ROADWAY DESIGN DIVISION.

PROJECT NO.	SHEET NO.
ER-39-3(106)	A1
◣ CONTROL NO. 42895	
▲ CONTROL NO.	
■ CONTROL NO.	

INDEX OF SHEETS

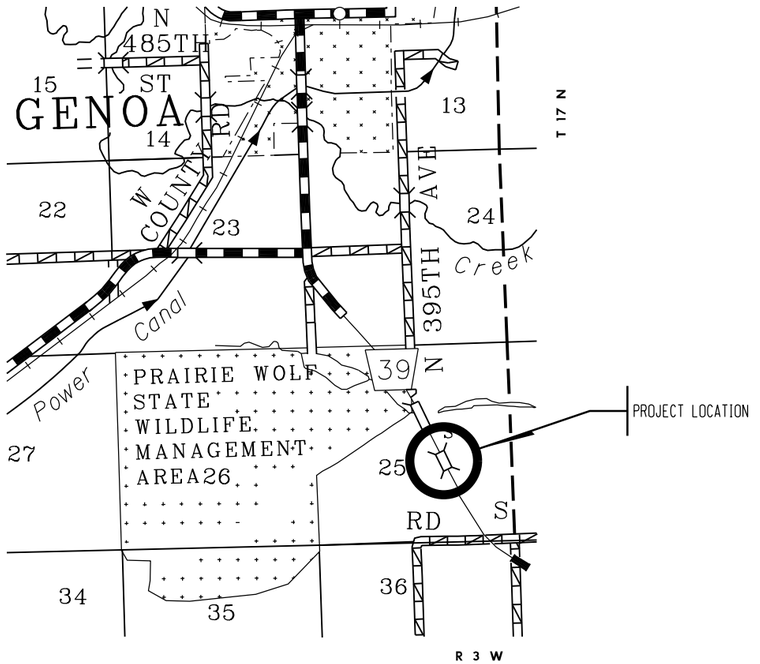
STATE OF NEBRASKA

DEPARTMENT OF TRANSPORTATION

PLANS FOR CONSTRUCTION

LOUP RIVER OVERFLOW SOUTH OF N-22

NANCE COUNTY



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

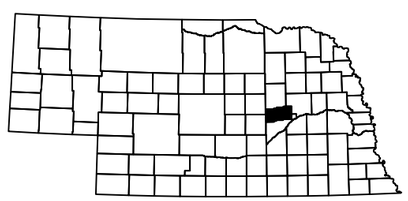
THE WORK ON THIS PROJECT CONSISTS OF GROUPS 1-GRADING, 3-CONCRETE PAVEMENT, 5-SEEDING, 6-BRIDGE, 7-GUARDRAIL & 10-GENERAL

◣ GROUPS 1, 3, 5, 6, 7 & 10 ARE INCLUDED
IN THE LETTING OF MAY 13, 2019

▲ GROUPS _____ ARE INCLUDED
IN THE LETTING OF _____

■ GROUPS _____ ARE INCLUDED
IN THE LETTING OF _____

DESIGN DESIGNATION
MAINTENANCE
TRAFFIC
YEAR: 2019
ADT: 1,520



CONVENTIONAL SIGNS

FENCE R.O.W. OR WIRE	—x—x—
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

PROFESSIONAL CIVIL ENGINEER
MICHAEL H. OWEN
E-6515
May 7 2019
COORDINATING PROFESSIONAL

PROFESSIONAL CIVIL ENGINEER
MICHAEL R. STOLLENBERG
E-6505
STATE OF NEBRASKA
May 3 2019

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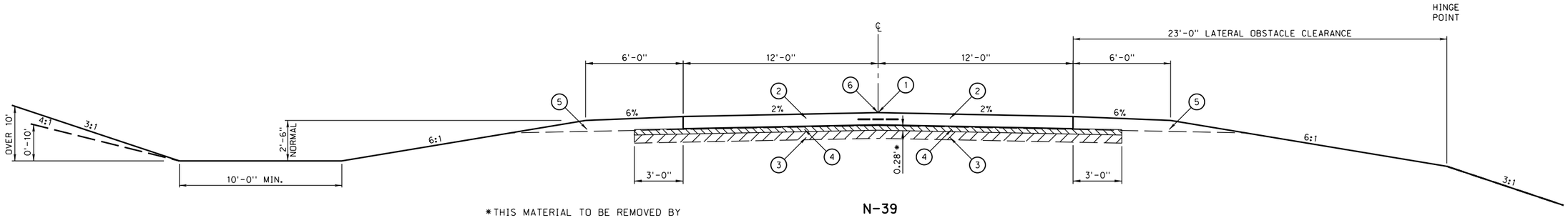
Roadway Design Division

JEO CONSULTING GROUP

PROJECT NO.	SHEET NO.
ER-39-3(106)	B1

C.N. 42895

TYPICAL CROSS SECTIONS

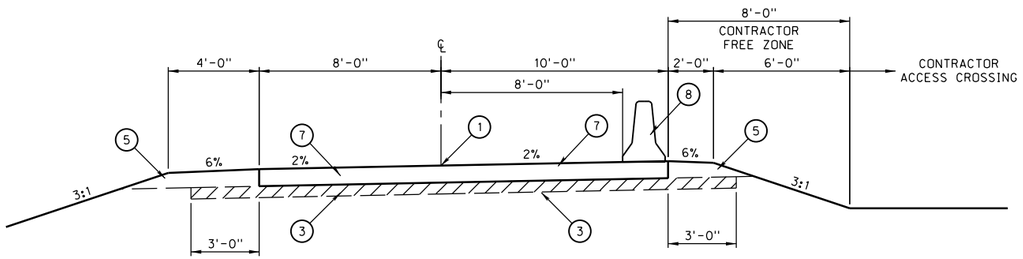


*THIS MATERIAL TO BE REMOVED BY THE SURFACING CONTRACTOR AND INCORPORATED INTO THE SHOULDERS.

N-39

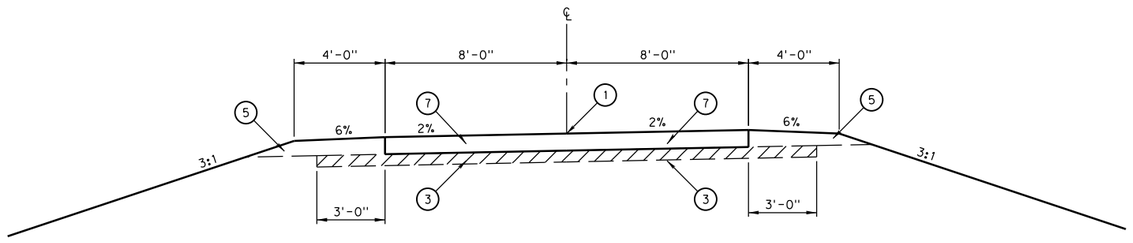
STA. 446+89 TO STA. 451+21

BRIDGE EXCEPTION: STA. 447+39.00 TO STA. 450+71.00



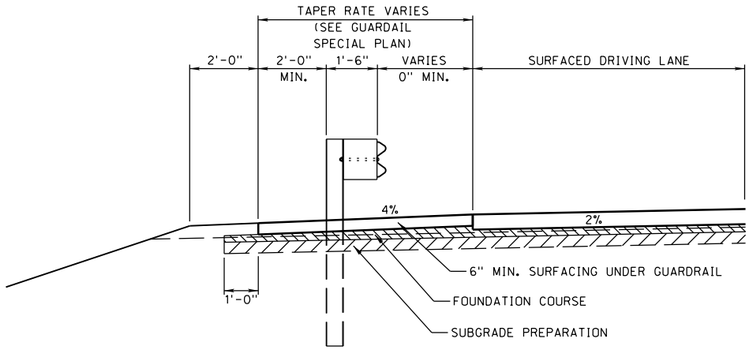
TEMPORARY ROAD WITH CONCRETE PROTECTION BARRIER

STA. 18+65 TO STA. 21+07



TEMPORARY ROAD

STATION	TO	STATION
10+79	-	18+65
21+07	-	29+51



SURFACING UNDER GUARDRAIL

LEGEND

1. PROFILE GRADE LINE
2. 9" DOWELED CONCRETE PAVEMENT
3. SUBGRADE PREPARATION
4. 4" FOUNDATION COURSE
5. SHOULDER CONSTRUCTION
6. LONGITUDINAL JOINT
7. 9" TEMPORARY SURFACING
8. CONCRETE PROTECTION BARRIER

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
5/2/19
STATE OF NEBRASKA

FOR DETAILS NOT SHOWN SEE PLANS 301 & 329

COMPUTER$$$$$
DATE$$$$$$$$$$$$$$$

DGNSPEC$$$$$$$$$$$$$
SCALE$$$$$$$$$$$$$

SUMMARY OF QUANTITIES

PROJECT NO.	SHEET NO.
ER-39-3(106)	C1

C.N. 42895

GRADING ITEMS
GROUP 1

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
GENERAL CLEARING AND GRUBBING	1.000	LS
EXCAVATION (ESTABLISHED QUANTITY)	11,345.000	CY
WATER	175.000	MGAL
EARTHWORK MEASURED IN EMBANKMENT	11,637.000	CY
SALVAGING AND PLACING TOPSOIL	10,093.000	SY
REMOVE ASPHALT SURFACE	937.000	SY
REMOVE GUARDRAIL	172.000	LF
36" CULVERT PIPE, TYPE 3,4 OR 5	204.000	LF

CONCRETE PAVEMENT ITEMS
GROUP 3

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
9" DOWELED CONCRETE PAVEMENT, CLASS 47B-3500	266.000	SY
TEMPORARY SURFACING 9"	2,896.000	SY
FOUNDATION COURSE 4"	266.000	SY
GRANULAR SUBDRAIN	10.000	EACH
WATER	1.000	MGAL
SUBGRADE PREPARATION	266.000	SY
SURFACING UNDER GUARDRAIL	564.000	SY

SEEDING ITEMS
GROUP 5

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
SEEDING, TYPE A	1.500	ACRE
COVER CROP SEEDING	2.500	ACRE
EROSION CONTROL, CLASS 1D	4,037.000	SY
FABRIC SILT FENCE-LOW POROSITY	703.000	LF
MULCH	6.000	TON

BRIDGE AT STA 449+05.00 ITEMS
GROUP 6

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
EARTHWORK MEASURED IN EMBANKMENT	3,920.000	CY
RIPRAP FILTER FABRIC	1,690.000	SY
CONCRETE FOR PAVEMENT APPROACHES CLASS 47BD-4000	194.600	CY
EPOXY COATED REINFORCING STEEL FOR PAVEMENT APPROACHES	36,415.000	LB
ABUTMENT NO.1 EXCAVATION	1.000	LS
ABUTMENT NO.2 EXCAVATION	1.000	LS
BENT NO.1 EXCAVATION	1.000	LS
BENT NO.2 EXCAVATION	1.000	LS
BRIDGE JOINT NOSING	13.300	CF
PREFORMED EXPANSION JOINT, TYPE A	89.300	LF
INSTALL EXPANSION BEARING, PTFE TYPE	1.000	LS
INSTALL FIXED BEARING	1.000	LS
BRIDGE DECK GROOVING	1,245.000	SY
CLASS 47B-3000 CONCRETE FOR BRIDGE	203.700	CY
CLASS 47BD-4000 CONCRETE FOR BRIDGE	308.200	CY
REMOVE STRUCTURE AT STA 449+05.00	1.000	EACH
ACCESS CROSSING AT STA 449+05.00 LT	1.000	LS
INSTALL STEEL SUPERSTRUCTURE AT STA 449+05	1.000	LS
STRUCTURAL STEEL FOR SUBSTRUCTURE	610.000	LB
BROKEN CONCRETE RIPRAP	170.000	TON
ROCK RIPRAP, TYPE B	1,095.000	TON
SALVAGING AND PLACING TOPSOIL ON RIPRAP	985.000	SY
EPOXY COATED REINFORCING STEEL	82,820.000	LB
SUBSURFACE DRAINAGE MATTING	78.000	SY
HP 12 INCH X 53 LB STEEL PILING	5,980.000	LF
STEEL SHEET PILING	3,458.000	SF
GRANULAR BACKFILL	305.000	CY

GUARDRAIL ITEMS
GROUP 7

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
W-BEAM GUARDRAIL	75.000	LF
BRIDGE APPROACH SECTIONS	4.000	EACH
GUARDRAIL END TREATMENT, TYPE II	4.000	EACH

GENERAL ITEMS
GROUP 10

ITEM	QUANTITY	UNITS
BARRICADE, TYPE II	3,375.000	BDAY
BARRICADE, TYPE III	1,318.000	BDAY
TEMPORARY SIGN DAY	50.000	EACH
SIGN DAY	6,465.000	EACH
BARRICADE SIGN DAY	500.000	EACH
TEMPORARY PAVEMENT MARKING REMOVAL	736.000	LF
PAVEMENT MARKING REMOVAL	1,916.000	LF
TEMPORARY PAVEMENT MARKING, TYPE PAINT	4,002.000	LF
TEMPORARY PAVEMENT MARKING SURFACE PREPARATION	4,002.000	LF
FLAGGING	10.000	DAY
CONCRETE PROTECTION BARRIER	268.000	LF
TEMPORARY RUMBLE STRIP	4.000	EACH
TEMPORARY TRAFFIC SIGNAL W/WAIT TIME DISPLAY	1.000	EACH
FIELD OFFICE	1.000	EACH
TRAINING	100.000	HOUR
MOBILIZATION	1.000	LS
RENTAL OF LOADER, FULLY OPERATED	5.000	HOUR
RENTAL OF DUMP TRUCK, FULLY OPERATED	5.000	HOUR
RENTAL OF SKID LOADER, FULLY OPERATED	5.000	HOUR
RENTAL OF CRAWLER MOUNTED HYDRAULIC EXCAVATOR, FULLY OPERATED	5.000	HOUR
TEMPORARY SEEDING	1.000	ACRE
TEMPORARY SILT CHECK	500.000	LF
TEMPORARY SILT FENCE	800.000	LF
TEMPORARY MULCH	2.500	TON
ENVIRONMENTAL COMMITMENTS - CONTRACTOR COMPLIANCE	1.000	LS

PROFESSIONAL CIVIL ENGINEER
MICHAEL H. STOCKENBERG
-6505
STATE OF NEBRASKA

May 3 2019 DocuSign

ROADWAY DESIGN DIVISION.

Computer: NDOTDESIGN13

Date: 03-MAY-2019 10:25

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Scale: 1:200

Roadway Design Division

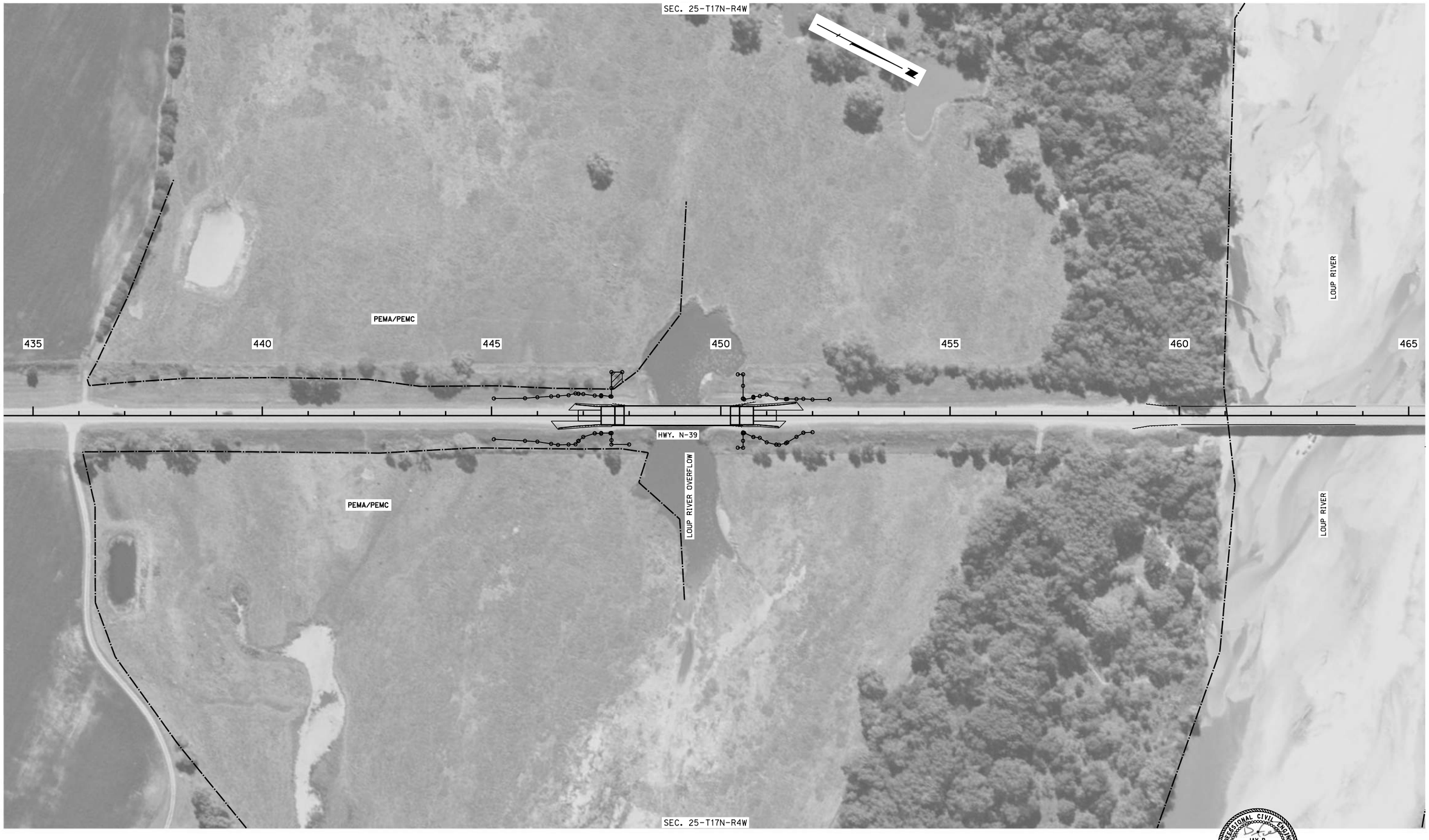
LEGEND

— SEN — SENSITIVE AREA - DO NOT ENTER
— HAZ — HAZARDOUS MATERIAL SITE
LIMITS OF CONSTRUCTION
WETLANDS - DO NOT DISTURB
IMPACTED WETLANDS
TEMPORARY IMPACTED WETLANDS

JEO CONSULTING GROUP

PROJECT NO.	SHEET NO.
ER-39-3(106)	E1

C.N. 42895



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LOUP RIVER OVERFLOW SOUTH OF N-22

NANCE COUNTY

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA

DATE: 2016
FLIGHT: NAIP2016
SCALE: 1" = 100'

Roadway Design Division

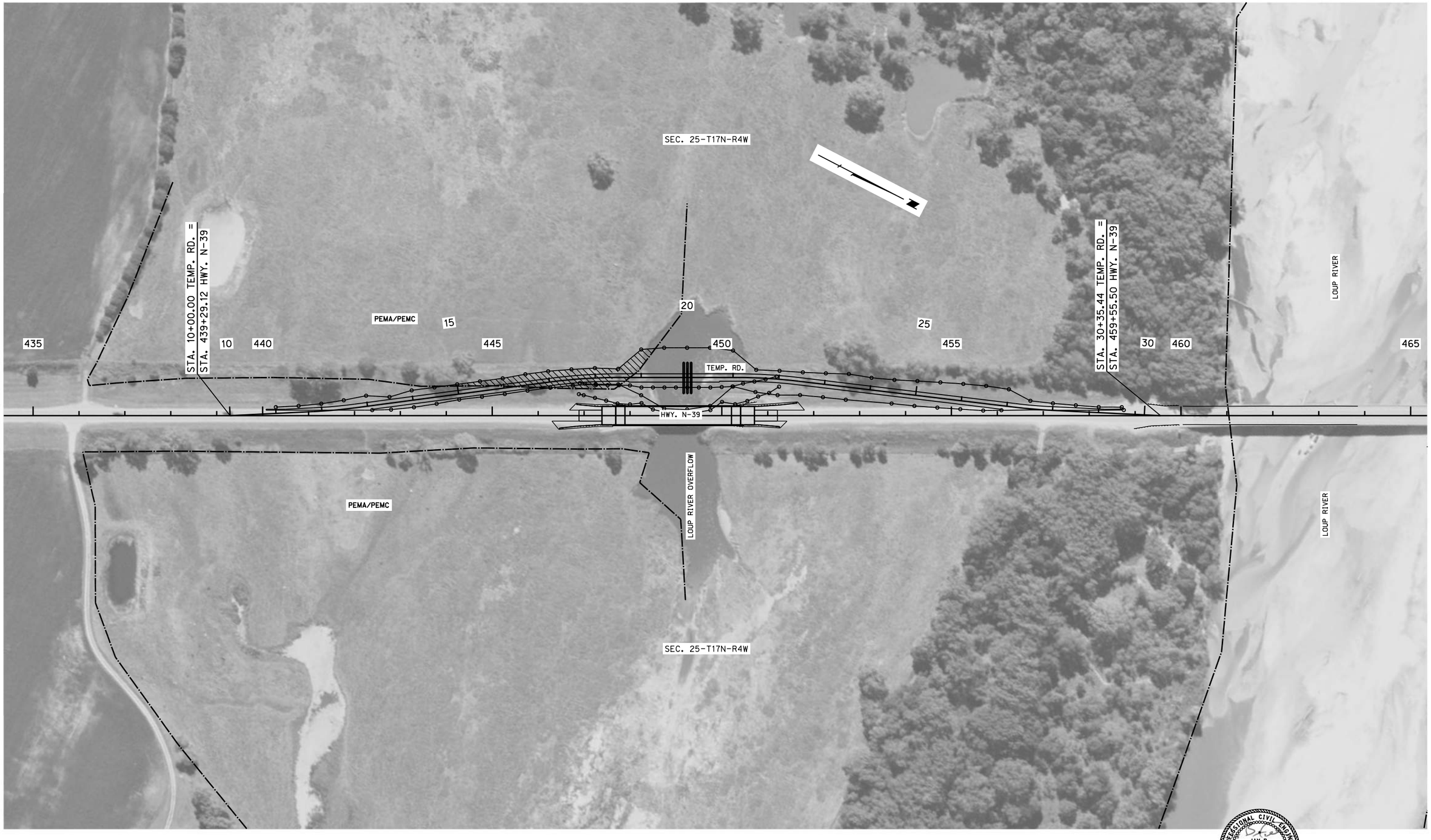
LEGEND

- SEN — SENSITIVE AREA - DO NOT ENTER
- HAZ — HAZARDOUS MATERIAL SITE
- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB
- IMPACTED WETLANDS
- TEMPORARY IMPACTED WETLANDS

JEO CONSULTING GROUP

PROJECT NO.	SHEET NO.
ER-39-3(106)	E2

C.N. 42895



PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA

DATE: 2016
FLIGHT: NAIP2016
SCALE: 1" = 100'

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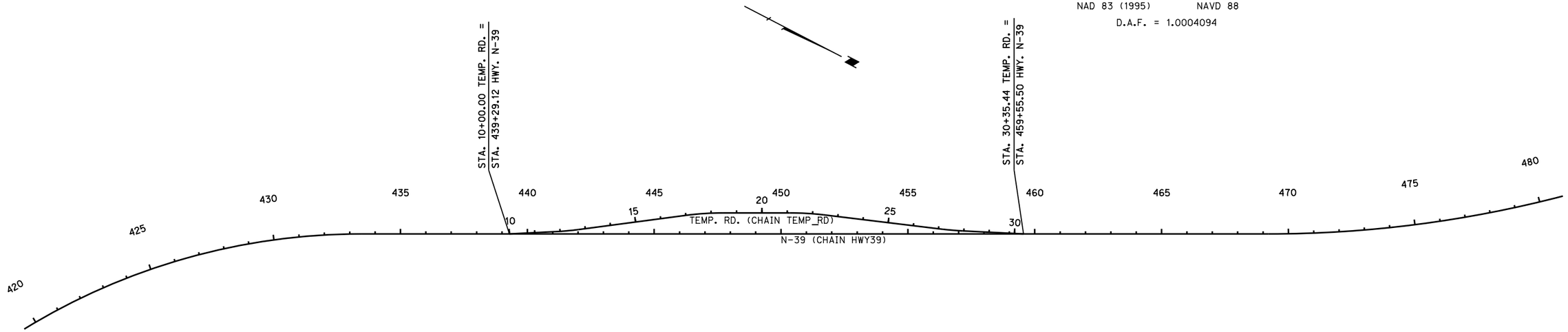
JEO CONSULTING GROUP

PROJECT NO.	SHEET NO.
ER-39-3(106)	F1
C.N. 42895	

DATUM INFORMATION

HORIZONTAL	VERTICAL
NAD 83 (1995)	NAVD 88

D.A.F. = 1.0004094



HWY. N-39

Curve Data

Curve PI38
P.I. Station = 426+65.23 X = 2,267,156.6518 Y = 582,507.0362
Delta = 31° 28' 20.95" (RT)
Degree = 2° 15' 00.00"
Tangent = 717.5214
Length = 1,398.7772
Radius = 2,546.4791
External = 99.1574
Long Chord = 1,381.2579
Mid. Ord. = 95.4411
P.C. Station = 419+47.71 X = 2,267,770.8234 Y = 582,136.0508
P.T. Station = 433+46.49 X = 2,266,826.5178 Y = 583,144.0986
C.C. X = 2,269,087.4485 Y = 584,315.7421
Back = 301° 08' 01.46"
Ahead = 332° 36' 22.41"
Chord Bear = 316° 52' 11.94"

Course from PT PI38 to PC PI43 332° 36' 22.41" Dist 3,575.1203

Curve Data

Curve PI43
P.I. Station = 475+11.26 X = 2,264,910.2926 Y = 586,841.8552
Delta = 14° 39' 38.76" (LT)
Degree = 1° 15' 00.00"
Tangent = 589.6514
Length = 1,172.8612
Radius = 4,583.6624
External = 37.7713
Long Chord = 1,169.6642
Mid. Ord. = 37.4626
P.C. Station = 469+21.61 X = 2,265,181.5931 Y = 586,318.3242
P.T. Station = 480+94.47 X = 2,264,515.3219 Y = 587,279.6758
C.C. X = 2,261,111.9180 Y = 584,209.3660
Back = 332° 36' 22.41"
Ahead = 317° 56' 43.66"
Chord Bear = 325° 16' 33.03"

Course from PT PI43 to PC PI48 317° 56' 43.66" Dist 2,728.3364

TEMP. RD.

Point 3 X = 2,266,558.4478 Y = 583,661.3957 Sta = 10+00.00

Course from 3 to PC TEMP_RD_3 329° 48' 48.68" Dist 181.4613

Curve Data

Curve TEMP_RD_3
P.I. Station = 12+26.98 X = 2,266,444.3185 Y = 583,857.5961
Delta = 4° 44' 21.13" (LT)
Degree = 5° 12' 31.35"
Tangent = 45.5190
Length = 90.9862
Radius = 1,100.0000
External = 0.9414
Long Chord = 90.9602
Mid. Ord. = 0.9406
P.C. Station = 11+81.46 X = 2,266,467.2062 Y = 583,818.2497
P.T. Station = 12+72.45 X = 2,266,418.2582 Y = 583,894.9169
C.C. X = 2,265,516.3733 Y = 583,265.1522
Back = 329° 48' 48.68"
Ahead = 325° 04' 27.55"
Chord Bear = 327° 26' 38.12"

Course from PT TEMP_RD_3 to PC TEMP_RD_6 325° 04' 27.55" Dist 430.9151

Curve Data

Curve TEMP_RD_6
P.I. Station = 17+75.77 X = 2,266,130.1005 Y = 584,307.5871
Delta = 7° 31' 54.86" (RT)
Degree = 5° 12' 31.35"
Tangent = 72.4054
Length = 144.6022
Radius = 1,100.0000
External = 2.3804
Long Chord = 144.4981
Mid. Ord. = 2.3753
P.C. Station = 17+03.36 X = 2,266,171.5535 Y = 584,248.2222
P.T. Station = 18+47.96 X = 2,266,096.7865 Y = 584,371.8733
C.C. X = 2,267,073.4384 Y = 584,877.9870
Back = 325° 04' 27.55"
Ahead = 332° 36' 22.41"
Chord Bear = 328° 50' 24.98"

Course from PT TEMP_RD_6 to PC TEMP_RD_9 332° 36' 22.41" Dist 262.6622

Curve Data

Curve TEMP_RD_9
P.I. Station = 21+76.67 X = 2,265,945.5498 Y = 584,663.7161
Delta = 6° 52' 16.88" (RT)
Degree = 5° 12' 31.35"
Tangent = 66.0394
Length = 131.9206
Radius = 1,100.0000
External = 1.9806
Long Chord = 131.8415
Mid. Ord. = 1.9770
P.C. Station = 21+10.63 X = 2,265,975.9348 Y = 584,605.0820
P.T. Station = 22+42.55 X = 2,265,922.3981 Y = 584,725.5644
C.C. X = 2,266,952.5867 Y = 585,111.1956
Back = 332° 36' 22.41"
Ahead = 339° 28' 39.29"
Chord Bear = 336° 02' 30.85"

Course from PT TEMP_RD_9 to PC TEMP_RD_12 339° 28' 39.29" Dist 475.0285

Curve Data

Curve TEMP_RD_12
P.I. Station = 27+56.74 X = 2,265,742.1339 Y = 585,207.1282
Delta = 4° 04' 43.15" (LT)
Degree = 5° 12' 31.35"
Tangent = 39.1688
Length = 78.3045
Radius = 1,100.0000
External = 0.6971
Long Chord = 78.2880
Mid. Ord. = 0.6967
P.C. Station = 27+17.58 X = 2,265,755.8655 Y = 585,170.4452
P.T. Station = 27+95.88 X = 2,265,725.8281 Y = 585,242.7416
C.C. X = 2,264,725.6769 Y = 584,784.8140
Back = 339° 28' 39.29"
Ahead = 335° 23' 56.14"
Chord Bear = 337° 26' 17.72"

Course from PT TEMP_RD_12 to 4 335° 23' 56.14" Dist 239.5559

Point 4 X = 2,265,626.1015 Y = 585,460.5526 Sta = 30+35.44

Ending chain TEMP_RD description

GEOPAK ALIGNMENT INFORMATION

ALIGNMENT	CHAIN	PROFILE
HWY. N-39	HWY39	FGHWY39
TEMP. RD.	TEMP_RD	TEMP_RD_FG

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA

HORIZONTAL ALIGNMENT & ORIENTATION

Computer: TEMPLEMAN
Date: 23-APR-2019 17:06
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ROADWAY DESIGN DIVISION

CONTROL POINT TIES

DATUM INFORMATION

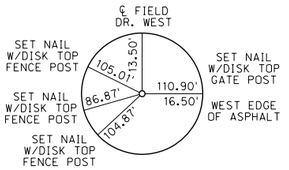
HORIZONTAL	VERTICAL
NAD 83 (1995)	NAVD 88

D.A.F. = 1.0004094

JEO CONSULTING GROUP

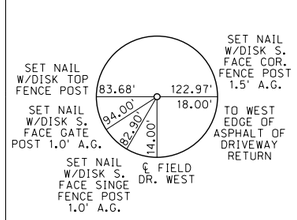
PROJECT NO.	SHEET NO.
ER-39-3(106)	F2
C.N. 42895	

CP 2



5/8" x 36" REBAR AT SURFACE

CP 3



5/8" x 36" REBAR AT SURFACE

CONTROL POINT DATA

Control Point	X	Y	Z	Station	Offset
CP 2	2266378.29	583945.01	1557.32	442+63.82	-29.4632
CP 3	2266663.37	583373.39	1558.32	436+25.13	-29.4632

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GENERAL INFORMATION

JEO CONSULTING GROUP

PROJECT NO.	SHEET NO.
ER-39-3(106)	G1
C.N. 42895	

ROADWAY DESIGN DIVISION

COMPUTER$$$$

DATE$$$$$$$$$$$$$$

DGNSPEC$$$$$$$$$$$

SCALE$$$$$$$$$$$

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.

The Contractor will be required to furnish Borrow on this Project.

EARTHWORK QUANTITIES

STATION	TO	STATION	EXCAVATION AVAILABLE (CU. YDS.)	EARTHWORK MEASURED IN EMBANKMENT (CU. YDS.)
445+05.00	-	447+63.25	0	258
450+46.75	-	452+37.00	0	34
11+00.00	-	29+50.00	803	11,345
TOTAL			803	11,637

EARTHWORK QUANTITIES FOR TEMPORARY ROAD REMOVAL

STATION	TO	STATION	EXCAVATION ESTABLISHED QUANTITIES (CU. YDS.)
11+00.00	-	29+50.00	11,345
TOTAL			11,345

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	ACCMP	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

LEGEND

- GAS LINE
- ELECTRICAL SERVICE
- POWER LINE
- OVERHEAD POWER LINE
- SANITARY SEWER
- STORM SEWER
- TELEPHONE LINE
- FIBER OPTIC TELE. LINE
- OVERHEAD TELEPHONE LINE
- CABLE TV LINE
- OVERHEAD CABLE TV LINE
- WATER LINE
- FENCE - CHAIN LINK
- FENCE - R.O.W. OR WIRE
- FENCE - WOOD
- FLOWLINE
- CENTER LINE DRIVE
- BENCH MARK
- CENTER PIVOT
- CONTROL POINT
- DIKE
- GAS METER
- GAS VALVE
- GRID TICK
- GUARDRAIL
- GUARD POST
- GUY POLE
- GUY WIRE
- 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

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA

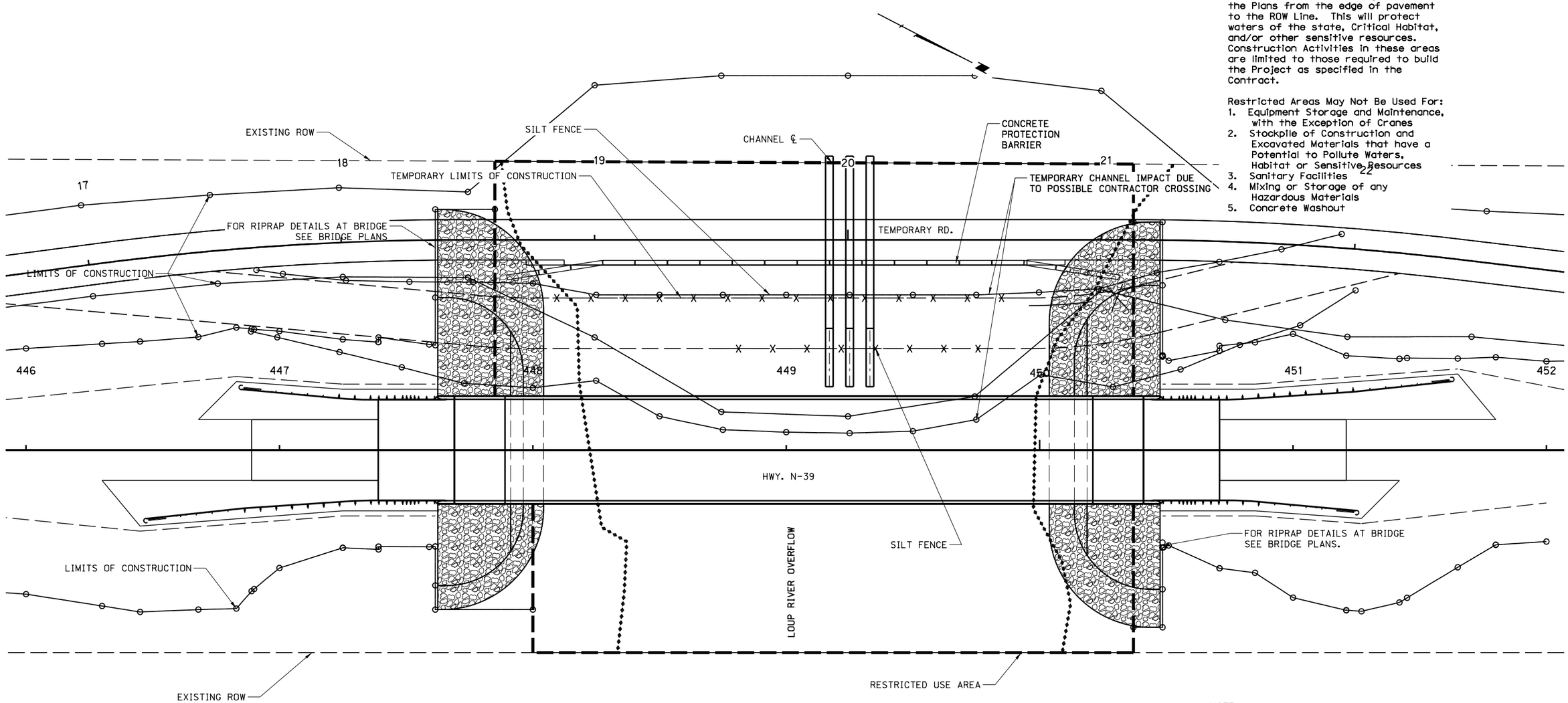
GENERAL INFORMATION

JEO CONSULTING GROUP

PROJECT NO.	SHEET NO.
ER-39-3(106)	G2

C.N. 42895

SEC. 25-T17N-R4W



- RESTRICTED AREAS
  Restricted Areas are designated on the Plans from the edge of pavement to the ROW Line. This will protect waters of the state, Critical Habitat, and/or other sensitive resources. Construction Activities in these areas are limited to those required to build the Project as specified in the Contract.

  Restricted Areas May Not Be Used For:
  1. Equipment Storage and Maintenance, with the Exception of Cranes
  2. Stockpile of Construction and Excavated Materials that have a Potential to Pollute Waters, Habitat or Sensitive Resources
  3. Sanitary Facilities
  4. Mixing or Storage of any Hazardous Materials
  5. Concrete Washout

NOTE:
BRIDGE CONTRACTOR IS ALLOWED TO WORK WITHIN THE ROW SHOWN ON THIS SHEET.

THE AREA BELOW THE ORDINARY HIGH WATER ELEVATION IS TO BE IMPACTED ONLY DURING THE OPERATIONS REQUIRED TO BUILD, MAINTAIN AND REMOVE THE CONTRACTOR CROSSING.

THE CONTRACTOR IS ALLOWED TO CONSTRUCT ONLY ONE STREAM CROSSING AT THE LOCATION.

LOUP RIVER OVERFLOW #(S039 01792)

STA. 449+05

SEC. 25-T17N-R4W

LEGEND

- LIMITS OF CONSTRUCTION
- WETLANDS - DO NOT DISTURB
- IMPACTED WETLANDS
- TEMPORARY IMPACTED WETLANDS
- TEMPORARY CHANNEL DISTURBANCE
- EXISTING ROW

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA

SHEET 1 OF 2

ACCESS CROSSING

ROADWAY DESIGN DIVISION

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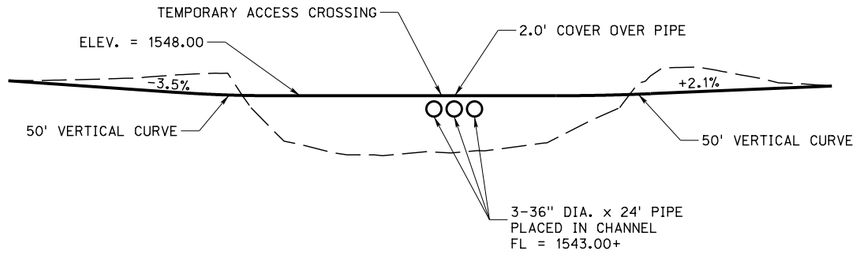
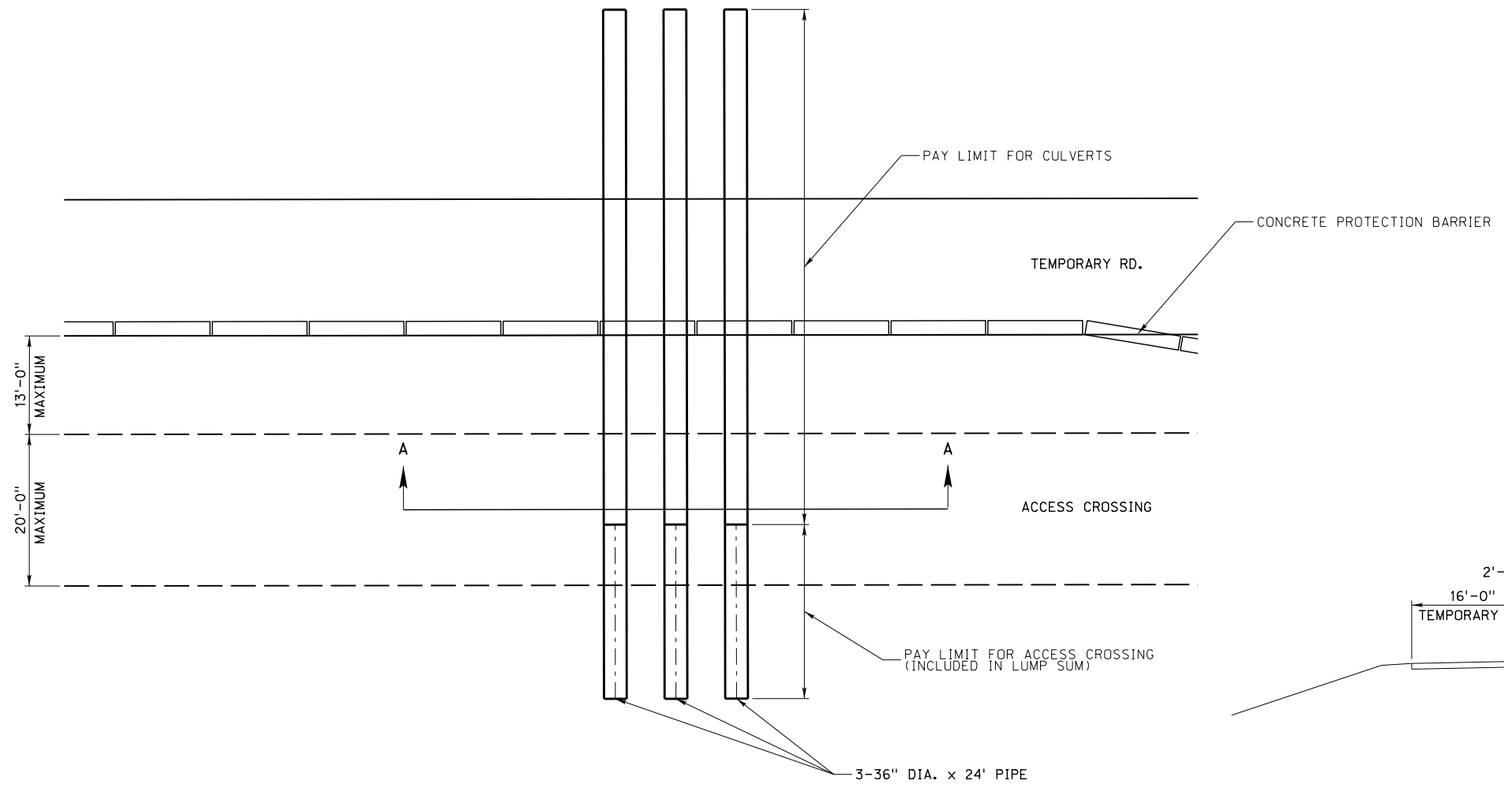
GENERAL INFORMATION



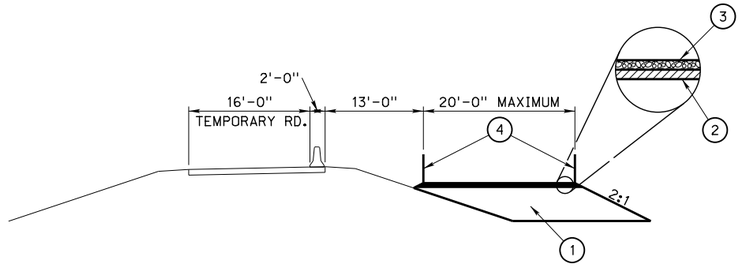
SECTION A-A



TYPICAL CONTRACTOR CROSSING

LEGEND

1. MATERIAL SHALL BE CLEAN EARTHEN FILL.
2. 3" EMBEDDED CRUSHED ROCK OR CRUSHED CONCRETE
3. 3" CRUSHED ROCK OR CRUSHED CONCRETE
4. SILT FENCE



TYPICAL SECTION OF CROSSING

SHEET 2 OF 2

ACCESS CROSSING

ROADWAY DESIGN DIVISION

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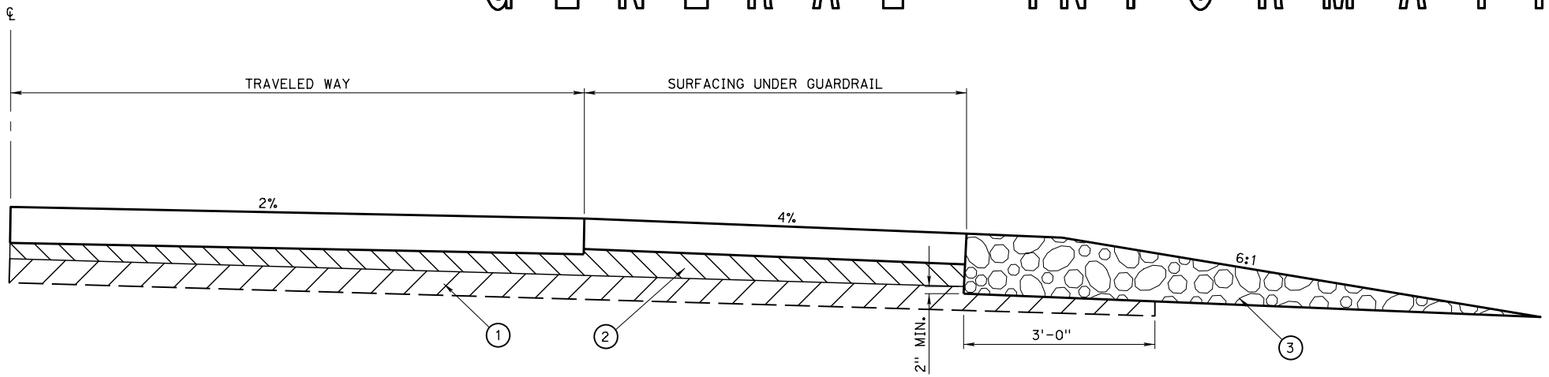
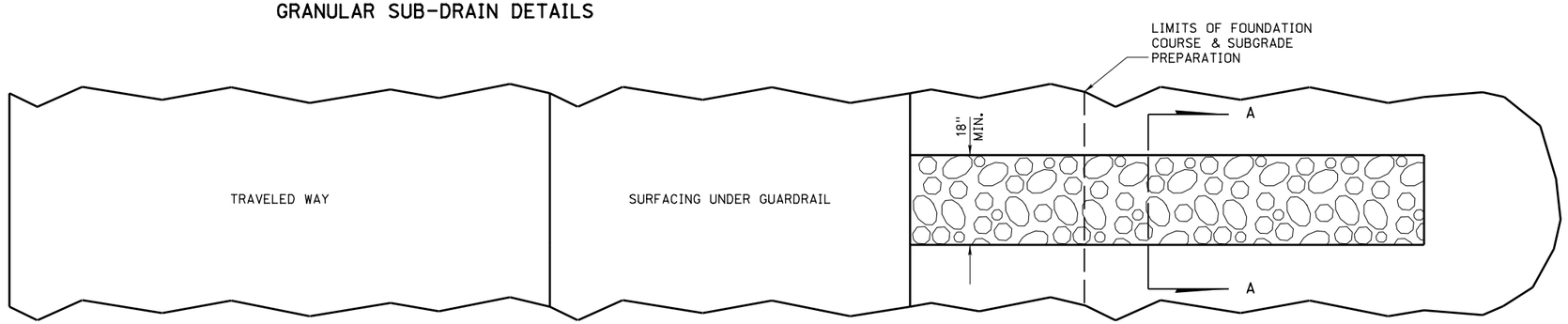
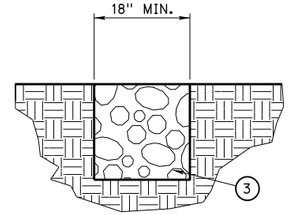
GENERAL INFORMATION



GRANULAR SUB-DRAIN DETAILS





SECTION A-A

GRANULAR SUB-DRAIN DETAILS

1. SUBGRADE PREPARATION
2. FOUNDATION COURSE
3. GRANULAR BACKFILL MATERIAL (SUBSIDIARY)

CONSTRUCTION NOTES:

THE GRANULAR SUB-DRAIN SHALL BE CONSTRUCTED WITH POSITIVE DRAINAGE.

GRANULAR SUB-DRAIN SHALL BE INSTALLED AFTER ALL SHOULDERING & EARTH WORK IS COMPLETED AND PRIOR TO SEEDING.

GRANULAR SUB-DRAINS SHALL BE CONSTRUCTED AT INTERVALS OF 200'-0" WHERE THE GRADE IS 1% OR OVER AND AT INTERVALS OF 100 FT. ON GRADES UNDER 1%.

GRANULAR SUB-DRAINS SHALL BE BUILT PERPENDICULAR TO THE CENTER LINE.

BUILD GRANULAR SUB-DRAIN

STATION	TO	STATION	SIDE	EACH	SPACING
445+30	-	447+62	RT	3	100
445+68	-	447+62	LT	3	100
450+49	-	451+42	RT	2	100
450+49	-	451+80	LT	2	100

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA

ROADWAY DESIGN DIVISION

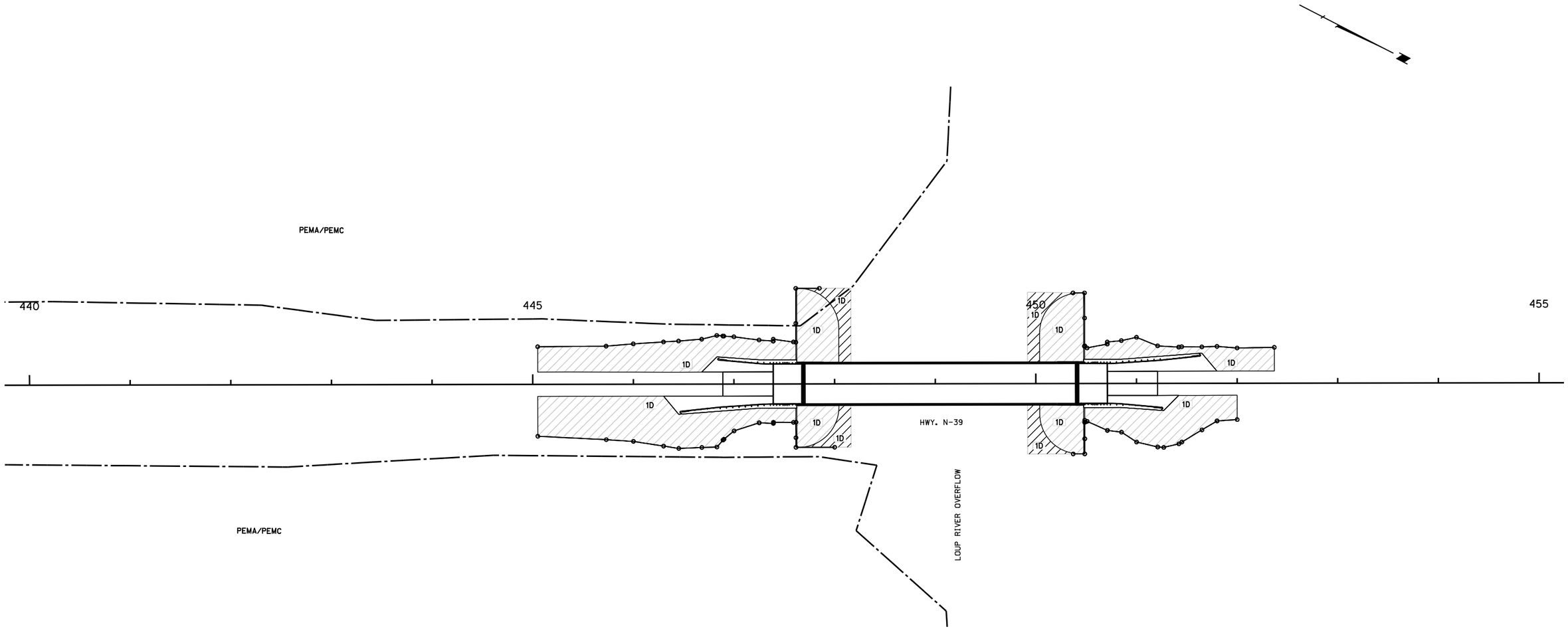
Computer: TEMPLEMAN
Date: 23-APR-2019 17:06
File: 428950cn04.dgn
Scale: 1:40

JEO CONSULTING GROUP

PROJECT NO.	SHEET NO.
ER-39-3(106)	J1

C.N. 42895

SEC. 25-T17N-R4W



1D	BUILD EROSION CONTROL-CLASS 1D, PLAN 501					
STATION	TO	STATION	SIDE	DESCRIPTION	WIDTH	SQ. YDS.
445+18	-	447+62	Rt.	Under Guardrail	Varies	977
445+73	-	447+61	Lt.	Under Guardrail	Varies	721
447+63	-	448+04	Rt.	Riprap Cover	Varies	155
447+63	-	448+04	Lt.	Riprap Cover	Varies	304
447+63	-	448+17	Rt.	Bench	Varies	94
447+63	-	448+17	Lt.	Bench	Varies	198
449+92	-	450+48	Rt.	Bench	Varies	103
449+92	-	450+48	Lt.	Bench	Varies	132
450+04	-	450+48	Rt.	Riprap Cover	Varies	198
450+04	-	450+47	Lt.	Riprap Cover	Varies	296
450+49	-	451+60	Rt.	Under Guardrail	Varies	516
450+49	-	452+14	Lt.	Under Guardrail	Varies	343

SEC. 25-T17N-R4W

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA
5/31/19

LEGEND

LIMITS OF CONSTRUCTION

WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

EROSION & SEDIMENT CONTROL

ROADWAY DESIGN DIVISION.

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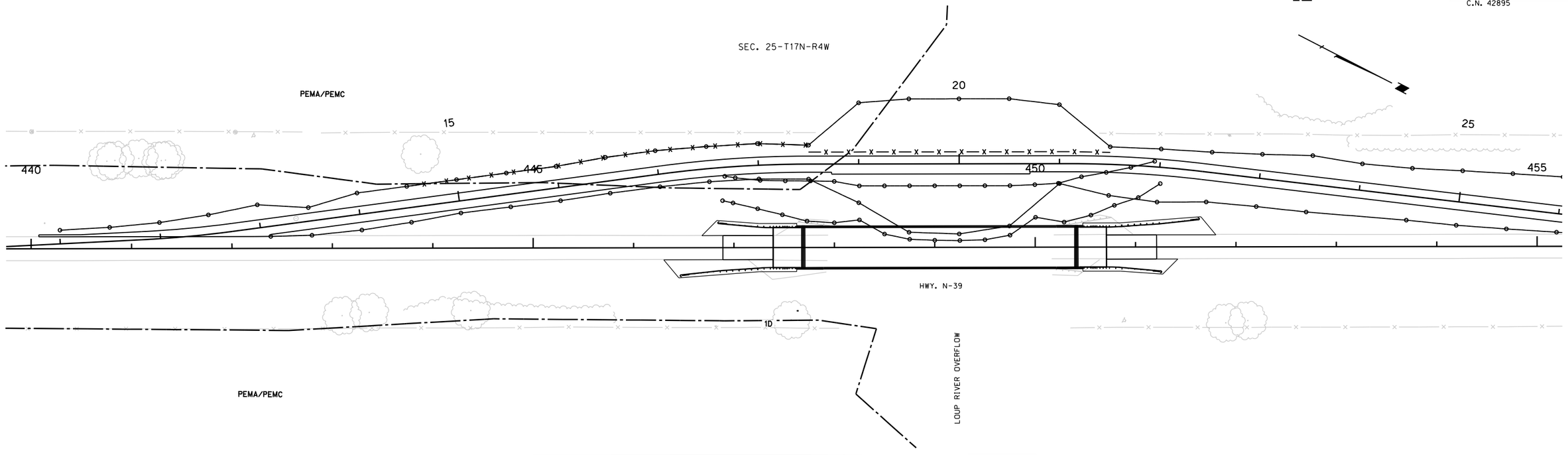
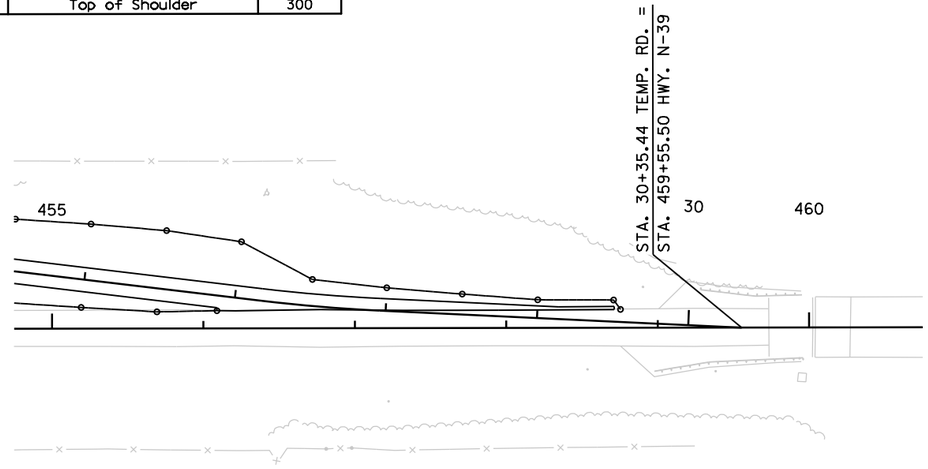


—x— BUILD FABRIC SILT FENCE-LOW POROSITY, PLAN 502						
STATION	TO	STATION	SIDE	BAY	DESCRIPTION	LIN. FT.
14+50	-	18+50	Lt.	-	Toe of Foreslope	403
18+50	-	21+50	Lt.	-	Top of Shoulder	300



JAY B. FALLICK E-11635 5/2/19 PROFESSIONAL CIVIL ENGINEER STATE OF NEBRASKA

LEGEND

⟷ LIMITS OF CONSTRUCTION

WETLANDS - DO NOT DISTURB UNIMPACTED WETLANDS, SEE SHEET E

SEC. 25-T17N-R4W

EROSION & SEDIMENT CONTROL

ROADWAY DESIGN DIVISION.

