

MINNESOTA DEPARTMENT OF TRANSPORTATION ANOKA COUNTY

CONSTRUCTION PLAN FOR BOX CULVERTS, GRADING, BITUMINOUS SURFACING

LOCATED ON CSAH 18 FROM 975' NORTH OF CSAH 14 TO 1625' NORTH OF CSAH 14

STATE AID PROJ. NO. Q02-618-034
 GROSS LENGTH . . . 631.53 . . . FEET . 0.120 . MILES
 BRIDGES-LENGTH . . . 0.00 . . . FEET . 0.00 . MILES
 EXCEPTIONS-LENGTH . 0.00 . . . FEET . 0.00 . MILES
 NET LENGTH 631.53 . . . FEET . 0.120 . MILES

NOTE: LENGTH AND DESCRIPTION BASED ON CSAH 18 NORTHBOUND ALIGNMENT

PROJECT LOCATION
 ANOKA COUNTY
 CITY OF COON RAPIDS
 MNDOT TRANSP. DISTRICT - METRO
 SECTION 4
 TOWNSHIP 31 N
 RANGE 24W

PROJECT LOCATION
 COUNTY : ANOKA
 DISTRICT : METRO



END S.A.P. 002-618-034
 END S.A.P. 114-020-059
 CSAH 18 NB
 STA. 127+12.07

REMOVE BRIDGE #02549
 CONSTRUCT BRIDGE #02J57

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

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

TRAIL DESIGN DESIGNATION

Design Speed 20 MPH
 Height of eye 4.5'
 Height of object 0.0'

CSAH 18 DESIGN DESIGNATION

FUNCTIONAL CLASSIFICATION = MINOR ARTERIAL
 Design Speed 45 MPH TON DESIGN 10
 Design ESALS = N/A NO. OF PARKING LANES = 0
 R-VALUE = N/A Based on STOPPING Sight Distance
 NO. OF TRAFFIC LANES = 2 Height of eye 3.5' Height of object 2.0'
 ADT (Current Year) 2018 = 15,131 Design Speed not achieved at: N/A
 ADT (Future Year) 2044 = 17,226 STA. N/A TO STA. N/A MPH
 T (Heavy Commercial) = % STA. N/A TO STA. N/A MPH

SCALES

PLAN 60'
 PROFILE 60' HORIZ. 6' VERT.
 INDEX MAP 1/2 MI

PLAN REVISIONS		
DATE	SHEET NO.	APPROVER

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GOVERNING SPECIFICATIONS

THE 2020 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION 'STANDARD SPECIFICATIONS FOR CONSTRUCTION' AND THE 'SUPPLEMENTAL SPECIFICATIONS' DATED SEPTEMBER 2022 SHALL GOVERN.

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THIS PLAN CONTAINS 79 SHEETS

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

PRINT NAME: **BRETT A. VOTH** LICENSE # **49045**

DATE: **3/3/2023** SIGNATURE: *Brett Voth*

APPROVED *[Signature]* 3-6-23
 ANOKA COUNTY ENGINEER

APPROVED *[Signature]* 3/6/2023
 CITY OF COON RAPIDS ENGINEER

REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY DISTRICT STATE AID ENGINEER 20

APPROVED FOR STATE AID FUNDING FOR STATE AID ENGINEER 20

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

PRINT NAME: _____ LICENSE # _____

DATE: _____ SIGNATURE: _____

ANOKA COUNTY S.A.P. 002-618-034
 CITY OF COON RAPIDS S.A.P. 114-020-059

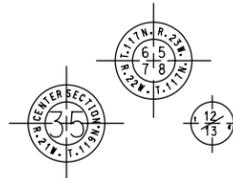
PLAN SYMBOLS

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

UTILITY SYMBOLS

POWER POLE	
TELEPHONE POLE	
ANCHOR	
STEEL TOWER	
POWER POLE/LIGHT POLE	
TELEPHONE CABINET	
TELEPHONE PEDESTAL	
SEWER MANHOLE OR ELECTRIC MANHOLE	
TELEPHONE MANHOLE	
WATER MAIN	
BURIED TELEPHONE CABLE	
OVERHEAD POWER	
BURIED ELECTRIC CABLE	
STORM SEWER	
OVERHEAD UTILITY	
SANITARY SEWER	
GAS MAIN	
ABANDONED GAS MAIN	
SIGNAL INTERCONNECT	
BURIED FIBER IN CONDUIT	
BURIED FIBER OPTIC	
FIBER OPTIC	
COMMUNICATION LINE	

SECTION SYMBOLS



NOTE: SECTION NUMBERS READ FROM THE SOUTH.

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NO	DATE	BY	CKD	APPR	REVISION

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

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: DATE 3/3/2023

LICENSED PROFESSIONAL ENGINEER

DRAWN BY: JCN
DESIGNED BY: JCN
CHECKED BY: GEB



GENERAL LEGEND

SHEET NO. 2 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

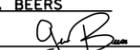
STATEMENT OF ESTIMATED QUANTITIES

TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	NOTE NO.	UNIT	TOTAL ESTIMATED QUANTITY	PARTICIPATING STATE FUNDS		LOCAL FUNDS
							ANOKA COUNTY S.A.P. 002-618-034	CITY OF COON RAPIDS S.A.P. 114-020-059	ANOKA COUNTY
		2021.501	MOBILIZATION		LUMP SUM	1	1		
		2031.502	COMBINATION FIELD LABORATORY-OFFICE		EACH	1	1		
		2051.501	MAINT & RESTORATION OF HAUL ROADS		LUMP SUM	1	1		
A	7	2101.502	CLEARING		EACH	4	4		
A	7	2101.502	GRUBBING		EACH	4	4		
H	8	2104.502	REMOVE PIPE APRON		EACH	5	5		
H	8	2104.502	REMOVE MANHOLE OR CATCH BASIN		EACH	1	1		
ST	51	2104.502	REMOVE DELINEATOR / MARKER		EACH	4	4		
ST	51	2104.502	REMOVE SIGN		EACH	4	4		
K	7	2104.502	REMOVE ENERGY ABSORBING TERMINAL		EACH	4	4		
E	7	2104.503	SAWING BIT PAVEMENT (FULL DEPTH)	(2)	LIN FT	184	184		
H	8	2104.503	REMOVE PIPE SEWERS		LIN FT	181	181		
D	7	2104.503	REMOVE CURB & GUTTER		LIN FT	332	332		
D	7	2104.503	REMOVE FENCE		LIN FT	915	915		
K	7	2104.503	REMOVE GUARDRAIL-PLATE BEAM		LIN FT	756	756		
D	7	2104.504	REMOVE CONCRETE APPROACH PANEL		SQ YD	598	598		
D	7	2104.504	REMOVE BITUMINOUS PAVEMENT	(2)	SQ YD	3340	3340		
D	7	2104.518	REMOVE SIDEWALK		SQ FT	1430	1430		
B	6	2106.507	EXCAVATION - COMMON		CU YD	723	723		
B	6	2106.507	EXCAVATION - SUBGRADE		CU YD	10115	10115		
B	6	2106.507	SELECT GRANULAR EMBANKMENT (CV)		CU YD	10585	10585		
B	6	2106.507	COMMON EMBANKMENT (CV)		CU YD	468	468		
T	B2	2108.504	GEOGRID TYPE 2	(P)	SQ YD	8120	8120		
T	B2	2108.504	GEOTEXTILE FABRIC TYPE 7	(P)	SQ YD	2136	2136		
C,F	7	2211.507	AGGREGATE BASE (CV) CLASS 5	(P)	CU YD	1255	1255		
F	7	2360.509	TYPE SP 9.5 WEARING COURSE MIX (2,B)	(1)	TON	67	67		
F	7	2360.509	TYPE SP 12.5 NON WEAR COURSE MIX (4,B)	(1)	TON	685	685		
F	7	2360.509	TYPE SP 12.5 WEARING COURSE MIX (4,F)	(1)	TON	914	914		
T	B2	2401.503	TYPE S (TL-4) 36" BARRIER CONC (3S52)	(P)	LIN FT	206	206		
T	B2	2401.507	STRUCTURAL CONCRETE (3S52)	(P)	CU YD	53	53		
T	B2	2411.508	REINFORCEMENT BARS (EPOXY COATED)	(P)	POUND	25160	25160		
T	B2	2412.502	14X10 PRECAST CONCRETE BOX CULV END SECT	(P)	EACH	6	6		
T	B2	2412.503	14X10 PRECAST CONCRETE BOX CULVERT	(P)	LIN FT	558	558		
T	B2	2442.501	REMOVE EXISTING BRIDGE		LUMP SUM	1			1
G	8	2451.507	FINE AGGREGATE BEDDING (CV)		CU YD	529	529		
T	B2	2451.507	COARSE AGGREGATE BEDDING (CV)	(P)	CU YD	2368	2368		
T	B2	2452.502	C-I-P CONC TEST PILE 85 FT LONG 12"		EACH	4	4		
T	B2	2452.502	PILE REDRIVING		EACH	36	36		
T	B2	2452.502	PILE ANALYSIS		EACH	4	4		
T	B2	2452.503	C-I-P CONCRETE PILING 12"		LIN FT	27825	27825		
G	8	2501.502	36" RC PIPE APRON		EACH	2	2		
G	8	2501.502	18" RC SAFETY APRON		EACH	1	1		
G	8	2501.602	PIPE TIES - FLAT BAR		EACH	18	18		
G	8	2503.503	18" RC PIPE SEWER DES 3006 CL III		LIN FT	20	20		
G	8	2503.503	36" RC PIPE SEWER DES 3006 CL III		LIN FT	233	233		
G	8	2503.602	CONNECT TO EXISTING STORM SEWER		EACH	1	1		
G	8	2506.502	CASTING ASSEMBLY		EACH	2	2		
G	8	2506.503	CONST DRAINAGE STRUCTURE DES 48-4020		LIN FT	12.0	12		
I	8	2511.507	RANDOM RIPRAP CLASS IV		CU YD	999	999		
C	7	2521.518	4" CONCRETE WALK		SQ FT	6701	6701		
C	7	2531.503	CONCRETE CURB & GUTTER DESIGN B424		LIN FT	516	258	258	
C	7	2531.503	CONCRETE CURB & GUTTER DESIGN B418 (MOD)		LIN FT	724	724		
G	8	2554.502	GUIDE POST TYPE B		EACH	3	3		
K	7	2554.502	END TREATMENT-TANGENT TERMINAL		EACH	4	4		
K	7	2554.503	TRAFFIC BARRIER DESIGN TYPE 31		LIN FT	413	413		
K	7	2554.503	TRAFFIC BARRIER DESIGN TRANS TYPE 31		LIN FT	100	100		

NOTES:
(P) = PLAN QUANTITY
(1) BITUMINOUS MATERIAL FOR TACK COAT SHALL BE INCIDENTAL.
(2) SEE TYPICAL SECTIONS FOR APPROXIMATE EXISTING PAVEMENT DEPTHS.

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
NAME: GINA E. BEERS LIC. NO. 56150
CERTIFIED BY:  3/3/2023
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
DESIGNED BY: JCN
CHECKED BY: GEB



STATEMENT OF ESTIMATED QUANTITIES
SHEET NO. 3 OF 59 SHEETS
S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

STATEMENT OF ESTIMATED QUANTITIES

TAB	SHEET NO.	ITEM NO.	ITEM DESCRIPTION	NOTE NO.	UNIT	TOTAL ESTIMATED QUANTITY	PARTICIPATING STATE FUNDS		LOCAL FUNDS
							ANOKA COUNTY S.A.P. 002-618-034	CITY OF COON RAPIDS S.A.P. 114-020-059	ANOKA COUNTY
M	7	2557.503	WIRE FENCE DESIGN 60V-9322		LIN FT	759	759		
		2563.601	TRAFFIC CONTROL		LUMP SUM	1	1		
N	C1	2565.501	TRAFFIC CONTROL INTERCONNECT		LUMP SUM	1	1		
ST	51	2564.602	DELINEATOR / MARKER		EACH	4	4		
ST	51	2564.618	SIGN		SQ FT	54	54		
J	8	2573.502	STORM DRAIN INLET PROTECTION		EACH	4	4		
J	8	2573.502	CULVERT END CONTROLS		EACH	1	1		
J	8	2573.503	SILT FENCE, TYPE MS		LIN FT	802	802		
J	8	2573.503	FLOTATION SILT CURTAIN TYPE MOVING WATER		LIN FT	123	123		
J	8	2573.503	SEDIMENT CONTROL LOG TYPE WOOD FIBER		LIN FT	66	66		
J	8	2573.503	SEDIMENT CONTROL LOG TYPE COMPOST		LIN FT	14	14		
		2573.601	TEMPORARY STREAM DIVERSION SYSTEM		LUMP SUM	1	1		
I	8	2574.508	FERTILIZER TYPE 3		POUND	188	188		
I	8	2574.508	FERTILIZER TYPE 4		POUND	17	17		
I	8	2575.504	ROLLED EROSION PREVENTION CATEGORY 25		SQ YD	1400	1400		
I	8	2575.505	SEEDING		ACRE	0.7	0.7		
I	8	2575.508	SEED MIXTURE 25-121		POUND	32	32		
I	8	2575.508	SEED MIXTURE 33-261		POUND	4	4		
PM	53	2582.503	4" SOLID LINE MULTI COMP		LIN FT	2284	2284		
PM	53	2582.503	4" BROKEN LINE MULTI COMP		LIN FT	56	56		
PM	53	2582.503	4" DBLE SOLID LINE MULTI COMP		LIN FT	488	488		
PM	53	2582.503	24" SOLID LINE PREF THERMO GR IN		LIN FT	25	25		
PM	53	2582.518	PAVT MSSG PREF THERMO		SQ FT	15	15		

NOTES:
 (P) = PLAN QUANTITY
 (1) BITUMINOUS MATERIAL FOR TACK COAT SHALL BE INCIDENTAL.
 (2) SEE TYPICAL SECTIONS FOR APPROXIMATE EXISTING PAVEMENT DEPTHS.

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 NAME: GINA E. BEERS LIC. NO. 56150
 CERTIFIED BY: *GEB* 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB



STATEMENT OF ESTIMATED QUANTITIES
 SHEET NO. 4 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

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

STANDARD PLATES

PLATE NO.	DESCRIPTION
3000M	REINFORCED CONCRETE PIPE (6 SHEETS)
3100G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3133D	RIPRAP AT RCP OUTLETS
3145G	CONCRETE PIPE OR PRECAST BOX CULVERT TIES
4020J	MANHOLE OR CATCH BASIN (FOR USE WITH OR WITHOUT TRAFFIC LOADS) (2 SHEETS)
4101D	RING CASTING FOR MANHOLE OR CATCH BASIN
4110F	COVER CASTING FOR MANHOLE (FOR USE IN ALL TRAFFIC AREAS) * CASTING NO. 715 AND 716
4154B	CATCH BASIN GRATE CASTING - CASTING NO. 816
7100H	CONCRETE CURB AND GUTTER (DESIGN B AND DESIGN V)
7111J	INSTALLATION OF CATCH BASIN CASTINGS (CONCRETE CURB AND GUTTER)
8000K	TEMPORARY CHANNELIZERS (3 SHEETS)
8150C	INSTALLATION OF CULVERT MARKERS
8316C	POST SEAT FOR ANCHORAGE ON FOOTING OR BOX CULVERTS
8318C	GUARDRAIL ANCHORAGE PLATE FOR BRIDGES AND BCT'S
8338D	W-BEAM GUARDRAIL & END ANCHORAGES (STEEL POSTS) (4 SHEETS)
8350A	THRIE BEAM ANCHORAGE PLATE
8355B	W-BEAM GUARDRAIL (2 SHEETS)
8356A	W-BEAM TO THRIE-BEAM TRANSITION GUARDRAIL
8357A	THRIE-BEAM GUARDRAIL
8360B	GUARDRAIL POST LENGTH MARKING
8361B	GUARDRAIL STEEL POST (3 SHEETS)
8362A	UNIVERSAL BREAKAWAY STEEL POST (UBSP) (2 SHEETS)
8369B	GUARDRAIL BLOCKOUT (2 SHEETS)
9101B	SHAPING AND SODDING OF SLOPES AT BOX CULVERT ENDS
9322K	CHAIN LINK FENCE (2 SHEETS)

(Q) BASIS OF QUANTITIES	
BITUMINOUS MIXTURES (ROAD AND TRAIL)	115 LB/SY/IN
SEED MIXTURE 25-121	61 LB/ACRE
SEED MIXTURE 33-361	35 LB/ACRE
FERTILIZER TYPE 3	350 LB/ACRE
FERTILIZER TYPE 4	150 LB/ACRE

(1) SPECIFIC NOTES:
(2) (1) 22-5-10 ANALYSIS

CONSTRUCTION NOTES

- TOP OF THE GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.
- COMMON EXCAVATION SHALL CONSIST OF ALL EXCAVATION MATERIALS NOT CLASSIFIED AS EXCAVATION - ROCK AND EXCAVATION - MUCK.
- SELECTED GRADING MATERIALS SHALL CONSIST OF ALL SOILS ENCOUNTERED EXCLUDING TOPSOIL, ORGANIC MATERIAL, ROCK AND OTHER UNSUITABLE MATERIAL. THESE SELECTED GRADING MATERIALS SHALL BE OBTAINED FROM THE SUBGRADE AND THE COMMON EXCAVATION IN ACCORDANCE WITH MNDOT SPEC. 2106.
- SELECT GRANULAR BORROW REGARDLESS OF SOURCE SHALL MEET THE REQUIREMENTS OF MNDOT SPEC. 3149.2B2.
- COMPACTION OF ALL EXCAVATION AND EMBANKMENT CONSTRUCTION, INCLUDING CULVERT BACKFILLS, SHALL BE AS DESCRIBED IN MNDOT 2106. AGGREGATE BASE COURSE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROVISIONS OF MNDOT 2211. COMPACTION OF ALL AGGREGATE BASE, GRANULAR, AND SELECT GRANULAR MATERIAL SHALL BE IN ACCORDANCE WITH MNDOT'S "MODIFIED PENETRATION INDEX" METHOD. COMPACTION OF ALL BITUMINOUS MIXTURES SHALL BE IN ACCORDANCE WITH MNDOT'S "MAXIMUM DENSITY" METHOD.
- ALL DISTURBED ROADWAY MATERIALS SUCH AS CONCRETE, BITUMINOUS, AND AGGREGATES MAY BE UTILIZED ACCORDING TO MNDOT SPECIFICATIONS. MATERIALS NOT UTILIZED ON THIS PROJECT WILL BECOME THE PROPERTY OF THE CONTRACTOR AND DISPOSED OF OFF THE RIGHT OF WAY IN ACCORDANCE WITH MNDOT SPECIFICATION 2104 AND AS AGREED UPON BY THE ENGINEER.
- EXCESS EXCAVATION MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. DISPOSITION OF EXCESS EXCAVATION MATERIAL SHALL BE IN ACCORDANCE WITH SPECIFICATION 2106.3I AND SHALL BE DISPOSED OF OFF THE RIGHT OF WAY, AT NO ADDITIONAL COMPENSATION, AND IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

CONSTRUCTION NOTES (CONTINUED)

- WHERE CHANGING SUBCUT DEPTHS OR WHERE CONNECTING TO THE INPLACE ROADWAYS AT THE PROJECT TERMINI, CUT VERTICALLY TO THE BOTTOM OF INPLACE AGGREGATE BASE OR THE BOTTOM OF PROPOSED AGGREGATE BASE, WHICHEVER IS DEEPER, THEN TAPER AT A 1(V):20(H) RATE TO THE BOTTOM OF THE RECOMMENDED SUBGRADE EXCAVATION.
- COMMON MATERIAL ASSUMED TO MEET THE REQUIREMENTS OF MNDOT 3149.2B1.
- NO OVER EXCAVATION WILL BE ALLOWED INSIDE COUNTY RIGHT OF WAY.
- EXCESS COMMON MATERIAL MUST BE DEEMED EXCESS BY THE ENGINEER PRIOR TO LEAVING PROJECT.
- THE CONTRACTOR SHALL PROVIDE TACK COAT BETWEEN ALL BITUMINOUS MIXTURES AND PRIOR TO PLACING ANY BITUMINOUS MIXTURES ON EXISTING PAVEMENT IN ACCORDANCE WITH SPECIFICATION 2357. TACK COAT IS INCIDENTAL.
- PROVIDE A SAW CUT WHERE PLACING NEW PAVEMENT NEXT TO INPLACE PAVEMENT TO ENSURE A UNIFORM JOINT.
- STRIP ALL EXISTING TOPSOIL AND SLOPE DRESSING IN AREAS TO BE DISTURBED BY CONSTRUCTION AND REUSE AS SLOPE DRESSING. PAYMENT FOR STRIPPING IS INCLUDED IN EXCAVATION-COMMON AND PAYMENT FOR SLOPE DRESSING PAYMENT IS INCLUDED IN COMMON EMBANKMENT (CV). FOR ESTIMATING PURPOSES, TOPSOIL ASSUMED TO BE 4".
- NO EXTRA PAYMENT WILL BE MADE FOR TEMPORARY STOCKPILING OF EXCAVATED OR EMBANKMENT MATERIAL.
- THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING CONSTRUCTION IN A MANNER THAT WILL CONTROL EROSION. SEE THE EROSION CONTROL PLANS FOR SUGGESTED LOCATIONS AND DEVICES TO DO SO.
- UTILITY RELOCATIONS IN THE AREA WILL BE OCCURRING PRIOR TO AND DURING THE PROJECT. THE CONTRACTOR SHALL EXPECT UTILITY CONFLICTS AND ACCOUNT FOR THEM ACCORDINGLY IN THEIR WORK SCHEDULE AND ANTICIPATED PRODUCTION.
- PRIOR TO PLACING AGGREGATE BASE MATERIAL, TEST ROLL PAVEMENT SUBGRADES TO DETERMINE IF THE SUBGRADE MATERIALS ARE LOOSE, SOFT OR WEAK, AND IN NEED OF FURTHER STABILIZATION, COMPACTION OR SUB-EXCAVATION, AND RECOMPACTION OR REPLACEMENT. A SECOND TEST ROLL SHALL BE PERFORMED AFTER THE AGGREGATE BASE MATERIAL IS IN PLACE, AND PRIOR TO BITUMINOUS PAVEMENT. TEST ROLLING SHALL ONLY BE REQUIRED FOR ROADWAYS. COMPACTION OF ALL AGGREGATE BASE, GRANULAR, AND SELECT GRANULAR MATERIAL SHOULD BE IN ACCORDANCE WITH MNDOT "MODIFIED PENETRATION INDEX METHOD".
- CONSTRUCTION SLOPES SHALL BE COVERED WITH 4" OF TOPSOIL MATERIAL. INPLACE TOPSOIL THAT IS REUSED SHALL MEET MNDOT STANDARD SPECIFICATION 3877 OR APPROVED BY THE ENGINEER AND SHALL BE SCREENED PRIOR TO REUSE. PAYMENT FOR TOPSOIL MATERIAL IS PAID FOR AS COMMON EMBANKMENT.
- ANY TOPSOIL MATERIAL NOT UTILIZED ON THIS PROJECT SHALL BE THE PROPERTY OF THE OWNER UNTIL RELEASED TO THE CONTRACTOR BY THE ENGINEER FOR USE OR DISPOSAL OUTSIDE OF THE RIGHT OF WAY IN ACCORDANCE WITH SPEC 2104.
- TEMPORARY AND INTERMEDIATE EXCAVATION LIMITS AND SLOPES ARE TO BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION. DEPENDING ON SOIL PROPERTIES AND SAFETY FACTORS, ADDITIONAL EXCAVATION AND BACKFILL BEYOND THE LIMITS SHOWN IN THE PLAN SHALL BE CONSIDERED THE CONTRACTOR EXPENSE (2106).
- WHEN REMOVING PAVEMENTS, FULL-DEPTH SAWCUTS SHOULD BE MADE PERPENDICULAR TO THE ROADWAY CENTERLINE.
- NON-STRUCTURAL GRADING MATERIAL ARE ALL MINERAL SOILS, EXCESS TOPSOIL, AND ORGANIC SOILS, CAPABLE OF SUPPORTING CONSTRUCTION EQUIPMENT. NON-STRUCTURAL GRADING MATERIAL SHALL ONLY BE PLACED OUTSIDE OF THE ROADWAY CORE AND IN A MANNER IN WHICH THE MATERIAL WILL MAINTAIN LONG TERM STABILITY.
- EXCEPT FOR SUBGRADE ZONES WHERE SELECT GRANULAR MATERIAL IS SPECIFICALLY REQUIRED, THE SUBGRADE SHALL BE CONSTRUCTED OF SELECT GRADING MATERIAL.
- STORM SEWERS CONNECTING TO MANHOLES AND CATCH BASINS SHALL BE IN ACCORDANCE WITH MNDOT STANDARD SPECIFICATION 2503. BEDDING AND BACKFILL SHALL CONSIST OF UNIFORM SELECT GRADING MATERIAL MATCHING ADJACENT SOILS UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR AS SHOWN IN THE PLAN.
- WHERE UNSUITABLE MATERIAL IS ENCOUNTERED DURING COMMON OR SUBGRADE EXCAVATION. THE CONTRACTOR SHALL PROVIDE GRANULAR MATERIAL, FOUND ELSEWHERE ON THE JOB SITE. NO DIRECT COMPENSATION WILL BE MADE THEREAFTER.
- THE TOP OF BACKSLOPES AND THE TOE OF FILL SLOPES SHALL BE ROUNDED TO NATURALIZE THE CONSTRUCTION EVEN THOUGH THE CROSS SECTIONS DO NOT SHOW ANY SUCH ROUNDING.
- THE CONSTRUCTION LIMITS AS SHOWN IN THE PLANS REPRESENT THE POINT OF INTERSECTION BETWEEN THE REQUIRED FILL OR CUT SLOPE AND THE EXISTING GROUNDLINE AS DEPICTED ON THE CROSS SECTIONS. THE CONSTRUCTION LIMITS DO NOT INCLUDE AREAS REQUIRED FOR SLOPE ROUNDING.

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 NAME: GINA E. BEERS LIC. NO. 56150
 CERTIFIED BY: [Signature] 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB



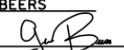

STANDARD PLATES & CONSTRUCTION NOTES
 SHEET NO. 5 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

(B) STATION TO STATION EARTHWORK TABULATION				
STATION	EXCAVATION		EMBANKMENT	
	EXCAVATION - COMMON	EXCAVATION - SUBGRADE	COMMON EMBANKMENT (CV)	SELECT GRANULAR (CV)
	CU YD	CU YD	CU YD	CU YD
S.A.P. 002-618-034				
CSAH 18 NB				
120+80.54				
121+00.00	26	48	4	49
121+50.00	63	124	20	128
122+00.00	94	119	24	136
SEE EARTHWORK SUMMARY FOR BOX CULVERTS				
124+00.00				
124+50.00	134	102	251	123
125+00.00	143	103	48	116
125+50.00	71	109	38	113
126+00.00	56	113	41	114
126+50.00	55	121	30	121
127+00.00	64	129	12	129
127+12.07	17	32		32
CSAH 18 NB TOTAL	723	1000	468	1061

(B) EARTHWORK SUMMARY				
STATION TO STATION	EXCAVATION		EMBANKMENT	
	EXCAVATION - COMMON	EXCAVATION - SUBGRADE	COMMON EMBANKMENT (CV)	SELECT GRANULAR (CV)
	CU YD	CU YD	CU YD	CU YD
S.A.P. 002-618-034				
CSAH 18 NB				
120+80.54 - 127+12.07	723	1000	468	1061
BOX CULVERTS		9115		9524
TOTAL	723	10115	468	10585

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NO	DATE	BY	CKD	APPR	REVISION

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 NAME: GINA E. BEERS LIC. NO. 56150
 CERTIFIED BY:  3/3/2023
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 DESIGNED BY: JCN
 CHECKED BY: GEB



TABULATED QUANTITIES
SHEET NO. 6 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

(A) CLEARING AND GRUBBING			
STATION TO STATION	LOCATION	CLEAR EACH	GRUB EACH
S.A.P. 002-618-034			
CSAH 18 NB			
122+03.95	68' RT	1	1
122+48.40	44' RT	1	1
122+50.48	46' RT	1	1
124+04.94	140' LT	1	1
TOTAL		4	4

(D) REMOVALS						
STATION TO STATION	LOCATION	REMOVE				
		CURB & GUTTER	BITUMINOUS PAVEMENT	SIDEWALK ④	FENCE	CONCRETE APPROACH PANEL
		LIN FT	SQ YD	SQ FT	LIN FT	SQ YD
S.A.P. 002-618-034						
CSAH 18 NB						
120+80.54 - 122+96.03	LT/RT	332	622	1214		320
121+49.73 - 124+61.09	RT				494	
122+56.27 - 125+94.83	LT				421	
123+13.16 - 127+12.07	LT/RT		2718	216		278
TOTAL		332	3340	1430	915	598

(E) SAWING		
STATION TO STATION	OFFSET	BITUMINOUS PAVEMENT (FULL DEPTH)
		LIN FT
S.A.P. 002-618-034		
CSAH 18 NB		
120+80.54	LT/RT	49
124+40.72 - 127+12.07	LT/RT	135
TOTAL		184

(M) MISCELLANEOUS		
STATION TO STATION	OFFSET	WIRE FENCE DESIGN 60V-9322 ⑤
		LIN FT
S.A.P. 002-618-034		
CSAH 18 NB		
122+65.09 - 125+94.83	LT	414
121+12.81 - 124+61.09	RT	345
TOTAL		759

(K) TRAFFIC BARRIER							REMARKS
STATION TO STATION	LOCATION	REMOVE GUARDRAIL - PLATE BEAM	REMOVE ENERGY ABSORBING TERMINAL	END TREATMENT - TANGENT TERMINAL	TRAFFIC BARRIER DESIGN TYPE 31	TRAFFIC BARRIER DESIGN TRANS TYPE 31	
	LT/RT	LIN FT	EACH	EACH	LIN FT	LIN FT	
S.A.P. 002-618-034							
CSAH 18 NB							
120+41.18 - 121+87.49	RT	147	1 ①				STATIONING INCLUDES END TREATMENT
120+76.30 - 121+76.30	RT			1	50	25	STATIONING INCLUDES END TREATMENT
121+59.53 - 122+59.51	LT			1	50	25	STATIONING INCLUDES END TREATMENT
121+69.96 - 122+56.78	LT	87	1 ②				STATIONING INCLUDES END TREATMENT
122+79.30 - 123+80.63	RT			1	50	25	STATIONING INCLUDES END TREATMENT
123+42.44 - 126+51.66	RT	306	1 ②				STATIONING INCLUDES END TREATMENT
123+59.32 - 126+59.34	LT			1	263	25	STATIONING INCLUDES END TREATMENT
124+19.02 - 126+59.15	LT	216	1 ③				STATIONING INCLUDES END TREATMENT
TOTAL		756	4	4	413	100	

(F) AGGREGATE AND BITUMINOUS PAVEMENT							
STATION TO STATION	LOCATION	AGG. BASE (CV) CLASS 5	BITUMINOUS TYPE SP 9.5		BITUMINOUS TYPE SP 12.5		
			WEARING COURSE	WEARING COURSE	NON WEARING COURSE		
			MIX (2,B) (SPWEA230B)	MIX (4,F) (SPWEB440F)	MIX (4,B) (SPNWB430B)		
		CU YD	TON	TON	TON	TON	
S.A.P. 002-618-034							
CSAH 18 NB							
120+80.54 - 122+71.74	LT/RT	306	8	249	186		
122+71.74 - 127+12.07	LT/RT	849	59	665	499		
TOTAL		1155	67	914	685		

(C) CONCRETE CURB & GUTTER AND WALK					
STATION TO STATION	LT/RT	AGG. BASE (CV) CLASS 5	WALK	C&G DESIGN	
			4"	B424	B418 MOD
		CU YD	SQ FT	LIN FT	LIN FT
S.A.P. 002-618-034					
CSAH 18 NB					
120+80.54 - 122+71.74	LT/RT	45	2901	274	382
122+71.74 - 127+12.07	LT/RT	55	3800	242	342
TOTAL		100	6701	516	724

SPECIFIC NOTES

- ① ET-PLUS (STEEL POST) END TERMINAL
- ② CAT-350 END TERMINAL
- ③ ECCENTRIC LOADER TERMINAL (ELT)
- ④ FULL DEPTH CONCRETE SAWING IS INCIDENTAL
- ⑤ WIRE FENCE DESIGN 60V-9322 SHALL HAVE TOP RAIL IN LIEU OF A TENSION WIRE

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NO	DATE	BY	CKD	APPR	REVISION

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 NAME: GINA E. BEERS LIC. NO. 56150
 CERTIFIED BY: [Signature] 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB



TABULATED QUANTITIES
 SHEET NO. 7 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

(G) DRAINAGE																		
STRUCTURE NO.	STRUCTURE LOCATION		DRAINAGE STRUCTURE				TOP OF CASTING ELEV.	OUTLET ELEV.	INLET ELEV.	RC PIPE SEWER DES 3006		36" RC PIPE APRON	18" RC SAFETY APRON	GUIDE POST TYPE B	CONNECT TO EXISTING PIPE DRAIN	PIPE TIES - FLAT BAR	FINE AGGREGATE BEDDING (CV)	
	FLOWS FROM	FLOWS TO	STATION	OFFSET	TYPE	PAY HEIGHT 48-4020 LIN FT				CASTING ASSEMBLY	18"							36"
											LIN FT							LIN FT
S.A.P. 002-618-034																		
CSAH 18 NB																		
5001	5002	120+99.55	31 RT	MH	7.9	A-4D	860.89	853.36	853.25	20					1	6	51	
5002		121+17.31	50 RT					853.25					1	1				
5003		122+02.20	68 RT					854.00				1		1		6		
5004	5003	122+57.94	48 RT	CB	4.1	B-13	858.35	854.13	854.00		89						185	
5005	5004	124+35.53	42 RT					854.50	854.13		144	1		1		6	293	
TOTAL					12.0	2				20	233	2	1	3	1	18	529	

(H) INPLACE DRAINAGE					
STATION TO STATION		DRAINAGE STRUCTURE	REMOVE PIPE SEWERS	REMOVE PIPE APRON	REMOVE MANHOLE OR CATCH BASIN
STATION	OFFSET TO STATION				
		LIN FT	EACH	EACH	
S.A.P. 002-618-034					
CSAH 18 NB					
120+60.41	31 RT - 121+38.64	18" RCP	18		
121+38.64	31 RT	MH			1
121+38.64	31 RT - 121+38.56	18" RCP	23		
121+38.56	54 RT	PIPE APRON		1	
122+70.50	41 RT	PIPE APRON		1	
123+53.22	43 RT	PIPE APRON		1	
123+53.22	43 RT - 122+70.50	48" CMP	80		
124+11.34	70 LT	PIPE APRON		1	
124+68.00	73 LT	PIPE APRON		1	
124+68.00	73 LT - 124+11.34	24" CMP	60		
TOTAL			181	5	1

(G) CASTING ASSEMBLY KEY AND SUMMARY			
ASS' Y.	ASS'Y REQ'D	CASTING NUMBER	STANDARD PLATE
A-4D	1	RING CASTING NO. 700-4 COVER CASTING 715	4101 4110
B-13	1	FRAME CASTING NO. 806 GRATE CASTING NO. 816	4132 4154

(J) EROSION CONTROL							
STATION TO STATION	OFFSET	SILT FENCE, TYPE MS	FLOTATION SILT CURTAIN TYPE MOVING WATER	SEDIMENT CONTROL LOG TYPE COMPOST	SEDIMENT CONTROL LOG TYPE WOOD FIBER	CULVERT END CONTROLS	STORM DRAIN INLET PROTECTION
S.A.P. 002-618-034							
CSAH 18 NB							
SOUTH OF PROJECT LIMITS		LT/RT					3
120+81.63	- 126+61.82	RT	384	123	14	66	
120+81.63	- 127+11.21	LT	418				1
TOTAL			802	123	14	66	4

(I) TURF ESTABLISHMENT									
STATION TO STATION	OFFSET	SEEDING	SEED		FERTILIZER TYPE 3	FERTILIZER TYPE 4	ROLLED EROSION PREVENTION CATEGORY 25	RANDOM RIPRAP CLASS IV	
			MIX. 25-121	MIX. 33-261					
			LT / RT	ACRE					POUND
S.A.P. 002-618-034									
CSAH 18 NB									
120+80.54	- 124+40.72	RT	0.34	18	1	106	6	744	552
120+81.63	- 126+59.34	LT	0.31	14	3	82	11	656	447
TOTAL			0.7	32	4	188	17	1400	999

SPECIFIC NOTES
 ① 2 INPLACE CATCH BASINS AT 128TH AVE INTERSECTION.
 1 INPLACE CATCH BASIN CSAH 18 EAST CURB.

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 NAME: GINA E. BEERS LIC. NO. 56150
 CERTIFIED BY: [Signature] 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB



TABULATED QUANTITIES
 SHEET NO. 8 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

UTILITIES

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

- ANOKA COUNTY
- CITY OF COON RAPIDS
- CONNEXUS ENERGY
- COMCAST
- CENTERPOINT ENERGY
- LUMEN

(C) UTILITY TABULATION										
STATION TO STATION	ROADWAY	ALIGNMENT	OFFSET TO OFFSET (FT)	ITEM INPLACE	OWNER	REMARKS				NOTES
						LEAVE AS IS	REMOVE	ADJUST	RELOCATE	
POWER/ELECTRIC - S.A.P. 002-618-034										
120+82.07 - 125+40.18	CSAH 18	P_CSAH18_NB	65.58 LT - 48.5 LT	BURIED POWER (X2)	CONNEXUS				X	
COMMUNICATION - S.A.P. 002-618-034										
120+79.29 - 121+78.77	CSAH 18	P_CSAH18_NB	31.56 RT - 29.35 RT	BURIED FIBER OPTIC	ANOKA				X	①
121+78.77 - 123+05.86	CSAH 18	P_CSAH18_NB	20.66 RT - 20.30 RT	BURIED FIBER OPTIC	ANOKA				X	①
123+05.86 - 127+11.13	CSAH 18	P_CSAH18_NB	29.54 RT - 27.44 RT	BURIED FIBER OPTIC	ANOKA				X	①
	128TH AVE NW			COM BUR	COMCAST	X				LOCATED SOUTH OF PROJECT LIMITS ON 128TH AVE NW
GAS - S.A.P. 002-618-034										
	128TH AVE NW			GAS	CENTERPOINT	X				LOCATED SOUTH OF PROJECT LIMITS ON 128TH AVE NW

OWNERSHIP	
ANOKA	ANOKA COUNTY
CITY	CITY OF COON RAPIDS
CONNEXUS	CONNEXUS ENERGY
COMCAST	COMCAST
CENTERPOINT	CENTERPOINT ENERGY
LUMEN	LUMEN

SPECIFIC NOTES

① WORK TO BE COMPLETED BY CONTRACTOR. SEE SHEET C1.

GENERAL NOTES

1. UTILITY WORK WILL BE PERFORMED BY OTHERS UNLESS NOTED OTHERWISE.
2. THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE GOPHER STATE ONE CALL EXCAVATION NOTICE SYSTEM REQUIRED BY MINNESOTA STATUTE, CHAPTER 216D FOR ALL UNDERGROUND UTILITY LOCATIONS.
4. ALL RELOCATES AND ADJUSTMENTS SUBJECT TO ANOKA COUNTY RIGHT OF WAY.
5. ALL POWERLINES ARE DISTRIBUTION UNLESS NOTED OTHERWISE.
6. UTILITIES TABULATED BASED ON CSAH 18 NB STATIONING UNLESS NOTED OTHERWISE.

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

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NO	DATE	BY	CKD	APPR	REVISION

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NAME: JACOB C. NICHOLS LIC. NO. 60631

CERTIFIED BY: Jacob Nichols 3/3/2023
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN

DESIGNED BY: JCN

CHECKED BY: GEB

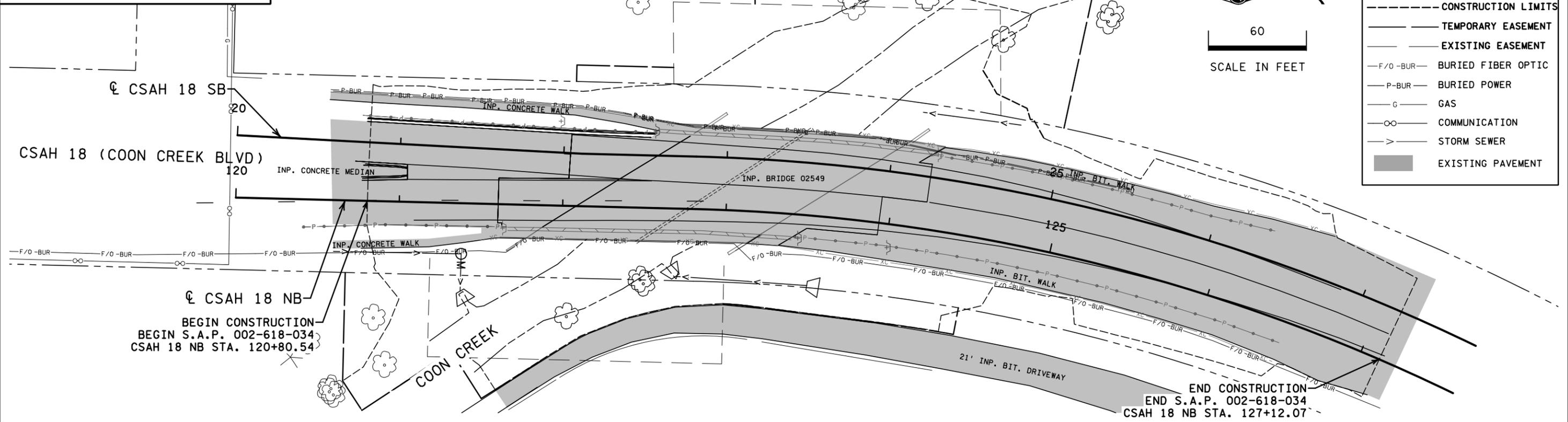


INPLACE UTILITY TABULATIONS

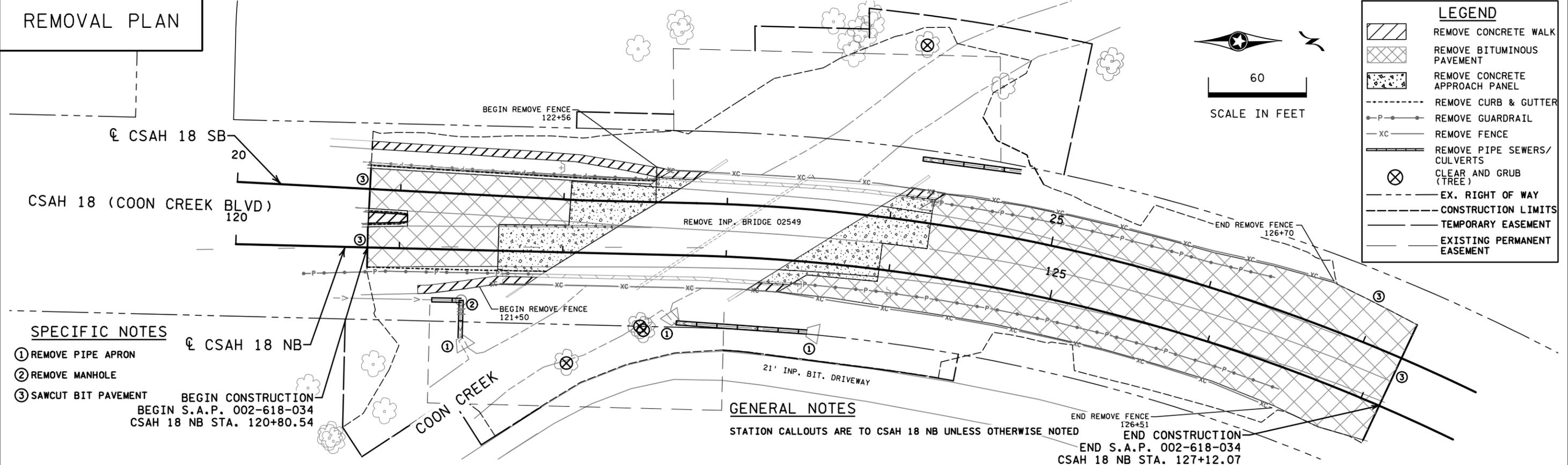
SHEET NO. 9 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

INPLACE TOPOGRAPHY & UTILITY PLAN



REMOVAL PLAN



SPECIFIC NOTES

- ① REMOVE PIPE APRON
- ② REMOVE MANHOLE
- ③ SAWCUT BIT PAVEMENT

GENERAL NOTES

STATION CALLOUTS ARE TO CSAH 18 NB UNLESS OTHERWISE NOTED

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NAME: JACOB C. NICHOLS LIC. NO. 60631

CERTIFIED BY: *Jacob Nichols* 3/3/2023 DATE

LICENSED PROFESSIONAL ENGINEER

DRAWN BY: JCN

DESIGNED BY: JCN

CHECKED BY: GEB



INPLACE TOPOGRAPHY, UTILITY & REMOVAL PLAN

SHEET NO. 10 OF 59 SHEETS

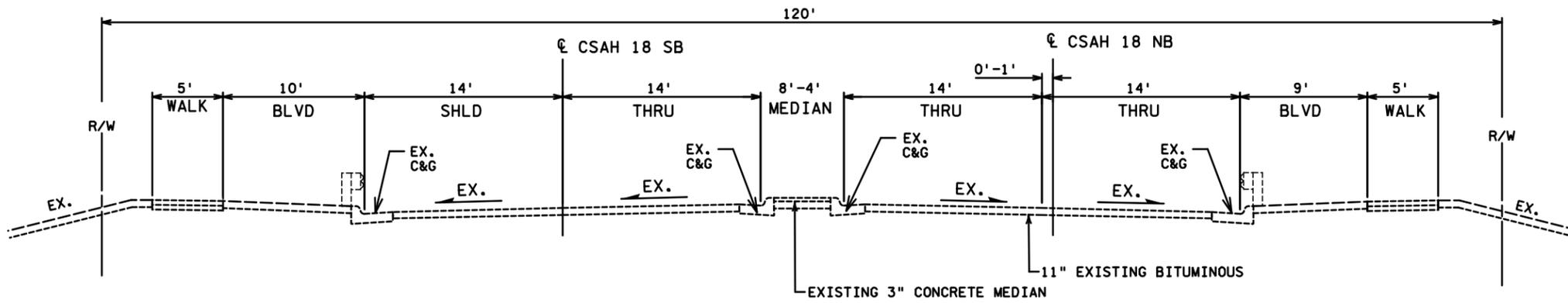
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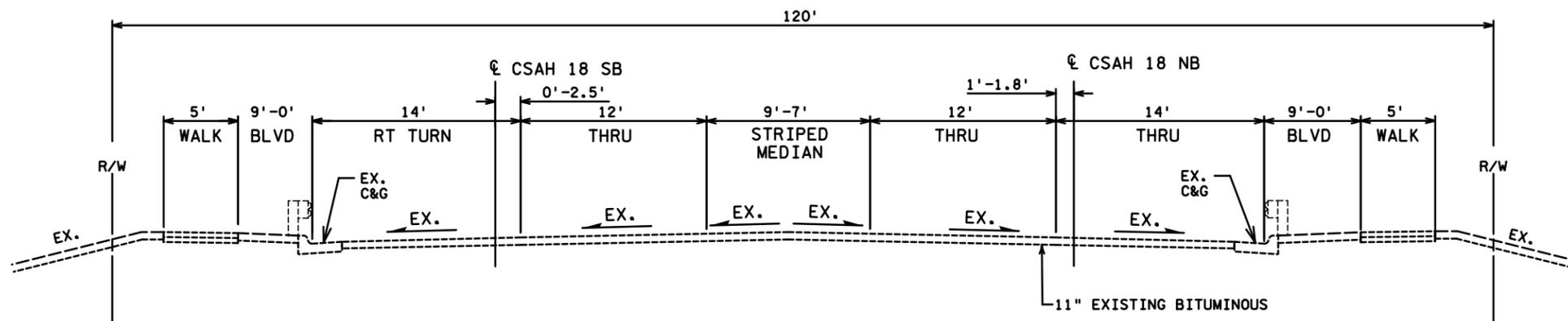
EXISTING CSAH 18 (COON CREEK BLVD)

CSAH 18 NB STA. 120+80.54 TO 121+04.66



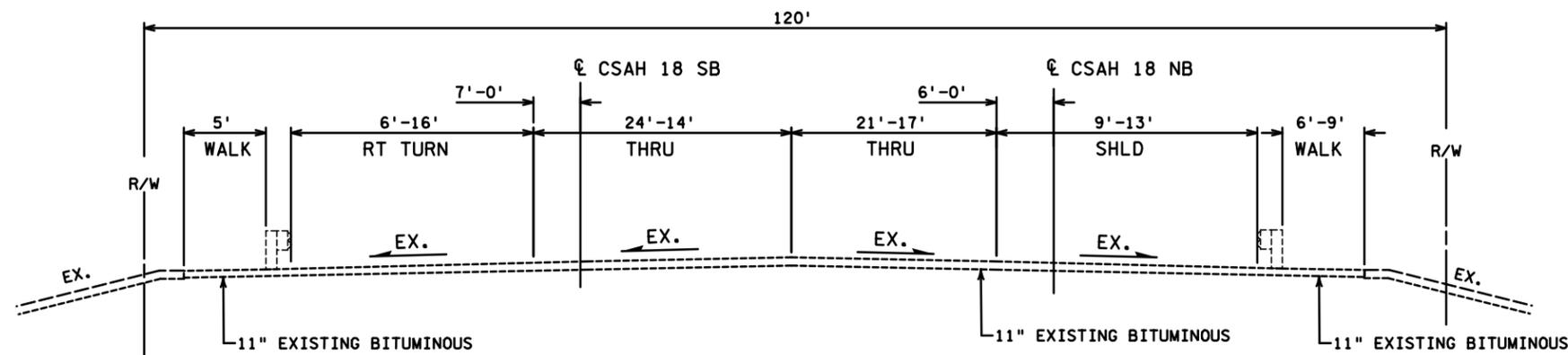
EXISTING CSAH 18 (COON CREEK BLVD)

CSAH 18 NB STA. 121+04.66 TO 122+55.61



EXISTING CSAH 18 (COON CREEK BLVD)

CSAH 18 NB STA. 123+42.44 TO 127+12.07



EXISTING CSAH 18

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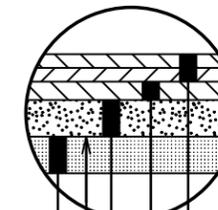
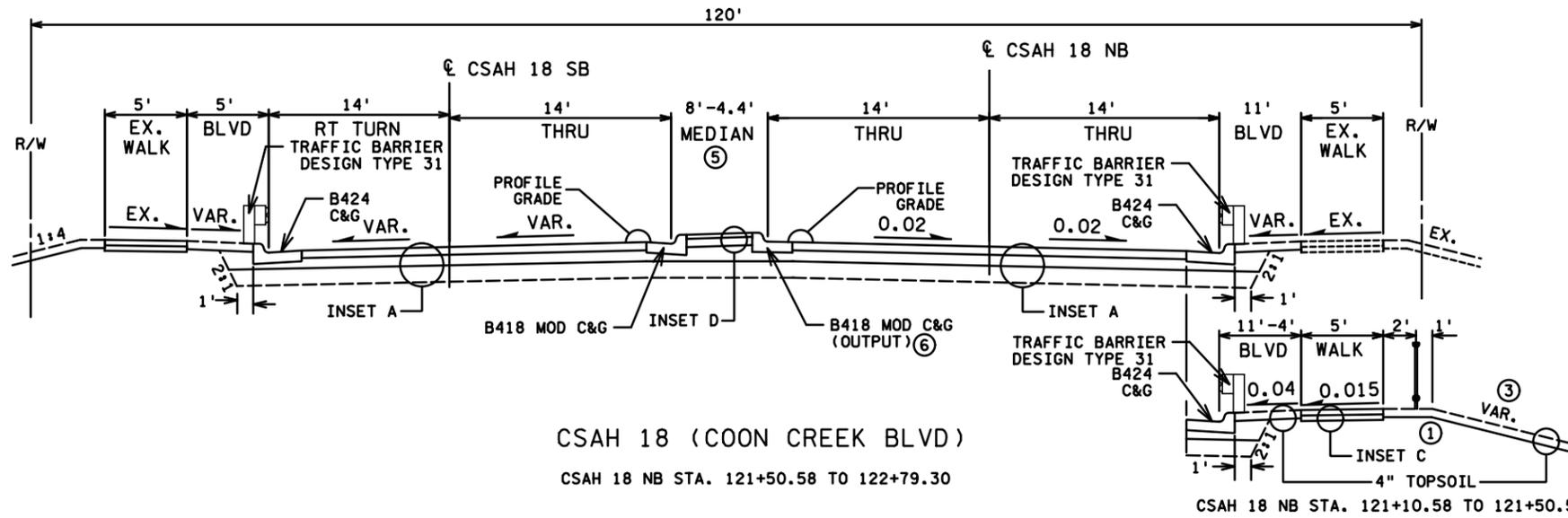
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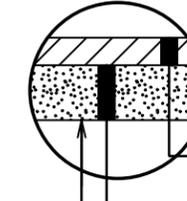
TYPICAL SECTIONS
 SHEET NO. 11 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

CSAH 18 (COON CREEK BLVD)

CSAH 18 NB STA. 120+80.54 TO 121+50.58



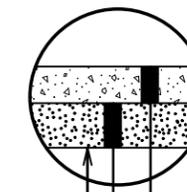
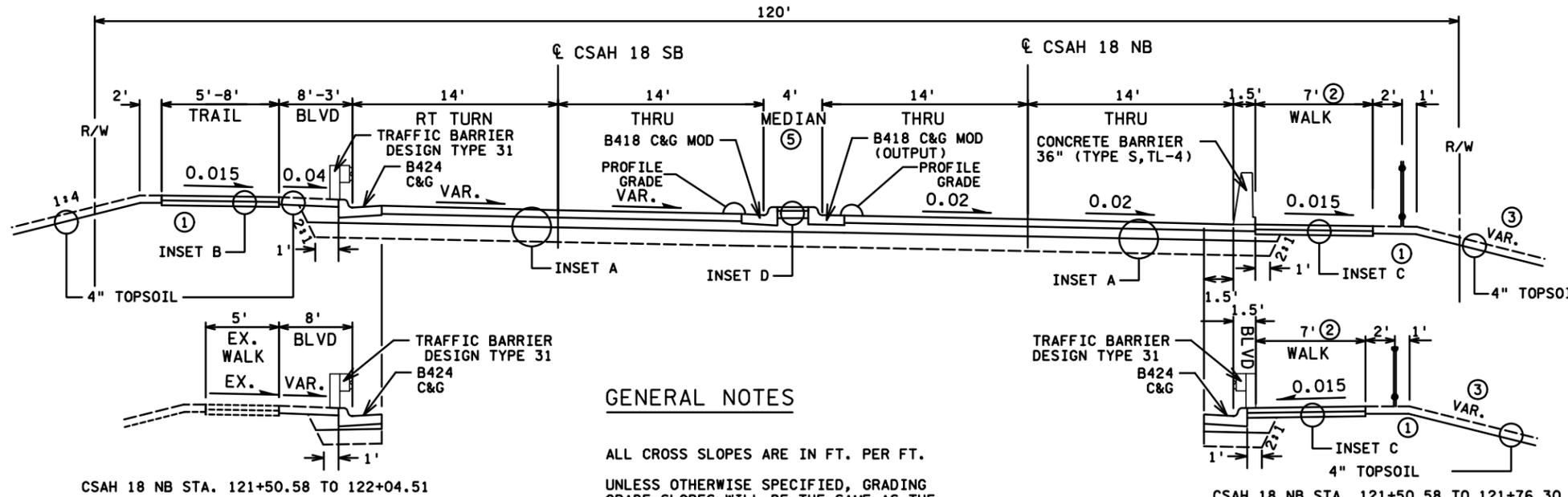
- INSET A ④**
CSAH 18
- 4.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440F) (2 LIFTS)
 - 3.0" TYPE SP 12.5 NON WEARING COURSE MIXTURE (SPNWB430B)
 - 10.0" AGGREGATE BASE (CV) CLASS 5 (MNDOT SPEC. 2211)
 - GRADING GRADE
 - 12" SELECT GRANULAR EMBANKMENT (CV)



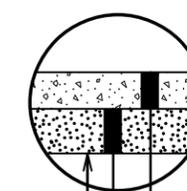
- INSET B**
BITUMINOUS TRAIL
- 2.5" TYPE SP 9.5 WEARING COURSE MIXTURE (SPWEA230B)
 - 4.0" AGGREGATE BASE (CV) CLASS 5 (MNDOT SPEC. 2211)
 - GRADING GRADE

CSAH 18 (COON CREEK BLVD)

CSAH 18 NB STA. 121+50.58 TO 122+79.30



- INSET C**
CONCRETE SIDEWALK
- 4.0" CONCRETE WALK
 - 4.0" AGGREGATE BASE (CV) CLASS 5 (MNDOT SPEC. 2211)
 - GRADING GRADE



- INSET D**
CONCRETE MEDIAN
- 4.0" CONCRETE WALK
 - 4.0" AGGREGATE BASE (CV) CLASS 5 (MNDOT SPEC. 2211)
 - GRADING GRADE

GENERAL NOTES

- ALL CROSS SLOPES ARE IN FT. PER FT.
- UNLESS OTHERWISE SPECIFIED, GRADING GRADE SLOPES WILL BE THE SAME AS THE PROPOSED DRIVING SURFACE.
- SEE SUPERELEVATION PLANS FOR CROSS SLOPES.
- SOUTHBOUND PROFILE GRADE IS 12' RIGHT OF ALIGNMENT CENTERLINE.
- NORTHBOUND PROFILE GRADE IS 12' LEFT OF ALIGNMENT CENTERLINE.
- SEE CONSTRUCTION PLAN SHEETS FOR CONCRETE WALK AND BITUMINOUS TRAIL LOCATIONS.
- AGGREGATE BASE CLASS 5 SHALL BE EXTENDED 6" ON EACH EDGE OF WALK AND TRAIL WIDTH.
- MINIMUM CLEARANCE OF 1.5' MUST BE PROVIDED FROM THE FACE OF CURB TO FIXED OBJECTS.

SPECIFIC NOTES

- ① BACKFILL WITH SUITABLE GRADING MATERIAL.
- ② PAVE 9' WALK WIDTH TO FENCE FROM STA. 121+63.29 TO 122+62.24
- ③ SEE CROSS SECTIONS.
- ④ SEE SHEET 13 FOR MODIFIED PAVEMENT SECTION OVER THE BOX CULVERTS.
- ⑤ SEE DETAIL "E" ON SHEET 14 .
- ⑥ TRANSITION TO INPUT GUTTER TO MATCH EXISTING AT STA. 120+80.54

PROPOSED CSAH 18

TYPICAL SECTIONS

SHEET NO. 12 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 NAME: JACOB C. NICHOLS LIC. NO. 60631
 CERTIFIED BY: Jacob Nichols 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB

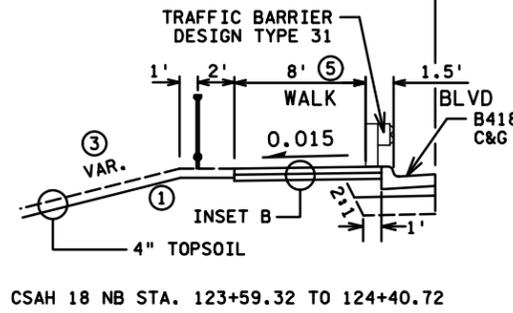
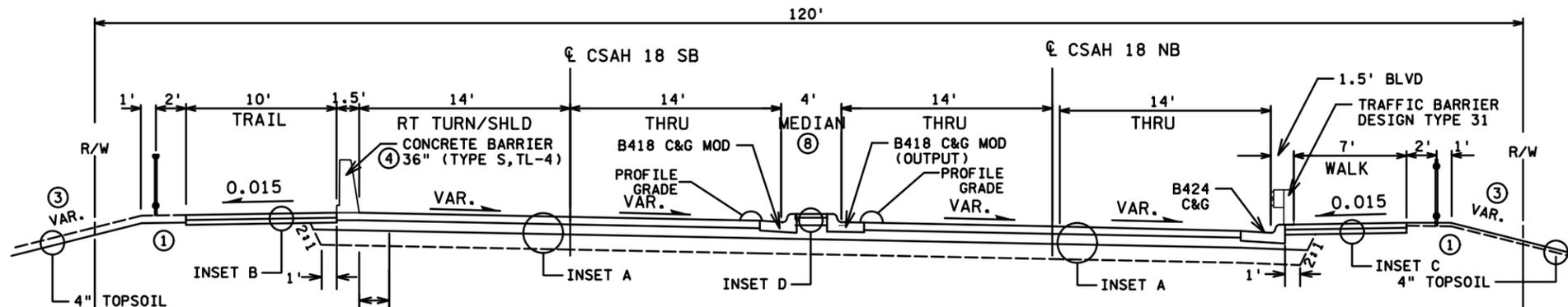


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CSAH 18 (COON CREEK BLVD)

CSAH 18 NB STA. 122+79.30 TO 124+40.72

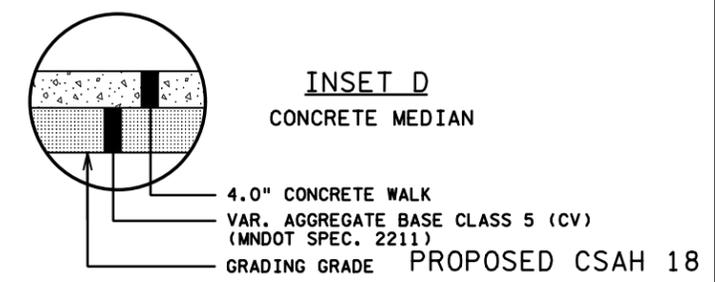
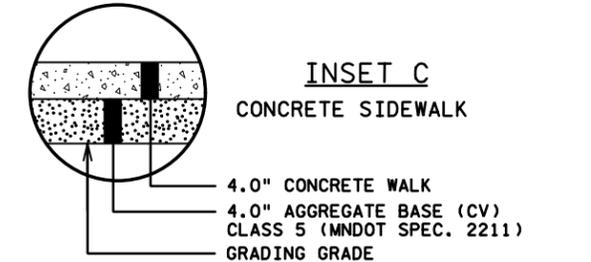
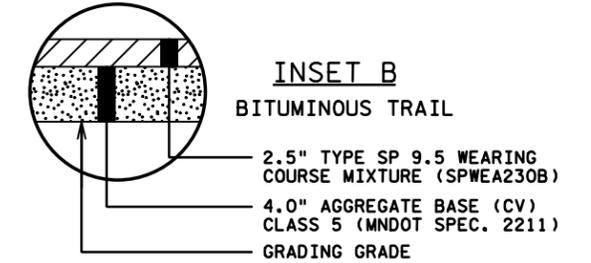
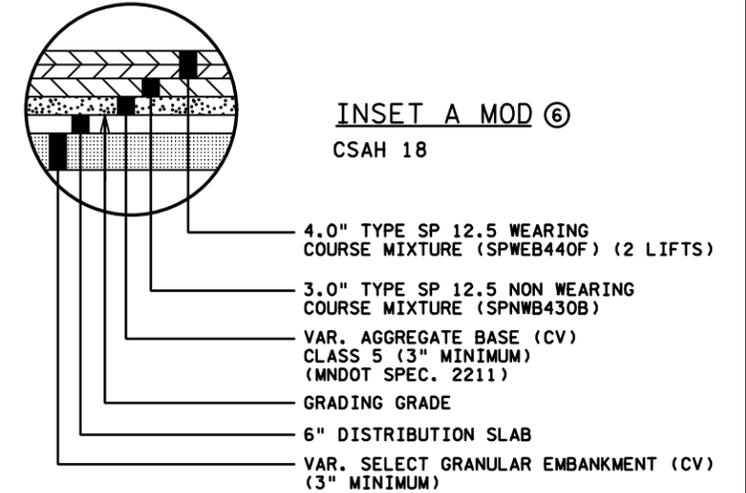
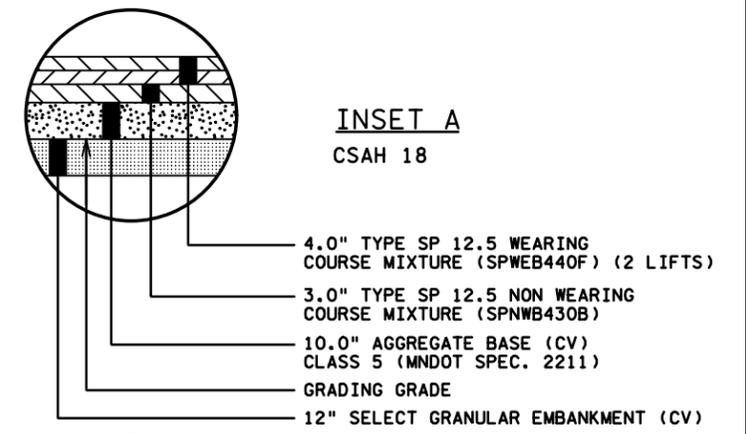


GENERAL NOTES

- ALL CROSS SLOPES ARE IN FT. PER FT.
- UNLESS OTHERWISE SPECIFIED, GRADING GRADE SLOPES WILL BE THE SAME AS THE PROPOSED DRIVING SURFACE.
- SEE SUPERELEVATION PLANS FOR CROSS SLOPES.
- SOUTHBOUND PROFILE GRADE IS 12' RIGHT OF ALIGNMENT CENTERLINE.
- NORTHBOUND PROFILE GRADE IS 12' LEFT OF ALIGNMENT CENTERLINE.
- SEE CONSTRUCTION PLAN SHEETS FOR CONCRETE WALK AND BITUMINOUS TRAIL LOCATIONS.
- AGGREGATE BASE CLASS 5 SHALL BE EXTENDED 6" ON EACH EDGE OF WALK AND TRAIL WIDTH.
- MINIMUM CLEARANCE OF 1.5' MUST BE PROVIDED FROM THE FACE OF CURB TO FIXED OBJECTS.

