

CITY OF CRETE, NEBRASKA
CITY COUNCIL REGULAR MEETING
January 20, 2015

Notice of the meeting was given by posting and publishing in The Crete News, the appointed method for giving notice as shown by the Proof of Publication attached to the minutes. Advance notice of the meeting was also given to the Mayor and City Council. Pursuant to Section 84-1412(8) of the Nebraska Open Meetings Act, the City has posted a current copy of the Open Meetings Act, Laws of the State of Nebraska in the back of the Council Chambers. Additional copies are available to read. The City may consider items listed on the agenda in random order. All proceedings shown were taken while the meeting was open to the attendance of the public.

Those in attendance pledged allegiance to the flag.

1. Open Meeting
2. Roll Call
3. Special Order of Business
 - 3.A. Iris Avenue - School Intersection
1/20/15 Recommend approval of the plans and specifications, engineers estimate and advertise for bids to be opened February 12, 2015 at 10:00 AM. Carried with a motion by Judy Henning and a second by Travis Sears.
David Bauer: Aye, Judy Henning: Aye, Travis Sears: Aye
Aye: 3, No: 0
 - 3.B. Electric Code
1/20/15 Recommend the adoption of the 2011 Electric Code Carried with a motion by Travis Sears and a second by Judy Henning.
David Bauer: Aye, Judy Henning: Aye, Travis Sears: Aye
Aye: 3, No: 0
4. Officers' Reports
5. Adjournment

Mayor

(SEAL)

City Clerk-Treasurer

I, Jerry Wilcox, City Clerk for the City of Crete, hereby certify that the foregoing is a true and correct copy of the proceedings had and done by the Mayor and Council. I hereby certify that a copy of the Open Meetings Act was posted in the back of the Council Chambers. I certify that all of the subjects included in the foregoing proceedings were contained in the agenda for the meeting, kept continually current and available

for public inspection at the office of the City Clerk. I certify that such subjects were contained in said agenda for at least twenty-four hours prior to said meeting and that at least one copy of all reproducible material discussed at the meeting was available at the meeting for examination and copying by members of the public. I certify that the minutes were in written form and available for public inspection within ten working days and prior to the next convened meeting of the City Council. I certify that all news media requesting notification concerning meetings of the City Council were provided with advance notification of the time and place of said meeting and the subjects to be discussed.

City Clerk-Treasurer

(S E A L)

ADVERTISEMENT FOR BIDS

The City of Crete, Nebraska, will receive bids for the construction of Street Improvement District 2014-6, until 10:00 a.m., on February 12, 2015, at the City Office, 243 East 13th Street, Crete, Nebraska, 68333. At that time, all bids will be opened and publicly read aloud.

The Work to be done for this Project is as follows:

CRETE STREET IMPROVEMENT DISTRICT 2014-6 (IRIS AVENUE, M226-(270))

Earthwork Measured In Embankment	2300	CY
Water		JOB
Adjust Valve Box To Grade		JOB
Remove Inlet		JOB
Remove Driveway Culvert Pipe		JOB
Remove Sewer Pipe		JOB
Remove Pavement	2637	SY
Remove Walk		JOB
Foundation Course 4"	3267	SY
Subgrade Preparation	3267	SY
Concrete Class 47B-3500 Imprinted Median Surfacing	663	SY
9" Concrete Pavement, Class 47B-3500	3267	SY
9" Imprinted Concrete Pavement, Class 47B-3500	218	SY
Concrete Class 47B-3000 Sidewalks - 4"	394	SY
Cast Iron Cover And Frame		JOB
Class 47B-3000 Concrete For Inlet And Junction Box	22	CY
Reinforcing Steel For Inlet And Junction Box		JOB
18" Concrete Flared-End Section		JOB
18" Storm Sewer Pipe, Type 1	380	LF
Yield Line, Wet Reflective Polyurea Pavement Marking, Grooved		JOB
5" White Wet Reflective Polyurea Pavement Marking, Grooved		JOB
5" Yellow Wet Reflective Polyurea Pavement Marking, Grooved		JOB
Silt Check, Type 1 - Low		JOB
Seeding, Type B		JOB
Mulch		JOB
Curb Inlet Sediment Filter		JOB

Details of construction, materials to be used, and methods of installation for this Project are given in the Drawings and Project Manual. A Contract will be awarded in the division, to the low, responsive, responsible bidder, based on the total aggregate bid for the Work in any order or combination of bids accepted, construction time schedule, materials, and past performance on contracts with the Owner.

Bidding Documents, including Drawings and Project Manual, are on file at the City Office, 243 East 13th Street, Crete, Nebraska. Copies of these documents for bidding purposes may be obtained from the consulting engineer, JEO Consulting Group, Inc., 2700 Fletcher Avenue, Lincoln, Nebraska 68504, telephone (402) 435-3080, upon payment of \$40, \$10 of which will be refunded if the Drawings and Project Manual are returned in good condition, with no markings, within 10 days after the letting. A minimum charge of \$10 will be assessed for Drawings and Project Manual returned a minimum of three days before the letting date; after that time the full amount will be assessed. A refund will not be issued to the successful Bidder.

Complete sets of Bidding Documents as issued by the Issuing Office must be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors of misinterpretations resulting from the use of incomplete sets of Bidding Documents, or copies of Bidding Documents obtained in electronic media form, internet plan rooms or other internet sites, or copies of Bidding Documents obtained from any source other than the Issuing Office.

Each Bid shall be accompanied in a separate sealed envelope by a certified check drawn on a solvent bank in the State of Nebraska, or Bid Bond in an amount not less than five percent of the total Bid, and shall be made payable to the City of Crete, Nebraska, as security that the Bidder to whom the Contract will be awarded will enter into a Contract to build the improvements in accordance with this notice, and give bond in the sum as hereinafter provided for construction of the improvements. Checks and bonds accompanying Bids not accepted shall be returned to the Bidder in accordance with the terms contained in the Instructions to Bidders.

No Bids shall be withdrawn after the opening of Bids without consent of the City of Crete, Nebraska, for a period of 45 days after the scheduled time of opening Bids.

The successful Bidder(s) will be required to furnish satisfactory Performance and Payment Bonds in the sum of the full amount of the Contract. Said bonds, to be executed by a responsible corporate surety, shall guarantee: the faithful performance of the Contract; the terms and conditions therein contained; and payment for all labor and materials used in connection with the Work.

The City of Crete, Nebraska, reserves the right to reject any and all Bids and to waive any technicalities in bidding.

Dated at Crete, Nebraska, this 28th day of January, 2015.

CITY OF CRETE, NEBRASKA

Roger Foster, Mayor

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Adjust Valve Box To Grade		JOB
Remove Inlet		JOB
Remove Driveway Culvert Pipe		JOB
Remove Sewer Pipe		JOB
Remove Pavement	2637	SY
Remove Walk		JOB
Foundation Course 4"	3267	SY
Subgrade Preparation	3267	SY
Concrete Class 47B-3500 Imprinted Median Surfacing	663	SY
9" Concrete Pavement, Class 47B-3500	3267	SY
9" Imprinted Concrete Pavement, Class 47B-3500	218	SY
Concrete Class 47B-3000 Sidewalks - 4"	394	SY
Cast Iron Cover And Frame		JOB
Class 47B-3000 Concrete For Inlet And Junction Box	22	CY
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18" Concrete Flared-End Section		JOB
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5" White Wet Reflective Polyurea Pavement Marking, Grooved		JOB
5" Yellow Wet Reflective Polyurea Pavement Marking, Grooved		JOB
Silt Check, Type 1 - Low		JOB
Seeding, Type B		JOB
Mulch		JOB
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Remove Walk		JOB
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Subgrade Preparation	3267	SY
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9" Concrete Pavement, Class 47B-3500	3267	SY
9" Imprinted Concrete Pavement, Class 47B-3500	218	SY
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Dated at Crete, Nebraska, this 28th day of January, 2015.

CITY OF CRETE, NEBRASKA

Roger Foster, Mayor



OPINION OF COST
Iris Ave/Crete School Intersection Improvements
January 20, 2015

Iris Ave/Crete School Intersection Improvements					
ITEM NO.	QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL
1	1	LS	MOBILIZATION	\$ 20,800.00	\$20,800.00
2	1	LS	GENERAL CLEARING AND GRUBBING	\$ 400.00	\$ 400.00
3	2300	CY	EARTHWORK MEASURED IN EMBANKMENT	\$ 8.00	\$18,400.00
4	23	MGAL	WATER	\$ 30.00	\$690.00
5	5	EACH	ADJUST VALVE BOX TO GRADE	\$ 195.00	\$975.00
9	2	LF	REMOVE INLET	\$ 490.00	\$980.00
10	39	LF	REMOVE DRIVEWAY CULVERT PIPE	\$ 11.25	\$438.75
11	61	LF	REMOVE SEWER PIPE	\$ 10.00	\$610.00
12	2,637	SY	REMOVE PAVEMENT	\$ 6.00	\$15,822.00
13	104	SY	REMOVE WALK	\$ 5.00	\$520.00
14	3,267	SY	FOUNDATION COURSE 4"	\$ 4.75	\$15,518.25
15	3,267	SY	SUBGRADE PREPARATION	\$ 2.20	\$7,187.40
16	663	SY	CONCRETE CLASS 47B-3500 IMPRINTED MEDIAN SURFACING	\$ 70.00	\$46,410.00
17	3,267	SY	9" CONCRETE PAVEMENT, CLASS 47B-3500	\$ 48.00	\$156,816.00
18	218	SY	9" IMPRINTED CONCRETE PAVEMENT, CLASS 47B-3500	\$ 70.00	\$15,260.00
19	394	SY	CONCRETE CLASS 47B-3000 SIDEWALKS - 4"	\$ 41.00	\$16,154.00
21	625	LB	CAST IRON COVER AND FRAME	\$ 2.75	\$1,718.75
22	22	CY	CLASS 47B-3000 CONCRETE FOR INLET AND JUNCTION BOX	\$ 770.00	\$16,940.00
23	1,332	LB	REINFORCING STEEL FOR INLET AND JUNCTION BOX	\$ 1.70	\$2,264.40
24	2	EACH	18" CONCRETE FLARED-END SECTION	\$ 765.00	\$1,530.00
25	380	LF	18" STORM SEWER PIPE, TYPE 1	\$ 60.00	\$22,800.00
26	4	EACH	YIELD LINE, WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	\$ 100.00	\$400.00
27	628	LF	5" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	\$ 3.00	\$1,884.00
28	1175	LF	5" YELLOW WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	\$ 3.00	\$3,525.00
31	1400	LF	SILT CHECK, TYPE 1 - LOW	\$ 2.50	\$3,500.00
32	0.55	ACRE	SEEDING, TYPE B	\$ 810.00	\$445.50
33	1.25	TON	MULCH	\$ 204.00	\$255.00
34	5	EACH	CURB INLET SEDIMENT FILTER	\$ 129.00	\$645.00
TOTAL CONSTRUCTION					\$372,889.05

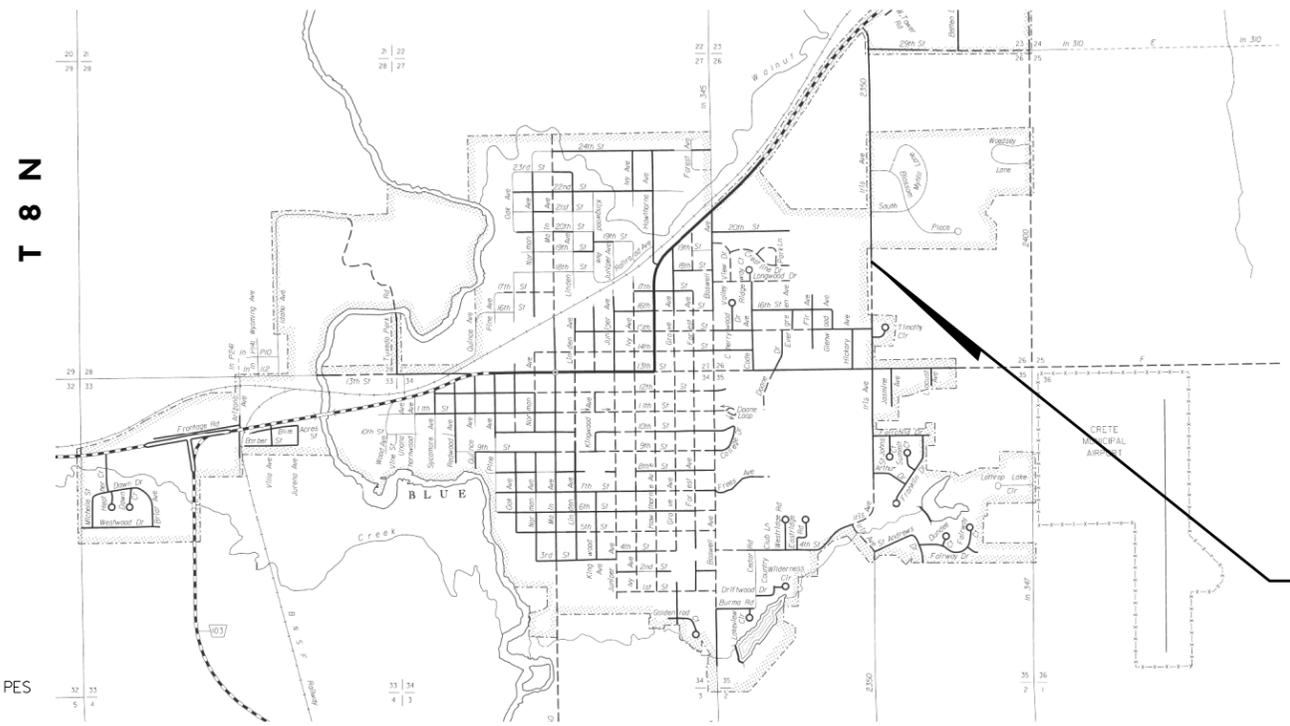
Assumptions:

- 1) Unit prices based on Tabulation of Bids from 13th Street Phase II (Code Ave to Hawthorne Ave) with adjustments to account for higher costs associated with a roundabout compared to traditional roadway construction, inflation, and the recent increase in contractor prices. In addition, 4" Foundation Course has been added.
- 2) Existing sight distances are sufficient for roundabout and will not require significant profile or grade changes.
- 3) Entrance to new high school will be built in conjunction with roundabout to minimize rework.
- 4) City of Crete will provide temporary traffic control and detectable warning panels.
- 5) No pipe underdrains or granular backfill are included.
- 6) Pavement Determination was provided to JEO by the city of Crete.
- 7) Construction contingency is not included in the Opinion of Cost, but standard industry practice is to budget 10% for potential unforeseen project overruns.

CITY OF CRETE PUBLIC WORKS DEPARTMENT PROJECT NO. M226-(270) PLAN FOR CONSTRUCTION IRIS AVENUE SCHOOL ROUNDABOUT

SALINE COUNTY

R 4 E



THE 2007 EDITION OF THE NEBRASKA STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS APPLY TO THIS PROJECT.