Computer: DGORMAN

Date: 02-MAY-2019 15:14

File: 428950cx02.dgn
Scale: 1:100

ROADWAY DESIGN DIVISION.

JEO CONSULTING GROUP

PROJECT NO.	SHEET NO.
ER-39-3(106)	L1

C.N. 42895

SEC. 25-T17N-R4W

Sta. 446+89 to Sta. 447+94 Remove 473 Sq. Yds. of Asphalt Surface.

STA. 449+05 #(S039 01792) 2-40'-0" & 1-40'-6" SPANS CONT. CONC. TEE BEAM BR. W/40' RDWY. Remove Structure.

Sta. 499+05 Remove 172 Lin. Ft. of Guardrail.

Sta. 450+16 to Sta. 451+21 Remove 464 Sq. Yds. of Asphalt Surface.

435 440 445 450 455 460 465

FIELD DRIVE

LOUP RIVER

HWY. N-39

LOUP RIVER OVERFLOW

FIELD DRIVE

LOUP RIVER

Sta. 446+89 to Sta. 447+39 Build 133 Sq. Yds. of 9" Doweled Concrete Pavement. Plan 329.

Sta. 449+05 #(S039 01792) Build 2-70'-0" & 1-90'-0" Spans Rolled Beam Girder Bridge (40' Roadway). Special Plan 1.

SEC. 25-T17N-R4W

Sta. 449+05 Build 75 Lin. Ft. of W-Beam Guardrail. 4-Bridge Approach Sections. Plans 740 & 743. 4-Guardrail End Treatment, Type II. Special Plan 1C.

Sta. 450+71 to Sta. 451+21 Build 133 Sq. Yds. of 9" Doweled Concrete Pavement. Plan 329.

JAY B. FALLICK E-11635 5/2/19 PROFESSIONAL CIVIL ENGINEER STATE OF NEBRASKA

1580 1570 1560 1550 1540 1530

1,559.39

+0.3858 %

1,561.31

1,559.39 1,559.58 1,559.77 1,559.96 1,560.16 1,560.35 1,560.54 1,560.74 1,560.93 1,561.12 1,561.31

1,559.24 1,559.11 1,558.90 1,558.84 1,558.78 1,558.74 1,558.72 1,558.68 1,558.61 1,558.67 1,558.68 1,558.73 1,558.76 1,558.82 1,558.90 1,559.00 1,559.12 1,559.26 1,559.39 1,559.54 1,559.65 1,554.34 1,536.08 1,530.99 1,530.15 1,545.93 1,560.85 1,561.06 1,561.31 1,561.57 1,561.79 1,561.98 1,562.22 1,562.44 1,562.65 1,562.88 1,563.10 1,563.28 1,563.53 1,563.77 1,564.00 1,564.25 1,564.37 1,564.62 1,564.82 1,564.91

Datum Elev. = 1510.00 ft Above Sea Level U.S.C.& G.S.

5 6 7 8 9 440 1 2 3 4 445 6 7 8 9 450 1 2 3 4 455 6 7 8 9 460 1 2 3 4 465

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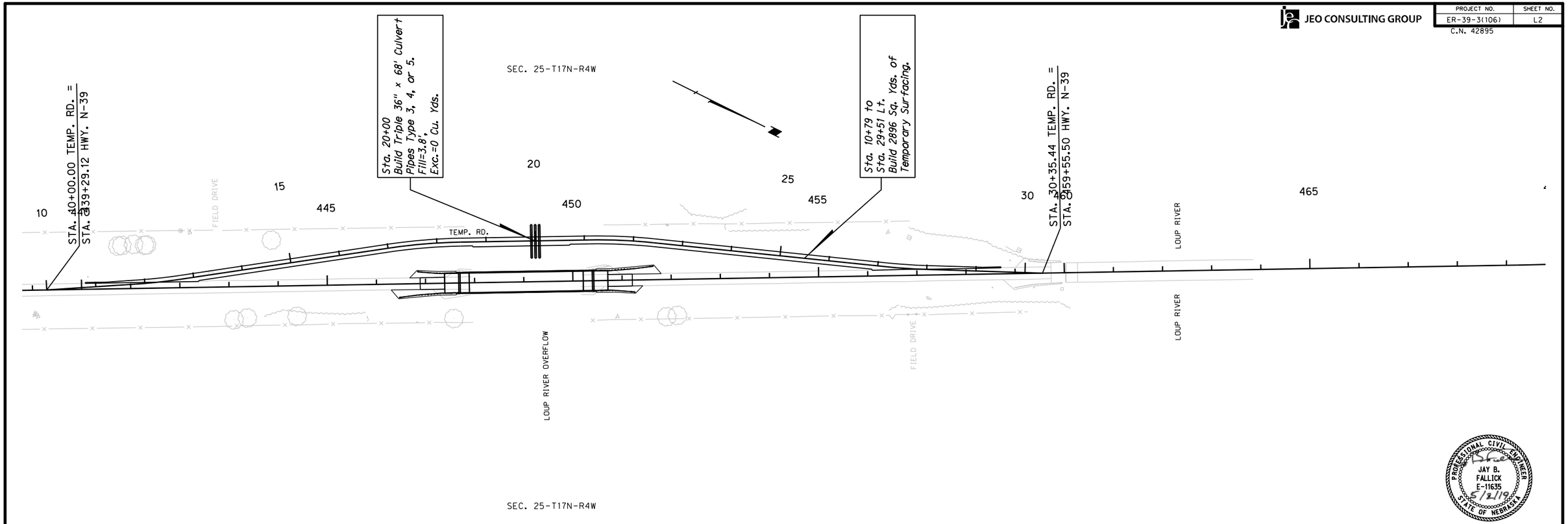
ROADWAY DESIGN DIVISION.

JEO CONSULTING GROUP

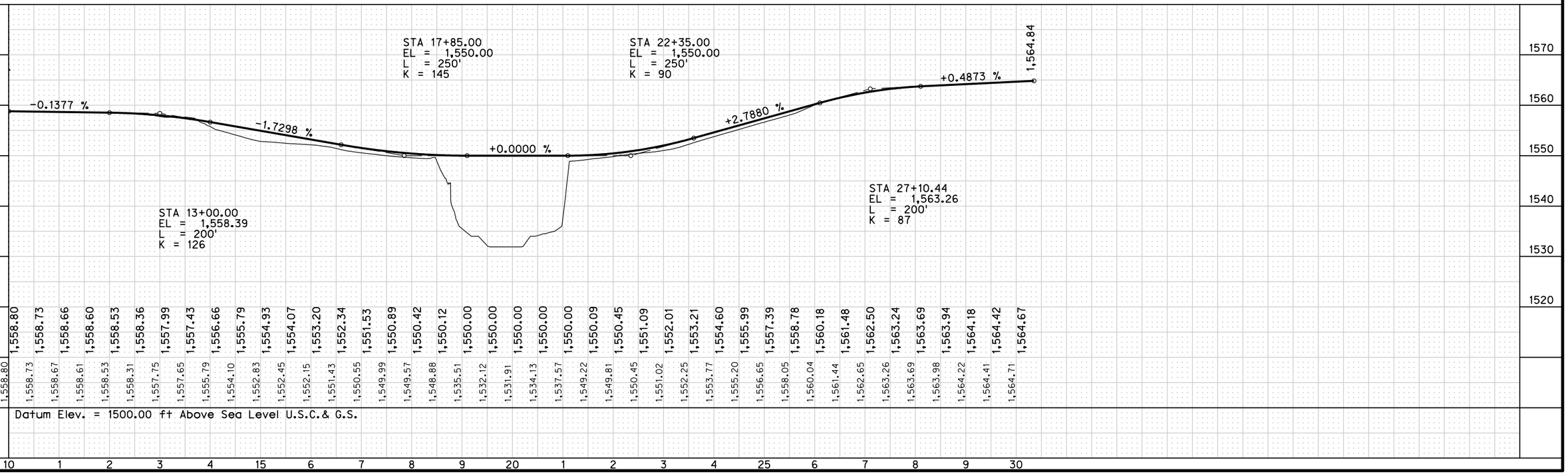
PROJECT NO.	SHEET NO.
ER-39-3(106)	L2

C.N. 42895



JAY B. FALLICK E-11635 5/2/19 PROFESSIONAL CIVIL ENGINEER STATE OF NEBRASKA

TEMPORARY ROAD



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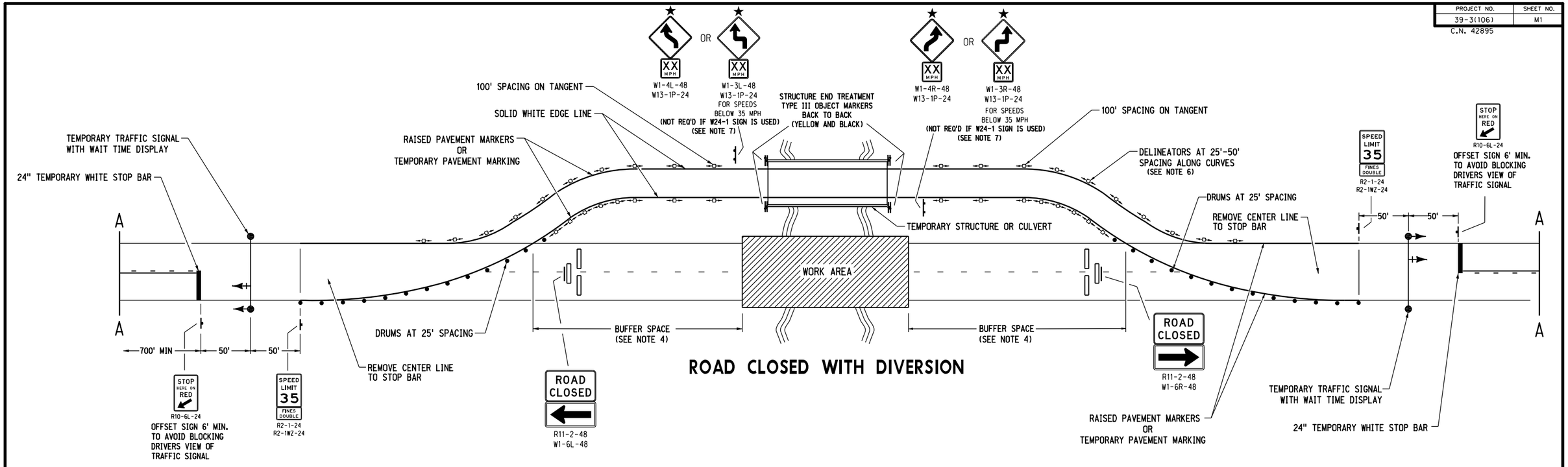
PROJECT NO.	SHEET NO.
39-3(106)	M1

C.N. 42895



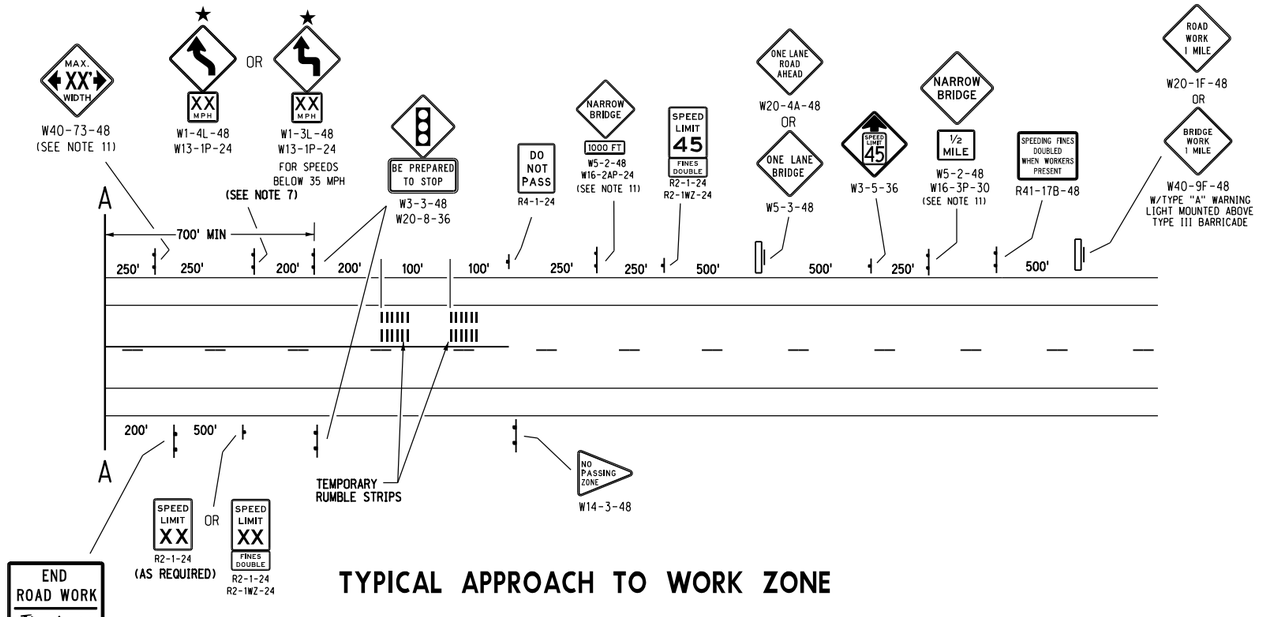
ROAD CLOSED WITH DIVERSION

NOTES

1. SIGNS SHOWN ARE FOR ONE DIRECTION OF TRAVEL ONLY.
2. RAISED PAVEMENT MARKERS (IF USED) SHALL BE SPACED AT 5' INTERVALS.
3. THE WORK AREA SHALL INCLUDE THE AREA USED BY THE WORK ACTIVITY, EQUIPMENT, VEHICLES AND MATERIALS.
4. NO EQUIPMENT, VEHICLES OR CONSTRUCTION MATERIAL SHALL BE PLACED WITHIN THE BUFFER SPACE OR IN FRONT OF THE WORK AREA.
5. REMOVE ALL CONFLICTING PAVEMENT MARKINGS.
6. DELINEATORS SHALL BE REPLACED BY VERTICAL PANELS, PLACED BACK-TO-BACK, AT 25' TO 50' SPACING ALONG THE SHOOFLY WHEN THE FILL SLOPE IS STEEPER THAN 3:1. SEE STANDARD PLAN 921 FOR VERTICAL PANEL INSTALLATION DETAILS.
7. A DOUBLE REVERSE CURVE SIGN (W24-1) MAY BE USED WHEN THE TANGENT DISTANCE BETWEEN TWO REVERSE CURVES IS LESS THAN 600'.
8. ALL TEMPORARY PAVEMENT MARKINGS SHALL BE INSTALLED WITH SMOOTH AND GRADUAL TRANSISTIONS AND ALIGNMENTS. WHEN NECESSARY, THE CONTRACTOR SHALL PREMARK THE PAVEMENT PRIOR TO PLACING THE MARKINGS.
9. ★ 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.
10. WORK ZONE SPEED LIMITS SHALL NOT BE INSTALLED WITHOUT A SPEED ZONE AUTHORIZATION COMPLETED BY THE DEPARTMENT. THE WORK ZONE SPEED LIMIT SHALL BE ESTABLISHED ACCORDING TO DOR-01 60-18. SEE WORK ZONE SPEED LIMIT NOTES ON STANDARD PLAN 920.
11. INSTALL WHEN LANE WIDTH ACROSS DIVERSION IS LESS THAN THE APPROACH LANE WIDTH OF THE ROADWAY.
12. 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.
13. WHEN THE CONTRACTOR IS ACTIVELY WORKING ON THE SHOO-FLY, THE CONTRACTOR, AT THEIR EXPENSE, MAY TURN THE TRAFFIC SIGNAL TO RED FLASH AND PROVIDE FLAGGERS TO CONTROL TRAFFIC. ADVANCE FLAGGER SIGN (W20-7-48) SHALL BE INSTALLED OVER THE SIGNAL AHEAD SIGN.
14. ALL BARRICADE AND SIGN LOCATIONS ARE APPROXIMATE, AND MAY BE ADJUSTED TO FIT FIELD CONDITIONS. THE SIGNS SHALL BE INSTALLED SO AS TO NOT OBSCURE THE VIEW OF OTHER TRAFFIC CONTROL DEVICES FROM MOTORISTS.

LEGEND

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



TYPICAL APPROACH TO WORK ZONE

NEBRASKA DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING DIVISION

TYPICAL TRAFFIC SIGNAL CONTROL PLAN

DESIGNED KSF	TEMPORARY TRAFFIC SIGNAL WITH WAIT TIME DISPLAY FOR PAVED SHOO-FLY DETOUR (1/1)
REVIEWED	
DATE DRAWN 04/19	TRAFFIC ENGINEER DATE

TRAFFIC ENGINEERING DIVISION

Computer: NDOTTRAFFIC45
Date: 24-APR-2019 09:51
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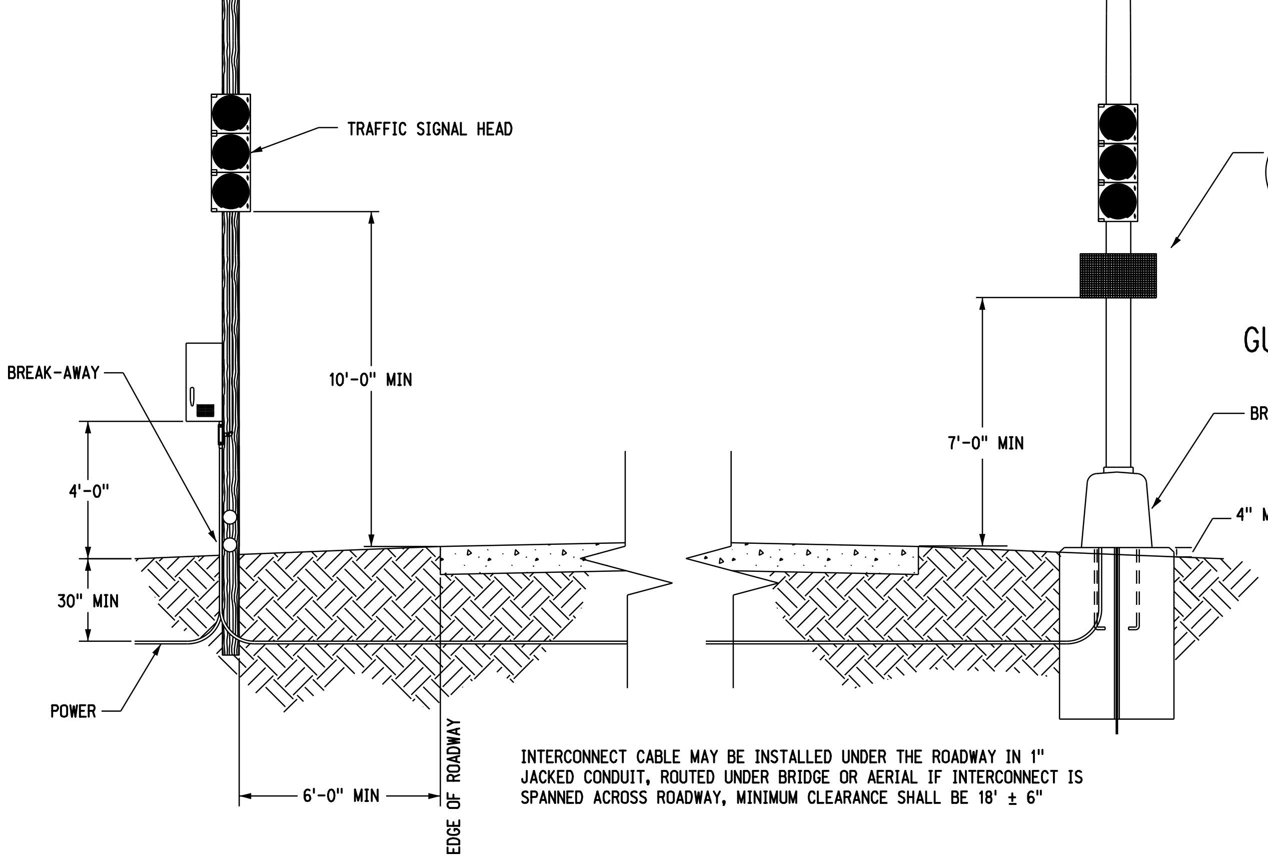
TRAFFIC ENGINEERING DIVISION

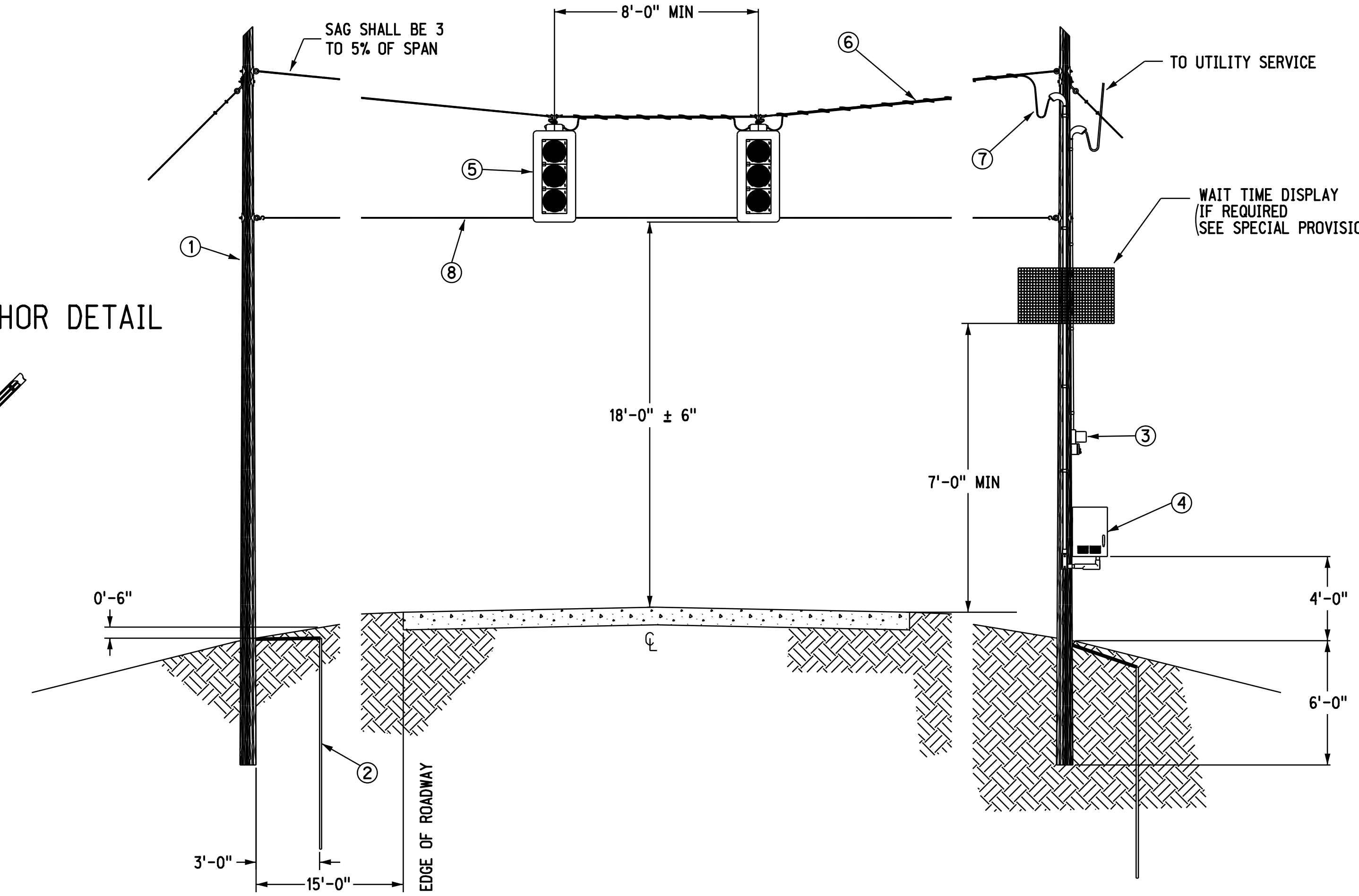
PEDESTAL POLE INSTALLATION



INTERCONNECT CABLE MAY BE INSTALLED UNDER THE ROADWAY IN 1" JACKED CONDUIT, ROUTED UNDER BRIDGE OR AERIAL IF INTERCONNECT IS SPANNED ACROSS ROADWAY, MINIMUM CLEARANCE SHALL BE 18' ± 6"

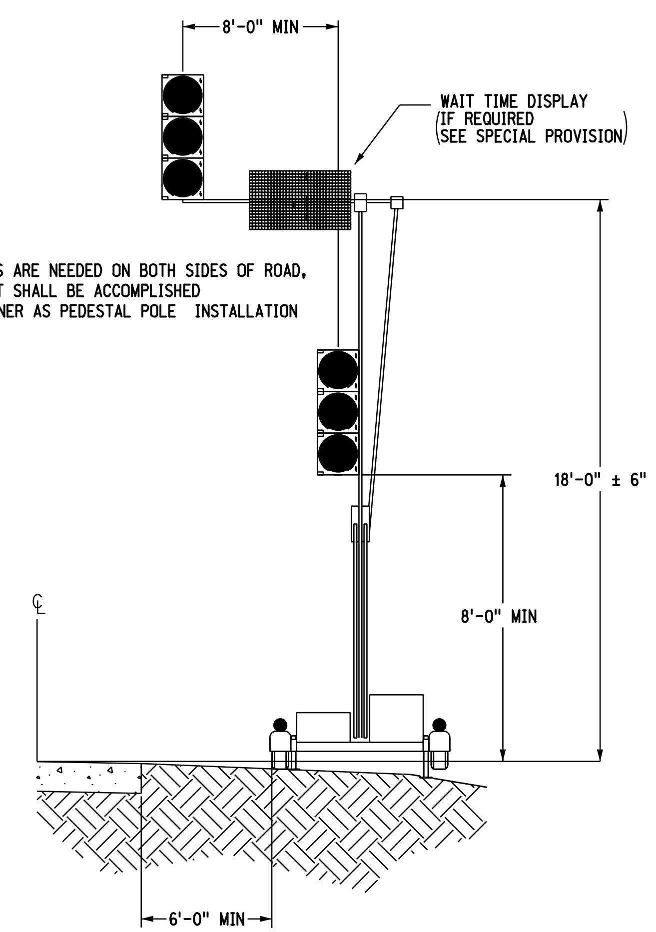
GUY WIRE ANCHOR DETAIL

SPAN WIRE INSTALLATION

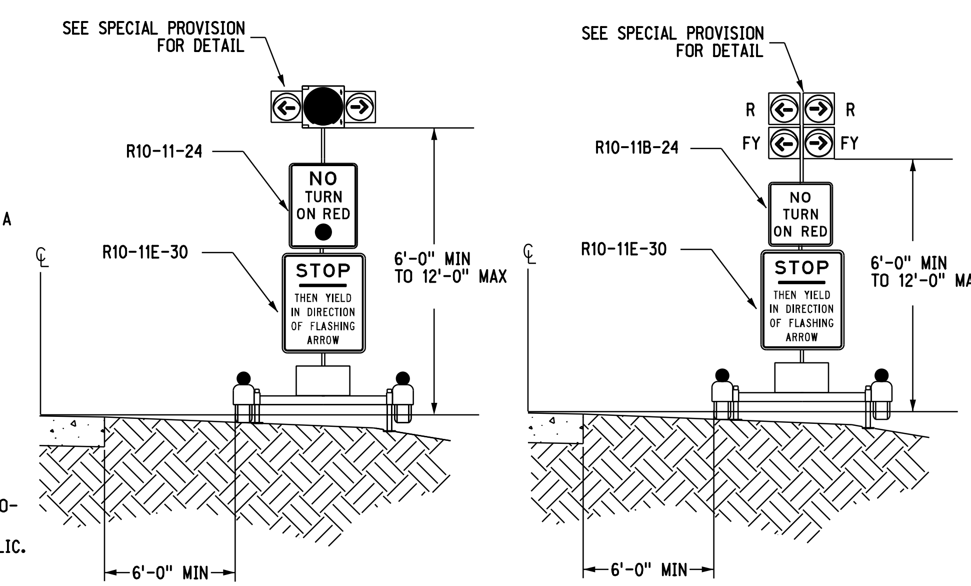


PORTABLE SIGNAL

WHEN SIGNALS ARE NEEDED ON BOTH SIDES OF ROAD, INTERCONNECT SHALL BE ACCOMPLISHED IN SAME MANNER AS PEDESTAL POLE INSTALLATION



DRIVEWAY ASSISTANCE DEVICE



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	STA. 449+05 ON HWY N-39, LOUP RIVER OVERFLOW BRIDGE WITH WAIT TIME DISPLAY
2	
3	
4	

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 ENGINEEER UNLESS THE EXACT PLACEMENT IS NOTED IN THE PLANS.
9. THE TIMING OF THE SIGNAL CYCLE SHALL BE DETERMINED BY THE STATE TRAFFIC ENGINEERING DIVISION. FOR THE SPECIFIC INSTALLATION, CALL TRAFFIC ENGINEERING DIVISION AT 402-479-4594.
10. THE SIGNAL SHALL BE PLACED INTO FLASHING AMBER OPERATON 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.

PROFESSIONAL CIVIL ENGINEER
ZHUROWSKI
E-16374
STATE OF NEBRASKA
Apr 24 2019

NEBRASKA DEPARTMENT OF TRANSPORTATION
TRAFFIC ENGINEERING DIVISION

TYPICAL TRAFFIC SIGNAL CONTROL PLAN

DESIGNED TJF	TEMPORARY TRAFFIC SIGNAL DETAILS		1/1
REVIEWED			
APPROVED	DATE DRAWN 03/18	TRAFFIC ENGINEER	DATE

File: sptts_r3.dgn
Scale: 1:200
Date: 23-APR-2019 12:23
Computer: NDOTTRAFFIC45

BASELINE/TAB NAME: BASELINE: HWY39

Station	Excavation CUT AREA Sq.Ft.	Excavation ADDED CUT Cu.Yds.	Excavation TOTAL CUT-VOL Cu.Yds.	Embankment FILL AREA Sq.Ft.	Embankment ADDED FILL Cu.Yds.	Embankment TOTAL FILL-VOL Cu.Yds.	BALANCE FACTOR	ADJUSTED FILL-VOL Cu.Yds.	MASS ORDINATE Cu.Yds.
445+05.00	0.0	0.00	0	14.3	0.00	0			
445+73.00	0.0	0.00	0	25.1	0.00	50			
446+00.00	0.0	0.00	0	32.4	0.00	29			
446+30.00	0.0	0.00	0	44.3	0.00	43			
446+45.00	0.0	0.00	0	59.4	0.00	29			
446+68.00	0.0	0.00	0	44.1	0.00	44			
446+83.00	0.0	0.00	0	36.9	0.00	23			
446+89.00	0.0	0.00	0	28.6	0.00	7			
447+00.00	0.0	0.00	0	19.4	0.00	10			
447+25.00	0.0	0.00	0	9.6	0.00	13			
447+39.00	0.0	0.00	0	9.2	0.00	5			
447+61.49	0.0	0.00	0	3.8	0.00	5			
447+63.25	0.0	0.00	0	0.0	0.00	0			

GRAND SUMMARY TOTALS

	Unadjusted Volume (cu. yd.)	Adjusted Volume (cu. yd.)	Mult Factor
Excavation	0		
Fill	258		

BASELINE/TAB NAME: BASELINE: HWY39

Station	Excavation CUT AREA Sq.Ft.	Excavation ADDED CUT Cu.Yds.	Excavation TOTAL CUT-VOL Cu.Yds.	Embankment FILL AREA Sq.Ft.	Embankment ADDED FILL Cu.Yds.	Embankment TOTAL FILL-VOL Cu.Yds.	BALANCE FACTOR	ADJUSTED FILL-VOL Cu.Yds.	MASS ORDINATE Cu.Yds.
450+46.75	0.0	0.00	0	0.0	0.00	0			
450+48.50	0.0	0.00	0	0.5	0.00	0			
450+71.00	0.0	0.00	0	2.0	0.00	1			
450+85.00	0.0	0.00	0	5.2	0.00	2			
451+00.00	0.0	0.00	0	8.4	0.00	4			
451+21.00	0.0	0.00	0	17.2	0.00	10			
451+27.00	0.0	0.00	0	21.7	0.00	4			
451+42.00	0.0	0.00	0	7.8	0.00	8			
451+65.00	0.0	0.00	0	2.3	0.00	4			
451+80.00	0.0	0.00	0	0.2	0.00	1			
452+00.00	0.0	0.00	0	0.0	0.00	0			

GRAND SUMMARY TOTALS

	Unadjusted Volume (cu. yd.)	Adjusted Volume (cu. yd.)	Mult Factor
Excavation	0		
Fill	34		

BASELINE/TAB NAME: BASELINE: TEMP_RD

Station	Excavation CUT AREA Sq.Ft.	Excavation ADDED CUT Cu.Yds.	Excavation TOTAL CUT-VOL Cu.Yds.	Embankment FILL AREA Sq.Ft.	Embankment ADDED FILL Cu.Yds.	Embankment TOTAL FILL-VOL Cu.Yds.	BALANCE FACTOR	ADJUSTED FILL-VOL Cu.Yds.	MASS ORDINATE Cu.Yds.
11+00.00	3.6	0.00	0	0.0	0.00	0			
11+50.00	3.9	0.00	7	0.3	0.00	0			
12+00.00	4.3	0.00	8	0.8	0.00	1			
12+50.00	5.2	0.00	9	5.1	0.00	5			
13+00.00	6.9	0.00	11	14.7	0.00	18			
13+50.00	27.8	0.00	32	0.2	0.00	14			
14+00.00	12.7	0.00	38	19.6	0.00	18			
14+50.00	5.3	0.00	17	32.5	0.00	48			
15+00.00	2.3	0.00	7	29.8	0.00	58			
15+50.00	1.0	0.00	3	24.4	0.00	50			
16+00.00	2.3	0.00	3	16.7	0.00	38			
16+50.00	5.4	0.00	7	21.0	0.00	35			
17+00.00	6.8	0.00	11	21.3	0.00	39			
17+50.00	8.1	0.00	14	17.9	0.00	36			
18+00.00	9.1	0.00	16	16.4	0.00	32			
18+50.00	8.4	0.00	16	27.0	0.00	40			
19+00.00	0.0	0.00	8	846.0	0.00	808			
19+50.00	0.0	0.00	0	1390.9	0.00	2071			
20+00.00	0.0	0.00	0	1416.3	0.00	2599			
20+50.00	0.0	0.00	0	1169.9	0.00	2395			
21+00.00	0.0	0.00	0	631.6	0.00	1668			
21+50.00	27.8	0.00	26	8.9	0.00	593			
22+00.00	26.9	0.00	51	14.9	0.00	22			
22+50.00	22.1	0.00	45	17.9	0.00	30			
23+00.00	25.8	0.00	44	26.3	0.00	41			
23+50.00	31.5	0.00	53	33.1	0.00	55			
24+00.00	31.8	0.00	59	35.0	0.00	63			
24+50.00	28.7	0.00	56	42.0	0.00	71			
25+00.00	26.4	0.00	51	50.7	0.00	86			
25+50.00	25.1	0.00	48	63.9	0.00	106			
26+00.00	25.8	0.00	47	55.9	0.00	111			
26+50.00	18.4	0.00	41	51.5	0.00	99			
27+00.00	8.8	0.00	25	22.0	0.00	68			
27+50.00	5.7	0.00	13	2.8	0.00	23			
28+00.00	5.1	0.00	10	0.6	0.00	3			
28+50.00	5.4	0.00	10	0.2	0.00	1			
29+00.00	4.5	0.00	9	0.0	0.00	0			
29+50.00	4.3	0.00	8	0.0	0.00	0			

GRAND SUMMARY TOTALS

	Unadjusted Volume (cu. yd.)	Adjusted Volume (cu. yd.)	Mult Factor
Excavation	803		
Fill	11345		

JEO CONSULTING GROUP

PROJECT NO.	SHEET NO.
ER-39-3(106)	R1

C.N. 42895

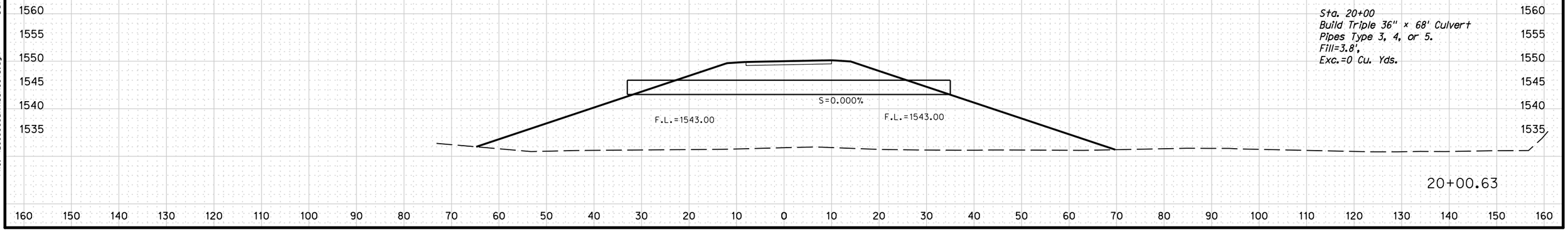
JAY B. FALLICK E-11635 5/3/19 PROFESSIONAL CIVIL ENGINEER STATE OF NEBRASKA

ROADWAY DESIGN DIVISION.

Computer: DGORMAN

Date: 02-MAY-2019 15:15

File: 42895Occulvxssheets.dgn



- LOUP RIVER OVERFLOW SOUTH OF N-22 -

- NOTES -

This structure is designed in accordance with the AASHTO LRFD Bridge Design Specifications, Eighth Edition, including subsequent interim revisions.

The existing structure was built under project RF-329(11)-2 dated February 1974 and repaired under project 39-2 (104) dated May 1993. Plans are available on request from the Bridge Office.

The concrete bridge deck is designed by the empirical design method.

The girders and substructure are designed for a future wearing surface of 40 psf.

The Contractor may substitute any one of the alternate designs shown on the plans for the original design. All quantities are based on the original design and no additions or deductions will be allowed or deductions will be allowed for the use of an alternate design.

All structural steel for girder flanges, webs, stiffeners, separators, and all splice materials shall conform to the requirements of ASTM A709/A709M, Grade 50W weathering steel.

All other structural steel shall conform to the requirements of ASTM A709/A709M, Grade 36.

All fasteners shall be 7/8" Φ high strength bolts, ASTM F3125, with a minimum tensile strength of 120 ksi.

Nuts, bolts, and washers used in the assembly of weathering steel shall be Type 3.

During girder fabrication, the flanges at the splice must line up within 1/8" of parallel to the adjacent flanges without applying external force, before the splice is drilled.

Field splices shall be clean and free of all foreign matter before field assembly. The plates shall be in full contact when the bolts are tightened to a snug-tight condition.

When assembling the girders, they shall be set according to the blocking diagram before any bolts are tightened to a snug-tight condition.

The girders for this bridge are not designed to resist any torsional or lateral forces due to temporary construction loads. The Contractor must provide any temporary bracing necessary to support the girder web and flanges against all torsional or lateral forces resulting from construction loads.

Field tack welding of form hangers or miscellaneous hardware to any part of the steel girder, with the exception of the shear connectors, shall be prohibited.

All bearing stiffeners and girder ends, except at field splices, shall be vertical after final erection. All other stiffeners and all field splices shall be normal to the top flange.

The Pay Item, "STRUCTURAL STEEL FOR SUBSTRUCTURE", shall include the nose angles at the piers.

After fabrication, nose angles at the piers shall be galvanized according to ASTM A123/A123M.

Concrete for slab, approach slabs, 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 reinforcing steel shall be epoxy coated and 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 3", except where otherwise noted.

Girder shims that will be provided to the Contractor account for the dead load deflection due to weight of the slab, rail or barrier, and median (if present) only. The Contractor is responsible for making the necessary adjustments for the particular forming system used to achieve the slab grades and elevations shown on the plans.

The shim shots may be taken before or after the turndowns are poured.

All plastic pipe, galvanized wire screen, and miscellaneous drainage items at the abutments shall be considered subsidiary to the Pay Item "SUBSURFACE DRAINAGE MATTING".

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

The Pay Item, "EARTHWORK MEASURED IN EMBANKMENT", shall include the channel excavation/fill through the bridge as shown on the plans.

Any excavation required for Broken Concrete Riprap or Rock Riprap, Type "B" shall be subsidiary to the Pay Item, "BROKEN CONCRETE RIPRAP" or "ROCK RIPRAP, TYPE "B"" respectively.

Where the entire slab is not expected to be placed in one day, the Contractor may submit an alternate proposed slab pouring sequence to the Bridge Division at the preconstruction conference so that the new shims may be calculated.

- QUANTITIES -

GROUP 6

EARTHWORK MEASURED IN EMBANKMENT		3,920 CY
ABUTMENT NO. 1 EXCAVATION		1 LS
BENT NO. 1 EXCAVATION		1 LS
BENT NO. 2 EXCAVATION		1 LS
ABUTMENT NO. 2 EXCAVATION		1 LS
◕ STEEL SUPERSTRUCTURE INSTALLATION		1 LS
◕ EXPANSION BEARING, PTFE TYPE, INSTALLATION		1 LS
◕ FIXED BEARING INSTALLATION		1 LS
CLASS 47B-3000 CONCRETE FOR BRIDGE		203.7 CY
ABUTMENTS	104.8 CY	
BENTS	98.9 CY	
CLASS 47BD-4000 CONCRETE FOR BRIDGE		308.2 CY
SLAB	261.2 CY	
CONCRETE RAILS	42.2 CY	
HAUNCHES	4.8 CY	
EPOXY COATED REINFORCING STEEL		82,820 LB
ABUTMENTS	11,650 LB	
BENTS	7,800 LB	
SLAB	54,490 LB	
CONCRETE RAILS	8,880 LB	
STRUCTURAL STEEL FOR SUBSTRUCTURE		610 LB
STEEL SHEET PILING		3,458 SF
HP 12 INCH x 53 LB STEEL PILING		5,980 LF
GRANULAR BACKFILL		305 CY
SUBSURFACE DRAINAGE MATTING		78 SY
◪ BROKEN CONCRETE RIPRAP		170 TON
◪ ROCK RIPRAP, TYPE B		1,095 TON
RIPRAP FILTER FABRIC		1,690 SY
CONCRETE FOR PAVEMENT APPROACHES CLASS 47BD-4000		194.6 CY
SLABS	182.2 CY	
CONCRETE RAILS	12.4 CY	
EPOXY COATED REINFORCING STEEL FOR PAVEMENT APPROACHES		36,415 LB
SLABS	32,005 LB	
CONCRETE RAILS	4,410 LB	
PREFORMED EXPANSION JOINT, TYPE A		89.3 LF
BRIDGE JOINT NOSING		13.3 CF
ACCESS CROSSING AT STATION 449+05.00 LT.		1 LS
BRIDGE DECK GROOVING		1,245 SY
SALVAGING AND PLACING TOPSOIL ON RIPRAP		985 SY

- NOTES, CONT. -

Unless noted as "Optional" all construction joints shown are mandatory.

7/8" Φ x 0'-5" end welded studs have an in-place weight of 98.0 lb. /100 studs.

Steel (weight) quantities are based upon 490 pcf and 1 lb. per bolt.

All rolled beams and splice plates shall be considered main tension members for the purpose of charpy-V-Notch tests.

All rolled beams shall be placed with mill camber upwards.

◪ Broken Concrete Riprap quantity is calculated based on existing bridge plans. Quantity available does not include the asphalt covered bridge deck. Bituminous material shall not be used as broken concrete riprap. Broken Concrete Riprap from other sources will be acceptable. All Broken Concrete Riprap shall conform to the requirements of Section 906 of the 2017 NDOT Standard Specifications.

- INDEX -

◕ FOR INFORMATION ONLY

STEEL SUPERSTRUCTURE AT STATION 449+05.00		1 LS
GIRDERS	333,240 LB	
SEPARATORS & MISC.	16,070 LB	
SHEAR CONNECTORS	3,705 LB	
BOLTS	1,895 LB	
TOTAL	354,910 LB	
EXPANSION BEARING, PTFE TYPE		12 EA
FIXED BEARING		12 EA

Steel Superstructure, Expansion Bearings, and Fixed Bearings to be furnished by NDOT. Shop drawings are available from the NDOT Bridge Division upon request. The CONTRACTOR shall coordinate delivery of Superstructure and Bearings with CAPITAL CONTRACTORS, INC. Contact CHUCK SIDLES or DAVID CRIST at (402) 476-1021

Shop plans required for review:
Substructure Steel (Nose Armor Angles/Etc.)
Steel Sheet Piling

Shop plans for record:
Stay-In-Place Forms

PROJECT NUMBER	SHEET NO.
39-3(106)	S1

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
GENERAL NOTES, QUANTITIES, & INDEX

LOUP RIVER OVERFLOW SOUTH OF N-22

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY JJS
DESIGNED BY JJS
DATE APRIL 2019
DRAWN BY SWA

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
5/2/19

SPECIAL PLAN NO.	1 / 21
1	

BRIDGE DIVISION.

Computer: SIRE

Date: 02-MAY-2019 13:31

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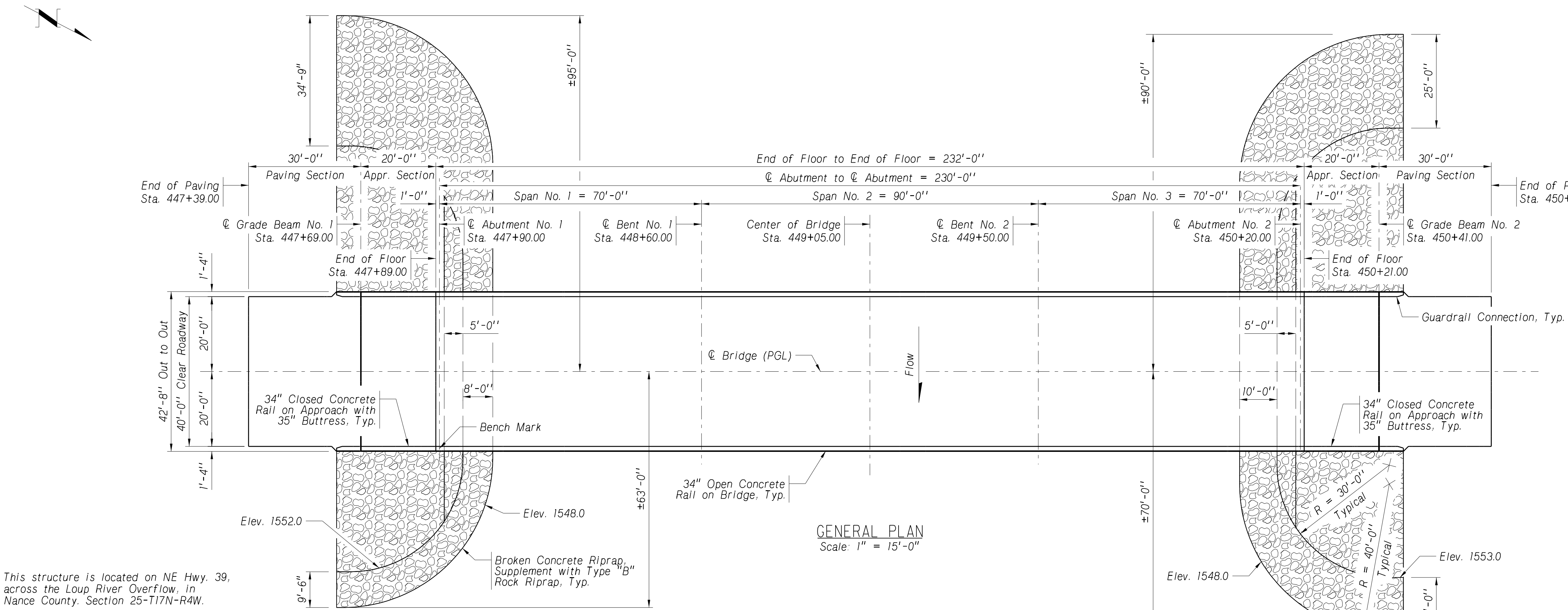
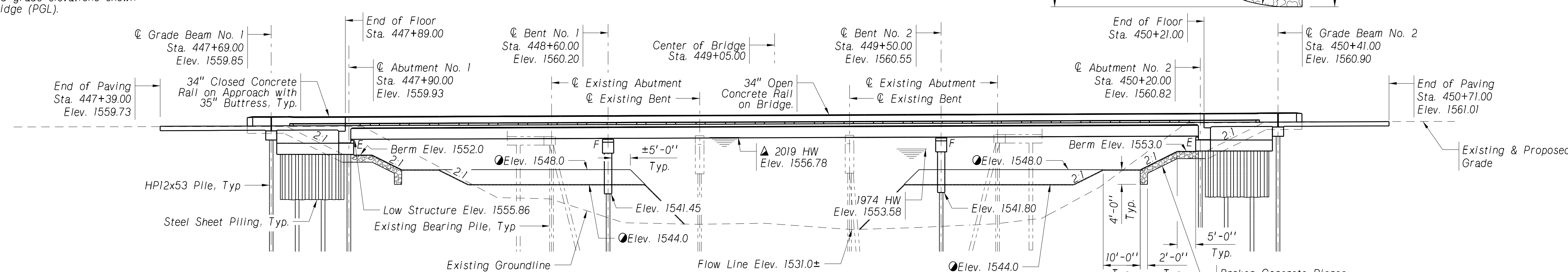


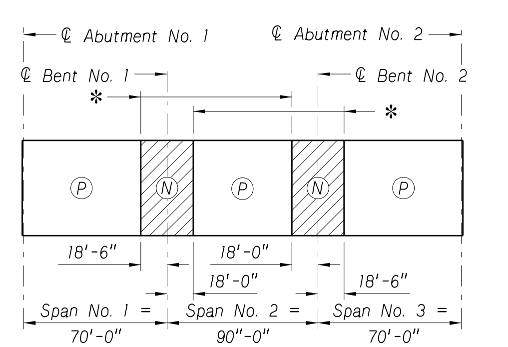
GENERAL PLAN
Scale: 1" = 15'-0"

This structure is located on NE Hwy. 39, across the Loup River Overflow, in Nance County. Section 25-T17N-R4W.

The stations and grade elevations shown are along © Bridge (PGL).



SECTIONAL ELEVATION
Scale: 1" = 15'-0"

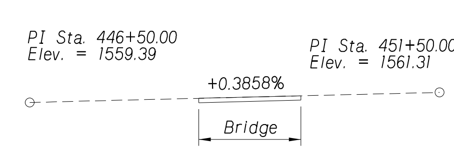


* Optional Construction Joints (Pour in direction of arrows)

POURING DIAGRAM
Not to Scale

POURING SEQUENCE:
The entire slab shall be poured starting at either end and proceeding to the other end, stopping at the completion of any "P" section.

(P)=Positive moment section
(N)=Negative moment section



VERTICAL CURVE INFORMATION
Profile Grade Line (PGL)
Not to Scale

NOTES:

◐ Bench at elevation 1548.0 is proposed for construction purposes. After construction, bench shall be excavated to final bench elevation at 1544.0 as detailed. All cost for material, labor, and equipment shall be included in the pay item "Earthwork Measured in Embankment".

Excavate for new riprap at both abutments upstream and downstream as shown in the plan and elevation view. Wrap grading around toe of roadway slope.

At Abutments, construct berm 5'-0" from face of Abutment at elevation 1552.0 (Abutment No. 1) or 1553.0 (Abutment No. 2), then down to elevation 1548.0 on a 2:1 slope. Bench for 10'-0" at elevation 1548.0, then down to elevation 1544.0 on a 2:1 slope. Bench at elevation 1544.0 to approximately 5'-0" inside Bents. Place 2'-0" thick Broken Concrete Riprap, supplemented with 2'-0" thick Type "B" Rock Riprap, embedded as detailed. Key in riprap at the toe as shown, wrap "key" around entire 40'-0" radius. Place filter fabric under all riprap. Place 6" of topsoil on all riprap that is more than 5'-0" outside the the bridge deck.

All grading and riprap shall be within Right-of-Way.

▲ 2019 flooding event elevation with original structure in place.

C.N. 42895
STRUCTURE NUMBER S039 01792

PROFESSIONAL CIVIL ENGINEER MARK J. TRAYNOWICZ E-8119 STATE OF NEBRASKA

BRIDGE ENGINEER

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00
LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
GENERAL PLAN & SECTIONAL ELEVATION
DESIGNED BY JJS
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019

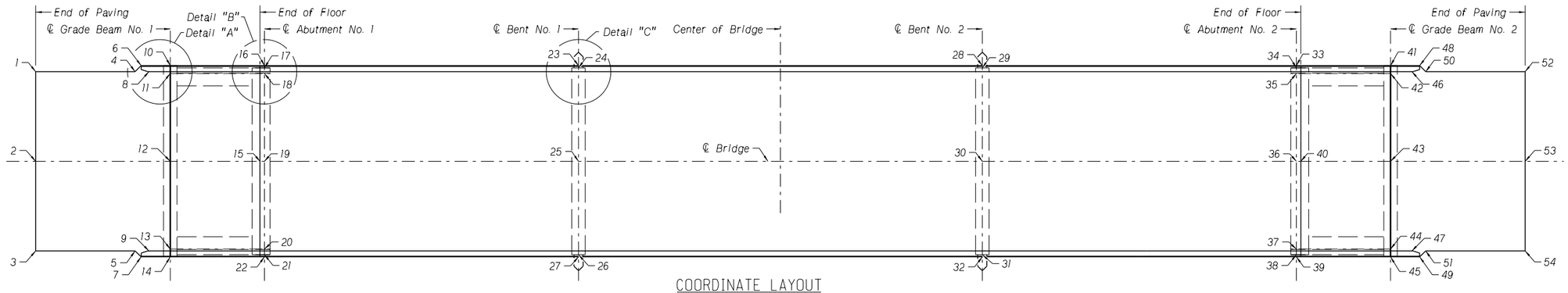
NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA Good Life. Great Journey. DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER JESSE J. SIRE E-14496 STATE OF NEBRASKA 4/16/19

SPECIAL PLAN NO. 1 2/21

BRIDGE DIVISION.



