PROJECT NO.	SHEET NO.
ER-116-4(106)	A1
◣ CONTROL NO. 32324	
▲ CONTROL NO.	
■ CONTROL NO.	

STATE OF NEBRASKA
DEPARTMENT OF TRANSPORTATION
PLANS FOR CONSTRUCTION

DIXON SOUTH BRIDGE
DIXON 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
6-BRIDGE & 10-GENERAL

◣ GROUPS 6 & 10 ARE INCLUDED
IN THE LETTING OF MAY 24, 2019

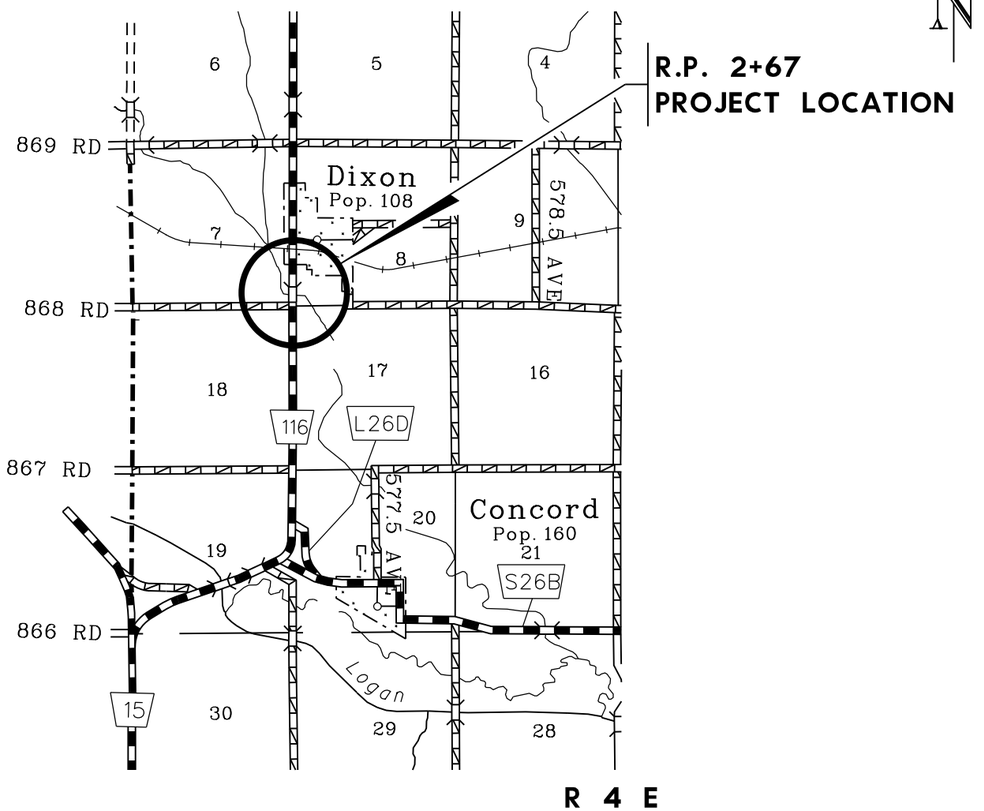
▲ GROUPS _____ ARE INCLUDED
IN THE LETTING OF _____

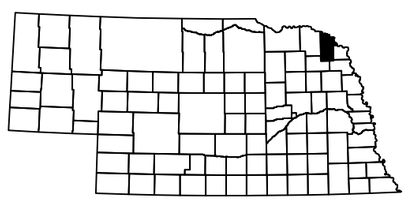
■ GROUPS _____ ARE INCLUDED
IN THE LETTING OF _____

INDEX OF SHEETS

STANDARD PLANS

501-R7	(3 SHEETS) EROSION CONTROL
502-R2	(2 SHEETS) SILT FENCE DETAILS
920-R7	(3 SHEETS) TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE
923-R2	TRAFFIC CONTROL ROAD CLOSURE





CONVENTIONAL SIGNS

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

R.O.W. LEGEND

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

REFERENCE POST NO. TO REFERENCE POST NO.

EXCEPTIONS: FROM STA. TO STA.

TOTAL NET LENGTH OF PROJECT: FEET MILES

PROFESSIONAL CIVIL ENGINEER
MICHAEL H. OWEN
E-6515
STATE OF NEBRASKA
May 16 2019
COORDINATING PROFESSIONAL

PROFESSIONAL CIVIL ENGINEER
MICHAEL H. STOCKENBERG
E-6505
STATE OF NEBRASKA
May 16 2019

ROADWAY DESIGN DIVISION.

File: 323240 NDOT_Title_Sheet.dgn Date: 16-MAY-2019 08:23 Computer: NDOTDESIGN13
Scale: 1:200

SUMMARY OF QUANTITIES

PROJECT NO.	SHEET NO.
ER-116-4(106)	C1

C.N. 32324

BRIDGE AT STATION 123+25.00 ITEMS
GROUP 6

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
PREPARATION OF BRIDGE AT STATION 123+25.00	1.000	EACH
ACCESS CROSSING	1.000	LS
STRUCTURAL STEEL FOR SUBSTRUCTURE	16,000.000	LB
PIPE PILING	340.000	LF
TIMBER PILE REPAIR	1.000	EACH

GENERAL ITEMS
GROUP 10

ITEM	QUANTITY	UNITS
BARRICADE, TYPE III	20.000	BDAY
SIGN DAY	120.000	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 SILT CHECK	300.000	LF
TEMPORARY SILT FENCE	300.000	LF
ENVIRONMENTAL COMMITMENTS - CONTRACTOR COMPLIANCE	1.000	LS

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

May 16 2019 DocuSign

DIXON SOUTH BRIDGE

- NOTES -

This structure is designed in accordance with the AASHTO Bridge Design Specifications, 16th Edition, including subsequent interim revisions.

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 for the use of an alternate design.

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

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

The Pay Item, "STRUCTURAL STEEL FOR SUBSTRUCTURE", shall include all Channels, Plates and 7/8"Φ All-Threaded Bolts.

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

The existing structure was built under projects, 116-4(103) dated 2009 & S-428(2)-1 dated 1941. Plans are available from the Bridge Division upon request.

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

The Contractor will be allowed to place temporary scaffolding to complete the construction under the deck. All scaffolding shall be removed in its entirety upon completion of the work.

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

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

All materials, equipment, tools, labor, and incidentals necessary to complete the work, not paid for directly, shall be considered subsidiary to other items for which payment is made.

All exposed pipe piles shall be filled with concrete. This concrete shall be Class "47B" with a minimum 28-day compressive strength of 3,000 psi. This concrete shall be subsidiary to the Pay Item, "PIPE PILING".

Field welding is required, and it shall be done by a certified Welder. The Contractor shall provide the welding certification to the Engineer for approval.

- QUANTITIES -

PREPARATION OF BRIDGE AT STATION 123+25.00	1	EA
PIPE PILING	340	LF
STRUCTURAL STEEL FOR SUBSTRUCTURE	16000	LB
ACCESS CROSSING	1	LS
TIMBER PILE REPAIR	1	EA

- INDEX -

Shop plans required for review;
Substructure Steel (All Channels Plates & All-thread Bolts.)

PROJECT NUMBER	SHEET NO.
ER-116-4(106)	S1

C.N. 32324

STRUCTURE NUMBER
S116 00267

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

BRIDGE ENGINEER

3 SPAN CONCRETE SLAB BRIDGE
EMERGENCY REPAIR
GENERAL NOTES, QUANTITIES, & INDEX

DATE APRIL 2019
CHECKED BY AG
DETAILED BY DAV
DESIGNED BY DAV

LOCATION Dixon South Bridge
SKEW 0°
ROADWAY 26'-0"
DESIGN LIVE LOAD

COUNTY Dixon
HWY. NO. N-116
REF. POST. 002.67
STA. 123+25.00

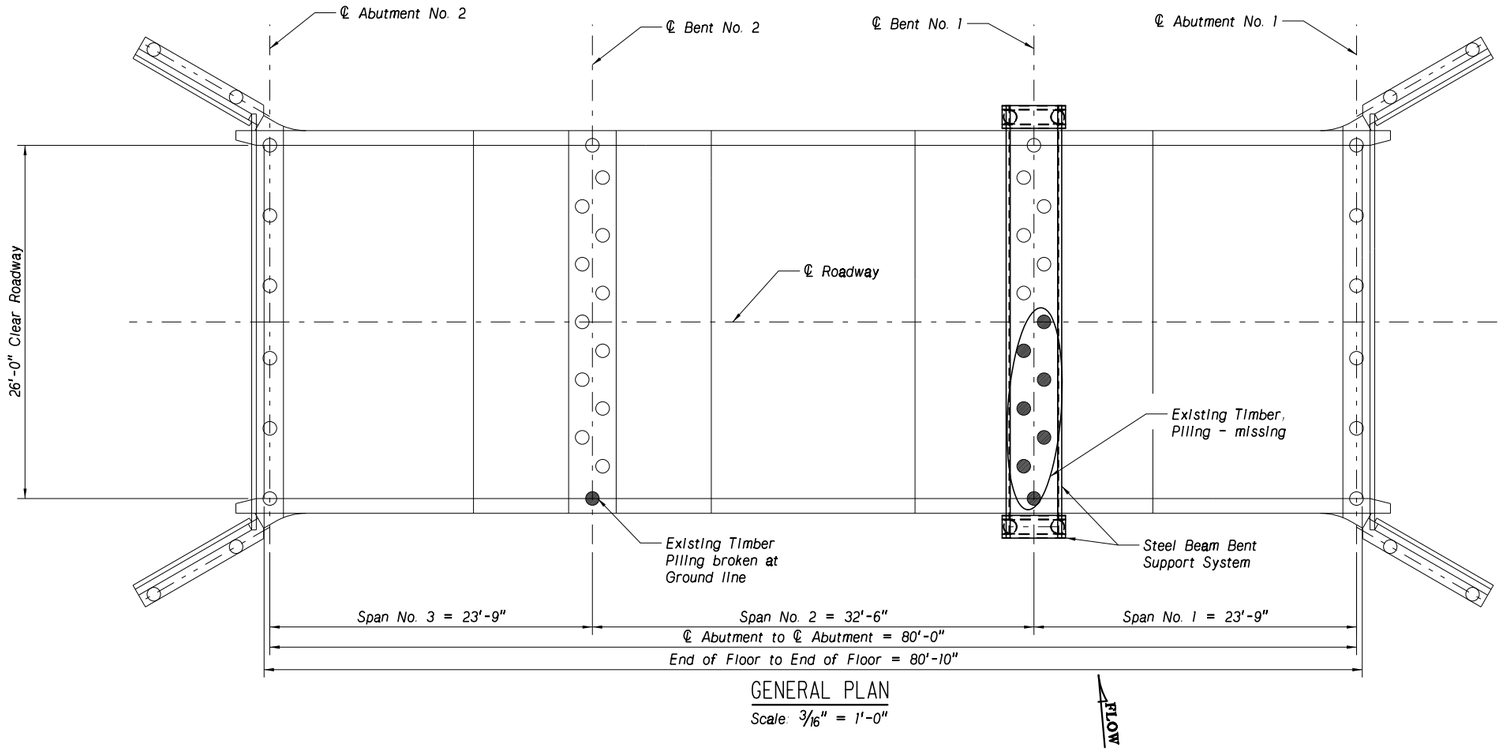
NEBRASKA - DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL STRUCTURAL ENGINEER
AMGAD F.M. GIRGIS
14402
STATE OF NEBRASKA

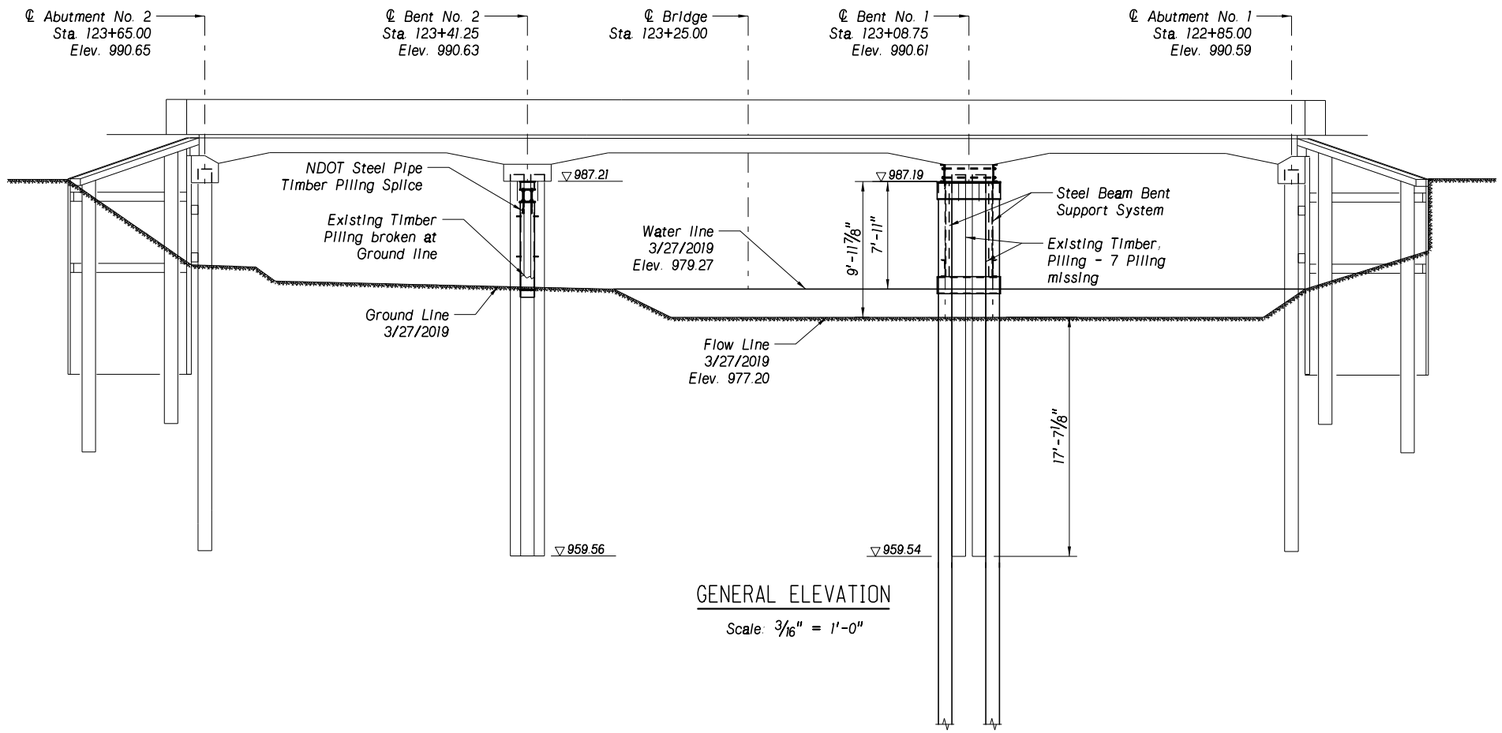
SPECIAL PLAN NO.	
1	1/8

COMPUTER$$$$
USERNAME$$$$
DATE$$$$$$$$$$$$$$
DGNSPEC$$$$$$$$$$$$



GENERAL PLAN

Scale: 3/16" = 1'-0"



GENERAL ELEVATION

Scale: 3/16" = 1'-0"

PROJECT NUMBER	SHEET NO.
ER-116-4(106)	S2

C.N. 32324

STRUCTURE NUMBER
S116 00267

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

BRIDGE ENGINEER

3 SPAN CONCRETE SLAB BRIDGE
EMERGENCY REPAIR
GENERAL PLAN & ELEVATION

LOCATION Dixon South Bridge
SKEW 0°
ROADWAY 26'-0"
DESIGN LIVE LOAD
DETAILED BY DAV
CHECKED BY AG
DATE APRIL 2019

COUNTY Dixon
HWY. NO. N-116
REF. POST. 002.67
STA. 123+25.00
DESIGNED BY DAV

NEBRASKA - DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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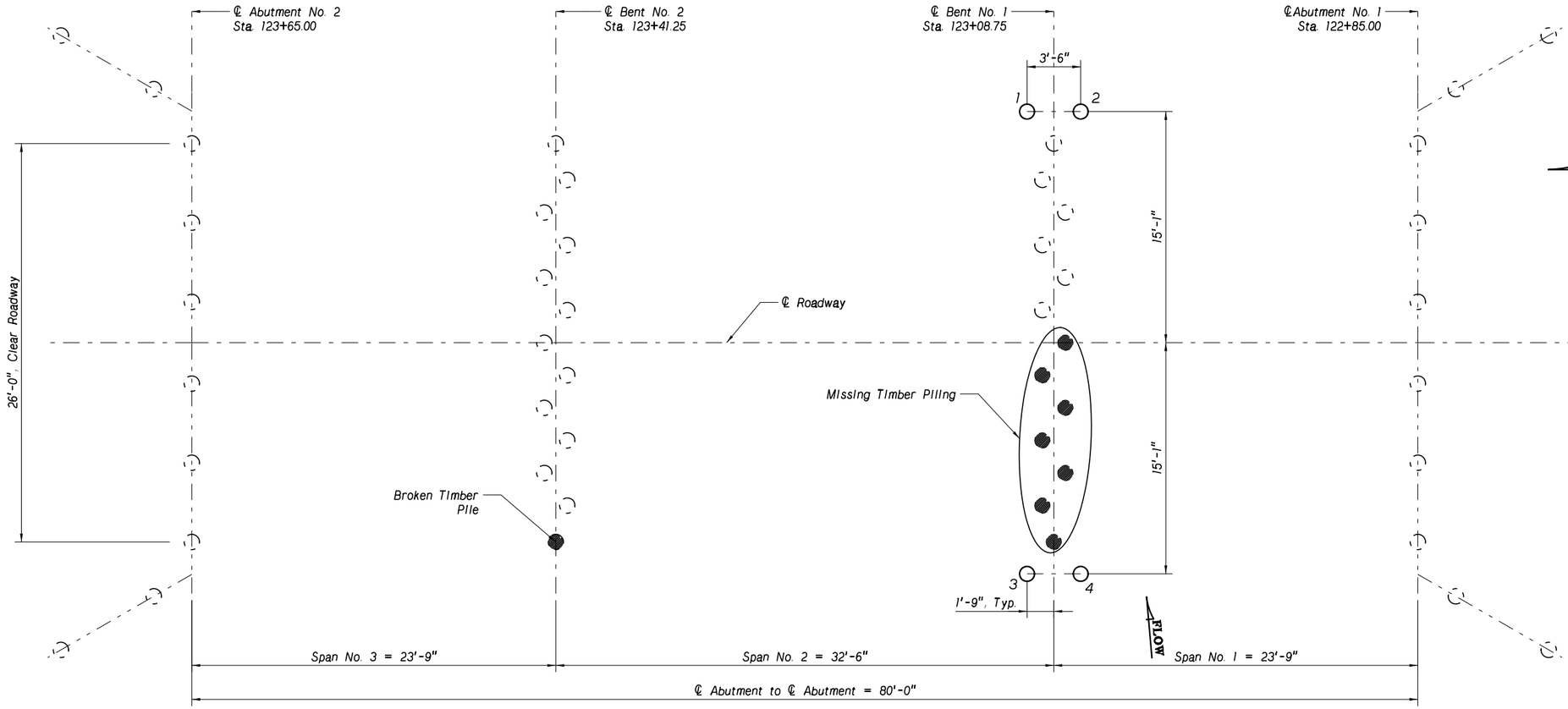
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL STRUCTURAL ENGINEER
AMGAD F.M. GIRGIS
14402
STATE OF NEBRASKA

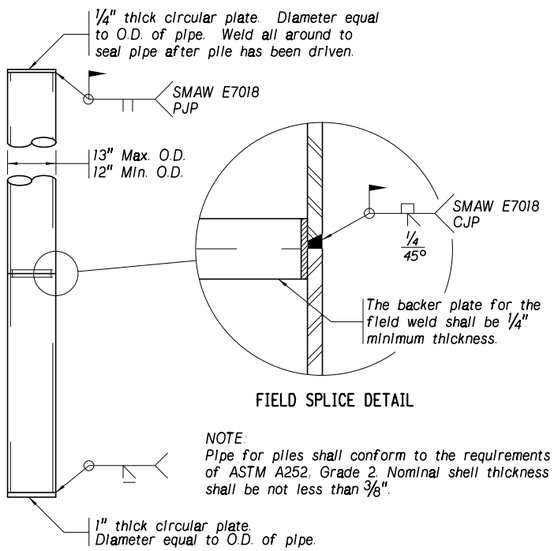
SPECIAL PLAN NO.	
1	2/8

COMPUTER$$$$
USERNAME$$$$
DATE$$$$$$$$$$$$
DGNSPEC$$$$$$$$$$



PILE LAYOUT

Scale: 1/4" = 1'-0"



FIELD SPLICE DETAIL

PIPE PILE DETAIL

Not to Scale

PILE DATA						
LOCATION	PILE NUMBER	CUT-OFF ELEVATION ▲	MINIMUM PENETRATION BELOW CUT-OFF (feet)	PILE ORDER LENGTH (feet)	DESIGN PILE BEARING ★ (tons/pile)	PILE TYPE
Bent No. 1	1 - 4	987.13	80	85	50	Pipe

★ Service Loads
▲ Final Cut-Off Elevation to be field verified to ensure proper elevation.

