

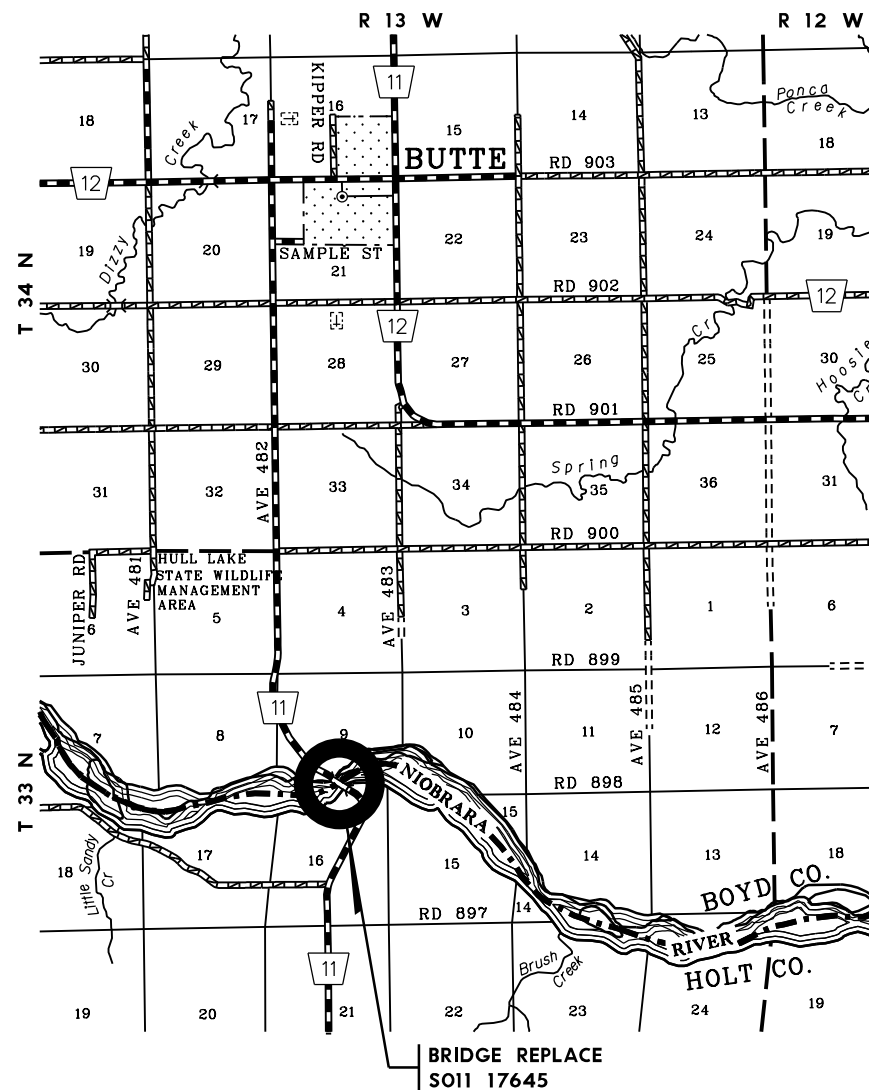
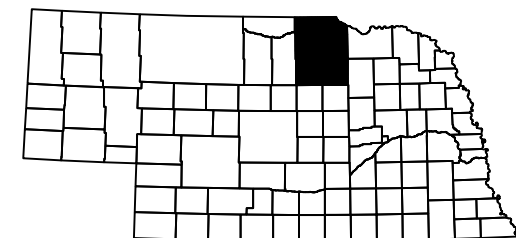
STATE OF NEBRASKA
DEPARTMENT OF TRANSPORTATION
PLANS FOR CONSTRUCTION
**HOLT / BOYD C/L
NIOBRARA RV BRIDGE**
HOLT AND BOYD COUNTIES

PROJECT NO.	SHEET NO.
ER-11-4(120)	A1
▲ CONTROL NO.	81038
▲ CONTROL NO.	
■ CONTROL NO.	

THE 2017 EDITION OF THE NEBRASKA STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS APPLY TO THIS PROJECT.

THE WORK ON THIS PROJECT CONSISTS OF GROUPS 1-GRADING, 3-PAVEMENT, 5-SEEDING, 6-BRIDGE, 7-GUARDRAIL & 10-GENERAL	
▲ GROUPS	1, 3, 5, 6, 7 & 10 ARE INCLUDED IN THE LETTING OF MAY 28, 2019
▲ GROUPS	ARE INCLUDED IN THE LETTING OF _____
■ GROUPS	ARE INCLUDED IN THE LETTING OF _____

DESIGN DESIGNATION
MAINTENANCE
TRAFFIC
YEAR: 2019
ADT: 360



INDEX OF SHEETS

SHEET NO.	TITLE PAGE
A1	TYPICAL CROSS SECTIONS
B1 - B2	SUMMARY OF QUANTITIES
C1	ENVIRONMENTAL
E1	HORIZONTAL ALIGNMENT & ORIENTATION
F1 - F2	GENERAL INFORMATION
G1 - G2	EROSION AND SEDIMENT CONTROL
J1	PLAN AND PROFILE SHEETS
L1	TRAFFIC
M1	TYPICAL TRAFFIC SIGNAL CONTROL PLAN--TEMPORARY TRAFFIC SIGNAL DETAILS
M2	SPECIAL PLAN 1 744'-0" 7-SPAN STEEL WELDED PLATE GIRDER BRIDGE REPAIR STA. 3444+27.00
S1 - S16	SPECIAL PLAN 1C GUARDRAIL PLANS
U1	SPECIAL PLAN 2C CONCRETE PROTECTION BARRIER
U2 - U3	SPECIAL PLAN 3C SILT CHECKS ALL TYPES
U4 - U7	SPECIAL PLAN 4C CONCRETE WASHOUT & CONSTRUCTION EXIT
U8	

STANDARD PLANS

108-R5	SUPERELEVATION PLAN FOR CONCRETE & BITUMINOUS SURFACING (3 SHEETS)
501-R7	EROSION CONTROL (2 SHEETS)
502-R2	SILT FENCE DETAILS (3 SHEETS)
740-R1	MIDWEST GUARDRAIL SYSTEM BRIDGE APPROACH SECTION (4 SHEETS)
743-R2	GUARDRAIL DETAILS (2 SHEETS)
901-R11	HIGHWAY DELINEATORS AND CHEVRONS (3 SHEETS)
920-R7	TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE (2 SHEETS)
921-R8	TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE (2 SHEETS)
941	PAVEMENT MARKING (4 SHEETS)
943	TEMPORARY PAVEMENT MARKING

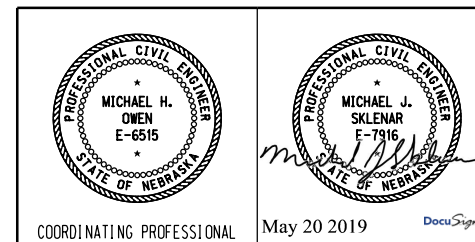
CONVENTIONAL SIGNS

FENCE R.O.W. OR WIRE	
GUARDRAIL	
TRAVELED WAY	
DIKE	
CULVERT	
POWER POLE	
TELEPHONE POLE	
MAILBOX	
RAILROAD TRACKS	
MARSH	
TREE - CONIFEROUS	
TREE - DECIDUOUS	

R.O.W. LEGEND

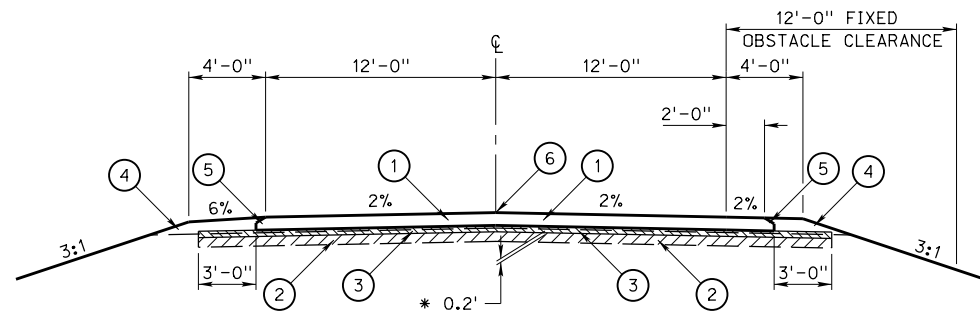
NEW CONTROLLED ACCESS	
PREVIOUS CONTROLLED ACCESS	
LIMITS OF CONSTRUCTION	
PREVIOUS R.O.W.	
NEW R.O.W.	
EXISTING PERMANENT EASEMENT	
TEMPORARY EASEMENT	
EXCESS TAKING	
PERMANENT EASEMENT	
EXISTING RAILROAD EASEMENT	
NEW RAILROAD PERMANENT EASEMENT	
NEW RAILROAD TEMPORARY EASEMENT	

REFERENCE POST NO. _____ TO REFERENCE POST NO. _____
EXCEPTIONS: FROM STA. _____ TO STA. _____
TOTAL NET LENGTH OF PROJECT: _____ FEET _____ MILES

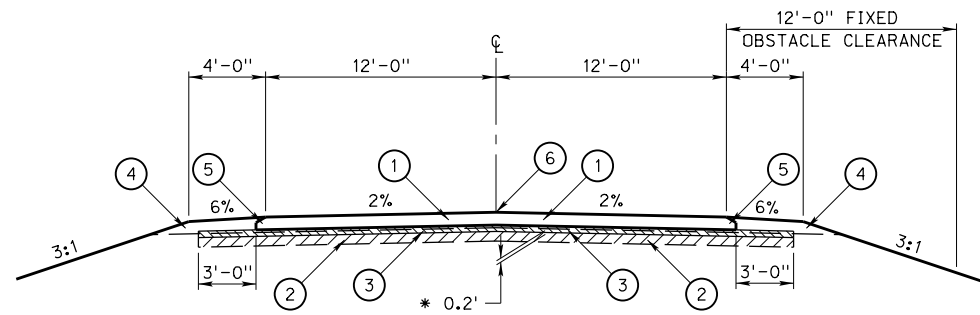


TYPICAL CROSS SECTIONS

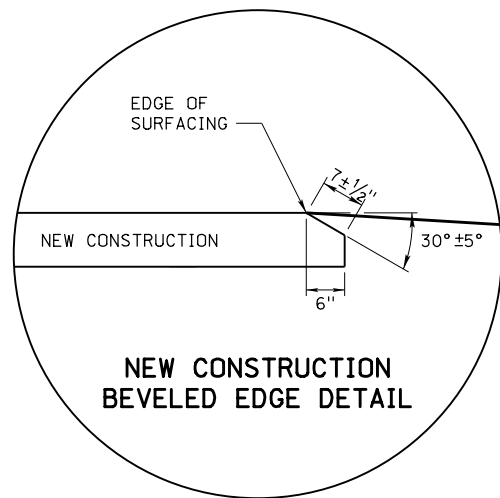
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STA. 3447+99 TO STA. 3451+00



STA. 3451+00 TO STA. 3463+35



LEGEND

- ① 8" SURFACING
- ② STABILIZED SUBGRADE, TYPE LIME
- ③ 4" FOUNDATION COURSE
- ④ EARTH SHOULDER CONSTRUCTION
- ⑤ BEVELED EDGE (SEE DETAIL)
- ⑥ PROFILE GRADE POINT

BRIDGE EXCEPTION: STA. 3440+55 TO STA. 3447+99

*THIS MATERIAL TO BE REMOVED BY THE SURFACING CONTRACTOR AND INCORPORATED INTO THE SHOULDERS.

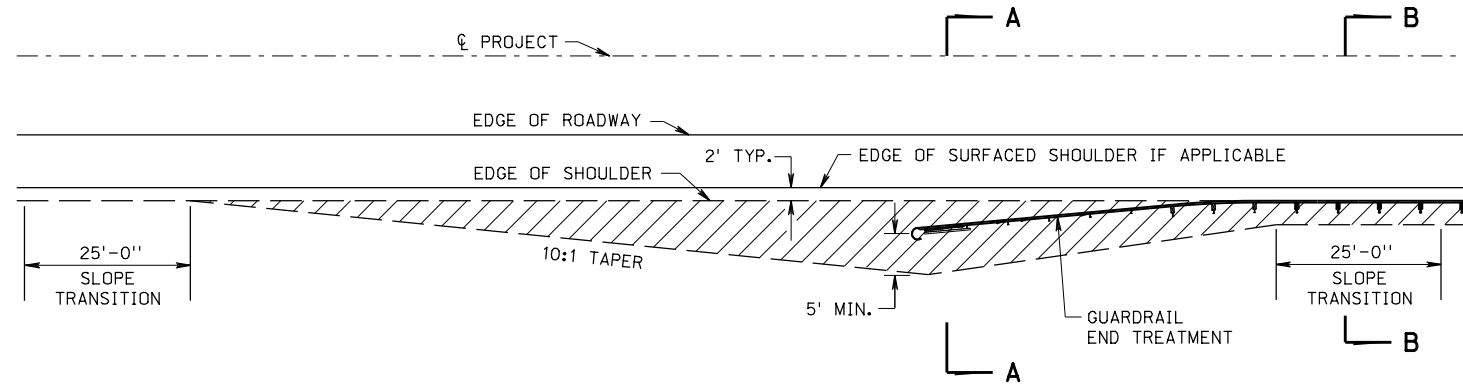
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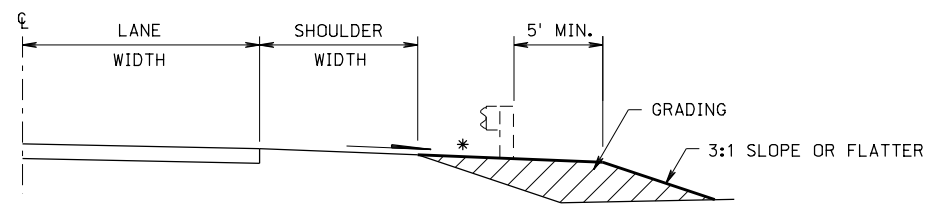


TYPICAL CROSS SECTIONS



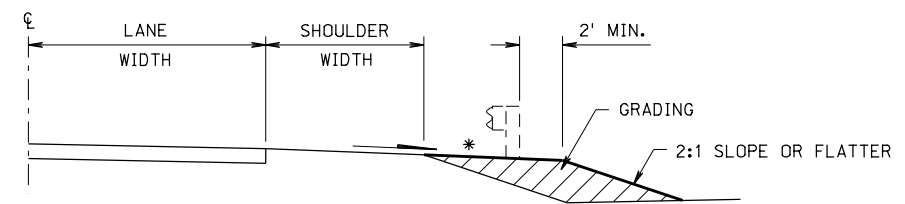
GRADING FOR GUARDRAIL END TREATMENTS

PLAN



SECTION A-A

* EXTENSION OF SHOULDER SLOPE



SECTION B-B

* EXTENSION OF SHOULDER SLOPE

ROADWAY DESIGN DIVISION

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SUMMARY OF QUANTITIES

PROJECT NO.	SHEET NO.
ER-11-4(120)	C1

C.N. 81038

GRADING ITEMS GROUP 1

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
GENERAL CLEARING AND GRUBBING	1.000	LS
EXCAVATION (ESTABLISHED QUANTITY)	553.000	CY
REMOVE ASPHALT SURFACE	4,096.000	SY
REMOVE GUARDRAIL	158.000	LF

BRIDGE AT STATION 3444+27.00 ITEMS GROUP 6

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
ABUTMENT NO. 2 EXCAVATION	1.000	LS
REPLACING DECK JOINT SEALS	35.000	LF
EXPANSION BEARING, PTFE TYPE	16.000	EACH
CLASS 47B-3000 CONCRETE FOR BRIDGE	10.600	CY
CLASS 47BD-4000 CONCRETE FOR BRIDGE	58.600	CY
REINFORCING STEEL FOR BRIDGE	10,192.000	LB
PREPARATION OF BRIDGE AT STATION 3444+27.00	1.000	EACH
ACCESS CROSSING	1.000	LS
STRUCTURAL STEEL FOR SUBSTRUCTURE	510.000	LB
STRUCTURAL STEEL FOR SUPERSTRUCTURE	50,200.000	LB
TEMPORARY BRIDGE SHORING	1.000	LS
JACK AND RESET BRIDGE SUPERSTRUCTURE	1.000	LUMP

GENERAL ITEMS GROUP 10

ITEM	QUANTITY	UNITS
BARRICADE, TYPE II	1,520.000	BDAY
BARRICADE, TYPE III	570.000	BDAY
TEMPORARY SIGN DAY	50.000	EACH
SIGN DAY	6,080.000	EACH
TEMPORARY PAVEMENT MARKING REMOVAL	6,200.000	LF
PAVEMENT MARKING REMOVAL	3,500.000	LF
TEMPORARY PAVEMENT MARKING, TYPE PAINT	6,200.000	LF
TEMPORARY PAVEMENT MARKING SURFACE PREPARATION	6,200.000	LF
FLAGGING	10.000	DAY
CONCRETE PROTECTION BARRIER	1,000.000	LF
TEMPORARY TRAFFIC SIGNAL	1.000	EACH
FIELD OFFICE	1.000	EACH
TRAINING	100.000	HOURL
MOBILIZATION	1.000	LS
RENTAL OF LOADER, FULLY OPERATED	10.000	HOURL
RENTAL OF DUMP TRUCK, FULLY OPERATED	10.000	HOURL
RENTAL OF SKID LOADER, FULLY OPERATED	10.000	HOURL
RENTAL OF CRAWLER MOUNTED HYDRAULIC EXCAVATOR, FULLY OPERATED	10.000	HOURL
TEMPORARY EROSION CONTROL BLANKET	4,840.000	SY
TEMPORARY SILT FENCE	2,000.000	LF
TEMPORARY EARTH CHECK	1,600.000	LF
TEMPORARY MULCH	2.000	TON
ENVIRONMENTAL COMMITMENTS - CONTRACTOR COMPLIANCE	1.000	LS

CONCRETE PAVEMENT ITEMS GROUP 3

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
DELINEATOR, TYPE III	10.000	EACH
INSTALL CHEVRONS	8.000	EACH
GRAVEL SURFACE COURSE	10.000	CY
5" PERMANENT PAVEMENT MARKING PAINT	92.000	LF
HYDRATED LIME	88.000	TON
FOUNDATION COURSE 4"	4,335.000	SY
GRANULAR SUBDRAIN	20.000	EACH
STABILIZED SUBGRADE TYPE LIME	4,335.000	SY
SURFACING 8"	4,335.000	SY
WATER	24.000	MGAL
EARTH SHOULDER CONSTRUCTION	30.720	STA

GUARDRAIL ITEMS GROUP 7

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
W-BEAM GUARDRAIL	37.500	LF
BRIDGE APPROACH SECTIONS	2.000	EACH
GUARDRAIL END TREATMENT, TYPE II	2.000	EACH

SEEDING ITEMS GROUP 5

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
SEEDING, TYPE B	1.000	ACRE
COVER CROP SEEDING	2.000	ACRE
EROSION CONTROL, CLASS 1D	411.000	SY
MULCH	2.000	TON



ROADWAY DESIGN DIVISION

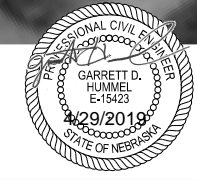


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HOLT/BOYD C/L NIOBRARA RIVER BRIDGE
HOLT/BOYD COUNTY



DATE: 6/2/2017
 FLIGHT: DigitalGlobe
 SCALE: N/A

DATUM INFORMATION
 HORIZONTAL: NAD 83 (1995)
 VERTICAL: NAVD 88
 D.A.F. = 1.0001309

HWY N-11

Beginning chain NE-11 description
 Point ALI201 N 1,097,116.8281 E 1,949,569.9481 Sta 3420+00.00
 Course from ALI201 to TS NE11-2B N 27° 42' 55.45" E Dist 320.5490
 SCS NE11-2 found within chain NE-11, contains:
 SPI NE11-2B CUR NE11-2 SPI NE11-2A
 PISCS NE11-2 N 1,098,220.0164 E 1,950,149.5133 STA 3432+46.16
 Total Tangent = 925.6132
 Total Length = 1,525.1097
 Total Delta = 86° 07' 55.67" (LT)
 Back Tangent = N 27° 42' 55.45" E
 Ahead Tangent = N 58° 25' 00.22" W

Beginning SCS NE11-2 description
 Spiral Back
 Spiral NE11-2B Type 1 Spiral Element
 Angle 6° 30' 00.00" (LT) P 1.8899 BK N 27° 42' 55.45" E
 LS 200.0000 K 99.9571 AH N 21° 12' 55.45" E
 R 881.4735 LT 133.4233 CB N 25° 32' 56.30" E
 YS 7.5561 ST 66.7485 Defl 2° 09' 59.15"
 XS 199.7428 LC 199.8856 Deg 6° 30' 00.00"

HWY N-11 (CONTINUED)

Spiral Coordinates

Point	North	East	Station
TS	1,097,400.6001	1,949,719.0290	3423+20.55
PI	1,097,518.7155	1,949,781.0816	3424+53.97
SC	1,097,580.9403	1,949,805.2362	3425+20.55
CC	1,097,899.9237	1,948,983.5032	

Circular Section
 Curve NE11-2
 P.I. Station = 3431+74.38 N 1,098,190.4583 E 1,950,041.8412
 Delta = 73° 07' 55.67" (LT)
 Degree = 6° 30' 00.00"
 Tangent = 653.8304
 Length = 1,125.1097
 Radius = 881.4735
 External = 216.0189
 Long Chord = 1,050.2745
 Mid. Ord. = 173.5000
 P.C. Station = 3425+20.55 N 1,097,580.9403 E 1,949,805.2362
 P.T. Station = 3436+45.66 N 1,098,593.7448 E 1,949,527.2014
 C.C. = N 21° 12' 55.45" E
 Back = N 51° 55' 00.22" W
 Ahead = N 15° 21' 02.38" W
 Chord Bear = N 15° 21' 02.38" W

Spiral Ahead
 Spiral NE11-2A Type 2 Spiral Element
 Angle 6° 30' 00.00" (LT) P 1.8899 BK N 51° 55' 00.22" W
 LS 200.0000 K 99.9571 AH N 58° 25' 00.22" W
 R 881.4735 LT 133.4233 CB N 56° 15' 01.07" W
 YS 7.5561 ST 66.7485 Defl 2° 09' 59.15"
 XS 199.7428 LC 199.8856 Deg 6° 30' 00.00"

Spiral Coordinates

Point	North	East	Station
CS	1,098,593.7448	1,949,527.2014	3436+45.66
PI	1,098,634.9157	1,949,474.6627	3437+12.41
ST	1,098,704.7945	1,949,361.0020	3438+45.66
CC	1,097,899.9237	1,948,983.5032	

Ending SCS NE11-2 description
 Course from ST NE11-2A to TS NE11-3B N 58° 25' 00.22" W Dist 1,550.6276
 SCS NE11-3 found within chain NE-11, contains:
 SPI NE11-3B CUR NE11-3 SPI NE11-3A
 PISCS NE11-3 N 1,099,747.1092 E 1,947,665.6349 STA 3458+35.81
 Total Tangent = 439.5206
 Total Length = 871.7376
 Total Delta = 20° 09' 07.66" (RT)
 Back Tangent = N 58° 25' 00.22" W
 Ahead Tangent = N 38° 15' 52.55" W

HWY N-11 (CONTINUED)

Beginning SCS NE11-3 description
 Spiral Back
 Spiral NE11-3B Type 1 Spiral Element
 Angle 3° 00' 00.00" (RT) P 0.8726 BK N 58° 25' 00.22" W
 LS 200.0000 K 99.9909 AH N 55° 25' 00.22" W
 R 1,909.8593 LT 133.3525 CB N 57° 25' 00.30" W
 YS 3.4900 ST 66.6841 Defl 0° 59' 59.92"
 XS 199.9452 LC 199.9756 Deg 3° 00' 00.00"

Spiral Coordinates

Point	North	East	Station
TS	1,099,516.9159	1,948,040.0536	3453+96.29
PI	1,099,586.7575	1,947,926.4533	3455+29.64
SC	1,099,624.6076	1,947,871.5521	3455+96.29
CC	1,101,196.9989	1,948,955.5948	

Circular Section
 Curve NE11-3
 P.I. Station = 3458+33.36 N 1,099,759.1724 E 1,947,676.3675
 Delta = 14° 09' 07.66" (RT)
 Degree = 3° 00' 00.00"
 Tangent = 237.0754
 Length = 471.7376
 Radius = 1,909.8593
 External = 14.6581
 Long Chord = 470.5393
 Mid. Ord. = 14.5465
 P.C. Station = 3455+96.29 N 1,099,624.6076 E 1,947,871.5521
 P.T. Station = 3460+68.02 N 1,099,937.3753 E 1,947,520.0074
 C.C. = N 41° 15' 52.55" W
 Back = N 55° 25' 00.22" W
 Ahead = N 41° 15' 52.55" W
 Chord Bear = N 48° 20' 26.39" W

Spiral Ahead
 Spiral NE11-3A Type 2 Spiral Element
 Angle 3° 00' 00.00" (RT) P 0.8726 BK N 41° 15' 52.55" W
 LS 200.0000 K 99.9909 AH N 38° 15' 52.55" W
 R 1,909.8593 LT 133.3525 CB N 39° 15' 52.47" W
 YS 3.4900 ST 66.6841 Defl 0° 59' 59.92"
 XS 199.9452 LC 199.9756 Deg 3° 00' 00.00"

Spiral Coordinates

Point	North	East	Station
CS	1,099,937.3753	1,947,520.0074	3460+68.02
PI	1,099,987.4998	1,947,476.0268	3461+34.71
ST	1,100,092.2028	1,947,393.4424	3462+68.02
CC	1,101,196.9989	1,948,955.5948	

Ending SCS NE11-3 description
 Course from ST NE11-3A to ALI202 N 38° 15' 52.55" W Dist 631.9761
 Point ALI202 N 1,100,588.4046 E 1,947,002.0634 sta 3469+00.00
 Ending chain NE-11 description

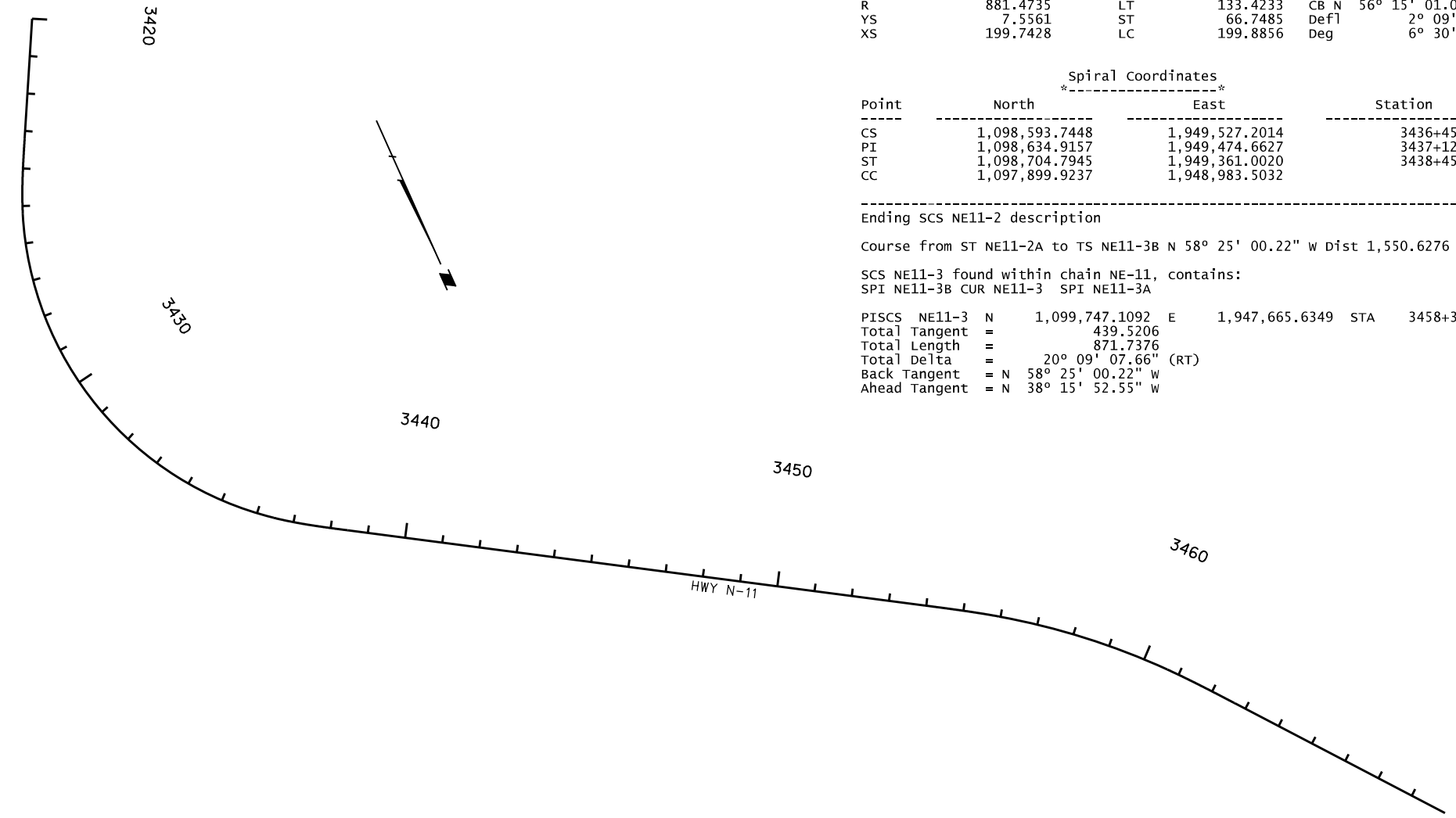
GEOPAK ALIGNMENT INFORMATION		
ALIGNMENT	CHAIN	PROFILE
HWY N-11	NE-11	NE-11_P

ROADWAY DESIGN DIVISION

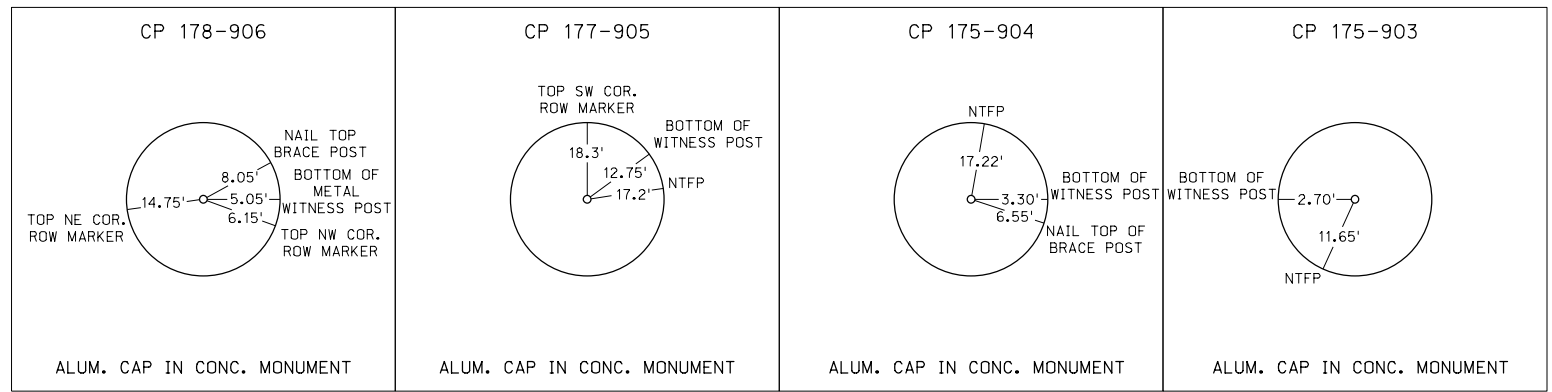
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DATUM INFORMATION
HORIZONTAL **VERTICAL**
 NAD 83 (1995) NAVD 88
 D.A.F. = 1.0001309



CONTROL POINT DATA					
CONTROL POINT	X	Y	Z	STATION	OFFSET
CP 178-906	1946210.133	1107734.577	1833.199	N/A	N/A
CP 177-905	1946394.011	1101662.729	1638.380	N/A	N/A
CP 175-904	1949867.218	1097536.755	1665.779	3425+03.18	73.949936
CP 175-903	1948234.849	1092806.988	1723.995	N/A	N/A



GENERAL INFORMATION

ROADWAY DESIGN DIVISION

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NOTES

- The locations of all aerial and underground utility facilities may not be indicated in these plans. Underground utilities, whether indicated or not will be located and flagged by the Utilities at the request of the Contractor.

No excavation will be permitted in the area of underground utility facilities until all such facilities have been located and identified to the satisfaction of all parties. The excavation must be accomplished with extreme care in order to avoid any possibility of damage to the utility facility.

FOR INFORMATION ONLY

- As indicated by the Typical Section, Embankment will be required to construct the earth portion of the shoulder. This material will be furnished by the Contractor from sources other than State Right-of-Way.

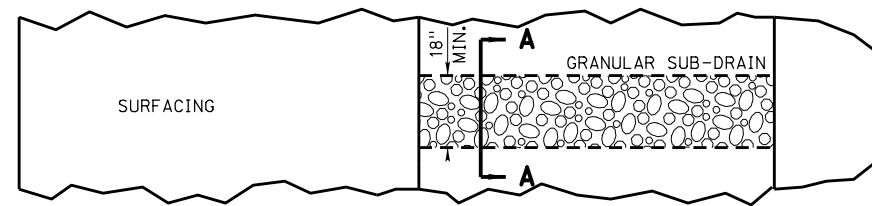
CULVERT PIPE LEGEND		
TYPE	DESCRIPTION	
1	RCSP	Reinforced Concrete Sewer Pipe
2	RCP	Reinforced Concrete Pipe
3	GCCMP	Galvanized (zinc) Coated Corrugated Metal Pipe
4	ACCOMP	Aluminum Coated Corrugated Metal Pipe
5	PCCMP	Polymer Coated Corrugated Metal Pipe
6	HDPE-CI	High Density Polyethylene (corrugated Interior)
7	HDPE-SI	High Density Polyethylene (smooth Interior)
8	PVC	Polyvinyl Chloride Pipe

EARTHWORK				
STATION TO STATION	EXCAVATION ESTABLISHED QUANTITY (CU. YDS.)	EMBANKMENT (CU. YDS.)	BALANCE FACTOR	EXCESS EXCAVATION (CU. YDS.)
3447+92 - 3463+35	553	0	1.5	553
TOTAL	553	0	-	553

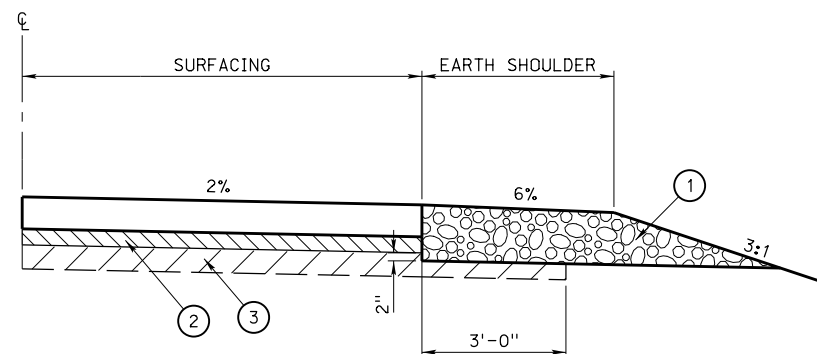
THE CONTRACTOR MAY USE THE EXCESS EXCAVATION FOR SHOULDER CONSTRUCTION AND/OR OTHER EMBANKMENT.

EARTHWORK QUANTITIES GIVEN ARE DETERMINED USING TYPICAL CROSS SECTIONS AND ARE NOT BASED OFF SURVEY DATA.

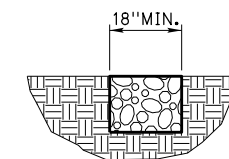
BUILD GRANULAR SUBDRAIN				
STATION TO STATION	SIDE	SPACING	EACH	
3448+13 - 3453+13	LT/RT	100'	12	
3454+13 - 3457+13	RT	100'	4	
3459+13 - 3461+13	RT	200'	2	
3463+13 - 3463+13	LT/RT	200'	2	
		TOTAL	20	



GRANULAR SUB-DRAIN DETAILS



GRANULAR SUB-DRAIN DETAILS



SECTION A - A

LEGEND

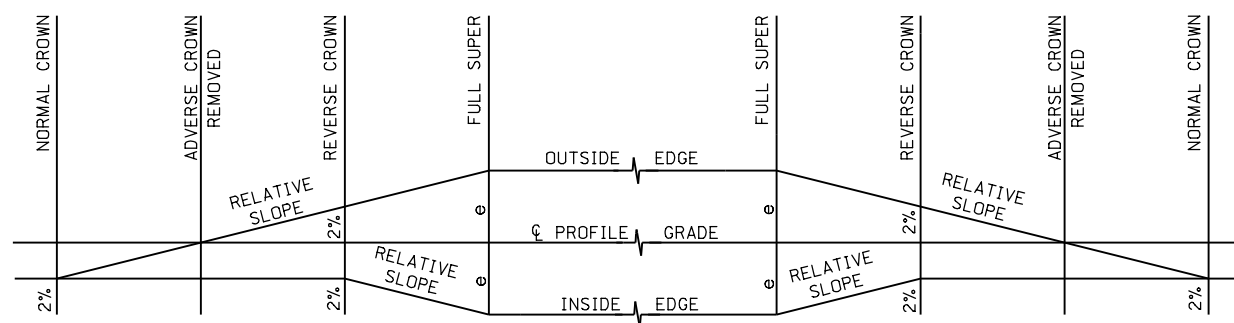
- ① GRANULAR SUBDRAIN
- ② 4" FOUNDATION COURSE
- ③ STABILIZED SUBGRADE, TYPE LIME

CONSTRUCTION NOTES

- (A) THE GRANULAR SUB-DRAINS SHALL BE CONSTRUCTED WITH POSITIVE DRAINAGE.
- (B) GRANULAR SUB-DRAINS SHALL BE INSTALLED AFTER ALL SHOULDERING AND EARTH WORK IS COMPLETED AND PRIOR TO SEEDING.
- (C) GRANULAR SUB-DRAINS SHALL BE CONSTRUCTED AT INTERVALS OF 200'-0" WHERE THE GRADE IS 1% OR OVER AND AT INTERVALS OF 100'-0" ON GRADES UNDER 1%.
- (D) GRANULAR SUB-DRAINS SHALL BE BUILT PERPENDICULAR TO THE CENTER LINE.
- (E) PLACE ADDITIONAL GRANULAR SUB-DRAINS AS DIRECTED BY THE CONSTRUCTION ENGINEER.

LEGEND

- G --- GAS LINE
- E --- ELECTRICAL SERVICE
- P --- POWER LINE
- OP --- OVERHEAD POWER LINE
- SAN --- SANITARY SEWER
- SS --- STORM SEWER
- T --- TELEPHONE LINE
- FO --- FIBER OPTIC TELE. LINE
- OT --- OVERHEAD TELEPHONE LINE
- TV --- CABLE TV LINE
- OTV --- OVERHEAD CABLE TV LINE
- W --- WATER LINE
- O --- FENCE - CHAIN LINK
- X --- FENCE - R.O.W. OR WIRE
- □ --- FENCE - WOOD
- --- FLOWLINE
- --- CENTER LINE DRIVE
- ⊕ BENCH MARK
- ⊙ CENTER PIVOT
- ⊙ CONTROL POINT
- XXXXXXXXX DIKE
- ⊗ GAS METER
- ⊗ GAS VALVE
- ⊕ GRID TICK
- GUARDRAIL
- GUARD POST
- GUY POLE
- GUY WIRE
- ☀ OR ☀ LIGHT POLE
- ☐ MAILBOX
- ⊙ MANHOLE
- MARSH
- ☐ OIL WELL
- ⬡ PHOTO CODE POINT
- ☐ POWER BOX
- ⊕ POWER POLE
- ⊕ POWER PULL BOX
- PROPANE TANK
- ⊕ R.O.W. MARKER
- ⊕ ADVANCED R.R. WARNING SIGN
- ⊕ RAILROAD WARNING
- RAILROAD TRACKS
- RETAINING WALL
- ⊕ SATELLITE DISH
- ⊕ SIGN
- ☀ TRAFFIC SIGNAL
- ☀ TRAFFIC SIGNAL/ST. LIGHT
- ☐ TELEPHONE BOX
- ☐ TELE. FIBER OPTICS BOX
- ⊕ TELEPHONE PULL BOX
- ⊕ TELEPHONE POLE
- ☐ TELEVISION BOX
- ☀ TREE - CONIFEROUS
- ☀ TREE - DECIDUOUS
- ☀ TREE STUMP
- ⊕ WATER (FIRE) HYDRANT
- ⊕ WATER VALVE
- ⊕ WATER METER
- ⊕ WELL
- ⊕ WINDMILL



SUPERELEVATION DIAGRAM

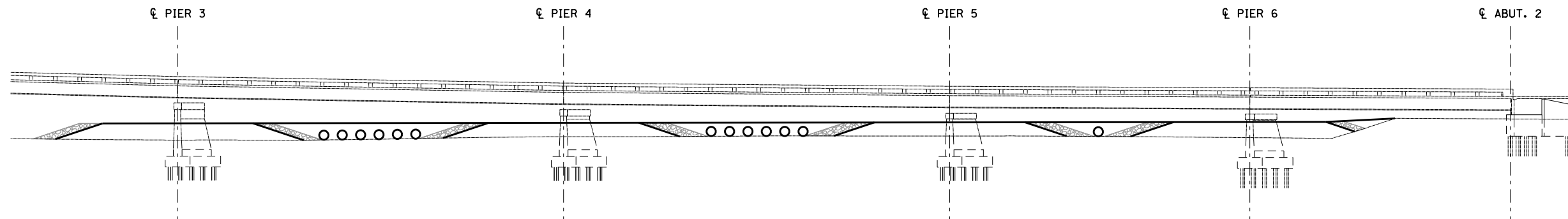
SUPERELEVATION											
CURVE IDENTIFICATION P.I. STATION	RADIUS OF CURVE	SUPERELEVATION e %	RELATIVE SLOPE	NORMAL CROWN STATION	ADVERSE CROWN REMOVED STATION	REVERSE CROWN STATION	FULL SUPER STATION	FULL SUPER STATION	REVERSE CROWN STATION	ADVERSE CROWN REMOVED STATION	NORMAL CROWN STATION
3458+33.36	1,909.86	6.0	1:278	3453+30	3453+96	3454+63	3455+96	3460+68	3462+01	3462+68	3463+35

FOR DETAILS NOT SHOWN, SEE PLAN 108.

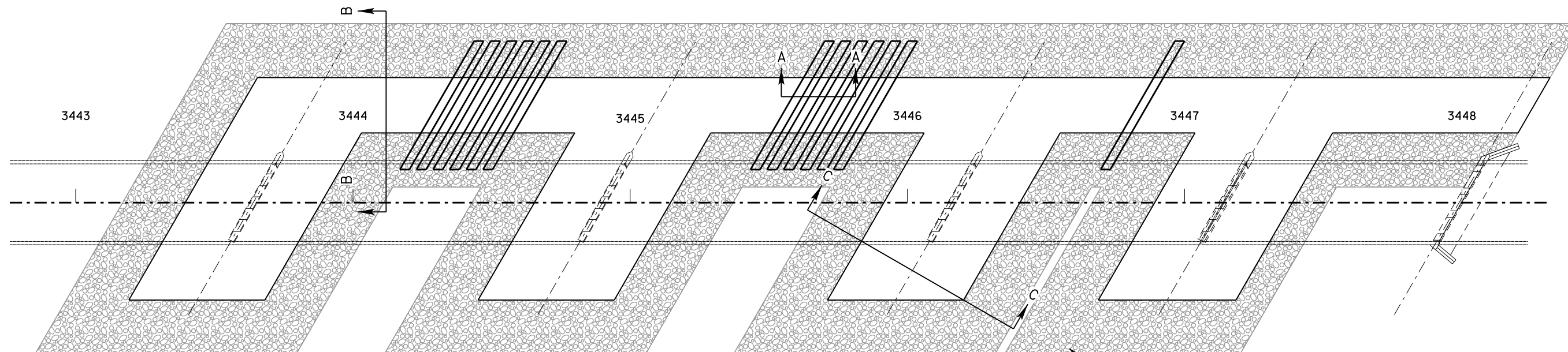


GENERAL INFORMATION

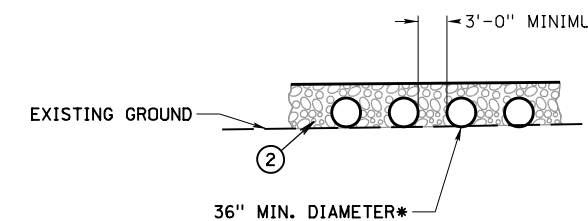
ROADWAY DESIGN DIVISION



CAUSEWAY ELEVATION

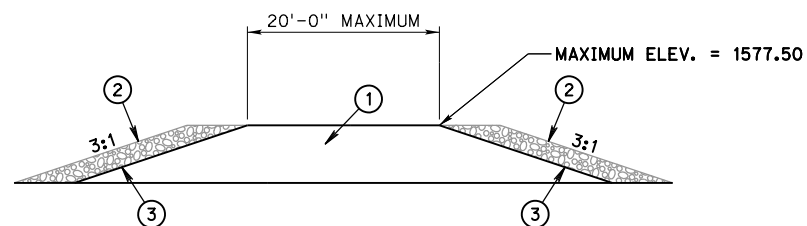


CAUSEWAY PLAN

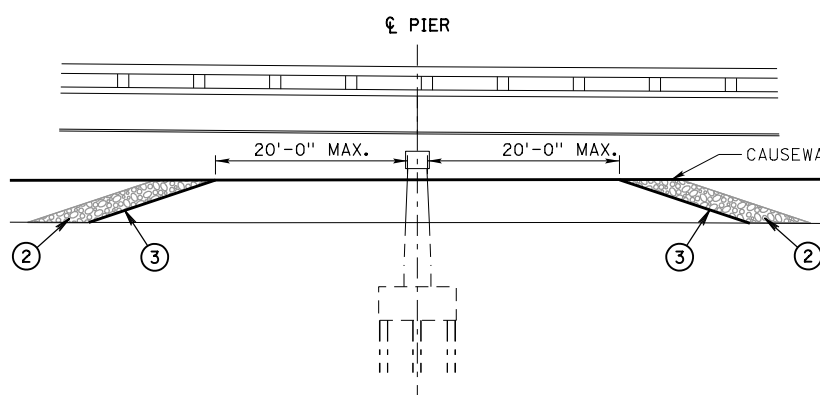


*CONTRACTOR TO PROVIDE MAXIMUM NUMBER OF PIPES POSSIBLE)

SECTION A-A

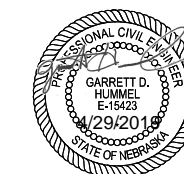


SECTION B-B



SECTION C-C
(MAY BE OMITTED AT CONTRACTOR'S DISCRETION)

- LEGEND**
- ① MATERIAL SHALL BE CLEAN EARTHEN FILL.
 - ② MINIMUM 2'-0" TYPE B ROCK RIPRAP OR BROKEN CONCRETE RIPRAP THAT MEETS THE REQUIREMENTS OF THE NDOT STANDARD SPECIFICATIONS.
 - ③ FILTER FABRIC



CONTRACTOR ACCESS CROSSING

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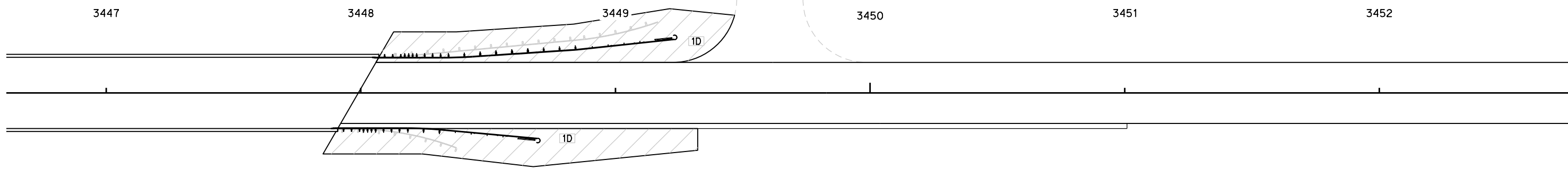
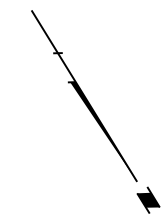
ROADWAY DESIGN DIVISION

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SEC. 9-T33N-R13W



SEC. 9-T33N-R13W

BUILD EROSION CONTROL-CLASS 1D, PLAN 501						
STATION	TO	STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
3447+85	-	3449+32	Rt.	Behind Guardrail	VARIABLES	185
3448+06	-	3449+47	Lt.	Behind Guardrail	VARIABLES	226

- LEGEND**
- LIMITS OF CONSTRUCTION
 - WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E



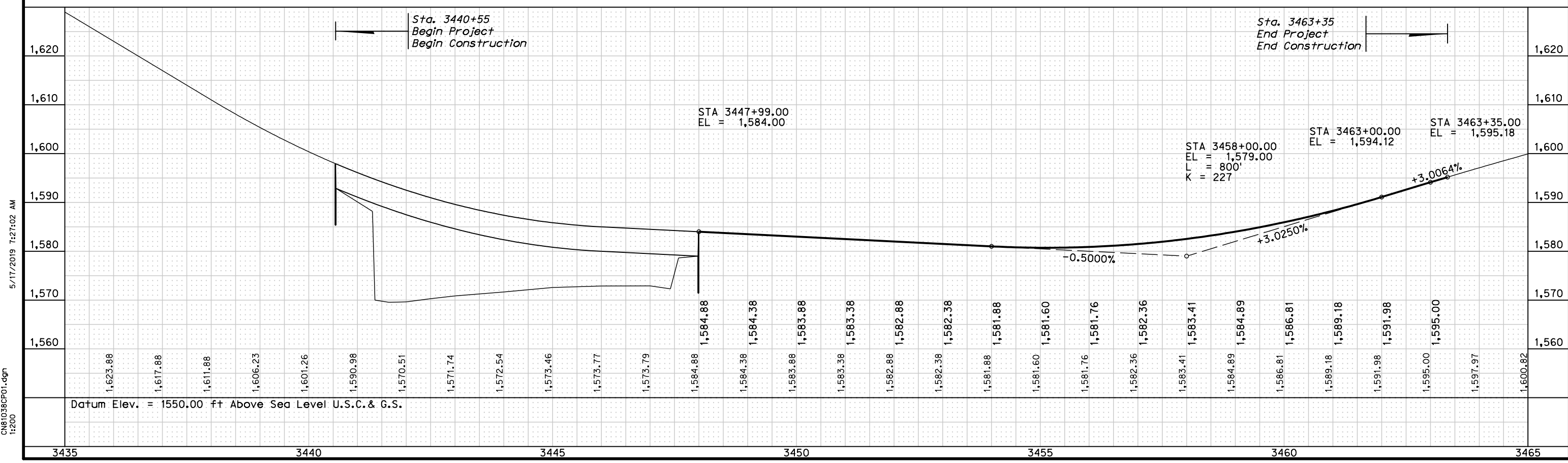
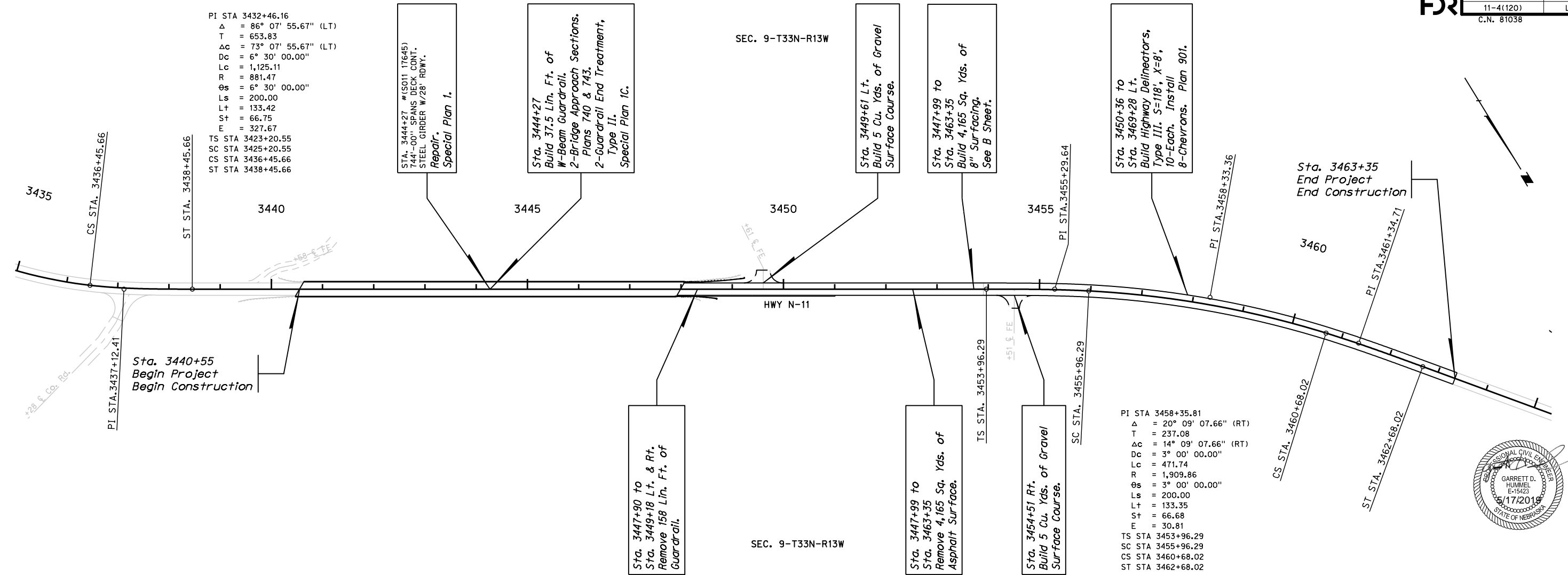
EROSION CONTROL

ROADWAY DESIGN DIVISION

PI STA 3432+46.16
 $\Delta = 86^\circ 07' 55.67''$ (LT)
 $T = 653.83$
 $\Delta C = 73^\circ 07' 55.67''$ (LT)
 $DC = 6^\circ 30' 00.00''$
 $LC = 1,125.11$
 $R = 881.47$
 $OS = 6^\circ 30' 00.00''$
 $LS = 200.00$
 $LT = 133.42$
 $ST = 66.75$
 $E = 327.67$
 TS STA 3423+20.55
 SC STA 3425+20.55
 CS STA 3436+45.66
 ST STA 3438+45.66

SEC. 9-T33N-R13W

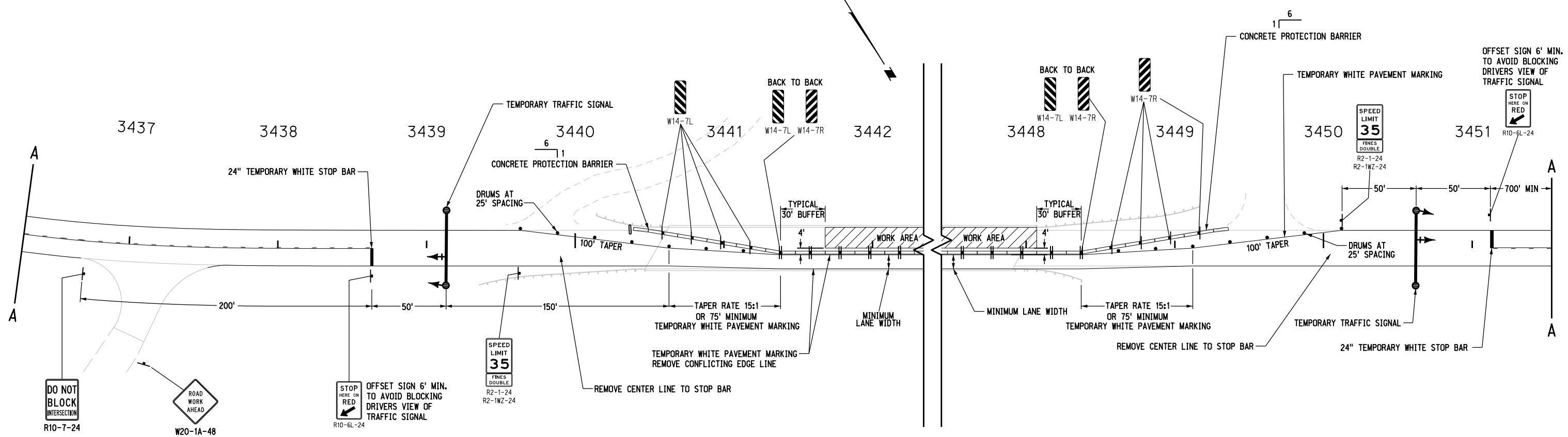
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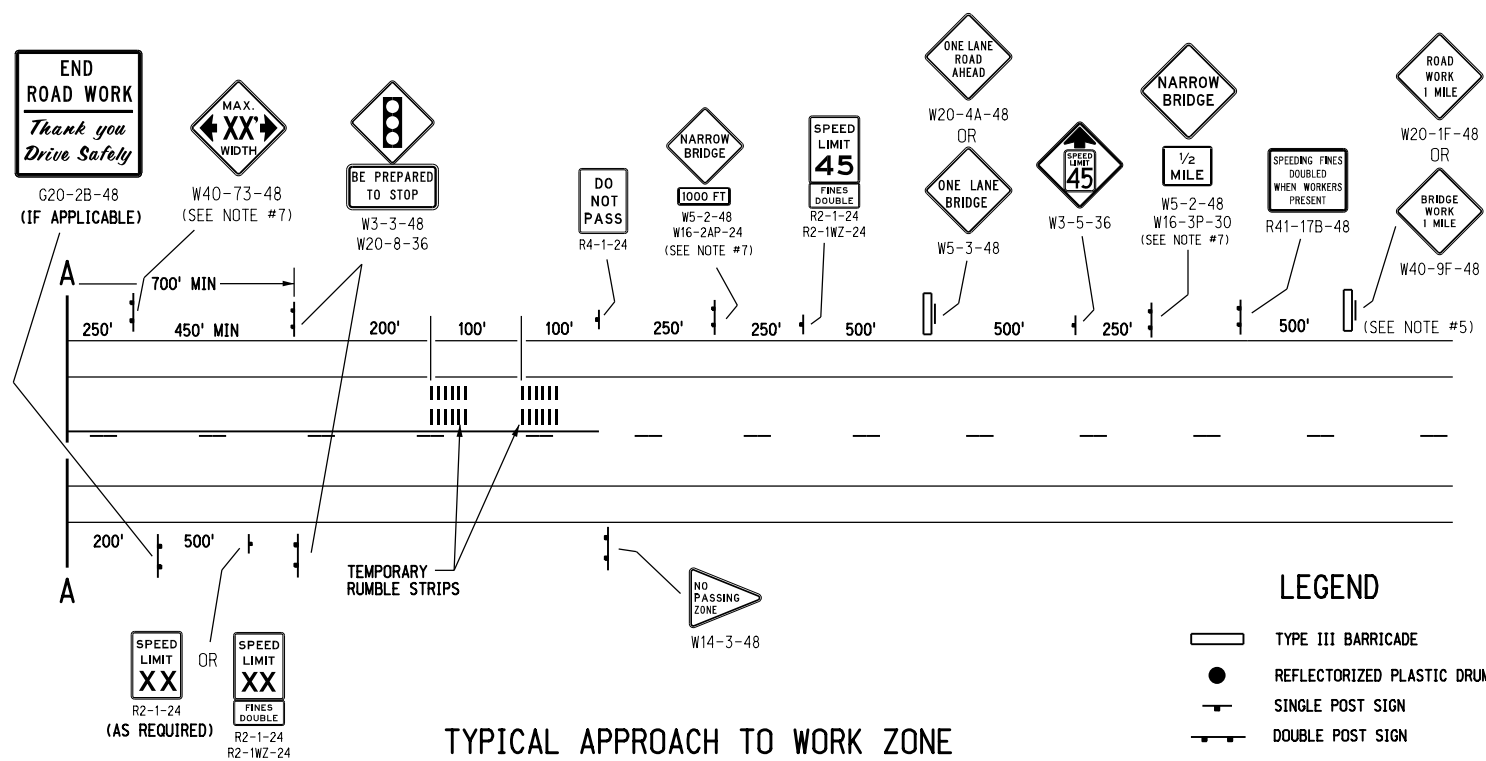
ROADWAY DESIGN DIVISION



TNRVIEL

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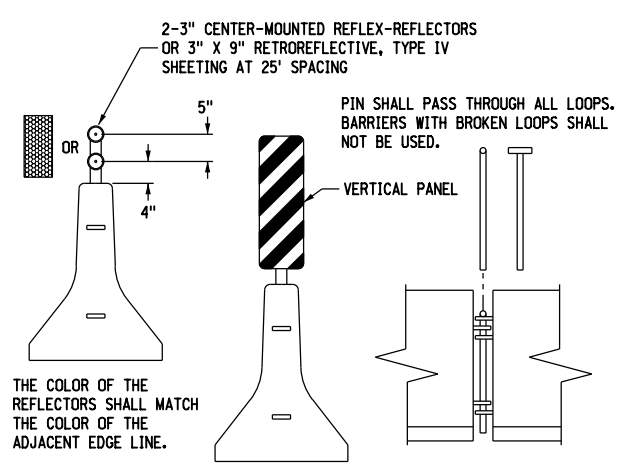
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LEGEND

	TYPE III BARRICADE
	REFLECTORIZED PLASTIC DRUM
	SINGLE POST SIGN
	DOUBLE POST SIGN

CONCRETE PROTECTION BARRIER DETAIL



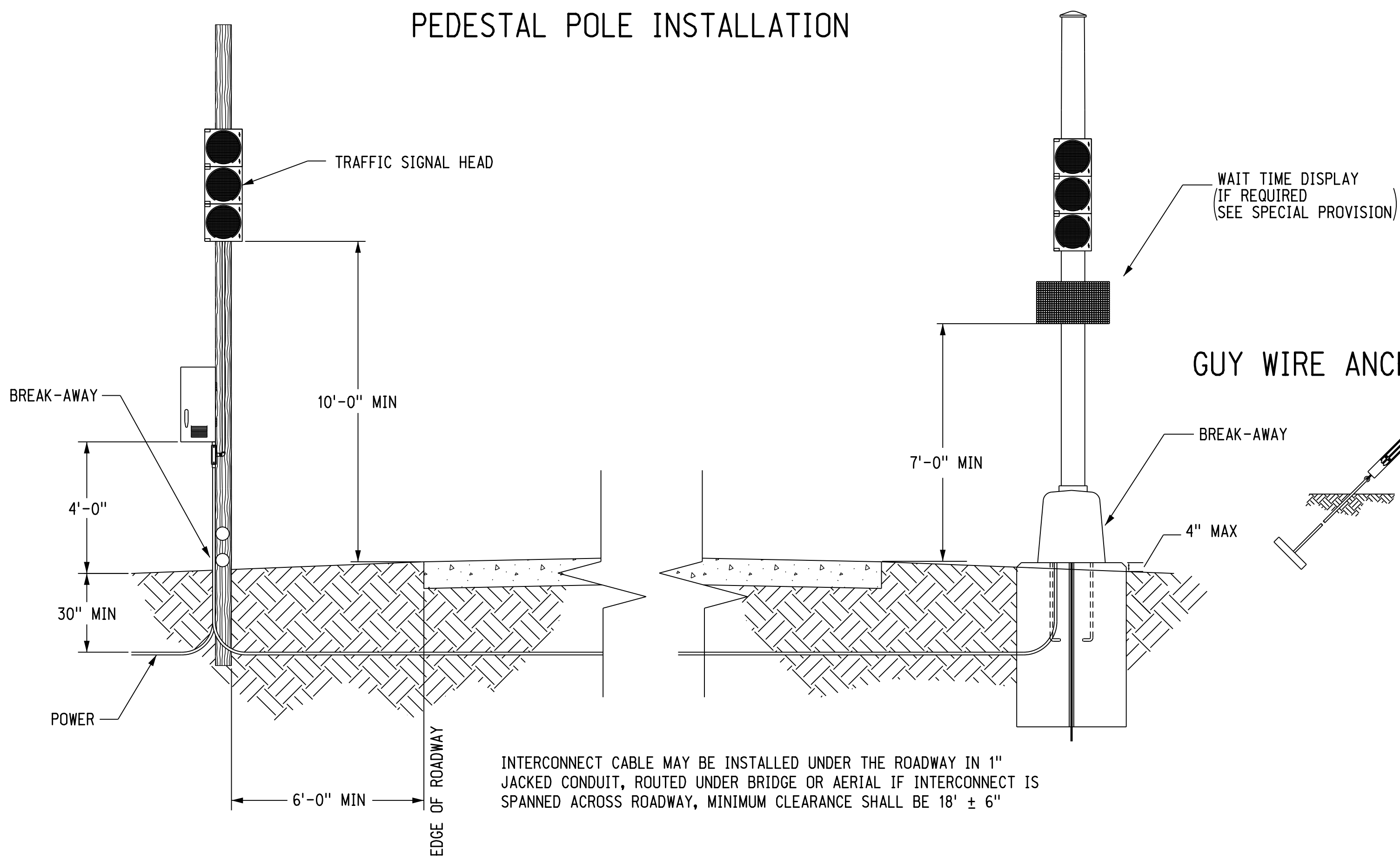
VERTICAL PANELS MOUNTED ON LEFT SIDE OF TRAFFIC SHALL BE W14-7L, RIGHT SIDE SHALL BE W14-7R, AT EVERY 2S SPACING ON TOP OF BARRIER, EVERY S SPACING ALONG BARRIER TAPER. INSTALL VERTICAL PANEL IN PLACE OF REFLECTOR WHEN BOTH FALL IN SAME LOCATION.

NOTES

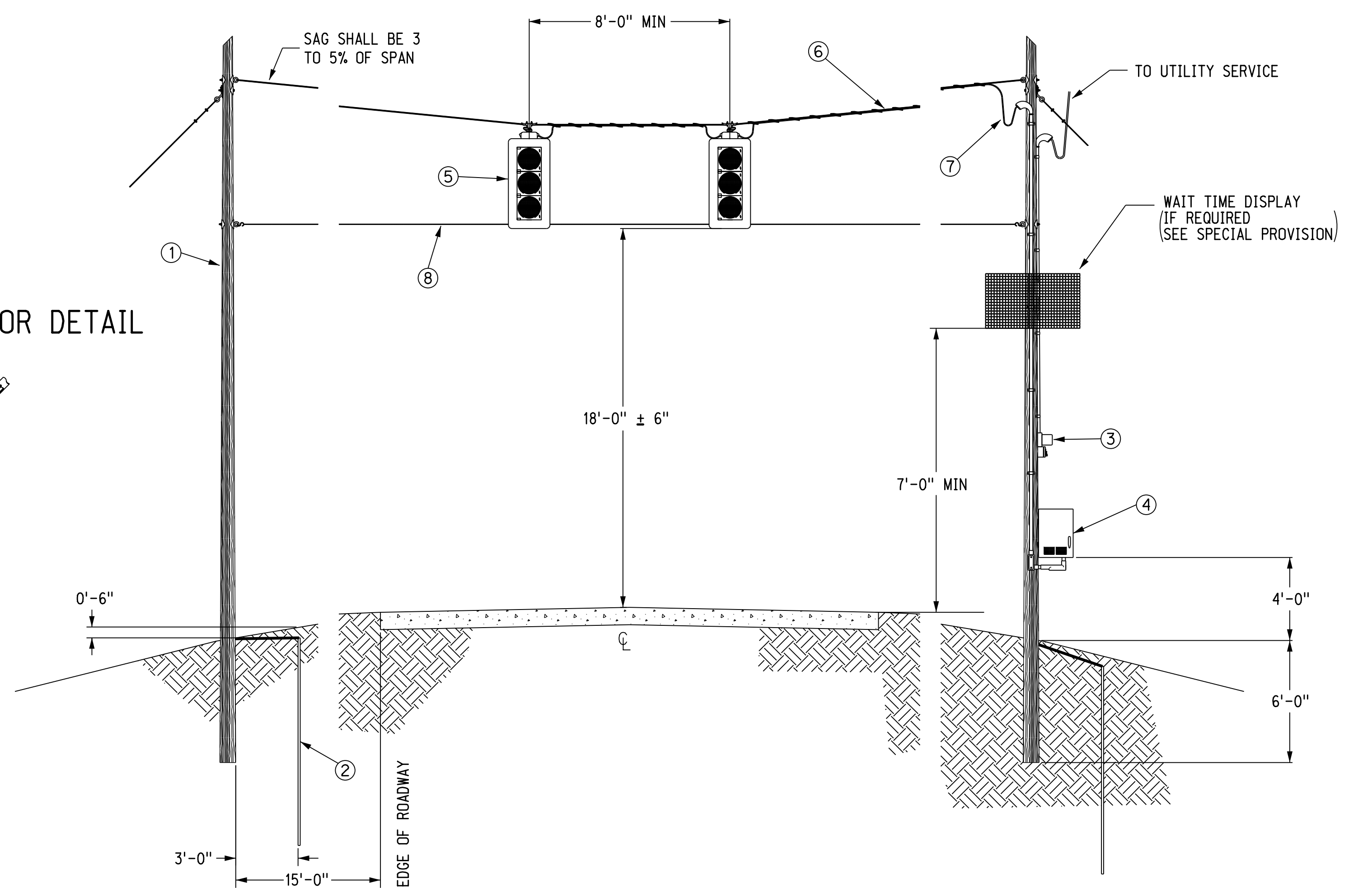
1. THE CONTRACTOR SHALL FURNISH REFLECTORS, VERTICAL PANELS AND A BRACKET TO SUPPORT THEM IN A STABLE POSITION ON THE CONCRETE BARRIERS. THE BRACKET SHALL BE CONSTRUCTED OF MATERIAL THAT MAY BEND, BUT NOT COME LOOSE IF STRUCK BY A PASSING VEHICLE.
2. CONCRETE PROTECTION BARRIERS SHOULD EXTEND TO EDGE OF PAVEMENT. NO EQUIPMENT OR CONSTRUCTION MATERIAL IS TO BE PLACED IN FRONT OF THE PROTECTION BARRIERS AT ANY TIME. IF BARRIERS ARE REQUIRED TO BE MOVED FOR WORK ACCESS THEY SHALL BE REPOSITIONED BACK EACH NIGHT. AT NO TIME WILL A BLUNT END OF THE BARRIER BE ALLOWED IN THE TRAVEL LANE OF APPROACHING TRAFFIC.
3. REFLECTORS USED FOR WORK ZONE TRAFFIC CONTROL SHALL BE SUBSIDIARY TO OTHER TRAFFIC CONTROL DEVICES.
4. MINIMUM WIDTH OF TRAVELED LANE SHALL BE DETERMINED BY THE ENGINEER.
5. TYPE "A" LIGHTS WILL BE USED WHEN OTHER ADVANCE CONSTRUCTION SIGNS ARE ON THE PROJECT.
6. SIGNS R41-17B-48, W20-1F-48 AND W40-9F-48 ARE NOT REQUIRED IF INSTALLED ON THE PROJECT IN ADVANCE OF THIS WORK SITE.
7. INSTALL WHEN LANE WIDTH ACROSS IS LESS THAN APPROACH LANE WIDTH.
8. CONTACT NEBRASKA DOT TRAFFIC ENGINEERING DIVISION FOR SIGNAL TIMING INFORMATION.