COORDINATE LAYOUT

Scale: 1" = 12'-0"

COORDINATES, STATIONING & OFFSETS

POINT	STATION	OFFSET	SIDE	X COORDINATE	Y COORDINATE
1	447+39.00	20.00	LT	2266168.06	584371.26
2	447+39.00	0.00		2266185.82	584380.46
3	447+39.00	20.00	RT	2266203.58	584389.66
4	447+61.17	20.00	LT	2266157.86	584390.94
5	447+61.17	20.00	RT	2266193.38	584409.35
6	447+62.50	21.33	LT	2266156.07	584391.51
7	447+62.50	21.33	RT	2266193.95	584411.14
8	447+64.25	20.00	LT	2266156.44	584393.68
9	447+64.25	20.00	RT	2266191.96	584412.08
10	447+69.00	21.33	LT	2266153.07	584397.28
11	447+69.00	19.58	LT	2266154.63	584398.09
12	447+69.00	0.00		2266172.02	584407.10
13	447+69.00	19.58	RT	2266189.40	584416.11
14	447+69.00	21.33	RT	2266190.96	584416.91
15	447+89.00	0.00		2266162.81	584424.86
16	447+90.00	21.33	LT	2266143.41	584415.93
17	447+90.00	20.83	LT	2266143.86	584416.16
18	447+90.00	19.58	LT	2266144.97	584416.73
19	447+90.00	0.00		2266162.35	584425.74
20	447+90.00	19.58	RT	2266179.74	584434.75
21	447+90.00	20.83	RT	2266180.85	584435.33
22	447+90.00	21.33	RT	2266181.29	584435.56
23	448+60.00	21.33	LT	2266111.20	584478.08
24	448+60.00	20.83	LT	2266111.65	584478.31
25	448+60.00	0.00		2266130.15	584487.89
26	448+60.00	20.83	RT	2266148.64	584497.48
27	448+60.00	21.33	RT	2266149.09	584497.71
28	449+50.00	21.33	LT	2266069.80	584557.99
29	449+50.00	20.83	LT	2266070.24	584558.22
30	449+50.00	0.00		2266088.74	584567.80
31	449+50.00	20.83	RT	2266107.23	584577.39
32	449+50.00	21.33	RT	2266107.68	584577.62
33	450+20.00	21.33	LT	2266037.59	584620.14
34	450+20.00	20.83	LT	2266038.03	584620.37
35	450+20.00	19.58	LT	2266039.14	584620.94
36	450+20.00	0.00		2266056.53	584629.95
37	450+20.00	19.58	RT	2266073.92	584638.96
38	450+20.00	20.83	RT	2266075.03	584639.54
39	450+20.00	21.33	RT	2266075.47	584639.77
40	450+21.00	0.00		2266056.07	584630.84
41	450+41.00	21.33	LT	2266027.93	584638.78
42	450+41.00	19.58	LT	2266029.48	584639.59
43	450+41.00	0.00		2266046.87	584648.60
44	450+41.00	19.58	RT	2266064.25	584657.61
45	450+41.00	21.33	RT	2266065.81	584658.41
46	450+45.75	20.00	LT	2266026.92	584643.61
47	450+45.75	20.00	RT	2266062.44	584662.02
48	450+47.50	21.33	LT	2266024.94	584644.55
49	450+47.50	21.33	RT	2266062.82	584664.18
50	450+48.83	20.00	LT	2266025.51	584646.35
51	450+48.83	20.00	RT	2266061.02	584664.75
52	450+71.00	20.00	LT	2266015.31	584666.03
53	450+71.00	0.00		2266033.06	584675.23
54	450+71.00	20.00	RT	2266050.82	584684.44

DATUM INFORMATION

HORIZONTAL	VERTICAL
NAD 83 (1995)	NAVD 88

D.A.F. = 1.0004094

ROADWAY CONTROL POINTS

STATION	OFFSET	X COORDINATE	Y COORDINATE
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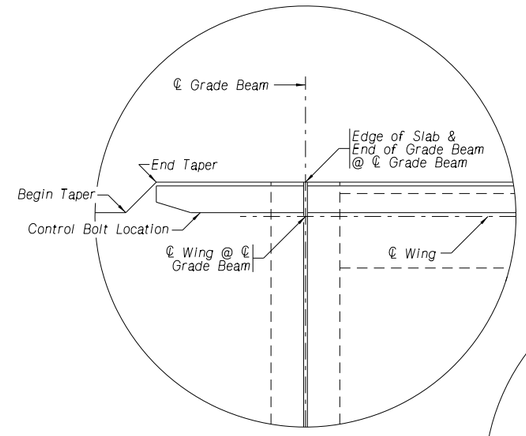
455+00.00	On ℄	2265835.6796	585056.1279



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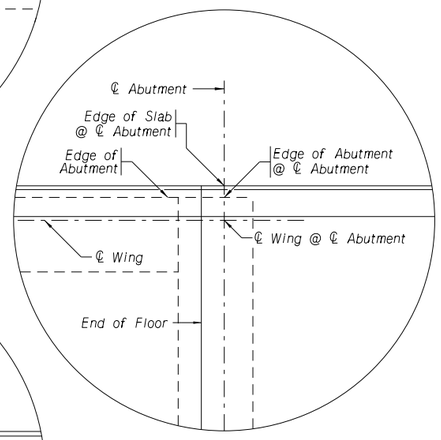

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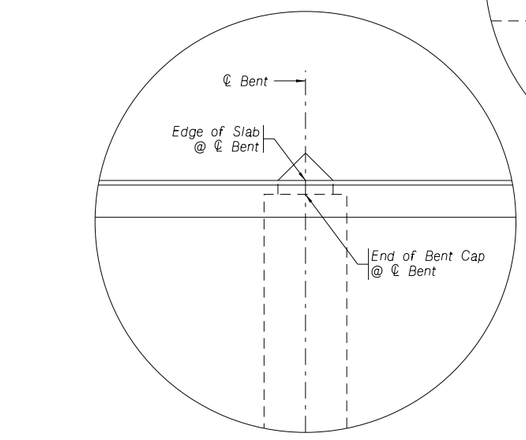

DETAIL "C"
Not to Scale

PROJECT NUMBER	SHEET NO.
39-3(106)	S3

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
COORDINATE LAYOUT & DATA

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019

COUNTY NANCE
HWY. NO. N-39
REF. POST 17.92
STA. 449+05.00
DESIGNED BY JJS

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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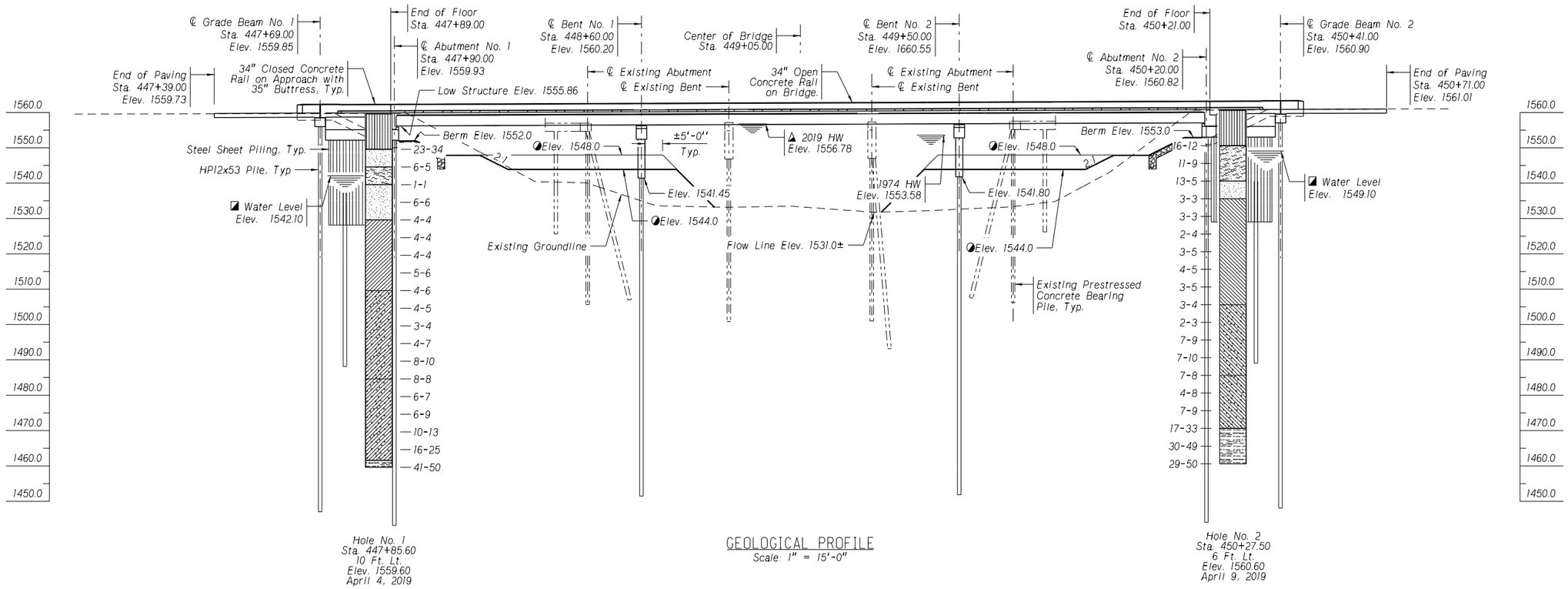
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
04/16/19

SPECIAL PLAN NO.	3
1	21

File: S039 01792_Steel Bridge Plan Sheets Date: 16-APR-2019 07:22 Computer: SIRE



GEOLOGICAL PROFILE

Scale: 1" = 15'-0"

SAND

CLAY

SHALE

SILT

FILL

TILL

NOTES:

Figures beside the column of borings indicate the number of blows required to drive a standard penetrometer, of 2" O.D., the second and third 6 inches using a 140 lb. weight falling 30 inches, in accordance with A.S.T.M. D1586 procedures.

The borings, as logged on the plans, represent the character of the subsoil at the location indicated. No guarantee is made that the subsoil conditions vary uniformly between or outside the given location.

◑ Bench at elevation 1548.0 is proposed for construction purposes. After construction, bench shall be excavated to final bench elevation at 1544.0 as detailed. See sheet 2 of 21 for more details and notes.

◭ 2019 flooding event elevation with original structure in place

◪ Immediately after drilling

PROJECT NUMBER	SHEET NO.
39-3(106)	S4

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE

GEOLOGICAL PROFILE

DATE APRIL 2019

CHECKED BY SWA

DETAILED BY JJS

DESIGNED BY JJS

LOCATION LOUP RIVER OVERFLOW
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
4/16/19
STATE OF NEBRASKA

SPECIAL PLAN NO.	
1	4 / 21

BRIDGE DIVISION.

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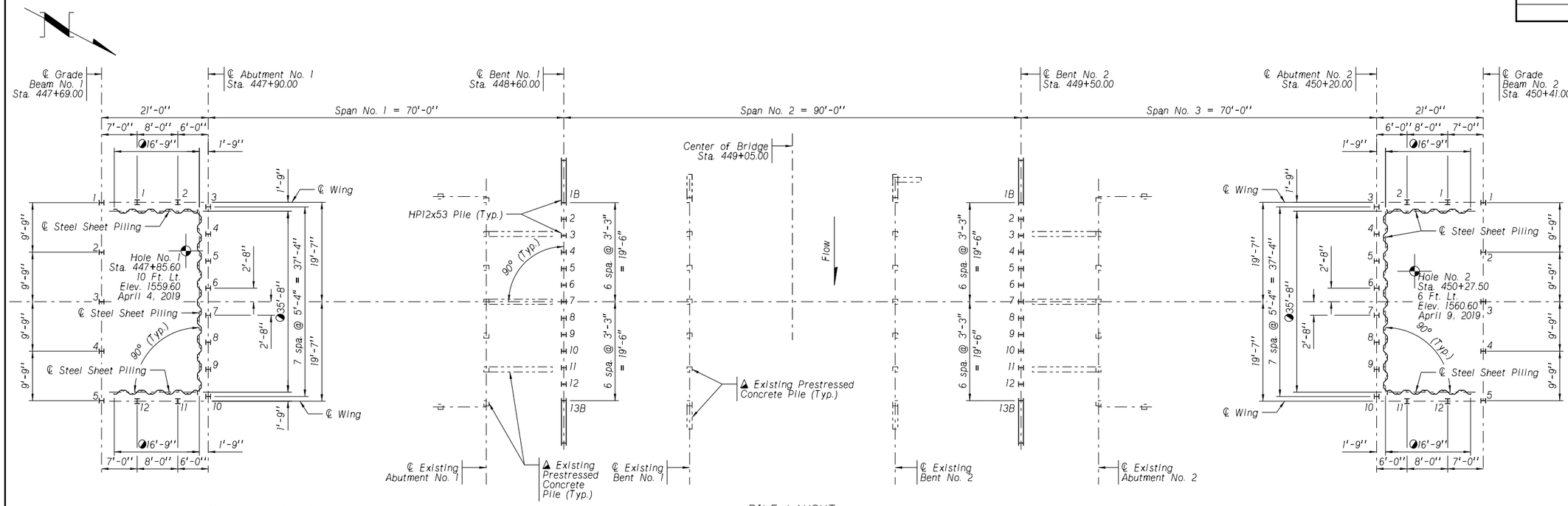
BRIDGE DIVISION.



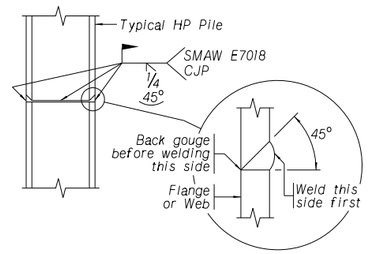
PILE LAYOUT
Scale: 1" = 10'-0"

◗ Steel Sheet Pile Dimensions

▲ Pull all existing prestressed concrete pile. If pile can not be pulled, break down below water surface elevation as deep as practical. At a minimum existing pile shall be removed down to elevation 1542.0 ft.

PILE DATA

LOCATION	PILE NUMBER	CUT-OFF ELEVATION	MINIMUM PENETRATION BELOW CUT-OFF (feet)	PILE ORDER LENGTH (feet)	DESIGN PILE BEARING (kips/pile)	PILE TYPE
GRADE BEAM NO. 1	1-5	1557.05	100	110	145	HP12x53
ABUTMENT NO. 1	1,2,11,12	1553.15	55	65	50	
	3-10	1553.15	100	110	160	
BENT NO. 1	1B,2-12,13B	1551.45	90	100	180	
BENT NO. 2	1B,2-12,13B	1551.80	90	100	180	
ABUTMENT NO. 2	1,2,11,12	1554.05	55	65	50	
	3-10	1554.05	100	110	160	
GRADE BEAM NO. 2	1-5	1558.10	100	110	145	



STANDARD PILE SPLICE
Not to Scale

NOTES:

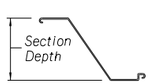
All pile spacing is given at the bottom of concrete.

Bent piling followed by the letter "B" shall be battered at 1½ : 12.

Bents are designed for scour to elevation 1526.0 ft.

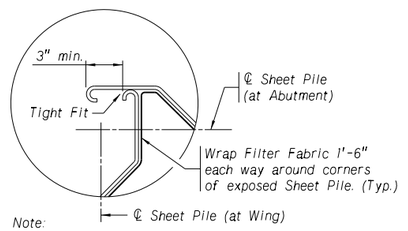
As a minimum, all steel sheet piling shall conform to ASTM A328/A328M steel and shall meet the following requirements:

Section Length	25 ft.
Maximum Section Depth	13 in.
Minimum Section Thickness	0.3125 in.
Elastic Section Modulus	19.3 in^3/ft



The Contractor shall submit for approval a shop plan of the sheet pile layout showing all pertinent dimensions, details, and section properties.

The pay quantity will be based on the sheet pile wall dimensions shown. The constructed wall length will be within ± 2'-0" of the sheet pile wall dimensions shown.



Note:
Corner Filter Fabric shall be Subsidiary to the pay item "STEEL SHEET PILING".

SHEET PILE CORNER DETAIL (TYP.)
Not to Scale

PROJECT NUMBER	SHEET NO.
39-3(106)	S5

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
PILE LAYOUT & DATA

LOCATION LOUP RIVER OVERFLOW
SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019
DESIGNED BY JJS
COUNTY NANCE
HWY. NO. N-39
REF. POST 17.92
STA. 449+05.00

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO. 1

5/21

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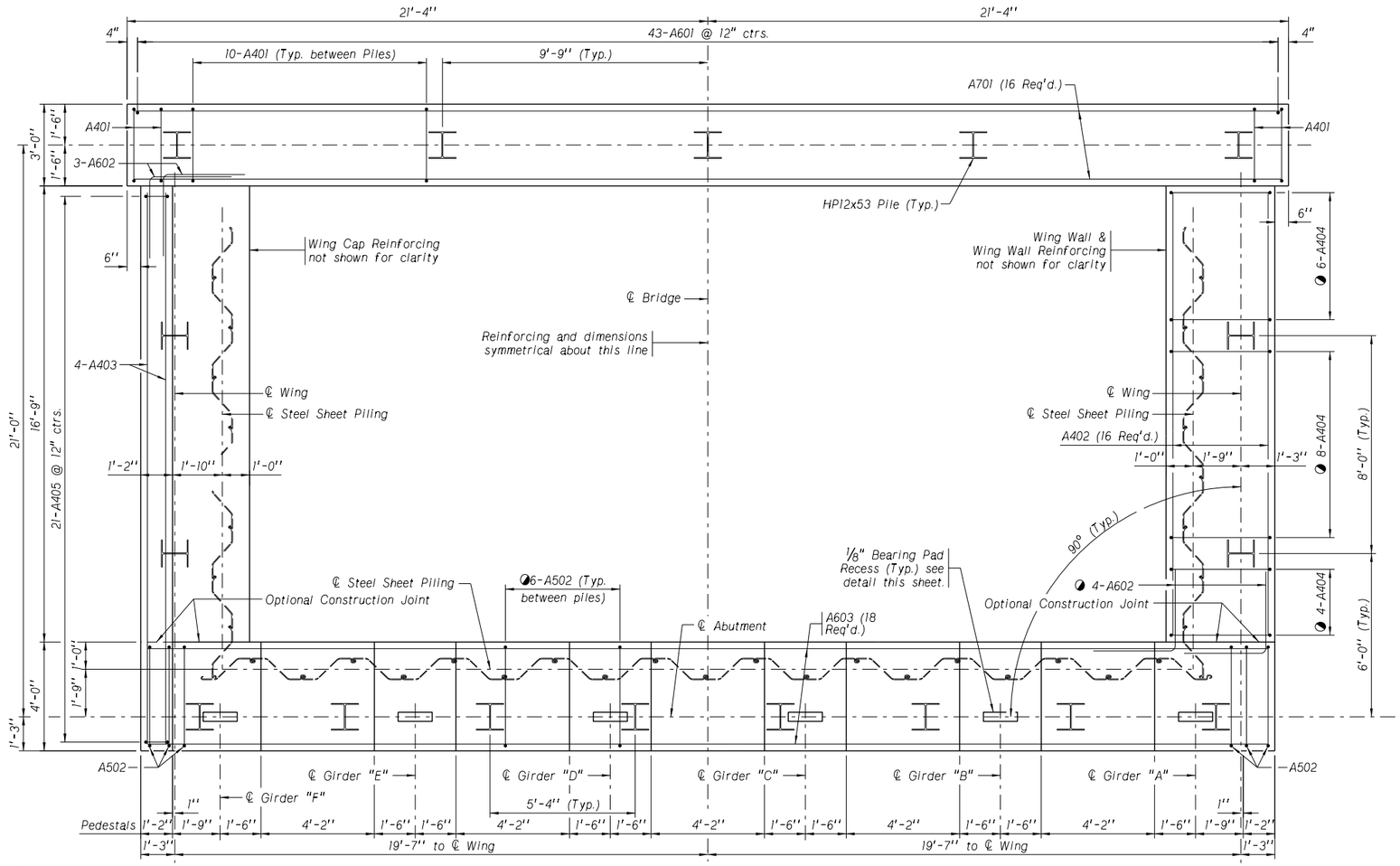
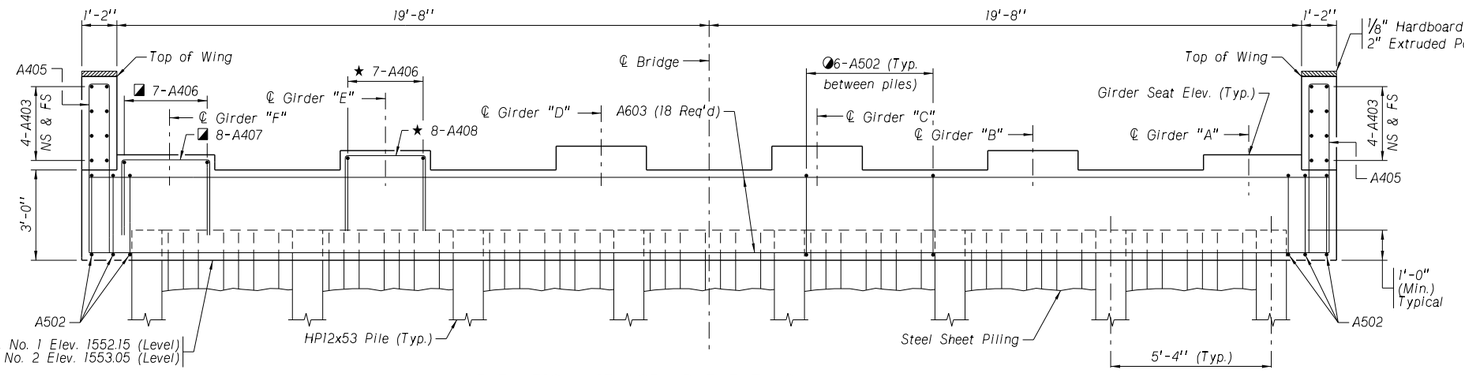
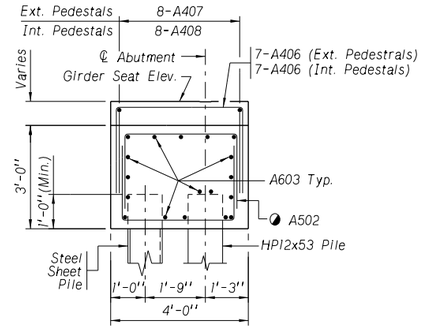


PLAN VIEW OF ABUTMENT NO. 1
(Abutment No. 2 is similar, but opposite-hand)
Not to Scale

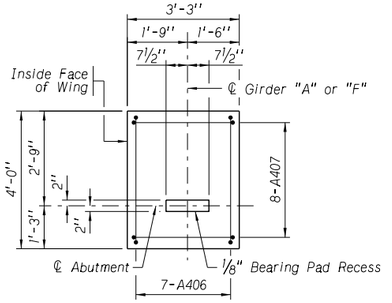
◑ Field burn 1½"Ø hole through steel sheet piling as needed.
◪ Typical at exterior girder seats.
★ Typical at interior girder seats.
NS = Near Side
FS = Far Side



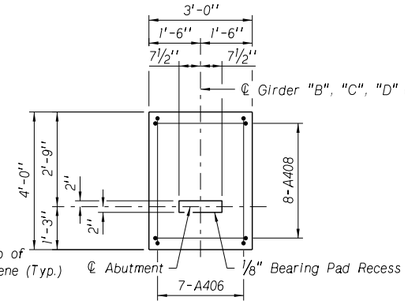
ELEVATION VIEW OF ABUTMENT NO. 1
(Abutment No. 2 is similar, but opposite-hand)
Not to Scale



SECTION OF ABUTMENT
Not to Scale



PLAN OF EXTERIOR PEDESTAL
(Depending on location, Detail may be opposite-hand)
Not to Scale



PLAN OF INTERIOR PEDESTAL
Not to Scale

NOTE: 2" minimum reinforcing clearance on all pedestals.

GIRDER SEAT ELEVATIONS		
LOCATION	ABUTMENT NO. 1 ELEVATION	ABUTMENT NO. 2 ELEVATION
Girder "A"	1555.65	1556.54
Girder "B"	1555.79	1556.68
Girder "C"	1555.94	1556.82
Girder "D"	1555.94	1556.82
Girder "E"	1555.79	1556.68
Girder "F"	1555.65	1556.54

PROJECT NUMBER	SHEET NO.
39-3(106)	S6

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
ABUTMENT DETAILS

LOCATION LOUP RIVER OVERFLOW
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019

COUNTY NANCE
HWY. NO. N-39
REF. POST 17.92
STA. 449+05.00
DESIGNED BY JJS

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO. 1

6 / 21

BRIDGE DIVISION.

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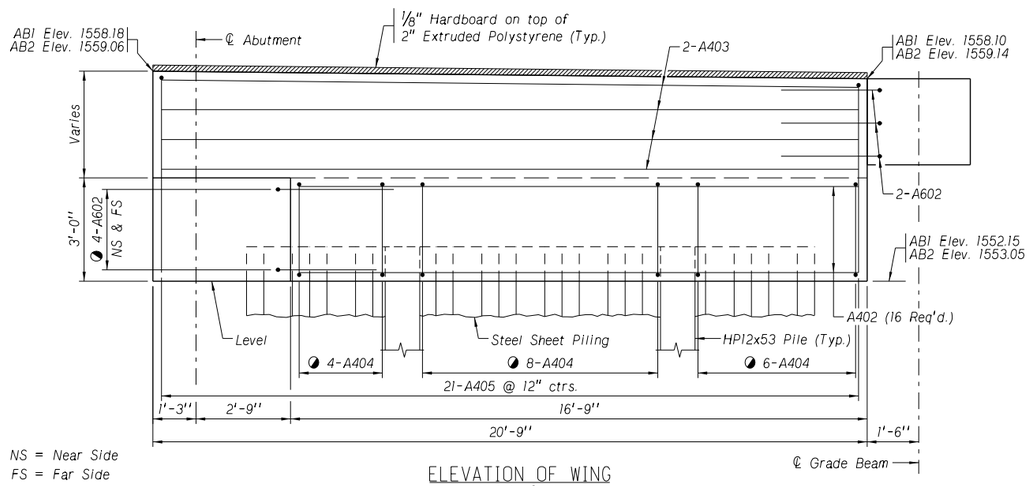
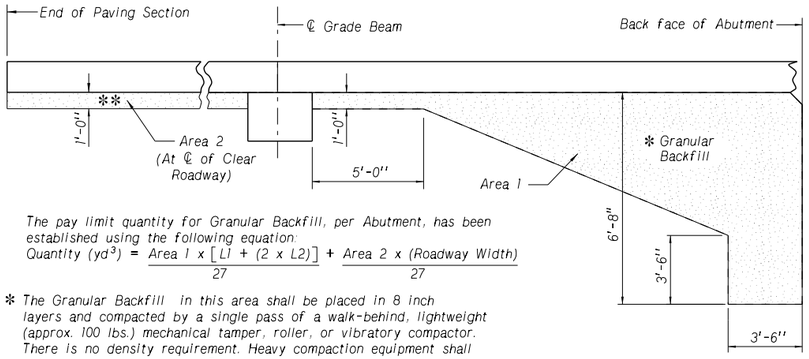


NS = Near Side
FS = Far Side
ABI = Abutment No. 1
AB2 = Abutment No. 2
◑ Field burn 1½"Ø hole through steel sheet piling as needed.

ELEVATION OF WING
Not to Scale



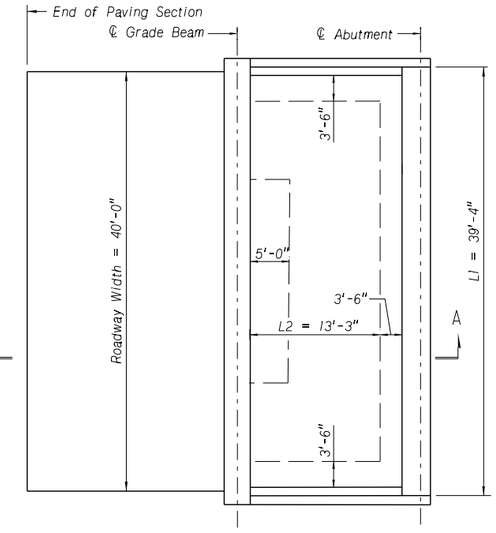
The pay limit quantity for Granular Backfill, per Abutment, has been established using the following equation:

$$\text{Quantity } (yd^3) = \frac{\text{Area 1} \times [LI + (2 \times L2)]}{27} + \frac{\text{Area 2} \times (\text{Roadway Width})}{27}$$

* *The Granular Backfill in this area shall be placed in 8 inch layers and compacted by a single pass of a walk-behind, lightweight (approx. 100 lbs.) mechanical tamper, roller, or vibratory compactor. There is no density requirement. Heavy compaction equipment shall not be used in this area. Flooding the granular backfill with water is not allowed.*

** *The Granular Backfill in this area shall be compacted in accordance with the Standard Specifications.*

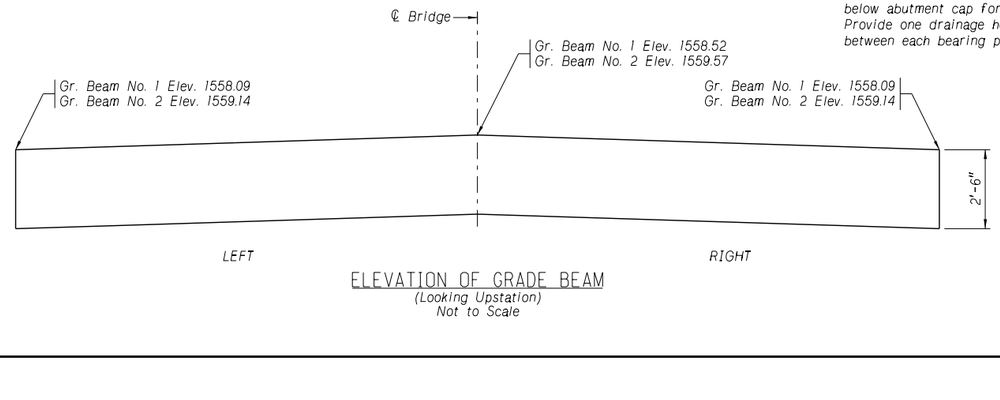
SECTION A-A
Not to Scale



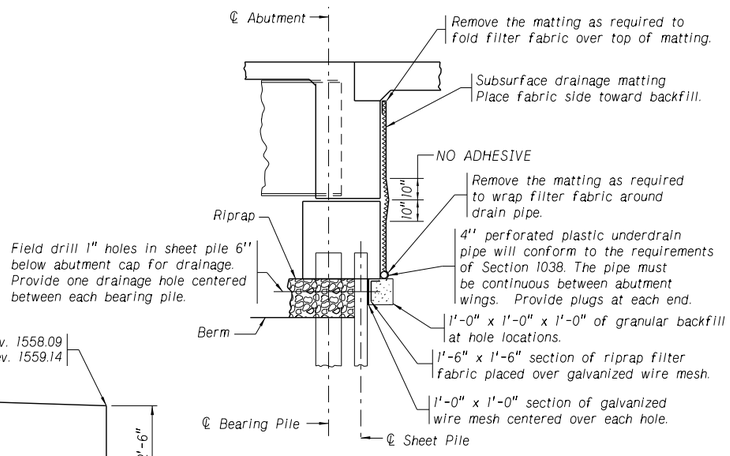
PLAN OF GRANULAR BACKFILL
Not to Scale

SECTION OF WING
Not to Scale

SECTION OF GRADE BEAM
Not to Scale



ELEVATION OF GRADE BEAM
(Looking Upstation)
Not to Scale



DRAINAGE DETAIL
Not to Scale

Note:
Extend drainage matting 3'-0" along the wings.

PROJECT NUMBER	SHEET NO.
39-3(106)	S7

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
WING, GRADE BEAM, & DRAINAGE DETAILS

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY JJS
DESIGNED BY JJS
STA. 449+05.00
REF. POST. 17.92
HWY. NO. N-39
COUNTY NANCE

DRAWN BY SWA
DATE APRIL 2019

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PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO.	7
1	21

BILL OF BARS

ABUTMENT NO. 1

MARK	NO.	LENGTH	TYPE	"A"	"B"	"C"	"D"	"E"	"F"	PIN	HOOK	WEIGHT LB
A701	16	42'-2"	STR									1379
A601	43	3'-0"	105	1'-6"	1'-6"	1'-1"				4½"		194
A602	28	6'-0"	104	3'-0"	3'-0"					4½"		252
A603	18	41'-2"	STR									1113
A502	48	17'-0"	108	2'-6"	3'-6"	2'-6"	2'-6"			2½"		851
A401	44	9'-9"	107	2'-0"	2'-6"					2"	4½"	287
A402	32	16'-3"	STR									347
A403	16	20'-3"	STR									216
A404	36	17'-0"	108	2'-6"	3'-6"	2'-6"	2'-6"			2"		409
A405	42	10'-2"	103	4'-9"	8"	4'-9"				2"		285
A406	42	8'-8"	103	2'-6"	3'-8"	2'-6"				2"		243
A407	16	7'-11"	103	2'-6"	2'-11"	2'-6"				2"		85
A408	32	7'-8"	103	2'-6"	2'-8"	2'-6"				2"		164
										SUBTOTAL =		5825

ABUTMENT NO. 2

MARK	NO.	LENGTH	TYPE	"A"	"B"	"C"	"D"	"E"	"F"	PIN	HOOK	WEIGHT LB
A701	16	42'-2"	STR									1379
A601	43	3'-0"	105	1'-6"	1'-6"	1'-1"				4½"		194
A602	28	6'-0"	104	3'-0"	3'-0"					4½"		252
A603	18	41'-2"	STR									1113
A502	48	17'-0"	108	2'-6"	3'-6"	2'-6"	2'-6"			2½"		851
A401	44	9'-9"	107	2'-0"	2'-6"					2"	4½"	287
A402	32	16'-3"	STR									347
A403	16	20'-3"	STR									216
A404	36	17'-0"	108	2'-6"	3'-6"	2'-6"	2'-6"			2"		409
A405	42	10'-2"	103	4'-9"	8"	4'-9"				2"		285
A406	42	8'-8"	103	2'-6"	3'-8"	2'-6"				2"		243
A407	16	7'-11"	103	2'-6"	2'-11"	2'-6"				2"		85
A408	32	7'-8"	103	2'-6"	2'-8"	2'-6"				2"		164
										SUBTOTAL =		5825
										EPOXY COATED REINFORCING STEEL - ABUTMENTS TOTAL =		11650

NOTE:

FOR BENDING DIAGRAMS, HOOK LENGTHS & PIN DIAMETERS SEE SHEET 21 OF 21.

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 NDOT.

PROJECT NUMBER	SHEET NO.
39-3(106)	S8

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE

ABUTMENT BILL OF BARS

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93

DESIGNED BY JJS | DETAILED BY JJS | CHECKED BY SWA | DATE APRIL 2019

COUNTY NANCE
HWY. NO. N-39
REF. POST 17.92
STA. 449+05.00

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO.	
1	8 / 21

BRIDGE DIVISION.

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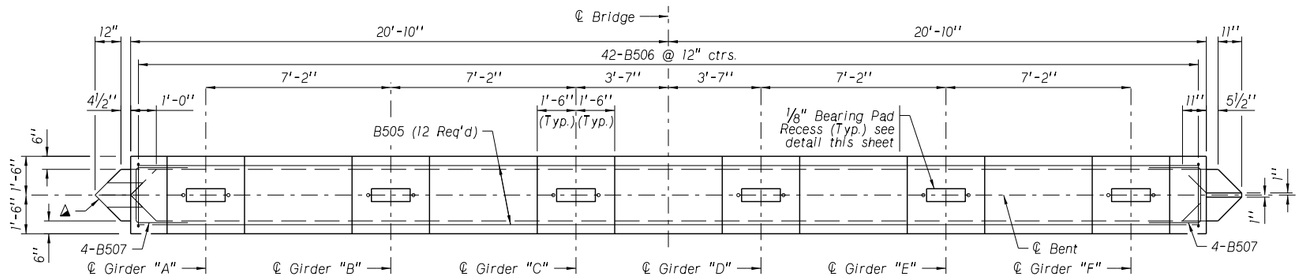
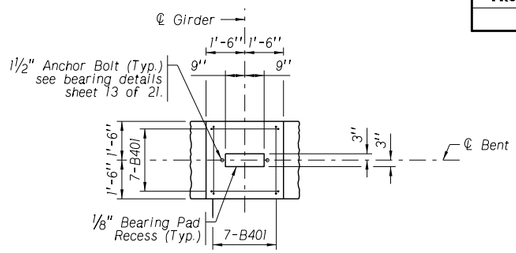


PLAN OF BENT CAP

Scale: ⅜" = 1'-0"

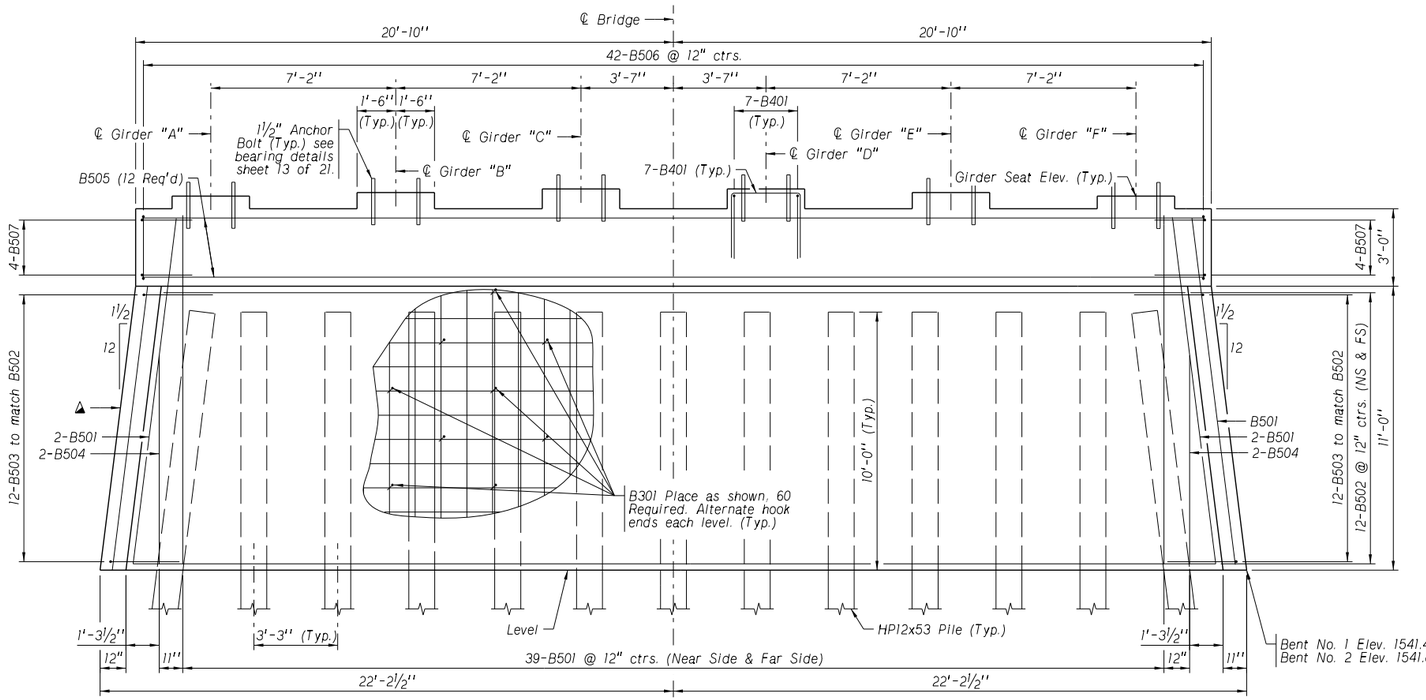
▲ L8x8x½ upstream side only. See sheet 10 of 21 for Details.



PLAN OF GIRDER SEAT

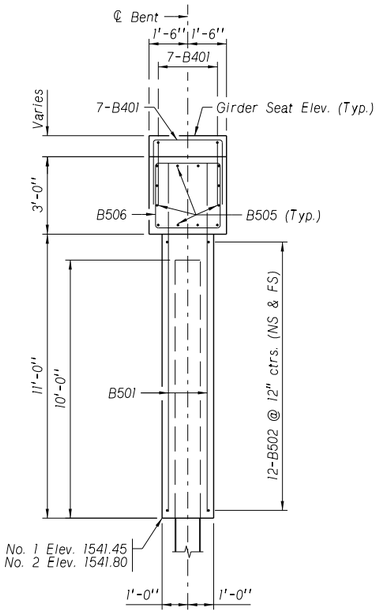
Scale: ⅜" = 1'-0"

NOTE: 2" minimum reinforcing clearance on all pedestals.



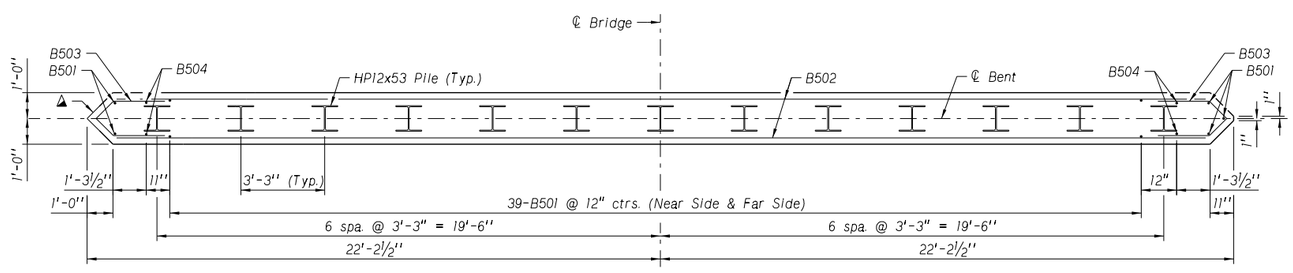
ELEVATION OF BENT

Scale: ⅜" = 1'-0"



SECTIONAL ELEVATION OF BENT

Scale: ⅜" = 1'-0"



SECTION AT BOTTOM OF BENT WALL

Scale: ⅜" = 1'-0"

GIRDER SEAT ELEVATIONS		
LOCATION	BENT NO. 1 ELEVATION	BENT NO. 2 ELEVATION
Girder "A"	1555.94	1556.28
Girder "B"	1556.08	1556.43
Girder "C"	1556.22	1556.57
Girder "D"	1556.22	1556.57
Girder "E"	1556.08	1556.43
Girder "F"	1555.94	1556.28

NOTES:

See Sheet 10 of 21 for Section at Top of Bent Wall

NS = Near Side
FS = Far Side

PROJECT NUMBER	SHEET NO.
39-3(106)	S9

C.N. 42895

STRUCTURE NUMBER S039 01792

PROFESSIONAL CIVIL ENGINEER — MARK J. TRAYNOWICZ E-8119 — STATE OF NEBRASKA

BRIDGE ENGINEER

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
BENT DETAILS

LOCATION LOUP RIVER OVERFLOW, SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00
DESIGNED BY JJS

NEBRASKA
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DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER — JESSE J. SIRE E-14496 — STATE OF NEBRASKA — 4/16/19

SPECIAL PLAN NO. 1

9 / 21

BRIDGE DIVISION.

Computer: SIRE

Date: 16-APR-2019 07:22

File: S039 01792_Steel Bridge Plan Sheets

BILL OF BARS

BENT NO. 1

MARK	NO.	LENGTH	TYPE	"A"	"B"	"C"	"D"	"E"	"F"	PIN	HOOK	WEIGHT LB
B501	83	13'-6"	STR									1169
B502	24	40'-7" AVG	STR									1016
B503	24	6'-2"	122	2'-0"	1'-1"	1'-1"	9"	9"		2½"		154
B504	4	8'-1"	STR									34
B505	12	41'-2"	STR									515
B506	42	10'-11"	107	2'-6"	2'-6"					2½"	5½"	478
B507	8	6'-5"	103	2'-0"	2'-5"	2'-0"				2½"		54
B401	84	7'-8"	103	2'-6"	2'-8"	2'-6"				2"		430
B301	60	2'-2"	113		1'-6"					1½"	4"	49
										SUBTOTAL =		3899

BENT NO. 2

MARK	NO.	LENGTH	TYPE	"A"	"B"	"C"	"D"	"E"	"F"	PIN	HOOK	WEIGHT LB
B501	83	13'-6"	STR									1169
B502	24	40'-7" AVG	STR									1016
B503	24	6'-2"	122	2'-0"	1'-1"	1'-1"	9"	9"		2½"		154
B504	4	8'-1"	STR									34
B505	12	41'-2"	STR									515
B506	42	10'-11"	107	2'-6"	2'-6"					2½"	5½"	478
B507	8	6'-5"	103	2'-0"	2'-5"	2'-0"				2½"		54
B401	84	7'-8"	103	2'-6"	2'-8"	2'-6"				2"		430
B301	60	2'-2"	113		1'-6"					1½"	4"	49
										SUBTOTAL =		3899
										EPOXY COATED REINFORCING STEEL - BENTS TOTAL =		7798

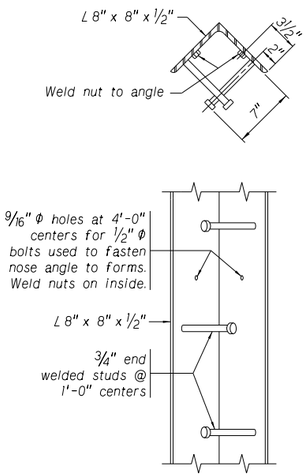
NOTE:

FOR BENDING DIAGRAMS, HOOK LENGTHS & PIN DIAMETERS SEE SHEET 21 OF 21.

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 NDOT.

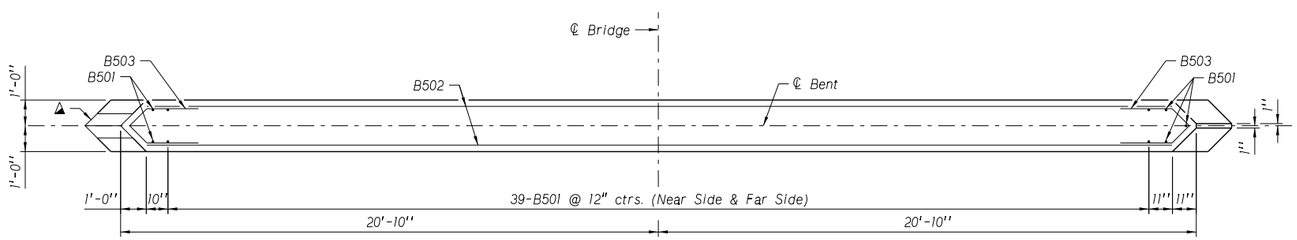
BAR SETS

MARK	MAX. LENGTH	MIN. LENGTH	NO. OF SETS	BARS PER SET
B502	41'-11"	39'-3"	4	12



NOSE ARMOR ANGLE DETAILS

Not to Scale



SECTION AT TOP OF BENT WALL

Scale: 3/8" = 1'-0"

▲ L8x8x½ upstream side only. See this sheet for Details.

PROJECT NUMBER	SHEET NO.
39-3(106)	S10

C.N. 42895

STRUCTURE NUMBER S039 01792

PROFESSIONAL CIVIL ENGINEER — MARK J. TRAYNOWICZ E-8119 — STATE OF NEBRASKA

BRIDGE ENGINEER

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
BENT BILL OF BARS & MISCELLANEOUS DETAILS

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS — CHECKED BY SWA — DATE APRIL 2019
DESIGNED BY JJS
COUNTY NANCE
HWY. NO. N-39
REF. POST 17.92
STA. 449+05.00

NEBRASKA Good Life. Great Journey. DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER — JESSE J. SIRE E-14496 — STATE OF NEBRASKA — 4/16/19

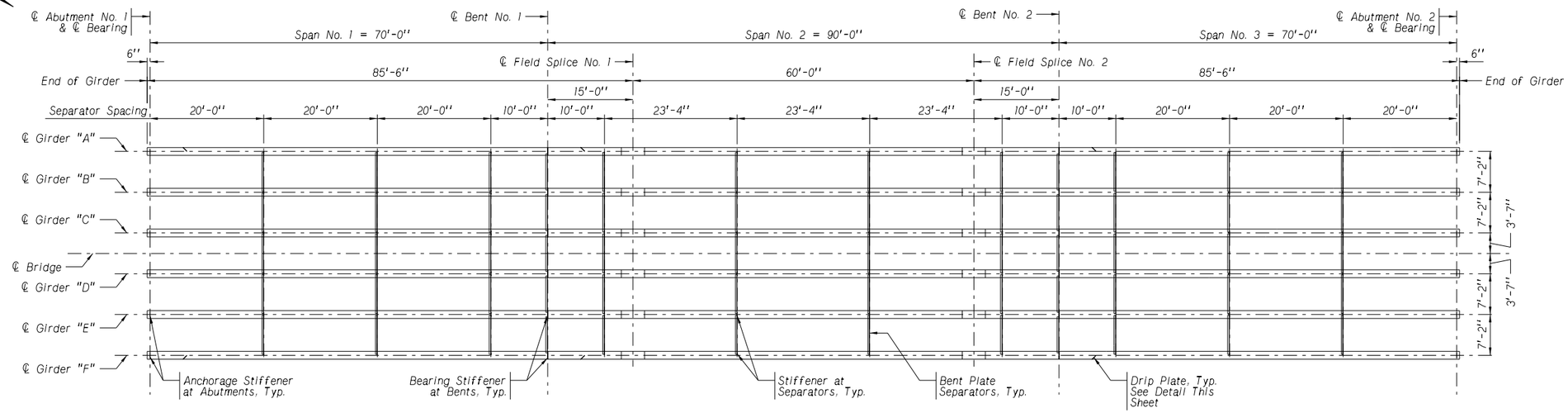
SPECIAL PLAN NO. 1 — 10/21

BRIDGE DIVISION.

Computer: SIRE

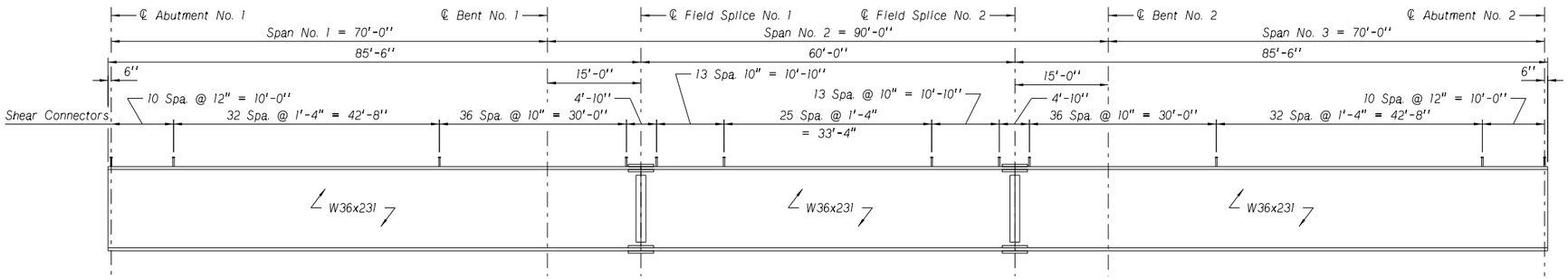
Date: 16-APR-2019 07:22

File: S039 01792_Steel Bridge Plan Sheets

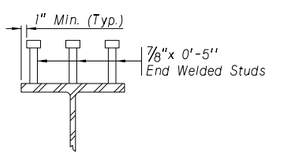


GIRDER LAYOUT
Scale: 1" = 10'-0"

NOTE: See sheet 13 of 21 for bent plate separator details.



GIRDER ELEVATION
Scale: 1" = 10'-0"



SHEAR CONNECTOR DETAIL
Not to Scale

When Shear Connectors (Studs) are field applied, the following notes shall apply:

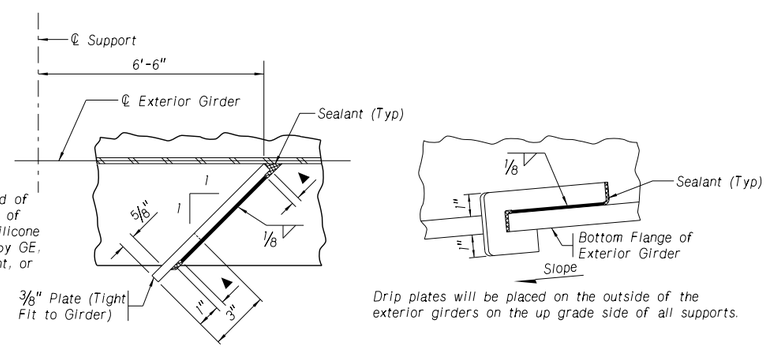
The Bridge Office shall be notified a minimum of one week prior to the application of the field welded studs.

Stud welding shall be accomplished in accordance with the AWS D1.5 Standard Specifications, Section 7.

All stud welding shall be done by a certified stud welder. At the time of stud welding, the studs and base metal shall be free from rust, rust pits, scale, oil, moisture, falling rain or snow, and any other foreign material. Areas must be wire brushed or cleaned by grinding before any welding can occur.

Any studs that do not exhibit a 360° collar must be repaired by a SMAW fillet weld (E8018-C3 Electrode) and the repair shall extend 3/8" beyond each end of the missing collar.

Mill Certification for the studs shall be submitted to the Engineer.



▲ Stop weld 1/2" from end of drip plate and from edge of girder. Fill with 100% silicone sealant as manufactured by GE, DAP, Dow Corning, DuPont, or Titebond as shown.

Drip plates will be placed on the outside of the exterior girders on the up grade side of all supports.

TYPICAL DRIP PLATE DETAILS FOR EXTERIOR GIRDERS
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 girders
All field splice plates

PROJECT NUMBER	SHEET NO.
39-3(106)	S11

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER ★ MARK J. TRAYNOWICZ E-8119 ★ STATE OF NEBRASKA

BRIDGE ENGINEER

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE

GIRDER LAYOUT, ELEVATION, & DETAILS

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00

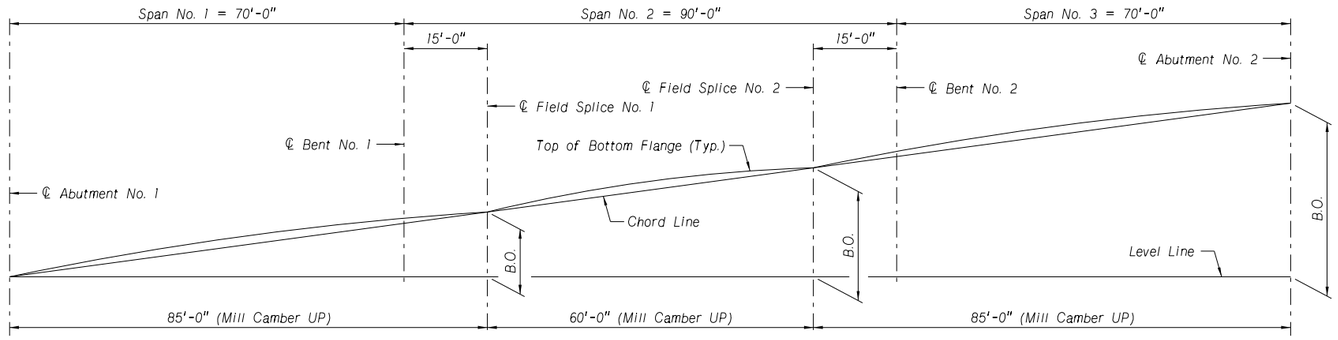
LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93

DESIGNED BY JJS
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

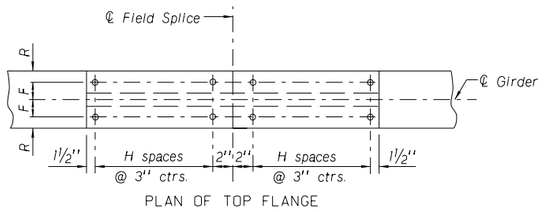
PROFESSIONAL CIVIL ENGINEER ★ JESSE J. SIRE E-14496 ★ STATE OF NEBRASKA
04/16/19

SPECIAL PLAN NO.	11 / 21
1	

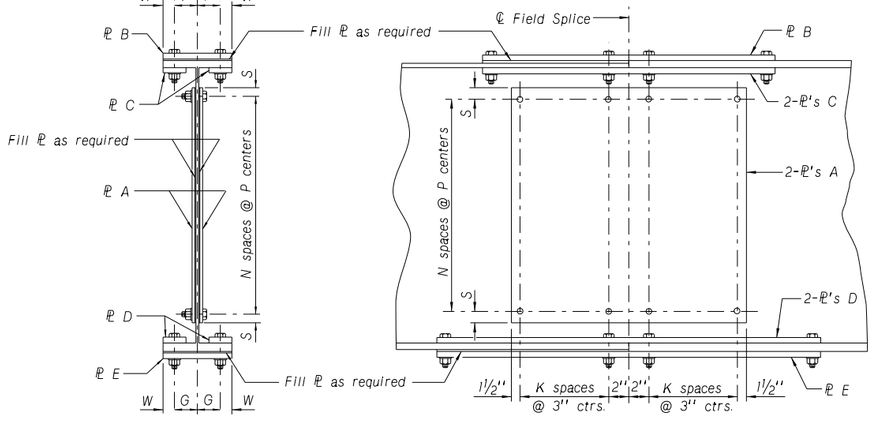


CAMBER & BLOCKING DIAGRAM

Not to Scale



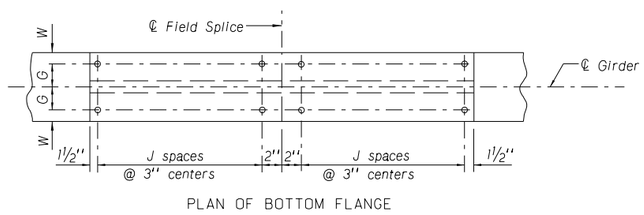
PLAN OF TOP FLANGE



SECTION

ELEVATION

FIELD SPLICE DATA										
Field Splice No. 1 & 2										
	Thickness		Width		Length					
Plate A	½"		1'-7"		2'-5"					
Plate B	¾"		1'-4½"		4'-1"					
Plate C	¾"		6½"		4'-1"					
Plate D	¾"		6½"		4'-1"					
Plate E	¾"		1'-4½"		4'-1"					
No. of Bolt Spaces				Bolt Spacing						
H	J	K	N	P	S	F	R	G	W	
7	7	2	8	3¼"	1½"	5"	3¼"	5"	3¼"	



PLAN OF BOTTOM FLANGE

FIELD SPLICE DETAILS

Not to Scale

DEFLECTION AND BLOCKING			
ALL GIRDERS			
	Tenth Point	Shim Dead Load Deflection (in.)	Blocking Ordinate (in.)
Abutment No. 1	1.0	0.000	0
	1.1	0.140	
	1.2	0.257	
	1.3	0.334	
	1.4	0.365	
	1.5	0.347	
	1.6	0.286	
	1.7	0.196	
	1.8	0.099	
	1.9	0.021	
Bent No. 1	2.0	0.000	
	2.1	0.092	
Field Splice No. 1	2.1667	0.203	3 15/16"
	2.2	0.258	
	2.3	0.428	
	2.4	0.549	
	2.5	0.593	
	2.6	0.549	
	2.7	0.428	
	2.8	0.258	
Field Splice No. 2	2.8333	0.203	6 11/16"
	2.9	0.092	
Bent No. 2	3.0	0.000	
	3.1	0.021	
	3.2	0.099	
	3.3	0.196	
	3.4	0.286	
	3.5	0.347	
	3.6	0.365	
	3.7	0.334	
	3.8	0.257	
	3.9	0.140	
Abutment No. 2	4.0	0.000	10 5/8"

PROJECT NUMBER	SHEET NO.
39-3(106)	S12

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
CAMBER AND BLOCKING & FIELD SPLICE DETAILS

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019
DESIGNED BY JJS

COUNTY NANCE
HWY. NO. N-39
REF. POST 17.92
STA. 449+05.00

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
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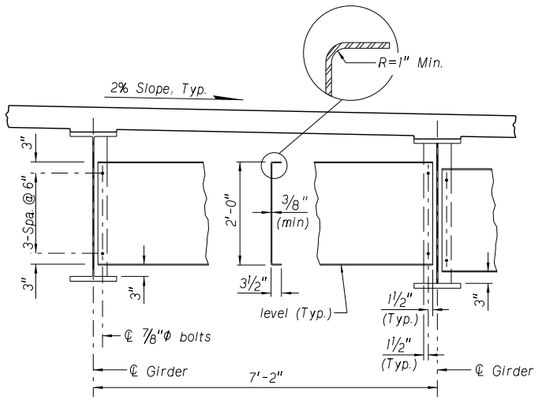
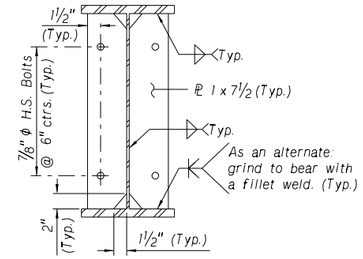
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO.	
1	12/21

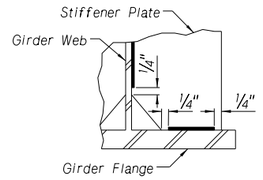


BENT PLATE SEPARATOR
Not to Scale

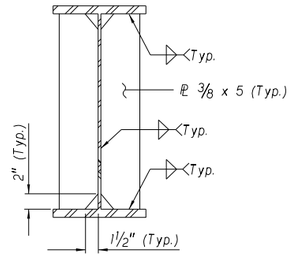


NOTE: Do not drill holes in exterior stiffener plates on exterior girders.