TRAFFIC COUNTS			
YEAR:	2014	2034	
ADT:	766	1087	
DHV:	-	-	
T=	- %	D=	- %

**IRIS AVENUE
SCHOOL ROUNDABOUT
PROJECT LOCATION**

CITY OFFICIALS

- | | |
|--------------------|--|
| MAYOR | ROGER FOSTER |
| COUNCIL MEMBERS | TRAVIS SEARS
DAVID BAUER
DALE STREHLE
JUDY JENNING
CHARLES VYHNALEK
JACK DESCHLAGER |
| CITY ADMINISTRATOR | TOM QURADA |
| CLERK | JERRY WILCOX |
| ATTORNEY | STEVEN J. REISDORF |

INDEX OF SHEETS

SHEET NO.	TITLE
1	TITLE PAGE
2-T1	TYPICAL CROSS SECTIONS
2-S1	SUMMARY OF QUANTITIES
2-H1	HORIZONTAL ALIGNMENT & ORIENTATION
2-N1	GENERAL INFORMATION
2-N2	EROSION CONTROL DETAILS
2-L1 - 2-L3	GEOMETRICS
2-L4 - 2-L5	JOINTS AND GRADES
2-L6	GRADING PLAN
2-L7	DRAINAGE
2-L8	CONSTRUCTION
2-L9	REMOVALS
3	DRAINAGE CROSS SECTIONS
4 - 5	PAVEMENT MARKING AND SIGNAGE

NDOR STANDARD PLANS

301-R10	(3 SHEETS) PAVEMENT DETAILS
303-R2	(4 SHEETS) CURB RAMPS
329-R9	(4 SHEETS) 8 TO 16 INCH CONCRETE PAVEMENT
410-R3	(2 SHEETS) FLARED END SECTIONS FOR CULVERT PIPES
411-R1	(4 SHEETS) BEDDING AND BACKFILL REQUIREMENTS FOR CONCRETE PIPES
443-R9	(2 SHEETS) CURB INLETS AND JUNCTION BOX
920-R6	(3 SHEETS) TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE
921-R6	(2 SHEETS) TRAFFIC CONTROL, CONSTRUCTION AND MAINTENANCE
923-R1	(1 SHEET) TRAFFIC CONTROL ROAD CLOSURE
924-R1	(3 SHEETS) URBAN TRAFFIC CONTROL

**DESIGN STANDARD: COLLECTOR, 2-LANE
DESIGN SPEED: 25 mph**

PROJECT LENGTH = 0.10 MILES



ROADWAY DESIGN DIVISION

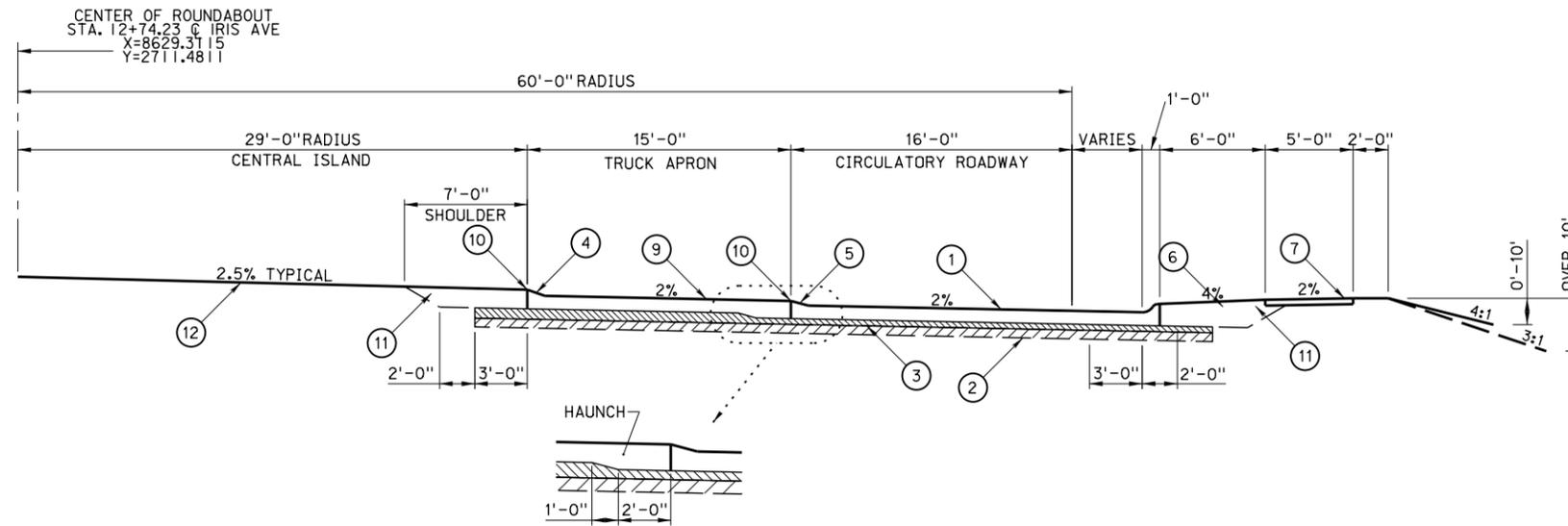
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User: mtempleman

Date: 20-JAN-2015 14:50

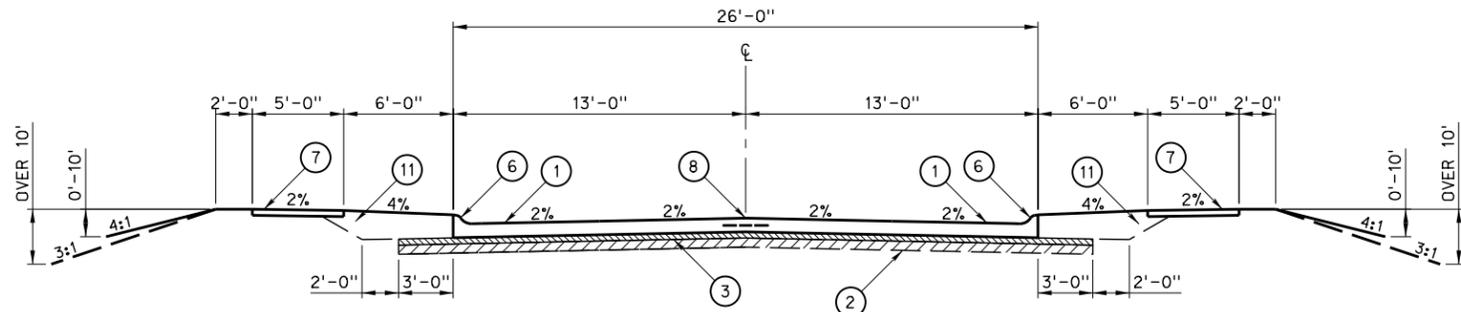
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TYPICAL CROSS SECTIONS

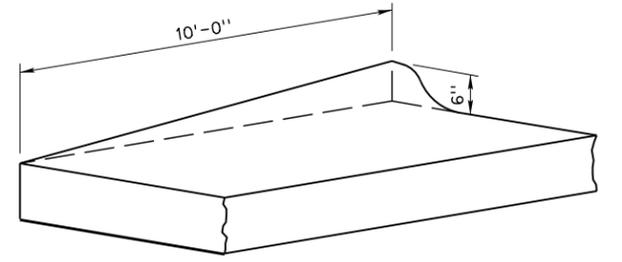


- LEGEND**
- ① 9" CONCRETE PAVEMENT
 - ② SUBGRADE PREPARATION
 - ③ 4" AGGREGATE FOUNDATION COURSE
 - ④ 4" INTEGRAL CONCRETE SLOPING CURB
 - ⑤ 3" INTEGRAL LIP CURB, SEE DETAIL 'A'
 - ⑥ 6" INTEGRAL CONCRETE CURB
 - ⑦ 4" SIDEWALK
 - ⑧ LONGITUDINAL JOINT
 - ⑨ 9" IMPRINTED CONCRETE PAVEMENT (COLOR)
 - ⑩ NON-DOWELED EXPANSION JOINT
 - ⑪ SHOULDER CONSTRUCTION
 - ⑫ SOIL

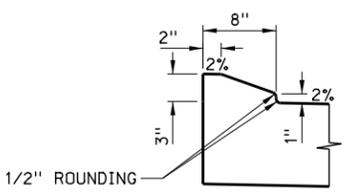
**IRIS AVENUE
 ROUNDABOUT (HALF SECTION)
 TYPICAL TO ALL QUADRANTS
 (EXCEPT AS SHOWN ELSEWHERE)**



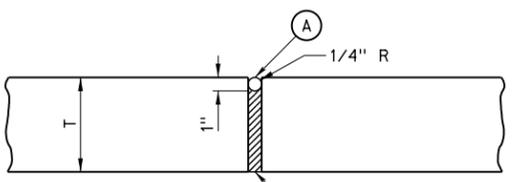
**IRIS AVENUE
 STA. 10+38.69 TO STA. 15+79.80
 (EXCEPT AS SHOWN ELSEWHERE)**



CURB TAPER DETAIL

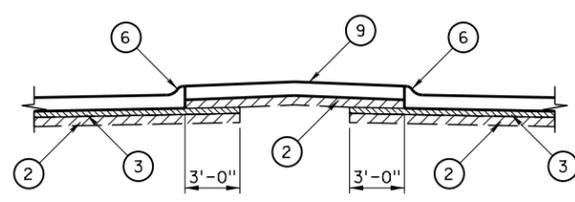


DETAIL A - 3" INTEGRAL LIP CURB

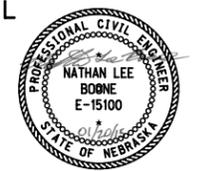


- Ⓐ JOINT SEALANT
- Ⓑ 1/2" PREFORMED EXPANSION JOINT FILLER

DETAIL 'B' - NON-DOWELED EXPANSION JOINT



ISLAND LOCATIONS



FOR DETAILS NOT SHOWN
 SEE PLANS 301-R10 & 329-R9

ROADWAY DESIGN DIVISION
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 File: 140436c01.dgn
 Scale: 1:10

SUMMARY OF QUANTITIES

ITEM	QUANTITY	UNITS
MOBILIZATION	1	LS
GENERAL CLEARING AND GRUBBING	1	LS
EARTHWORK MEASURED IN EMBANKMENT	2300	CY
WATER	23	MGAL
ADJUST VALVE BOX TO GRADE	5	EACH
REMOVE LIGHT POLE	1	EACH
REMOVE LIGHT FOUNDATION	1	EACH
REMOVE AND REINSTALL SIGN	1	EACH
REMOVE INLET	2	LF
REMOVE DRIVEWAY CULVERT PIPE	39	LF
REMOVE SEWER PIPE	61	LF
REMOVE PAVEMENT	2637	SY
REMOVE WALK	104	SY
FOUNDATION COURSE 4"	3267	SY
SUBGRADE PREPARATION	3267	SY
CONCRETE CLASS 47B-3500 IMPRINTED MEDIAN SURFACING	663	SY
9" CONCRETE PAVEMENT, CLASS 47B-3500	3267	SY
9" IMPRINTED CONCRETE PAVEMENT, CLASS 47B-3500	218	SY
CONCRETE CLASS 47B-3000 SIDEWALKS - 4"	394	SY
DETECTABLE WARNING PANEL (INSTALLATION ONLY)	256	SF
CAST IRON COVER AND FRAME	625	LB
CLASS 47B-3000 CONCRETE FOR INLET AND JUNCTION BOX	22	CY
REINFORCING STEEL FOR INLET AND JUNCTION BOX	1332	LB
18" CONCRETE FLARED-END SECTION	2	EACH
18" STORM SEWER PIPE, TYPE 1	380	LF
YIELD LINE, WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	4	EACH
5" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	628	LF
5" YELLOW WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	1175	LF
TYPE A SIGN	155	SF
SIGN POST	22	EACH
SILT CHECK, TYPE 1 - LOW	1400	LF
SEEDING, TYPE B	0.55	ACRE
MULCH	1.25	TON
CURB INLET SEDIMENT FILTER	5	EACH

ROADWAY DESIGN DIVISION

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Date: 20-JAN-2015 14:51

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ROADWAY DESIGN DIVISION

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User: mtempleman

Date: 20-JAN-2015 14:51

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IRIS AVENUE

Point RDWY1000 N 2,439.5249 E 8,606.7357 Sta 10+00.00
 Course from RDWY1000 to PC IRIS-1 N 0° 07' 29.55" W Dist 50.0000

Curve Data

Curve IRIS-1
 P.I. Station 10+83.42 N 2,522.9476 E 8,606.5538
 Delta = 3° 11' 26.98" (RT)
 Degree = 4° 46' 28.73"
 Tangent = 33.4229
 Length = 66.8285
 Radius = 1,200.0000
 External = 0.4654
 Long Chord = 66.8199
 Mid. Ord. = 0.4652
 P.C. Station 10+50.00 N 2,489.5248 E 8,606.6267
 P.T. Station 11+16.83 N 2,556.3226 E 8,608.3415
 C.C. N 2,492.1401 E 9,806.6238
 Back = N 0° 07' 29.55" W
 Ahead = N 3° 03' 57.42" E
 Chord Bear = N 1° 28' 13.94" E

Course from PT IRIS-1 to RDWY1001 N 3° 03' 57.42" E Dist 97.4048
 Point RDWY1001 N 2,653.5880 E 8,613.5512 Sta 12+14.23

Course from RDWY1001 to RDWY1002 N 15° 13' 43.16" E Dist 60.0000
 Point RDWY1002 N 2,711.4811 E 8,629.3115 Sta 12+74.23

Course from RDWY1002 to PC IRIS-2 N 6° 41' 44.95" E Dist 60.0000

Curve Data

Curve IRIS-2
 P.I. Station 13+53.26 N 2,789.9722 E 8,638.5263
 Delta = 23° 47' 12.76" (LT)
 Degree = 63° 24' 40.63"
 Tangent = 19.0301
 Length = 37.5121
 Radius = 90.3558
 External = 1.9823
 Long Chord = 37.2432
 Mid. Ord. = 1.9397
 P.C. Station 13+34.23 N 2,771.0719 E 8,636.3074
 P.T. Station 13+71.75 N 2,808.1620 E 8,632.9335
 C.C. N 2,781.6072 E 8,546.5679
 Back = N 6° 41' 44.95" E
 Ahead = N 17° 05' 27.81" W
 Chord Bear = N 5° 11' 51.43" W

Curve Data

Curve IRIS-3
 P.I. Station 14+61.85 N 2,894.2863 E 8,606.4529
 Delta = 17° 04' 51.03" (RT)
 Degree = 9° 32' 57.47"
 Tangent = 90.1034
 Length = 178.8702
 Radius = 600.0000
 External = 6.7278
 Long Chord = 178.2085
 Mid. Ord. = 6.6532
 P.C. Station 13+71.75 N 2,808.1620 E 8,632.9335
 P.T. Station 15+50.62 N 2,984.3897 E 8,606.4369
 C.C. N 2,984.4967 E 9,206.4368
 Back = N 17° 05' 27.81" W
 Ahead = N 0° 00' 36.79" W
 Chord Bear = N 8° 33' 02.30" W

Course from PT IRIS-3 to RDWY1003 N 0° 00' 36.79" W Dist 115.0000
 Point RDWY1003 N 3,099.3897 E 8,606.4163 Sta 16+65.62

SCHOOL DRIVE

Point RDWY2000 N 2,624.0297 E 8,436.6105 Sta 19+50.00
 Course from RDWY2000 to PC SCHOOL-1 N 47° 12' 27.40" E Dist 79.6933

Curve Data

Curve SCHOOL-1
 P.I. Station 20+82.24 N 2,713.8639 E 8,533.6485
 Delta = 44° 13' 09.23" (RT)
 Degree = 44° 17' 58.93"
 Tangent = 52.5435
 Length = 99.8183
 Radius = 129.3367
 External = 10.2656
 Long Chord = 97.3594
 Mid. Ord. = 9.5107
 P.C. Station 20+29.69 N 2,678.1688 E 8,495.0910
 P.T. Station 21+29.51 N 2,712.5556 E 8,586.1757
 C.C. N 2,583.2589 E 8,582.9551
 Back = N 47° 12' 27.40" E
 Ahead = S 88° 34' 23.37" E
 Chord Bear = N 69° 19' 02.02" E

Course from PT SCHOOL-1 to RDWY2001 S 88° 34' 23.37" E Dist 43.1492
 Point RDWY2001 N 2,711.4811 E 8,629.3115 Sta 21+72.66

Course from RDWY2001 to PC SCHOOL-2 N 88° 32' 56.88" E Dist 57.2790

Curve Data

Curve SCHOOL-2
 P.I. Station 22+50.05 N 2,713.4405 E 8,706.6740
 Delta = 15° 16' 14.06" (LT)
 Degree = 38° 11' 49.87"
 Tangent = 20.1083
 Length = 39.9783
 Radius = 150.0000
 External = 1.3418
 Long Chord = 39.8600
 Mid. Ord. = 1.3299
 P.C. Station 22+29.94 N 2,712.9314 E 8,686.5721
 P.T. Station 22+69.92 N 2,719.2261 E 8,725.9320
 C.C. N 2,862.8833 E 8,682.7742
 Back = N 88° 32' 56.88" E
 Ahead = N 73° 16' 42.82" E
 Chord Bear = N 80° 54' 49.85" E

Course from PT SCHOOL-2 to PC SCHOOL-3 N 73° 16' 42.82" E Dist 16.4717

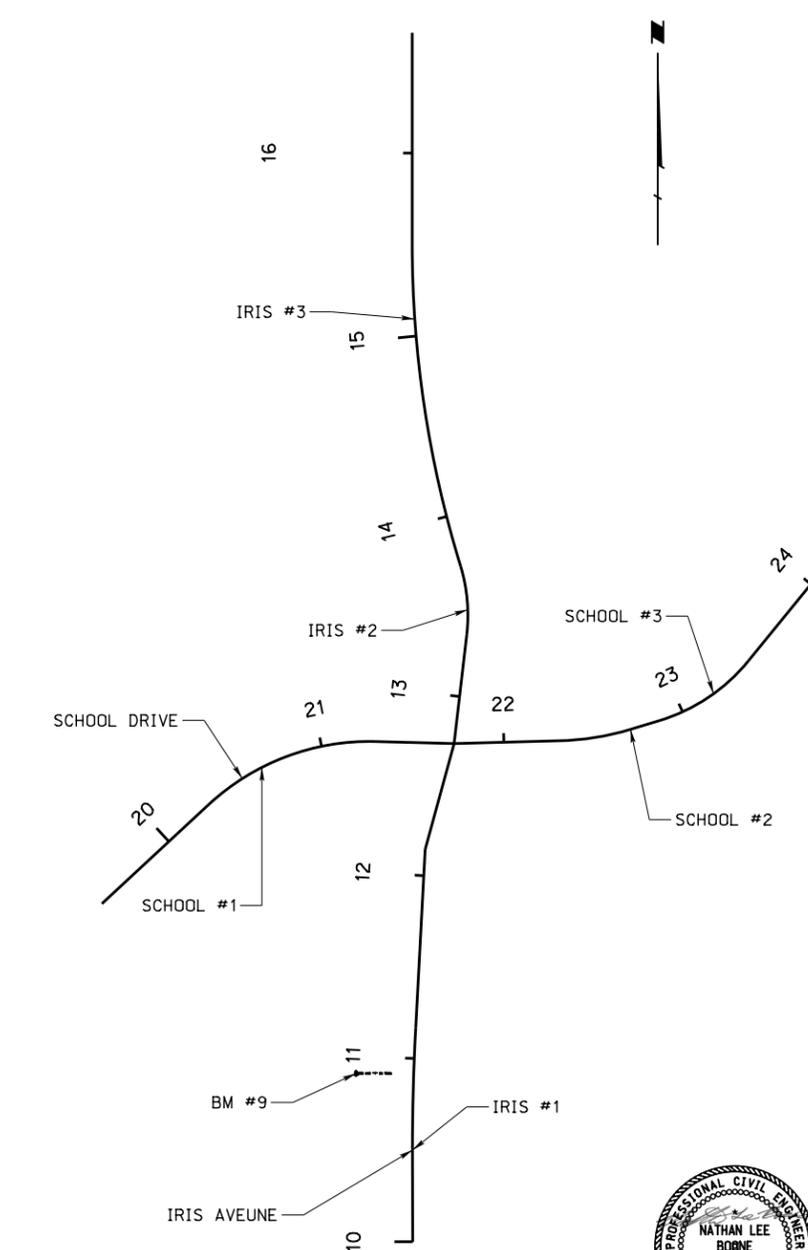
Curve Data

Curve SCHOOL-3
 P.I. Station 23+17.04 N 2,732.7853 E 8,771.0661
 Delta = 34° 05' 09.39" (LT)
 Degree = 57° 17' 44.81"
 Tangent = 30.6551
 Length = 59.4912
 Radius = 100.0000
 External = 4.5932
 Long Chord = 58.6178
 Mid. Ord. = 4.3915
 P.C. Station 22+86.39 N 2,723.9653 E 8,741.7072
 P.T. Station 23+45.88 N 2,756.5438 E 8,790.4379
 C.C. N 2,819.7368 E 8,712.9353
 Back = N 73° 16' 42.82" E
 Ahead = N 39° 11' 33.43" E
 Chord Bear = N 56° 14' 08.13" E

Course from PT SCHOOL-3 to RDWY2002 N 39° 11' 33.43" E Dist 54.1190
 Point RDWY2002 N 2,798.4875 E 8,824.6373 Sta 24+00.00

SURVEY CONTROL: HORIZONTAL DATUM - ASSUMED, VERTICAL DATUM - ASSUMEND.