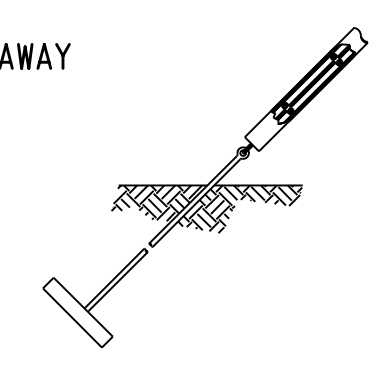
PEDESTAL POLE INSTALLATION



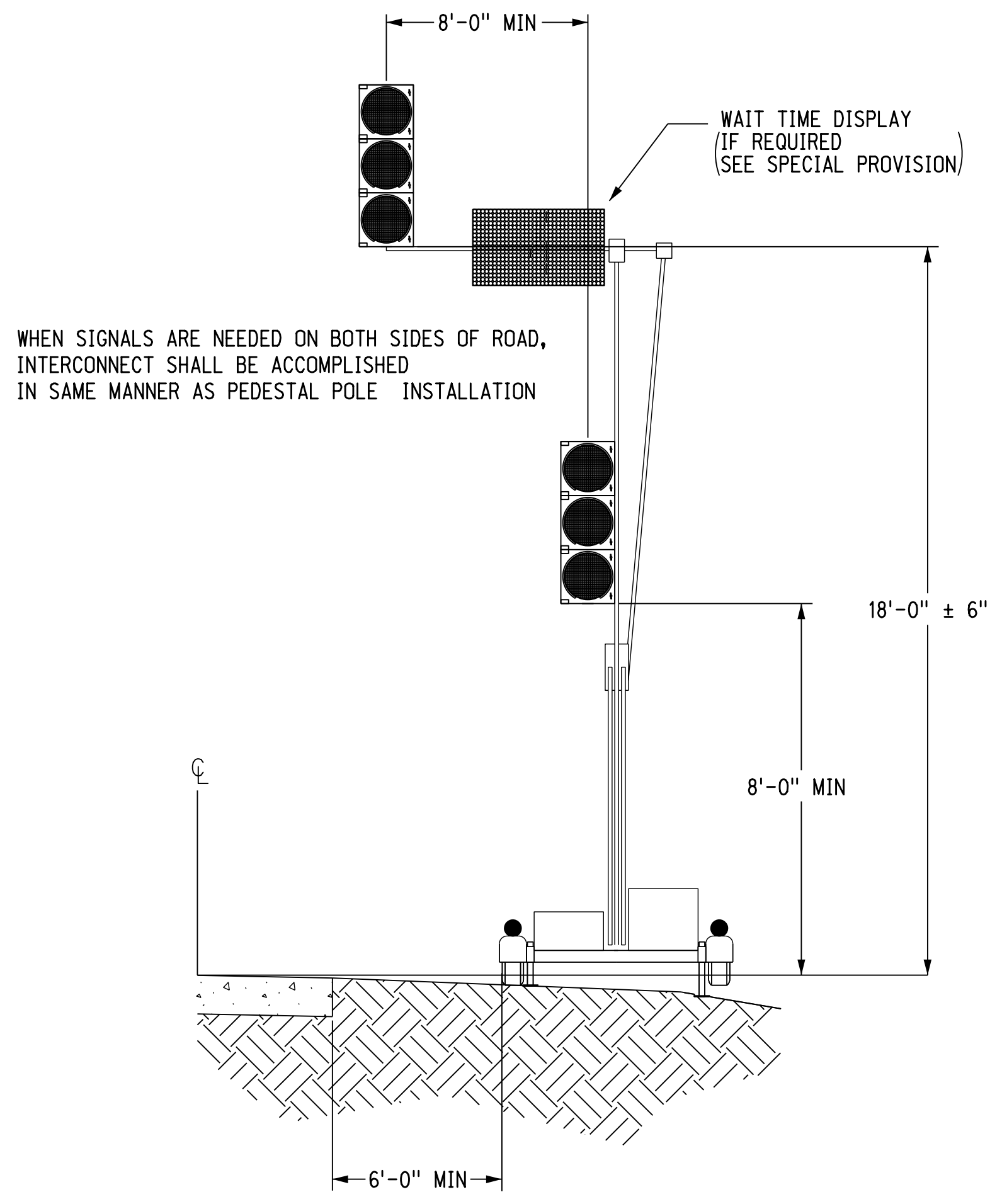
SPAN WIRE INSTALLATION



GUY WIRE ANCHOR DETAIL



PORTABLE SIGNAL



NOTES

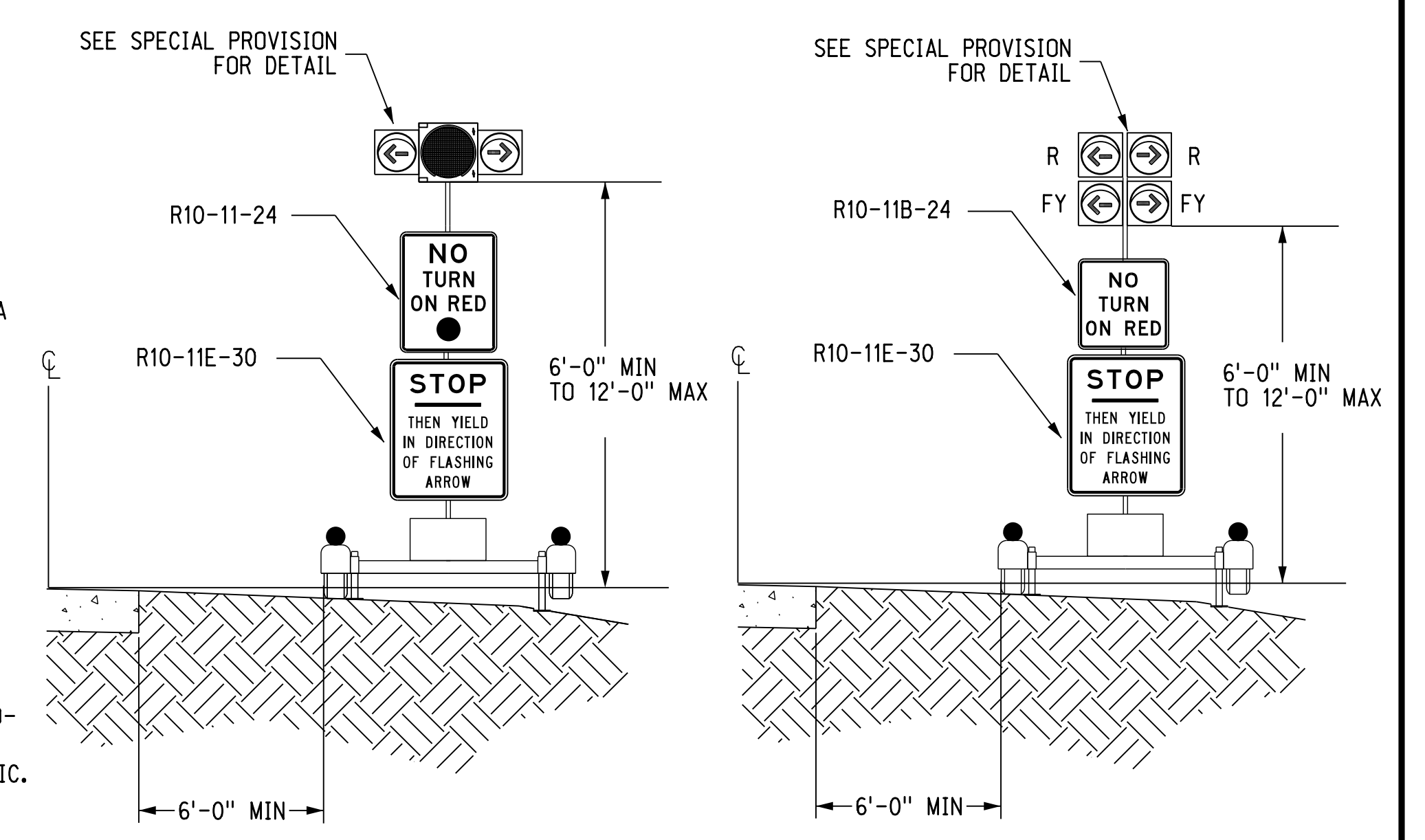
1. THE LOCATIONS OF ALL AERIAL AND UNDERGROUND UTILITY FACILITIES MAY NOT BE INDICATED IN THESE PLANS, UNDERGROUND UTILITIES, WHETHER INDICATED OR NOT WILL BE LOCATED AND FLAGGED BY THE UTILITIES AT THE REQUEST OF THE CONTRACTOR. NO EXCAVATION WILL BE PERMITTED IN THE AREA OF UNDERGROUND UTILITY FACILITIES UNTIL ALL SUCH FACILITIES HAVE BEEN LOCATED AND IDENTIFIED TO THE SATISFACTION OF ALL PARTIES. THE EXCAVATION MUST BE ACCOMPLISHED WITH EXTREME CARE IN ORDER TO AVOID ANY POSSIBILITY OF DAMAGE TO THE UTILITY FACILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL AERIAL AND UNDERGROUND UTILITIES AND CONSTRUCTIONS.
2. THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT AND MATERIAL REQUIRED FOR THE TEMPORARY SIGNAL UNLESS OTHERWISE SPECIFIED. ALL EQUIPMENT AND MATERIAL FURNISHED BY THE CONTRACTOR SHALL REMAIN HIS PROPERTY.
3. ANY STATE SUPPLIED EQUIPMENT OR MATERIAL SHALL REMAIN THE PROPERTY OF THE STATE OF NEBRASKA.
4. THE SIGNAL HEAD LENSES SHALL BE A MINIMUM OF 12 INCHES IN DIAMETER.
5. ALL SIGNAL LAMPS SHALL BE EXTENDED ANGLE LED.
6. MAINTENANCE OF THE TEMPORARY SIGNAL SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.
7. TRAFFIC SIGNALS POWERED BY MEANS OF A PORTABLE GENERATOR SHALL HAVE STANDBY BATTERY POWER CAPABLE OF OPERATING THE SIGNAL NOT LESS THAN 26 HOURS. PORTABLE TRAFFIC SIGNALS SHALL BE CHECKED EVERY 24 HOURS TO INSURE PROPER OPERATION.
8. SIGNAL POLE LOCATIONS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER UNLESS THE EXACT PLACEMENT IS NOTED IN THE PLANS.
9. THE TIMING OF THE SIGNAL CYCLE SHALL BE DETERMINED BY THE NDOT TRAFFIC ENGINEERING DIVISION. FOR THE SPECIFIC INSTALLATION, CALL TRAFFIC ENGINEERING DIVISION AT 402-479-4594. HAVE THE FOLLOWING INFORMATION READY WHEN YOU CALL. PROJECT NAME, CONTROL NUMBER, DISTANCE BETWEEN STOP BARS, NUMBER OF SIDE STREET SIGNALS AND ADT FOR HIGHWAYS. TIMING SHOULD BE REQUESTED ONE WEEK PRIOR TO INSTALLATION TO AVOID UNEXPECTED PROJECT DELAYS.
10. THE SIGNAL SHALL BE PLACED INTO FLASHING AMBER OPERATOR FOR BOTH DIRECTIONS DURING PERIODS WHEN THE BRIDGE IS OPEN TO TWO-WAY TRAFFIC. UNDER NO CIRCUMSTANCES SHALL AN INOPERATIVE TRAFFIC SIGNAL BE LEFT UNCOVERED ON AN OPEN ROAD TO THE PUBLIC.
11. INSTALLATION OF THE TEMPORARY SIGNAL SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRIC CODE (LATEST EDITION), THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, ALL LOCAL ORDINANCES AND REGULATIONS, THE SPECIFICATIONS AND THE PROJECT PLANS.
12. THE TRAFFIC SIGNAL SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE ITEM "TEMPORARY TRAFFIC SIGNAL" OR "TEMPORARY TRAFFIC SIGNAL WITH WAIT TIME DISPLAY". THIS PRICE SHALL BE FULL COMPENSATION FOR FURNISHING, INSTALLING, MAINTAINING AND REMOVING THE COMPLETE TEMPORARY SIGNAL.
13. SEE SIGNING STANDARD FOR REQUIRED SIGNING TO ACCOMPANY SIGNAL.
14. WHEN REQUIRED, THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT AND MATERIAL REQUIRED FOR VEHICLE DETECTION ON ALL APPROACHES.

ITEM NO.	DESCRIPTION
1	CLASS IV BUTT TREATED WOOD POLE W/DOWN GUYS
2	5/8" X 10' COPPERWELD GROUND ROD
3	METER SOCKET (IF REQ'D BY UTILITY)
4	CONTROLLER CABINET *
5	TRAFFIC SIGNAL W/BACKPLATE
6	3/8" HIGH STRENGTH 7 STRAND WIRE ROPE
7	600 VOLT NO. 12 AWG 5/C TRAFFIC SIGNAL CABLE
8	1/4" SIEMANS MARTIN 7 STRAND WIRE ROPE

* CONTRACTOR SHALL FURNISH A SOLID STATE DIGITAL CONTROLLER WITH A PROGRAMMING MANUAL.

SIGNAL	APPROXIMATE LOCATION OF TEMP TRAFFIC SIGNAL
1	APPROX STA 3445+00 -- PHASED BRIDGE REPAIRS
2	
3	
4	
5	

DRIVEWAY ASSISTANCE DEVICE



May 9 2019

NEBRASKA DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING DIVISION

TYPICAL TRAFFIC SIGNAL CONTROL PLAN

DESIGNED	TJF	TEMPORARY TRAFFIC SIGNAL	
REVIEWED		DETAILS	1/1
APPROVED		DATE DRAWN	05/19
		TRAFFIC ENGINEER	DATE

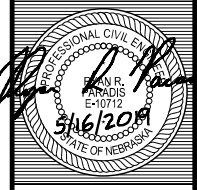
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 TRAFFIC ENGINEERING DIVISION



BRIDGE ENGINEER

LOCATION HOLT/BOYD COUNTY LINE NIobrARA RIVER BRIDGE 7441'-0" 7-SPAN STEEL WELDED PLATE GIRDER BRIDGE - REPAIR
 COUNTY BOYD & HOLT HWY. NO. N-11 SKEW 30° ROADWAY 28'-0" DESIGN LIVE LOAD H20-44
 REF. POST. 176.45 STA. 3444+27.00
 DETAILED BY TMS CHECKED BY RRB DATE MAY 2019
 NOTES, QUANTITIES & INDEX
 NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
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DEPARTMENT OF TRANSPORTATION



- HOLT / BOYD COUNTY LINE NIOBRARA RIVER BRIDGE -

- NOTES -

- QUANTITIES -

GROUP 6	
PREPARATION OF BRIDGE AT STA. 3444+27.00	1 EA
ABUTMENT NO. 2 EXCAVATION	1 LS
CLASS 47BD-4000 CONCRETE FOR BRIDGE	58.6 CY
SLAB	40.9 CY
HAUNCHES	1.8 CY
CONCRETE RAILS	15.9 CY
CLASS 47B-3000 CONCRETE FOR BRIDGE	10.6 CY
ABUTMENTS	1.8 CY
PIERS	8.8 CY
REINFORCING STEEL FOR BRIDGE	10,192 LB
ABUTMENTS	17 LB
PIERS	1,513 LB
SLAB	3,012 LB
CONCRETE RAILS	5,650 LB
STRUCTURAL STEEL FOR SUPERSTRUCTURE	50,200 LB
STRUCTURAL STEEL FOR SUBSTRUCTURE	510 LB
EXPANSION BEARING, PTFE TYPE	16 EA
REPLACING DECK JOINT SEALS	35 LF
TEMPORARY BRIDGE SHORING	1 LS
JACK AND RESET BRIDGE SUPERSTRUCTURE	1 LS
ACCESS CROSSING	1 LS

- INDEX -

NOTES, QUANTITIES & INDEX	1
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PHASING DETAILS	3
REMOVAL DETAILS	4
ABUTMENT REPAIR DETAILS	5
PIER REPAIR DETAILS (1 OF 2)	6
PIER REPAIR DETAILS (2 OF 2)	7
SUPERSTRUCTURE JACKING DETAILS	8
GIRDER LAYOUT	9
GIRDER REPLACEMENT DETAILS (1 OF 2)	10
GIRDER REPLACEMENT DETAILS (2 OF 2)	11
BEARING REPAACEMENT DETAILS	12
DECK REPLACEMENT DETAILS	13
BRIDGE DECK SEAL REPAIR DETAILS	14
CONCRETE BARRIER RAIL REPAIR DETAILS	15
BILL OF BARS & BENDING DIAGRAMS	16

BRIDGE DIVISION.

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The existing structure was built under project Butte South, dated June 1982. Plans are available from the Bridge Division upon request.

The Contractor shall coordinate Traffic Control with the District 8 Engineer before start of work.

The locations of all aerial and underground utility facilities may not be indicated in these plans and shall be the responsibility of the Contractor to locate if he deems necessary to conduct his operations. Underground utilities, whether indicated or not, will be located and flagged by the utilities at the request of the Contractor.

No excavation will be permitted in the area of underground utility facilities until all such facilities have been located and identified to the satisfaction of all parties. The excavation must be accomplished with extreme care in order to avoid any possibility of damage to the utilities facility.

The State does not guarantee that these repair plans or the As-Built Plans depict the actual site conditions and shall not be liable for any discrepancies.

Actual field conditions may require more or less repair than what is depicted in the plans. The final areas to be repaired shall be determined by the Engineer. The Bridge Office shall be notified when the field conditions impede the implementation of these plans or vary significantly from what is shown.

Before ordering any materials, the Contractor shall make a detailed field inspection of the structure verifying all dimensions and reporting to the Engineer any discrepancies between the field measurements and those shown on the plans.

Damage to existing structures, consequent to the Contractor's operations, shall be repaired at the Contractor's expense, under the direction of the Engineer.

The Contractor shall take all necessary precautions, during construction, to prevent debris from falling in the channel.

All materials removed shall become the property of the Contractor and shall be removed from the project site.

All dimensions shown are in horizontal plane only. No allowances have been made for vertical curve or roadway cross slope.

Dimensions and stations shown are obtained from the As-Built Plans.

The As-Built Plans were based on NGVD 1929 datum. All elevations shown in these plans have been changed by +0.88 feet to account for the datum adjustment from NGVD 1929 to NAVD 1988.

Match existing grade profile.

The Contractor shall place a 1" deep saw cut at the limits of the removal to facilitate a clean, smooth line when breaking back existing concrete.

When breaking existing concrete, the use of a 15 lb. maximum hammer applied at a 45° angle is required to chip along the edges of removal, and a 30 lb. maximum hammer applied at a 45° angle is required for all other concrete removal.

All reinforcing steel encountered in breaking back concrete shall be cleaned, straightened to its original shape, and incorporated into the new work.

Field bend and/or clip existing reinforcing bars to maintain minimum clearance.

All existing concrete surfaces to be in contact with the new construction shall be thoroughly roughened and cleaned before placing any new concrete.

Chamfer all exposed edges of concrete.

All new reinforcing steel shall conform to the requirements of ASTM A615/A615M, Grade 60 steel.

The minimum clearance, measured from the face of the concrete to the surface of any reinforcing bar shall be 2", except where otherwise noted.

Concrete for slab, turndowns and rails shall be Class "47BD", with a 28-day strength of 4,000 psi.

All other cast-in-place concrete shall be Class "47B" concrete, with a 28-day strength of 3,000 psi.

All new structural steel shall conform to the requirements of ASTM A709/A709M, Grade 36 or 50, and shall be shop primed unless noted otherwise.

All field welding shall be performed by a certified welder using the shielded metal arc welding (SMAW) process and E8018 Electrodes.

Field tack welding of form hangers or miscellaneous hardware to any part of the steel girders shall be prohibited.

All new bolts shall conform to the requirements of ASTM A325 with threads excluded from the shear plane.

All new structural steel shall be painted in accordance with Nebraska Standard Specifications for Highway Construction using paint from the NDOT Approved Products list. The color and gloss of finish coat shall be a near match to the existing green color. The cost of painting shall be considered subsidiary to the item "STRUCTURAL STEEL FOR SUPERSTRUCTURE".

No construction materials or vehicles may be stored on the bridge.

No equipment or material is allowed on the bridge deck prior to the superstructure being relocated to its original position and supported on its bearings.

Scrape samples of paint were taken from the existing structure located at Station 3444+27.00, and were analyzed for the presence of toxic metals. Analysis of the samples shows that the existing paint contains the metals lead and chromium, and may also contain other toxic metals. Analysis indicates a concentration of 260 PPM (parts per million) total lead and 10760 PPM total chromium.

Removal of paint containing hazardous metals at the levels indicated by this analysis could create exposure conditions above regulatory limits for health and safety requirements.

Any test results provided by the Department are for bidding purposes only. The Contractor is required to conduct their own monitoring at project start-up, and adjust worker protection and work practices according to the results.

The item "STRUCTURAL STEEL FOR SUPERSTRUCTURE" includes the replacement of Girder A between the field splices in Span 3; the replacement of Girder A and Girder D from the field splice in Span 6 to Pier No. 6; the replacement of Girder A from Pier No. 6 to Abutment No. 2 in Span 7; and the replacement of the diaphragms at Pier No. 6.

The item "STRUCTURAL STEEL FOR SUBSTRUCTURE" includes the anchor bolts, nuts and washers at Girder A of Abutment No. 2; the angles and shear studs used in the restraint blocks at Pier Nos. 4-6; and the masonry plate and shear studs used at the pedestal repair at Girder B of Pier No. 5.

Shop plans required for review:
Superstructure Steel
Substructure Steel
Bearing Devices

Other submittals required for review:
Proposed Superstructure Jacking Procedures
Girder Heat Straightening Procedures

Shop plans required for record:
Temporary Bridge Shoring

BRIDGE DIVISION.

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PROJECT NUMBER	SHEET NO.
ER-11-4(120)	S2

C.N. 81038

STRUCTURE NUMBER

S011 17645



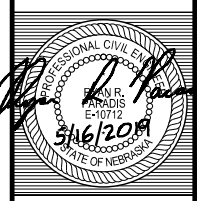
BRIDGE ENGINEER

HOLT/BOYD COUNTY LINE
NIORARA RIVER BRIDGE
744'-0" 7-SPAN STEEL WELDED
PLATE GIRDER BRIDGE - REPAIR
PLAN & ELEVATION
DATE MAY 2019

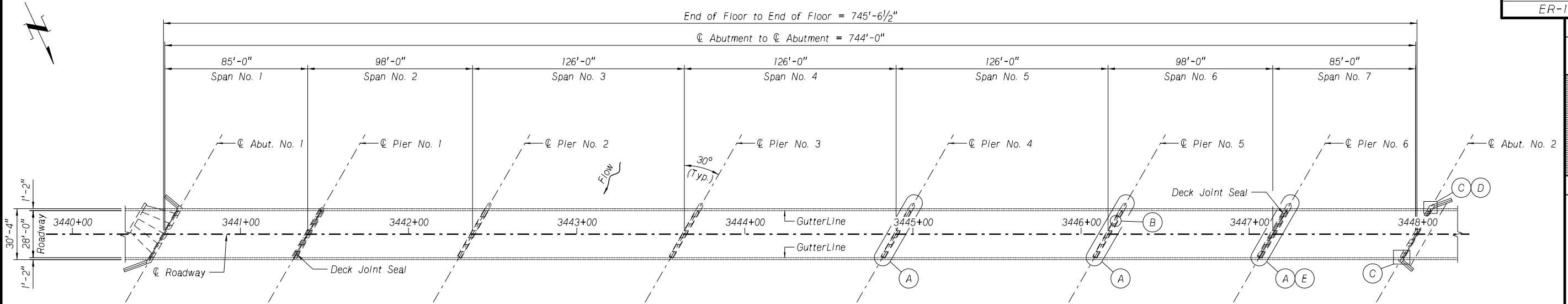
CHECKED BY RRB
DESIGNED BY RRP
H20-44

COUNTY BOYD & HOLT
HWY. NO. N-11
REF. POST. 176.45
STA. 3444+27.00

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SPECIAL PLAN NO.	2
1	16

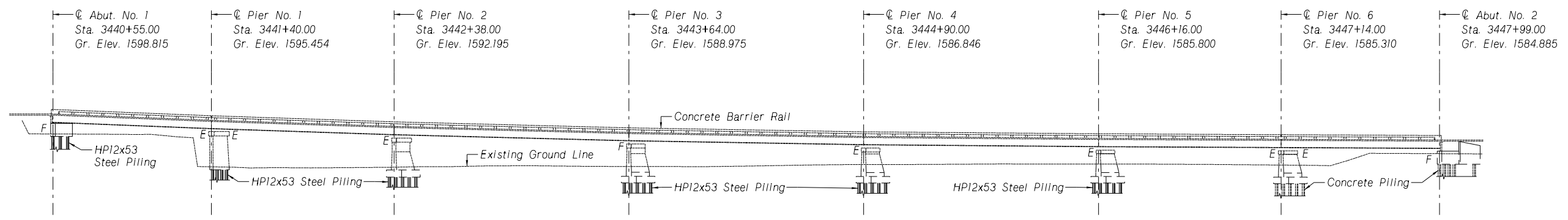


PLAN
Not to Scale

REFERENCE NOTES:

- (A) Install restraint blocks and bearing replacement, see "Pier Repair Details" and "Bearing Replacement Details" sheets.
- (B) Pedestal repair at Girder B, see "Pier Repair Details (2 of 2)" sheet.
- (C) Barrier rail buttress repair, see "Concrete Barrier Rail Repair Details" sheet.
- (D) Abutment cap and turndown repair, see "Abutment Repair Details" sheet.
- (E) Deck joint seal replacement, see "Deck Seal Repair Details" sheet.

For repair details of superstructure steel, see "Girder Replacement Details" sheets.



ELEVATION
Not to Scale

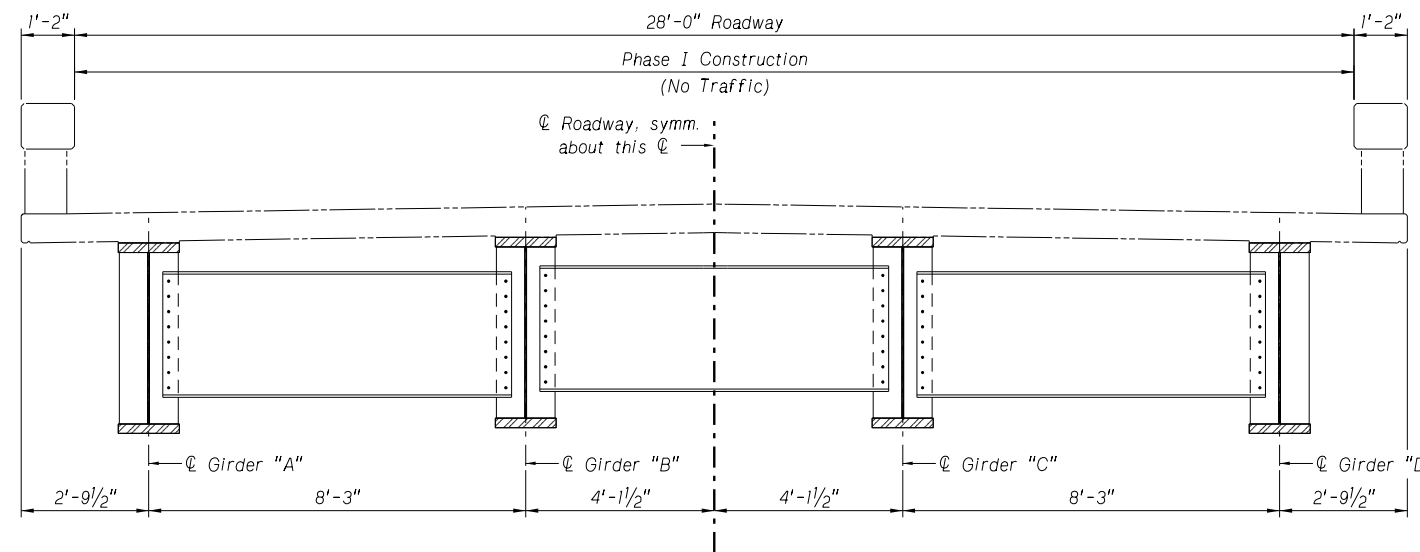
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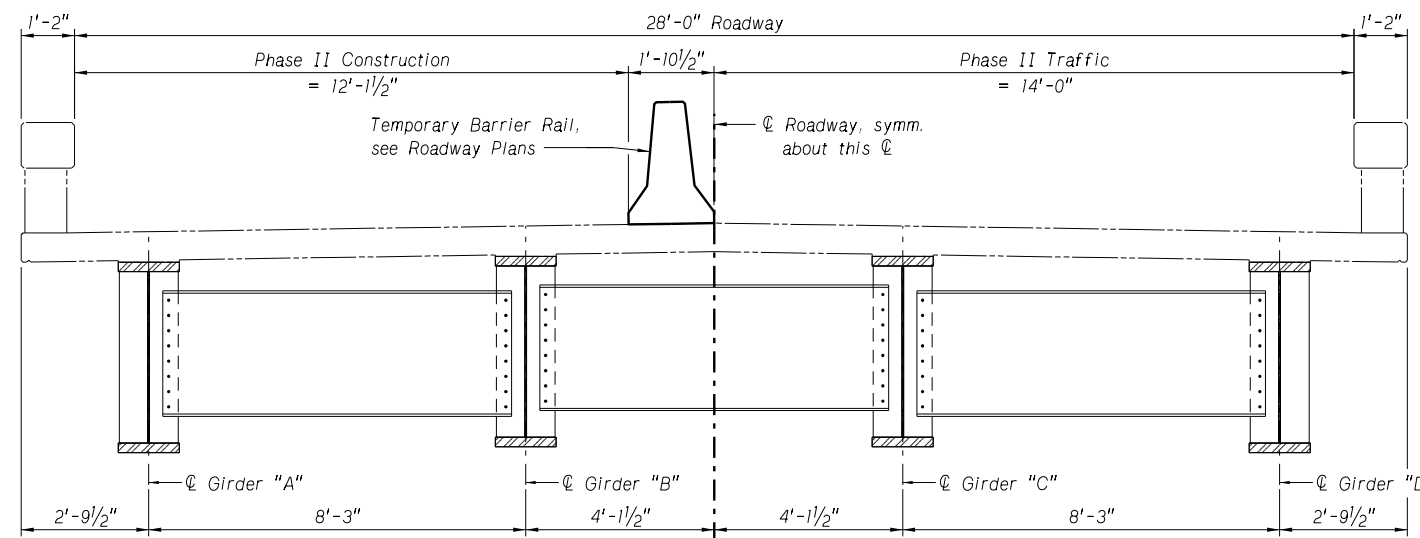
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TYPICAL SECTION SHOWING PHASE I CONSTRUCTION

Not to Scale



TYPICAL SECTION SHOWING PHASE II CONSTRUCTION

Not to Scale

PROJECT NUMBER	SHEET NO.
ER-11-4(120)	S3

C.N. 81038

STRUCTURE NUMBER

S011 17645



BRIDGE ENGINEER

DATE MAY 2019

CHECKED BY ATN

DESIGNED BY RRP

STATION 3444+27.00

REF. POST. 176.45

HWY. NO. N-11

LOCATION HOLT/BOYD COUNTY LINE

SKEW 30°

ROADWAY 28'-0"

DESIGN LIVE LOAD H20-44

DETAILED BY TMS

CHECKED BY ATN

DATE MAY 2019

PHASING DETAILS

PLATE GIRDER BRIDGE - REPAIR

7441-0" 7-SPAN STEEL WELDED

HOLT/BOYD COUNTY LINE

NIOBRARA RIVER BRIDGE

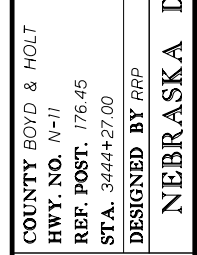
BRIDGE DIVISION

DEPARTMENT OF TRANSPORTATION

NEBRASKA

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SPECIAL PLAN NO.

3

1

16

PHASE I

- Construct causeway, see Roadway plans for details and payment.
- Utilizing the causeway, remove debris from the bridge deck and from around the bearing devices. Remove damaged utility conduit from under the bridge leaving the conduit hangers in place. Payment is included in the bid item "PREPARATION OF BRIDGE AT STA. 3444+27.00".
- Raise the superstructure vertically and move it laterally to return the bridge to its original horizontal alignment. Once the bridge is returned to its original horizontal alignment, and the girders are blocked at the jacking locations, the girder alignment shall be reviewed by the Engineer for tolerances and verification of girder repair locations. Payment is included in the bid item "JACK AND RESET BRIDGE SUPERSTRUCTURE".
- Remove the existing bearings except for the masonry plates as shown on "Removal Details" sheet. Payment is included in the bid item "PREPARATION OF BRIDGE AT STA. 3444+27.00".
- Replace Girder D between Pier Nos. 5 and 6 as shown on "Girder Layout" sheet and reconnect to existing and replacement diaphragms. Repair any additional items noted to Girders B thru D from the post jacking inspection. Payment is subsidiary to the bid item "STRUCTURAL STEEL FOR SUPERSTRUCTURE".
- Repair the deck and concrete barrier rail in the locations of the girder replacements as shown on the "Deck Replacement Details" and "Concrete Barrier Rail Repair Details" sheets. Repair the concrete pedestal at Pier No. 5, Girder B as shown on "Pier Repair Details" sheets.
- Replace the bearings at Pier Nos. 4-6 as shown on "Bearing Replacement Details" sheet. Release the jacks and blocking, setting the bridge on the new bearings. Payment for bearings is included in the bid item "EXPANSION BEARING, PTFE TYPE."
- Replace concrete barrier rail buttress on right (downstream) side of Abutment No. 2.

PHASE II

- Open the bridge to one lane of traffic as shown in the "Typical Section Showing Phase II Construction" on this sheet. Refer to the Traffic Control Details in the Roadway Plans for more information.
- The following items can occur simultaneously or in an order determined by the Contractor.
 - Excavate Abutment No. 2 at Girder A to facilitate the repair of Girder A and the repair of the Abutment No. 2 turnout and cap. Refer to the "Girder Layout" and the "Abutment Repair Details" sheets.
 - Replace the remaining Girder A locations shown on the "Girder Layout" sheet. Repair the deck and concrete barrier rail in locations of girder replacement.
 - Replace the remaining diaphragms at Pier No. 6 as shown on the "Girder Layout" sheet.
 - Replace concrete barrier rail buttress on left (upstream) side of Abutment No. 2.
 - Construct the restraint blocks as shown on "Pier Repair Details" sheets.
 - If restraint blocks are not in place prior to opening the bridge to one lane of traffic, the Contractor shall provide temporary bracing to resist any transverse loads anticipated during construction. Payment is subsidiary to the bid item "JACK AND RESET BRIDGE SUPERSTRUCTURE".
- Remove traffic control, refer to the Traffic Control Details in the Roadway Plans for more information.
- The following items shall be done one lane at a time utilizing flaggers.
 - Remove the expansion joint gland at Pier No. 6. Payment is included in the bid item "PREPARATION OF BRIDGE AT STA. 3444+27.00".
 - Replace the expansion joint gland at Pier No. 6. Payment is included in the bid item "REPLACING DECK JOINT SEALS".
- Open Bridge to traffic.



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BRIDGE DIVISION



TYPICAL SUPERSTRUCTURE DEBRIS REMOVAL



TYPICAL BEARING DEBRIS REMOVAL



TYPICAL BEARING REMOVAL



TYPICAL CONDUIT REMOVAL

REMOVAL NOTES:

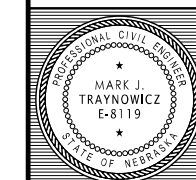
All flood related debris shall be removed from the bridge. This includes tree limbs, branches and mud on the superstructure, as well as tree limbs, branches, wire rope, cables, etc. around the bearings and diaphragms. Exposed areas of the bearings shall be cleaned of all foreign material.

All bearings at Pier Nos. 4-6 shall be removed. Bearing removal includes removal of the sole plate and pot bearing only, as part of the item "PREPARATION OF BRIDGE AT STATION 3444+27.00". Masonry plates and anchor bolts are to remain in place. After removal of the sole plate and pot bearing, any remaining weld on the girder flange or masonry plate, respectively, shall be ground flush with surface of the existing material.

Utility conduit shall be removed. Conduit hangers are to remain in place.

PROJECT NUMBER	SHEET NO.
ER-11-4(120)	S4

C.N. 81038
 STRUCTURE NUMBER
 S011 17645

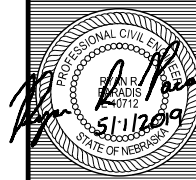


BRIDGE ENGINEER

7441-0" 7-SPAN STEEL WELDED
 PLATE GIRDER BRIDGE - REPAIR
 REMOVAL DETAILS
 DATE MAY 2019

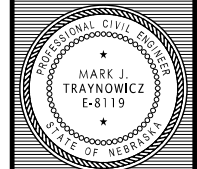
LOCATION HOLT/BOYD COUNTY LINE
 NIobrara RIVER BRIDGE
 SKEW 30°
 ROADWAY 28'-0"
 DESIGN LIVE LOAD H20-44
 COUNTY BOYD & HOLT
 HWY. NO. N-11
 REF. POST. 176.45
 STA. 3444+27.00
 DESIGNED BY RRP
 CHECKED BY RRB
 TMS

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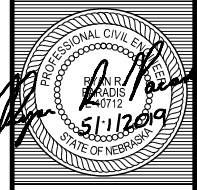
SPECIAL PLAN NO.	4
1	16





LOCATION HOLT/BOYD COUNTY LINE 7441'-0" 7-SPAN STEEL WELDED PLATE GIRDER BRIDGE
 COUNTY BOYD & HOLT HWY. NO. N-11
 ROADWAY 281'-0"
 DESIGN LIVE LOAD H20-44
 DETAILED BY TMS
 CHECKED BY RRB
 DATE MAY 2019
 NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION
 ABUTMENT REPAIR DETAILS

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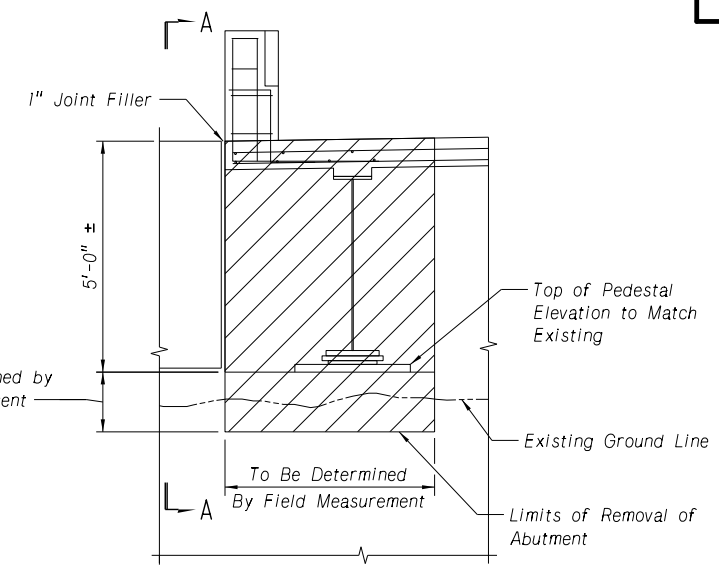
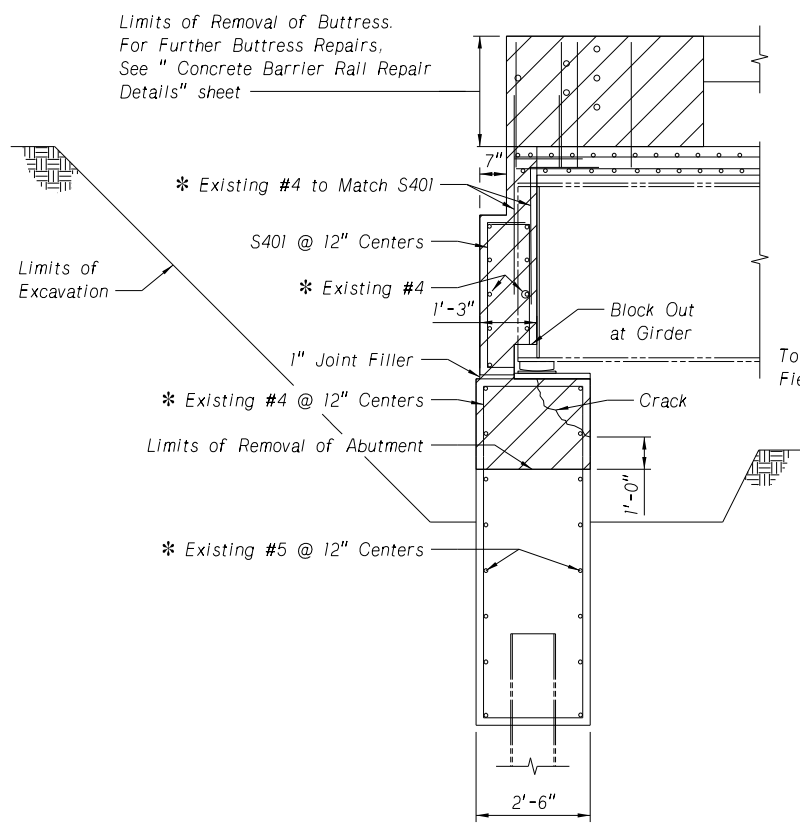
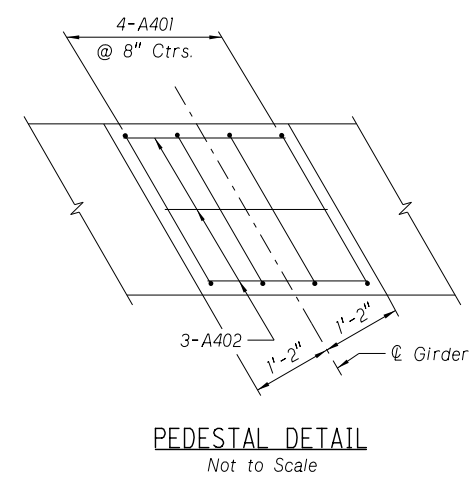
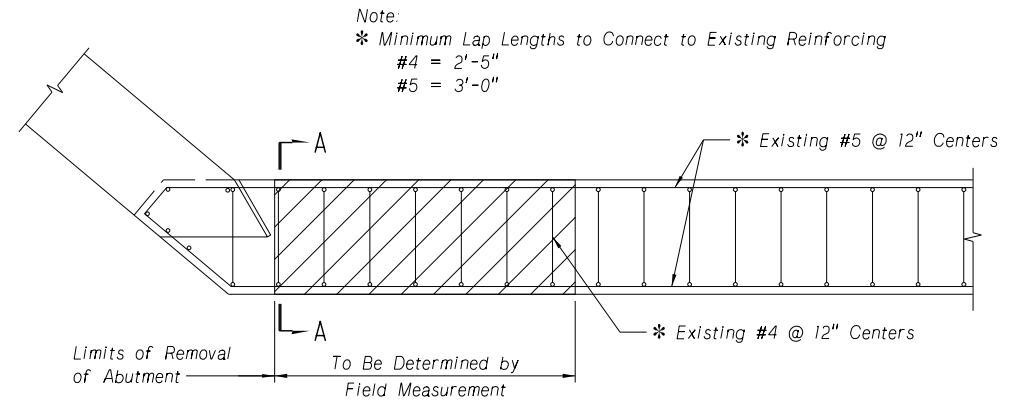
BRIDGE DIVISION.

Computer: OME-2UA7181PFW

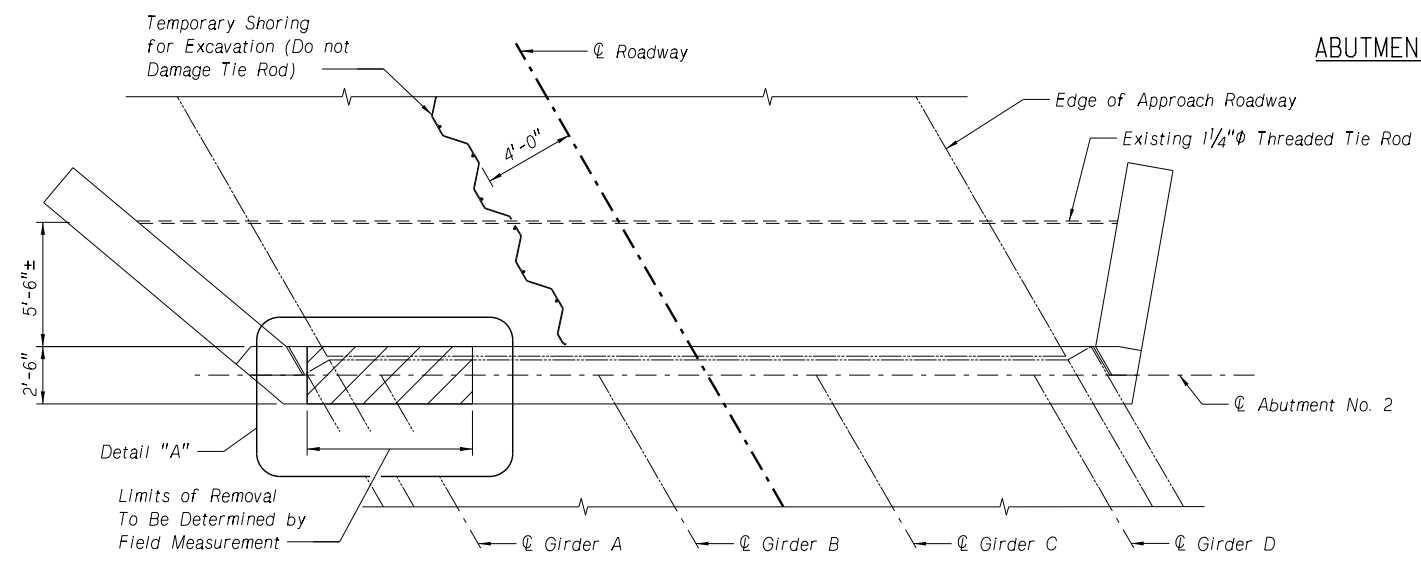
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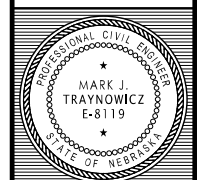
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ABUTMENT REPAIR NOTES:
 Provide temporary shoring and remove a portion of the approach roadway and shoulder of the southbound lanes to effectively excavate to an elevation necessary to complete the removal and reconstruction of damaged abutment pile cap concrete.
 Provide temporary support to Girder A at Abutment No. 2 (Subsidiary to "TEMPORARY BRIDGE SHORING").
 Existing #4 and #5 vertical and horizontal reinforcing steel in abutment turndown and cap shall remain and shall be cleaned and incorporated into new construction.
 Care shall be exercised to prevent cutting or otherwise damaging any exposed reinforcing bars. Repairs to damaged reinforcing steel shall be performed at no expense to the Department. Additional concrete removal and replacement necessary to repair damaged bars shall be at no expense to the Department.
 For damaged or broken reinforcing steel, provide mechanical couplers or a minimum lap splice of 2'-5" for #4 bars, and 3'-0" for #5 bars at no cost to the Department.
 Refer to Notes on "Notes, Quantities & Index" sheet for concrete removal requirements.



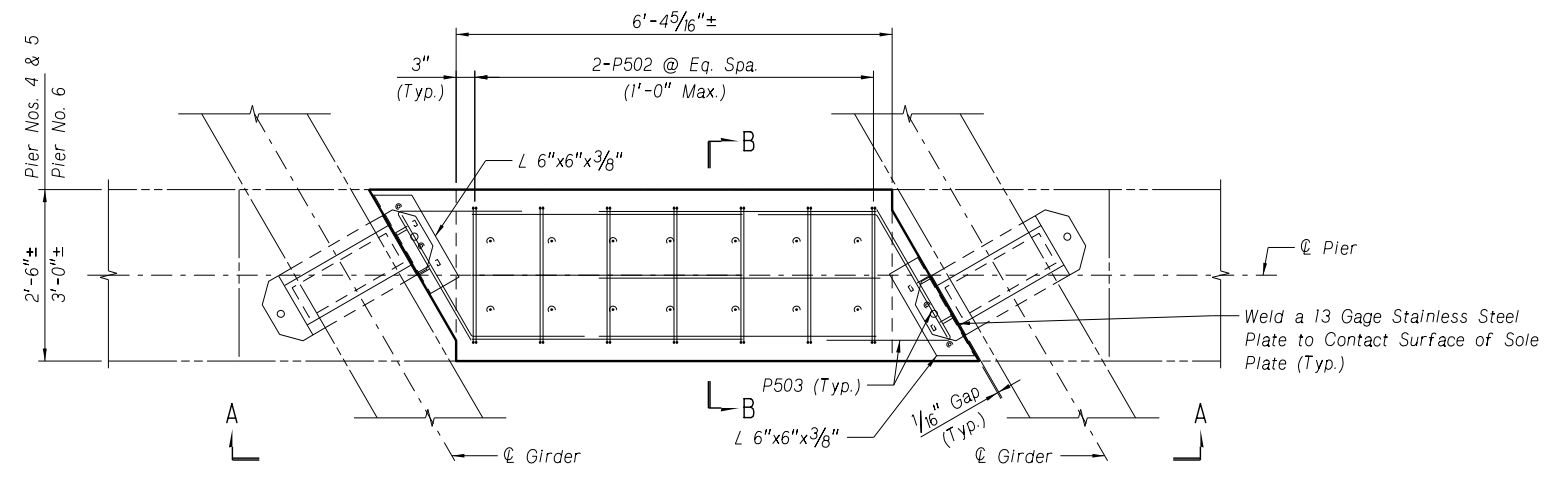
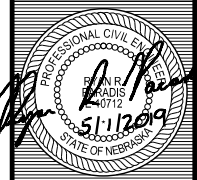
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BRIDGE ENGINEER

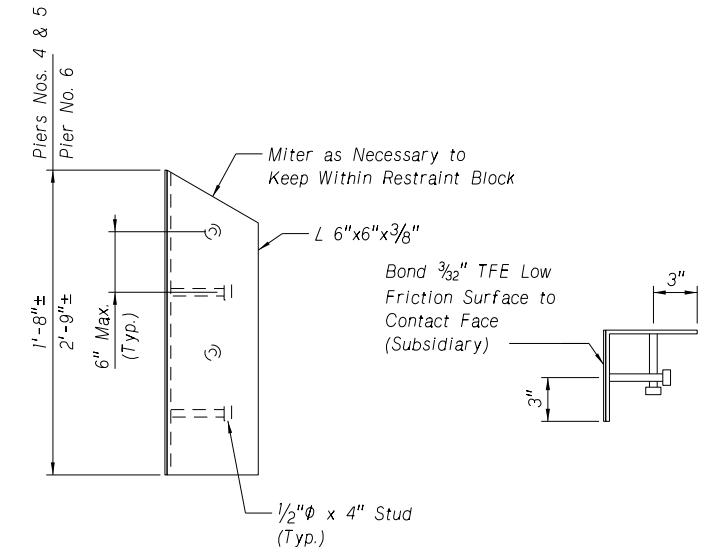
LOCATION HOLT/BOYD COUNTY LINE 7441'-0" 7-SPAN STEEL WELDED
 NIobrara RIVER BRIDGE PLATE GIRDER BRIDGE - REPAIR
 COUNTY BOYD & HOLT HWY. NO. N-11 ROADWAY 281'-0" PIER REPAIR DETAILS (1 OF 2)
 REF. POST. 176.45 DESIGN LIVE LOAD H20-44 CHECKED BY CMZ DATE MAY 2019
 STA. 3444+27.00 DETAILED BY TMS

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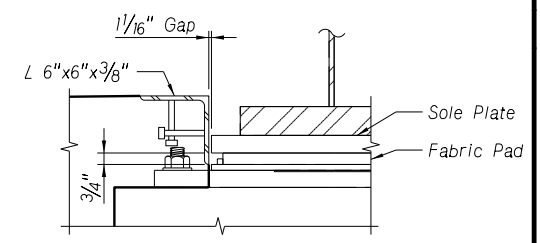


RESTRAINT BLOCK PLAN
Not to Scale

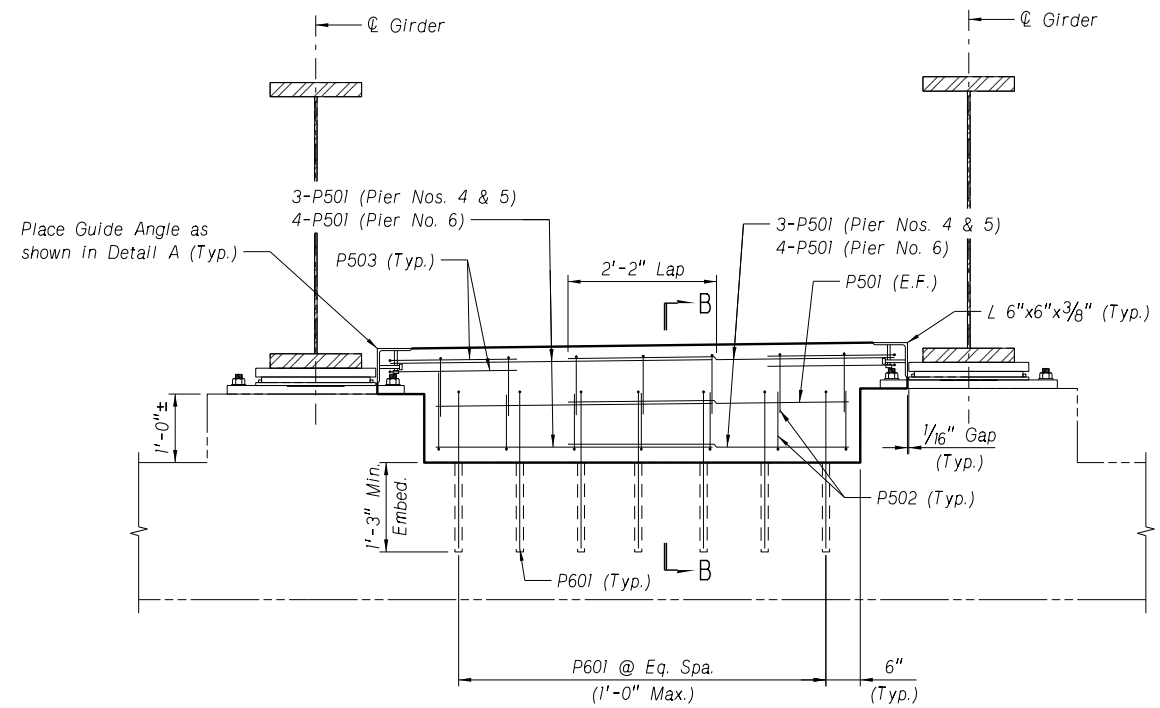
(Pier Nos. 4 & 5 Shown, Pier No. 6 Similar. Provide Restraint Block between Girders A and B and between Girders B and C. Typical Restraint Block shown.)



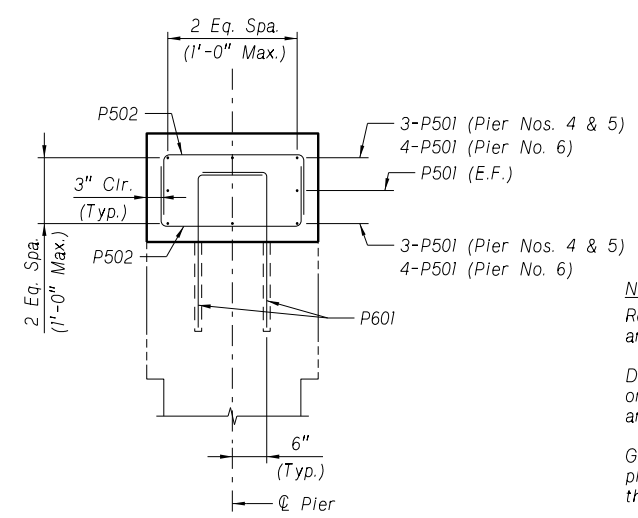
GUIDE ANGLE DETAIL
Not to Scale



DETAIL A
Not to Scale



VIEW A-A
Not to Scale



SECTION B-B
Not to Scale

NOTES:

- Restraint block shall be provided between Girders A & B and Girders B & C at Pier Nos. 4-6.
- Dimensions and reinforcement details shown are based on existing plans and estimated field conditions. All dimensions and details to be field verified by Contractor.
- Guide angles shall be placed relative to the sole plate or sole plates so that there is a minimum of 3" of guide angle beyond the end of all sole plates in the longitudinal direction.
- The stainless steel and TFE shall meet the requirements for bridge bearings.
- Epoxy grout P601 bars into drilled holes in the pier with an NDOT approved epoxy adhesive. (Subsidiary to "REINFORCING STEEL FOR BRIDGE.")
- Bearings shall be in place prior to constructing the restraint blocks.
- If existing anchor bolts interfere with restraint block details, cut anchor bolt level with existing masonry plate.



NOTES:

The concrete of the damaged pedestal at Pier No. 5, Girder B shall be removed to be flush with the pier cap, leaving the existing pedestal reinforcing in place. The replacement pedestal and pier cap repair shall be poured as a unit.

The limits of concrete removal for areas requiring repair shall be as directed by the Engineer.

Refer to Notes on "Notes, Quantities & Index" sheet for concrete removal requirements.

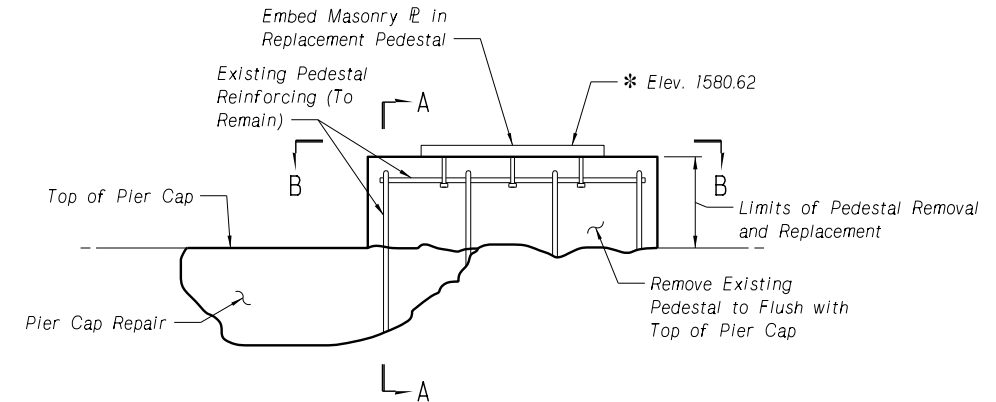
Pier cap concrete removal shall include removal of all unsound concrete and shall proceed to a depth at least 3/4" below the outer layer of reinforcing steel so that the reinforcing steel cage is engaged in the concrete pour for the replacement concrete.

Care shall be exercised to prevent cutting or otherwise damaging any exposed reinforcing bars. Repairs to damaged reinforcing steel shall be performed at no expense to the Department. Additional concrete removal and replacement necessary to repair damaged bars shall be at no expense to the Department.

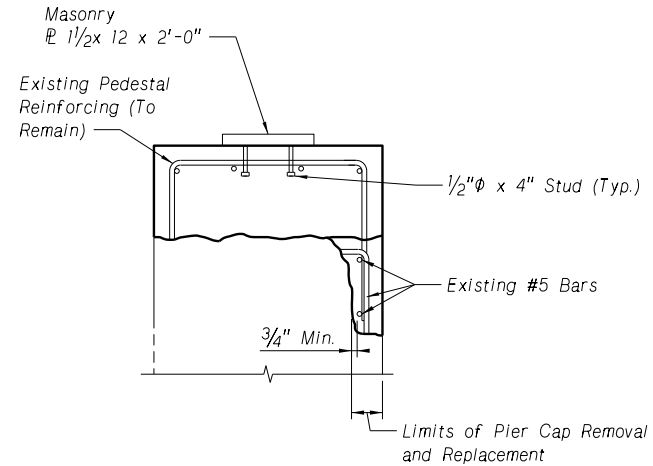
When breaking existing concrete and existing reinforcing steel is encountered that is broken or has section loss due to corrosion greater than 20%, the Contractor shall lap the existing bar with a new bar of the same size a minimum 2'-0". The new bar shall be doweled into the existing pier concrete as necessary to obtain the required lap. This work shall be considered subsidiary to "REINFORCING STEEL FOR BRIDGE".

If required, epoxy grout new bars into the pier with an NDOT approved epoxy adhesive. (Subsidiary to "REINFORCING STEEL FOR BRIDGE").

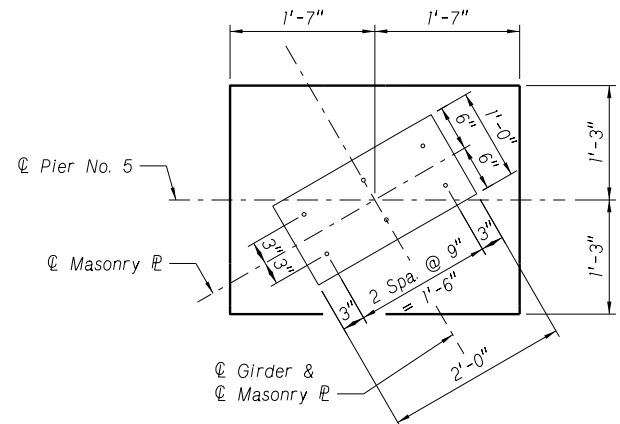
* Elevation is based on proposed bearing details.



PIER NO. 5, GIRDER B PEDESTAL REPAIR
 Not to Scale



SECTION A-A
 Not to Scale



SECTION B-B
 Not to Scale



CONCRETE REPAIR - PIER NO. 5
 NORTH FACE UNDER GIRDER B

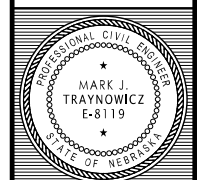
BRIDGE DIVISION.

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BRIDGE ENGINEER

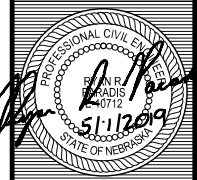
744'-0" 7-SPAN STEEL WELDED PLATE GIRDER BRIDGE - REPAIR
SUPERSTRUCTURE JACKING DETAILS
DATE MAY 2019
CHECKED BY ATN
DESIGNED BY RRP

LOCATION HOLT/BOYD COUNTY LINE
SKEW 30°
ROADWAY 28'-0"
DESIGN LIVE LOAD H20-44

COUNTY BOYD & HOLT
HWY. NO. N-11
REF. POST. 176.45
STA. 3444+27.00

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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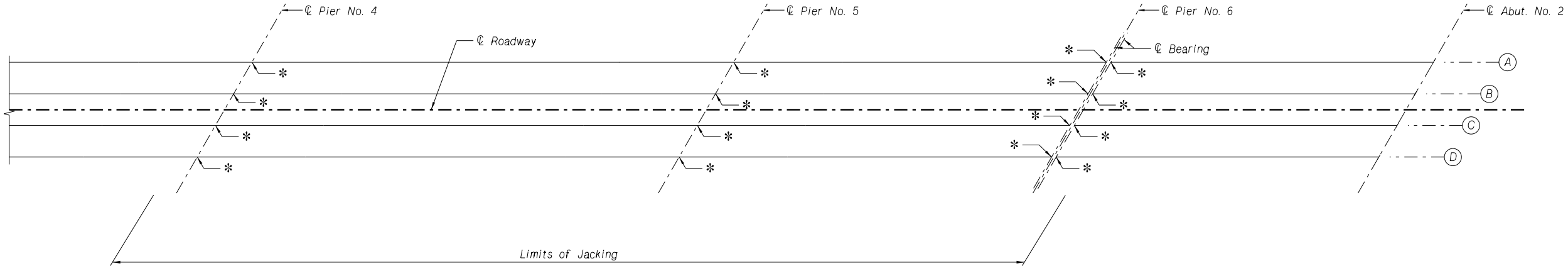
BRIDGE DIVISION.

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GIRDER LAYOUT
Not to Scale

NOTES:

- * Denotes locations where bearings are to be replaced.
- Girders A-D at Pier No. 4 are shifted North 12" (+/-) Transverse to \varnothing Roadway due to flood effects.
- Girders A-D at Pier Nos. 5 & 6 are shifted North 16" (+/-) Transverse to \varnothing Roadway due to flood effects.
- All Girders at Pier Nos. 4-6 shall be raised, moved transversely, and lowered together in a uniform controlled manner.
- Maximum jacking height is the minimum required to slide the existing pot bearing off the masonry plate or to install the new bearing assembly.
- Refer to the special provision "JACK AND RESET BRIDGE SUPERSTRUCTURE" for additional information.

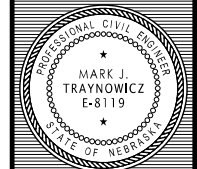
LOCATION	Girder A	Girder B	Girder C	Girder D
Pier No. 4	120	136	136	120
Pier No. 5	122	137	137	122
Pier No. 6 Back	30	34	34	30
Pier No. 6 Ahead	38	44	44	38

NOTE:
Reported values are unfactored, service level loads.



