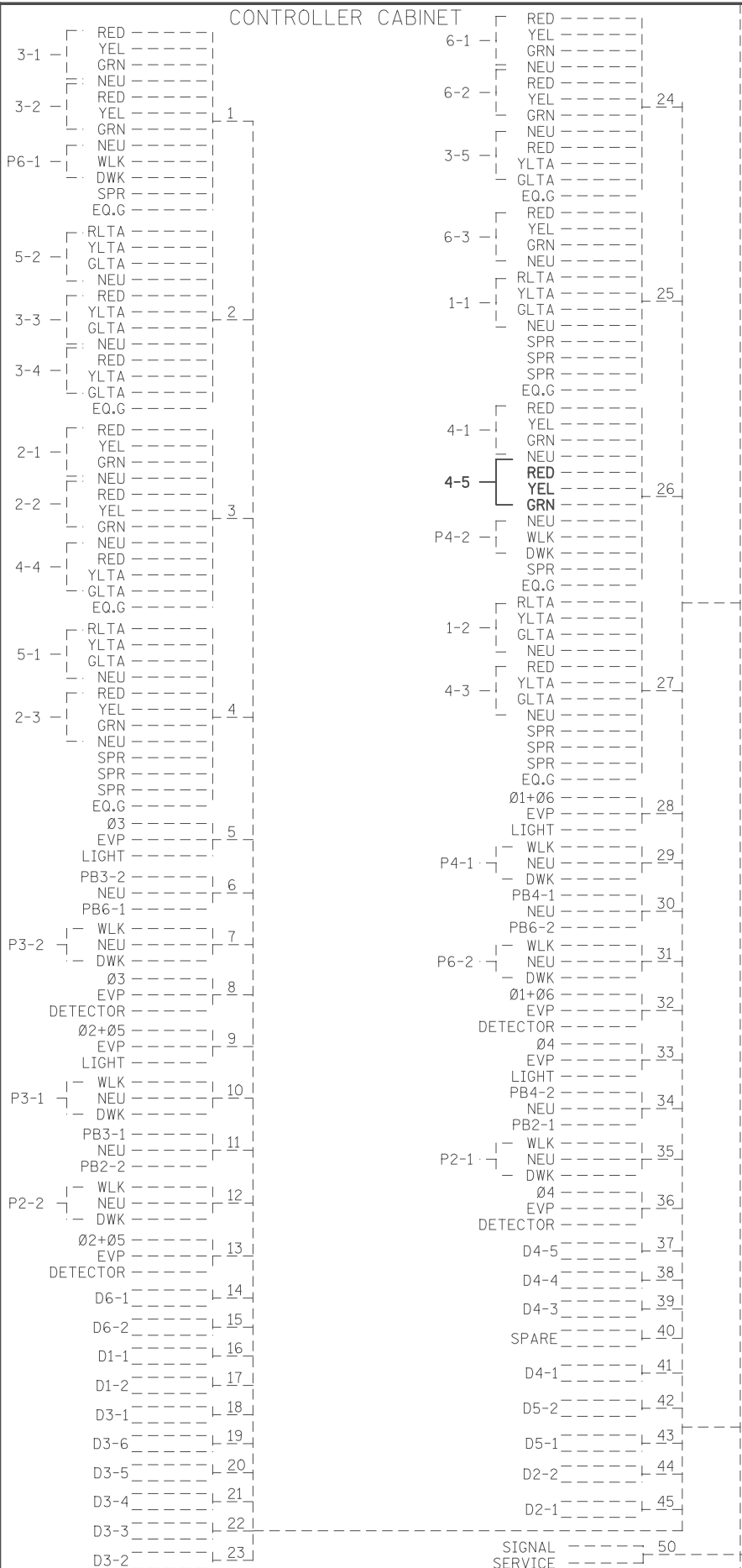


ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
 REVISED MATCH LINE LAYOUT (SYS. "A") (STAGE 1)
 CSAH 1 (COON RAPIDS BLVD) AT CSAH 78 (HANSON BLVD)

SHEET
 157
 OF
 175

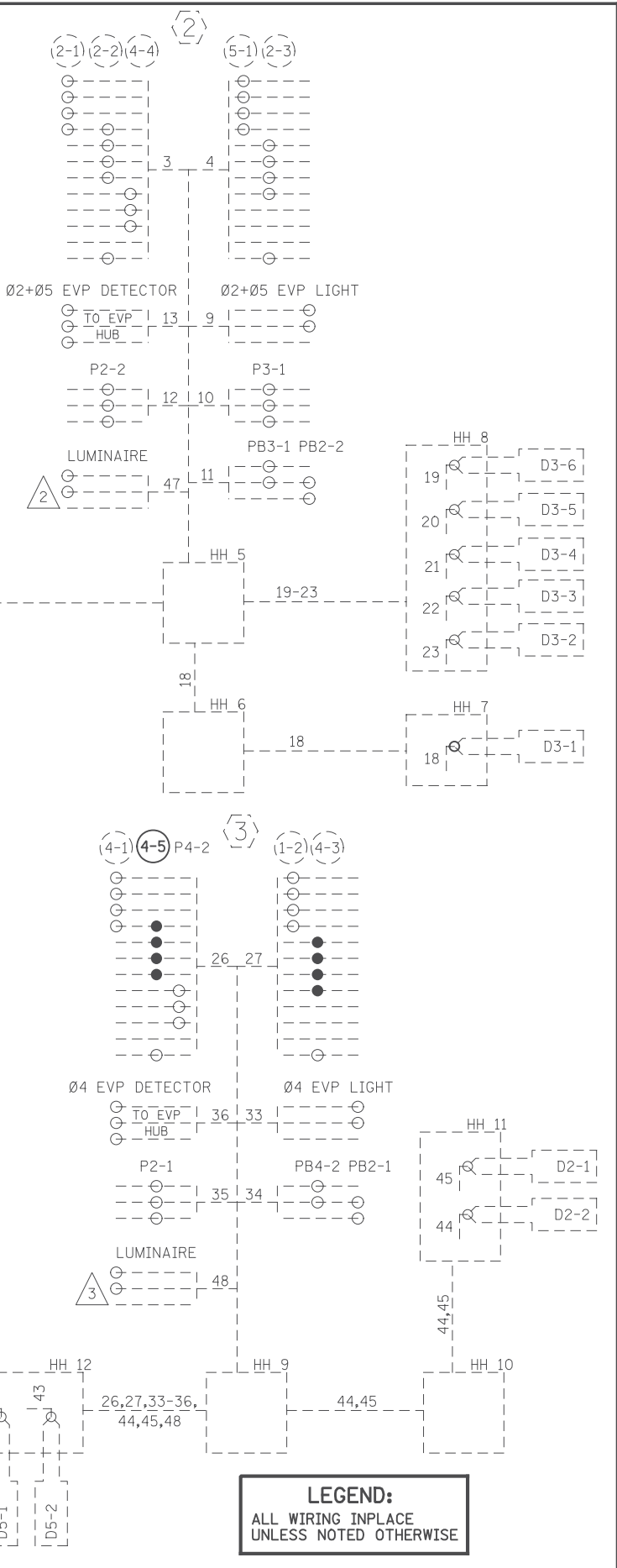
CONTROLLER CABINET



CONDUCTOR COLOR CODE

3/C#20	R OR O	R
	WH OR YEL	O
	BLK OR BL	BL
2/C#14	BLK	WH
	CLR OR WH	R/BLK
12/C#12	R	O/BLK
		BL/BLK
3-1/C#2	BLK	WH/BLK
	INPUT POWER	BLK
		BLK/WH
3-1/C#6	WH	G/BLK
	SIGNAL SERVICE	G
		R
2-1/C	BLK	O
		BLK
5/C#12	WH	WH
		G
1/C#6	G	R
6PR#19		WH
		BLK

NOTE: ALL TERMINAL BLOCK CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.



LEGEND:
ALL WIRING INPLACE UNLESS NOTED OTHERWISE

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: SCOTT C. POSKA

SCOTT C. POSKA

Date: 6/14/2017 License #: 47068

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY M. BRESSLER
DESIGNED BY M. BRESSLER
CHECKED BY S. POSKA
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
REVISED FIELD WIRING DIAGRAM (SYS. "A") (STAGE 1)
CSAH 1 (COON RAPIDS BLVD) AT CSAH 78 (HANSON BLVD)

SHEET
158
OF
175

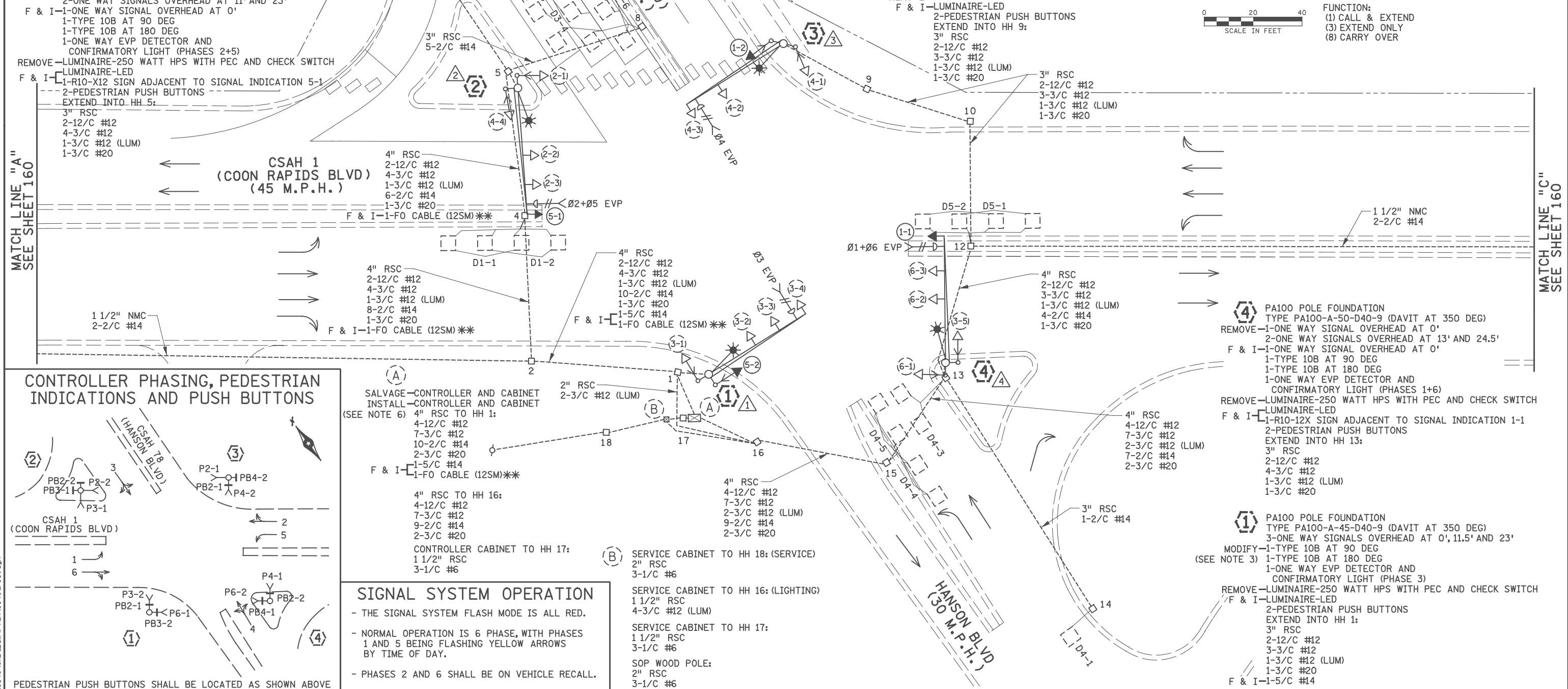
SIGNAL HEAD CHART				
FACE	R	Y	FYA	G
1-1, 1-2	←	←	←	←
2-1, 2-2, 2-3	○	○	○	○
3-1, 3-2	○	○	○	○
3-3, 3-4, 3-5	○	◁	◁	◁
4-1, 4-2	○	○	○	○
4-3, 4-4	○	◁	◁	◁
5-1, 5-2	←	←	←	←
6-1, 6-2, 6-3	○	○	○	○

-ALL SIGNAL INDICATIONS SHALL BE 12" LED
 -ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BACKGROUND SHIELDS
 -FYA DENOTES FLASHING YELLOW ARROW

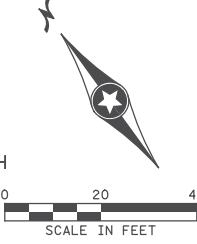
LOOP DETECTOR CHART				
NUMBER	SIZE (FT)	LOCATION	FUNCTION	
D1-1	2-6x6	INP.	1	
D1-2	2-6x6	INP.	1	
D2-1, D2-2	6x6	INP.	1	
D3-1	6x6	250	3,8	
D3-2	2-6x6	INP.	1	
D3-4, D3-6	2-6x6	INP.	1	
D3-3, D3-5	2-6x6	INP.	1	
D4-1	6x6	INP.	3,8	
D4-3	2-6x6	INP.	1	
D5-1	2-6x6	INP.	1	
D5-2	2-6x6	INP.	1	
D6-1, D6-2	6x6	INP.	1	

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

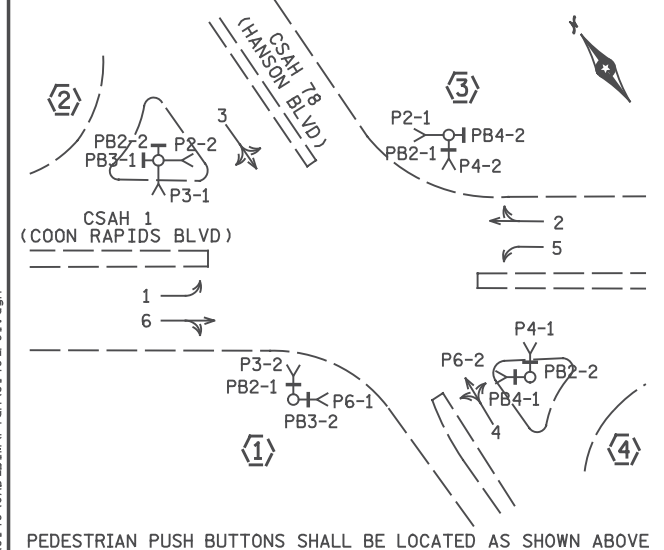
FUNCTION:
 (1) CALL & EXTEND
 (3) EXTEND ONLY
 (8) CARRY OVER



- NOTES:
1. ALL ITEMS SHOWN ARE INPLACE AND SHALL REMAIN INPLACE UNLESS NOTED OTHERWISE.
 2. FOR PAVEMENT MARKINGS, SEE SIGNING AND STRIPING PLANS.
 3. THE CONTRACTOR SHALL REMOVE THE VEHICLE HEAD AND SALVAGE THE PEDESTRIAN HEAD. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW VEHICLE HEAD AS SHOWN IN THE PLANS. THE CONTRACTOR SHALL ADJUST EXISTING BRACKETING OR FURNISH AND INSTALL NEW BRACKETING.
 4. REFER TO "FOR INFORMATION ONLY" SHEETS FOR INPLACE SIGNAL SYSTEMS THAT SHALL BE MODIFIED. THESE SIGNAL MODIFICATIONS ARE INCLUDED IN PAYMENT FOR THE REVISE SIGNAL SYSTEM "A" PAY ITEM.
 5. ITEMS DENOTED WITH ** ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.
 6. SEE SPECIAL PROVISIONS FOR SALVAGING EXISTING CONTROLLER CABINET AND INSTALLING COUNTY FURNISHED CONTROLLER CABINET.



CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



- (A) SALVAGE CONTROLLER AND CABINET
 INSTALL CONTROLLER AND CABINET
 (SEE NOTE 6) 4" RSC TO HH 1:
 4-12/C #12
 7-3/C #12
 10-2/C #14
 2-3/C #20
 F & I 1-5/C #14
 1-FO CABLE (12SM)**
- 4" RSC TO HH 16:
 4-12/C #12
 7-3/C #12
 9-2/C #14
 2-3/C #20
- CONTROLLER CABINET TO HH 17:
 1 1/2" RSC
 3-1/C #6
- (B) SERVICE CABINET TO HH 18: (SERVICE)
 2" RSC
 3-1/C #6
- SERVICE CABINET TO HH 16: (LIGHTING)
 1 1/2" RSC
 4-3/C #12 (LUM)
- SERVICE CABINET TO HH 17:
 1 1/2" RSC
 3-1/C #6
- SOP WOOD POLE:
 2" RSC
 3-1/C #6

SIGNAL SYSTEM OPERATION

- THE SIGNAL SYSTEM FLASH MODE IS ALL RED.
- NORMAL OPERATION IS 6 PHASE, WITH PHASES 1 AND 5 BEING FLASHING YELLOW ARROWS BY TIME OF DAY.
- PHASES 2 AND 6 SHALL BE ON VEHICLE RECALL.

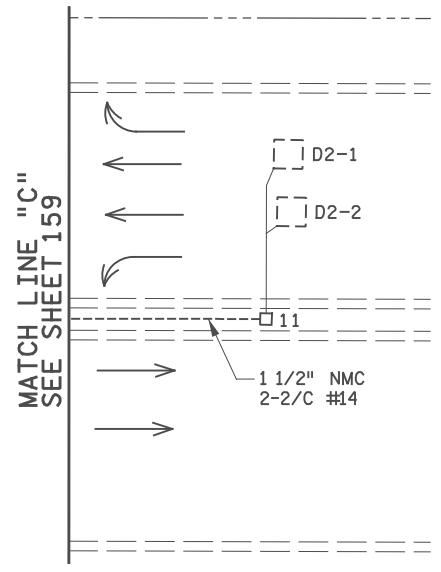
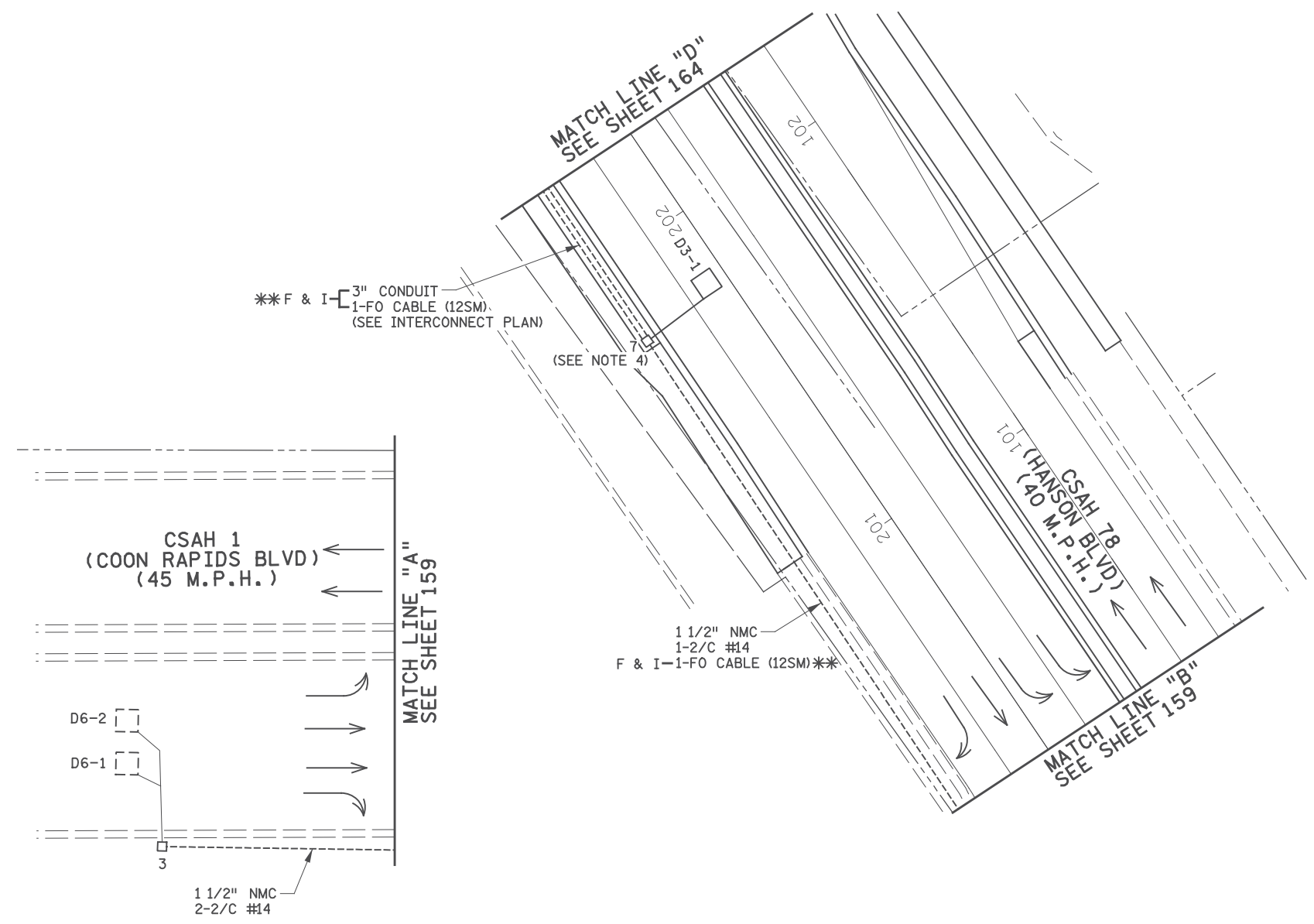
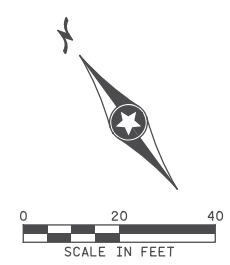
NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: SCOTT C. POSKA
 Date: 6/14/2017 License #: 47068

STATE AID PROJECT NO. 002-678-023, 114-020-051

DRAWN BY M. BRESSLER
 DESIGNED BY M. BRESSLER
 CHECKED BY S. POSKA
 COMM. NO. 0169140





- NOTES:
1. ALL ITEMS SHOWN ARE INPLACE AND SHALL REMAIN INPLACE UNLESS NOTED OTHERWISE.
 2. FOR PAVEMENT MARKINGS, SEE SIGNING AND STRIPING PLANS.
 3. REFER TO "FOR INFORMATION ONLY" SHEETS FOR INPLACE SIGNAL SYSTEMS THAT SHALL BE MODIFIED. THESE SIGNAL MODIFICATIONS ARE INCLUDED IN PAYMENT FOR THE REVISE SIGNAL SYSTEM "A" PAY ITEM.
 4. THE CONTRACTOR SHALL ADJUST INPLACE HANDHOLE 7 TO THE PROPOSED FINISHED GRADE.
 5. ITEMS DENOTED WITH ** ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.

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NO	DATE	BY	CKD	APPR	REVISION

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Print Name: SCOTT C. POSKA

SCOTT C. POSKA

Date: 6/14/2017 License #: 47068

STATE AID PROJECT NO
 002-678-023, 114-020-051

DRAWN BY
 M. BRESSLER
 DESIGNED BY
 M. BRESSLER
 CHECKED BY
 S. POSKA
 COMM. NO. 0169140

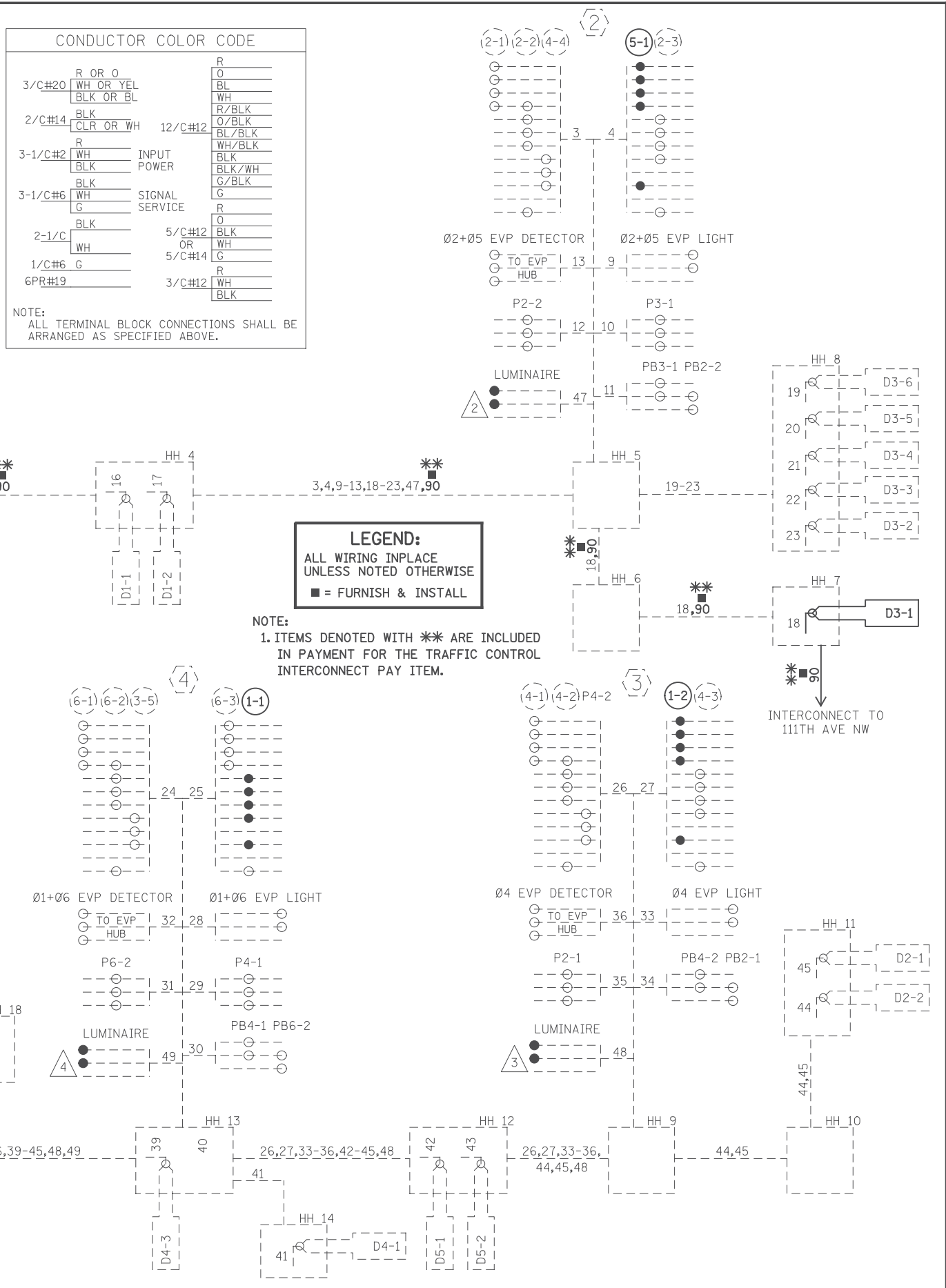
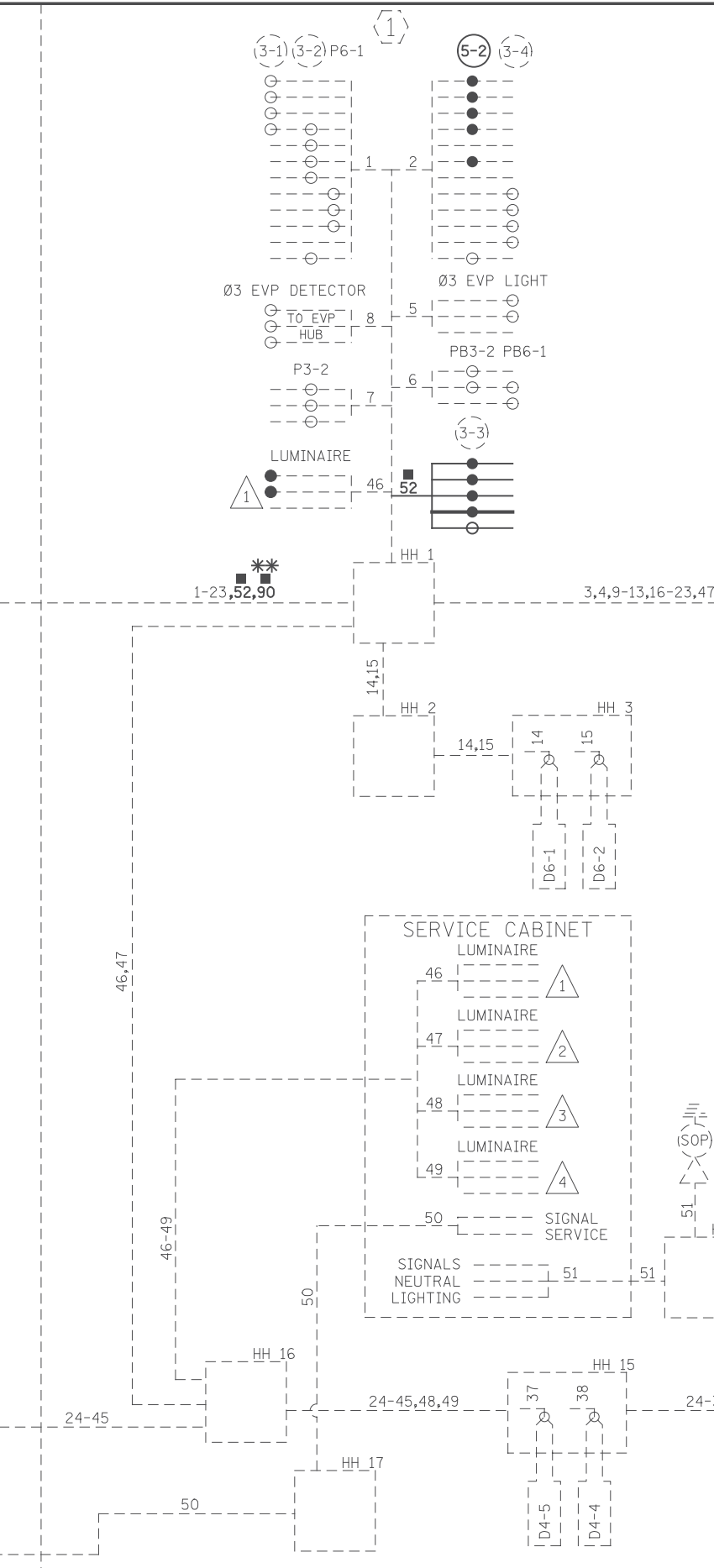
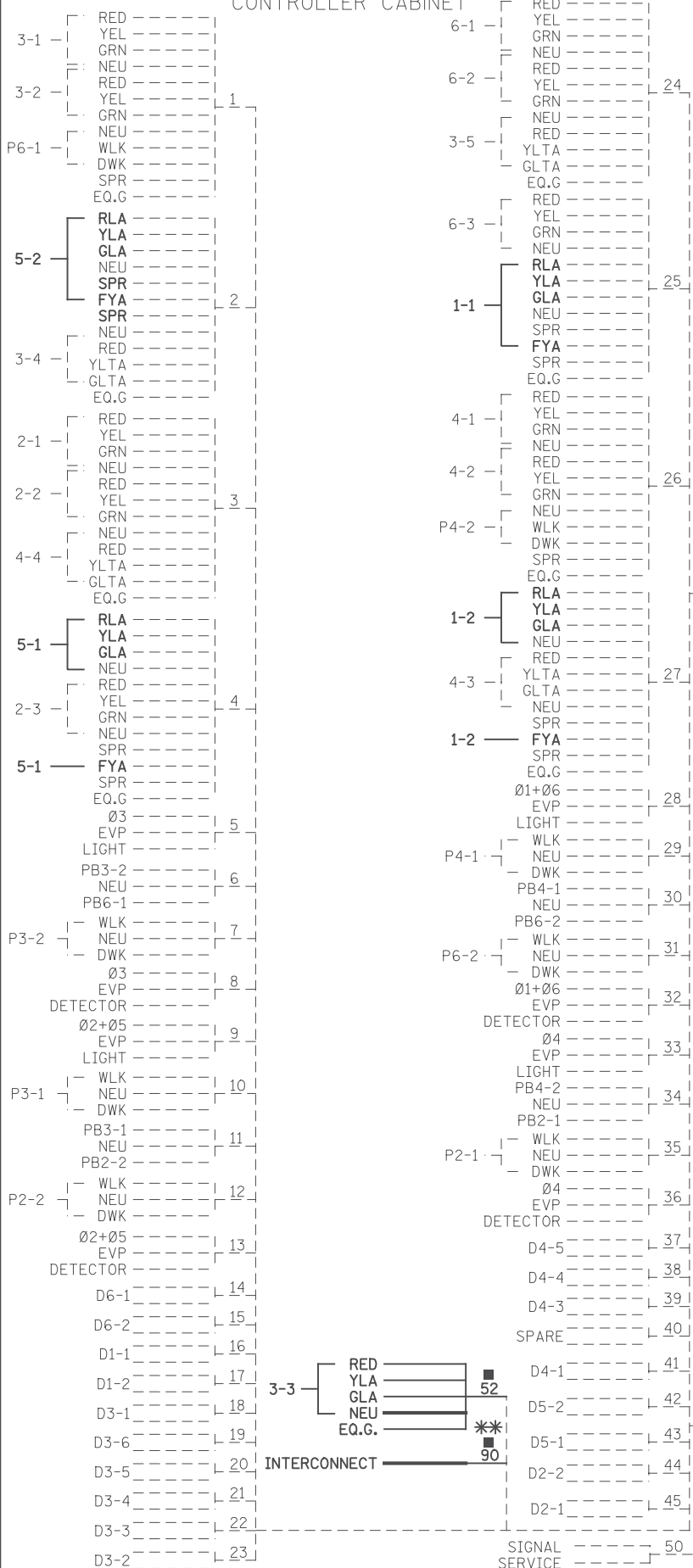


ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
 REVISED MATCH LINE LAYOUT (SYSTEM "A")
 CSAH 1 (COON RAPIDS BLVD) AT CSAH 78 (HANSON BLVD)

SHEET
 160
 OF
 175

CONTROLLER CABINET



LEGEND:
ALL WIRING INPLACE UNLESS NOTED OTHERWISE
■ = FURNISH & INSTALL

NOTE:
1. ITEMS DENOTED WITH ** ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.

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NO	DATE	BY	CKD	APPR	REVISION

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Print Name: SCOTT C. POSKA
Date: 6/14/2017 License #: 47068

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY M. BRESSLER
DESIGNED BY M. BRESSLER
CHECKED BY S. POSKA
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
REVISED FIELD WIRING DIAGRAM (SYSTEM "A")
CSAH 1 (COON RAPIDS BLVD) AT CSAH 78 (HANSON BLVD)

SHEET 161 OF 175



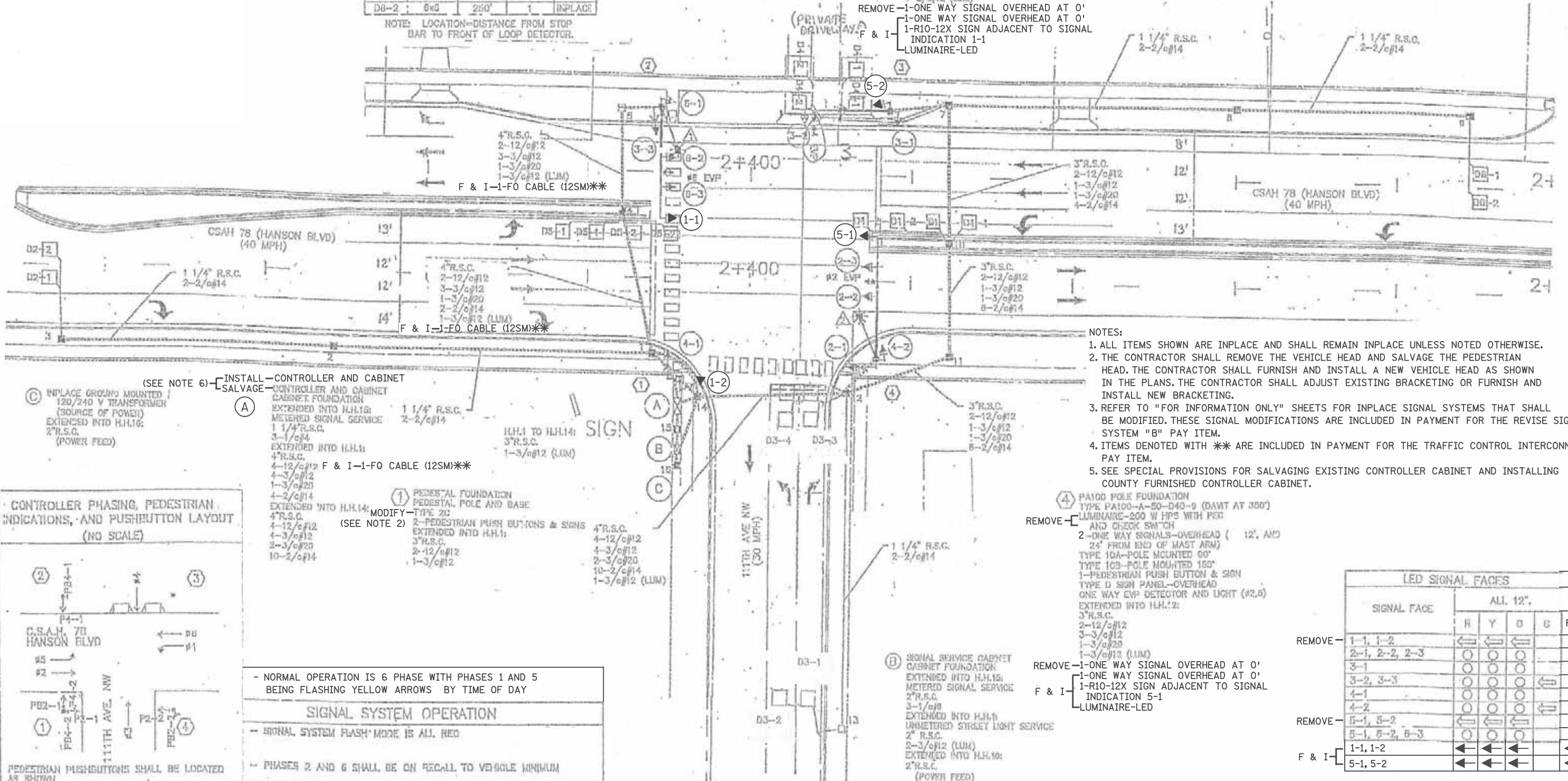
PVC LOOP DETECTORS				
NUMBER	SIZE (FT.)	LOCATION	FUNCTION	STATUS
D1-1	2-6x8	20' & 35'	1	INPLACE
D1-2	2-6x8	-10' & 5'	1	INPLACE
D2-1	6x8	250'	1	INPLACE
D2-2	6x8	250'	1	INPLACE
D3-1	6x8	120'	3,6	F & I
D3-2	6x8	120'	3,6	F & I
D3-3	2-6x8	0' & 15'	7	F & I
D3-4	2-6x8	0' & 15'	1	F & I
D4-1	2-6x8	AS SHOWN	7	INPLACE
D4-2	2-6x8	AS SHOWN	7	INPLACE
D5-1	6x8	20' & 35'	1	INPLACE
D5-2	6x8	-10' & 5'	1	INPLACE
D6-1	6x8	250'	1	INPLACE
D6-2	6x8	250'	1	INPLACE

- LOOP DETECTOR FUNCTION CODES:
- 1.) CALL AND EXTEND
 - 2.) CALL ONLY
 - 3.) EXTEND ONLY
 - 4.) CALL ONLY DENSITY
 - 5.) DELAYED CALL ONLY
 - 6.) DELAYED CALL ONLY DENSITY
 - 7.) DELAYED CALL IMMEDIATE EXTEND
 - 8.) CARRY OVER (STRETCH)
 - 9.) ADVISORY DETECTOR
 - 10.) SAMPLING DETECTOR

- REMOVE [2] PA100 POLE FOUNDATION
TYPE PA100-A-45-340-U (DAWT AT 350°)
LUMINAIRE-200 W HPS WITH PEC
AND CHECK SWITCH
2-ONE WAY SIGNAL-OVERHEAD (12', AND
24' FROM END OF MAST ARM)
TYPE 10A-POLE MOUNTED 90°
TYPE 10A-POLE MOUNTED 270°
1-PEDESTRIAN PUSH BUTTON & SIGN
TYPE C SIGN PANEL-OVERHEAD
ONE WAY EVP DETECTOR AND LIGHT (#6.1)
EXTENDED INTO H.H.1:
3"R.S.C.
2-12/c#12
3-3/c#12
1-3/c#20
1-3/c#12 (LUM)
- REMOVE [3] PADD POLE FOUNDATION
TYPE PADD-A-35
ONE WAY SIGNAL-OVERHEAD
1-TYPE 10A-POLE MOUNTED 270°
TYPE D SIGN PANEL-OVERHEAD
ONE WAY EVP DETECTOR AND LIGHT (#3)
EXTENDED INTO H.H.7:
3"R.S.C.
2-12/c#12
1-3/c#12
1-3/c#20
- REMOVE [F & I] 1-ONE WAY SIGNAL OVERHEAD AT 0'
1-ONE WAY SIGNAL OVERHEAD AT 0'
1-R10-12X SIGN ADJACENT TO SIGNAL
INDICATION 1-1
LUMINAIRE-LED

- REMOVE [1] TYPE 10A-POLE MOUNTED AT 90°
F & I-1-TYPE 10A-POLE MOUNTED AT 90°

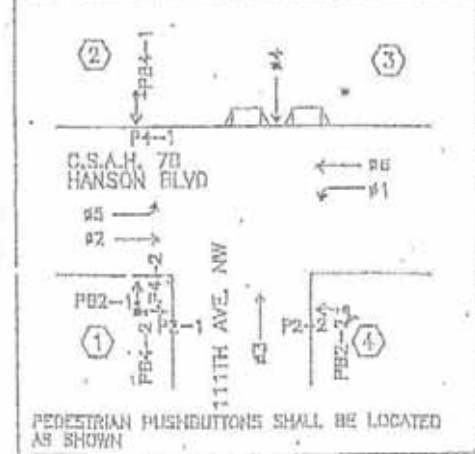
NOTE: LOCATION-DISTANCE FROM STOP BAR TO FRONT OF LOOP DETECTOR.



NOTES:

1. ALL ITEMS SHOWN ARE INPLACE AND SHALL REMAIN INPLACE UNLESS NOTED OTHERWISE.
2. THE CONTRACTOR SHALL REMOVE THE VEHICLE HEAD AND SALVAGE THE PEDESTRIAN HEAD. THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW VEHICLE HEAD AS SHOWN IN THE PLANS. THE CONTRACTOR SHALL ADJUST EXISTING BRACKETING OR FURNISH AND INSTALL NEW BRACKETING.
3. REFER TO "FOR INFORMATION ONLY" SHEETS FOR INPLACE SIGNAL SYSTEMS THAT SHALL BE MODIFIED. THESE SIGNAL MODIFICATIONS ARE INCLUDED IN PAYMENT FOR THE REVISE SIGNAL SYSTEM "B" PAY ITEM.
4. ITEMS DENOTED WITH ** ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.
5. SEE SPECIAL PROVISIONS FOR SALVAGING EXISTING CONTROLLER CABINET AND INSTALLING COUNTY FURNISHED CONTROLLER CABINET.

CONTROLLER PHASING, PEDESTRIAN INDICATIONS, AND PUSHBUTTON LAYOUT (NO SCALE)



SIGNAL SYSTEM OPERATION	
- NORMAL OPERATION IS 6 PHASE WITH PHASES 1 AND 5 BEING FLASHING YELLOW ARROWS BY TIME OF DAY	
- SIGNAL SYSTEM FLASH MODE IS ALL RED	
- PHASES 2 AND 6 SHALL BE ON RECALL TO VEHICLE MINIMUM	

LED SIGNAL FACES					
SIGNAL FACE	ALL 12"				
	R	Y	G	G	FYA
REMOVE [1-1, 1-2]	←	←	←		
REMOVE [2-1, 2-2, 2-3]	○	○	○		
REMOVE [3-1]	○	○	○		
REMOVE [3-2, 3-3]	○	○	○	←	
REMOVE [4-1]	○	○	○	←	
REMOVE [4-2]	○	○	○	←	
REMOVE [5-1, 5-2]	←	←	←		
REMOVE [5-1, 5-2, 5-3]	←	←	←		
F & I [1-1, 1-2]	←	←	←		
F & I [5-1, 5-2]	←	←	←		

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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: SCOTT C. POSKA
Date: 6/14/2017 License #: 47068

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY M. BRESSLER
DESIGNED BY M. BRESSLER
CHECKED BY S. POSKA
COMM. NO. 0169140

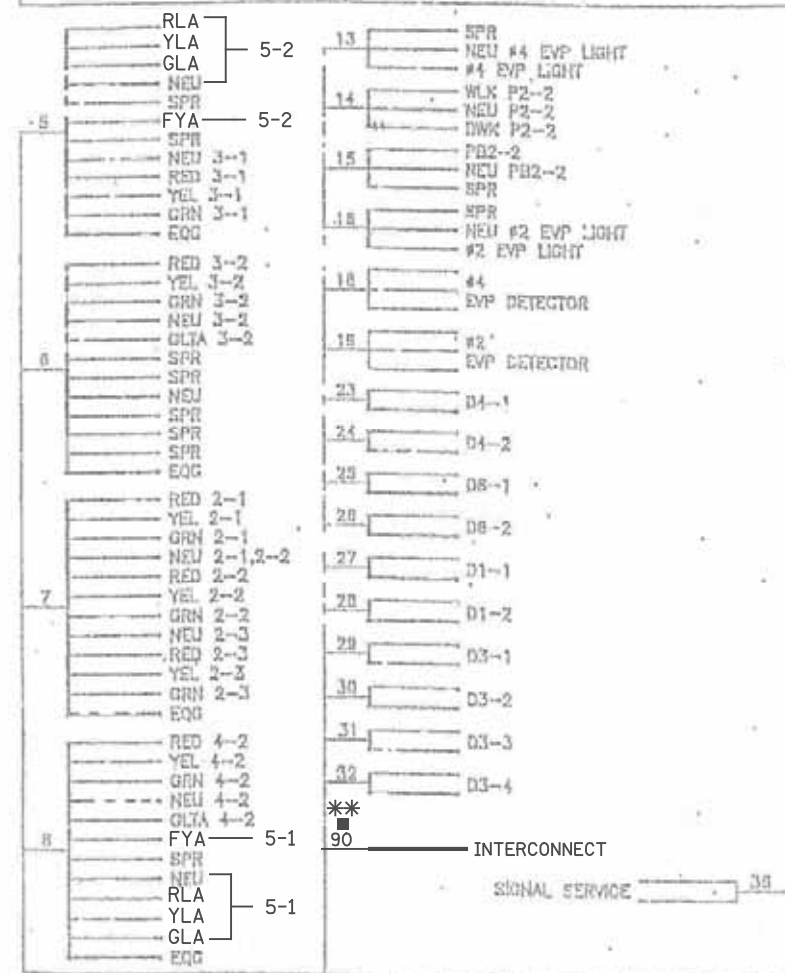
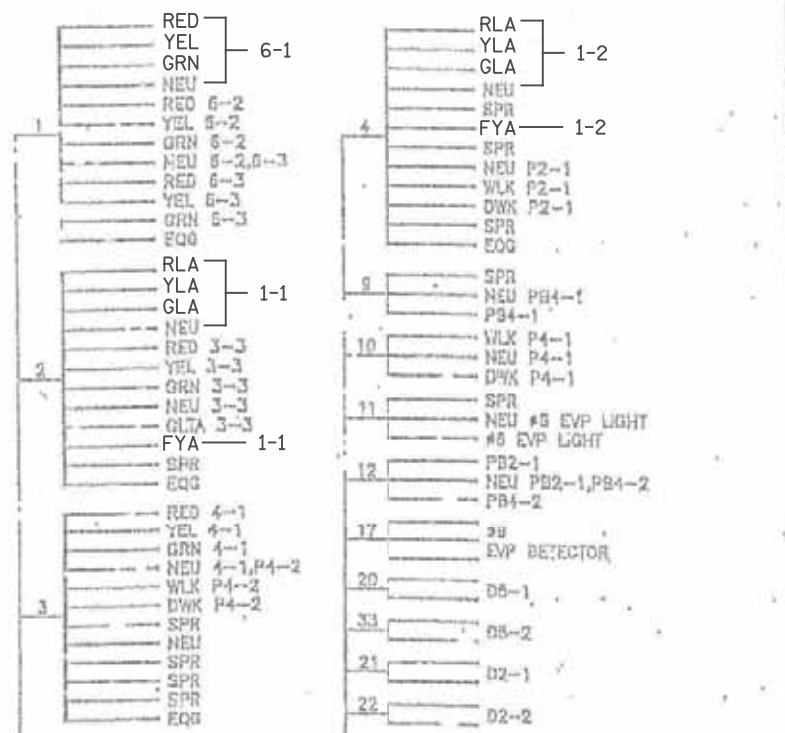


ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
REVISED INTERSECTION LAYOUT (SYSTEM "B")
CSAH 78 (HANSON BLVD) AT 111TH AVE NW

SHEET
162
OF
175

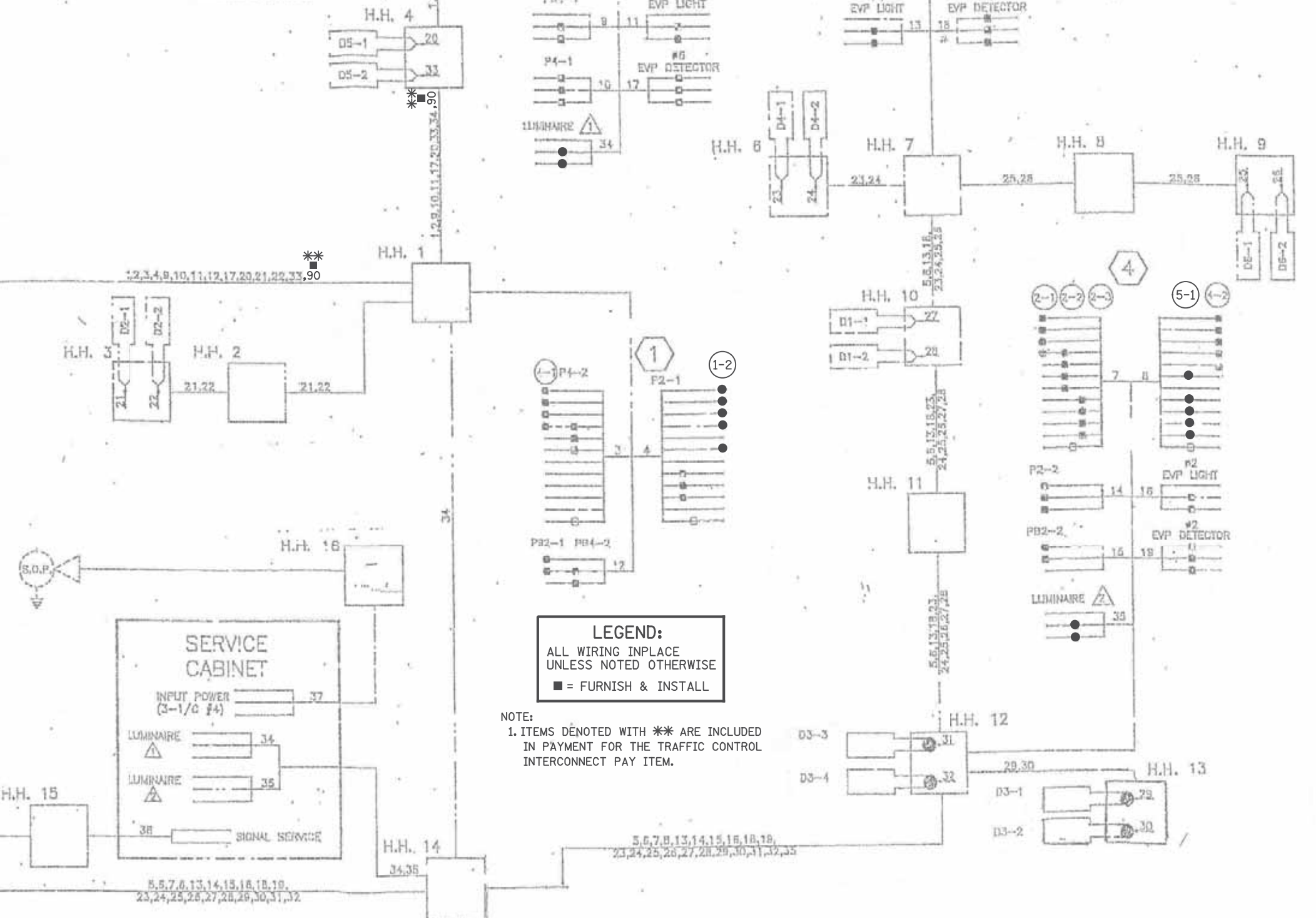
CONTROLLER CABINET



CONDUCTOR COLOR CODE

R	12/C#12	WH	
BLK		BLK	
WH		R OR O	
R/BLK	1/C#20	WH OR YEL	EVP
O/BLK		BLK OR BL	DETECTOR
BL/BLK		BLK	
WH/BLK	1/C#14	CLR	
BLK		BLK	
BLK/WH		WH	SIGNAL SERVICE
O/BLK	3-1/C#4		
O			

NOTE: ALL TERMINAL BLOCK CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE.



LEGEND:
ALL WIRING INPLACE UNLESS NOTED OTHERWISE
■ = FURNISH & INSTALL

NOTE:
1. ITEMS DENOTED WITH ** ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM.

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ENGINEERS
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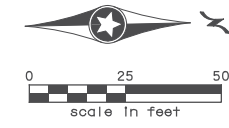
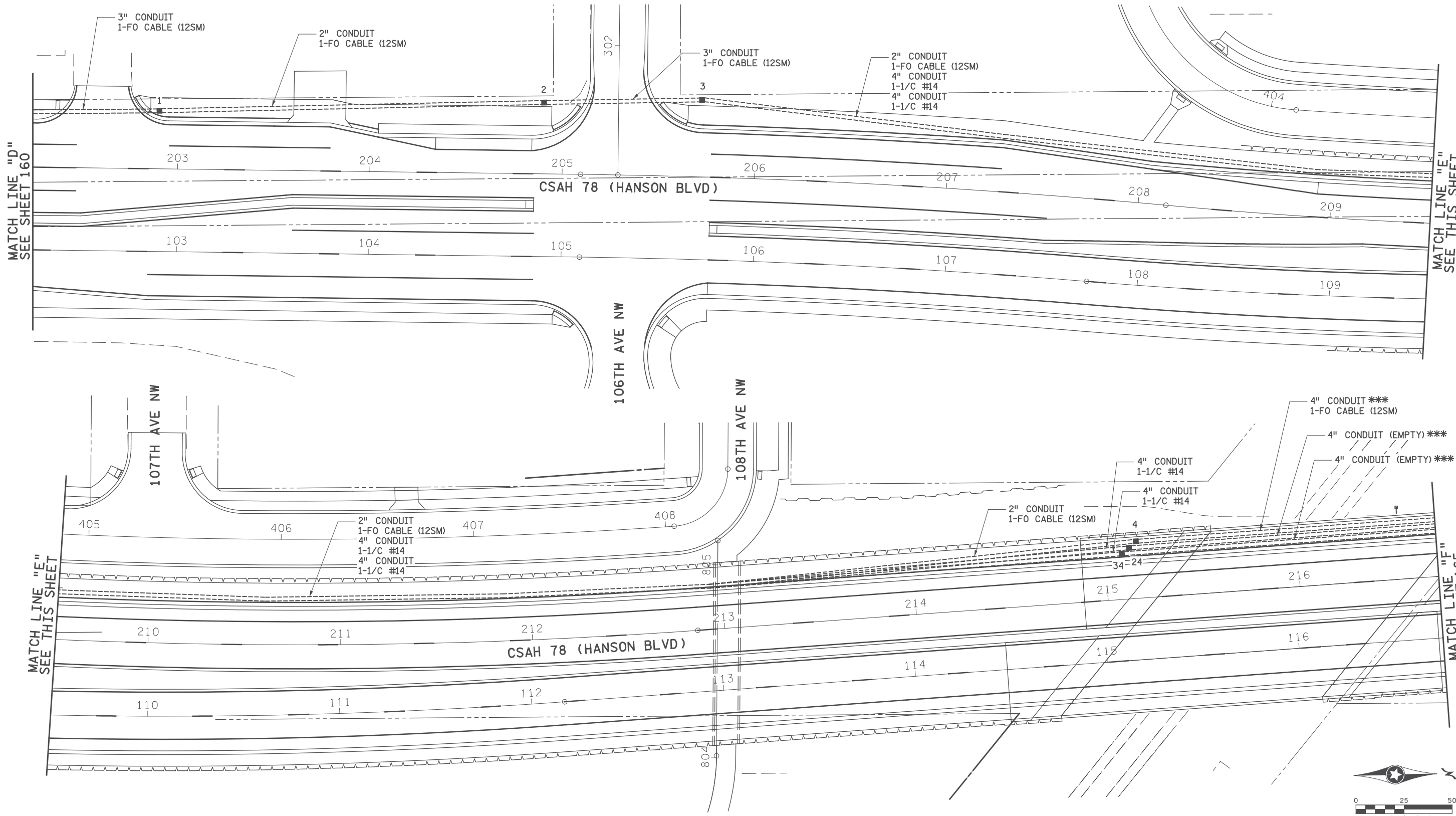
ANOKA COUNTY
TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
REVISED FIELD WIRING DIAGRAM (SYSTEM "B")
CSAH 78 (HANSON BLVD) AT 111TH AVE NW

SHEET
163
OF
175

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NO DATE BY CKD APPR
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REVISION



NOTE:
 1. ALL ITEMS SHOWN ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM UNLESS NOTED OTHERWISE.
 2. ITEMS DENOTED WITH *** ARE INCLUDED IN PAYMENT FOR BRIDGE. SEE BRIDGE PLANS.

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: SCOTT C. POSKA
 Date: 7/12/2017 License #: 47068

STATE AID PROJECT NO 002-678-023, 114-020-051

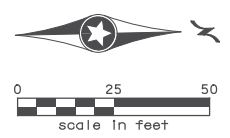
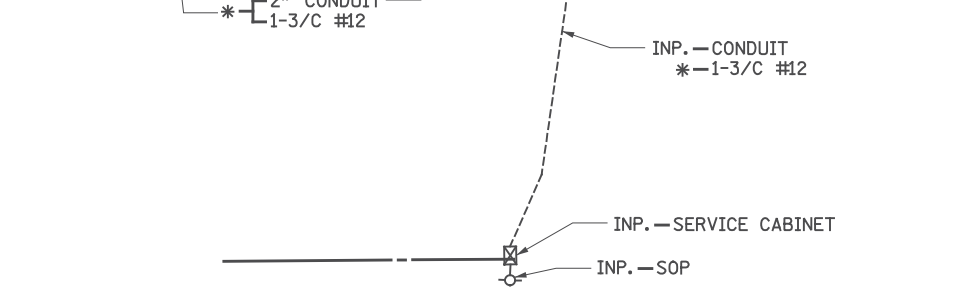
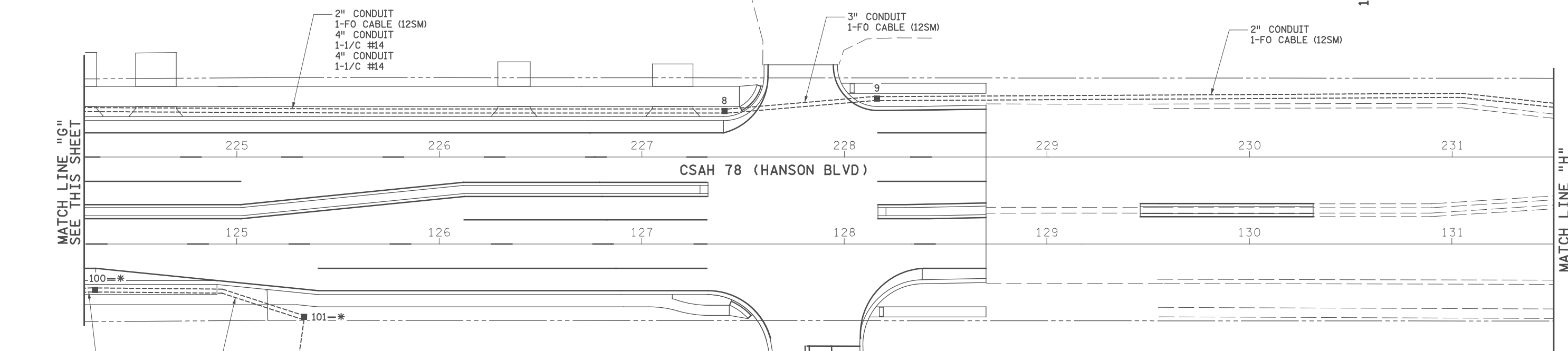
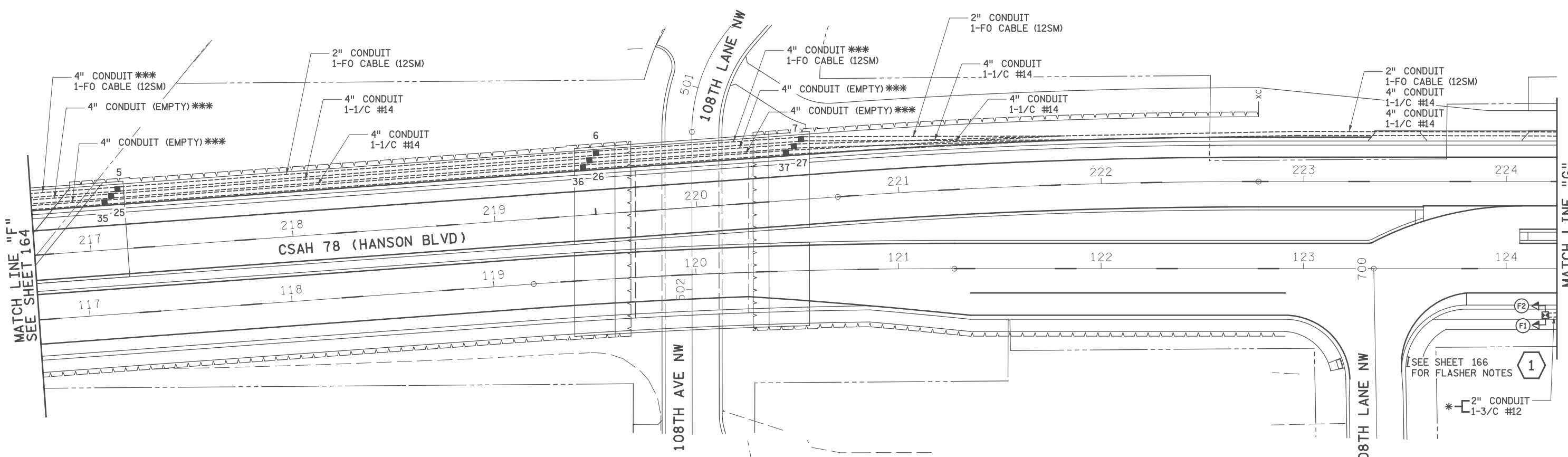
DRAWN BY M. BRESSLER
 DESIGNED BY M. BRESSLER
 CHECKED BY S. POSKA
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 INTERCONNECT PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 INTERCONNECT LAYOUT

SHEET
 164
 OF
 175



- NOTE:
1. ALL ITEMS SHOWN ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM EXCEPT WHERE NOTED.
 2. SEE SPECIAL PROVISIONS FOR SALVAGING AND REMOVAL OF INPLACE FLASHER SYSTEM.
 3. SEE SPECIAL PROVISIONS AND DETAILS FOR FURTHER INFORMATION REGARDING FLASHER SYSTEM INSTALLATION.
 4. * = CONTRACTOR SHALL FURNISH AND INSTALL UNDER ITEM NUMBER 2565 (REVISE FLASHER SYSTEM).
 5. ** = CONTRACTOR SHALL INSTALL COUNTY FURNISHED MATERIALS UNDER ITEM NUMBER 2565 (REVISE FLASHER SYSTEM).
 6. ALL ITEMS DENOTED WITH *** ARE INCLUDED IN PAYMENT FOR BRIDGE. SEE BRIDGE PLANS.

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NO	DATE	BY	CKD	APPR	REVISION

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Print Name: SCOTT C. POSKA

SCOTT C. POSKA

Date: 7/12/2017 License #: 47068

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
M. BRESSLER

DESIGNED BY
M. BRESSLER

CHECKED BY
S. POSKA

COMM. NO. 0169140



ANOKA COUNTY
INTERCONNECT PLANS
CSAH 78 - BNSF GRADE SEPARATION
INTERCONNECT/FLASHER LAYOUT

SHEET
165
OF
175

MATCH LINE "H"
SEE SHEET 165

2" CONDUIT
1-FO CABLE (12SM)

3" CONDUIT
1-FO CABLE (12SM)

2" CONDUIT
1-FO CABLE (12SM)

4" CONDUIT
2-12/C #12
3-3/C #12
1-3/C #12 (LUM.)
1-3/C #20
1-FO CABLE (12SM)

110TH LANE NW

CSAH 78 (HANSON BLVD)

111TH AVE NW

232

233

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136

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10

11

INP.-5

INP.-4

INP.-

INP.-1

4" CONDUIT
2-12/C #12
3-3/C #12
1-3/C #12 (LUM.)
1-3/C #20
2-2/C #14
1-FO CABLE (12SM)

4" CONDUIT
4-12/C #12
4-3/C #12
1-3/C #20
4-2/C #14
1-FO CABLE (12SM)

INP.-CONTROLLER & CABINET

- ① * PEDESTAL FOUNDATION
- 14' PEDESTAL POLE AND BASE
- WIND COLLAR FOR PEDESTAL POLE
- 2-12" LED YELLOW FLASHERS WITH VISORS, BRACKETING, AND SLIPFITTER COLLAR (FACING NORTHBOUND TRAFFIC)
- RADAR SPEED SIGN (YOUR SPEED)-POLE MOUNTED
- S5-1 (SCHOOL-SPEED LIMIT 30 WHEN FLASHING) SIGN PANEL (24" x 48")-POLE MOUNTED
- ** DISPLAY DISCONNECT CABINET-MOUNT ON BACK OF RADAR SIGN
- 1/2" FLEXIBLE CONDUIT FROM CABINET TO BOTTOM OF RADAR SPEED SIGN
- 1/2" EL FROM CABINET TO PEDESTAL POLE
- ELECTRICAL CABLES FROM SIGN PANEL AND FLASHERS TO PEDESTAL POLE BASE (CONNECT TO WIRE IN POLE BASE)
- EXTEND INTO HH-100
- * 2" CONDUIT
- 1-3/C #12



NOTE:
 1. ALL ITEMS SHOWN ARE INCLUDED IN PAYMENT FOR THE TRAFFIC CONTROL INTERCONNECT PAY ITEM EXCEPT WHERE NOTED.
 2. SEE SPECIAL PROVISIONS FOR SALVAGING AND REMOVAL OF INPLACE FLASHER SYSTEM.
 3. SEE SPECIAL PROVISIONS AND DETAILS FOR FURTHER INFORMATION REGARDING FLASHER SYSTEM INSTALLATION.
 4. * = CONTRACTOR SHALL FURNISH AND INSTALL UNDER ITEM NUMBER 2565 (REVISE FLASHER SYSTEM).
 5. ** = CONTRACTOR SHALL INSTALL COUNTY FURNISHED MATERIALS UNDER ITEM NUMBER 2565 (REVISE FLASHER SYSTEM).

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: SCOTT C. POSKA
 Date: 6/14/2017 License #: 47068

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
M. BRESSLER
DESIGNED BY
M. BRESSLER
CHECKED BY
S. POSKA
COMM. NO. 0169140



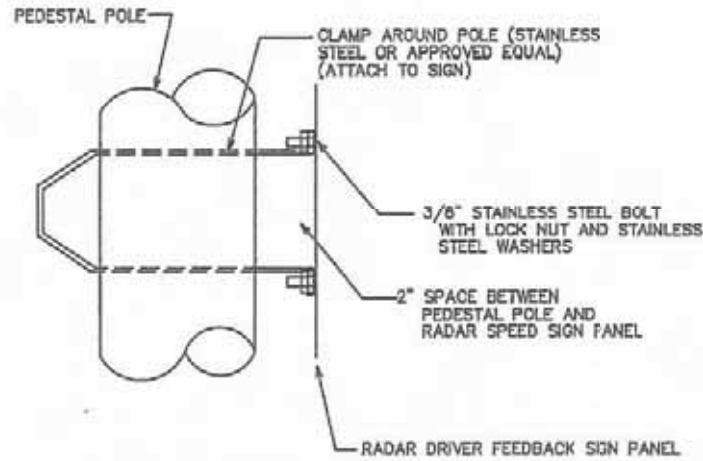
ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
INTERCONNECT PLANS
CSAH 78 - BNSF GRADE SEPARATION
INTERCONNECT/FLASHER LAYOUT

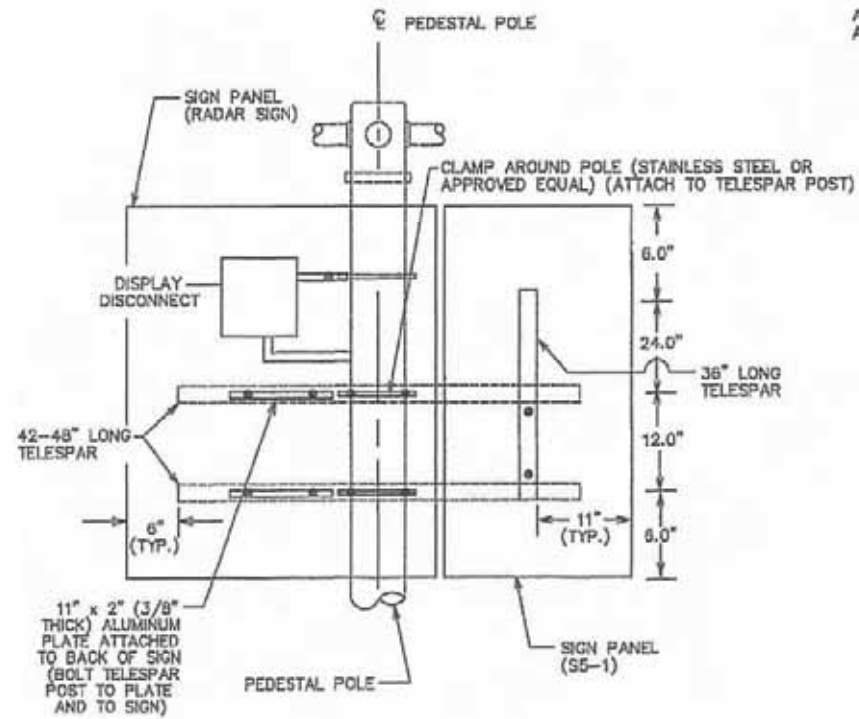
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FLASHER SIGN MOUNTING ATTACHMENT DETAILS

SIDE DETAIL



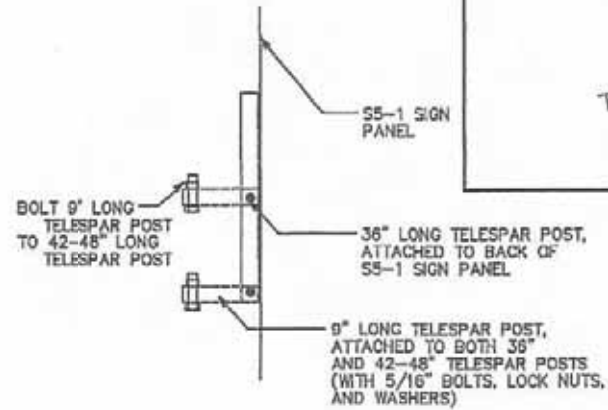
FRONT DETAIL



3/8" STAINLESS STEEL BOLTS WITH STAINLESS STEEL WASHERS & LOCK NUTS

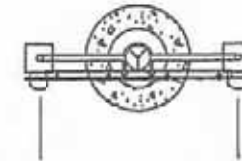
ALL TELESPAR POSTS ARE 2" POSTS.

SIDE DETAIL

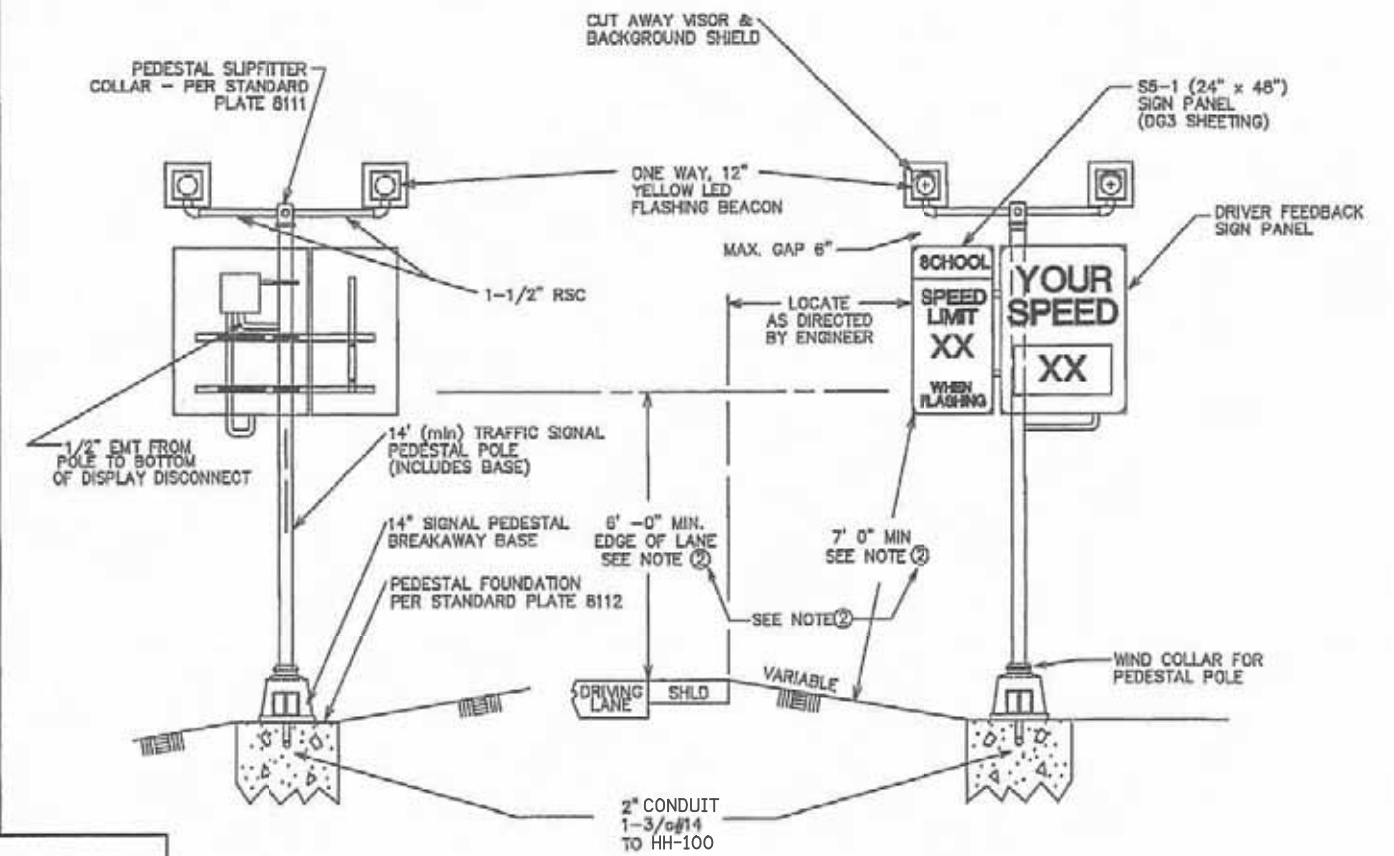


HARDWIRE POWERED FLASHER POLE DETAILS

TOP VIEW



FRONT VIEW



② CONTRACTOR SHALL MEET BOTH MINIMUM REQUIRED MOUNTING HEIGHTS WITH THE SHORTEST PEDESTAL POLE POSSIBLE OR AS DIRECTED BY THE ENGINEER

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

Print Name: SCOTT C. POSKA

Date: 6/14/2017 License #: 47068

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY M. BRESSLER
DESIGNED BY M. BRESSLER
CHECKED BY S. POSKA
COMM. NO. 0169140

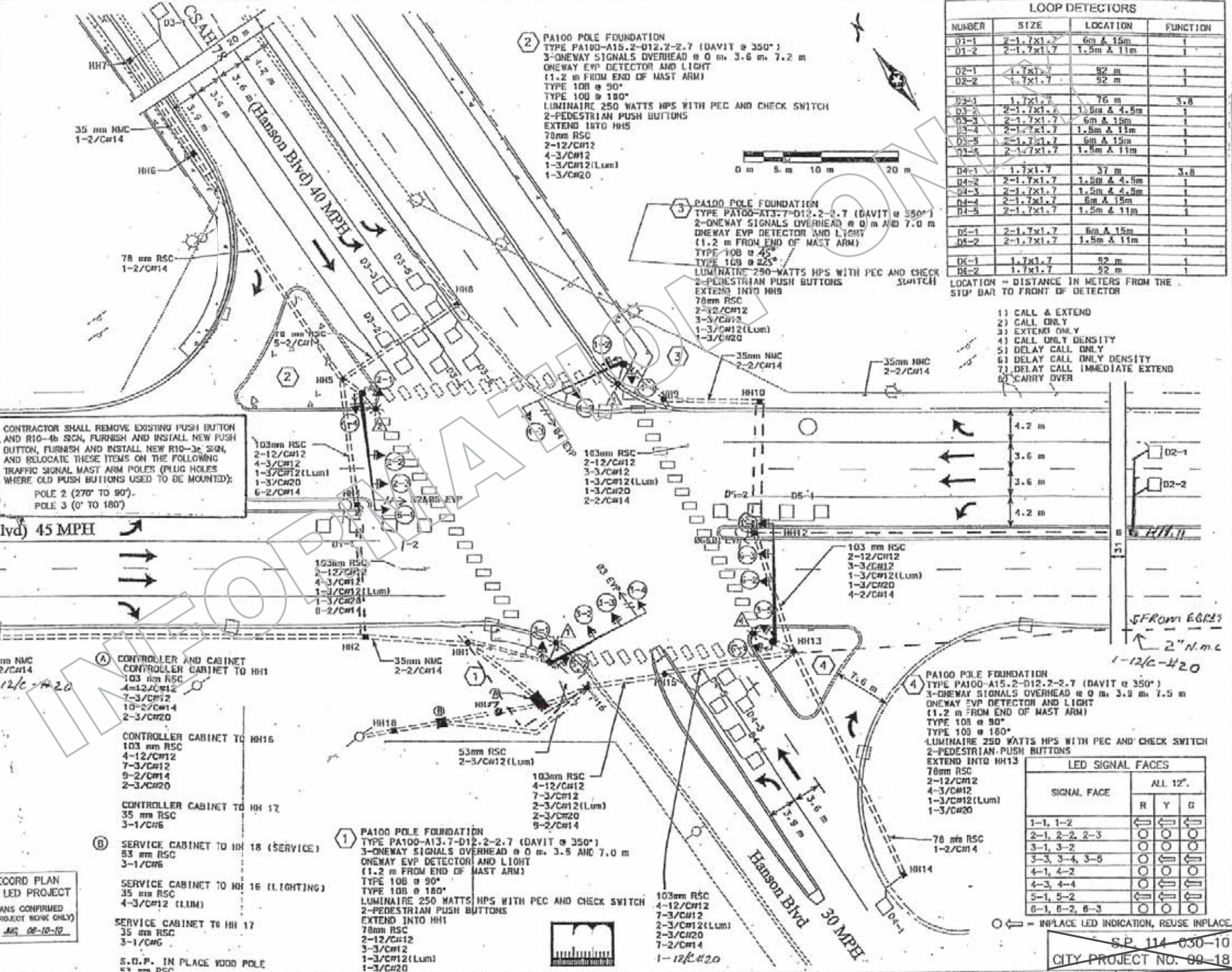


ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
FLASHING BEACON SYSTEM TYPICAL DETAILS

SHEET
167
OF
175

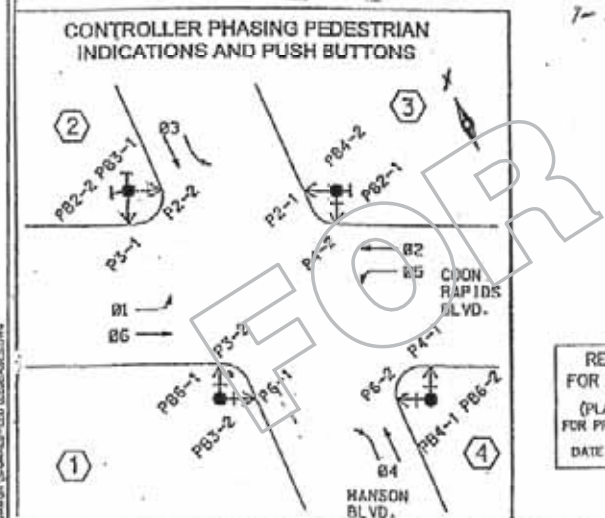
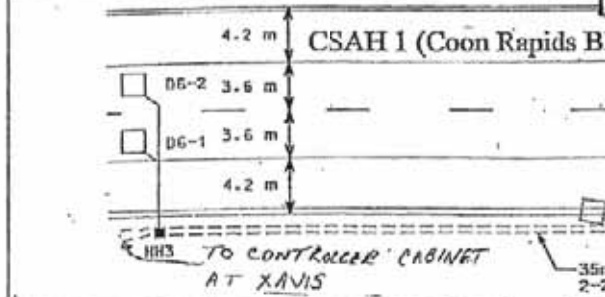
- LED RETROFIT--SYSTEM "G" NOTES:**
- ALL ITEMS OF SIGNAL SYSTEM ARE IN PLACE AND SHALL BE REUSED AND MAINTAINED IN PLACE, UNLESS OTHERWISE NOTED ON PLANS.
 - CONTRACTOR SHALL REMOVE THE IN PLACE "HAND/WALKING PERSON" LENS FROM EACH IN PLACE ONE SECTION PED SIGNAL INDICATION, AND SHALL FURNISH & INSTALL A NEW **COUNTDOWN TIMER LED "HAND/WALKING PERSON" LENS** IN ITS PLACE.
 - CONTRACTOR SHALL PROTECT AND MAINTAIN EACH IN PLACE ONE SECTION PEDESTRIAN SIGNAL HOUSING & VISOR WHEN REMOVING AND REPLACING EACH LENS, AND SHALL REPLACE THE COMPLETE PEDESTRIAN SIGNAL INDICATION UNIT (HOUSING, VISOR, AND LENS) SHOULD ANY DAMAGE BE DONE TO THE UNIT BY CONTRACTOR DURING WORK ON THIS PROJECT (INCIDENTAL).
 - IN LIEU OF THE LENS REPLACEMENT WORK DESCRIBED ABOVE, THE CONTRACTOR ALSO HAS THE OPTION OF REMOVING EACH IN PLACE ONE SECTION PEDESTRIAN SIGNAL INDICATION (HOUSING, VISOR AND LENS) AND REPLACING THEM WITH NEW ONE SECTION PEDESTRIAN SIGNAL INDICATIONS (HOUSING, VISOR, AND LED LENSES), AT NO ADDITIONAL COST TO THE PROJECT.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MODIFICATIONS TO IN PLACE POLE MOUNTED BRACKETING ON EACH TRAFFIC SIGNAL POLE TO ACCOMMODATE INSTALLATION OF NEW ONE SECTION PEDESTRIAN SIGNAL INDICATIONS (INCLUDING THE REPLACEMENT OF THE POLE MOUNTED BRACKETING IF NEEDED TO ACCOMMODATE EACH PEDESTRIAN SIGNAL INDICATION INSTALLATION) (INCIDENTAL).
 - ANY DAMAGE TO IN PLACE TRAFFIC SIGNAL POLES OR VEHICLE SIGNAL HEADS & BRACKETING DUE TO WORK ON THIS PROJECT SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE ENGINEER, AT NO EXPENSE TO THE CITY.
 - IF NEW PEDESTRIAN HOUSINGS AND VISORS ARE USED, THEY SHALL BE FABRICATED USING NEW POLYCARBONATE MATERIALS.
 - ALL VEHICULAR SIGNAL INDICATIONS ARE LED AND ARE IN PLACE (MAINTAIN AND REUSE IN PLACE AS SHOWN).
 - CONTRACTOR SHALL REMOVE ALL IN PLACE PEDESTRIAN PUSH BUTTONS (6 TOTAL), R10-4b STICKER SIGNS, AND "MEANING OF WALK" STICKER SIGNS, & SHALL FURNISH & INSTALL NEW SOLID STATE PED PUSH BUTTONS AND R10-3a SIGNS IN THEIR PLACE.
 - CONTRACTOR SHALL MAINTAIN OPERATION OF THE SIGNAL SYSTEM AT ALL TIMES, EXCEPT AS OTHERWISE APPROVED BY THE ENGINEER.
 - SEE STATEMENT OF ESTIMATED QUANTITIES FOR BID ITEMS FOR WORK AT THIS SIGNAL SYSTEM.



LOOP DETECTORS

NUMBER	SIZE	LOCATION	FUNCTION
D1-1	2-1.7x1.7	6m & 15m	1
D1-2	2-1.7x1.7	1.5m & 11m	1
D2-1	1.7x1.7	92 m	1
D2-2	1.7x1.7	92 m	1
D3-1	1.7x1.7	76 m	3,8
D3-2	2-1.7x1.7	1.5m & 4.5m	1
D3-3	2-1.7x1.7	6m & 15m	1
D3-4	2-1.7x1.7	1.5m & 11m	1
D3-5	2-1.7x1.7	6m & 15m	1
D3-6	2-1.7x1.7	1.5m & 11m	1
D4-1	1.7x1.7	57 m	3,8
D4-2	2-1.7x1.7	1.5m & 4.5m	1
D4-3	2-1.7x1.7	1.5m & 4.5m	1
D4-4	2-1.7x1.7	6m & 15m	1
D4-5	2-1.7x1.7	1.5m & 11m	1
D5-1	2-1.7x1.7	6m & 15m	1
D5-2	2-1.7x1.7	1.5m & 11m	1
D6-1	1.7x1.7	92 m	1
D6-2	1.7x1.7	92 m	1

LOCATION = DISTANCE IN METERS FROM THE STOP BAR TO FRONT OF DETECTOR



CONTRACTOR SHALL REMOVE EXISTING PUSH BUTTON AND R10-4b SIGN, FURNISH AND INSTALL NEW PUSH BUTTON, FURNISH AND INSTALL NEW R10-3a SIGN, AND RELOCATE THESE ITEMS ON THE FOLLOWING TRAFFIC SIGNAL MAST ARM POLES (PLUG HOLES WHERE OLD PUSH BUTTONS USED TO BE MOUNTED):

POLE 2 (270° TO 90°)
POLE 3 (0° TO 180°)

- (A) CONTROLLER AND CABINET**
CONTROLLER CABINET TO HH1
103 mm RSC
4-12/C#12
7-3/C#12
10-2/C#14
2-3/C#20
- CONTROLLER CABINET TO HH16
103 mm RSC
4-12/C#12
7-3/C#12
9-2/C#14
2-3/C#20
- CONTROLLER CABINET TO HH 17
35 mm RSC
3-1/C#16
- (B) SERVICE CABINET TO HH 18 (SERVICE)**
83 mm RSC
3-1/C#16
- SERVICE CABINET TO HH 16 (LIGHTING)
35 mm RSC
4-3/C#12 (LUM)
- SERVICE CABINET TO HH 17
35 mm RSC
3-1/C#16
- S.O.P. IN PLACE WOOD POLE
83 mm RSC

LED SIGNAL FACES

SIGNAL FACE	ALL 12"		
	R	Y	G
1-1, 1-2	←	←	←
2-1, 2-2, 2-3	○	○	○
3-1, 3-2	○	○	○
3-3, 3-4, 3-5	○	○	○
4-1, 4-2	○	○	○
4-3, 4-4	←	←	←
5-1, 5-2	←	←	←
6-1, 6-2, 6-3	○	○	○

○ ← = IN PLACE LED INDICATION, REUSE IN PLACE.

DRAWN BY: JMG
DESIGNER: JMG
CHECKED BY: JMG

RECORD DRAWING FOR PROJECT

REVISIONS

NO. DATE BY CKD APPR REVISION

STATE AID PROJECT NO. 002-678-023, 114-020-051

DRAWN BY: [Signature]
DESIGNED BY:
CHECKED BY:
COMM. NO. 0169140

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.

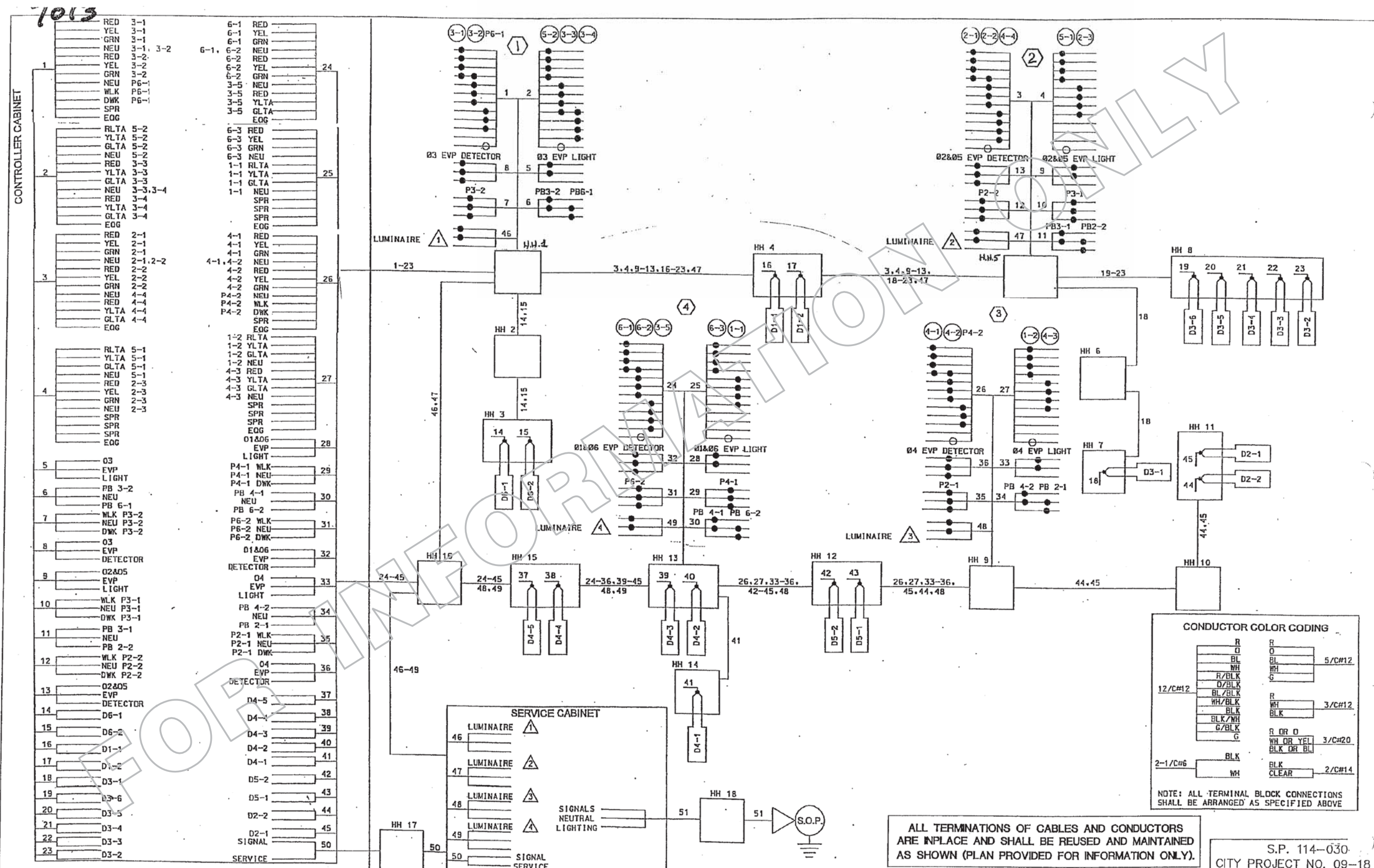
John M. Gray, PE
Lic. No. 22457

SEH
PHONE: (551) 400-2000
3438 VANDUWY CENTER DR.
ST. PAUL, MN 55110

COON RAPIDS, MINNESOTA

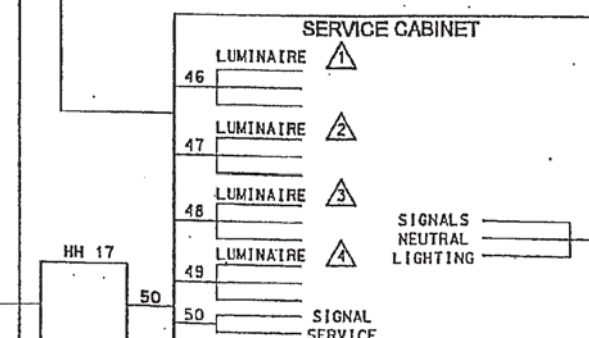
LED RETROFIT--SYSTEM "G"
INTERSECTION LAYOUT
CSAH 1 AT CSAH 78/HANSON BLVD

FILE NO. 107418
DATE 05/18/2008
18
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7013

1	RED 3-1	6-1	RED 24
	YEL 3-1	6-1	YEL 24
	GRN 3-1	6-1	GRN 24
	NEU 3-1, 3-2	6-2	NEU 24
	RED 3-2	6-2	RED 24
	YEL 3-2	6-2	YEL 24
	GRN 3-2	6-2	GRN 24
	NEU P6-1	3-5	NEU 24
	WLK P6-1	3-5	RED 24
	DWK P6-1	3-5	YLTA 24
	SPR P6-1	3-5	GLTA 24
	EOG P6-1	3-5	EOG 24
2	RLTA 5-2	6-3	RED 25
	YLTA 5-2	6-3	YEL 25
	GLTA 5-2	6-3	GRN 25
	NEU 5-2	6-3	NEU 25
	RED 3-3	1-1	RLTA 25
	YLTA 3-3	1-1	YLTA 25
	GLTA 3-3	1-1	GLTA 25
	NEU 3-3, 3-4	1-1	NEU 25
	RED 3-4	1-1	RED 25
	YLTA 3-4	1-1	YLTA 25
	GLTA 3-4	1-1	GLTA 25
	EOG 3-4	1-1	EOG 25
3	RED 2-1	4-1	RED 26
	YEL 2-1	4-1	YEL 26
	GRN 2-1	4-1	GRN 26
	NEU 2-1, 2-2	4-2	NEU 26
	RED 2-2	4-2	RED 26
	YEL 2-2	4-2	YEL 26
	GRN 2-2	4-2	GRN 26
	NEU 4-4	P4-2	NEU 26
	RED 4-4	P4-2	RED 26
	YLTA 4-4	P4-2	YLTA 26
	GLTA 4-4	P4-2	GLTA 26
	EOG 4-4	P4-2	EOG 26
4	RLTA 5-1	1-2	RLTA 27
	YLTA 5-1	1-2	YLTA 27
	GLTA 5-1	1-2	GLTA 27
	NEU 5-1	1-2	NEU 27
	RED 2-3	4-3	RED 27
	YEL 2-3	4-3	YEL 27
	GRN 2-3	4-3	GRN 27
	NEU 2-3	4-3	NEU 27
	SPR 2-3	SPR	SPR 27
	SPR 2-3	SPR	SPR 27
	SPR 2-3	SPR	SPR 27
	EOG 2-3	EOG	EOG 27
5	03	D1&06	EVP 28
	EVP LIGHT	EVP LIGHT	EVP LIGHT 28
6	P4-1 WLK	P4-1	WLK 29
	P4-1 NEU	P4-1	NEU 29
	P4-1 DWK	P4-1	DWK 29
7	PB 3-2	PB 3-2	PB 3-2 30
	NEU 6-1	NEU 6-1	NEU 6-1 30
8	WLK P3-2	P6-2	WLK 31
	NEU P3-2	P6-2	NEU 31
	DWK P3-2	P6-2	DWK 31
9	03	D1&06	EVP 32
	EVP DETECTOR	EVP DETECTOR	EVP DETECTOR 32
10	02&05	02&05	EVP 33
	EVP LIGHT	EVP LIGHT	EVP LIGHT 33
11	WLK P3-1	PB 4-2	WLK 34
	NEU P3-1	PB 4-2	NEU 34
	DWK P3-1	PB 4-2	DWK 34
12	PB 3-1	PB 2-1	PB 3-1 35
	NEU 2-2	P2-1	NEU 2-2 35
	PB 2-2	P2-1	PB 2-2 35
	WLK P2-2	P2-1	WLK P2-2 35
	NEU P2-2	P2-1	NEU P2-2 35
	DWK P2-2	P2-1	DWK P2-2 35
13	02&05	02&05	EVP 36
	EVP DETECTOR	EVP DETECTOR	EVP DETECTOR 36
14	D6-1	D4-5	D6-1 37
15	D6-2	D4-4	D6-2 38
16	D1-1	D4-3	D1-1 39
17	D1-2	D4-2	D1-2 40
18	D3-1	D4-1	D3-1 41
19	D3-6	D5-2	D3-6 42
20	D3-5	D5-1	D3-5 43
21	D3-4	D2-2	D3-4 44
22	D3-3	D2-1	D3-3 45
23	D3-2	SIGNAL	SIGNAL 50
		SERVICE	SERVICE 50



CONDUCTOR COLOR CODING

R	R	
O	BL	5/C#12
BL	WH	
WH	S	
R/BLK	R	
O/BLK	WH	3/C#12
BL/BLK	BLK	
WH/BLK	R OR O	3/C#20
BLK	WH OR YEL	
BLK/WH	BLK OR BL	
G/BLK	BLK	
G	WH	2/C#14
BLK	CLEAR	
WH		

NOTE: ALL TERMINAL BLOCK CONNECTIONS SHALL BE ARRANGED AS SPECIFIED ABOVE

ALL TERMINATIONS OF CABLES AND CONDUCTORS ARE INPLACE AND SHALL BE REUSED AND MAINTAINED AS SHOWN (PLAN PROVIDED FOR INFORMATION ONLY).

S.P. 114-030
CITY PROJECT NO. 09-18

DRAWN BY: JMG
DESIGNER: JMG
CHECKED BY: JMG

NO.	BY	DATE	REVISIONS

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

Name: John M. Gray, PE
Lic. No. 22457
Date: May 18, 2009

COON RAPIDS, MINNESOTA

LED RETROFIT SYSTEM 'G'
FIELD WIRING DIAGRAM
CSAH 1 AT CSAH 78/HANSON BLVD

FILE NO. 107418
DATE 04/18/2008
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NO.	DATE	BY	CKD	APPR	REVISION

STATE AID PROJECT NO. 002-678-023, 114-020-051

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DESIGNED BY
CHECKED BY
COMM. NO. 0169140



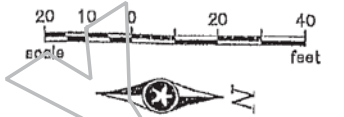
ANOKA COUNTY
TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
FOR INFORMATION ONLY

SHEET 169 OF 175

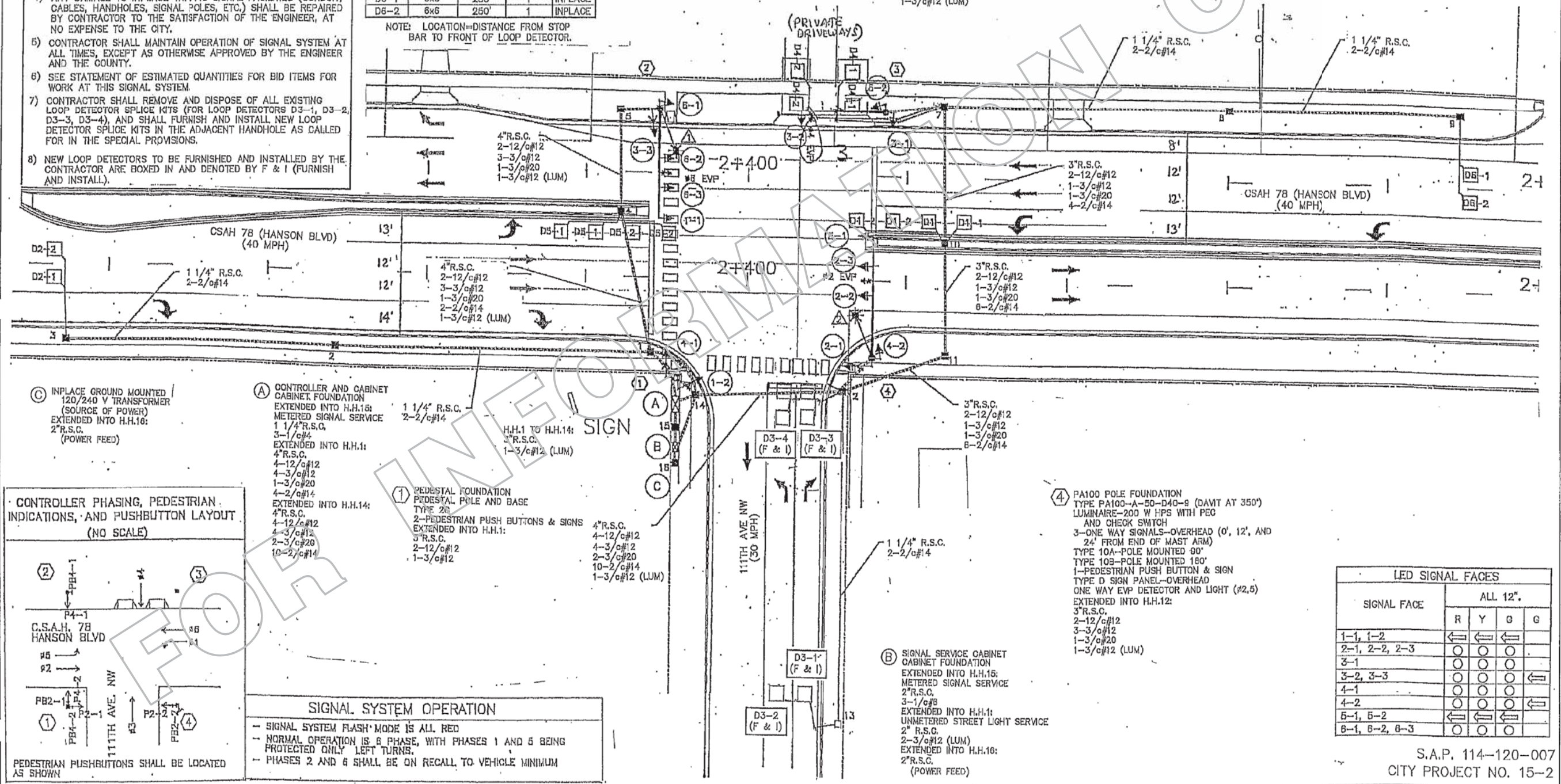
- LOOP DETECTOR REPLACEMENT NOTES:**
- 1) ALL ITEMS OF SIGNAL SYSTEM ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE, UNLESS OTHERWISE NOTED ON PLANS.
 - 2) CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING HANDHOLES IN THE VICINITY OF CONSTRUCTION, AND SHALL ADJUST HANDHOLES 1, 12, 13, AND 14 AS NECESSARY TO MATCH FINISHED SURROUNDING GRADE AFTER ROAD WORK HAS BEEN COMPLETED. SEE SPECIAL PROVISIONS & STATEMENT OF ESTIMATED QUANTITIES.
 - 3) LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 3/4" NMG. NEW LOOP DETECTORS D3-1, D3-2, D3-3, AND D3-4 SHALL BE FURNISHED, INSTALLED AND MADE OPERATIONAL BY CONTRACTOR TO THE SATISFACTION OF THE ENGINEER AND THE ANOKA COUNTY HIGHWAY DEPARTMENT. SEE DETAILS AND SPECIAL PROVISIONS.
 - 4) ANY DAMAGE TO INPLACE TRAFFIC SIGNAL FACILITIES (CONDUIT, CABLES, HANDHOLES, SIGNAL POLES, ETC.) SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE ENGINEER, AT NO EXPENSE TO THE CITY.
 - 5) CONTRACTOR SHALL MAINTAIN OPERATION OF SIGNAL SYSTEM AT ALL TIMES, EXCEPT AS OTHERWISE APPROVED BY THE ENGINEER AND THE COUNTY.
 - 6) SEE STATEMENT OF ESTIMATED QUANTITIES FOR BID ITEMS FOR WORK AT THIS SIGNAL SYSTEM.
 - 7) CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING LOOP DETECTOR SPLICE KITS (FOR LOOP DETECTORS D3-1, D3-2, D3-3, D3-4), AND SHALL FURNISH AND INSTALL NEW LOOP DETECTOR SPLICE KITS IN THE ADJACENT HANDHOLE AS CALLED FOR IN THE SPECIAL PROVISIONS.
 - 8) NEW LOOP DETECTORS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR ARE BOXED IN AND DENOTED BY F & I (FURNISH AND INSTALL).

PVC LOOP DETECTORS				
NUMBER	SIZE (FT.)	LOCATION	FUNCTION	STATUS
D1-1	2-6x6	20' & 33'	1	INPLACE
D1-2	2-6x6	-10' & 5'	1	INPLACE
D2-1	6x6	250'	1	INPLACE
D2-2	6x6	250'	1	INPLACE
D3-1	6x6	120'	3,8	F & I
D3-2	6x6	120'	3,8	F & I
D3-3	2-6x6	0' & 15'	7	F & I
D3-4	2-6x6	0' & 15'	1	F & I
D4-1	2-6x6	AS SHOWN	7	INPLACE
D4-2	2-6x6	AS SHOWN	7	INPLACE
D5-1	6x6	20' & 36'	1	INPLACE
D5-2	6x6	-10' & 6'	1	INPLACE
D6-1	6x6	250'	1	INPLACE
D6-2	6x6	250'	1	INPLACE

- LOOP DETECTOR FUNCTION CODES:**
- 1.) CALL AND EXTEND
 - 2.) CALL ONLY
 - 3.) EXTEND ONLY
 - 4.) CALL ONLY DENSITY
 - 5.) DELAYED CALL ONLY
 - 6.) DELAYED CALL ONLY DENSITY
 - 7.) DELAYED CALL IMMEDIATE EXTEND
 - 8.) CARRY OVER (STRETCH)
 - 9.) ADVISORY DETECTOR
 - 10.) SAMPLING DETECTOR



NOTE: LOCATION=DISTANCE FROM STOP BAR TO FRONT OF LOOP DETECTOR.



(C) INPLACE GROUND MOUNTED 120/240 V TRANSFORMER (SOURCE OF POWER) EXTENDED INTO H.H.16: 2" R.S.C. (POWER FEED)

(A) CONTROLLER AND CABINET CABINET FOUNDATION EXTENDED INTO H.H.15: METERED SIGNAL SERVICE 1 1/4" R.S.C. EXTENDED INTO H.H.1: 4" R.S.C. 4-12/c#12 4-3/c#12 1-3/c#20 4-2/c#14 EXTENDED INTO H.H.14: 4" R.S.C. 4-12/c#12 4-3/c#12 2-3/c#20 10-2/c#14

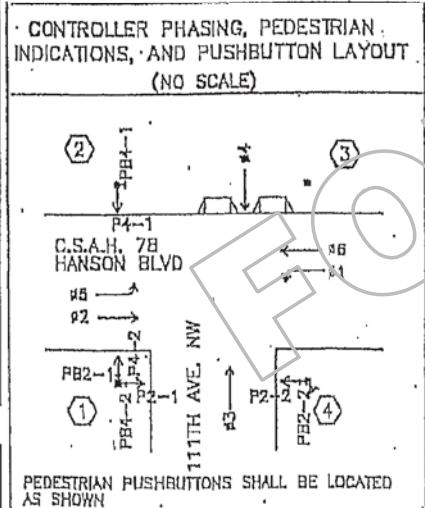
(1) PEDESTAL FOUNDATION PEDESTAL POLE AND BASE TYPE 2C 2-PEDESTRIAN PUSH BUTTONS & SIGNS EXTENDED INTO H.H.1: 3" R.S.C. 2-12/c#12 1-3/c#12

H.H.1 TO H.H.14: 3" R.S.C. 1-3/c#12 (LUM)

4" R.S.C. 4-12/c#12 4-3/c#12 2-3/c#20 10-2/c#14 1-3/c#12 (LUM)

(B) SIGNAL SERVICE CABINET CABINET FOUNDATION EXTENDED INTO H.H.15: METERED SIGNAL SERVICE 2" R.S.C. 3-1/c#8 EXTENDED INTO H.H.1: UNMETERED STREET LIGHT SERVICE 2" R.S.C. 2-3/c#12 (LUM) EXTENDED INTO H.H.10: 2" R.S.C. (POWER FEED)

(4) PA100 POLE FOUNDATION TYPE PA100-A-50-D40-8 (DAVT AT 350") LUMINAIRE-200 W HPS WITH PEC AND CHECK SWITCH 3-ONE WAY SIGNALS-OVERHEAD (0', 12', AND 24' FROM END OF MAST ARM) TYPE 10A-POLE MOUNTED 90' TYPE 10B-POLE MOUNTED 150' 1-PEDESTRIAN PUSH BUTTON & SIGN TYPE D SIGN PANEL-OVERHEAD ONE WAY EVP DETECTOR AND LIGHT (#2,5) EXTENDED INTO H.H.12: 3" R.S.C. 2-12/c#12 3-3/c#12 1-3/c#20 1-3/c#12 (LUM)



SIGNAL SYSTEM OPERATION

- SIGNAL SYSTEM FLASH MODE IS ALL RED
- NORMAL OPERATION IS 6 PHASE, WITH PHASES 1 AND 6 BEING PROTECTED ONLY LEFT TURNS.
- PHASES 2 AND 6 SHALL BE ON RECALL TO VEHICLE MINIMUM

LED SIGNAL FACES				
SIGNAL FACE	ALL 12"			
	R	Y	G	G
1-1, 1-2	←	←	←	
2-1, 2-2, 2-3	○	○	○	
3-1	○	○	○	←
3-2, 3-3	○	○	○	←
4-1	○	○	○	←
4-2	○	○	○	←
5-1, 5-2	←	←	←	
6-1, 6-2, 6-3	○	○	○	

S.A.P. 114-120-007
CITY PROJECT NO. 15-2

DRAWN BY: JMG
DESIGNER: JMG
CHECKED BY: JMG

Record Drawing

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

Home: John M. Gray, PE

PHONE: (855) 490-2000
3535 VANDERBILT CENTER DR.
ST. PAUL, MN 55110

GOON RAPIDS, MINNESOTA

LOOP DETECTOR REPLACEMENT
INTERSECTION LAYOUT

FILE NO. COONR 116823
SIGNAL SHEET

NO	DATE	BY	CKD	APPR	REVISION

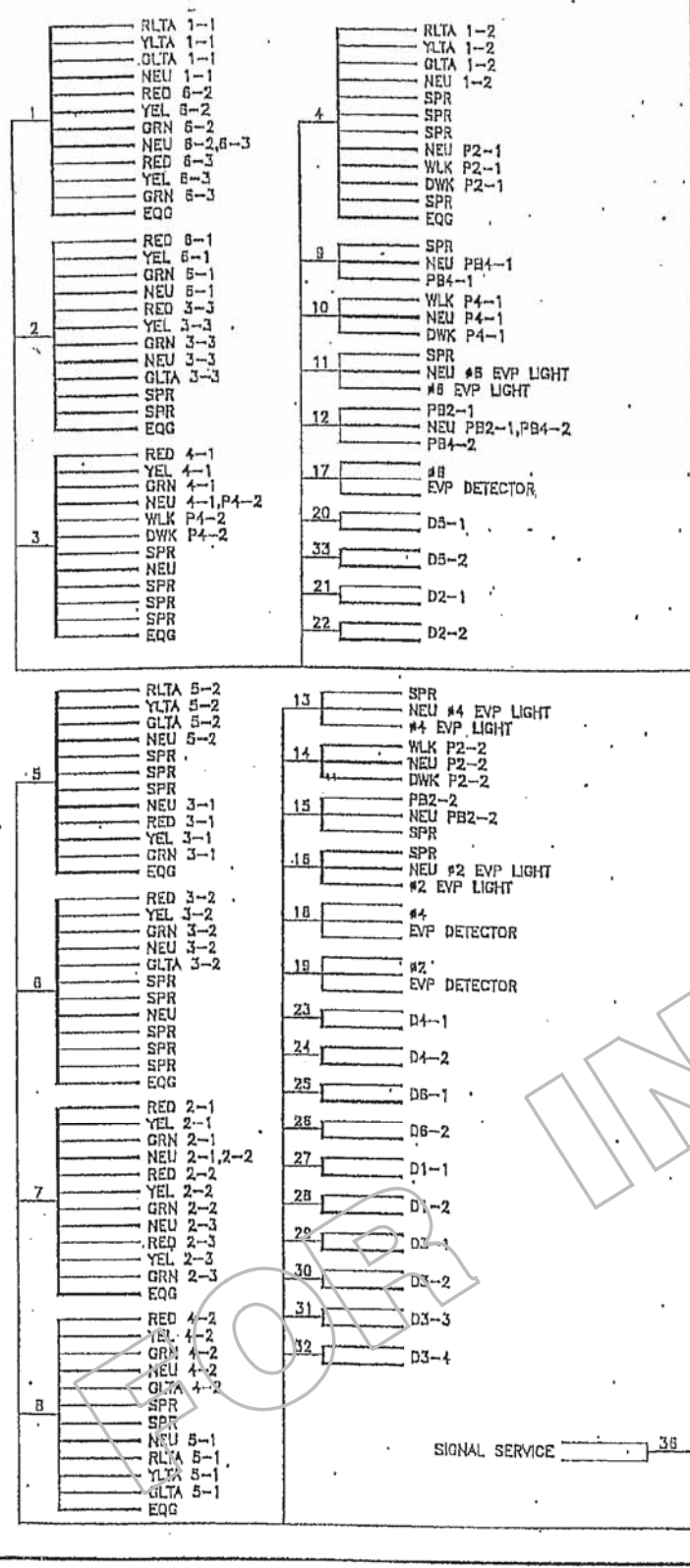
STATE AID PROJECT NO. 002-678-023, 114-020-051

DRAWN BY: _____
DESIGNED BY: _____
CHECKED BY: _____
COMM. NO. 0169140

SRE ENGINEERS PLANNERS DESIGNERS
Consulting Group, Inc.

ANOKA COUNTY
TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
FOR INFORMATION ONLY

CONTROLLER CABINET



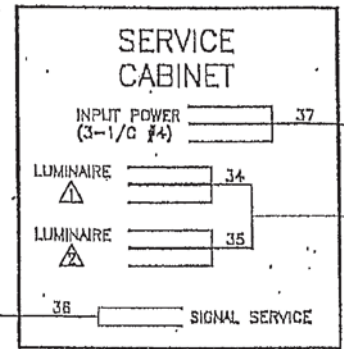
CONDUCTOR COLOR CODE

R	3/C#12	R	WH
O		B	BLK
BC		R OR O	
WH		WH OR YEL	EVP
R/BLK	3/C#20	BLK OR BL	DETECTOR
O/BLK			
BL/BLK		BLK	
WH/BLK	2/C#14	CLR	
BLK			
BLK/WH		BLK	SIGNAL
G/BLK	2-1/C#4	WH	SERVICE
G			

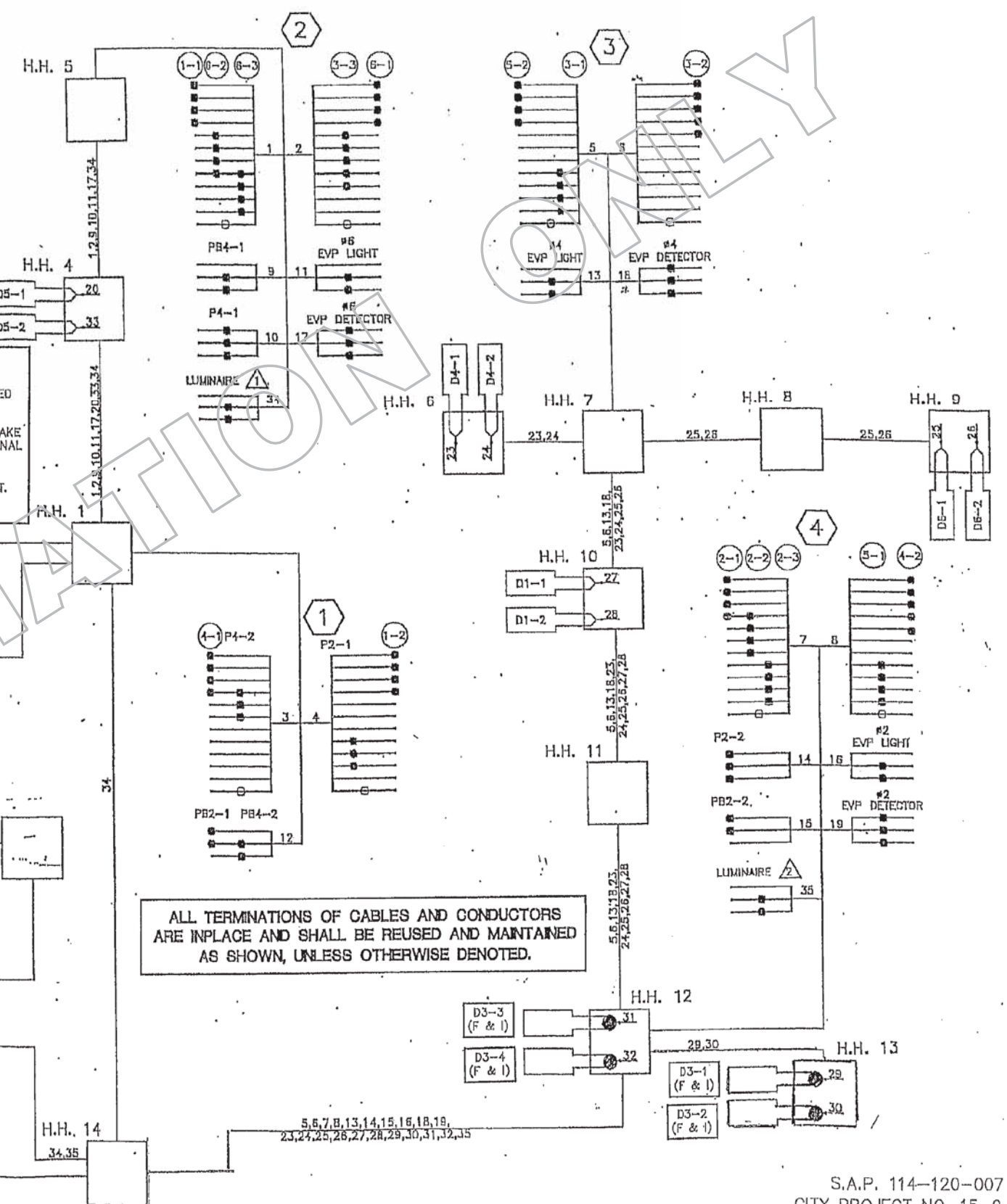
LOOP DETECTOR REPLACEMENT NOTES:

- 1) ALL ITEMS OF SIGNAL SYSTEM ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE, UNLESS OTHERWISE NOTED ON PLANS.
- 2) CONTRACTOR SHALL REUSE AND MAKE OPERATIONAL ALL EXISTING LOOP DETECTOR LEAD-IN CABLES IN ORDER TO MAKE NEW LOOP DETECTORS D3-1, D3-2, D3-3, D3-4 OPERATIONAL TO THE SATISFACTION OF THE ENGINEER.
- 3) (F & I) DENOTES NEW LOOP DETECTORS TO BE FURNISHED AND INSTALLED BY CONTRACTOR AS PART OF THIS PROJECT.
- 4) (N) = NEW TERMINATION ON EXISTING LEAD-IN CABLE.

1,2,3,4,9,10,11,12,17,20,21,22,33



ALL TERMINATIONS OF CABLES AND CONDUCTORS ARE INPLACE AND SHALL BE REUSED AND MAINTAINED AS SHOWN, UNLESS OTHERWISE DENOTED.



DRAWN BY: JMG
 DESIGNER: JMG
 CHECKED BY: JMG

RECORD DRAWING

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 MINNESOTA.

Name: John M. Gray, PE
 No. 92457

PHONE: (651) 490-2000
 3555 WYOMING CENTER DR
 ST. PAUL, MN 55110

COON RAPIDS, MINNESOTA

LOOP DETECTOR REPLACEMENT
 FIELD WIRING DIAGRAM

FILE NO. COONR 116823
 SIGNAL SHEET 7 OF 17

S.A.P. 114-120-007
 CITY PROJECT NO. 15-2

NO	DATE	BY	CKD	APPR	REVISION

STATE AID PROJECT NO. 002-678-023, 114-020-051

DRAWN BY

DESIGNED BY

CHECKED BY

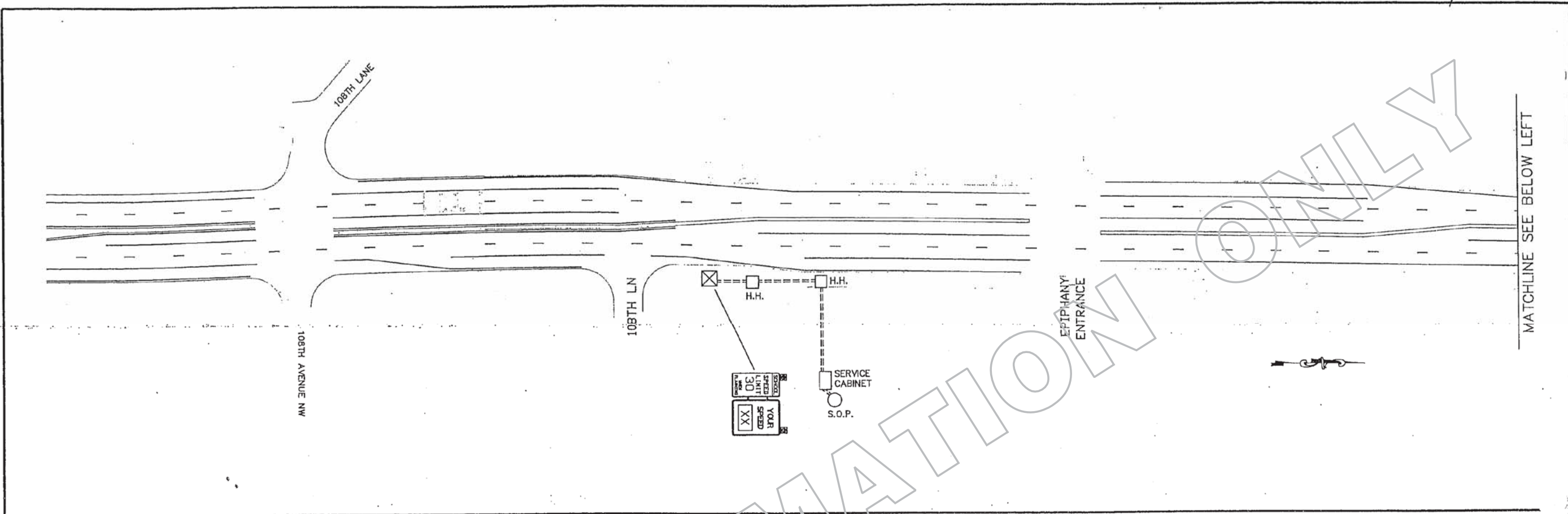
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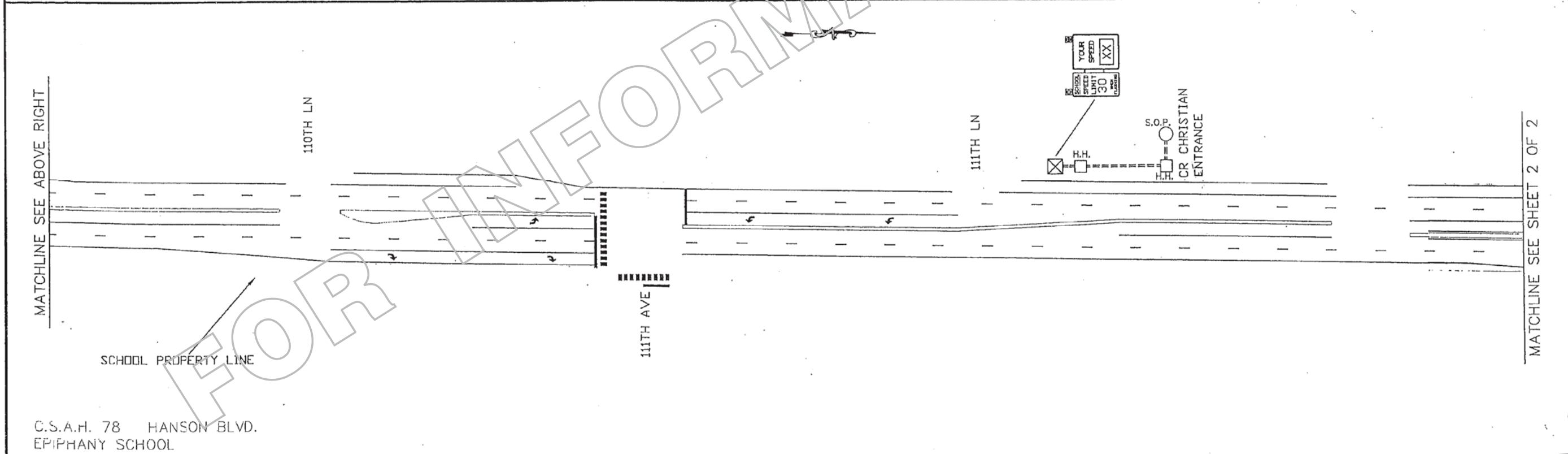
ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 TRAFFIC SIGNAL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 FOR INFORMATION ONLY

SHEET
 171
 OF
 175



MATCHLINE SEE BELOW LEFT



MATCHLINE SEE ABOVE RIGHT

MATCHLINE SEE SHEET 2 OF 2

C.S.A.H. 78 HANSON BLVD.
EPIPHANY SCHOOL

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

PRINT NAME: _____
DESIGN BY: _____ DATE: _____

ANOKA COUNTY
HIGHWAY DEPT

STATE PROJECT NO. _____
STATE AID PROJECT NO. _____
STATE AID PROJECT NO. _____

D.F.B. SIGN
S.O.P. LAYOUT

NO	DATE	BY	CKD	APPR	REVISION

STATE AID PROJECT NO.
002-678-023, 114-020-051

DRAWN BY _____
DESIGNED BY _____
CHECKED BY _____
COMM. NO. 0169140

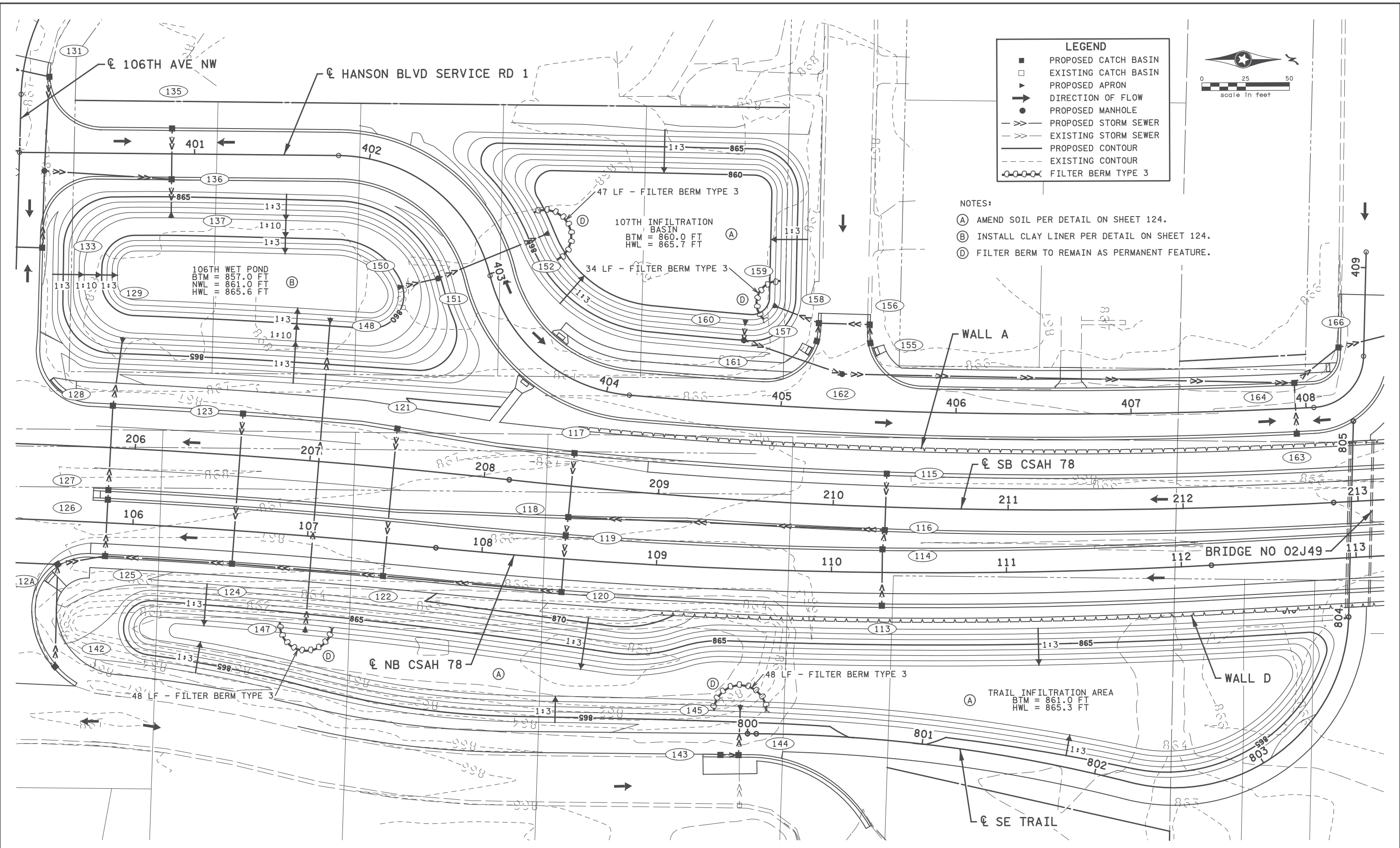


ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
TRAFFIC SIGNAL PLANS
CSAH 78 - BNSF GRADE SEPARATION
FOR INFORMATION ONLY

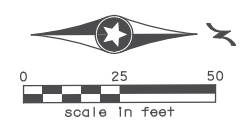
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172
OF
175

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LEGEND

- PROPOSED CATCH BASIN
- EXISTING CATCH BASIN
- ▽ PROPOSED APRON
- DIRECTION OF FLOW
- PROPOSED MANHOLE
- - - PROPOSED STORM SEWER
- - - EXISTING STORM SEWER
- - - PROPOSED CONTOUR
- - - EXISTING CONTOUR
- ○ ○ ○ ○ FILTER BERM TYPE 3



- NOTES:**
- (A) AMEND SOIL PER DETAIL ON SHEET 124.
 - (B) INSTALL CLAY LINER PER DETAIL ON SHEET 124.
 - (D) FILTER BERM TO REMAIN AS PERMANENT FEATURE.

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: JEREMY NIELSEN

Jeremy Nielsen

Date: 06/17/2017 License #: 45047

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG

DESIGNED BY
Z. THELEN

CHECKED BY
K. LACHOWITZER

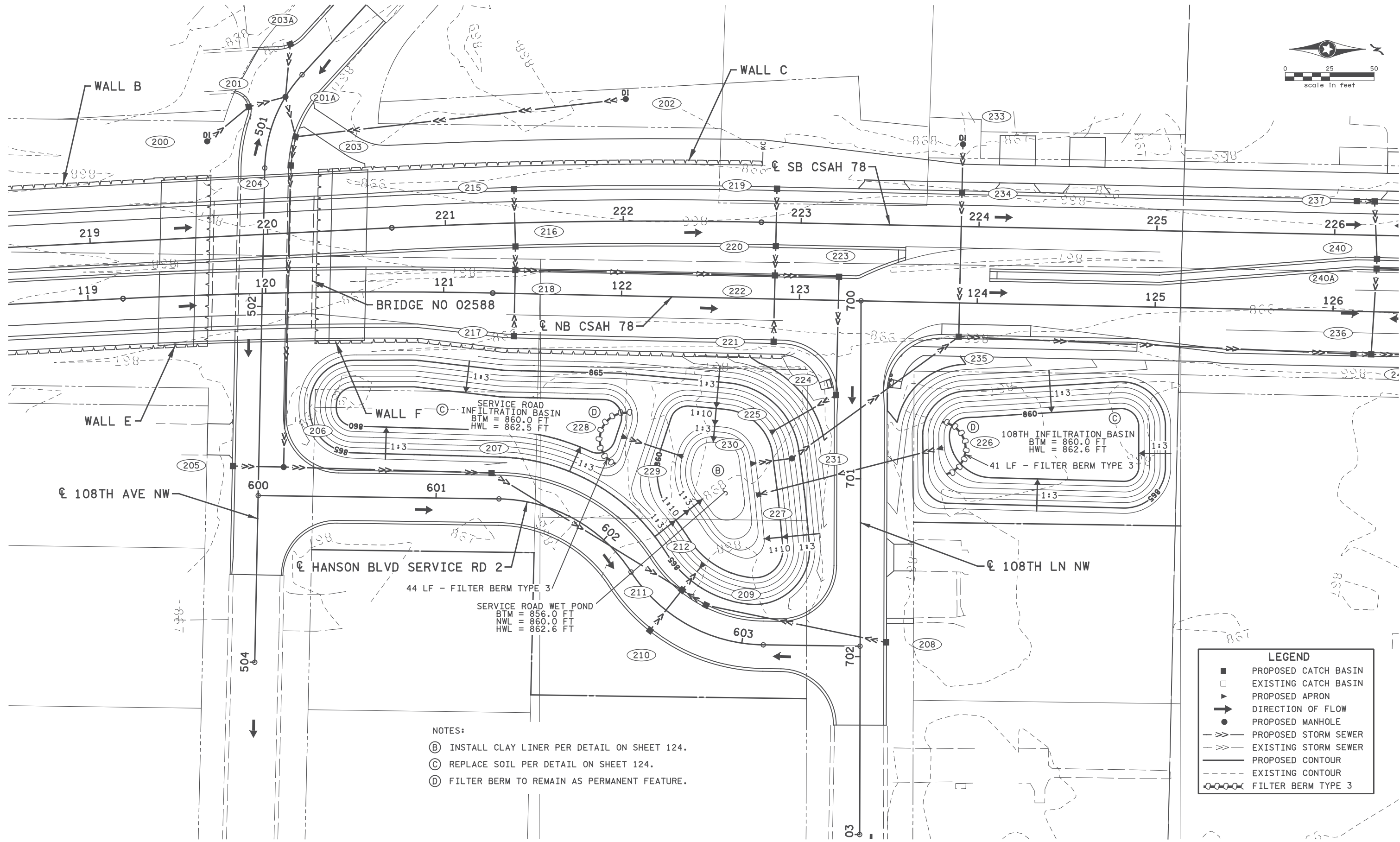
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
CONTOUR PLANS
CSAH 78 - BNSF GRADE SEPARATION

SHEET
173
OF
175



- NOTES:
- (B) INSTALL CLAY LINER PER DETAIL ON SHEET 124.
 - (C) REPLACE SOIL PER DETAIL ON SHEET 124.
 - (D) FILTER BERM TO REMAIN AS PERMANENT FEATURE.

LEGEND

- PROPOSED CATCH BASIN
- EXISTING CATCH BASIN
- ▬ PROPOSED APRON
- ➔ DIRECTION OF FLOW
- PROPOSED MANHOLE
- PROPOSED STORM SEWER
- - - - EXISTING STORM SEWER
- PROPOSED CONTOUR
- - - - EXISTING CONTOUR
- FILTER BERM TYPE 3

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: JEREMY NIELSEN

Jeremy Nielsen

Date: 06/17/2011 License #: 45047

STATE AID PROJECT NO 002-678-023, 114-020-051

DRAWN BY S. VANG

DESIGNED BY Z. THELEN

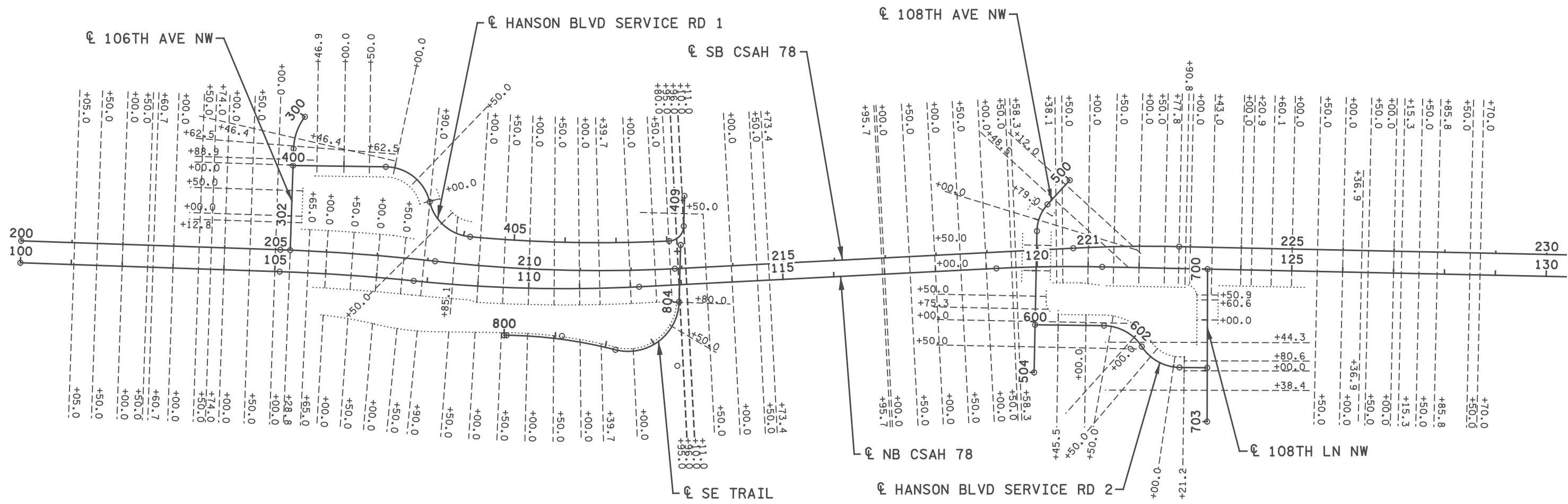
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COMM. NO. 0169140



ANOKA COUNTY
 CONTOUR PLANS
 CSAH 78 - BNSF GRADE SEPARATION

SHEET
 174
 OF
 175



LEGEND

----- CROSS SECTION PATTERN LINE

..... MATCH LINE

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NO	DATE	BY	CKD	APPR	REVISION

... \CAD_BIMVP\an\9140_xs101.dgn

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

Print Name: BENJAMIN P ROBECK

Ben Robeck

Date 6/13/2017 License # 53680

STATE AID PROJECT NO
002-678-023, 114-020-051

DRAWN BY
S. VANG

DESIGNED BY
T. SMITH

CHECKED BY
B. ROBECK

COMM. NO. 0169140



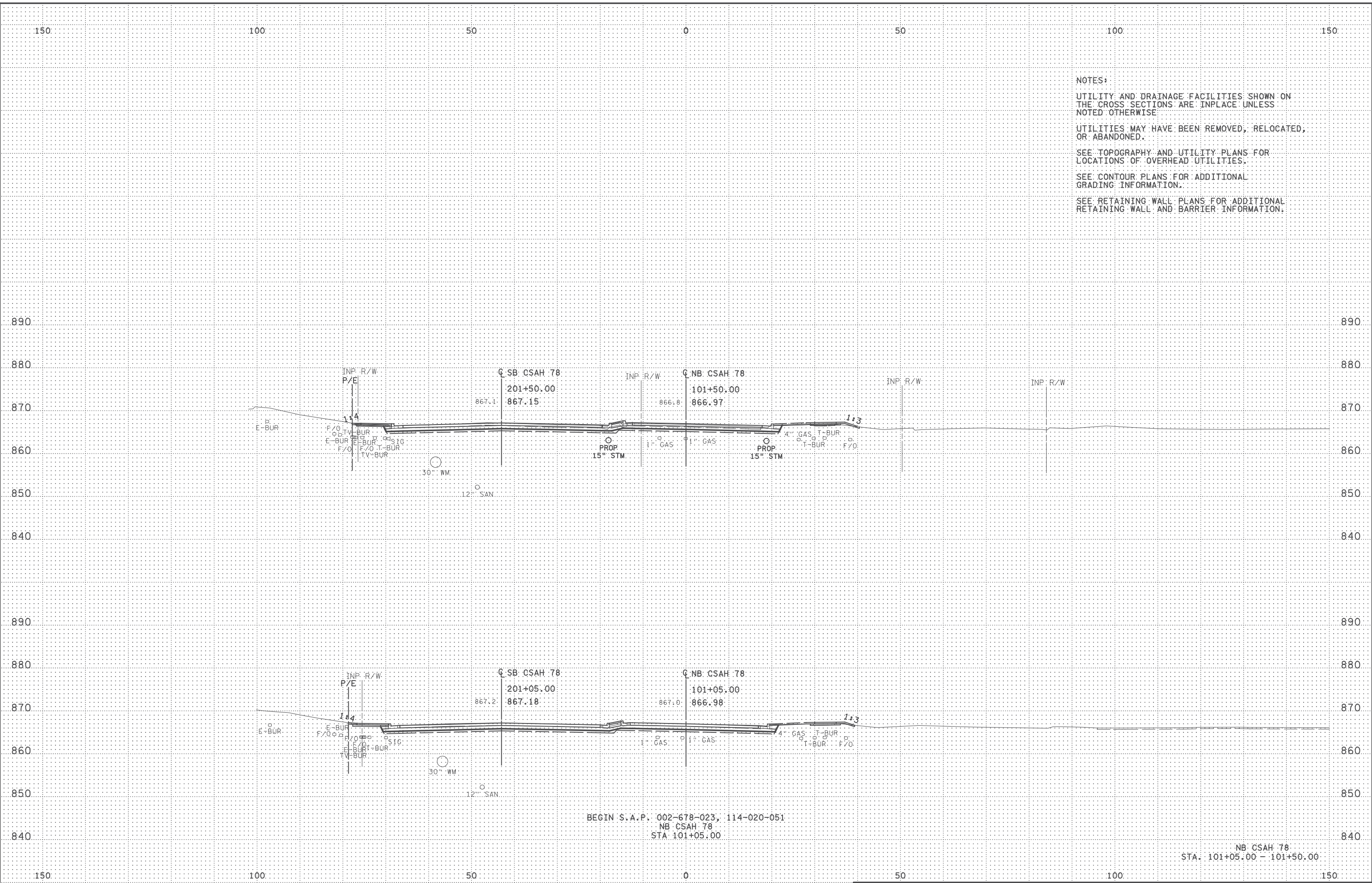
**ENGINEERS
PLANNERS
DESIGNERS**

ANOKA COUNTY

CROSS SECTION MATCHLINE LAYOUT PLAN
CSAH 78 - BNSF GRADE SEPARATION

**SHEET
175
OF
175**

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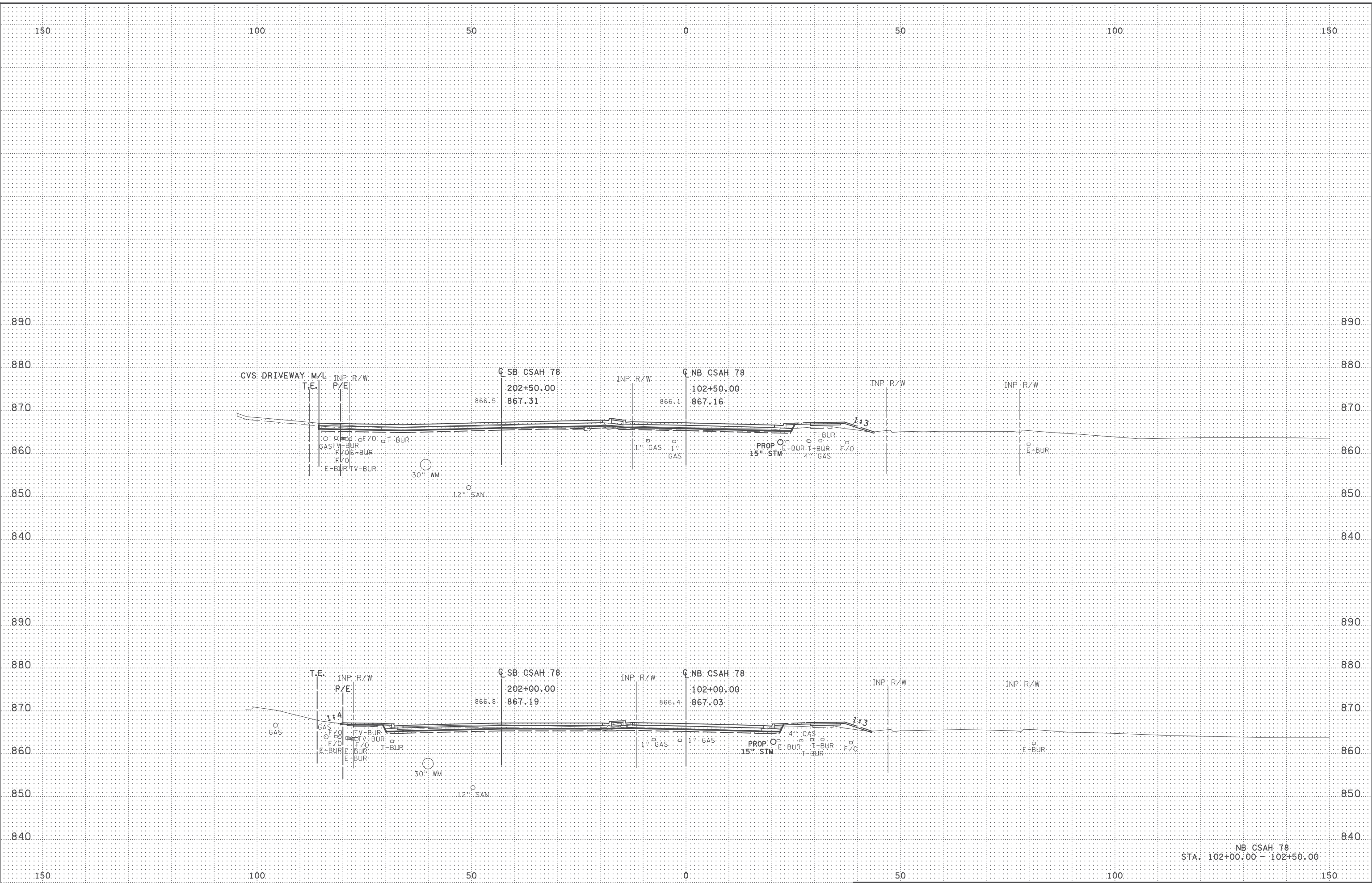


NOTES:
UTILITY AND DRAINAGE FACILITIES SHOWN ON THE CROSS SECTIONS ARE INPLACE UNLESS NOTED OTHERWISE.
UTILITIES MAY HAVE BEEN REMOVED, RELOCATED, OR ABANDONED.
SEE TOPOGRAPHY AND UTILITY PLANS FOR LOCATIONS OF OVERHEAD UTILITIES.
SEE CONTOUR PLANS FOR ADDITIONAL GRADING INFORMATION.
SEE RETAINING WALL PLANS FOR ADDITIONAL RETAINING WALL AND BARRIER INFORMATION.

BEGIN S.A.P. 002-678-023, 114-020-051
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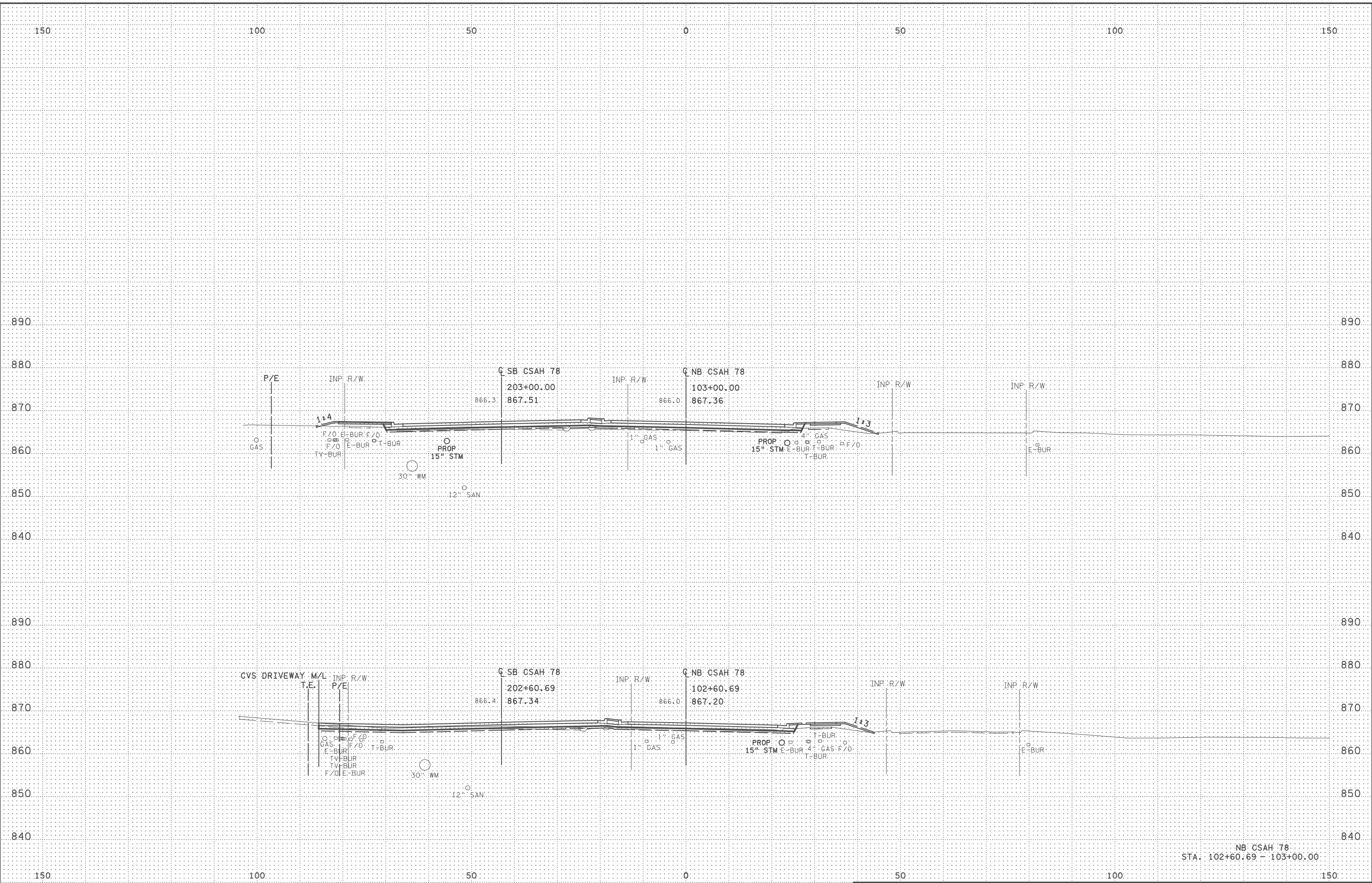
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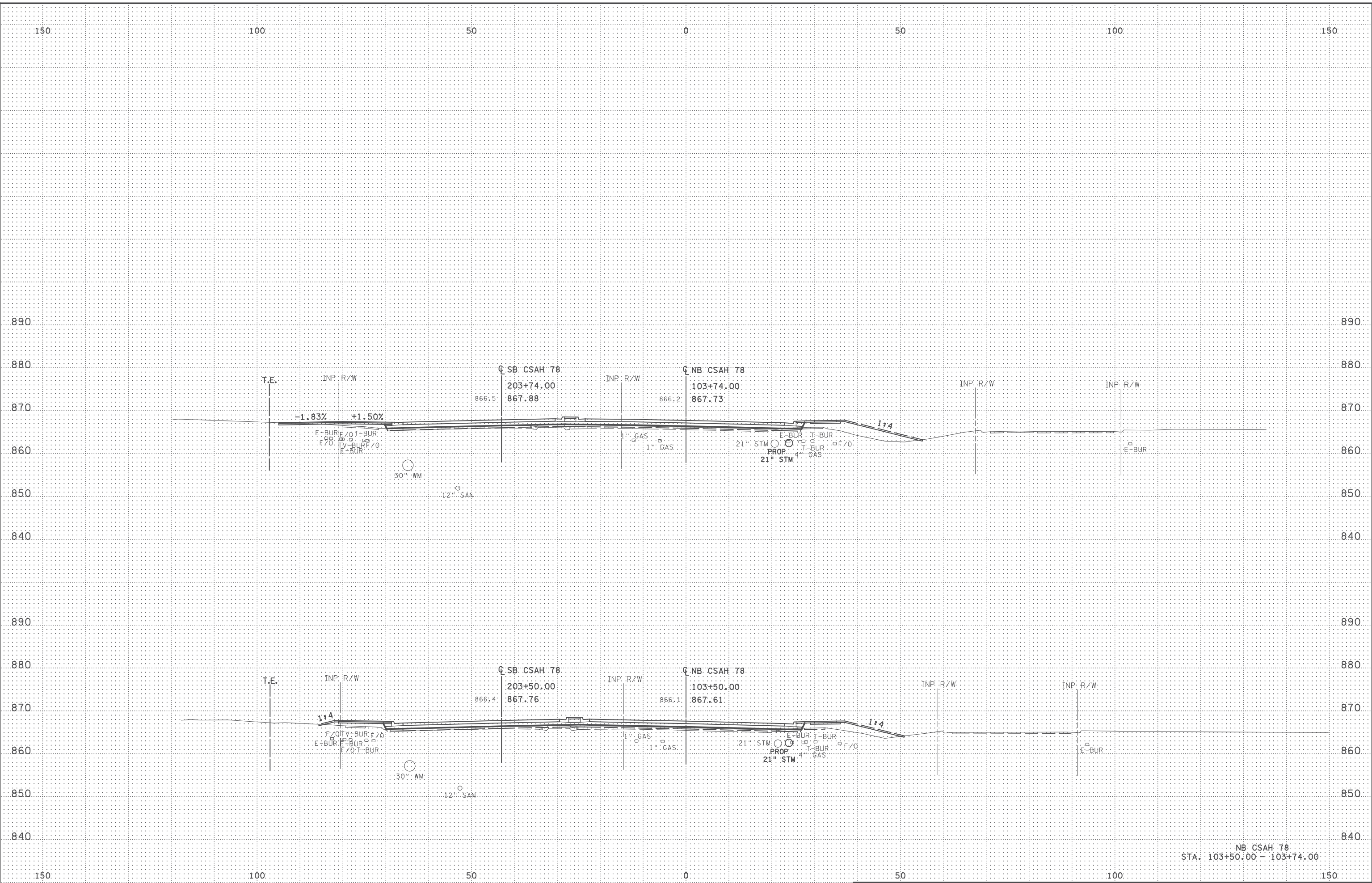
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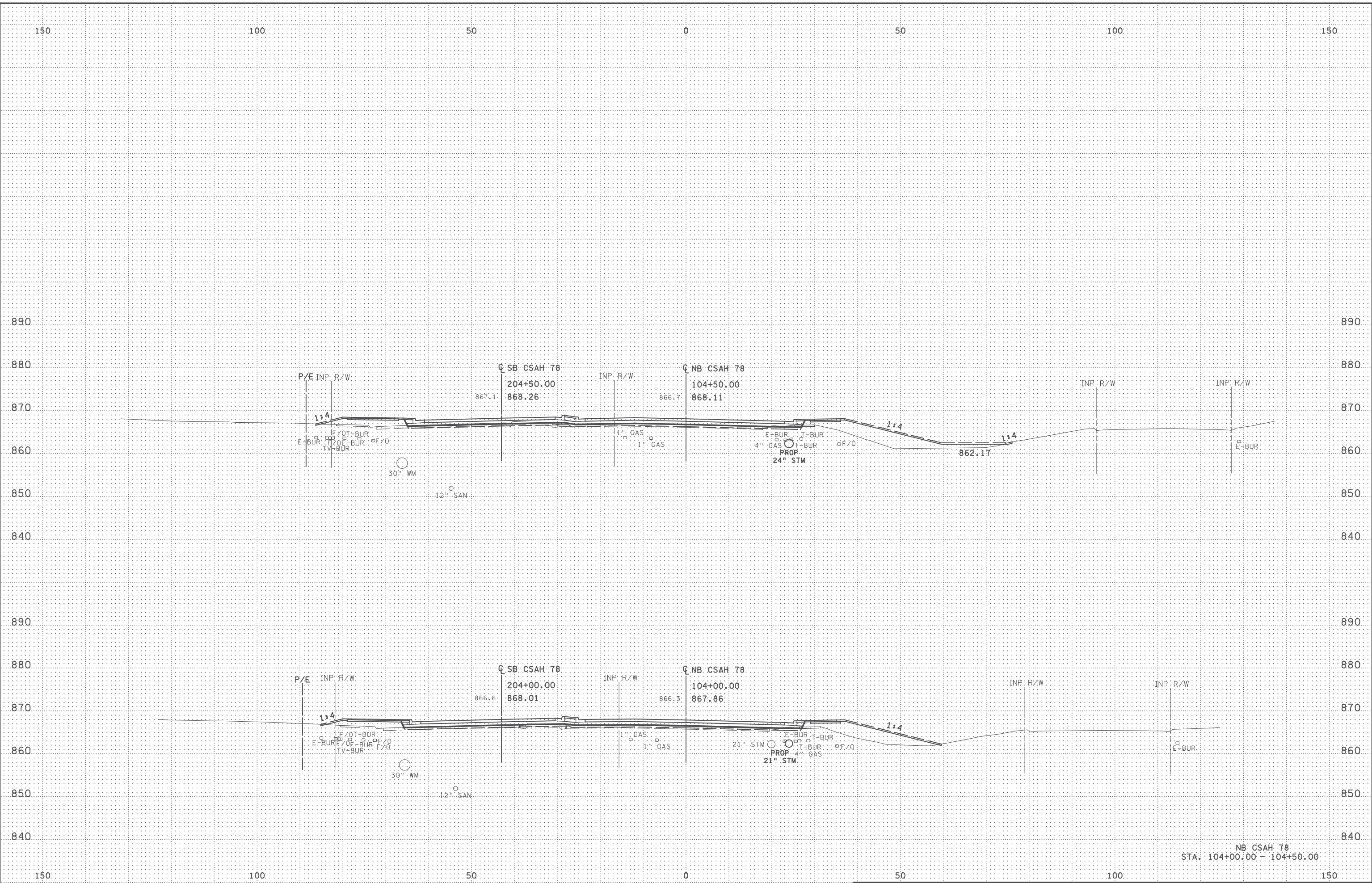
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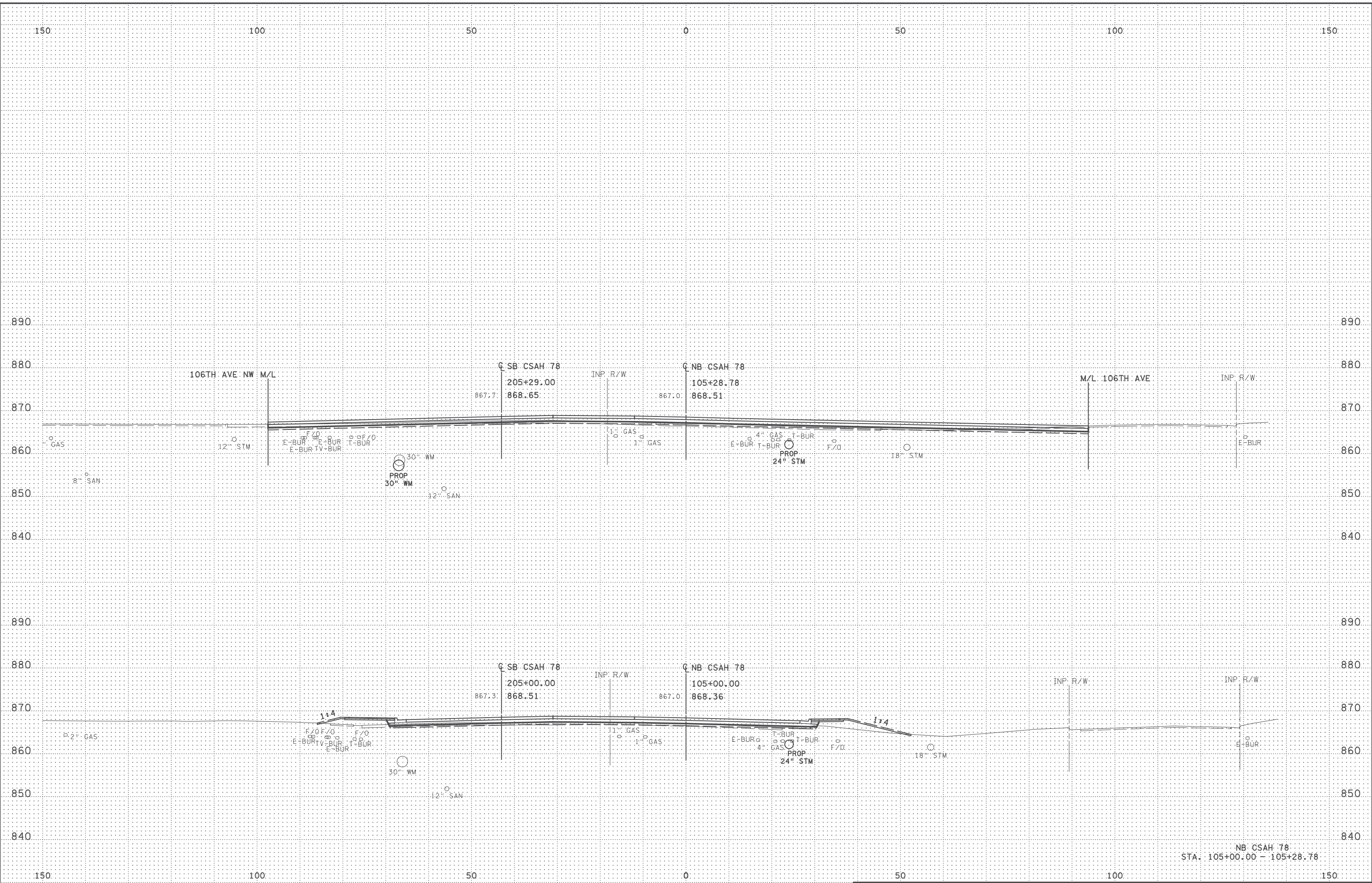
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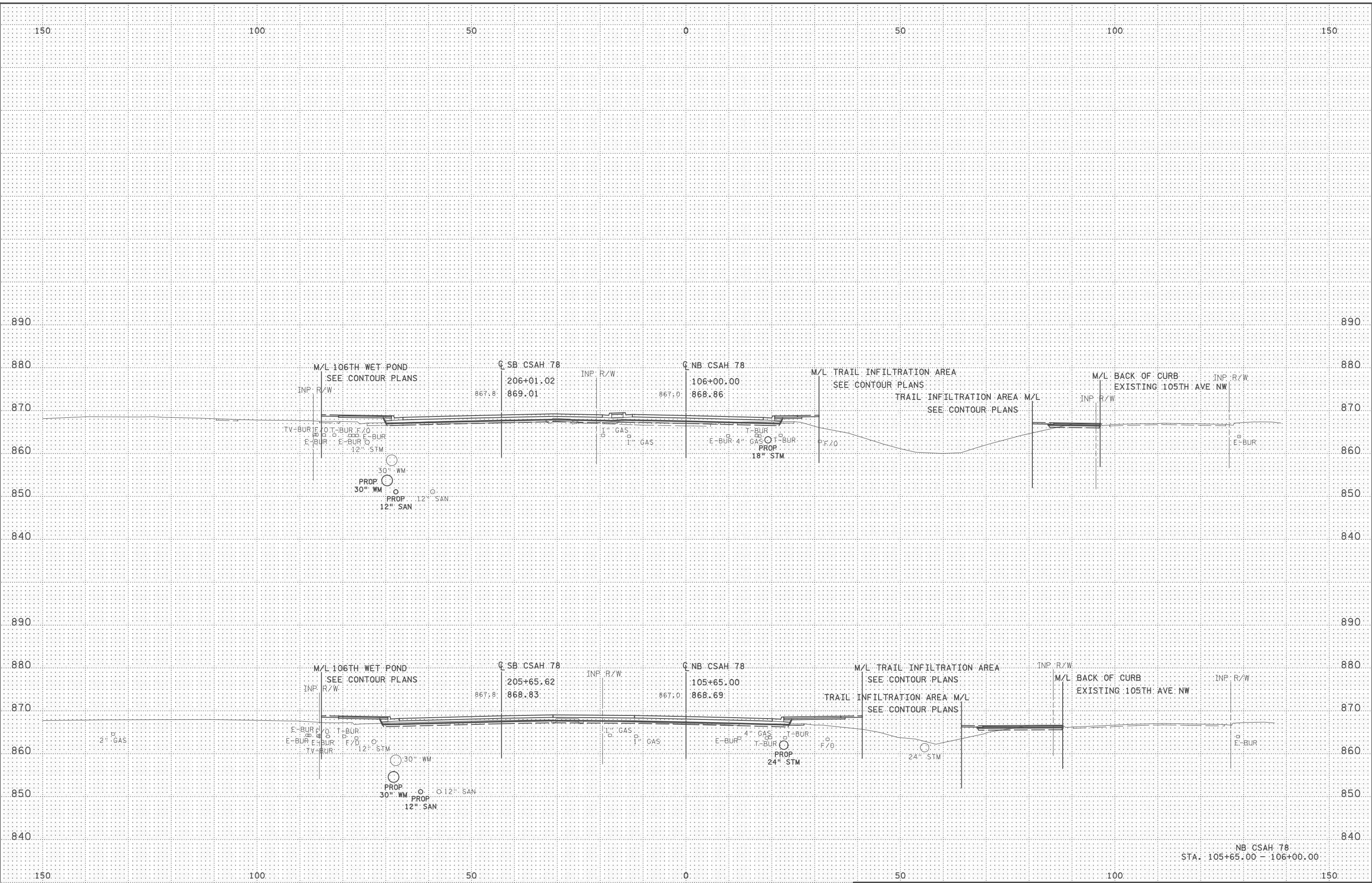
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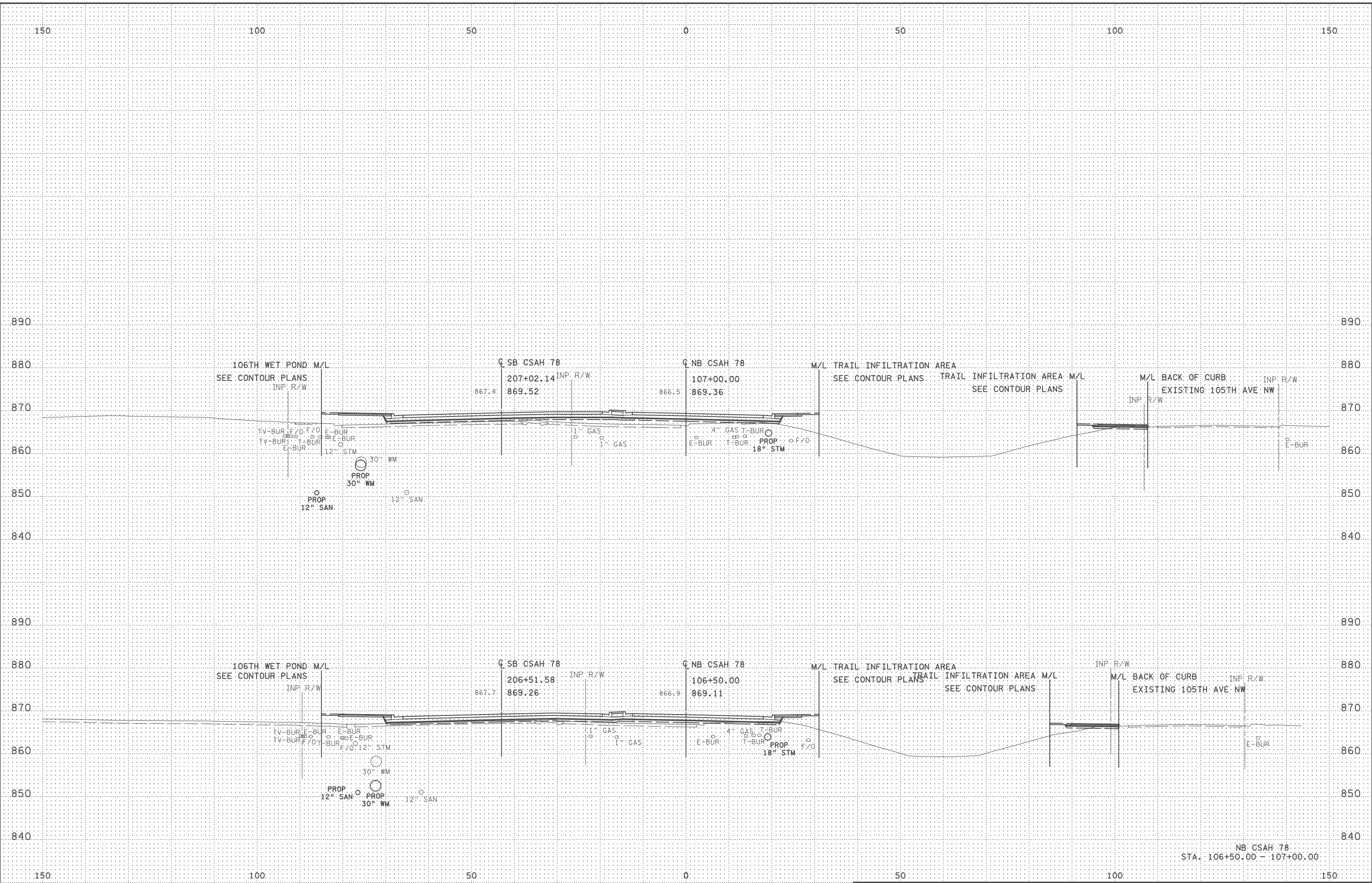
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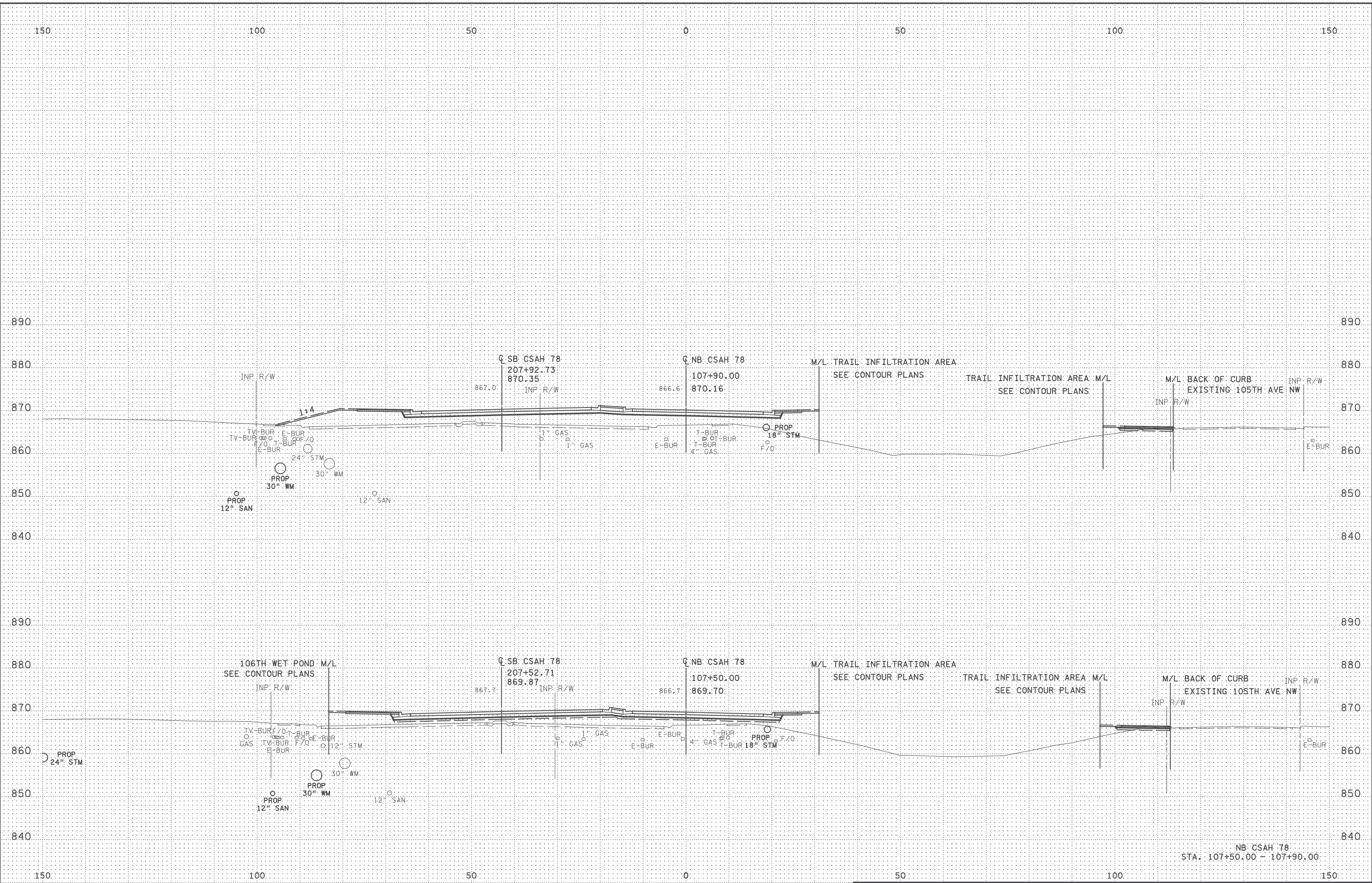


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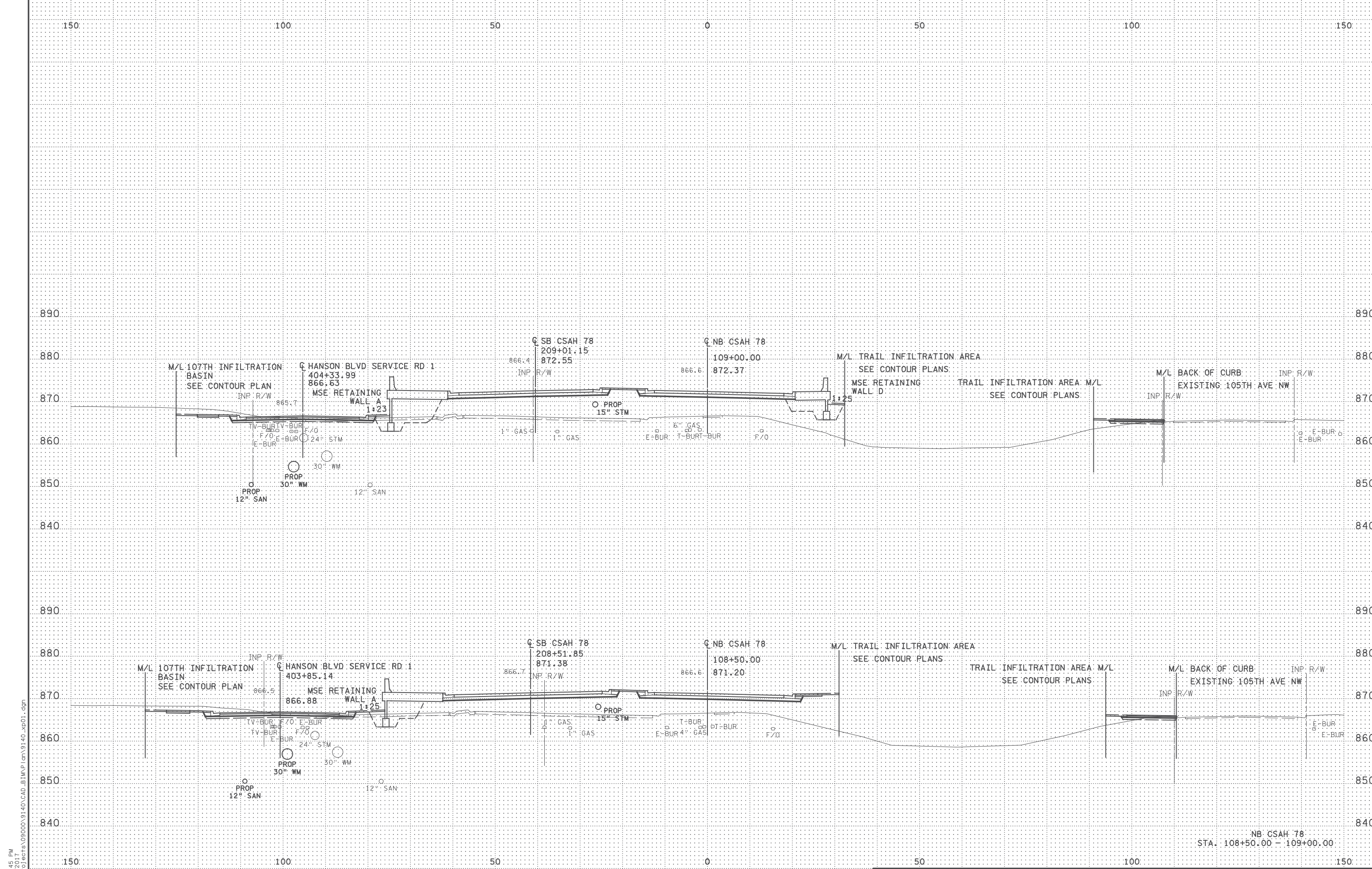
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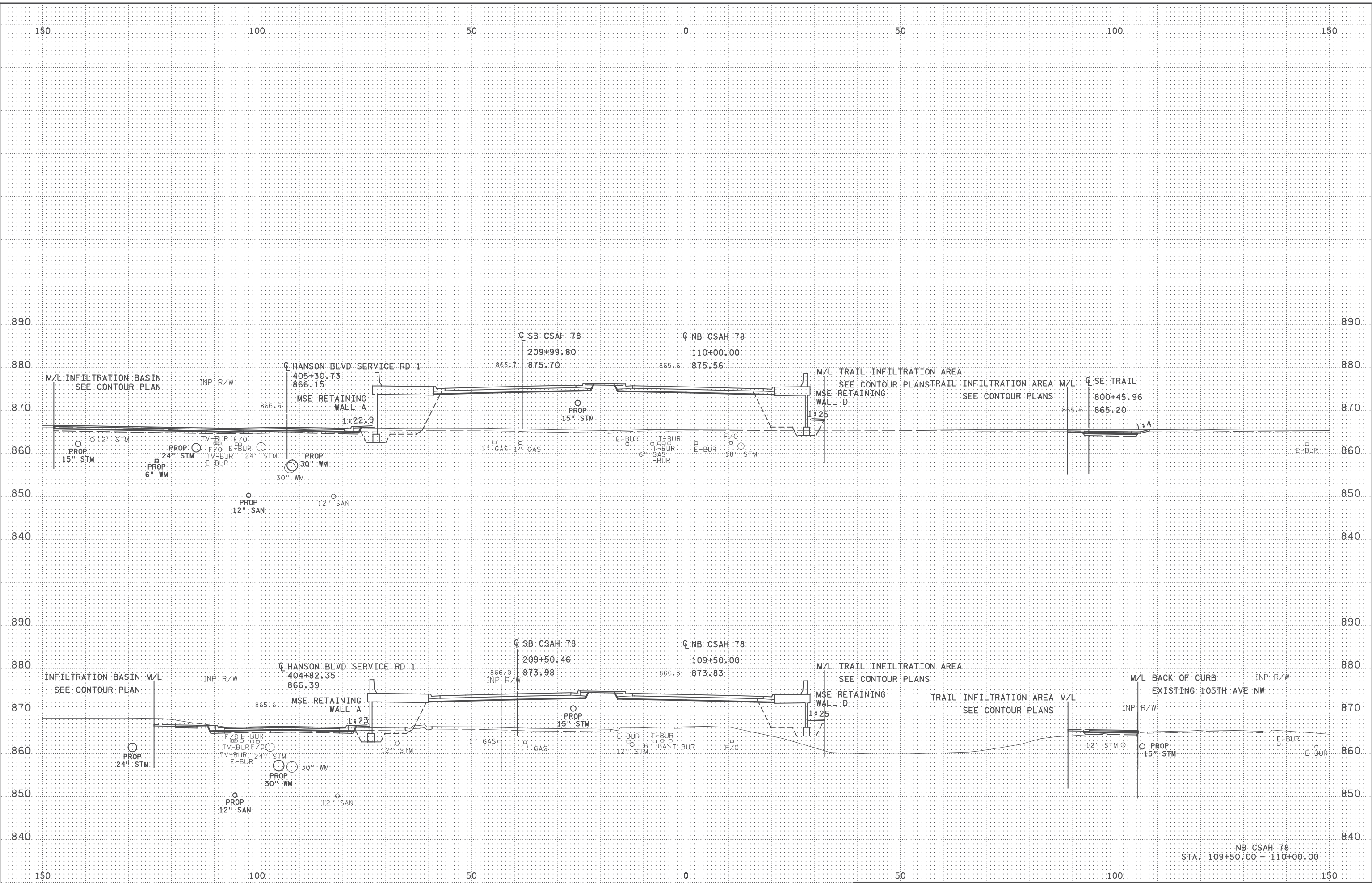


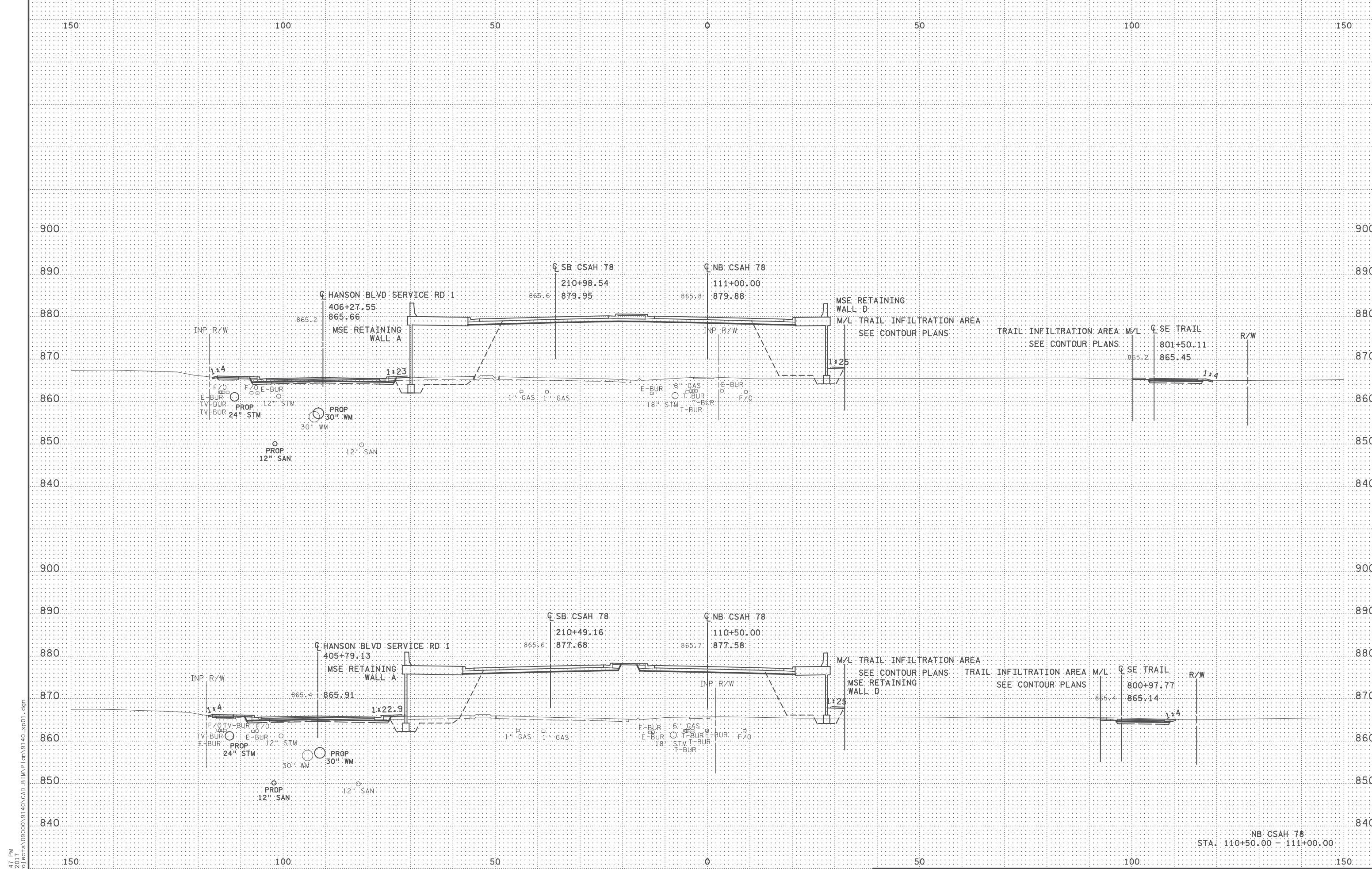
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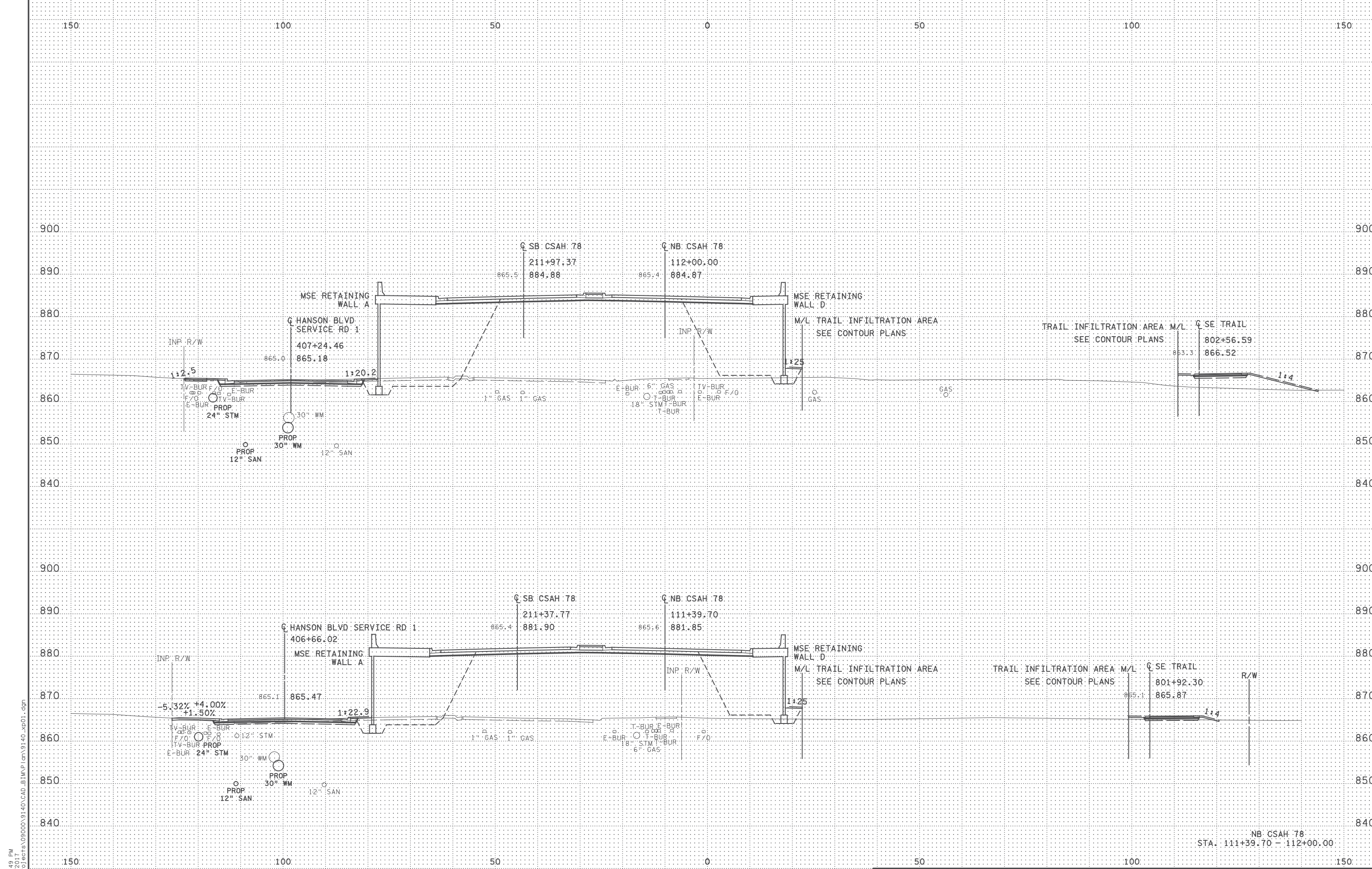
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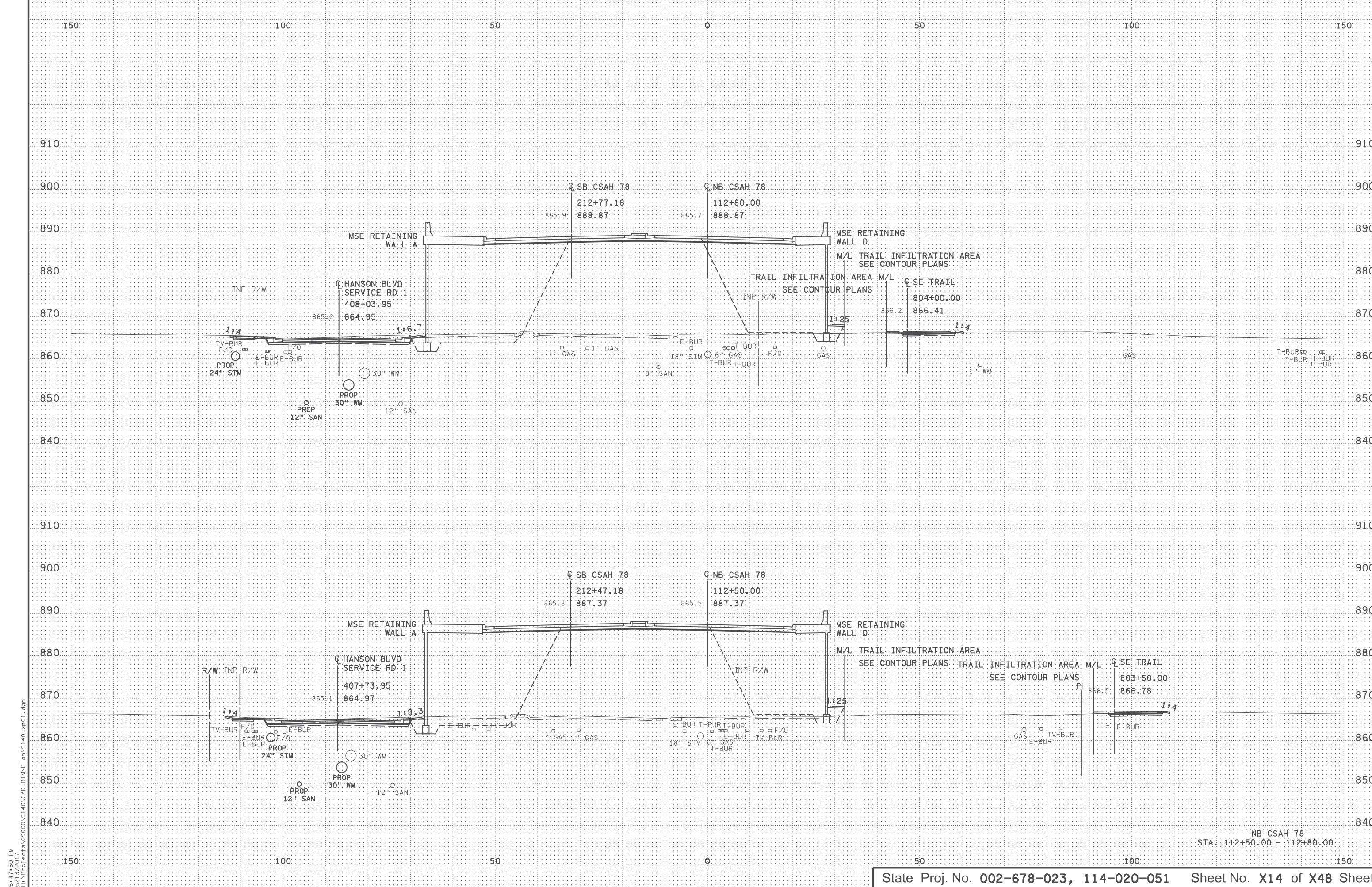