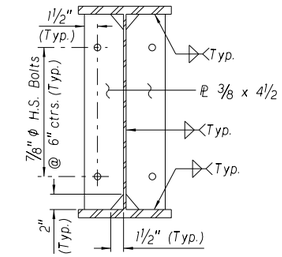
BEARING STIFFENERS AT BENTS
Not to Scale



TYPICAL STIFFENER WELD DETAIL
Not to Scale

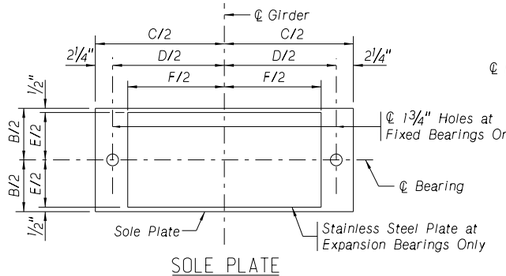


ANCHORAGE STIFFENER AT ABUTMENTS
Not to Scale

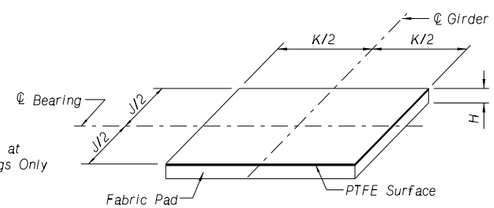


NOTE: Stiffener plates not required on exterior side of exterior girders.

STIFFENER PLATES AT SEPARATORS
Not to Scale

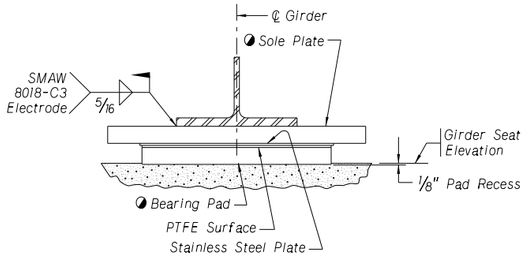


SOLE PLATE
Not to Scale



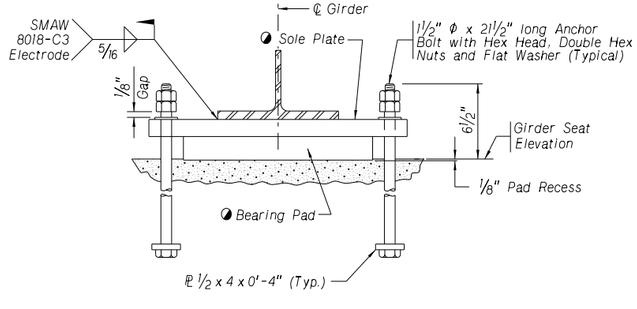
Omit PTFE low friction surface at fixed bearing devices.

FABRIC PAD
Not to Scale



SECTION AT EXPANSION BEARING (PTFE TYPE)
AT ABUTMENTS
Not to Scale

◕ Sole Plates and Fabric Pads need to be inspected prior to installation. Please contact the Bridge Office a minimum of three weeks before contractor's scheduled installation for inspection.



FIXED BEARING WITH SOLE PLATE
AT BENTS
Not to Scale

◕ Sole Plates and Fabric Pads need to be inspected prior to installation. Please contact the Bridge Office a minimum of three weeks before contractor's scheduled installation for inspection.

DIMENSIONS FOR BEARING DEVICES

LOCATION	SOLE PLATE				STAINLESS STEEL		FABRIC PAD		
	A	B	C	D	E	F	H	J	K
Abutment No. 1	1½"	12"	19"	--	11"	16"	1"	4"	15"
Bent No. 1	1½"	12"	25½"	21"	--	--	1"	6"	18"
Bent No. 2	1½"	12"	25½"	21"	--	--	1"	6"	18"
Abutment No. 2	1½"	12"	19"	--	11"	16"	1"	4"	15"

PROJECT NUMBER	SHEET NO.
39-3(106)	S13

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

LOCATION LOUP RIVER OVERFLOW
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
SEPARATOR, STIFFENER & BEARING DETAILS

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00
DESIGNED BY JJS

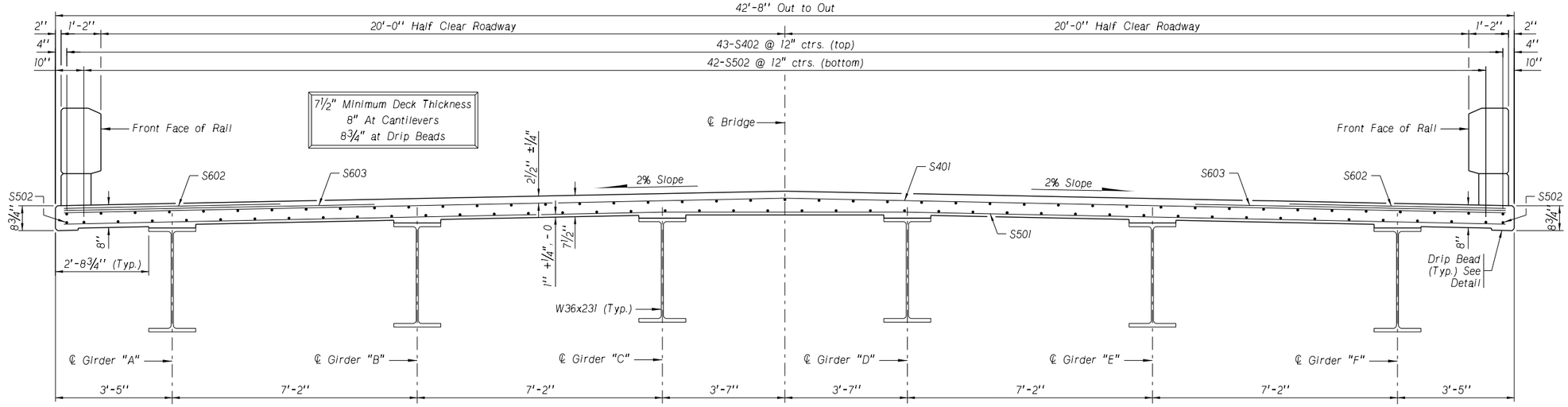
NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

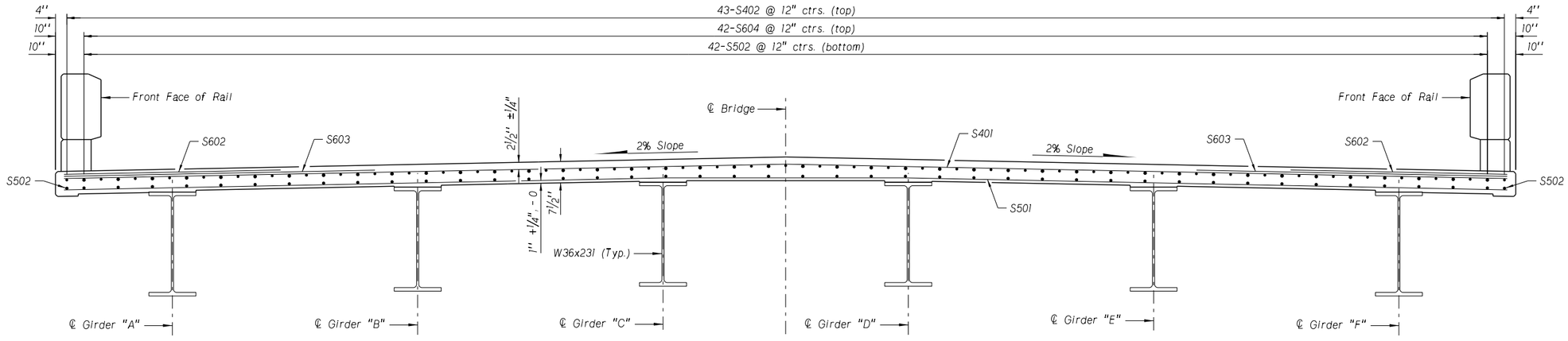
SPECIAL PLAN NO. 1

13/21



CROSS SECTION OF BRIDGE NEAR MIDSPAN

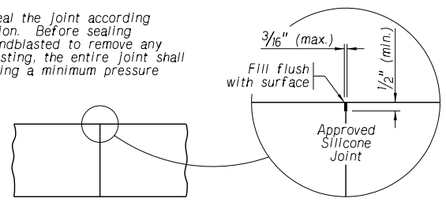
Not to Scale



CROSS SECTION OF BRIDGE NEAR BENTS

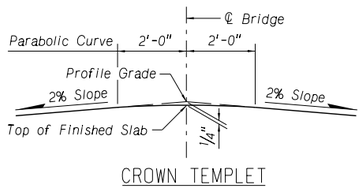
Not to Scale

The Contractor shall prepare and seal the joint according to the Manufacturer's Recommendation. Before sealing the joint, wall surfaces shall be sandblasted to remove any deleterious material. After sandblasting, the entire joint shall be cleaned with compressed air having a minimum pressure of 90 p.s.i. The compressed air shall be free of any contaminents. The joints shall be dry at the time of sealing.



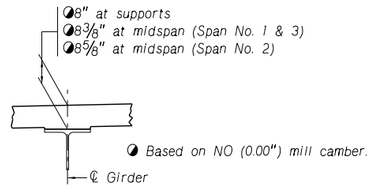
SLAB CONSTRUCTION JOINT

Not to Scale



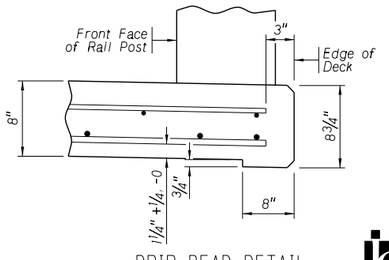
CROWN TEMPLET

Not to Scale



SHIM DETAIL

Not to Scale



DRIP BEAD DETAIL

Not to Scale

PROJECT NUMBER	SHEET NO.
39-3(106)	S14

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
CROSS SECTION OF BRIDGE

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019

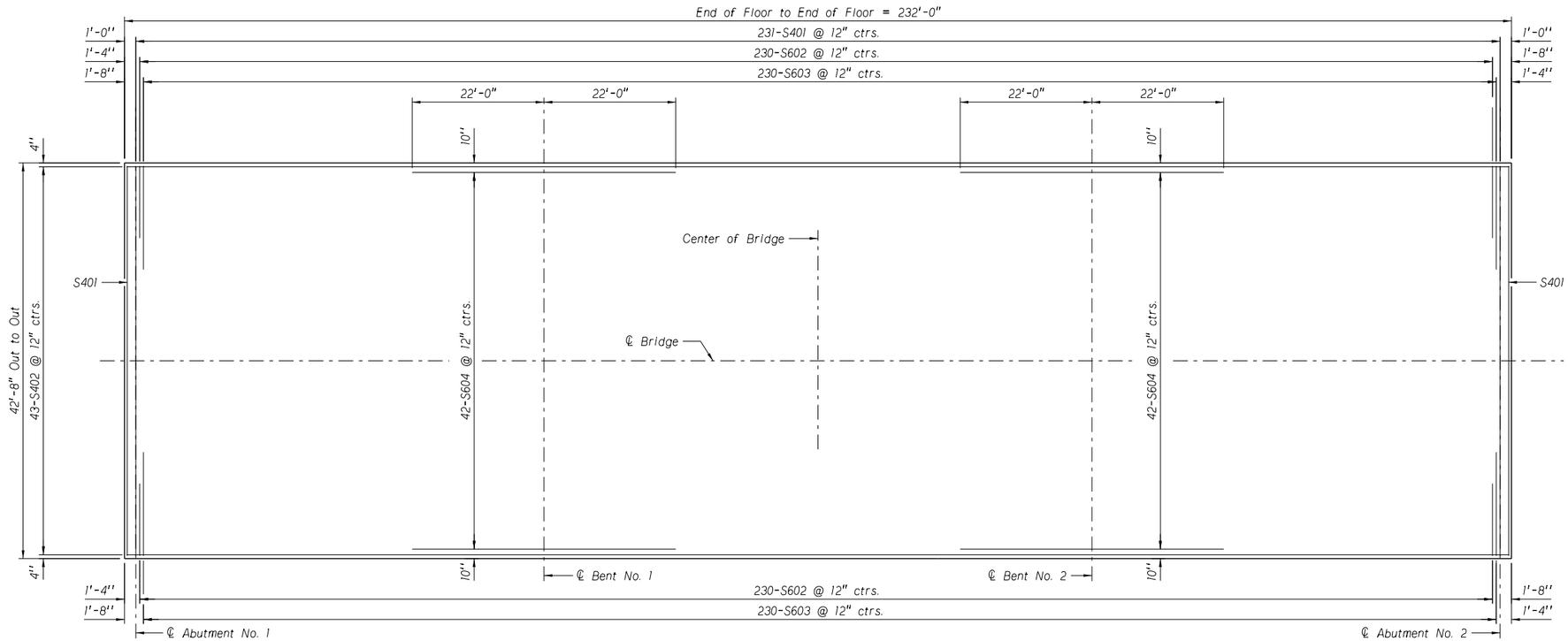
COUNTY NANCE
HWY. NO. N-39
REF. POST 17.92
STA. 449+05.00
DESIGNED BY JJS

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

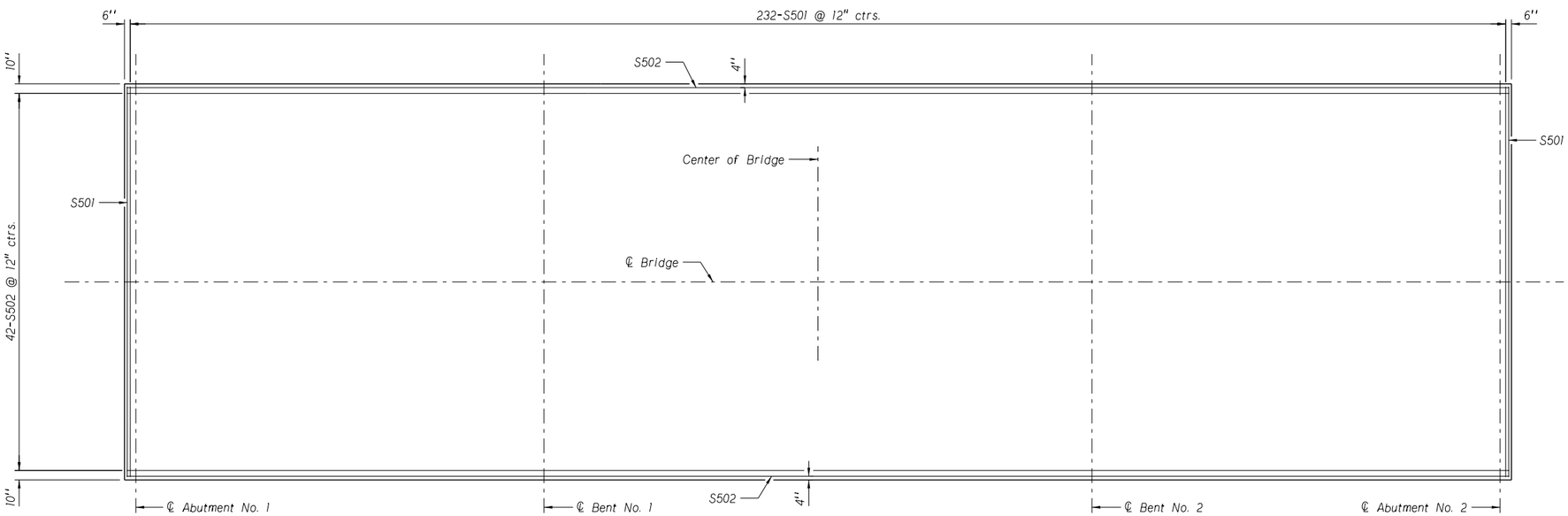
PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO.	14
1	21



SLAB REINFORCEMENT (TOP MAT)

Not to Scale



SLAB REINFORCEMENT (BOTTOM MAT)

Not to Scale

PROJECT NUMBER	SHEET NO.
39-3(106)	S15

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE

SLAB REINFORCING LAYOUT

LOCATION LOUP RIVER OVERFLOW
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00

DESIGNED BY JJS
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

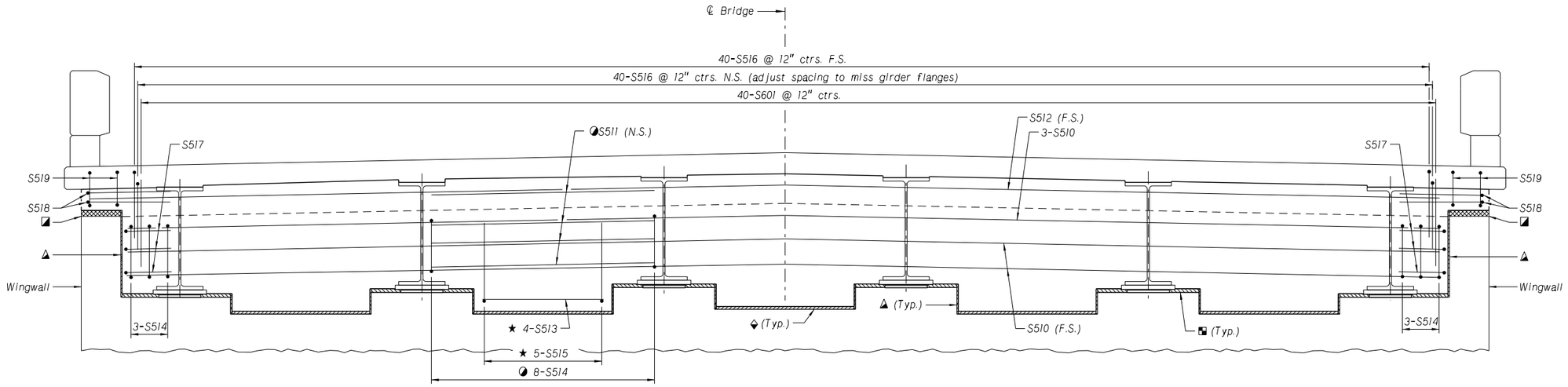
SPECIAL PLAN NO.	
1	15 / 21

BRIDGE DIVISION.

Computer: SIRE

Date: 16-APR-2019 07:22

File: S039 01792_Steel Bridge Plan Sheets



ELEVATION OF ABUTMENT TURNDOWN

Not to Scale

★ *Typ. between Pedestals*

◕ *Typ. between Girders*

◪ *⅛" Hardboard on top of 2" Extruded Polystyrene*

◭ *½" Preformed Joint Filler or Polystyrene*

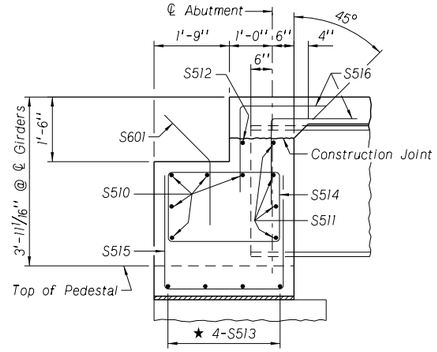
⬙ *1" Preformed Joint Filler or Polystyrene*

◪ *1¼" Preformed Joint Filler or Polystyrene*

N.S. = Near Side

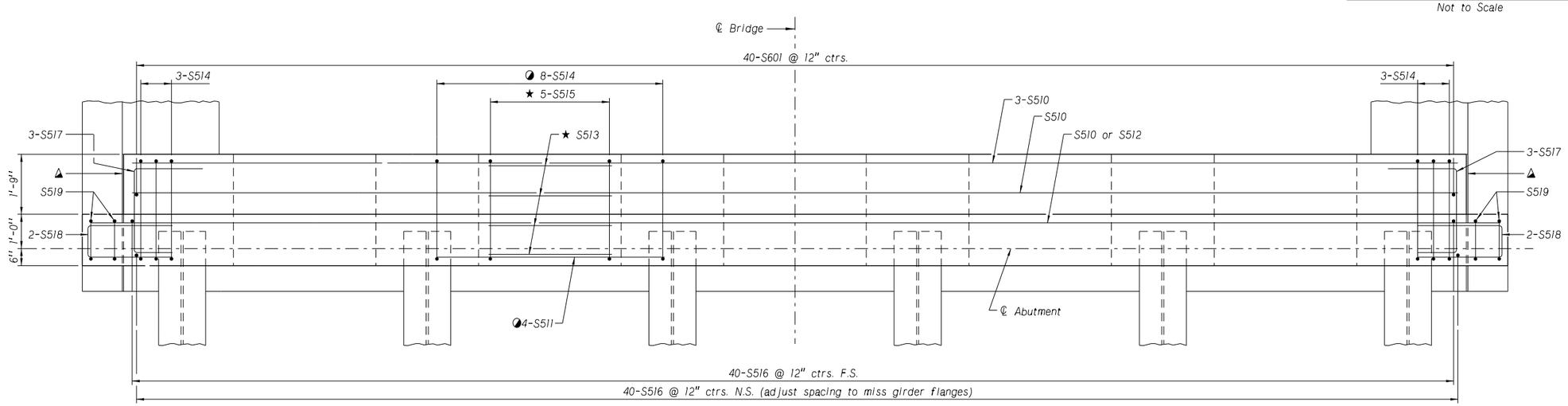
F.S. = Far Side

ABUTMENT TURNDOWN CONCRETE QUANTITIES FOR INFORMATION ONLY	
ABUTMENT NO. 1	*14.7 CY*
ABUTMENT NO. 2	*14.7 CY*



SECTION OF ABUTMENT TURNDOWN

Not to Scale



PLAN OF ABUTMENT TURNDOWN

Not to Scale

PROJECT NUMBER	SHEET NO.
39-3(106)	S16

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE

ABUTMENT TURNDOWN DETAILS

LOCATION LOUP RIVER OVERFLOW
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93

DETAILED BY JJS — CHECKED BY SWA — DATE APRIL 2019

COUNTY NANCE
HWY. NO. N-39
REF. POST 17.92
STA. 449+05.00

DESIGNED BY JJS

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO. 1

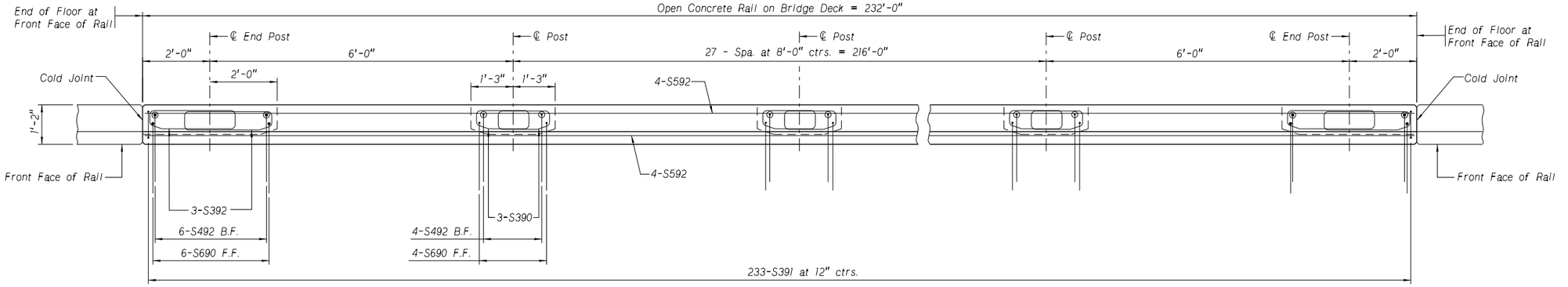
16 / 21

BRIDGE DIVISION.

Computer: SIRE

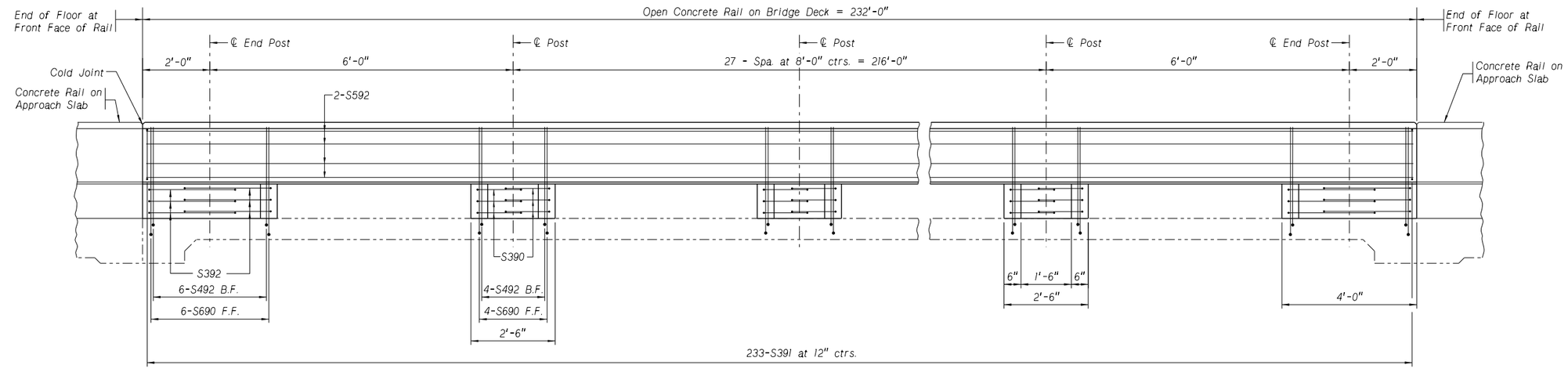
Date: 16-APR-2019 07:22

File: S039 01792_Steel Bridge Plan Sheets



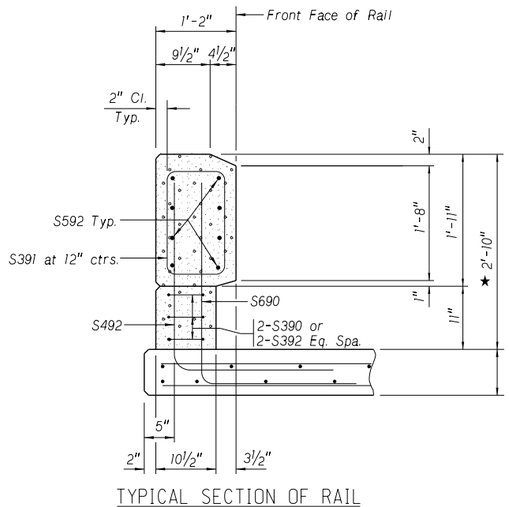
PARTIAL PLAN OF OPEN CONCRETE RAIL ON BRIDGE

Not to Scale



PARTIAL ELEVATION OF OPEN CONCRETE RAIL ON BRIDGE

Not to Scale



TYPICAL SECTION OF RAIL

Scale: 1" = 1'-0"

NOTES:

Posts must be plumb.

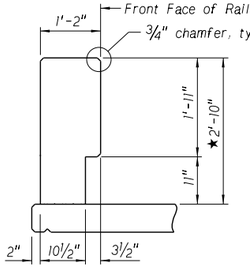
★ Measured at front face of rail.

For Bill of Bars see sheet 18 of 21.

Steel forms are required when using the 4½" rail chamfer.

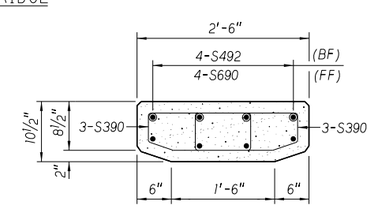
(EF) = Each Face
(FF) = Front Face
(BF) = Back Face

⊙ Circled bars indicate placement in the top layer of slab reinforcement. Concrete Rail will be built plumb.



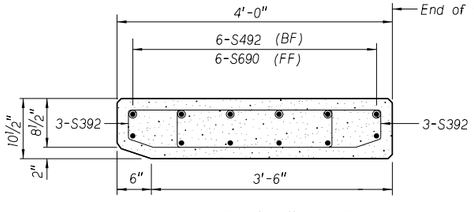
ALTERNATE CHAMFER DETAIL

Scale: ¾" = 1'-0"



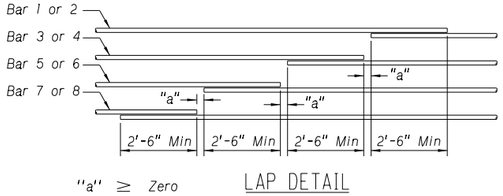
PLAN OF 2'-6" POST

Scale: 1" = 1'-0"



PLAN OF 4'-0" POST

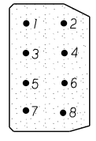
Scale: 1" = 1'-0"



"a" ≥ Zero

LAP DETAIL

Not to Scale



RAIL SECTION

See Lap Detail

Scale: 1" = 1'-0"

PROJECT NUMBER	SHEET NO.
39-3(106)	S17

C.N. 42895

STRUCTURE NUMBER S039 01792

PROFESSIONAL CIVIL ENGINEER ★ MARK J. TRAYNOWICZ E-8119 ★ STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE

CONCRETE RAIL ON BRIDGE

LOCATION LOUP RIVER OVERFLOW
SKEW 0° SOUTH OF N-22
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS CHECKED BY SWA DATE APRIL 2019
DESIGNED BY JJS

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
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DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER ★ JESSE J. SIRE E-14496 ★ STATE OF NEBRASKA 4/16/19

SPECIAL PLAN NO.	
1	17 / 21

BRIDGE DIVISION.

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BILL OF BARS

	MARK	NO.	LENGTH	TYPE	"A"	"B"	"C"	"D"	"E"	"F"	PIN	HOOK	WEIGHT LB
SLAB	S601	80	3'-0"	105	1'-6"	1'-6"	1'-1"				4½"		360
	S602	460	6'-4"	STR									4376
	S603	460	9'-1"	STR									6276
	S604	84	44'-0"	STR									5551
	S501	234	42'-2"	STR									10291
	S502	44	(1) 240'-6"	STR									11037
	S510	10	38'-9"	STR									404
	S511	40	6'-7"	STR									275
	S512	2	41'-2"	STR									86
	S513	40	3'-7"	STR									149
	S514	92	9'-7"	107	1'-7"	2'-9"					2½"	5½"	920
	S515	50	7'-5"	103	2'-4"	2'-9"	2'-4"				2½"		387
	S516	160	5'-0"	104	2'-6"	2'-6"					2½"		834
	S517	12	5'-10"	103	1'-2"	2'-8"	2'-0"				2½"		73
	S518	8	5'-11"	103	2'-6"	11"	2'-6"				2½"		49
	S519	8	4'-5"	107	9"	1'-0"					2½"	5½"	37
	S401	233	42'-2"	STR									6563
	S402	43	(2) 237'-6"	STR									6822
	EPOXY COATED REINFORCING STEEL - SLAB TOTAL =												54490
RAILS	S690	248	6'-4"	104	3'-2"	3'-2"					4½"		2359
	S592	16	(3) 239'-2"	STR									3991
	S492	248	5'-10"	104	2'-11"	2'-11"					3"		966
	S390	336	4'-8"	130	1'-1½"	6½"	1'-6"	5"	5"	4½"	1½"	4"	590
	S391	466	5'-2"	107	1'-5"	10"					1½"	4"	905
	S392	24	7'-8"	130	2'-7½"	6½"	3'-0"	5"	5"	4½"	1½"	4"	69
	EPOXY COATED REINFORCING STEEL - CONCRETE RAILS TOTAL =												8880

NOTE:

FOR BENDING DIAGRAMS, HOOK LENGTHS & PIN DIAMETERS SEE SHEET 21 OF 21.

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 NDOT.

(1) Includes Three (3) - 3'-0" Lap Splices
(2) Includes Three (3) - 2'-0" Lap Splices
(3) Includes Three (3) - 2'-6" Lap Splices

BRIDGE DIVISION.

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Date: 16-APR-2019 07:22

File: S039 01792_Steel Bridge Plan Sheets

PROJECT NUMBER	SHEET NO.
39-3(106)	S18

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
SLAB & RAIL BILL OF BARS

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93

DESIGNED BY JJS | DETAILED BY JJS | CHECKED BY SJRE | DATE APRIL 2019

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00

NEBRASKA DEPARTMENT OF TRANSPORTATION

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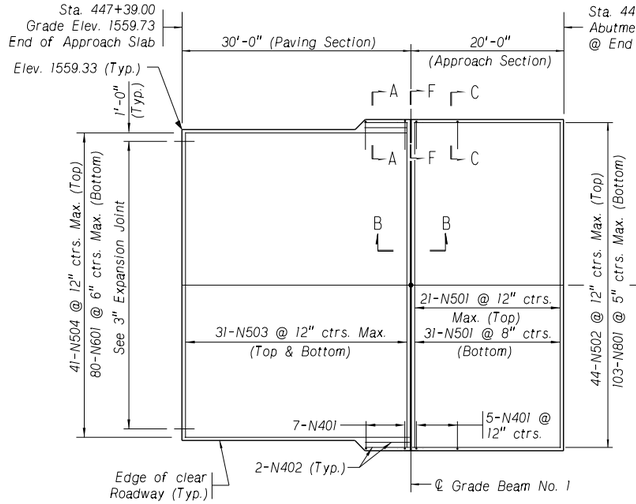
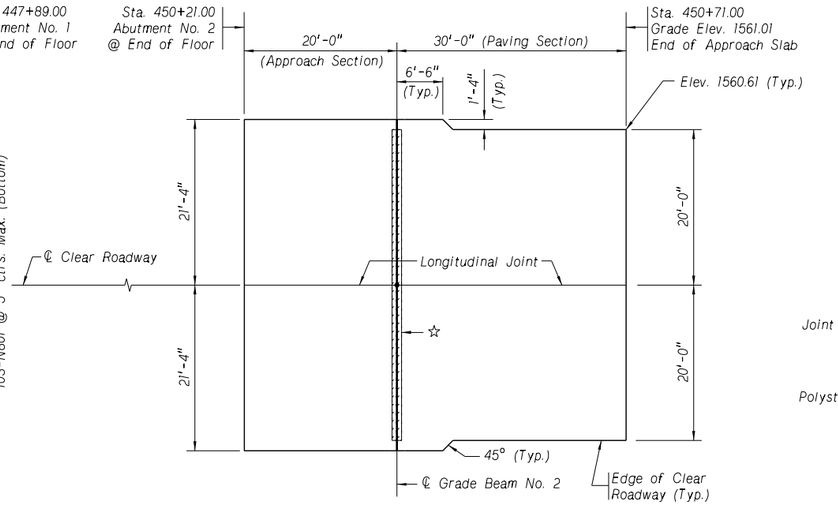
PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO.	
1	18 / 21

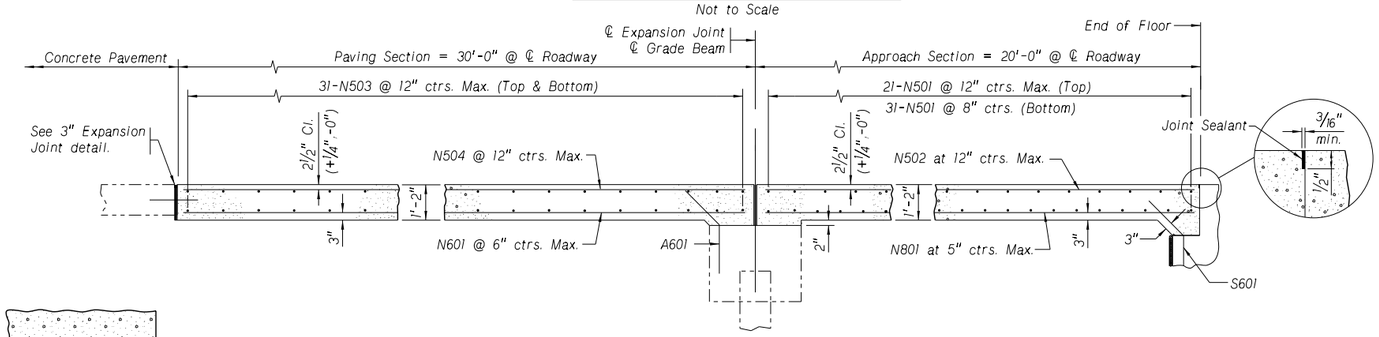


APPROACH SLAB NO. 1
SHOWING REINFORCING

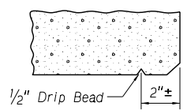


APPROACH SLAB NO. 2
SHOWING DIMENSIONS

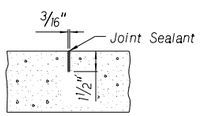
GENERAL PLAN OF APPROACH SLABS
Not to Scale



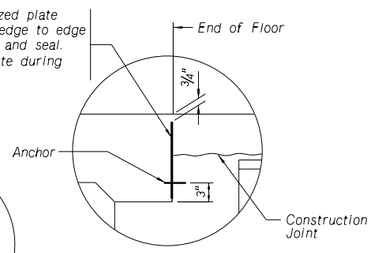
LONGITUDINAL SECTION
Not to Scale



DRIP BEAD DETAIL
Not to Scale

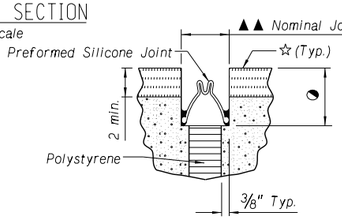


LONGITUDINAL JOINT
Not to Scale

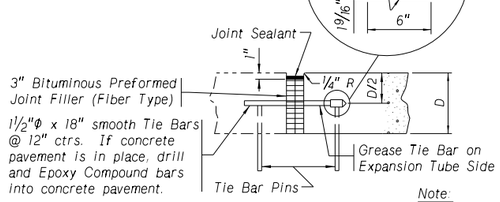


ALTERNATE JOINT DETAIL
AT END OF FLOOR

To be used if approach slab is poured continuous with bridge deck.
Not to Scale



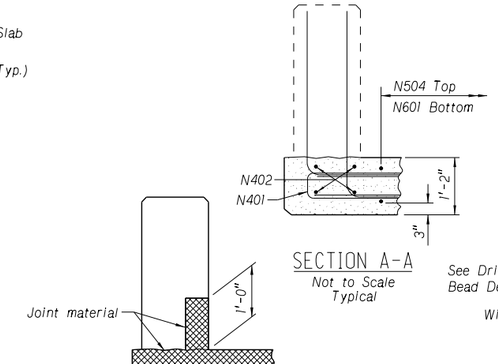
DETAIL FOR PREFORMED SILICONE JOINT
AT GRADE BEAM
Not to Scale
(Preformed Silicone Joint Substitution for Precompressed Polyurethane Foam)



3" EXPANSION JOINT
Not to Scale

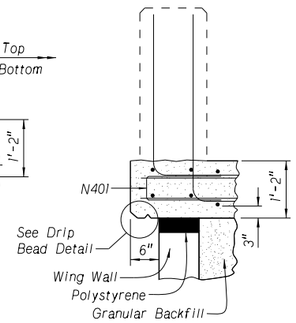
Note:
Use D/2 of Roadway Pavement
if less than D/2 of Paving Section.

PPF ORDER SIZE ▲ 2.25"			
AMBIENT TEMPERATURE RANGE DURING POUR	PPF ▲▲	Silicaflex ▲▲	Wabo ▲▲
35°F - 40°F	2.25"	3.00"	2.75"
40°F - 60°F	2.00"	2.75"	2.50"
60°F - 85°F	1.75"	2.50"	2.25"

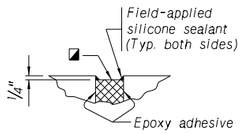


SECTION A-A
Not to Scale
Typical

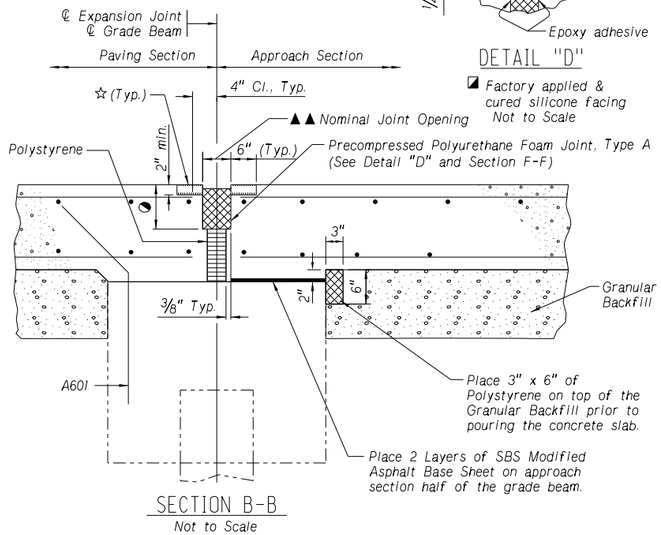
SECTION F-F
Not to Scale



SECTION C-C
Not to Scale



DETAIL "D"
◪ Factory applied &
cured silicone facing
Not to Scale



SECTION B-B
Not to Scale

APPROACH SLAB NOTES:

Concrete Rail Width = 1'-2". See sheet 20 of 21 for placement of rail reinforcement.

See Standard Specifications for grooving and finishing of approach slabs.

SBS Modified Asphalt base sheets and all other miscellaneous items shall be considered subsidiary to the Pay Item, CONCRETE FOR PAVEMENT APPROACHES CLASS 47BD-4000.

SBS Modified Asphalt base sheets shall be modified bitumen roofing material, with a minimum thickness of 0.090 inch and a minimum weight of 60 lbs. per 100 sq. feet.

Longitudinal Joints shall be 1½" deep and placed in the paving and approach slabs in accordance with section 603.03 paragraph 12 of the Standard Specifications. Contractor shall exercise care not to damage reinforcing steel placed in the top layer of the slabs.

The expansion gap between approach section and paving section shall be cleaned of all foreign matter before the installation of the expansion device or the filler material.

☆ Bridge Joint Nosing Material shall be one of the products found in the Approved Products List. Follow all manufacturer's recommendations. Bridge Joint Nosing Material shall run from front face of rail to front face of rail.

◪ This depth is to be determined by the preformed joint manufacturer.

▲ PPF Joint material, size to be ordered for a 50° opening + ¼".

▲▲ Nominal Joint Opening at time of pour.

PROJECT NUMBER	SHEET NO.
39-3(106)	S19

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
APPROACH SLAB DETAILS

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS **CHECKED BY** SWA **DATE** APRIL 2019
DESIGNED BY JJS

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
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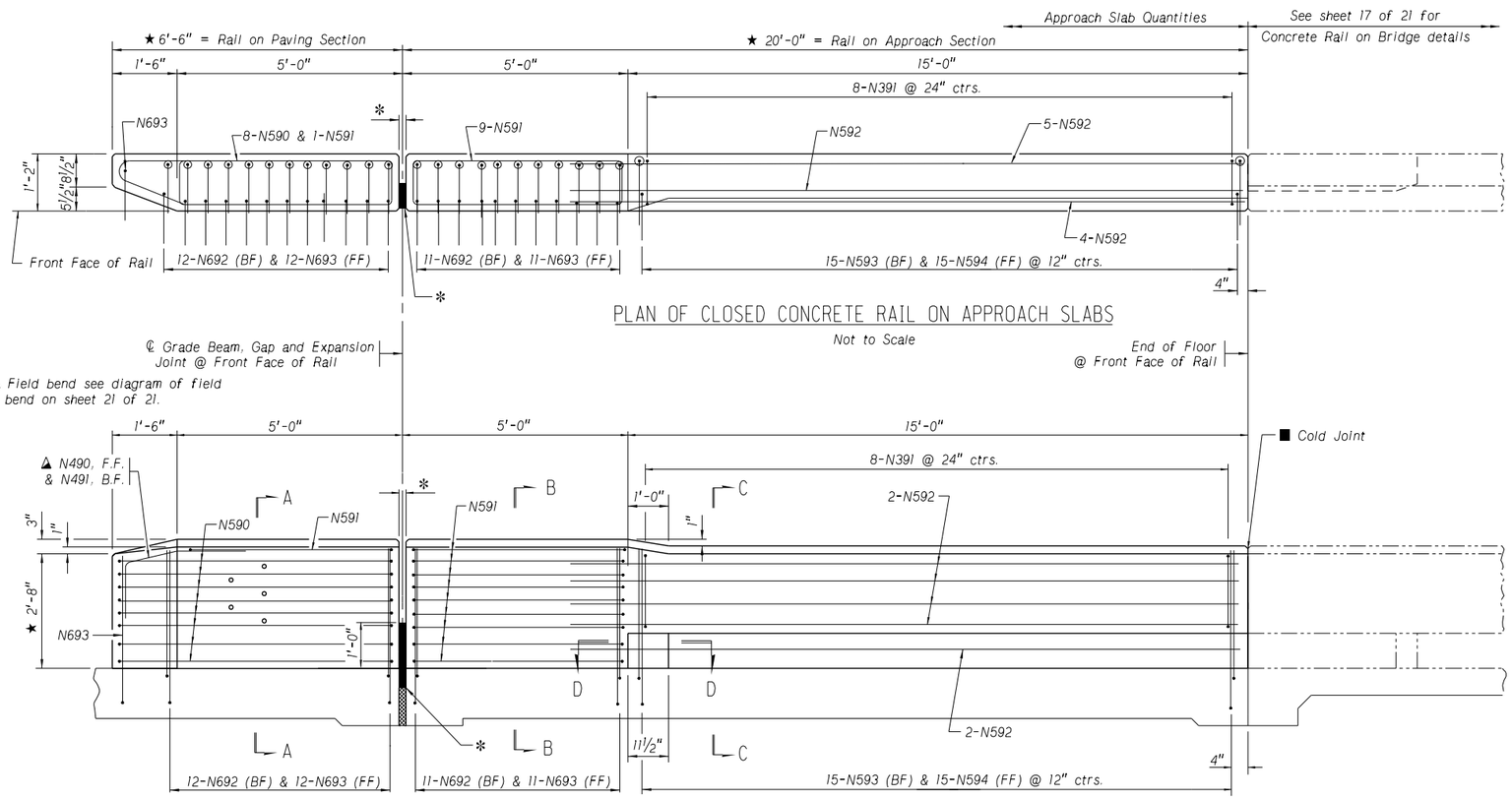
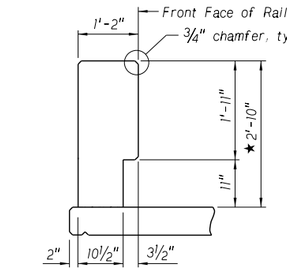
DEPARTMENT OF TRANSPORTATION

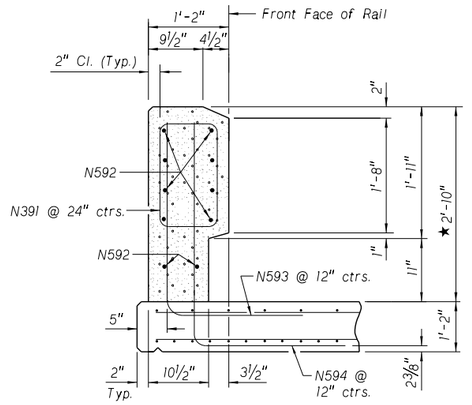
PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO.	19
1	21

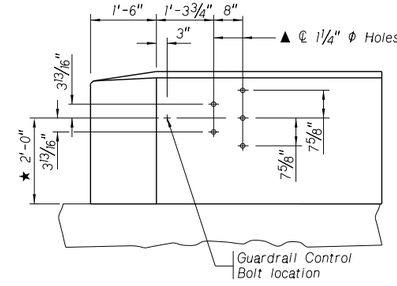




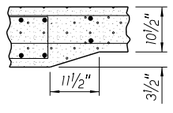
ALTERNATE CHAMFER DETAIL
Scale: ¾" = 1'-0"



SECTION C-C
Scale: 1" = 1'-0"

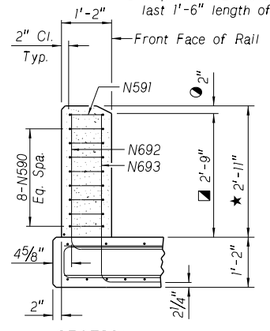


THRIE BEAM TERMINAL CONNECTION DETAIL
Not to Scale

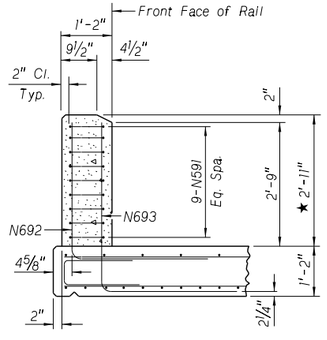


SECTION D-D
Scale: ¾" = 1'-0"

◪ Slope from 2'-9" to 2'-8" the last 1'-6" length of rail.
◑ Slope from 2" to 0" the last 1'-6" length of rail.



SECTION A-A
Not to Scale



SECTION B-B
Not to Scale

CONCRETE RAIL
Not to Scale

NOTES

⊙ Circled bars indicate placement in the top layer of slab reinforcement.

★ Measured at front face of rail.
Concrete Rail will be built plumb.
Steel forms are required when using the 4½" rail chamfer.

* Joint material and opening width shall match what is shown on Approach Slab sheet, see sheet 19 of 21.

■ When pouring concrete rails, a mandatory chamfered cold joint must be formed at the end of floor.

For Rail Bill of Bars on Approach Slab see sheet 21 of 21.

(EF) = Each Face
(FF) = Front Face
(BF) = Back Face

▲ As an alternate method, the contractor shall furnish and cast into the concrete an approved welded assembly consisting of threaded inserts, held accurately to the template of the holes shown. Inserts are to be complete with galvanized plate washers and galvanized ⅞"ϕ x 2" cap screws. The insert assembly shall be a standard product of a reputable manufacturer of such items and be capable of resisting a shear load of 80,000 lbs.

PROJECT NUMBER	SHEET NO.
39-3(106)	S20

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
RAIL ON APPROACH SLAB

LOCATION LOUP RIVER OVERFLOW SOUTH OF N-22
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
DESIGNED BY JJS
CHECKED BY SWA
DATE APRIL 2019

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00

NEBRASKA
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DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO.	20
1	21

BRIDGE DIVISION.

Computer: SIRE

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BILL OF BARS

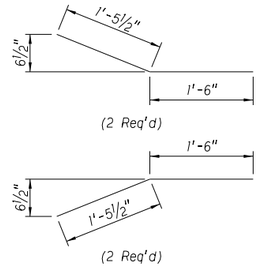
	MARK	NO.	LENGTH	TYPE	"A"	"B"	"C"	"D"	"E"	"F"	PIN	HOOK	WEIGHT LB
APPROACH SLAB NO. 1													
	N801	103	19'-5"	STR									5340
	N601	80	29'-5"	STR									3535
	N501	52	42'-2"	STR									2287
	N502	44	19'-5"	STR									891
	N503	62	39'-6"	STR									2554
	N504	41	29'-5"	STR									1258
	N401	24	6'-7"	103	3'-0"	7"	3'-0"				2"		106
	N402	8	6'-0"	STR									32
											SUBTOTAL =		16003
APPROACH SLAB NO. 2													
	N801	103	19'-5"	STR									5340
	N601	80	29'-5"	STR									3535
	N501	52	42'-2"	STR									2287
	N502	44	19'-5"	STR									891
	N503	62	39'-6"	STR									2554
	N504	41	29'-5"	STR									1258
	N401	24	6'-7"	103	3'-0"	7"	3'-0"				2"		106
	N402	8	6'-0"	STR									32
											SUBTOTAL =		16003
											EPOXY COATED REINFORCING STEEL FOR PAVEMENT APPROACHES - SLABS TOTAL =		32006
RAIL ON APPROACH SLAB NO. 1	N692	46	6'-0"	104	3'-0"	3'-0"					4½"		415
	N693	48	7'-0"	104	3'-6"	3'-6"					4½"		505
	N590	16	14'-5"	130	4'-8"	0'-10"	6'-1"	0'-5"	1'-6"	1'-5"	2½"	5½"	241
	N591	20	11'-11"	107	4'-8"	0'-10"					2½"	5½"	249
	N592	20	17'-0"	STR									355
	N593	30	5'-10"	104	2'-11"	2'-11"					3¾"		183
	N594	30	6'-10"	104	3'-5"	3'-5"					3¾"		214
	N490	2	4'-5¾"	135	1'-6"	1'-5¾"	1'-6"	1'-4¼"	3"		2"		6
	N491	2	4'-4½"	135	1'-6"	1'-4½"	1'-6"	1'-4¼"	3"		2"		6
	N391	16	5'-2"	107	1'-5"	0'-10"					1½"	4"	31
											SUBTOTAL =		2205
RAIL APPROACH SLAB NO. 2	N692	46	6'-0"	104	3'-0"	3'-0"					4½"		415
	N693	48	7'-0"	104	3'-6"	3'-6"					4½"		505
	N590	16	14'-5"	130	4'-8"	0'-10"	6'-1"	0'-5"	1'-6"	1'-5"	2½"	5½"	241
	N591	20	11'-11"	107	4'-8"	0'-10"					2½"	5½"	249
	N592	20	17'-0"	STR									355
	N593	30	5'-10"	104	2'-11"	2'-11"					3¾"		183
	N594	30	6'-10"	104	3'-5"	3'-5"					3¾"		214
	N490	2	4'-5¾"	135	1'-6"	1'-5¾"	1'-6"	1'-4¼"	3"		2"		6
	N491	2	4'-4½"	135	1'-6"	1'-4½"	1'-6"	1'-4¼"	3"		2"		6
	N391	16	5'-2"	107	1'-5"	0'-10"					1½"	4"	31
											SUBTOTAL =		2205
											EPOXY COATED REINFORCING STEEL FOR PAVEMENT APPROACHES - CONCRETE RAILS TOTAL =		4410

NOTE:

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 NDOT.