TYPICAL BEARING CONFIGURATION





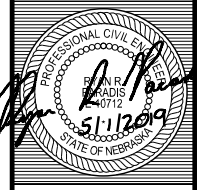
BRIDGE ENGINEER

LOCATION HOLT/BOYD COUNTY LINE
744'-0" 7-SPAN STEEL WELDED
PLATE GIRDER BRIDGE - REPAIR
GIRDER LAYOUT
DATE MAY 2019

CHECKED BY RTH
DESIGNED BY RRB
DETAILS BY TMS
H20-44

COUNTY BOYD & HOLT
HWY. NO. N-11
REF. POST. 176.45
STA. 3444+27.00

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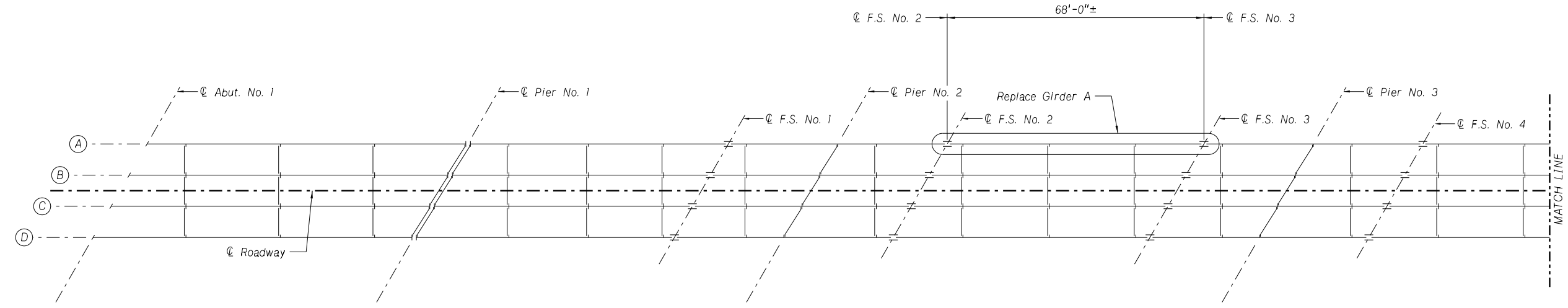
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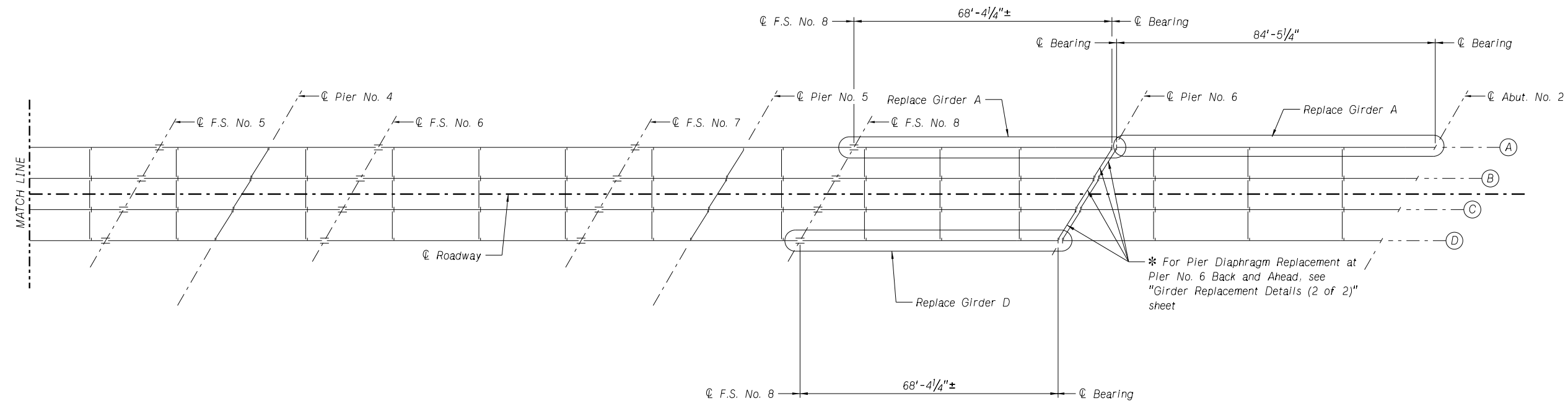
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GIRDER LAYOUT
Not to Scale

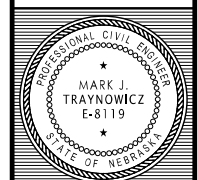


GIRDER LAYOUT
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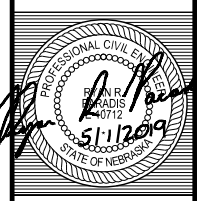
NOTES:

- Dimensions are shown horizontal with no allowance for grade.
- For details and notes for replacement girders, see "Girder Replacement Details (1 of 2)" sheet.
- For details of existing intermediate diaphragm connection to replacement girders, see "Girder Replacement Details (2 of 2)" sheet.
- * Replace Pier No. 6 (ahead) diaphragm between Girders A and B, and all Pier No. 6 (back) diaphragms.
- Field measure diaphragm spacing for replacement girders.





LOCATION: HOLT/BOYD COUNTY LINE
7441'-0" 7-SPAN STEEL WELDED PLATE GIRDER BRIDGE - REPAIR
ROADWAY 281'-0"
DESIGN LIVE LOAD H20-44
DATE: MAY 2019
CHECKED BY: RTH
DATE: MAY 2019
DESIGNED BY: RRB
GIRDER REPLACEMENT DETAILS (1 of 2)



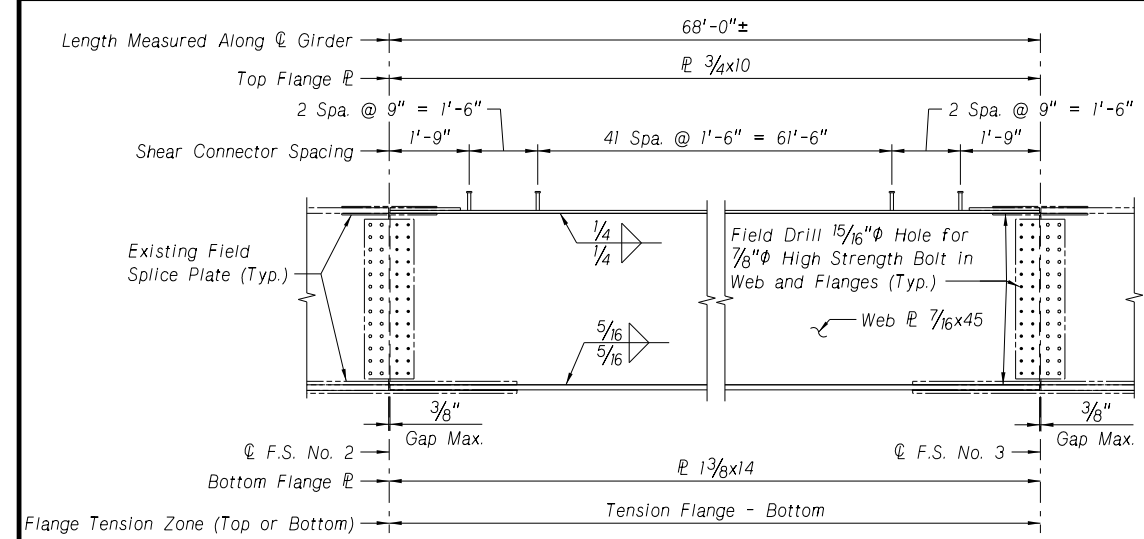
BRIDGE DIVISION.

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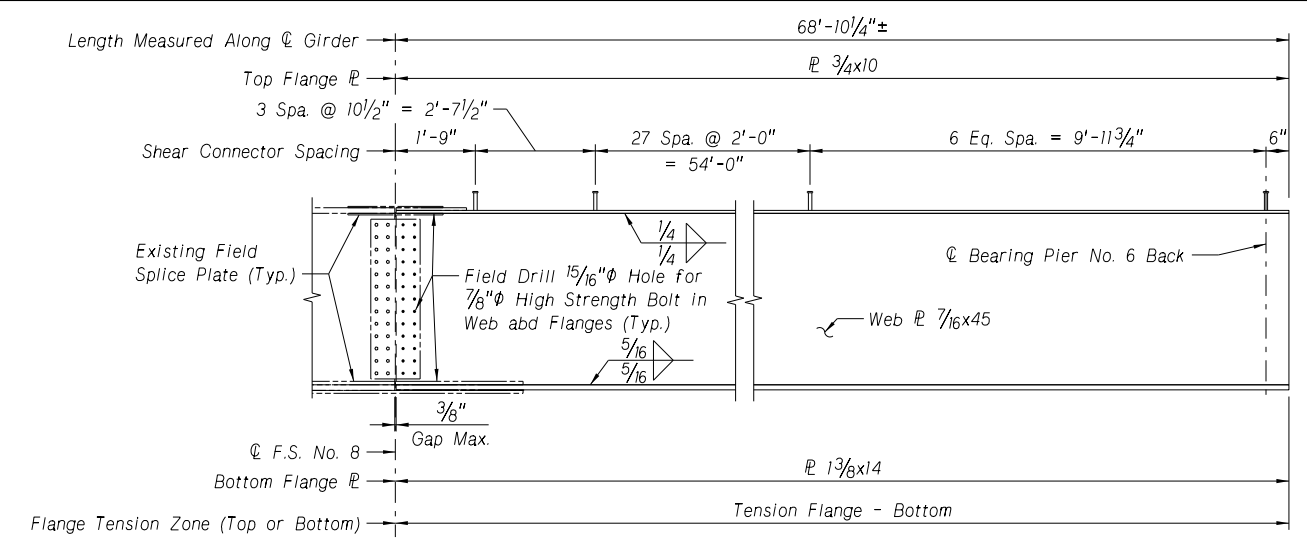
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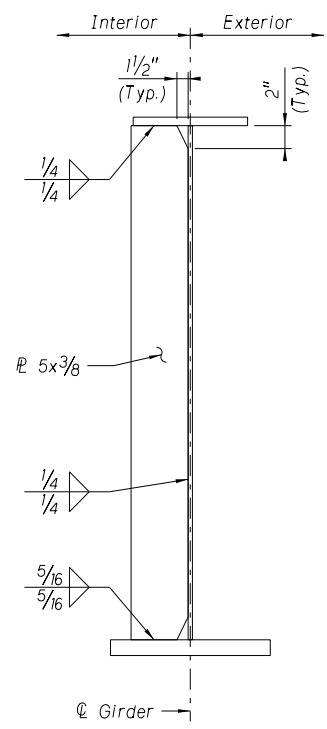
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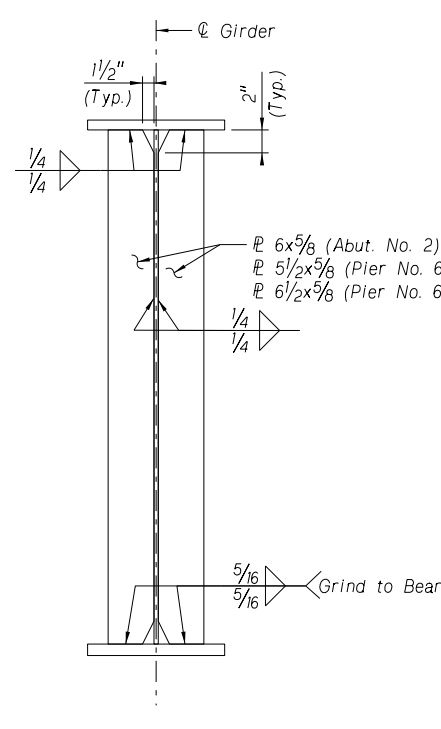
ELEVATION OF GIRDER A REPLACEMENT BETWEEN FS. NO. 2 & 3
Scale: 1/2" = 1'-0"



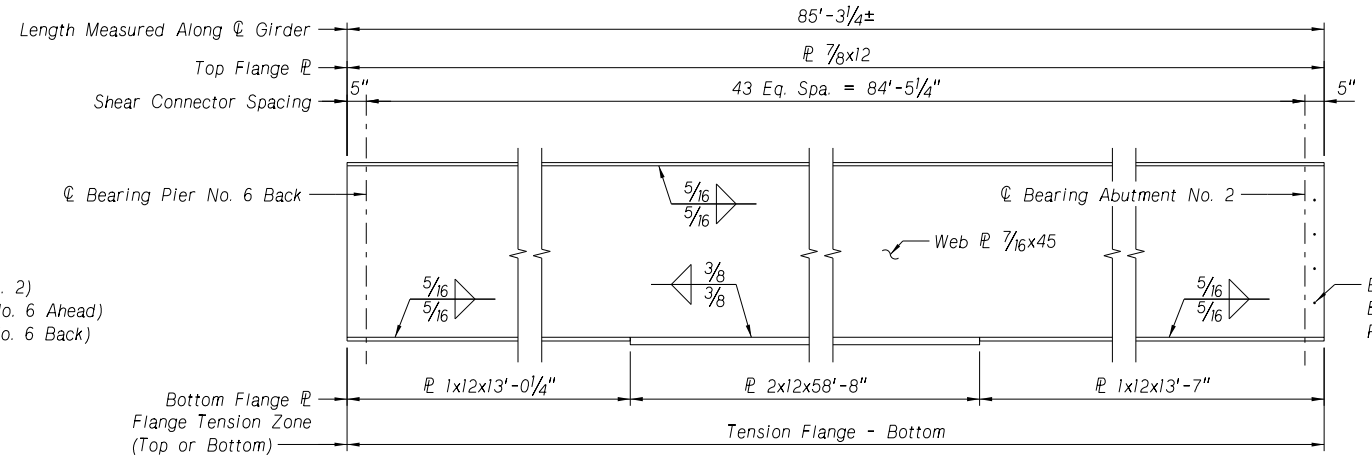
ELEVATION OF GIRDER A & D REPLACEMENT BETWEEN FS. NO. 8 & PIER NO. 6
Scale: 1/2" = 1'-0"



STIFFENERS AT INTERMEDIATE DIAPHRAGMS
Not to Scale



BEARING STIFFENERS AT
ABUTMENT NO. 2 AND PIER NO. 6
Not to Scale



ELEVATION OF GIRDER A REPLACEMENT BETWEEN PIER NO. 6 AND ABUTMENT NO. 2
Not to Scale

CHARPY IMPACT TEST REQUIREMENTS FOR MAIN TENSION MEMBERS
For the purpose of impact test the following material shall be classified as main tension members:
All bottom flanges
All web plates
All field splice plates

NOTES:

At the contractors option new field splice plates can be provided. If field splice plates are damaged during removal, new plates shall be provided.

As an alternate to providing new girder segments, the Contractor may elect to heat straighten the existing girders. See heat straightening details and notes on "Girder Replacement Details (2 of 2)" sheet.

All diaphragm and intermediate stiffeners shall be normal to the top flange.

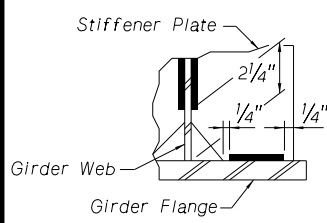
Splice bolts shall be 7/8" high strength bolts, ASTM A325. Replace all bolts removed from the splice. Field drill 15/16" holes in new structural steel for the splice bolts. Before the splice is drilled, the flanges at the splice must line up within 1/8" of parallel to the adjacent flanges without applying external force.

Pier diaphragm and intermediate diaphragm bolts shall be 3/4" high strength bolts, ASTM A325. Replace all bolts removed from the pier and intermediate diaphragms. Field drill 13/16" holes in new structural steel for the pier and intermediate diaphragm bolts.

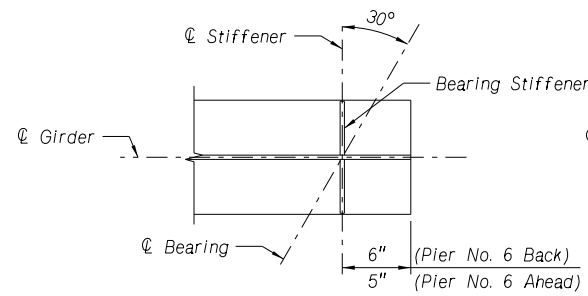
Dimensions are shown horizontal with no allowance for grade.

Refer to existing bridge plans available from the Bridge Division for camber and blocking and other details not shown here for girder segments to be replaced.

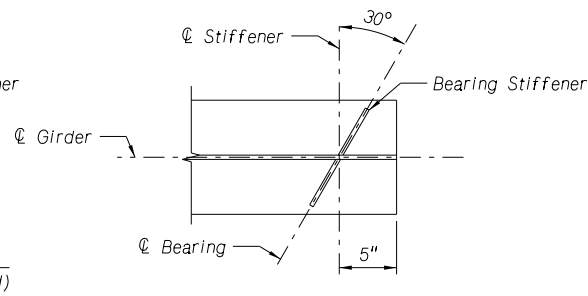
Refer to "Girder Layout" sheet for diaphragm locations.



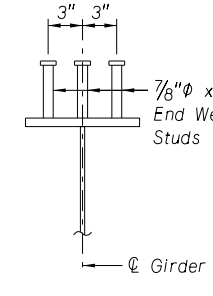
WELD TERMINATION DETAIL
Not to Scale



BEARING STIFFENER PLAN
AT PIER NO. 6
Not to Scale



BEARING STIFFENER PLAN
AT ABUTMENT NO. 2
Not to Scale



SHEAR CONNECTOR DETAIL
Not to Scale



GIRDER HEAT STRAIGHTENING NOTES:

As an alternate to replacing designated girder segments, at the girder locations shown on the "Girder Layout" sheet, girders may be heat straightened to the tolerances specified in these plans and notes. Bearing stiffener locations shall be heat straightened and repaired as shown on this sheet as required.

Prior to beginning work, the Contractor shall submit to the Engineer documentation of 10 or more years of experience in the field of heat straightening major structural elements on highway or railroad bridges and a documented list of at least three bridge structures that have been successfully heat straightened.

The Contractor shall notify the Engineer 2 weeks prior to the starting date of heat straightening operations.

The Contractor shall blast clean the portions of the beam, in accordance with the plans, that have been damaged and require heat straightening. Refer to "General Notes" on Sheet 1 for information regarding hazardous materials.

Heating shall be done using No. 7 or smaller torch tips on an oxygen-acetylene gas mixture. The temperature of the steel during heat straightening shall be between 600°F and 1200°F to produce deformations of the steel member conforming to the specified tolerances. Heating patterns and sequences shall be selected by the contractor to match the type of damage. After the beam has been heat straightened, the heating pattern used shall be furnished to the Engineer for informational purposes. In no case shall the temperature exceed 1200°F (a dull red) as determined with use of temperature indicating crayons, liquids or a bimetal thermometer.

Material shall be heated in a single pass following the proposed pattern and allowed to cool to below 250°F prior to re-heating.

The Contractor shall provide the Engineer with temperature indicating crayons manufactured for 600°F, 1000°F, 1100°F, and 1200°F. Not to exceed 1200°F.

The temperature of the heated metal may be determined by the color of the steel adjacent to the tip of the torch by using temperature crayons to correlate the temperature of the heated metal to the color of the steel. In normal daylight conditions, 1200°F will be indicated by a satiny, silver color near the torch tip. After cooling, the area should be gray in color.

Only quenching with clean dry air will be permitted. Cooling with compressed air may be done only after the steel has cooled naturally to at least 600°F. Cooling shall be uniform throughout the heated area.

After the heat straightening has been completed, the Engineer will visually inspect the repaired beam. At the Engineer's discretion, nondestructive testing of the structural steel may be performed if cracks are suspected. The State shall be notified and arrange for testing.

Out of plane local stiffener and web deviations shall be repaired to a tolerance of 3/8 inch. Girder flanges shall be returned to within 1/4 inch of level and global girder sweep shall be less than 2". Contractor shall prepare a procedure to measure the deviations and submit to the Engineer for approval.

All heating and straightening shall follow the AWS D1.7 2010 "Guide for Strengthening and Repairing Existing Structures".

The Contractor doing the heat straightening shall submit a heating and jacking procedure to the Engineer prior to starting the work.

BEARING STIFFENER HEAT STRAIGHTENING

Remove existing diaphragm and bolts at the bearing stiffener as shown on this sheet.

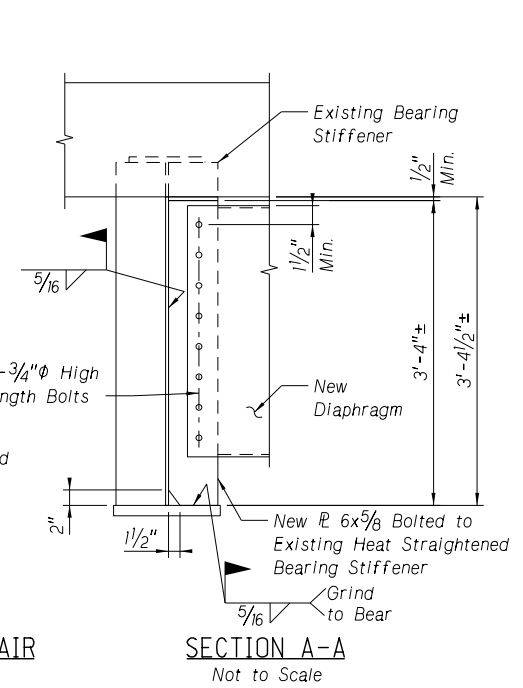
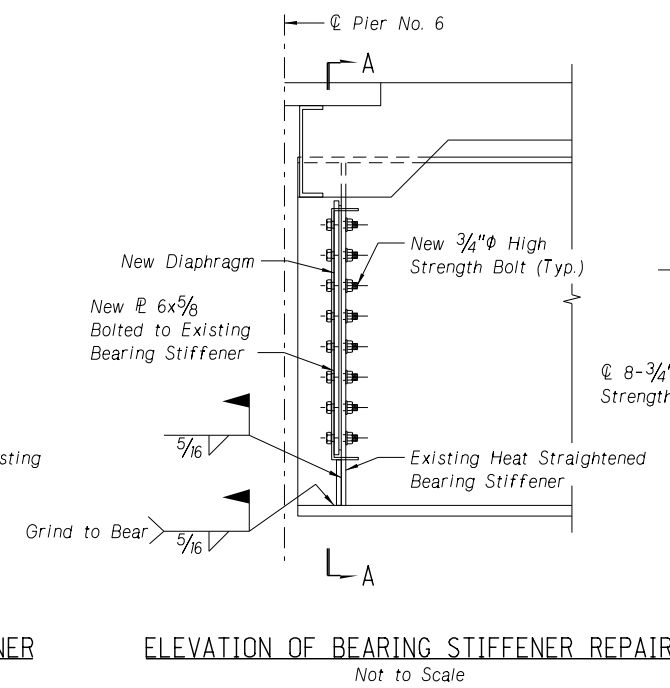
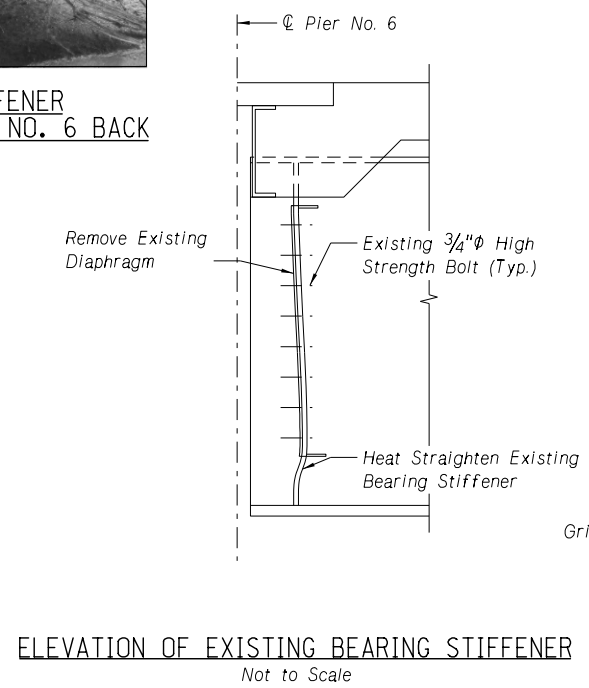
Heat straighten existing bearing and girder within tolerance. See Girder Heat Straightening Notes on this sheet.

Attach new $6 \times \frac{5}{8}$ " to existing bearing stiffener and diaphragm. Field drill $\frac{13}{16}$ " ϕ holes for $\frac{3}{4}$ " ϕ high strength bolts.

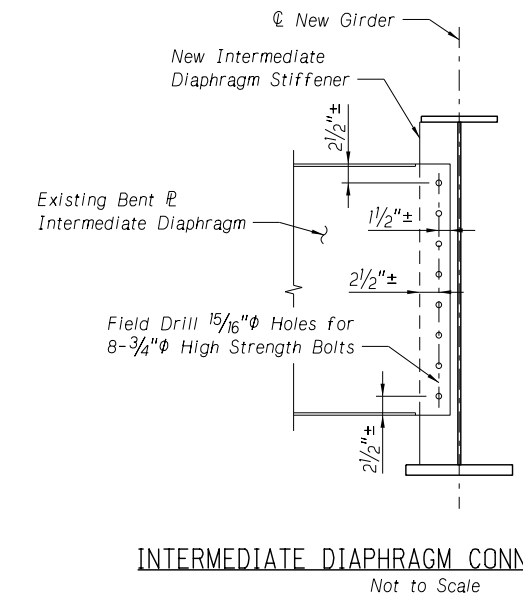
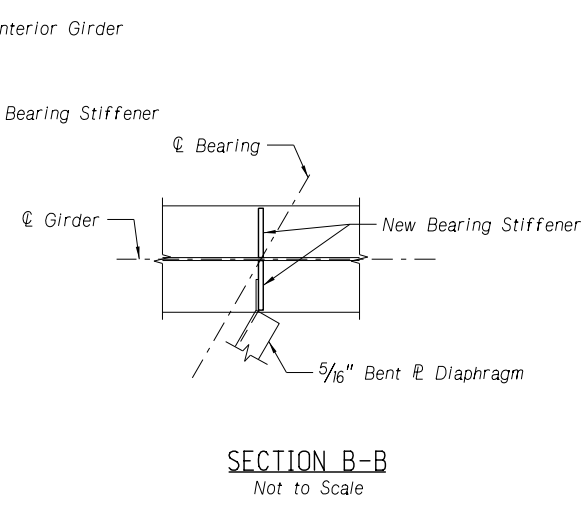
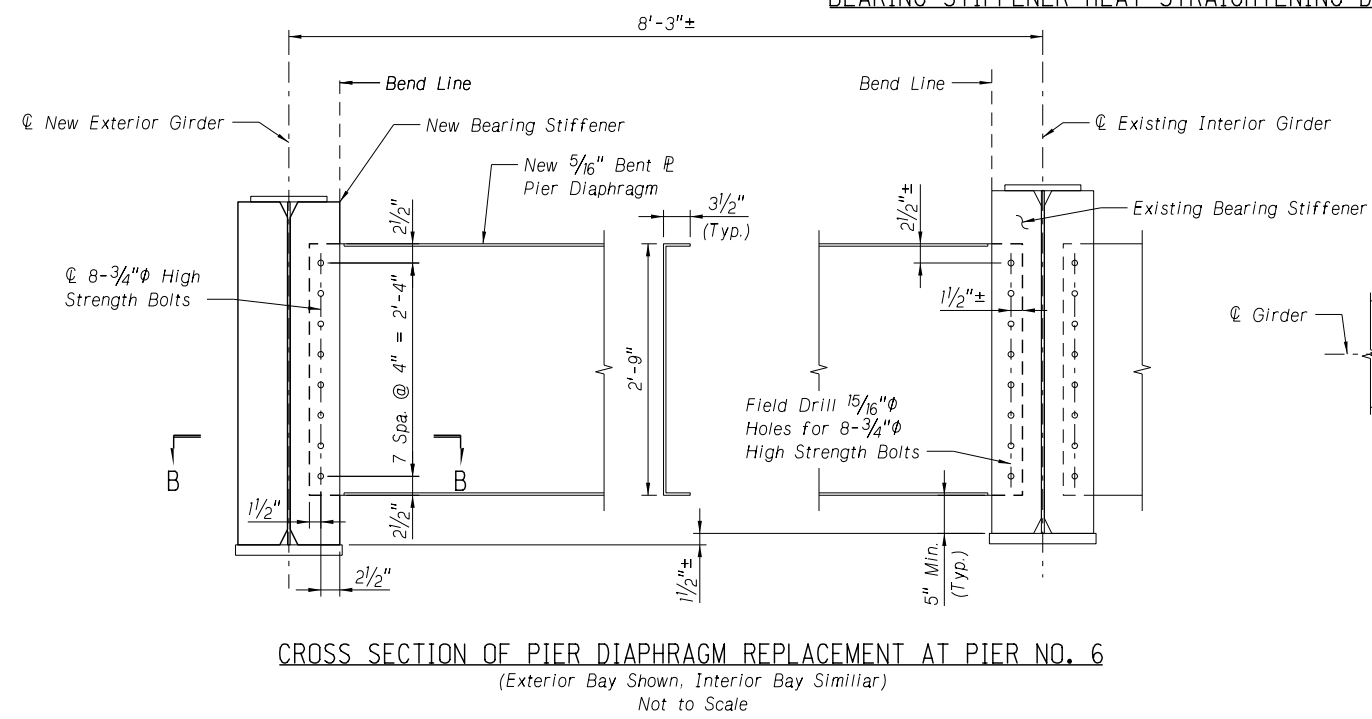
The new plate shall be ground to bear on the bottom flange and must provide a tight fit when installation is complete as shown on this sheet.



BENT STIFFENER GIRDER D @ PIER NO. 6 BACK



BEARING STIFFENER HEAT STRAIGHTENING DETAILS



BRIDGE DIVISION
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DIMENSIONS FOR BEARING DEVICES

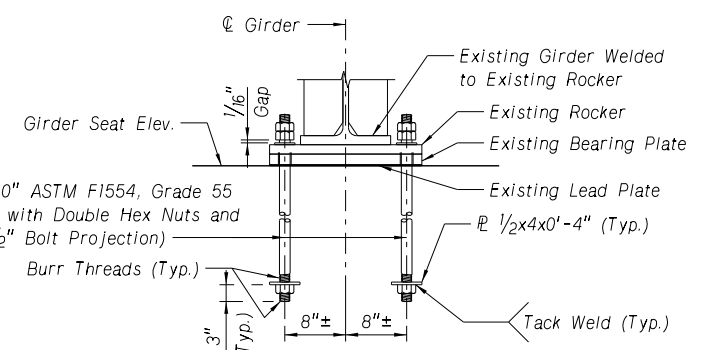
LOCATION	SOLE PLATE					STAINLESS STEEL		FABRIC PAD		LOWER BEARING PLATE	
	A	A1	A2	B	C	E	F	H	J	L	M
Pier No. 4	1 1/2"	1 9/16"	1 7/16"	1'-0"	1'-9"	1 1/4"	1'-8"	0'-6"	1'-7"	1'-9"	0'-8"
Pier No. 5	1 1/2"	1 1/2"	1 1/2"	1'-0"	1'-9"	1 1/4"	1'-8"	0'-6"	1'-7"	1'-9"	0'-8"
Pier No. 6 Back	1 1/2"	1 1/2"	1 1/2"	1'-0"	1'-5"	1 1/4"	1'-1"	0'-4"	1'-0"	1'-2"	0'-6"
Pier No. 6 Ahead	1 1/2"	1 1/2"	1 1/2"	1'-0"	1'-5"	1 1/4"	1'-1"	0'-4"	1'-0"	1'-2"	0'-6"

LOWER BEARING PLATE THICKNESS

Location	Bottom of Girder Elev.	Surveyed Top of Masonry Plate Elev.	Pad + Sole Plate Thickness (ft)	Required Lower Bearing Plate Thickness (in)
☉ Pier No. 4				
Girder A	1581.74		0.224	
Girder B	1581.92		0.224	
Girder C	1581.98		0.224	
Girder D	1581.92		0.224	
☉ Pier No. 5				
Girder A	1580.75		0.224	
Girder B	1580.89		0.224	
Girder C	1580.92		0.224	
Girder D	1580.82		0.224	
☉ Pier No. 6 Back				
Girder A	1580.35		0.224	
Girder B	1580.50		0.224	
Girder C	1580.52		0.224	
Girder D	1580.42		0.224	
☉ Pier No. 6 Ahead				
Girder A	1580.38		0.224	
Girder B	1580.53		0.224	
Girder C	1580.55		0.224	
Girder D	1580.45		0.224	

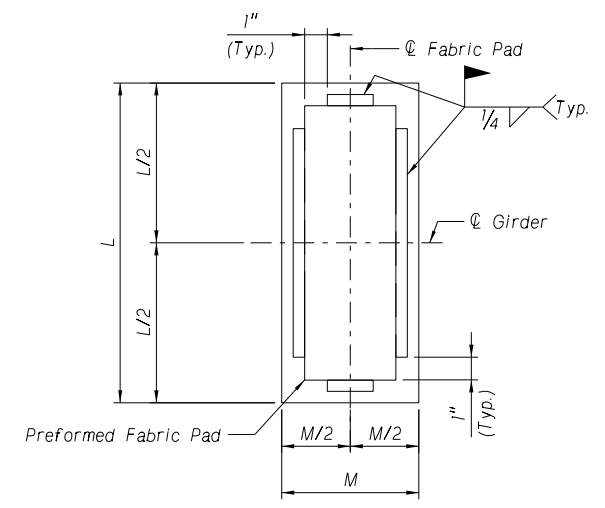
NOTES:
In order to determine the required lower bearing plate thickness, the Contractor shall survey the top of the existing masonry plate elevation. The required thickness can then be determined using the following formula: (Bottom of Girder Elev. - Surveyed Top of Masonry Plate Elev. - 0.224') x 12. The minimum thickness of the lower bearing plate shall be 1/2".
The Contractor shall submit the results of the survey and proposed lower bearing plate thickness to the Engineer for review and approval prior to ordering materials for the bearings.
Payment for this work shall be subsidiary to the item "EXPANSION BEARING, PTFE TYPE".

BEARING NOTES:
Sole plates shall be centered over fabric pad.
Each sole plate shall be identified with a mark indicating girder designation & span number. Location of mark shall be shown on shop drawings.
Sole plates and fabric pads need to be inspected prior to installation. Please contact the Engineer a minimum of three weeks before contractor's scheduled installation for inspection.
Prior to welding, Contractor to remove paint to bare steel. Existing welds on masonry plates and girder flanges shall be removed and ground smooth.
The lower bearing plate assembly and field weld to the existing masonry plate shall be subsidiary to the item "EXPANSION BEARING, PTFE TYPE". Sole plate shall be welded to girder prior to setting on fabric pad.
Lower bearing plate assembly shall be ASTM A709 Grade 50W or as an alternate ASTM A36 Grade 36 steel, metalized.

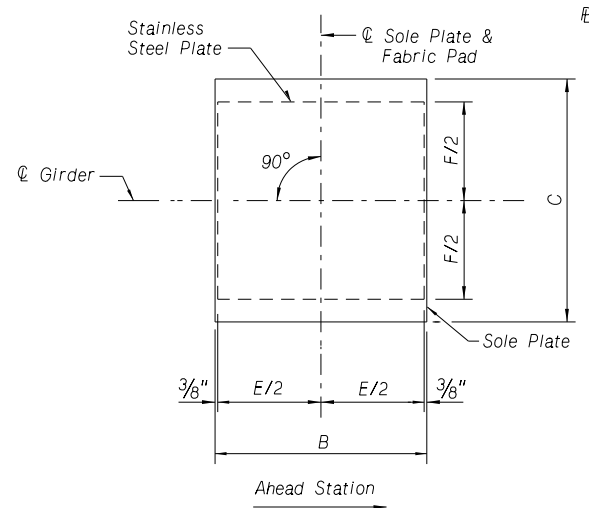


ANCHOR BOLT NOTES:
Existing bearing, lead and rocker plates may be reused if in good condition. Ensure all plates and welds between the girder and rocker plate are free from cracks or defects. If defects are found, any repair/replacement shall be as directed by the Engineer. Payment is subsidiary to "STRUCTURAL STEEL FOR SUBSTRUCTURE".
Place anchor bolts to be used with existing plate geometry. Center anchor bolts in rocker plate slots.
The cost of furnishing and installing anchor bolts shall be included in the item "STRUCTURAL STEEL FOR SUBSTRUCTURE".

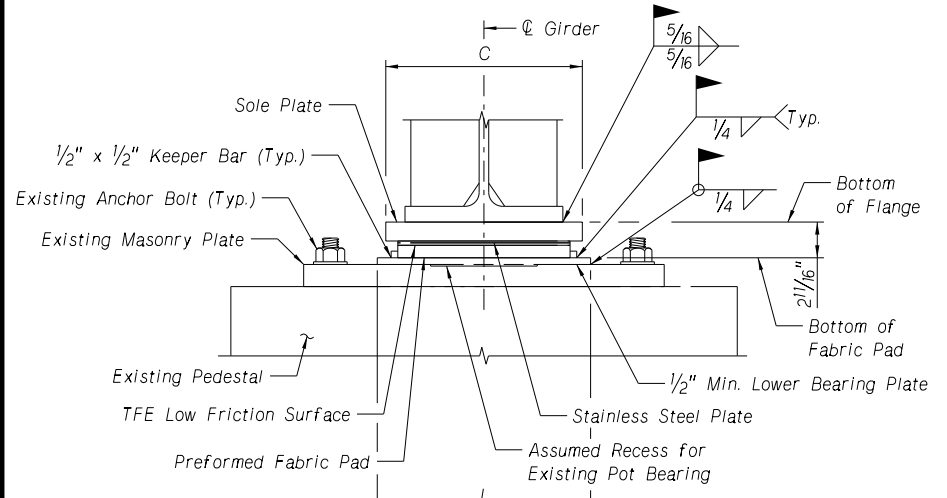
ANCHOR BOLT REPLACEMENT AT ABUTMENT NO. 2
Not to Scale



LOWER BEARING PLATE DETAIL

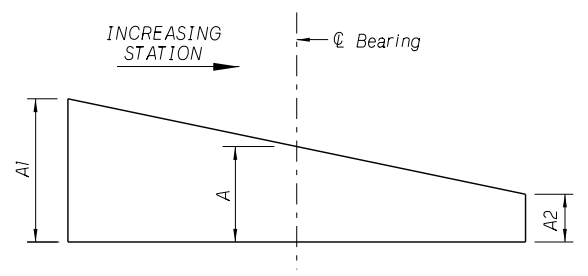


EXPANSION BEARING

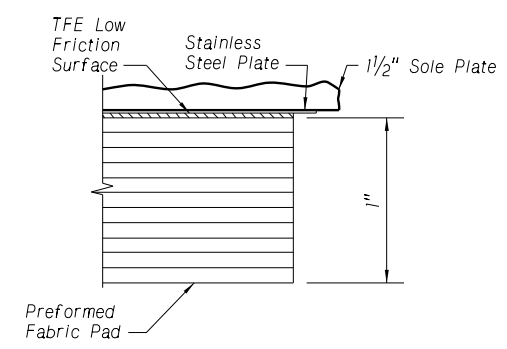


EXPANSION BEARING @ PIERS

BEARING SECTIONS
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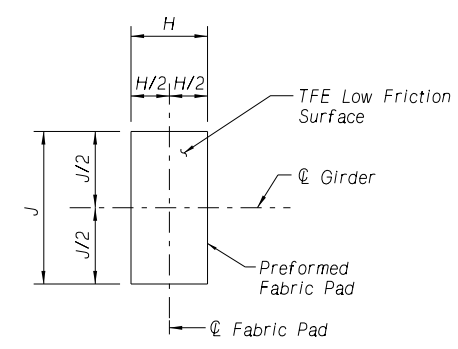


SECTION OF BEVELED SOLE PLATE
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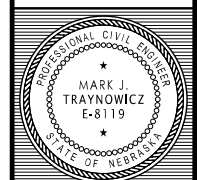
EXPANSION BEARINGS

PREFORMED FABRIC PAD DETAILS
Not to Scale



PREFORMED FABRIC PAD PLAN
Not to Scale

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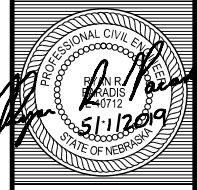
BRIDGE ENGINEER

LOCATION HOLT/BOYD COUNTY LINE
SKEW 30°
ROADWAY 28'-0"
DESIGN LIVE LOAD H20-44
DETAILED BY CMZ
CHECKED BY TMS
DATE MAY 2019

744'-0" 7-SPAN STEEL WELDED
PLATE GIRDER BRIDGE - REPAIR
DECK REPLACEMENT DETAILS

NEBRASKA
DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
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DEPARTMENT OF TRANSPORTATION



BRIDGE DIVISION.

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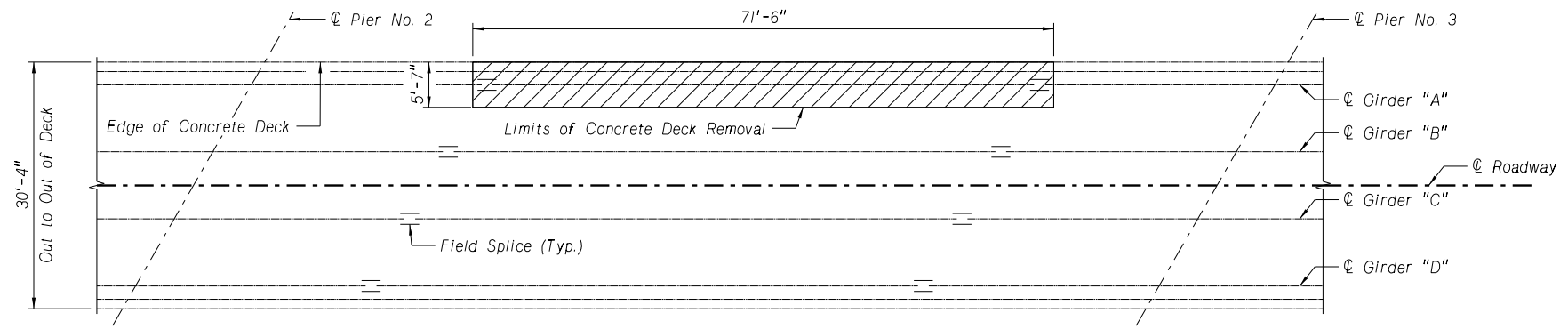
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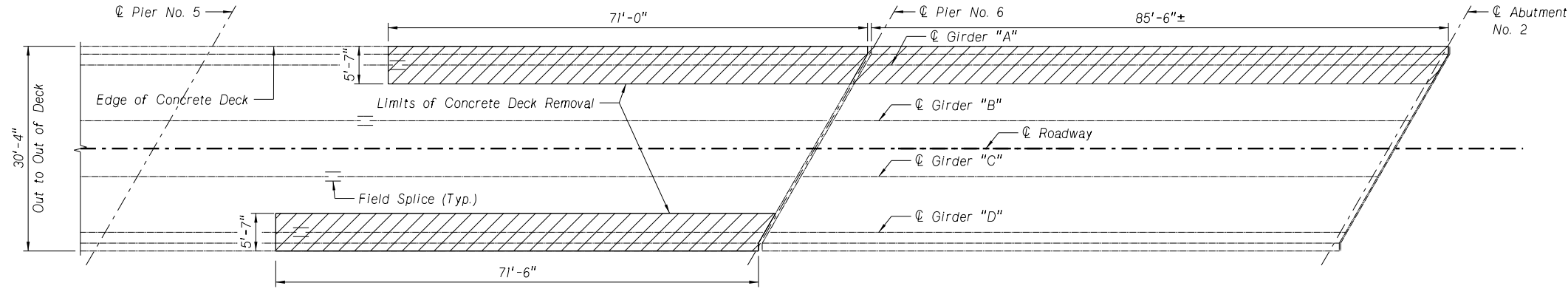
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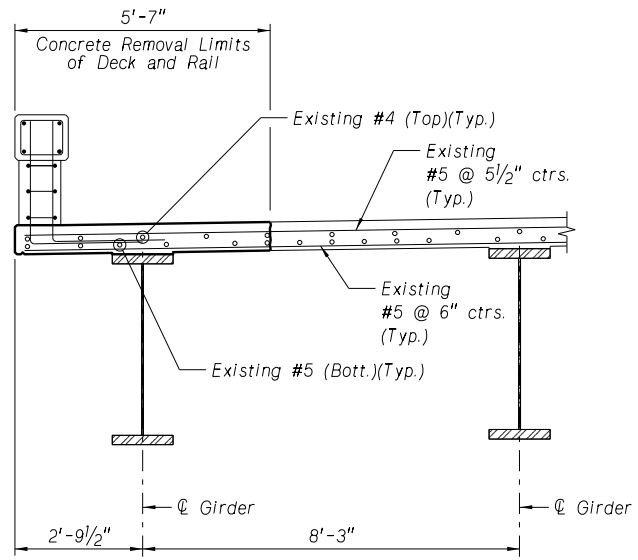
REMOVAL OF GIRDER A IN SPAN 3



DECK REMOVAL LIMITS - SPAN 3
Not to Scale



DECK REMOVAL LIMITS - SPAN 6
Not to Scale



TYPICAL REMOVAL LIMITS

(For Details of Bridge Deck and Rail Replacement, see "Concrete Barrier Rail Repair Details" sheet.)

DECK REMOVAL NOTES:

Longitudinal #7 bars in bridge rail shall be replaced with new #7 bars. When breaking back existing concrete provide a 3'-7" minimum extension of existing #7 rail bars to lap with new #7 rail bars.

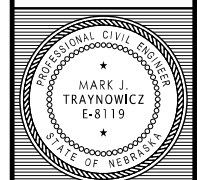
Top longitudinal #4 bars in bridge deck shall be replaced with new #4 bars. When breaking back existing concrete, provide a 1'-7" minimum extension of existing #4 top bars to lap with new #4 bars.

Bottom longitudinal #5 bars in bridge deck shall be replaced with new #5 bars. When breaking back existing concrete, provide a 2'-0" minimum extension of existing #5 bottom bars to lap with new #5 bars.

Care shall be exercised to prevent cutting or otherwise damaging any existing transverse deck reinforcing bars. Repairs to damaged reinforcing steel shall be performed at no expense to the Department. Additional concrete removal and replacement necessary to repair damaged bars shall be at no expense to the Department.

See Notes on "Notes, Quantities & Index" sheet for additional concrete removal requirements.





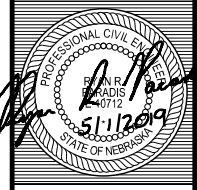
BRIDGE ENGINEER

LOCATION HOLT/BOYD COUNTY LINE
 SKEW 30°
 ROADWAY 28'-0"
 DESIGN LIVE LOAD H20-44
 CHECKED BY RRB
 DATE MAY 2019

744'-0" 7-SPAN STEEL WELDED
 PLATE GIRDER BRIDGE - REPAIR
 BRIDGE DECK SEAL REPAIR DETAILS

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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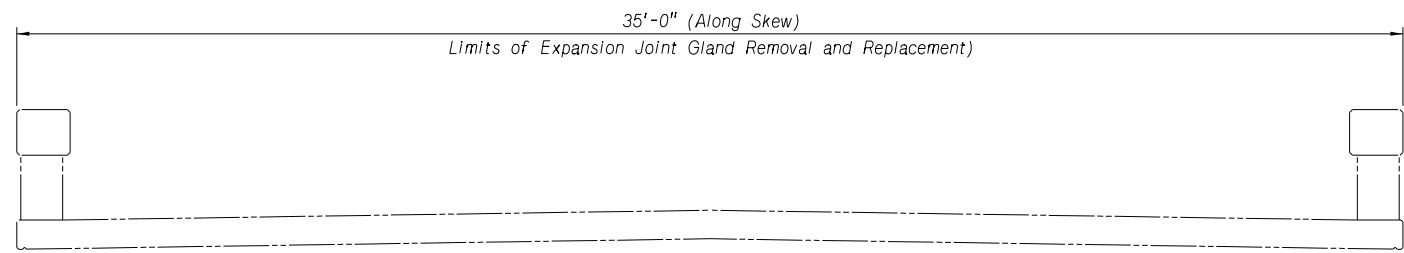
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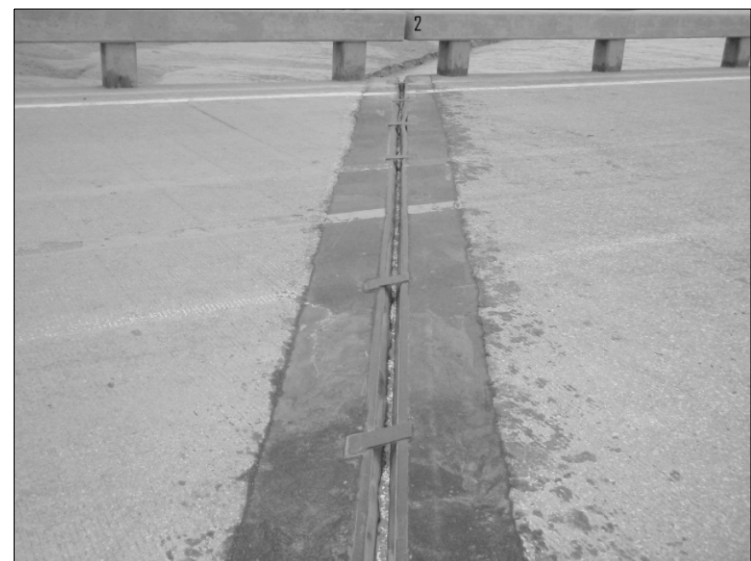
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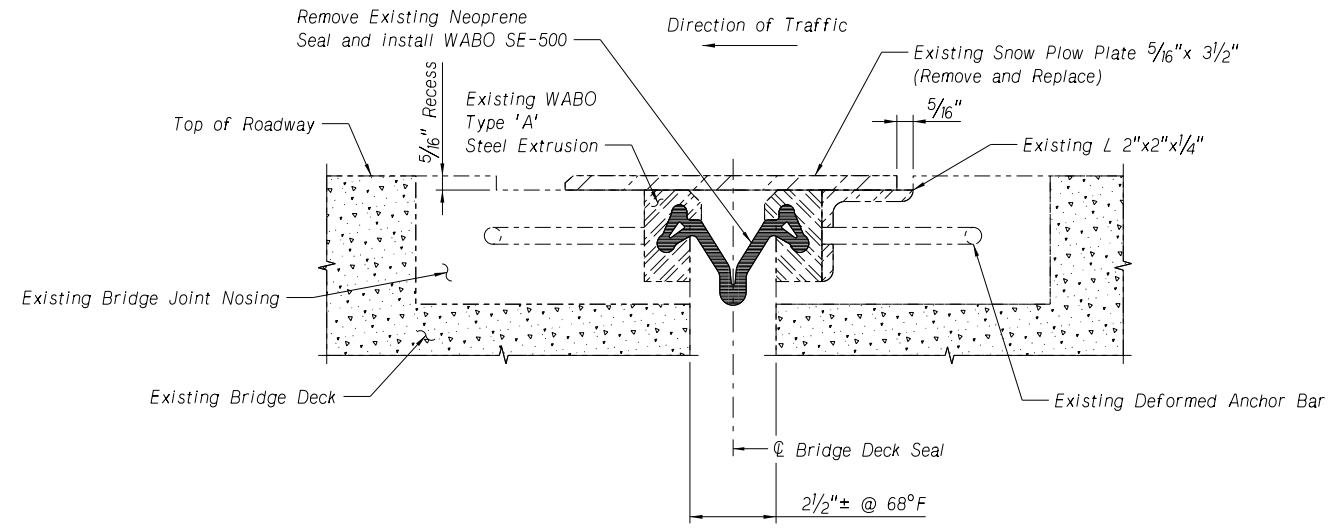
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TYPICAL SECTION THROUGH EXISTING BRIDGE DECK
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EXPANSION JOINT AT PIER NO. 6 (PRIOR TO FLOOD EVENT)

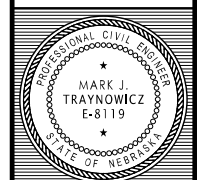


SECTION OF EXPANSION JOINT SEAL REPLACEMENT
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NOTES

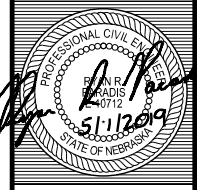
1. Grind welds to remove existing 5/16" x 3/2" snow plow guard plates from the steel rails of the expansion joint at Pier No. 6.
2. Remove existing neoprene seal from the steel rails of the expansion joint.
3. After the bridge superstructure has been returned to its final position, install a new neoprene seal into the steel rails of the expansion joint in accordance with the manufacturer's recommendations. Based on shop drawings dated May, 2009, the current expansion joint was produced by Watson Bowman ACME Corporation. Contact Chris Smyth of Watson Bowman ACME at (716) 544-4620 for ordering information. Any expansion device installation that fails to meet the manufacturer's installation specifications will be removed and replaced with a properly installed joint at the expense of the Contractor. No payment will be made unless the manufacturer's representative certifies the installation.
4. Provide new 5/16" x 3/2" snow plow guard plates and weld to the existing 2" x 2"x1/4" angles. Weld only to the approach side for the direction of traffic for each lane direction.
5. Removal of the snow plow guard plates and neoprene seal shall be included in the item "PREPARATION OF BRIDGE AT STA. 3444+27.00".
6. Bridge deck seal repair shall be measured and paid for by the lineal foot for the item "REPLACING DECK JOINT SEALS" and shall include all labor, materials (including supplying and installing new 5/16" x 3/2" snow plow guard plates), equipment and incidentals needed to complete the work.





LOCATION HOLT/BOYD COUNTY LINE
7441'-0" 7-SPAN STEEL WELDED
PLATE GIRDER BRIDGE - REPAIR
CONCRETE BARRIER RAIL REPAIR DETAILS
DATE MAY 2019
CHECKED BY PER
DESIGNED BY CMZ
STATION 3444+27.00
REF. POST. 176.45
HWY. NO. N-11
COUNTY BOYD & HOLT
SKEW 30°
ROADWAY 28'-0"
DESIGN LIVE LOAD H20-44

NEBRASKA
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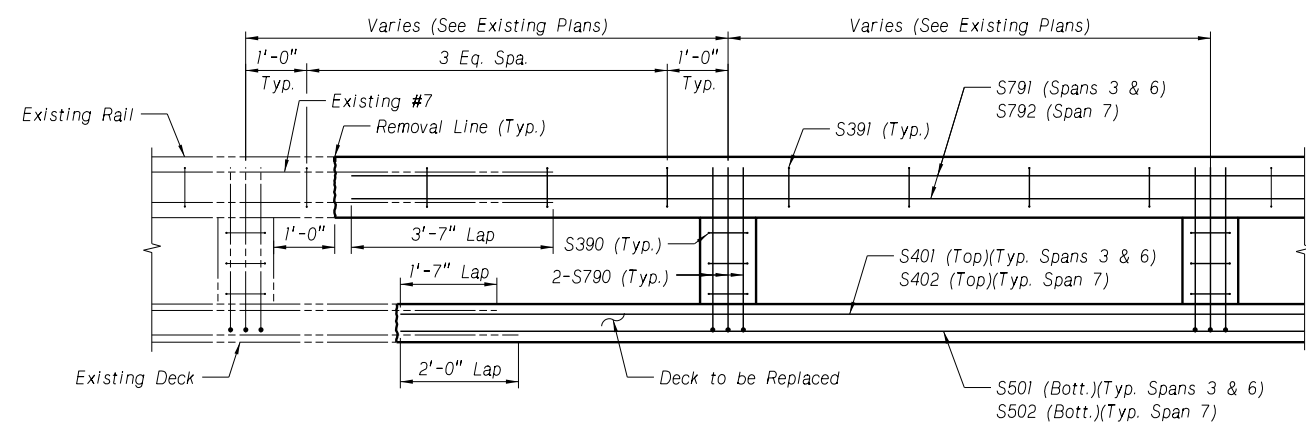
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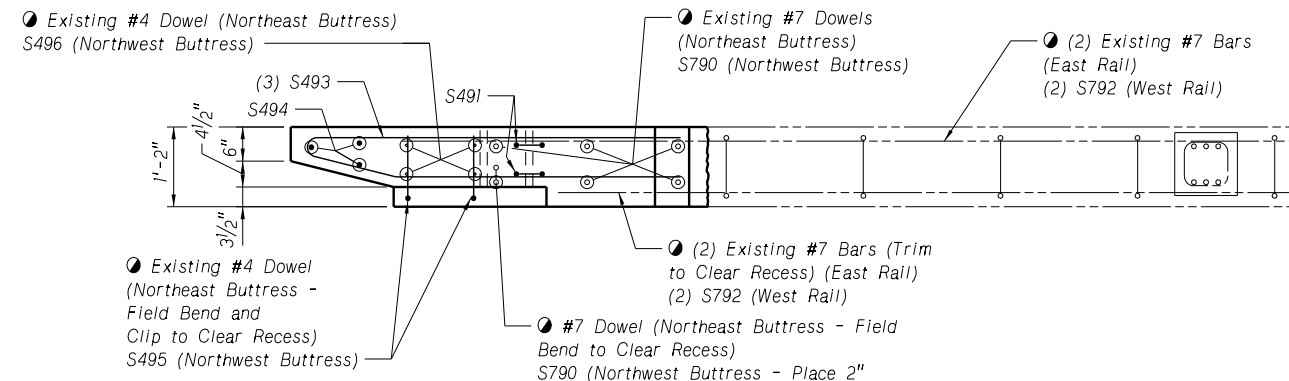
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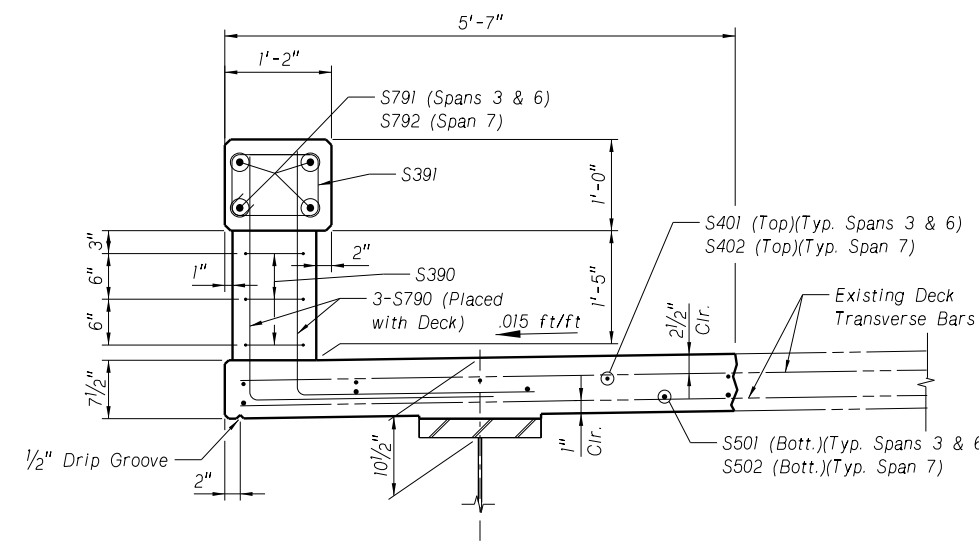
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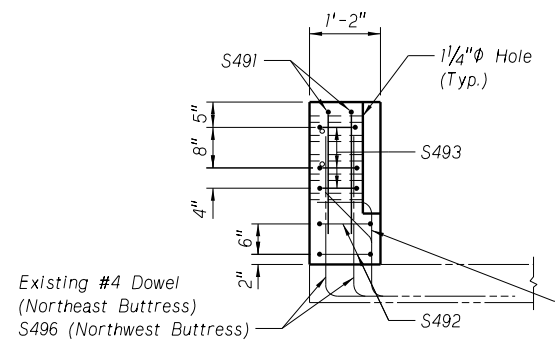
BARRIER RAIL ELEVATION
Not to Scale



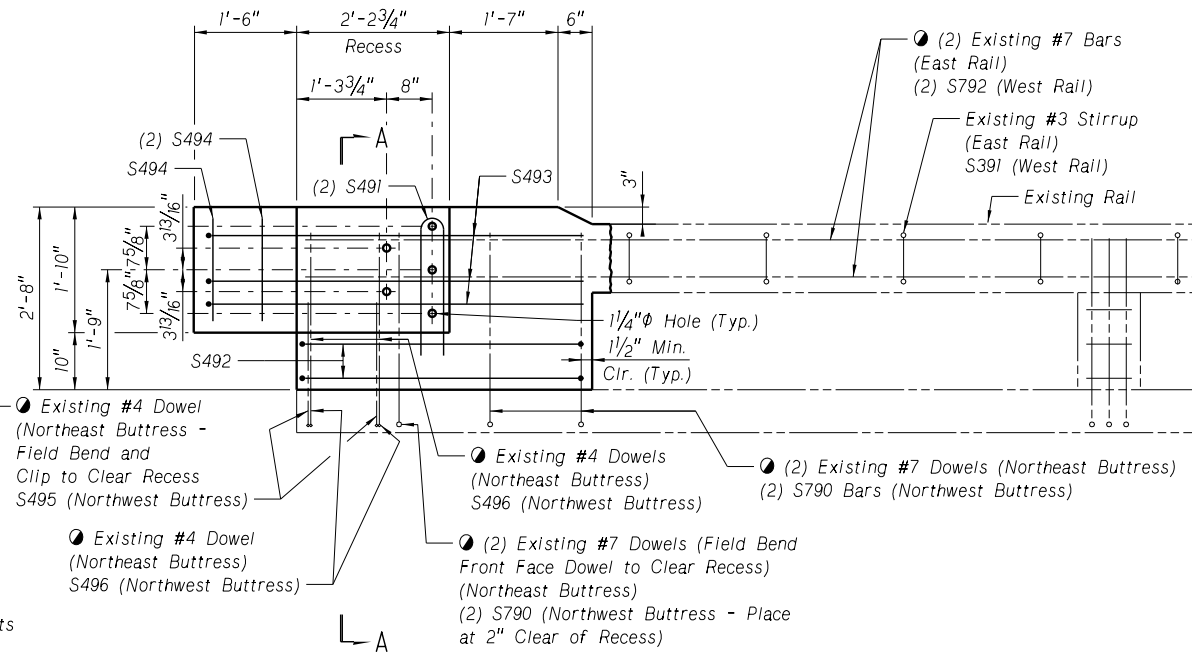
BUTRESS PLAN
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BARRIER RAIL AND DECK REPLACEMENT
Not to Scale



SECTION A-A
(Typical Deck Reinforcing Steel Not Shown)



BUTRESS ELEVATION
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BUTRESS REMOVAL NOTES:

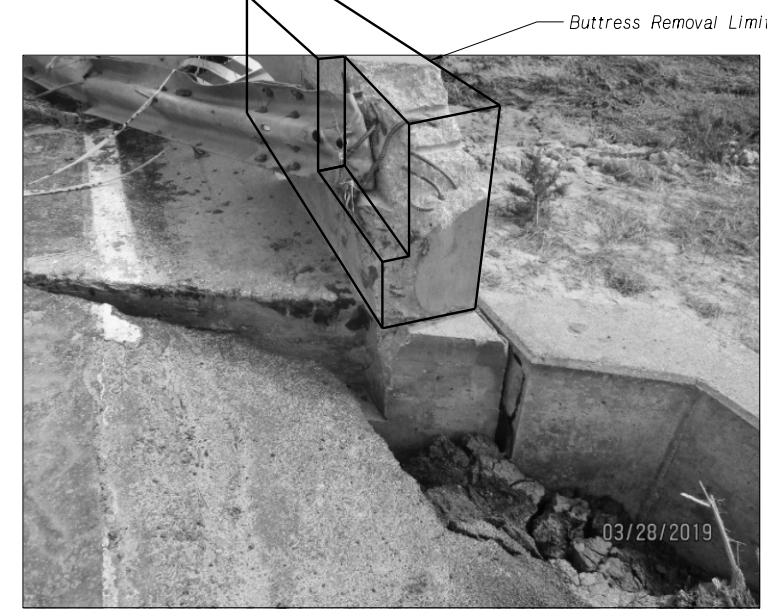
Barrier rail buttress removal shall be initiated by a 1" deep saw cut. In no case shall the saw cut penetrate deeper than the outer layer of reinforcing steel. See General Notes on Sheet 1 for additional concrete removal requirements.

Care shall be exercised to prevent cutting or otherwise damaging any reinforcing bars extending from the existing bridge rail or bridge deck. Repairs to damaged reinforcing steel shall be performed at no expense to the Department. Additional concrete removal and replacement necessary to repair damaged bars shall be at no expense to the Department.

Following removal of forms, the concrete shall receive an ordinary surface finish in accordance with Section 704.03.18.b of the specifications for buttress and barrier rail replacement.



NORTHEAST BUTTRESS REMOVAL



NORTHWEST BUTTRESS REMOVAL

BRIDGE DIVISION

Computer: DME-2UA7181PFW

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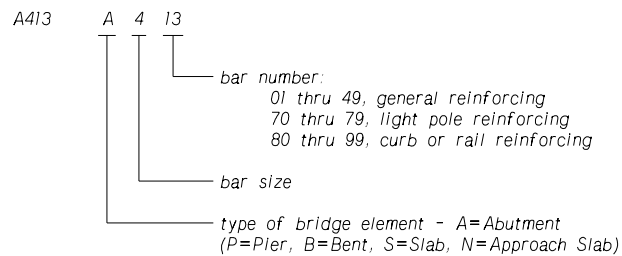
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B I L L O F B A R S

	MARK	NO.	LENGTH	TYPE	"A"	"B"	"C"	"D"	"E"	"F"	PIN	HOOK	WEIGHT (LBS)
PIER NO. 4	P601	28	3'-3"	104	1'-0"	2'-3"					4 1/2"		137
	P501	32	4'-7"	STR	Includes 1-2'-2" Lap								153
	P502	28	4'-4"	103	1'-2"	2'-0"	1'-2"				2 1/2"		127
	P503	8	7'-10"	135	1'-10"	2'-2"	2'-0"	1'-1 1/4"	1'-10"		2 1/2"		65
SUBTOTAL = 482 Lbs.													
PIER NO. 5	P601	28	3'-3"	104	1'-0"	2'-3"					4 1/2"		137
	P501	32	4'-7"	STR	Includes 1-2'-2" Lap								153
	P502	28	4'-4"	103	1'-2"	2'-0"	1'-2"				2 1/2"		127
	P503	8	7'-10"	135	1'-10"	2'-2"	2'-0"	1'-1 1/4"	1'-10"		2 1/2"		65
SUBTOTAL = 482 Lbs.													
PIER NO. 6	P601	28	3'-3"	104	1'-0"	2'-3"					4 1/2"		137
	P501	40	4'-9"	STR	Includes 1-2'-2" Lap								198
	P502	28	4'-10"	103	1'-2"	2'-6"	1'-2"				2 1/2"		141
	P503	8	8'-9"	135	2'-0"	2'-9"	2'-0"	1'-4 3/4"	2'-0"		2 1/2"		73
SUBTOTAL = 549 Lbs.													
BARRIER REPLACEMENT	S790	228	5'-4"	104	2'-8"	2'-8"					5 1/4"		2,486
	S791	24	39'-11"	STR	Includes 1-3'-7" Lap								1,958
	S792	8	44'-9"	STR	Includes 1-3'-7" Lap								732
	S491	4	4'-2"	114	4"	1'-10"					3"		11
	S492	4	10'-5"	107	10"	4'-0"					2"	4 1/2"	28
	S493	6	10'-10 1/2"	136	4'-1 1/2"	1'-4"	5'-5"	7"	1'-3 1/2"		2 1/2"		44
	S494	6	1'-6"	STR									6
	S495	2	3'-0"	117	1'-2"	10"			1'-0"				4
	S496	4	5'-8"	104	3'-0"	2'-8"					3"		15
	P390	111	3'-4"	107	8"	8"					1 1/2"	4"	139
P391	151	4'-0"	107	11"	9"					1 1/2"	4"	227	
SUBTOTAL = 5,650 Lbs.													
DECK REPLACEMENT	S501	36	36'-9"	STR	Includes 1-2'-0" Lap								1,380
	S502	12	43'-9"	STR	Includes 1-2'-0" Lap								548
	S401	30	36'-7"	STR	Includes 1-1'-7" Lap								733
	S402	10	43'-7"	STR	Includes 1-1'-7" Lap								291
S403	8	11'-2"	108	2'-4"	11"	2'-4"	VARIES					60	
SUBTOTAL = 3,012 Lbs.													
ABUTMENT NO. 2	A401	4	4'-6"	103	1'-0"	2'-6"	1'-0"						12
	A402	3	2'-3"	STR									5
SUBTOTAL = 17 Lbs.													
TOTAL = 10,192 Lbs.													

B A R M A R K



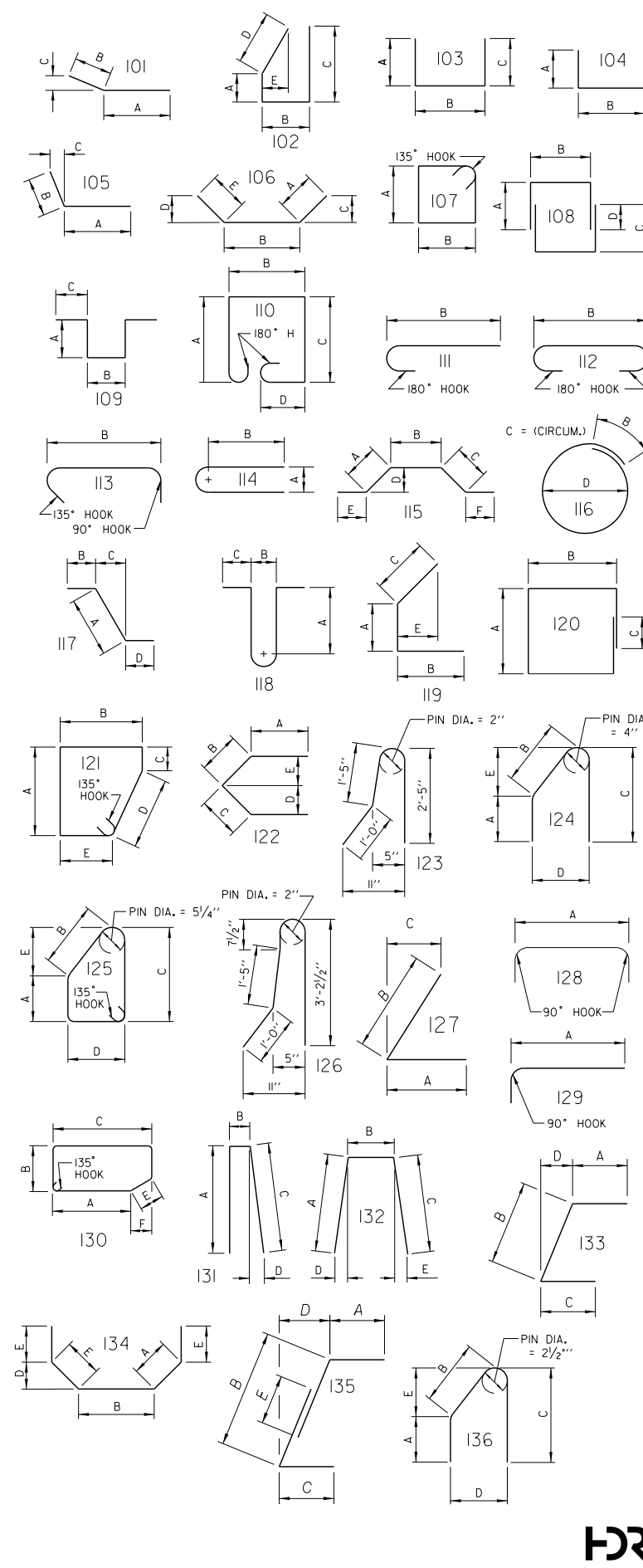
NOTES

The number of lap splices are calculated based on 60'-0" lengths of reinforcing steel bars.