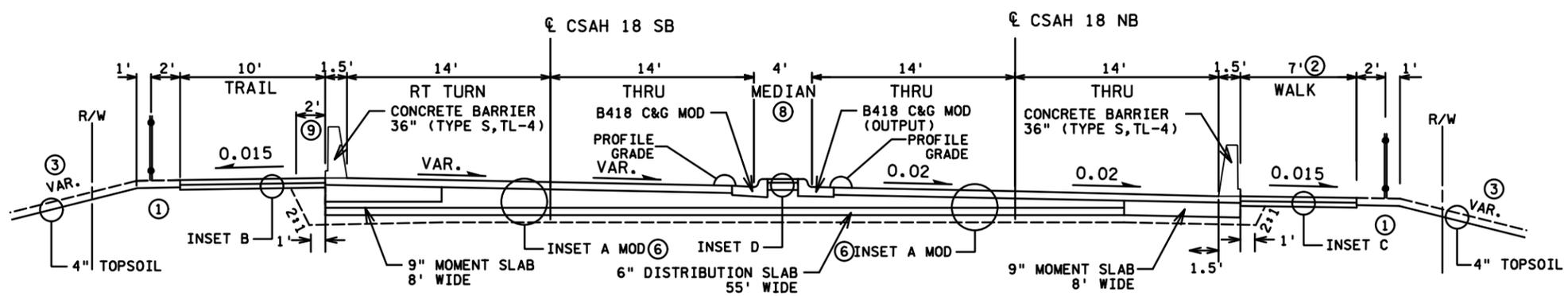
SPECIFIC NOTES

- ① BACKFILL WITH SUITABLE GRADING MATERIAL.
- ② PAVE 9' WALK WIDTH TO FENCE FROM STA. 121+63.29 TO 122+62.24
- ③ SEE CROSS SECTIONS.
- ④ BARRIER BEGINS AT STA. 122+59.51
- ⑤ WALK WIDTH
10' FROM STA. 123+59.32 TO 123+65.18
10' TO 8' FROM STA. 123+65.18 TO 123+77.73
- ⑥ INSET A MOD FOR MODIFIED PAVEMENT SECTION OVER THE BOX CULVERTS.
- ⑦ LOCATED OVER THE BOX CULVERTS. PAVEMENT SECTION INSET A MOD IS SKEWED ALONG THE BOX CULVERT. SEE BRIDGE PLAN FOR DISTRIBUTION AND MOMENT SLAB DETAILS.
- ⑧ SEE DETAIL "E" ON SHEET 14 .
- ⑨ 2' CLEAR ZONE FROM EDGE OF BARRIER.



CSAH 18 (COON CREEK BLVD)

OVER BOX CULVERTS ⑦
CSAH 18 NB STA. 122+01.39 TO 122+90.28
CSAH 18 SB STA. 22+48.56 TO 23+35.65



CSAH18-ts03.dgn
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NO	DATE	BY	CKD	APPR	REVISION

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

NAME: JACOB C. NICHOLS LIC. NO. 60631

CERTIFIED BY: Jacob Nichols 3/3/2023
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
DESIGNED BY: JCN
CHECKED BY: GEB



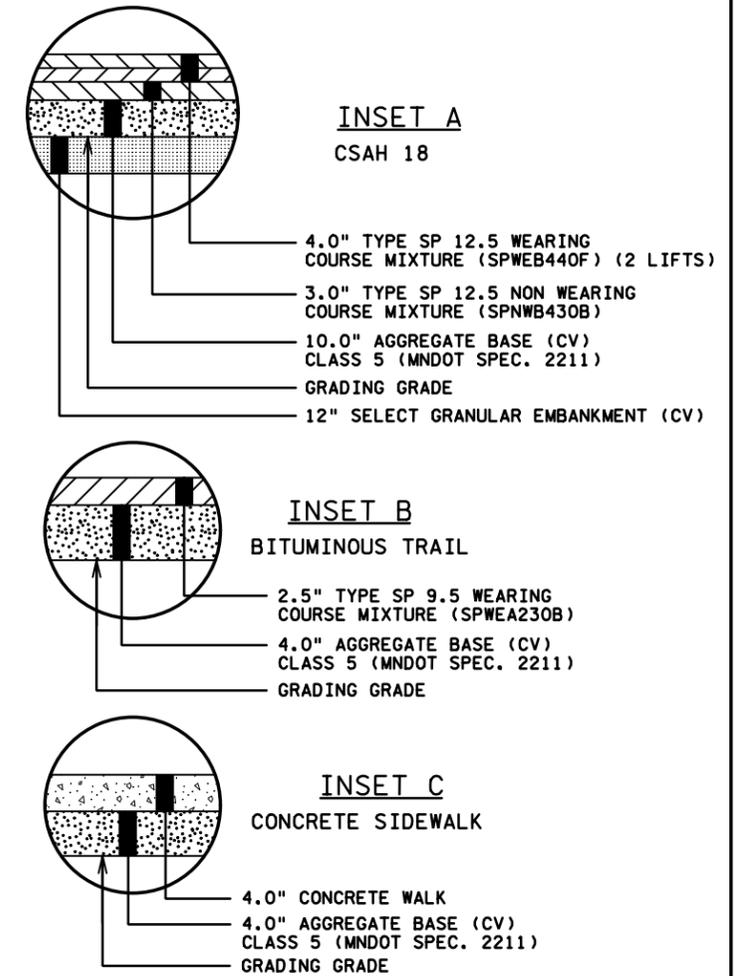
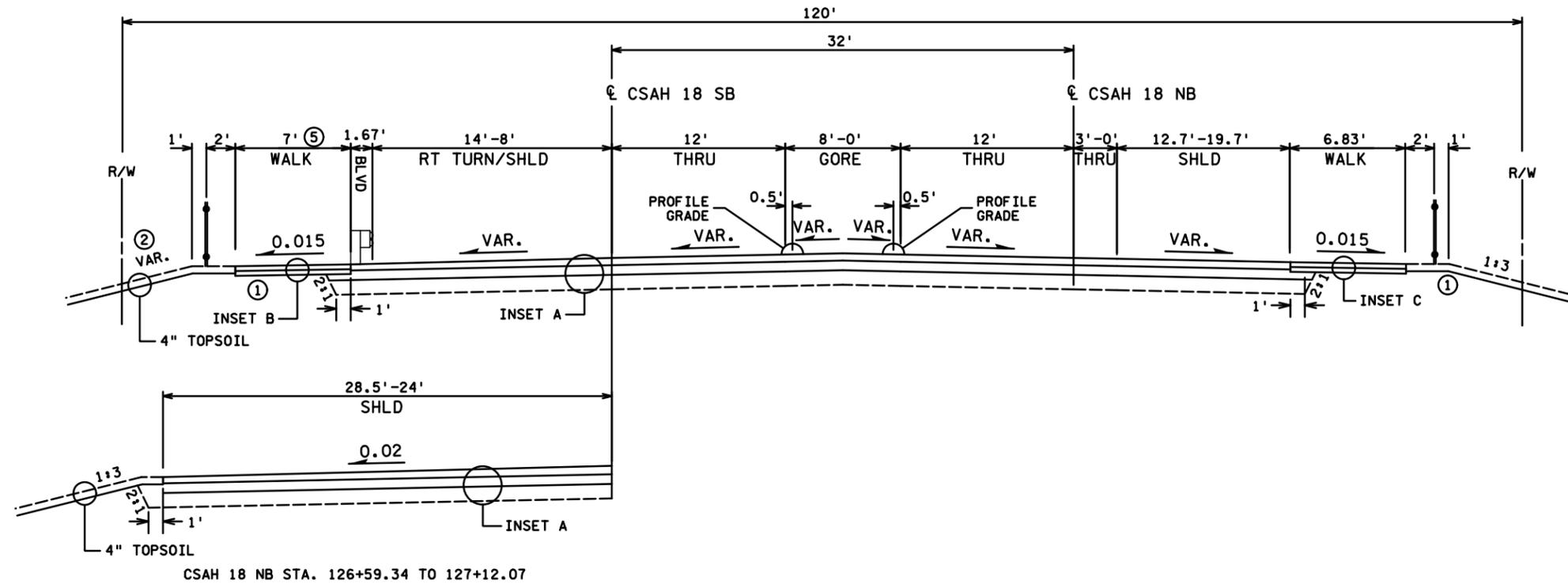
TYPICAL SECTIONS

SHEET NO. 13 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

CSAH 18 (COON CREEK BLVD)

CSAH 18 NB STA. 124+40.72 TO 127+12.07 ③

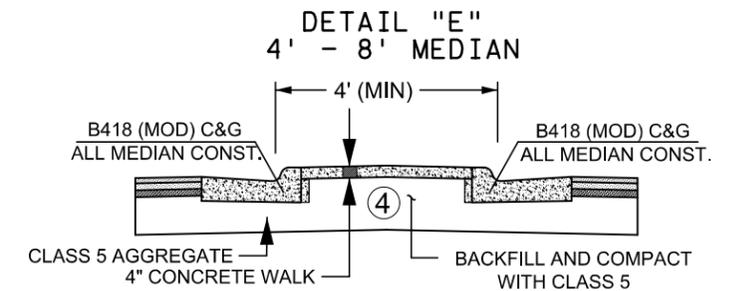


GENERAL NOTES

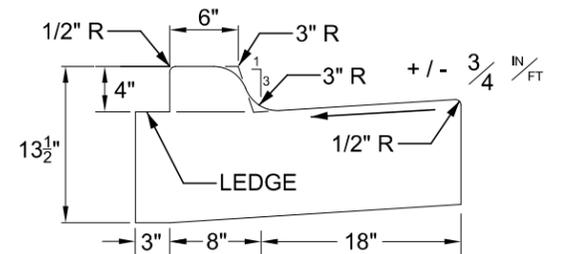
- ALL CROSS SLOPES ARE IN FT. PER FT.
- UNLESS OTHERWISE SPECIFIED, GRADING GRADE SLOPES WILL BE THE SAME AS THE PROPOSED DRIVING SURFACE.
- SEE SUPERELEVATION PLANS FOR CROSS SLOPES.
- SOUTHBOUND PROFILE GRADE IS 12' RIGHT OF ALIGNMENT CENTERLINE.
- NORTHBOUND PROFILE GRADE IS 12' LEFT OF ALIGNMENT CENTERLINE.
- SEE CONSTRUCTION PLAN SHEETS FOR CONCRETE WALK AND BITUMINOUS TRAIL LOCATIONS.
- AGGREGATE BASE CLASS 5 SHALL BE EXTENDED 6" ON EACH EDGE OF WALK AND TRAIL WIDTH.
- MINIMUM CLEARANCE OF 1.5' MUST BE PROVIDED FROM THE FACE OF CURB TO FIXED OBJECTS.

SPECIFIC NOTES

- ① BACKFILL WITH SUITABLE GRADING MATERIAL.
- ② SEE CROSS SECTIONS.
- ③ TRANSITION SECTION. SEE CONSTRUCTION PLAN.
- ④ SUBGRADE EXCAVATION, SELECT GRANULAR BORROW, AND AGGREGATE BASE TO BE CARRIED THROUGH ENTIRE WIDTH OF MEDIAN WHEN MEDIAN WIDTH IS LESS THAN 8.0' MEASURED FROM FACE OF CURB TO FACE OF CURB.
- ⑤ WALK WIDTH
8' TO 7' FROM STA. 124+40.72 TO 124+50.84
7' FROM STA. 124+50.84 TO 126+59.34



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



PROPOSED CSAH 18

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NO	DATE	BY	CKD	APPR	REVISION

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

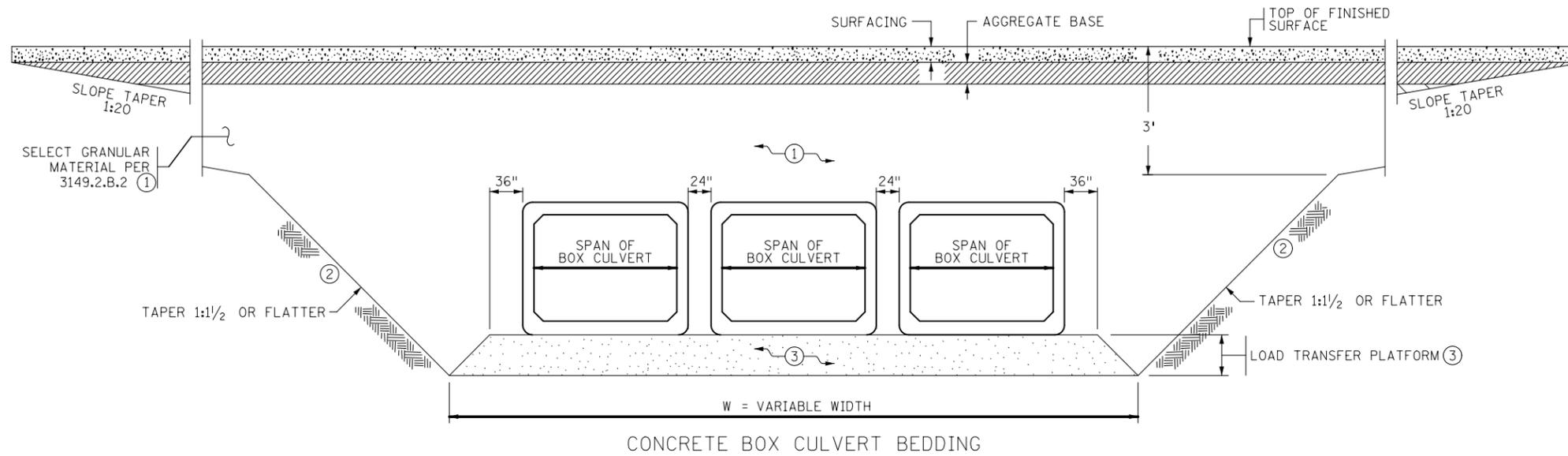
NAME: JACOB C. NICHOLS LIC. NO. 60631

CERTIFIED BY: Jacob Nichols 3/3/2023
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
DESIGNED BY: JCN
CHECKED BY: GEB



TYPICAL SECTIONS
SHEET NO. 14 OF 59 SHEETS
S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059



NOTES

EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.
ALL SLOPES SHOWN AS (V) : (H)

- ① MAXIMUM EMBANKMENT PARTICLE SIZE WITHIN 2 FT. OF CULVERT IS 3" PER SPEC. TABLE 2106-4.
- ② OVER EXCAVATION BENEATH TAPERS IS NOT PERMITTED UNLESS REQUIRED BY OSHA. (TYP.)
- ③ 3.5' THICK PILE-SUPPORTED LOAD TRANSFER PLATFORM. SEE BRIDGE PLANS FOR MATERIAL AND CONSTRUCTION REQUIREMENTS FOR LOAD TRANSFER PLATFORM.

BOX CULVERT BEDDING

MISCELLANEOUS DETAILS

SHEET NO. 15 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

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NO	DATE	BY	CKD	APPR	REVISION

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

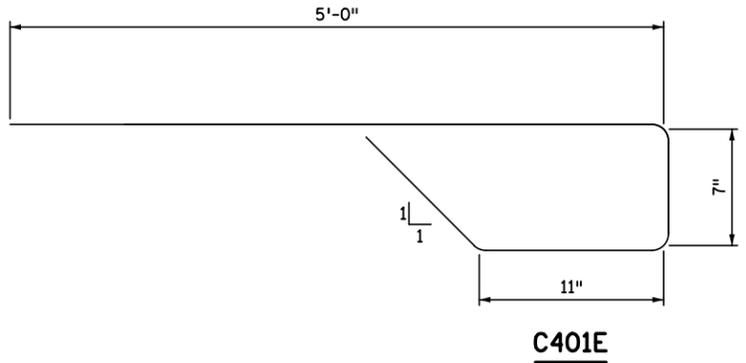
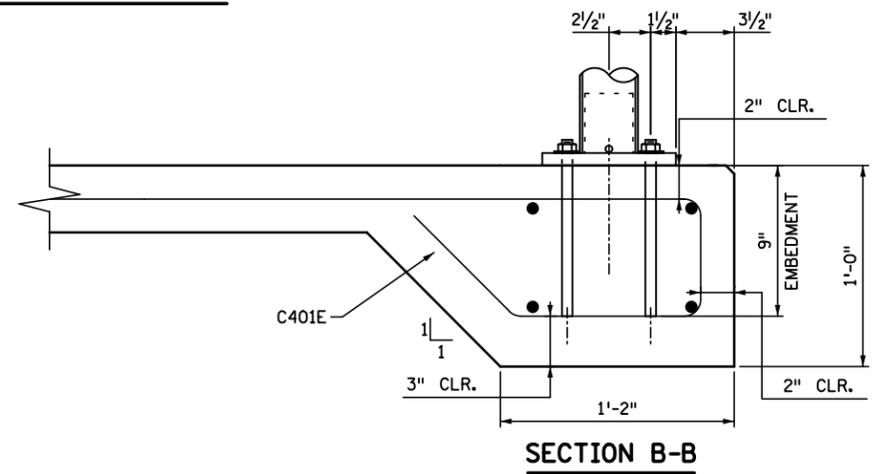
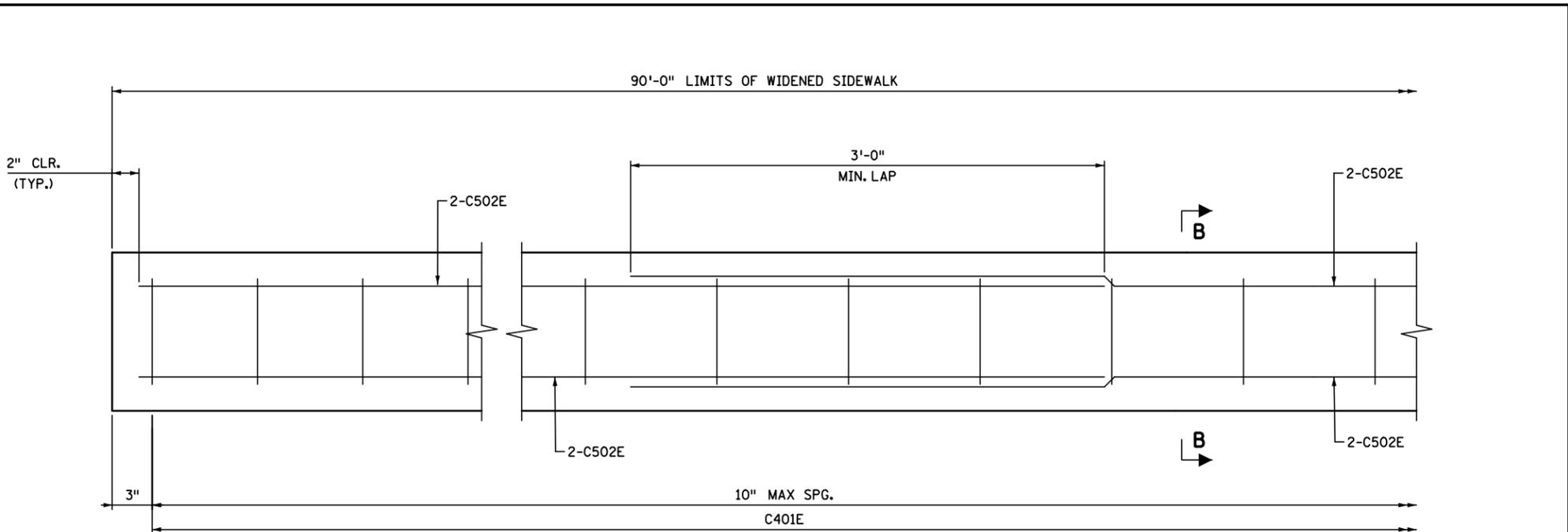
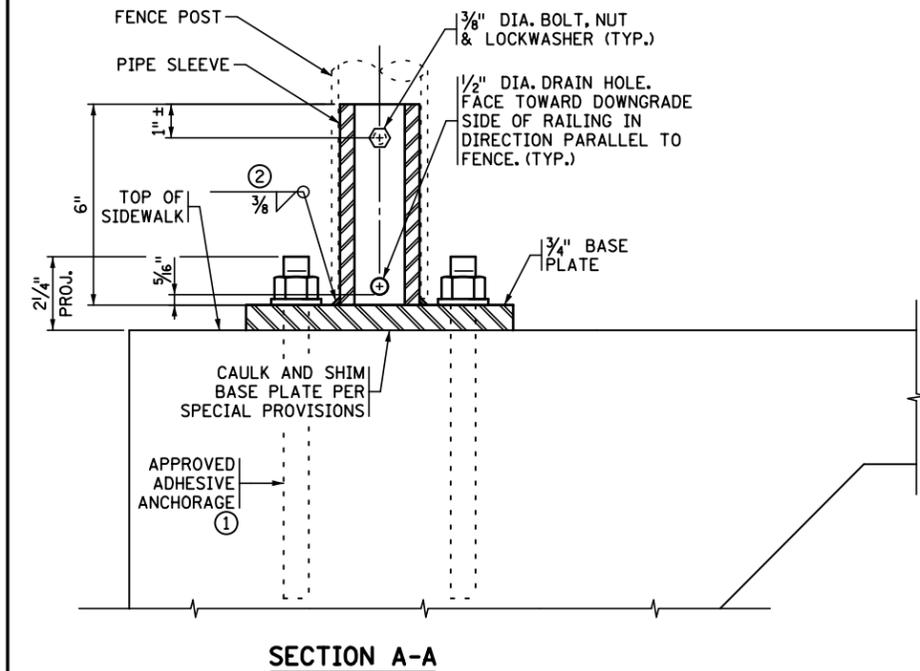
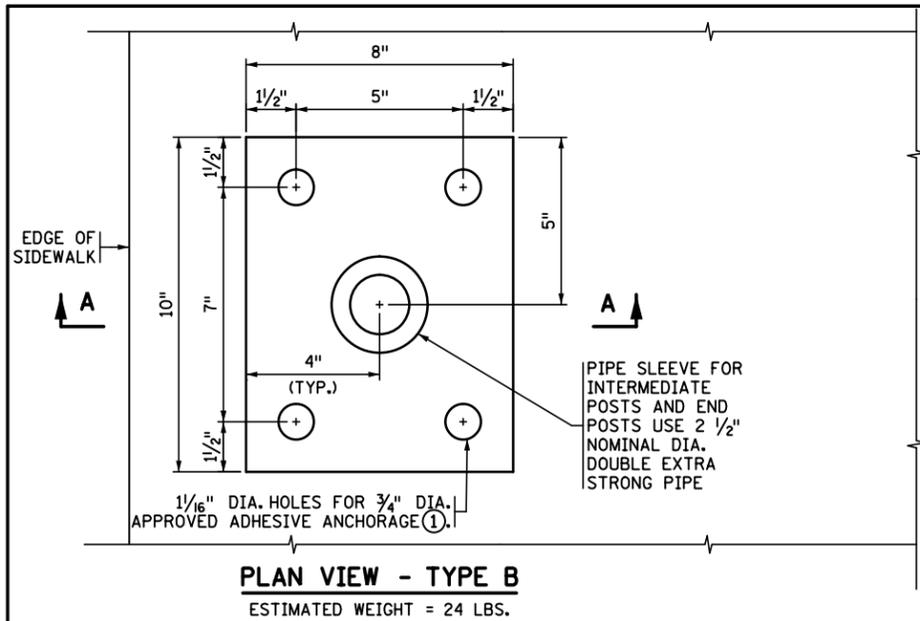
NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: *GEB* 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB



Project information and sheet identification, including the project name 'S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059' and sheet number 'SHEET NO. 15 OF 59 SHEETS'.



BILL OF REINFORCEMENT FOR WIDENED SIDEWALK				
BAR	NO.	LENGTH	SHAPE	LOCATION
C401E	109	7'-3"		SIDEWALK EDGE TRANS.
C502E	12	31'-11"		SIDEWALK EDGE LONGIT.

NOTES:

ALL PIPE DIAMETERS ARE NOMINAL.

SEE SPECIAL PROVISIONS FOR REQUIREMENTS NOT INCLUDED ON THIS SHEET.

STRUCTURAL STEEL IN ACCORDANCE WITH SPEC. 3306

STRUCTURAL PIPE IN ACCORDANCE WITH SPEC. 3362

GALVANIZE THE FENCE POST ANCHORAGE AFTER FABRICATION IN ACCORDANCE WITH SPEC. 3394. GALVANIZE THE FASTENERS IN ACCORDANCE WITH SPEC. 3392.

FURNISHING AND INSTALLING FENCE POST ANCHORAGES IS INCIDENTAL TO THE WIRE FENCE.

- ① ADHESIVE ANCHORAGE WITH 3/4" DIA. ANCHOR ROD IN ACCORDANCE WITH SPEC. 3385, TYPE A WITH HEX NUT AND WASHER. PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHORAGE NO LESS THAN 9" 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 12.7 KIPS. REFER TO THE APPROVED/QUALIFIED PRODUCTS LIST AND THE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
 - ② E70X ELECTRODES FOR 3/8" POST TO BASE PLATE WELD.
- DOUBLE EXTRA STRONG PIPE WEIGHTS;
2 1/2" NOMINAL DIA. = 13.69 LBS./FT.
- THICKENED CONCRETE AND REINFORCING AT SIDEWALK EDGE ARE INCIDENTAL TO 4" CONCRETE WALK.

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

NAME: TODD A. LANG LIC. NO. 42962

CERTIFIED BY: DATE 3/3/2023

LICENSED PROFESSIONAL ENGINEER

DRAWN BY: JCN

DESIGNED BY: JCN

CHECKED BY: GEB



FENCE POST ANCHOR

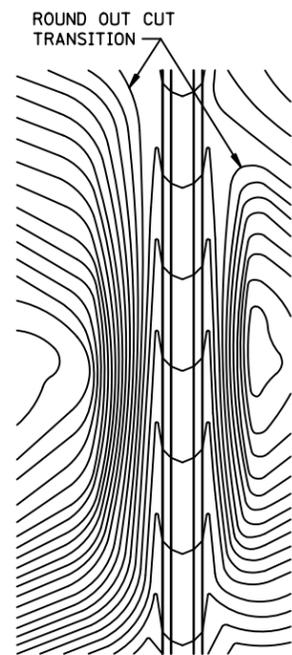
MISCELLANEOUS DETAILS

SHEET NO. 16 OF 59 SHEETS

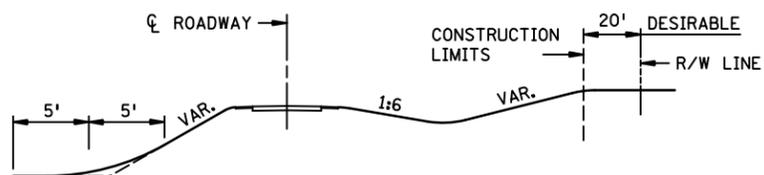
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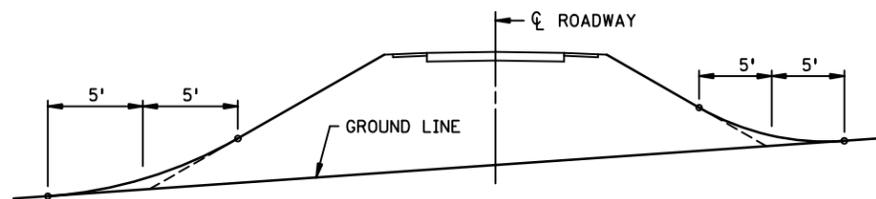
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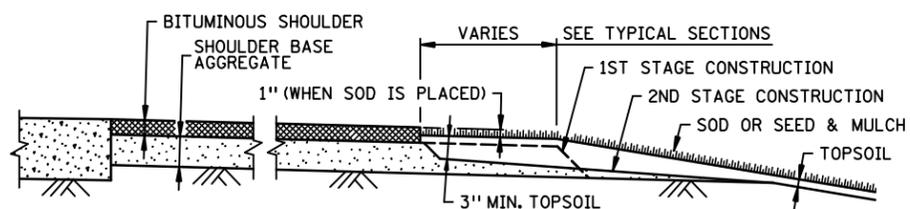
CONTOURING ROAD CUTS



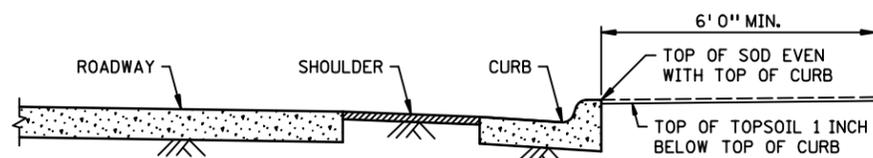
ROUNDING SHOULDERS AND BACKSLOPES



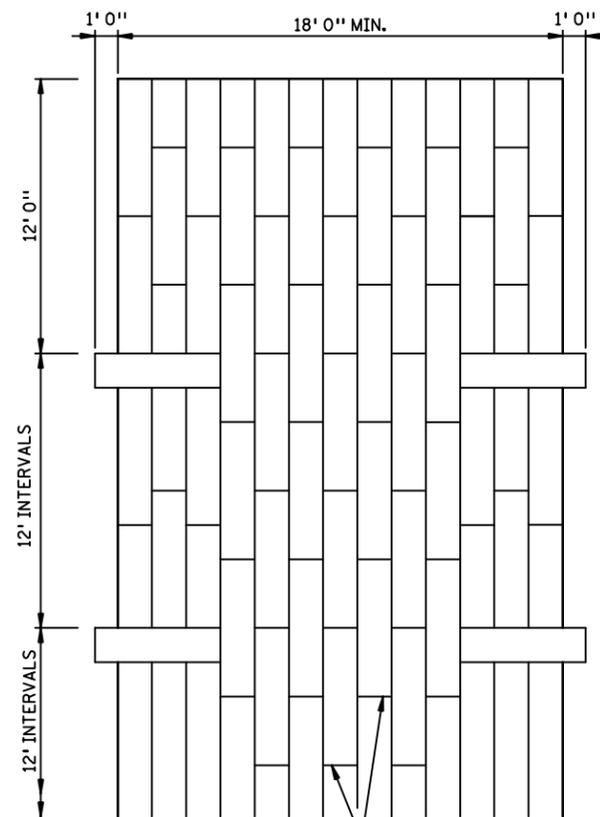
SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES



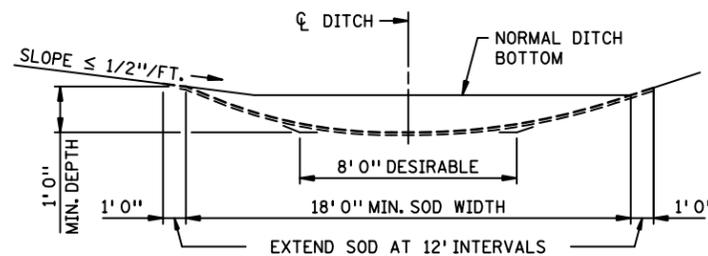
SHAPING AND TOPSOILING INSLOPES



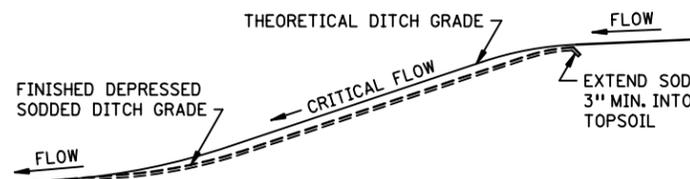
SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED



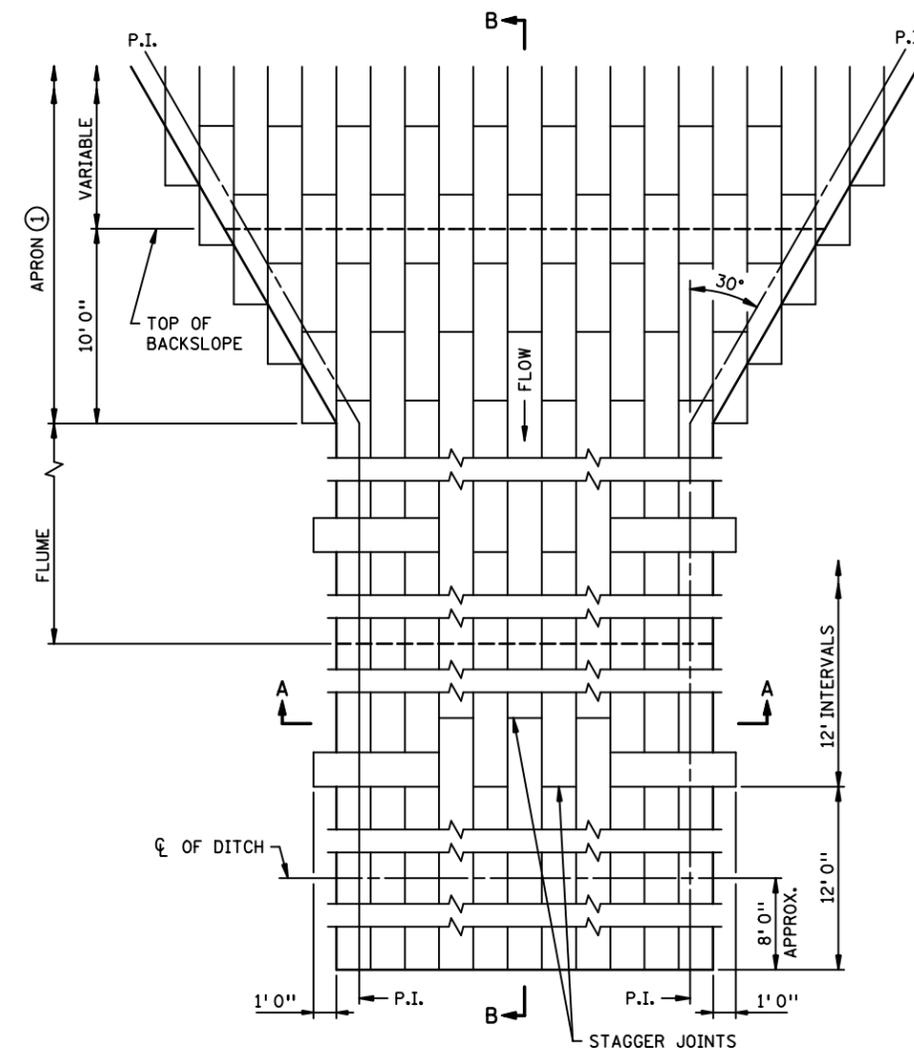
STAGGER JOINTS
PLAN VIEW



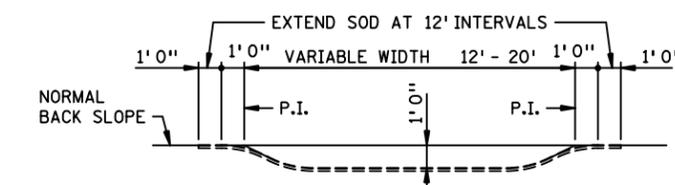
SODDED DITCH CROSS SECTION
WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.), FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.



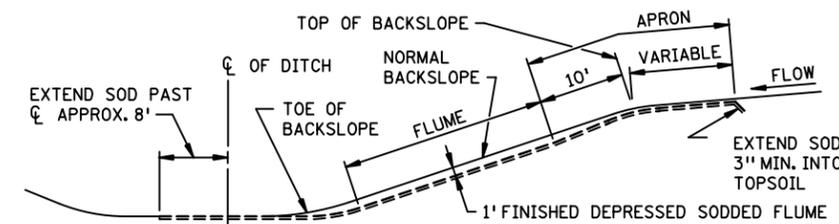
DITCH PROFILE
SODDED DITCH DETAILS



PLAN VIEW



SECTION A-A



SECTION B-B

SODDED FLUME DETAILS

NOTES:
SEE SPEC. 2575.3 FOR ADDITIONAL INFORMATION.
① CONSTRUCT TAPER AS DIRECTED BY THE ENGINEER.



STANDARD PLAN 5-297.404 1 OF 3

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

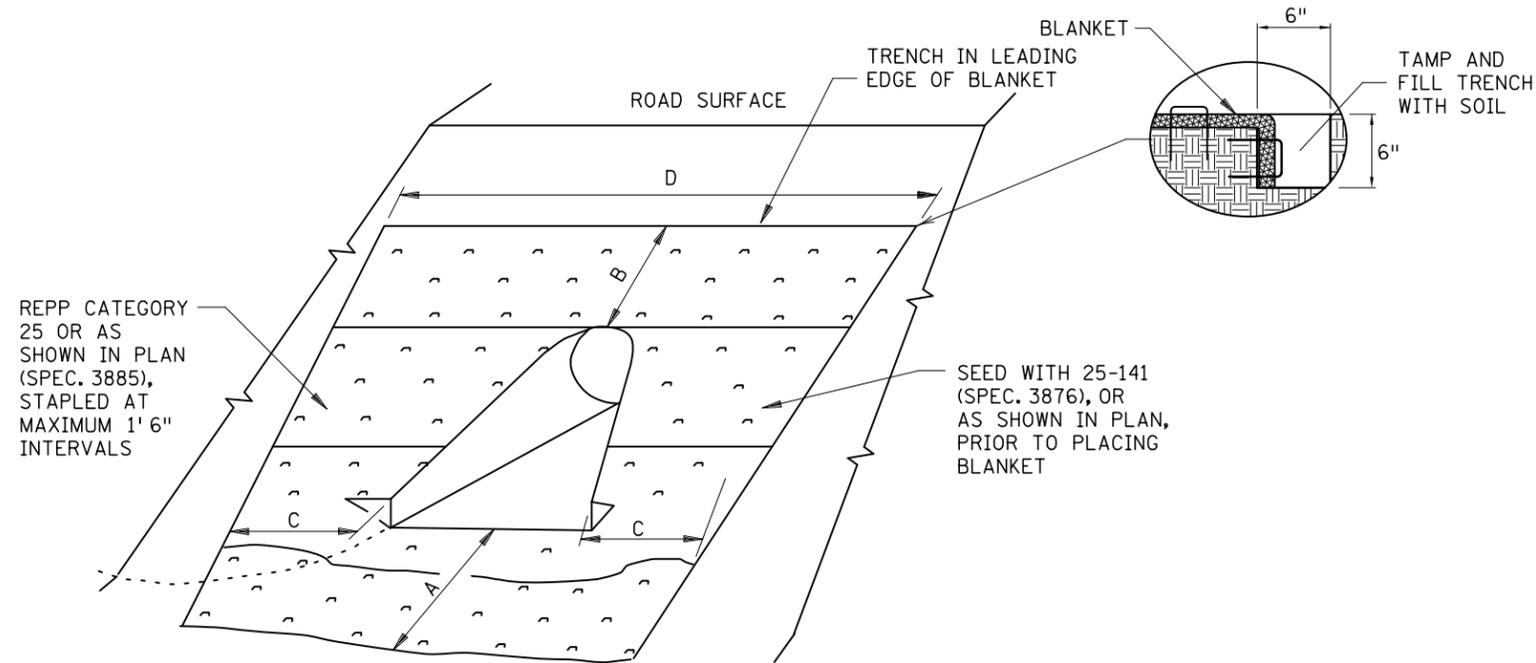
APPROVED: 2-28-2017
REVISOR:

PERMANENT EROSION CONTROL
ALONG ROADWAYS, DITCHES AND FLUMES

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059 SHEET NO. 17 OF 59 SHEETS

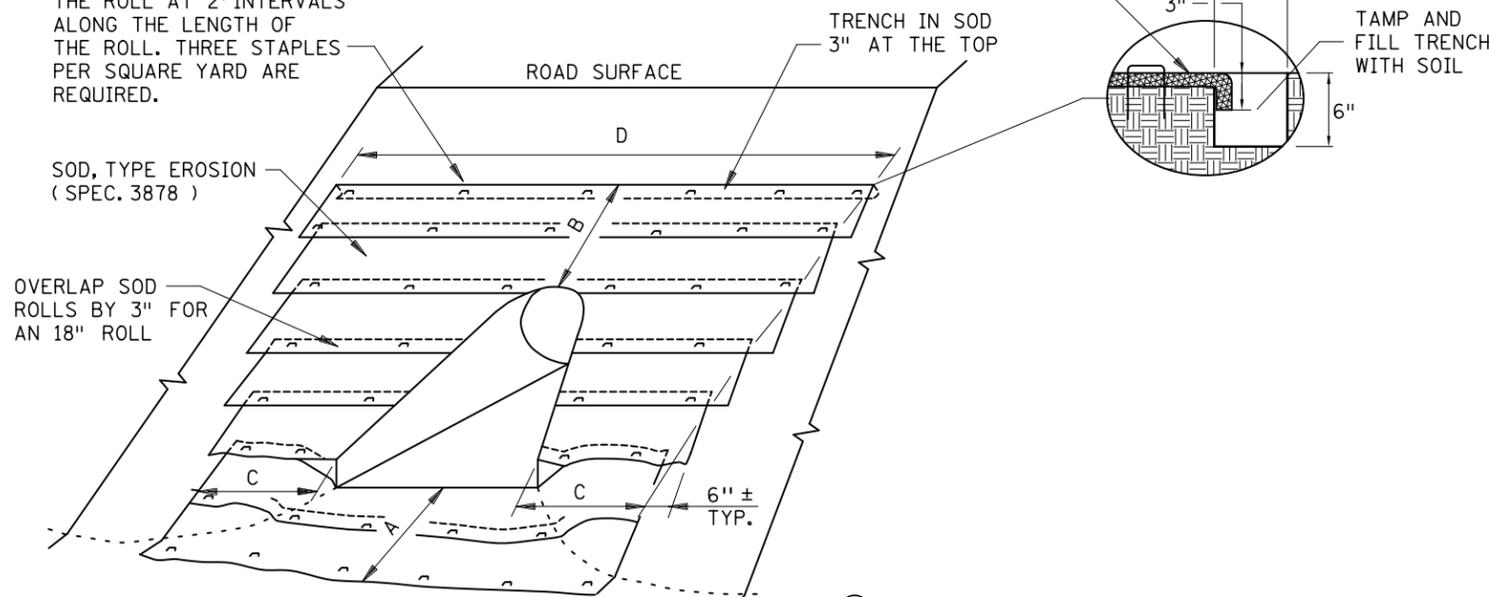
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REVISION:
APPROVED: 2-28-2017
CHIEF ENVIRONMENTAL OFFICER



ROLLED EROSION PREVENTION PRODUCT (BLANKET) & SEED DETAIL

SOD SHALL BE STAPLED ON THE UPHILL SIDE OF THE ROLL AT 2' INTERVALS ALONG THE LENGTH OF THE ROLL. THREE STAPLES PER SQUARE YARD ARE REQUIRED.



SODDING DETAIL

- ① ADDITIONAL QUANTITIES MAY BE SHOWN IN THE PLAN OR REQUIRED BY THE ENGINEER.
- ② FOR ARCH PIPE USE CLOSEST CIRCULAR PIPE DIAMETER AND APRON SLOPE. DIAMETERS LARGER THAN 72" REQUIRE SPECIAL DESIGNS.

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

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

NOTES:

REPP = ROLLED EROSION PREVENTION PRODUCT.

AREA SHOWN IN SQUARE YARDS IS FOR ONE CULVERT END.

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

FOR PIPE ARCHES USE EQUIVALENT PIPE DIAMETER TO APPROXIMATE AREA.

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

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

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

DISTRICT # 1
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REVISION:

APPROVED: JANUARY 8, 2020

Marni Karnowski
MARNI KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER



STANDARD PLAN 5-297.404

2 OF 3

Tom Styrbicki
THOMAS STYRBICKI
STATE DESIGN ENGINEER

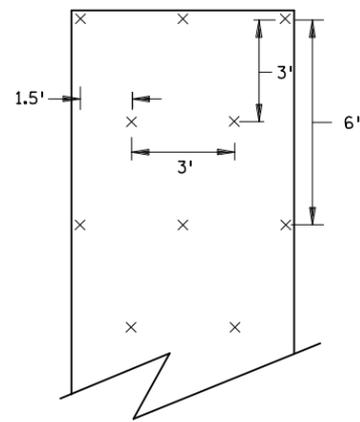
APPROVED: 1-8-2020
REVISED:

PERMANENT EROSION CONTROL

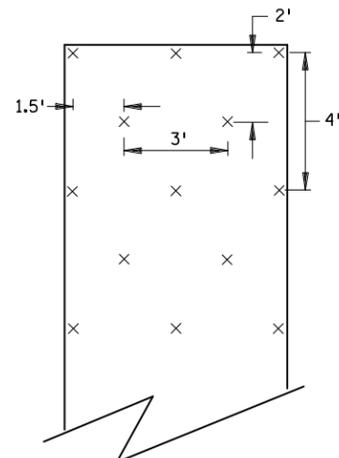
TURF ESTABLISHMENT DETAIL AT CULVERT ENDS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

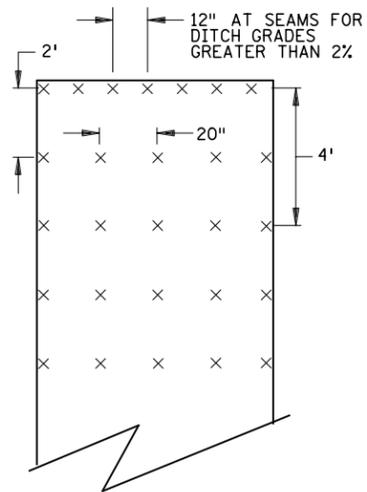
SHEET NO. 18 OF 59 SHEETS



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

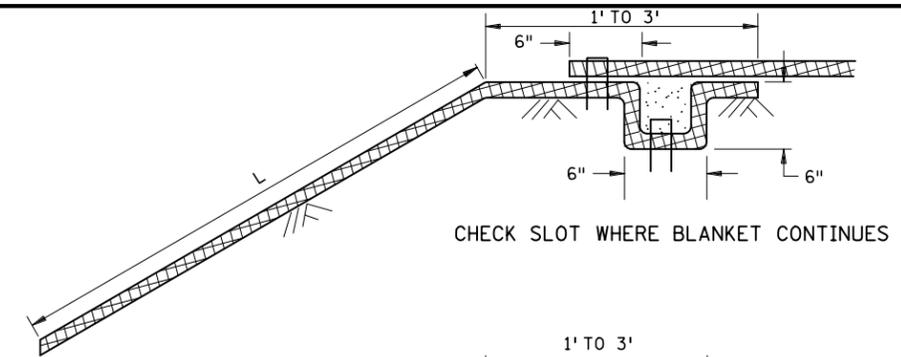


SLOPES 1:2 TO 1:1
170 STAPLES PER 100 SQ YD

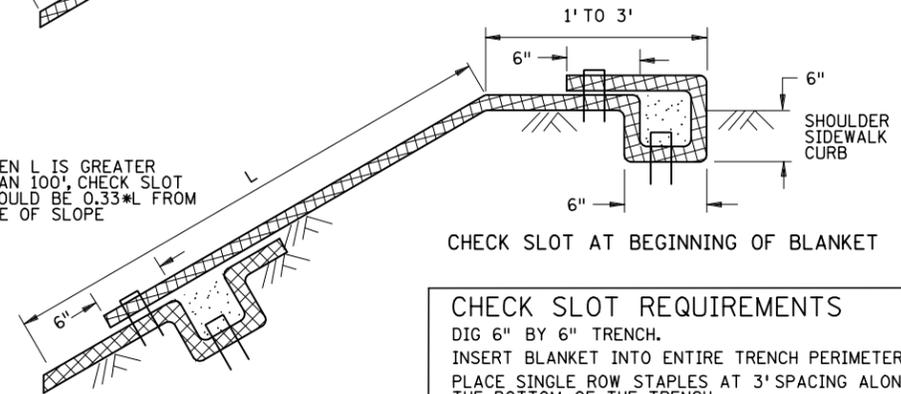


CHANNEL AND DITCH APPLICATIONS
350 STAPLES PER 100 SQ YD

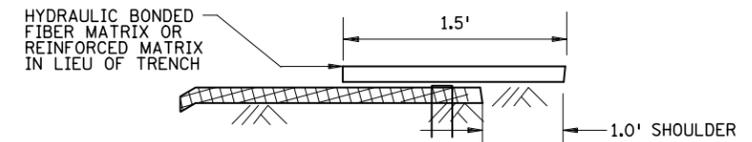
BLANKET STAPLE PATTERN



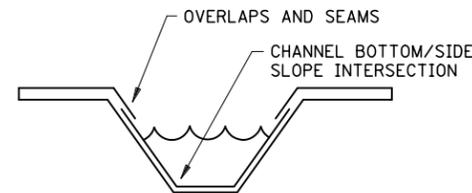
WHEN L IS GREATER THAN 100', CHECK SLOT SHOULD BE 0.33*L FROM TOE OF SLOPE



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



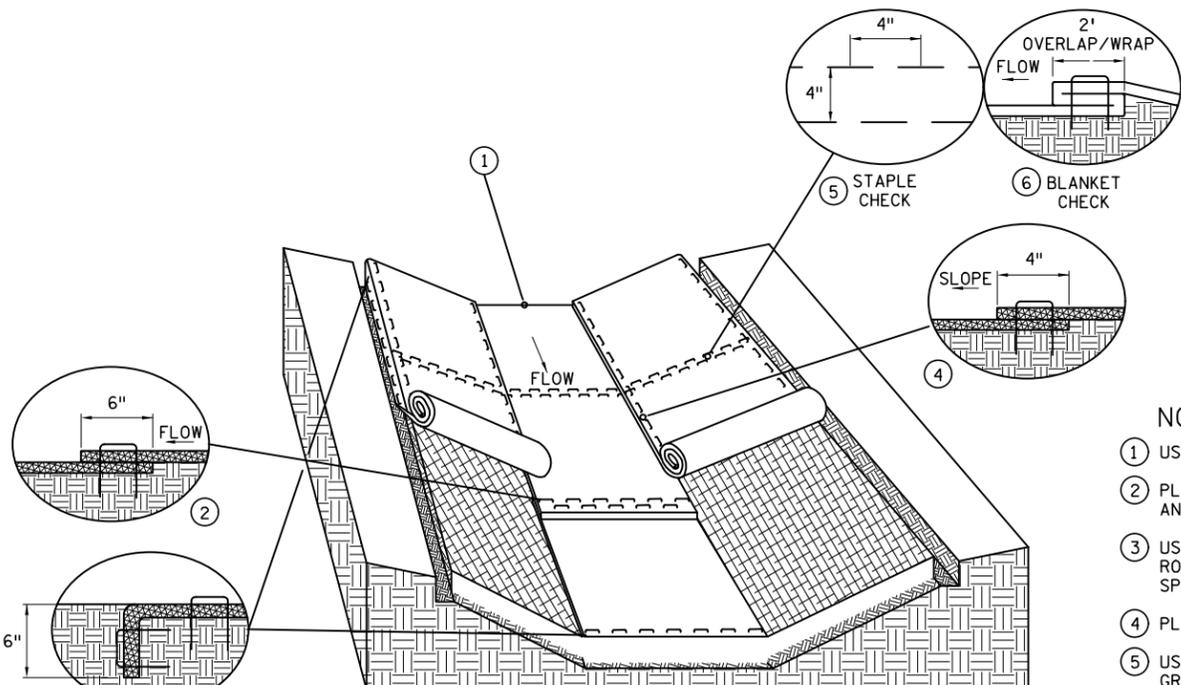
CHECK SLOT ALTERNATIVE
PLACE SINGLE ROW STAPLES AT 12" SPACING
CHECK SLOT DETAILS



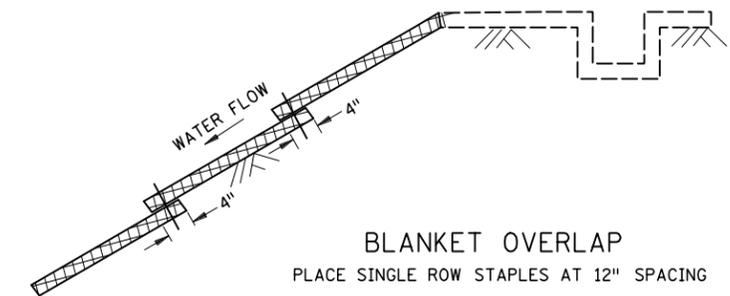
DITCH BLANKET CRITICAL POINTS ⑦

NOTES:

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



DITCH BLANKET STAPLE DETAIL



BLANKET OVERLAP
PLACE SINGLE ROW STAPLES AT 12" SPACING

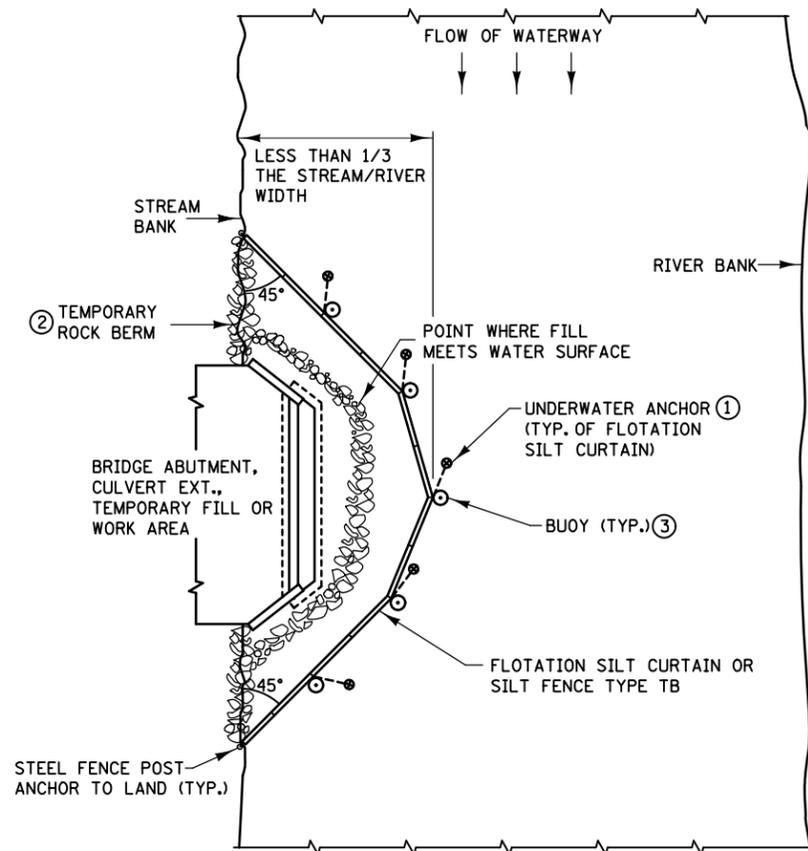
GENERAL BLANKET INSTALLATION REQUIREMENTS
REPP = ROLLED EROSION PREVENTION PRODUCT.
PREPARE SOIL AS PER SPECIFICATION 2574.
LAY PARALLEL OR PERPENDICULAR TO THE DIRECTION OF WATER FLOW.
OVERLAP ADJACENT STRIP EDGES A MINIMUM OF 4".
OVERLAP BLANKET 6" (MINIMUM) AT EACH END. OVERLAP BOTTOM END OF UPPER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

REVISION:
APPROVED: JANUARY 8, 2020
Marni Karnowski
MARNI KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER

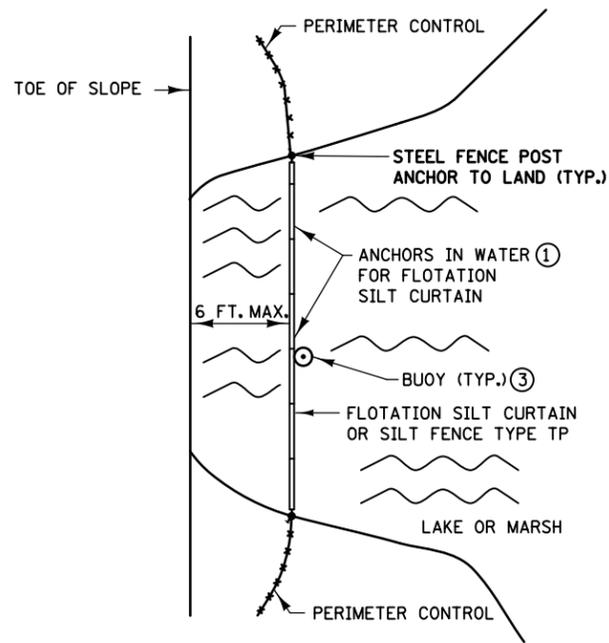
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DEPARTMENT OF TRANSPORTATION
STANDARD PLAN 5-297.404
3 OF 3
APPROVED: 1-8-2020
REVISED:
Tom Styrbicki
THOMAS STYRBICKI
STATE DESIGN ENGINEER

PERMANENT EROSION CONTROL
REPP (BLANKET) STAPLE PATTERN FOR SLOPES
S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059
SHEET NO. 19 OF 59 SHEETS

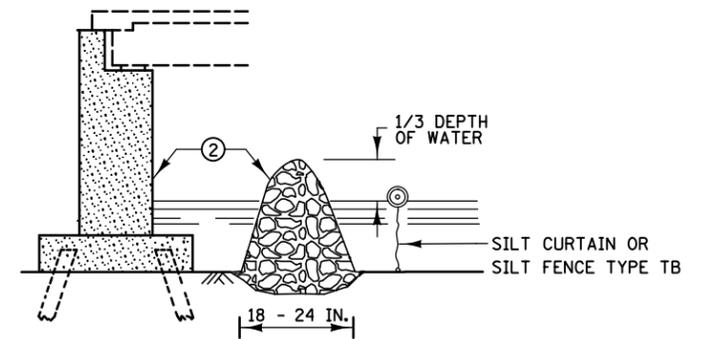
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PLAN VIEW FOR STREAM ⑤



PLAN VIEW FOR LAKE OR MARSH ⑤



TEMPORARY ROCK BERM FOR SEDIMENT CONTROL

INSTALLATION GUIDELINES SILT FENCE TYPE TB

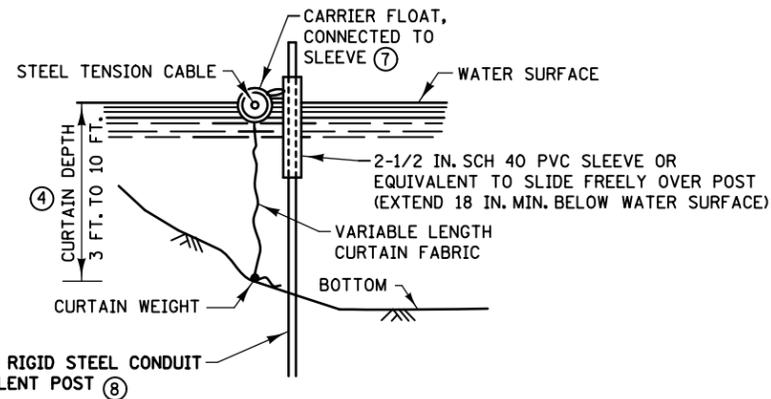
MINIMUM WATER DEPTH: 1 FT.
MAXIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.

INSTALLATION GUIDELINES FLOTATION SILT CURTAIN TYPE: STILL WATER

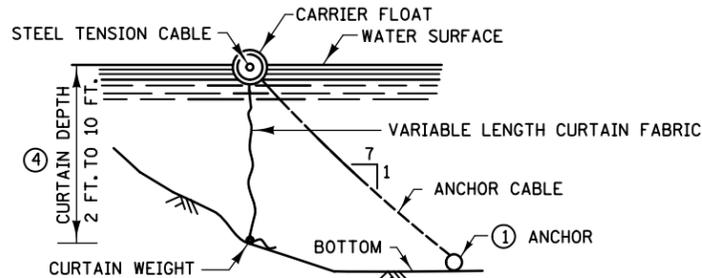
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 2 FT./SEC.
MAXIMUM WAVE HEIGHT: 1 FT

INSTALLATION GUIDELINES FLOTATION SILT CURTAIN TYPE: MOVING WATER

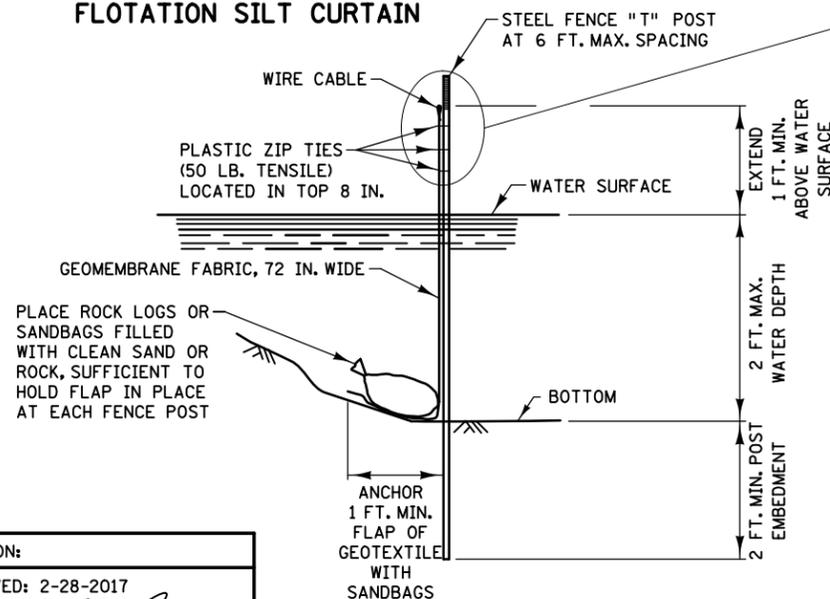
MINIMUM WATER DEPTH: 3 FT.
MAXIMUM WATER DEPTH: 10 FT.
MAXIMUM WATER VELOCITY: 5 FT./SEC.
MAXIMUM WAVE HEIGHT: 2 FT.



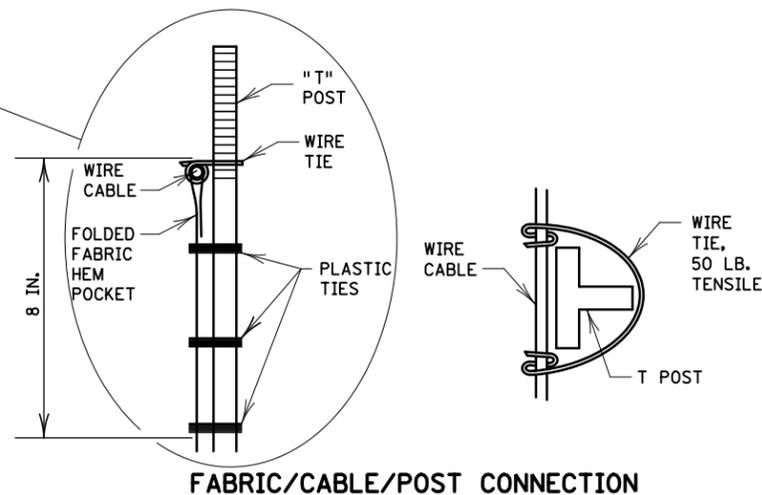
ALTERNATE FLOTATION SILT CURTAIN



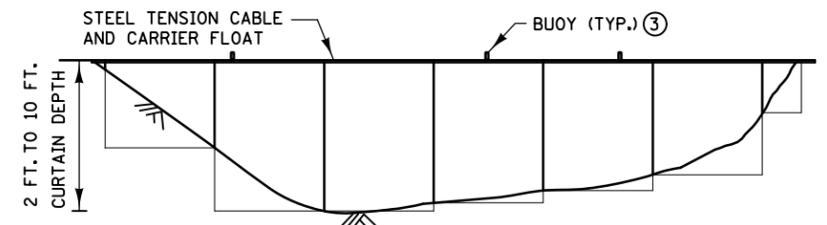
FLOTATION SILT CURTAIN



SILT FENCE TYPE TB ⑥



FABRIC/CABLE/POST CONNECTION



FRONT VIEW FOR FLOTATION SILT CURTAIN

NOTES:

- SEE SPECS. 2573, 3886, 3887 & 3893.
- ① FOR ANCHOR SPACING AND WEIGHT REQUIREMENTS, SEE SPEC. 2573.
- ② IN AREAS WHERE THE PLAN CALLS FOR RIPRAP AT A BRIDGE, CULVERT, OR SLOPE, A TEMPORARY ROCK BERM CONSTRUCTED FROM THE RIPRAP CAN BE USED TO PROVIDE ADDITIONAL PROTECTION. WHEN THE WORK IS COMPLETE THE RIPRAP CAN THEN BE MOVED TO THE PERMANENT LOCATION INDICATED IN THE PLANS. THE TEMPORARY ROCK BERM IS INCIDENTAL.
- ③ ON U.S. COAST GUARD OR OTHER MOTORIZED WATERWAYS, BUOYS ARE REQUIRED TO MARK THE ENDS AND SPECIAL AREAS FOR VISIBILITY. PLACE BUOYS AS REQUIRED FOR NAVIGATIONAL PURPOSES.
- ④ MINIMUM WATER DEPTH APPLIES TO THE DEEPEST POINT ALONG THE FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB FOR DETERMINING APPLICABILITY OF FLOTATION SILT CURTAIN OR SILT FENCE TYPE TB.
- ⑤ SILT CURTAIN SHOULD BE REMOVED WHEN THE AREA CONTRIBUTING DIRECT RUNOFF HAS BEEN TEMPORARILY OR PERMANENTLY STABILIZED. SILT CURTAIN SHOULD ALSO BE REMOVED BEFORE WINTER IF ICE UP OR ICE FLOW IS ANTICIPATED.
- ⑥ EMBED POST INTO BOTTOM A MINIMUM OF 40% OF THE WATER DEPTH (INCLUDING WAVE HEIGHT), BUT IN NO CASE SHALL EMBEDMENT BE LESS THAN 2 FEET.
- ⑦ ANCHOR FLOAT MUST BE CONNECTED SECURELY TO SLEEVE WITH A MINIMUM TENSILE STRENGTH OF 100 LBS. CONNECTION METHOD MUST ALLOW FOR SLEEVE TO MOVE FREELY ON POST.
- ⑧ PROVIDE SUFFICIENT NUMBER OF POST ANCHORS TO MAINTAIN SILT CURTAIN POSITION.