POINT NO.	NORTH	EAST	ELEV	DESCRIPTION
CP 1	6291.93	8605.35	1410.6	5/8" REBAR NORTH QUARTER COR. SEC. 26-8-4
CP 2	1000.00	8607.07	1454.7	2" ALUM CAP SOUTH QUARTER COR. SEC. 26-8-4
CP 5	3634.40	8606.42	1451.4	5/8" REBAR CENTER QUARTER COR. SEC. 26-8-4
BM 8	2012.9	8576.9	1467.25	CHAIR NAILS IN POWER POLE
BM 9	2531.4	8575.7	1473.04	"T" IN TENN ON FIRE HYDRANT
CP 10	2317.23	8606.77	1472.46	PROPERTY CORNER SW S2NW4SE4 26-8-4
CP 11	2305.37	8584.56	1472.69	MAG NAIL IN SIDEWALK
CP 12	3242.94	8658.75	1466.26	5/8" REBAR



GENERAL INFORMATION

PRELIMINARY PLAN
 NOT FINAL - SUBJECT TO CHANGE

NOTES

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

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

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

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

EARTHWORK		
STATION TO STATION	EARTHWORK EXCAVATION* (CU. YDS.)	EARTHWORK MEASURED IN EMBANKMENT (CU. YDS.)
10+38.69 - 15+79.80	620	2300
TOTAL	620	2300

* FOR INFORMATION ONLY

COMPACTION REQUIREMENTS

CLASS III (See Specifications)

	SOIL TYPE	DEPTH BELOW FINISHED SUBGRADE	PERCENT DENSITY	MOISTURE MINIMUM	REQUIREMENTS MARXISM
Embankment/Roadway Grading, Including driveways, to receive concrete pavement	Silt-Clay	Upper 3 feet	98 Min.	Opt. -3%	Opt. +2%
	Silt-Clay	At Depths greater than 3 feet	95 Min.	Opt. -3%	Opt. +2%
	Granular	All depths	100 Min.	**	**
Embankment/Roadway Grading not to be surfaced.	All	All depths	95 Min.	Opt. -3%	Opt. +2%
	Silt-Clay	The upper 6 inches of Subgrade soil	98 Min.	Opt. -3%	Opt. +2%
Subgrade Preparation, Shoulder Subgrade Preparation (Concrete Pavement)	Granular	The upper 6 inches of subgrade soil	100 Min.	**	**
	--	--	100 Min.	(See Specifications)	

** Moisture as necessary to obtain density.
 (A moisture target value at maximum density shall be established in the field by the Contractor during the compaction process. The acceptable moisture content shall be +/- 2% of the target value.)

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

NOTE:
 NEITHER THE OWNER (CLIENT) NOR JEO CONSULTING GROUP, INC. ASSUMES ANY RESPONSIBILITY FOR UTILITY LOCATIONS BEING ACCURATELY SHOWN OR NOT SHOWN ON THE PLANS. A REQUEST FOR UTILITY LOCATES WAS MADE FOR THIS LOCATION AS PER THE ONE-CALL NOTIFICATION SYSTEM ACT. (DATE: --/-- TICKET NO.: ----).

 UTILITIES SHOWN ARE FROM FIELD MARKINGS PROVIDED IN THE FIELD BY THE UTILITY PROVIDERS.

 THE EXACT LOCATION AND/OR SIZE OF UNDERGROUND FEATURES MAY NOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. FIELD VERIFICATION OF UTILITIES MAY BE REQUIRED. CONTRACTOR(S) SHALL NOTIFY THE RESPECTIVE UTILITY COMPANIES BEFORE COMMENCING ANY WORK.

**Diggers Hotline
Of Nebraska**

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ROADWAY DESIGN DIVISION

 Computer: TEMPLEMANDSKTOP

 User: mtempleman

 Date: 20-JAN-2015 14:51

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 Scale: 1:200

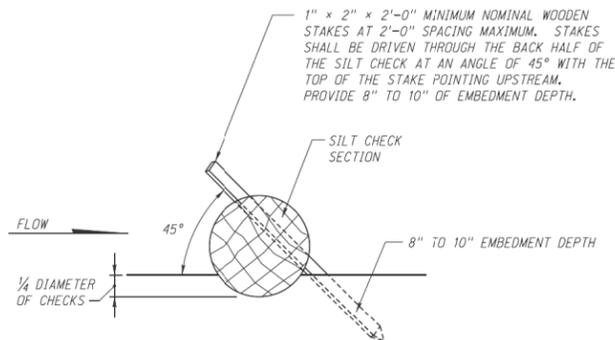
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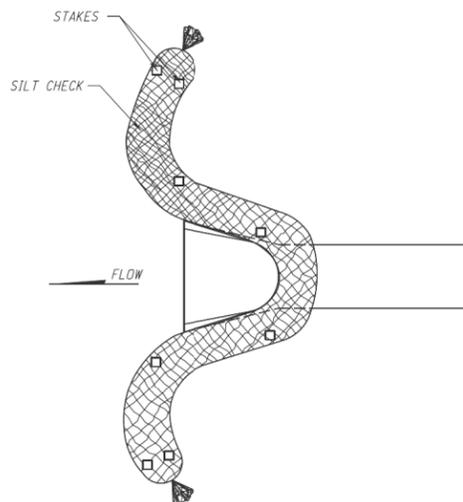
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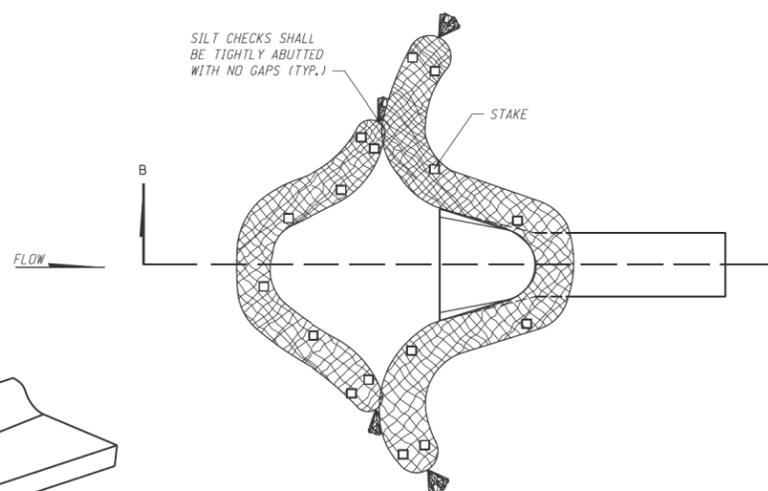
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SILT STAKE DETAIL

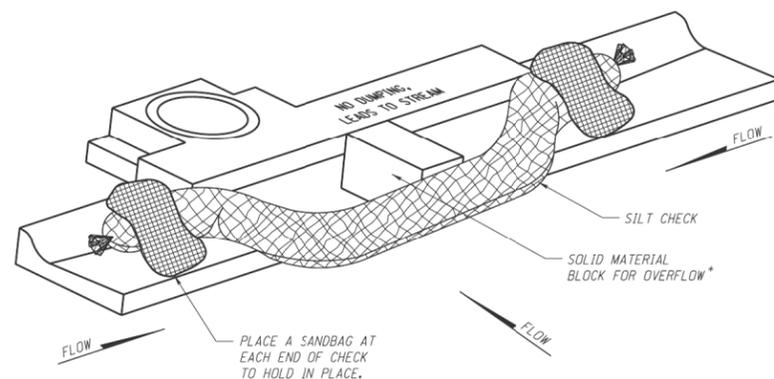


SILT CHECK OUTLET PROTECTION



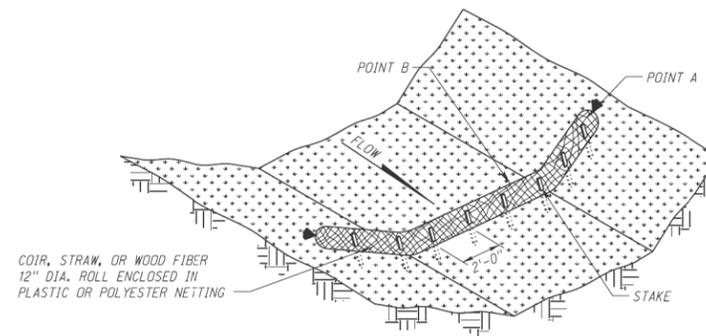
PLAN VIEW

SILT CHECK INLET PROTECTION

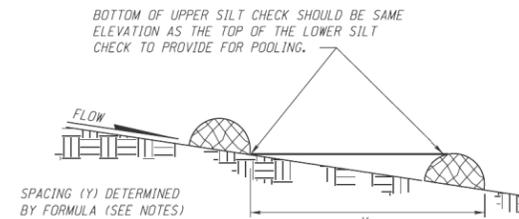


CURB INLET PERSPECTIVE VIEW

*APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.



TYPE 1, LOW
USE ON ROUGH GRADED & BARE SOIL AREAS



SILT CHECK SPACING-DITCH

NOTES:

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

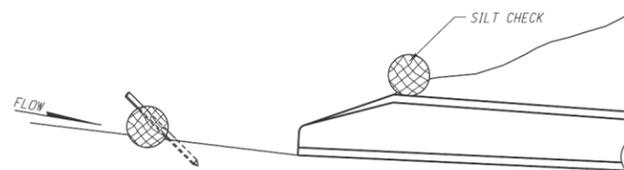
$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{SILT CHECK HEIGHT (FT.)}}{\% \text{ CHANNEL SLOPE}} \times 100$$

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

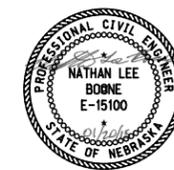
THE MANUFACTURERS RECOMMENDED INSTALLATION DETAILS SHALL GOVERN OVER THE PLANS.

GENERAL NOTES:

SILT CHECKS SHALL BE PLACED A MINIMUM OF 6'-0" FROM TOE OF SLOPE.



SECTION B-B



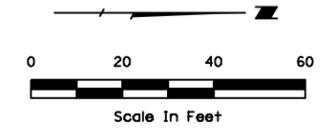
ROADWAY DESIGN DIVISION

Computer: TEMPLEMANSTOP

User: mtemplm

Date: 20-JAN-2015 14:51

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- ① POINT 16.00' Lt. STA. 10+38.69
X=8590.6514 Y=2478.1832
- ② POINT 16.00' Rt. STA. 10+38.69
X=8622.6513 Y=2478.2529
- ③ 90' R.P. 107.83' Rt. STA. 11+50.84
X=8717.8351 Y=2584.5146
P.C. 17.83' Rt. STA. 11+50.32
X=8627.9378 Y=2588.8131
P.T. 54.95' Rt. STA. 12+38.44
X=8672.9251 Y=2662.5088
- ④ P.I. 20.70' Lt. STA. 11+67.24
X=8590.3690 Y=2607.7643
 $\Delta = 17^\circ 27' 17.35''$ Lt.
D = 22° 55' 05.92"
T = 38.38
L = 76.16
R = 250.00
P.C. 18.56' Lt. STA. 11+28.92
X=8590.4526 Y=2569.3866
P.T. 34.23' Lt. STA. 12+03.15
X=8578.7776 Y=2644.3497
- ⑤ 2' R.P. 0.00' Lt. STA. 11+20.69
X=8608.5482 Y=2560.1812
P.C. 2.00' Lt. STA. 11+20.60
X=8606.5482 Y=2560.1986
P.T. 2.00' Rt. STA. 11+20.70
X=8610.5459 Y=2560.0857

- ③③ POINT 13.00' Lt. STA. 15+79.80
X=8593.4316 Y=3013.5735

- ⑨ P.I. 1.66' Lt. STA. 11+77.74
X=8609.9435 Y=2617.2360
 $\Delta = 30^\circ 38' 24.71''$ Rt.
D = 1145° 54' 56.12"
T = 1.37
L = 2.67
R = 5.00
P.C. 2.99' Lt. STA. 11+77.40
X=8608.6000 Y=2616.9693
P.T. 0.34' Lt. STA. 11+77.35
X=8611.2354 Y=2616.7807

- ⑩ 1' R.P. 1.28' Rt. STA. 11+75.84
X=8612.7747 Y=2615.1780
P.C. 2.27' Rt. STA. 11+75.73
X=8613.7616 Y=2615.0165
P.T. 1.56' Rt. STA. 11+76.80
X=8613.1071 Y=2616.1211

- ⑭ P.I. 7.26' Rt. STA. 11+99.29
X=8620.0012 Y=2638.2776
 $\Delta = 15^\circ 23' 04.35''$ Lt.
D = 63° 39' 43.12"
T = 12.16
L = 24.17
R = 90.00
P.C. 13.19' Rt. STA. 12+09.90
X=8626.4942 Y=2648.5544
P.T. 4.35' Rt. STA. 11+87.49
X=8616.4673 Y=2626.6465

- ⑮ 1' R.P. 12.32' Rt. STA. 12+10.39
X=8625.6488 Y=2649.0885
P.C. 12.39' Rt. STA. 12+11.38
X=8625.7743 Y=2650.0806
P.T. 13.19' Rt. STA. 12+09.90
X=8626.4942 Y=2648.5544

- ⑯ 3' R.P. 6.60' Lt. STA. 12+09.75
X=8606.7198 Y=2649.4681
P.C. 9.59' Lt. STA. 12+09.44
X=8603.7236 Y=2649.3169
P.T. 6.38' Lt. STA. 12+12.75
X=8607.0964 Y=2652.4444

- ⑰ 80' R.P. 98.40' Lt. STA. 14+05.87
X=8528.2917 Y=2817.5215
P.C. 18.45' Lt. STA. 14+03.38
X=8606.5446 Y=2834.1492
P.T. 64.48' Lt. STA. 13+03.93
X=8568.7296 Y=2748.4942

- ⑱ 1' R.P. 13.41' Lt. STA. 13+35.46
X=8623.1014 Y=2773.6718
P.C. 14.37' Lt. STA. 13+35.78
X=8622.1724 Y=2774.0418
P.T. 13.28' Lt. STA. 13+34.29
X=8623.1273 Y=2772.6722

- ⑲ P.I. 10.43' Lt. STA. 13+48.33
X=8626.4312 Y=2784.7372
 $\Delta = 16^\circ 22' 39.10''$ Rt.
D = 71° 37' 11.01"
T = 11.51
L = 22.87
R = 80.00
P.C. 8.12' Lt. STA. 13+60.91
X=8627.5014 Y=2796.1995
P.T. 14.37' Lt. STA. 13+35.78
X=8622.1724 Y=2774.0418

- ⑳ 3' R.P. 5.62' Rt. STA. 13+39.67
X=8642.3930 Y=2776.1717
P.C. 5.92' Rt. STA. 13+36.87
X=8642.4706 Y=2773.1727
P.T. 8.48' Rt. STA. 13+40.52
X=8645.2938 Y=2776.9366

- ㉑ 1' R.P. 3.30' Rt. STA. 13+59.87
X=8638.9252 Y=2797.1681
P.C. 4.30' Rt. STA. 13+59.96
X=8639.8922 Y=2797.4230
P.T. 3.13' Rt. STA. 13+60.83
X=8638.5849 Y=2798.1084

- ㉒ P.I. 0.71' Lt. STA. 13+70.32
X=8632.6574 Y=2806.5977
 $\Delta = 28^\circ 36' 21.59''$ Lt.
D = 1145° 54' 56.12"
T = 1.27
L = 2.50
R = 5.00
P.C. 1.87' Lt. STA. 13+70.87
X=8631.3973 Y=2806.7907
P.T. 0.56' Rt. STA. 13+70.40
X=8633.8560 Y=2807.0316
- ㉓ P.I. 3.18' Lt. STA. 13+80.82
X=8627.2779 Y=2815.9714
 $\Delta = 11^\circ 10' 37.22''$ Rt.
D = 71° 37' 11.01"
T = 7.83
L = 15.61
R = 80.00
P.C. 2.98' Lt. STA. 13+88.61
X=8625.3291 Y=2823.5528
P.T. 4.99' Lt. STA. 13+73.26
X=8627.7201 Y=2808.1560
- ㉔ 1' R.P. 2.17' Rt. STA. 13+71.48
X=8635.0878 Y=2808.5410
P.C. 3.17' Rt. STA. 13+71.50
X=8636.0384 Y=2808.8512
P.T. 2.23' Rt. STA. 13+70.51
X=8635.4282 Y=2807.6007