BAR MARK

A413 — A (TYPE OF BRIDGE ELEMENT- A=ABUTMENT (P=PIER, B=BENT, S=SLAB, N=APPROACH SLAB)) — 4 (BAR SIZE) — 13 (BAR NUMBER: 01 THRU 49, GENERAL REINFORCING; 70 THRU 79, LIGHT POLE REINFORCING; 90 THRU 99, CURB OR RAIL REINFORCING)



Field bend N490 bars laterally in direction of beveled end of the terminal section. TOP VIEW

ADDITONAL N490 BENDING DIAGRAM

(4 Total Req'd)

BAR SETS

MARK	MAX. LENGTH	MIN. LENGTH	NO. OF SETS	BARS PER SET

BAR SETS

MARK	MAX. LENGTH	MIN. LENGTH	NO. OF SETS	BARS PER SET

STANDARD HOOK LENGTH

PRIMARY STRESS BARS			STIRRUPS & TIES		
BAR SIZE	HOOK H 90°	180°	BAR SIZE	HOOK H 90°	135°
4	8"	6"	3	4"	4"
5	10"	7"	4	4½"	4½"
6	12"	8"	5	6"	5½"
7	15"	10"	6	12"	8"
8	17"	1 1"	7	14"	9"
9	19"	15"	8	16"	10½"
10	23"	17"			
1 1	24"	19"			

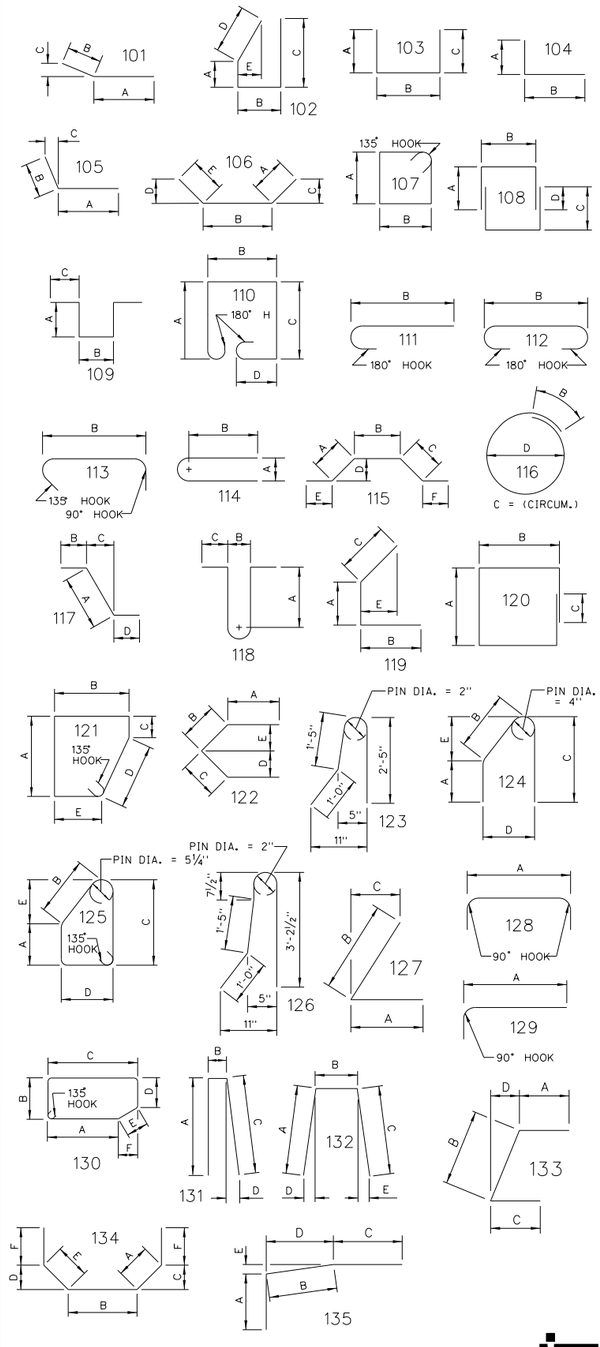
d = BAR SIZE
Dp = PIN DIAMETER

PIN DIAMETER

PRIMARY STRESS		STIRRUPS & TIES	
BAR SIZE	Dp	BAR SIZE	Dp
4	3"	3	1½"
5	3¾"	4	2"
6	4½"	5	2½"
7	5¼"	6	4½"
8	6"	7	5¼"
9	9½"	8	6"
10	1 1"		
1 1	1 2"		

BENDING DIAGRAMS

ALL DIMENSIONS ARE OUT TO OUT & NOT TO SCALE
ALL REINFORCING STEEL SHALL BE EPOXY COATED



PROJECT NUMBER	SHEET NO.
39-3(106)	S21

C.N. 42895

STRUCTURE NUMBER
S039 01792

PROFESSIONAL CIVIL ENGINEER
MARK J. TRAYNOWICZ
E-8119
STATE OF NEBRASKA

BRIDGE ENGINEER

LOCATION LOUP RIVER OVERFLOW
SKEW 0°
ROADWAY 40'-0"
DESIGN LIVE LOAD HL93
DETAILED BY JJS
CHECKED BY SWA
DATE APRIL 2019

COUNTY NANCE
HWY. NO. N-39
REF. POST. 17.92
STA. 449+05.00
DESIGNED BY JJS

230'-0" 3 SPAN ROLLED BEAM GIRDER BRIDGE
APPROACH SLAB & RAIL BILL OF BARS AND BENDING DIAGRAMS

NEBRASKA DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL CIVIL ENGINEER
JESSE J. SIRE
E-14496
STATE OF NEBRASKA
4/16/19

SPECIAL PLAN NO.	
1	21
	21

BRIDGE DIVISION.

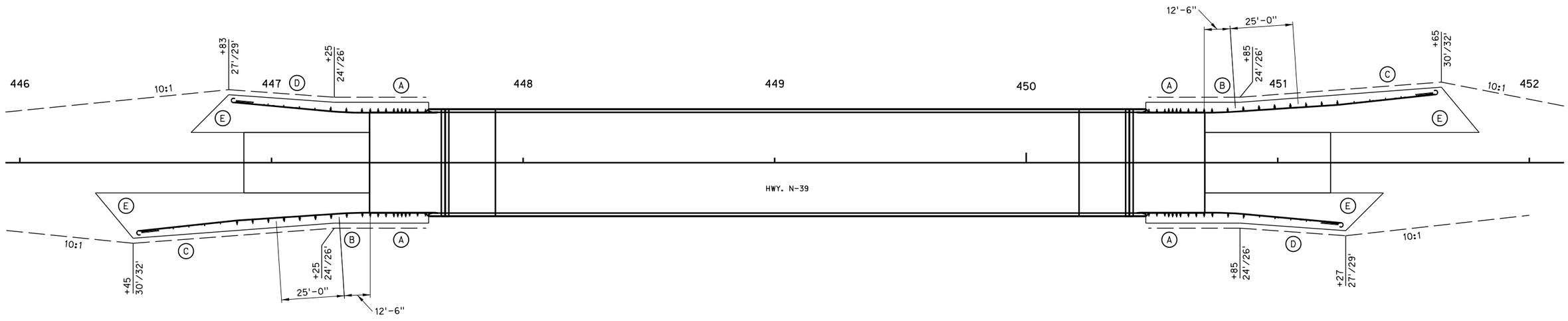
Computer: SIRE

Date: 16-APR-2019 07:22

File: S039 01792_Steel Bridge Plan Sheets

ROADWAY DESIGN DIVISION.

SEC. 25-T17N-R4W



SEC. 25-T17N-R4W

LEGEND

- (A) BRIDGE APPROACH SECTION (25'-0")
- (B) R=188' (TABLE D)
- (C) END TREATMENT, TYPE II (53'-1½")
- (D) END TREATMENT, TYPE II (PARALLEL, 53'-1½")
- (E) SURFACING UNDER GUARDRAIL
- —— - GRADING LINE

GUARDRAIL INSTALLATION AT STA 449+05.00

BRIDGE #(S039 01792)

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA

SHEET 1 OF 1

SPECIAL PLAN 1C

Computer: TEMPLEMAN
Date: 23-APR-2019 17:07
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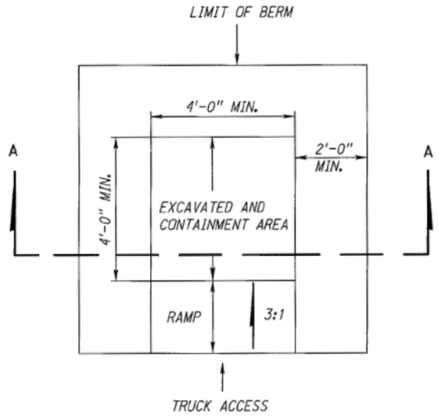
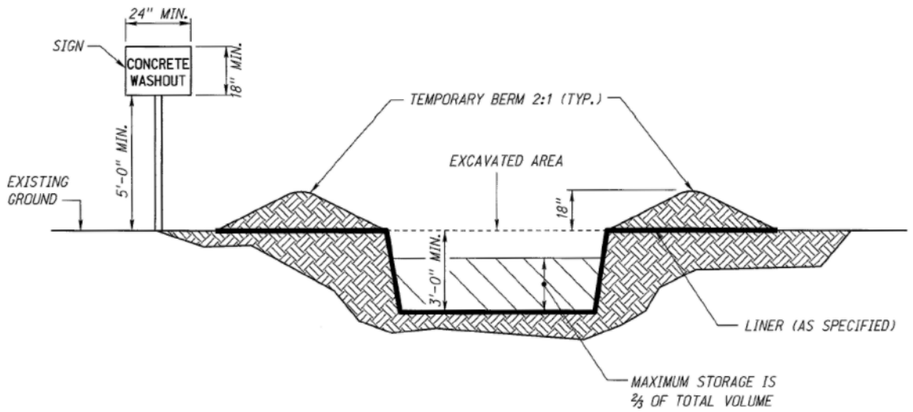
PROJECT NO.	SHEET NO.
39-3(106)	U2

C.N. 42895

ROADWAY DESIGN DIVISION



PLAN VIEW



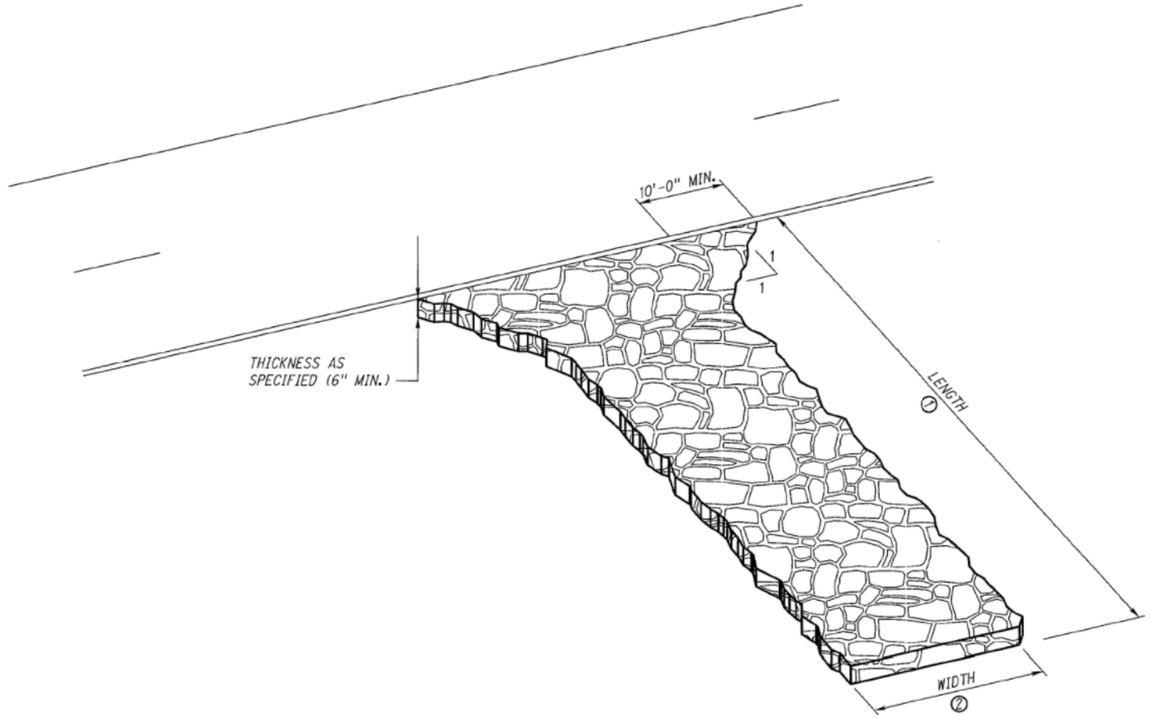
SECTION A-A

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 2C

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SHEET 1 OF 1 Scale: 1:200 5101 1 e 00
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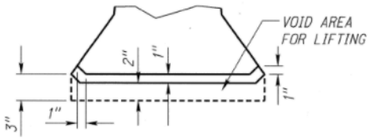
PROJECT NO.	SHEET NO.
39-3(106)	U3

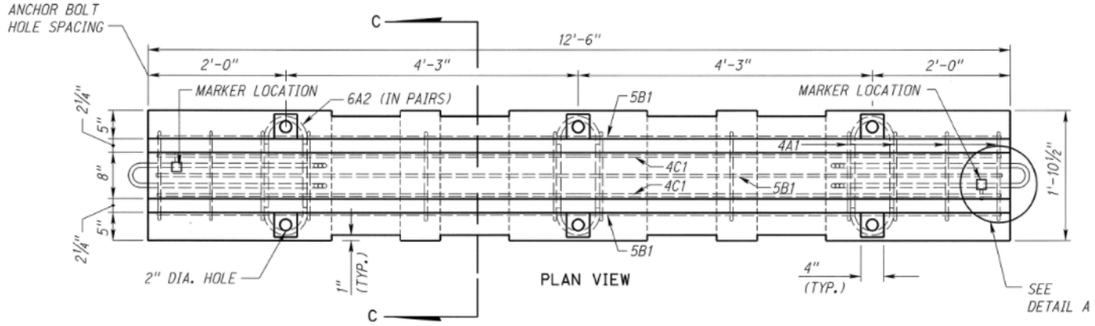
C.N. 42895



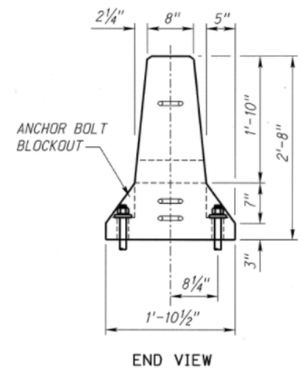
SECTION C-C

LIFTING SLOT DETAIL

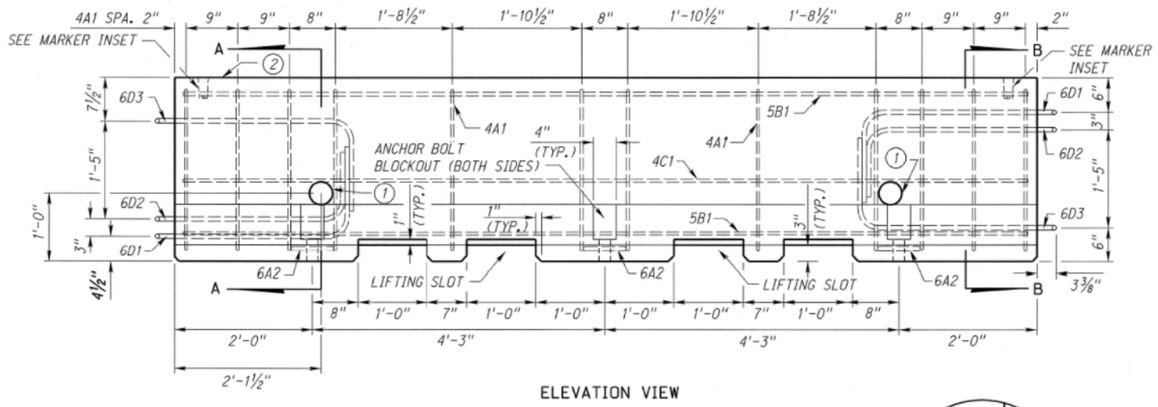
(1" CHAMFER TO PREVENT SPALLING)



PLAN VIEW

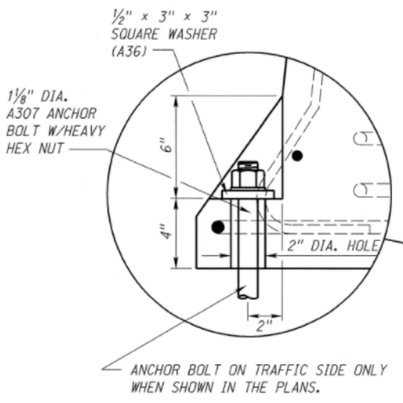


END VIEW

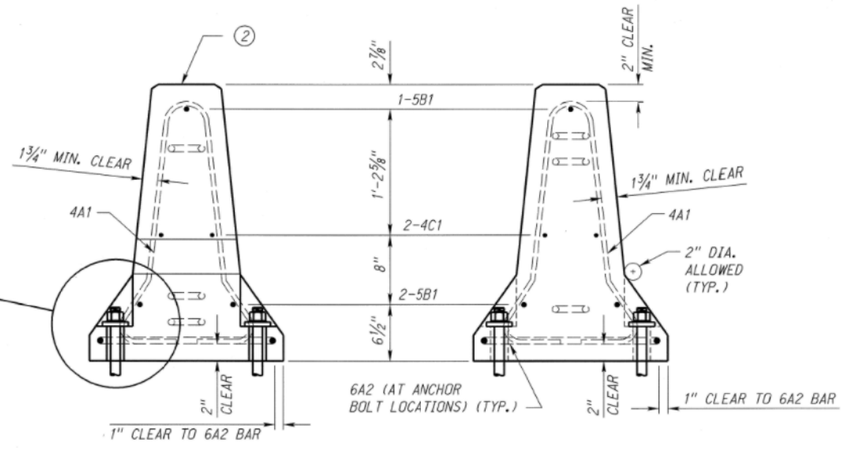


ELEVATION VIEW

* MARKED END

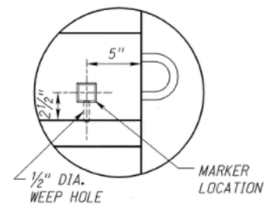


ANCHOR BOLT BLOCKOUT DETAIL

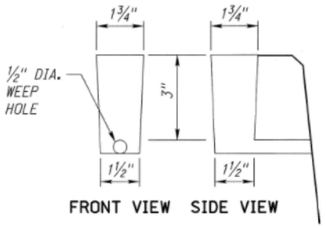


SECTION A-A
(STIRRUP PLACEMENT)

SECTION B-B
(STIRRUP PLACEMENT)



DETAIL A



FRONT VIEW SIDE VIEW

MARKER INSERT

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 (BAPS 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 2¾" PIN.

TENSILE REQUIREMENTS	
YIELD STRENGTH, MINIMUM PSI	60,000
TENSILE STRENGTH, MINIMUM PSI	80,000
ELONGATION IN 8 INCH, MINIMUM	14%

CHEMICAL COMPOSITION	
ELEMENT	MAXIMUM%
CARBON	0.30
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" DIAMETER PVC OR 11 GAUGE STEEL ROUND MECHANICAL TUBING SLEEVE.

(2) ONE END OF EACH BARRIER SHALL BE PERMANENTLY MARKED WITH THE FOLLOWING INFORMATION:

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

USE 1⅛" DIA. ASTM A 307 ANCHOR BOLTS WITH HEAVY HEX NUT & WASHER (A36). USE ASTM A36 MATERIAL FOR THE CONNECTION PIN.

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.

CONCRETE PROTECTION BARRIER

SHEET 1 OF 2

SPECIAL PLAN 3C

ROADWAY DESIGN DIVISION

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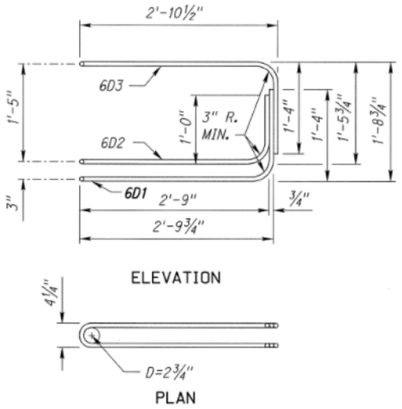
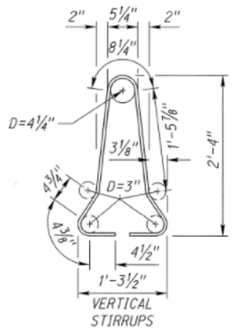
SHEET 1 OF 2

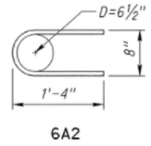


LOOP BAR ASSEMBLY

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



4A1



6A2

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

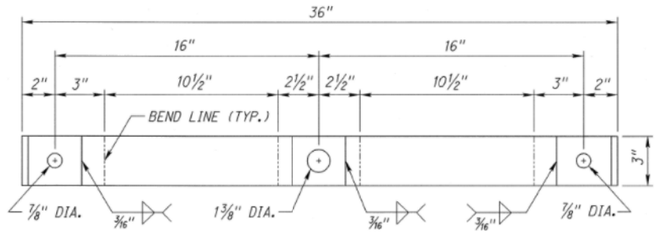
CONCRETE QUANTITY = 1.3 CU. YD.

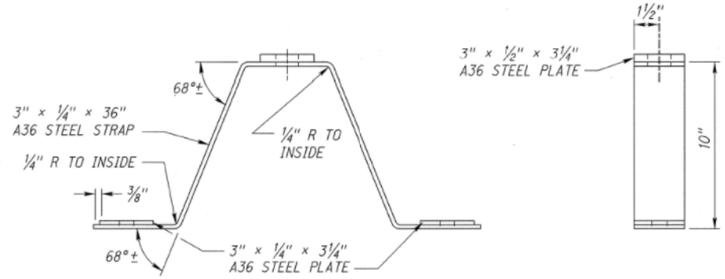
TIE-DOWN NOTES:

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.

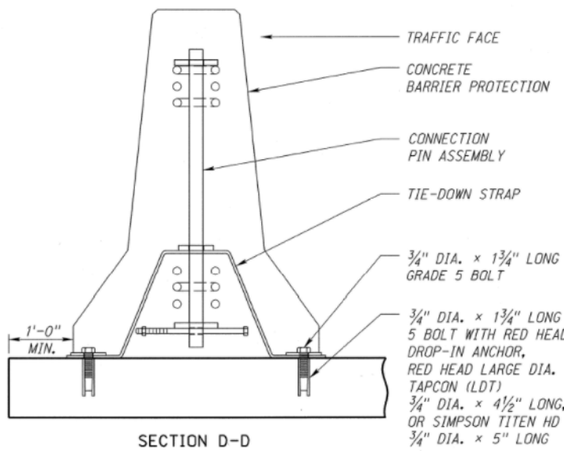
WHEN THE ANCHOR BOLTS ARE REMOVED, THE HOLES SHOULD BE FILLED WITH A NON-SHRINK GROUT FROM THE APPROVED PRODUCT LIST, MEETING THE REQUIREMENTS OF ASTM C 1107 FOR GRADE B OR C.

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

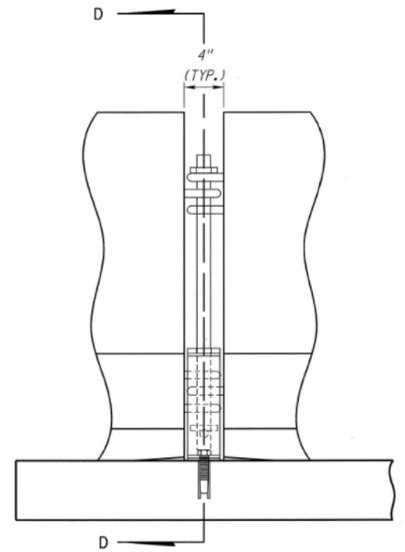




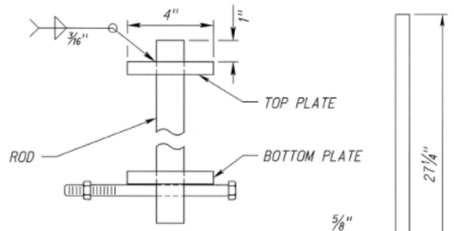
TIE-DOWN STRAP DETAILS



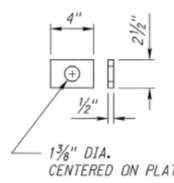
SECTION D-D



TIE DOWN DETAILS (STRAP)

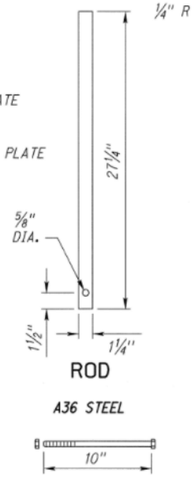


ENLARGED PIN DETAIL



TOP & BOTTOM PLATE

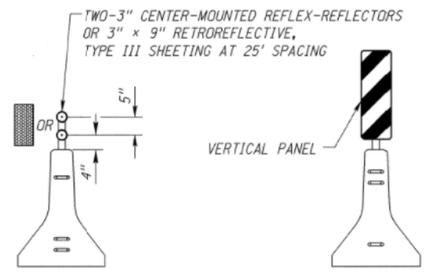
A36 STEEL



BOLT & NUT

½" DIA. x 10" BOLT & NUT (ASTM A325)

CONNECTION PIN DETAILS



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.

CONCRETE PROTECTION BARRIER

SHEET 2 OF 2

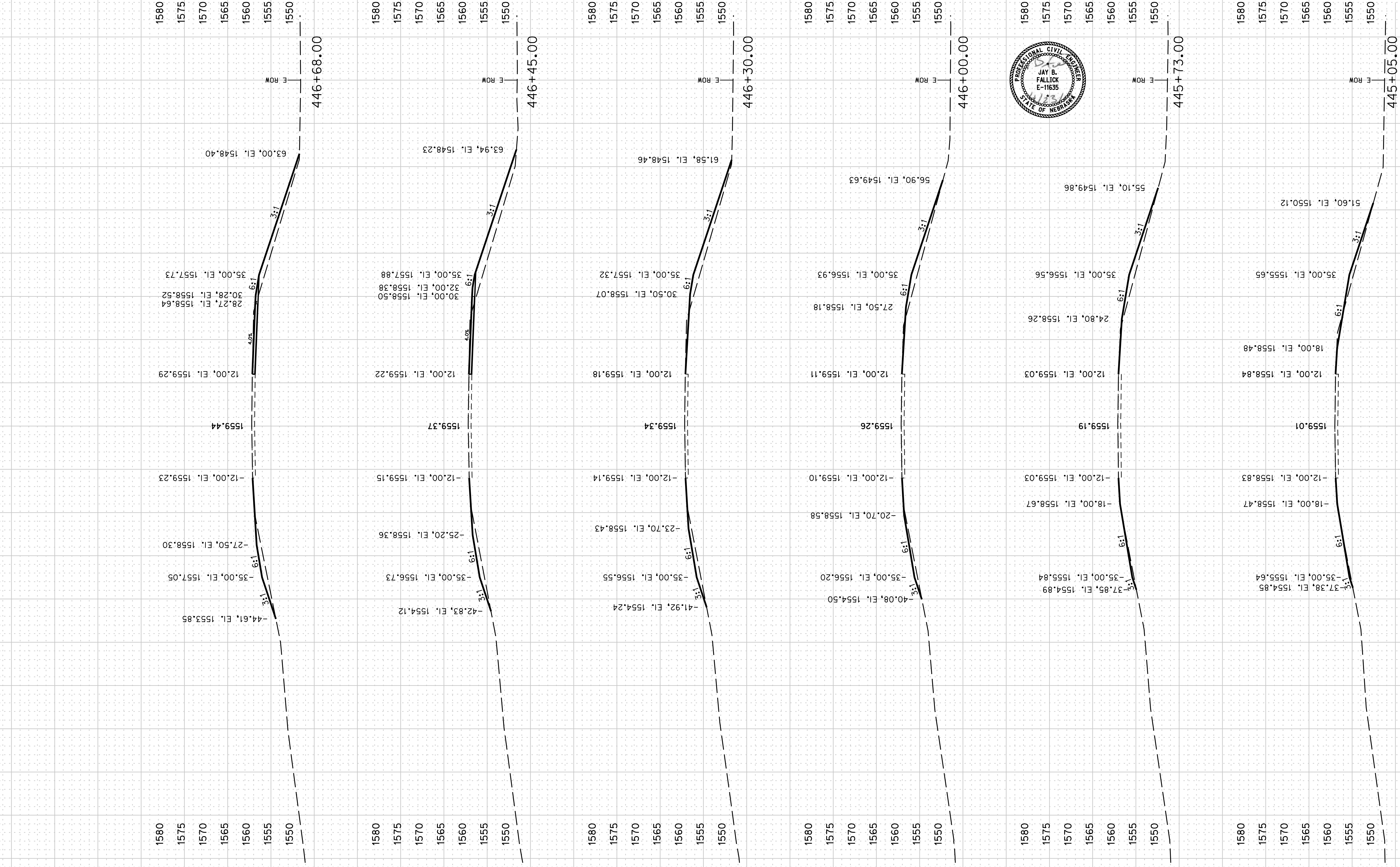
SPECIAL PLAN 3C

JEO CONSULTING GROUP

Horizontal Scale	1 : 10
Vertical Scale	1 : 10

PROJECT NO.	SHEET NO.
ER-39-3(106)	X1

C.N. 42895



ROADWAY DESIGN DIVISION.

Computer: TEMPLEMAN

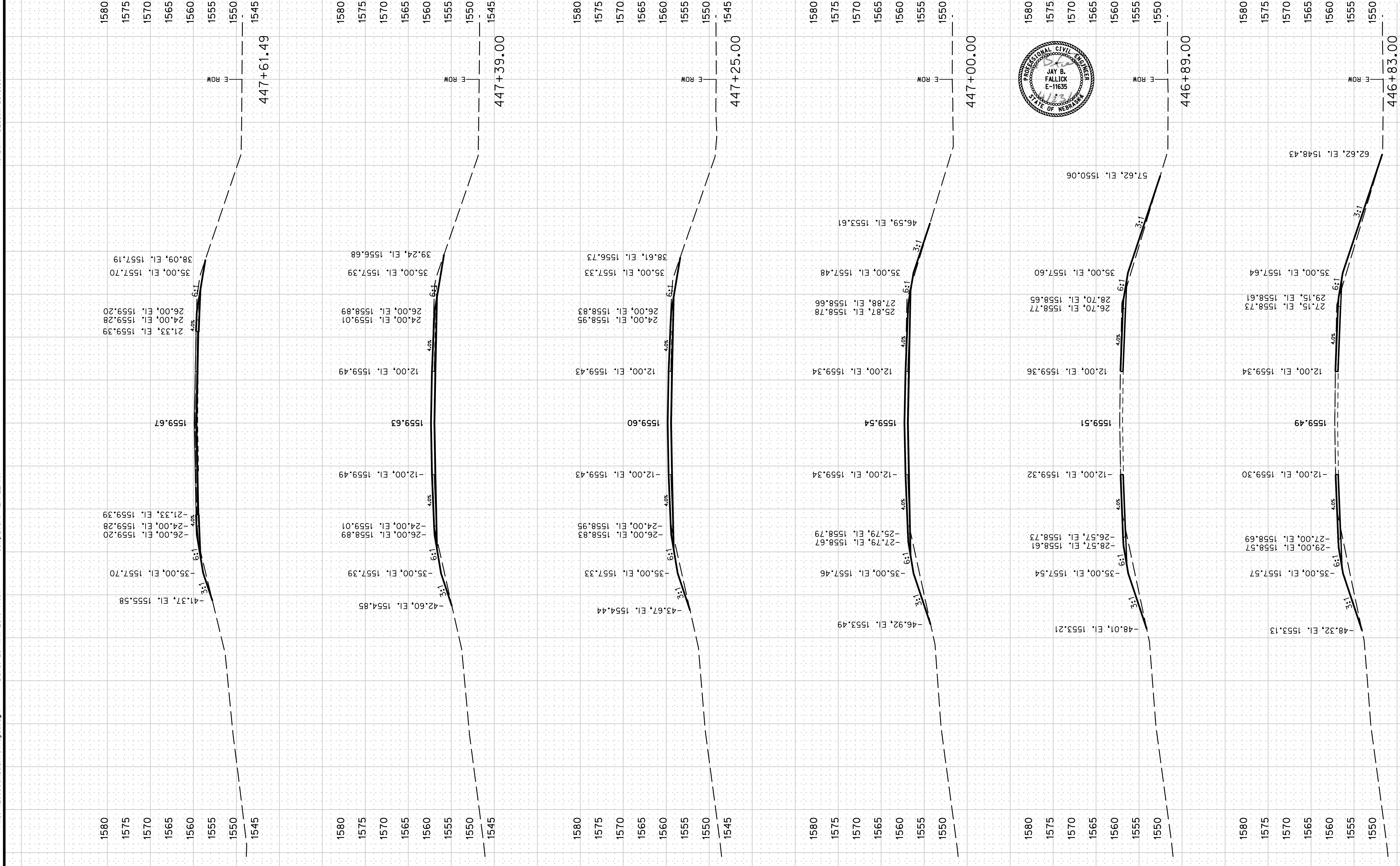
Date: 23-APR-2019 17:07

File: 428950cxs_sht01hwy39.dgn

JEO CONSULTING GROUP

Horizontal Scale	1 : 10
Vertical Scale	1 : 10

PROJECT NO.	SHEET NO.
ER-39-3(106)	X2
C.N. 42895	



447+61.49
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35.00', El. 1557.70
26.00', El. 1559.20
24.00', El. 1559.28
21.33', El. 1559.39
1559.67
-21.33', El. 1559.39
-24.00', El. 1559.28
-26.00', El. 1559.20
-35.00', El. 1557.70
-41.37', El. 1555.58
447+39.00
39.24', El. 1556.68
35.00', El. 1557.39
26.00', El. 1558.89
24.00', El. 1559.01
12.00', El. 1559.49
1559.63
-12.00', El. 1559.49
-24.00', El. 1559.01
-26.00', El. 1558.89
-35.00', El. 1557.39
-42.60', El. 1554.85
447+25.00
38.61', El. 1556.73
35.00', El. 1557.33
26.00', El. 1558.83
24.00', El. 1558.95
12.00', El. 1559.43
1559.60
-12.00', El. 1559.43
-24.00', El. 1558.95
-26.00', El. 1558.83
-35.00', El. 1557.33
-43.67', El. 1554.44
447+00.00
46.59', El. 1553.61
35.00', El. 1557.48
27.88', El. 1558.66
25.87', El. 1558.78
12.00', El. 1559.34
1559.54
-12.00', El. 1559.34
-25.79', El. 1558.79
-27.79', El. 1558.67
-35.00', El. 1557.46
-46.92', El. 1553.49
446+89.00
57.62', El. 1550.06
35.00', El. 1557.60
28.70', El. 1558.65
26.70', El. 1558.77
12.00', El. 1559.36
1559.51
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-26.57', El. 1558.73
-28.57', El. 1558.61
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-48.01', El. 1553.21
446+83.00
62.62', El. 1548.43
35.00', El. 1557.64
29.15', El. 1558.61
27.15', El. 1558.73
12.00', El. 1559.34
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-29.00', El. 1558.57
-35.00', El. 1557.57
-48.32', El. 1553.13
℄ ROW
6:1
3:1
4.0%
PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA

ROADWAY DESIGN DIVISION.

Computer: TEMPLEMAN

Date: 23-APR-2019 17:07

File: 42895Ocxs_sht01hwy39.dgn

JEO CONSULTING GROUP

Horizontal Scale	1 : 10
Vertical Scale	1 : 10

PROJECT NO.	SHEET NO.
ER-39-3(106)	X3

C.N. 42895

ROADWAY DESIGN DIVISION.

Computer: TEMPLEMAN

Date: 23-APR-2019 17:07

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JEO CONSULTING GROUP

Horizontal Scale	1 : 10	PROJECT NO.	SHEET NO.
Vertical Scale	1 : 10	ER-39-3(106)	X4

C.N. 42895

ROADWAY DESIGN DIVISION.

Computer: TEMPLEMAN

Date: 23-APR-2019 17:07

File: 428950cxs_sht01hwy39.dgn

JAY B. FALLICK E-11635 PROFESSIONAL CIVIL ENGINEER STATE OF NEBRASKA

452+37.00 E ROW

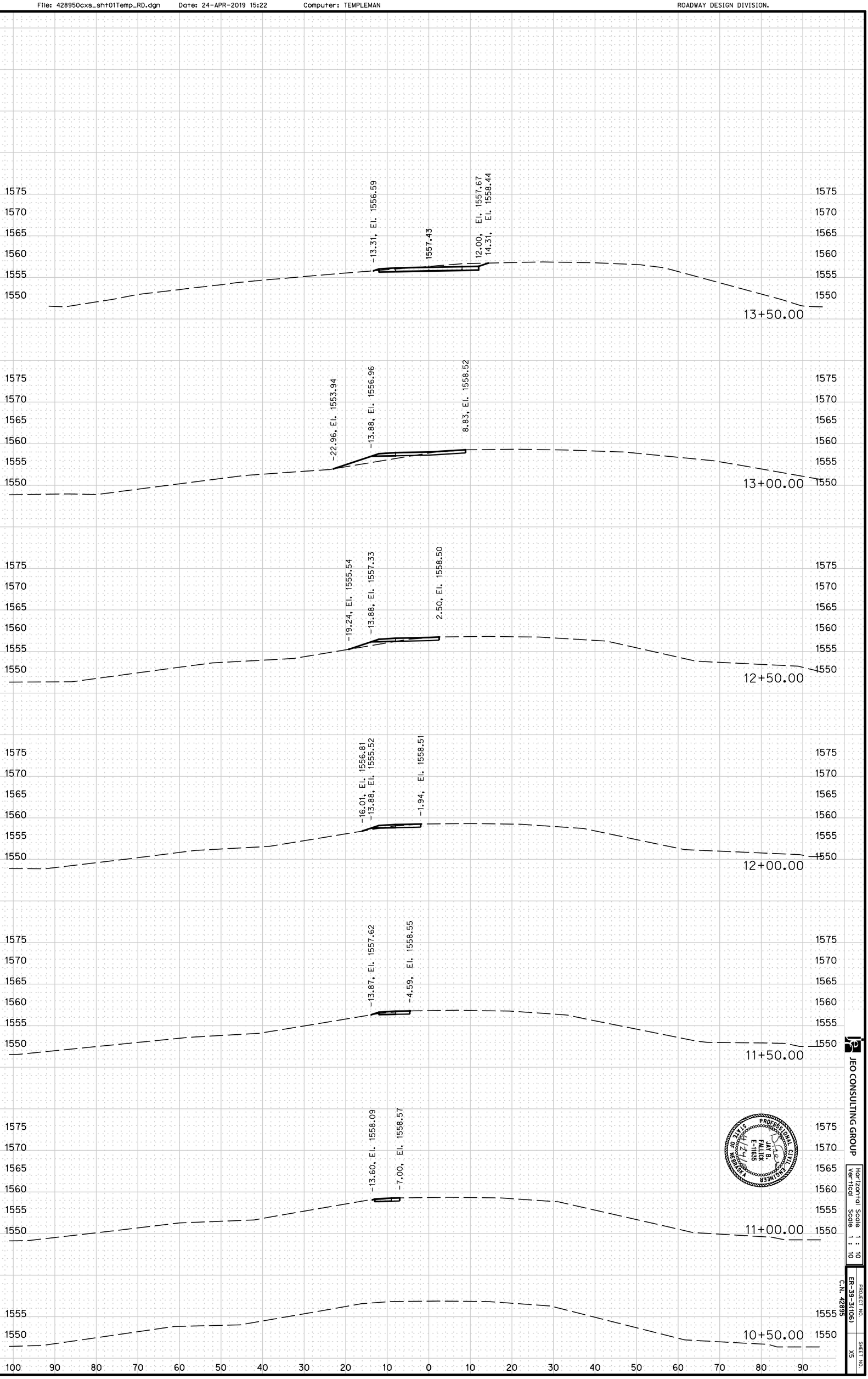
452+00.00 E ROW

451+80.00 E ROW

451+65.00 E ROW

451+42.00 E ROW

451+27.00 E ROW



JEO CONSULTING GROUP

PROFESSIONAL ENGINEER
STATE OF NEBRASKA
JAY B. FALLICK
E-11635

Horizontal Scale 1 : 10
Vertical Scale 1 : 10

PROJECT NO. ER-39-3(106)
C.N. 42895

SHEET NO. X5

JEO CONSULTING GROUP

Horizontal Scale	1 : 10
Vertical Scale	1 : 10

PROJECT NO.	SHEET NO.
ER-39-3(106)	X6

C.N. 42895

14+00.00

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15.73, El. 1558.14
1556.66
-14.41, El. 1555.45
-21.42, El. 1553.12

14+50.00

12.00, El. 1556.03
14.66, El. 1556.92
1555.79
-14.41, El. 1554.59
-21.54, El. 1552.21

15+00.00

12.00, El. 1555.17
12.04, El. 1555.16
1554.93
-14.41, El. 1553.72
-21.56, El. 1551.34

15+50.00

12.00, El. 1554.31
12.60, El. 1554.10
1554.07
-14.41, El. 1552.86
-21.90, El. 1550.37

16+00.00

12.00, El. 1553.44
13.07, El. 1553.08
1553.20
-14.41, El. 1552.00
-22.27, El. 1549.38

16+50.00

12.00, El. 1552.58
12.23, El. 1552.50
1552.34
-14.41, El. 1551.13
-23.76, El. 1548.01

17+00.00

12.00, El. 1551.77
12.44, El. 1551.91
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ROADWAY DESIGN DIVISION.

Computer: TEMPLEMAN

Date: 24-APR-2019 15:22

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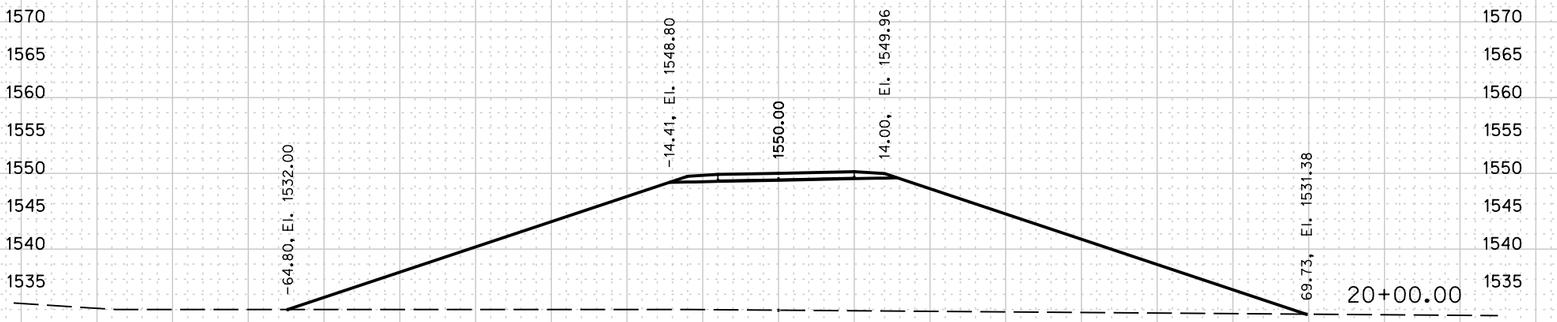
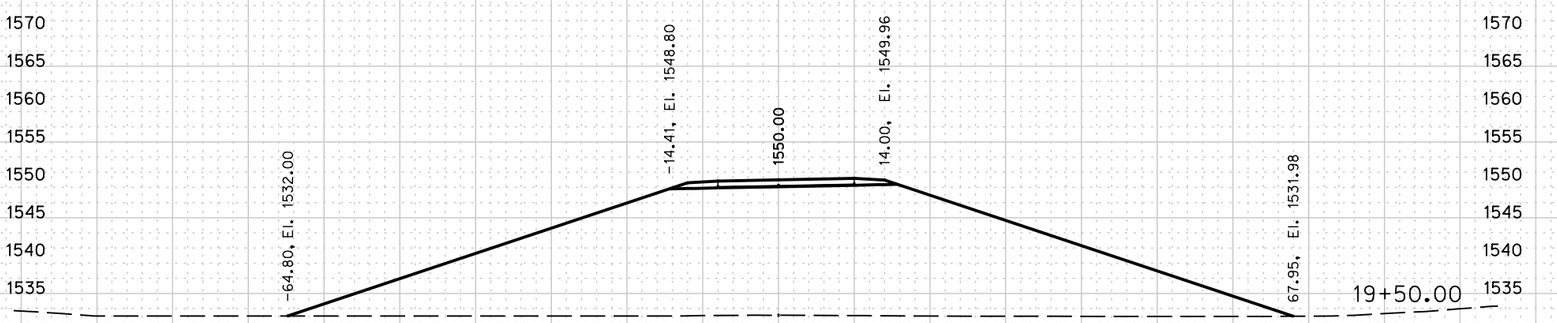
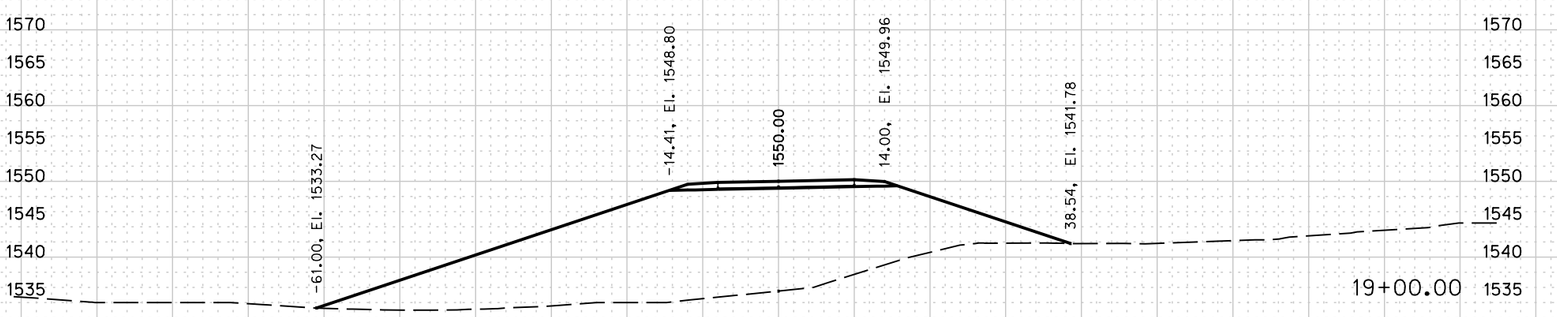
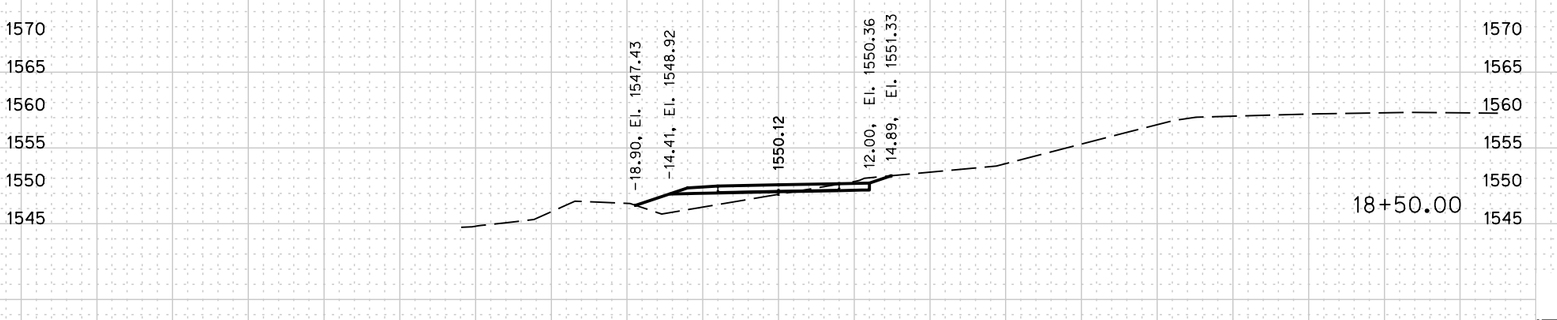
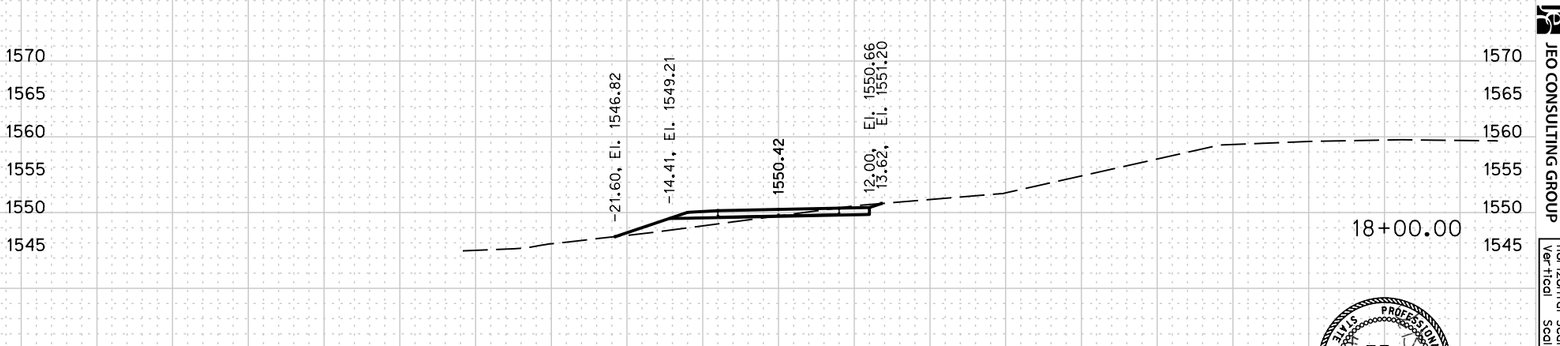
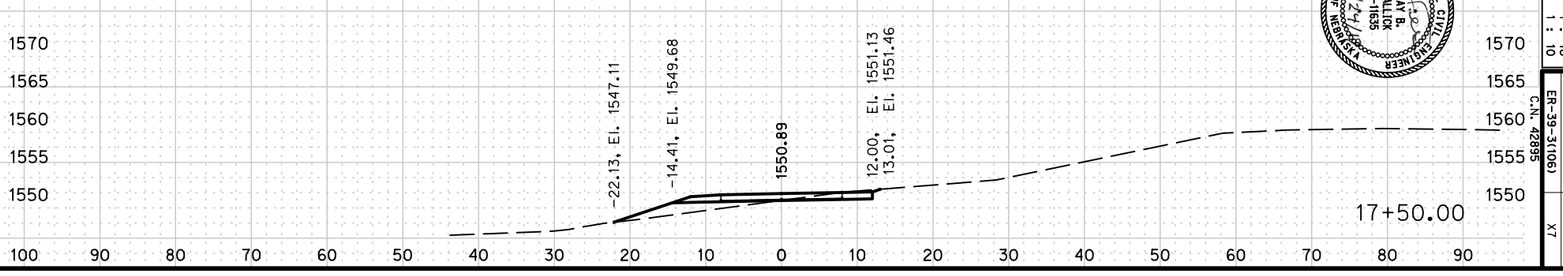












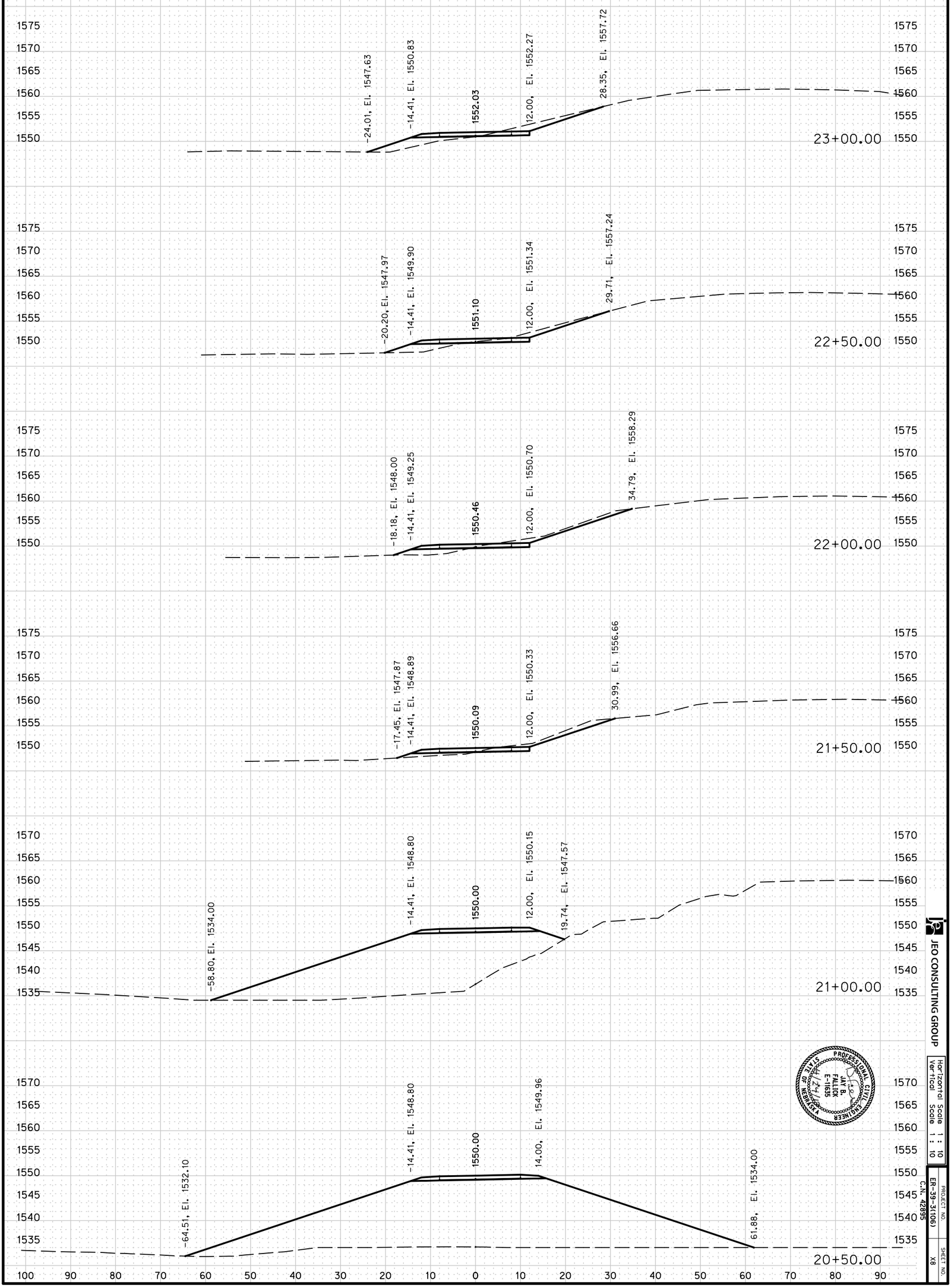
JEO CONSULTING GROUP

Horizontal Scale 1 : 10
Vertical Scale 1 : 10

PROFESSIONAL ENGINEER
STATE OF NEBRASKA
JAY B. FALLICK
E-11635

PROJECT NO. ER-39-3(106) C.N. 42885

SHEET NO. X7



JEO CONSULTING GROUP

PROFESSIONAL ENGINEER
JAY B. FALLICK
E-11635
STATE OF FLORIDA

Horizontal Scale	1 : 10
Vertical Scale	1 : 10
PROJECT NO.	ER-39-3(106)
C.N.	428950
SHEET NO.	X8

JEO CONSULTING GROUP

Horizontal Scale 1 : 10
Vertical Scale 1 : 10

PROJECT NO.	SHEET NO.
ER-39-3(106)	X9

C.N. 42895

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
4/24/19
STATE OF NEBRASKA

ROADWAY DESIGN DIVISION.

Computer: TEMPLEMAN

Date: 24-APR-2019 15:22

File: 42895cxs_sht01Temp_RD.dgn

JEO CONSULTING GROUP

Horizontal Scale	1 : 10
Vertical Scale	1 : 10

PROJECT NO.	SHEET NO.
ER-39-3(106)	X10

C.N. 42895

ROADWAY DESIGN DIVISION.