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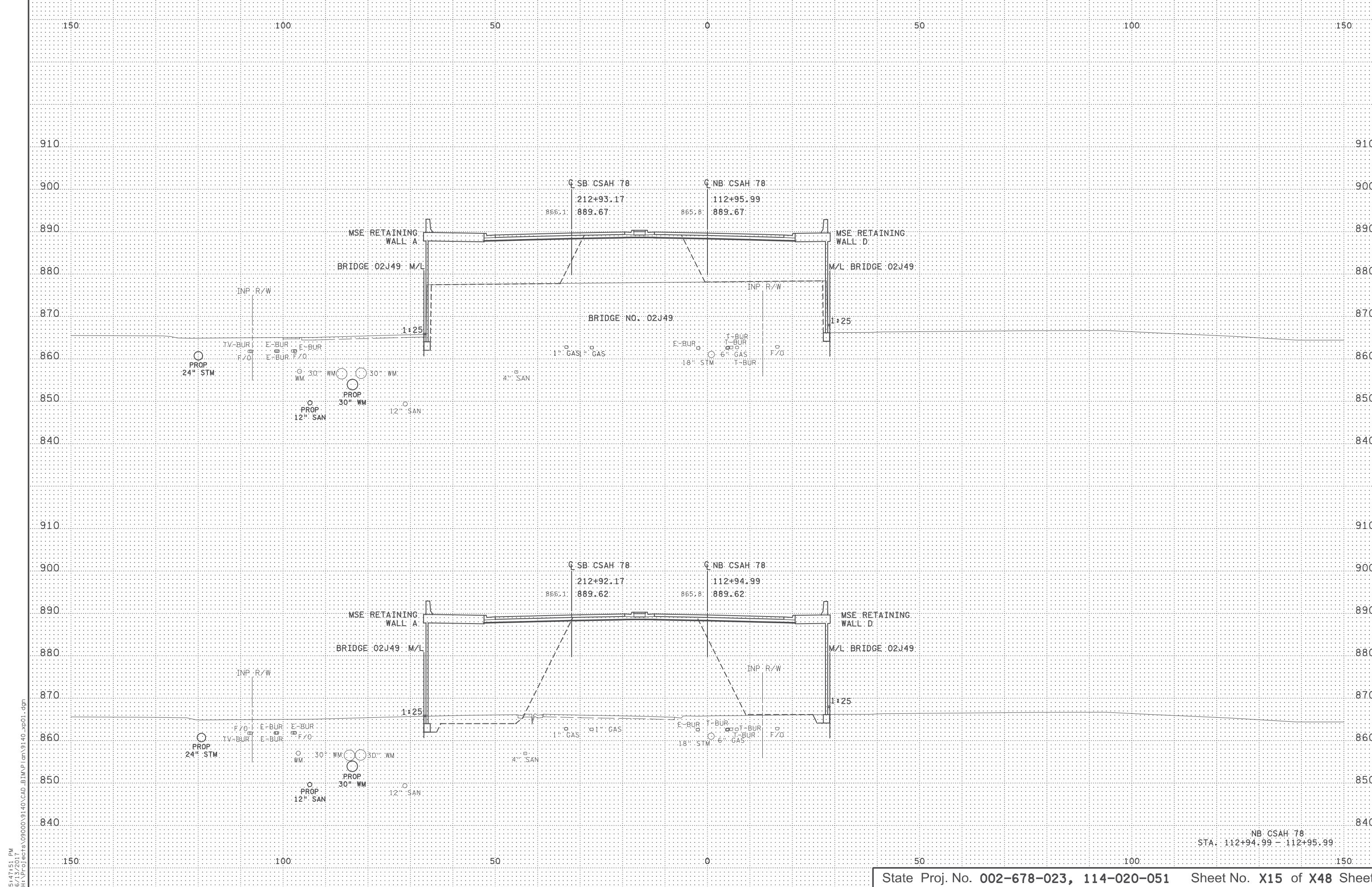


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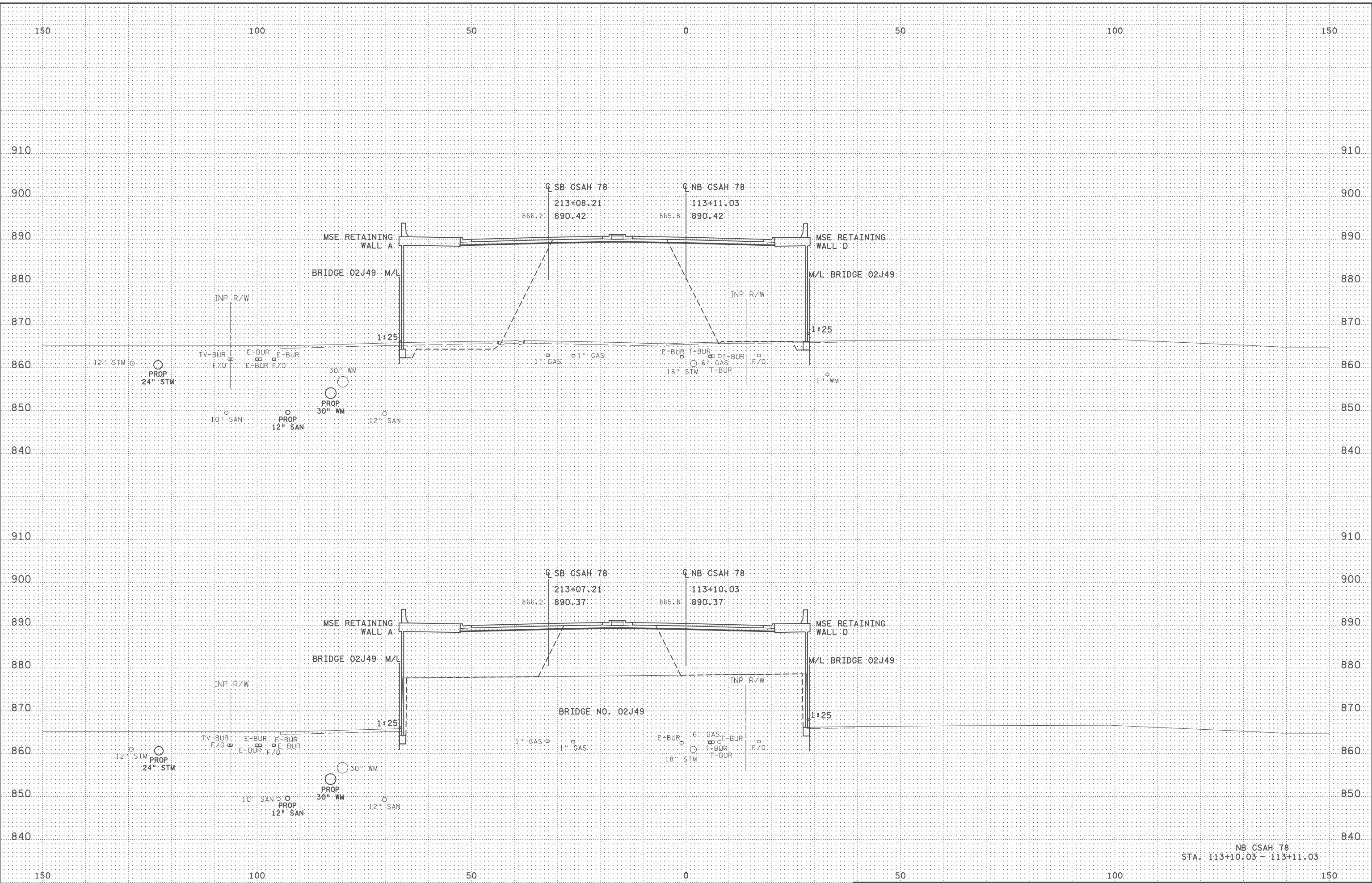
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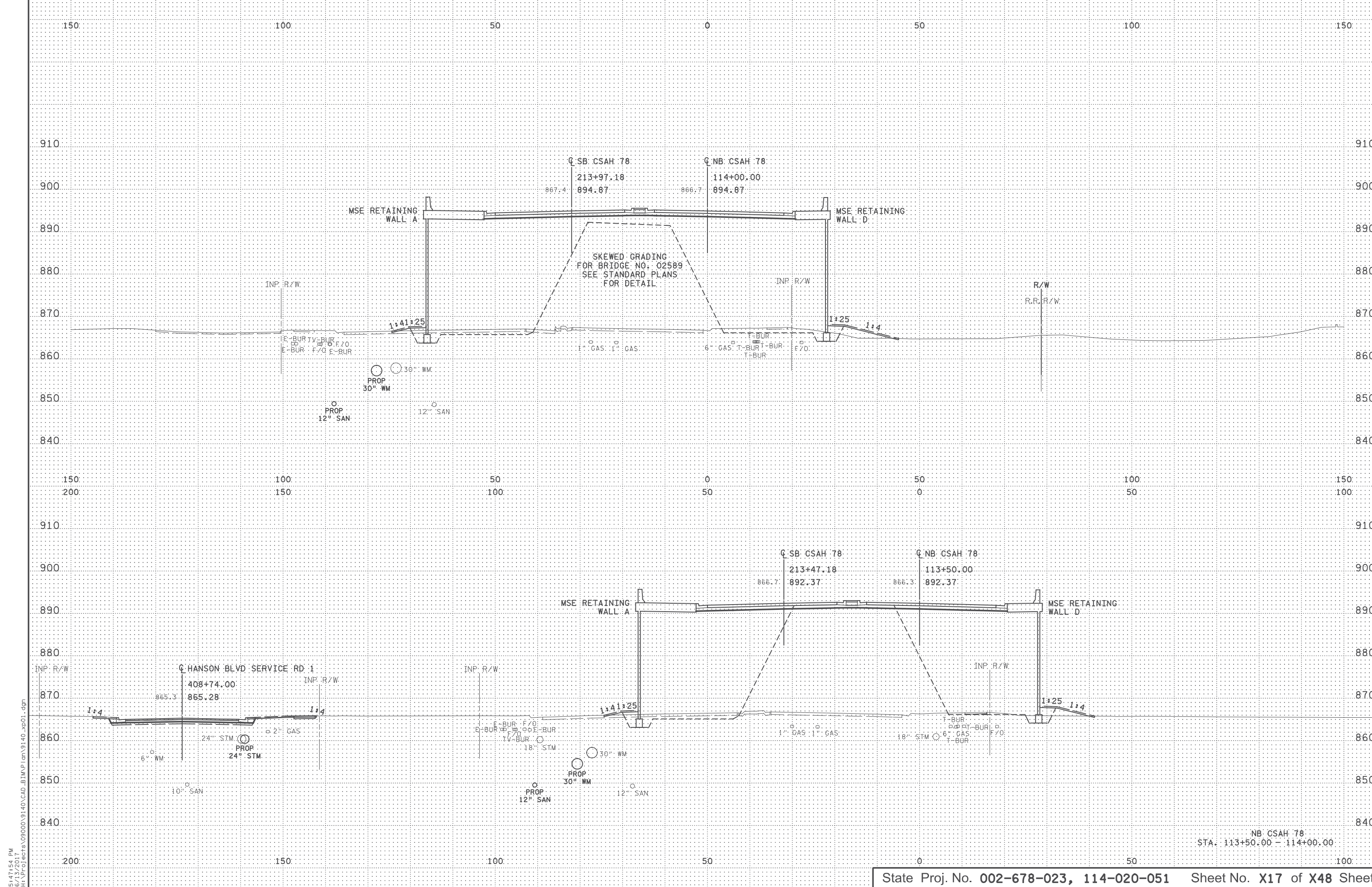
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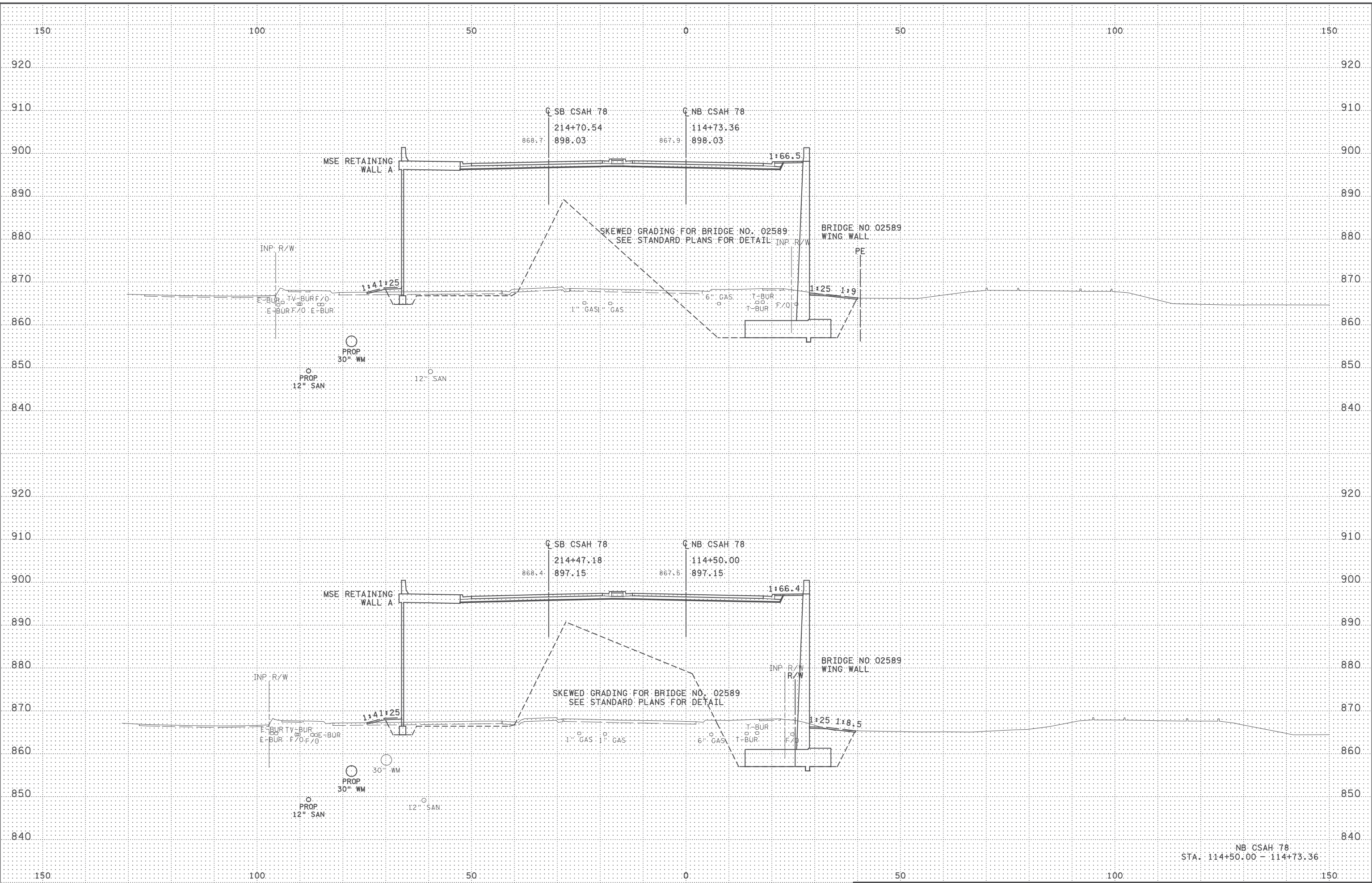


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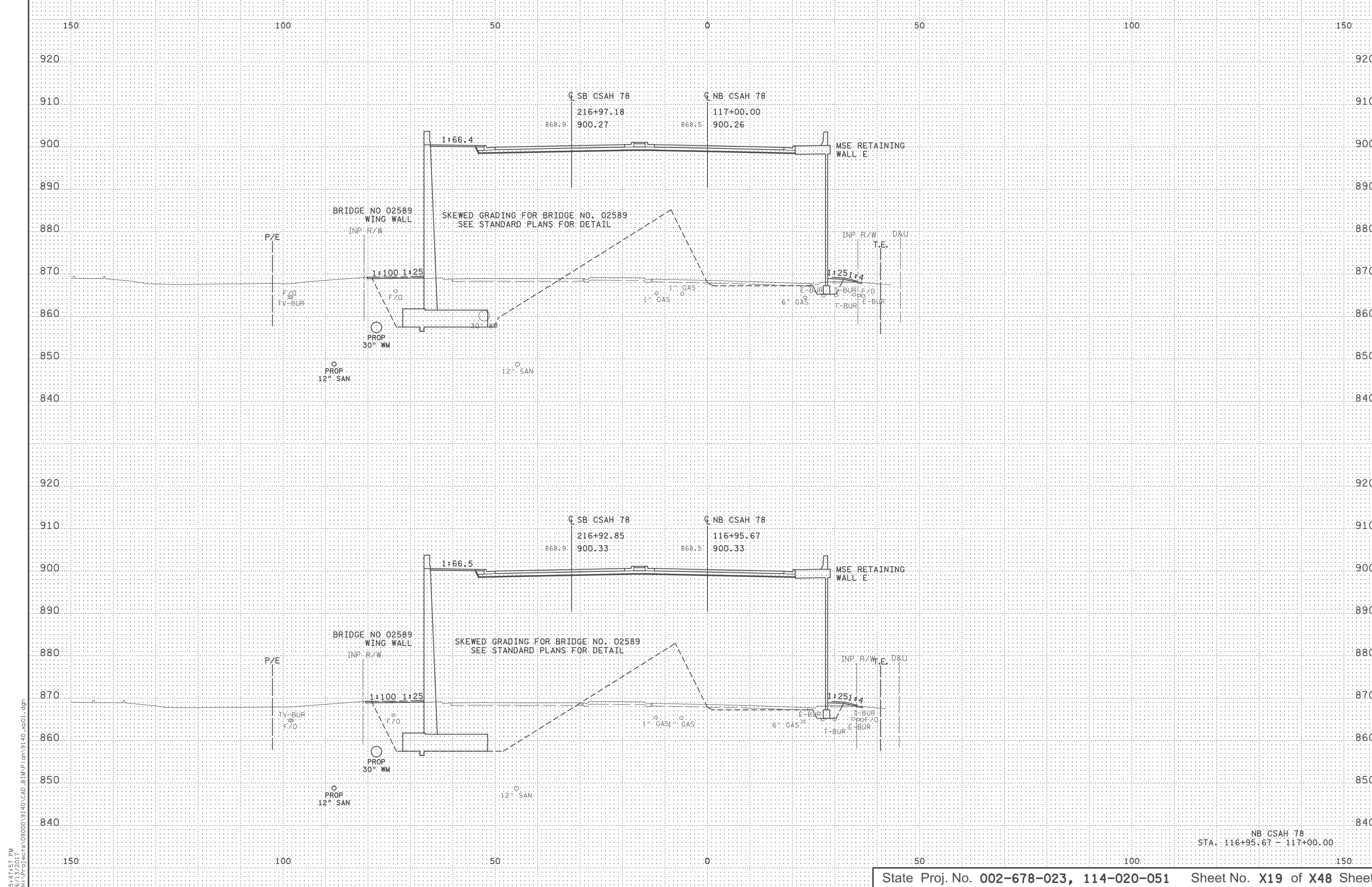
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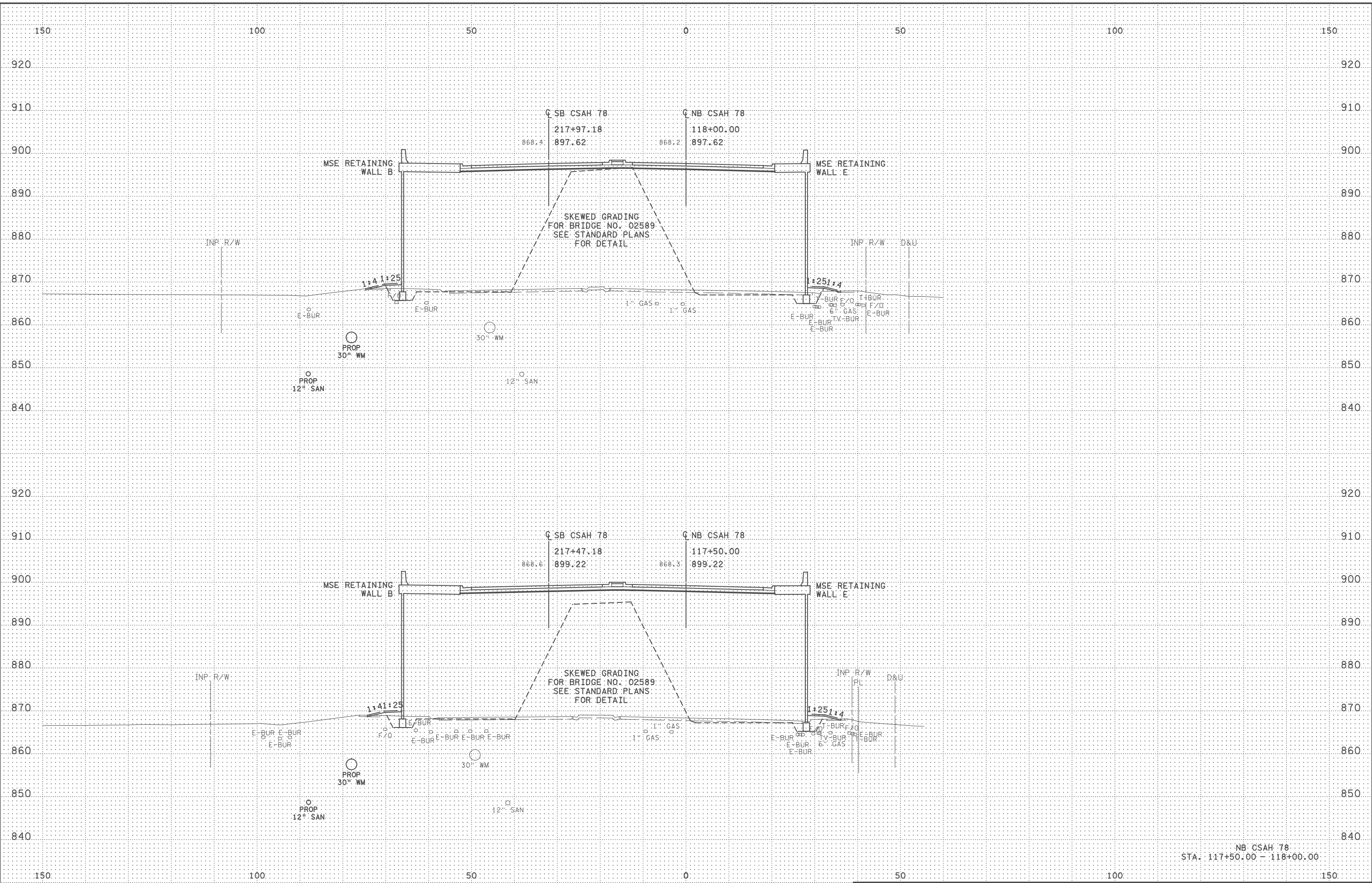
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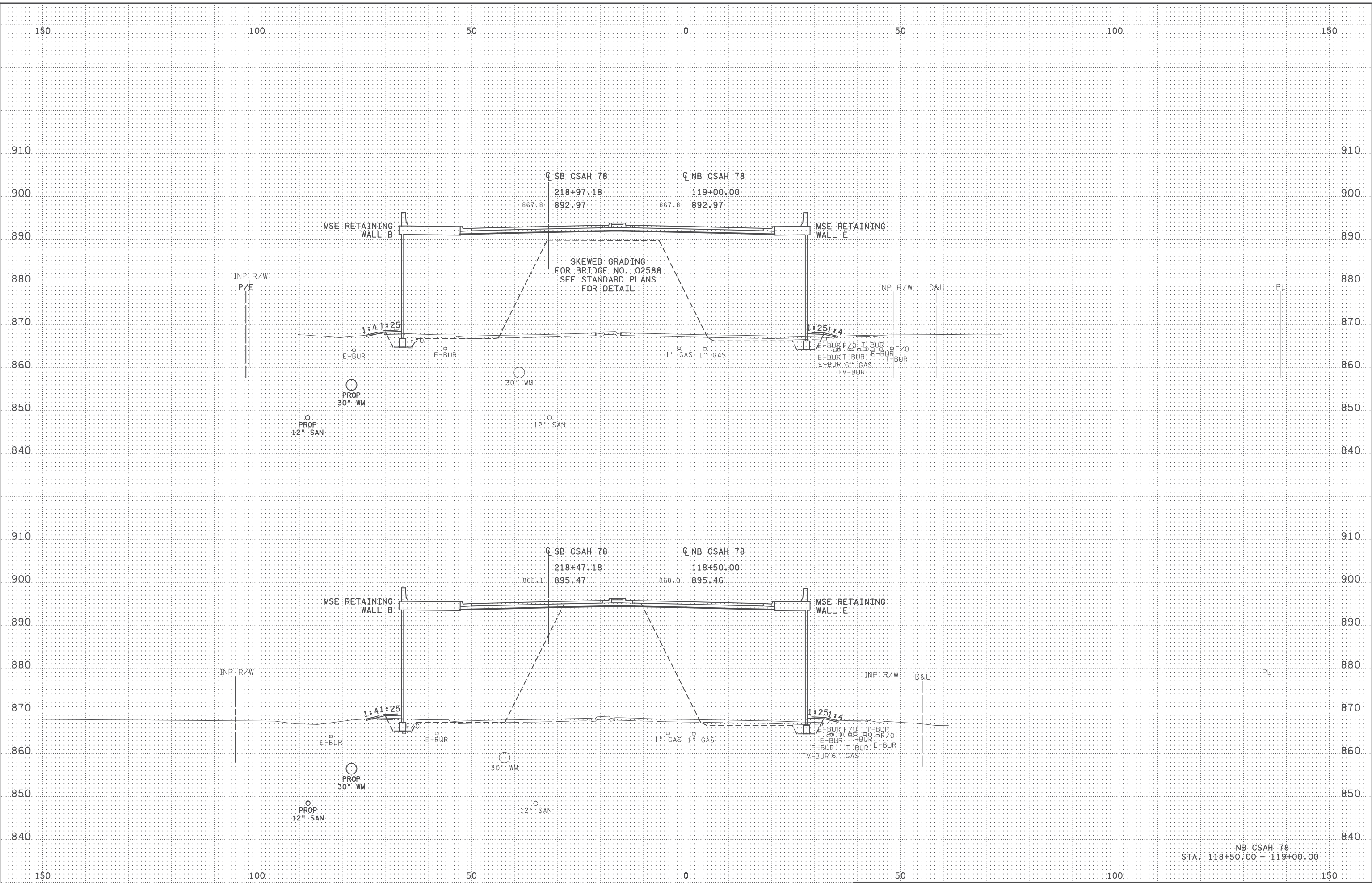
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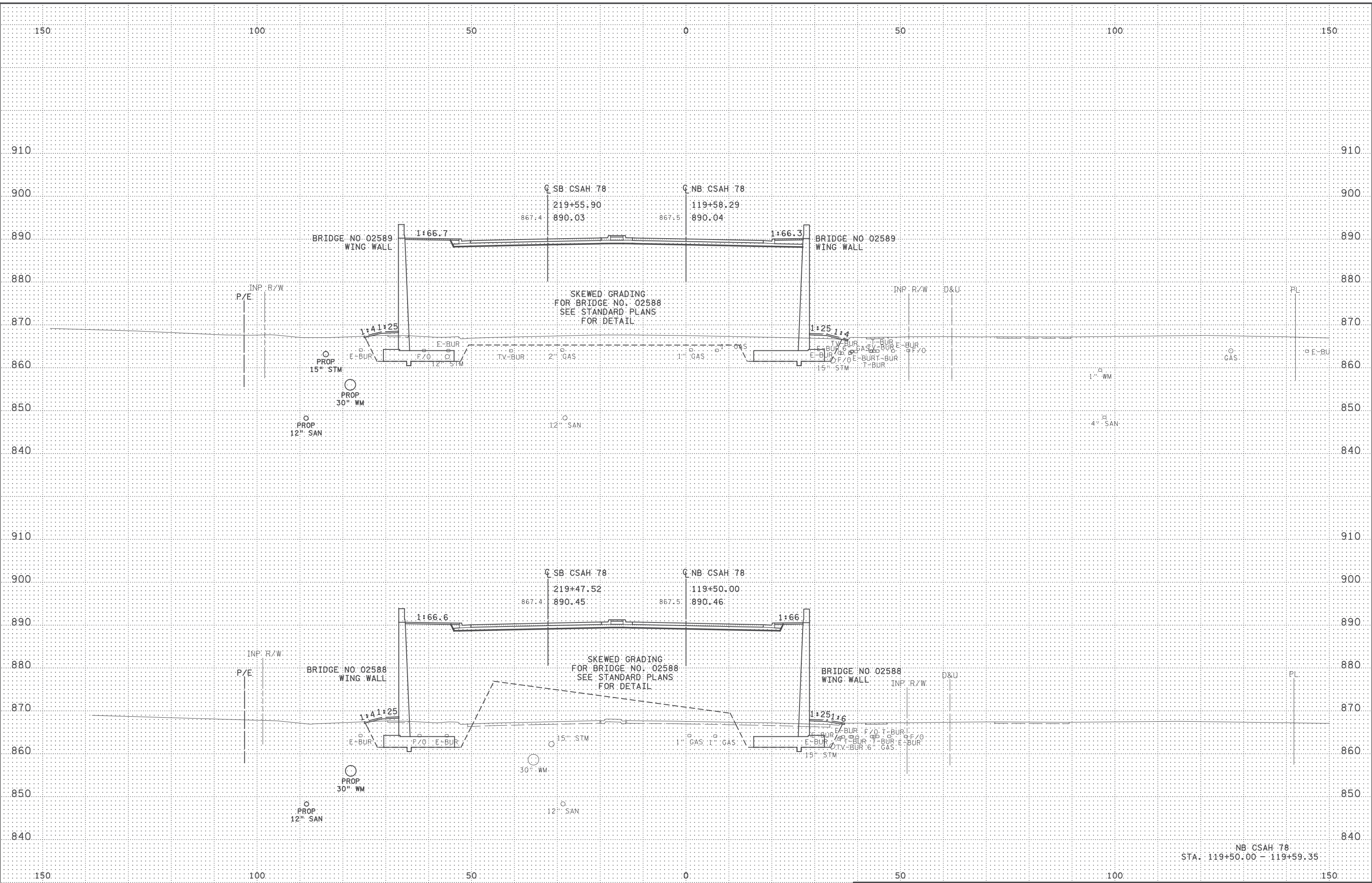
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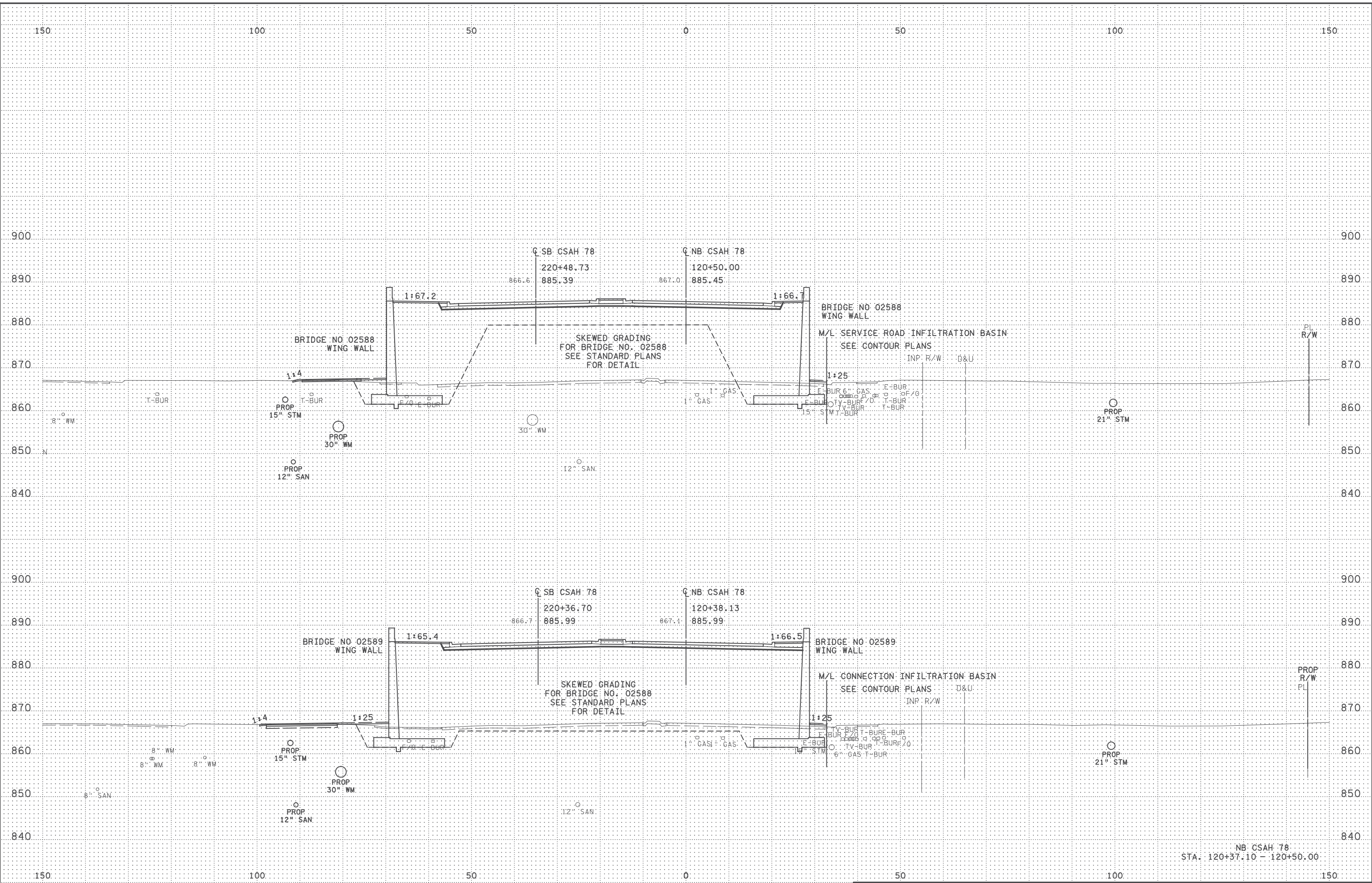


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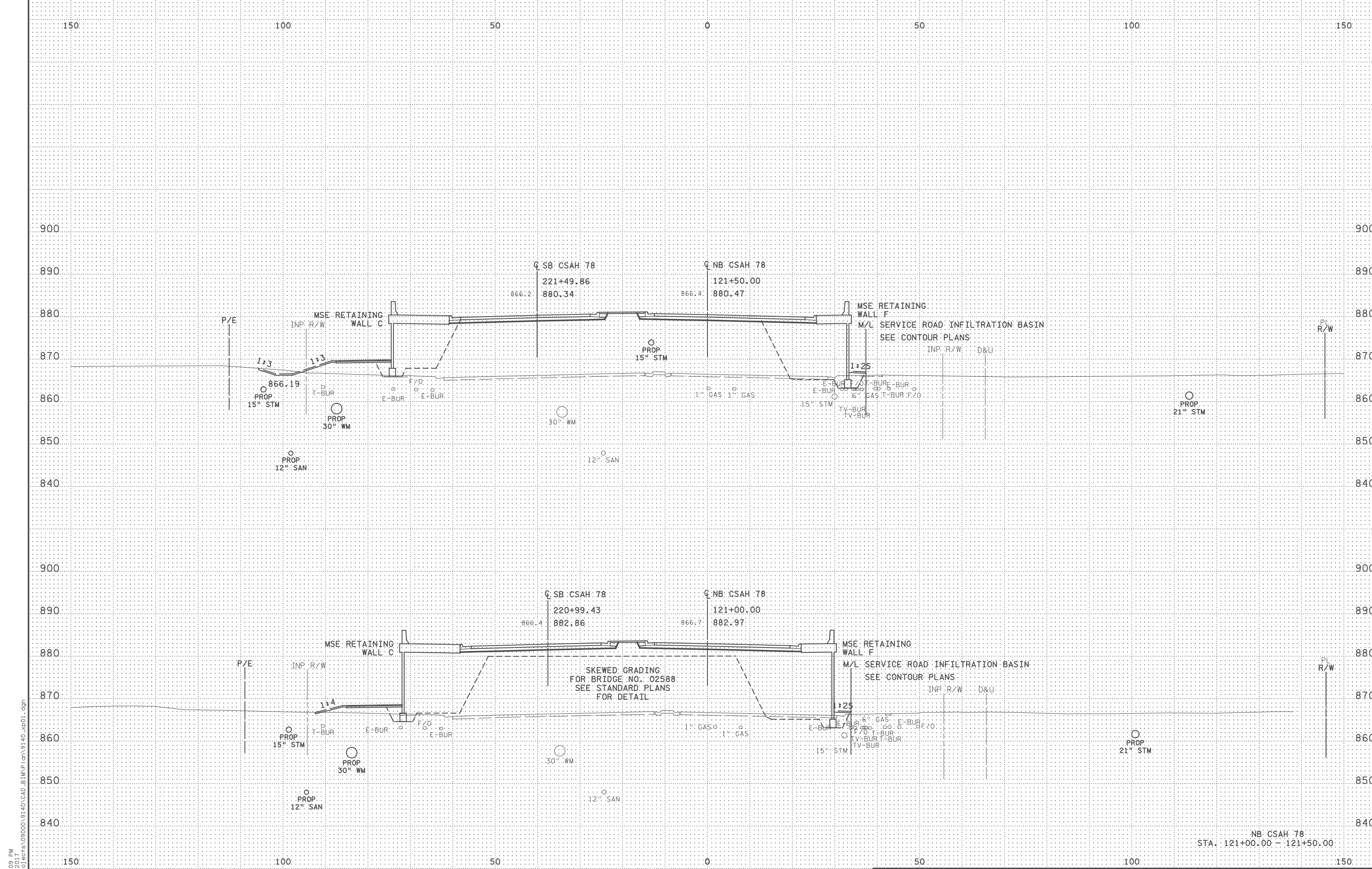
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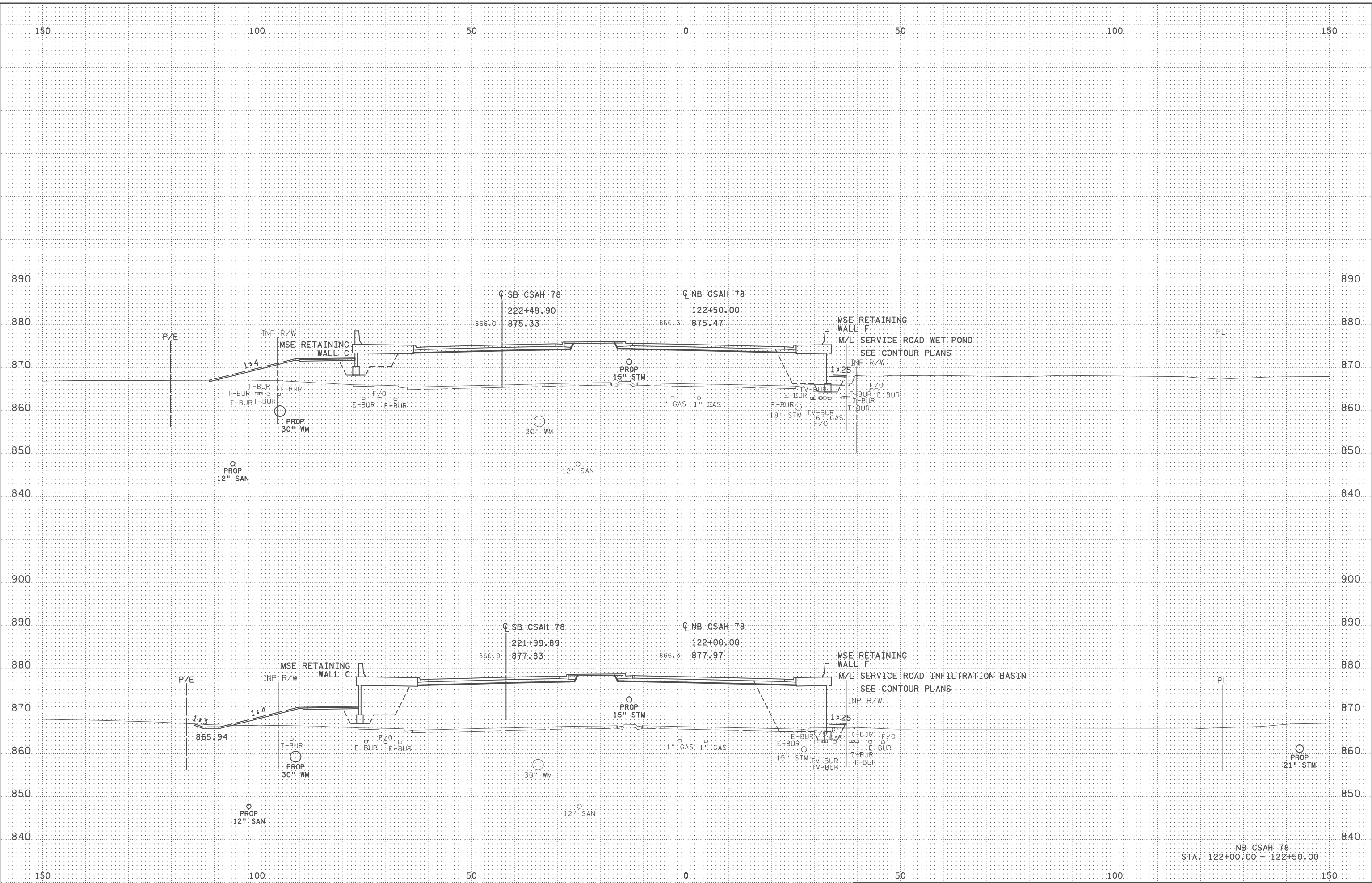
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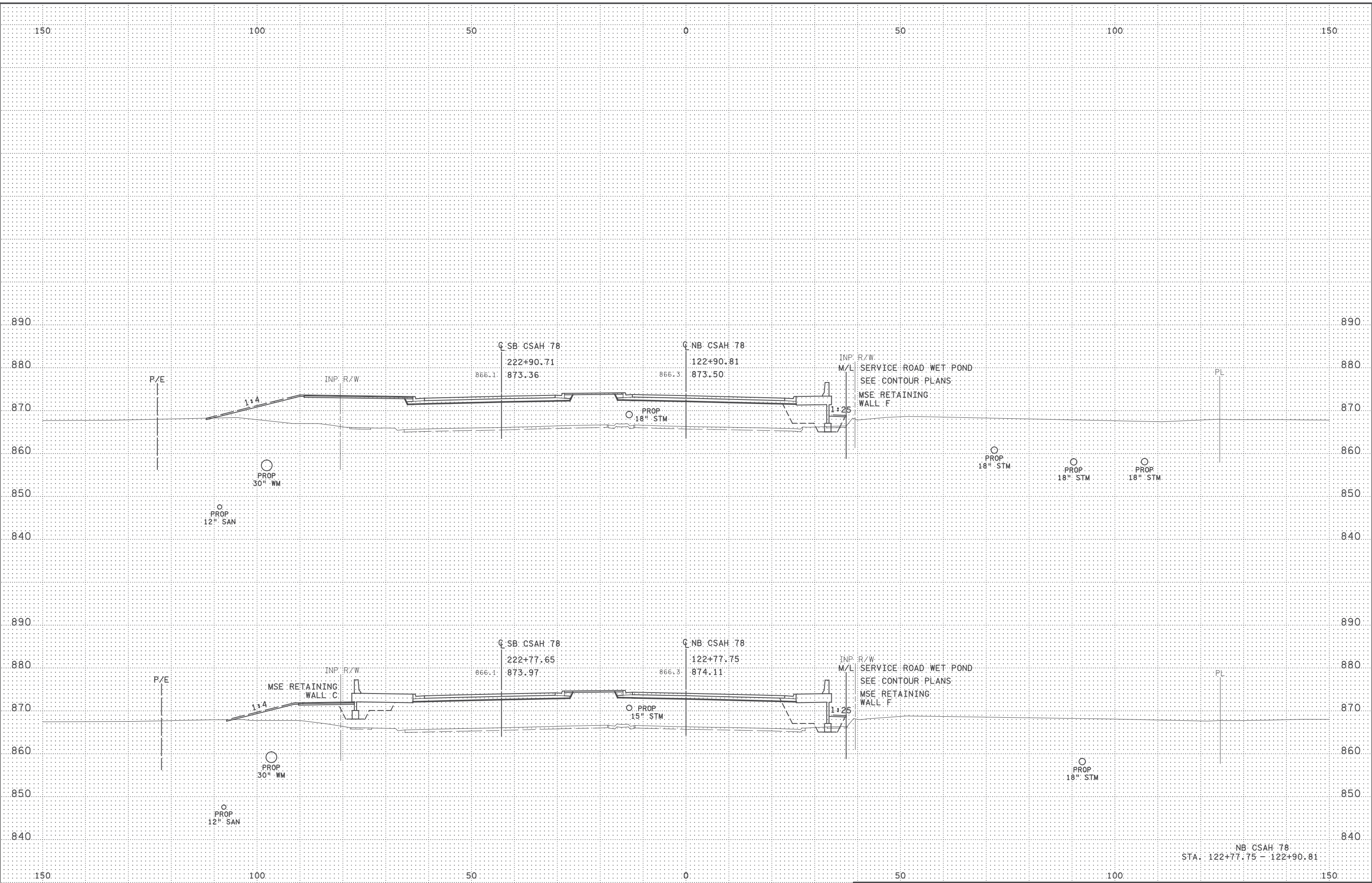
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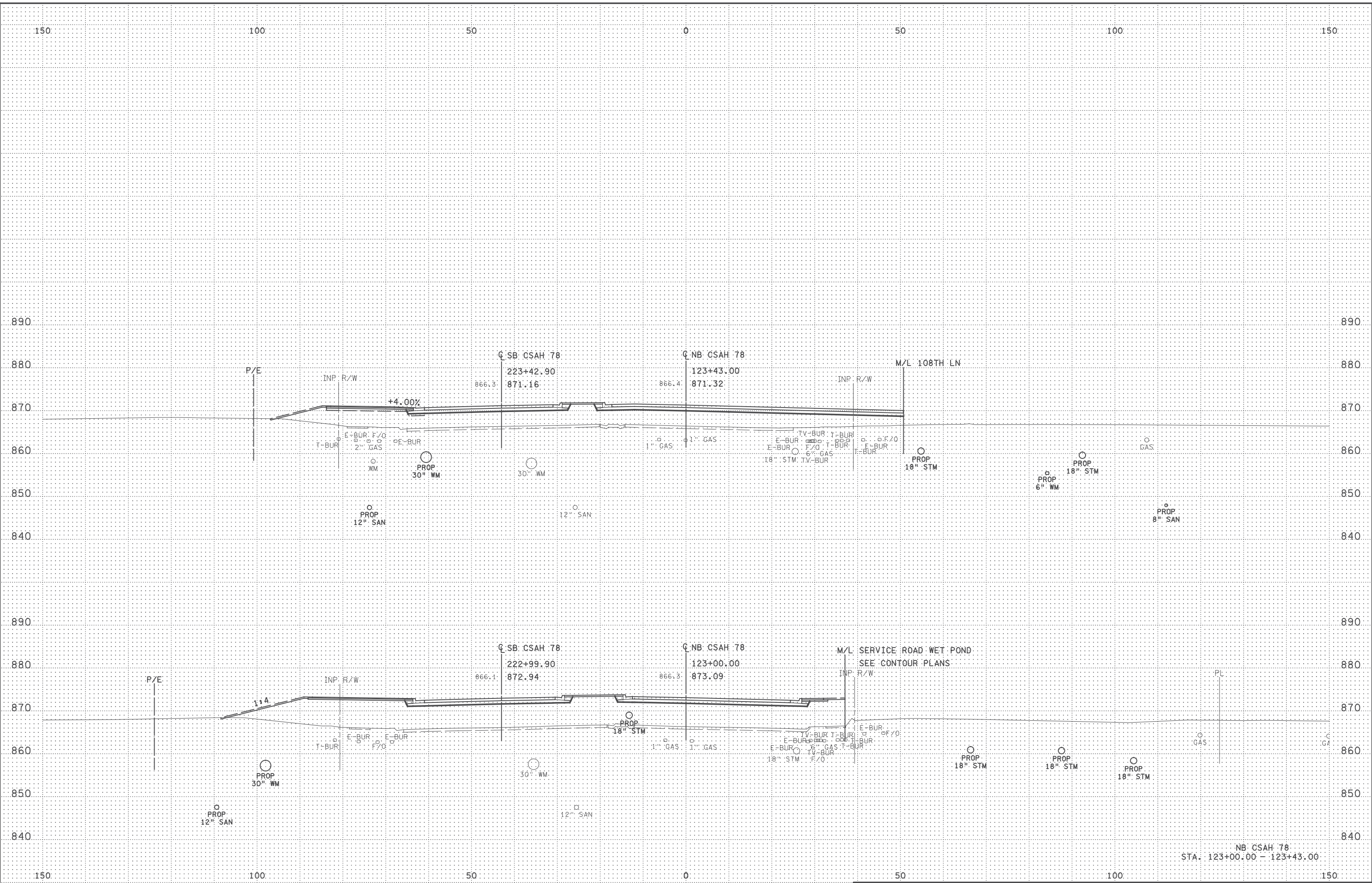
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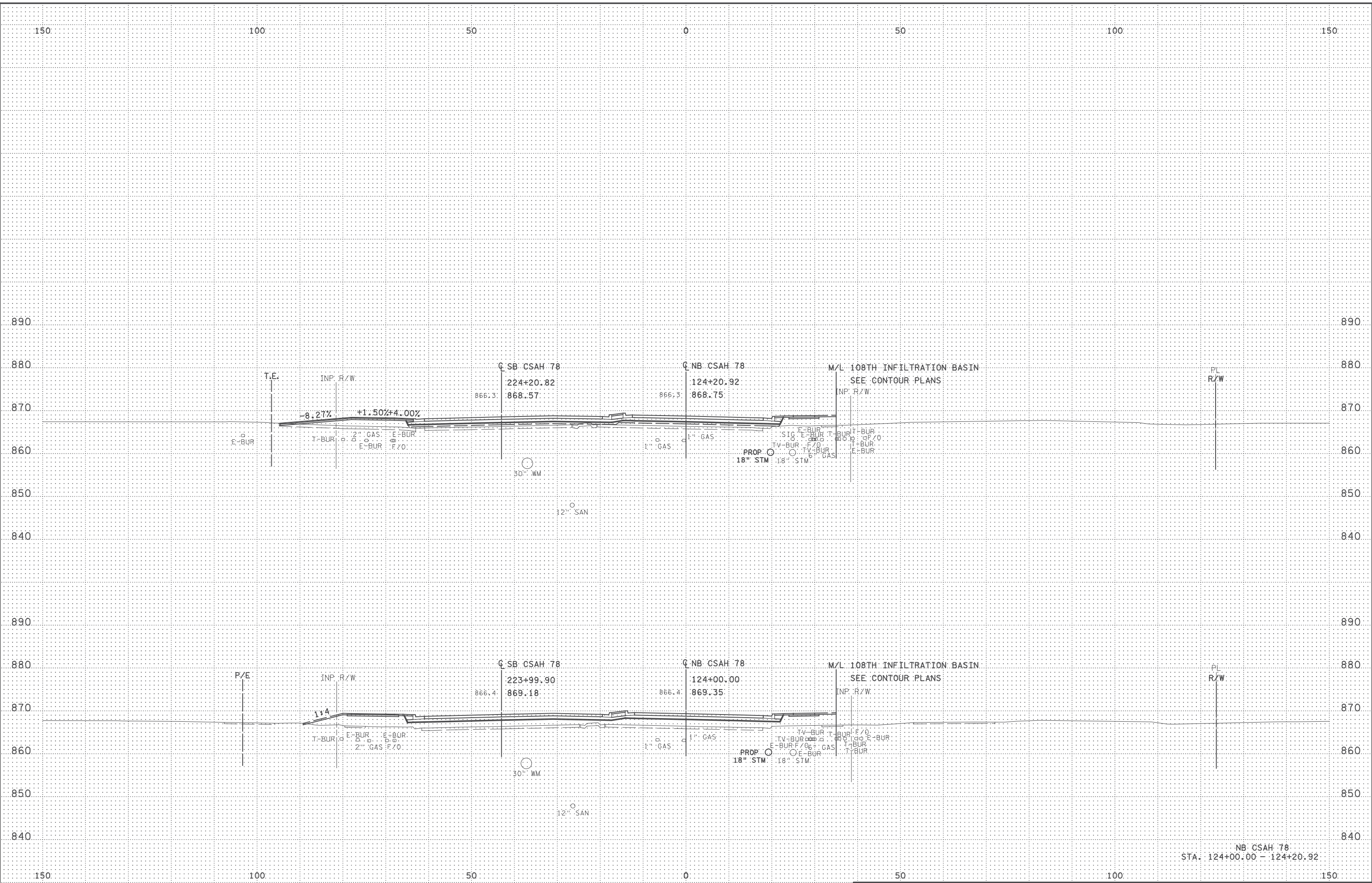


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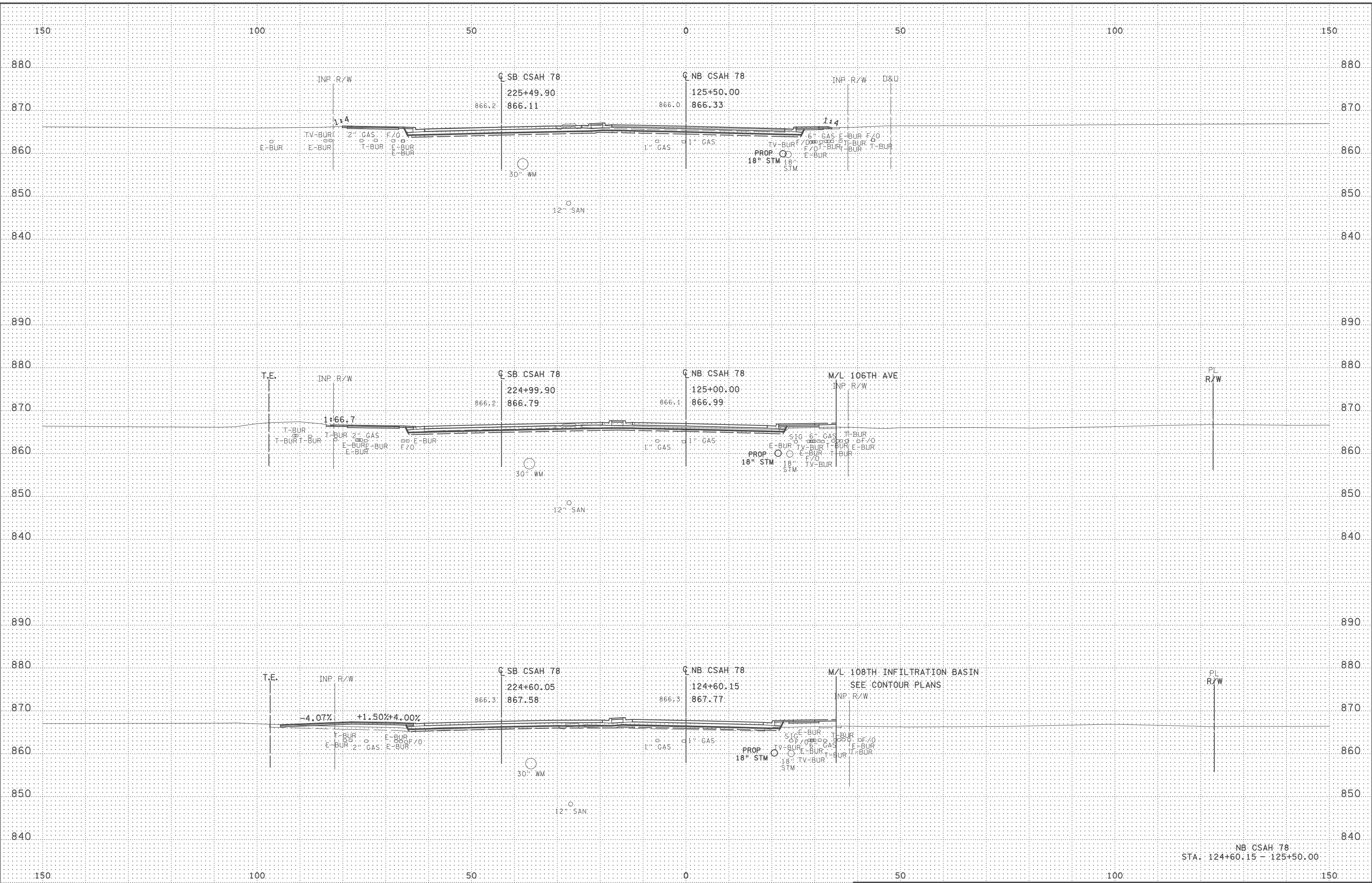


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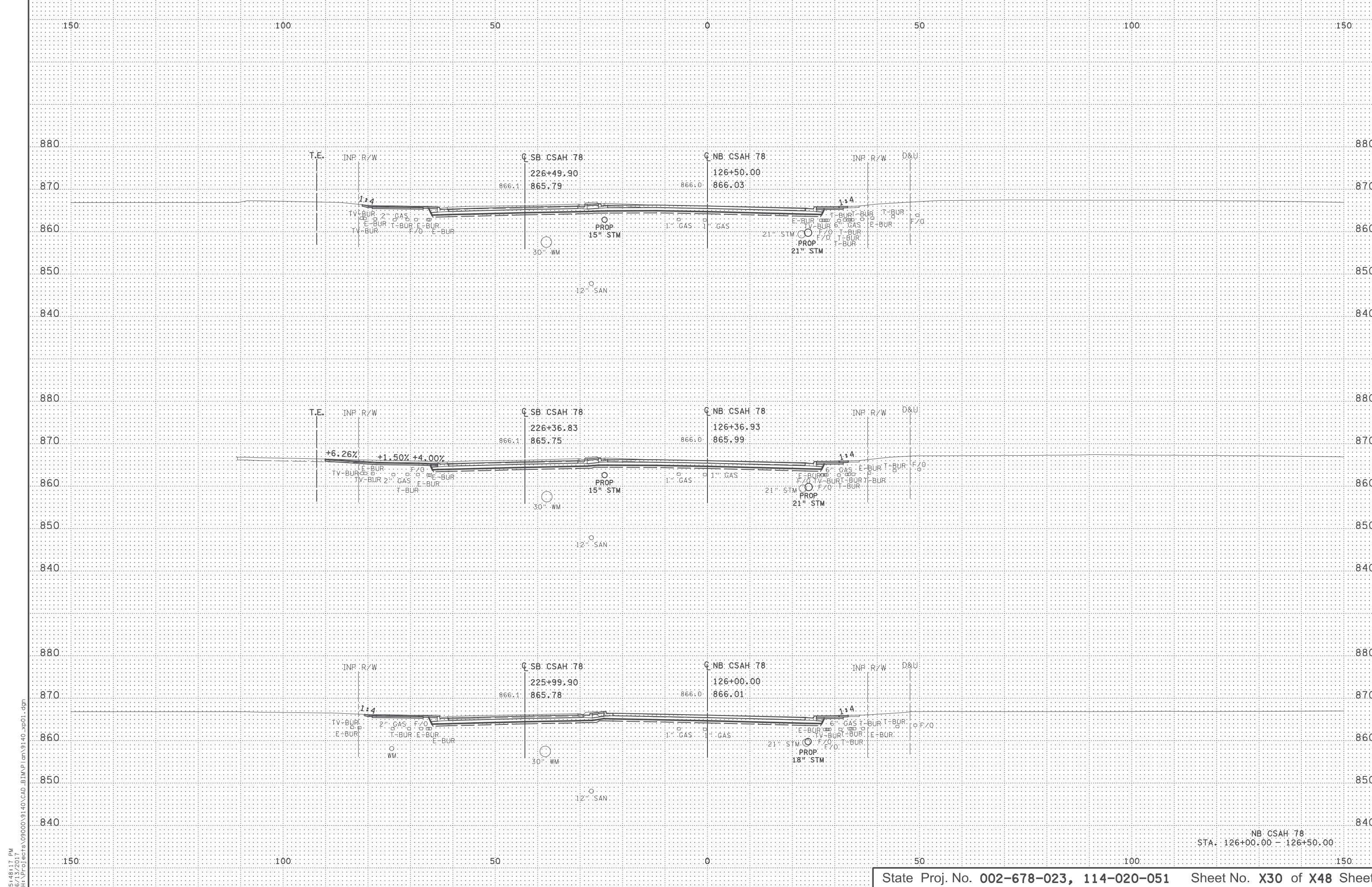


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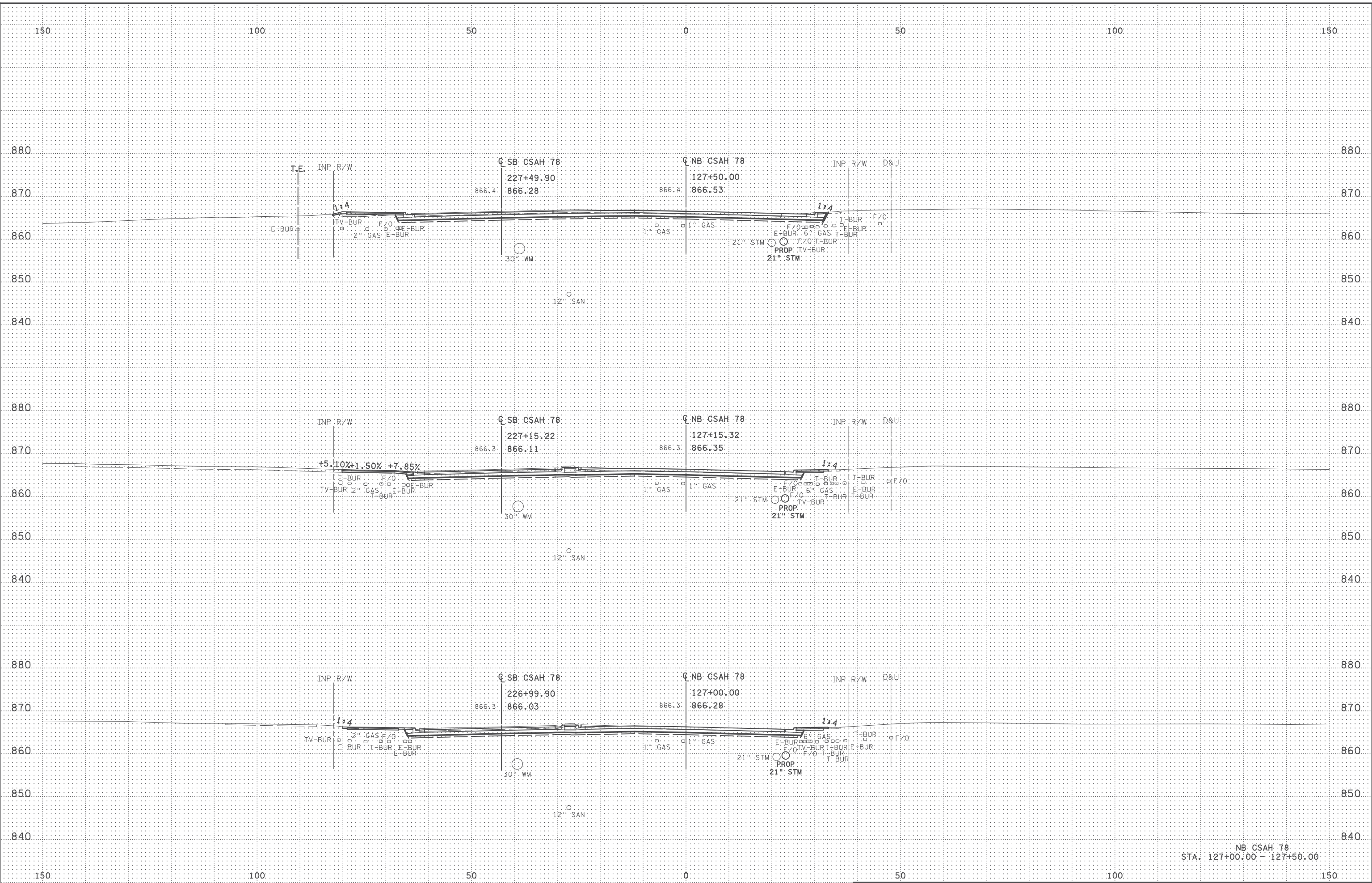
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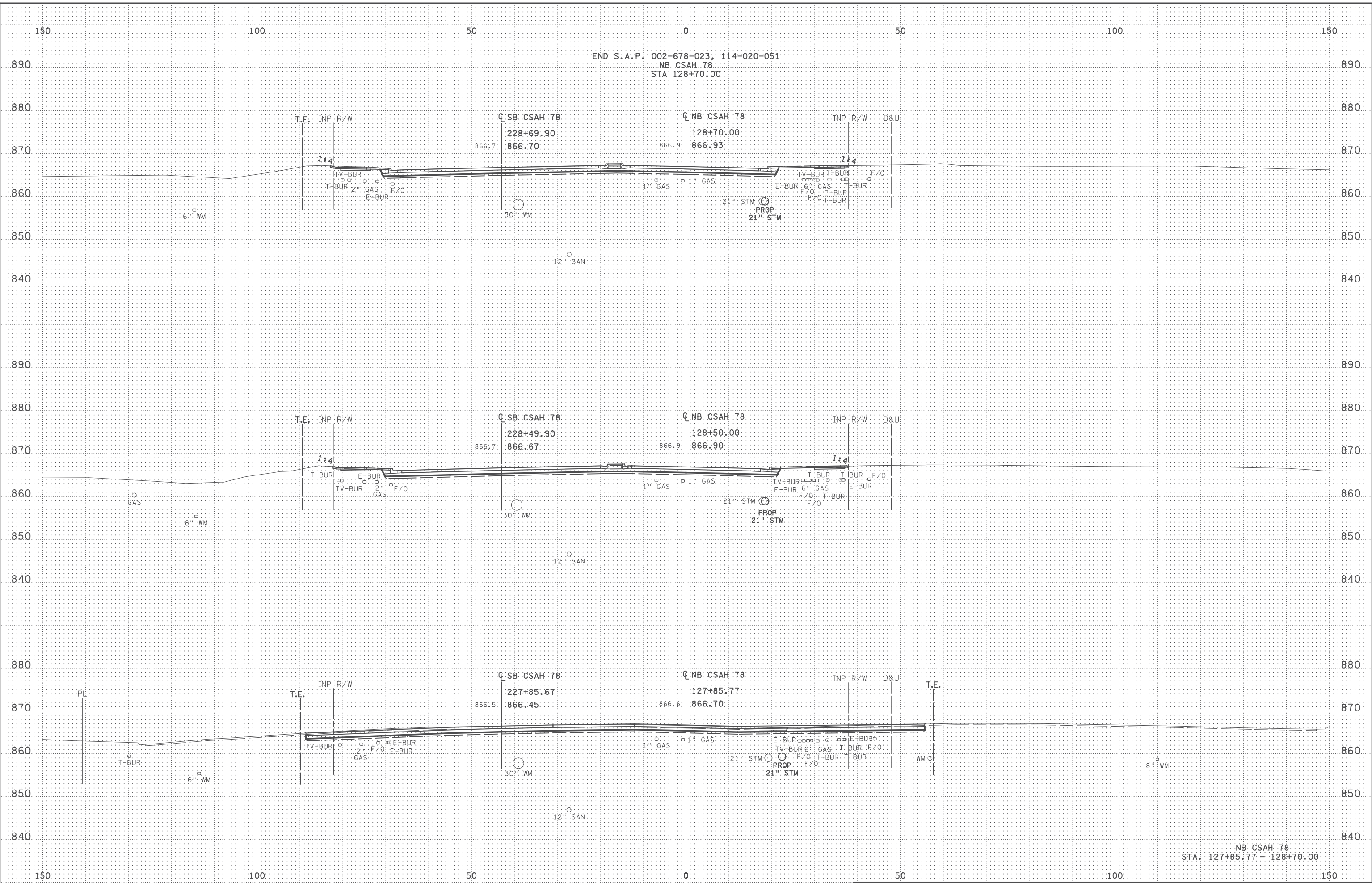
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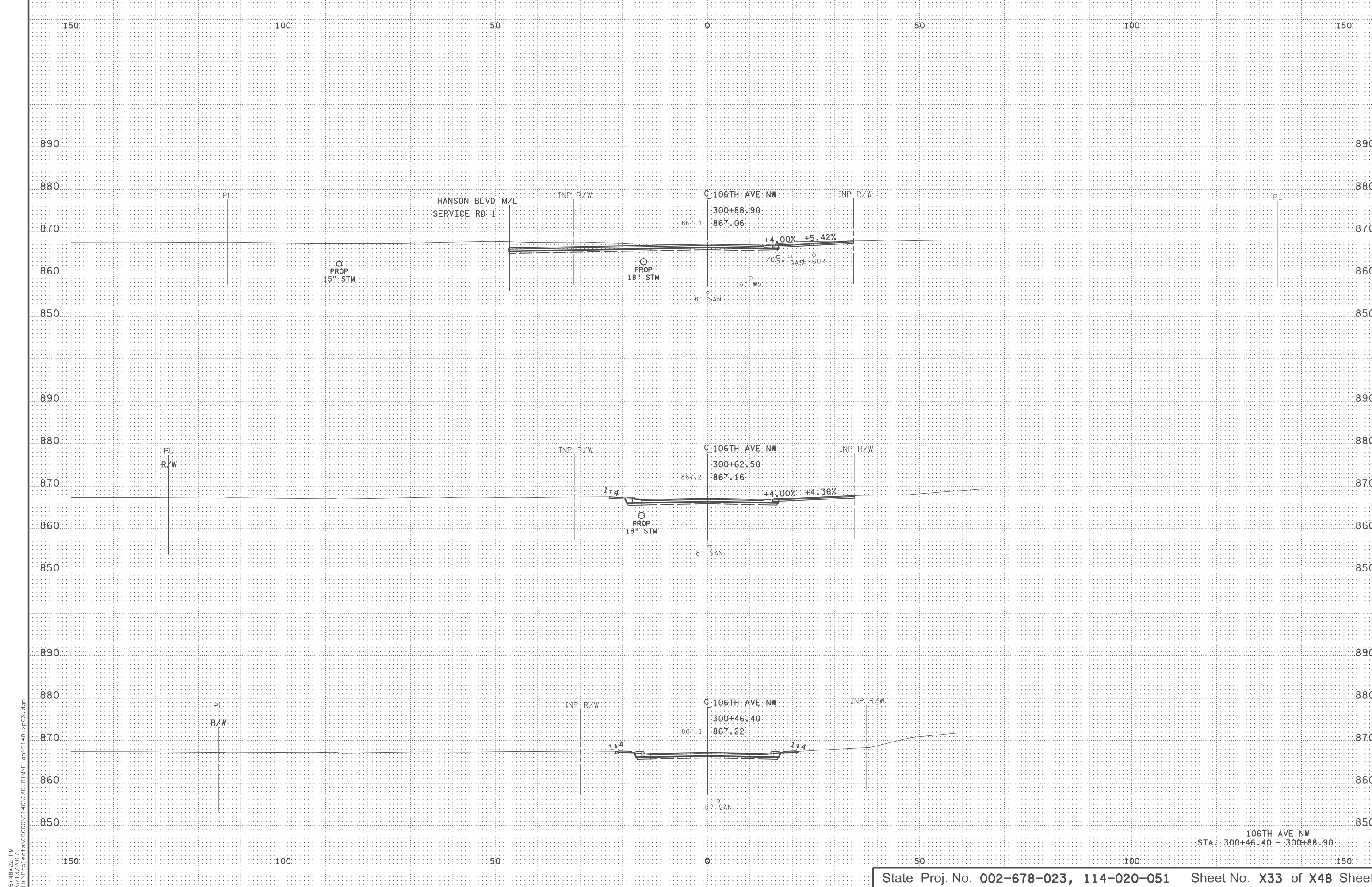
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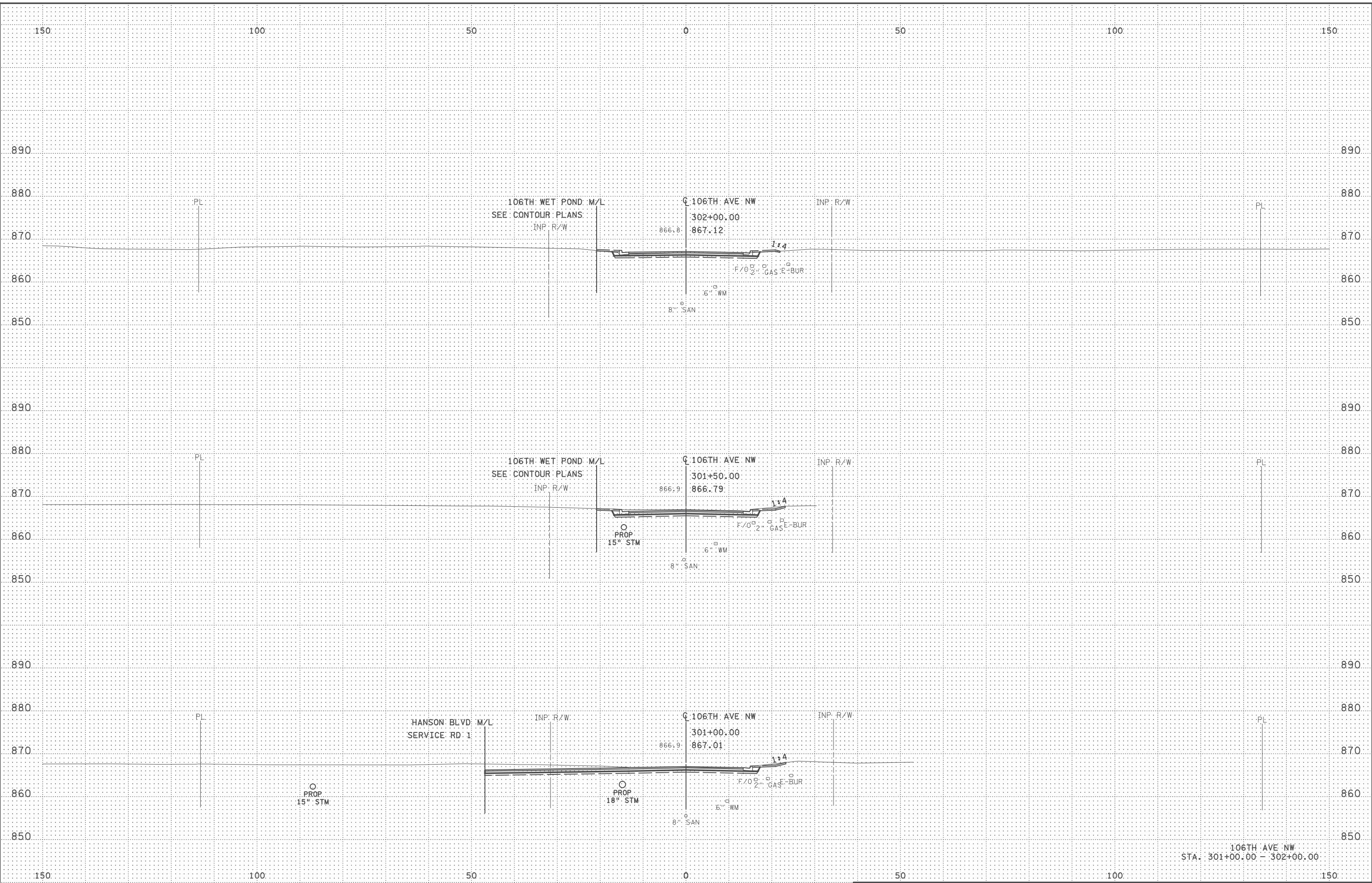
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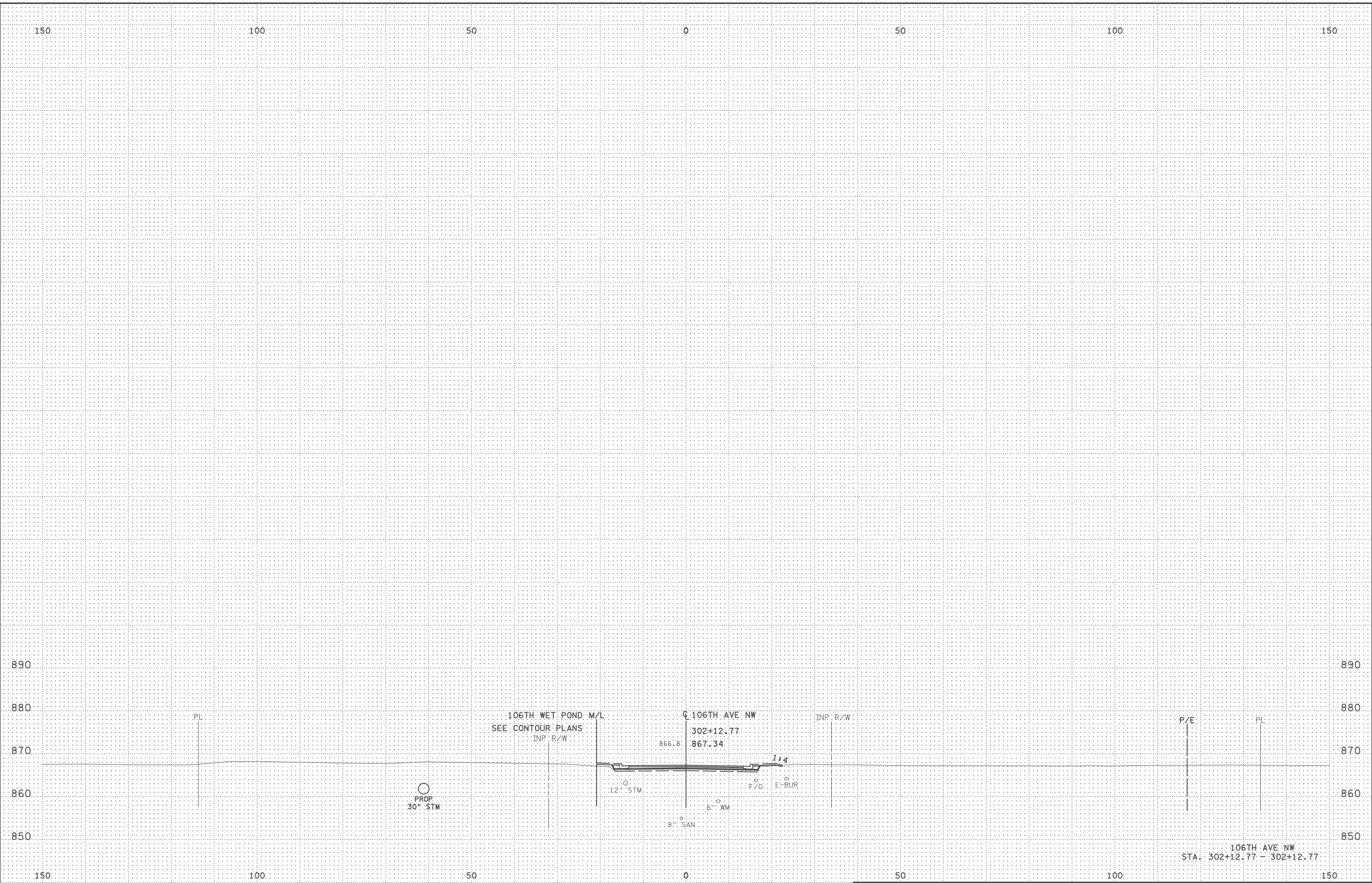
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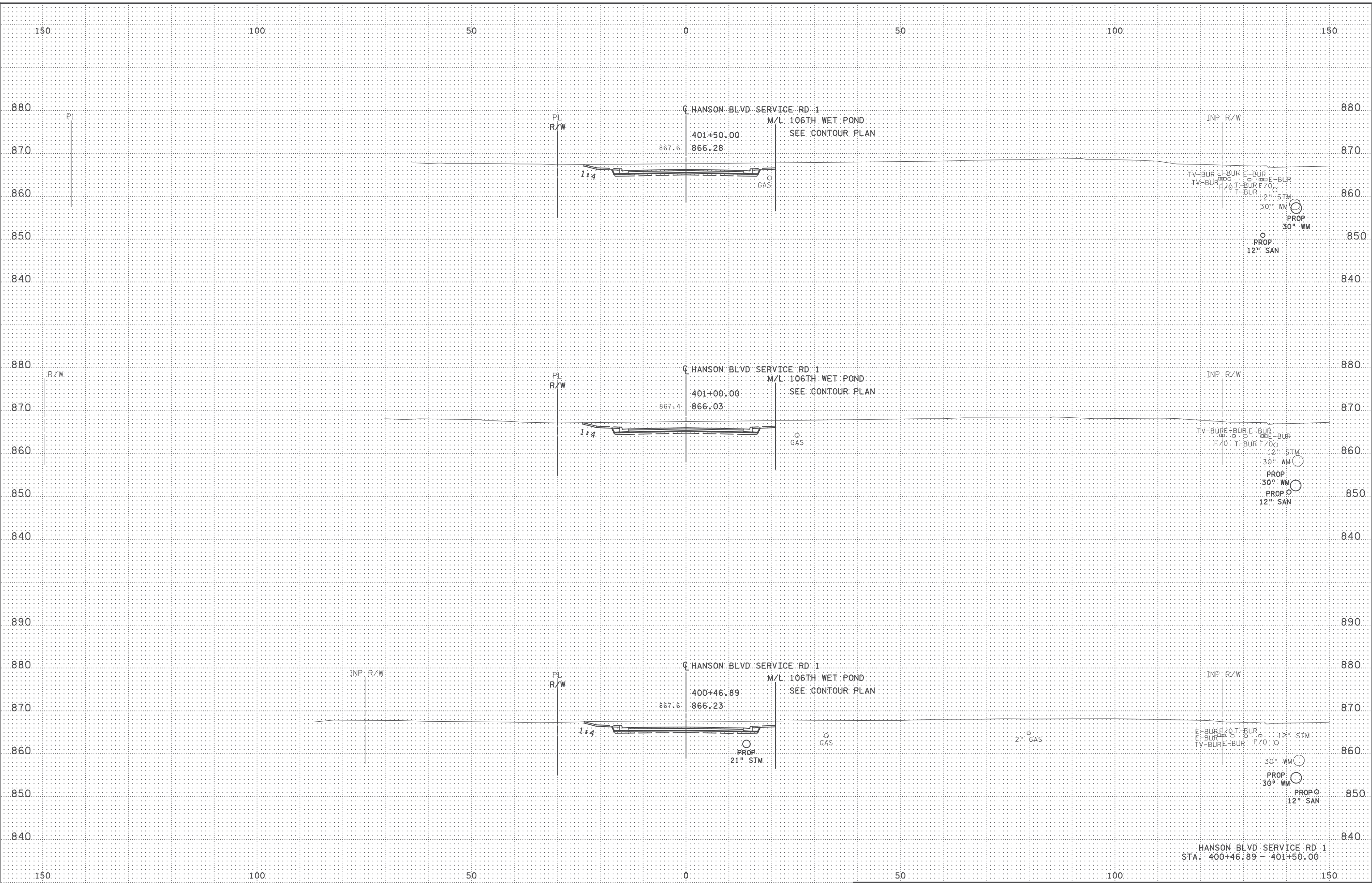


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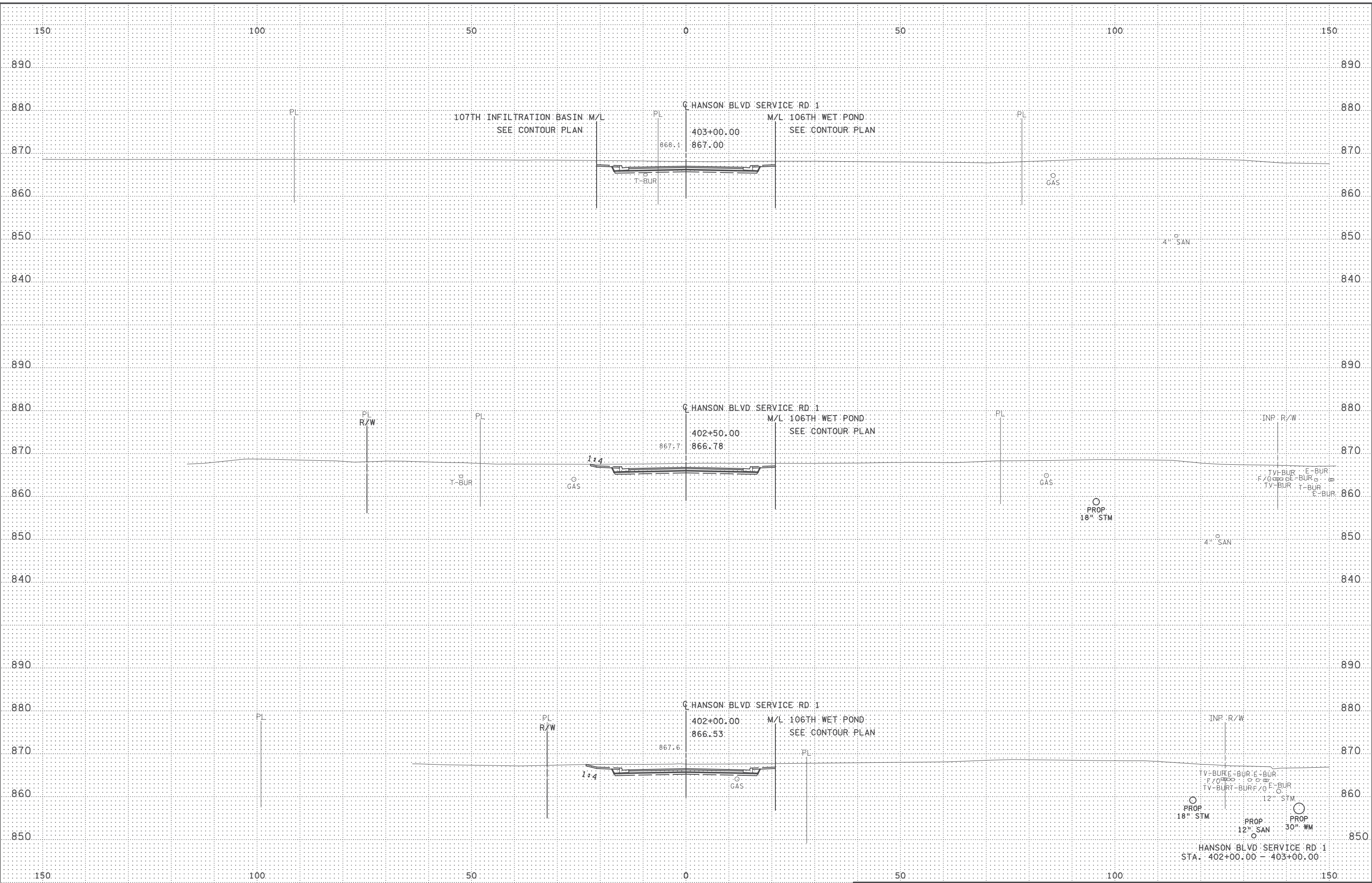
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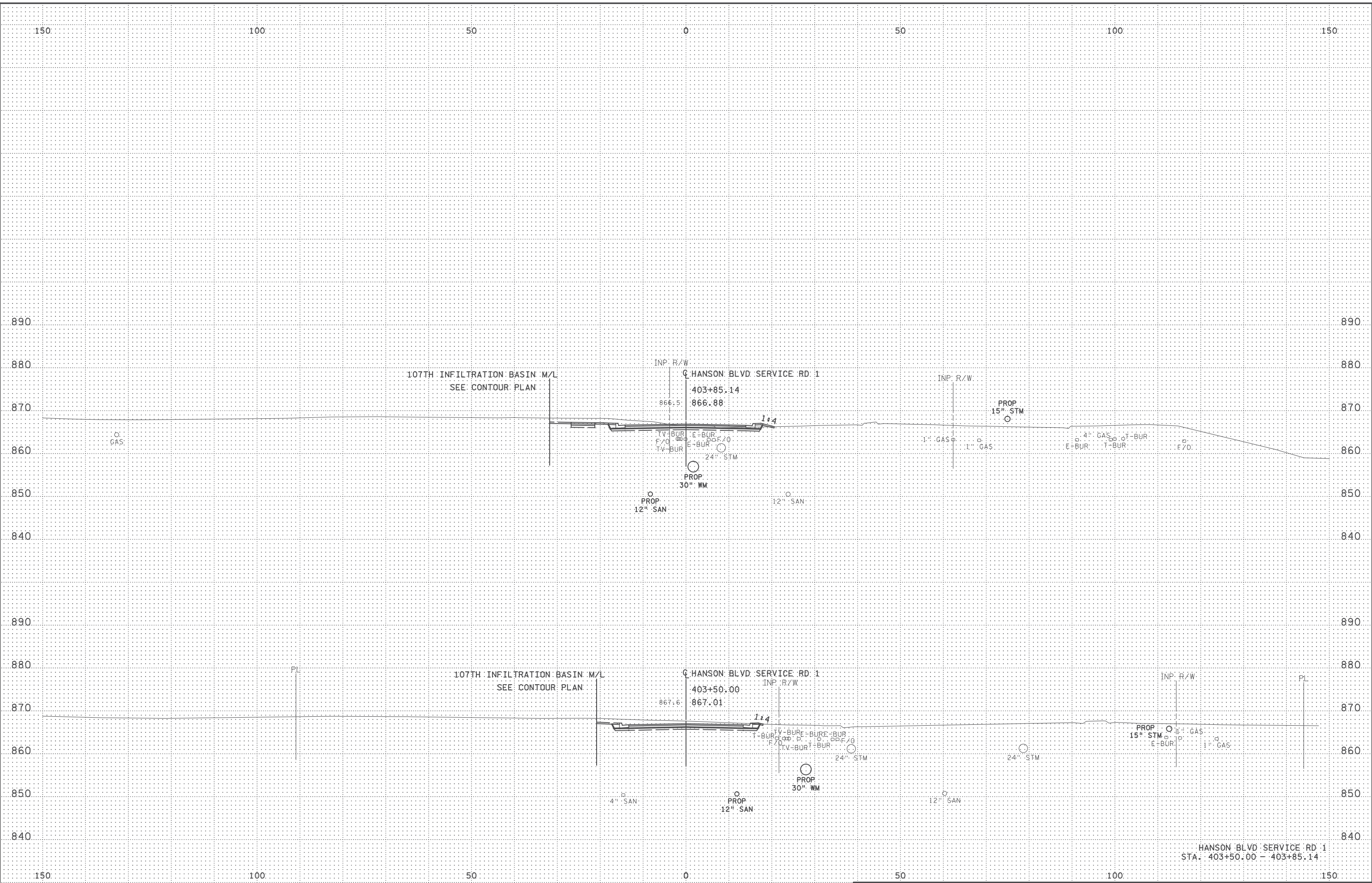
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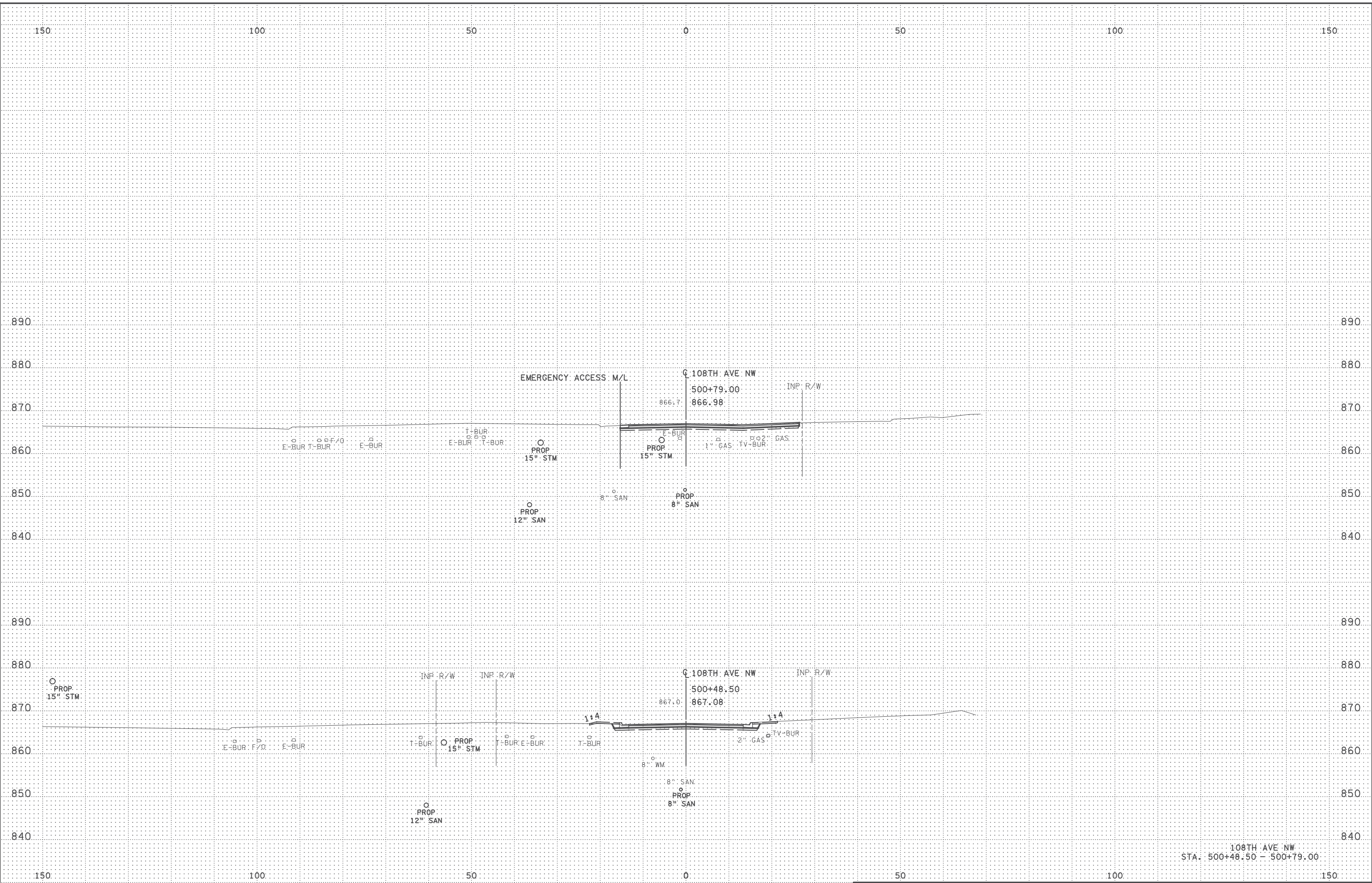
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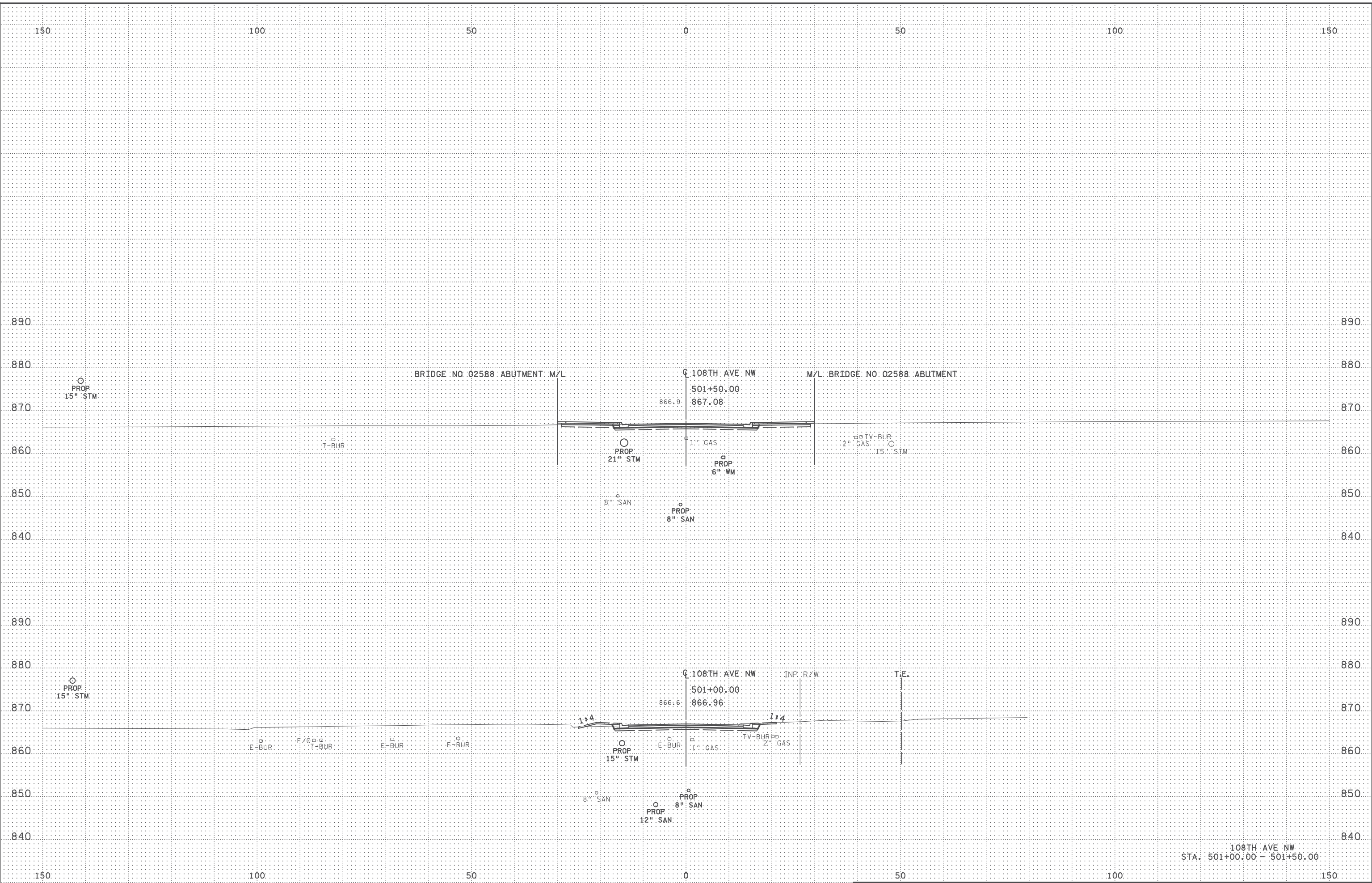
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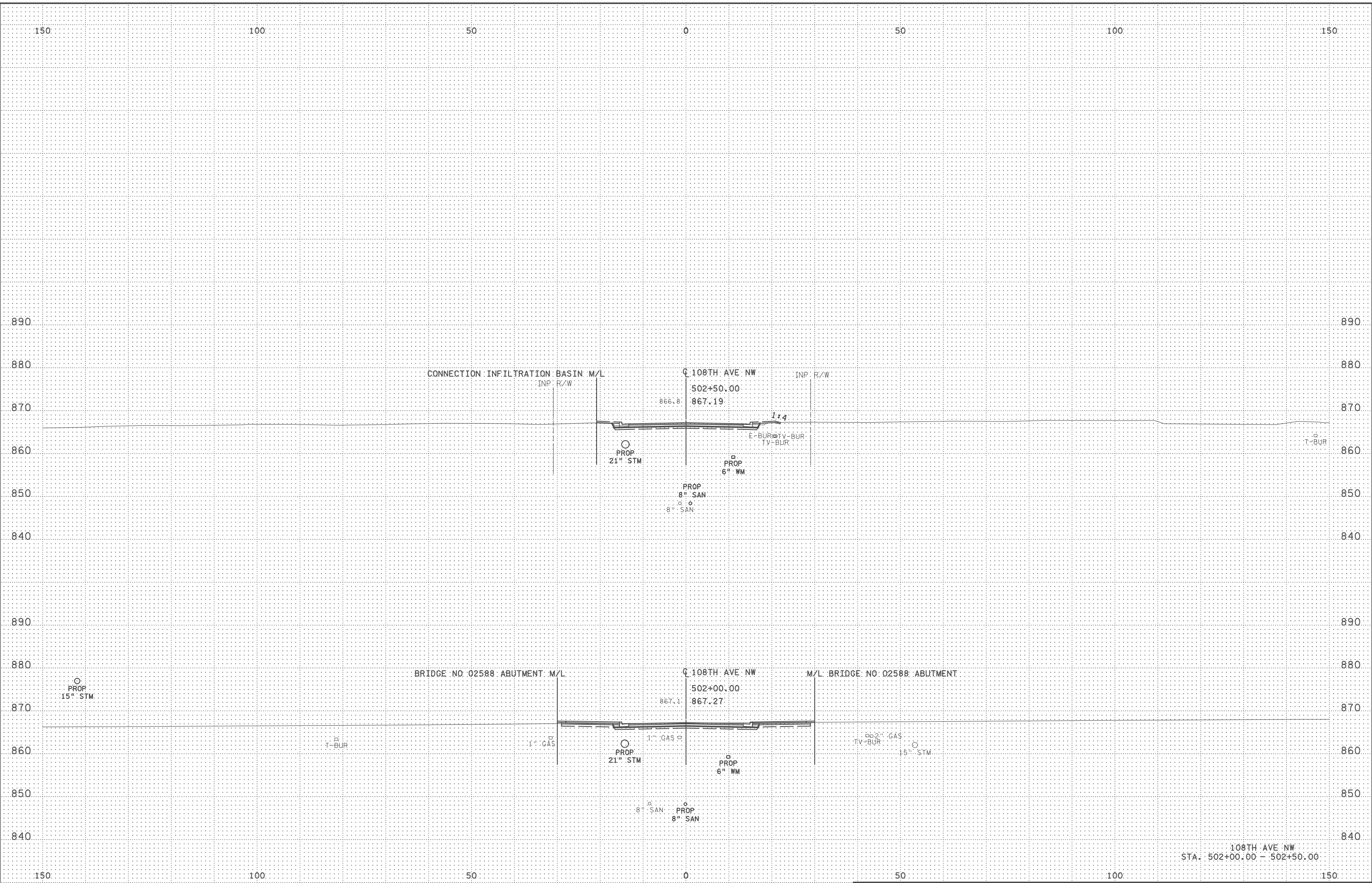


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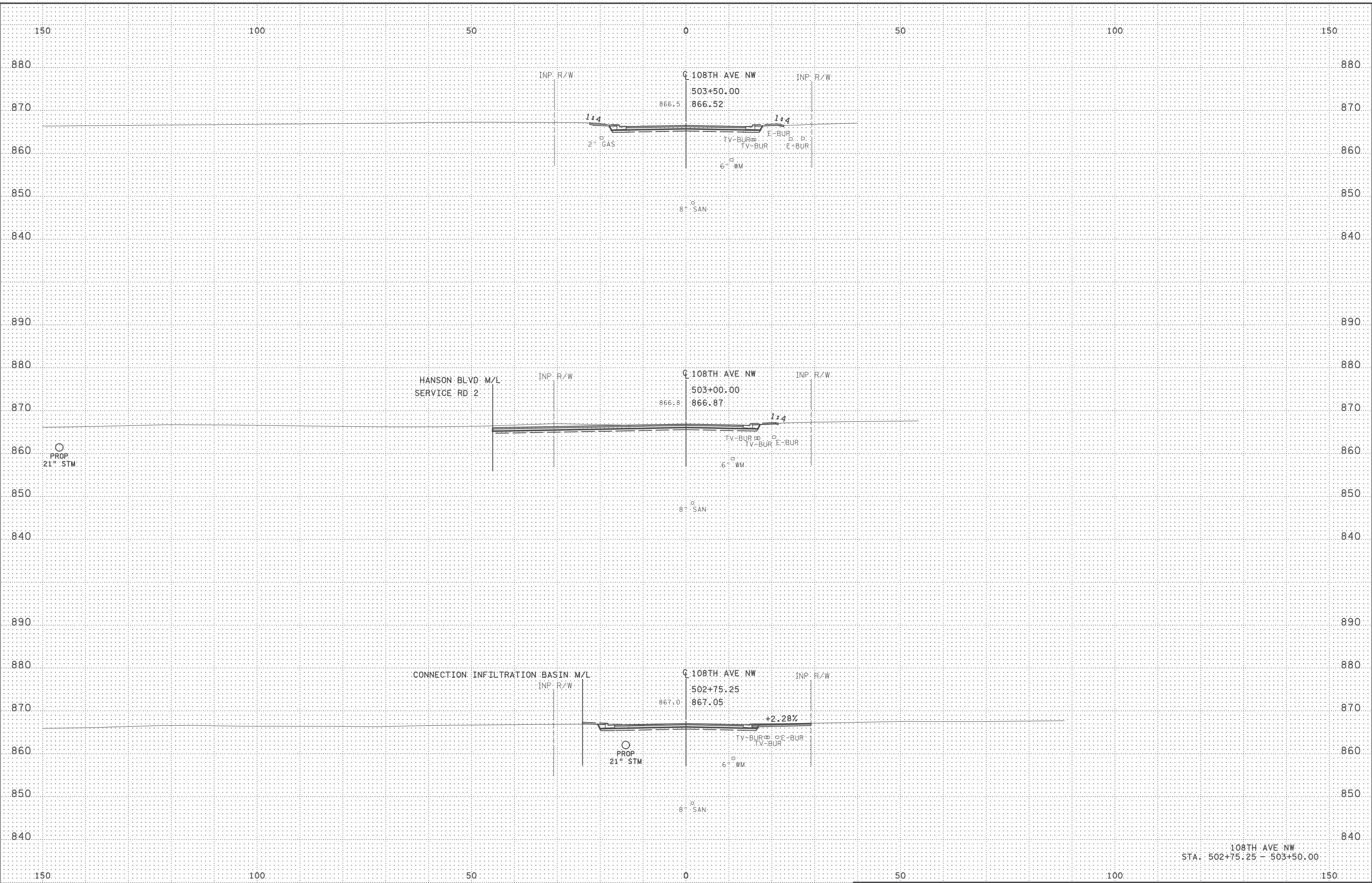
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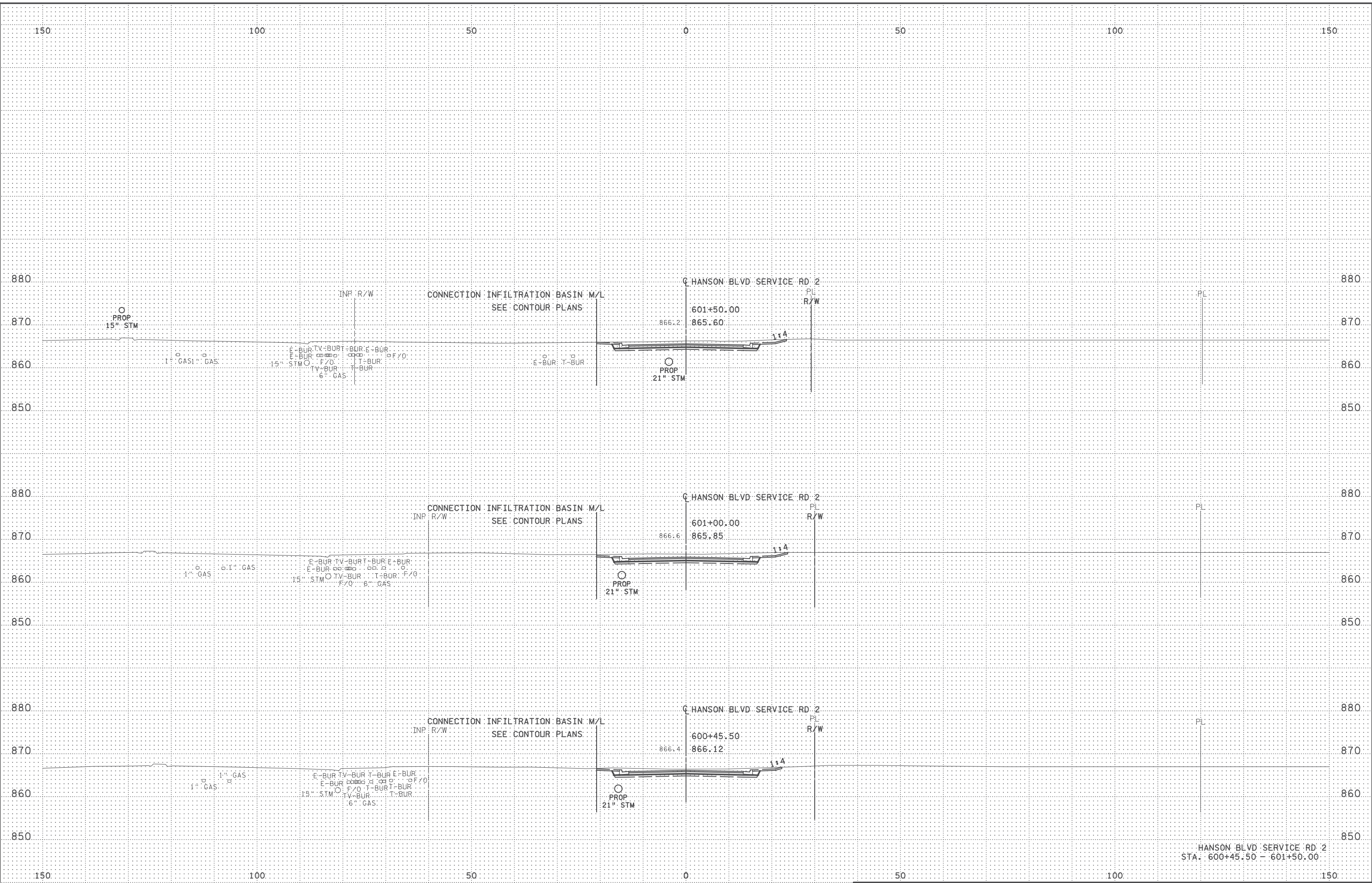
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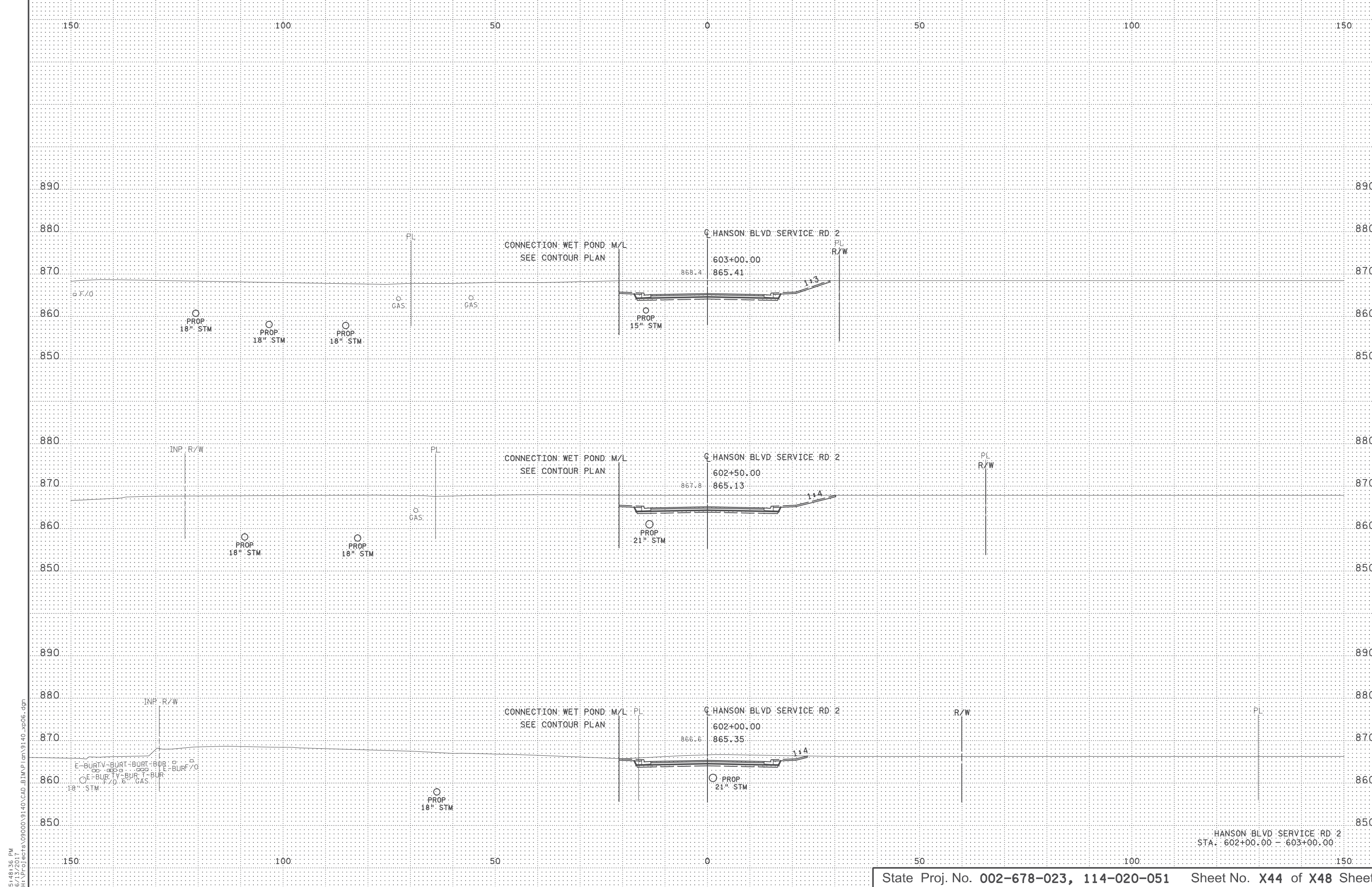


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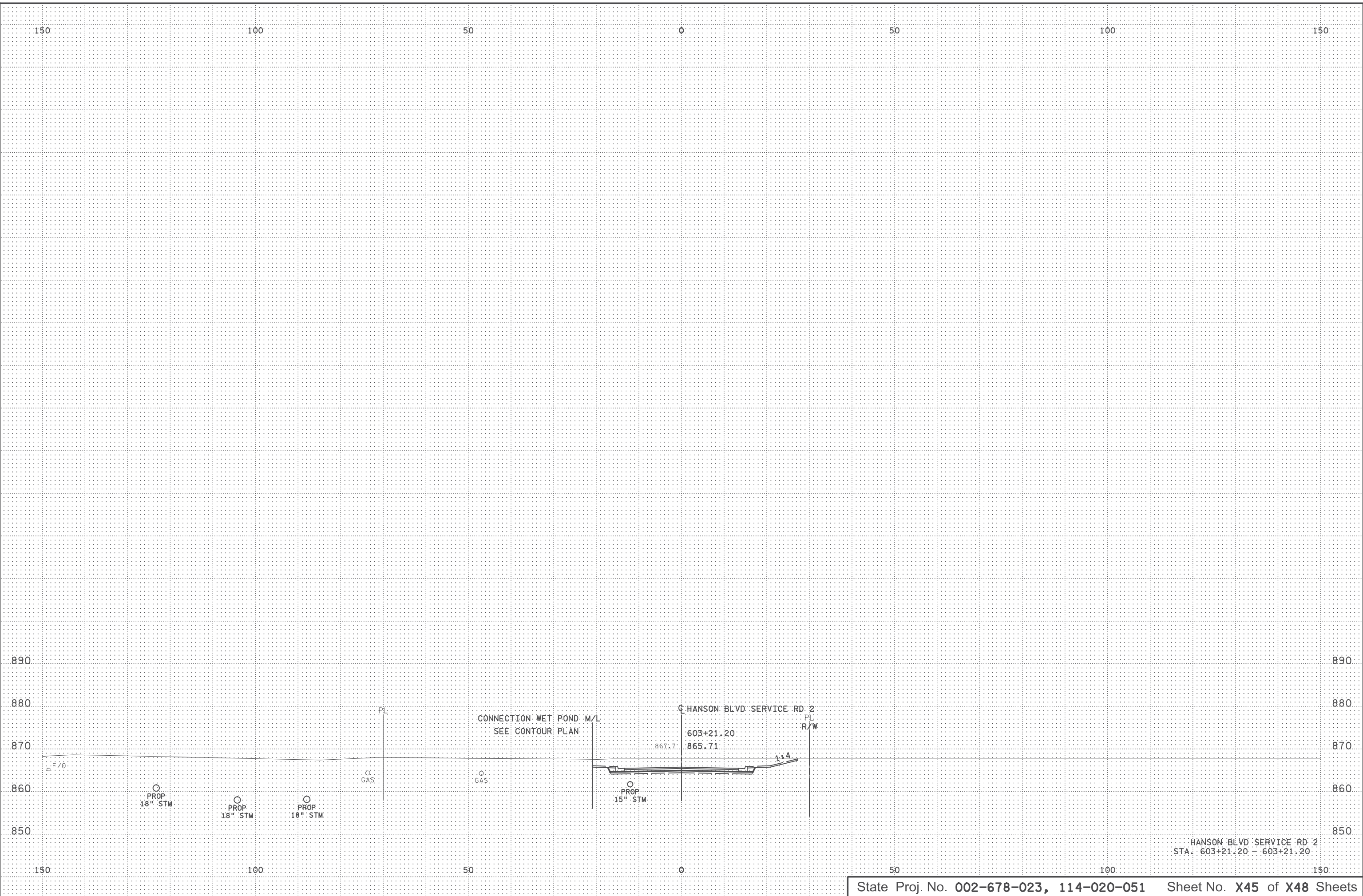
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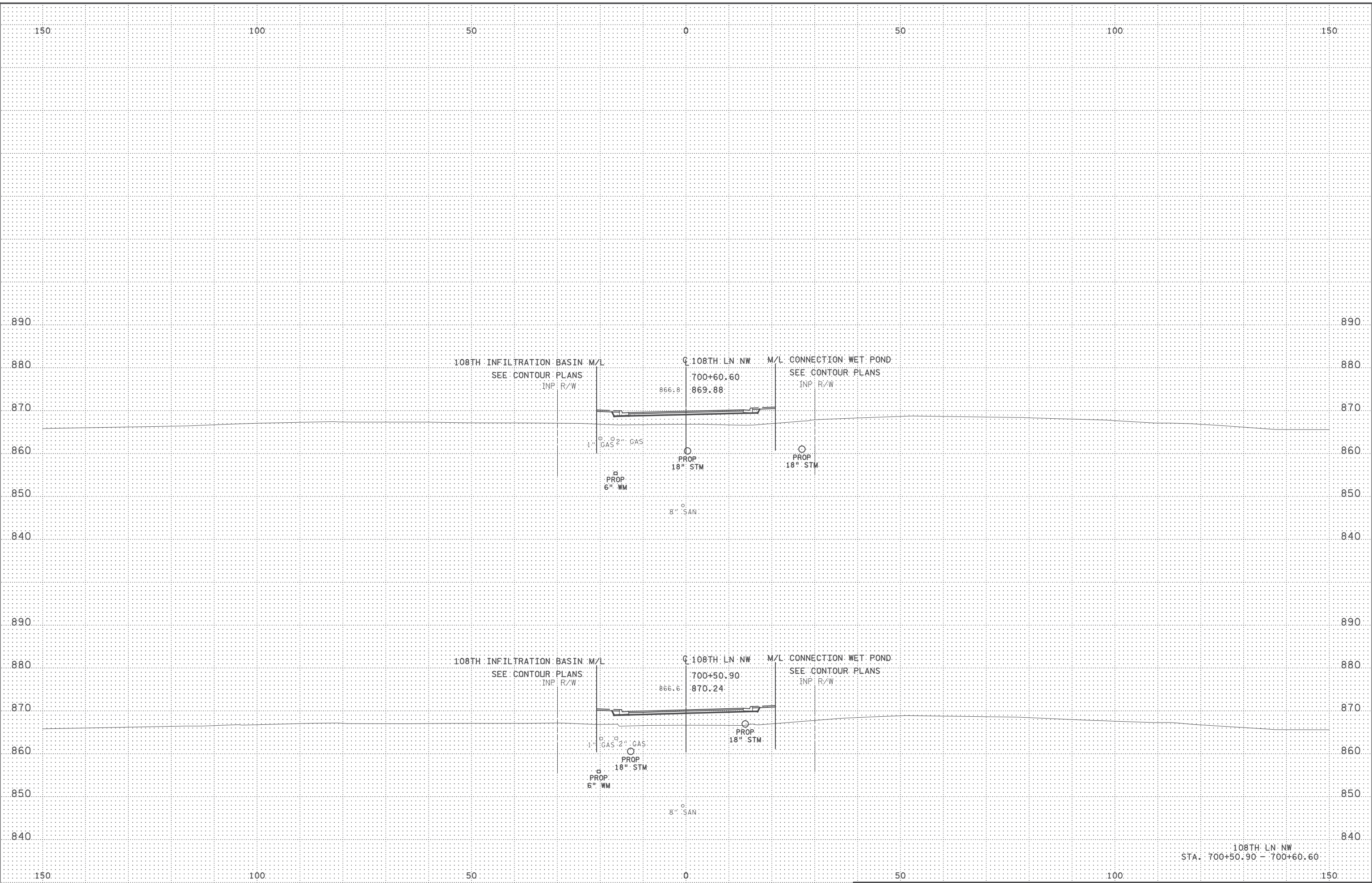


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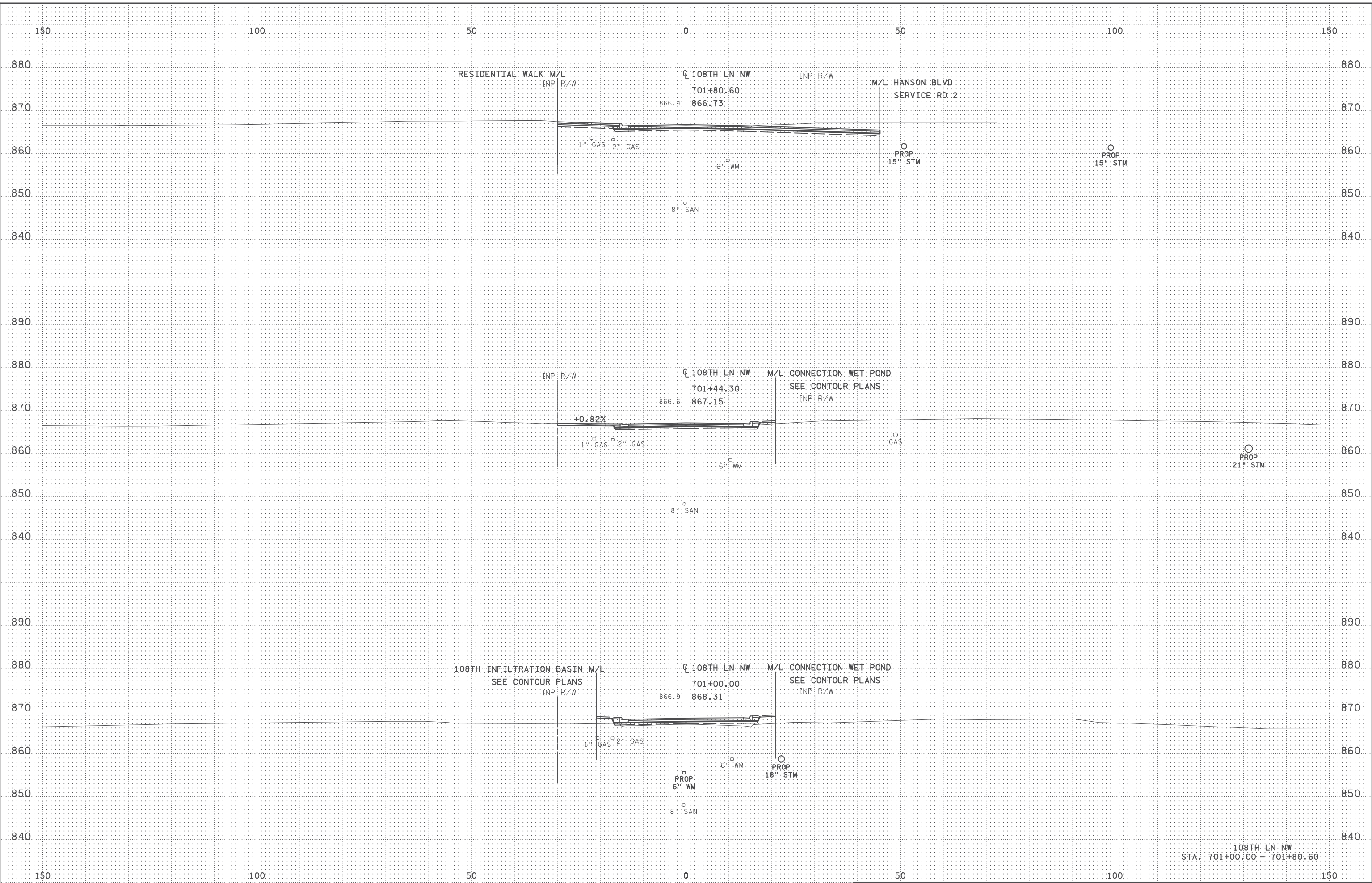




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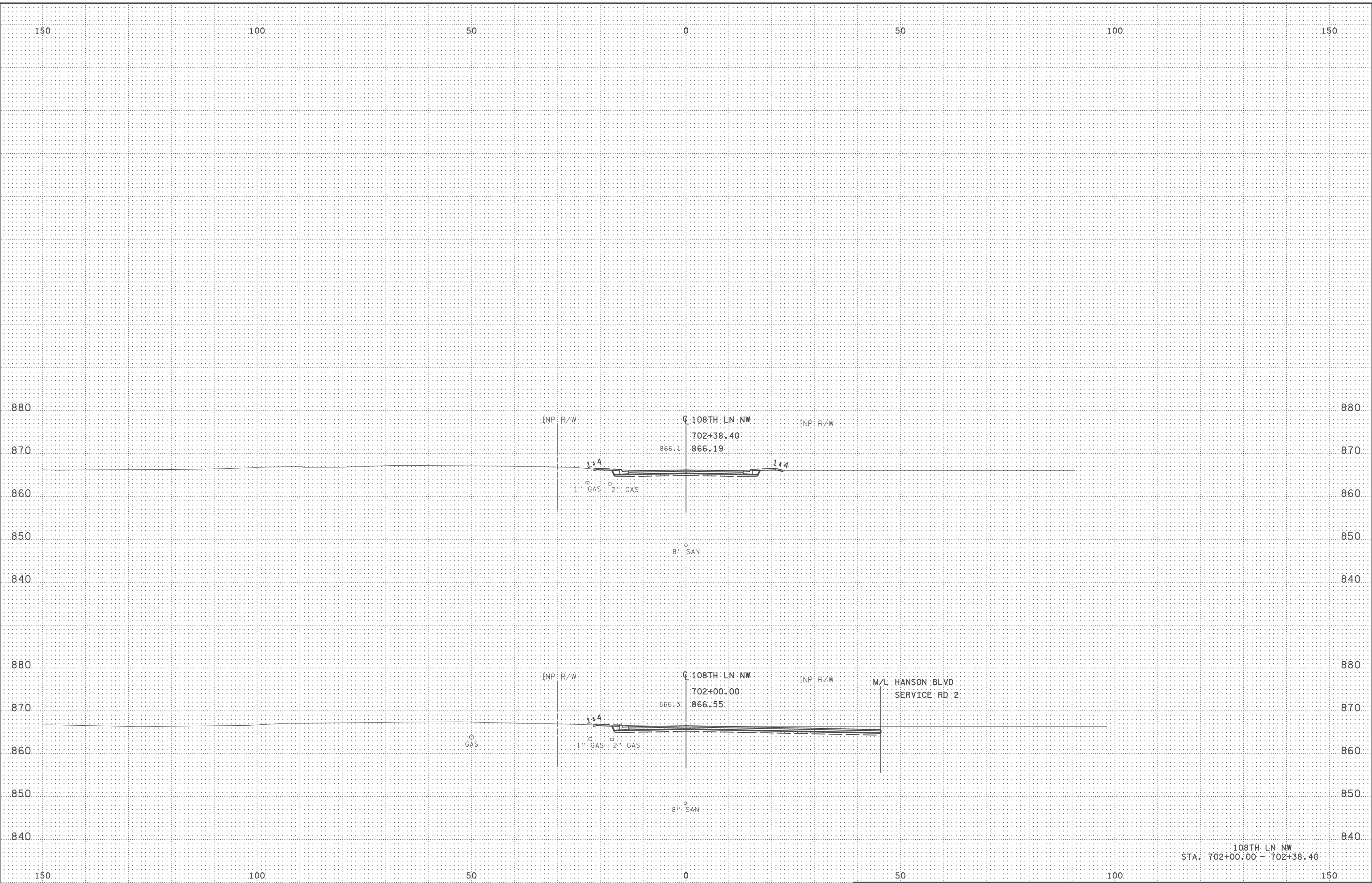
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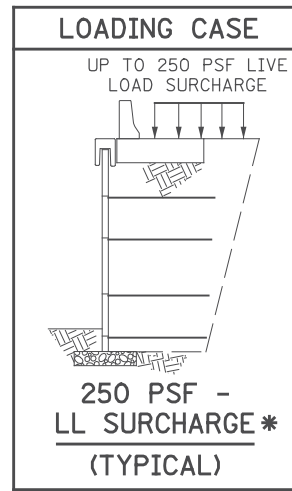


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108TH LN NW
STA. 702+00.00 - 702+38.40



SUMMARY OF QUANTITIES FOR MSE RETAINING WALLS												HH
ITEM NO.	ITEM	UNIT	MSE RETAINING WALL								TOTAL	
			A	B	C	D	E	F	G	H		
2106.521	GRANULAR EMBANKMENT (CV)	CU YD	299	96	97	244	132	103	42	43	1056	
2401.501	STRUCTURAL CONCRETE (3B52)	CU YD	332	117	117	151	73	65	-	-	855	
2401.513	TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	632	223	222	551	265	235	-	-	2128	
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	46650	21920	21800	27470	17520	16440	-	-	151800	
2402.583	ORNAMENTAL METAL RAILING	LIN FT	675	225	222	552	303	235	-	-	2212	
2411.604	MECHANICALLY STABILIZED EARTH WALL	SQ YD	1519	688	272	1063	1044	348	172	136	5242	
2411.618	ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ FT	8924	4420	1144	5775	6560	1413	880	569	29685	
2411.618	ARCHITECTURAL CONCRETE TEXTURE (ASHLAR STONE)	SQ FT	8924	4420	1144	5775	6560	1413	880	569	29685	
2411.618	ANTI-GRAFFITI COATING	SQ FT	3496	1325	1035	2885	1775	1023	593	595	12727	
2411.618	SPECIAL SURFACE FINISH	SQ FT	6919	2388	1937	5265	3355	2363	926	920	24073	
2502.521	4" TP PIPE DRAIN	LIN FT	180	100	100	304	100	100	200	200	1284	
2502.541	4" PERF TP PIPE DRAIN	LIN FT	2018	741	747	1643	981	789	189	193	7301	
2545.509	CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	0.3	0.1	0.1	0.3	0.1	0.1	-	-	1	
2564.602	SIGN TYPE C (BRIDGE MOUNTED)	EACH	-	-	-	-	-	1	-	-	1	

DESIGN CRITERIA

THE DESIGN SHALL CONSIDER THE INTERNAL, EXTERNAL, AND COMPOUND STABILITY OF THE WALL MASS INCLUDING ECCENTRICITY, SLIDING, BEARING PRESSURE AND STABILITY OF TEMPORARY CONSTRUCTION SLOPES. THE DESIGN SHALL BE IN ACCORDANCE WITH THE SPECIAL PROVISIONS, THE MSE WALL DESIGN AND CONSTRUCTION PROVISIONS OF THE 2014 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND THE FEDERAL HIGHWAY ADMINISTRATION REQUIREMENTS AS REPORTED IN PUBLICATION NO. FHWA NHI-10-024/025, ENTITLED "DESIGN AND CONSTRUCTION OF MECHANICALLY STABILIZED EARTH WALLS AND REINFORCED SOIL SLOPES - VOLUME I & II" SHALL GOVERN. THE DESIGN SHALL BE PERFORMED USING THE LRFD METHOD.

DESIGN LIFE FOR SOIL REINFORCEMENT, CONNECTIONS AND CORROSION PROTECTION OF ALL COMPONENTS SHALL BE 100 YEARS; OTHERWISE FOR ALL OTHER WALL SYSTEM COMPONENTS THE DESIGN LIFE SHALL BE 75 YEARS.

DEFINITION OF TERMS

MSE =	MECHANICALLY STABILIZED EARTH
LL =	LIVE LOAD
H =	WALL HEIGHT
CIP =	CAST-IN-PLACE

STANDARD PLATES

PLATE NO.	TITLE
3131 C	PRECAST CONCRETE HEADWALL FOR SUBSURFACE DRAINS

STANDARD FIGURES

FIGURE NO.	DESCRIPTION
5-397.166	CONCRETE PARAPET (TYPE MOD. P-1)
5-397.162	METAL RAILING TYPE T-2 MOD. DETAILS

MSE RETAINING WALL PLANS

SHEET INDEX

MSE WALLS A-H

SHEET NO.	DESCRIPTION
W1	MSE GENERAL NOTES
W2	MSE WALL ALIGNMENT TABULATIONS
W3 - W5	MSE WALL ARCHITECTURAL DETAILS
W6 - W7	MSE WALL TYPICAL SECTIONS
W8 - W9	MOMENT SLAB LAYOUT AND DETAILS
W10 - W11	CONCRETE PARAPET (TYPE P-1)
W12	CONDUIT SYSTEM (LIGHTING)
W13 - W16	METAL RAILING DETAILS
W17	BRIDGE MOUNTED SIGN DETAIL
W18	RETAINING WALL A SECTION & QUANTITIES
W19 - W21	RETAINING WALL A PLAN & PROFILE
W22	RETAINING WALL B SECTION & QUANTITIES
W23	RETAINING WALL B PLAN & PROFILE
W24	RETAINING WALL C SECTION & QUANTITIES
W25	RETAINING WALL C PLAN & PROFILE
W26	RETAINING WALL D SECTION & QUANTITIES
W27 - W28	RETAINING WALL D PLAN & PROFILE
W29	RETAINING WALL E SECTION & QUANTITIES
W30	RETAINING WALL E PLAN & PROFILE
W31	RETAINING WALL F SECTION & QUANTITIES
W32	RETAINING WALL F PLAN & PROFILE
W33	RETAINING WALL G SECTION & QUANTITIES
W34	RETAINING WALL G PLAN & PROFILE
W35	RETAINING WALL H SECTION & QUANTITIES
W36	RETAINING WALL H PLAN & PROFILE

NOTES TO CONTRACTOR:

APPROVED COMBINATIONS OF MSE PANEL UNIT AND SOIL REINFORCEMENT PRODUCTS LIST ARE HELD AND MAINTAINED BY THE FOUNDATIONS UNIT, AND POSTED AT www.dot.state.mn.us/products/walls/msewalls.html. ONLY APPROVED PRODUCT COMBINATIONS, INCLUDING WALL PANELS PRODUCED FROM APPROVED SOURCES MEETING DURABILITY AND QUALITY CONTROL REQUIREMENTS, MAY BE USED IN STANDARD DESIGNS.

PROVIDE DETAILED DRAWINGS FOR CONSTRUCTION CONTAINING:

- ELEVATION VIEW WITH SOIL REINFORCEMENT PLACEMENT REQUIREMENTS, WALL FACING LAYOUT, GEOMETRIC INFORMATION, MAX. BEARING PRESSURE UNDER EACH WALL.
- PLAN VIEW WITH BOTTOM AND TOP OF WALL ALIGNMENT, AND PLAN LIMITS OF WALL ALIGNMENT, INCLUDE ALL INTERFERING UTILITIES, ALL UTILITIES TO BE BUILT IN CONJUNCTION WITH THE WALLS, AND LIMITS OF SOIL REINFORCEMENT.
- CROSS SECTIONS DETAILING REINFORCEMENT, VERTICAL SPACING, REINFORCEMENT LENGTHS, SUBSURFACE DRAINAGE, SURFACE DRAINAGE, WATER RUNOFF COLLECTION ABOVE WALL, ELEVATION OF LEVELING PAD, EMBEDMENT DEPTH, EXCAVATION LIMITS, AND WALL TREATMENTS.
- REINFORCEMENT LAYOUT: REINFORCEMENT SHALL BE PLACED AT 100% COVERAGE RATIO, REINFORCEMENT ELEVATION SHALL BE CONSISTANT ACCROSS LENGTH OF STRUCTURE.
- NOTE PANEL, REINFORCEMENT, AND FILL PLACEMENT METHODS AND REQUIREMENTS.
- DETAIL ALL WALL FILL PENETRATIONS AND WALL FACE PENETRATIONS. DETAIL REINFORCEMENT AND/OR WALL FACING UNIT PLACEMENT AROUND PENETRATIONS.
- DETAILS THAT ARE SPECIFIC TO VENDOR PRODUCTS AND THEIR INTERACTION WITH OTHER PROJECT COMPONENTS.
- CONNECTION DETAILS AND DIMENSIONS BETWEEN CONCRETE PANELS, EMBEDDED DEVICES, AND SOIL REINFORCEMENT.
- ALL PANEL JOINTS ALONG THE MSE RETAINING WALL, MUST BE LOCATED ON THE REFERENCE LINE. KINK POINTS CAN BE ELIMINATED ALONG THE REFERENCE LINE BY CONNECTING ADJACENT PANEL JOINTS WITH A STRAIGHT LINE.
- SEE SPECIAL PROVISIONS FOR ADDITIONAL DESIGN AND SUBMITTAL REQUIREMENTS. SEE, ALSO, MN DOT TECH MEMO NO. 14-02-B-01.
- CERTIFICATION BY PROFESSIONAL ENGINEER IN MINNESOTA THAT THE CONSTRUCTION LAYOUT MEETS THE REQUIREMENTS OF PLANS AND Mn/DOT MSEW STANDARDS.

GENERAL NOTES:

- UTILITIES:**
EXISTING AND PROPOSED UTILITIES ARE SHOWN IN THE GRADING PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING FACILITIES AND SHALL EXERCISE CARE IN ADJACENT CONSTRUCTION.
- NO BURIED UTILITIES OTHER THAN WHAT IS REQUIRED FOR HIGHWAY DRAINAGE SHALL BE PLACED WITHIN THE REINFORCED EARTH ZONE. THE PLACEMENT OF THE DRAINAGE SYSTEM SHALL OCCUR ONLY DURING THE CONSTRUCTION BACKFILLING.
- EXCAVATION AND EARTHWORK:**
ALL EXCAVATION AND EMBANKMENT WORK SHALL CONFORM TO Mn/DOT 2451.
- CONCRETE:**
ALL CONCRETE SHALL CONFORM TO Mn/DOT 2461, EXCEPT AS NOTED.
- CONSTRUCTION:**
CONSTRUCTION SHALL BE IN ACCORDANCE WITH Mn/DOT 2411, EXCEPT AS NOTED.
- NO DRILLING OR DRIVING OF POSTS (SIGN, GUARDRAIL, ETC.) OR OTHER ROADSIDE HARDWARE THROUGH THE REINFORCED BACKFILL SHALL OCCUR AFTER PLACEMENT OF BACKFILL.
- GEOMETRICS AND GRADES:**
DATA FOR BASELINE GEOMETRY IS TABULATED FOR WALL ALIGNMENT, SEE LAYOUT SHEETS. WALL ALIGNMENT REFERENCE IS ALONG FRONT FACE OF WALL.
THE FILL SLOPE CONVENTION OF 1 VERTICAL TO HORIZONTAL IS USED IN THIS PLAN.
- COMPACTION REQUIREMENTS:**
COMPACT REINFORCED WALL FILL IN ACCORDANCE WITH Mn/DOT SPEC. 2105.3F1 UNLESS RECOMMENDED OTHERWISE BY THE SOILS ENGINEER.
- REINFORCING STEEL:**
USE REINFORCEMENT BARS CONFORMING TO SPEC. 3301, GRADE 60.
BARS MARKED WITH THE SUFFIX "E" TO BE EPOXY COATED. ALL BARS WHICH EXTEND OUT OF THE FOOTING AND ALL BARS WHICH ARE ABOVE THE FOOTING TO BE EPOXY COATED.
ALL BENT BAR DIMENSIONS ARE GIVEN OUT-TO-OUT.
MAINTAIN CLEAR DISTANCES BETWEEN REINFORCEMENT BARS AND FACE OF CONCRETE OF 3 INCHES IN FOOTINGS, 5 INCHES IN BOTTOM OF SPREAD FOOTINGS, AND 2 INCHES ELSEWHERE UNLESS OTHERWISE NOTED.
- LEVELING PAD:**
A MINIMUM OF 24 HOURS OF CURING IS REQUIRED BEFORE PLACING THE PANELS.

NOTES:

- SEE SPECIAL PROVISIONS DIVISION SB FOR ADDITIONAL DESIGN, SUBMITTAL, MATERIALS AND CONSTRUCTION REQUIREMENTS.
- QUANTITY INCLUDES VOLUME OF CONCRETE FOR MOMENT SLABS PANELS.
- PAY ITEM INCLUDES MSE WALL PANELING, SURFACE TEXTURE, SOIL REINFORCEMENT, PRECAST CAP, IMPERVIOUS MEMBRANE, LEVELING PAD, PIPE SLEEVES AND OTHER ITEMS AS SHOWN IN THE SPECIAL PROVISIONS.
- AREA OF ARCHITECTURAL TREATMENTS CALCULATED AS THE AREA OF WALL FROM THE TOP OF THE LEVELING PAD TO THE TOP OF WALL, EXCLUDING AREAS FINISHED WITH A SMOOTH SURFACE.
- COATING LIMITS ON MSE WALL PANELS SHALL EXTEND FROM 2'-0" BELOW TO 10'-0" ABOVE THE PROPOSED FINISHED GROUNDLINE. APPLY ONLY TO AREAS RECEIVING ARCHITECTURAL SURFACE FINISH.
- QUANTITY INCLUDES SPECIAL SURFACE FINISH APPLIED TO SMOOTH FINISHED SURFACES OF PRECAST CONCRETE ELEMENTS INCLUDING MSE WALL PANELS AND ALL EXPOSED SURFACES OF THE PRECAST COPING. SEE SPECIAL PROVISIONS FOR APPLICATION REQUIREMENTS TO OTHER ELEMENTS.
- INCLUDES LIGHT BLISTERS LOCATED ON MOMENT SLABS.
- GEOTEXTILE FABRIC SHALL BE INCIDENTAL.
- POLYSTYRENE TYPES A & B SHALL BE INCIDENTAL.
- PAY ITEM INCLUDES METAL RAILING WITH NOMINAL HEIGHTS FROM 4'-6" TO 8'-0" AS MEASURED FROM THE TOP OF WALK TO TOP OF TOP RAIL AS DETAILED ON SHEETS W13 AND W15.

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11/01/2017				RELEASED FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR
				REVISION

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

Print Name: CASEY E. BLACK

Casey E. Black

Date: 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
MSE RETAINING WALL PLANS
CSAH 78 - BNSF GRADE SEPARATION
MSE WALL GENERAL NOTES & QUANTITIES

SHEET
W1
OF
W36

ALIGNMENT TABULATION


POINT NUMBER	POINT	STATION	CIRCULAR CURVE DATA					COORDINATES		AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	
			SPIRAL CURVE DATA							
ANGLE (θs)	DEGREE	ST	LT	LS						
WALL A <RWA>										
1200	POT	WALL A 1000+00.000						486,773.8039	147,520.0964	
1201	PC	1002+42.766						486,786.2556	147,277.6502	177° 03' 35.81"
1202	PI	1004+58.081	8° 42' 01.12" RT	2° 01' 27.34"	2,830.456'	215.315'	429.802'	486,797.2993	147,062.6187	PI
1203	CC							483,959.5256	147,132.4730	
1204	PT	WALL A 1006+72.568						486,775.6890	146,848.3910	185° 45' 36.93"
WALL B <RWB>										
1210	POT	WALL B 1100+00.000						486,752.8285	147,928.5047	
1211	POT	WALL B 1102+15.989						486,763.9069	147,712.7995	
WALL C <RWC>										
1220	PC	WALL C 1200+00.000						486,742.8958	148,270.6368	181° 13' 02.51"
1221	PI	1201+05.227	4° 09' 26.71" LT	1° 58' 34.73"	2,899.122'	105.227'	210.362'	486,740.6602	148,165.4333	PI
1222	CC							489,641.3637	148,209.0437	
1223	PT	WALL C 1202+10.362						486,746.0574	148,060.3445	177° 03' 35.81"
WALL D <RWD>										
1230	PC	WALL D 1300+00.000						486,883.1815	146,890.7470	3° 24' 12.09"
1231	PI	1301+60.318	6° 20' 36.28" LT	1° 58' 49.49"	2,893.122'	160.318'	320.307'	486,892.6987	147,050.7818	PI
1232	CC							483,995.1616	147,062.4969	
1233	PT	1303+20.307						486,884.4758	147,210.8883	357° 03' 35.81"
1234	POT	WALL D 1305+47.569						486,872.8193	147,437.8510	
WALL E <RWE>										
1240	POT	WALL E 1400+00.000						486,862.9223	147,630.5541	
1241	PC	1402+82.327						486,848.4415	147,912.5094	357° 03' 35.81"
1242	PI	1402+89.434	0° 17' 13.68" RT	2° 01' 11.92"	2,836.456'	7.107'	14.215'	486,848.0769	147,919.6074	PI
1243	CC							489,681.1636	148,057.9944	
1244	PT	WALL E 1402+96.542						486,847.7480	147,926.7071	357° 20' 49.48"

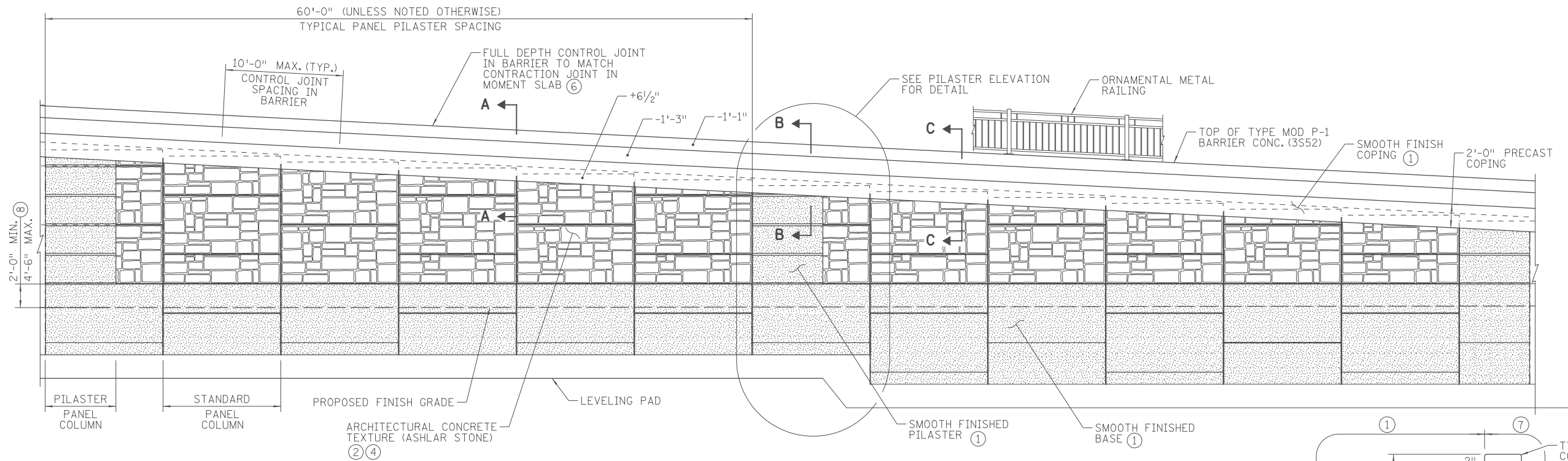
ALIGNMENT TABULATION

POINT NUMBER	POINT	STATION	CIRCULAR CURVE DATA					COORDINATES		AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	
			SPIRAL CURVE DATA							
ANGLE (θs)	DEGREE	ST	LT	LS						
WALL F <RWF>										
1250	PC	WALL F 1500+00.000						486,844.7170	148,050.8500	359° 51' 20.47"
1251	PI	1500+12.670	0° 30' 42.68" RT	2° 01' 11.92"	2,836.456'	12.670'	25.340'	486,844.6851	148,063.5199	PI
1252	CC							489,681.1636	148,057.9944	
1253	PT	1500+25.340						486,844.7663	148,076.1895	0° 22' 03.15"
1254	PC	1500+25.340						486,844.7663	148,076.1895	6° 08' 07.02"
1255	PI	1500+44.979	0° 47' 49.58" RT	2° 01' 45.70"	2,823.341'	19.640'	39.279'	486,846.8654	148,095.7167	PI
1256	CC							489,651.9361	147,774.4411	
1257	PT	1500+64.618						486,849.2358	148,115.2128	6° 55' 56.61"
1258	POT	1500+75.148						486,850.5068	148,125.6659	
1259	POT	WALL F 1502+30.861						486,853.8150	148,281.3429	
WALL G <RWG>										
1270	POT	WALL G 1700+00.000						486,846.0294	147,958.5409	
1271	POT	WALL G 1700+94.443						486,751.6054	147,960.4440	
WALL H <RWH>										
1260	POT	WALL H 1600+00.000						486,748.5029	148,020.8521	
1261	POT	WALL H 1600+96.079						486,844.5621	148,018.9160	

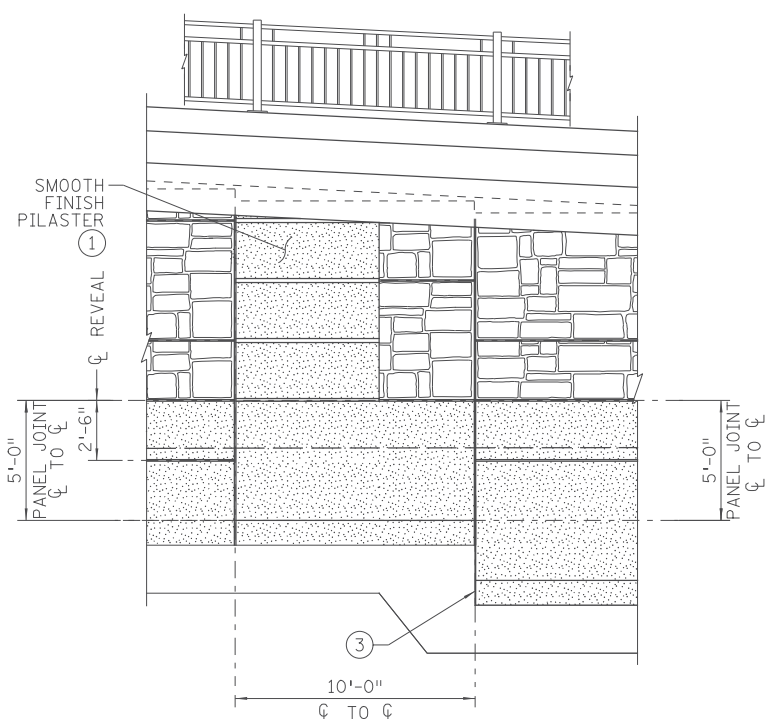
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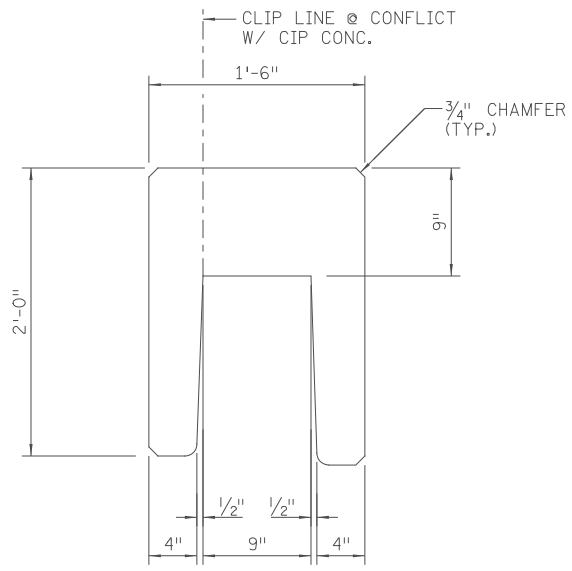
11/01/2017	RELEASED FOR CONSTRUCTION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: <u>CASEY E. BLACK</u> <i>Casey E. Black</i> Date: <u>11/01/2017</u> License # <u>49163</u>	STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051	DRAWN BY E. JOHNSON DESIGNED BY A. BEHNKE CHECKED BY C. BLACK COMM. NO. 0169140		ANOKA COUNTY MSE RETAINING WALL PLANS CSAH 78 - BNSF GRADE SEPARATION MSE WALL ALIGNMENT TABULATIONS	SHEET W2 OF W36
NO	DATE	BY	CKD	APPR			



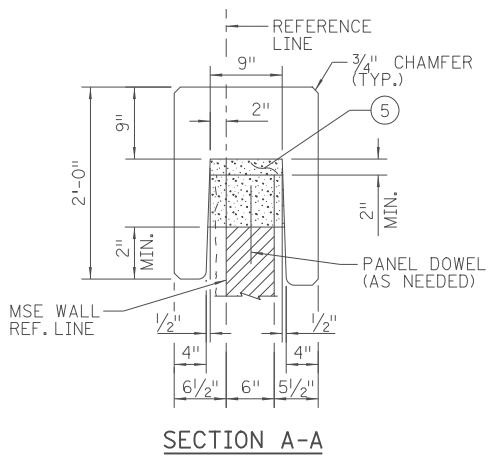
ARCHITECTURAL ELEVATION
MSE RETAINING WALLS



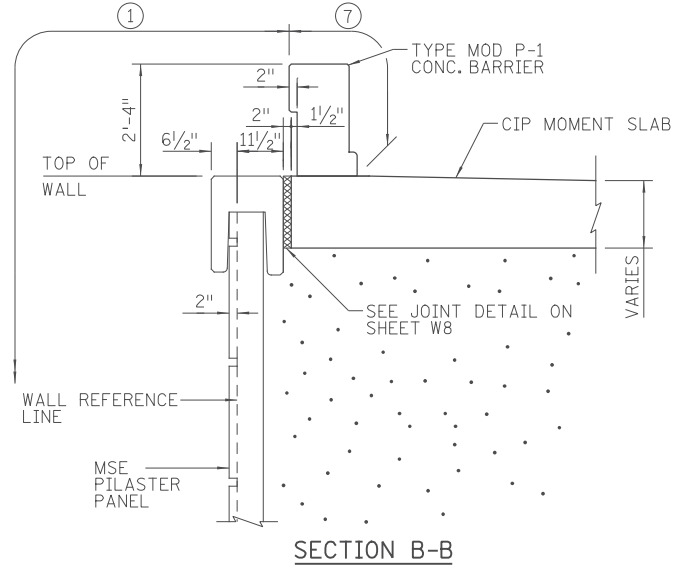
PILASTER ELEVATION



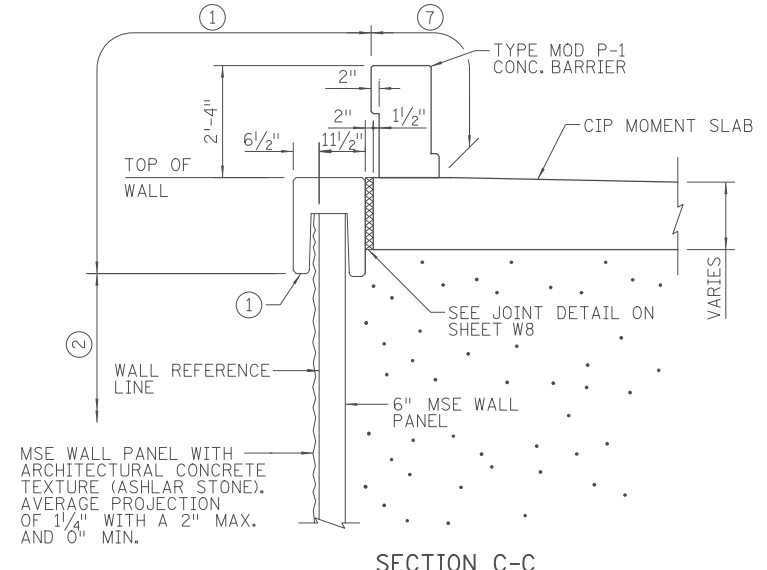
PRECAST COPING SECTION



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:

- ① SPECIAL SURFACE FINISH.
- ② ARCHITECTURAL SURFACE FINISH (SINGLE COLOR).
- ③ PROVIDE ALL STEPS AT PILASTER LOCATION. INTERMEDIATE STEP ALLOWABLE ONLY AS GRADE REQUIRES.
- ④ ROTATE PANELS 180° AND ALTERNATE PANELS TO PROVIDE A MORE RANDOM APPEARANCE.
- ⑤ LEVEL-UP CONCRETE WITH PANEL DOWELS AS NECESSARY.
- ⑥ CONTRACTION JOINTS IN MOMENT SLAB TO BE SPACED BETWEEN 35' MIN. AND 400' MAX. SEE RETAINING WALL PLAN AND PROFILE SHEETS FOR LOCATIONS.
- ⑦ ROADWAY FACE AND TOP OF BARRIER SHALL BE COATED WITH ACRYLIC PAINT AND IS INCIDENTAL. SEE SPECIAL PROVISIONS.
- ⑧ PROVIDE A 2'-6" STEP WHERE REQUIRED. SEE WALL PLAN AND ELEVATION SHEETS.

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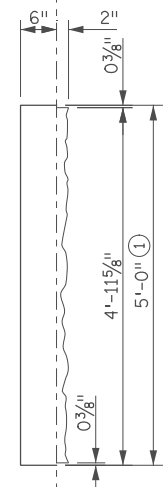
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Casey E. Black
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 BRIDGE NO. _____
 COMM. NO. 0169140

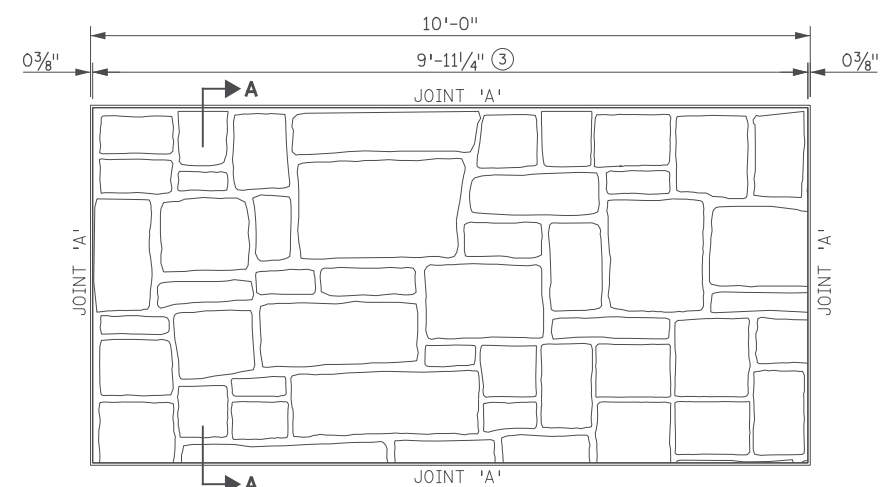
SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 MSE WALL ARCHITECTURAL DETAILS (SHEET 1 OF 3)

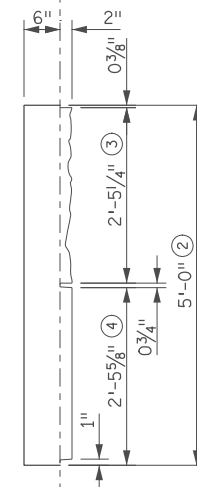
SHEET
W3
OF
W36



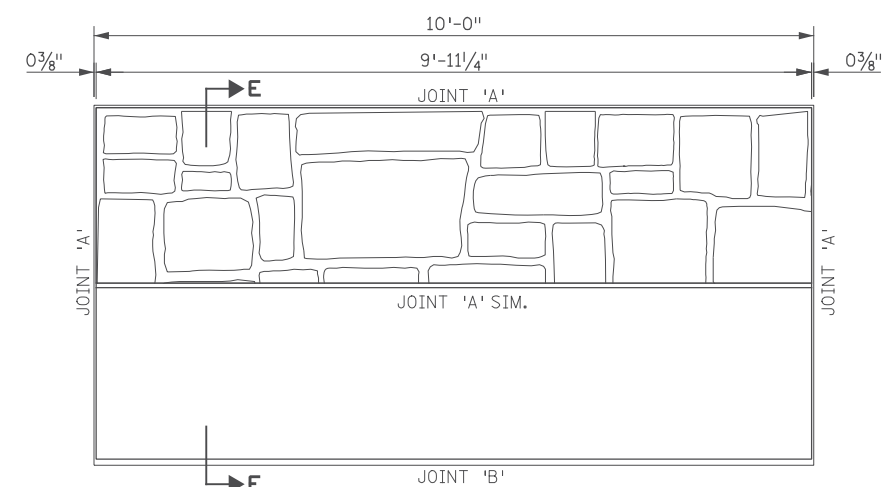
SECTION A-A



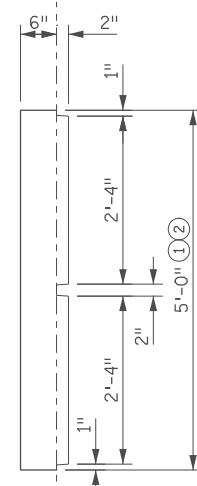
PANEL 'A'



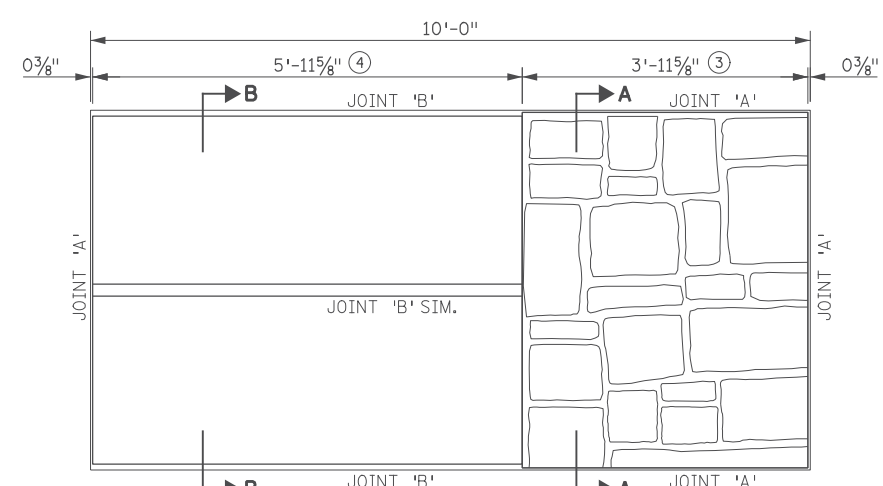
SECTION E-E



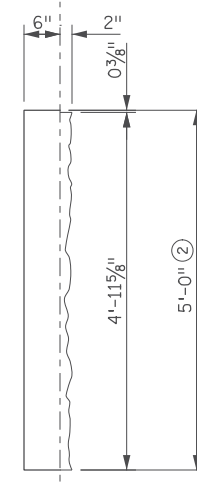
PANEL 'D'



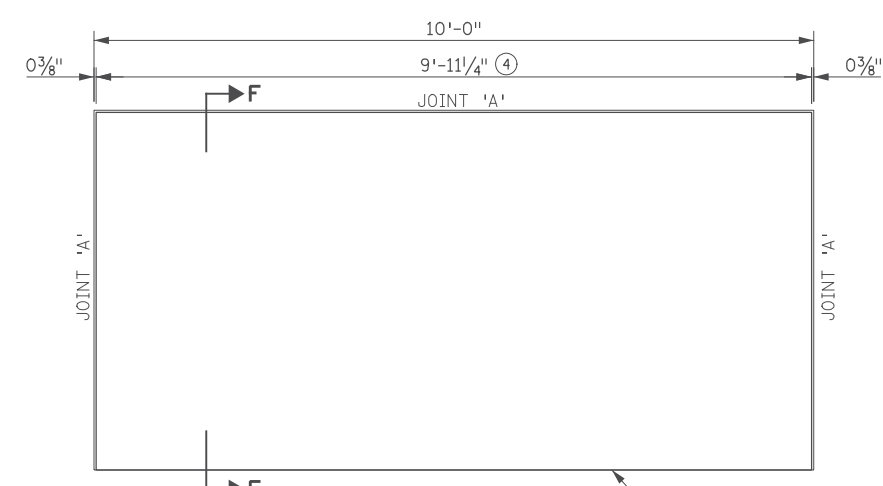
SECTION B-B



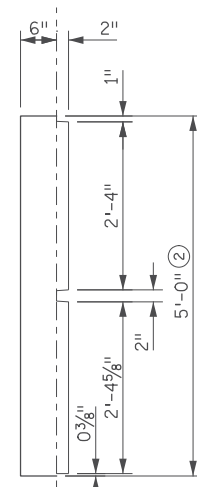
PANEL 'B'



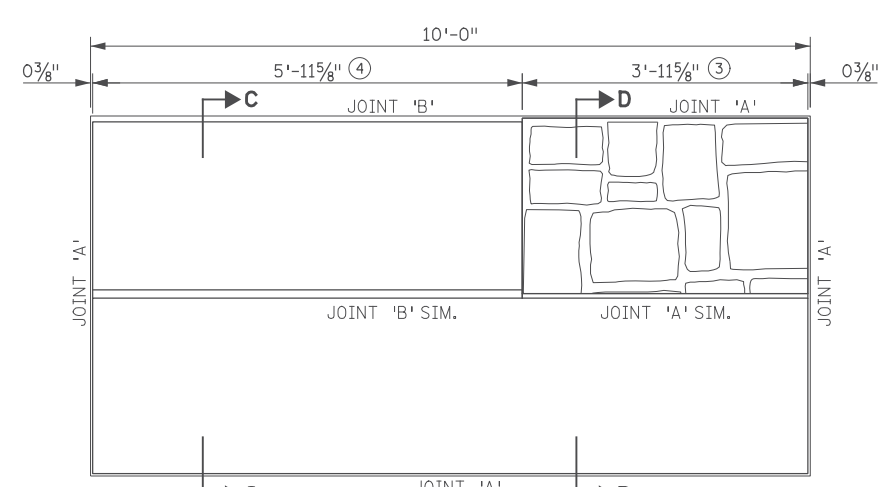
SECTION F-F



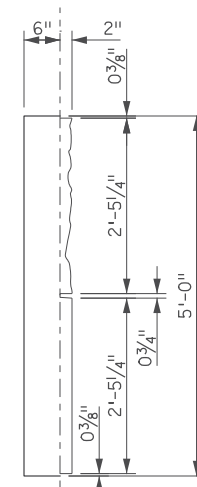
PANEL 'E'



SECTION C-C



PANEL 'C'



SECTION D-D

NOTES:

- ① PANEL HEIGHT CAN VARY AT TOP TO ACCOMMODATE PROFILE GRADE AND COPING. MINIMUM PANEL HEIGHT AT TOP PANEL IS 1'-6".
- ② PANEL HEIGHT VARIES TO MATCH STAGGERED JOINT PATTERN AND STEPS IN LEVELING PAD. MINIMUM PANEL HEIGHT SHALL BE 1'-6".
- ③ CUSTOM ROCK FORMLINER PATTERN #1214 MINNESOTA ASHLAR, ARCHITECTURAL SURFACE FINISH (SINGLE COLOR).
- ④ SMOOTH SURFACE SPECIAL SURFACE FINISH (SINGLE COLOR).

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				REVISION

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 Print Name: CASEY E. BLACK
Casey E. Black
 Date 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO. _____

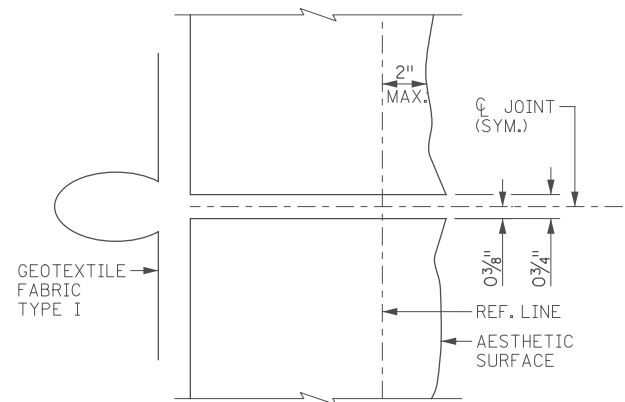
COMM. NO. 0169140

DRAWN BY
 E. JOHNSON
 DESIGNED BY
 S. NEFF
 CHECKED BY
 C. BLACK

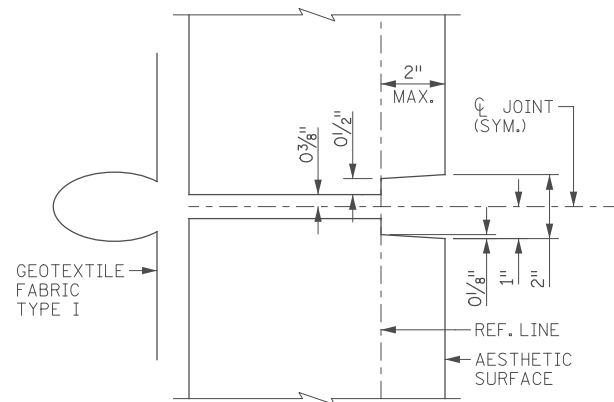
SRE ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 MSE WALL ARCHITECTURAL DETAILS (SHEET 2 OF 3)

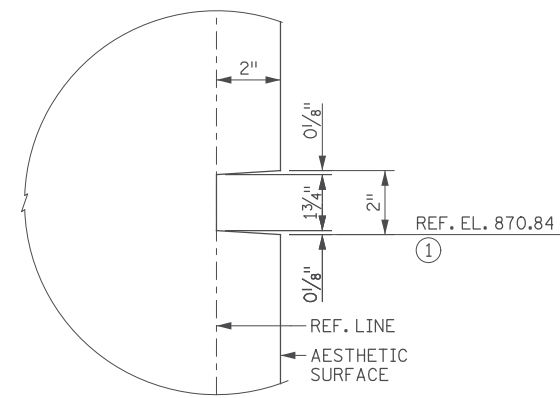
SHEET
W4
OF
W36



JOINT 'A' DETAIL



JOINT 'B' DETAIL



REVEAL DETAIL

NOTES:

① PROJECT WIDE AESTHETIC REFERENCE ELEVATION.

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Casey E. Black

Date: 11/01/2017 License # 49163

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SAP 002-678-023
SAP 114-020-051

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DESIGNED BY
S. NEFF

CHECKED BY
C. BLACK

COMM. NO. 0169140

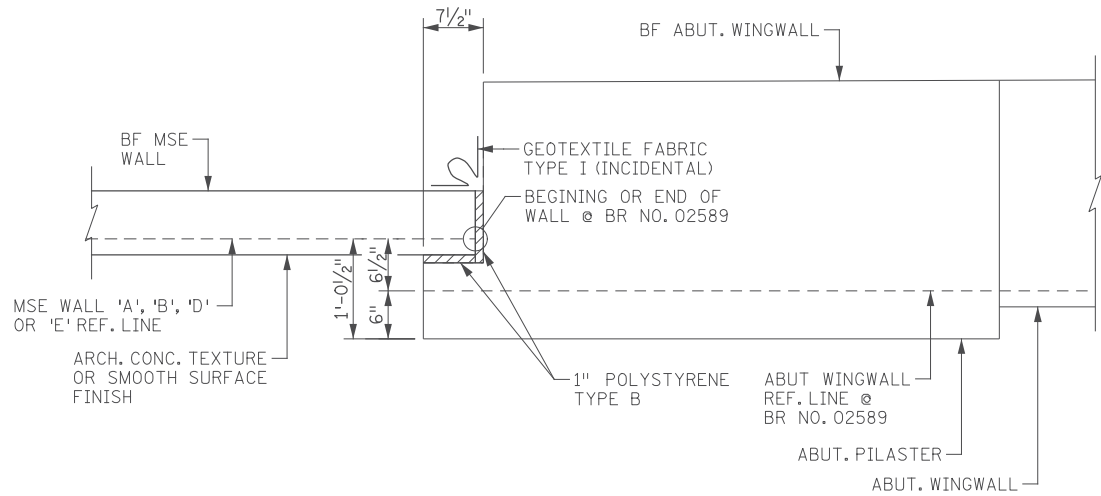
SRE ENGINEERS
PLANNERS
DESIGNERS

Consulting Group, Inc.

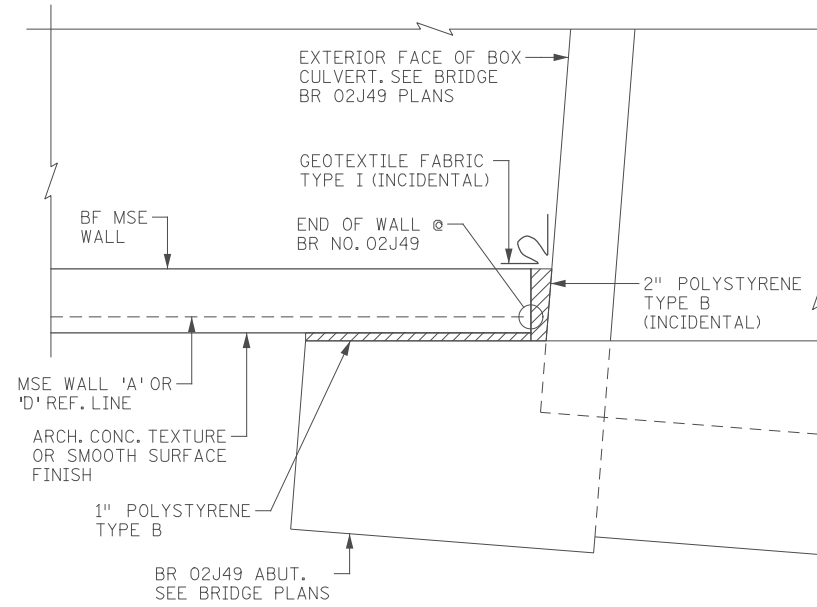
ANOKA COUNTY

MSE RETAINING WALL PLANS
CSAH 78 - BNSF GRADE SEPARATION
MSE WALL ARCHITECTURAL DETAILS (SHEET 3 OF 3)

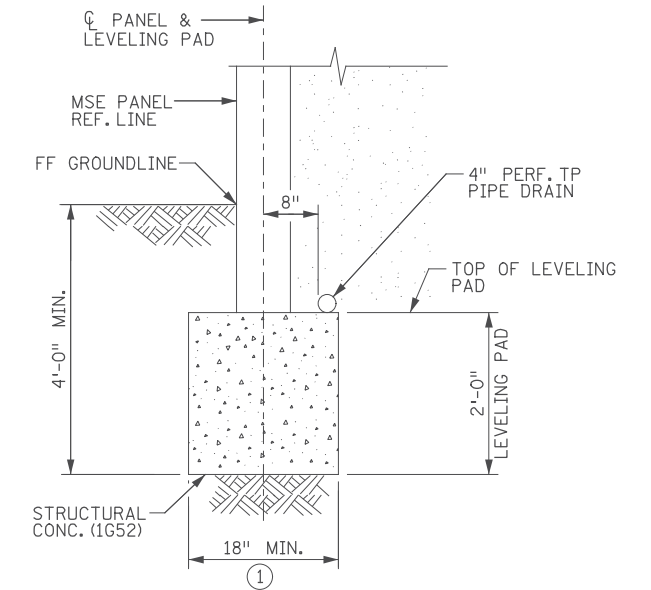
**SHEET
W5
OF
W36**



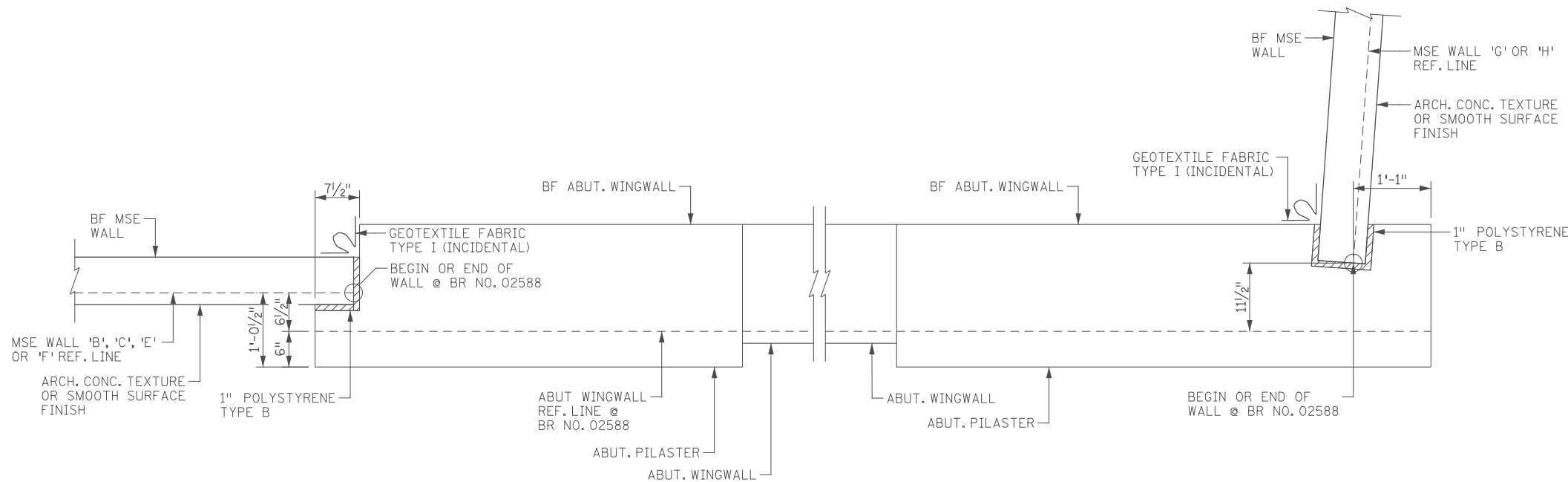
TYPICAL CORNER DETAIL
(SEE BRIGE NO. 02589 PLAN)



TYPICAL CORNER DETAIL
(SEE BRIGE NO. 02J49 PLAN)



CONCRETE LEVELING PAD



TYPICAL CORNER DETAIL
(SEE BRIGE NO. 02588 PLAN)

NOTES:

- ① THE LEVELING PAD WIDTH MAY NEED TO BE INCREASED TO ACCOMMODATE CURVED WALL SECTIONS.