Splices on bars shorter than 60'-0" will require additional lap splices at no additional expense to the Department.

B E N D I N G D I A G R A M S

ALL DIMENSIONS ARE OUT TO OUT & NOT TO SCALE

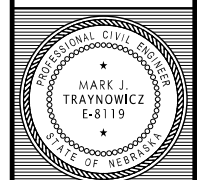


STANDARD HOOK LENGTH					PIN DIAMETER				
PRIMARY STRESS BARS			STIRRUPS & TIES		PRIMARY STRESS		STIRRUPS & TIES		
BAR SIZE	HOOK H		BAR SIZE	HOOK H		BAR SIZE	Dp		
	90°	180°		90°	135°		Dp	Dp	
4	8"	6"	3	4"	4"	4	3"	3	1 1/2"
5	10"	7"	4	4 1/2"	4 1/2"	5	3 3/4"	4	2"
6	12"	8"	5	6"	5 1/2"	6	4 1/2"	5	2 1/2"
7	15"	10"	6	12"	8"	7	5 1/4"	6	4 1/2"
8	17"	11"	7	14"	9"	8	6"	7	5 1/4"
9	19"	15"	8	16"	10 1/2"	9	9 1/2"	8	6"
10	23"	17"				10	11"		
11	24"	19"				11	12"		

d = BAR SIZE
Dp = PIN DIAMETER

PROJECT NUMBER ER-11-4(120) SHEET NO. S16

C.N. 81038
STRUCTURE NUMBER S011 17645

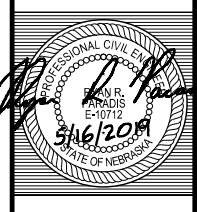


BRIDGE ENGINEER

LOCATION: 7441-0" 7-SPAN STEEL WELDED PLATE GIRDER BRIDGE - REPAIR
BILL OF BARS & BENDING DIAGRAMS
DATE: MAY 2019

COUNTY: BOYD & HOLT
HWY. NO.: N-11
REF. POST.: 176.45
STA.: 3444+27.00
DESIGNED BY: CMZ
CHECKED BY: RRB
TMS

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION



SPECIAL PLAN NO. 16
1/16



ROADWAY DESIGN DIVISION

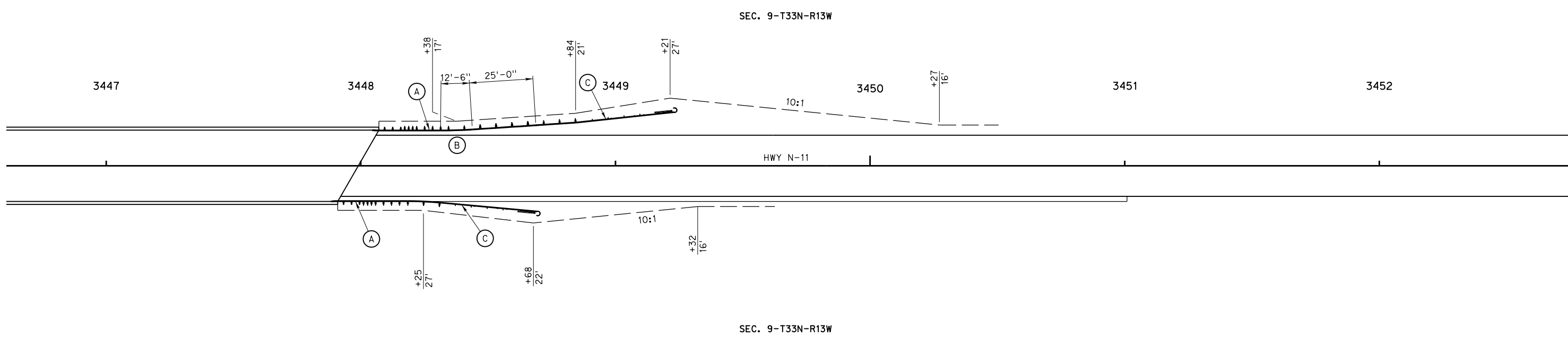
TNDRVIEL

4/29/2019

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1:40

LEGEND

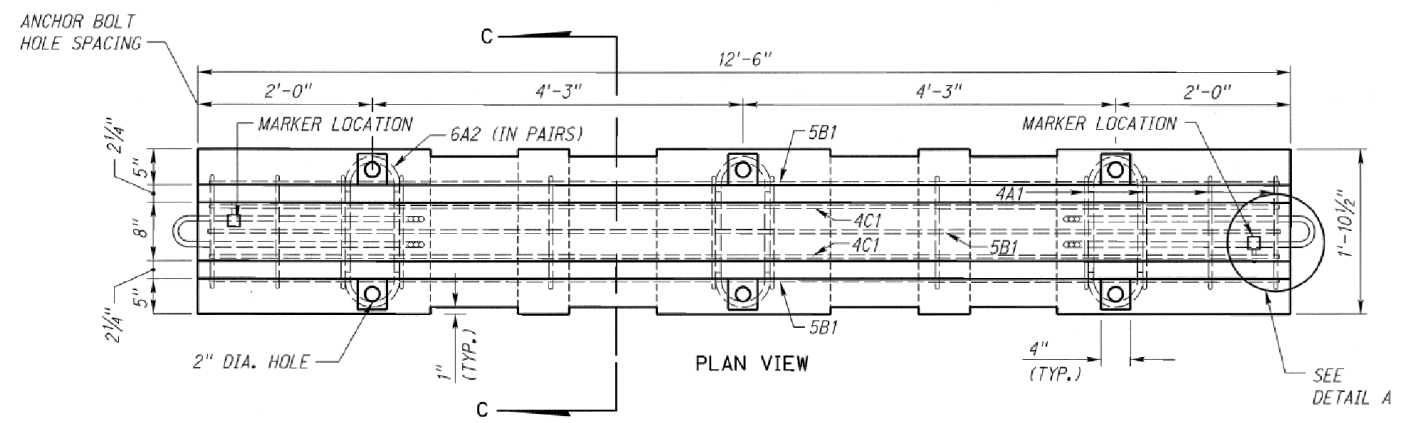
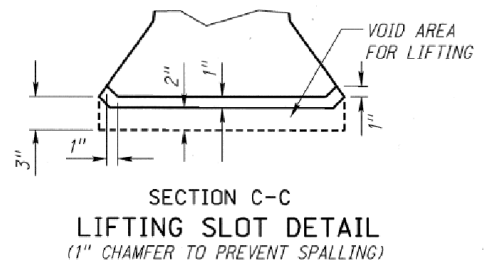
- (A) BRIDGE APPROACH SECTION (25'-0")
- (B) R=187.77' (TABLE "D")
- (C) END TREATMENT, TYPE II (53'-1 1/2 ")
- - GRADING LINE



GUARDRAIL INSTALLATION AT STA. 3444+27
STRUCTURE NO. S011 17645



ROADWAY DESIGN DIVISION



NOTES:

THESE DETAILS ARE FOR THE FABRICATION AND INSTALLATION OF CONCRETE PROTECTION BARRIER. DETAILS SHOWN ARE TYPICAL.

CONCRETE PROTECTION BARRIERS SHALL BE MADE OF 5,000 PSI CONCRETE AND BE PRECAST IN ACCORDANCE WITH APPLICABLE PORTIONS OF SECTION 705 IN THE STANDARD SPECIFICATIONS. THE FORMS MAY BE REMOVED WHEN THE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH OF 2,175 PSI. THE BARRIERS MAY BE TRANSPORTED WITHIN THE PLANT ONCE THE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH OF 3,000 PSI. THE BARRIERS MAY BE SHIPPED WHEN THE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH OF 5,000 PSI.

REINFORCING STEEL USED WITHIN THE CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 615 GRADE 60.

THE LOOP REINFORCING STEEL (BARS 6D1, 6D2 & 6D3) SHALL BE SMOOTH, MEETING THE REQUIREMENTS OF ASTM A 706 GRADE 60 OR ASTM A 615 GRADE 60, MODIFIED TO MEET THE FOLLOWING PHYSICAL AND CHEMICAL REQUIREMENTS. THE LOOP SHALL PASS A 180° BEND TEST ON A 2 3/4\"/>

TENSILE REQUIREMENTS		CHEMICAL COMPOSITION	
YIELD STRENGTH, MINIMUM PSI	60,000	ELEMENT	MAXIMUM%
TENSILE STRENGTH, MINIMUM PSI	80,000	CARBON	0.30
ELONGATION IN 8 INCH, MINIMUM	14%	MANGANESE	1.50
		PHOSPHORUS	0.035
		SULFUR	0.045
		SILICON	0.50

THE CONTRACTOR OR SUPPLIER SHALL FURNISH THE MATERIALS & RESEARCH DIVISION THE MANUFACTURERS CERTIFIED TEST REPORTS FOR THE ACTUAL HEAT OF STEEL BEING USED THAT SHOWS THE CHEMICAL AND PHYSICAL TEST RESULTS FOR THE LOOP REINFORCING STEEL BEFORE COATING OR FABRICATION BEGINS.

THE STEEL SHALL BE ZINC-COATED (GALVANIZED) AS SPECIFIED BELOW OR EPOXY COATED TO NEBRASKA STANDARDS.

ZINC-COATED (GALVANIZED) STEEL BARS SHALL MEET THE REQUIREMENTS OF ASTM A 123, (COATING GRADE 100, MINIMUM COATING--2.30 OZ. PER SQUARE FOOT). THE BARS SHALL BE FABRICATED PRIOR TO GALVANIZING. THE PROCEDURES OF ASTM A 143 SHALL BE OBSERVED AS APPLICABLE. ALL ZINC COATING DAMAGE DUE TO FABRICATION OR HANDLING SHALL BE REPAIRED WITH A ZINC DUST (ZINC-RICH) FORMULATION IN ACCORDANCE WITH ASTM A 780.

THE COATING PLANT INTENDING TO SUPPLY THE LOOP REINFORCING STEEL SHALL NOTIFY THE MATERIALS AND RESEARCH DIVISION (402-479-4746 OR 402-479-3849) TWO TO THREE WEEKS BEFORE PROCESSING ANY MATERIAL TO ARRANGE FOR NDOT PERSONNEL TO INSPECT THE MATERIAL DURING THE COATING AND FABRICATION PROCESS.

THE CONTRACTOR SHALL PROVIDE THE ENGINEER A LETTER CERTIFYING THE CONCRETE PROTECTION BARRIERS FOR USE ON THIS PROJECT ARE MADE IN ACCORDANCE WITH THESE PLANS.

CONCRETE PROTECTION BARRIERS ARE THE PROPERTY OF THE CONTRACTOR.

THE CONTRACTOR SHALL PROVIDE FOR AN APPROVED MONITORING SCHEDULE, WITH A PERSON ON CALL, AND AVAILABLE 24 HOURS A DAY, EACH DAY OF THE WEEK, TO REALIGN CONCRETE PROTECTION BARRIER WHICH HAS BEEN STRUCK. INITIATION OF SERVICE SHALL BE WITHIN ONE HOUR OF NOTIFICATION OF NEED.

- ① 4\"/>
- ② ONE END OF EACH BARRIER SHALL BE PERMANENTLY MARKED WITH THE FOLLOWING INFORMATION:

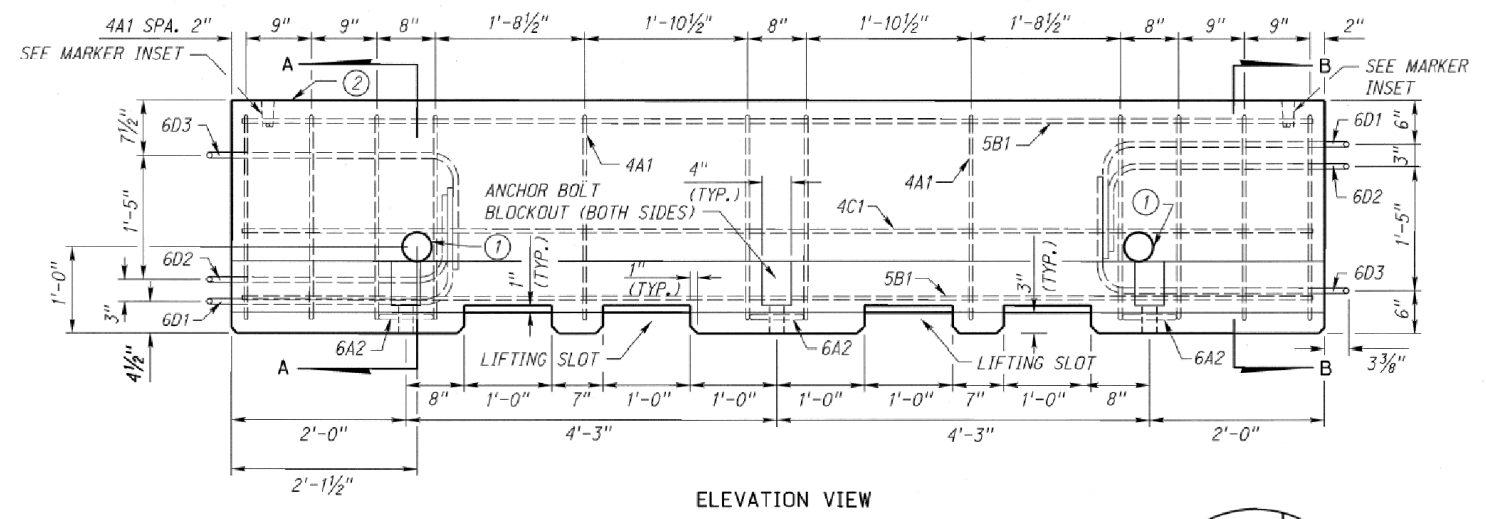
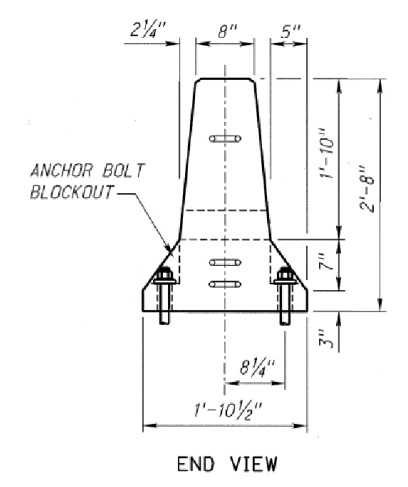
- TYPE C
- MANUFACTURER
- DATE MANUFACTURED (MONTH AND YEAR)

USE 1/8\"/>

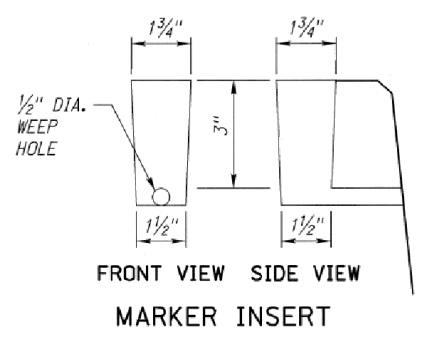
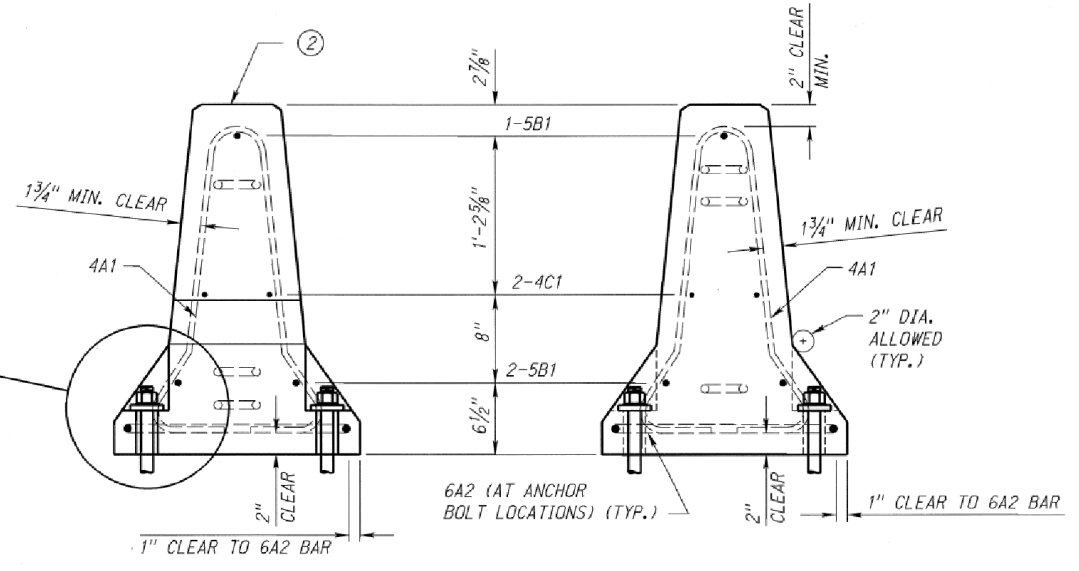
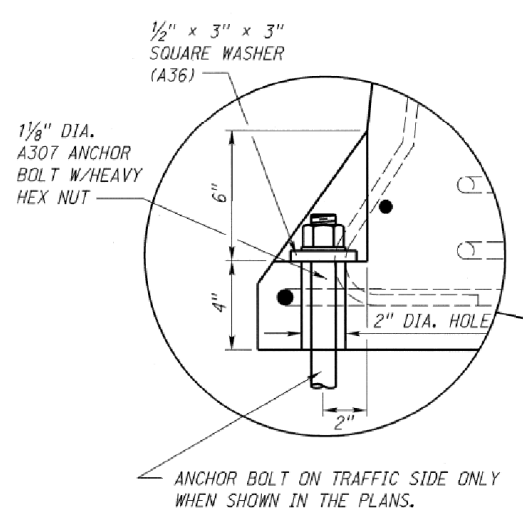
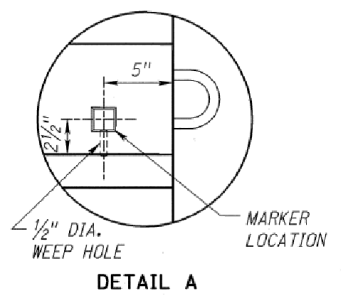
SURFACE PREPARATION: WHEN PLACED ON A PAVED SURFACE ALL LOOSE DIRT AND SAND SHALL BE REMOVED FROM THE ROADWAY SURFACE PRIOR TO PLACEMENT OF THE BARRIER.

BARRIERS MUST BE PULLED TIGHT DURING INSTALLATION TO REMOVE SLACK.

AT NO TIME SHALL THE BARRIERS BE LIFTED BY USE OF THE LOOP BARS: 6D1, 6D2 OR 6D3.



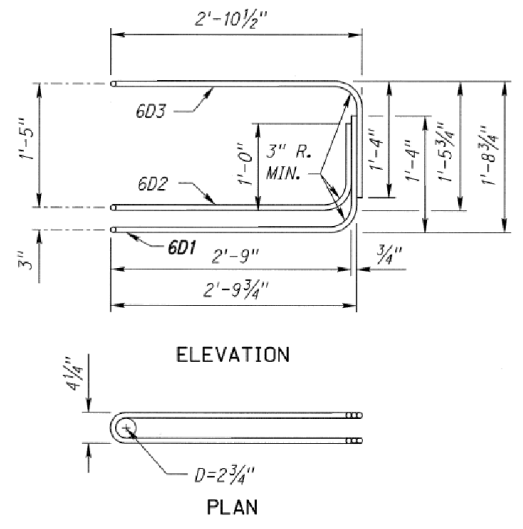
* MARKED END



CONCRETE PROTECTION BARRIER
SHEET 1 OF 2
SPECIAL PLAN 2C

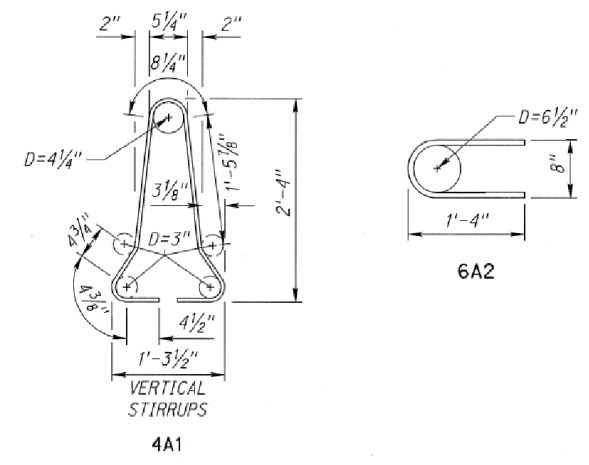
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Computer: NDOTDESIGN13
SHEET 1 OF 2

ROADWAY DESIGN DIVISION



LOOP BAR ASSEMBLY

(MARKED END SHOWN, ROTATE FOR OTHER END)
(MATERIAL AS STATED IN GENERAL NOTES)
(DIMENSIONS ARE OUT TO OUT OF BARS UNLESS OTHERWISE NOTED)



REINFORCING STEEL A615 GRADE 60 PER 12'-6" BARRIER					
BAR	BAR SIZE	SHAPE	NO. OF BARS	LENGTH FT.	WEIGHT LBS.
4A1	4		12	6'-0"	48.1
6A2	6		6	2'-11"	26.3
5B1	5		3	12'-2"	38.1
4C1	4		2	12'-2"	16.3
LOOP STEEL (SEE NOTES)					
6D1	6		2	8'-5"	25.3
6D2	6		2	7'-7"	22.8
6D3	6		2	8'-6"	25.5

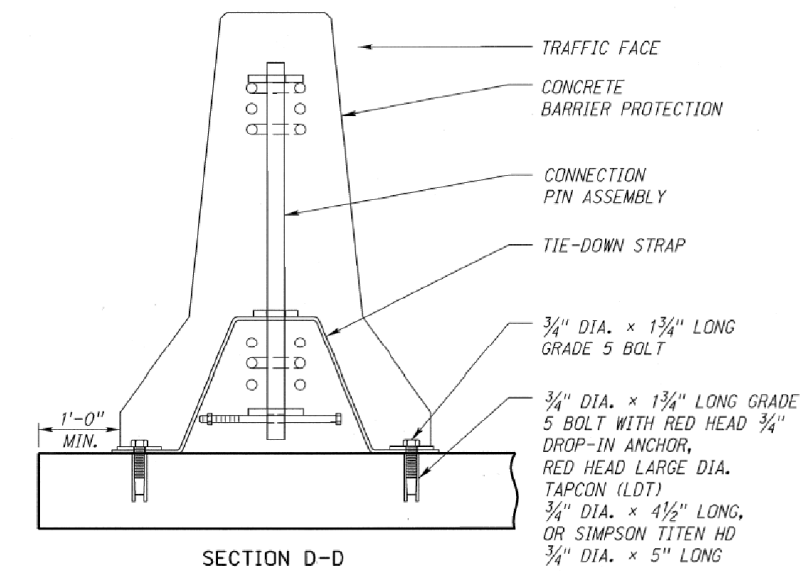
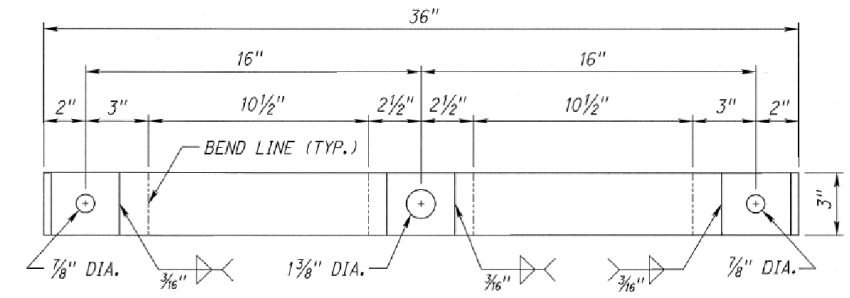
CONCRETE QUANTITY = 1.3 CU. YD.

TIE-DOWN NOTES:

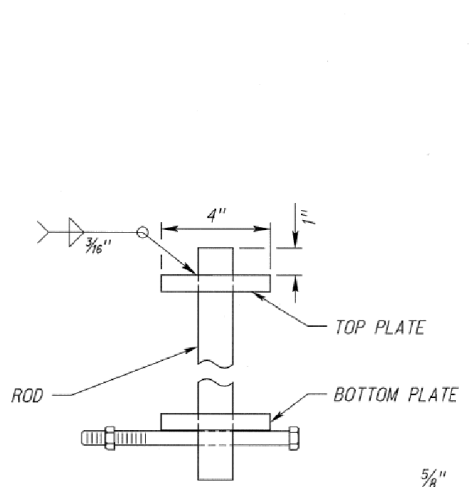
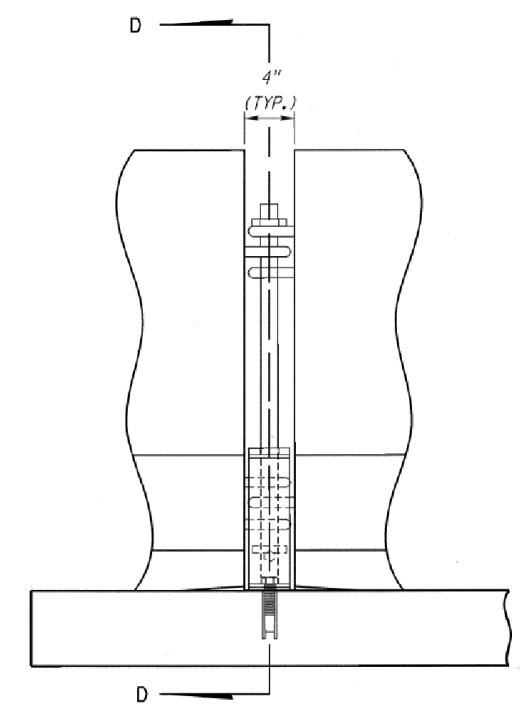
TIE DOWN STRAPS ARE REQUIRED ONLY WHERE THE CONCRETE PROTECTION BARRIER IS WITHIN 2 FEET OF A 3 FEET OR GREATER DROP-OFF. HOLES INTO THE PAVEMENT TO ANCHOR THE CONCRETE PROTECTION BARRIER MAY BE DRILLED AFTER POSITIONING THE CONCRETE PROTECTION BARRIER RAIL.

WHEN THE ANCHOR BOLTS ARE REMOVED, THE HOLES SHOULD BE FILLED WITH A NON-SHRINK GROUT FROM THE APPROVED PRODUCT LIST, MEETING THE REQUIREMENTS OF ASTM C 1107 FOR GRADE B OR C.

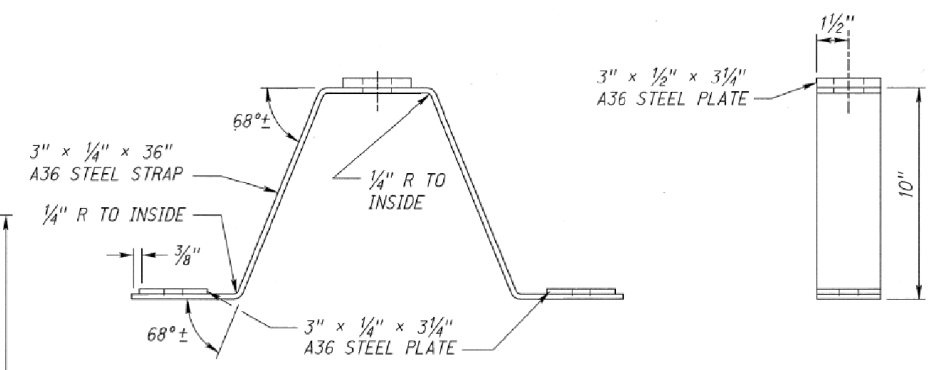
CONCRETE PROTECTION BARRIER TIE DOWNS ARE CONSIDERED SUBSIDIARY TO THE PAY ITEM "CONCRETE PROTECTION BARRIER".



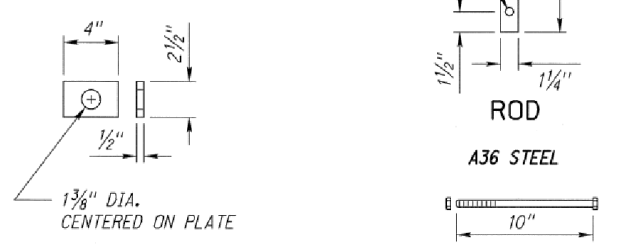
TIE DOWN DETAILS (STRAP)



ENLARGED PIN DETAIL

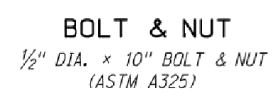


TIE-DOWN STRAP DETAILS



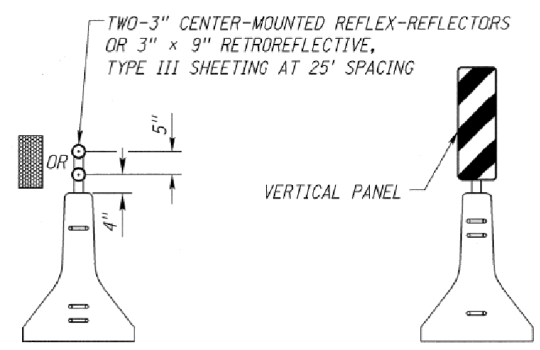
TOP & BOTTOM PLATE

A36 STEEL



BOLT & NUT

1/2" DIA. x 10" BOLT & NUT (ASTM A325)



MARKER PLACEMENT DETAIL

MARKER NOTES:

REFLECTORS MOUNTED ON LEFT SIDE OF TRAFFIC SHALL BE AMBER, RIGHT SIDE SHALL BE CRYSTAL.

VERTICAL PANELS MOUNTED ON LEFT SIDE OF TRAFFIC SHALL BE VP-1L, RIGHT SIDE SHALL BE VP-1R, AT EVERY 2 x S = (FT) SPACING ON TOP OF BARRIER, EVERY S (FT) SPACING ALONG BARRIER TAPER. INSTALL VERTICAL PANEL IN PLACE OF REFLECTOR WHEN BOTH FALL IN SAME LOCATION. (S = POSTED SPEED LIMIT IN MPH)

THE CONTRACTOR SHALL FURNISH VERTICAL PANELS, REFLECTORS AND A BRACKET TO SUPPORT THE VERTICAL PANELS AND REFLECTORS IN A STABLE POSITION ON THE CONCRETE PROTECTION BARRIERS. THE BRACKET SHALL BE CONSTRUCTED OF A MATERIAL THAT MAY BEND, BUT NOT COME LOOSE IF STRUCK BY A PASSING VEHICLE. THE CONTRACTOR SHALL MAINTAIN THE MARKERS AND PROMPTLY REPAIR OR REPLACE ANY DAMAGED OR MISSING UNITS. ALL COSTS FOR FURNISHING, INSTALLING AND MAINTAINING REFLECTORS SHALL BE INCLUDED IN THE PRICE BID FOR THE CONCRETE PROTECTION BARRIER.

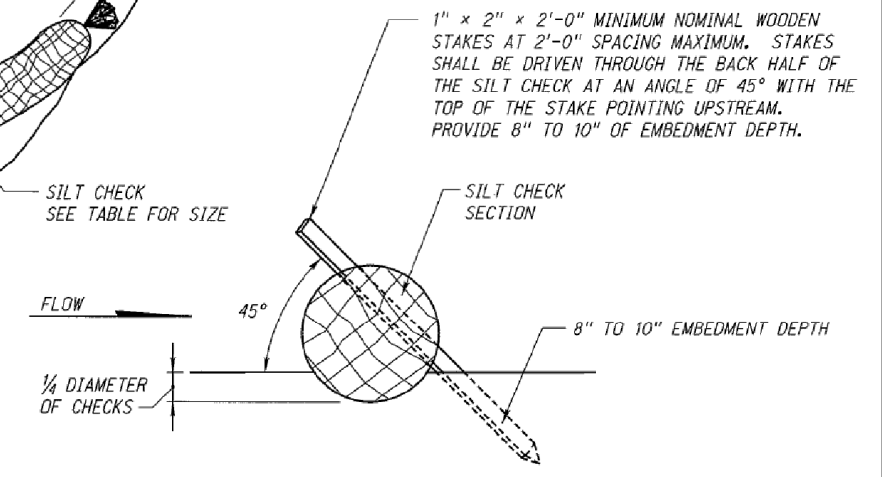
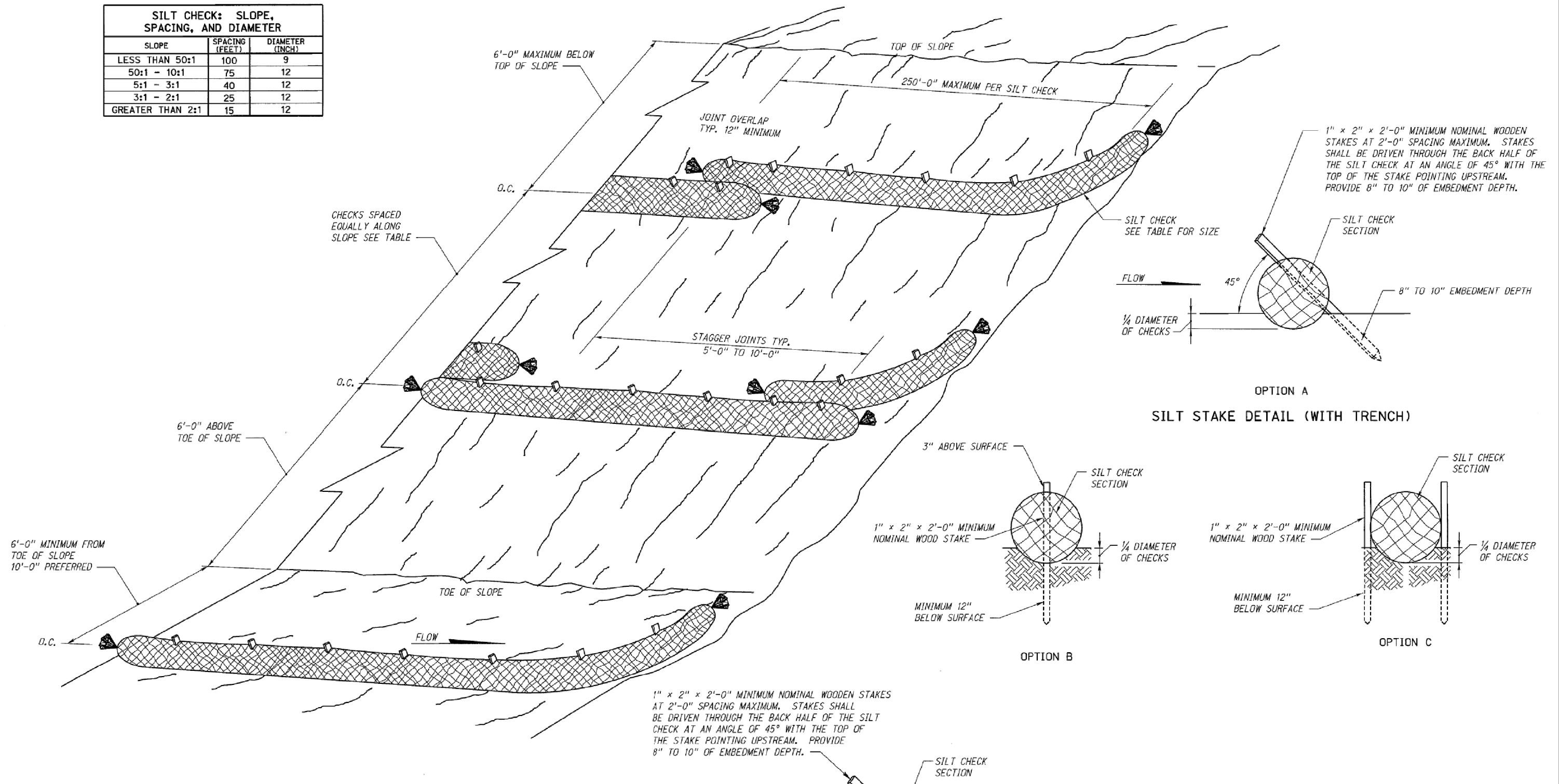


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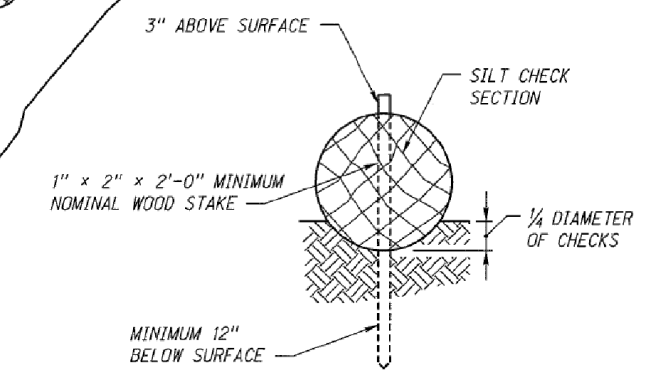
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SHEET 2 OF 2

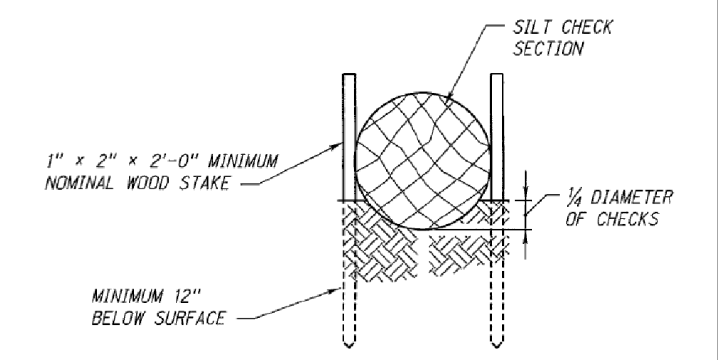
SILT CHECK: SLOPE, SPACING, AND DIAMETER		
SLOPE	SPACING (FEET)	DIAMETER (INCH)
LESS THAN 50:1	100	9
50:1 - 10:1	75	12
5:1 - 3:1	40	12
3:1 - 2:1	25	12
GREATER THAN 2:1	15	12



OPTION A
SILT STAKE DETAIL (WITH TRENCH)

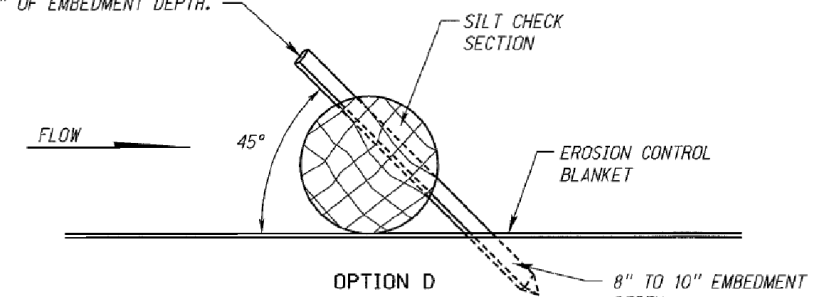


OPTION B



OPTION C

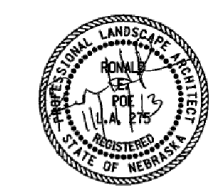
1" x 2" x 2'-0" MINIMUM NOMINAL WOODEN STAKES AT 2'-0" SPACING MAXIMUM. STAKES SHALL BE DRIVEN THROUGH THE BACK HALF OF THE SILT CHECK AT AN ANGLE OF 45° WITH THE TOP OF THE STAKE POINTING UPSTREAM. PROVIDE 8" TO 10" OF EMBEDMENT DEPTH.



OPTION D
STAKE DETAIL (NO TRENCH)

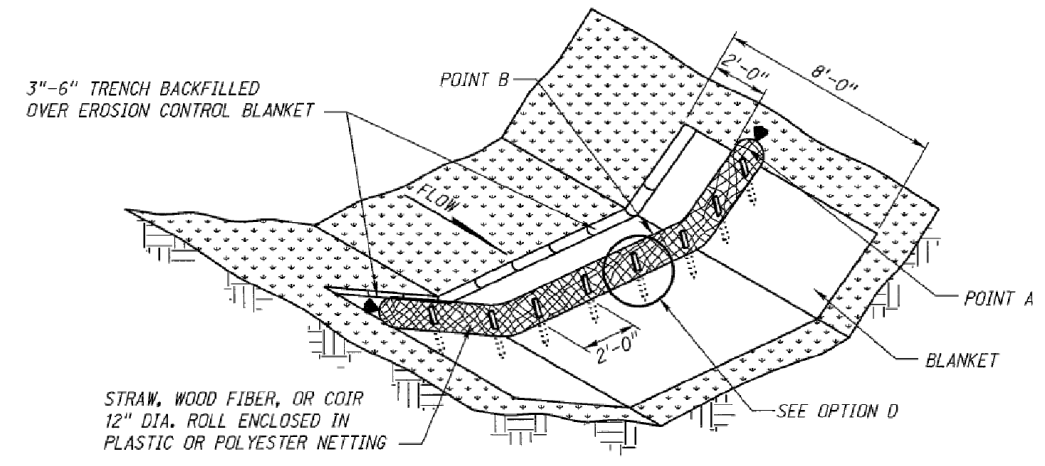
NOTE:
TRENCHING IS OPTIONAL FOR CHECKS ON BACKSLOPES & FORESLOPES

SLOPE APPLICATION
PERSPECTIVE VIEW



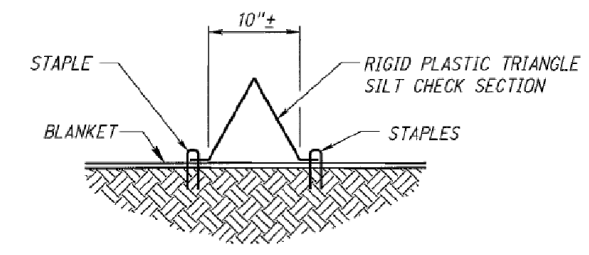
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 SHEET: 1 of 4

ROADWAY DESIGN DIVISION

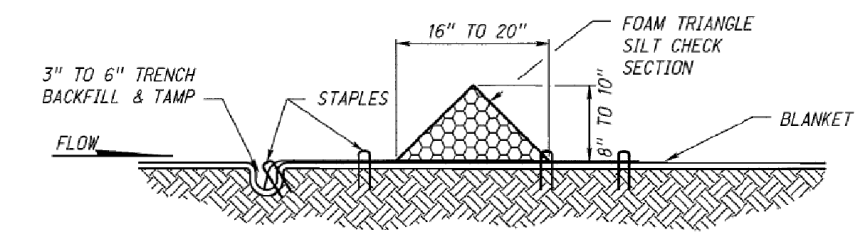


TYPE 2 & 3: HIGH & LOW WITH EROSION CONTROL

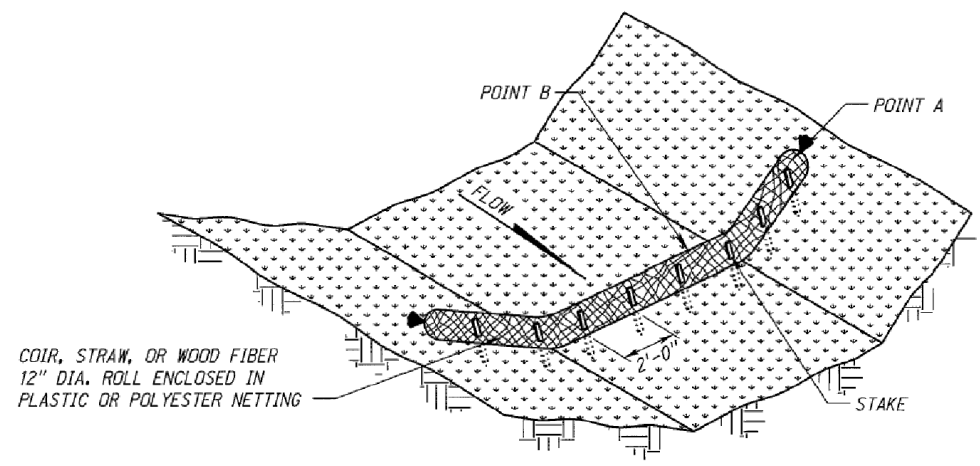
3"-6" TRENCH BACKFILLED OVER EROSION CONTROL BLANKET
STRAW, WOOD FIBER, OR COIR 12" DIA. ROLL ENCLOSED IN PLASTIC OR POLYESTER NETTING
SEE OPTION D



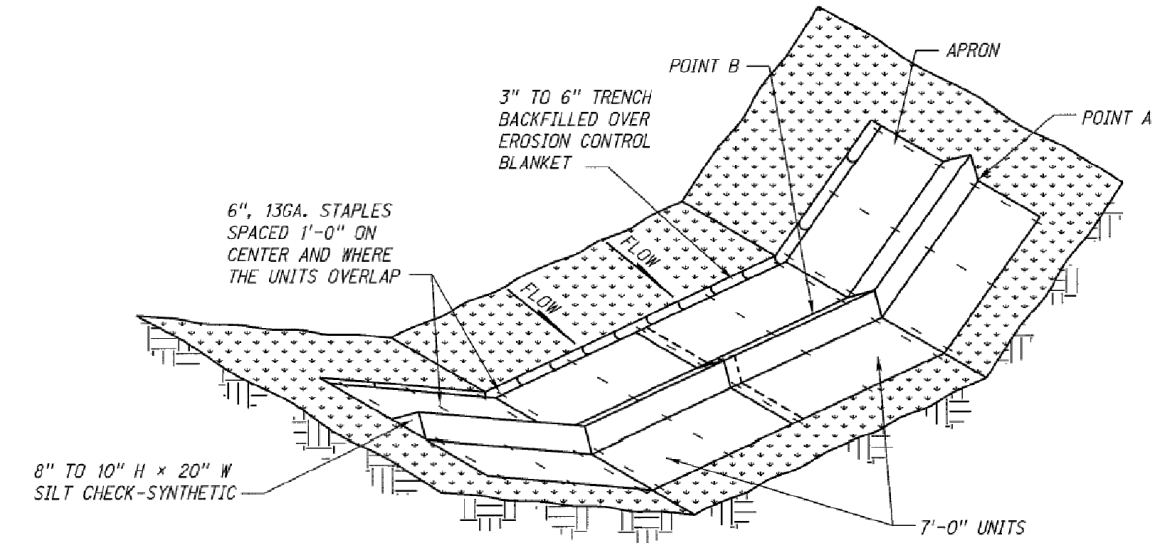
TYPE 4 SECTION



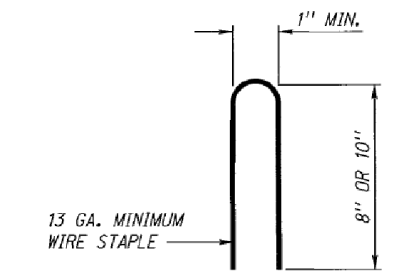
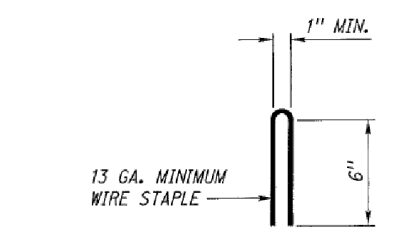
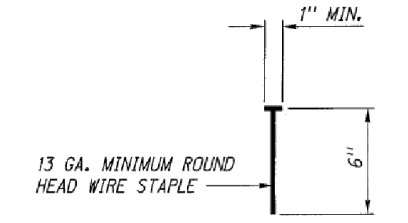
TYPE 4 SECTION



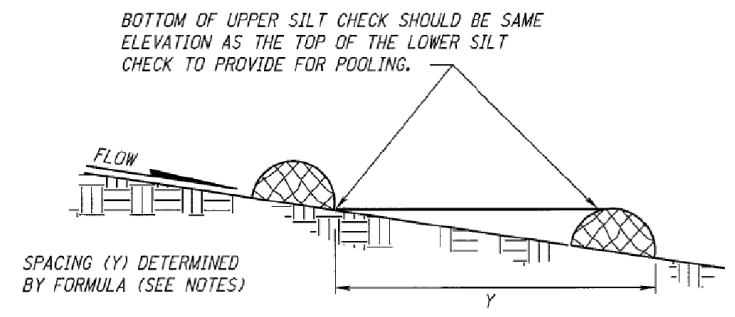
TYPE 1, 2 & 3: HIGH & LOW USE ON ROUGH GRADED & BARE SOIL AREAS



SILT CHECK: TYPE 4



WIRE STAPLE DETAIL



SILT CHECK SPACING-DITCH

NOTES:

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

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{SILT CHECK HEIGHT (FT.)}}{\% \text{ CHANNEL SLOPE}} \times 100$$
- POINT A MUST BE A MINIMUM OF 6" HIGHER THAN POINT B TO ENSURE THAT WATER FLOWS OVER THE CHECK AND NOT AROUND THE ENDS.
- PERMANENT ROCK CHECKS PLACED WITHIN THE CLEAR ZONE WILL NEED TO BE 18" OR LESS IN HEIGHT. A 10:1 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.
- THE TRENCH ON THE UPSTREAM SIDE OF THE SILT CHECK IS NOT REQUIRED IF THE EROSION CONTROL BLANKET CONTINUES IN THE ENTIRE LENGTH OF THE DITCH.
- THE MANUFACTURERS RECOMMENDED INSTALLATION DETAILS SHALL GOVERN OVER THE PLANS.
- SEE STAKING DETAIL SHEET 1 OF 4



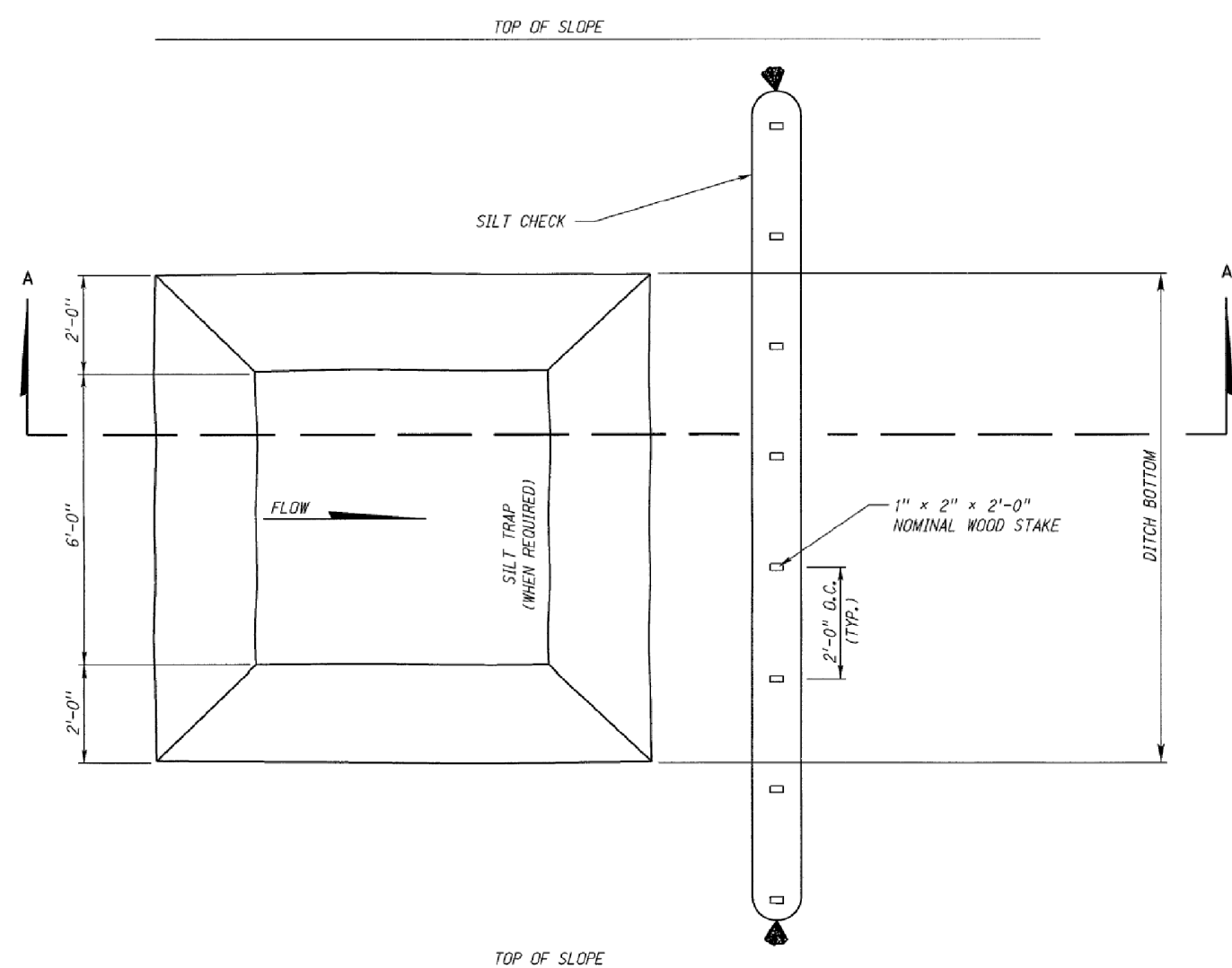
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ROADWAY DESIGN DIVISION

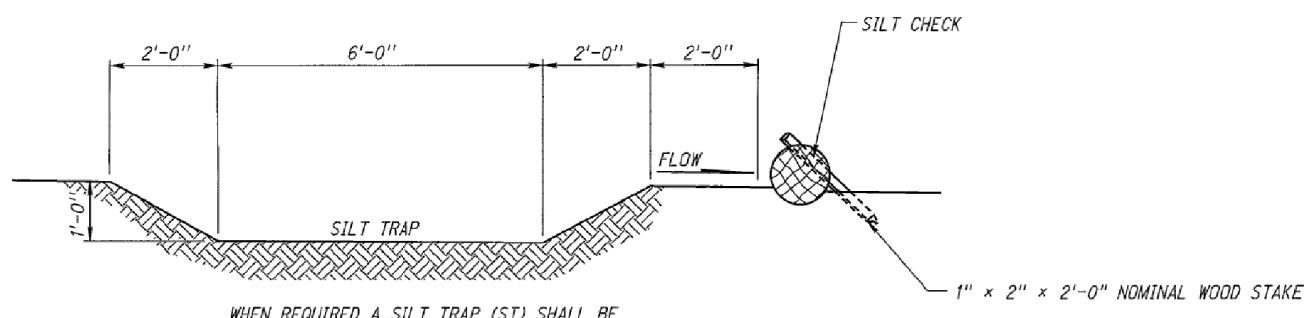
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SHEET 3 OF 4

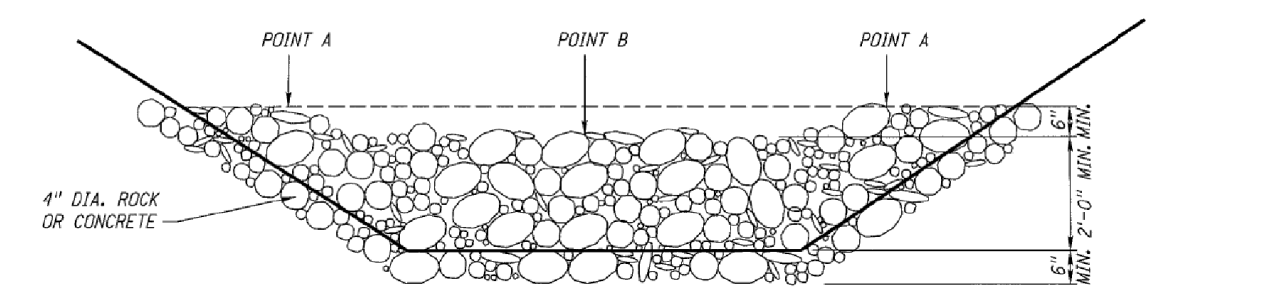


PLAN VIEW
FOR FLAT BOTTOM DITCH

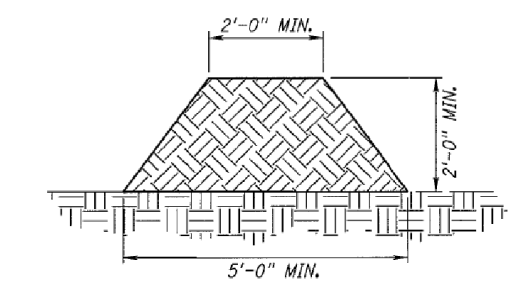


WHEN REQUIRED A SILT TRAP (ST) SHALL BE
EXCAVATED TO THE WIDTH OF THE DITCH AND
NO DIRECT PAYMENT WILL BE MADE.

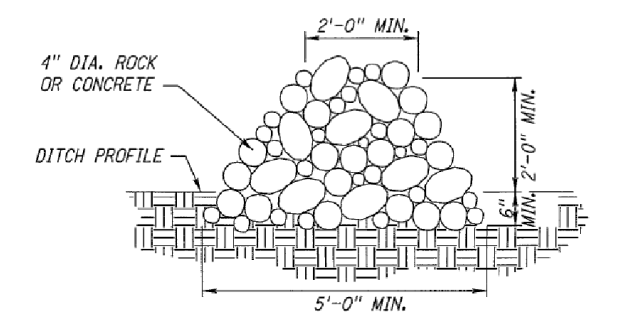
SECTION A-A



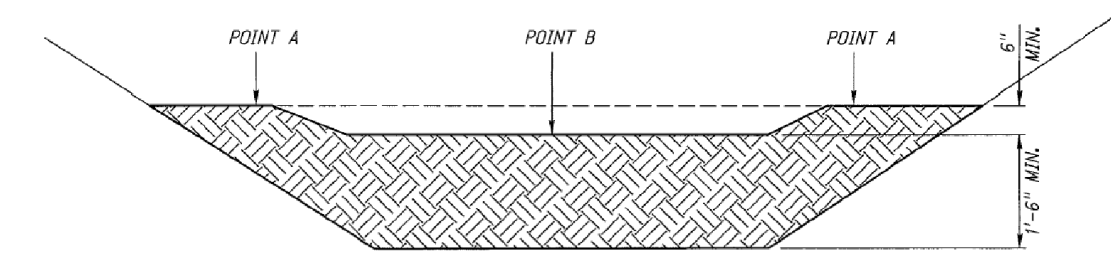
ROCK CHECK
ELEVATION VIEW



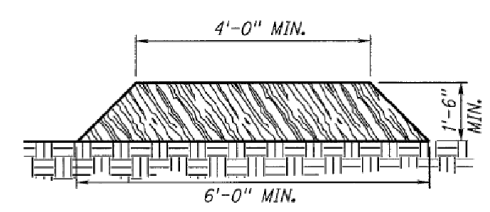
EARTH-SLASH MULCH PERIMETER BERM
CROSS SECTION



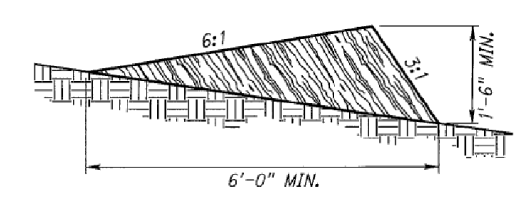
ROCK CHECK
CROSS SECTION



EARTH-SLASH MULCH CHECK
ELEVATION VIEW



CROSS SECTION
SILT CHECK-SLASH MULCH
OPTION A



CROSS SECTION
SILT CHECK-SLASH MULCH
OPTION B

SEE STAKING DETAIL SHEET 1 OF 4

SILT CHECKS ALL TYPES
SHEET 3 OF 4



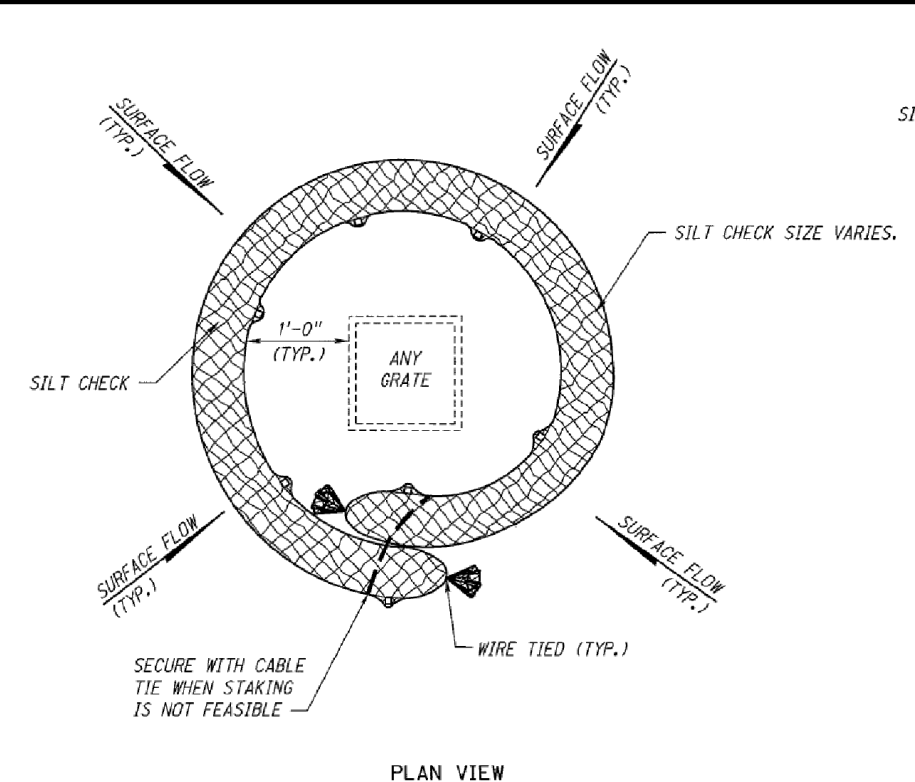
SPECIAL PLAN 3C

ROADWAY DESIGN DIVISION

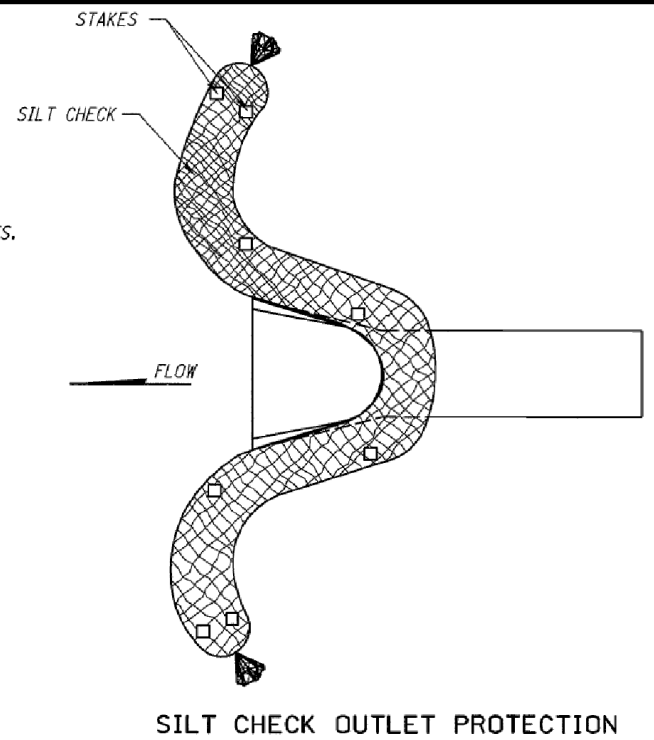
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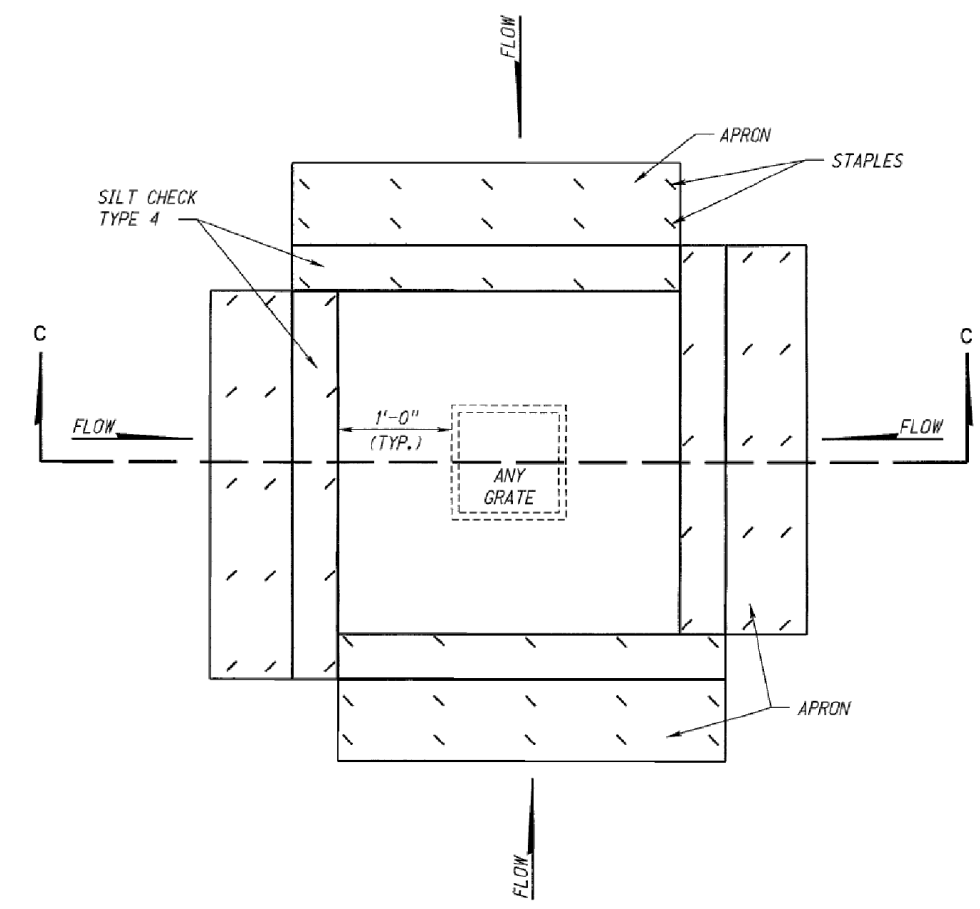
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SHEET 4 OF 4