Computer: TEMPLEMAN

Date: 24-APR-2019 15:22

File: 428950cxs_sht01Temp_RD.dgn

PROFESSIONAL CIVIL ENGINEER
JAY B. FALLICK
E-11635
4/24/19
STATE OF NEBRASKA

29+00.00

-5.26, El. 1564.16

-12.02, El. 1563.86

28+50.00

-2.76, El. 1563.95

-12.00, El. 1563.60

-13.44, El. 1563.12

28+00.00

-0.46, El. 1563.69

-13.88, El. 1562.68

-15.24, El. 1562.23

27+50.00

2.65, El. 1563.43

-13.88, El. 1562.31

-17.50, El. 1561.11

27+00.00

8.82, El. 1563.18

-13.88, El. 1561.58

-37.13, El. 1553.83

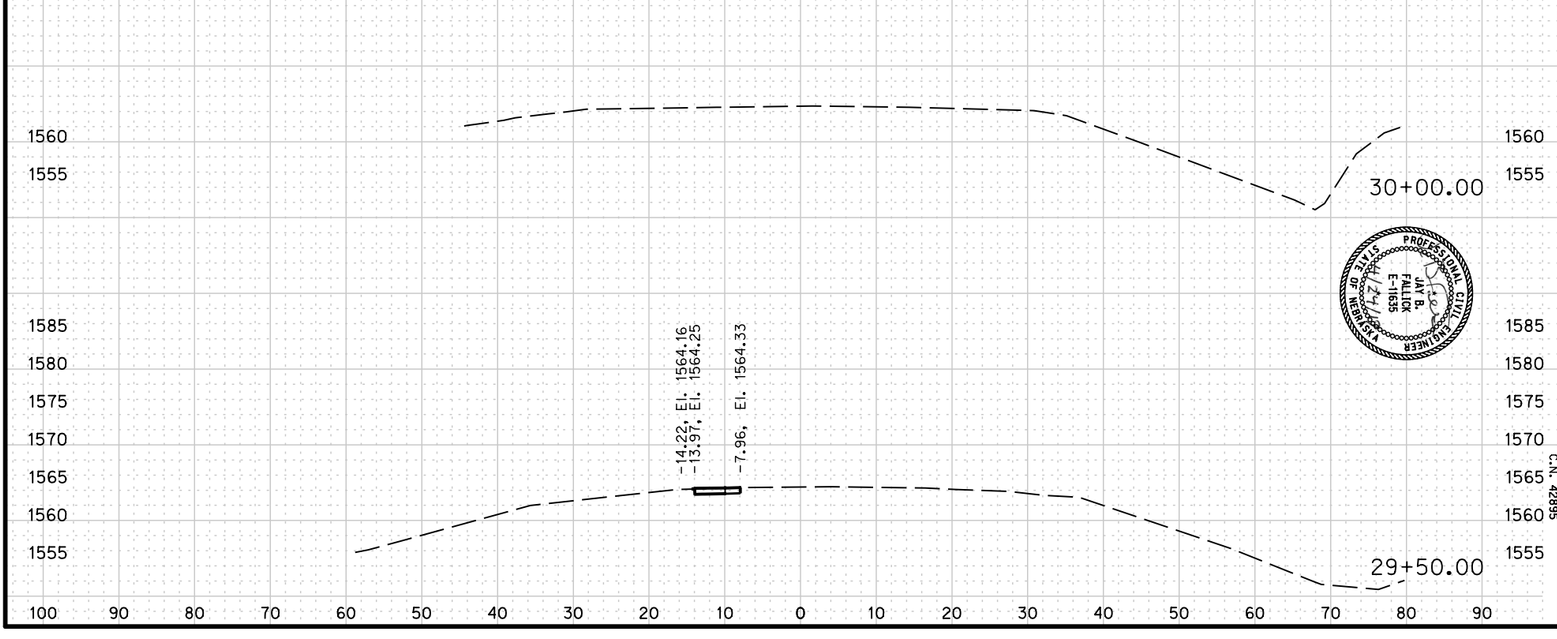
26+50.00

12.00, El. 1561.85

15.44, El. 1562.99

-13.88, El. 1560.56

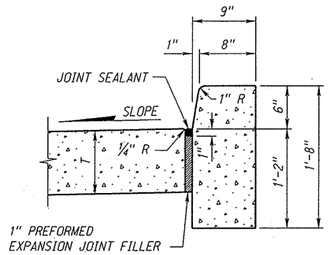
-38.58, El. 1552.32



JEO CONSULTING GROUP

PROFESSIONAL ENGINEER
JAY B. FALLICK
E-11635
STATE OF NEBRASKA
4/24/19

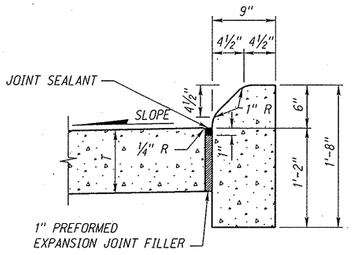
Horizontal Scale	1 : 10
Vertical Scale	1 : 10
PROJECT NO.	ER-39-3(106)
C.N.	42885
SHEET NO.	X11



CONCRETE BARRIER CURB *

QUANTITIES

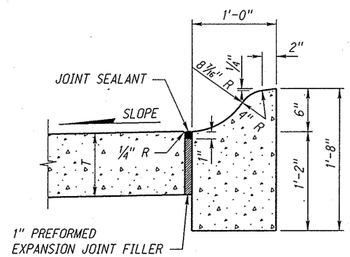
CONCRETE	*4.55 CU. YDS./STA.*
AREA	*1.228 SQ. FT.*



CONCRETE MEDIAN CURB *

QUANTITIES

CONCRETE	*4.42 CU. YDS./STA.*
AREA	*1.192 SQ. FT.*

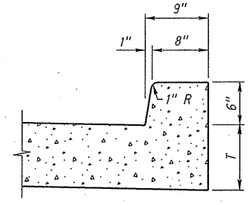


CONCRETE CURB, * TYPE I

QUANTITIES

CONCRETE	*5.22 CU. YDS./STA.*
AREA	*1.408 SQ. FT.*

*NOTE: * ONE INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED AT INTERVALS OF NOT MORE THAN 100 FEET THRU CONCRETE BARRIER CURB, CONCRETE MEDIAN CURB, AND CONCRETE CURB, TYPE I.*

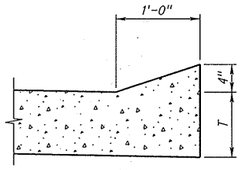


NOTE: MAY BE USED WHEN T IS LESS THAN 1 FOOT.

INTEGRAL CONCRETE BARRIER CURB

QUANTITIES

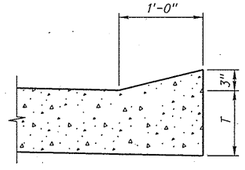
CONCRETE	*1.33 CU. YDS./STA.*
AREA	*0.359 SQ. FT.*



INTEGRAL CONCRETE SLOPING CURB

QUANTITIES

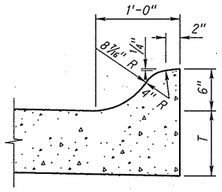
CONCRETE	*0.62 CU. YDS./STA.*
AREA	*0.167 SQ. FT.*



INTEGRAL CONCRETE SLOPING CURB

QUANTITIES

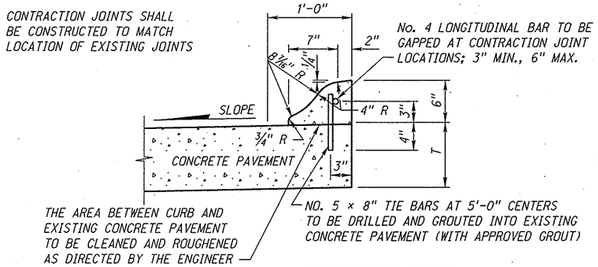
CONCRETE	*0.46 CU. YDS./STA.*
AREA	*0.123 SQ. FT.*



INTEGRAL CONCRETE CURB

QUANTITIES

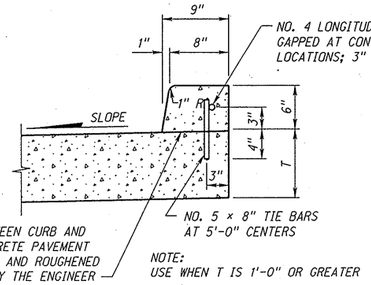
CONCRETE	*0.89 CU. YDS./STA.*
AREA	*0.239 SQ. FT.*



CONCRETE CURB, TYPE II

QUANTITIES

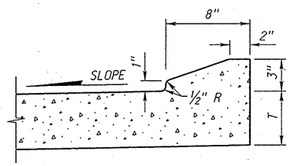
CONCRETE	*0.87 CU. YDS./STA.*
AREA	*0.234 SQ. FT.*



CONCRETE BARRIER CURB ALTERNATE

QUANTITIES

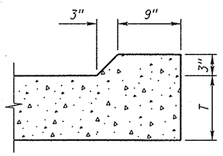
CONCRETE	*1.33 CU. YDS./STA.*
AREA	*0.359 SQ. FT.*



INTEGRAL CONCRETE TRUCK APRON CURB

QUANTITIES

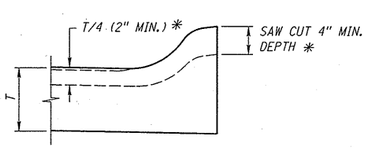
CONCRETE	*0.47 CU. YDS./STA.*
AREA	*0.127 SQ. FT.*



EROSION CONTROL CURB

QUANTITIES

CONCRETE	*0.81 CU. YDS./STA.*
AREA	*0.219 SQ. FT.*



CONTRACTION JOINT THRU CURB

* *FOR NON-INTEGRAL CURB THE CONTRACTION JOINTS MAY BE MADE WITH A DOUBLE EDGER WHILE THE CONCRETE IS STILL PLASTIC.*

NOTE: T = PAVEMENT THICKNESS

REV. NO.	DATE	DESCRIPTION OF REVISION
R12	JAN 18	NDOR BORDER TO NDOT BORDER
R11	JUL 15	ADDED TRUCK APRON CURB
R10	FEB 09	MULTIPLE REVISIONS

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 301-R12

PAVEMENT DETAILS

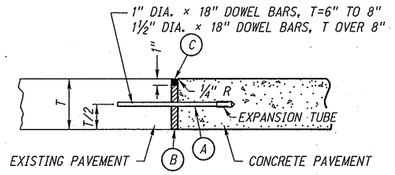
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

MARY BURROUGHS

12/6/2017
DATE

PROFESSIONAL CIVIL ENGINEER
MICHAEL H. OWEN
E-6515
STATE OF NEBRASKA

ORIGINAL:
JANUARY 31, 1974
DATE



(A) GREASE DOWEL BAR ON EXPANSION TUB SIDE
(B) 1" PREFORMED EXPANSION JOINT FILLER
(C) JOINT SEALANT

NOTES:

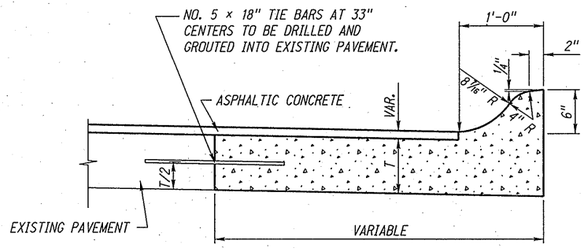
DOWEL BARS SHALL BE DRILLED TO A DEPTH OF 8" INTO EXISTING PAVEMENT AND GROUTED.

DOWEL BARS SHALL BE PLACED AT 1 FOOT CENTERS. THE OUTSIDE DOWEL BAR SHALL BE PLACED 6" FROM THE EDGE OF THE PAVEMENT.

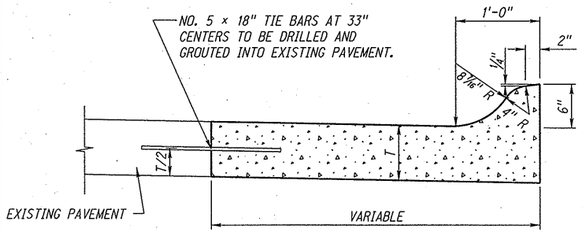
THIS JOINT SHALL BE CONSTRUCTED TRANSVERSE TO THE ROADWAY WHERE THE NEW CONCRETE ABUTS THE EXISTING CONCRETE.

DOWEL BARS SHALL BE PLACED PARALLEL TO THE ROADWAY ℄ AND TO THE ROAD BED.

EXPANSION JOINT (SUBSIDIARY)

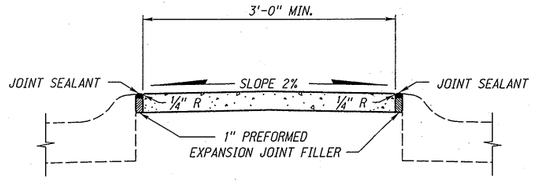


CONCRETE BASE COURSE W/INTEGRAL CURB



THE FOLLOWING NOTE IS TYPICAL FOR CONCRETE BASE COURSE WITH INTEGRAL CURB AND CONCRETE PAVEMENT WIDENING: CONTRACTION AND EXPANSION JOINTS SHALL BE CONSTRUCTED TO MATCH LOCATIONS OF EXISTING JOINTS.

CONCRETE PAVEMENT WIDENING



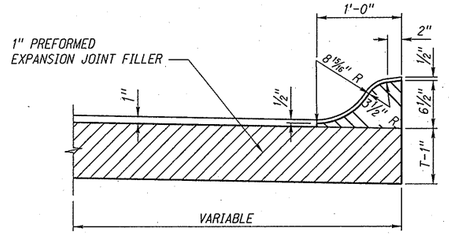
CONCRETE MEDIAN SURFACING

ONE INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED ACROSS THE FULL WIDTH OF THE MEDIAN SURFACING AT INTERVALS OF NOT MORE THAN 49 FEET.

LONGITUDINAL JOINTS ONE INCH DEEP SHALL BE MADE IN ALL MEDIANS WHEN SURFACING WIDTH IS 16 FEET OR GREATER.

TRANSVERSE JOINTS ONE INCH DEEP SHALL BE MADE IN ALL MEDIANS AT INTERVALS OF NOT MORE THAN 8 FEET.

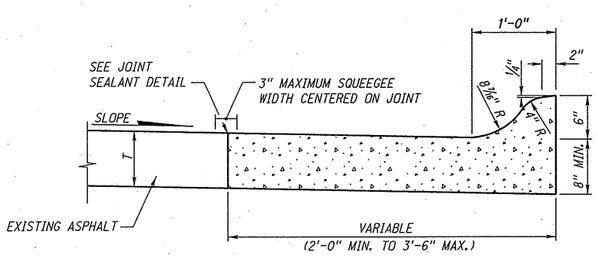
TRANSVERSE AND LONGITUDINAL JOINTS SHALL NOT BE FILLED.



ONE INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED AT INTERSECTION RETURNS AND WHERE SHOWN ON THE PLANS. TRANSVERSE JOINTS SHALL BE PLACED EVERY 8 FEET OR WHERE SHOWN ON THE PLANS.

NOTE:
RECESS THE EXPANSION JOINT FILLER 1/2" FROM THE TOP SURFACE OF THE CURB UNDER CONSTRUCTION

DETAIL FOR CUTTING & PLACEMENT OF EXPANSION JOINT FILLER

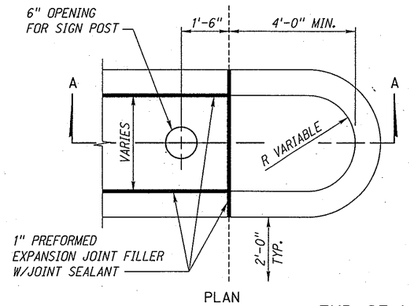


COMBINATION CONCRETE CURB & GUTTER

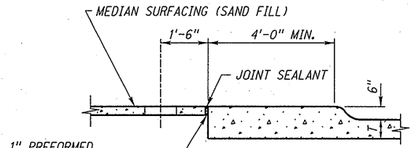
NOTE:

TRANSVERSE JOINTS SHALL BE PLACED EVERY 8 FEET AND JOINTS SHALL BE PLACED AT EACH HEADER, 2-NO. 5 x 18" TIE BARS ARE TO BE USED.

PLACE 1" PREFORMED EXPANSION JOINT FILLER AND SEAL AT THE RETURN OF RADIUS AT INTERSECTIONS.

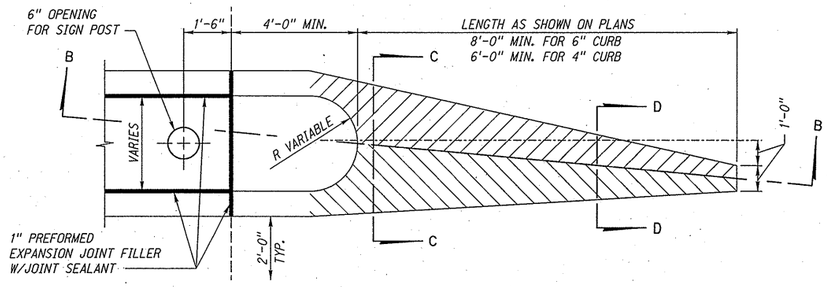


PLAN

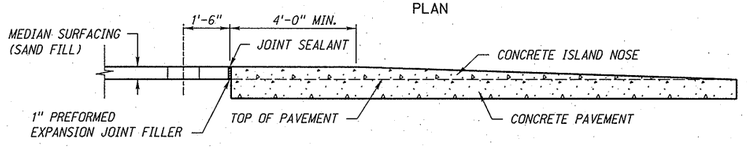


SECTION A-A

END OF MEDIAN ISLAND



PLAN



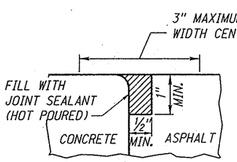
SECTION B-B

SECTION C-C

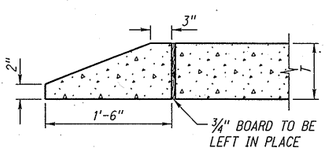
SECTION D-D

CONCRETE ISLAND NOSE

NOTE:
EXISTING CONCRETE PAVEMENT IS TO BE REMOVED TO BUILD CONCRETE ISLAND NOSE.



JOINT SEALANT DETAIL



CONCRETE HEADER

NOTE: T = PAVEMENT THICKNESS

REV. NO.	DATE	DESCRIPTION OF REVISION
R12	JAN 18	NDOR BORDER TO NDOT BORDER
R11	JUL 15	ADDED TRUCK APRON CURB
R10	FEB 09	MULTIPLE REVISIONS

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 301-R12

PAVEMENT DETAILS

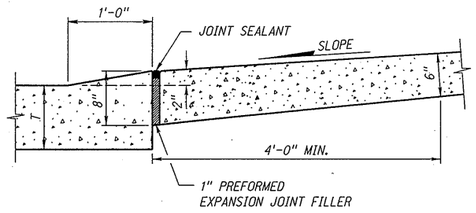
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

MARY BURROUGHS
12/6/2017
DATE

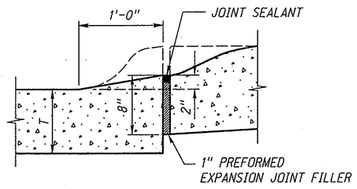
PROFESSIONAL CIVIL ENGINEER
MICHAEL H. OWEN
E-6515
12-4-17
STATE OF NEBRASKA

ORIGINAL:
JANUARY 31, 1974
DATE

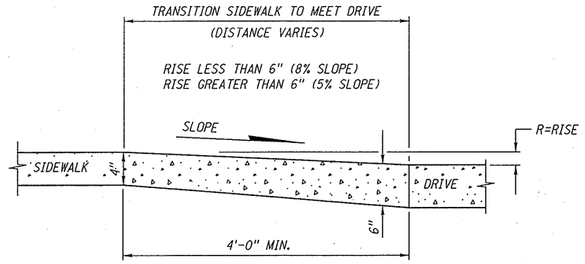
2/3



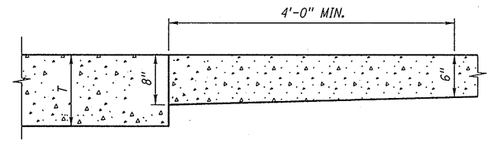
SECTION E-E



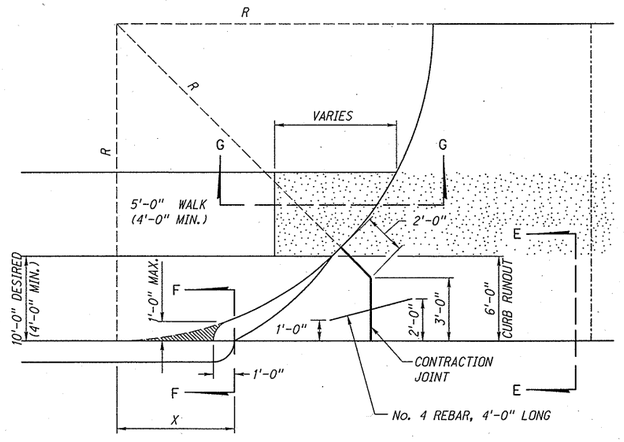
SECTION F-F



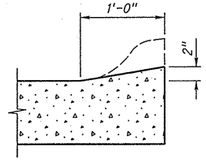
SECTION G-G



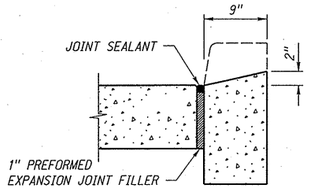
(RURAL DRIVEWAY)



URBAN DRIVEWAY PLAN

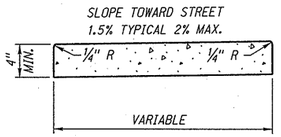


INTEGRAL CURB

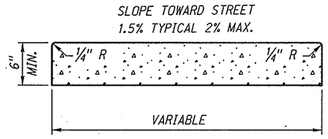


BARRIER CURB

DETAILS OF CURB DROPS



SIDEWALK



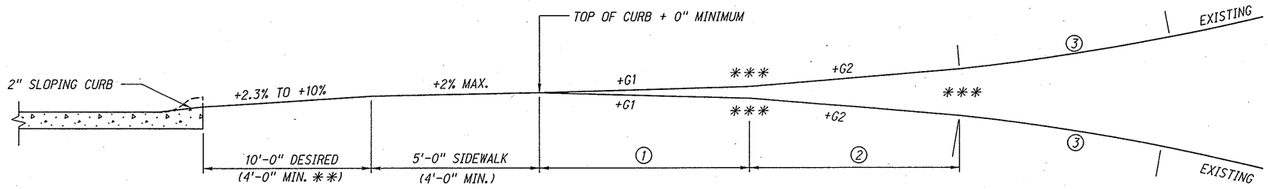
SIDEWALK AT
DRIVEWAY

NOTE:

1 INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED IN ALL SIDEWALKS OR CROSSWALKS AT INTERVALS OF NOT MORE THAN 50 FOOT, AND AT ALL POINTS WHERE SIDEWALKS OR CROSSWALKS ARE ADJACENT TO CURB. IF SIDEWALK OR CROSSWALK TO BE CONSTRUCTED IS LESS THAN 50 FOOT IN LENGTH, ONE SUCH EXPANSION JOINT SHALL BE PLACED AS DIRECTED BY THE ENGINEER.

R	X
10'-0"	4.6'
15'-0"	5.6'
20'-0"	6.0'
25'-0"	7.0'
30'-0"	8.0'
35'-0"	8.6'
40'-0"	9.0'

R = RADIUS
X = $\sqrt{(2R-1)}$
(X & R IN FEET)



DRIVEWAY TYPE	G1 (MAX.)	G2 (MAX.)
COMMERCIAL, INDUSTRIAL	±5%	±8%
DWELLINGS (RESIDENTIAL)	±8%	±15%

PROFILE URBAN DRIVEWAY WITH SIDEWALK
(MAXIMUM PERCENT OF GRADE)

① 10'-0" MINIMUM IS REQUIRED WHEN THE EXISTING GRADE IS GREATER THAN ±8%
② 10'-0" MINIMUM IS REQUIRED WHEN THE EXISTING GRADE IS GREATER THAN ±15%
③ 10'-0" MINIMUM ROUNDING IS REQUIRED WHEN THE EXISTING GRADE IS GREATER THAN ±22%

***0 FEET IS ALLOWED IN URBAN BUSINESS DISTRICTS WITH SIDEWALKS OF 6 FEET MINIMUM WIDTH.*
**** 10 FEET MINIMUM ROUNDING DESIRABLE FOR THE FOLLOWING GRADE CHANGES.*

NOTE: T = PAVEMENT THICKNESS

REV. NO.	DATE	DESCRIPTION OF REVISION
R12	JAN 18	NDOR BORDER TO NDOT BORDER
R11	JUL 15	ADDED TRUCK APRON CURB
R10	FEB 09	MULTIPLE REVISIONS

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 301-R12

PAVEMENT DETAILS

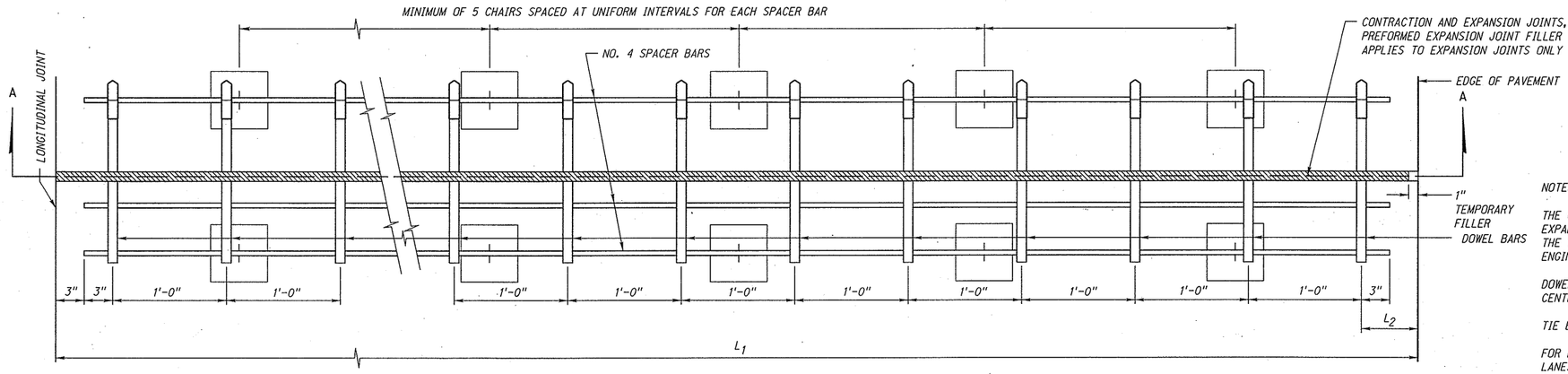
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

PROFESSIONAL CIVIL ENGINEER
MICHAEL H. OWEN
E-6515
STATE OF NEBRASKA

Mary Burroughs
MARY BURROUGHS
12/6/2017
DATE

ORIGINAL:
JANUARY 31, 1974
DATE

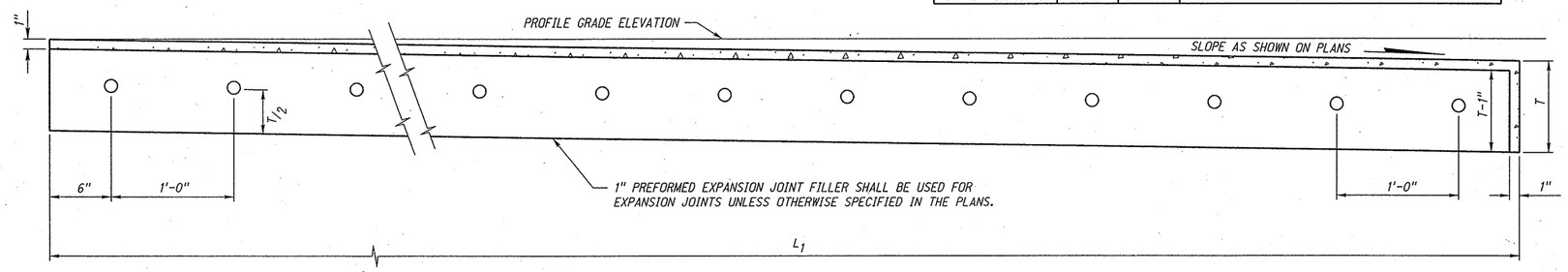
3
3



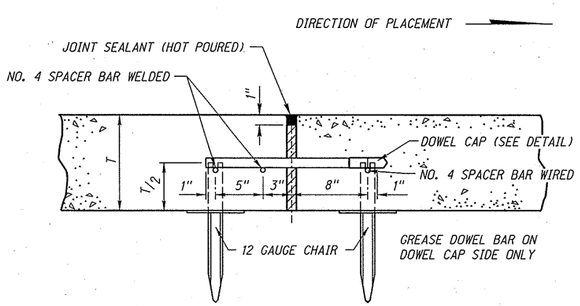
ASSEMBLY PLAN

DOWEL BAR HEIGHT AND DIAMETER			
PAVEMENT THICKNESS (T)	MINIMUM BAR DIA.	DOWEL BAR HEIGHT (T/2)	SKEW TOLERANCE
LESS THAN 10"	1¼"	T/2 ± ½"	¼"
10" OR MORE	1½"	T/2 ± ½"	¼"

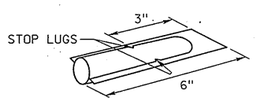
DOWEL BAR LOCATION TABLE			
L_1	L_2	#BARS	DESCRIPTION
* LESS THAN 12'-0'	6"	VARIES	IRREGULAR AREAS (WIDEN, FILLETS, GORE....)
12'-0"	6"	12	12'-0" PAVEMENT
14'-0"	2'-6"	12	14'-0" PAVEMENT
15'-0"	2'-6"	13	15'-0' PAVEMENT (INCLUDES 3'-0" SHOULDER)
16'-0"	3'-6"	13	16'-0" PAVEMENT (INCLUDES 4'-0" SHOULDER)
16'-0"	6"	16	16'-0" RAMP & LOOPS
LESS THAN 14'-6"	1'-6"	VARIES	PAVEMENT WITH CURB
14'-6" OR MORE	2'-6"	VARIES	



SECTION A-A
CONTRACTION AND EXPANSION JOINTS
(PREFORMED EXPANSION JOINTS FILLER APPLIES TO EXPANSION JOINTS ONLY)

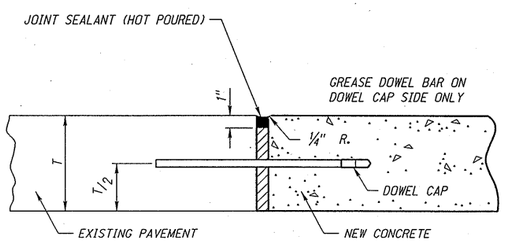


SECTION



DOWEL CAP

EXPANSION JOINT
(SUBSIDIARY)



NOTES:
DOWEL BARS SHALL BE DRILLED TO A DEPTH OF 8" INTO EXISTING PAVEMENT AND GROUTED.

SECTION

NOTES:

THE CONTRACTOR MAY SUBSTITUTE OTHER DESIGNS FOR EXPANSION AND CONTRACTION JOINT SUPPORTS IN LIEU OF THE TYPE SHOWN WITH PRIOR WRITTEN APPROVAL BY THE ENGINEER.

DOWEL BARS SHALL BE A MINIMUM OF 17¾" IN LENGTH, CENTERED ON JOINTS AND BE SMOOTH BARS.

TIE BARS SHALL BE DEFORMED BARS.

FOR LOAD TRANSFER DEVICES AT EXPANSION JOINTS IN LANES OTHER THAN THE LANES SHOWN, MAINTAIN THE SPACING OF THE 1'-6" DOWEL BARS AT 1'-0" INTERVALS.

THE ENDS OF THE NO. 4 SPACER BARS SHALL NOT BE LESS THAN 3" FROM THE EDGES OF THE PAVEMENT OR THE LONGITUDINAL JOINT.

THE CONTRACTOR MAY USE A MACHINE FOR PLACING THE LONGITUDINAL TIE BARS IN LIEU OF THE TIE BAR PINS. IF A MECHANICAL TIE BAR PLACEMENT MACHINE IS NOT USED, TIE BAR PINS AS SHOWN SHALL BE USED.

TIE, DOWEL & SPACER BARS SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS.

KEY TYPE LONGITUDINAL JOINTS AND TRANSVERSE CONSTRUCTION JOINTS SHALL BE EDGED WITH ¼" R. AT TIME OF CONCRETE PLACEMENT.

CONCRETE PAVEMENT SHALL BE TINED UNLESS OTHERWISE SHOWN IN THE PLANS.

EXPANSION JOINTS SHALL BE INSTALLED AT LOCATIONS SHOWN IN THE PLANS.

PAVEMENT PLACED ADJACENT TO R.R. TRACKS REQUIRES 3-EXPANSION JOINTS SPACED AT APPROXIMATELY 49'-6" INTERVALS.

EXPANSION JOINTS SHALL NOT BE SKEWED.

T= PAVEMENT THICKNESS

* THE DEPARTMENT REQUIRES THAT DOWEL BASKETS BE PLACED IN ALL CONTRACTION JOINTS WHICH ARE 6'-0" OR WIDER. THE DOWEL BASKETS SHALL BE PLACED TRANSVERSE TO THE DIRECTION OF THE PREDOMINANT TRAFFIC DIRECTION.

REV. NO.	DATE	DESCRIPTION OF REVISION
R10	JAN 18	CHANGED DOWEL BAR LOCATION TABLE
R9	JUL 11	JOINT: EARLY SAW CUT
R8	OCT 10	CHANGED TINING INFORMATION

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 329-R10

8 TO 16 INCH CONCRETE PAVEMENT

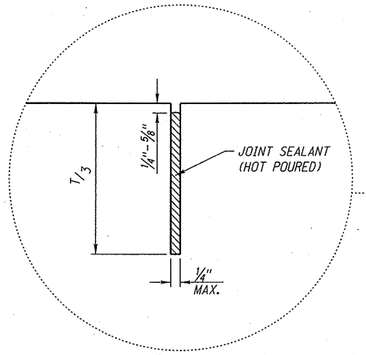
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

PROFESSIONAL CIVIL ENGINEER
NICK S. SYSLO
E-10043
STATE OF NEBRASKA

MARY DARROUGHS
12/6/2017
DATE

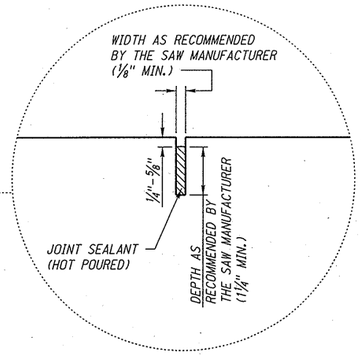
ORIGINAL:
OCTOBER 25, 1994
DATE

1/4



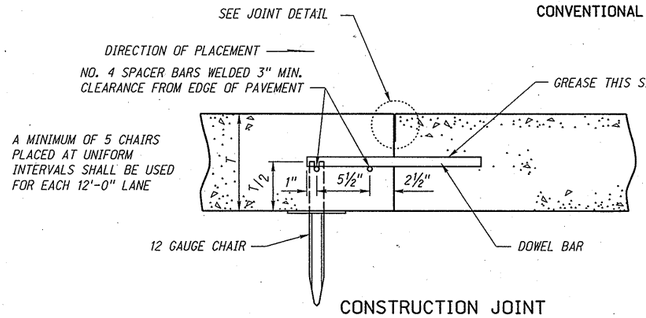
CONVENTIONAL SAWING

OR



EARLY-SAW CUT

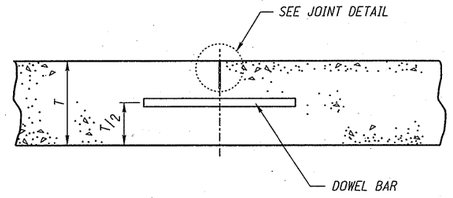
JOINT DETAIL



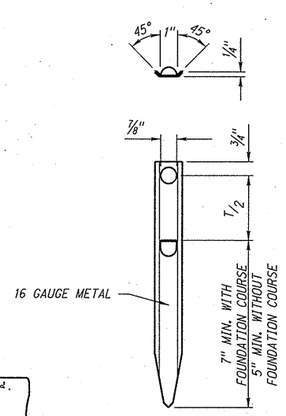
CONSTRUCTION JOINT

(BARS ARE SUBSIDIARY)
TO PAVEMENT

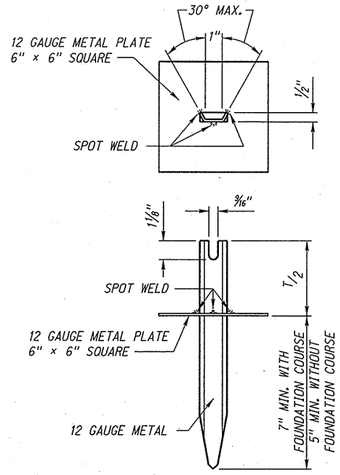
THE DOWEL BAR SPACING SHALL BE THE SAME AS SHOWN FOR THE EXPANSION JOINT. REFER TO DOWEL BAR LOCATION TABLE AND THE DOWEL BAR HEIGHT AND DIAMETER TABLE ON SHEET 1 OF 4.



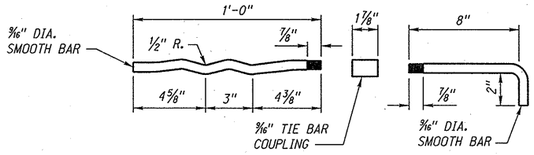
CONTRACTION JOINT



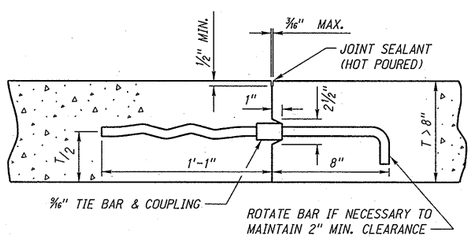
TIE BAR PIN



CHAIR

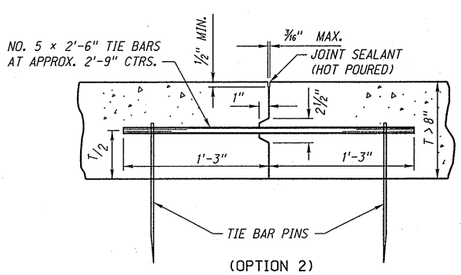


DETAILS OF "W" BAR



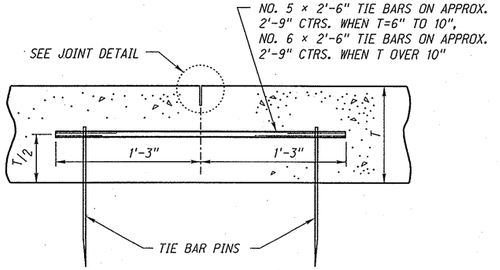
(OPTION 1)
KEY TYPE

NO. 5 HOOK AND W-BARS AT APPROX. 2'-9" CTRS.
OR 3/16" HOOK AND W-BARS AT APPROX. 2'-9" CTRS.



(OPTION 2)
KEY TYPE

KEY TYPE JOINT SHALL BE USED ON ALL LONGITUDINAL CONSTRUCTION JOINTS WHEN THE ADJACENT LANE IS NOT PLACED AT THE SAME TIME

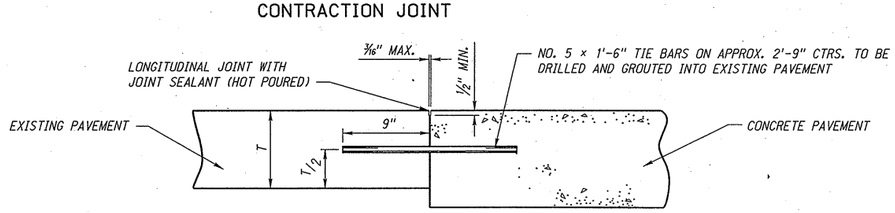


SAWED

WHEN TWO ADJACENT LANES ARE PLACED AT THE SAME TIME, THE LONGITUDINAL JOINT COMMON TO THE LANES SHALL BE SAWED

LONGITUDINAL JOINTS

NOTE:
NO TIE BARS SHALL BE CLOSER THAN 1'-3" TO A TRANSVERSE JOINT. ALL LONGITUDINAL JOINTS BETWEEN LANES AND BETWEEN LANES AND SHOULDERS MUST BE TIED. MEDIAN SHOULD NOT BE TIED.



TIE BARS ARE TO BE INSTALLED WHERE NEW CONCRETE PAVEMENT IS PLACED ADJACENT TO EXISTING CONCRETE PAVEMENT

DETAILS OF TIE BAR

NOTE: T = PAVEMENT THICKNESS

REV. NO.	DATE	DESCRIPTION OF REVISION
R10	JAN 18	CHANGED DOWEL BAR LOCATION TABLE
R9	JUL 11	JOINT: EARLY SAW CUT
R8	OCT 10	CHANGED TINING INFORMATION

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 329-R10

8 TO 16 INCH CONCRETE PAVEMENT

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

PROFESSIONAL CIVIL ENGINEER
NICK S. SYSLO
E-10093
12-12-17
STATE OF NEBRASKA

MARY BURROUGHS
12/6/2017
DATE

ORIGINAL:
OCTOBER 25, 1994
DATE

ROADWAY DESIGN DIVISION
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User: dor13017
Date: 17-NOV-2017 09:05
File: 32906e10.dgn
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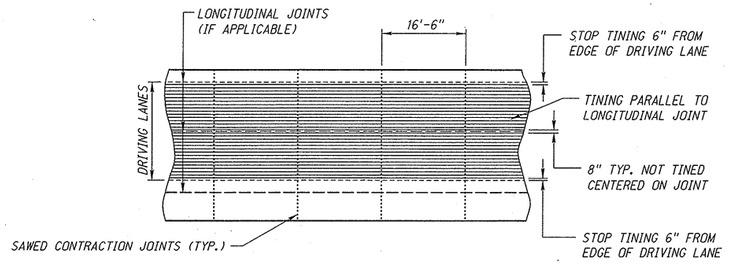
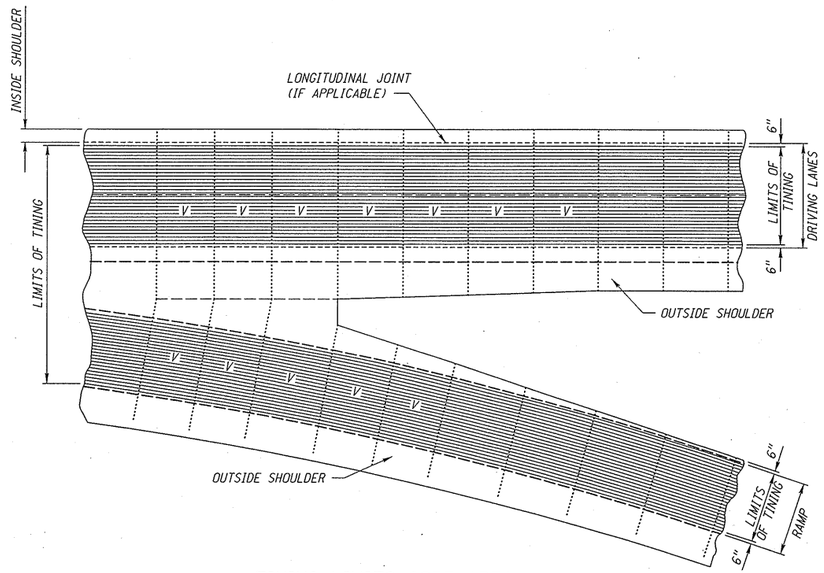
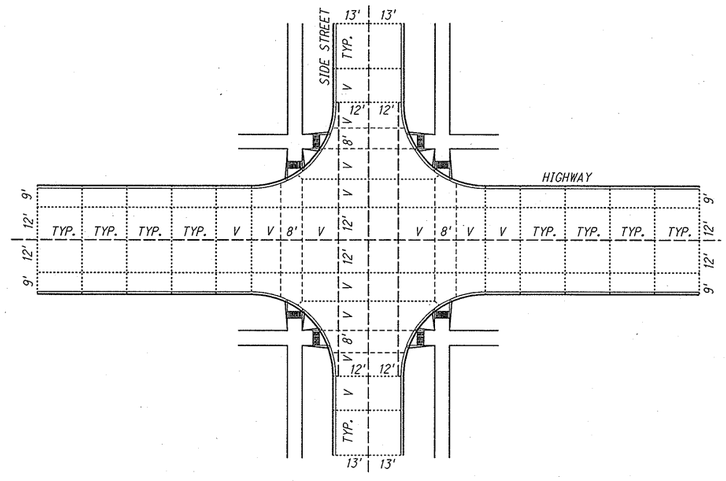


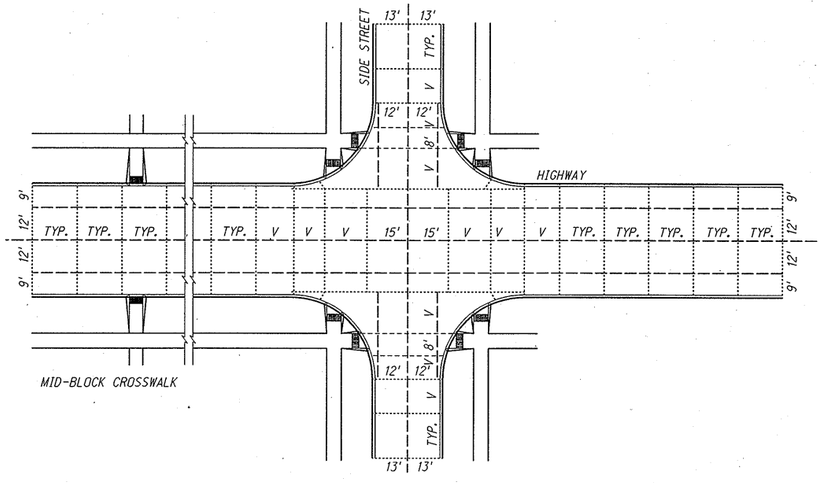
TINING WITH CONCRETE SHOULDER



TINING LIMITS GORE AREA



STOP OR YIELD CONTROL ON ALL FOUR LEGS



STOP OR YIELD CONTROL ON THE SIDE STREETS ONLY

NOTES:

TINING REQUIRED FOR POSTED SPEEDS GREATER THAN 40 MPH.

16'-6" TRANSVERSE JOINT SPACING IS THE STANDARD JOINT SPACING REGARDLESS OF THE PAVEMENT THICKNESS.

V VARIES FROM 10'-0" TO MAX. 16'-6".

THE LONGITUDINAL JOINT BETWEEN THE SHOULDER AND THE 12'-0" DRIVING LANE IS NOT REQUIRED FOR SHOULDER WIDTHS OF 4'-0" OR LESS.

TRANSVERSE JOINTS FOR DOWELED CONCRETE PAVEMENT SHALL BE CONSTRUCTED PERPENDICULAR TO THE ROADWAY.

ALL CONCRETE SURFACES, NOT TINED, WILL REQUIRE TRANSVERSE BROOMING OR BURLAP DRAG. (NOT APPLICABLE TO SHOULDERS)

REV. NO.	DATE	DESCRIPTION OF REVISION
R10	JAN 18	CHANGED DOWEL BAR LOCATION TABLE
R9	JUL 11	JOINT: EARLY SAW CUT
R8	OCT 10	CHANGED TINING INFORMATION

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 329-R10

8 TO 16 INCH CONCRETE PAVEMENT

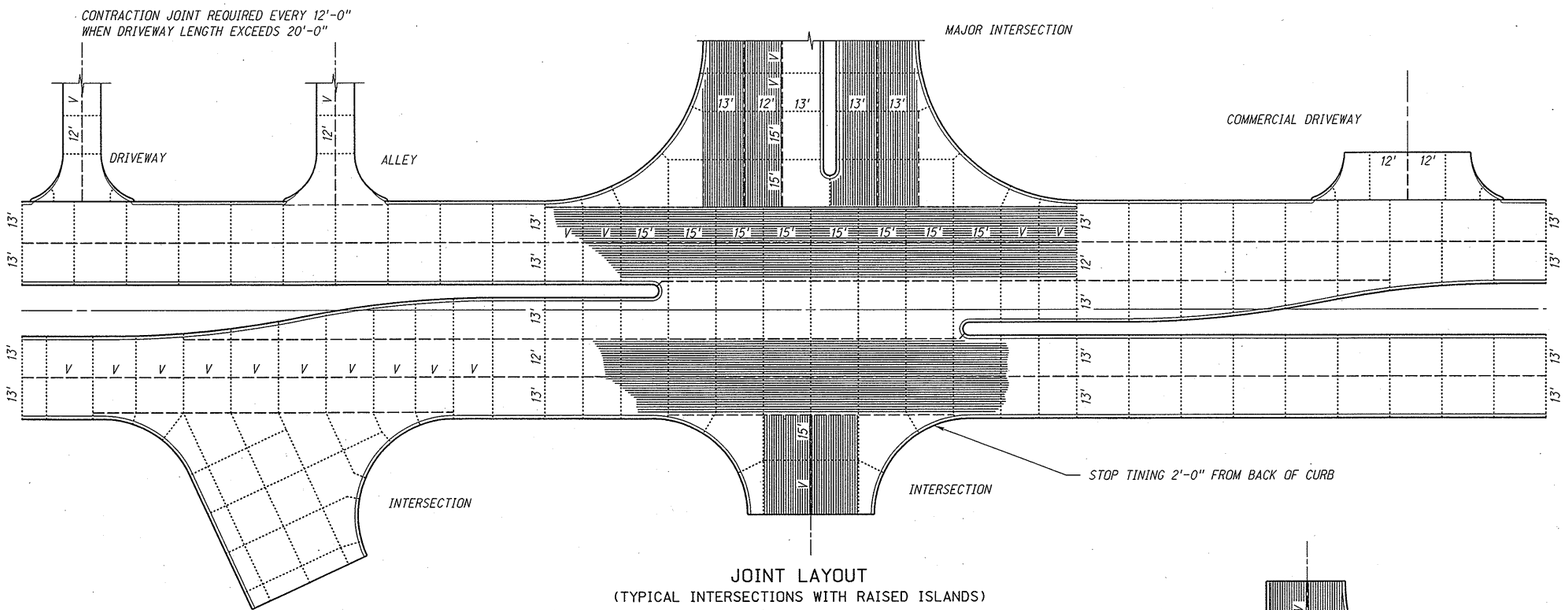
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

PROFESSIONAL CIVIL ENGINEER
MICK S. SYSLO
E-10043
STATE OF NEBRASKA

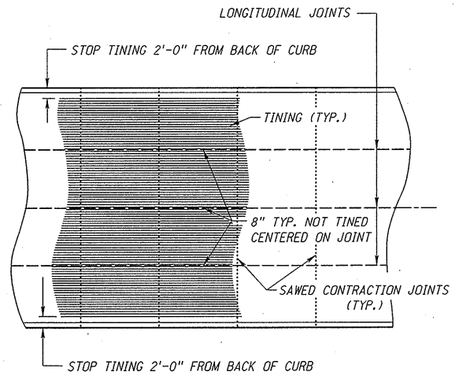
MARY BURROUGHS

12/6/2017
DATE

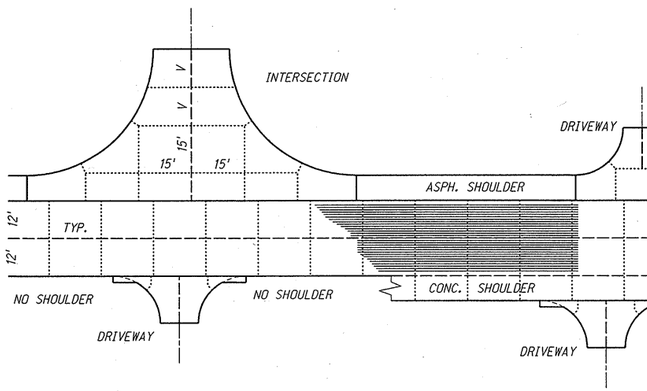
ORIGINAL:
OCTOBER 25, 1994
DATE

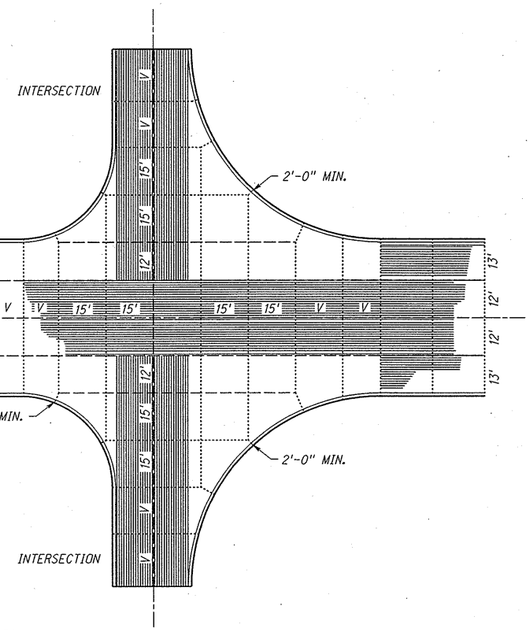


JOINT LAYOUT
(TYPICAL INTERSECTIONS WITH RAISED ISLANDS)

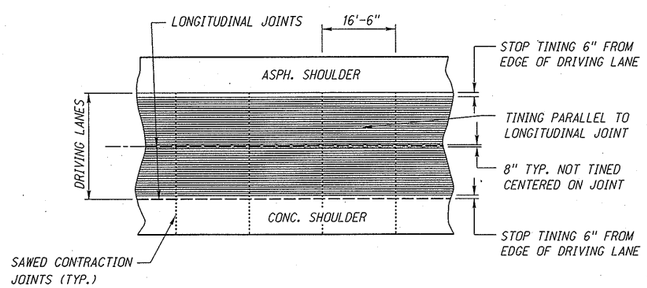


TINING LIMITS





JOINT LAYOUT
(TYPICAL INTERSECTIONS & DRIVES)



RURAL TINING LIMITS WITH SURFACED SHOULDERS

LEGEND

..... SAWED CONTRACTION JOINT

———— LONGITUDINAL JOINT

NOTES:

TINING REQUIRED FOR POSTED SPEEDS GREATER THAN 40 MPH.

16'-6" TRANSVERSE JOINT SPACING IS THE STANDARD JOINT SPACING REGARDLESS OF THE PAVEMENT THICKNESS.

V VARIES FROM 10'-0" TO MAX. 16'-6".

VARIABLE SPACING IS USED AROUND INTERSECTIONS AND LARGE DRIVEWAYS WHICH IS TIED TO THE CONCRETE LANES OR SHOULDERS TO MATCH THE JOINTS.