NOTES:

All pile spacing is given at the bottom of concrete.

PROJECT NUMBER	SHEET NO.
ER-116-4(106)	S3

C.N. 32324

STRUCTURE NUMBER
S116 00267

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

BRIDGE ENGINEER

3 SPAN CONCRETE SLAB BRIDGE
EMERGENCY REPAIR
PILE LAYOUT

LOCATION Dixon South Bridge
SKEW 0°
ROADWAY 26'-0"
DESIGN LIVE LOAD
DETAILED BY DAV **CHECKED BY** AG **DATE** APRIL 2019

COUNTY Dixon
HWY. NO. N-116
REF. POST. 002.67
STA. 123+25.00
DESIGNED BY DAV

NEBRASKA - DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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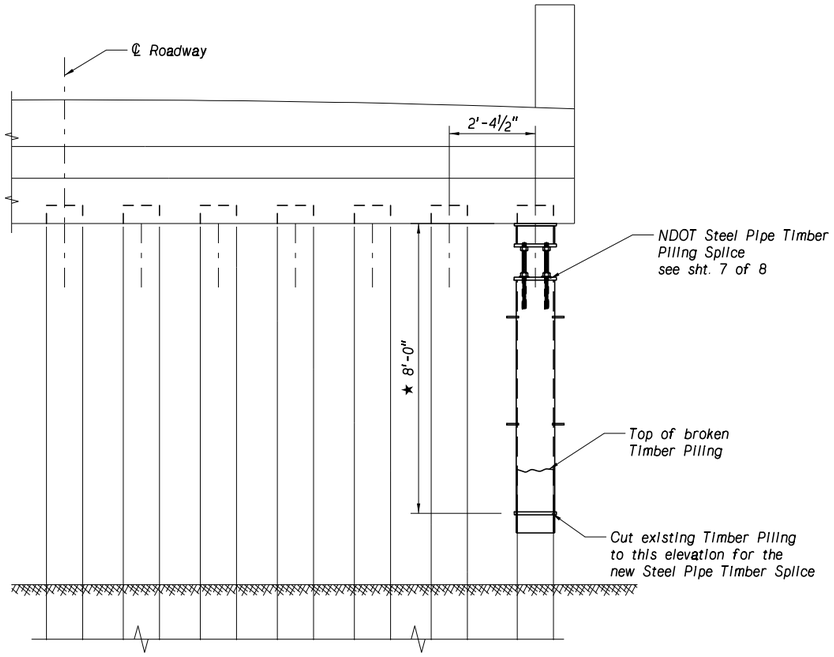
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL STRUCTURAL ENGINEER
AMGAD F.M. GIRGIS
E-14402
STATE OF NEBRASKA

SPECIAL PLAN NO.	
1	3 / 8

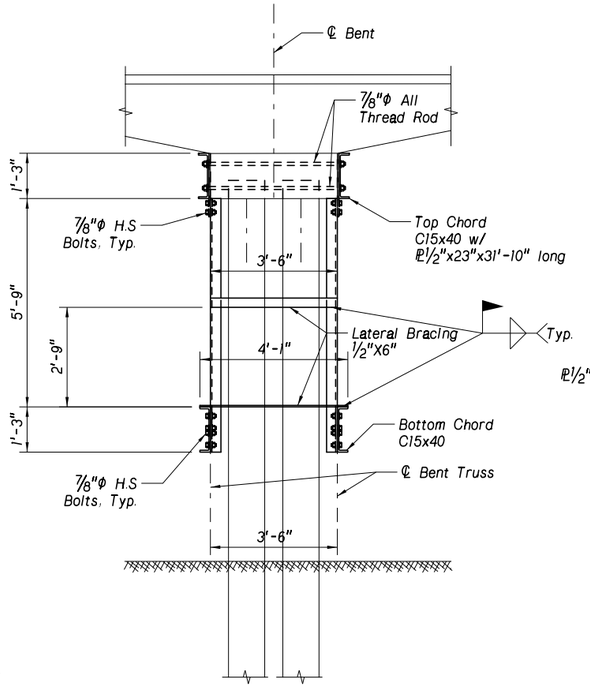
COMPUTER$$$$
USERNAME$$$$
DATE$$$$$$$$$$$$$$
DGNSPEC$$$$$$$$$$$$



PART ELEVATION OF BENT NO. 2

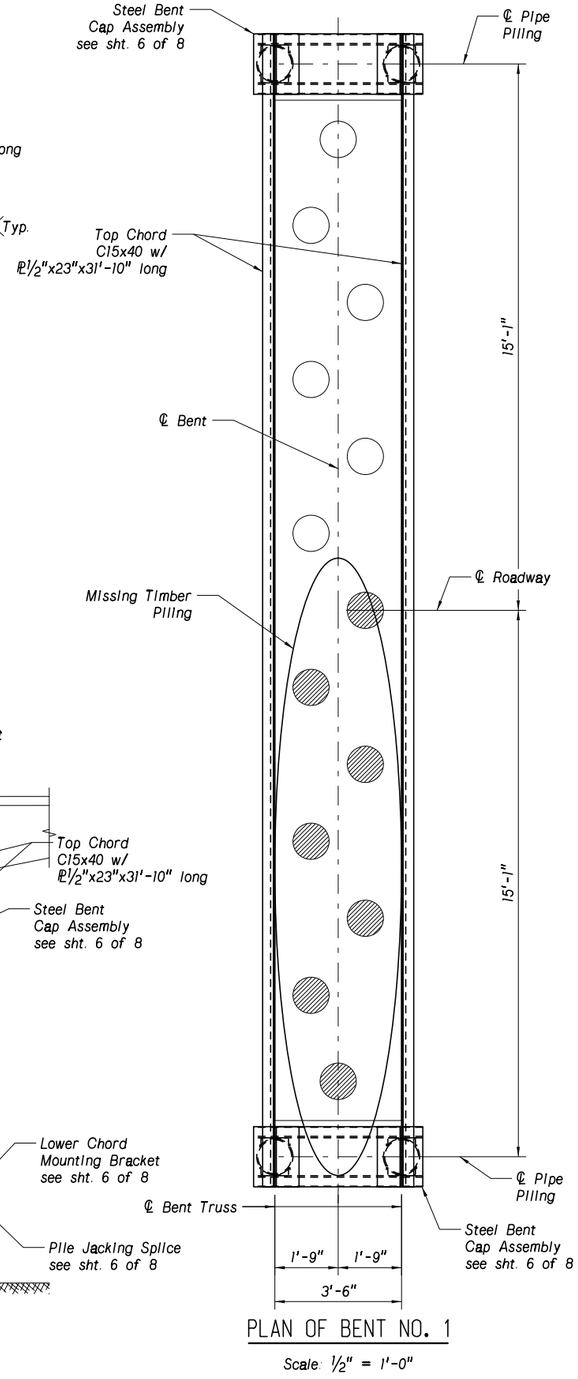
Scale: ½" = 1'-0"

Note:
★ Field verify this dimension before fabrication to ensure that the Timber Splice is placed on solid wood.



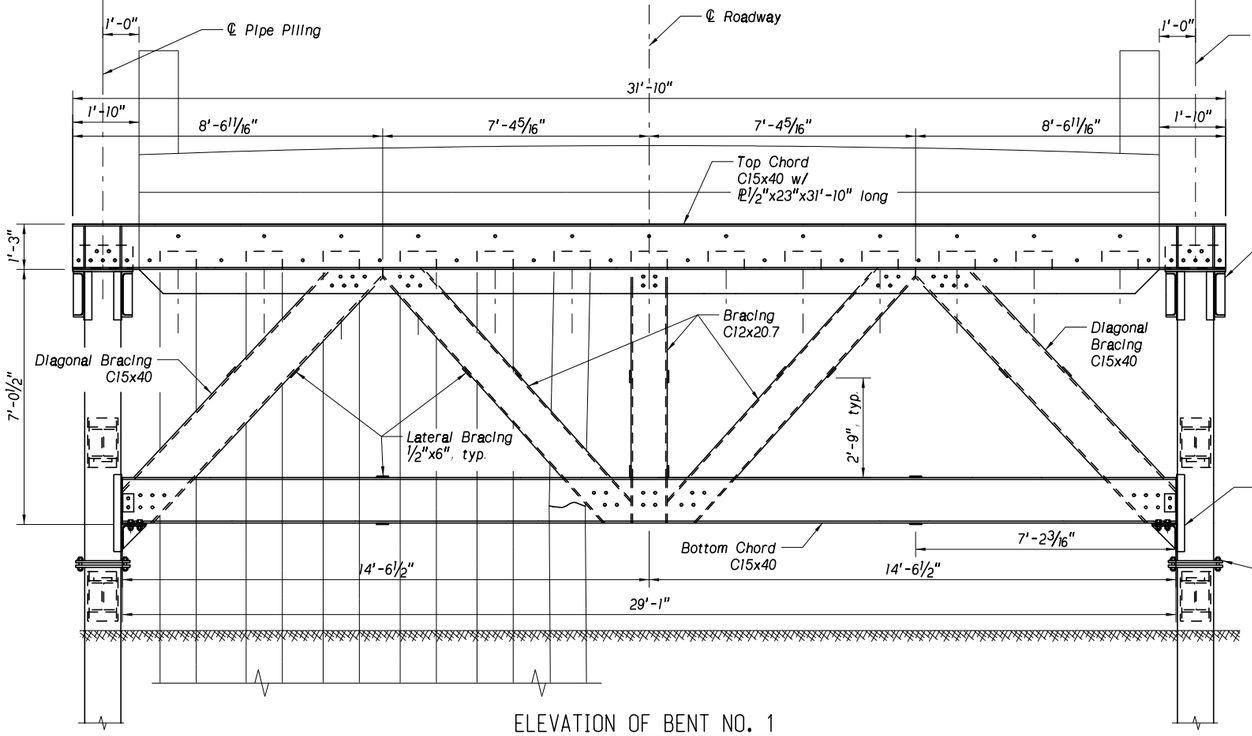
SECTION OF BENT NO. 1

Scale: ½" = 1'-0"



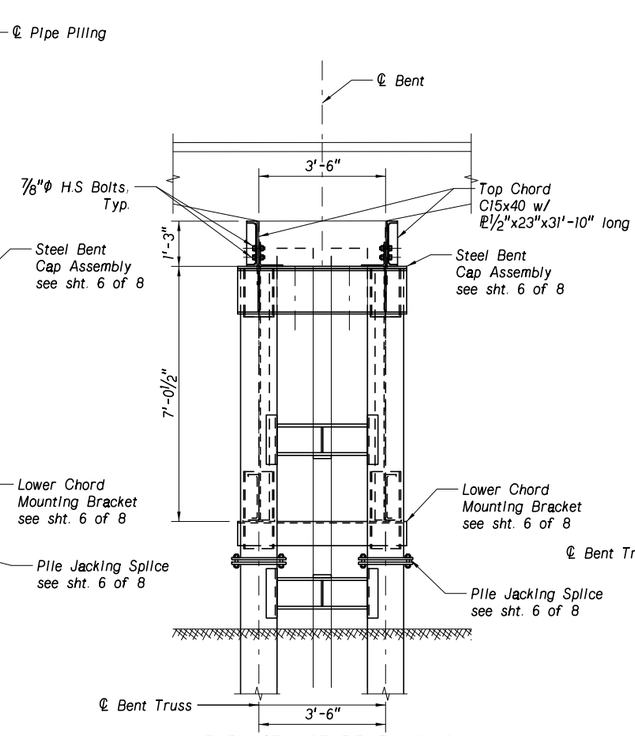
PLAN OF BENT NO. 1

Scale: ½" = 1'-0"



ELEVATION OF BENT NO. 1

Scale: ½" = 1'-0"



END VIEW OF BENT NO. 1

Scale: ½" = 1'-0"

PROJECT NUMBER	SHEET NO.
ER-116-4(106)	S4

C.N. 32324

STRUCTURE NUMBER
S116 00267

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

BRIDGE ENGINEER

3 SPAN CONCRETE SLAB BRIDGE
EMERGENCY REPAIR
PLAN & ELELVATION OF BENT

COUNTY Dixon
HWY. NO. N-116
REF. POST. 002.67
STA. 123+25.00

LOCATION Dixon South Bridge
SKEW 0°
ROADWAY 26'-0"
DESIGN LIVE LOAD

DESIGNED BY DAV **DETAILED BY** DAV **CHECKED BY** AG **DATE** APRIL 2019

NEBRASKA - DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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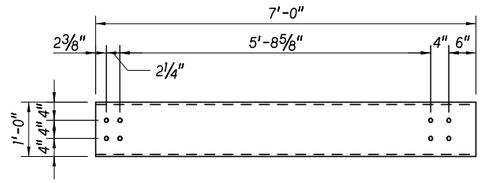
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL STRUCTURAL ENGINEER
A.M.G.A.D F.M.
GIRGIS
14402
STATE OF NEBRASKA

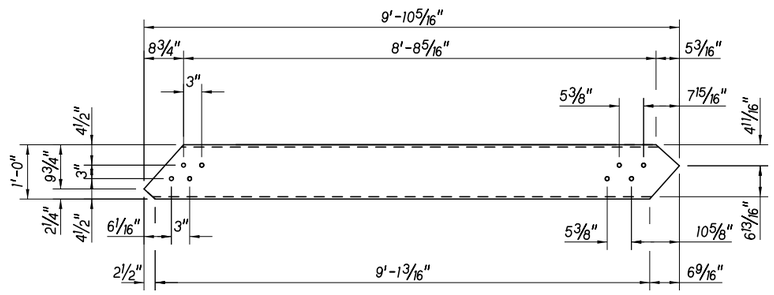
SPECIAL PLAN NO.	4 / 8
1	

COMPUTER$$$$
USERNAME$$$$
DATE$$$$$$$$$$$$$
DGNSPEC$$$$$$$$$$$$



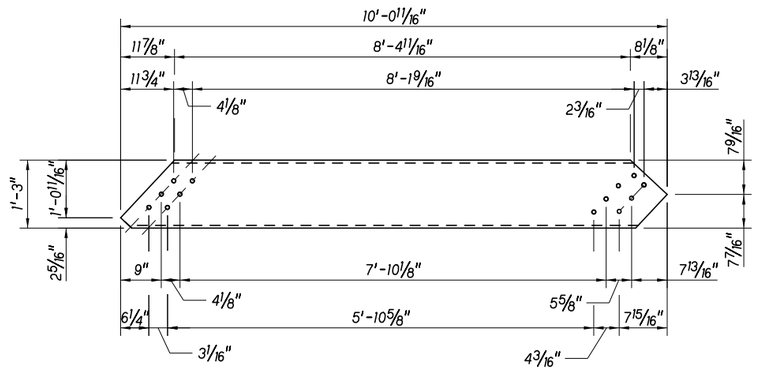
C12x20.7 VERTICAL BRACE CHANNEL

Not to Scale
(2 Required)



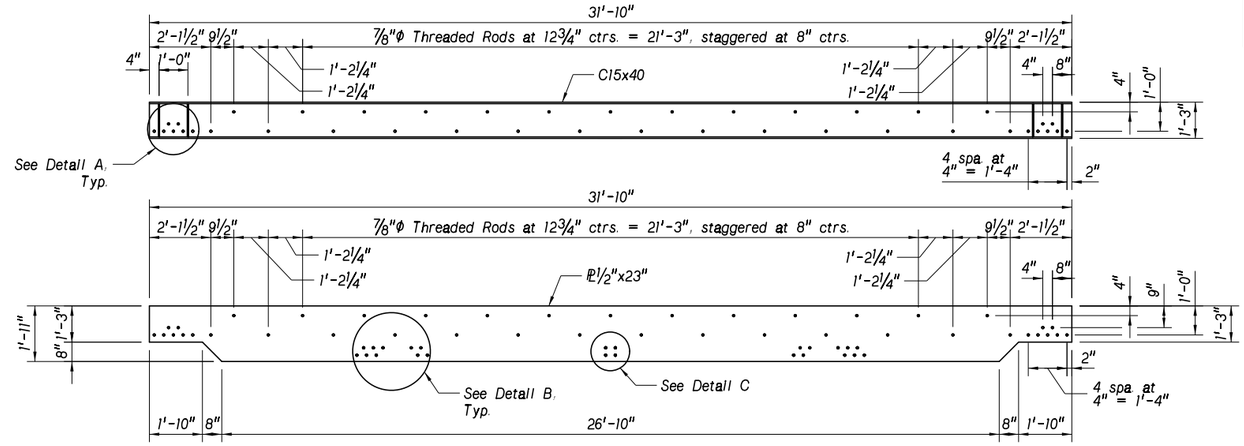
C12x20.7 DIAGONAL BRACE CHANNEL

Not to Scale
(4 Required, 2 as shown, 2 mirrored)



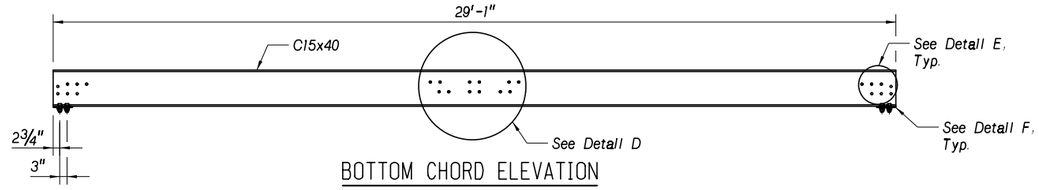
C15x40 DIAGONAL BRACE CHANNEL

Not to Scale
(4 Required, 2 as shown, 2 mirrored)



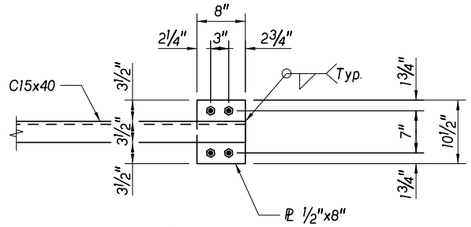
TOP CHORD ELEVATION

Not to Scale
(2 Required)



BOTTOM CHORD ELEVATION

Not to Scale
(2 Required)



DETAIL F

Not to Scale

Notes:

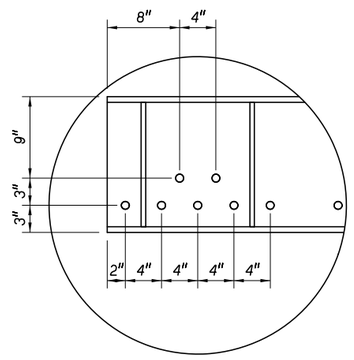
Threaded rods shall be ASTM F1554 with a yield strength, Fy=105 ksi and an ultimate strength, Fu=125 ksi.