- ⑥ P.I. 1.71' Rt. STA. 11+70.60
X=8612.9292 Y=2609.9296
 $\Delta = 6^\circ 33' 20.80''$ Lt.
D = 63° 39' 43.12"
T = 5.15
L = 10.30
R = 90.00
P.C. 2.27' Rt. STA. 11+75.73
X=8613.7616 Y=2615.0165
P.T. 1.74' Rt. STA. 11+65.45
X=8612.6830 Y=2604.7810

- ⑦ P.I. 4.43' Lt. STA. 11+65.91
X=8606.5438 Y=2605.5695
 $\Delta = 3^\circ 48' 55.62''$ Rt.
D = 19° 05' 54.94"
T = 9.99
L = 19.98
R = 300.00
P.C. 5.63' Lt. STA. 11+75.83
X=8605.8731 Y=2615.5395
P.T. 3.89' Lt. STA. 11+55.93
X=8606.5495 Y=2595.5770

- ⑧ 1' R.P. 4.64' Lt. STA. 11+75.95
X=8606.8709 Y=2615.6066
P.C. 5.63' Lt. STA. 11+75.83
X=8605.8731 Y=2615.5395
P.T. 4.89' Lt. STA. 11+76.92
X=8606.6762 Y=2616.5875

- ⑪ 1' R.P. 6.33' Lt. STA. 11+87.90
X=8605.8193 Y=2627.6320
P.C. 7.33' Lt. STA. 11+87.80
X=8604.8206 Y=2627.5816
P.T. 6.09' Lt. STA. 11+86.93
X=8606.0140 Y=2626.6511

- ⑫ P.I. 1.47' Lt. STA. 11+88.11
X=8610.6836 Y=2627.5780
 $\Delta = 30^\circ 38' 24.71''$ Rt.
D = 572° 57' 28.06"
T = 2.74
L = 5.35
R = 10.00
P.C. 4.13' Lt. STA. 11+87.43
X=8607.9966 Y=2627.0447
P.T. 1.16' Rt. STA. 11+87.34
X=8613.2673 Y=2626.6675

- ⑬ 1' R.P. 3.38' Rt. STA. 11+87.73
X=8615.5105 Y=2626.9372
P.C. 4.35' Rt. STA. 11+87.49
X=8616.4673 Y=2626.6465
P.T. 3.10' Rt. STA. 11+86.77
X=8615.1781 Y=2625.9941

- ㉒ P.I. 2.02' Lt. STA. 13+59.92
X=8633.6638 Y=2796.3270
 $\Delta = 28^\circ 36' 21.59''$ Lt.
D = 572° 57' 28.06"
T = 2.55
L = 4.99
R = 10.00
P.C. 4.44' Lt. STA. 13+60.76
X=8631.1436 Y=2796.7129
P.T. 0.48' Rt. STA. 13+60.37
X=8636.0611 Y=2797.1948

- ㉓ 1' R.P. 7.15' Lt. STA. 13+60.62
X=8628.4971 Y=2796.1066
P.C. 8.12' Lt. STA. 13+60.91
X=8627.5014 Y=2796.1995
P.T. 6.83' Lt. STA. 13+61.64
X=8628.6484 Y=2797.0950

- ㉔ P.I. 6.50' Rt. STA. 14+61.71
X=8619.4525 Y=2896.7667
 $\Delta = 22^\circ 02' 01.37''$ Rt.
D = 9° 32' 57.47"
T = 116.81
L = 230.74
R = 600.00
P.C. 26.57' Rt. STA. 13+50.12
X=8663.2938 Y=2788.4947
P.T. 13.00' Rt. STA. 15+79.80
X=8619.4316 Y=3013.5781

- ㉕ 1' R.P. 4.02' Lt. STA. 13+73.02
X=8628.7185 Y=2808.2125
P.C. 4.99' Lt. STA. 13+73.26
X=8627.7201 Y=2808.1560
P.T. 4.45' Lt. STA. 13+72.13
X=8628.5671 Y=2807.2241

- ㉙ P.I. 1.60' Rt. STA. 14+06.11
X=8625.3299 Y=2841.6660
 $\Delta = 6^\circ 35' 06.60''$ Rt.
D = 9° 32' 57.47"
T = 34.52
L = 68.96
R = 600.00
P.C. 3.17' Rt. STA. 13+71.50
X=8636.0384 Y=2808.8512
P.T. 2.00' Rt. STA. 14+40.74
X=8618.4552 Y=2875.4923

- ㉚ P.I. 3.07' Lt. STA. 14+14.68
X=8618.8077 Y=2848.9239
 $\Delta = 4^\circ 59' 59.49''$ Rt.
D = 9° 32' 57.47"
T = 26.20
L = 52.36
R = 600.00
P.C. 2.98' Lt. STA. 13+88.61
X=8625.3291 Y=2823.5528
P.T. 2.00' Lt. STA. 14+40.74
X=8614.5222 Y=2874.7668

- ㉛ 2' R.P. 0.00' Rt. STA. 14+40.70
X=8616.4953 Y=2875.0940
P.C. 2.00' Lt. STA. 14+40.74
X=8614.5222 Y=2874.7668
P.T. 2.00' Rt. STA. 14+40.74
X=8618.4552 Y=2875.4923

- ㉜ P.I. 19.37' Lt. STA. 14+64.47
X=8593.4527 Y=2895.7620
 $\Delta = 11^\circ 59' 09.56''$ Rt.
D = 9° 32' 57.47"
T = 62.99
L = 125.52
R = 600.00
P.C. 18.45' Lt. STA. 14+03.38
X=8606.5446 Y=2834.1492
P.T. 13.54' Lt. STA. 15+25.54
X=8593.4414 Y=2958.7504



GEOMETRICS

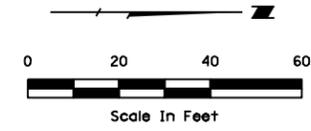
ROADWAY DESIGN DIVISION

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1 45' R.P. 62.50' Rt. STA. 20+27.42
X=8535.8789 Y=2630.7627
P.C. 68.10' Rt. STA. 21+17.46
X=8578.7767 Y=2644.3560
P.T. 17.50' Rt. STA. 20+27.42
X=8505.3070 Y=2663.7832

2 P.I. 20.25' Rt. STA. 22+82.92
X=8744.2095 Y=2703.5707
Δ = 33° 28' 42.95" Rt.
D = 229° 10' 59.22"
T = 7.52
L = 14.61
R = 25.00
P.C. 21.97' Rt. STA. 22+75.60
X=8737.6936 Y=2699.8184
P.T. 22.91' Rt. STA. 22+89.30
X=8751.7142 Y=2703.1061

3 3' R.P. 11.80' Rt. STA. 22+37.07
X=8694.5495 Y=2701.5141
P.C. 11.89' Rt. STA. 22+34.29
X=8691.5626 Y=2701.2338
P.T. 14.62' Rt. STA. 22+38.00
X=8695.7767 Y=2698.7766

4 1' R.P. 8.07' Rt. STA. 22+55.54
X=8713.5554 Y=2707.8431
P.C. 7.75' Rt. STA. 22+56.44
X=8714.4220 Y=2708.3422
P.T. 9.04' Rt. STA. 22+55.75
X=8713.9645 Y=2706.9306

5 P.I. 3.10' Rt. STA. 22+54.93
X=8711.9728 Y=2712.5952
Δ = 34° 56' 13.25" Rt.
D = 572° 57' 28.06"
T = 3.15
L = 6.10
R = 10.00
P.C. 6.08' Rt. STA. 22+55.91
X=8713.5432 Y=2709.8681
P.T. 0.08' Rt. STA. 22+55.79
X=8712.2471 Y=2715.7301

6 1' R.P. 5.49' Lt. STA. 22+56.40
X=8711.7311 Y=2721.3048
P.C. 6.46' Lt. STA. 22+56.66
X=8711.7800 Y=2722.3036
P.T. 5.20' Lt. STA. 22+57.40
X=8712.7273 Y=2721.2176

7 P.I. 8.77' Lt. STA. 22+45.54
X=8700.9875 Y=2722.8321
Δ = 13° 41' 32.50" Lt.
D = 63° 39' 43.12"
T = 10.81
L = 21.51
R = 90.00
P.C. 12.79' Lt. STA. 22+34.73
X=8690.6268 Y=2725.9004
P.T. 6.46' Lt. STA. 22+56.66
X=8711.7800 Y=2722.3036

8 1' R.P. 11.85' Lt. STA. 22+34.36
X=8690.3429 Y=2724.9415
P.C. 12.79' Lt. STA. 22+34.73
X=8690.6268 Y=2725.9004
P.T. 11.81' Lt. STA. 22+33.28
X=8689.3473 Y=2724.8481

9 P.I. 3.19' Rt. STA. 22+65.20
X=8722.2090 Y=2714.8585
Δ = 34° 56' 13.25" Lt.
D = 1145° 54' 56.12"
T = 1.57
L = 3.05
R = 5.00
P.C. 1.71' Rt. STA. 22+65.73
X=8722.3462 Y=2716.4259
P.T. 4.71' Rt. STA. 22+65.59
X=8722.9943 Y=2713.4949

10 1' R.P. 4.64' Rt. STA. 22+66.58
X=8723.9543 Y=2713.8316
P.C. 4.89' Rt. STA. 22+65.64
X=8723.0878 Y=2713.3326
P.T. 5.60' Rt. STA. 22+66.82
X=8724.4534 Y=2712.9650

11 1' R.P. 2.80' Lt. STA. 22+68.50
X=8723.7953 Y=2721.5148
P.C. 3.78' Lt. STA. 22+68.71
X=8723.7116 Y=2722.5113
P.T. 3.16' Lt. STA. 22+67.55
X=8722.7991 Y=2721.6020

12 2' R.P. 0.01' Lt. STA. 22+81.73
X=8737.2451 Y=2722.6393
P.C. 2.01' Lt. STA. 22+81.86
X=8736.7872 Y=2724.5861
P.T. 1.93' Rt. STA. 22+82.19
X=8738.2431 Y=2720.9061

17 P.I. 20.36' Lt. STA. 20+55.00
X=8504.5591 Y=2710.7883
Δ = 12° 40' 17.95" Lt.
D = 38° 11' 49.87"
T = 16.66
L = 33.17
R = 150.00
P.C. 20.86' Lt. STA. 20+69.37
X=8518.9649 Y=2719.1469
P.T. 18.03' Lt. STA. 20+40.64
X=8492.3377 Y=2699.4732

18 2' R.P. 0.00' Lt. STA. 20+53.54
X=8513.9769 Y=2692.6717
P.C. 1.99' Rt. STA. 20+53.37
X=8514.9035 Y=2690.8993
P.T. 1.99' Lt. STA. 20+53.28
X=8512.6947 Y=2694.2066

23 1' R.P. 4.32' Lt. STA. 20+76.15
X=8532.4292 Y=2706.9927
P.C. 5.30' Lt. STA. 20+76.01
X=8531.9162 Y=2707.8511
P.T. 4.46' Lt. STA. 20+77.11
X=8533.2906 Y=2707.5007

24 1' R.P. 6.53' Rt. STA. 20+86.64
X=8545.8903 Y=2700.3408
P.C. 7.49' Rt. STA. 20+86.37
X=8545.9398 Y=2699.3420
P.T. 6.17' Rt. STA. 20+85.66
X=8544.8920 Y=2700.3982

25 P.I. 0.10' Rt. STA. 20+88.02
X=8545.2649 Y=2706.8826
Δ = 33° 49' 25.63" Rt.
D = 572° 57' 28.06"
T = 3.04
L = 5.90
R = 10.00
P.C. 2.86' Lt. STA. 20+87.32
X=8543.7203 Y=2709.5015
P.T. 2.94' Rt. STA. 20+86.94
X=8545.0903 Y=2703.8471

19 P.I. 2.42' Rt. STA. 20+63.78
X=8523.9763 Y=2695.6423
Δ = 15° 32' 45.80" Lt.
D = 76° 23' 39.74"
T = 10.24
L = 20.35
R = 75.00
P.C. 4.79' Rt. STA. 20+74.03
X=8533.9883 Y=2697.7803
P.T. 1.99' Rt. STA. 20+53.37
X=8514.9035 Y=2690.8993

20 P.I. 4.05' Lt. STA. 20+64.66
X=8521.7678 Y=2701.7863
Δ = 9° 00' 47.31" Rt.
D = 38° 11' 49.87"
T = 11.82
L = 23.60
R = 150.00
P.C. 1.99' Lt. STA. 20+53.28
X=8512.6947 Y=2694.2066
P.T. 5.30' Lt. STA. 20+76.01
X=8531.9162 Y=2707.8511

21 1' R.P. 3.80' Rt. STA. 20+74.23
X=8533.7795 Y=2698.7582
P.C. 4.79' Rt. STA. 20+74.03
X=8533.9883 Y=2697.7803
P.T. 4.25' Rt. STA. 20+75.16
X=8534.7778 Y=2698.7008

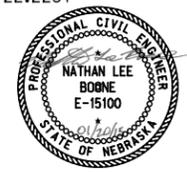
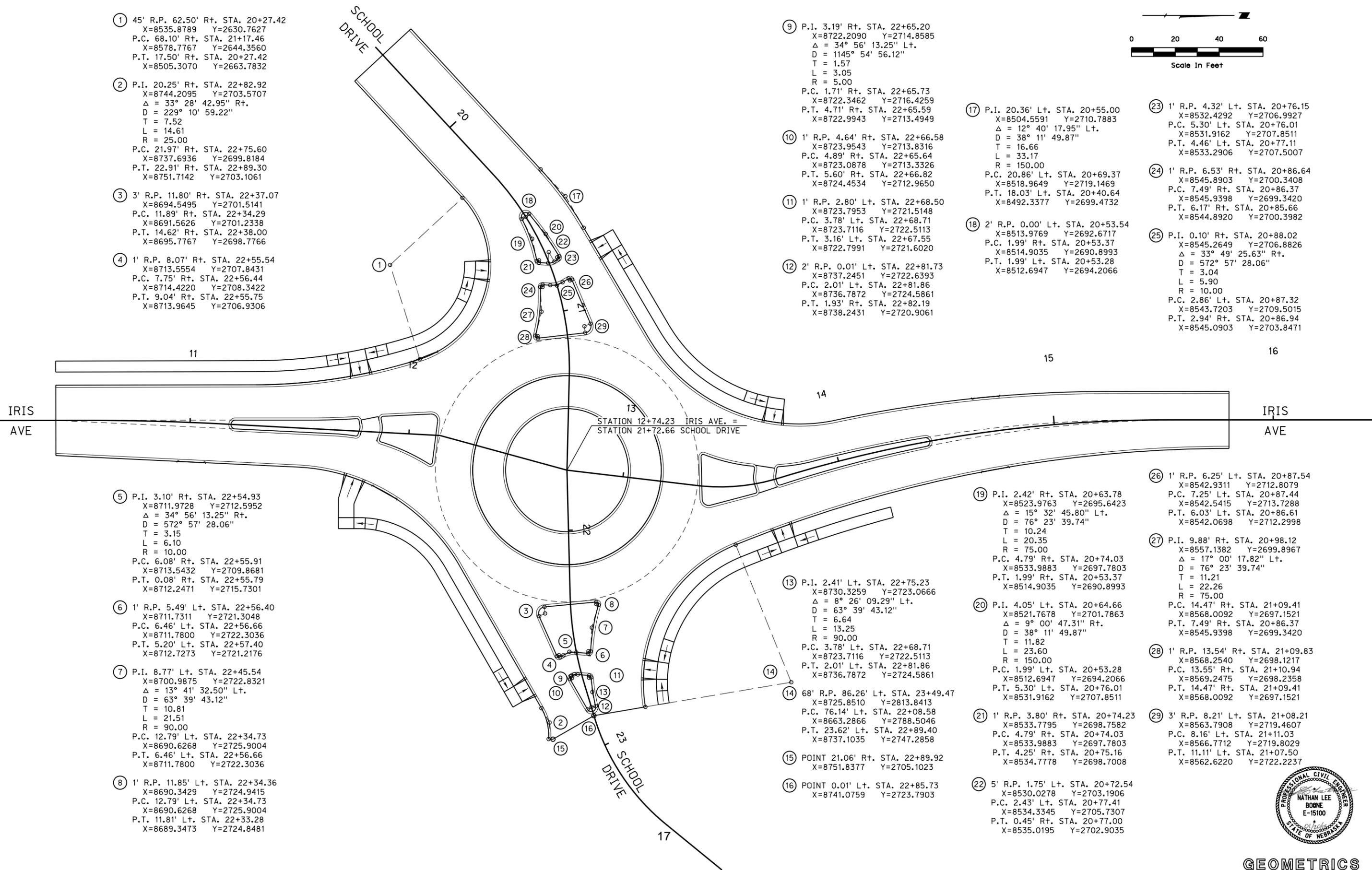
22 5' R.P. 1.75' Lt. STA. 20+72.54
X=8530.0278 Y=2703.1906
P.C. 2.43' Lt. STA. 20+77.41
X=8534.3345 Y=2705.7307
P.T. 0.45' Rt. STA. 20+77.00
X=8535.0195 Y=2702.9035