ALL CONCRETE SURFACES, NOT TINED, WILL REQUIRE TRANSVERSE BROOMING OR BURLAP DRAG. (NOT APPLICABLE TO SHOULDERS)

REV. NO.	DATE	DESCRIPTION OF REVISION
R10	JAN 18	CHANGED DOWEL BAR LOCATION TABLE
R9	JUL 11	JOINT: EARLY SAW CUT
R8	OCT 10	CHANGED TINING INFORMATION

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 329-R10

8 TO 16 INCH CONCRETE PAVEMENT

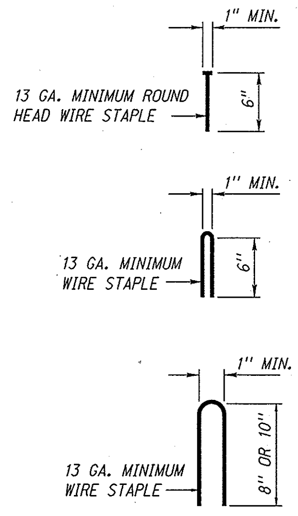
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

MARK S. SYSLO E-10043 PROFESSIONAL CIVIL ENGINEER STATE OF NEBRASKA

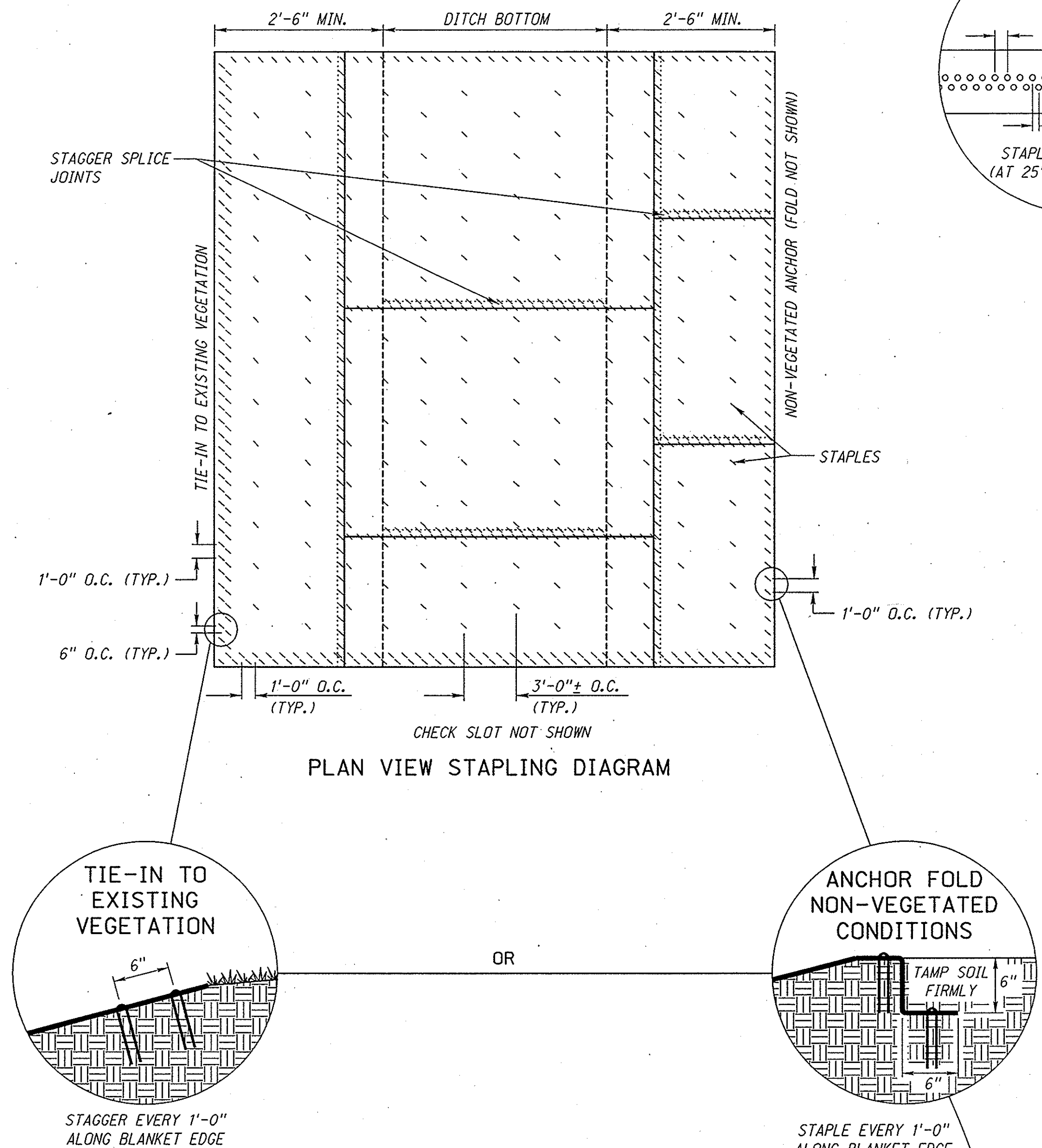
Mary Buroughs
MARY BUROUGHS
12/16/2017
DATE

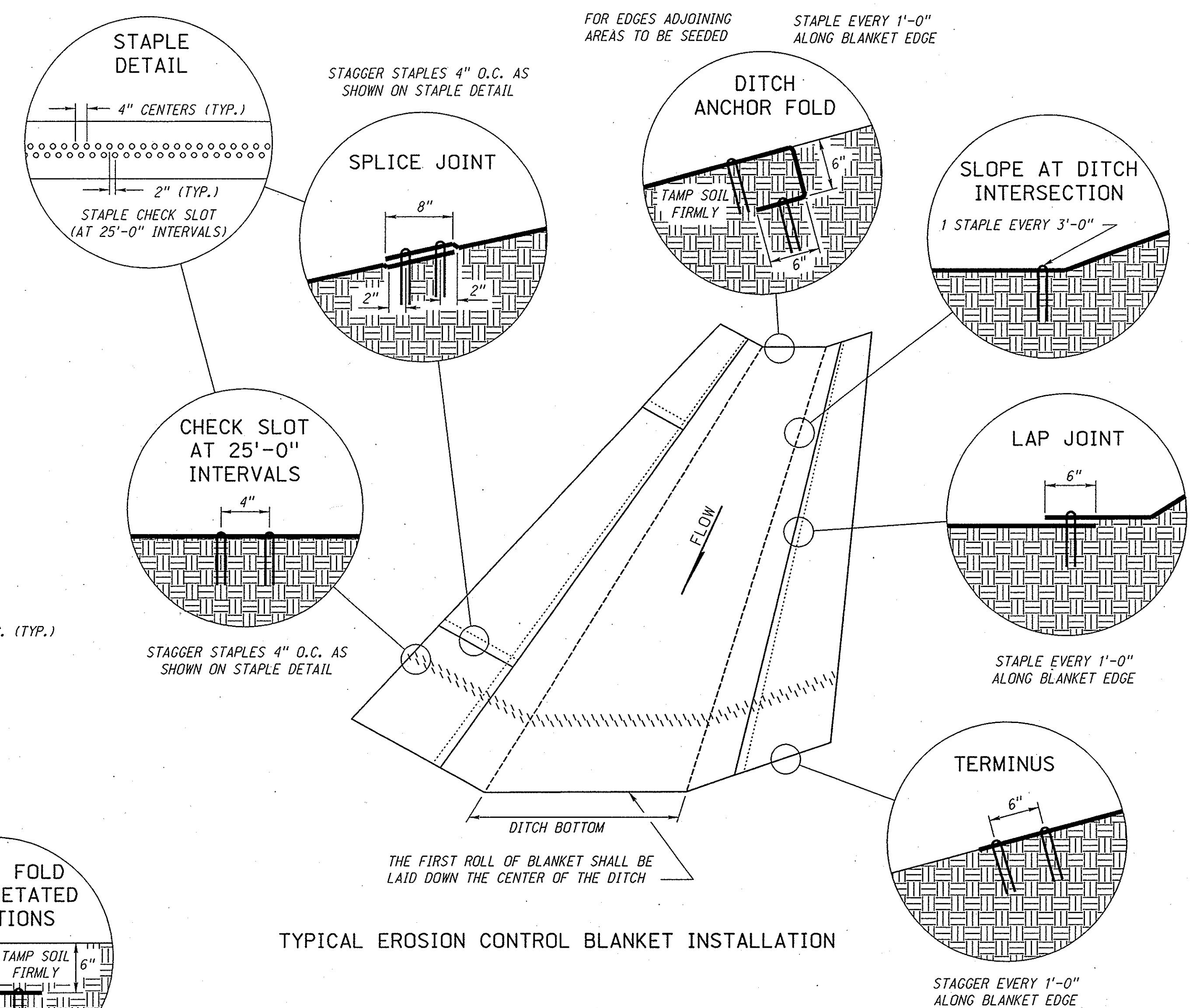
ORIGINAL:
OCTOBER 25, 1994
DATE

4
4

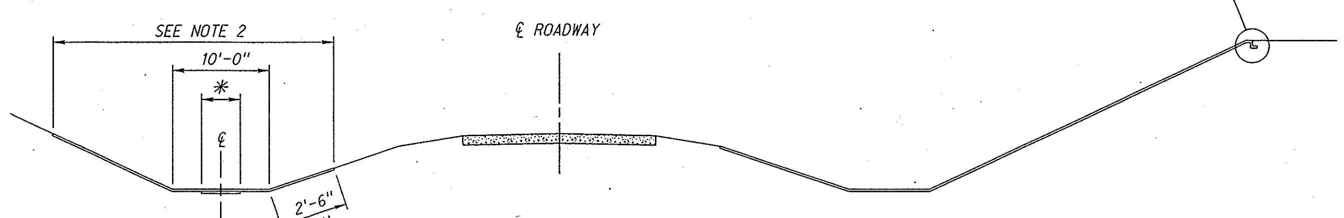


WIRE STAPLE DETAIL





TYPICAL EROSION CONTROL BLANKET INSTALLATION



DITCH INSTALLATION

FORESLOPE AND BACKSLOPE INSTALLATION

TYPICAL CROSS-SECTION

* 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.

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

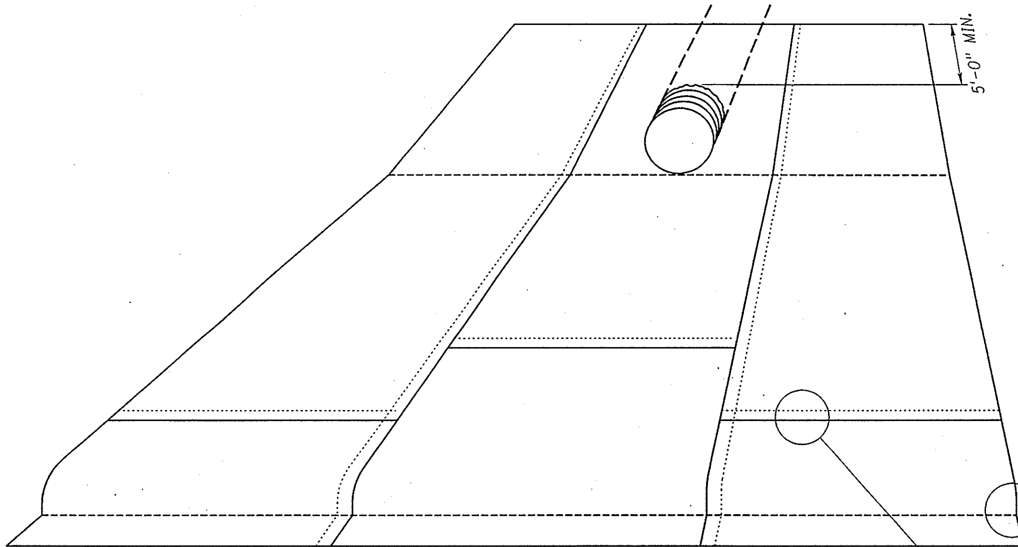
DATE

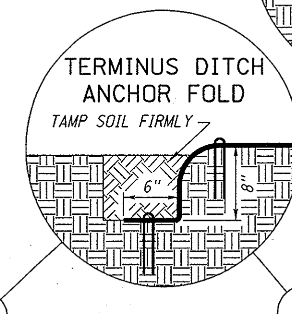
PROFESSIONAL CIVIL ENGINEER — BRADLEY J. REEMANN — E-11829 — STATE OF NEBRASKA

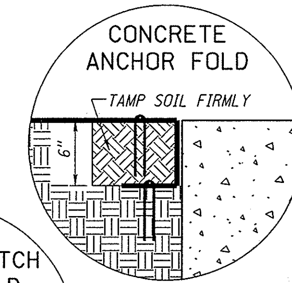
ORIGINAL: NOVEMBER 14, 1973

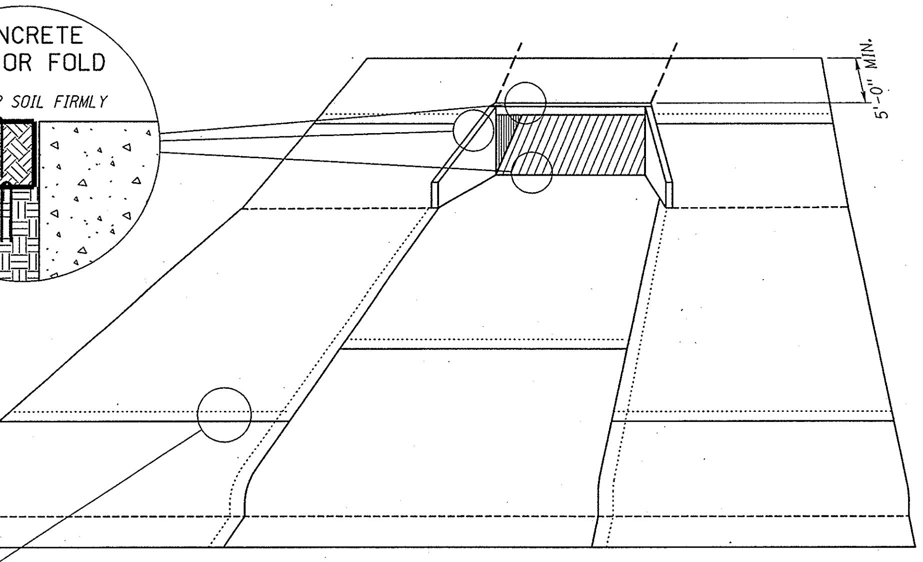
DATE

1 / 3





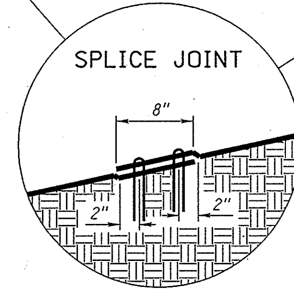


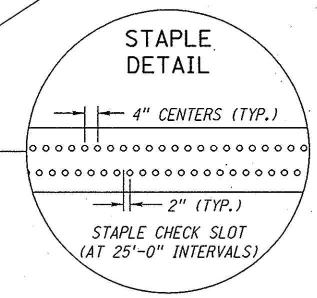


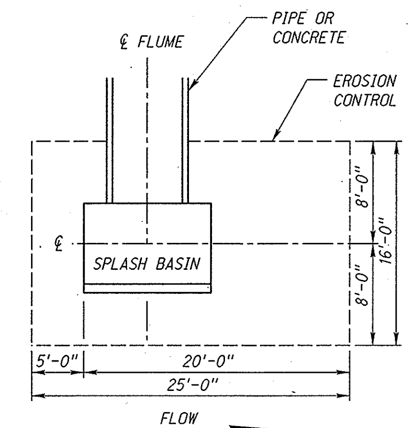
TYPICAL INSTALLATION AT PIPE CULVERT

(SHOWING STRAIGHT PIPE)

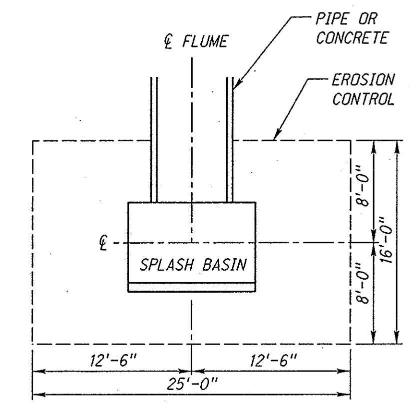
TYPICAL INSTALLATION AT BOX CULVERT





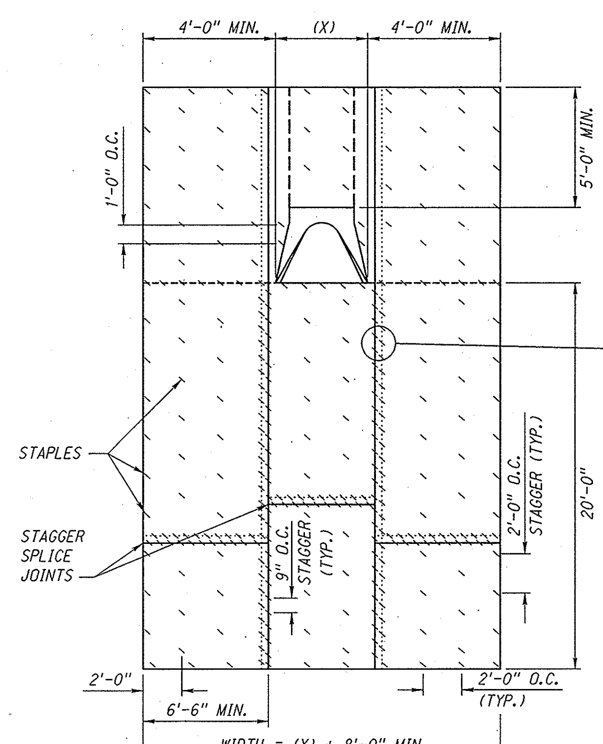


NOTE:
OFFSET EROSION CONTROL PLACEMENT ALONG THE DRAINAGE PATH



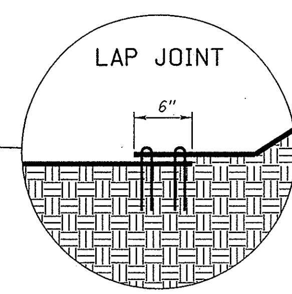
NOTE:
CENTER EROSION CONTROL ON FLUME WHERE THERE IS NO DEFINED DRAINAGE PATH

EROSION CONTROL BLANKET PLACEMENT AT SPLASH BASIN

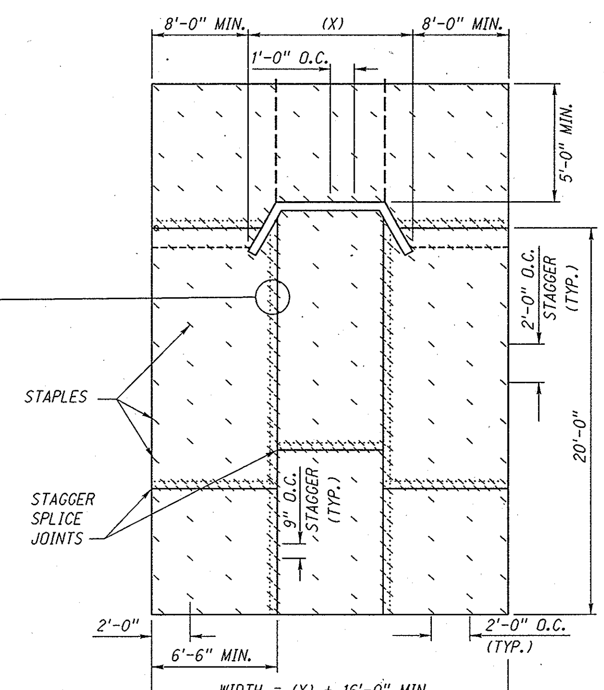


PLAN VIEW STAPLING DIAGRAM

(X) IS EQUAL TO THE OUTSIDE WIDTH OF THE FLARED END SECTION



STAGGER STAPLES EVERY 1'-0" O.C. WITHIN 20'-0" OF PIPE



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 Mraz

8-16-2017
DATE

PROFESSIONAL CIVIL ENGINEER — NEEMANN — E-11829 — STATE OF NEBRASKA

ORIGINAL:
NOVEMBER 14, 1973
DATE

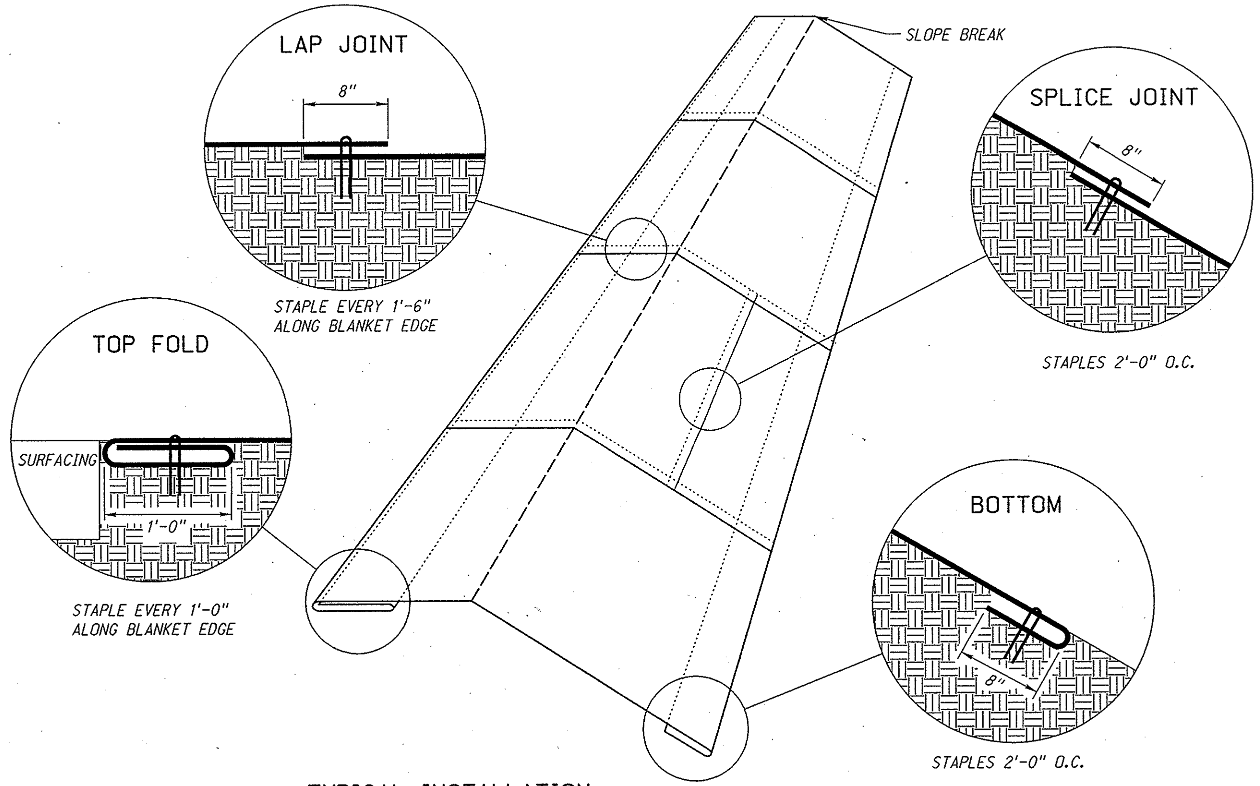
Computer: DRDESIGN147 User: dor13017 Date: 25-JUL-2017 09:48

File: 50100e07.dgn Scale: 1:100 SHEET 2 OF 3

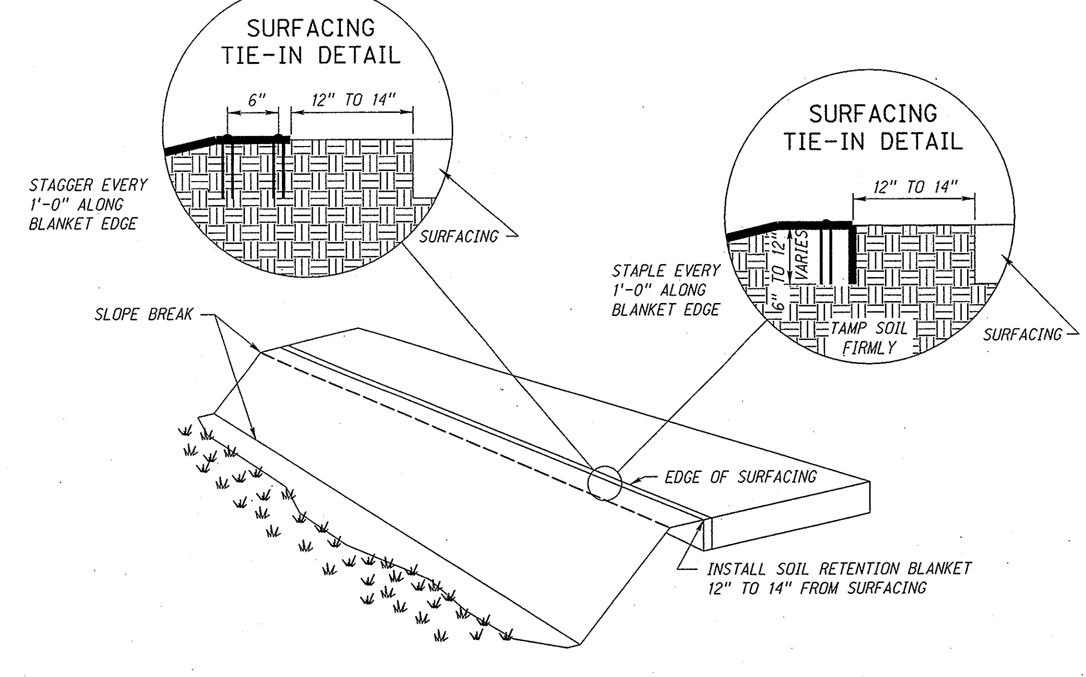
ROADWAY DESIGN DIVISION

Computer: DRDESIGN147 User: dor13017 Date: 25-JUL-2017 09:48

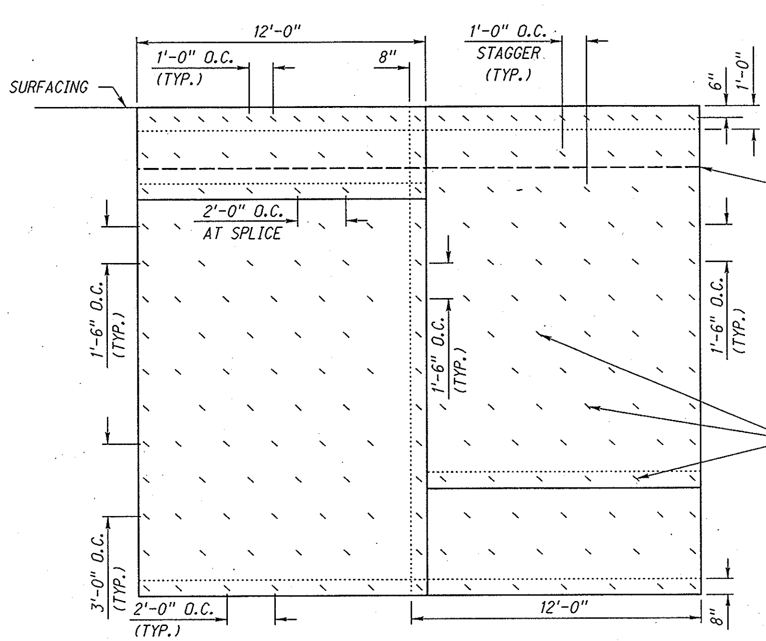
File: 50100e07.dgn Scale: 1:100 SHEET 3 OF 3



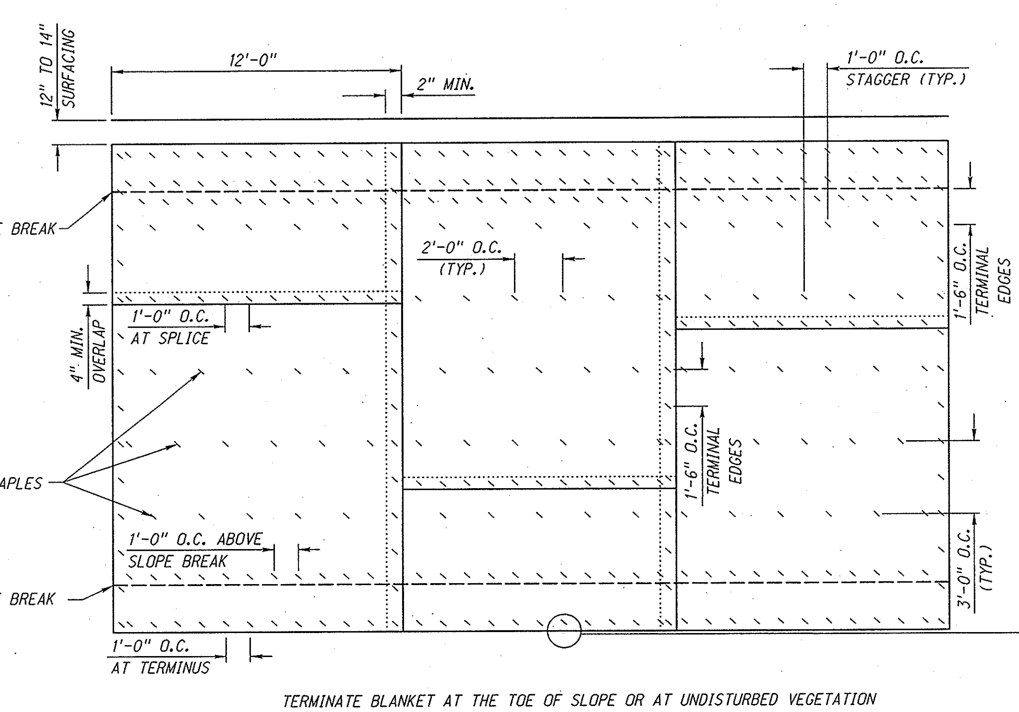
TYPICAL INSTALLATION
CLASS 1A (SLOPE PROTECTION, SAND)



SURFACING INSTALLATION

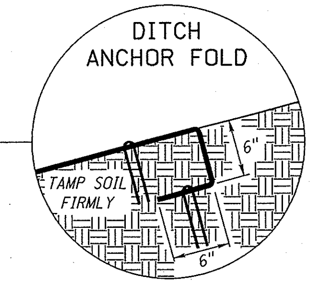


PLAN VIEW STAPLING DIAGRAM FOR
CLASS 1A (SLOPE PROTECTION, SAND)



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

FOR EDGES ADJOINING
AREAS TO BE SEEDED



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 Mraz

8-16-2017
DATE

PROFESSIONAL CIVIL ENGINEER
BRANDIE NEEMANN
E-11829
STATE OF NEBRASKA
8/4/17

ORIGINAL:
NOVEMBER 14, 1973
DATE

3
3

CONNECTION NOTES:

FOR DIVIDED ROADWAY

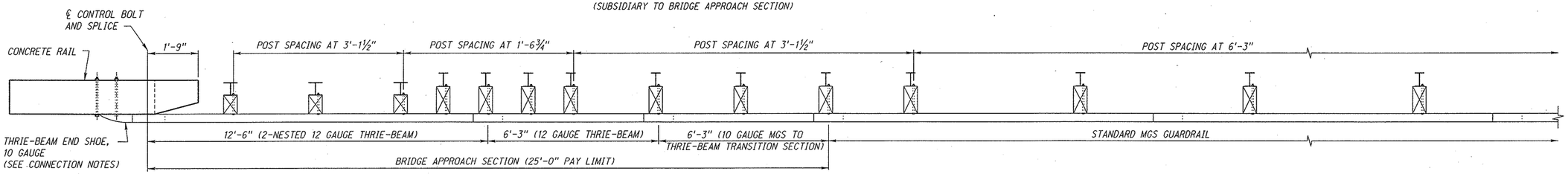
INSTALL THRIE-BEAM END SHOE, BETWEEN NESTED GUARDRAIL ELEMENTS. (SUBSIDIARY TO BRIDGE APPROACH SECTION)

TRAFFIC FLOW ➡

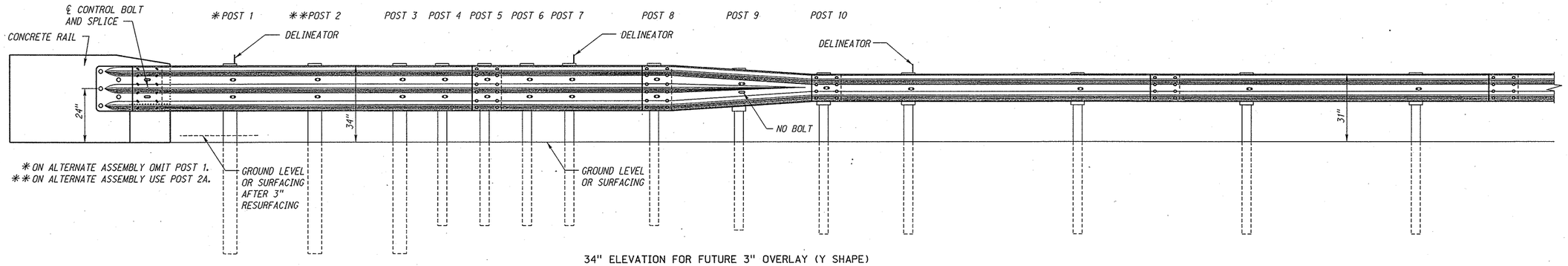
FOR 2-LANE ROADWAY

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

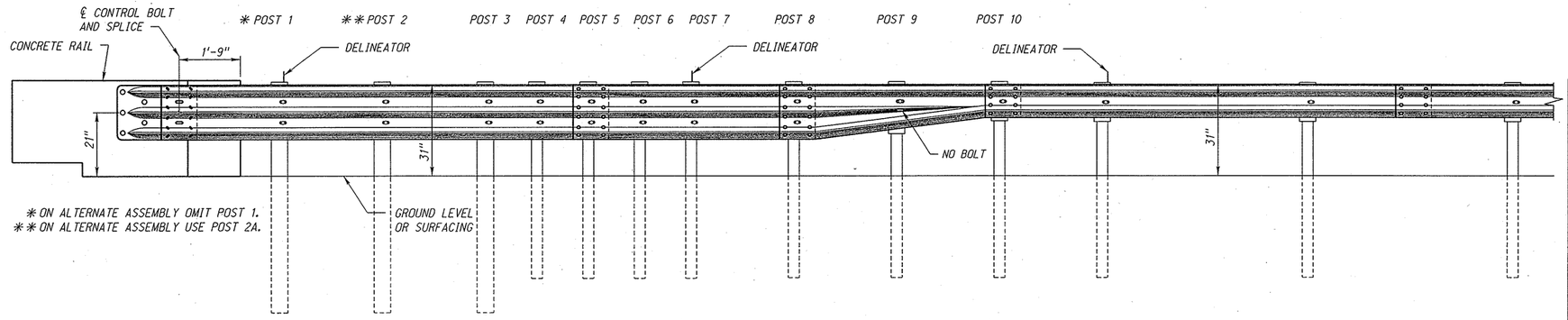
FOR DEPARTING TRAFFIC INSTALL THRIE-BEAM END SHOE, OUTSIDE OF THE NESTED GUARDRAIL ELEMENTS. (SUBSIDIARY TO BRIDGE APPROACH SECTION)



PLAN VIEW



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



31" ELEVATION STANDARD INSTALLATION (ASYMMETRICAL SHAPE)

REV. NO.	DATE	DESCRIPTION OF REVISION
R1	JAN 18	NEW 34 INCH B.A.S.

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:

PROFESSIONAL CIVIL ENGINEER — MICHAEL H. OWEN E-6515 — STATE OF NEBRASKA

MARY BURROUGHS 12/15/17 DATE

ORIGINAL: AUGUST 2011 DATE

1/3

ROADWAY DESIGN DIVISION

Computer: NDOTDESIGN61

User: dor13199

Date: 15-DEC-2017 09:01

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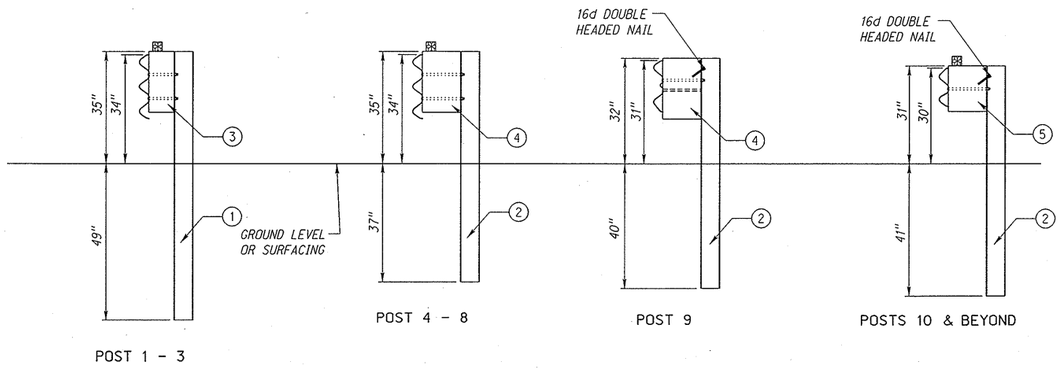
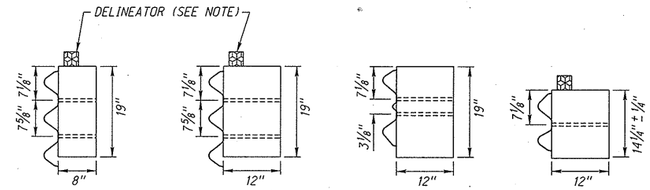


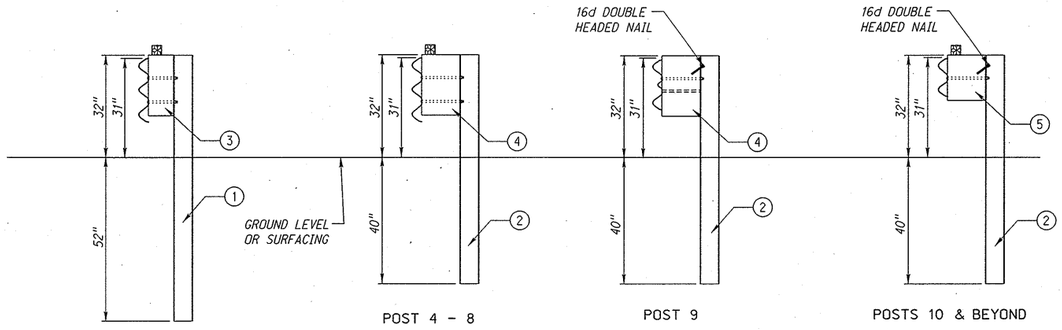
LEGEND

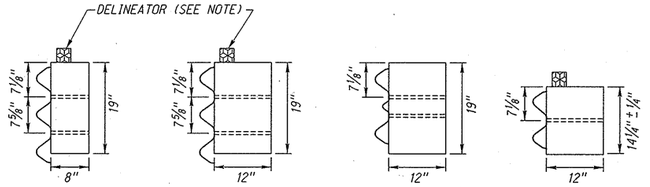
1. W6 × 15 × 7' POST
2. W6 × 9 × 6' POST OR W6 × 8.5 × 6' POST
3. 6" × 8" × 19" OFFSET BLOCK
4. 6" × 12" × 19" OFFSET BLOCK
5. 6" × 12" × 14¼" ± ¼" OFFSET BLOCK



BLOCK DETAILS

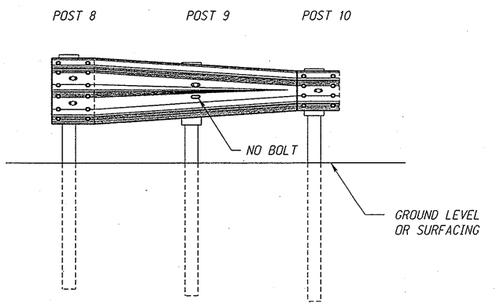
POSTS FOR FUTURE 3" OVERLAY PLACEMENT PRIOR TO 3" OVERLAY USING Y SHAPE W-BEAM



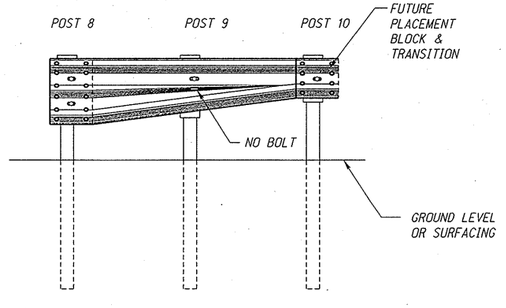


BLOCK DETAILS

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 ⅝" DIA. × LENGTH AS REQUIRED, SECURED WITH HEX NUT.

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

REV. NO.	DATE	DESCRIPTION OF REVISION
R1	JAN 18	NEW 34 INCH B.A.S.

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 740-R1

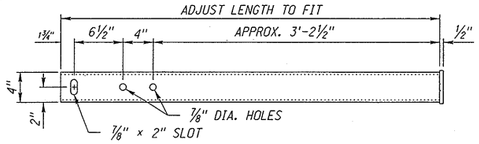
MIDWEST GUARDRAIL SYSTEM BRIDGE APPROACH SECTION

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

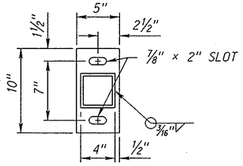
PROFESSIONAL CIVIL ENGINEER
MICHAEL H. OWEN
E-6515
STATE OF NEBRASKA

MARY BURROUGHS
12/15/17
DATE

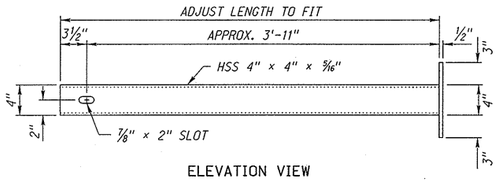
ORIGINAL:
AUGUST 2011
DATE



PLAN VIEW

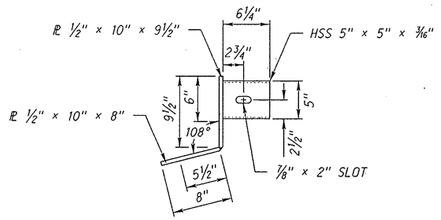


SIDE VIEW
℄ ½" x 10" x 5"

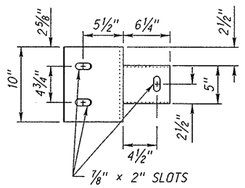


ELEVATION VIEW

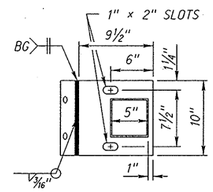
RAIL DETAIL



TOP VIEW

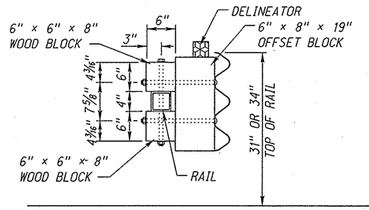


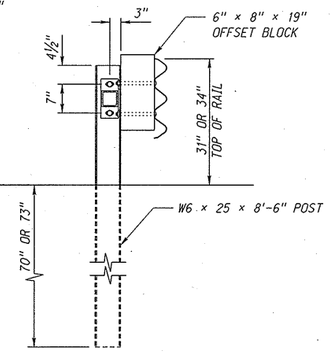
ELEVATION VIEW



SIDE VIEW

END BRACKET DETAIL





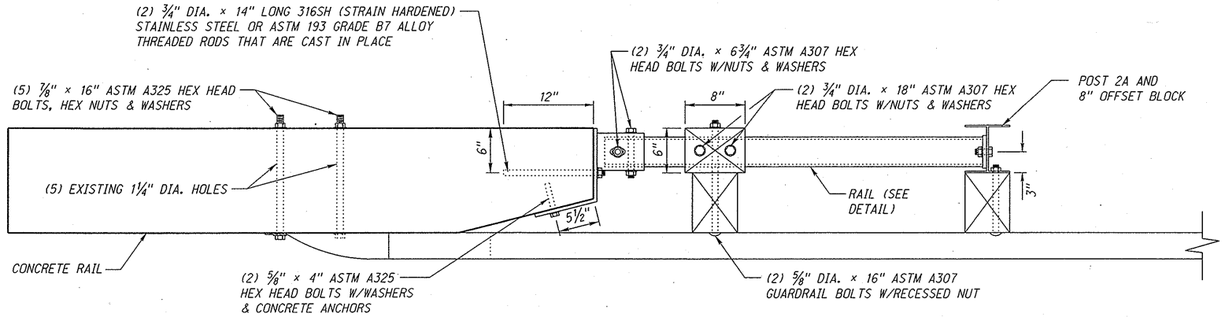
MIDSPAN RAIL SUPPORT

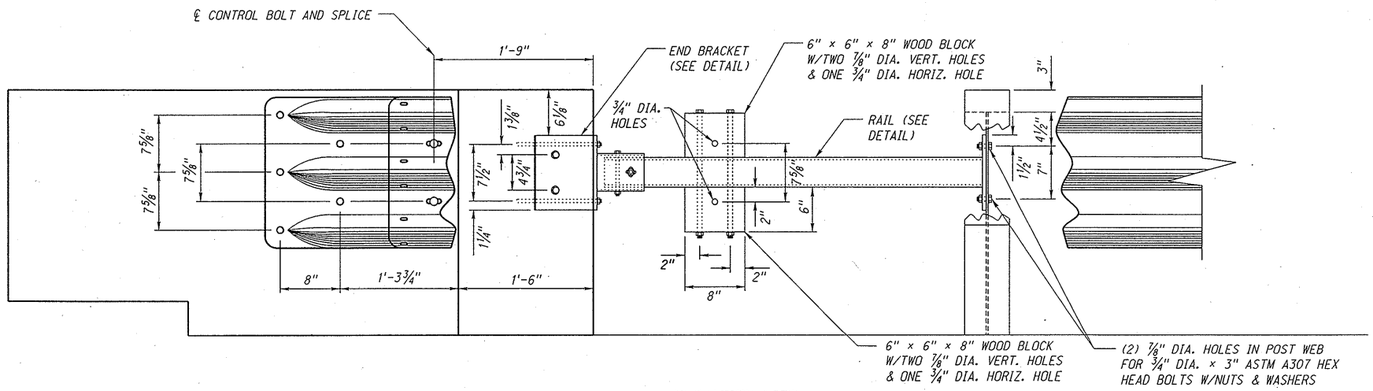
NOTE:

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

POST 2A

SIDE VIEW





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 ¾" DIA. x 14" ANCHOR BOLTS, THE CONTRACTOR MAY GROUT ¾" DIA. x 12" BOLTS INTO ⅞" DIA. x 12" DRILLED HOLES. ALL GROUT USED SHALL BE AN APPROVED NON-SHRINK GROUT. FOR ⅝" DIA. BOLTS USE ¾" DIA. HOLES. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR THIS OPTION.

REV. NO.	DATE	DESCRIPTION OF REVISION
R1	JAN 18	NEW 34 INCH B.A.S.

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:

PROFESSIONAL CIVIL ENGINEER
MICHAEL H. OWEN
E-6515
STATE OF NEBRASKA

Mary Burroughs
MARY BURROUGHS
12/15/17
DATE

ORIGINAL:
AUGUST 2011
DATE

3
3

ROADWAY DESIGN DIVISION

Computer: NDOTDESIGN61 User: dor13199 Date: 15-DEC-2017 09:01

File: 74300e02.dgn
Scale: 1:100

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	240.5	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	202.0	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

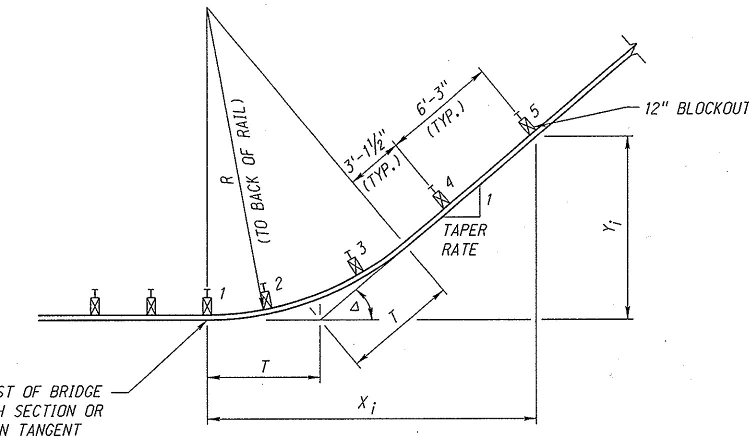
DEFLECTION, Δ = 2°51'44"
TAPER = 20:1
RADIUS, R = 250.20'
TANGENT, T = 6.25'

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

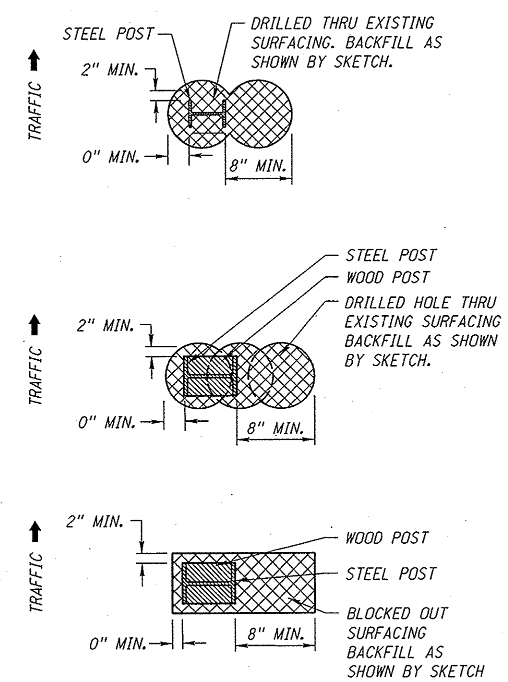
TABLE D

DEFLECTION, Δ = 3°48'51"
TAPER = 15:1
RADIUS, R = 187.77'
TANGENT, T = 6.25'

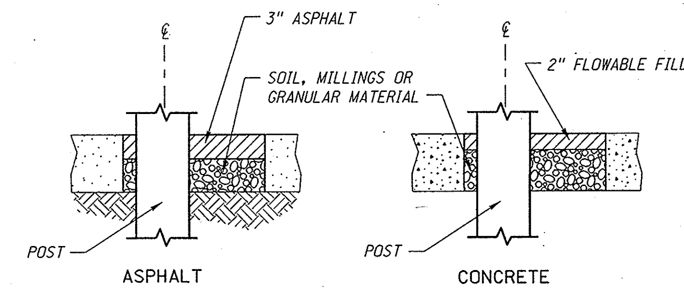
POST NUMBER	X_i	Y_i
1	0.0	0.0
2	3.1	0.0
3	9.4	0.2
4	15.6	0.6
5	21.9	1.0
6	28.1	1.5
7	34.3	1.9
8	40.6	2.3
9	46.8	2.7
10	53.0	3.1
11	59.3	3.5
12	65.5	4.0
13	71.8	4.4
14	78.0	4.8
15	84.2	5.2
16	90.5	5.6
17	96.7	6.0
18	102.9	6.4
19	109.2	6.9
20	115.4	7.3
21	121.6	7.7
22	127.9	8.1
23	134.1	8.5
24	140.4	8.9
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.



GUARDRAIL POSTS
IN SURFACING



DETAIL OF BACKFILLING AROUND POST

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

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 743-R2

GUARDRAIL DETAILS

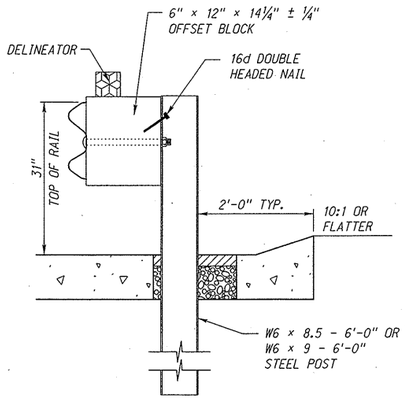
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

PROFESSIONAL CIVIL ENGINEER MICHAEL H. OWEN E-6515 STATE OF NEBRASKA 12-15-17

MARK BURROUGHS
12/15/17
DATE

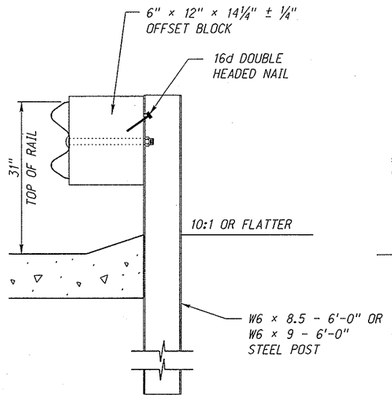
ORIGINAL:
AUGUST 25, 2011
DATE

1/4

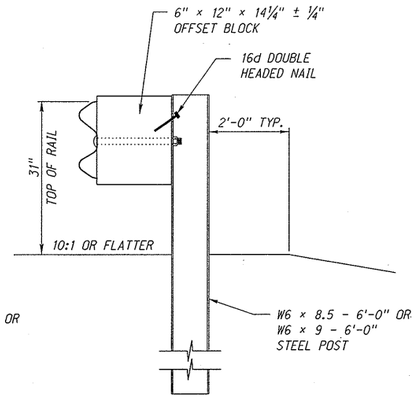


SIDE VIEW

CURBED LOCATIONS:

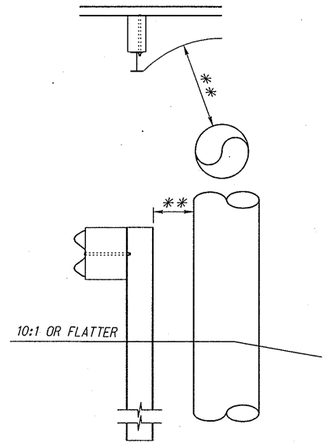


SIDE VIEW



SIDE VIEW

NON-CURBED LOCATIONS:

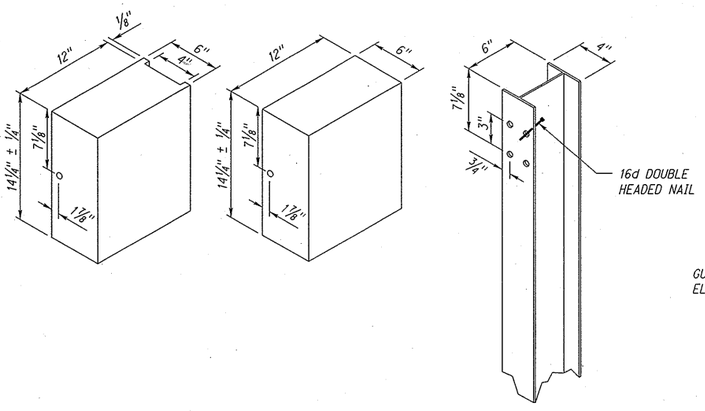


MINIMUM REQUIRED GUARDRAIL OFFSET	
FROM BACK OF POST TO A POINT OBSTACLE (e.g. PIER COLUMN)**	
GUARDRAIL INSTALLATION TYPE	MINIMUM OFFSET*
THREE STRAND CABLE GUARDRAIL (LOW-TENSION)	12'-0" (4'-0" AND 16'-0" POST SPACING)
CABLE GUARDRAIL (HIGH-TENSION)	7'-0" TO 12'-0", DEPENDING ON THE SYSTEM
MIDWEST GUARDRAIL SYSTEM (MGS) & W-BEAM GUARDRAIL*	3'-0" 10'-0" FOR NORMAL POST SPACING (6'-3") 3'-5" FOR ½ POST SPACING 3'-1½") 2'-6" FOR ¼ POST SPACING (1'-6¾")
THRIE-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 ½ POST SPACING (3'-1½") 2'-6" FOR ¼ POST SPACING (1'-6¾")
THRIE-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



NOTES:

ALL HOLE DIAMETERS ARE ¾"

W6 x 8.5 OR W6 x 9 POST & 14¼" ± ¼" 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)

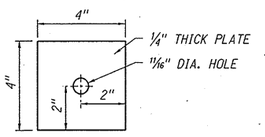
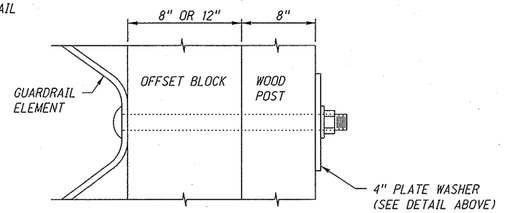
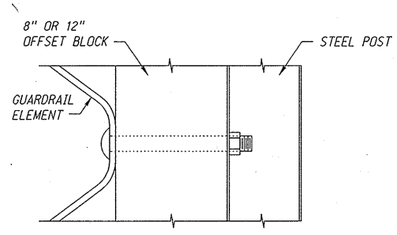


PLATE WASHER



WOOD POST BOLT ASSEMBLY



STEEL POST BOLT ASSEMBLY

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 ⅝" DIA. × 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 ➡

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

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 743-R2

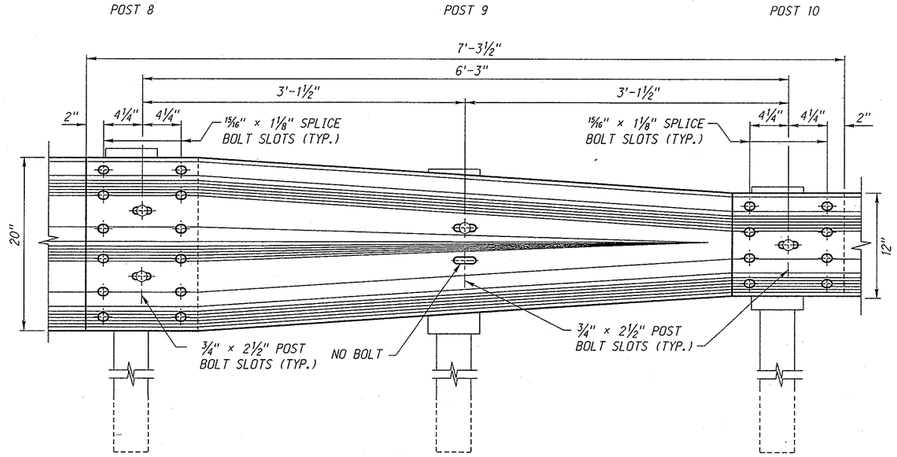
GUARDRAIL DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

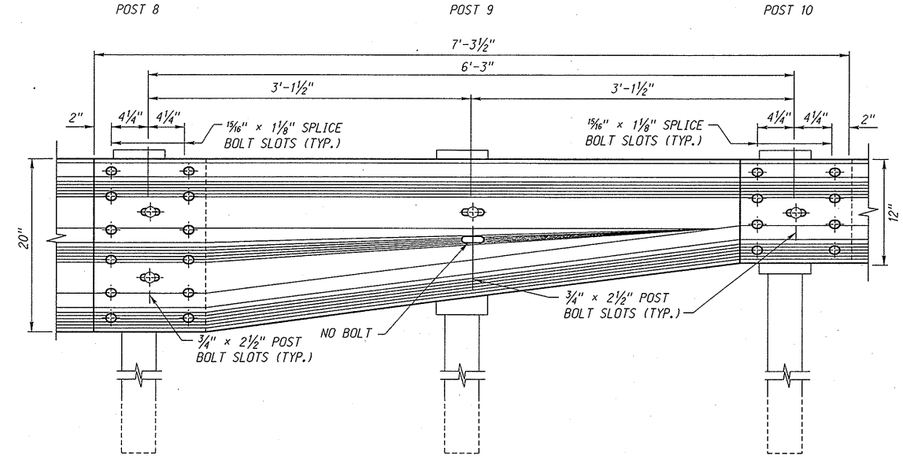
PROFESSIONAL CIVIL ENGINEER
MICHAEL H. OWEN
E-6515
12-15-17
STATE OF NEBRASKA

MARK BOHAC
12/15/17
DATE

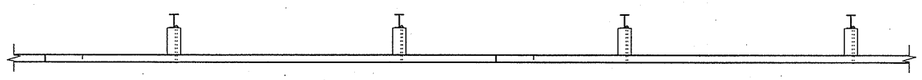
ORIGINAL:
AUGUST 25, 2011
DATE



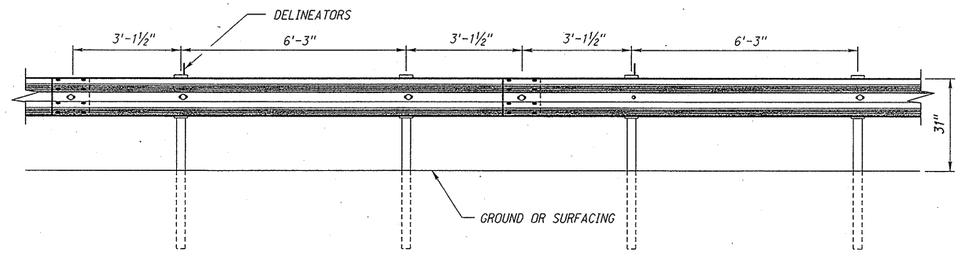
W-THRIE BEAM TRANSITION (10 GAUGE)
(34" ELEVATION FOR FUTURE 3" OVERLAY Y SHAPE)



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

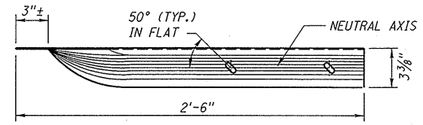


PLAN

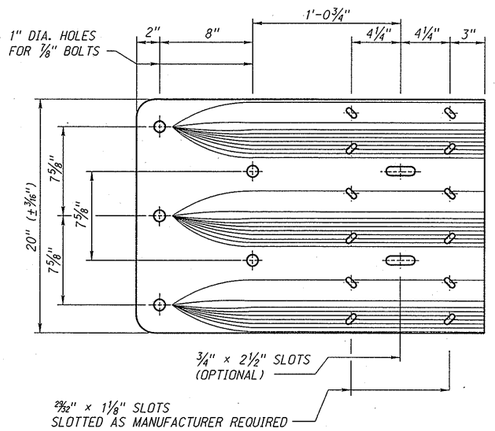


ELEVATION

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



PLAN



ELEVATION

THRIE-BEAM END SHOE

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

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 743-R2

GUARDRAIL DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

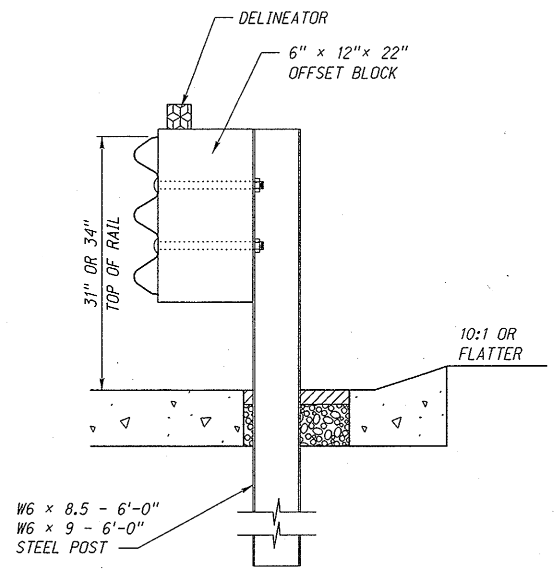
PROFESSIONAL CIVIL ENGINEER — MICHAEL H. OWEN E-6515 — 12-6-17 — STATE OF NEBRASKA

MARY BURROWS
12/15/17
DATE

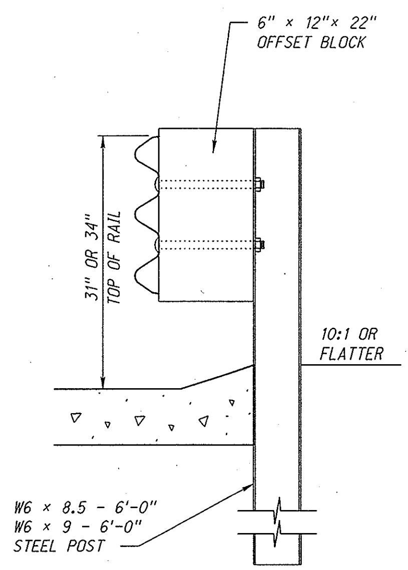
ORIGINAL:
AUGUST 25, 2011
DATE

3
4

ROADWAY DESIGN DIVISION

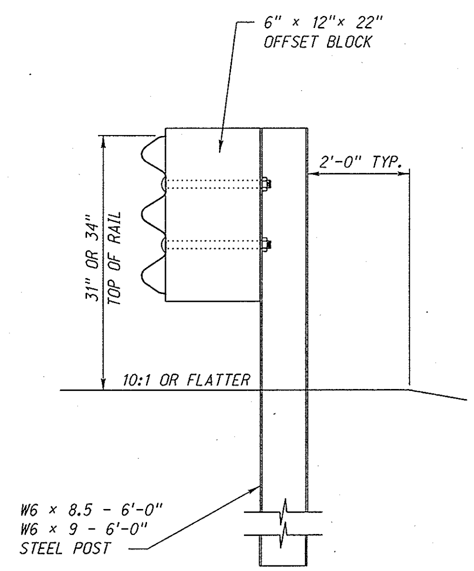


SIDE VIEW



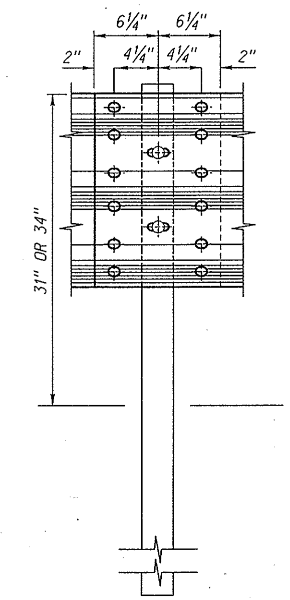
SIDE VIEW

TRHIE-BEAM (CURBED LOCATIONS)

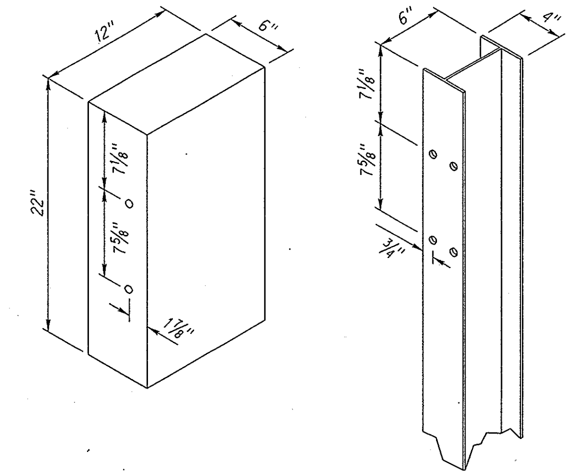


SIDE VIEW

THRIE-BEAM (NON-CURBED LOCATIONS)



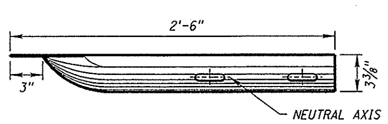
RAIL ELEMENT SPLICING AND POST MOUNTING DETAIL FOR ¼ OR ½ POST SPACING



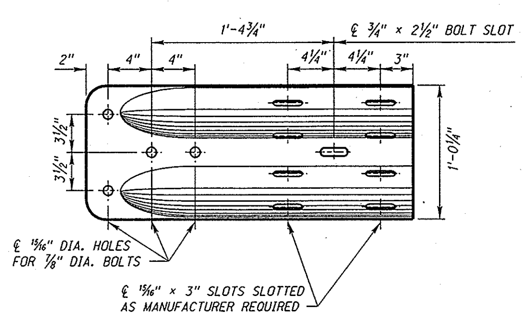
OFFSET BLOCK & STEEL POST

(FOR THRIE-BEAM)

SPECIAL END SHOE SHALL BE 10 GAUGE STEEL AND GALVANIZED IN ACCORDANCE WITH ASTM A93 OR ASTM A123 WITH COATING CLASS 250.