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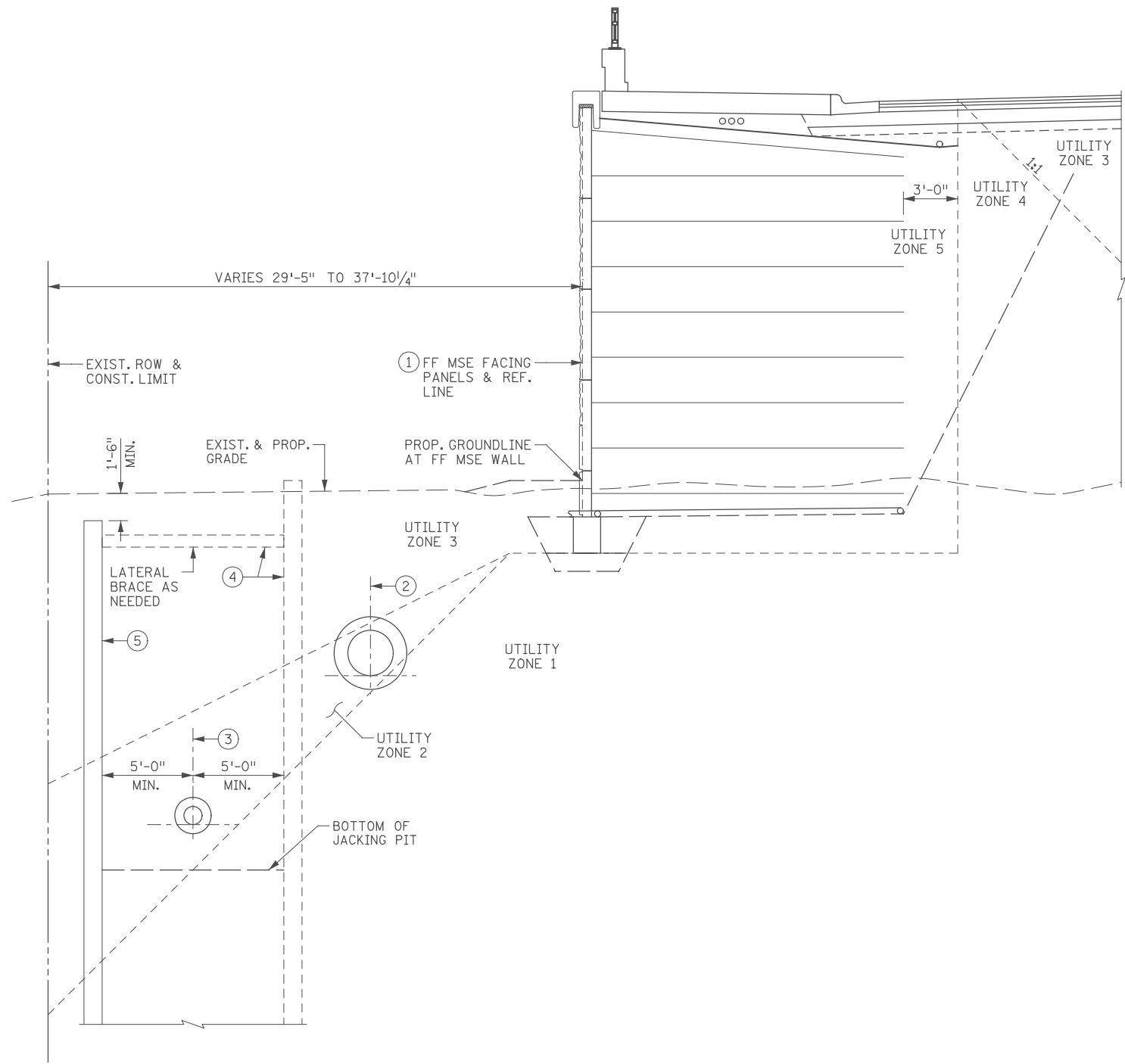
STATE AID PROJ. NO.'S
 SAP 002-678-023
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 BRIDGE NO. _____
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 S. NEFF
 CHECKED BY
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 COMM. NO. 0169140



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 PLANNERS
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ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 MSE WALL DETAILS (SHEET 1 OF 2)

SHEET
 W6
 OF
 W36



SECTION AT WALL A & WALL B

NOTES:

- ① FOR MSE WALL INFORMATION, SEE WALL A AND WALL B PLANS.
- ② ϕ CASED WATER MAIN. SEE WALL A AND WALL B PLANS AND PROPOSED SANITARY AND WATER MAIN PLANS FOR ADDITIONAL INFORMATION. IT IS ASSUMED THAT THIS UTILITY MAY BE INSTALLED PRIOR TO MSE RETAINING WALLS AND SANITARY SEWER BY WAY OF A TRENCH BOX OR BY OTHER MEANS. THE CONTRACTOR SHALL PROVIDE ADDITIONAL TEMPORARY VERTICAL SHORING FOR THE INSTALLATION IF DEEMED NECESSARY, AND SHALL BE CONSIDERED INCIDENTAL.
- ③ ϕ CASED SANITARY SEWER. SEE WALL A AND WALL B PLANS AND PROPOSED SANITARY AND WATER MAIN PLANS FOR ADDITIONAL INFORMATION. INSTALLATION SHALL BE BY MEANS OF SHORED EXCAVATION AND JACKING WHERE INDICATED.
- ④ TEMPORARY VERTICAL SHORING (CONTRACTOR DESIGN). SEE SPECIAL PROVISIONS FOR REQUIREMENTS. LATERAL BRACING SYSTEM SHALL BE INCLUDED IN BID ITEM. SEE ROADWAY PLANS AND PROPOSED SANITARY AND WATER MAIN PLANS FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL PROVIDE CALCULATIONS AND SHOP PLANS AT LEAST 6 WEEKS PRIOR TO INSTALLATION FOR REVIEW BY THE ENGINEER. FINAL CALCULATIONS AND SHOP PLANS SHALL BE CERTIFIED BY A REGISTERED ENGINEER IN THE STATE OF MINNESOTA.
- ⑤ STEEL SHEET PILE (PERMANENT). INSTALLATION SHALL PROVIDE FOR THE INSTALLATION OF THE SANITARY SEWER AND PROTECTION OF PRIVATE ADJACENT LANDS. THE SYSTEM SHALL REMAIN AS A PERMANENT INSTALLATION FOR FUTURE USE FOR POSSIBLE FUTURE MAINTENANCE ACCESS. SHEET PILE SHALL NOT BE LATERALLY SUPPORTED OUTSIDE OF THE EXISTING RIGHT-OF-WAY. LATERAL SUPPORT SHALL BE PROVIDED BY A TEMPORARY LATERAL BRACE AS SHOWN. PERMANENT SHEET PILE SHALL BE DESIGNED TO BE SUPPORTED BY A TEMPORARY LATERAL BRACE AT THE TIME OF INSTALLATION AND FOR FUTURE MAINTENANCE ACCESS. ALL HARDWARE NECESSARY FOR SUPPORT BY A TEMPORARY LATERAL BRACE SHALL BE INCIDENTAL. CONTRACTOR SHALL PROVIDE CALCULATIONS AND SHOP PLANS AT LEAST 6 WEEKS PRIOR TO INSTALLATION FOR REVIEW BY THE ENGINEER. FINAL CALCULATIONS AND SHOP PLANS SHALL BE CERTIFIED BY A REGISTERED ENGINEER IN THE STATE OF MINNESOTA. THE CONTRACTOR SHALL PROVIDE AN AS-BUILT PLAN DOCUMENTING THE START AND END OF INSTALLATION, DEPTH OF COVER TO TOP OF INSTALLATION AND OVERALL DEPTH OF INSTALLATION FOR FUTURE REFERENCE. SHOP PLANS SHALL BE PROVIDED TO THE ENGINEER AND OWNER

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1	11/01/2017				RELEASED FOR CONSTRUCTION
1	1/9/2018	SMN	CEB	CEB	ADDENDUM 2 - STAGING UPDATES FOR WINTER SUSPENSION
NO	DATE	BY	CKD	APPR	REVISION
...Ret Wall\9140_wdet02.dgn					

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Casey E. Black

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BRIDGE NO.

DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
 COMM. NO. 0169140



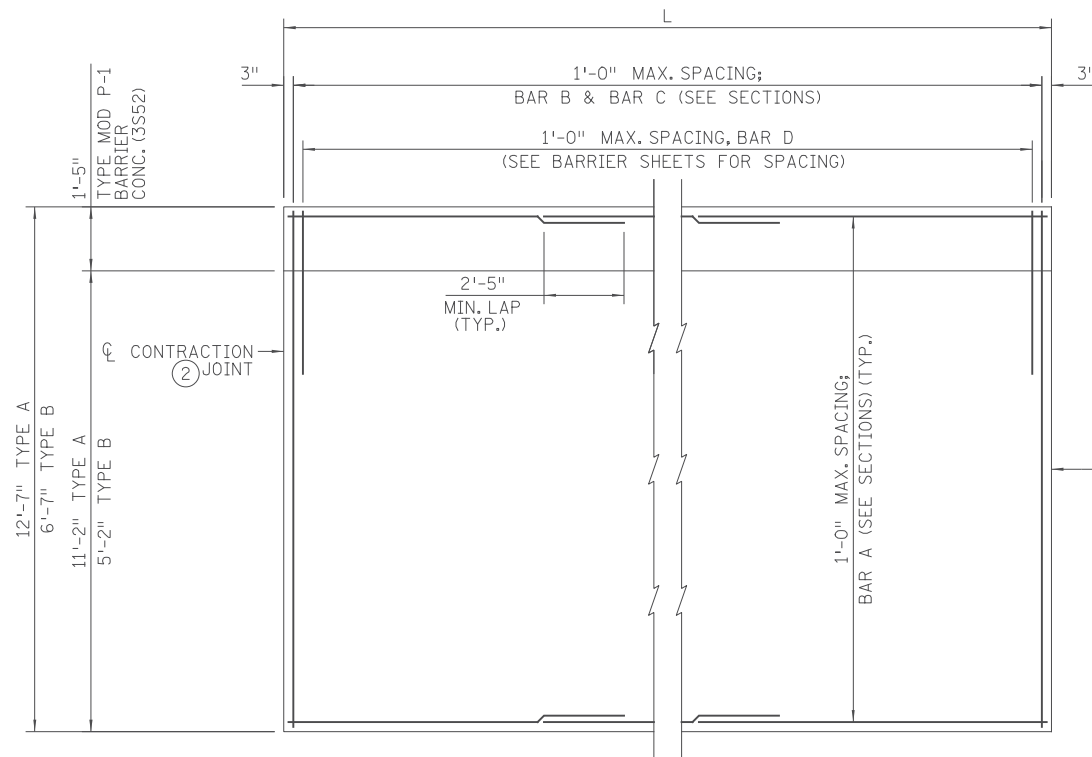
ANOKA COUNTY

MSE RETAINING WALL PLANS

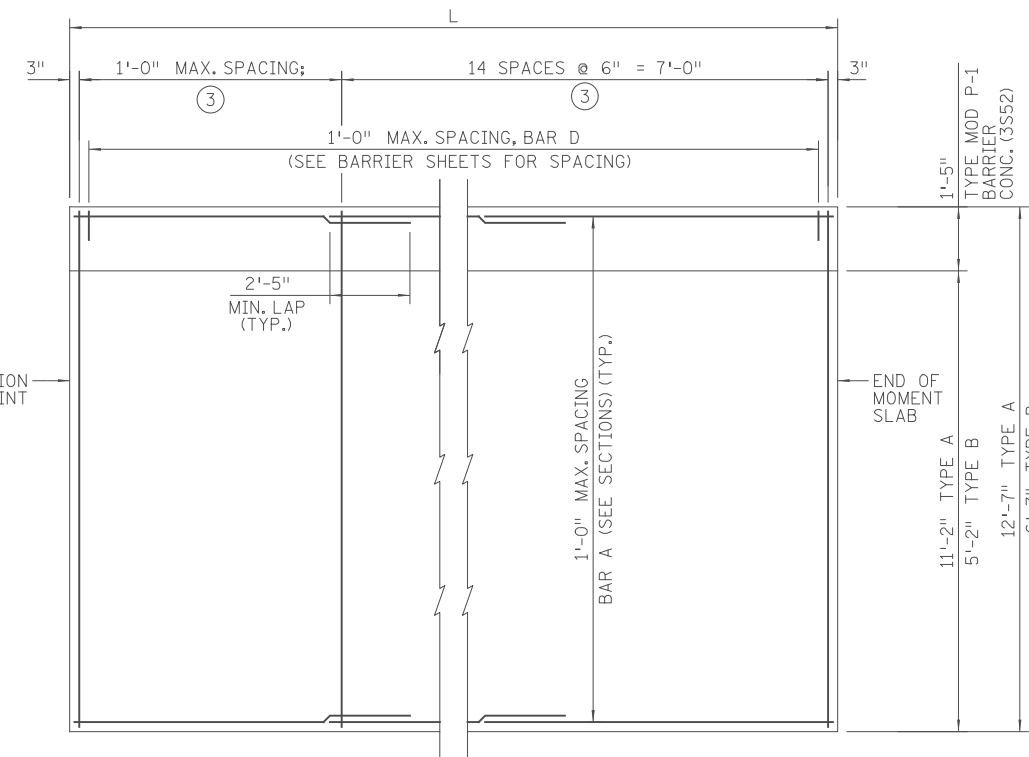
CSAH 78 - BNSF GRADE SEPARATION

MSE WALL DETAILS (SHEET 2 OF 2)

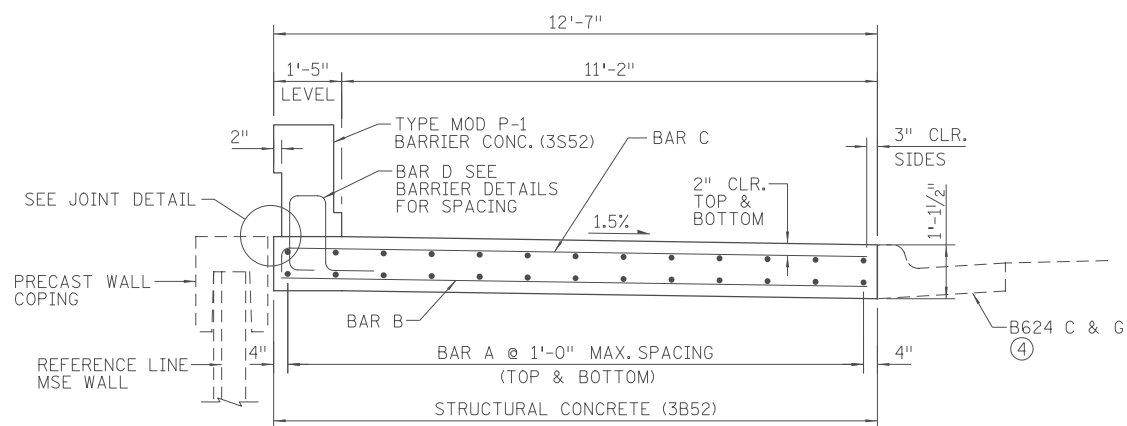
SHEET
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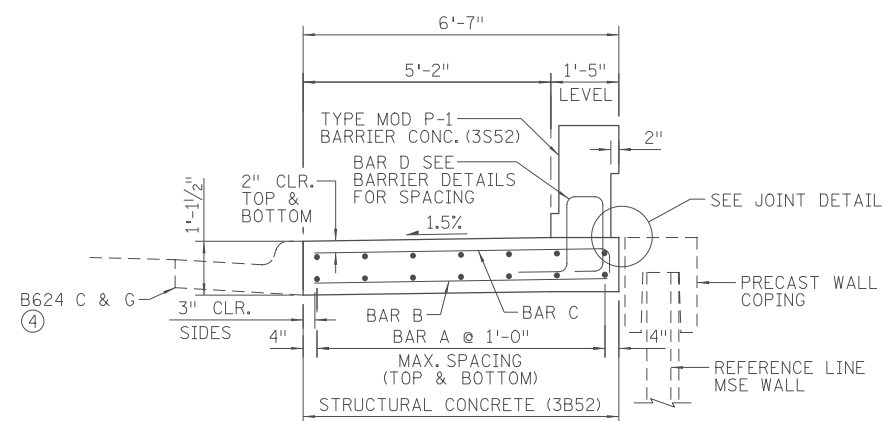
MOMENT SLAB TYPICAL PANEL PLAN



MOMENT SLAB END PANEL PLAN

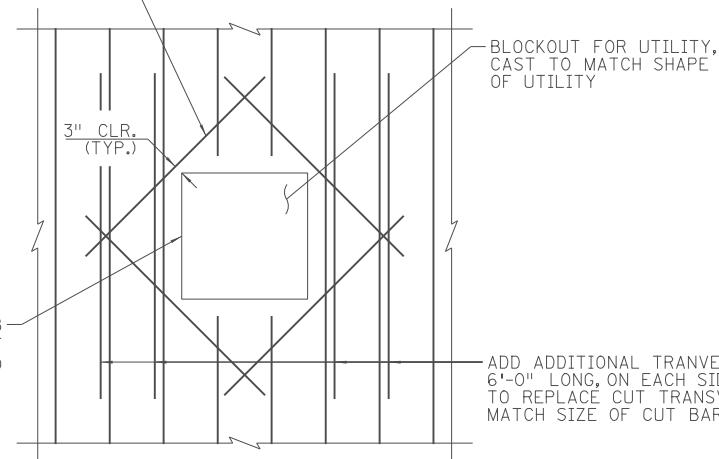


MOMENT SLAB TYPE A SECTION

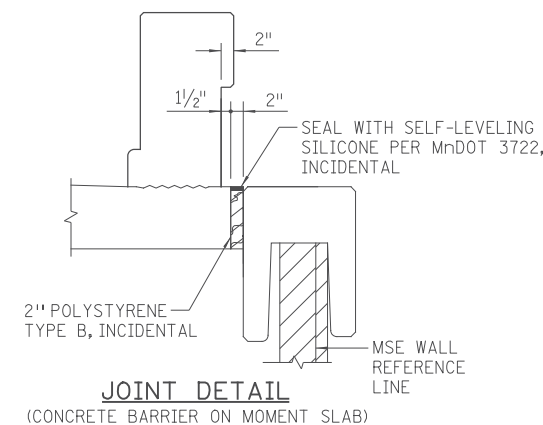


MOMENT SLAB TYPE B SECTION

#5 X 6' LONG REBAR TOP AND BOTTOM (INCIDENTAL)



UTILITY BLOCKOUT DETAIL



JOINT DETAIL
(CONCRETE BARRIER ON MOMENT SLAB)

NOTES:

1. SEE MnDOT SPEC. 2401.3.F.2.d FOR FINISHING REQUIREMENTS.
2. SEE MnDOT STANDARD PLATE 1103 FOR DETAILS. DOWEL BAR ASSEMBLIES ARE INCLUDED IN THE PAY ITEM FOR "STRUCTURAL CONCRETE (3B52)". PLACE CONTRACTION JOINTS IN MOMENT SLAB BETWEEN 35' MIN. AND 400' MAX.
3. BAR B & BAR C (SEE SECTIONS).
4. SEE ROADWAY PLANS.

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STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140

DRAWN BY
E. JOHNSON

DESIGNED BY
A. BEHNKE

CHECKED BY
C. BLACK

SRE ENGINEERS
PLANNERS
DESIGNERS

Consulting Group, Inc.

ANOKA COUNTY

MSE RETAINING WALL PLANS

CSAH 78 - BNSF GRADE SEPARATION

MOMENT SLAB DETAILS (SHEET 1 OF 2)

**SHEET
W8
OF
W36**

RETAINING WALL A					
MOMENT SLAB TYPE A SEGMENT #1 (L = 80' - 5 1/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	52	5	41 - 5	STR	LONG T & B
B	88	5	12 - 1	STR	TRANS BOTTOM
C	88	5	12 - 11	BENT	TRANS TOP
D	86	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE A SEGMENT #2 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	52	5	58 - 9	STR	LONG T & B
B	116	5	12 - 1	STR	TRANS BOTTOM
C	116	5	12 - 11	BENT	TRANS TOP
D	120	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE A SEGMENT #3 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	52	5	58 - 9	STR	LONG T & B
B	116	5	12 - 1	STR	TRANS BOTTOM
C	116	5	12 - 11	BENT	TRANS TOP
D	120	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE A SEGMENT #4 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	52	5	58 - 9	STR	LONG T & B
B	116	5	12 - 1	STR	TRANS BOTTOM
C	116	5	12 - 11	BENT	TRANS TOP
D	120	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE A SEGMENT #5 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	52	5	58 - 9	STR	LONG T & B
B	116	5	12 - 1	STR	TRANS BOTTOM
C	116	5	12 - 11	BENT	TRANS TOP
D	120	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE A SEGMENT #6 (L = 82' - 9 3/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	52	5	47 - 8	STR	LONG T & B
B	101	5	12 - 1	STR	TRANS BOTTOM
C	101	5	12 - 11	BENT	TRANS TOP
D	99	5	5 - 10	BENT	BARRIER DOWEL

RETAINING WALL B					
MOMENT SLAB TYPE A SEGMENT #1 (L = 118' - 2 3/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	78	5	41 - 2	STR	LONG T & B
B	126	5	12 - 1	STR	TRANS BOTTOM
C	126	5	12 - 11	BENT	TRANS TOP
D	124	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE A SEGMENT #2 (L = 104' - 8 7/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	52	5	53 - 8	STR	LONG T & B
B	113	5	12 - 1	STR	TRANS BOTTOM
C	113	5	12 - 11	BENT	TRANS TOP
D	110	5	5 - 10	BENT	BARRIER DOWEL

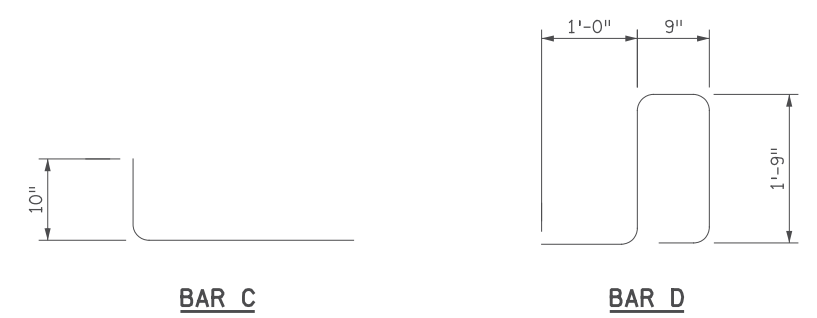
RETAINING WALL C					
MOMENT SLAB TYPE A SEGMENT #1 (L = 110' - 2 1/4")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	52	5	56 - 5	STR	LONG T & B
B	118	5	12 - 1	STR	TRANS BOTTOM
C	118	5	12 - 11	BENT	TRANS TOP
D	116	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE A SEGMENT #2 (L = 112' - 0 1/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	52	5	57 - 3	STR	LONG T & B
B	120	5	12 - 1	STR	TRANS BOTTOM
C	120	5	12 - 11	BENT	TRANS TOP
D	118	5	5 - 10	BENT	BARRIER DOWEL

RETAINING WALL D					
MOMENT SLAB TYPE B SEGMENT #1 (L = 96' - 9 1/4")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	28	5	49 - 8	STR	LONG T & B
B	105	5	6 - 1	STR	TRANS BOTTOM
C	105	5	6 - 11	BENT	TRANS TOP
D	103	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE B SEGMENT #2 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	28	5	58 - 9	STR	LONG T & B
B	116	5	6 - 1	STR	TRANS BOTTOM
C	116	5	6 - 11	BENT	TRANS TOP
D	120	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE B SEGMENT #3 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	28	5	58 - 9	STR	LONG T & B
B	116	5	6 - 1	STR	TRANS BOTTOM
C	116	5	6 - 11	BENT	TRANS TOP
D	120	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE B SEGMENT #4 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	28	5	58 - 9	STR	LONG T & B
B	116	5	6 - 1	STR	TRANS BOTTOM
C	116	5	6 - 11	BENT	TRANS TOP
D	120	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE B SEGMENT #5 (L = 108' - 10 3/4")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	28	5	55 - 8	STR	LONG T & B
B	117	5	6 - 1	STR	TRANS BOTTOM
C	117	5	6 - 11	BENT	TRANS TOP
D	115	5	5 - 10	BENT	BARRIER DOWEL

RETAINING WALL E					
MOMENT SLAB TYPE B SEGMENT #1 (L = 81' - 8 5/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	28	5	42 - 2	STR	LONG T & B
B	90	5	6 - 1	STR	TRANS BOTTOM
C	90	5	6 - 11	BENT	TRANS TOP
D	87	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE B SEGMENT #2 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	28	5	58 - 9	STR	LONG T & B
B	116	5	6 - 1	STR	TRANS BOTTOM
C	116	5	6 - 11	BENT	TRANS TOP
D	120	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE B SEGMENT #3 (L = 68' - 2 7/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	28	5	35 - 5	STR	LONG T & B
B	76	5	6 - 1	STR	TRANS BOTTOM
C	76	5	6 - 11	BENT	TRANS TOP
D	74	5	5 - 10	BENT	BARRIER DOWEL

RETAINING WALL F					
MOMENT SLAB TYPE B SEGMENT #1 (L = 116' - 7 7/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	28	5	59 - 8	STR	LONG T & B
B	125	5	6 - 1	STR	TRANS BOTTOM
C	125	5	6 - 11	BENT	TRANS TOP
D	122	5	5 - 10	BENT	BARRIER DOWEL
MOMENT SLAB TYPE B SEGMENT #2 (L = 117' - 11 7/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
A	42	5	41 - 0	STR	LONG T & B
B	126	5	6 - 1	STR	TRANS BOTTOM
C	126	5	6 - 11	BENT	TRANS TOP
D	124	5	5 - 10	BENT	BARRIER DOWEL

BAR SHAPES:



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 Date: 11/01/2017 License #: 49163

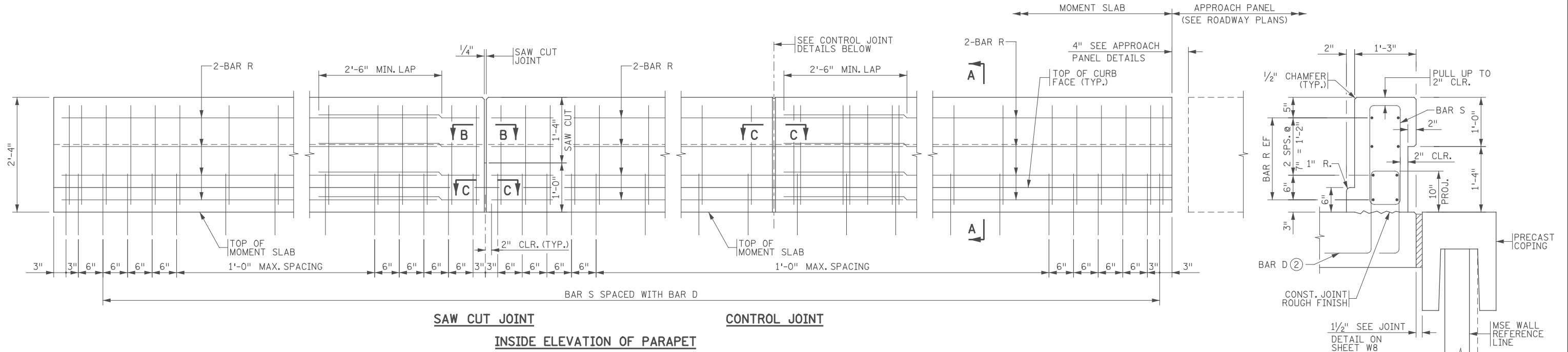
STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO. _____
 COMM. NO. 0169140

DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK

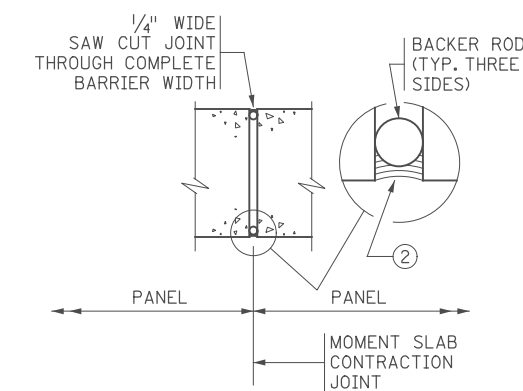
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ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 MOMENT SLAB DETAILS (SHEET 2 OF 2)

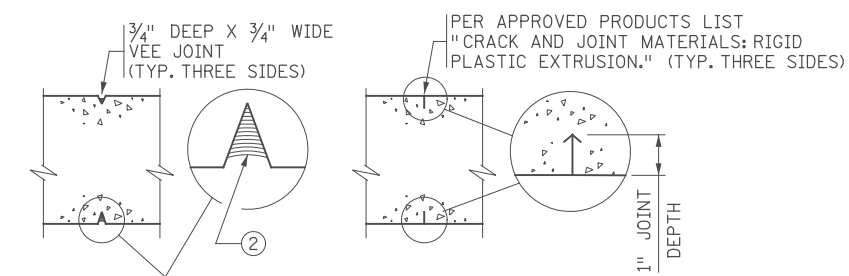
SHEET
 W9
 OF
 W36



SAW CUT JOINT **CONTROL JOINT**
INSIDE ELEVATION OF PARAPET



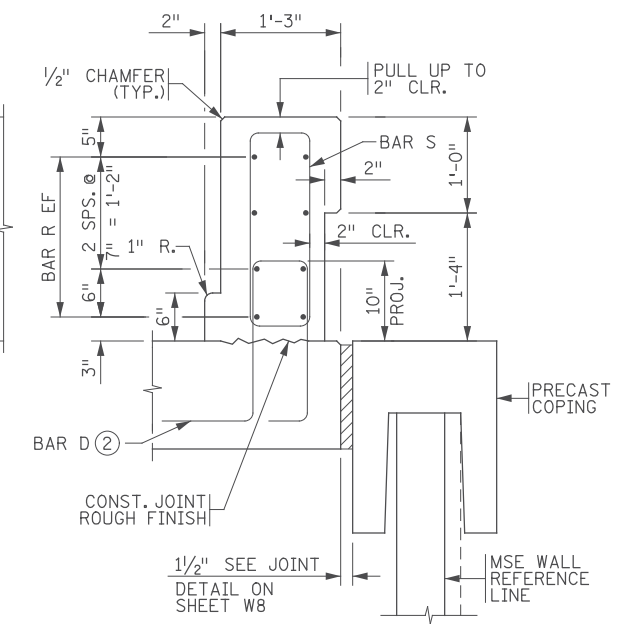
SECTION B-B



SECTION C-C **SECTION C-C**
CAST-IN-PLACE CONSTRUCTION **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.



SECTION A-A

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 BETWEEN THE OUTSIDE FACES OF THE CONCRETE PARAPET.
- CONCRETE PARAPET = 416 LBS./FT. (0.103 CU. YDS./FT.)
- FINISH ALL EDGES OF PARAPET WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
- MAXIMUM SPACING OF CONTROL JOINTS ON MOMENT SLAB SHALL BE 10 FT.
- BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR WALLS.
- SEE CONDUIT SYSTEM LIGHTING SHEETS FOR LIGHT BLISTER DETAILS.
- MATCH PARAPET SAW CUT JOINT WITH MOMENT SLAB CONTRACTION JOINTS.
- ① JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
- ② BAR D SPACING AND CLEARANCES ARE SHOWN ON THIS SHEET. BAR D QUANTITIES ARE INCLUDED IN THE MOMENT SLAB REINFORCEMENT.

MODIFIED
FIG. 5-397.166

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Casey E. Black
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COMM. NO. 0169140

SRE ENGINEERS
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 DESIGNERS

Consulting Group, Inc.

ANOKA COUNTY
 MSE RETAINING WALL PLANS
CSAH 78 - BNSF GRADE SEPARATION
 TYPE MOD P-1 CONC BARRIER DETAILS (SHEET 1 OF 2)

SHEET
W10
OF
W36

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RETAINING WALL A					
MOMENT SLAB SEGMENT #1 (L = 80' - 5 1/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	28 - 6	STR	PARAPET - HORIZ
S	86	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #2 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	40 - 0	STR	PARAPET - HORIZ
S	120	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #3 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	40 - 0	STR	PARAPET - HORIZ
S	120	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #4 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	40 - 0	STR	PARAPET - HORIZ
S	120	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #5 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	40 - 0	STR	PARAPET - HORIZ
S	120	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #6 (L = 82' - 9 3/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	32 - 8	STR	PARAPET - HORIZ
S	99	5	6 - 5	BENT	PARAPET - VERT

RETAINING WALL C					
MOMENT SLAB SEGMENT #1 (L = 110' - 2 1/4")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	38 - 5	STR	PARAPET - HORIZ
S	116	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #2 (L = 112' - 0 1/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	39 - 2	STR	PARAPET - HORIZ
S	118	5	6 - 5	BENT	PARAPET - VERT

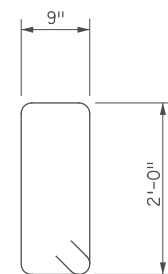
RETAINING WALL E					
MOMENT SLAB SEGMENT #1 (L = 81' - 8 5/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	28 - 11	STR	PARAPET - HORIZ
S	87	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #2 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	40 - 0	STR	PARAPET - HORIZ
S	120	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #3 (L = 68' - 2 7/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	16	4	35 - 5	STR	PARAPET - HORIZ
S	74	5	6 - 5	BENT	PARAPET - VERT

RETAINING WALL D					
MOMENT SLAB SEGMENT #1 (L = 96' - 9 1/4")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	34 - 0	STR	PARAPET - HORIZ
S	103	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #2 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	40 - 0	STR	PARAPET - HORIZ
S	120	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #3 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	40 - 0	STR	PARAPET - HORIZ
S	120	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #4 (L = 115' - 0")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	40 - 0	STR	PARAPET - HORIZ
S	120	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #5 (L = 108' - 10 3/4")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	38 - 0	STR	PARAPET - HORIZ
S	115	5	6 - 5	BENT	PARAPET - VERT

RETAINING WALL F					
MOMENT SLAB SEGMENT #1 (L = 116' - 7 7/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	32	4	31 - 1	STR	PARAPET - HORIZ
S	122	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #2 (L = 117' - 11 7/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	32	4	31 - 6	STR	PARAPET - HORIZ
S	124	5	6 - 5	BENT	PARAPET - VERT

RETAINING WALL B					
MOMENT SLAB SEGMENT #1 (L = 118' - 2 3/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	32	4	31 - 6	STR	PARAPET - HORIZ
S	124	5	6 - 5	BENT	PARAPET - VERT
MOMENT SLAB SEGMENT #2 (L = 104' - 8 7/8")					
BAR	NO	SIZE	LENGTH [FT-IN]	SHAPE	LOCATION
R	24	4	36 - 8	STR	PARAPET - HORIZ
S	110	5	6 - 5	BENT	PARAPET - VERT

BAR SHAPES:



BAR S

FIG. 5-397.166 MOD

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Casey E. Black

Date: 11/01/2017 License # 49163

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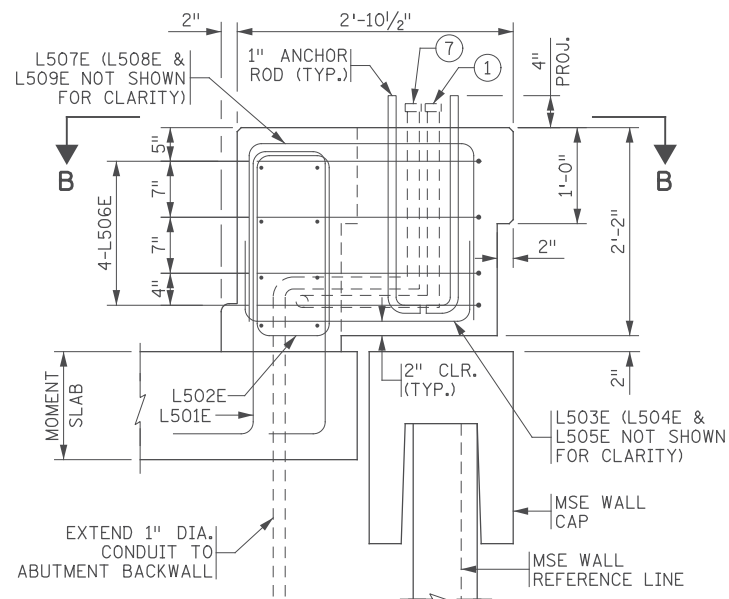
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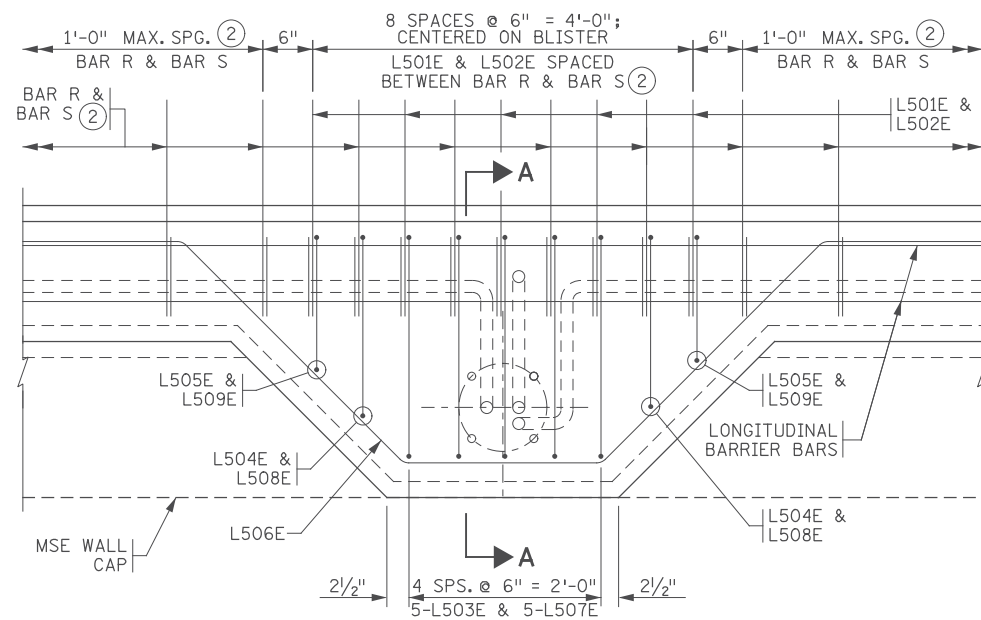

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CSAH 78 - BNSF GRADE SEPARATION
 TYPE MOD P-1 CONC BARRIER DETAILS (SHEET 2 OF 2)

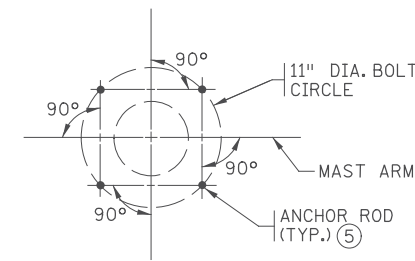
**SHEET
W11
OF
W36**



SECTION A-A
(THRU MOMENT SLAB)



PLAN



ANCHOR ROD PLACEMENT

BILL OF REINFORCEMENT FOR BARRIER AT ONE LIGHT POLE (8)

MARK	NO	LENGTH [FT-IN]	SHAPE	LOCATION
L501E	5	8 - 6		PARAPET DOWEL
L502E	5	6 - 5		PARAPET VERTICAL
L503E	5	3 - 11		VERTICAL TIE
L504E	2	3 - 6		VERTICAL TIE
L505E	2	3 - 0		VERTICAL TIE
L506E	4	12 - 9		LONGITUDINAL TIE
L507E	5	5 - 11		VERTICAL TIE
L508E	2	5 - 6		VERTICAL TIE
L509E	2	5 - 0		VERTICAL TIE

TOTAL REINFORCEMENT PER LIGHT POLE LOCATION IS 218 LBS.

GENERAL NOTES

PROVIDE HEAVY HEX NUTS, PER SPEC. 3391.2.A FOR 1" DIA. THREADED RODS. TAP NUTS 1/6" OVERSIZED PRIOR TO GALVANIZING, AND RETAP TO STANDARD SIZE AFTER GALVANIZING.

USE A BRUSH TO APPLY ANTI-SIEZE COMPOUND PER MIL-PRF-907E TO THE THREADS OF ANCHOR RODS.

GALVANIZE THREADED RODS AND NUTS AFTER FABRICATION PER SPEC. 3392.

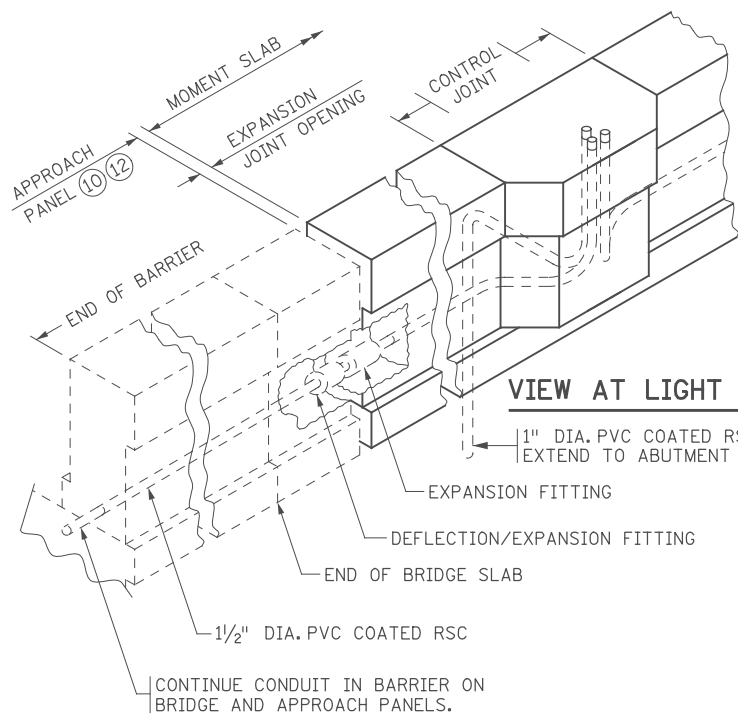
A RIGID TEMPLATE SHALL BE PROVIDED FOR ANCHOR ROD AND CONDUIT PLACEMENT AND SHALL BE LEFT IN PLACE UNTIL THE CONCRETE HAS SET. ANCHOR RODS TO BE PLACED AT RIGHT ANGLES TO THE DIRECTION OF THE MAST ARM.

BOND AND GROUND THE CONDUIT SYSTEM (LIGHTING) IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF SPEC. 2545.3.R.

ADDITIONAL BARRIER CONCRETE REQUIRED TO CONSTRUCT THE LIGHT POLE ANCHORAGE IS INCIDENTAL TO THE CONCRETE BARRIER PAY ITEM.

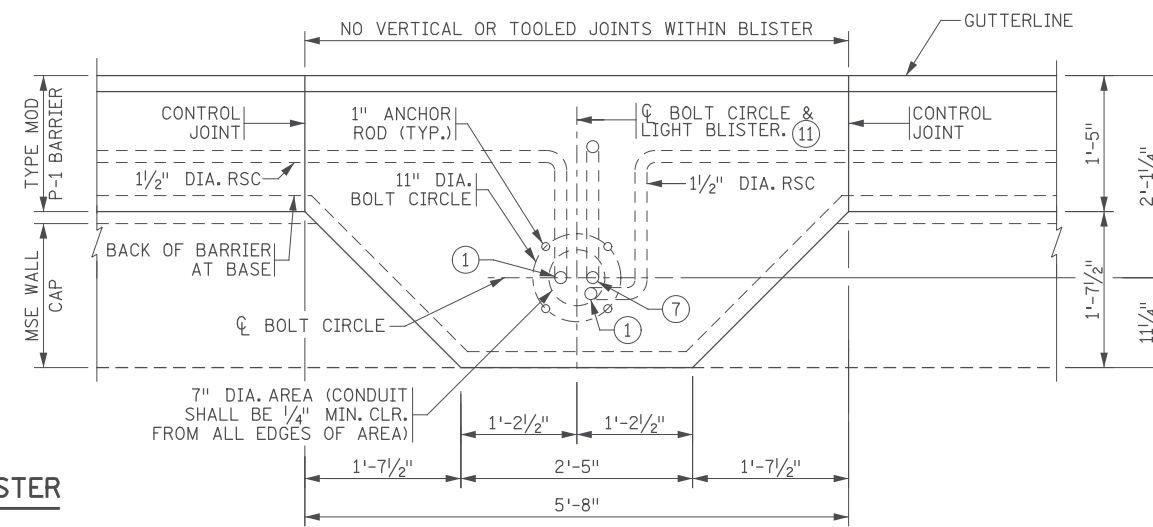
ANCHOR RODS AND RIGID TEMPLATE ARE INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (LIGHTING)".

- ① EXTEND THE 1/2" DIA. PVC COATED RIGID STEEL CONDUIT 3" ABOVE THE BARRIER AND INSTALL CAP.
- ② SEE CONCRETE BARRIER SHEETS FOR TYPICAL BARRIER REINFORCEMENT. WEIGHT OF REINFORCEMENT IS INCLUDED IN PRICE BID FOR "REINFORCEMENT BARS (EPOXY COATED)."
- ~~③ WRAP PER SPEC. 2565.3.D.7.~~
- ~~④ PROVIDE COMBINATION DEFLECTION/EXPANSION FITTING PER SPEC. 3030.~~
- ⑤ PROVIDE 1" NOMINAL DIA. ANCHOR RODS WITH 1-8UNC-2A THREADS. USE TYPE B INTERMEDIATE STRENGTH ANCHOR RODS PER ASTM F1554 GR.55 PER SPEC. 3385.2.B. (4 REQUIRED).
- ⑥ WRAP THE THREADS OF THE TOP 4" OF EACH ANCHOR ROD WITH THREE LAYERS OF PLASTIC ELECTRICAL TAPE TO AVOID CONTAMINATION BY CONCRETE DURING PLACEMENT.
- ⑦ EXTEND THE 1" DIA. PVC COATED RIGID STEEL CONDUIT 3" ABOVE THE BARRIER AND INSTALL CAP.
- ⑧ BARS SHOWN ARE FOR ONE LIGHT BLISTER.
- ⑨ PROVIDE AN EXPANSION FITTING AT BARRIER CONTRACTION JOINTS.
- ⑩ SEE BRIDGE PLANS.
- ⑪ SEE ELECTRICAL PLANS.
- ⑫ SEE ROADWAY PLANS.

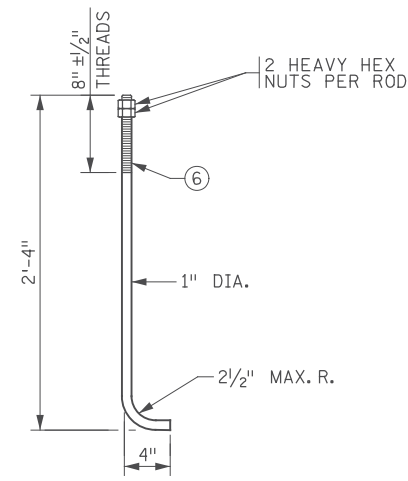


VIEW AT LIGHT BLISTER

VIEW AT END OF MOMENT SLAB



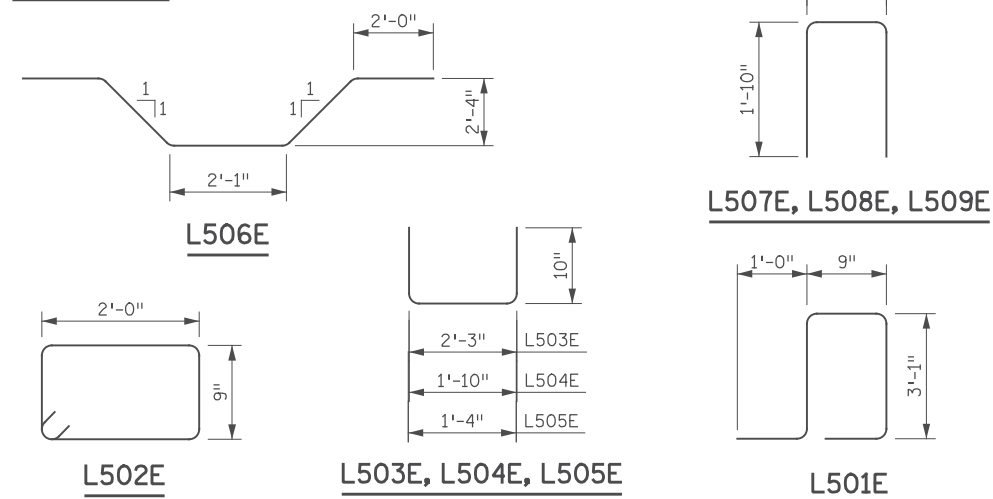
SECTION B-B



ANCHOR ROD DETAIL

4 REQUIRED (5)

BAR SHAPES:



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FIG. 5-397.406(B)

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Date 11/01/2017 License # 49163

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SAP 114-020-051

BRIDGE NO.

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J. HOFFMAN
DESIGNED BY
DESIGNED-3
CHECKED BY
C. BLACK

COMM. NO. 0169140



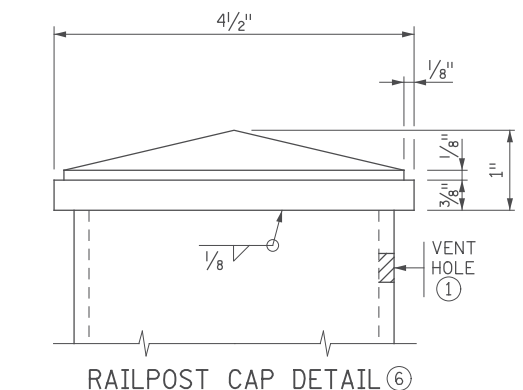
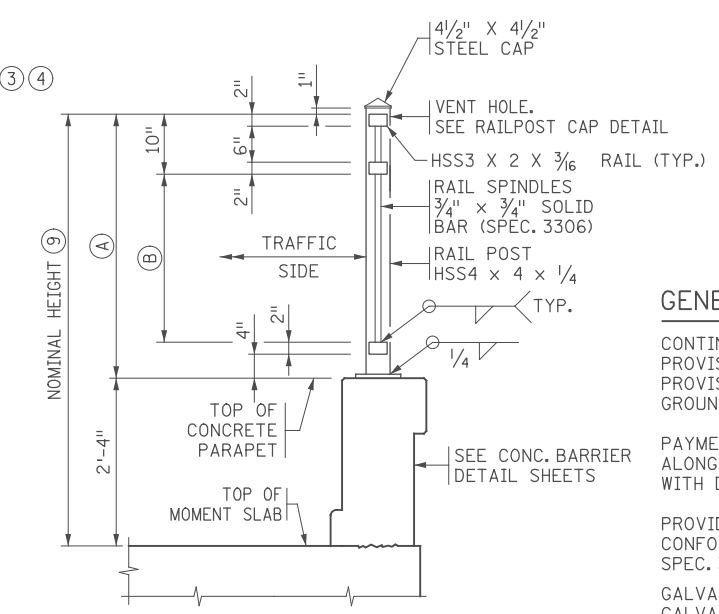
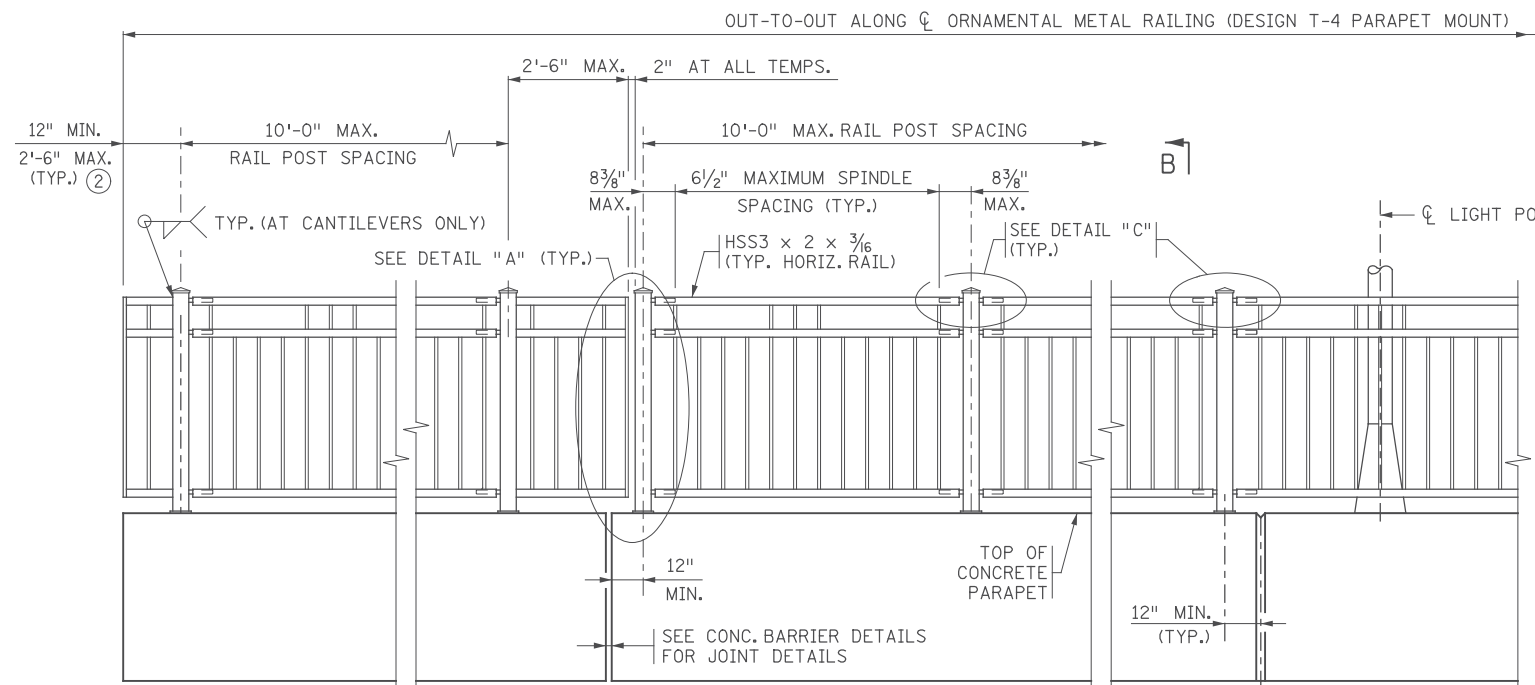
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CSAH 78 - BNSF GRADE SEPARATION
CONDUIT SYSTEM (LIGHTING)

SHEET
W12
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W36

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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. ALL OTHER STEEL SHALL CONFORM TO SPEC. 3306.

GALVANIZE BOLTS, NUTS, WASHERS AND ANCHORS PER SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL PER SPEC. 3394, AFTER FABRICATION.

COAT THE GALVANIZED RAILING, BASE PLATES, AND PROTRUDING PORTIONS OF BOLTS, NUTS, ANCHORS, AND WASHERS.

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.

1 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.

2 PLACE CL OF END POST 12" FROM END OF CONCRETE PARAPET IF GUARDRAIL CONNECTION PLATE IS PRESENT.

3 LIGHT POLE IS MOUNTED ON BLISTER, RAILING SHALL BE CONTINUOUS IN FRONT OF LIGHT POLE (SEE PARAPET & LIGHT POLE DETAILS).

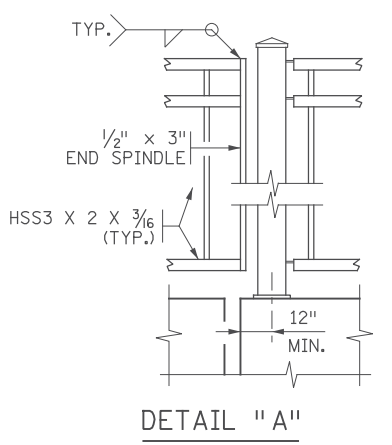
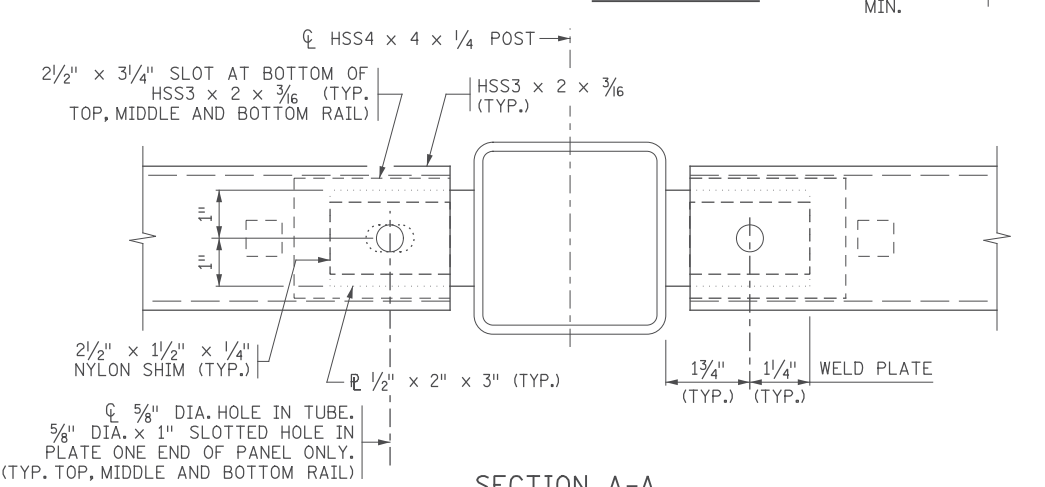
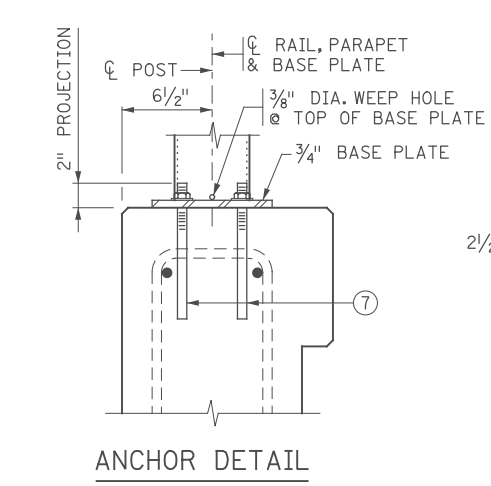
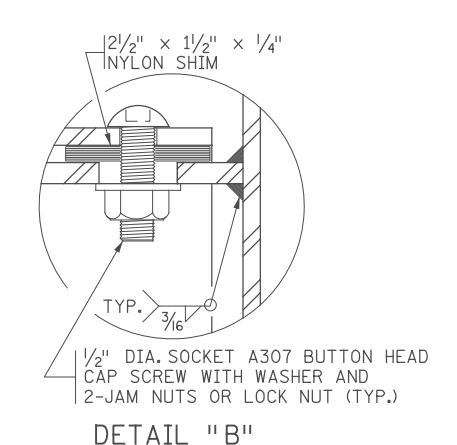
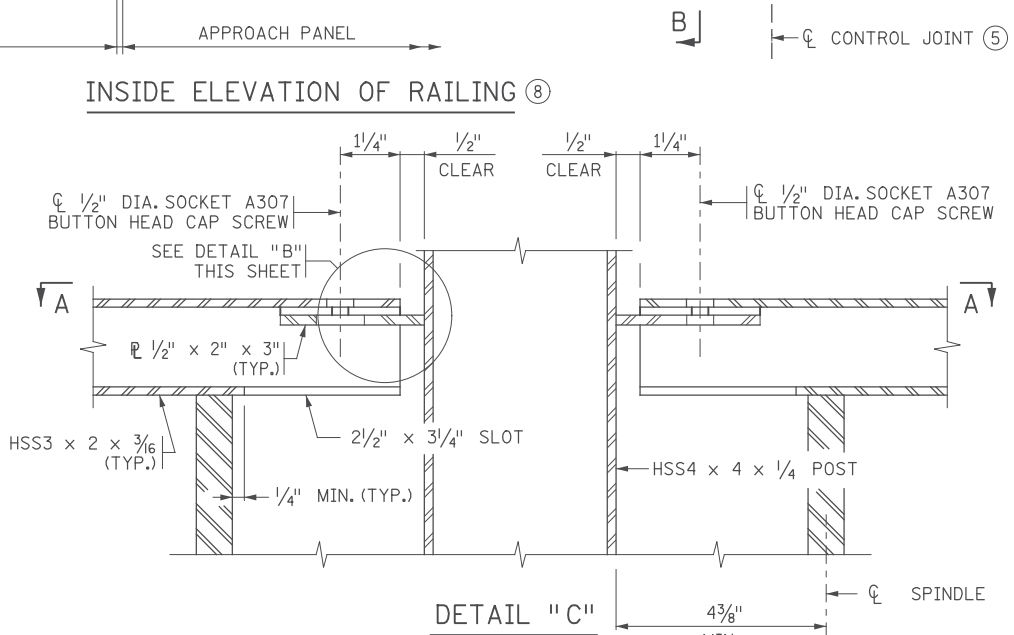
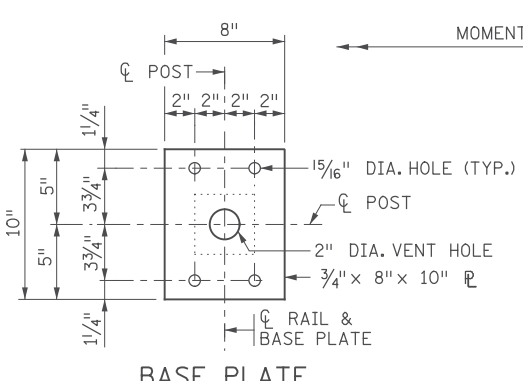
4 CONTRACTOR TO COORDINATE LIGHT POLE DETAILS WITH THE RAILING FABRICATOR TO ENSURE PROPER CLEARANCES AND RAILING CONFIGURATION ADJACENT TO THE POLE.

5 SEE CONCRETE BARRIER DETAIL SHEETS FOR CONTROL JOINT SPACING AND DETAILS. CONTRACTOR TO COORDINATE CONTROL JOINTS AS NOT TO CONFLICT WITH RAILING ANCHORAGE LOCATIONS.

6 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.

7 ADHESIVE ANCHORAGE WITH 5/8" DIA. ANCHOR ROD PER 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 5" 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 6.9 KIPS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.

8 SEE ORNAMENTAL METAL RAILING DETAILS SHEET 2 OF 4 THRU SHEET 4 OF 4 FOR RAILING LAYOUT.



9 RAILING HEIGHT TABLE

NOMINAL HEIGHT	(A)	(B)
4'-6"	2'-2"	10"
6'-0"	3'-8"	2'-4"
8'-0"	5'-8"	4'-4"

9 ORNAMENTAL METAL RAILING MINIMAL HEIGHT SHALL BE 4'-6", EXCEPT AS SHOWN IN THE INSIDE ELEVATION OF RAIL END DETAIL A AND B ON SHEET W15.

REVISION: 05-25-2016
 APPROVED: NOVEMBER 6, 2013
 Nancy Douberberger
 STATE BRIDGE ENGINEER

NO	DATE	BY	CKD	APPR	REVISION
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 Print Name: CASEY E. BLACK
 Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140

DRAWN BY E. JOHNSON
 DESIGNED BY A. BEHNKE
 CHECKED BY C. BLACK

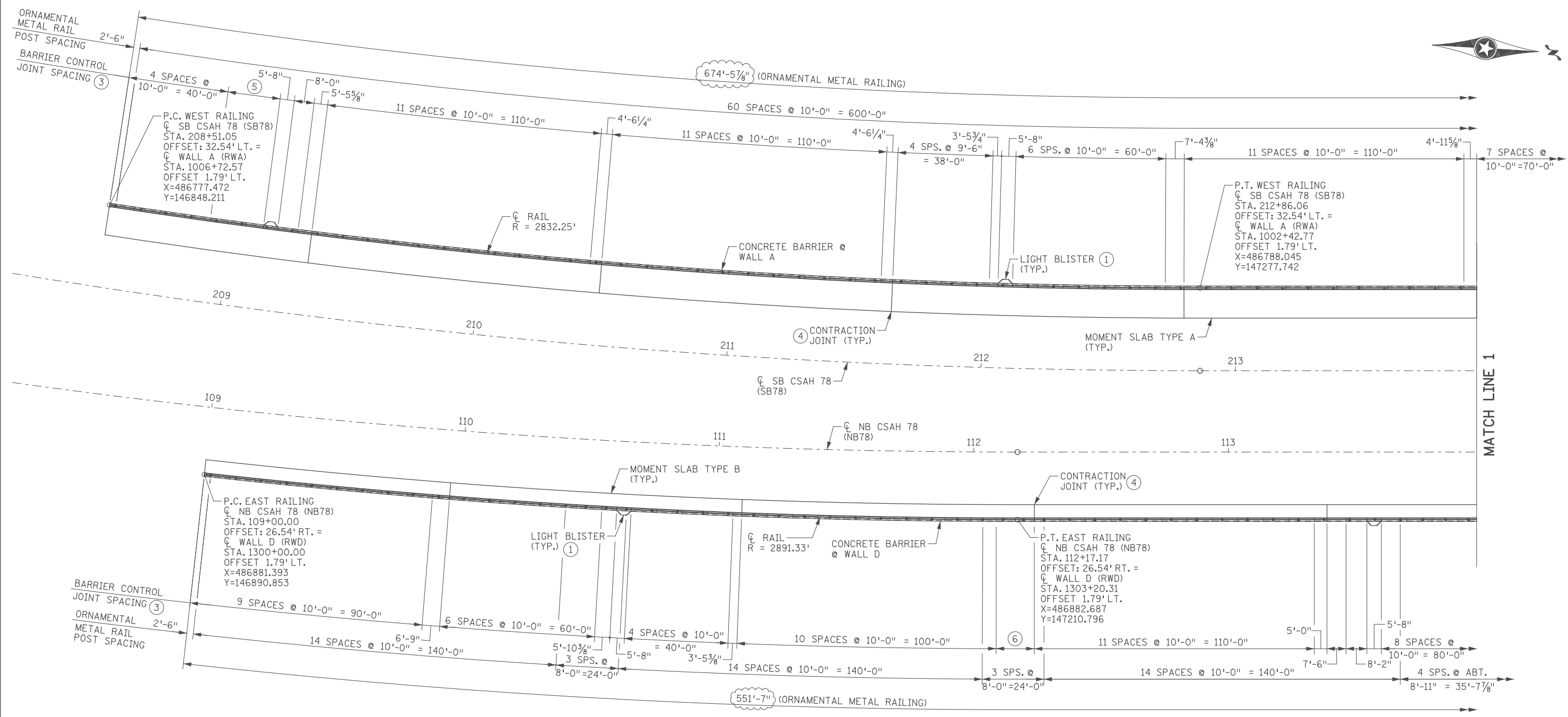
SRE ENGINEERS PLANNERS DESIGNERS
 Consulting Group, Inc.

ORNAMENTAL METAL RAILING (DESIGN T-4 PARAPET MOUNT) **MODIFIED**

ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 ORNAMENTAL METAL RAILING DETAILS (SHEET 1 OF 4)

SHEET W13 OF W36

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PARTIAL METAL RAILING LAYOUT

NOTES:

- (1) SEE ELECTRICAL PLANS FOR LOCATIONS.
- (2) LENGTH OF RAILING AND RAIL POST SPACING IS MEASURED ALONG THE CENTERLINE OF RAIL.
- (3) CONTROL JOINT SPACING IS MEASURED ALONG THE CENTERLINE OF RAIL.
- (4) SEE WALL PLAN & PROFILE SHEETS FOR MOMENT SLAB CONTRACTION JOINT LOCATIONS. MATCH PARAPET SAW CUT JOINTS WITH MOMENT SLAB CONTRACTION JOINTS.
- (5) 3 SPACES @ 7'-0 1/4" = 21'-0 3/4".
- (6) 2 SPACES @ ABT. 7'-5 7/8" = 14'-11 5/8".

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PLANNERS
DESIGNERS

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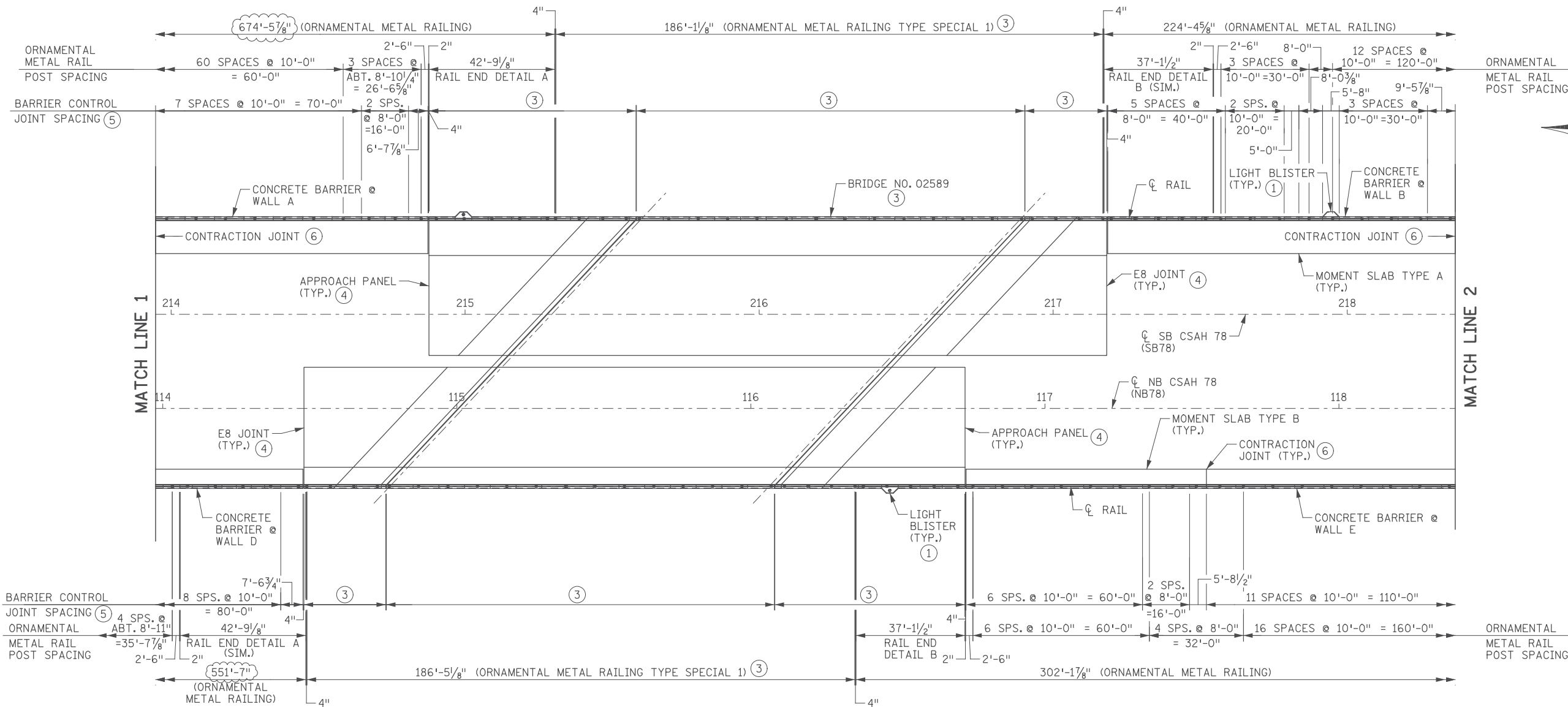
ANOKA COUNTY

MSE RETAINING WALL PLANS

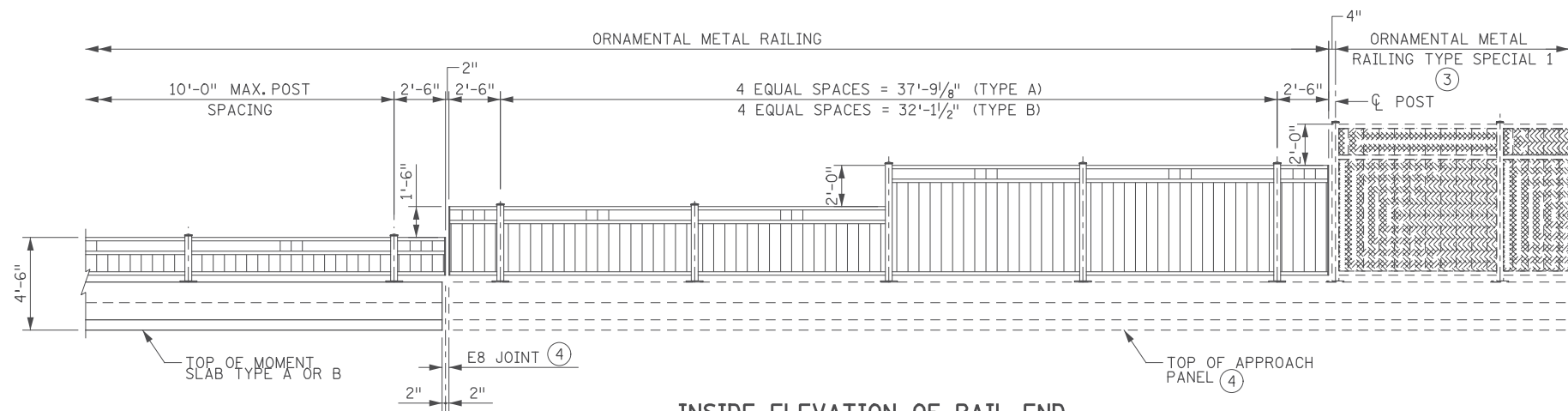
CSAH 78 - BNSF GRADE SEPARATION

ORNAMENTAL METAL RAILING DETAILS (SHEET 2 OF 4)

SHEET W14 OF W36



PARTIAL METAL RAILING LAYOUT



INSIDE ELEVATION OF RAIL END
(DETAIL A & B)

NOTES:

- ① SEE ELECTRICAL PLANS FOR LOCATIONS.
- 2. LENGTH OF RAILING AND RAIL POST SPACING IS MEASURED ALONG THE CENTERLINE OF RAIL.
- ③ SEE BRIDGE PLANS.
- ④ SEE ROADWAY PLANS.
- ⑤ CONTROL JOINT SPACING IS MEASURED ALONG THE CENTERLINE OF RAIL.
- ⑥ SEE WALL PLAN & PROFILE SHEETS FOR MOMENT SLAB CONTRACTION JOINT LOCATIONS. MATCH PARAPET SAW CUT JOINTS WITH MOMENT SLAB CONTRACTION JOINTS.

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BRIDGE NO. _____

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DESIGNERS

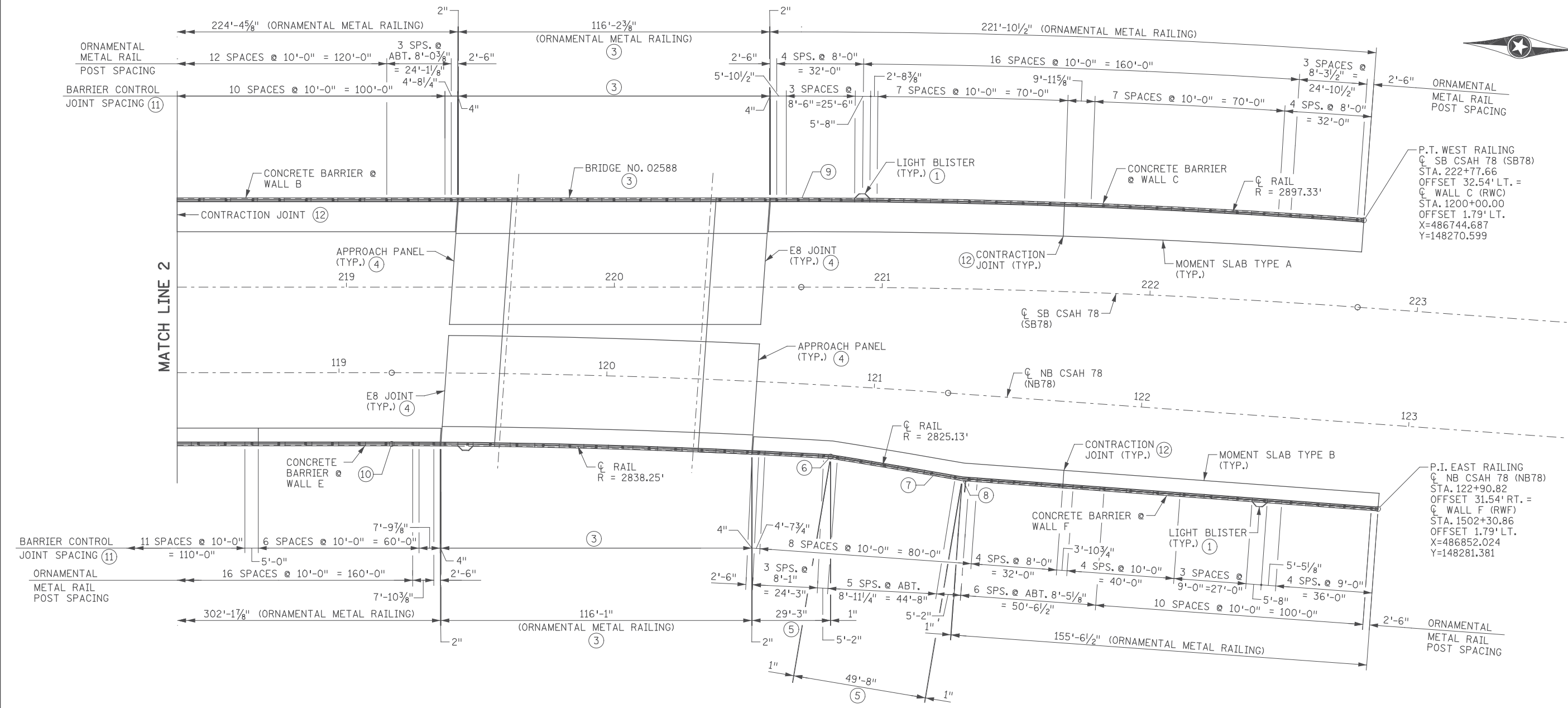
ANOKA COUNTY

MSE RETAINING WALL PLANS

CSAH 78 - BNSF GRADE SEPARATION

ORNAMENTAL METAL RAILING DETAILS (SHEET 3 OF 4)

SHEET
W15
OF
W36



PARTIAL METAL RAILING LAYOUT

NOTES:

- ① SEE ELECTRICAL PLANS FOR LOCATIONS.
- 2. LENGTH OF RAILING AND RAIL POST SPACING IS MEASURED ALONG THE CENTERLINE OF RAIL.
- ③ SEE BRIDGE PLANS.
- ④ SEE ROADWAY PLANS.
- ⑤ ORNAMENTAL METAL RAILING.
- ⑥ P.T./P.C. EAST RAILING
 C NB CSAH 78 (NB78)
 STA. 120+85.19
 OFFSET 26.54' RT. =
 C WALL F (RWF)
 STA. 1500+25.34
 OFFSET 1.79' LT.
 X=486842.975
 Y=148076.291
- ⑦ P.T. EAST RAILING
 C NB CSAH 78 (NB78)
 STA. 121+24.78
 OFFSET 30.50' RT. =
 C WALL F (RWF)
 STA. 1500+64.62
 OFFSET 1.79' LT.
 X=486847.457
 Y=148115.429
- ⑧ P.I. EAST RAILING
 C NB CSAH 78 (NB78)
 STA. 121+35.20
 OFFSET 31.54' RT. =
 C WALL F (RWF)
 STA. 1500+75.24
 OFFSET 1.79' LT.
 X=486848.717
 Y=148125.793
- ⑨ P.C. WEST RAILING
 C SB CSAH 78 (SB78)
 STA. 220+69.79
 OFFSET 32.54' LT. =
 C WALL C (RWC)
 STA. 1202+10.36
 OFFSET 1.79' LT.
 X=486747.847
 Y=148060.436
- ⑩ P.C. EAST RAILING
 C NB CSAH 78 (NB78)
 STA. 119+19.72
 OFFSET 26.54' RT. =
 C WALL E (RWE)
 STA. 1402+82.33
 OFFSET 1.79' LT.
 X=486846.652
 Y=147912.418
- ⑪ CONTROL JOINT SPACING IS MEASURED ALONG THE CENTERLINE OF RAIL.
- ⑫ SEE WALL PLAN & PROFILE SHEETS FOR MOMENT SLAB CONTRACTION JOINT LOCATIONS. MATCH PARAPET SAWCUT JOINTS WITH MOMENT SLAB CONTRACTION JOINTS.

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				REVISION

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Casey E. Black

Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140

DRAWN BY
E. JOHNSON

DESIGNED BY
A. BEHNKE

CHECKED BY
C. BLACK

SRF ENGINEERS
PLANNERS
DESIGNERS

Consulting Group, Inc.

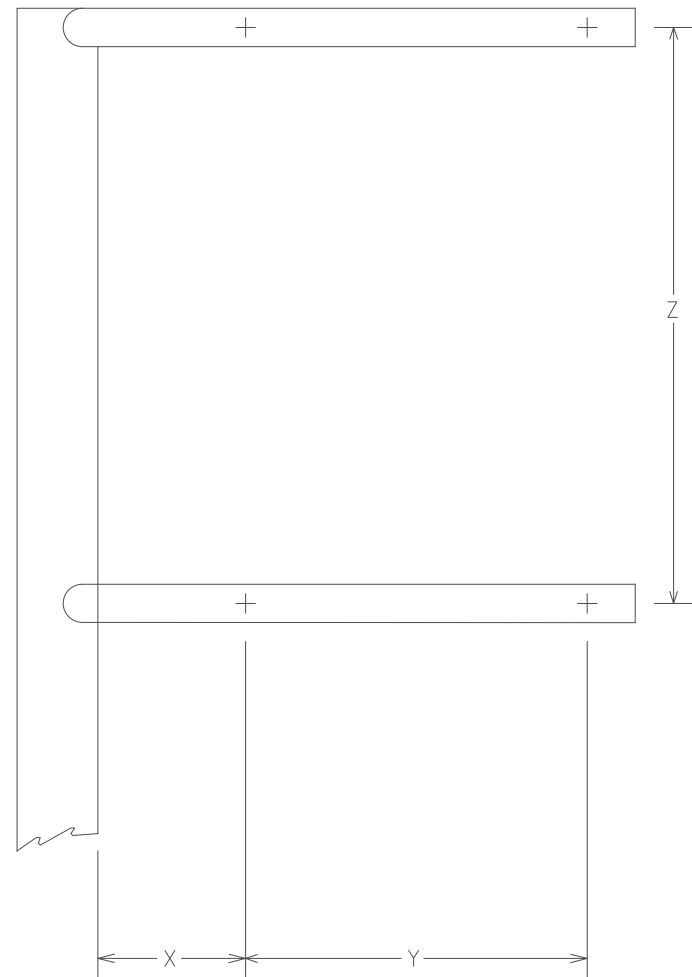
ANOKA COUNTY

MSE RETAINING WALL PLANS

CSAH 78 - BNSF GRADE SEPARATION

ORNAMENTAL METAL RAILING DETAILS (SHEET 4 OF 4)

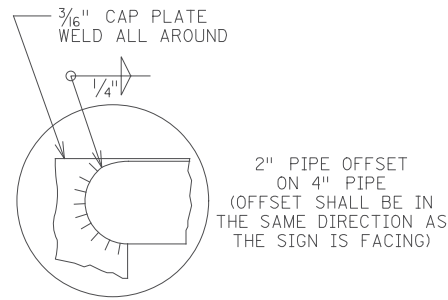
SHEET
W16
OF
W36



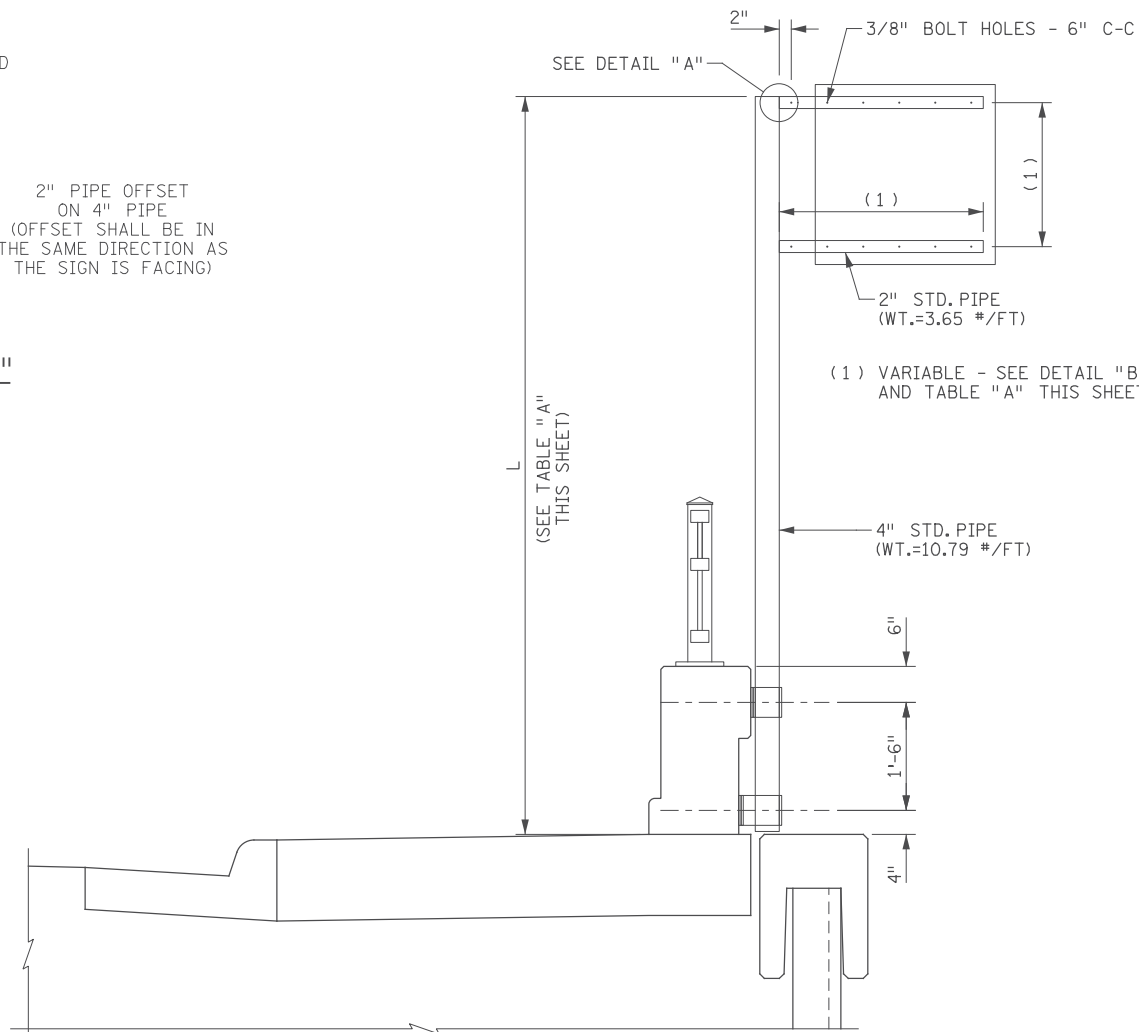
DETAIL "B"

SIGN NO.	X (IN.)	Y (IN.)	Z (IN.)	L (FT.)
R3-7R	8	24	24	10.25

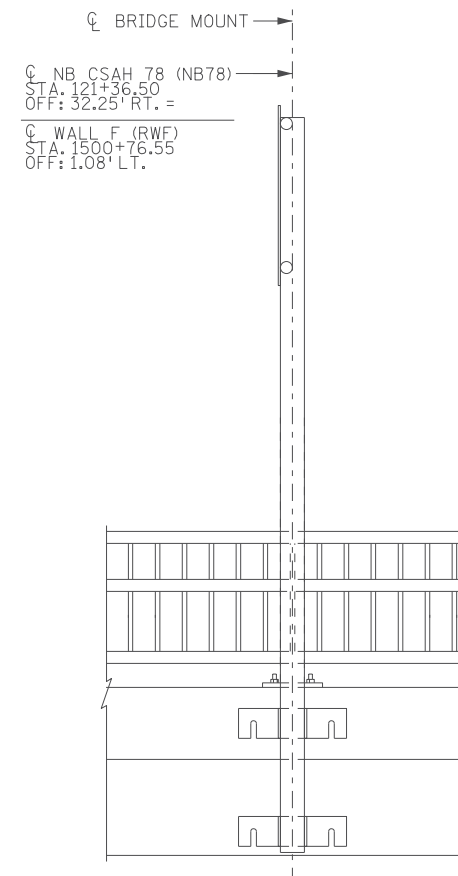
TABLE "A"



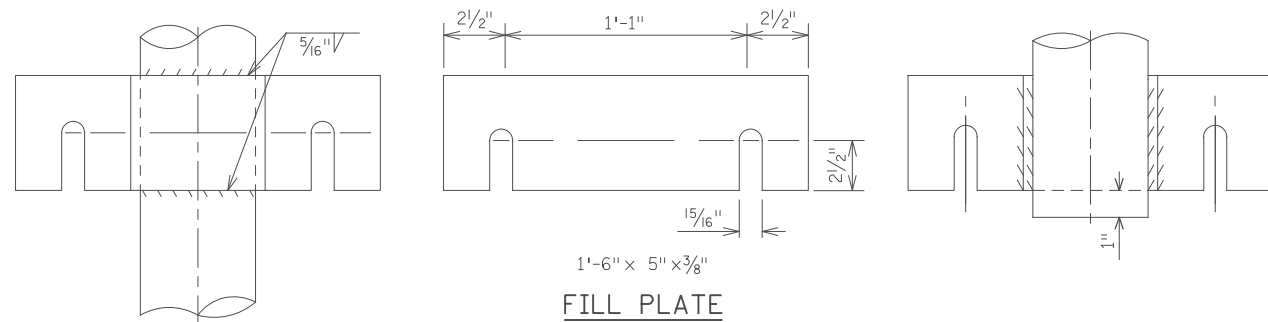
DETAIL "A"



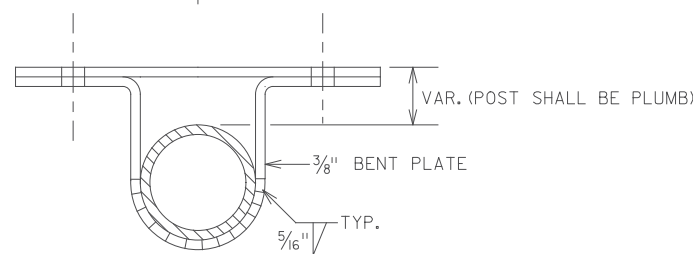
ELEVATION



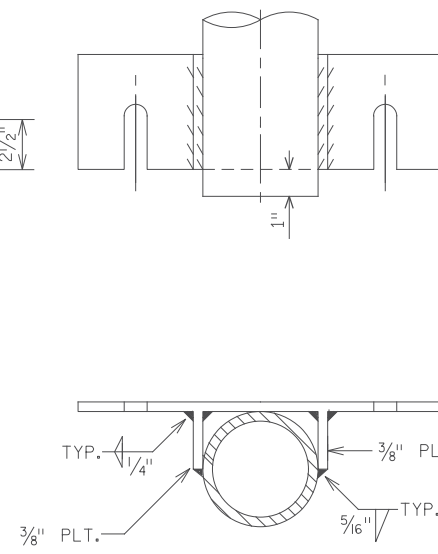
END VIEW



FILL PLATE



LOWER CONNECTION



UPPER CONNECTION

NOTES:

1. ALL PIPE MATERIAL SHALL CONFORM TO ASTM DESIGNATION A53, GRADE B, SCHEDULE 40.
2. ALL STEEL FOR STRUCTURAL ITEMS SHALL CONFORM TO MnDOT 3306 (STRUCTURAL STEEL) UNLESS OTHERWISE NOTED.
3. FOR NOTES AND DETAILS NOT SHOWN, SEE TYPE C AND D SIGN DETAILS AND TABULATIONS.
4. ADHESIVE ANCHORAGE WITH 5/8" DIA. ANCHOR ROD PER 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 6" 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 12 KIPS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
5. GALVANIZE BOLTS, NUTS, WASHERS AND ANCHORS PER SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL PER SPEC. 3394 AFTER FABRICATION.
6. PAYMENT FOR FURNISHING AND INSTALLING PIPES, TUBES, PLATES, BOLTS, NUTS, WASHERS AND ANCHORS SHALL BE INCLUDED IN PRICE BID FOR ITEM 2564.602 "SIGN TYPE C (BRIDGE MOUNTED)".
7. SEE SIGNING PLANS FOR SIGN PANEL DETAILS AND REQUIREMENTS.

BRIDGE MOUNTED SIGN DETAILS

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: CASEY E. BLACK
 Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.

DRAWN BY J. HOFFMAN
 DESIGNED BY A. BEHNKE
 CHECKED BY C. BLACK
 COMM. NO. 0169140

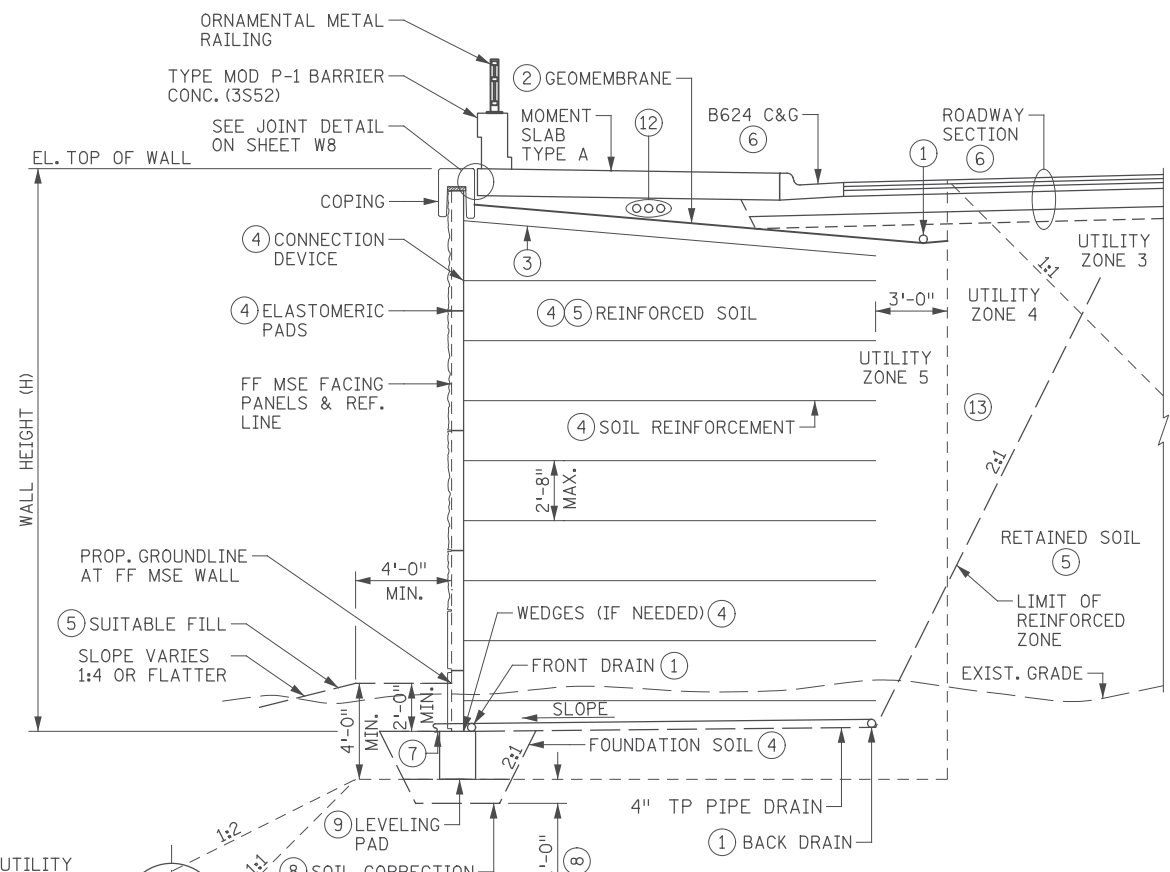


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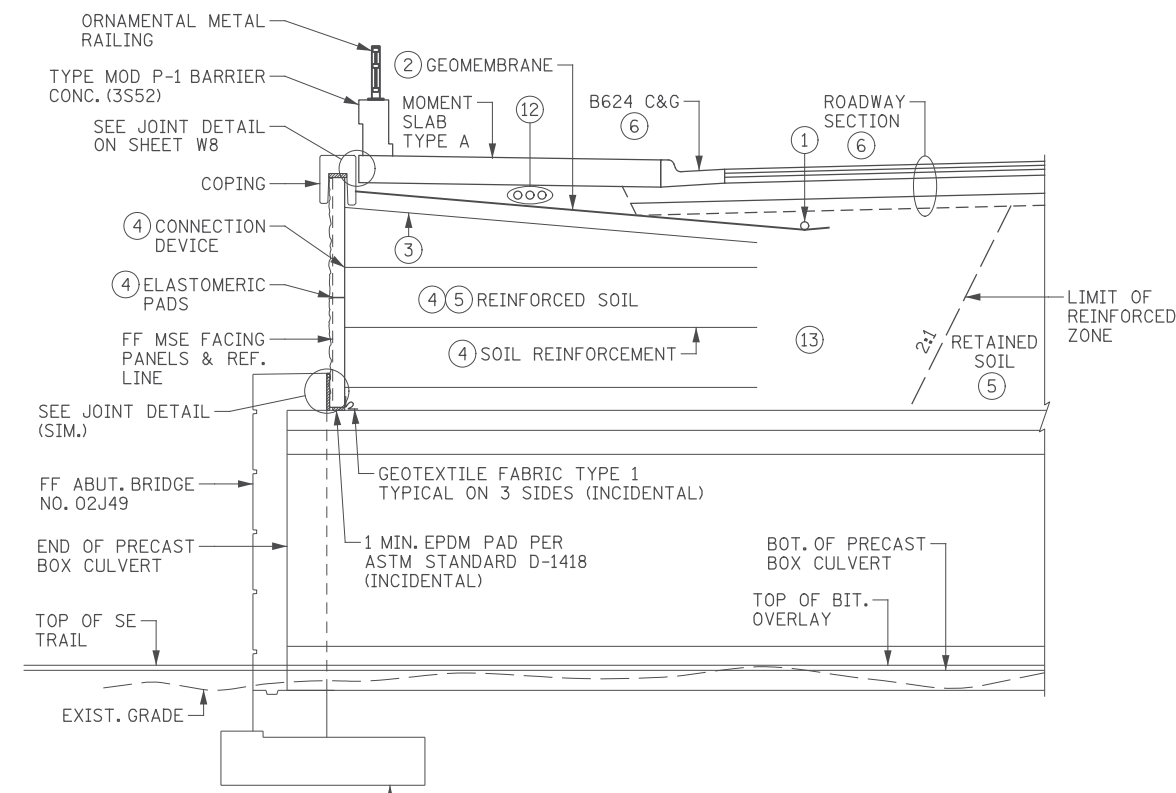
ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 MSE WALL MISCELLANEOUS DETAILS

SHEET
 W17
 OF
 W36

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TYPICAL SECTION - WALL A



TYPICAL SECTION - WALL A
(AT BRIDGE NO. 02J49)

FTG. BR NO. 02J49. SEE BRIDGE PLANS FOR STRUCTURE EXCAVATION AND SOIL CORRECTION REQUIREMENTS AT BRIDGE STRUCTURE.

NOTES:

- ① 4" PERF TP PIPE DRAIN PER SPEC. 3245. WRAP WITH GEOTEXTILE, TYPE 1 PER SPEC. 3733.
- ② IMPERVIOUS LAYER (GEOMEMBRANE). PROVIDE CONNECTION DETAILS TO THE PRECAST COPING IN SHOP PLANS FOR REVIEW AND APPROVAL.
- ③ TOP LAYER OF SOIL REINFORCEMENT SLOPE TO MATCH GEOMEMBRANE TO A MAXIMUM OF 15 DEGREES FROM HORIZONTAL.
- ④ SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- ⑤ SEE GRADING PLANS.
- ⑥ SEE ROADWAY PLANS.
- ⑦ DAYLIGHT OUTLET PIPE DRAIN OR CONNECT TO NEAR BY STRUCTURE. SEE RETAINING WALL PLAN AND PROFILE SHEETS FOR RETAINING WALL DRAINAGE SYSTEM ROUTING. CORE DRAINAGE STRUCTURES AND GROUT PIPE DRAIN INTO STRUCTURE. WORK TO CORE AND GROUT PIPE DRAINS INTO DRAINAGE STRUCTURES SHALL BE INCIDENTAL. SEE DRAINAGE PLANS FOR DRAINAGE STRUCTURE INFORMATION.
- ⑧ GEOTECHNICAL REPORT FOR MSE WALLS INDICATES AREAS WHERE SUBCUTS AND SOIL CORRECTIONS FOR WALL CONSTRUCTION MAY VARY FROM 1'-0" TO 6'-0" FROM EXISTING GRADE WHERE NECESSARY AS DETERMINED BY THE GEOTECHNICAL ENGINEER IN THE FIELD UPON REVIEW OF EXCAVATIONS. THIS PLAN ASSUMES A UNIFORM 1'-0" DEEP SOIL CORRECTION WILL BE NECESSARY ALONG THE ENTIRE LENGTH OF THE WALL. THE PAY LIMIT FOR SOIL CORRECTIONS IS ESTABLISHED IN THE WALL TYPICAL SECTION AND QUANTITIES ARE BASED ON THIS LIMIT. ACTUAL LIMITS MAY VARY AS DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER. ADDITIONAL MATERIAL REQUIRED FOR SOIL CORRECTIONS SHALL BE INCIDENTAL. SUBCUTS SHALL BE BACKFILLED WITH GRANULAR EMBANKMENT PER SPEC. 3149.2.B.1.
- ⑨ LEVELING PAD SHALL BE CONSTRUCTED OF CONCRETE PER SPEC. 2461, MIX NUMBER 1G52.
- ⑩ CASED WATER MAIN, SEE PROPOSED SANITARY AND WATER MAIN PLANS: WM LOCATION ALONG WALL A:
STA. 1000+65.400 (RWA)
MIN. OFFSET: 11.67' RT (TO WM)
FF GRADE: ±867.41
INV. EL. 856.66
ZONE 1&2 BOUNDARY EL: 855.74
UTILITY ZONE: 2
- ⑪ CASED SANITARY SEWER, SEE PROPOSED SANITARY AND WATER MAIN PLANS: SANITARY SEWER LOCATION ALONG WALL A:
STA. 1000+48.823 (RWA)
MIN. OFFSET: 21.44' RT (TO SAN)
FF GRADE: ±867.69
INV. EL. 848.74
ZONE 1&2 BOUNDARY EL: 846.25
UTILITY ZONE: 2
- ⑫ CONDUIT FOR SIGNAL INTERCONNECT AND FUTURE SYSTEMS, SEE SIGNAL PLANS.
- ⑬ ALL EXCAVATION REQUIRED PAID FOR AS "EXCAVATION - STRUCTURE CLASS U", SEE GRADING PLANS.

SUMMARY OF QUANTITIES : RETAINING WALL A		
ITEM	UNIT	QUANTITY
GRANULAR EMBANKMENT (CV)	CU YD	299
STRUCTURAL CONCRETE (3B52)	CU YD	332
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	632
REINFORCEMENT BARS (EPOXY COATED)	POUND	46650
ORNAMENTAL METAL RAILING	LIN FT	675
MECHANICALLY STABILIZED EARTH WALL	SQ YD	1519
ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ FT	8924
ARCHITECTURAL CONCRETE TEXTURE (ASHLAR STONE)	SQ FT	8924
ANTI-GRAFFITI COATING	SQ FT	3496
SPECIAL SURFACE FINISH	SQ FT	6919
4" TP PIPE DRAIN	LIN FT	180
4" PERF TP PIPE DRAIN	LIN FT	2018
CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	0.3
SIGN TYPE C (BRIDGE MOUNTED)	EACH	0

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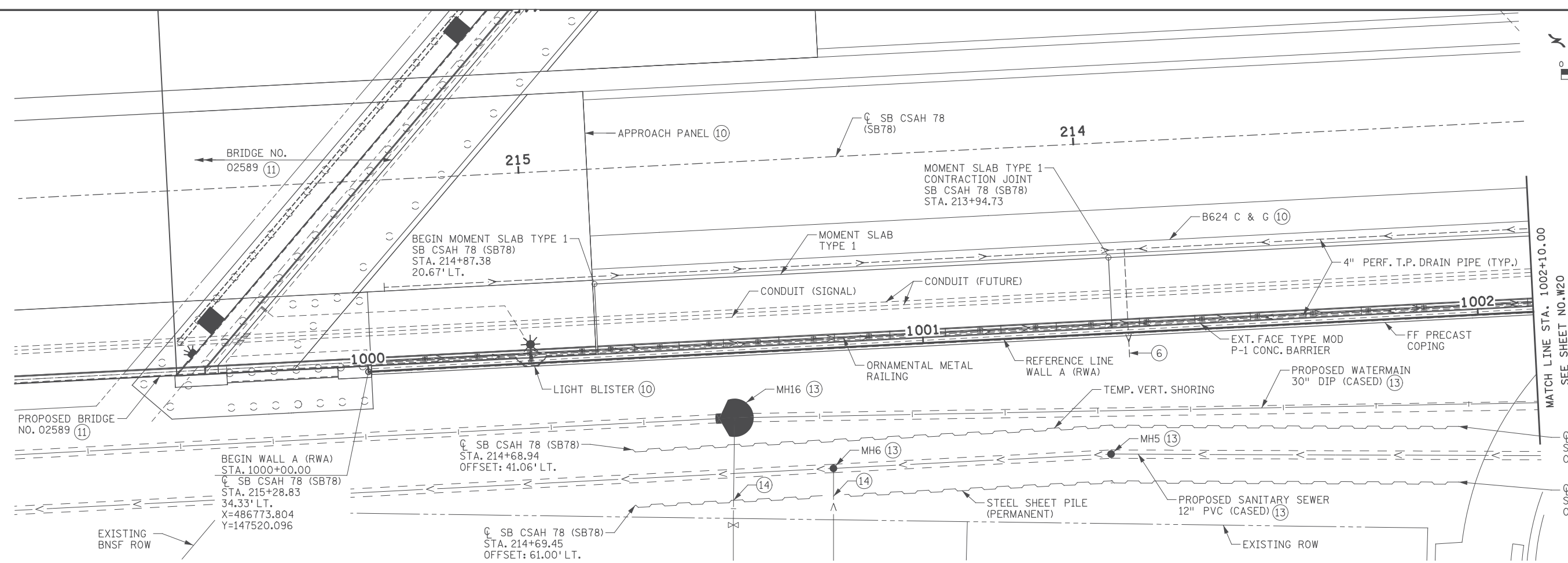
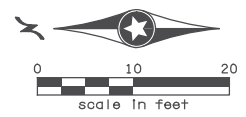
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 Date: 11/01/2017 License # 49163

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 BRIDGE NO. _____
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DRAWN BY
 J. HOFFMAN
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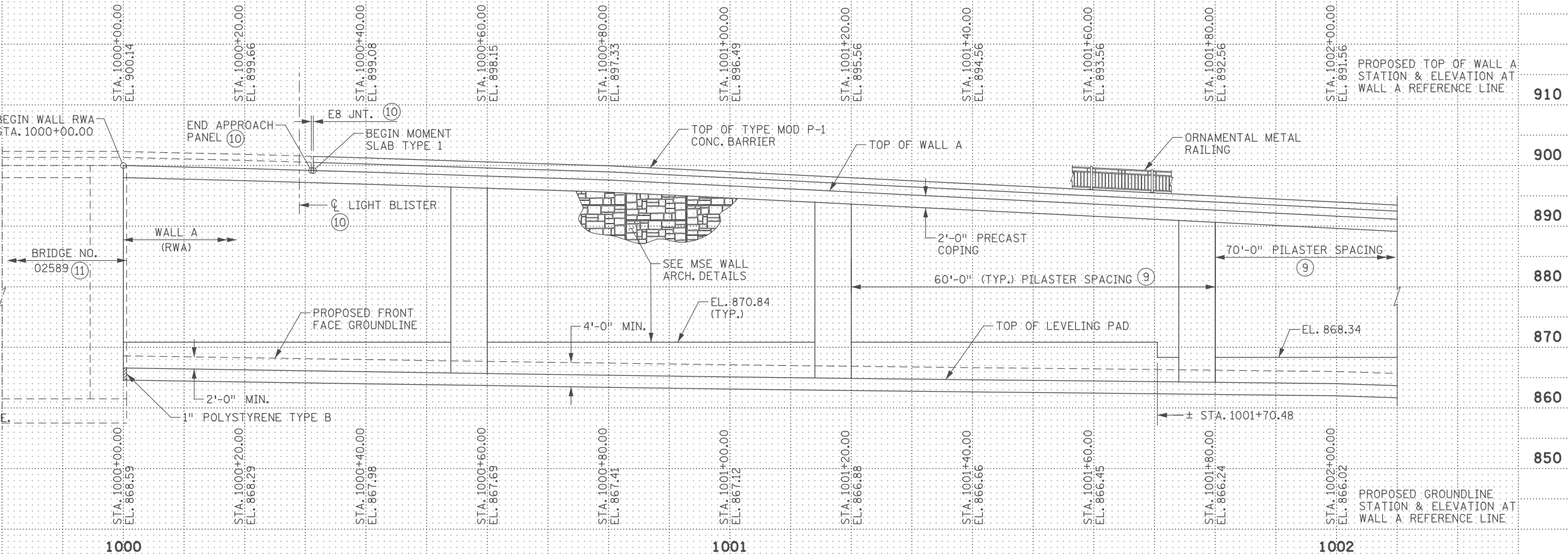
ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 RETAINING WALL A TYPICAL SECTION & QUANTITIES

SHEET
 W18
 OF
 W36



NOTES:

1. RETAINING WALL ALIGNMENT MEASURED ALONG REFERENCE LINE. SEE MSE WALL ALIGNMENTS TABULATIONS SHEET FOR WALL ALIGNMENT INFORMATION.
2. PROPOSED UTILITIES SHOWN FOR REFERENCE ONLY. SEE UTILITY PLANS FOR EXISTING UTILITIES AND REMOVALS.
3. MSE WALL SUPPLIERS SHALL INCORPORATE AND SPECIFICALLY DETAIL DRAINAGE STRUCTURES AND OTHER UTILITIES IN THE REINFORCEMENT ZONE. SEE DRAINAGE PLAN FOR ADDITIONAL INFORMATION.
4. SEE ARCHITECTURAL DETAILS FOR AESTHETIC INFORMATION.
5. FINAL ELEVATIONS OF LEVELING PAD TO BE DETERMINED BY MSE WALL SUPPLIER AND SUBMITTED TO ENGINEER FOR REVIEW, UNLESS NOTED OTHERWISE IN THE PLAN.
6. DIRECTION OF DRAINAGE SHOWN REPRESENTS LOWER WALL DRAINS. MEMBRANE DRAIN FOLLOWS THE TOP OF WALL PROFILE.
7. CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
8. MEASURED ALONG REFERENCE LINE.
9. START PILASTER SPACING RELATIVE TO BRIDGE.
10. SEE ROADWAY PLANS.
11. SEE BRIDGE PLANS.
12. SEE DRAINAGE PLANS.
13. SEE SANITARY & WATERMAIN PLANS.
14. ACCOMMODATE IN-PLACE UTILITY.



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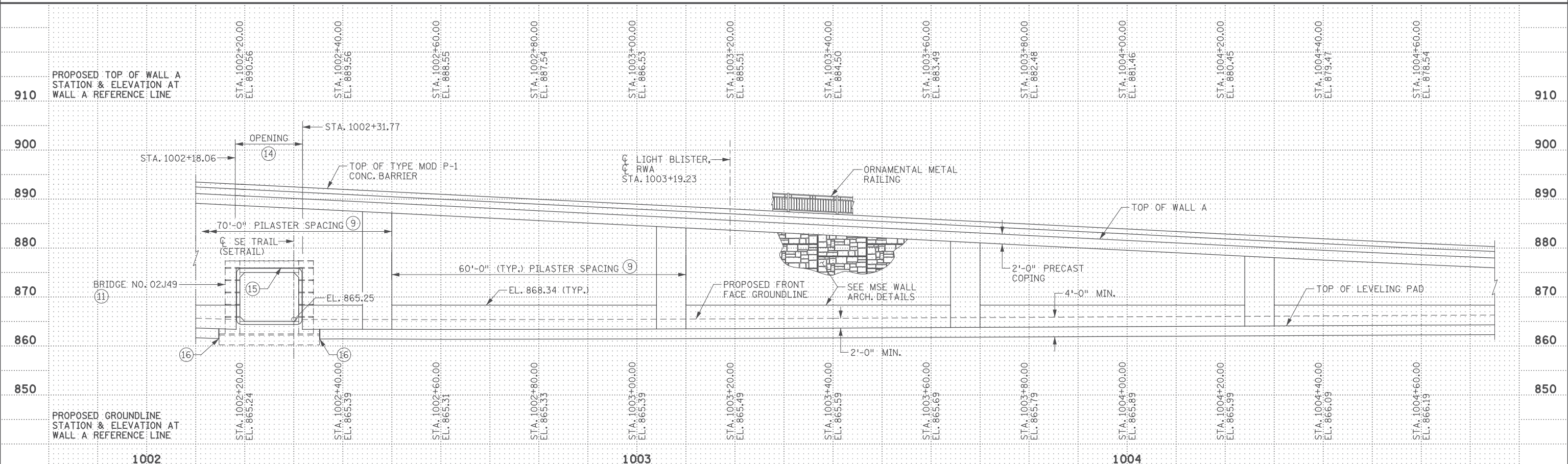
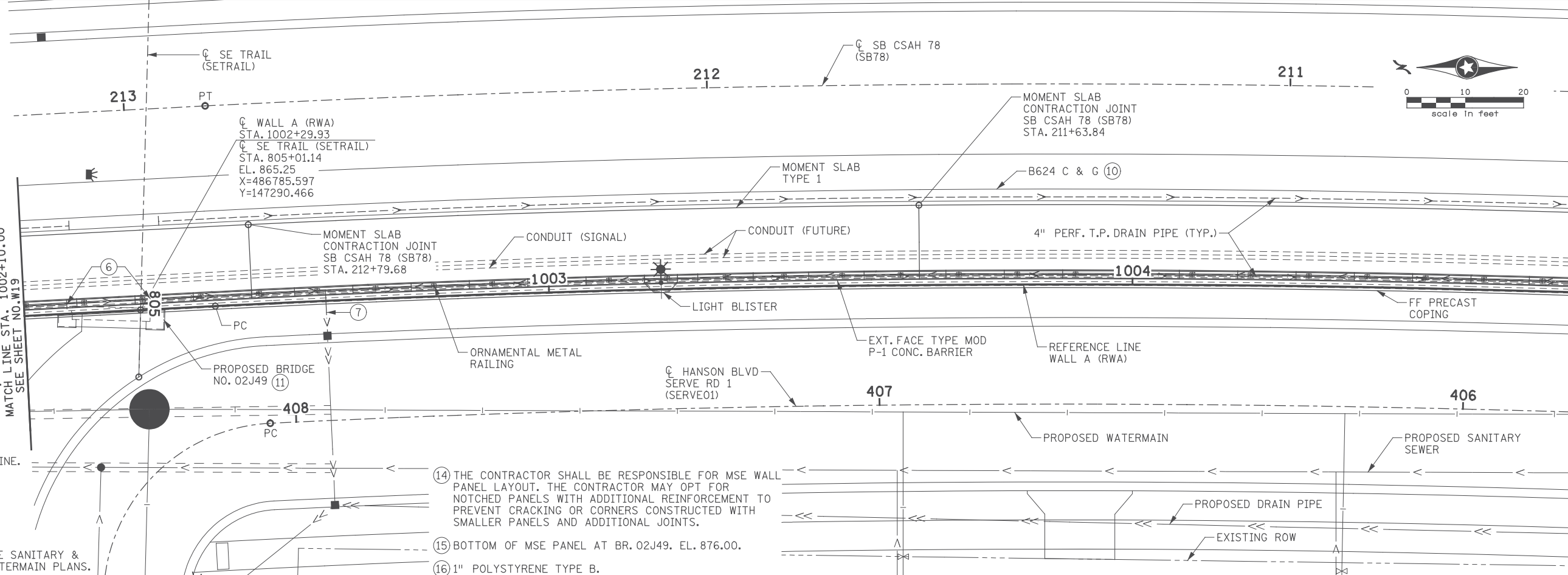


ANOKA COUNTY
MSE RETAINING WALL PLANS
CSAH 78 - BNSF GRADE SEPARATION
RETAINING WALL A PLAN & PROFILE (SHEET 1 OF 3)

SHEET
W19
OF
W36

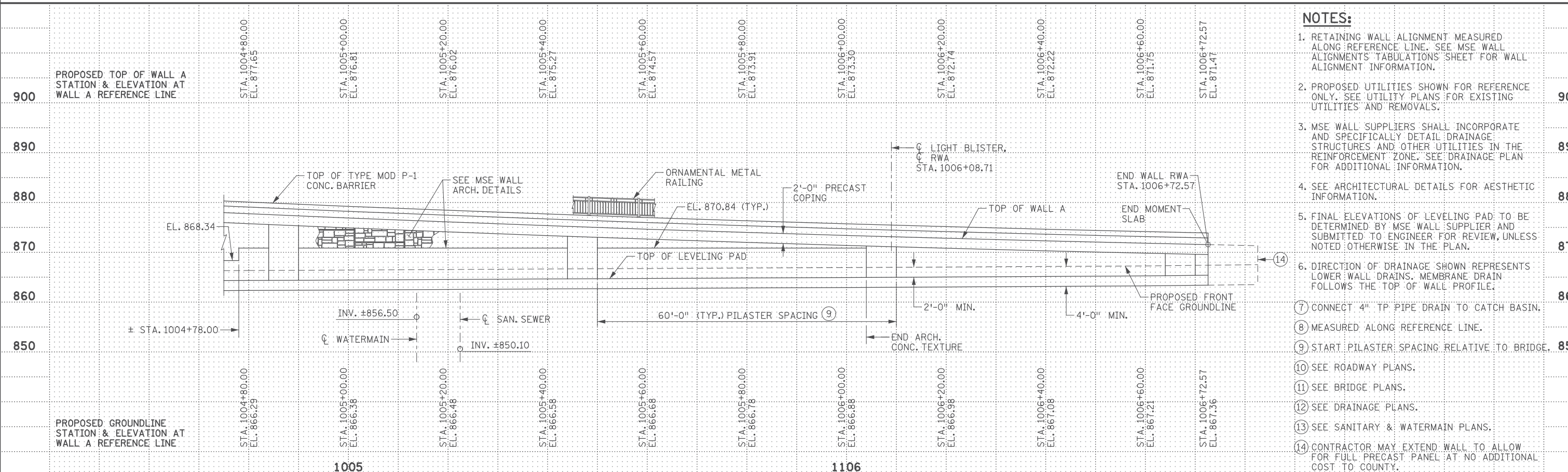
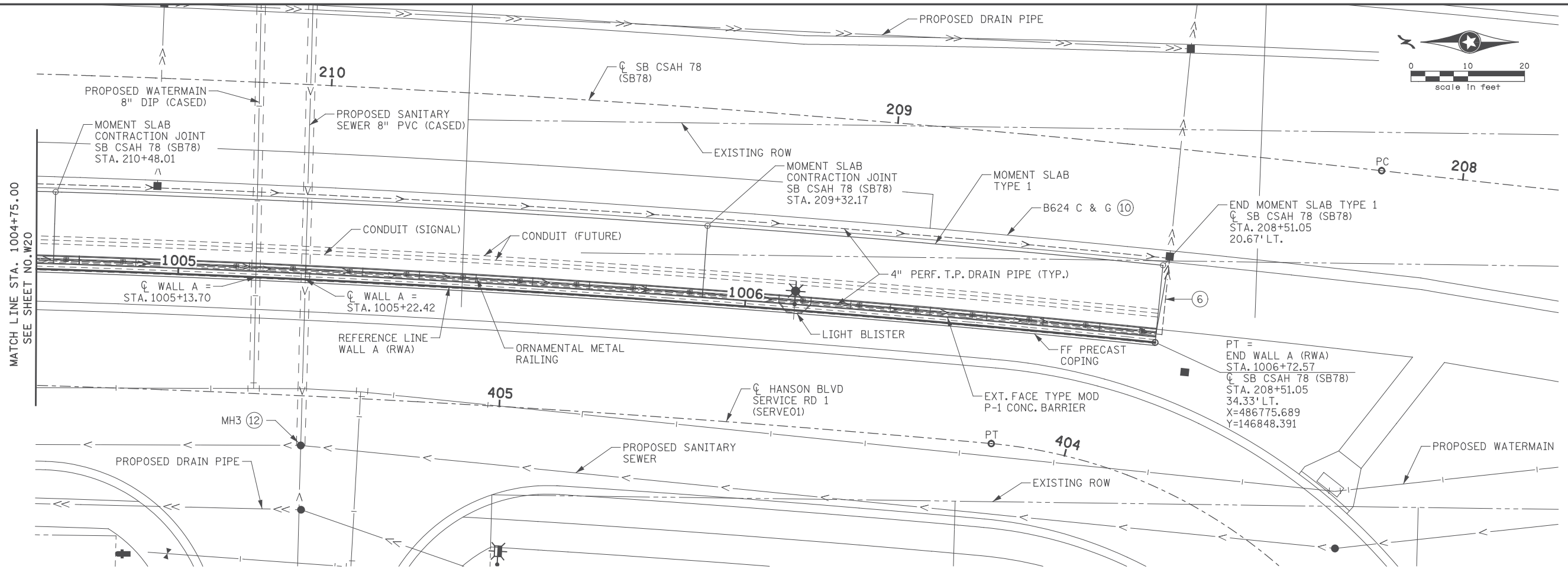
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 - MSE WALL SUPPLIERS SHALL INCORPORATE AND SPECIFICALLY DETAIL DRAINAGE STRUCTURES AND OTHER UTILITIES IN THE REINFORCEMENT ZONE. SEE DRAINAGE PLAN FOR ADDITIONAL INFORMATION.
 - SEE ARCHITECTURAL DETAILS FOR AESTHETIC INFORMATION.
 - FINAL ELEVATIONS OF LEVELING PAD TO BE DETERMINED BY MSE WALL SUPPLIER AND SUBMITTED TO ENGINEER FOR REVIEW, UNLESS NOTED OTHERWISE IN THE PLAN.
 - DIRECTION OF DRAINAGE SHOWN REPRESENTS LOWER WALL DRAINS. MEMBRANE DRAIN FOLLOWS THE TOP OF WALL PROFILE.
- ⑦ CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
 ⑧ MEASURED ALONG REFERENCE LINE.
 ⑨ START PILASTER SPACING RELATIVE TO BRIDGE.
 ⑩ SEE ROADWAY PLANS.
 ⑪ SEE BRIDGE PLANS.
 ⑫ SEE DRAINAGE PLANS. ⑬ SEE SANITARY & WATERMAIN PLANS.



11/01/2017		RELEASED FOR CONSTRUCTION		I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.		STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051		DRAWN BY E. JOHNSON DESIGNED BY A. BEHNKE CHECKED BY C. BLACK				ENGINEERS PLANNERS DESIGNERS		ANOKA COUNTY MSE RETAINING WALL PLANS CSAH 78 - BNSF GRADE SEPARATION RETAINING WALL A PLAN & PROFILE (SHEET 2 OF 3)		SHEET W20 OF W36	
NO	DATE	BY	CKD	APPR	REVISION	BRIDGE NO.	COMM. NO. 0169140	Print Name: <u>CASEY E. BLACK</u> Date: <u>11/01/2017</u> License #: <u>49163</u>									

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- NOTES:**
- RETAINING WALL ALIGNMENT MEASURED ALONG REFERENCE LINE. SEE MSE WALL ALIGNMENTS TABULATIONS SHEET FOR WALL ALIGNMENT INFORMATION.
 - PROPOSED UTILITIES SHOWN FOR REFERENCE ONLY. SEE UTILITY PLANS FOR EXISTING UTILITIES AND REMOVALS.
 - MSE WALL SUPPLIERS SHALL INCORPORATE AND SPECIFICALLY DETAIL DRAINAGE STRUCTURES AND OTHER UTILITIES IN THE REINFORCEMENT ZONE. SEE DRAINAGE PLAN FOR ADDITIONAL INFORMATION.
 - SEE ARCHITECTURAL DETAILS FOR AESTHETIC INFORMATION.
 - FINAL ELEVATIONS OF LEVELING PAD TO BE DETERMINED BY MSE WALL SUPPLIER AND SUBMITTED TO ENGINEER FOR REVIEW, UNLESS NOTED OTHERWISE IN THE PLAN.
 - DIRECTION OF DRAINAGE SHOWN REPRESENTS LOWER WALL DRAINS. MEMBRANE DRAIN FOLLOWS THE TOP OF WALL PROFILE.
 - CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
 - MEASURED ALONG REFERENCE LINE.
 - START PILASTER SPACING RELATIVE TO BRIDGE.
 - SEE ROADWAY PLANS.
 - SEE BRIDGE PLANS.
 - SEE DRAINAGE PLANS.
 - SEE SANITARY & WATERMAIN PLANS.
 - CONTRACTOR MAY EXTEND WALL TO ALLOW FOR FULL PRECAST PANEL AT NO ADDITIONAL COST TO COUNTY.

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Print Name: CASEY E. BLACK

Casey E. Black

Date: 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140

DRAWN BY
E. JOHNSON

DESIGNED BY
A. BEHNKE

CHECKED BY
C. BLACK

ENGINEERS
PLANNERS
DESIGNERS

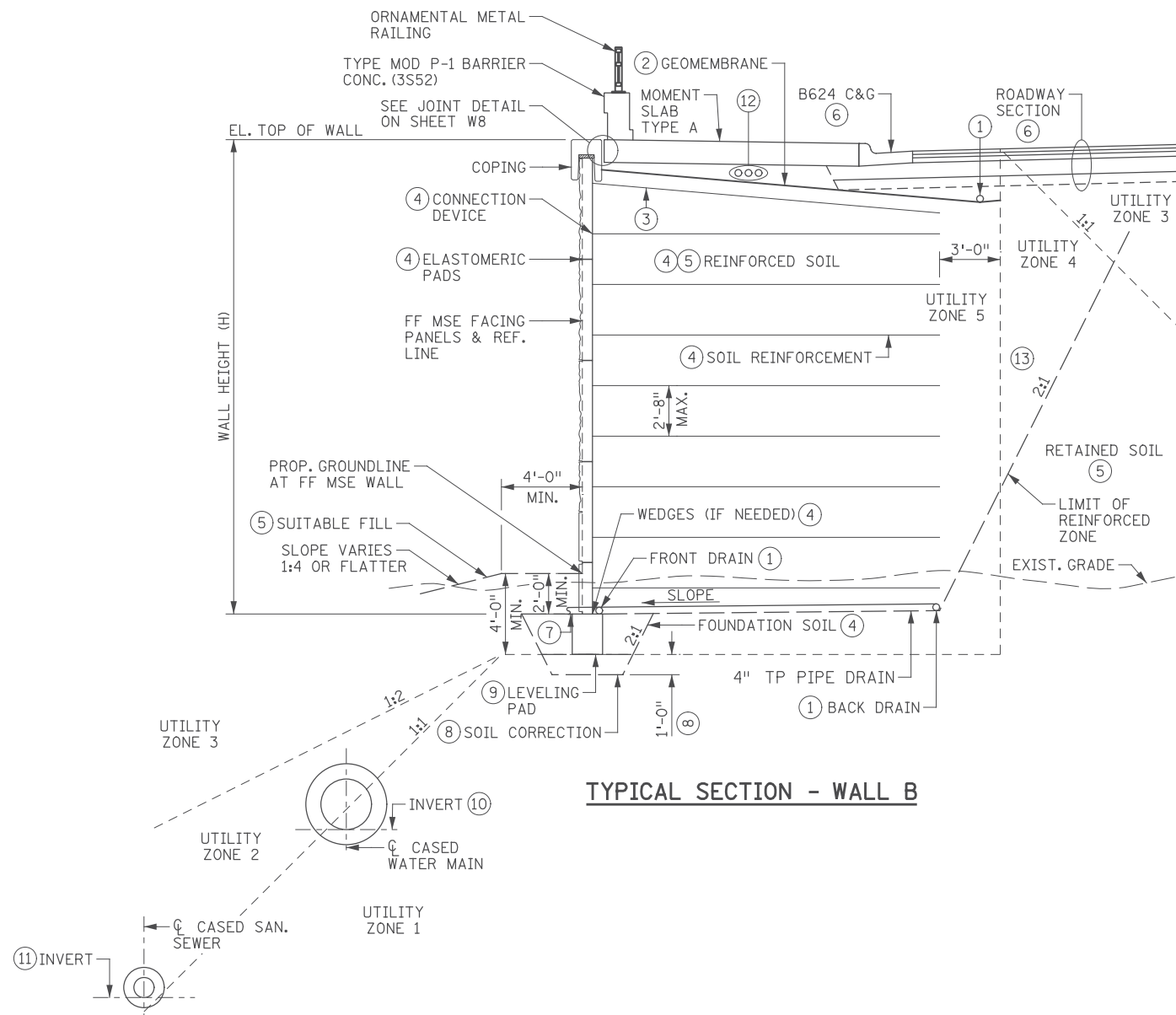


ANOKA COUNTY

MSE RETAINING WALL PLANS
CSAH 78 - BNSF GRADE SEPARATION
RETAINING WALL A PLAN & PROFILE (SHEET 3 OF 3)

SHEET
W21
OF
W36

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TYPICAL SECTION - WALL B

NOTES:

- ① 4" PERF TP PIPE DRAIN PER SPEC. 3245. WRAP WITH GEOTEXTILE, TYPE 1 PER SPEC. 3733.
- ② IMPERVIOUS LAYER (GEOMEMBRANE). PROVIDE CONNECTION DETAILS TO THE PRECAST COPING IN SHOP PLANS FOR REVIEW AND APPROVAL.
- ③ TOP LAYER OF SOIL REINFORCEMENT SLOPE TO MATCH GEOMEMBRANE TO A MAXIMUM OF 15 DEGREES FROM HORIZONTAL.
- ④ SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- ⑤ SEE GRADING PLANS.
- ⑥ SEE ROADWAY PLANS.
- ⑦ DAYLIGHT OUTLET PIPE DRAIN OR CONNECT TO NEAR BY STRUCTURE. SEE RETAINING WALL PLAN AND PROFILE SHEETS FOR RETAINING WALL DRAINAGE SYSTEM ROUTING. CORE DRAINAGE STRUCTURES AND GROUT PIPE DRAIN INTO STRUCTURE. WORK TO CORE AND GROUT PIPE DRAINS INTO DRAINAGE STRUCTURES SHALL BE INCIDENTAL. SEE DRAINAGE PLANS FOR DRAINAGE STRUCTURE INFORMATION.
- ⑧ GEOTECHNICAL REPORT FOR MSE WALLS INDICATES AREAS WHERE SUBCUTS AND SOIL CORRECTIONS FOR WALL CONSTRUCTION MAY VARY FROM 1'-0" TO 6'-0" FROM EXISTING GRADE WHERE NECESSARY AS DETERMINED BY THE GEOTECHNICAL ENGINEER IN THE FIELD UPON REVIEW OF EXCAVATIONS. THIS PLAN ASSUMES A UNIFORM 1'-0" DEEP SOIL CORRECTION WILL BE NECESSARY ALONG THE ENTIRE LENGTH OF THE WALL. THE PAY LIMIT FOR SOIL CORRECTIONS IS ESTABLISHED IN THE WALL TYPICAL SECTION AND QUANTITIES ARE BASED ON THIS LIMIT. ACTUAL LIMITS MAY VARY AS DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER. ADDITIONAL MATERIAL REQUIRED FOR SOIL CORRECTIONS SHALL BE INCIDENTAL. SUBCUTS SHALL BE BACKFILLED WITH GRANULAR EMBANKMENT PER SPEC. 3149.2.B.1.
- ⑨ LEVELING PAD SHALL BE CONSTRUCTED OF CONCRETE PER SPEC. 2461, MIX NUMBER 1G52.
- ⑩ CASED WATER MAIN, SEE PROPOSED SANITARY AND WATER MAIN PLANS:
 WM LOCATION ALONG WALL:
 LOCATION: BEGIN WALL END WALL
 STA. 1100+00.000 (RWB) 1102.+15.99 (RWB)
 MIN. OFFSET: 11.67' RT (TO WM) 11.67' RT (TO WM)
 FF GRADE: ±868.59 ±870.34
 INV. EL. 855.93 858.00
 ZONE 1&2 BOUNDARY EL: 856.92 858.67
 UTILITY ZONE: 1 1
- ⑪ CASED SANITARY SEWER, SEE PROPOSED SANITARY AND WATER MAIN PLANS:
 SANITARY SEWER LOCATION ALONG WALL:
 LOCATION: BEGIN WALL END WALL
 STA. 1100+00.000 (RWB) 1102.+15.99 (RWB)
 MIN. OFFSET: 21.67' RT (TO SAN) 21.67' RT (TO SAN)
 FF GRADE: ±868.59 ±870.34
 INV. EL. 847.62 848.14
 ZONE 1&2 BOUNDARY EL: 846.92 848.67
 UTILITY ZONE: 2 1
- ⑫ CONDUIT FOR SIGNAL INTERCONNECT AND FUTURE SYSTEMS, SEE SIGNAL PLANS.
- ⑬ ALL EXCAVATION REQUIRED PAID FOR AS "EXCAVATION - STRUCTURE CLASS U", SEE GRADING PLANS.

SUMMARY OF QUANTITIES : RETAINING WALL B

ITEM	UNIT	QUANTITY
GRANULAR EMBANKMENT (CV)	CU YD	96
STRUCTURAL CONCRETE (3B52)	CU YD	117
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	223
REINFORCEMENT BARS (EPOXY COATED)	POUND	21920
ORNAMENTAL METAL RAILING	LIN FT	225
MECHANICALLY STABILIZED EARTH WALL	SQ YD	688
ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ FT	4420
ARCHITECTURAL CONCRETE TEXTURE (ASHLAR STONE)	SQ FT	4420
ANTI-GRAFFITI COATING	SQ FT	1325
SPECIAL SURFACE FINISH	SQ FT	2388
4" TP PIPE DRAIN	LIN FT	100
4" PERF TP PIPE DRAIN	LIN FT	741
CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	0.1
SIGN TYPE C (BRIDGE MOUNTED)	EACH	0

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Print Name: CASEY E. BLACK

Casey E. Black

Date 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140



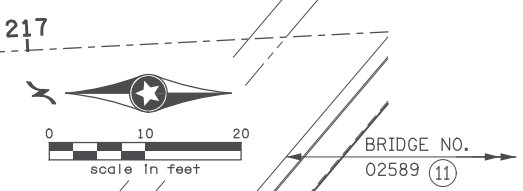
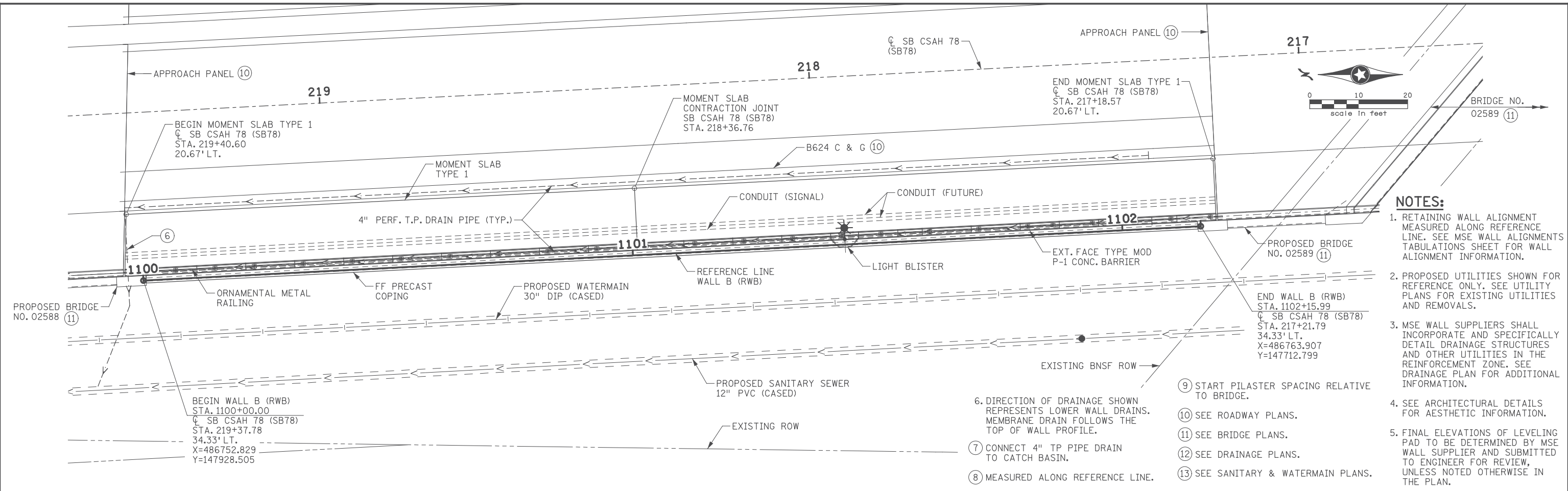
ANOKA COUNTY

MSE RETAINING WALL PLANS

CSAH 78 - BNSF GRADE SEPARATION

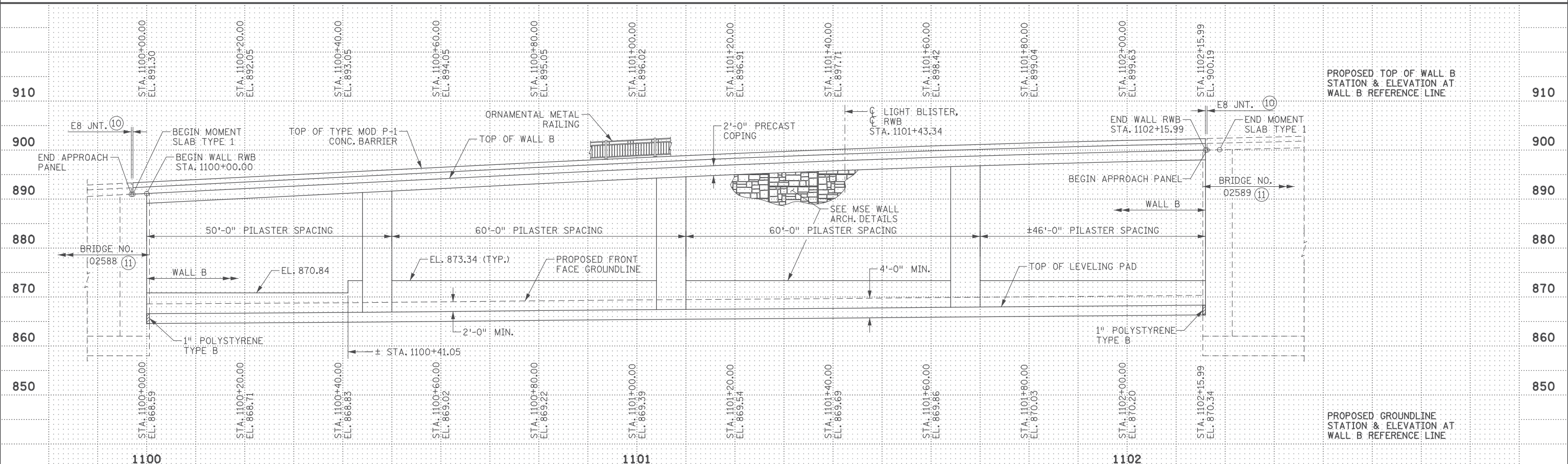
RETAINING WALL B TYPICAL SECTION & QUANTITIES

SHEET
W22
OF
W36



- NOTES:**
- RETAINING WALL ALIGNMENT MEASURED ALONG REFERENCE LINE. SEE MSE WALL ALIGNMENTS TABULATIONS SHEET FOR WALL ALIGNMENT INFORMATION.
 - PROPOSED UTILITIES SHOWN FOR REFERENCE ONLY. SEE UTILITY PLANS FOR EXISTING UTILITIES AND REMOVALS.
 - MSE WALL SUPPLIERS SHALL INCORPORATE AND SPECIFICALLY DETAIL DRAINAGE STRUCTURES AND OTHER UTILITIES IN THE REINFORCEMENT ZONE. SEE DRAINAGE PLAN FOR ADDITIONAL INFORMATION.
 - SEE ARCHITECTURAL DETAILS FOR AESTHETIC INFORMATION.
 - FINAL ELEVATIONS OF LEVELING PAD TO BE DETERMINED BY MSE WALL SUPPLIER AND SUBMITTED TO ENGINEER FOR REVIEW, UNLESS NOTED OTHERWISE IN THE PLAN.

- START PILASTER SPACING RELATIVE TO BRIDGE.
- SEE ROADWAY PLANS.
- SEE BRIDGE PLANS.
- SEE DRAINAGE PLANS.
- SEE SANITARY & WATERMAIN PLANS.
- DIRECTION OF DRAINAGE SHOWN REPRESENTS LOWER WALL DRAINS. MEMBRANE DRAIN FOLLOWS THE TOP OF WALL PROFILE.
- CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
- MEASURED ALONG REFERENCE LINE.



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SAP 002-678-023
SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140

DRAWN BY
E. JOHNSON

DESIGNED BY
A. BEHNKE

CHECKED BY
C. BLACK

ENGINEERS
PLANNERS
DESIGNERS



ANOKA COUNTY

MSE RETAINING WALL PLANS

CSAH 78 - BNSF GRADE SEPARATION

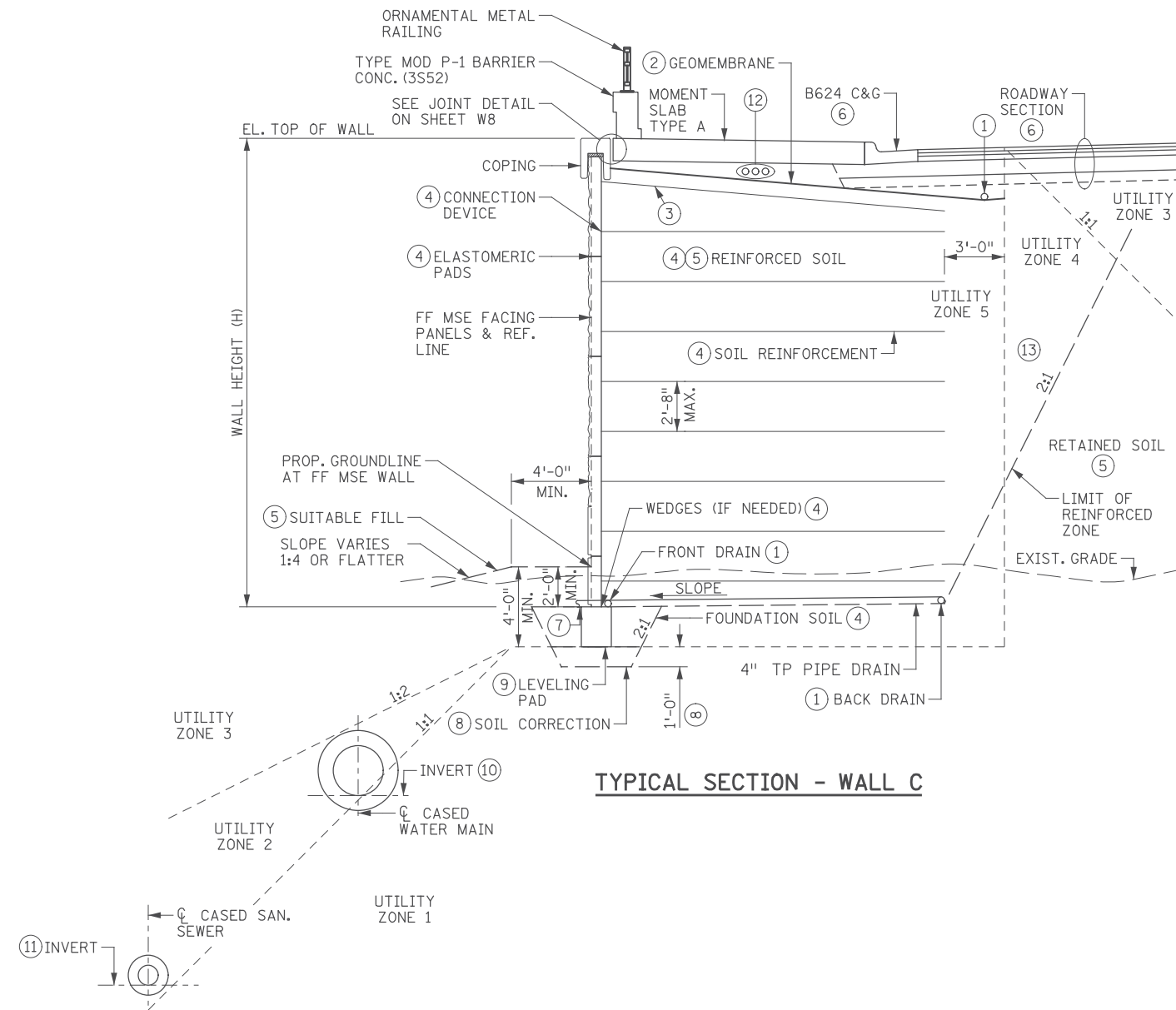
RETAINING WALL B PLAN & PROFILE

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W36

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NOTES:

- ① 4" PERF TP PIPE DRAIN PER SPEC. 3245. WRAP WITH GEOTEXTILE, TYPE 1 PER SPEC. 3733.
- ② IMPERVIOUS LAYER (GEOMEMBRANE). PROVIDE CONNECTION DETAILS TO THE PRECAST COPING IN SHOP PLANS FOR REVIEW AND APPROVAL.
- ③ TOP LAYER OF SOIL REINFORCEMENT SLOPE TO MATCH GEOMEMBRANE TO A MAXIMUM OF 15 DEGREES FROM HORIZONTAL.
- ④ SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- ⑤ SEE GRADING PLANS.
- ⑥ SEE ROADWAY PLANS.
- ⑦ DAYLIGHT OUTLET PIPE DRAIN OR CONNECT TO NEAR BY STRUCTURE. SEE RETAINING WALL PLAN AND PROFILE SHEETS FOR RETAINING WALL DRAINAGE SYSTEM ROUTING. CORE DRAINAGE STRUCTURES AND GROUT PIPE DRAIN INTO STRUCTURE. WORK TO CORE AND GROUT PIPE DRAINS INTO DRAINAGE STRUCTURES SHALL BE INCIDENTAL. SEE DRAINAGE PLANS FOR DRAINAGE STRUCTURE INFORMATION.
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- ⑨ LEVELING PAD SHALL BE CONSTRUCTED OF CONCRETE PER SPEC. 2461, MIX NUMBER 1G52.
- ⑩ CASED WATER MAIN, SEE PROPOSED SANITARY AND WATER MAIN PLANS:
WM LOCATION ALONG WALL:
LOCATION: BEGIN WALL END WALL
STA. 1200+00.000 (RWC) 1202.+10.36 (RWC)
MIN. OFFSET: 19.35' RT (TO WM) 11.67' RT (TO WM)
FF GRADE: ±872.08 ±867.96
INV. EL. 856.00 856.52
ZONE 1&2 BOUNDARY EL: 852.73 856.29
UTILITY ZONE: 2 2
- ⑪ CASED SANITARY SEWER, SEE PROPOSED SANITARY AND WATER MAIN PLANS:
SANITARY SEWER LOCATION ALONG WALL:
LOCATION: BEGIN WALL END WALL
STA. 1200+00.000 (RWC) 1202.+10.36 (RWC)
MIN. OFFSET: 30.41' RT (TO SAN) 22.18' RT (TO SAN)
FF GRADE: ±872.08 ±867.96
INV. EL. 847.02 847.62
ZONE 1&2 BOUNDARY EL: 841.67 845.78
UTILITY ZONE: 2 2
- ⑫ CONDUIT FOR SIGNAL INTERCONNECT AND FUTURE SYSTEMS, SEE SIGNAL PLANS.
- ⑬ ALL EXCAVATION REQUIRED PAID FOR AS "EXCAVATION - STRUCTURE CLASS U", SEE GRADING PLANS.



TYPICAL SECTION - WALL C

SUMMARY OF QUANTITIES : RETAINING WALL C

ITEM	UNIT	QUANTITY
GRANULAR EMBANKMENT (CV)	CU YD	97
STRUCTURAL CONCRETE (3B52)	CU YD	117
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	222
REINFORCEMENT BARS (EPOXY COATED)	POUND	21800
ORNAMENTAL METAL RAILING	LIN FT	222
MECHANICALLY STABILIZED EARTH WALL	SQ YD	272
ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ FT	1144
ARCHITECTURAL CONCRETE TEXTURE (ASHLAR STONE)	SQ FT	1144
ANTI-GRAFFITI COATING	SQ FT	1035
SPECIAL SURFACE FINISH	SQ FT	1937
4" TP PIPE DRAIN	LIN FT	100
4" PERF TP PIPE DRAIN	LIN FT	747
CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	0.1
SIGN TYPE C (BRIDGE MOUNTED)	EACH	0

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NO	DATE	BY	CKD	APPR
REVISION				
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 Print Name: CASEY E. BLACK
Casey E. Black
 Date 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO. _____

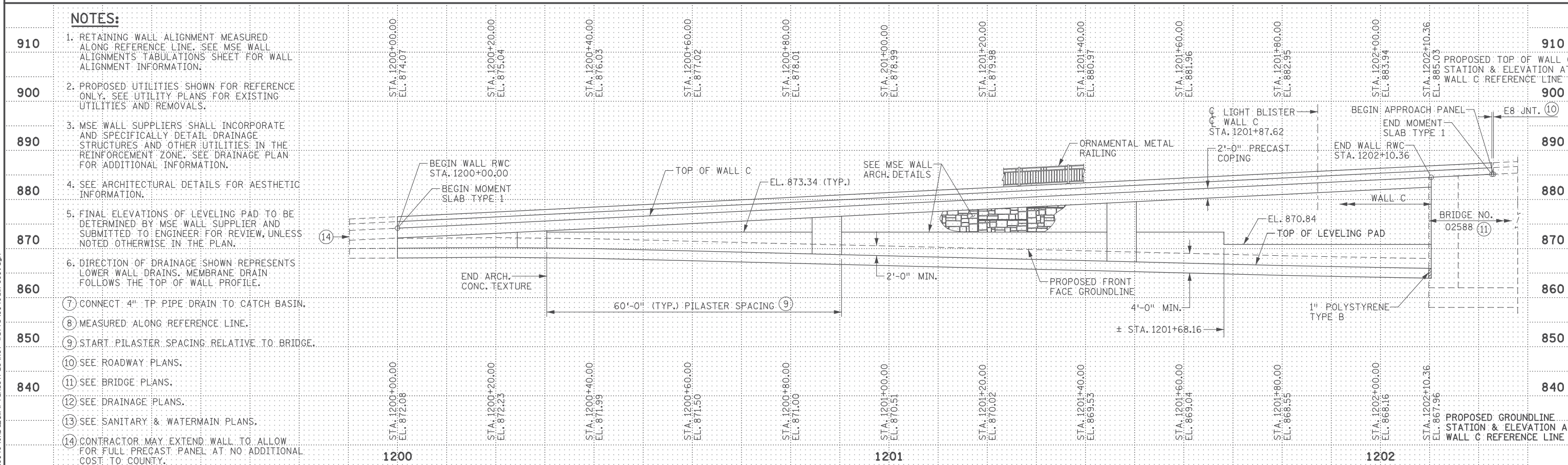
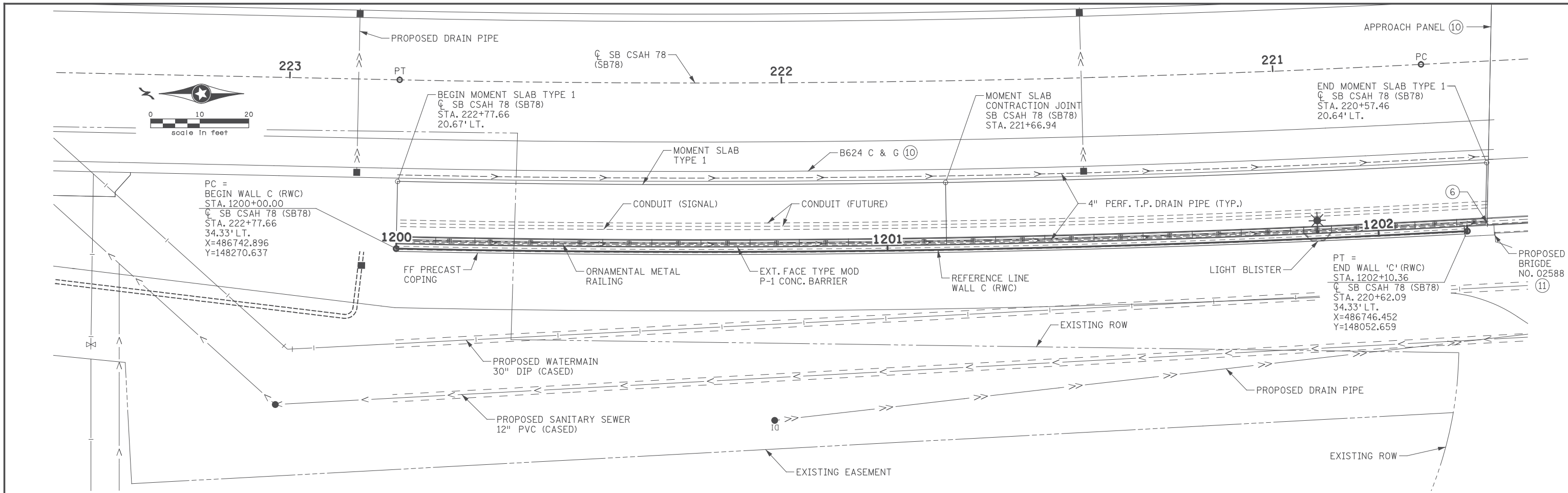
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**ENGINEERS
 PLANNERS
 DESIGNERS**

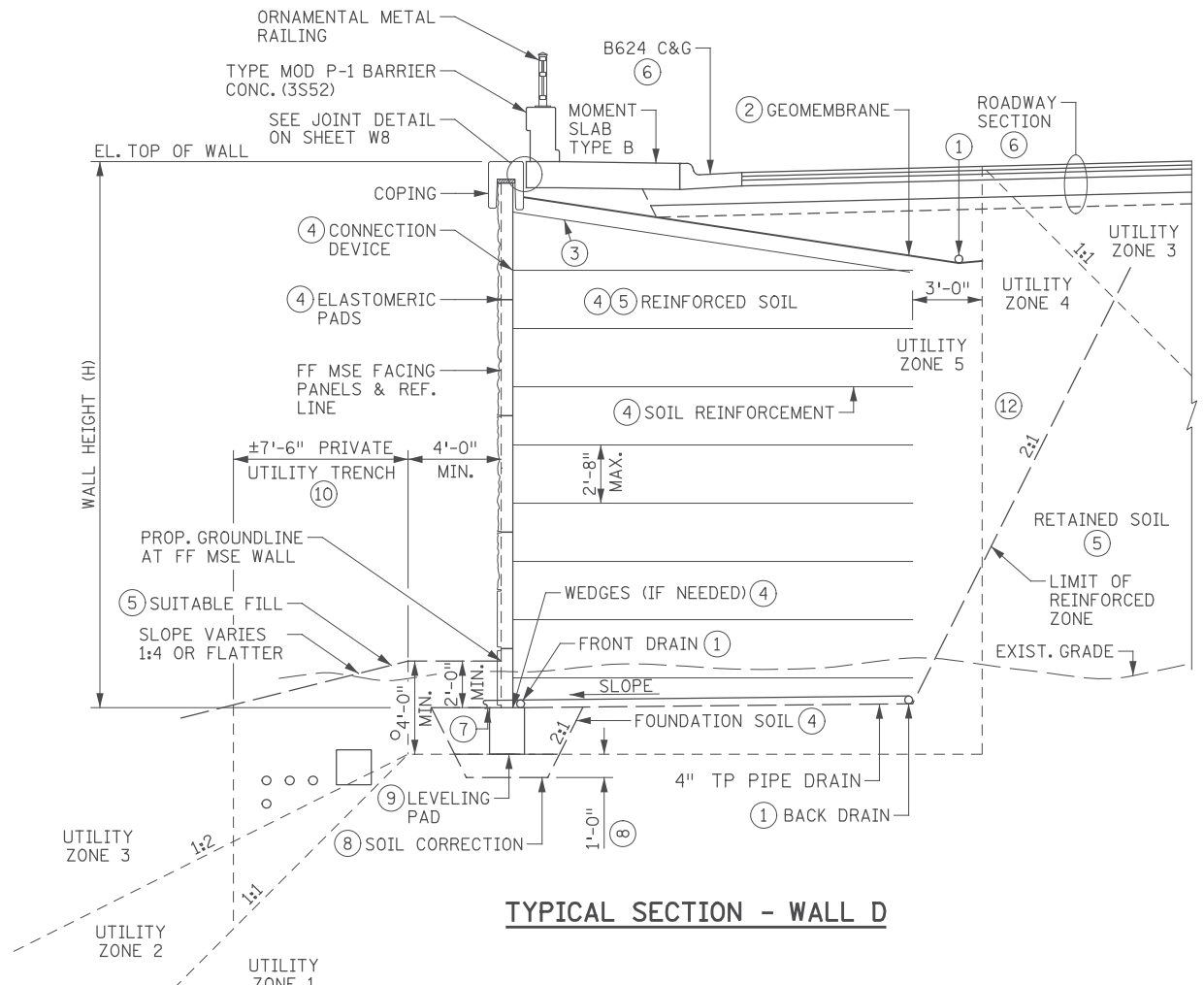
ANOKA COUNTY
 MSE RETAINING WALL PLANS
CSAH 78 - BNSF GRADE SEPARATION
 RETAINING WALL C TYPICAL SECTION & QUANTITIES

**SHEET
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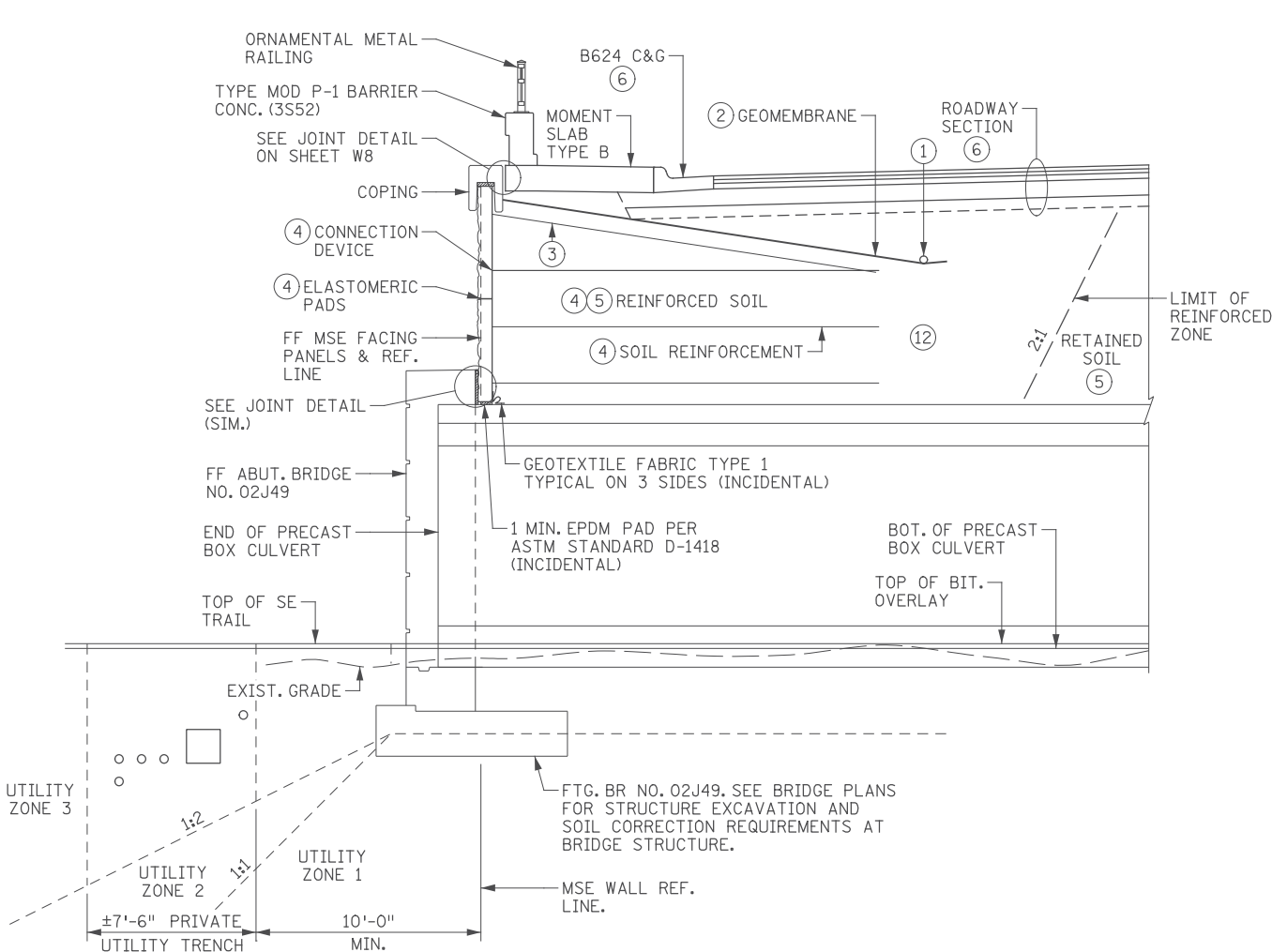


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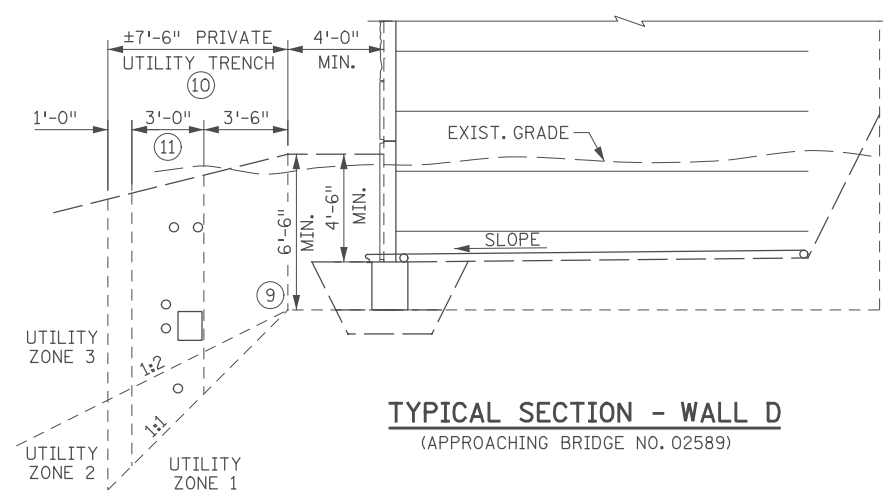
TYPICAL SECTION - WALL D



**TYPICAL SECTION - WALL D
(AT BRIDGE NO. 02J49)**

NOTES:

- ① 4" PERF TP PIPE DRAIN PER SPEC. 3245. WRAP WITH GEOTEXTILE, TYPE 1 PER SPEC. 3733.
- ② IMPERVIOUS LAYER (GEOMEMBRANE). PROVIDE CONNECTION DETAILS TO THE PRECAST COPING IN SHOP PLANS FOR REVIEW AND APPROVAL.
- ③ TOP LAYER OF SOIL REINFORCEMENT SLOPE TO MATCH GEOMEMBRANE TO A MAXIMUM OF 15 DEGREES FROM HORIZONTAL.
- ④ SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- ⑤ SEE GRADING PLANS.
- ⑥ SEE ROADWAY PLANS.
- ⑦ DAYLIGHT OUTLET PIPE DRAIN OR CONNECT TO NEAR BY STRUCTURE. SEE RETAINING WALL PLAN AND PROFILE SHEETS FOR RETAINING WALL DRAINAGE SYSTEM ROUTING. CORE DRAINAGE STRUCTURES AND GROUT PIPE DRAIN INTO STRUCTURE. WORK TO CORE AND GROUT PIPE DRAINS INTO DRAINAGE STRUCTURES SHALL BE INCIDENTAL. SEE DRAINAGE PLANS FOR DRAINAGE STRUCTURE INFORMATION.
- ⑧ GEOTECHNICAL REPORT FOR MSE WALLS INDICATES AREAS WHERE SUBCUTS AND SOIL CORRECTIONS FOR WALL CONSTRUCTION MAY VARY FROM 1'-0" TO 6'-0" FROM EXISTING GRADE WHERE NECESSARY AS DETERMINED BY THE GEOTECHNICAL ENGINEER IN THE FIELD UPON REVIEW OF EXCAVATIONS. THIS PLAN ASSUMES A UNIFORM 1'-0" DEEP SOIL CORRECTION WILL BE NECESSARY ALONG THE ENTIRE LENGTH OF THE WALL. THE PAY LIMIT FOR SOIL CORRECTIONS IS ESTABLISHED IN THE WALL TYPICAL SECTION AND QUANTITIES ARE BASED ON THIS LIMIT. ACTUAL LIMITS MAY VARY AS DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER. ADDITIONAL MATERIAL REQUIRED FOR SOIL CORRECTIONS SHALL BE INCIDENTAL. SUBCUTS SHALL BE BACKFILLED WITH GRANULAR EMBANKMENT PER SPEC. 3149.2.B.1.
- ⑨ LEVELING PAD SHALL BE CONSTRUCTED OF CONCRETE PER SPEC. 2461, MIX NUMBER 1652.
- ⑩ PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY TRENCH PRIOR TO CONSTRUCTION OF RETAINING WALL. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.



**TYPICAL SECTION - WALL D
(APPROACHING BRIDGE NO. 02589)**

- ⑪ UTILITIES TRANSITION IN DEPTH AND LOCATION TO ENTER CASING NEAR BRIDGE NUMBER 02589. SEE BRIDGE PLANS FOR UTILITY PROTECTION REQUIREMENTS FOR EXCAVATION. 30" DIAMETER STEEL CASING WILL BEGIN AT APPROXIMATE WALL STATION 1305+28.14 AND CONTINUE PAST THE END OF WALL. UTILITIES LOCATED IN THE CASING ARE ANTICIPATED TO INCLUDE CENTURYLINK, COMCAST AND ZAYO.
- ⑫ ALL EXCAVATION REQUIRED PAID FOR AS "EXCAVATION - STRUCTURE CLASS U", SEE GRADING PLANS.

SUMMARY OF QUANTITIES : RETAINING WALL D		
ITEM	UNIT	QUANTITY
GRANULAR EMBANKMENT (CV)	CU YD	244
STRUCTURAL CONCRETE (3B52)	CU YD	151
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	551
REINFORCEMENT BARS (EPOXY COATED)	POUND	27470
ORNAMENTAL METAL RAILING	LIN FT	552
MECHANICALLY STABILIZED EARTH WALL	SQ YD	1063
ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ FT	5775
ARCHITECTURAL CONCRETE TEXTURE (ASHLAR STONE)	SQ FT	5775
ANTI-GRAFFITI COATING	SQ FT	2885
SPECIAL SURFACE FINISH	SQ FT	5265
4" TP PIPE DRAIN	LIN FT	304
4" PERF TP PIPE DRAIN	LIN FT	1643
CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	0.3
SIGN TYPE C (BRIDGE MOUNTED)	EACH	0

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11/01/2017				RELEASED FOR CONSTRUCTION
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				REVISION

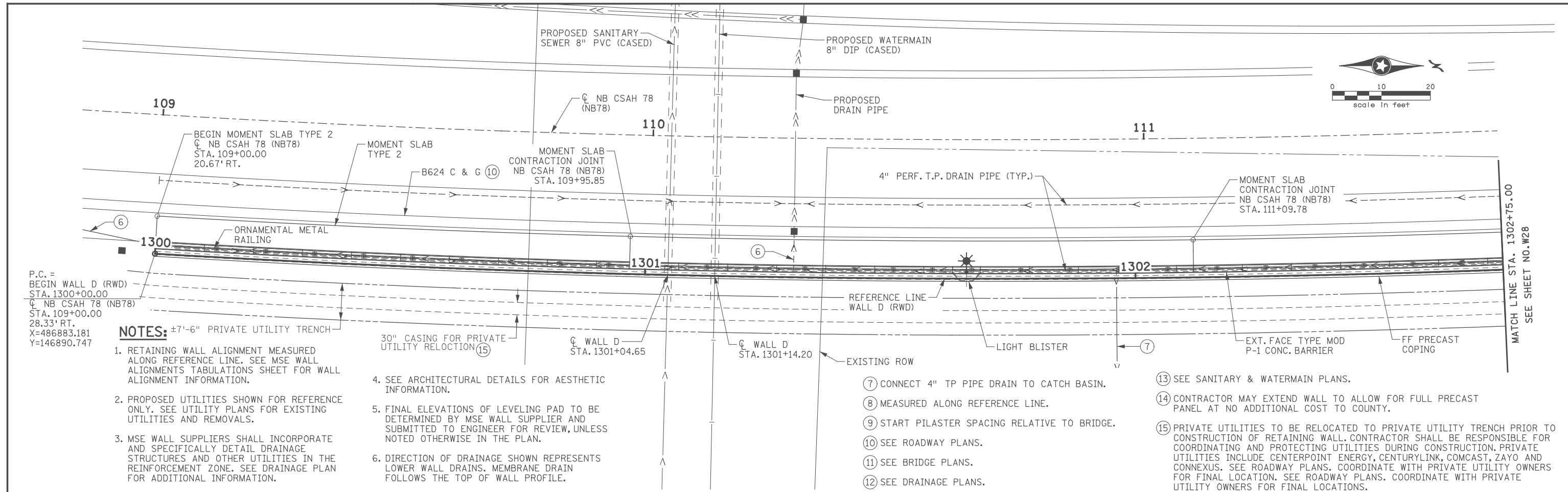
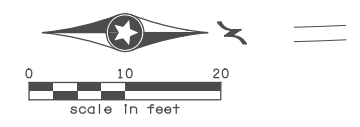
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 Print Name: CASEY E. BLACK
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 Date 11/01/2017 License # 49163

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 BRIDGE NO. _____
 COMM. NO. 0169140

DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
 ENGINEERS
 PLANNERS
 DESIGNERS
SRF
 Consulting Group, Inc.

ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 RETAINING WALL D TYPICAL SECTION & QUANTITIES

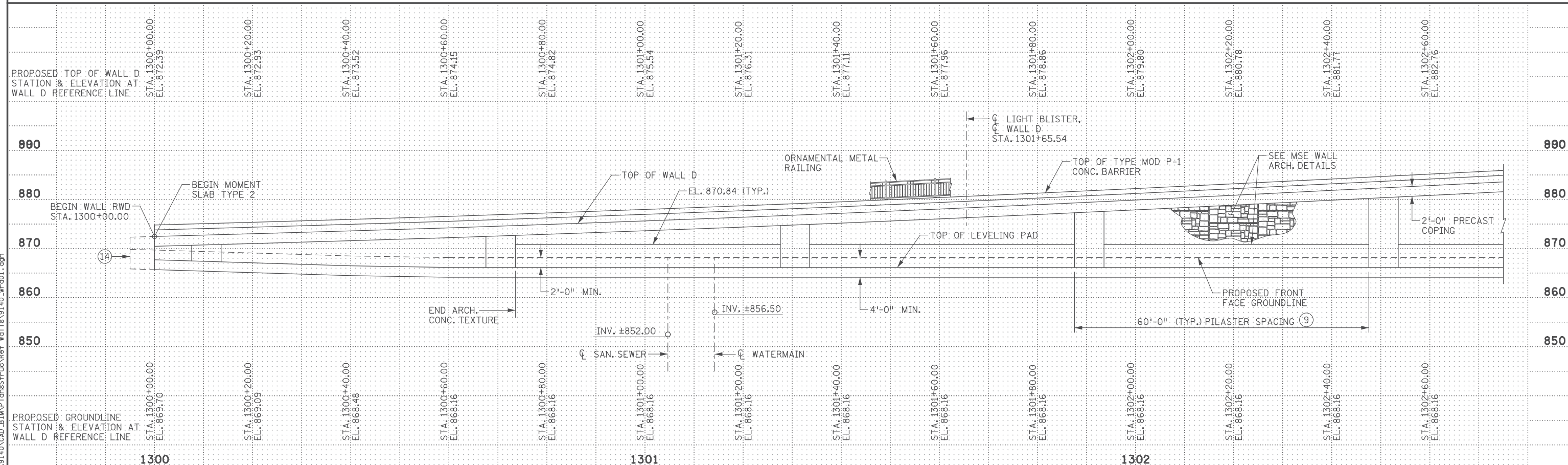
SHEET
 W26
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 W36



P.C. =
 BEGIN WALL D (RWD)
 STA. 1300+00.00
 C NB CSAH 78 (NB78)
 STA. 109+00.00
 28.33' RT.
 X=486883.181
 Y=146890.747

NOTES:

- 1. RETAINING WALL ALIGNMENT MEASURED ALONG REFERENCE LINE. SEE MSE WALL ALIGNMENTS TABULATIONS SHEET FOR WALL ALIGNMENT INFORMATION.
- 2. PROPOSED UTILITIES SHOWN FOR REFERENCE ONLY. SEE UTILITY PLANS FOR EXISTING UTILITIES AND REMOVALS.
- 3. MSE WALL SUPPLIERS SHALL INCORPORATE AND SPECIFICALLY DETAIL DRAINAGE STRUCTURES AND OTHER UTILITIES IN THE REINFORCEMENT ZONE. SEE DRAINAGE PLAN FOR ADDITIONAL INFORMATION.
- 4. SEE ARCHITECTURAL DETAILS FOR AESTHETIC INFORMATION.
- 5. FINAL ELEVATIONS OF LEVELING PAD TO BE DETERMINED BY MSE WALL SUPPLIER AND SUBMITTED TO ENGINEER FOR REVIEW, UNLESS NOTED OTHERWISE IN THE PLAN.
- 6. DIRECTION OF DRAINAGE SHOWN REPRESENTS LOWER WALL DRAINS. MEMBRANE DRAIN FOLLOWS THE TOP OF WALL PROFILE.
- 7. CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
- 8. MEASURED ALONG REFERENCE LINE.
- 9. START PILASTER SPACING RELATIVE TO BRIDGE.
- 10. SEE ROADWAY PLANS.
- 11. SEE BRIDGE PLANS.
- 12. SEE DRAINAGE PLANS.
- 13. SEE SANITARY & WATERMAIN PLANS.
- 14. CONTRACTOR MAY EXTEND WALL TO ALLOW FOR FULL PRECAST PANEL AT NO ADDITIONAL COST TO COUNTY.
- 15. PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY TRENCH PRIOR TO CONSTRUCTION OF RETAINING WALL. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATION. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.



11/01/2017	RELEASED FOR CONSTRUCTION				
NO	DATE	BY	CKD	APPR	REVISION
...

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: CASEY E. BLACK
Casey E. Black
 Date 11/01/2017 License # 49163

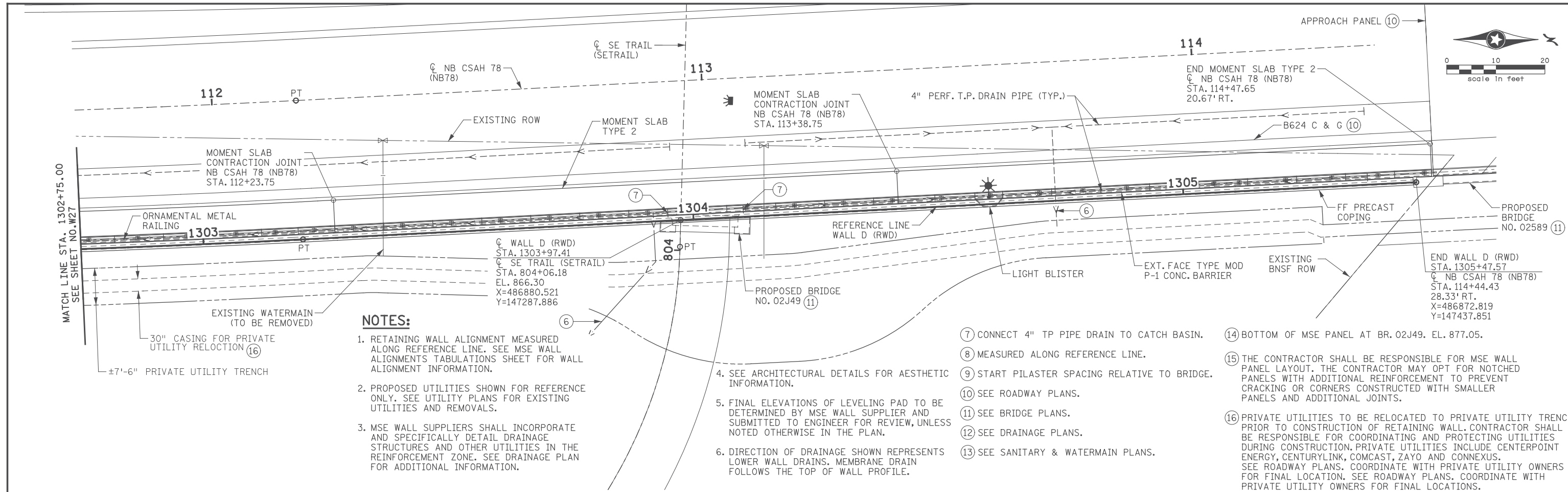
STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO. _____
 COMM. NO. 0169140

SRF
 Consulting Group, Inc.
 ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 RETAINING WALL D PLAN & PROFILE (SHEET 1 OF 2)

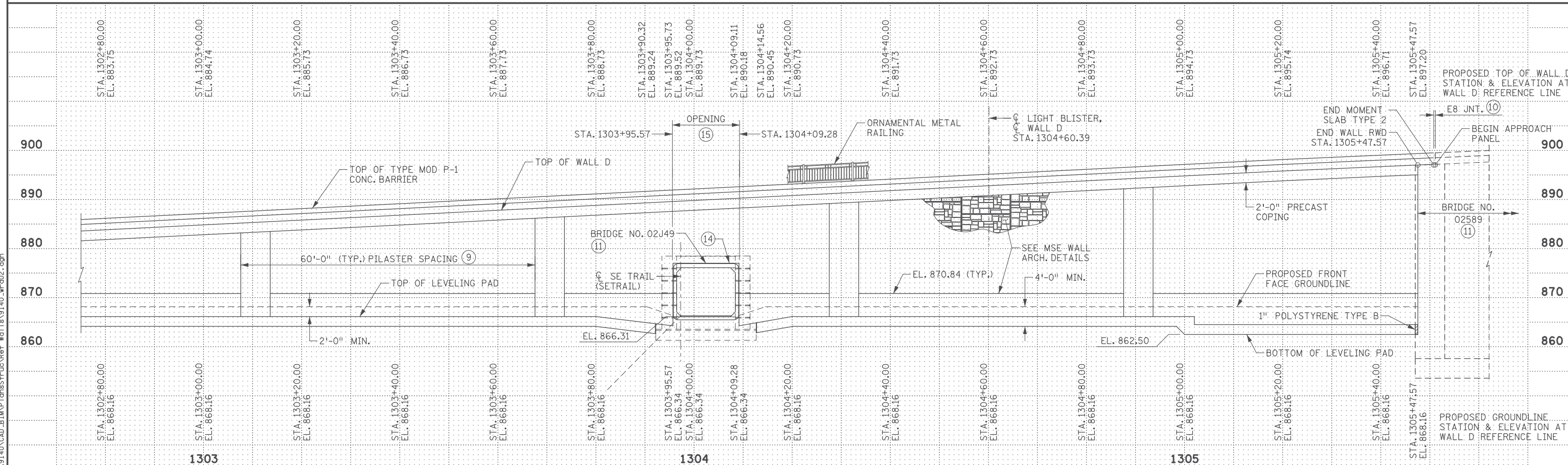
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W27
OF
W36

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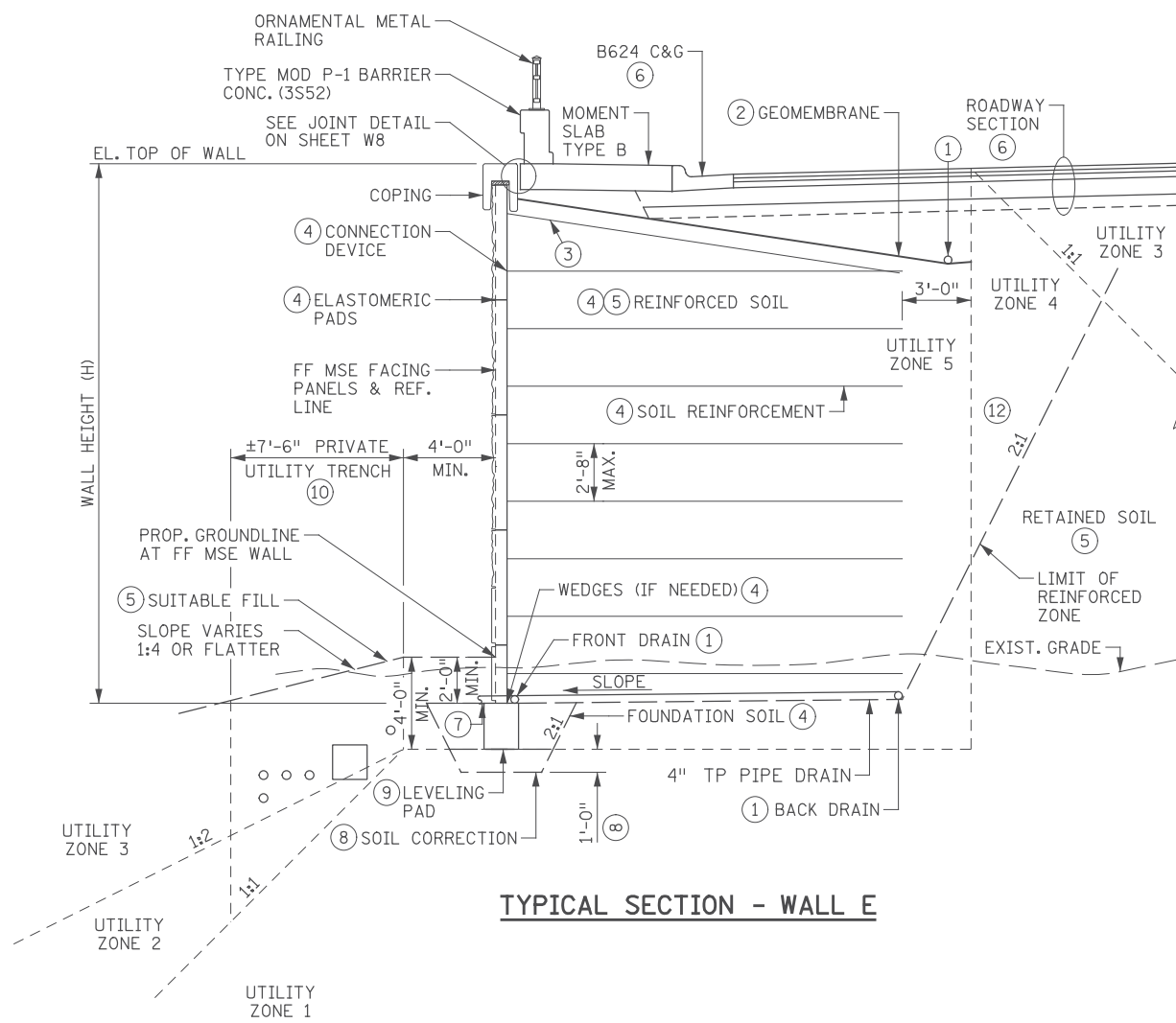
NOTES:

1. RETAINING WALL ALIGNMENT MEASURED ALONG REFERENCE LINE. SEE MSE WALL ALIGNMENTS TABULATIONS SHEET FOR WALL ALIGNMENT INFORMATION.
2. PROPOSED UTILITIES SHOWN FOR REFERENCE ONLY. SEE UTILITY PLANS FOR EXISTING UTILITIES AND REMOVALS.
3. MSE WALL SUPPLIERS SHALL INCORPORATE AND SPECIFICALLY DETAIL DRAINAGE STRUCTURES AND OTHER UTILITIES IN THE REINFORCEMENT ZONE. SEE DRAINAGE PLAN FOR ADDITIONAL INFORMATION.
4. SEE ARCHITECTURAL DETAILS FOR AESTHETIC INFORMATION.
5. FINAL ELEVATIONS OF LEVELING PAD TO BE DETERMINED BY MSE WALL SUPPLIER AND SUBMITTED TO ENGINEER FOR REVIEW, UNLESS NOTED OTHERWISE IN THE PLAN.
6. DIRECTION OF DRAINAGE SHOWN REPRESENTS LOWER WALL DRAINS. MEMBRANE DRAIN FOLLOWS THE TOP OF WALL PROFILE.
7. CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
8. MEASURED ALONG REFERENCE LINE.
9. START PILASTER SPACING RELATIVE TO BRIDGE.
10. SEE ROADWAY PLANS.
11. SEE BRIDGE PLANS.
12. SEE DRAINAGE PLANS.
13. SEE SANITARY & WATERMAIN PLANS.
14. BOTTOM OF MSE PANEL AT BR. 02J49. EL. 877.05.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MSE WALL PANEL LAYOUT. THE CONTRACTOR MAY OPT FOR NOTCHED PANELS WITH ADDITIONAL REINFORCEMENT TO PREVENT CRACKING OR CORNERS CONSTRUCTED WITH SMALLER PANELS AND ADDITIONAL JOINTS.
16. PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY TRENCH PRIOR TO CONSTRUCTION OF RETAINING WALL. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATION. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.

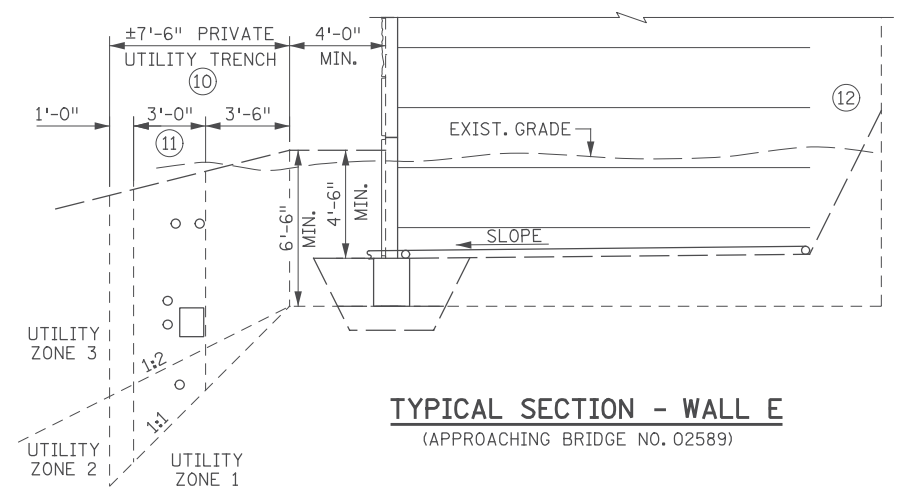


11/01/2017 RELEASED FOR CONSTRUCTION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: CASEY E. BLACK <i>Casey E. Black</i> Date: 11/01/2017 License #: 49163	STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051 BRIDGE NO.	DRAWN BY E. JOHNSON DESIGNED BY A. BEHNKE CHECKED BY C. BLACK COMM. NO. 0169140	 ENGINEERS PLANNERS DESIGNERS	ANOKA COUNTY MSE RETAINING WALL PLANS CSAH 78 - BNSF GRADE SEPARATION RETAINING WALL D PLAN & PROFILE (SHEET 2 OF 2)	SHEET W28 OF W36
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TYPICAL SECTION - WALL E



TYPICAL SECTION - WALL E
(APPROACHING BRIDGE NO. 02589)

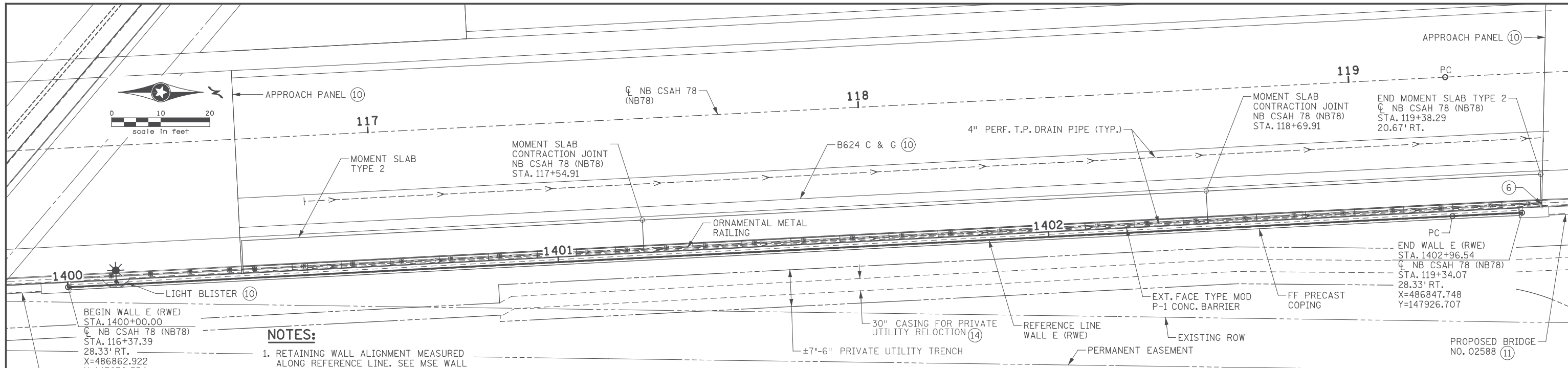
NOTES:

- ① 4" PERF TP PIPE DRAIN PER SPEC. 3245. WRAP WITH GEOTEXTILE, TYPE 1 PER SPEC. 3733.
- ② IMPERVIOUS LAYER (GEOMEMBRANE). PROVIDE CONNECTION DETAILS TO THE PRECAST COPING IN SHOP PLANS FOR REVIEW AND APPROVAL.
- ③ TOP LAYER OF SOIL REINFORCEMENT SLOPE TO MATCH GEOMEMBRANE TO A MAXIMUM OF 15 DEGREES FROM HORIZONTAL.
- ④ SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- ⑤ SEE GRADING PLANS.
- ⑥ SEE ROADWAY PLANS.
- ⑦ DAYLIGHT OUTLET PIPE DRAIN OR CONNECT TO NEAR BY STRUCTURE. SEE RETAINING WALL PLAN AND PROFILE SHEETS FOR RETAINING WALL DRAINAGE SYSTEM ROUTING. CORE DRAINAGE STRUCTURES AND GROUT PIPE DRAIN INTO STRUCTURE. WORK TO CORE AND GROUT PIPE DRAINS INTO DRAINAGE STRUCTURES SHALL BE INCIDENTAL. SEE DRAINAGE PLANS FOR DRAINAGE STRUCTURE INFORMATION.
- ⑧ GEOTECHNICAL REPORT FOR MSE WALLS INDICATES AREAS WHERE SUBCUTS AND SOIL CORRECTIONS FOR WALL CONSTRUCTION MAY VARY FROM 1'-0" TO 6'-0" FROM EXISTING GRADE WHERE NECESSARY AS DETERMINED BY THE GEOTECHNICAL ENGINEER IN THE FIELD UPON REVIEW OF EXCAVATIONS. THIS PLAN ASSUMES A UNIFORM 1'-0" DEEP SOIL CORRECTION WILL BE NECESSARY ALONG THE ENTIRE LENGTH OF THE WALL. THE PAY LIMIT FOR SOIL CORRECTIONS IS ESTABLISHED IN THE WALL TYPICAL SECTION AND QUANTITIES ARE BASED ON THIS LIMIT. ACTUAL LIMITS MAY VARY AS DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER. ADDITIONAL MATERIAL REQUIRED FOR SOIL CORRECTIONS SHALL BE INCIDENTAL. SUBCUTS SHALL BE BACKFILLED WITH GRANULAR EMBANKMENT PER SPEC. 3149.2.B.1.
- ⑨ LEVELING PAD SHALL BE CONSTRUCTED OF CONCRETE PER SPEC. 2461, MIX NUMBER 1G52.
- ⑩ PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY TRENCH PRIOR TO CONSTRUCTION OF RETAINING WALL. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATION. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.
- ⑪ UTILITIES TRANSITION IN DEPTH AND LOCATION TO ENTER CASING NEAR BRIDGE NUMBER 02589. SEE BRIDGE PLANS FOR UTILITY PROTECTION REQUIREMENTS FOR EXCAVATION. 30" DIAMETER STEEL CASING WILL BEGIN PRIOR TO THE BEGINNING OF WALL AND CONTINUE TO APPROXIMATE STATION 1400+87.61. UTILITIES LOCATED IN THE CASING ARE ANTICIPATED TO INCLUDE CENTURYLINK, COMCAST AND ZAYO.
- ⑫ ALL EXCAVATION REQUIRED PAID FOR AS "EXCAVATION - STRUCTURE CLASS U", SEE GRADING PLANS.