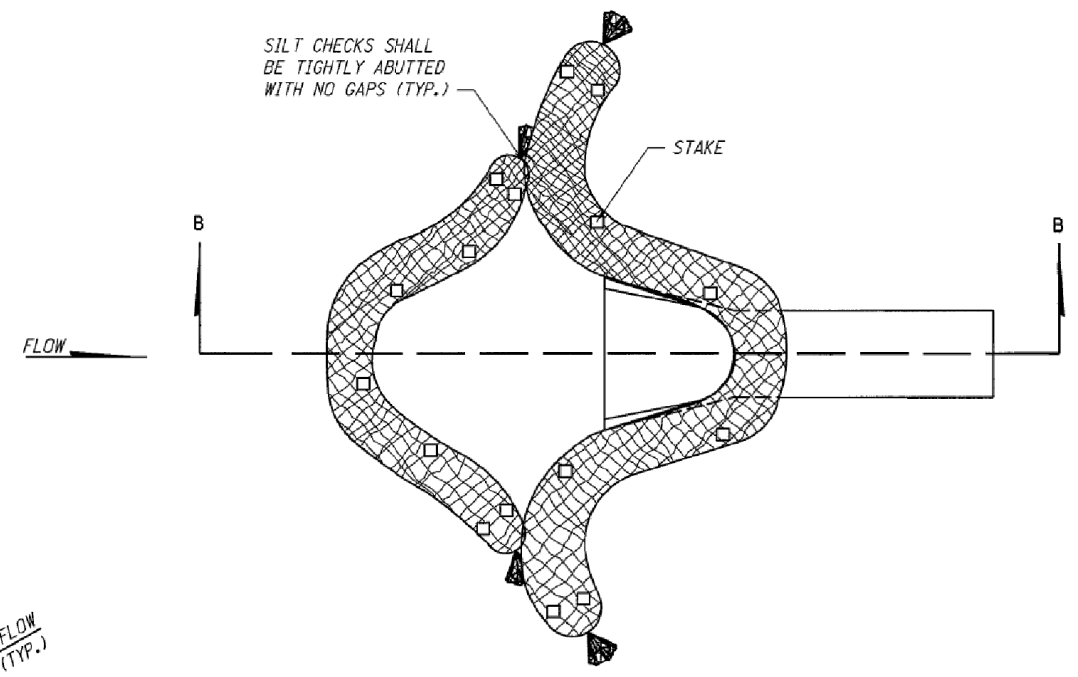
PLAN VIEW



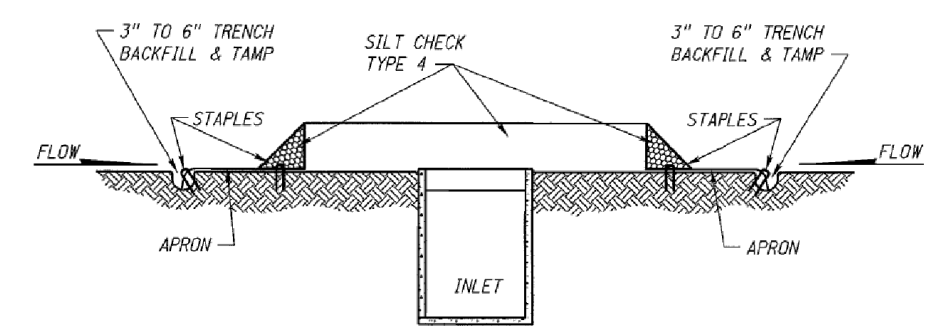
SILT CHECK OUTLET PROTECTION



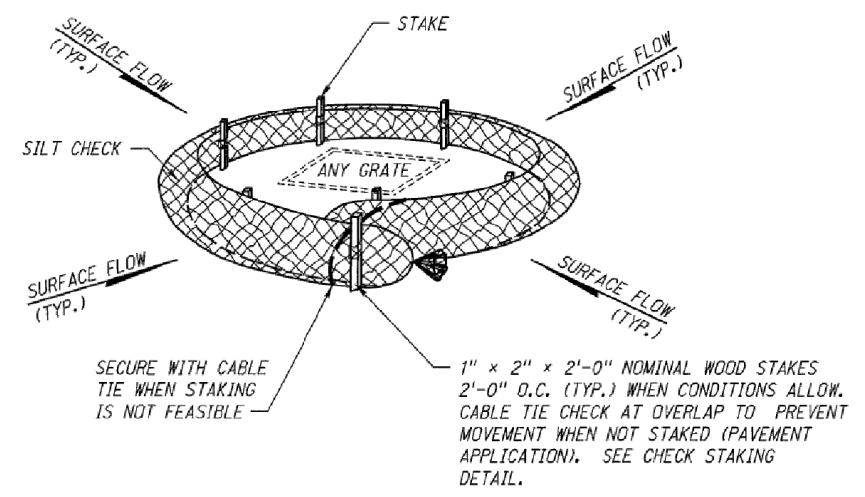
PLAN VIEW



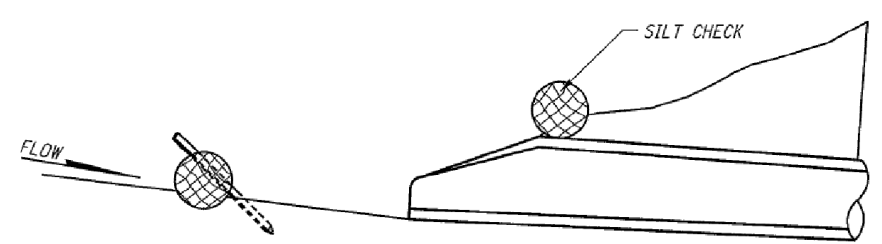
PLAN VIEW
SILT CHECK INLET PROTECTION



SECTION C-C
SILT CHECK TYPE 4
AT INLET



SILT CHECK INLET FILTER
PERSPECTIVE VIEW



SECTION B-B

SEE STAKING DETAIL SHEET 1 OF 4



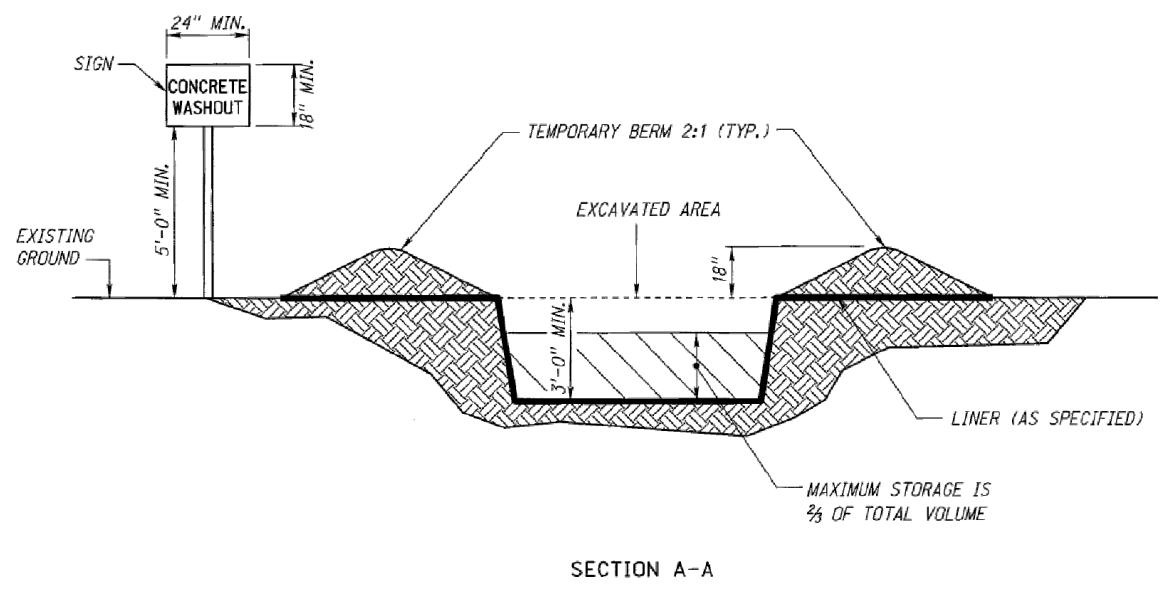
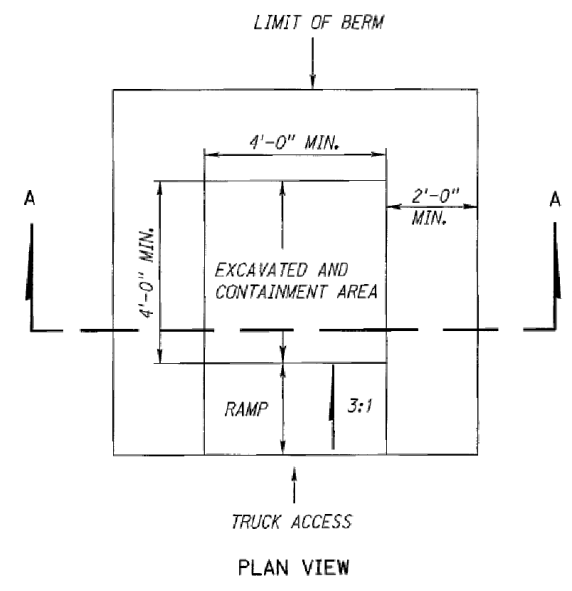
SILT CHECKS ALL TYPES
SHEET 4 OF 4
SPECIAL PLAN 3C

ROADWAY DESIGN DIVISION

Computer: NDOTDESIGN13

Date: 01-MAY-2019 15:03

File: 810380503.dgn
SHEET 1 OF 1

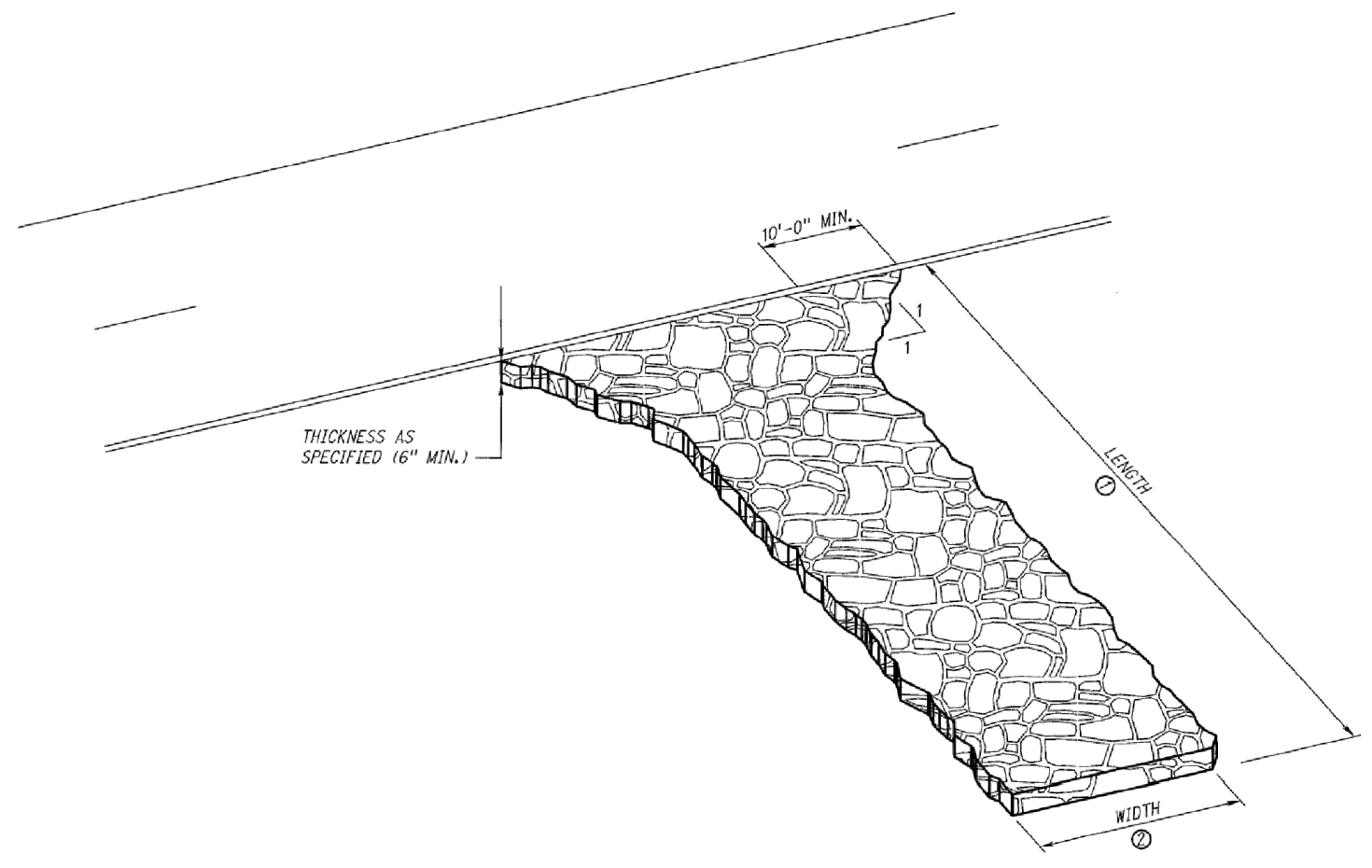


NOTES:
EROSION BALES MAY BE USED AS AN ALTERNATIVE FOR THE BERM AREA, EXCEPT AT THE OPENING.

THE CONCRETE WASHOUT SIGN SHALL HAVE LETTERS AT LEAST 3 INCHES HIGH.

STRUCTURE MUST BE LINED WITH MATERIAL NOTED IN SPECIAL PROVISIONS.

CONCRETE WASHOUT STRUCTURE



NOTES:

REMOVE VEGETATION AND EXCAVATE SOFT SOILS FROM EXIT AREA. THOROUGHLY COMPACT SUBGRADE PRIOR TO PLACING STONE.

INSTALL CULVERT UNDER EXIT IF NECESSARY TO MAINTAIN DRAINAGE.

GRADE EXIT TO PREVENT RUNOFF FROM FLOWING ONTO STREET. DIRECT ALL RUNOFF FROM EXIT TO A SEDIMENT RETENTION DEVICE.

WHEN SPECIFIED, INSTALL SUBGRADE STABILIZATION FABRIC PRIOR TO PLACING CRUSHED STONE.

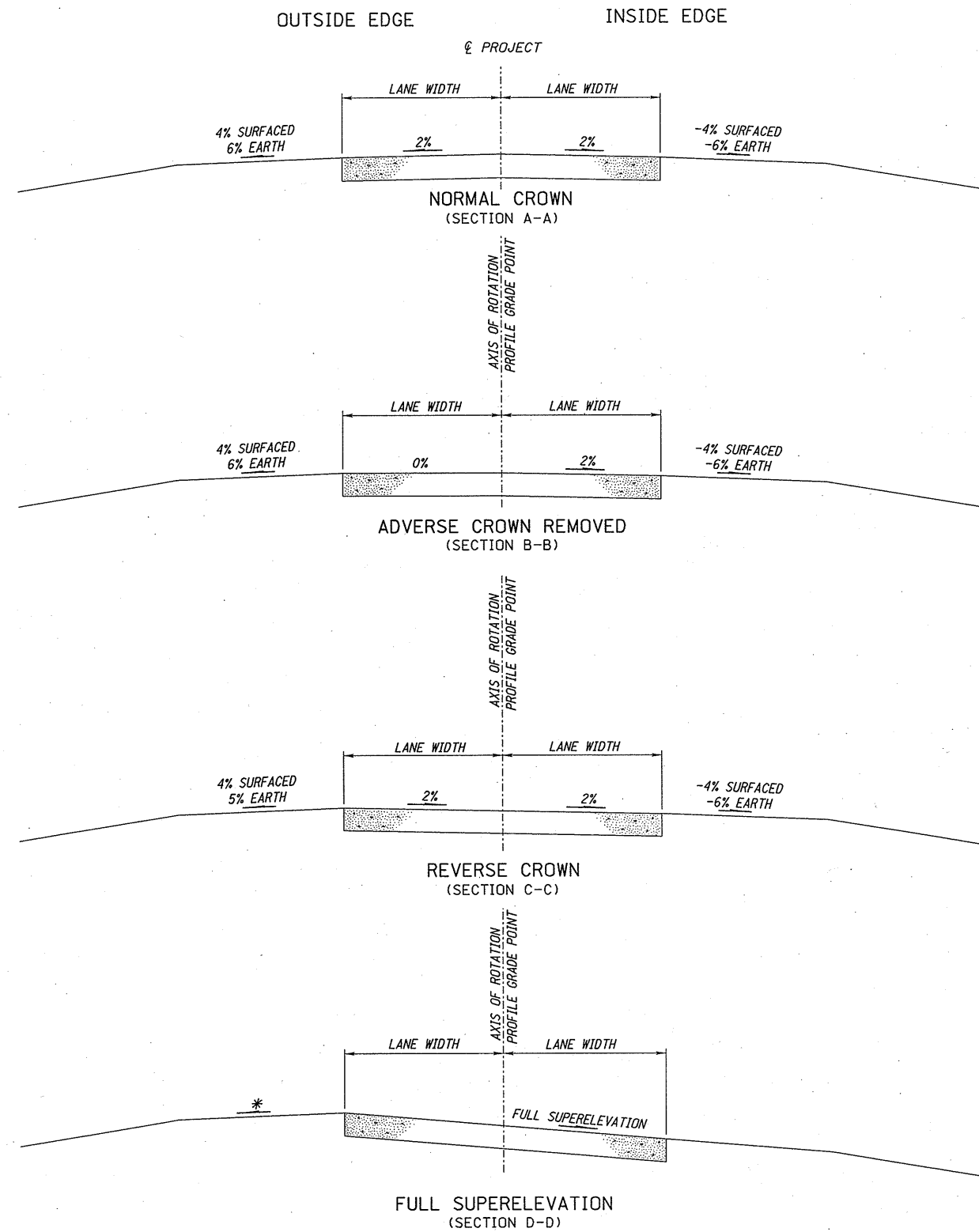
INSTALL LAYER OF CRUSHED STONE TO THE THICKNESS (6 INCH MINIMUM) AND DIMENSIONS SPECIFIED.

- ① EXIT LENGTH: 30 FT. MINIMUM OR AS SPECIFIED. LENGTH OF EXIT MAY BE INCREASED IF SEDIMENT TRACK-OUT OCCURS.
- ② EXIT WIDTH: 20 FT. MINIMUM.

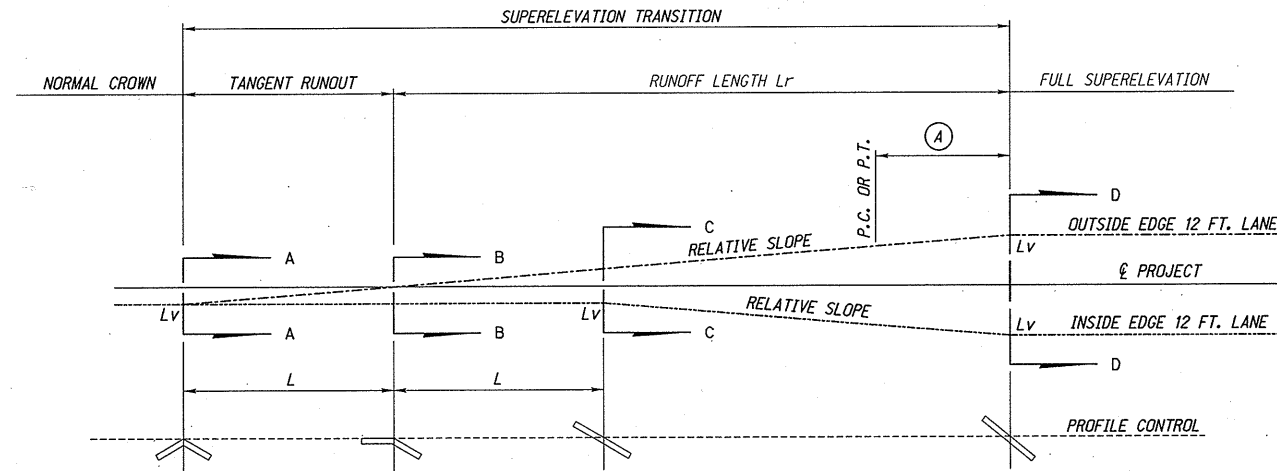
STABILIZED CONSTRUCTION EXIT



CONCRETE WASHOUT &
CONSTRUCTION EXIT
SHEET 1 OF 1
SPECIAL PLAN 4C



* THE SHOULDER SLOPE SHOULD BE MAINTAINED UNTIL THE SUPERELEVATION RATE ON THE ROADWAY IS SUCH THAT THE ALGEBRAIC DIFFERENCE BETWEEN CROSS SLOPES ON THE ROADWAY AND SHOULDER EQUALS 7%.
 THIS ALGEBRAIC DIFFERENCE SHOULD NOT EXCEED 7%.



DIAGRAMMATIC PROFILE SHOWING METHOD OF ATTAINING SUPERELEVATION

NOTES:

e = SUPERELEVATION RATE AS SHOWN IN THE PLANS (IN %)

FOR A 28 FT. TOP SYSTEM THE SUPERELEVATION RATE FOR THE 2 FT. SURFACED SHOULDER WILL BE THE SAME AS FOR THE THRU LANE.

AT POINTS MARKED "Lv" IT MAY BE NECESSARY TO INSERT A SHORT CONVENIENT LENGTH OF PARABOLIC CURVE TO ELIMINATE THE SHARP BREAK IN THE STRAIGHT LINE TRANSITION.

$L = 12$ FT. (WIDTH OF ROADWAY BEING ROTATED) $\times 0.02$ (CHANGE IN ROADWAY CROSS-SLOPE) \times RELATIVE SLOPE.
 $L_r = 12$ FT. (WIDTH OF ROADWAY BEING ROTATED) $\times e/100$ (FULL SUPERELEVATION) \times RELATIVE SLOPE.

FOR A 14 FT. LANE WIDTH L AND L_r SHOULD BE COMPUTED USING THE 12 FT. DRIVING LANE WIDTH.

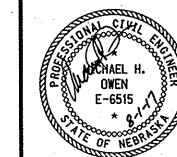
(A) 60% TO 90% OF THE RUNOFF LENGTH SHOULD BE PLACED ON THE TANGENT.

DESIGN SPEED (mph)	MAXIMUM RELATIVE SLOPE
50	200:1
55	213:1
60	222:1
65	233:1
70	250:1

REV. NO.	DATE	DESCRIPTION OF REVISION
R5	JAN. 18	NDOR BORDER TO NDOT BORDER
R4	OCT. 10	RUNOFF PLACEMENT
R3	SEP. 07	RELATIVE SLOPE TABLE

NEBRASKA DEPARTMENT OF TRANSPORTATION
 STANDARD PLAN NO. 108-R5
SUPERELEVATION PLAN
 FOR CONCRETE AND BITUMINOUS SURFACING

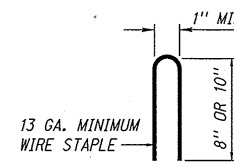
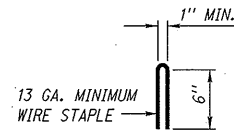
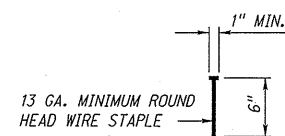
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:



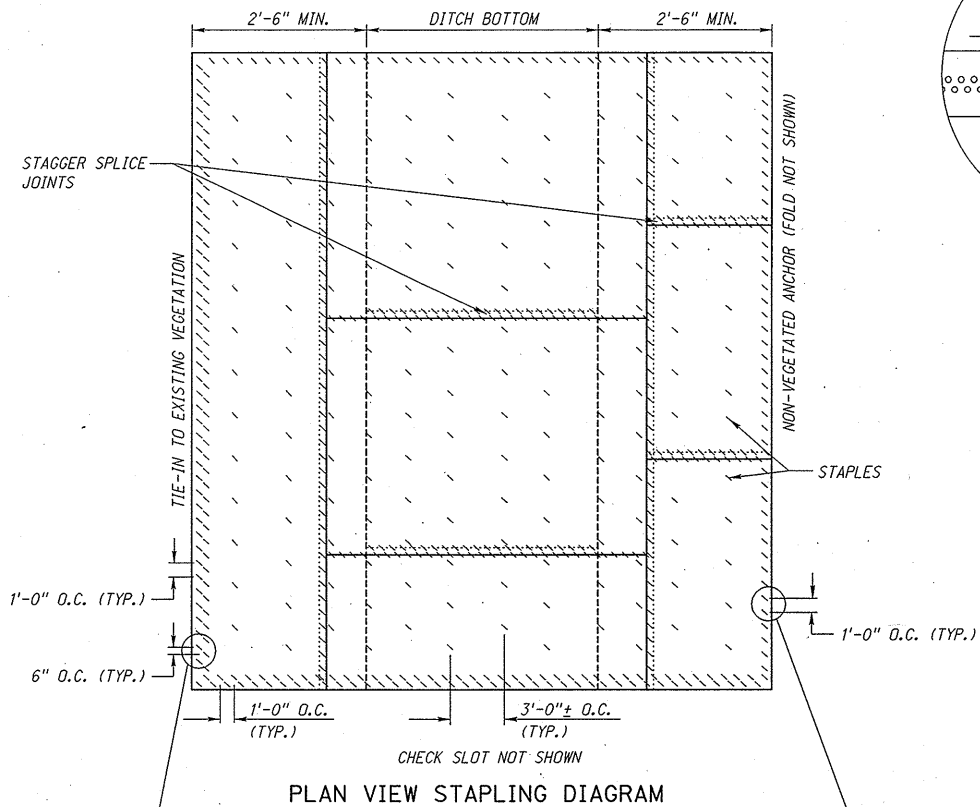
David May
 8-16-2017
 DATE

ORIGINAL:
 JULY 30, 1974
 DATE

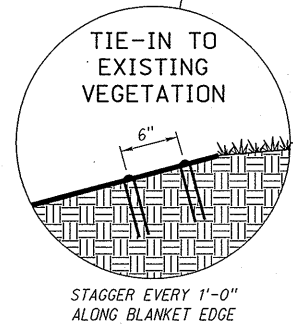
1
 1



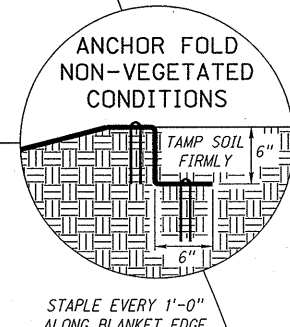
WIRE STAPLE DETAIL



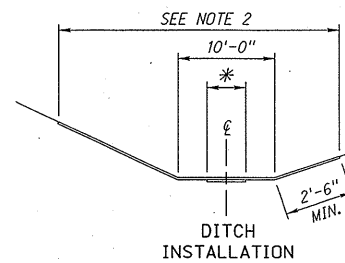
PLAN VIEW STAPLING DIAGRAM



TIE-IN TO EXISTING VEGETATION
STAGGER EVERY 1'-0" ALONG BLANKET EDGE



ANCHOR FOLD NON-VEGETATED CONDITIONS
STAPLE EVERY 1'-0" ALONG BLANKET EDGE

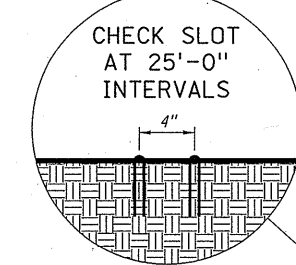
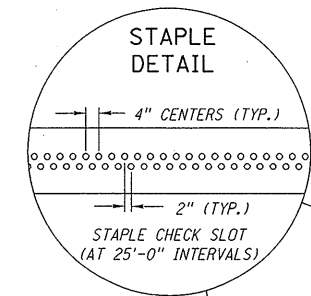


DITCH INSTALLATION

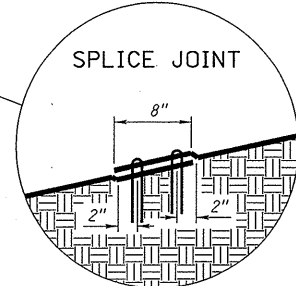
TYPICAL CROSS-SECTION

* THE FIRST ROLL OF BLANKET SHALL BE LAID DOWN THE CENTER OF THE DITCH

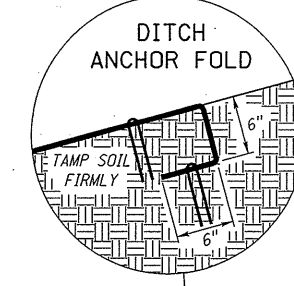
FORESLOPE AND BACKSLOPE INSTALLATION



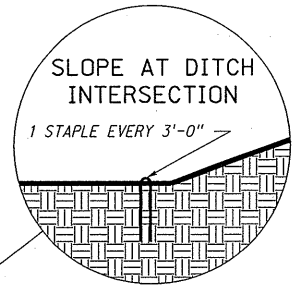
CHECK SLOT AT 25'-0" INTERVALS
STAGGER STAPLES 4" O.C. AS SHOWN ON STAPLE DETAIL



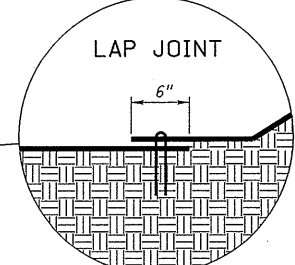
SPLICE JOINT
STAGGER STAPLES 4" O.C. AS SHOWN ON STAPLE DETAIL



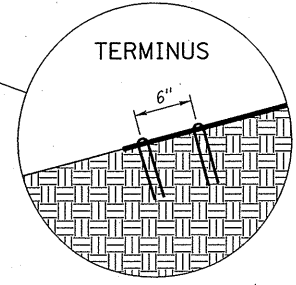
FOR EDGES ADJOINING AREAS TO BE SEEDED
STAPLE EVERY 1'-0" ALONG BLANKET EDGE



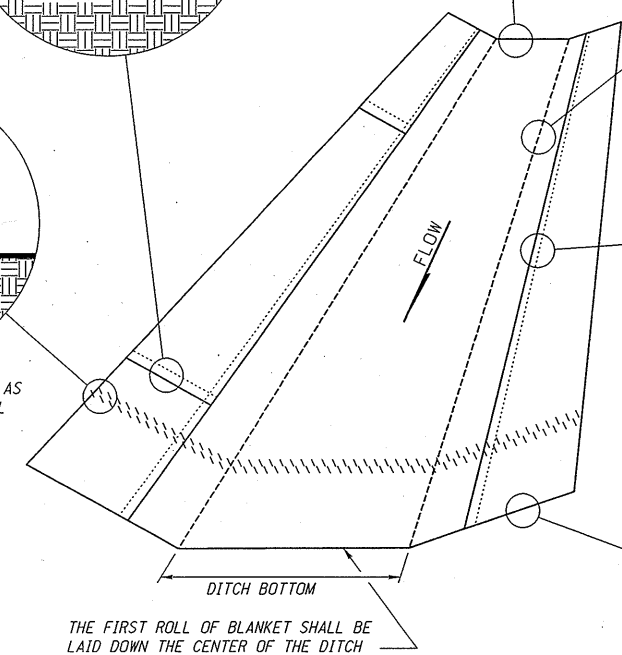
SLOPE AT DITCH INTERSECTION
1 STAPLE EVERY 3'-0"



LAP JOINT
STAPLE EVERY 1'-0" ALONG BLANKET EDGE



TERMINUS
STAGGER EVERY 1'-0" ALONG BLANKET EDGE



TYPICAL EROSION CONTROL BLANKET INSTALLATION

THE FIRST ROLL OF BLANKET SHALL BE LAID DOWN THE CENTER OF THE DITCH

NOTES:

1. THIS PLAN IS APPLICABLE FOR THE FOLLOWING: EROSION CONTROL CLASS 1B, 1C, 1D, 1E, 1F, 2A, 2B & 2C.
2. SOIL RETENTION BLANKET SHALL BE LAID A MINIMUM OF 2'-6" UP THE BACKSLOPE AND FORESLOPE.
3. CHECK SLOTS ARE PLACED PERPENDICULAR TO DITCH CENTER LINE ON 25'-0" INTERVALS.
4. THE MANUFACTURERS' RECOMMENDED STAPLING PATTERNS SHALL GOVERN OVER THE PLANS.

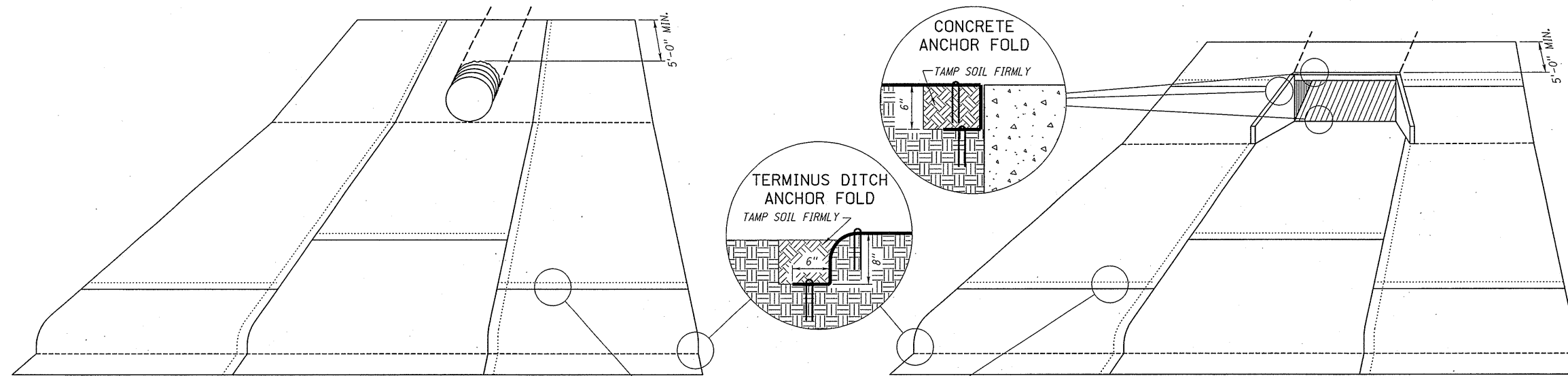
R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	APR 14	UPDATE INSTALLATION METHOD
R5	OCT 07	EROSION CONTROL AT SPLASH BASIN
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 501-R7
EROSION CONTROL

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

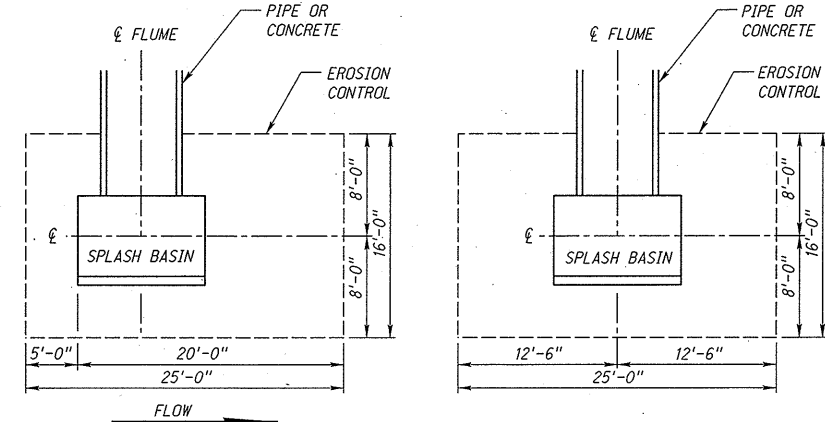
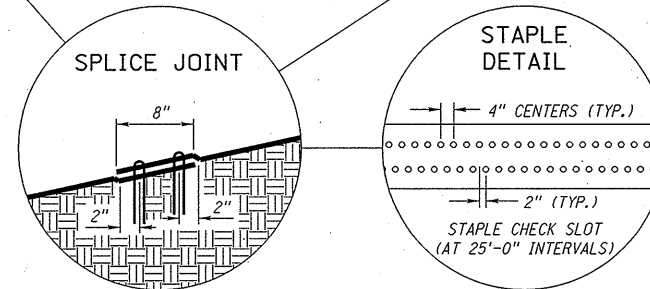


David May
8-16-2017
DATE
ORIGINAL:
NOVEMBER 14, 1973
DATE



TYPICAL INSTALLATION AT PIPE CULVERT
(SHOWING STRAIGHT PIPE)

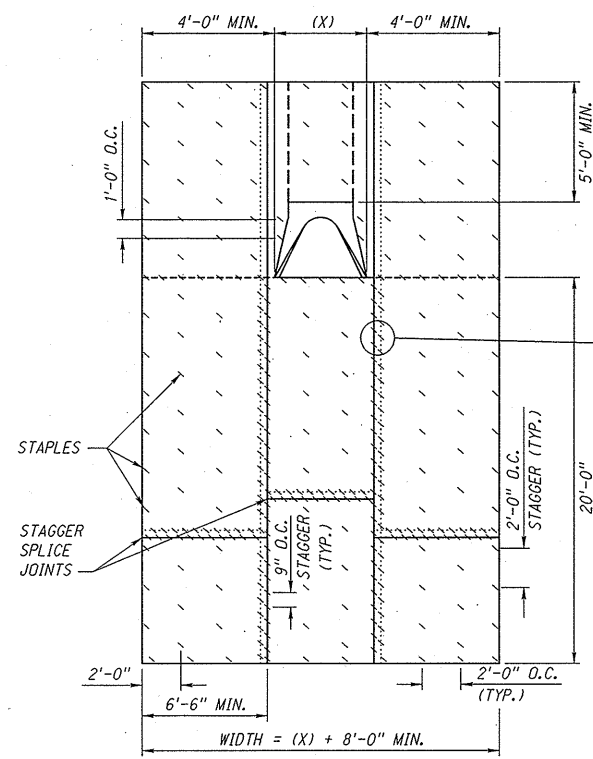
TYPICAL INSTALLATION AT BOX CULVERT



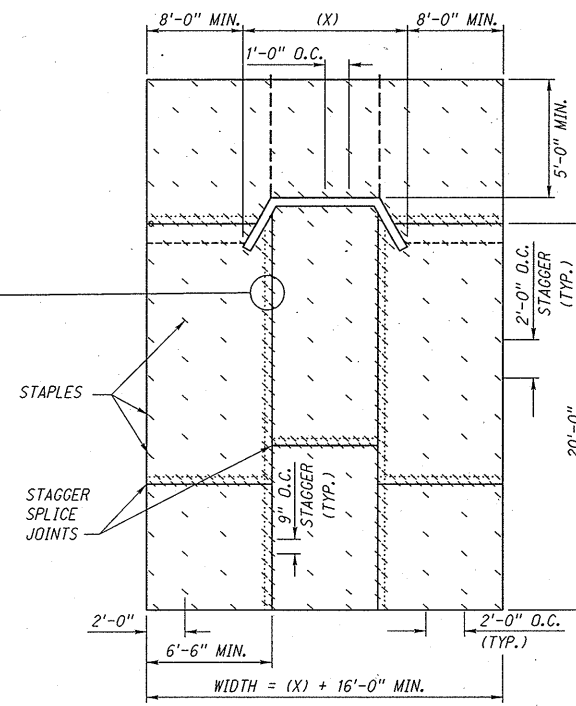
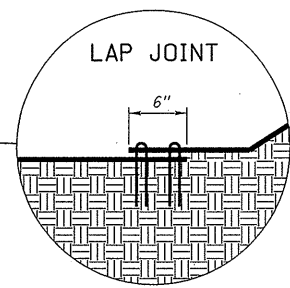
NOTE:
OFFSET EROSION CONTROL PLACEMENT
ALONG THE DRAINAGE PATH

NOTE:
CENTER EROSION CONTROL ON FLUME WHERE
THERE IS NO DEFINED DRAINAGE PATH

EROSION CONTROL BLANKET PLACEMENT AT SPLASH BASIN



PLAN VIEW STAPLING DIAGRAM
(X) IS EQUAL TO THE OUTSIDE WIDTH
OF THE FLARED END SECTION



PLAN VIEW STAPLING DIAGRAM
(X) IS EQUAL TO THE OUTSIDE WIDTH
OF THE WING WALLS

REV. NO.	DATE	DESCRIPTION OF REVISION
R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	APR 14	UPDATE INSTALLATION METHOD
R5	OCT 07	EROSION CONTROL AT SPLASH BASIN

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 501-R7

EROSION CONTROL

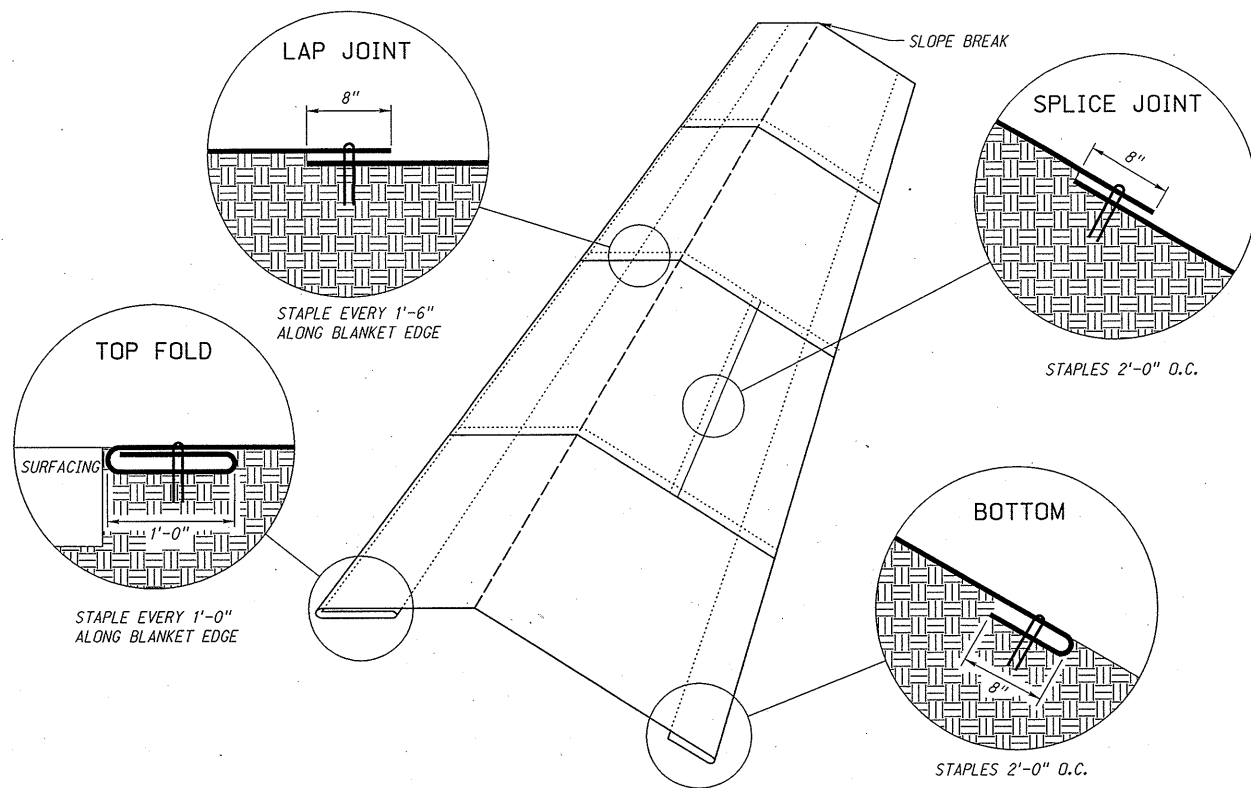
ACCEPTED BY FHWA FOR USE ON THE
NATIONAL HIGHWAY SYSTEM:



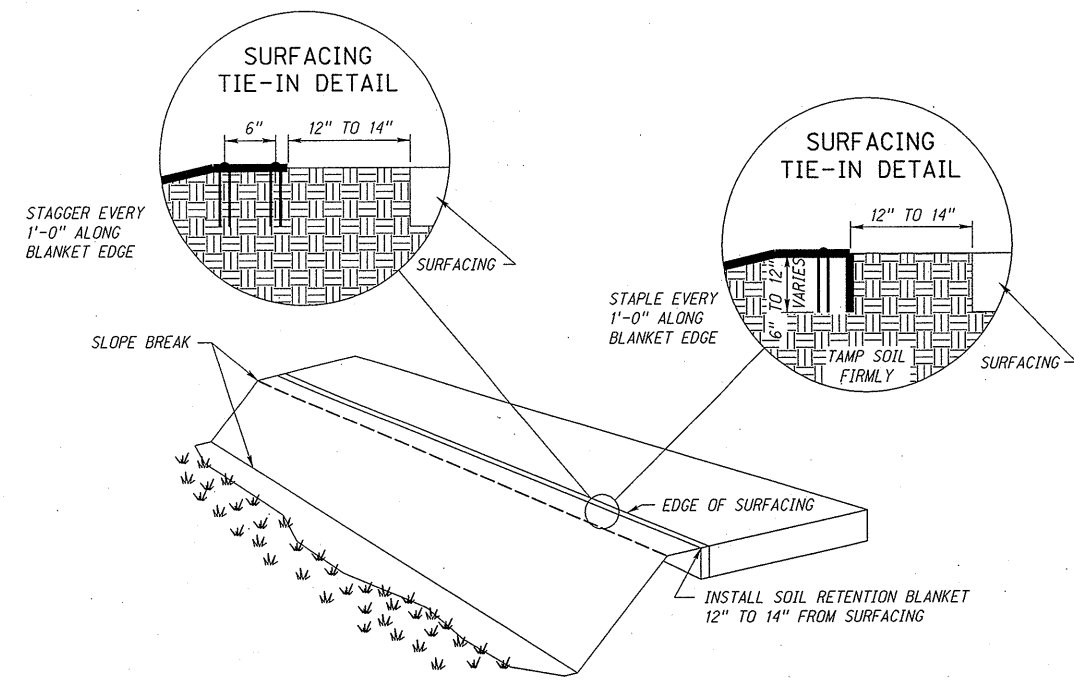
David M. M...
8-16-2017
DATE

ORIGINAL:
NOVEMBER 14, 1973
DATE

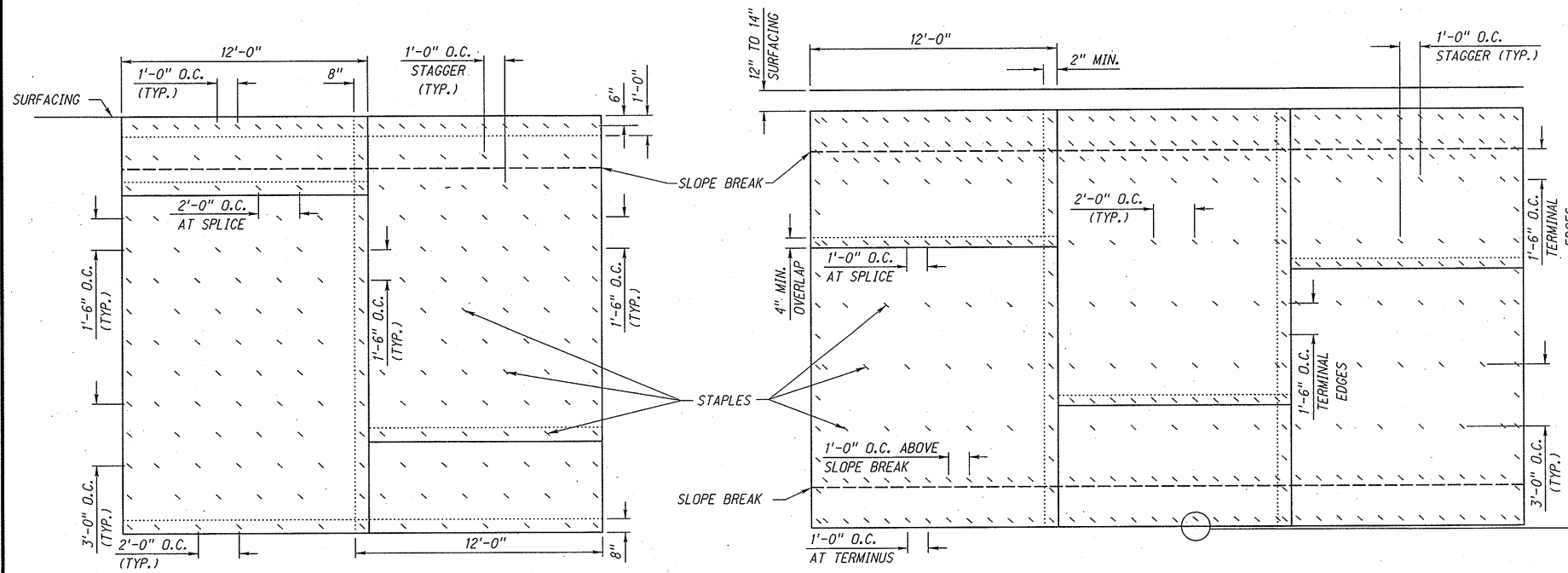
2
3



TYPICAL INSTALLATION
CLASS 1A (SLOPE PROTECTION, SAND)



SURFACING INSTALLATION

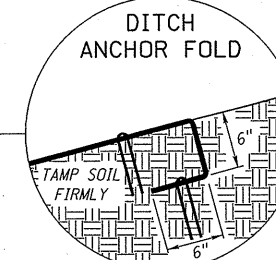


PLAN VIEW STAPLING DIAGRAM FOR
CLASS 1A (SLOPE PROTECTION, SAND)

TERMINATE BLANKET AT THE TOE OF SLOPE OR AT UNDISTURBED VEGETATION

PLAN VIEW STAPLING DIAGRAM FOR
CLASS 1B, 1C, 1D, 1E, 1F, 2A, 2B, & 2C

FOR EDGES ADJOINING
AREAS TO BE SEED



STAPLE EVERY 1'-0"
ALONG BLANKET EDGE

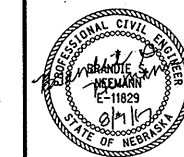
NOTES:

1. THE MANUFACTURERS' RECOMMENDED STAPLING PATTERNS SHALL GOVERN OVER THE PLANS.
2. SURFACING INSTALLATION IS APPLICABLE FOR ASPHALT, CONCRETE, OR BEVELLED EDGE.

REV. NO.	DATE	DESCRIPTION OF REVISION
R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	APR 14	UPDATE INSTALLATION METHOD
R5	OCT 07	EROSION CONTROL AT SPLASH BASIN

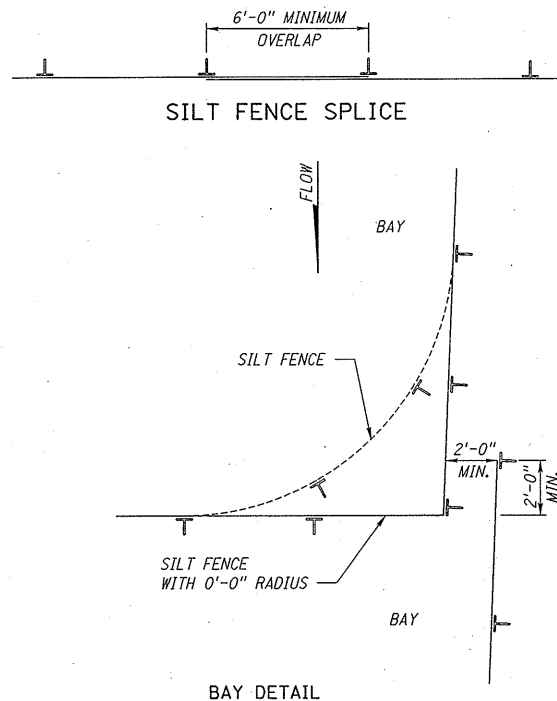
NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 501-R7
EROSION CONTROL

ACCEPTED BY FHWA FOR USE ON THE
NATIONAL HIGHWAY SYSTEM:

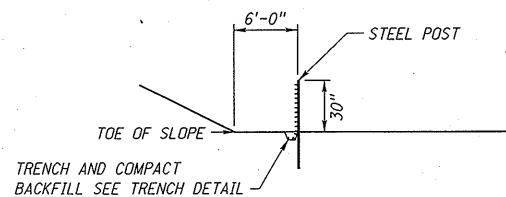


David May
8-16-2017
DATE

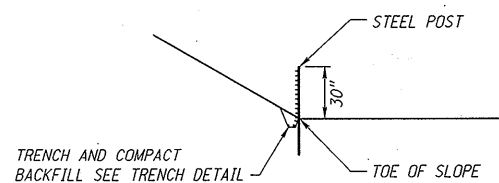
ORIGINAL:
NOVEMBER 14, 1973
DATE



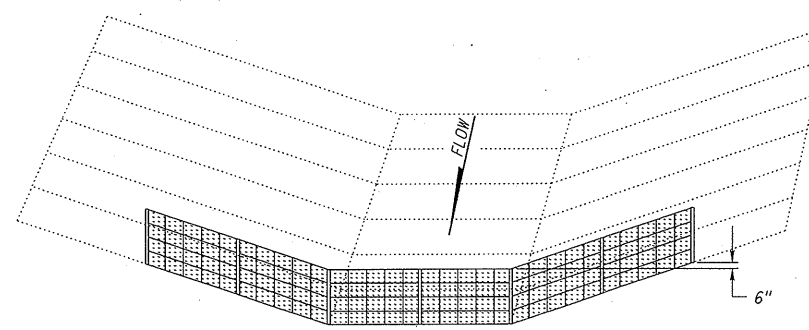
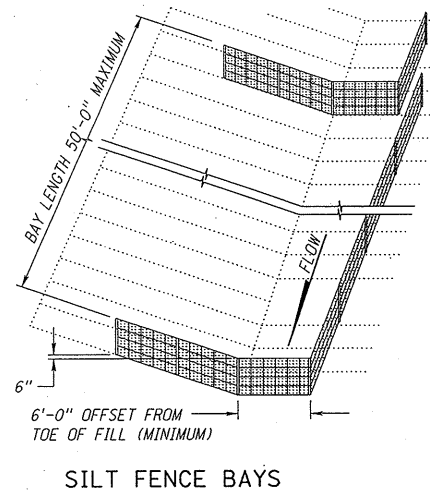
NOTE:
SILT FENCE AT CORNERS SHALL HAVE A RADIUS OF 0'-0" MINIMUM TO 10'-0" MAXIMUM



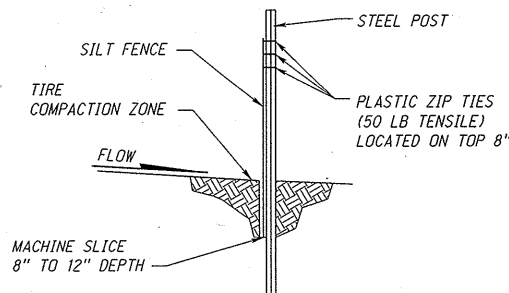
OPTION ONE (PREFERRED)
SILT FENCE
(6'-0" OFFSET FROM TOE OF FILL)



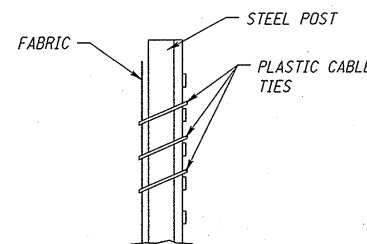
OPTION TWO (WITH LIMITED R.O.W.)
SILT FENCE
(AT TOE OF FILL)



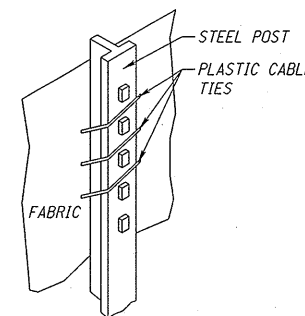
NOTE:
POST SPACING 6'-0" MAXIMUM MULTIPLE BAYS MAY BE USED



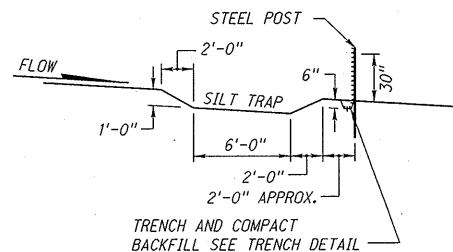
SILT FENCE MACHINE SLICED



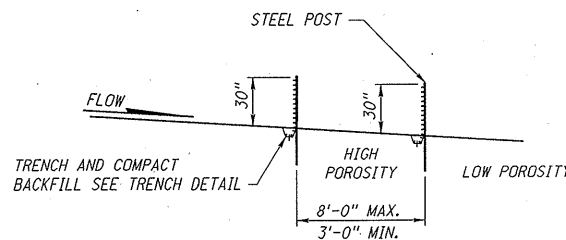
PROFILE VIEW
ATTACHMENT TO POST



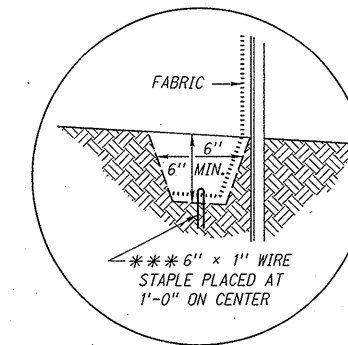
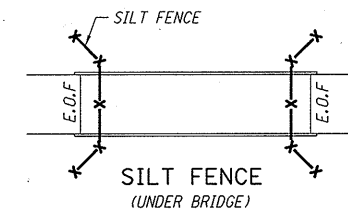
BACK VIEW
ATTACHMENT TO POST



HIGH POROSITY SILT FENCE WITH SILT TRAP
(ACROSS DITCH)



SILT FENCE
(ACROSS DITCH)



TRENCH DETAIL

*** SILT FENCE MAY ALSO BE INSTALLED WITH A SILT FENCE PLOW. NO STAPLING IS REQUIRED WHEN THE SILT FENCE PLOW IS USED.

NOTES:

SILT FENCE SHOULD BE 30" ABOVE GRADE (MAY VARY)

SILT FENCE MINIMUM ROLL WIDTH:
LOW POROSITY = 42"
HIGH POROSITY = 42"
LOW PROFILE = 36"
COIR SILT FENCE = 36"

STEEL STUDDED "T" LINE POSTS 5'-6" LENGTH;
6'-0" MAXIMUM SPACING.

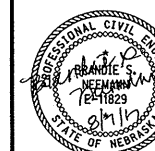
FOR EACH STEEL STUDDED "T" LINE POST, 3 PLASTIC CABLE TIES ARE REQUIRED.

2" x 2" x 6'-0" NOMINAL WOOD STAKES SPACING,
6'-0" MAXIMUM ON CENTER DRIVEN UNTIL FIRM.

R2	JAN 18	NDOR BORDER TO NDOT BORDER
R1	APR 14	STEEL POST INSTALLATION
REV. NO.	DATE	DESCRIPTION OF REVISION

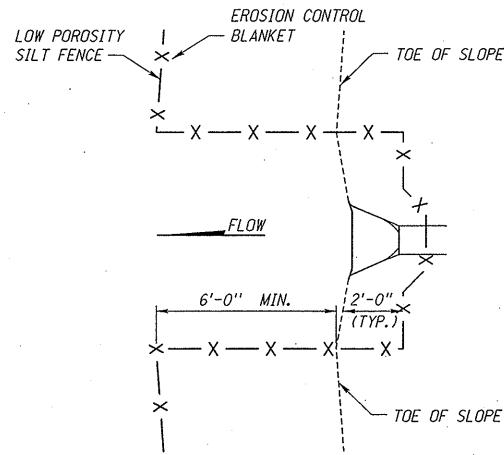
NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 502-R2
SILT FENCE DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:



David May
8-16-2017
DATE

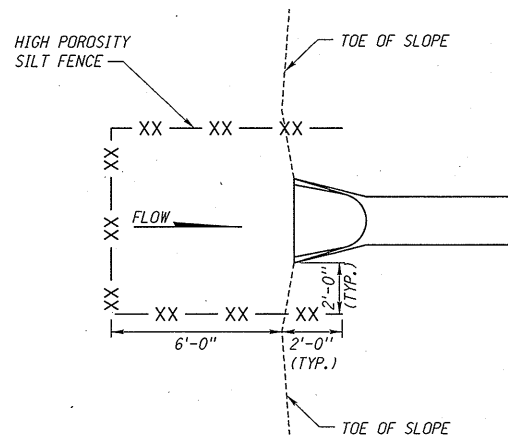
ORIGINAL:
DECEMBER 18, 2006
DATE



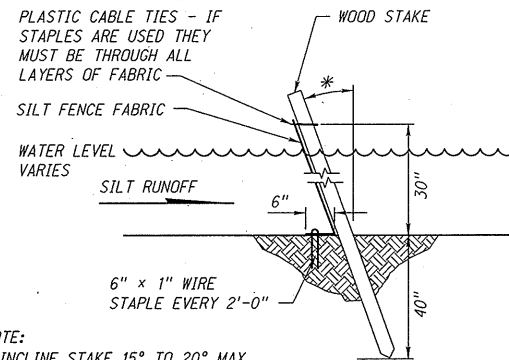
SILT FENCE OUTLET PROTECTION

NOTES:

1. SILT FENCE SHOULD BE BROUGHT FLUSH WITH WING WALLS ON BOX CULVERTS IF IT CAN NOT BE INSTALLED ABOVE THE BOX CULVERT.
2. IF APPLICABLE, SILT FENCE AROUND THE CULVERT SHOULD BE ADJUSTED TO ALLOW FOR THE INSTALLATION OF EROSION CONTROL AS SHOWN IN STANDARD PLAN 501.
3. SILT CHECKS MAY BE USED IN PLACE OF SILT FENCE ABOVE THE OPENING OF A CULVERT, AS SHOWN IN SPECIAL PLAN C.

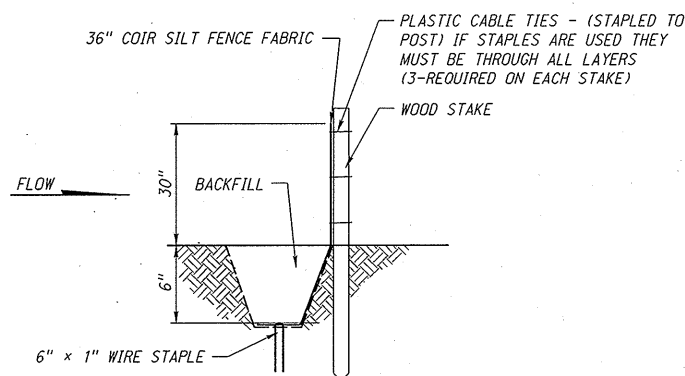


SILT FENCE INLET PROTECTION

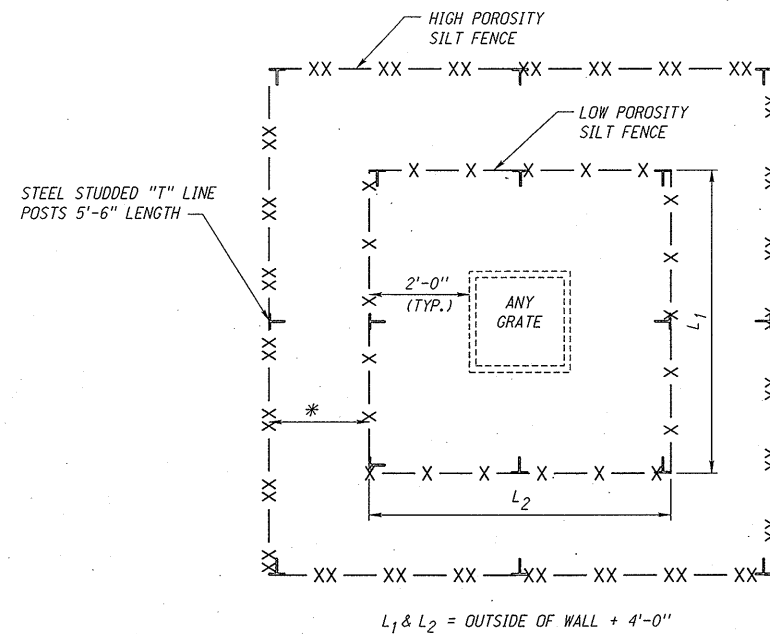


NOTE:
* INCLINE STAKE 15° TO 20° MAX. FROM VERTICAL, TOWARD FLOW.