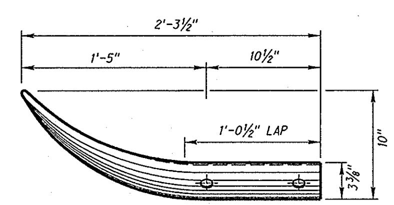


PLAN

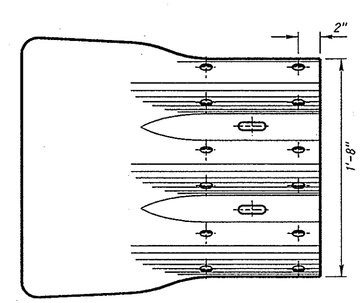


ELEVATION

W-BEAM END SHOE

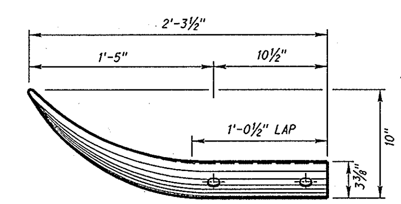


PLAN

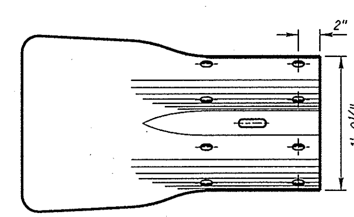


ELEVATION

THRIE-BEAM TERMINAL SECTION



PLAN



ELEVATION

W-BEAM TERMINAL SECTION

NOTES:

ALL HOLE DIAMETERS ARE ¾"

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.

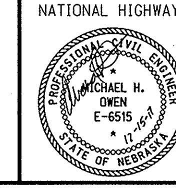
REV. NO.	DATE	DESCRIPTION OF REVISION
R2	JAN 18	NDOR BORDER TO NDOT BORDER
R1	DEC 16	UPDATED GUARDRAIL OFFSET TABLE

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 743-R2

GUARDRAIL DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:



MARY BURKHOLTS

12/15/17

DATE

ORIGINAL:
AUGUST 25, 2011

DATE

Computer: NDOTDESIGN61 User: dor13199 Date: 15-DEC-2017 09:01

File: 74300e02.dgn Scale: 1:100

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)	
S	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 ($CD/LUX/M^2$)

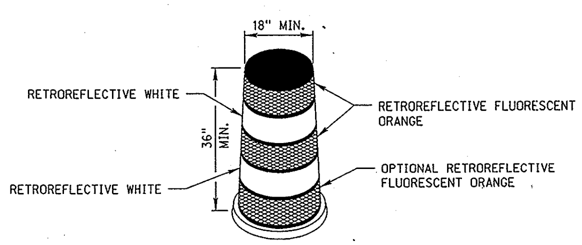
WHITE	ORANGE	RED	YELLOW
250	100	45	170

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.

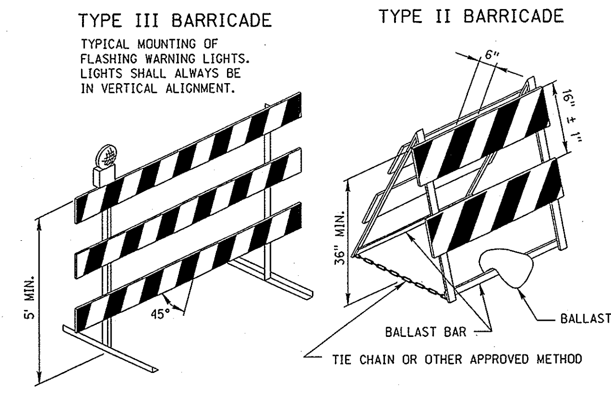
BALLAST SHALL NOT BE PLACED ON TOP OF THE DRUM. DRUMS SHOULD NOT BE WEIGHTED WITH SAND, WATER, OR ANY MATERIAL.

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 / 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

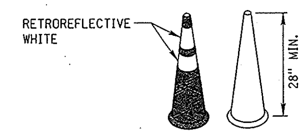
TYPE II BARRICADES ARE INTENDED FOR USE IN SITUATIONS WHERE TRAFFIC IS MAINTAINED THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE. THEY MAY BE USED INDIVIDUALLY OR IN GROUPS TO MARK A SPECIFIC CONDITION, OR THEY MAY BE USED IN A SERIES FOR CHANNELIZING TRAFFIC. ON THE INTERSTATE, FREEWAY AND EXPRESSWAY SYSTEM, 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 ERECTED ABOVE THE BARRICADE. THE SIGNS "ROAD CLOSED", OR "ROAD WORK AHEAD", FOR EXAMPLE CAN EFFECTIVELY BE MOUNTED ABOVE THE BARRICADE THAT CLOSES 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, FLOURESCENT RED-ORANGE, OR FLOURESCENT 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.

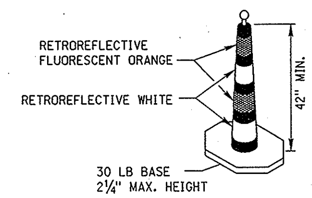
FOR NIGHTTIME USE, CONES SHALL BE RETROREFLECTIVE OR EQUIPPED WITH LIGHTING DEVICES FOR MAXIMUM VISIBILITY. RETROREFLECTION OF 28 INCH OR 36 INCH CONES SHALL BE PROVIDED BY A WHITE BAND 6 INCHES WIDE, NO MORE THAN 4 INCHES FROM THE TOP OF THE CONE, AND AN ADDITIONAL 4 INCH WIDE WHITE BAND A MINIMUM OF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



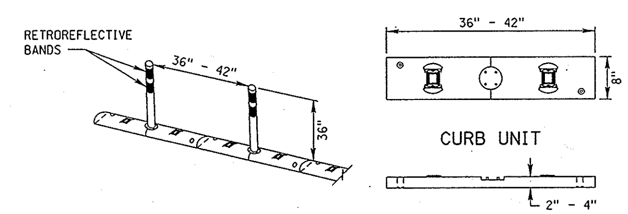
DESIGN

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

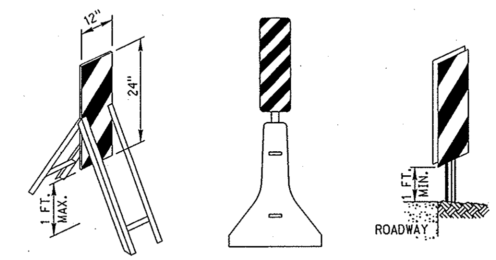
APPLICATION

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.

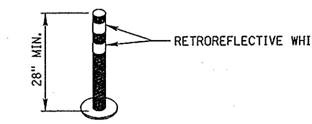
MARKINGS FOR VERTICAL PANELS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTORIZED STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.

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:

David Waddle
9-1-2017
DATE

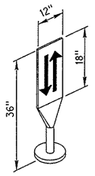
PROFESSIONAL ENGINEER DANIEL J. WADDLE E-6289 STATE OF NEBRASKA

ORIGINAL:
OCTOBER 1998
DATE

1 / 3

ROADWAY DESIGN DIVISION
File: 92000e07.dgn Scale: 1:100 SHEET 1 OF 3
Date: 17-AUG-2017 15:54 User: dor13017 Computer: DRDESIGN147

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.

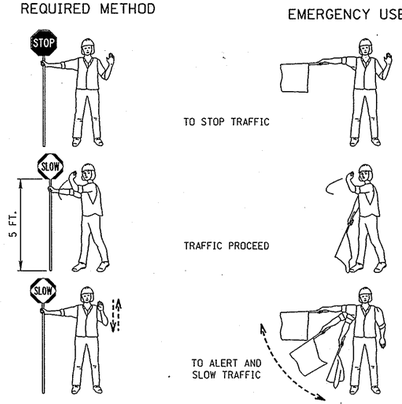
APPLICATION

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

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.

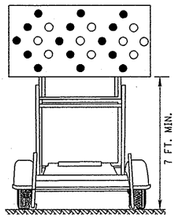
FLASHING ARROW PANEL (DISPLAY)

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 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.

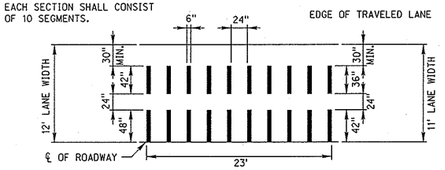
FOR SHOULDER WORK BLOCKING THE SHOULDER, FOR ROADSIDE WORK NEAR THE SHOULDER, OR FOR TEMPORARILY CLOSING ONE LANE ON A TWO-LANE, TWO-WAY ROADWAY, AN ARROW PANEL SHALL BE USED ONLY IN THE CAUTION MODE.

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.

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	FLASHING LINE OR FLASHING CORNERS OR ALTERNATING DIAMOND CAUTION

TEMPORARY RUMBLE STRIPS

EACH SECTION SHALL CONSIST OF 10 SEGMENTS.



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 5/8". PREFORMED RUMBLE STRIPS MAY BE USED PROVIDED THEY HAVE A MINIMUM ½" HEIGHT.

TRAFFIC SIGNALS

TRAFFIC SIGNALS MAY BE ALLOWED AT CERTAIN EQUIPMENT CROSSINGS WHERE THE VOLUME OF FILL MATERIAL 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		
S	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

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:

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

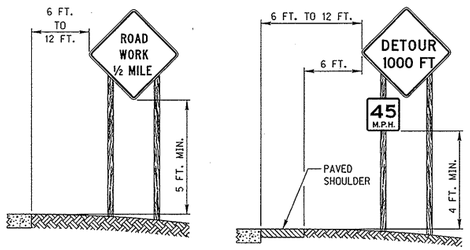
David Murray
9-1-2017
DATE

ORIGINAL:
OCTOBER 1998
DATE

ROADWAY DESIGN DIVISION
Computer: DROESIGN147
User: dor13017
Date: 17-AUG-2017 15:56
File: 92000e07.dgn
Scale: 1:100
SHEET 3 OF 3

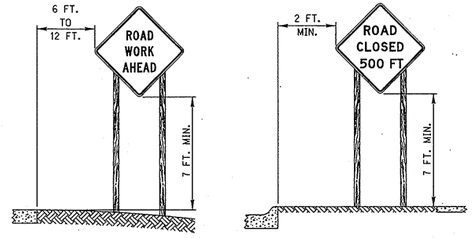
ROADSIDE SIGNS

HEIGHT AND LATERAL LOCATION OF SIGNS RURAL AREA



WITH SPEED ADVISORY PLATE

URBAN AREA



TYPICAL FIRST SIGN AT CONSTRUCTION SITE

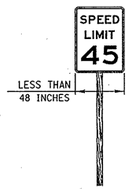
WITH TYPE "A" FLASHING WARNING LIGHT MOUNTED ABOVE TYPE III BARRICADE

PORTABLE AND TEMPORARY MOUNTING

TYPICAL SIGN MOUNTINGS

POST MOUNTED

SIGNS 48 INCHES OR WIDER REQUIRE TWO POSTS



SIGN WIDTHS LESS THAN 48 INCHES MAY BE MOUNTED WITH ONE POST

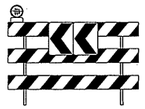
TYPICAL SIGN MOUNTINGS

OTHER THAN POST MOUNTED

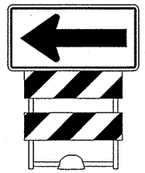
TYPE III BARRICADE WITH SIGN

PORTABLE AND TEMPORARY MOUNTING

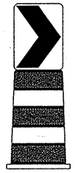
TYPE III BARRICADE WITH SIGN AND DETOUR ARROW



TYPE III BARRICADE WITH CHEVRONS



TYPE II BARRICADE WITH DETOUR ARROW OR SIGN



PLASTIC DRUM WITH CHEVRON OR SIGN

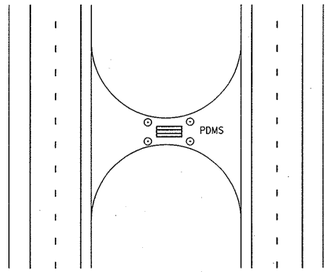
TEMPORARY SIGN SUPPORTS

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

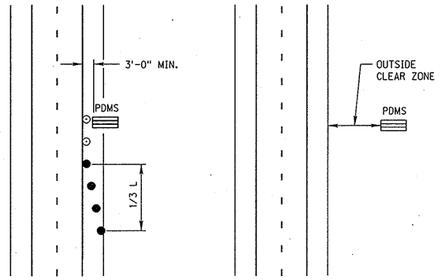
"TEMPORARY SIGNS" ARE ALL TEMPORARILY MOUNTED WORK ZONE SIGNS THAT ARE NOT POST MOUNTED IN THE GROUND AT THE TYPICAL 5 FOOT MOUNTING HEIGHT. TEMPORARY SIGNS ARE CONSIDERED NCHRP 350 OR MASH CATEGORY 2 DEVICES AND ARE MOUNTED ON TEMPORARY SIGN STANDS. TEMPORARY SIGNS SHALL BE MOUNTED A MINIMUM OF 1 FOOT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



IN MEDIAN



ON SHOULDER OFF SHOULDER

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

1. 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).
2. 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.
3. TRAFFIC CONTROL DEVICES SHALL BE INSTALLED SO AS NOT TO OBSTRUCT THE VIEW OF OTHER TRAFFIC CONTROL DEVICES.
4. 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

A. WORK ZONE SPEED LIMITS SHALL NOT BE INSTALLED WITHOUT A SPEED ZONE AUTHORIZATION COMPLETED BY THE DEPARTMENT.

B. 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.

C. WORK ZONE SPEED LIMITS SHOWN ARE TYPICAL APPLICATIONS ONLY AND ARE NOT TO BE ASSUMED AS THE SPEED LIMITS REQUIRED FOR THE WORK.

D. EXISTING SPEED LIMIT SIGNS SHALL BE REMOVED OR COVERED WHEN A REDUCED WORK ZONE SPEED LIMIT IS IN EFFECT IN THE SAME AREA.

E. WORK ZONE SPEED LIMIT SIGNS SHALL BE INSTALLED EVERY MILE THROUGH THE WORK AREA WHEN SPEED ZONE IS REDUCED.

F. A SPEED LIMIT SIGN ENDING THE REDUCED SPEED ZONE SHALL BE INSTALLED AT THE END OF EACH ZONE.

G. DOUBLE FINES AND REDUCED SPEED ZONE SIGNING ARE NOT REQUIRED FOR SHORT-DURATION WORK LESS THAN 12 HOURS.

TAPER FORMULA

L = S x 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

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ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

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

David Murray
9-1-2017
DATE

ORIGINAL:
OCTOBER 1998
DATE

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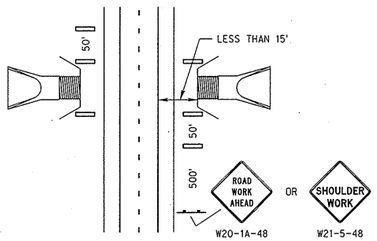
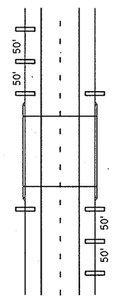
3



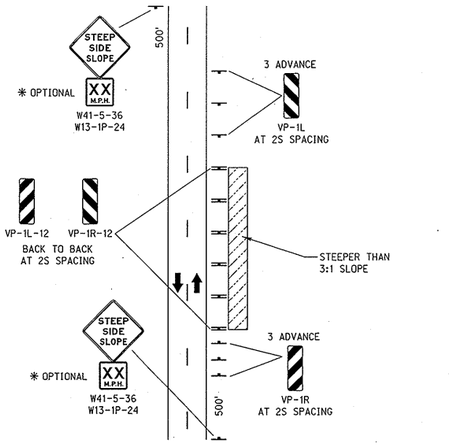
CULVERT DELINEATION

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

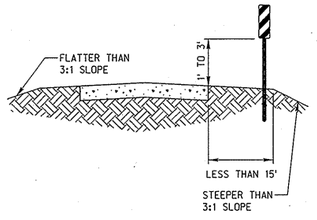


BRIDGE RAIL END DELINEATION

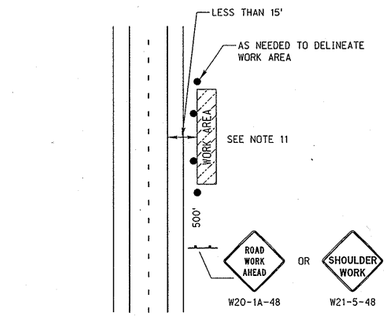
WHEN GUARDRAIL IS REMOVED



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.



STEEP SLOPE DELINEATION



WORK BEYOND THE SHOULDER

TA-1

LEGEND

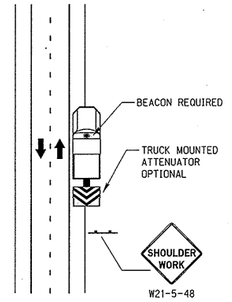
- FLAGGER
- REFLECTORIZED PLASTIC DRUM
- REFLECTORIZED PLASTIC DRUM OR 42" CONE
- TYPE III BARRICADE
- SINGLE POSTED SIGN
- DOUBLE POSTED SIGN
- TRAFFIC SIGNAL

TAPER FORMULA

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

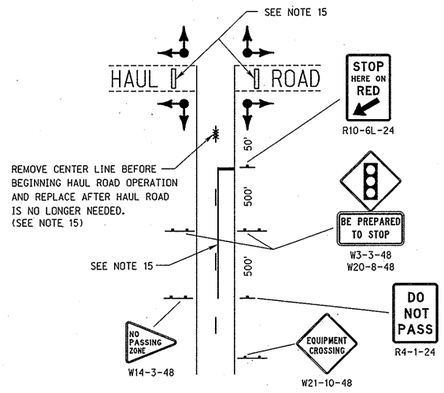
$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

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



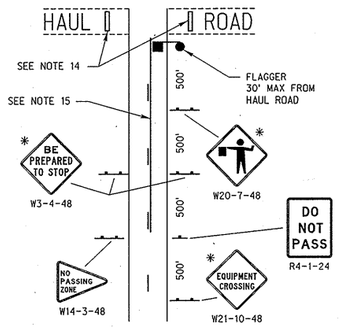
MOBILE OPERATION ON SHOULDER

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.

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

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 Kim
9-1-2017
DATE

PROFESSIONAL ENGINEER
DANIEL J. WADDLE
E-6289
9-20-17
STATE OF NEBRASKA

ORIGINAL:
JUNE 3, 1980
DATE

1/2

ROADWAY DESIGN DIVISION

Computer: DRDESIGN147
User: dor13017
Date: 17-AUG-2017 15:53
File: 92100s08.dgn
Scale: 1:100
SHEET 1 OF 2

ROADWAY DESIGN DIVISION
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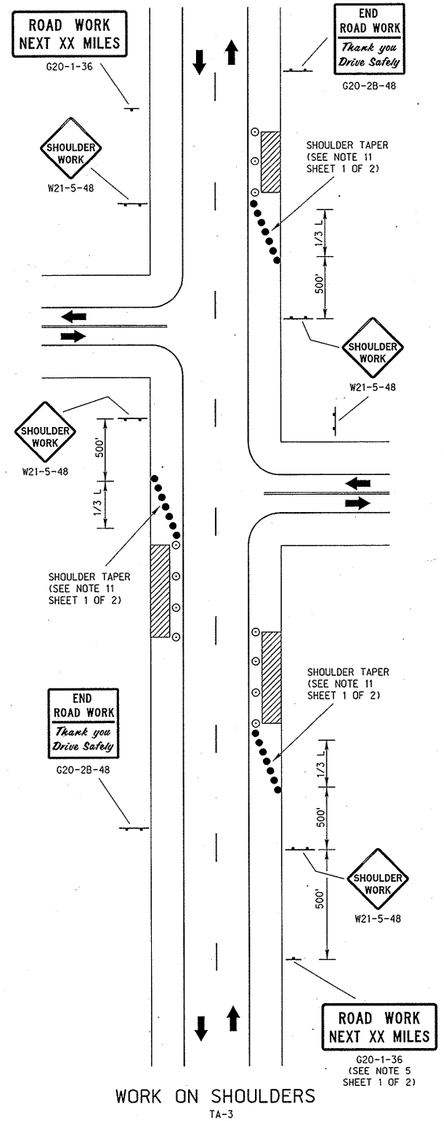
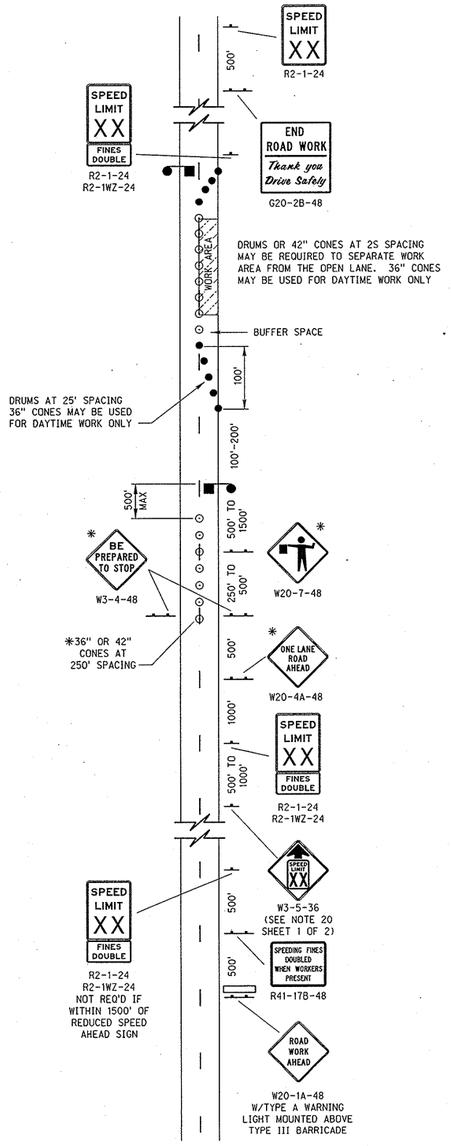
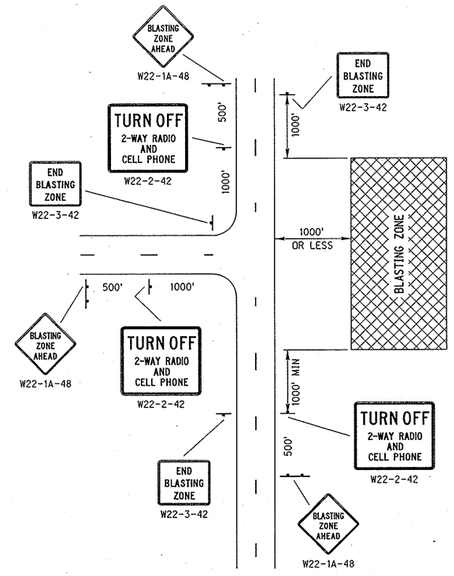
Date: 17-AUG-2017 15:53
File: 92100e08.dgn
Scale: 1:100
SHEET 2 OF 2



WORK ON SHOULDERS
TA-3



LANE CLOSURE
TA-10
* SIGNS AND CONES ARE SUBSIDIARY TO THE FLAGGING OPERATION.



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

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 921-R8

TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE

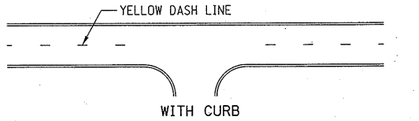
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

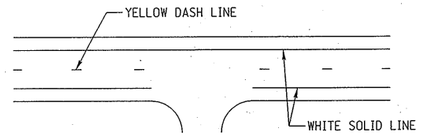
PROFESSIONAL CIVIL ENGINEER — DANIEL J. WADDLE E-6289 — STATE OF NEBRASKA

9-1-2017
DATE

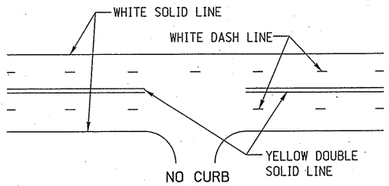
ORIGINAL:
JUNE 3, 1980
DATE

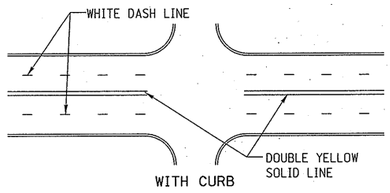
2/2



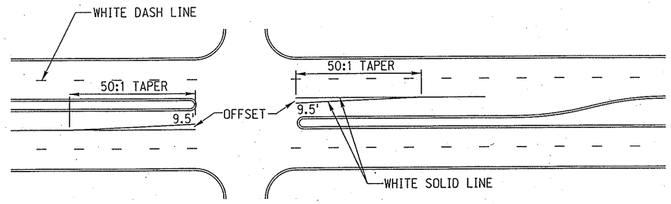


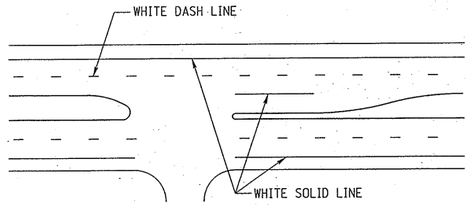
2 LANE ROADWAY

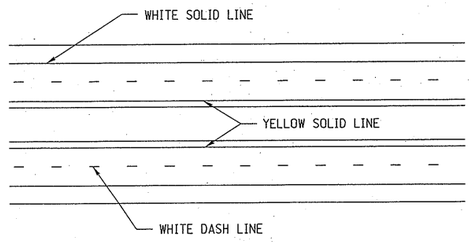




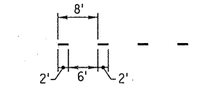
4 LANE UNDIVIDED ROADWAY



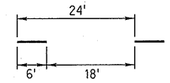




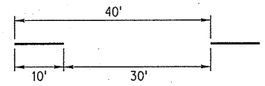
4 LANE DIVIDED ROADWAY



DOTTED LINE DETAIL

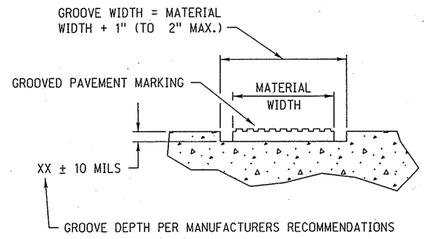


URBAN

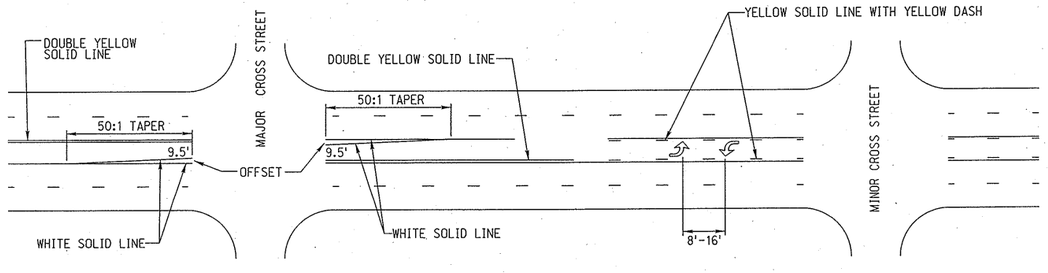


RURAL

DASH LINE DETAIL



PERMANENT PAVEMENT MARKINGS INSTALLED IN GROOVES



3 OR 5 LANE WITH TWO-WAY LEFT TURN LANE

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

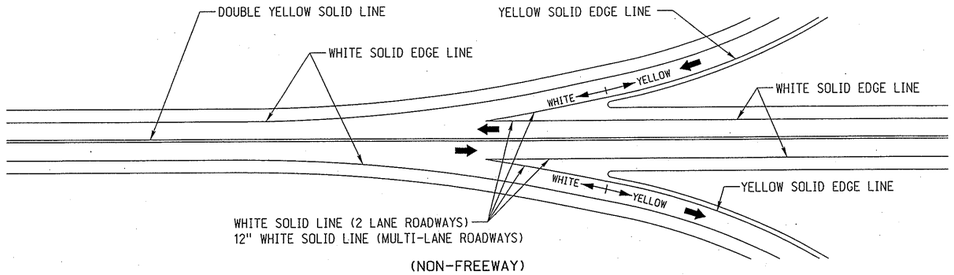
PAVEMENT MARKING

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

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

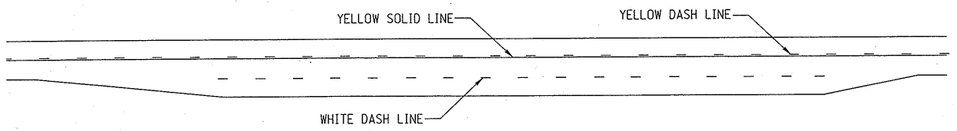
MARY BARROWS
5/14/2018
DATE

ORIGINAL:
OCT. 2018
DATE

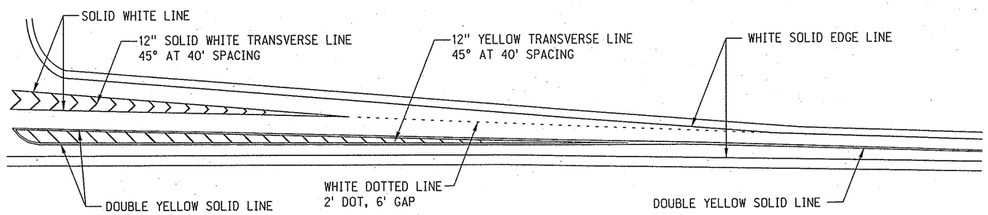


(NON-FREEWAY)

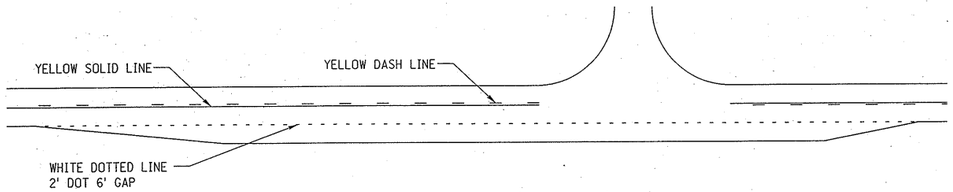
GORE MARKING



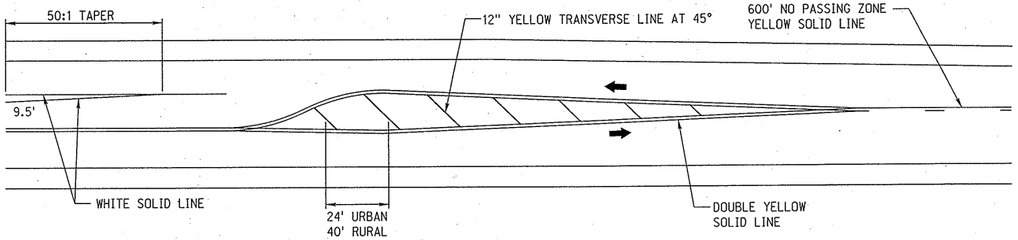
PASSING LANE MARKING



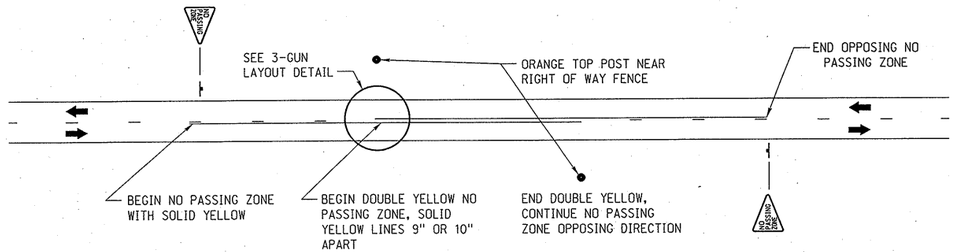
OFFSET RIGHT TURN LANE



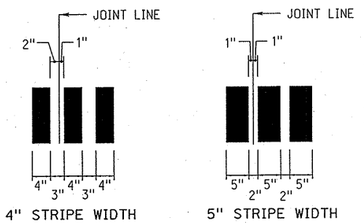
FLY-BY LANE MARKING



LEFT TURN LANE MARKING



NO PASSING ZONE MARKING



4" STRIPE WIDTH

5" STRIPE WIDTH

3-GUN LAYOUT

LEGEND

TRAFFIC FLOW

REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF ROADS

STANDARD PLAN NO. 941

PAVEMENT MARKING

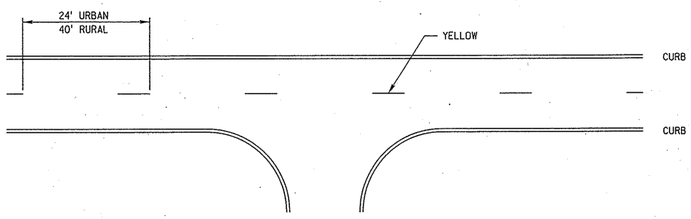
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

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

MARY BURROUGHS
5/14/18
DATE

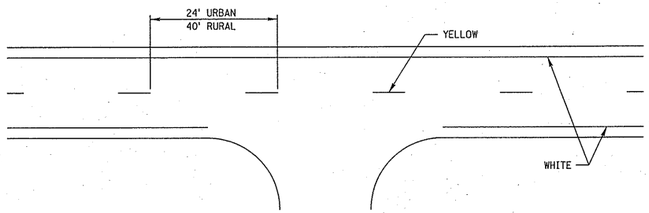
ORIGINAL:
OCT. 2018
DATE

2
2



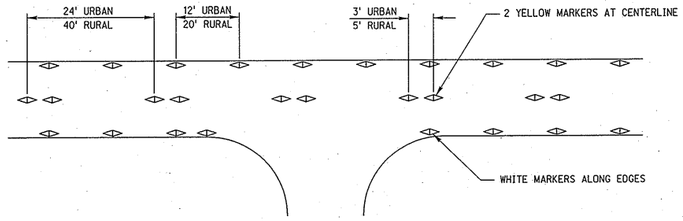
CURBED SECTION

(NO EDGELINES ARE REQUIRED)



SHOULDER SECTION

LOWER LAYER



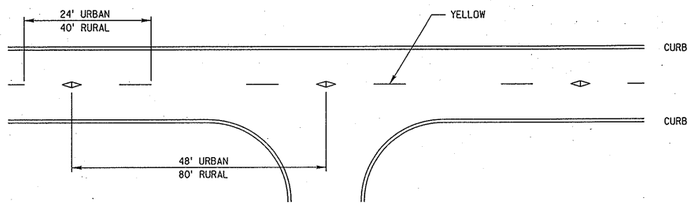
RPM/OVERLAY MARKER

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.

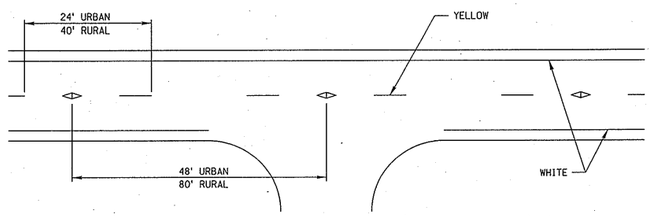
TABLE II				
SOLID LINES				
TYPE OF MARKING	LENGTH		MATERIAL ALLOWED	
	RURAL	URBAN	LOWER LAYER	TOP LAYER
PAINT	SOLID	SOLID	X	X
TYPE I TAPE	SOLID	SOLID		X
RPM/OVERLAY MARKER	20' SPACING	12' SPACING	X	X

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"



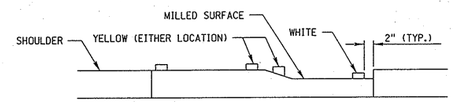
CURBED SECTION

(NO EDGELINES ARE REQUIRED)

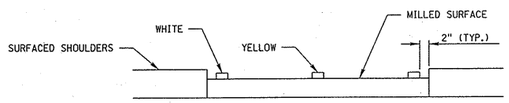


SHOULDER SECTION

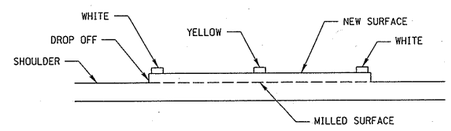
TOP LAYER



NOTCHED WEDGE CENTERLINE



MILLED SURFACE



NEW SURFACING

LATERAL LOCATION DETAILS

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

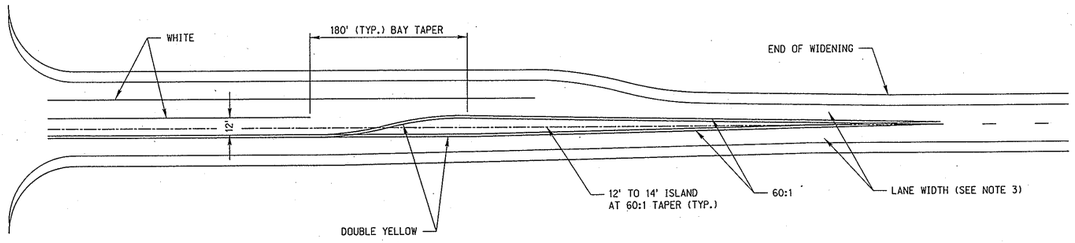
TEMPORARY PAVEMENT MARKING

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

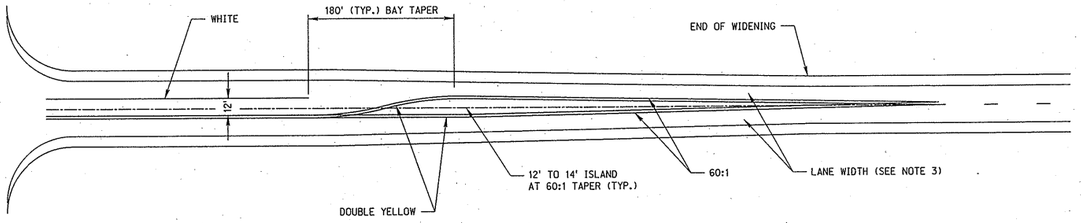
PROFESSIONAL CIVIL ENGINEER
DANIEL J. WADDLE
E-6289
STATE OF NEBRASKA

MARY BURROUGHS
5/14/2019
DATE

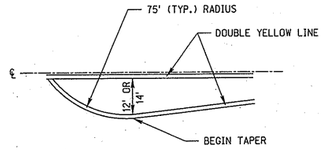
ORIGINAL:
OCT. 2018
DATE



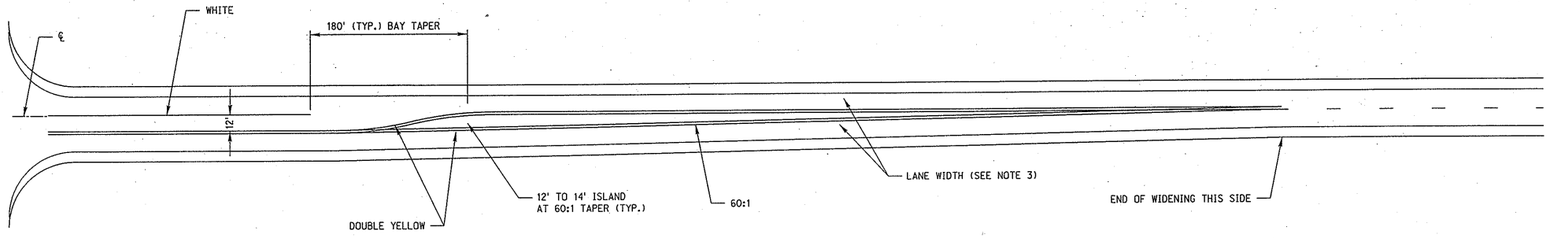
WIDENING BOTH SIDES WITH RIGHT TURN BAY



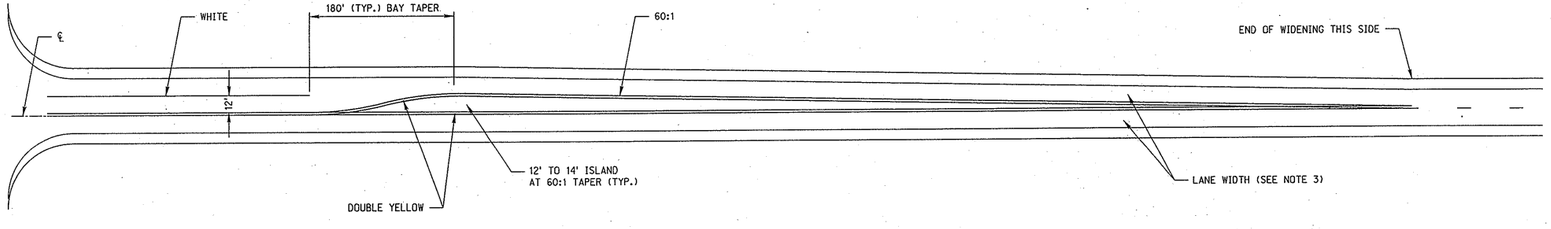
WIDENING BOTH SIDES



TYPICAL MARKING FOR
MEDIAN W/NO LEFT TURN



WIDENING ON DEPARTURE SIDE



WIDENING ON APPROACH SIDE

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)

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STATE OF NEBRASKA

MARY BURROUGHS
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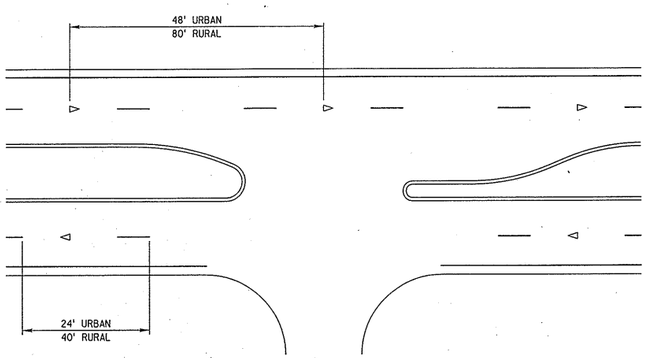
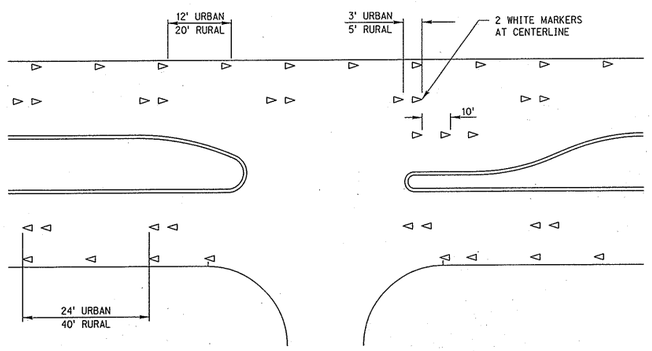
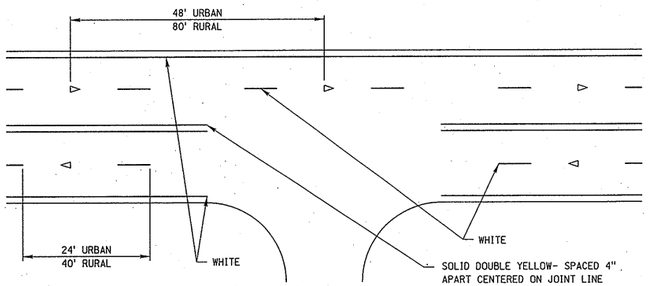


DIVIDED ROADWAY
ALL LINES & ⊳ ARE WHITE

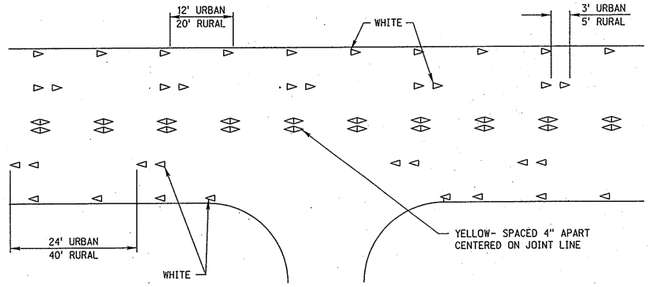


DIVIDED ROADWAY
ALL ⊳ ARE WHITE



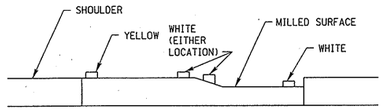
UNDIVIDED ROADWAY

PAINT/TAPE

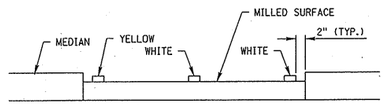


UNDIVIDED ROADWAY

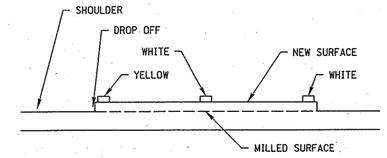
RPM/OVERLAY MARKER



NOTCHED WEDGE CENTERLINE

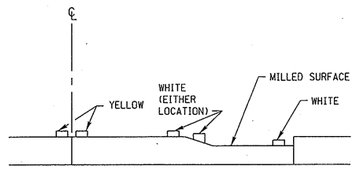


MILLED SURFACE

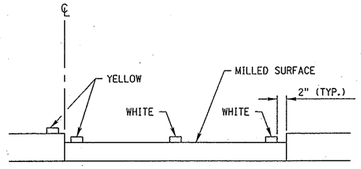


NEW SURFACING

DIVIDED ROADWAY



NOTCHED WEDGE CENTERLINE



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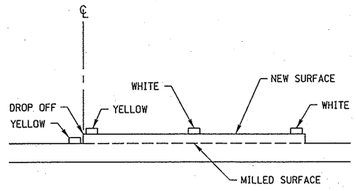

NEW SURFACING

UNDIVIDED ROADWAY

LATERAL LOCATION DETAILS

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

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

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

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.

LEGEND

◁ RPM/OVERLAY MARKER

◁▷ BIDIRECTIONAL RPM/OVERLAY MARKER

4-LANE

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

MARY BURROUGHS
5/14/2018
DATE

ORIGINAL:
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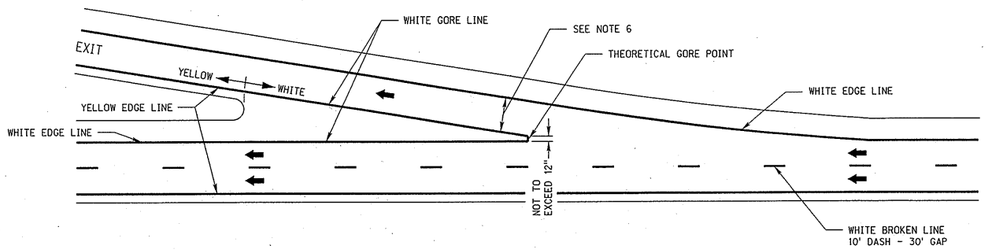
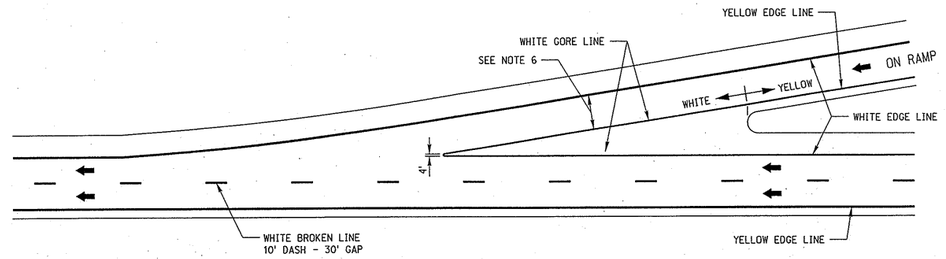


TAPERED DECELERATION LANE



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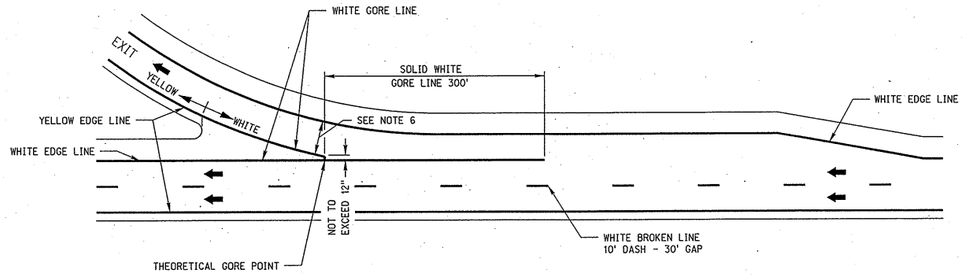
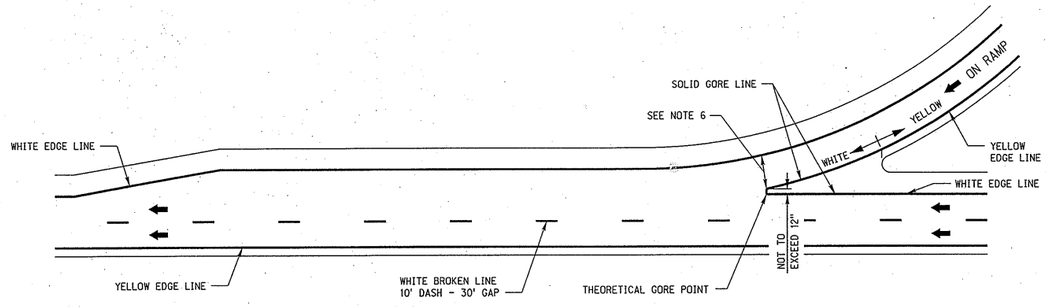
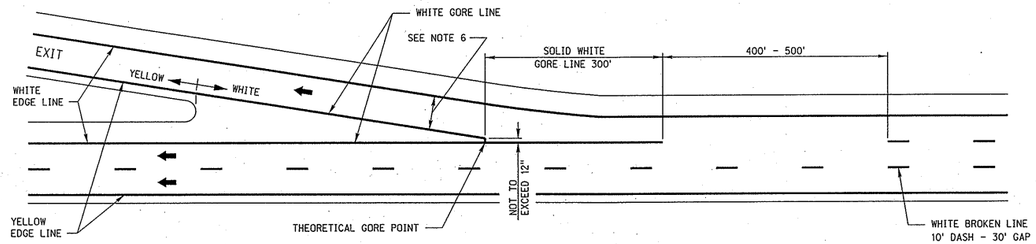


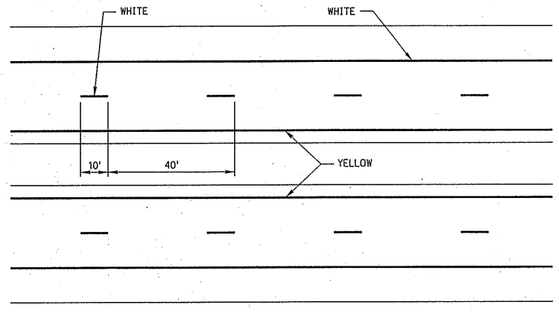
PARALLEL DECELERATION LANE



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 LINE 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

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4
4

ROADWAY DESIGN DIVISION

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