For the Top Chord connection to the Concrete Cap use 7/8"ϕ All Thread Rods with hex nuts, whashers & lock washers. Bar length = 4'-0". Use PL 1/2"x23"x31'-10" for a template.

All bolts shall be 7/8"ϕ High Strength Bolts with hex nut, washer & lock washer.

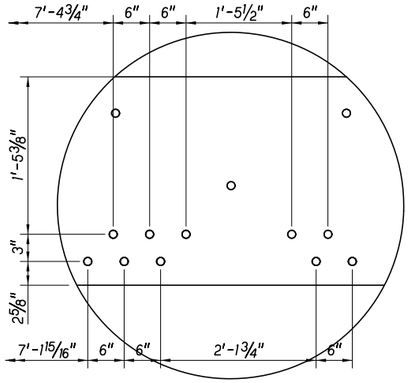
All shop and field welds shall be 1/4" fillet, U.N.O.

Holes to be 15/16"ϕ U.N.O.



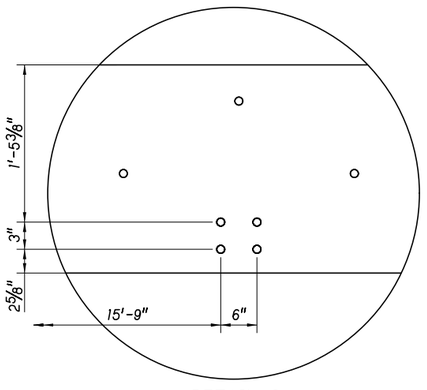
DETAIL A

Not to Scale



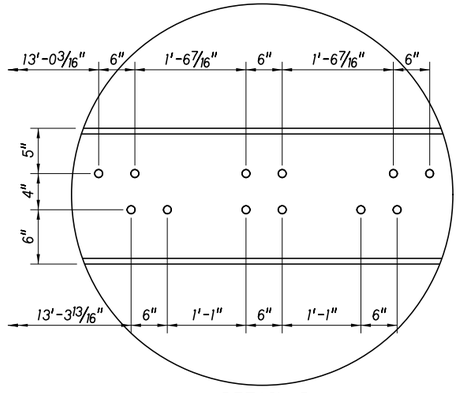
DETAIL B

Not to Scale



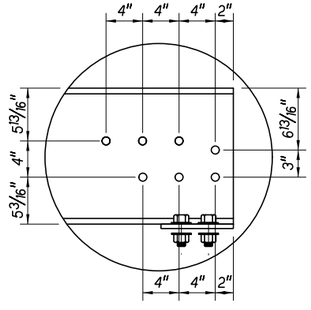
DETAIL C

Not to Scale



DETAIL D

Not to Scale



DETAIL E

Not to Scale

PROJECT NUMBER	SHEET NO.
ER-116-4(106)	S5

C.N. 32324

STRUCTURE NUMBER
S116 00267

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

BRIDGE ENGINEER

3 SPAN CONCRETE SLAB BRIDGE
EMERGENCY REPAIR
BENT REPAIR DETAILS 1 OF 2

DATE APRIL 2019
CHECKED BY AG
DETAILED BY DAV
DESIGNED BY DAV

LOCATION Dixon South Bridge
SKEW 0°
ROADWAY 26'-0"
DESIGN LIVE LOAD

COUNTY Dixon
HWY. NO. N-116
REF. POST. 002.67
STA. 123+25.00

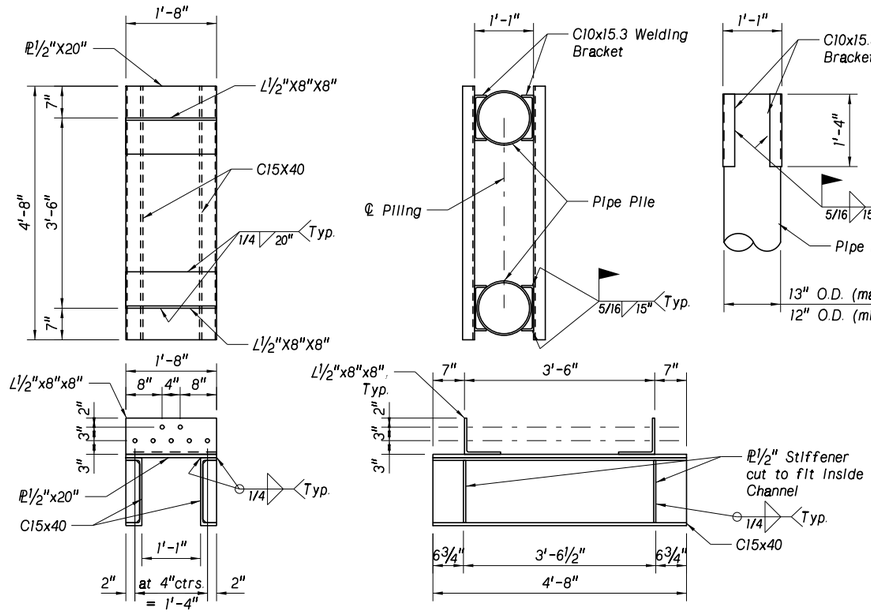
NEBRASKA - DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL STRUCTURAL ENGINEER
AMGAD F.M. GIRGIS
E-14402
STATE OF NEBRASKA
12 MY 2020

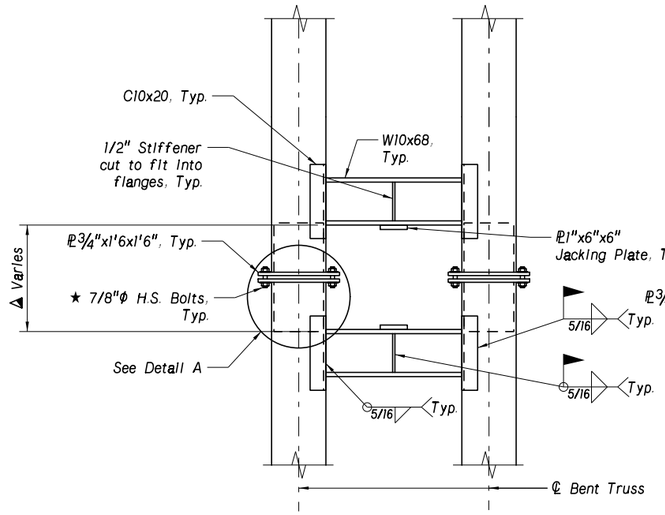
SPECIAL PLAN NO.	5 / 8
1	

COMPUTER$$$$
USERNAME$$$$
DATE$$$$$$$$$$$$$
DGNSPEC$$$$$$$$$$$$



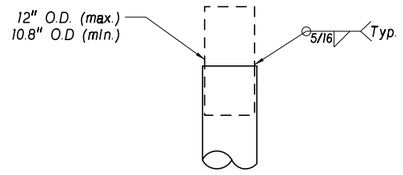
PILE BENT CAP DETAILS

Scale: ¾" = 1'-0"
(2 Required)



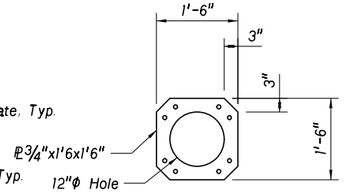
PILE JACKING SPLICE DETAIL

Scale: ¾" = 1'-0"
(2 Required)



DETAIL A

Scale: ¾" = 1'-0"



PILE PLATE DETAIL

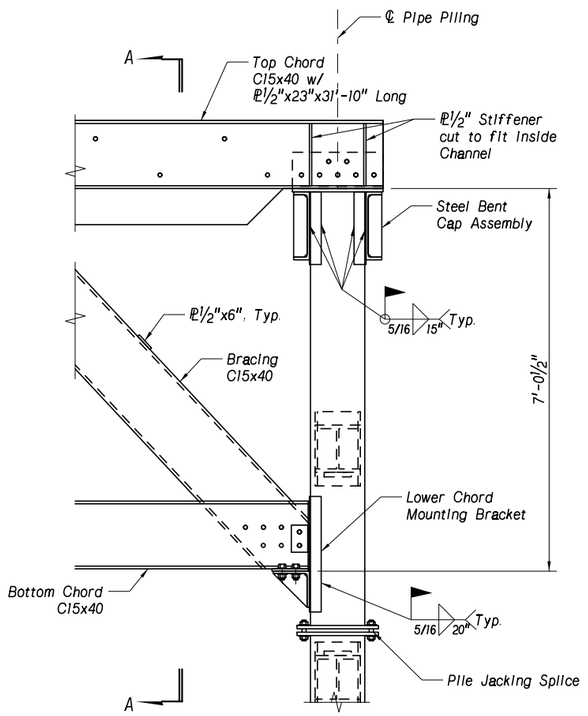
Scale: ¾" = 1'-0"

Notes:

Jacking to be preformed one side at a time. Load = 100 kips.

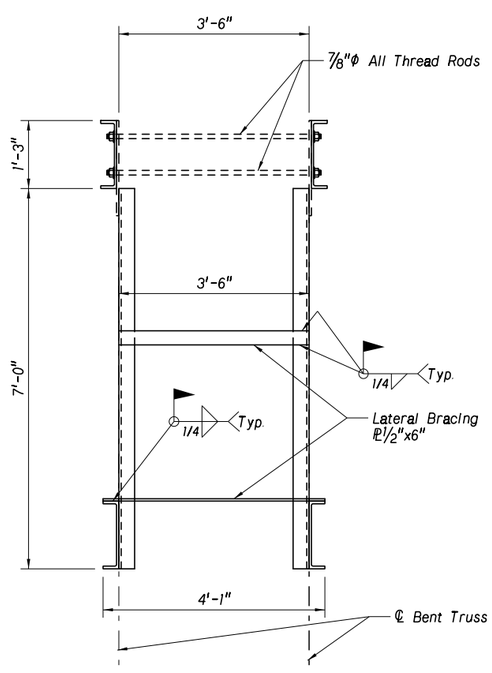
Δ This dimension is determined by Contractor Jacking system used. Center top and bottom W10x68 between pipe piles.

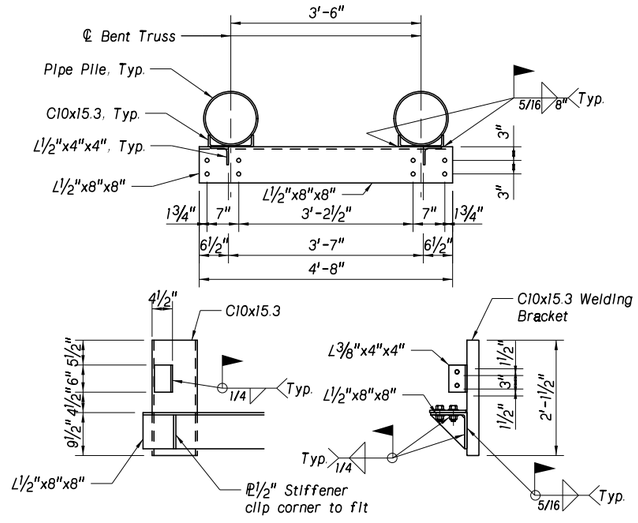
★ Jack to transfer loads to piling before placing steel shims and bolts.



PART ELEVATION OF BENT

Scale: ¾" = 1'-0"





LOWER CHORD MOUNTING BRACKET

Scale: ¾" = 1'-0"
(2 Required)

PROJECT NUMBER	SHEET NO.
ER-116-4(106)	S6

C.N. 32324

STRUCTURE NUMBER
S116 00267

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

BRIDGE ENGINEER

3 SPAN CONCRETE SLAB BRIDGE
EMERGENCY REPAIR
BENT REPAIR DETAILS 2 OF 2

COUNTY Dixon
HWY. NO. N-116
REF. POST. 002.67
STA. 1234+25.00

LOCATION Dixon South Bridge
SKEW 0°
ROADWAY 26'-0"
DESIGN LIVE LOAD

DESIGNED BY DAV
DETAILED BY DAV
CHECKED BY AG
DATE APRIL 2019

NEBRASKA - DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

NEBRASKA
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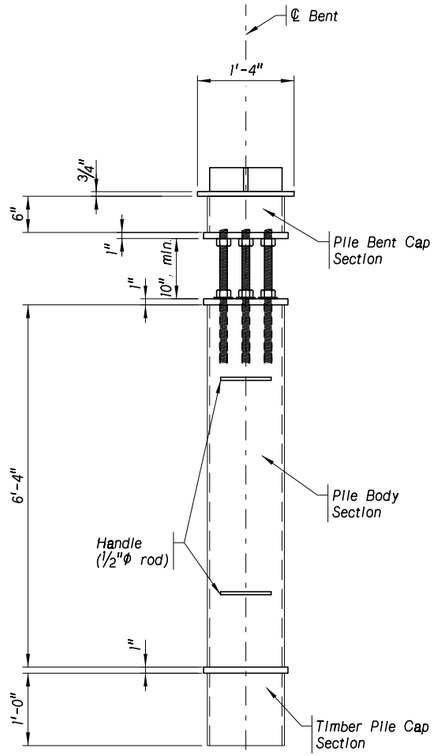
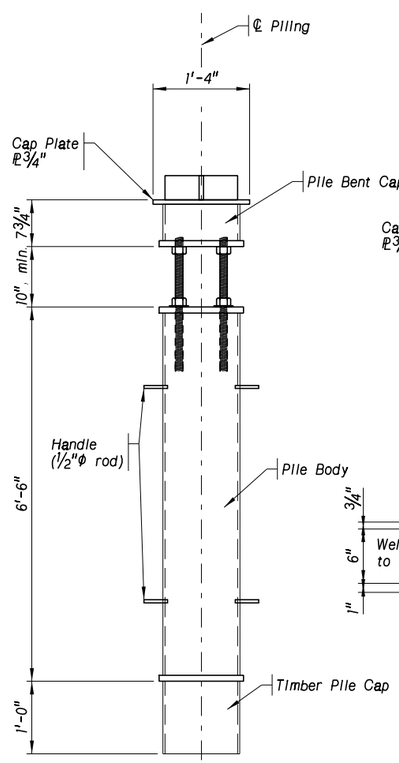
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL STRUCTURAL ENGINEER
AMGAD F.M. GIRGIS
E-14402
STATE OF NEBRASKA

SPECIAL PLAN NO.	
1	6 / 8

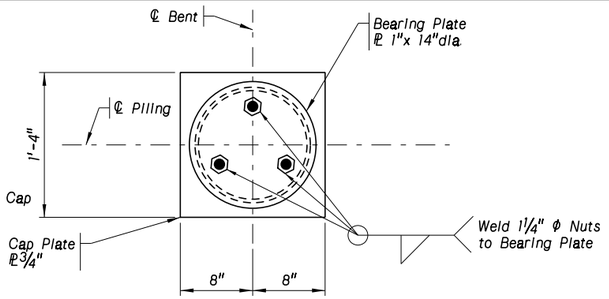
COMPUTER$$$$
USERNAME$$$$
DATE$$$$$$$$$$$$
DGNSPEC$$$$$$$$$$$$





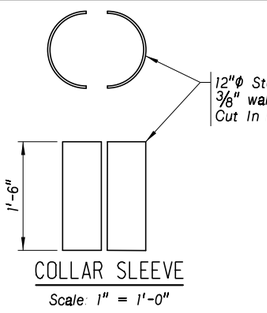
STANDARD TIMBER PILE SPLICE

Scale: 1" = 1'-0"



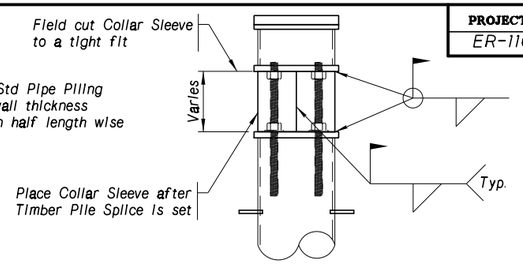
SECTION A-A

Scale: 1 1/2" = 1'-0"



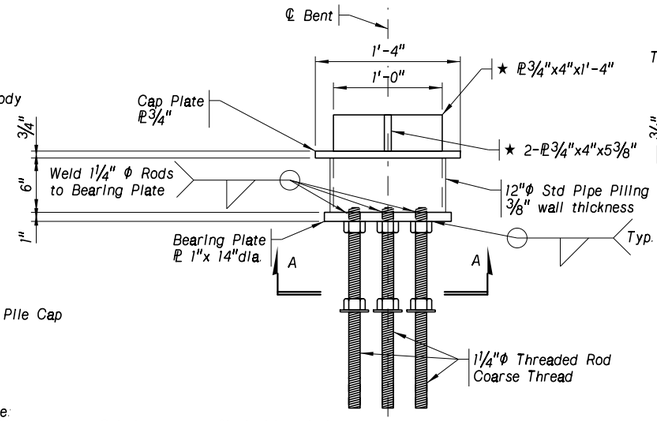
COLLAR SLEEVE

Scale: 1" = 1'-0"

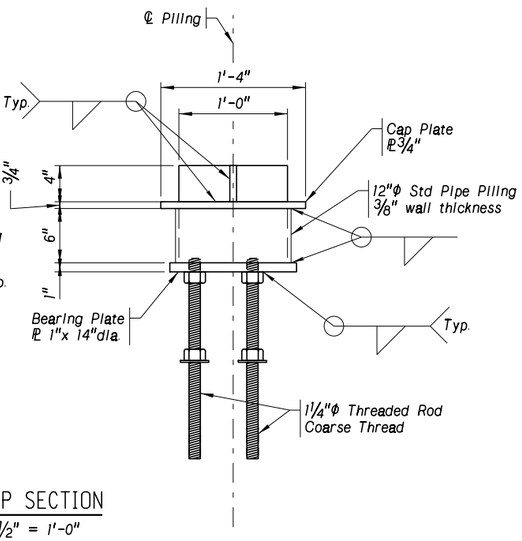


COLLAR SLEEVE PLACEMENT

Scale: 1" = 1'-0"

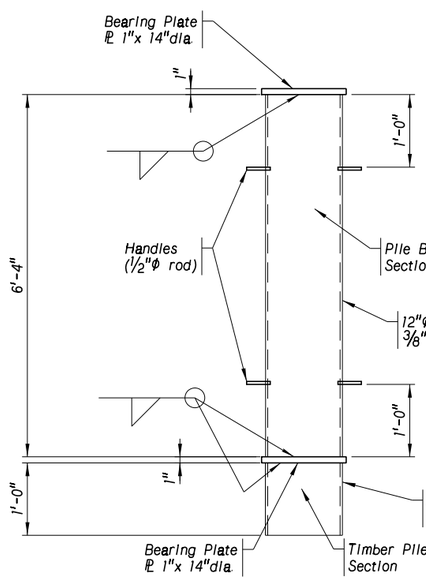


Note:
★ Made need to Grind or cut to fit inside existing Timber Pile pocket.