26 1' R.P. 6.25' Lt. STA. 20+87.54
X=8542.9311 Y=2712.8079
P.C. 7.25' Lt. STA. 20+87.44
X=8542.5415 Y=2713.7288
P.T. 6.03' Lt. STA. 20+86.61
X=8542.0698 Y=2712.2998

27 P.I. 9.88' Rt. STA. 20+98.12
X=8557.1382 Y=2699.8967
Δ = 17° 00' 17.82" Lt.
D = 76° 23' 39.74"
T = 11.21
L = 22.26
R = 75.00
P.C. 14.47' Rt. STA. 21+09.41
X=8568.0092 Y=2697.1521
P.T. 7.49' Rt. STA. 20+86.37
X=8545.9398 Y=2699.3420

28 1' R.P. 13.54' Rt. STA. 21+09.83
X=8568.2540 Y=2698.1217
P.C. 13.55' Rt. STA. 21+10.94
X=8569.2475 Y=2698.2358
P.T. 14.47' Rt. STA. 21+09.41
X=8568.0092 Y=2697.1521

29 3' R.P. 8.21' Lt. STA. 21+08.21
X=8563.7908 Y=2719.4607
P.C. 8.16' Lt. STA. 21+11.03
X=8566.7712 Y=2719.8029
P.T. 11.11' Lt. STA. 21+07.50
X=8562.6220 Y=2722.2237



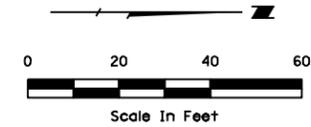
ROADWAY DESIGN DIVISION

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SIDEWALK GEOMETRICS

① 39' R.P. 76.34' Lt. STA. 11+87.28
X=8535.8792 Y=2630.7583
P.C. 39.84' Lt. STA. 12+01.03
X=8573.0578 Y=2642.5376
P.T. 81.06' Rt. STA. 12+14.23
X=8534.1149 Y=2669.7184

② P.I. 26.64' Lt. STA. 11+65.98
X=8584.3710 Y=2606.8302
Δ = 17° 27' 17.35" Lt.
D = 23° 28' 54.76"
T = 37.46
L = 74.33
R = 244.00
P.C. 24.55' Lt. STA. 11+28.58
X=8584.4526 Y=2569.3735
P.T. 39.84' Lt. STA. 12+01.03
X=8573.0578 Y=2642.5376

③ 45' R.P. 84.25' Rt. STA. 11+82.02
X=8695.9553 Y=2616.9193
P.C. 57.23' Rt. STA. 12+32.23
X=8673.5003 Y=2655.9164
P.T. 39.31' Rt. STA. 11+79.66
X=8650.9553 Y=2616.9656

⑨ POINT 33.17' Rt. STA. 11+76.65
X=8644.6599 Y=2614.2869
⑩ POINT 107.33' Rt. STA. 12+74.23
X=8734.7001 Y=2691.1559
⑪ POINT 27.00' Lt. STA. 10+38.69
X=8579.6514 Y=2478.1592
⑫ POINT 79.99' Rt. STA. 12+14.23
X=8534.3411 Y=2664.7235
⑬ POINT 31.05' Rt. STA. 11+69.44
X=8642.1619 Y=2607.1989
⑭ POINT 44.82' Rt. STA. 11+70.16
X=8655.9452 Y=2607.1854
⑮ POINT 44.30' Rt. STA. 11+79.33
X=8655.9553 Y=2616.9604

④ 61.50' R.P. 91.81 RT STA. 13+60.86
X=8725.8593 Y=2813.8286
P.C. 101.21' RT STA. 13+28.11
X=8736.1089 Y=2753.1887
P.T. 32.39 RT STA. 13+51.26
X=8669.0033 Y=2790.3843

⑤ 74' R.P. 98.40' Lt. STA. 14+05.87
X=8528.2917 Y=2817.5215
P.C. 29.10' Lt. STA. 13+82.38
X=8601.9379 Y=2810.2936
P.T. 67.93' Lt. STA. 13+08.85
X=8565.8827 Y=2753.7805

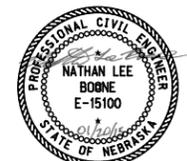
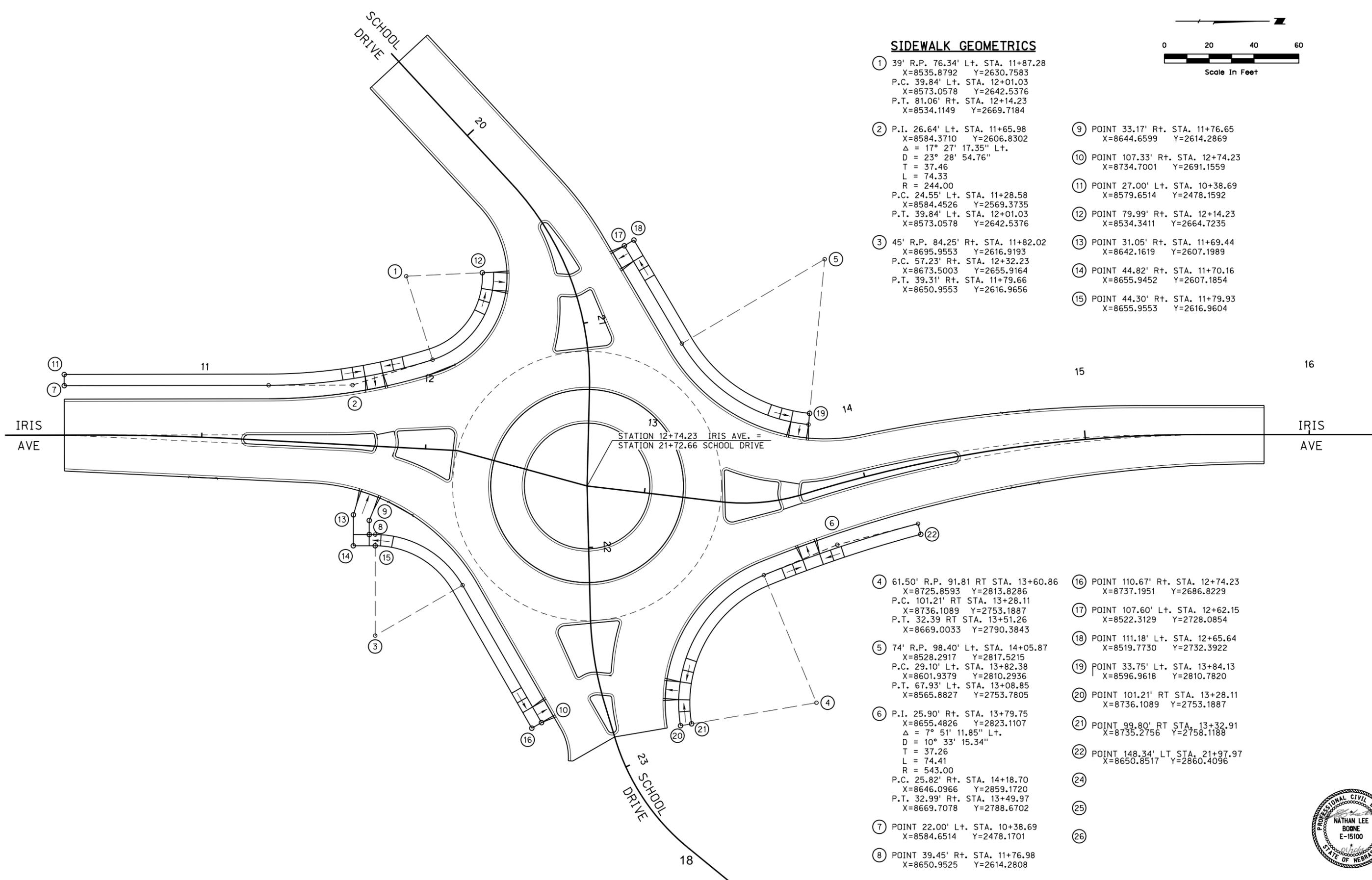
⑥ P.I. 25.90' Rt. STA. 13+79.75
X=8655.4826 Y=2823.1107
Δ = 7° 51' 11.85" Lt.
D = 10° 33' 15.34"
T = 37.26
L = 74.41
R = 543.00
P.C. 25.82' Rt. STA. 14+18.70
X=8646.0966 Y=2859.1720
P.T. 32.99' Rt. STA. 13+49.97
X=8669.7078 Y=2788.6702

⑦ POINT 22.00' Lt. STA. 10+38.69
X=8584.6514 Y=2478.1701

⑧ POINT 39.45' Rt. STA. 11+76.98
X=8650.9525 Y=2614.2808

⑯ POINT 110.67' Rt. STA. 12+74.23
X=8737.1951 Y=2686.8229
⑰ POINT 107.60' Lt. STA. 12+62.15
X=8522.3129 Y=2728.0854
⑱ POINT 111.18' Lt. STA. 12+65.64
X=8519.7730 Y=2732.3922
⑲ POINT 33.75' Lt. STA. 13+84.13
X=8596.9618 Y=2810.7820
⑳ POINT 101.21' RT STA. 13+28.11
X=8736.1089 Y=2753.1887
㉑ POINT 99.80' RT STA. 13+32.91
X=8735.2756 Y=2758.1188
㉒ POINT 148.34' LT STA. 21+97.97
X=8650.8517 Y=2860.4096

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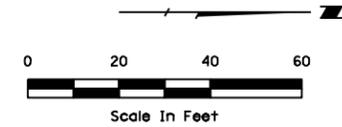
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- LEGEND**
- LONGITUDINAL JOINT
 - TRANSVERSE JOINT
 - EXPANSION JOINT
 - CONSTRUCTION JOINT
 - - - NON-DOWELED EXPANSION JOINT
 - V VARIABLE SPACING
 - TURNING SPACE

NOTES:

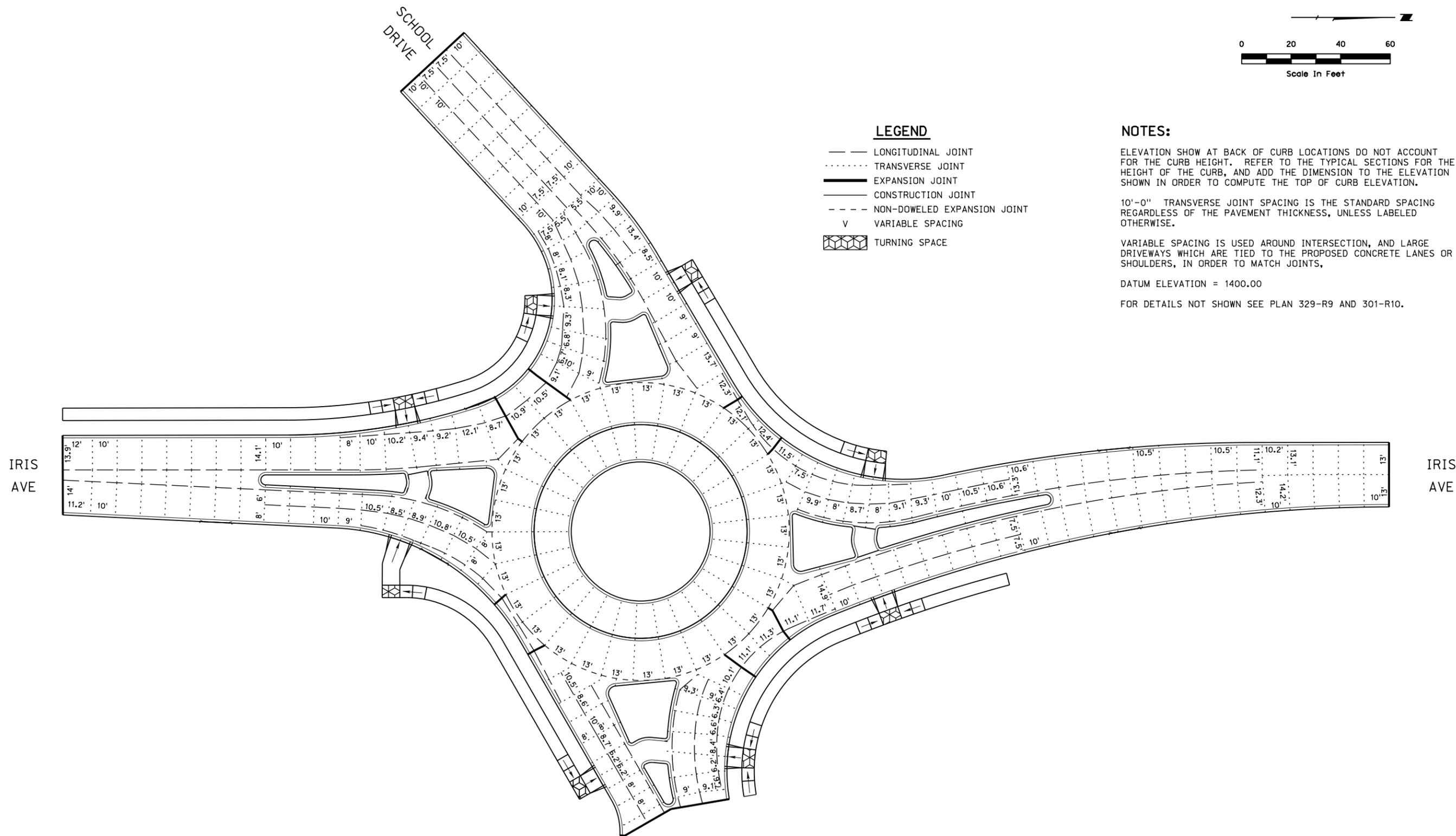
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10'-0" TRANSVERSE JOINT SPACING IS THE STANDARD SPACING REGARDLESS OF THE PAVEMENT THICKNESS, UNLESS LABELED OTHERWISE.

VARIABLE SPACING IS USED AROUND INTERSECTION, AND LARGE DRIVEWAYS WHICH ARE TIED TO THE PROPOSED CONCRETE LANES OR SHOULDERS, IN ORDER TO MATCH JOINTS.

DATUM ELEVATION = 1400.00

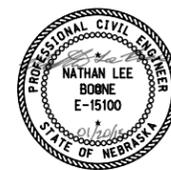
FOR DETAILS NOT SHOWN SEE PLAN 329-R9 AND 301-R10.



SCHOOL DRIVE

IRIS AVE

IRIS AVE



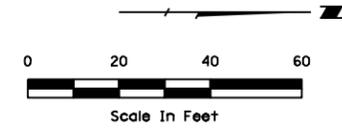
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User: mtempleman

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- LEGEND**
- LONGITUDINAL JOINT
 - TRANSVERSE JOINT
 - EXPANSION JOINT
 - CONSTRUCTION JOINT
 - - - NON-DOWELED EXPANSION JOINT
 - V VARIABLE SPACING
 - TURNING SPACE

NOTES:

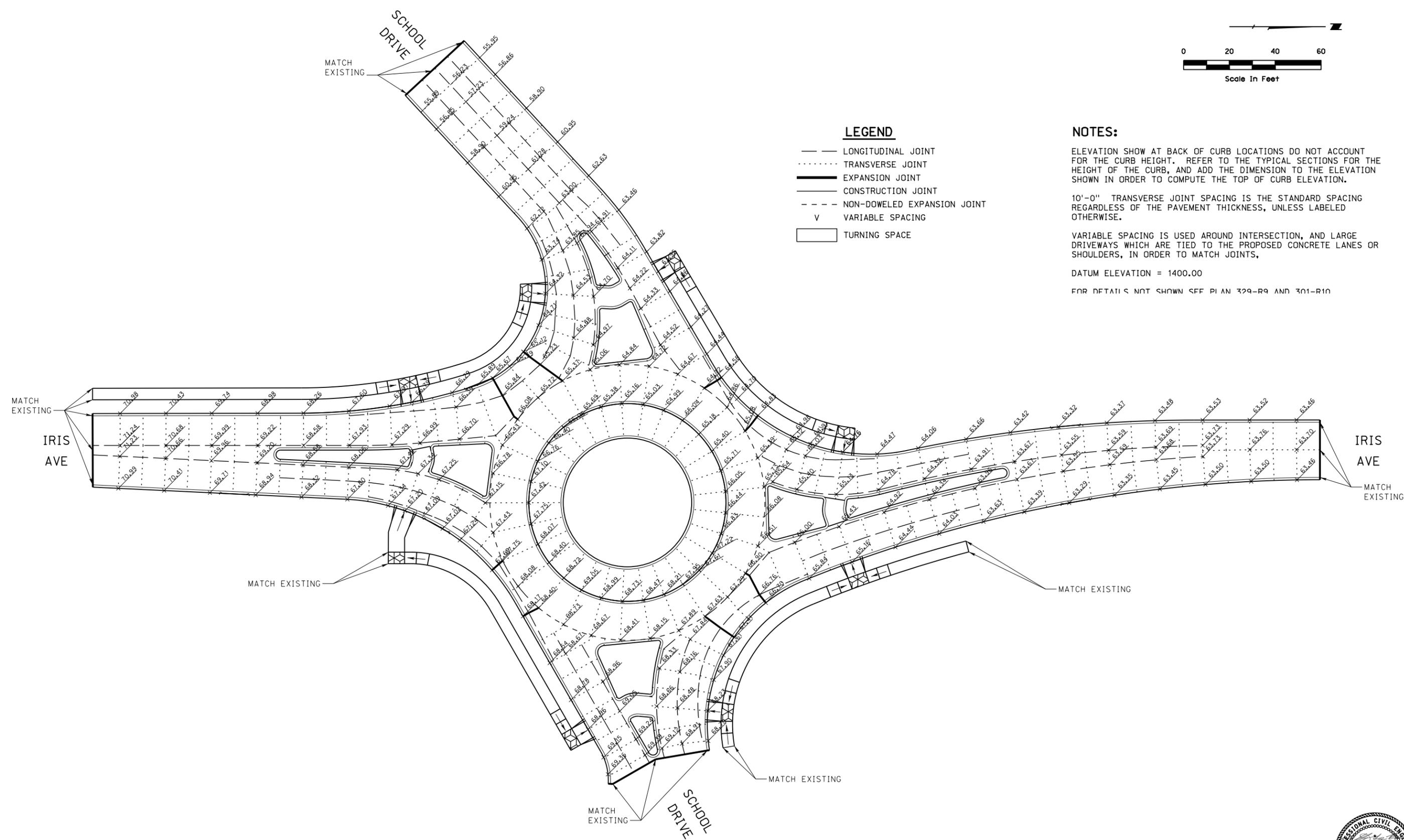
ELEVATION SHOW AT BACK OF CURB LOCATIONS DO NOT ACCOUNT FOR THE CURB HEIGHT. REFER TO THE TYPICAL SECTIONS FOR THE HEIGHT OF THE CURB, AND ADD THE DIMENSION TO THE ELEVATION SHOWN IN ORDER TO COMPUTE THE TOP OF CURB ELEVATION.