SUMMARY OF QUANTITIES : RETAINING WALL E		
ITEM	UNIT	QUANTITY
GRANULAR EMBANKMENT (CV)	CU YD	132
STRUCTURAL CONCRETE (3B52)	CU YD	73
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	265
REINFORCEMENT BARS (EPOXY COATED)	POUND	17520
ORNAMENTAL METAL RAILING	LIN FT	303
MECHANICALLY STABILIZED EARTH WALL	SQ YD	1044
ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ FT	6560
ARCHITECTURAL CONCRETE TEXTURE (ASHLAR STONE)	SQ FT	6560
ANTI-GRAFFITI COATING	SQ FT	1775
SPECIAL SURFACE FINISH	SQ FT	3355
4" TP PIPE DRAIN	LIN FT	100
4" PERF TP PIPE DRAIN	LIN FT	981
CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	0.1
SIGN TYPE C (BRIDGE MOUNTED)	EACH	0

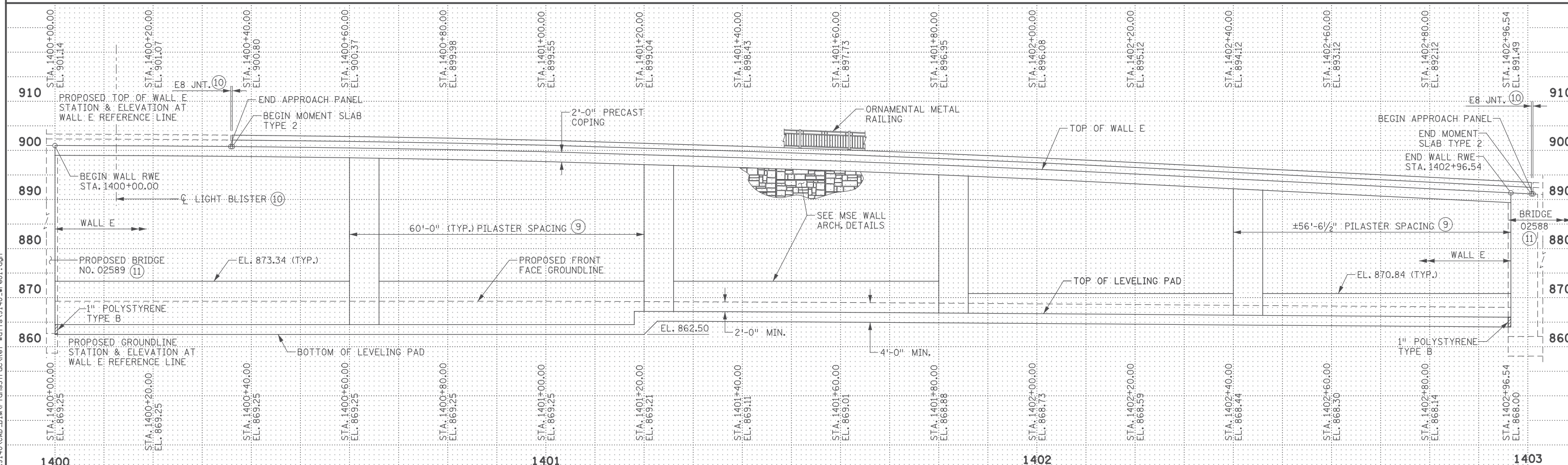
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NO	DATE	BY	CKD	APPR	REVISION													



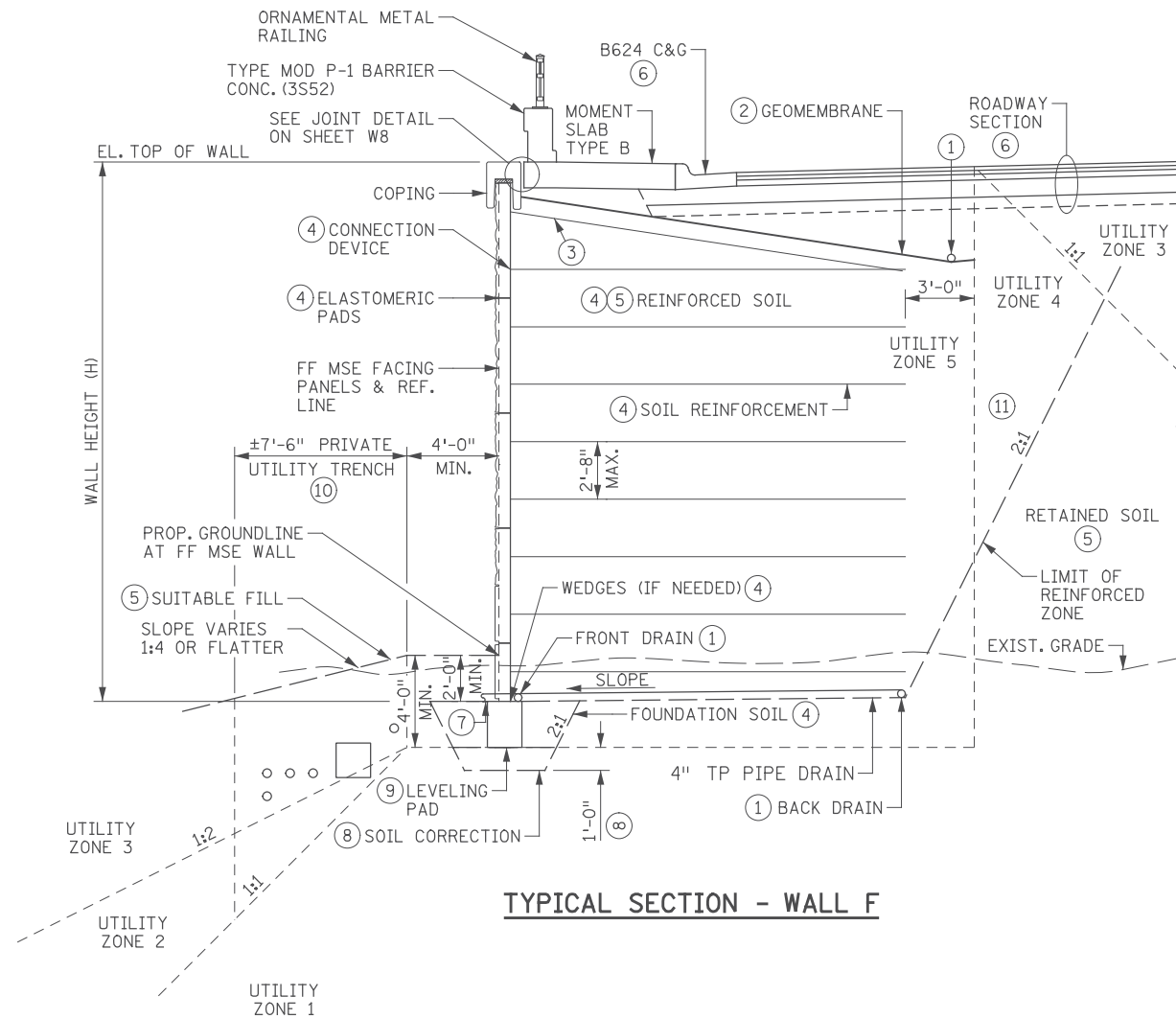
NOTES:

- RETAINING WALL ALIGNMENT MEASURED ALONG REFERENCE LINE. SEE MSE WALL ALIGNMENTS TABULATIONS SHEET FOR WALL ALIGNMENT INFORMATION.
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- MSE WALL SUPPLIERS SHALL INCORPORATE AND SPECIFICALLY DETAIL DRAINAGE STRUCTURES AND OTHER UTILITIES IN THE REINFORCEMENT ZONE. SEE DRAINAGE PLAN FOR ADDITIONAL INFORMATION.
- SEE ARCHITECTURAL DETAILS FOR AESTHETIC INFORMATION.
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- CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
- MEASURED ALONG REFERENCE LINE.
- START PILASTER SPACING RELATIVE TO BRIDGE.
- SEE ROADWAY PLANS.
- SEE BRIDGE PLANS.
- SEE DRAINAGE PLANS.
- SEE SANITARY & WATERMAIN PLANS.
- PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY TRENCH PRIOR TO CONSTRUCTION OF RETAINING WALL. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATION. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.



11/01/2017 NO DATE BY CKD APPR ...Ret Wall's\9140_wre01.dgn	RELEASED FOR CONSTRUCTION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: <u>CASEY E. BLACK</u> <i>Casey E. Black</i> Date <u>11/01/2017</u> License # <u>49163</u>	STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051 BRIDGE NO.	DRAWN BY E. JOHNSON DESIGNED BY A. BEHNKE CHECKED BY C. BLACK COMM. NO. 0169140	SRF Consulting Group, Inc.	ENGINEERS PLANNERS DESIGNERS	ANOKA COUNTY MSE RETAINING WALL PLANS CSAH 78 - BNSF GRADE SEPARATION RETAINING WALL E PLAN & PROFILE	SHEET W30 OF W36
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TYPICAL SECTION - WALL F

NOTES:

- ① 4" PERF TP PIPE DRAIN PER SPEC. 3245. WRAP WITH GEOTEXTILE, TYPE 1 PER SPEC. 3733.
- ② IMPERVIOUS LAYER (GEOMEMBRANE). PROVIDE CONNECTION DETAILS TO THE PRECAST COPING IN SHOP PLANS FOR REVIEW AND APPROVAL.
- ③ TOP LAYER OF SOIL REINFORCEMENT SLOPE TO MATCH GEOMEMBRANE TO A MAXIMUM OF 15 DEGREES FROM HORIZONTAL.
- ④ SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- ⑤ SEE GRADING PLANS.
- ⑥ SEE ROADWAY PLANS.
- ⑦ DAYLIGHT OUTLET PIPE DRAIN OR CONNECT TO NEAR BY STRUCTURE. SEE RETAINING WALL PLAN AND PROFILE SHEETS FOR RETAINING WALL DRAINAGE SYSTEM ROUTING. CORE DRAINAGE STRUCTURES AND GROUT PIPE DRAIN INTO STRUCTURE. WORK TO CORE AND GROUT PIPE DRAINS INTO DRAINAGE STRUCTURES SHALL BE INCIDENTAL. SEE DRAINAGE PLANS FOR DRAINAGE STRUCTURE INFORMATION.
- ⑧ GEOTECHNICAL REPORT FOR MSE WALLS INDICATES AREAS WHERE SUBCUTS AND SOIL CORRECTIONS FOR WALL CONSTRUCTION MAY VARY FROM 1'-0" TO 6'-0" FROM EXISTING GRADE WHERE NECESSARY AS DETERMINED BY THE GEOTECHNICAL ENGINEER IN THE FIELD UPON REVIEW OF EXCAVATIONS. THIS PLAN ASSUMES A UNIFORM 1'-0" DEEP SOIL CORRECTION WILL BE NECESSARY ALONG THE ENTIRE LENGTH OF THE WALL. THE PAY LIMIT FOR SOIL CORRECTIONS IS ESTABLISHED IN THE WALL TYPICAL SECTION AND QUANTITIES ARE BASED ON THIS LIMIT. ACTUAL LIMITS MAY VARY AS DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER. ADDITIONAL MATERIAL REQUIRED FOR SOIL CORRECTIONS SHALL BE INCIDENTAL. SUBCUTS SHALL BE BACKFILLED WITH GRANULAR EMBANKMENT PER SPEC. 3149.2.B.1.
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- ⑪ ALL EXCAVATION REQUIRED PAID FOR AS "EXCAVATION - STRUCTURE CLASS U", SEE GRADING PLANS.

SUMMARY OF QUANTITIES : RETAINING WALL F

ITEM	UNIT	QUANTITY
GRANULAR EMBANKMENT (CV)	CU YD	103
STRUCTURAL CONCRETE (3B52)	CU YD	65
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	235
REINFORCEMENT BARS (EPOXY COATED)	POUND	16440
ORNAMENTAL METAL RAILING	LIN FT	235
MECHANICALLY STABILIZED EARTH WALL	SQ YD	348
ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ FT	1413
ARCHITECTURAL CONCRETE TEXTURE (ASHLAR STONE)	SQ FT	1413
ANTI-GRAFFITI COATING	SQ FT	1023
SPECIAL SURFACE FINISH	SQ FT	2363
4" TP PIPE DRAIN	LIN FT	100
4" PERF TP PIPE DRAIN	LIN FT	789
CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	0.1
SIGN TYPE C (BRIDGE MOUNTED)	EACH	1

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11/01/2017				RELEASED FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR
REVISION				
...Ret Wall\9140_wrf.dgn				

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Print Name: CASEY E. BLACK

Casey E. Black

Date 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
MSE RETAINING WALL PLANS
CSAH 78 - BNSF GRADE SEPARATION
RETAINING WALL F TYPICAL SECTION & QUANTITIES

SHEET
W31
OF
W36



BEGIN MOMENT SLAB TYPE 2
 C NB CSAH 78 (NB78)
 STA. 120+55.88
 20.67' RT.

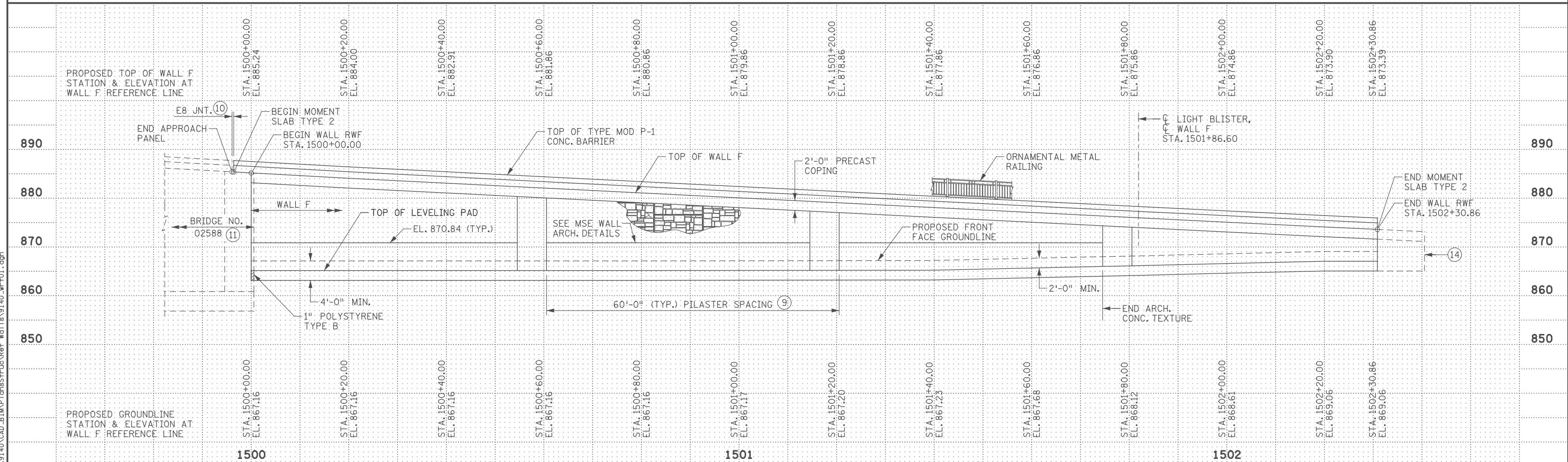
END MOMENT SLAB TYPE 2
 C NB CSAH 78 (NB78)
 STA. 122+90.82
 25.67' RT.

BEGIN WALL F (RWF)
 STA. 1500+00.00
 C NB CSAH 78 (NB78)
 STA. 120+59.50
 28.33' RT.
 X=486844.717
 Y=148050.850

END WALL F (RWF)
 STA. 1502+30.86
 C NB CSAH 78 (NB78)
 STA. 122+90.82
 33.33' RT.
 X=486853.815
 Y=148281.343

NOTES:

1. RETAINING WALL ALIGNMENT MEASURED ALONG REFERENCE LINE. SEE MSE WALL ALIGNMENTS TABULATIONS SHEET FOR WALL ALIGNMENT INFORMATION.
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7. CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
8. MEASURED ALONG REFERENCE LINE.
9. START PILASTER SPACING RELATIVE TO BRIDGE.
10. SEE ROADWAY PLANS.
11. SEE BRIDGE PLANS.
12. SEE DRAINAGE PLANS.
13. SEE SANITARY & WATERMAIN PLANS.
14. CONTRACTOR MAY EXTEND WALL TO ALLOW FOR FULL PRECAST PANEL AT NO ADDITIONAL COST TO COUNTY.
15. PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY TRENCH PRIOR TO CONSTRUCTION OF RETAINING WALL. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATION. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.



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 Print Name: CASEY E. BLACK
Casey E. Black
 Date 11/01/2017 License # 49163

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 BRIDGE NO. _____
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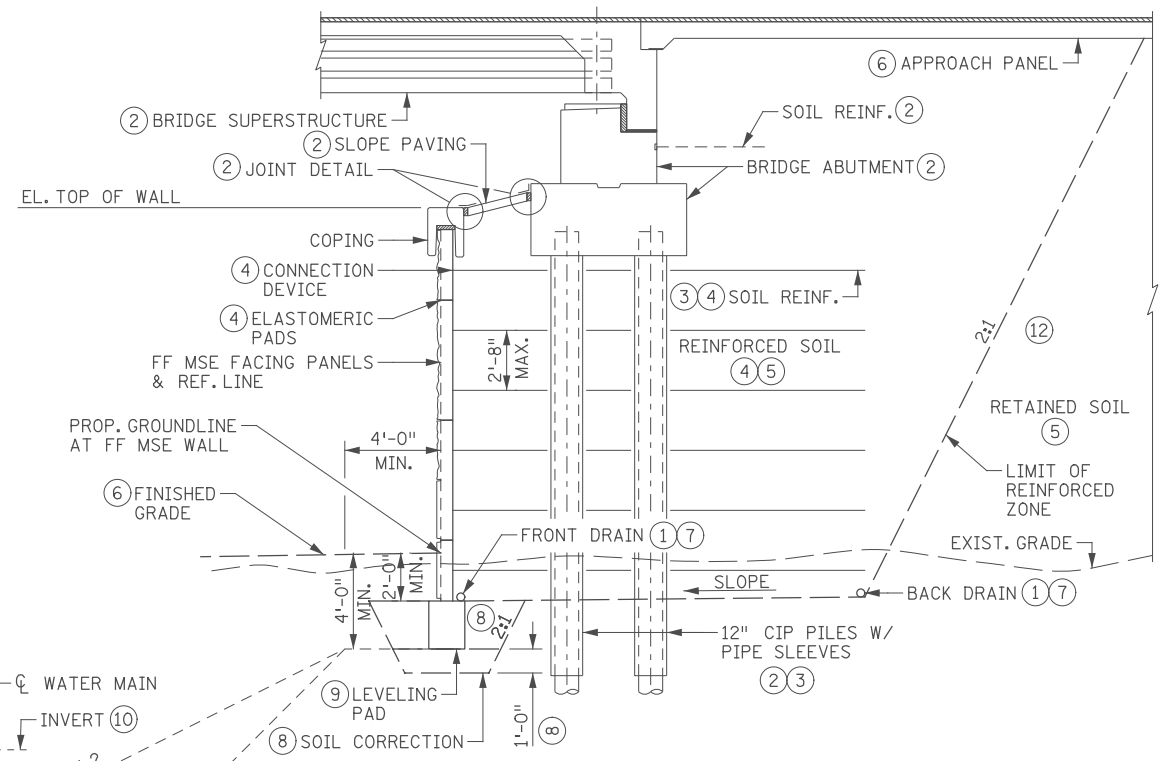
DRAWN BY
 E. JOHNSON
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
 ENGINEERS
 PLANNERS
 DESIGNERS



ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 RETAINING WALL F PLAN & PROFILE

SHEET
 W32
 OF
 W36

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TYPICAL SECTION - WALL G

NOTES:

- ① 4" PERF TP PIPE DRAIN PER SPEC. 3245. WRAP WITH GEOTEXTILE, TYPE 1 PER SPEC. 3733.
- ② SEE BRIDGE NUMBER 02588 PLANS.
- ③ PLACE SOIL REINFORCEMENT BETWEEN AND AROUND BRIDGE PIPE SLEEVES.
- ④ SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- ⑤ SEE GRADING PLANS.
- ⑥ SEE ROADWAY PLANS.
- ⑦ SEE RETAINING WALL PLAN AND PROFILE SHEETS FOR RETAINING WALL DRAINAGE SYSTEM ROUTING.
- ⑧ GEOTECHNICAL REPORT FOR MSE WALLS INDICATES AREAS WHERE SUBCUTS AND SOIL CORRECTIONS FOR WALL CONSTRUCTION MAY VARY FROM 1'-0" TO 6'-0" FROM EXISTING GRADE WHERE NECESSARY AS DETERMINED BY THE GEOTECHNICAL ENGINEER IN THE FIELD UPON REVIEW OF EXCAVATIONS. THIS PLAN ASSUMES A UNIFORM 1'-0" DEEP SOIL CORRECTION WILL BE NECESSARY ALONG THE ENTIRE LENGTH OF THE WALL. THE PAY LIMIT FOR SOIL CORRECTIONS IS ESTABLISHED IN THE WALL TYPICAL SECTION AND QUANTITIES ARE BASED ON THIS LIMIT. ACTUAL LIMITS MAY VARY AS DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER. ADDITIONAL MATERIAL REQUIRED FOR SOIL CORRECTIONS SHALL BE INCIDENTAL. SUBCUTS SHALL BE BACKFILLED WITH GRANULAR EMBANKMENT PER SPEC. 3149.2.B.1.
- ⑨ LEVELING PAD SHALL BE CONSTRUCTED OF CONCRETE PER SPEC. 2461, MIX NUMBER 1G52.
- ⑩ WATER MAIN, SEE PROPOSED SANITARY AND WATER MAIN PLANS:
 WM LOCATION ALONG WALL:
 LOCATION: BEGIN WALL END WALL
 STA. 1700+00.000 (RWG) 1700+94.443 (RWG)
 MIN. OFFSET: 19.79' RT (TO WM) 21.97' RT (TO WM)
 FF GRADE: ±867.64 ±867.37
 INV. EL. 859.44 859.30
 ZONE 2&3 BOUNDARY EL: 855.75 854.39
 UTILITY ZONE: 3 3
- ⑪ CASED SANITARY SEWER, SEE PROPOSED SANITARY AND WATER MAIN PLANS:
 SANITARY SEWER LOCATION ALONG WALL:
 LOCATION: BEGIN WALL END WALL
 STA. 1700+00.000 (RWG) 1700+94.443 (RWG)
 MIN. OFFSET: 29.97' RT (TO SAN) 31.97' RT (TO SAN)
 FF GRADE: ±867.64 ±867.37
 INV. EL. 848.10 847.65
 ZONE 1&2 BOUNDARY EL: 837.85 835.40
 UTILITY ZONE: 2 2
- ⑫ ALL EXCAVATION REQUIRED PAID FOR AS "EXCAVATION - STRUCTURE CLASS U", SEE GRADING PLANS.

SUMMARY OF QUANTITIES : RETAINING WALL G

ITEM	UNIT	QUANTITY
GRANULAR EMBANKMENT (CV)	CU YD	42
STRUCTURAL CONCRETE (3B52)	CU YD	0
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	0
REINFORCEMENT BARS (EPOXY COATED)	POUND	0
ORNAMENTAL METAL RAILING	LIN FT	0
MECHANICALLY STABILIZED EARTH WALL	SQ YD	172
ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ FT	880
ARCHITECTURAL CONCRETE TEXTURE (ASHLAR STONE)	SQ FT	880
ANTI-GRAFFITI COATING	SQ FT	593
SPECIAL SURFACE FINISH	SQ FT	926
4" TP PIPE DRAIN	LIN FT	200
4" PERF TP PIPE DRAIN	LIN FT	189
CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	0.0
SIGN TYPE C (BRIDGE MOUNTED)	EACH	0

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NO	DATE	BY	CKD	APPR

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: CASEY E. BLACK
Casey E. Black
 Date 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

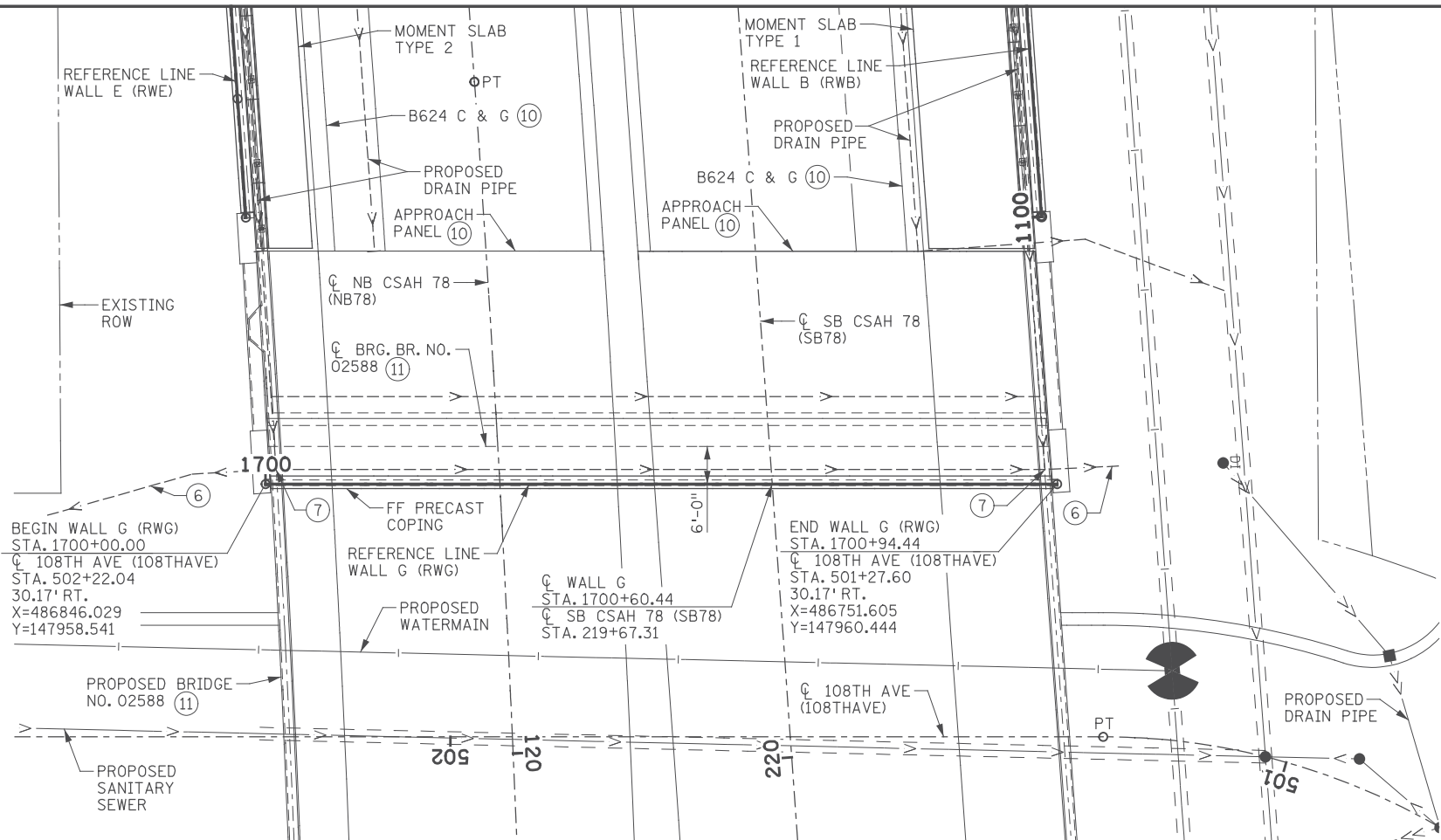
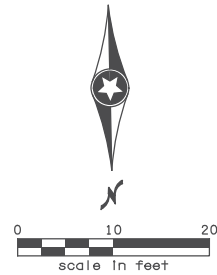
BRIDGE NO. _____

COMM. NO. 0169140



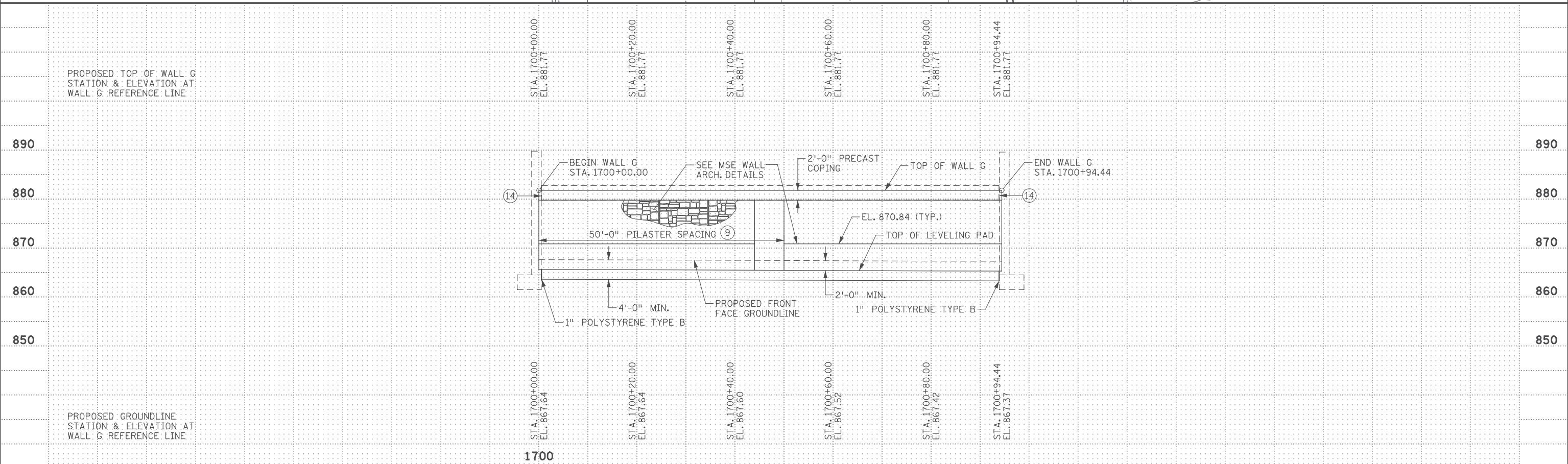
ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 RETAINING WALL G TYPICAL SECTION & QUANTITIES

SHEET
 W33
 OF
 W36



NOTES:

1. RETAINING WALL ALIGNMENT MEASURED ALONG REFERENCE LINE. SEE MSE WALL ALIGNMENTS TABULATIONS SHEET FOR WALL ALIGNMENT INFORMATION.
2. PROPOSED UTILITIES SHOWN FOR REFERENCE ONLY. SEE UTILITY PLANS FOR EXISTING UTILITIES AND REMOVALS.
3. MSE WALL SUPPLIERS SHALL INCORPORATE AND SPECIFICALLY DETAIL DRAINAGE STRUCTURES AND OTHER UTILITIES IN THE REINFORCEMENT ZONE. SEE DRAINAGE PLAN FOR ADDITIONAL INFORMATION.
4. SEE ARCHITECTURAL DETAILS FOR AESTHETIC INFORMATION.
5. FINAL ELEVATIONS OF LEVELING PAD TO BE DETERMINED BY MSE WALL SUPPLIER AND SUBMITTED TO ENGINEER FOR REVIEW, UNLESS NOTED OTHERWISE IN THE PLAN.
6. DIRECTION OF DRAINAGE SHOWN REPRESENTS LOWER WALL DRAINS. MEMBRANE DRAIN FOLLOWS THE TOP OF WALL PROFILE.
7. CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
8. MEASURED ALONG REFERENCE LINE.
9. START PILASTER SPACING RELATIVE TO BRIDGE.
10. SEE ROADWAY PLANS.
11. SEE BRIDGE PLANS.
12. SEE DRAINAGE PLANS.
13. SEE SANITARY & WATERMAIN PLANS.
14. PLACE 1" POLYSTYRENE TYPE B BETWEEN C-I-P LEVELING PAD AND BRIDGE 02588 C-I-P WINGWALL FOOTINGS.



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REVISION			

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Print Name: CASEY E. BLACK

Casey E. Black

Date: 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO. _____

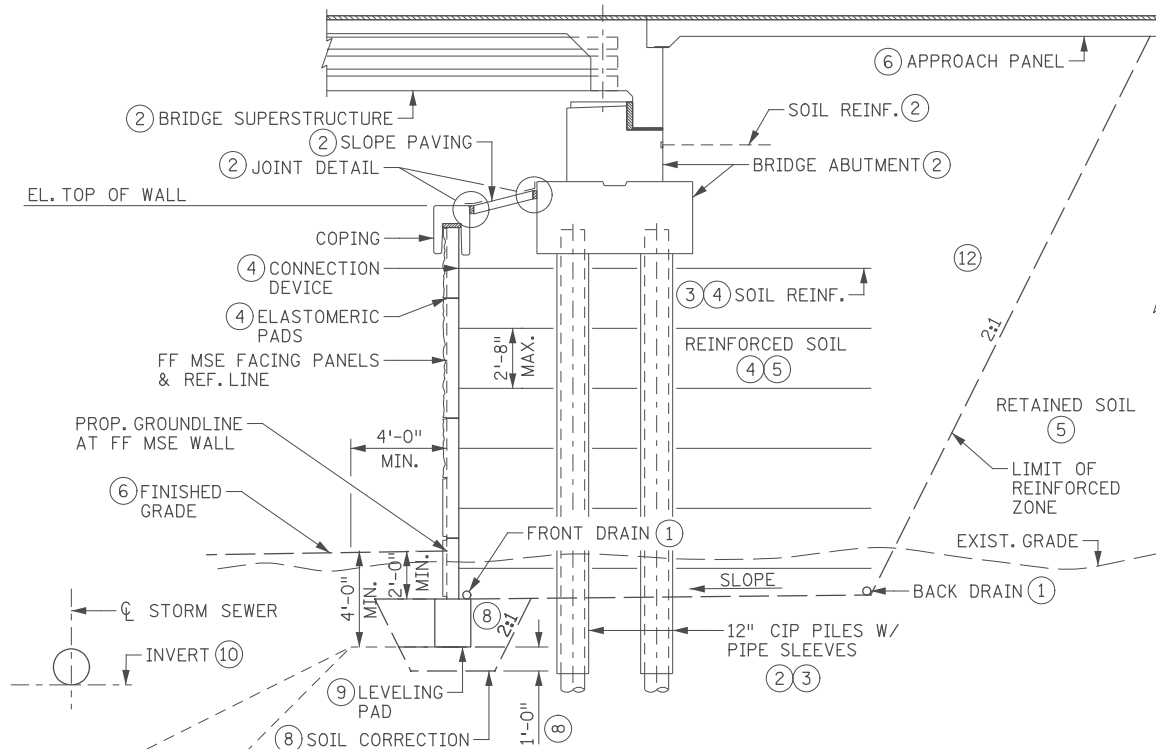
COMM. NO. 0169140

DRAWN BY E. JOHNSON
DESIGNED BY A. BEHNKE
CHECKED BY C. BLACK

ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
MSE RETAINING WALL PLANS
CSAH 78 - BNSF GRADE SEPARATION
RETAINING WALL G PLAN & PROFILE

SHEET
W34
OF
W36



TYPICAL SECTION - WALL H

NOTES:

- ① 4" PERF TP PIPE DRAIN PER SPEC. 3245. WRAP WITH GEOTEXTILE, TYPE 1 PER SPEC. 3733.
- ② SEE BRIDGE NUMBER 02588 PLANS.
- ③ PLACE SOIL REINFORCEMENT BETWEEN AND AROUND BRIDGE PIPE SLEEVES.
- ④ SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
- ⑤ SEE GRADING PLANS.
- ⑥ SEE ROADWAY PLANS.
- ⑦ SEE RETAINING WALL PLAN AND PROFILE SHEETS FOR RETAINING WALL DRAINAGE SYSTEM ROUTING.
- ⑧ GEOTECHNICAL REPORT FOR MSE WALLS INDICATES AREAS WHERE SUBCUTS AND SOIL CORRECTIONS FOR WALL CONSTRUCTION MAY VARY FROM 1'-0" TO 6'-0" FROM EXISTING GRADE WHERE NECESSARY AS DETERMINED BY THE GEOTECHNICAL ENGINEER IN THE FIELD UPON REVIEW OF EXCAVATIONS. THIS PLAN ASSUMES A UNIFORM 1'-0" DEEP SOIL CORRECTION WILL BE NECESSARY ALONG THE ENTIRE LENGTH OF THE WALL. THE PAY LIMIT FOR SOIL CORRECTIONS IS ESTABLISHED IN THE WALL TYPICAL SECTION AND QUANTITIES ARE BASED ON THIS LIMIT. ACTUAL LIMITS MAY VARY AS DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER. ADDITIONAL MATERIAL REQUIRED FOR SOIL CORRECTIONS SHALL BE INCIDENTAL. SUBCUTS SHALL BE BACKFILLED WITH GRANULAR EMBANKMENT PER SPEC. 3149.2.B.1.
- ⑨ LEVELING PAD SHALL BE CONSTRUCTED OF CONCRETE PER SPEC. 2461, MIX NUMBER 1052.
- ⑩ STORM SEWER, SEE DRAINAGE PLANS:
 STORM SEWER LOCATION ALONG WALL:

LOCATION:	BEGIN WALL	END WALL
STA.	1600+00.000 (RWH)	1600+96.079 (RWH)
MIN. OFFSET:	15.65' RT (TO SS)	15.95' RT (TO SS)
FF GRADE:	+867.36	+867.64
INV. EL.	861.78	861.11
ZONE 2&3 BOUNDARY EL:	857.54	857.67
UTILITY ZONE:	3	3
- ⑪ CASED SANITARY SEWER, SEE PROPOSED SANITARY AND WATER MAIN PLANS:
 SANITARY SEWER LOCATION ALONG WALL:

LOCATION:	BEGIN WALL	END WALL
STA.	1600+00.000 (RWH)	1600+96.079 (RWH)
MIN. OFFSET:	28.26' RT (TO SAN)	30.48' RT (TO SAN)
FF GRADE:	+867.36	+867.64
INV. EL.	847.65	848.10
ZONE 1&2 BOUNDARY EL:	839.10	837.16
UTILITY ZONE:	2	2
- ⑫ ALL EXCAVATION REQUIRED PAID FOR AS "EXCAVATION - STRUCTURE CLASS U", SEE GRADING PLANS.

SUMMARY OF QUANTITIES : RETAINING WALL H

ITEM	UNIT	QUANTITY
GRANULAR EMBANKMENT (CV)	CU YD	43
STRUCTURAL CONCRETE (3B52)	CU YD	0
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	0
REINFORCEMENT BARS (EPOXY COATED)	POUND	0
ORNAMENTAL METAL RAILING	LIN FT	0
MECHANICALLY STABILIZED EARTH WALL	SQ YD	136
ARCHITECTURAL SURFACE FINISH (SINGLE COLOR)	SQ FT	569
ARCHITECTURAL CONCRETE TEXTURE (ASHLAR STONE)	SQ FT	569
ANTI-GRAFFITI COATING	SQ FT	595
SPECIAL SURFACE FINISH	SQ FT	920
4" TP PIPE DRAIN	LIN FT	200
4" PERF TP PIPE DRAIN	LIN FT	193
CONDUIT SYSTEM (LIGHTING) (WALLS)	LUMP SUM	0.0
SIGN TYPE C (BRIDGE MOUNTED)	EACH	0

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REVISION				
...Ret Wall\9140_wrh.dgn				

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: CASEY E. BLACK
Casey E. Black
 Date: 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140

DRAWN BY
J. HOFFMAN
 DESIGNED BY
A. BEHNKE
 CHECKED BY
C. BLACK

SRE ENGINEERS
 PLANNERS
 DESIGNERS

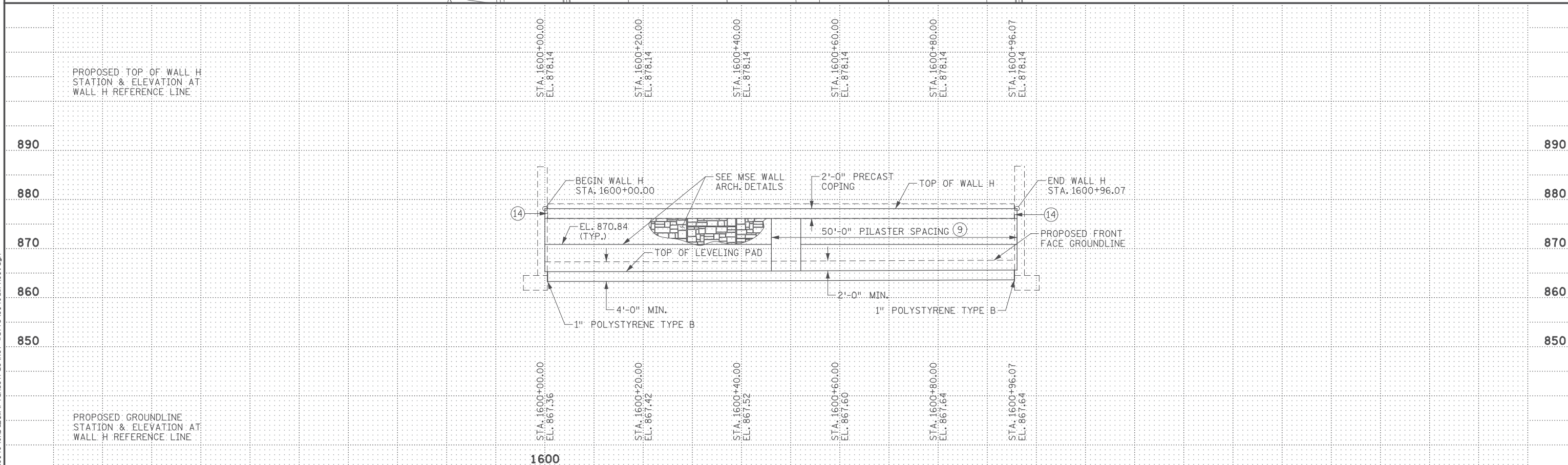
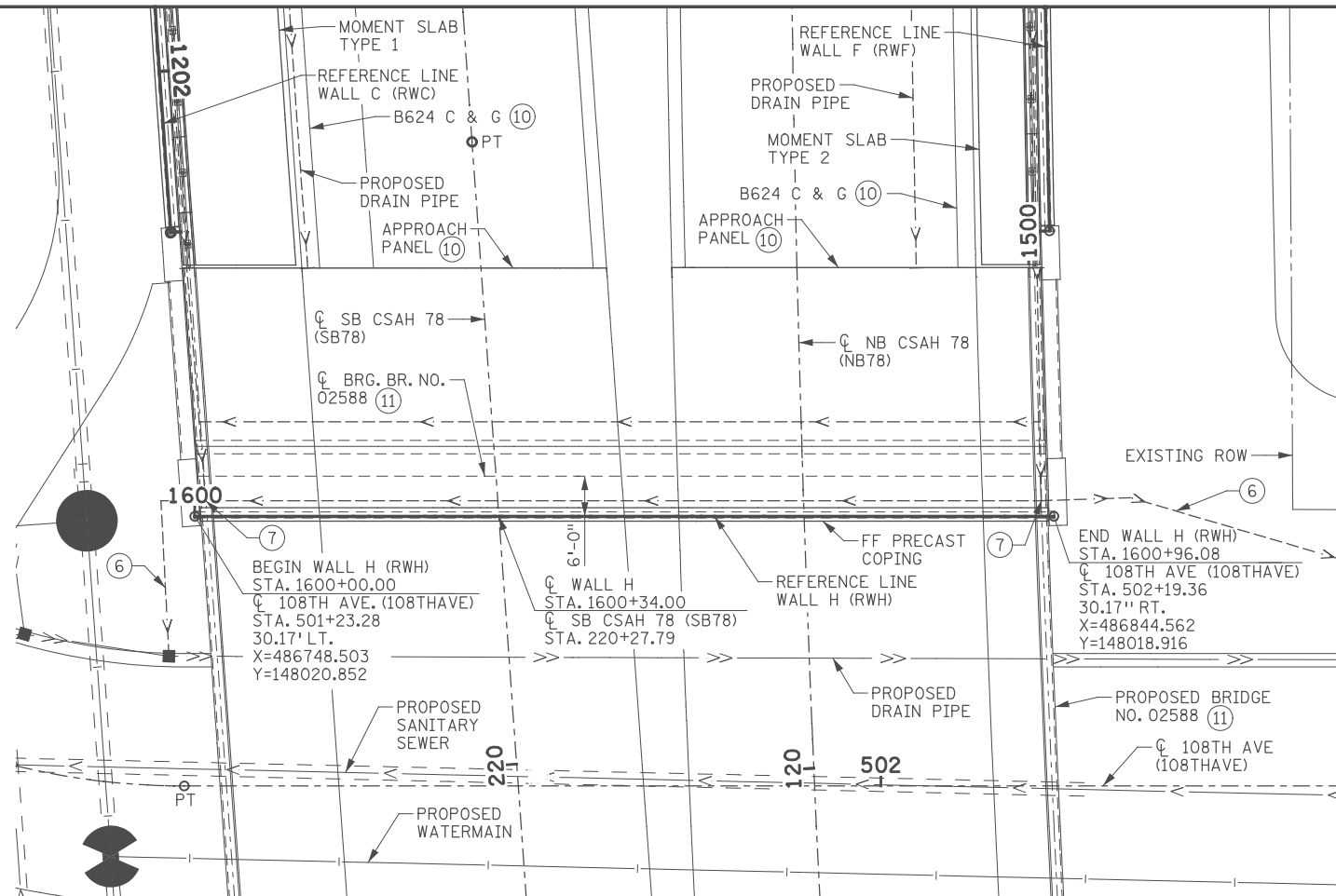
Consulting Group, Inc.

ANOKA COUNTY
 MSE RETAINING WALL PLANS
 CSAH 78 - BNSF GRADE SEPARATION
 RETAINING WALL H TYPICAL SECTION & QUANTITIES

SHEET
W35
 OF
W36

NOTES:

1. RETAINING WALL ALIGNMENT MEASURED ALONG REFERENCE LINE. SEE MSE WALL ALIGNMENTS TABULATIONS SHEET FOR WALL ALIGNMENT INFORMATION.
2. PROPOSED UTILITIES SHOWN FOR REFERENCE ONLY. SEE UTILITY PLANS FOR EXISTING UTILITIES AND REMOVALS.
3. MSE WALL SUPPLIERS SHALL INCORPORATE AND SPECIFICALLY DETAIL DRAINAGE STRUCTURES AND OTHER UTILITIES IN THE REINFORCEMENT ZONE. SEE DRAINAGE PLAN FOR ADDITIONAL INFORMATION.
4. SEE ARCHITECTURAL DETAILS FOR AESTHETIC INFORMATION.
5. FINAL ELEVATIONS OF LEVELING PAD TO BE DETERMINED BY MSE WALL SUPPLIER AND SUBMITTED TO ENGINEER FOR REVIEW, UNLESS NOTED OTHERWISE IN THE PLAN.
6. DIRECTION OF DRAINAGE SHOWN REPRESENTS LOWER WALL DRAINS. MEMBRANE DRAIN FOLLOWS THE TOP OF WALL PROFILE.
7. CONNECT 4" TP PIPE DRAIN TO CATCH BASIN.
8. MEASURED ALONG REFERENCE LINE.
9. START PILASTER SPACING RELATIVE TO BRIDGE.
10. SEE ROADWAY PLANS.
11. SEE BRIDGE PLANS.
12. SEE DRAINAGE PLANS.
13. SEE SANITARY & WATERMAIN PLANS.
14. PLACE 1" POLYSTYRENE TYPE B BETWEEN C-I-P LEVELING PAD AND BRIDGE 02588 C-I-P WINGWALL FOOTINGS.



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...Ret Wall\9140_wrh01.dgn				

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

Print Name: CASEY E. BLACK

Casey E. Black

Date 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO. _____

COMM. NO. 0169140

DRAWN BY E. JOHNSON
DESIGNED BY A. BEHNKE
CHECKED BY C. BLACK

SRF ENGINEERS PLANNERS DESIGNERS
Consulting Group, Inc.

ANOKA COUNTY
MSE RETAINING WALL PLANS
CSAH 78 - BNSF GRADE SEPARATION
RETAINING WALL H PLAN & PROFILE

SHEET
W36
OF
W36

DESIGN DATA

DESIGNED IN ACCORDANCE WITH 2014 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SEVENTH EDITION AND MDOT BRIDGE DESIGN MANUAL.

HL-93 LIVE LOAD
 BARREL INSIDE WIDTH = 12'-0"
 BARREL INSIDE HEIGHT = 10'-0"
 BARREL LENGTH = 98'-0"
 EST. MIN. FILL DEPTH (A) = 12.20'
 EST. MAX. FILL DEPTH (B) = 14.82'
 SKEW ANGLE = 4° 29' 48.6"

DESIGN SPEED = 30 MPH
 CURRENT ADT (2015) = 12,500
 PROJECTED ADT (2030) = 16,800

HL-93 LRFR
 BRIDGE OPERATING RATING FACTOR RF = 1.3

CONSTRUCTION NOTES

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

SEE SPECIAL PROVISIONS FOR ALL XXXX,6XX SERIES PAY ITEMS FOR ADDITIONAL REQUIREMENTS.

ALL EXPOSED CONCRETE EDGES SHALL BE FORMED WITH A 1/2" OR 3/4" CHAMFER UNLESS OTHERWISE NOTED.

CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPEC. 2411 AND 2412, EXCEPT AS NOTED.

REFER TO REMAINDER OF GRADING PLAN FOR SUPERSTRUCTURE EXCAVATION AND BACKFILL. SPEC. 2451.

THE BAR SIZES SHOWN IN THIS PLAN ARE IN U.S. CUSTOMARY DESIGNATIONS.

BAR SIZES MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

USE RECESSED 1" DIAMETER CULVERT TIES. SEE STANDARD PLATE NO. 3145 FOR CONNECTION DETAILS.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF C1/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

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

Print Name: CASEY E. BLACK
 Signature: *Casey E. Black*
 Date: 8/23/2017 License #: 49163
 SRI Consulting Group, Inc.

ANOKA COUNTY

GENERAL PLAN AND ELEVATION BRIDGE NO. 02J49

CSAH 78 (HANSON BLVD) OVER MULTI-USE TRAIL 1.3 MILES SOUTH OF EXISTING JUNCTION OF CSAH 78 (HANSON BLVD) & TH 10 IN THE CITY OF COON RAPIDS

SINGLE BARREL BOX CULVERT
 1 - 12'x10' BOX CULVERT BARREL

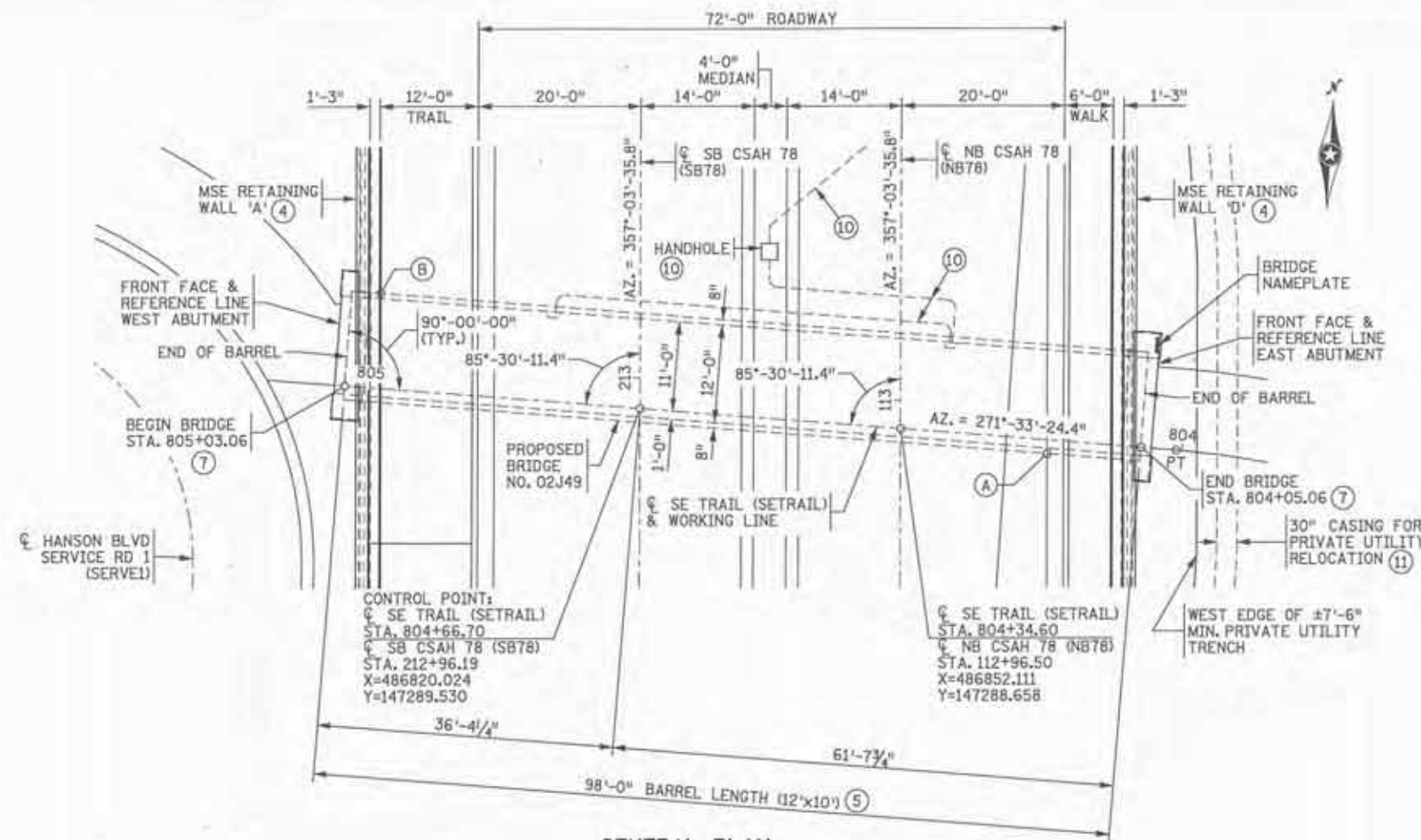
IDENTIFICATION NO. 513

SEC. 22 T 31 N R 24 W
 CITY OF COON RAPIDS ANOKA COUNTY

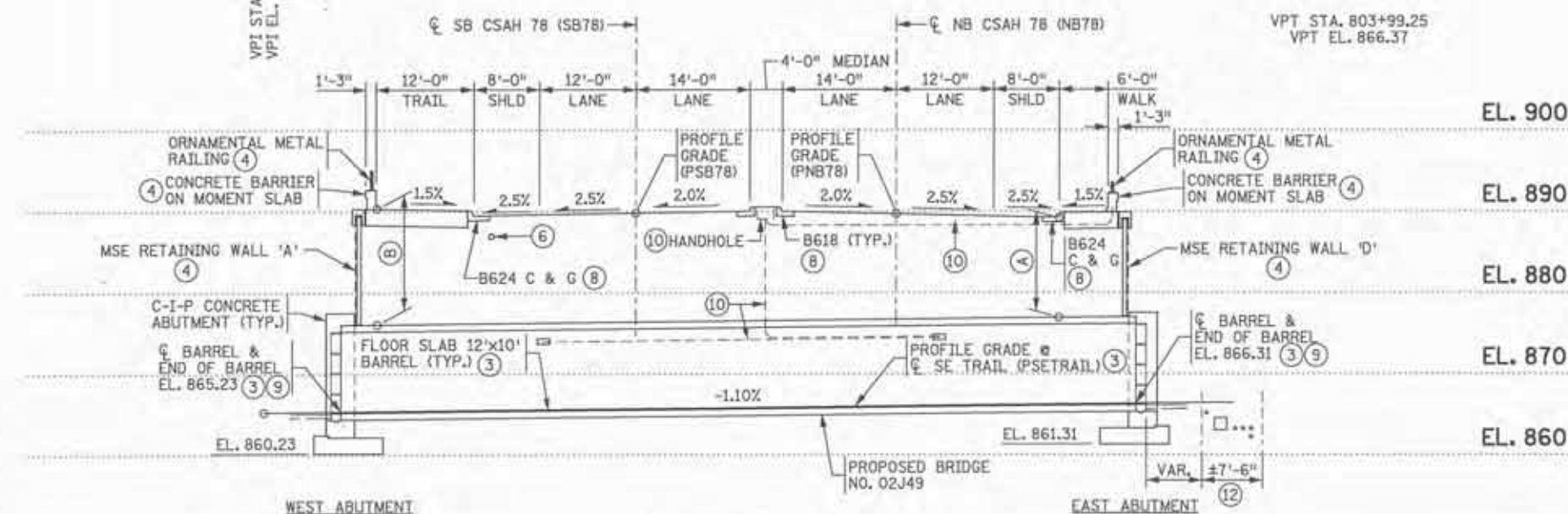
APPROVED: *[Signature]* 8/23/17
 ANOKA COUNTY ENGINEER DATE
 APPROVED: *[Signature]* 11/3/17
 STATE BRIDGE ENGINEER DATE

NOTES:

- SEE BORING SURVEY SHEET AND UTILITY PLANS FOR INPLACE UTILITIES.
- C-I-P DENOTES CAST IN PLACE MSE DENOTES MECHANICALLY STABILIZED EARTH
- FLOOR SLAB OF BOX SECTION SHALL RECEIVE 2 1/2" OF BITUMINOUS OVERLAY.
- SEE RETAINING WALL PLANS FOR DETAILS.
- MEASURED ALONG CENTERLINE OF SE TRAIL (SETRAIL).
- PROPOSED SIGNAL INTERCONNECT. SEE SIGNAL PLANS.
- STATIONS ARE GIVEN AT THE BARREL ENDS.
- SEE ROADWAY PLAN FOR DETAILS.
- ELEVATION AT TOP OF FINISHED TRAIL SURFACE.
- SEE CONDUIT SYSTEM LIGHTING DETAILS.
- PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY TRENCH PRIOR TO CONSTRUCTION OF RETAINING WALL. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATION.
- PRIVATE UTILITY TRENCH.



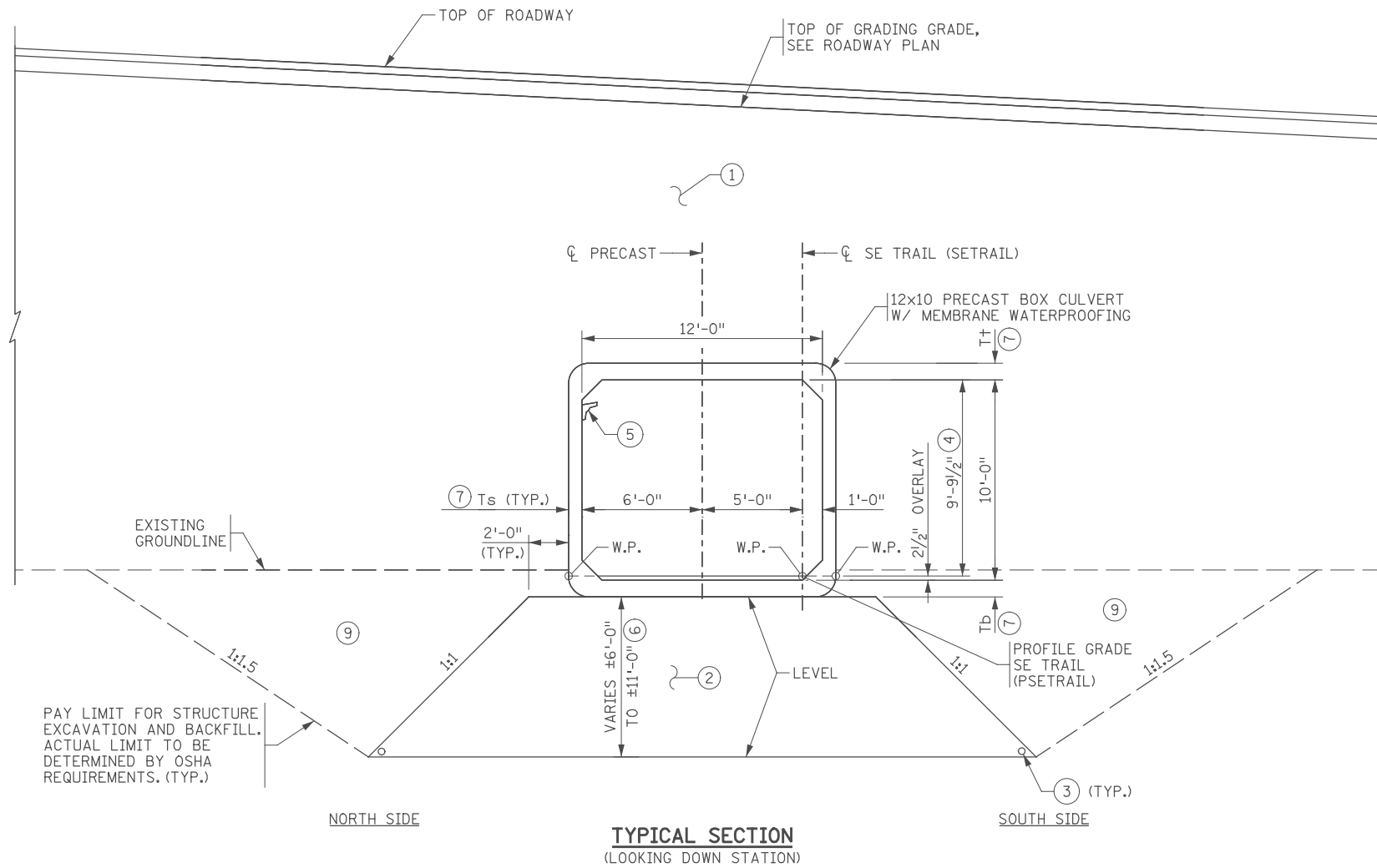
GENERAL PLAN



GENERAL ELEVATION


LIST OF SHEETS	
BA1	GENERAL PLAN & ELEVATION
BA2	TRANSVERSE SECTION & QUANTITIES
BA3	BRIDGE LAYOUT
BA4	BRIDGE AESTHETIC DETAILS
BA5 & BA6	ABUTMENT GEOMETRY DETAILS
BA7	ABUTMENT REINFORCEMENT DETAILS
BA8	PRECAST CONCRETE BARREL DETAILS
BA9	CONDUIT SYSTEM LIGHTING DETAILS
BA10	B-DETAILS
BA11	AS-BUILT BRIDGE DATA
BA12	BRIDGE SURVEY
BA13	BORINGS - PLAN & PROFILE
BA14	SOIL BORINGS

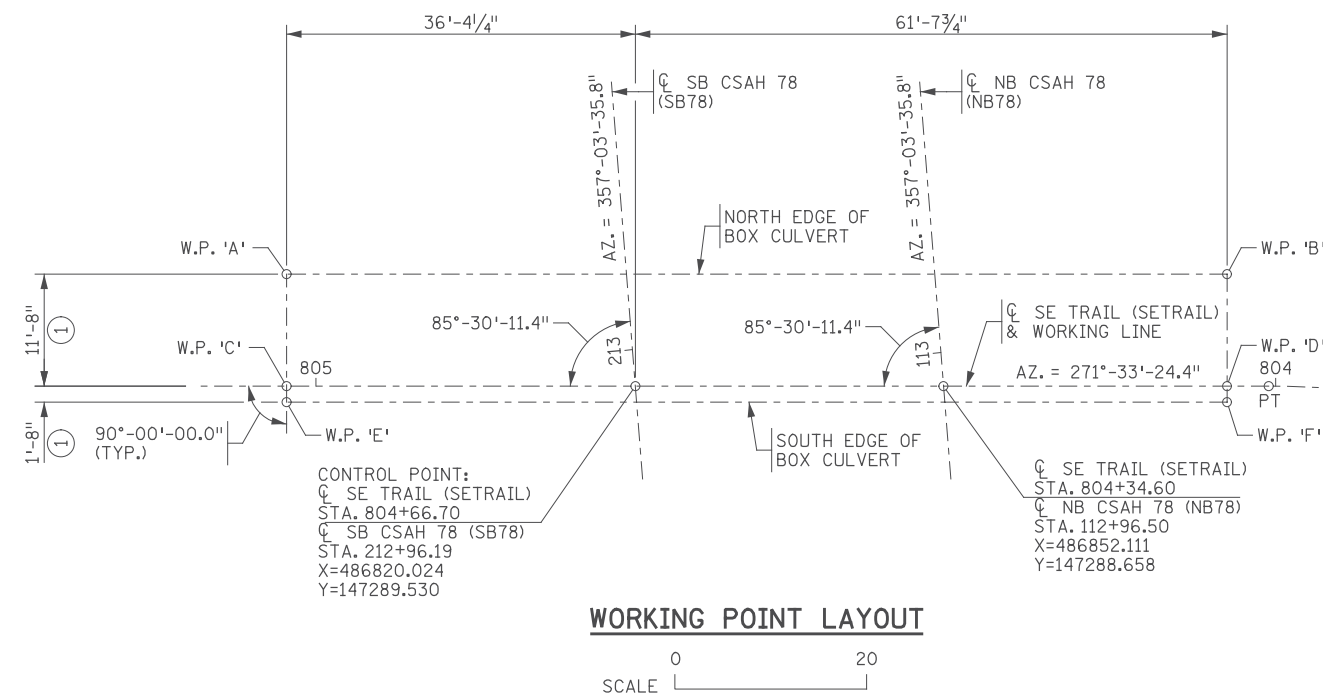
SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE NO. 02J49 GG			
ITEM NO.	ITEM	UNIT	QUANTITY
⑥	2106.521 GRANULAR EMBANKMENT (CV)	CU YD	890 (P)
	2401.501 STRUCTURAL CONCRETE (1G52)	CU YD	28 (P)
	2401.501 STRUCTURAL CONCRETE (3B52)	CU YD	30 (P)
	2401.541 REINFORCEMENT BARS	POUND	2340 (P)
	2401.541 REINFORCEMENT BARS (EPOXY COATED)	POUND	3440 (P)
	2401.601 STRUCTURE EXCAVATION (BR NO 02J49)	LUMP SUM	1
⑧	2411.618 ANTI-GRAFFITI COATING	SQ FT	3750 (P)
	2412.511 12X10 PRECAST CONCRETE BOX CULVERT	LIN FT	98 (P)
	2481.601 MEMBRANE WATERPROOFING SYSTEM	LUMP SUM	1
	2502.541 4" PERF TP PIPE DRAIN	LIN FT	200
	2545.509 CONDUIT SYSTEM (LIGHTING) (BR NO 02J49)	LUMP	1



- NOTES:**
- ① SEE RETAINING WALL PLANS AND GRADING PLANS FOR FILL MATERIAL REQUIREMENTS.
 - ② GRANULAR EMBANKMENT PER SPEC. 3149.2.B.1. COMPACTION SHALL BE IN ACCORDANCE WITH SPEC. 2106.
 - ③ 4" PERFORATED THERMAL PLASTIC PIPE DRAIN PER SPEC. 3245. SEE RETAINING WALL PLANS FOR OVERALL PIPE DRAIN PLAN. LOCATE PIPE DRAINS IN ELEVATION TO ENSURE DRAINAGE OUTLET INTO STRUCTURE 163 OR TRAIL INFILTRATION AREA. SEE DRAINAGE PLANS.
 - ④ 9'-9" MINIMUM VERTICAL CLEARANCE REQUIRED.
 - ⑤ SEE CONDUIT SYSTEM LIGHTING DETAILS.
 - ⑥ SUBCUT DEPTH APPROXIMATE. SOIL IN THE CUT SHALL BE EVALUATED BY THE GEOTECHNICAL ENGINEER AND SUBCUT SHALL BE EXTENDED AS DIRECTED. QUANTITY IS BASED ON A ASSUMED 8'-0" AVERAGE SUBCUT.
 - ⑦ SEE PRECAST CONCRETE BARRIER DETAILS FOR DIMENSIONS Tt, Tb AND Ts.
 - ⑧ QUANTITY INCLUDES 3,100 SQUARE FEET FOR APPLICATION TO INTERIOR PRECAST WALLS AND TOP SLAB. PRIOR TO APPLYING, CONFIRM WITH THE OWNER THAT TREATMENT TO THE PRECAST SECTIONS IS DESIRED.
 - ⑨ SUITABLE MATERIAL.

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NO					DATE					BY					CKD					APPR																			



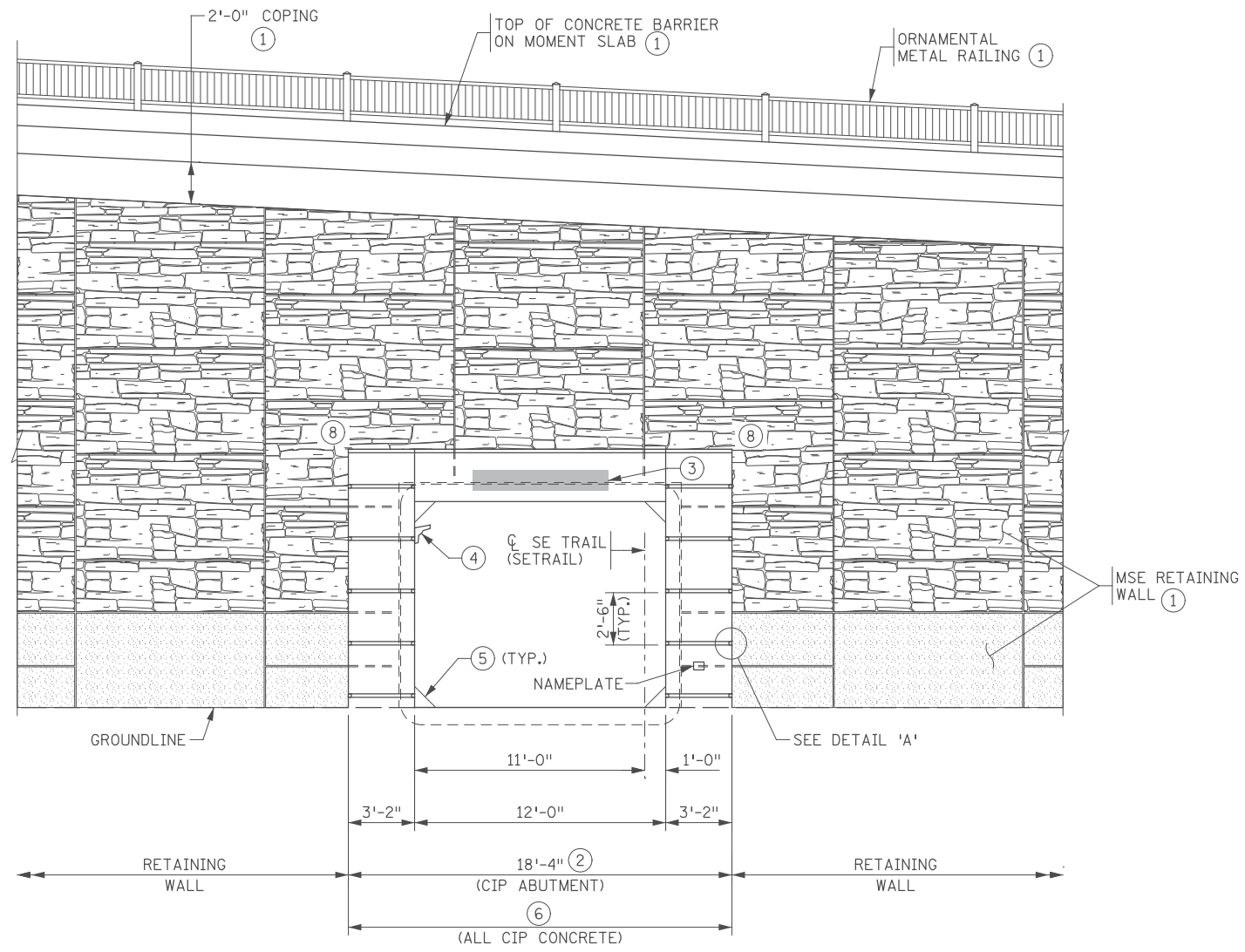
TOP OF TRAIL TO BEARING LEDGE				
	BITUMINOUS OVERLAY THICKNESS	BOX CULVERT BOT. SLAB THICKNESS	TOTAL	
			INCHES	FEET
WEST ABUTMENT	2 1/2"	10"	12 1/2"	1.04'
EAST ABUTMENT	2 1/2"	10"	12 1/2"	1.04'

DIMENSIONS BETWEEN WORKING POINTS										ELEVATION			
POINT	STATION	X-COORDINATE	Y-COORDINATE	A	B	C	D	E	F	TOP OF FIN. TRAIL	FIN. TRAIL TO BEARING LEDGE	BEARING LEDGE	POINT
A	805+03.06	486784.001	147302.180		98.00	11.67	98.69		98.90	865.23	1.04	864.19	A
B	804+05.06	486881.965	147299.518				11.67	98.90		866.31	1.04	865.27	B
C	805+03.06	486783.684	147290.518				98.00	1.67	98.01	865.23	1.04	864.19	C
D	804+05.06	486881.648	147287.855						1.67	866.31	1.04	865.27	D
E	805+03.06	486783.639	147288.852						98.00	865.23	1.04	864.19	E
F	804+05.06	486881.603	147286.189							866.31	1.04	865.27	F

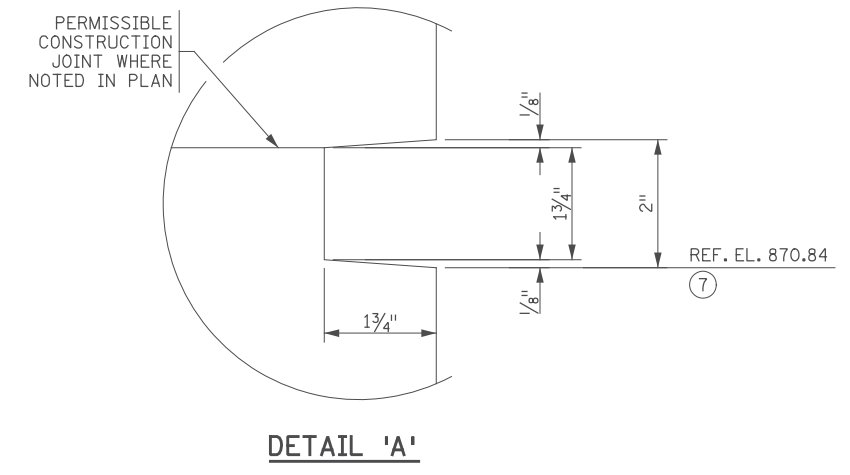
- NOTES:**
- WORKING POINTS ARE LOCATED ON THE WORKING LINE AND THE EXTERIOR FACES OF THE BOX CULVERT.
 - WORKING POINT ELEVATIONS ARE GIVEN AT THE TOP OF THE FINISHED TRAIL ON THE WORKING LINE AND A PROJECTION OF THE 2 1/2" BITUMINOUS OVERLAY TO THE OUTSIDE FACES OF THE BOX CULVERT.

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11/01/2017 RELEASED FOR CONSTRUCTION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. Print Name: <u>CASEY E. BLACK</u> <i>Casey E. Black</i> Date: <u>11/01/2017</u> License # <u>49163</u>	STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051 BRIDGE NO. <u>02J49</u>	DRAWN BY E. JOHNSON DESIGNED BY A. BEHNKE CHECKED BY C. BLACK COMM. NO. 0169140	ANOKA COUNTY BRIDGE LAYOUT CSAH 78 OVER TRAIL UNDERPASS	SHEET BA3 OF BA14
---	---	---	---	---	--



ELEVATION
(LOOKING DOWN STATION)



NOTES:

- ① SEE RETAINING WALL PLANS.
- ② MEASURED ALONG FRONT FACE OF ABUTMENT.
- ③ SIGNAGE OPPORTUNITY (FUTURE).
- ④ SEE CONDUIT SYSTEM LIGHTING DETAILS.
- ⑤ BOX CULVERT INTERIOR CORNER CHAMFER.
- ⑥ SPECIAL SURFACE COATING FEDERAL STANDARD 595B NO. 33522 (LIGHT SAND).
- ⑦ PROJECT WIDE AESTHETIC REFERENCE ELEVATION.
- ⑧ AESTHETIC DETAIL IS SCHEMATIC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MSE WALL PANEL LAYOUT. THE CONTRACTOR MAY OPT FOR NOTCHED PANELS WITH ADDITIONAL REINFORCEMENT TO PREVENT CRACKING OR CORNERS CONSTRUCTED WITH SMALLER PANELS AND ADDITIONAL JOINTS.

12:43:07 PM H:\Projects\09000\9140\CAD_BITMAP\ans\Tru\CBR02J49\F Ina\CBR02J49_arch01.dgn

11/01/2017				RELEASED FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: CASEY E. BLACK
Casey E. Black
 Date 11/01/2017 License # 49163

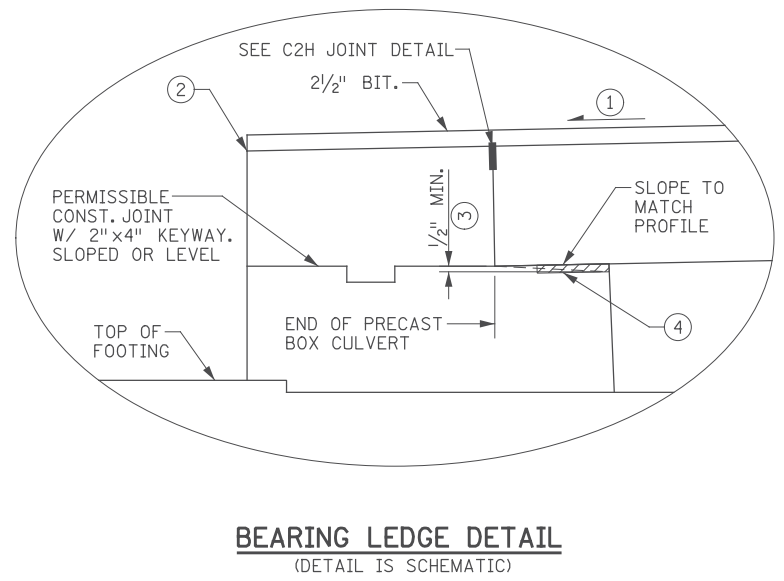
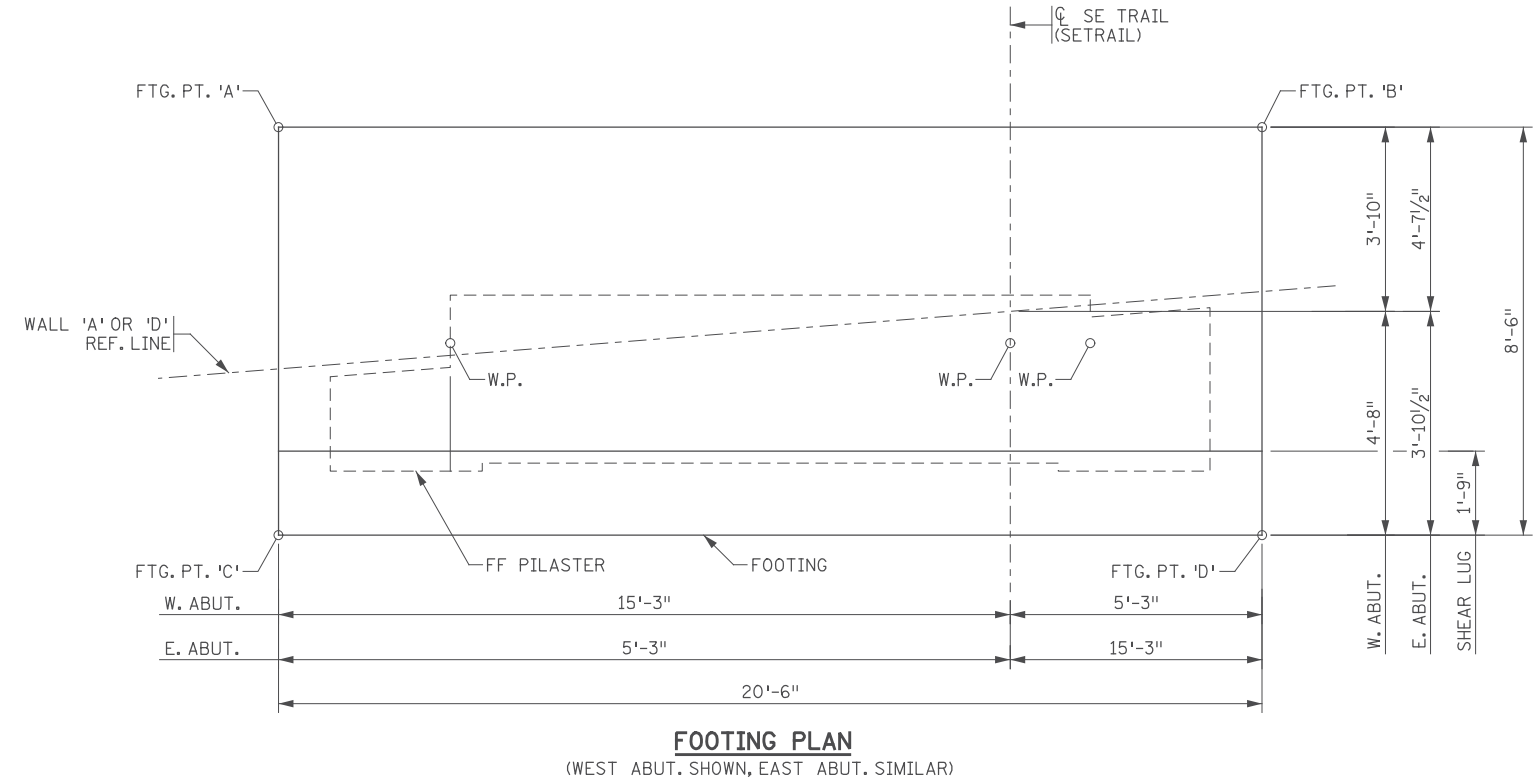
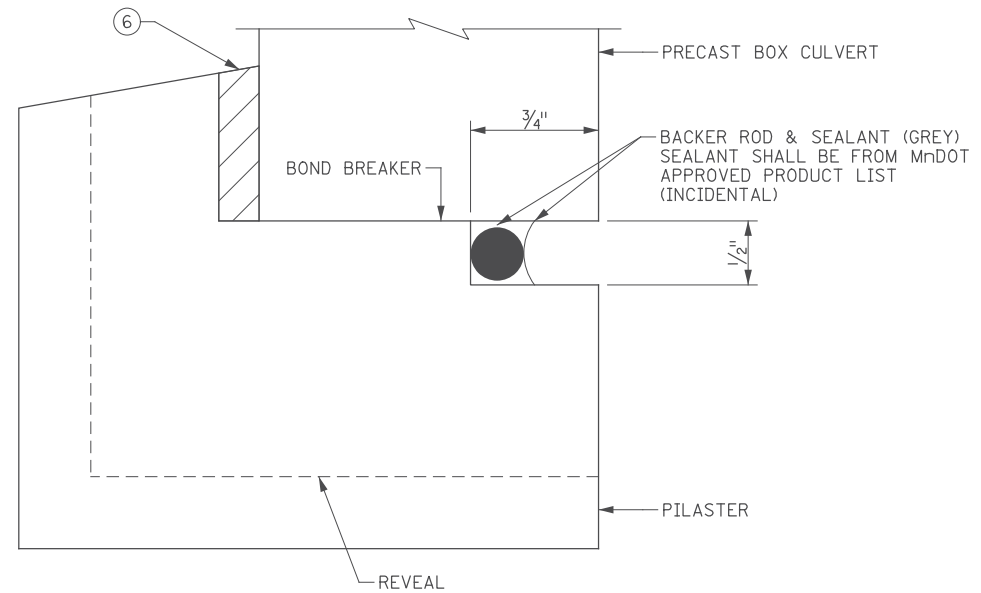
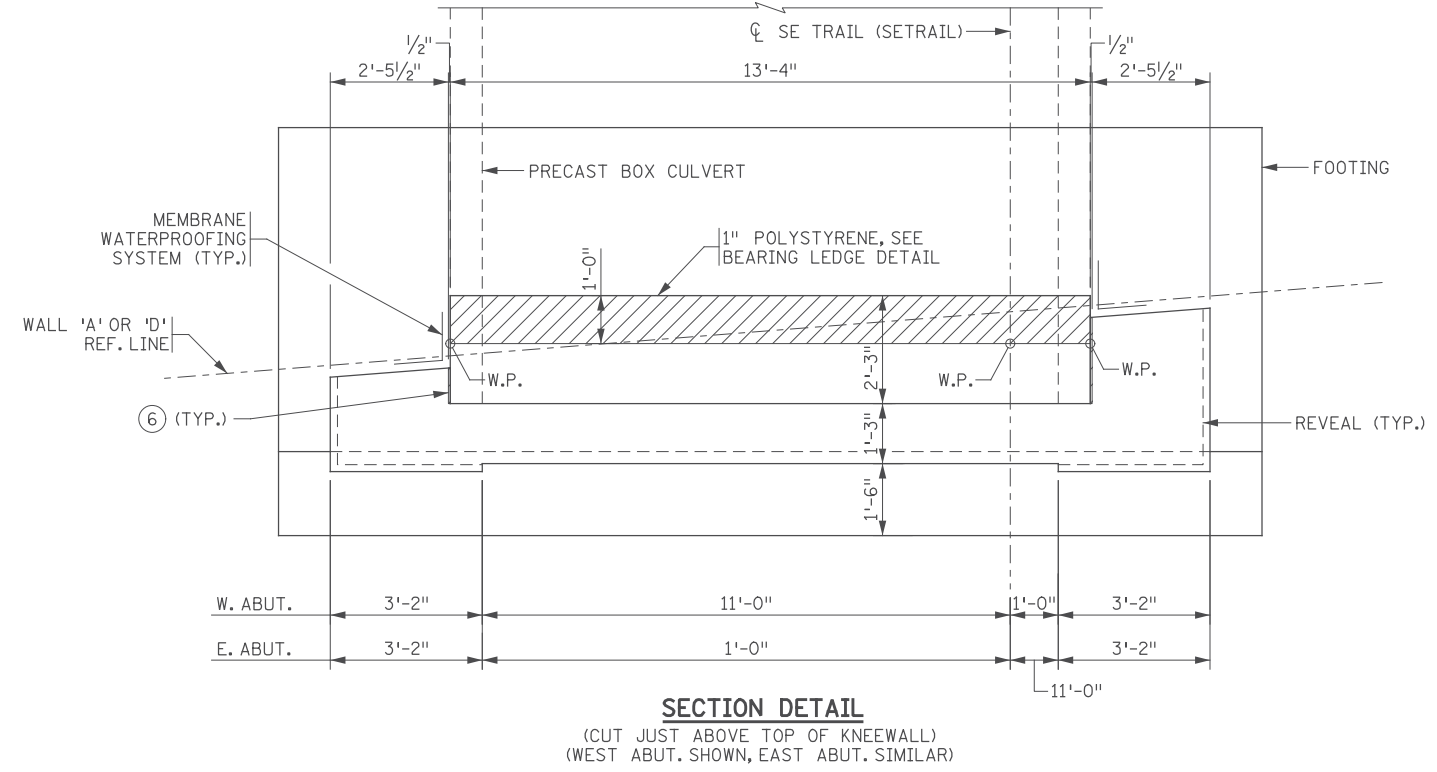
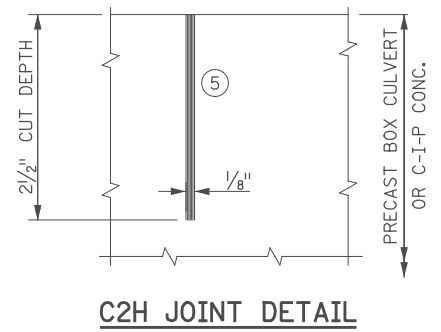
STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02J49
 DRAWN BY
 E. JOHNSON
 DESIGNED BY
 S. NEFF
 CHECKED BY
 C. BLACK
 COMM. NO. 0169140



ANOKA COUNTY
 BRIDGE AESTHETIC DETAILS
 CSAH 78 OVER TRAIL UNDERPASS

SHEET
 BA4
 OF
 BA14

FOOTING COORDINATES				
POINT	WEST ABUTMENT		EAST ABUTMENT	
	X-COORDINATE	Y-COORDINATE	X-COORDINATE	Y-COORDINATE
A	486789.847	147305.606	486875.758	147282.763
B	486789.290	147285.113	486876.315	147303.256
C	486781.350	147305.837	486884.255	147282.532
D	486780.793	147285.344	486884.811	147303.025



- NOTES:**
- SEE SHEET BA1 FOR PROFILE GRADE AT EACH ABUTMENT.
 - LOCATION OF DIMENSION MEASUREMENT POINT IN ABUTMENT SECTIONS.
 - PROVIDE A TOOLED V-GROOVE SLOPED AWAY FROM THE END OF PRECAST SUCH THAT MOISTURE MAY DRAIN AWAY. SPACE AT 3'-0" MAXIMUM ALONG BEARING LEDGE.
 - 1" x 9" POLYSTYRENE TYPE A TO BE INCIDENTAL.
 - CLEAN AND DRY FULLY CURED JOINT FACES BY SANDBLASTING PRIOR TO SEALING THE JOINT.
 - 1/2" POLYSTYRENE TYPE B AROUND 3 SIDES TO BE INCIDENTAL.

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				REVISION

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Print Name: CASEY E. BLACK

Casey E. Black

Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02J49

COMM. NO. 0169140

DRAWN BY
J. HOFFMAN

DESIGNED BY
A. BEHNKE

CHECKED BY
C. BLACK

SRE ENGINEERS
PLANNERS
DESIGNERS

Consulting Group, Inc.

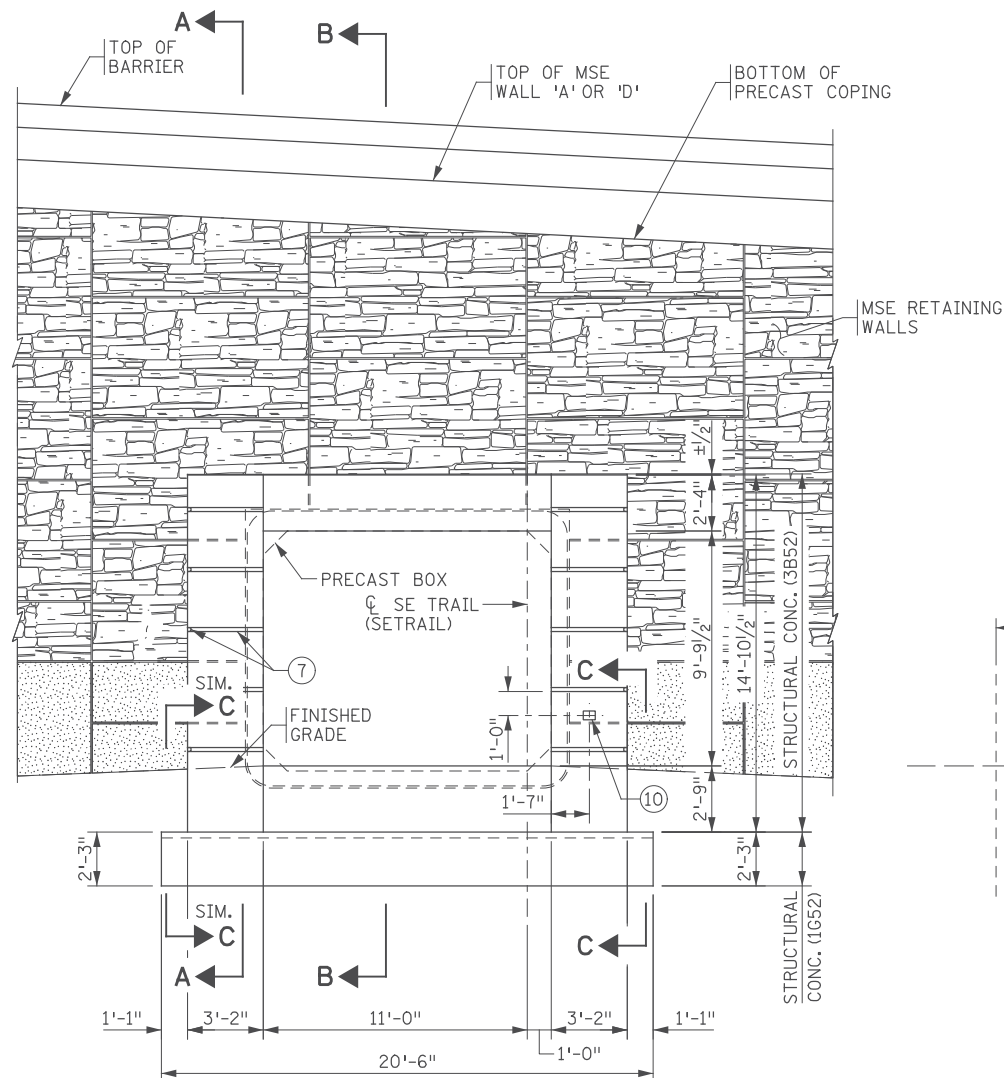
ANOKA COUNTY

ABUTMENT GEOMETRY DETAILS

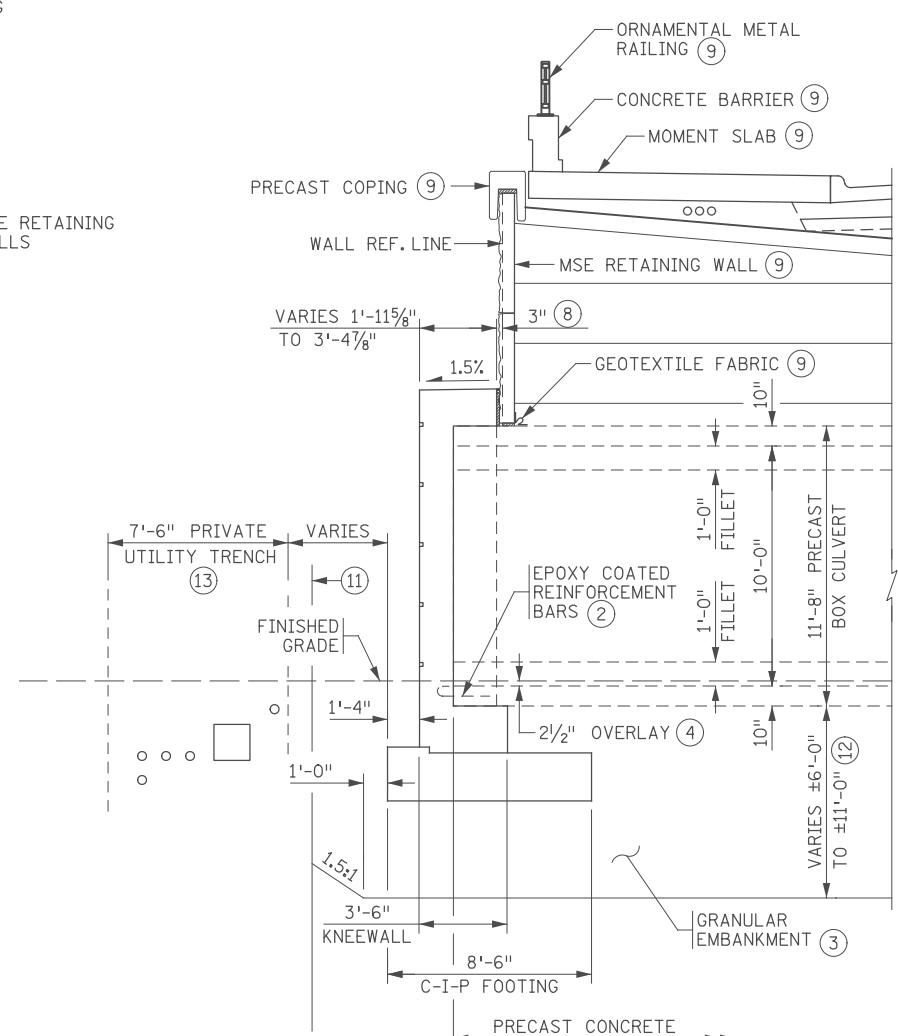
CSAH 78 OVER TRAIL UNDERPASS

(SHEET 1 OF 2)

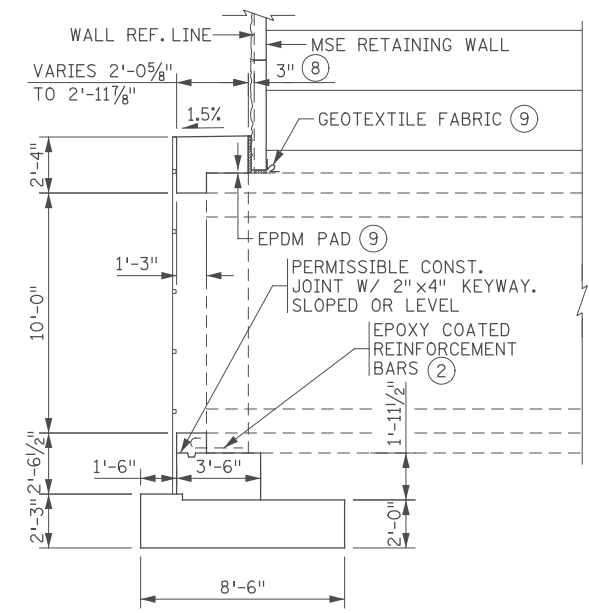
SHEET
BA5
OF
BA14



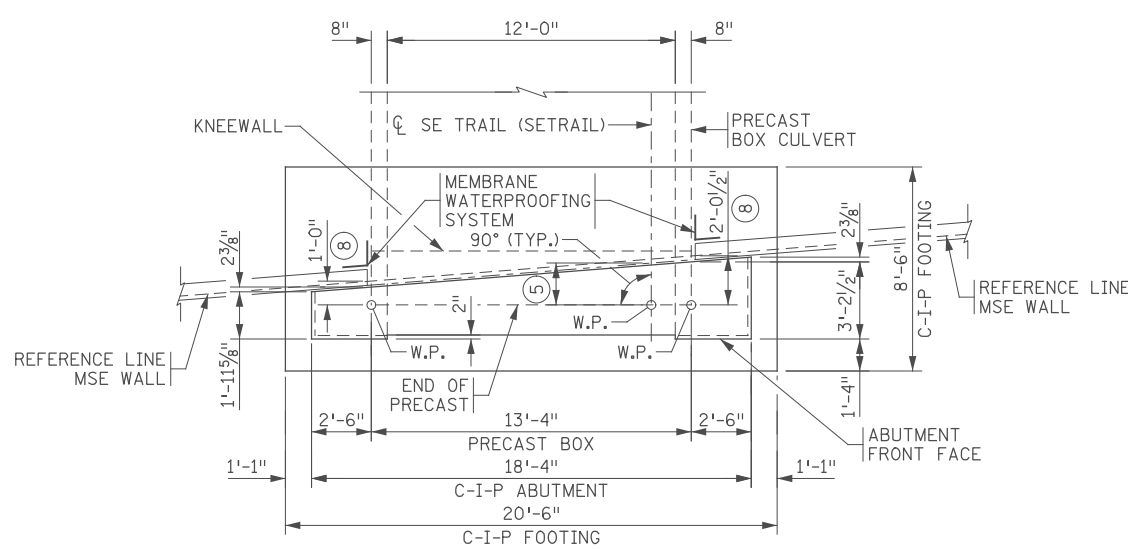
ELEVATION
(WEST ABUTMENT SHOWN, EAST ABUTMENT SIMILAR)



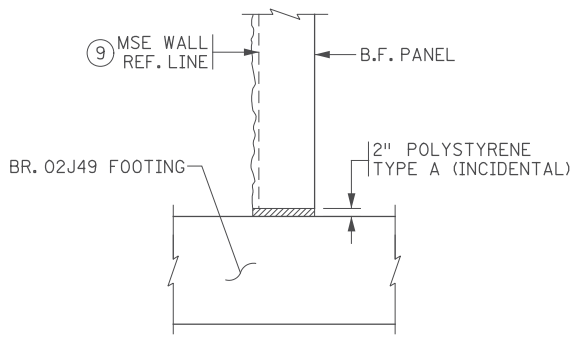
SECTION A-A



SECTION B-B



ABUTMENT PLAN
(WEST ABUTMENT SHOWN, EAST ABUTMENT SIMILAR)



SECTION C-C

- NOTES:**
- F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
E.F. DENOTES EACH FACE
 - PROVIDED BY PRECAST SUPPLIER.
 - GRANULAR EMBANKMENT PER SPEC. 3149.2.B.1.
COMPACTION SHALL BE IN ACCORDANCE WITH SPEC. 2106.
 - SEE ROADWAY PLANS.
 - END OF PRECAST BOX TO WALL REFERENCE LINE 1'-11" AT WEST ABUTMENT AND WALL 'A', 1'-1 1/2" AT EAST ABUTMENT AND WALL 'D'.
 - ITEM SHALL BE INCIDENTAL.
 - REVEALS TO BE ON ABUTMENT FRONT FACE AND EXTERIOR FACE ONLY.
 - MEASURED TO WALL REFERENCE LINE.
 - SEE RETAINING WALL PLANS.
 - NAMEPLATE. SEE SHEET BA1 FOR LOCATION.
 - SHORING AS NEEDED TO PROTECT IN-PLACE PRIVATE UTILITIES SHALL BE INCLUDED IN ITEM 2452.601 "STRUCTURE EXCAVATION (BR 02588)".
 - SUBCUT DEPTH APPROXIMATE. SOIL IN THE CUT SHALL BE EVALUATED BY THE GEOTECHNICAL ENGINEER AND SUBCUT SHALL BE EXTENDED AS DIRECTED. QUANTITY IS BASED ON A ASSUMED 8'-0" AVERAGE SUBCUT.
 - SEE NOTE (11) ON SHEET BA1.

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				REVISION

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Casey E. Black
 Date: 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO.
02J49

COMM. NO. 0169140

DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK

SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

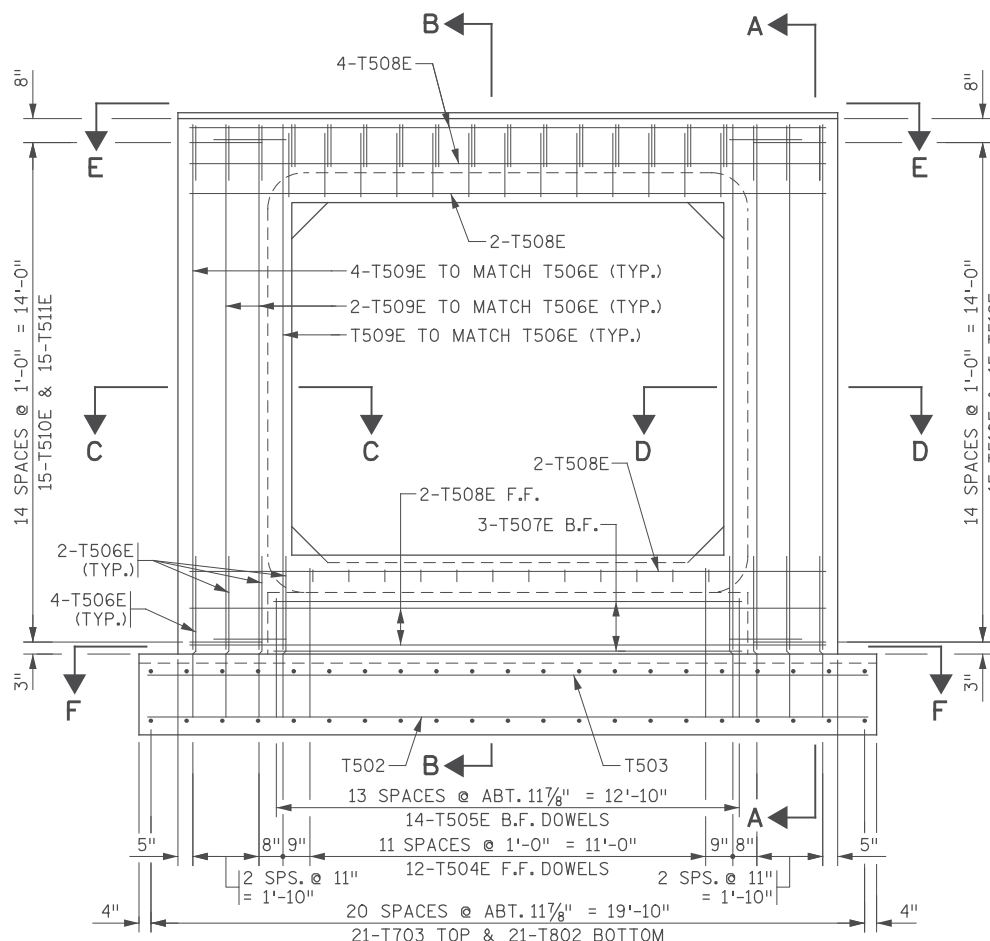
ANOKA COUNTY
 ABUTMENT GEOMETRY DETAILS
CSAH 78 OVER TRAIL UNDERPASS
 (SHEET 2 OF 2)

SHEET
BA6
OF
BA14

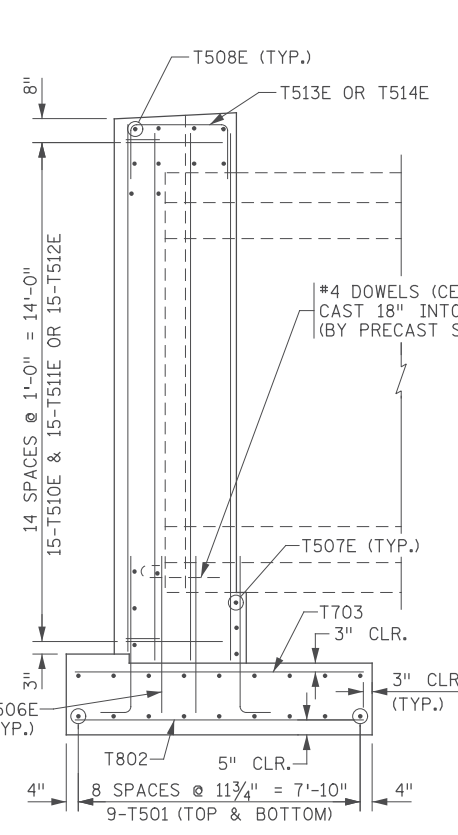
NOTES:

- F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
E.F. DENOTES EACH FACE
- INCLUDES REINFORCEMENT REQUIRED TO CONSTRUCT BOTH EAST AND WEST ABUTMENTS.

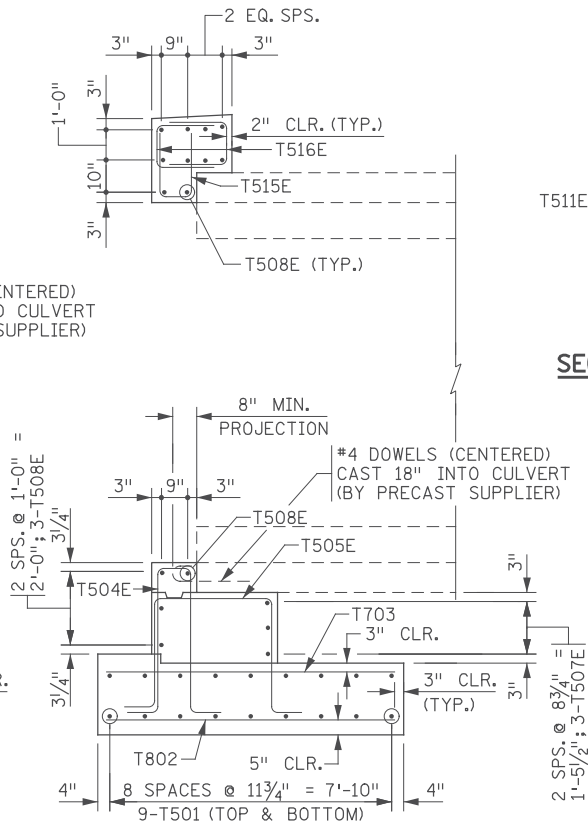
BILL OF REINFORCEMENT: PED TUNNEL ②				
MARK	NO	LENGTH [FT-IN]	SHAPE	LOCATION
T501	36	20 - 0	—	FTG TOP & BOT LONG
T802	42	8 - 0	—	FTG BOT TRANS
T703	42	8 - 0	—	FTG TOP TRANS
T504E	24	10 - 5	⌋	KNEEWALL DOWEL
T505E	30	11 - 2	⌋	KNEEWALL DOWEL
T506E	40	5 - 2	⌋	PORTAL DOWEL
T507E	6	13 - 0	—	KNEEWALL LONG
T508E	28	17 - 8	—	PORTAL LONG
T509E	40	14 - 8	—	PORTAL VERT
T510E	60	6 - 9	⊠	PORTAL TIE
T511E	30	7 - 9	⊠	PORTAL TIE
T512E	30	10 - 3	⊠	PORTAL TIE
T513E	6	4 - 5	⌋	PORTAL CAP
T514E	6	5 - 8	⌋	PORTAL CAP
T515E	26	4 - 5	⌋	PORTAL TIE
T516E	52	4 - 4	⌋	PORTAL TIE



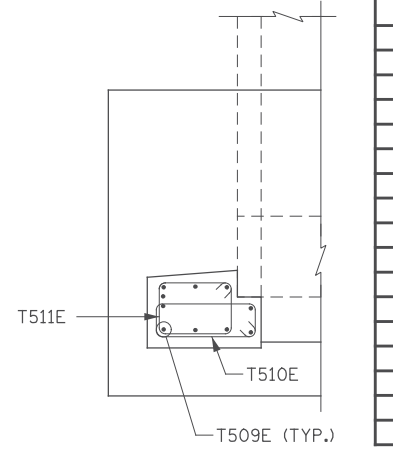
PORTAL REINFORCEMENT ELEVATION



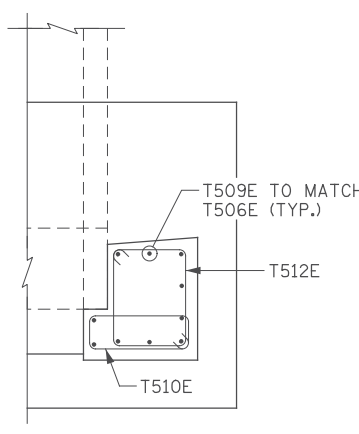
SECTION A-A REINFORCEMENT



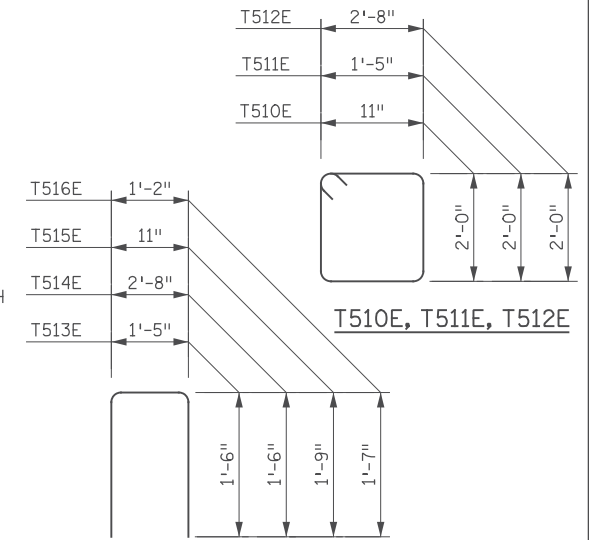
SECTION B-B REINFORCEMENT



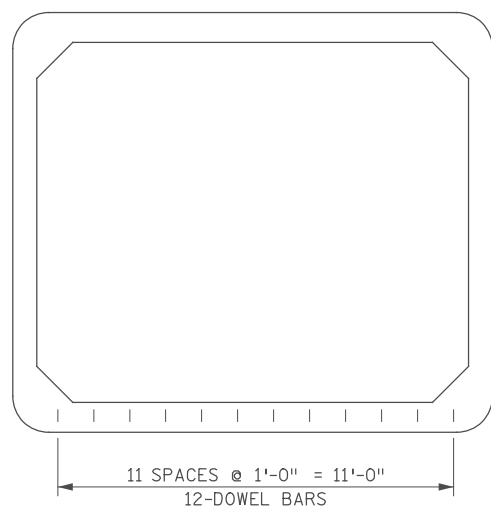
SECTION C-C REINFORCEMENT



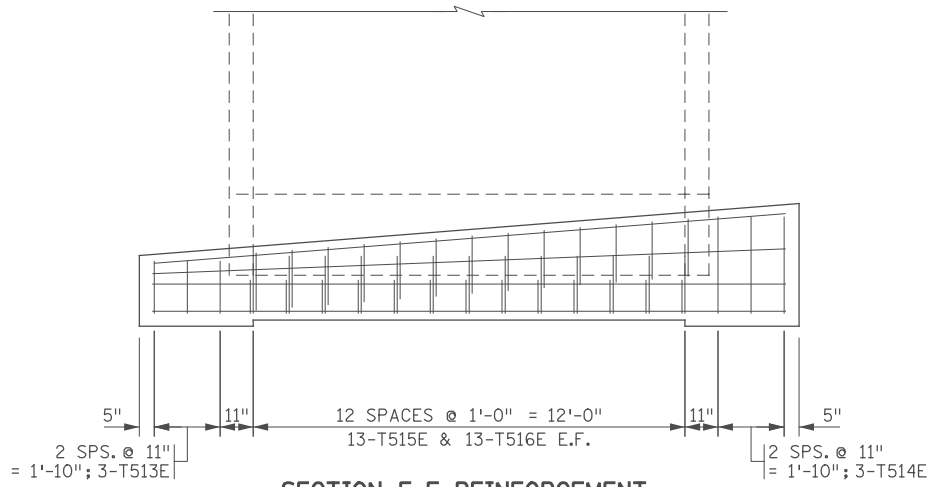
SECTION D-D REINFORCEMENT



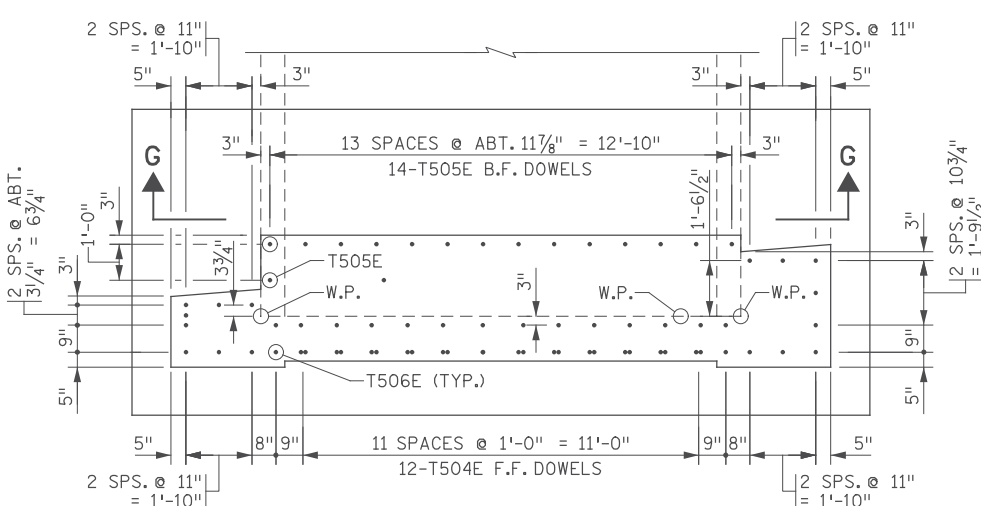
T513E, T514E, T515E, T516E



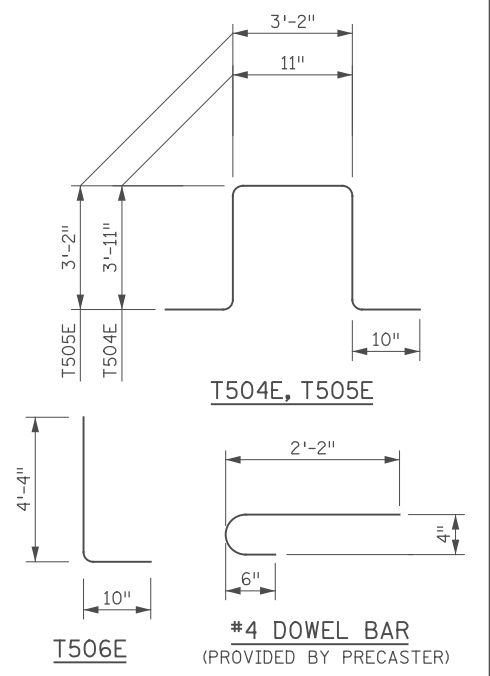
SECTION G-G REINFORCEMENT (SHOWING PRECAST ONLY)



SECTION E-E REINFORCEMENT



SECTION F-F REINFORCEMENT (DOWELS ONLY SHOWN)



#4 DOWEL BAR (PROVIDED BY PRECASTER)

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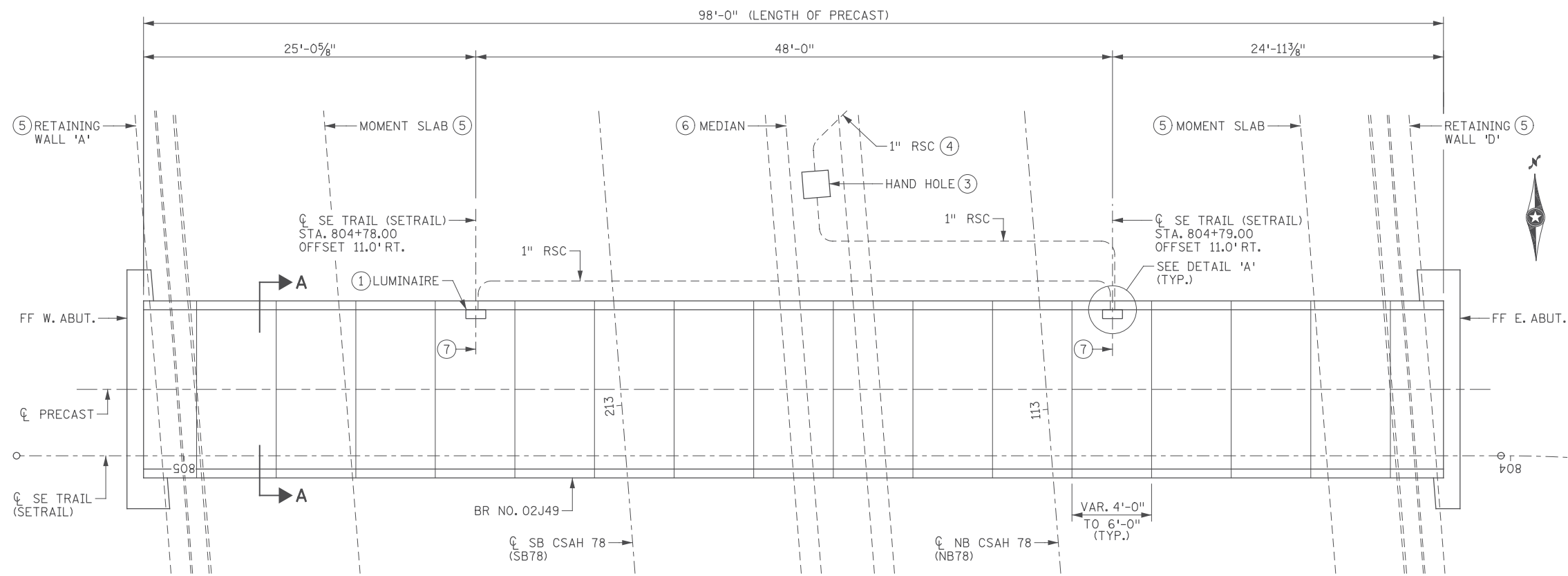
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 Print Name: CASEY E. BLACK
 Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02J49
 COMM. NO. 0169140

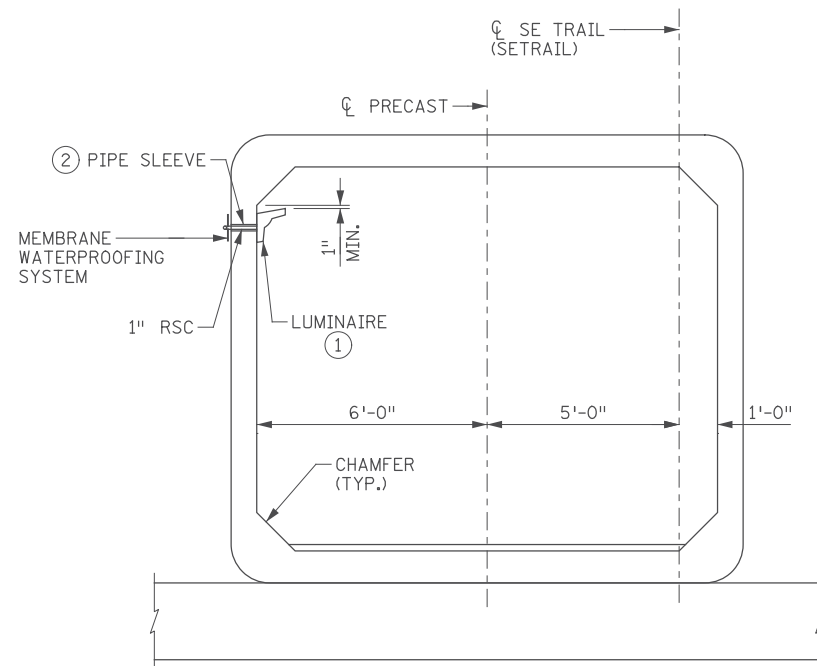
DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 ABUTMENT REINFORCEMENT DETAILS
 CSAH 78 OVER TRAIL UNDERPASS

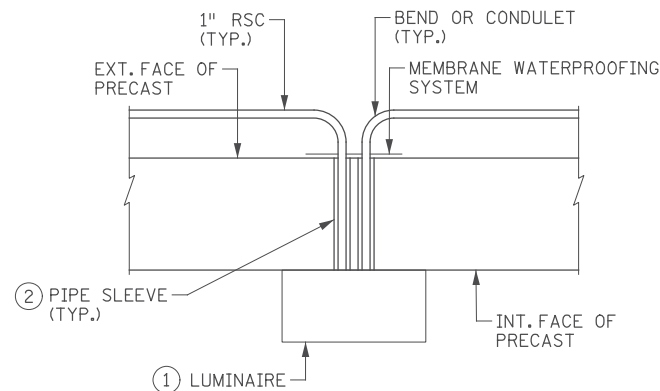
SHEET
BA7
OF
BA14



PLAN



SECTION A-A



DETAIL 'A'

NOTES:

- ALL ITEMS IDENTIFIED IN THIS PLAN SHALL BE INCLUDED IN BID ITEM 2545.509 "CONDUIT SYSTEM (LIGHTING) (BR NO 02J49)", UNLESS OTHERWISE NOTED.
- ① SEE ELECTRICAL PLANS FOR INTERIOR LUMINAIRE INFORMATION AND PAYMENT.
- ② CONTRACTOR SHALL CAST A R.S.C. PIPE SLEEVE INTO THE PRECAST BOX CULVERT TO ACCOMMODATE CONDUIT SYSTEM. FILL HOLE WITH NON-SHRINK GROUT PRIOR TO WATERPROOFING.
- ③ HAND HOLE CAST INTO MEDIAN. CONTRACTOR SHALL SELECT A HANDHOLE FROM MnDOT'S APPROVED PRODUCTS LIST.
- ④ EXTEND CONDUIT TO NEAREST LIGHT ON MOMENT SLAB. SEE WALL 'A' IN THE RETAINING WALL PLANS FOR LIGHT LOCATION.
- ⑤ SEE RETAINING WALL PLANS FOR DETAILS.
- ⑥ SEE ROADWAY PLANS FOR DETAILS.
- ⑦ CONTRACTOR TO ENSURE CENTER OF LUMINAIRE AND PIPE SLEEVE IS LOCATED A MINIMUM OF 2'-0" FROM THE PRECAST JOINT. SHIFT SLIGHTLY AS NECESSARY.

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Casey E. Black
 Date 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02J49

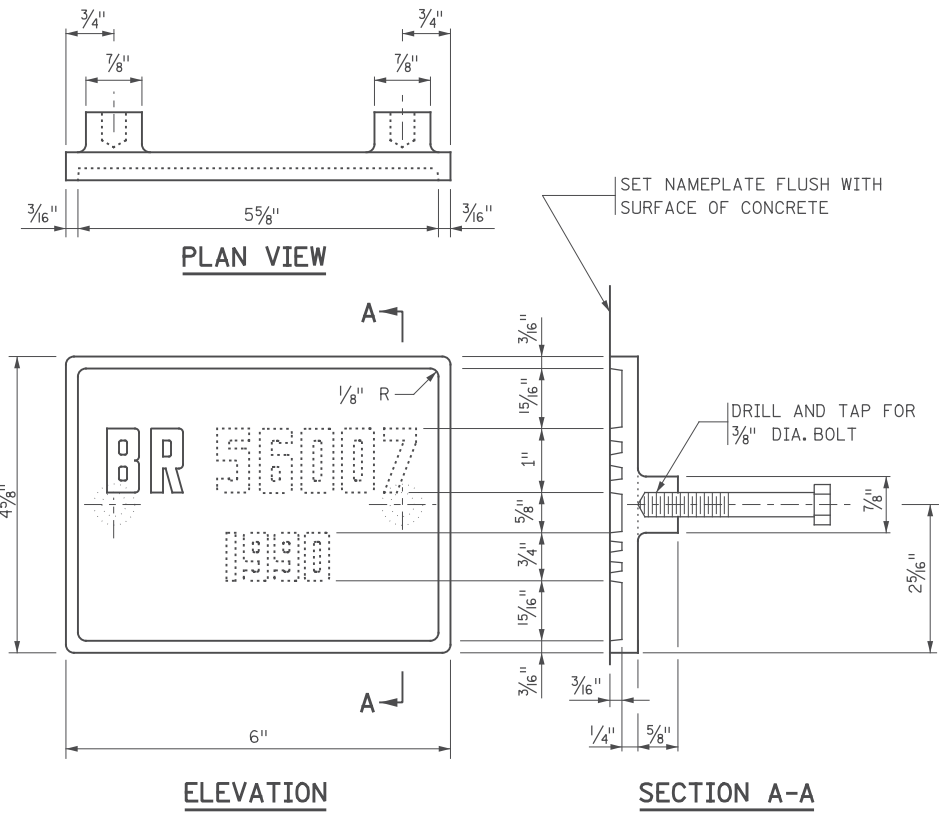
DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
 COMM. NO. 0169140



ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 CONDUIT SYSTEM LIGHTING DETAILS
 CSAH 78 OVER TRAIL UNDERPASS

SHEET
 BA9
 OF
 BA14



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION.
DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 02J49
YEAR 2018



NUMBERS FOR NAMEPLATE

NOTES:

- MATERIAL SHALL COMPLY WITH SPEC. 3327.
- LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.
- DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".
- HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.
- TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.
- FURNISH 2 STEEL BOLTS 3/8" DIA. x 3" LONG WITH EACH PLATE.
- ALL DIMENSIONS FOR 3/4" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

APPROVED: NOVEMBER 22, 2002

Samuel J. Hoffman
STATE BRIDGE ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE NAMEPLATE
(FOR NEW BRIDGES)

REVISION
09-11-2014

DETAIL NO.

B101

11/01/2017					RELEASED FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR	REVISION

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Casey E. Black
Date 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051
BRIDGE NO.
02J49

DRAWN BY
J. HOFFMAN
DESIGNED BY
A. BEHNKE
CHECKED BY
C. BLACK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
B-DETAILS
CSAH 78 OVER TRAIL UNDERPASS

SHEET
BA10
OF
BA14

WEARING COURSE

LOW SLUMP
 OTHER _____
TYPE OR MANUFACTURER _____

EXPANSION JOINTS

JOINT MANUFACTURER _____
MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED _____
GLAND MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE) _____
SIZE OF GLAND _____
MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED _____

ELASTOMERIC BEARING PADS

PAD MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE) _____

SPECIAL SURFACE FINISH

PRODUCT NAME: _____ COLOR & TEXTURE: _____

FINISHING ROADWAY FACES OF BARRIER OR PARAPET

PRODUCT NAME: _____ COLOR & TEXTURE: _____

ANTI-GRAFFITI COATING

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE) _____
PRODUCT NAME: _____ LOCATION: _____

PAINT SYSTEM

MnDOT SPECIFICATION NUMBER _____
2478 OR 2479 OR OTHER _____
MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE) _____
PRIME COAT _____
MnDOT MATERIAL SPECIFICATION NUMBER _____
INTERMEDIATE COAT _____
MnDOT MATERIAL SPECIFICATION NUMBER _____
FINISH COAT _____
MnDOT MATERIAL SPECIFICATION NUMBER _____ COLOR _____

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)
DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. _____
BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. _____
SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. _____
(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. _____
COMMENTS: _____

NUMBER OF BRIDGE SUPPLEMENTAL AGREEMENTS: _____ COST: \$ _____
LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

NOTIFICATION TO ADD, REMOVE, OR REHAB A STRUCTURE

PLEASE GO TO THE FOLLOWING WEBSITE AND COMPLETE THE FORM WHEN ADDING, REMOVING OR REHABILITATING A STRUCTURE:
(CONTACT THE BRIDGE INVENTORY MANAGEMENT UNIT AT 651-366-4557 IF YOU HAVE QUESTIONS)
- WHEN ADDING A NEW STRUCTURE - (SEND WHEN THE BRIDGE IS OPEN TO TRAFFIC)
<http://www.dot.state.mn.us/bridge/new-structure.html>
- WHEN REMOVING A STRUCTURE - (SEND WHEN THE BRIDGE IS NO LONGER IN SERVICE)
<http://www.dot.state.mn.us/bridge/remove-structure.html>
- WHEN REHABILITATING A STRUCTURE - (SEND WHEN THE REHABILITATION IS COMPLETE)
<http://www.dot.state.mn.us/bridge/rehab-structure.html>

CHANGE OF VERTICAL CLEARANCE

PLEASE GO TO THE FOLLOWING WEBSITE WHEN CHANGING THE VERTICAL CLEARANCE OF EXISTING BRIDGE STRUCTURE:
(CONTACT THE BRIDGE INVENTORY MANAGEMENT UNIT AT 651-366-4557 IF YOU HAVE QUESTIONS)
<http://www.dot.state.mn.us/bridge/pdf/clearanceform.pdf>

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.
FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES NO

REMOVE & PATCH QUANTITIES (SF)						CONCRETE SURFACE REPAIR (SF)	CLEAN & PAINT REINF. (SF)
TYPE A:	TYPE B:	TYPE C:	TYPE D:	TYPE E:	TYPE F:		

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:


INSPECTOR(S) SIGNATURE _____ DATE _____
CHECKED BY: _____ PROJECT ENGINEER/SUPERVISOR SIGNATURE _____ DATE _____
WHEN BRIDGE IS OPEN TO TRAFFIC, COMPLETE THIS AS-BUILT BRIDGE DATA SHEET AND SUBMIT TO THE BRIDGE OFFICE VIA EMAIL AT: BridgeForms.dot@state.mn.us.

REVISION:
APPROVED: MAY 10, 2017
Kevin Westrom
STATE BRIDGE ENGINEER

AS-BUILT DETAILS (AS NEEDED)

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASED FOR CONSTRUCTION

FIG. 5-397.900

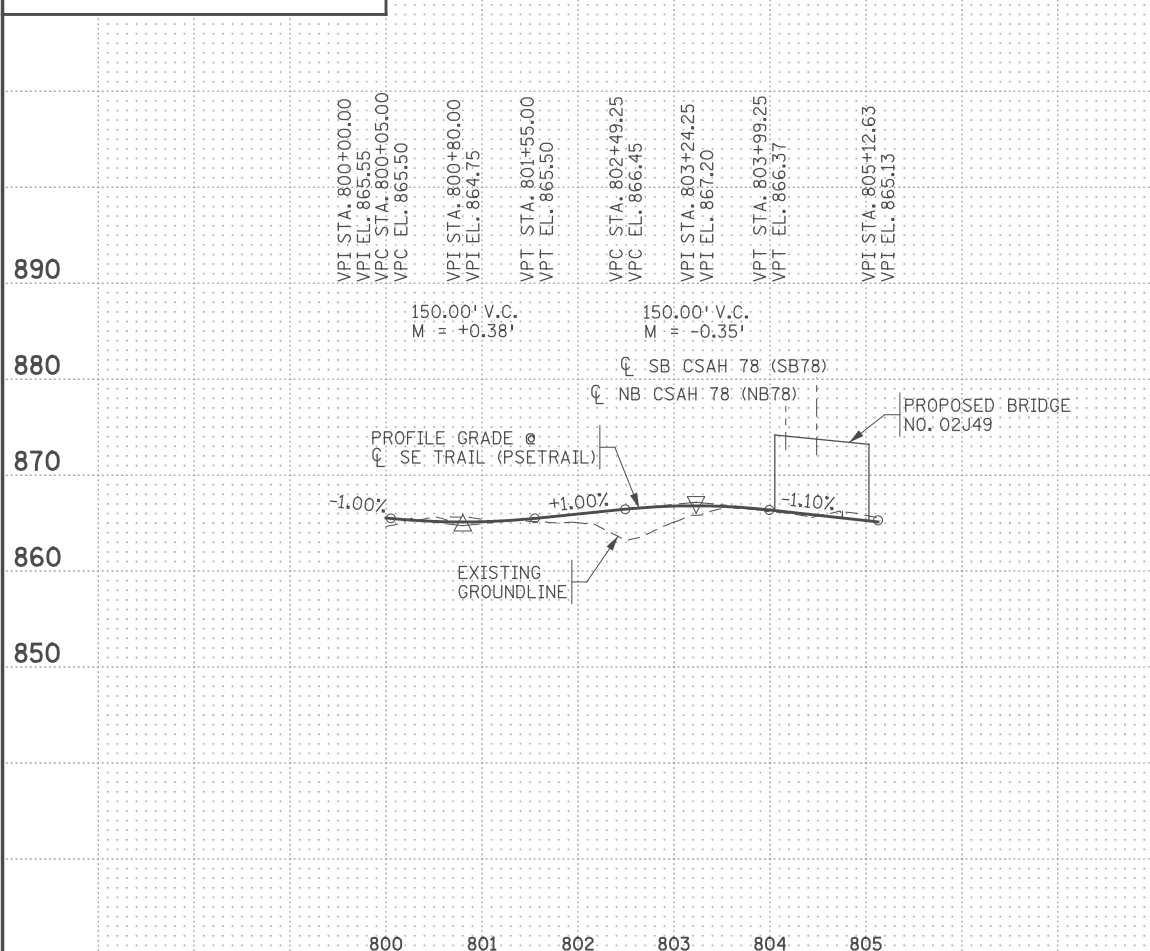
STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051	DRAWN BY	 Consulting Group, Inc.	ENGINEERS PLANNERS DESIGNERS
BRIDGE NO. 02J49	DESIGNED BY		
	CHECKED BY	ANOKA COUNTY	
	COMM. NO. 0169140	AS-BUILT BRIDGE DATA	
		CSAH 78 OVER TRAIL UNDERPASS	

SHEET
BA11
OF
BA14

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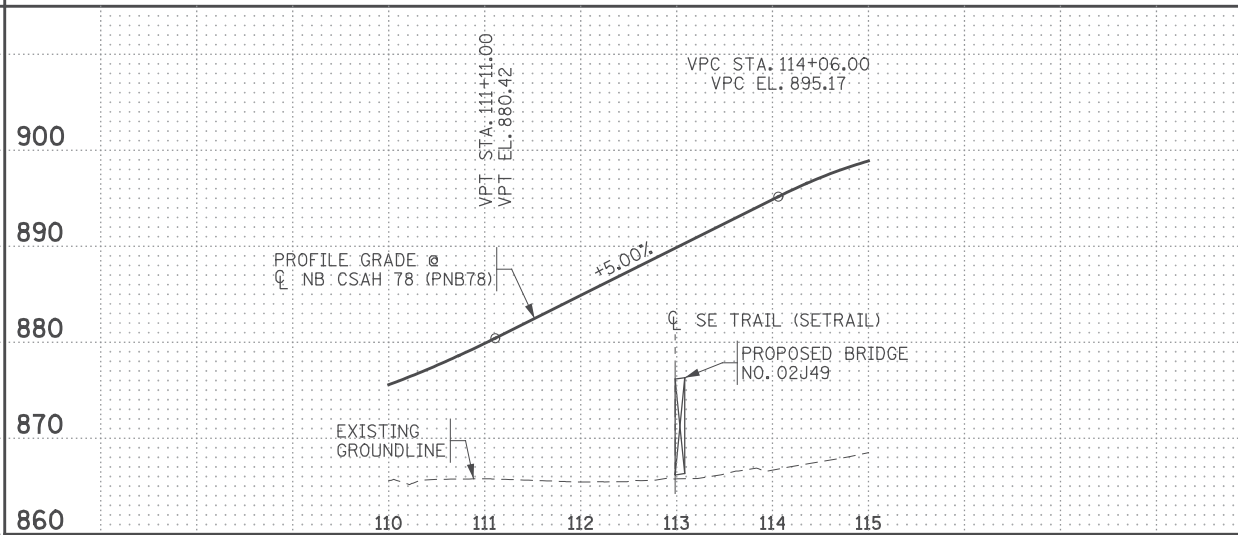
CONTRACTED PROFILE

SCALE : 0 50' 100' 0 5' 10'
HORIZONTAL VERTICAL

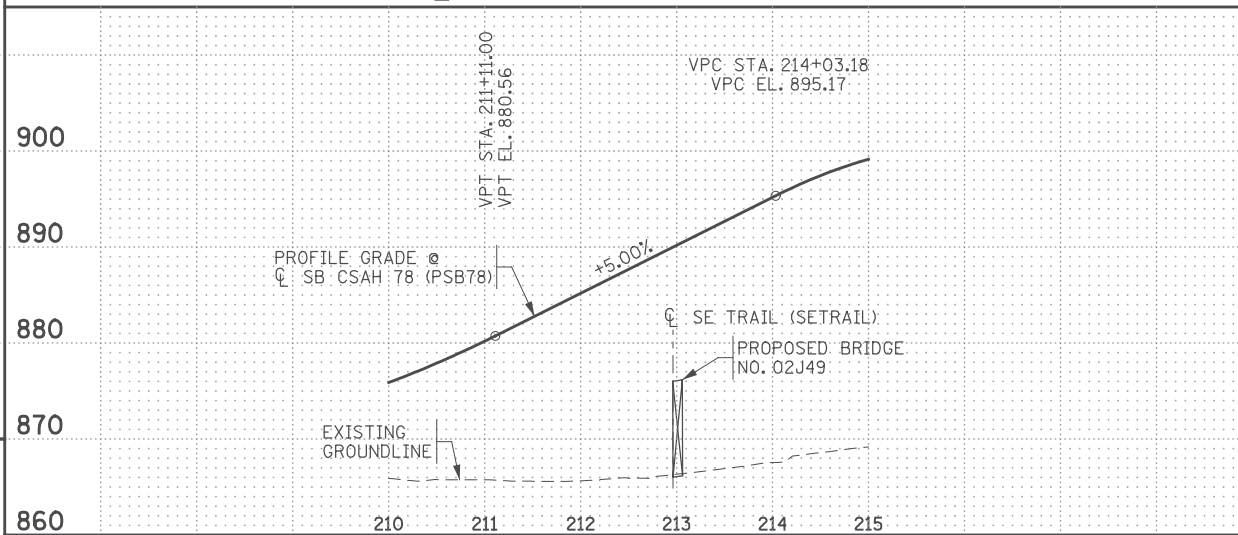


SE TRAIL (PSETRAIL)

NB CSAH 78 (PNB78)



SB CSAH 78 (PSB78)



LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

- SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS, SLIDING BANKS, RECREATIONAL BOATING.
- OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARLY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS-SECTIONAL AREA ETC.
- APPARENT HIGHWATER ELEVATION OBTAINED FROM:
- OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEERS RECOMMENDATION

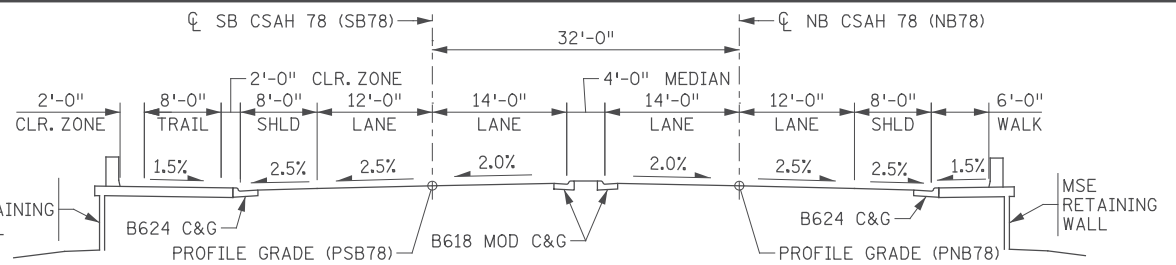
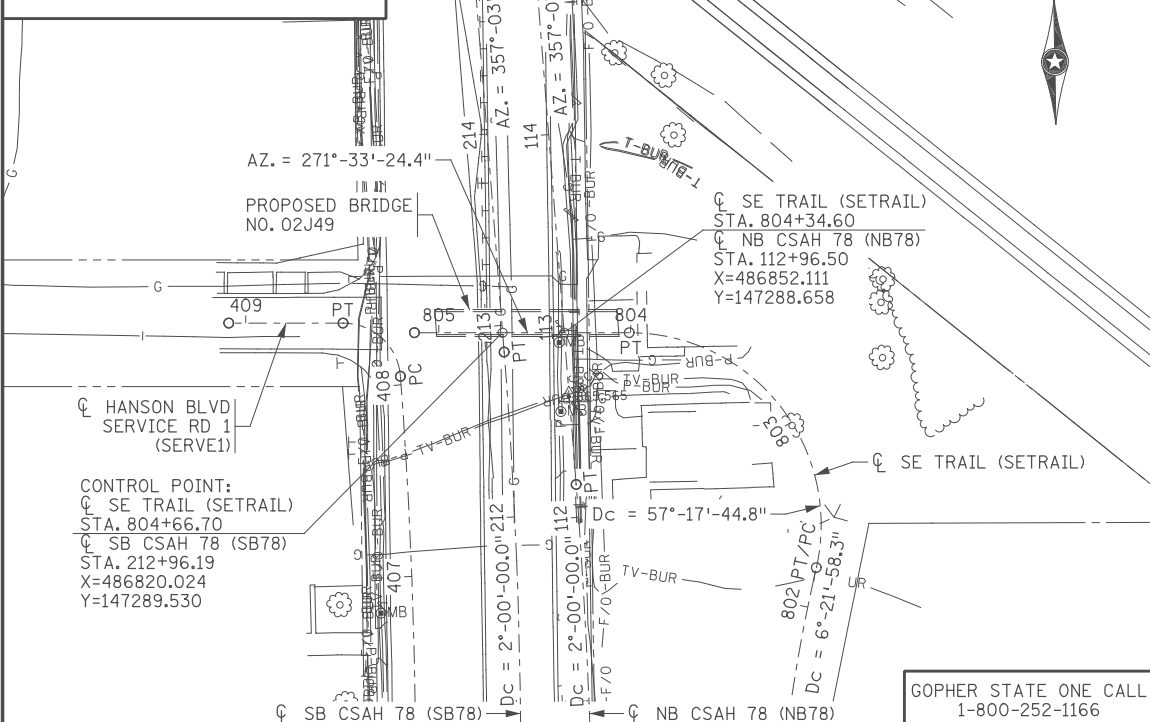
DATE	
STREAM OR DITCH DESIGNATION	
DRAINAGE AREA	
MAX. FLOOD ON RECORD	
MAXIMUM OBSERVED HIGHWATER ELEVATION	
DESIGN FLOOD (YR. FREQ.)	C.F.S.
HEADWATER ELEVATION	FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE	F.P.S.
TOTAL STAGE INCREASE	FT.
LOW MEMBER AT OR ABOVE ELEVATION	FT.
WATERWAY AREA REQUIRED BELOW ELEVATION AT RIGHT ANGLES TO CHANNEL	SG.FT.
BASIC FLOOD (100 YR. FREQ.)	C.F.S.
HEADWATER ELEVATION	FT.
TOTAL STAGE INCREASE	FT.
MEAN VELOCITY THROUGH STRUCTURE	F.P.S.
FLOWLINE ELEVATION	SKUEW ANGLE
ESTIMATED DEPTH OF PIER SCOUR	FT.

SCOUR CONFIRMATION RECOMMENDATION

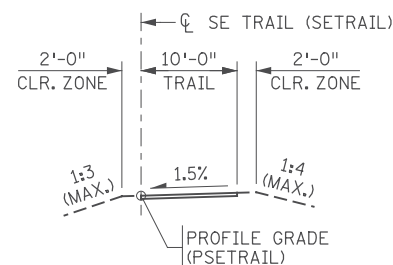
DATE	
TOTAL SCOUR AT PIER EL. (500 OR 01 YR. FREQ.)	
SCOUR CODE =	
BRIDGE SURVEY SHEETS MADE FROM :	SURVEYS BY SRF CONSULTING GROUP, INC.

PLAT

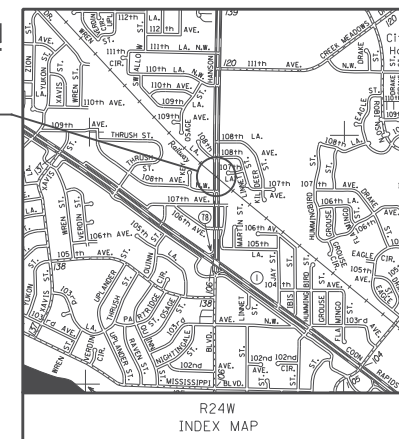
SCALE : 0 25' 50'



CSAH 78 ROADWAY SECTION



SE TRAIL APPROACH SECTION



MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

AT MILE POINT ON (T.H., C.S.A.H., C.R., etc.)

PROPOSED BRIDGE LOCATED 1.3 MILES S OF JCT CSAH 78 (HANSON BLVD) & TH 10

SEC 22 TWP. T31N R. R24W

CITY COON RAPIDS COUNTY ANOKA

ANOKA COUNTY

BRIDGE SURVEY

CSAH 78 OVER TRAIL UNDERPASS

SHEET BA12 OF BA14

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NO	DATE	BY	CKD	APPR	REVISION
...

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

Print Name: CASEY E. BLACK

Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02J49

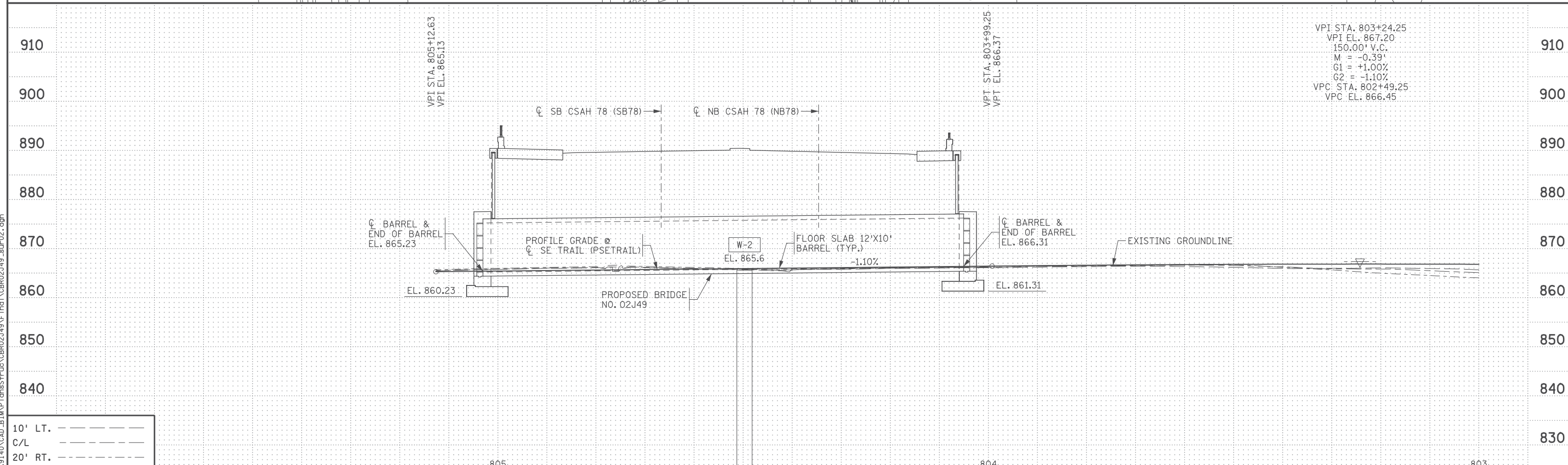
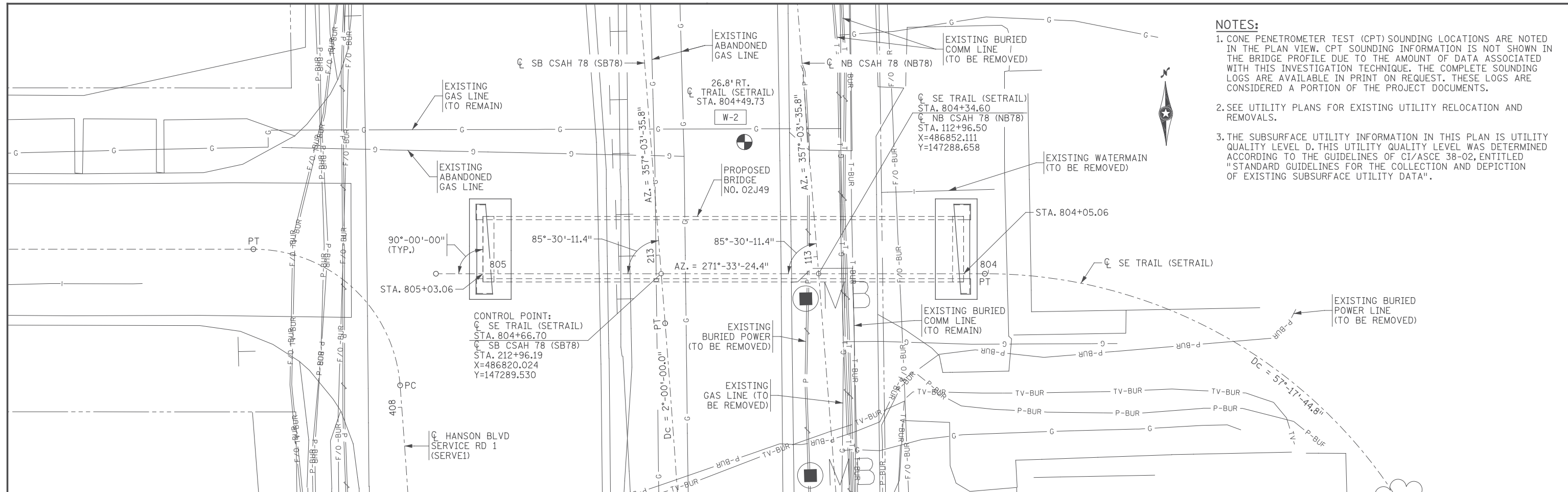
COMM. NO. 0169140

SRF ENGINEERS PLANNERS DESIGNERS

Consulting Group, Inc.

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- NOTES:**
1. CONE PENETROMETER TEST (CPT) SOUNDING LOCATIONS ARE NOTED IN THE PLAN VIEW. CPT SOUNDING INFORMATION IS NOT SHOWN IN THE BRIDGE PROFILE DUE TO THE AMOUNT OF DATA ASSOCIATED WITH THIS INVESTIGATION TECHNIQUE. THE COMPLETE SOUNDING LOGS ARE AVAILABLE IN PRINT ON REQUEST. THESE LOGS ARE CONSIDERED A PORTION OF THE PROJECT DOCUMENTS.
 2. SEE UTILITY PLANS FOR EXISTING UTILITY RELOCATION AND REMOVALS.
 3. THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".



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...

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 Print Name: CASEY E. BLACK
 Date: 11/01/2017 License # 49163

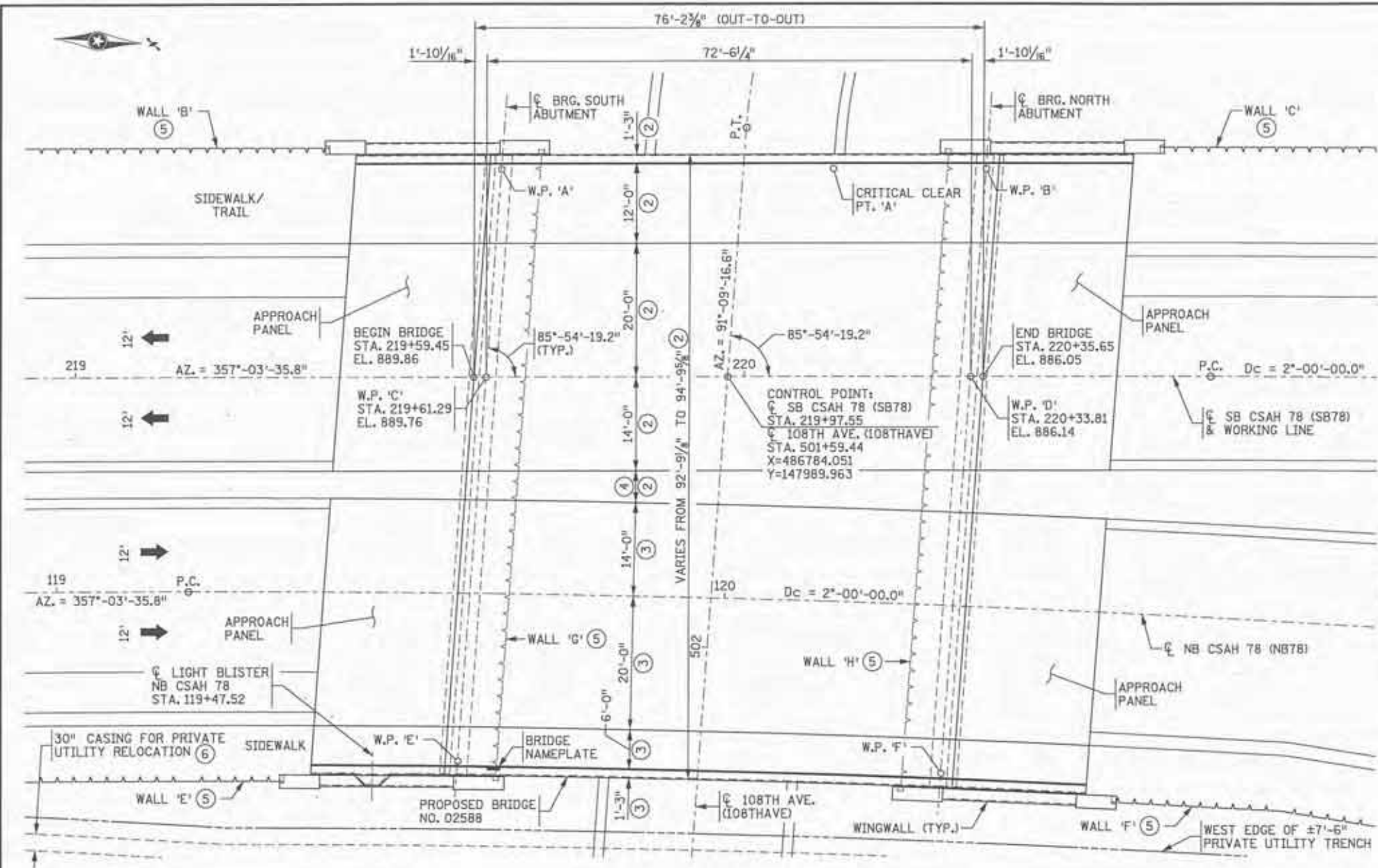
STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02J49
 COMM. NO. 0169140

DRAWN BY
 E. JOHNSON
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
 SRP
 Consulting Group, Inc.
 ENGINEERS
 PLANNERS
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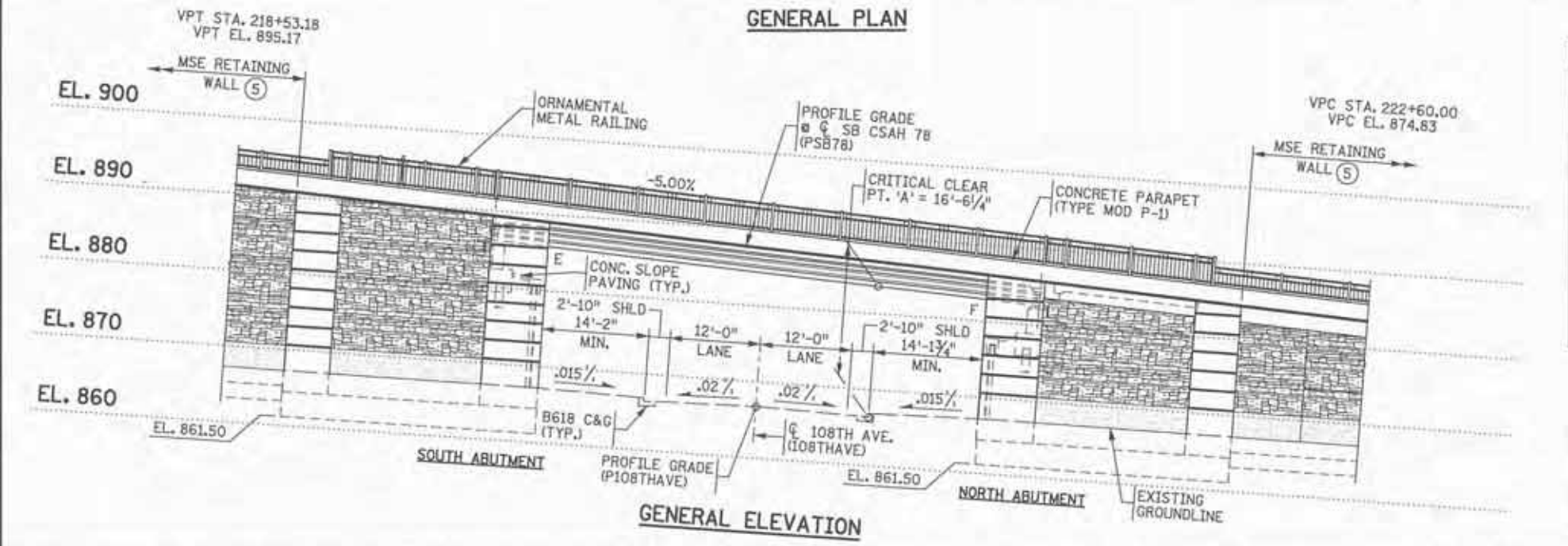
ANOKA COUNTY
 BORINGS - PLAN & PROFILE
 CSAH 78 OVER TRAIL UNDERPASS

SHEET
 BA13
 OF
 BA14

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GENERAL PLAN



GENERAL ELEVATION

DESIGN DATA

DESIGNED IN ACCORDANCE WITH 2016 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS HL 93 LIVE LOAD

DEAD LOAD INCLUDES 20 POUNDS PER SQUARE FOOT ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS

MATERIAL DESIGN PROPERTIES:

REINFORCED CONCRETE:
 $f'_c = 4$ KSI CONCRETE
 $f_y = 60$ KSI PLAIN AND EPOXY COATED BARS
 $f_y = 60$ KSI STAINLESS STEEL BARS
 $n = 8$ FOR REINFORCEMENT

PRESTRESSED CONCRETE:
 $f'_c = 8.7$ KSI CONCRETE
 $f_{pu} = 270$ KSI LOW RELAXATION STRANDS
 $n = 1$ FOR REINFORCEMENT
 $0.75 f_{pu}$ FOR INITIAL PRESTRESS

DESIGN SPEED:
 OVER = 40 MPH
 UNDER = 30 MPH

APPROXIMATE DECK AREA = 7,133 SQUARE FEET

2030 PROJECTED TRAFFIC VOLUMES:
 ROADWAY OVER 16,800 ADT
 ROADWAY UNDER 300

HL 93 LRFR
 BRIDGE OPERATING RATING FACTOR $R_f = 1.87$

CONSTRUCTION NOTES

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

SEE SPECIAL PROVISIONS FOR ALL XXXX.6XX SERIES PAY ITEMS FOR ADDITIONAL REQUIREMENTS.

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. BARS MARKED WITH THE SUFFIX "S" SHALL BE STAINLESS STEEL IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

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

THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (R_n) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

THE GIRDERS HAVE BEEN DESIGNED AND DETAILED WITHOUT DIAPHRAGMS. THE CONTRACTOR'S ENGINEER SHALL DESIGN AND THE CONTRACTOR SHALL CONSTRUCT A TEMPORARY BRACING SYSTEM AND/OR A DECK FALSEWORK/FORMWORK SYSTEM. THE SYSTEM SHALL PROVIDE LATERAL AND ROTATIONAL STABILITY OF THE GIRDERS TO RESIST UNSYMMETRICAL CONCRETE AND CONSTRUCTION LOADS UNTIL DECK CONCRETE HAS ATTAINED A MINIMUM STRENGTH OF 2800 PSI.

NOTES:

1. MSE DENOTES MECHANICALLY STABILIZED EARTH.
2. MEASURED PERPENDICULAR TO WORKING LINE.
3. MEASURED PERPENDICULAR TO ϕ NB CSAH 78.
4. MEDIAN VARIES FROM 4'-3/2" TO 6'-4 1/8".
5. SEE RETAINING WALL PLANS.
6. PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY RELOCATION CORRIDOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.

LIST OF SHEETS

BB1	GENERAL PLAN & ELEVATION
BB2	TRANSVERSE SECTION & QUANTITIES
BB3	BRIDGE LAYOUT
BB4 - BB21	ABUTMENT DETAILS
BB22	FRAMING PLAN
BB23	27M PRESTRESSED CONCRETE BEAMS
BB24 - BB28	BRIDGE DECK DETAILS
BB29	CORNER DETAILS
BB30 - BB32	RAILING DETAILS
BB33 & BB34	CONDUIT SYSTEM DETAILS
BB35	SLOPE PAVING DETAILS
BB36 - BB38	B-DETAILS
BB39	A5-BUILT BRIDGE DATA
BB40	BRIDGE SURVEY
BB41	BORINGS - PLAN & PROFILE
BB42	SOIL BORINGS

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

Print Name: CASEY E. BLACK
 Signature: *[Signature]*
 Date: 8/23/2017 License #: 49163
 SRI Consulting Group, Inc.

ANOKA COUNTY

BRIDGE NO. 02588

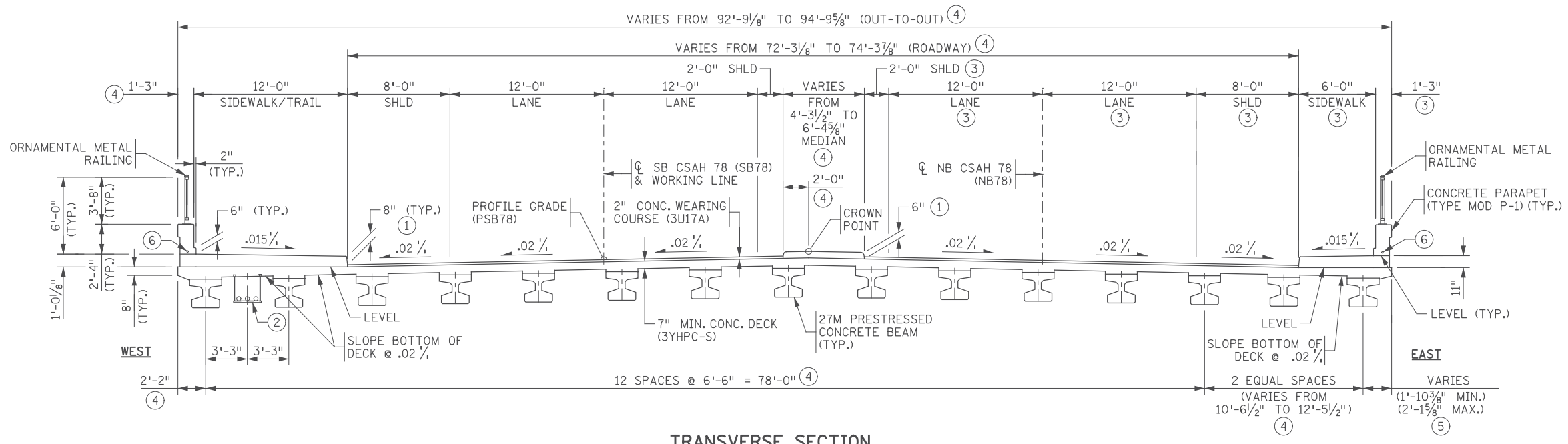
CSAH 78 (HANSON BLVD) OVER 108TH AVENUE NW
 1.1 MILES SOUTH OF EXISTING JUNCTION OF
 CSAH 78 (HANSON BLVD) & TH 10
 IN THE CITY OF COON RAPIDS
 72'-6 1/4" PRESTRESSED CONC. BEAM SPAN
 VARIABLE RDWY, 4'5"40.8" SKEW, TWO TYPE MOD. P-1
 CONC. RAILS, 12'-0" TRAIL, VAR. MEDIAN & 6'-0" WALK

IDENTIFICATION NO. 501
GENERAL PLAN AND ELEVATION

SEC. 22 T 31 N R 24 W
 CITY OF COON RAPIDS ANOKA COUNTY

APPROVED: *[Signature]* ANOKA COUNTY ENGINEER
 APPROVED: *[Signature]* STATE BRIDGE ENGINEER
 DATE: 11/3/17

SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE NO. 02588				FF
ITEM NO.	ITEM	UNIT	QUANTITY	
2401.501	STRUCTURAL CONCRETE (1G52)	CU YD	205	(P)
2401.501	STRUCTURAL CONCRETE (3B52)	CU YD	442	(P)
2401.513	TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	233	(P)
2401.515	SIDEWALK CONCRETE (3S52)	SQ FT	2343	(P)
2401.516	RAISED MEDIAN CONCRETE (3S52)	SQ FT	395	(P)
2401.541	REINFORCEMENT BARS	POUND	40470	(P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	102930	(P)
2401.541	REINFORCEMENT BARS (STAINLESS-60KSI)	POUND	950	(P)
2401.601	STRUCTURE EXCAVATION (BR NO 02588)	LUMP SUM	1	
2401.618	BRIDGE SLAB CONCRETE (3YHPC-S)	SQ FT	7133	(P)
2402.583	ORNAMENTAL METAL RAILING	LIN FT	233	(P)
2402.595	BEARING ASSEMBLY	EACH	30	(P)
2404.501	CONCRETE WEARING COURSE (3U17A)	SQ FT	7898	(P)
2405.502	PRESTRESSED CONCRETE BEAMS 27M	LIN FT	1108	(P)
2411.618	ARCH CONC TEXTURE (ASHLAR STONE)	SQ FT	1244	(P)
2411.618	ARCH SURFACE FINISH (SINGLE COLOR)	SQ FT	1244	(P)
2411.618	ANTI-GRAFFITI COATING	SQ FT	1244	(P)
2452.519	C-I-P CONCRETE TEST PILE 40 FT LONG 12"	EACH	4	
2452.519	C-I-P CONCRETE TEST PILE 55 FT LONG 12"	EACH	2	
2452.603	C-I-P CONCRETE PILING 12"	LIN FT	3570	
2452.603	PILE SLEEVES	LIN FT	655	
2514.501	CONCRETE SLOPE PAVING	SQ YD	50	(P)
2545.509	CONDUIT SYSTEM (LIGHTING) (BR NO 02588)	LUMP SUM	1	
2545.509	CONDUIT SYSTEM (SIGNALS) (BR NO 02588)	LUMP SUM	1	
2545.509	CONDUIT SYSTEM (FUTURE) (BR NO 02588)	LUMP SUM	1	



- NOTES:**
- ① MEASURED FROM TOP OF 2" WEARING COURSE.
 - ② WEST BRIDGE SUPPORTED CONDUIT SYSTEM TO INCLUDE (1)-4" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (SIGNALS) & (2)-4" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (FUTURE).
 - ③ MEASURED PERPENDICULAR TO CL NB CSAH 78.
 - ④ MEASURED PERPENDICULAR TO WORKING LINE.
 - ⑤ MEASURED PERPENDICULAR TO FASCIA BEAM.
 - ⑥ 1/2" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (LIGHTING).

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11/01/2017				RELEASED FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR

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

Print Name: **ERIC S. HANSON**

Eric S. Hanson

Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

COMM. NO. 0169140

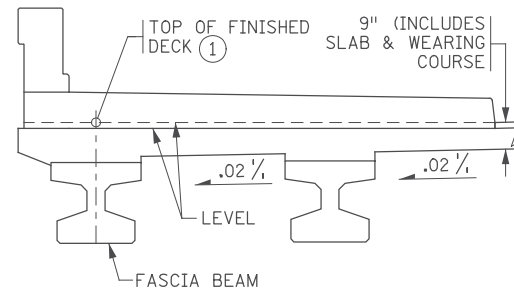
SRH ENGINEERS PLANNERS DESIGNERS

Consulting Group, Inc.

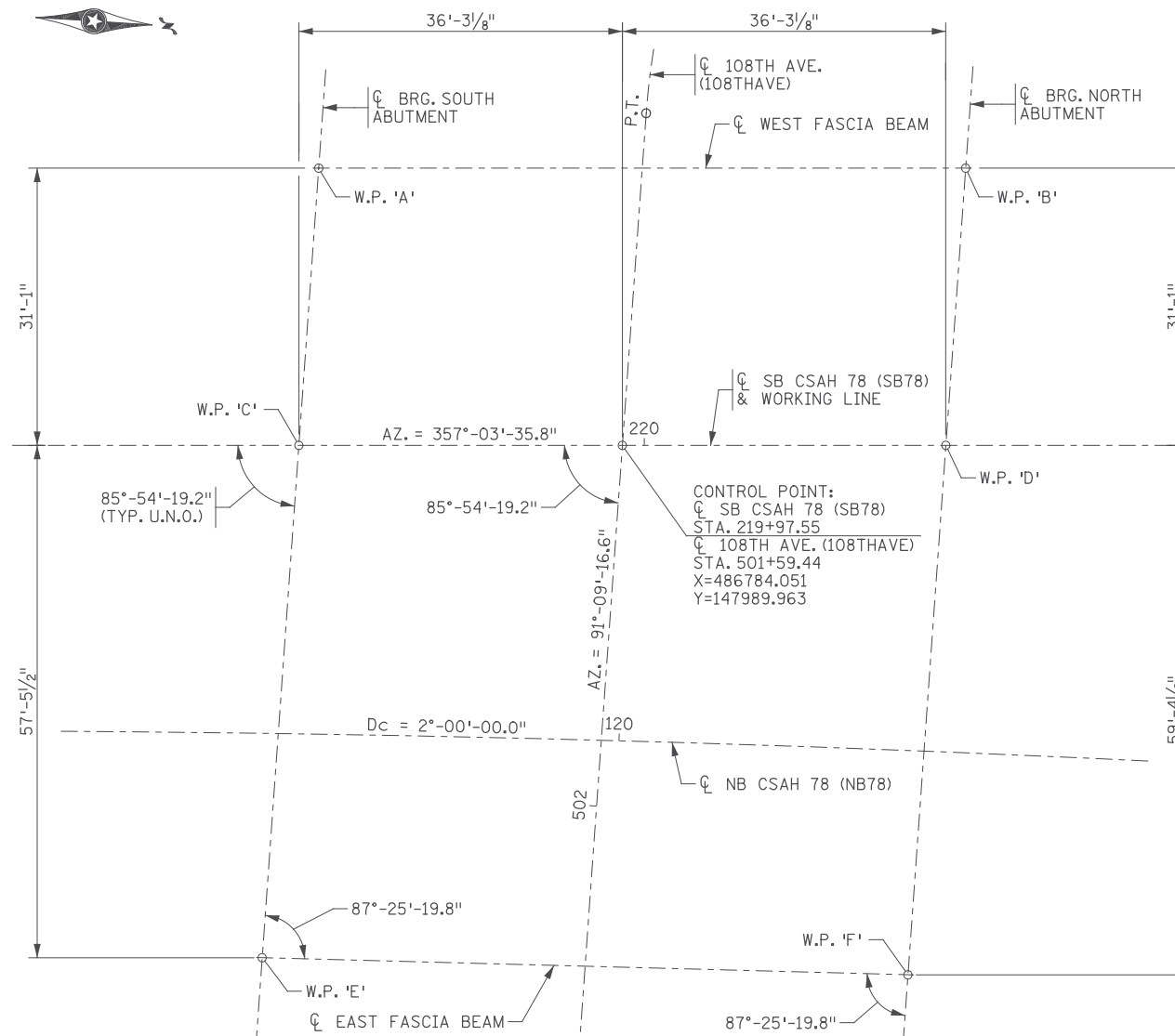
ANOKA COUNTY

TRANSVERSE SECTION & QUANTITIES
CSAH 78 OVER 108TH AVENUE NW

SHEET
BB2
OF
BB42



SIDEWALK DETAIL



WORKING POINT LAYOUT



TOP OF ROADWAY TO BRIDGE SEAT							
	BEAM LINE	SLAB THICKNESS ②	STOOL HEIGHT	BEAM HEIGHT	BEARING HEIGHT	TOTAL HEIGHT ②	
						INCHES	FEET
SOUTH ABUTMENT	WEST FASCIA BEAM	11 5/8"	3 5/8"	27"	5 1/4"	47 1/2"	3.96'
SOUTH ABUTMENT	WEST 1ST INTERIOR BEAM	10 1/8"	3 5/8"	27"	5 1/4"	46"	3.83'
SOUTH ABUTMENT	TYPICAL INTERIOR BEAM	9"	3 5/8"	27"	5 1/4"	44 7/8"	3.74'
SOUTH ABUTMENT	EAST FASCIA BEAM	10 1/4"	3 5/8"	27"	5 1/4"	46 1/8"	3.84'
NORTH ABUTMENT	WEST FASCIA BEAM	11 5/8"	3 5/8"	27"	3 1/4"	45 1/2"	3.80'
NORTH ABUTMENT	WEST 1ST INTERIOR BEAM	10 1/8"	3 5/8"	27"	3 1/4"	44"	3.67'
NORTH ABUTMENT	TYPICAL INTERIOR BEAM	9"	3 5/8"	27"	3 1/4"	42 7/8"	3.57'
NORTH ABUTMENT	EAST FASCIA BEAM	10 1/4"	3 5/8"	27"	3 1/4"	44 1/8"	3.68'

DIMENSIONS BETWEEN WORKING POINTS										ELEVATION			
POINT	STATION	X-COORDINATE	Y-COORDINATE	A	B	C	D	E	F	TOP OF FIN. DECK ①	FIN. DECK TO BR. SEAT ②	BRIDGE SEAT	POINT
A	219+63.52	486754.754	147954.379		72.52	31.16	76.86		112.00	889.25	3.96	885.29	A
B	220+36.03	486751.034	148026.802				31.16	118.57		885.63	3.80	881.83	B
C	219+61.29	486785.910	147953.751				72.52	57.61	90.48	889.76	-	-	C
D	220+33.81	486782.191	148026.174						59.53	886.14	-	-	D
E	219+57.18	486843.504	147952.591						72.41	889.56	3.84	885.72	E
F	220+29.56	486841.706	148024.975							885.91	3.68	882.23	F

NOTES:

- ① TOP OF FINISHED DECK IS THEORETICAL TOP OF CONCRETE WEARING COURSE EXTENDED LEVEL BELOW SIDEWALK FOR W.P.'S A, B, E AND F.
- ② SLAB THICKNESS AND TOTAL HEIGHT VARIES BELOW SIDEWALK.

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			REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: ERIC S. HANSON
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02588
 COMM. NO. 0169140

DRAWN BY
 E. JOHNSON
 DESIGNED BY
 S. NEFF
 CHECKED BY
 E. HANSON
SRH ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 BRIDGE LAYOUT
 CSAH 78 OVER 108TH AVENUE NW

SHEET
BB3
OF
BB42

SOUTH ABUTMENT ^④ REQUIRED NOMINAL PILE BEARING RESISTANCE R_n - TONS/PILE		
FIELD CONTROL METHOD	ϕ dyn	* R_n
MnDOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000}} \times \text{LOG}(\frac{10}{S})$	0.50	186.2
PDA	0.65	143.2

* $R_n = (\text{FACTORED DESIGN LOAD}) / \phi$ dyn

SOUTH ABUTMENT ^④ COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	72.8
FACTORED LIVE LOAD	20.3
* FACTORED DESIGN LOAD	93.1

* BASED ON STRENGTH I LOAD COMBINATION

SOUTH ABUTMENT ^⑤ COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	82.3
FACTORED DOWNDRAW	29.7
*** FACTORED DEAD LOAD + EARTH PRESSURE + DOWNDRAW	112.1

*** BASED ON STRENGTH I LOAD COMBINATION, NOT INCLUDING TRANSIENT LOADS. ONLY USED FOR COMPARISON WITH FACTORED STRUCTURAL RESISTANCE. NOT TO BE USED FOR DRIVING.

NOTES:

1. T.T.C. DENOTES TANGENT TO CURVE
2. 20" DIAMETER BLOCKOUT IN LOWER FOOTING FOR UPPER FOOTING PILE.
3. MSE WALL LEVELING PAD WITH 1" BOND BREAKER. SEE RETAINING WALL PLANS.
4. PILE LOAD TABLE APPLIES TO UPPER AND LOWER FOOTINGS. PILE LOAD TABLE REPORTS MAXIMUM EFFECTS PER UPPER AND LOWER FOOTING DESIGN, AND GOVERNS FOR ALL PILE.
5. PILE LOAD TABLE REPORTS MAXIMUM EFFECTS. LOWER FOOTING DESIGN CONTROLS.
6. GEOTEXTILE FABRIC SHALL BE CONSIDERED INCIDENTAL.
7. POLYSTYRENE TYPE A AND B SHALL BE CONSIDERED INCIDENTAL.

PILE NOTES:

- 1 - 12" C-I-P TEST PILES, 55 FEET LONG.
- 2 - 12" C-I-P TEST PILES, 40 FEET LONG.
- 19 - 12" C-I-P PILES, ESTIMATED LENGTH 45 FEET LONG.
- 34 - 12" C-I-P PILES, ESTIMATED LENGTH 30 FEET LONG.
- 56 - 12" C-I-P PILES REQUIRED FOR SOUTH ABUTMENT.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

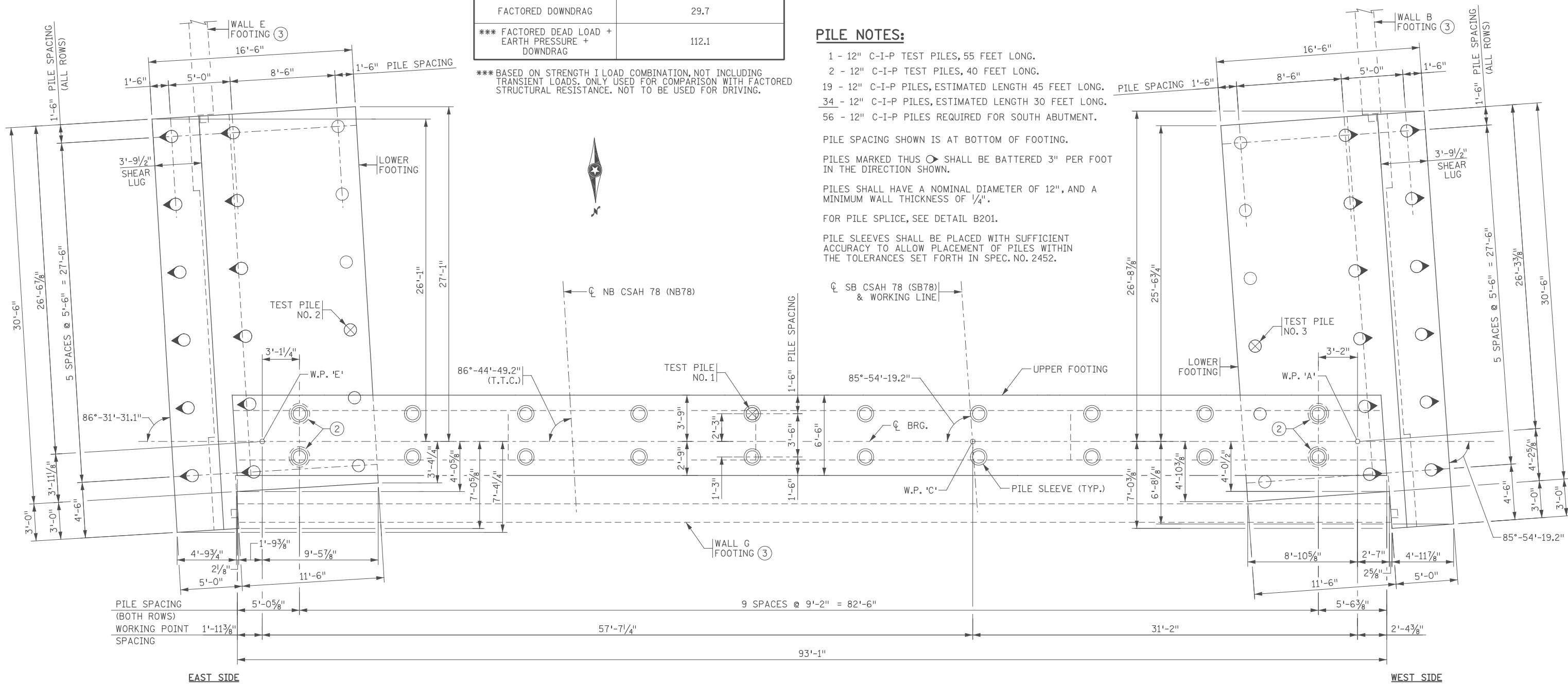
PILES MARKED THUS \odot SHALL BE BATTERED 3" PER FOOT IN THE DIRECTION SHOWN.

PILES SHALL HAVE A NOMINAL DIAMETER OF 12", AND A MINIMUM WALL THICKNESS OF 1/4".

FOR PILE SPLICE, SEE DETAIL B201.

PILE SLEEVES SHALL BE PLACED WITH SUFFICIENT ACCURACY TO ALLOW PLACEMENT OF PILES WITHIN THE TOLERANCES SET FORTH IN SPEC. NO. 2452.

SUMMARY OF QUANTITIES : S. ABUTMENT		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (1G52)	CU YD	118
STRUCTURAL CONCRETE (3B52)	CU YD	232
REINFORCEMENT BARS	POUND	22080
REINFORCEMENT BARS (EPOXY COATED)	POUND	28080
ARCH CONC TEXTURE (ASHLAR STONE)	SQ FT	716
ARCH SURFACE FINISH (SINGLE COLOR)	SQ FT	716
ANTI-GRAFFITI COATING	SQ FT	716
C-I-P CONCRETE TEST PILE 40 FT LONG 12"	EACH	2
C-I-P CONCRETE TEST PILE 55 FT LONG 12"	EACH	1
C-I-P CONCRETE PILING 12"	LIN FT	1875
PILE SLEEVES	LIN FT	365
CONCRETE SLOPE PAVING	SQ YD	25



SOUTH ABUTMENT FOOTING PLAN

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NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: CASEY E. BLACK

Casey E. Black

Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

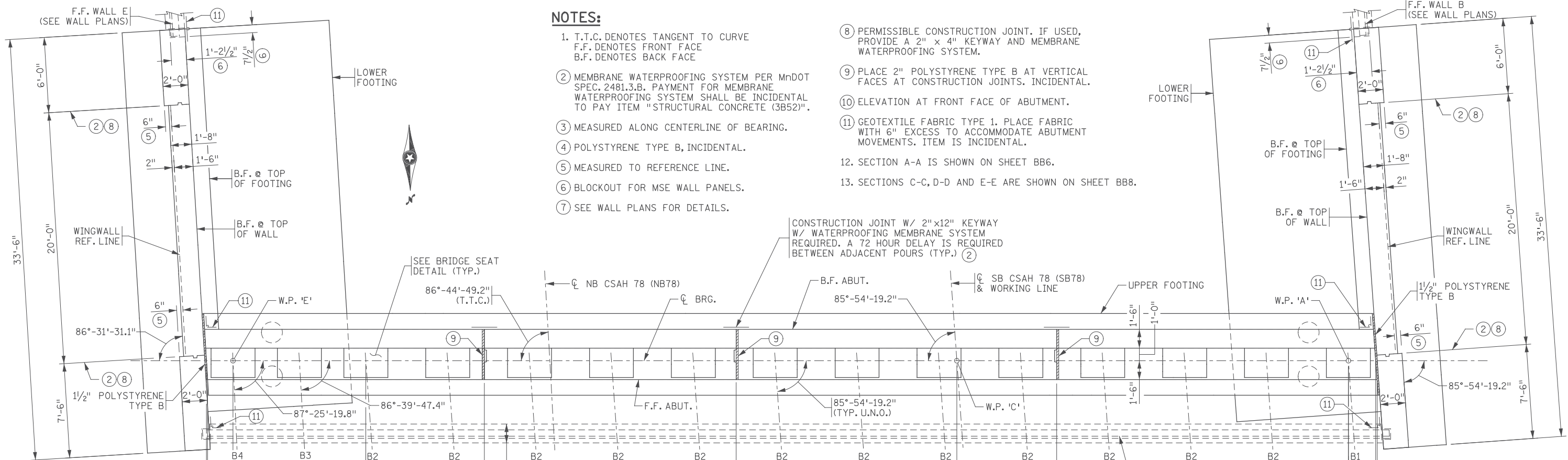
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
SOUTH ABUTMENT DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 1 OF 5)

SHEET
BB4
OF
BB42

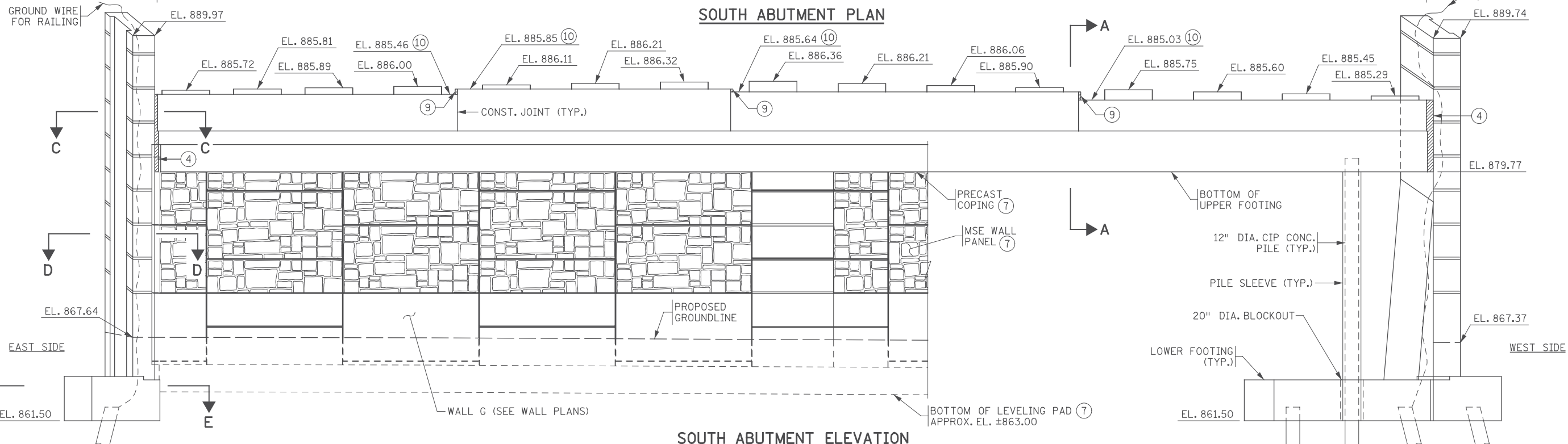


NOTES:

1. T.T.C. DENOTES TANGENT TO CURVE
F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
2. MEMBRANE WATERPROOFING SYSTEM PER MNDOT SPEC. 2481.3.B. PAYMENT FOR MEMBRANE WATERPROOFING SYSTEM SHALL BE INCIDENTAL TO PAY ITEM "STRUCTURAL CONCRETE (3B52)".
3. MEASURED ALONG CENTERLINE OF BEARING.
4. POLYSTYRENE TYPE B, INCIDENTAL.
5. MEASURED TO REFERENCE LINE.
6. BLOCKOUT FOR MSE WALL PANELS.
7. SEE WALL PLANS FOR DETAILS.
8. PERMISSIBLE CONSTRUCTION JOINT. IF USED, PROVIDE A 2" x 4" KEYWAY AND MEMBRANE WATERPROOFING SYSTEM.
9. PLACE 2" POLYSTYRENE TYPE B AT VERTICAL FACES AT CONSTRUCTION JOINTS. INCIDENTAL.
10. ELEVATION AT FRONT FACE OF ABUTMENT.
11. GEOTEXTILE FABRIC TYPE 1. PLACE FABRIC WITH 6" EXCESS TO ACCOMMODATE ABUTMENT MOVEMENTS. ITEM IS INCIDENTAL.
12. SECTION A-A IS SHOWN ON SHEET BB6.
13. SECTIONS C-C, D-D AND E-E ARE SHOWN ON SHEET BB8.