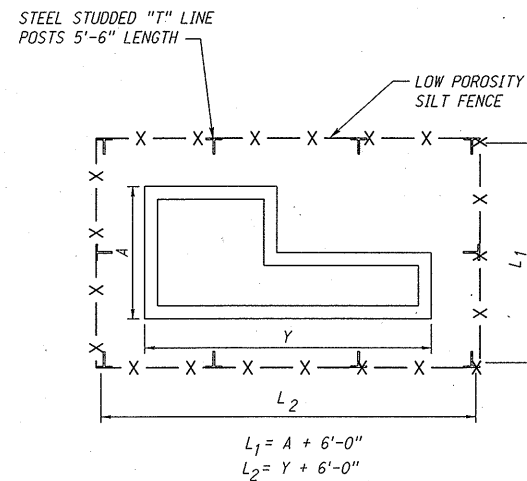
SILT FENCE
(WET & BELOW WATER INSTALLATION)



COIR SILT FENCE - ON WOOD POSTS - DRY INSTALLATION



PLAN VIEW
SILT FENCE FOR GRATE, AREA, MEDIAN INLETS
OR JUNCTION BOXES
* 3'-0" IF POSSIBLE (MAY VARY)



PLAN VIEW
SILT FENCE CURB INLET

REV. NO.	DATE	DESCRIPTION OF REVISION
R2	JAN 18	NDOR BORDER TO NDOT BORDER
R1	APR 14	STEEL POST INSTALLATION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 502-R2
SILT FENCE DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

David May
8-16-2017
DATE

ORIGINAL:
DECEMBER 18, 2006
DATE

2
2

ROADWAY DESIGN DIVISION

Computer: NDOTDESIGN61

User: dor13199

Date: 15-DEC-2011 09:01

File: 7400e01.dgn
Scale: 1:100

CONNECTION NOTES:

FOR DIVIDED ROADWAY

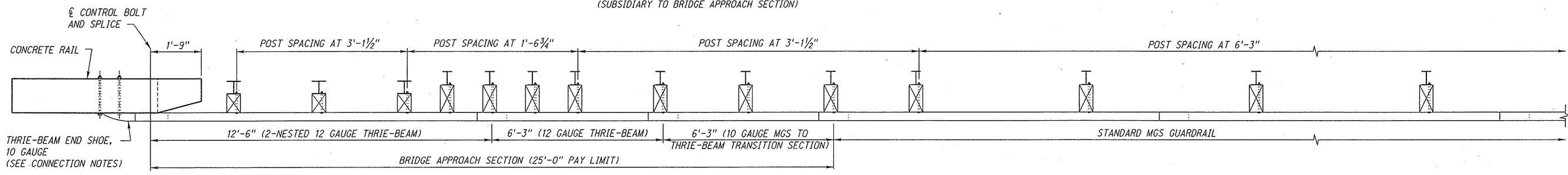
INSTALL THRIE-BEAM END SHOE,
BETWEEN NESTED GUARDRAIL ELEMENTS.
(SUBSIDIARY TO BRIDGE APPROACH SECTION)

FOR 2-LANE ROADWAY

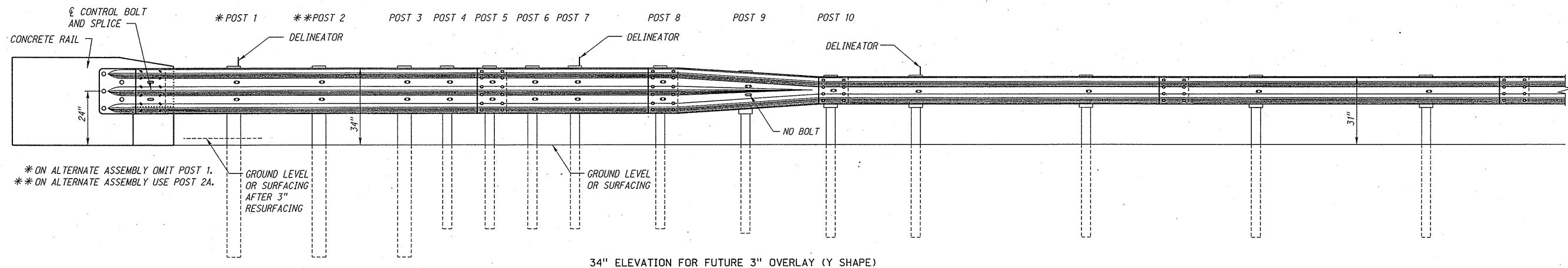
FOR APPROACHING TRAFFIC
INSTALL THRIE-BEAM END SHOE,
BETWEEN NESTED GUARDRAIL ELEMENTS.
(SUBSIDIARY TO BRIDGE APPROACH SECTION)

FOR DEPARTING TRAFFIC
INSTALL THRIE-BEAM END SHOE,
OUTSIDE OF THE NESTED GUARDRAIL ELEMENTS.
(SUBSIDIARY TO BRIDGE APPROACH SECTION)

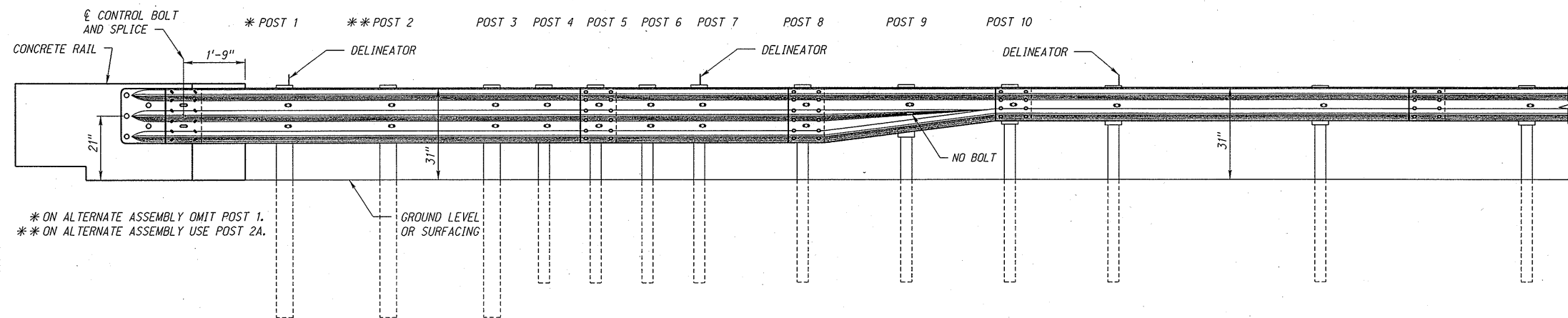
TRAFFIC FLOW →




PLAN VIEW

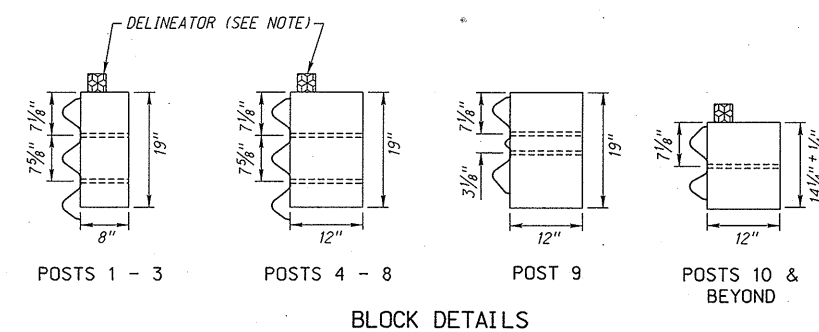
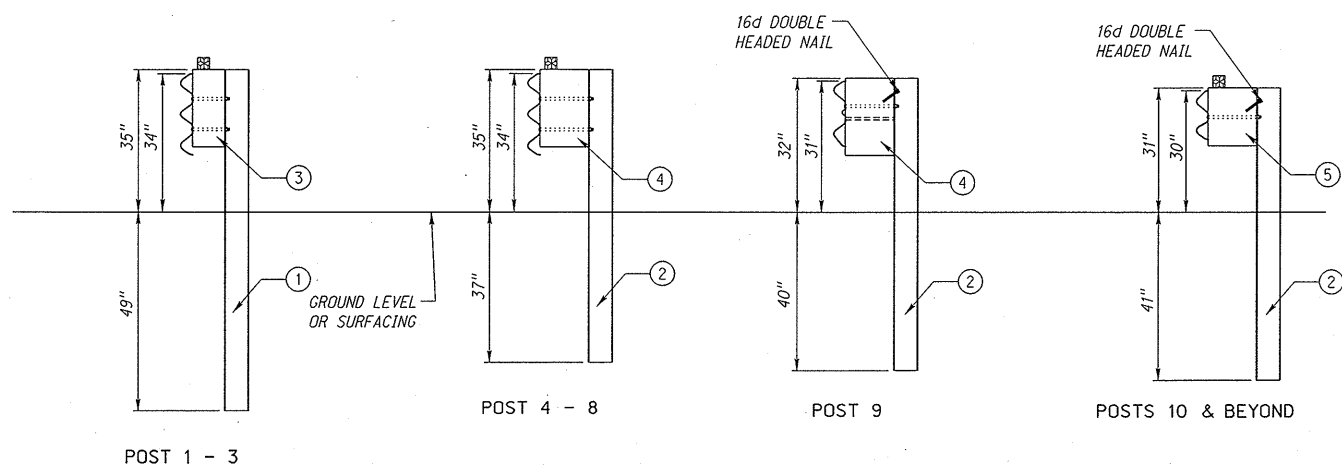


34" ELEVATION FOR FUTURE 3" OVERLAY (Y SHAPE)



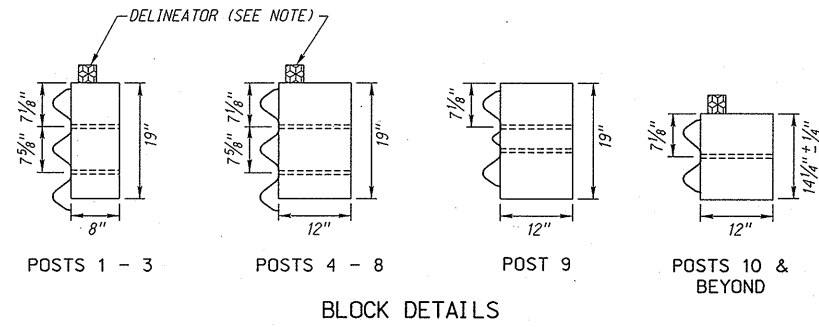
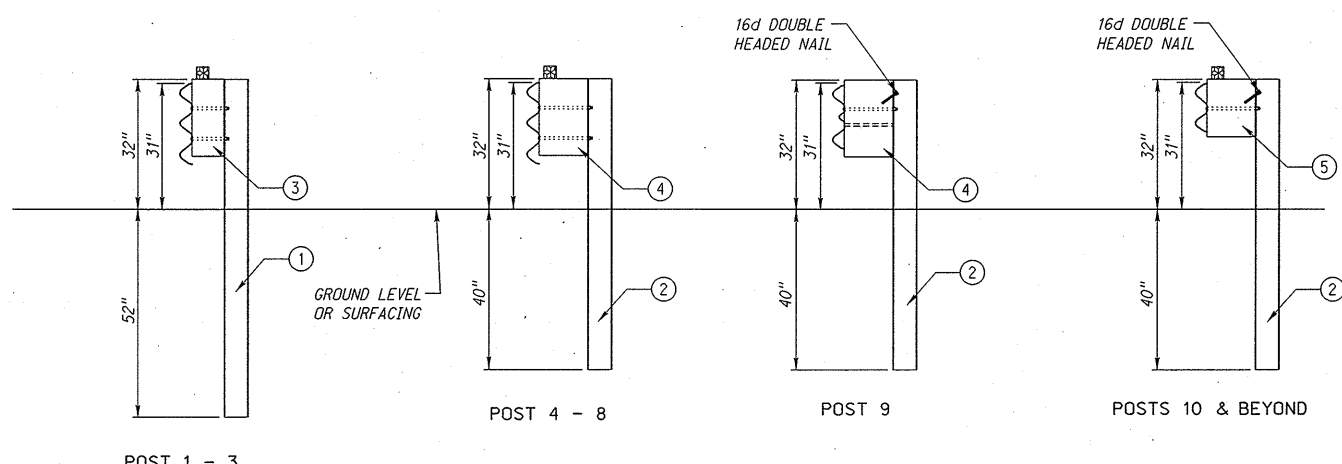
31" ELEVATION STANDARD INSTALLATION (ASYMMETRICAL SHAPE)

R1	JAN 18	NEW 34 INCH B.A.S.
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 740-R1 MIDWEST GUARDRAIL SYSTEM BRIDGE APPROACH SECTION		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
ORIGINAL: AUGUST 2011 DATE		
		1 3

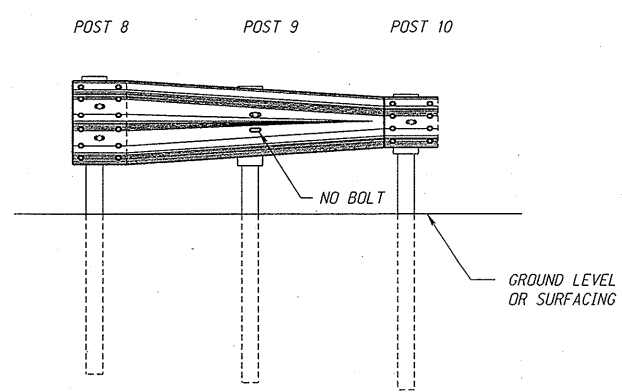


- LEGEND**
- ① W6 x 15 x 7' POST
 - ② W6 x 9 x 6' POST OR W6 x 8.5 x 6' POST
 - ③ 6" x 8" x 19" OFFSET BLOCK
 - ④ 6" x 12" x 19" OFFSET BLOCK
 - ⑤ 6" x 12" x 14 1/4" +/- 1/4" OFFSET BLOCK

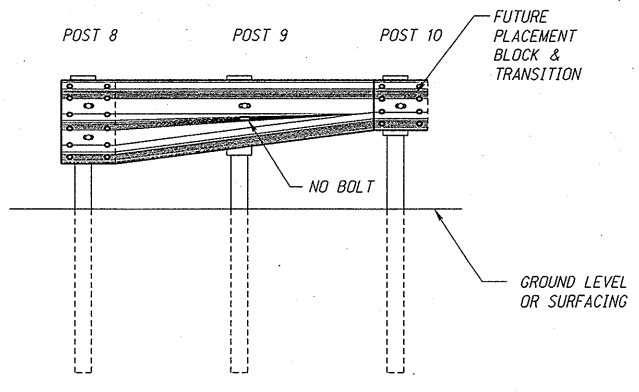
POSTS FOR FUTURE 3" OVERLAY PLACEMENT PRIOR TO 3" OVERLAY USING Y SHAPE W-BEAM



POSTS FOR ASYMMETRICAL SHAPE



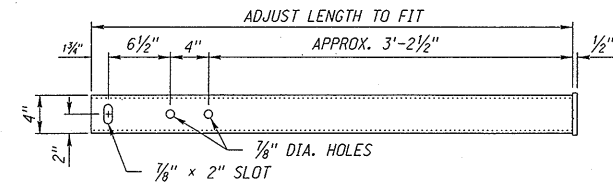
INSTALLATION PRIOR TO 3" OVERLAY USING Y SHAPE TRANSITION



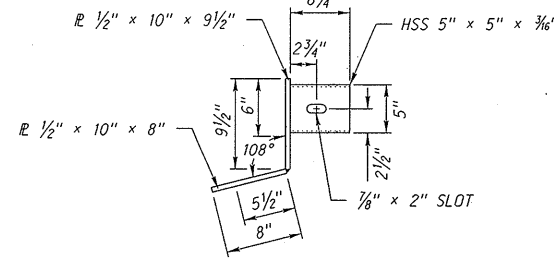
STANDARD 31" INSTALLATION USING ASYMMETRICAL SHAPE TRANSITION

- NOTES:**
- DELINEATORS SUBSIDIARY TO BRIDGE APPROACH SECTION.
 - BUTTON HEAD BOLT 5/8" DIA. x LENGTH AS REQUIRED, SECURED WITH HEX NUT.
 - ALL STEEL MEMBERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

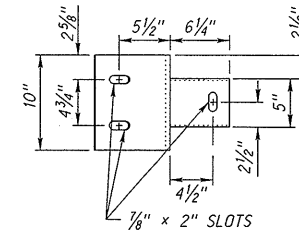
R1	JAN 18	NEW 34 INCH B.A.S.
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 740-R1 MIDWEST GUARDRAIL SYSTEM BRIDGE APPROACH SECTION		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
DATE: 12/15/17 ORIGINAL: AUGUST 2011 DATE:		
		2 3



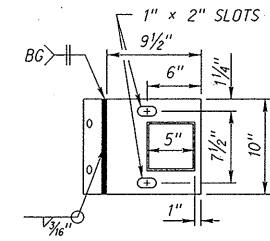
PLAN VIEW



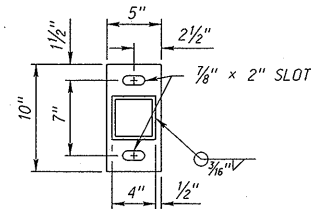
TOP VIEW



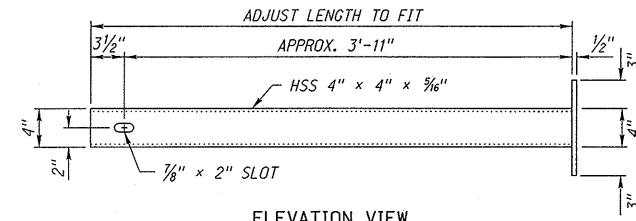
ELEVATION VIEW
END BRACKET DETAIL



SIDE VIEW

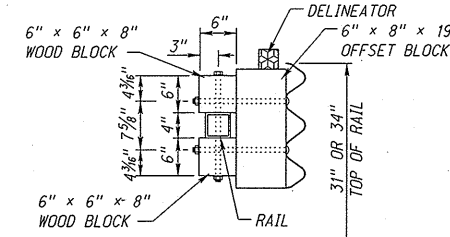


SIDE VIEW
R 1/2" x 10" x 5"



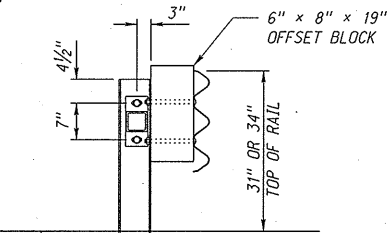
ELEVATION VIEW

RAIL DETAIL

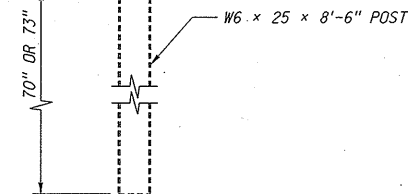


MIDSPAN RAIL SUPPORT

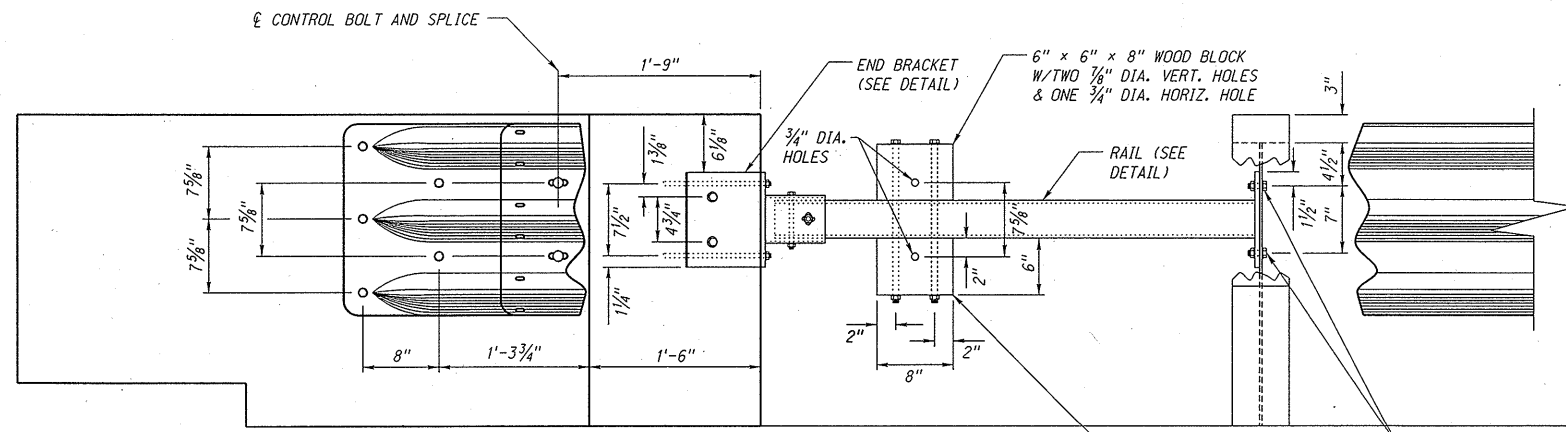
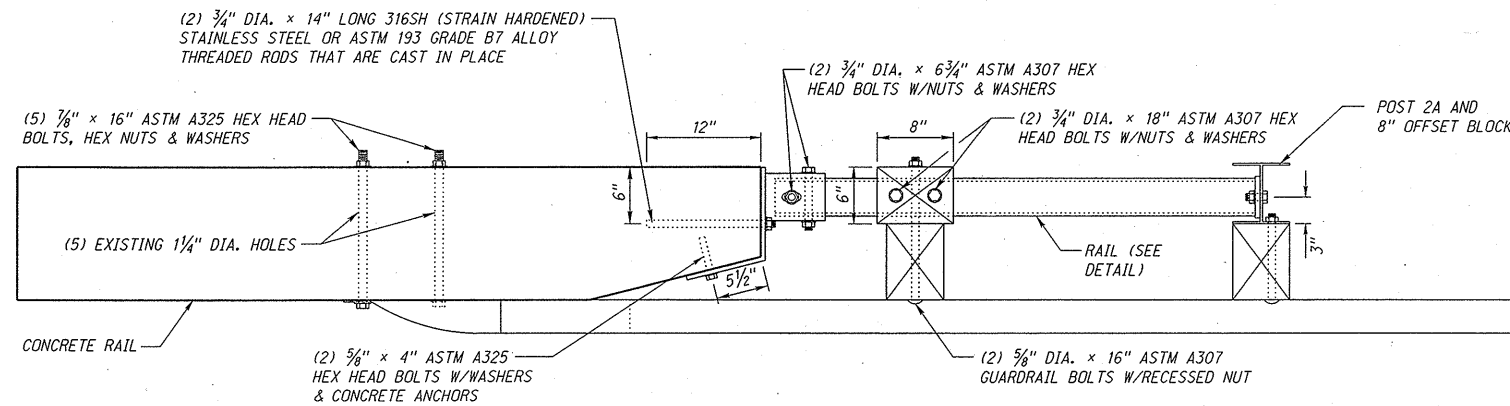
NOTE:
OFFSET BLOCK LISTED ON THE APPROVED PRODUCTS LIST MAY ALSO BE USED.



SIDE VIEW




POST 2A



ELEVATION VIEW
MIDSPAN RAIL SUPPORT DETAIL
MUST USE POST 2A (W6 x 25 x 8'-6")

NOTE:
ALL STEEL MEMBERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
IN LIEU OF THE CAST IN PLACE 3/4" DIA. x 14" ANCHOR BOLTS, THE CONTRACTOR MAY GROUT 3/4" DIA. x 12" BOLTS INTO 7/8" DIA. x 12" DRILLED HOLES. ALL GROUT USED SHALL BE AN APPROVED NON-SHRINK GROUT. FOR 5/8" DIA. BOLTS USE 3/4" DIA. HOLES. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THIS OPTION.

R1	JAN 18	NEW 34 INCH B.A.S.
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 740-R1 MIDWEST GUARDRAIL SYSTEM BRIDGE APPROACH SECTION		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		 ORIGINAL: AUGUST 2011 DATE
12/16/17 DATE		
3		3

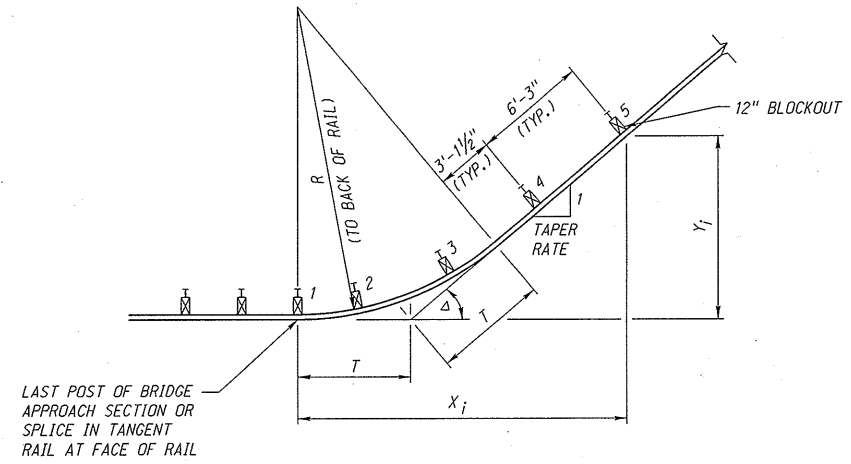
POST SPACING = 6.25'
POST NO. 1: X = 0 & Y = 0

TABLE A		
DEFLECTION, Δ = 1°54'33"		
TAPER = 30:1		
RADIUS, R = 375.10'		
TANGENT, T = 6.25'		
POST NUMBER	X _i	Y _i
1	0.0	0.0
2	3.1	0.0
3	9.4	0.1
4	15.6	0.3
5	21.8	0.5
6	28.1	0.7
7	34.3	0.9
8	40.6	1.1
9	46.8	1.4
10	53.1	1.6
11	59.3	1.8
12	65.6	2.0
13	71.8	2.2
14	78.1	2.4
15	84.3	2.6
16	90.6	2.8
17	96.8	3.0
18	103.1	3.2
19	109.3	3.4
20	115.6	3.6
21	121.8	3.9
22	128.1	4.1
23	134.3	4.3
24	140.6	4.5
25	146.8	4.7
26	153.1	4.9
27	159.3	5.1
28	165.5	5.3
29	171.8	5.5
30	178.0	5.7
31	184.3	5.9
32	190.5	6.1
33	196.8	6.4
34	203.0	6.6
35	209.3	6.8
36	215.5	7.0
37	221.8	7.2
38	228.0	7.4
39	234.3	7.6
40	240.6	7.8
41	246.8	8.0
42	253.0	8.2
43	259.2	8.4
44	265.5	8.7
45	271.7	8.8
46	278.0	9.1
47	284.2	9.3
48	290.5	9.5
49	296.7	9.7
50	303.0	9.9
51	309.2	10.1
52	315.5	10.3
53	321.7	10.5
54	328.0	10.7
55	334.2	10.9
56	340.4	11.1
57	346.7	11.3
58	352.9	11.6
59	359.2	11.8
60	365.4	12.0

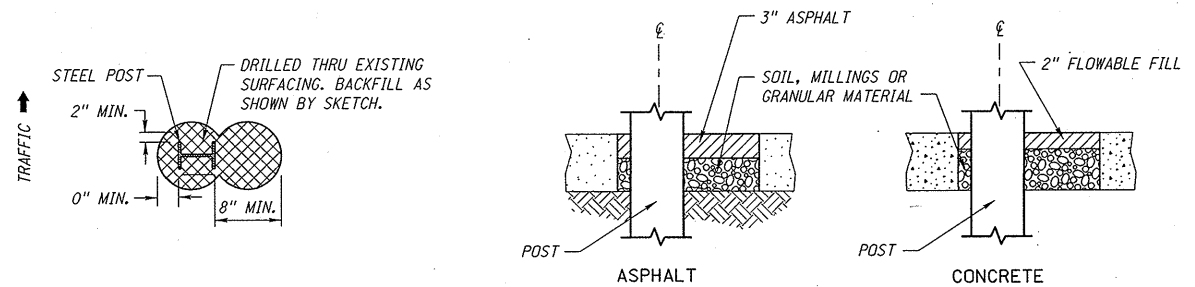
TABLE B		
DEFLECTION, Δ = 2°17'26"		
TAPER = 25:1		
RADIUS, R = 312.67'		
TANGENT, T = 6.25'		
POST NUMBER	X _i	Y _i
1	0.0	0.0
2	3.1	0.0
3	9.4	0.1
4	15.6	0.4
5	21.9	0.6
6	28.1	0.9
7	34.4	1.1
8	40.6	1.4
9	46.9	1.6
10	53.1	1.9
11	59.3	2.1
12	65.6	2.4
13	71.8	2.6
14	78.1	2.6
15	84.3	3.1
16	90.6	3.4
17	96.8	3.6
18	103.1	3.9
19	109.3	4.1
20	115.6	4.4
21	121.8	4.6
22	128.0	4.9
23	134.3	5.1
24	140.5	5.4
25	146.8	5.6
26	153.0	5.9
27	159.3	6.1
28	165.5	6.4
29	171.8	6.6
30	178.0	6.9
31	184.2	7.1
32	190.5	7.4
33	196.7	7.6
34	202.9	7.9
35	209.2	8.1
36	215.5	8.4
37	221.8	8.6
38	228.0	8.9
39	234.2	9.1
40	240.5	9.4
41	246.7	9.6
42	253.0	9.9
43	259.2	10.1
44	265.4	10.4
45	271.7	10.6
46	278.0	10.9
47	284.2	11.1
48	290.4	11.4
49	296.7	11.6
50	302.9	11.9
51	309.1	12.1
52	315.4	12.4
53	321.6	12.6
54	327.9	12.9
55	334.1	13.1
56	340.4	13.4
57	346.6	13.6
58	352.9	13.9
59	359.1	14.1
60	365.4	14.4

TABLE C		
DEFLECTION, Δ = 2°51'44"		
TAPER = 20:1		
RADIUS, R = 250.20'		
TANGENT, T = 6.25'		
POST NUMBER	X _i	Y _i
1	0.0	0.0
2	3.1	0.0
3	9.4	0.2
4	15.6	0.5
5	21.9	0.8
6	28.1	1.1
7	34.4	1.4
8	40.6	1.7
9	46.8	2.0
10	53.1	2.3
11	59.3	2.7
12	65.6	3.0
13	71.8	3.3
14	78.1	3.6
15	84.3	3.9
16	90.5	4.2
17	96.8	4.5
18	103.0	4.8
19	109.3	5.1
20	115.6	5.5
21	121.7	5.8
22	128.0	6.1
23	134.2	6.4
24	140.5	6.7
25	146.7	7.0
26	153.0	7.3
27	159.2	7.6
28	165.4	8.0
29	171.7	8.3
30	177.9	8.6
31	184.2	8.9
32	190.4	9.2
33	196.7	9.5
34	202.9	9.8
35	209.1	10.1
36	215.4	10.4
37	221.6	10.8
38	227.9	11.0
39	234.1	11.4
40	240.3	11.7
41	246.6	12.0
42	252.8	12.3
43	259.0	12.6
44	265.3	12.9
45	271.6	13.3
46	277.8	13.6
47	284.0	13.9
48	290.3	14.2
49	296.5	14.5
50	302.8	14.8
51	309.0	15.1
52	315.3	15.4
53	321.5	15.7
54	327.7	16.1
55	334.0	16.4
56	340.2	16.7
57	346.5	17.0
58	352.7	17.3
59	359.0	17.6
60	365.2	17.9

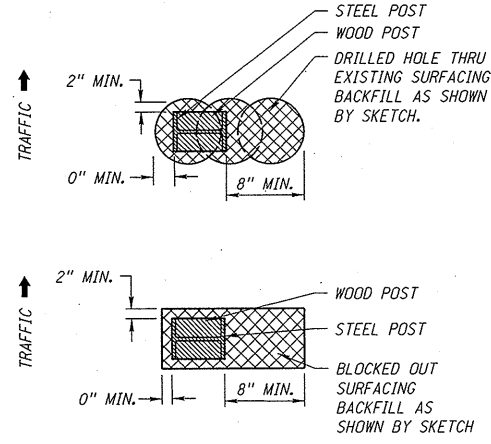
TABLE D		
DEFLECTION, Δ = 3°48'51"		
TAPER = 15:1		
RADIUS, R = 187.77'		
TANGENT, T = 6.25'		
POST NUMBER	X _i	Y _i
1	0.0	0.0
2	3.1	0.0
3	9.4	0.2
4	15.6	0.6
5	21.9	1.0
6	28.1	1.5
7	34.3	1.9
8	40.6	2.3
9	46.8	2.7
10	53.0	3.1
11	59.3	3.5
12	65.5	4.0
13	71.8	4.4
14	78.0	4.8
15	84.2	5.2
16	90.5	5.6
17	96.7	6.0
18	102.9	6.4
19	109.2	6.9
20	115.4	7.3
21	121.6	7.7
22	127.9	8.1
23	134.1	8.5
24	140.4	8.9
25	146.6	9.3
26	152.8	9.8
27	159.0	10.2
28	165.3	10.6
29	171.5	11.0
30	177.8	11.4
31	184.0	11.8
32	190.2	12.2
33	196.5	12.7
34	202.7	13.1
35	209.0	13.5
36	215.2	13.9
37	221.4	14.3
38	227.7	14.7
39	233.9	15.1
40	240.1	15.6
41	246.4	16.0
42	252.6	16.4
43	258.8	16.8
44	265.0	17.2
45	271.3	17.6
46	277.5	18.1
47	283.8	18.5
48	290.0	18.9
49	296.3	19.3
50	302.5	19.7
51	308.7	20.1
52	315.0	20.5
53	321.2	21.0
54	327.4	21.4
55	333.7	21.8
56	339.9	22.2
57	346.1	22.6
58	352.4	23.0
59	358.6	23.4
60	364.9	23.9



NOTE
THE X_i AND Y_i DISTANCES FOUND IN THE TABLES SHALL BE MEASURED FROM A LINE THAT PARALLELS THE EDGE OF THE PAVEMENT.



DETAIL OF BACKFILLING AROUND POST




GUARDRAIL POSTS IN SURFACING

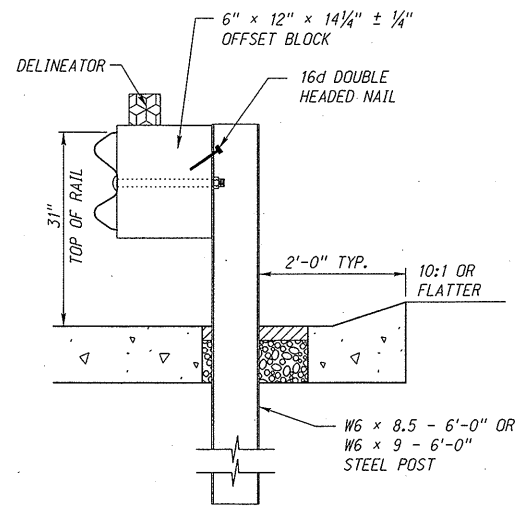
R2	JAN 18	NDOR BORDER TO NDOT BORDER
R1	DEC 16	UPDATED GUARDRAIL OFFSET TABLE
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 743-R2
GUARDRAIL DETAILS

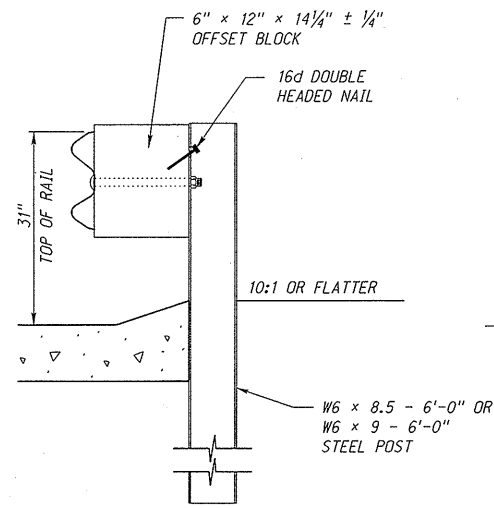
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:



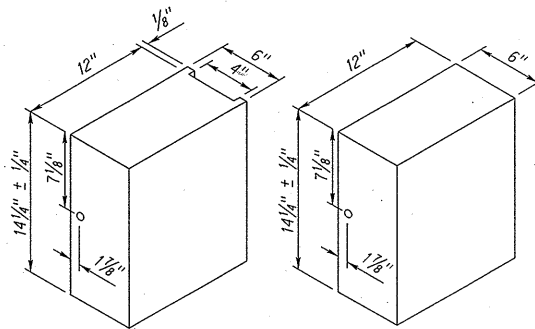
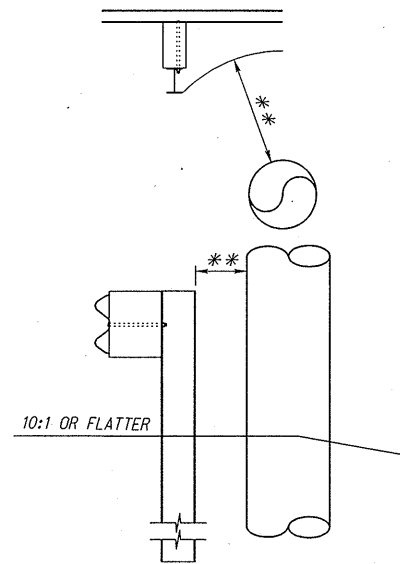
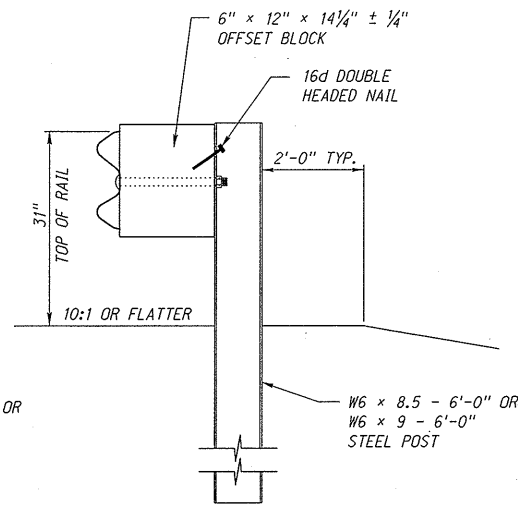
 Michael H. Owen
 E-6515
 DATE: 12/15/17
 ORIGINAL: AUGUST 25, 2011
 DATE:



SIDE VIEW
CURBED LOCATIONS:



SIDE VIEW
NON-CURBED LOCATIONS:



NOTES:

ALL HOLE DIAMETERS ARE 3/4"

W6 x 8.5 OR W6 x 9 POST & 14 1/4" ± 1/4" OFFSET BLOCKS, TO BE USED WITH MGS INSTALLATIONS.

OFFSET BLOCKS LISTED ON THE APPROVED PRODUCTS LIST MAY ALSO BE USED.

16d NAIL NEEDS TO BE PUT IN OFFSET BLOCK AGAINST POST IN EMPTY HOLE AS NEEDED TO PREVENT ROTATION WHEN NO RIBS ARE PRESENT.

ALTERNATE OFFSET BLOCK & STEEL POST
(FOR W-BEAM)

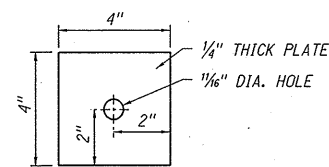
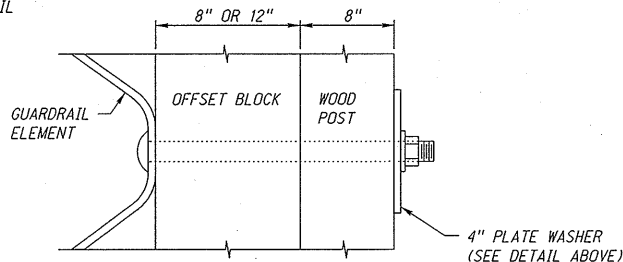
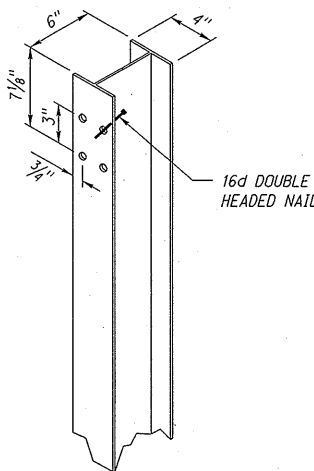
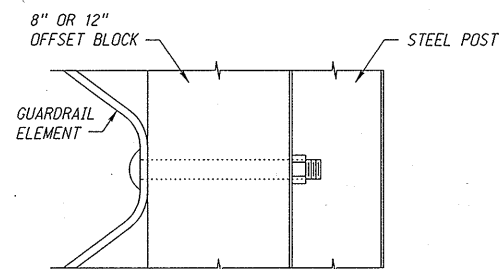


PLATE WASHER



WOOD POST BOLT ASSEMBLY



STEEL POST BOLT ASSEMBLY

MINIMUM REQUIRED GUARDRAIL OFFSET	
FROM BACK OF POST TO A POINT OBSTACLE (e.g. PIER COLUMN)**	
GUARDRAIL INSTALLATION TYPE	MINIMUM OFFSET*
THREE STRAND CABLE GUARDRAIL (LOW-TENSION)	12'-0" (4'-0" AND 16'-0" POST SPACING)
CABLE GUARDRAIL (HIGH-TENSION)	7'-0" TO 12'-0", DEPENDING ON THE SYSTEM
MIDWEST GUARDRAIL SYSTEM (MGS) & W-BEAM GUARDRAIL *	3'-0" 10'-0" FOR NORMAL POST SPACING (6'-3") 3'-5" FOR 1/2 POST SPACING (3'-1 1/2") 2'-6" FOR 1/4 POST SPACING (1'-6 3/4")
THREE-BEAM GUARDRAIL	2'-3" FOR NORMAL POSTS SPACING (6'-3")
FROM BACK OF POST TO A LINEAR OBSTRUCTION (e.g. MSE WALL)	
MGS & W-BEAM GUARDRAIL	4'-1" FROM NORMAL POST SPACING (6'-3") 3'-5" FOR 1/2 POST SPACING (3'-1 1/2") 2'-6" FOR 1/4 POST SPACING (1'-6 3/4")
THREE-BEAM GUARDRAIL	2'-10" FOR NORMAL POST SPACING (6'-3")

* BASED ON THE DYNAMIC DEFLECTIONS FROM THE NCHRP REPORT 350 STANDARD STRENGTH TEST FOR THE 4,400 LB. PICKUP TRUCK IMPACTING A BARRIER AT AN ANGLE OF 25° AT A VELOCITY OF 60 MPH.
**ADJUST THE POSTS LONGITUDINALLY SO THAT THEY WILL NOT BE PLACED DIRECTLY OPPOSITE A POINT OBSTACLE (E.G. PIER COLUMN, TREE). THE MINIMUM OFFSET BETWEEN THE BACK OF THE GUARDRAIL POST AND THE POINT OBSTACLE MAY BE FOUND IN THE TABLE ABOVE.

MINIMUM GUARDRAIL OFFSETS WHEN ADJACENT TO A FIXED OBSTACLE

DELINEATOR NOTES:

4 LANE: YELLOW ON LEFT AND WHITE ON RIGHT.
2 LANE: WHITE ON BOTH SIDES.

DELINEATORS ARE A MINIMUM OF 3" HIGH AND ARE DOUBLE-FACED HIGH INTENSITY DELINEATORS ON 2 LANE ROADWAYS, SINGLE-FACED HIGH INTENSITY DELINEATORS ON 4 LANE ROADWAYS.

WHEN GUARDRAIL IS ATTACHED TO A BRIDGE APPROACH SECTION: GUARDRAIL DELINEATION AT 12'-6" SPACING FOR THE FIRST 50', THEN 25' SPACING WHEN THE REMAINING GUARDRAIL LENGTH IS 150' OR LESS; USE 50' SPACING WHEN THE REMAINING GUARDRAIL LENGTH IS GREATER THAN 150'.

WHEN GUARDRAIL IS INDEPENDENT OF A BRIDGE: GUARDRAIL DELINEATION AT 25' SPACING WHEN THE GUARDRAIL LENGTH IS 200' OR LESS; USE 50' SPACING WHEN THE GUARDRAIL LENGTH IS GREATER THAN 200'.

DELINEATORS SUBSIDIARY TO GUARDRAIL.

NOTES:

BUTTON HEAD BOLT 5/8" DIA. x LENGTH AS REQUIRED, SECURED WITH HEX NUT.

ALL STEEL MEMBERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

POST SPACING SHALL BE 6'-3" UNLESS OTHERWISE NOTED IN THE PLANS.

GUARDRAIL LAPPING PROCEDURE TRAFFIC FLOW →

R2	JAN 18	NDOR BORDER TO NDOT BORDER
R1	DEC 16	UPDATED GUARDRAIL OFFSET TABLE
REV. NO.	DATE	DESCRIPTION OF REVISION

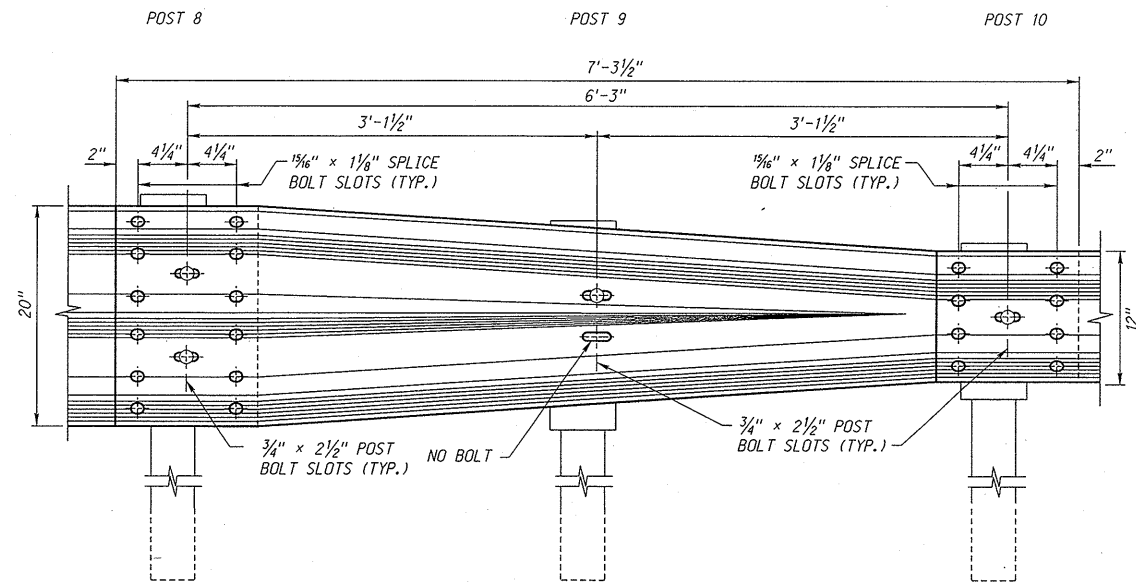
NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 743-R2
GUARDRAIL DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

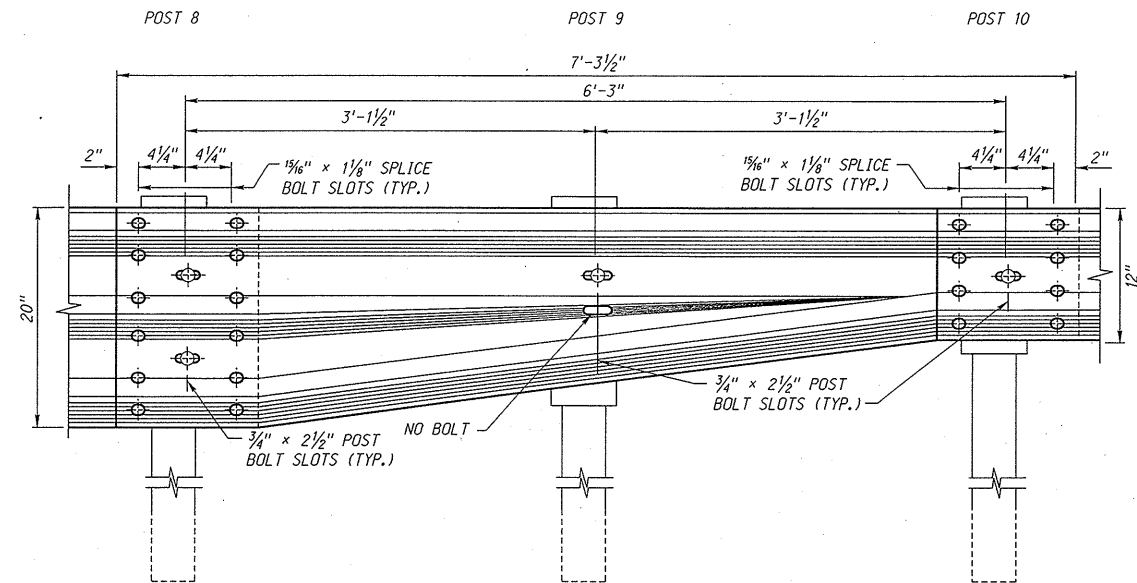
PROFESSIONAL CIVIL ENGINEER
MARK BUNROUCHS
12/15/17
DATE

ORIGINAL:
AUGUST 25, 2011
DATE

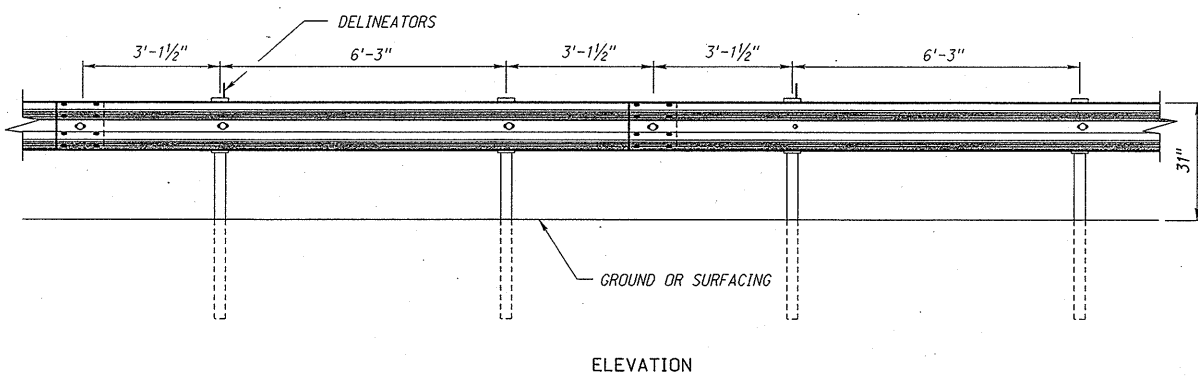
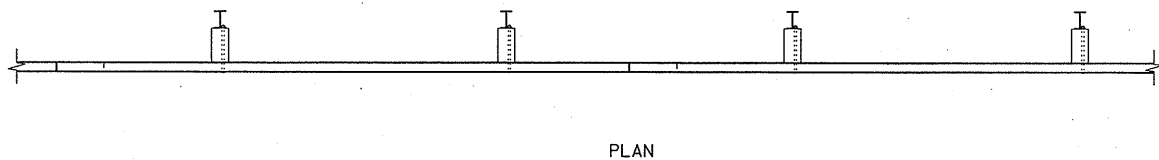
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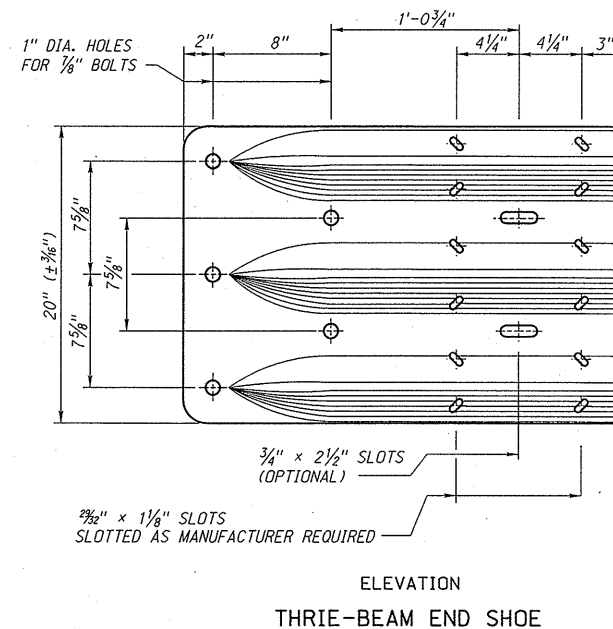
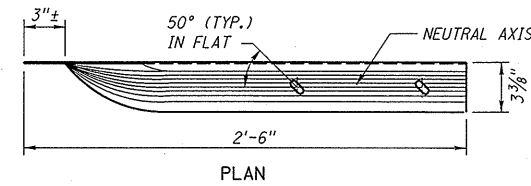
W-THRIE BEAM TRANSITION (10 GAUGE)
(34" ELEVATION FOR FUTURE 3" OVERLAY Y SHAPE)



W-THRIE BEAM TRANSITION (10 GAUGE)
31" ELEVATION (ASYMMETRICAL SHAPE)



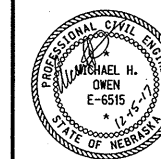
MIDWEST GUARDRAIL SYSTEM (MGS) INSTALLATION
(PAID FOR AS W-BEAM GUARDRAIL)



R2	JAN 18	NDOR BORDER TO NDOT BORDER
R1	DEC 16	UPDATED GUARDRAIL OFFSET TABLE
REV. NO.	DATE	DESCRIPTION OF REVISION

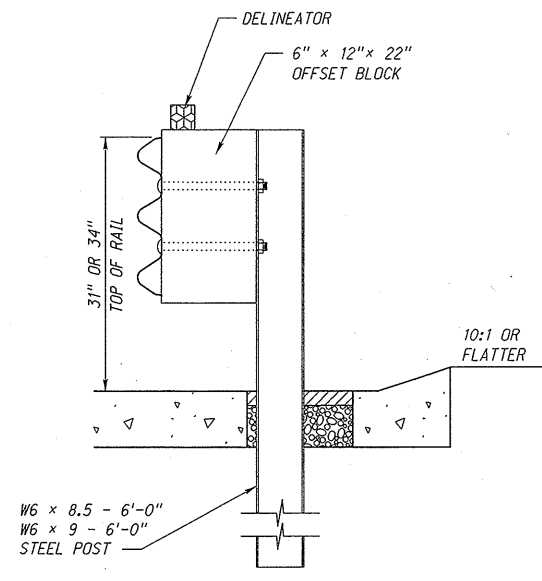
NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 743-R2
GUARDRAIL DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:



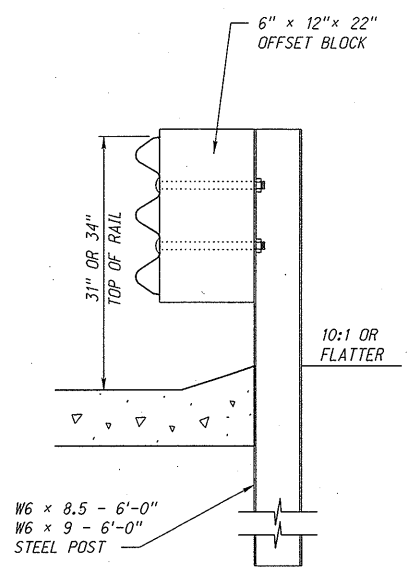
MARK BARKGREN
12/15/17
DATE

ORIGINAL:
AUGUST 25, 2011
DATE



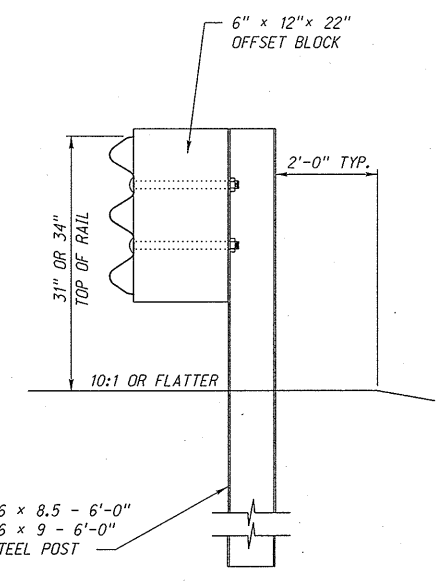
SIDE VIEW

THRIE-BEAM (CURBED LOCATIONS)



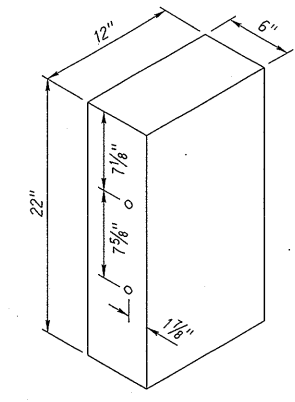
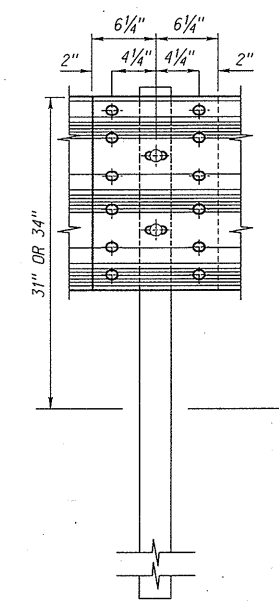
SIDE VIEW

THRIE-BEAM (NON-CURBED LOCATIONS)

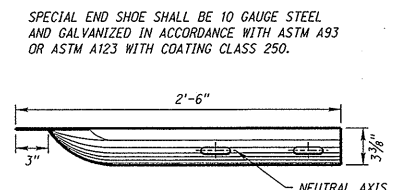


SIDE VIEW

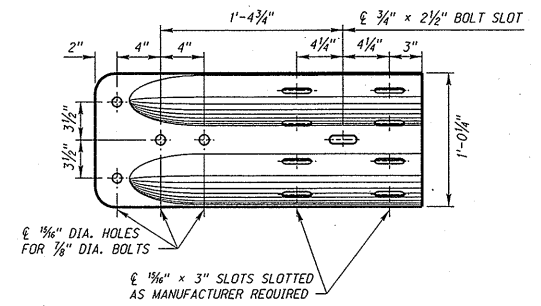
RAIL ELEMENT SPLICING AND POST MOUNTING DETAIL FOR 1/4 OR 1/2 POST SPACING



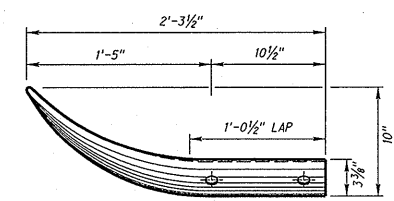
OFFSET BLOCK & STEEL POST (FOR THRIE-BEAM)



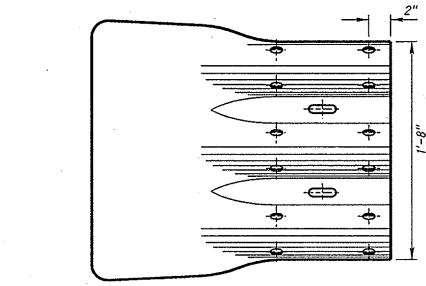
PLAN



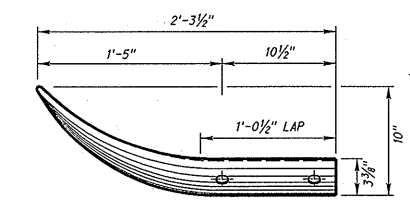
ELEVATION
W-BEAM END SHOE



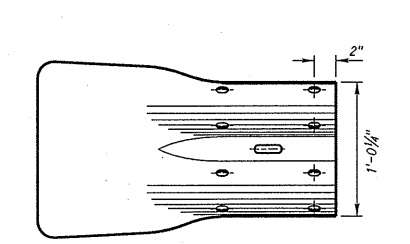
PLAN



ELEVATION
THRIE-BEAM TERMINAL SECTION



PLAN



ELEVATION
W-BEAM TERMINAL SECTION

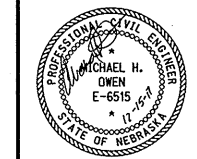
NOTES:

- ALL HOLE DIAMETERS ARE 3/4"
- W6 x 8.5 POST & W6 x 9 & 22" OFFSET BLOCK, TO BE USED WITH THRIE-BEAM GUARDRAIL INSTALLATIONS.
- OFFSET BLOCKS LISTED ON THE APPROVED PRODUCTS LIST MAY ALSO BE USED.

R2	JAN 18	NDOR BORDER TO NDOT BORDER
R1	DEC 16	UPDATED GUARDRAIL OFFSET TABLE
REV. NO.	DATE	DESCRIPTION OF REVISION

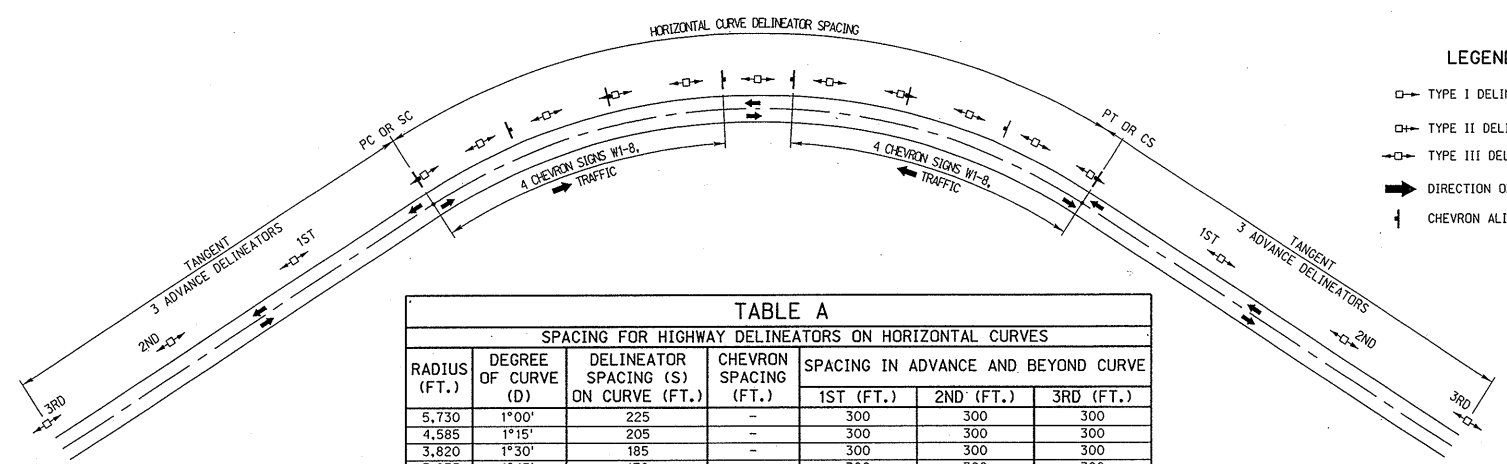
NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 743-R2
GUARDRAIL DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:



M. Owen
MIRY BARRONENS
12/15/17
DATE

ORIGINAL:
AUGUST 25, 2011
DATE



- LEGEND**
- TYPE I DELINEATOR
 - TYPE II DELINEATOR
 - TYPE III DELINEATOR
 - DIRECTION OF TRAVEL
 - ↓ CHEVRON ALIGNMENT SIGN

TABLE A
SPACING FOR HIGHWAY DELINEATORS ON HORIZONTAL CURVES

RADIUS (FT.)	DEGREE OF CURVE (D)	DELINEATOR SPACING (S) ON CURVE (FT.)	CHEVRON SPACING (FT.)	SPACING IN ADVANCE AND BEYOND CURVE		
				1ST (FT.)	2ND (FT.)	3RD (FT.)
5,730	1°00'	225	-	300	300	300
4,585	1°15'	205	-	300	300	300
3,820	1°30'	185	-	300	300	300
3,275	1°45'	170	-	300	300	300
2,865	2°00'	160	200	300	300	300
2,545	2°15'	150	200	300	300	300
2,290	2°30'	140	200	280	300	300
2,085	2°45'	135	200	270	300	300
1,910	3°00'	130	195	260	300	300
1,765	3°15'	125	190	250	300	300
1,635	3°30'	120	180	240	300	300
1,530	3°45'	115	175	230	300	300
1,430	4°00'	110	165	220	300	300
1,275	4°30'	105	155	210	300	300
1,145	5°00'	100	150	200	300	300
1,040	5°30'	95	140	190	285	300
955	6°00'	90	135	180	270	300
820	7°00'	85	125	170	255	300
715	8°00'	80	120	160	240	300
640	9°00'	75	110	150	225	300
575	10°00'	70	105	140	210	300

TABLE B
TYPE III DELINEATOR SPACING FOR TANGENT FILL SECTIONS WITHOUT GUARDRAIL

LENGTH (FT.)	SPACING (FT.)
150-250	50
OVER 250	100

WHEN FILL SECTIONS ARE DEEPER THAN 10 FT., LONGER THAN 150 FT., AND HAVE SHOULDER SECTIONS LESS THAN 6 FT., WITH A FORESLOPE STEEPER THAN 1:3.

DELINEATOR SPACING FOR SPECIFIC CURVES NOT SHOWN SHOULD BE ROUNDED DOWN TO THE NEAREST DISTANCE AS SHOWN IN TABLE A. SPACINGS WHICH FALL OUTSIDE THE VALUES SHOWN IN THE TABLE SHOULD BE COMPUTED FROM THE FORMULA $S = \sqrt{R \times \text{DEGREE OF CURVE}}$ AND ROUNDED DOWN TO THE NEAREST 5 FT. INCREMENT. THE MINIMUM SPACING SHOULD BE 20 FT. THE SPACING ON CURVES SHOULD NOT EXCEED 300 FT. THE SPACING OF THE FIRST DELINEATOR APPROACHING A CURVE IS 2S, THE SECOND 3S, AND THE THIRD IS 6S, BUT NOT TO EXCEED 300 FT. IF A SPACING LESS THAN 300 FT. IS USED APPROACHING THE CURVE, THE DISTANCES SHOWN ABOVE SHOULD BE ADJUSTED ACCORDINGLY.

CHEVRONS SHOULD BE INSTALLED AT 1 1/2 DELINEATOR SPACING, NOT TO EXCEED 200 FT.

NOTES

DELINEATORS

- DELINEATOR REFLECTOR COLOR SHALL CONFORM TO THE COLOR OF THE ADJACENT STRIPED EDGE LINE UNLESS OTHERWISE NOTED.
- ALL DELINEATORS SHALL BE MOUNTED TRULY VERTICAL.
- ALL LIGHT-DUTY POSTS USED FOR STEEL DELINEATORS SHALL BE HEAVY BLACK OR DARK GREEN ENAMEL TYPE. THE POST'S WEIGHT SHALL NOT BE GREATER THAN 1.2 LB./FT. ALL FLEXIBLE DELINEATOR POSTS SHALL BE BLACK UNLESS OTHERWISE NOTED.
- DELINEATORS SHALL BE PLACED 2 FT. TO 8 FT. OUTSIDE THE OUTER EDGE OF THE PAVEMENT. DELINEATORS FOR RAMPS AND GORES SHALL BE PLACED 6 FT. OUTSIDE THE OUTER EDGE OF THE PAVEMENT. WHEN DELINEATORS ARE TO BE INSTALLED WHERE GUARDRAIL IS IN PLACE, THE DELINEATOR POST SHALL BE DRIVEN IN LINE AND ADJACENT TO GUARDRAIL POSTS. SEE TABLE C OR D FOR DELINEATOR POST LENGTHS.
- TYPICALLY, DELINEATORS WILL NOT BE REQUIRED ON CURVES OF LESS THAN 1°.
- WHEN UNIFORM SPACING IS INTERRUPTED BY SUCH FEATURES AS DRIVEWAYS AND INTERSECTIONS, DELINEATORS WHICH WOULD ORDINARILY BE LOCATED WITHIN THE FEATURES MAY BE RELOCATED IN EITHER DIRECTION FOR A DISTANCE NOT EXCEEDING ONE QUARTER OF THE UNIFORM SPACING. DELINEATORS STILL FALLING WITHIN SUCH FEATURES MAY BE ELIMINATED.
- INSTALL DELINEATOR REFLECTORS ON THE SAME POST AS THE CHEVRON SIGN WHEN THE DELINEATOR LOCATION IS WITHIN 25 FT. OF THE CHEVRON SIGN. (STEEL POST ONLY).
- TYPE I DELINEATORS SHALL BE INSTALLED AT 100 FT. INTERVALS ALONG ON RAMPS, EXCEPT FOR CURVES SHARPER THAN 5° WHERE THE SPACING WILL BE IN ACCORDANCE WITH TABLE A.
- TYPE II DELINEATORS SHALL BE INSTALLED AT 100 FT. INTERVALS ALONG TRANSITION LANES, ACCELERATION LANES, DECELERATION LANES, AND ALONG OFF RAMPS, EXCEPT FOR CURVES SHARPER THAN 5° WHERE SPACING WILL BE IN ACCORDANCE WITH TABLE A.
- WHEN USED ON EXPRESSWAY OR FREEWAY-TYPE FACILITIES, TYPE I DELINEATORS SHALL BE SPACED AT 0.05 MILE ALONG THE THROUGH ROAD, INCLUDING CURVES UP TO 1°30' (RADIUS 3,820 FT.). DELINEATOR MEASUREMENTS SHALL BE MADE TO CORRESPOND WITH THE HIGHWAY REFERENCE POST (I.E. EVERY 20TH DELINEATOR SHALL BE MOUNTED ON THE REFERENCE POST AT THE RECOMMENDED HEIGHT WITH THE REFERENCE NUMBER PLACED ABOVE).
- WHEN INSTALLED ON CURVES OF 3° OR GREATER, STEEL TYPE III DELINEATORS SHALL BE INSTALLED ON MOUNTING BRACKETS, TO HOLD THE DELINEATORS PERPENDICULAR TO APPROACHING TRAFFIC. A LIGHT ALUMINUM STRAP 1/2" TO 1 1/2" WIDE MAY BE USED FOR THE BRACKET TO ADJUST THE ANGLE OF THE DELINEATOR TO APPROACHING TRAFFIC, APPROXIMATELY 200 FT. FROM THE DELINEATOR POST.
- 3" x 9" RETROREFLECTIVE PANELS MAY BE USED IN LIEU OF ROUND REFLECTORS ON STEEL POST DELINEATORS. IF USED, 3" x 9" PANELS MAY BE USED FOR TYPE I, II OR III DELINEATORS.

CHEVRONS

- ALL CHEVRONS SHALL BE MOUNTED TRULY VERTICAL.
- ALL POSTS USED FOR CHEVRONS SHALL BE 10 FT. STEEL, HEAVY BLACK OR DARK GREEN ENAMEL TYPE, AND POST'S WEIGHT SHALL NOT BE LESS THAN 2.5 LB./FT.
- FOR CURVES OF 2° OR MORE, FOUR CHEVRON SIGNS (W1-8) SHALL BE USED FOR EACH DIRECTION OF TRAVEL ON THE CURVE.
- THE CONTRACTOR WILL INSTALL CHEVRON SIGNS (FURNISHED BY THE STATE) ON 10 FT. POSTS (SUPPLIED BY THE CONTRACTOR). INSTALLATION OF THE CHEVRON SIGNS, 10 FT. POSTS, HARDWARE AND DELINEATOR BUTTONS WHEN REQUIRED, ON THE SAME POST, ARE INCLUDED IN THE PAY ITEM "INSTALL CHEVRON."
- THE FIRST CHEVRON SIGN SHALL BE PLACED AT THE BEGINNING OF THE CURVE FOLLOWED BY THE NEXT THREE CHEVRON SIGNS AT THE REQUIRED SPACING.
- CHEVRONS ARE NOT REQUIRED ON CURVES LESS THAN 2°.
- WHEN AN ADVISORY SPEED PLAQUE INDICATES A REDUCTION OF SPEED GREATER THAN 15 MILES PER HOUR, THE ONE-DIRECTIONAL LARGE ARROW SIGN (W1-6-48) SHOULD BE USED INSTEAD OF THE CHEVRON SIGN. WHEN USED, INSTALL A MINIMUM OF TWO ARROWS STARTING WITH THE SECOND CHEVRON LOCATION BEYOND THE BEGINNING OF THE CURVE.