10'-0" TRANSVERSE JOINT SPACING IS THE STANDARD SPACING REGARDLESS OF THE PAVEMENT THICKNESS, UNLESS LABELED OTHERWISE.

VARIABLE SPACING IS USED AROUND INTERSECTION, AND LARGE DRIVEWAYS WHICH ARE TIED TO THE PROPOSED CONCRETE LANES OR SHOULDERS, IN ORDER TO MATCH JOINTS,

DATUM ELEVATION = 1400.00

FOR DETAILS NOT SHOWN SEE PLAN 329-R9 AND 301-R10





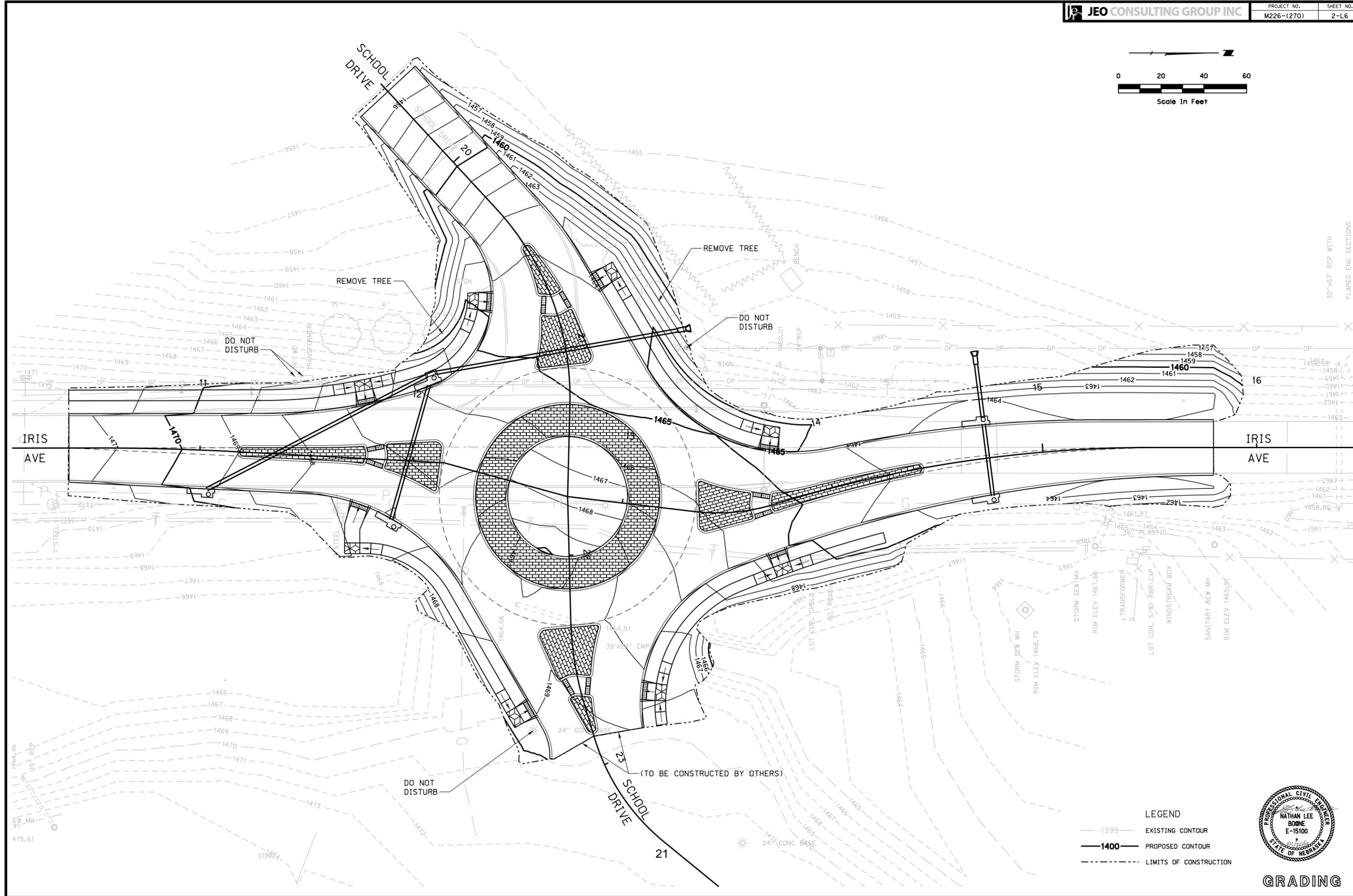
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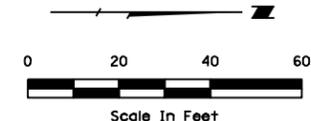


30"x67" RCP WITH
FLARED END SECTIONS

- LEGEND
- 1399 — EXISTING CONTOUR
 - 1400 — PROPOSED CONTOUR
 - - - - - LIMITS OF CONSTRUCTION



GRADING



BUILD CURB INLET, PLAN 443-R9					
NO.	STATION	SIDE	"X"	"A"	"Y"
1	11+05	Rt.	5'-0"	2'-8"	10'
2	12+08	Lt.	5'-4"	4'-7"	10'
3	11+92	Rt.	5'-5"	2'-8"	10'
4	14+74	Rt.	3'-11"	2'-8"	10'
5	14+74	Lt.	4'-4"	2'-8"	10'

BUILD STORM SEWER PIPE						
NO.	STATION	TO	STATION	SIDE	DESCRIPTION	
1	11+04	-	12+04	Lt./Rt.	18" x 120', Type 1, FROM CURB INLET 1 TO CURB INLET 2. FIII = 2.0'.	
2	12+08	-	13+16	Lt.	18" x 118', Type 1, FROM CURB INLET 2 TO F.E.S. ON OUTLET. FIII = 2.0'.	
3	11+91	-	12+05	Lt./Rt.	18" x 70', Type 1, FROM CURB INLET 3 TO CURB INLET 2. FIII = 2.5'.	
4	14+74	-	14+74	Lt./Rt.	18" x 38', Type 1, FROM CURB INLET 4 TO CURB INLET 5. FIII = 1.5'.	
5	14+74	-	14+74	Lt.	18" x 34', Type 1, FROM CURB INLET 5 TO F.E.S. ON OUTLET. FIII = 1.7'.	

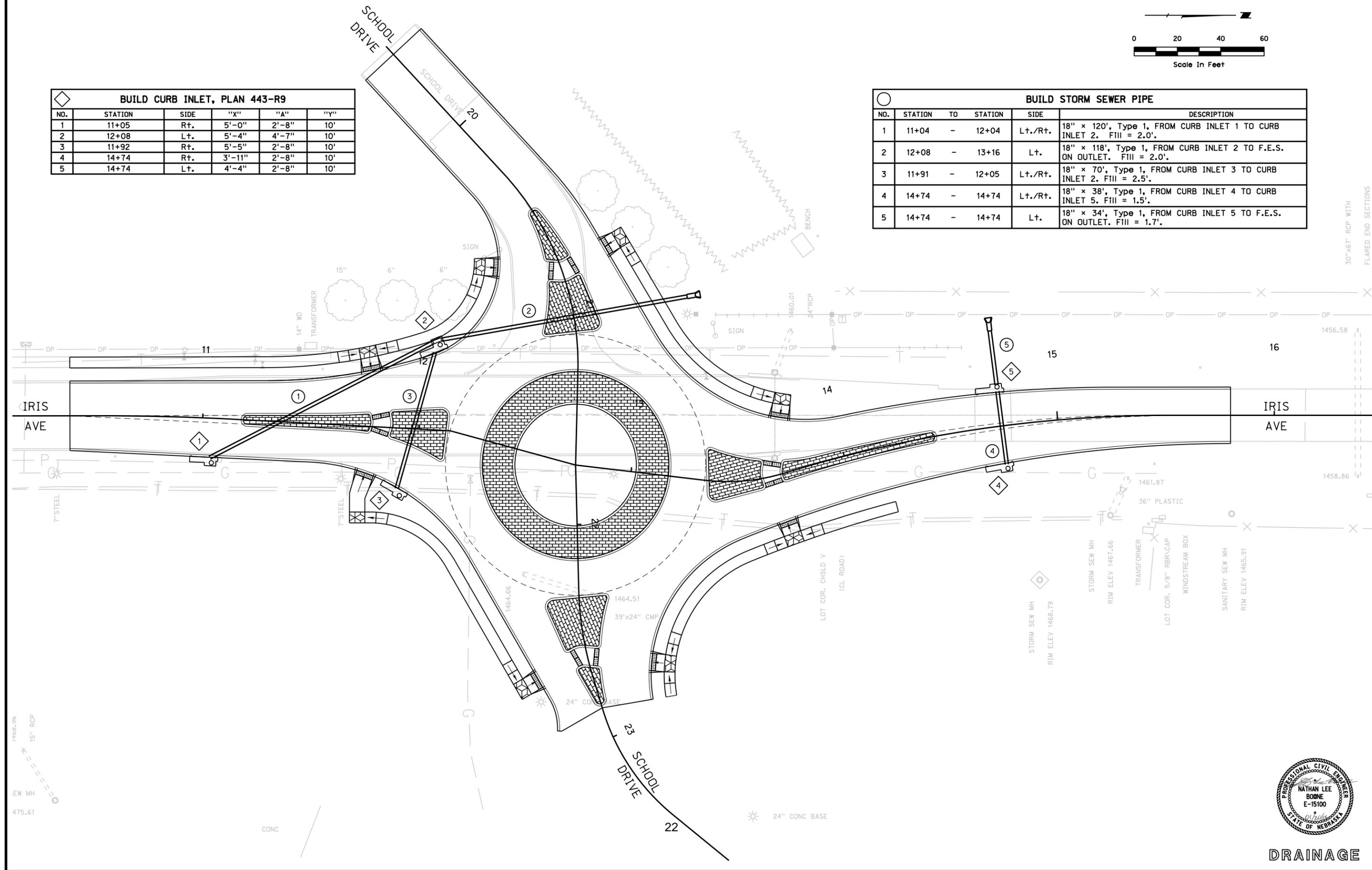
ROADWAY DESIGN DIVISION

Computer: TEMPLEMANSTOP

User: mrempleman

Date: 20-JAN-2015 14:51

File: 140436cd01.dgn
Scale: 1:40



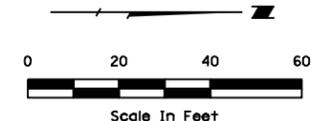
DRAINAGE

BUILD 9" CONCRETE PAVEMENT, PLAN 329-R9			
STATION	TO	STATION	SQ. YDS.
10+39	-	15+80	3267

BUILD 9" IMPRINTED COLORED CONC. PAVEMENT, PLAN 329-R9			
STATION	TO	STATION	SQ. YDS.
11+19	-	11+77	35
11+88	-	12+12	47
12+31	-	13+17	352
13+36	-	13+60	47
13+70	-	14+43	43
20+52	-	20+77	19
20+88	-	21+11	54
22+34	-	22+56	54
22+66	-	22+84	12

BUILD CONCRETE SIDEWALK, PLAN 301-R10					
STATION	TO	STATION	SIDE	WIDTH	SQ. YDS.
10+39	-	12+14	Lt.	5'	130
11+70	-	12+74	Rt.	5'	91
12+57	-	13+81	Lt.	5'	77
13+20	-	13+71	Rt.	5'	96

BUILD 9" IMPRINTED COLORED CONCRETE TRUCK APRON				
STATION	TO	STATION	SIDE	SQ. YDS.
11+49	-	12+14	Lt.	88
11+60	-	12+61	Rt.	35
12+99	-	13+90	Lt.	44
13+19	-	13+52	Rt.	51



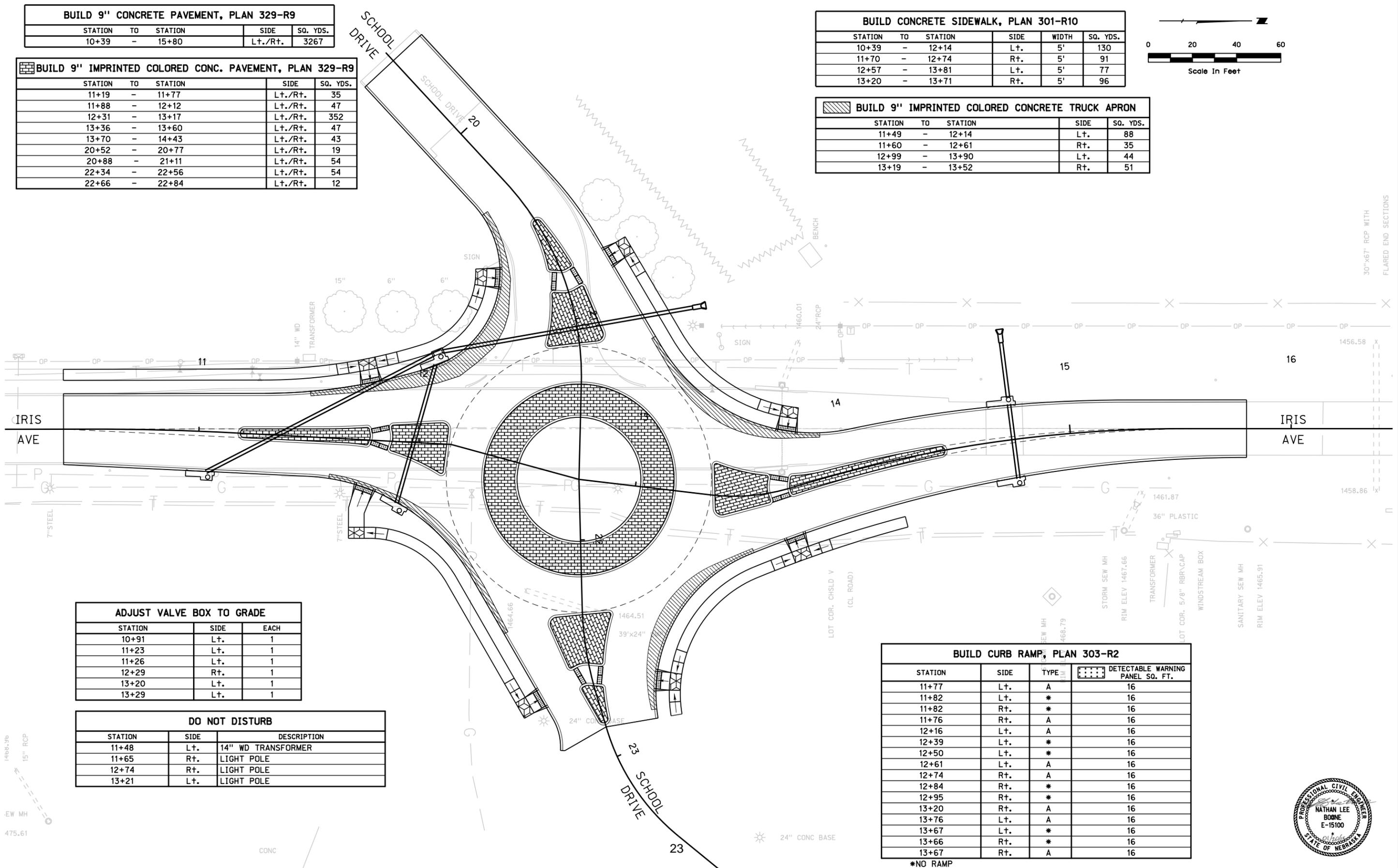
ROADWAY DESIGN DIVISION

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User: mremplem

Date: 20-JAN-2015 15:17

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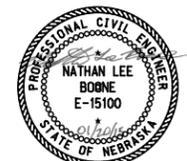


ADJUST VALVE BOX TO GRADE		
STATION	SIDE	EACH
10+91	Lt.	1
11+23	Lt.	1
11+26	Lt.	1
12+29	Rt.	1
13+20	Lt.	1
13+29	Lt.	1

DO NOT DISTURB		
STATION	SIDE	DESCRIPTION
11+48	Lt.	14" WD TRANSFORMER
11+65	Rt.	LIGHT POLE
12+74	Rt.	LIGHT POLE
13+21	Lt.	LIGHT POLE