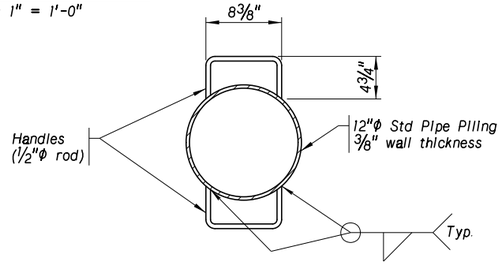
PILE BENT CAP SECTION

Scale: 1 1/2" = 1'-0"

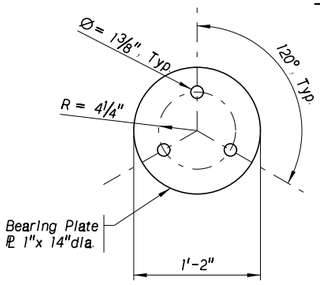


PILE BODY SECTION

Scale: 1" = 1'-0"

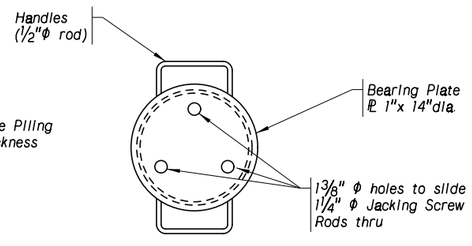


SECTION NEAR HANDLES

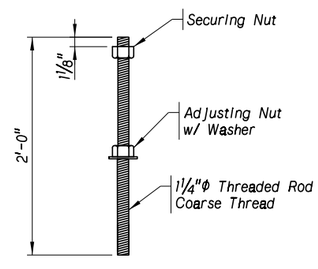


BEARING PLATE

Scale: 1 1/2" = 1'-0"



TOP VIEW OF PILE BODY SECTION



1 1/4" DIA. JACKING SCREW

TIMBER PILE REPAIR SPLICE INSTRUCTION

1. Cut one and only one damaged Timber Pile at a time before moving on to the next damaged Pile. Start with the worst Timber Pile first.
2. Measure from the bottom of the Concrete Bent Cap anywhere from 6'-7" to 7'-3" for the Standard Repair Splice to a point of solid Timber Pile. Cut a level line, lower the bottom part of Splice onto the Timber Pile, trim Timber Pile side and top for a positive contact with the Splice base plate. Once the fit is made coat the top of Timber Pile with Foundation Coating Tar.
3. Now reset the Pile Repair Splice and place on top of the Timber Pile.

   a. Slide the Pile Bent Cap up to make contact with the Bent Cap concrete using the adjusting nuts by hand, than with a 12" crescent wrench, turn the adjusting nuts until the nuts will not turn with the 12" wrench, stop. As an alternate, can use a 2 ton scissors jack to speed up the process, keep jacking until the jack can not lift any more.

   b. Take a 36" Pipe wrench and turn the adjusting nuts equally until The adjusting nuts no longer will turn with the 36" Pipe wrench. Now record this distance and send the two dimensions to the Bridge Office (SPU Section). (You have reach the existing Bridge Pile capacity)
4. Your Done, the existing Piling is now carrying it's designed load once again.
5. Now field cut the Collar Sleeve to length as shown on sht. 1 of 3 to fit around Jacking Screws, than field weld Collar Sleeve for a permanent fix.

NOTES:
All Structural Steel can be either Grade A36 or 50.

The 1 1/4"ϕ Threaded Rod, coarse thread shall conform to the requirement ASTM A193, grade B7.

Pipe for Piling shall conform to the requirement of ASTM A252, grade 2 with a wall thickness not less than 3/8".

After fabrication, coat with a zinc base primer, the finish coat not required.

PROJECT NUMBER	SHEET NO.
ER-116-4(106)	S7

C.N. 32324

STRUCTURE NUMBER S116 00267

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

BRIDGE ENGINEER

3 SPAN CONCRETE SLAB BRIDGE
EMERGENCY REPAIR
STEEL PIPE TIMBER PILING SPICE DETAILS

LOCATION Dixon South Bridge
SKEW 0° ROADWAY 26'-0" DESIGN LIVE LOAD
DETAILED BY DAV DATE APRIL 2019 CHECKED BY AG

COUNTY Dixon
HWY. NO. N-116
REF. POST. 002.67
STA. 123+25.00

DESIGNED BY DAV

NEBRASKA - DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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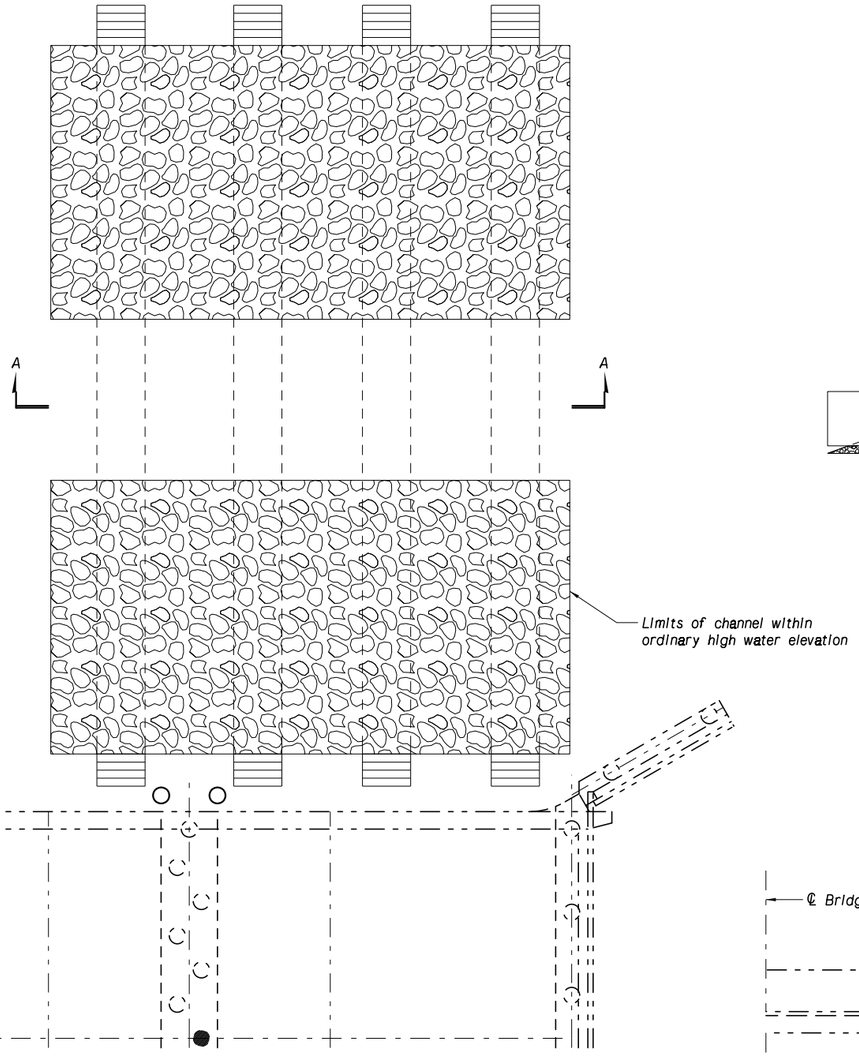
DEPARTMENT OF TRANSPORTATION

PROFESSIONAL STRUCTURAL ENGINEER — AMGAD F.M. GIRGIS 24402 — STATE OF NEBRASKA

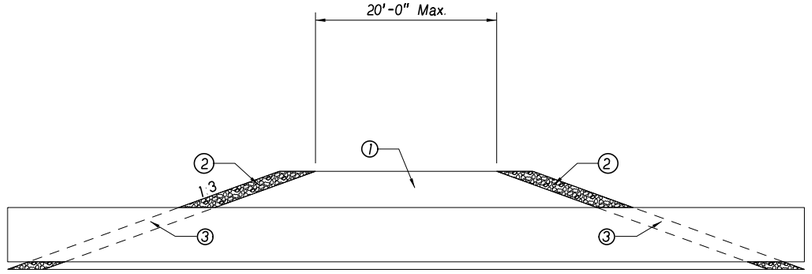
SPECIAL PLAN NO.	
1	7/8

COMPUTER$$$$
USERNAME$$$$
DATE$$$$$$$$$$$$
DGNSPEC$$$$$$$$$$$$



PART GENERAL PLAN

Not to Scale
(only 1 crossing shown for clarity)



TYPICAL SECTION OF CROSSING

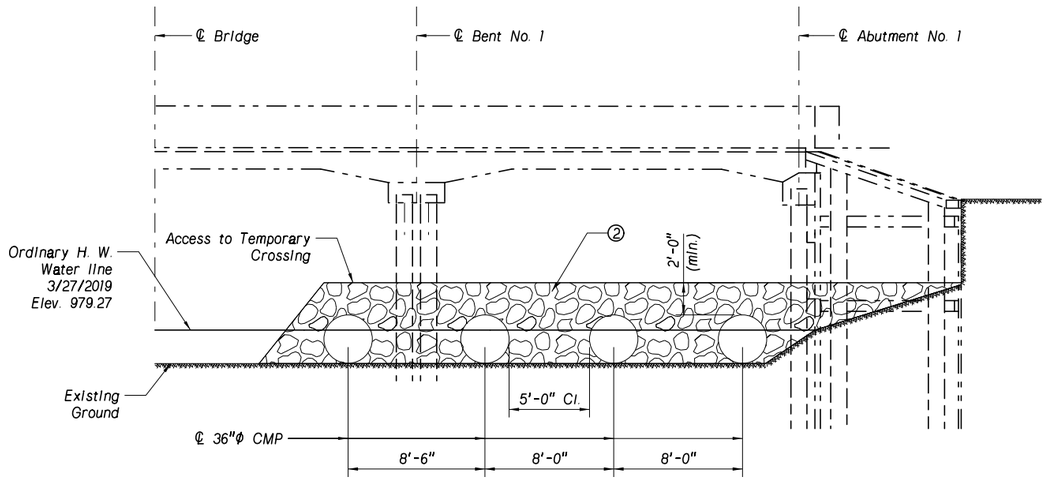
Not to Scale

LEGEND

① *Material Shall be clean earthen fill.*

② *Minimum 2'-0" Type B Rock Riprap or Broken Rock Riprap that meets the requirements of the NDOT standard specification.*

③ *Filter Fabic*



SECTION A-A

Not to Scale

PROJECT NUMBER	SHEET NO.
ER-116-4(106)	S8

C.N. 32324

STRUCTURE NUMBER
S116 00267

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

BRIDGE ENGINEER

3 SPAN CONCRETE SLAB BRIDGE
EMERGENCY REPAIR
ACCESS CROSSING DETAILS

DATE APRIL 2019
CHECKED BY AG

LOCATION Dixon South Bridge
SKEW 0°
ROADWAY 26'-0"
DESIGN LIVE LOAD

COUNTY Dixon
HWY. NO. N-116
REF. POST. 002.67
STA. 123+25.00

DESIGNED BY DAV
DETAILED BY DAV
CHECKED BY

NEBRASKA - DEPARTMENT OF TRANSPORTATION - BRIDGE DIVISION

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DEPARTMENT OF TRANSPORTATION

PROFESSIONAL STRUCTURAL ENGINEER
AMGAD F.M. GIRGIS
14402
STATE OF NEBRASKA

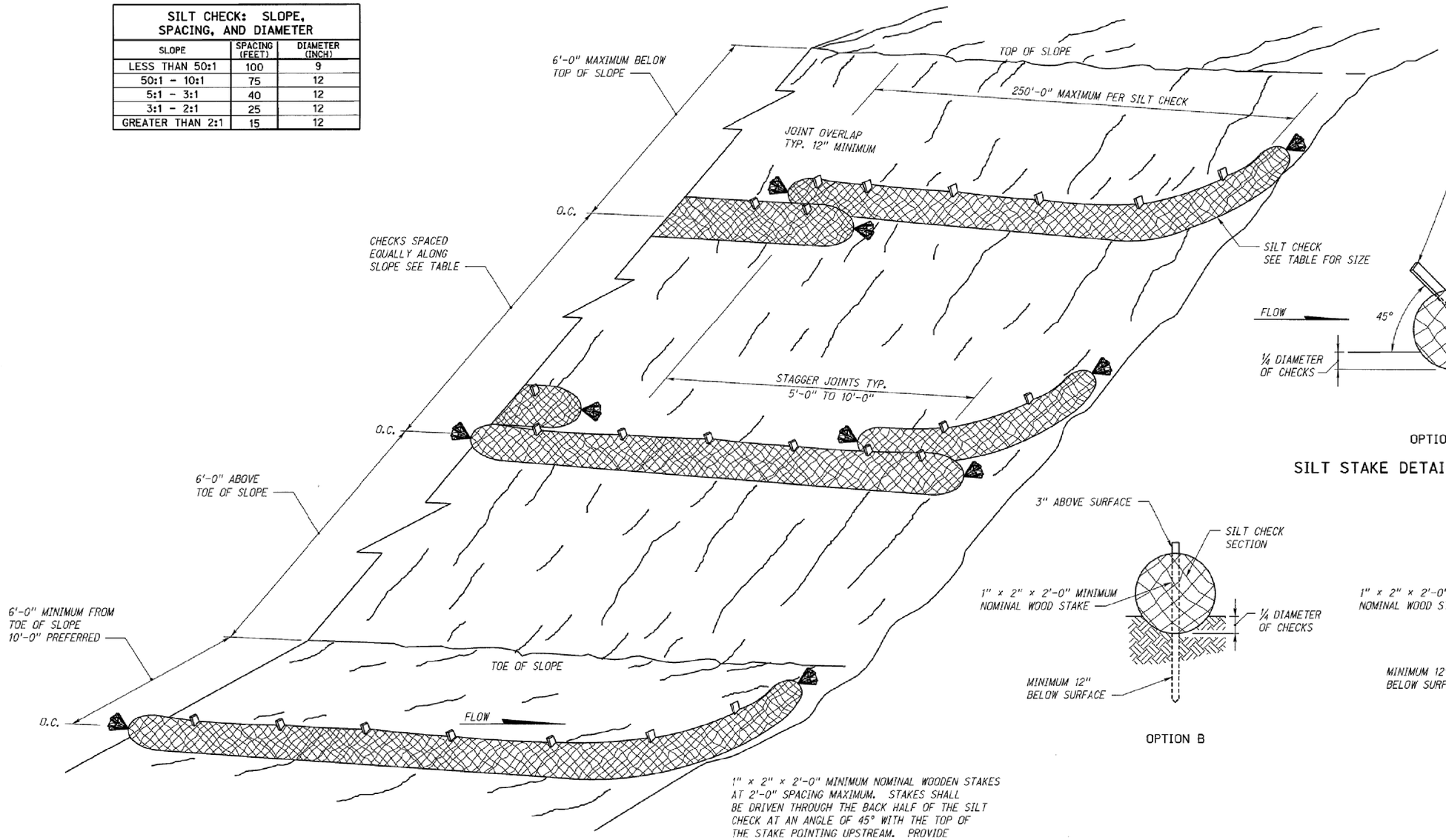
SPECIAL PLAN NO.	
1	8/8

COMPUTER$$$$
USERNAME$$$$
DATE$$$$$$$$$$$$$$
DGNSPEC$$$$$$$$$$$$

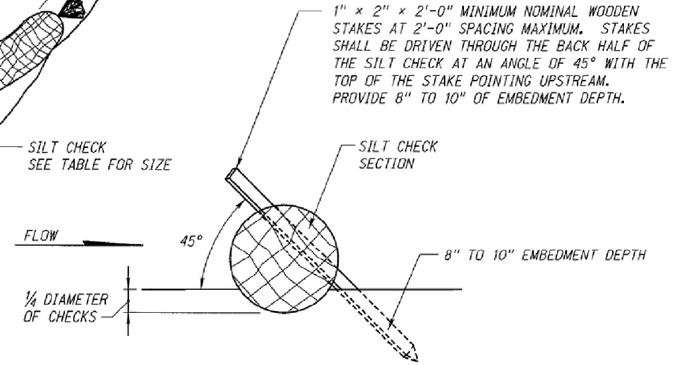
PROJECT NO.	SHEET NO.
116-4(106)	U1
C.N. 32324	