SOUTH ABUTMENT PLAN

SOUTH ABUTMENT ELEVATION



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NO	DATE	BY	CKD	APPR	REVISION
...

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Print Name: CASEY E. BLACK
Casey E. Black
 Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO.
02588

COMM. NO. 0169140

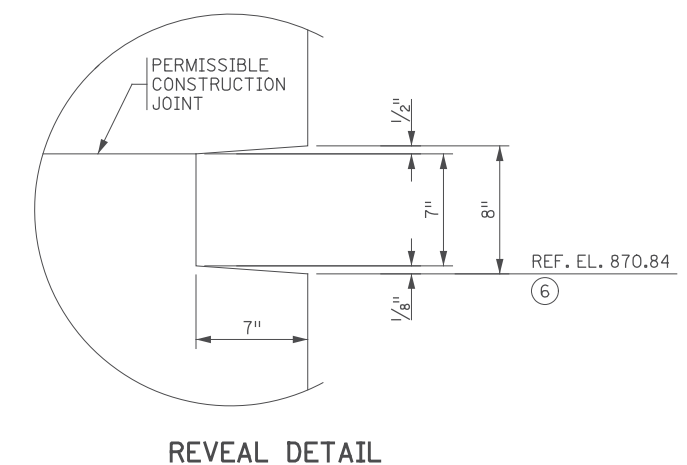
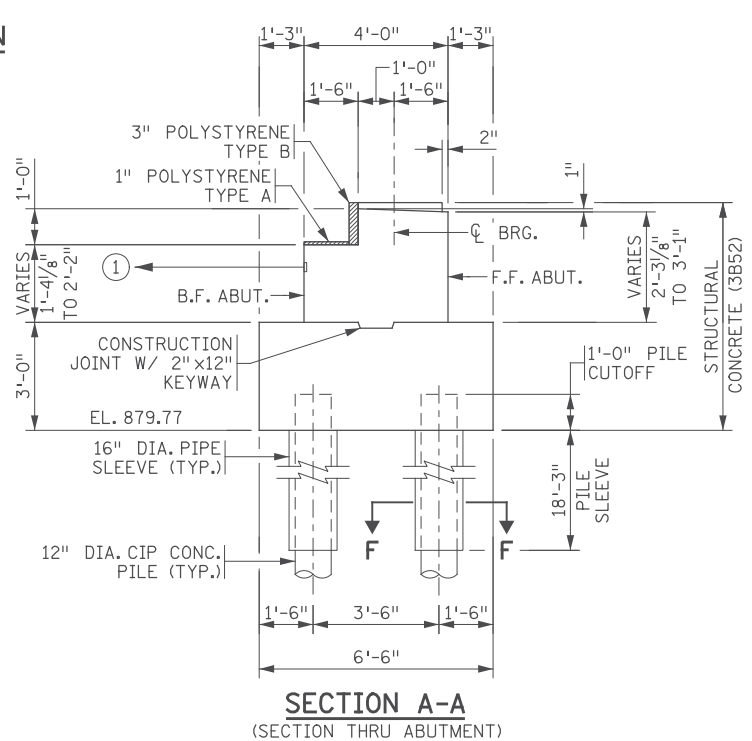
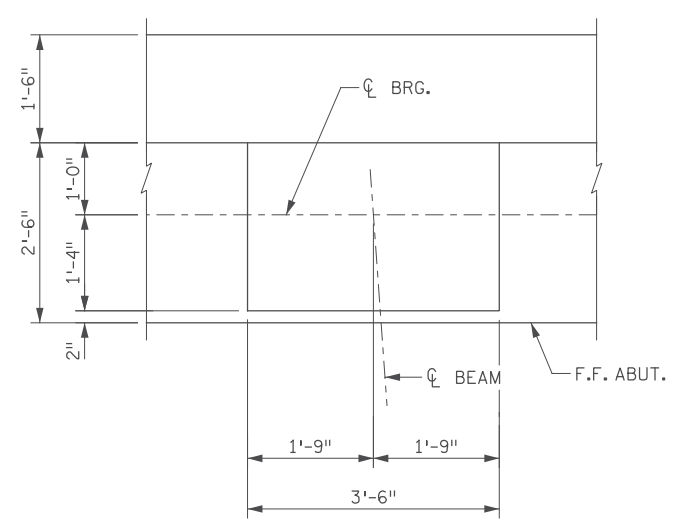
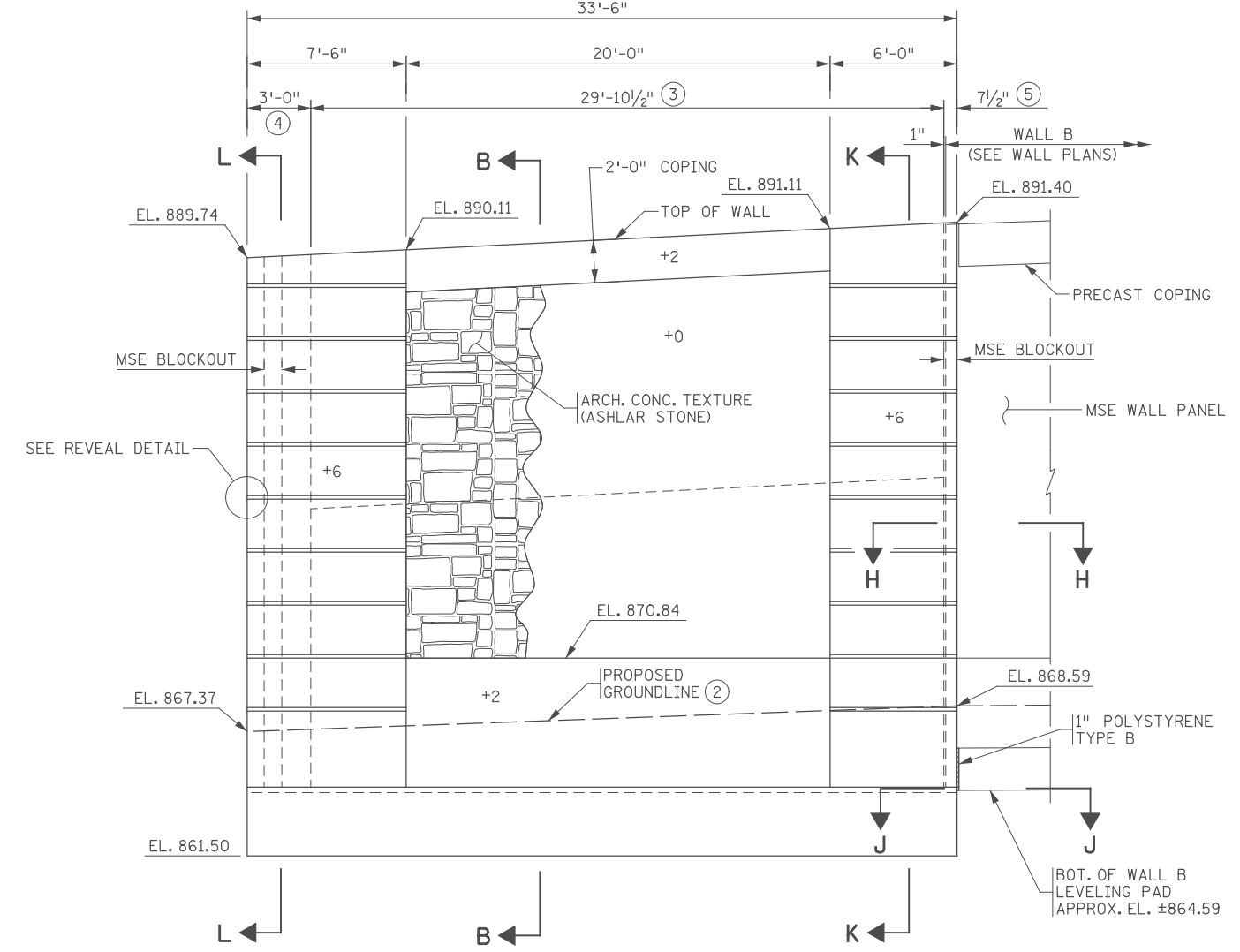
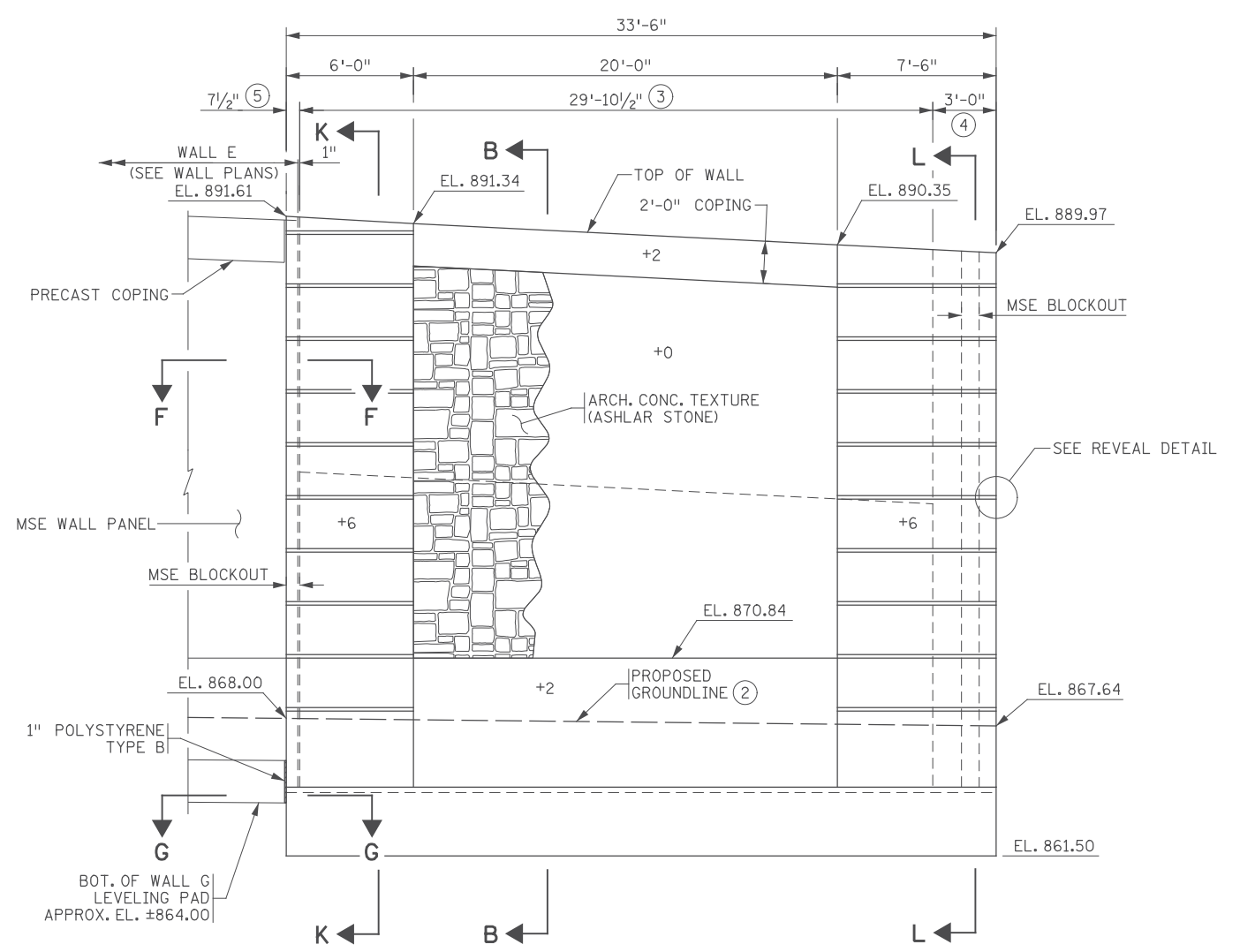
DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK

SRF
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**ENGINEERS
 PLANNERS
 DESIGNERS**

ANOKA COUNTY
 SOUTH ABUTMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 2 OF 5)

**SHEET
 BB5
 OF
 BB42**

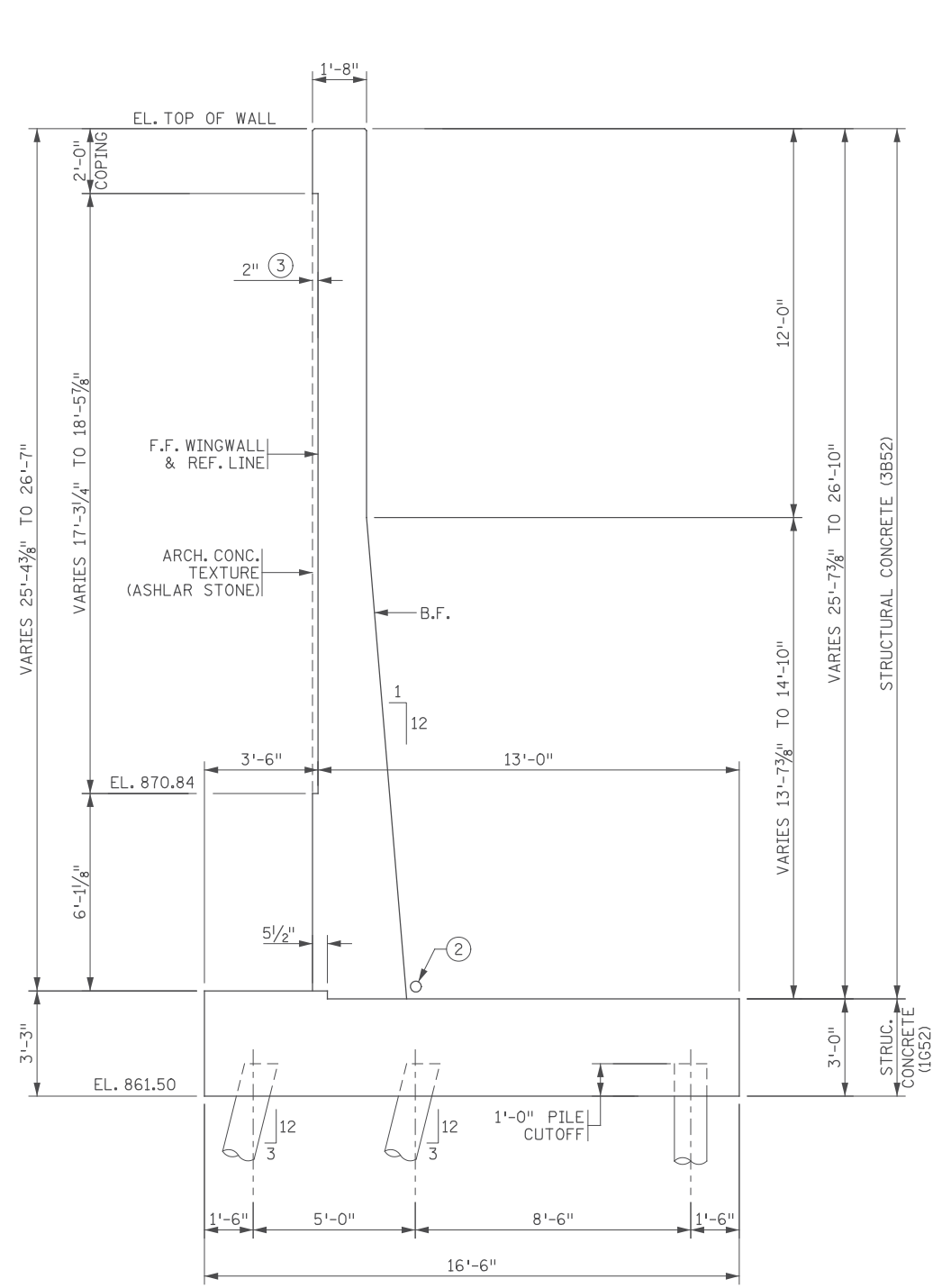


- NOTES:**
- THE SOIL REINFORCEMENT AND FASTENERS FOR THE ABUTMENT BACKWALL SHALL BE DESIGNED AND FURNISHED BY THE CONTRACTOR. THE SOIL REINFORCEMENT SHALL BE DESIGNED TO RESIST A SERVICE HORIZONTAL LOAD OF 1.7 KIPS PER FOOT OF ABUTMENT WIDTH. THIS SERVICE HORIZONTAL LOAD ACCOUNTS FOR EARTH HORIZONTAL AND LIVE LOAD SURCHARGE. THE COST OF THE REINFORCEMENT AND FASTENERS IS TO BE INCLUDED IN THE COST OF THE MSE WALL SYSTEM. INSTALLATION SHALL BE BY THE CONTRACTOR.
 - EXTEND ARCHITECTURAL CONCRETE TEXTURE AND SURFACE FINISH TO A MINIMUM OF 2'-0" BELOW THE PROPOSED GROUNDLINE.
 - WINGWALL SECTION WITH BATTERED BACK FACE.
 - WINGWALL SECTION WITH VERTICAL BACK FACE.
 - BLOCKOUT FOR MSE RETAINING WALL.
 - PROJECT WIDE AESTHETIC REFERENCE ELEVATION.
 - SECTIONS B-B, K-K AND L-L ARE SHOWN ON SHEET BB7.
 - SECTIONS F-F, G-G, H-H AND J-J ARE SHOWN ON SHEET BB8.

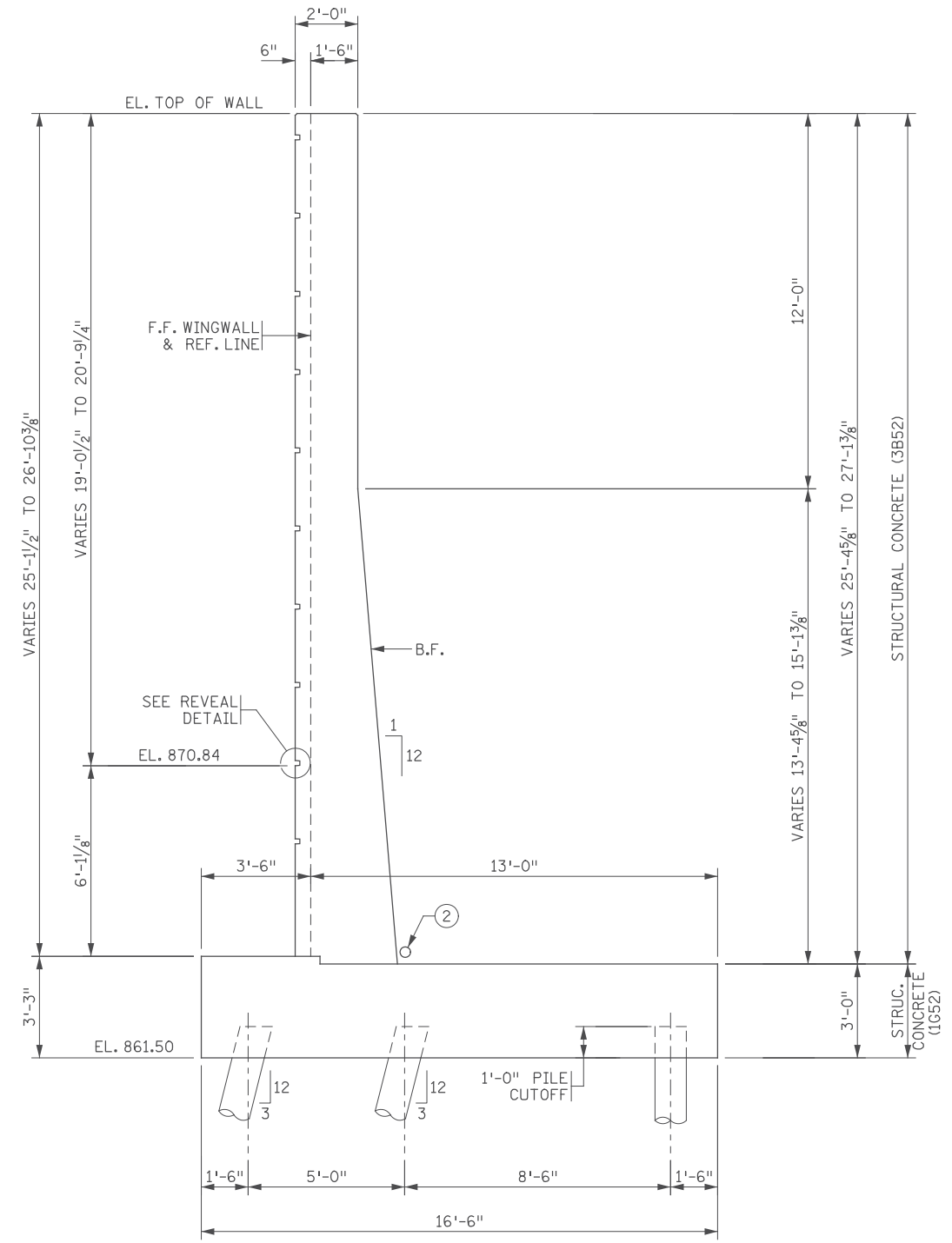
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11/01/2017					RELEASED FOR CONSTRUCTION					I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.					STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051					DRAWN BY J. HOFFMAN DESIGNED BY A. BEHNKE CHECKED BY C. BLACK COMM. NO. 0169140					ANOKA COUNTY SOUTH ABUTMENT DETAILS CSAH 78 OVER 108TH AVENUE NW (SHEET 3 OF 5)					SHEET BB6 OF BB42																			
NO					DATE					BY					CKD					APPR					REVISION					Print Name: CASEY E. BLACK Date: 11/01/2017 License #: 49163					BRIDGE NO. 02588					ENGINEERS PLANNERS DESIGNERS									
...					Ina\CBR02588_abr03.dgn																																												

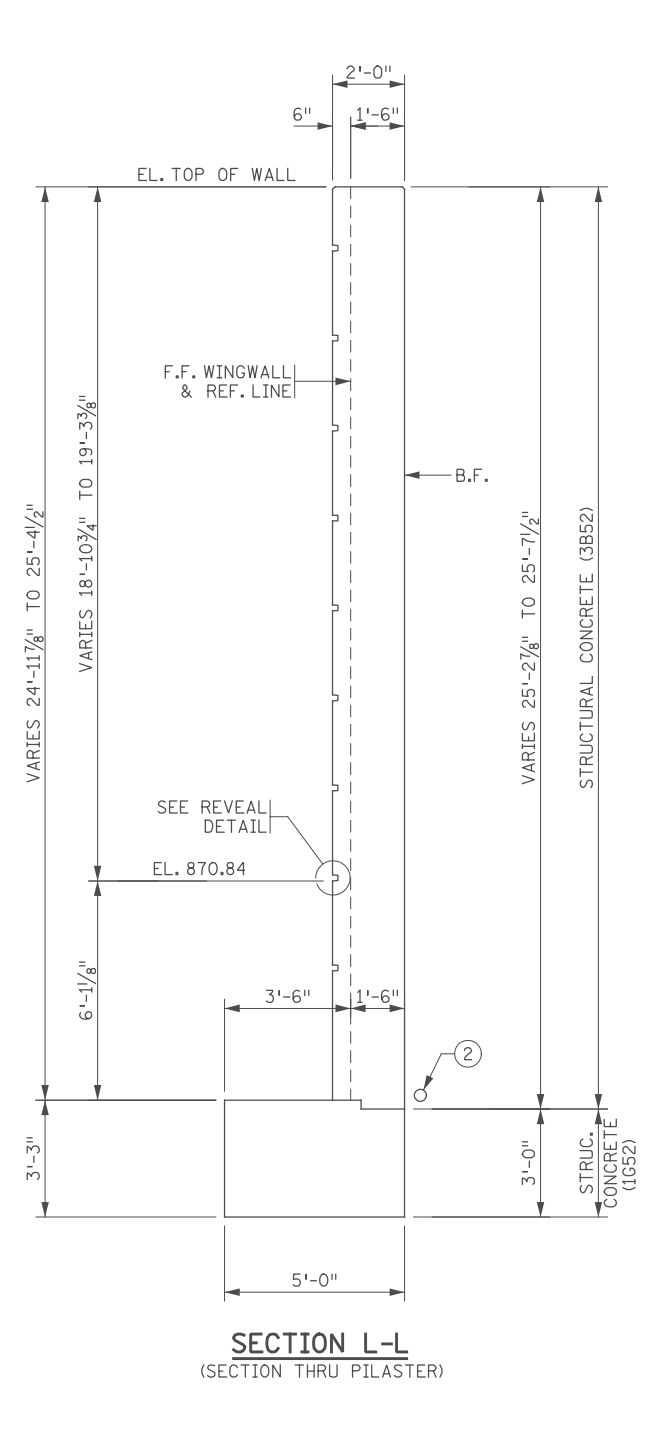
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SECTION B-B
(SECTION THRU WINGWALL)



SECTION K-K
(SECTION THRU PILASTER)



SECTION L-L
(SECTION THRU PILASTER)

- NOTES:**
1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
 - ② 4" PERFORATED THERMAL PLASTIC PIPE, SEE WALL PLANS.
 - ③ MAXIMUM TEXTURE RELIEF.

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				REVISION

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 Print Name: CASEY E. BLACK
Casey E. Black
 Date: 11/01/2017 License # 49163

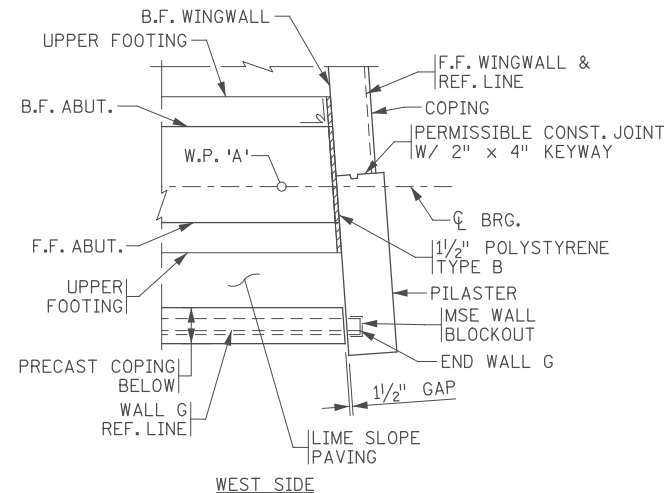
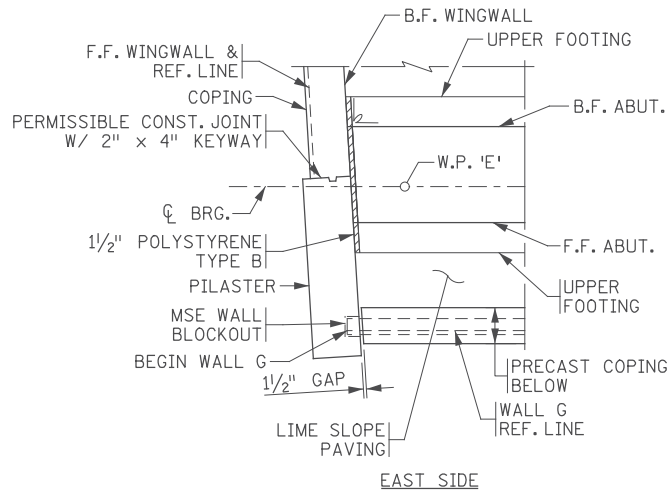
STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02588
 COMM. NO. 0169140

DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK

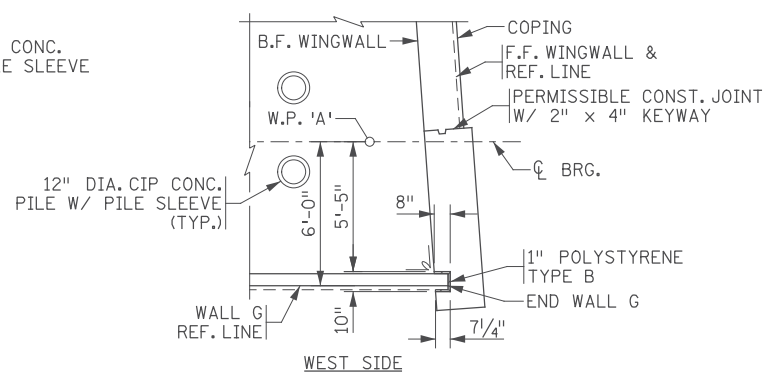
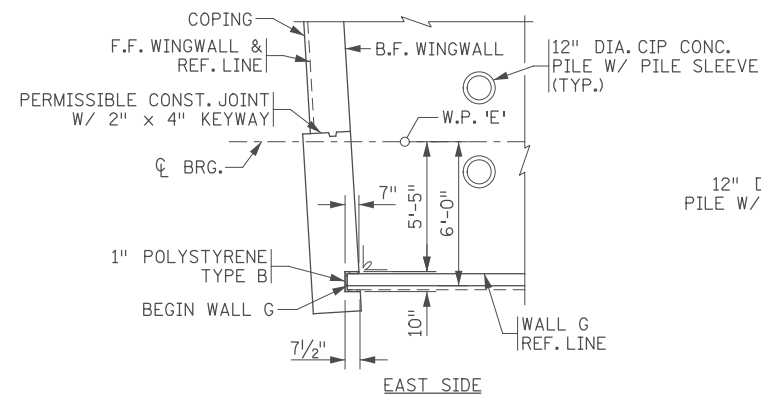
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 PLANNERS
 DESIGNERS

ANOKA COUNTY
 SOUTH ABUTMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 4 OF 5)

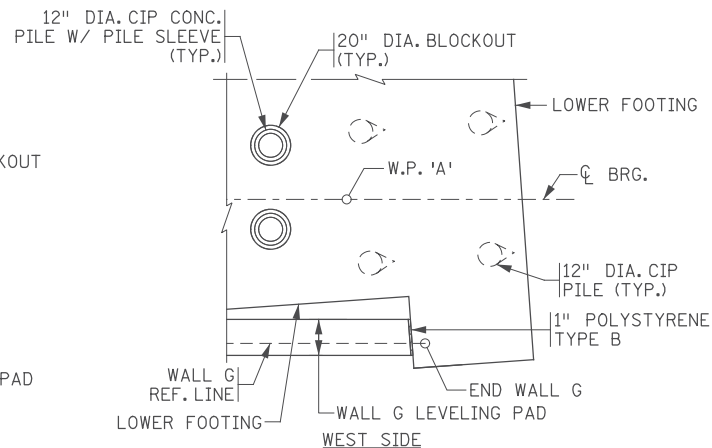
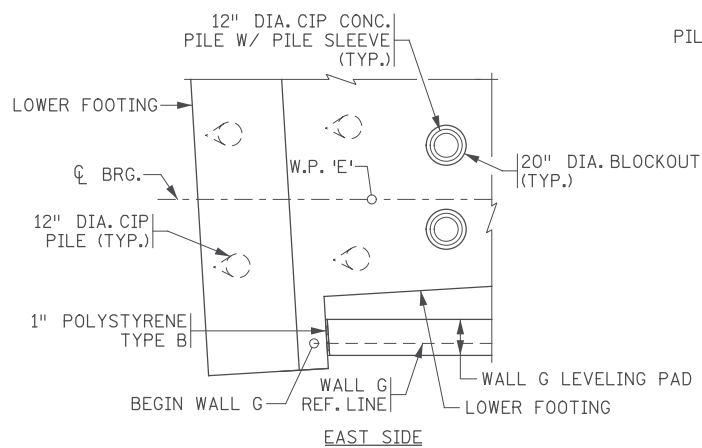
SHEET
BB7
OF
BB42



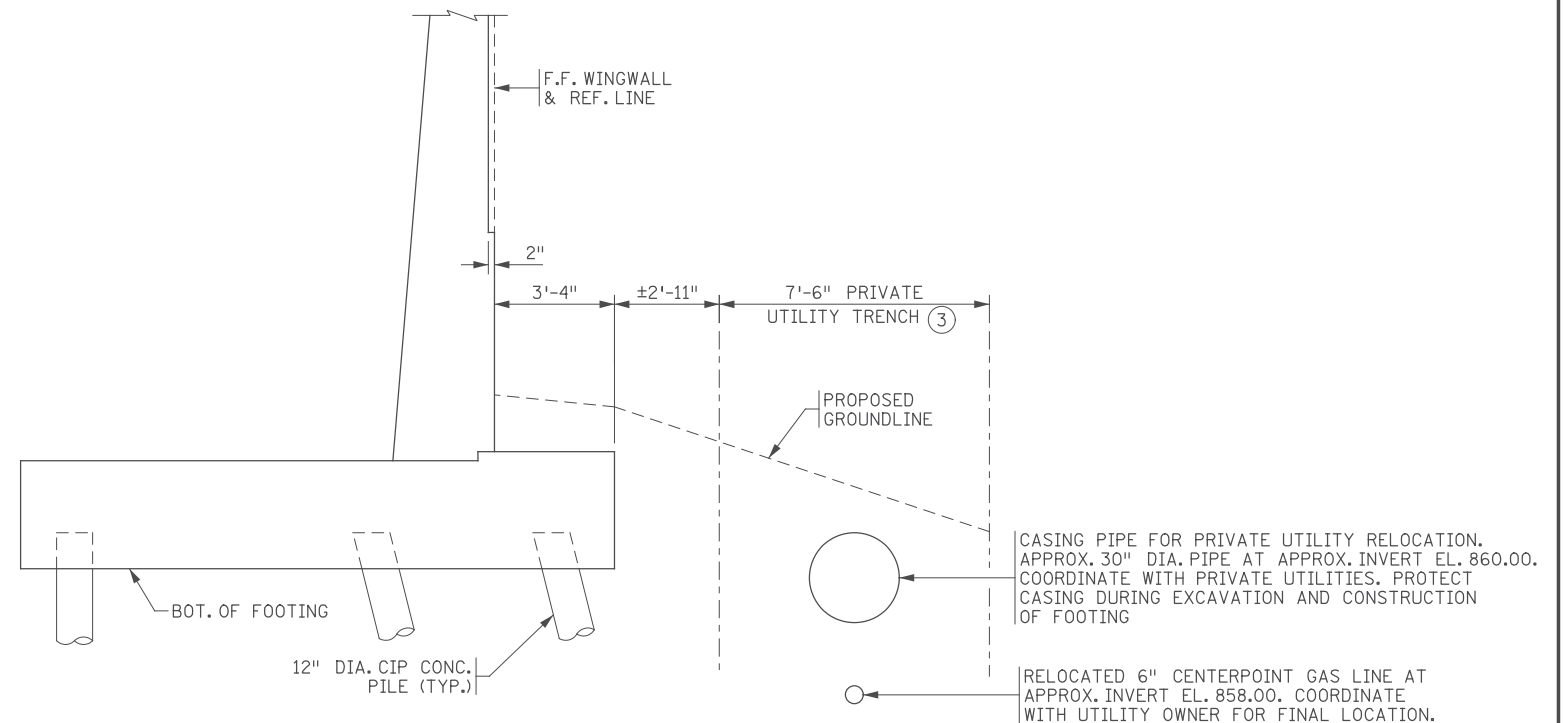
SECTION C-C



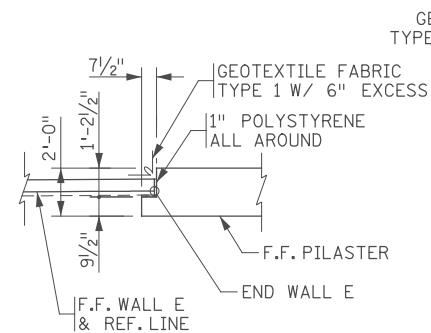
SECTION D-D



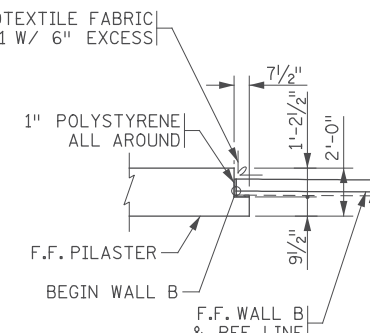
SECTION E-E



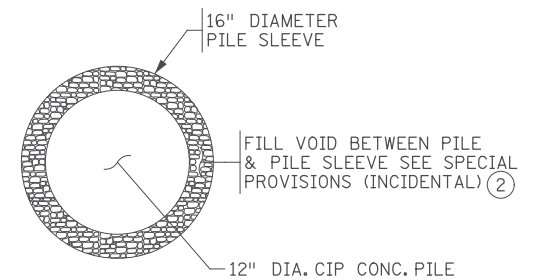
PRIVATE UTILITY RELOCATION DETAIL
(EAST SIDE OF BRIDGE ONLY)



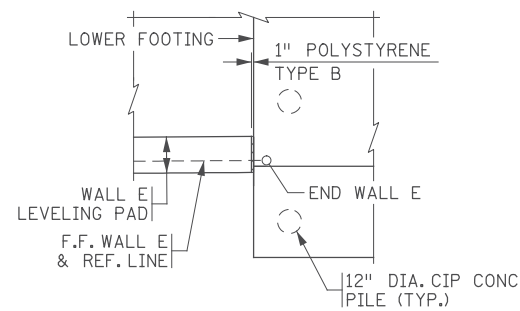
SECTION F-F



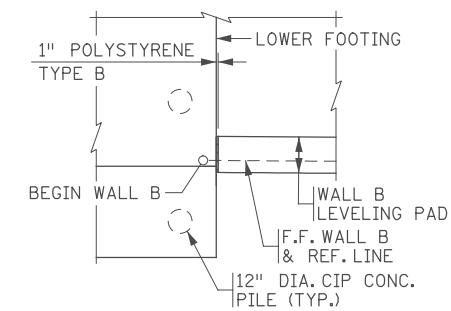
SECTION H-H



SECTION F-F



SECTION G-G



SECTION J-J

NOTES:

1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
2. FILL MATERIAL AND PLACEMENT SHALL BE INCIDENTAL TO BID ITEM 2452.603 "PILE SLEEVES".
3. PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY RELOCATION CORRIDOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.

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 Print Name: CASEY E. BLACK
Casey E. Black
 Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02588
 COMM. NO. 0169140



ANOKA COUNTY
 SOUTH ABUTMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 5 OF 5)

SHEET
 BB8
 OF
 BB42

WALL E (SEE RETAINING WALL PLANS)

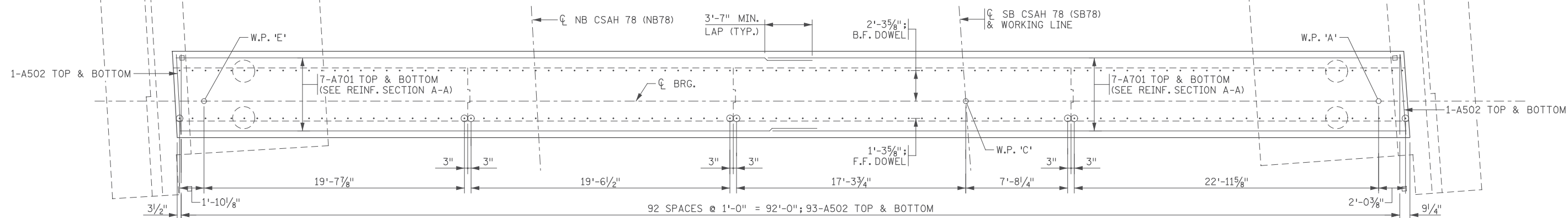
WALL B (SEE RETAINING WALL PLANS)

NOTES:

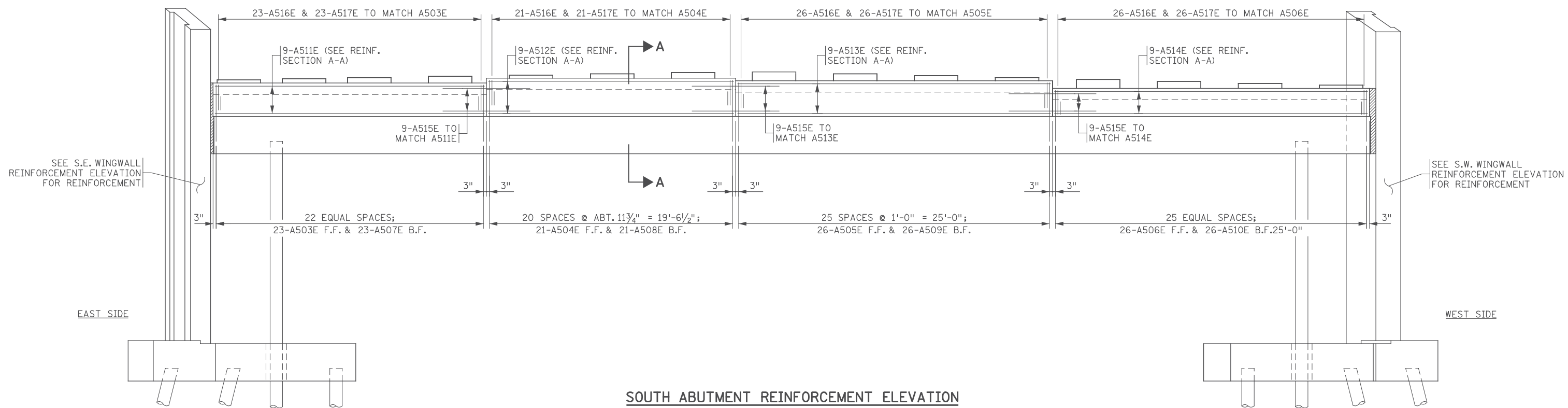
1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
E.F. DENOTES EACH FACE
2. SECTION A-A IS SHOWN ON SHEET BB11.

SEE S.E. WINGWALL FOOTING REINFORCEMENT PLAN FOR REINFORCEMENT

SEE S.W. WINGWALL FOOTING REINFORCEMENT PLAN FOR REINFORCEMENT



SOUTH ABUTMENT FOOTING REINFORCEMENT PLAN



SOUTH ABUTMENT REINFORCEMENT ELEVATION

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				REVISION
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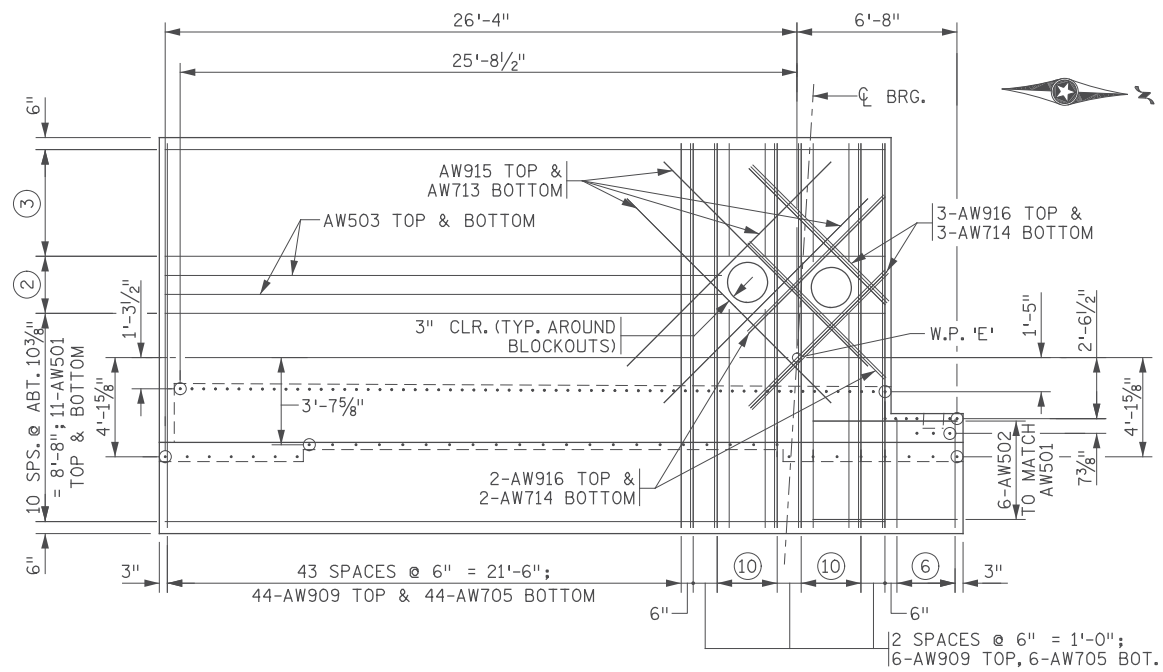
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Casey E. Black
 Date 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02588
 COMM. NO. 0169140

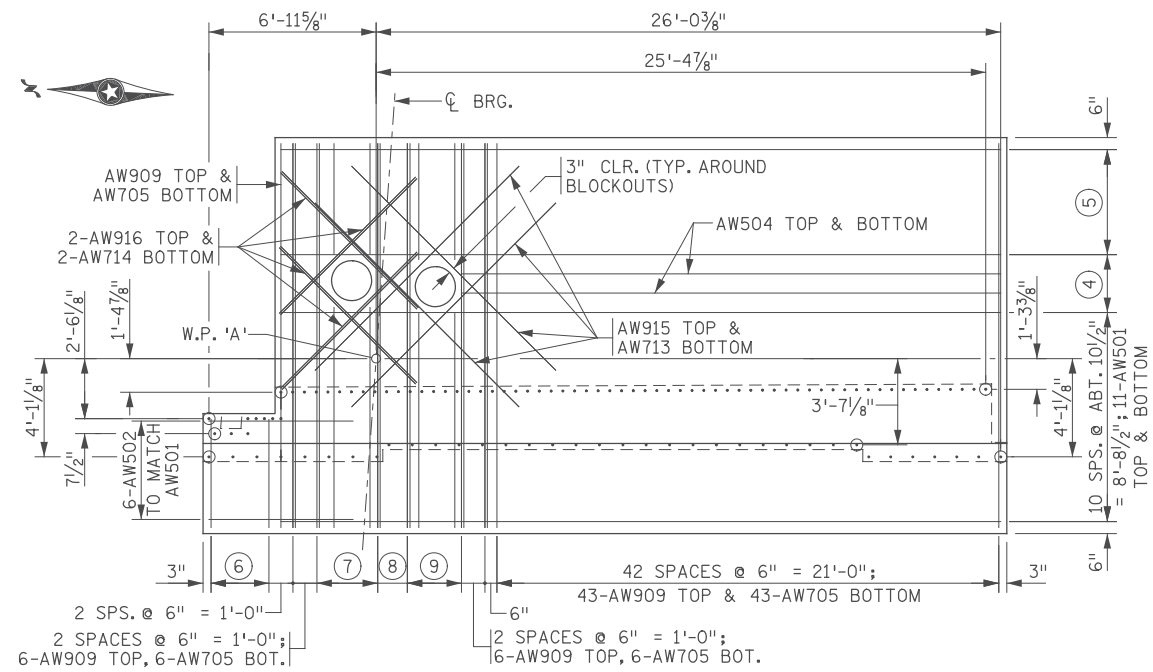
DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
 **ENGINEERS
 PLANNERS
 DESIGNERS**
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ANOKA COUNTY
 SOUTH ABUTMENT REINFORCEMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 1 OF 4)

**SHEET
 BB9
 OF
 BB42**



S.E. WINGWALL FOOTING REINFORCEMENT PLAN

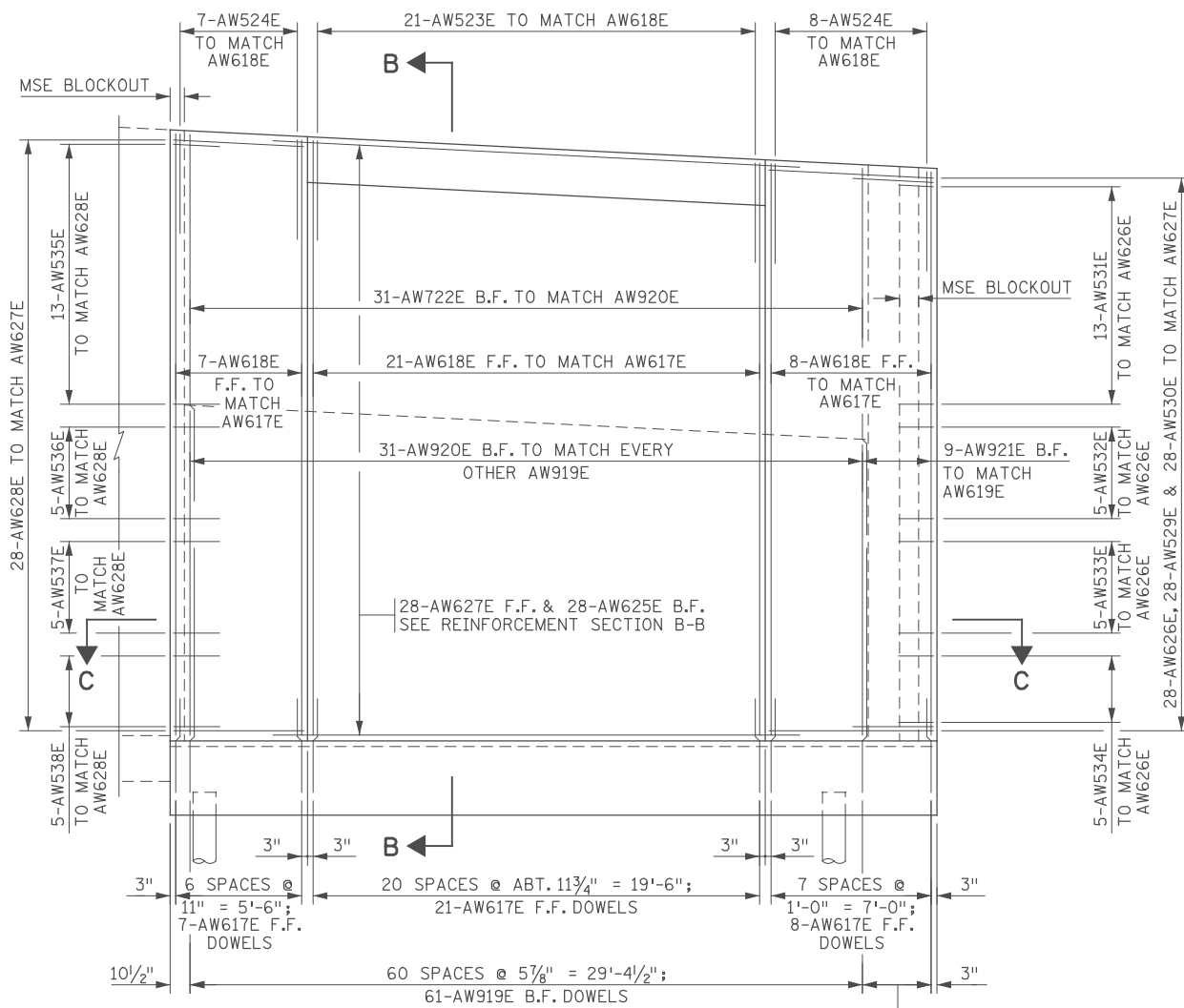


S.W. WINGWALL FOOTING REINFORCEMENT PLAN

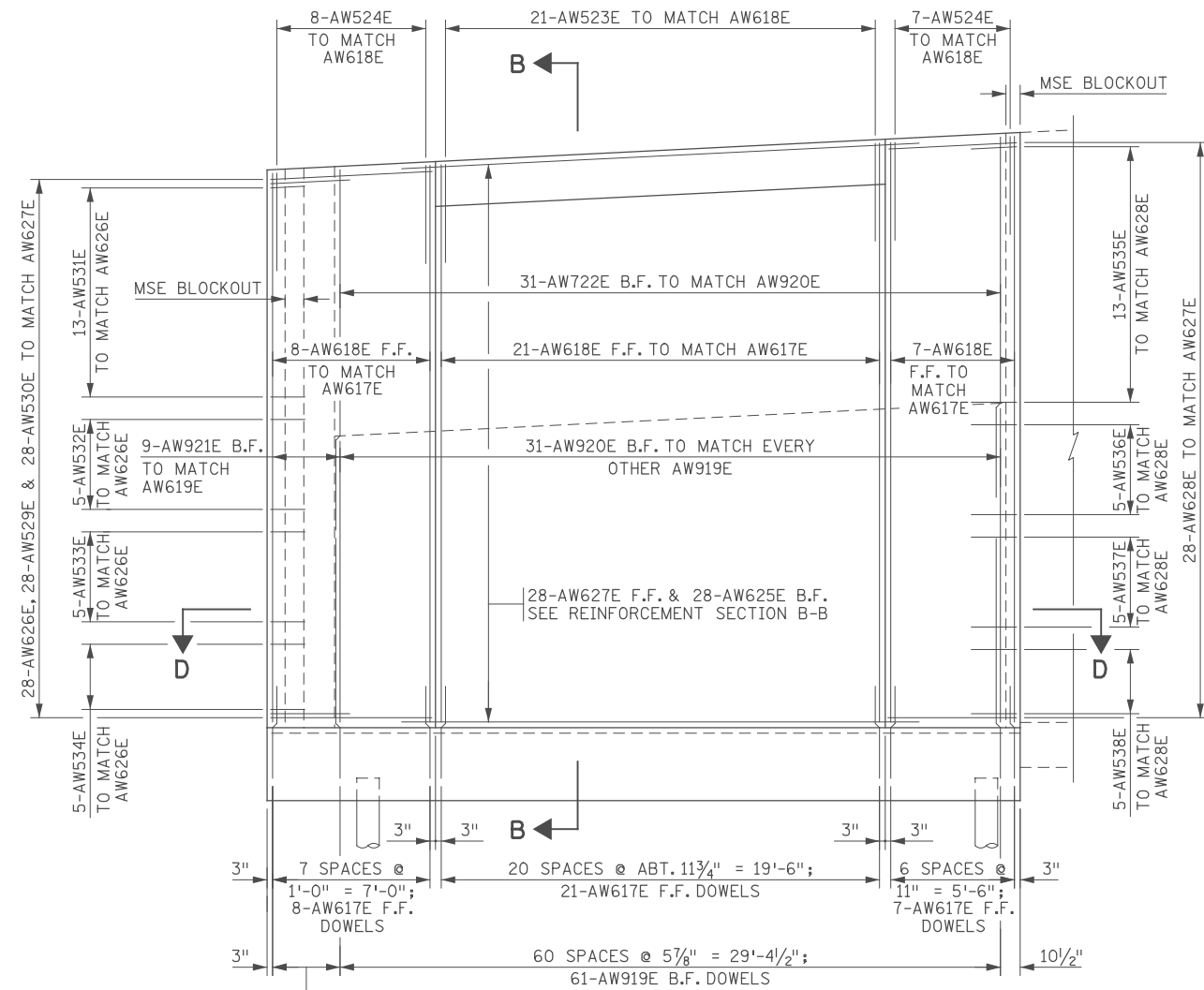
NOTES:

1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
E.F. DENOTES EACH FACE
- ② 3 SPACES @ 9 1/2" = 2'-4 1/2";
- ③ 5 SPACES @ ABT. 10 5/8" = 4'-5 3/4";
6-AW501 TOP & BOTTOM.
- ④ 3 SPACES @ ABT. 9 5/8" = 2'-5";
- ⑤ 5 SPACES @ 10 1/2" = 4'-4 1/2";
6-AW501 TOP & BOTTOM.
- ⑥ 5 SPACES @ 6" = 2'-6"; 6-AW910 TOP
& 6-AW706 BOTTOM.
- ⑦ 5 SPACES @ ABT. 6 1/8" = 2'-6 3/8";
4-AW911 & 4-AW912 TOP; 4-AW707
& 4-AW708 BOTTOM.
- ⑧ 2 SPACES @ ABT. 7 1/2" = 1'-2 7/8";
6-AW909 TOP & 6-AW705 BOTTOM.
- ⑨ 5 SPACES @ ABT. 5 3/8" = 2'-3";
4-AW911 & 4-AW912 TOP; 4-AW707
& 4-AW708 BOTTOM.
- ⑩ 5 SPACES @ 6" = 2'-6"; 4-AW911 &
4-AW912 TOP; 4-AW707 & 4-AW708
BOTTOM.

11. SECTION B-B IS SHOWN ON SHEET BB11.



S.E. WINGWALL REINFORCEMENT ELEVATION



S.W. WINGWALL REINFORCEMENT ELEVATION

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Casey E. Black
 Date 11/01/2017 License # 49163

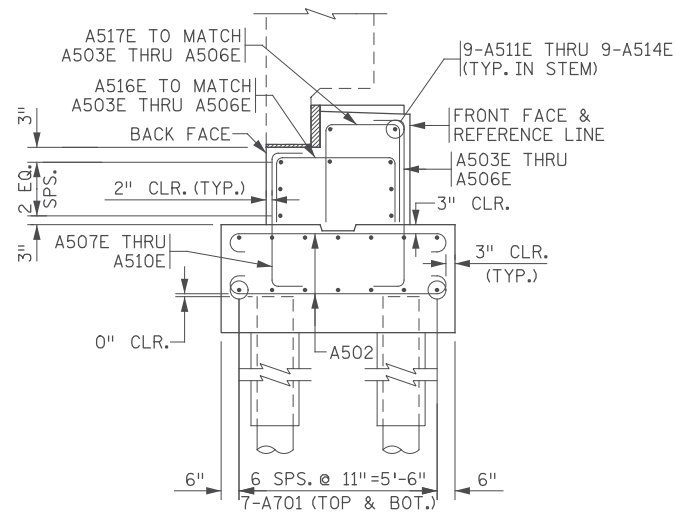
STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02588
 DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
 COMM. NO. 0169140



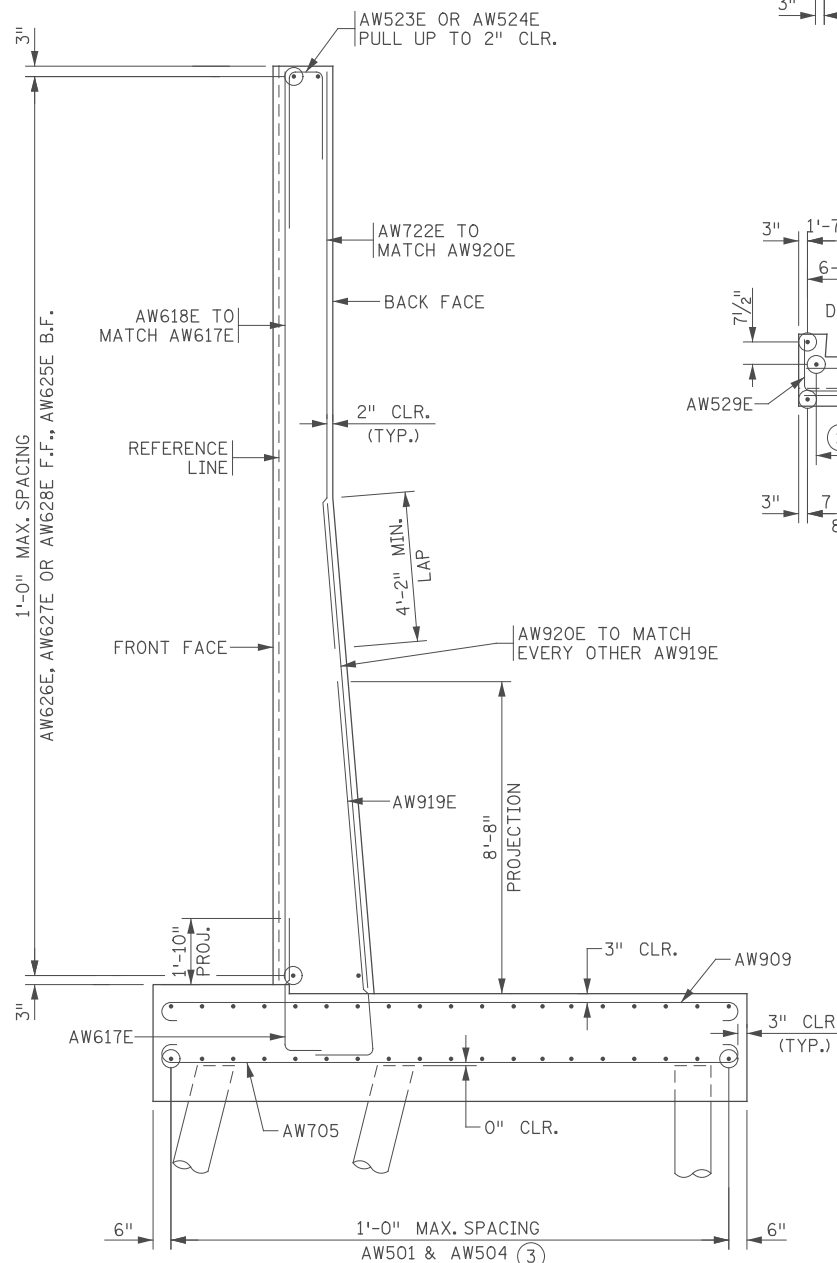
ANOKA COUNTY
 SOUTH ABUTMENT REINFORCEMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 2 OF 4)

SHEET BB10 OF BB42

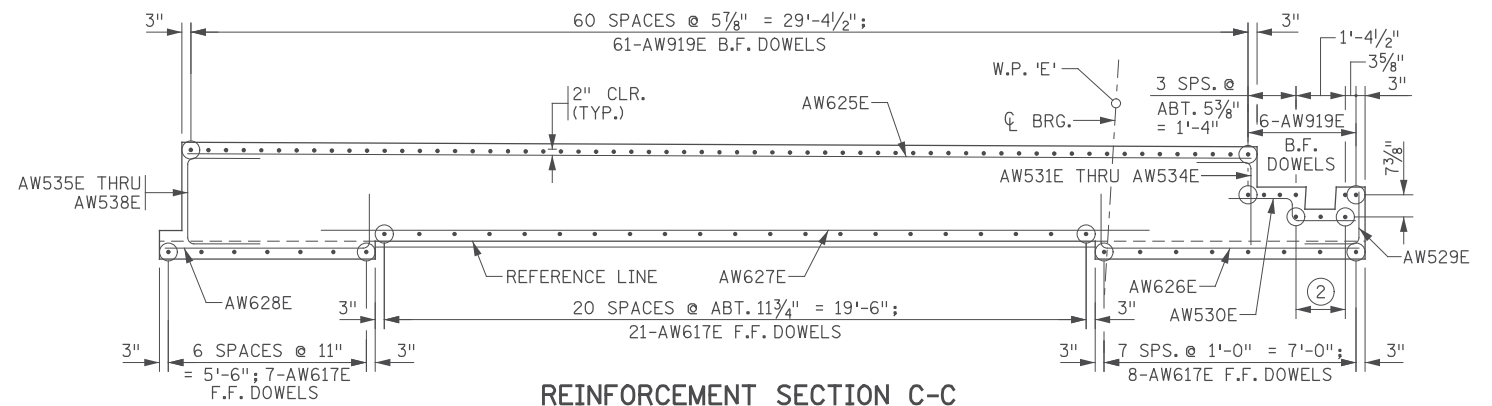
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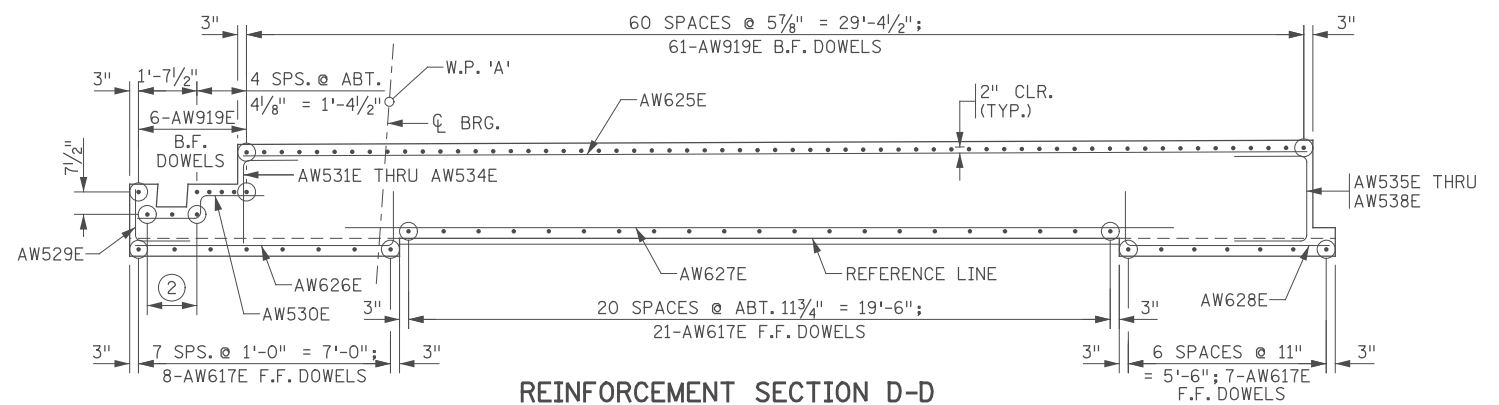
REINFORCEMENT SECTION A-A
(SECTION THRU ABUTMENT)



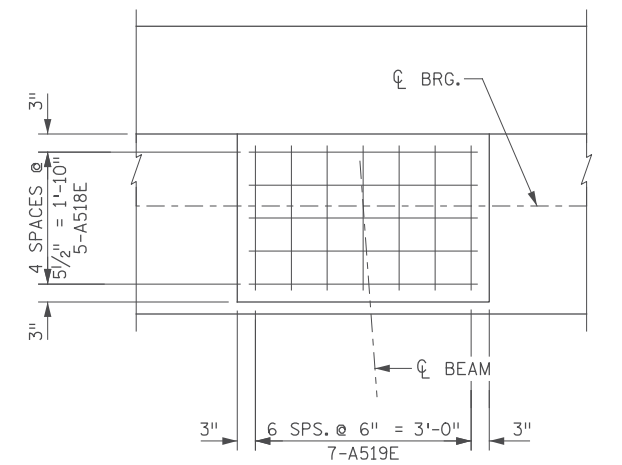
REINFORCEMENT SECTION B-B
(SECTION THRU WINGWALL)



REINFORCEMENT SECTION C-C



REINFORCEMENT SECTION D-D



BRIDGE SEAT REINFORCEMENT DETAIL

NOTES:

1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
E.F. DENOTES EACH FACE
- ② 2 SPACES @ ABT. 8 1/4" = 1'-4 1/2";
3-AW919E DOWELS.
- ③ SEE FOOTING REINFORCEMENT
PLAN FOR DETAILS.

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				REVISION
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Casey E. Black
 Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
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02588
 COMM. NO. 0169140

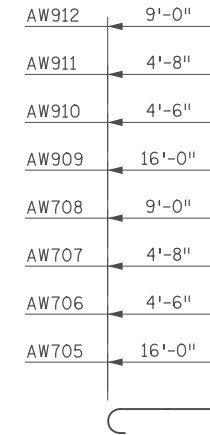
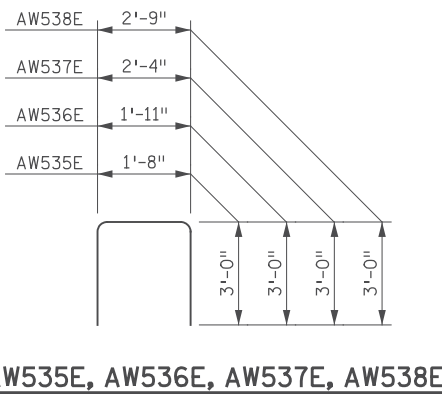
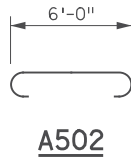


ANOKA COUNTY
 SOUTH ABUTMENT REINFORCEMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 3 OF 4)

SHEET
BB11
OF
BB42

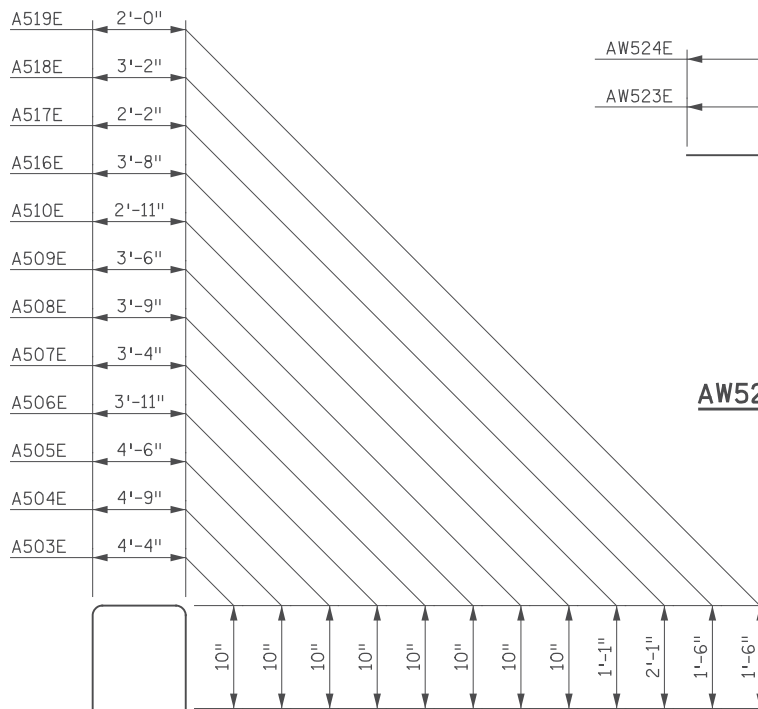
BILL OF REINFORCEMENT: S. WINGWALL				
MARK	NO	LENGTH [FT-IN]	SHAPE	LOCATION
AW501	68	30 - 0	—	FOOTING LONG
AW502	24	6 - 0	—	FOOTING LONG
AW503	4	23 - 2	—	EAST FTG LONG
AW504	4	22 - 6	—	WEST FTG LONG
AW705	123	17 - 8	—	FOOTING TRANS
AW706	12	6 - 2	—	FOOTING TRANS
AW707	16	6 - 4	—	FOOTING TRANS
AW708	16	10 - 8	—	FOOTING TRANS
AW909	123	18 - 6	—	FOOTING TRANS
AW910	12	7 - 0	—	FOOTING TRANS
AW911	16	7 - 2	—	FOOTING TRANS
AW912	16	11 - 6	—	FOOTING TRANS
AW713	8	10 - 0	—	FOOTING DIAGONAL
AW714	18	7 - 0	—	FOOTING DIAGONAL
AW915	8	12 - 0	—	FOOTING DIAGONAL
AW916	18	8 - 0	—	FOOTING DIAGONAL
AW617E	72	5 - 2	—	FF DOWEL
AW618E	72	24 - 9	—	FF VERT
AW919E	140	12 - 4	—	BF DOWEL
AW920E	62	15 - 2	—	BF VERT
AW921E	18	25 - 0	—	BF VERT
AW722E	62	16 - 6	—	BF VERT
AW523E	42	7 - 8	—	STEM CAP
AW524E	30	8 - 5	—	PILASTER CAP
AW625E	56	29 - 6	—	STEM HORIZ
AW626E	56	8 - 8	—	PILASTER HORIZ
AW627E	56	25 - 8	—	STEM HORIZ
AW628E	56	7 - 2	—	PILASTER HORIZ
AW529E	56	3 - 0	—	MSE BLOCKOUT
AW530E	56	4 - 1	—	MSE BLOCKOUT
AW531E	26	4 - 6	—	MSE BLOCKOUT
AW532E	10	4 - 9	—	MSE BLOCKOUT
AW533E	10	5 - 2	—	MSE BLOCKOUT
AW534E	10	5 - 7	—	MSE BLOCKOUT
AW535E	26	7 - 8	—	MSE BLOCKOUT
AW536E	10	7 - 11	—	MSE BLOCKOUT
AW537E	10	8 - 4	—	MSE BLOCKOUT
AW538E	10	8 - 9	—	MSE BLOCKOUT

BAR SHAPES:

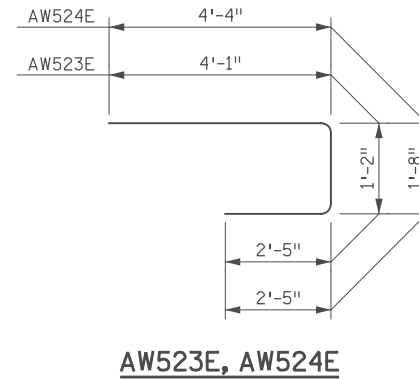


BILL OF REINFORCEMENT: SOUTH ABUT.				
MARK	NO	LENGTH [FT-IN]	SHAPE	LOCATION
A701	28	48 - 4	—	FOOTING LONG
A502	190	7 - 2	—	FOOTING TRANS
A503E	23	6 - 0	—	FF DOWEL
A504E	21	6 - 5	—	FF DOWEL
A505E	26	6 - 2	—	FF DOWEL
A506E	26	5 - 7	—	FF DOWEL
A507E	23	5 - 0	—	BF DOWEL
A508E	21	5 - 5	—	BF DOWEL
A509E	26	5 - 2	—	BF DOWEL
A510E	26	4 - 7	—	BF DOWEL
A511E	9	21 - 8	—	STEM LONG
A512E	9	19 - 9	—	STEM LONG
A513E	9	25 - 2	—	STEM LONG
A514E	9	24 - 11	—	STEM LONG
A515E	27	7 - 0	—	STEM LONG
A516E	96	5 - 10	—	STEM VERT
A517E	96	6 - 4	—	STEM VERT
A518E	75	6 - 2	—	BRG SEAT
A519E	105	5 - 0	—	BRG SEAT

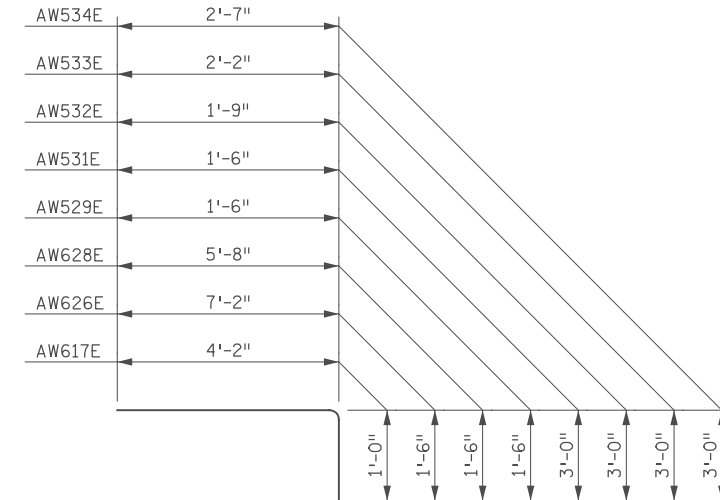
AW705, AW706, AW707, AW708, AW909, AW910, AW911, AW912



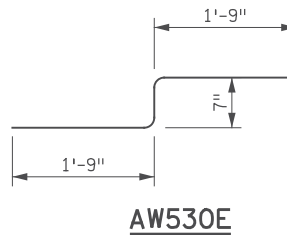
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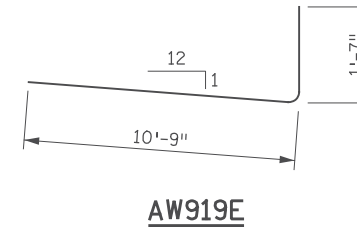
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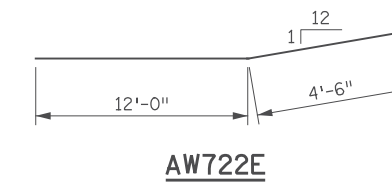
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AW530E



AW919E



AW722E

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				REVISION

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 Print Name: CASEY E. BLACK
Casey E. Black
 Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02588
 COMM. NO. 0169140

SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 SOUTH ABUTMENT REINFORCEMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 4 OF 4)

SHEET
 BB12
 OF
 BB42

NORTH ABUTMENT ④ REQUIRED NOMINAL PILE BEARING RESISTANCE R_n - TONS/PILE		
FIELD CONTROL METHOD	ϕ dyn	* R_n
MnDOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000}} \times \text{LOG}\left(\frac{10}{S}\right)$	0.50	188.0
PDA	0.65	144.6

* $R_n = (\text{FACTORED DESIGN LOAD}) / \phi$ dyn

NORTH ABUTMENT ④ COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	73.7
FACTORED LIVE LOAD	20.3
* FACTORED DESIGN LOAD	94.0

* BASED ON STRENGTH I LOAD COMBINATION


NORTH ABUTMENT ⑤ COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	74.8
FACTORED DOWNDRAG	24.2
*** FACTORED DL + EH + DD	99.0

*** BASED ON STRENGTH I LOAD COMBINATION, NOT INCLUDING TRANSIENT LOADS. ONLY USED FOR COMPARISON WITH FACTORED STRUCTURAL RESISTANCE. NOT TO BE USED FOR DRIVING.

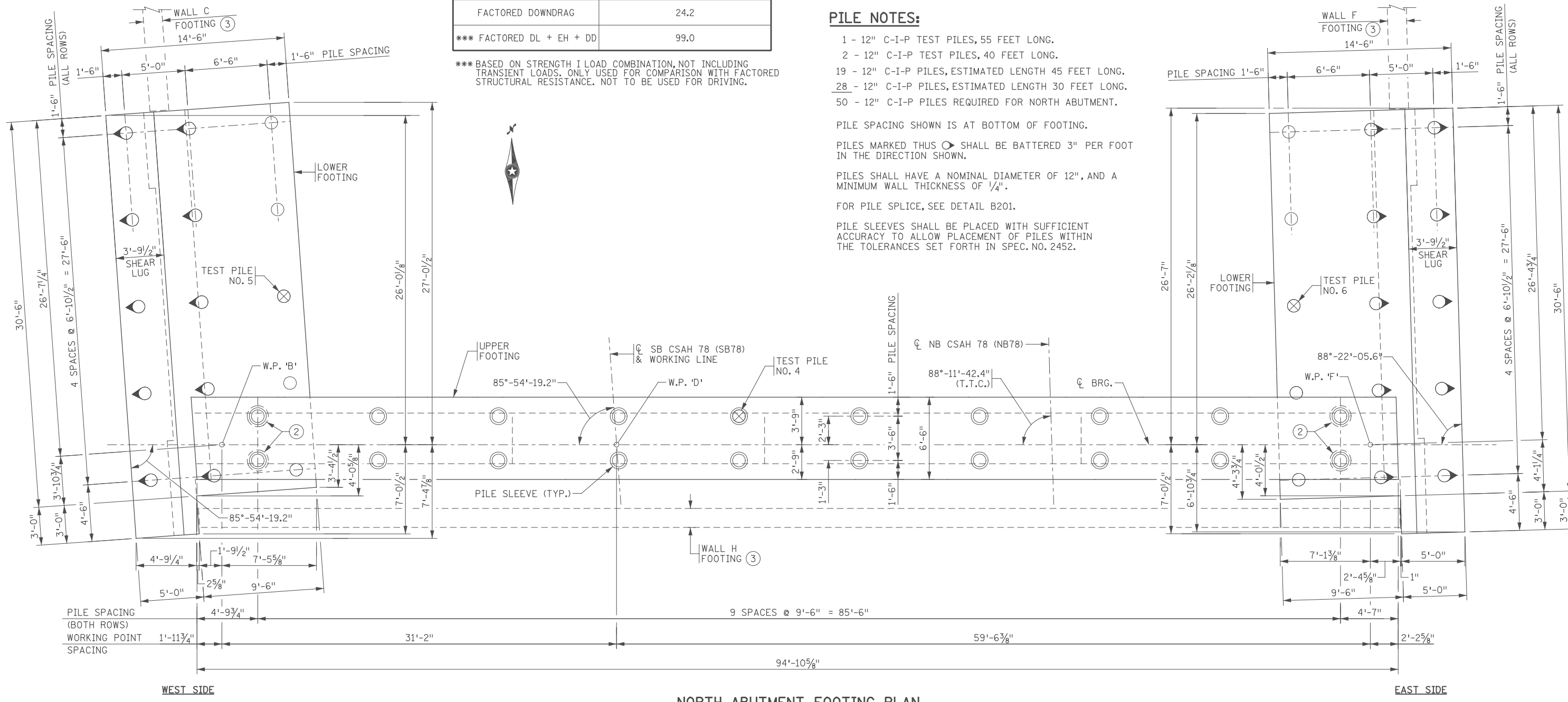
NOTES:

1. T.T.C. DENOTES TANGENT TO CURVE
2. 20" DIAMETER BLOCKOUT IN LOWER FOOTING FOR UPPER FOOTING PILE.
3. MSE WALL LEVELING PAD WITH 1" BOND BREAKER. SEE RETAINING WALL PLANS.
4. PILE LOAD TABLE APPLIES TO UPPER AND LOWER FOOTINGS. PILE LOAD TABLE REPORTS MAXIMUM EFFECTS PER UPPER AND LOWER FOOTING DESIGN, AND GOVERNS FOR ALL PILE.
5. PILE LOAD TABLE REPORTS MAXIMUM EFFECTS. LOWER FOOTING DESIGN CONTROLS.
6. GEOTEXTILE FABRIC SHALL BE CONSIDERED INCIDENTAL.
7. POLYSTYRENE TYPE A AND B SHALL BE CONSIDERED INCIDENTAL.

PILE NOTES:

- 1 - 12" C-I-P TEST PILES, 55 FEET LONG.
 - 2 - 12" C-I-P TEST PILES, 40 FEET LONG.
 - 19 - 12" C-I-P PILES, ESTIMATED LENGTH 45 FEET LONG.
 - 28 - 12" C-I-P PILES, ESTIMATED LENGTH 30 FEET LONG.
 - 50 - 12" C-I-P PILES REQUIRED FOR NORTH ABUTMENT.
- PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
- PILES MARKED THUS  SHALL BE BATTERED 3" PER FOOT IN THE DIRECTION SHOWN.
- PILES SHALL HAVE A NOMINAL DIAMETER OF 12", AND A MINIMUM WALL THICKNESS OF 1/4".
- FOR PILE SPLICE, SEE DETAIL B201.
- PILE SLEEVES SHALL BE PLACED WITH SUFFICIENT ACCURACY TO ALLOW PLACEMENT OF PILES WITHIN THE TOLERANCES SET FORTH IN SPEC. NO. 2452.

SUMMARY OF QUANTITIES : N. ABUTMENT		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (1G52)	CU YD	87
STRUCTURAL CONCRETE (3B52)	CU YD	210
REINFORCEMENT BARS	POUND	18390
REINFORCEMENT BARS (EPOXY COATED)	POUND	18660
ARCH CONC TEXTURE (ASHLAR STONE)	SQ FT	528
ARCH SURFACE FINISH (SINGLE COLOR)	SQ FT	528
ANTI-GRAFFITI COATING	SQ FT	528
C-I-P CONCRETE TEST PILE 40 FT LONG 12"	EACH	2
C-I-P CONCRETE TEST PILE 55 FT LONG 12"	EACH	1
C-I-P CONCRETE PILING 12"	LIN FT	1695
PILE SLEEVES	LIN FT	290
CONCRETE SLOPE PAVING	SQ YD	25



NORTH ABUTMENT FOOTING PLAN

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Casey E. Black

Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

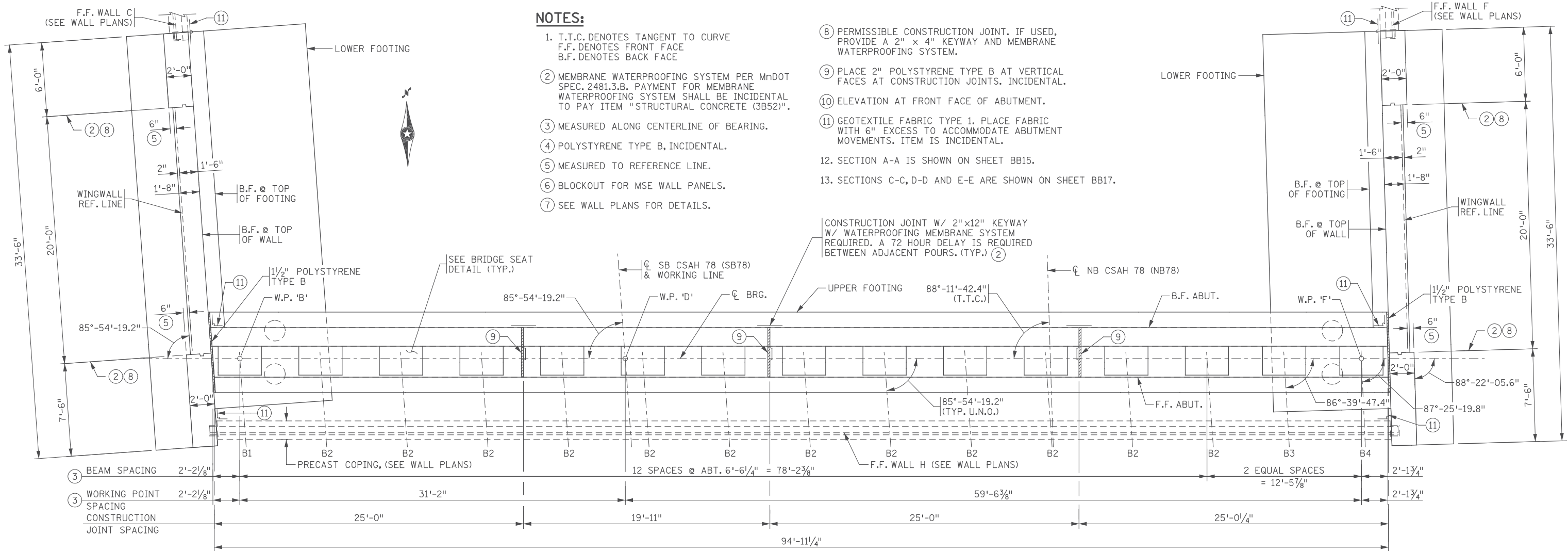
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
NORTH ABUTMENT DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 1 OF 5)

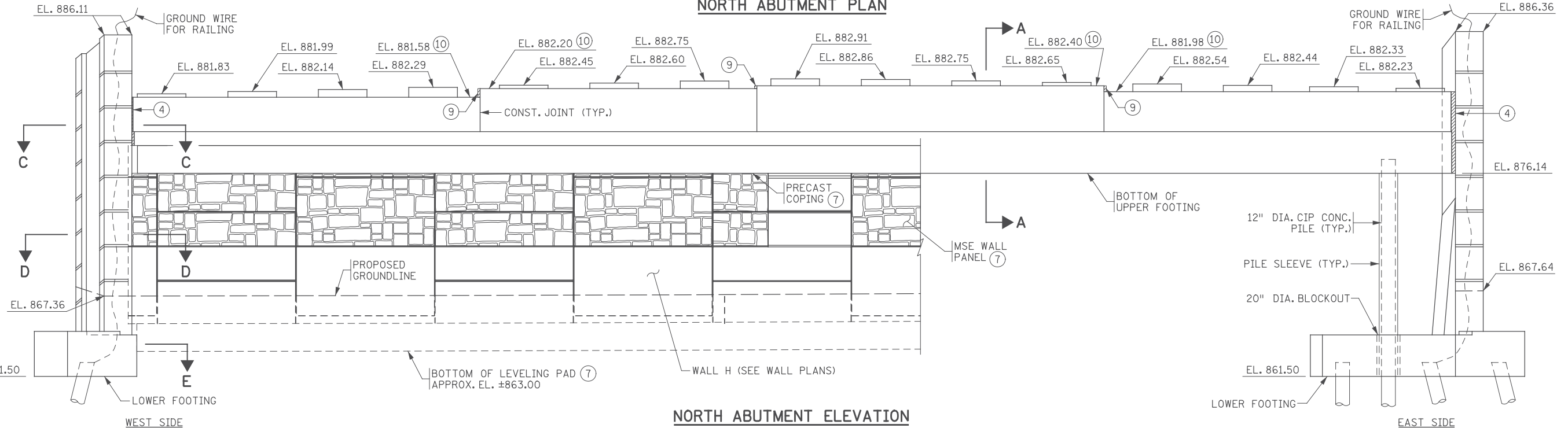
SHEET
BB13
OF
BB42



NOTES:

- 1. T.T.C. DENOTES TANGENT TO CURVE
F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
- 2. MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3.B. PAYMENT FOR MEMBRANE WATERPROOFING SYSTEM SHALL BE INCIDENTAL TO PAY ITEM "STRUCTURAL CONCRETE (3B52)".
- 3. MEASURED ALONG CENTERLINE OF BEARING.
- 4. POLYSTYRENE TYPE B, INCIDENTAL.
- 5. MEASURED TO REFERENCE LINE.
- 6. BLOCKOUT FOR MSE WALL PANELS.
- 7. SEE WALL PLANS FOR DETAILS.
- 8. PERMISSIBLE CONSTRUCTION JOINT. IF USED, PROVIDE A 2" x 4" KEYWAY AND MEMBRANE WATERPROOFING SYSTEM.
- 9. PLACE 2" POLYSTYRENE TYPE B AT VERTICAL FACES AT CONSTRUCTION JOINTS. INCIDENTAL.
- 10. ELEVATION AT FRONT FACE OF ABUTMENT.
- 11. GEOTEXTILE FABRIC TYPE 1. PLACE FABRIC WITH 6" EXCESS TO ACCOMMODATE ABUTMENT MOVEMENTS. ITEM IS INCIDENTAL.
- 12. SECTION A-A IS SHOWN ON SHEET BB15.
- 13. SECTIONS C-C, D-D AND E-E ARE SHOWN ON SHEET BB17.

NORTH ABUTMENT PLAN



NORTH ABUTMENT ELEVATION

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 SAP 114-020-051
 BRIDGE NO.
02588
 DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
 COMM. NO. 0169140

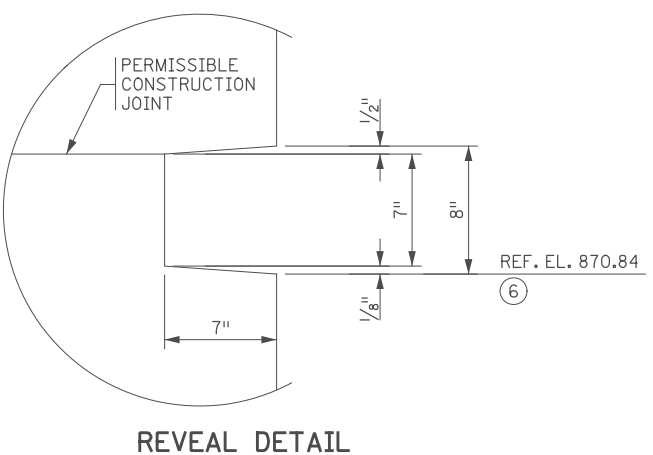
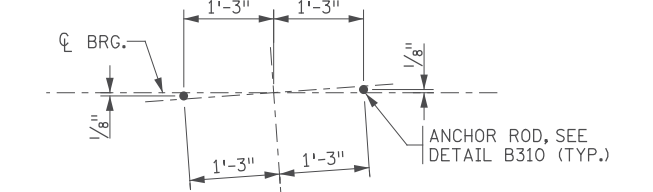
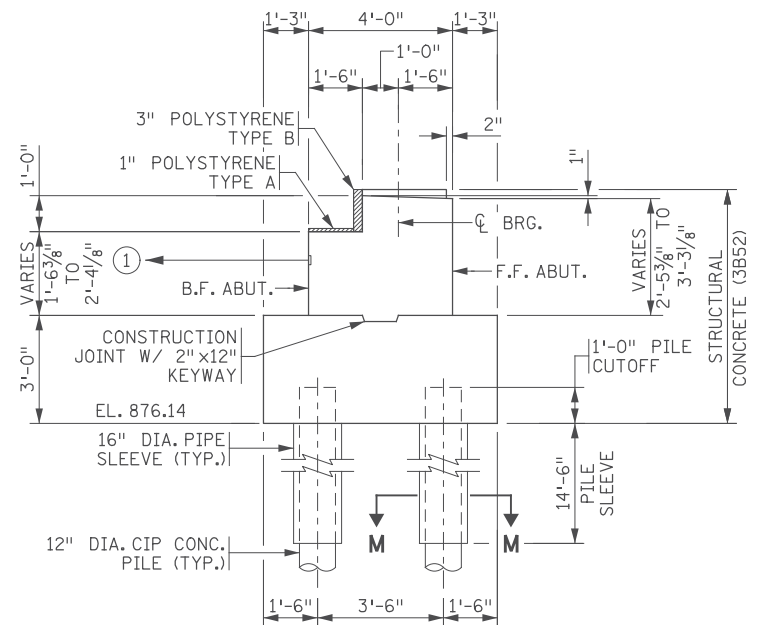
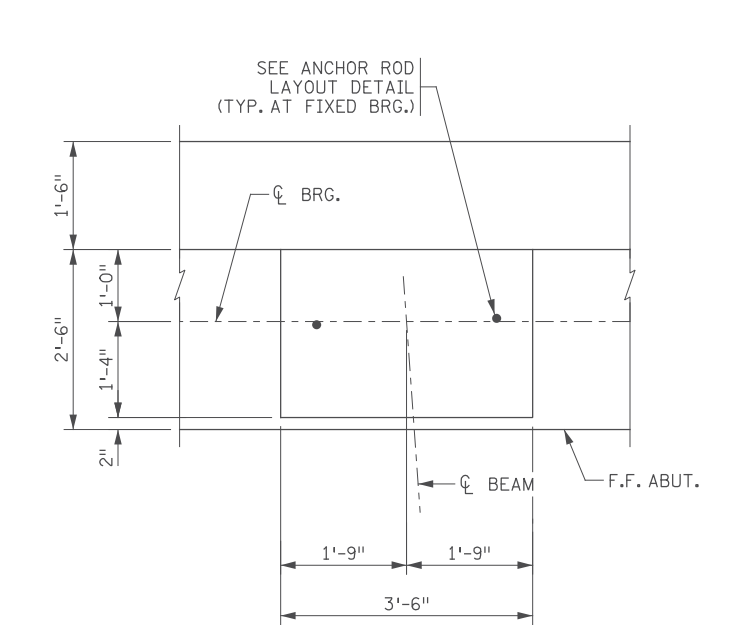
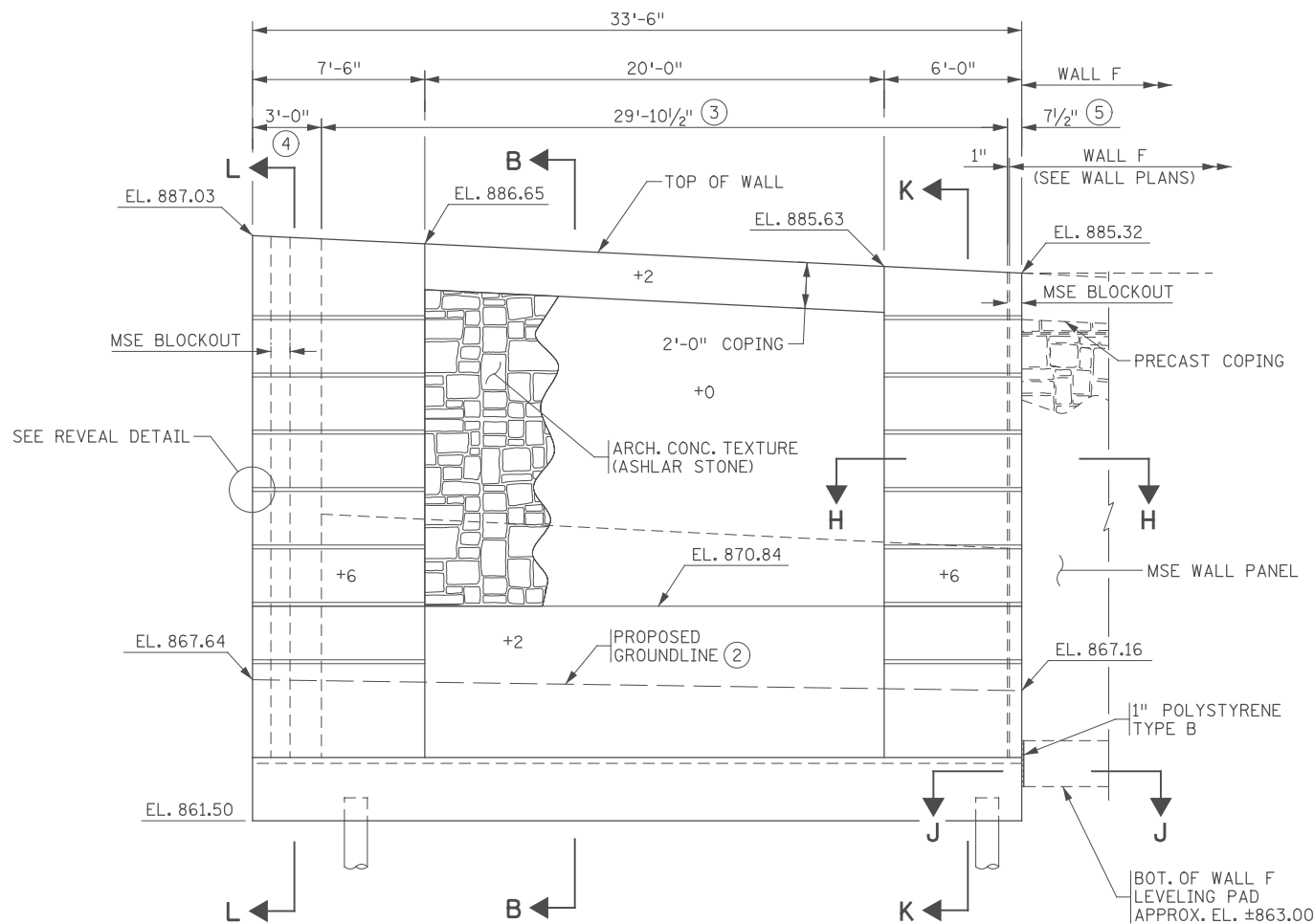
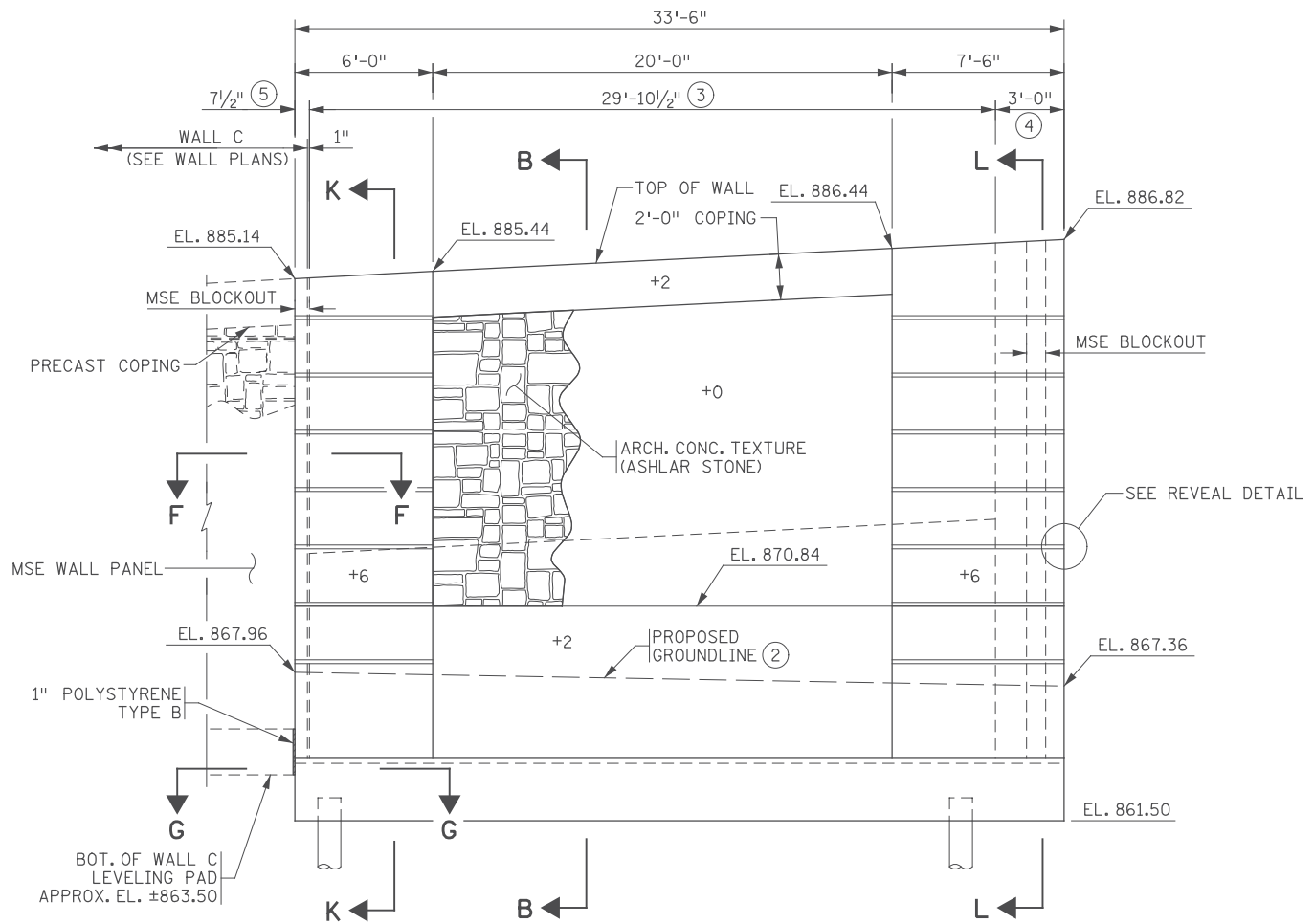


ANOKA COUNTY
 NORTH ABUTMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 2 OF 5)

SHEET BB14 OF BB42

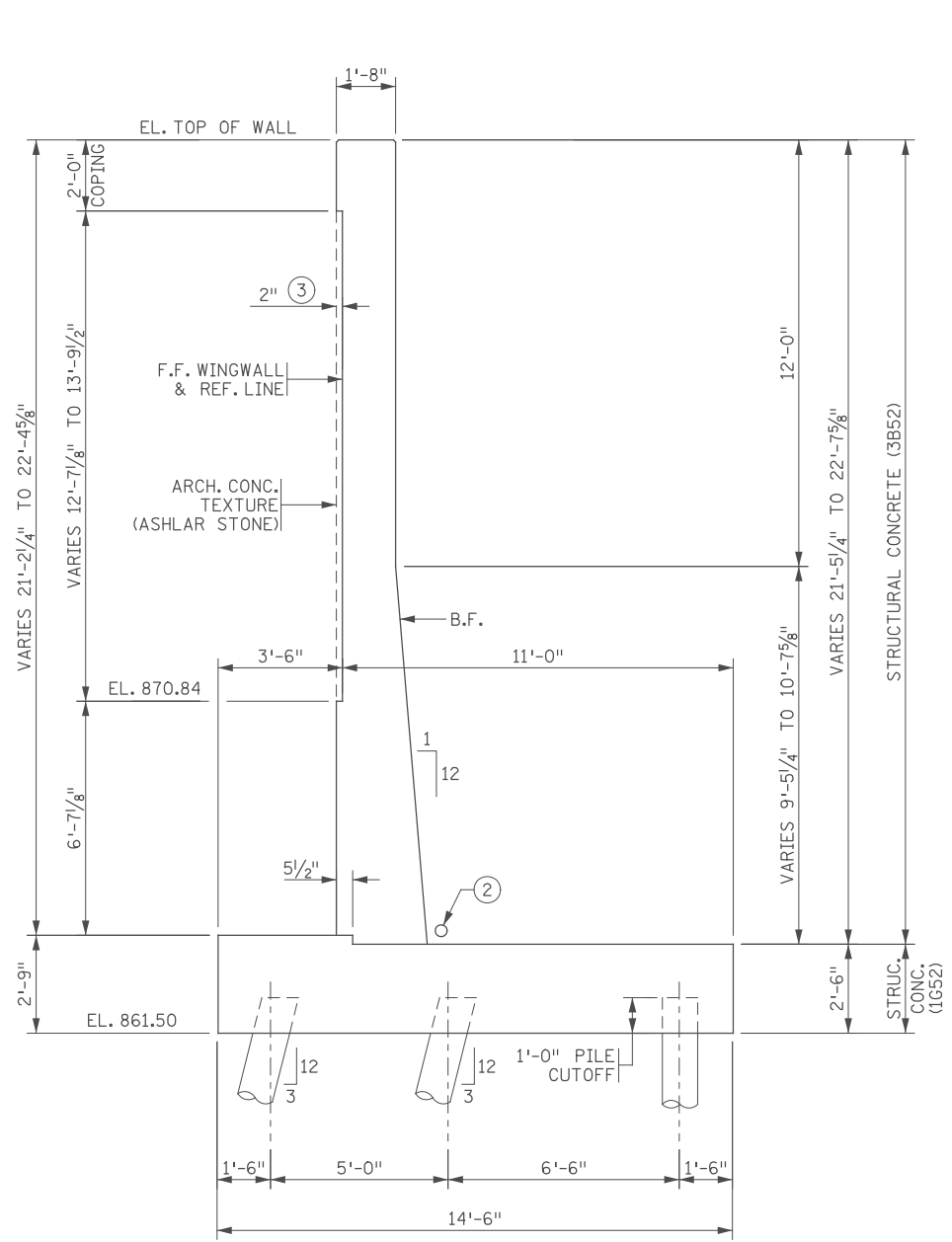
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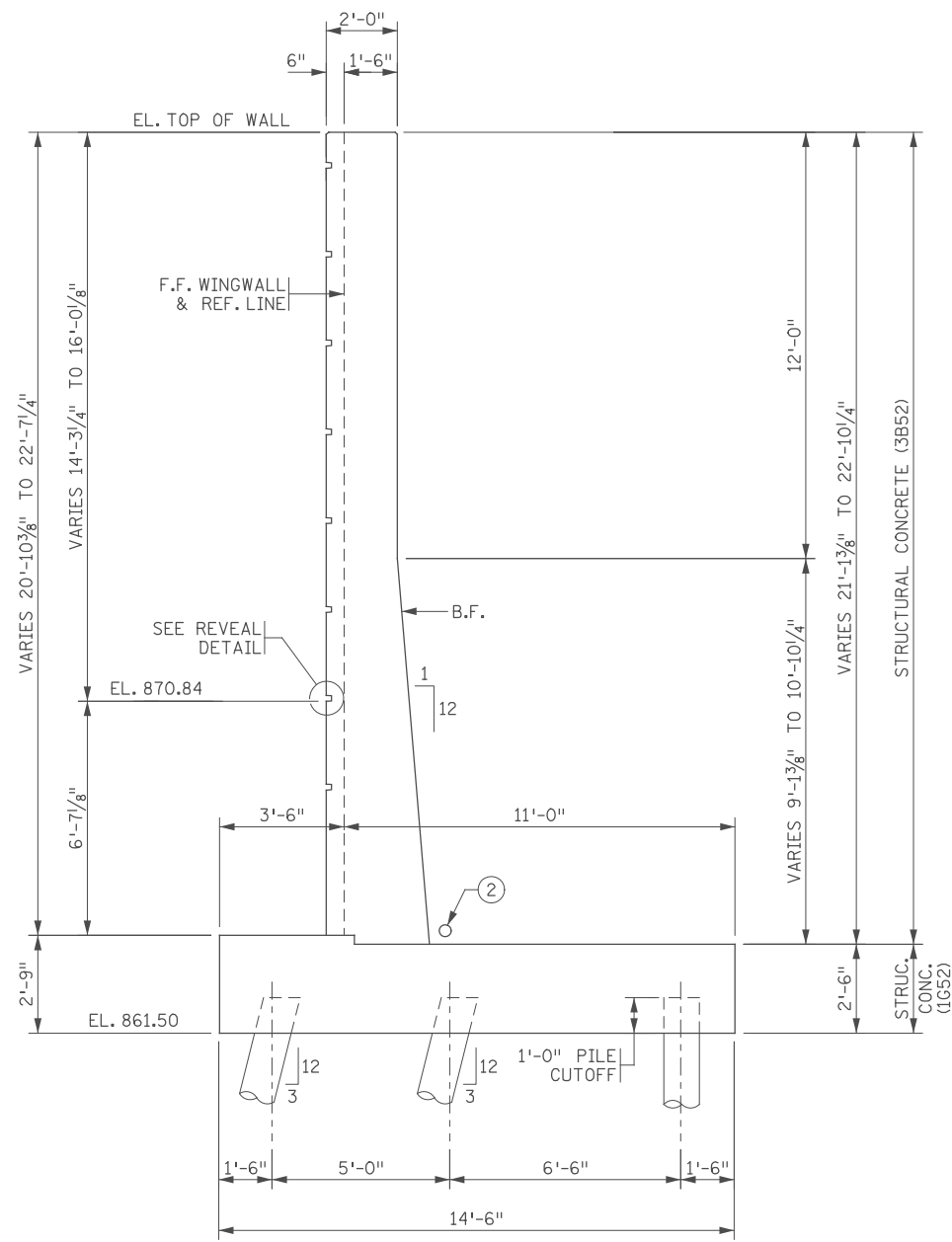


- NOTES:**
- ① THE SOIL REINFORCEMENT AND FASTENERS FOR THE ABUTMENT BACKWALL SHALL BE DESIGNED AND FURNISHED BY THE CONTRACTOR. THE SOIL REINFORCEMENT SHALL BE DESIGNED TO RESIST A SERVICE HORIZONTAL LOAD OF 1.7 KIPS PER FOOT OF ABUTMENT WIDTH. THIS SERVICE HORIZONTAL LOAD ACCOUNTS FOR EARTH HORIZONTAL AND LIVE LOAD SURCHARGE. THE COST OF THE REINFORCEMENT AND FASTENERS IS TO BE INCLUDED IN THE COST OF THE MSE WALL SYSTEM. INSTALLATION SHALL BE BY THE CONTRACTOR.
 - ② EXTEND ARCHITECTURAL CONCRETE TEXTURE AND SURFACE FINISH TO A MINIMUM OF 2'-0" BELOW THE PROPOSED GROUNDLINE.
 - ③ WINGWALL SECTION WITH BATTERED BACK FACE.
 - ④ WINGWALL SECTION WITH VERTICAL BACK FACE.
 - ⑤ BLOCKOUT FOR MSE RETAINING WALL.
 - ⑥ PROJECT WIDE AESTHETIC REFERENCE ELEVATION.
 7. SECTIONS B-B, K-K AND L-L ARE SHOWN ON SHEET BB16.
 8. SECTIONS F-F, G-G, H-H AND J-J ARE SHOWN ON SHEET BB17.

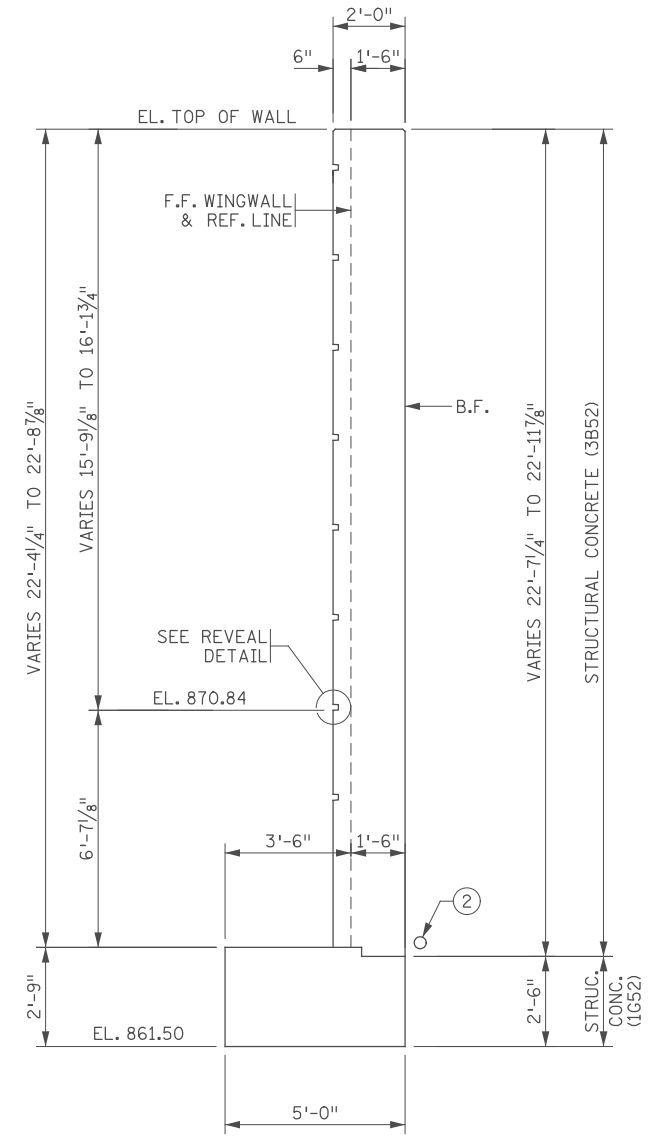
11/01/2017	RELEASED FOR CONSTRUCTION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.	STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051	DRAWN BY J. HOFFMAN DESIGNED BY A. BEHNKE CHECKED BY C. BLACK COMM. NO. 0169140	 ENGINEERS PLANNERS DESIGNERS	ANOKA COUNTY NORTH ABUTMENT DETAILS CSAH 78 OVER 108TH AVENUE NW (SHEET 3 OF 5)	SHEET BB15 OF BB42	
NO	DATE	BY	CKD	APPR	REVISION		Print Name: CASEY E. BLACK Date: 11/01/2017 License #: 49163	BRIDGE NO. 02588
...\\FInal\CBR02588_abt12.dgn							BRIDGE NO. 02588	COMM. NO. 0169140



SECTION B-B
(SECTION THRU WINGWALL)



SECTION K-K
(SECTION THRU PILASTER)



SECTION L-L
(SECTION THRU PILASTER)

- NOTES:**
- 1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
 - ② 4" PERFORATED THERMAL PLASTIC PIPE,
SEE WALL PLANS.
 - ③ MAXIMUM TEXTURE RELIEF.

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Casey E. Black

Date: 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

COMM. NO. 0169140

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J. HOFFMAN

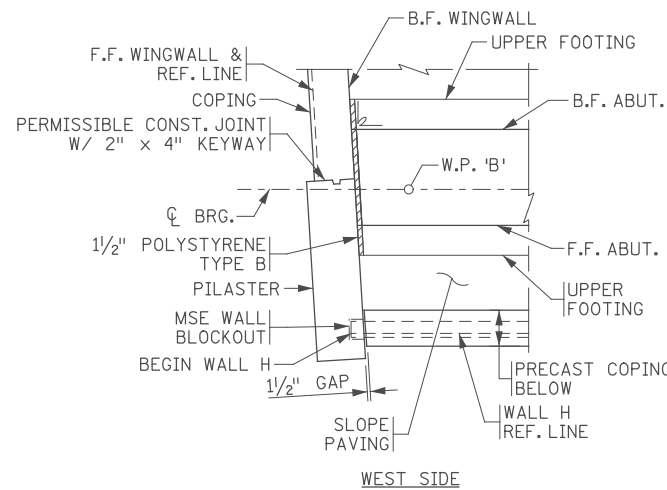
DESIGNED BY
A. BEHNKE

CHECKED BY
C. BLACK

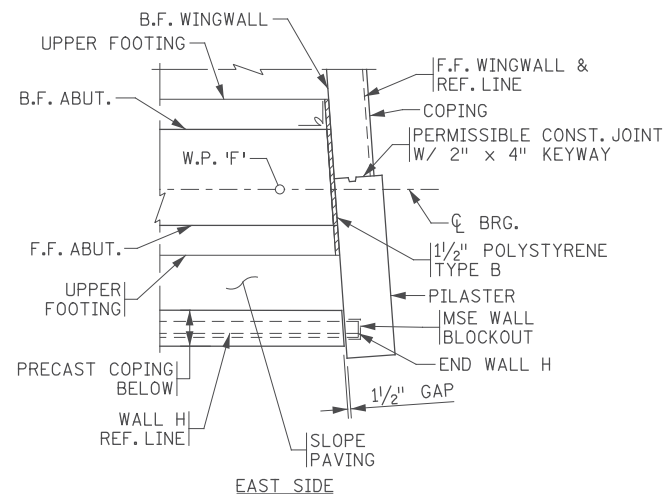
SRF ENGINEERS
PLANNERS
DESIGNERS
Consulting Group, Inc.

ANOKA COUNTY
NORTH ABUTMENT DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 4 OF 5)

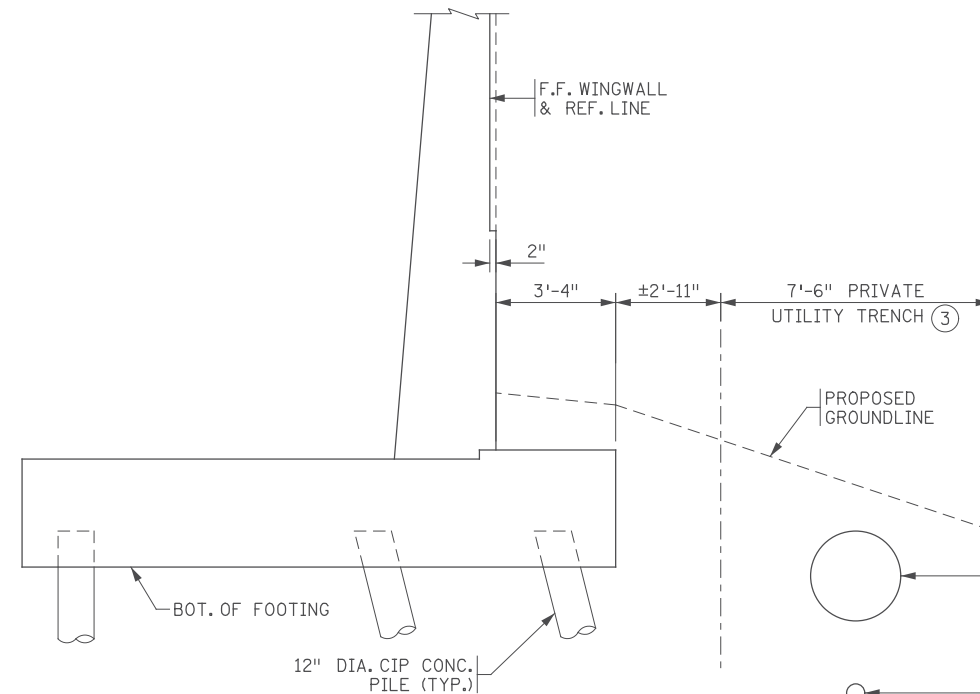
SHEET
BB16
OF
BB42



SECTION C-C



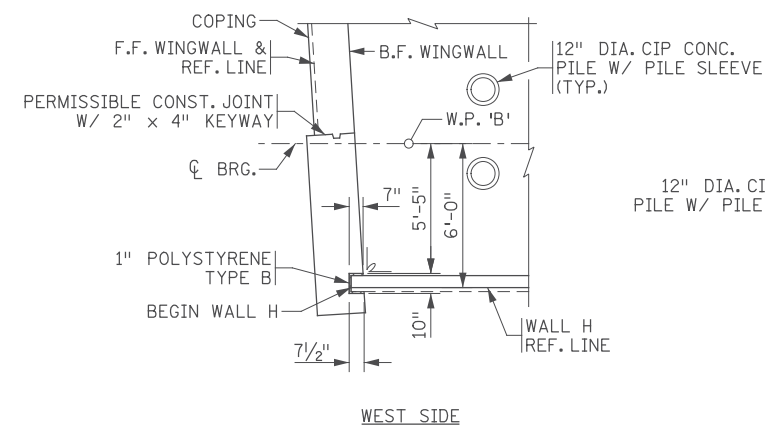
EAST SIDE



PRIVATE UTILITY RELOCATION DETAIL
(EAST SIDE OF BRIDGE ONLY)

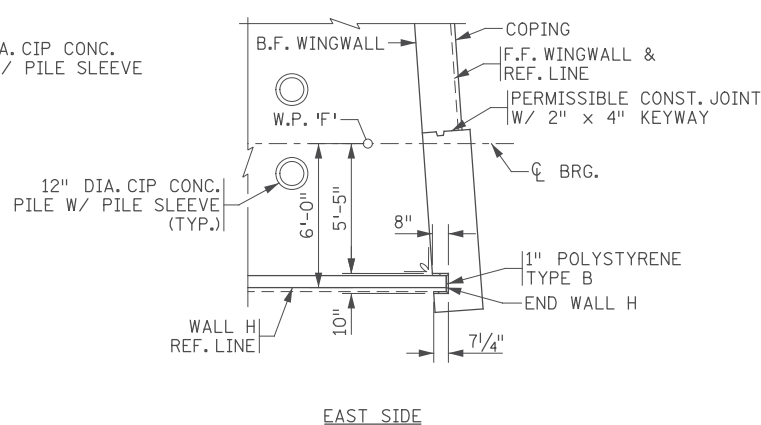
CASING PIPE FOR PRIVATE UTILITY RELOCATION. APPROX. 30" DIA. PIPE AT APPROX. INVERT EL. 860.00. COORDINATE WITH PRIVATE UTILITIES. PROTECT CASING DURING EXCAVATION AND CONSTRUCTION OF FOOTING

RELOCATED 6" CENTERPOINT GAS LINE AT APPROX. INVERT EL. 858.00. COORDINATE WITH UTILITY OWNER FOR FINAL LOCATION.

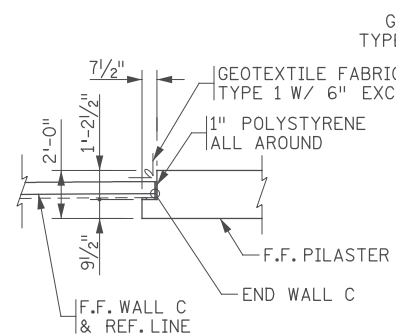


WEST SIDE

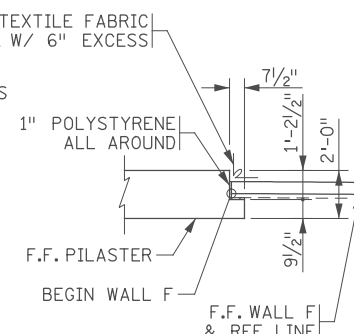
SECTION D-D



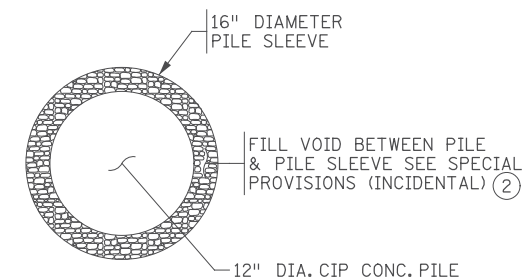
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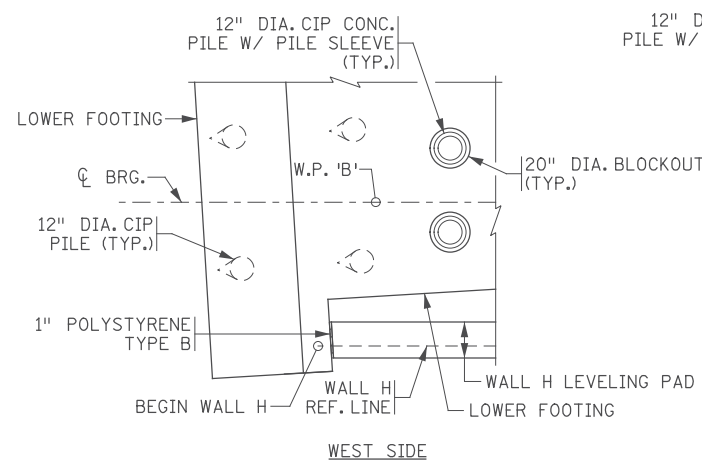
SECTION F-F



SECTION H-H

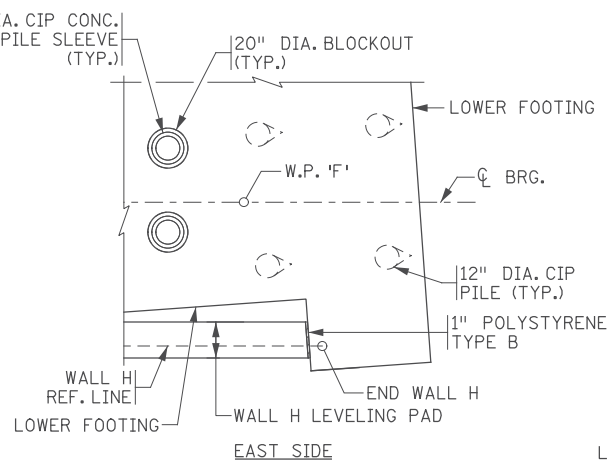


SECTION M-M

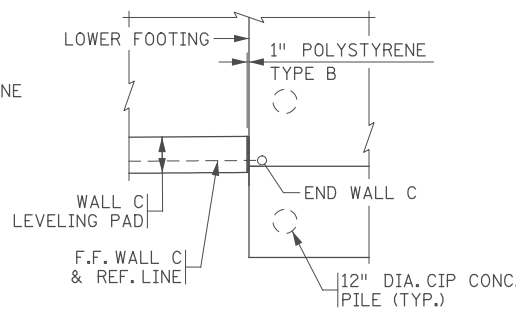


WEST SIDE

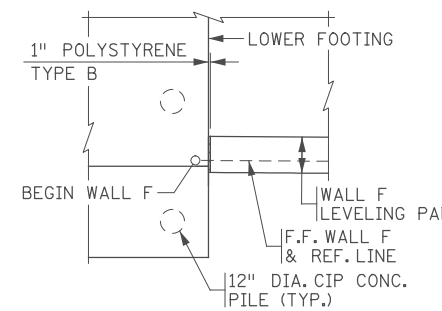
SECTION E-E



EAST SIDE



SECTION G-G



SECTION J-J

NOTES:

1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
2. FILL MATERIAL AND PLACEMENT SHALL BE INCIDENTAL TO BID ITEM 2452.603 "PILE SLEEVES".
3. PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY RELOCATION CORRIDOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.

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Print Name: CASEY E. BLACK
Date: 11/01/2017 License #: 49163

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SAP 002-678-023
SAP 114-020-051
BRIDGE NO.
02588
DRAWN BY
J. HOFFMAN
DESIGNED BY
A. BEHNKE
CHECKED BY
C. BLACK
COMM. NO. 0169140



ANOKA COUNTY
NORTH ABUTMENT DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 5 OF 5)

SHEET
BB17
OF
BB42

WALL C (SEE RETAINING WALL PLANS)

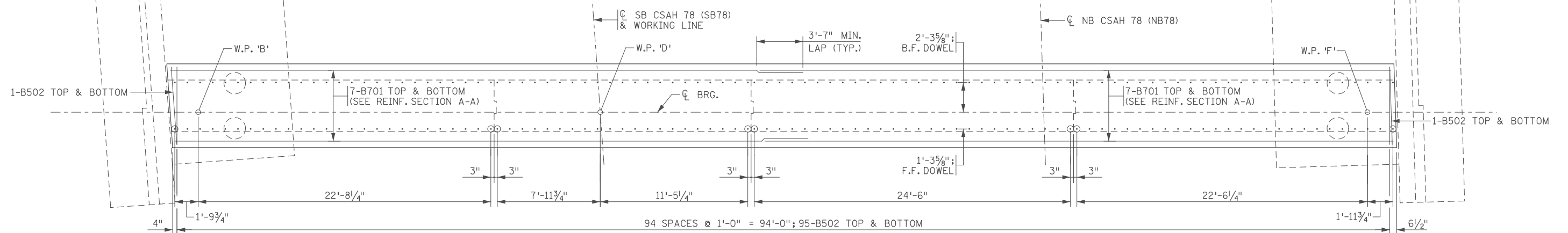
WALL F (SEE RETAINING WALL PLANS)

NOTES:

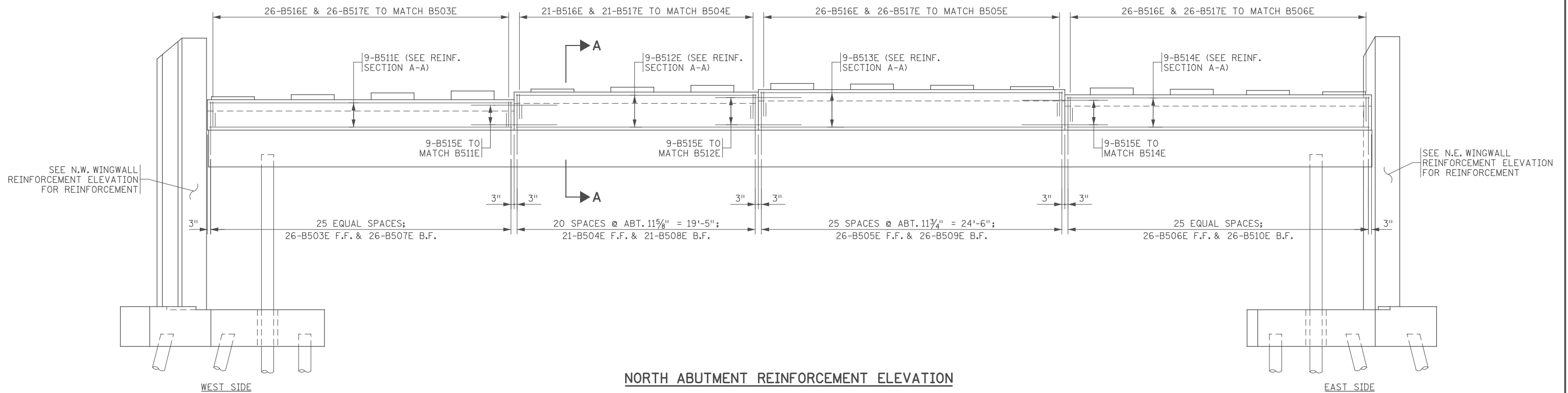
1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
E.F. DENOTES EACH FACE
2. SECTION A-A IS SHOWN ON SHEET BB20.

SEE N.W. WINGWALL FOOTING REINFORCEMENT PLAN FOR REINFORCEMENT

SEE N.E. WINGWALL FOOTING REINFORCEMENT PLAN FOR REINFORCEMENT



NORTH ABUTMENT FOOTING REINFORCEMENT PLAN



NORTH ABUTMENT REINFORCEMENT ELEVATION

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COMM. NO. 0169140

DRAWN BY
J. HOFFMAN

DESIGNED BY
A. BEHNKE

CHECKED BY
C. BLACK

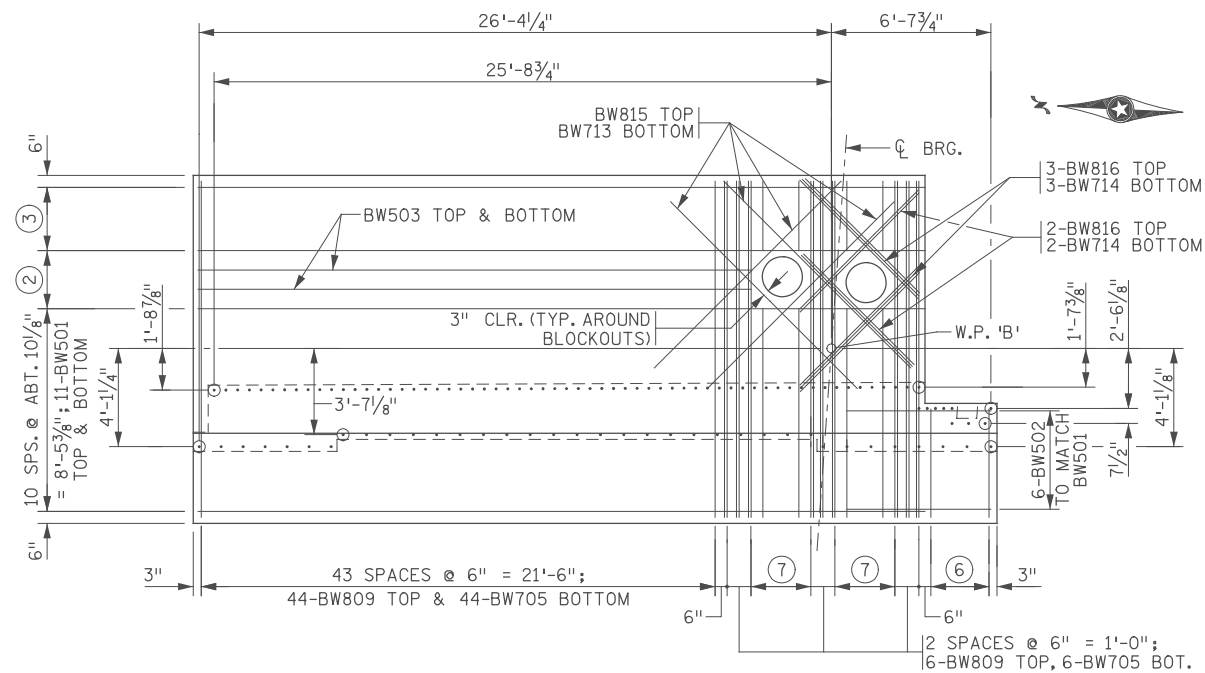
SRE ENGINEERS
PLANNERS
DESIGNERS

Consulting Group, Inc.

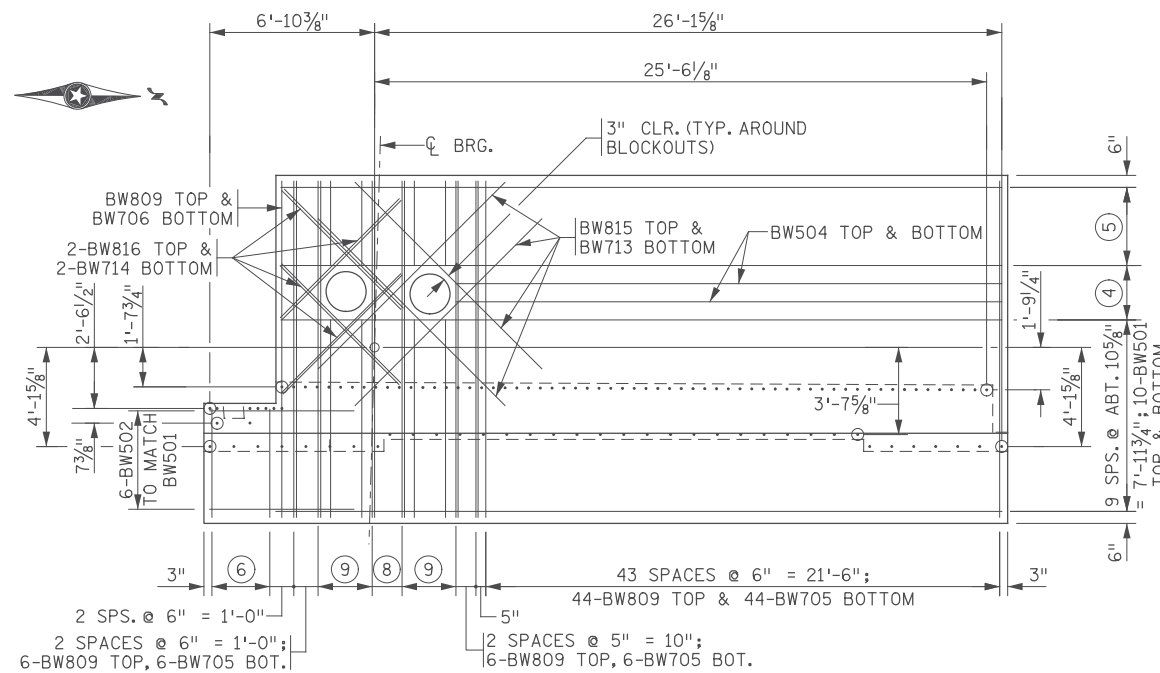
ANOKA COUNTY

NORTH ABUTMENT REINFORCEMENT DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 1 OF 4)

SHEET
BB18
OF
BB42



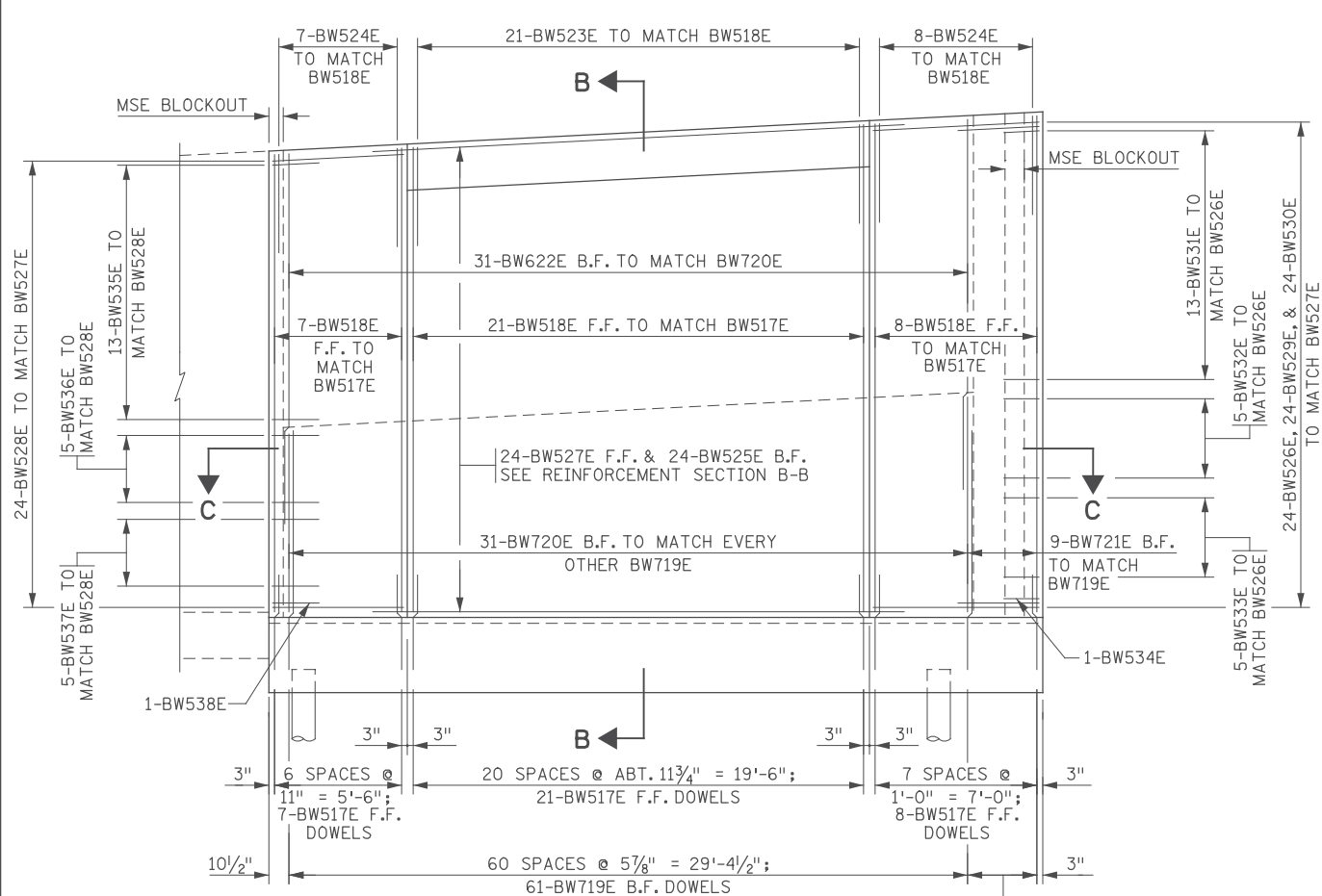
N.W. WINGWALL FOOTING REINFORCEMENT PLAN



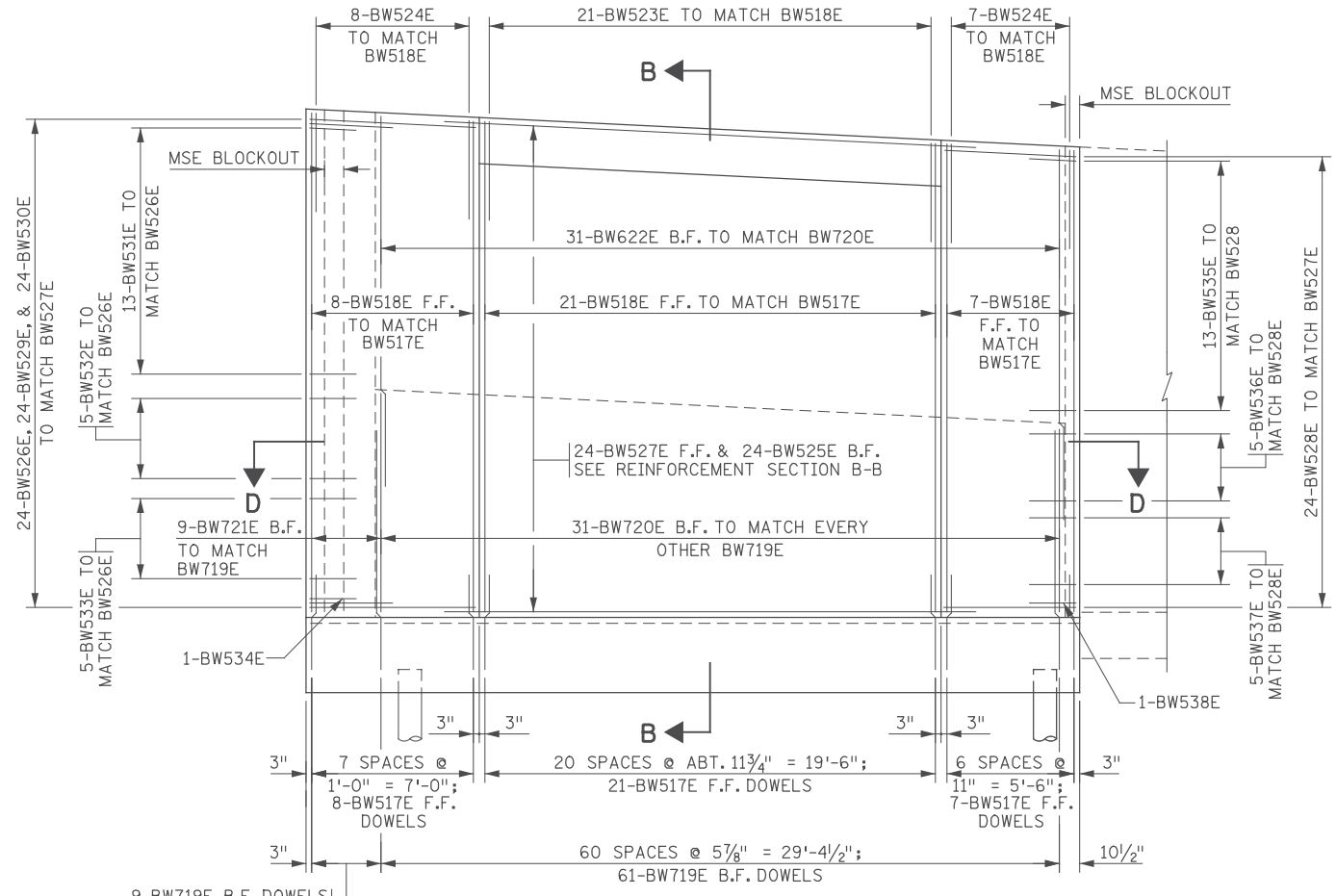
N.E. WINGWALL FOOTING REINFORCEMENT PLAN

NOTES:

1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
E.F. DENOTES EACH FACE
- ② 3 SPACES @ ABT. 9 5/8" = 2'-5";
- ③ 3 SPACES @ ABT. 10 1/2" = 2'-7 5/8";
4-BW501 TOP & BOTTOM.
- ④ 3 SPACES @ ABT. 9 1/8" = 2'-3 1/4";
- ⑤ 4 SPACES @ ABT. 9 3/4" = 3'-3 3/8";
5-BW501 TOP & BOTTOM.
- ⑥ 5 SPACES @ 6" = 2'-6"; 6-BW810
TOP & 6-BW706 BOTTOM.
- ⑦ 5 SPACES @ 6" = 2'-6"; 4-BW811 &
4-BW812 TOP; 4-BW707 & 4-BW708
BOTTOM.
- ⑧ 3 SPACES @ ABT. 5 3/8" = 1'-4";
8-BW809 TOP & 8-BW706 BOTTOM.
- ⑨ 5 SPACES @ ABT. 5 3/8" = 2'-3";
4-BW811 & 4-BW812 TOP; 4-BW707
& 4-BW708 BOTTOM.
10. SECTION B-B IS SHOWN ON
SHEET BB20.



N.W. WINGWALL REINFORCEMENT ELEVATION



N.E. WINGWALL REINFORCEMENT ELEVATION

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				REVISION

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 Print Name: CASEY E. BLACK
Casey E. Black
 Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO.
02588

COMM. NO. 0169140

DRAWN BY
 J. HOFFMAN

DESIGNED BY
 A. BEHNKE

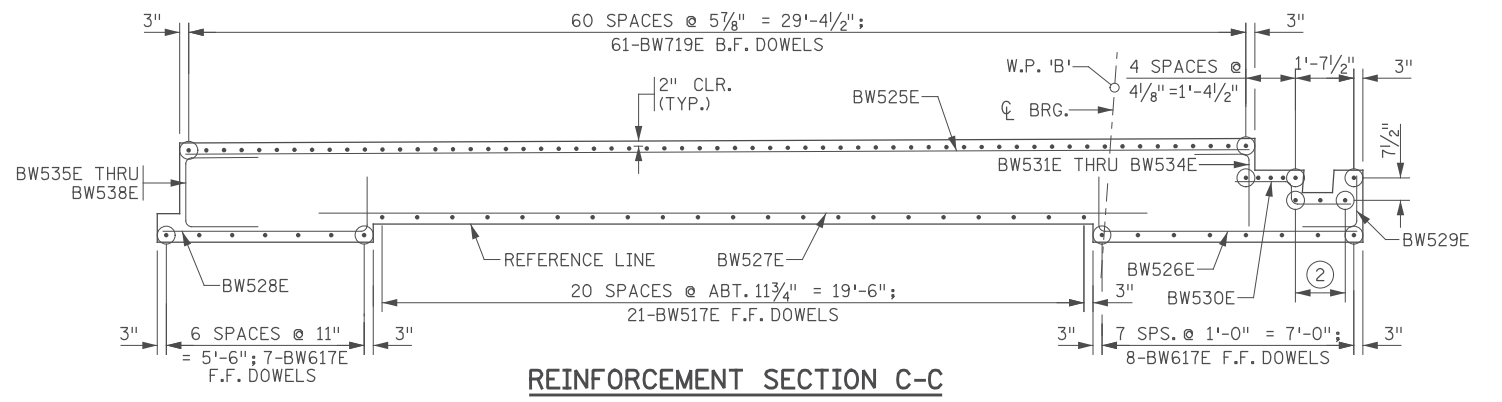
CHECKED BY
 C. BLACK

SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

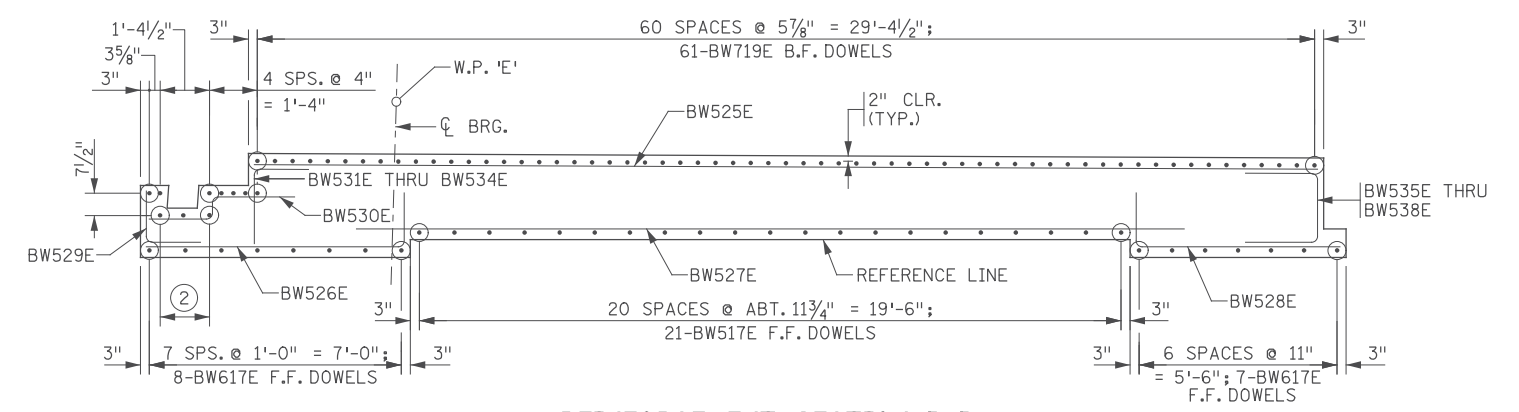
ANOKA COUNTY
 NORTH ABUTMENT REINFORCEMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 2 OF 4)

SHEET
BB19
OF
BB42

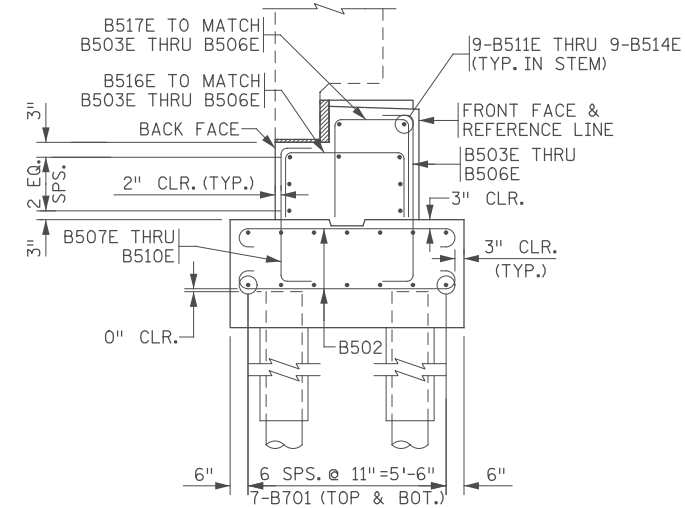
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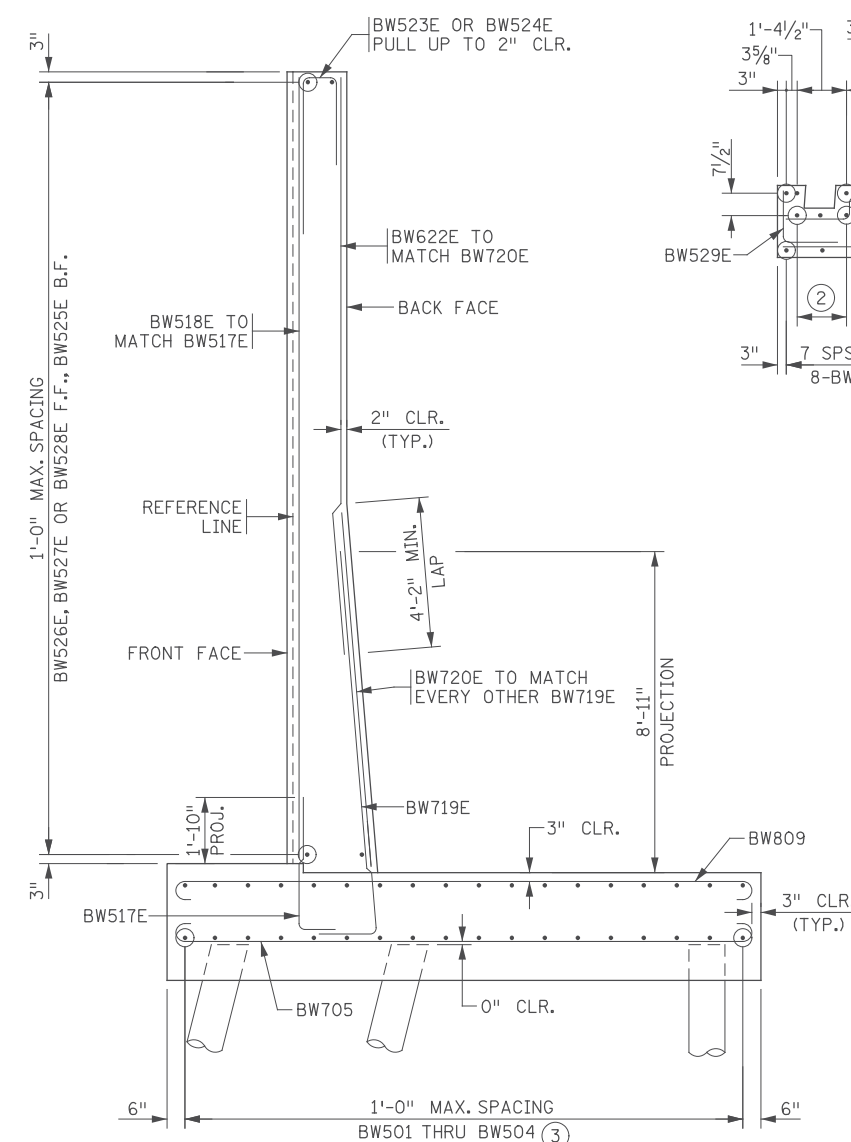
REINFORCEMENT SECTION C-C



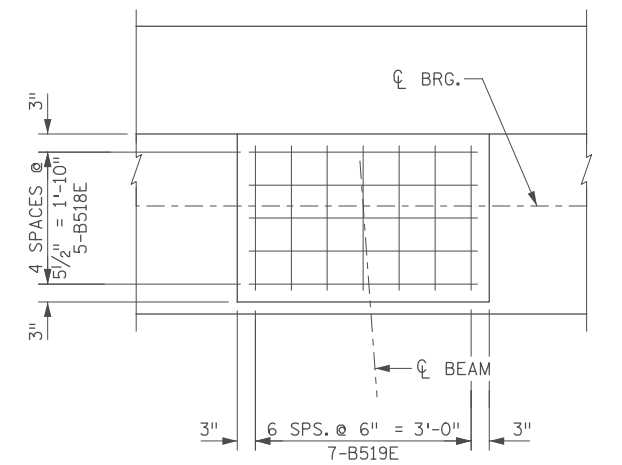
REINFORCEMENT SECTION D-D



REINFORCEMENT SECTION A-A
(SECTION THRU ABUTMENT)



REINFORCEMENT SECTION B-B
(SECTION THRU WINGWALL)



BRIDGE SEAT REINFORCEMENT DETAIL

- NOTES:**
1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
E.F. DENOTES EACH FACE
 2. 2 SPACES @ ABT. 8 1/4" = 1'-4 1/2";
3-BW919E DOWELS.
 3. SEE FOOTING REINFORCEMENT
PLAN FOR DETAILS.

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PLANNERS
DESIGNERS

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ANOKA COUNTY

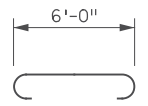
NORTH ABUTMENT REINFORCEMENT DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 3 OF 4)

SHEET
BB20
OF
BB42

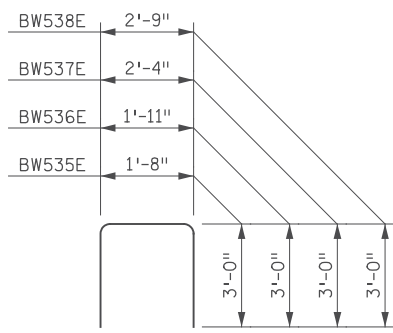
BILL OF REINFORCEMENT: NORTH WINGWALL

MARK	NO	LENGTH [FT-IN]	SHAPE	LOCATION
BW501	60	30 - 0	—	FOOTING LONG
BW502	24	6 - 0	—	FOOTING LONG
BW503	4	22 - 9	—	EAST FTG LONG
BW504	4	23 - 3	—	WEST FTG LONG
BW705	127	15 - 8	⌋	FOOTING TRANS
BW706	12	6 - 2	⌋	FOOTING TRANS
BW707	16	4 - 7	⌋	FOOTING TRANS
BW708	16	9 - 11	⌋	FOOTING TRANS
BW809	127	15 - 10	⌋	FOOTING TRANS
BW810	12	6 - 4	⌋	FOOTING TRANS
BW811	16	4 - 9	⌋	FOOTING TRANS
BW812	16	10 - 1	⌋	FOOTING TRANS
BW713	8	10 - 0	—	FOOTING DIAGONAL
BW714	18	7 - 0	—	FOOTING DIAGONAL
BW815	8	11 - 0	—	FOOTING DIAGONAL
BW816	18	7 - 0	—	FOOTING DIAGONAL
BW517E	72	4 - 6	⌋	FF DOWEL
BW518E	72	20 - 8	—	FF VERT
BW719E	140	11 - 8	⌋	BF DOWEL
BW720E	62	11 - 0	—	BF VERT
BW721E	18	22 - 3	—	BF VERT
BW622E	62	16 - 6	—	BF VERT
BW523E	42	7 - 7	⌋	STEM CAP
BW524E	30	8 - 5	⌋	PILASTER CAP
BW525E	48	29 - 6	—	STEM HORIZ
BW526E	48	8 - 8	⌋	PILASTER HORIZ
BW527E	48	25 - 8	—	STEM HORIZ
BW528E	48	7 - 2	⌋	PILASTER HORIZ
BW529E	48	3 - 0	⌋	MSE BLOCKOUT
BW530E	48	4 - 1	⌋	MSE BLOCKOUT
BW531E	26	4 - 6	⌋	MSE BLOCKOUT
BW532E	10	4 - 9	⌋	MSE BLOCKOUT
BW533E	10	5 - 2	⌋	MSE BLOCKOUT
BW534E	2	5 - 7	⌋	MSE BLOCKOUT
BW535E	26	7 - 8	⌋	MSE BLOCKOUT
BW536E	10	7 - 11	⌋	MSE BLOCKOUT
BW537E	10	8 - 4	⌋	MSE BLOCKOUT
BW538E	2	8 - 9	⌋	MSE BLOCKOUT

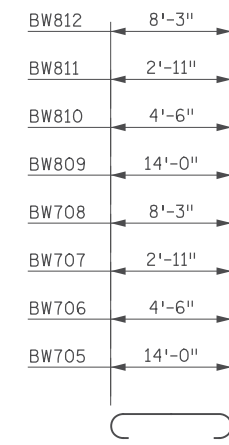
BAR SHAPES:



B502



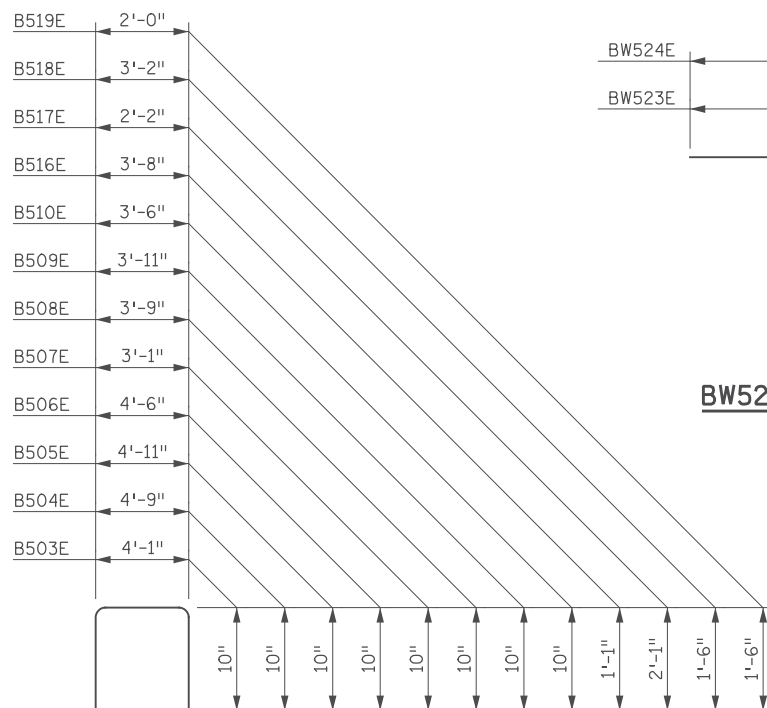
BW535E, BW536E, BW537E, BW538E



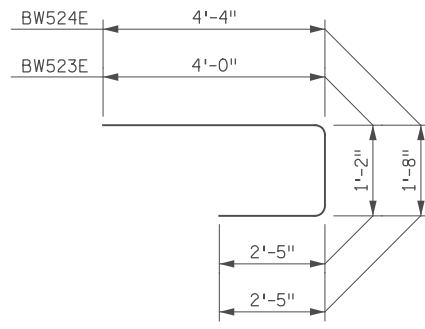
BW705, BW706, BW707, BW708, BW809, BW810, BW811, BW812

BILL OF REINFORCEMENT: NORTH ABUT.

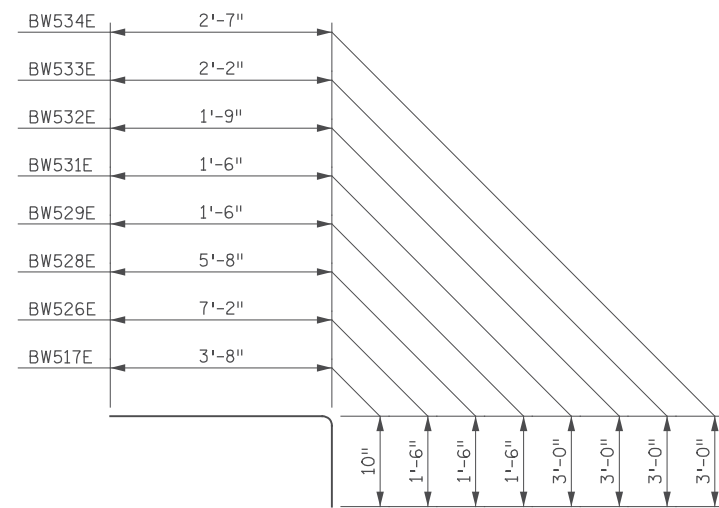
MARK	NO	LENGTH [FT-IN]	SHAPE	LOCATION
B701	28	49 - 5	—	FOOTING LONG
B502	194	7 - 2	⌋	FOOTING TRANS
B503E	26	5 - 9	⌋	FF DOWEL
B504E	21	6 - 5	⌋	FF DOWEL
B505E	26	6 - 7	⌋	FF DOWEL
B506E	26	6 - 2	⌋	FF DOWEL
B507E	26	4 - 9	⌋	BF DOWEL
B508E	21	5 - 5	⌋	BF DOWEL
B509E	26	5 - 7	⌋	BF DOWEL
B510E	26	5 - 2	⌋	BF DOWEL
B511E	9	24 - 8	—	STEM LONG
B512E	9	19 - 8	—	STEM LONG
B513E	9	24 - 8	—	STEM LONG
B514E	9	24 - 7	—	STEM LONG
B515E	27	7 - 0	—	STEM LONG
B516E	99	5 - 10	⌋	STEM VERT
B517E	99	6 - 4	⌋	STEM VERT
B518E	75	6 - 2	⌋	BRG SEAT
B519E	105	5 - 0	⌋	BRG SEAT



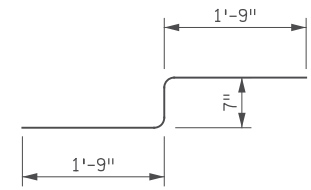
B503E, B504E, B505E, B506E, B507E, B508E, B509E, B510E, B516E, B517E, B518E, B519E



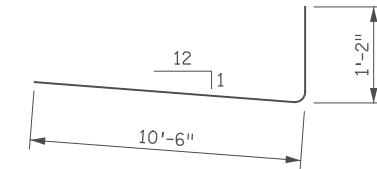
BW523E, BW524E



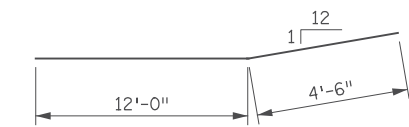
BW517E, BW526E, BW528E, BW529E, BW531E, BW532E, BW533E, BW534E



BW530E



BW719E



BW622E

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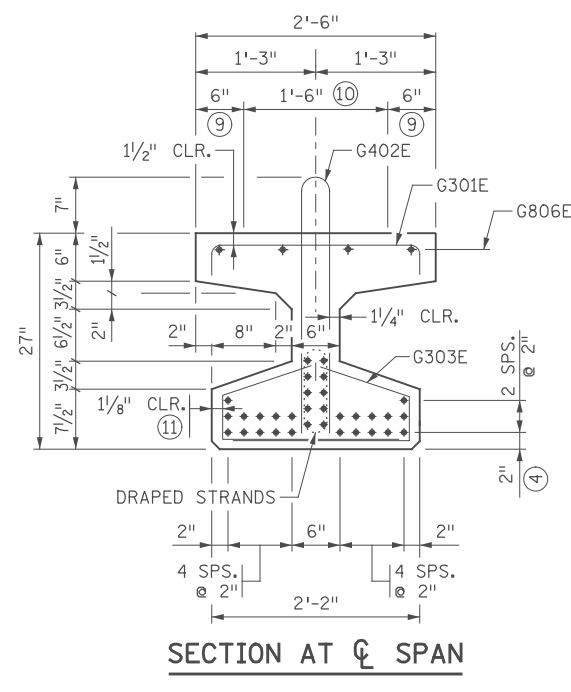
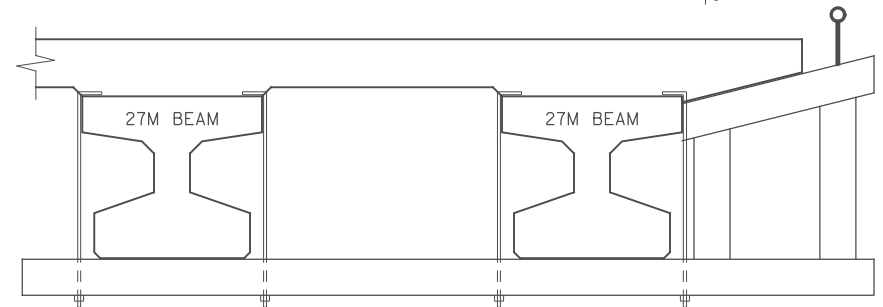
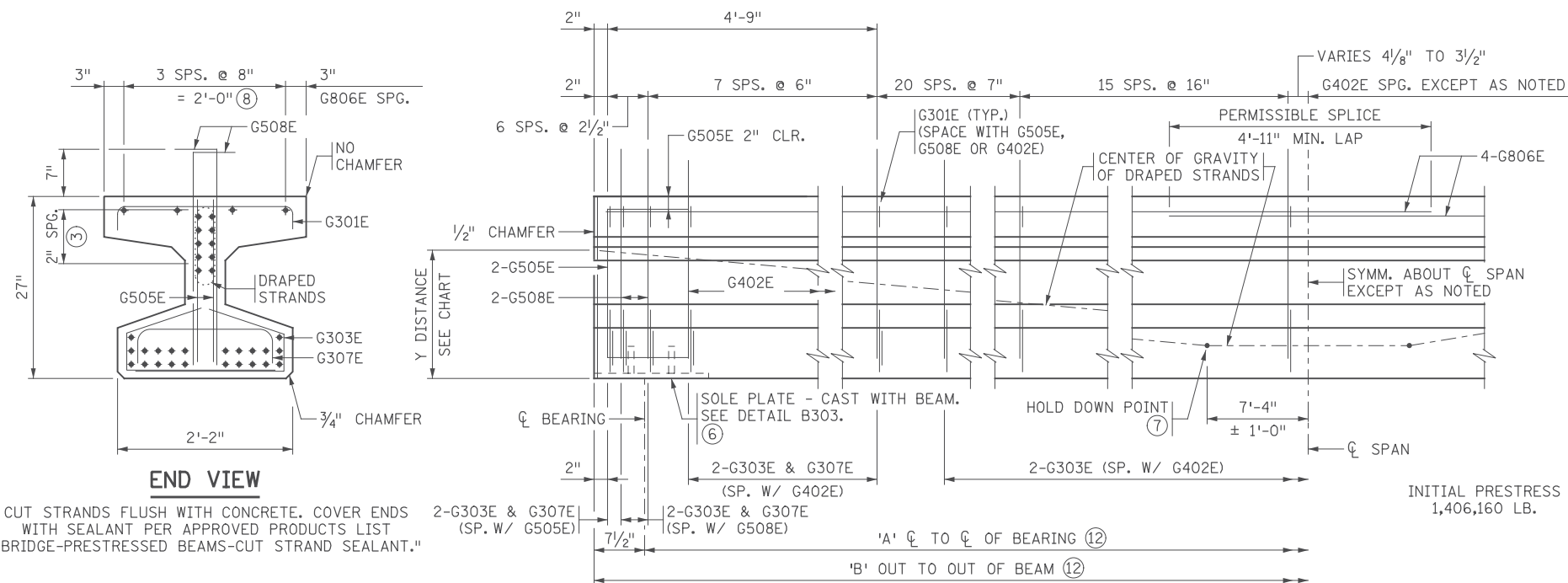
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Casey E. Black
 Date 11/01/2017 License # 49163

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 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02588
 COMM. NO. 0169140


**ENGINEERS
 PLANNERS
 DESIGNERS**
 Consulting Group, Inc.

ANOKA COUNTY
 NORTH ABUTMENT REINFORCEMENT DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 4 OF 4)

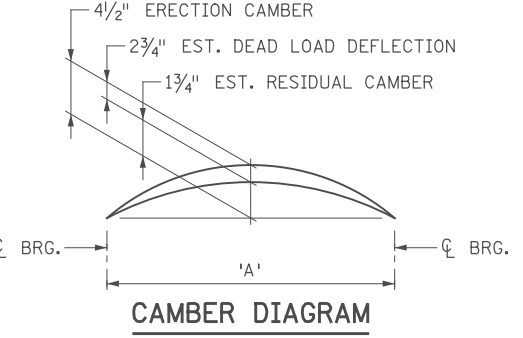
**SHEET
 BB21
 OF
 BB42**



Y DISTANCES (INCHES)			
	NO.	CL SPAN	END
STRAIGHT STRANDS	22	3.27	
DRAPED STRANDS	10	7.00	20.00
TOTAL STRANDS	32	4.44	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

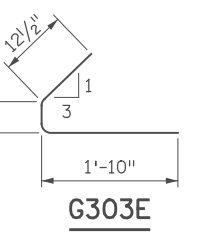
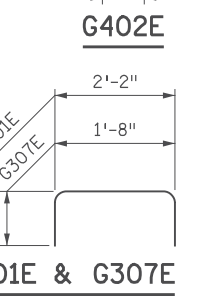
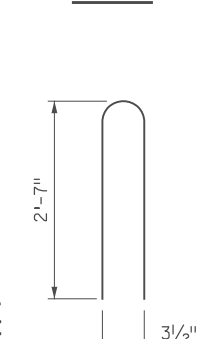
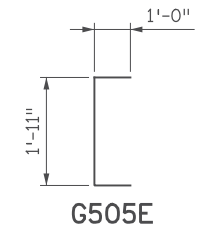
CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.

CONTRACTOR SHALL VERIFY STABILITY OF FASCIA BEAMS FROM OVERTURNING (NO PERMANENT BEAM DIAPHRAGMS ARE PRESENT). CONTRACTOR SHALL PROVIDE TEMPORARY BRACING.

	DIM. 'A'	DIM. 'B'
B1-B2	72'-7 3/8"	73'-10 3/8"
B3	72'-6 1/2"	73'-9 1/2"
B4	72'-6"	73'-9"

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	24.26 KSI
LONG TERM LOSSES	24.28 KSI
TOTAL LOSSES	48.54 KSI

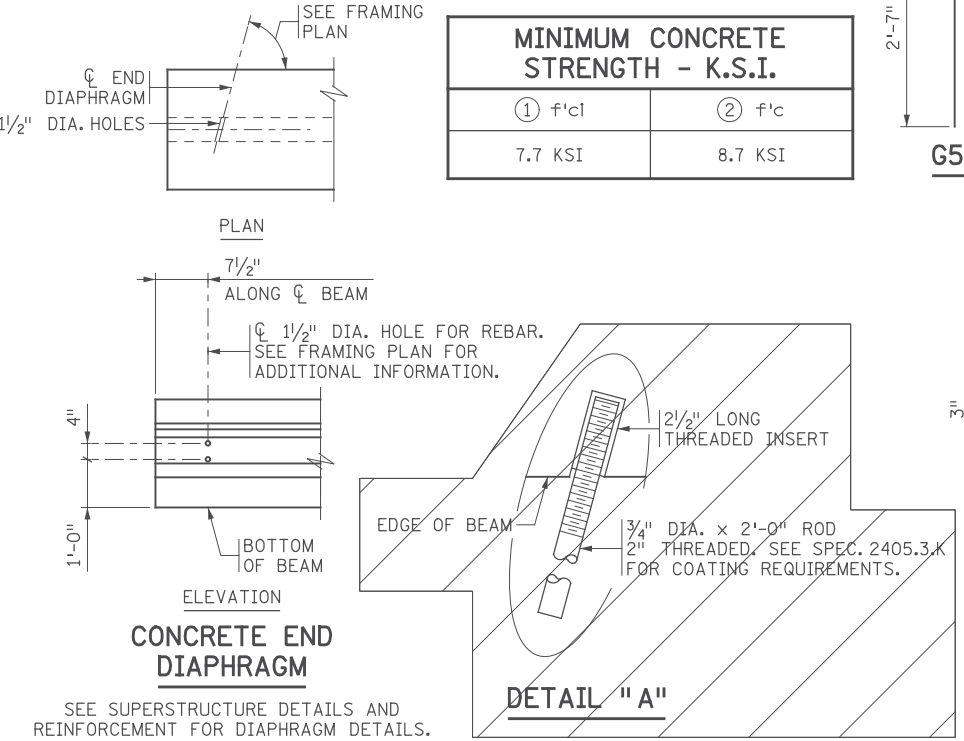
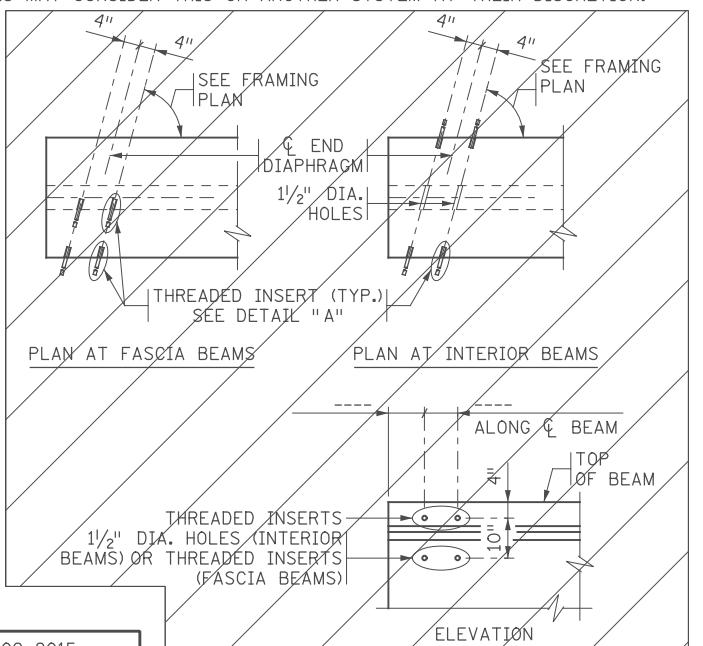
MINIMUM CONCRETE STRENGTH - K.S.I.	
① f'cl	② f'c
7.7 KSI	8.7 KSI



GENERAL NOTES

- PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.
- MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.
- ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.
- SEE FRAMING PLAN FOR BEAM END MARKED "X".
- AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.
- APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.

- ① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.
- ② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.
- ③ DRAPED STRANDS.
- ④ STRAIGHT STRANDS.
- ⑤ USE 0.6" DIA. 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.
- ⑥ FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.
- ⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.
- ⑧ TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.
- ⑨ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.
- ⑩ ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.
- ⑪ TYP. CLR. FOR ENTIRE BOTTOM FLANGE.
- ⑫ BEAM DIMENSIONS ARE SLOPED LENGTH.



REVISED: DECEMBER 02, 2015
 APPROVED: JANUARY 13, 2015
 Nancy Dubenberger
 STATE BRIDGE ENGINEER

CONCRETE END DIAPHRAGM
 PARAPET ABUTMENT
 (SEE DETAIL B014 FOR DIAPHRAGM DETAILS)

SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.

NO.	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASED FOR CONSTRUCTION

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 Print Name: ERIC S. HANSON
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02588
 COMM. NO. 0169140



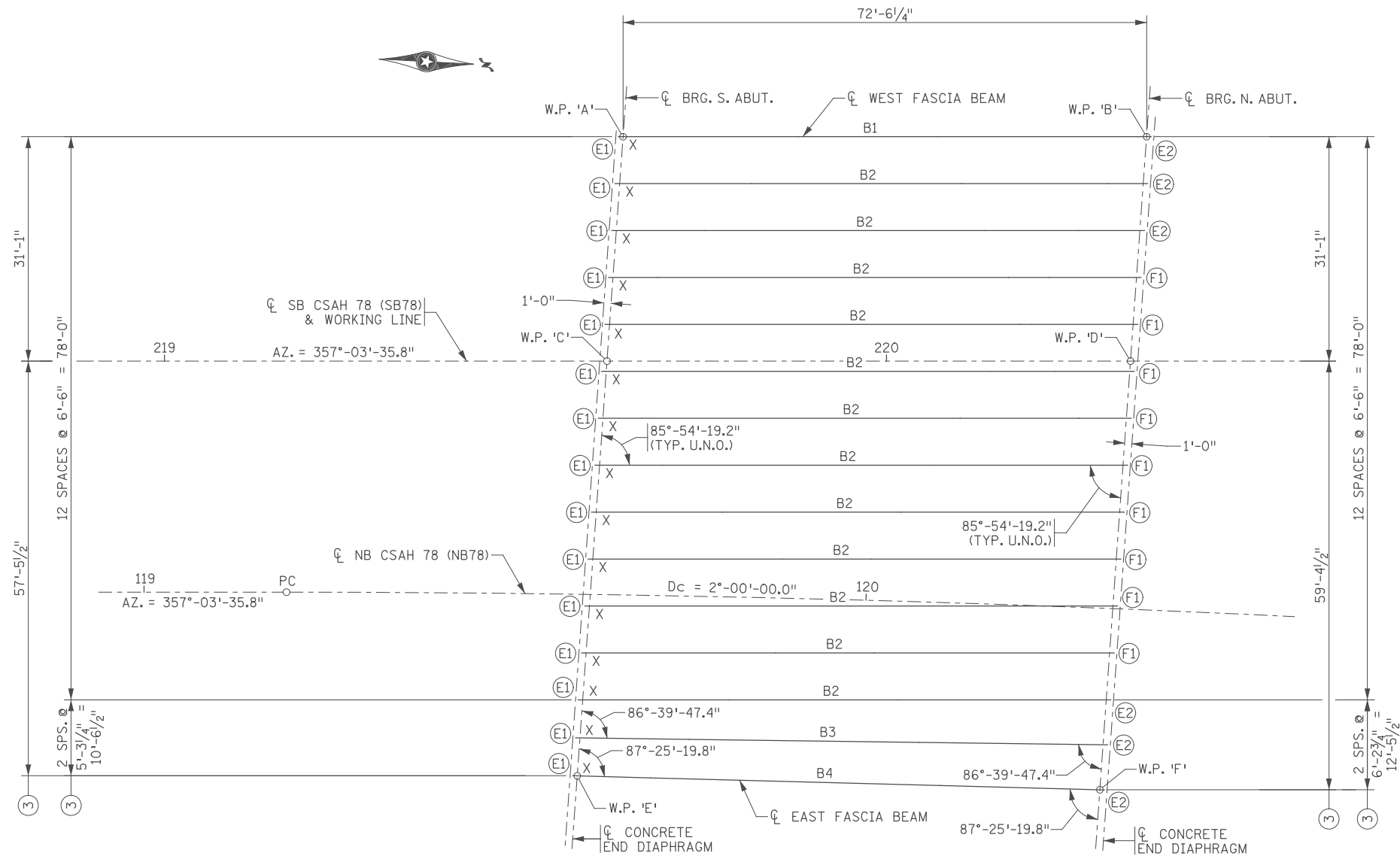
ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 27" PRESTRESSED CONCRETE BEAM (PRETENSIONED) 27M-74
 CSAH 78 OVER 108TH AVENUE NW

SHEET
 BB23
 OF
 BB42

FIG. 5-397.504

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FRAMING PLAN

- LEGEND:**
- (F1) FIXED CURVED PLATE BEARING ASSEMBLY TYPE F-1.
 - (E1) EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE E-1.
 - (E2) EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE E-2.

- NOTES:**
1. X DENOTES WHICH END OF BEAM IS TO BE MARKED WITH AN "X".
 2. U.N.O. DENOTES UNLESS NOTED OTHERWISE.
 3. DIMENSIONS ARE MEASURED PERPENDICULAR TO WORKING LINE.

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Eric S. Hanson

Date: 11/01/2017 License #: 50463

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BRIDGE NO.
02588

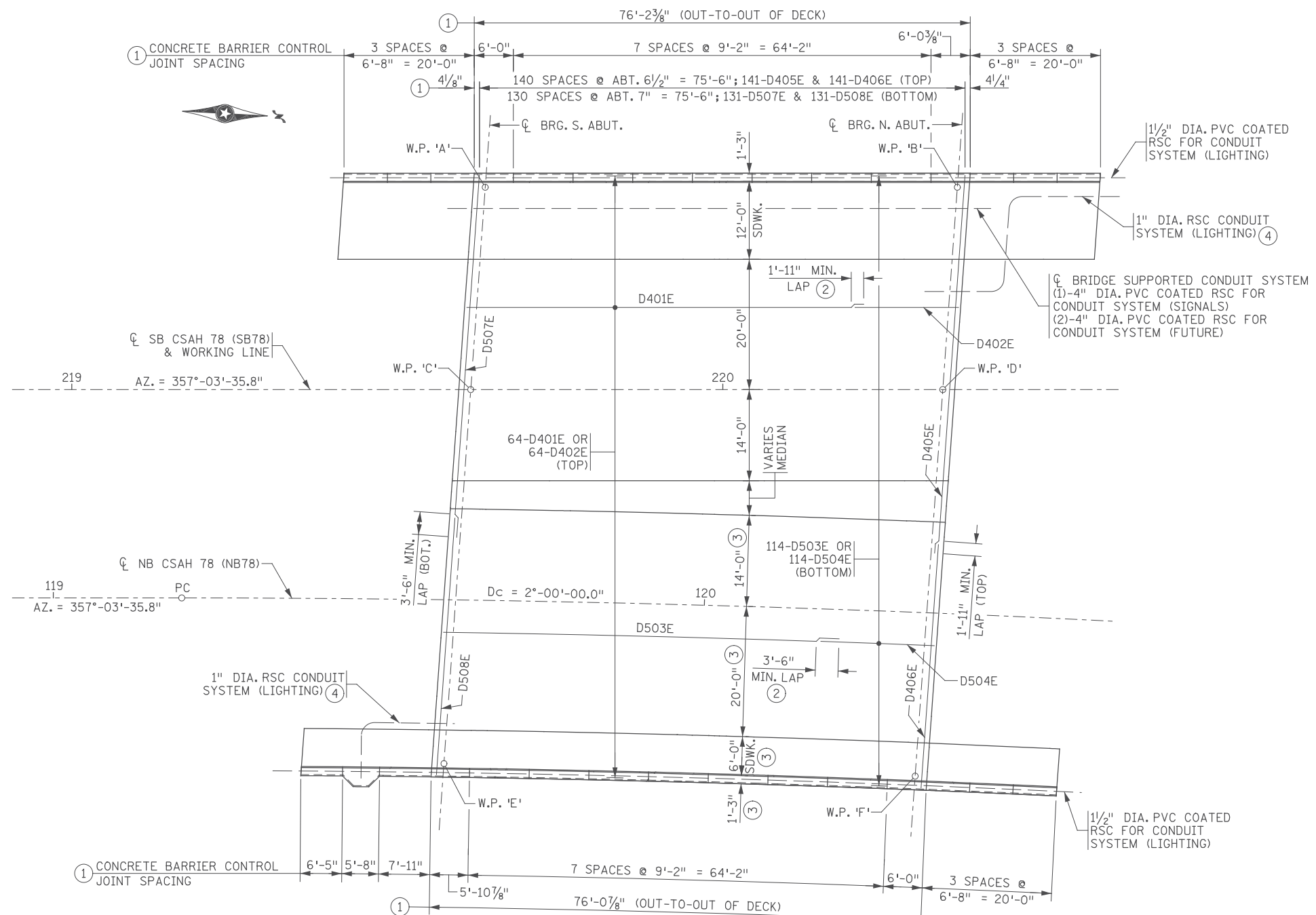
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SRE ENGINEERS PLANNERS DESIGNERS

Consulting Group, Inc.