TABLE C FLEXIBLE DELINEATOR POST

X (FT.)	POST LENGTH & FORESLOPE			
	1:10 (FT.)	1:6 (FT.)	1:4 (FT.)	1:3 (FT.)
2	4	4	4	4
4	4	5	5	5
6	5	5	5	6
8	5	5	6	6

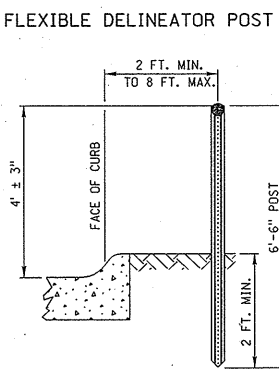
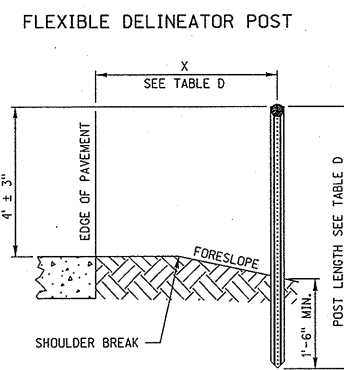
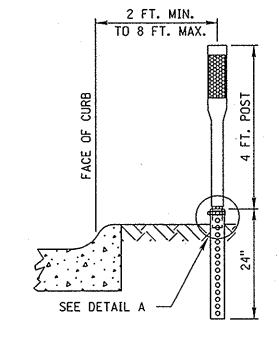
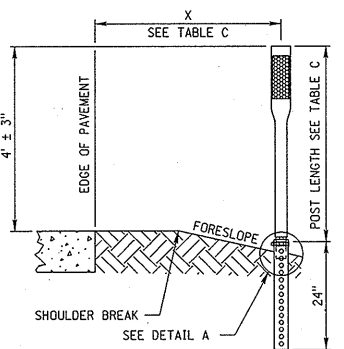
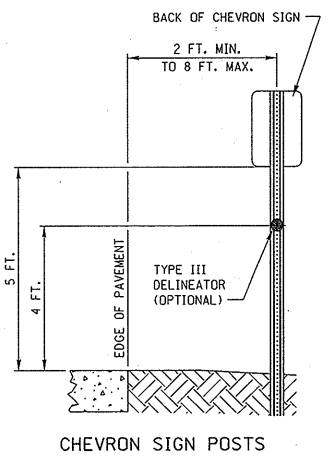


TABLE D STEEL DELINEATOR POST

X (FT.)	POST LENGTH & FORESLOPE			
	1:10 (FT.)	1:6 (FT.)	1:4 (FT.)	1:3 (FT.)
2	6.5	6.5	6.5	6.5
4	6.5	7.0	7.0	7.0
6	6.5	7.0	7.5	8.0
8	6.5	7.5	8.0	8.5

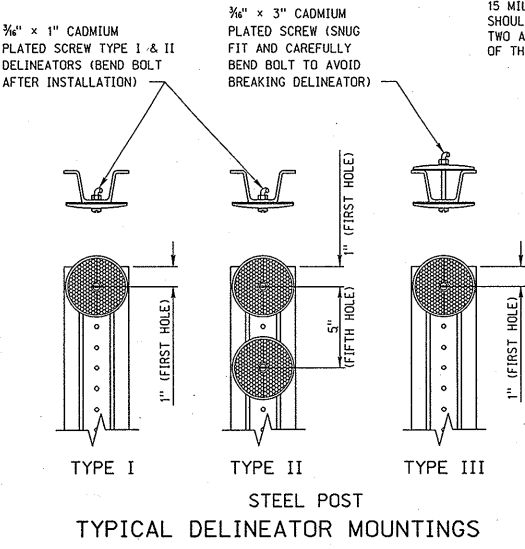
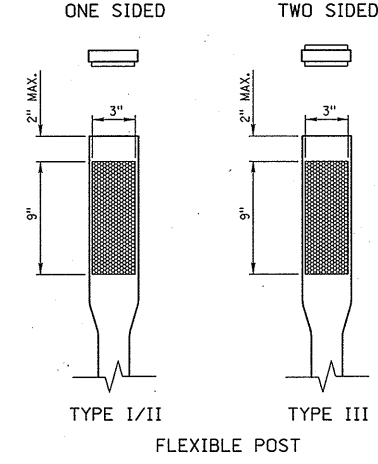
STEEL DELINEATOR POST

STEEL DELINEATOR POST



CHEVRON SIGN POSTS

DELINEATOR POST LOCATIONS



REV. NO.	DATE	DESCRIPTION OF REVISION
R11	JAN 19	MULTIPLE CHANGES & PAGE 2 ADDED
R10	JAN 18	NDOR BORDER TO NDOT BORDER
R9	JUN 04	MULTIPLE CHANGES

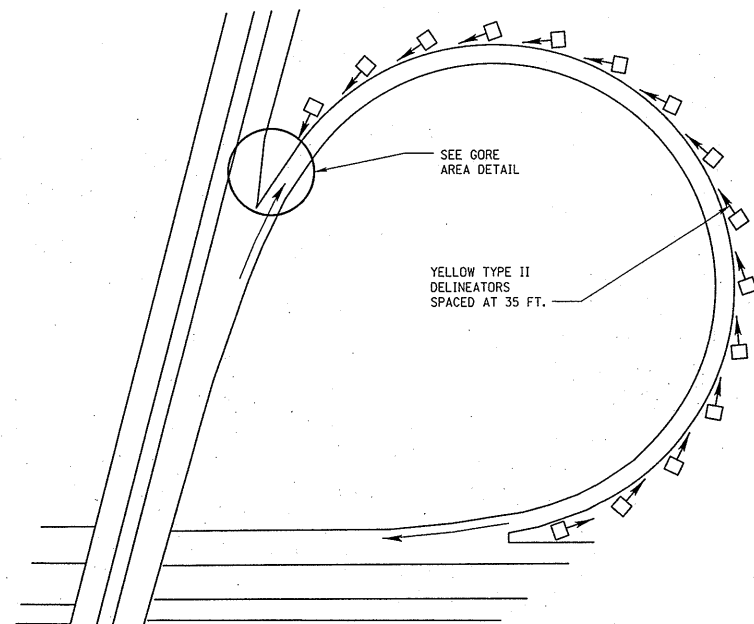
NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 901-R11
HIGHWAY DELINEATORS AND CHEVRONS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

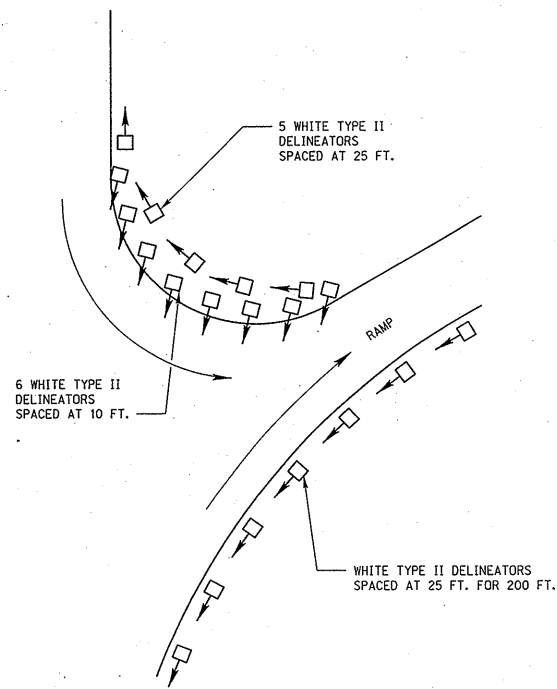
PROFESSIONAL ENGINEER
DANIEL J. WADDLE
E-6289
STATE OF NEBRASKA

MARY BURROUGHS
DATE: 11/8/18

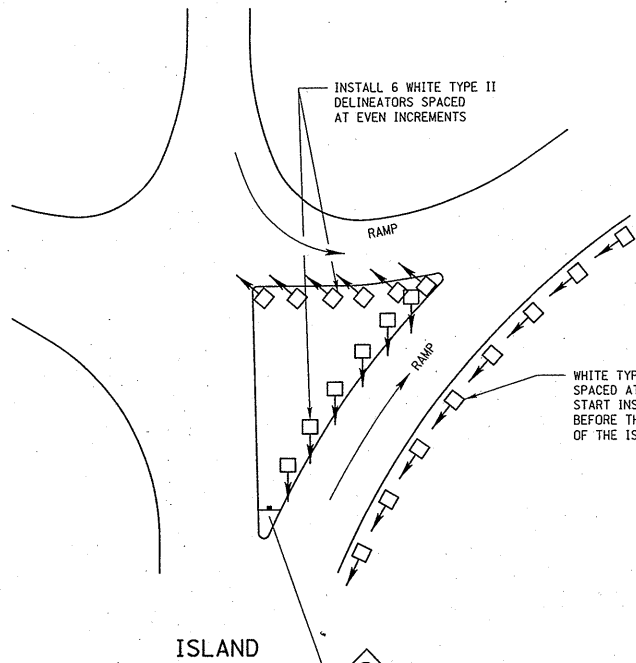
ORIGINAL: JUNE 11, 1975
DATE



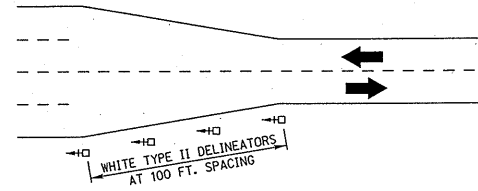
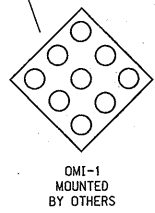
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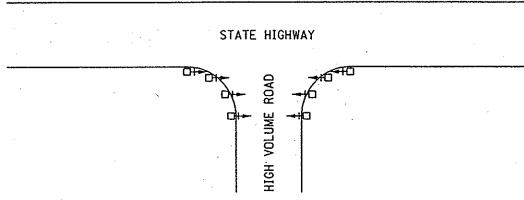
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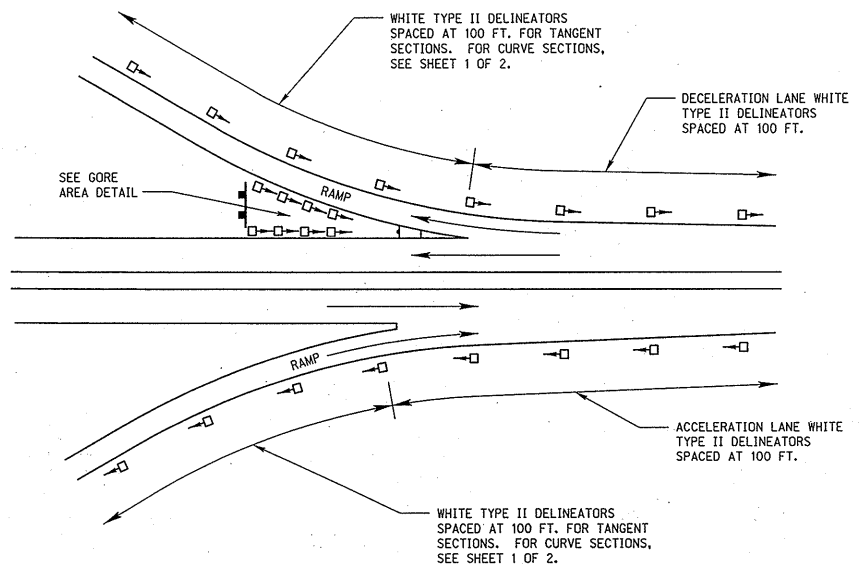


TYPICAL DELINEATOR LAYOUT FOR TRANSITION LANE

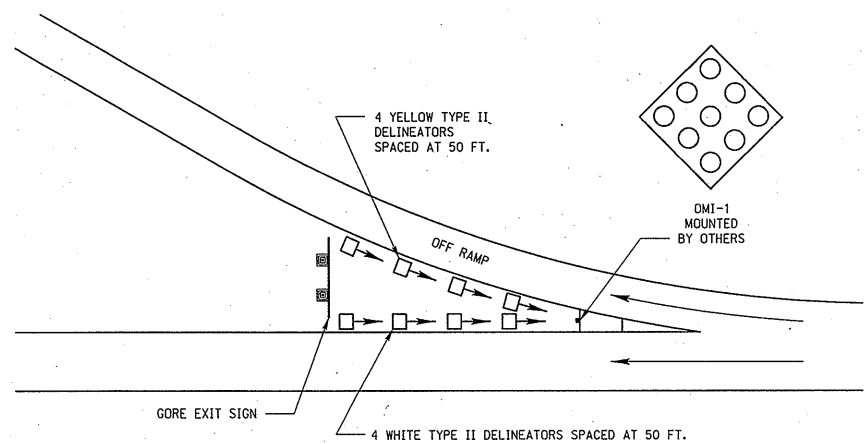


WHITE TYPE II DELINEATORS SHALL BE LAID OUT AS SHOWN. AT LOCATIONS REQUIRED BY THE ENGINEER, DELINEATORS SHALL BE SPACED 15 FT. APART.

TYPICAL DELINEATOR LAYOUT FOR HIGH VOLUME RURAL ROADS AND STATE HIGHWAYS



ON/OFF RAMP

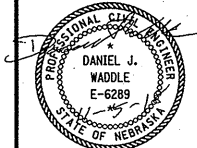


GORE AREA DETAIL

R11	JAN 19	MULTIPLE CHANGES & PAGE 2 ADDED
R10	JAN 18	NDOR BORDER TO NDOT BORDER
R9	JUN 04	MULTIPLE CHANGES
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 901-R11
HIGHWAY DELINEATORS AND CHEVRONS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:



MARY BURROUGHS
DATE 11/5/17

ORIGINAL:
JUNE 11, 1975
DATE

CHANNELIZATION DEVICES

THE FUNCTION OF CHANNELIZATION DEVICES IS TO WARN ROAD USERS OF CONDITIONS CREATED BY WORK ACTIVITIES IN OR NEAR THE TRAVELED WAY, TO PROTECT WORKERS IN THE TEMPORARY TRAFFIC CONTROL ZONE, AND TO GUIDE DRIVERS AND PEDESTRIANS SAFELY. CHANNELIZING DEVICES INCLUDE BUT ARE NOT LIMITED TO CONES, TUBULAR POSTS, VERTICAL PANELS, DRUMS, BARRICADES, TRAFFIC LANE DIVIDERS, TEMPORARY RAISED ISLANDS, AND BARRIERS.

DEVICES USED FOR CHANNELIZATION SHOULD PROVIDE FOR SMOOTH AND GRADUAL TRAFFIC MOVEMENT FROM ONE LANE TO ANOTHER, ONTO A BYPASS OR DETOUR, OR TO REDUCE THE WIDTH OF THE TRAVELED WAY. THEY MAY ALSO BE USED TO SEPARATE TRAFFIC FROM THE WORK SPACE, PAVEMENT DROP-OFFS, PEDESTRIAN PATHS, OR OPPOSING DIRECTIONS OF TRAFFIC.

CHANNELIZING DEVICES SHALL MEET THE CRASHWORTHY PERFORMANCE CRITERIA CONTAINED IN THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH). THEY SHOULD BE CONSTRUCTED AND BALLASTED TO PERFORM IN A PREDICTABLE MANNER WHEN INADVERTENTLY STRUCK BY A VEHICLE. IF STRUCK, THE DEVICE SHOULD YIELD OR BREAK AWAY, FRAGMENTS OR OTHER DEBRIS FROM THE DEVICE SHOULD NOT PENETRATE THE PASSENGER COMPARTMENT OF THE VEHICLE OR BE A POTENTIAL HAZARD TO WORKERS OR PEDESTRIANS IN THE IMMEDIATE AREA.

SPACING OF CHANNELIZING DEVICES SHOULD NOT EXCEED A DISTANCE IN FEET EQUAL TO THE SPEED WHEN USED FOR THE TAPER CHANNELIZATION, AND A DISTANCE IN FEET OF TWICE THE SPEED WHEN USED FOR TANGENT CHANNELIZATION.

SPACING OF CHANNELIZATION DEVICES		
SPEED (MPH)	SPACING OF DEVICES (FEET)	
	TAPER	TANGENT
25	25	50
35	35	70
45	45	90
55	55	110
60	60	120
65	65	130
75	75	150

WARNING LIGHTS MAY BE ADDED TO CHANNELIZING DEVICES IN AREAS WITH FREQUENT FOG, SNOW, OR SEVERE ROADWAY CURVATURE, OR WHERE VISUAL DISTRACTIONS ARE PRESENT, EXCEPT FOR THE SEQUENTIAL FLASHING WARNING LIGHTS, WARNING LIGHTS PLACED ON CHANNELIZING DEVICES USED IN A SERIES TO CHANNELIZE ROAD USERS SHALL BE STEADY-BURN.

THE RETROREFLECTIVE MATERIAL USED ON CHANNELIZING DEVICES SHALL HAVE A SMOOTH, SEALED OUTER SURFACE, MEETING THE REQUIREMENTS OF THE ASTM SPECIFICATION D4956, FOR TYPE IV SHEETING OR TYPE V REBOUNDABLE SHEETING (OR GREATER).

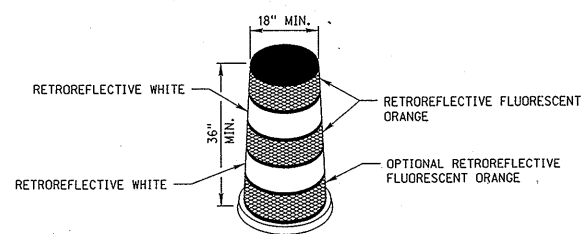
COEFFICIENT OF RETROREFLECTION (CD/LUX/M ²)			
WHITE	ORANGE	RED	YELLOW
250	100	45	170

THE AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA) "QUALITY GUIDELINES FOR WORK ZONE TRAFFIC CONTROL DEVICES" SHALL BE USED AS A VISUAL GUIDE FOR DETERMINING IF A TRAFFIC CONTROL DEVICE/OR SIGN IS ACCEPTABLE, MARGINAL OR UNACCEPTABLE.

THE NAME AND TELEPHONE NUMBER OF THE AGENCY, CONTRACTOR, OR SUPPLIER MAY BE SHOWN ON THE CHANNELIZING DEVICE BACK OR SUPPORT, BUT NOT ON THE DEVICE FACE. THE LETTERS AND NUMBERS SHALL BE A NON-REFLECTIVE COLOR AND NOT OVER 15 SQUARE INCHES IN TOTAL AREA.

PARTICULAR ATTENTION SHOULD BE GIVEN TO MAINTAINING THE CHANNELIZING DEVICES TO KEEP THEM CLEAN, VISIBLE, AND PROPERLY POSITIONED. DEVICES SHALL BE REPLACED THAT ARE DAMAGED AND/OR HAVE LOST A SIGNIFICANT AMOUNT OF THEIR RETROREFLECTIVITY AND EFFECTIVENESS.

REFLECTORIZED PLASTIC DRUMS



DESIGN

REFLECTORIZED PLASTIC DRUMS USED FOR TRAFFIC WARNING OR CHANNELIZATION SHALL BE CONSTRUCTED OF LIGHTWEIGHT, FLEXIBLE, AND DEFORMABLE MATERIALS AND BE A MINIMUM OF 36 INCHES IN HEIGHT AND HAVE A MINIMUM WIDTH OF AT LEAST A 18 INCHES, REGARDLESS OF ORIENTATION. THE PREDOMINANT COLOR OF THE DRUM SHALL BE ORANGE. METAL DRUMS SHALL NOT BE USED. THE MARKINGS ON DRUMS SHALL BE HORIZONTAL, SHALL BE CIRCUMFERENTIAL, AND SHALL DISPLAY FOUR 6 INCH WIDE BANDS OF RETROREFLECTIVE SHEETING, ALTERNATING FLUORESCENT ORANGE-WHITE-FLUORESCENT ORANGE-WHITE. DRUMS SHALL HAVE CLOSED TOPS THAT WILL NOT ALLOW COLLECTION OF CONSTRUCTION OR OTHER DEBRIS.

APPLICATION

DRUMS ARE MOST COMMONLY USED TO CHANNELIZE OR DELINEATE TRAFFIC FLOW BUT MAY ALSO BE USED INDIVIDUALLY OR IN GROUPS TO MARK SPECIFIC LOCATIONS. DRUMS ARE HIGHLY VISIBLE AND HAVE GOOD TARGET VALUE; THEY GIVE THE APPEARANCE OF BEING FORMIDABLE OBSTACLES AND, THEREFORE, COMMAND THE RESPECT OF ROAD USERS.

BALLAST SHALL NOT BE PLACED ON TOP OF THE DRUM. DRUMS SHOULD NOT BE WEIGHTED WITH SAND, WATER, OR ANY MATERIAL.

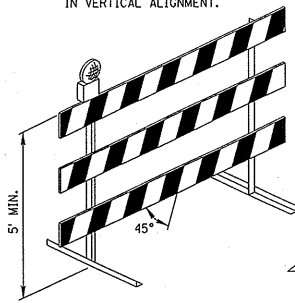
BARRICADES

BARRICADE TYPE	TYPE II	TYPE III
WIDTH OF RAIL*	8 INCHES MIN. - 12 INCHES MAX.	8 INCHES MIN. - 12 INCHES MAX.
LENGTH OF RAIL	36 INCHES	8 FEET**
WIDTH OF STRIPES	6 INCHES	6 INCHES
HEIGHT	36 INCHES	5 FEET
REFLECTIVE SHEETING	TYPE IV	TYPE IV
NUMBER OF REFLECTORIZED RAIL FACES	4 (TWO EACH DIRECTION)	6 (THREE EACH DIRECTION)

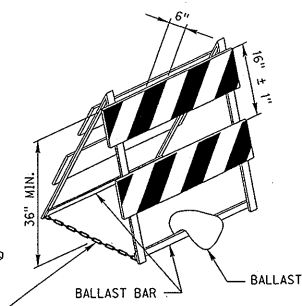
*NOMINAL DIMENSIONS ARE PERMISSIBLE WHEN CONSTRUCTED FROM LUMBER.
**WHEN LATERAL SPACE IS LIMITED, SOME TYPE III BARRICADES WITH A 4 FOOT LENGTH OF RAIL, MAY BE ALLOWED WHEN APPROVED BY THE ENGINEER.

TYPE III BARRICADE

TYPICAL MOUNTING OF FLASHING WARNING LIGHTS. LIGHTS SHALL ALWAYS BE IN VERTICAL ALIGNMENT.



TYPE II BARRICADE



BALLAST SHALL NOT BE PLACED OVER ANY REFLECTIVE DEVICE

DESIGN

A BARRICADE IS A PORTABLE OR FIXED DEVICE HAVING TWO OR THREE RAILS WITH APPROPRIATE MARKINGS. IT IS USED TO CONTROL ROAD USERS BY CLOSING, RESTRICTING, OR DELINEATING ALL OR A PORTION OF THE RIGHT-OF-WAY.

BARRICADES SHALL BE ONE OF TWO TYPES: TYPE II OR TYPE III.

STRIPES ON BARRICADE RAILS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTIVE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION ROAD USERS ARE TO PASS. THE STRIPES SHALL BE 6 INCHES WIDE. THE MINIMUM RAIL LENGTH FOR A TYPE II BARRICADE IS 36 INCHES.

WHERE BARRICADES EXTEND ENTIRELY ACROSS A ROADWAY, THE STRIPES SHOULD SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH ROAD USERS MUST TURN. WHERE BOTH RIGHT AND LEFT TURNS ARE PROVIDED, THE STRIPES MAY SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE OR BARRICADES. WHERE NO TURNS ARE INTENDED, THE STRIPES SHOULD SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES.

BARRICADE RAILS SHOULD BE SUPPORTED IN A MANNER THAT WILL ALLOW THEM TO BE SEEN BY THE ROAD USER, AND IN A MANNER THAT PROVIDES A STABLE SUPPORT THAT IS NOT EASILY BLOWN OVER OR DISPLACED.

ON HIGH-SPEED ROADWAYS OR IN OTHER SITUATIONS WHERE BARRICADES MAY BE SUSCEPTIBLE TO OVERTURNING IN THE WIND, SANDBAGS SHOULD BE USED FOR BALLASTING. SANDBAGS MAY BE PLACED ON LOWER PARTS OF THE FRAME OR STAYS TO PROVIDE THE REQUIRED BALLAST BUT SHALL NOT BE PLACED ON TOP OF ANY STRIPED RAIL. BARRICADES SHALL NOT BE BALLASTED BY HEAVY OBJECTS SUCH AS ROCKS OR CHUNKS OF CONCRETE.

THE BARRICADE OWNERS NAME, NOT TO EXCEED 15 SQUARE INCHES SHALL BE SHOWN ON THE BARRICADE BACK OR SUPPORT BUT NOT ON ITS FACE.

** WHEN LATERAL SPACE IS LIMITED, SOME TYPE III BARRICADES WITH A 4 FOOT LENGTH OF RAIL, MAY BE ALLOWED WHEN APPROVED BY THE ENGINEER.

APPLICATION

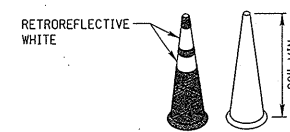
TYPE II BARRICADES ARE INTENDED FOR USE IN SITUATIONS WHERE TRAFFIC IS MAINTAINED THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE. THEY MAY BE USED INDIVIDUALLY OR IN GROUPS TO MARK A SPECIFIC CONDITION, OR THEY MAY BE USED IN A SERIES FOR CHANNELIZING TRAFFIC. ON THE INTERSTATE, FREEWAY AND EXPRESSWAY SYSTEM, TYPE II BARRICADES SHALL NOT BE USED FOR CHANNELIZATION.

TYPE III BARRICADES USED AT A ROAD CLOSURE MAY EXTEND COMPLETELY ACROSS A ROADWAY FROM CURB TO CURB. WHERE PROVISION IS MADE FOR ACCESS OF AUTHORIZED EQUIPMENT AND VEHICLES, THE RESPONSIBILITY FOR THE TYPE III BARRICADES SHOULD BE ASSIGNED TO A PERSON WHO SHALL PROVIDE PROPER CLOSURE AT THE END OF EACH WORK DAY.

WHEN A HIGHWAY IS LEGALLY CLOSED BUT ACCESS MUST STILL BE ALLOWED FOR LOCAL TRAFFIC, THE TYPE III BARRICADES MAY NOT BE EXTENDED COMPLETELY ACROSS A ROADWAY. A SIGN WITH THE APPROPRIATE LEGEND CONCERNING PERMISSIBLE USE BY LOCAL TRAFFIC SHALL BE MOUNTED.

NORMALLY PERMANENT SIGNS MOUNTED ON BARRICADES SHALL BE ERRECTED ABOVE THE BARRICADE. THE SIGNS "ROAD CLOSED", OR "ROAD WORK AHEAD", FOR EXAMPLE CAN EFFECTIVELY BE MOUNTED ABOVE THE BARRICADE THAT CLOSSES THE ROADWAY. TYPE III BARRICADES SHALL BE SUPPLEMENTED WITH A LIGHTING DEVICE UNLESS SPECIFICALLY OMITTED BY THE ENGINEER. DETOUR ARROW AND LARGE WARNING ARROW SIGNS SHOULD BE PLACED ON THE FACE OF BARRICADE.

CONES



DESIGN

CONES SHALL BE PREDOMINANTLY ORANGE, FLUORESCENT RED-ORANGE, OR FLUORESCENT YELLOW/ORANGE, NOT LESS THAN 28 INCHES IN HEIGHT, AND SHALL BE MADE OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING VEHICLES ON IMPACT. CONES WHEN ALLOWED ON THE INTERSTATE, FREEWAY OR EXPRESSWAY SYSTEM SHALL BE A MINIMUM OF 36 INCHES IN HEIGHT.

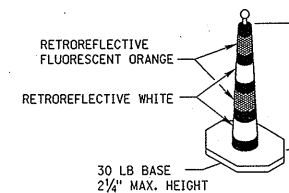
FOR NIGHTTIME USE, CONES SHALL BE RETROREFLECTIVE OR EQUIPPED WITH LIGHTING DEVICES FOR MAXIMUM VISIBILITY. RETROREFLECTION OF 28 INCH OR 36 INCH CONES SHALL BE PROVIDED BY A WHITE BAND 6 INCHES WIDE, NO MORE THAN 4 INCHES FROM THE TOP OF THE CONE, AND AN ADDITIONAL 4 INCH WIDE WHITE BAND A MINIMUM OF 2 INCHES BELOW THE 6 INCH BAND.

APPLICATION

TRAFFIC CONES ARE USED TO CHANNELIZE TRAFFIC, DIVIDE OPPOSING TRAFFIC LANES, DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION, AND DELINEATE SHORT-DURATION MAINTENANCE AND UTILITY WORK. CONES SHALL NOT BE USED FOR LANE CLOSURE TAPERS OR SHIFTS, CONES SMALLER THAN 42 INCHES SHALL NOT BE USED AT NIGHT ON RURAL HIGHWAYS, UNLESS SHOWN ON THE PLANS OR AS APPROVED OR DIRECTED BY THE ENGINEER.

STEPS SHOULD BE TAKEN TO ENSURE THAT CONES WILL NOT BE BLOWN OVER OR DISPLACED BY WIND OR MOVING TRAFFIC. CONES CAN BE DOUBLED UP TO INCREASE THEIR WEIGHT. SOME CONES ARE CONSTRUCTED WITH BASES THAT CAN BE FILLED WITH BALLAST. OTHERS HAVE SPECIAL WEIGHTED BASES, OR WEIGHTS SUCH AS SANDBAG RINGS THAT CAN BE DROPPED OVER THE CONES AND ONTO THE BASE TO PROVIDE ADDED STABILITY. BALLAST, HOWEVER, SHOULD NOT PRESENT A HAZARD IF THE CONES ARE INADVERTENTLY STRUCK.

42 INCH CONES



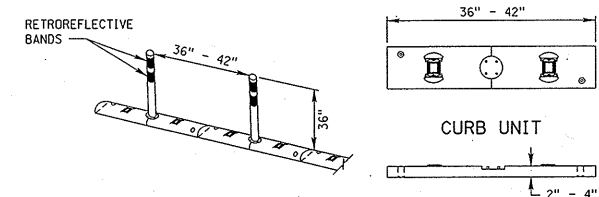
DESIGN

42 INCH CONES SHALL INCLUDE A 30 POUND RUBBER BASE AND DISPLAY FOUR 6 INCH WIDE BANDS OF RETROREFLECTIVE SHEETING, ALTERNATING FLUORESCENT ORANGE-WHITE-FLUORESCENT ORANGE-WHITE.

APPLICATION

WHEN APPROVED BY THE ENGINEER OR SHOWN IN THE PLANS, 42 INCH REFLECTIVE CONES MAY BE USED IN LIEU OF TYPE II BARRICADES OR REFLECTORIZED DRUMS. 42 INCH CONES SHALL NOT BE USED FOR LANE-CLOSURE TAPERS OR SHIFTS. IF A RECTANGULAR BASE IS USED, THE LONG SIDE OF THE BASE SHOULD BE ORIENTED PARALLEL TO THE DIRECTION OF TRAFFIC.

TUBULAR POST AND CURB SYSTEM



DESIGN

TUBULAR POSTS USED IN THE SYSTEM SHALL BE 36 INCHES HIGH AND A MINIMUM OF 2 INCHES WIDE WHEN FACING TRAFFIC. THE TUBULAR POST AND CURB SYSTEM SHALL BE MADE OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING IMPACTING VEHICLES. THE COLOR SHALL BE AS SHOWN IN THE PLANS.

THE TUBULAR POSTS SHALL BE RETROREFLECTIVE. RETROREFLECTION OF TUBULAR POSTS SHALL BE PROVIDED BY TWO 3-INCH WIDE RETROREFLECTIVE BANDS PLACED A MAXIMUM OF 2 INCHES FROM THE TOP WITH A MAXIMUM OF 6 INCHES BETWEEN THE BANDS. EACH CURB SECTION SHALL CONTAIN ONE RETROREFLECTIVE MARKER FACING EACH DIRECTION OF TRAFFIC. THE COLOR OF THE RETROREFLECTIVE BANDS AND MARKERS SHALL MATCH THE POST/CURB COLOR.

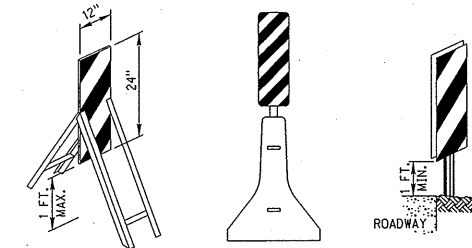
THE CURB SECTIONS SHALL BE CONFIGURED TO ALLOW FOR DRAINAGE FROM THE PAVEMENT SURFACE.

APPLICATION

TUBULAR POST AND CURB SYSTEMS MAY BE USED TO DIVIDE OPPOSING LANES OF TRAFFIC OR TO DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION. FASTENING THE CURBS TO THE PAVEMENT WITH ANCHOR BOLTS OR OTHER SUITABLE METHODS AS DIRECTED BY THE MANUFACTURER IS REQUIRED TO MINIMIZE THE CHANCE OF BEING MOVED BY TRAFFIC.

TUBULAR POST AND CURB SYSTEMS SHALL BE INSTALLED IN THE LOCATIONS SHOWN IN THE PLANS OR DIRECTED BY THE ENGINEER.

VERTICAL PANELS



DESIGN

RETROREFLECTIVE MATERIAL ON VERTICAL PANELS SHALL BE 12 INCHES WIDE AND AT LEAST 24 INCHES HIGH. THEY SHALL HAVE ALTERNATING ORANGE AND WHITE STRIPES, WHERE THE HEIGHT OF THE RETROREFLECTIVE MATERIAL ON THE VERTICAL PANEL IS MORE THAN 36 INCHES, A PANEL STRIPE WIDTH OF 6 INCHES SHALL BE USED. WHERE THE HEIGHT OF THE RETROREFLECTIVE MATERIAL ON THE VERTICAL PANEL IS 36 INCHES OR LESS, A PANEL STRIPE WIDTH OF 4 INCHES SHALL BE USED. IF USED FOR TWO-WAY TRAFFIC, BACK-TO-BACK PANELS SHALL BE USED.

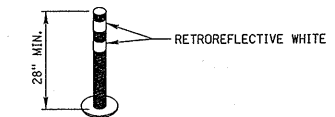
MARKINGS FOR VERTICAL PANELS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTORIZED STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.

POST MOUNTED VERTICAL PANELS SHALL BE MOUNTED WITH THE BOTTOM A MINIMUM OF 1 FOOT ABOVE THE ROADWAY. VERTICAL PANELS ON A TEMPORARY STAND SHALL BE MOUNTED WITH THE BOTTOM A MAXIMUM OF 1 FOOT ABOVE THE ROADWAY.

APPLICATION

WHERE SPACE IS LIMITED VERTICAL PANELS MAY BE USED TO CHANNEL TRAFFIC, DIVIDE OPPOSING LANES OF TRAFFIC, DIVIDE TRAFFIC LANES OR REPLACE BARRICADES. WHEN APPROVED BY THE ENGINEER, VERTICAL PANELS MAY BE POST-MOUNTED ALONG THE SIDE OF THE ROADWAY.

TUBULAR POSTS



DESIGN

TUBULAR POSTS SHALL BE PREDOMINANTLY ORANGE, NOT LESS THAN 28 INCHES HIGH, BE A MINIMUM OF 2 INCHES WIDE WHEN FACING TRAFFIC, AND MADE OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING IMPACTING VEHICLES.

TUBULAR POSTS SHALL BE RETROREFLECTIVE. RETROREFLECTION OF TUBULAR POSTS SHALL BE PROVIDED BY TWO 3 INCHES WIDE WHITE BANDS PLACED A MAXIMUM OF 2 INCHES FROM THE TOP, WITH A MAXIMUM OF 6 INCHES BETWEEN THE BANDS. THE BASE SHALL NOT BE WIDER THAN 12 INCHES OR HIGHER THAN 2 INCHES.

APPLICATION

TUBULAR POSTS HAVE LESS VISIBLE AREA THAN OTHER DEVICES AND SHOULD BE USED ONLY WHERE SPACE RESTRICTIONS DO NOT ALLOW FOR THE USE OF OTHER MORE VISIBLE DEVICES. THEY MAY BE USED EFFECTIVELY TO DIVIDE OPPOSING LANES OF TRAFFIC OR TO DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION.

STEPS SHOULD BE TAKEN TO ASSURE THAT TUBULAR POSTS WILL NOT BE BLOWN OVER OR DISPLACED BY TRAFFIC BY EITHER AFFIXING THEM TO THE PAVEMENT WITH ANCHOR BOLTS OR ADHESIVE, IF A NONCYLINDRICAL DEVICE IS USED, IT SHALL BE ATTACHED TO THE PAVEMENT TO ENSURE THAT THE WIDTH FACING TRAFFIC MEETS THE MINIMUM REQUIREMENTS.

TUBULAR POSTS SHOULD NOT BE USED FOR PEDESTRIAN CHANNELIZATION OR A PEDESTRIAN BARRIERS IN TEMPORARY TRAFFIC CONTROL ZONES ON OR ALONG SIDEWALKS.

REV. NO.	DATE	DESCRIPTION OF REVISION
R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 920-R7
TRAFFIC CONTROL,
CONSTRUCTION AND MAINTENANCE

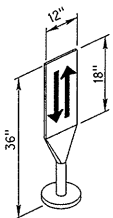
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:
DANIEL J. WADDLE
E-6289
OCTOBER 1998

DATE: 9-1-2017

DATE: OCTOBER 1998

1
3

OPPOSING TRAFFIC LANE DIVIDERS



DESIGN

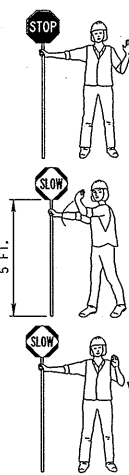
OPPOSING TRAFFIC LANE DIVIDERS SHALL BE A TWO SIDED UPRIGHT RETROREFLECTORIZED ORANGE PANEL, WITH A WIDTH OF 12 INCHES AND A HEIGHT OF 18 INCHES. THE TOP OF THE PANEL SHALL BE 36 INCHES ABOVE THE PAVEMENT. THE SYMBOL ON EACH SIDE SHALL BE TWO OPPOSING BLACK ARROWS. THE LANE DIVIDER SHALL BE MADE OF LIGHTWEIGHT MATERIAL THAT WILL YIELD UPON IMPACT BY A VEHICLE. THE LANE DIVIDER BASE SHALL NOT BE WIDER THAN 12 INCHES OR HIGHER THAN 4 INCHES. THE BASE SHALL BE ATTACHED TO THE EXISTING SURFACE BY EPOXY OR OTHER SUITABLE ADHESIVE, TO ENSURE THAT THE PANEL REMAINS FACING TRAFFIC.

APPLICATION

OPPOSING TRAFFIC LANE DIVIDERS ARE DELINEATION DEVICES USED AS CENTER LANE DIVIDERS TO SEPARATE OPPOSING TRAFFIC ON A TWO-LANE, TWO-WAY OPERATION.

FLAGGERS

REQUIRED METHOD



TO STOP TRAFFIC

TRAFFIC PROCEED

TO ALERT AND SLOW TRAFFIC

EMERGENCY USE ONLY



FLAGGER PADDLE

THE STOP/SLOW PADDLE SHALL HAVE AN OCTAGONAL SHAPE ON A RIGID HANDLE. STOP/SLOW PADDLES SHALL BE AT LEAST 18 INCHES WIDE WITH LETTERS AT LEAST 6 INCHES HIGH. IF THE STOP/SLOW PADDLE IS PLACED ON A RIGID STAFF, THE MINIMUM LENGTH OF THE STAFF, MEASURED FROM THE BOTTOM OF THE SIGN TO THE END OF THIS STAFF THAT RESTS ON THE GROUND, SHOULD BE 5 FEET. THE STOP/SLOW PADDLE SHOULD BE THE PRIMARY AND PREFERRED HAND-SIGNALING DEVICE BECAUSE THE STOP/SLOW PADDLE GIVES ROAD USERS MORE POSITIVE GUIDANCE THAN RED FLAGS. USE OF FLAGS SHOULD BE LIMITED TO EMERGENCY SITUATIONS.

FLAGGERS

A FLAGGER MUST BE DRESSED FOR SAFETY. IN ADDITION TO THE REQUIREMENTS OF THE "WORKER VISIBILITY" SECTION LISTED BELOW, FLAGGERS SHALL WEAR:

1. AN ORANGE OR YELLOW/GREEN CAP OR HARD HAT.
2. A SHIRT WITH SLEEVES, PANTS AND SHOES (TANK TOPS, SHORTS OR SANDALS SHALL NOT BE WORN).

FLAGGERS SHALL BE INSTRUCTED IN THE PROPER LOCATION, DUTIES AND PROCEDURES FOR FLAGGING AS OUTLINED IN THE CURRENT MUTCD AND THE DEPARTMENT OF ROADS FLAGGER'S HANDBOOK. AS REQUIRED BY THE DEPARTMENT OF ROADS, THE FLAGGER SHALL BE CERTIFIED, AND HAVE IN THEIR POSSESSION, A VALID FLAGGER CERTIFICATION CARD.

WORKER VISIBILITY

ALL WORKERS WITHIN THE RIGHT-OF-WAY WHO ARE EXPOSED EITHER TO TRAFFIC (VEHICLES USING THE HIGHWAY FOR PURPOSES OF TRAVEL) OR TO CONSTRUCTION EQUIPMENT WITHIN THE WORK AREA SHALL WEAR HIGH-VISIBILITY SAFETY APPAREL. HIGH-VISIBILITY SAFETY APPAREL IS DEFINED TO MEAN PERSONAL PROTECTIVE SAFETY CLOTHING THAT:

1. IS INTENDED TO PROVIDE CONSPICUITY DURING BOTH DAYTIME AND NIGHTTIME USAGE, AND
2. MEETS THE PERFORMANCE CLASS 2 OR CLASS 3 REQUIREMENTS OF THE ANSI/ISEA 107-2004 PUBLICATION ENTITLED "AMERICAN NATIONAL STANDARDS FOR HIGH-VISIBILITY SAFETY APPAREL AND HEADWEAR"

LIGHTING DEVICES

FUNCTION

CONSTRUCTION AND MAINTENANCE ACTIVITIES OFTEN CREATE CONDITIONS ON OR NEAR THE TRAVELED WAY THAT ARE PARTICULARLY HAZARDOUS AT NIGHT. IT IS OFTEN DESIRABLE AND NECESSARY TO SUPPLEMENT THE REFLECTORIZED SIGNS, BARRIERS, AND CHANNELIZING DEVICES WITH LIGHTING DEVICES. STROBE TYPE LIGHTS ARE NOT PERMITTED.

BARRICADE WARNING LIGHTS DESIGN (BATTERY OPERATED)

TYPE "A" LOW INTENSITY FLASHING WARNING LIGHTS ARE MOST COMMONLY MOUNTED ON BARRICADES, OR WITH SIGNS AND ARE INTENDED TO WARN THE DRIVER THAT THEY ARE PROCEEDING IN A HAZARDOUS AREA. THESE LIGHTS SHALL NOT BE USED FOR DELINEATION, AS A SERIES OF FLASHING LIGHTS IN A ROW WOULD TEND TO OBSCURE THE DESIRED PATH.

TYPE "A" HIGH INTENSITY FLASHING WARNING LIGHTS ARE NORMALLY MOUNTED ON THE TYPE III BARRICADE THAT ACCOMPANIES THE ADVANCE WARNING SIGNS.

TYPE "C" STEADY BURN LIGHTS AS USED HEREIN, SHALL MEAN A SERIES OF LOW WATTAGE YELLOW ELECTRIC LIGHTS. WHERE LIGHTS ARE NEEDED TO DELINEATE OR MARK THE TRAVELED WAY THROUGH AND AROUND OBSTRUCTIONS IN A CONSTRUCTION MAINTENANCE AREA, THE DELINEATION SHALL BE ACCOMPLISHED BY USE OF STEADY BURNING LIGHTS. WHEN USED TO SUPPLEMENT CHANNELIZATION, THE MAXIMUM SPACING FOR WARNING LIGHTS SHOULD BE IDENTICAL TO THE CHANNELIZING DEVICE SPACING REQUIREMENTS. WHEN USED TO DELINEATE A CURVE, TYPE "C" WARNING LIGHTS SHOULD ONLY BE USED ON DEVICES ON THE OUTSIDE OF THE CURVE, AND NOT ON THE INSIDE OF THE CURVE.

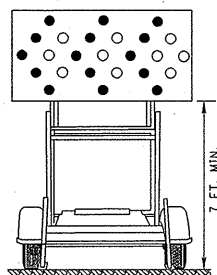
FLASHING ARROW PANEL (DISPLAY)

AN ARROW PANEL IS A SIGN WITH A MATRIX OF ELEMENTS, CAPABLE OF EITHER FLASHING OR SEQUENTIAL DISPLAYS. THIS SIGN SHALL PROVIDE ADDITIONAL WARNING AND DIRECTIONAL INFORMATION TO ASSIST IN MERGING AND CONTROLLING ROAD USERS THROUGH OR AROUND A TEMPORARY TRAFFIC CONTROL ZONE. AN ARROW PANEL SHOULD BE USED IN COMBINATION WITH APPROPRIATE SIGNS, CHANNELIZING DEVICES OR OTHER TRAFFIC CONTROL DEVICES.

DESIGN

ARROW PANELS SHALL MEET THE SIZE AND SPECIFICATIONS OF THE MUTCD FOR TYPE "C" ARROW DISPLAYS.

FLASHING ARROW PANEL SHALL BE RECTANGULAR, OF SOLID APPEARANCE AND FINISHED IN NON-REFLECTIVE BLACK. THE PANEL SHALL BE MOUNTED ON A VEHICLE, TRAILER OR OTHER SUITABLE SUPPORT. MINIMUM MOUNTING HEIGHT MEASURED VERTICALLY FROM THE BOTTOM OF THE PANEL TO THE ROADWAY BELOW IT OR TO THE ELEVATION OF THE NEAR EDGE OF THE ROADWAY, SHALL BE 7 FEET EXCEPT ON VEHICLE-MOUNTED PANELS, WHICH SHOULD BE AS HIGH AS PRACTICAL.



THE FOLLOWING SELECTIONS SHALL BE PROVIDED ON THE ARROW PANEL	
OPERATING MODE	PANEL DISPLAY
FLASHING ARROW	RIGHT SHOWN; LEFT OPPOSITE
SEQUENTIAL ARROW	RIGHT SHOWN; LEFT OPPOSITE
SEQUENTIAL CHEVRON	RIGHT SHOWN; LEFT OPPOSITE
FLASHING DOUBLE ARROW	
FLASHING OR ALTERNATING CAUTION	OR OR

THE ARROW PANEL SHALL HAVE A MINIMUM SIZE OF 96 INCHES WIDE AND 48 INCHES HIGH. THE MINIMUM LEGIBILITY DISTANCE SHALL BE 1 MILE. THE PANEL SHALL CONTAIN 25 LAMP ELEMENTS. ARROW PANEL ELEMENTS SHALL BE CAPABLE OF A MINIMUM 50 PERCENT DIMMING, AUTOMATICALLY WHEN AMBIENT LIGHT FALLS BELOW 50 LUX.

THE MINIMUM ELEMENT "ON TIME" SHALL BE 50 PERCENT FOR THE FLASHING MODE AND EQUAL INTERVALS OF 25 PERCENT FOR EACH SEQUENTIAL CHEVRON PHASE. THE FLASHING RATE SHALL BE NO FEWER THAN 25 NOR MORE THAN 40 FLASHES PER MINUTE.

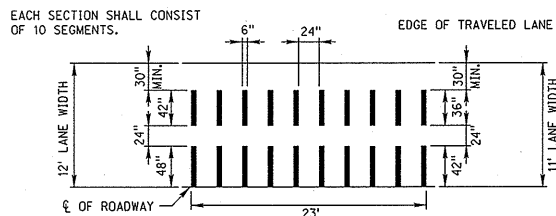
APPLICATION

A FLASHING ARROW OR SEQUENTIAL CHEVRON MODE SHALL ONLY BE USED FOR STATIONARY OR MOVING LANE CLOSURES.

FOR SHOULDER WORK BLOCKING THE SHOULDER, FOR ROADSIDE WORK NEAR THE SHOULDER, OR FOR TEMPORARILY CLOSING ONE LANE ON A TWO-LANE, TWO-WAY ROADWAY, AN ARROW PANEL SHALL BE USED ONLY IN THE CAUTION MODE.

AN ARROW DISPLAY MODE SHALL NOT BE USED ON A TWO-LANE TWO-WAY ROADWAY FOR TEMPORARY ONE-LANE OPERATION OR LANE SHIFTS. AN ARROW DISPLAY SHALL NOT BE USED TO LATERALLY SHIFT TRAFFIC.

TEMPORARY RUMBLE STRIPS



DESIGN

TEMPORARY RUMBLE STRIPS MAY BE MADE OF ASPHALT PAVING MATERIAL, EPOXY AND AGGREGATE OR OTHER SUITABLE MATERIAL WHICH WILL MAINTAIN A DESIRABLE RUMBLE EFFECT. THE TEMPORARY RUMBLE STRIP SHOULD HAVE AN INSTALLED HEIGHT OF 3/8". PREFORMED RUMBLE STRIPS MAY BE USED PROVIDED THEY HAVE A MINIMUM 1/2" HEIGHT.

TRAFFIC SIGNALS

TRAFFIC SIGNALS MAY BE ALLOWED AT CERTAIN EQUIPMENT CROSSINGS WHERE THE VOLUME OF TRAFFIC AND THE NUMBER OF EQUIPMENT CROSSINGS PER HOUR IS HIGH. TRAFFIC SIGNALS MAY BE ALLOWED AT CERTAIN BRIDGE CONSTRUCTION SITES WHERE A COMBINATION OF ONE-WAY TRAFFIC AND HIGH TRAFFIC VOLUMES WOULD BE BEST SERVED WITH THIS TYPE OF TRAFFIC CONTROL.

ALL TRAFFIC SIGNAL REQUESTS AND METHOD OF INSTALLATION ON THE STATE HIGHWAY SYSTEM SHALL BE IN COMPLIANCE WITH THE MUTCD AND MUST BE APPROVED BY THE STATE TRAFFIC ENGINEER.

IF, AFTER THE SIGNAL ASSEMBLIES ARE ERECTED AND THE ROAD IS OPEN TO PUBLIC TRAVEL, THE SIGNAL SYSTEM IS NOT PUT IMMEDIATELY INTO OPERATION, THE SIGNAL FACES SHALL BE COVERED WITH BURLAP OR OTHER OPAQUE MATERIAL SUBJECT TO THE APPROVAL OF THE ENGINEER. INOPERATIVE SIGNALS ON ROADS OPEN TO THE PUBLIC SHALL ALWAYS BE COVERED. TILTING THE SIGNALS UPWARD IS NOT AN ACCEPTABLE ALTERNATIVE TO COVERING THE HEADS.

FLOODLIGHTS

WHEN NIGHTTIME WORK IS REQUIRED, FLOODLIGHTS SHALL BE USED TO ILLUMINATE FLAGGER STATIONS. FLOODLIGHTS SHOULD BE USED TO ILLUMINATE EQUIPMENT CROSSINGS, AND OTHER AREAS WHERE EXISTING LIGHT IS NOT ADEQUATE FOR THE WORK TO BE PERFORMED SAFELY.

IN NO CASE SHALL FLOODLIGHTING BE PERMITTED TO CREATE A DISABLING GLARE FOR DRIVERS. THE ADEQUACY OF THE FLOODLIGHT PLACEMENT AND ELIMINATION OF POTENTIAL GLARE SHOULD BE CHECKED BY DRIVING THROUGH THE PROJECT.

PAVEMENT MARKING

IT IS INTENDED TO THE EXTENT POSSIBLE, THAT MOTORISTS BE PROVIDED MARKINGS WITHIN A WORK AREA COMPARABLE TO THE MARKINGS NORMALLY MAINTAINED ALONG ADJACENT ROADWAYS, PARTICULARLY AT EITHER END OF THE WORK AREA.

ALL MARKINGS AND DEVICES USED TO DELINEATE VEHICLE AND PEDESTRIAN PATHS SHALL BE CAREFULLY REVIEWED DURING DAYTIME AND NIGHTTIME PERIODS TO AVOID INADVERTENTLY LEADING DRIVERS OR PEDESTRIANS FROM THE INTENDED PATH.

PAVEMENT MARKINGS NO LONGER APPLICABLE SHALL BE REMOVED UNLESS OTHERWISE APPROVED BY THE ENGINEER.

TAPERS

TAPERS ARE CREATED USING A SERIES OF CHANNELIZING DEVICES OR PAVEMENT MARKINGS TO MOVE TRAFFIC OUT OF OR INTO ITS NORMAL PATH.

MERGING TAPER

A MERGING TAPER REQUIRES THE LONGEST DISTANCE BECAUSE DRIVERS ARE REQUIRED TO MERGE INTO COMMON ROAD SPACE. THE TAPER SHOULD BE LONG ENOUGH TO ENABLE MERGING DRIVERS TO HAVE ADEQUATE ADVANCE WARNING AND SUFFICIENT LENGTH TO ADJUST THEIR SPEEDS AND MERGE INTO A SINGLE LANE BEFORE THE DOWNSTREAM END OF THE TRANSITION.

SHIFTING TAPER

A SHIFTING TAPER IS USED WHEN MERGING IS NOT REQUIRED, BUT A LATERAL SHIFT IS NEEDED. APPROXIMATELY ONE-HALF "L" HAS BEEN FOUND TO BE ADEQUATE, WHERE MORE SPACE IS AVAILABLE, IT MAY BE BENEFICIAL TO USE LONGER TAPERS. GUIDANCE FOR CHANGES IN ALIGNMENT MAY ALSO BE ACCOMPLISHED BY USING HORIZONTAL CURVES DESIGNED FOR NORMAL HIGHWAY SPEEDS.

SHOULDER TAPERS

A SHOULDER TAPER MAY BE BENEFICIAL ON HIGH-SPEED ROADWAYS WHERE SHOULDERS ARE PART OF THE ACTIVITY AREA AND ARE CLOSED, OR WHEN IMPROVED SHOULDERS MIGHT BE MISTAKEN AS A DRIVING LANE IN THESE INSTANCES, THE SAME TYPE, BUT ABBREVIATED, CLOSURE PROCEDURES USED ON A NORMAL PORTION OF THE ROADWAY CAN BE USED. IF USED, SHOULDER TAPERS APPROACHING THE ACTIVITY AREA SHOULD HAVE A LENGTH OF ABOUT ONE-THIRD "L".

DOWNSTREAM TAPERS

THE DOWNSTREAM TAPER MAY BE USEFUL IN TERMINATION AREAS TO PROVIDE A VISUAL CUE TO THE DRIVER THAT ACCESS IS AVAILABLE TO THE ORIGINAL LANE OR PATH THAT WAS CLOSED. WHEN USED, IT SHOULD HAVE A MINIMUM LENGTH OF ABOUT 100 FEET PER LANE, WITH DEVICES SPACED ABOUT 20 FEET APART.

ONE LANE, TWO WAY TAPER

THE ONE-LANE, TWO-WAY TAPER IS USED IN ADVANCE OF AN ACTIVITY AREA THAT OCCUPIES PART OF A TWO-WAY ROADWAY IN SUCH A WAY THAT A PORTION OF THE ROAD IS USED ALTERNATELY BY TRAFFIC IN EACH DIRECTION. A SHORT TAPER HAVING A MINIMUM LENGTH OF 50 FEET AND A MAXIMUM LENGTH OF 100 FEET WITH CHANNELIZING DEVICES AT APPROXIMATELY 20 FOOT SPACINGS SHOULD BE USED TO GUIDE TRAFFIC INTO THE ONE-LANE-SECTION AND A DOWNSTREAM TAPER WITH A LENGTH OF APPROXIMATELY 100 FEET SHOULD BE USED TO GUIDE TRAFFIC BACK INTO THEIR ORIGINAL LANE.

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES	
TYPE OF TAPER	TAPER LENGTH (FEET)
MERGING TAPER	L MINIMUM
SHIFTING TAPER	1/2 L MINIMUM
SHOULDER TAPER	1/3 L MINIMUM
TWO-WAY TAPER	100 FEET MAXIMUM

FORMULAS FOR L	
SPEED	FORMULA
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR GREATER	$L = WS$

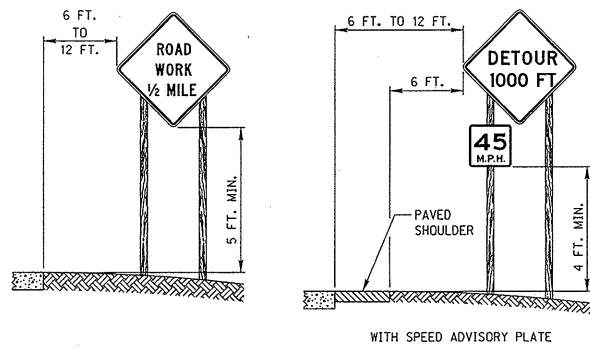
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED LIMIT PRIOR TO WORK IN MPH

TAPER LENGTH L (FEET)				
SPEED (MPH)	LANE WIDTH			
	5	10 FT.	11 FT.	12 FT.
25	105	115	125	
30	150	165	180	
35	205	225	245	
40	270	295	320	
45	450	495	540	
50	500	550	600	
55	550	605	660	
60	600	660	720	
65	650	715	780	
75	750	825	900	

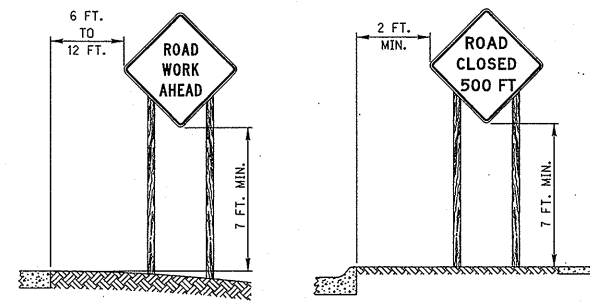
R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 920-R7		
TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		2 3
David Mung 9-1-2017 DATE		ORIGINAL: OCTOBER 1998 DATE

File: 92000e07.dgn
 Scale: 1:100
 SHEET 3 OF 3
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 Computer: DRDESIGN147

ROADSIDE SIGNS HEIGHT AND LATERAL LOCATION OF SIGNS RURAL AREA



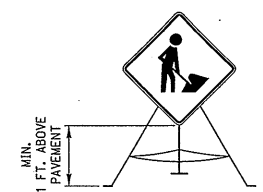
URBAN AREA



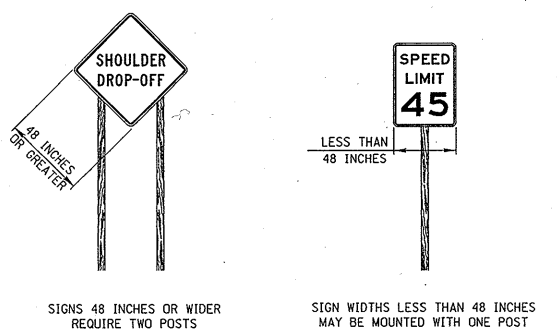
TYPICAL FIRST SIGN AT CONSTRUCTION SITE



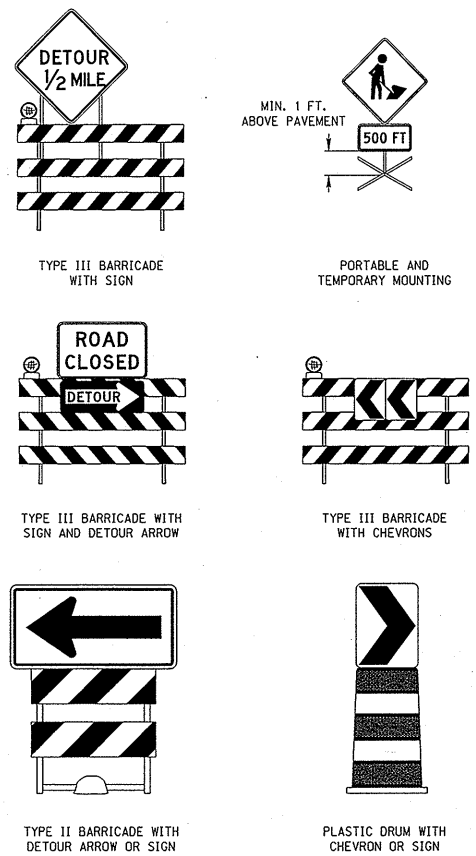
PORTABLE AND TEMPORARY MOUNTING



TYPICAL SIGN MOUNTINGS POST MOUNTED



TYPICAL SIGN MOUNTINGS OTHER THAN POST MOUNTED



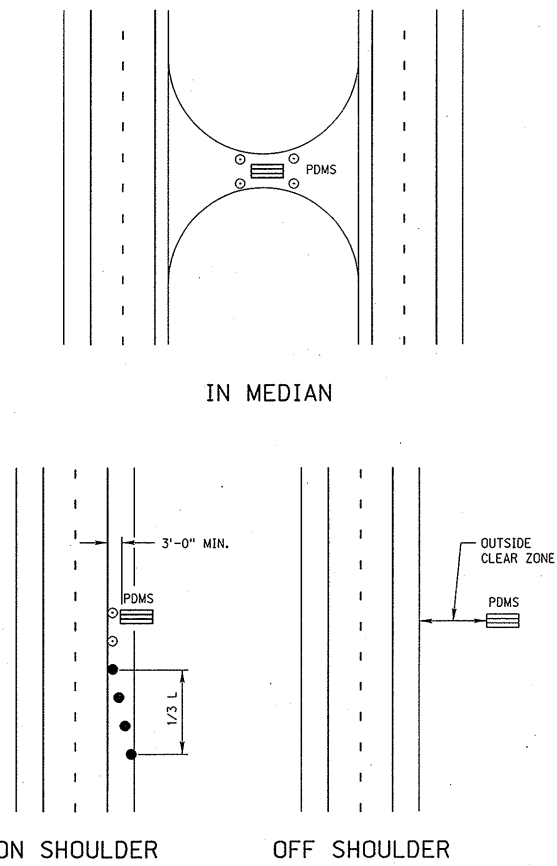
TEMPORARY SIGN SUPPORTS

ALL "TEMPORARY SIGN" SUPPORTS (BASES) SHALL BE NCHRP 350 OR MASH (TL-3) APPROVED.

"TEMPORARY SIGNS" ARE ALL TEMPORARILY MOUNTED WORK ZONE SIGNS THAT ARE NOT POST MOUNTED IN THE GROUND AT THE TYPICAL 5 FOOT MOUNTING HEIGHT. TEMPORARY SIGNS ARE CONSIDERED NCHRP 350 OR MASH CATEGORY 2 DEVICES AND ARE MOUNTED ON TEMPORARY SIGN STANDS. TEMPORARY SIGNS SHALL BE MOUNTED A MINIMUM OF 1 FOOT ABOVE THE GROUND, UNLESS OTHERWISE REQUIRED TO BE MOUNTED AT A HIGHER HEIGHT.

TEMPORARY SIGNS AND THEIR SUPPORTS SHALL NOT BE IN PLACE LONGER THAN 3 DAYS. ANY SIGN THAT IS TO BE IN PLACE LONGER THAN 3 DAYS SHALL BE POST MOUNTED OR MOUNTED TO A DRUM, BARRICADE, OR BARRIER, AS REQUIRED BY THE PLANS OR SPECIFICATIONS.

PORTABLE DYNAMIC MESSAGE SIGN DELINEATION



PORTABLE DYNAMIC MESSAGE SIGNS (PDMS)

THE PLACEMENT OF PDMS SHOULD BE IN THE FOLLOWING ORDER:

WHENEVER POSSIBLE, PDMS SHOULD BE PLACED OFF OF ANY USABLE PORTION OF THE ROADWAY ON THE RIGHT SIDE OF THE ROADWAY. WHEN PLACED OUTSIDE THE CLEAR ZONE OR BEHIND GUARDRAIL OR CONCRETE PROTECTION BARRIERS, DELINEATION IS NOT REQUIRED.

WHERE FIELD CONDITIONS DO NOT ALLOW FOR THIS PLACEMENT, THE SIGNS MAY BE LOCATED ON THE OUTSIDE SHOULDER OF THE ROADWAY OR WITHIN THE MEDIAN.

- A MINIMUM CLEARANCE OF 3 FEET MEASURED HORIZONTALLY FROM THE EDGE OF THE SIGN TO THE EDGE OF THE TRAVELED WAY IS RECOMMENDED.
- THE PDMS SHOULD HAVE A MINIMUM MOUNTED HEIGHT OF 7 FEET ON FREEWAYS, EXPRESSWAYS AND IN URBAN AREAS.
- ALL OTHER RURAL APPLICATIONS SHOULD HAVE A MINIMUM HEIGHT OF 5 FEET.

THESE HEIGHTS ARE MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE ELEVATION OF THE NEAR EDGE OF THE PAVEMENT.

REFLECTORIZED PLASTIC DRUMS SHOULD BE USED TO DELINEATE EACH SIGN USING A 1/3 L TAPER. THESE DRUMS SHOULD BE POSITIONED ON THE UPSTREAM END OF THE SIGN TO FORM A TAPER LEADING UP TO THE TRAFFIC SIDE OF THE SIGN. FOR A SIGN LOCATED IN THE MEDIAN, THE SIGN SHOULD BE DELINEATED WITH A 42 INCH CONE ON ALL FOUR CORNERS.

WHEN DEPLOYED, THE SIGN SHALL BE SIGHTED AND ALIGNED WITH APPROACHING TRAFFIC TO ENSURE VISIBILITY OF THE MESSAGE. IF MULTIPLE SIGNS ARE USED, THE SIGNS SHOULD BE LOCATED ON THE SAME SIDE OF THE ROAD AND SEPARATED ACCORDING TO PROPER SIGN SPACING.

WHEN PRACTICAL, PDMS SHOULD NOT BE USED TO REPLACE STATIC SIGNS FOR LONG TERM USAGE (OVER 10 DAYS).

WHEN PDMS ARE TO BE DEPLOYED FOR LONG PERIODS, SUCH AS INCIDENT MANAGEMENT ROLES, CONCRETE PADS WITH APPROPRIATE TIE DOWNS SHOULD BE CONSTRUCTED FOR THEIR PLACEMENT.

PDMS NOT ACTIVELY BEING USED IN A CONSTRUCTION OR INCIDENT MANAGEMENT ROLE SHOULD BE REMOVED.

REFER TO NDOR "DMS GUIDELINES" FOR PROPER PDMS MESSAGE INFORMATION.

NOTES

- ALL TRAFFIC CONTROL DEVICES SHALL MEET THE APPLICABLE STANDARDS AND SPECIFICATIONS PRESCRIBED IN PART 6 OF THE LATEST ADOPTED EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)" AND THE STATE OF NEBRASKA SUPPLEMENT TO THE MUTCD. ALL TRAFFIC CONTROL DEVICES SHALL BE CRASHWORTHY AND QUALIFY AS SUCH ACCORDING TO THE TESTING AND ACCEPTANCE GUIDELINES OF THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
- TRAFFIC CONTROL PLANS AND DEVICES SHOULD FOLLOW THE PRINCIPLES SET FORTH, BUT MAY DEVIATE FROM THE TYPICAL DRAWINGS TO ALLOW FOR CONDITIONS AND REQUIREMENTS OF THE PROJECT.
- TRAFFIC CONTROL DEVICES SHALL BE INSTALLED SO AS NOT TO OBSTRUCT THE VIEW OF OTHER TRAFFIC CONTROL DEVICES.
- THE ENGINEER SHALL HAVE THE AUTHORITY TO REQUIRE THE USE, AND APPROVE THE LOCATION OF ANY OF THE DEVICES SHOWN IN THESE PLANS.

WORK ZONE SPEED LIMIT NOTES

- WORK ZONE SPEED LIMITS SHALL NOT BE INSTALLED WITHOUT A SPEED ZONE AUTHORIZATION COMPLETED BY THE DEPARTMENT.
- REDUCED SPEED LIMITS SHOULD BE USED ONLY IN THE SPECIFIC PORTION OF THE WORK ZONE WHERE CONDITIONS OR RESTRICTIVE FEATURES ARE PRESENT. HOWEVER, FREQUENT CHANGES IN THE SPEED LIMIT SHOULD BE AVOIDED. THE REDUCTION OF SPEED SHOULD BE DESIGNED SO VEHICLES CAN SAFELY TRAVEL THROUGH THE WORK ZONE WITH A SPEED LIMIT REDUCTION OF NO MORE THAN 10 MPH UNLESS OTHERWISE NOTED IN THE PLANS.
- WORK ZONE SPEED LIMITS SHOWN ARE TYPICAL APPLICATIONS ONLY AND ARE NOT TO BE ASSUMED AS THE SPEED LIMITS REQUIRED FOR THE WORK.
- EXISTING SPEED LIMIT SIGNS SHALL BE REMOVED OR COVERED WHEN A REDUCED WORK ZONE SPEED LIMIT IS IN EFFECT IN THE SAME AREA.
- WORK ZONE SPEED LIMIT SIGNS SHALL BE INSTALLED EVERY MILE THROUGH THE WORK AREA WHEN SPEED ZONE IS REDUCED.
- A SPEED LIMIT SIGN ENDING THE REDUCED SPEED ZONE SHALL BE INSTALLED AT THE END OF EACH ZONE.
- DOUBLE FINES AND REDUCED SPEED ZONE SIGNING ARE NOT REQUIRED FOR SHORT-DURATION WORK LESS THAN 12 HOURS.

TAPER FORMULA

$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE

$L = \frac{WS^2}{80}$ FOR SPEEDS OF 40 MPH OR LESS.

WHERE:

- L - MINIMUM LENGTH OF TAPER.
- S - NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.
- W - WIDTH OF OFFSET (LANE WIDTH).

LEGEND

- TYPE III BARRICADE
- REFLECTORIZED PLASTIC DRUM
- REFLECTORIZED PLASTIC DRUM OR 42" CONE
- PORTABLE DYNAMIC MESSAGE SIGN

R7	JAN 18	NDOR BORDER TO NDOT BORDER
R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 920-R7

TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE

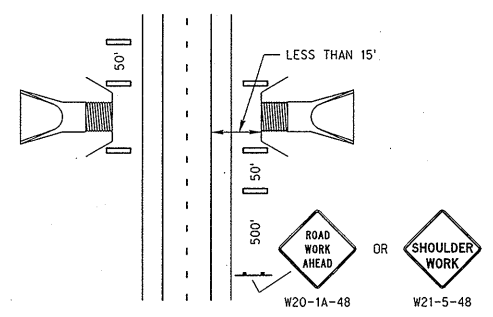
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

Daniel J. Waddle
DATE: 9-1-2017

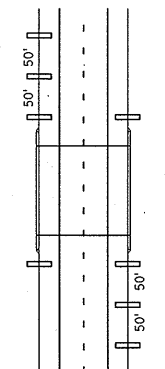
DANIEL J. WADDLE
E-6289
STATE OF NEBRASKA

ORIGINAL:
OCTOBER 1998
DATE

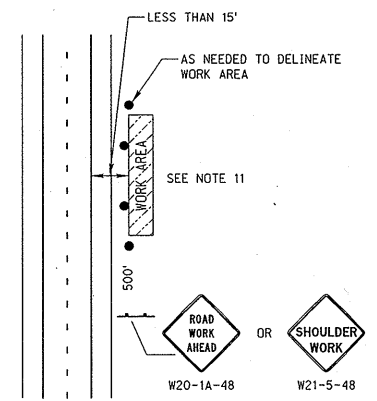
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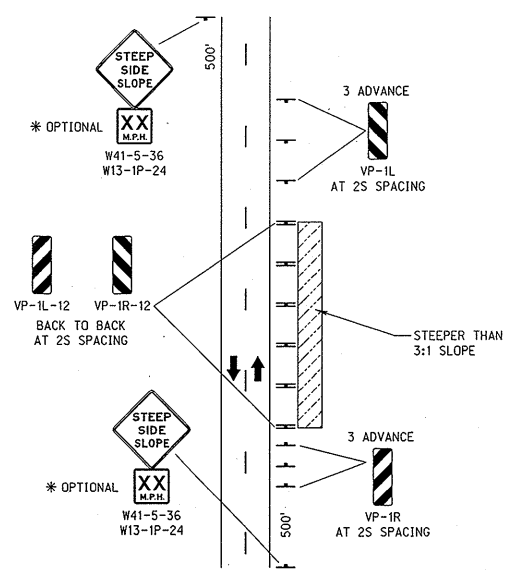
CULVERT DELINEATION
WHEN GUARDRAIL IS REMOVED AND/OR EXCAVATION IS LESS THAN 15 FEET FROM EDGE OF TRAVELED WAY



BRIDGE RAIL END DELINEATION
WHEN GUARDRAIL IS REMOVED

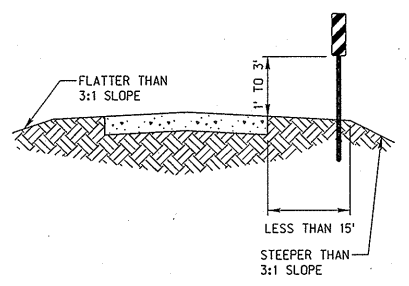


WORK BEYOND THE SHOULDER
TA-1



STEEP SLOPE DELINEATION

VERTICAL PANELS SHOULD BE USED FOR AREAS WHERE GUARDRAIL IS REMOVED, OR PROJECT GRADING HAS CREATED A FORESLOPE STEEPER THAN 3:1, AND WITHIN 15 FEET OF THE TRAVELED WAY. NOT USED FOR CULVERT OR BRIDGE END DELINEATION. VERTICAL PANEL SPACING MAY BE REDUCED FOR HORIZONTAL CURVES. CONES/DRUMS MAY BE USED AS A SUBSTITUTE WHEN APPROVED BY THE ENGINEER.