ROADWAY DESIGN DIVISION

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



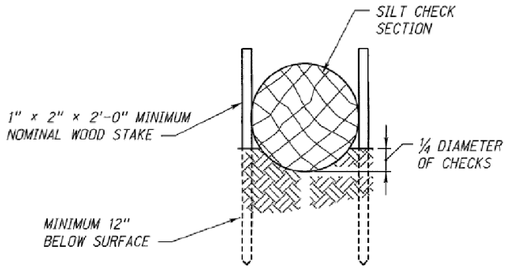
SLOPE APPLICATION
PERSPECTIVE VIEW



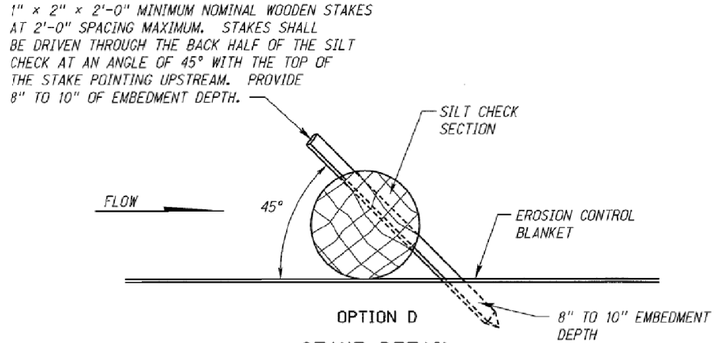
OPTION A

SILT STAKE DETAIL (WITH TRENCH)

OPTION B



OPTION C



OPTION D

STAKE DETAIL
(NO TRENCH)

NOTE:

TRENCHING IS OPTIONAL FOR CHECKS ON BACKSLOPES & FORESLOPES

PROFESSIONAL LANDSCAPE ARCHITECT
RONALD LEE POE
LA 275
REGISTERED
STATE OF NEBRASKA

SILT CHECKS ALL TYPES
SHEET 1 OF 4

SPECIAL PLAN 1C

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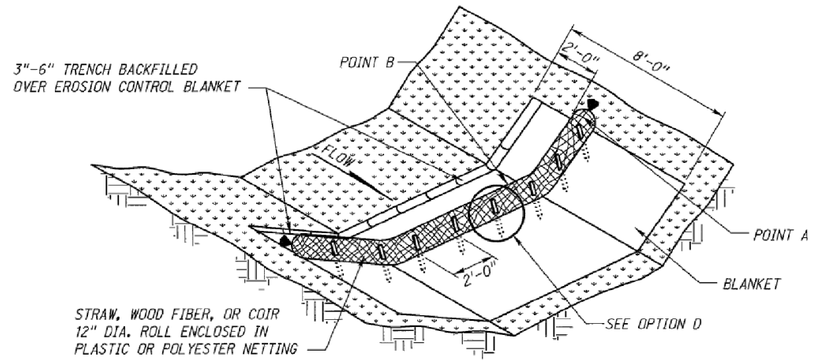
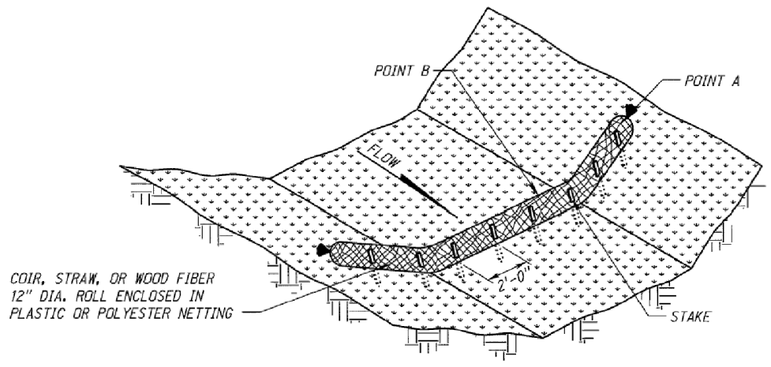
SHEET 1 OF 4

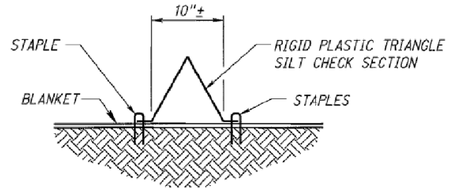
PROJECT NO.	SHEET NO.
116-4(106)	U2
C.N. 32324	



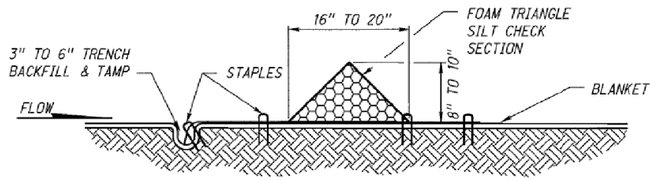
TYPE 2 & 3: HIGH & LOW
WITH EROSION CONTROL



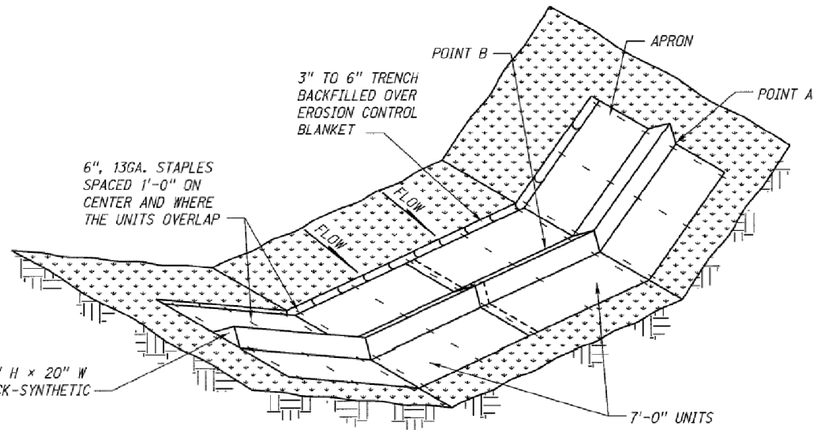
TYPE 1, 2 & 3: HIGH & LOW
USE ON ROUGH GRADED & BARE SOIL AREAS



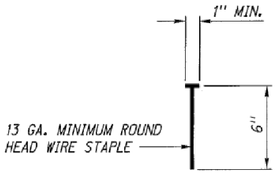
TYPE 4 SECTION

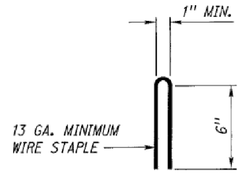


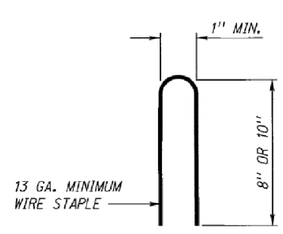
TYPE 4 SECTION



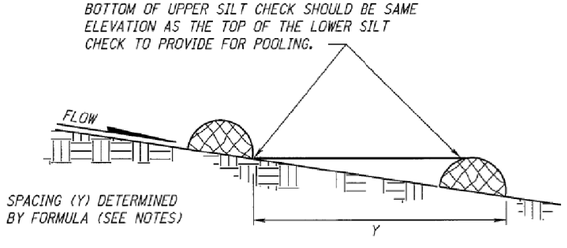
SILT CHECK: TYPE 4







WIRE STAPLE DETAIL



SILT CHECK SPACING-DITCH

NOTES:

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

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

POINT A MUST BE A MINIMUM OF 6" HIGHER THAN POINT B TO ENSURE THAT WATER FLOWS OVER THE CHECK AND NOT AROUND THE ENDS.

PERMANENT ROCK CHECKS PLACED WITHIN THE CLEAR ZONE WILL NEED TO BE 18" OR LESS IN HEIGHT. A 10:1 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

THE TRENCH ON THE UPSTREAM SIDE OF THE SILT CHECK IS NOT REQUIRED IF THE EROSION CONTROL BLANKET CONTINUES IN THE ENTIRE LENGTH OF THE DITCH.

THE MANUFACTURERS RECOMMENDED INSTALLATION DETAILS SHALL GOVERN OVER THE PLANS.

SEE STAKING DETAIL SHEET 1 OF 4

PROFESSIONAL LANDSCAPE ARCHITECT
REGISTERED
STATE OF NEBRASKA
RONALD C. PUST
LA. 275

SILT CHECKS ALL TYPES
SHEET 2 OF 4

SPECIAL PLAN 1C

ROADWAY DESIGN DIVISION

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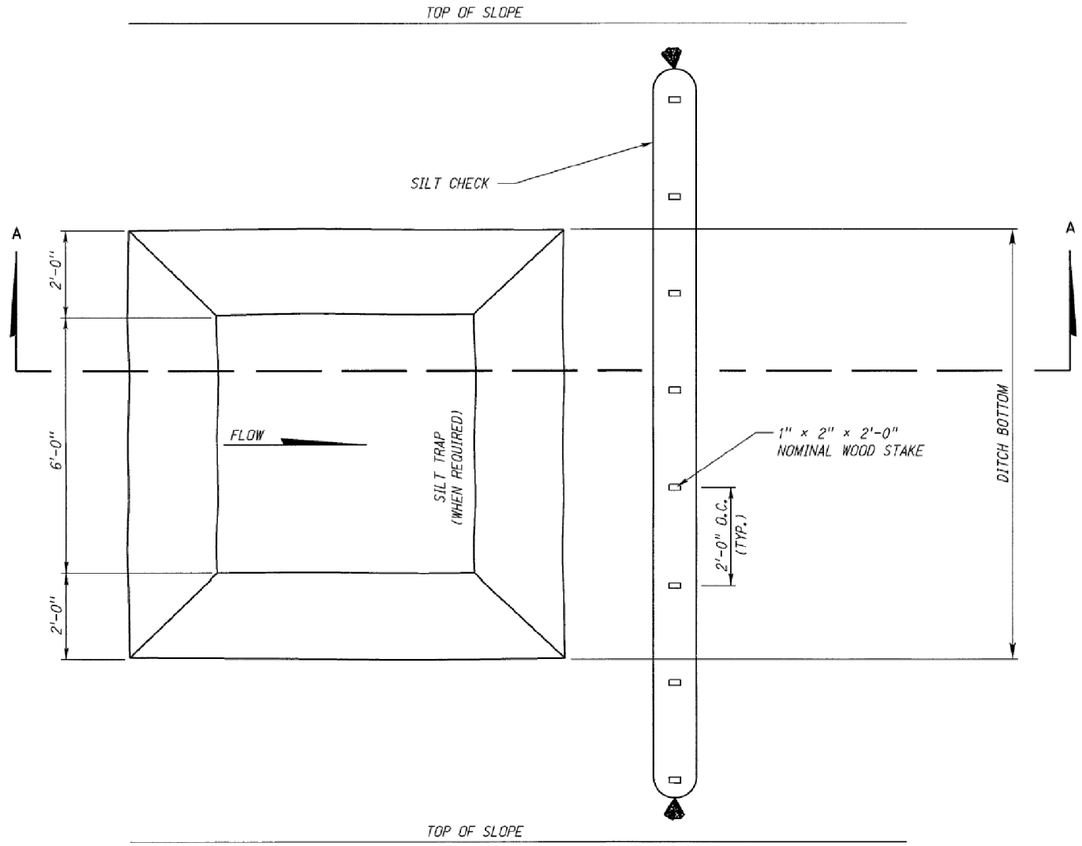
SHEET 2 OF 4 5104 1 e 00

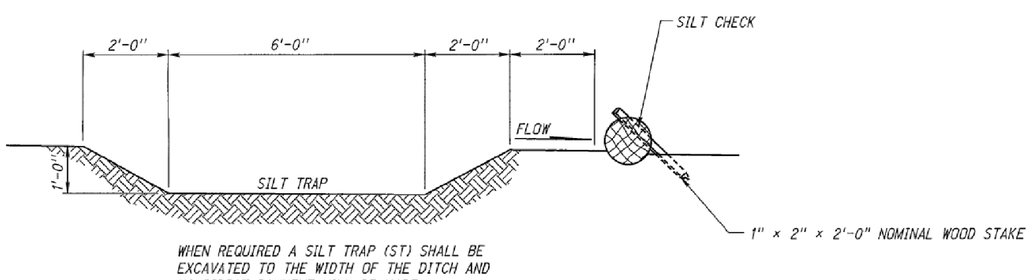
PROJECT NO. 116-4(106) C.N. 32324 | SHEET NO. U3

ROADWAY DESIGN DIVISION

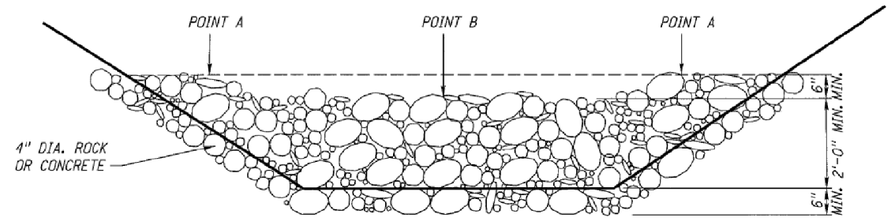


PLAN VIEW

FOR FLAT BOTTOM DITCH

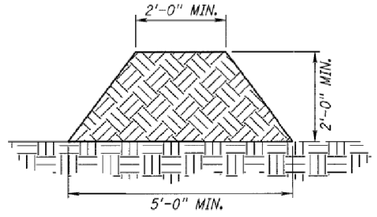


SECTION A-A



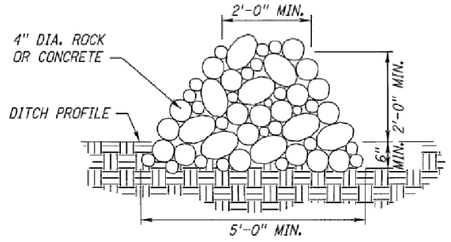
ROCK CHECK

ELEVATION VIEW



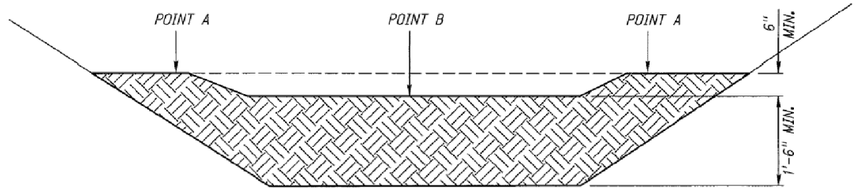
EARTH-SLASH MULCH PERIMETER BERM

CROSS SECTION



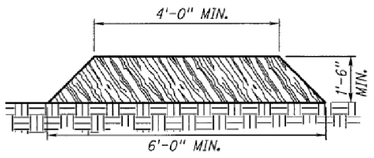
ROCK CHECK

CROSS SECTION



EARTH-SLASH MULCH CHECK

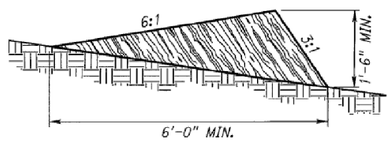
ELEVATION VIEW



CROSS SECTION

SILT CHECK-SLASH MULCH

OPTION A



CROSS SECTION

SILT CHECK-SLASH MULCH

OPTION B

SEE STAKING DETAIL SHEET 1 OF 4

SILT CHECKS ALL TYPES

SHEET 3 OF 4

SPECIAL PLAN 1C

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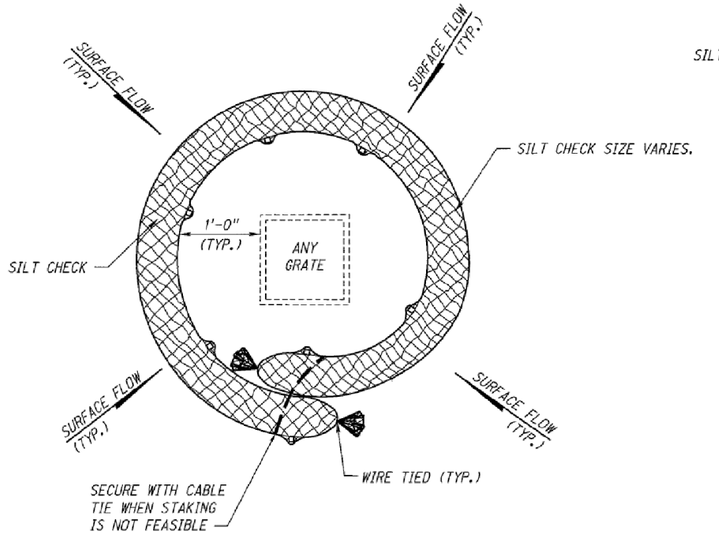
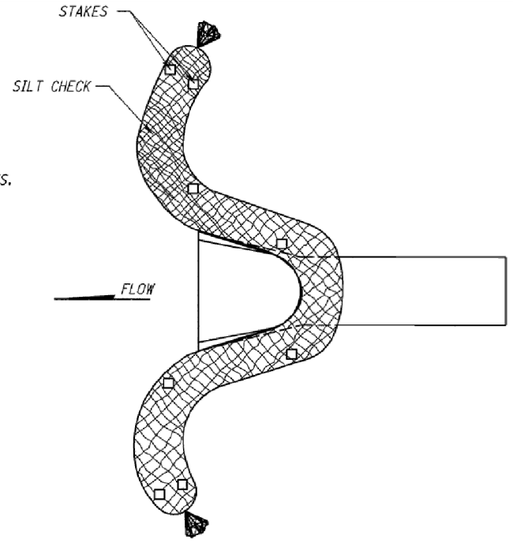
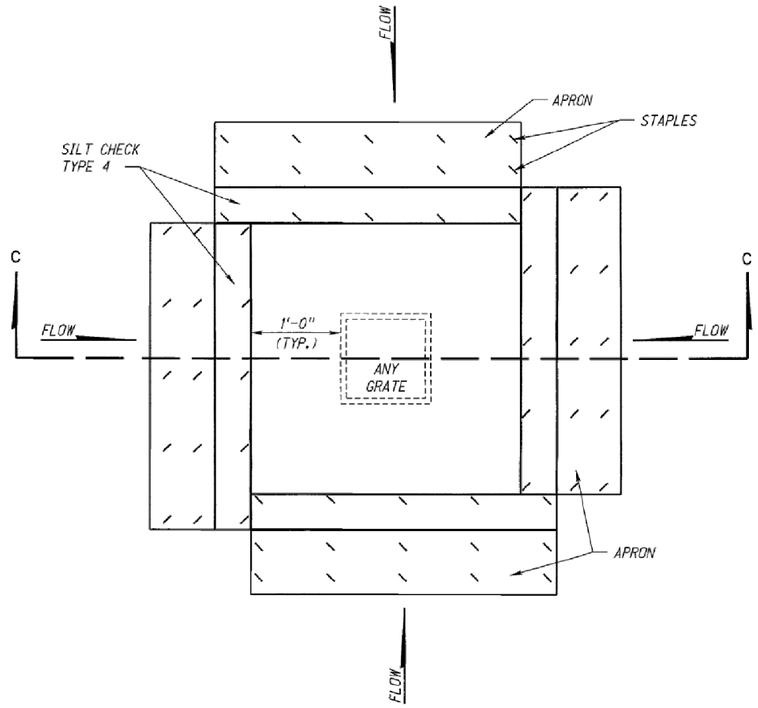
SHEET 3 OF 4
Date: 02-MAY-2019 17:35
Computer: NDOTDESIGN13