ANOKA COUNTY
FRAMING PLAN
CSAH 78 OVER 108TH AVENUE NW

SHEET BB22 OF BB42



BRIDGE DECK LAYOUT

- NOTES:**
- ① MEASURED ALONG EDGE OF DECK.
 - ② ALTERNATE LAPS.
 - ③ MEASURED PERPENDICULAR TO CL N.B. CSAH 78.
 - ④ CONDUIT TO EXTEND FROM END DIAPHRAGM TO NEAREST LIGHT BLISTER AND SHALL BE INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (LIGHTING) (BR. NO. 02588)". SEE LIGHTING PLANS FOR ADDITIONAL CONDUIT AND LIGHTING DETAILS.

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REVISION				
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SAP 114-020-051

BRIDGE NO.
02588

COMM. NO. 0169140

DRAWN BY
J. HOFFMAN

DESIGNED BY
S. NEFF

CHECKED BY
C. BLACK

SRE ENGINEERS
PLANNERS
DESIGNERS

Consulting Group, Inc.

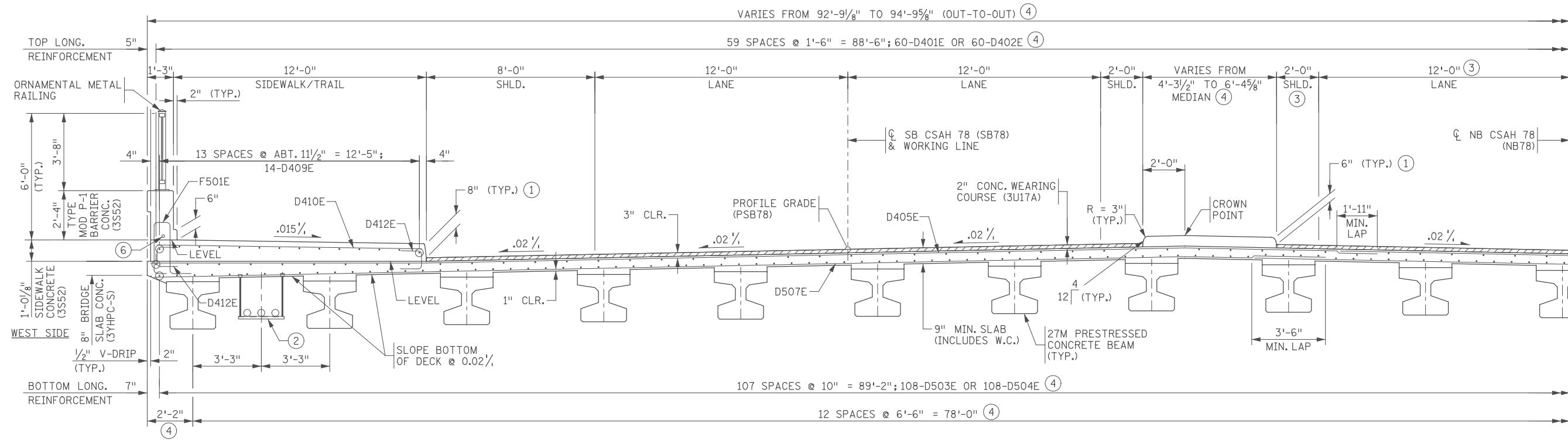
ANOKA COUNTY

BRIDGE DECK DETAILS

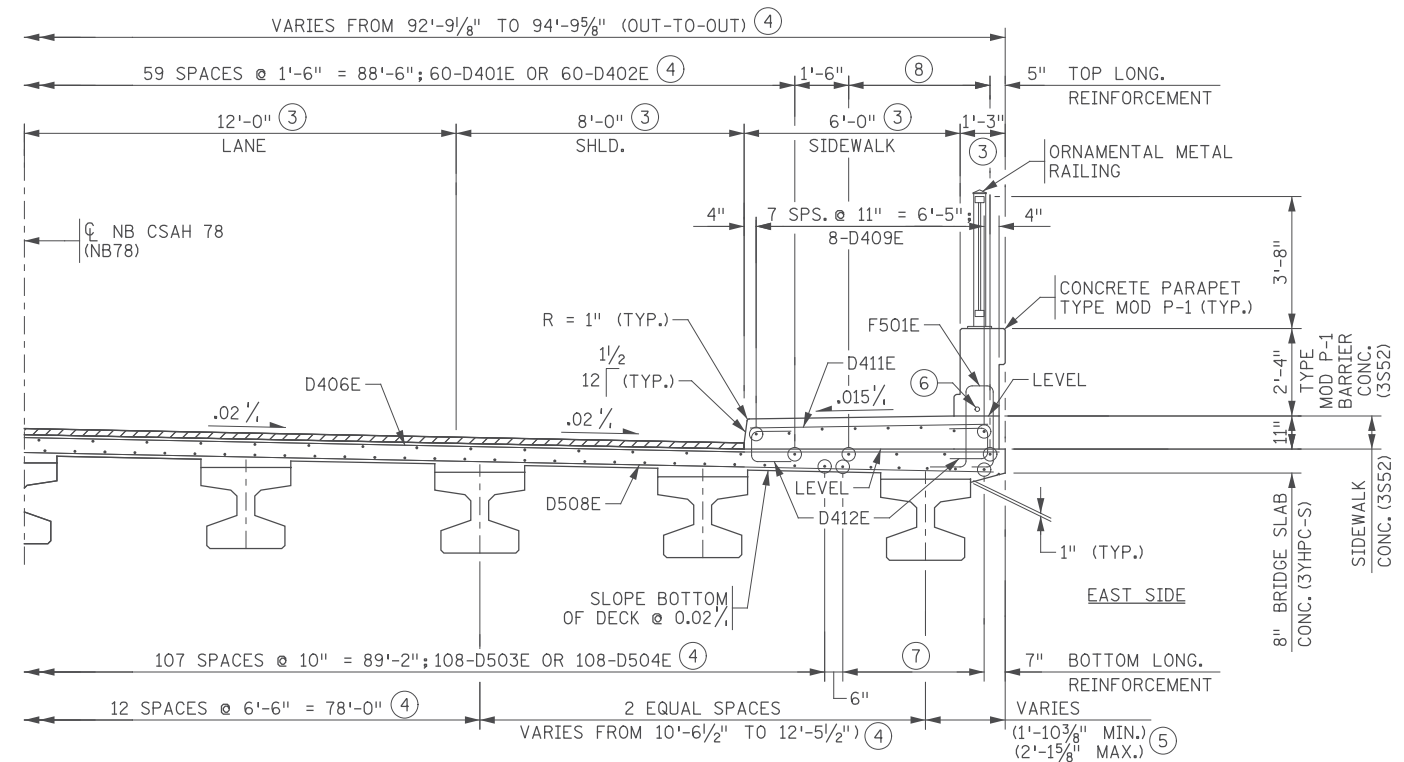
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(SHEET 1 OF 5)

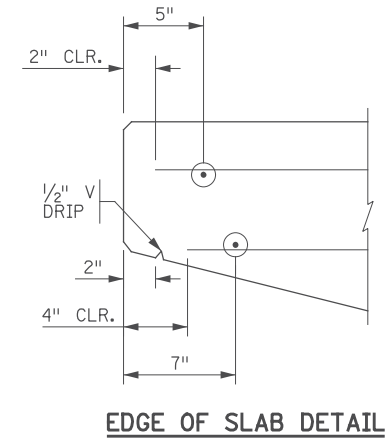
SHEET
BB24
OF
BB42



PARTIAL TRANSVERSE SECTION



PARTIAL TRANSVERSE SECTION



- NOTES:**
- ① MEASURED FROM TOP OF 2" WEARING COURSE.
 - ② WEST BRIDGE SUPPORTED CONDUIT SYSTEM TO INCLUDE (1)-4" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (SIGNALS) & (2)-4" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (FUTURE).
 - ③ MEASURED PERPENDICULAR TO CL NB CSAH 78.
 - ④ MEASURED PERPENDICULAR TO WORKING LINE.
 - ⑤ MEASURED PERPENDICULAR TO FASCIA BEAM.
 - ⑥ 1 1/2" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (LIGHTING).
 - ⑦ 5 SPACES @ 4 5/8" = 1'-11 1/8"; 6-D503E OR 6-D504E (SOUTH END)
5 SPACES @ ABT. 9 1/2" = 3'-11 5/8"; 6-D503E OR 6-D504E (NORTH END).
 - ⑧ 3 SPACES @ ABT. 7 3/4" = 1'-11 1/8"; 4-D401E OR 4-D402E (SOUTH END)
3 SPACES @ 1'-3 7/8" = 3'-11 5/8"; 4-D401E OR 4-D402E (NORTH END).

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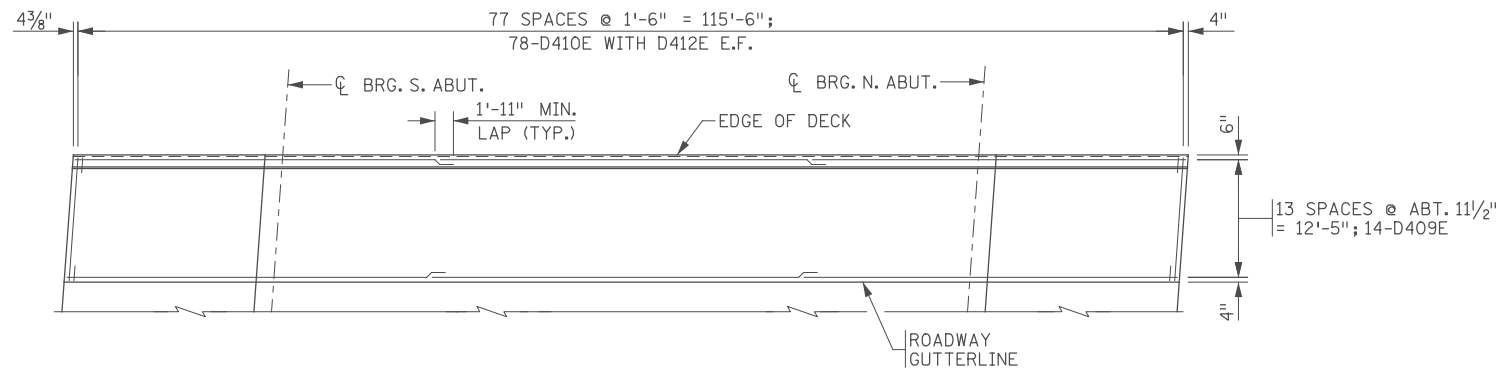
BRIDGE NO.
02588

COMM. NO. 0169140

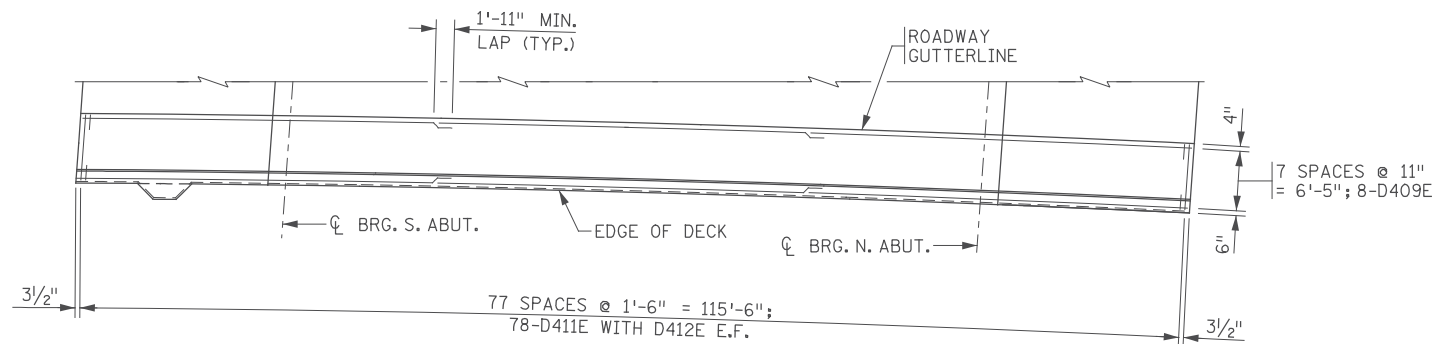


ANOKA COUNTY
BRIDGE DECK DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 2 OF 5)

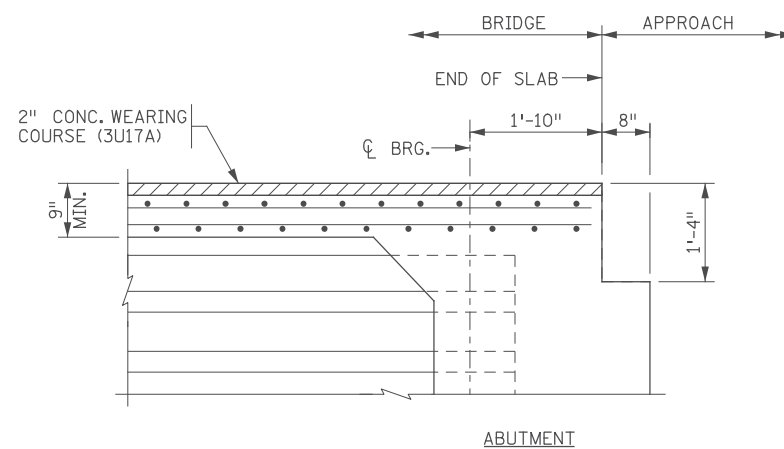
SHEET BB25 OF BB42



WEST SIDEWALK REINFORCEMENT PLAN



EAST SIDEWALK REINFORCEMENT PLAN

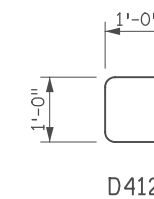


LONGITUDINAL SECTION
(DIMS. SHOWN ARE PERP. TO ϕ BRG.)

SUMMARY OF QUANTITIES : SUPERSTRUCTURE		
ITEM	UNIT	QUANTITY
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	233
SIDEWALK CONCRETE (3S52)	SQ FT	2343
RAISED MEDIAN CONCRETE (3S52)	SQ FT	395
REINFORCEMENT BARS (EPOXY COATED)	POUND	56190
REINFORCEMENT BARS (STAINLESS-60KSI)	POUND	950
BRIDGE SLAB CONCRETE (3YHPC-S)	SQ FT	7133
ORNAMENTAL METAL RAILING	LIN FT	233
BEARING ASSEMBLY	EACH	30
CONCRETE WEARING COURSE (3U17A)	SQ FT	7898
PRESTRESSED CONCRETE BEAMS 27M	LIN FT	1108

BILL OF REINFORCEMENT: DECK				
MARK	NO	LENGTH [FT - IN]	SHAPE	LOCATION
D401E	64	60 - 0	—	LONG. TOP
D402E	64	17 - 11	—	LONG. TOP
D503E	114	60 - 0	—	LONG. BOTTOM
D504E	114	19 - 2	—	LONG. BOTTOM
D405E	141	58 - 6	—	TRANSV. TOP
D406E	141	38 - 2	—	TRANSV. TOP
D507E	131	56 - 1	—	TRANSV. BOTTOM
D508E	131	41 - 10	—	TRANSV. BOTTOM
D409E	66	40 - 0	—	LONG. SIDEWALK
D410E	78	12 - 8	—	TRANSV. SIDEWALK
D411E	78	6 - 8	—	TRANSV. SIDEWALK
D412E	312	3 - 0	□	VERT. SIDEWALK

BAR SHAPES:



NOTES:

- E.F. DENOTES EACH FACE
- INCLUDES SLAB, END DIAPHRAGM, SIDEWALK AND RAILING REINFORCEMENT.
- "CONCRETE WEARING COURSE (3U17A)" INCLUDES 2720 SQUARE FEET FOR BRIDGE APPROACH PANEL.
- ITEM INCLUDES PAYMENT FOR FIXED AND EXPANSION CURVED PLATE BEARING ASSEMBLIES.

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NO	DATE	BY	CKD	APPR

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: ERIC S. HANSON
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

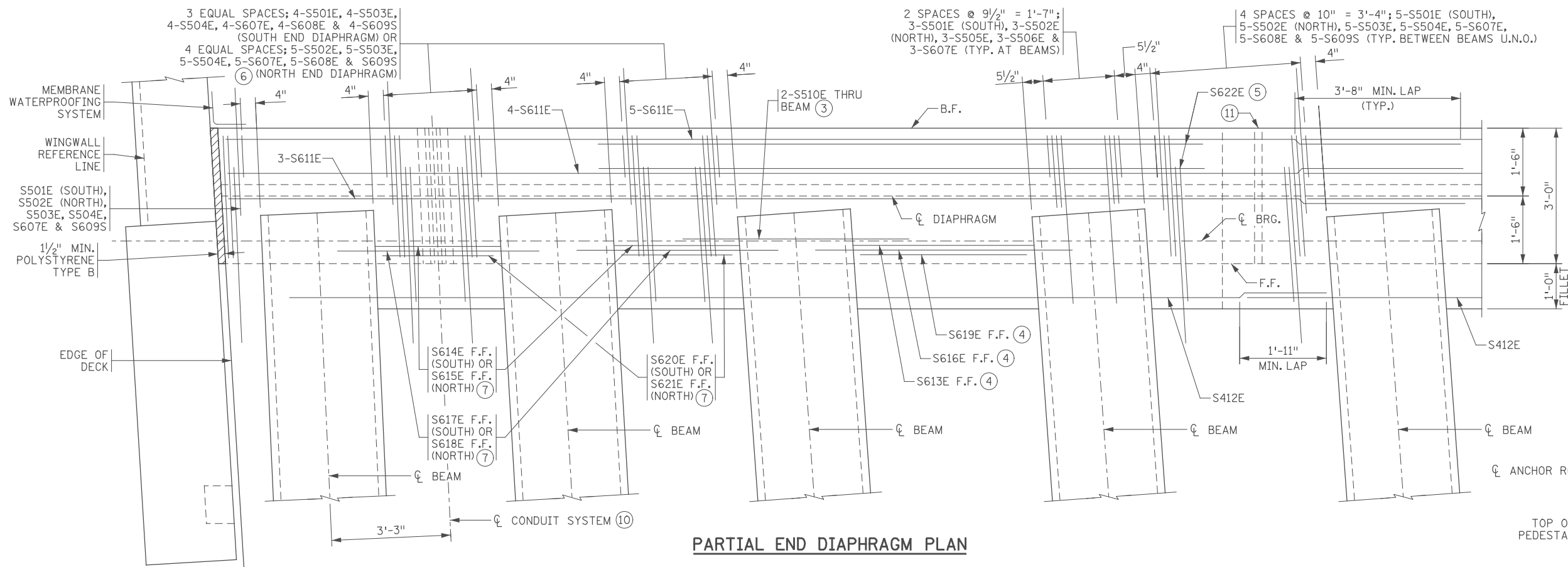
STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02588
 COMM. NO. 0169140



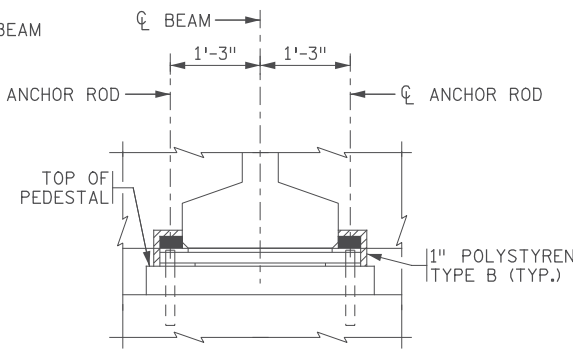
ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 BRIDGE DECK DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 3 OF 5)

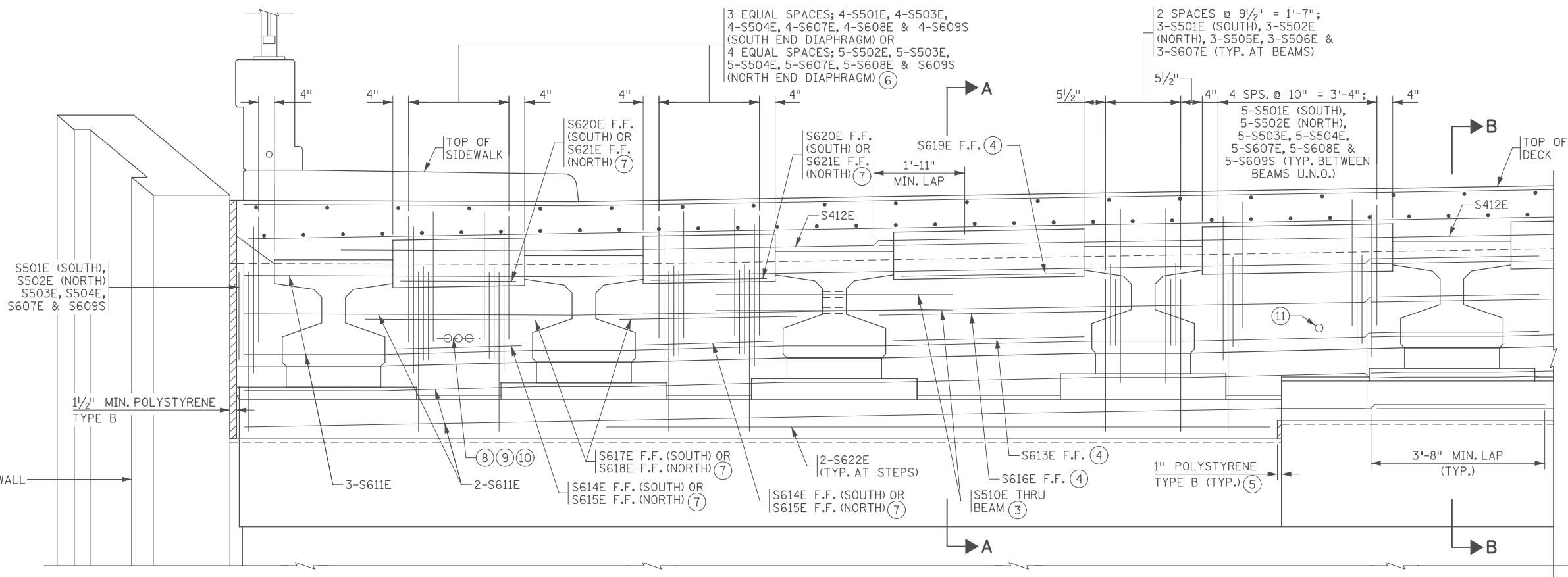
SHEET
 BB26
 OF
 BB42



PARTIAL END DIAPHRAGM PLAN



PEDESTAL ELEVATION DETAIL
TYPICAL AT NORTH ABUTMENT FIXED BEARINGS



PARTIAL END DIAPHRAGM ELEVATION

NOTES:

1. F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
U.N.O. DENOTES UNLESS NOTED OTHERWISE
2. FOR SECTIONS A-A & B-B SEE SHEET BB28
- ③ TYPICAL AT EACH BEAM.
- ④ TYPICAL BETWEEN BEAMS U.N.O.
- ⑤ TYPICAL AT STEP.
- ⑥ SPACING AT EAST SIDE OF BRIDGE ONLY. SEE TYPICAL BETWEEN BEAM SPACING FOR SPACING AT WEST SIDE FASCIA BAYS.
- ⑦ BARS AT EAST SIDE OF BRIDGE ONLY. SEE TYPICAL FRONT FACE BARS BETWEEN BEAMS FOR BARS AT WEST SIDE FASCIA BAYS.
- ⑧ PIPE SLEEVES FOR CONDUIT SYSTEM (SIGNALS) AND CONDUIT SYSTEM (FUTURE). SEE CONDUIT SYSTEM FOR SIGNALS AND FUTURE DETAILS. SHIFT BARS SLIGHTLY AS NEEDED.
- ⑨ ϕ CONDUIT ELEVATION AT FRONT FACE.
SOUTH = EL. 886.65
NORTH = EL. 883.07
- ⑩ CONDUIT SYSTEM IN WEST FASCIA BAY ONLY.
- ⑪ 2" PIPE SLEEVE FOR CONDUIT SYSTEM (LIGHTING). COORDINATE FINAL LOCATION. SEE LIGHTING AND RETAINING WALL PLANS.

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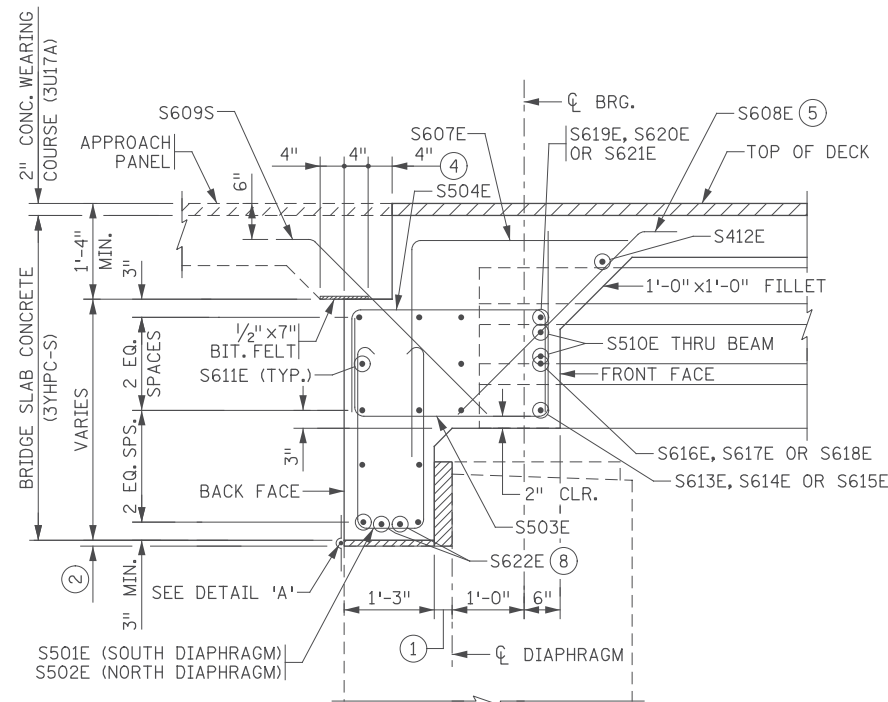
DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 C. BLACK
SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 BRIDGE DECK DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 4 OF 5)

SHEET
BB27
OF
BB42

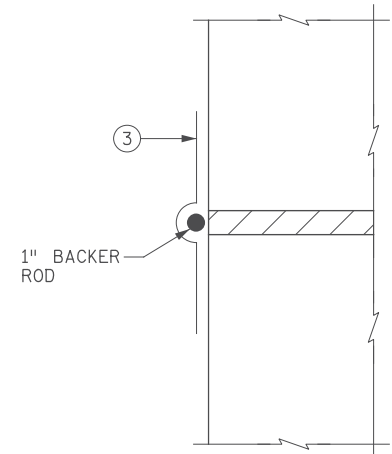
BILL OF REINFORCEMENT: END DIAPHRAGM (7)

MARK	NO	LENGTH [FT-IN]	SHAPE	LOCATION
S501E	115	8 - 2		S ABUT VERT
S502E	117	7 - 4		N ABUT VERT
S503E	142	6 - 10		STIRRUP
S504E	142	5 - 8		STIRRUP
S505E	90	5 - 9		STIRRUP
S506E	90	4 - 7		STIRRUP
S607E	232	6 - 0		DECK TIE
S608E	138	4 - 9		DECK TIE
S609S	142	4 - 5		APPROACH TIE
S510E	60	5 - 0		THRU BEAM
S611E	48	49 - 3		HORIZONTAL
S412E	6	32 - 3		HORIZONTAL
S613E	24	4 - 0		FF HORIZ
S614E	2	2 - 9		FF HORIZ
S615E	2	3 - 8		FF HORIZ
S616E	24	5 - 8		FF HORIZ
S617E	2	4 - 5		FF HORIZ
S618E	2	5 - 4		FF HORIZ
S619E	24	3 - 8		FF HORIZ
S620E	2	2 - 5		FF HORIZ
S621E	2	3 - 4		FF HORIZ
S622E	12	14 - 0		SHEAR LUG HORIZ.

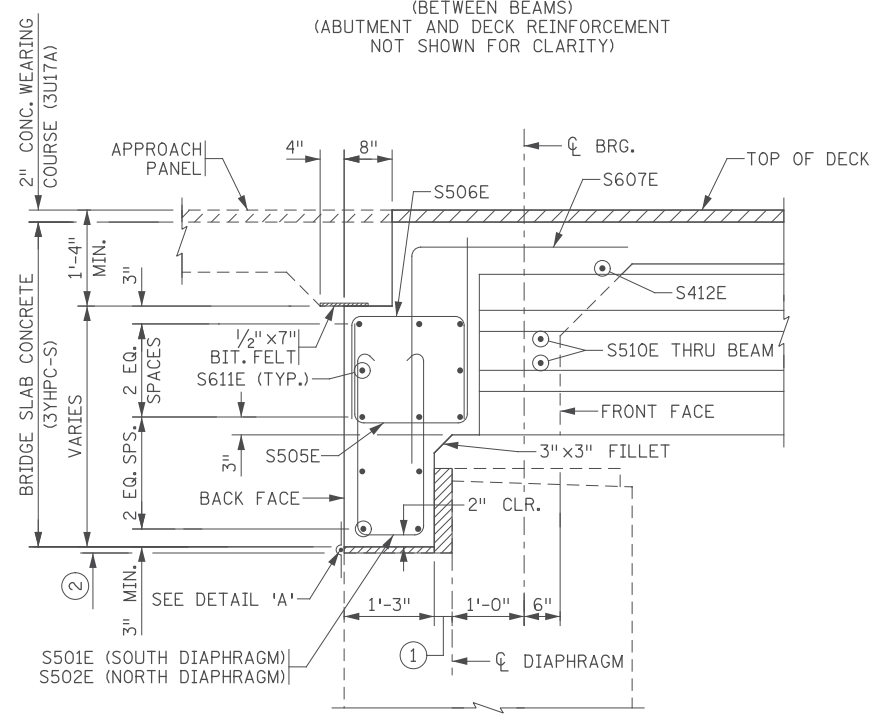


SECTION A-A REINFORCEMENT

(BETWEEN BEAMS)
(ABUTMENT AND DECK REINFORCEMENT NOT SHOWN FOR CLARITY)



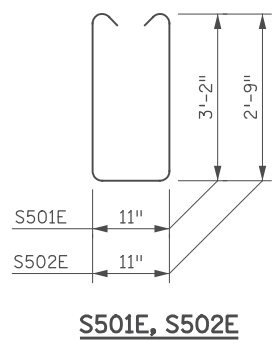
DETAIL 'A'



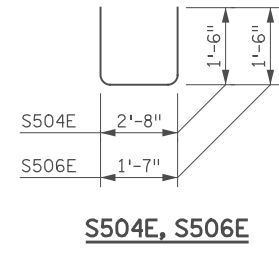
SECTION B-B REINFORCEMENT

(AT BEAMS)
(ABUTMENT AND DECK REINFORCEMENT NOT SHOWN FOR CLARITY)

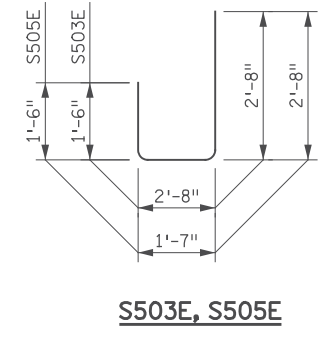
BAR SHAPES:



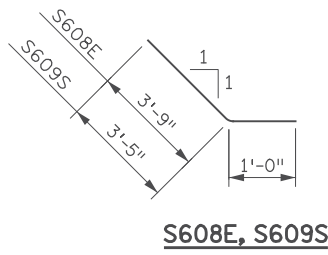
S501E, S502E



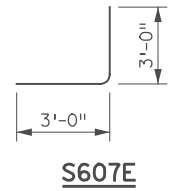
S504E, S506E



S503E, S505E



S608E, S609S



S607E

NOTES:

- 3" TYPE B POLYSTYRENE.
- 1" TYPE A POLYSTYRENE.
- MEMBRANE WATERPROOFING SYSTEM PER SPEC. 2481.3.B. EXCEPT THE STRIP SHALL BE 24" WIDE TO ALLOW MOVEMENT. WATERPROOFING IS INCIDENTAL TO "BRIDGE SLAB CONCRETE (3YHPC-S)".
- DISTANCE TO APPROACH PANEL DOWEL BAR.
- TIE BAR TO TOP MAT DECK REINFORCEMENT.
- BAR S609S TO BE STAINLESS STEEL AND IS NOT INCLUDED IN THE QUANTITY FOR EPOXY COATED BARS.
- END DIAPHRAGM REINFORCEMENT IS INCLUDED IN THE SUPERSTRUCTURE QUANTITY.
- TYPICAL AT STEPS.

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 Print Name: **ERIC S. HANSON**

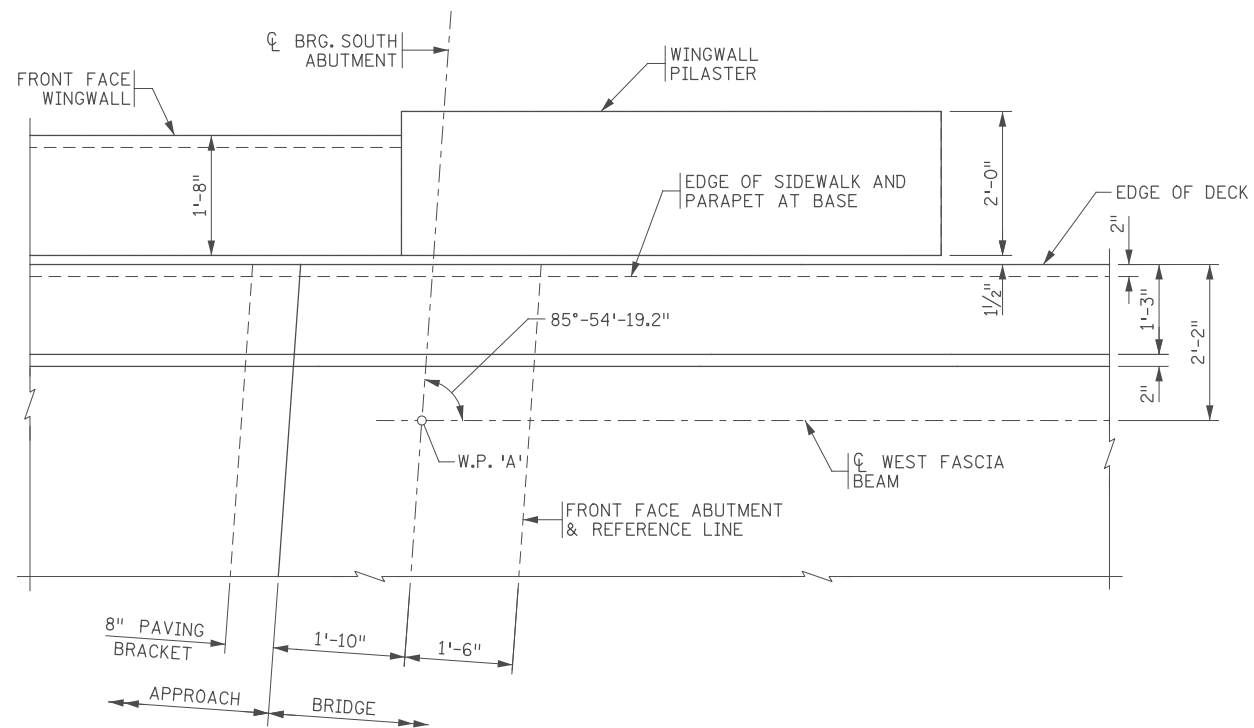
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 SAP 114-020-051
 BRIDGE NO.
 02588
 COMM. NO. 0169140

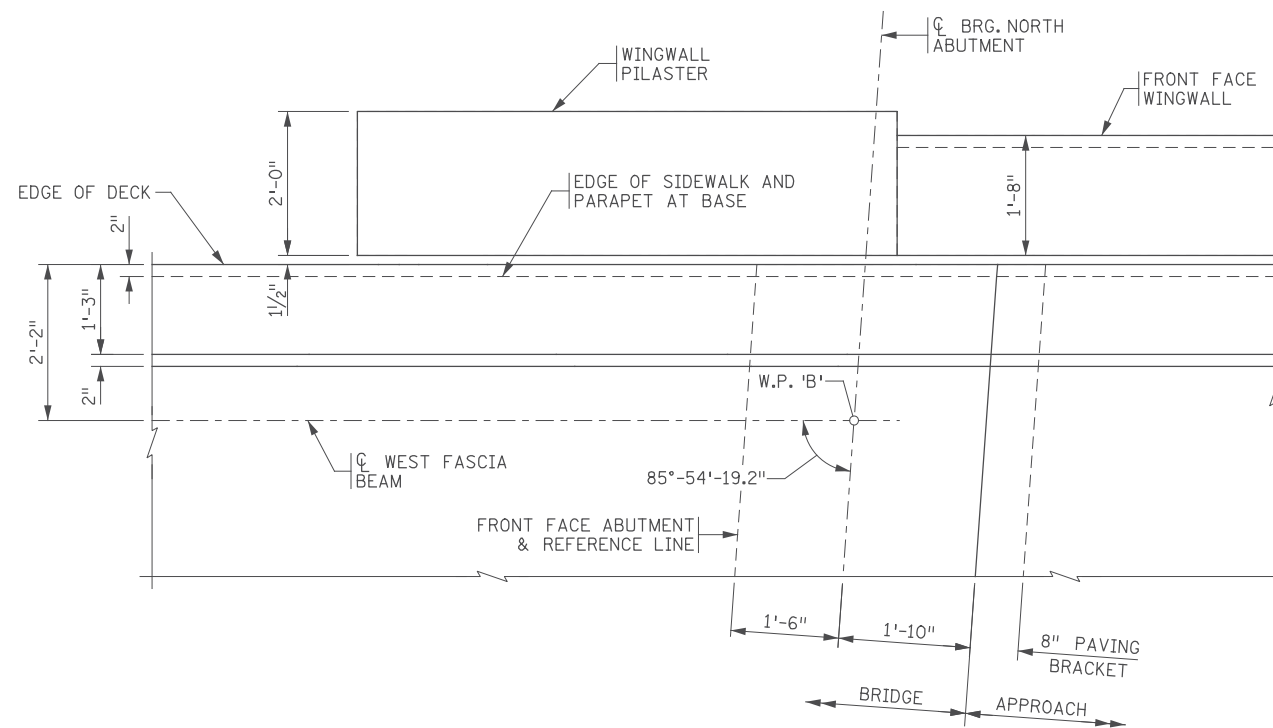
SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 BRIDGE DECK DETAILS
 CSAH 78 OVER 108TH AVENUE NW
 (SHEET 5 OF 5)

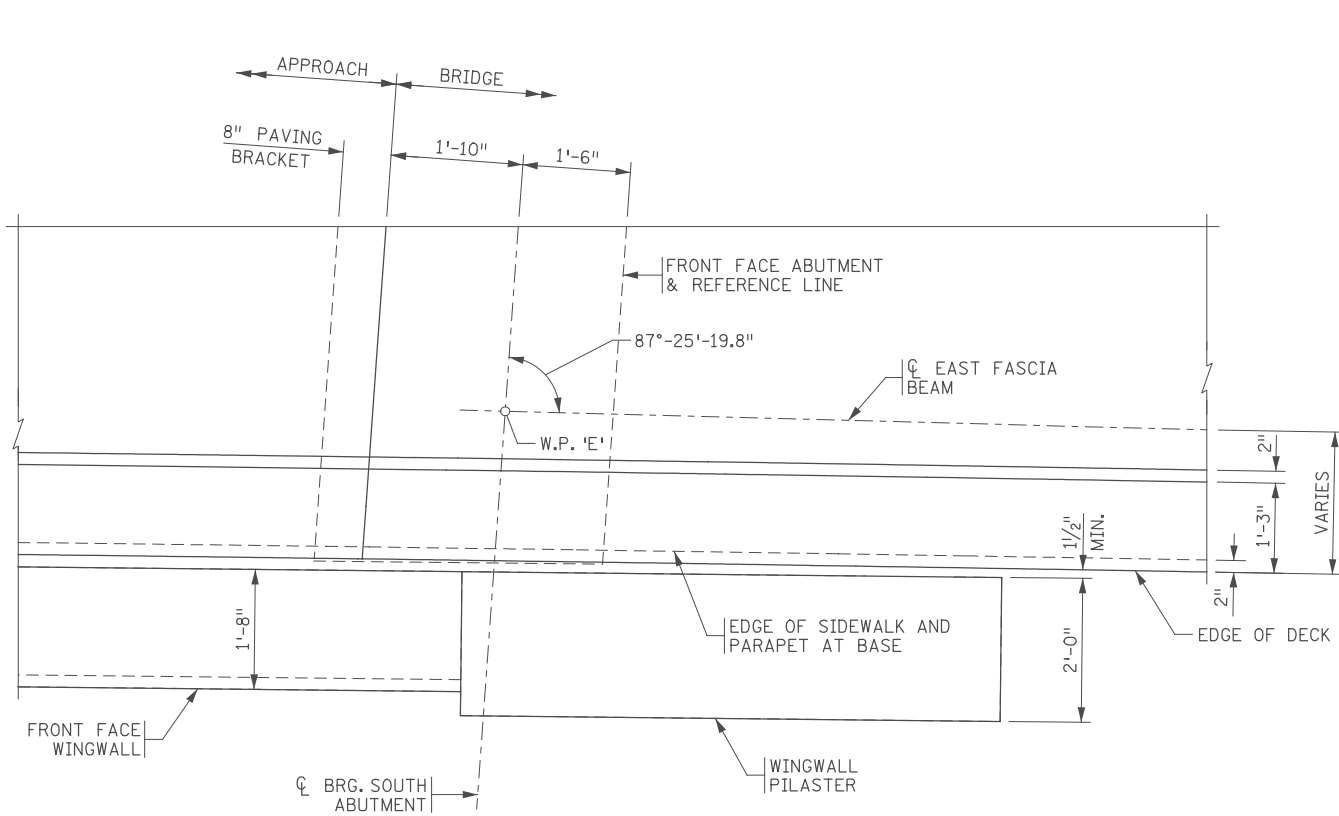
SHEET
BB28
OF
BB42



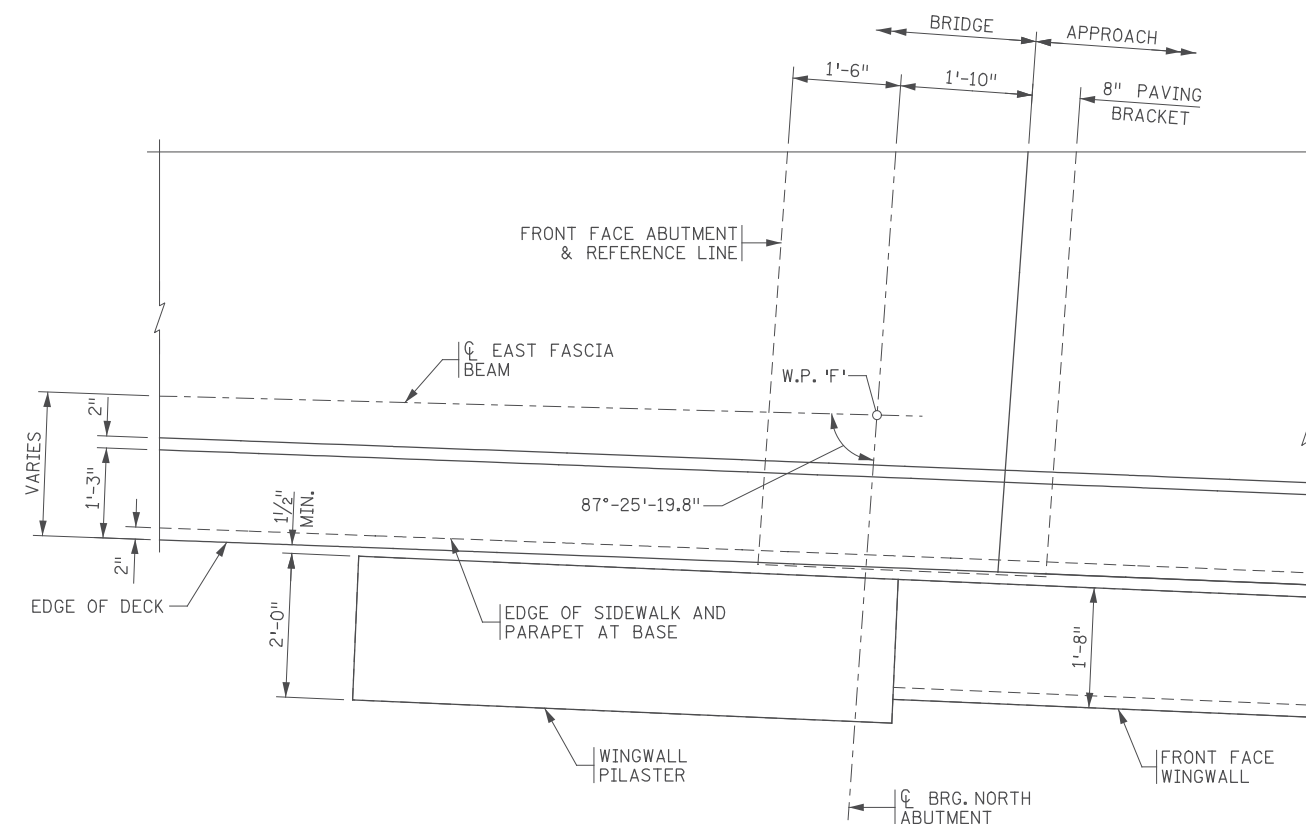
S.W. CORNER DETAIL



N.W. CORNER DETAIL



S.E. CORNER DETAIL



N.E. CORNER DETAIL

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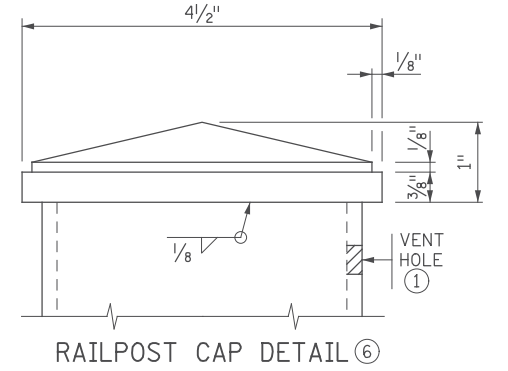
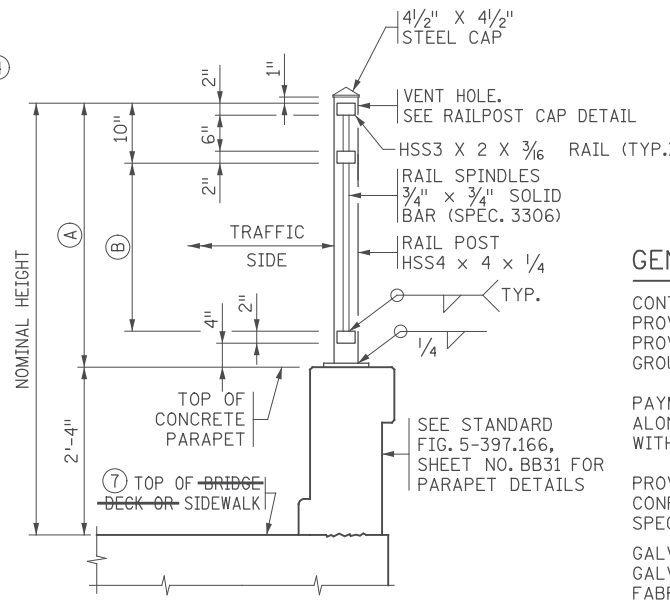
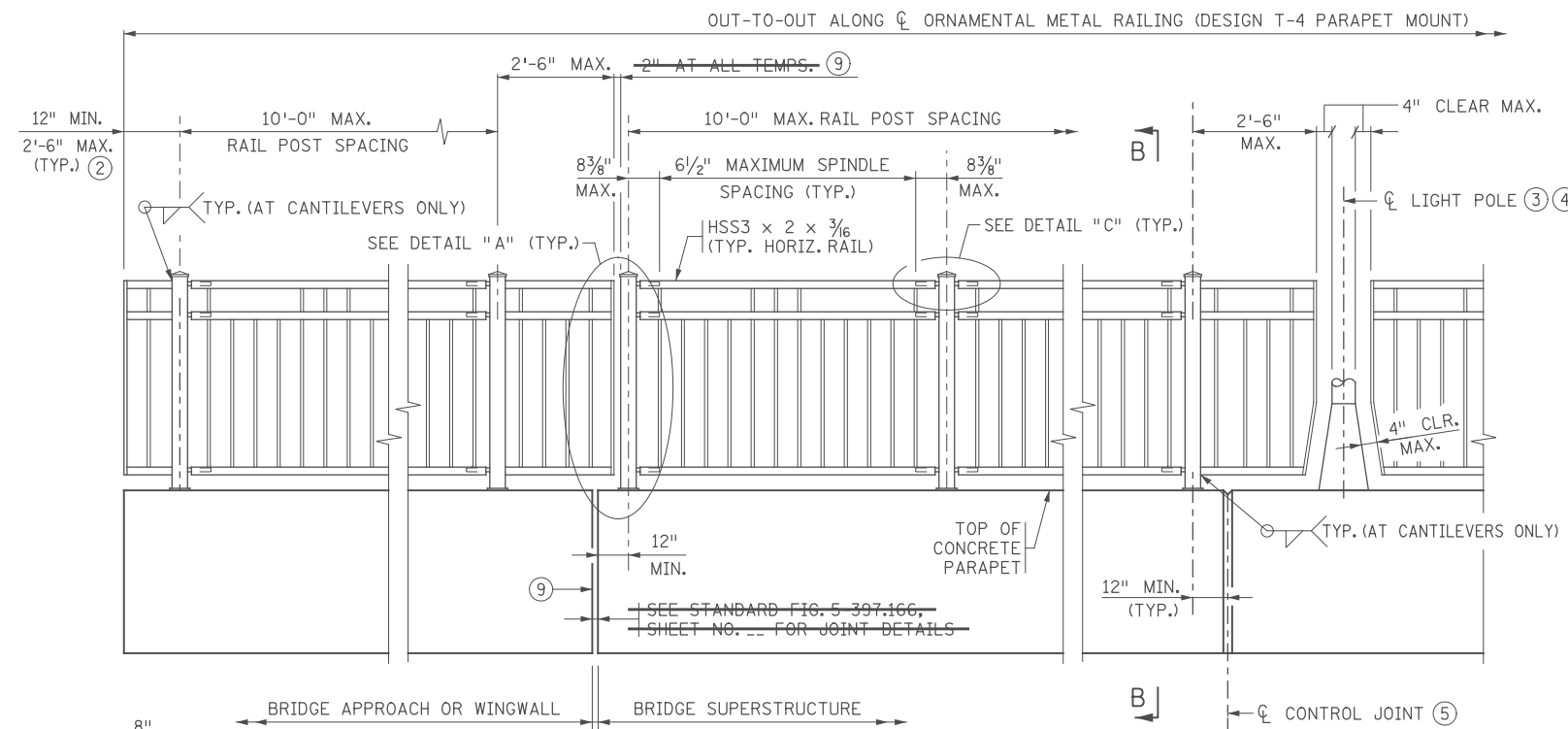
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DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 E. HANSON
 **ENGINEERS
 PLANNERS
 DESIGNERS**
 Consulting Group, Inc.

ANOKA COUNTY
 CORNER DETAILS
 CSAH 78 OVER 108TH AVENUE NW

**SHEET
 BB29
 OF
 BB42**



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. ALL OTHER STEEL SHALL CONFORM TO SPEC. 3306.

GALVANIZE BOLTS, NUTS, WASHERS AND ANCHORS PER SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL PER SPEC. 3394, AFTER FABRICATION.

COAT THE GALVANIZED RAILING, BASE PLATES, AND PROTRUDING PORTIONS OF BOLTS, NUTS, ANCHORS, AND WASHERS.

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.

① 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.

② PLACE CL OF END POST 12" FROM END OF CONCRETE PARAPET IF GUARDRAIL CONNECTION PLATE IS PRESENT.

③ IF LIGHT POLE IS MOUNTED ON BLISTER, RAILING MAY BE CONTINUOUS IN FRONT OF LIGHT POLE (SEE PARAPET & LIGHT POLE DETAILS).

④ CONTRACTOR TO COORDINATE LIGHT POLE DETAILS WITH THE RAILING FABRICATOR TO ENSURE PROPER CLEARANCES AND RAILING CONFIGURATION ADJACENT TO THE POLE.

⑤ SEE SUPERSTRUCTURE SHEETS AND STANDARD FIGURE 5-397.166 FOR CONTROL JOINT SPACING AND DETAILS.

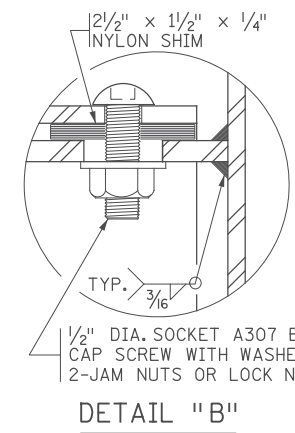
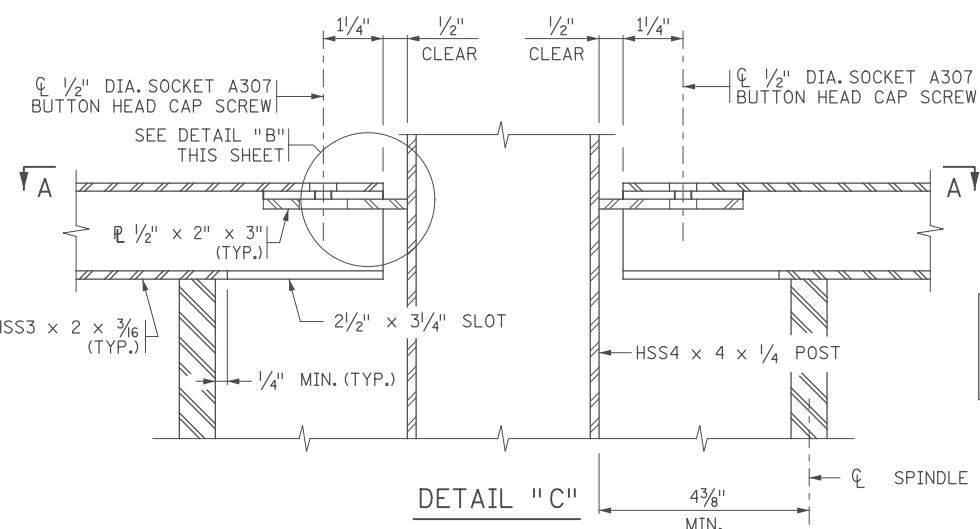
⑥ PROVIDE A PYRAMID TOP STYLE STEEL CAP WELDED TO TOP OF POST WITH A SURFACE FINISH OF 1000 MICRO-INCH, OR SMOOTHER, PRIOR TO GALVANIZING.

⑦ IF TOP OF RAISED SIDEWALK, SEE SECTION B-B ON STANDARD FIGURE 5-397.166.

⑧ ADHESIVE ANCHORAGE WITH 5/8" DIA. ANCHOR ROD PER 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 5" 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 6.9 KIPS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.

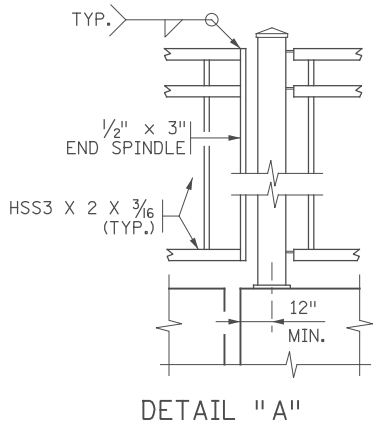
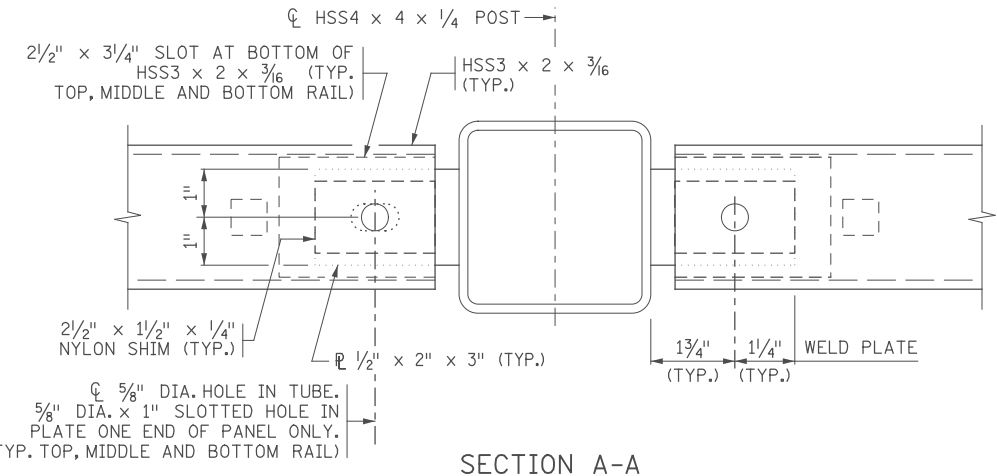
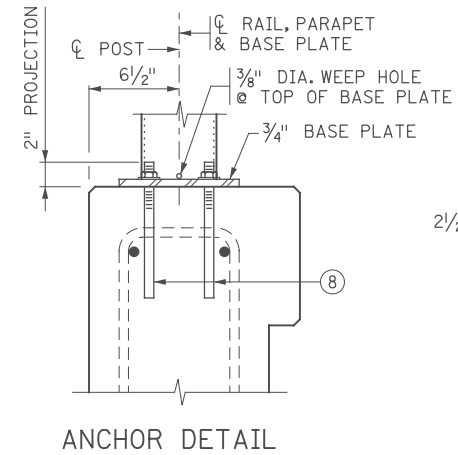
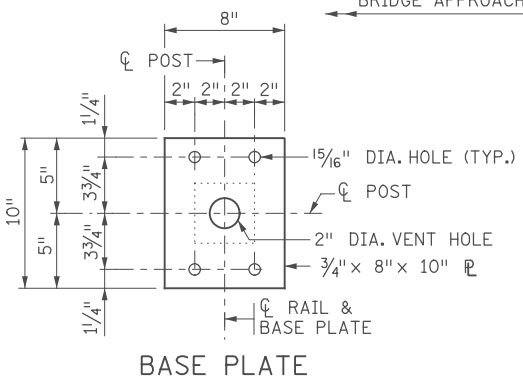
⑨ GEOMETRY SHOWN FOR PARAPET ABUTMENT. NO EXPANSION JOINT REQUIRED FOR SEMI-INTEGRAL ABUTMENT. SEE CONCRETE BARRIER DETAILS SHEET FOR RAILING AND BARRIER CONFIGURATION AT ENDS OF BRIDGE.

INSIDE ELEVATION OF RAILING



MODIFICATIONS:
- ADDED NOTE ⑨

NOMINAL HEIGHT	A	B
4'-6"	2'-2"	10"
6'-0"	3'-8"	2'-4"
8'-0"	5'-8"	4'-4"



REVISION: 05-25-2016
APPROVED: NOVEMBER 6, 2013
Nancy Douberberger
STATE BRIDGE ENGINEER

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASED FOR CONSTRUCTION

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02588
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J. HOFFMAN
DESIGNED BY
S. NEFF
CHECKED BY
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COMM. NO. 0169140

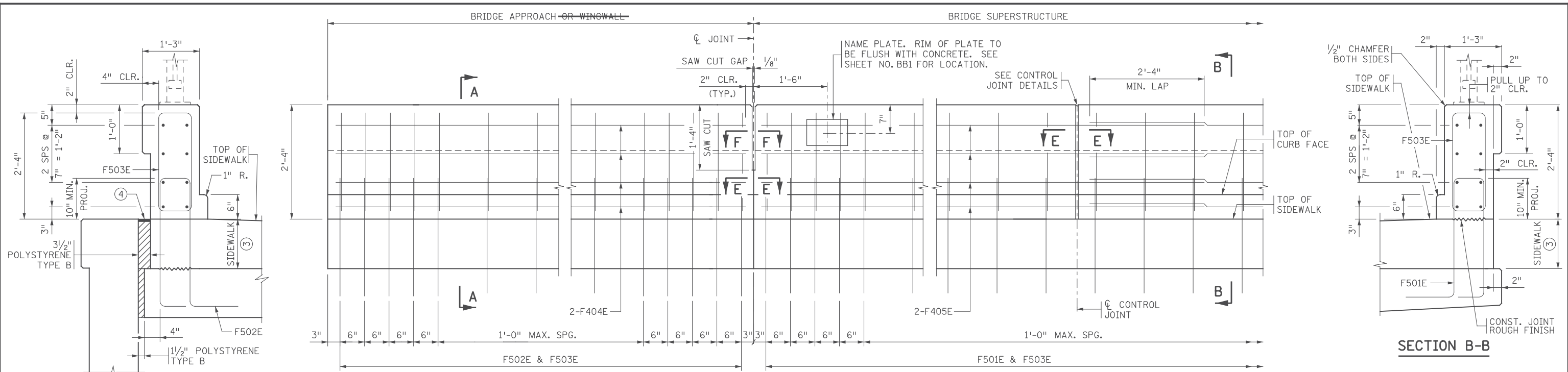


ANOKA COUNTY
ORNAMENTAL RAILING (DESIGN T-4 PARAPET MOUNT)
CSAH 78 OVER 108TH AVENUE NW

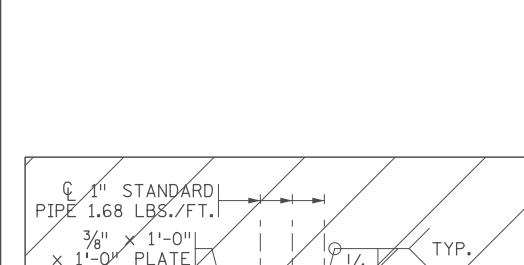
SHEET
BB30
OF
BB42

MODIFIED
FIG. 5-397.162

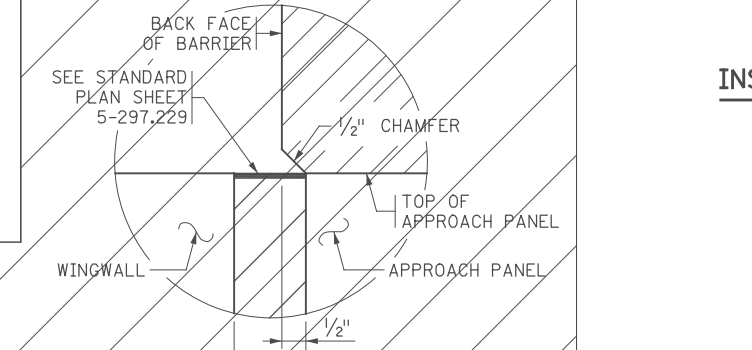
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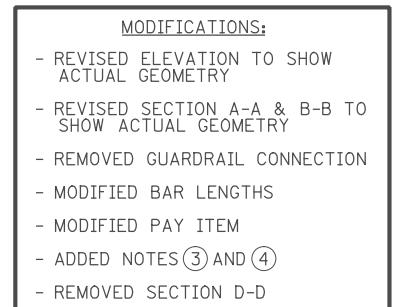
SECTION A-A



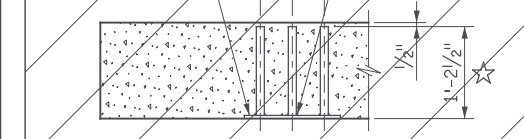
**JOINT AT ABUTMENT
INSIDE ELEVATION OF PARAPET**



CONTROL JOINT

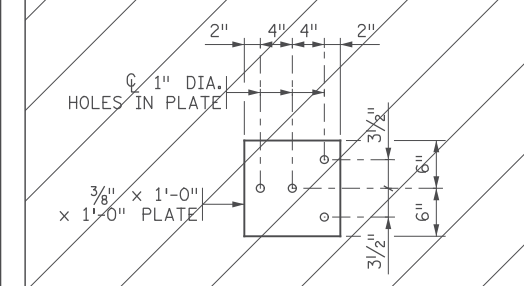


SECTION B-B



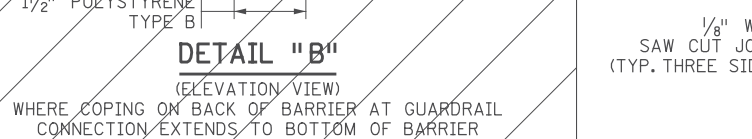
SECTION C-C

(REINFORCEMENT NOT SHOWN)
★ DIMENSION INCLUDES 3/8" PLATE



GUARDRAIL CONNECTION DETAIL

GALVANIZE AFTER FABRICATION PER SPEC. 3394. ESTIMATED WEIGHT = 23 LBS.



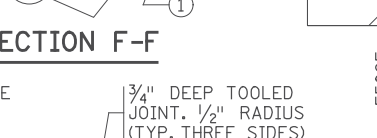
DETAIL "B"

WHERE COPING ON BACK OF BARRIER AT GUARDRAIL CONNECTION EXTENDS TO BOTTOM OF BARRIER



SECTION F-F

1/8" WIDE SAW CUT JOINT (TYP. THREE SIDES)



SECTION E-E

CONTRACTOR OPTION 1 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)

- MODIFICATIONS:**
- REVISED ELEVATION TO SHOW ACTUAL GEOMETRY
 - REVISED SECTION A-A & B-B TO SHOW ACTUAL GEOMETRY
 - REMOVED GUARDRAIL CONNECTION
 - MODIFIED BAR LENGTHS
 - MODIFIED PAY ITEM
 - ADDED NOTES ③ AND ④
 - REMOVED SECTION D-D

BILL OF REINFORCEMENT: CONCRETE PARAPET

MARK	NO	LENGTH [FT - IN]	SHAPE	LOCATION
F501E	162	7 - 4	U	PARAPET VERT.
F502E	100	7 - 0	U	PARAPET VERT.
F503E	262	6 - 5	U	PARAPET VERT.
F404E	32	19 - 8	—	PARAPET LONGIT.
F405E	32	39 - 3	—	PARAPET LONGIT.

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 BETWEEN THE OUTSIDE FACES OF THE CONCRETE PARAPET.
- CONCRETE PARAPET = 416 LBS./FT. (0.103 CU. YDS./FT.)
- CONCRETE PARAPET W/ADJACENT SIDEWALK (BASED ON A 10" SIDEWALK HEIGHT) = 606 LBS./FT. (0.150 CU. YDS./FT.)
- FINISH ALL EDGES OF PARAPET WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
- MAXIMUM SPACING OF CONTROL JOINTS ON SUPERSTRUCTURE, APPROACH AND WINGWALL SHALL BE 10 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.
- GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306. GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO "TYPE MOD P-1 BARRIER CONCRETE (3S52)".
- SEE SHEET BB32 FOR LIGHT BLISTER DETAILS.
- PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
- ① JOINT SEALANT PER MNDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
- ② REFER TO STANDARD FIGURE 5-397.632 FOR COVER PLATE DETAILS.
- ③ 1'-0 1/8" WEST SIDE; 11" EAST SIDE.
- ④ SEAL WITH SELF-LEVELING SILICONE PER MNDOT 3722.

REVISION:
APPROVED: NOVEMBER 6, 2013
Nancy Dubenberger
STATE BRIDGE ENGINEER

NO	DATE	BY	CKD	APPR	REVISION
1	11/01/2017				RELEASED FOR CONSTRUCTION

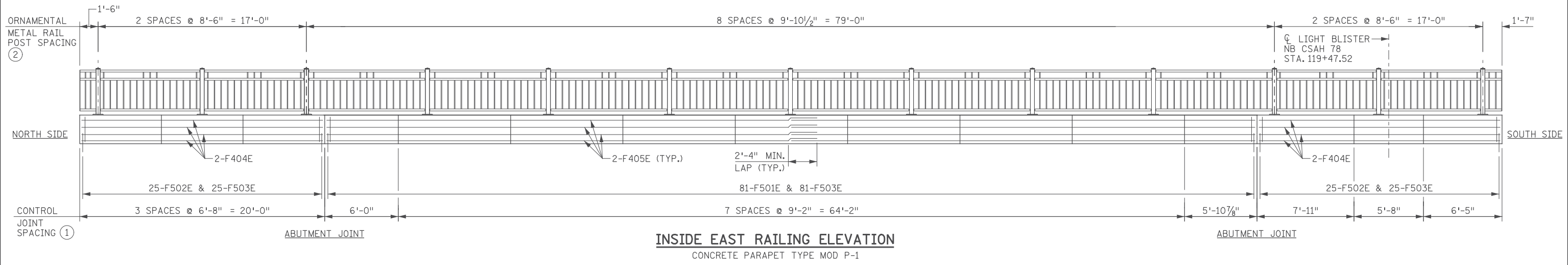
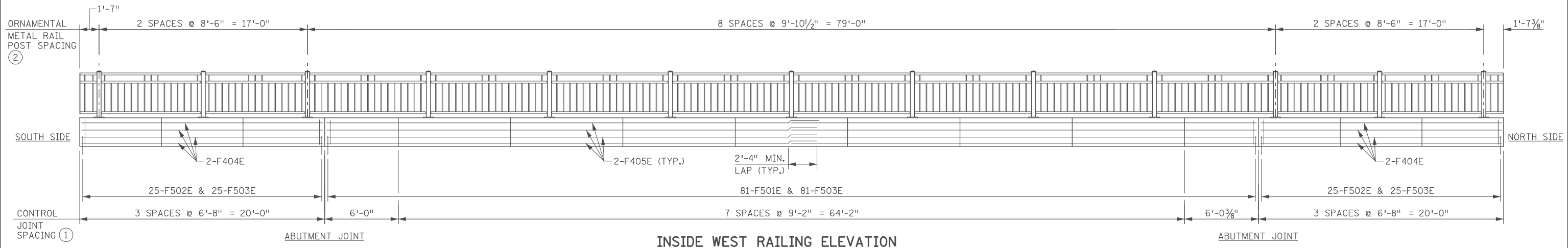
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: ERIC S. HANSON
Eric S. Hanson
Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051
BRIDGE NO.
02588
DRAWN BY
J. HOFFMAN
DESIGNED BY
S. NEFF
CHECKED BY
E. HANSON
COMM. NO. 0169140



ANOKA COUNTY
CONCRETE PARAPET (TYPE P-1)
CSAH 78 OVER 108TH AVENUE NW
SHEET BB31 OF BB42

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- NOTES:**
- ① DIMENSIONS ARE ALONG EDGE OF DECK.
 - ② DIMENSIONS ARE ALONG CL OF ORNAMENTAL METAL RAILING.

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				REVISION

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Print Name: **ERIC S. HANSON**

Eric S. Hanson

Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

COMM. NO. 0169140

DRAWN BY
J. HOFFMAN

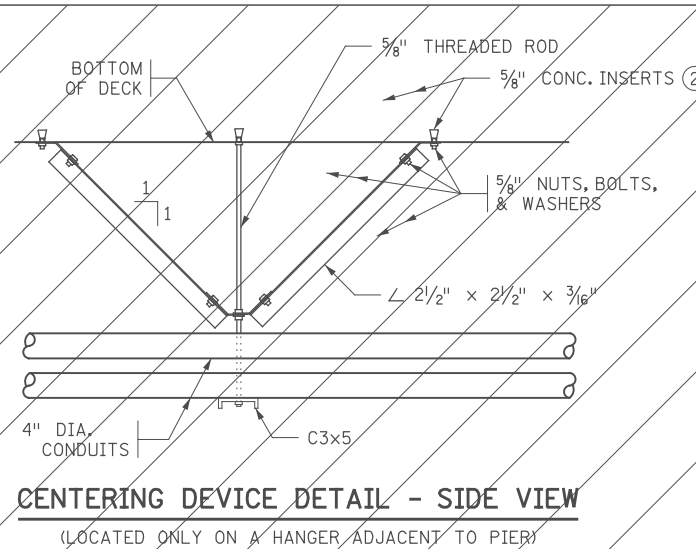
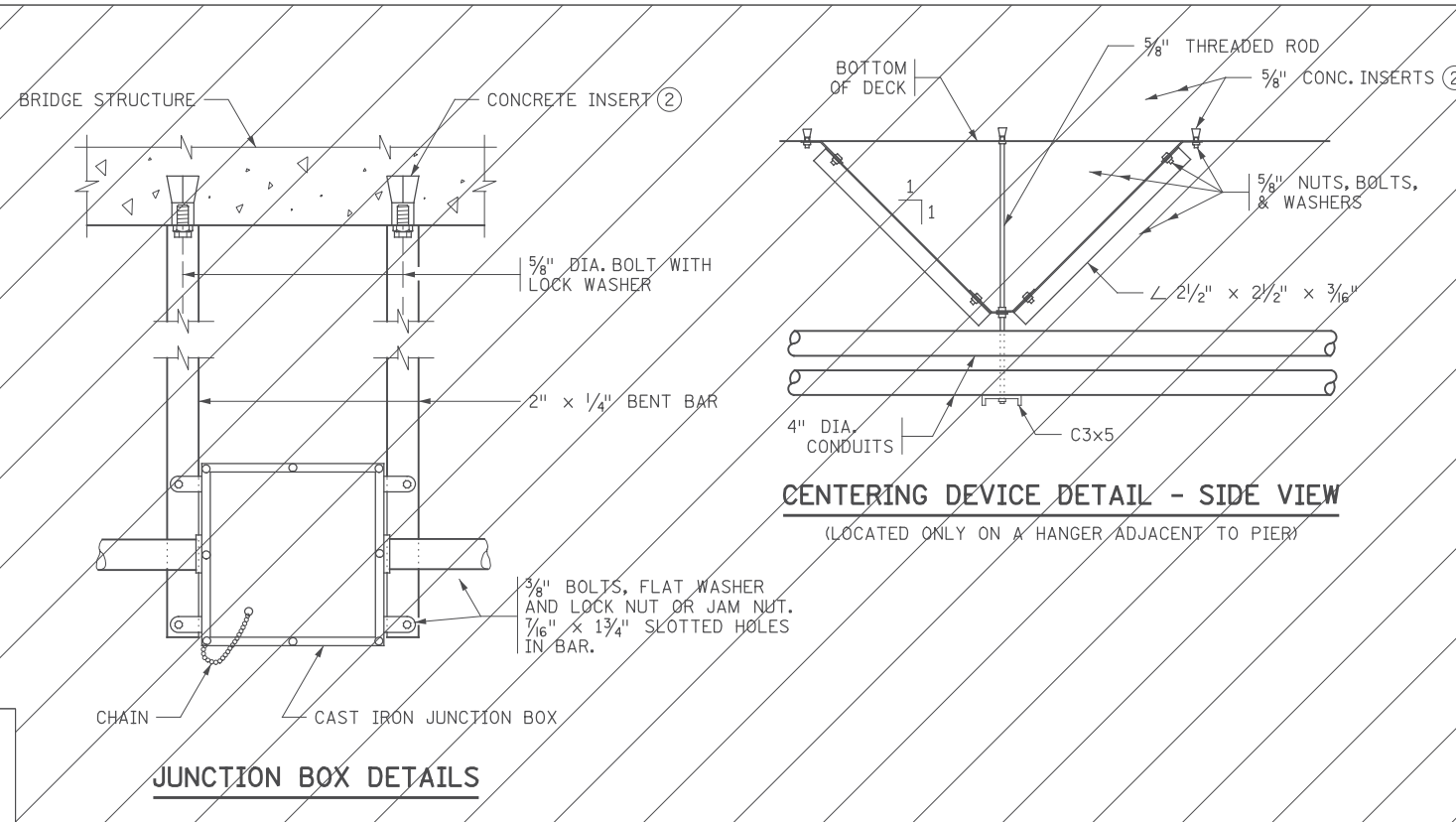
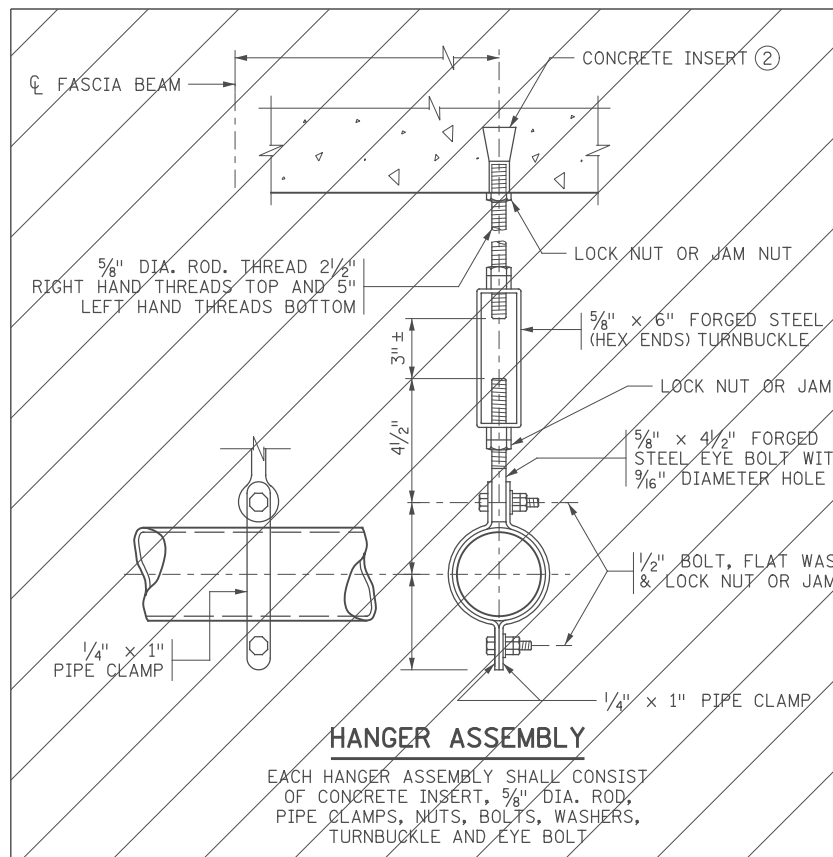
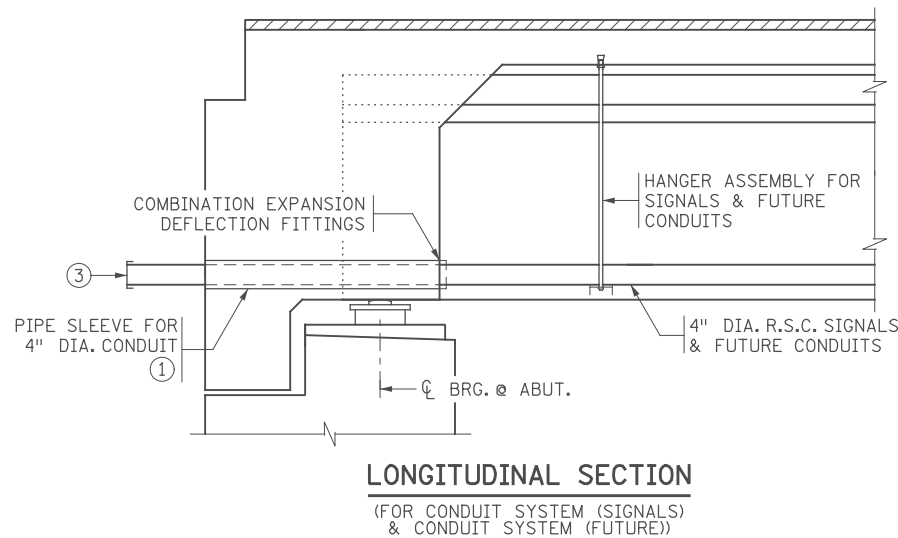
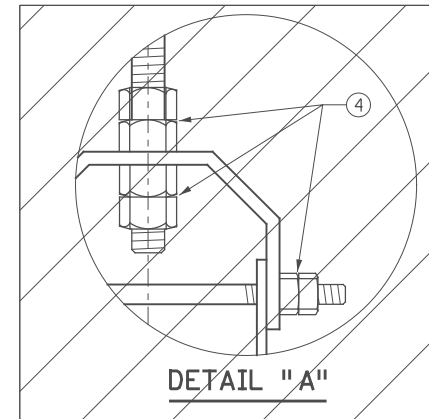
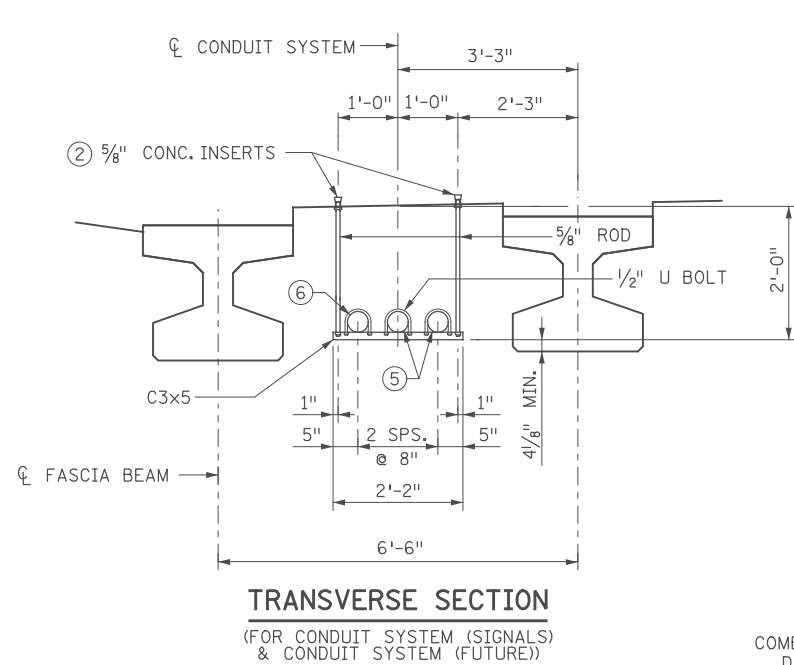
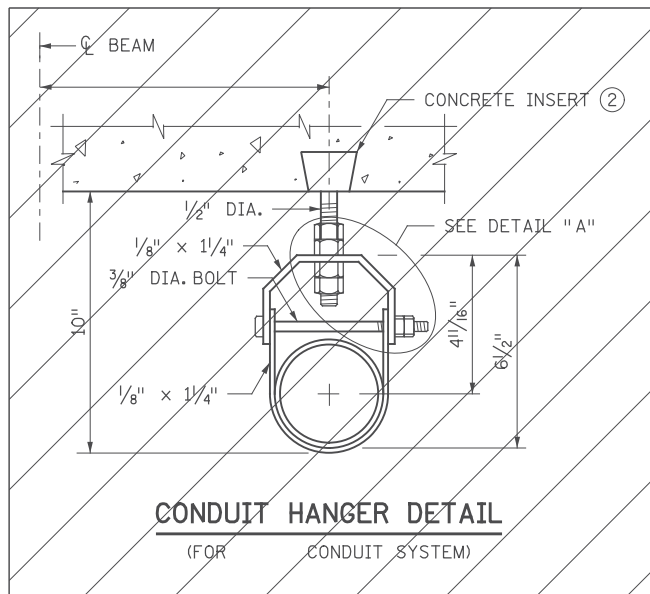
DESIGNED BY
S. NEFF

CHECKED BY
E. HANSON

SRE ENGINEERS
PLANNERS
DESIGNERS
Consulting Group, Inc.

ANOKA COUNTY
CONCRETE BARRIER DETAILS
CSAH 78 OVER 108TH AVENUE NW

SHEET
BB32
OF
BB42



⑦ HANGER ASSEMBLY	3 UNITS
CONDUIT CAP	2 UNITS
COMBINATION EXPANSION/DEFLECTION FITTING	2 UNITS
① 4" RIGID STEEL CONDUIT	102 LIN. FT.
5" PIPE SLEEVE	2 UNITS

ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (SIGNALS)".

⑦ HANGER ASSEMBLY	4 UNITS
CONDUIT CAP	4 UNITS
COMBINATION EXPANSION/DEFLECTION FITTING	4 UNITS
① 4" RIGID STEEL CONDUIT	204 LIN. FT.
5" PIPE SLEEVE	4 UNITS

ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (FUTURE)".

MODIFICATIONS:
 - REVISED LONG. SECTION
 - REVISED TRANS. SECTION
 - ADDED NOTES 5 - 7
 - REVISED NOTES 1 & 3

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.
- ① SEE END DIAPHRAGM SHEETS FOR LOCATIONS AND DETAILS.
- ② SPACE INSERTS AT 10'-0" MAXIMUM CENTERS.
- ③ CONDUIT TO EXTEND TO HANDHOLES IN APPROACH PANELS. SEE INTERCONNECT PLANS FOR HANDHOLE LOCATIONS AND PAYMENT DETAILS. CAP ENDS.
- ④ DOUBLE NUTS OR JAM NUTS OR LOCK NUT.
- ⑤ (2)-4" DIA. PVC COATED R.S.C. FOR CONDUIT SYSTEM (FUTURE).
- ⑥ (1)-4" DIA. PVC COATED R.S.C. FOR CONDUIT SYSTEM (SIGNALS).
- ⑦ QUANTITY AND PAYMENT FOR HANGER ASSEMBLIES ARE DIVIDED AS SHOWN FOR CONDUIT SYSTEM (SIGNALS) AND CONDUIT SYSTEM (FUTURE).

MODIFIED
FIG. 5-397.402

REVISION: 05-24-2012
 APPROVED: SEPTEMBER 26, 2003
Eric S. Hanson
 STATE BRIDGE ENGINEER

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASED FOR CONSTRUCTION

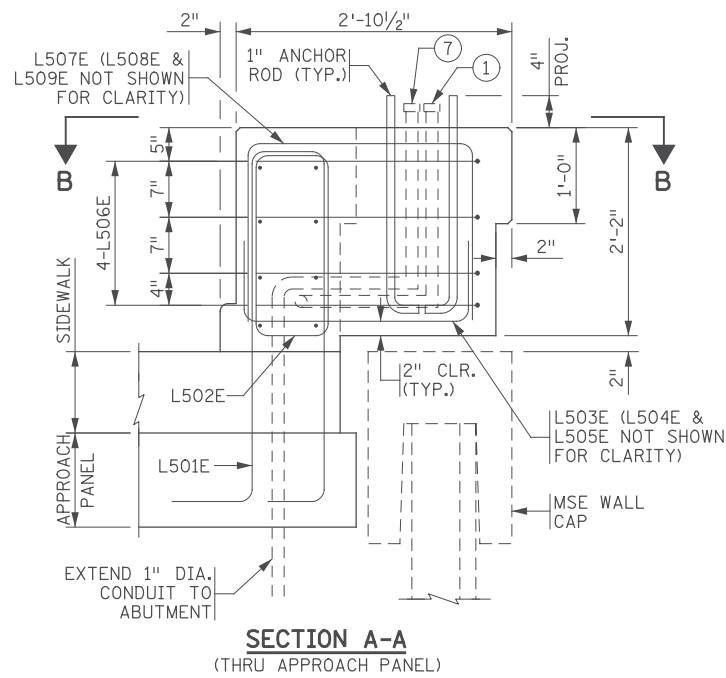
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 Print Name: ERIC S. HANSON
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02588
 COMM. NO. 0169140

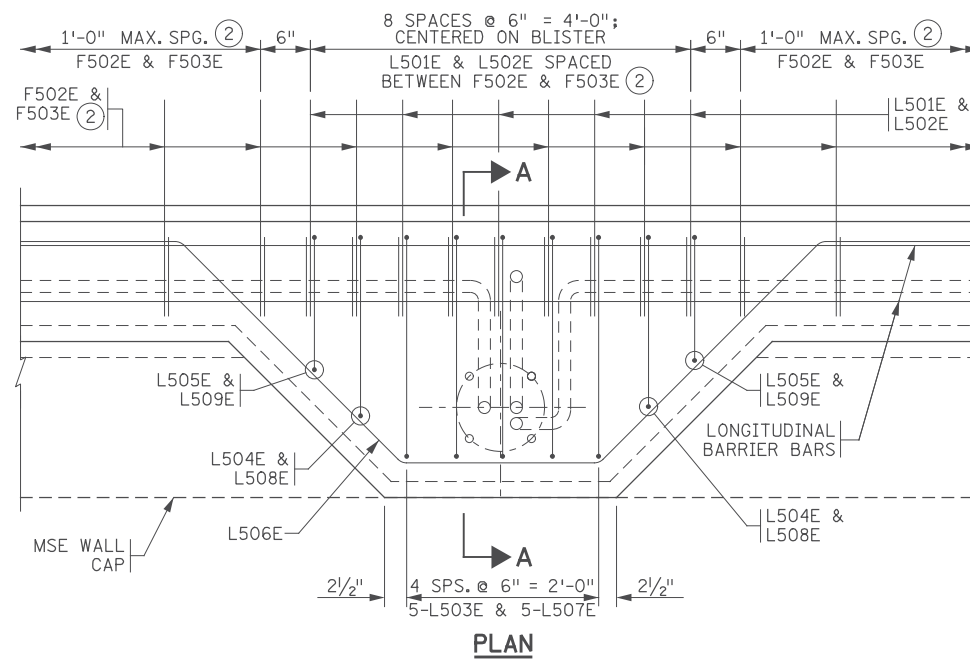
DRAWN BY J. HOFFMAN
 DESIGNED BY S. NEFF
 CHECKED BY E. HANSON
SRF ENGINEERS PLANNERS DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 CONDUIT SYSTEM FOR SIGNALS & FUTURE
 CSAH 78 OVER 108TH AVENUE NW
SHEET BB33 OF BB42

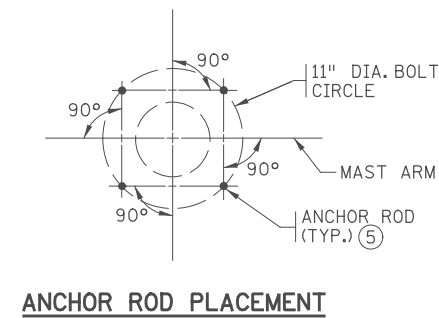
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SECTION A-A
(THRU APPROACH PANEL)

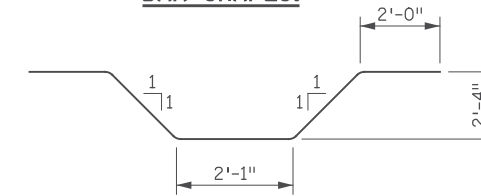


PLAN

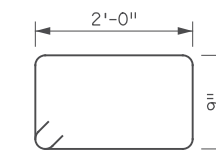


ANCHOR ROD PLACEMENT

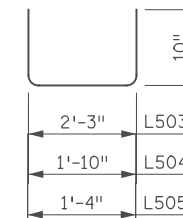
BAR SHAPES:



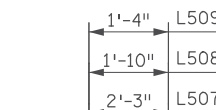
L506E



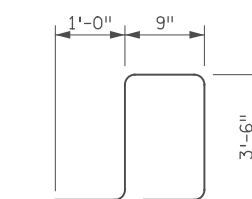
L502E



L503E, L504E, L505E



L507E, L508E, L509E



L501E

BILL OF REINFORCEMENT FOR BARRIER AT ONE LIGHT POLE ⑧

MARK	NO	LENGTH [FT-IN]	SHAPE	LOCATION
L501E	5	9 - 4		PARAPET DOWEL
L502E	5	6 - 5		PARAPET VERTICAL
L503E	5	3 - 11		VERTICAL TIE
L504E	2	3 - 6		VERTICAL TIE
L505E	2	3 - 0		VERTICAL TIE
L506E	4	12 - 9		LONGITUDINAL TIE
L507E	5	5 - 11		VERTICAL TIE
L508E	2	5 - 6		VERTICAL TIE
L509E	2	5 - 0		VERTICAL TIE

TOTAL REINFORCEMENT PER LIGHT POLE LOCATION IS 223 LBS.

GENERAL NOTES

PROVIDE HEAVY HEX NUTS, PER SPEC. 3391.2.A FOR 1" DIA. THREADED RODS. TAP NUTS 1/6" OVERSIZED PRIOR TO GALVANIZING, AND RETAP TO STANDARD SIZE AFTER GALVANIZING.

USE A BRUSH TO APPLY ANTI-SIEZE COMPOUND PER MIL-PRF-907E TO THE THREADS OF ANCHOR RODS.

GALVANIZE THREADED RODS AND NUTS AFTER FABRICATION PER SPEC. 3392.

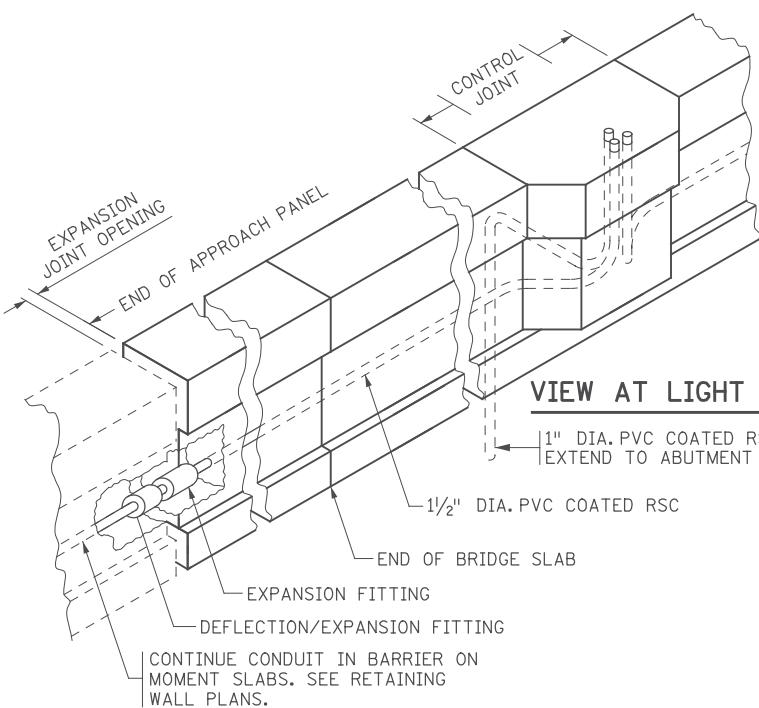
A RIGID TEMPLATE SHALL BE PROVIDED FOR ANCHOR ROD AND CONDUIT PLACEMENT AND SHALL BE LEFT IN PLACE UNTIL THE CONCRETE HAS SET. ANCHOR RODS TO BE PLACED AT RIGHT ANGLES TO THE DIRECTION OF THE MAST ARM.

BOND AND GROUND THE CONDUIT SYSTEM (LIGHTING) IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF SPEC. 2545.3.R.

ADDITIONAL BARRIER CONCRETE REQUIRED TO CONSTRUCT THE LIGHT POLE ANCHORAGE IS INCIDENTAL TO THE CONCRETE BARRIER PAY ITEM.

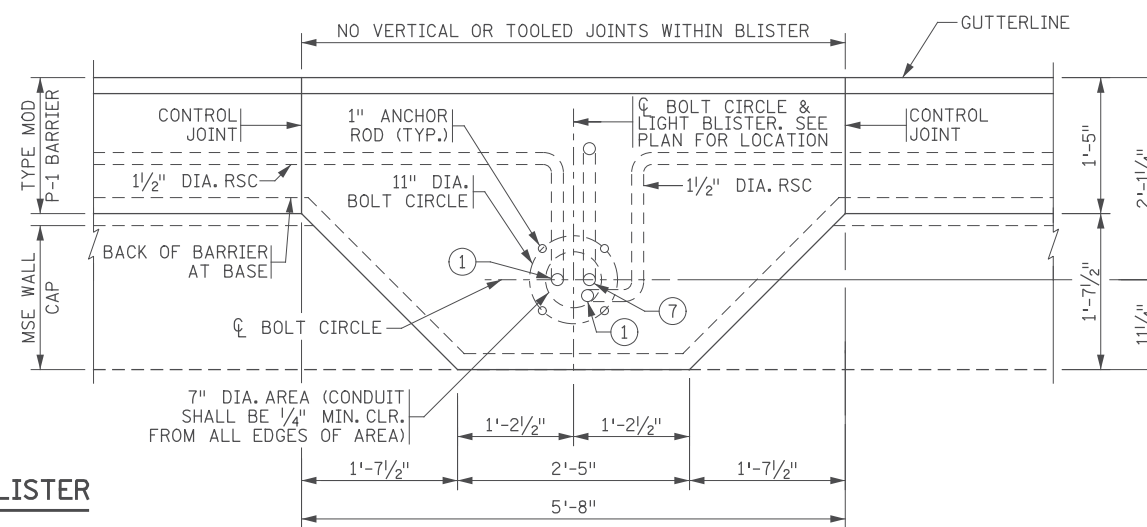
ANCHOR RODS AND RIGID TEMPLATE ARE INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (LIGHTING)".

- 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)."
- WRAP PER SPEC. 2565.3.D.7.
- PROVIDE COMBINATION DEFLECTION/EXPANSION FITTING PER SPEC. 3839.
- PROVIDE 1" NOMINAL DIA. ANCHOR RODS WITH 1-8UNC-2A THREADS. USE TYPE B INTERMEDIATE STRENGTH ANCHOR RODS PER ASTM F1554 GR.55 PER SPEC. 3385.2.B. (4 REQUIRED).
- WRAP THE THREADS OF THE TOP 4" OF EACH ANCHOR ROD WITH THREE LAYERS OF PLASTIC ELECTRICAL TAPE TO AVOID CONTAMINATION BY CONCRETE DURING PLACEMENT.
- EXTEND THE 1" DIA. PVC COATED RIGID STEEL CONDUIT 3" ABOVE THE BARRIER AND INSTALL CAP.
- BARS SHOWN ARE FOR ONE LIGHT BLISTER.

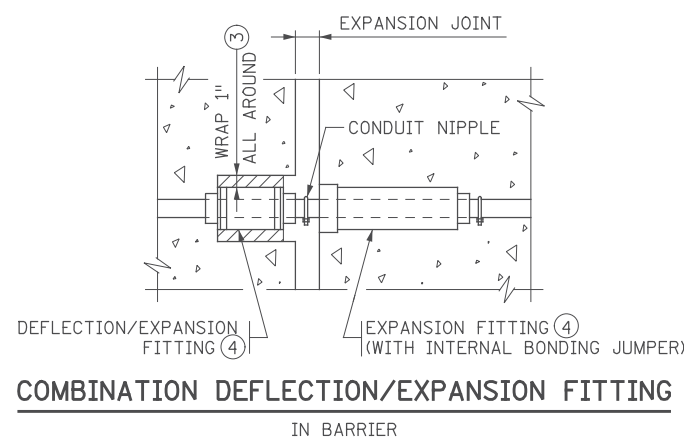


VIEW AT LIGHT BLISTER

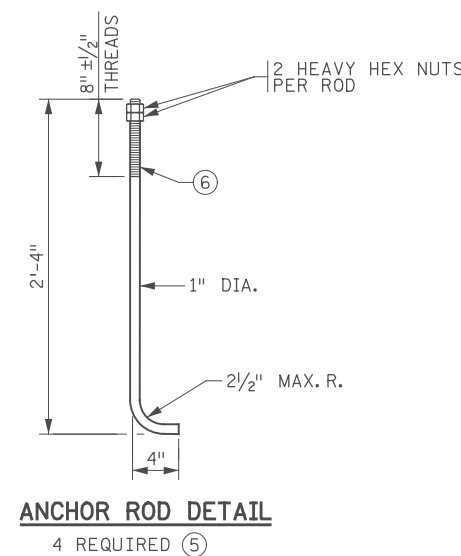
VIEW AT END OF APPROACH PANEL
RETAINING WALL NOT SHOWN.



SECTION B-B



COMBINATION DEFLECTION/EXPANSION FITTING
IN BARRIER



ANCHOR ROD DETAIL

4 REQUIRED ⑤

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NO	DATE	BY	CKD	APPR	REVISION
11	7				INSTRUCTION

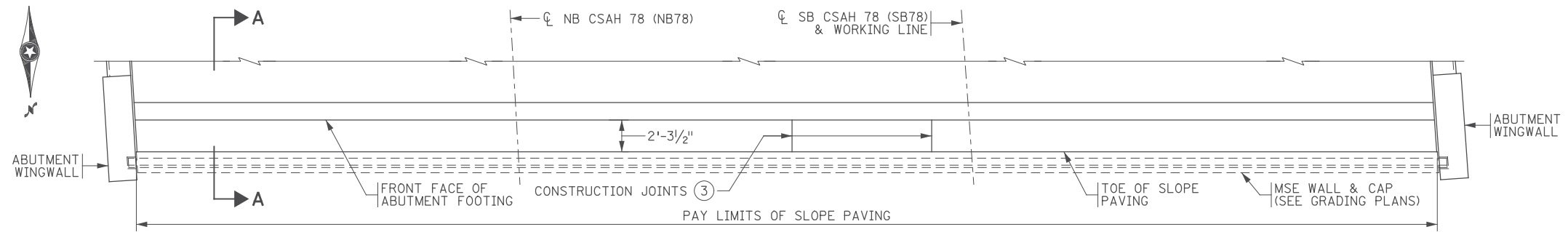
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 Print Name: **ERIC S. HANSON**
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

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 SAP 114-020-051
 BRIDGE NO.
 02588
 DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 A. BEHNKE
 CHECKED BY
 E. HANSON
 COMM. NO. 0169140

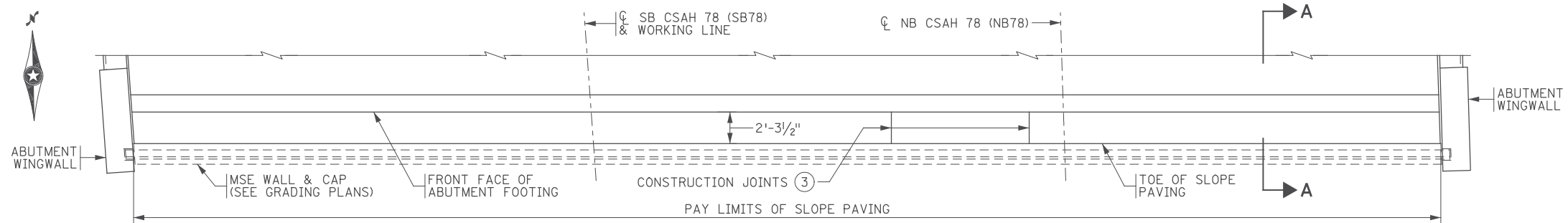


ANOKA COUNTY
 CONDUIT SYSTEM (LIGHTING)
 CSAH 78 OVER 108TH AVENUE NW

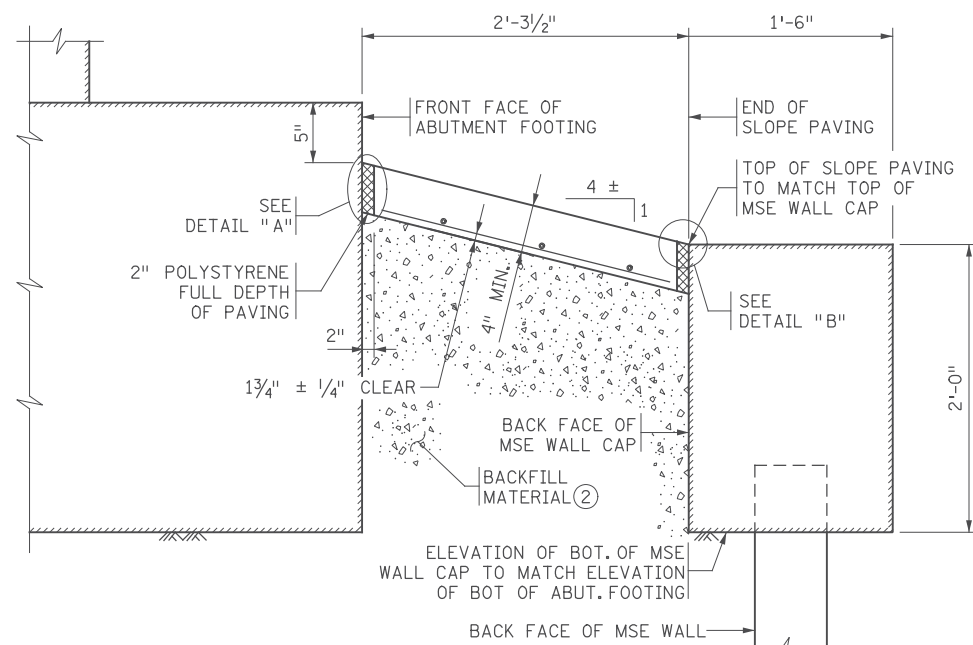
SHEET
 BB34
 OF
 BB42



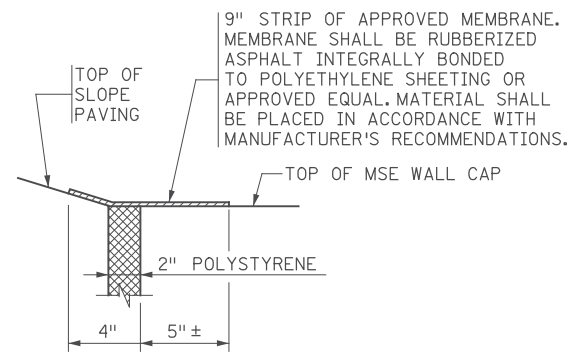
LAYOUT FOR SLOPES AT MSE WALL
(SOUTH ABUTMENT)



LAYOUT FOR SLOPES AT MSE WALL
(NORTH ABUTMENT)

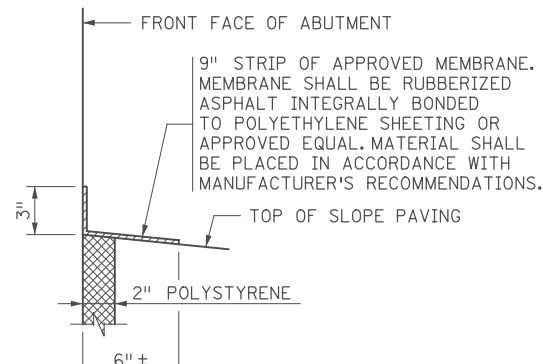


SECTION A-A



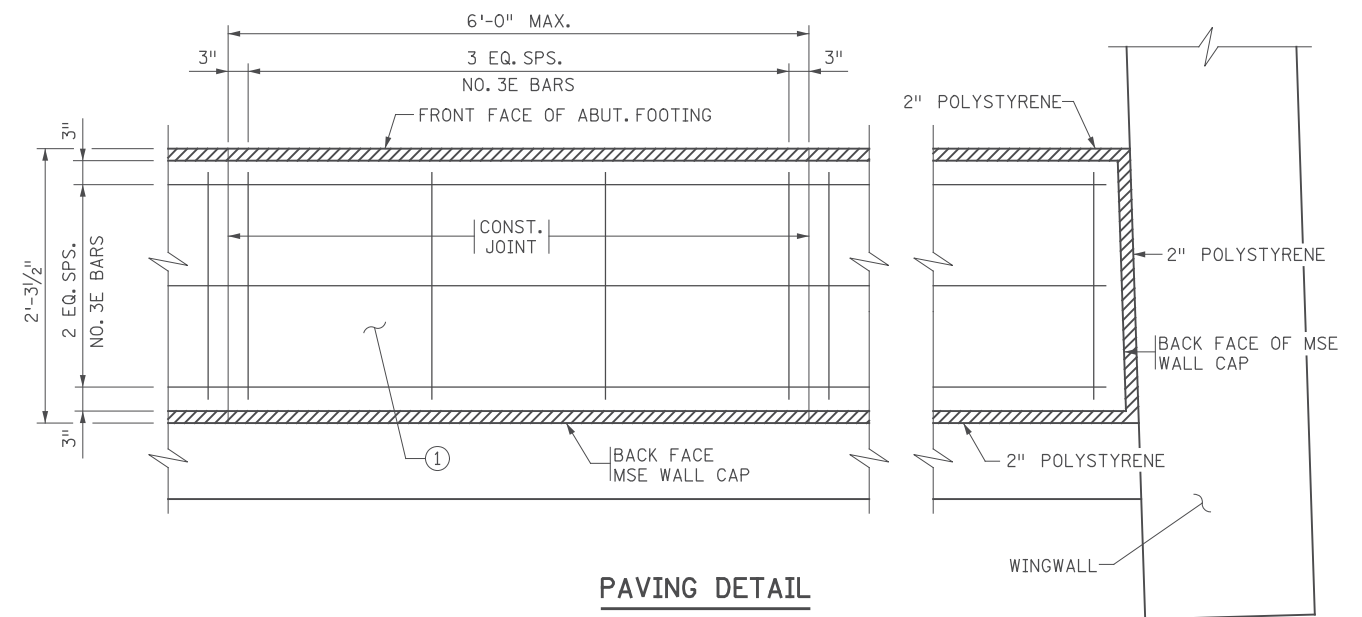
DETAIL "B"

SLOPE PAVING AS PER SPEC. 2514.



DETAIL "A"

SLOPE PAVING AS PER SPEC. 2514.



PAVING DETAIL

GENERAL NOTES:

- ① 0.111 CU. YD. CONCRETE/ SQ. YD.
6.40 LBS. OF REINFORCEMENT/ SQ. YD.
- ② BACKFILL MATERIAL SHALL BE INCLUDED
IN GRADING PORTION OF CONTRACT.
- ③ CONSTRUCTION JOINTS SHALL
BE CONSTRUCTED PERPENDICULAR TO
THE ABUTMENT FOOTING.
4. SLOPE PAVING PER SPEC. 2514.

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				REVISION

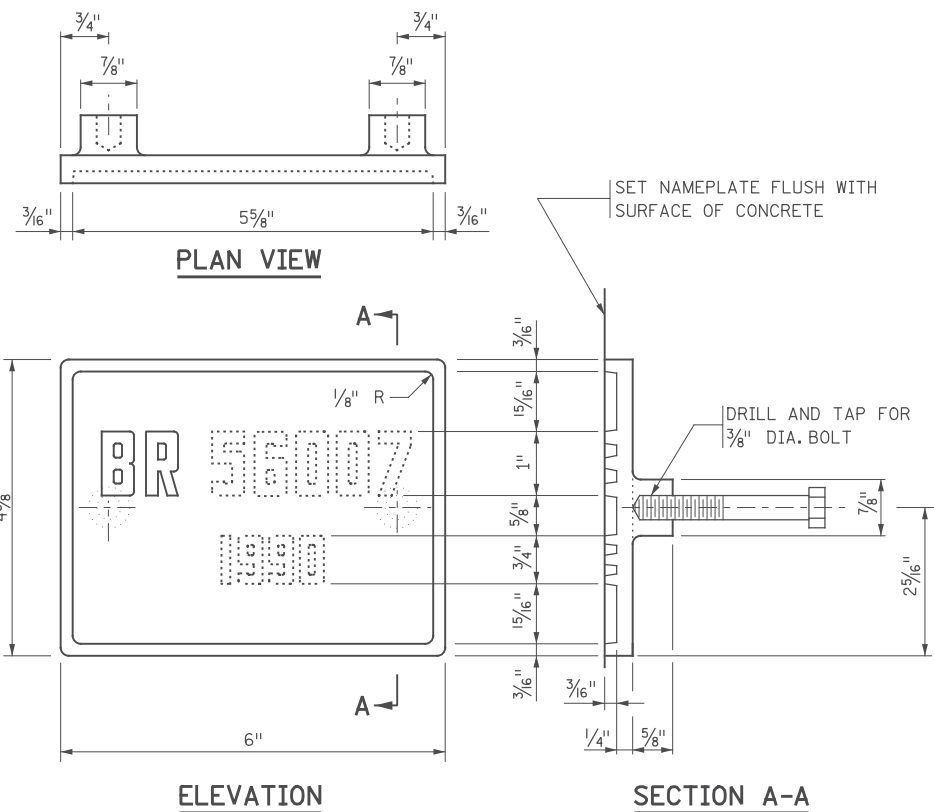
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Eric S. Hanson
Date: 11/01/2017 License #: 50463

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BRIDGE NO.
02588
DRAWN BY
J. HOFFMAN
DESIGNED BY
A. BEHNKE
CHECKED BY
E. HANSON
COMM. NO. 0169140



ANOKA COUNTY
CONCRETE SLOPE PAVING
CSAH 78 OVER 108TH AVENUE NW

SHEET
BB35
OF
BB42



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

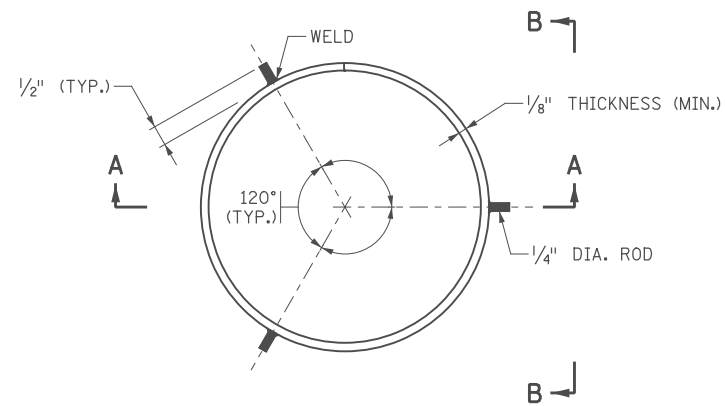
BRIDGE 02588
YEAR 2018

1234567890

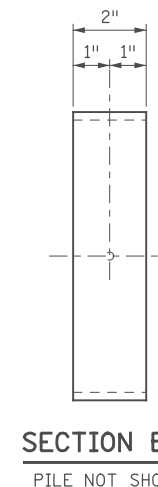
NUMBERS FOR NAMEPLATE

NOTES:

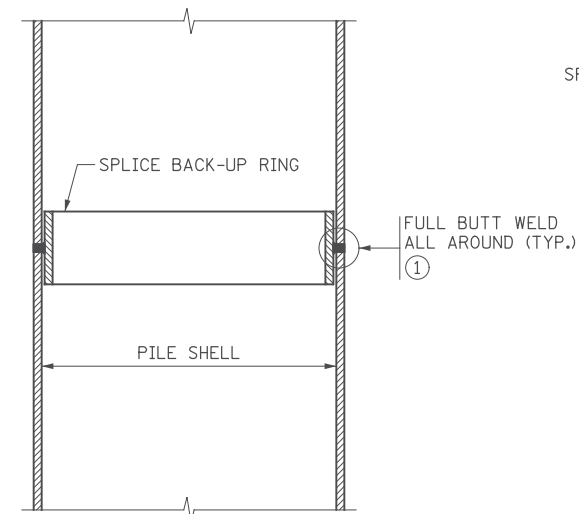
- MATERIAL SHALL COMPLY WITH SPEC. 3327.
- LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.
- DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".
- HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.
- TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.
- FURNISH 2 STEEL BOLTS 3/8" DIA. x 3" LONG WITH EACH PLATE.
- ALL DIMENSIONS FOR 3/4" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.



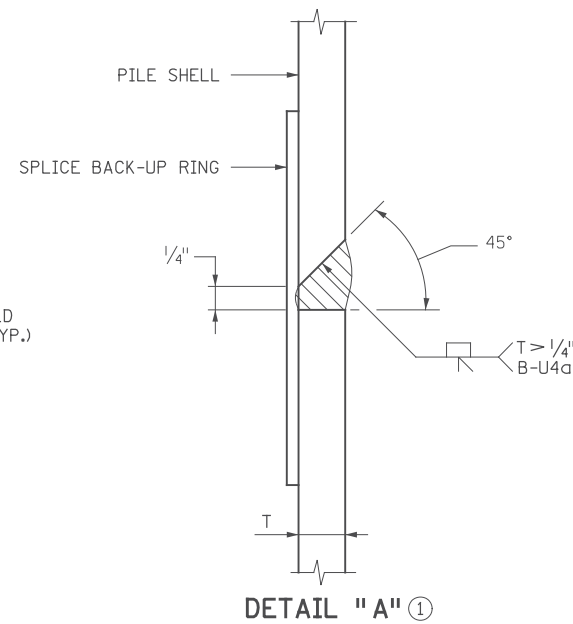
PLAN VIEW - SPLICE BACK-UP RING
PILE NOT SHOWN



SECTION B-B
PILE NOT SHOWN



SECTION A-A



DETAIL "A" ①

NOTES:

- APPROVED COMMERCIAL PILE SPLICE BACK-UP RING MAY BE USED IN LIEU OF THE TYPE DETAILED, PROVIDED THAT 1/4" ROOT IS MAINTAINED. BACK-UP RING SHALL HAVE A TIGHT FIT.
- WELDING ELECTRODES SHALL BE CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011.
- ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.
- WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN 0° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.
- ① FOR PILE SHELL THICKNESSES GREATER THAN 1/4", USE A B-U4g WELD CONFIGURATION. SEE DETAIL "A".

APPROVED: NOVEMBER 22, 2002

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISION
09-11-2014

DETAIL NO.

Daniel J. Morgan
STATE BRIDGE ENGINEER

BRIDGE NAMEPLATE
(FOR NEW BRIDGES)

B101

APPROVED: NOVEMBER 22, 2002

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISION:
11-06-2013

DETAIL NO.

Daniel J. Morgan
STATE BRIDGE ENGINEER

PILE SPLICE
(CAST-IN-PLACE CONCRETE PILES)

B201

11/01/2017				RELEASED FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR
				REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: ERIC S. HANSON
Eric S. Hanson
Date 11/01/2017 License # 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051
BRIDGE NO.
02588

DRAWN BY
J. HOFFMAN
DESIGNED BY
S. NEFF
CHECKED BY
C. BLACK
COMM. NO. 0169140

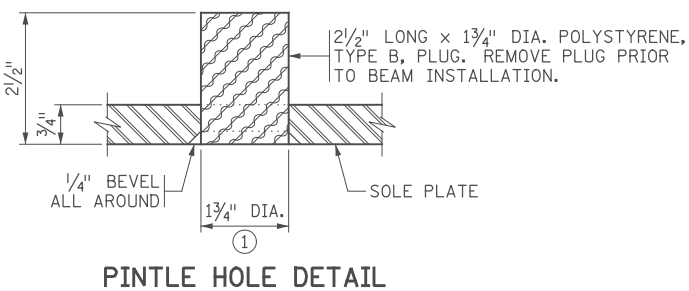
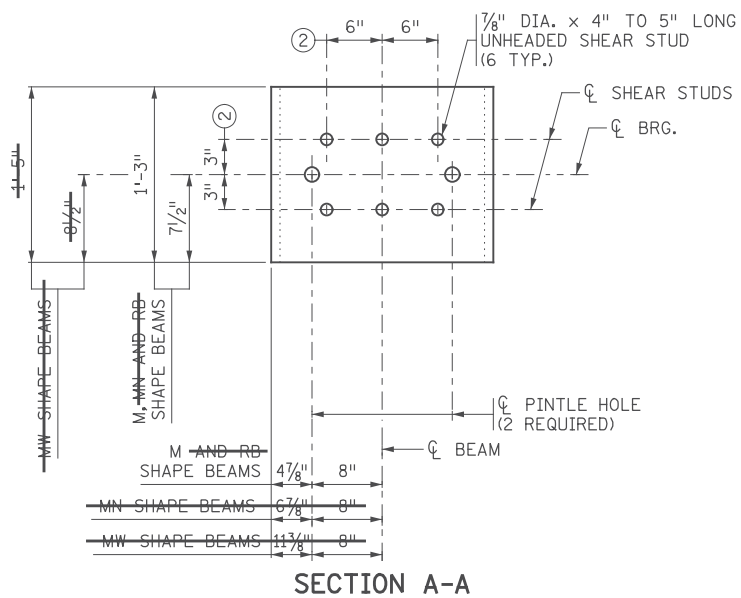
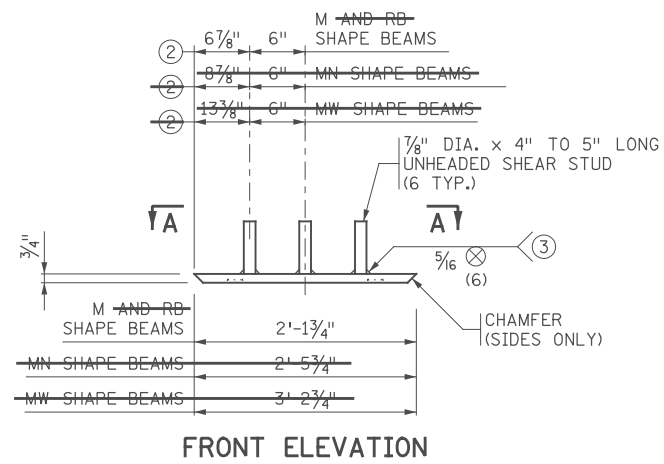


ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
B-DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 1 OF 3)

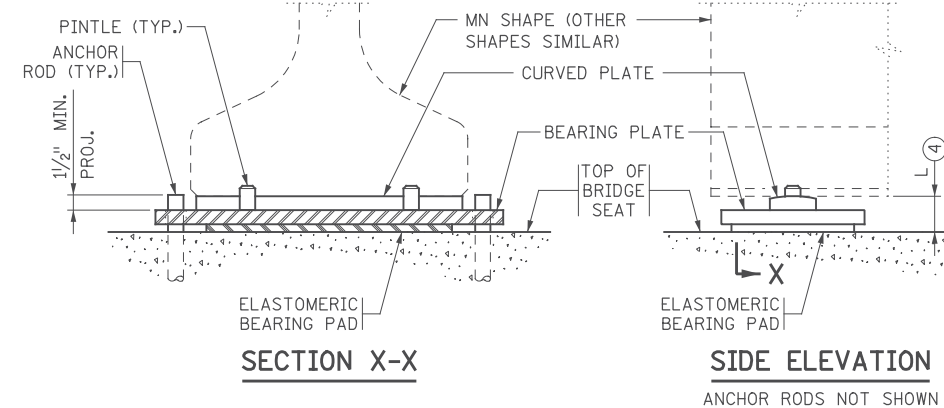
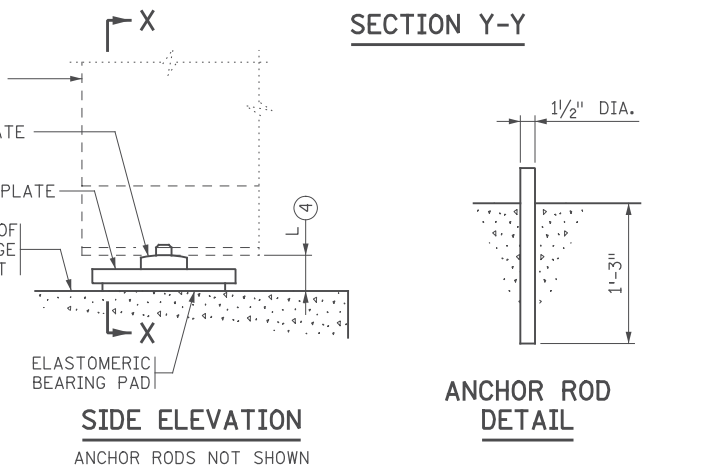
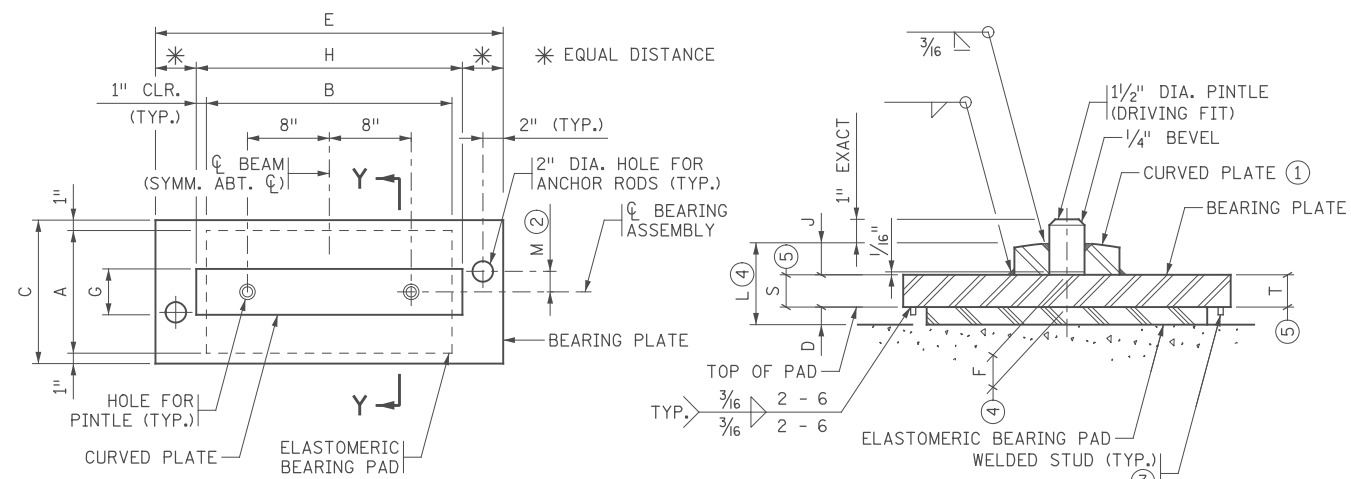
SHEET
BB36
OF
BB42

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NOTES:

- PROVIDE STRUCTURAL STEEL PER SPEC. 3306.
- PROVIDE WELDED STUDS OF WELDABLE CARBON STEEL PER SPEC. 3391.2D.
- GALVANIZE SOLE PLATE FOR BEARING ASSEMBLY PER SPEC. 3394 AFTER FABRICATION.
- ENSURE PINTLE HOLES ARE FREE OF ZINC BUILD UP FROM GALVANIZING.
- SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.
- ① FOR 1/2" DIA. PINTLES.
- ② THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS. HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.
- ③ STUD WELDING PER AWS D1.1.



TABLE

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ANCHOR ROD OFFSET		ASSY. HEIGHT	CURVED PLATE		SLOPED BRG. PLATE	
			A	B	D		C	E	F	G	H	J	+/- ②	M		L ④	R ①	S ⑤	T ⑤
F1	N. ABUT.	27M	12"	24"	1/2"	8.0	14"	34"	1 1/2"	4 1/2"	26"	1 1/4"	-	1 1/8"	3 1/4"	16"	1 1/8"	1 7/8"	

NOTES:

- PROVIDE ELASTOMERIC MATERIALS AND PAD CONSTRUCTION PER SPEC. 3741.
- PROVIDE STEEL PLATES PER SPEC. 3306.
- PROVIDE ANCHOR RODS PER SPEC. 3306. GALVANIZE PER SPEC. 3394.
- PROVIDE PINTLES PER SPEC. 3309.
- GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.
- PAYMENT FOR BEARING ASSEMBLY INCLUDES ALL MATERIAL ON THIS DETAIL.

- ① THE MIN. RADIUS IS 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS IS 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.
- ② "+" DENOTES OFFSET AS SHOWN. "-" DENOTES OFFSET OPPOSITE OF SHOWN.
- ③ 3/8" X 3/8" BAR INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. BAR LENGTH IS 2" LESS THAN ADJACENT PAD DIMENSION, CENTERED ON PAD. CENTERLINE OF BAR TO EDGE OF PAD DIMENSION = 1/2".
- ④ DIMENSION AT CENTERLINE OF BEARING.
- ⑤ DIMENSIONS FOR BEARINGS WITH TAPERED BEARING PLATES.

MODIFICATIONS:
- TAPERED BEARING PLATE

DESIGN DATA:

MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1/2" PINTLES.

APPROVED: SEPTEMBER 22, 2011

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISION
01-05-2017

DETAIL NO.

B303

Nancy Dubenberger
STATE BRIDGE ENGINEER

SOLE PLATE
(PRESTRESSED CONCRETE BEAMS)
(FOR BEARINGS WITH PINTLES)

APPROVED: SEPTEMBER 22, 2011

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISED
11-06-2013
11-03-2015
01-05-2017

DETAIL NO.

MOD.
B310

Nancy Dubenberger
STATE BRIDGE ENGINEER

CURVED PLATE BEARING ASSEMBLY
(PRESTRESSED CONCRETE BEAMS)
(FIXED)

11/01/2017 RELEASED FOR CONSTRUCTION

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

Print Name: ERIC S. HANSON

Eric S. Hanson
Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

DRAWN BY
J. HOFFMAN
DESIGNED BY
S. NEFF
CHECKED BY
C. BLACK
COMM. NO. 0169140



ANOKA COUNTY
B-DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 2 OF 3)

SHEET
BB37
OF
BB42

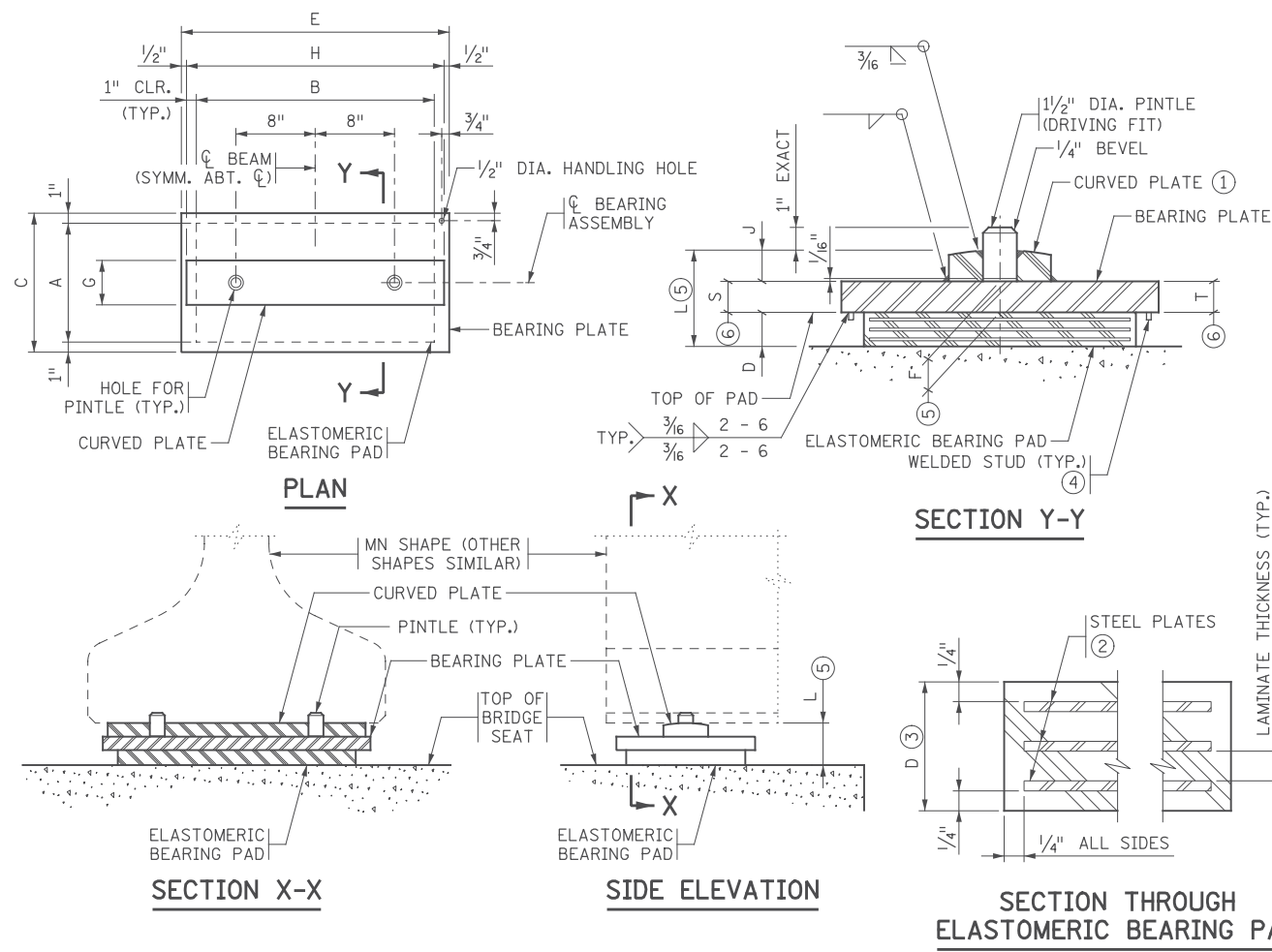


TABLE																				
ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			STEEL PLATES		LAMINATES		SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ASSY. HEIGHT L (5)	CURVED PLATE R (1)	SLOPED BRG. PLATE	
			A	B	D	NO.	THICK.	NO.	THICK.		C	E	F	G	H	J			S (6)	T (6)
E1	S. ABUT.	27M	12"	24"	2 1/2"	4	1/8"	3	1/2"	8.0	14"	27"	1 1/2"	4 1/2"	26"	1 1/4"	5 1/4"	16"	1 1/8"	1 7/8"
E2	N. ABUT.	27M	12"	24"	1/2"	-	1/8"	-	1/2"	8.0	14"	27"	1 1/2"	4 1/2"	26"	1 1/4"	3 3/4"	16"	1 1/8"	1 7/8"

- NOTES:**
- PROVIDE ELASTOMERIC MATERIALS AND PAD CONSTRUCTION PER SPEC. 3741.
 - PROVIDE STEEL PLATES PER SPEC. 3306.
 - PROVIDE PINTLES PER SPEC. 3309.
 - GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.
 - PAYMENT FOR BEARING ASSEMBLY INCLUDES ALL MATERIAL ON THIS DETAIL.
 - ① THE MIN. RADIUS IS 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS IS 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.
 - ② DO NOT GALVANIZE THESE PLATES.
 - ③ THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.
 - ④ 3/8" X 3/8" BAR INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. BAR LENGTH IS 2" LESS THAN ADJACENT PAD DIMENSION, CENTERED ON PAD. CENTERLINE OF BAR TO EDGE OF PAD DIMENSION = 1/2".
 - ⑤ DIMENSION AT CENTERLINE OF BEARING.
 - ⑥ DIMENSIONS FOR BEARINGS WITH TAPERED BEARING PLATES.

MODIFICATIONS:
- TAPERED BEARING PLATE

DESIGN DATA:
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1 1/2" PINTLES.

APPROVED: SEPTEMBER 22, 2011

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

Nancy Dubenberger
STATE BRIDGE ENGINEER

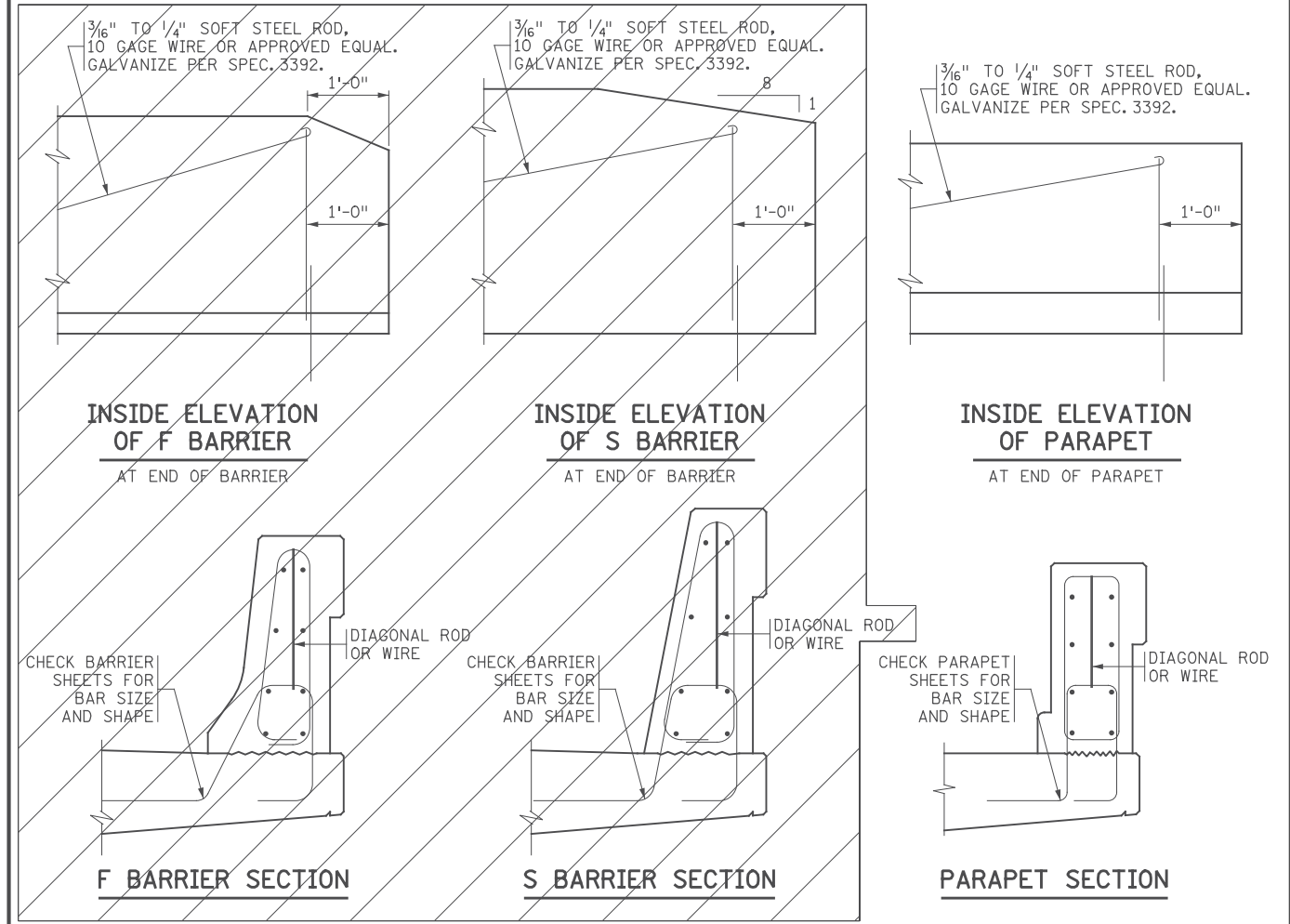
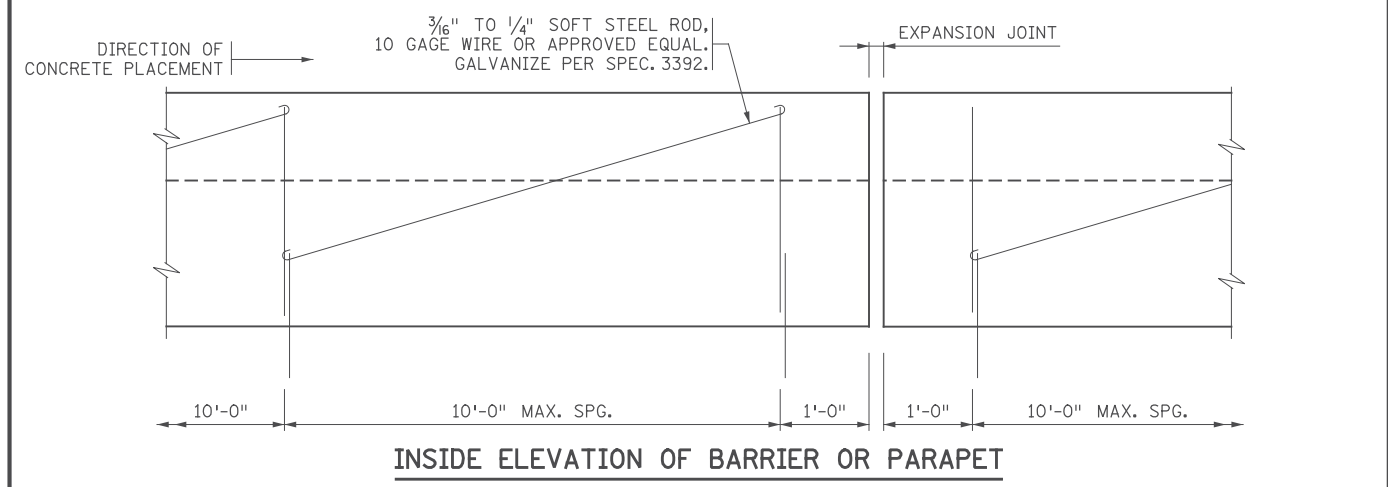
CURVED PLATE BEARING ASSEMBLY
(PRESTRESSED CONCRETE BEAMS)
(EXPANSION)

REVISED 11-03-2015

DETAIL NO. **MOD. B311**

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASED FOR CONSTRUCTION

Print Name: ERIC S. HANSON
Date: 11/01/2017 License #: 50463



- NOTES:**
- FOR ADDITIONAL DIMENSIONS, DETAILS, REINFORCEMENT, NOTES, AND CONTROL JOINT SPACING SEE BARRIER OR PARAPET SHEET.
 - PAY QUANTITIES WILL NOT BE ADJUSTED AS A RESULT OF SELECTING SLIPFORM ALTERNATE.
 - USE A SIMILAR METHOD FOR TALLER BARRIERS OR MODIFIED VERSIONS OF THIS BARRIER.

APPROVED: AUGUST 24, 2016

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

Kevin Weston
STATE BRIDGE ENGINEER

CONCRETE BARRIER OR PARAPET
(SLIPFORM ALTERNATE)

REVISION

DETAIL NO. **B830**

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO. **02588**

COMM. NO. 0169140

DRAWN BY J. HOFFMAN
DESIGNED BY S. NEFF
CHECKED BY E. HANSON

SRF ENGINEERS PLANNERS DESIGNERS
Consulting Group, Inc.

ANOKA COUNTY
B-DETAILS
CSAH 78 OVER 108TH AVENUE NW
(SHEET 3 OF 3)

SHEET **BB38** OF **BB42**

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WEARING COURSE

LOW SLUMP
 OTHER _____
TYPE OR MANUFACTURER _____

EXPANSION JOINTS

JOINT MANUFACTURER _____
MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED
GLAND MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)
SIZE OF GLAND _____
MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED

ELASTOMERIC BEARING PADS

PAD MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SPECIAL SURFACE FINISH

PRODUCT NAME: _____ COLOR & TEXTURE: _____

FINISHING ROADWAY FACES OF BARRIER OR PARAPET

PRODUCT NAME: _____ COLOR & TEXTURE: _____

ANTI-GRAFFITI COATING

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)
PRODUCT NAME: _____ LOCATION: _____

PAINT SYSTEM

MnDOT SPECIFICATION NUMBER _____
2478 OR 2479 OR OTHER
MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)
PRIME COAT _____
MnDOT MATERIAL SPECIFICATION NUMBER
INTERMEDIATE COAT _____
MnDOT MATERIAL SPECIFICATION NUMBER
FINISH COAT _____
MnDOT MATERIAL SPECIFICATION NUMBER COLOR

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)

DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. _____
BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. _____
SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. _____
(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. _____

COMMENTS: _____

NUMBER OF BRIDGE SUPPLEMENTAL AGREEMENTS: _____ COST: \$ _____

LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

NOTIFICATION TO ADD, REMOVE, OR REHAB A STRUCTURE

PLEASE GO TO THE FOLLOWING WEBSITE AND COMPLETE THE FORM WHEN ADDING, REMOVING OR REHABILITATING A STRUCTURE:
(CONTACT THE BRIDGE INVENTORY MANAGEMENT UNIT AT 651-366-4557 IF YOU HAVE QUESTIONS)
- WHEN ADDING A NEW STRUCTURE - (SEND WHEN THE BRIDGE IS OPEN TO TRAFFIC)
<http://www.dot.state.mn.us/bridge/new-structure.html>
- WHEN REMOVING A STRUCTURE - (SEND WHEN THE BRIDGE IS NO LONGER IN SERVICE)
<http://www.dot.state.mn.us/bridge/remove-structure.html>
- WHEN REHABILITATING A STRUCTURE - (SEND WHEN THE REHABILITATION IS COMPLETE)
<http://www.dot.state.mn.us/bridge/rehab-structure.html>

CHANGE OF VERTICAL CLEARANCE

PLEASE GO TO THE FOLLOWING WEBSITE WHEN CHANGING THE VERTICAL CLEARANCE OF EXISTING BRIDGE STRUCTURE:
(CONTACT THE BRIDGE INVENTORY MANAGEMENT UNIT AT 651-366-4557 IF YOU HAVE QUESTIONS)
<http://www.dot.state.mn.us/bridge/pdf/clearanceform.pdf>

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.
FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES NO

REMOVE & PATCH QUANTITIES (SF)						CONCRETE SURFACE REPAIR (SF)	CLEAN & PAINT REINF. (SF)
TYPE A:	TYPE B:	TYPE C:	TYPE D:	TYPE E:	TYPE F:		

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:

INSPECTOR(S) SIGNATURE _____ DATE _____
CHECKED BY: _____ PROJECT ENGINEER/SUPERVISOR SIGNATURE _____ DATE _____
WHEN BRIDGE IS OPEN TO TRAFFIC, COMPLETE THIS AS-BUILT BRIDGE DATA SHEET AND SUBMIT TO THE BRIDGE OFFICE VIA EMAIL AT: BridgeForms.dot@state.mn.us.

REVISION:
APPROVED: MAY 10, 2017
Kevin Weston
STATE BRIDGE ENGINEER

AS-BUILT DETAILS (AS NEEDED)

FIG. 5-397.900

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASED FOR CONSTRUCTION

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

DRAWN BY _____
DESIGNED BY _____
CHECKED BY _____
COMM. NO. 0169140
 ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
AS-BUILT BRIDGE DATA
CSAH 78 OVER 108TH AVENUE NW

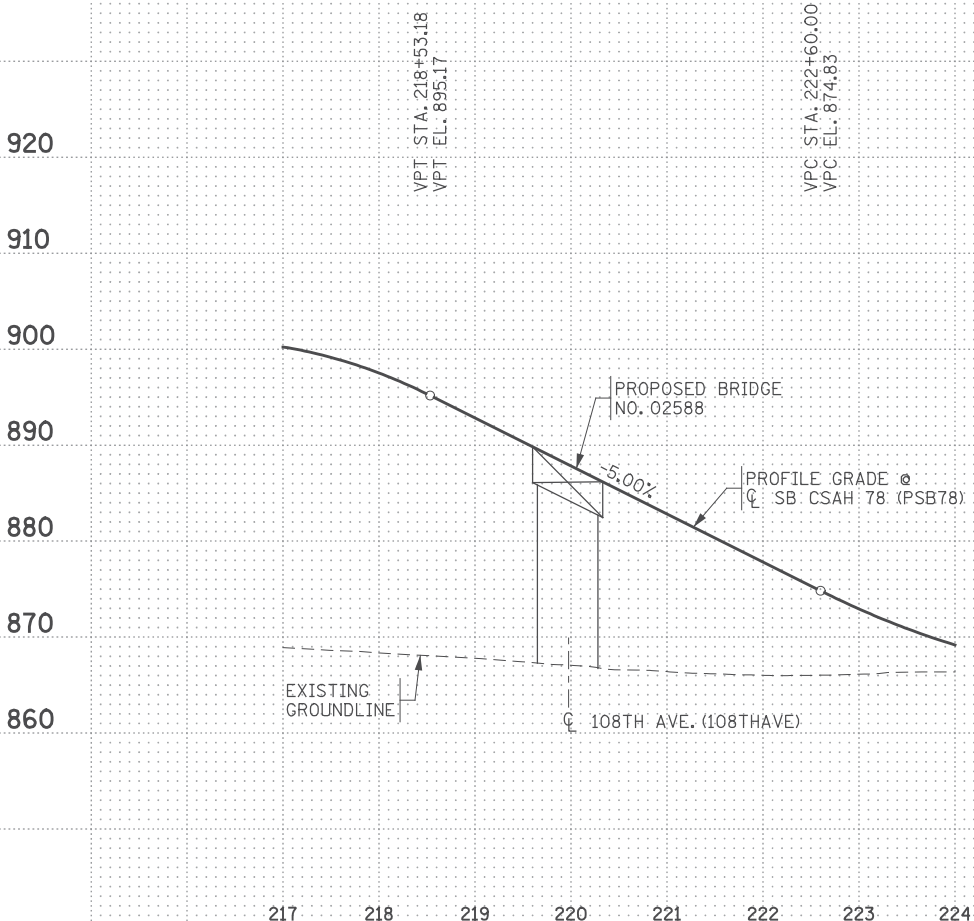
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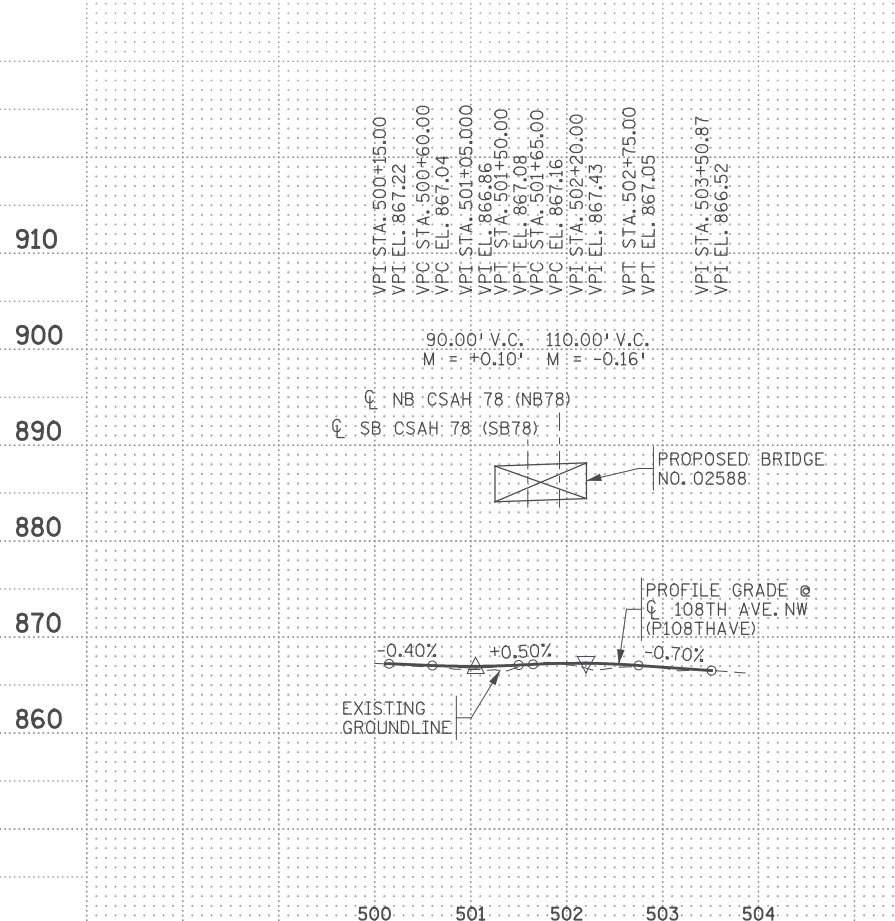
CONTRACTED PROFILE

SCALE : $\frac{1}{400}$ HORIZONTAL $\frac{1}{80}$ VERTICAL

SB CSAH 78 (PSB78)



108TH AVE. NW (P108THAVE)



LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

- SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS, SLIDING BANKS, RECREATIONAL BOATING.
- OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARLY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVE LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS-SECTIONAL AREA ETC.
- APPARENT HIGHWATER ELEVATION OBTAINED FROM:
- OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEERS RECOMMENDATION

DATE _____

STREAM OR DITCH DESIGNATION _____

DRAINAGE AREA _____

MAX. FLOOD ON RECORD _____

MAXIMUM OBSERVED HIGHWATER ELEVATION _____

DESIGN FLOOD (YR. FREQ.) C.F.S. _____

HEADWATER ELEVATION FT. _____

DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S. _____

TOTAL STAGE INCREASE FT. _____

LOW MEMBER AT OR ABOVE ELEVATION FT. _____

WATERWAY AREA REQUIRED BELOW ELEVATION = SQ.FT. _____

AT RIGHT ANGLES TO CHANNEL

BASIC FLOOD (100 YR. FREQ.) C.F.S. _____

HEADWATER ELEVATION FT. _____

TOTAL STAGE INCREASE FT. _____

MEAN VELOCITY THROUGH STRUCTURE F.P.S. _____

FLOWLINE ELEVATION _____ SKEW ANGLE _____

ESTIMATED DEPTH OF PIER SCOUR = FT. _____

SCOUR CONFIRMATION RECOMMENDATION

DATE _____

TOTAL SCOUR AT PIER EL. (500 OR 01 YR. FREQ.) _____

SCOUR CODE = _____

BRIDGE SURVEY SHEETS MADE FROM : _____

SURVEYS BY SRF CONSULTING GROUP, INC.

BENCH MARK ELEVATION 860.422 (NAVD88)

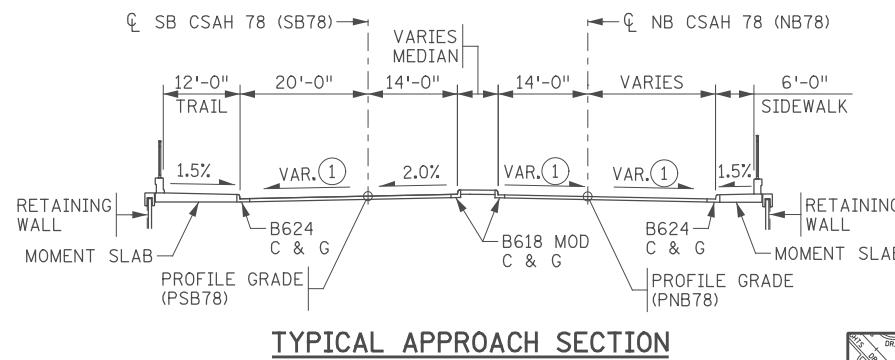
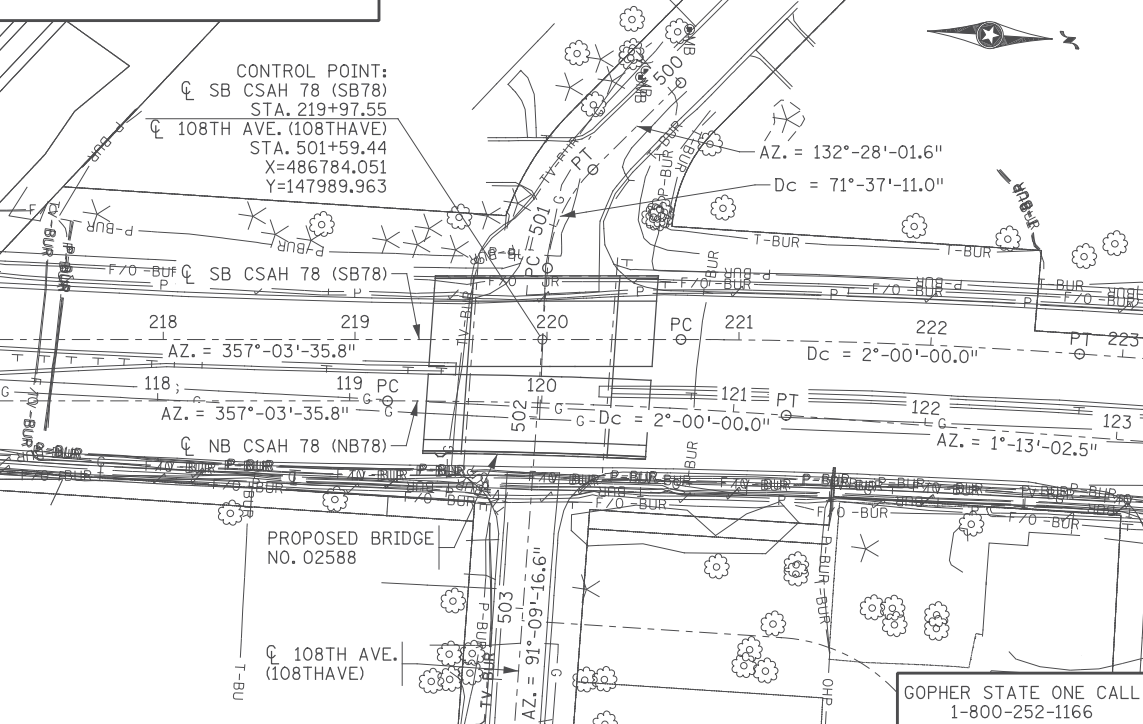
LOCATION MNDOT B.M. 0215 AA - IN COON RAPIDS, 1.85 MI NW ALONG TH 10 FROM JCT OF TH 10 AND CTY ROAD 11/FOLEY BLVD, AT TH 10 MILEPOINT 230.05, 89.2 FT NE OF TH 10, 37.7 FT FROM GRAY ELECTRICAL SHED, 1.5 FT SW OF WITNESS POST.

BENCH MARK ELEVATION 859.103 (NAVD88)

LOCATION MNDOT B.M. C257 - 3.35 MI E-SE OF ANOKA, 3.85 MI E-SE ALONG TH 10 FROM JCT OF TH 10 AND TH 47 IN ANOKA, AT TH 10 MILEPOINT 228.65, 0.4 MI N OF HANSON BLVD BRIDGE, 99.5 FT SW OF SB TH 10, 1.0 FT N OF FENCE ON EAST SIDE OF ATHLETIC FIELD, 1.0 FT S OF ROW FENCE, 1.3 FT S OF WITNESS POST. GATES BLOCK ENTRANCE TO ATHLETIC FIELD, NEED ACCESS THRU GATES OR FENCE CLIMBERS, DISK DENTED, MAY HAVE BEEN HIT ON SIDE.

PLAT

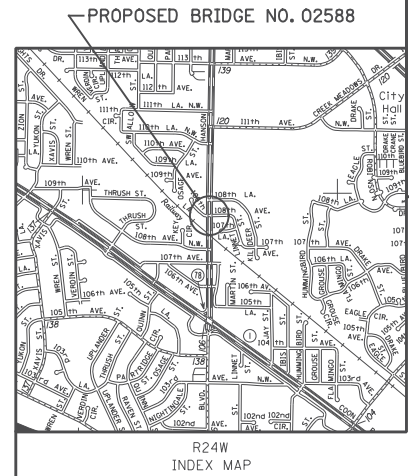
SCALE : $\frac{1}{1250}$



TYPICAL APPROACH SECTION

NOTES:

- CROSS SLOPE VARIES FROM 2.5% AT ROADWAY TO 2.0% AT BRIDGE APPROACH PANEL.



11/01/2017	RELEASED FOR CONSTRUCTION				
NO	DATE	BY	CKD	APPR	REVISION
...

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

Print Name: **ERIC S. HANSON**

Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

COMM. NO. 0169140

SRF ENGINEERS PLANNERS DESIGNERS
Consulting Group, Inc.

MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

AT MILE POINT _____ ON _____ (T.H., C.S.A.H., C.R., etc.)

PROPOSED BRIDGE LOCATED 1.05 MILES S _____ OF JCT CSAH 78 (HANSON BLVD) & TH 10

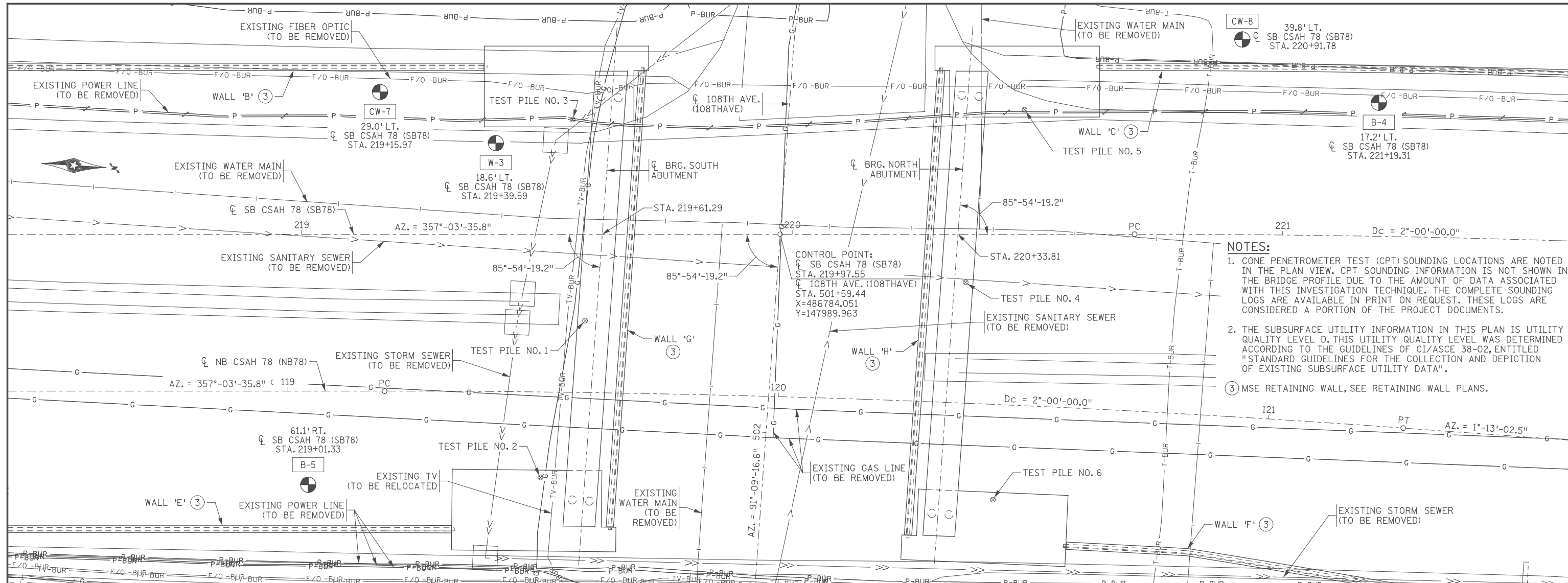
SEC 22 TWP. T31N R R24W

CITY COON RAPIDS COUNTY ANOKA

ANOKA COUNTY
BRIDGE SURVEY (SHEET 1 OF 2)
CSAH 78 OVER 108TH AVENUE NW

SHEET BB40 OF BB42

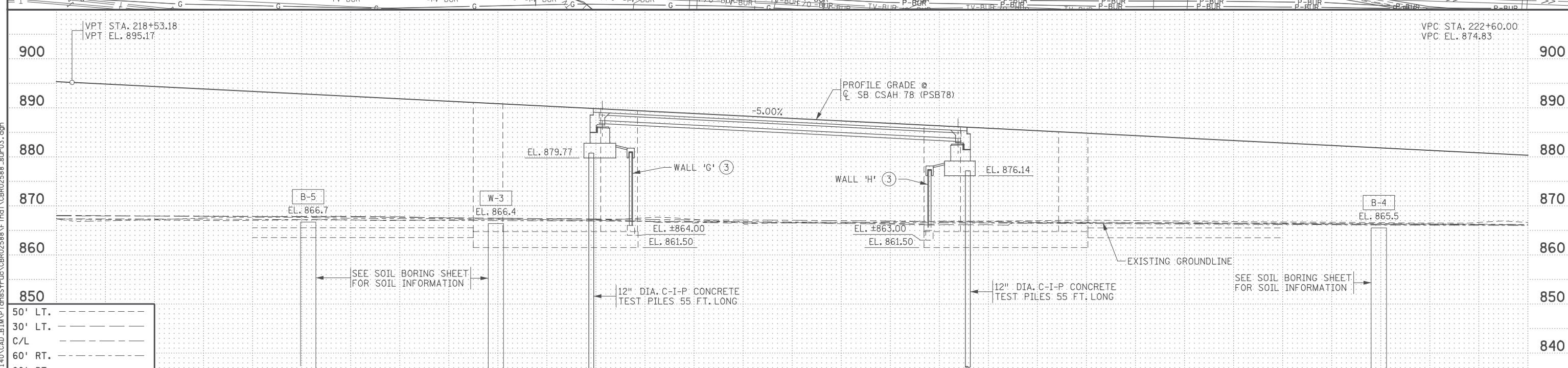
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NOTES:

1. CONE PENETROMETER TEST (CPT) SOUNDING LOCATIONS ARE NOTED IN THE PLAN VIEW. CPT SOUNDING INFORMATION IS NOT SHOWN IN THE BRIDGE PROFILE DUE TO THE AMOUNT OF DATA ASSOCIATED WITH THIS INVESTIGATION TECHNIQUE. THE COMPLETE SOUNDING LOGS ARE AVAILABLE IN PRINT ON REQUEST. THESE LOGS ARE CONSIDERED A PORTION OF THE PROJECT DOCUMENTS.
2. THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

(3) MSE RETAINING WALL, SEE RETAINING WALL PLANS.



11/01/2017	RELEASED FOR CONSTRUCTION				
NO	DATE	BY	CKD	APPR	REVISION

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

Print Name: CASEY E. BLACK

Casey E. Black

Date: 11/01/2017 License # 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

COMM. NO. 0169140

DRAWN BY
E. JOHNSON

DESIGNED BY
S. NEFF

CHECKED BY
C. BLACK

Consulting Group, Inc.

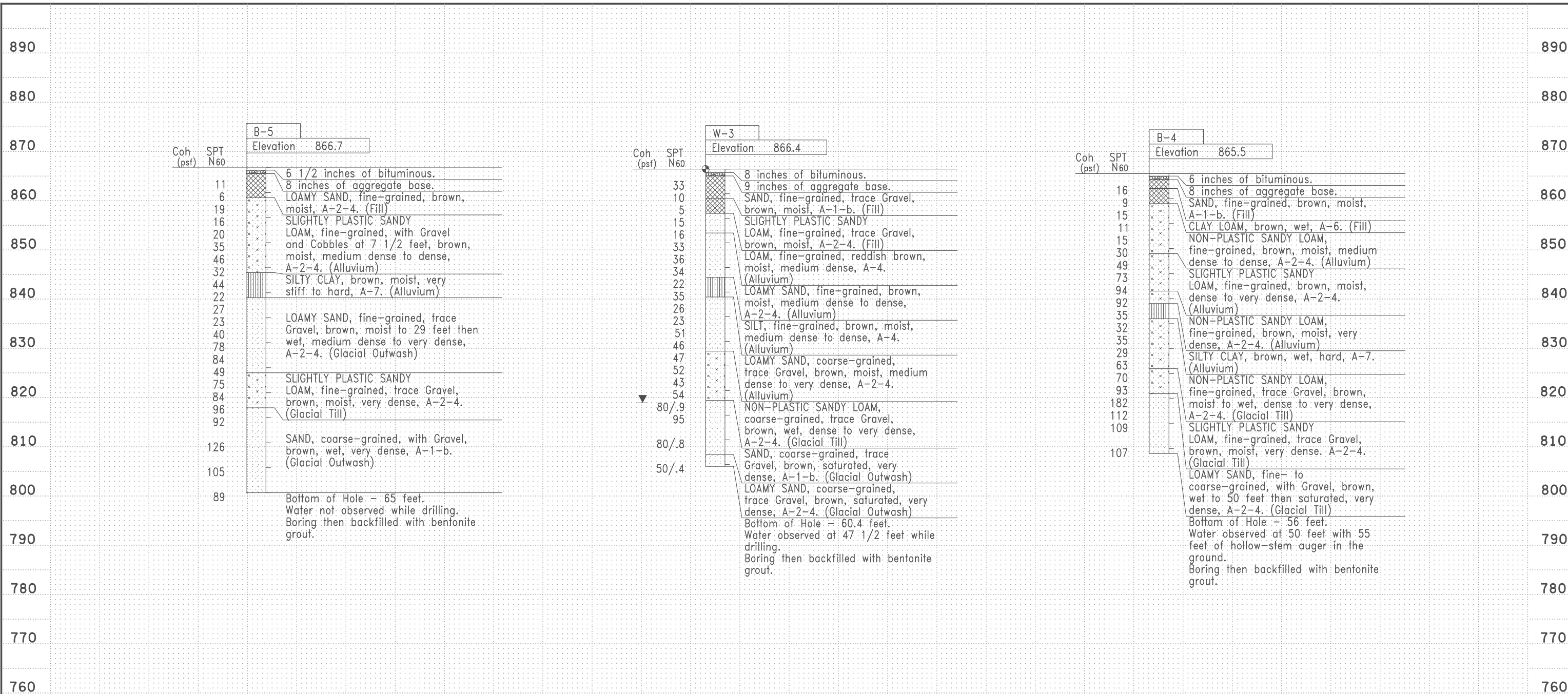
ANOKA COUNTY

BORINGS - PLAN & PROFILE

CSAH 78 OVER 108TH AVENUE NW

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OF
BB42

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BORING LOG TERMINOLOGY

C ... Clay	Lmst ... Limestone
L ... Loam	Sst ... Sandstone
S ... Sand	Dolo ... Dolomite
Si ... Silt	wx ... weathered
T ... Glacial Till	Bldr ... Boulder (+3 in.)
G ... Gravel (No. 10 Sieve to 3 in.)	

The above soil terms are from the MNDOT Triangular Textural Classification System, as shown below.

blk ... Black	wht ... White
brn ... Brown	yel ... Yellow
org ... Orange	lt ... Light
grn ... Green	dk ... dark
IOS ... Iron Oxide Stains	gr ... Grey

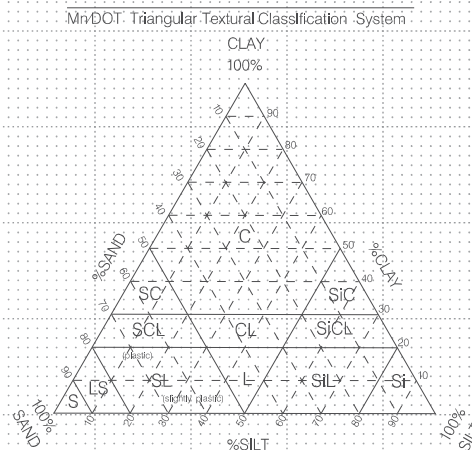
VF ... Very Fine	pl ... Plastic
F ... Fine	spl ... Slightly Plastic
Cr ... Coarse	

SPT No. MNDOT Modified Standard Penetration Test. Blows per ft. with 140 lb. hammer and a standard energy of 210 ft-lbs. This energy represents 60% of the potential energy of the system and is the average energy provided by a Rope & Cathead system.

WR ... Weight of Rods
WH ... Weight of Hammer

COH ... Cohesion (Undrained Shear Strength)
REC ... Percent Core Recovered
RQD ... Rock Quality Description (Percent of total core interval consisting of unbroken pieces 4 in. or longer)
ACL ... Average Core Length (Average length of core that is greater than 4 in. long)
Core Breaks ... Number of natural core breaks per 2 ft.

▼ Measured or assumed ground water level.



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11/01/2017 RELEASED FOR CONSTRUCTION

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

Print Name: CASEY E. BLACK
Date: 11/01/2017 License #: 49163

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02588

DRAWN BY
E. JOHNSON
DESIGNED BY
S. NEFF
CHECKED BY
C. BLACK
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
SOIL BORINGS
CSAH 78 OVER 108TH AVENUE NW

SHEET
BB42
OF
BB42

DESIGN DATA

DESIGNED IN ACCORDANCE WITH 2016 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS HL-93 LIVE LOAD
 DEAD LOAD INCLUDES 20 POUNDS PER SQUARE FOOT ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS
 MATERIAL DESIGN PROPERTIES:
 REINFORCED CONCRETE:
 $f'_c = 4$ KSI CONCRETE
 $f_y = 60$ KSI PLAIN AND EPOXY COATED BARS
 $f_y = 75$ KSI STAINLESS STEEL BARS
 $n = 8$ FOR REINFORCEMENT
 PRESTRESSED CONCRETE:
 $f'_c = 9.3$ KSI CONCRETE
 $f_{pu} = 270$ KSI LOW RELAXATION STRANDS
 $n = 1$ FOR REINFORCEMENT
 $0.75 f_{pu}$ FOR INITIAL PRESTRESS
 DESIGN SPEED:
 OVER = 40 MPH
 UNDER = N/A MPH
 APPROXIMATE DECK AREA = 12,589 SQUARE FEET
 2030 PROJECTED TRAFFIC VOLUMES:
 ROADWAY OVER ROADWAY UNDER
 16,800 ADT N/A
 HL-93 LRFR
 BRIDGE OPERATING RATING FACTOR RF = 1.71

CONSTRUCTION NOTES

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.
 SEE SPECIAL PROVISIONS FOR ALL XXXX.GXX SERIES PAY ITEMS FOR ADDITIONAL REQUIREMENTS.
 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 UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".
 THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (R_n) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

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.
 Print Name: ERIC S. HANSON
 Signature: *Eric S. Hanson*
 Date: 8/23/17 License No.: 50463
 SRP Consulting Group, Inc.

ANOKA COUNTY

BRIDGE NO. 02589

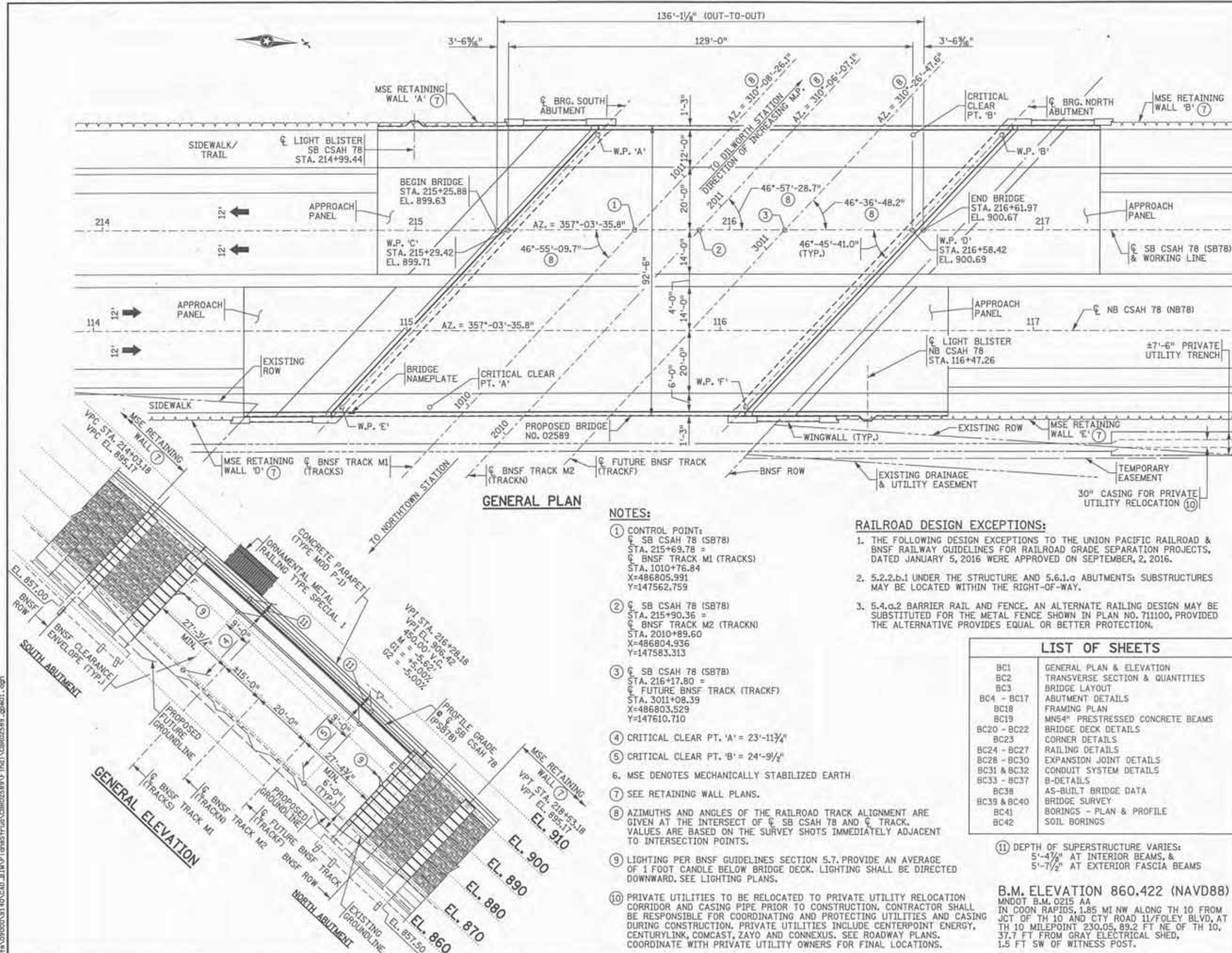
CSAH 78 (HANSON BLVD) OVER BNSF RAILWAY COMPANY 1.2 MILES SOUTH OF EXISTING JUNCTION OF CSAH 78 (HANSON BLVD) & TH 10 IN THE CITY OF COON RAPIDS
 129'-0" PRESTRESSED CONC. BEAM SPAN
 72'-0" RDWY, 43°14'19.0" SKEW, TWO TYPE MOD. P-1 CONC. RAILS, 12'-0" TRAL, 4'-0" MEDIAN & 6'-0" WALK RAILROAD MILE POST 22.82

IDENTIFICATION NO. 501

GENERAL PLAN AND ELEVATION

SEC. 22 T 31 N R 24 W
 CITY OF COON RAPIDS ANOKA COUNTY

APPROVED: *[Signature]* 8/28/17
 ANOKA COUNTY ENGINEER
 APPROVED: *[Signature]* 11/3/17
 STATE BRIDGE ENGINEER DATE



GENERAL PLAN

GENERAL ELEVATION

NOTES:

- 1 CONTROL POINT:
 1. SB CSAH 78 (SB78)
 STA. 215+69.78 =
 2. BNSF TRACK M1 (TRACKS)
 STA. 1010+76.84
 X=486805.991
 Y=147562.759
- 2 SB CSAH 78 (SB78)
 STA. 215+90.36 =
 3. BNSF TRACK M2 (TRACKN)
 STA. 2010+89.60
 X=486804.936
 Y=147583.313
- 3 SB CSAH 78 (SB78)
 STA. 216+17.80 =
 4. FUTURE BNSF TRACK (TRACKF)
 STA. 3011+08.39
 X=486803.529
 Y=147610.710
- 4 CRITICAL CLEAR PT. 'A' = 23'-11 3/4"
- 5 CRITICAL CLEAR PT. 'B' = 24'-9 1/2"
6. MSE DENOTES MECHANICALLY STABILIZED EARTH
- 7 SEE RETAINING WALL PLANS.
- 8 AZIMUTHS AND ANGLES OF THE RAILROAD TRACK ALIGNMENT ARE GIVEN AT THE INTERSECT OF SB CSAH 78 AND TRACK. VALUES ARE BASED ON THE SURVEY SHOTS IMMEDIATELY ADJACENT TO INTERSECTION POINTS.
- 9 LIGHTING PER BNSF GUIDELINES SECTION 5.7. PROVIDE AN AVERAGE OF 1 FOOT CANDLE BELOW BRIDGE DECK. LIGHTING SHALL BE DIRECTED DOWNWARD. SEE LIGHTING PLANS.
- 10 PRIVATE UTILITIES TO BE RELOCATED TO PRIVATE UTILITY RELOCATION CORRIDOR AND CASING PIPE PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND PROTECTING UTILITIES AND CASING DURING CONSTRUCTION. PRIVATE UTILITIES INCLUDE CENTERPOINT ENERGY, CENTURYLINK, COMCAST, ZAYO AND CONNEXUS. SEE ROADWAY PLANS. COORDINATE WITH PRIVATE UTILITY OWNERS FOR FINAL LOCATIONS.

RAILROAD DESIGN EXCEPTIONS:

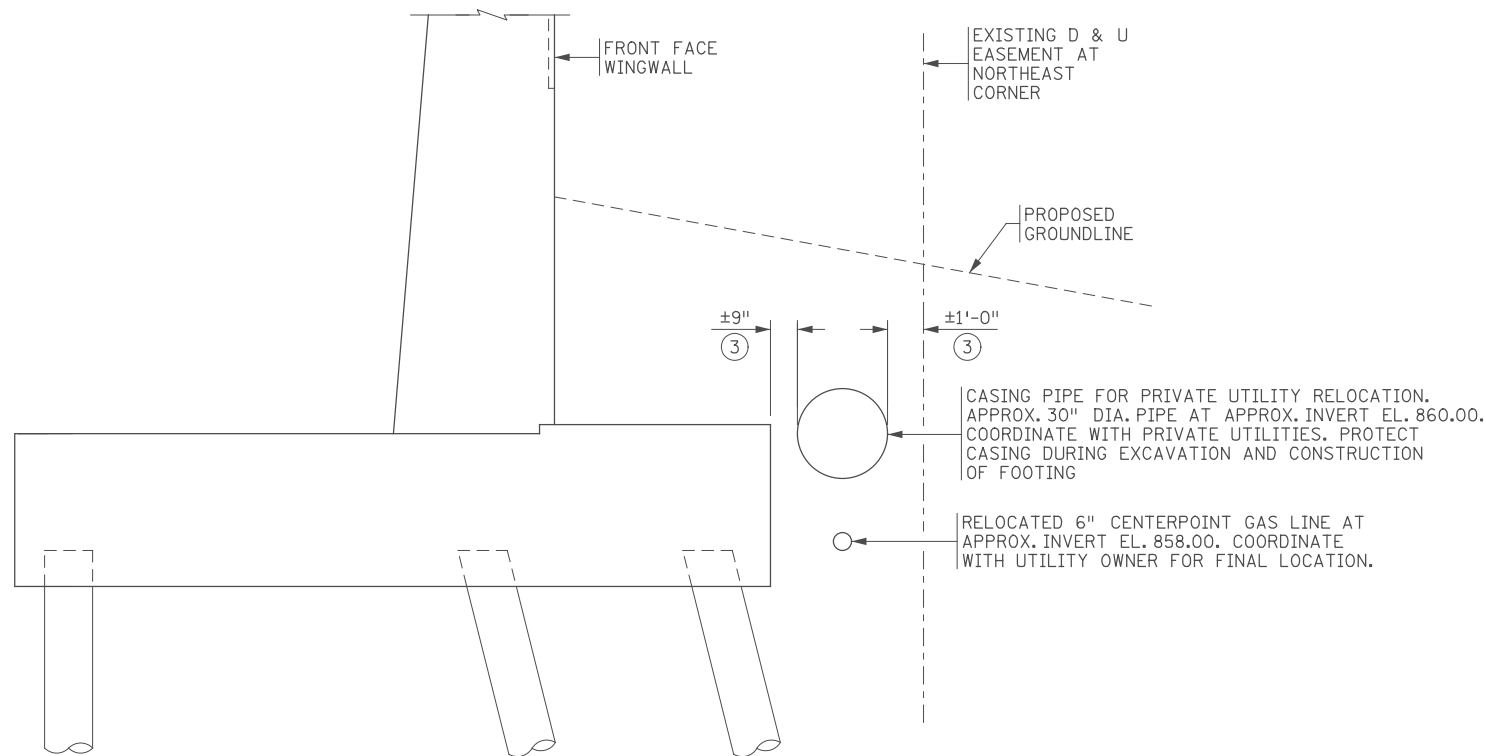
1. THE FOLLOWING DESIGN EXCEPTIONS TO THE UNION PACIFIC RAILROAD & BNSF RAILWAY GUIDELINES FOR RAILROAD GRADE SEPARATION PROJECTS, DATED JANUARY 5, 2016 WERE APPROVED ON SEPTEMBER, 2, 2016.
2. 5.2.2.b.1 UNDER THE STRUCTURE AND 5.6.1.a ABUTMENTS: SUBSTRUCTURES MAY BE LOCATED WITHIN THE RIGHT-OF-WAY.
3. 5.4.a.2 BARRIER RAIL AND FENCE. AN ALTERNATE RAILING DESIGN MAY BE SUBSTITUTED FOR THE METAL FENCE SHOWN IN PLAN NO. 711100, PROVIDED THE ALTERNATIVE PROVIDES EQUAL OR BETTER PROTECTION.

LIST OF SHEETS

BC1	GENERAL PLAN & ELEVATION
BC2	TRANSVERSE SECTION & QUANTITIES
BC3	BRIDGE LAYOUT
BC4 - BC17	ABUTMENT DETAILS
BC18	FRAMING PLAN
BC19	MNS4" PRESTRESSED CONCRETE BEAMS
BC20 - BC22	BRIDGE DECK DETAILS
BC23	CORNER DETAILS
BC24 - BC27	RAILING DETAILS
BC28 - BC30	EXPANSION JOINT DETAILS
BC31 & BC32	CONDUIT SYSTEM DETAILS
BC33 - BC37	B-DETAILS
BC38	AS-BUILT BRIDGE DATA
BC39 & BC40	BRIDGE SURVEY
BC41	BORINGS - PLAN & PROFILE
BC42	SOIL BORINGS

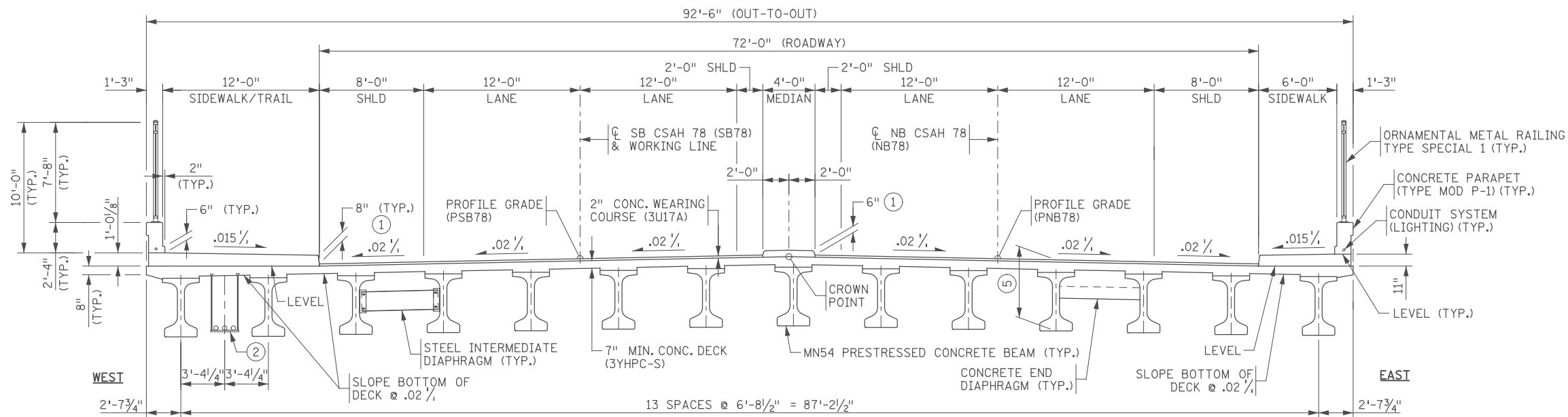
11 DEPTH OF SUPERSTRUCTURE VARIES:
 5'-4 1/2" AT INTERIOR BEAMS, &
 5'-7 1/2" AT EXTERIOR FASCIA BEAMS

B.M. ELEVATION 860.422 (NAVD88)
 MNDOT B.M. 0215 AA
 IN COON RAPIDS, 1.85 MI NW ALONG TH 10 FROM
 JCT OF TH 10 AND CITY ROAD 11/FOLEY BLVD, AT
 TH 10 MILEPOINT 230.05, 89.2 FT NE OF TH 10,
 37.7 FT FROM GRAY ELECTRICAL SHED,
 1.5 FT SW OF WITNESS POST.