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REVISIONS:
APPROVED: 2-28-2017

CHIEF ENVIRONMENTAL OFFICER

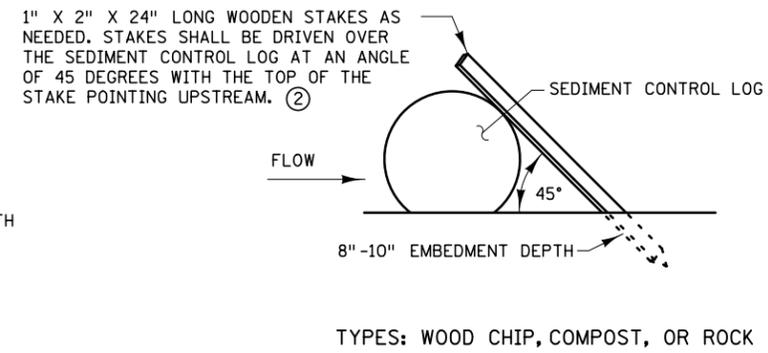
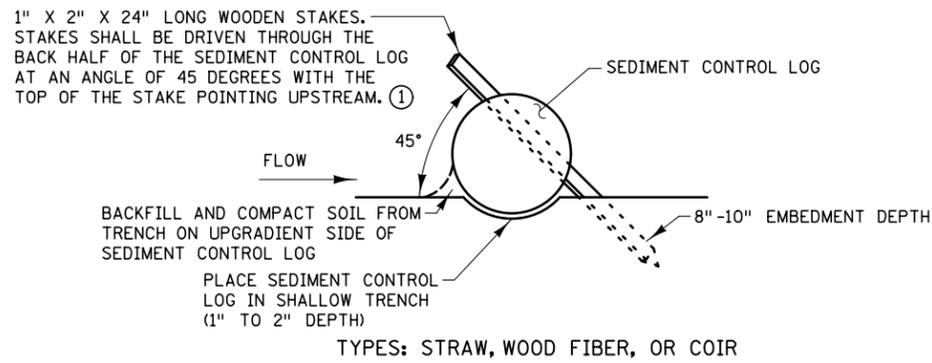


STANDARD PLAN 5-297.405 1 OF 8

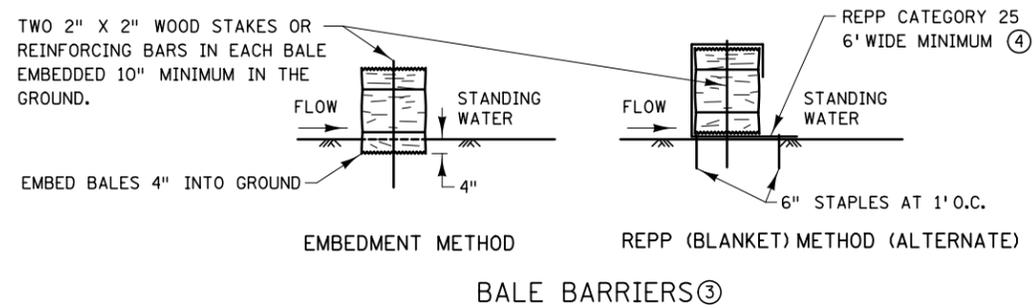
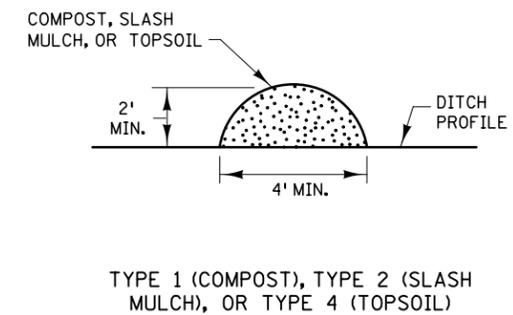
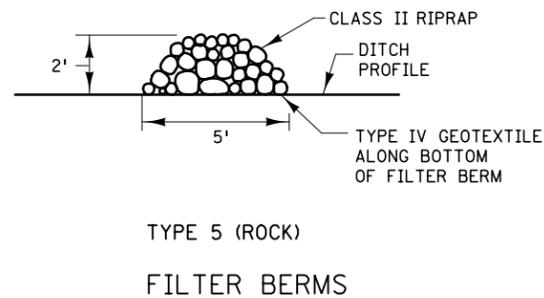
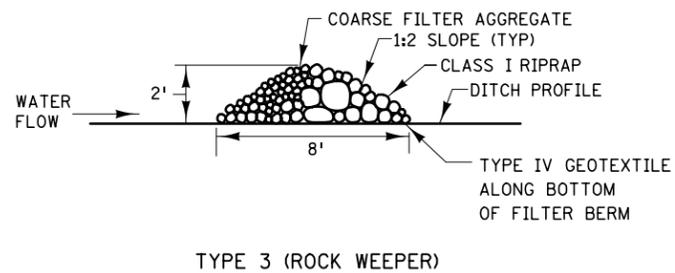
STATE DESIGN ENGINEER

APPROVED: 2-28-2017
REVISED:

TEMPORARY SEDIMENT CONTROL
SILT CURTAIN OR SILT FENCE TYPE TB



SEDIMENT CONTROL LOGS



NOTES:

REPP = ROLLED EROSION PREVENTION PRODUCT.

SEE SPECS. 2573, 3149, 3874, 3882, 3885, 3886, AND 3897.

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

REVISION:

APPROVED: JANUARY 8, 2020

Marni Karnowski

MARNI KARNOWSKI
CHIEF ENVIRONMENTAL OFFICER



STANDARD PLAN 5-297.405

2 OF 8

Tom Styrbicki
THOMAS STYRBICKI
STATE DESIGN ENGINEER

APPROVED: 1-8-2020
REVISED:

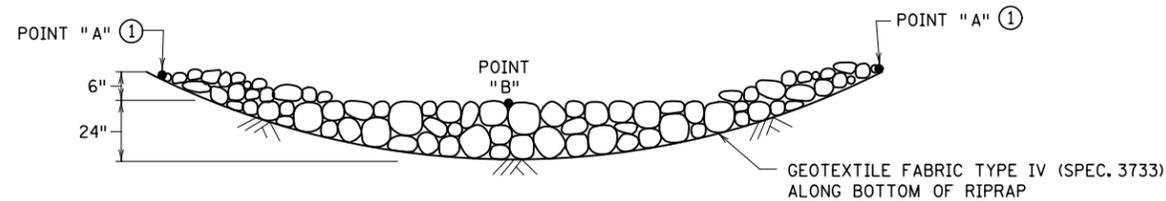
TEMPORARY SEDIMENT CONTROL

FILTER BERMS, SEDIMENT CONTROL LOGS, AND BALE BARRIERS

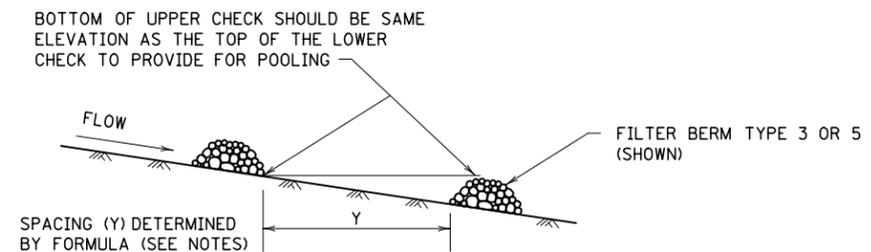
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SHEET NO. 21 OF 59 SHEETS

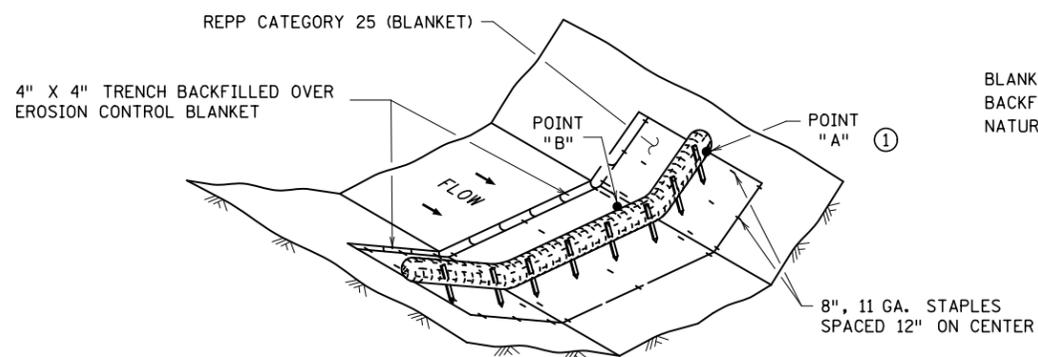
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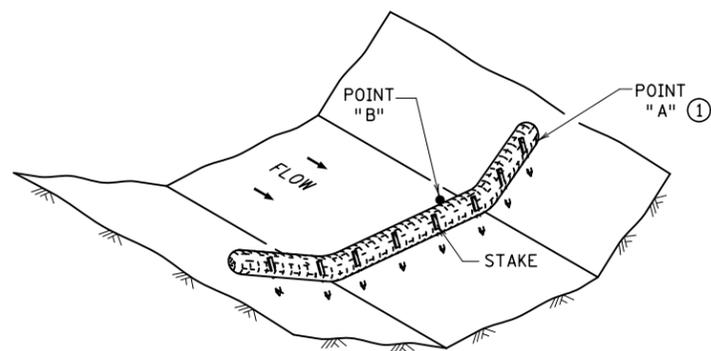
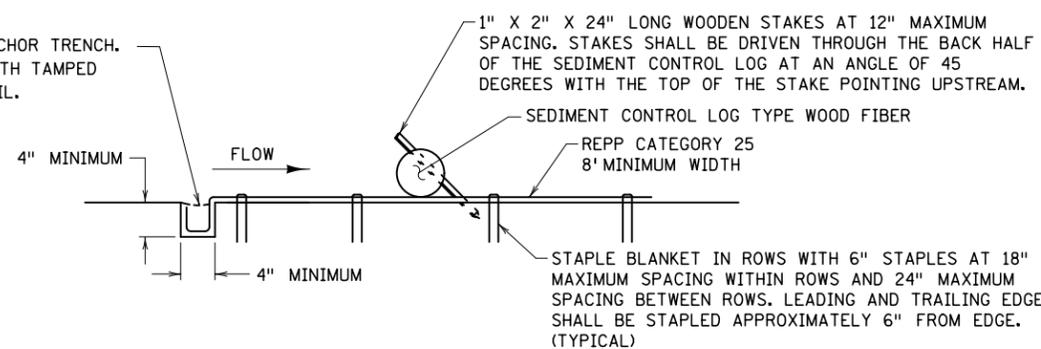
ROCK DITCH CHECKS
 FILTER BERMS TYPE 3 (ROCK WEEPER) OR FILTER TYPE 5 (ROCK) ③
 FOR USE ON ROUGH-GRADED AREAS
 ONLY FOR USE OUTSIDE CLEAR ZONE ②



DITCH CHECK SPACING
 FOR ALL FILTER BERM TYPES



SEDIMENT CONTROL LOG TYPE REPP (BLANKET) SYSTEM ④



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

NOTES:

REPP = ROLLED EROSION PREVENTION PRODUCT.

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

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

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

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

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

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REVISION:
 APPROVED: JANUARY 8, 2020

 MARNI KARNOWSKI
 CHIEF ENVIRONMENTAL OFFICER

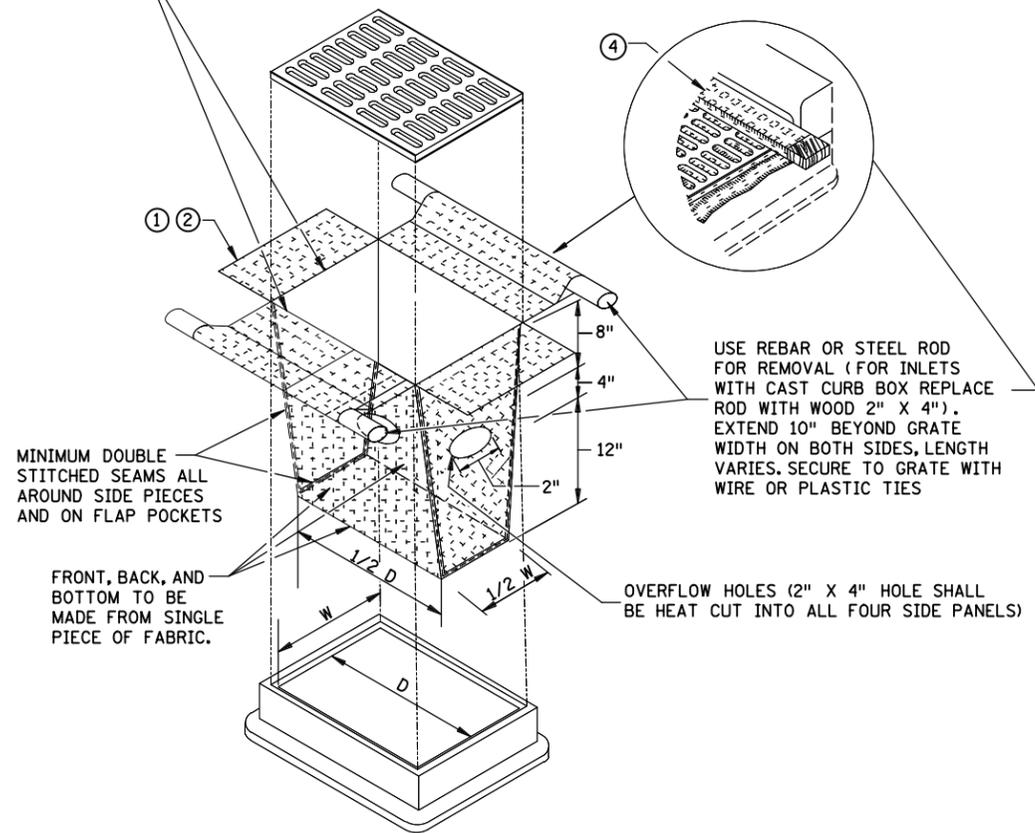
DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.405 3 OF 8

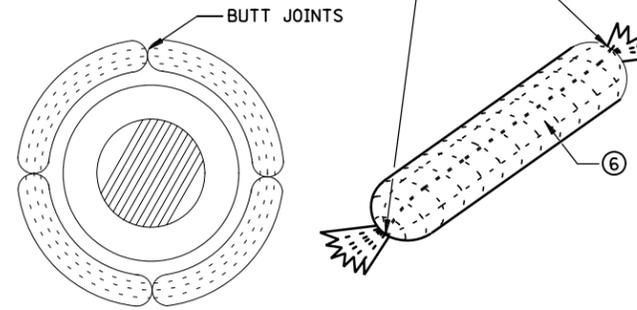
 THOMAS STYRBICKI
 STATE DESIGN ENGINEER
 APPROVED: 1-8-2020
 REVISED:

TEMPORARY SEDIMENT CONTROL
 DITCH CHECK

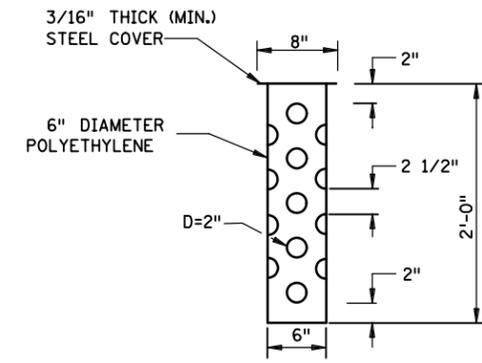
INLET SPECIFICATIONS AS PER THE PLAN
DIMENSION LENGTH AND WIDTH TO MATCH
FLAP POCKET



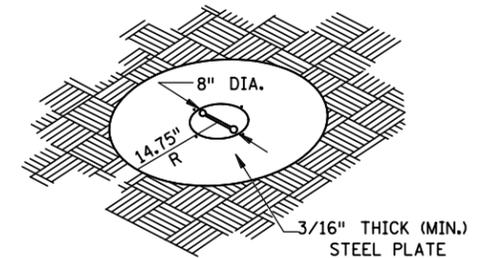
ENDS SECURELY CLOSED TO PREVENT LOSS OF OPEN GRADED AGGREGATE FILL. SECURED WITH 50 PSI. ZIP TIE.



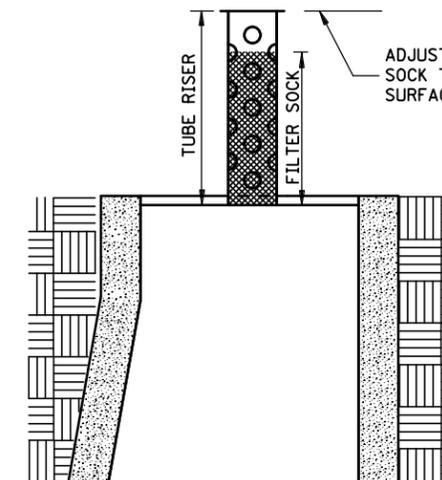
ROCK LOG/COMPOST LOG



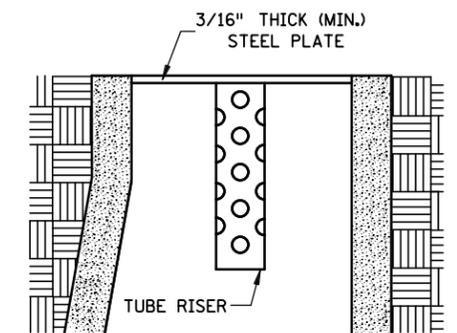
TUBE RISER



PERSPECTIVE VIEW



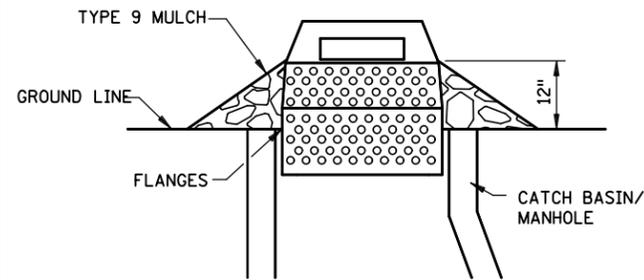
SECTION (UP POSITION)



SECTION (DOWN POSITION)

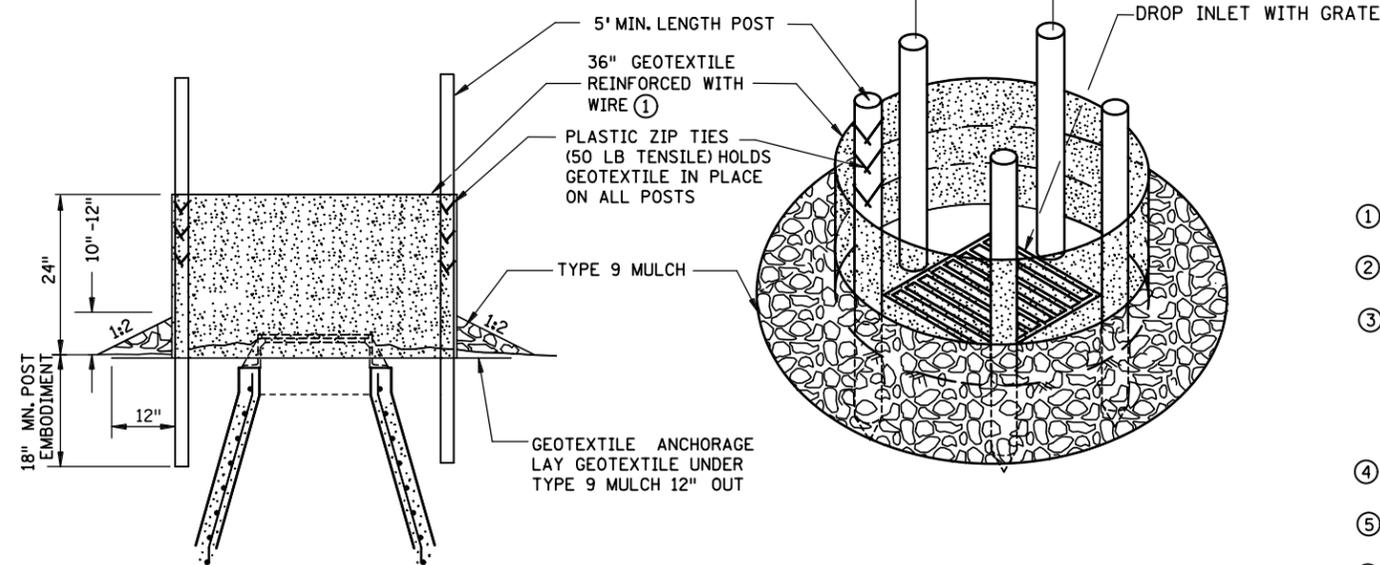
FILTER BAG INSERT ③

(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

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.

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REVISION:
APPROVED: 2-28-2017

Chief Environmental Officer



STANDARD PLAN 5-297.405

4 OF 8

APPROVED: 2-28-2017
REVISED:

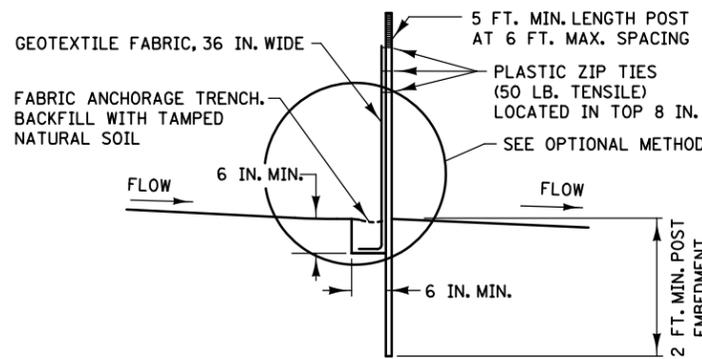
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S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

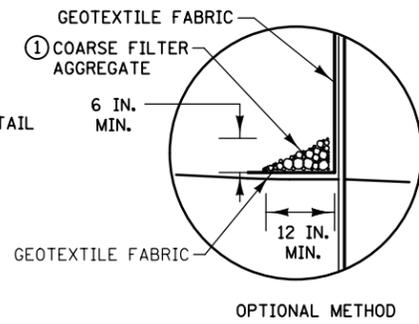
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STORM DRAIN INLET PROTECTION

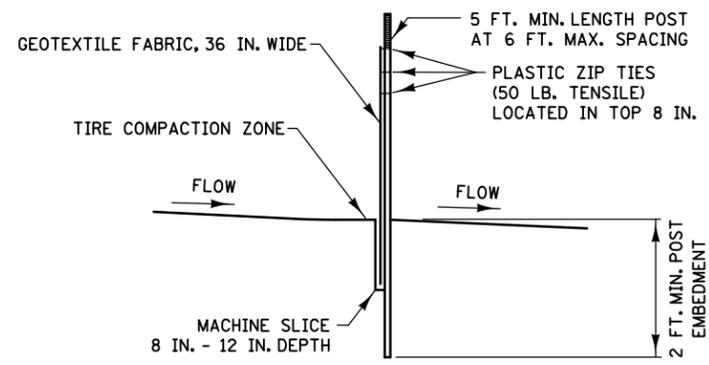
SHEET NO. 23 OF 59 SHEETS



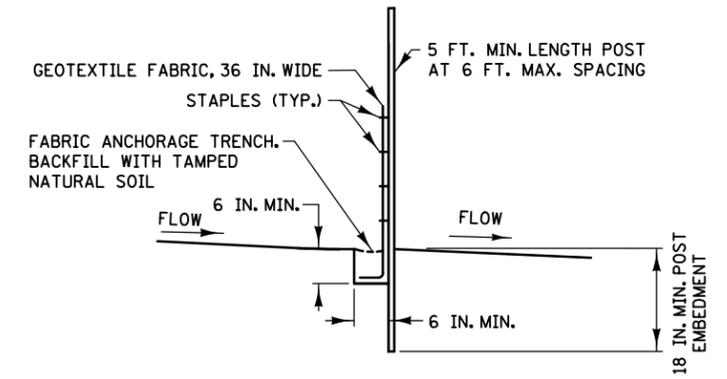
**SILTS FENCE TYPE HI ②
(HAND INSTALLED)**



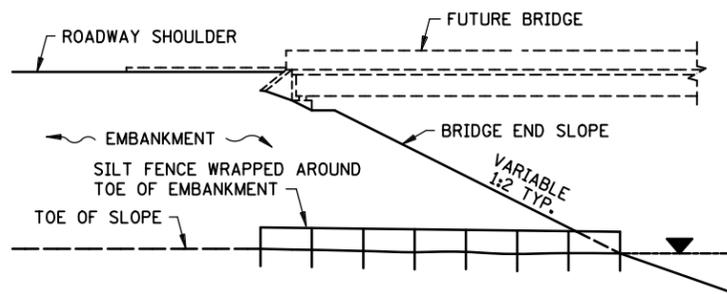
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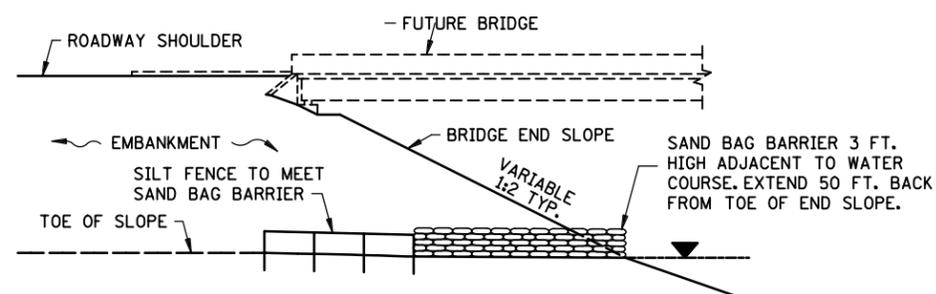
**SILTS FENCE TYPE MS ②
(MACHINE SLICED)**



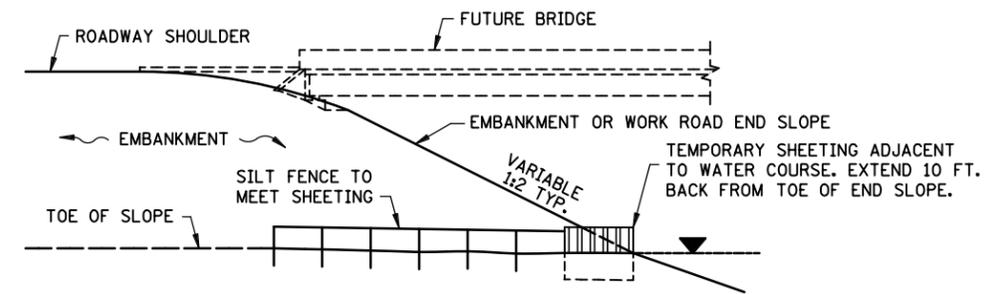
**SILTS FENCE TYPE PA ③
(PREASSEMBLED)**



SILTS FENCE ONLY ④

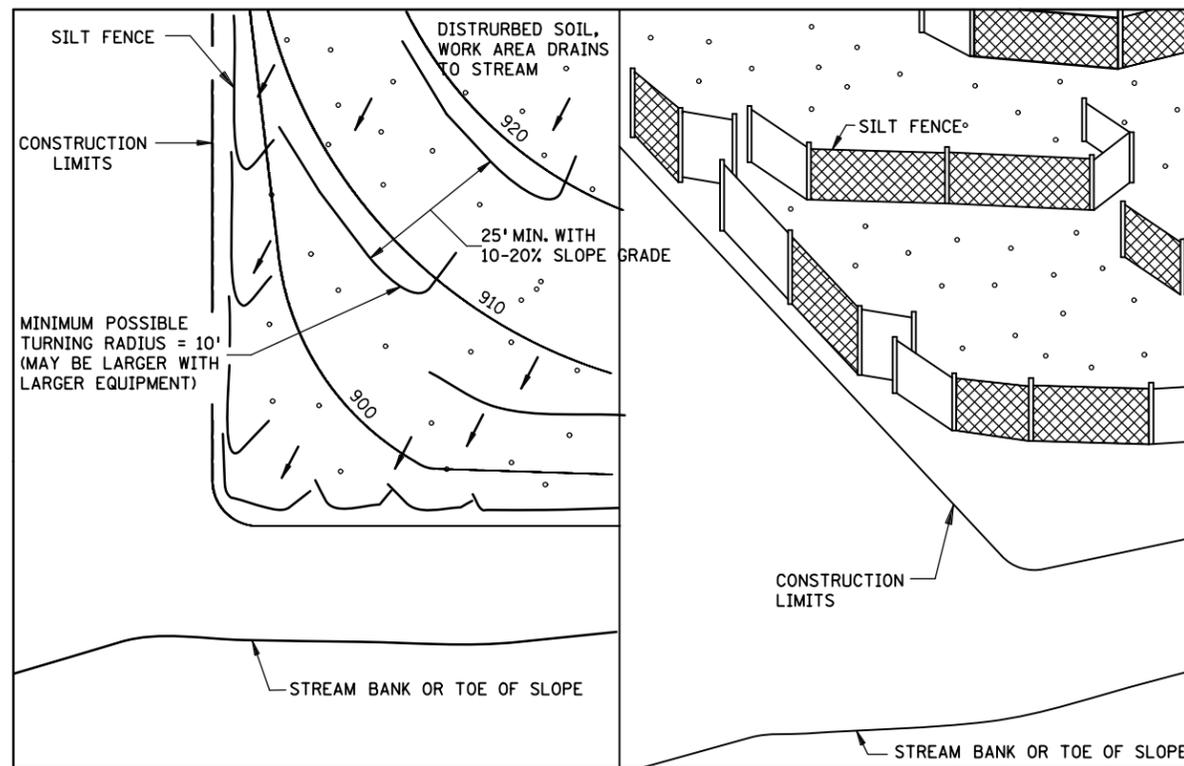


SILTS FENCE WITH SAND BAGS ⑤



SILTS FENCE WITH SHEETING ⑥

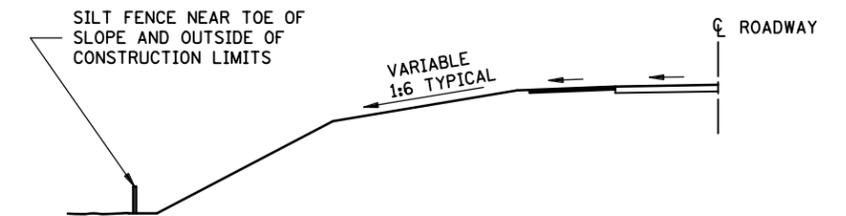
INSTALLATION AT BRIDGE EMBANKMENT ADJACENT TO WATER



PLAN VIEW

PERSPECTIVE VIEW

J-HOOK INSTALLATION



LOCATION AT TOE OF ROADWAY EMBANKMENT

NOTES:

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

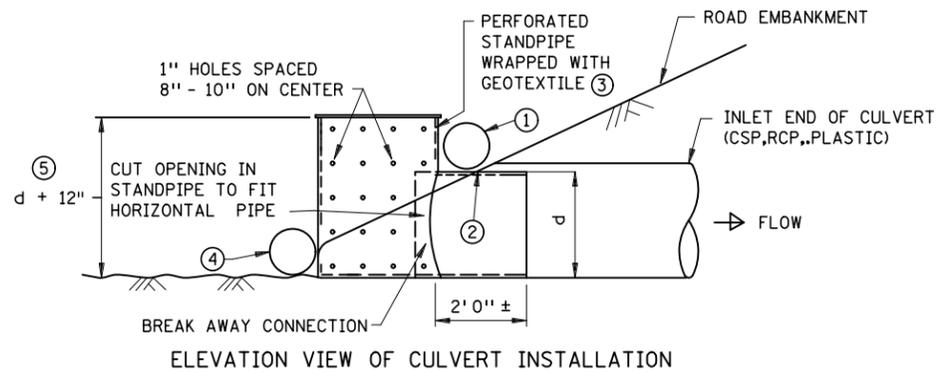
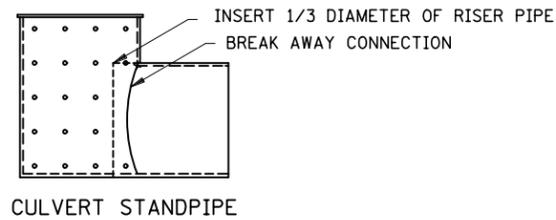
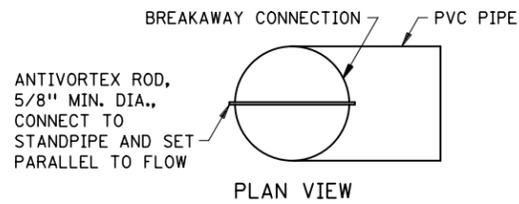
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APPROVED: 2-28-2017
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CHIEF ENVIRONMENTAL OFFICER

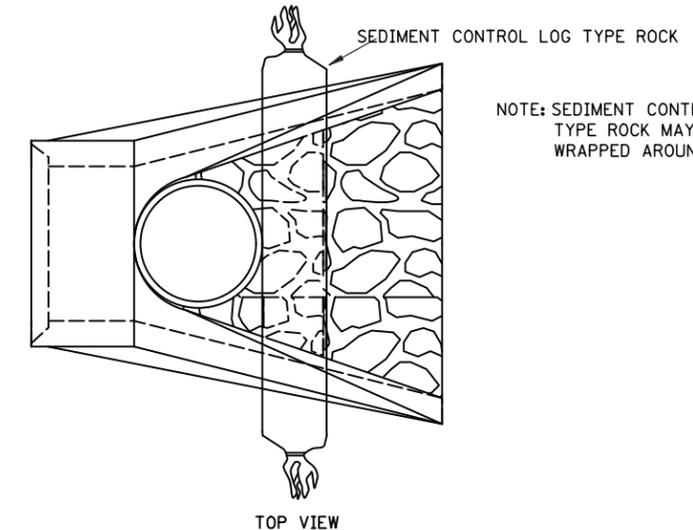
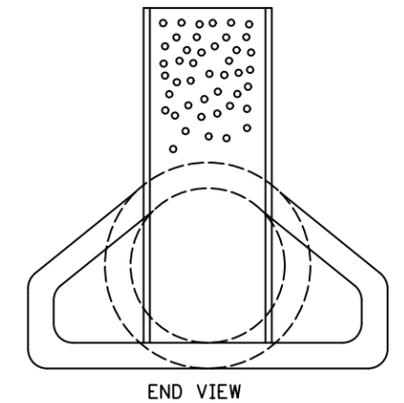
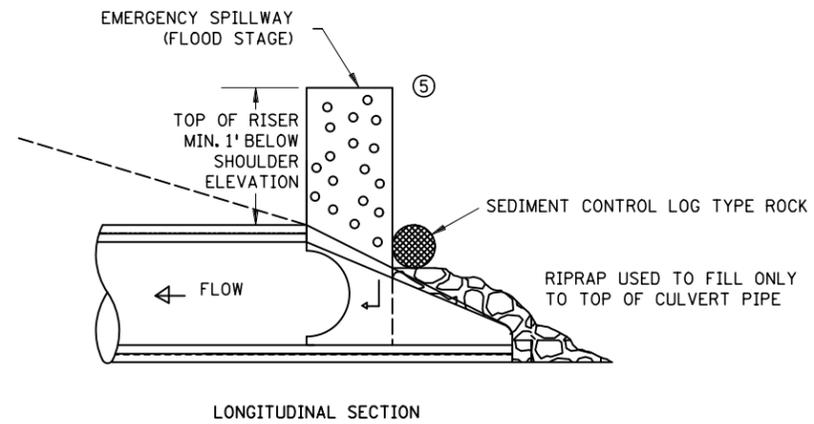


STANDARD PLAN 5-297.405 6 OF 8
APPROVED: 2-28-2017
REVISOR:
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STATE DESIGN ENGINEER

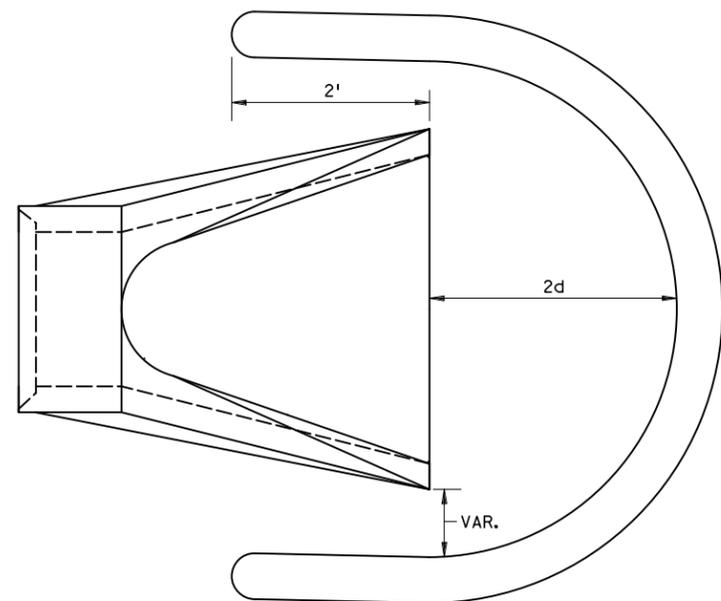
**TEMPORARY SEDIMENT CONTROL
SILTS FENCE**



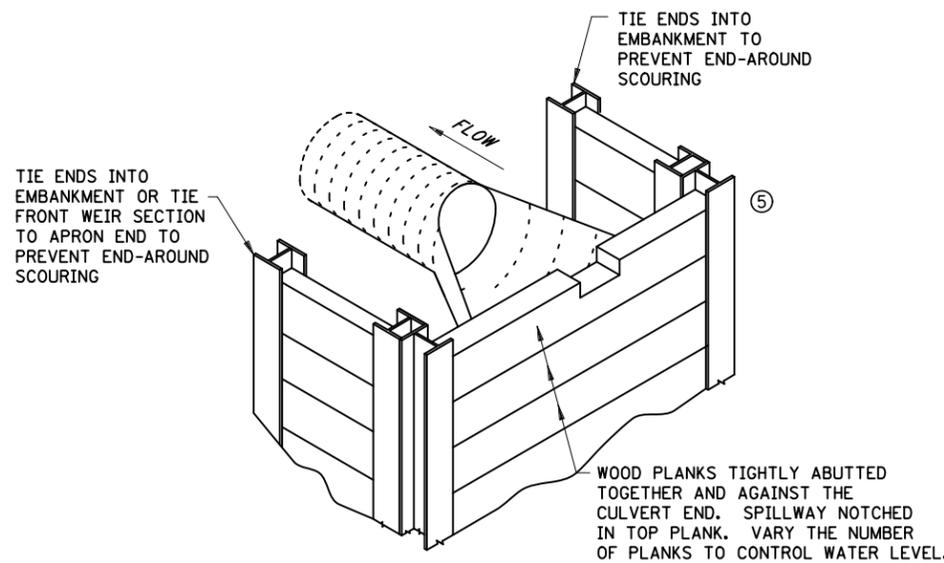
CULVERT STANDPIPE INSERT (D-RISER)
d= CULVERT SIZE: 12" - 36"



CULVERT STANDPIPE INSERT (D-RISER)



SEDIMENT CONTROL LOG WEIR
(COMPOST, WOOD CHIP, OR ROCK)
d = CULVERT SIZE: 12" - 36"



WOOD PLANK WEIR

NOTES:

- SEE SPECS. 2573, 3891 & 3893.
- FOR USE WHEN TEMPORARY PONDING IS NEEDED IN DITCH SECTIONS FOR SEDIMENT CONTROL.
- MANUFACTURED ALTERNATIVES LISTED ON MnDOT'S APPROVED PRODUCTS LIST MAY BE SUBSTITUTED AT NO ADDITIONAL COST.
- ① ROCK LOG OR SANDBAG TO HOLD STANDPIPE AND ACT AS A SEAL BETWEEN RISER PIPE AND CULVERT.
- ② PLACE CULVERT APRON AND SLIDE TEMPORARY STANDPIPE INTO CSP OR RCP CULVERT.
- ③ ALL GEOTEXTILE USED FOR CULVERT PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886 FOR MACHINE SLICED.
- ④ ROCK LOG OR RIP RAP TO HOLD STANDPIPE AND ACT AS A FILTER BETWEEN RISER PIPE AND CULVERT.
- ⑤ HEIGHT OVERFLOW NOT TO CAUSE FLOODING OF ROAD OR ADJACENT PROPERTIES.

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



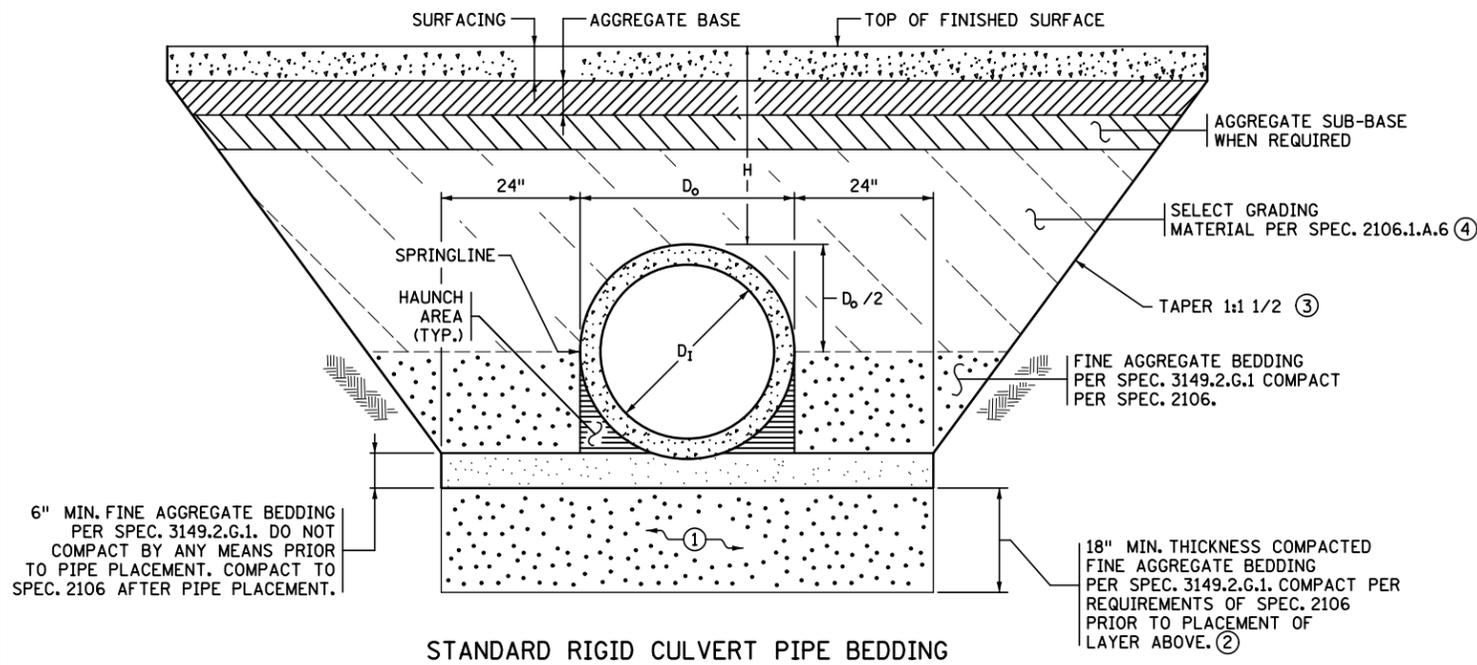
STANDARD PLAN 5-297.405 8 OF 8

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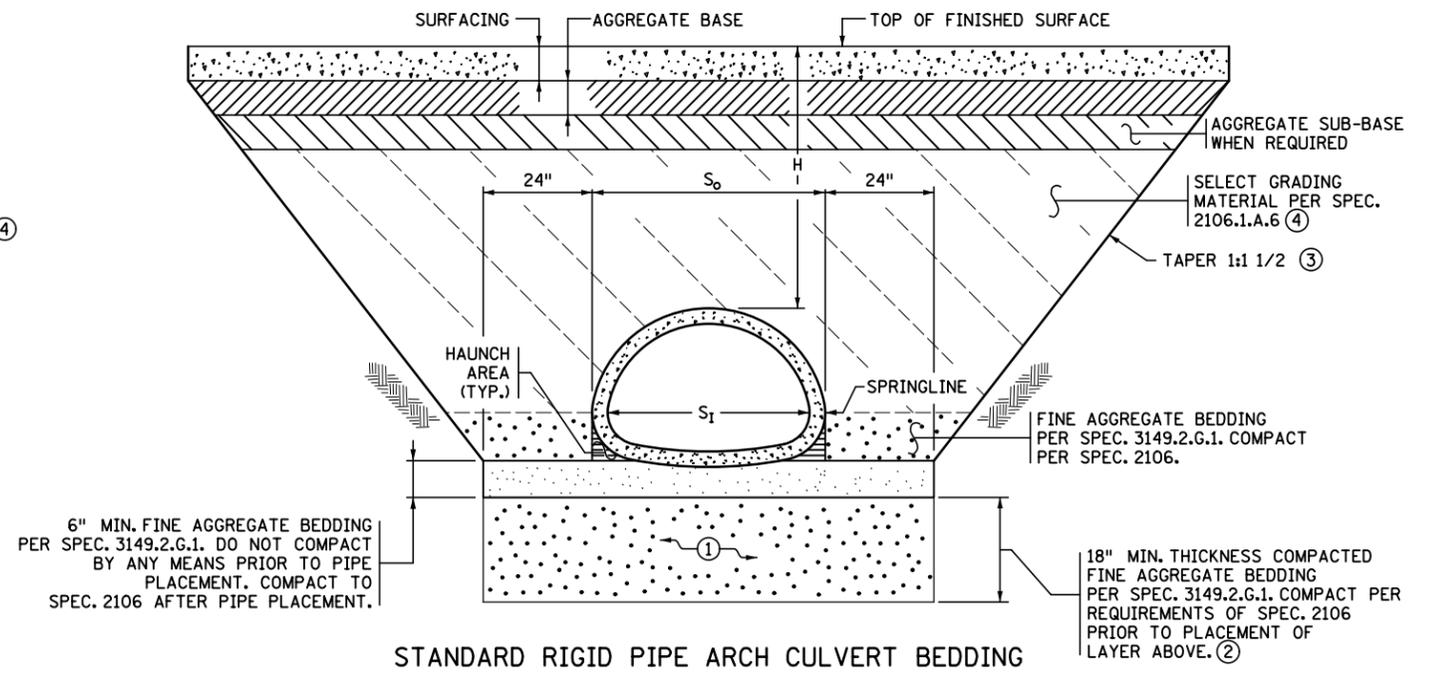
APPROVED: 2-28-2017
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TEMPORARY SEDIMENT CONTROL
CULVERT END CONTROLS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059 SHEET NO. 25 OF 59 SHEETS



STANDARD RIGID CULVERT PIPE BEDDING



STANDARD RIGID PIPE ARCH CULVERT BEDDING

-LEGEND-

- D₁ = INSIDE DIAMETER OF ROUND PIPE (INCHES).
- D₀ = OUTSIDE DIAMETER OF ROUND PIPE (INCHES).
- S₁ = INSIDE SPAN OF PIPE-ARCH (INCHES).
- S₀ = OUTSIDE SPAN OF PIPE-ARCH (INCHES).
- H = FILL COVER HEIGHT OVER PIPE (FEET).
- = UNDISTURBED SOIL
- = COMPACTED BEDDING
- = LOOSE BEDDING, COMPACTED AFTER PIPE PLACEMENT

NOTES

- STANDARD BEDDING FOR RIGID PIPE CULVERTS WITHOUT TREATMENTS.
- RIGID PIPE INCLUDES CONCRETE.
- ENTRANCE CULVERTS (FIELD AND DRIVEWAY CULVERTS) DO NOT NEED BEDDING UNLESS SPECIFIED IN THE PLANS OR SPECIAL PROVISIONS.
- UNLESS OTHERWISE NOTED IN THE PLAN, BEDDING QUANTITIES ARE COMPUTED FOR THE FULL LENGTH OF THE PIPE AND APRON, AND WILL NOT BE ADJUSTED FOR CHANGES TO MEET OSHA REQUIREMENTS.
- WHEN RIPRAP IS REQUIRED AT THE APRON END, SEE STANDARD PLATE OR PLAN FOR RIPRAP INSTALLATION AND QUANTITIES. FOR APRONS WITHOUT RIPRAP PLACE 6" MIN. FINE AGGREGATE BEDDING UNDER APRONS. USE A TRENCH WIDTH EQUAL TO THE PIPE TRENCH WIDTH.
- CONTRACT PAY ITEM FOR FINE AGGREGATE BEDDING INCLUDES THE COST OF EXCAVATION, PLACEMENT AND COMPACTION.
- EXCAVATION AND BACKFILL WITH SELECT GRADING MATERIAL ARE NOT TABULATED SEPARATELY BUT ARE INCLUDED IN THE CONTRACT UNIT PRICE OF THE RELEVANT CULVERT PAY ITEM.
- EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.
- ALL SLOPES SHOWN AS (V):(H).
- PIPE SIZE IS BASED ON THE NOMINAL INSIDE DIAMETER OR SPAN.
- PROTECT ALL PIPE DURING CONSTRUCTION PER SPEC. 2501.
- PLACE MULTIPLE PIPE CULVERTS WITH A CLEARANCE OF 24 INCHES OR GREATER BETWEEN STRINGS OF PIPE.
- ① IF APPROVED BY THE ENGINEER, IN WET CONDITIONS THE CONTRACTOR MAY SUBSTITUTE 18" OF COARSE FILTER AGGREGATE PER SPEC. 3149.2.H COMPACTED TO THE QUALITY COMPACTION REQUIREMENTS OF SPEC. 2106. WRAP WITH GEOTEXTILE FABRIC TYPE IV PER SPEC. 3733. SEAM ALL FABRIC SIDES AND ENDS PER SPEC. TABLE 3733-1 INCLUDING FOOTNOTE (a) OR OVERLAP A MINIMUM OF 3 FT., ALL AT NO ADDITIONAL COST.
- ② FOR INSTALLATIONS ON INTACT BEDROCK, OMIT THIS LAYER.
- ③ OVER-EXCAVATION BENEATH TAPERS IS NOT PERMITTED UNLESS REQUIRED BY OSHA. (TYP.)
- ④ MAXIMUM EMBANKMENT PARTICLE SIZE WITHIN 2 FT. OF RIGID PIPE IS 3".

CONSTRUCTION SEQUENCE

1. PLACE AND COMPACT 18" OF FINE AGGREGATE BEDDING TO THE REQUIREMENTS OF SPEC. 2106.
2. LOOSELY PLACE 6" OF FINE AGGREGATE BEDDING MATERIAL (SPEC. 3149.2.G.1) TO GRADE. DO NOT COMPACT PRIOR TO PIPE PLACEMENT.
3. FOR PIPES WITH BELL, REMOVE MATERIAL IN BELL AREA PRIOR TO PLACEMENT.
4. FURNISH AND INSTALL PIPE TO GRADE.
5. AFTER PLACEMENT OF THE PIPE, PLACE ADDITIONAL BEDDING AND COMPACT THE FULL LENGTH ON BOTH SIDES OF THE PIPE UNDERNEATH THE HAUNCH AREA BY FIRST SHOVEL SLICING (MANUALLY SHOVE THE BLADE END OF A SHOVEL AT AN ANGLE DOWN THE ENTIRE LENGTH OF THE PIPE IN THE HAUNCH AREA) THEN COMPACT THE HAUNCH AT AN ANGLE USING A POWERED MECHANICAL OR PNEUMATIC DEVICE (I.E. POLE TAMPER, JUMPING JACK, OR SIMILAR).
6. COMPACT THE REMAINING MATERIAL OUTSIDE THE HAUNCH AREA TO THE REQUIREMENTS OF SPEC. 2106 ENSURING THAT THE ENTIRE LENGTH OF PIPE IS SUPPORTED UNIFORMLY BY BEDDING.
7. PLACE AND COMPACT BACKFILL EVENLY AND SIMULTANEOUSLY IN 6" LIFTS ON EACH SIDE OF THE PIPE UP TO THE SPRINGLINE WHEN COMPACTED.
8. COMPLETE REMAINING BACKFILL.

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REVISION:
 APPROVED: JANUARY 18, 2019

 STATE BRIDGE ENGINEER



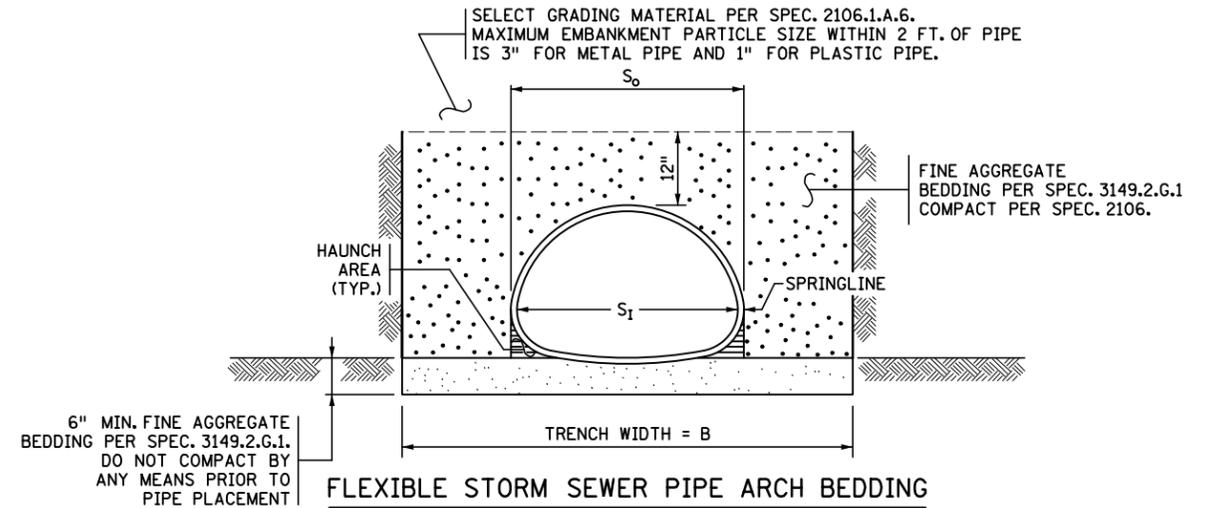
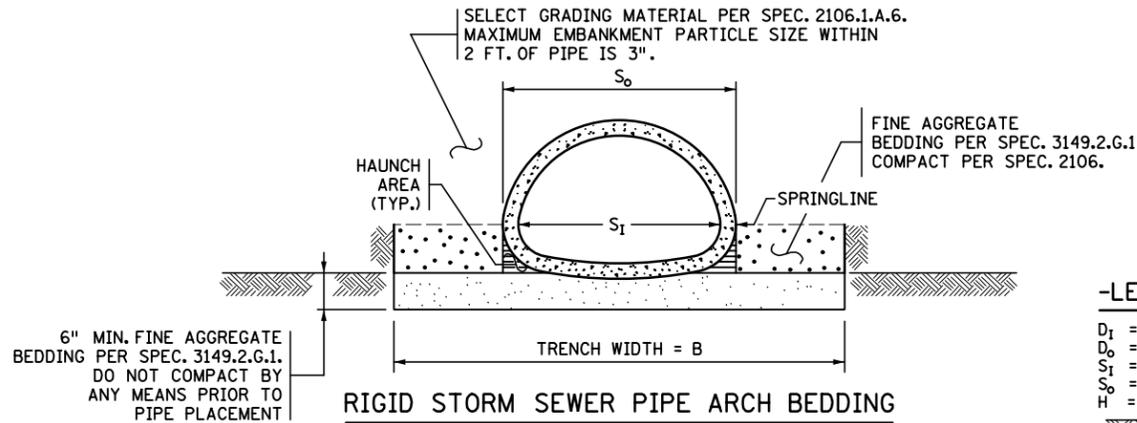
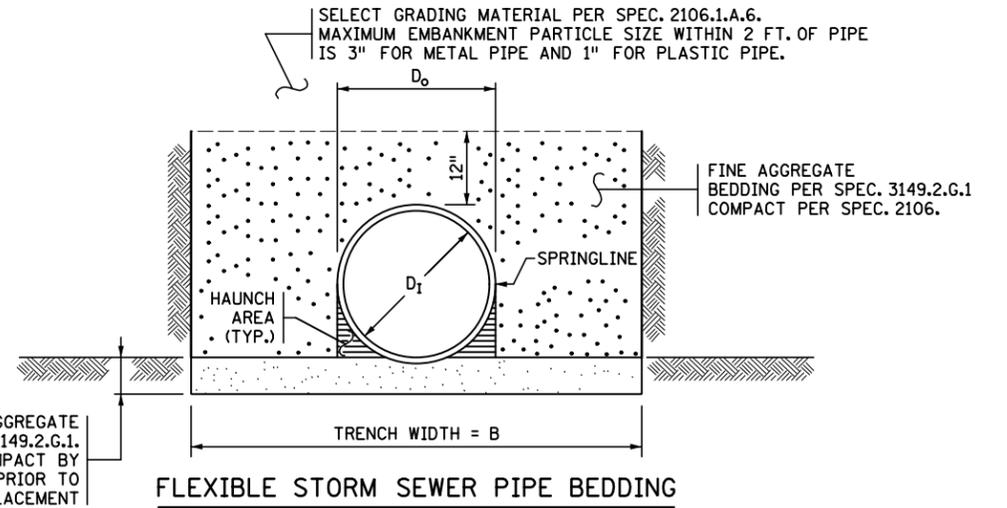
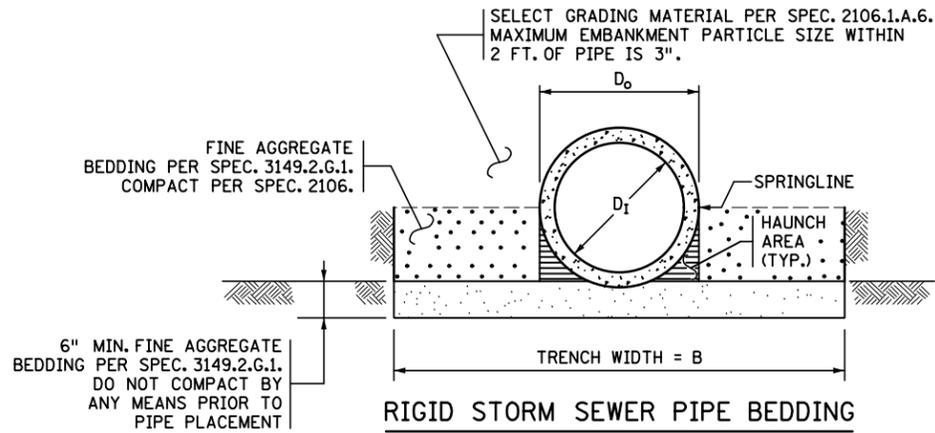
STANDARD PLAN 5-297.441 **1 OF 1**
 APPROVED: 01-18-2019
 REVISED:

 STATE DESIGN ENGINEER

STANDARD CULVERT BEDDING FOR RIGID PIPE (WITHOUT TREATMENTS)

TRENCH BASE WIDTH ①②	
PIPE DIA. D_1 OR S_1	TRENCH WIDTH B
< 42"	$D_0 + 24"$
42" TO 54"	$1.5 \times D_0$
> 54"	$D_0 + 36"$

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



-LEGEND-

- D_1 = INSIDE DIAMETER OF ROUND PIPE (INCHES).
- D_0 = OUTSIDE DIAMETER OF ROUND PIPE (INCHES).
- S_1 = INSIDE SPAN OF PIPE-ARCH (INCHES).
- S_0 = OUTSIDE SPAN OF PIPE-ARCH (INCHES).
- H = FILL COVER HEIGHT OVER PIPE (FEET).
- = UNDISTURBED SOIL
- = COMPACTED BEDDING
- = LOOSE BEDDING, COMPACTED AFTER PIPE PLACEMENT

CONSTRUCTION SEQUENCE

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

NOTES

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

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REVISION:
 APPROVED: JANUARY 18, 2019

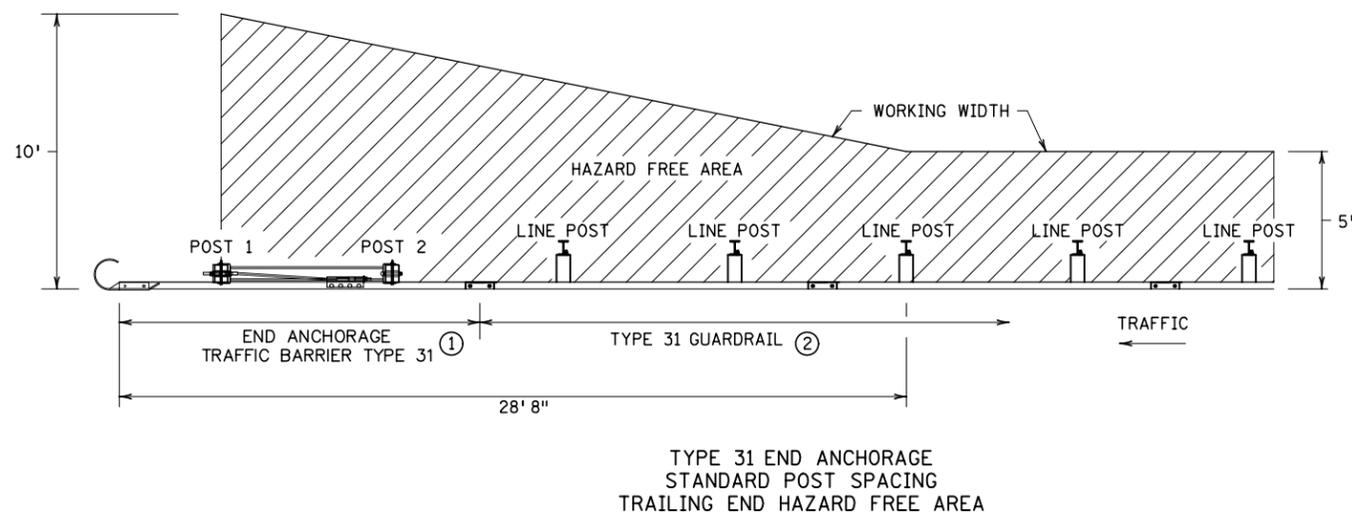
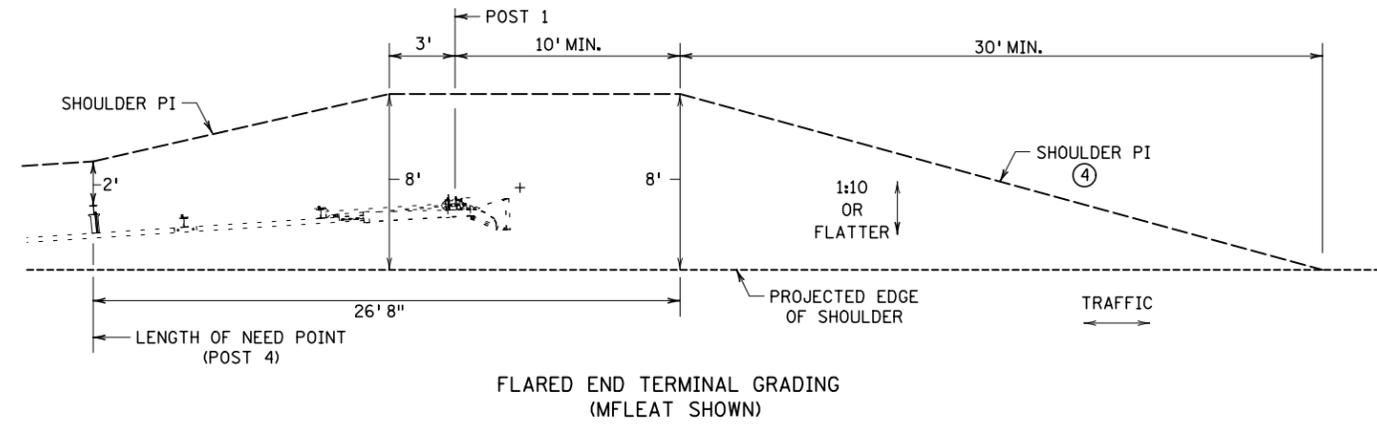
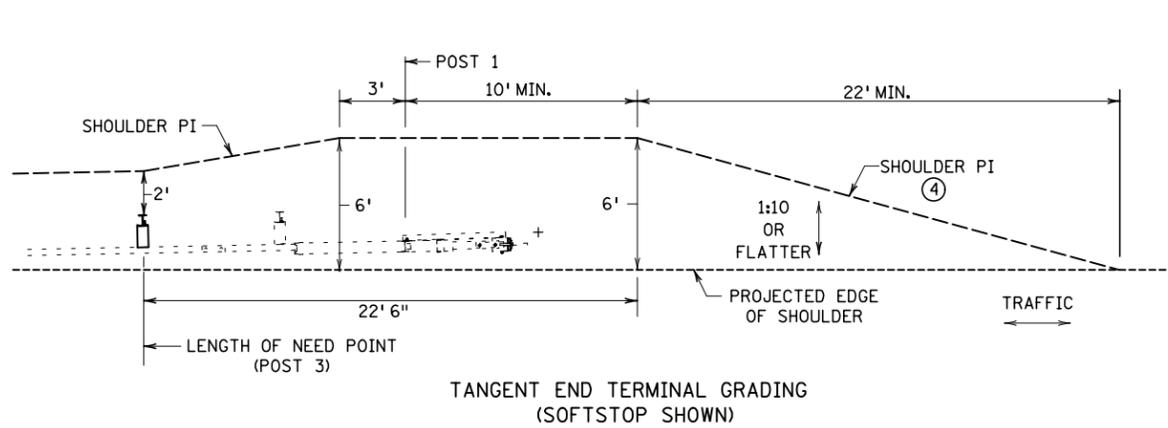
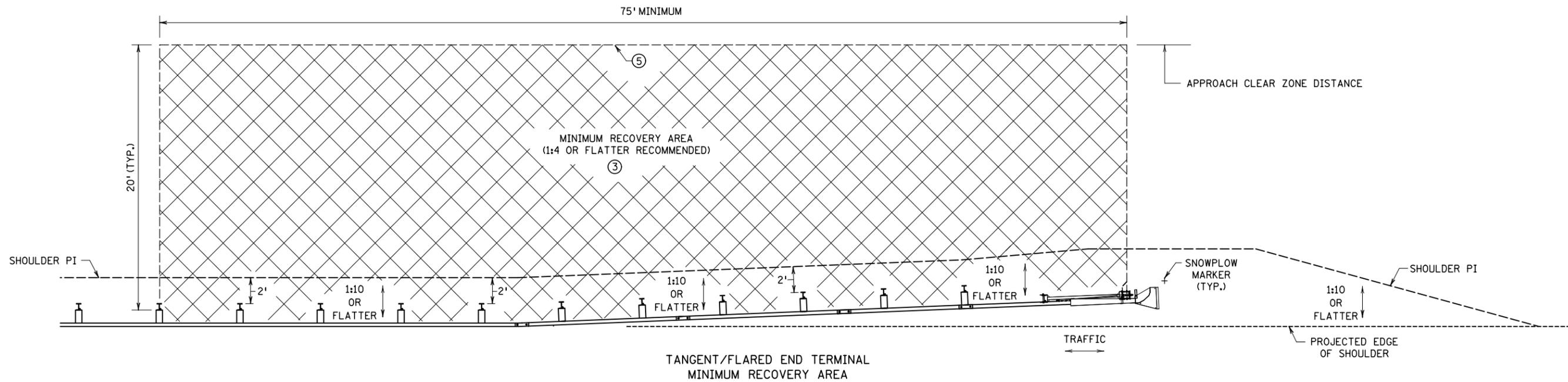
 STATE BRIDGE ENGINEER



STANDARD PLAN 5-297.442 **1 OF 1**
 APPROVED: 01-18-2019
 REVISED:

 STATE DESIGN ENGINEER

STANDARD STORM SEWER BEDDING FOR RIGID AND FLEXIBLE PIPE
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059 SHEET NO. 27 OF 59 SHEETS



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

REVISION:

APPROVED: 05-14-2021

Nancy Yoo
 NANCY YOO
 DESIGN SUPPORT DIRECTOR
 OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT



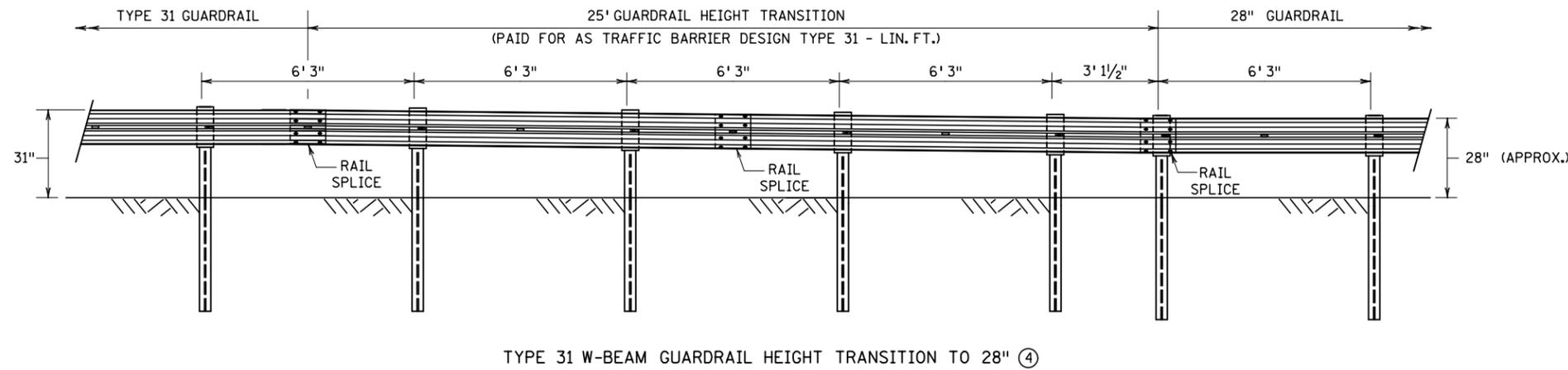
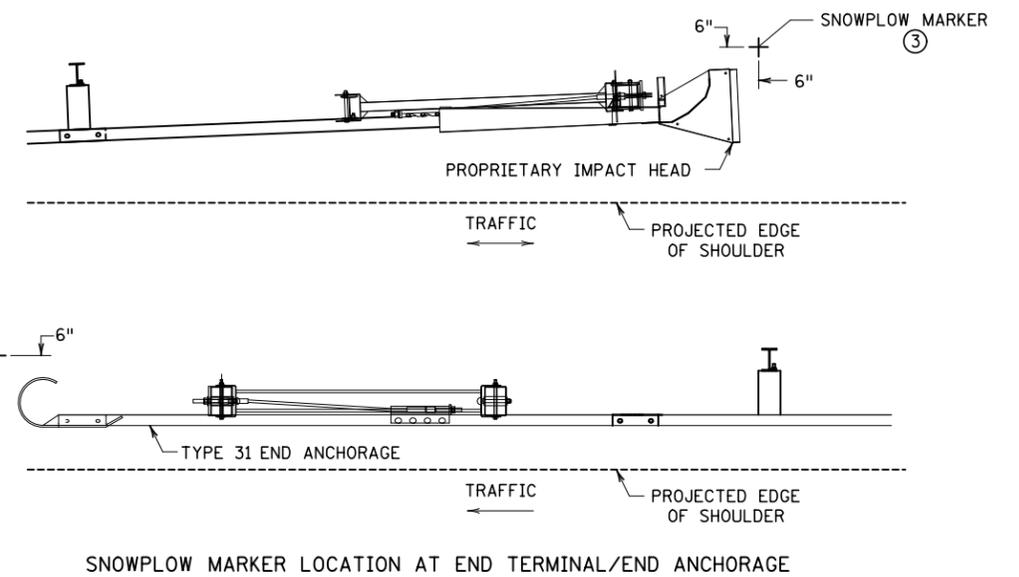
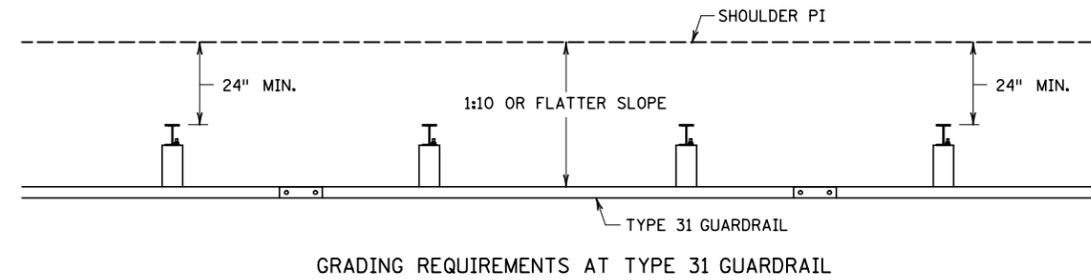
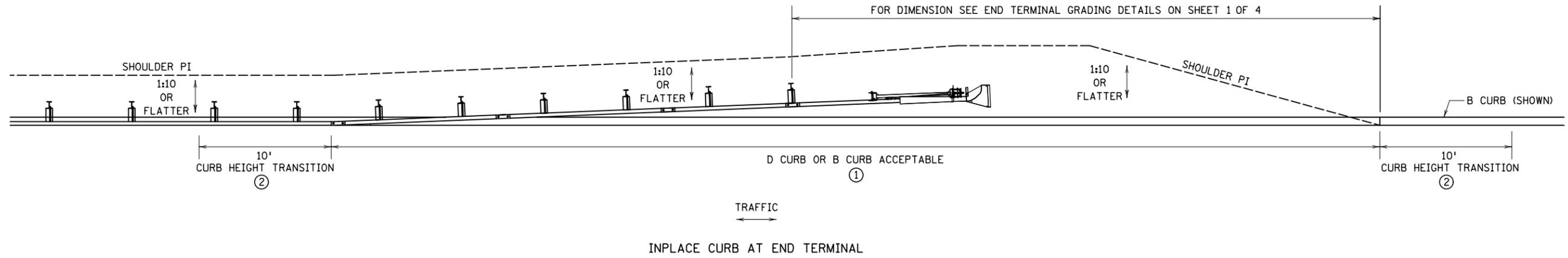
STANDARD PLAN 5-297.601 1 OF 4

APPROVED: 05-14-2021
 REVISED:

Thomas Styrbicki
 THOMAS STYRBICKI
 STATE DESIGN ENGINEER

**GUARDRAIL / END TREATMENTS
 MISCELLANEOUS DETAILS**

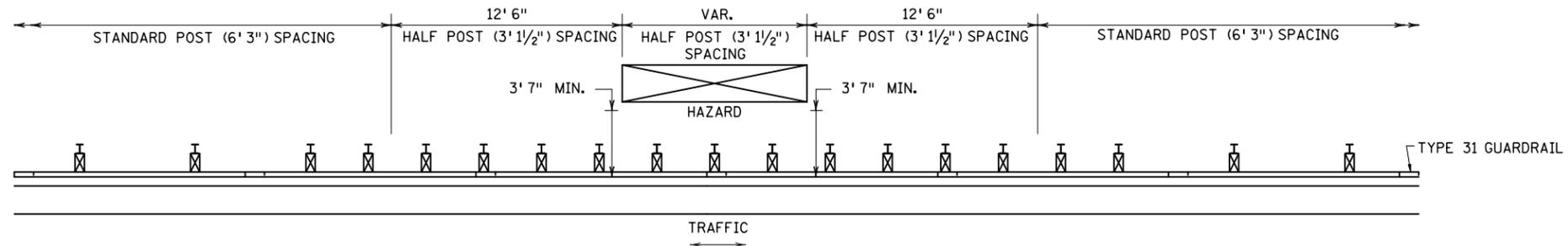
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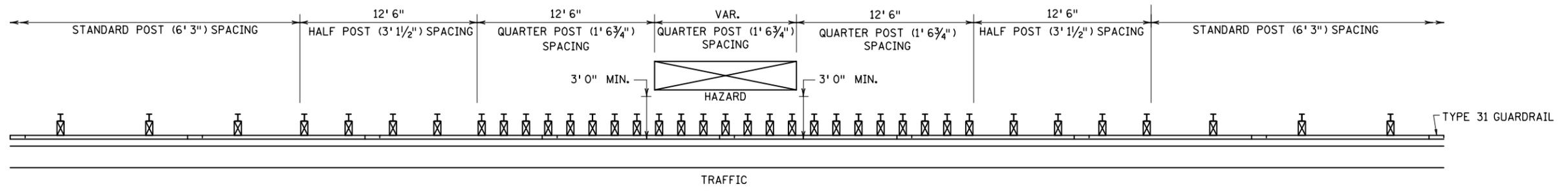
- NOTES:
- ① IF INPLACE CURB IS OVER 4" HEIGHT, MILL TO 3" HEIGHT.
 - ② CONTINUE MILLING FROM 3" MILLED HEIGHT TO MATCH INPLACE CURB HEIGHT.
 - ③ SNOWPLOW MARKER (X3-5) WITH A SQUARE-TUBE THREE-WALL SIGN BASE PER STANDARD PLAN 5-297.721. TOP OF POST SHALL BE 3' ABOVE THE HEIGHT OF THE END TERMINAL/END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

REVISION:
 APPROVED: 05-14-2021
Nancy Yoo
 NANCY YOO
 DESIGN SUPPORT DIRECTOR
 OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

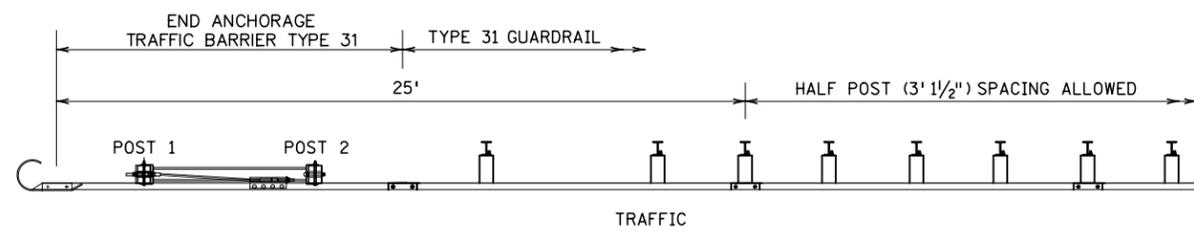
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	APPROVED: 05-14-2021 REVISED:	
THOMAS STYRBICKI STATE DESIGN ENGINEER	S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059	



GUARDRAIL STIFFENING GENERAL - HALF POST SPACING

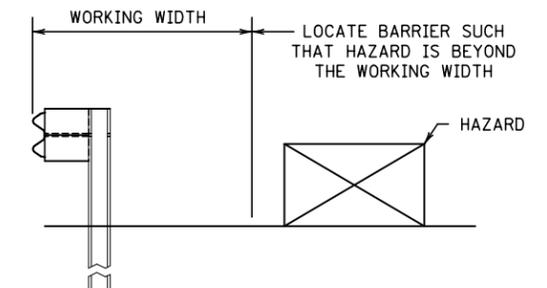


GUARDRAIL STIFFENING GENERAL - QUARTER POST SPACING



GUARDRAIL STIFFENING AT TYPE 31 END ANCHORAGE

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



BARRIER LOCATION / WORKING WIDTH

NOTES:

REGARDLESS OF TRAFFIC DIRECTION, ALL GUARDRAIL STIFFENING SHALL TRANSITION INTO AND OUT OF EACH POST SPACING SEGMENT.

REVISION:
 APPROVED: 05-14-2021

 NANCY YOO
 DESIGN SUPPORT DIRECTOR
 OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

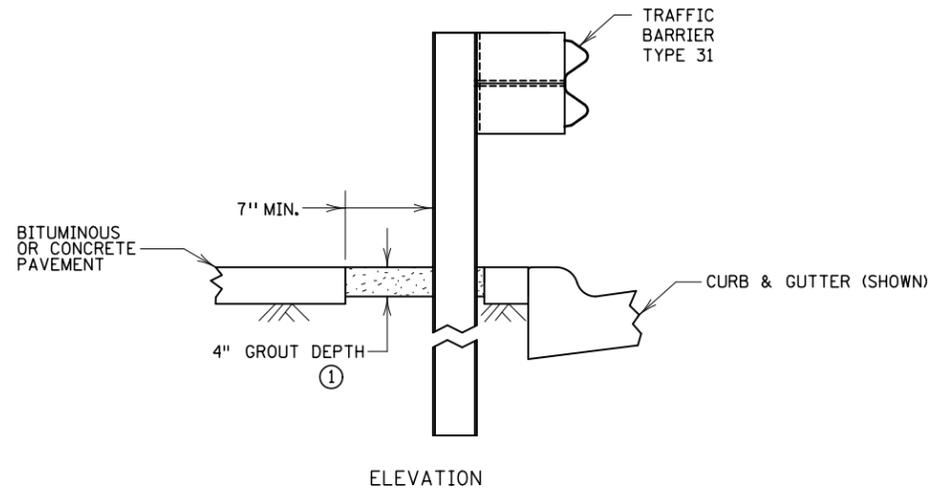
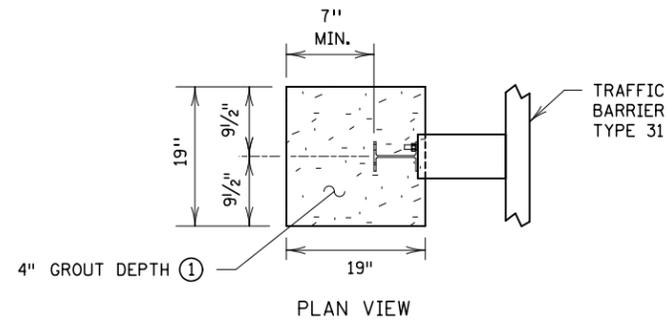


STANDARD PLAN 5-297.601 3 OF 4

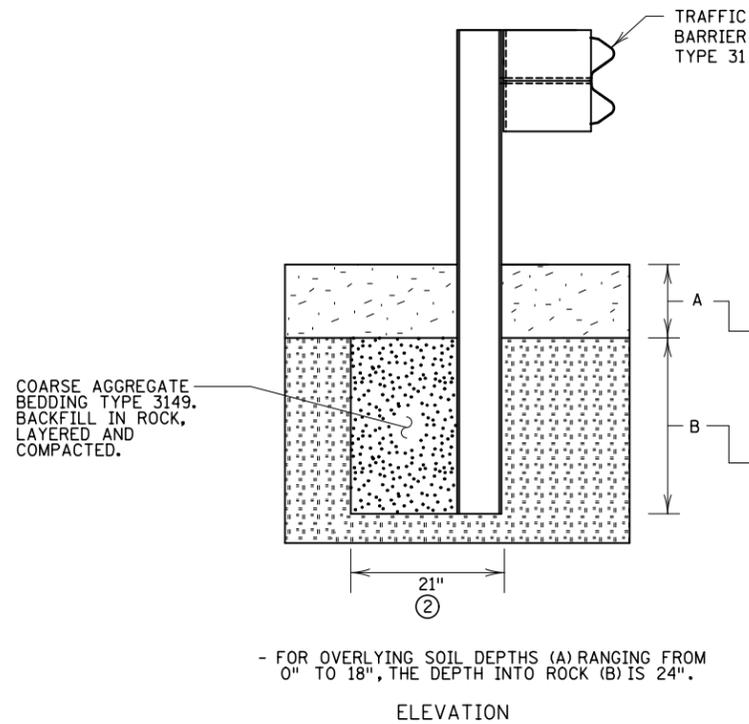
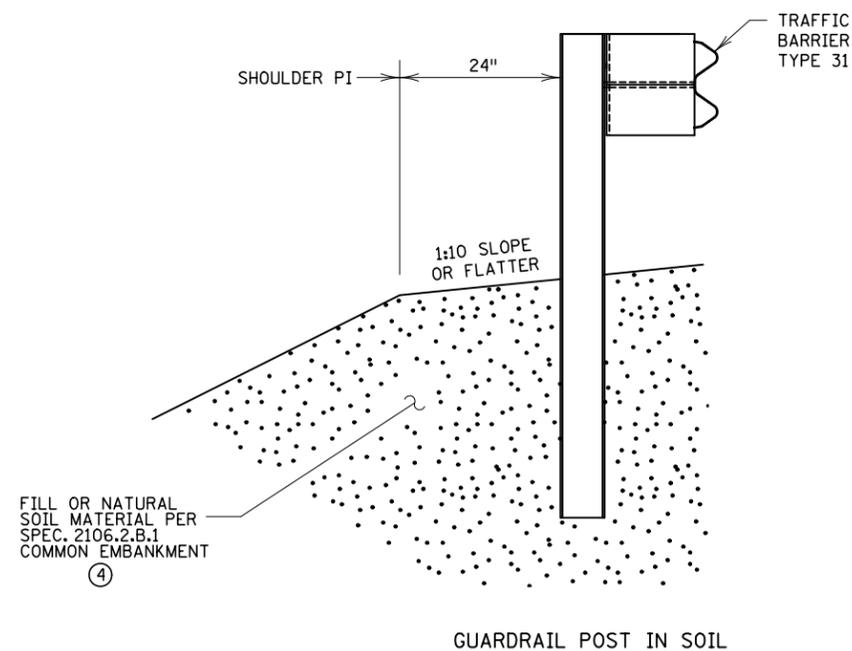
 THOMAS STYRBICKI
 STATE DESIGN ENGINEER
 APPROVED: 05-14-2021
 REVISED:

GUARDRAIL / END TREATMENTS
 MISCELLANEOUS DETAILS

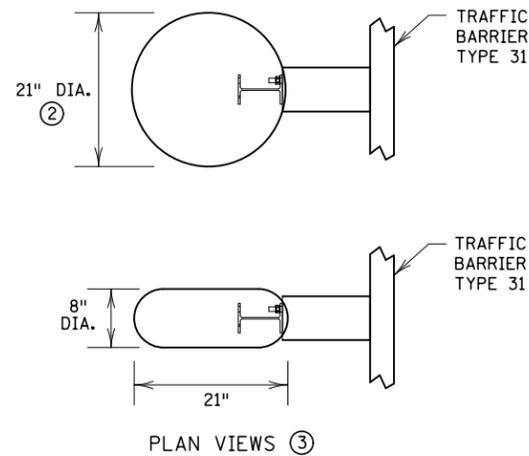
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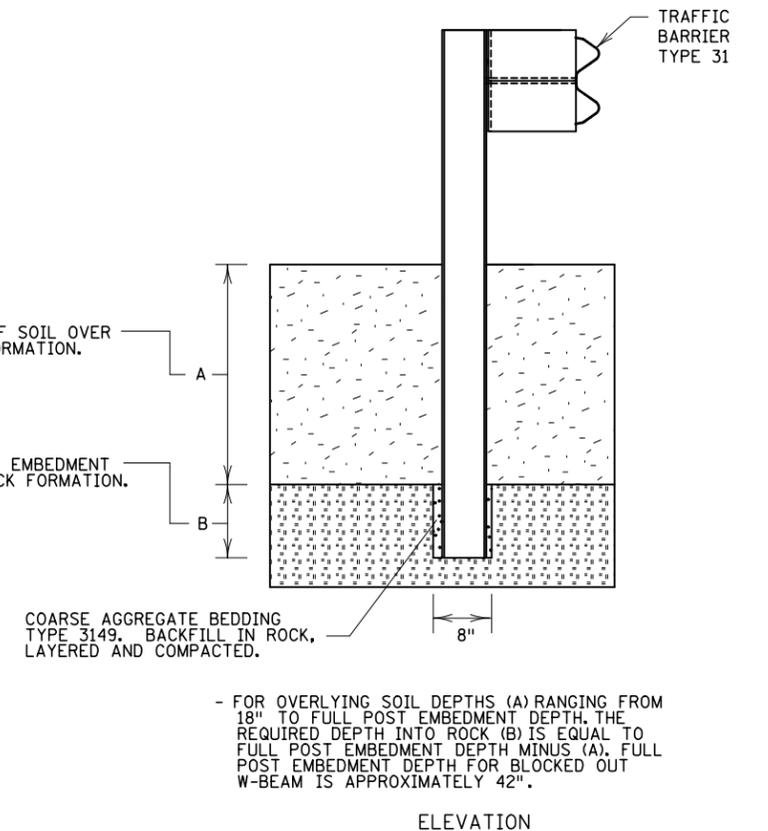
POST LEAVE-OUT FOR TRAFFIC BARRIER TYPE 31



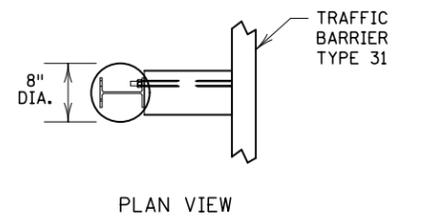
- FOR OVERLYING SOIL DEPTHS (A) RANGING FROM 0" TO 18", THE DEPTH INTO ROCK (B) IS 24".



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



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



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

NOTES:

- ① GROUT IS ONE PART TYPE 1A CEMENT, 14 PARTS SAND, AND 5 PARTS WATER, BY VOLUME.
- ② 24" DIAMETER ACCEPTABLE.
- ③ EITHER HOLE CONFIGURATION (CIRCULAR OR ELONGATED) ACCEPTABLE.
- ④ MATERIAL SHALL NOT CONTAIN GEOFOAM, TIRE SHREDS, OR OTHER LIGHTWEIGHT FILL MATERIALS. POST SHALL NOT BE DRIVEN THROUGH PAVEMENT OR GEOCELL SLOPE REINFORCEMENT.

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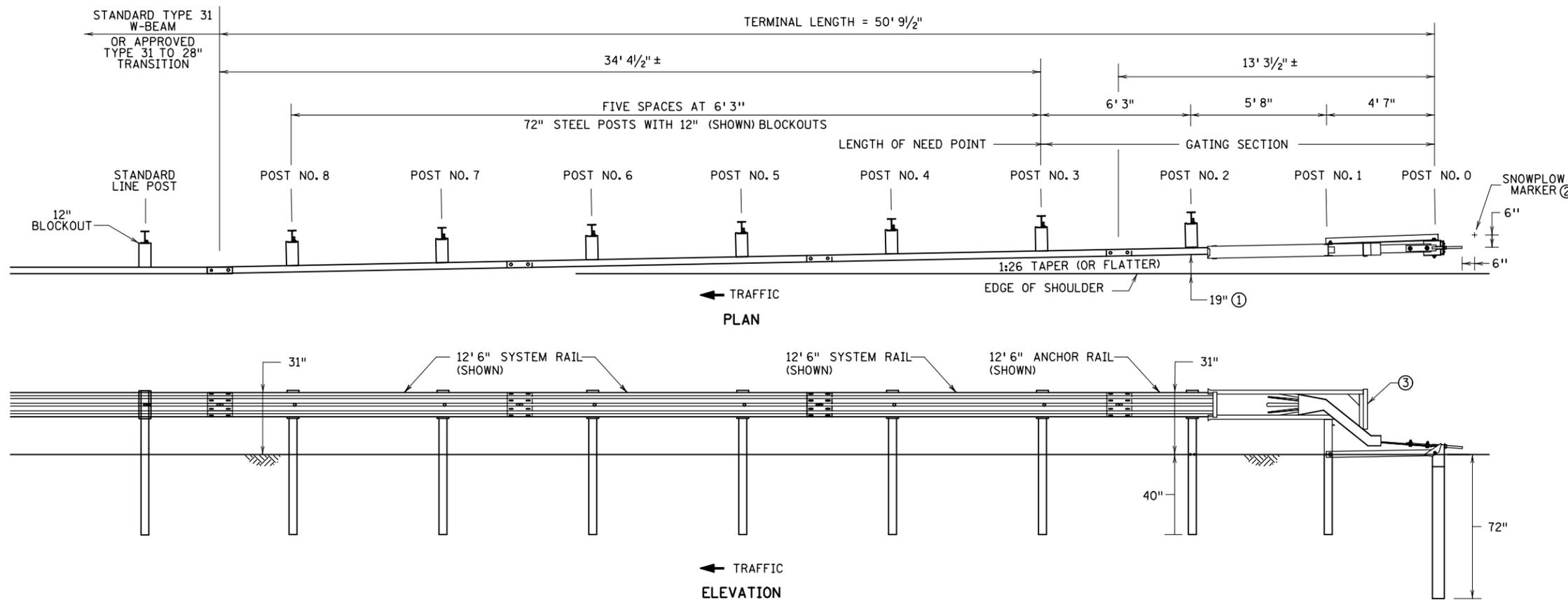
REVISION:
APPROVED: 05-14-2021
Nancy Yoo
NANCY YOO
DESIGN SUPPORT DIRECTOR
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT



STANDARD PLAN 5-297.601 4 OF 4
Tom Styrbicki
THOMAS STYRBICKI
STATE DESIGN ENGINEER
APPROVED: 05-14-2021
REVISED:

GUARDRAIL / END TREATMENTS
MISCELLANEOUS DETAILS

**SOFTSTOP
(TRINITY HIGHWAY PRODUCTS)**



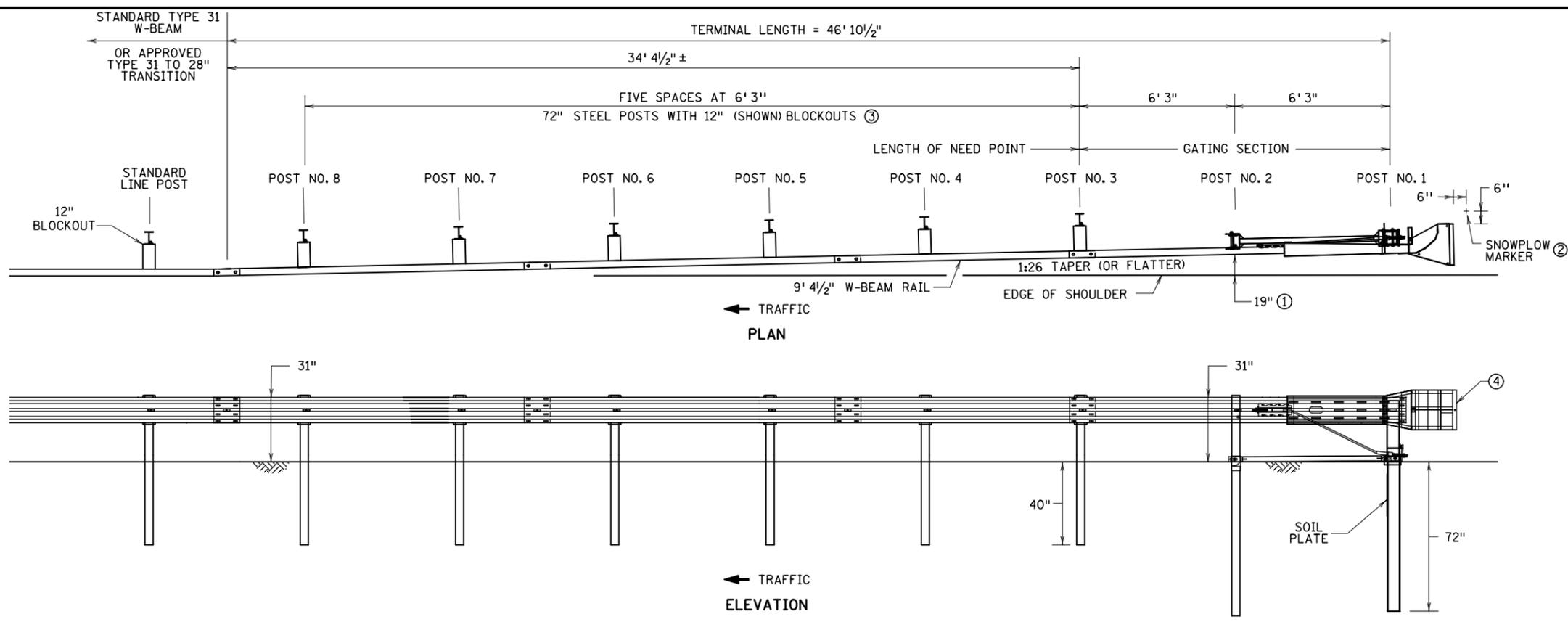
NOTES:
THIS IS A PROPRIETARY ITEM AS PER SPEC. 1703.

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

ALL TERMINAL RAIL MUST BE STRAIGHT. CURVED TERMINAL RAIL IS NOT ALLOWED.
ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS, AND BEARING PLATES SHALL BE GALVANIZED PER MNDOT SPEC. 3392.
POSTS 1 AND 2 ARE PROPRIETARY STEEL YIELDING TERMINAL POSTS.
POST 0 IS A PROPRIETARY ANCHOR POST.
POSTS 2 - 8, 8" BLOCKOUTS ACCEPTABLE.
OPTIONAL 25' ANCHOR RAIL AND 25' SYSTEM RAIL ACCEPTABLE. END TERMINAL TO FOLLOW A STRAIGHT TAPER.

- PLACE STEEL I-BEAM POST DELINEATORS PER THE APPROVED PRODUCTS LIST ON THE TOP OF THE FIRST FIVE I-BEAM POSTS OF UPSTREAM TERMINAL AND THE LAST FIVE I-BEAM POSTS OF DOWNSTREAM TERMINAL. ATTACH USING ADHESIVE (PER MANUFACTURER RECOMMENDATION). THE RETROREFLECTIVE SHEETING SHALL FACE TRAFFIC AND MATCH THE COLOR OF THE ADJACENT EDGE LINE.
- ① LESSER OFFSET ALLOWED WITH APPROVAL OF THE ENGINEER.
 - ② SEE STANDARD PLAN 5-297.601.
 - ③ 6" X 18" OBJECT MARKER (OM3-R OR OM3-L) PER MNDOT STANDARD SIGNS AND MARKINGS MANUAL. ALTERNATING STRIPES SHALL BE SLOPED DOWN TOWARD THE SIDE ON WHICH TRAFFIC IS TO PASS THE OBSTRUCTION.

**MSKT
(ROAD SYSTEMS INC.)**



NOTES:
THIS IS A PROPRIETARY ITEM AS PER SPEC. 1703.

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

ALL TERMINAL RAIL MUST BE STRAIGHT. CURVED TERMINAL RAIL IS NOT ALLOWED.
ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS, AND BEARING PLATES SHALL BE GALVANIZED PER MNDOT SPEC. 3392.
POSTS 1 AND 2 ARE PROPRIETARY HINGED POSTS.
THE RAIL IS DESIGNED TO EXIT THE IMPACT HEAD ON THE BACK SIDE OF THE TERMINAL.
END TERMINAL TO FOLLOW A STRAIGHT TAPER.

- PLACE STEEL I-BEAM POST DELINEATORS PER THE APPROVED PRODUCTS LIST ON THE TOP OF THE FIRST FIVE I-BEAM POSTS OF UPSTREAM TERMINAL AND THE LAST FIVE I-BEAM POSTS OF DOWNSTREAM TERMINAL. ATTACH USING ADHESIVE (PER MANUFACTURER RECOMMENDATION). THE RETROREFLECTIVE SHEETING SHALL FACE TRAFFIC AND MATCH THE COLOR OF THE ADJACENT EDGE LINE.
- ① LESSER OFFSET ALLOWED WITH APPROVAL OF THE ENGINEER.
 - ② SEE STANDARD PLAN 5-297.601.
 - ③ 8" BLOCKOUTS ARE ACCEPTABLE.
 - ④ 18" X 18" OBJECT MARKER (OM3-R OR OM3-L) PER MNDOT STANDARD SIGNS AND MARKINGS MANUAL. ALTERNATING STRIPES SHALL BE SLOPED DOWN TOWARD THE SIDE ON WHICH TRAFFIC IS TO PASS THE OBSTRUCTION.

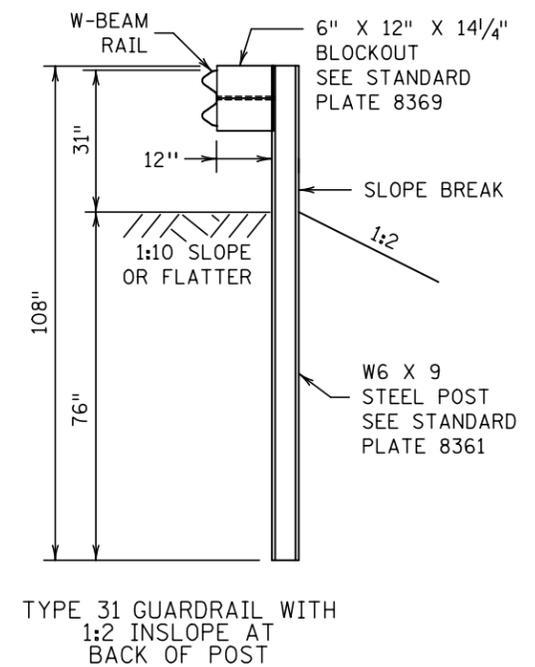
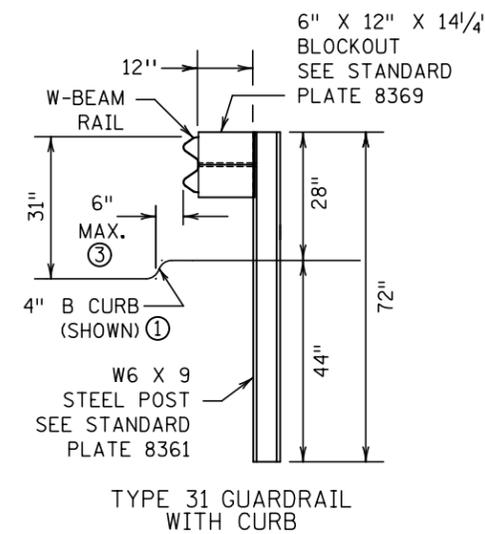
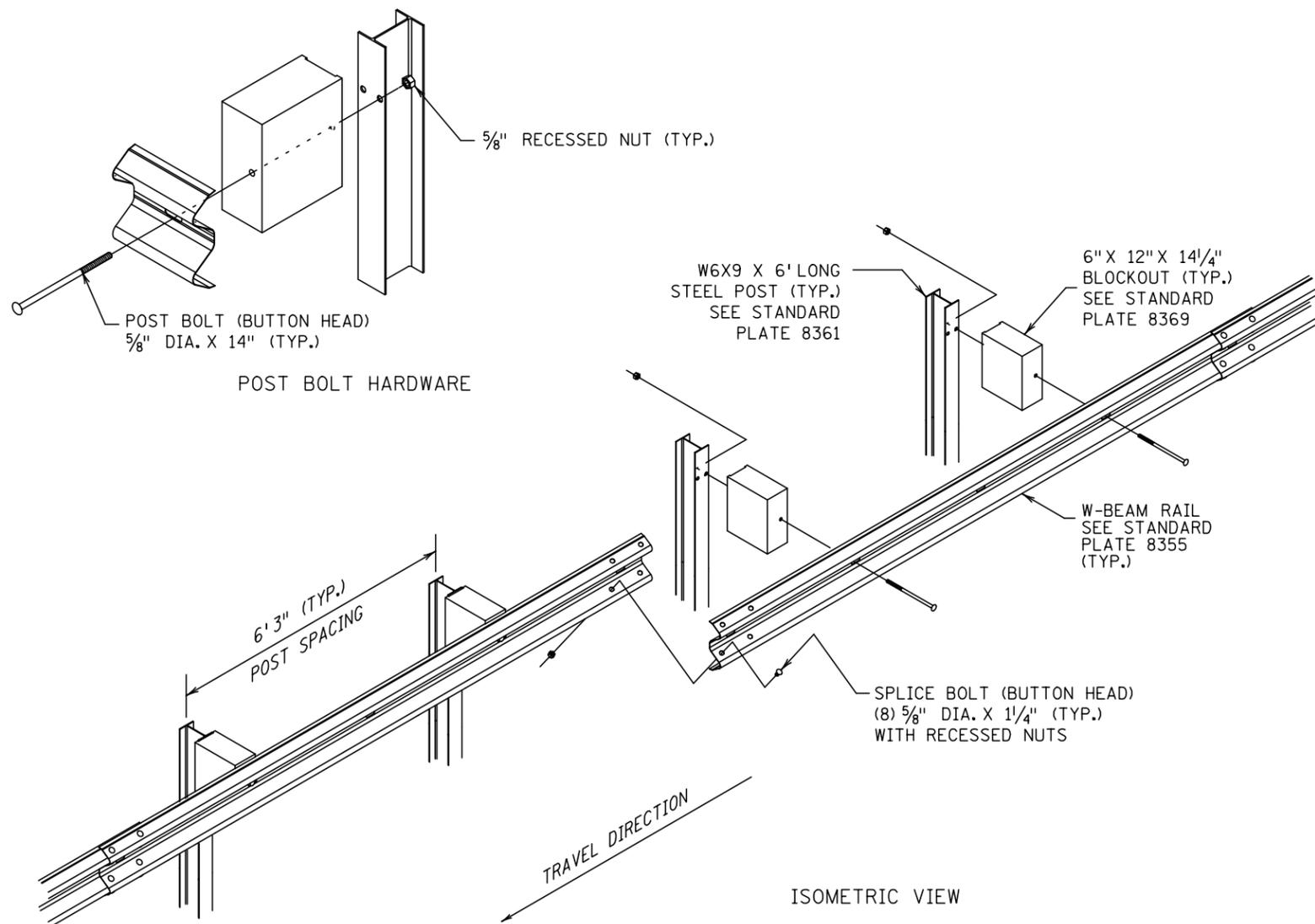
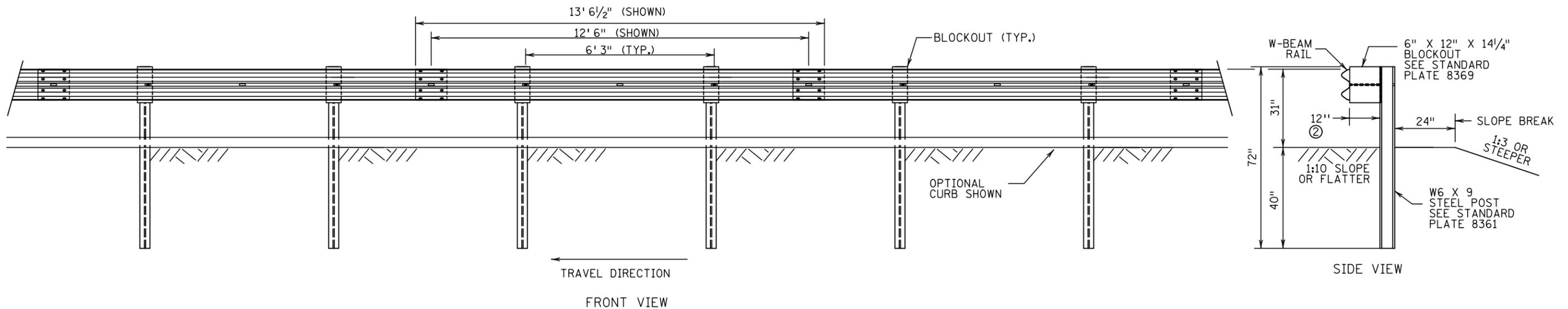
REVISION:
APPROVED: 11-02-2021
Nancy Yoo
NANCY YOO
DESIGN SUPPORT DIRECTOR
OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

	STANDARD PLAN 5-297.612	1 OF 1
	 THOMAS STYRBICKI STATE DESIGN ENGINEER	APPROVED: 11-02-2021 REVISED:

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

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059 SHEET NO. 32 OF 59 SHEETS

DISTRICT # 1
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- NOTES:
- GUARDRAIL IS PLACED ON SLOPES 1:10 OR FLATTER WITH SLOPE EXTENDING A MINIMUM 24" BEHIND POST TO SLOPE BREAK POINT.
 - ALL RAIL AND HARDWARE COMPONENTS IN ACCORDANCE WITH AASHTO SPEC. M 180
 - ① 4" B CURB OR D CURB ACCEPTABLE.
 - ② MAXIMUM OF 24" MAY BE USED WHERE UNDERGROUND POST OBSTRUCTIONS ARE ENCOUNTERED.
 - ③ 0" TO 6" MAXIMUM.

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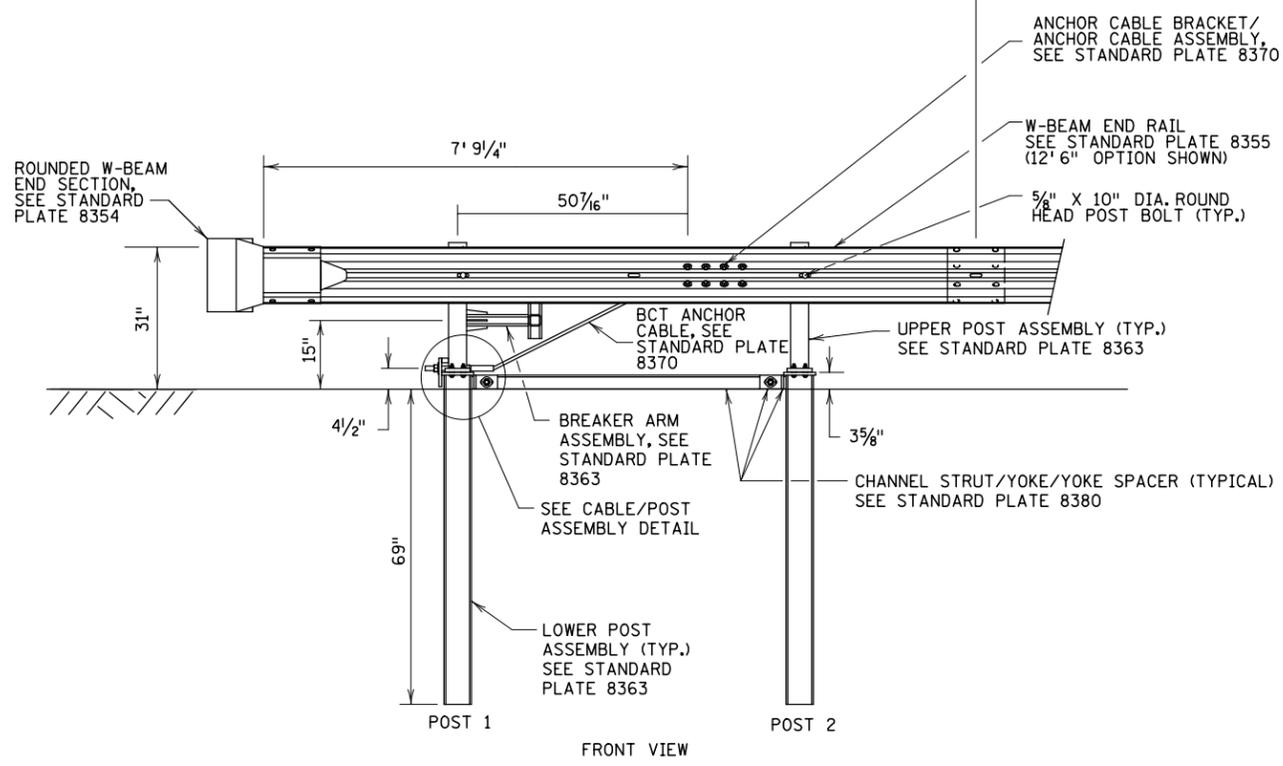
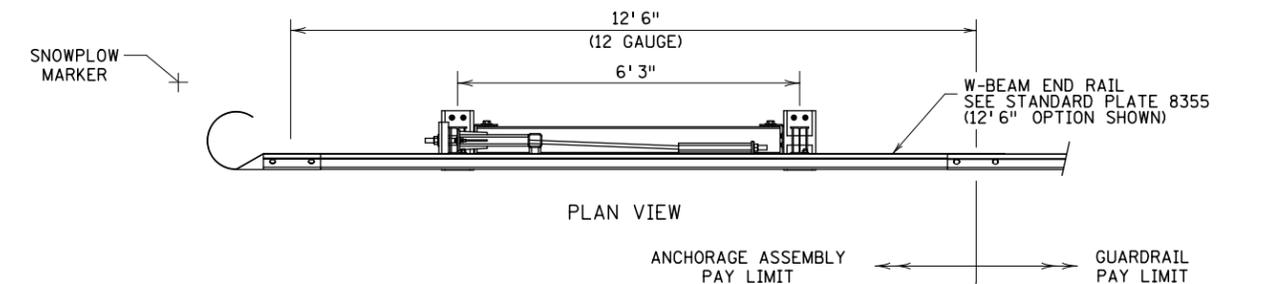
LEAD EXPERT OFFICE

NANCY YOO
 DESIGN SUPPORT DIRECTOR
 OFFICE OF PROJECT MANAGEMENT
 & TECHNICAL SUPPORT

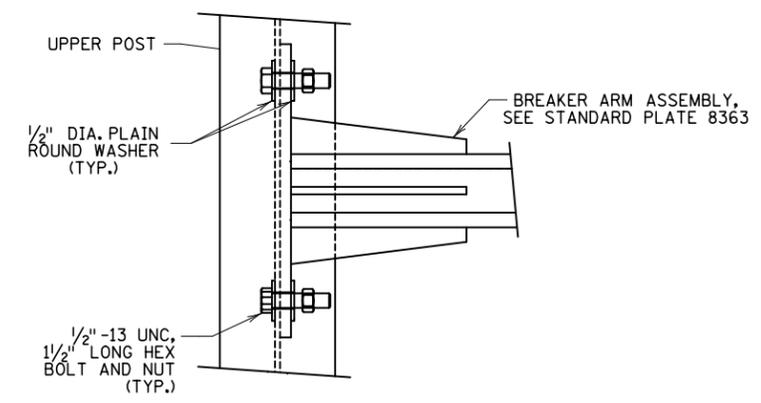
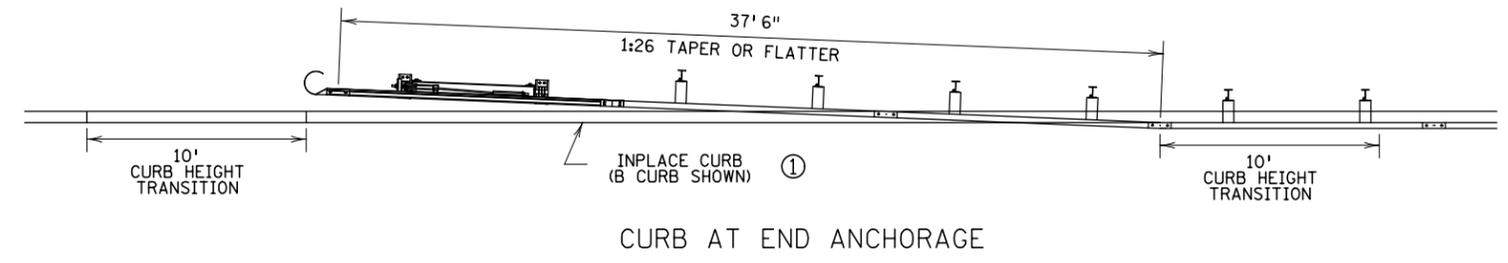
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	APPROVED: 07-05-2022 REVISED:	
THOMAS STYRBICKI STATE DESIGN ENGINEER	S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059	

TRAFFIC BARRIER TYPE 31 ASSEMBLY DETAILS

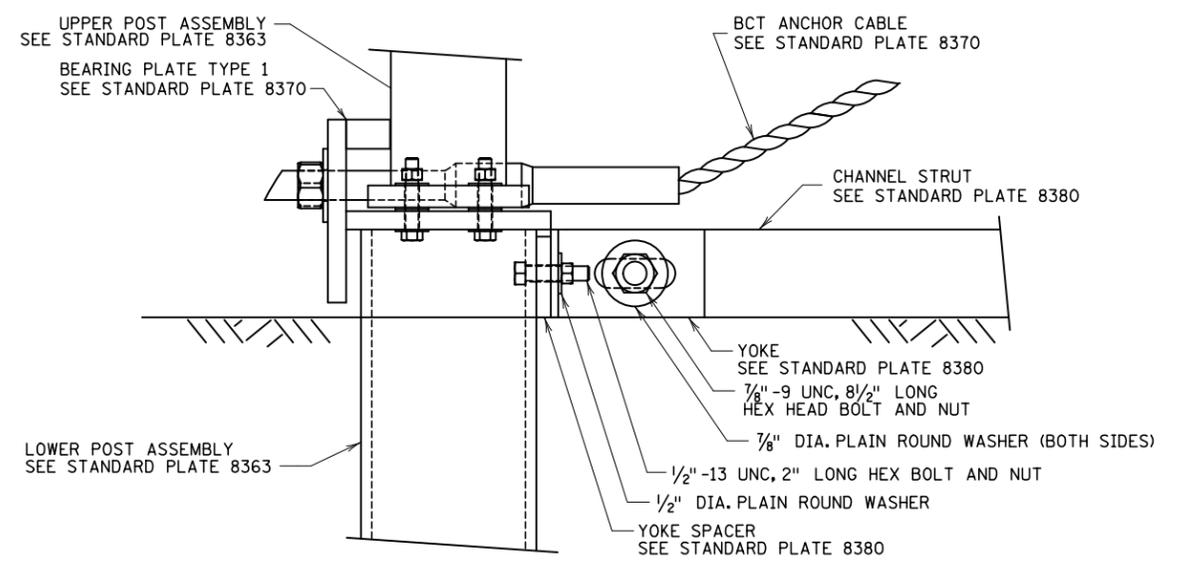
SHEET NO. 33 OF 59 SHEETS



END RAIL DETAIL



BREAKER ARM ASSEMBLY CONNECTION AT POST



POST 1 CABLE/YOKE ASSEMBLY

NOTES:
 ALL RAIL AND HARDWARE COMPONENTS IN ACCORDANCE WITH AASHTO SPEC. M 180.
 ① WHERE INPLACE CURB HEIGHT IS GREATER THAN 4" MILL TO 3" HEIGHT (INCIDENTAL). PROVIDE 10' CURB HEIGHT TRANSITIONS AS SHOWN.

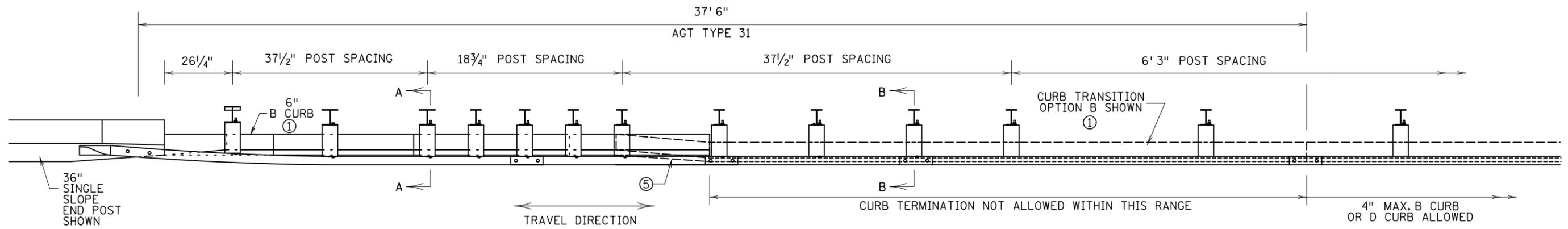
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 NANCY YOO
 DESIGN SUPPORT DIRECTOR
 OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

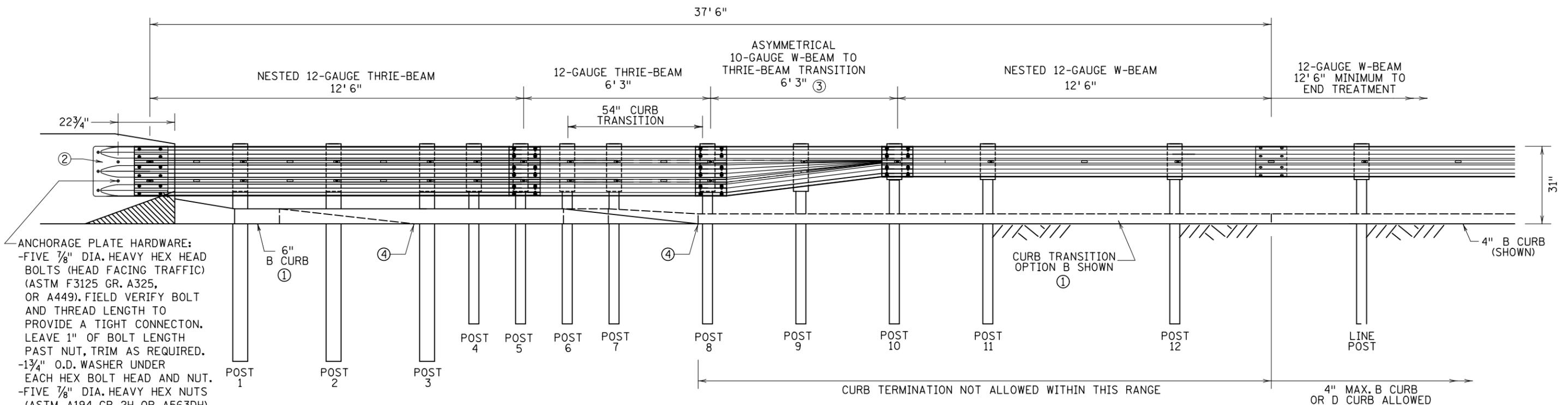
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 MINNESOTA
 DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.692
 1 OF 1
 APPROVED: 02-09-2023
 REVISED:
 THOMAS STYRBICKI
 STATE DESIGN ENGINEER

TRAFFIC BARRIER TYPE 31 END ANCHORAGE
 ASSEMBLY DETAILS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059 SHEET NO. 34 OF 59 SHEETS

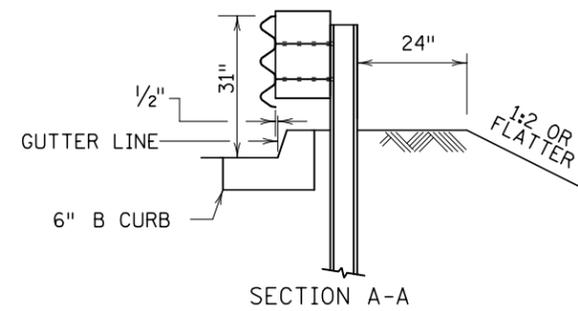


PLAN VIEW

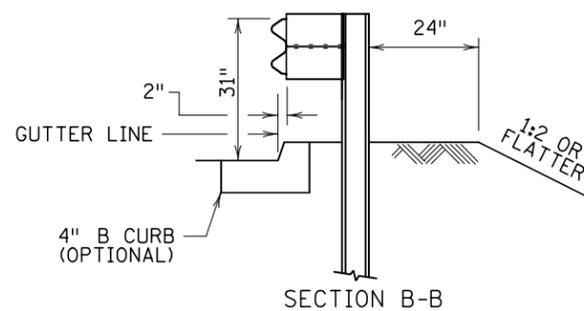


FRONT VIEW

ANCHORAGE PLATE HARDWARE:
 -FIVE 7/8" DIA. HEAVY HEX HEAD BOLTS (HEAD FACING TRAFFIC) (ASTM F3125 GR. A325, OR A449). FIELD VERIFY BOLT AND THREAD LENGTH TO PROVIDE A TIGHT CONNECTION. LEAVE 1" OF BOLT LENGTH PAST NUT, TRIM AS REQUIRED.
 -1 3/4" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
 -FIVE 7/8" DIA. HEAVY HEX NUTS (ASTM A194 GR. 2H OR A563DH).
 -ALL HARDWARE GALVANIZED PER ASTM A153 AND A780.



SECTION A-A



SECTION B-B

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

NOTES:

- APPROACH GUARDRAIL TRANSITION SHALL BE USED ON THE APPROACH SIDE, AND SHALL BE USED ON THE DEPARTING/TRAILING END IF GUARDRAIL IS NEEDED. GUARDRAIL BEAM AND HARDWARE IN ACCORDANCE WITH AASHTO SPEC. M 180. REFER TO APPROACH PANEL PLANS FOR LOCATION OF E8 JOINT.
- ① SEE CURB DETAILS ON SHEET 2 OF 3.
- ② THRIE-BEAM ANCHORAGE PLATE (STANDARD PLATE 8350) IS INCIDENTAL.
- ③ SEE STANDARD PLATE 8356.
- ④ CURB MAY BE TERMINATED AT THIS LOCATION, SEE CONSTRUCTION PLAN SHEETS FOR LOCATION. SEE CURB DETAILS ON SHEET 2 OF 3.
- ⑤ GUTTER LINE TAPERS 2 1/2" TO MATCH EXTENDED GUTTER LINE FROM BRIDGE.

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 & TECHNICAL SUPPORT



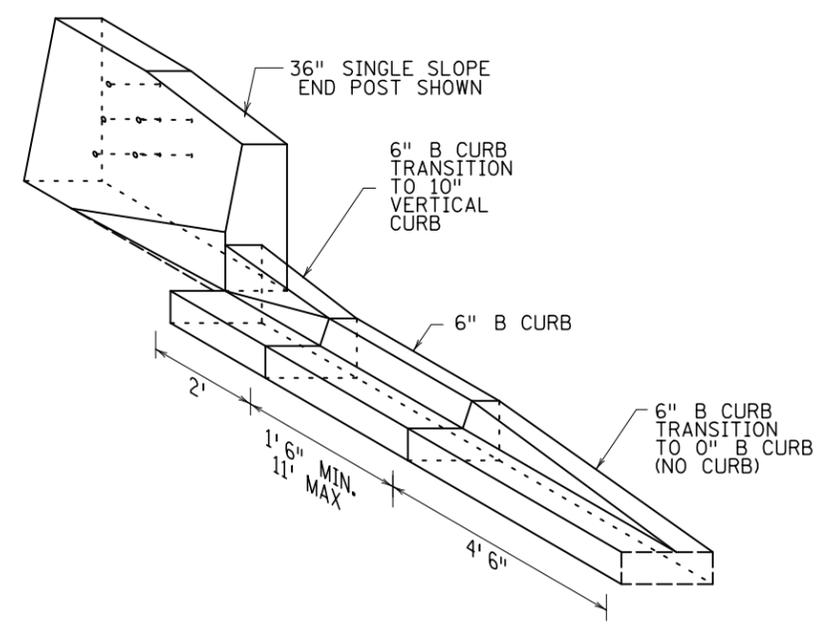
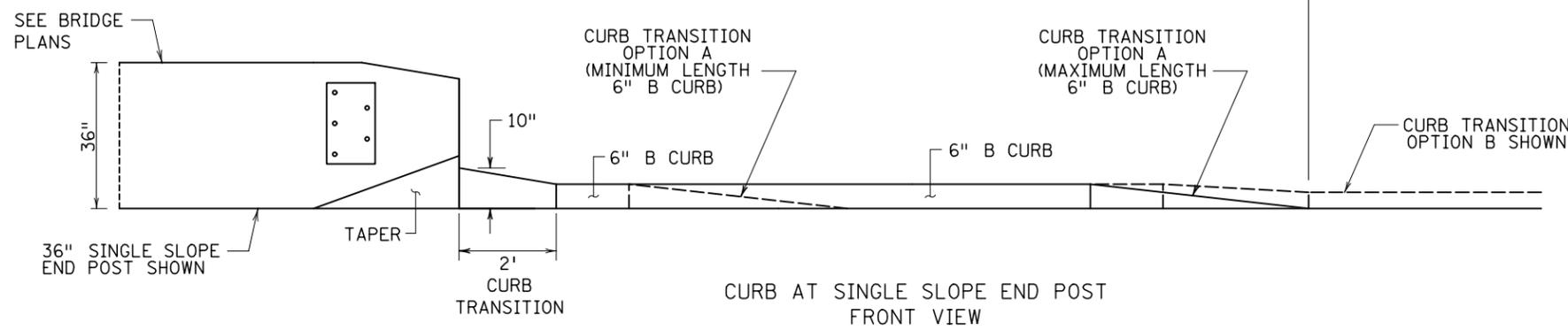
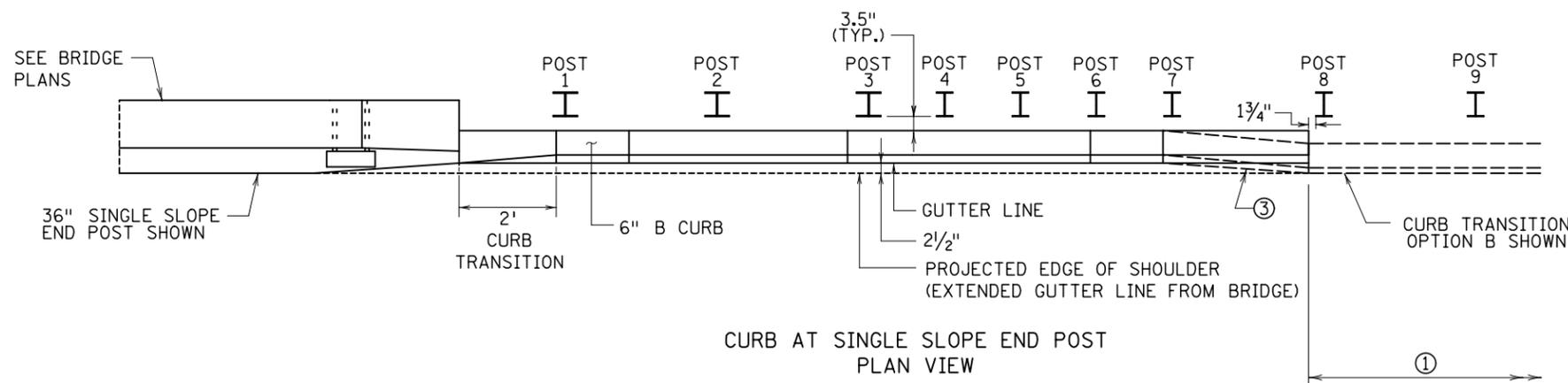
STANDARD PLAN 5-297.694

1 OF 3

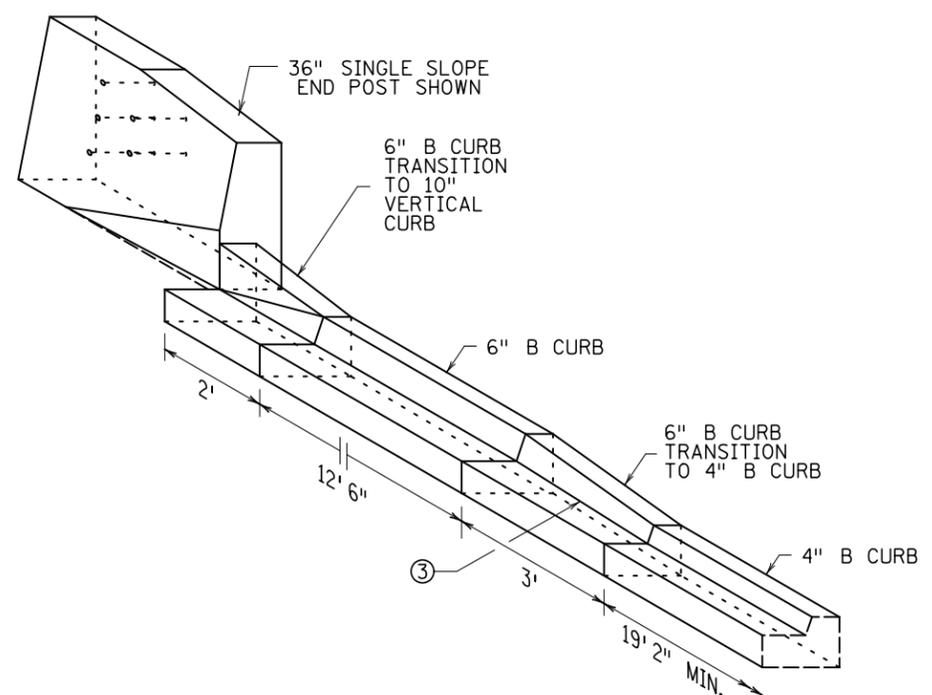
THOMAS STYRBIK
 STATE DESIGN ENGINEER

APPROVED: 07-05-2022
 REVISED:

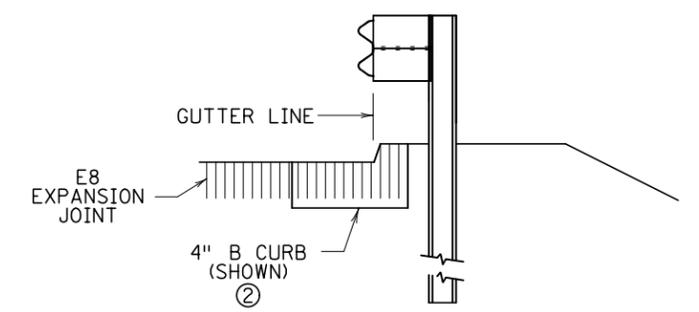
APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31
 AT SINGLE SLOPE END POST
 ASSEMBLY DETAILS



CURB TRANSITION - OPTION A
6" B CURB ONLY



CURB TRANSITION - OPTION B ①
6" WITH 4" B CURB



EXPANSION JOINT AT CURB

- NOTES:
- DESIGN B CURB REQUIRED WITH THIS SYSTEM.
 - DESIGN D CURB ALLOWED BEYOND THE 37'6" DISTANCE FROM THE RAIL CONNECTION AT THE THRIE-BEAM ANCHORAGE PLATE.
 - REFER TO APPROACH PANEL PLANS FOR LOCATION OF E8 JOINT.
 - ① CURB TERMINATION NOT ALLOWED BETWEEN POST 8 AND THE 37'6" DISTANCE FROM THE RAIL CONNECTION AT THE THRIE-BEAM ANCHORAGE PLATE. SEE SHEET 1 OF 3.
 - ② AT CURB CONTAINING E8 EXPANSION JOINT, PLACE BACK FACE OF GUARDRAIL AT THE GUTTER LINE.
 - ③ GUTTER LINE TAPERS 2 1/2" TO MATCH EXTENDED GUTTER LINE FROM BRIDGE.