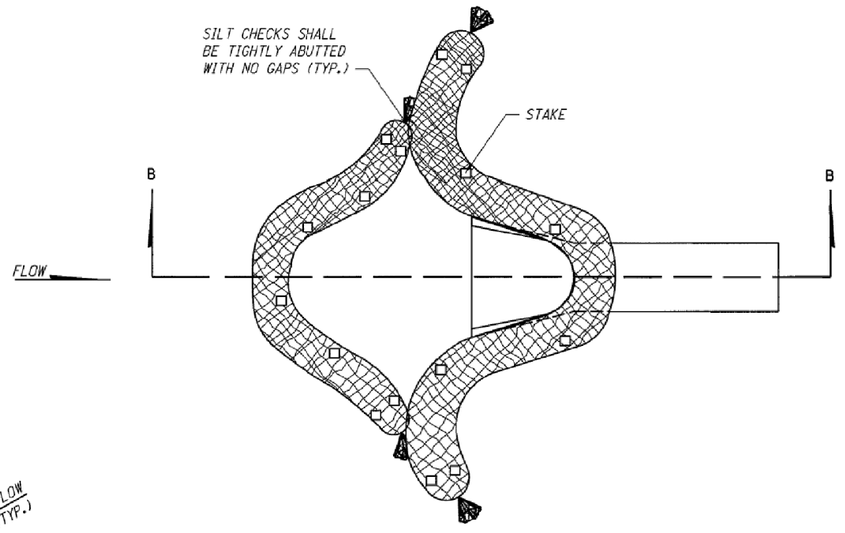
PLAN VIEW



SILT CHECK OUTLET PROTECTION

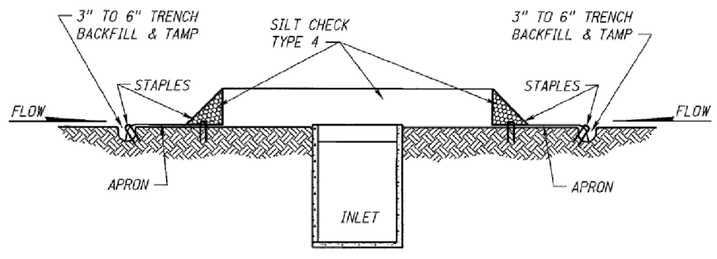


PLAN VIEW



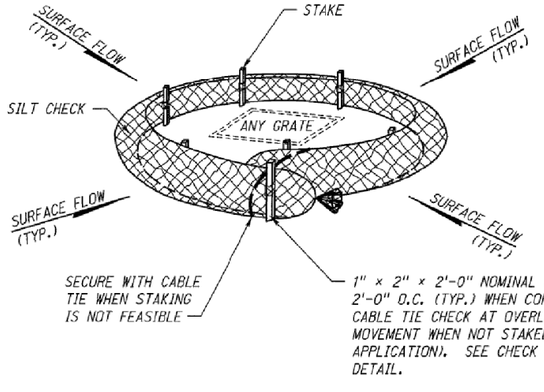
PLAN VIEW

SILT CHECK INLET PROTECTION

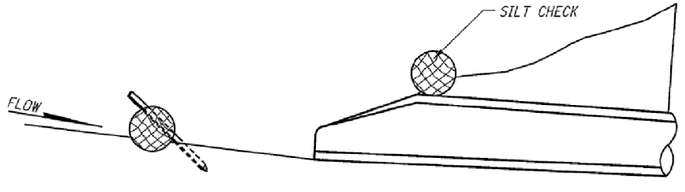


SECTION C-C

SILT CHECK TYPE 4
AT INLET



SILT CHECK INLET FILTER
PERSPECTIVE VIEW



SECTION B-B

SEE STAKING DETAIL SHEET 1 OF 4

SILT CHECKS ALL TYPES
SHEET 4 OF 4

SPECIAL PLAN 1C

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Scale: 1:200 Date: 02-MAY-2019 17:35
SHEET 4 OF 4 S104 1 e 00

ROADWAY DESIGN DIVISION
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User: dor13017
Date: 25-JUL-2017 09:48
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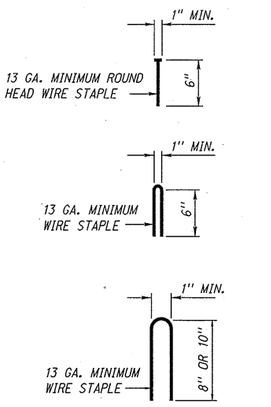
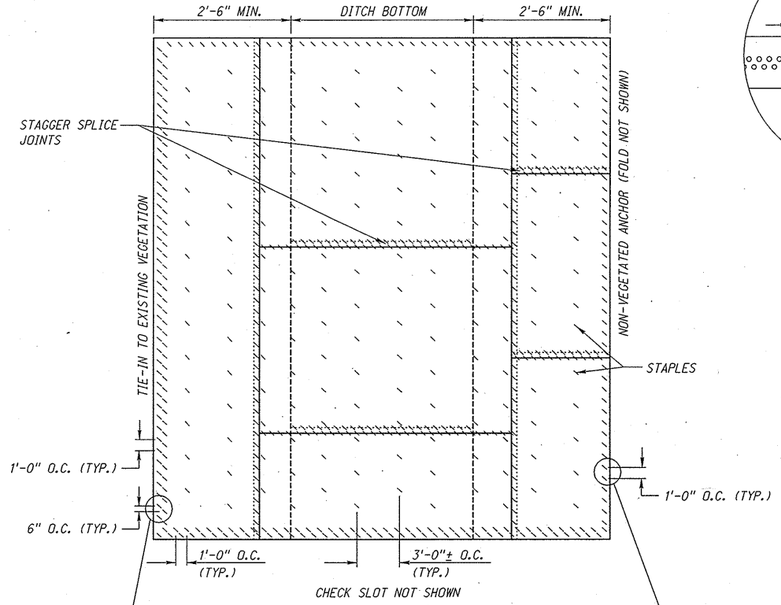
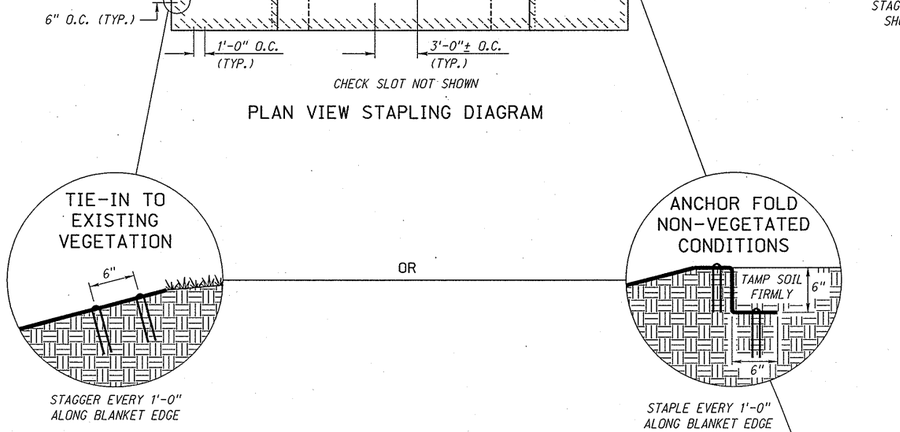
SHEET 1 OF 3

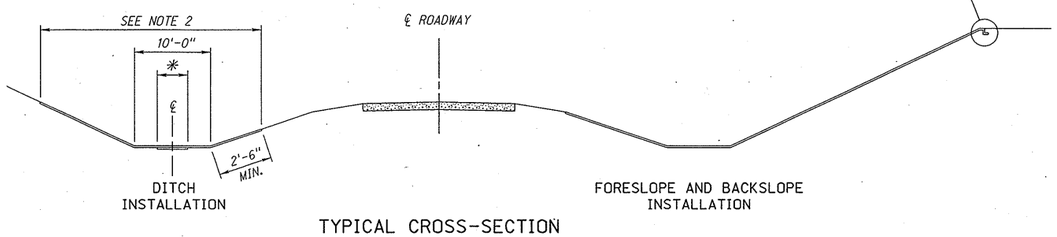


WIRE STAPLE DETAIL



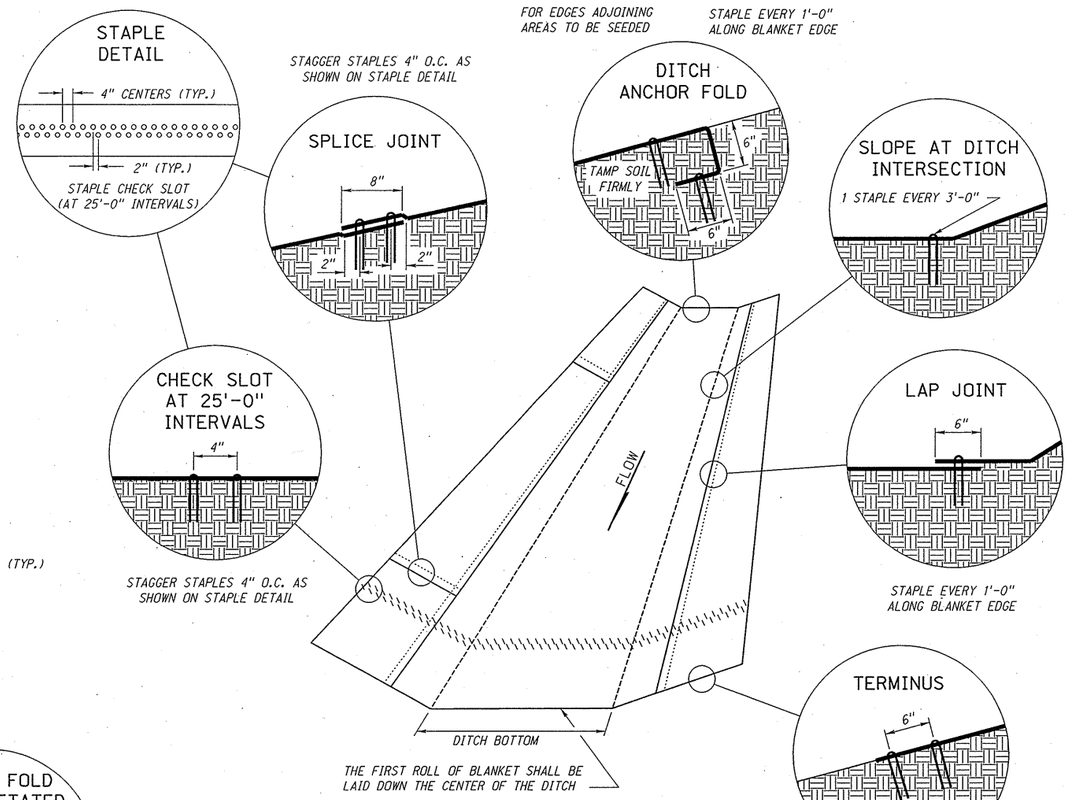
PLAN VIEW STAPLING DIAGRAM





TYPICAL CROSS-CROSS-SECTION

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



TYPICAL EROSION CONTROL BLANKET INSTALLATION

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 Mray
8-16-2017
DATE

PROFESSIONAL CIVIL ENGINEER — JEROME M. FEEMAN, JR. — E-11829 — STATE OF NEBRASKA

ORIGINAL:
NOVEMBER 14, 1973
DATE

1/3

ROADWAY DESIGN DIVISION
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User: dor13017
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File: 50100e07.dgn
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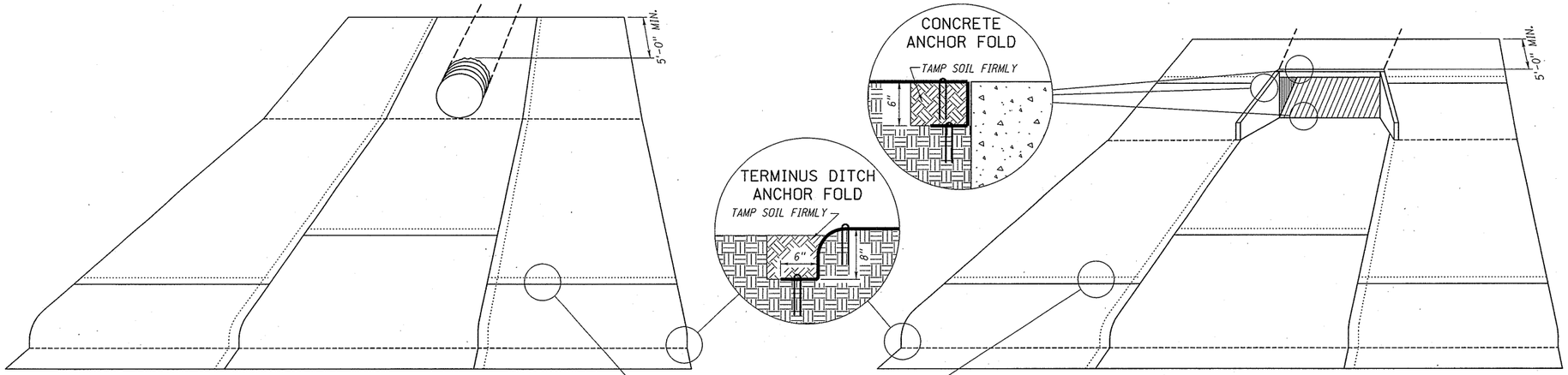
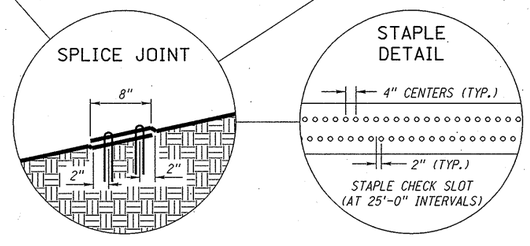
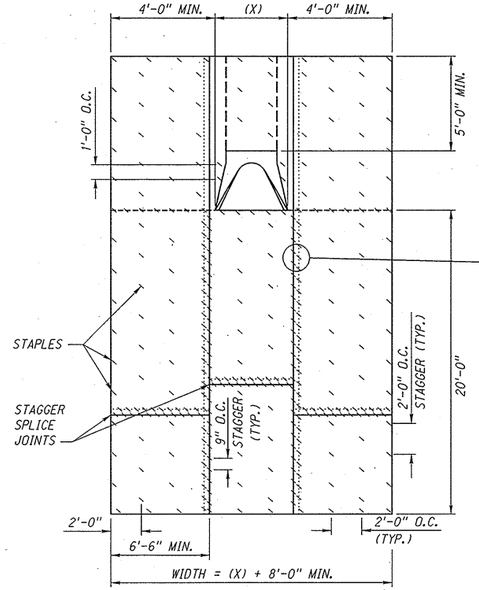
SHEET 2 OF 3

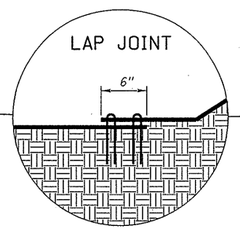


TYPICAL INSTALLATION AT PIPE CULVERT
(SHOWING STRAIGHT PIPE)

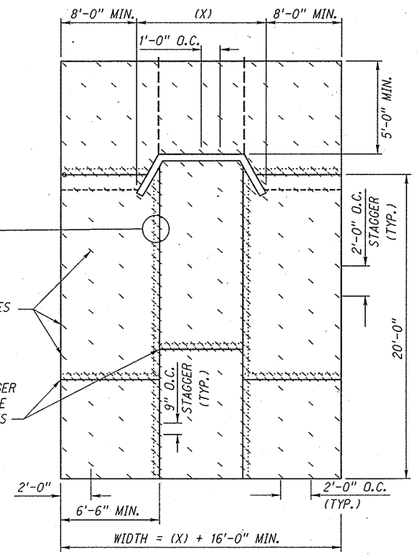
TYPICAL INSTALLATION AT BOX CULVERT





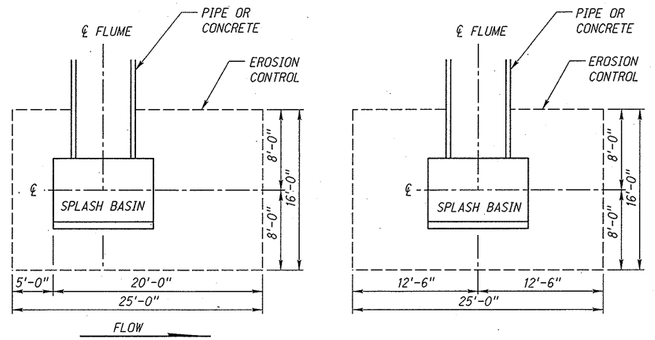


STAGGER STAPLES
EVERY 1'-0" O.C.
WITHIN 20'-0" OF PIPE



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

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



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

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

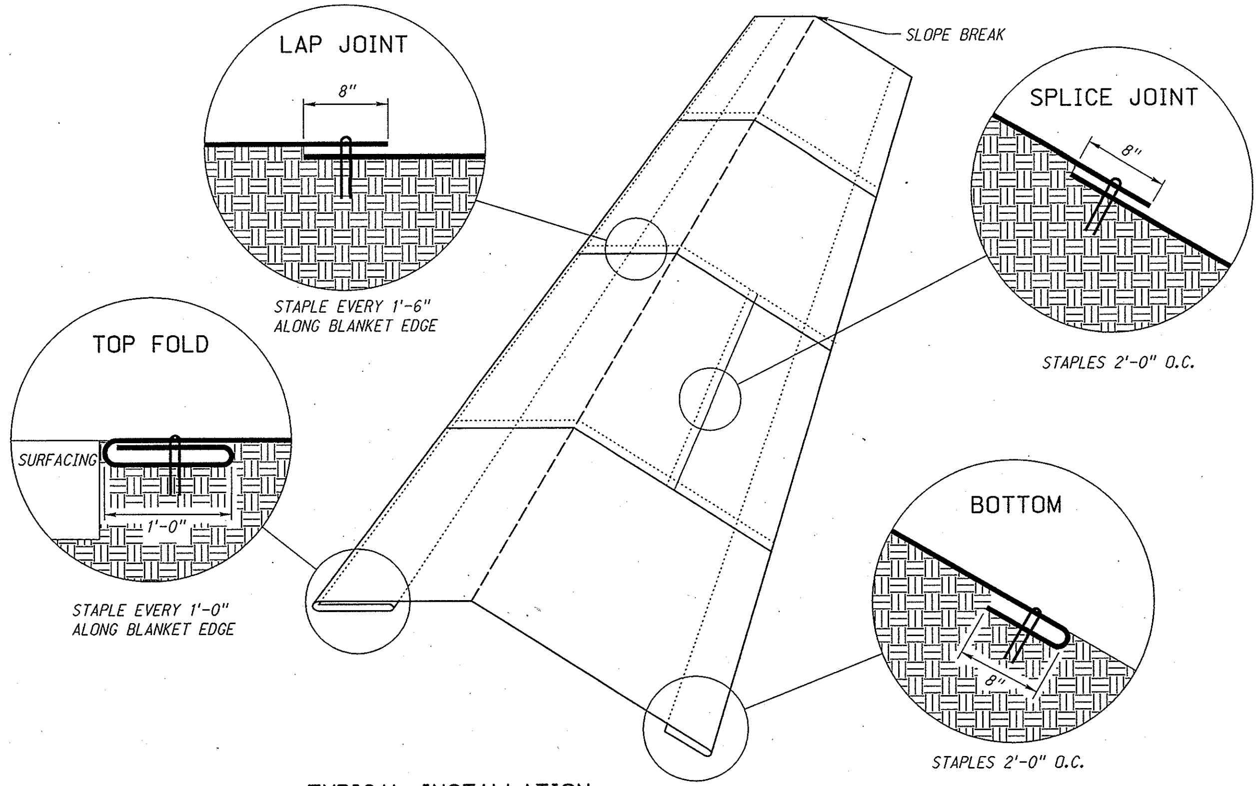
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