PRIVATE UTILITY RELOCATION DETAIL
(EAST SIDE OF BRIDGE ONLY)

SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE NO. 02589				EE
ITEM NO.	ITEM	UNIT	QUANTITY	
2401.501	STRUCTURAL CONCRETE (1G52) (BR NO 02589)	CU YD	1122	(P)
2401.501	STRUCTURAL CONCRETE (3B52) (BR NO 02589)	CU YD	2171	(P)
2401.513	TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	456	(P)
2401.515	SIDEWALK CONCRETE (3S52)	SQ FT	4609	(P)
2401.516	RAISED MEDIAN CONCRETE (3S52)	SQ FT	545	(P)
2401.541	REINFORCEMENT BARS	POUND	124820	(P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	333600	(P)
2401.601	STRUCTURE EXCAVATION (BR NO 02589)	LUMP SUM	1	
2401.618	BRIDGE SLAB CONCRETE (3YHPC-S)	SQ FT	12589	(P)
2402.583	ORNAMENTAL METAL RAILING TYPE SPECIAL 1	LIN FT	374	(P)
2402.591	EXPANSION JOINT DEVICES TYPE 5	LIN FT	254	(P)
2402.595	BEARING ASSEMBLY	EACH	28	
2404.501	CONCRETE WEARING COURSE (3U17A)	SQ FT	15485	(P)
2405.502	PRESTRESSED CONCRETE BEAMS MN54	LIN FT	1824	(P)
2405.511	DIAPHRAGMS FOR TYPE MN54 PREST BEAMS	LIN FT	175	(P)
2411.618	ARCH CONC TEXTURE (ASHLAR STONE)	SQ FT	7202	
2411.618	ARCH SURFACE FINISH (SINGLE COLOR)	SQ FT	7202	
2411.618	ANTI-GRAFFITI COATING	SQ FT	7202	
2452.519	C-I-P CONCRETE TEST PILE 60 FT LONG 16"	EACH	8	
2452.528	PILE ANALYSIS	EACH	8	
2452.603	C-I-P CONCRETE PILING 16"	LIN FT	10700	
2502.502	DRAINAGE SYSTEM TYPE (B910)	LUMP SUM	1	
2545.509	CONDUIT SYSTEM (SIGNALS) (BR NO 02589)	LUMP SUM	1	
2545.509	CONDUIT SYSTEM (FUTURE) (BR NO 02589)	LUMP SUM	1	
2545.509	CONDUIT SYSTEM (LIGHTING) (BR NO 02589)	LUMP SUM	1	



TRANSVERSE SECTION

NOTES:

- ① MEASURED FROM TOP OF 2" WEARING COURSE.
- ② WEST BRIDGE SUPPORTED CONDUIT SYSTEM TO INCLUDE (1)-4" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (SIGNALS) & (2)-4" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (FUTURE).
- ③ DIMENSIONS AT NORTH BNSF ROW LINE SHOWN.
- ④ INCLUDES BRIDGE ELEMENTS WITH MASS CONCRETE REQUIREMENTS. SEE SPECIAL PROVISIONS.
- ⑤ DEPTH OF SUPERSTRUCTURE VARIES: 5'-4 7/8" AT INTERIOR BEAMS, & 5'-7 1/2" AT EXTERIOR FASCIA BEAMS

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11/01/2017				RELEASE FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: **ERIC S. HANSON**
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

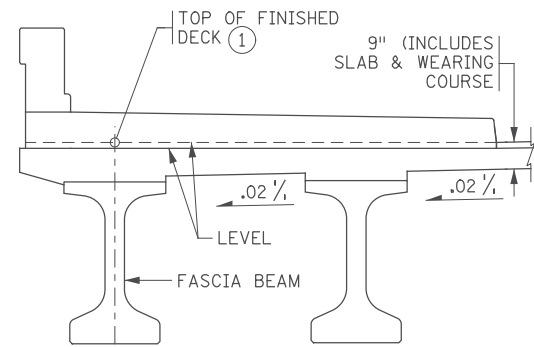
BRIDGE NO.
02589

COMM. NO. 0169140

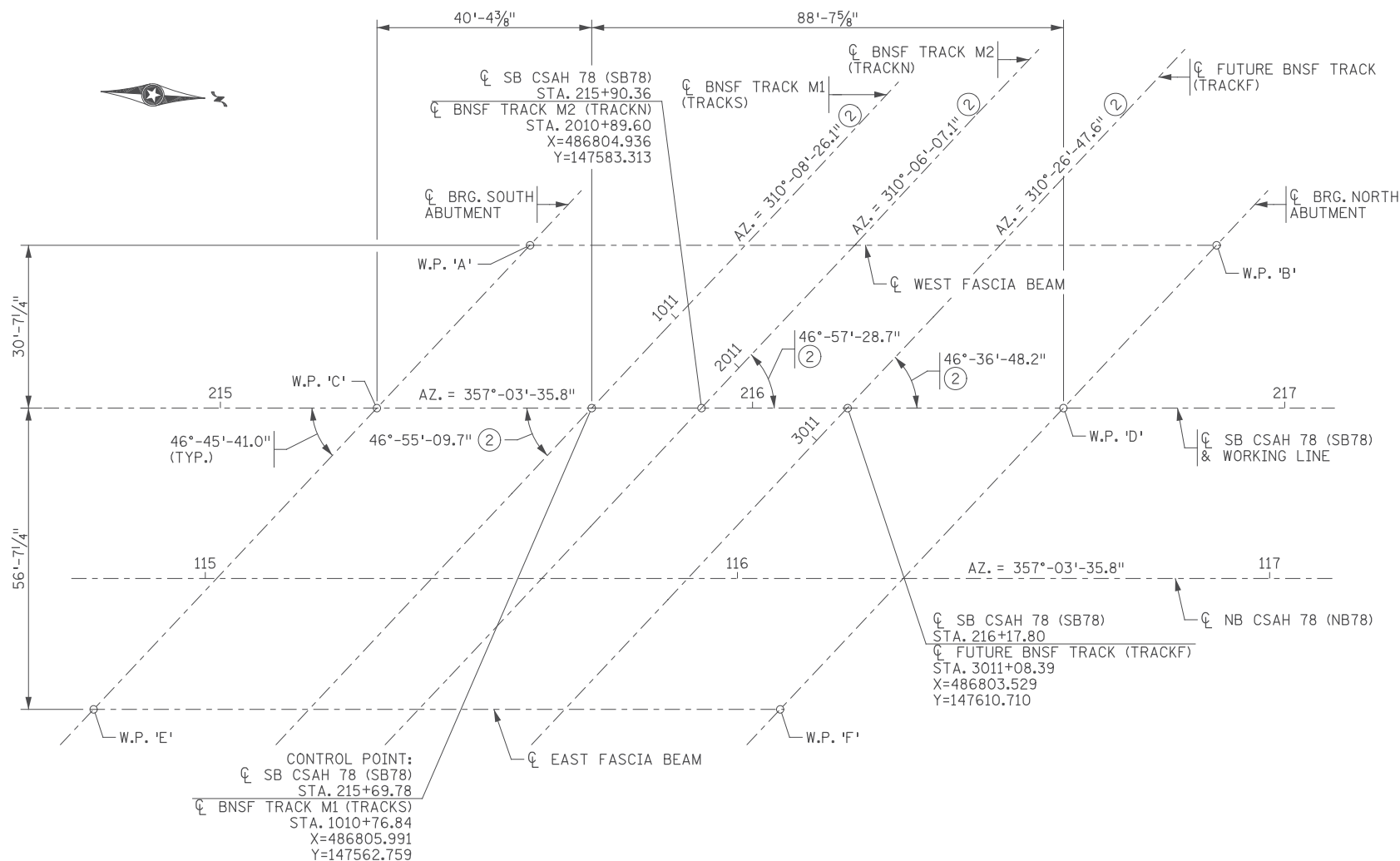
SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 TRANSVERSE SECTION & QUANTITIES
 CSAH 78 OVER BNSF RAILWAY COMPANY

SHEET
BC2
OF
BC42



SIDEWALK DETAIL



WORKING POINT LAYOUT



TOP OF ROADWAY TO BRIDGE SEAT							
	BEAM LINE	SLAB THICKNESS ③	STOOL HEIGHT	BEAM HEIGHT	BEARING HEIGHT	TOTAL HEIGHT ③	
						INCHES	FEET
SOUTH ABUTMENT	WEST FASCIA BEAM	11 5/8"	1 7/8"	54"	5 3/4"	73 1/4"	6.10'
SOUTH ABUTMENT	WEST 1ST INTERIOR BEAM	9 7/8"	1 7/8"	54"	5 3/4"	71 1/2"	5.96'
SOUTH ABUTMENT	TYPICAL INTERIOR BEAM	9"	1 7/8"	54"	3 1/2"	68 3/8"	5.70'
SOUTH ABUTMENT	EAST 1ST INTERIOR BEAM	9"	1 7/8"	54"	5 3/4"	70 5/8"	5.89'
SOUTH ABUTMENT	EAST FASCIA BEAM	10 1/8"	1 7/8"	54"	5 3/4"	71 3/4"	5.98'
NORTH ABUTMENT	WEST FASCIA BEAM	11 5/8"	1 7/8"	54"	5 3/4"	73 1/4"	6.10'
NORTH ABUTMENT	WEST 1ST INTERIOR BEAM	9 7/8"	1 7/8"	54"	5 3/4"	71 1/2"	5.96'
NORTH ABUTMENT	TYPICAL INTERIOR BEAM	9"	1 7/8"	54"	5 3/4"	70 5/8"	5.89'
NORTH ABUTMENT	EAST FASCIA BEAM	10 1/8"	1 7/8"	54"	5 3/4"	71 3/4"	5.98'

DIMENSIONS BETWEEN WORKING POINTS										ELEVATION			
POINT	STATION	X-COORDINATE	Y-COORDINATE	A	B	C	D	E	F	TOP OF FIN. DECK ①	FIN. DECK TO BR. SEAT ③	BRIDGE SEAT	POINT
A	215+58.20	486776.022	147549.622		129.00	42.01	104.79		99.06	899.85	6.10	893.75	A
B	216+87.20	486769.405	147678.452				42.01	228.32		900.01	6.10	893.91	B
C	215+29.42	486808.061	147522.452				129.00	77.70	94.58	899.71	-	-	C
D	216+58.42	486801.445	147651.282						77.70	900.69	-	-	D
E	214+76.20	486867.321	147472.198					129.00	897.83	5.98	-	891.85	E
F	216+05.20	486860.705	147601.028						900.34	5.98	-	894.36	F

NOTES:

- ① TOP OF FINISHED DECK IS THEORETICAL TOP OF CONCRETE WEARING COURSE EXTENDED LEVEL BELOW SIDEWALK FOR W.P.'S A, B, E AND F.
- ② AZIMUTHS AND ANGLES OF THE RAILROAD TRACK ALIGNMENT ARE GIVEN AT THE INTERSECTION OF SB CSAH 78 AND TRACK. VALUES ARE BASED ON THE SURVEY SHOTS IMMEDIATELY ADJACENT TO INTERSECTION POINTS.
- ③ SLAB THICKNESS AND TOTAL HEIGHT VARIES BELOW SIDEWALK.

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11/01/2017				RELEASE FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR
				REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: ERIC S. HANSON
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02589
 COMM. NO. 0169140

SRF ENGINEERS PLANNERS DESIGNERS
 Consulting Group, Inc.
 DRAWN BY E. JOHNSON
 DESIGNED BY S. NEFF
 CHECKED BY E. HANSON

ANOKA COUNTY
 BRIDGE LAYOUT
 CSAH 78 OVER BNSF RAILWAY COMPANY

SHEET BC3 OF BC42

SOUTH ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE R_n - TONS/PILE		
FIELD CONTROL METHOD	ϕ_{dyn}	* R_n
MnDOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000}} \times \text{LOG}(\frac{10}{S})$	0.50	328.0
PDA	0.65	252.3

* $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{dyn}$

SOUTH ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	156.8
FACTORED LIVE LOAD	7.2
* FACTORED DESIGN LOAD	164.0

* BASED ON STRENGTH I LOAD COMBINATION

SOUTH ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	156.8
FACTORED DOWNDRAW	73.7
*** FACTORED DEAD LOAD + EARTH PRESSURE + DOWNDRAW	230.5

*** BASED ON STRENGTH I LOAD COMBINATION, NOT INCLUDING TRANSIENT LOADS. ONLY USED FOR COMPARISON WITH FACTORED STRUCTURAL RESISTANCE. NOT TO BE USED FOR DRIVING.

PILE NOTES:

4 - 16" C-I-P TEST PILES, 60 FEET LONG.
107 - 16" C-I-P PILES, ESTIMATED LENGTH 50 FEET LONG.
111 - 16" C-I-P PILES REQUIRED FOR SOUTH ABUTMENT.

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS \odot SHALL BE BATTERED 3" PER FOOT IN THE DIRECTION SHOWN.

PILES TO HAVE A NOMINAL DIAMETER OF 16" AND MINIMUM WALL THICKNESS OF $\frac{5}{16}$ ".

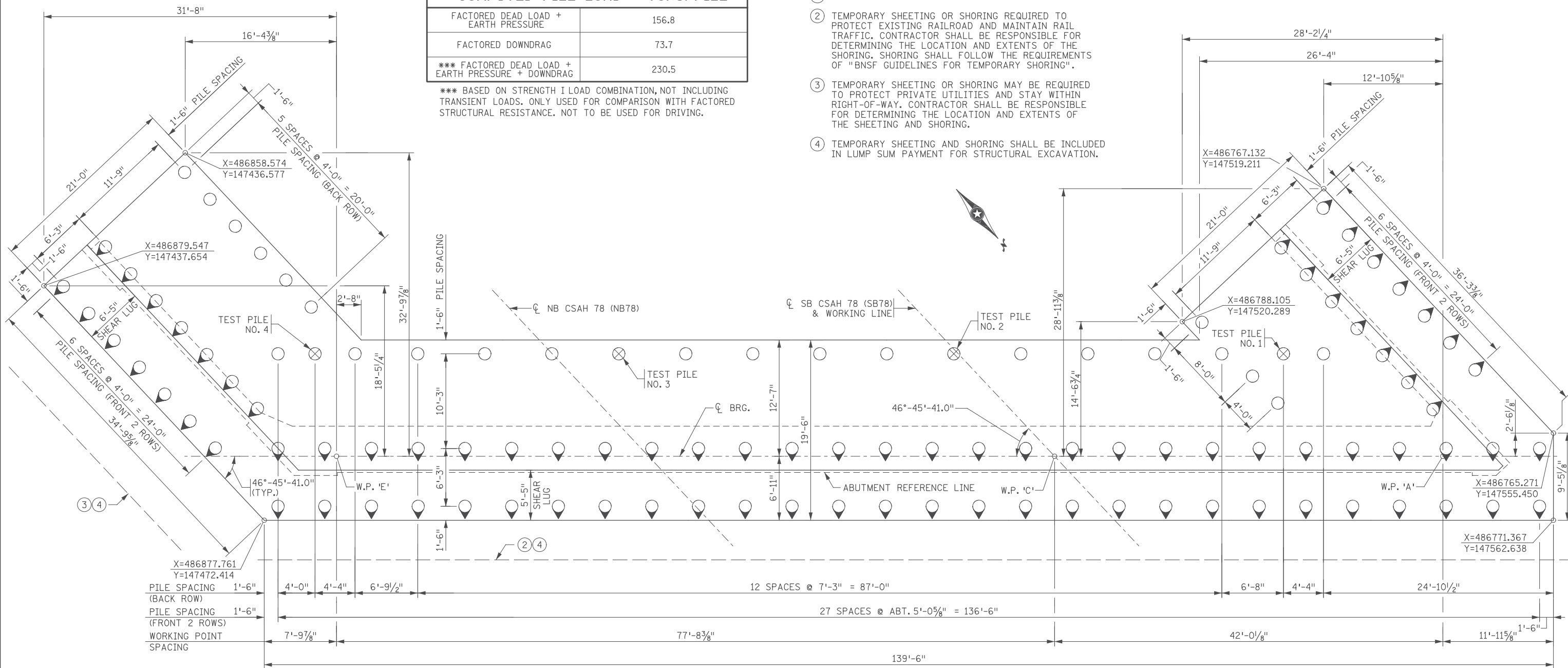
FOR PILE SPLICE DETAILS, SEE DETAIL B201.

NOTES:

- ① DOES NOT INCLUDE TEST PILES.
- ② TEMPORARY SHEETING OR SHORING REQUIRED TO PROTECT EXISTING RAILROAD AND MAINTAIN RAIL TRAFFIC. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE LOCATION AND EXTENTS OF THE SHORING. SHORING SHALL FOLLOW THE REQUIREMENTS OF "BNSF GUIDELINES FOR TEMPORARY SHORING".
- ③ TEMPORARY SHEETING OR SHORING MAY BE REQUIRED TO PROTECT PRIVATE UTILITIES AND STAY WITHIN RIGHT-OF-WAY. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE LOCATION AND EXTENTS OF THE SHEETING AND SHORING.
- ④ TEMPORARY SHEETING AND SHORING SHALL BE INCLUDED IN LUMP SUM PAYMENT FOR STRUCTURAL EXCAVATION.

SUMMARY OF QUANTITIES : S. ABUTMENT

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (1G52) (BR NO 02589)	CU YD	561
STRUCTURAL CONCRETE (3B52) (BR NO 02589)	CU YD	1070
REINFORCEMENT BARS	POUND	62410
REINFORCEMENT BARS (EPOXY COATED)	POUND	123640
ARCH CONC TEXTURE (ASHLAR STONE)	SQ FT	3495
ARCH SURFACE FINISH (SINGLE COLOR)	SQ FT	3495
ANTI-GRAFFITI COATING	SQ FT	3495
C-I-P CONCRETE TEST PILE 60 FT LONG 16"	EACH	4
PILE ANALYSIS	EACH	4
C-I-P CONCRETE PILING 16"	LIN FT	5350



SOUTH ABUTMENT FOOTING PLAN

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11/01/2017	RELEASE FOR CONSTRUCTION				
NO	DATE	BY	CKD	APPR	REVISION
...

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: **ERIC S. HANSON**
Eric S. Hanson
Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051
BRIDGE NO.
02589
DRAWN BY
J. HOFFMAN
DESIGNED BY
S. NEFF
CHECKED BY
E. HANSON
COMM. NO. 0169140

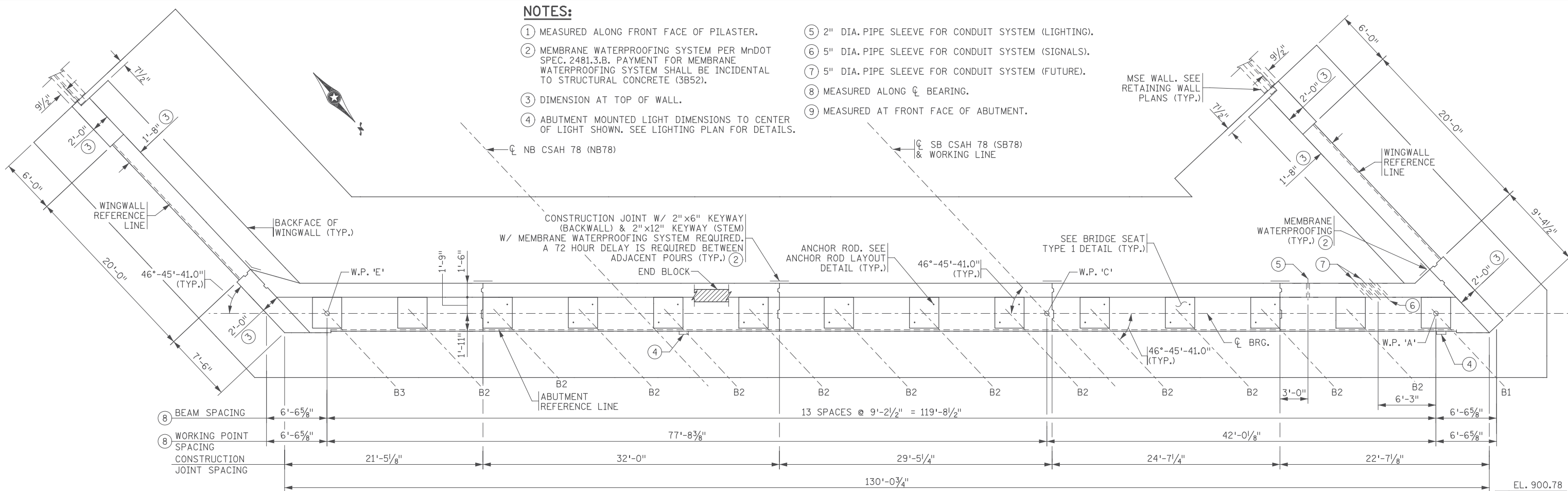


ANOKA COUNTY
SOUTH ABUTMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 1 OF 4)

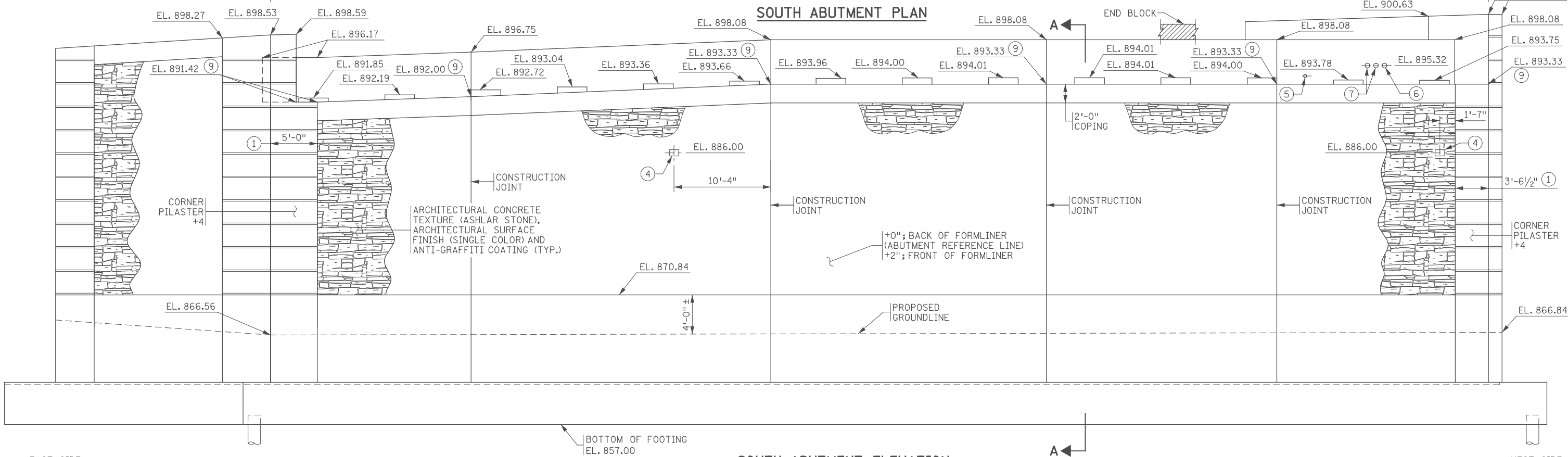
SHEET BC4 OF BC42

NOTES:

- ① MEASURED ALONG FRONT FACE OF PILASTER.
- ② MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3.B. PAYMENT FOR MEMBRANE WATERPROOFING SYSTEM SHALL BE INCIDENTAL TO STRUCTURAL CONCRETE (3B52).
- ③ DIMENSION AT TOP OF WALL.
- ④ ABUTMENT MOUNTED LIGHT DIMENSIONS TO CENTER OF LIGHT SHOWN. SEE LIGHTING PLAN FOR DETAILS.
- ⑤ 2" DIA. PIPE SLEEVE FOR CONDUIT SYSTEM (LIGHTING).
- ⑥ 5" DIA. PIPE SLEEVE FOR CONDUIT SYSTEM (SIGNALS).
- ⑦ 5" DIA. PIPE SLEEVE FOR CONDUIT SYSTEM (FUTURE).
- ⑧ MEASURED ALONG \bar{C} BEARING.
- ⑨ MEASURED AT FRONT FACE OF ABUTMENT.



SOUTH ABUTMENT PLAN



SOUTH ABUTMENT ELEVATION

11/01/2017	RELEASE FOR CONSTRUCTION				
NO	DATE	BY	CKD	APPR	REVISION

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Eric S. Hanson
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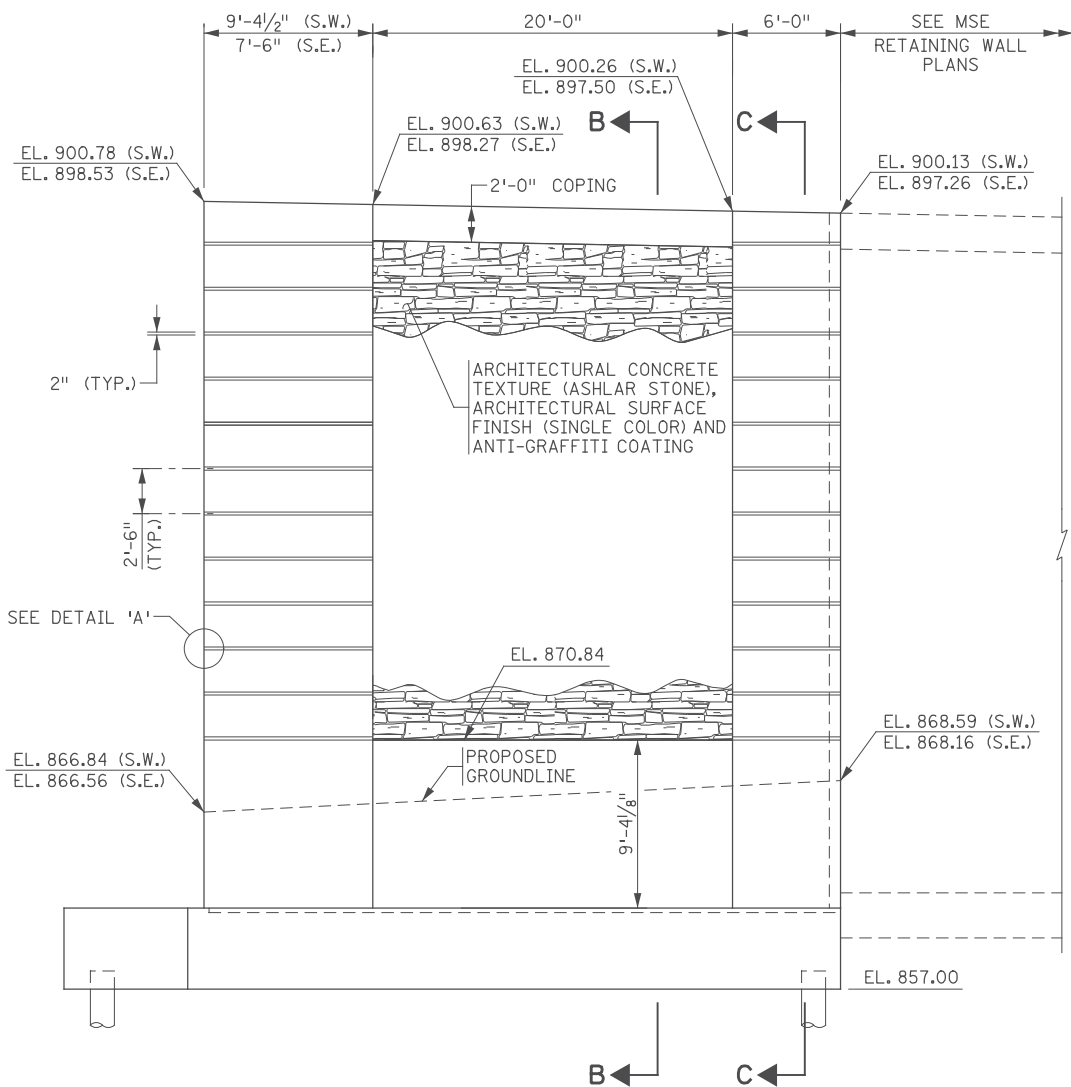
STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
02589
 COMM. NO. 0169140

DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 S. NEFF
 CHECKED BY
 E. HANSON
SRE ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

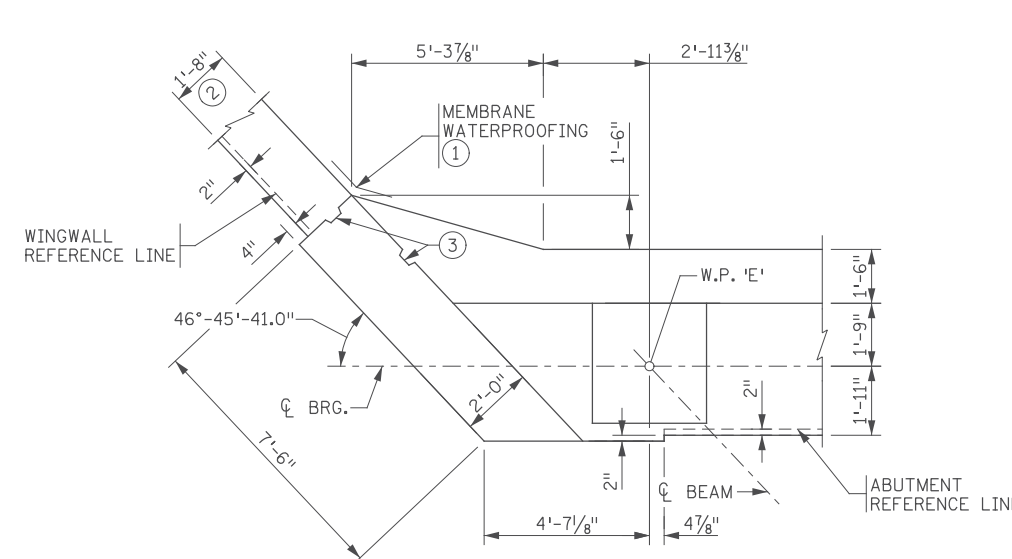
ANOKA COUNTY
 SOUTH ABUTMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
 (SHEET 2 OF 4)

SHEET
BC5
OF
BC42

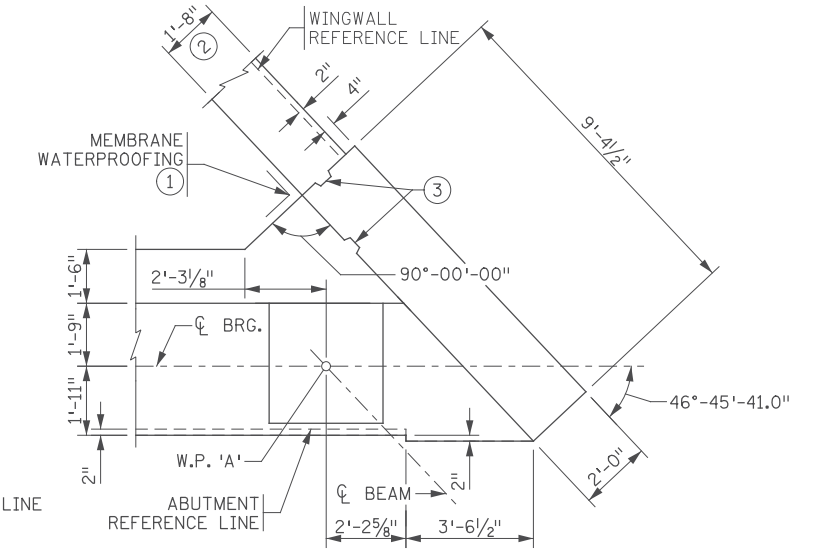
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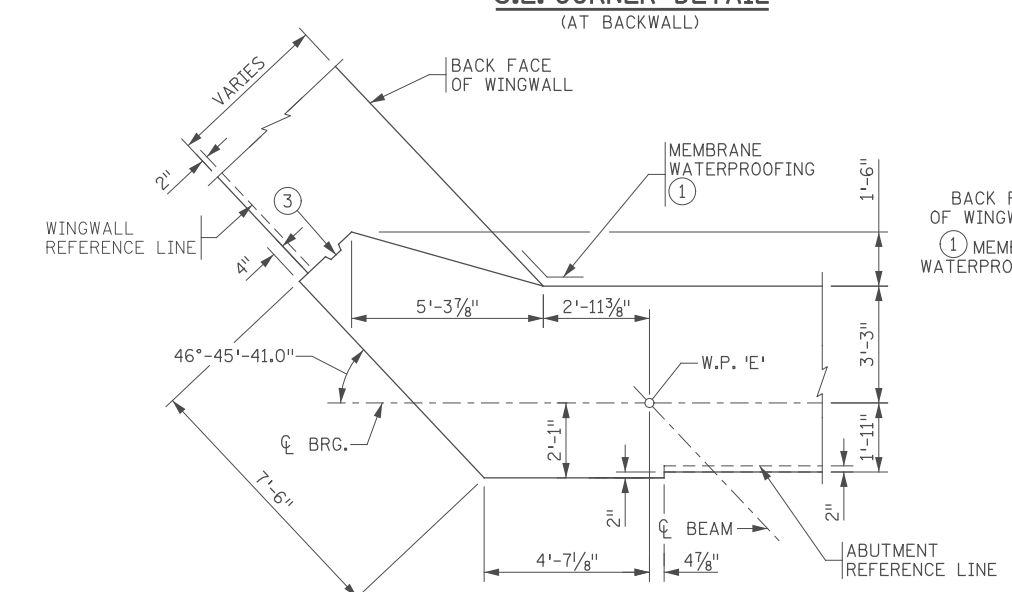
S.E. & S.W. WINGWALL ELEVATION



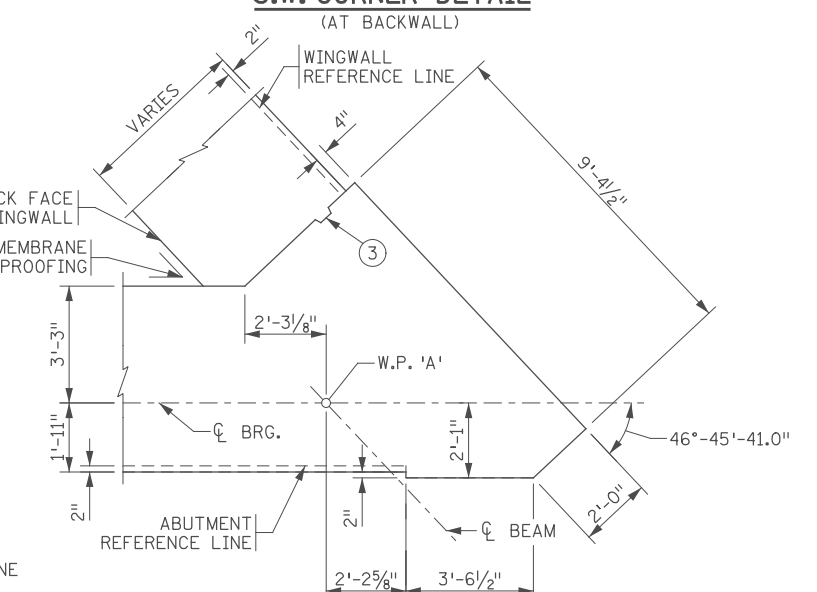
**S.E. CORNER DETAIL
(AT BACKWALL)**



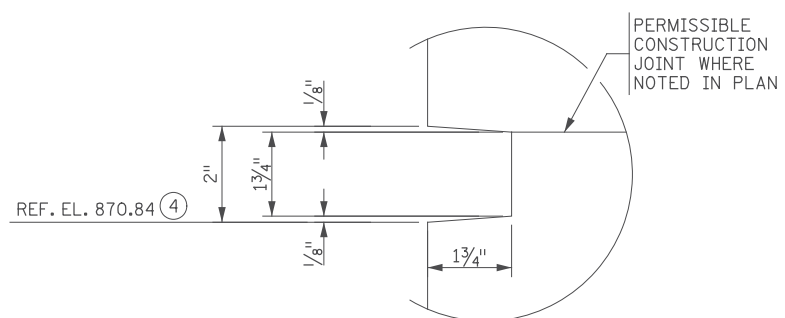
**S.W. CORNER DETAIL
(AT BACKWALL)**



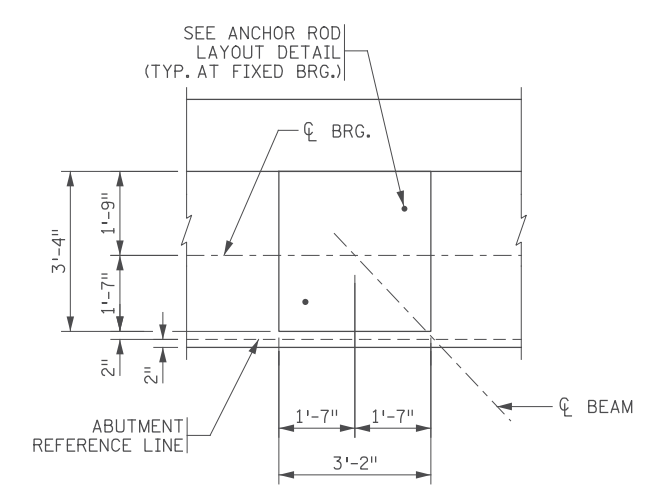
**S.E. CORNER DETAIL
(AT STEM)**



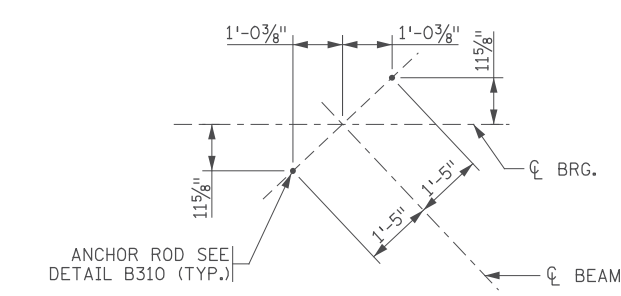
**S.W. CORNER DETAIL
(AT STEM)**



DETAIL 'A'



BRIDGE SEAT TYPE 1 DETAIL



ANCHOR ROD LAYOUT DETAIL

- NOTES:**
- ① PAYMENT FOR MEMBRANE WATERPROOFING SYSTEM SHALL BE INCIDENTAL TO STRUCTURAL CONCRETE (3B52).
 - ② DIMENSION AT TOP OF WALL.
 - ③ PERMISSIBLE CONSTRUCTION JOINT W/ 2" X 6" KEYWAY.
 - ④ PROJECT AESTHETIC REFERENCE ELEVATION.

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NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASE FOR CONSTRUCTION

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Eric S. Hanson

Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

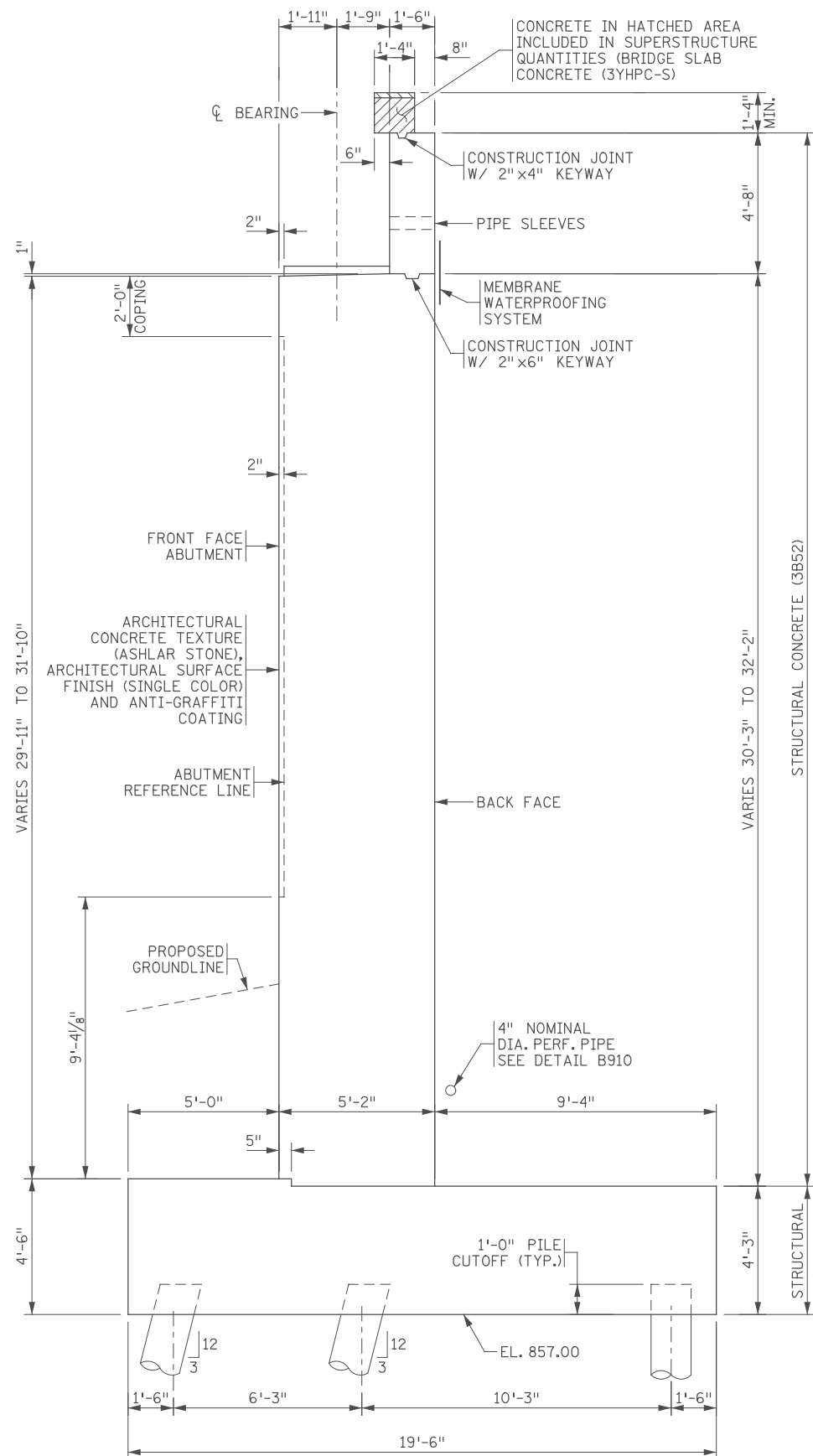
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COMM. NO. 0169140

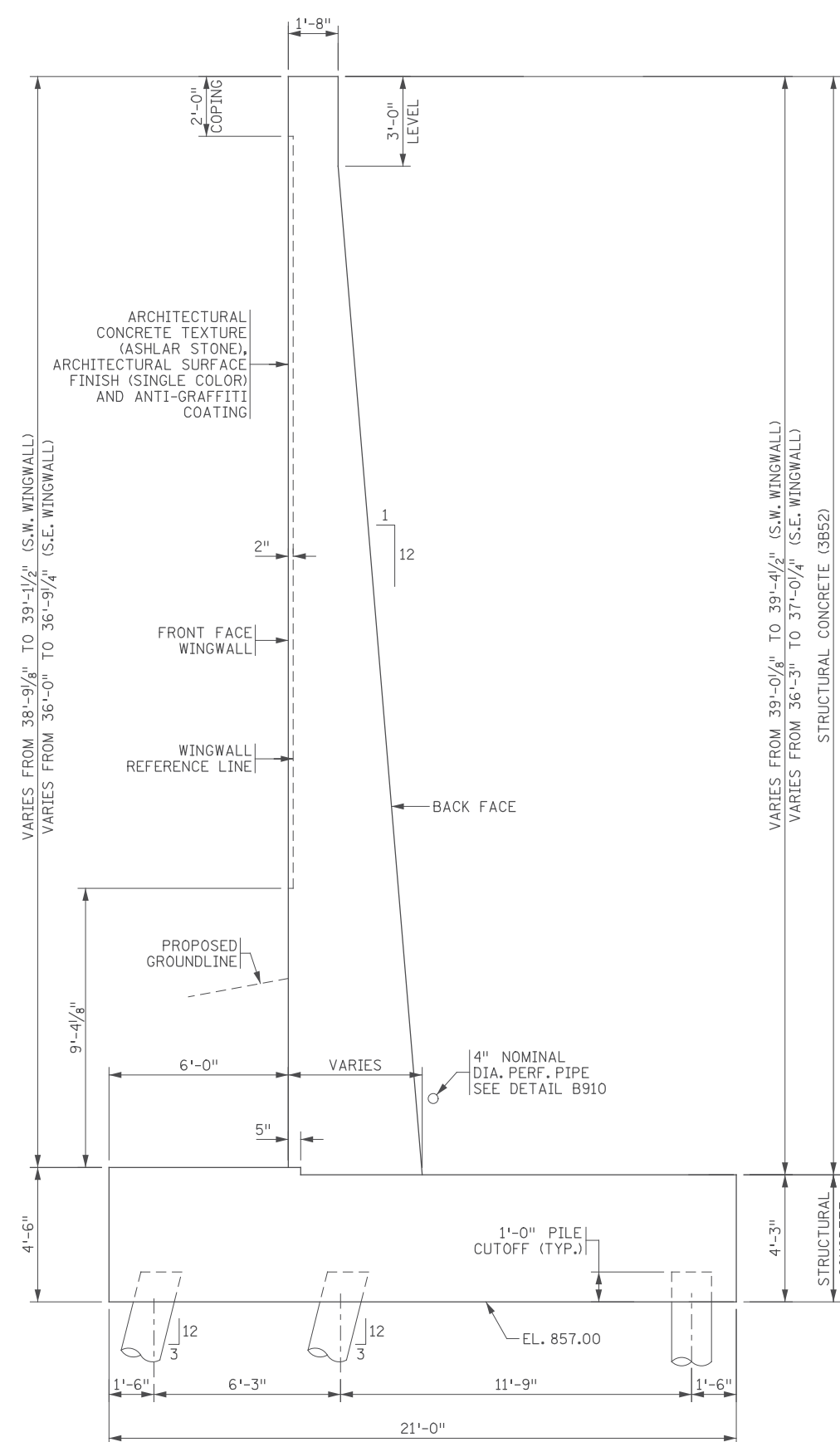

**ENGINEERS
PLANNERS
DESIGNERS**
 Consulting Group, Inc.

ANOKA COUNTY
 SOUTH ABUTMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
 (SHEET 3 OF 4)

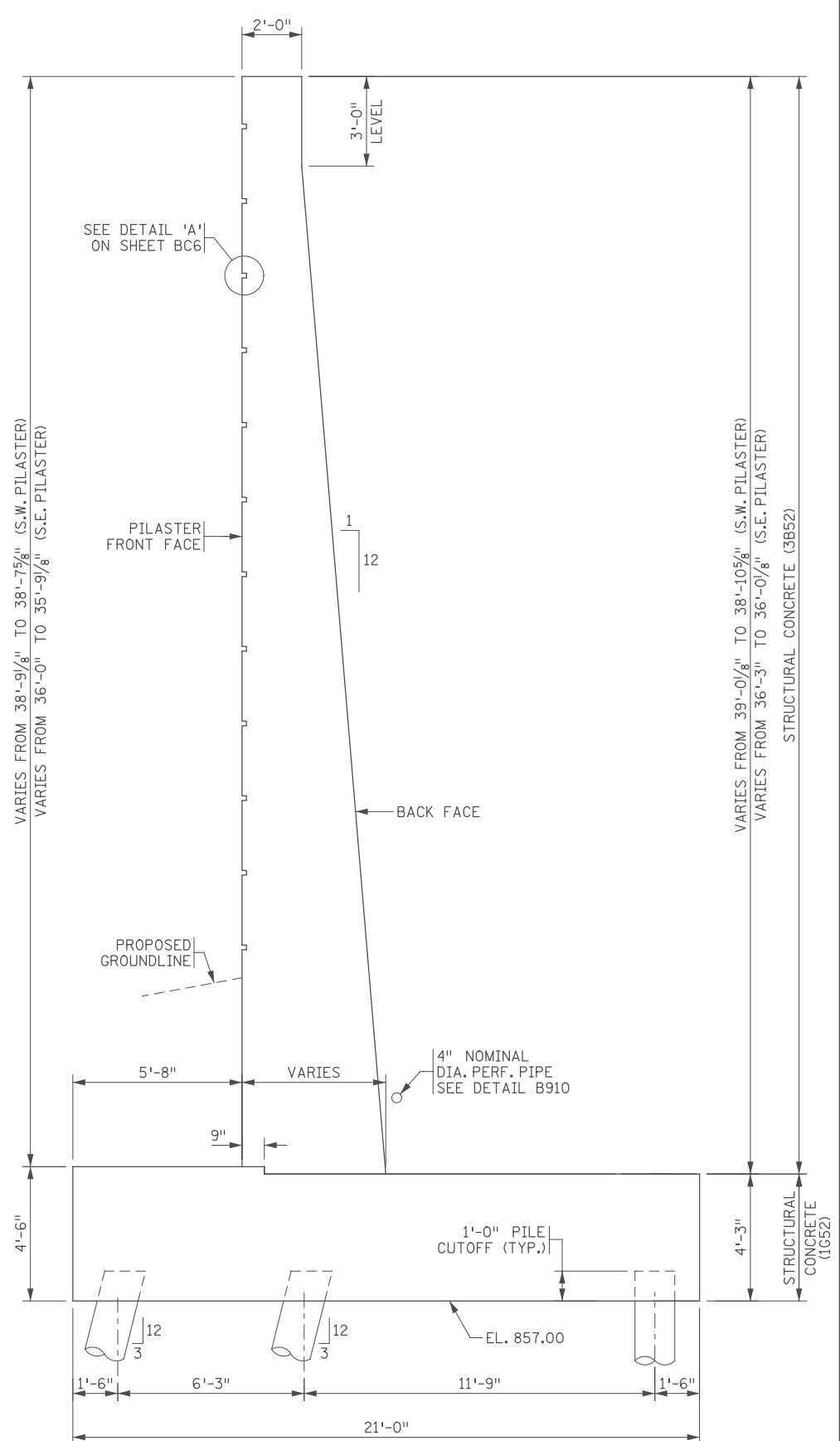
**SHEET
BC6
OF
BC42**



SECTION A-A
(SECTION THRU ABUTMENT)



SECTION B-B
(SECTION THRU WINGWALL)



SECTION C-C
(SECTION THRU PILASTER)

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11/01/2017				RELEASE FOR CONSTRUCTION
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				REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: **ERIC S. HANSON**
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02589
 COMM. NO. 0169140

DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 S. NEFF
 CHECKED BY
 E. HANSON
SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 SOUTH ABUTMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
 (SHEET 4 OF 4)

SHEET
BC7
OF
BC42

NORTH ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE R_n - TONS/PILE		
FIELD CONTROL METHOD	ϕ_{dyn}	* R_n
MnDOT PILE FORMULA 2012 (MPF12)	0.50	328.0
$R_n = 20 \sqrt{\frac{W \times H}{1000}} \times \text{LOG}\left(\frac{10}{S}\right)$		
PDA	0.65	252.3

* $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{dyn}$

NORTH ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	156.8
FACTORED LIVE LOAD	7.2
* FACTORED DESIGN LOAD	164.0

* BASED ON STRENGTH I LOAD COMBINATION

NORTH ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	156.8
FACTORED DOWNDRAW	61.6
*** FACTORED DEAD LOAD + EARTH PRESSURE + DOWNDRAW	218.4

*** BASED ON STRENGTH I LOAD COMBINATION, NOT INCLUDING TRANSIENT LOADS. ONLY USED FOR COMPARISON WITH FACTORED STRUCTURAL RESISTANCE. NOT TO BE USED FOR DRIVING.

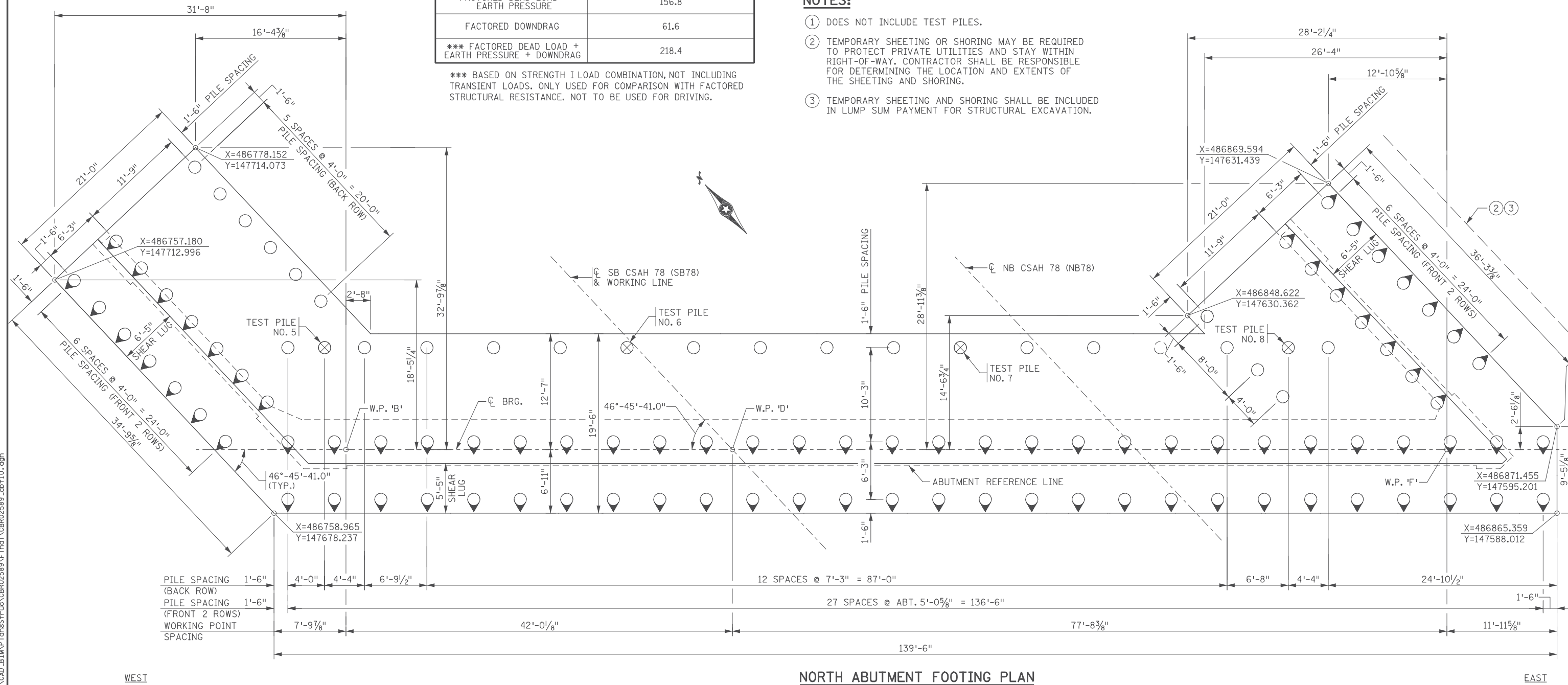
PILE NOTES:

4 - 16" C-I-P TEST PILES, 60 FEET LONG.
 107 - 16" C-I-P PILES, ESTIMATED LENGTH 50 FEET LONG.
 111 - 16" C-I-P PILES REQUIRED FOR NORTH ABUTMENT.
 PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
 PILES MARKED THUS \odot SHALL BE BATTERED 3" PER FOOT IN THE DIRECTION SHOWN.
 PILES TO HAVE A NOMINAL DIAMETER OF 16" AND MINIMUM WALL THICKNESS OF $\frac{5}{16}$ ".
 FOR PILE SPLICE DETAILS, SEE DETAIL B201.

SUMMARY OF QUANTITIES : N. ABUTMENT		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (1G52) (BR NO 02589)	CU YD	561
STRUCTURAL CONCRETE (3B52) (BR NO 02589)	CU YD	1101
REINFORCEMENT BARS	POUND	62410
REINFORCEMENT BARS (EPOXY COATED)	POUND	124510
ARCH CONC TEXTURE (ASHLAR STONE)	SQ FT	3707
ARCH SURFACE FINISH (SINGLE COLOR)	SQ FT	3707
ANTI-GRAFFITI COATING	SQ FT	3707
C-I-P CONCRETE TEST PILE 60 FT LONG 16"	EACH	4
PILE ANALYSIS	EACH	4
① C-I-P CONCRETE PILING 16"	LIN FT	5350

NOTES:

- ① DOES NOT INCLUDE TEST PILES.
- ② TEMPORARY SHEETING OR SHORING MAY BE REQUIRED TO PROTECT PRIVATE UTILITIES AND STAY WITHIN RIGHT-OF-WAY. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE LOCATION AND EXTENTS OF THE SHEETING AND SHORING.
- ③ TEMPORARY SHEETING AND SHORING SHALL BE INCLUDED IN LUMP SUM PAYMENT FOR STRUCTURAL EXCAVATION.



NORTH ABUTMENT FOOTING PLAN

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ANOKA COUNTY
 NORTH ABUTMENT DETAILS
 CSAH 78 OVER BNSF RAILWAY COMPANY
 (SHEET 1 OF 4)

**SHEET
 BC8
 OF
 BC42**

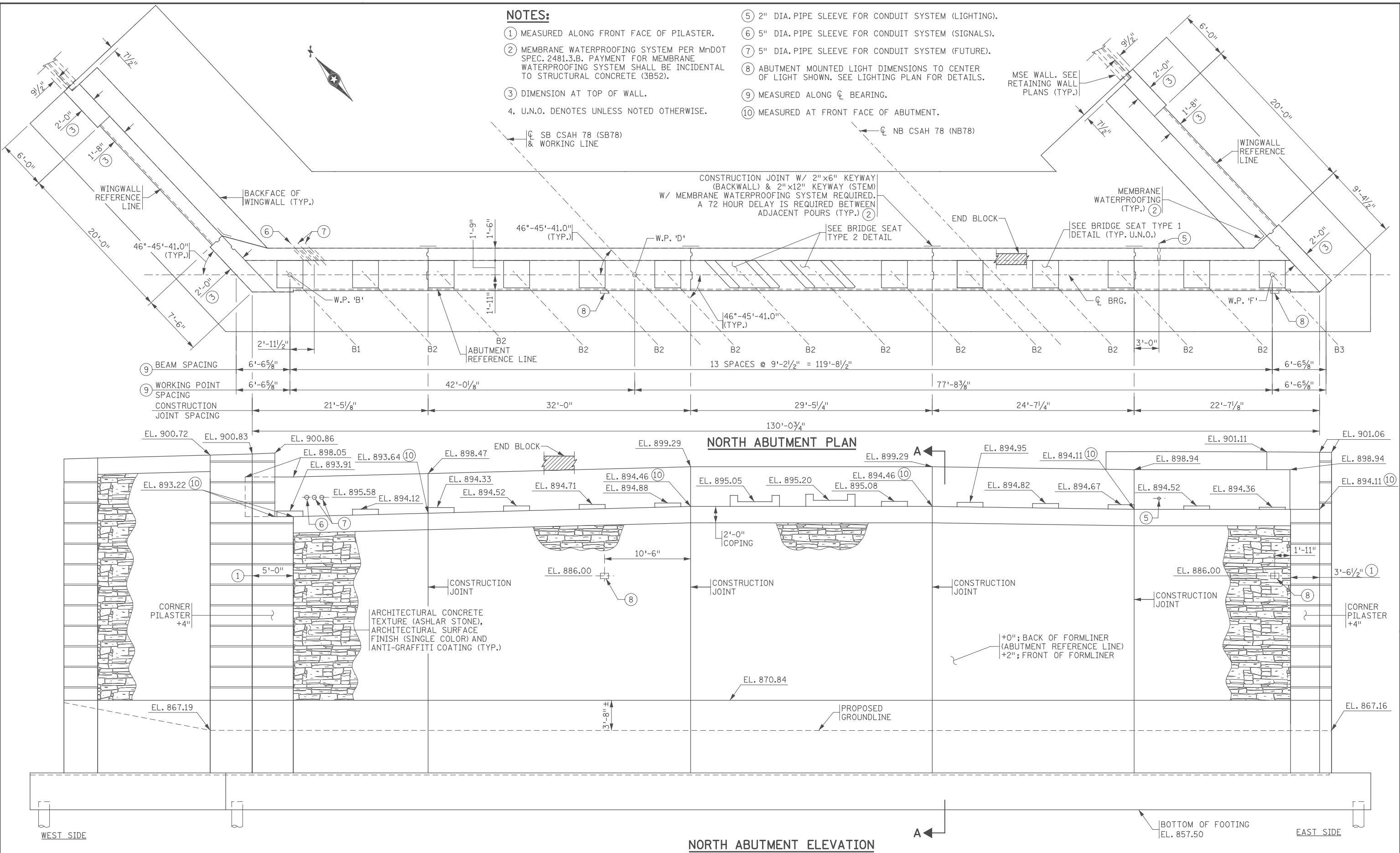
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NOTES:

- ① MEASURED ALONG FRONT FACE OF PILASTER.
- ② MEMBRANE WATERPROOFING SYSTEM PER MnDOT SPEC. 2481.3.B. PAYMENT FOR MEMBRANE WATERPROOFING SYSTEM SHALL BE INCIDENTAL TO STRUCTURAL CONCRETE (3B52).
- ③ DIMENSION AT TOP OF WALL.
- 4. U.N.O. DENOTES UNLESS NOTED OTHERWISE.
- ⑤ 2" DIA. PIPE SLEEVE FOR CONDUIT SYSTEM (LIGHTING).
- ⑥ 5" DIA. PIPE SLEEVE FOR CONDUIT SYSTEM (SIGNALS).
- ⑦ 5" DIA. PIPE SLEEVE FOR CONDUIT SYSTEM (FUTURE).
- ⑧ ABUTMENT MOUNTED LIGHT DIMENSIONS TO CENTER OF LIGHT SHOWN. SEE LIGHTING PLAN FOR DETAILS.
- ⑨ MEASURED ALONG CL BEARING.
- ⑩ MEASURED AT FRONT FACE OF ABUTMENT.

CL SB CSAH 78 (SB78)
& WORKING LINE

CL NB CSAH 78 (NB78)



NORTH ABUTMENT PLAN

NORTH ABUTMENT ELEVATION

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BRIDGE NO.
02589

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DRAWN BY
J. HOFFMAN

DESIGNED BY
S. NEFF

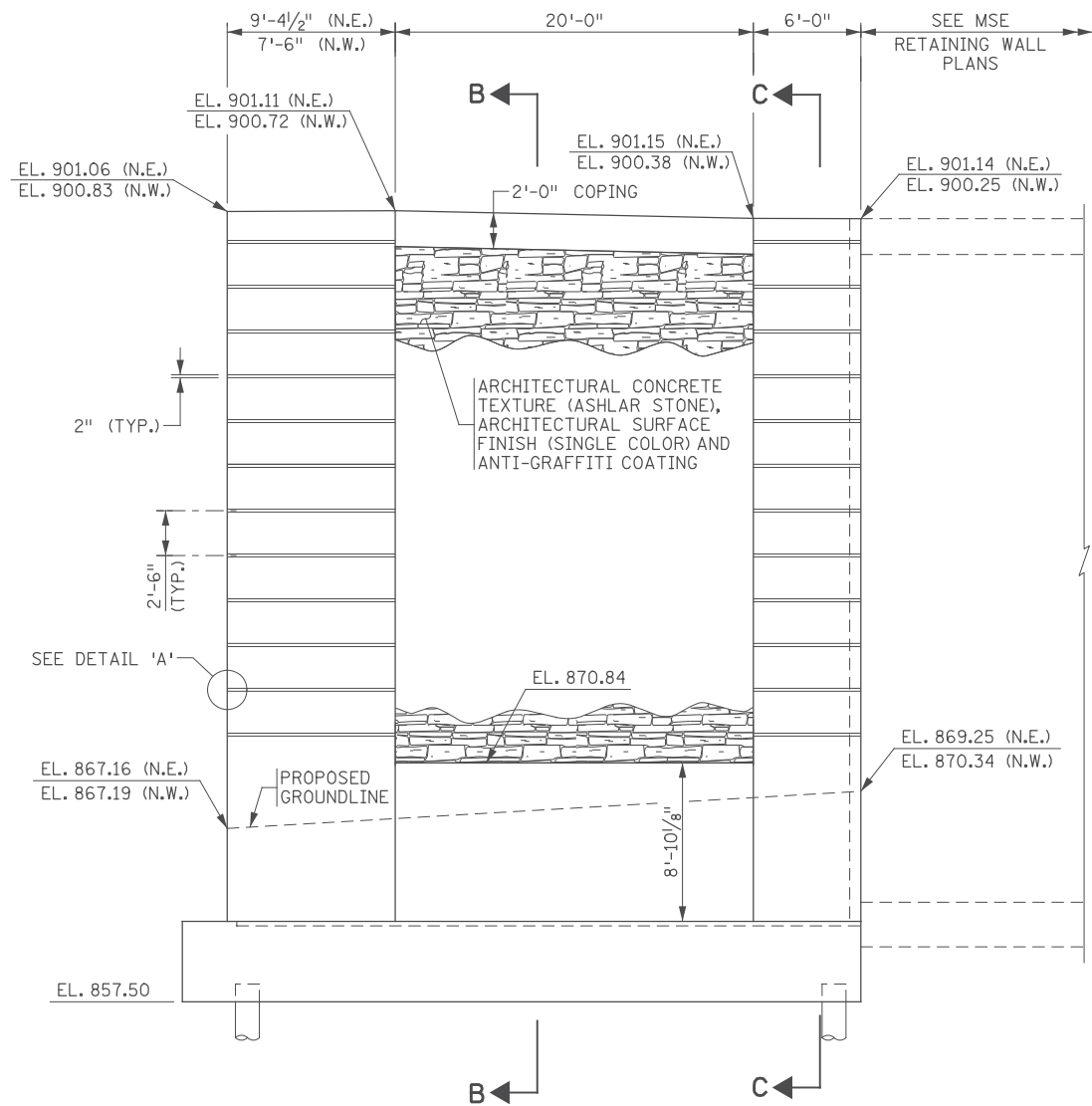
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E. HANSON

SRH CONSULTING GROUP, INC.
ENGINEERS
PLANNERS
DESIGNERS

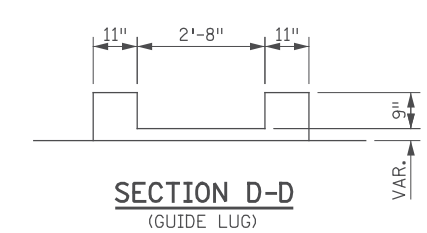
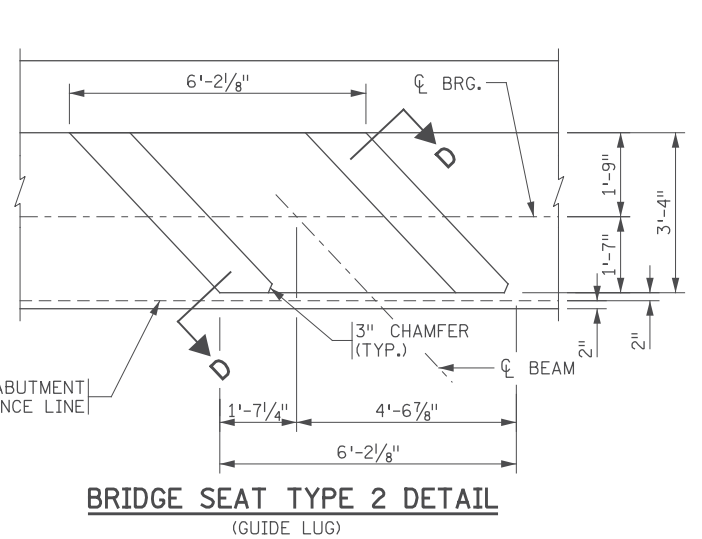
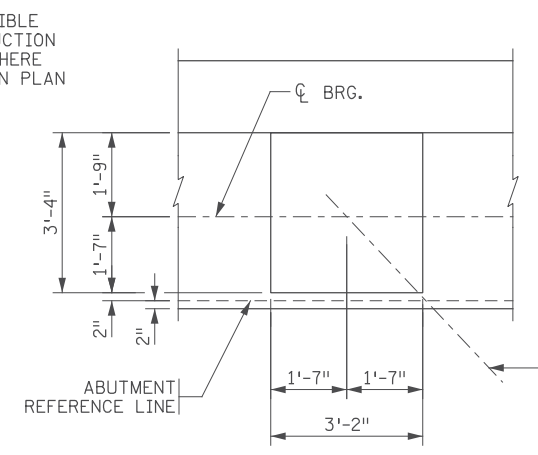
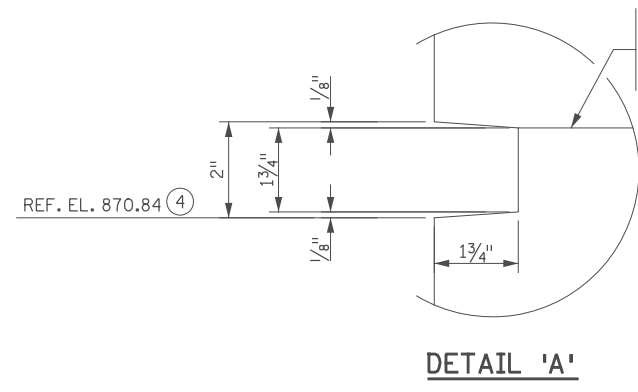
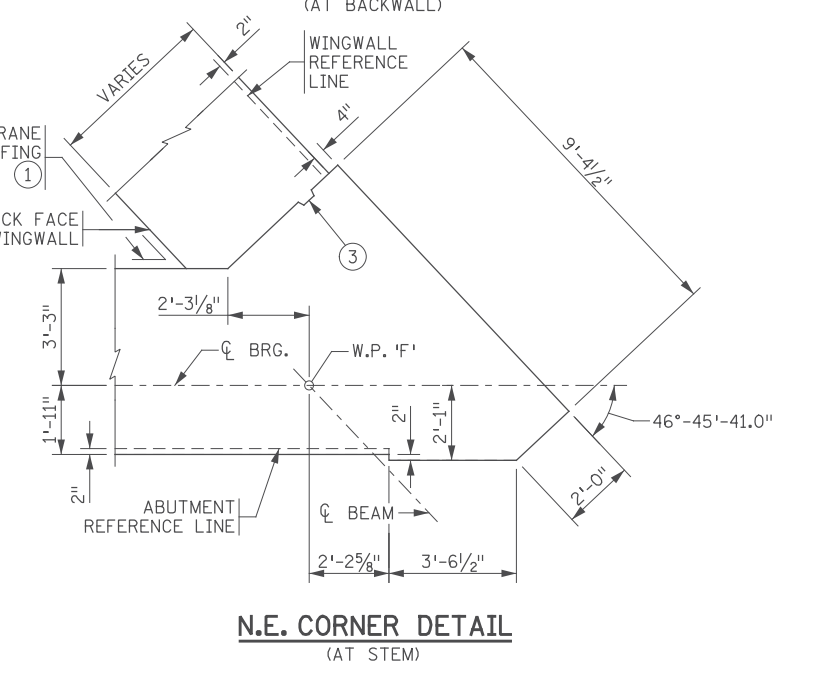
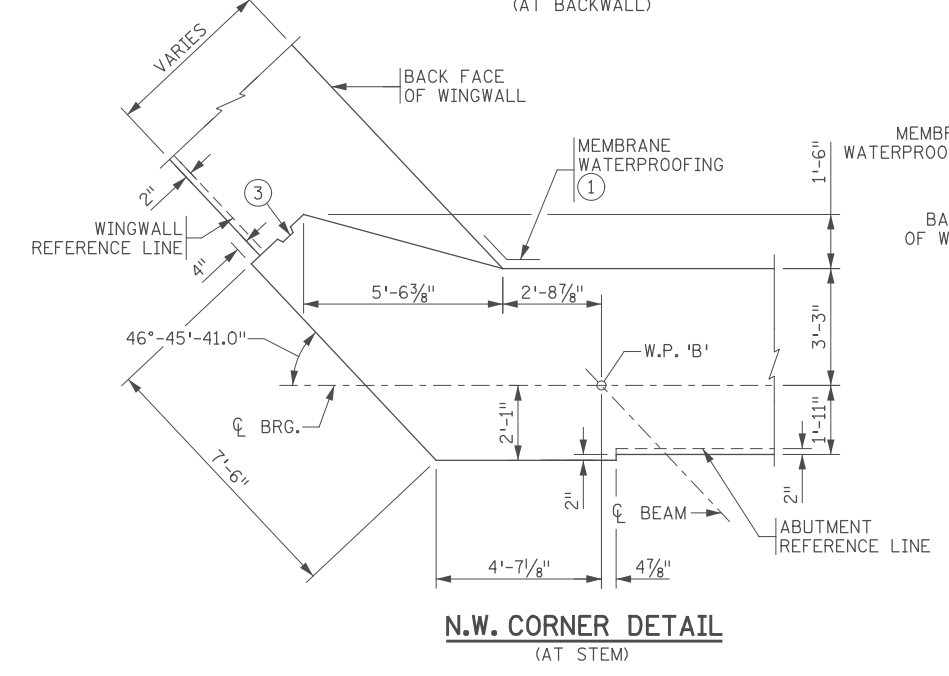
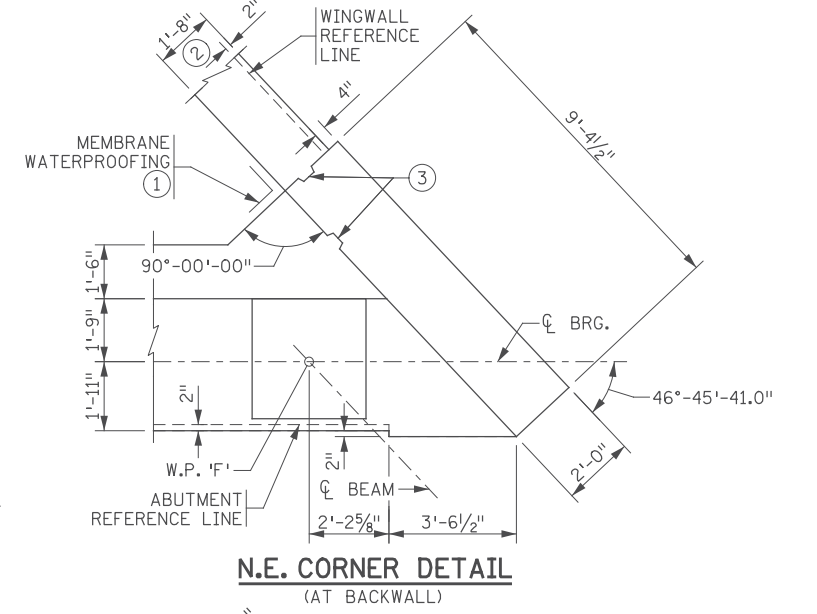
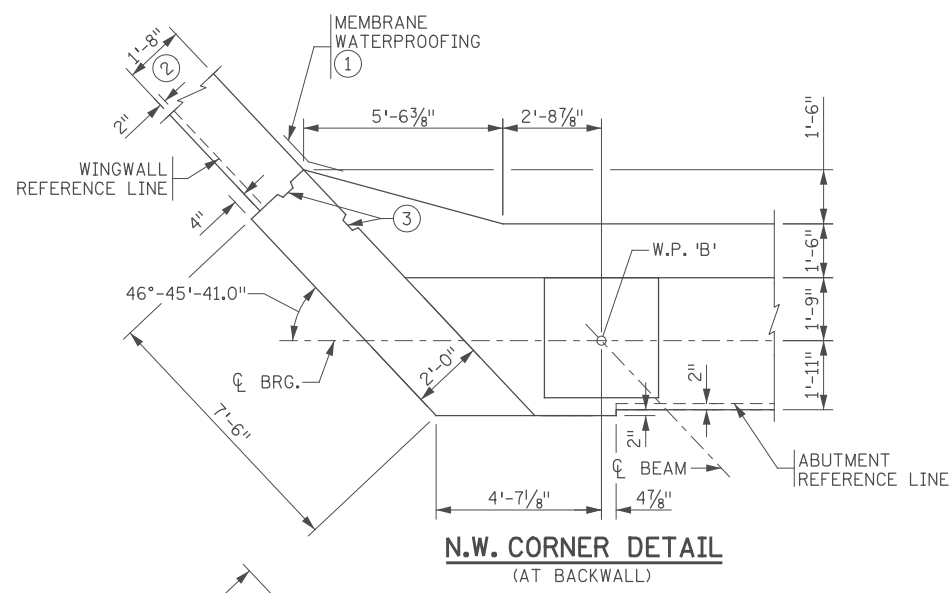
ANOKA COUNTY
NORTH ABUTMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 2 OF 4)

SHEET BC9 OF BC42

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N.E. & N.W. WINGWALL ELEVATION



- NOTES:**
- ① PAYMENT FOR MEMBRANE WATERPROOFING SYSTEM SHALL BE INCIDENTAL TO STRUCTURAL CONCRETE (3B52).
 - ② DIMENSION AT TOP OF WALL.
 - ③ PERMISSIBLE CONSTRUCTION JOINT W/ 2" X 6" KEYWAY.
 - ④ PROJECT AESTHETIC REFERENCE ELEVATION.

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Eric S. Hanson

Date: 11/01/2017 License #: 50463

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SAP 114-020-051

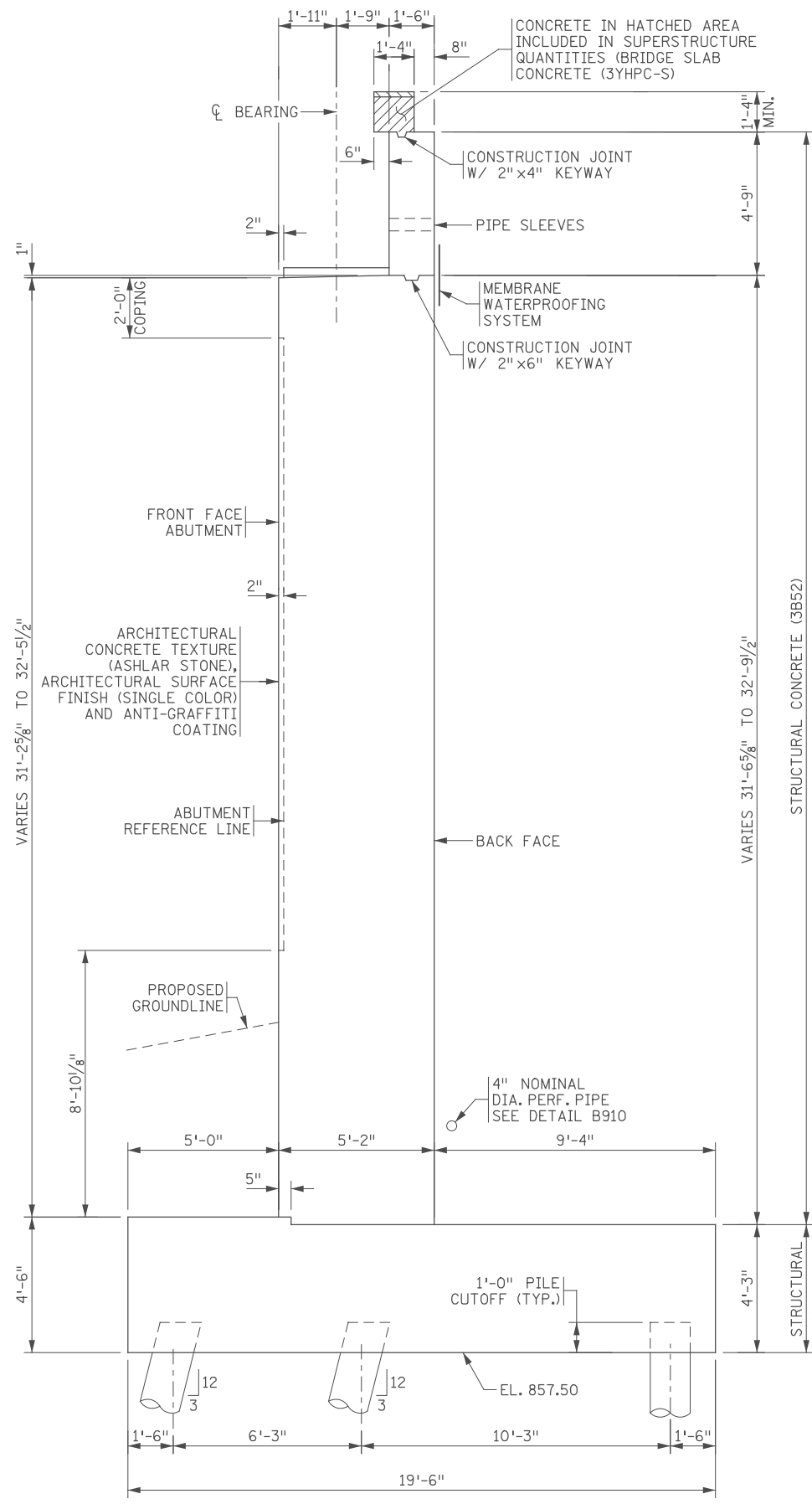
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COMM. NO. 0169140

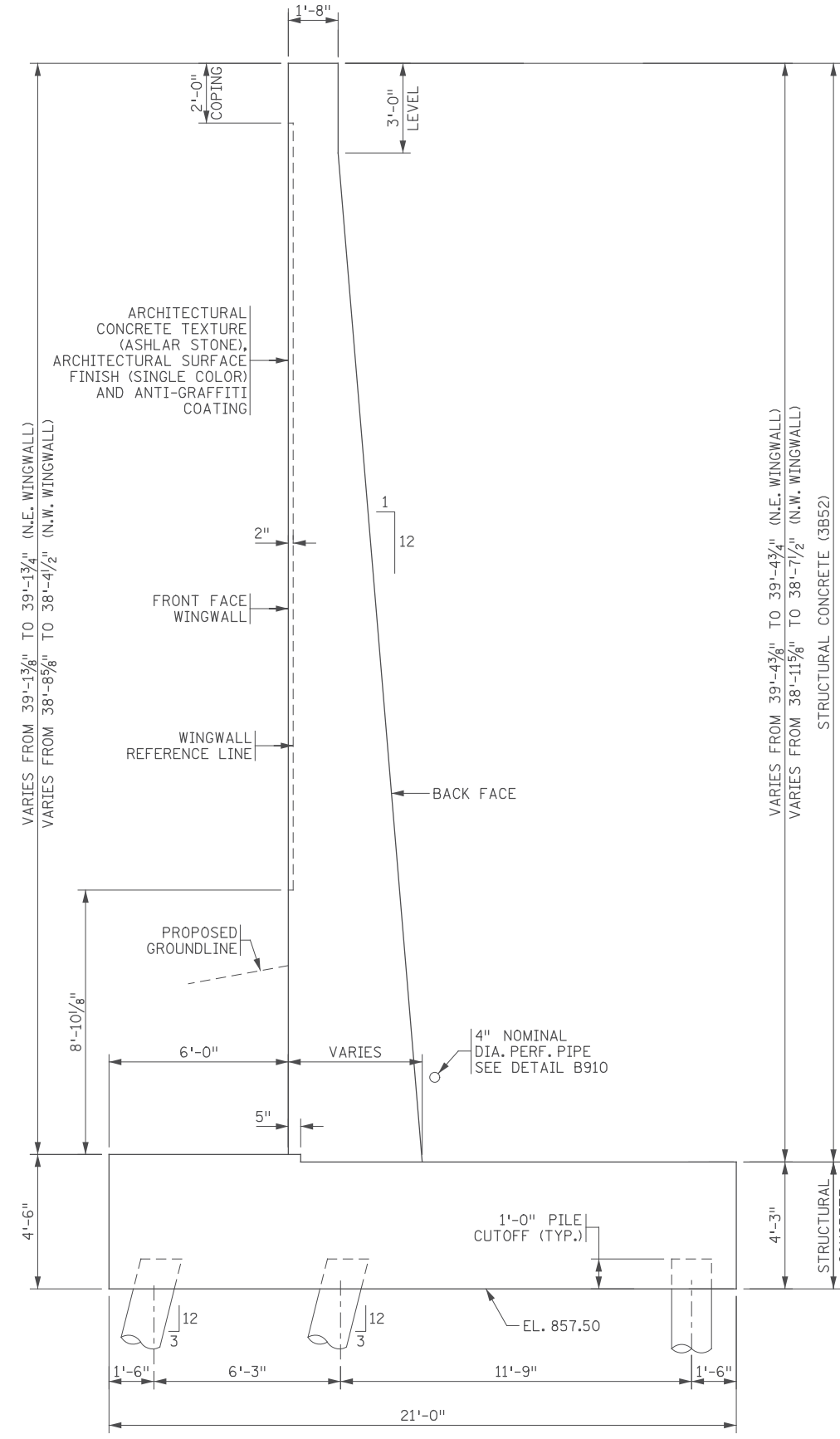


ANOKA COUNTY
NORTH ABUTMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 3 OF 4)

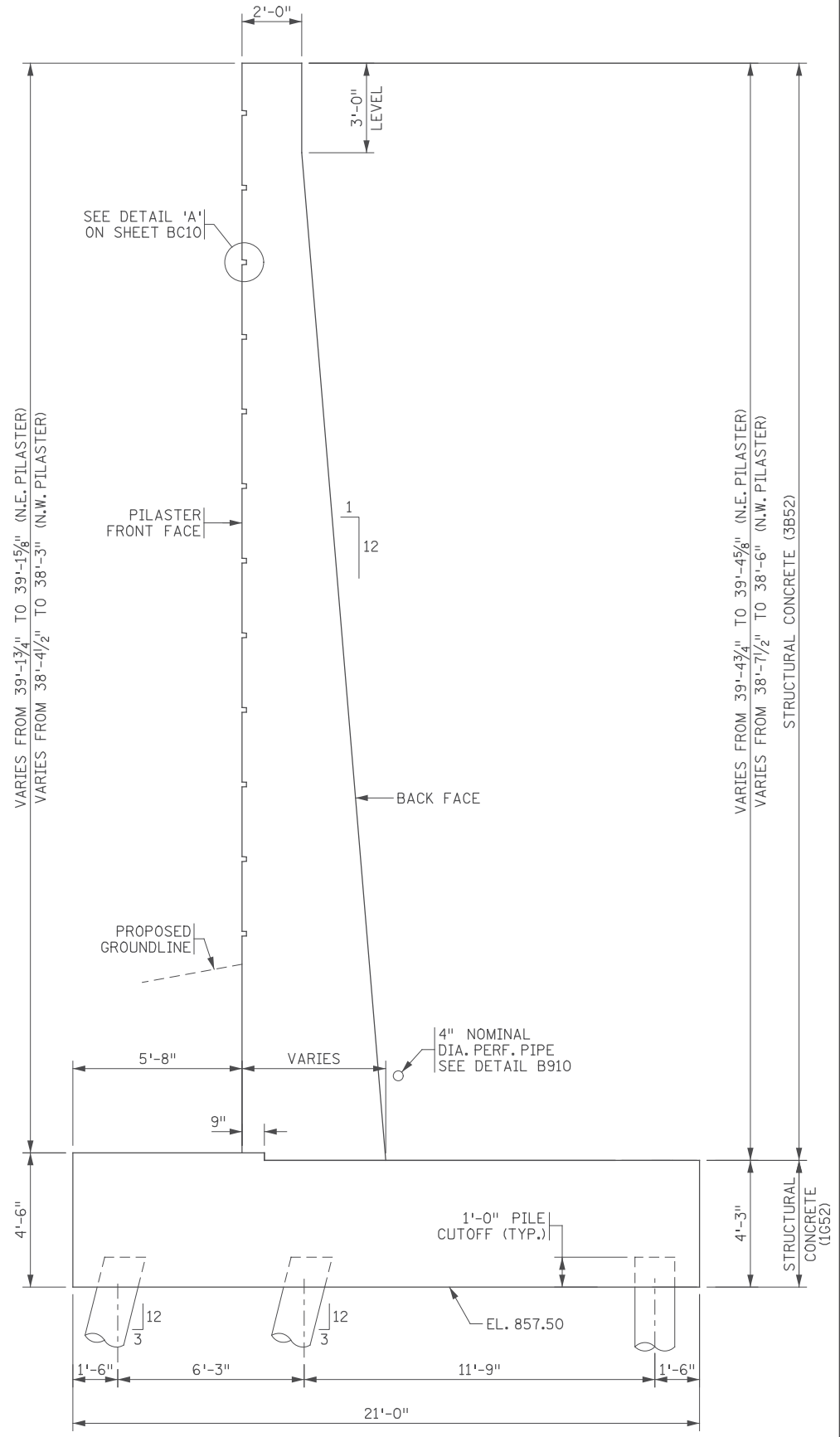
**SHEET
BC10
OF
BC42**



SECTION A-A
(SECTION THRU ABUTMENT)



SECTION B-B
(SECTION THRU WINGWALL)



SECTION C-C
(SECTION THRU PILASTER)

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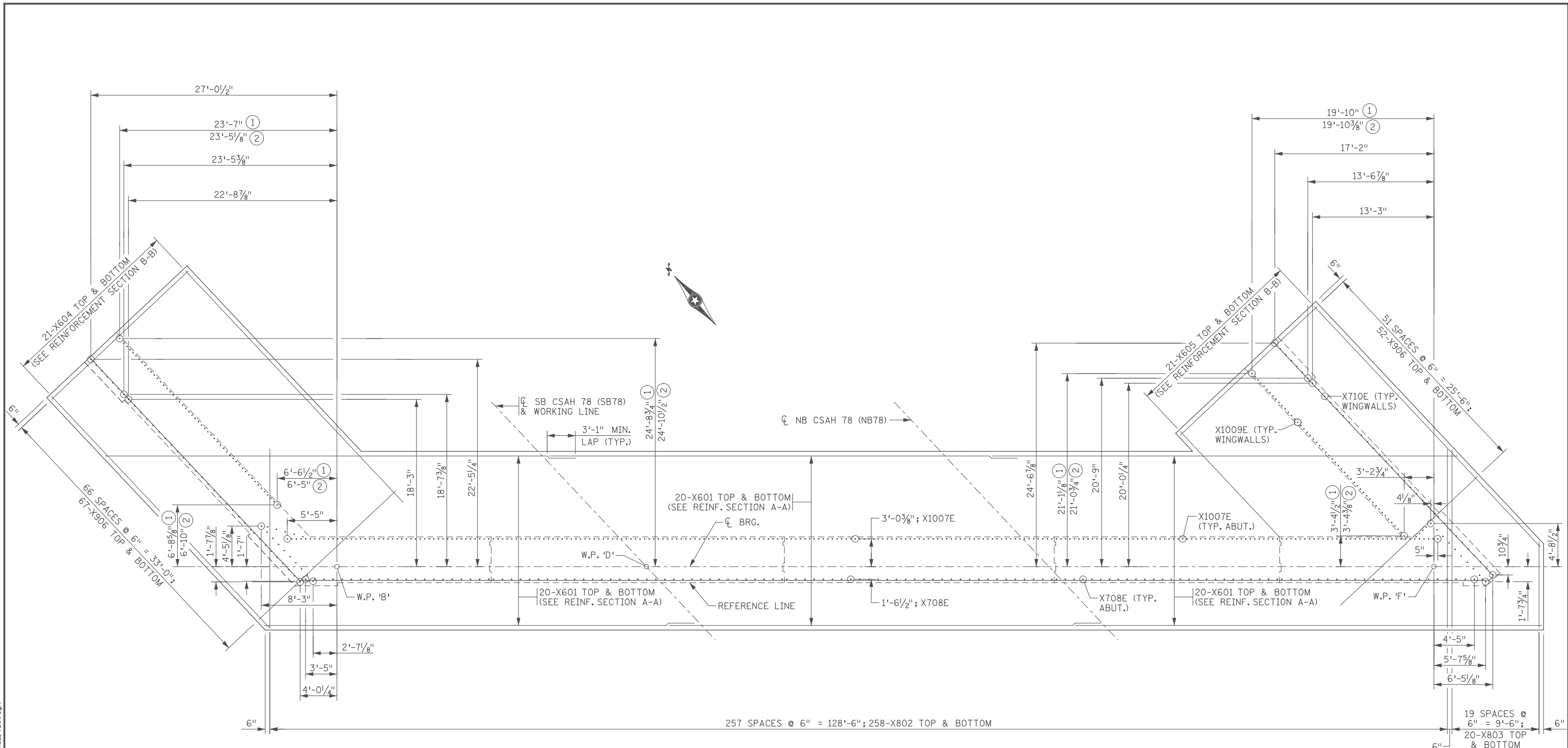
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 SAP 114-020-051
 BRIDGE NO.
 02589
 COMM. NO. 0169140

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 J. HOFFMAN
 DESIGNED BY
 S. NEFF
 CHECKED BY
 E. HANSON
SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 NORTH ABUTMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
 (SHEET 4 OF 4)

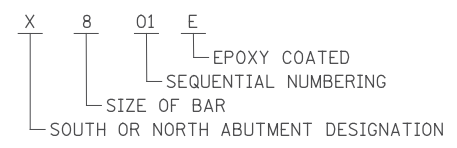
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OF
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ABUTMENT FOOTING REINFORCEMENT PLAN
(NORTH ABUTMENT SHOWN, SOUTH ABUTMENT SIMILAR)

REINFORCEMENT NOTES:

REINFORCEMENT BAR MARKS ARE AS FOLLOWS:



NOTES:

- ① SOUTH ABUTMENT
- ② NORTH ABUTMENT

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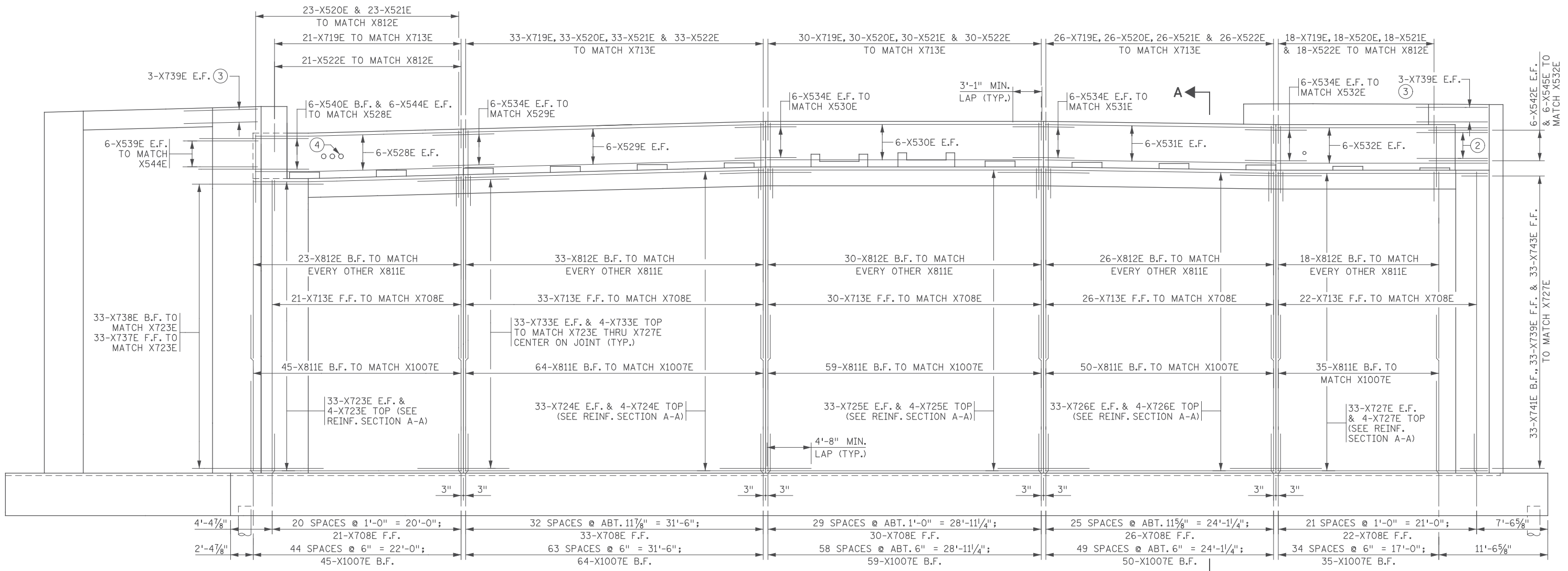
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COMM. NO. 0169140



ANOKA COUNTY
ABUTMENT REINFORCEMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 1 OF 6)

**SHEET
BC12
OF
BC42**

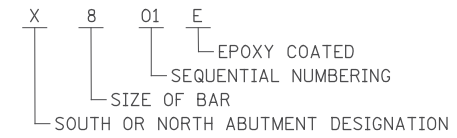


ABUTMENT REINFORCEMENT ELEVATION

(WINGWALL REINFORCEMENT NOT SHOWN FOR CLARITY. SEE WINGWALL REINFORCEMENT ELEVATION)
(NORTH ABUTMENT SHOWN, SOUTH ABUTMENT SIMILAR)

REINFORCEMENT NOTES:

REINFORCEMENT BAR MARKS ARE AS FOLLOWS:



NOTES:

1. E.F. DENOTES EACH FACE
F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
- ② 6-X739E E.F. TO MATCH X542E.
- ③ SEE WINGWALL REINFORCEMENT ELEVATION.
- ④ ADJUST VERTICAL AND HORIZONTAL REINFORCEMENT SLIGHTLY TO ACCOMMODATE PIPE SLEEVES. VERTICAL BARS SHALL EXTEND THROUGH THE CONCRETE BETWEEN CONDUIT SLEEVES.

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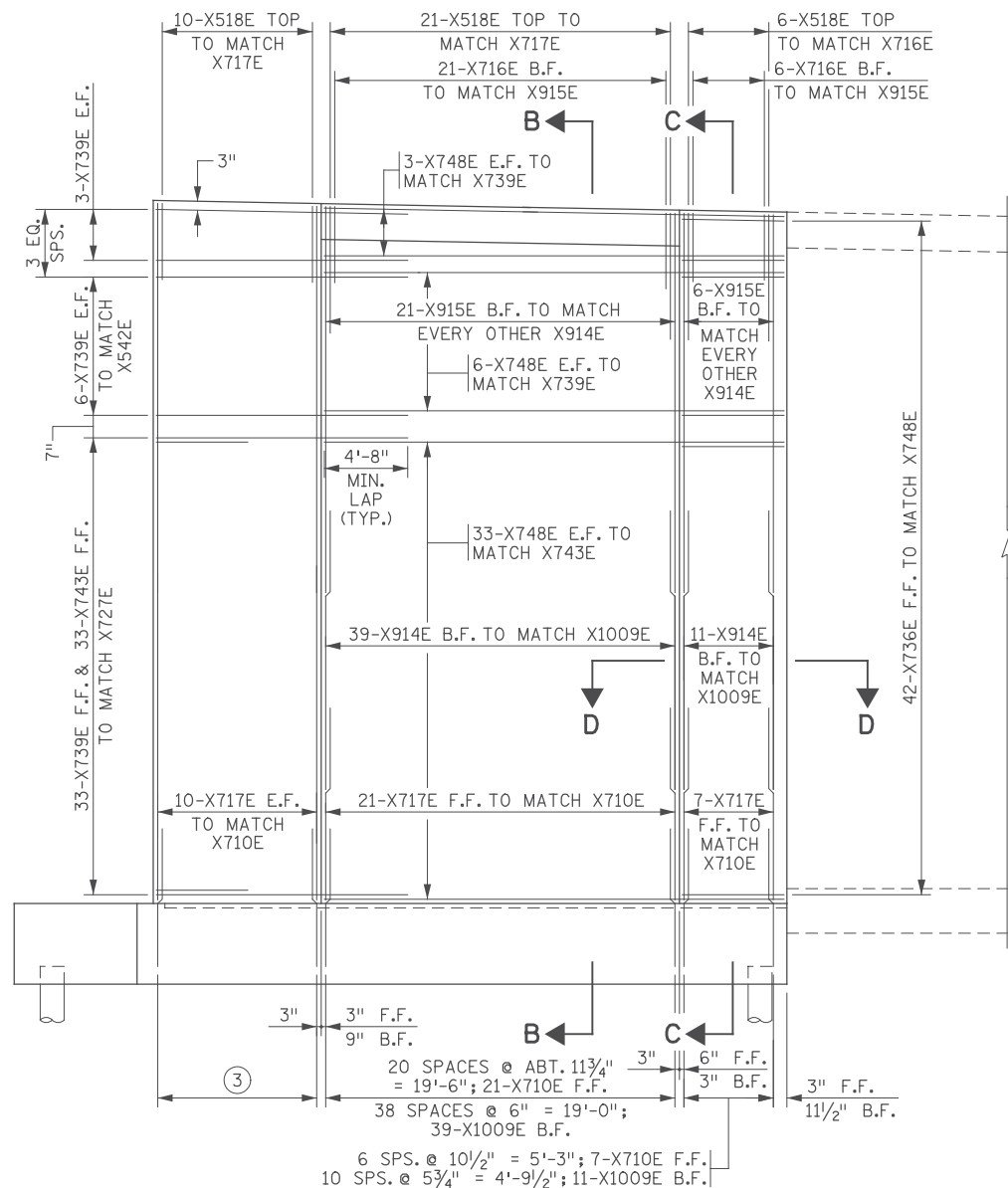
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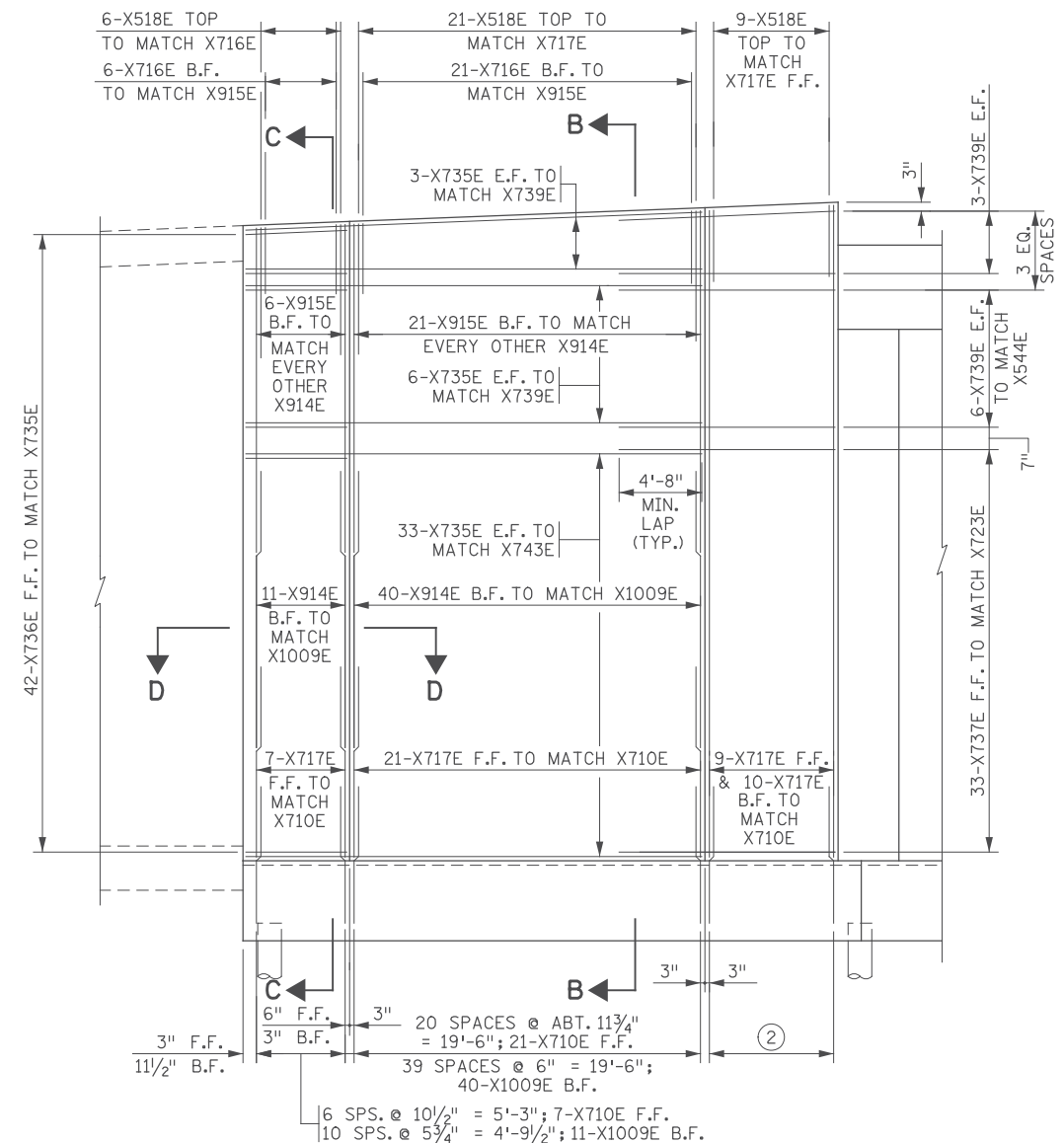


ANOKA COUNTY
ABUTMENT REINFORCEMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 2 OF 6)

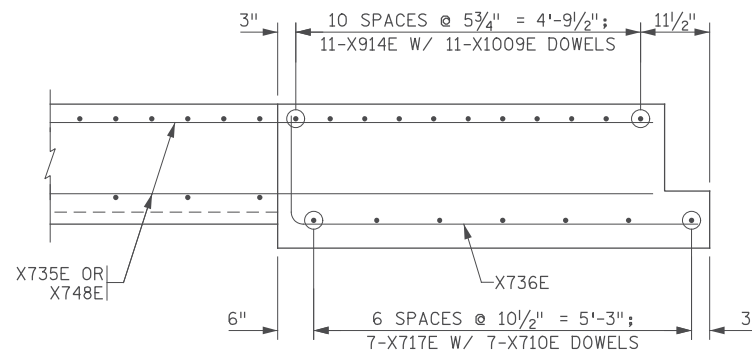
SHEET BC13 OF BC42



S.W. OR N.E. WINGWALL REINFORCEMENT ELEVATION



S.E. OR N.W. WINGWALL REINFORCEMENT ELEVATION

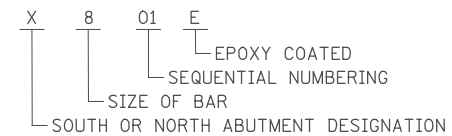


REINFORCEMENT SECTION D-D

(S.W. OR N.E. WINGWALL SHOWN, S.E. OR N.W. WINGWALL SIMILAR)

REINFORCEMENT NOTES:

REINFORCEMENT BAR MARKS ARE AS FOLLOWS:



NOTES:

1. E.F. DENOTES EACH FACE
F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
- ② 8 SPACES @ 11" = 7'-4"; 9-X710E F.F.
9 SPACES @ 11" = 8'-3"; 10-X710E B.F.
- ③ 9 SPACES @ 11 5/8" = 8'-8 5/8"; 10-X710E E.F.

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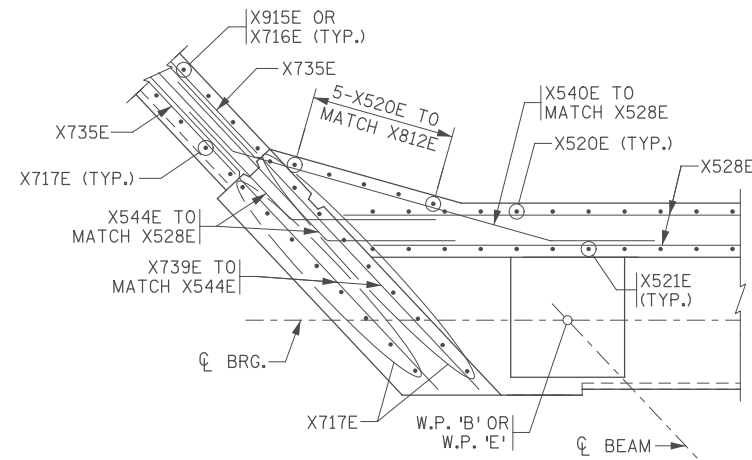
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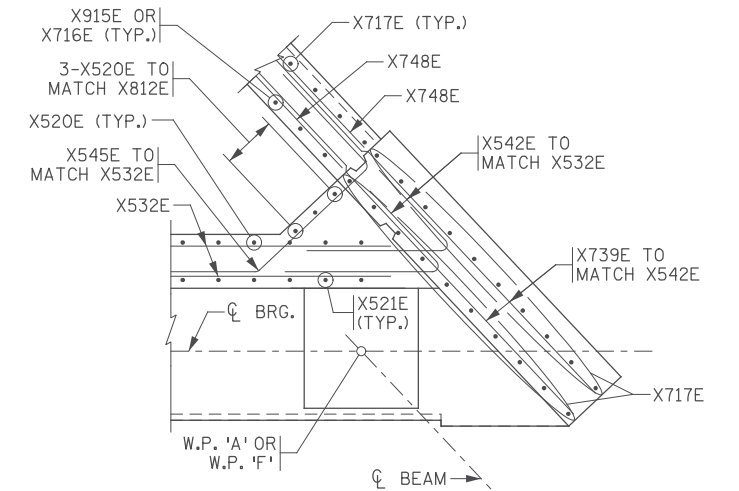
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ANOKA COUNTY
 ABUTMENT REINFORCEMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
 (SHEET 3 OF 6)

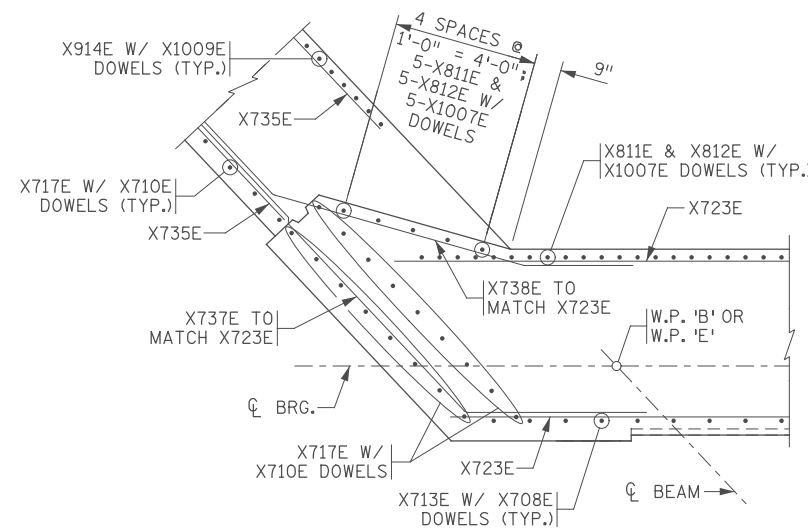
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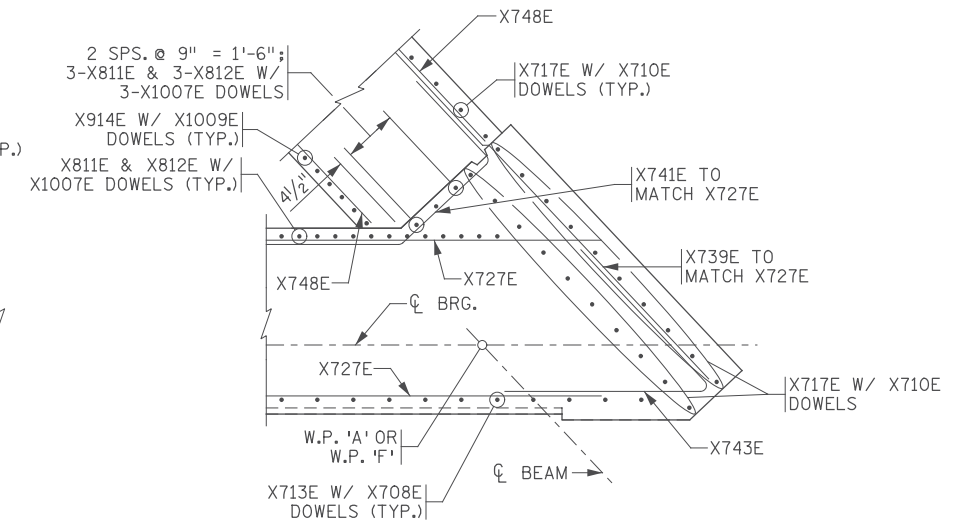
N.W. OR S.E. CORNER REINFORCEMENT DETAIL
(AT BACKWALL)



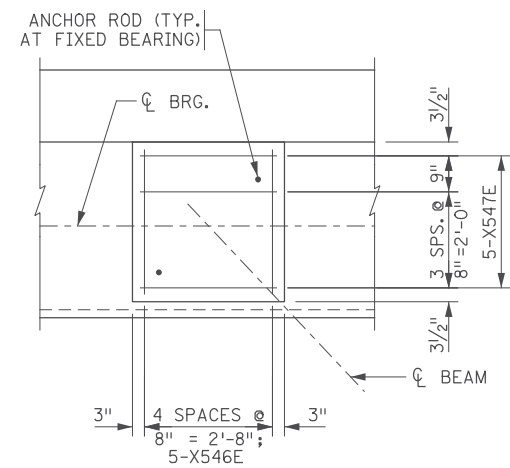
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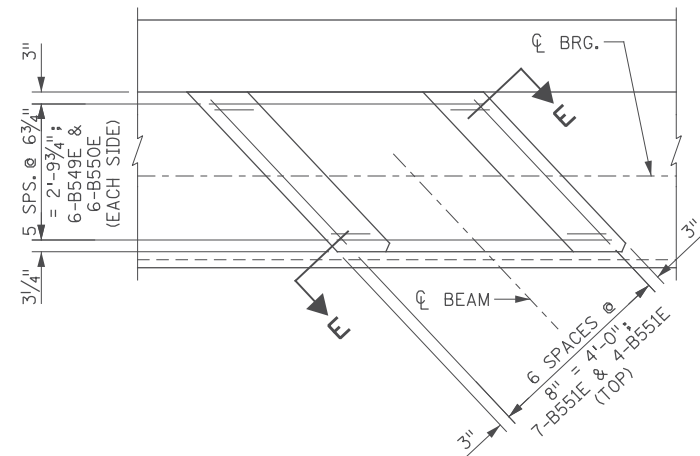
N.W. OR S.E. CORNER REINFORCEMENT DETAIL
(AT STEM)



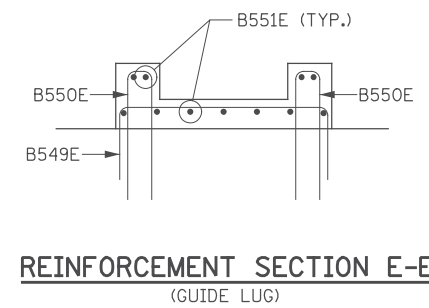
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(AT STEM)



BRIDGE SEAT TYPE 1 REINFORCEMENT DETAIL



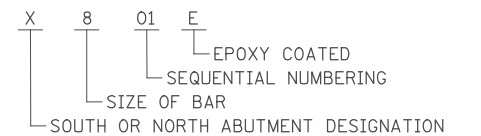
BRIDGE SEAT TYPE 2 REINFORCEMENT DETAIL
(GUIDE LUG)



REINFORCEMENT SECTION E-E
(GUIDE LUG)

REINFORCEMENT NOTES:

REINFORCEMENT BAR MARKS ARE AS FOLLOWS:



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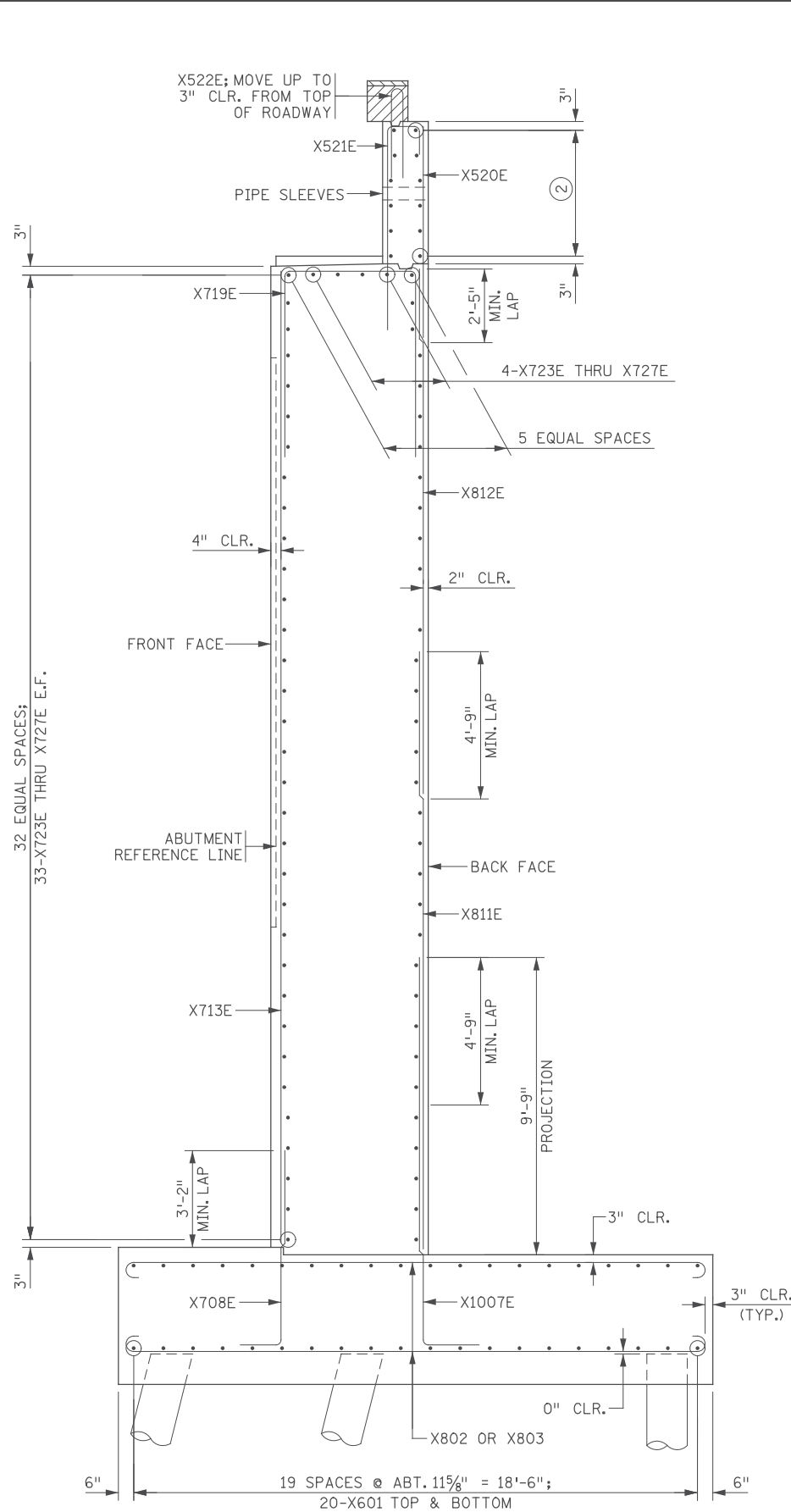
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S. NEFF
CHECKED BY
E. HANSON
COMM. NO. 0169140



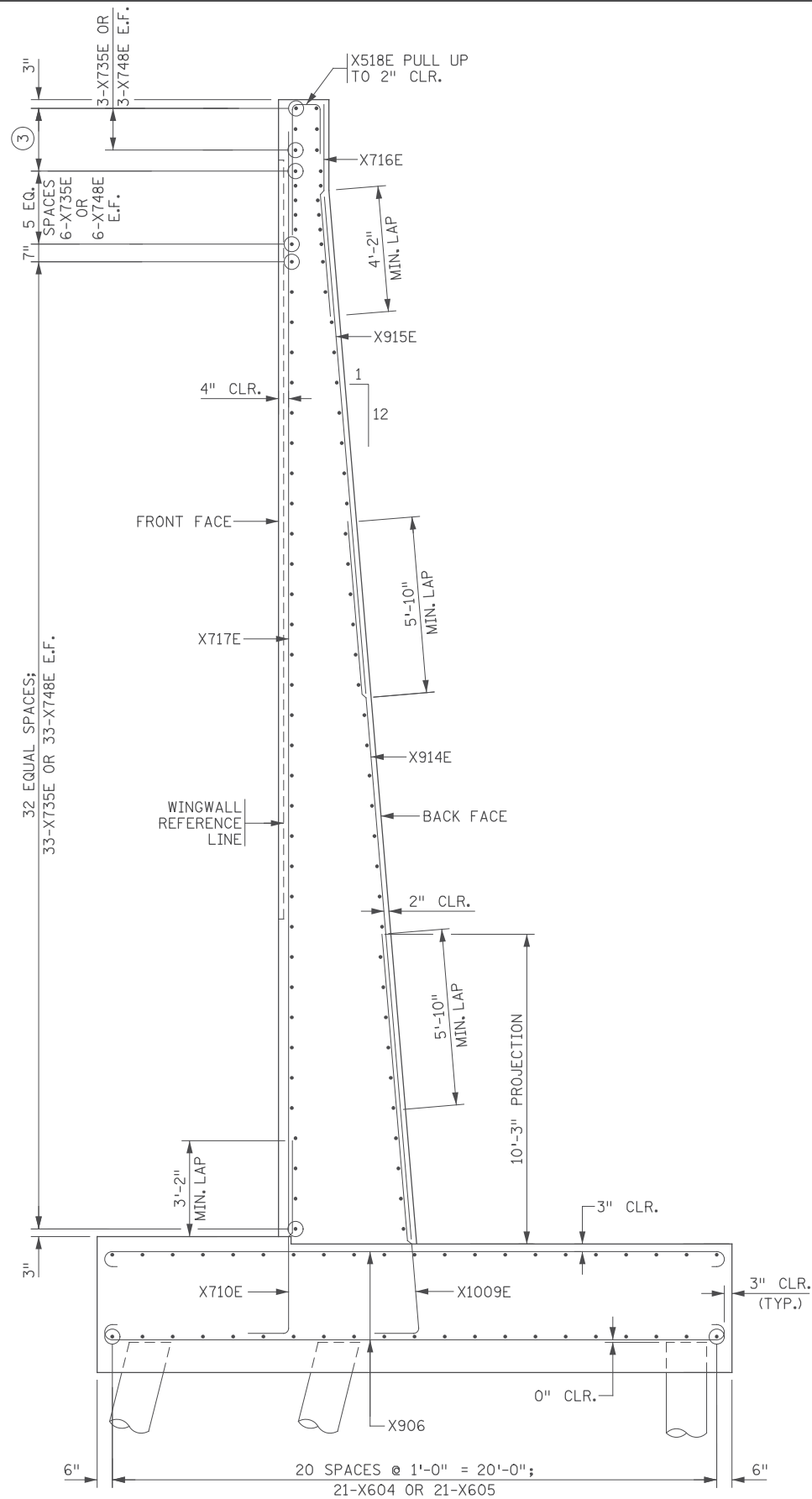
ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
ABUTMENT REINFORCEMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 4 OF 6)

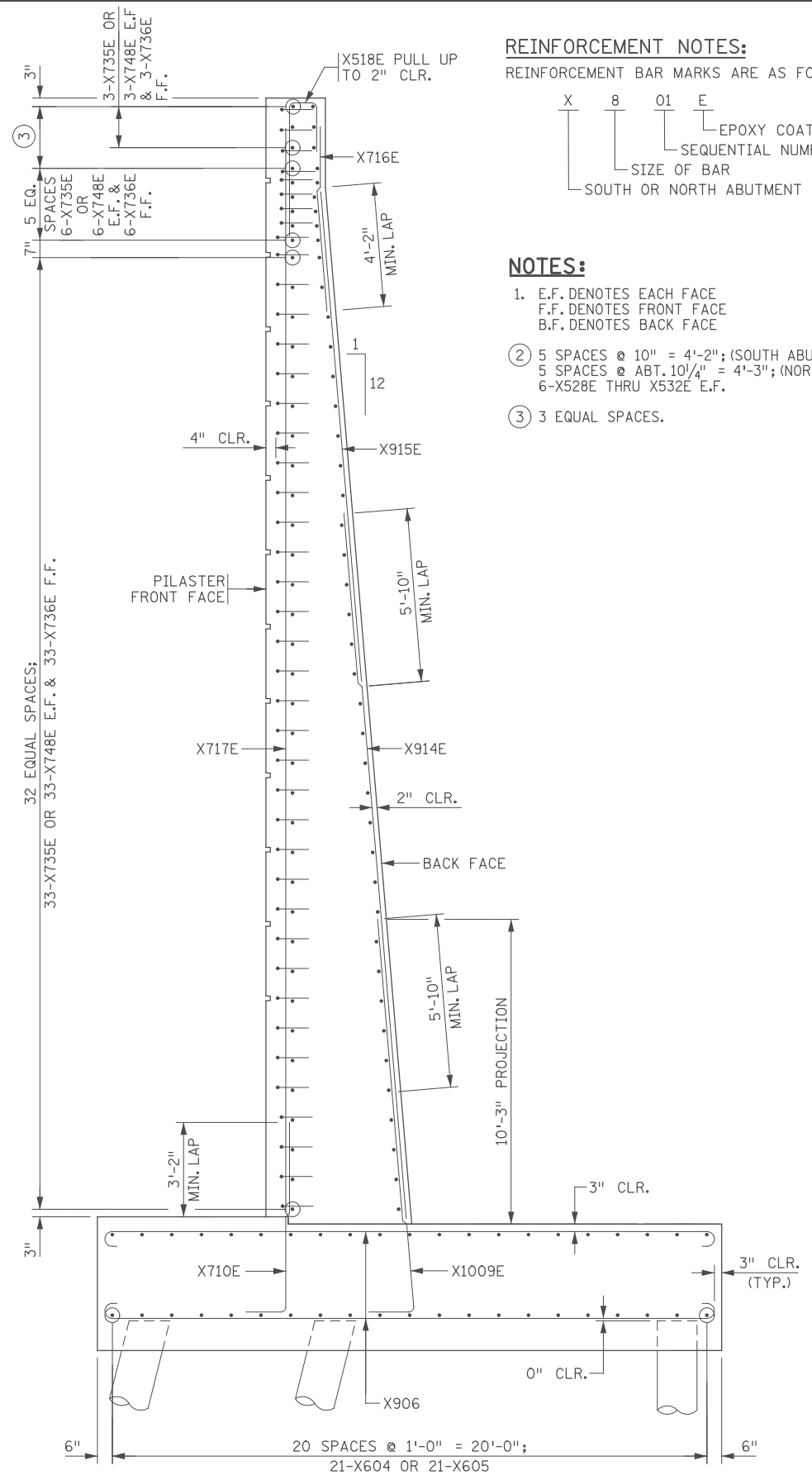
SHEET
BC15
OF
BC42



REINFORCEMENT SECTION A-A
(SECTION THRU ABUTMENT)



REINFORCEMENT SECTION B-B
(SECTION THRU WINGWALL)



REINFORCEMENT SECTION C-C
(SECTION THRU PILASTER)

REINFORCEMENT NOTES:
REINFORCEMENT BAR MARKS ARE AS FOLLOWS:

X 8 01 E
 ↳ EPOXY COATED
 ↳ SEQUENTIAL NUMBERING
 ↳ SIZE OF BAR
 ↳ SOUTH OR NORTH ABUTMENT DESIGNATION

NOTES:

- E.F. DENOTES EACH FACE
F.F. DENOTES FRONT FACE
B.F. DENOTES BACK FACE
- 5 SPACES @ 10" = 4'-2"; (SOUTH ABUTMENT) OR
5 SPACES @ ABT. 10 1/4" = 4'-3"; (NORTH ABUTMENT).
6-X528E THRU X532E E.F.
- 3 EQUAL SPACES.

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11/01/2017				RELEASE FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR
				REVISION
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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Print Name: **ERIC S. HANSON**

Eric S. Hanson

Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02589

COMM. NO. 0169140



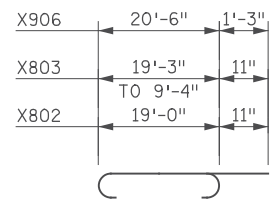
**ENGINEERS
PLANNERS
DESIGNERS**

Consulting Group, Inc.

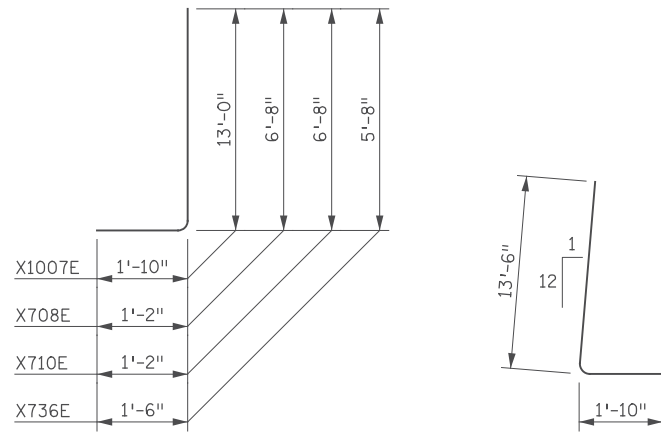
ANOKA COUNTY
ABUTMENT REINFORCEMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 5 OF 6)

**SHEET
BC16
OF
BC42**

BAR SHAPES:

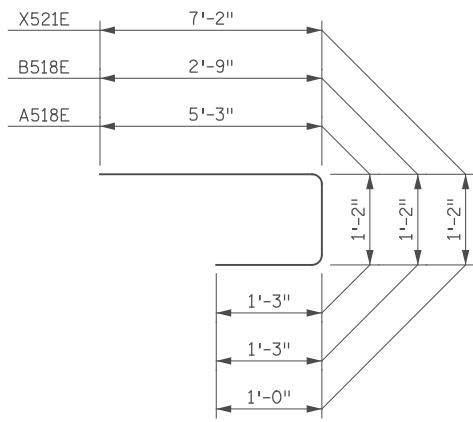


X802, X803, X906

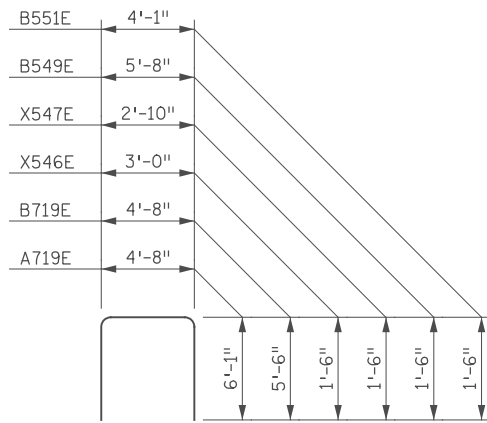


X1007E, X708E, X710E, X736E

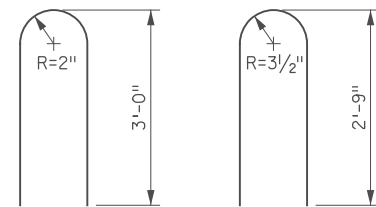
X1009E



A518E, B518E, X521E

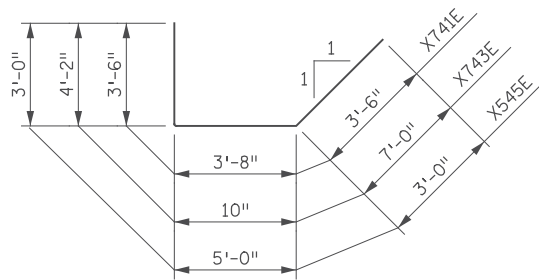


A719E, B719E, X546E, X547E, B549E, B551E

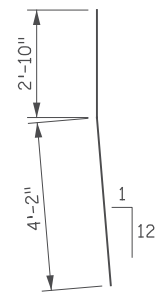


X522E

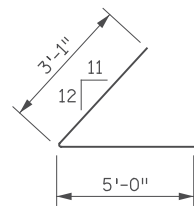
B550E



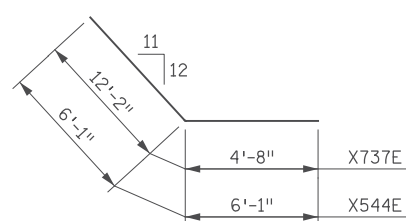
X741E, X743E, X545E



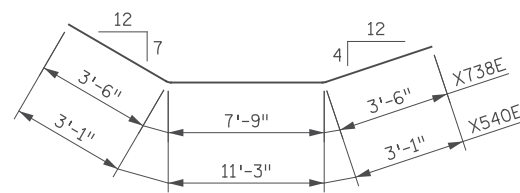
X716E



X542E



X737E, X544E



X738E, X540E

BILL OF REINFORCEMENT: SOUTH ABUTMENT				
MARK	NO	LENGTH [FT - IN]	SHAPE	LOCATION
A601	120	51 - 2	—	FOOTING LONG.
A802	516	20 - 10	—	FOOTING TRANS.
A803	2 SERIES	11 - 2	—	FOOTING TRANS.
	OF 20	21 - 1		
A604	42	34 - 8	—	FOOTING LONG.
A605	2 SERIES	26 - 0	—	FOOTING LONG.
	OF 21	36 - 0		
A906	238	23 - 0	—	FOOTING TRANS.
A1007E	261	14 - 10	—	DOWEL
A708E	132	7 - 10	—	DOWEL
A1009E	101	15 - 4	—	DOWEL
A710E	95	7 - 10	—	DOWEL
A811E	261	19 - 6	—	STEM VERT.
A812E	138	17 - 3	—	STEM VERT.
A713E	132	29 - 9	—	STEM VERT.
A914E	101	19 - 3	—	WW VERT.
A915E	54	23 - 0	—	WW VERT.
A716E	54	7 - 0	—	WW VERT.
A717E	95	35 - 7	—	WW VERT.
A518E	73	7 - 8	—	WW TOP
A719E	128	16 - 10	—	STEM TOP
A520E	138	7 - 2	—	BACKWALL VERT.
A521E	130	9 - 4	—	BACKWALL VERT.
A522E	128	6 - 3	—	END BLOCK
A723E	70	21 - 0	—	STEM HORIZ.
A724E	70	31 - 8	—	STEM HORIZ.
A725E	70	29 - 1	—	STEM HORIZ.
A726E	70	24 - 3	—	STEM HORIZ.
A727E	70	19 - 9	—	STEM HORIZ.
A528E	12	22 - 1	—	BACKWALL HORIZ.
A529E	12	31 - 8	—	BACKWALL HORIZ.
A530E	12	29 - 1	—	BACKWALL HORIZ.
A531E	12	24 - 3	—	BACKWALL HORIZ.
A532E	12	17 - 6	—	BACKWALL HORIZ.
A733E	280	9 - 8	—	STEM HORIZ.
A534E	48	6 - 6	—	BACKWALL HORIZ.
A735E	84	25 - 0	—	WW HORIZ.
A736E	84	7 - 2	—	PILASTER HORIZ.
A737E	33	16 - 10	—	CORNER
A738E	33	14 - 9	—	CORNER
A739E	69	13 - 10	—	WING HORIZ.
A540E	6	17 - 5	—	CORNER
A741E	33	10 - 8	—	CORNER
A542E	12	8 - 1	—	CORNER
A743E	33	12 - 0	—	CORNER
A544E	12	12 - 2	—	CORNER
A545E	6	11 - 0	—	CORNER
A546E	70	6 - 0	—	BRIDGE SEAT
A547E	70	5 - 10	—	BRIDGE SEAT
A748E	84	24 - 8	—	WING HORIZ.

BILL OF REINFORCEMENT: NORTH ABUTMENT				
MARK	NO	LENGTH [FT - IN]	SHAPE	LOCATION
B601	120	51 - 2	—	FOOTING LONG.
B802	516	20 - 10	—	FOOTING TRANS.
B803	2 SERIES	11 - 2	—	FOOTING TRANS.
	OF 20	21 - 1		
B604	42	34 - 8	—	FOOTING LONG.
B605	2 SERIES	26 - 0	—	FOOTING LONG.
	OF 21	36 - 0		
B906	238	23 - 0	—	FOOTING TRANS.
B1007E	261	14 - 10	—	DOWEL
B708E	132	7 - 10	—	DOWEL
B1009E	101	15 - 4	—	DOWEL
B710E	95	7 - 10	—	DOWEL
B811E	261	19 - 6	—	STEM VERT.
B812E	138	17 - 11	—	STEM VERT.
B713E	132	31 - 0	—	STEM VERT.
B914E	101	19 - 3	—	WW VERT.
B915E	54	23 - 0	—	WW VERT.
B716E	54	7 - 0	—	WW VERT.
B717E	95	38 - 1	—	WW VERT.
B518E	73	5 - 2	—	WW TOP
B719E	128	15 - 8	—	STEM TOP
B520E	138	7 - 2	—	BACKWALL VERT.
B521E	130	9 - 4	—	BACKWALL VERT.
B522E	128	6 - 3	—	END BLOCK
B723E	70	21 - 0	—	STEM HORIZ.
B724E	70	31 - 8	—	STEM HORIZ.
B725E	70	29 - 1	—	STEM HORIZ.
B726E	70	24 - 3	—	STEM HORIZ.
B727E	70	19 - 9	—	STEM HORIZ.
B528E	12	22 - 1	—	BACKWALL HORIZ.
B529E	12	31 - 8	—	BACKWALL HORIZ.
B530E	12	29 - 1	—	BACKWALL HORIZ.
B531E	12	24 - 3	—	BACKWALL HORIZ.
B532E	12	17 - 6	—	BACKWALL HORIZ.
B733E	280	9 - 8	—	STEM HORIZ.
B534E	48	6 - 6	—	BACKWALL HORIZ.
B735E	84	25 - 0	—	WW HORIZ.
B736E	84	7 - 2	—	PILASTER HORIZ.
B737E	33	16 - 10	—	CORNER
B738E	33	14 - 9	—	CORNER
B739E	69	13 - 10	—	WING HORIZ.
B540E	6	17 - 5	—	CORNER
B741E	33	10 - 8	—	CORNER
B542E	12	8 - 1	—	CORNER
B743E	33	12 - 0	—	CORNER
B544E	12	12 - 2	—	CORNER
B545E	6	11 - 0	—	CORNER
B546E	60	6 - 0	—	BRIDGE SEAT
B547E	60	5 - 10	—	BRIDGE SEAT
B748E	84	24 - 8	—	WING HORIZ.
B549E	12	8 - 8	—	BRIDGE SEAT
B550E	24	5 - 10	—	BRIDGE SEAT
B551E	22	7 - 1	—	BRIDGE SEAT

REINFORCEMENT NOTES:
 REINFORCEMENT BAR MARKS ARE AS FOLLOWS:

X 8 01 E
 EPOXY COATED
 SEQUENTIAL NUMBERING
 SIZE OF BAR
 SOUTH OR NORTH ABUTMENT DESIGNATION

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11/01/2017				RELEASE FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR

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Print Name: **ERIC S. HANSON**

Eric S. Hanson

Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO.
 02589

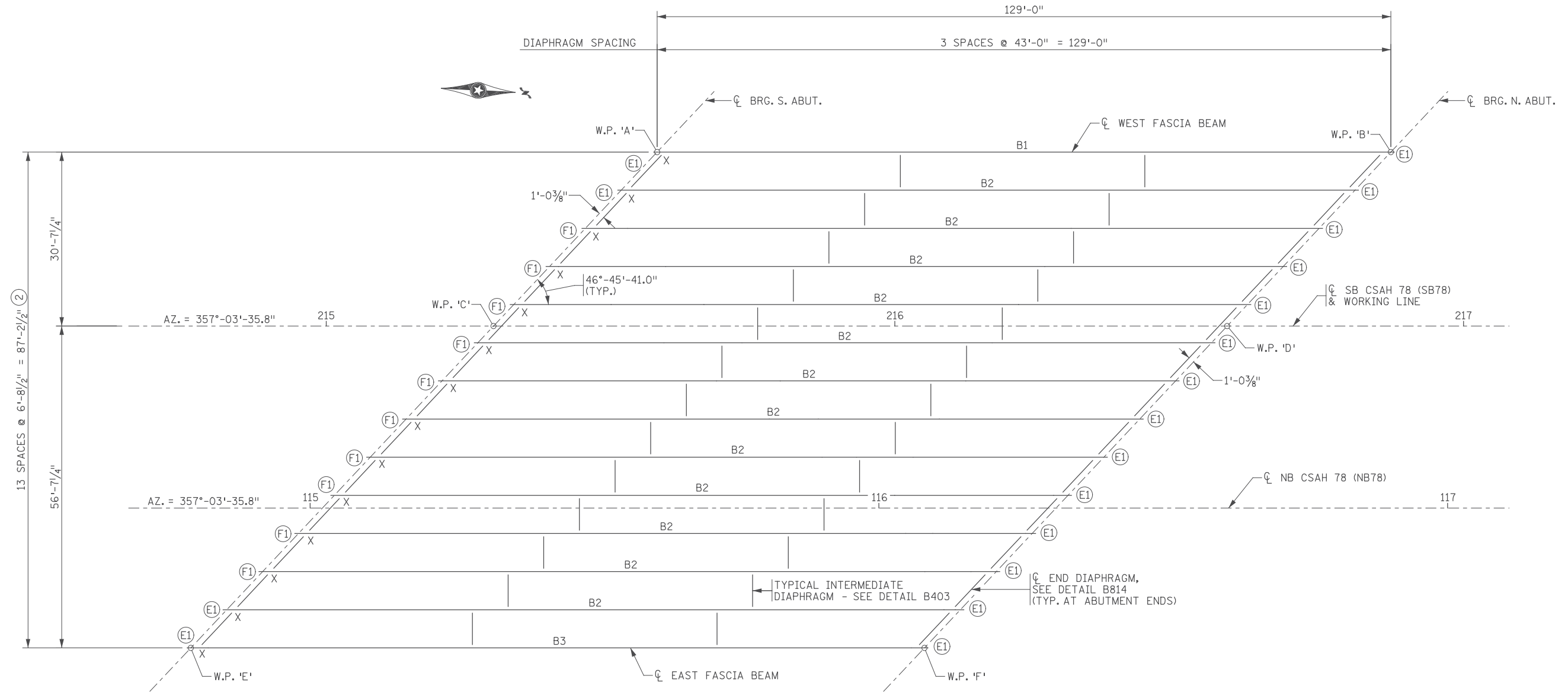
COMM. NO. 0169140

SRH ENGINEERS
 PLANNERS
 DESIGNERS

Consulting Group, Inc.

ANOKA COUNTY
 ABUTMENT REINFORCEMENT DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
 (SHEET 6 OF 6)

SHEET
BC17
OF
BC42



FRAMING PLAN

- LEGEND:**
- (E1) EXPANSION CURVED PLATE BEARING ASSEMBLY TYPE E-1.
 - (F1) FIXED CURVED PLATE BEARING ASSEMBLY TYPE F-1.
- NOTES:**
1. X DENOTES WHICH END OF BEAM IS TO BE MARKED WITH AN "X".
 2. DIMENSIONS ARE MEASURED PERPENDICULAR TO CL BEAMS.

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 SAP 002-678-023
 SAP 114-020-051

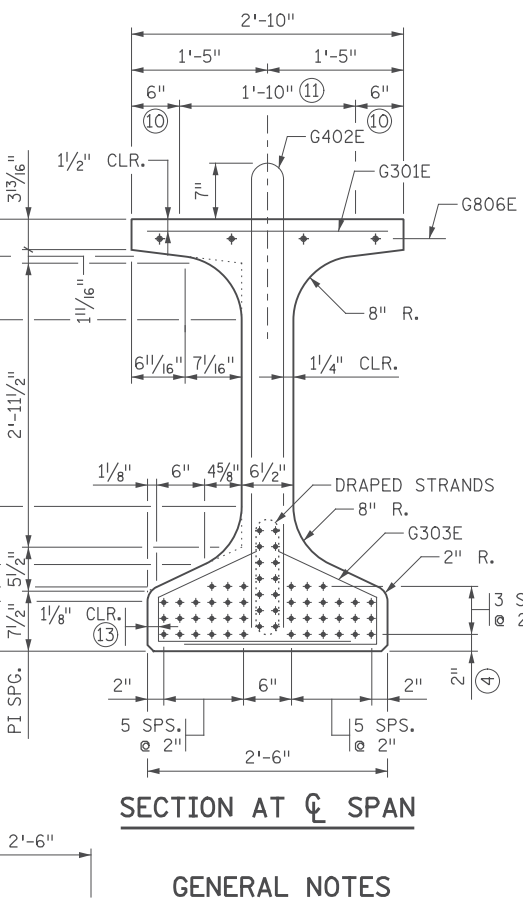
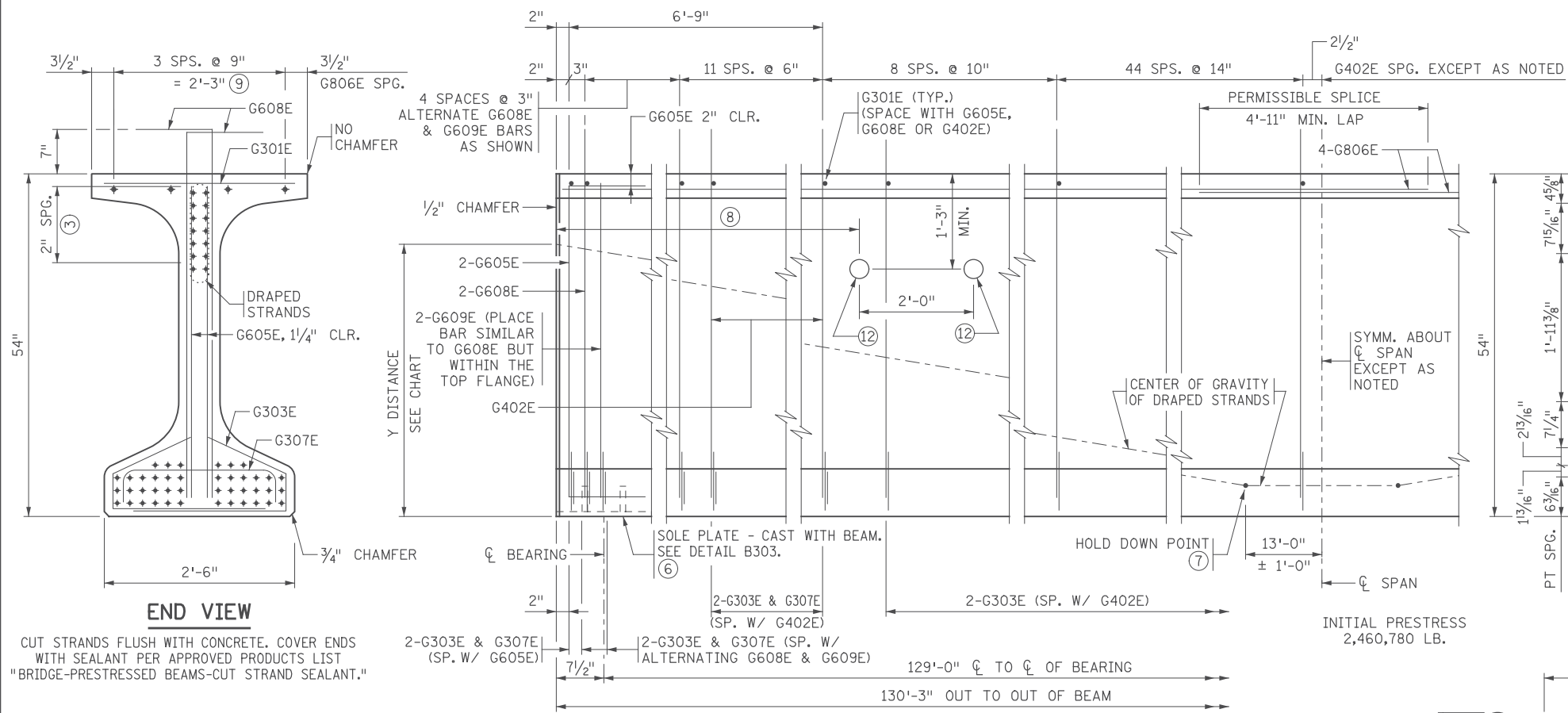
BRIDGE NO.
 02589

COMM. NO. 0169140


**ENGINEERS
 PLANNERS
 DESIGNERS**
 Consulting Group, Inc.

ANOKA COUNTY
 FRAMING PLAN
CSAH 78 OVER BNSF RAILWAY COMPANY

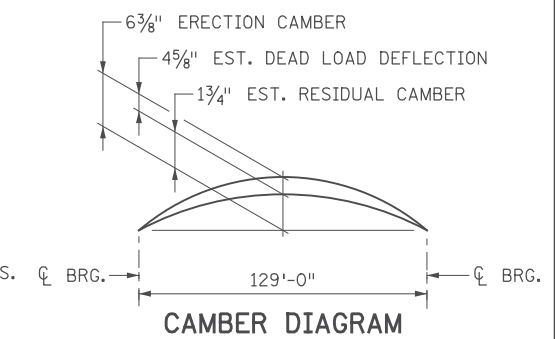
**SHEET
 BC18
 OF
 BC42**



Y DISTANCES (INCHES)			
	NO.	CL SPAN	END
STRAIGHT STRANDS	42	4.57	
DRAPED STRANDS	14	9.00	45.00 [Ⓟ]
TOTAL STRANDS	56	5.68	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

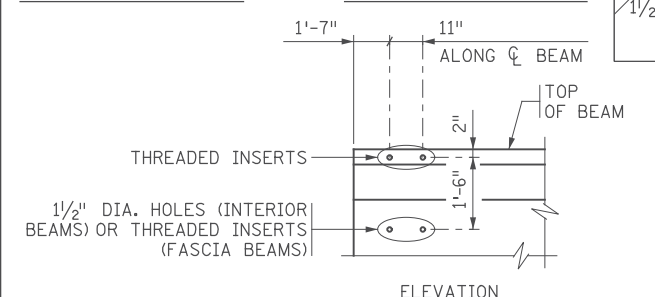
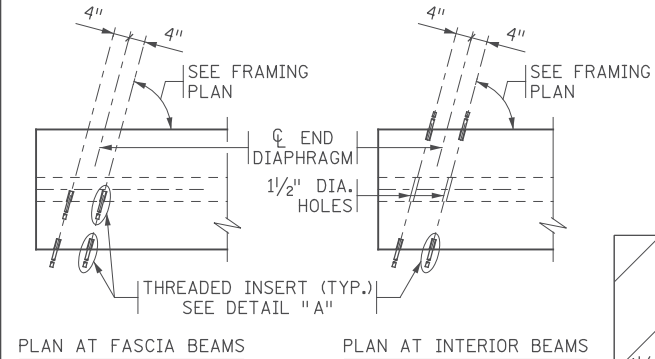
[Ⓟ] A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



ERECTOR CAMBER SHOWN IS AFTER DIAPHRAGMS ARE IN PLACE.

DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, BARRIER, SIDEWALK AND MEDIAN WHERE APPLICABLE.

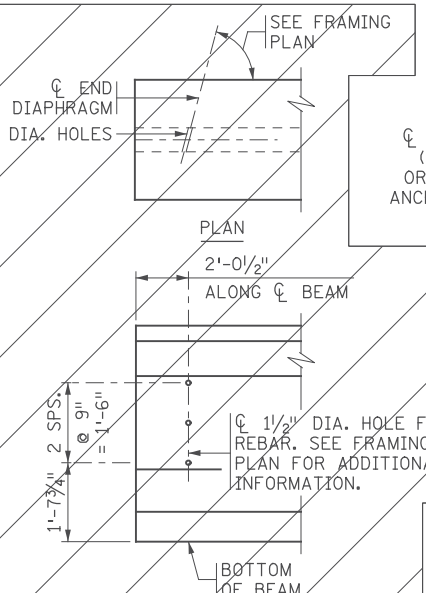
CONTRACTOR WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE BUILDING FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS. PROVIDE COPY OF ELEVATIONS TO THE ENGINEER.



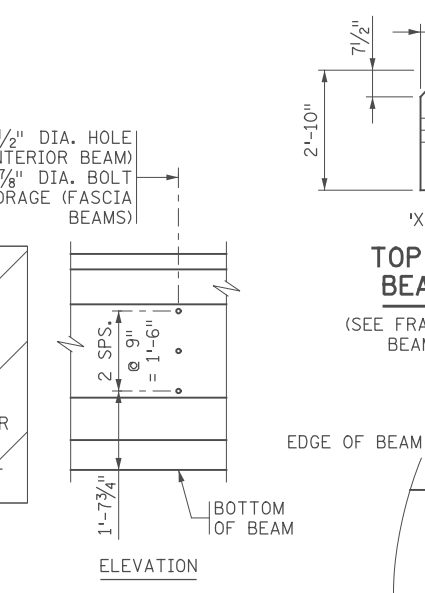
CONCRETE END DIAPHRAGM
PARAPET ABUTMENT
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	26.34 KSI
LONG TERM LOSSES	27.12 KSI
TOTAL LOSSES	53.46 KSI

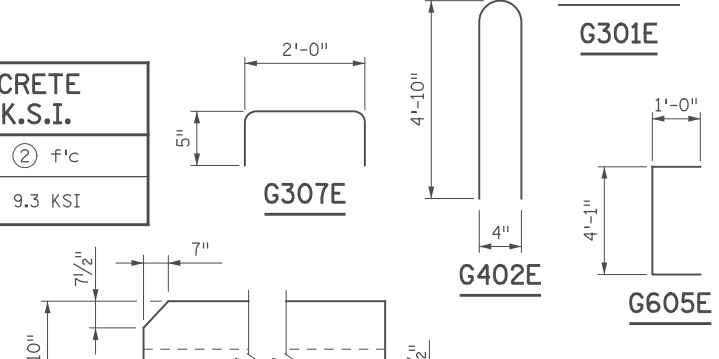
MINIMUM CONCRETE STRENGTH - K.S.I.	
① f'ci	② f'c
7.8 KSI	9.3 KSI



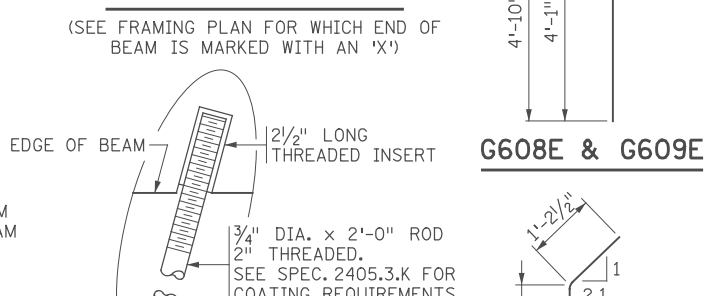
CONCRETE END DIAPHRAGM
SEE SUPERSTRUCTURE DETAILS AND REINFORCEMENT FOR DIAPHRAGM DETAILS.



STEEL INTERMEDIATE DIAPHRAGM
(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)



TOP FLANGE CONCRETE BEAM COPING DETAIL
(SEE FRAMING PLAN FOR WHICH END OF BEAM IS MARKED WITH AN 'X')



DETAIL "A"

GENERAL NOTES

- PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.
- MARK EACH BEAM SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. MARK FASCIA BEAMS ON THE INSIDE FACE. ENSURE ALL MARKINGS ARE STENCILLED AND CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.
- ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET IS INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE SPEC. 2405.
- SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.
- AS AN ALTERNATE TO THE END DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.
- APPLY AN APPROVED SEALER TO THE SIDES OF THE BEAM NEAR EACH END PER THE SPECIAL PROVISIONS.
- ① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.
- ② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.
- ③ DRAPED STRANDS.
- ④ STRAIGHT STRANDS.
- ⑤ USE 0.6" DIA. 7-WIRE LOW RELAXATION PRESTRESSING STRAND, CONFORMING TO ASTM A416, GRADE 270.
- ⑥ FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE. BEAMS DETAILED TO INCLUDE A TAPERED PLATE PER STANDARD FIGURE B309 MUST INCLUDE SOLE PLATE.
- ⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.
- ⑧ DIMENSION DETERMINED BY CONTRACTOR. MAINTAIN 2" MINIMUM CLEAR FROM STRANDS.
- ⑨ TWO INSIDE BARS MAY BE PLACED ADJACENT TO VERTICAL STIRRUP FOR TYING CONVENIENCE.
- ⑩ STEEL TROWEL TO SMOOTH FINISH AND APPLY BOND BREAKER PER APPROVED PRODUCTS LIST.
- ⑪ ROUGH FLOAT AND BROOM TRANSVERSELY FOR BOND PER SPEC. 2405.3.D.
- ⑫ OPTIONAL: 3" MAX. DIA. SLEEVE FOR HAULING (AFTER INSTALLATION, COAT WITH APPROVED EPOXY BONDING AGENT & FILL WITH APPROVED NON-SHRINK GROUT).
- ⑬ TYP. CLR. FOR ENTIRE BOTTOM FLANGE.

REVISED: DECEMBER 02, 2015
APPROVED: JANUARY 13, 2015
Nancy Douberberger
STATE BRIDGE ENGINEER

MODIFICATIONS:
- ADDED TOP FLANGE COPING DETAIL

NO.	DATE	BY	CKD	APPR	REVISION
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Eric S. Hanson
Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051
BRIDGE NO.
02589
DRAWN BY
J. HOFFMAN
DESIGNED BY
S. NEFF
CHECKED BY
E. HANSON
COMM. NO. 0169140



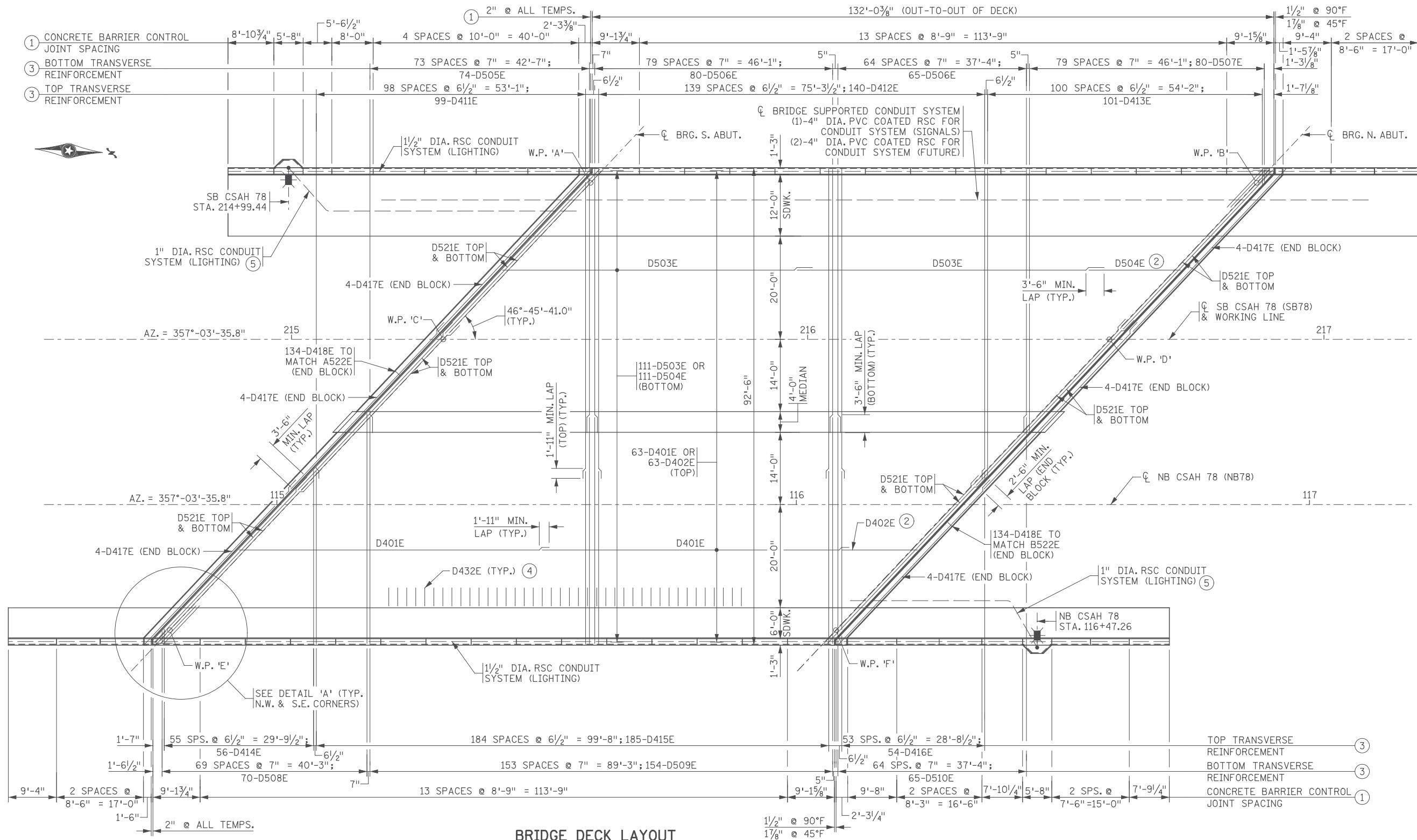
ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
MN54" PCB (PRETENSIONED) MN54-131
CSAH 78 OVER BNSF RAILWAY COMPANY

SHEET
BC19
OF
BC42

MODIFIED
BEAMS B1-B3
FIG. 5-397.508

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BRIDGE DECK LAYOUT

NOTES:

- ① MEASURED ALONG EDGE OF DECK.
- ② ALTERNATE LAPS.
- ③ TRANSVERSE REINFORCEMENT PLACED PERPENDICULAR TO ϕ SB CSAH 78 (SB78). SEE LIGHTING PLANS FOR ADDITIONAL CONDUIT AND LIGHTING DETAILS.
- ④ D432E BARS REQUIRED WHERE STOOL HEIGHT IS 5" OR GREATER. EXPECTED LOCATION IS AT CENTER OF ALL BEAMS. FINAL LOCATIONS SHALL BE DETERMINED IN THE FIELD.
- ⑤ CONDUIT TO EXTEND FROM BACKWALL OF ABUTMENT TO LIGHT BLISTER AND SHALL BE INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (LIGHTING) (BR02589)". SEE LIGHTING PLANS FOR ADDITIONAL CONDUIT AND LIGHTING DETAILS.

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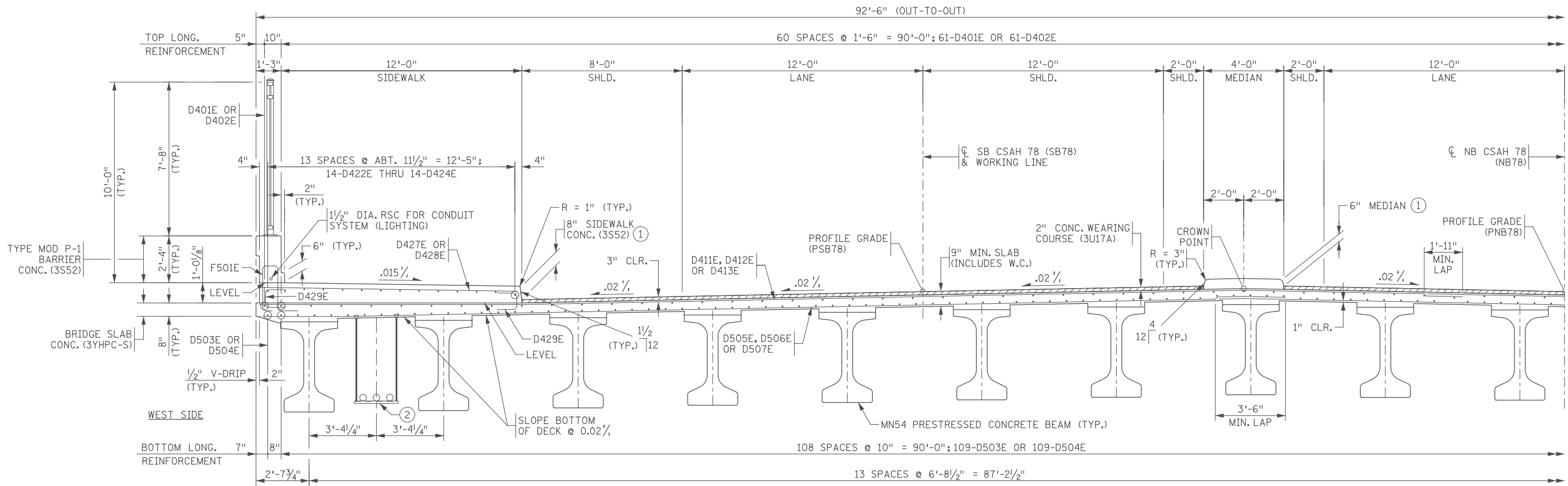
COMM. NO. 0169140

SRE ENGINEERS PLANNERS DESIGNERS

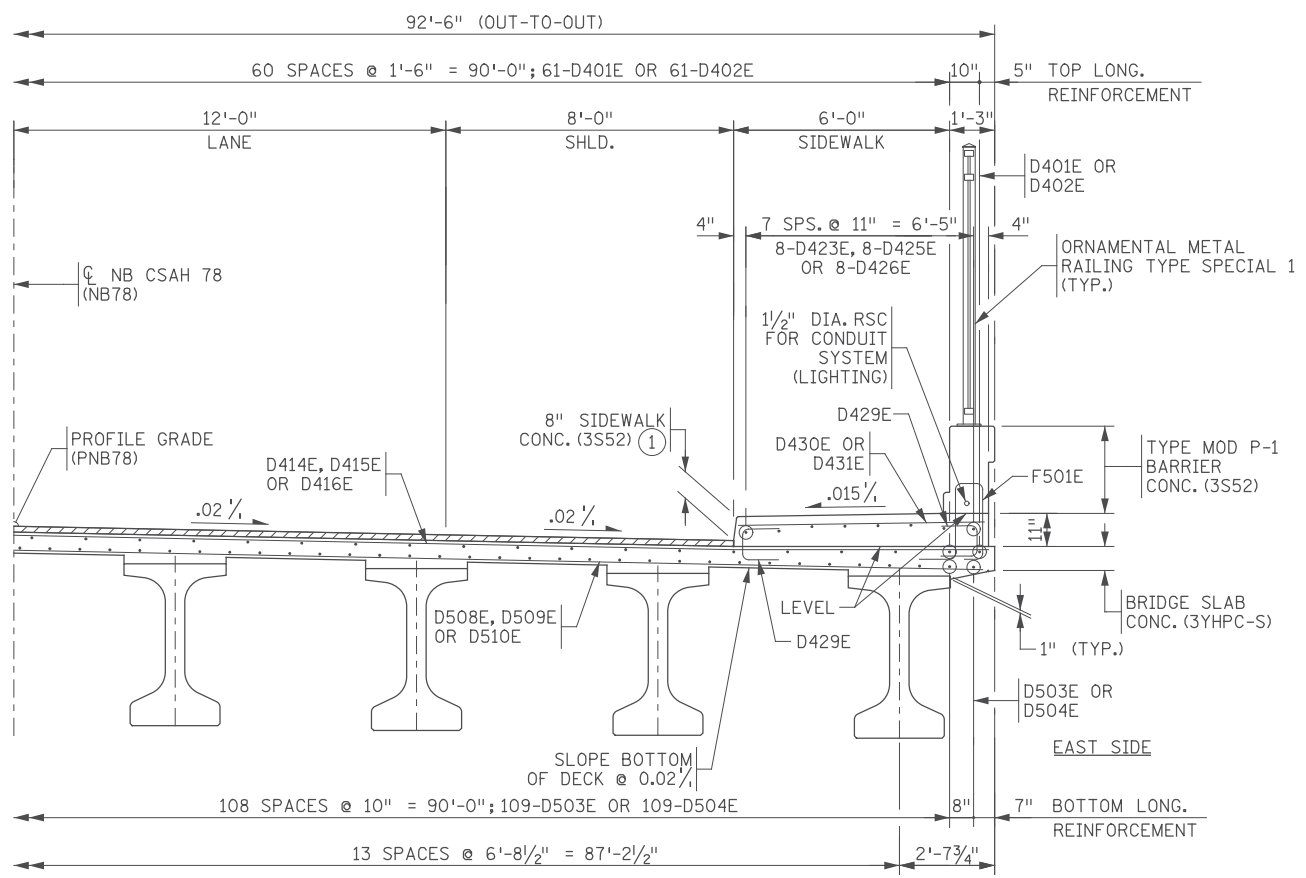
DRAWN BY J. HOFFMAN
DESIGNED BY S. NEFF
CHECKED BY E. HANSON

ANOKA COUNTY
BRIDGE DECK DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 1 OF 3)

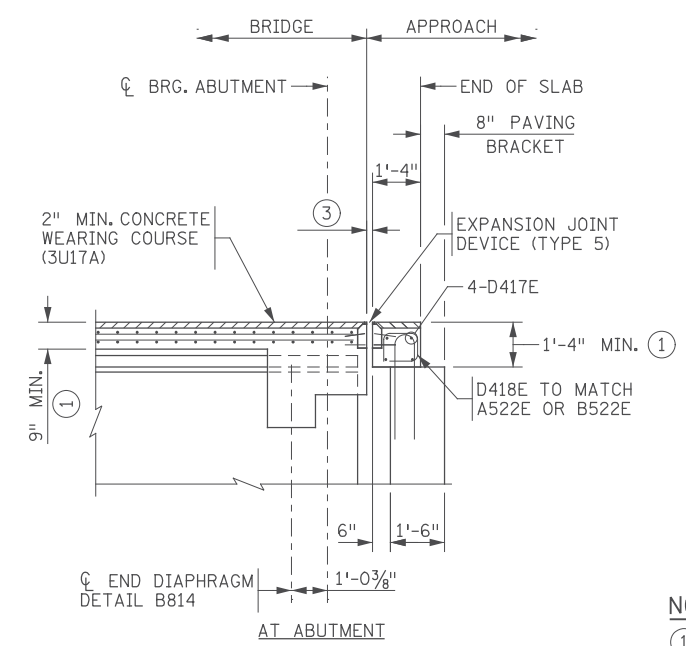
SHEET BC20 OF BC42



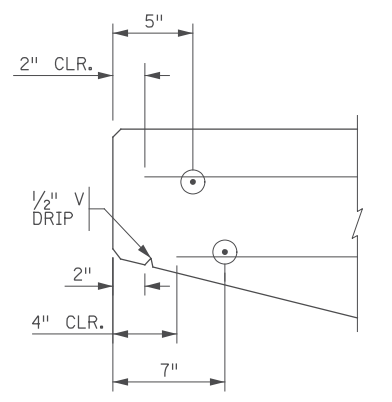
PARTIAL TRANSVERSE SECTION



PARTIAL TRANSVERSE SECTION



LONGITUDINAL SECTION
(DIMS. SHOWN ARE PERP. TO CL. BRG.)



EDGE OF SLAB DETAIL

- NOTES:**
- ① MEASURED FROM TOP OF 2" WEARING COURSE.
 - ② WEST BRIDGE SUPPORTED CONDUIT SYSTEM TO INCLUDE (1)-4" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (SIGNALS) & (2)-4" DIA. PVC COATED RSC FOR CONDUIT SYSTEM (FUTURE).
 - ③ 2" @ ALL TEMPS. (SOUTH ABUTMENT)
1 1/2" @ 90° F, 1 3/8" @ 45° F (NORTH ABUTMENT).

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 Date: 11/01/2017 License #: 50463

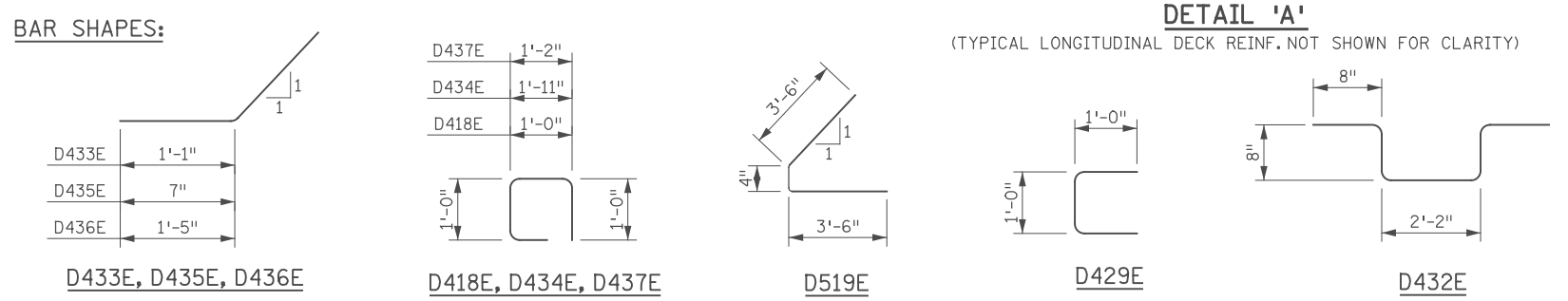
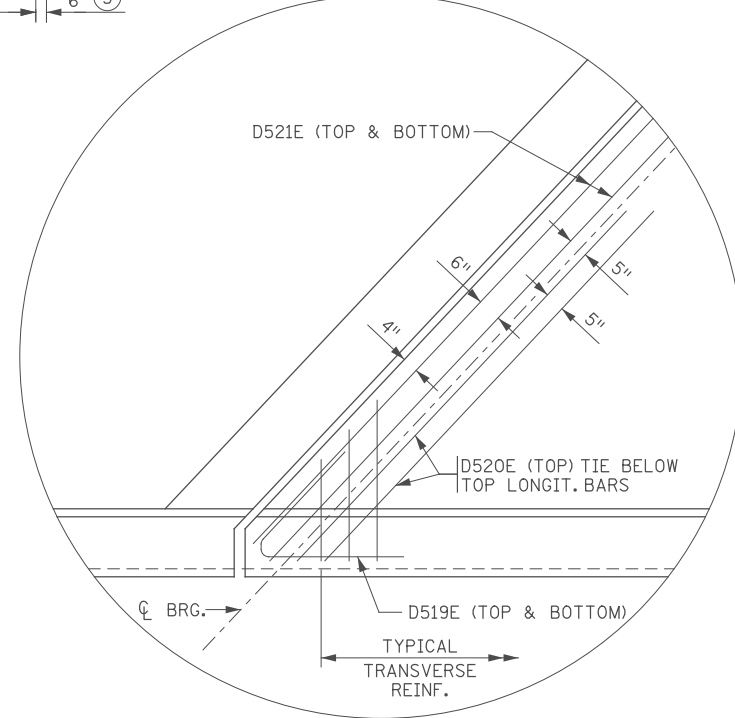
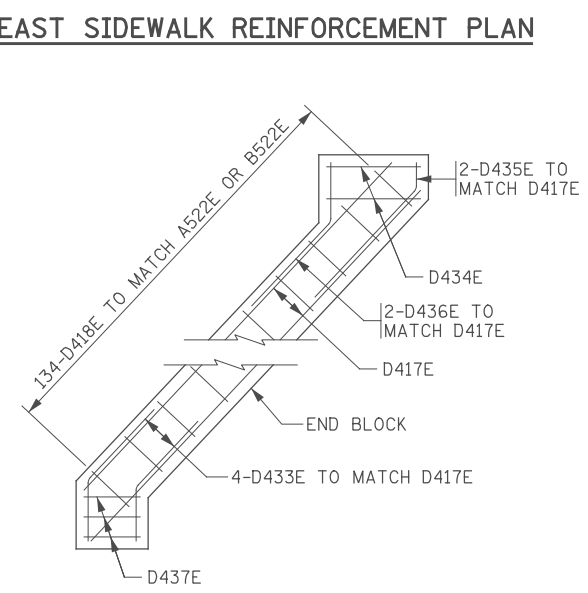
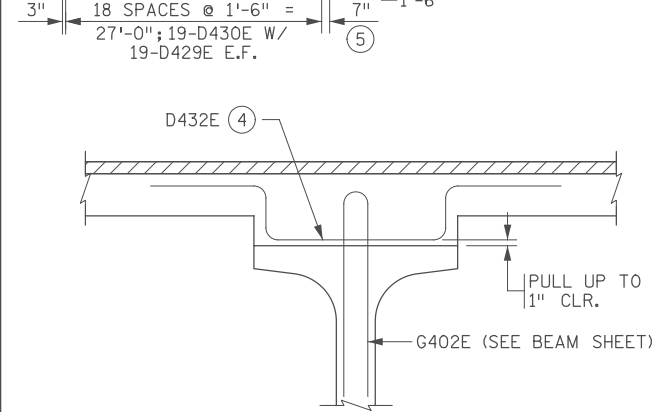
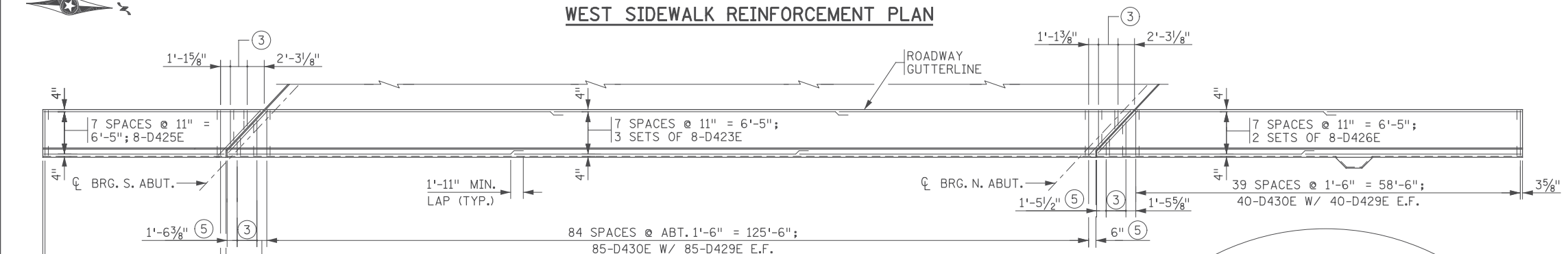
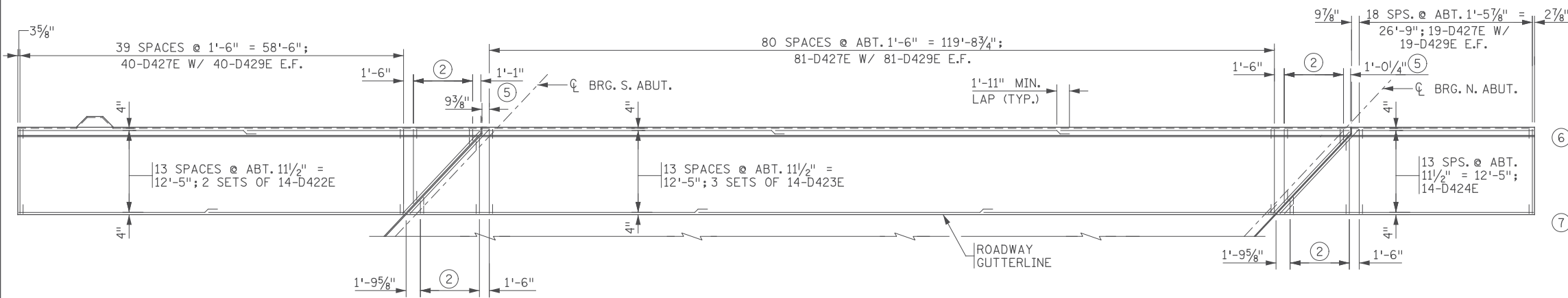
STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02589
 COMM. NO. 0169140

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 J. HOFFMAN
 DESIGNED BY
 S. NEFF
 CHECKED BY
 E. HANSON
SRF
 Consulting Group, Inc.
 ENGINEERS
 PLANNERS
 DESIGNERS

ANOKA COUNTY
 BRIDGE DECK DETAILS
 CSAH 78 OVER BNSF RAILWAY COMPANY
 (SHEET 2 OF 3)

SHEET
 BC21
 OF
 BC42

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SUMMARY OF QUANTITIES : SUPERSTRUCTURE		
ITEM	UNIT	QUANTITY
TYPE MOD P-1 BARRIER CONC (3S52)	LIN FT	456
SIDEWALK CONCRETE (3S52)	SQ FT	4609
RAISED MEDIAN CONCRETE (3S52)	SQ FT	545
REINFORCEMENT BARS (EPOXY COATED)	POUND	85450
BRIDGE SLAB CONCRETE (3YHPC-S)	SQ FT	12589
ORNAMENTAL METAL RAILING TYPE SPECIAL 1	LIN FT	374
EXPANSION JOINT DEVICES TYPE 5	LIN FT	254
BEARING ASSEMBLY	EACH	28
CONCRETE WEARING COURSE (3U17A)	SQ FT	15485
PRESTRESSED CONCRETE BEAMS MN54	LIN FT	1824
DIAPHRAGMS FOR TYPE MN54 PREST BEAMS	LIN FT	175
CONDUIT SYSTEM (SIGNALS) (BR NO 02589)	LUMP SUM	1
CONDUIT SYSTEM (FUTURE) (BR NO 02589)	LUMP SUM	1
CONDUIT SYSTEM (LIGHTING) (BR NO 02589)	LUMP SUM	1

BILL OF REINFORCEMENT: DECK				
MARK	NO	LENGTH [FT - IN]	SHAPE	LOCATION
D401E	126	60 - 0	—	LONG. TOP
D402E	63	15 - 9	—	LONG. TOP
D503E	222	60 - 0	—	LONG. BOTTOM
D504E	111	18 - 11	—	LONG. BOTTOM
D505E	1 SERIES OF 74	4 - 7 49 - 10	—	TRANSV. BOTTOM
D506E	145	50 - 11	—	TRANSV. BOTTOM
D507E	1 SERIES OF 80	1 - 8 50 - 6	—	TRANSV. BOTTOM
D508E	1 SERIES OF 70	1 - 11 44 - 9	—	TRANSV. BOTTOM
D509E	154	44 - 6	—	TRANSV. BOTTOM
D510E	1 SERIES OF 65	3 - 9 43 - 5	—	TRANSV. BOTTOM
D411E	1 SERIES OF 99	2 - 5 58 - 10	—	TRANSV. TOP
D412E	140	60 - 0	—	TRANSV. TOP
D413E	1 SERIES OF 101	2 - 3 59 - 10	—	TRANSV. TOP
D414E	1 SERIES OF 56	2 - 3 33 - 11	—	TRANSV. TOP
D415E	185	34 - 2	—	TRANSV. TOP
D416E	1 SERIES OF 54	2 - 6 32 - 11	—	TRANSV. TOP
D417E	24	43 - 7	—	END BLOCK
D418E	268	3 - 8	□	END BLOCK VERT
D519E	4	7 - 4	∠	ACUTE CORNERS
D520E	4	10 - 0	∠	ACUTE CORNERS
D521E	24	44 - 6	—	END LONG.
D422E	28	36 - 0	—	LONG. SIDEWALK
D423E	66	45 - 2	—	LONG. SIDEWALK
D424E	1 SERIES OF 14	26 - 6 38 - 1	—	LONG. SIDEWALK
D425E	1 SERIES OF 8	26 - 6 32 - 6	—	LONG. SIDEWALK
D426E	16	33 - 2	—	LONG. SIDEWALK
D427E	140	12 - 8	—	TRANSV. SIDEWALK
D428E	4 SERIES OF 7	1 - 5 11 - 0	—	TRANSV. SIDEWALK
D429E	648	3 - 0	□	VERT. SIDEWALK
D430E	144	6 - 8	—	TRANSV. SIDEWALK
D431E	4 SERIES OF 3	1 - 11 5 - 1	—	TRANSV. SIDEWALK
D432E	812	4 - 10	∩	HAT BAR
D433E	8	3 - 6	□	END BLOCK
D434E	4	5 - 6	□	END BLOCK
D435E	4	3 - 0	∩	END BLOCK
D436E	4	3 - 10	∩	END BLOCK
D437E	6	4 - 0	□	END BLOCK

- NOTES:**
- E.F. DENOTES EACH FACE
 - 6 SPACES @ 1'-6" = 9'-0"; 7-D428E W/ 7-D429E E.F.
 - 2 SPACES @ 1'-6" = 3'-0"; 3-D431E W/ 3-D429E E.F.
 - USE D432E BARS WHERE STOOL HEIGHT IS 5" OR GREATER. SPACE WITH G402E. TOP OF BAR SHALL BE ABOVE BOTTOM MAT OF DECK REINFORCEMENT.
 - MEASURED ALONG EDGE OF DECK.
 - INCLUDES SLAB, END DIAPHRAGM, SIDEWALK AND RAILING REINFORCEMENT.
 - "CONCRETE WEARING COURSE (3U17A)" INCLUDES 6230 SQUARE FEET FOR BRIDGE APPROACH PANEL.

11/01/2017				RELEASE FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR
				REVISION

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

Print Name: ERIC S. HANSON

Date: 11/01/2017 License #: 50463

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SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02589

COMM. NO. 0169140

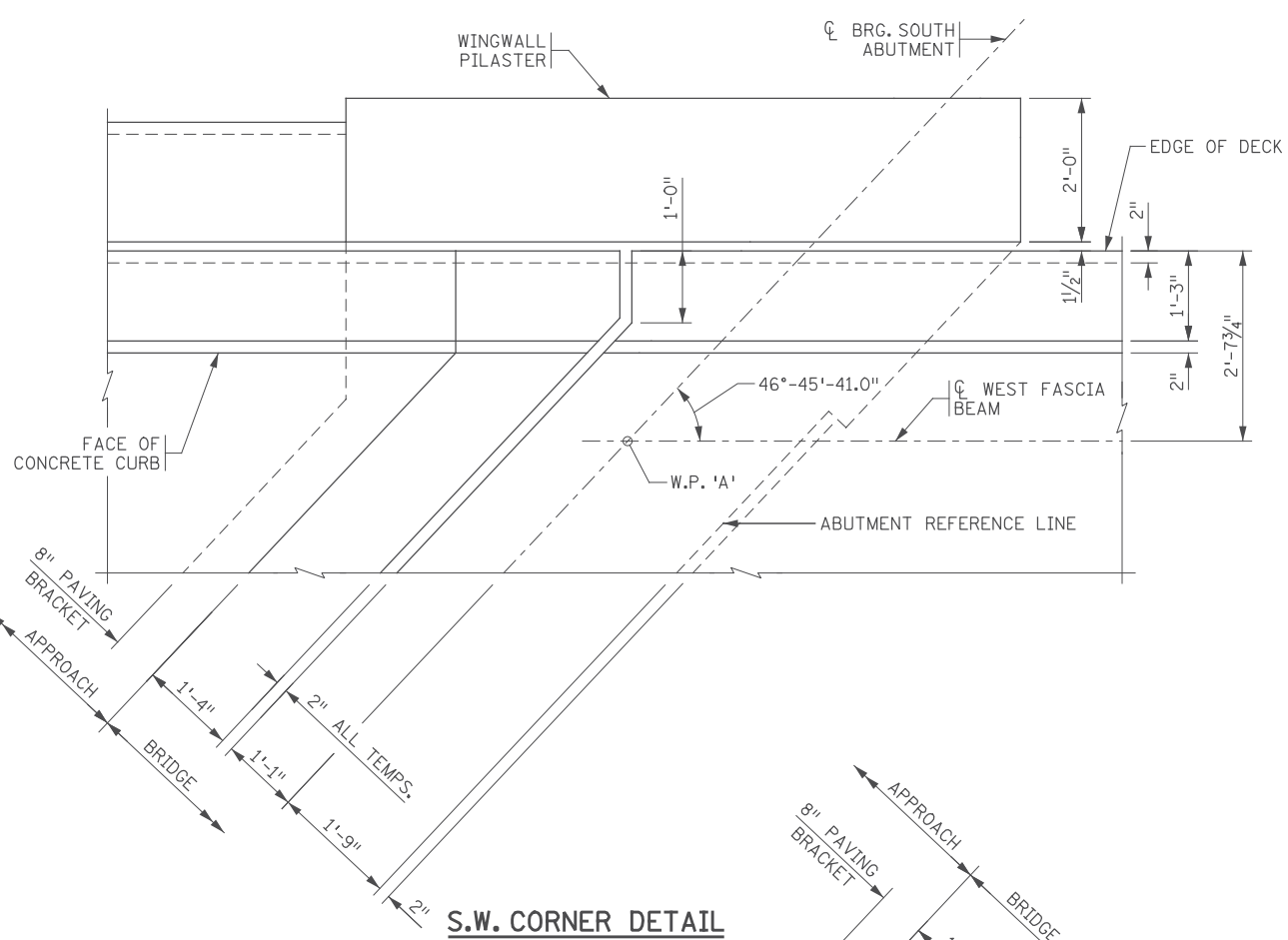
DRAWN BY J. HOFFMAN
DESIGNED BY S. NEFF
CHECKED BY E. HANSON

SRH ENGINEERS PLANNERS DESIGNERS
Consulting Group, Inc.