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NANCY YOO
 DESIGN SUPPORT DIRECTOR
 OFFICE OF PROJECT MANAGEMENT
 & TECHNICAL SUPPORT

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 DEPARTMENT OF TRANSPORTATION

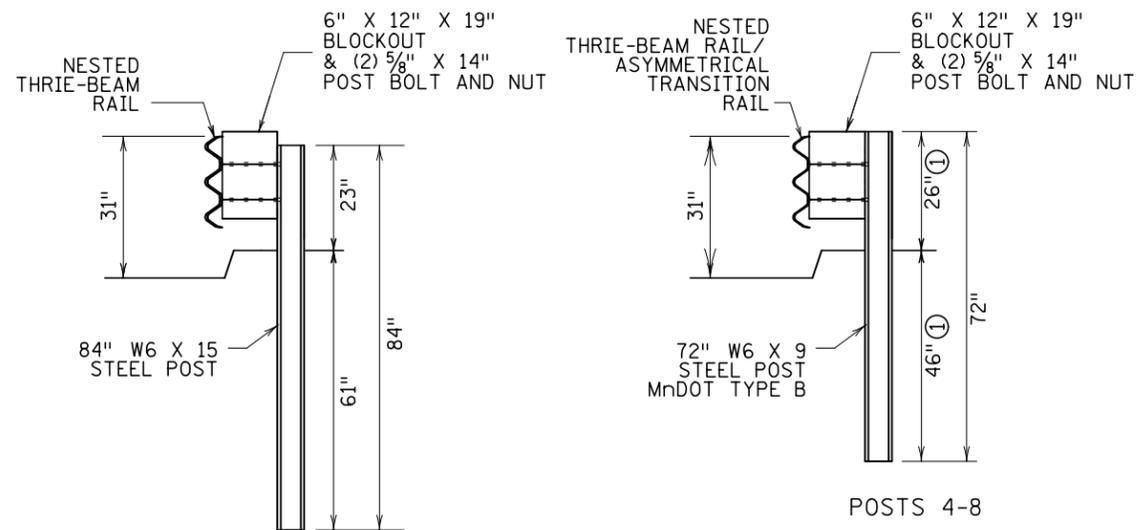
STANDARD PLAN 5-297.694 **2 OF 3**

APPROVED: 07-05-2022
 REVISED:

Tom Styrbicki
 THOMAS STYRBICKI
 STATE DESIGN ENGINEER

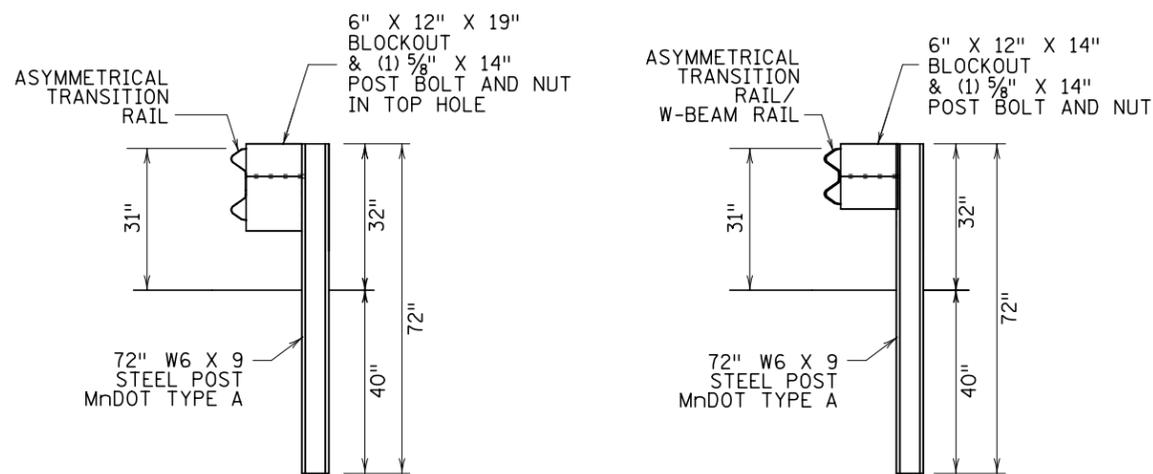
**APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31
 AT SINGLE SLOPE END POST
 CURB DETAILS**

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059 SHEET NO. 36 OF 59 SHEETS



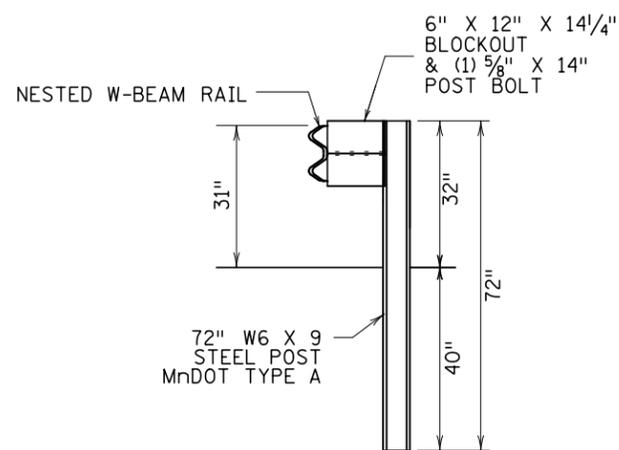
POSTS 1-3

POSTS 4-8



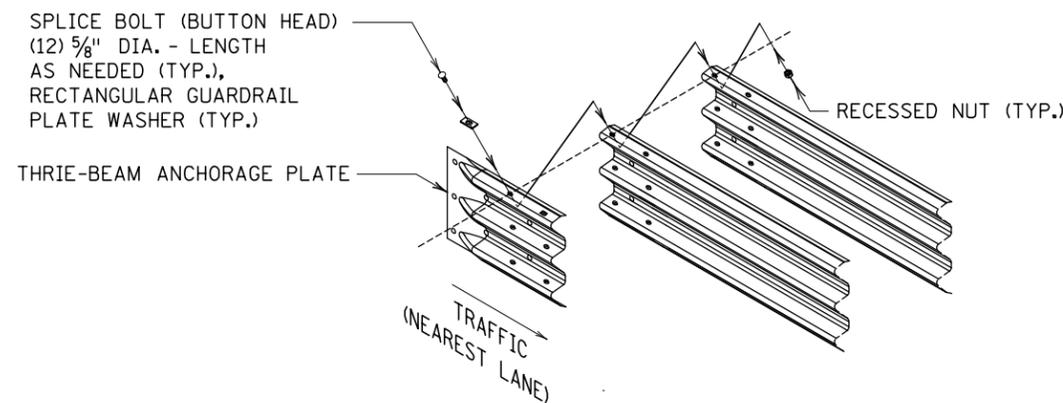
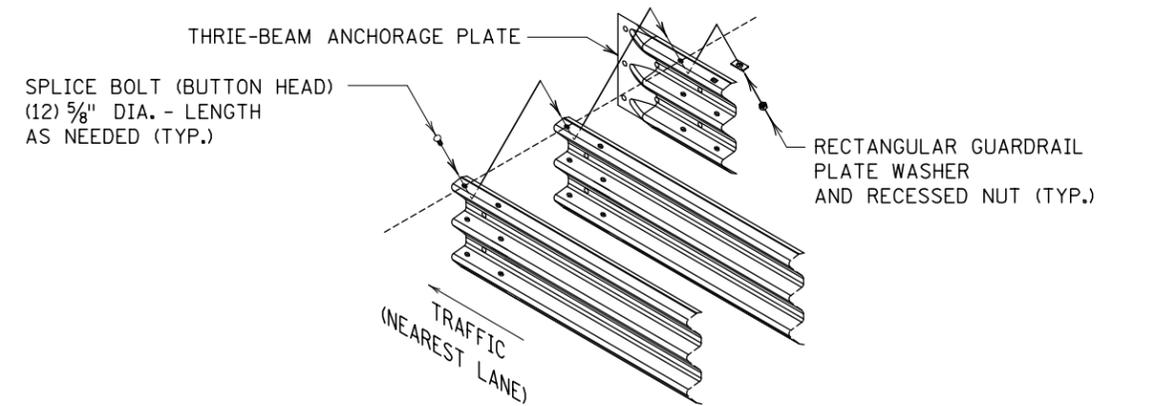
POST 9

POST 10

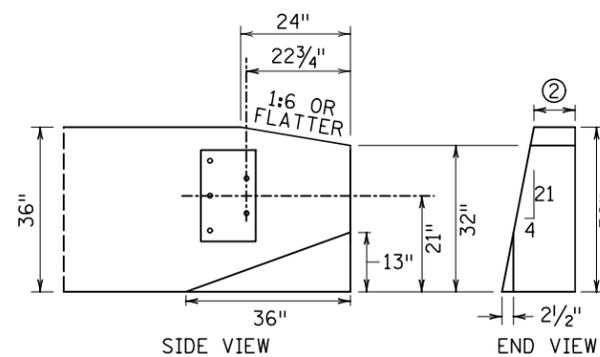


POSTS 11-12

AGT POST COMPONENTS

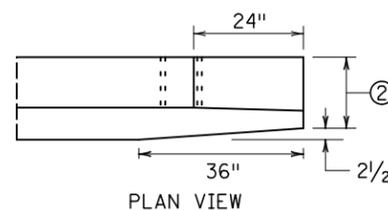


THRIE BEAM RAIL/ANCHORAGE PLATE SPLICE CONNECTION DETAIL ④



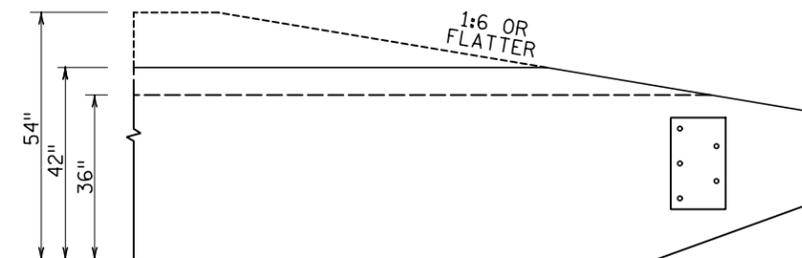
SIDE VIEW

END VIEW



PLAN VIEW

SINGLE SLOPE BARRIER ③ (36" HEIGHT SHOWN)



SINGLE SLOPE BARRIER HEIGHT OPTIONS

- NOTES:
- FOR GUARDRAIL STEEL POSTS, SEE STANDARD PLATE 8361.
 - FOR GUARDRAIL BLOCKOUTS, SEE STANDARD PLATE 8369.
 - GUARDRAIL BEAM AND HARDWARE IN ACCORDANCE WITH AASHTO SPEC. M 180.
 - ① DIMENSIONS APPLICABLE FOR POSTS 4-5. DIMENSIONS VARY AT POSTS 4-6 WHERE CURB HEIGHT TRANSITIONS TO NO HEIGHT.
 - ② SEE BRIDGE PLAN.
 - ③ 36" HEIGHT SHOWN.
 - ④ DRILL THRIE-BEAM ANCHORAGE PLATE AS NEEDED FOR FIT, REPAIR GALVANIZED COATINGS IN ACCORDANCE WITH ASTM SPEC. A780.

DISTRICT # 1
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NANCY YOO
 DESIGN SUPPORT DIRECTOR
 OFFICE OF PROJECT MANAGEMENT
 & TECHNICAL SUPPORT



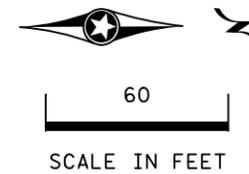
STANDARD PLAN 5-297.694

3 OF 3

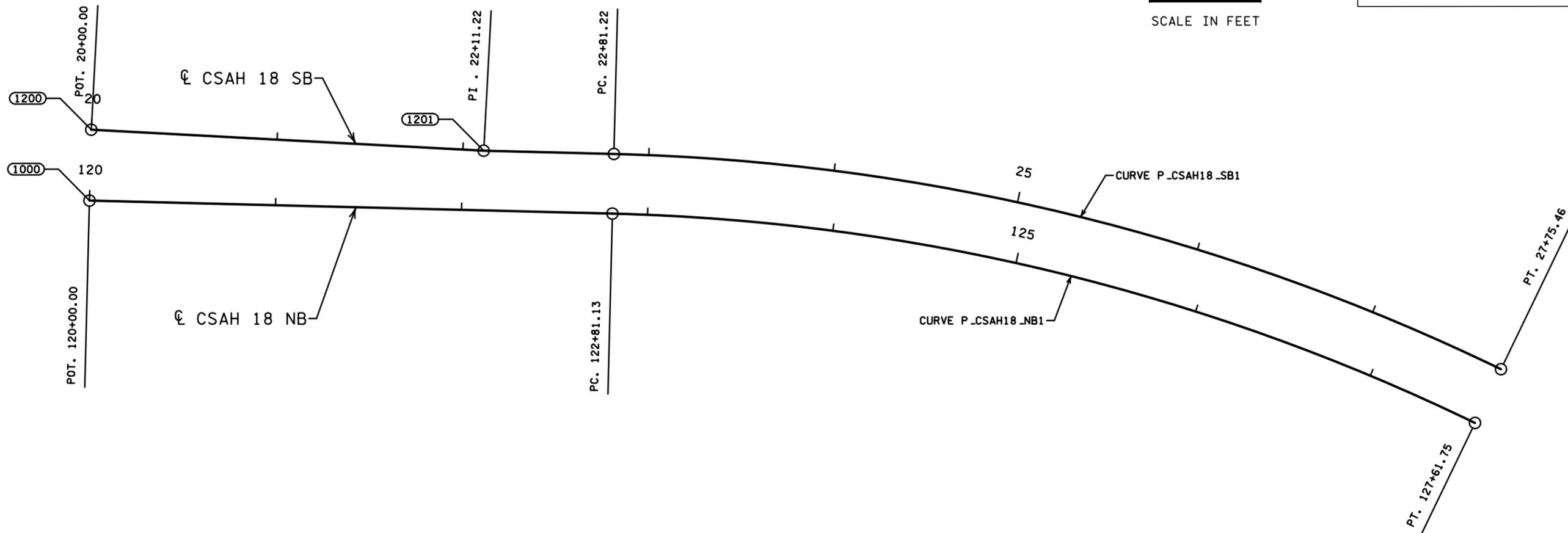
THOMAS STYRBICKI
 STATE DESIGN ENGINEER

APPROVED: 07-05-2022
 REVISED:

APPROACH GUARDRAIL TRANSITION (AGT) TYPE 31
AT SINGLE SLOPE END POST
MISCELLANEOUS AND COMPONENT DETAILS



LEGEND	
POINT NUMBER	XXXX
CURVE NAME	CURVE XXXX



ALIGNMENT TABULATION										
POINT / CURVE NUMBER	POINT DESC.	STATION	CURVE DATA					COORDINATES		AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	
CSAH 18 NB (P_CSAH18_NB)										
1000	POT	120+00.000						483,031.8903	160,133.4094	
	PC	122+81.129						483,038.8798	160,414.4515	1° 25' 28.80"
P_CSAH18_NB1	PI	125+25.134	24° 22' 43.47" RT	5° 04' 20.31"	1,129.580'	244.005'	480.624'	483,044.9464	160,658.3806	PI
	CC							484,168.1107	160,386.3673	
	PT	127+61.753						483,151.1578	160,878.0561	25° 48' 12.27"

CSAH 18 SB (P_CSAH18_SB)										
1200	POT	20+00.000						482,993.8697	160,134.3542	
1201	POT	22+11.216						483,005.1493	160,345.2688	
	PC	22+81.216						483,006.8897	160,415.2471	1° 25' 28.80"
P_CSAH18_SB1	PI	25+32.133	24° 22' 43.47" RT	4° 55' 57.26"	1,161.580'	250.917'	494.240'	483,013.1282	160,666.0865	PI
	CC							484,168.1107	160,386.3673	
	PT	27+75.456						483,122.3485	160,891.9852	25° 48' 12.27"

HORIZONTAL CONTROL
 COORDINATES SHOWN IN THIS PLAN ARE BASED ON ANOKA COUNTY COORDINATE SYSTEM, USING NAD 1983 (HARN 1996 ADJUSTMENT) DATUM.

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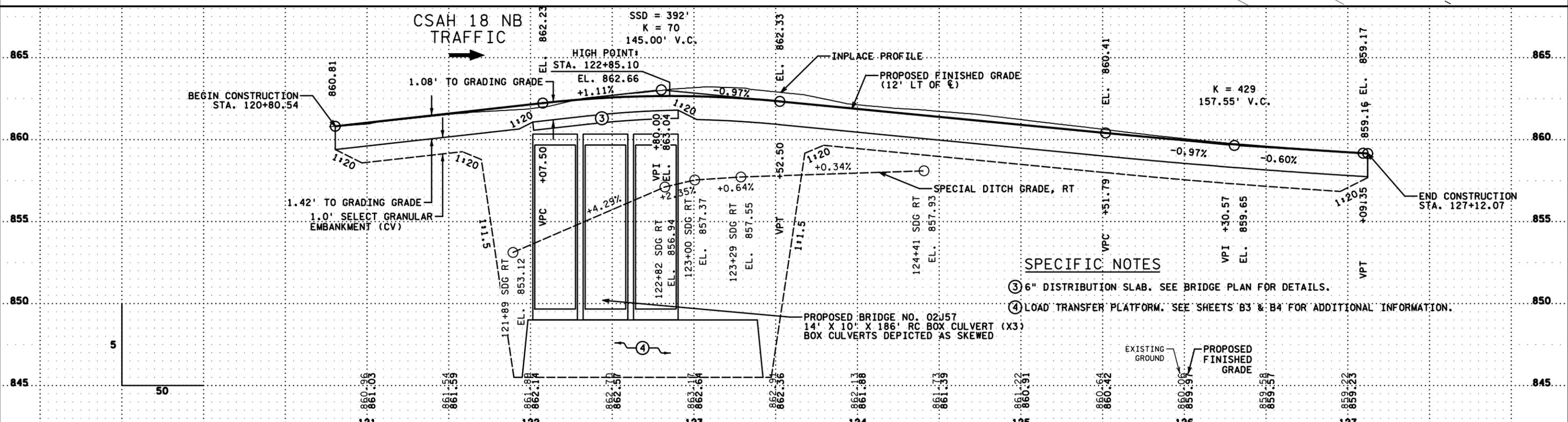
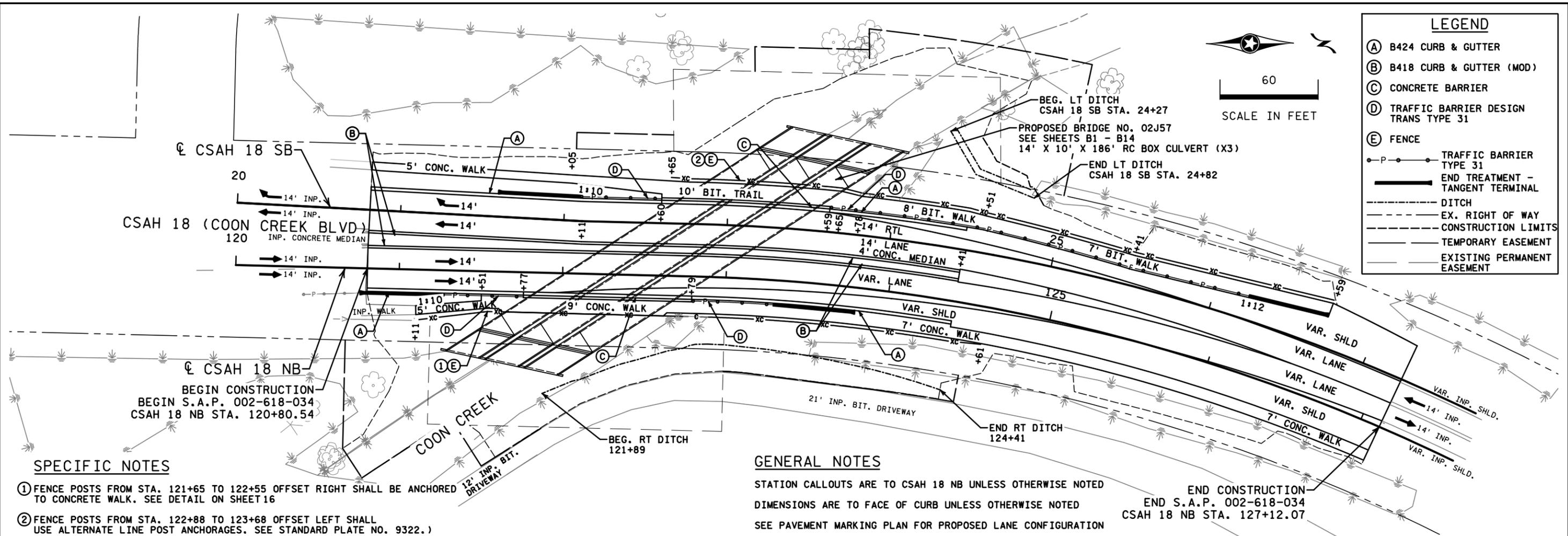
NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 NAME: JACOB C. NICHOLS LIC. NO. 60631
 CERTIFIED BY: Jacob Nichols 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB



ALIGNMENT PLAN & TABULATION
 SHEET NO. 38 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059



NO	DATE	BY	CKD	APPR	REVISION

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CERTIFIED BY: Jacob Nichols 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB

HR
ANOCA COUNTY

CONSTRUCTION PLAN & PROFILE
 SHEET NO. 39 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

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LEGEND
 SUPERELEVATION TRANSITION
 ALL CROSS SLOPES ARE
 SHOWN IN FT/FT
 TRANSITION RATES ARE AT 1:200
 UNLESS OTHERWISE NOTED



60
 SCALE IN FEET

☉ CSAH 18 SB
 20

120

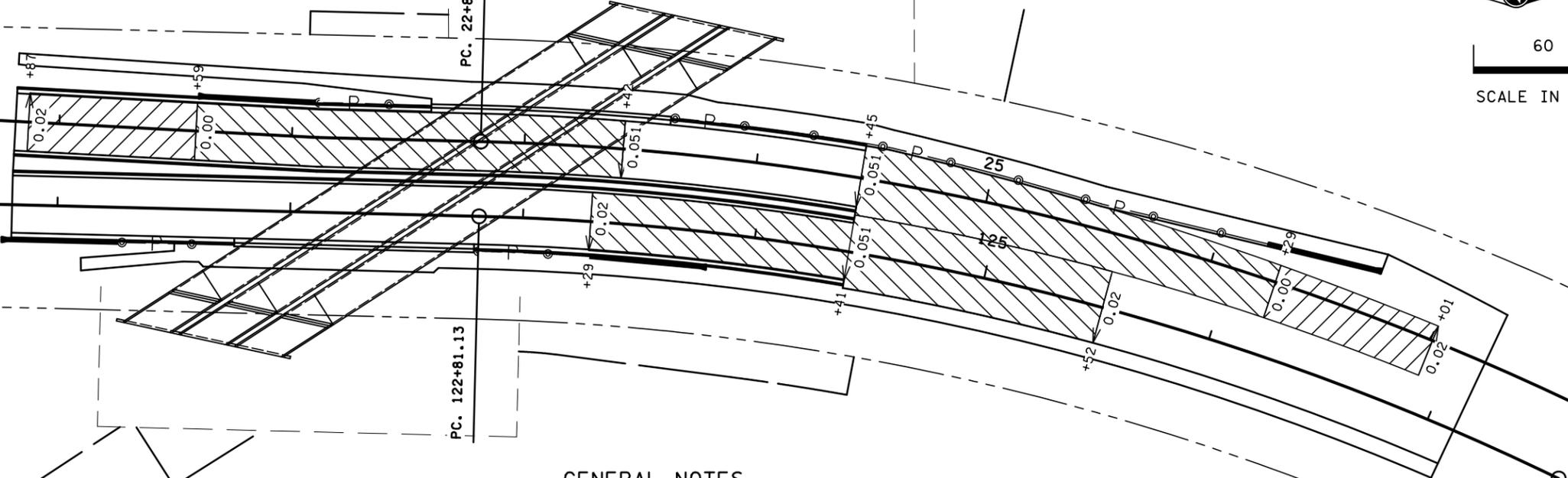
☉ CSAH 18 NB

PC. 22+81.22

PC. 122+81.13

PT. 27+75.46

PT. 127+61.75



GENERAL NOTES

PARTIAL STATIONS ARE TO ADJACENT ALIGNMENT
 UNLESS OTHERWISE NOTED

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 NAME: JACOB C. NICHOLS LIC. NO. 60631
 CERTIFIED BY: Jacob Nichols 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB



SUPERELEVATION PLAN
 SHEET NO. 41 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

STAGE 1

☉ CSAH 18 SB

CSAH 18 (COON CREEK BLVD)
120

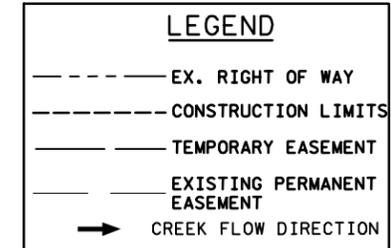
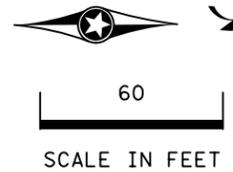
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COON CREEK

BOX CULVERT #2
14' X 10' X 186'
AND TWO END SECTIONS

BOX CULVERT #1
14' X 10' X 186'
AND TWO END SECTIONS

PROTECT BANK



BOX CULVERT STAGING NARRATIVE

STAGE 1

- PLACE TEMPORARY STREAM DIVERSION SYSTEM.
- CONSTRUCT PORTION OF LOAD TRANSFER PLATFORM AND BOX CULVERTS #1 AND #2.

STAGE 2

- DIVERT STREAM INTO BOX CULVERT #1.
- CONSTRUCT REMAINDER OF LOAD TRANSFER PLATFORM AND BOX CULVERT #3.

GENERAL NOTES

- THIS STAGING NARRATIVE IS AN EXAMPLE OF STREAM DIVERSION DETAILS TO BE USED FOR THE REMOVAL OF EXISTING BRIDGE 02549 AND THE INSTALLATION OF BRIDGE 02J57.

- SITE PLAN DESIGNED BY A CERTIFIED ENGINEER IS REQUIRED TO BE SUBMITTED BY THE CONTRACTOR PER MNDOT SPEC 1717 FOR ENGINEER APPROVAL. ACCEPTED CONTRACTOR SITE PLAN SHALL BECOME PART OF THE PROJECT SWPPP.

- PAYMENT SHALL BE COMPENSATION IN FULL FOR ALL COSTS ASSOCIATED WITH THE EXCAVATION, MATERIALS, INSTALLATION, STOCKPILE PERIMETER CONTROL AND TURF ESTABLISHMENT, TRENCH DEWATERING SYSTEM, TEMPORARY SHEET PILE, EROSION PREVENTION AND SEDIMENT CONTROL, MAINTENANCE, REMOVAL AND BACKFILL OF ANY TEMPORARY STREAM DIVERSION SYSTEM AND PAID AS LUMP SUM UNDER ITEM 2105 TEMPORARY STREAM DIVERSION SYSTEM.

- USE TEMPORARY CONSTRUCTION AS NEEDED TO CONSTRUCT LOAD TRANSFER PLATFORM AND BOX CULVERTS UNDER DRY CONDITIONS.
- TEMPORARY STREAM DIVERSION METHODS ARE SUBJECT TO APPROVAL BY THE ENGINEER.

COON CREEK NOTES

- THE 2 YEAR FLOW IS 390 CFS.

STAGE 2

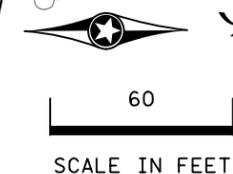
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CSAH 18 (COON CREEK BLVD)
120

☉ CSAH 18 NB

COON CREEK

BOX CULVERT #3
14' X 10' X 186'
AND TWO END SECTIONS



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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.

NAME: GINA E. BEERS LIC. NO. 56150
CERTIFIED BY: [Signature] 3/3/2023
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
DESIGNED BY: JCN
CHECKED BY: GEB



STREAM DIVERSION STAGING PLAN

SHEET NO. 42 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

NO	DATE	BY	CKD	APPR	REVISION

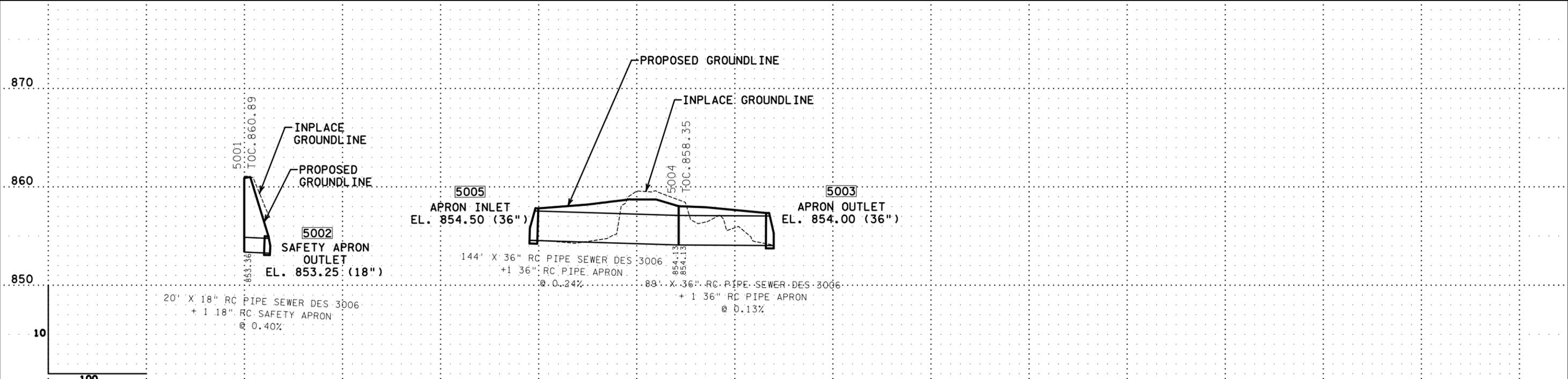
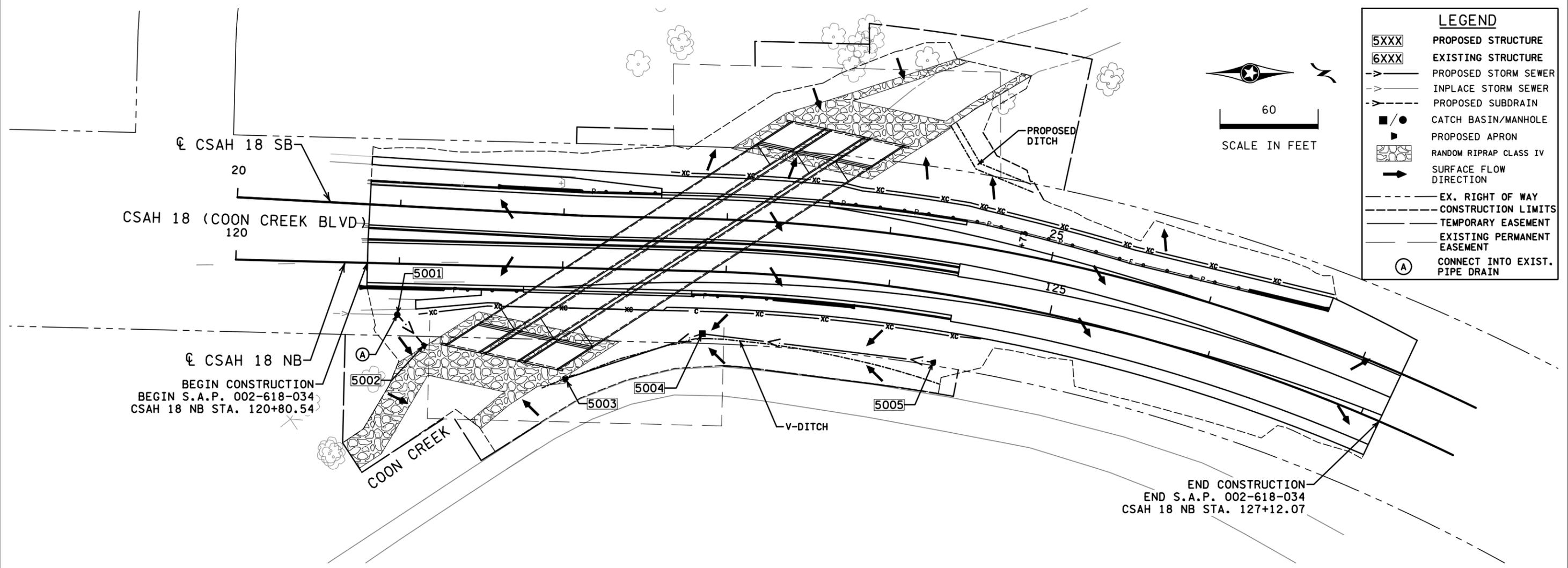
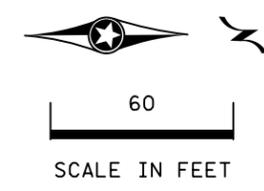
CSAH 18 (COON CREEK BLVD)
120

CSAH 18 NB
BEGIN CONSTRUCTION
BEGIN S.A.P. 002-618-034
CSAH 18 NB STA. 120+80.54

END CONSTRUCTION
END S.A.P. 002-618-034
CSAH 18 NB STA. 127+12.07

LEGEND

- 5XXX PROPOSED STRUCTURE
- 6XXX EXISTING STRUCTURE
- > PROPOSED STORM SEWER
- > INPLACE STORM SEWER
- > PROPOSED SUBDRAIN
- /● CATCH BASIN/MANHOLE
- ▴ PROPOSED APRON
- ◻ RANDOM RIPRAP CLASS IV
- SURFACE FLOW DIRECTION
- - - EX. RIGHT OF WAY
- - - CONSTRUCTION LIMITS
- - - TEMPORARY EASEMENT
- - - EXISTING PERMANENT EASEMENT
- (A) CONNECT INTO EXIST. PIPE DRAIN



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NO	DATE	BY	CKD	APPR	REVISION

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

NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: Brett Voth 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: CMK
 DESIGNED BY: CMK
 CHECKED BY: GEB

HDR
ANOKA COUNTY

DRAINAGE PLAN & PROFILE

SHEET NO. 43 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE

PROJECT DESCRIPTION/LOCATION

THE PROJECT IS LOCATED ON COUNTY STATE AID HIGHWAY (CSAH) 18 (COON CREEK BLVD) IN THE CITY OF COON RAPIDS, ANOKA COUNTY, MINNESOTA. THE PROJECT INVOLVES THE RECONSTRUCTION OF CSAH 18 FROM JUST NORTH OF 128TH AVENUE NW TO JUST NORTH OF COON CREEK. RECEIVING WATERS FOR STORMWATER FROM THIS PROJECT INCLUDE COON CREEK WHICH IS ON THE SOUTH END OF THE PROJECT.

ENVIRONMENTAL FEATURES

THIS PROJECT IS NOT LOCATED IN A DRINKING WATER SUPPLY MANAGEMENT AREA.

THIS PROJECT IS NOT LOCATED IN A WELLHEAD PROTECTION AREA.

THERE ARE NO KARST FEATURES IN THE PROJECT LIMITS.

SPECIAL AND IMPAIRED WATERS

COON CREEK (AUID 07010206-530) IS LOCATED WITHIN THE LIMITS OF THE PROJECT AND IS IMPAIRED FOR AQUATIC MACROINVERTEBRATE BIOASSESSMENTS AND E. COLI. DUE TO THE PROXIMITY TO COON CREEK AND THE AQUATIC MACROINVERTEBRATE BIOASSESSMENTS IMPAIRMENT, THE BMPS DESCRIBED IN LINES 23.9 AND 23.10 OF THE NPDES PERMIT WILL BE APPLIED TO THIS PROJECT. THOSE BMPS REQUIRE STABILIZATION OF EXPOSED SOILS WITHIN SEVEN (7) CALENDAR DAYS OF CONSTRUCTION ENDING IN THAT PORTION OF THE SITE, AND A TEMPORARY SEDIMENT BASIN FOR COMMON DRAINAGE AREAS THAT SERVE AN AREA WITH FIVE (5) OR MORE ACRES DISTURBED AT ONE TIME.

SOIL INFORMATION

ACCORDING TO THE NRCS WEB SOIL SURVEY, SOILS IN THE PROJECT AREA PRIMARILY CONSIST OF FINE SANDS OR SANDY LOAMS. A GEOTECHNICAL EVALUATION WAS PERFORMED IN FEBRUARY 2021. SOIL BORINGS INDICATE THAT THE PROJECT AREA CONSISTS OF POORLY GRADED SAND WITH SILT, ORGANIC SILT, AND POORLY GRADED SAND.

LAND FEATURES

TOTAL DISTURBED AREA = 1.99 ACRES
 EXISTING IMPERVIOUS SURFACE AREA = 1.08 ACRES
 EXISTING PERVIOUS SURFACE AREA = 0.92 ACRES
 PROPOSED IMPERVIOUS SURFACE AREA = 1.10 ACRES
 PROPOSED PERVIOUS SURFACE AREA = 0.89 ACRES
 NEW IMPERVIOUS SURFACE AREA = 0.02 ACRES

LONG TERM OPERATION AND MAINTENANCE

ANOKA COUNTY WILL BE RESPONSIBLE FOR THE LONG TERM OPERATION AND MAINTENANCE OF THE PERMANENT STORMWATER MANAGEMENT SYSTEM.

1440 BUNKER LAKE BOULEVARD
 ANDOVER, MN 55304
 PHONE: 763-324-3100

PROJECT PERSONNEL AND TRAINING

THIS SWPPP WAS PREPARED BY PERSONNEL THAT ARE CERTIFIED IN THE DESIGN OF CONSTRUCTION SWPPPS. COPIES OF THE CERTIFICATIONS ARE ON FILE WITH MNDOT AND ARE AVAILABLE UPON REQUEST.

PROVIDE A CERTIFIED EROSION CONTROL SUPERVISOR IN GOOD STANDING WHO IS KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES. THE EROSION CONTROL SUPERVISOR WILL WORK WITH THE PROJECT ENGINEER TO OVERSEE THE IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION (NOT) HAS BEEN FILED WITH THE MPCA. PROVIDE PROOF OF CERTIFICATION AT THE PRECONSTRUCTION MEETING. WORK WILL NOT BE ALLOWED TO COMMENCE UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT ENGINEER.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A CERTIFIED EROSION CONTROL SUPERVISOR THAT IS RESPONSIBLE FOR OVERSEEING THE IMPLEMENTATION OF THE SWPPP. THE CONTRACTOR MUST PROVIDE PROOF OF CERTIFICATION AT THE PRECONSTRUCTION MEETING AND WILL NOT BE ALLOWED TO COMMENCE WORK UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT MANAGER.

THE EROSION CONTROL SUPERVISOR IS INCIDENTAL.

PROVIDE AT LEAST ONE CERTIFIED INSTALLER FOR EACH CONTRACTOR OR SUBCONTRACTOR THAT PLACES THE PRODUCTS LISTED IN SPECIFICATION SECTION 2573.3.A.2. PROVIDE PROOF OF CERTIFICATION AT THE PRECONSTRUCTION MEETING. WORK WILL NOT BE ALLOWED TO COMMENCE UNTIL PROOF OF CERTIFICATION HAS BEEN PROVIDED TO THE PROJECT ENGINEER.

PROJECT CONTACTS

THE PROJECT ENGINEER AND CONTRACTOR ARE RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND INSTALLATION, INSPECTION AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPS BEFORE, DURING AND AFTER CONSTRUCTION UNTIL THE NOTICE OF TERMINATION HAS BEEN FILED. ANOKA COUNTY STAFF ARE ALSO AVAILABLE FOR TECHNICAL ASSISTANCE.

ORGANIZATION	CONTACT	PHONE
MPCA	BRANDON DAHL	651-757-2279
ANOKA COUNTY	CHRIS OSTERHUS	763-324-3100
CITY OF COON RAPIDS	TIM HIMMER	763-755-2880
COON CREEK WATERSHED DISTRICT	TIM KELLY	763-755-0975
HDR, INC.	BRETT VOTH	763-591-5400

LOCATION OF SWPPP REQUIREMENTS

THE REQUIRED SWPPP ELEMENTS MAY BE LOCATED IN MANY PLACES WITHIN THE PLAN SET AS WELL AS IN THE SPECIAL PROVISIONS, MNDOT SPEC BOOK (2020 EDITION) OR ON FILE WITH MNDOT. THE NOTES AND TABLE BELOW ARE INTENDED TO BE A QUICK REFERENCE FOR THE CONTRACTOR AND PROJECT ENGINEER TO USE IN THE FIELD. THERE MAY BE ADDITIONAL REQUIRED SWPPP ELEMENTS INCLUDED ON THE PROJECT THAT ARE NOT LISTED ON THIS SHEET.

DESCRIPTION	LOCATION
TEMPORARY EROSION CONTROL MEASURES	SHEET NO. 46
PERMANENT EROSION AND SEDIMENT CONTROL MEASURES	SHEET NO. 46
DIRECTION OF FLOW	SHEET NO. 43
FINAL STABILIZATION	SHEET NO. 46
DRAINAGE STRUCTURES	SHEET NO. 8
DRAINAGE TABULATIONS	SHEET NO. 8
STORM SEWER TABULATIONS	SHEET NO. 8
STORM SEWER PROFILE SHEETS	SHEET NO. 43
EROSION AND SEDIMENT CONTROL DETAILS	SHEETS NO. 17 - 25
EROSION CONTROL TABULATION	SHEET NO. 8
TURF ESTABLISHMENT TABULATION	SHEET NO. 8

SITE INSPECTION AND MAINTENANCE

INSPECT THE ENTIRE CONSTRUCTION SITE A MINIMUM OF ONCE EVERY SEVEN DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. INSPECT ALL TEMPORARY AND PERMANENT WATER QUALITY MANAGEMENT, EROSION PREVENTION AND SEDIMENT CONTROL BMPS UNTIL THE SITE HAS UNDERGONE FINAL STABILIZATION AND THE NOT HAS BEEN SUBMITTED. INSPECT CONSTRUCTION SITE VEHICLE EXIT LOCATIONS FOR EVIDENCE OF TRACKING ONTO PAVED SURFACES. INSPECT SURROUNDING PROPERTIES FOR EVIDENCE OF OFF SITE SEDIMENT ACCUMULATION. INSPECT FILTRATION AREAS FOR SIGNS OF SEDIMENT DEPOSITION AND COMPACTION (TO ENSURE THAT EQUIPMENT IS NOT BEING DRIVEN ACROSS THE AREA).

RECORD ALL INSPECTIONS AND MAINTENANCE ACTIVITIES IN WRITING WITHIN 24 HOURS. SUBMIT INSPECTION REPORTS IN A FORMAT THAT IS ACCEPTABLE TO THE PROJECT ENGINEER. INCLUDE THE FOLLOWING IN THE RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY:

- A. DATE AND TIME OF INSPECTIONS;
- B. NAME OF PERSONS CONDUCTING INSPECTIONS;
- C. FINDINGS OF INSPECTION, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS;
- D. CORRECTIVE ACTION TAKEN INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES;
- E. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCH IN 24 HOURS;
- F. DOCUMENTS AND CHANGES MADE TO THE SWPPP.

ENVIRONMENTAL REVIEW

THERE ARE NO STORMWATER MITIGATION MEASURES REQUIRED AS A RESULT OF AN ENVIRONMENTAL, ARCHEOLOGICAL OR AGENCY REVIEW. ALL MITIGATION MEASURES HAVE BEEN ADDRESSED IN THIS PLAN SET OR THE SPECIAL PROVISIONS.

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NO	DATE	BY	CKD	APPR	REVISION

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NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: Brett Voth 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB




STORMWATER POLLUTION PREVENTION PLAN

SHEET NO. 44 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) NARRATIVE

GENERAL SWPPP NOTES FOR CONSTRUCTION ACTIVITY

1. THIS PROJECT DOES REQUIRE A NPDES PERMIT. THE CONTRACTOR IS RESPONSIBLE TO COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION STORMWATER PERMIT AT ALL TIMES PER MNDOT SPEC 1717. THE CONTRACTOR WILL DEVELOP A CHAIN OF COMMAND WITH ALL OPERATORS ON THE SITE TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED AND STAY IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE, THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION, AND A NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED TO THE MPCA.
2. THE CONTRACTOR WILL PREPARE A WRITTEN, NOT ORAL, WEEKLY SCHEDULE OF PROPOSED EROSION CONTROL ACTIVITIES FOR THE PROJECT ENGINEERS APPROVAL AS PER MNDOT SPEC. 1717.
3. THE CONTRACTOR WILL COMPLY WITH THE REQUIREMENTS REGARDING POLLUTION PREVENTION MANAGEMENT DURING CONSTRUCTION, WHICH WILL INCLUDE, BUT IS NOT LIMITED TO, PROVIDING:
 - A. CONCRETE WASHOUT AREAS FOR USE BY ALL SUBCONTRACTORS AND MNDOT PERSONNEL. LOCATION OF WASHOUT AREAS MUST BE IDENTIFIED BY SIGNAGE AND MUST BE AT LEAST 200' FROM SITE PLAN REQUIREMENT AREAS OR ENVIRONMENTALLY SENSITIVE AREAS, AND UTILIZE A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER THAT PREVENTS RUNOFF ONTO ADJACENT SOILS. AN ENGINEERED COLLECTION SYSTEM CAN ALSO BE USED IF IT IS APPROVED BY THE PROJECT ENGINEER.
 - B. SOLID WASTE COLLECTION AND REMOVAL.
 - C. SECONDARY CONTAINMENT.
 - D. SECURED HAZARDOUS WASTE STORAGE CONTAINERS.
 - F. CHEMICAL SPILL KITS.
 - G. PORTABLE RESTROOM FACILITIES THAT ARE ANCHORED TO PREVENT TIPPING.
4. CHEMICALS MUST BE KEPT IN A SECURE STORAGE AREA WHEN NOT IN USE. CHEMICAL STORAGE CONTAINERS MUST HAVE SECONDARY CONTAINMENT WHEN BEING USED OR STORED ON THE PROJECT SITE. CHEMICAL SPILLS OF ANY KIND (OIL, FUEL, FERTILIZER, ETC.) MUST BE CLEANED UP AND REMOVED FROM THE SITE IMMEDIATELY. THE CONTRACTOR MUST HAVE A SPILL KIT ON SITE AT ALL TIMES.
5. THE CONTRACTOR IS RESPONSIBLE FOR CREATING AND FOLLOWING A WRITTEN DISPOSAL PLAN FOR ALL WASTE MATERIALS. THE PLAN WILL INCLUDE HOW THE MATERIAL WILL BE DISPOSED OF AND THE LOCATION OF THE DISPOSAL SITE. THE PLAN WILL BE SUBMITTED TO THE ENGINEER.
6. BURNING OF ANY MATERIAL IS NOT ALLOWED WITHIN PROJECT BOUNDARY.
7. THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs WILL BE PLACED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND TO CAPTURE SEDIMENT ON SITE. ALL EROSION CONTROL MEASURES WILL BE IN PLACE PRIOR TO COMMENCEMENT OF ANY REMOVAL WORK AND/OR GROUND DISTURBING ACTIVITIES AND WILL BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION HAS BEEN ELIMINATED.
8. SEDIMENT CONTROL DEVICES MUST BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN. SEDIMENT CONTROL DEVICES INCLUDE, BUT ARE NOT LIMITED TO:
 - A. PERIMETER CONTROL SHALL BE LOCATED ON THE CONTOUR TO CAPTURE OVERLAND, LOW-VELOCITY SHEET FLOWS DOWN GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS WITH THE BMP J-HOOKED AT A MAXIMUM OF 100 FOOT INTERVALS AND SHALL CONTAIN NO MORE THAN 1/4 ACRE OF DRAINAGE AREA.
 - B. DITCH CHECKS WILL BE PLACED AS INDICATED ON THE PLANS DURING ALL PHASES OF CONSTRUCTION.
 1. TEMPORARY DITCH CHECKS WILL CONSIST OF USING ROCK DITCH CHECKS, BIOLOGS, AND ROCK WEEPERS IN FRONT OF CULVERT INLETS. IN LIEU OF REMOVING TEMPORARY DITCH CHECKS, THE ROCK MAY BE PUSHED INTO THE GROUND.
 2. FILTER LOGS WILL BE PLACED DURING PERMANENT TURF ESTABLISHMENT AT THE INTERVALS IDENTIFIED IN THE PLAN.
 - C. SEDIMENT DAMAGE FROM STOCKPILES WILL BE MINIMIZED BY PLACING A ROW OF SILT FENCE A MINIMUM 5 FEET FROM THE TOE. IF THERE IS NOT ADEQUATE PROJECT AREA TO PLACE THE SILT FENCE MORE THAN 5 FEET FROM THE TOE OF THE SLOPE THE CONTRACTOR MAY SUBMIT AN ALTERNATIVE FOR APPROVAL BY THE PROJECT ENGINEER.
9. STORM SEWER INLETS WILL BE PROTECTED AT ALL TIMES WITH THE APPROPRIATE INLET PROTECTION FOR EACH SPECIFIC PHASE OF CONSTRUCTION. INLET PROTECTION DEVICES MAY NEED TO BE PLACED MULTIPLE TIMES IN THE SAME LOCATION OVER THE LIFE OF THE CONTRACT. INLET PROTECTION DEVICES WILL BE PAID FOR ONCE PER INLET REGARDLESS OF THE NUMBER OF TIMES THE BMP IS PLACED. ALL STORM SEWER INLET PROTECTION DEVICES WILL BE KEPT IN GOOD FUNCTIONAL CONDITION AT ALL TIMES. IF THE PROJECT ENGINEER DEEMS AN INLET PROTECTION DEVICE TO BE NONFUNCTIONAL, IN POOR CONDITION, INEFFECTIVE, OR NOT APPROPRIATE FOR THE CURRENT CONSTRUCTION ACTIVITIES IT WILL BE REPLACED WITH A SUITABLE ALTERNATIVE AT NO COST TO MNDOT.
10. THE CONTRACTOR WILL PLACE CONSTRUCTION EXITS, AS NECESSARY, TO PREVENT TRACKING OF SEDIMENT ONTO PAVED SURFACES AND IN COMPLIANCE WITH PART IV OF THE NPDES PERMIT. CONSTRUCTION EXITS WILL BE SUFFICIENTLY SIZED AND MAINTAINED TO PREVENT TRACK OUT. TYPE 5 MULCH (SLASH MULCH) OR AN APPROVED ENGINEERED PRODUCT WILL BE ALLOWED FOR CONSTRUCTION EXITS IN LIEU OF CRUSHED ROCK.
11. THE CONTRACTOR MUST USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT DISCHARGE OR PLACEMENT OF BITUMINOUS GRINDING, CUTTINGS, MILLINGS, AND OTHER BITUMINOUS WASTES FROM AREAS OF EXISTING OR FUTURE VEGETATED SOILS AND ALL WATER CONVEYANCE SYSTEMS, INCLUDING INLETS.
12. THE CONTRACTOR MUST USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT CONCRETE DUST, PARTICLES, SAW CUT SLURRY, PLANNING WASTE AND OTHER CONCRETE WASTES FROM LEAVING MNDOT RIGHT OF WAY, DEPOSITING IN EXISTING OR FUTURE VEGETATED AREAS, OR ENTERING STORMWATER CONVEYANCE SYSTEMS, INCLUDING INLETS AND CURB FLOW LINES.
13. DITCHES AND EXPOSED SOILS MUST BE KEPT IN AN EVEN ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES AND BLANKETS.
14. ALL EXPOSED SOIL AREAS MUST BE TEMPORARILY OR PERMANENTLY STABILIZED NO MORE THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THAT PORTION OF THE SITE THAT HAS BEEN TEMPORARILY CEASED. IN MANY INSTANCES, THIS WILL REQUIRE STABILIZATION TO OCCUR MORE THAN ONCE DURING ROUGH GRADING. RAPID STABILIZATION METHOD 3 OR 4 WILL BE USED TO PROVIDE TEMPORARY COVER IN THESE AREAS AS APPROPRIATE.
15. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH THAT DRAINS WATER FROM THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE CONSTRUCTION SITE, MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE OR POINT OF DISCHARGE TO ANY SURFACE WATER. STABILIZATION MUST OCCUR WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER, EXISTING GUTTER, STORM SEWER INLET, DRAINAGE DITCH, OR OTHER STORMWATER CONVEYANCE SYSTEM ACCORDING TO MNDOT SPEC 1717. THE REMAINDER OF THE DITCH MUST BE STABILIZED WITHIN 7 DAYS OF CONNECTING TO THE SURFACE WATER. PERMANENT EROSION CONTROL BLANKET WILL BE USED TO STABILIZE THESE AREAS. DISK ANCHORED MULCH AND HYDRAULIC SOIL STABILIZERS ARE NOT ALLOWED FOR PERMANENT DITCH STABILIZATION.

16. OUTLETS INTO SURFACE WATERS SHALL BE STABILIZED WITH ENERGY DISSIPATION WITHIN 24 HOURS OF BEING CONSTRUCTED.
17. ALL EXPOSED SOIL AREAS WILL BE STABILIZED PRIOR TO THE ONSET OF WINTER. ANY WORK STILL BEING PERFORMED WILL BE SNOW MULCHED, SEEDED, OR BLANKETED WITHIN THE TIME FRAMES LISTED IN THE MPCA'S GENERAL NPDES CONSTRUCTION STORMWATER PERMIT.
18. ALL TOPSOIL BERMS SHALL BE STABILIZED WITH HYDROMULCH.
19. THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING INSPECTION AND MAINTENANCE REQUIREMENTS:
 - A. A SILT FENCE MUST BE REPAIRED, REPLACED OR SUPPLEMENTED WHEN IT BECOME NON-FUNCTIONAL OR 1/2 THE HEIGHT OF THE SILT FENCE. REPAIRS MUST BE MADE WITHIN 24 HOURS OF DISCOVERY.
 - B. INLET PROTECTION DEVICES SHOULD BE REPAIRED WHEN THEY BECOME NON-FUNCTIONAL OR SEDIMENT REACHES 1/2 THE HEIGHT AND/OR DEPTH OF THE DEVICE.
 - C. TEMPORARY SEDIMENT BASIN MUST HAVE THE SEDIMENT REMOVED ONCE THE SEDIMENT HAS REACHED 1/2 THE STORAGE VOLUME WITHIN 72 HOURS OF DISCOVERY.
 - D. TRACKED SEDIMENT MUST BE REMOVED WITHIN 24 HOURS OF DISCOVERY OF TRACKING ONTO PAVED SURFACES.
 - E. ALL OTHER NONFUNCTIONAL BMPs MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WITHIN 24 HOURS OF DISCOVERY.
 - F. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL BMPs UNTIL WORK HAS BEEN COMPLETED, SITE HAS GONE UNDER FINAL STABILIZATION, AND THE NOTICE OF TERMINATION HAS BEEN SUBMITTED TO THE MPCA IN ACCORDANCE WITH PART II.B.5 OF THE CONSTRUCTION GENERAL PERMIT.
20. IF SEDIMENT DEPOSITS IN A WATER OF THE STATE, THE MATERIAL MUST BE REMOVED WITHIN 7 DAYS.
21. PAVEMENT SURFACES WILL BE SWEEPED WITHIN 24 HOURS OF DISCOVERY OF SEDIMENT OR TRACKING ONTO PAVEMENT THAT DRAINS TO CURB, INLETS, DITCHES, OR PONDS. PAVEMENT WILL BE LIGHTLY WETTED PRIOR TO SWEEPING. (INCIDENTAL)
22. AMEND THE SWPPP AND DOCUMENT ANY AND ALL CHANGES TO THE SWPPP AND ASSOCIATED PLAN SHEETS IN A TIMELY MANNER. STORE THE SWPPP AND ALL AMENDMENTS ON SITE AT ALL TIMES.

DEWATERING

IF DEWATERING BECOMES REQUIRED TO FACILITATE CONSTRUCTION, THE CONTRACTOR SHALL DEVELOP A DEWATERING PLAN IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. IF DEWATERING BECOMES REQUIRED, THE DEWATERING PLAN MUST BE SUBMITTED TO AND APPROVED BY COON CREEK WATERSHED DISTRICT PRIOR TO THE START OF DEWATERING. DEWATERING SHALL BE INCIDENTAL IF DEEMED NECESSARY BY THE ENGINEER.

SOIL & EROSION CONTROL SCHEDULE

THE CONTRACTOR WILL PREPARE A WRITTEN, WEEKLY SCHEDULE OF PROPOSED EROSION CONTROL ACTIVITIES FOR THE PROJECT ENGINEERS APPROVAL AS PER MNDOT SPEC. 1717.

THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs WILL BE PLACED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND TO CAPTURE SEDIMENT ON SITE. SEDIMENT CONTROL DEVICES WILL BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN. ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES WILL REMAIN IN PLACE AND WILL BE MAINTAINED UNTIL THE POTENTIAL FOR UP GRADIENT EROSION HAS BEEN ELIMINATED.

FILTRATION AREAS WILL NOT BE EXCAVATED UNTIL ALL UP GRADIENT LAND DISTURBANCE ACTIVITY HAS BEEN COMPLETED AND THE DRAINAGE AREA HAS BEEN STABILIZED. SIDE SLOPES WILL BE STABILIZED PRIOR TO PLACING ANY AMENDED TOPSOIL IN THE BOTTOM OF THE FILTRATION AREA.

ALL EXPOSED SOIL AREAS WILL BE TEMPORARILY OR PERMANENTLY STABILIZED NO MORE THAN 7 DAYS AFTER CONSTRUCTION ACTIVITY ON THAT PORTION OF THE SITE THAT HAS BEEN TEMPORARILY OR PERMANENTLY CEASED.

STABILIZE SOIL STOCKPILES WITHIN 7 DAYS OF ROUGH GRADING OR INACTIVITY.

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NO	DATE	BY	CHKD	APPR	REVISION

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

NAME: BRETT A. VOITH LIC. NO. 49045

CERTIFIED BY: Brett Voith 3/3/2023
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
DESIGNED BY: JCN
CHECKED BY: GEB

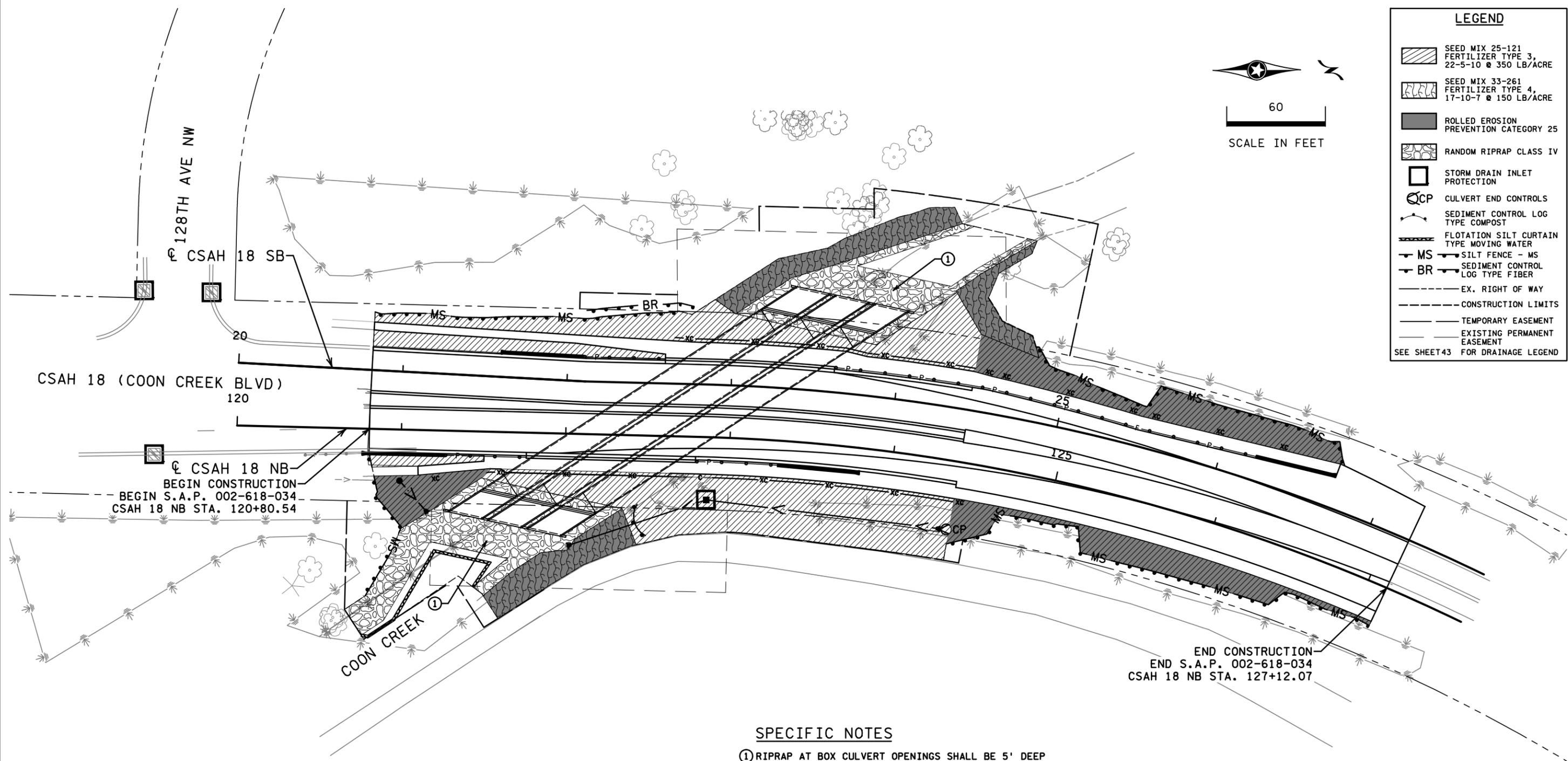
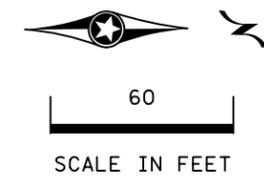



STORMWATER POLLUTION PREVENTION PLAN

SHEET NO. 45 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

LEGEND	
	SEED MIX 25-121 FERTILIZER TYPE 3, 22-5-10 @ 350 LB/ACRE
	SEED MIX 33-261 FERTILIZER TYPE 4, 17-10-7 @ 150 LB/ACRE
	ROLLED EROSION PREVENTION CATEGORY 25
	RANDOM RIPRAP CLASS IV
	STORM DRAIN INLET PROTECTION
	CULVERT END CONTROLS
	SEDIMENT CONTROL LOG TYPE COMPOST
	FLOTATION SILT CURTAIN TYPE MOVING WATER
	SILT FENCE - MS
	SEDIMENT CONTROL LOG TYPE FIBER
	EX. RIGHT OF WAY
	CONSTRUCTION LIMITS
	TEMPORARY EASEMENT
	EXISTING PERMANENT EASEMENT
SEE SHEET 43 FOR DRAINAGE LEGEND	



SPECIFIC NOTES
 ① RIPRAP AT BOX CULVERT OPENINGS SHALL BE 5' DEEP

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NO	DATE	BY	CKD	APPR	REVISION

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

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB



TURF ESTABLISHMENT & EROSION CONTROL PLAN

SHEET NO. 46 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

NOTES & GUIDELINES

GENERAL INFORMATION:

1. ALL DISTANCES ARE APPROXIMATE.

SIGNING:

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

CONSTRUCTION INFORMATION SIGNING:

1. THE CONTRACTOR SHALL USE CONSTRUCTION INFORMATION SIGNING AS SHOWN IN THE PLAN WHICH ARE TO BE USED AS FOLLOWS:
 PLACE G20-X2 ADVANCE NOTICE SIGNS 10 DAYS PRIOR TO THE WORK STARTING DATE. ONCE WORK BEGINS, COVER THE START DATE LEGEND WITH SUGGESTED PLAQUE CONTAINED IN THIS PLAN. IF NO ALTERNATE MESSAGE IS SHOWN IN THE PLAN OR APPROVED BY THE ENGINEER, DISPLAY THE CORRECT ESTIMATED FINISH DATE, MONTH, OR SEASON.

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

DETOUR PLAN INDEX

SHEET NO.	DESCRIPTIONS
47	DETOUR TITLE SHEET
48	DETOUR TABULATIONS
49	DETOUR SIGN PANEL LAYOUTS
50	DETOUR LAYOUT

TRAFFIC CONTROL DEVICES & SYMBOLS LEGEND

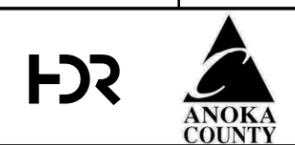
SYMBOL	DESCRIPTION
	WORK ZONE
	SIGNALIZED INTERSECTION
	DETOUR ROUTE
	TRAFFIC CONTROL SIGN
	TYPE III BARRICADE
	TYPE A FLASHING WARNING LIGHT

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 NAME: SRI DURGA YADA LIC. NO. 58794
 CERTIFIED BY: Y. Sri Durga 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
 DESIGNED BY: SY
 CHECKED BY: NJS



DETOUR PLAN
 SHEET NO. 47 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

"M" SERIES				
SIGN	SIGN NO.	SIZE (IN. X IN.) (WxH)	QUANTITY	
	M4-8	24 X 12	15	
	M3-1	24 X 12	15	
	M1-6M	24 X 24	15	
	M5-1R	21 X 15	1	
	M5-1L	21 X 15	2	
	M6-1R	21 X 15	1	
	M6-1L	21 X 15	2	
	M6-3	21 X 15	9	
	M4-8	24 X 12	20	
	M3-3	24 X 12	20	
	M1-6M	24 X 24	20	
	M5-1R	21 X 15	3	
	M5-1L	21 X 15	2	
	M6-1R	21 X 15	3	
	M6-1L	21 X 15	2	
	M6-3	21 X 15	10	

"M" SERIES (CONTINUED)				
SIGN	SIGN NO.	SIZE (IN. X IN.) (WxH)	QUANTITY	
	M4-8a	24 X 18	2	
	M3-1	24 X 12	1	
	M3-3	24 X 12	1	
	M1-6M	24 X 24	2	

"W" SERIES				
SIGN	SIGN NO.	SIZE (IN. X IN.) (WxH)	QUANTITY	
	M1-6M	24 X 24	6	
	W20-2	48 X 48	6	
	W20-2	48 X 48	1	
	W20-3	48 X 48	3	
	M1-6M	24 X 24	1	
	W20-3	48 X 48	1	
	W20-3	48 X 48	2	
	W16-2P	30 X 24	2	
	W20-3	48 X 48	2	
	W16-2P	30 X 24	2	

BARRICADE MOUNTED SIGNS				
SIGN	SIGN NO.	SIZE (IN. X IN.) (WxH)	QUANTITY	
	M4-10R	48 X 18	1	
	M4-10L	48 X 18	1	
	R11-3a	60 X 30	2	
	R11-3a	60 X 30	1	
	R11-3a	60 X 30	1	
	R11-2M	48 X 30	2	

MISCELLANEOUS				
SIGN	SIGN NO.	SIZE	QUANTITY	
	TYPE III	6 FOOT	21	
	FLASHER	-	29	
	CMS	-	2	①

"G" SERIES				
SIGN	SIGN NO.	SIZE (IN. X IN.) (WxH)	QUANTITY	
	G20-X2	132 X 108	3	
	G20-X2A	132 X 20	3	②
	G20-X2	132 X 108	4	
	G20-X2A	132 X 20	4	②

SPECIFIC NOTES

- ① CMS SIGN TO BE INSTALLED A MINIMUM OF TEN DAYS PRIOR TO ACTUAL COMMENCEMENT OF ROAD CLOSURE. SIGNS TO BE REMOVED WHEN ROAD CLOSURE BEGINS.
- ② SIGNS TO BE INSTALLED A MINIMUM OF TEN DAYS PRIOR TO ACTUAL CLOSING DATE OF ROAD CLOSURE AND IMPLEMENTATION OF DETOUR SIGNING. SIGNS TO BE REMOVED AT TIME OF DETOUR INSTALLATION. THESE SIGNS ARE INCIDENTAL TO DETOUR PAY ITEM.