David May
8-16-2017
DATE

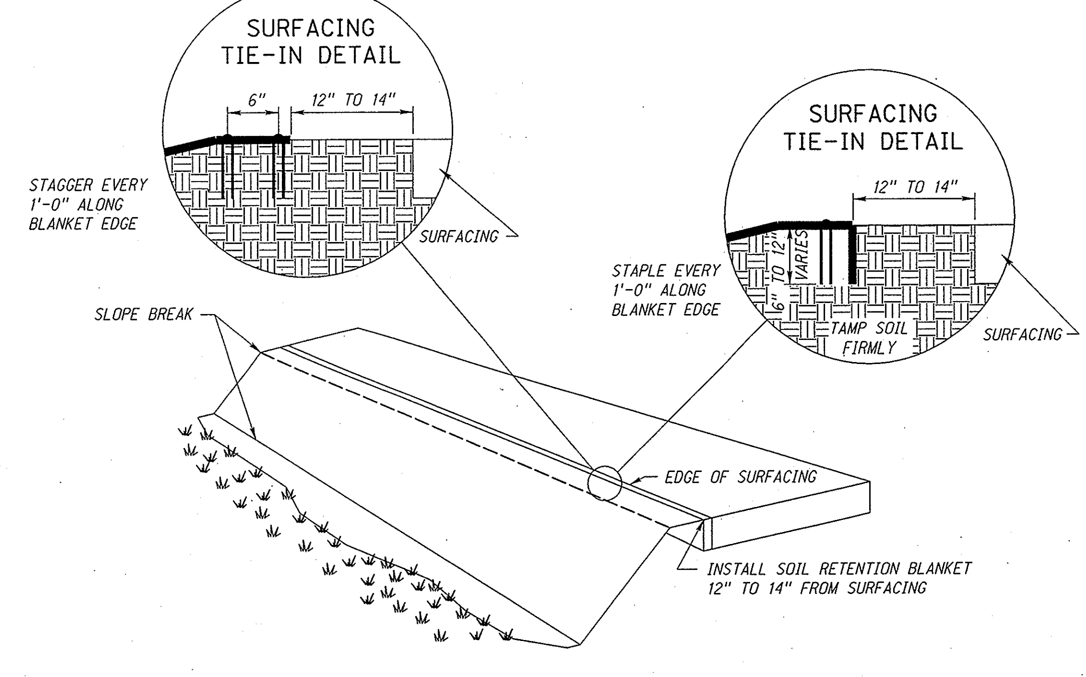
PROFESSIONAL CIVIL ENGINEER
DAVID L. MAY
NEBRASKA
E-11829
8/1/17
STATE OF NEBRASKA

ORIGINAL:
NOVEMBER 14, 1973
DATE

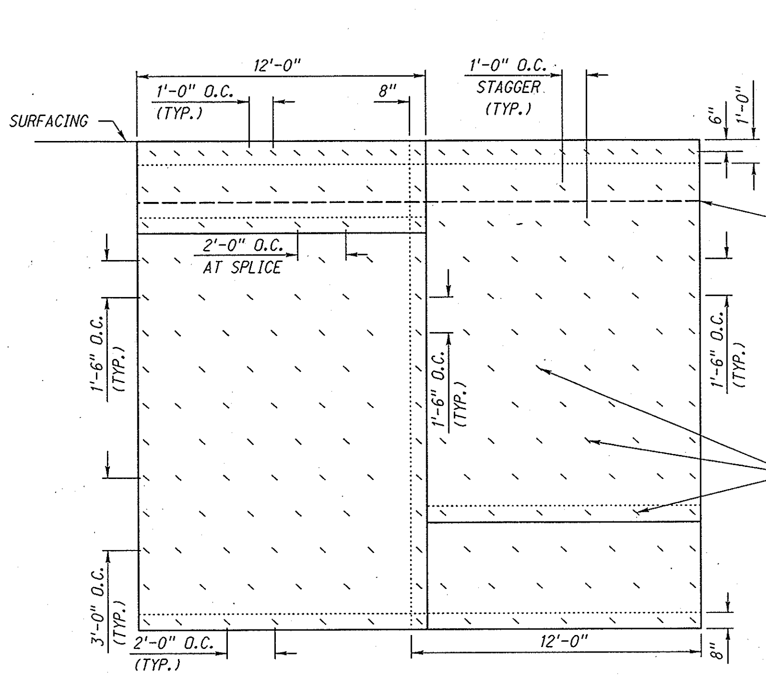
ROADWAY DESIGN DIVISION



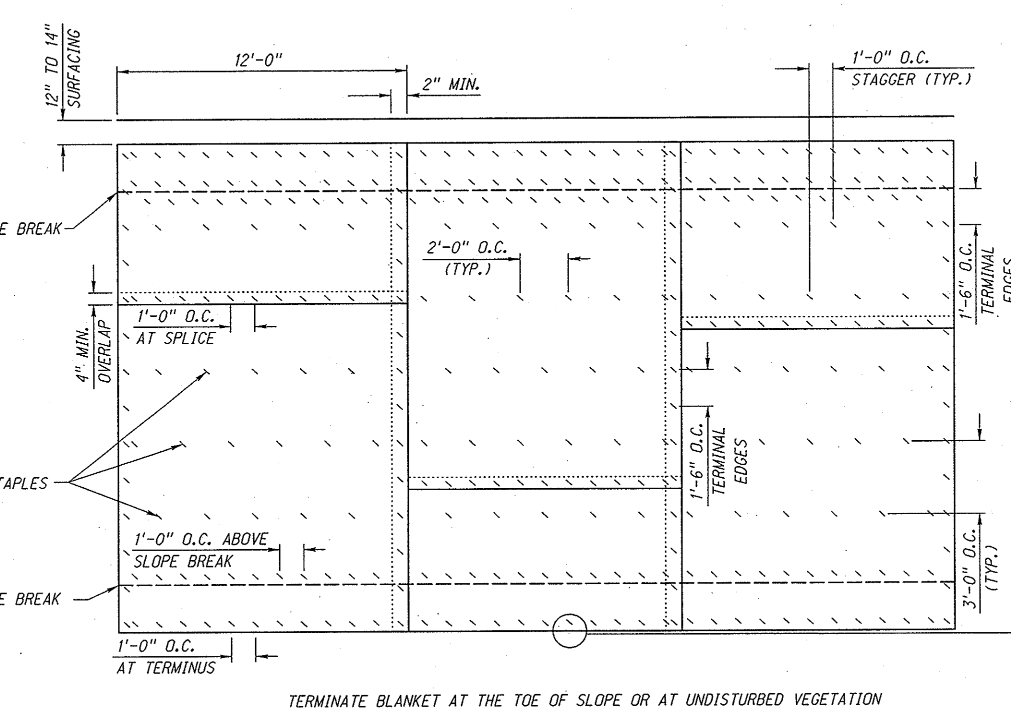
TYPICAL INSTALLATION
CLASS 1A (SLOPE PROTECTION, SAND)



SURFACING INSTALLATION



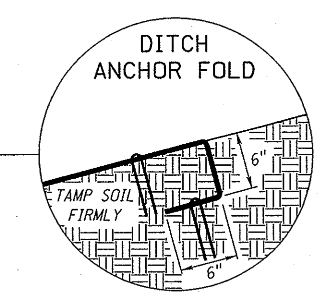
PLAN VIEW STAPLING DIAGRAM FOR
CLASS 1A (SLOPE PROTECTION, SAND)



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

FOR EDGES ADJOINING AREAS TO BE SEEDED

DITCH ANCHOR FOLD



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:

8-16-2017
DATE

PROFESSIONAL CIVIL ENGINEER E-11829 STATE OF NEBRASKA

ORIGINAL:
NOVEMBER 14, 1973
DATE

3/3

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

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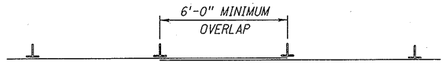
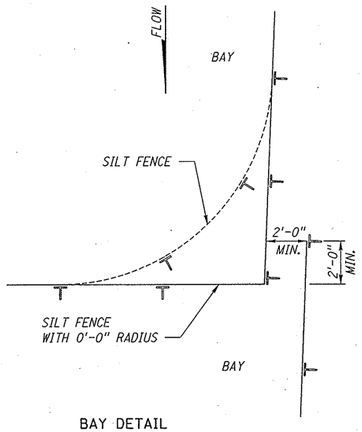
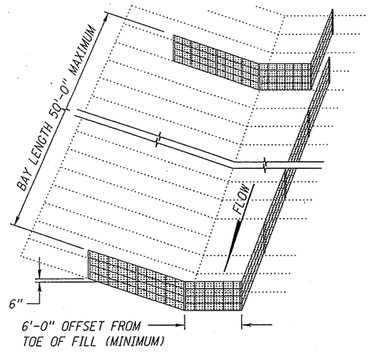


SILT FENCE SPLICE

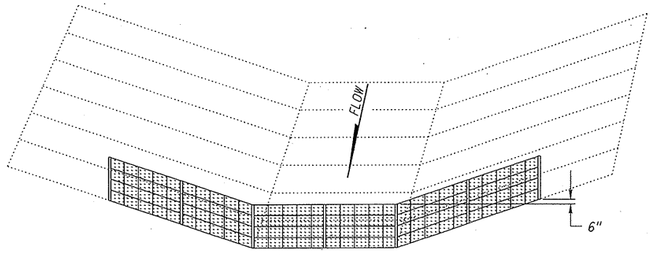


BAY DETAIL

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

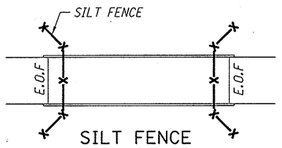


SILT FENCE BAYS

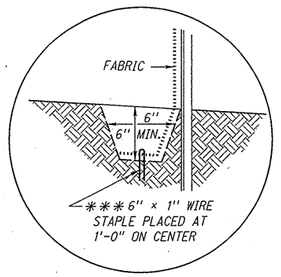


HIGH POROSITY SILT FENCE
(ACROSS DITCH)

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

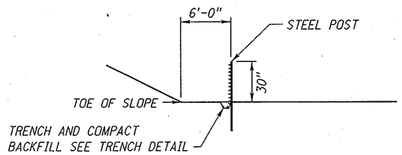


SILT FENCE
(UNDER BRIDGE)

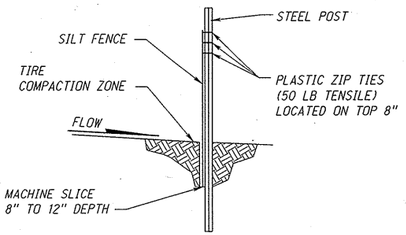


TRENCH DETAIL

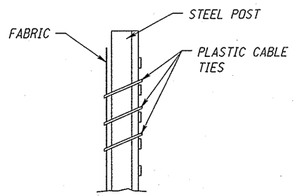
***SILT FENCE MAY ALSO BE INSTALLED WITH A SILT FENCE PLOW. NO STAPLING IS REQUIRED WHEN THE SILT FENCE PLOW IS USED.



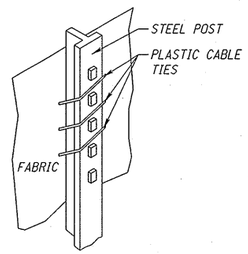
OPTION ONE (PREFERED)
SILT FENCE
(6'-0" OFFSET FROM TOE OF FILL)



SILT FENCE MACHINE SLICED



PROFILE VIEW
ATTACHMENT TO POST



BACK VIEW
ATTACHMENT TO POST

NOTES:

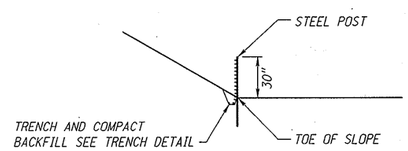
SILT FENCE SHOULD BE 30" ABOVE GRADE (MAY VARY)

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

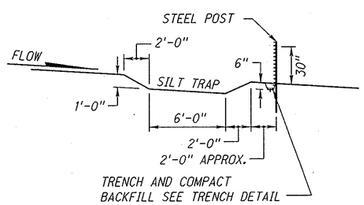
STEEL STUDDED "T" LINE POSTS 5'-6" LENGTH; 6'-0" MAXIMUM SPACING.

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

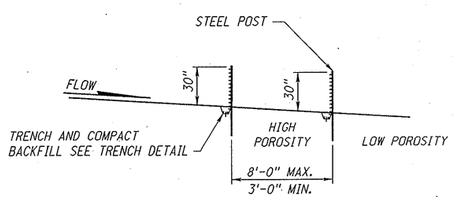
2" x 2" x 6'-0" NOMINAL WOOD STAKES SPACING, 6'-0" MAXIMUM ON CENTER DRIVEN UNTIL FIRM.



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



HIGH POROSITY SILT
FENCE WITH SILT TRAP
(ACROSS DITCH)



SILT FENCE
(ACROSS DITCH)

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

NEBRASKA DEPARTMENT OF TRANSPORTATION
STANDARD PLAN NO. 502-R2

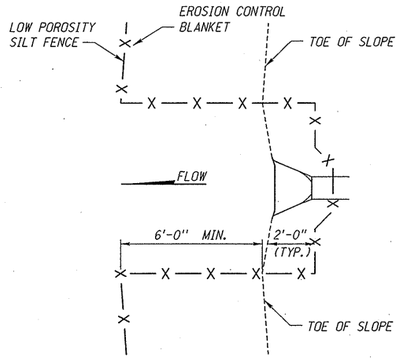
SILT FENCE DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

David May
8-16-2017
DATE

PROFESSIONAL CIVIL ENGINEER
BRANDIE S. NEEMANN
P-11829
STATE OF NEBRASKA

ORIGINAL:
DECEMBER 18, 2006
DATE



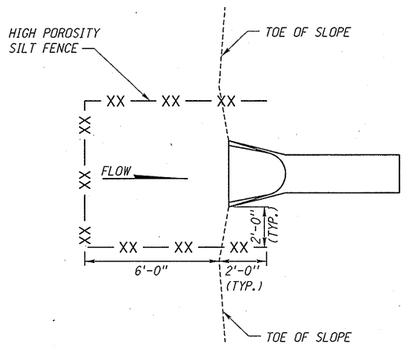
SILT FENCE OUTLET PROTECTION

NOTES:

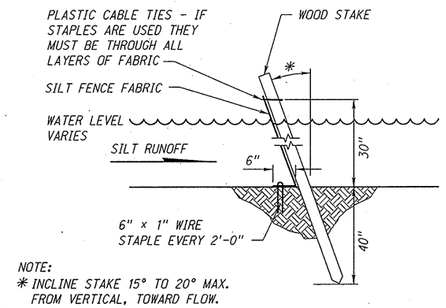
1. SILT FENCE SHOULD BE BROUGHT FLUSH WITH WING WALLS ON BOX CULVERTS IF IT CAN NOT BE INSTALLED ABOVE THE BOX CULVERT.

2. IF APPLICABLE, SILT FENCE AROUND THE CULVERT SHOULD BE ADJUSTED TO ALLOW FOR THE INSTALLATION OF EROSION CONTROL AS SHOWN IN STANDARD PLAN 501.

3. SILT CHECKS MAY USED IN PLACE OF SILT FENCE ABOVE THE OPENING OF A CULVERT, AS SHOWN IN SPECIAL PLAN C.

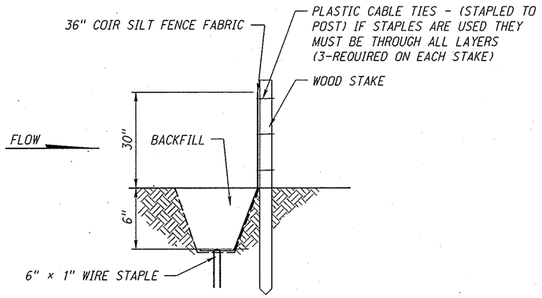


SILT FENCE INLET PROTECTION

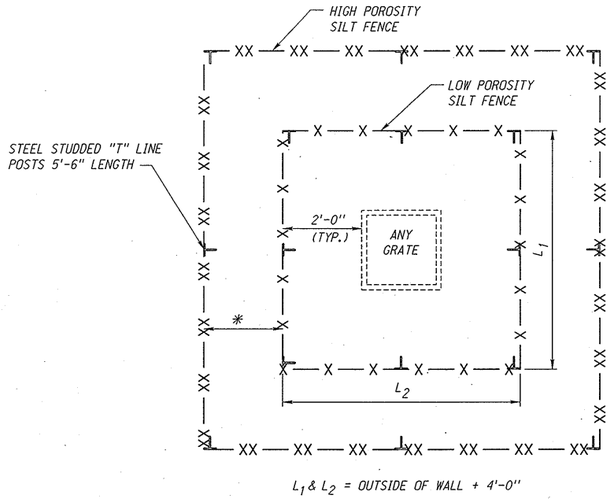


NOTE:
** INCLINE STAKE 15° TO 20° MAX. FROM VERTICAL, TOWARD FLOW.*

SILT FENCE
(WET & BELOW WATER INSTALLATION)



COIR SILT FENCE - ON WOOD POSTS - DRY INSTALLATION

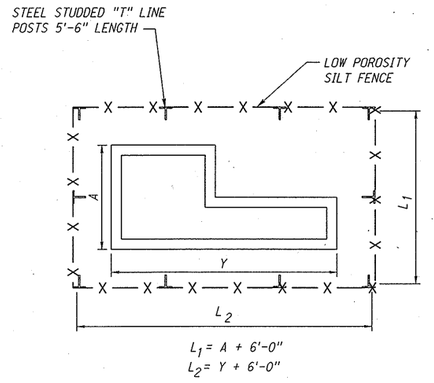


L_1 & L_2 = OUTSIDE OF WALL + 4'-0"

PLAN VIEW

SILT FENCE FOR GRATE, AREA, MEDIAN INLETS OR JUNCTION BOXES

** 3'-0" IF POSSIBLE (MAY VARY)*



L_1 = A + 6'-0"
L_2 = Y + 6'-0"

PLAN VIEW

SILT FENCE CURB INLET

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

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 502-R2

SILT FENCE DETAILS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

PROFESSIONAL CIVIL ENGINEER BRANDON L. NEEMANN NE 11629 STATE OF NEBRASKA

David May
8-16-2017
DATE

ORIGINAL:
DECEMBER 18, 2006
DATE

2/2

ROADWAY DESIGN DIVISION

Computer: DRDESIGN147
User: dor13017
Date: 25-JUL-2017 10:27
File: 50200e02.dgn
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SHEET 2 OF 2

ROADWAY DESIGN DIVISION
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SHEET 1 OF 3

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

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

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

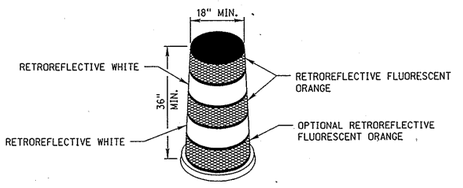
COEFFICIENT OF RETROREFLECTION (CD/LUX/M^2)			
WHITE	ORANGE	RED	YELLOW
250	100	45	170

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

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

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

REFLECTORIZED PLASTIC DRUMS



DESIGN

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

APPLICATION

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

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

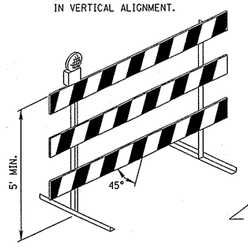
BARRICADES

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

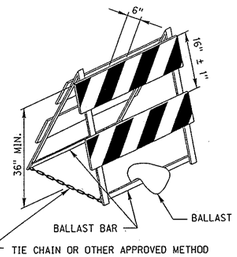
*NOMINAL DIMENSIONS ARE PERMISSIBLE WHEN CONSTRUCTED FROM LUMBER.
**WHEN LATERAL SPACE IS LIMITED, SOME TYPE III BARRICADES WITH A 4 FOOT LENGTH OF RAIL, MAY BE ALLOWED WHEN APPROVED BY THE ENGINEER.