BUILD CURB RAMP, PLAN 303-R2			
STATION	SIDE	TYPE	DETECTABLE WARNING PANEL SQ. FT.
11+77	Lt.	A	16
11+82	Lt.	*	16
11+82	Rt.	*	16
11+76	Rt.	A	16
12+16	Lt.	A	16
12+39	Lt.	*	16
12+50	Lt.	*	16
12+61	Lt.	A	16
12+74	Rt.	A	16
12+84	Rt.	*	16
12+95	Rt.	*	16
13+20	Rt.	A	16
13+76	Lt.	A	16
13+67	Lt.	*	16
13+66	Rt.	*	16
13+67	Rt.	A	16

*NO RAMP



CONSTRUCTION

ROADWAY DESIGN DIVISION

REMOVE PAVEMENT				
STATION	TO	STATION	SIDE	SQ. YDS.
10+39	-	15+80	Lt./Rt.	2637

REMOVE WALK				
STATION	TO	STATION	SIDE	SQ. YDS.
10+39	-	12+26	Lt.	104

REMOVE LIGHT POLE		
STATION	SIDE	EACH
12+92	Rt.	1

REMOVE AND REINSTALL SIGN		
STATION	SIDE	DESCRIPTION
12+14	Lt.	CRETE PUBLIC SCHOOL

REMOVE DRIVEWAY CULVERT PIPE		
STATION	SIDE	DESCRIPTION
22+31	Lt./Rt.	24" x 39' C.M. PIPE

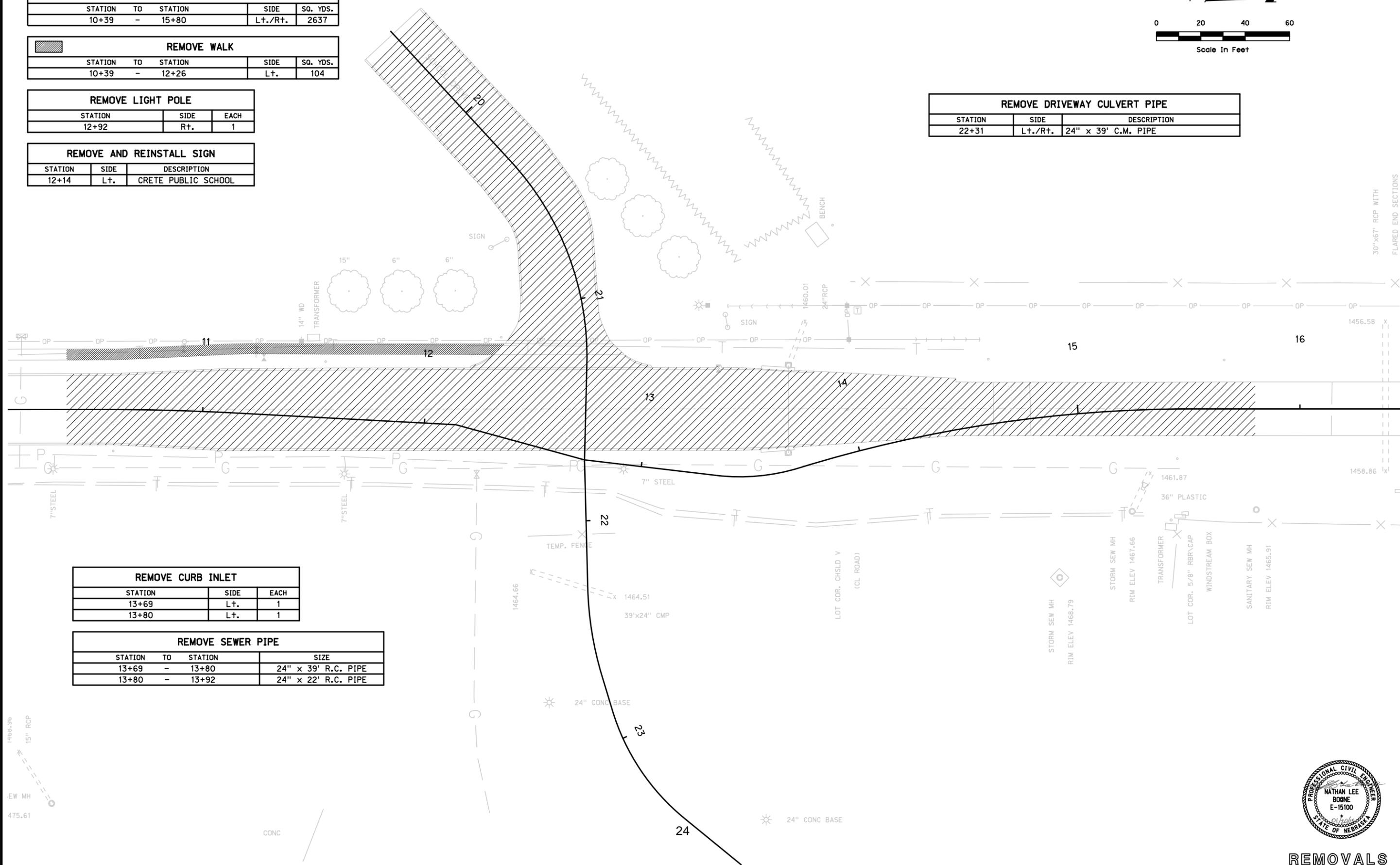


Computer: TEMPLEMANDSKTOP

User: mrempleman

Date: 20-JAN-2015 15:17

File: 140436cr01.dgn
Scale: 1:40



REMOVE CURB INLET		
STATION	SIDE	EACH
13+69	Lt.	1
13+80	Lt.	1

REMOVE SEWER PIPE			
STATION	TO	STATION	SIZE
13+69	-	13+80	24" x 39' R.C. PIPE
13+80	-	13+92	24" x 22' R.C. PIPE



REMOVALS

PRELIMINARY PLAN
NOT FINAL - SUBJECT TO CHANGE

C.N. \$\$\$

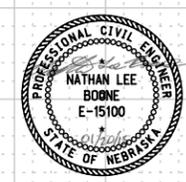
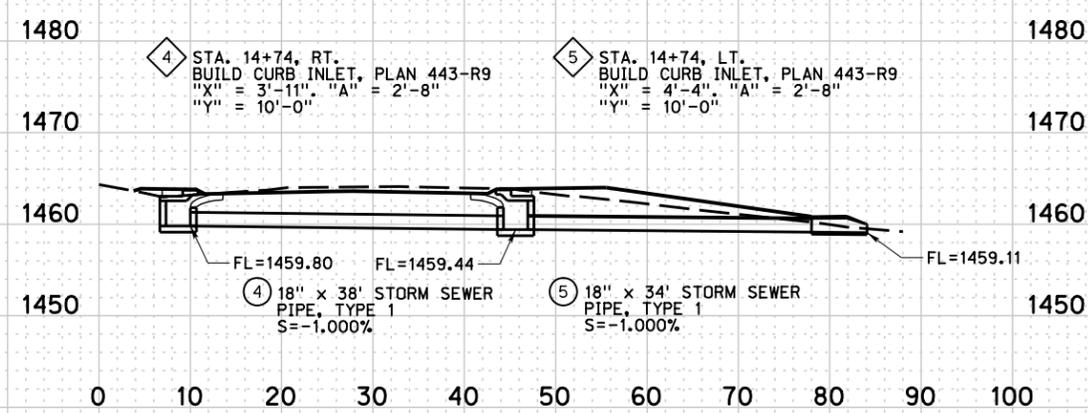
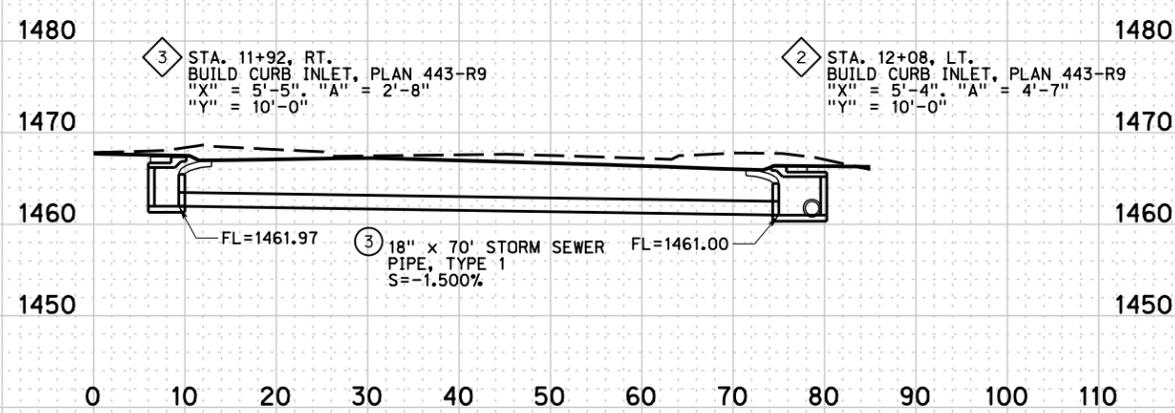
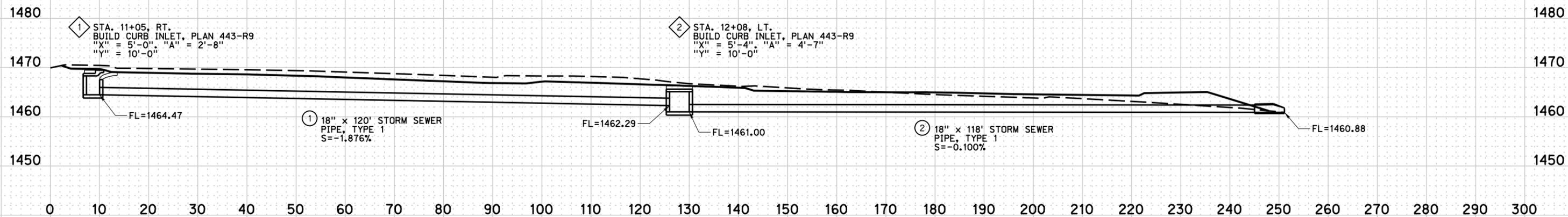
ROADWAY DESIGN DIVISION

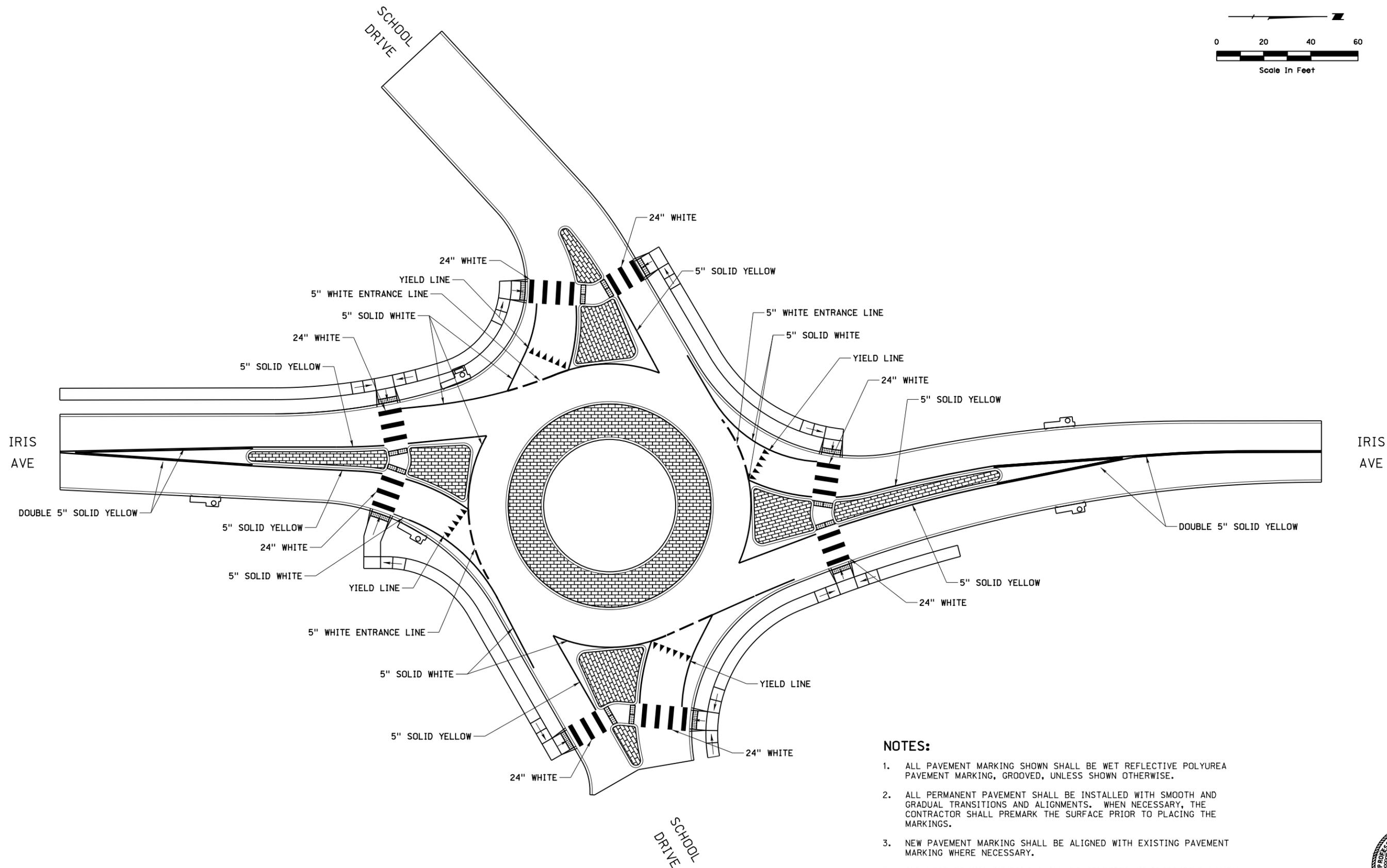
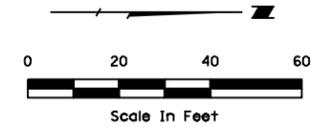
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User: mtemplman

Date: 20-JAN-2015 14:51

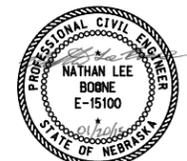
File: 140436cculvsh01.dgn





NOTES:

1. ALL PAVEMENT MARKING SHOWN SHALL BE WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED, UNLESS SHOWN OTHERWISE.
2. ALL PERMANENT PAVEMENT SHALL BE INSTALLED WITH SMOOTH AND GRADUAL TRANSITIONS AND ALIGNMENTS. WHEN NECESSARY, THE CONTRACTOR SHALL PREMARK THE SURFACE PRIOR TO PLACING THE MARKINGS.
3. NEW PAVEMENT MARKING SHALL BE ALIGNED WITH EXISTING PAVEMENT MARKING WHERE NECESSARY.
4. ALL LEGENDS AND SYMBOLS SHALL BE CENTERED IN RESPECTIVE LANES.



ROADWAY DESIGN DIVISION

Computer: TEMPLEMANDSKTOP

User: mtempleman

Date: 20-JAN-2015 14:51

File: 140436c+f01.dgn
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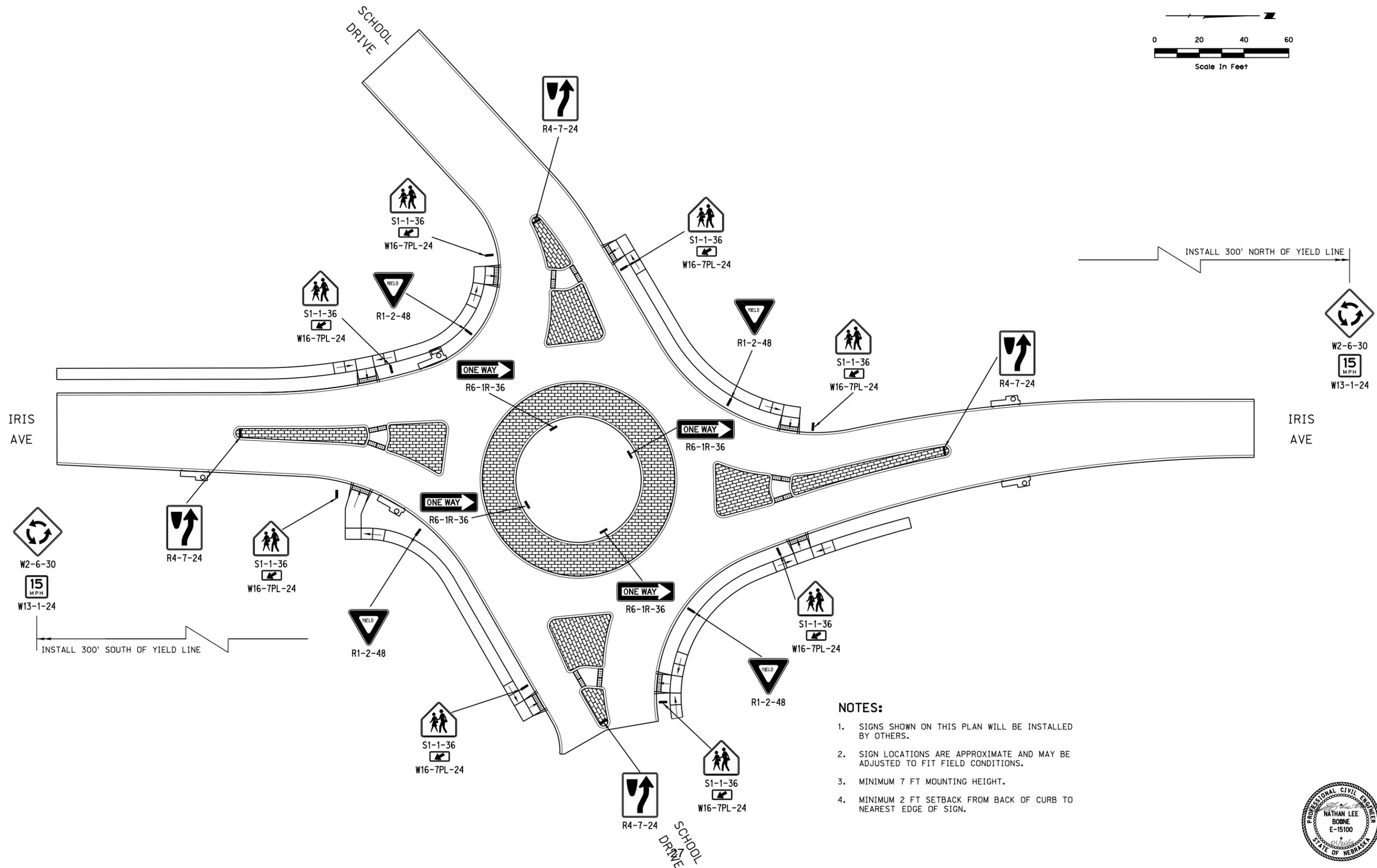
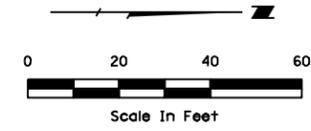
ROADWAY DESIGN DIVISION

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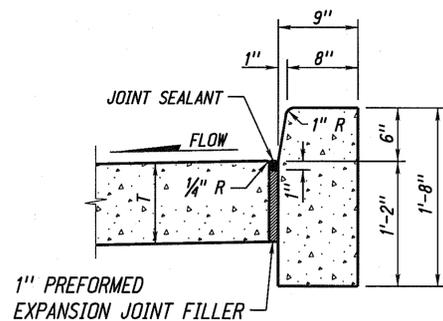
File: 140436c+f02.dgn Scale: 1:40



- NOTES:**
1. SIGNS SHOWN ON THIS PLAN WILL BE INSTALLED BY OTHERS.
 2. SIGN LOCATIONS ARE APPROXIMATE AND MAY BE ADJUSTED TO FIT FIELD CONDITIONS.
 3. MINIMUM 7 FT MOUNTING HEIGHT.
 4. MINIMUM 2 FT SETBACK FROM BACK OF CURB TO NEAREST EDGE OF SIGN.