NOTES:

- 1. ALL BARRICADES SHALL BE PROPERLY WEIGHTED WITH SANDBAGS.
- 2. ALL BARRICADES SHALL HAVE REFLECTIVE MATERIAL ON BOTH SIDES.
- 3. ALL BARRICADE MARKINGS SHALL BE SLANTED IN ACCORDANCE WITH THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING THE FIELD MANUAL DATED JANUARY, 2018.
- 4. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MOST RECENT EDITION OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING THE FIELD MANUAL DATED, JANUARY, 2018.
- 5. ADDITIONS OR CHANGES TO THIS PLAN MAY BE MADE AS DETERMINED BY THE ENGINEER.

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 NAME: SRI DURGA YADA LIC. NO. 58794
 CERTIFIED BY: Y. Sri Durga 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
 DESIGNED BY: SY
 CHECKED BY: NJS

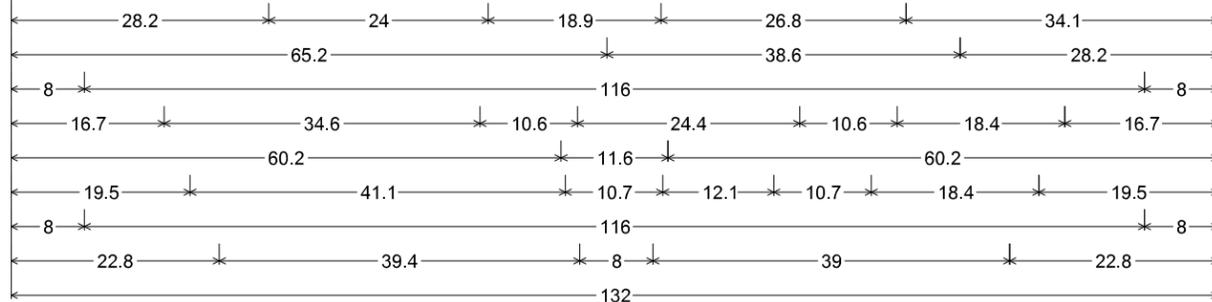
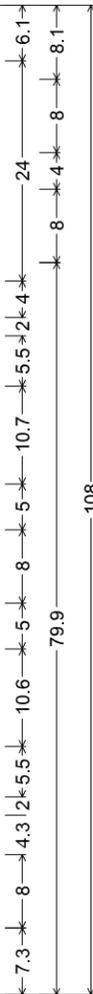


DETOUR PLAN
 SHEET NO. 48 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059



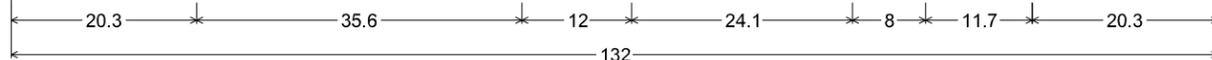
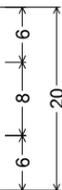
ROAD CLOSED

128th Ave NW TO Yukon St NW FOLLOW DETOUR



G20-X2(A).sgn; 12.0" Radius, 2.0" Border, Black on Orange; "ROAD", D 2K; "CLOSED", D 2K; "128th Ave NW", D 2K; "TO", D 2K; "Yukon St NW", D 2K; "FOLLOW DETOUR", D 2K;

BEGINS XXXX XX

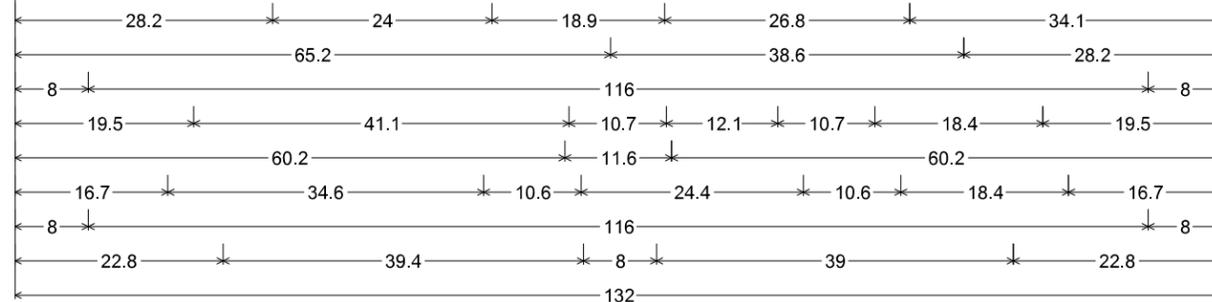
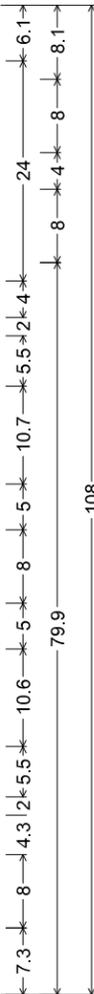


3.0" Radius, 2.0" Border, Black on Orange; "BEGINS", D 2K; "XXXX XX", D 2K;



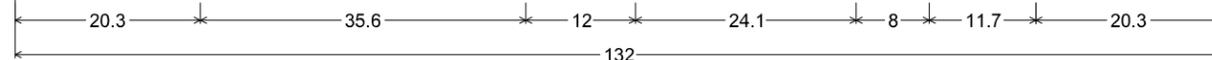
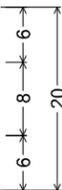
ROAD CLOSED

Yukon St NW TO 128th Ave NW FOLLOW DETOUR



G20-X2(A).sgn; 12.0" Radius, 2.0" Border, Black on Orange; "ROAD", D 2K; "CLOSED", D 2K; "Yukon St NW", D 2K; "TO", D 2K; "128th Ave NW", D 2K; "FOLLOW DETOUR", D 2K;

BEGINS XXXX XX



3.0" Radius, 2.0" Border, Black on Orange; "BEGINS", D 2K; "XXXX XX", D 2K;

NOTES ALL DIMENSIONS ARE IN INCHES.

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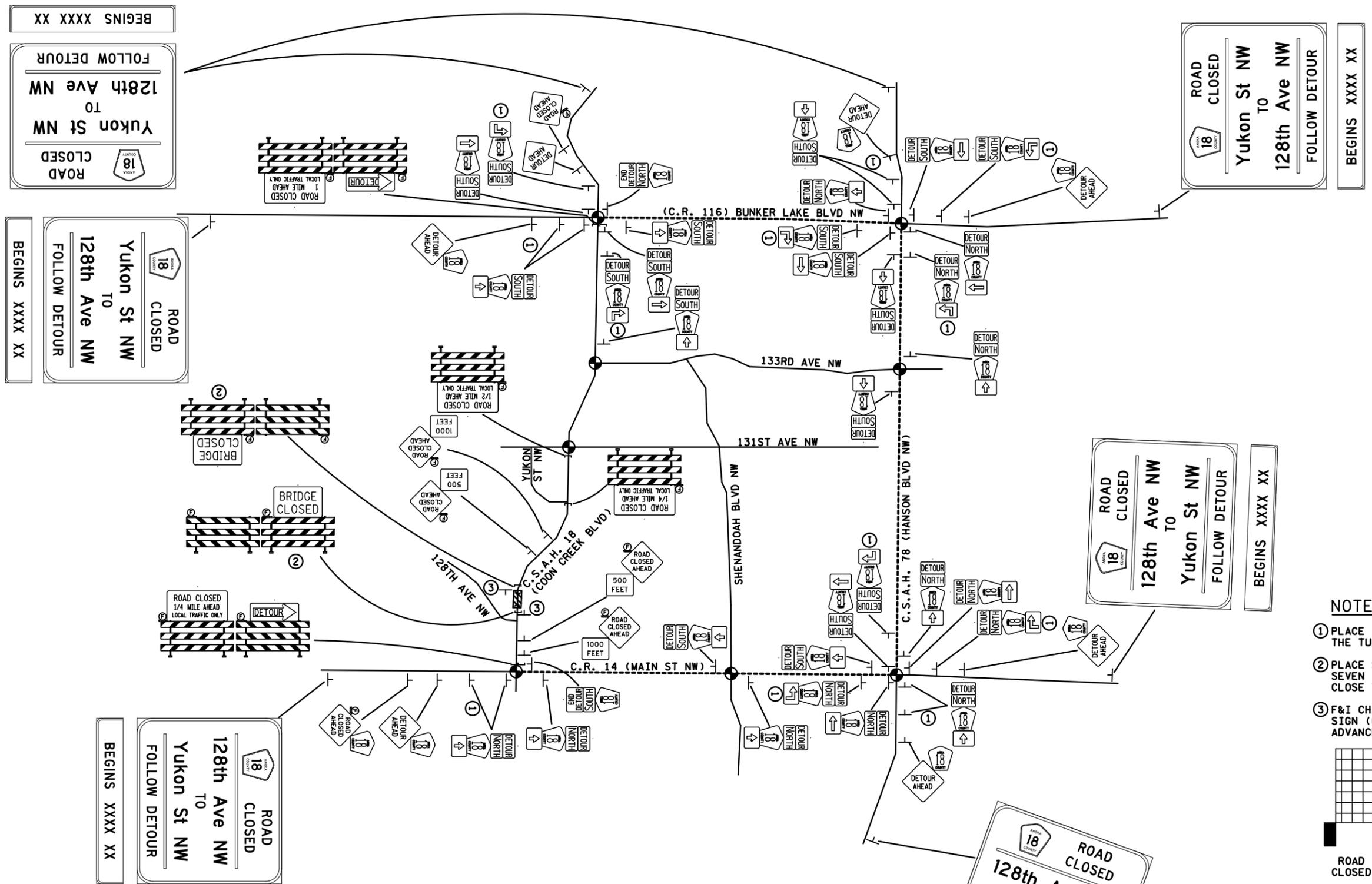
Table with columns: NO, DATE, BY, CKD, APPR, REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. NAME: SRI DURGA YADA LIC. NO. 58794 CERTIFIED BY: Y. Sri Durga DATE 3/3/2023 LICENSED PROFESSIONAL ENGINEER

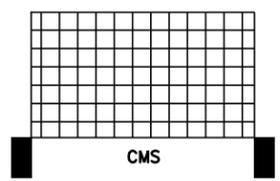
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DETOUR PLAN SHEET NO. 49 OF 59 SHEETS S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059



- NOTES**
- 1 PLACE IN ADVANCE OF THE TURN LANE(S).
 - 2 PLACE SIX (NB) AND SEVEN (SB) BARRICADES TO CLOSE THE ROADWAY.
 - 3 F&I CHANGEABLE MESSAGE SIGN (CMS) 10 DAYS IN ADVANCE OF CLOSING.



ROAD CLOSED / BEGINS XXXX XX /

- LEGEND**
- WORK ZONE
 - SIGNALIZED INTERSECTION
 - DETOUR ROUTE

ROAD CLOSED
Yukon St NW
TO
128th Ave NW
FOLLOW DETOUR
BEGINS XXXX XX

ROAD CLOSED
Yukon St NW
TO
128th Ave NW
FOLLOW DETOUR
BEGINS XXXX XX

ROAD CLOSED
128th Ave NW
TO
Yukon St NW
FOLLOW DETOUR
BEGINS XXXX XX

ROAD CLOSED
128th Ave NW
TO
Yukon St NW
FOLLOW DETOUR
BEGINS XXXX XX

ROAD CLOSED
128th Ave NW
TO
Yukon St NW
FOLLOW DETOUR
BEGINS XXXX XX

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NO	DATE	BY	CKD	APPR	REVISION

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

NAME: SRI DURGA YADA LIC. NO. 58794

CERTIFIED BY: Y. Sri Durga 3/3/2023
LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
DESIGNED BY: SY
CHECKED BY: NJS



DETOUR PLAN

SHEET NO. 50 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

SIGNING AND PAVEMENT MARKING INDEX

51	SIGNING TITLE SHEET
52	SIGNING TABULATIONS
53	PAVEMENT MARKING NOTES AND TABULATIONS
54 - 56	SIGNING DETAILS
57	PAVEMENT MARKING DETAILS
58	SIGNING AND PAVEMENT MARKING PLAN

PERMANENT SIGNING SUMMARY				ST
TAB	SHEET NO	ITEM	UNIT	TOTAL SIGNING QUANTITIES
ST-A	52	REMOVE DELINEATOR / MARKER	EACH	4
ST-A	52	REMOVE SIGN	EACH	4
ST-A	52	DELINEATOR / MARKER	EACH	4
ST-A	52	SIGN	SQ FT	54

ABBREVIATIONS

SQ SQUARE TUBE

SIGNING LEGEND

⊥ SIGN
 ⊥ SIGN BACK TO BACK

GENERAL INFORMATION:

1. MOUNTING HEIGHT IS MINIMUM (WITH A + 6 INCH TOLERANCE)
2. SEE ANOKA COUNTY STANDARD DETAILS FOR STANDARD SIGN DESIGNS, SPLICE PLATES, STRINGERS AND PUNCHING CODES, SIGN STRUCTURE INSTALLATION AND PLACEMENT.

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NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 NAME: SRI DURGA YADA LIC. NO. 58794
 CERTIFIED BY: *Y. Sri Durga* 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
 DESIGNED BY: SY
 CHECKED BY: NJS



SIGNING TITLE SHEET
SHEET NO. 51 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

SIGN AND DELINEATOR/MARKER										ST-A	
SIGN NUMBER	PANEL				SUPPORT		REMOVE SIGN EACH	SIGN SQ FT	REMOVE DELINEATOR/MARKER EACH	DELINEATOR/MARKER	
	PANEL CODE	LEGEND	SIZE (W X H)		MOUNTING HEIGHT	TYPE					NUMBER OF POSTS
			INCH	FEET							
S-1	W9-1R	RIGHT LANE ENDS	36 X 36		7	U - SOIL	2	9.00			
	W16-2P	800 FEET	30 X 24					5.00			
S-2	W6-3	TWO WAY TRAFFIC	INPLACE					1			
(1) S-3	R3-4	NO U-TURN	24 X 24		7	U - CONC	1	4.00			
	R4-7	KEEP RIGHT	24 X 30					5.00			
	OM1-2	TYPE 1 OBJECT MARKER	18 X 18					4			2.25
S-4	X3-5	SNOWPLOW MARKER	6 X 12		4	U - SOIL	1			2	
S-5	OM3-R	TYPE 3 OBJECT MARKER	INPLACE						1		
S-6	O-R3-X1	RIGHT TURN LANE	INPLACE					1			
	R8-3	NO PARKING	INPLACE								
S-7	R8-3	NO PARKING	24 X 24		7	U - SOIL	1		4.00		
S-8	OM3-L	TYPE 3 OBJECT MARKER	INPLACE							1	
S-9	OM3-L	TYPE 3 OBJECT MARKER	INPLACE							1	
S-10	O-R3-X1	RIGHT TURN LANE	30 X 30		7	U - SOIL	1		6.25		
S-11	W4-2R	RIGHT LANE ENDS	36 X 36		7	U - SOIL	2	1	9.00		
S-12	W6-3	TWO WAY TRAFFIC	36 X 36		7	U - SOIL	2		9.00		
S-13	X3-5	SNOWPLOW MARKER	6 X 12		4	U - SOIL	1			2	
S-14	OM3-R	TYPE 3 OBJECT MARKER	INPLACE							1	
TOTAL								4	54	4	4

SPECIFIC NOTES

(1) MOUNT BACK TO BACK

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NO	DATE	BY	CKD	APPR	REVISION

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

NAME: SRI DURGA YADA LIC. NO. 58794

CERTIFIED BY: *Y. Sri Durga* 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
 DESIGNED BY: SY
 CHECKED BY: NJS



SIGNING TABULATIONS

SHEET NO. 52 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

PERMANENT PAVEMENT MARKING PLAN

NOTES & GUIDELINES

GENERAL INFORMATION:

- SEE 2582 IN THE SPECIAL PROVISIONS FOR PAVEMENT MARKING SPOTTING RESPONSIBILITIES.
- EDGE LINES AND LANE LINES ARE TO BE BROKEN ONLY AT INTERSECTIONS WITH PUBLIC ROADS, AND AT PRIVATE ENTRANCES IF THEY ARE CONTROLLED BY AN AGENCY PLACED YIELD SIGN, STOP SIGN OR TRAFFIC SIGNAL. THE BREAK POINT IS TO BE AT THE START OF THE MAINLINE RADIUS.
- DO NOT APPLY THE PAVEMENT MARKINGS WHEN WEATHER AND OTHER CONDITIONS CAUSE A FILM OF DUST OR DEBRIS TO BE DEPOSITED ON THE PAVEMENT SURFACE AFTER CLEANING AND BEFORE THE MARKING MATERIAL IS APPLIED.
- THE FILLING OF TANKS, POURING OF MATERIALS OR CLEANING OF EQUIPMENT SHALL NOT BE PERFORMED ON UNPROTECTED PAVEMENT SURFACES UNLESS ADEQUATE PROVISIONS ARE MADE TO PREVENT SPILLAGE OF MATERIAL.

CONTRAST MARKINGS

- CONTRAST MARKINGS ARE DEFINED AS STANDARD LINEAR PAVEMENT MARKINGS, CROSSWALK MARKINGS AND PAVEMENT MESSAGES WITH 1.5 INCH NON REFLECTIVE BLACK BORDERS.

PERMANENT PAVEMENT MARKING TABULATION					PM
ITEM	UNIT	YELLOW	WHITE	TOTAL QUANTITY	LOCATION
4" SOLID LINE MULTI-COMPONENT	LIN FT	725	1559	2284	CENTERLINES, EDGELINES, TURN LANE LINES
4" BROKEN LINE MULTI-COMPONENT	LIN FT		56	56	LANE LINES
4" DOUBLE SOLID LINE MULTI-COMPONENT	LIN FT	488		488	CENTERLINES
24" SOLID LINE PREFORM THERMO GROUND IN	LIN FT	25		25	CROSSHATCH
PAVEMENT MESSAGE PREFORM THERMOPLASTIC	SQ FT		15	15	ONE RIGHT TURN ARROW

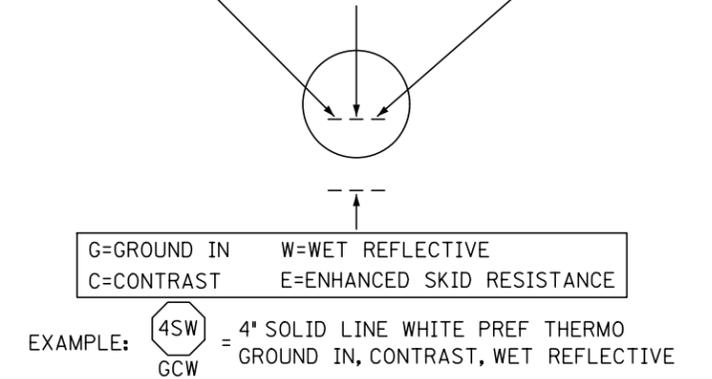
SYMBOLS & MATERIALS LEGEND

- BROKEN LINE-50' CYCLE (10' LINE, 40' GAP)
- DOTTED LINE-15' CYCLE (3' LINE, 12' GAP), UNLESS SHOWN OTHERWISE IN THE PLAN
- PAVEMENT MESSAGE (RIGHT ARROW)

STRIPING KEY

CIRCLE-MULTI COMP

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



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NO	DATE	BY	CKD	APPR	REVISION

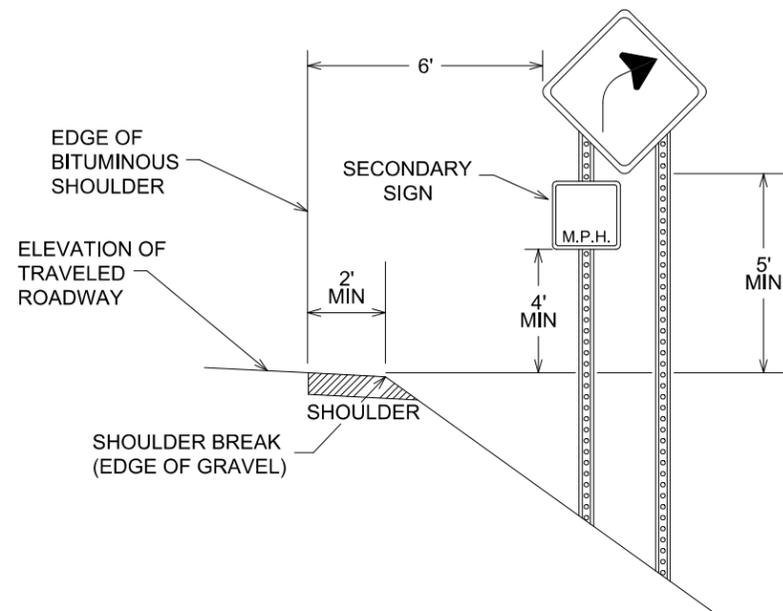
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.
 NAME: SRI DURGA YADA LIC. NO. 58794
 CERTIFIED BY: Y. Sri Durga 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
 DESIGNED BY: SY
 CHECKED BY: NJS

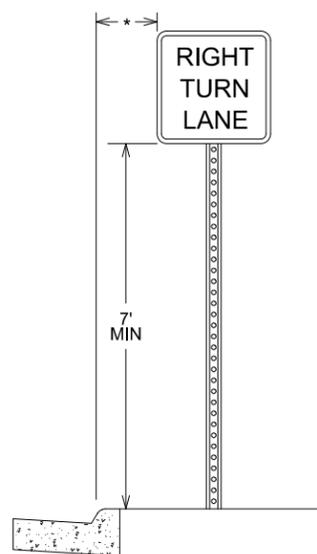


PAVEMENT MARKING TABULATIONS
SHEET NO. 53 OF 59 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

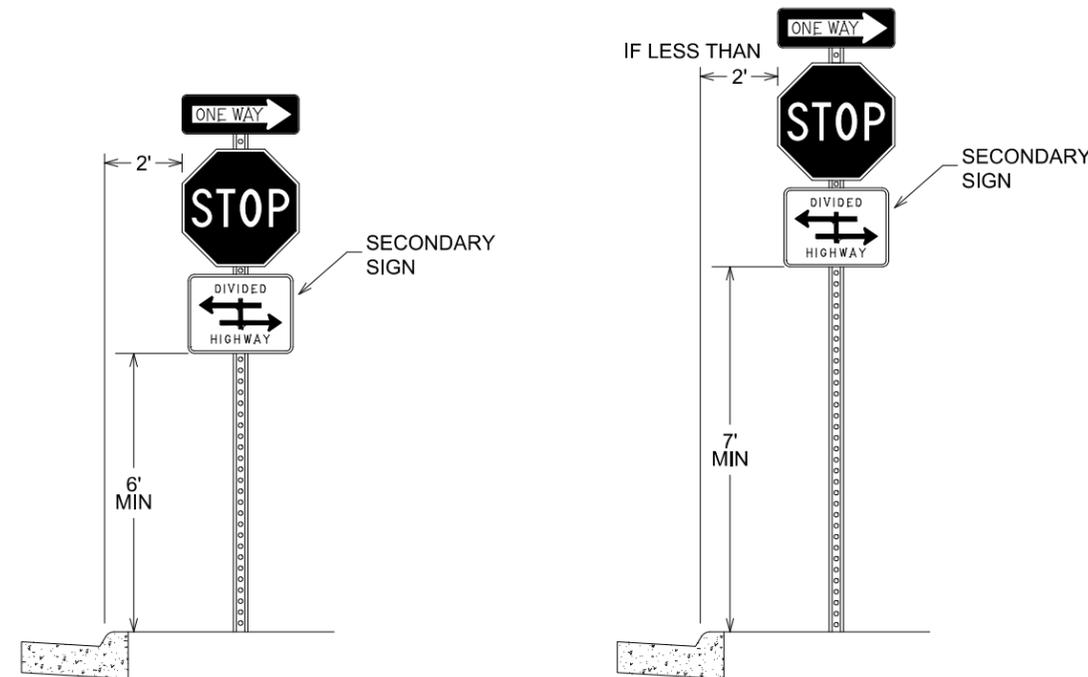
TYPICAL SIGN PLACEMENT
(RURAL)



TYPICAL SIGN PLACEMENT
(URBAN)



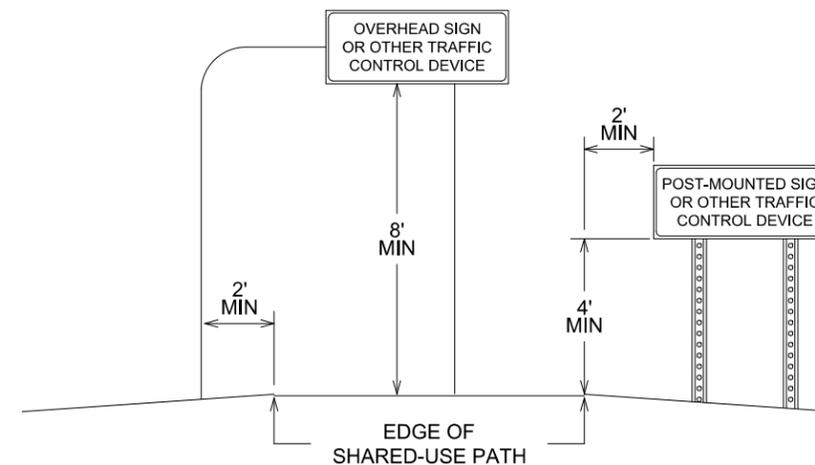
*2' - NARROW BOULEVARD (≤ 8' WIDE)
6' - WIDE BOULEVARD



NOTES:

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

TYPICAL SIGN PLACEMENT
SHARED-USE PATH



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NAME: SRI DURGA YADA LIC. NO. 58794

CERTIFIED BY: Y. Sri Durga 3/3/2023
LICENSED PROFESSIONAL ENGINEER DATE

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CHECKED BY: NJS

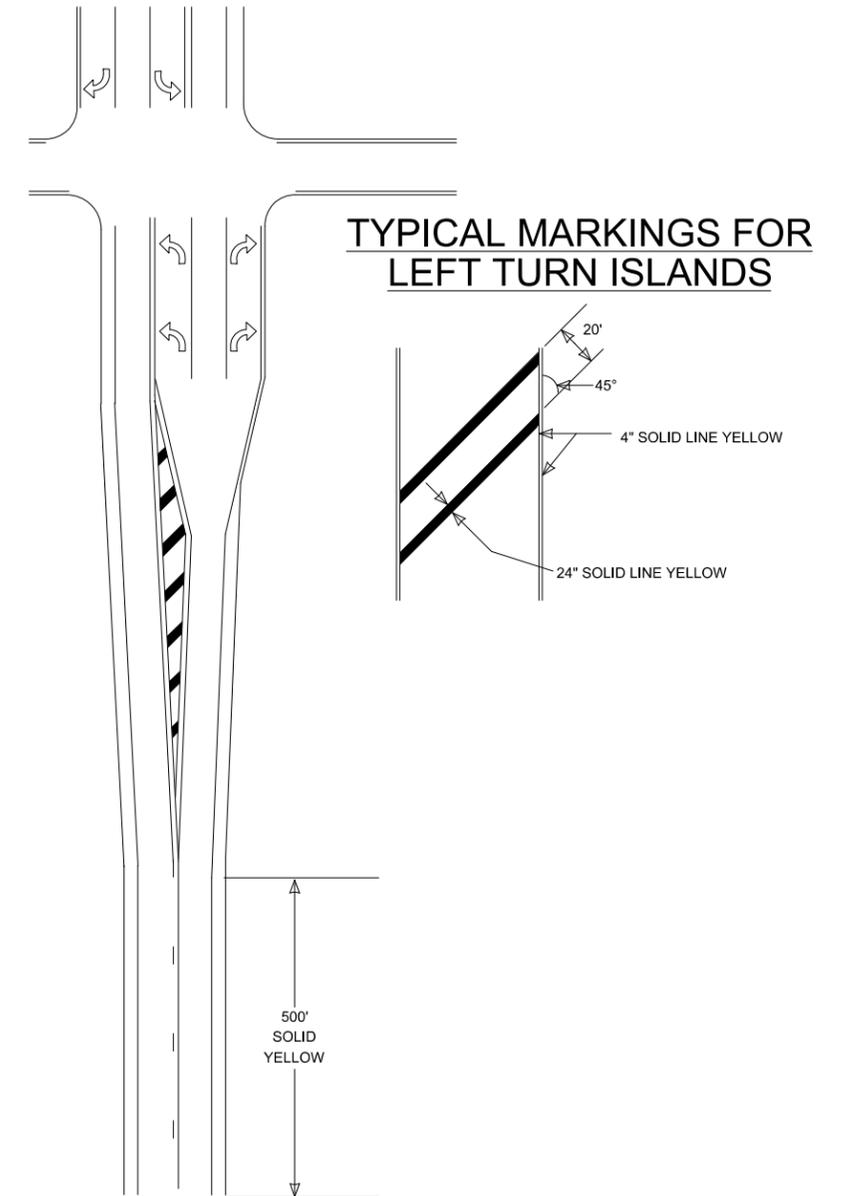
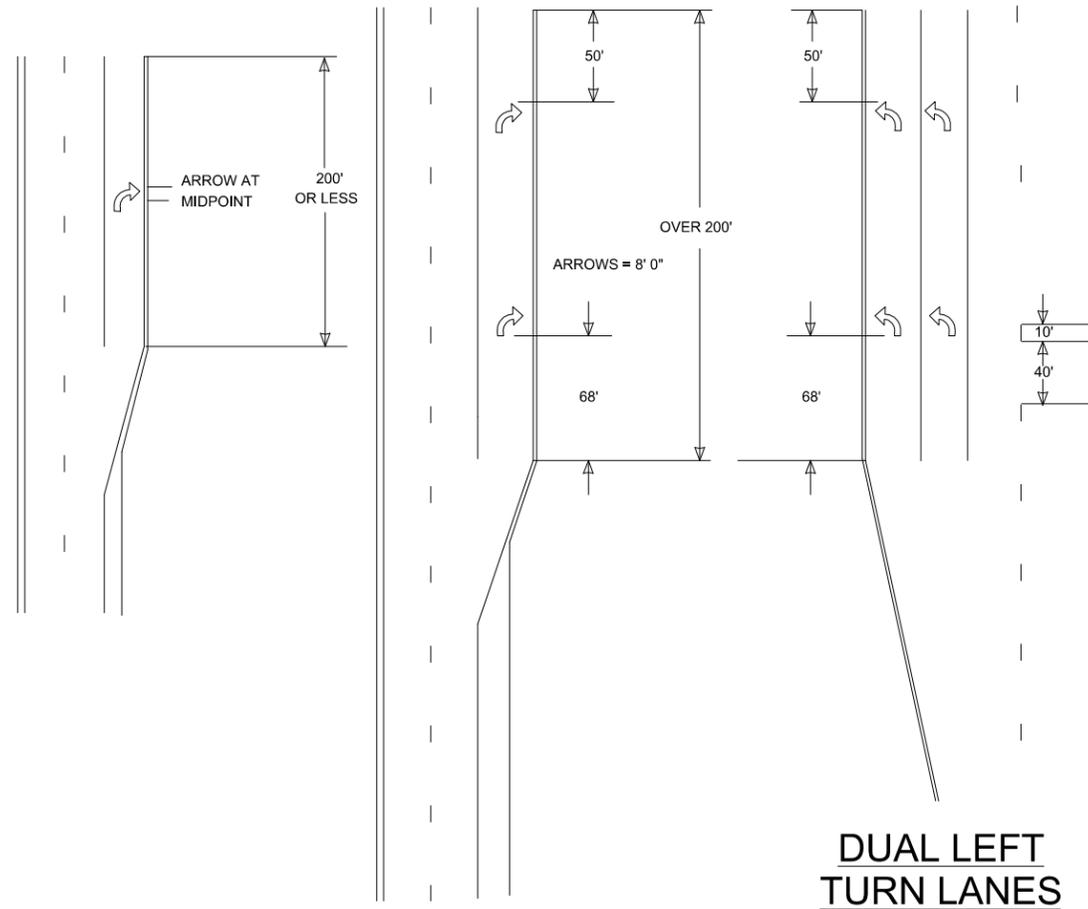


DETAILS

SHEET NO. 55 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

**TYPICAL MESSAGE PLACEMENT
FOR TURN LANES**



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NAME: SRI DURGA YADA LIC. NO. 58794

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LICENSED PROFESSIONAL ENGINEER DATE

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DESIGNED BY: SY
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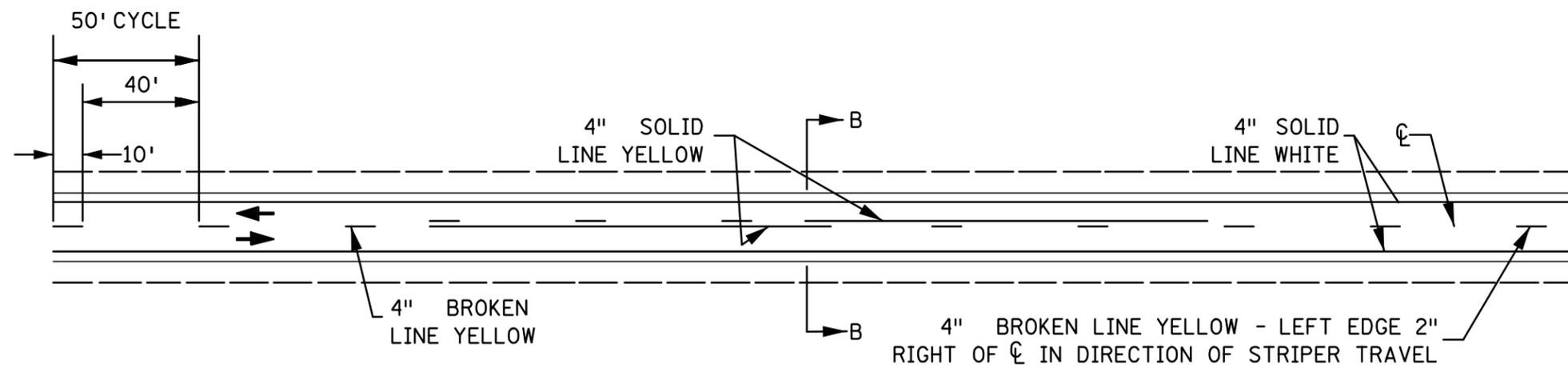
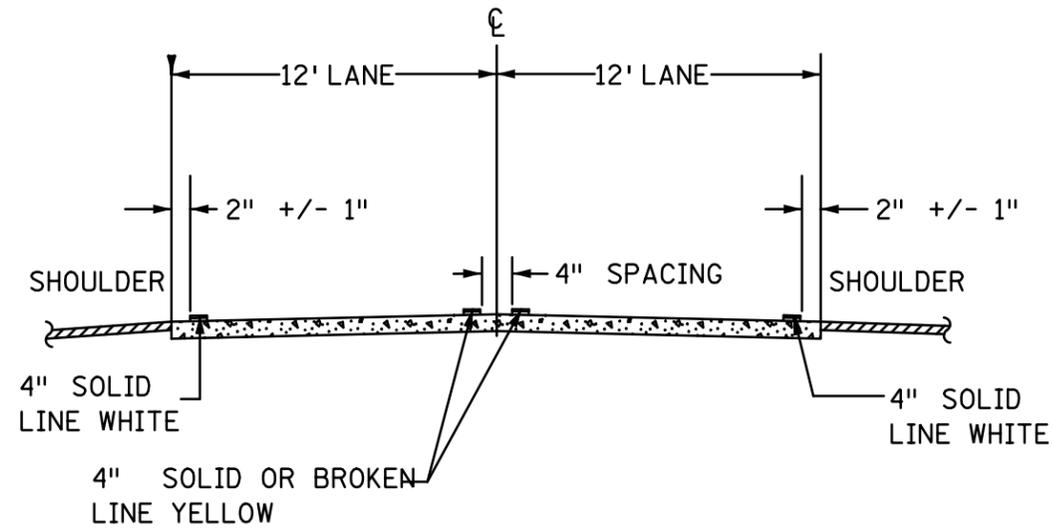


DETAILS

SHEET NO. 56 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

TWO-LANE, TWO-WAY



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PUBLISHED BY OTE: 16 NOV 2021 MODIFIED:

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NAME: SRI DURGA YADA LIC. NO. 58794

CERTIFIED BY: Y. Sri Durga 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
 DESIGNED BY: SY
 CHECKED BY: NJS



DETAILS

SHEET NO. 57 OF 59 SHEETS

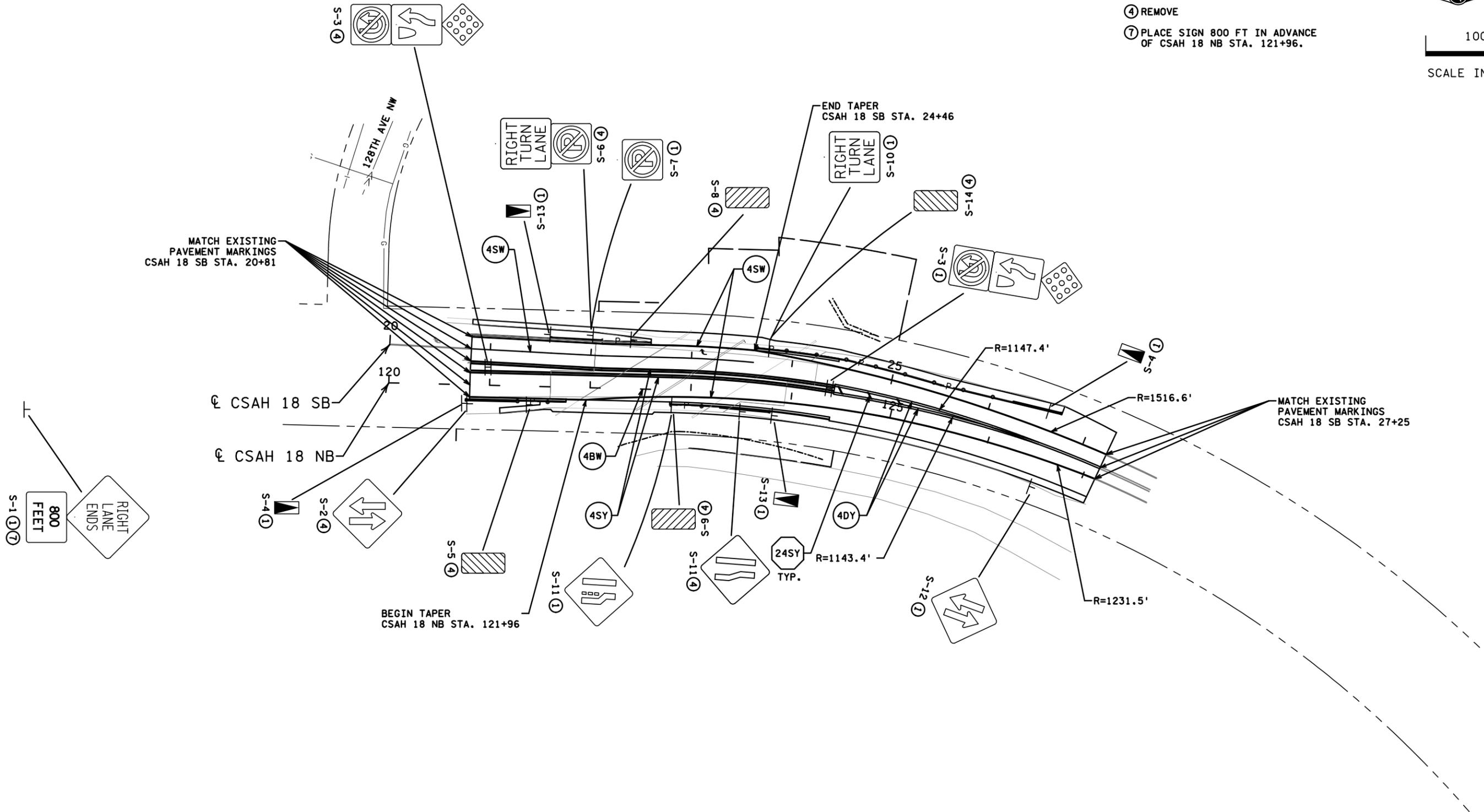
S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

NOTES

- ① F. & I.
- ④ REMOVE
- ⑦ PLACE SIGN 800 FT IN ADVANCE OF CSAH 18 NB STA. 121+96.



100
SCALE IN FEET



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NAME: SRI DURGA YADA LIC. NO. 58794

CERTIFIED BY: Y. Sri Durga 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: SY
 DESIGNED BY: SY
 CHECKED BY: NJS



SIGNING AND PAVEMENT MARKING PLAN

SHEET NO. 58 OF 59 SHEETS

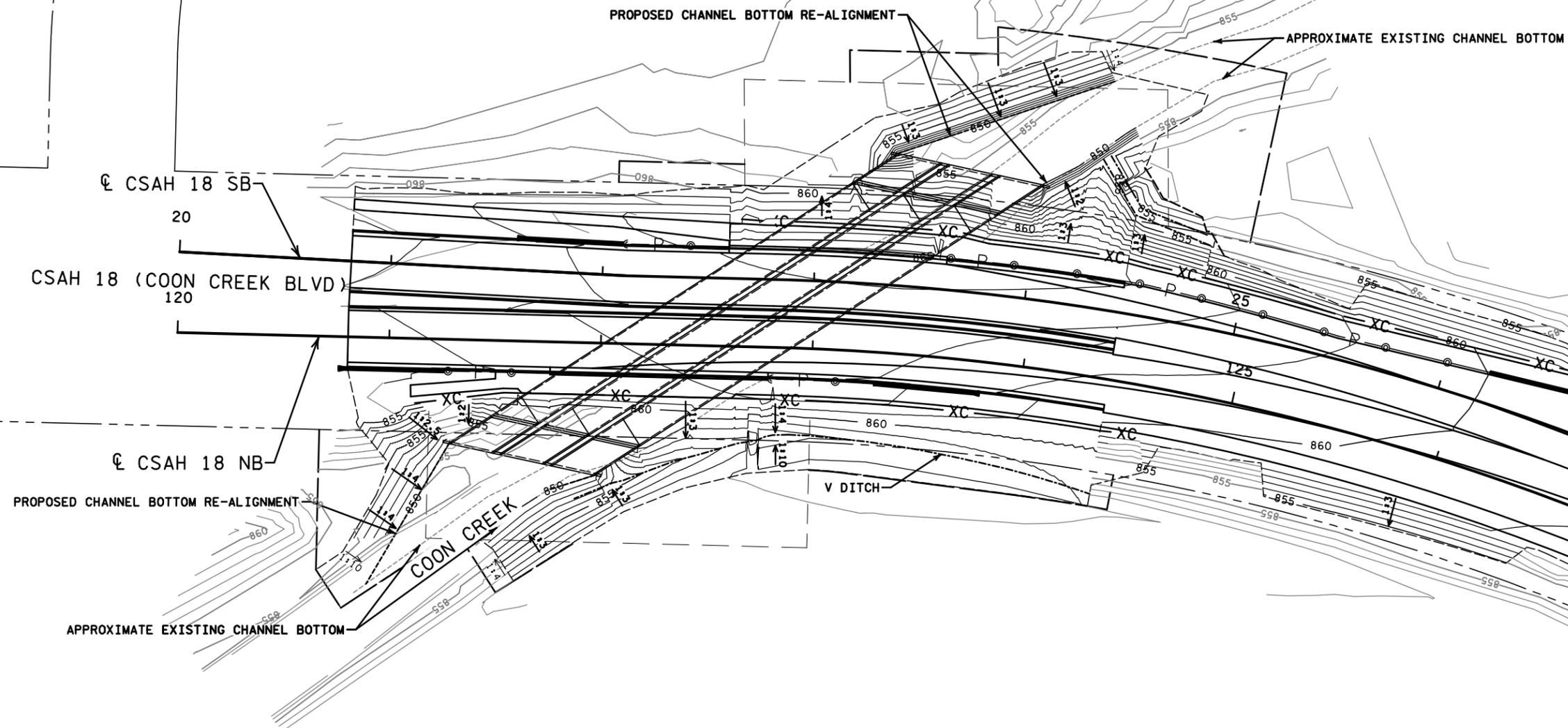
S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

LEGEND

- DITCH
- - - - - EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- EXISTING PERMANENT EASEMENT
- EXISTING CONTOUR
- PROPOSED CONTOUR



60
SCALE IN FEET



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NO	DATE	BY	CKD	APPR	REVISION

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

NAME: GINA E. BEERS LIC. NO. 56150

CERTIFIED BY: *GEB* 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB



CONTOUR GRADING PLAN

SHEET NO. 59 OF 59 SHEETS

S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

CONSTRUCTION NOTES

THE 2020 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AND THE "SUPPLEMENTAL SPECIFICATIONS" DATED SEPTEMBER 2022 SHALL GOVERN.

ALL EXPOSED CONCRETE EDGES SHALL BE FORMED WITH A 1/2" OR 3/4" CHAMFER UNLESS NOTED OTHERWISE.

CONSTRUCTION SHALL BE IN ACCORDANCE WITH SPEC. 2411 AND 2412, EXCEPT AS NOTED.

REFER TO GRADING PLAN FOR STRUCTURE 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.

THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE (Rn) WERE COMPUTED USING LRFD METHODOLOGY. PILE BEARING RESISTANCE DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

INPLACE BR. 02549 TO BE REMOVED.

SEE SPECIAL PROVISIONS FOR ALL XXXX.GXX SERIES PAY ITEMS FOR ADDITIONAL REQUIREMENTS.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY 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."

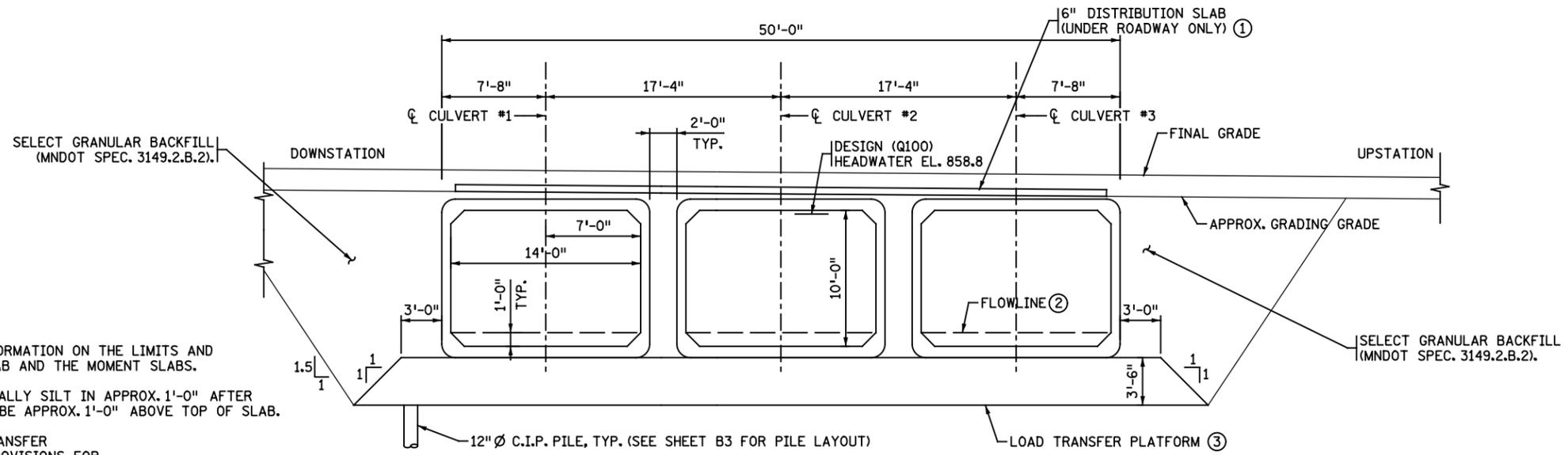
SEE BORINGS SHEET FOR INPLACE UTILITIES.

ALL DEWATERING ITEMS, LABOR, EQUIPMENT, AND MATERIALS FOR STAGED DIVERSION OF CHANNEL, FOR CONSTRUCTING EACH CULVERT BARREL IN THE DRY, SHALL BE PAID FOR UNDER THE LUMP SUM PAY ITEM FOR TEMPORARY STREAM DIVERSION SYSTEM. SEE STREAM DIVERSION STAGING PLAN SHEET IN GRADING PLANS AND SPECIAL PROVISIONS.

(T) SCHEDULE OF QUANTITIES FOR BOX CULVERTS

ITEM NO.	ITEM	UNIT	QUANTITY
(P) 2108.504	GEOGRID TYPE 2	SQ YD	8120
(P) 2108.504	GEOTEXTILE FABRIC TYPE 7	SQ YD	2136
(P) 2401.503	TYPE S (TL-4) 36" BARRIER CONCRETE (3S52)	LIN FT	206
⑤ (P) 2401.507	STRUCTURAL CONCRETE (3S52)	CU YD	53
⑥ (P) 2411.508	REINFORCEMENT BARS (EPOXY COATED)	POUND	25160
(P) 2412.502	14 X 10 PRECAST CONCRETE BOX CULVERT END SECTION	EACH	6
(P) 2412.503	14 X 10 PRECAST CONCRETE BOX CULVERT	LIN FT	558
④ 2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1
(P) 2451.507	COARSE AGGREGATE BEDDING (CV)	CU YD	2368
2452.502	C-I-P CONCRETE TEST PILE 85FT LONG 12"	EACH	4
2452.502	PILE REDRIVING	EACH	36
2452.502	PILE ANALYSIS	EACH	4
2452.503	C-I-P CONCRETE PILING 12"	LIN FT	27825

- (P) DENOTES PLAN QUANTITY PAY ITEM PER SPEC. 1901.1
- ④ NON-PARTICIPATING PAY ITEM FOR BRIDGE BOND FUNDS.
- ⑤ INCLUDES MOMENT SLABS ONLY
- ⑥ INCLUDES BARRIERS AND MOMENT SLABS



TRANSVERSE SECTION

NOTES:

- ① SEE SHEET B5 FOR ADDITIONAL INFORMATION ON THE LIMITS AND POSITION OF THE DISTRIBUTION SLAB AND THE MOMENT SLABS.
- ② CULVERTS ARE EXPECTED TO NATURALLY SILT IN APPROX. 1'-0" AFTER CONSTRUCTION. FINAL FLOWLINE TO BE APPROX. 1'-0" ABOVE TOP OF SLAB.
- ③ SEE SHEETS B3 & B4 FOR LOAD TRANSFER PLATFORM DETAILS. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION

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NO.	DATE	REVISION DESCRIPTION	DR.	CHK.	APP'D.

	CERTIFIED BY: LICENSED PROFESSIONAL ENGINEER NAME: TODD A. LANG	TITLE: TRANSVERSE SECTION AND QUANTITIES DATE: 03/01/2023 LIC. NO. 42962	DES: TJC	DR: TJC	APPROVED:	BRIDGE NO. 02J57
			CHK: TAL	CHK: TAL		
			S.A.P. NO. 002-618-034 (CSAH 18)			
SHEET NO. B2 OF B14 SHEETS						

PILE NOTES:

SOME INTERIOR PILES NOT SHOWN FOR CLARITY

SEE SHEET B4 FOR SECTION THRU LOAD TRANSFER PLATFORM

FIELD VERIFY LOCATIONS OF EXISTING PILING. FIELD ADJUST PILE LOCATIONS TO MAINTAIN 18" CLEAR DISTANCE BETWEEN EXISTING AND PROPOSED PILING

PILE SPACING AND LOAD TRANSFER PLATFORM LIMITS ON PLAN VIEW ARE SHOWN FOR BOTTOM OF LOAD TRANSFER PLATFORM

PILES TO BE NOMINAL DIAMETER OF 12" WITH THICKNESS OF 1/4"

PROVIDE A MINIMUM OF 4 TEST PILES AS SHOWN. DRIVE TEST PILES TO ESTIMATED FOUNDATION PILE LENGTH. IF REQUIRED NOMINAL PILE BEARING RESISTANCE IS NOT OBTAINED, WAIT 24 HOURS AND THEN PERFORM REDRIVE PER 2452.3.D.8. IF DESIGN BEARING IS NOT OBTAINED AFTER REDRIVE, CONTINUE DRIVING TO FULL TEST PILE LENGTH

THE QUANTITY FOR "PILE REDRIVING" HAS BEEN INCREASED (IN ADDITION TO THE 4 TEST PILES) TO ALLOW FOR ADDITIONAL REDRIVING AT THE DIRECTION OF THE ENGINEER. THE FINAL QUANTITY MAY BE INCREASED OR DECREASED AT THE DIRECTION OF THE ENGINEER BASED ON FIELD CONDITIONS

FOR PILE SPLICE DETAILS, SEE STANDARD DETAIL B201 ON SHEET B12

4 - 12" CAST-IN-PLACE CONC. TEST PILE 85 FT. LONG
 371 - 12" CAST-IN-PLACE CONC. PILES EST. LENGTH 75 FT.
 375 - 12" CAST-IN-PLACE CONC. PILES REQ'D FOR LOAD TRANSFER PLATFORM

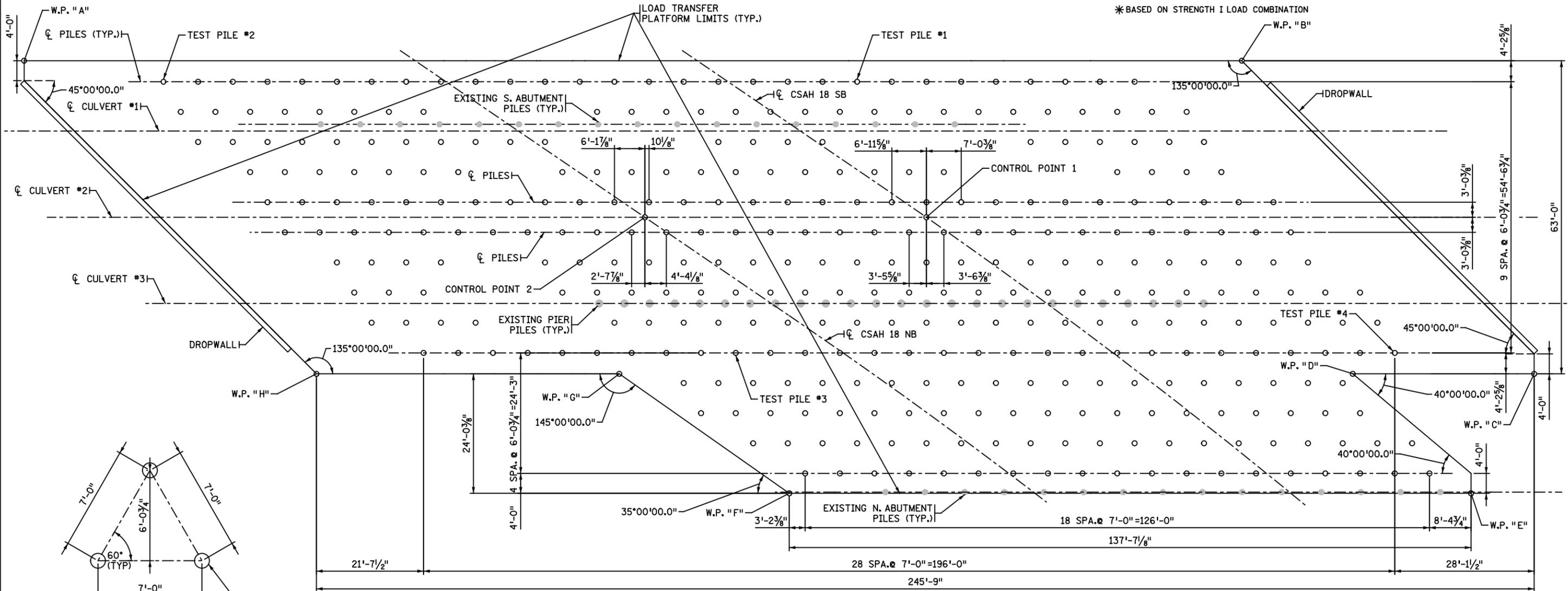
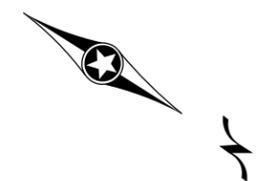
WORKING POINTS TABLE				
POINT	STATION	OFFSET	X-COORDIN	Y-COORDIN
A	121+24.55 (P_CSAH18_NB)	44.37 RT	483079.345	160256.819
B	23+25.50 (P_CSAH18_SB)	62.67 LT	482946.293	160463.435
C	24+06.94 (P_CSAH18_SB)	49.93 LT	482967.320	160547.144
D	23+79.69 (P_CSAH18_SB)	26.53 LT	482987.135	160516.373
E	24+12.71 (P_CSAH18_SB)	23.39 LT	482994.414	160549.451
F	123+01.72 (P_CSAH18_NB)	29.36 RT	483068.910	160433.767
G	122+59.30 (P_CSAH18_NB)	28.96 RT	483067.287	160391.906
H	122+08.76 (P_CSAH18_NB)	63.31 RT	483100.372	160340.529

LOAD TRANSFER PLATFORM REQUIRED NOMINAL PILE BEARING RESISTANCE FOR CIP PILES R_n - TONS/PILE		
FIELD CONTROL METHOD	ϕ dyn	$**R_n$
MNDOT PILE FORMULA 2012 (MPF12) $R_n = 20 \sqrt{\frac{W \times H}{1000}} \times \log\left(\frac{10}{S}\right)$	0.50	98.56
PDA	0.65	75.81

$**R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{\text{dyn}}$

COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD	43.45
FACTORED LIVE LOAD	5.83
*FACTORED DESIGN LOAD	49.28

*BASED ON STRENGTH I LOAD COMBINATION



LOAD TRANSFER PLATFORM PILE LAYOUT
 (STAGING NOT SHOWN FOR CLARITY)

TYPICAL PILE SPACING

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NO.	DATE	REVISION DESCRIPTION	DR.	CHK.	APP'D.



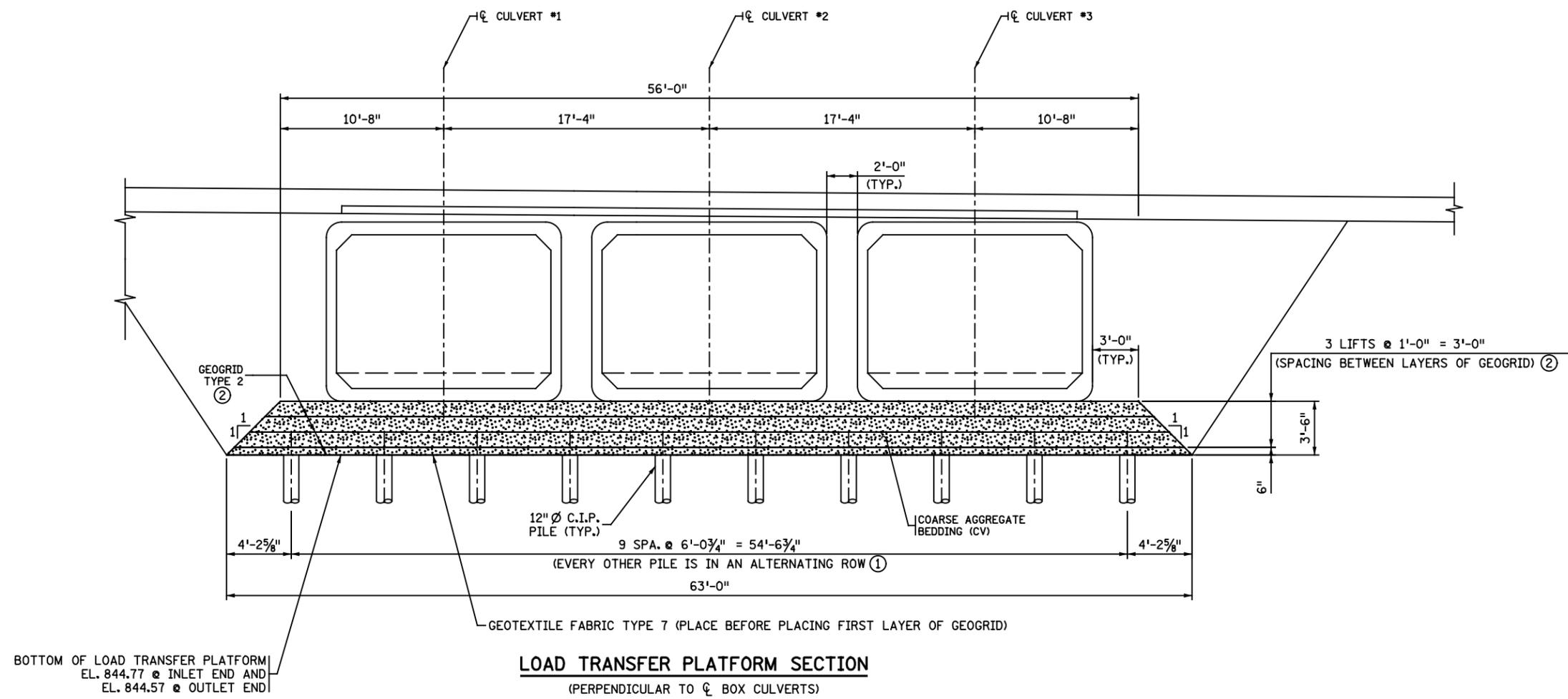
CERTIFIED BY: *Todd A. Lang*
 LICENSED PROFESSIONAL ENGINEER
 DATE: 03/01/2023
 NAME: TODD A. LANG
 LIC. NO. 42962

TITLE: **PILE LAYOUT**

DES: TJC	DR: TJC	APPROVED:
CHK: TAL	CHK: TAL	
S.A.P. NO. 002-618-034 (CSAH 18)		
SHEET NO. B3 OF B14 SHEETS		

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NOTES:

- ① PILES ARE IN A TRIANGULAR PATTERN. SEE SHEET B3 FOR PILE LAYOUT
- ② SEE MNDOT SPEC. 2108 AND 3733 FOR MATERIAL AND CONSTRUCTION REQUIREMENTS FOR GEOGRID

NO.	DATE	REVISION DESCRIPTION	DR.	CHK.	APP'D.