TYPE III BARRICADE

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



TYPE II BARRICADE



BALLAST SHALL NOT BE PLACED OVER ANY REFLECTIVE DEVICE

DESIGN

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

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

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

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

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

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

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

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

APPLICATION

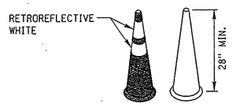
TYPE II BARRICADES ARE INTENDED FOR USE IN SITUATIONS WHERE TRAFFIC IS MAINTAINED THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE. THEY MAY BE USED INDIVIDUALLY OR IN GROUPS TO MARK A SPECIFIC CONDITION, OR THEY MAY BE USED IN A SERIES FOR CHANNELIZING TRAFFIC. ON THE INTERSTATE, FREEWAY AND EXPRESSWAY SYSTEM,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

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

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

NORMALLY PERMANENT SIGNS MOUNTED ON BARRICADES SHALL BE 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.

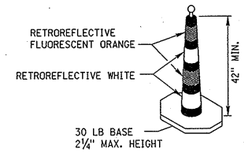
FOR NIGHTTIME USE, CONES SHALL BE RETROREFLECTIVE OR EQUIPPED WITH LIGHTING DEVICES FOR MAXIMUM VISIBILITY. RETROREFLECTION OF 28 INCH OR 36 INCH CONES SHALL BE PROVIDED BY A WHITE BAND 6 INCHES WIDE, NO MORE THAN 4 INCHES FROM THE TOP OF THE CONE, AND AN ADDITIONAL 4 INCH WIDE WHITE BAND A MINIMUM OF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



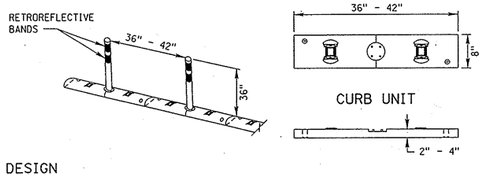
DESIGN

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

APPLICATION

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

TUBULAR POST AND CURB SYSTEM



DESIGN

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

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

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

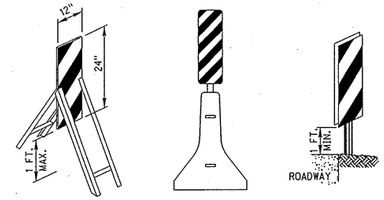
APPLICATION

TUBULAR POST AND CURB SYSTEMS MAY BE USED TO DIVIDE OPPOSING LANES OF TRAFFIC OR TO DIVIDE TRAFFIC LANES WHEN TWO OR MORE LANES ARE KEPT OPEN IN THE SAME DIRECTION.

FASTENING THE CURBS TO THE PAVEMENT WITH ANCHOR BOLTS OR OTHER SUITABLE METHODS AS DIRECTED BY THE MANUFACTURER IS REQUIRED TO MINIMIZE THE CHANCE OF BEING MOVED BY TRAFFIC.

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

VERTICAL PANELS



DESIGN

RETROREFLECTIVE MATERIAL ON VERTICAL PANELS SHALL BE 12 INCHES WIDE AND AT LEAST 24 INCHES HIGH. THEY SHALL HAVE ALTERNATING ORANGE AND WHITE STRIPES, WHERE THE HEIGHT OF THE RETRROREFLECTIVE 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.

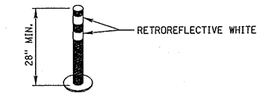
MARKINGS FOR VERTICAL PANELS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTORIZED STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.

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:

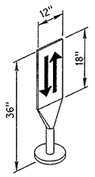
PROFESSIONAL ENGINEER — DANIEL J. WADDLE E-6289 — STATE OF NEBRASKA

David Nissen
9-1-2017
DATE

ORIGINAL:
OCTOBER 1998
DATE

1/3

OPPOSING TRAFFIC LANE DIVIDERS



DESIGN

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

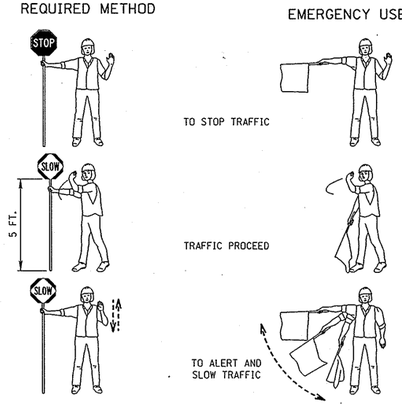
APPLICATION

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

FLAGGERS

REQUIRED METHOD

EMERGENCY USE ONLY



FLAGGER PADDLE

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

FLAGGERS

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

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

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

WORKER VISIBILITY

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

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

LIGHTING DEVICES

FUNCTION

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

BARRICADE WARNING LIGHTS DESIGN (BATTERY OPERATED)

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

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

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

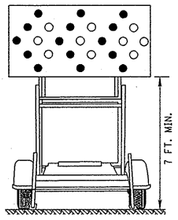
FLASHING ARROW PANEL (DISPLAY)

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

DESIGN

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

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



THE FOLLOWING SELECTIONS SHALL BE PROVIDED ON THE ARROW PANEL

OPERATING MODE	PANEL DISPLAY
FLASHING ARROW	RIGHT SHOWN; LEFT OPPOSITE
SEQUENTIAL ARROW	RIGHT SHOWN; LEFT OPPOSITE
SEQUENTIAL CHEVRON	RIGHT SHOWN; LEFT OPPOSITE
FLASHING DOUBLE ARROW	
FLASHING OR ALTERNATING CAUTION	FLASHING LINE OR FLASHING CORNERS OR ALTERNATING DIAMOND CAUTION

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

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

APPLICATION

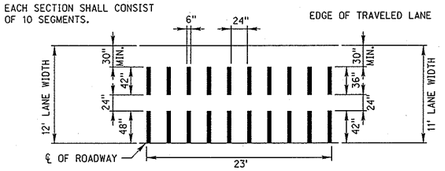
A FLASHING ARROW OR SEQUENTIAL CHEVRON MODE SHALL ONLY BE USED FOR STATIONARY OR MOVING LANE CLOSURES.

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

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

TEMPORARY RUMBLE STRIPS

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

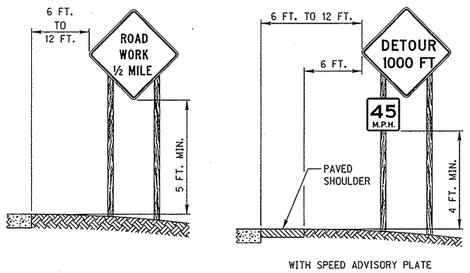
David Murray
9-1-2017
DATE

ORIGINAL:
OCTOBER 1998
DATE

ROADWAY DESIGN DIVISION
Computer: DROESIGN147
User: dor13017
Date: 17-AUG-2017 15:56
File: 920006e07.dgn
Scale: 1:100
SHEET 3 OF 3

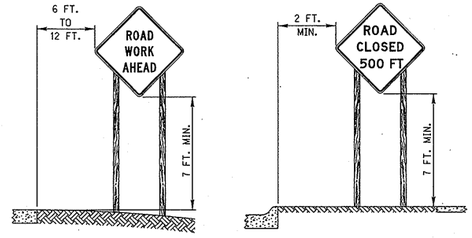
ROADSIDE SIGNS

HEIGHT AND LATERAL LOCATION OF SIGNS RURAL AREA



WITH SPEED ADVISORY PLATE

URBAN AREA



TYPICAL FIRST SIGN AT CONSTRUCTION SITE

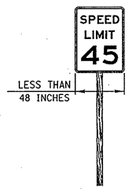
WITH TYPE "A" FLASHING WARNING LIGHT MOUNTED ABOVE TYPE III BARRICADE

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

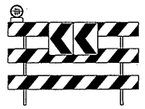
TYPICAL SIGN MOUNTINGS

OTHER THAN POST MOUNTED

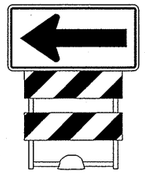
TYPE III BARRICADE WITH SIGN

PORTABLE AND TEMPORARY MOUNTING

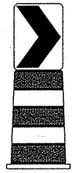
TYPE III BARRICADE WITH SIGN AND DETOUR ARROW



TYPE III BARRICADE WITH CHEVRONS



TYPE II BARRICADE WITH DETOUR ARROW OR SIGN



PLASTIC DRUM WITH CHEVRON OR SIGN

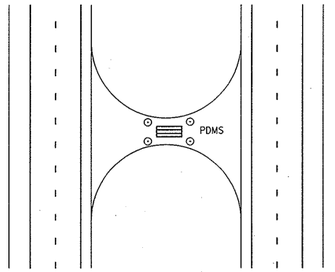
TEMPORARY SIGN SUPPORTS

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

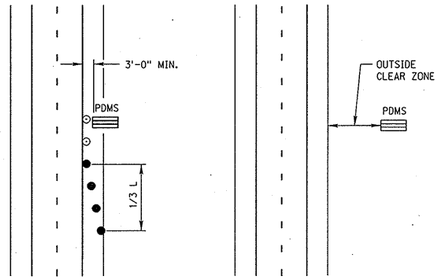
"TEMPORARY SIGNS" ARE ALL TEMPORARILY MOUNTED WORK ZONE SIGNS THAT ARE NOT POST MOUNTED IN THE GROUND AT THE TYPICAL 5 FOOT MOUNTING HEIGHT. TEMPORARY SIGNS ARE CONSIDERED NCHRP 350 OR MASH CATEGORY 2 DEVICES AND ARE MOUNTED ON TEMPORARY SIGN STANDS. TEMPORARY SIGNS SHALL BE MOUNTED A MINIMUM OF 1 FOOT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

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 Murphy

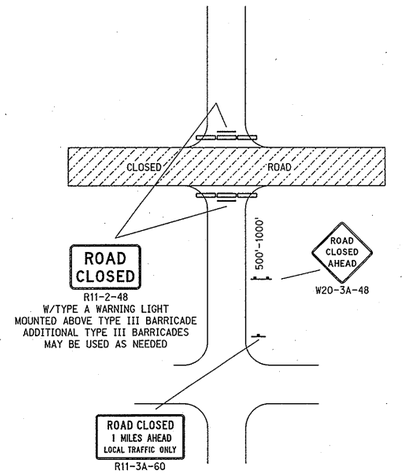
9-1-2017
DATE

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

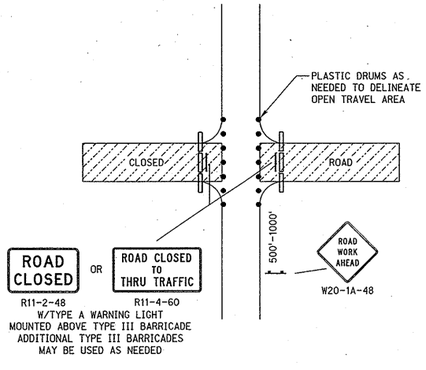
ORIGINAL:
OCTOBER 1998
DATE

3
3

CROSS ROAD INTERSECTING CLOSED ROAD

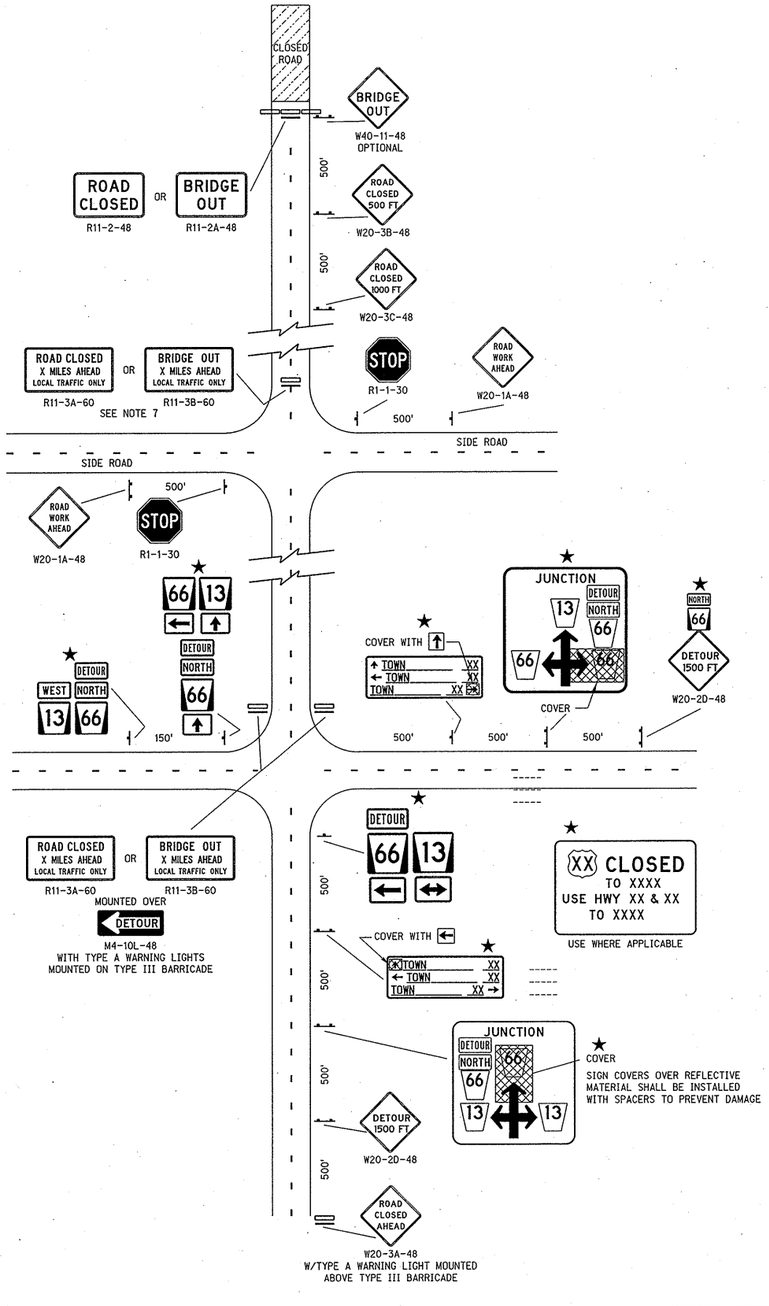


TRAFFIC NOT ALLOWED TO CROSS CLOSED ROAD



TRAFFIC ALLOWED TO CROSS CLOSED ROAD

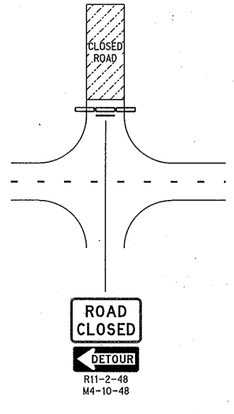
ROAD CLOSED BEYOND JUNCTION



NOTES

1. SIGNS SHOWN ARE USUALLY FOR ONE DIRECTION OF TRAVEL ONLY.
2. 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 OR OTHER GOVERNMENT AGENCY SHALL BE MAINTAINED AND REMOVED BY THEIR FORCES.
3. WHEN MESSAGE IS NOT PERTINENT, SIGNS SHALL BE TAKEN DOWN, COVERED OR FOLDED. TAPE IS NOT PERMITTED ON THE FACE OF THE SIGN.
4. VEHICLES OR EQUIPMENT SHALL NOT BE PARKED SO AS TO OBSCURE OR DISTRACT FROM TRAFFIC CONTROL DEVICES.
5. FLAGS MAY BE USED TO CALL ATTENTION TO WARNING SIGNS.
6. WHEN APPROPRIATE THE SIGN R11-2B "BRIDGE OUT" MAY BE USED INSTEAD OF R11-2 "ROAD CLOSED".
7. BARRICADE AND SIGN MAY BE PLACED ALONG EDGE OF ROAD IF NEEDED FOR LOCAL TRAFFIC.
8. REFER TO STANDARD PLAN 920 FOR GENERAL INFORMATION NOT SHOWN.

ROAD CLOSED AT JUNCTION



LEGEND

- TYPE III BARRICADE
- REFLECTORIZED PLASTIC DRUM
- SINGLE POSTED SIGN
- DOUBLE POSTED SIGN
- ★ INSTALLED BY OTHERS

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.

S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.

W = WIDTH OF OFFSET (LANE WIDTH).

REV. NO.	DATE	DESCRIPTION OF REVISION
R2	JAN 18	NDOR BORDER TO NDOT BORDER
R1	JUN 14	2009 MUTCD UPDATES

NEBRASKA DEPARTMENT OF TRANSPORTATION

STANDARD PLAN NO. 923-R2

TRAFFIC CONTROL ROAD CLOSURE

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

David Mroz

11-8-2017
DATE

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

ORIGINAL:
AUGUST 1998
DATE

1
1