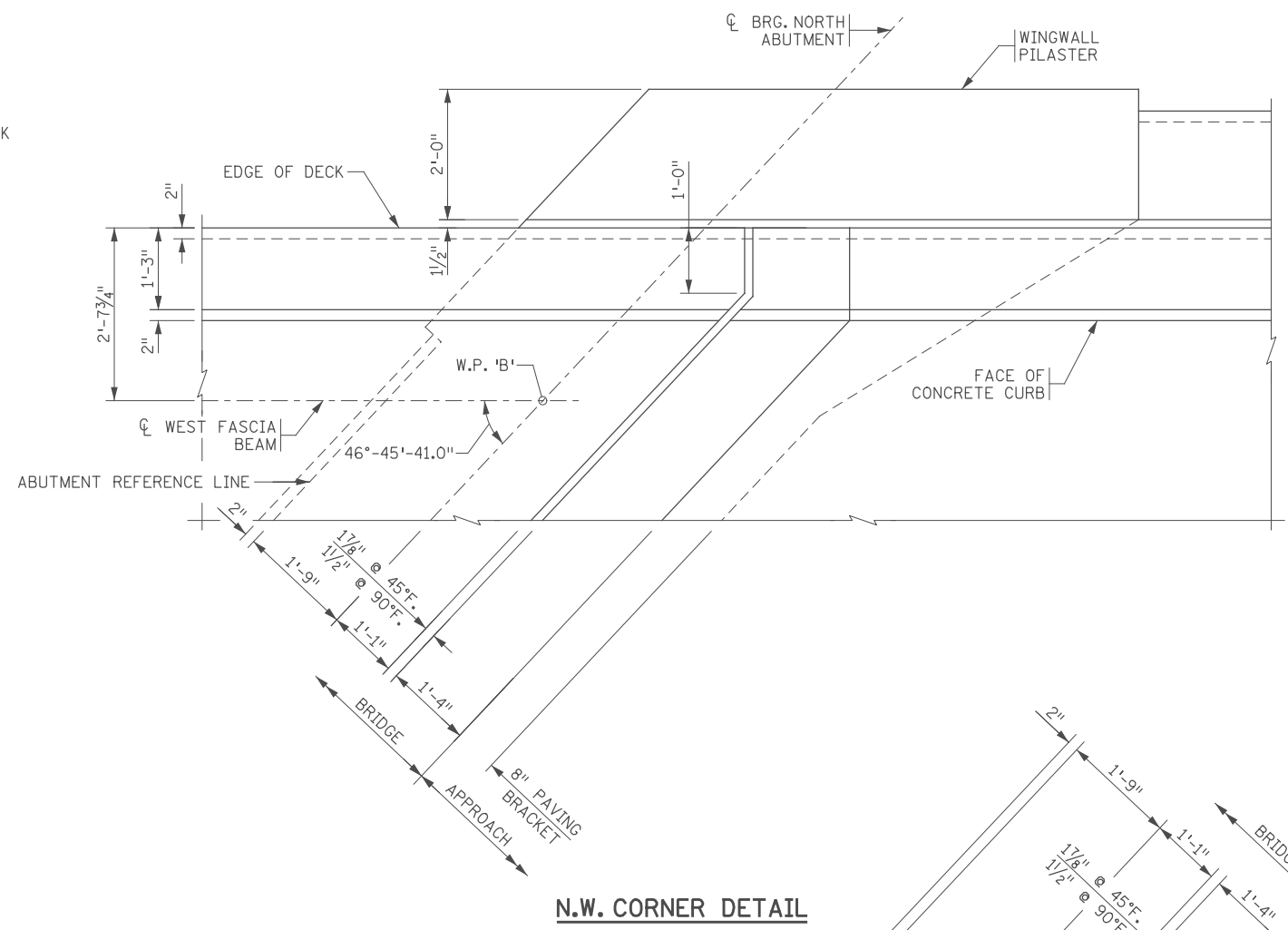
ANOKA COUNTY
BRIDGE DECK DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 3 OF 3)

SHEET BC22 OF BC42

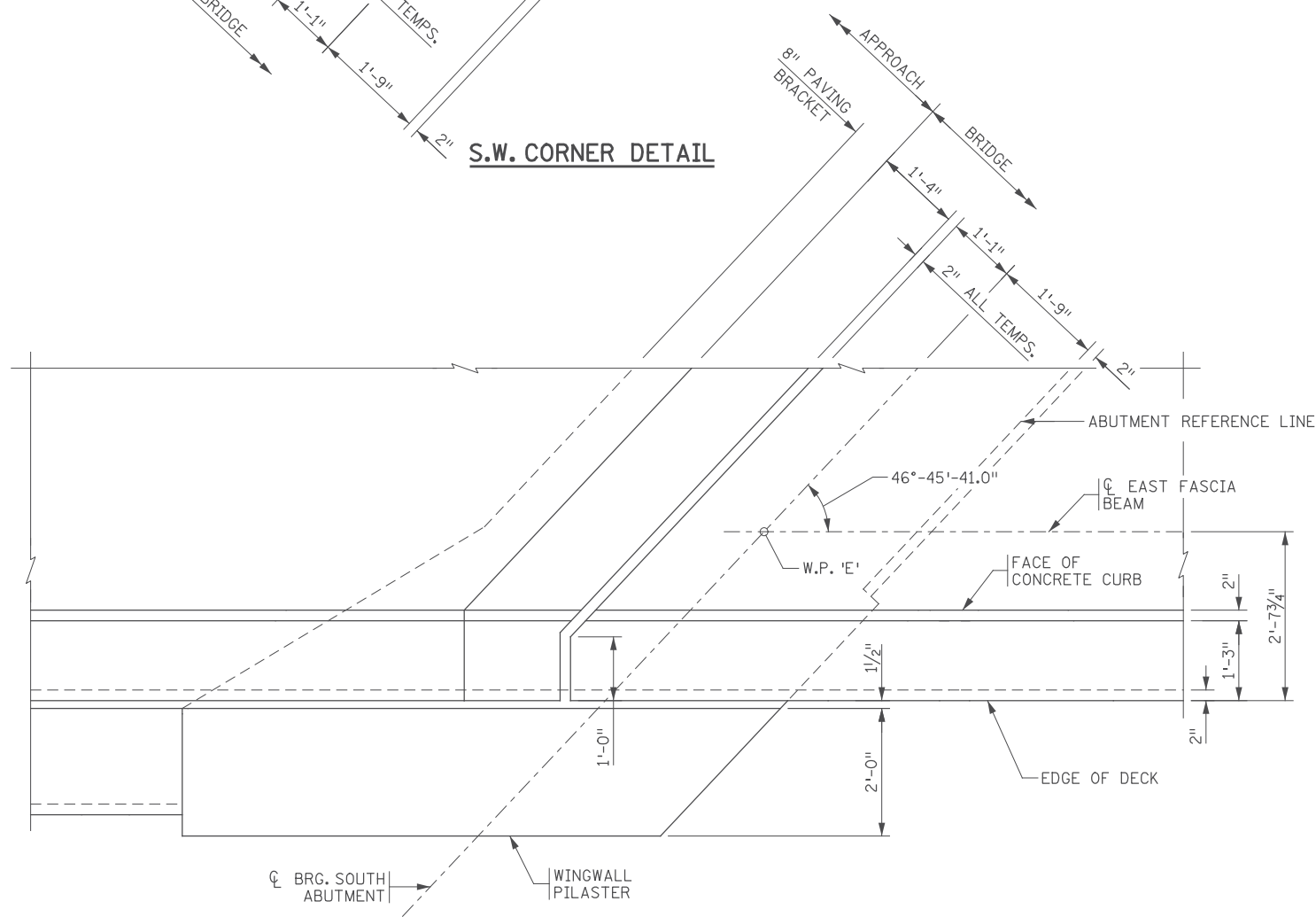
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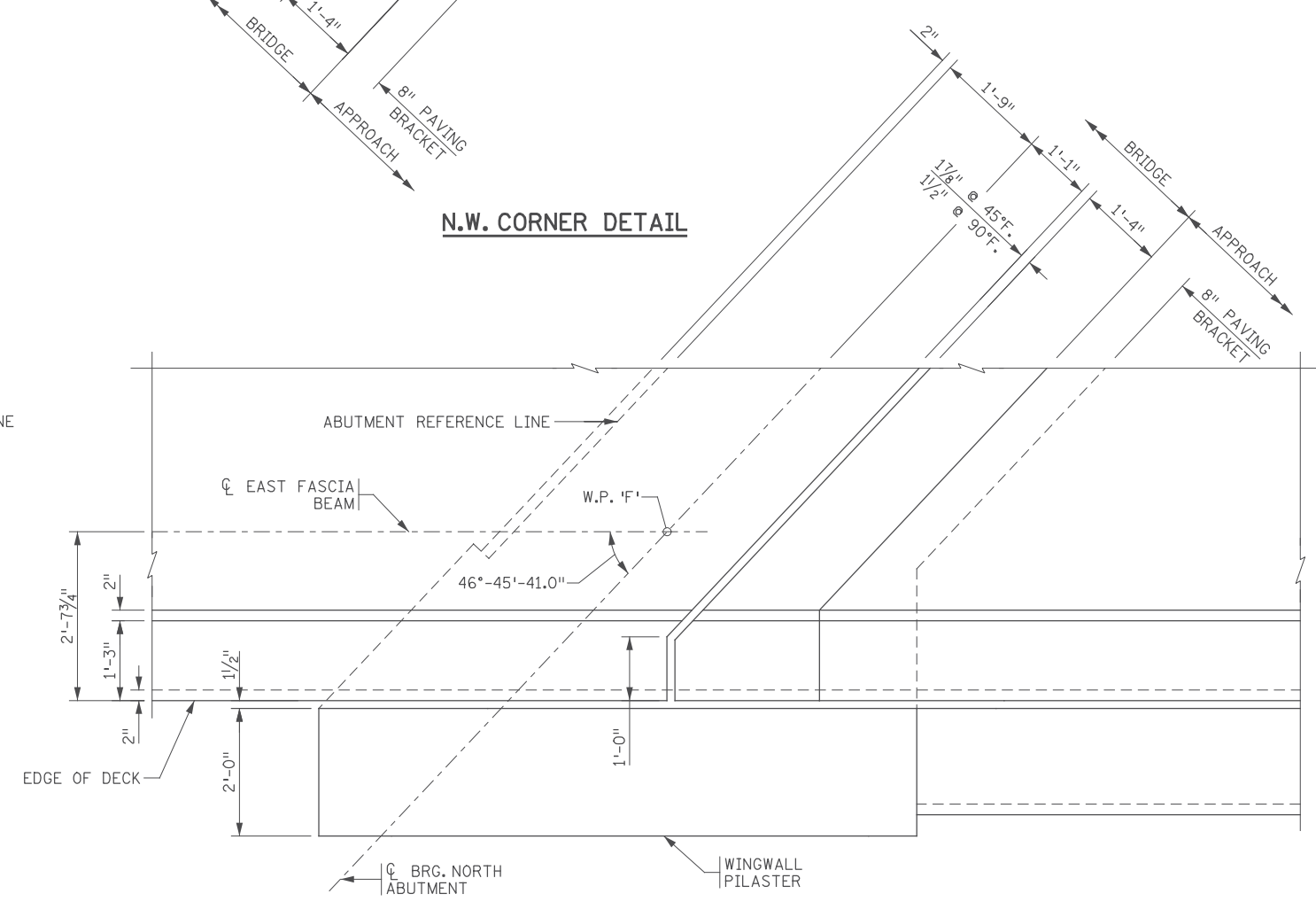
S.W. CORNER DETAIL



N.W. CORNER DETAIL



S.E. CORNER DETAIL



N.E. CORNER DETAIL

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REVISION				
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Eric S. Hanson
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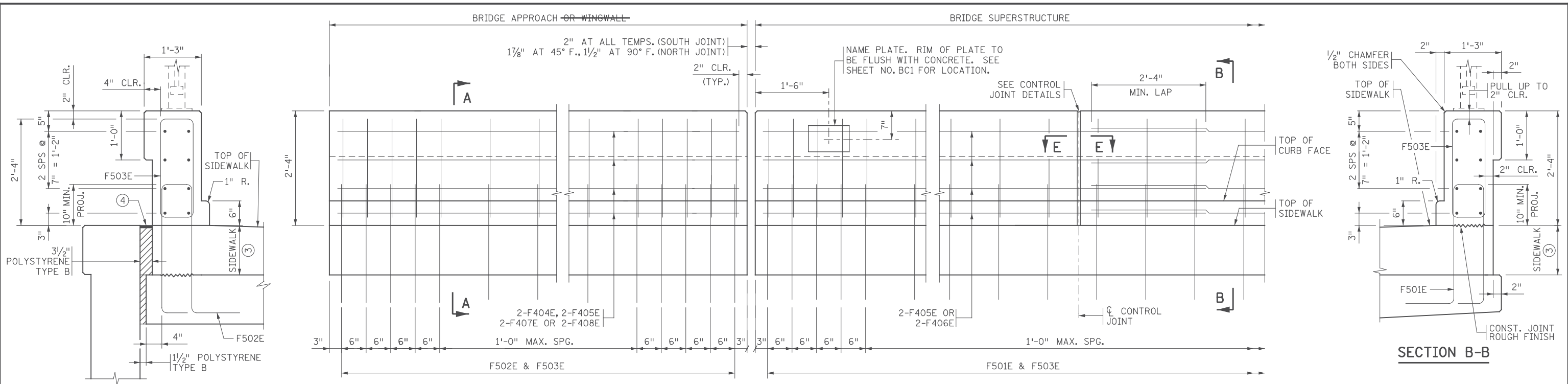


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 PLANNERS
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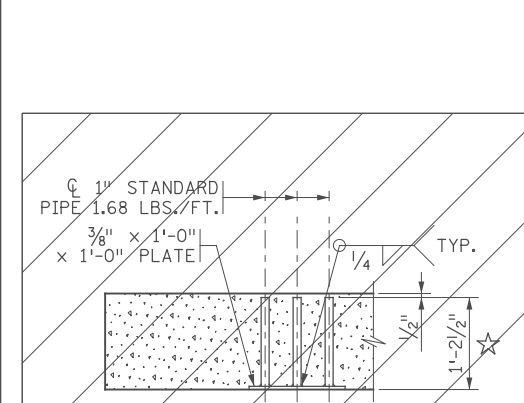
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ANOKA COUNTY
 CORNER DETAILS
 CSAH 78 OVER BNSF RAILWAY COMPANY

SHEET
 BC23
 OF
 BC42

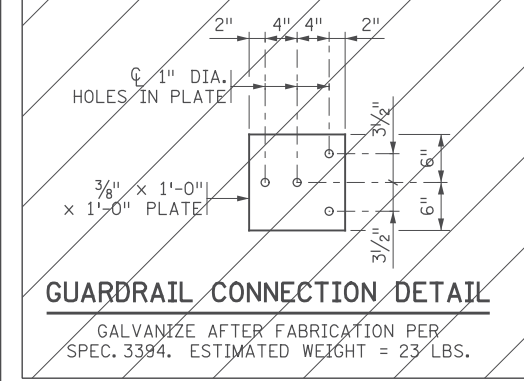


SECTION A-A

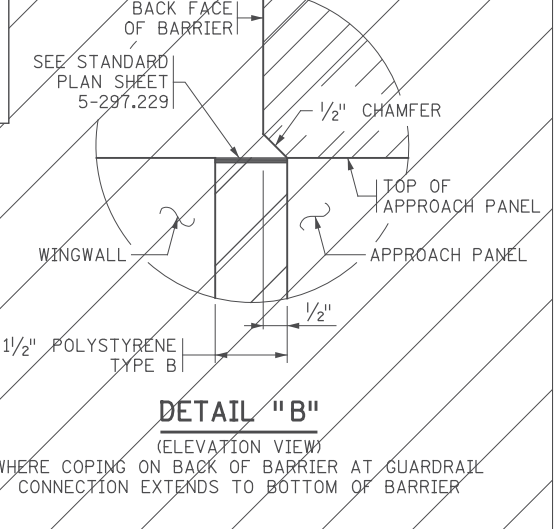


SECTION C-C

(REINFORCEMENT NOT SHOWN)
 ☆ DIMENSION INCLUDES 3/8" PLATE

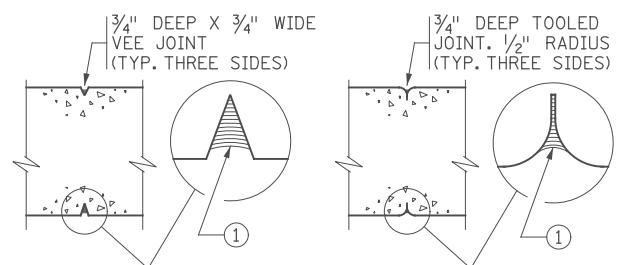
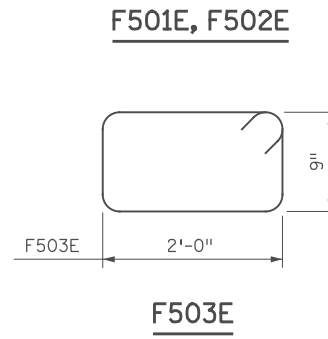
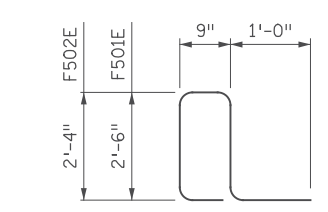
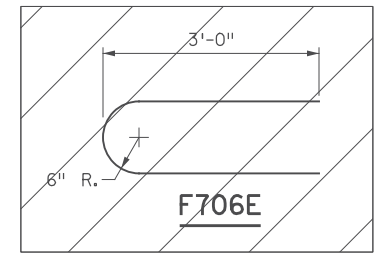
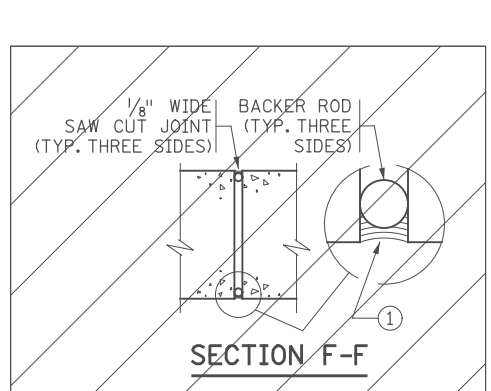


DETAIL "B"



JOINT AT ABUTMENT
 (EXPANSION DEVICE NOT SHOWN)
INSIDE ELEVATION OF PARAPET

PARAPET MEETS TEST LEVEL 2 REQUIREMENTS OF NCHRP REPORT 350



SECTION E-E
 CONTRACTOR OPTION 1 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)

BILL OF REINFORCEMENT: CONCRETE PARAPET

MARK	NO	LENGTH [FT - IN]	SHAPE	LOCATION
F501E	274	7 - 4		PARAPET VERT.
F502E	211	7 - 0		PARAPET VERT.
F503E	485	6 - 5		PARAPET VERT.
F404E	8	32 - 6		PARAPET LONGIT.
F405E	64	40 - 0		PARAPET LONGIT.
F406E	16	19 - 1		PARAPET LONGIT.
F407E	8	26 - 9		PARAPET LONGIT.
F408E	16	27 - 5		PARAPET LONGIT.

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 BETWEEN THE OUTSIDE FACES OF THE CONCRETE PARAPET.
- CONCRETE PARAPET = 416 LBS./FT. (0.103 CU. YDS./FT.)
- ~~CONCRETE PARAPET W/ADJACENT SIDEWALK (BASED ON A 10" SIDEWALK HEIGHT) = 573 LBS./FT. (0.141 CU. YDS./FT.)~~
- FINISH ALL EDGES OF PARAPET WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
- MAXIMUM SPACING OF CONTROL JOINTS ON SUPERSTRUCTURE, APPROACH AND WINGWALL SHALL BE 10 FT. SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.
- ~~GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, SPEC. 3306. GUARDRAIL CONNECTION AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO "TYPE MOD P-1 BARRIER CONCRETE (3S52)".~~
- SEE SHEET BC32 FOR LIGHT BLISTER DETAILS.
- PARAPET QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
- ① JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
- ② REFER TO STANDARD FIGURE 5-397.632 FOR COVER PLATE DETAILS.
- ③ 1'-0/8" WEST SIDE; 11" EAST SIDE.
- ④ SEAL WITH SELF-LEVELING SILICONE PER MnDOT 3722.

- MODIFICATIONS:**
- REVISED ELEVATION OF RAILING TO SHOW ACTUAL GEOMETRY
 - REVISED SECTION A-A & B-B TO SHOW ACTUAL GEOMETRY
 - REMOVED GUARDRAIL CONNECTION
 - MODIFIED PAY ITEM
 - MODIFIED BAR LENGTHS
 - MODIFIED JOINT AT ABUTMENT
 - ADDED NOTES ③ AND ④

REVISION:
 APPROVED: NOVEMBER 6, 2013
Nancy Dubenberger
 STATE BRIDGE ENGINEER

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASE FOR CONSTRUCTION

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 Print Name: ERIC S. HANSON
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

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 SAP 002-678-023
 SAP 114-020-051
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 02589
 COMM. NO. 0169140

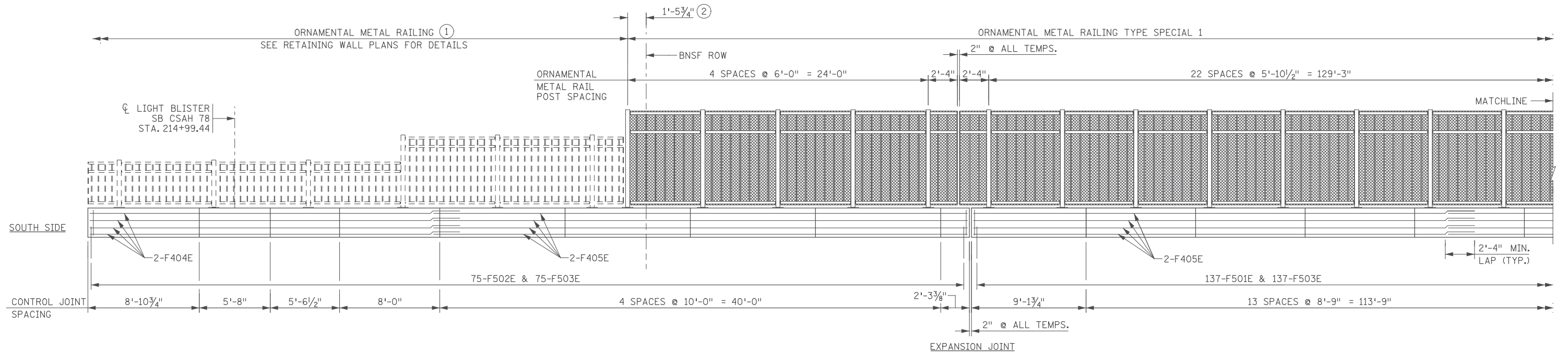


ANOKA COUNTY
 CONCRETE PARAPET (TYPE P-1)
 CSAH 78 OVER BNSF RAILWAY COMPANY

SHEET
 BC24
 OF
 BC42

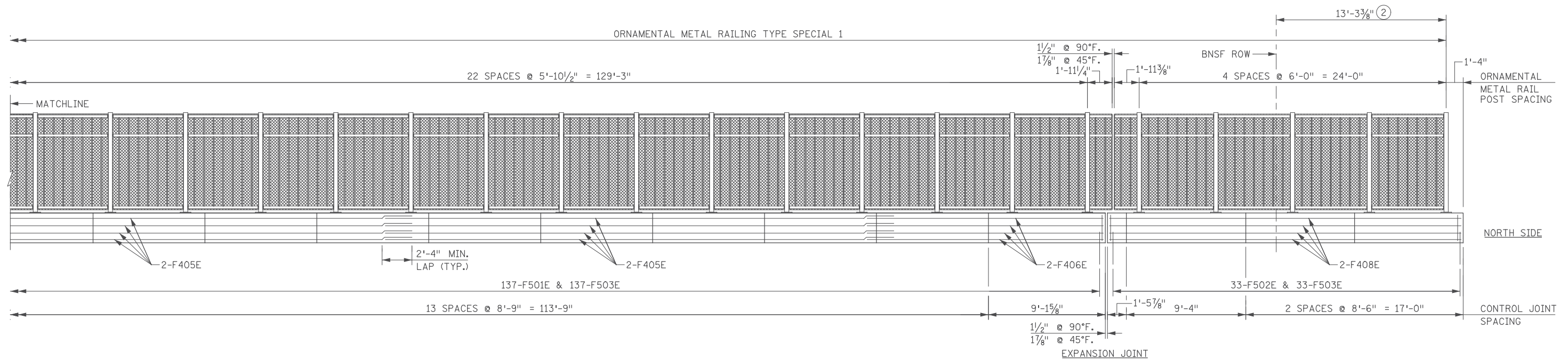
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FIG. 5-397.166

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INSIDE WEST RAILING ELEVATION

CONCRETE PARAPET TYPE MOD P-1
(DIMENSIONS ARE ALONG OUTSIDE EDGE OF DECK)



INSIDE WEST RAILING ELEVATION

CONCRETE PARAPET TYPE MOD P-1
(DIMENSIONS ARE ALONG OUTSIDE EDGE OF DECK)

NOTES:

- ① QUANTITIES FOR ORNAMENTAL METAL RAILING ARE INCLUDED IN THE RETAINING WALL PLANS.
- ② MEASURED ALONG CL RAILING

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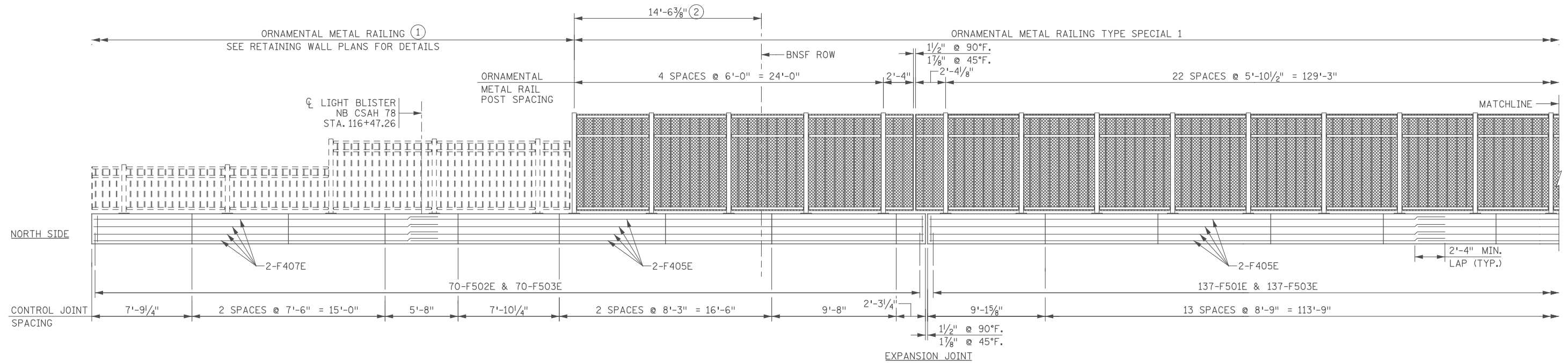
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DESIGNERS

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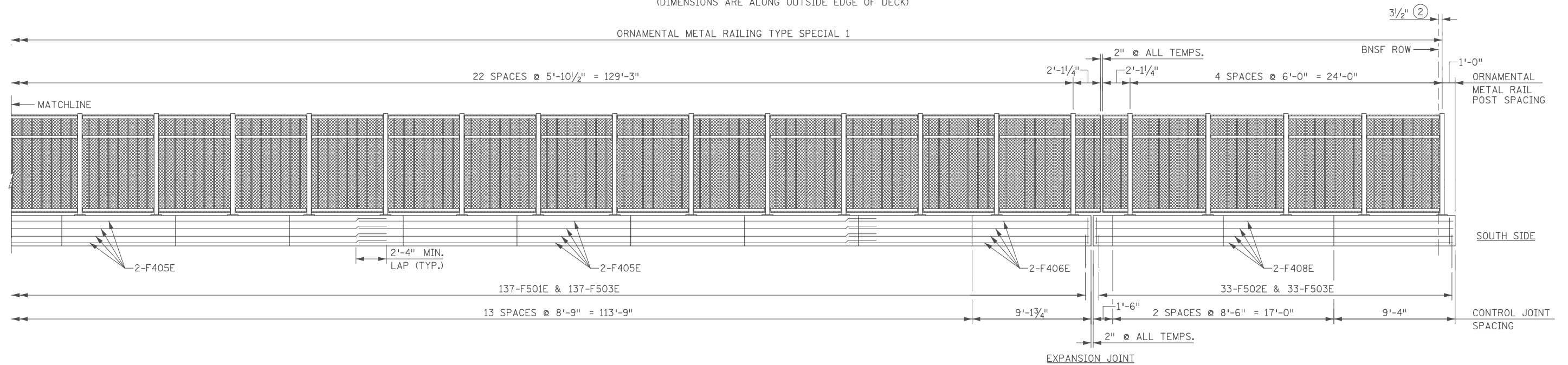
ANOKA COUNTY
CONCRETE BARRIER DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 1 OF 2)

SHEET BC25 OF BC42



INSIDE EAST RAILING ELEVATION

CONCRETE PARAPET TYPE MOD P-1
(DIMENSIONS ARE ALONG OUTSIDE EDGE OF DECK)



INSIDE EAST RAILING ELEVATION

CONCRETE PARAPET TYPE MOD P-1
(DIMENSIONS ARE ALONG OUTSIDE EDGE OF DECK)

NOTES:

- ① QUANTITIES FOR ORNTAMENTAL METAL RAILING ARE INCLUDED IN THE RETAINING WALL PLANS.
- ② MEASURED ALONG CL RAILING

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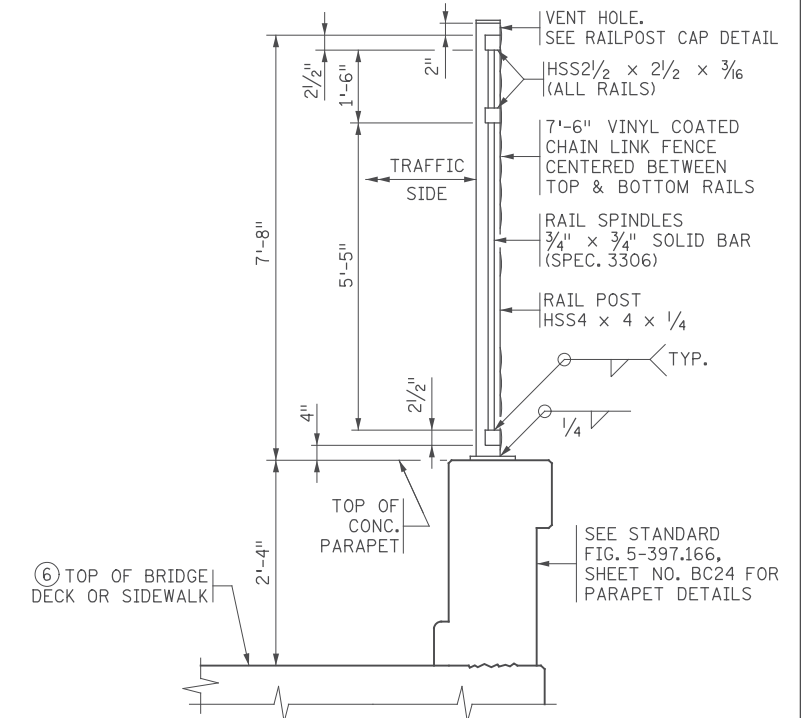
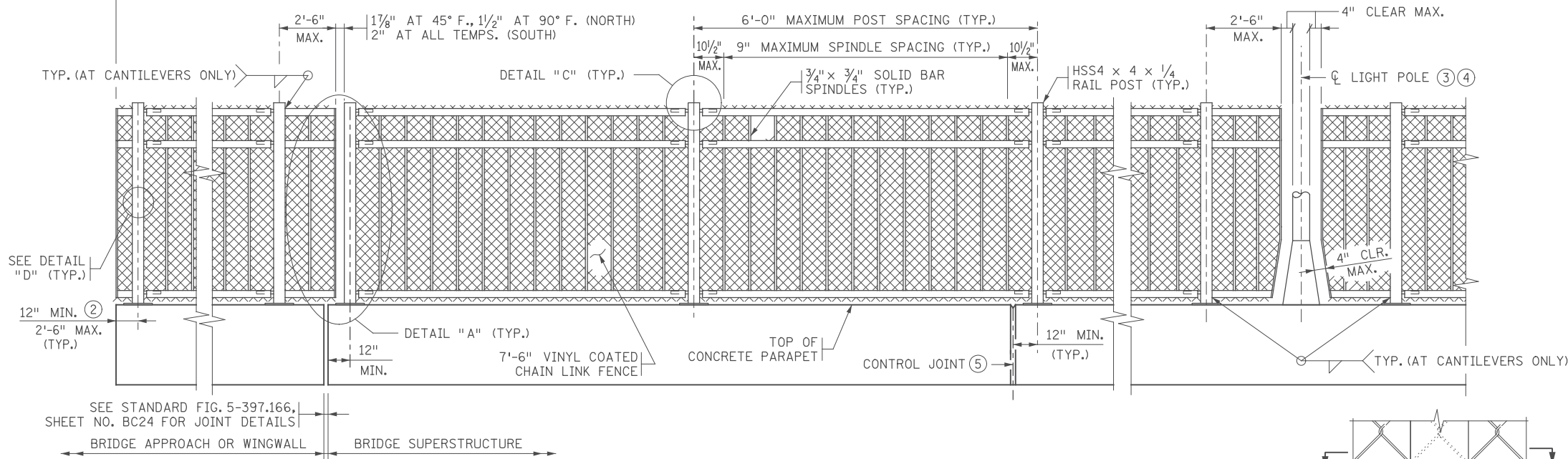
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PLANNERS
DESIGNERS

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Consulting Group, Inc.

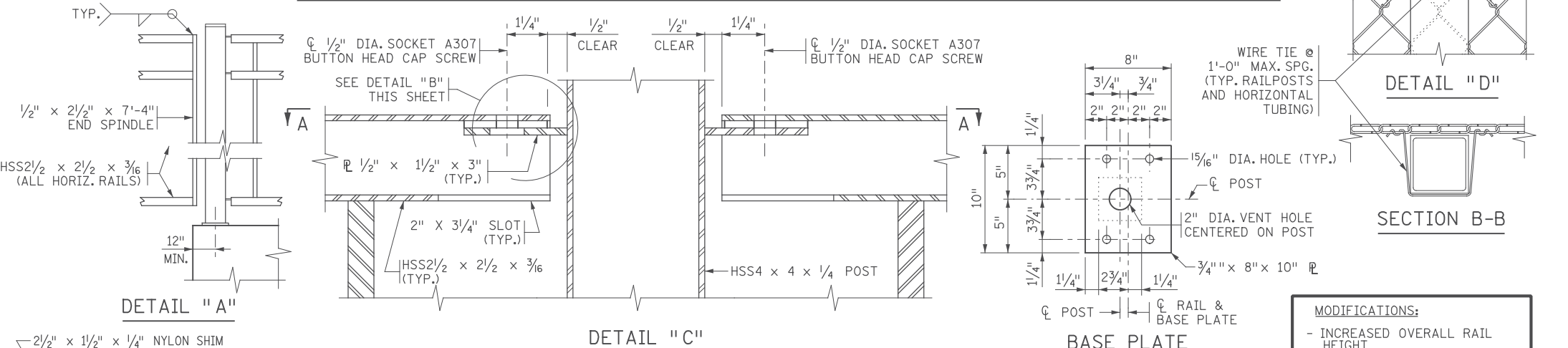
ANOKA COUNTY
CONCRETE BARRIER DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 2 OF 2)

SHEET
BC26
OF
BC42

OUT-TO-OUT ALONG ϕ ORNAMENTAL METAL RAILING TYPE SPECIAL 1 WITH FENCE (DESIGN T-3 PARAPET MOUNT)



PARTIAL ELEVATION OF ORNAMENTAL METAL RAILING TYPE SPECIAL 1 WITH FENCE (DESIGN T-3)



GENERAL NOTES SECTION THROUGH RAILING

- 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.
- USE A500, GRADE B STRUCTURAL STEEL TUBING (HSS) IN THE RAIL CONFORMING TO SPEC. 3361. ALL OTHER STEEL SHALL CONFORM TO SPEC. 3306.
- GALVANIZE BOLTS, NUTS, WASHERS AND ANCHORS PER SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL PER SPEC. 3394, AFTER FABRICATION.
- COAT THE GALVANIZED RAILING, BASE PLATES, AND PROTRUDING PORTIONS OF BOLTS, NUTS, ANCHORS, AND WASHERS.
- INSTALL RAIL POSTS AND SPINDLES PLUMB.
- CURVE HORIZONTAL RAILS WHERE APPLICABLE AND PLACE RAILS PARALLEL TO THE EDGE OF SIDEWALK PROFILE.
- ALWAYS USE CHAIN LINK FENCE WITH THIS RAILING. REFER TO SPEC. 2557 FOR CHAIN LINK FABRIC AND TIE REQUIREMENTS.
- 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.
 - PLACE ϕ OF END POST 12" FROM END OF CONCRETE PARAPET IF GUARDRAIL CONNECTION PLATE IS PRESENT.
 - IF LIGHT POLE IS MOUNTED ON BLISTER, RAILING MAY BE CONTINUOUS IN FRONT OF LIGHT POLE (SEE PARAPET & LIGHT POLE DETAILS).
 - CONTRACTOR TO COORDINATE LIGHT POLE DETAILS WITH THE RAILING FABRICATOR TO ENSURE PROPER CLEARANCES AND RAILING CONFIGURATION ADJACENT TO THE POLE.
 - SEE SUPERSTRUCTURE SHEETS AND STANDARD FIGURE 5-397.166 FOR CONTROL JOINT SPACING AND DETAILS.
 - IF TOP OF RAISED SIDEWALK, SEE SECTION D-D ON STANDARD FIGURE 5-397.166.
 - ADHESIVE ANCHORAGE WITH 5/8" DIA. ANCHOR ROD PER 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 6" 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 7.7 KIPS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.

MODIFICATIONS:

- INCREASED OVERALL RAIL HEIGHT
- ADDED INTERMEDIATE HORIZONTAL RAIL
- MODIFIED MAX. POST SPACING
- ADDED "TYPE SPECIAL 1" TO ELEVATION LABELS

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REVISION: 11-20-2014
 APPROVED: NOVEMBER 6, 2013
Nancy Dubenberger
 STATE BRIDGE ENGINEER

NO	DATE	BY	CKD	APPR	REVISION
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COMM. NO. 0169140

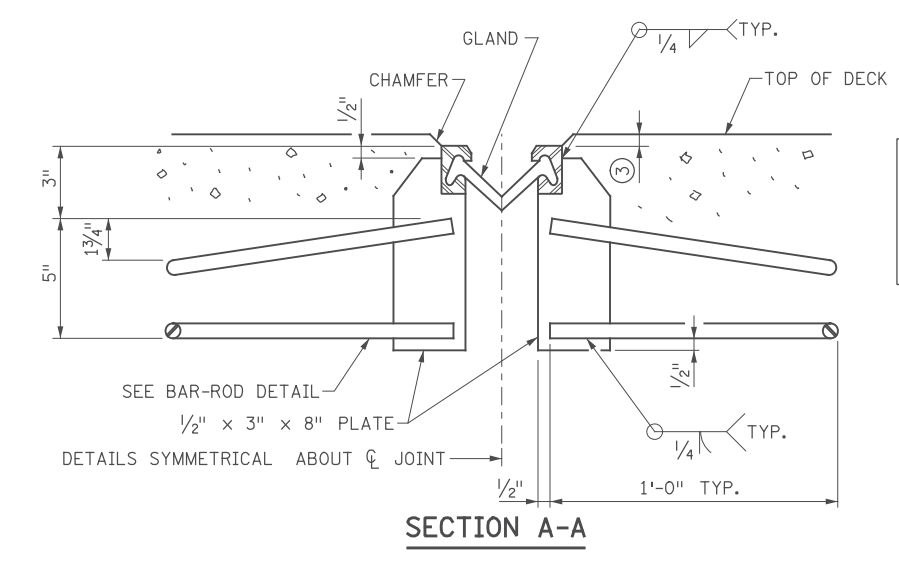
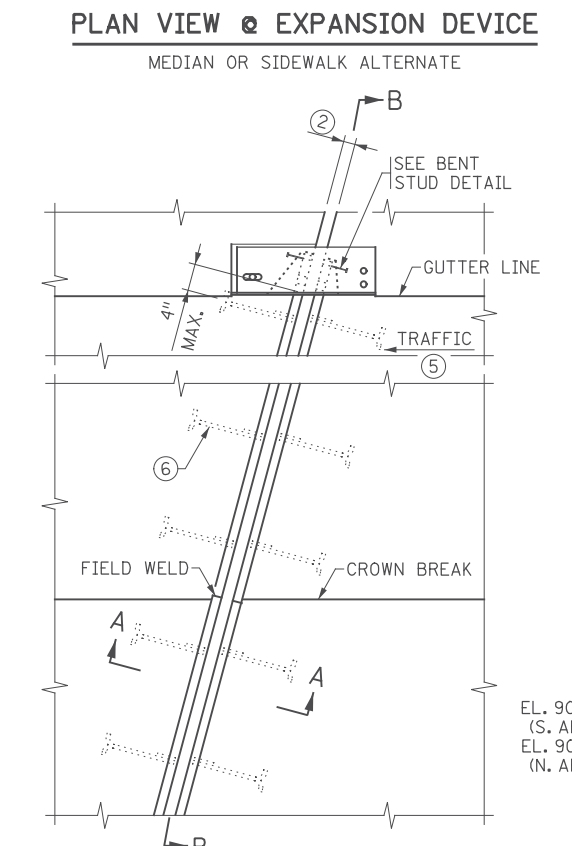
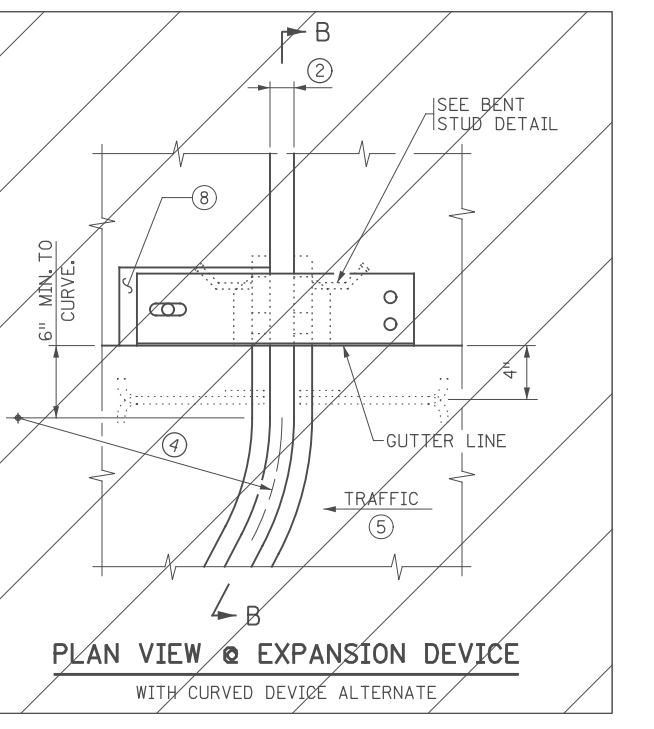
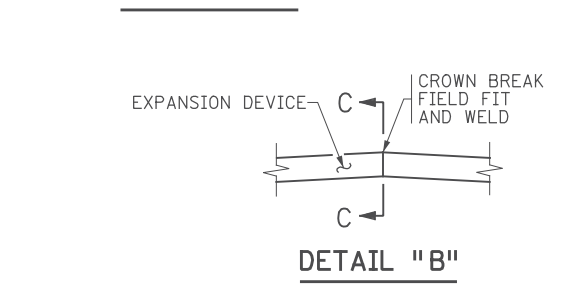
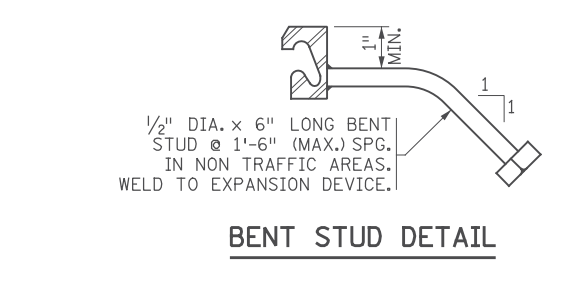
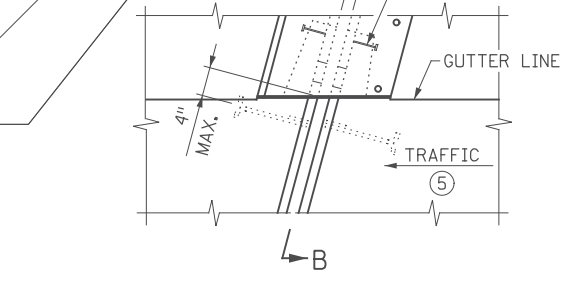
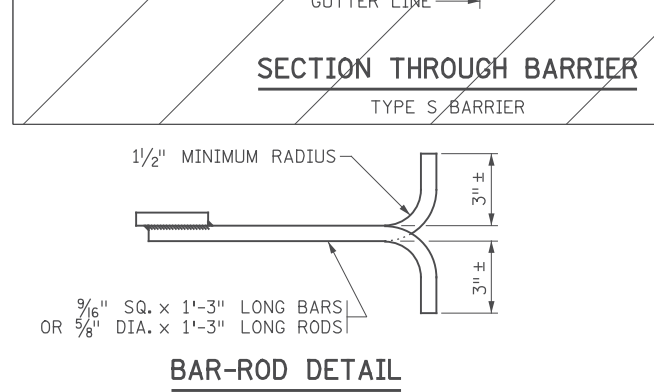
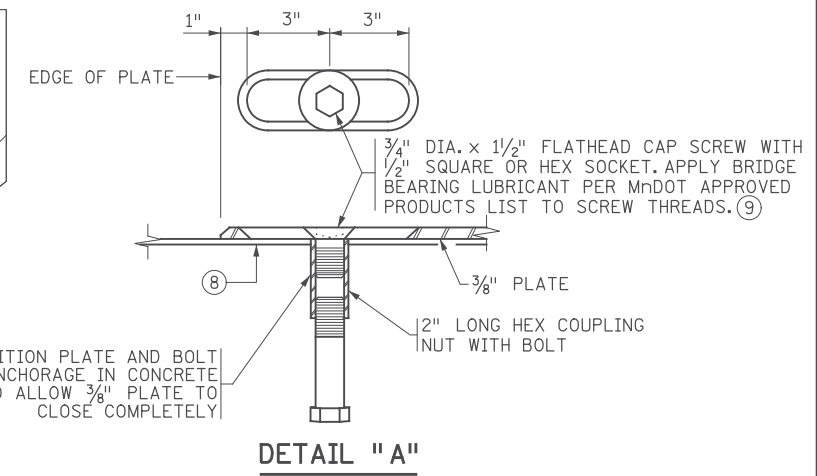
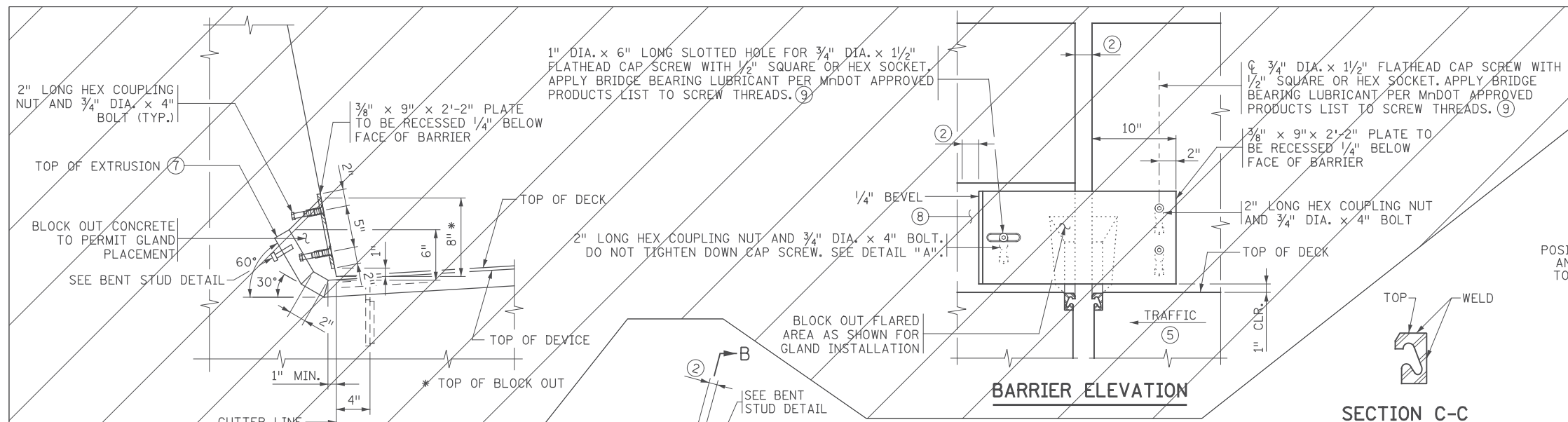
DRAWN BY J. HOFFMAN
 DESIGNED BY S. NEFF
 CHECKED BY E. HANSON

ENGINEERS
 PLANNERS
 DESIGNERS

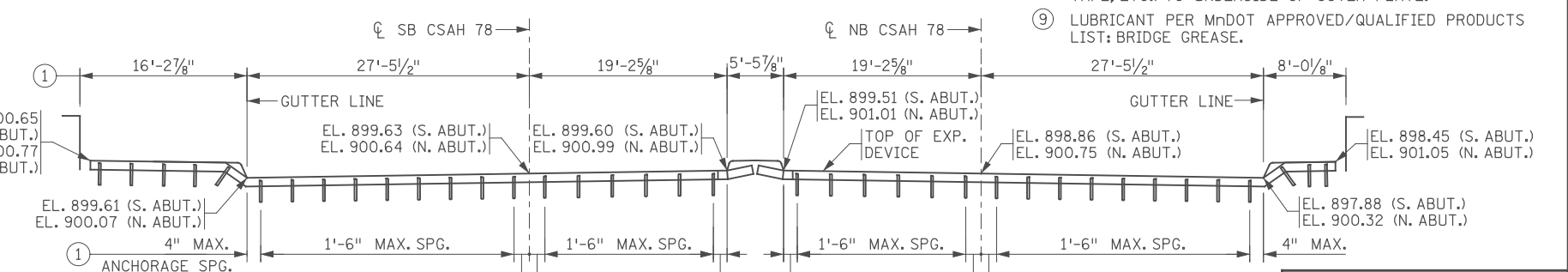


ANOKA COUNTY
 ORNAMENTAL RAILING (DESIGN T-3 PARAPET MOUNT)
 CSAH 78 OVER BNSF RAILWAY COMPANY

SHEET
 BC27
 OF
 BC42



MODIFICATIONS:
 - SECTION B-B UPDATED TO MATCH BRIDGE GEOMETRY



- 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.

- DIMENSIONS ARE ALONG CENTERLINE OF JOINT.
- 2" AT ALL TEMPS. (SOUTH)
1 7/8" AT 45° F & 1 1/2" AT 90° F. (NORTH)
- 1/8" (1/4" MAX.)
1/2" (5/8" MAX.) WHEN SNOWPLOW FINGERS ARE USED. SNOWPLOW FINGERS ARE REQUIRED FOR SKEWS OVER 15° AND LESS THAN 50°.
- SEE SUPERSTRUCTURE DETAILS FOR RADIUS.
- SEE SHEET NO. BC1 FOR DIRECTION OF TRAFFIC.
- 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.
- EXTEND GLAND 1" MIN. BEYOND THE TOP OF THE EXTRUSION.
- 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.
- LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE GREASE.

REVISION: 01-05-2017
 APPROVED: AUGUST 24, 2016
 Kevin Westman
 STATE BRIDGE ENGINEER

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASE FOR CONSTRUCTION

PLAN VIEW @ EXPANSION DEVICE
 WITH STRAIGHT DEVICE

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: ERIC S. HANSON
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02589
 COMM. NO. 0169140

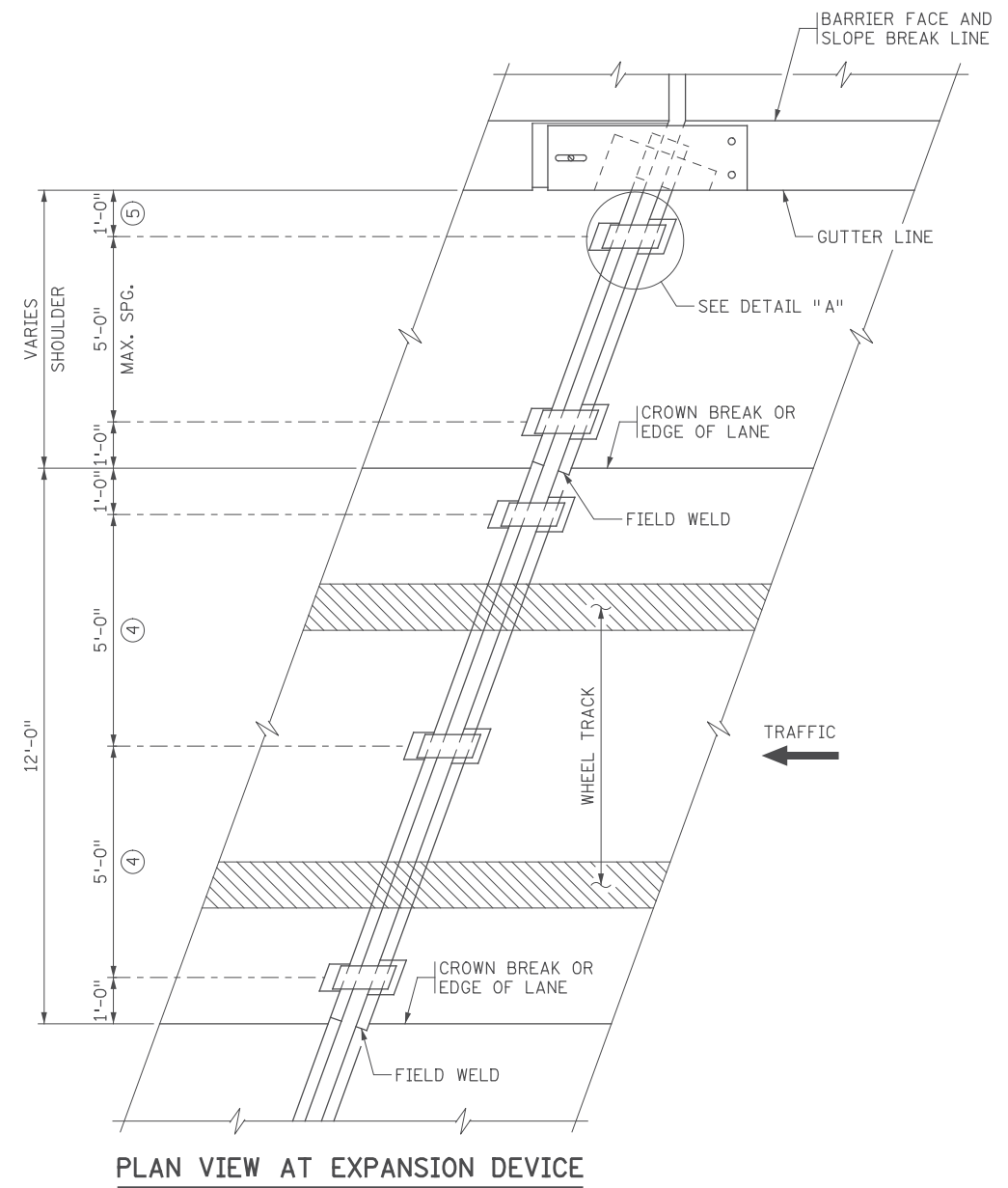
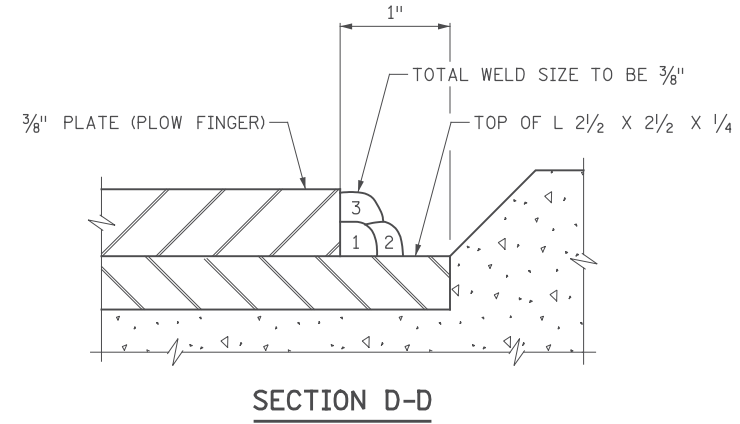
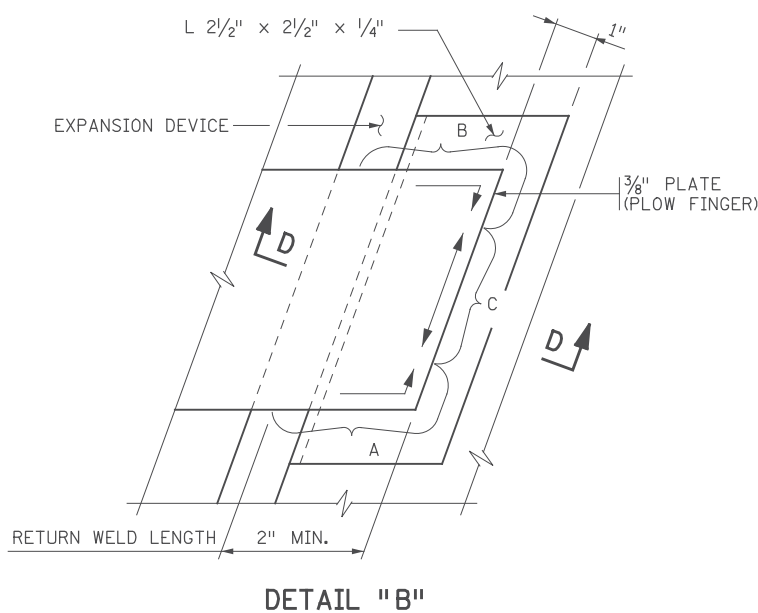
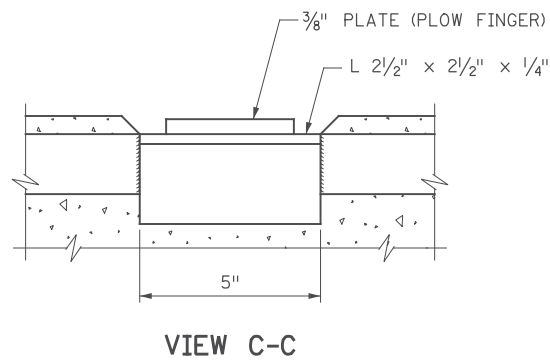
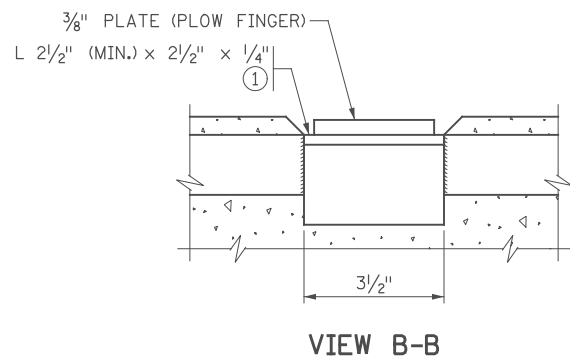
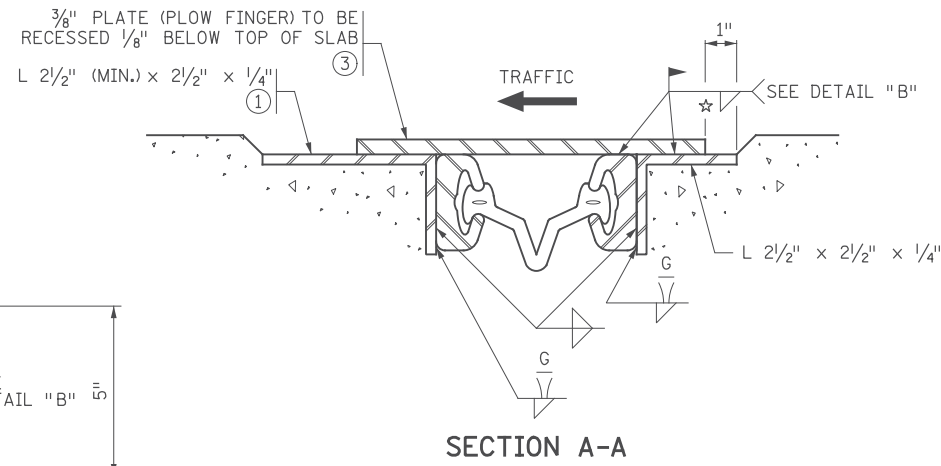
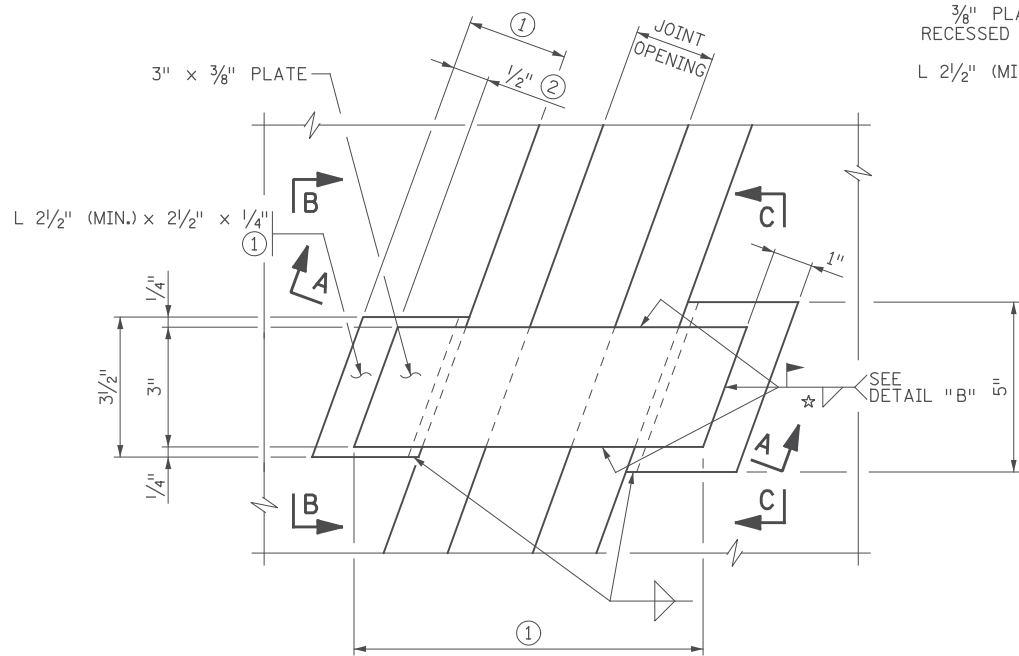
SRF ENGINEERS PLANNERS DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 WATERPROOF EXPANSION DEVICE
 CSAH 78 OVER BNSF RAILWAY COMPANY
 (SHEET 1 OF 3)

MODIFIED
 FIG. 5-397.627(B)

SHEET
 BC28
 OF
 BC42

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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.

REVISION: 11-06-2013

APPROVED: SEPTEMBER 26, 2003

Eric S. Hanson

STATE BRIDGE ENGINEER

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASE FOR CONSTRUCTION

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

Print Name: ERIC S. HANSON

Eric S. Hanson

Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S

SAP 002-678-023

SAP 114-020-051

BRIDGE NO.

02589

DRAWN BY J. HOFFMAN

DESIGNED BY S. NEFF

CHECKED BY E. HANSON

COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

Consulting Group, Inc.

ANOKA COUNTY

WATERPROOF EXPANSION DEVICE

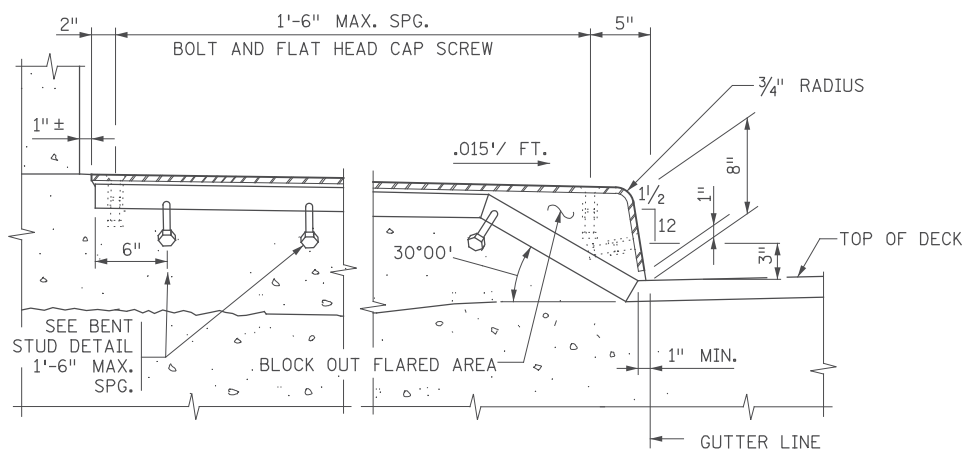
CSAH 78 OVER BNSF RAILWAY COMPANY

(SHEET 2 OF 3)

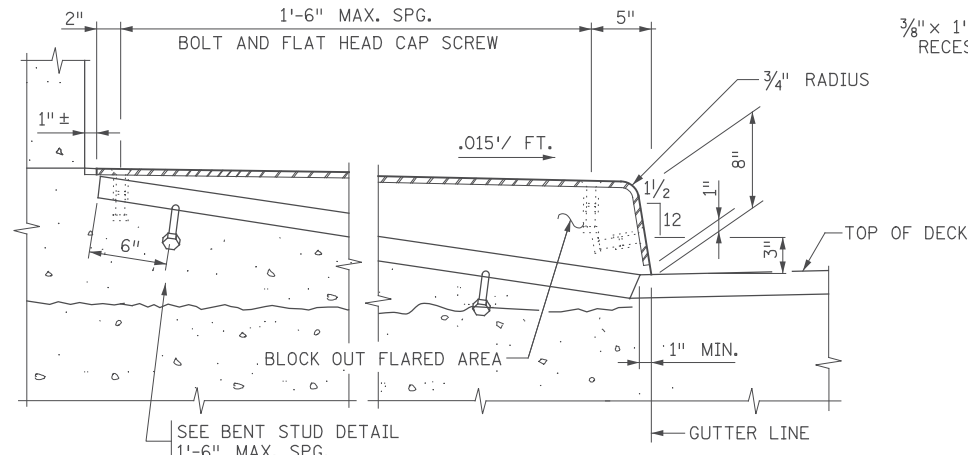
SHEET BC29 OF BC42

FIG. 5-397.628

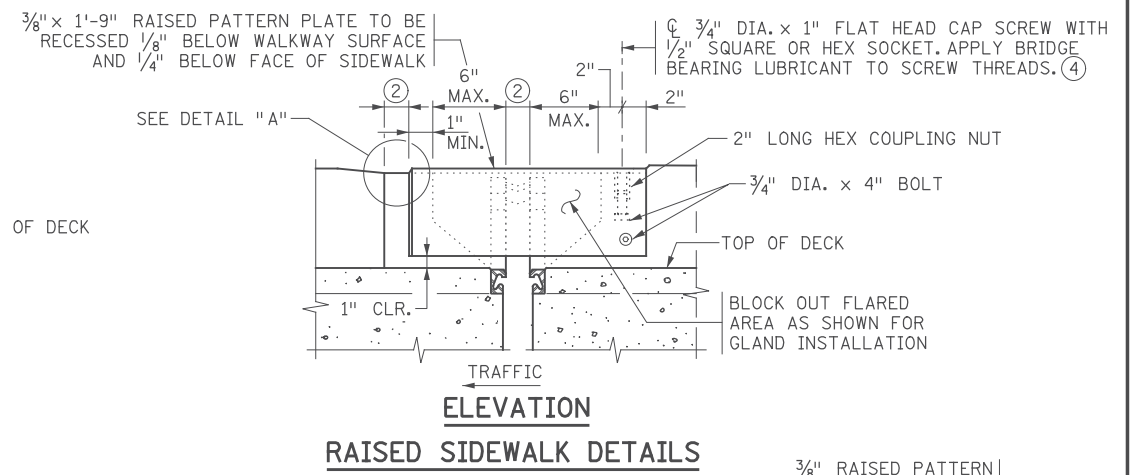
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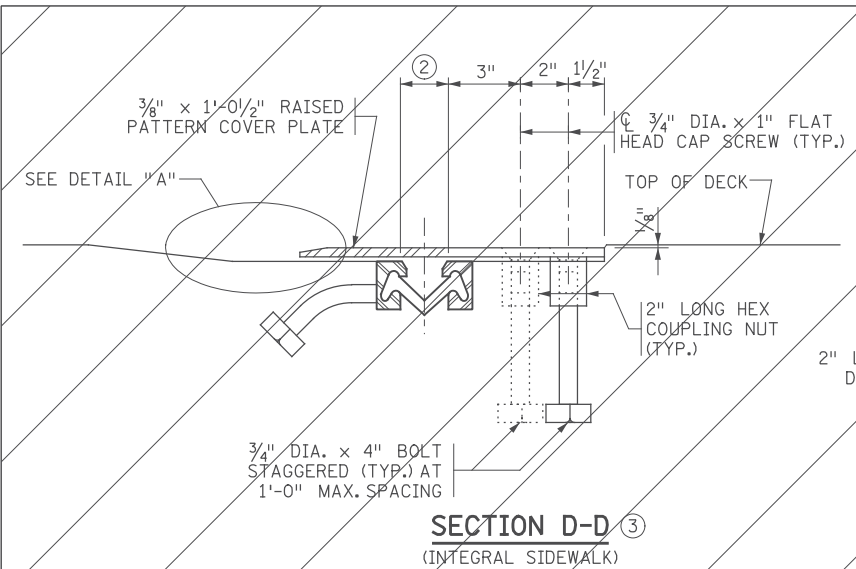
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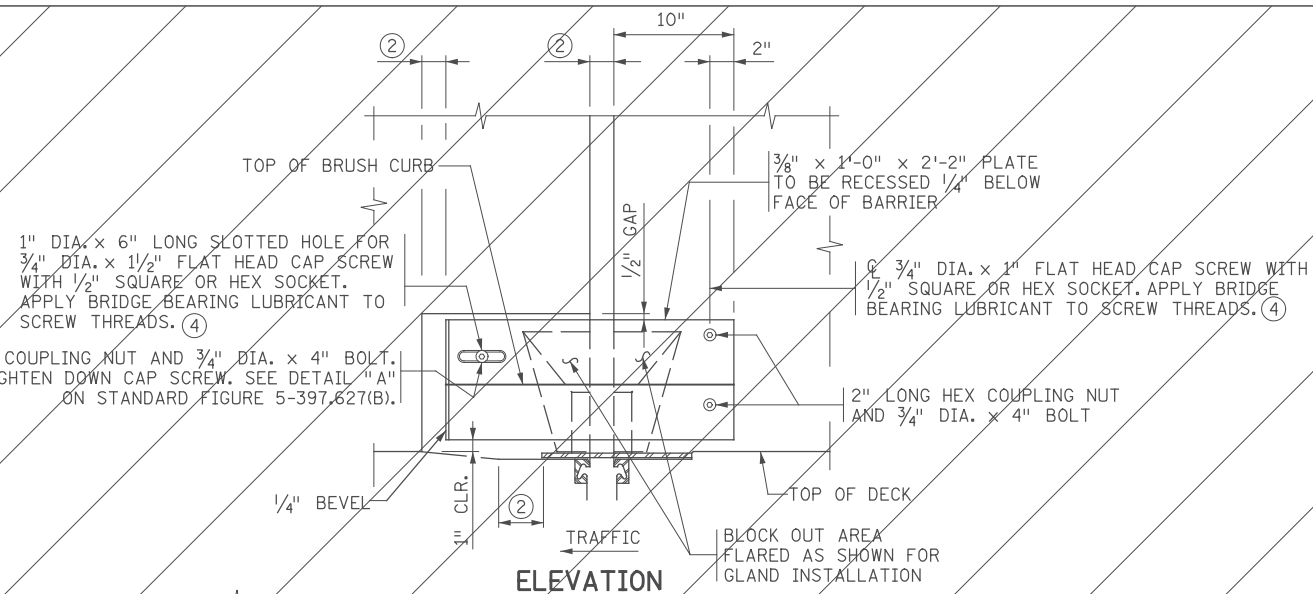
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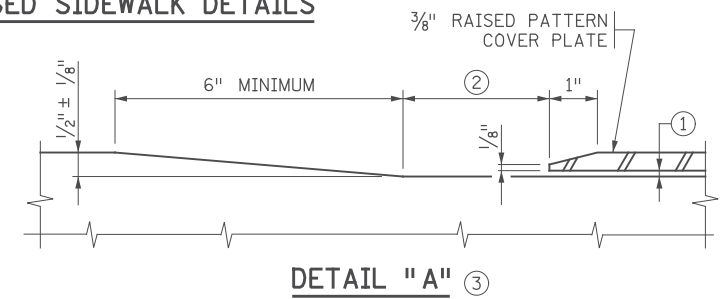
RAISED SIDEWALK DETAILS



SECTION D-D (INTEGRAL SIDEWALK)



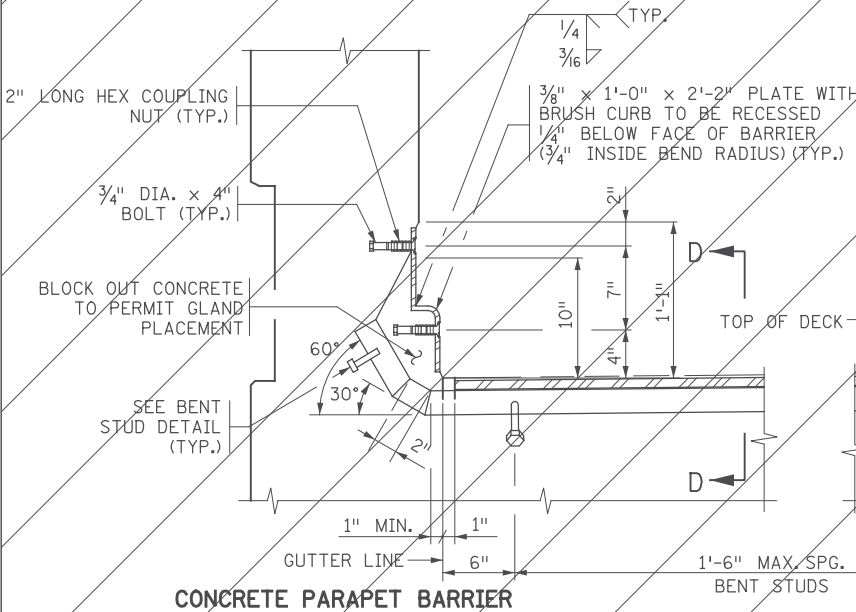
ELEVATION



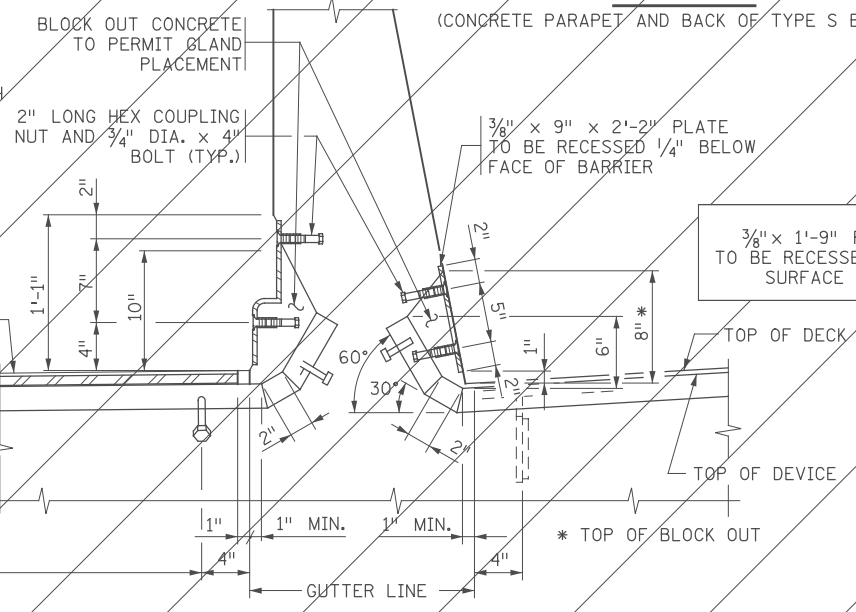
DETAIL "A"

GENERAL NOTES

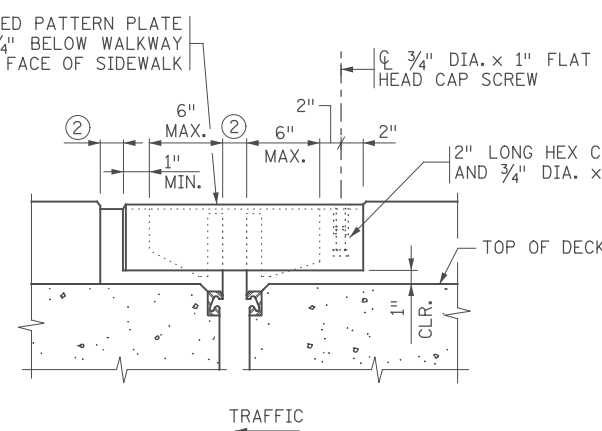
- SEE STANDARD FIGURE 5-397.627(B) FOR ADDITIONAL DETAILS AND NOTES.
- TRANSVERSE DECK REINFORCEMENT MAY BE SHIFTED THE MINIMUM DISTANCE REQUIRED FOR EXPANSION DEVICE PLACEMENT.
- 3/4" DIA. X 1" FLATHEAD CAP SCREW WITH 1/2" SQUARE OR HEX SOCKET PER SPEC 3391. COUNTERSINK CAP SCREWS 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT PER MnDOT APPROVED PRODUCTS LIST TO SCREW THREADS. (4)
- (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 STANDARD FIGURE 5-397.627(B).
- (3) DIMENSIONS SHOWN ARE REQUIRED TO COMPLY WITH A.D.A. STANDARDS.
- (4) LUBRICANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST: BRIDGE GREASE.



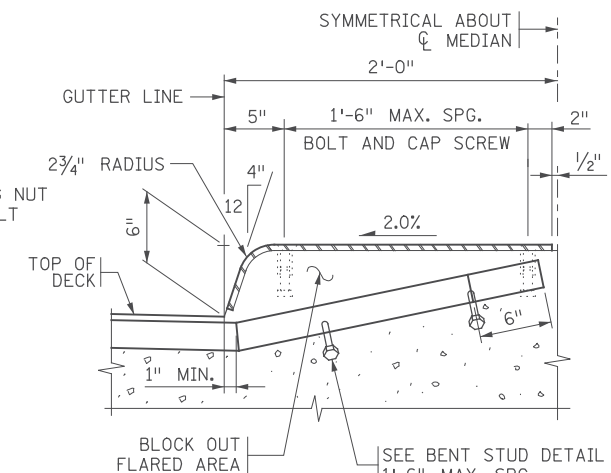
CONCRETE PARAPET BARRIER



TYPE S BARRIER



MEDIAN ELEVATION



MEDIAN SECTION

SECTION THROUGH BARRIERS - INTEGRAL SIDEWALK

FIG. 5-397.630(B)

REVISION:
APPROVED: AUGUST 24, 2016
Kevin Westrom
STATE BRIDGE ENGINEER

11/01/2017					RELEASE FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: ERIC S. HANSON
Eric S. Hanson
Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051
BRIDGE NO.
02589

DRAWN BY
J. HOFFMAN
DESIGNED BY
S. NEFF
CHECKED BY
E. HANSON
COMM. NO. 0169140

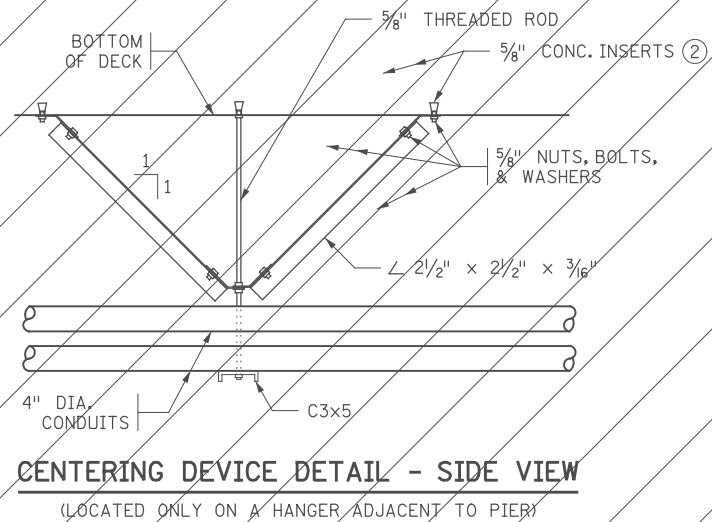
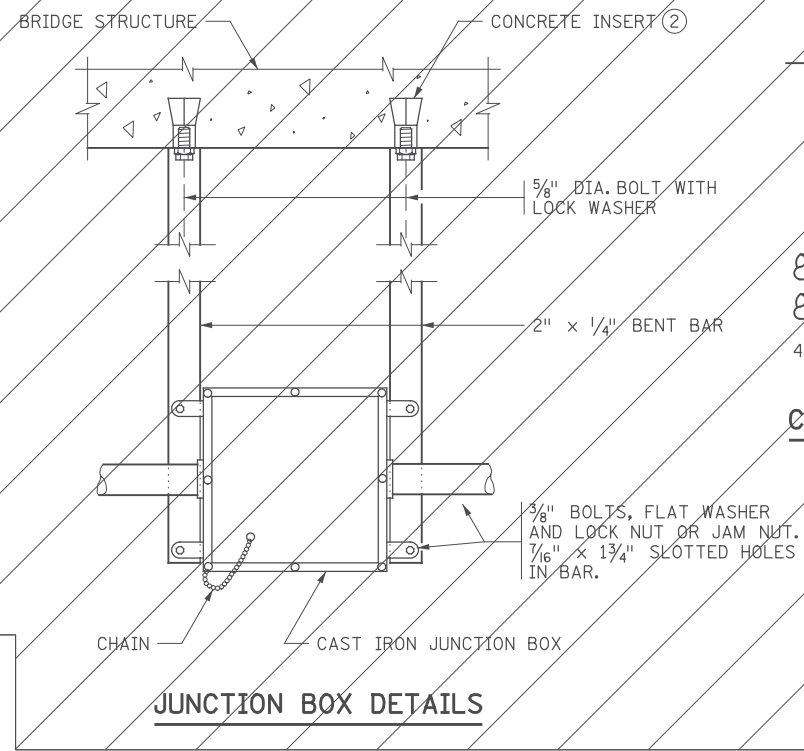
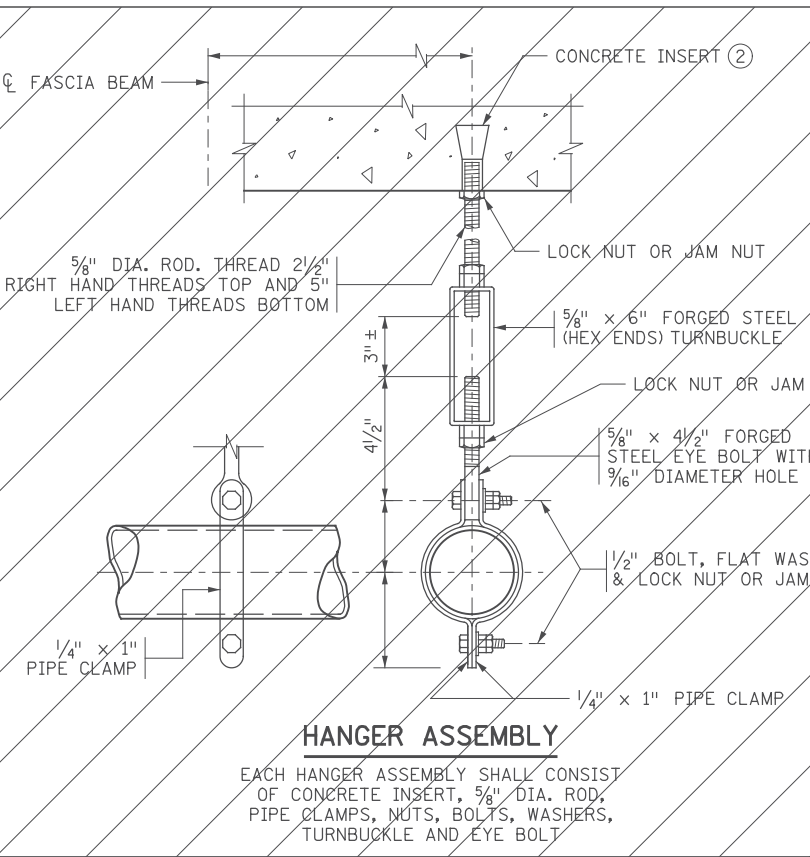
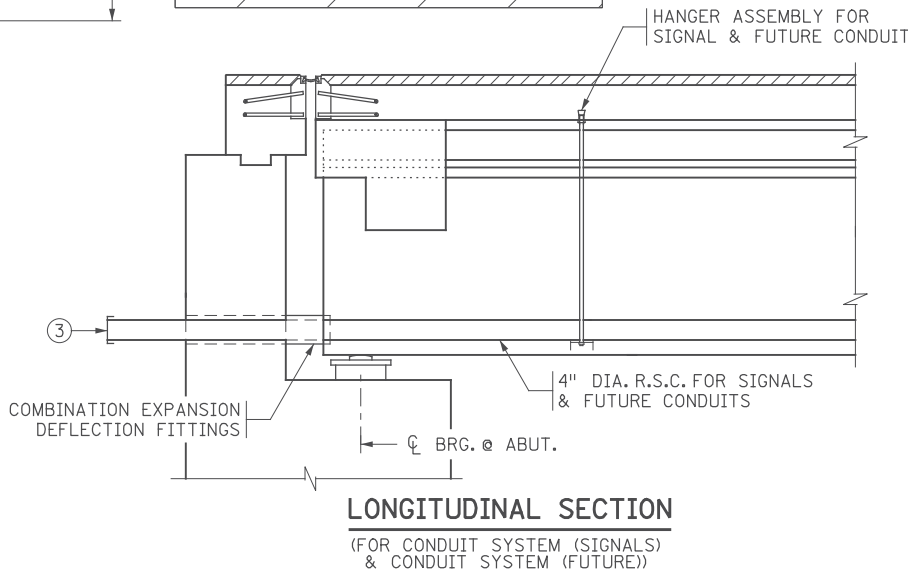
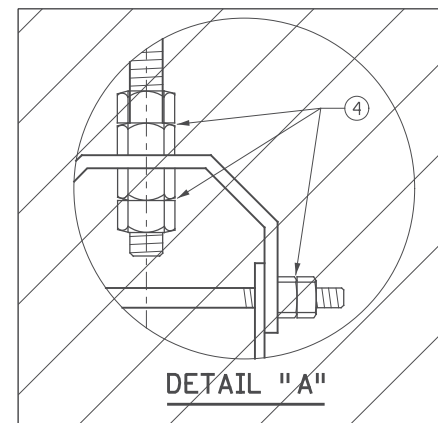
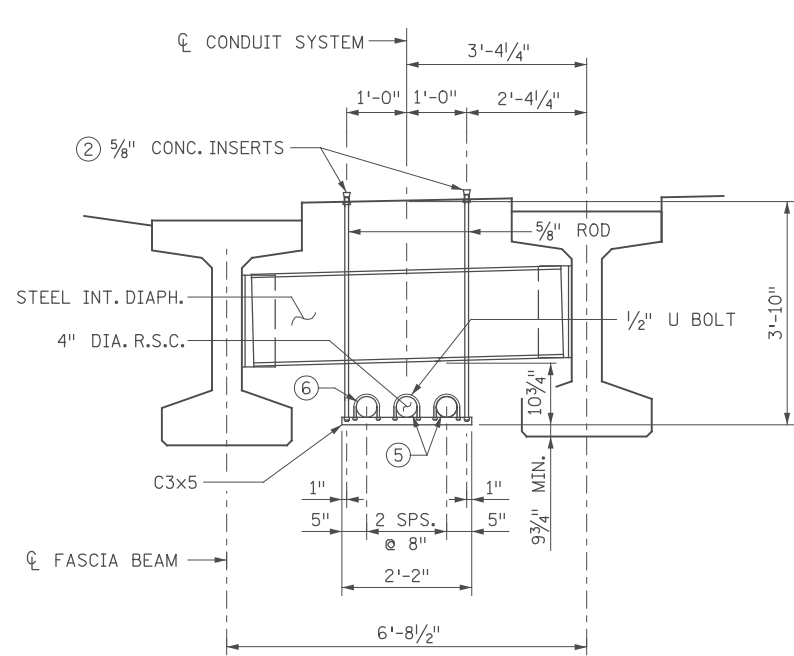
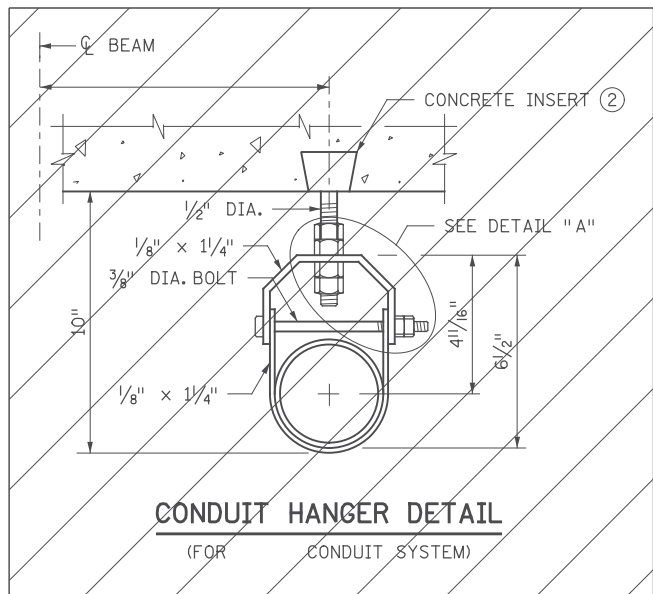


ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
WATERPROOF EXPANSION DEVICE
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 3 OF 3)

SHEET
BC30
OF
BC42

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SUMMARY OF QUANTITIES FOR CONDUIT SYSTEM (SIGNALS)		
⑦	HANGER ASSEMBLY	5 UNITS
	CONDUIT CAP	2 UNITS
	COMBINATION EXPANSION/DEFLECTION FITTING	2 UNITS
	4\"/>	
①	5\"/>	

ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (SIGNALS)".

SUMMARY OF QUANTITIES FOR CONDUIT SYSTEM (FUTURE)		
⑦	HANGER ASSEMBLY	10 UNITS
	CONDUIT CAP	4 UNITS
	COMBINATION EXPANSION/DEFLECTION FITTING	4 UNITS
	4\"/>	
①	5\"/>	

ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (FUTURE)".

MODIFICATIONS:
 - REVISED LONG. SECTION
 - REVISED TRANS. SECTION
 - ADDED NOTES 5 - 7

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.
- ① SEE ABUTMENT SHEETS FOR LOCATIONS AND DETAILS.
- ② SPACE INSERTS AT 10'-0" MAXIMUM CENTERS.
- ③ CONDUIT TO EXTEND TO HANDHOLES IN APPROACH PANELS. SEE INTERCONNECT PLANS FOR HANDHOLE LOCATIONS AND PAYMENT DETAILS. CAP ENDS.
- ④ DOUBLE NUTS OR JAM NUTS OR LOCK NUT.
- ⑤ (2)-4" DIA. PVC COATED R.S.C. FOR CONDUIT SYSTEM (FUTURE).
- ⑥ (1)-4" DIA. PVC COATED R.S.C. FOR CONDUIT SYSTEM (SIGNALS).
- ⑦ QUANTITY AND PAYMENT FOR HANGER ASSEMBLIES ARE DIVIDED AS SHOWN FOR CONDUIT SYSTEM (SIGNALS) AND CONDUIT SYSTEM (FUTURE).

MODIFIED
FIG. 5-397.402

REVISION: 05-24-2012
 APPROVED: SEPTEMBER 26, 2003
Eric S. Hanson
 STATE BRIDGE ENGINEER

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASE FOR CONSTRUCTION

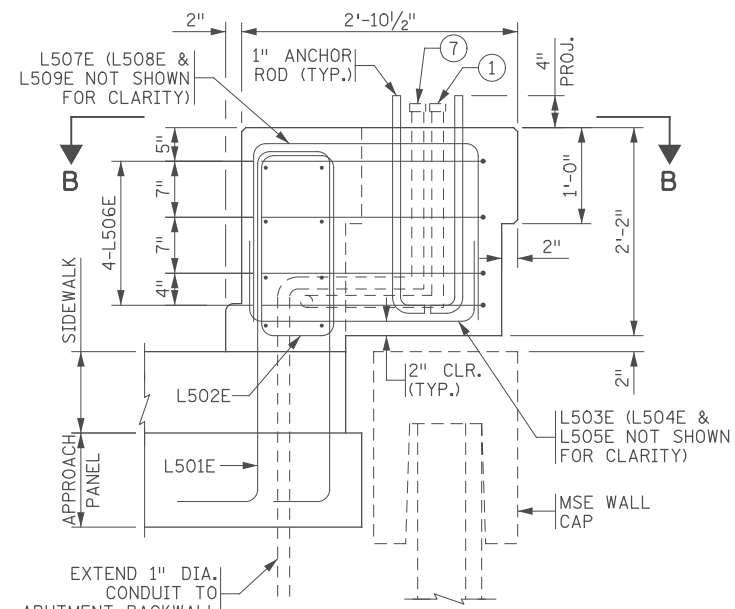
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: ERIC S. HANSON
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02589
 COMM. NO. 0169140

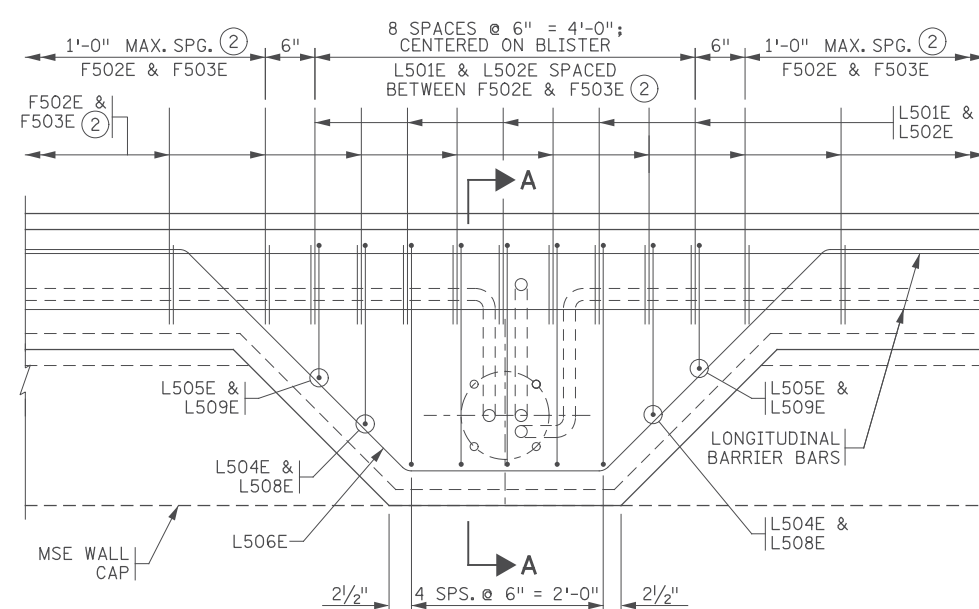
DRAWN BY J. HOFFMAN
 DESIGNED BY S. NEFF
 CHECKED BY E. HANSON
SRF ENGINEERS PLANNERS DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 CONDUIT SYSTEM FOR SIGNALS & FUTURE
 CSAH 78 OVER BNSF RAILWAY COMPANY
SHEET BC31 OF BC42

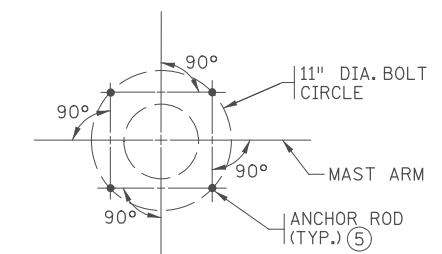
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SECTION A-A
(THRU APPROACH PANEL)

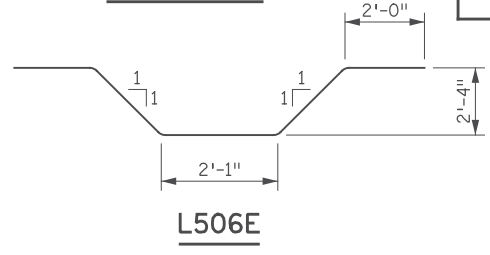


PLAN

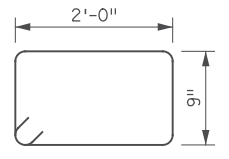


ANCHOR ROD PLACEMENT

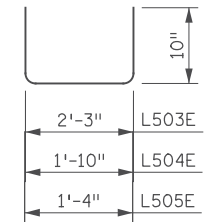
BAR SHAPES:



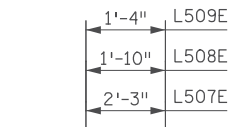
L506E



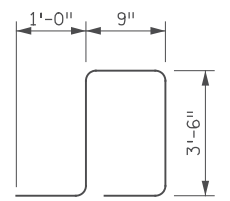
L502E



L503E, L504E, L505E



L507E, L508E, L509E



L501E

BILL OF REINFORCEMENT FOR BARRIER AT ONE LIGHT POLE

MARK	NO	LENGTH [FT-IN]	SHAPE	LOCATION
L501E	5	9 - 4	[Symbol]	PARAPET DOWEL
L502E	5	6 - 5	[Symbol]	PARAPET VERTICAL
L503E	5	3 - 11	[Symbol]	VERTICAL TIE
L504E	2	3 - 6	[Symbol]	VERTICAL TIE
L505E	2	3 - 0	[Symbol]	VERTICAL TIE
L506E	4	12 - 9	[Symbol]	LONGITUDINAL TIE
L507E	5	5 - 11	[Symbol]	VERTICAL TIE
L508E	2	5 - 6	[Symbol]	VERTICAL TIE
L509E	2	5 - 0	[Symbol]	VERTICAL TIE

TOTAL REINFORCEMENT PER LIGHT POLE LOCATION IS 223 LBS.

GENERAL NOTES

PROVIDE HEAVY HEX NUTS, PER SPEC. 3391.2.A FOR 1" DIA. THREADED RODS. TAP NUTS 1/8" OVERSIZED PRIOR TO GALVANIZING, AND RETAP TO STANDARD SIZE AFTER GALVANIZING.

USE A BRUSH TO APPLY ANTI-SIEZE COMPOUND PER MIL-PRF-907E TO THE THREADS OF ANCHOR RODS.

GALVANIZE THREADED RODS AND NUTS AFTER FABRICATION PER SPEC. 3392.

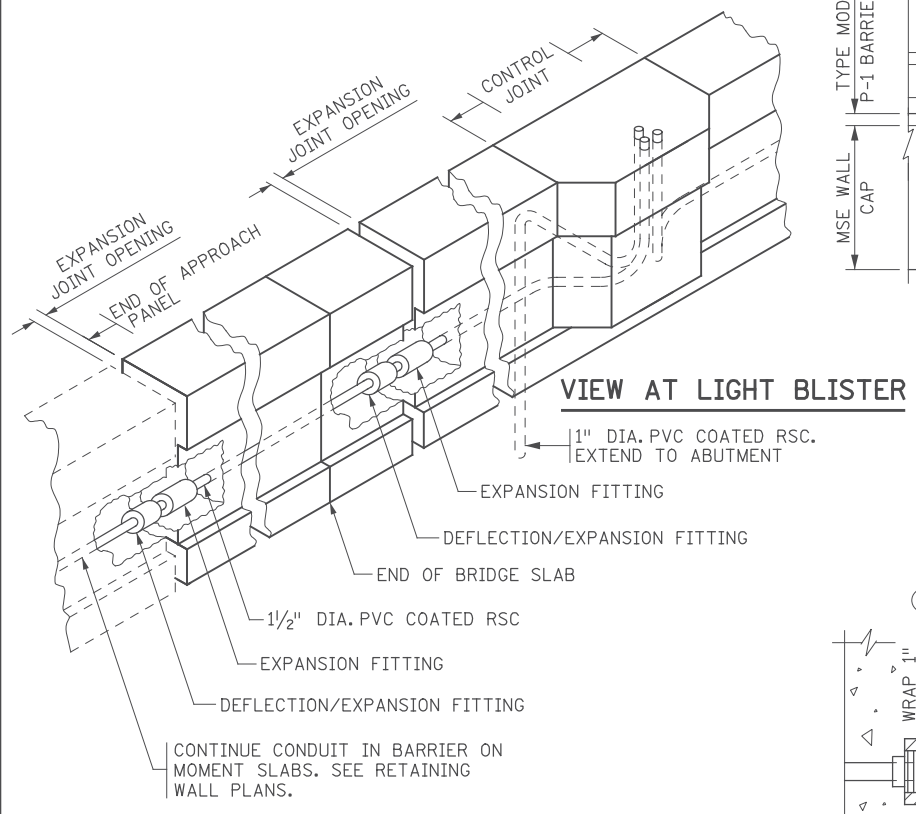
A RIGID TEMPLATE SHALL BE PROVIDED FOR ANCHOR ROD AND CONDUIT PLACEMENT AND SHALL BE LEFT IN PLACE UNTIL THE CONCRETE HAS SET. ANCHOR RODS TO BE PLACED AT RIGHT ANGLES TO THE DIRECTION OF THE MAST ARM.

BOND AND GROUND THE CONDUIT SYSTEM (LIGHTING) IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF SPEC. 2545.3.R.

ADDITIONAL BARRIER CONCRETE REQUIRED TO CONSTRUCT THE LIGHT POLE ANCHORAGE IS INCIDENTAL TO THE CONCRETE BARRIER PAY ITEM.

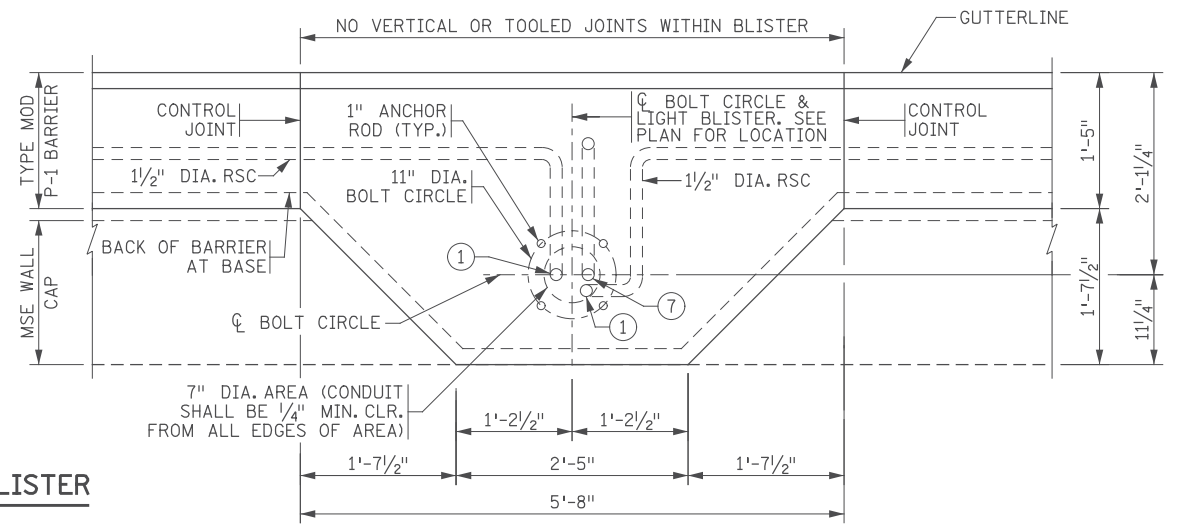
ANCHOR RODS AND RIGID TEMPLATE ARE INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (LIGHTING)".

- 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)."
- WRAP PER SPEC. 2565.3.D.7.
- PROVIDE COMBINATION DEFLECTION/EXPANSION FITTING PER SPEC. 3839.
- PROVIDE 1" NOMINAL DIA. ANCHOR RODS WITH 1-8UNC-2A THREADS. USE TYPE B INTERMEDIATE STRENGTH ANCHOR RODS PER ASTM F1554 GR.55 PER SPEC. 3385.2.B. (4 REQUIRED).
- WRAP THE THREADS OF THE TOP 4" OF EACH ANCHOR ROD WITH THREE LAYERS OF PLASTIC ELECTRICAL TAPE TO AVOID CONTAMINATION BY CONCRETE DURING PLACEMENT.
- EXTEND THE 1" DIA. PVC COATED RIGID STEEL CONDUIT 3" ABOVE THE BARRIER AND INSTALL CAP.
- BARS SHOWN ARE FOR ONE LIGHT BLISTER.

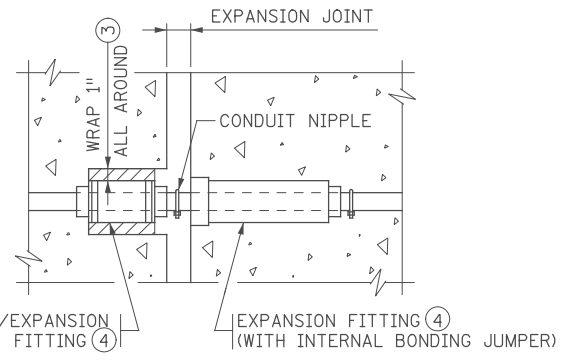


VIEW AT LIGHT BLISTER

VIEW AT END OF APPROACH PANEL

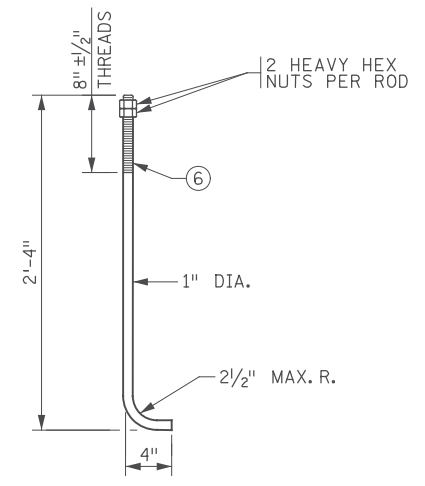


SECTION B-B



COMBINATION DEFLECTION/EXPANSION FITTING

IN BARRIER



ANCHOR ROD DETAIL

4 REQUIRED

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11/01/2017				RELEASE FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR
				REVISION

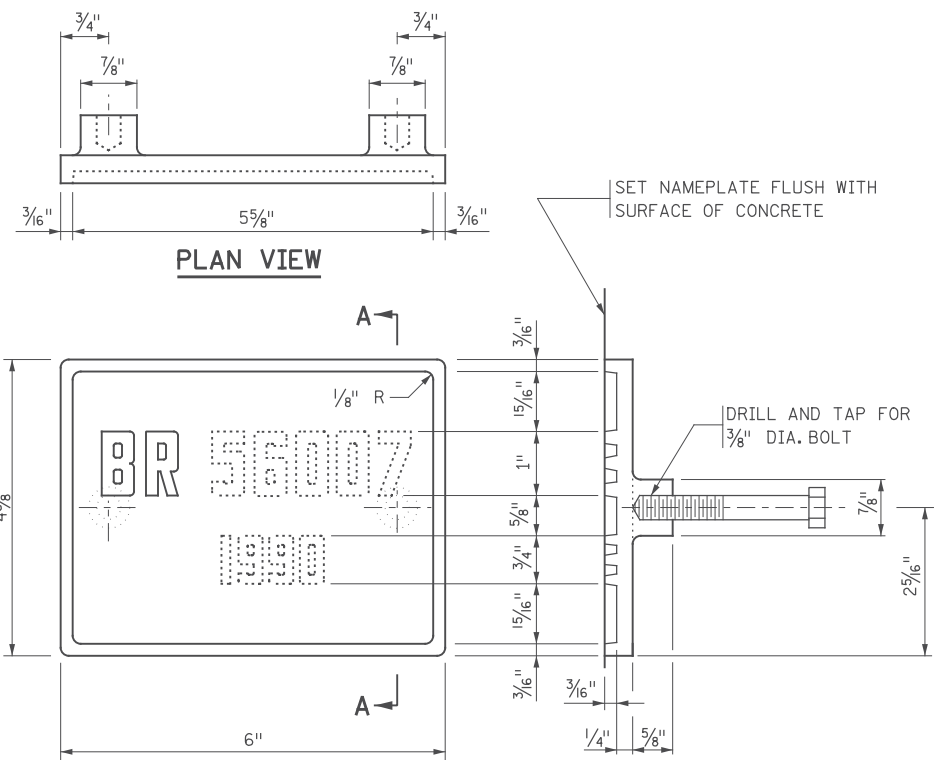
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 Print Name: **ERIC S. HANSON**
Eric S. Hanson
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051
 BRIDGE NO.
 02589
 COMM. NO. 0169140

DRAWN BY
 J. HOFFMAN
 DESIGNED BY
 S. NEFF
 CHECKED BY
 E. HANSON
SRF ENGINEERS
 PLANNERS
 DESIGNERS
 Consulting Group, Inc.

ANOKA COUNTY
 CONDUIT SYSTEM (LIGHTING)
 CSAH 78 OVER BNSF RAILWAY COMPANY

SHEET
 BC32
 OF
 BC42



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

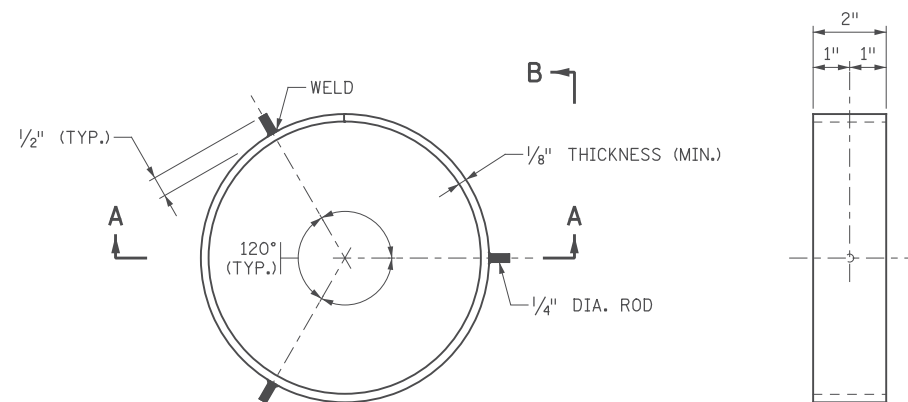
BRIDGE 02589
YEAR 2018

1234567890

NUMBERS FOR NAMEPLATE

NOTES:

- MATERIAL SHALL COMPLY WITH SPEC. 3327.
- LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.
- DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".
- HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.
- TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.
- FURNISH 2 STEEL BOLTS 3/8" DIA. x 3" LONG WITH EACH PLATE.
- ALL DIMENSIONS FOR 3/4" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

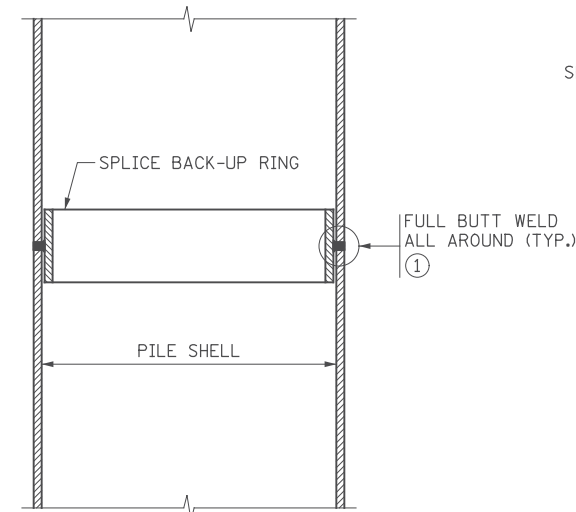


PLAN VIEW - SPLICE BACK-UP RING

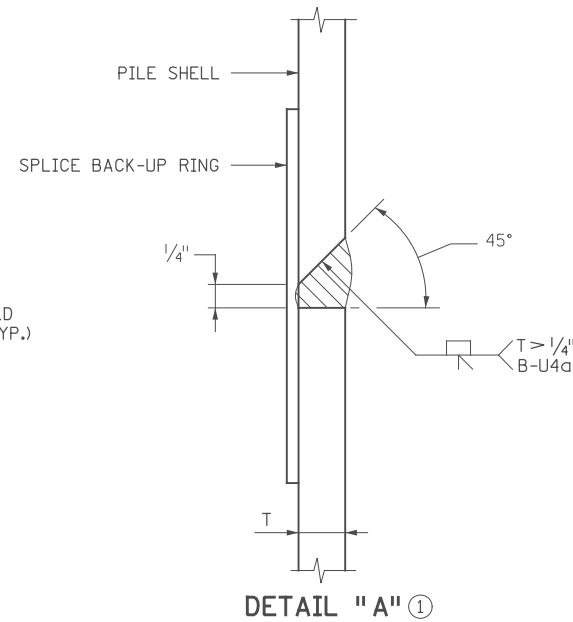
PILE NOT SHOWN

SECTION B-B

PILE NOT SHOWN



SECTION A-A



DETAIL "A" ①

NOTES:

- APPROVED COMMERCIAL PILE SPLICE BACK-UP RING MAY BE USED IN LIEU OF THE TYPE DETAILED, PROVIDED THAT 1/4" ROOT IS MAINTAINED. BACK-UP RING SHALL HAVE A TIGHT FIT.
- WELDING ELECTRODES SHALL BE CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011.
- ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.
- WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN 0° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.

① FOR PILE SHELL THICKNESSES GREATER THAN 1/4", USE A B-U4g WELD CONFIGURATION. SEE DETAIL "A".

APPROVED: NOVEMBER 22, 2002

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISION
09-11-2014

DETAIL NO.

Daniel J. Hanson
STATE BRIDGE ENGINEER

BRIDGE NAMEPLATE
(FOR NEW BRIDGES)

B101

APPROVED: NOVEMBER 22, 2002

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISION:
11-06-2013

DETAIL NO.

Daniel J. Hanson
STATE BRIDGE ENGINEER

PILE SPLICE
(CAST-IN-PLACE CONCRETE PILES)

B201

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASE FOR CONSTRUCTION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: ERIC S. HANSON
Eric S. Hanson
Date 11/01/2017 License # 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051
BRIDGE NO.
02589

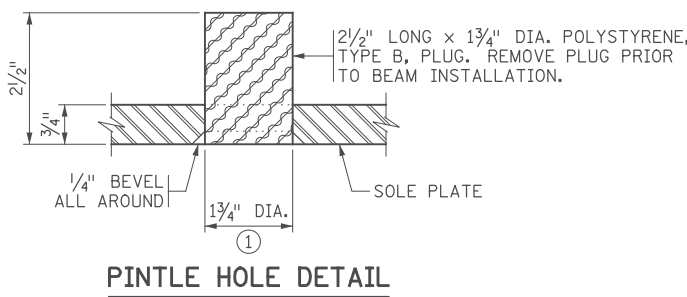
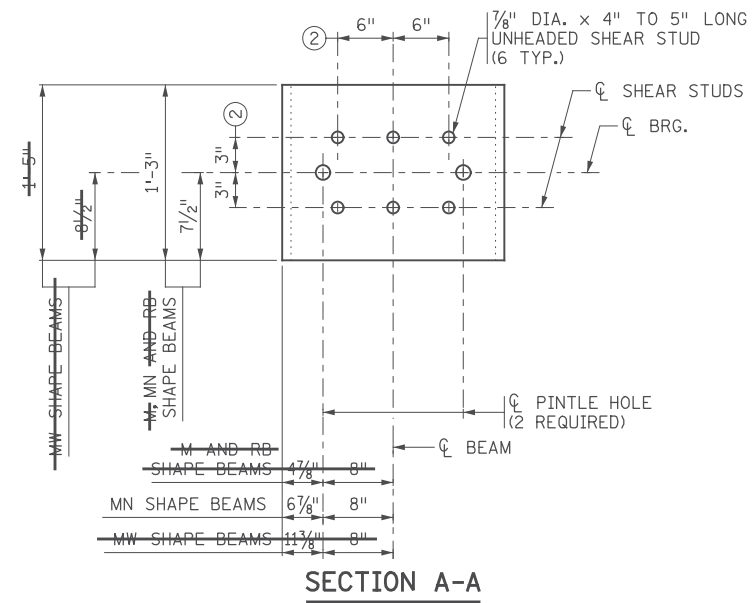
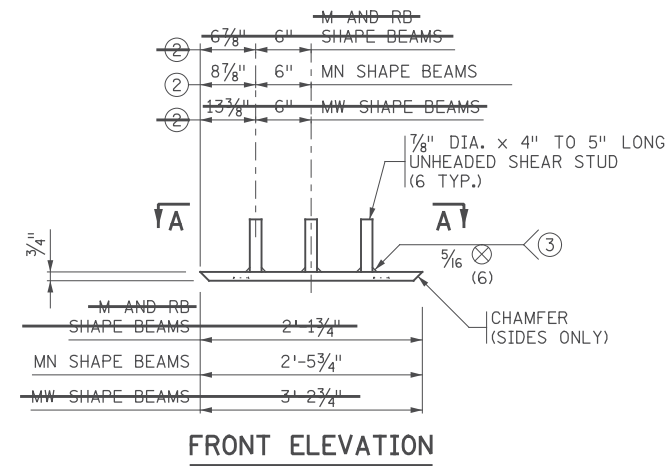
DRAWN BY
J. HOFFMAN
DESIGNED BY
S. NEFF
CHECKED BY
E. HANSON
COMM. NO. 0169140



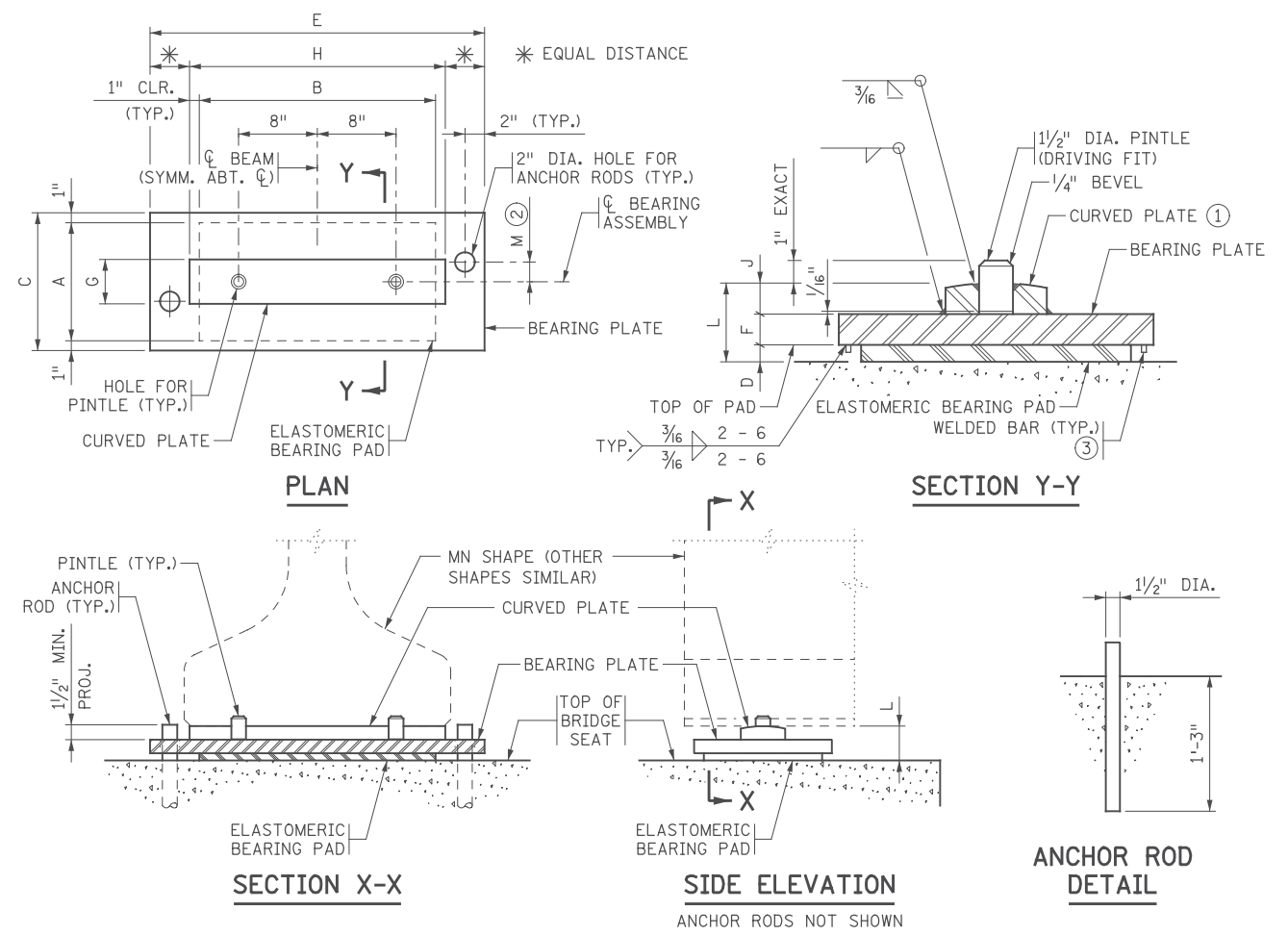
ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
B-DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 1 OF 5)

SHEET
BC33
OF
BC42



- NOTES:**
- PROVIDE STRUCTURAL STEEL PER SPEC. 3306.
 - PROVIDE WELDED STUDS OF WELDABLE CARBON STEEL PER SPEC. 3391.2D.
 - GALVANIZE SOLE PLATE FOR BEARING ASSEMBLY PER SPEC. 3394 AFTER FABRICATION.
 - ENSURE PINTLE HOLES ARE FREE OF ZINC BUILD UP FROM GALVANIZING.
 - SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.
 - ① FOR 1/2" DIA. PINTLES.
 - ② THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS. HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.
 - ③ STUD WELDING PER AWS D1.1.



TABLE

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ANCHOR ROD OFFSET	ASSY. HEIGHT	CURVED PLATE	
			A	B	D		C	E	F	G	H	J				+/- ②
F1	S. ABUT.	MN54	14"	24"	1/2"	8.8	16"	38"	13 3/4"	4 1/2"	26"	1 1/4"	+	0	3 1/2"	16"

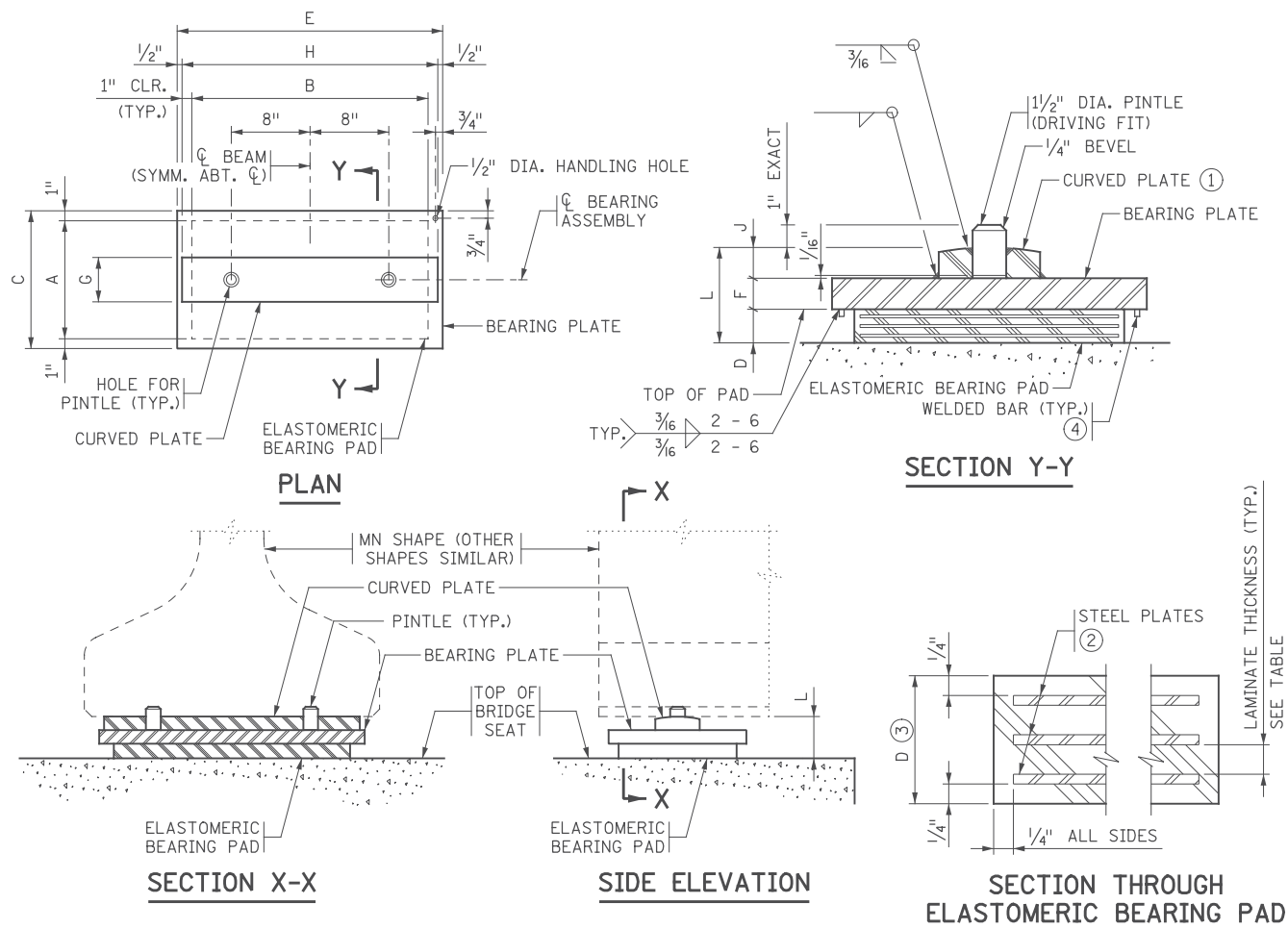
- NOTES:**
- PROVIDE ELASTOMERIC MATERIALS AND PAD CONSTRUCTION PER SPEC. 3741.
 - PROVIDE STEEL PLATES PER SPEC. 3306.
 - PROVIDE ANCHOR RODS PER SPEC. 3306. GALVANIZE PER SPEC. 3394.
 - PROVIDE PINTLES PER SPEC. 3309.
 - GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.
 - PAYMENT FOR BEARING ASSEMBLY INCLUDES ALL MATERIAL ON THIS DETAIL.
 - ① THE MIN. RADIUS IS 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS IS 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.
 - ② "+" DENOTES OFFSET AS SHOWN. "-" DENOTES OFFSET OPPOSITE OF SHOWN.
 - ③ 3/8" X 3/8" BAR INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. BAR LENGTH IS 2" LESS THAN ADJACENT PAD DIMENSION, CENTERED ON PAD. CENTERLINE OF BAR TO EDGE OF PAD DIMENSION = 1/2".

DESIGN DATA:
 MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1/2" PINTLES.

APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION 01-05-2017	DETAIL NO. B303	APPROVED: SEPTEMBER 22, 2011	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 11-06-2013 11-03-2015 01-05-2017	DETAIL NO. B310
<i>Nancy Saubenberg</i> STATE BRIDGE ENGINEER		SOLE PLATE (PRESTRESSED CONCRETE BEAMS) (FOR BEARINGS WITH PINTLES)		<i>Nancy Saubenberg</i> STATE BRIDGE ENGINEER		CURVED PLATE BEARING ASSEMBLY (PRESTRESSED CONCRETE BEAMS) (FIXED)	

11/01/2017	RELEASE FOR CONSTRUCTION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.	STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051	DRAWN BY J. HOFFMAN		ANOKA COUNTY	SHEET BC34 OF BC42
NO	DATE		BY	CKD		APPR	
... \F Ina \CBR02589 _det+01. dgm		Print Name: ERIC S. HANSON	Date: 11/01/2017 License #: 50463	CHECKED BY E. HANSON	CSAH 78 OVER BNSF RAILWAY COMPANY (SHEET 2 OF 5)	ENGINEERS PLANNERS DESIGNERS	

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ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE		STEEL PLATES NO. THICK.	LAMINATES NO. THICK.	SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ASSY. HEIGHT L	CURVED PLATE R (1)			
			A	B				D	C	E	F	G	H			J		
E1	N. & S. ABUT.	MN54	14"	24"	2 1/2"	4	1/8"	3	1/2"	8.8	16"	27"	2"	4 1/2"	26"	1 1/4"	5 3/4"	16"

NOTES:

- PROVIDE ELASTOMERIC MATERIALS AND PAD CONSTRUCTION PER SPEC. 3741.
- PROVIDE STEEL PLATES PER SPEC. 3306.
- PROVIDE PINTLES PER SPEC. 3309.
- GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER SPEC. 3394, EXCEPT AS NOTED.
- PAYMENT FOR BEARING ASSEMBLY INCLUDES ALL MATERIAL ON THIS DETAIL.

- (1) THE MIN. RADIUS IS 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS IS 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.
- (2) DO NOT GALVANIZE THESE PLATES.
- (3) THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.
- (4) 3/8" X 3/8" BAR INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. BAR LENGTH IS 2" LESS THAN ADJACENT PAD DIMENSION, CENTERED ON PAD. CENTERLINE OF BAR TO EDGE OF PAD DIMENSION = 1/2".

DESIGN DATA:

MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1 1/2" PINTLES.

APPROVED: SEPTEMBER 22, 2011

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISED
11-03-2015

DETAIL NO.

Nancy Dubenberger
STATE BRIDGE ENGINEER

CURVED PLATE BEARING ASSEMBLY
(PRESTRESSED CONCRETE BEAMS)
(EXPANSION)

B311

APPROVED: NOVEMBER 03, 2015

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISION
01-05-2017

DETAIL NO.

Reedy A. F. Sanchez
STATE BRIDGE ENGINEER

STEEL INTERMEDIATE DIAPHRAGM
(FOR 36M, MN45 - MN63 PRESTRESSED CONCRETE BEAMS)

B403

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASE FOR CONSTRUCTION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
Print Name: **ERIC S. HANSON**
Eric S. Hanson
Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051
BRIDGE NO.
02589

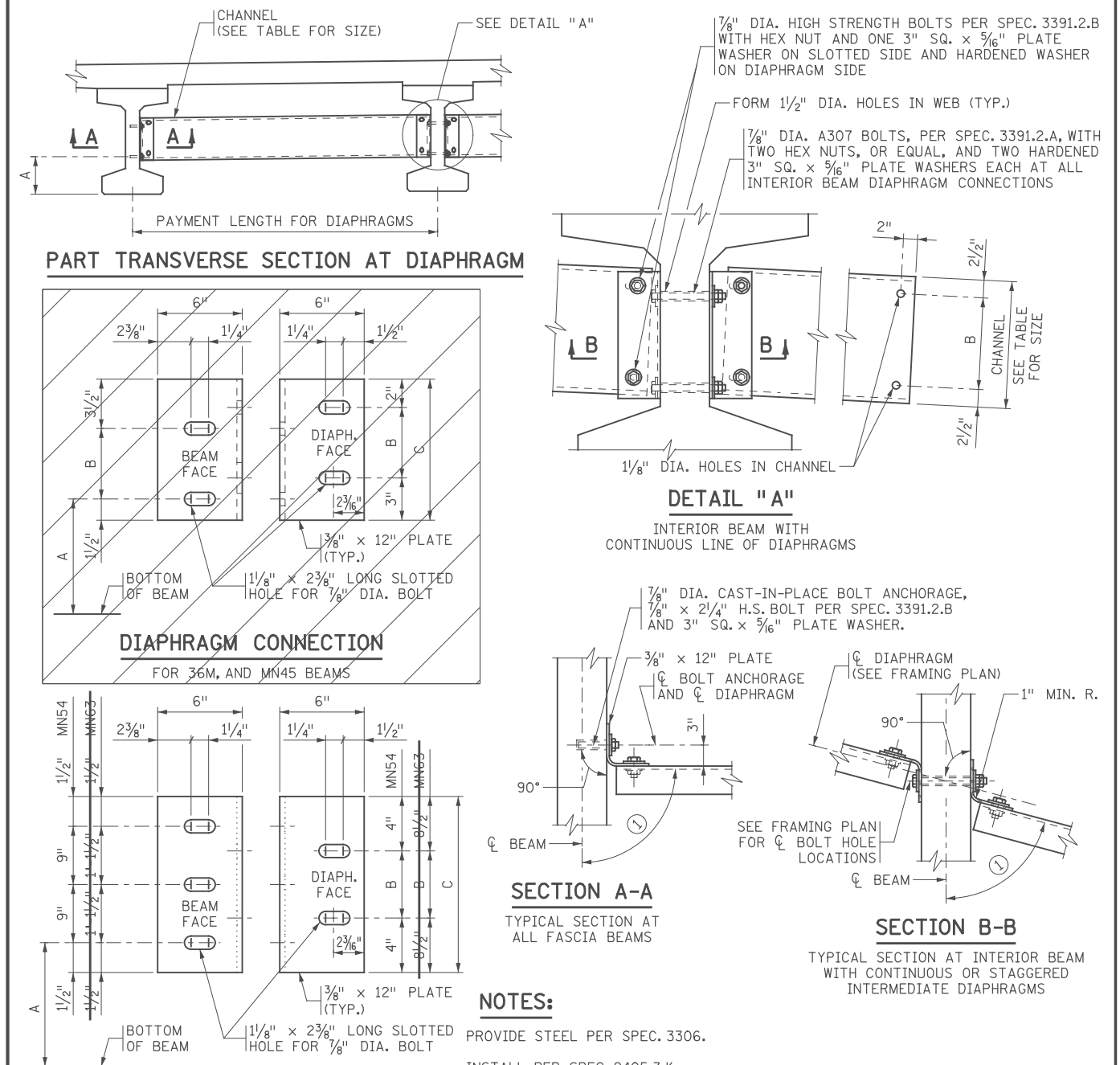
DRAWN BY
J. HOFFMAN
DESIGNED BY
S. NEFF
CHECKED BY
E. HANSON
COMM. NO. 0169140



ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
B-DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 3 OF 5)

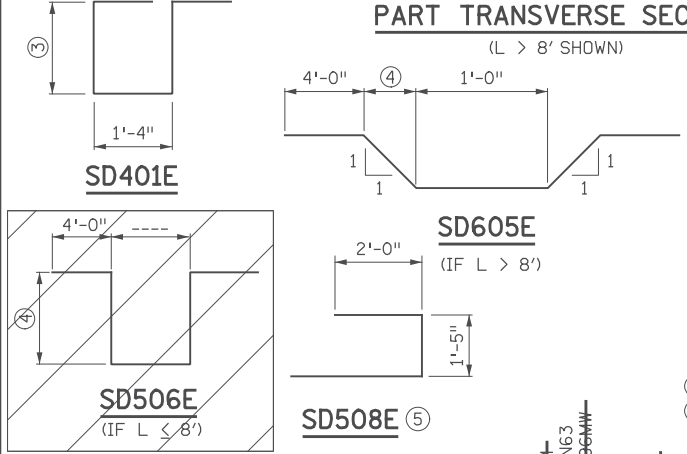
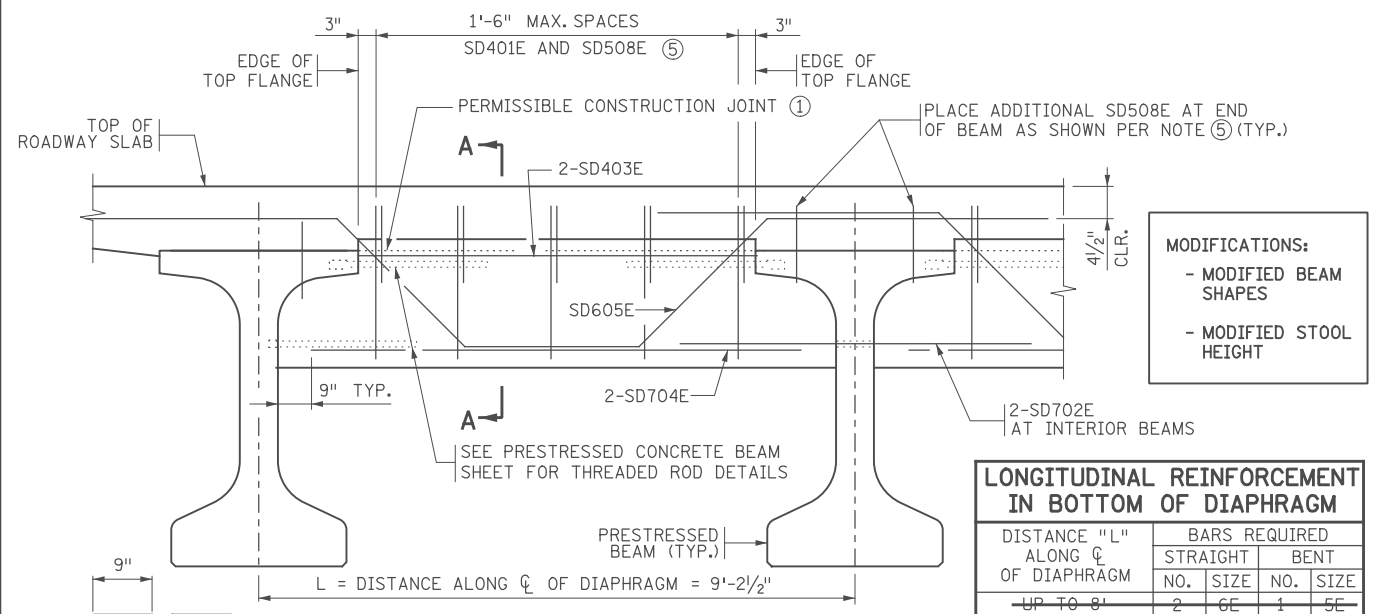
SHEET BC35 OF BC42



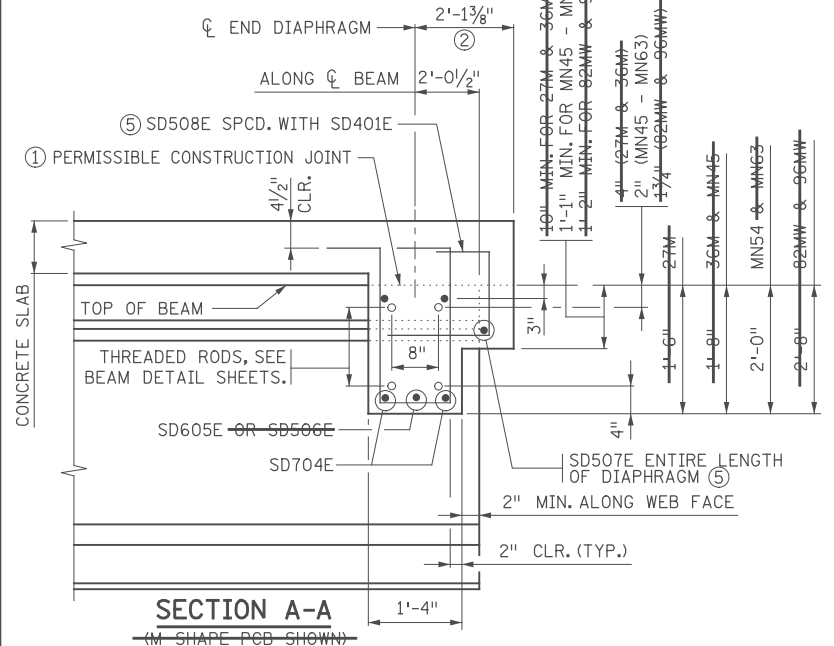
NOTES:

- PROVIDE STEEL PER SPEC. 3306.
- INSTALL PER SPEC. 2405.3.K.
- TORQUE ALL BOLTS, INCLUDING ANCHOR BOLTS TO 80 FT.-LBS.
- SHOP BEND THE LEG OF THE 12" PLATE TO CONFORM TO THE DIAPHRAGM. A 3/8" X 6" X 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.
- INCLUDE ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, IN UNIT PRICE BID FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.
- BENT PLATES MAY BE USED IN PLACE OF CHANNELS IF THE BENT PLATES HAVE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, ARE 3/8" IN THICKNESS, AND HAVE LEGS 5" LONG.
- GALVANIZE STEEL PLATES AND SHAPES PER SPEC. 3394.
- GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.
- (1) FOR SKEW ANGLES UNDER 20°, USE 90° LESS THE SKEW ANGLE. FOR SKEW ANGLES OVER 20°, USE 90°.

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MARK	NO	LENGTH (FT - IN)	SHAPE	LOCATION
SD401E	130	7 - 4	[Symbol]	VERTICAL TIE
SD702E	48	5 - 0	[Symbol]	LONG. THRU BEAM
SD403E	52	4 - 11	[Symbol]	LONG. TOP
SD704E	52	6 - 11	[Symbol]	LONG. BOTTOM
SD605E	26	15 - 2	[Symbol]	LONGITUDINAL
SD507E	6	41 - 8	[Symbol]	LONGITUDINAL
SD508E	182	6 - 5	[Symbol]	VERTICAL TIE



NOTES:

CONCRETE FOR END DIAPHRAGMS SHALL BE THE SAME MIX AS USED IN DECK.

QUANTITIES FOR END DIAPHRAGM CONCRETE AND REINFORCEMENT SHOWN ON THIS DETAIL SHALL BE LISTED IN SUPERSTRUCTURE QUANTITIES.

THREADED RODS ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

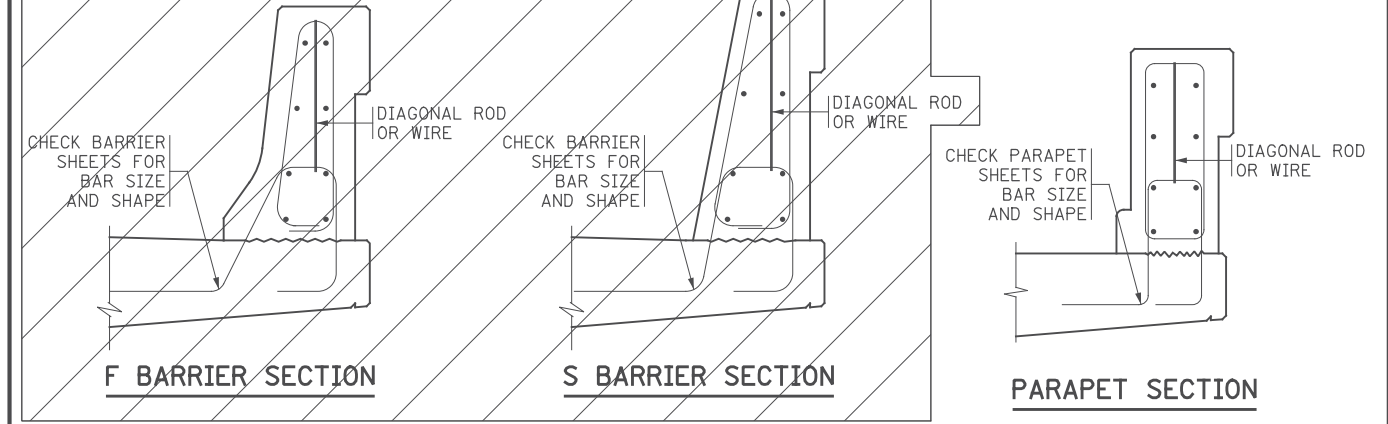
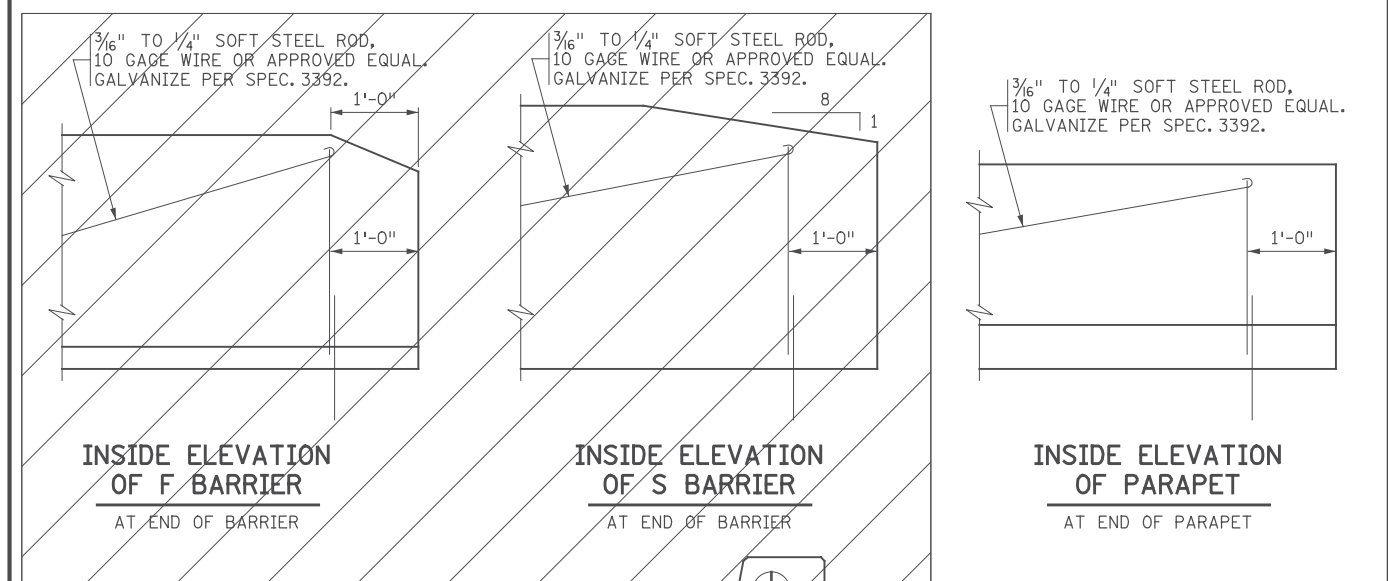
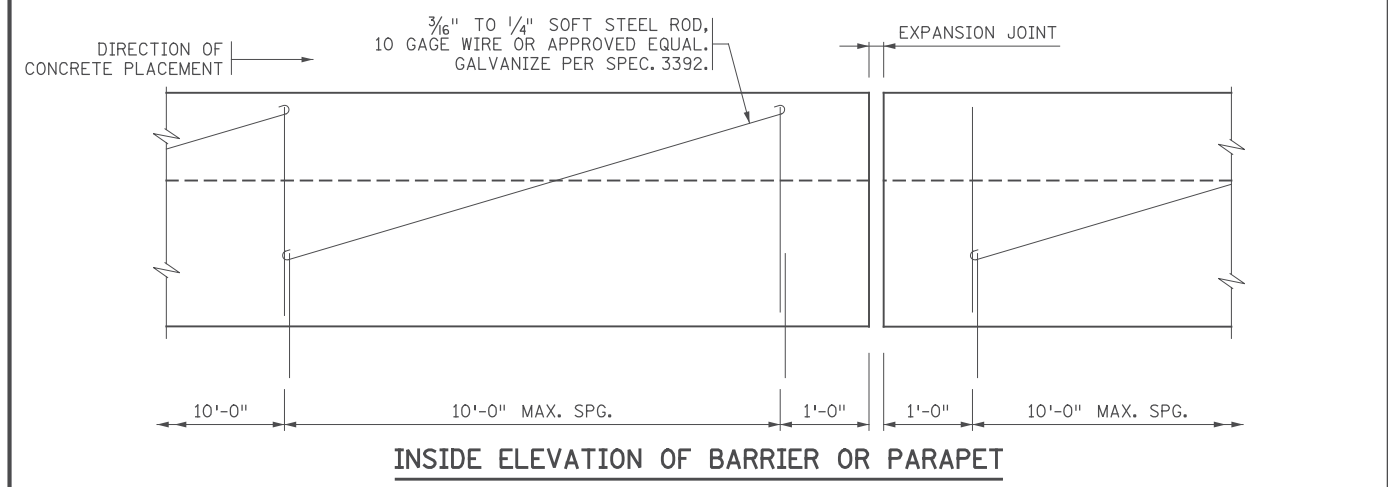
① USE OF CONSTRUCTION JOINT REQUIRES CLEARANCE FOR EXPANSION DEVICE. WHEN CONSTRUCTION JOINT IS USED AT THIS LOCATION, DIAPHRAGM FALSEWORK SHALL REMAIN IN PLACE UNTIL COMPLETION OF SLAB CURING PERIOD.

② PERPENDICULAR TO CENTERLINE OF DIAPHRAGM.

③ 1'-11" (27M), 2'-1" (36M AND MN45), 2'-3" (MN54 AND MN63), 3'-1" (82MW AND 96MW). BASED ON 1 7/8" STOOL AND 9" DECK.

④ 1'-10" (27M), 2'-0" (36M AND MN45), 2'-2" (MN54 AND MN63), 3'-0" (82MW AND 96MW). BASED ON NOTE ③.

⑤ ADD SD507E AND SD508E ONLY IF NO. OF BARS AND LENGTHS ARE INCLUDED IN BILL OF REINFORCEMENT. SPACE SD508E AT 1'-6" MAX. FOR ENTIRE LENGTH OF DIAPHRAGM. REFER TO "PART TRANSVERSE SECTION" ABOVE.



NOTES:

FOR ADDITIONAL DIMENSIONS, DETAILS, REINFORCEMENT, NOTES, AND CONTROL JOINT SPACING SEE BARRIER OR PARAPET SHEET.

PAY QUANTITIES WILL NOT BE ADJUSTED AS A RESULT OF SELECTING SLIPFORM ALTERNATE.

USE A SIMILAR METHOD FOR TALLER BARRIERS OR MODIFIED VERSIONS OF THIS BARRIER.

APPROVED: SEPTEMBER 22, 2011

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISED
04-17-2013
11-06-2013

DETAIL NO.
B814 MOD.

Nancy Dubenberger
STATE BRIDGE ENGINEER

CONCRETE END DIAPHRAGM
(27M & 36M, MN45 - MN63, 82MW & 96MW PRESTRESSED CONCRETE BEAMS)
(PARAPET ABUTMENT)

APPROVED: AUGUST 24, 2016

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REVISION

DETAIL NO.
B830

Kevin Westrom
STATE BRIDGE ENGINEER

CONCRETE BARRIER OR PARAPET
(SLIPFORM ALTERNATE)

NO	DATE	BY	CKD	APPR	REVISION
	11/01/2017				RELEASE FOR CONSTRUCTION

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

Print Name: **ERIC S. HANSON**

Eric S. Hanson

Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02589

COMM. NO. 0169140

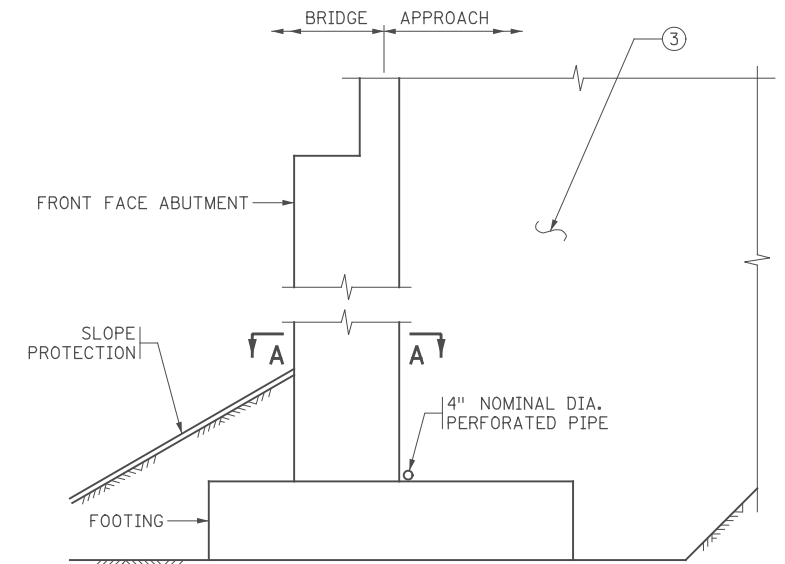
SRF
Consulting Group, Inc.

ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY
B-DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 4 OF 5)

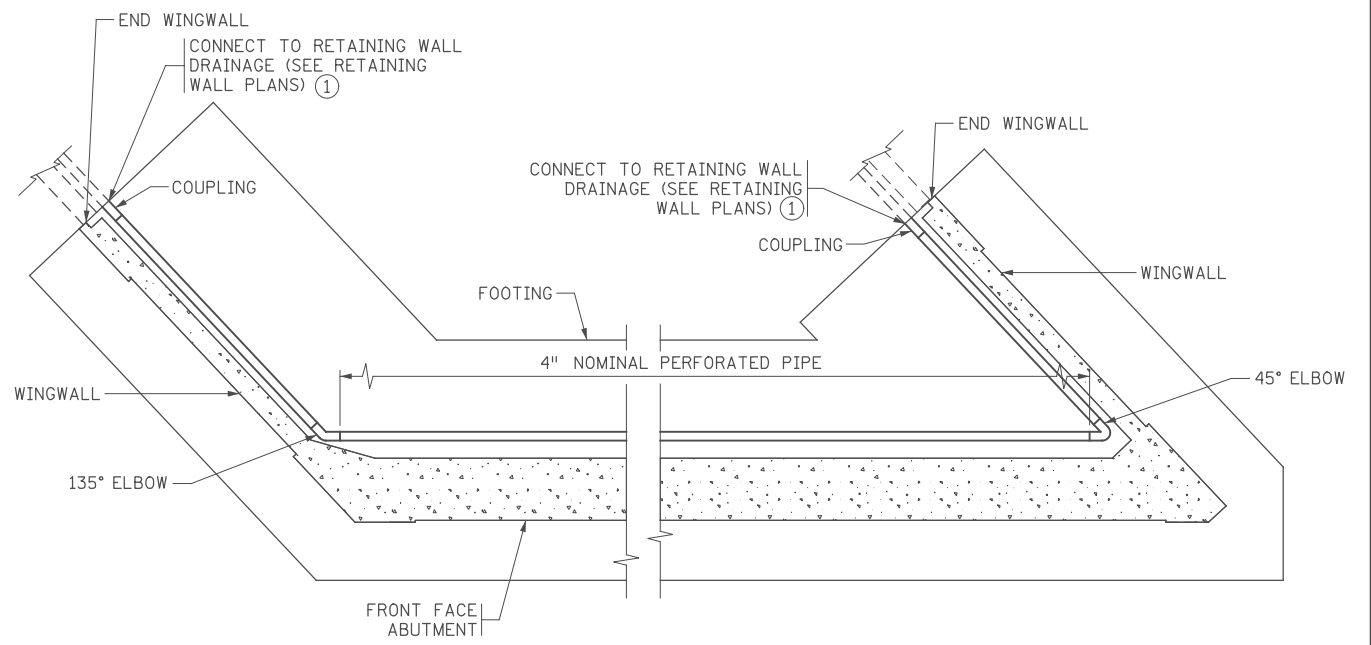
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BC36
OF
BC42

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MODIFICATIONS:
 - MODIFIED SECTION A-A TO CONNECT TO RETAINING WALL DRAINAGE AND FOR BRIDGE GEOMETRY

SECTION THROUGH PARAPET AND SEMI-INTEGRAL ABUTMENTS



SECTION A-A

NOTES:

PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR "DRAINAGE SYSTEM TYPE (B910)", INCLUDES BUT IS NOT LIMITED TO 4" DIAMETER PERFORATED AND NON-PERFORATED PIPE, ELBOWS, END CAPS, COUPLINGS, SLEEVES AND PRECAST CONCRETE HEADWALLS.

ALL PIPE TO COMPLY WITH SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE PER SPEC. 3733, TYPE 1. ATTACH TO PIPE PER SPEC. 2502.

- ① AT CONTRACTOR'S OPTION, MAY TIE APPROACH PANEL DRAINAGE SYSTEM AND ABUTMENT DRAINAGE SYSTEM INTO A SINGLE PRECAST CONCRETE HEADWALL OR INTO A CATCH BASIN AS LONG AS A MINIMUM OF 1% POSITIVE SLOPE CAN BE MAINTAINED.
- USE PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.
- ② 1/8" PER FT. MINIMUM SLOPE.
- ③ REFER TO GRADING PLANS FOR ABUTMENT BACKFILL REQUIREMENTS.

APPROVED: JANUARY 13, 2015	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 12-02-2015	DETAIL NO.
<i>Nancy Saubenberg</i> STATE BRIDGE ENGINEER	DRAINAGE SYSTEM		B910 MOD.

11/01/2017				RELEASE FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR
				REVISION

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

Print Name: **ERIC S. HANSON**

Eric S. Hanson

Date: 11/01/2017 License # 50463

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02589

DRAWN BY
J. HOFFMAN

DESIGNED BY
S. NEFF

CHECKED BY
E. HANSON

COMM. NO. 0169140



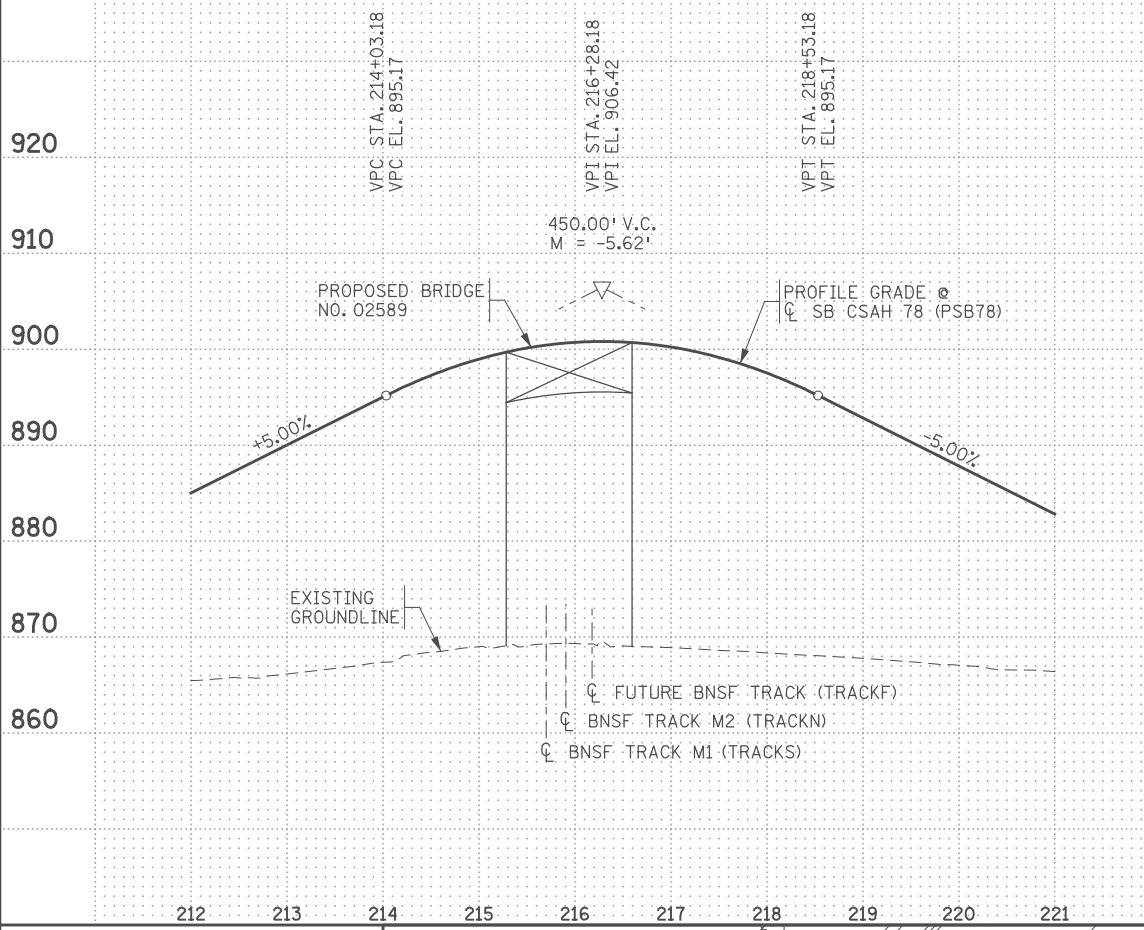
ANOKA COUNTY
B-DETAILS
CSAH 78 OVER BNSF RAILWAY COMPANY
(SHEET 5 OF 5)

**SHEET
BC37
OF
BC42**

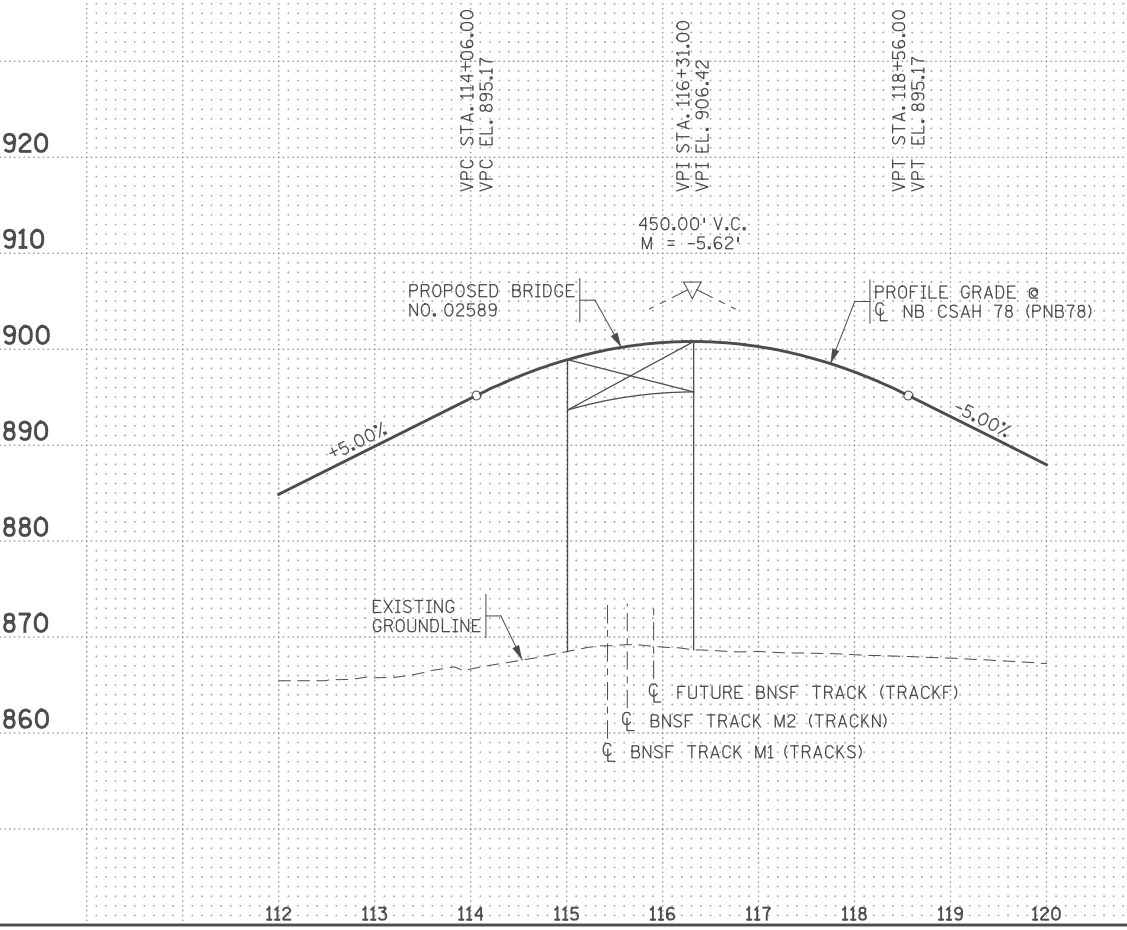
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CONTRACTED PROFILE
 SCALE : 0 50' 100' 0 5' 10'
 HORIZONTAL VERTICAL

☪ SB CSAH 78 (PSB78)



☪ NB CSAH 78 (PNB78)



LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

- SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS, SLIDING BANKS, RECREATIONAL BOATING.
- OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARLY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVE LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS-SECTIONAL AREA ETC.
- APPARENT HIGHWATER ELEVATION OBTAINED FROM:
- OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEERS RECOMMENDATION
 DATE _____

STREAM OR DITCH DESIGNATION _____
 DRAINAGE AREA _____
 MAX. FLOOD ON RECORD _____
 MAXIMUM OBSERVED HIGHWATER ELEVATION _____
 DESIGN FLOOD (YR. FREQ.) C.F.S. _____
 HEADWATER ELEVATION FT. _____
 DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S. _____
 TOTAL STAGE INCREASE FT. _____
 LOW MEMBER AT OR ABOVE ELEVATION FT. _____
 WATERWAY AREA REQUIRED BELOW ELEVATION = _____ SQ.FT.
 AT RIGHT ANGLES TO CHANNEL _____
 BASIC FLOOD (100 YR. FREQ.) C.F.S. _____
 HEADWATER ELEVATION FT. _____
 TOTAL STAGE INCREASE FT. _____
 MEAN VELOCITY THROUGH STRUCTURE F.P.S. _____
 FLOWLINE ELEVATION _____ SKEW ANGLE _____
 ESTIMATED DEPTH OF PIER SCOUR = _____ FT.

SCOUR CONFIRMATION RECOMMENDATION
 DATE _____

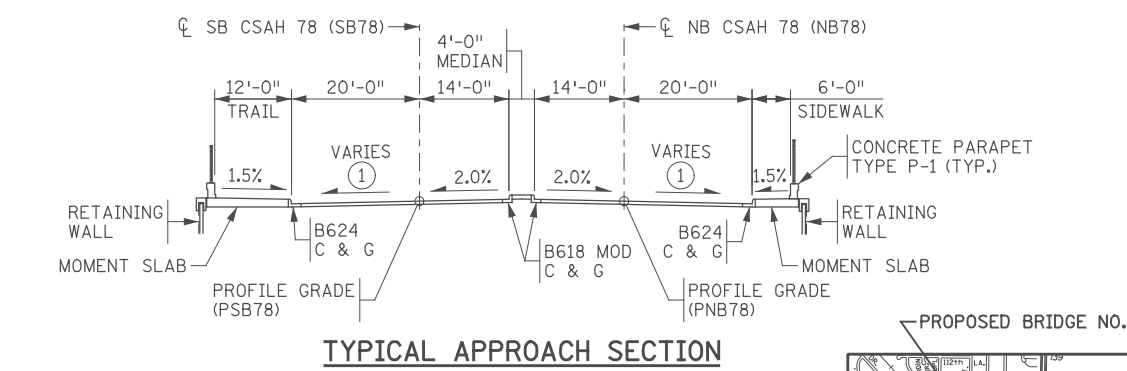
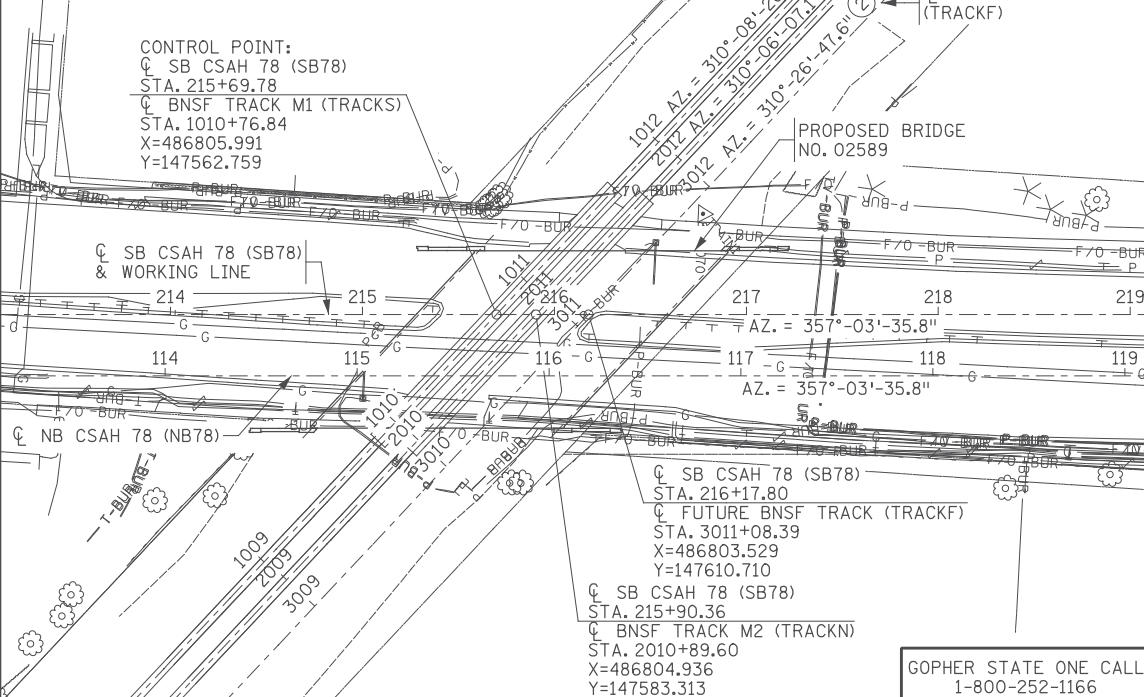
TOTAL SCOUR AT PIER EL. (500 OR 01 YR. FREQ.) _____
 SCOUR CODE = _____

BRIDGE SURVEY SHEETS MADE FROM : _____
 SURVEYS BY SRF CONSULTING GROUP, INC.

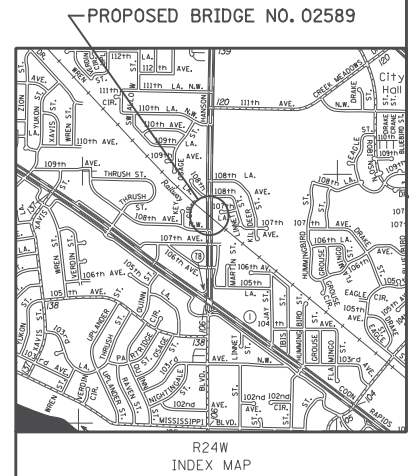
BENCH MARK ELEVATION 860.422 (NAVD88)
 LOCATION MNDOT B.M. 0215 AA - IN COON RAPIDS, 1.85 MI NW ALONG TH 10 FROM JCT OF TH 10 AND CTY ROAD 11/FOLEY BLVD, AT TH 10 MILEPOINT 230.05, 89.2 FT NE OF TH 10, 37.7 FT FROM GRAY ELECTRICAL SHED, 1.5 FT SW OF WITNESS POST.

BENCH MARK ELEVATION 859.103 (NAVD88)
 LOCATION MNDOT B.M. C257 - 3.35 MI E-SE OF ANOKA, 3.85 MI E-SE ALONG TH 10 FROM JCT OF TH 10 AND TH 47 IN ANOKA, AT TH 10 MILEPOINT 228.65, 0.4 MI N OF HANSON BLVD BRIDGE, 99.5 FT SW OF SB TH 10, 1.0 FT N OF FENCE ON EAST SIDE OF ATHLETIC FIELD, 1.0 FT S OF ROW FENCE, 1.3 FT S OF WITNESS POST. GATES BLOCK ENTRANCE TO ATHLETIC FIELD, NEED ACCESS THRU GATES OR FENCE CLIMBERS, DISK DENTED, MAY HAVE BEEN HIT ON SIDE.

PLAT
 SCALE : 0 25' 50'



- NOTES:**
- CROSS SLOPE VARIES FROM 2.5% AT ROADWAY TO 2.0% AT BRIDGE APPROACH PANEL.
 - AZIMUTHS OF RAILROAD TRACK ALIGNMENT ARE GIVEN AT THE INTERSECTION OF ☪ SB CSAH 78 AND ☪ OF TRACK. VALUES ARE BASED ON THE SURVEY SHOTS IMMEDIATELY ADJACENT TO INTERSECTION POINTS.



GOPHER STATE ONE CALL
 1-800-252-1166

11/01/2017	RELEASE FOR CONSTRUCTION				
NO	DATE	BY	CKD	APPR	REVISION
...

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

Print Name: ERIC S. HANSON
 Date: 11/01/2017 License #: 50463

STATE AID PROJ. NO.'S
 SAP 002-678-023
 SAP 114-020-051

BRIDGE NO.
 02589

COMM. NO. 0169140



MINNESOTA
 DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

AT MILE POINT _____ ON _____
 PROPOSED BRIDGE LOCATED 1.12 MILES S OF _____
 JCT CSAH 78 (HANSON BLVD) & TH 10

SEC 22 TWP. T31N R R24W
 CITY COON RAPIDS COUNTY ANOKA

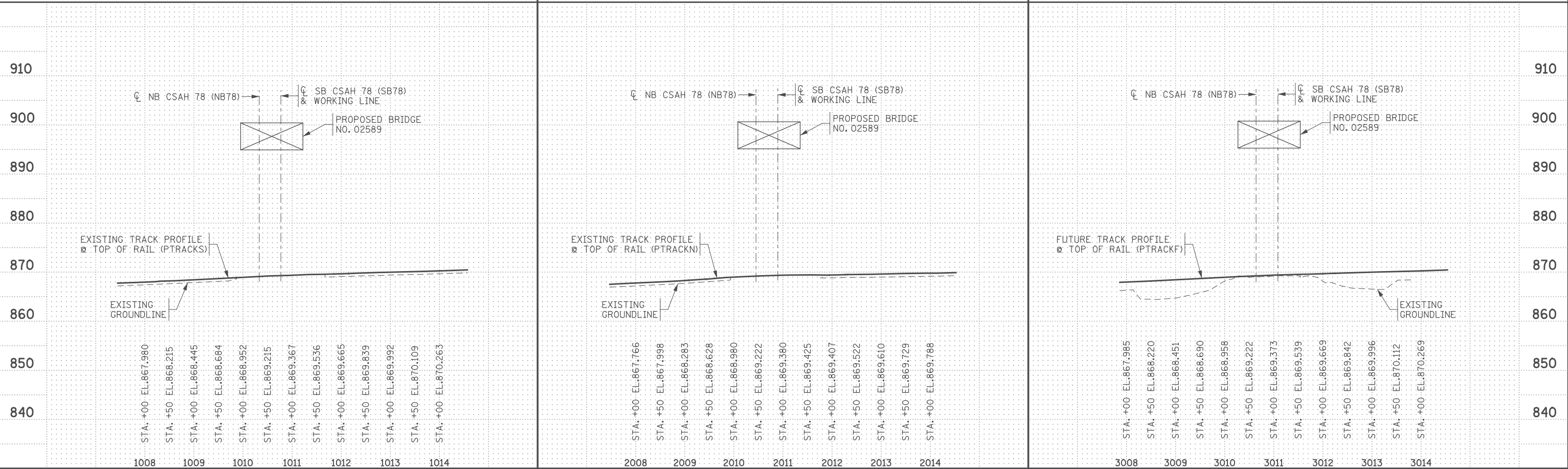
SHEET BC39 OF BC42

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☒ BNSF TRACK M1 (PTRACKS)

☒ BNSF TRACK M2 (PTRACKN)

☒ FUTURE BNSF TRACK (PTRACKF)



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11/01/2017				RELEASE FOR CONSTRUCTION
NO	DATE	BY	CKD	APPR
				REVISION
... \F Ina\CBR02589_sur02.dgn				

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

Print Name: **ERIC S. HANSON**

Eric S. Hanson

Date: **11/01/2017** License #: **50463**

STATE AID PROJ. NO.'S
SAP 002-678-023
SAP 114-020-051

BRIDGE NO.
02589

COMM. NO. 0169140

DRAWN BY
E. JOHNSON

DESIGNED BY
S. NEFF

CHECKED BY
E. HANSON

ENGINEERS
PLANNERS
DESIGNERS

ANOKA COUNTY

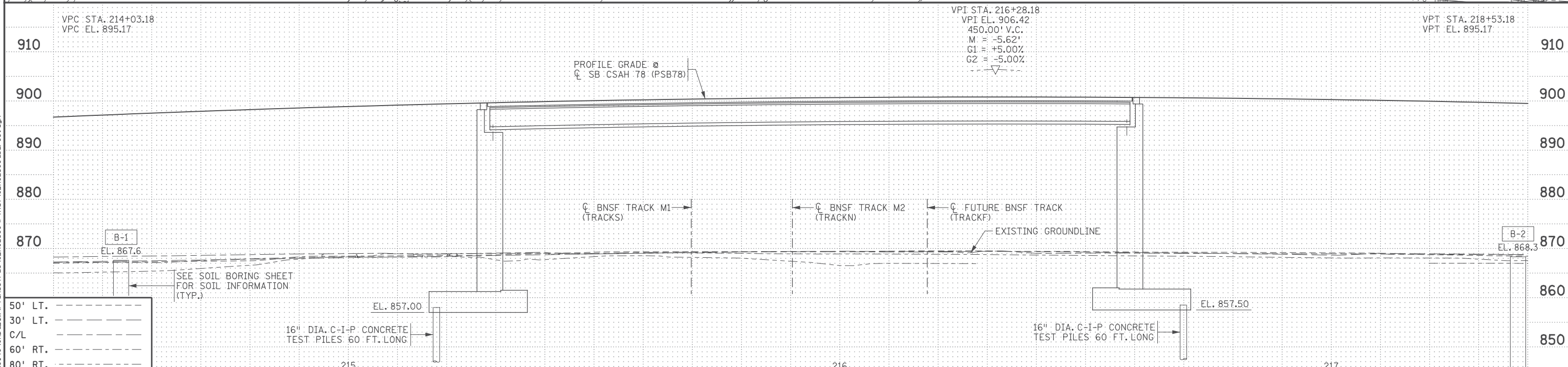
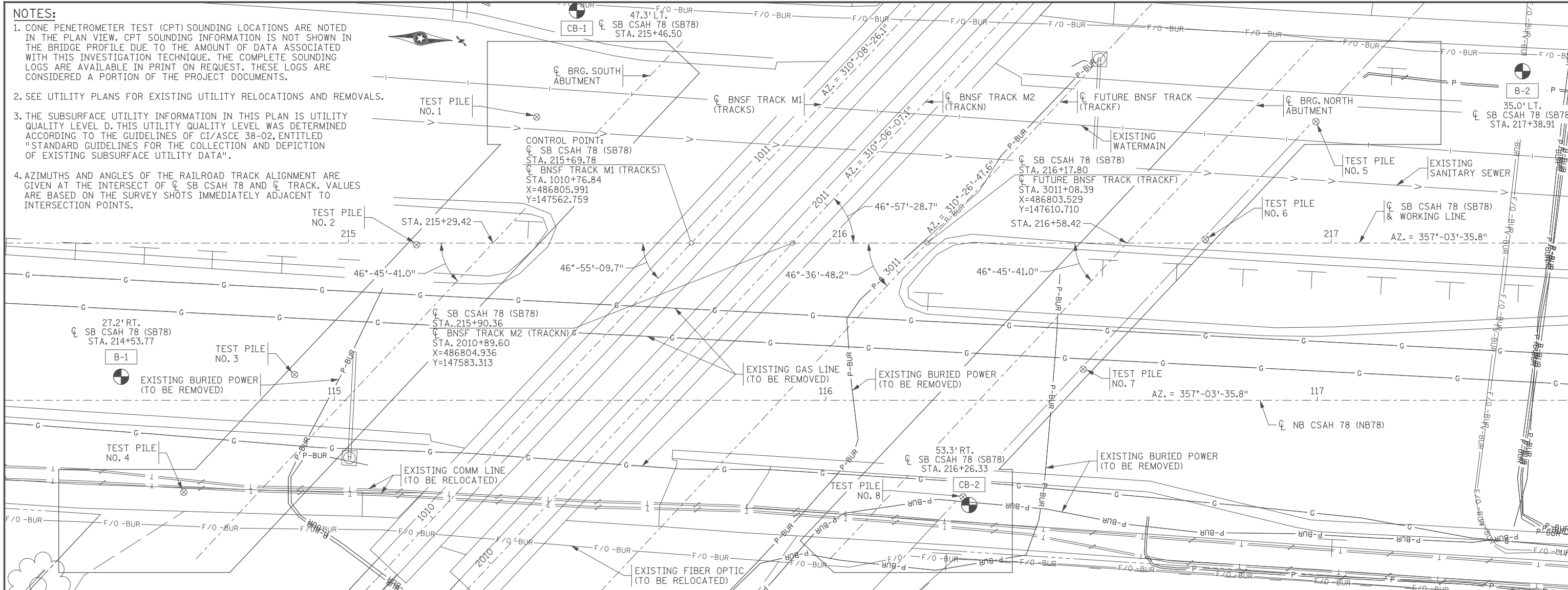
BRIDGE SURVEY (SHEET 2 OF 2)

CSAH 78 OVER BNSF RAILWAY COMPANY

SHEET BC40 OF BC42

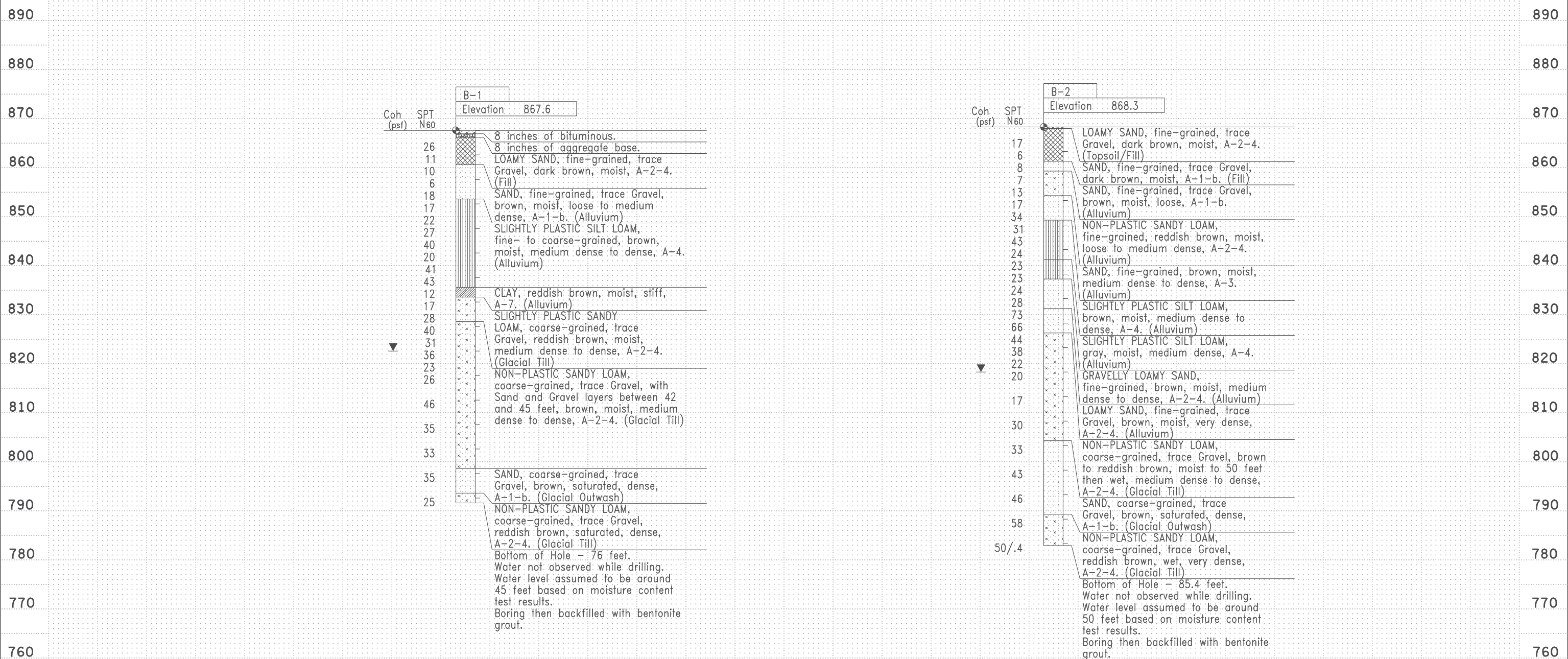
NOTES:

1. CONE PENETROMETER TEST (CPT) SOUNDING LOCATIONS ARE NOTED IN THE PLAN VIEW. CPT SOUNDING INFORMATION IS NOT SHOWN IN THE BRIDGE PROFILE DUE TO THE AMOUNT OF DATA ASSOCIATED WITH THIS INVESTIGATION TECHNIQUE. THE COMPLETE SOUNDING LOGS ARE AVAILABLE IN PRINT ON REQUEST. THESE LOGS ARE CONSIDERED A PORTION OF THE PROJECT DOCUMENTS.
2. SEE UTILITY PLANS FOR EXISTING UTILITY RELOCATIONS AND REMOVALS.
3. THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".
4. AZIMUTHS AND ANGLES OF THE RAILROAD TRACK ALIGNMENT ARE GIVEN AT THE INTERSECT OF SB CSAH 78 AND TRACK. VALUES ARE BASED ON THE SURVEY SHOTS IMMEDIATELY ADJACENT TO INTERSECTION POINTS.



11/01/2017	RELEASE FOR CONSTRUCTION	I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.	STATE AID PROJ. NO.'S SAP 002-678-023 SAP 114-020-051	DRAWN BY E. JOHNSON DESIGNED BY S. NEFF CHECKED BY E. HANSON COMM. NO. 0169140	 ENGINEERS PLANNERS DESIGNERS	ANOKA COUNTY BORINGS - PLAN & PROFILE CSAH 78 OVER BNSF RAILWAY COMPANY	SHEET BC41 OF BC42
NO	DATE	BY	CKD	APPR			

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BORING LOG TERMINOLOGY

C ... Clay	Lmst ... Limestone
L ... Loam	Sst ... Sandstone
S ... Sand	Dolo ... Dolomite
Si ... Silt	wx ... weathered
T ... Glacial Till	Bldr ... Boulder (+3 in.)
G ... Gravel (No. 10 Sieve to 3 in.)	

The above soil terms are from the MNDOT Triangular Textural Classification System, as shown below.

blk ... Black	wht ... White
brn ... Brown	yel ... Yellow
org ... Orange	lt ... Light
grn ... Green	dk ... dark
IOS ... Iron Oxide Stains	gr ... Grey

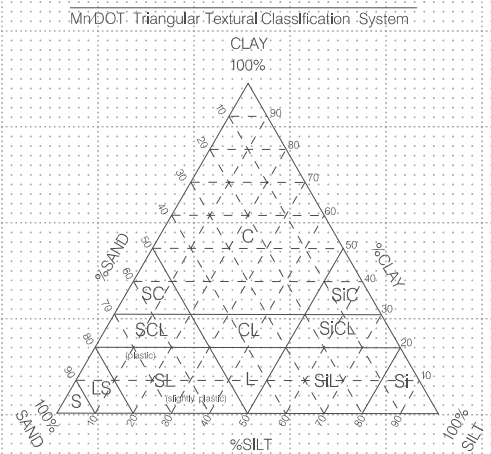
VF ... Very Fine	pl ... Plastic
F ... Fine	spl ... Slightly Plastic
Cr ... Coarse	

SPT ... MnDOT Modified Standard Penetration Test
Blows per ft. with 140 lb. hammer and a standard energy of 210 ft-lbs. This energy represents 60% of the potential energy of the system and is the average energy provided by a Rope & Cathead system.

WR ... Weight of Rods
WH ... Weight of Hammer

COH ... Cohesion (Undrained Shear Strength)
REC ... Percent Core Recovered
RQD ... Rock Quality Description (Percent of total core interval consisting of unbroken pieces 4 in. or longer)
ACL ... Average Core Length (Average length of core that is greater than 4 in. long)
Core Breaks ... Number of natural core breaks per 2 ft.

▼ ... Measured or assumed ground water level.



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