CERTIFIED BY: *Todd A. Lang*
 LICENSED PROFESSIONAL ENGINEER
 DATE: 03/01/2023
 NAME: TODD A. LANG
 LIC. NO. 42962

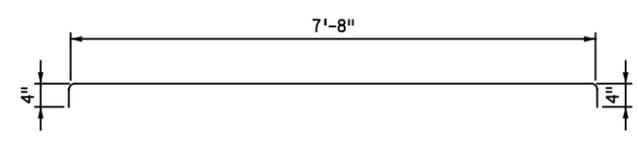
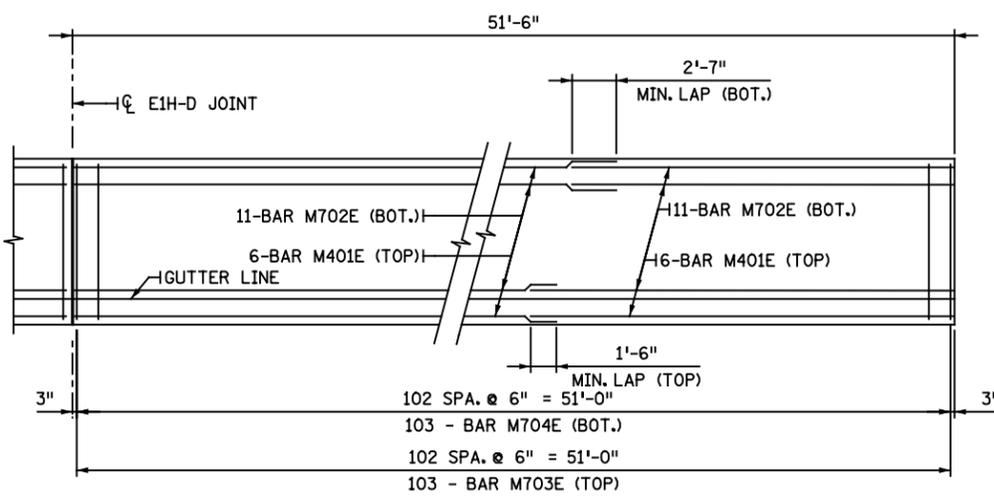
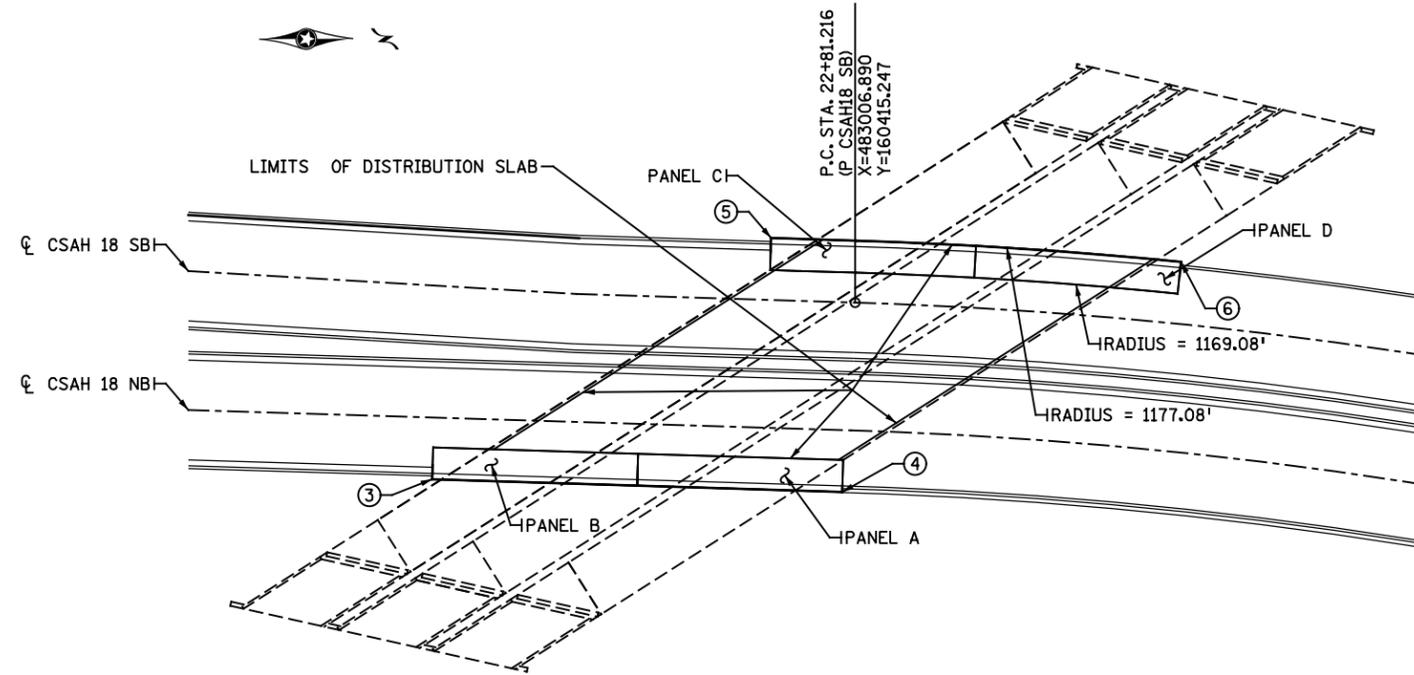
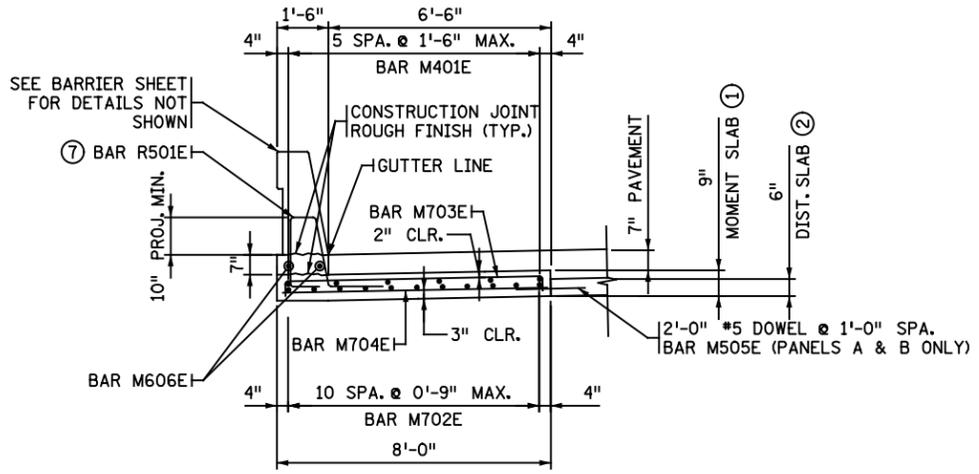
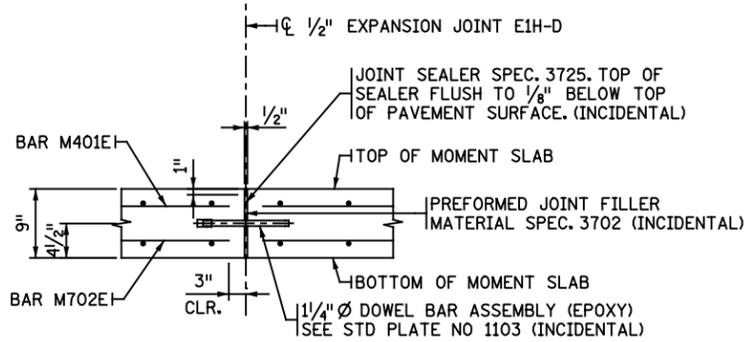
TITLE: **LOAD TRANSFER PLATFORM SECTION**

DES: TJC	DR: TJC	APPROVED:
CHK: TAL	CHK: TAL	
S.A.P. NO. 002-618-034 (CSAH 18)		
SHEET NO. B4 OF B14 SHEETS		

BRIDGE NO.
 02J57

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MARK	NO.	LENGTH	SHAPE	LOCATION	QUANTITIES	
MOMENT SLAB REINFORCEMENT						
BAR M401E	48	26'-6"	—	LONG. TOP	REINFORCEMENT (EPOXY)	
BAR M702E	88	27'-0"	—	LONG. BOTTOM	19910	LB
BAR M703E	412	8'-4"	┌	TRANS. TOP		
BAR M704E	412	7'-6"	—	TRANS. BOTTOM	CONCRETE (3S52)	
BAR M505E	104	2'-0"	—	DOWEL	53	CU. YD.
BAR M606E	16	26'-10"	—	PEDESTAL		

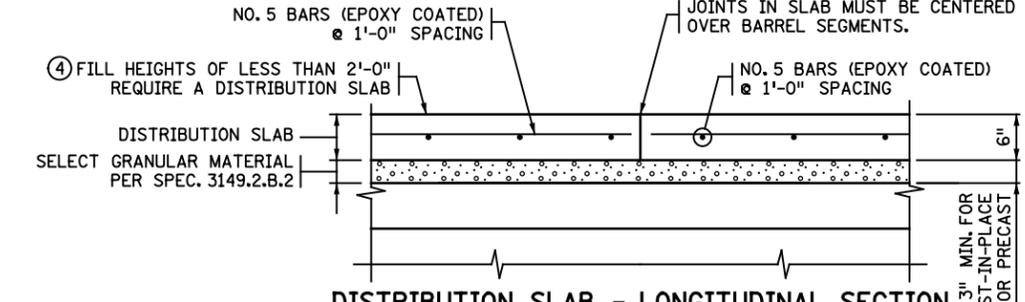
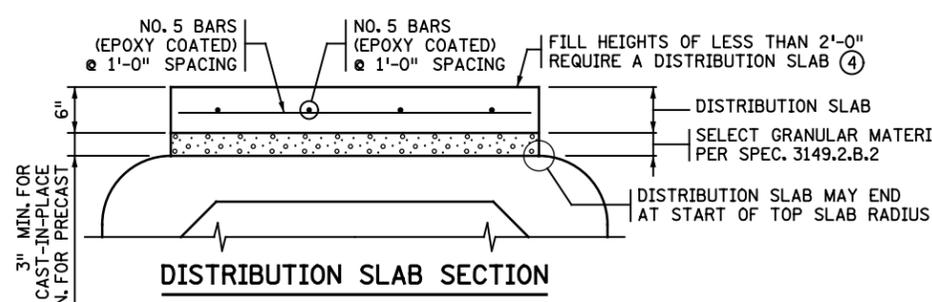


- NOTES:**
- STRUCTURAL CONCRETE (3S52). MNDOT SPEC. 2401
 - MOMENT SLABS ARE REQUIRED ON EACH SIDE OF CSAH 18. 6" DISTRIBUTION SLAB TO RUN BETWEEN THE MOMENT SLABS OVER THE BOX CULVERTS. CONNECT DISTRIBUTION SLAB TO MOMENT SLAB, AT PANELS A AND B ONLY WITH #5 DOWEL BARS @ 12" MAX. SPACING. AT PANELS C AND D, DISTRIBUTION SLAB EXTENDS UNDER MOMENT SLAB. SEE SHEET B6 FOR ADDITIONAL DETAILS OF THE DISTRIBUTION SLAB.
 - BEGIN BARRIER AND MOMENT SLAB STA. 121+76.30 (P_CSAH18_NB)
 - END BARRIER AND MOMENT SLAB STA. 122+79.30 (P_CSAH18_NB)
 - BEGIN BARRIER AND MOMENT SLAB STA. 122+59.51 (P_CSAH18_NB)
 - END BARRIER AND MOMENT SLAB STA. 123+59.32 (P_CSAH18_NB)
 - SEE SHEET B11 FOR BARRIER REINFORCEMENT DETAILS FOR BARS R510E, R502E, R503E, R504E
- PAYMENT FOR JOINT FILLER AND SEALER INCLUDED IN ITEM "STRUCTURAL CONCRETE (3S52)"

NO.	DATE	REVISION DESCRIPTION	DR.	CHK.	APP'D.

	CERTIFIED BY:	TITLE: MOMENT SLAB DETAILS	DES: TJC	DR: TJC	APPROVED:	BRIDGE NO. 02J57
	NAME: TODD A. LANG	DATE: 03/01/2023	CHK: TAL	CHK: TAL		
	LIC. NO. 42962		S.A.P. NO. 002-618-034 (CSAH 18)			

SHEET NO. B5 OF B14 SHEETS



CONSTRUCTION NOTES

CONSTRUCT CULVERTS PER SPEC. 2412 EXCEPT AS NOTED.

REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5-395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.

PROVIDE WELDED WIRE REINFORCEMENT, SHEAR REINFORCEMENT AND REINFORCEMENT BARS PER THE APPLICABLE REQUIREMENTS OF AASHTO M259.

1 1/2" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:
 (a) 1 OR 2 LAYERS OF WELDED WIRE REINFORCEMENT OR
 (b) 1 LAYER OF WELDED WIRE REINFORCEMENT AND 1 LAYER OF REINFORCEMENT BARS OR
 (c) 1 LAYER OF REINFORCEMENT BARS.

DEVELOP REINFORCEMENT IN ACCORDANCE WITH AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WELDED WIRE REINFORCEMENT, INCREASE THE AREA OF REINFORCEMENT BY 8%, AND SUBMIT DESIGN CALCULATIONS VERIFYING COMPLIANCE WITH AASHTO 5.7.3.4. "CONTROL OF CRACKING BY DISTRIBUTION OF REINFORCEMENT".

MAXIMUM SIZE OF REINFORCEMENT BARS IS NO. 6. THE MAXIMUM WELDED WIRE REINFORCEMENT SIZE IS W23 PER LAYER (MAXIMUM OF 2 LAYERS).

SPACE CENTER TO CENTER OF TRANSVERSE WIRES NOT LESS THAN 2" NOR MORE THAN 4". SPACE CENTER TO CENTER OF LONGITUDINAL WIRES NOT MORE THAN 8".

WHEN USING As1, As7, AND As8 REINFORCEMENT AS ONE CONTINUOUS CAGE WITH SPLICES OCCURRING IN THE CENTER OF THE TOP AND BOTTOM OF THE BOX SECTION, THE MIN. LAP LENGTH FOR THE As7 AND As8 IS 15".

WELDING IS NOT PERMITTED ON REINFORCEMENT BARS OR WELDED WIRE REINFORCEMENT, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE REINFORCEMENT IS ACCEPTABLE.

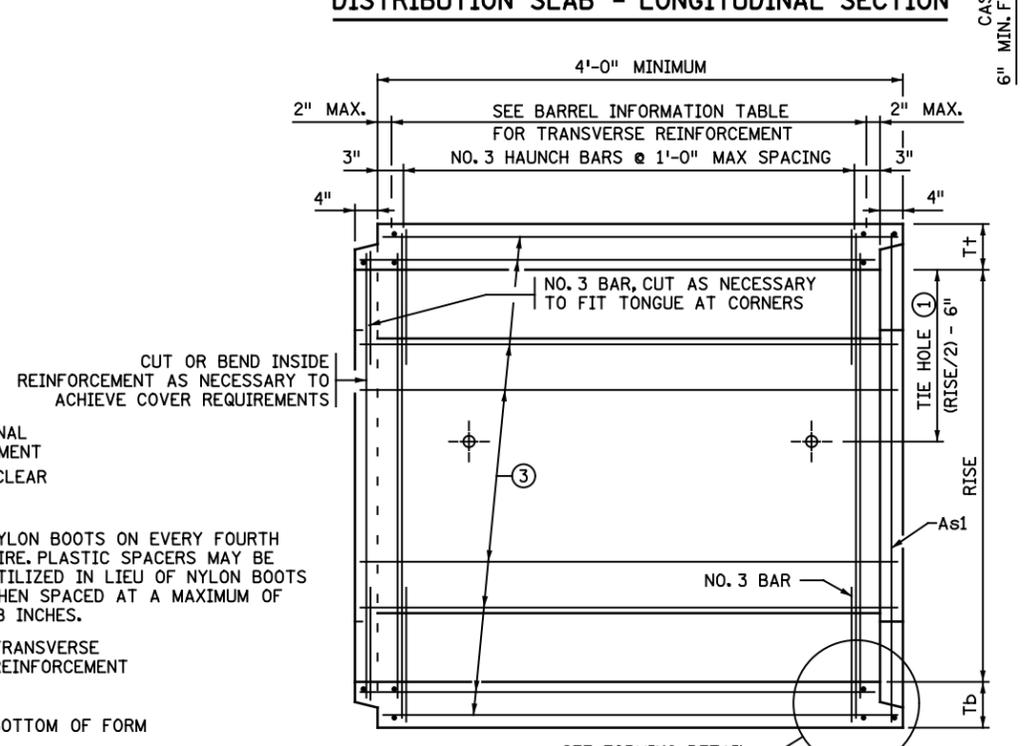
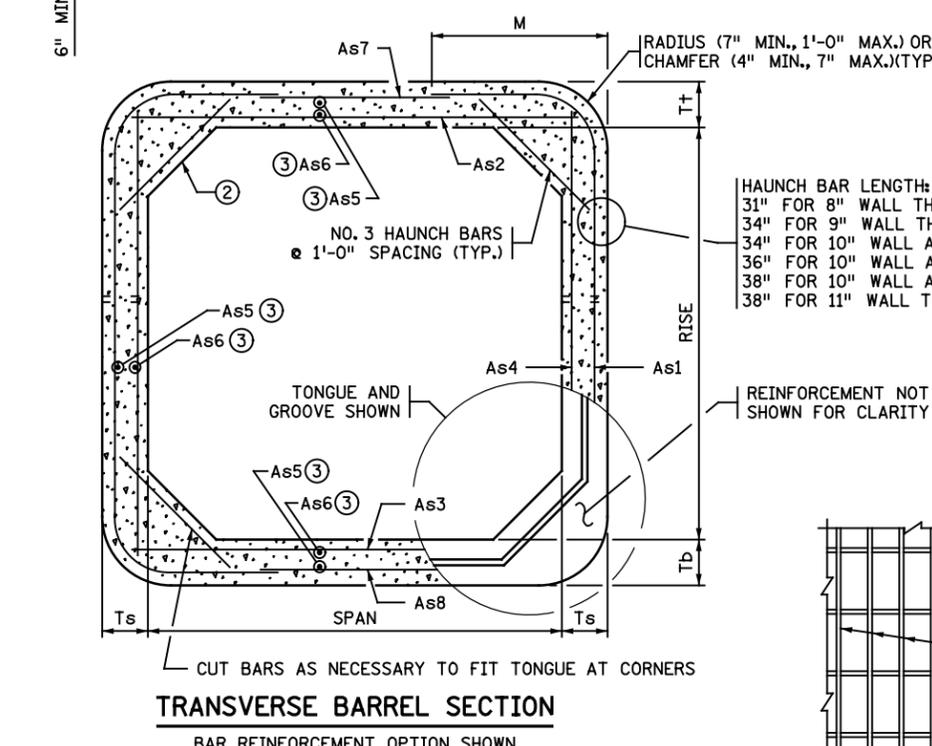
WHEN REINFORCEMENT IS CUT, PLACE ADDITIONAL REINFORCEMENT ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

USE CONCRETE MIX NO. 3W82 WITH NO CALCIUM CHLORIDE ALLOWED.

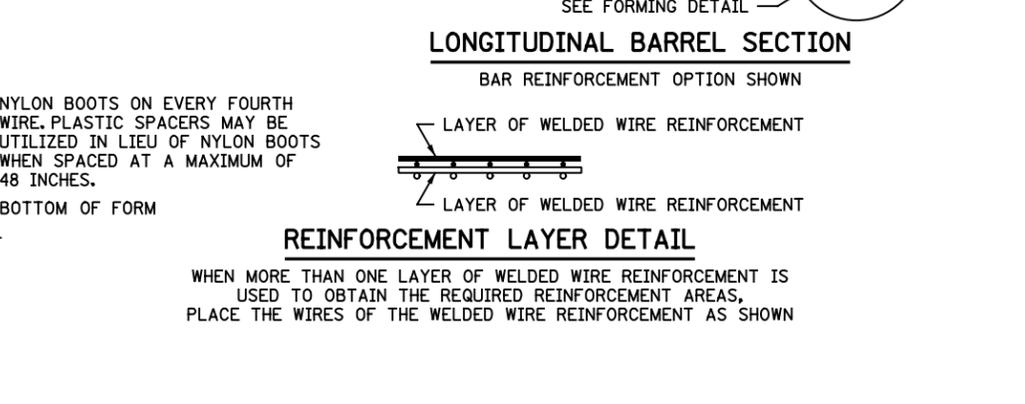
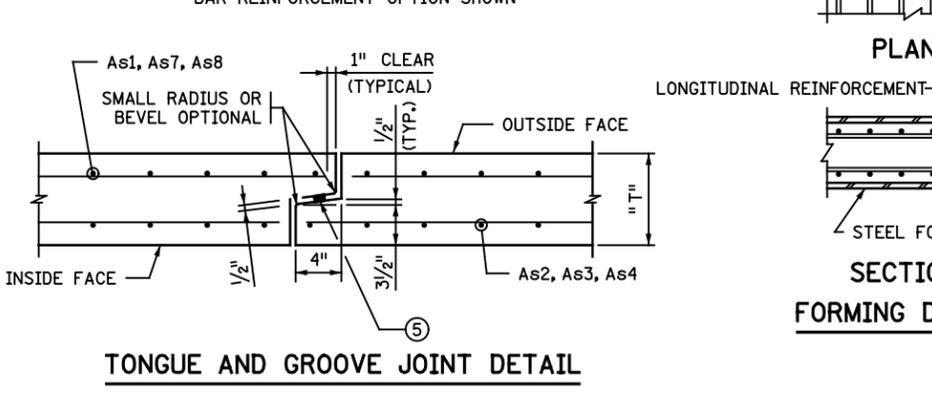
SHOP DRAWING APPROVAL PER SPEC. 3238.2.A IS NOT REQUIRED UNLESS OPENINGS OR ATTACHMENTS ARE PLACED ON A BARREL SEGMENT.

COMPACT THE FIRST 1.5' (LOOSE) OF FILL ABOVE THE BOX WITH LIGHT COMPACTION EQUIPMENT SUCH AS PLATE COMPACTORS OR WALK BEHIND ROLLERS.

TRANSVERSE REINFORCEMENT IS PARALLEL TO THE CULVERT SPAN. LONGITUDINAL REINFORCEMENT IS PERPENDICULAR TO THE CULVERT SPAN.



- ① USE 1" DIAMETER CULVERT TIES. SEE STANDARD PLATE NO. 3145 FOR DETAILS.
 - ② USE 12" VERTICAL, 12" HORIZONTAL HAUNCHES ON ALL BOX SIZES.
 - ③ PLACE LONGITUDINAL REINFORCEMENT DENOTED AS As5 AND As6 IN ALL SLABS AND WALLS WITH A MINIMUM OF 0.06 SQ. IN./FT.
 - ④ ROADWAY OR SHOULDER FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A 6" THICK DISTRIBUTION SLAB WITH CONCRETE MIX 3552.
- PLACE CAST-IN-PLACE DISTRIBUTION SLABS WITH 3" MIN. SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND DISTRIBUTION SLAB.
- PRECAST DISTRIBUTION SLABS MAY BE USED FOR FILL HEIGHTS OVER 1'-0". PROVIDE 6" MINIMUM SELECT GRANULAR MATERIAL PER SPEC. 3149.2.B.2 BETWEEN BARREL AND SLAB.
- EXTEND THE WIDTH OF THE DISTRIBUTION SLAB TO THE OUTSIDE EDGES OF THE ROADWAY SHOULDERS UNLESS DIRECTED BY THE ENGINEER.
- REDESIGN THE DISTRIBUTION SLAB PER THE MnDOT PAVEMENT DESIGN MANUAL IF IT IS USED AS PAVEMENT SURFACE.
- PAYMENT FOR THE DISTRIBUTION SLAB AND SELECT GRANULAR MATERIAL BENEATH THE SLAB IS CONSIDERED INCIDENTAL.



FORMING DETAIL

LONGITUDINAL REINFORCEMENT

NYLON BOOTS ON EVERY FOURTH WIRE. PLASTIC SPACERS MAY BE UTILIZED IN LIEU OF NYLON BOOTS WHEN SPACED AT A MAXIMUM OF 48 INCHES.

STEEL FORM OR EQUAL

REVISION: FEBRUARY 22, 2018

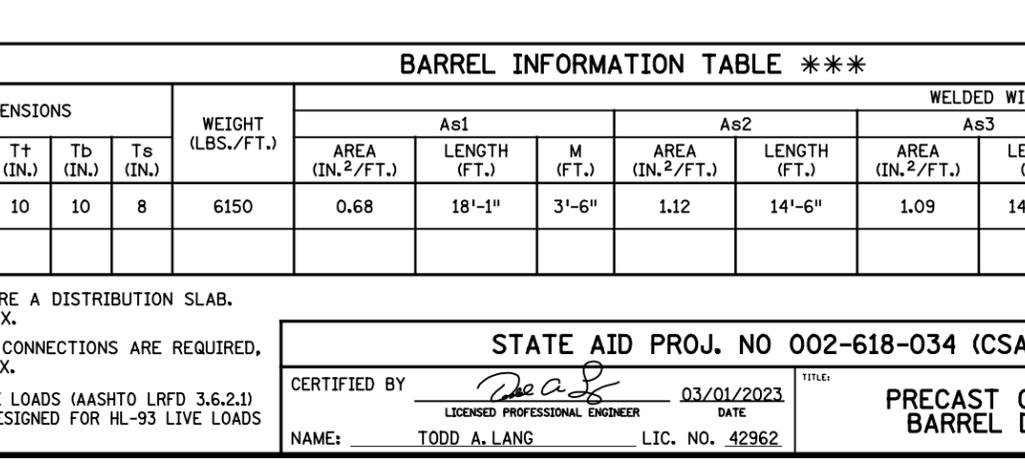
APPROVED: MARCH 24, 2011

Nancy D. Wenzelberger
STATE BRIDGE ENGINEER

*** ALL CLASS 1 CULVERTS WITH FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. IF A DISTRIBUTION SLAB IS NOT REQUIRED, INDICATE "NO" IN THIS BOX.

*** FOR PEDESTRIAN CULVERT APPLICATIONS HIDE-AWAY OR RECESSED TIE CONNECTIONS ARE REQUIRED, SEE STANDARD PLATE 3145. IF REQUIRED, INDICATE "YES" IN THIS BOX.

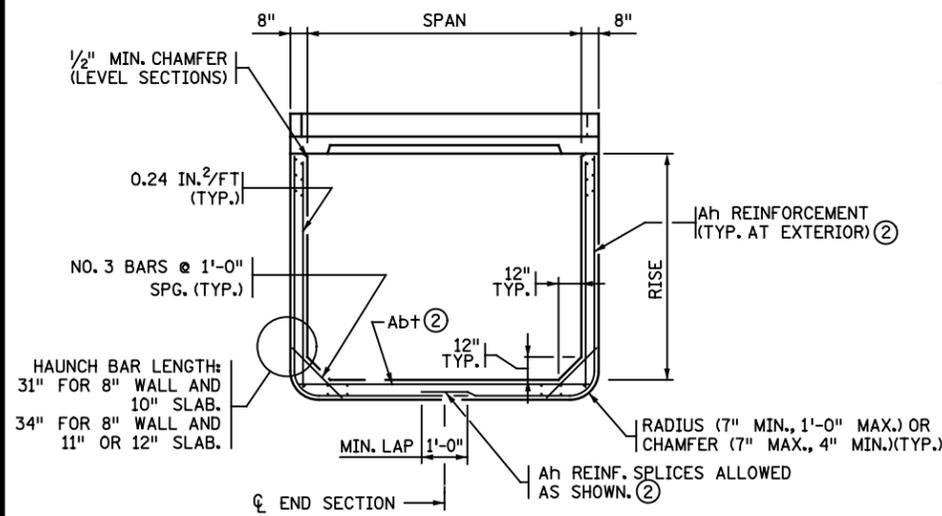
*** BOX CULVERTS WITH SPANS FROM 6 TO 14 FT. ARE DESIGNED FOR HL-93 LIVE LOADS (AASHTO LRFD 3.6.2.1) NOT INCLUDING THE DESIGN LANE LOAD. BOXES WITH SPANS OF 16 FT. ARE DESIGNED FOR HL-93 LIVE LOADS INCLUDING THE DESIGN LANE LOAD.



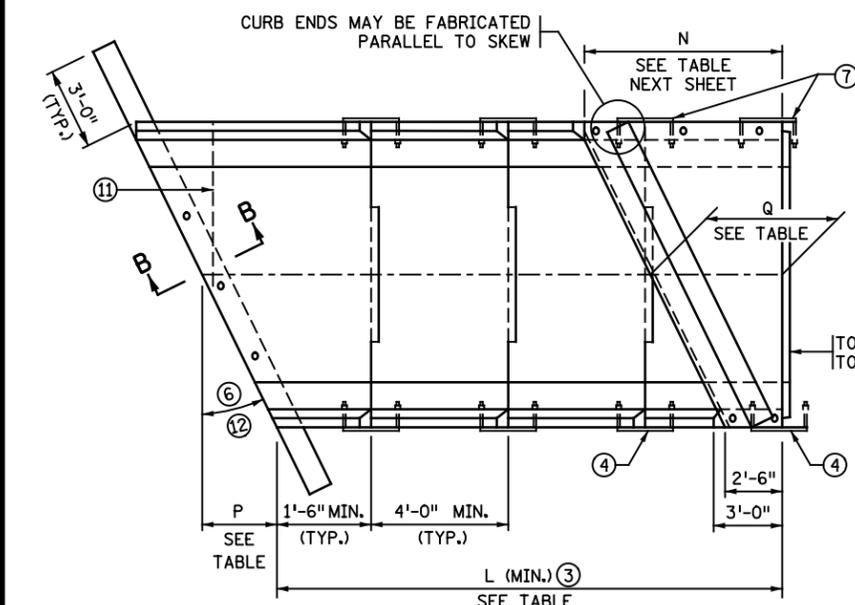
BARREL INFORMATION TABLE ***

LOCATION	SIZE	CLASS	f'c (P.S.I.)	FILL HEIGHT RANGE (FT.)	DISTRIBUTION SLAB REQUIRED *	RECESSED TIE RODS REQUIRED **	DIMENSIONS					WEIGHT (LBS./FT.)	WELDED WIRE REINFORCEMENT												
							SPAN (FT.)	RISE (FT.)	T+ (IN.)	Tb (IN.)	Ts (IN.)		As1		As2		As3		As4		As7		As8		
													AREA (IN. ² /FT.)	LENGTH (FT.)											
22+92.95	14X10	1	5000	1.6' - 3.9'	YES	NO	14	10	10	10	8	6150	0.68	18'-1"	3'-6"	1.12	14'-6"	1.09	14'-6"	0.20	10'-6"	0.24	10'-11"	0.24	10'-11"

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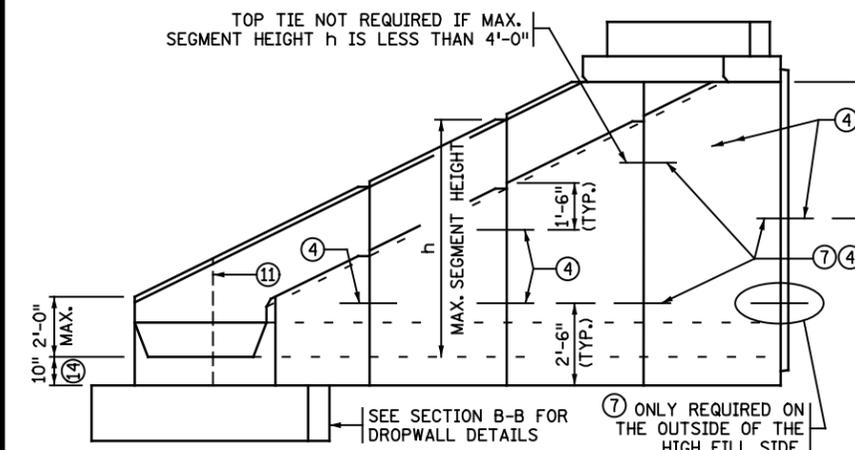


END VIEW

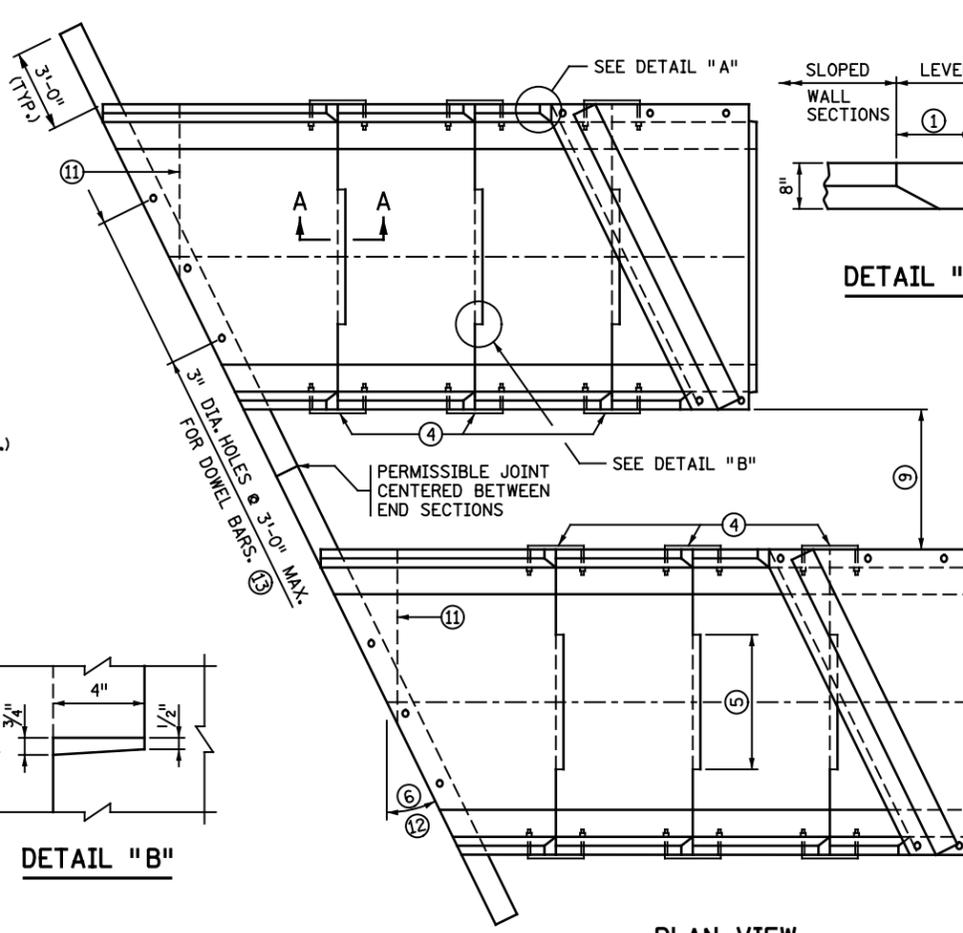


PLAN VIEW

SINGLE BARREL OPTION

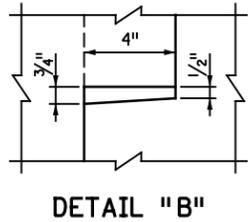


ELEVATION

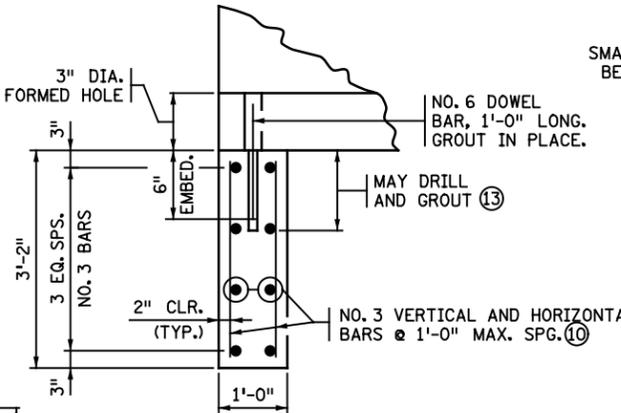


PLAN VIEW

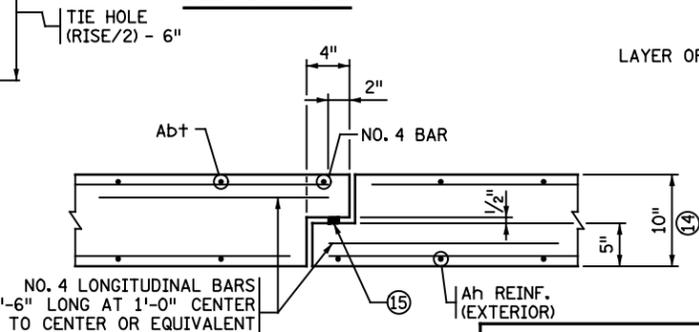
DOUBLE-BARREL OPTION



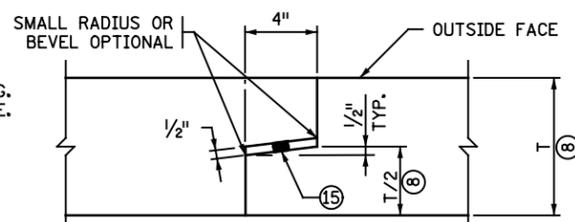
DETAIL "B"



SECTION B-B

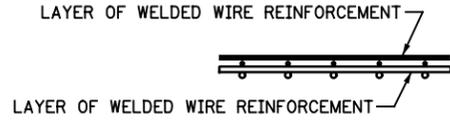


SECTION A-A



TONGUE AND GROOVE JOINT

MAKE DIMENSION OF TONGUE OR GROOVE ON ADJACENT PRECAST BARREL SECTIONS SO INSIDE WALLS ARE FLUSH.



REINFORCEMENT LAYER DETAIL

WHEN MORE THAN ONE LAYER OF WELDED WIRE REINFORCEMENT IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, PLACE THE WIRES OF THE WELDED WIRE REINFORCEMENT AS SHOWN

CONSTRUCTION NOTES

- SEE STANDARD FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.
- ON ALL END SECTIONS FOR WATERWAYS, USE DROPWALLS ON INLET AND OUTLET ENDS.
- FINISH ALL EXPOSED EDGES OF CONCRETE WITH 1/2" OR 3/4" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.
- USE CONCRETE MIX 3W82 WITH NO CALCIUM CHLORIDE ALLOWED.
- USE DROPWALL CONCRETE MIX 3S52, OR 3Y82 IF PRECAST. LIMITS FOR DROPWALL EXCAVATION TO BE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. FURNISHING AND INSTALLATION OF DROPWALL IS INCLUDED IN PRICE BID FOR END SECTIONS.
- PLACE LONGITUDINAL REINFORCEMENT WITH A MINIMUM OF 0.06 SQ. IN. PER FT. ON BOTH FACES.
- NO TONGUE OR GROOVE REQUIRED IN WALLS BETWEEN END SECTIONS.
- SEE STANDARD FIG. 5-395.115 FOR EMBANKMENT PROTECTION.
- 1) 8 1/8" @ 15"; 10 5/8" @ 30"; 1'-2" @ 45°
- 2) SEE STANDARD FIG. 5-395.110(B) FOR REINFORCEMENT TABLES.
- 3) NUMBER OF SECTIONS VARIES WITH CULVERT RISE.
- 4) EXCEPT AS NOTED, USE 1" DIA. CULVERT TIES. SEE STANDARD PLATE NO. 3145 FOR DETAILS. TWO TIES ARE REQUIRED PER JOINT WHERE h IS GREATER THAN 4'.
- 5) 3'-6" MIN. TONGUE AND 3'-7" MIN. GROOVE FOR CULVERTS WITH 6'-0" SPANS. 5'-0" MIN. TONGUE AND 5'-1" MIN. GROOVE FOR CULVERTS WITH SPANS GREATER THAN 6'-0". CENTER TONGUE AND GROOVE ON C OF EACH APRON JOINT. TONGUE AND GROOVE JOINT ON ALL THREE SIDES OF APRON IS PERMISSIBLE.
- 6) FOR SKEW ANGLES OVER 7 1/2° UP TO 22 1/2°, USE A 15° SKEW END SECTION. FOR SKEW ANGLES OVER 22 1/2° UP TO 37 1/2°, USE A 30° SKEW END SECTION. FOR SKEW ANGLES OVER 37 1/2° UP TO 45°, USE A 45° SKEW END SECTION.
- 7) PROVIDE EXTRA STRONG CONNECTION AT LOCATION SHOWN; REQUIRED ONLY ON HIGH FILL SIDE FOR 45° SKEW END SECTIONS OVER 6'-0" HIGH. FOR MULTIPLE BARREL OPTION, ONLY INCLUDE EXTRA STRONG TIES ON THE OUTSIDE OF THE HIGH FILL SIDE. SEE STANDARD FIG. 5-395.110(B) FOR DETAILS.
- 8) DIMENSION "T" IS EQUAL TO Tt, Td OR Ts.
- 9) REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES AND TO STANDARD FIGURE 5-395.115 FOR MATERIAL REQUIREMENTS FOR FILL BETWEEN ADJACENT BOXES.
- 10) WELDED WIRE REINFORCEMENT OF EQUAL AREA MAY BE SUBSTITUTED FOR REBAR.
- 11) ON THE LAST SEGMENT OF THE 45° SKEWED APRONS, A TRANSVERSE JOINT IN THE BOTTOM IS PERMITTED. A SPECIAL TIE, SIMILAR TO THE SIDE TIE, MUST BE PROVIDED. THE TIE SHALL BE INSET AND THE SPACE FILLED WITH AN APPROVED GROUT.
- 12) FOR BOX CULVERTS WITH SPANS OF 16' THE MAXIMUM SKEW SHALL BE 30°.
- 13) FILL HOLE WITH GROUT. GROUT CONSISTS OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX MAXIMUM SLUMP IS 4".
- 14) APRON BOTTOM SLAB THICKNESS MAY BE 8" FOR CULVERTS WITH 6' SPANS ONLY. BOTTOM SLAB THICKNESS MAY BE INCREASED UP TO 2" MAX. PROVIDED COVER IS 1 1/2" MIN., 2" MAX.
- 15) REFER TO SPEC. 2412 FOR SEALANT REQUIREMENTS.

LENGTH P				
SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW	
6	0'-11 3/4"	2'-1 3/8"	3'-8"	
8	1'-3"	2'-8 3/8"	4'-8"	
10	1'-6 1/4"	3'-3 1/4"	5'-8"	
12	1'-9 3/8"	3'-10 1/4"	6'-8"	
14	2'-0 5/8"	4'-5 1/8"	7'-8"	
16	2'-3 3/8"	5'-0"	(12)	

MIN. LENGTH L				
RISE (FT.)	15° SKEW	30° SKEW	45° SKEW	
4	7'-1 3/4"	7'-7 3/8"	8'-7 7/8"	
5	9'-2 1/2"	9'-11 1/4"	11'-5 1/8"	
6	11'-3 3/8"	12'-2 1/8"	14'-3 3/4"	
7	13'-4 1/4"	14'-6 5/8"	17'-1 1/4"	
8	15'-5 1/4"	16'-10 1/4"	19'-11 5/8"	
9	17'-5 7/8"	19'-2"	22'-9 5/8"	
10	19'-6 3/4"	21'-5 3/4"	25'-7 1/2"	
11	21'-7 5/8"	23'-9 3/8"	28'-5 1/2"	
12	23'-8 1/2"	26'-1 1/4"	31'-3 3/8"	
13	25'-9 3/8"	28'-4 7/8"	34'-1 3/8"	
14	27'-10 1/8"	30'-8 1/2"	36'-11 1/4"	

LENGTH Q				
SPAN (FT.)	15° SKEW	30° SKEW	45° SKEW	
6	3'-5 3/4"	4'-7 3/8"	6'-2"	
8	3'-9"	5'-2 3/8"	7'-2"	
10	4'-0"	5'-9 1/4"	8'-2"	
12	4'-3 3/8"	6'-4 1/8"	9'-2"	
14	4'-6 5/8"	6'-11 1/8"	10'-2"	
16	4'-9 3/8"	7'-6 1/8"	(12)	

REVISION: FEBRUARY 22, 2018

APPROVED: MARCH 24, 2011
Nancy D. Wenzelberger
 STATE BRIDGE ENGINEER

STATE AID PROJ. NO 002-618-034 (CSAH 18) STA. 22+92.95

FIG. 5-395.110(A)

CERTIFIED BY *Todd A. Lang* 3/01/2023
 LICENSED PROFESSIONAL ENGINEER DATE
 NAME: TODD A. LANG LIC. NO. 42962

TITLE: PRECAST CONCRETE END SECTION
 TYPE III - SINGLE OR DOUBLE BARREL
 FOR SKEWS 7 1/2° TO 45°

DES: TJC DR: TJC APPROVED:
 CHK: TAL CHK: TAL
 SHEET NO. B7 OF B14 SHEETS

BRIDGE NO.
 02J57

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HEIGHT h (FT.)	Ah (IN ² /FT.)	
	15° & 30° SKEW	45° SKEW
7 OR LESS	0.192	0.192
8	0.20	0.24
9	0.29	0.36
10	0.42	0.53
11	0.60	0.75
12	0.78	0.98
13	1.03	1.36
14	1.38	1.85

Ab† REINFORCEMENT	
SPAN (FT.)	Ab† (IN ² /FT.)
6-10	0.20
12	0.30
14	0.39
16	0.39

SPAN (FT.)	LINTEL BEAM REINFORCEMENT	
	A1	A2
6	NO. 4 @ 1'-0"	NO. 4 @ 9"
8	NO. 4 @ 1'-1"	NO. 4 @ 6"
10	NO. 4 @ 9"	NO. 5 @ 6"
12	NO. 5 @ 9"	NO. 6 @ 6"
14	NO. 6 @ 9"	NO. 8 @ 6"
16	NO. 6 @ 9"	NO. 8 @ 6"

SPAN (FT.)	LENGTH N		
	15° SKEW	30° SKEW	45° SKEW
6	4'-3 ³ / ₈ "	6'-4 ¹ / ₄ "	9'-2"
8	4'-9 ⁷ / ₈ "	7'-6"	11'-2"
10	5'-4 ¹ / ₄ "	8'-7 ⁷ / ₈ "	13'-2"
12	5'-10 ³ / ₄ "	9'-9 ³ / ₄ "	15'-2"
14	6'-5 ¹ / ₈ "	10'-11 ⁵ / ₈ "	17'-2"
16	6'-11 ⁵ / ₈ "	12'-1 ¹ / ₂ "	NA (7)

SPAN (FT.)	LINTEL BEAM THICKNESS		
	15° SKEW	30° SKEW	45° SKEW
≤ 12	9"	9"	9"
14	10" (8)	10" (8)	10" (8)
16	10" (8)	10" (8)	NA (7)

NOTE: h IS THE LARGEST VERTICAL DIMENSION OF THE SEGMENT.

CONSTRUCTION NOTES

SEE STANDARD FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.

ALL END SECTIONS REQUIRE CURB ON LINTEL BEAM.

GROUT CONSISTS OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX MAXIMUM SLUMP IS 4".

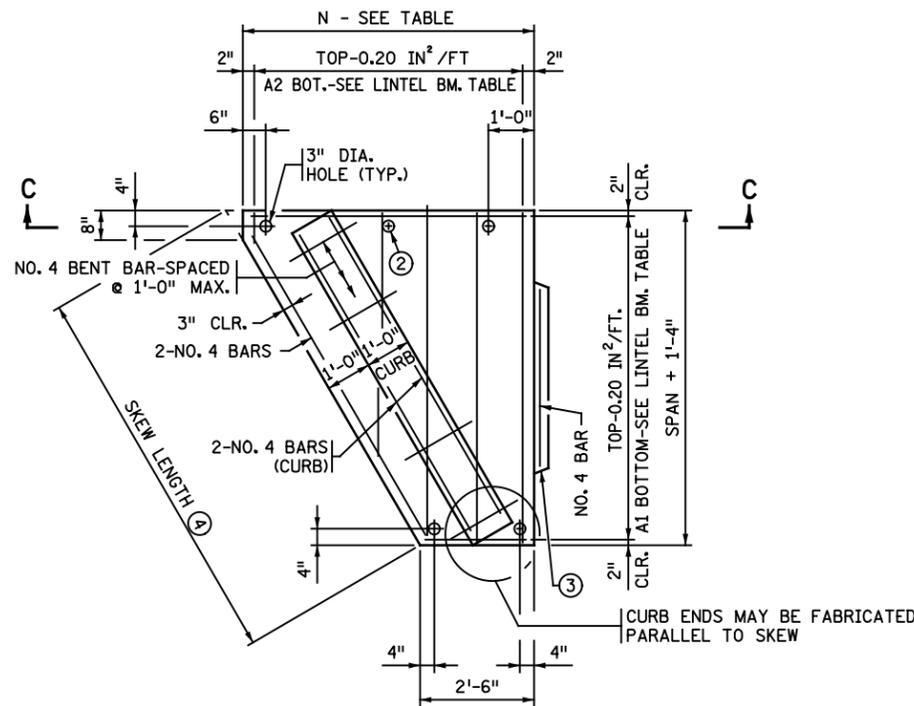
STRUCTURAL STEEL PER SPEC. 3306.

WELDING PER SPEC. 2471.

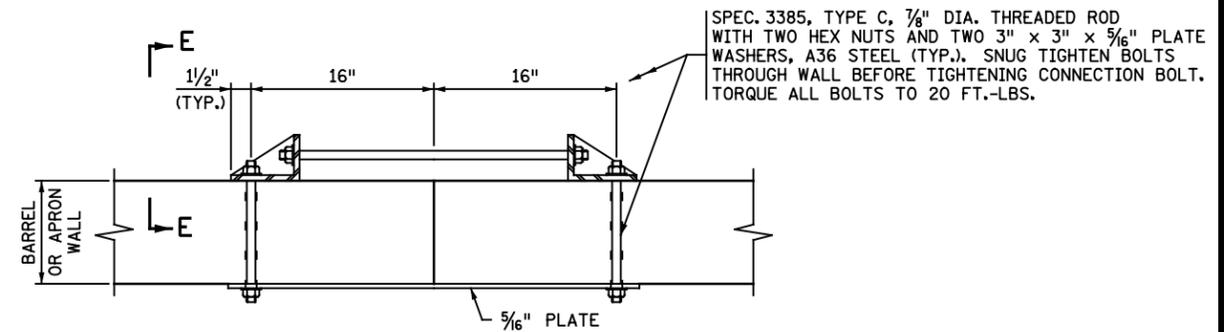
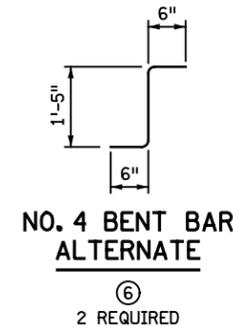
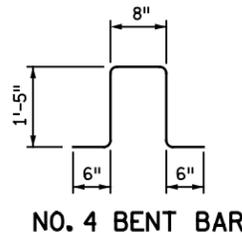
GALVANIZE STRUCTURAL STEEL PER SPEC. 3394.

GALVANIZE BOLTS, NUTS AND WASHERS PER SPEC. 3392.

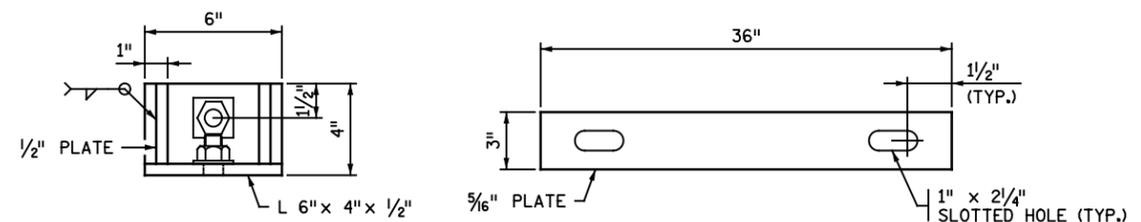
- NO. 8 DOWEL, 1'-0" LONG, 2" DIA. HOLE IN THE TOP OF THE WALL SECTION AND 3" DIA. HOLE IN THE LINTEL. FILL HOLE WITH GROUT.
- PROVIDE ADDITIONAL 3" HOLES AT 4'-0" MAXIMUM SPACING WHEN SIDE OF LINTEL BEAM IS OVER 6 FT.
- CHECK THE LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED. TONGUE AND GROOVE TO TERMINATE AT CULVERT RADIUS.
- FOR SKEW LENGTH UNDER 10' USE NO. 8 BARS. FOR SKEW LENGTH OF 10' TO 14' USE NO. 9 BARS. FOR SKEW LENGTH OVER 14' TO 18' USE NO. 10 BARS. FOR SKEW LENGTH OVER 18' TO 22' USE NO. 11 BARS OR EQUAL. SKEW LENGTH IS DISTANCE BETWEEN OUTSIDE FACES OF END SECTION ALONG LINTEL BEAM.
- SEE LINTEL BEAM THICKNESS TABLE ON THIS SHEET. USE LINTEL BEAMS WITH 5000 PSI 3W82 CONCRETE UNLESS OTHERWISE SPECIFIED.
- ALTERNATE BAR BEND MAY BE USED FOR NO. 4 BENT BARS.
- FOR CULVERTS WITH SPANS OF 16' THE MAXIMUM SKEW IS 30°.
- ALTERNATIVELY A 9" THICKNESS MAY BE USED WITH 6500 PSI 3W82 CONCRETE.



PLAN VIEW
LINTEL BEAM WITH INTEGRAL CURB



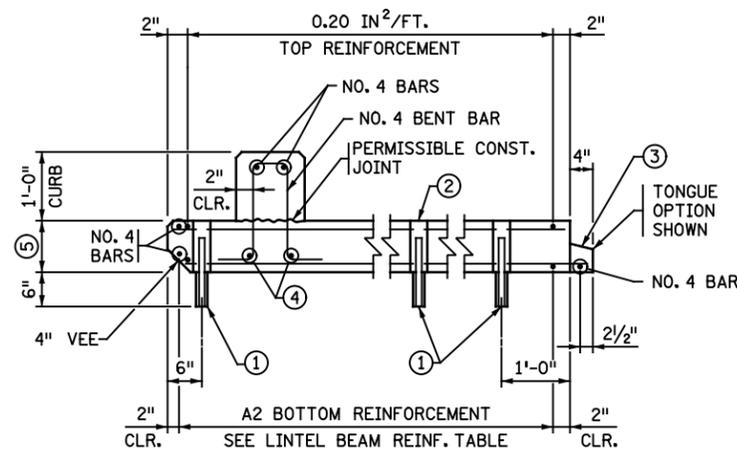
PLAN VIEW



SECTION E-E

PLATE DETAIL

EXTRA STRONG CONNECTION DETAILS



SECTION C-C

LINTEL BEAM WITH INTEGRAL CURB

REVISION: 10-09-2015

APPROVED: MARCH 24, 2011

Nancy D. Benberger
STATE BRIDGE ENGINEER

STATE AID PROJ. NO 002-618-034 (CSAH 18) STA. 22+92.95

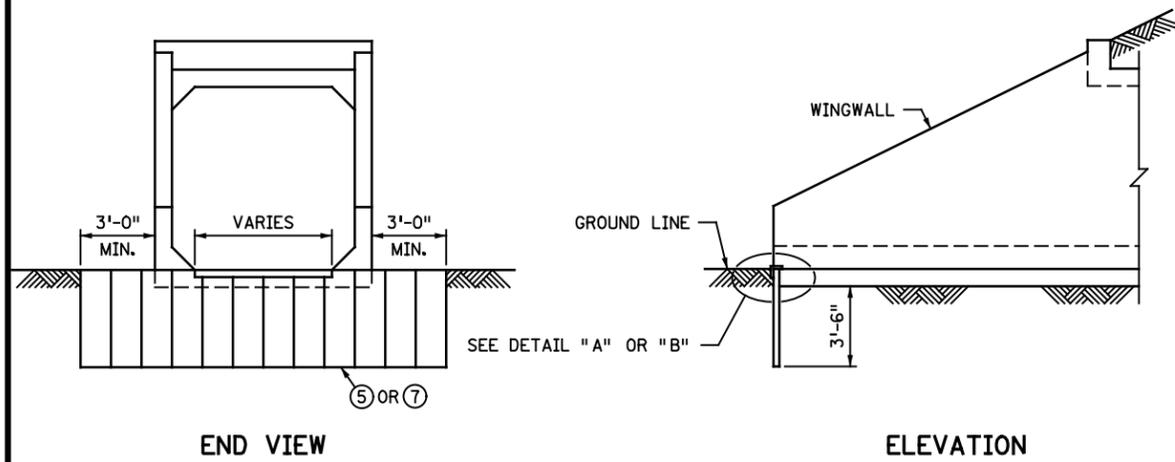
FIG. 5-395.110(B)

CERTIFIED BY *Todd A. Lang* 3/01/2023
LICENSED PROFESSIONAL ENGINEER DATE
NAME: TODD A. LANG LIC. NO. 42962

TITLE: PRECAST CONCRETE END SECTION
TYPE III - SINGLE OR DOUBLE BARREL
FOR SKEWS 7¹/₂ TO 45°

DES: TJC DR: TJC APPROVED:
CHK: TAL CHK: TAL
SHEET NO. B8 OF B14 SHEETS

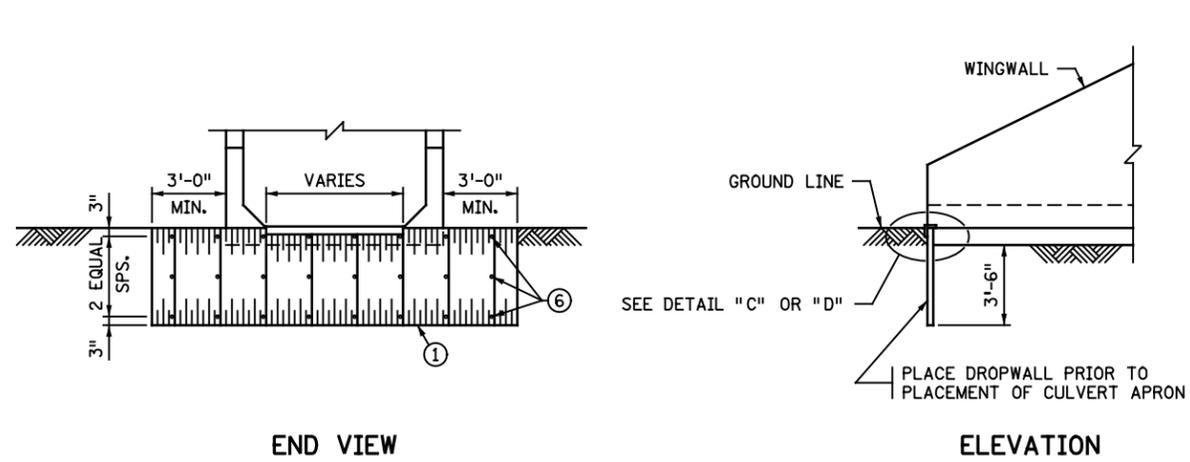
BRIDGE NO.
02J57



END VIEW

ELEVATION

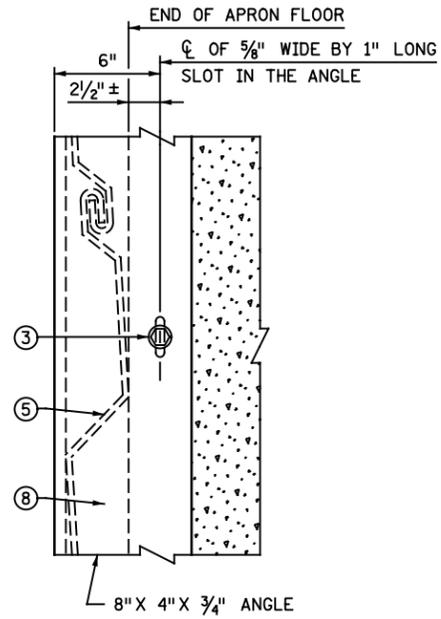
ALTERNATES 1 & 2 (STEEL SHEET PILING)



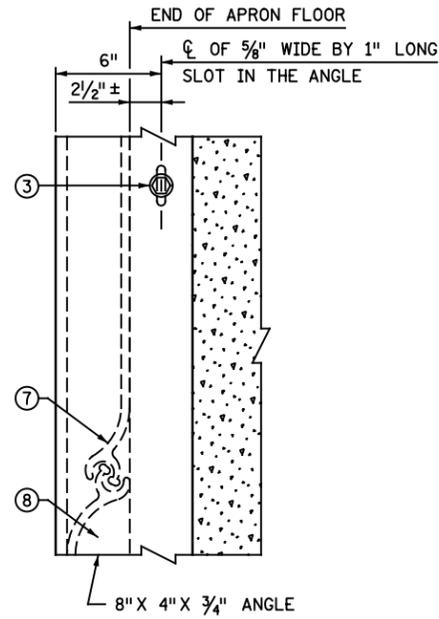
END VIEW

ELEVATION

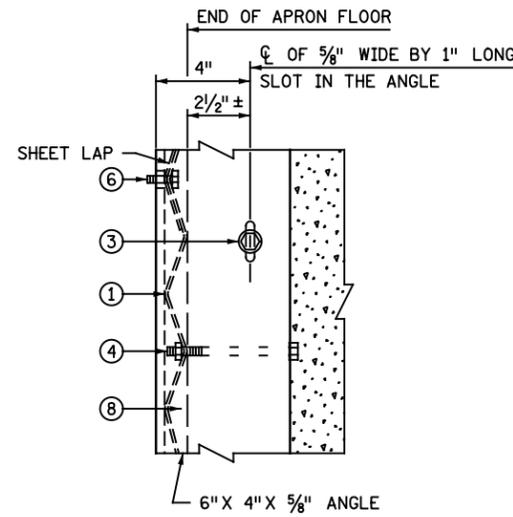
ALTERNATES 3 & 4 (GALVANIZED STEEL SHEETS)



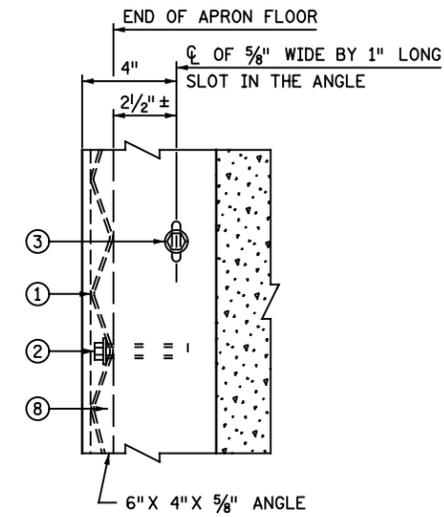
PLAN



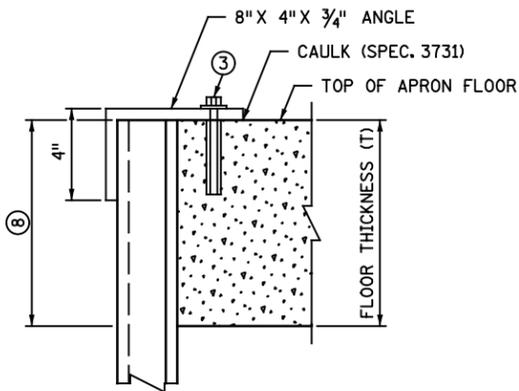
PLAN



PLAN

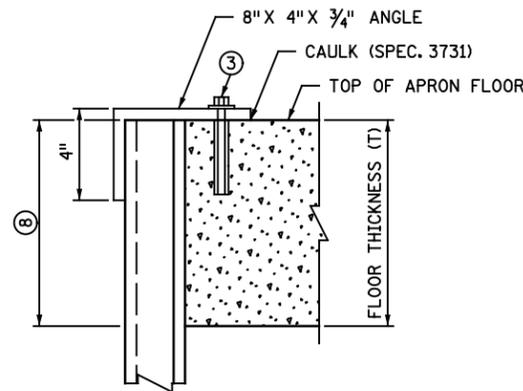


PLAN



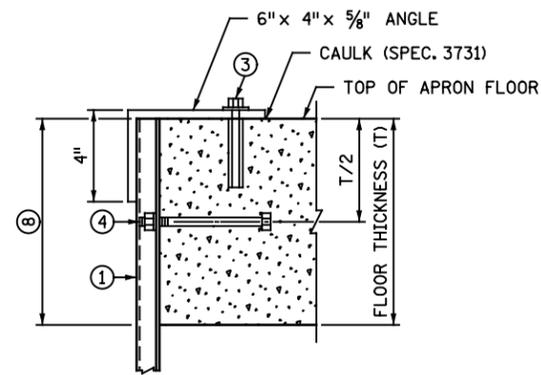
ELEVATION

DETAIL "A" - ALTERNATE 1
STEEL SHEET PILING SHOWN



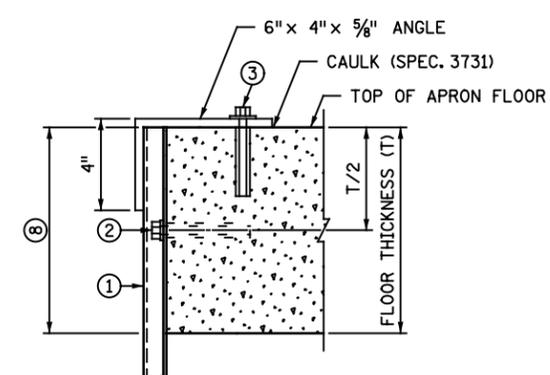
ELEVATION

DETAIL "B" - ALTERNATE 2
STEEL SHEET PILING SHOWN



ELEVATION

DETAIL "C" - ALTERNATE 3
ON NEW CONSTRUCTION ONLY



ELEVATION

DETAIL "D" - ALTERNATE 4
ON NEW OR OLD CONSTRUCTION

CONSTRUCTION NOTES

- GALVANIZE ALL FASTENERS AND ANCHORS PER SPEC. 3392.
- GALVANIZE STEEL ANGLES PER 3394.
- ① 2 1/2" x 1/2" OR 2 2/3" x 1/2" CORRUGATED (12 GAGE) OR HEAVIER GALVANIZED STEEL SHEETS.
- ② FASTEN THE STEEL SHEETS TO THE FRONT EDGE OF THE APRON WITH 3/8" DIAMETER BY 4" LONG BOLTS AND APPROVED ANCHORAGES (10" ± CENTER TO CENTER, TO THE NEAREST VALLEY).
- ③ FASTEN THE 8" x 4" x 3/4" OR 6" x 4" x 5/8" ANGLE WITH 3/8" DIAMETER 4" LONG BOLTS, 1" O.D. WASHER AND AN APPROVED ANCHORAGE (2'-0" SPACING).
- ④ FASTEN THE STEEL SHEETS TO THE FRONT EDGE OF THE APRON WITH 3/8" DIAMETER 5" LONG BOLTS, NUT AND LOCK WASHER (10" ± CENTER TO CENTER, TO THE NEAREST VALLEY).
- ⑤ (12 GAGE) GALVANIZED CORRUGATED STEEL SHEET PILING, INTERLOCKING TYPE A.
- ⑥ 3/8" DIA. x 1" LONG BOLT WITH NUT, TO LAP STEEL SHEETS.
- ⑦ STEEL SHEET PILING, SECTION NO. MP-112 OR EQUAL.
- ⑧ FILL THE VOIDS AS SHOWN, WITH CONCRETE OR CONCRETE GROUT, AS APPROVED BY THE ENGINEER.

c:\work\ing\central\01\2156983\Fig5111.dgn
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 3/1/2023

REVISION: 10-09-2015

APPROVED: MARCH 24, 2011

Nancy Rubenberger
STATE BRIDGE ENGINEER

STATE AID PROJ. NO 002-618-034 (CSAH 18) STA. 22+92.95

FIG. 5-395.111

CERTIFIED BY *Todd A. Lang* 3/01/2023
 LICENSED PROFESSIONAL ENGINEER DATE
 NAME: TODD A. LANG LIC. NO. 42962

TITLE: ALTERNATE DROPWALLS
FOR BOX CULVERTS

DES: TJC	DR: TJC	APPROVED:
CHK: TAL	CHK: TAL	
SHEET NO. B9 OF B14 SHEETS		

BRIDGE NO.
02J57

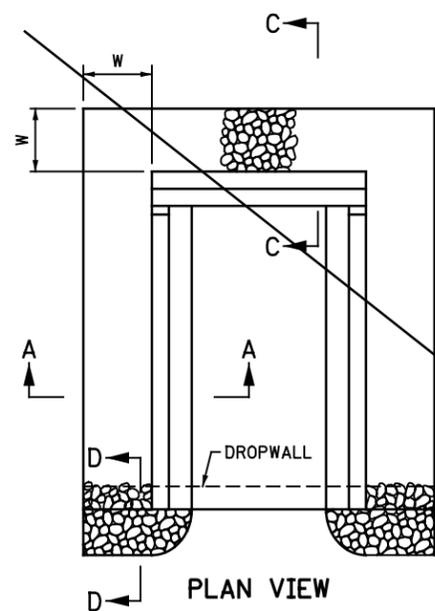
CONSTRUCTION NOTES

THIS PLAN SHEET IS FOR CULVERT EMBANKMENT PROTECTION ONLY. REFER TO THE GRADING PLANS FOR ADDITIONAL RIPRAP OR OTHER SCOUR PROTECTION MEASURES.

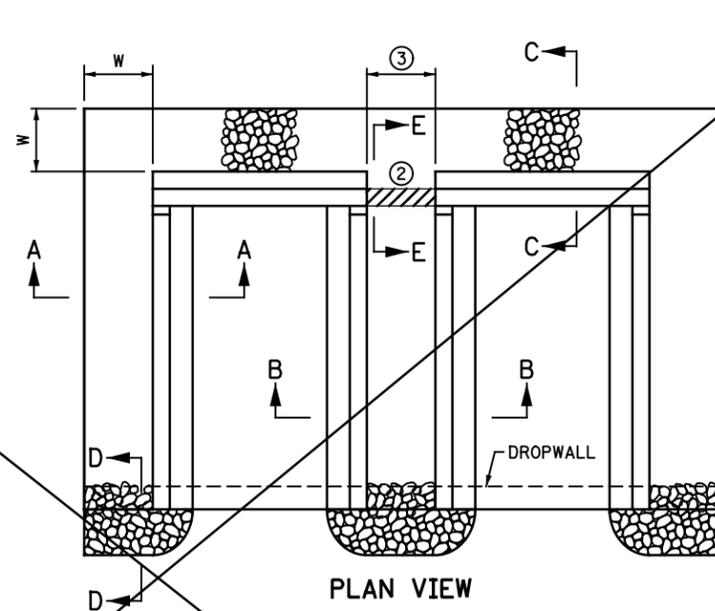
PROVIDE RIPRAP IN ACCORDANCE WITH SPECS. 2511 AND 3601.