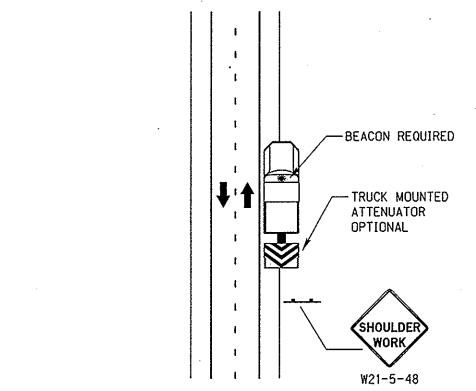
- LEGEND**
- FLAGGER
 - REFLECTORIZED PLASTIC DRUM
 - REFLECTORIZED PLASTIC DRUM OR 42" CONE
 - ▬ TYPE III BARRICADE
 - SINGLE POSTED SIGN
 - DOUBLE POSTED SIGN
 - ⬅ TRAFFIC SIGNAL

TAPER FORMULA

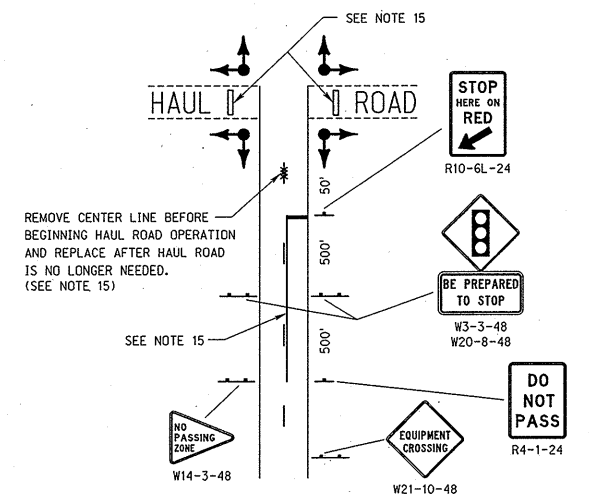
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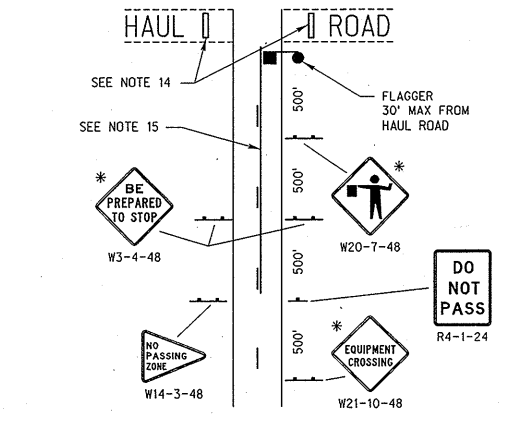
WHERE:
L = MINIMUM LENGTH OF TAPER.
S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.
W = WIDTH OF OFFSET (LANE WIDTH).



MOBILE OPERATION ON SHOULDER
NO ENCRoACHMENT ON TRAVEL LANE
TA-4



HAUL ROAD CROSSING IN CONSTRUCTION AREA USING TEMPORARY TRAFFIC SIGNAL
TA-14



HAUL ROAD CROSSING IN CONSTRUCTION AREA USING FLAGGERS
TA-14
* SIGNS ARE SUBSIDIARY TO THE FLAGGING OPERATION.

NOTES

1. SIGNS SHOWN ARE USUALLY FOR ONE DIRECTION OF TRAVEL ONLY.
2. DESIGNATION OF SPEED SHOWN ON ADVISORY SPEED SIGNS (W13-1P) SHALL BE DETERMINED BY THE ENGINEER IN ACCORDANCE WITH MUTCD. THE SPEED DESIGNATION SHALL BE AS HIGH AS PRACTICAL AND FEASIBLE.
3. "FLAGGER AHEAD SYMBOL" SIGN (W20-7) SHALL BE USED WHEN A FLAGGER IS PRESENT, AND REMOVED WHEN NOT APPLICABLE.
4. THE CONTRACTOR SHALL INSTALL, MAINTAIN, AND REMOVE ALL SIGNS IN ACCORDANCE WITH THE DETAILS OF AND AT THE LOCATIONS SHOWN IN THE PLANS. SIGNS INSTALLED BY THE DEPARTMENT OF ROADS OR OTHER GOVERNMENT AGENCY SHALL BE MAINTAINED AND REMOVED BY THEIR FORCES.
5. G20-1 "ROAD WORK NEXT X MILES" SHALL BE USED ON ANY CONSTRUCTION OR MAINTENANCE PROJECT LONGER THAN 2 MILES.
6. WHEN MESSAGE IS NOT PERTINENT, SIGNS SHALL BE TAKEN DOWN, COVERED OR FOLDED. TAPE IS NOT PERMITTED ON THE FACE OF THE SIGN.
7. VEHICLES OR EQUIPMENT SHALL NOT BE PARKED SO AS TO OBSCURE OR DISTRACT FROM TRAFFIC CONTROL DEVICES.
8. ORANGE FLAGS MAY BE USED TO CALL ATTENTION TO WARNING SIGNS.
9. CULVERT, BRIDGE AND STEEP SLOPE DELINEATION. EXISTING GUARDRAIL SHOULD REMAIN IN PLACE AS LONG AS PRACTICAL FOR THE PROTECTION IT PROVIDES, AND REINSTALLED AS SOON AS PRACTICAL.
10. TA-1 AND TA-3 FOR SHORT-DURATION OPERATIONS 60 MINUTES OR LESS, ALL SIGNS AND CHANNELIZING DEVICES MAY BE ELIMINATED IF A VEHICLE WITH AN ACTIVATED HIGH-INTENSITY ROTATING, FLASHING, OSCILLATING OR AMBER STROBE LIGHTS ARE USED, AND THE WORK DOES NOT ENCRoACH INTO THE OPEN TRAVEL LANE.
11. TA-1 AND TA-3 WHEN PAVED SHOULDERS HAVING A WIDTH OF 8 FEET OR MORE ARE CLOSED, AT LEAST ONE ADVANCE WARNING SIGN SHALL BE USED. IN ADDITION, CHANNELIZING DEVICES SHALL BE USED TO CLOSE THE SHOULDER IN ADVANCE TO DELINEATE THE BEGINNING OF THE WORK SPACE AND DIRECT VEHICULAR TRAFFIC TO REMAIN WITHIN THE TRAVELED WAY.
12. TA-4 VEHICLE HAZARD WARNING SIGNALS SHALL NOT BE USED INSTEAD OF THE VEHICLE'S HIGH-INTENSITY ROTATING, FLASHING OR AMBER STROBE LIGHTS.
13. TA-10 IF THE QUEUING OF VEHICLES ACROSS ACTIVE RAILROAD TRACKS CANNOT BE AVOIDED, A FLAGGER SHALL BE PROVIDED AT THE RAILROAD CROSSING TO PREVENT VEHICLES FROM STOPPING WITHIN THE RAILROAD CROSSING EVEN IF AUTOMATIC WARNING DEVICES ARE IN PLACE.
14. TA-14 WHEN THE HAUL ROAD IS NOT IN USE, TYPE III BARRICADES SHALL BE IN PLACE. THE "FLAGGER", "SIGNAL AHEAD", AND "BE PREPARED TO STOP" SIGNS SHALL BE COVERED OR REMOVED, AND THE TRAFFIC SIGNAL SHALL BE PUT INTO FLASH YELLOW ON THE HIGHWAY, RED ON THE HAUL ROAD.
15. TA-14 THE "NO PASSING" SIGNS (R4-1-24 AND W14-3-48) AND PAVEMENT MARKINGS ARE NOT REQUIRED IF HAULING OPERATION IS IN EFFECT ONLY DURING DAYLIGHT HOURS.
16. APPLICATIONS SHOWN ARE FOR LOCAL SITUATIONS IN PROPERLY MARKED CONSTRUCTION ZONES AND DO NOT INCLUDE LEAD SIGNS WHICH ARE INSTALLED AT THE BEGINNING OF THE PROJECT.
17. THE LEAD SIGNS ARE NOT NEEDED IF TWO PROJECTS ARE LESS THAN 1 MILE APART. THE "END CONSTRUCTION" SIGN (G20-2B-48) SHOULD NOT BE INSTALLED BETWEEN THE PROJECTS.
18. REFER TO STANDARD PLAN 920 FOR GENERAL INFORMATION NOT SHOWN.
19. A MINIMUM OF 7-36" OR 42" CONES SHALL BE PLACED ON THE CENTERLINE IN ADVANCE OF THE FLAGGER. THE CONES SHOULD BE SPACED AT 250 FEET.
20. THE SPEED IN FLAGGING/PILOT CAR OPERATIONS IS GENERALLY CONTROLLED BY THE PILOT CAR. A SPEED REDUCTION MAY NOT BE NECESSARY IF THE WORK ZONE CONDITIONS WILL NOT EXIST UPON COMPLETION OF EACH DAYS WORK. W3-5 SIGN IS NOT NEEDED IF SPEED LIMIT IS NOT REDUCED.

R8	JAN 18	NDOR BORDER TO NDOT BORDER
R7	JAN 17	ADD CONES ON CENTERLINE
R6	JUN 14	2009 MUTCD UPDATE
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 921-R8
**TRAFFIC CONTROL,
CONSTRUCTION AND MAINTENANCE**

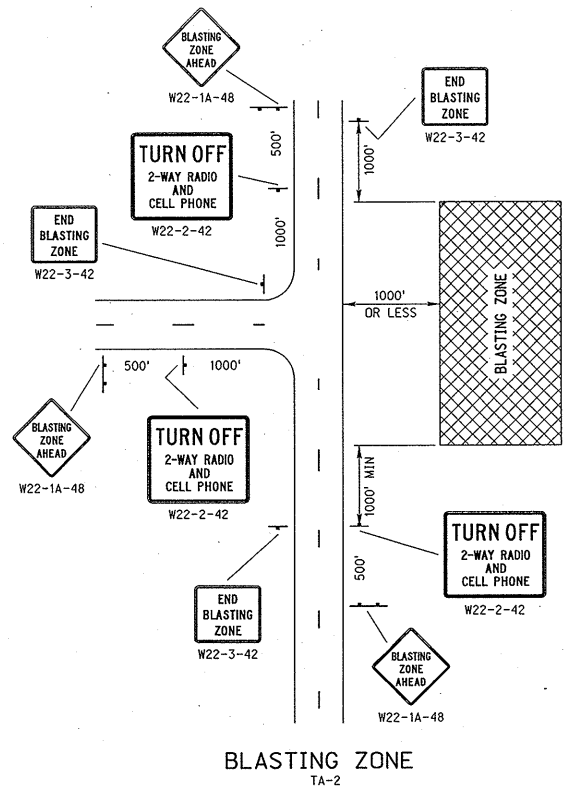
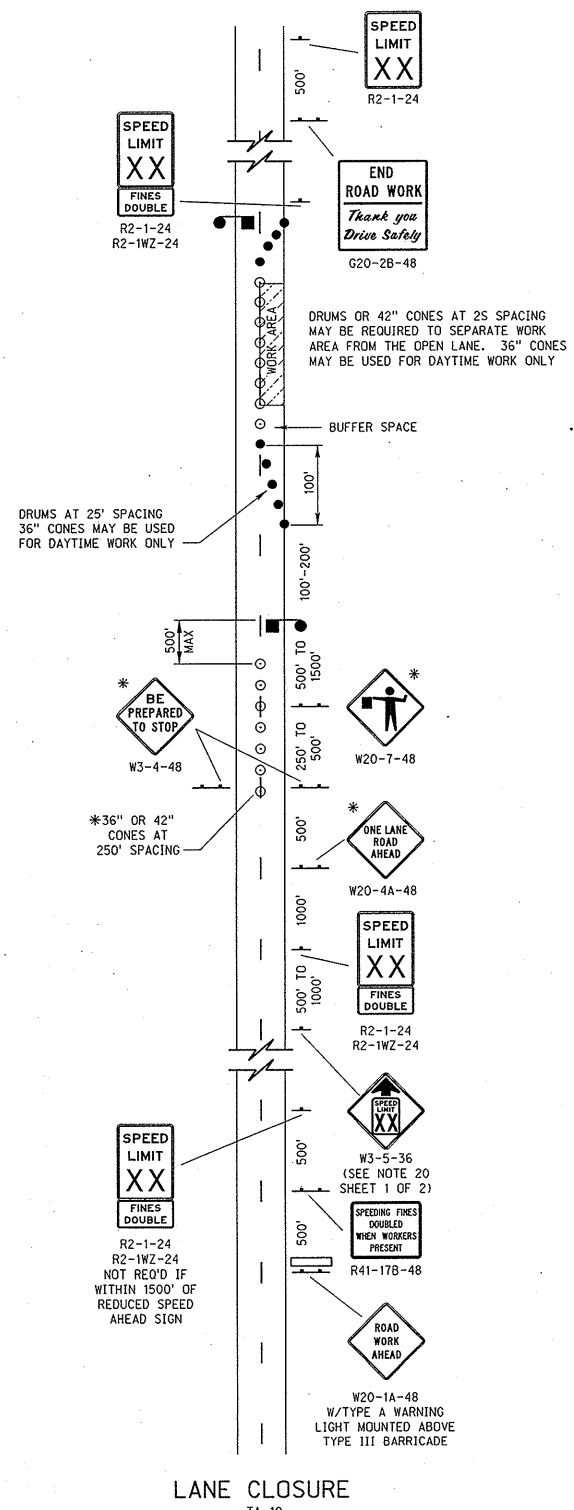
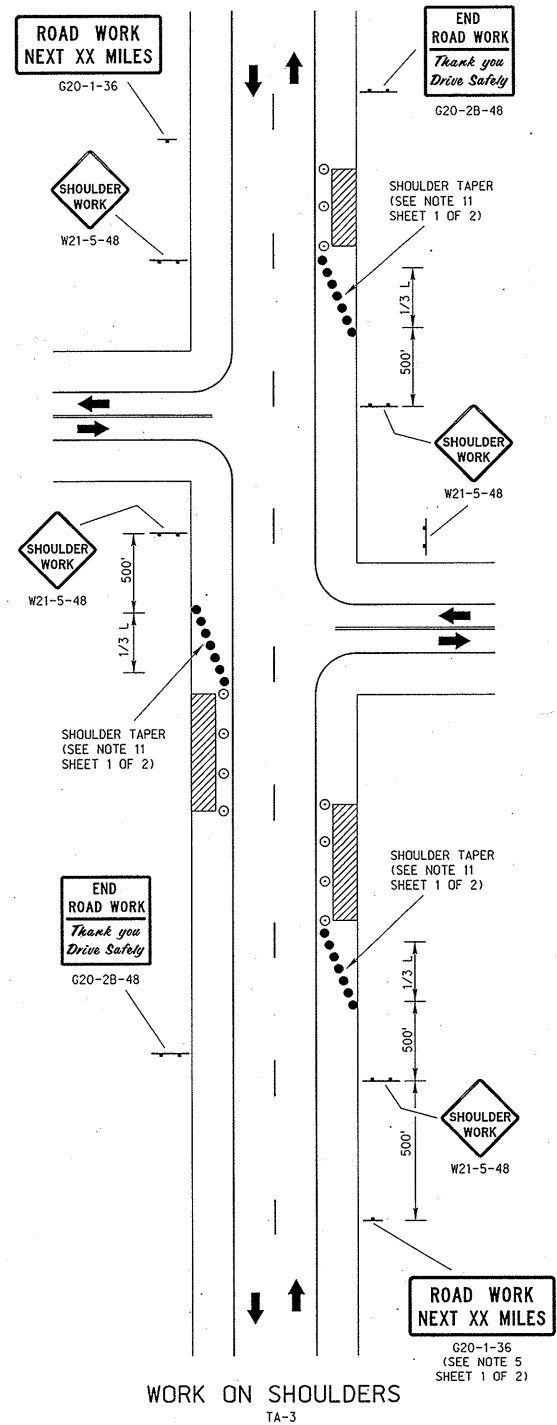
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

David M...
9-1-2017
DATE

DANIEL J. WADDLE
E-6289
STATE OF NEBRASKA

ORIGINAL:
JUNE 3, 1980
DATE

1
2



LEGEND

- FLAGGER
- REFLECTORIZED PLASTIC DRUM
- REFLECTORIZED PLASTIC DRUM OR 42" CONE
- ▬ TYPE III BARRICADE
- SINGLE POSTED SIGN
- DOUBLE POSTED SIGN
- ↑ TRAFFIC SIGNAL

TAPER FORMULA

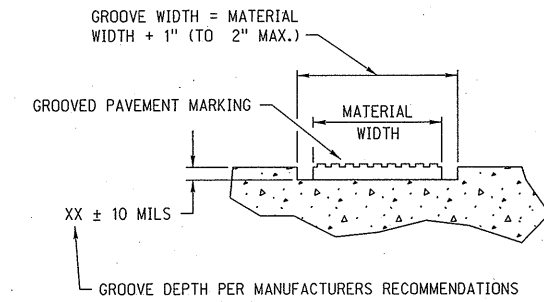
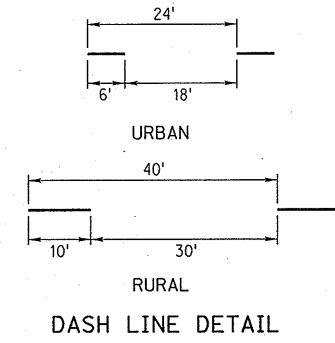
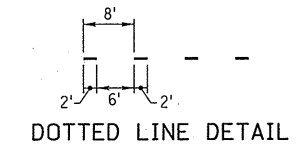
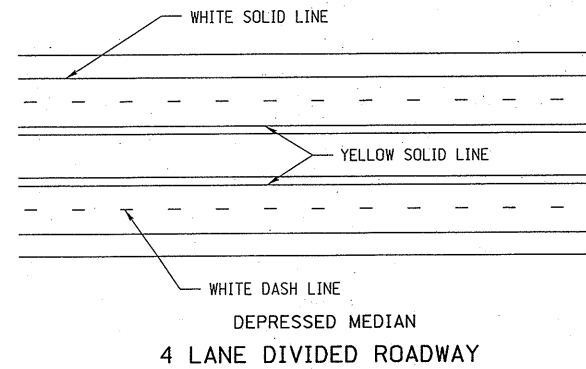
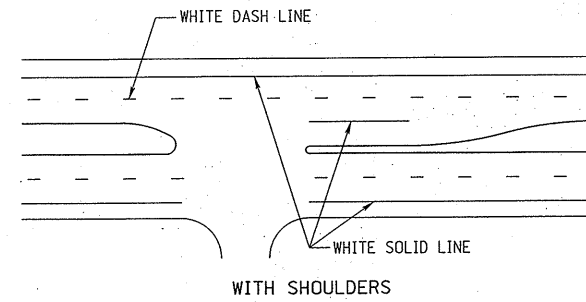
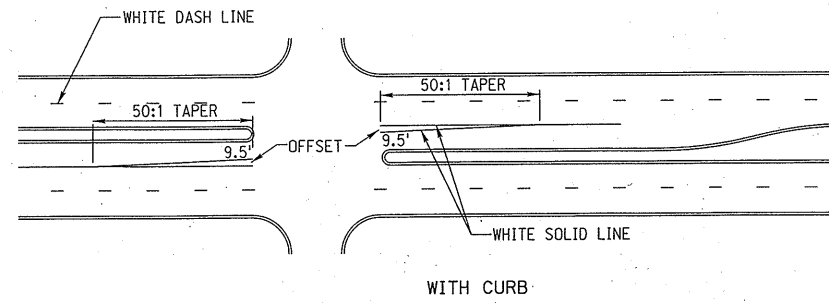
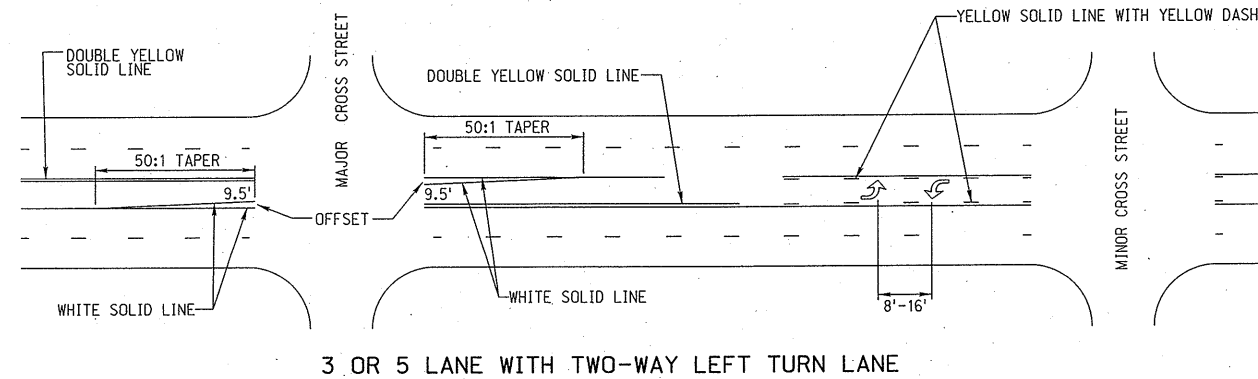
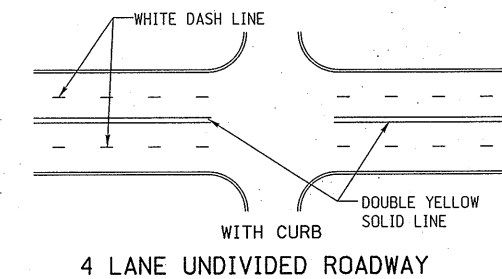
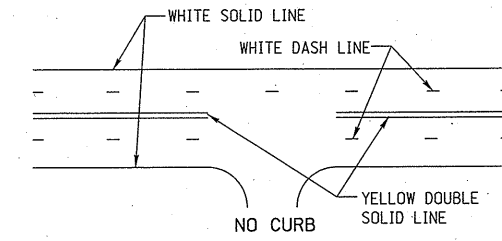
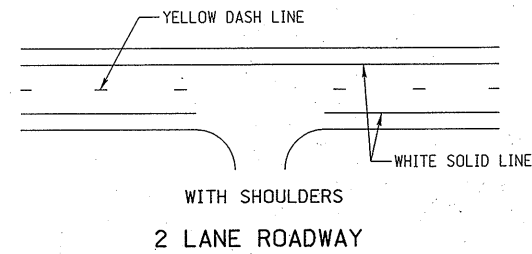
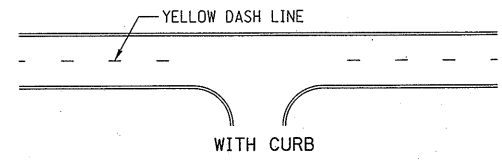
$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

WHERE:
 L = MINIMUM LENGTH OF TAPER.
 S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.
 W = WIDTH OF OFFSET (LANE WIDTH).

* SIGNS AND CONES ARE SUBSIDIARY TO THE FLAGGING OPERATION.

R8	JAN 18	NDOR BORDER TO NDOT BORDER
R7	JAN 17	ADD CONES ON CENTERLINE
R6	JUN 14	2009 MUTCD UPDATE
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 921-R8 TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
DATE: 9-1-2017 ORIGINAL: JUNE 3, 1980		
		2 2



PERMANENT PAVEMENT MARKINGS INSTALLED IN GROOVES

2-LANE ROADWAY REQUIRED LOCATION FOR EDGE LINES		
ROADWAY WIDTH	SHOULDER TYPE	DISTANCE FROM CENTERLINE OF ROADWAY TO OUTSIDE EDGE OF PAVEMENT EDGELINE
LESS THAN 24 FT	SURFACED	12 FT 0 IN
LESS THAN 24 FT	EARTH	PAVEMENT EDGE
24 FT	EARTH	PAVEMENT EDGE
24 FT	SURFACED	12 FT 0 IN
GREATER THAN 24 FT	EARTH	12 FT 0 IN

CENTERLINE MARKING SHALL BE PLACED ON THE "SOUTH" SIDE OF THE CENTER JOINT ON EAST-WEST ROADS AND ON THE "EAST" SIDE OF THE CENTER JOINT ON NORTH-SOUTH ROADS

REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF ROADS STANDARD PLAN NO. 941 PAVEMENT MARKING		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
		MARY BARROUGHS 5/14/2018 DATE
ORIGINAL: OCT. 2018		1 2

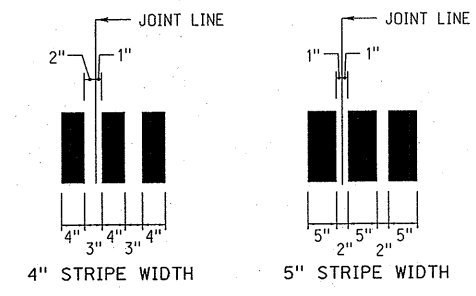
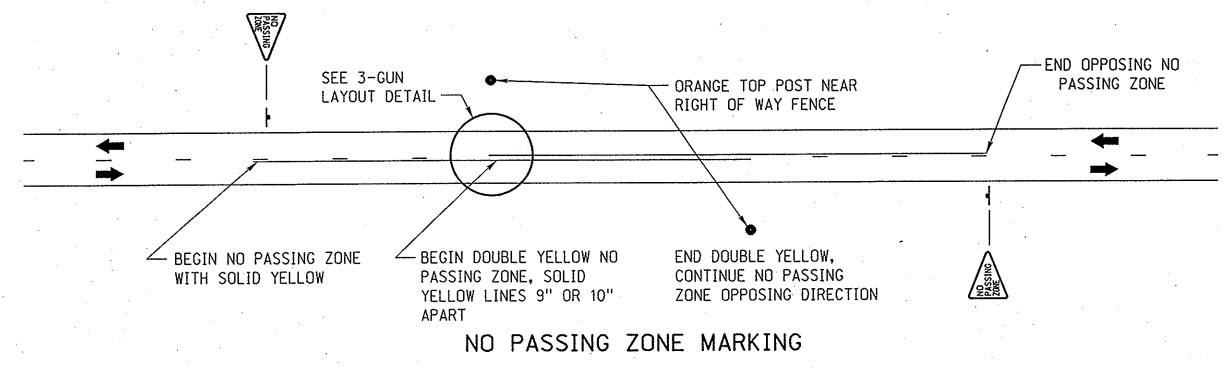
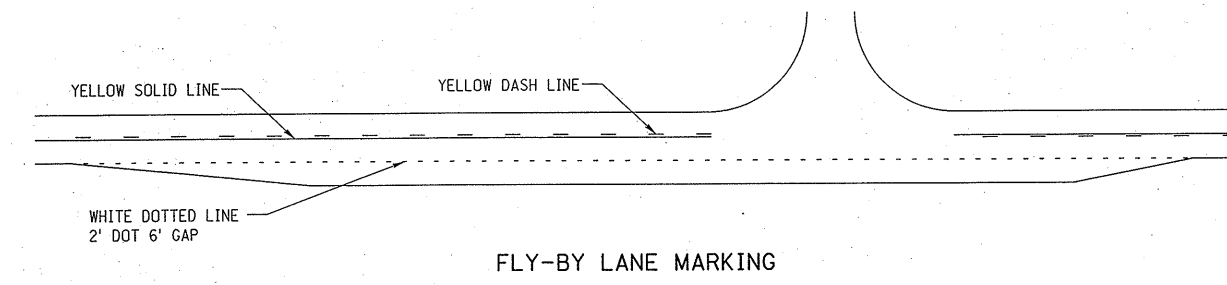
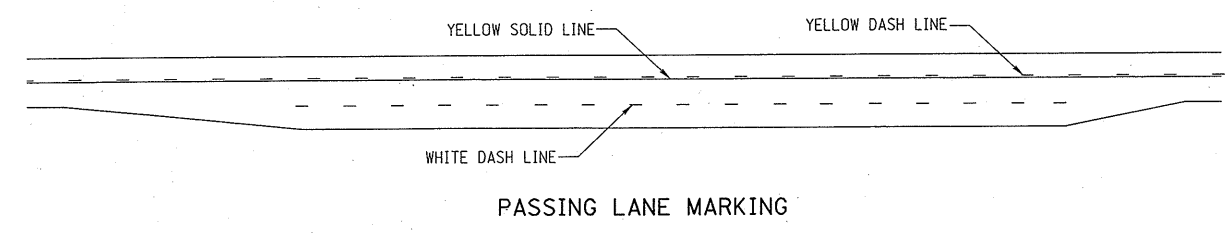
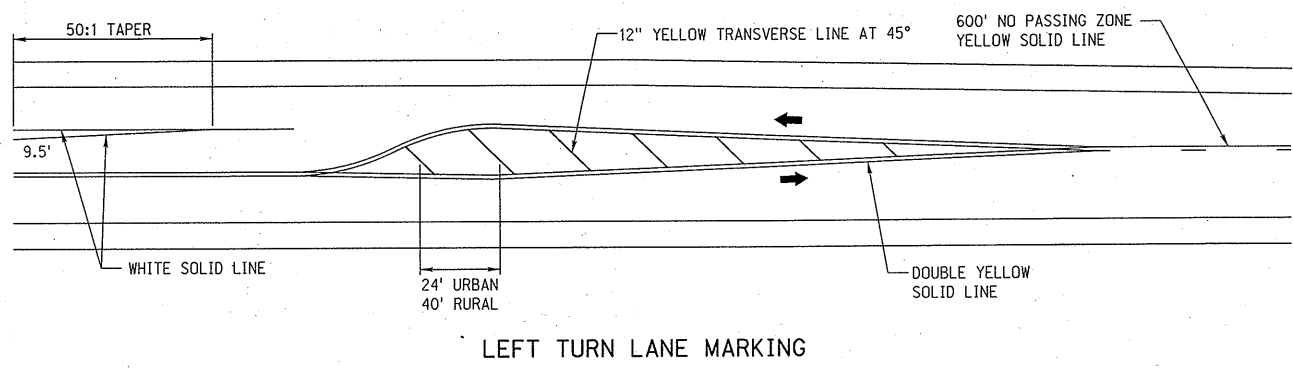
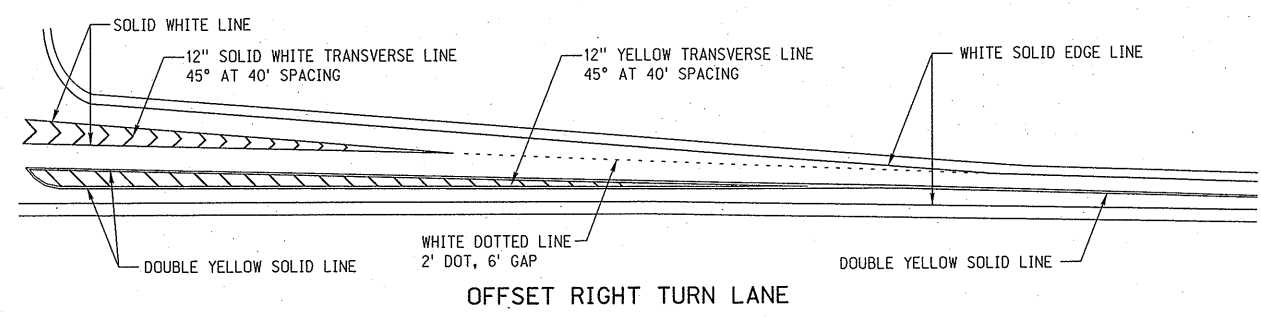
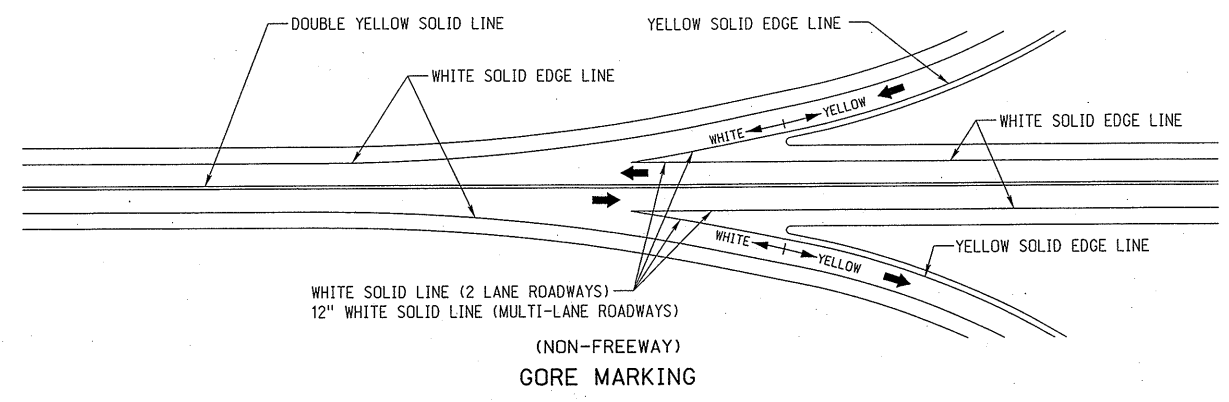
ROADWAY DESIGN DIVISION

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LEGEND
→ TRAFFIC FLOW

REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF ROADS STANDARD PLAN NO. 941 PAVEMENT MARKING		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		 ORIGINAL: OCT. 2018 DATE
DANIEL J. WADDLE E-6289 OCT. 2018 DATE		
 MARY BURROUGHS DATE		

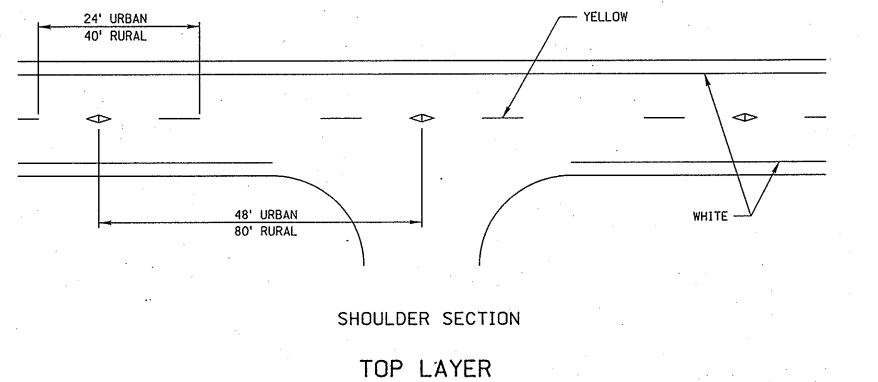
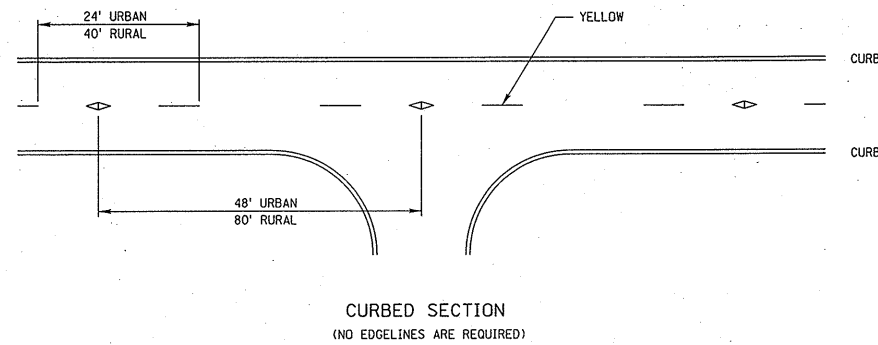
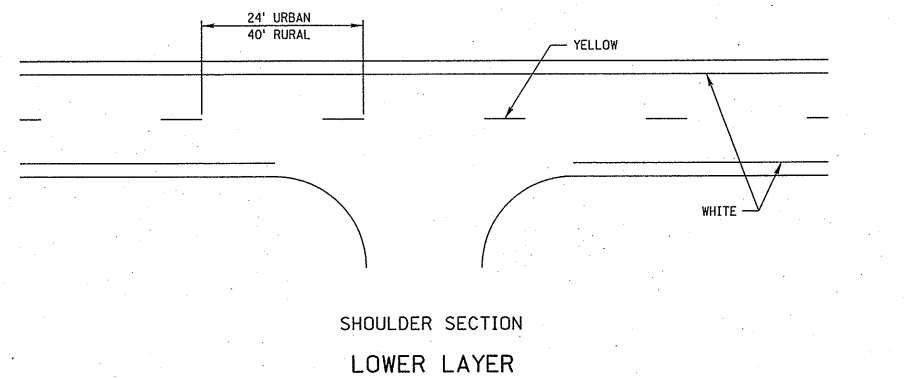
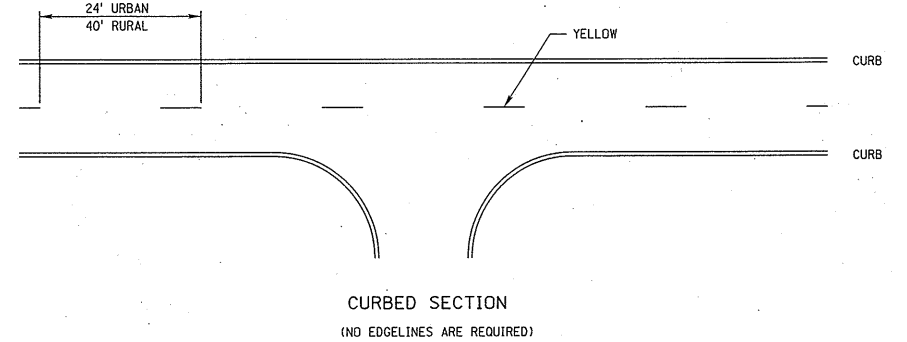
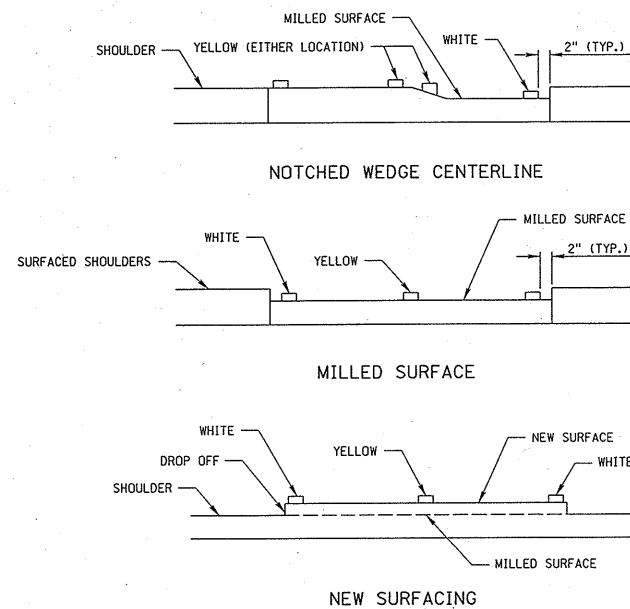
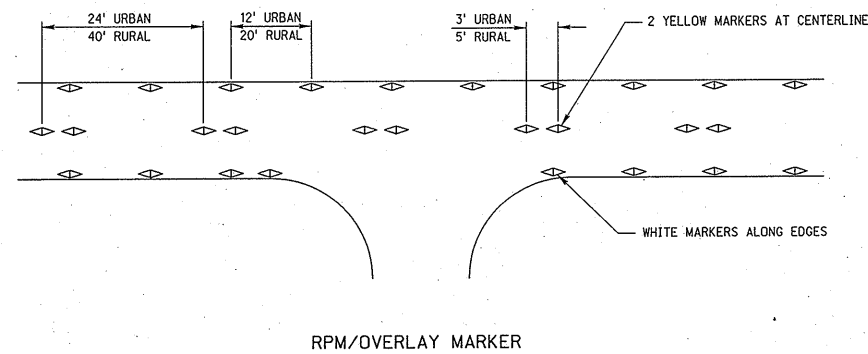


TABLE I BROKEN LINES				
TYPE OF MARKING	LENGTH		MATERIAL ALLOWED	
	RURAL	URBAN	LOWER LAYER	TOP LAYER
PAINT	10'	6'	X	
TYPE I TAPE	4' MIN.	2' MIN.		*X
RPM/OVERLAY MARKER	2 AT 5' SPACING	2 AT 3' SPACING	X	X

* TYPE I TAPE SHALL BE SUPPLEMENTED WITH A RPM OR AN OVERLAY MARKER AT THE INTERVALS AS SHOWN IN THE DRAWINGS BELOW.



LATERAL LOCATION DETAILS

TABLE II SOLID LINES				
TYPE OF MARKING	LENGTH		MATERIAL ALLOWED	
	RURAL	URBAN	LOWER LAYER	TOP LAYER
PAINT	SOLID	SOLID	X	X
TYPE I TAPE	SOLID	SOLID		X
RPM/OVERLAY MARKER	20' SPACING	12' SPACING	X	X

TABLE III LOCATION OF EDGE LINES ON THE TOP LAYER		
ROADWAY WIDTH	SHOULDER TYPE	PLACE OUTSIDE OF EDGE LINE AT
LESS THAN 24'	SURFACED	EDGE OF LANE
LESS THAN 24'	EARTH	PAVEMENT EDGE
24'	EARTH	PAVEMENT EDGE
24'	SURFACED	12'-0"
24' TO 28'	EARTH	12'-0"

LEGEND

- ◁ RPM/OVERLAY MARKER
- ◄ BIDIRECTIONAL RPM/OVERLAY MARKER

NOTES:

1. ALL TEMPORARY MARKINGS SHALL BE NO LESS THAN 4 INCHES WIDE.
2. ALL TEMPORARY PAVEMENT MARKINGS THAT WILL BE COVERED BY PERMANENT PAVEMENT MARKINGS SHALL COMPLY WITH THE ALIGNMENT AND LOCATION REQUIREMENTS OF THE FINAL PAVEMENT MARKING MATERIAL. TEMPORARY PAVEMENT MARKINGS THAT ARE NOT COVERED BY THE PERMANENT MARKINGS SHALL BE REMOVED AT THE CONTRACTOR'S EXPENSE.
3. RAISED PAVEMENT MARKERS (RPM'S) & OVERLAY MARKERS SHALL BE REMOVED PRIOR TO INSTALLATION OF THE NEXT LAYER AND UPON COMPLETION OF PERMANENT STRIPING.
4. TYPE I TAPE SHALL BE REMOVED UPON COMPLETION OF PERMANENT STRIPING.
5. RPM/OVERLAY MARKERS ARE NOT REQUIRED ON MILLED SURFACES, HYDRATED LIME SURFACES AND STABILIZED SURFACES.
6. PROJECTS WHICH DO NOT CREATE AN EDGELINE DROP OFF WILL NOT REQUIRE TEMPORARY EDGELINE MARKING.

(2-LANE)		
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 943 TEMPORARY PAVEMENT MARKING		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		1 4
MARY BURROUGHS DATE 5/14/2017		ORIGINAL: OCT. 2018 DATE

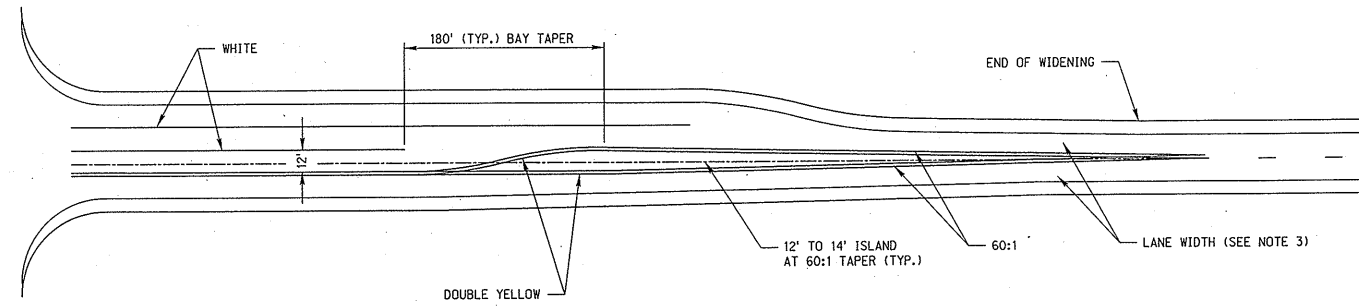
ROADWAY DESIGN DIVISION

Computer: NDDTDDESIGN134

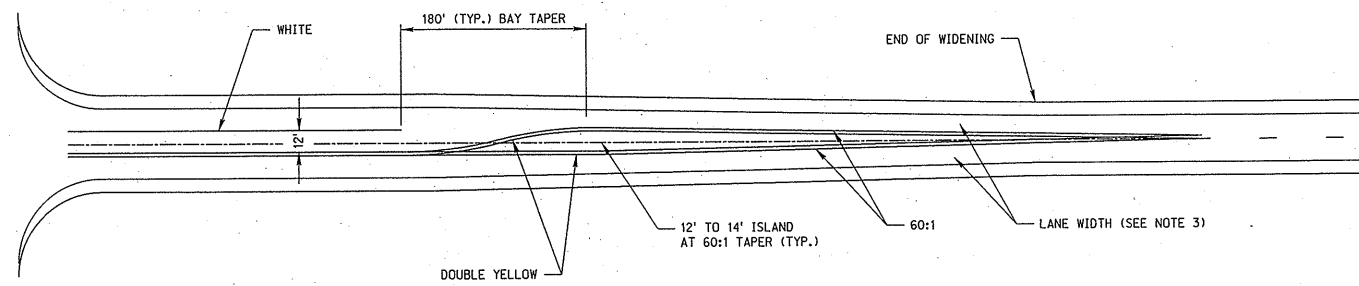
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Date: 26-APR-2018 15:57

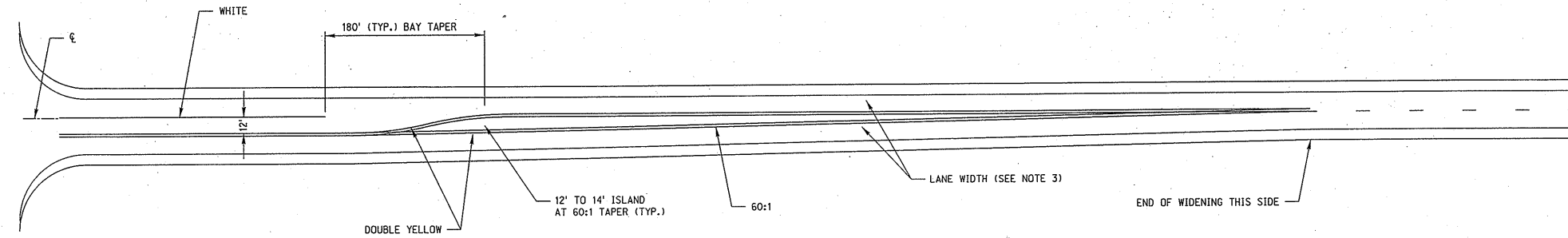
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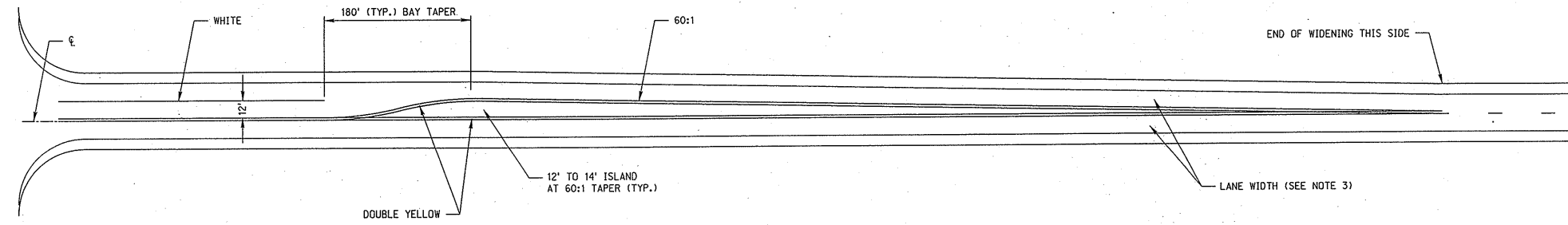
WIDENING BOTH SIDES WITH RIGHT TURN BAY



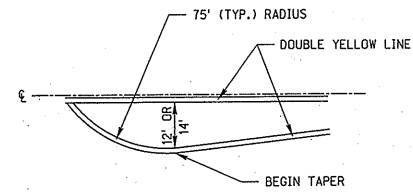
WIDENING BOTH SIDES



WIDENING ON DEPARTURE SIDE



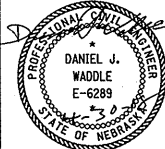
WIDENING ON APPROACH SIDE



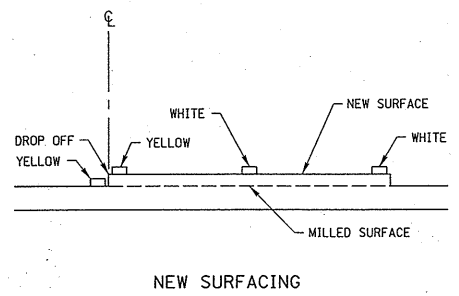
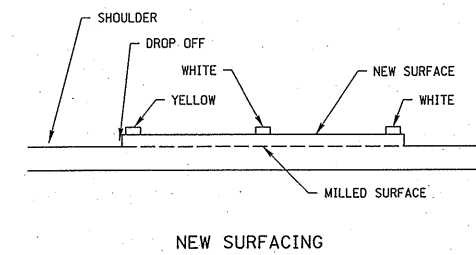
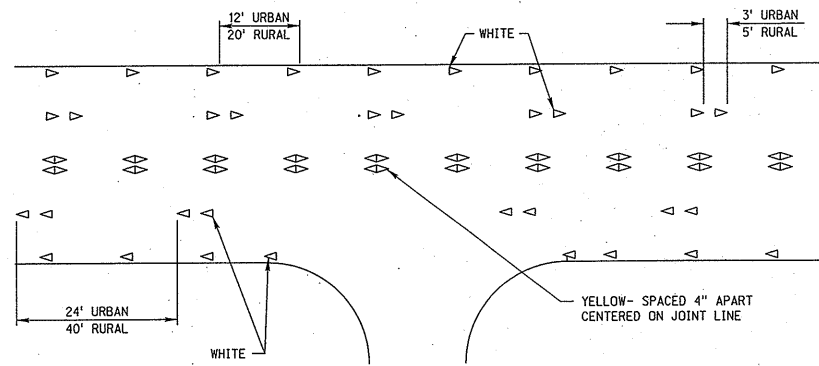
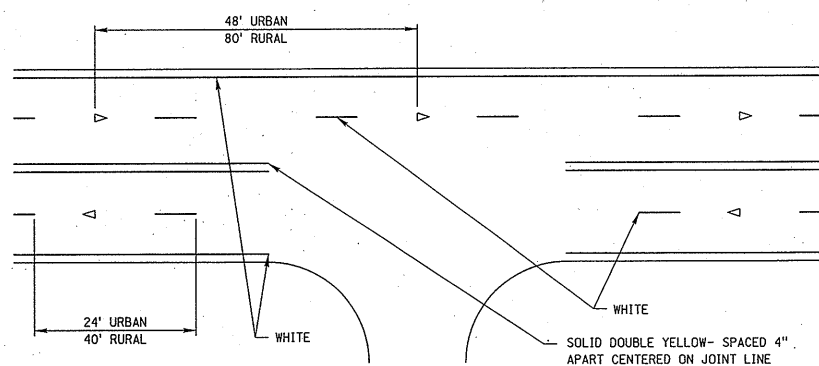
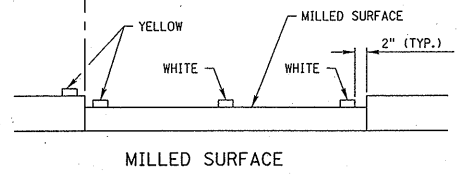
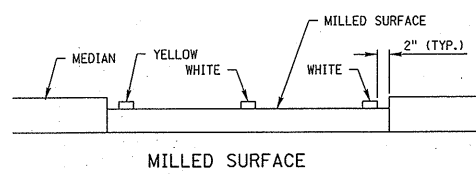
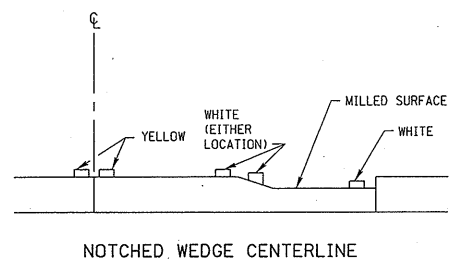
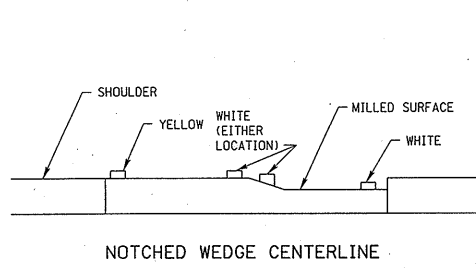
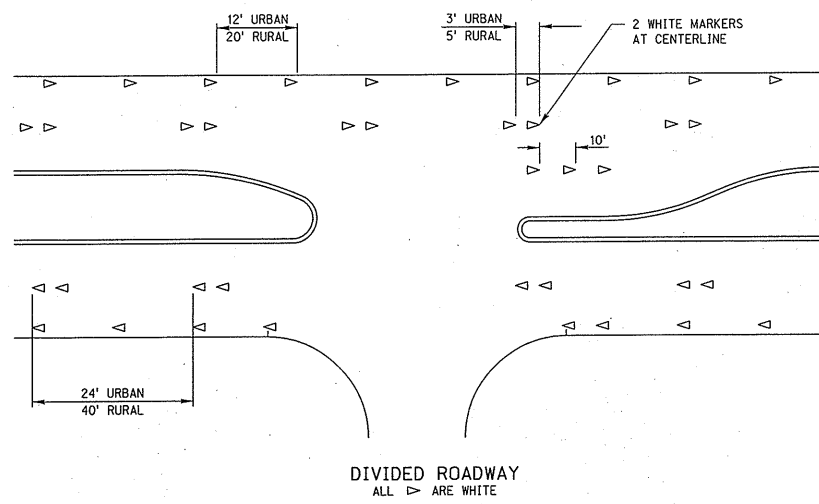
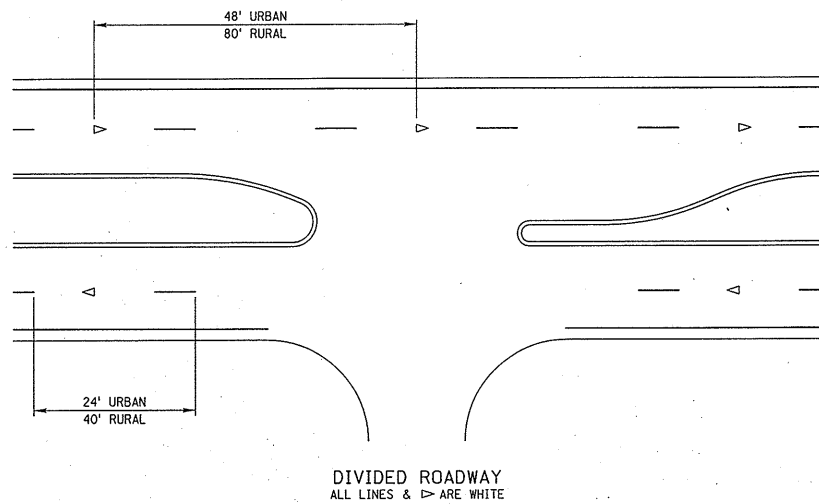
TYPICAL MARKING FOR
MEDIAN W/NO LEFT TURN

NOTES:

1. ALL TEMPORARY MARKINGS SHALL BE NO LESS THAN 4 INCHES WIDE.
2. MINIMUM LENGTH OF TURN BAYS SHALL BE 100 FEET. DESIRABLE LENGTH OF TURN BAYS FOR THE MAJOR TURNING MOVEMENT SHOULD BE FROM 150 FEET TO 240 FEET. ACTUAL LENGTHS WILL BE AS REQUIRED BY THE ENGINEER.
3. THE WIDTH OF TRAVELED LANE SHALL BE 12 FEET, UNLESS APPROVED OTHERWISE BY THE ENGINEER.
4. DIMENSIONS SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED TO FIT FIELD CONDITIONS.
5. THE STRIPING OF LEFT TURN LANES ARE CONSIDERED OPTIONAL, AS REQUIRED BY THE ENGINEER.

(2-LANE)		
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 943 TEMPORARY PAVEMENT MARKING		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>DANIEL J. WADDLE E-6289 STATE OF NEBRASKA</p> </div> <div style="text-align: center;"> <p><i>Mary Burroughs</i> MARY BURROUGHS DATE 5/14/2018</p> </div> </div>
ORIGINAL: OCT. 2018 DATE		

2
4



DIVIDED ROADWAY

UNDIVIDED ROADWAY

LATERAL LOCATION DETAILS

UNDIVIDED ROADWAY
PAINT/TAPE

UNDIVIDED ROADWAY
RPM/OVERLAY MARKER

LEGEND

- ▷ RPM/OVERLAY MARKER
- ◁ BIDIRECTIONAL RPM/OVERLAY MARKER

TABLE I BROKEN LINES				
TYPE OF MARKING	LENGTH		MATERIAL ALLOWED	
	RURAL	URBAN	LOWER LAYER	TOP LAYER
PAINT	10'	6'	X	* X
TYPE I TAPE	4' MIN.	2' MIN.		* X
RPM/OVERLAY MARKER	2 AT 5' SPACING	2 AT 3' SPACING	X	X

TABLE II SOLID LINES				
TYPE OF MARKING	LENGTH		MATERIAL ALLOWED	
	RURAL	URBAN	LOWER LAYER	TOP LAYER
PAINT	SOLID	SOLID	X	X
* TYPE I TAPE	SOLID	SOLID		X
RPM/OVERLAY MARKER	20' SPACING	12' SPACING	X	X

* PAINT OR TYPE I TAPE SHALL BE SUPPLEMENTED WITH A RPM OR AN OVERLAY MARKER AT INTERVALS SHOWN ON THE TOP LAYER.

NOTES:

1. ALL TEMPORARY MARKINGS SHALL BE NO LESS THAN 4 INCHES WIDE.
2. ALL TEMPORARY PAVEMENT MARKINGS THAT WILL BE COVERED BY PERMANENT PAVEMENT MARKINGS SHALL COMPLY WITH THE ALIGNMENT AND LOCATION REQUIREMENTS OF THE FINAL PAVEMENT MARKING MATERIAL. TEMPORARY PAVEMENT MARKINGS THAT ARE NOT COVERED BY THE PERMANENT MARKINGS SHALL BE REMOVED AT THE CONTRACTOR'S EXPENSE.
3. RAISED PAVEMENT MARKERS (RPM'S) & OVERLAY MARKERS SHALL BE REMOVED PRIOR TO INSTALLATION OF THE NEXT LAYER AND UPON COMPLETION OF PERMANENT STRIPING.
4. TYPE I TAPE SHALL BE REMOVED UPON COMPLETION OF PERMANENT STRIPING.
5. RPM/OVERLAY MARKERS ARE NOT REQUIRED ON MILLED SURFACES, HYDRATED LIME SURFACES AND STABILIZED SURFACES.
6. PLACE BROKEN LINE 2 INCHES TO THE LEFT OF JOINT LINE. EDGE LINE (SOLID) MARKINGS SHALL BE PLACED 12 FEET FROM THE CENTER JOINT LINE (2 INCHES INSIDE OF SHOULDER JOINT LINE WHEN APPLICABLE.)
7. PROJECTS WHICH DO NOT CREATE AN EDGELINE DROP OFF WILL NOT REQUIRE TEMPORARY EDGELINE MARKING.

4-LANE

REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 943
TEMPORARY PAVEMENT MARKING

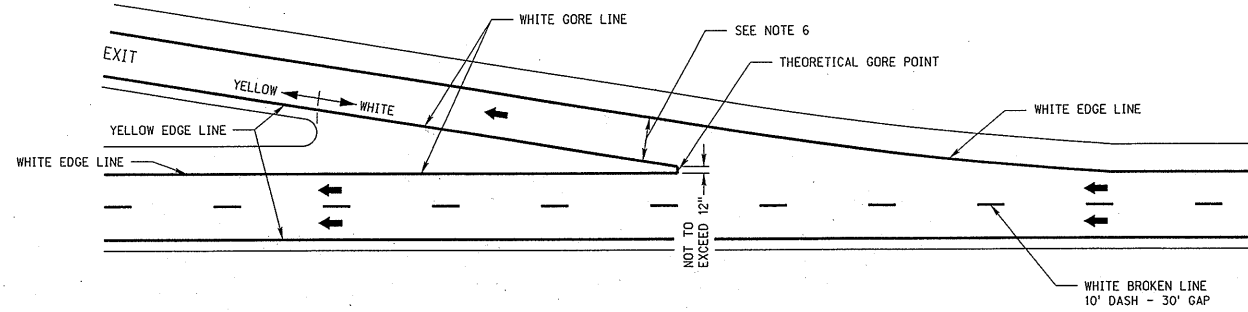
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

DANIEL J. WADDLE
E-6289
STATE OF NEBRASKA

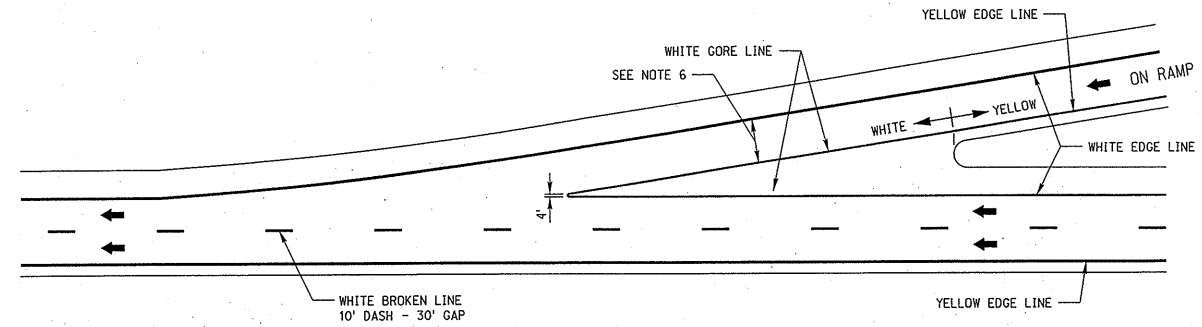
May B...
MAY 4 2018
5/14/2018
DATE

ORIGINAL:
OCT. 2018
DATE

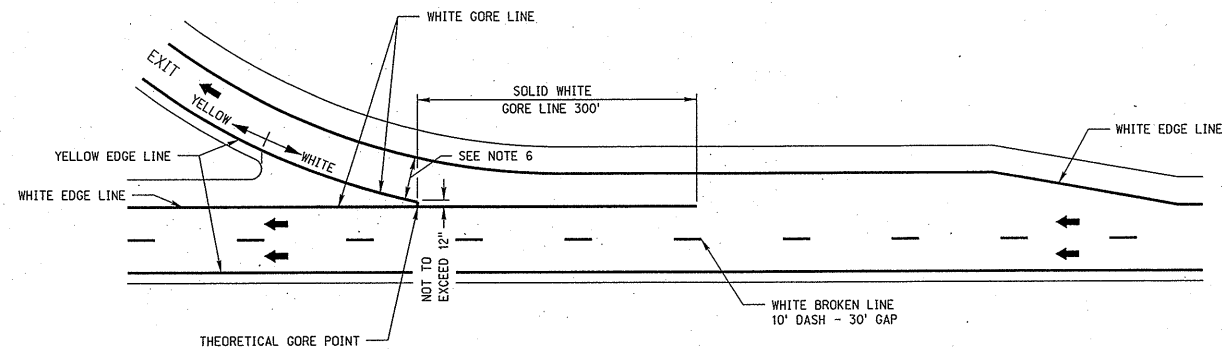
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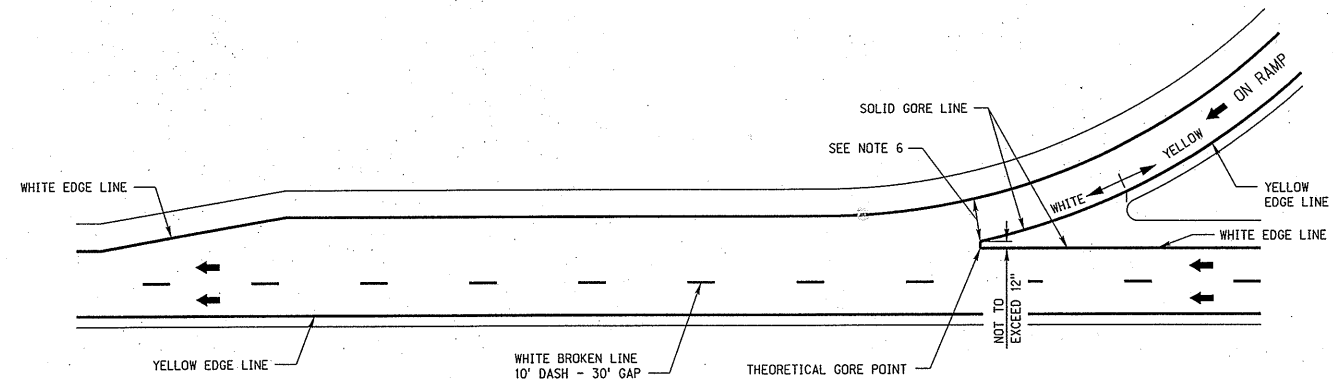
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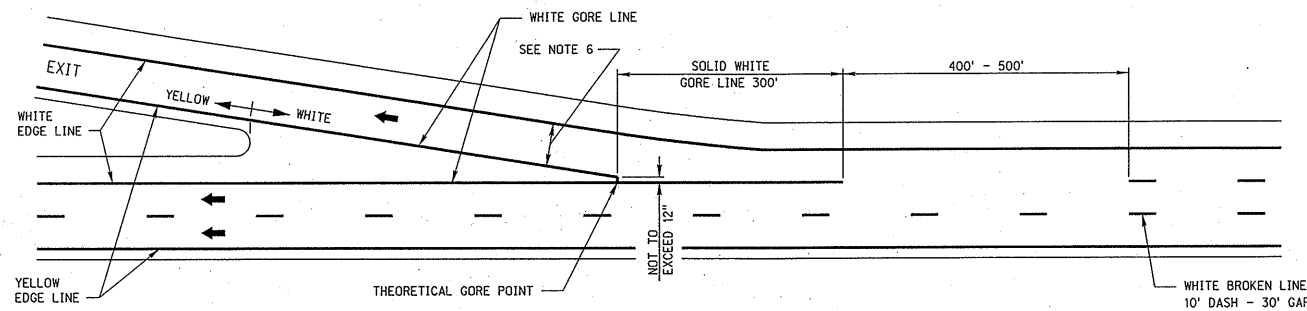
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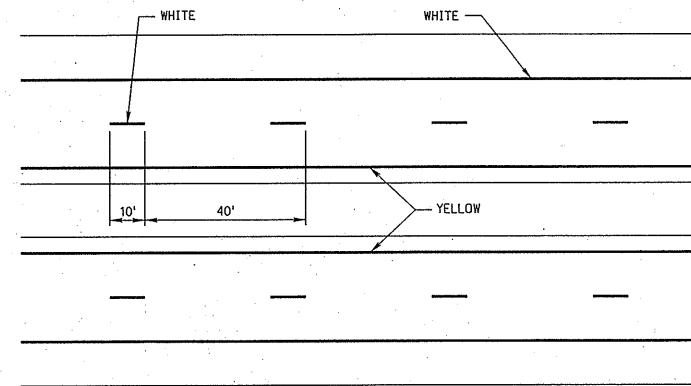
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PARALLEL ACCELERATION LANE



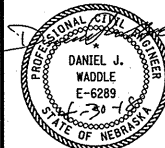
EXIT ONLY LANE DROP



4 LANE DEPRESSED MEDIAN WITH SURFACED SHOULDERS

NOTES:

1. ALL TEMPORARY MARKINGS SHALL BE NO LESS THAN 4 INCHES WIDE.
2. BROKEN LINE MARKINGS ON LOWER LAYERS (INCLUDING MILLED SURFACES) SHALL BE 4 INCHES BY 10 FEET PAINTED LINES AT 40 FEET INTERVALS, PLACED TO THE LEFT OF THE JOINT LINE.
3. BROKEN LINE MARKINGS ON TOP LAYERS SHALL BE 4 INCHES BY 8 FEET (MINIMUM) TO 10 FEET (MAXIMUM) PAINTED LINES AT 40 FEET INTERVALS, PLACED 2 INCHES TO THE LEFT OF THE JOINT LINE. THE INTERVAL SHALL BE 40 FEET (PLUS/MINUS) 2 INCHES TO ALLOW FOR THE PERMANENT PAVEMENT MARKING.
4. SOLID LINE MARKINGS SHALL BE PLACED 2 INCHES TO THE INSIDE OF THE EDGE JOINT LINE.
5. ALL TEMPORARY PAVEMENT MARKINGS THAT WILL BE COVERED BY PERMANENT PAVEMENT MARKINGS SHALL COMPLY WITH THE ALIGNMENT AND LOCATION REQUIREMENTS OF THE FINAL PAVEMENT MARKING MATERIAL. TEMPORARY PAVEMENT MARKINGS THAT ARE NOT COVERED BY THE PERMANENT MARKINGS SHALL BE REMOVED AT THE CONTRACTOR'S EXPENSE.
6. RAMP LANE WIDTH IS TYPICALLY 16 FEET FOR SINGLE LANE RAMP, 12 FEET FOR TWO LANE RAMP.

FREEWAY/EXPRESSWAY		
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF TRANSPORTATION STANDARD PLAN NO. 943 TEMPORARY PAVEMENT MARKING		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		4 4
 DANIEL J. WADDLE E-6289 STATE OF NEBRASKA		
ORIGINAL: OCT. 2018 DATE:		DATE: 5/14/2018 MARY BURROUGHS