EMBANKMENT PROTECTION, INCLUDING MATERIAL PLACED BETWEEN BARRELS THAT ARE LESS THAN 2'-0" APART, IS INCIDENTAL.

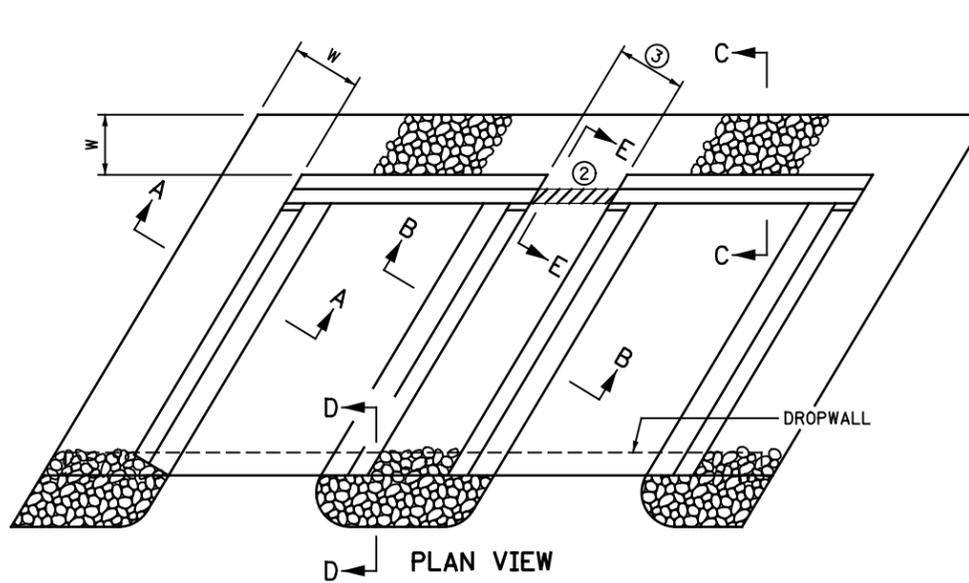
- ① PROVIDE TYPE 7 GEOTEXTILE IN ACCORDANCE WITH SPEC. 3733. PROVIDE GEOTEXTILE STRIPS CONTINUOUS WITHOUT OVERLAPS, EXCEPT FOR THE TOP STRIP, WHICH SHOULD SHINGLE VERTICAL STRIPS. BURY THE TOP EDGE TO PREVENT UNDERMINING.
- ② IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL (SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. IF PEA ROCK IS USED PROVIDE APPROVED GROUT SEEPAGE CUTOFF CORE, MINIMUM 12" THICK BETWEEN THE CULVERT'S TWO ENDS AND PROVIDE CLASS I GROUTED RIPRAP IN LIEU OF CLASS III RIPRAP.
- ③ REFER TO THE GENERAL PLAN AND ELEVATION SHEET FOR THE DISTANCE BETWEEN BARRELS OF ADJACENT BOXES.



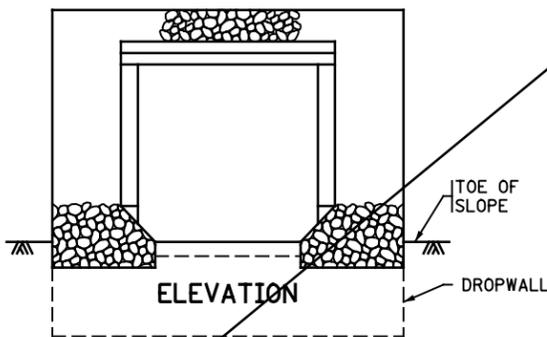
PLAN VIEW



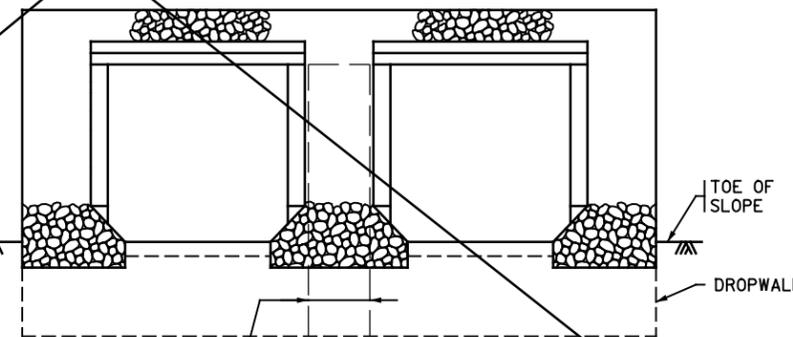
PLAN VIEW



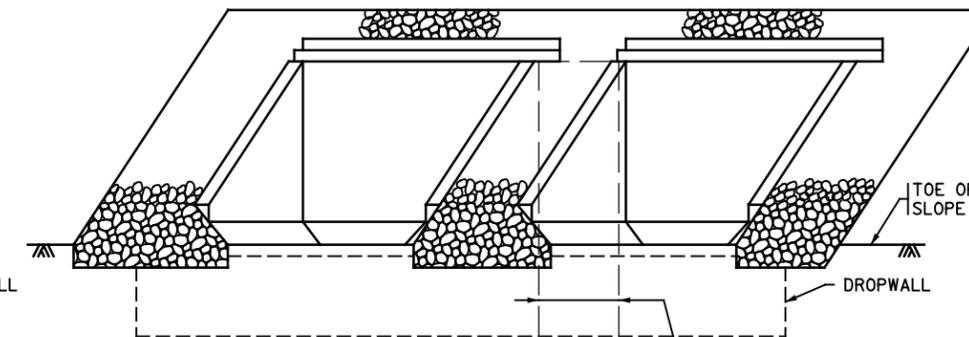
PLAN VIEW



ELEVATION



ELEVATION

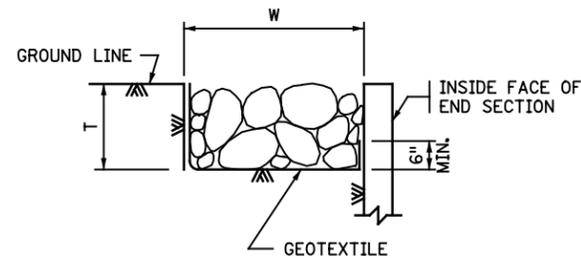


ELEVATION

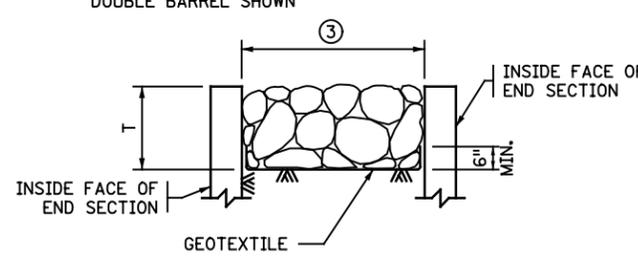
SINGLE BARREL
CLASS III OR IV SHOWN FOR SKEWS UP TO 7 1/2°

MULTIPLE BARREL
FOR SKEWS UP TO 7 1/2° CLASS III OR IV SHOWN DOUBLE BARREL SHOWN

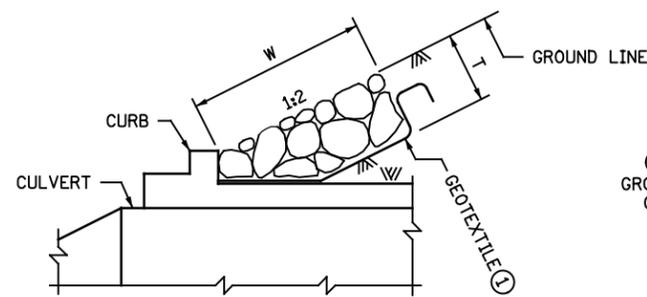
MULTIPLE BARREL
FOR SKEWS OVER 7 1/2° CLASS III OR IV SHOWN DOUBLE BARREL SHOWN, OTHER BARREL CONFIGURATIONS SIMILAR.



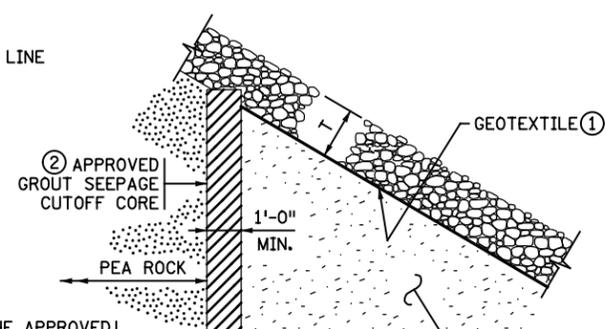
SECTION A-A



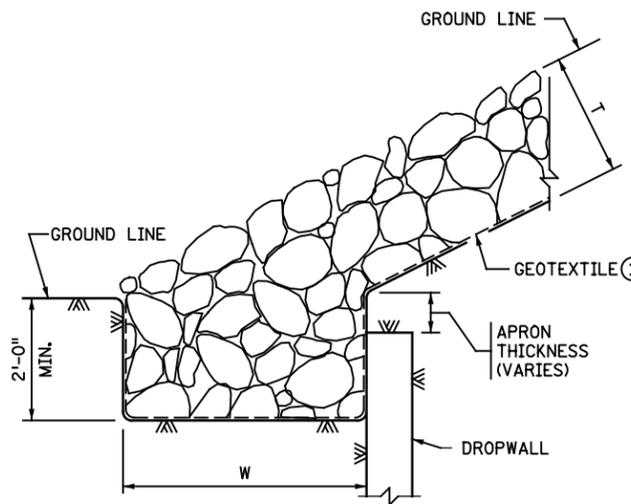
SECTION B-B



SECTION C-C



SECTION E-E



SECTION D-D

RIPRAP CLASS

RIPRAP CLASS	RIPRAP CLASS	T	W
□	III	1'-6"	3'-0"
⊗	IV	2'-0"	4'-0"

ELEVATION OF THE APPROVED GROUT SEEPAGE CUTOFF CORE IS TO BE THE SAME ELEVATION AS THE BOTTOM OF THE DROP WALL

REVISION: FEBRUARY 08, 2022

APPROVED: SEPTEMBER 11, 2014

Nancy D. Benbenberger
STATE BRIDGE ENGINEER

STATE AID PROJ. NO. 002-618-034 (CSAH 18) STA. 22+92.95

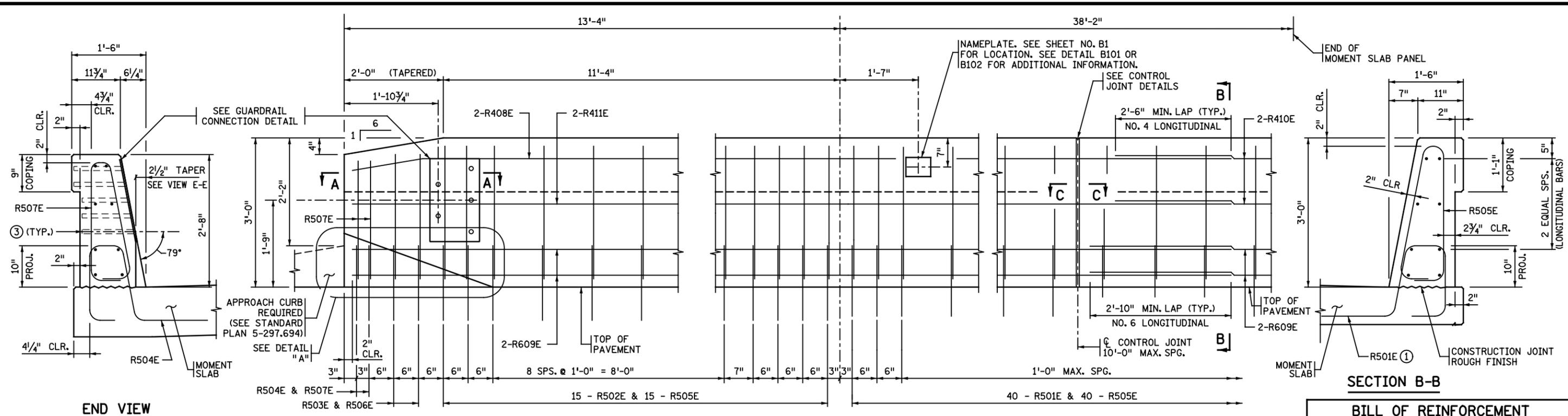
FIG. 5-395.115

CERTIFIED BY *Todd A. Lang* 3/01/2023
LICENSED PROFESSIONAL ENGINEER DATE
NAME: TODD A. LANG LIC. NO. 42962

TITLE: EMBANKMENT PROTECTION FOR BOX CULVERTS

DES: TJC DR: TJC APPROVED:
CHK: TAL CHK: TAL
SHEET NO. B10 OF B14 SHEETS

BRIDGE NO. 02J57



BILL OF REINFORCEMENT FOR BARRIER

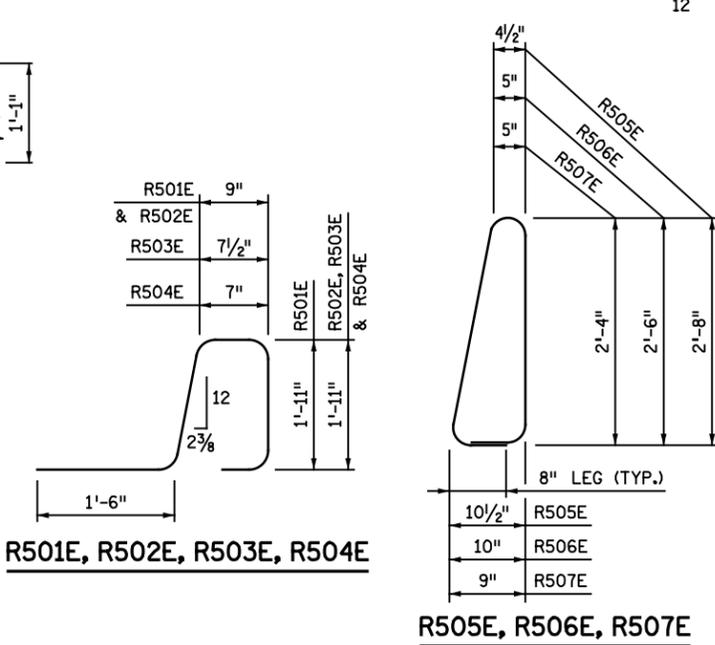
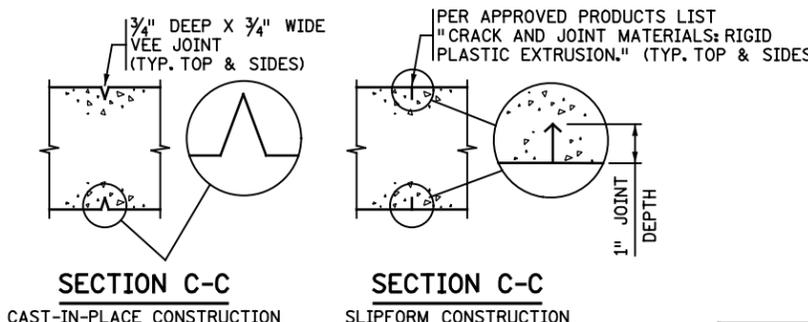
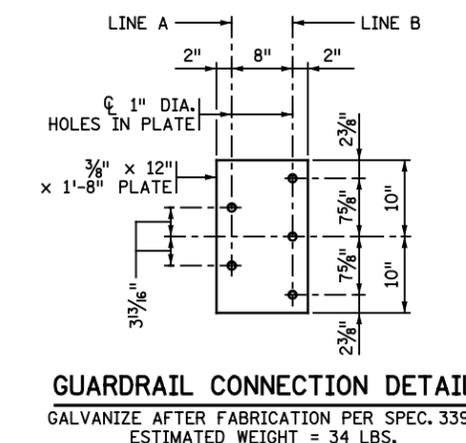
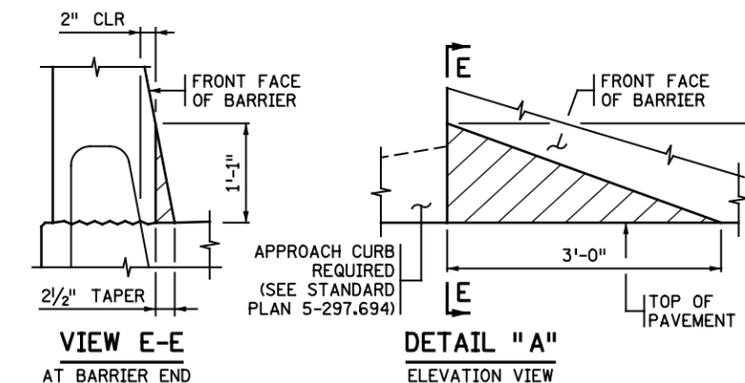
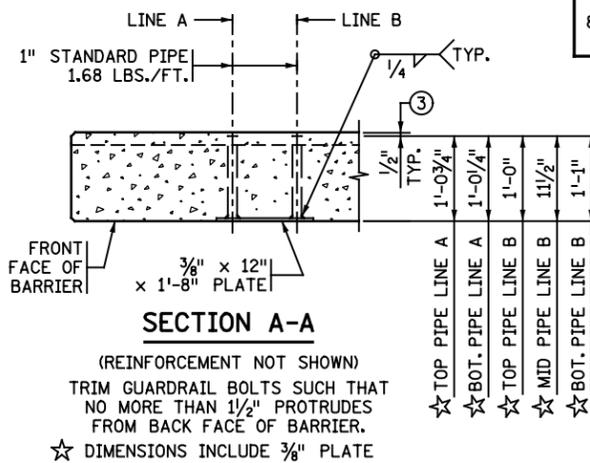
BAR NO.	NO.	LENGTH	SHAPE	LOCATION
R501E	160	6'-8"		BARRIER DOWEL
R502E	60	6'-8"		BARRIER DOWEL
R503E	8	6'-7"		BARRIER DOWEL
R504E	8	6'-6"		BARRIER DOWEL
R505E	220	7'-1"		BARRIER VERTICAL
R506E	8	6'-9"		BARRIER VERTICAL
R507E	8	6'-5"		BARRIER VERTICAL
R408E	8	23'-8"		BARRIER LONGIT.
R609E	32	27'-0"		BARRIER LONGIT.
R410E	16	30'-0"		BARRIER LONGIT.
R411E	8	23'-8"		BARRIER LONGIT.

MODIFIED

DATE	DESCRIPTION
8/30/2022	LENGTH OF R408E, R501E, R502E, R503E, R504E REMOVED SAW CUT JOINT. BARRIER ON MOMENT SLAB.

INSIDE ELEVATION OF BARRIER
(TYPICAL ON MOMENT SLAB PANELS A & C, PANELS B & D ARE MIRRORED)

BARRIER MEETS MASH TL-4 REQUIREMENTS ON BRIDGE DECK AND TL-3 ON APPROACH PANEL.



- GENERAL NOTES**
- FOR SLIPFORM CONSTRUCTION, TIE 100% OF THE REINFORCEMENT BAR INTERSECTIONS IN THE BARRIER.
 - CONCRETE BARRIER = 496 LBS./FT. (0.123 CU. YDS./FT.)
 - FINISH ALL EDGES OF BARRIER WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
 - SPACE CONTROL JOINTS AT 10 FT. MAXIMUM.
 - GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL IN ACCORDANCE WITH SPEC. 3306.
 - GUARDRAIL CONNECTION AND NAMEPLATE ARE INCIDENTAL.
 - BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES.
 - ① PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT IN MOMENT SLAB.
 - ② JOINT SEALANT PER MnDOT APPROVED/QUALIFIED PRODUCTS LIST - CRACK AND JOINT MATERIALS - SILICONE JOINT SEALERS.
 - ③ REMOVE CONCRETE FROM PIPE ENDS AFTER SLIPFORMING OR FORM REMOVAL.

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REVISION: FEBRUARY 08, 2022

APPROVED: AUGUST 24, 2016

Kevin Westrom
STATE BRIDGE ENGINEER

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.

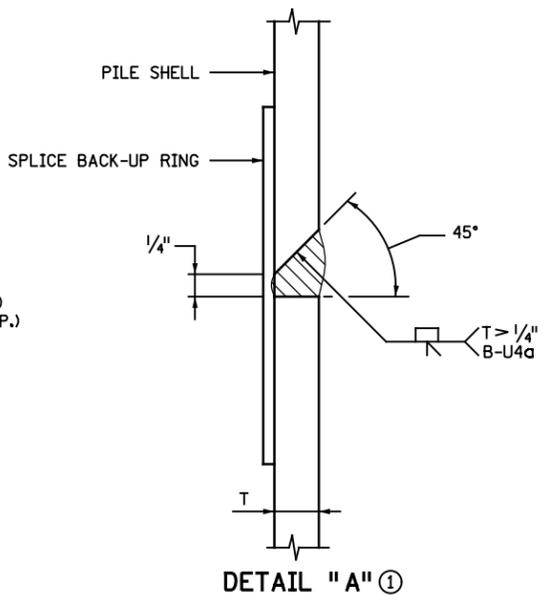
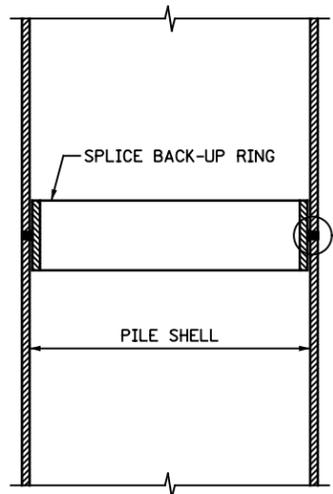
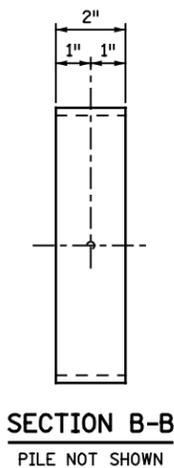
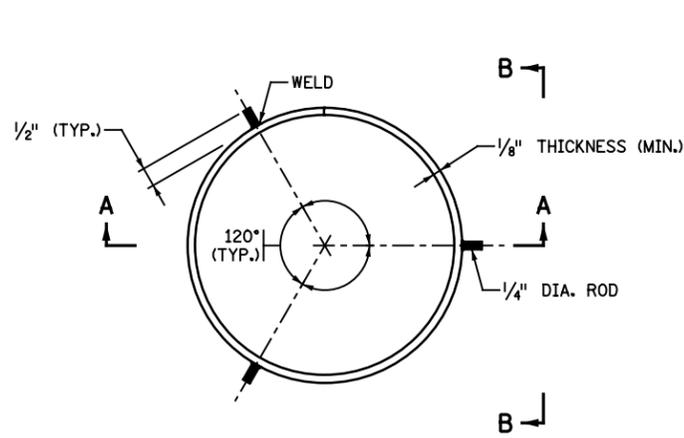
STATE AID PROJ. NO. 002-618-034 (CSAH 18) STA. 22+92.95

FIG. 5-397.138(A) MOD.

CERTIFIED BY: <i>Todd A. Lang</i> LICENSED PROFESSIONAL ENGINEER	DATE: 3/01/2023	TITLE: CONCRETE BARRIER 36" (TYPE S, TL-4) MODIFIED	DES: TJC	DR: TJC	APPROVED:
NAME: TODD A. LANG	LIC. NO. 42962	INTEGRAL OR SEMI-INTEGRAL ABUTMENT WITH GUARDRAIL CONNECTION (WITHOUT CONCRETE WEARING COURSE)	CHK: TAL	CHK: TAL	BRIDGE NO. 02J57

SHEET NO. B11 OF B14 SHEETS

P:\1\pdr\user01\HDR_US_Central\01\Documents\Anoka_County_Minnesota_Highway_Department\Anoka_Cty_CSAH_22_18_Bridg_Details\6.0_CAD_BIM\6.2_WFVCSAH_18_Bridg_Sheets\Pre\Im P in Shrs\B_Details



NOTES:

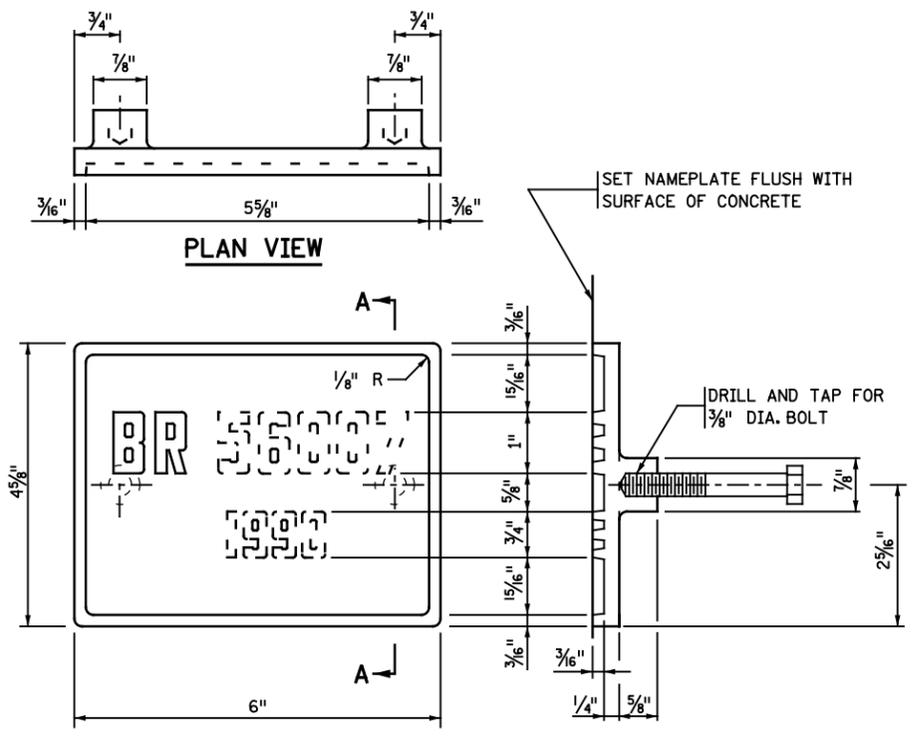
APPROVED COMMERCIAL PILE SPLICE BACK-UP RING MAY BE USED IN LIEU OF THE TYPE DETAILED, PROVIDED THAT 1/4" ROOT IS MAINTAINED. BACK-UP RING SHALL HAVE A TIGHT FIT.

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-U4a WELD CONFIGURATION. SEE DETAIL "A".



THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 02J57
YEAR 2023



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	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION: 11-06-2013	DETAIL NO.
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	PILE SPLICE (CAST-IN-PLACE CONCRETE PILES)		B201

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION: 09-11-2014	DETAIL NO.
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	BRIDGE NAMEPLATE (FOR NEW BRIDGES)		B101

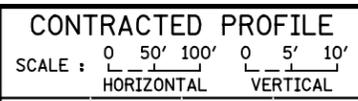
NO.	DATE	REVISION DESCRIPTION	DR.	CHK.	APP'D.

HR
 CERTIFIED BY: *Todd A. Lang*
 LICENSED PROFESSIONAL ENGINEER
 DATE: 03/01/2023
 NAME: TODD A. LANG
 LIC. NO. 42962

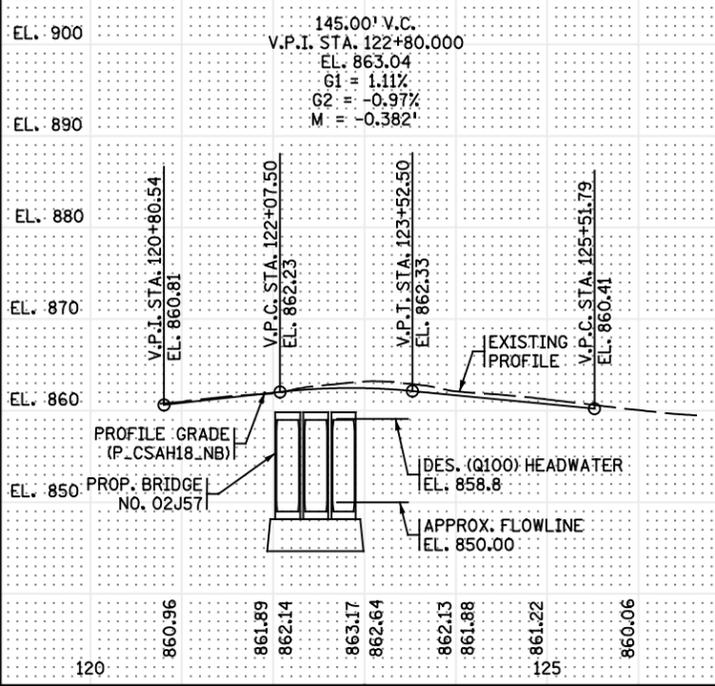
TITLE:
BRIDGE DETAILS

DES: TJC	DR: TJC	APPROVED:
CHK: TAL	CHK: TAL	
S.A.P. NO. 002-618-034 (CSAH 18)		
SHEET NO. B12 OF B14 SHEETS		
BRIDGE NO.		02J57

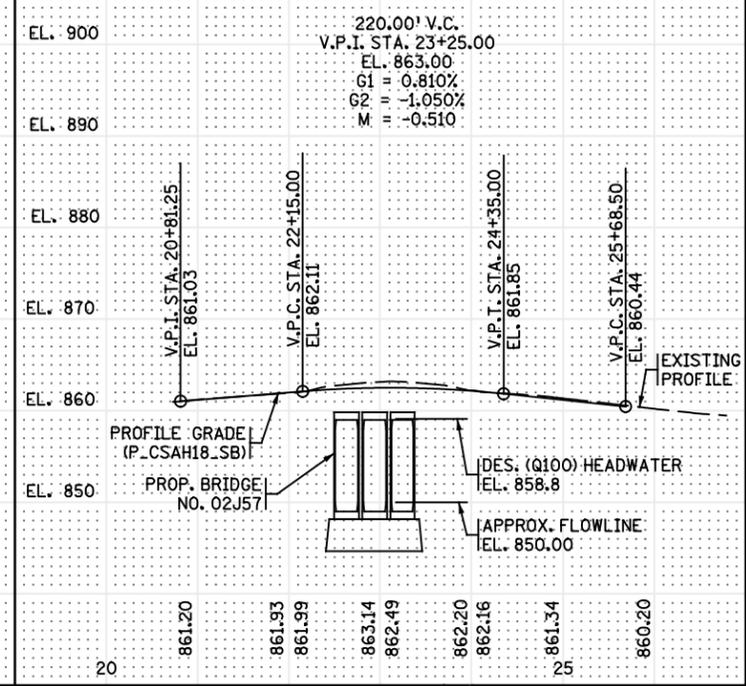
Untitled
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 3/1/2023



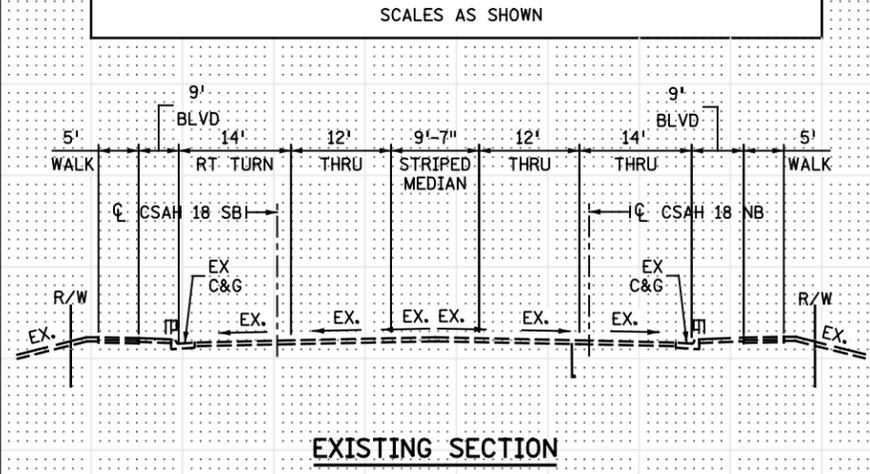
C.S.A.H. 18 NB PROFILE (P_CSAH18_NB)



C.S.A.H. 18 SB PROFILE (P_CSAH18_SB)



TYPICAL SECTIONS & PERTINENT DATA



EXISTING SECTION

- 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
 LOCATION: MAIN ST. NW
 TYPE: CONCRETE CONTINUOUS-SLAB
 LENGTH: N/A
 LOW CHORD HEIGHT ABOVE HIGH WATER: 0
 CROSS SECTIONAL AREA: 268 SQ FT
 DRAINAGE AREA: 74 SQ MILES
 - APPARENT HIGHWATER ELEVATION UNKNOWN OBTAINED FROM:
 - OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY. N/A

HYDRAULIC ENGINEERS RECOMMENDATION
 DATE: 4-19-22

STREAM OR DITCH DESIGNATION: COON CREEK
 DRAINAGE AREA: 69.9 SQ. MI.
 MAX. FLOOD ON RECORD: UNKNOWN
 MAXIMUM OBSERVED HIGHWATER ELEVATION: UNKNOWN
 DESIGN FLOOD (100 YR. FREQ.): 1177 C.F.S.
 HEADWATER ELEVATION: 858.84 FT.
 DESIGN MEAN VELOCITY THROUGH STRUCTURE: 3.24 F.P.S.
 TOTAL STAGE INCREASE: -0.11 FT.
 LOW MEMBER AT OR ABOVE ELEVATION: 859.1

WATERWAY AREA REQUIRED BELOW ELEV. 859.1 = 378 SQ. FT. AT RIGHT ANGLES TO CHANNEL
 BASIC FLOOD (100 YR. FREQ.): 1177 C.F.S.
 HEADWATER ELEVATION: 858.84 FT.
 TOTAL STAGE INCREASE: -0.11 FT.
 MEAN VELOCITY THROUGH STRUCTURE: 3.24 F.P.S.
 FLOWLINE ELEVATION: 850.0 FT. SKEW ANGLE: 56°
 ESTIMATED PRELIMINARY TOTAL SCOUR AT PIER EL. XXX.X (500 OR OT YR. FREQ.)

SCOUR CONFIRMATION RECOMMENDATION
 DATE: XX-XX-XX

TOTAL SCOUR AT PIER EL. XXX.XX (500 OR OT YR. FREQ.)
 SCOUR CODE: OBTAIN FROM HYDRAULIC ENGINEER

BRIDGE SURVEY SHEETS MADE FROM :

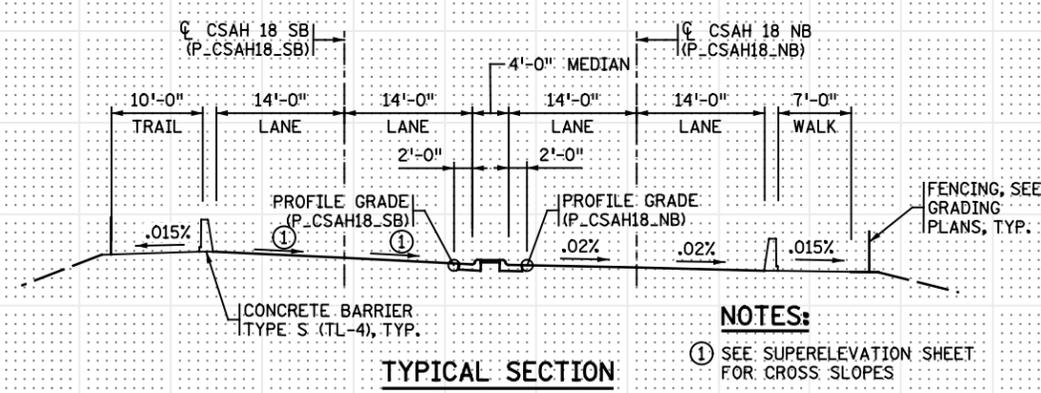
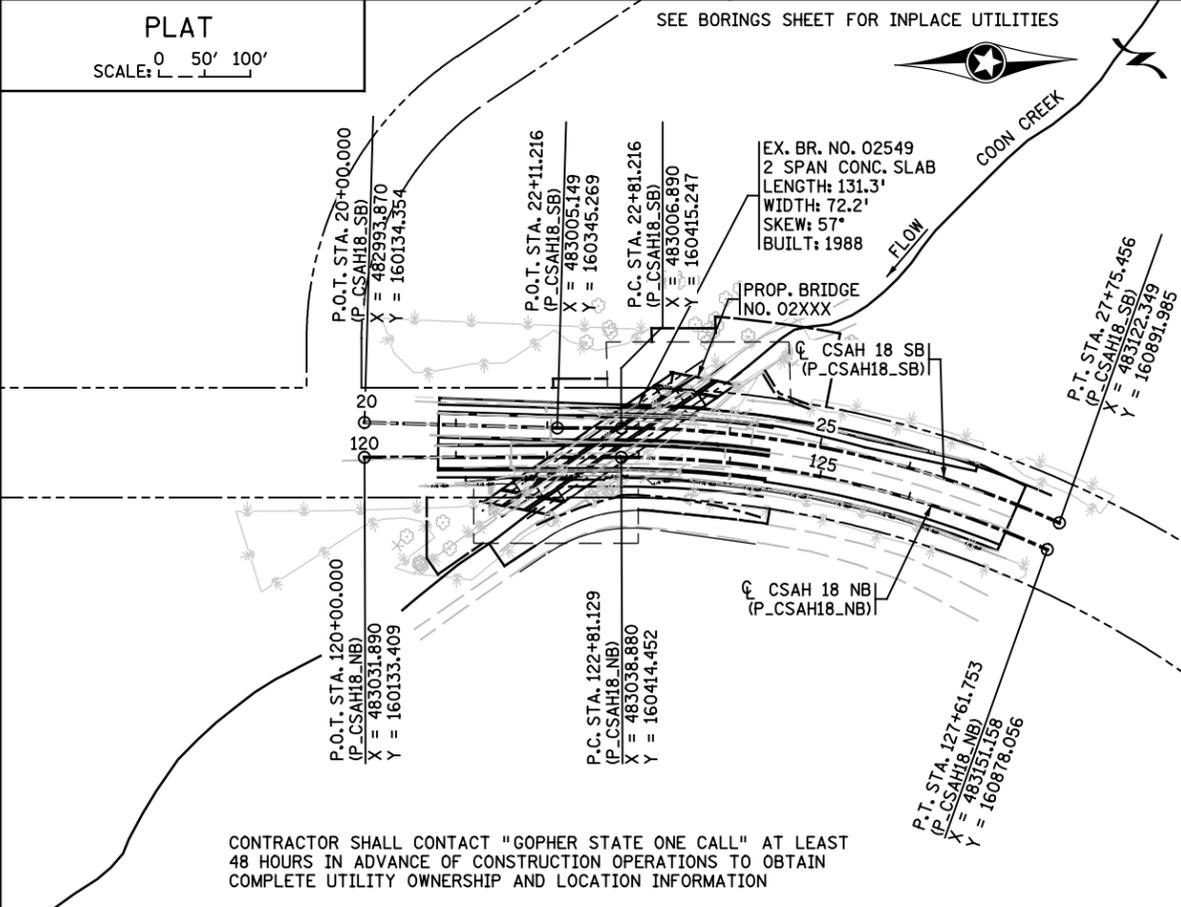
FILES:
 JOBd18.GPK, CSAH18_AL.DGN, CSAH18_GM.DGN
 CSAH18_HTP0-SURVEY.DGN, CSAH18_WETLAND.DGN,
 CSAH18_RW.DGN, CSAH18_UT.DGN, CSAH18_TS.DGN

BENCH MARK ELEVATION 893.243 (N.A.V.D. 88 ADJ.)
 GSD STATION #72567, S.E. CORNER OF BRIDGE RAILING,
 BRIDGE NO. 02559, CSAH 14 OVER TH 10.
 LAT = 451150.60 LONG. = 932023.64

ANOKA COUNTY
 MINNESOTA DEPARTMENT OF TRANSPORTATION

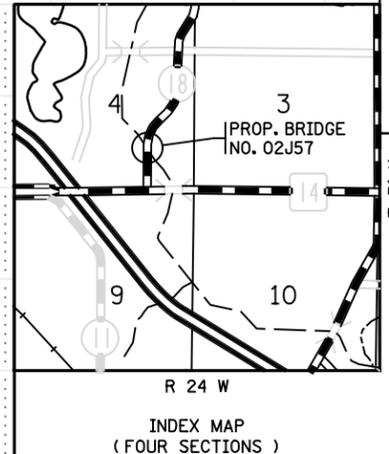
BRIDGE SURVEY
 0.2 MILES NORTH OF JCT CSAH 14
 ON CSAH 18 OVER COON CREEK

SEC. 4 TWP. 31 N. R. 24 W.
 COUNTY: ANOKA
 CITY: COON RAPIDS



TYPICAL SECTION

NOTES:
 ① SEE SUPERELEVATION SHEET FOR CROSS SLOPES

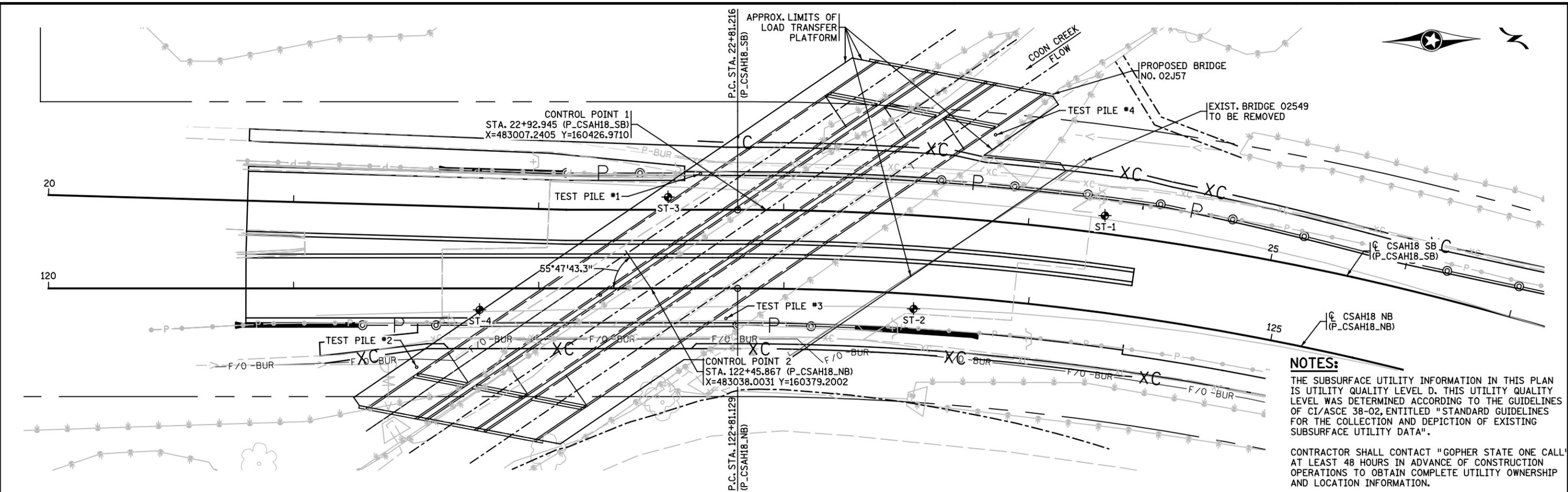


NO.	DATE	REVISION DESCRIPTION	DR.	CHK.	APP'D.

TITLE:
BRIDGE SURVEY

DES: TJC	DR: TJC	APPROVED:	BRIDGE NO. 02J57
CHK: TAL	CHK: TAL		
S.A.P. NO. 002-618-034 (CSAH 18)			
SHEET NO. B13 OF B14 SHEETS			

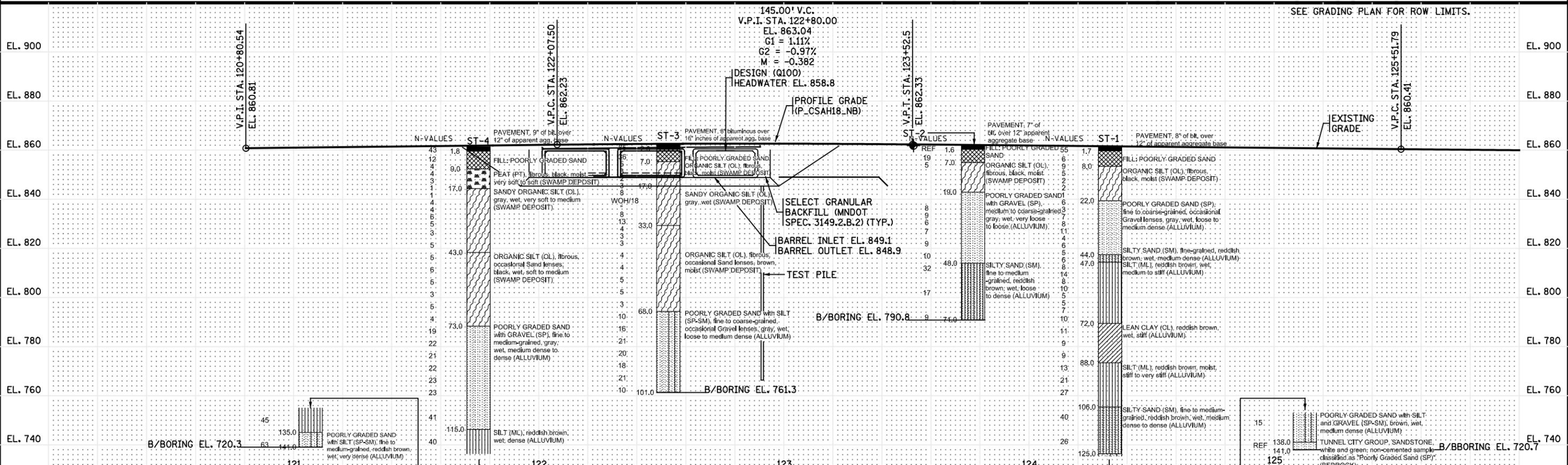
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 3/1/2023
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NOTES:

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".

CONTRACTOR SHALL CONTACT "GOPHER STATE ONE CALL" AT LEAST 48 HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS TO OBTAIN COMPLETE UTILITY OWNERSHIP AND LOCATION INFORMATION.

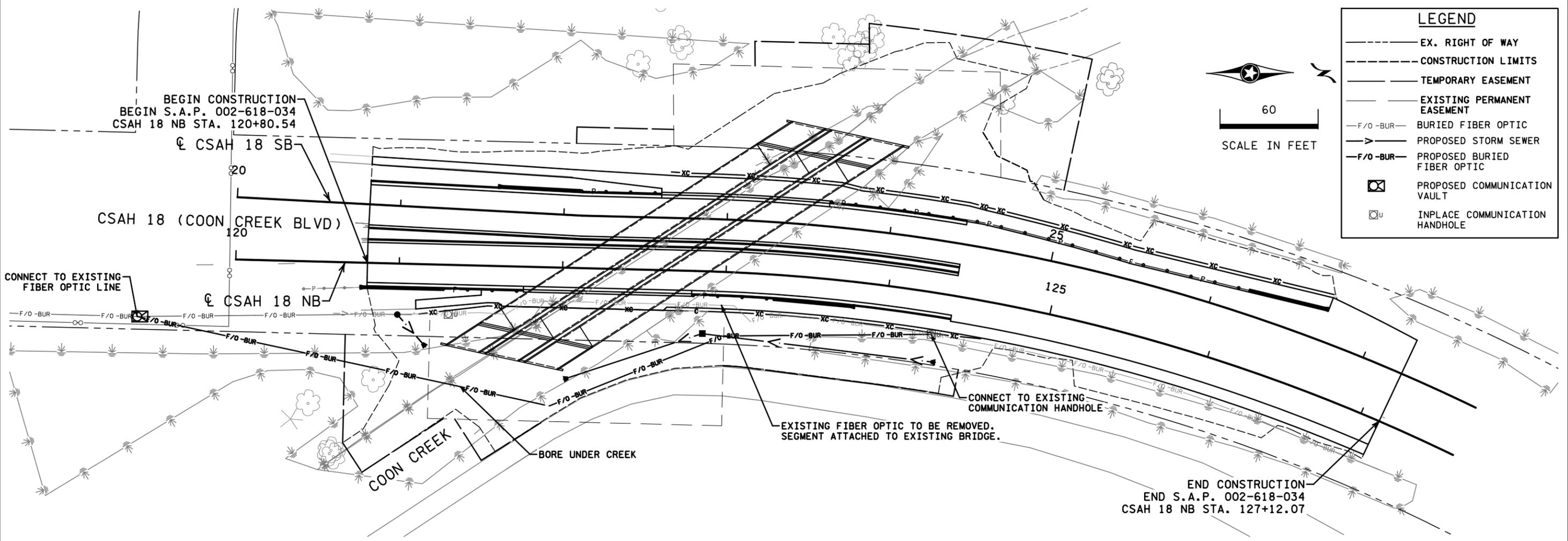


NO.	DATE	REVISION DESCRIPTION	DR.	CHK.	APP'D.

HR

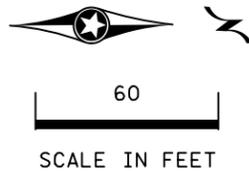
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DES: TJC	DR: TJC	APPROVED:
CHK: TAL	CHK: TAL	
S.A.P. NO. 002-618-034 (CSAH 18)		
SHEET NO. B14 OF B14 SHEETS		
BRIDGE NO.		02J57



LEGEND

- EX. RIGHT OF WAY
- CONSTRUCTION LIMITS
- TEMPORARY EASEMENT
- EXISTING PERMANENT EASEMENT
- F/O-BUR- BURIED FIBER OPTIC
- >- PROPOSED STORM SEWER
- F/O-BUR- PROPOSED BURIED FIBER OPTIC
- ☒ PROPOSED COMMUNICATION VAULT
- ☐U INPLACE COMMUNICATION HANDHOLE



BEGIN CONSTRUCTION
 BEGIN S.A.P. 002-618-034
 CSAH 18 NB STA. 120+80.54

CSAH 18 (COON CREEK BLVD)

CSAH 18 NB

END CONSTRUCTION
 END S.A.P. 002-618-034
 CSAH 18 NB STA. 127+12.07

(N) INTERCONNECT		
	LOCATION	TRAFFIC CONTROL INTERCONNECT
		LUMP SUM
S.A.P. 002-618-034		
CSAH 18 NB	RT	1
TOTAL		1

GENERAL NOTES

PROPOSED FIBER OPTIC SHOWN IS A SCHEMATIC ONLY. CONTRACTOR TO MEET WITH COUNTY IN THE FIELD TO DETERMINE LOCATION.

CSAH18-ufpd01_60.dgn
 2/14/23 1:00 PM
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NO	DATE	BY	CKD	APPR	REVISION

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

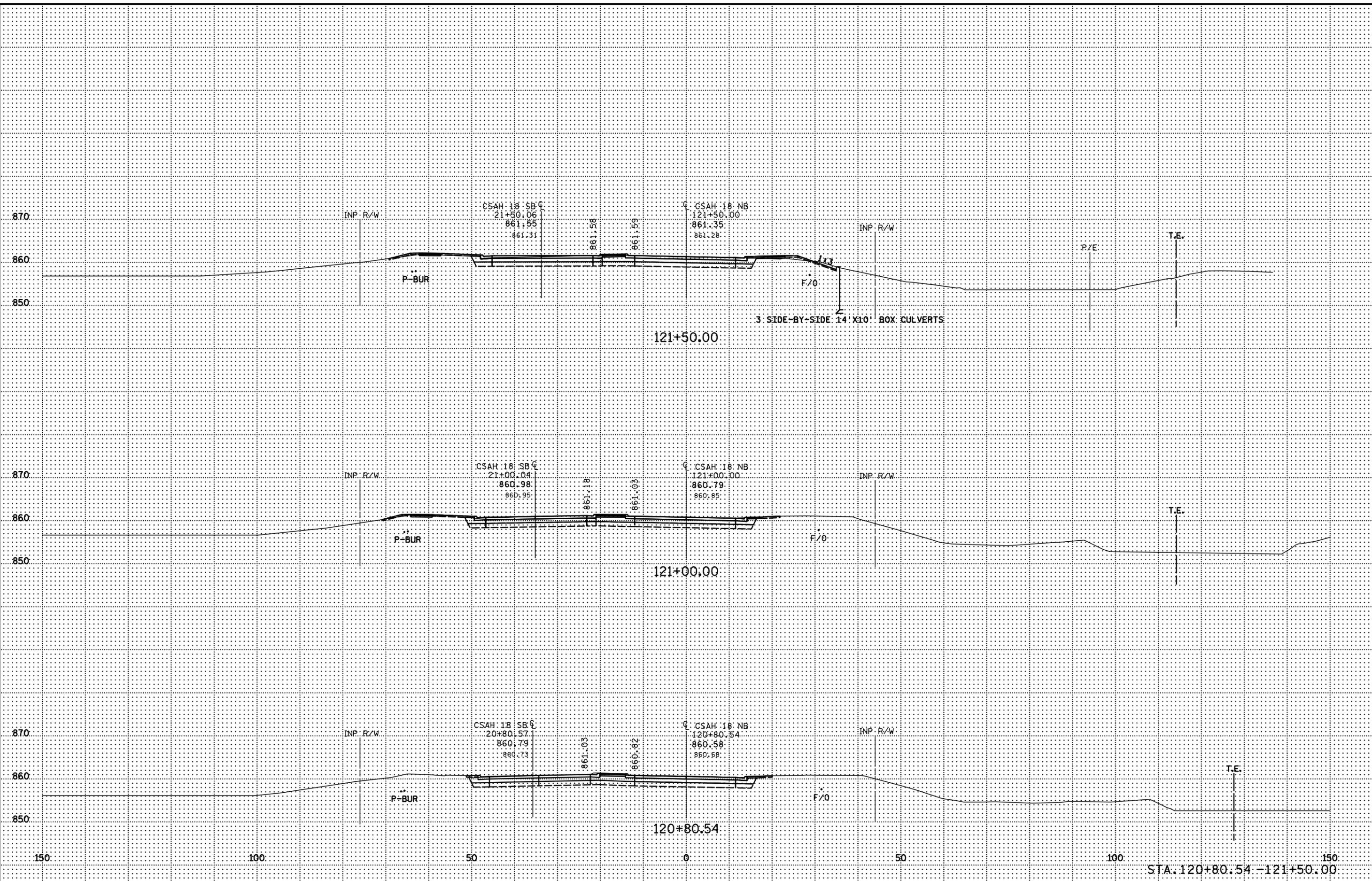
NAME: BRETT A. VOTH LIC. NO. 49045

CERTIFIED BY: Brett Voth 3/3/2023
 LICENSED PROFESSIONAL ENGINEER DATE

DRAWN BY: JCN
 DESIGNED BY: JCN
 CHECKED BY: GEB

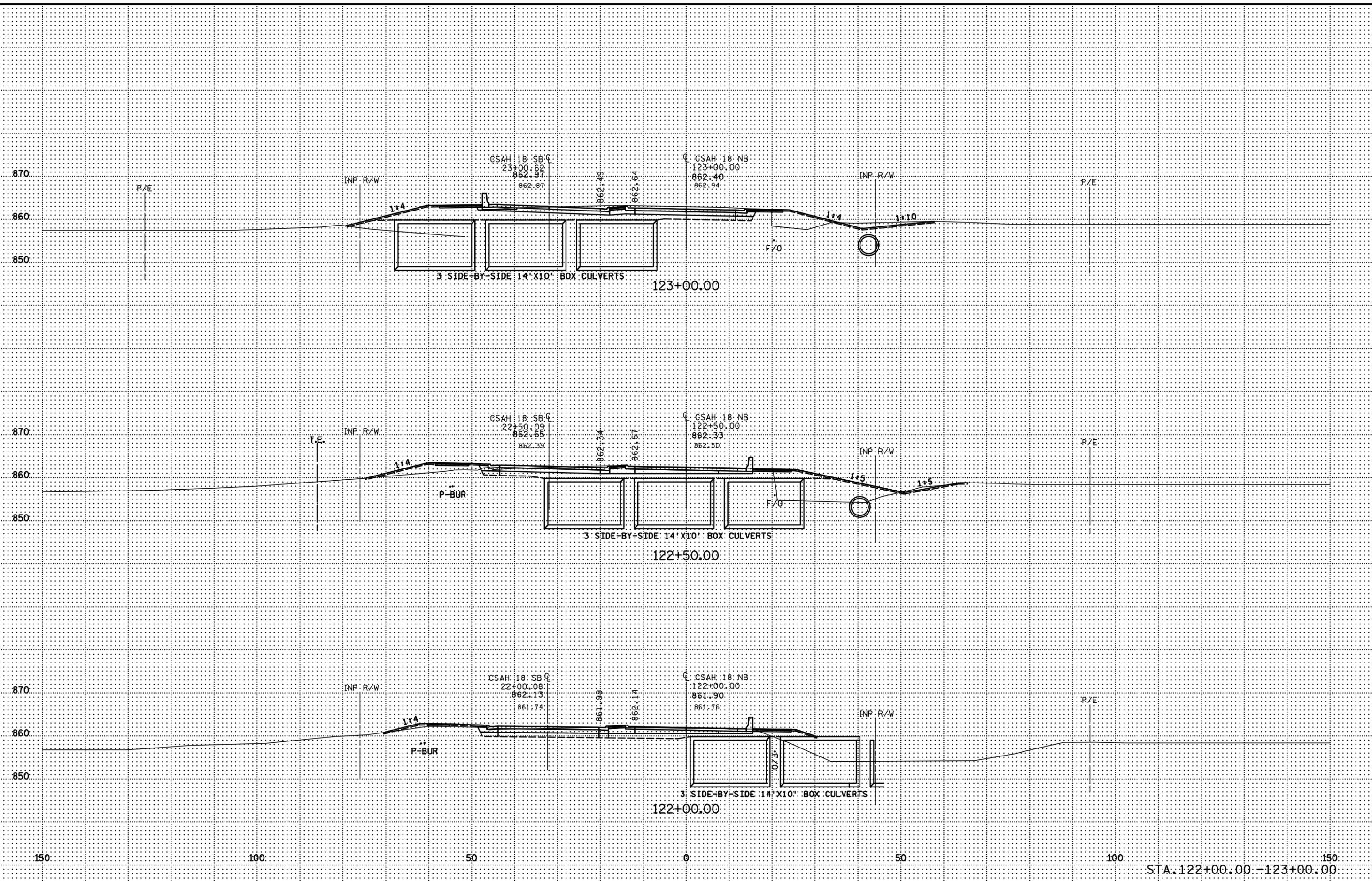
FIBER OPTIC RELOCATION PLAN
 SHEET NO. C1 OF C1 SHEETS
 S.A.P. 002-618-034 (CSAH 18), S.A.P. 114-020-059

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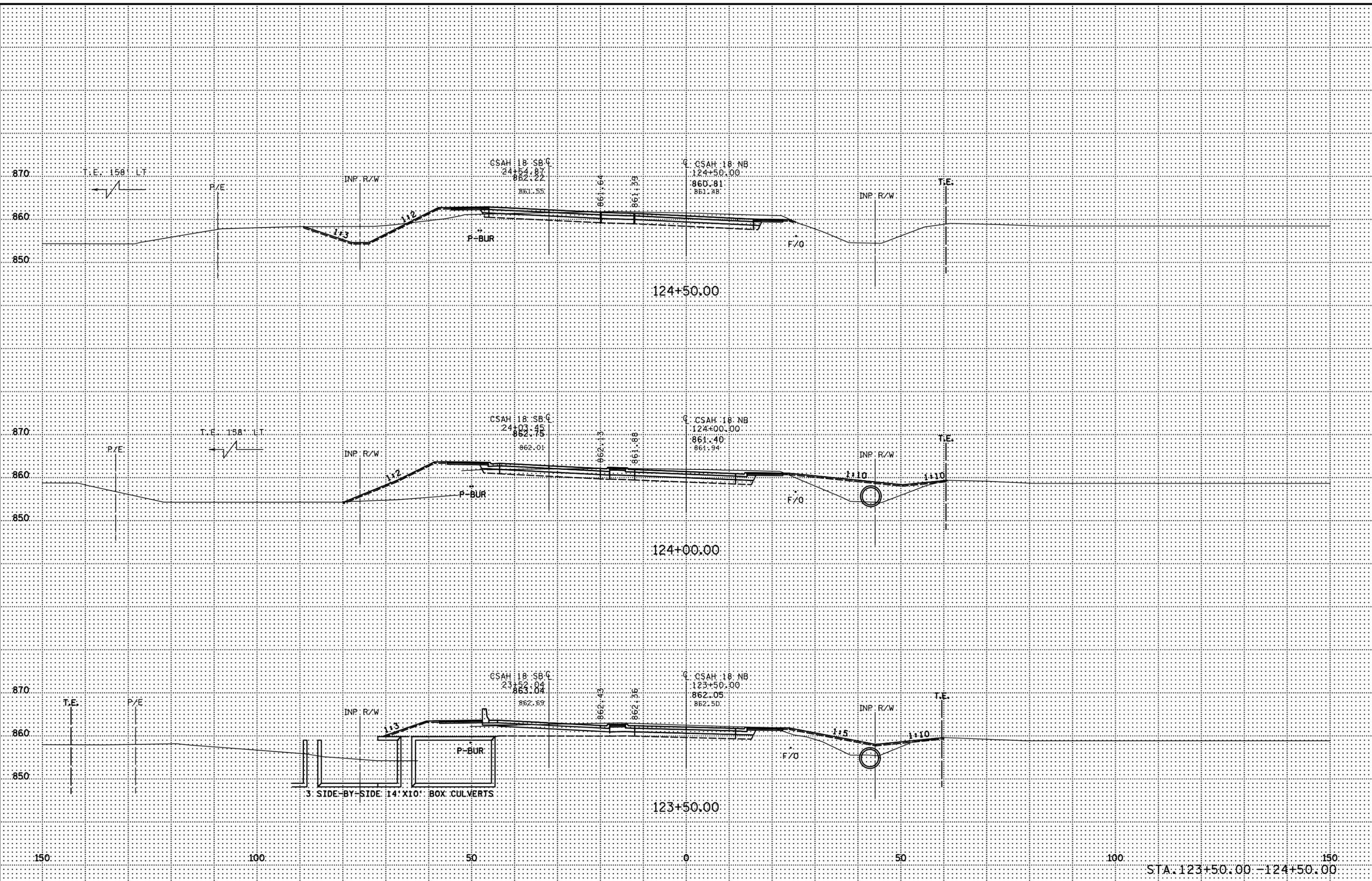
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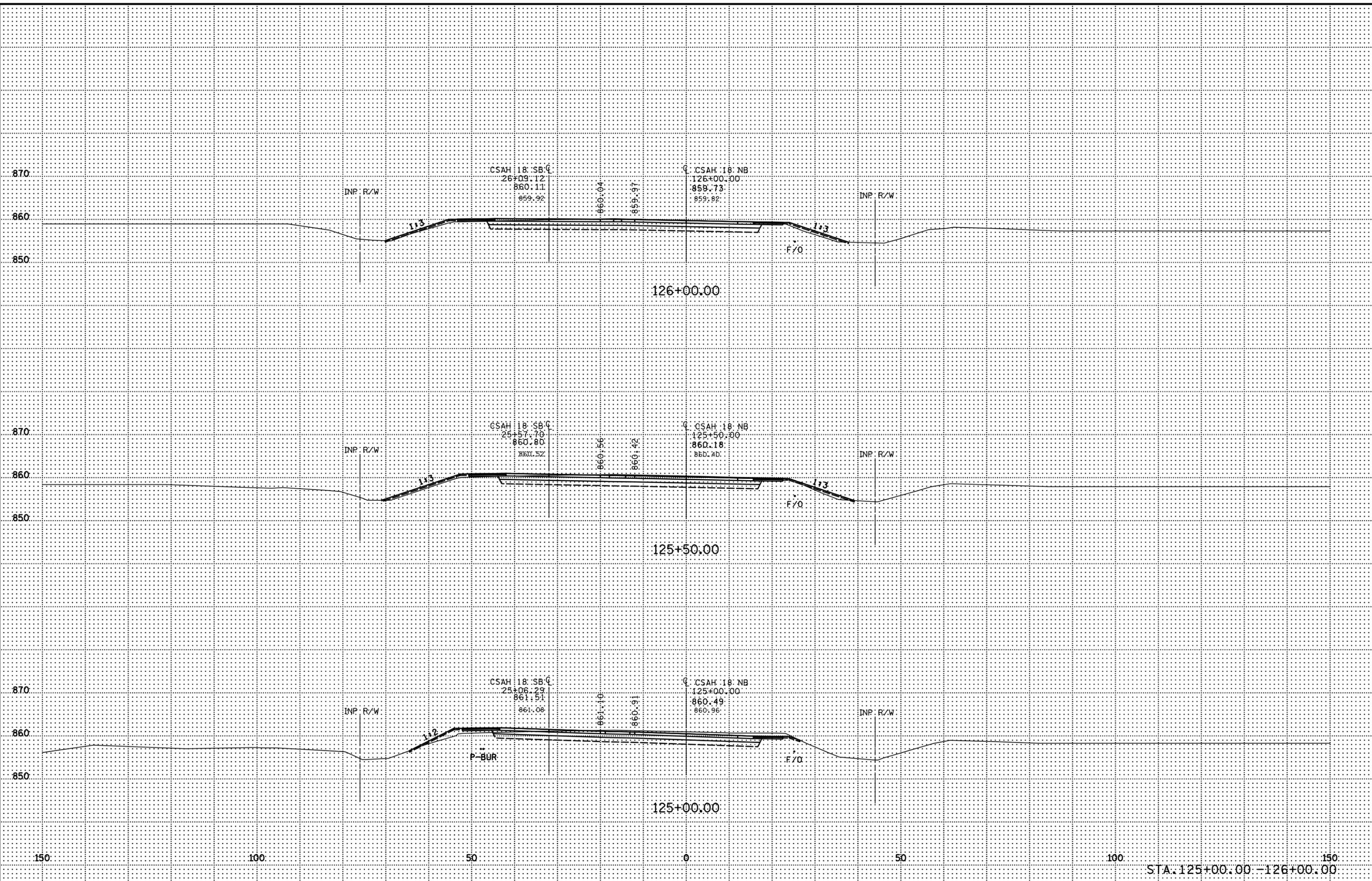
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STA. 123+50.00 - 124+50.00

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11/10/23
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STA: 125+00.00 - 126+00.00