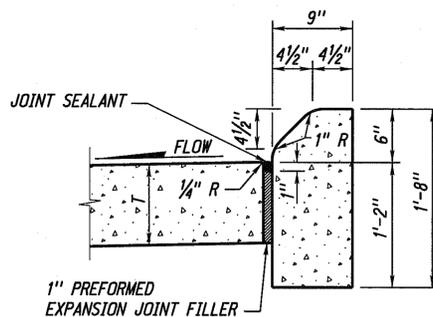


PAVEMENT MARKING AND SIGNAGE



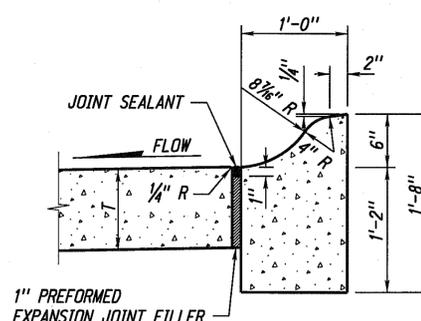
CONCRETE BARRIER CURB *

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



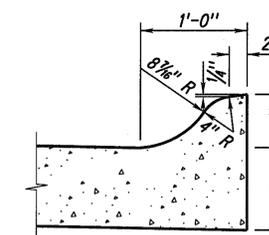
CONCRETE MEDIAN CURB *

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



**CONCRETE CURB, *
TYPE I**

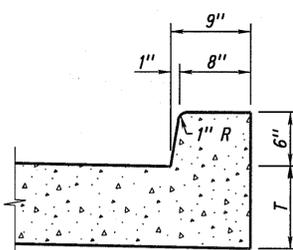
QUANTITIES
 CONCRETE 5.22 CU. YDS./STA.
 AREA 1.408 SQ. FT.



INTEGRAL CONCRETE CURB

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

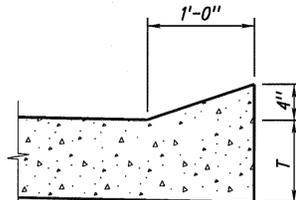
NOTE: * ONE INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED AT INTERVALS OF NOT MORE THAN 100' THRU CONCRETE BARRIER CURB, CONCRETE MEDIAN CURB, AND CONCRETE CURB, TYPE I.



NOTE: MAY BE USED WHEN T IS LESS THAN 12"

INTEGRAL CONCRETE BARRIER CURB

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



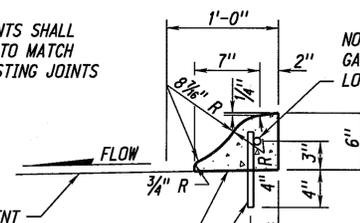
INTEGRAL CONCRETE SLOPING CURB

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

CONTRACTION JOINTS SHALL BE CONSTRUCTED TO MATCH LOCATION OF EXISTING JOINTS

EXISTING CONCRETE PAVEMENT

THE AREA BETWEEN CURB AND EXISTING CONCRETE PAVEMENT TO BE CLEANED AND ROUGHENED AS DIRECTED BY THE ENGINEER

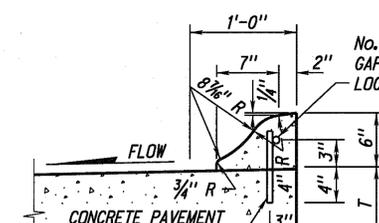


NO. 4 LONGITUDINAL BAR TO BE GAPPED AT CONTRACTION JOINT LOCATIONS; 3" MIN., 6" MAX.

NO. 5 x 8" TIE BARS AT 5'-0" CENTERS TO BE DRILLED AND GROUTED INTO EXISTING CONCRETE PAVEMENT (WITH APPROVED GROUT)

CONCRETE CURB, TYPE II

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

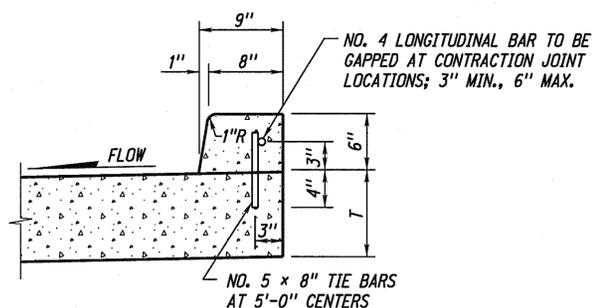


NO. 4 LONGITUDINAL BAR TO BE GAPPED AT CONTRACTION JOINT LOCATIONS; 3" MIN., 6" MAX.

NO. 5 x 8" TIE BARS AT 5'-0" CENTERS

INTEGRAL CONCRETE CURB ALTERNATE TYPE

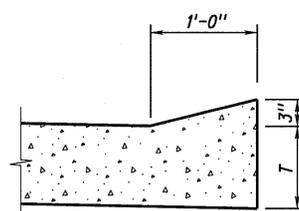
QUANTITIES
 CONCRETE 0.87 CU. YDS./STA.
 AREA 0.234 SQ. FT.



NOTE: USE WHEN T IS 12" OR GREATER

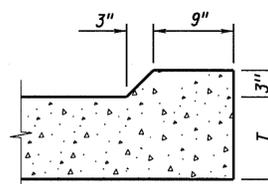
INTEGRAL CONCRETE BARRIER CURB ALTERNATE TYPE

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



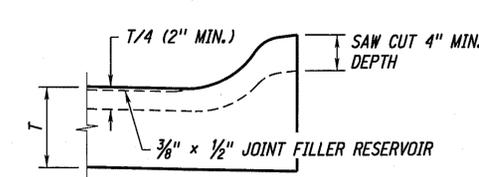
INTEGRAL CONCRETE SLOPING CURB

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



EROSION CONTROL CURB

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



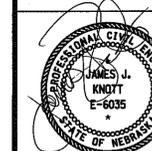
CONTRACTION JOINT THRU CURB

NOTE: T = PAVEMENT THICKNESS

R10	FEB 09	MULTIPLE REVISIONS
R9	MAR 05	MULTIPLE REVISIONS
R8	MAY 01	MULTIPLE REVISIONS
REV. NO.	DATE	DESCRIPTION OF REVISION

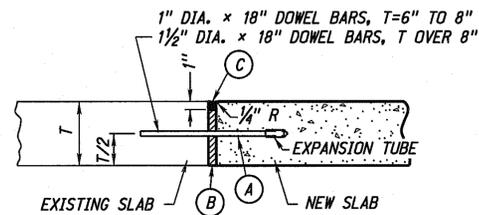
NEBRASKA DEPARTMENT OF ROADS
 STANDARD PLAN NO. 301-R10

PAVEMENT DETAILS



ORIGINAL:
 JANUARY 31, 1974
 DATE

1
 3



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

NOTES:

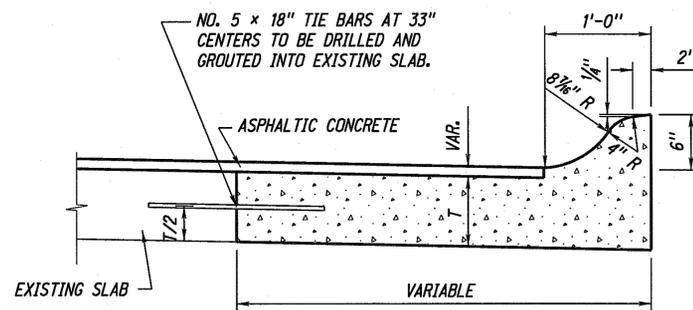
DOWEL BARS SHALL BE DRILLED TO A DEPTH OF 8" INTO EXISTING SLAB AND GROUTED.

DOWEL BARS SHALL BE PLACED AT 1'-0" CENTERS. THE OUTSIDE DOWEL BAR SHALL BE PLACED 6" FROM THE EDGE OF THE SLAB.

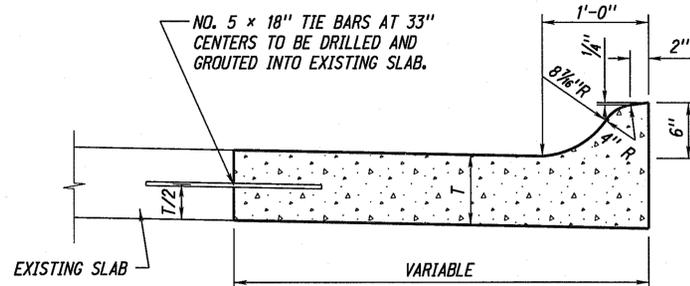
THIS JOINT SHALL BE CONSTRUCTED TRANSVERSE TO THE ROADWAY WHERE THE NEW CONCRETE ABUTS THE EXISTING CONCRETE.

DOWEL BARS SHALL BE PLACED PARALLEL TO THE ROADWAY & AND TO THE ROADBED.

EXPANSION JOINT (SUBSIDIARY)



CONCRETE BASE COURSE W/INTEGRAL CURB



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

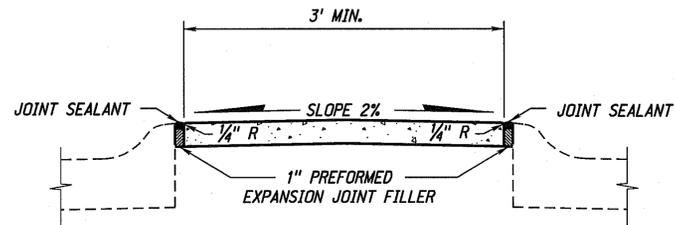
CONCRETE PAVEMENT WIDENING

ONE INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED ACROSS THE FULL WIDTH OF THE MEDIAN SURFACING AT INTERVALS OF NOT MORE THAN 49'-0".

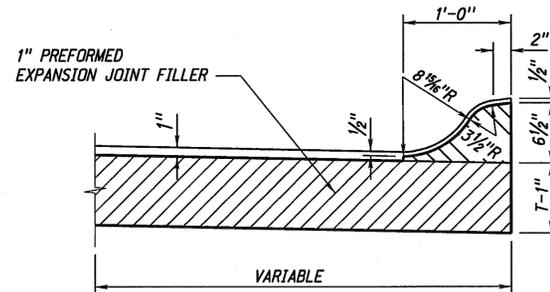
LONGITUDINAL JOINTS ONE INCH DEEP SHALL BE MADE IN ALL MEDIANS WHEN SURFACING WIDTH IS 16' OR GREATER.

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

TRANSVERSE AND LONGITUDINAL JOINTS SHALL NOT BE FILLED.



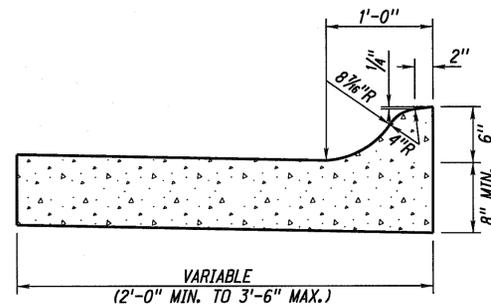
DETAILS OF CONCRETE MEDIAN SURFACING



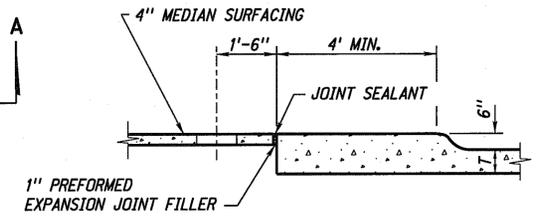
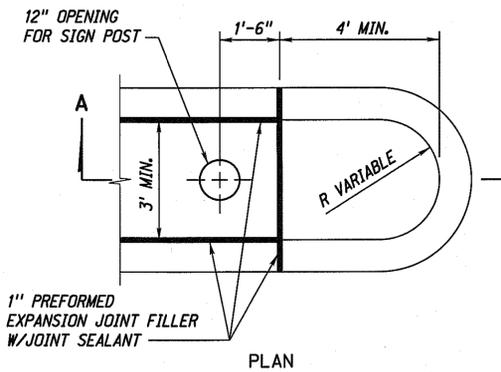
ONE INCH PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED AT INTERSECTION RETURNS AND WHERE SHOWN ON THE PLANS. TRANSVERSE JOINTS SHALL BE PROVIDED EVERY 8' OR WHERE SHOWN ON THE PLANS.

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

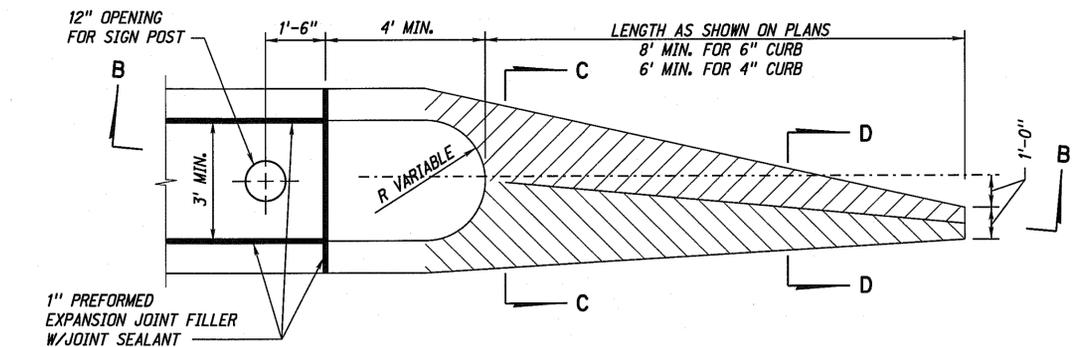
DETAIL FOR CUTTING EXPANSION JOINT FILLER



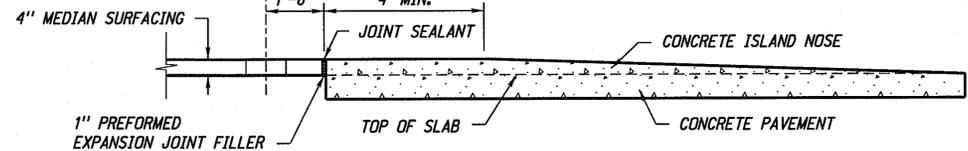
COMBINATION CONCRETE CURB & GUTTER



DETAIL AT END OF MEDIAN ISLAND



1" PREFORMED EXPANSION JOINT FILLER W/JOINT SEALANT



SECTION B-B



SECTION C-C

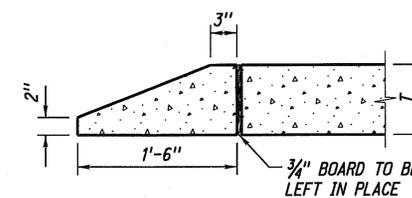


SECTION D-D

NOTE:

EXISTING CONCRETE PAVEMENT IS TO BE REMOVED IN AREA COVERED BY CONCRETE ISLAND NOSE.

DETAILS OF CONCRETE ISLAND NOSE



CONCRETE HEADER

NOTE: T = PAVEMENT THICKNESS

REV. NO.	DATE	DESCRIPTION OF REVISION
R10	FEB 09	MULTIPLE REVISIONS
R9	MAR.05	MULTIPLE REVISIONS
R8	MAY 01	MULTIPLE REVISIONS

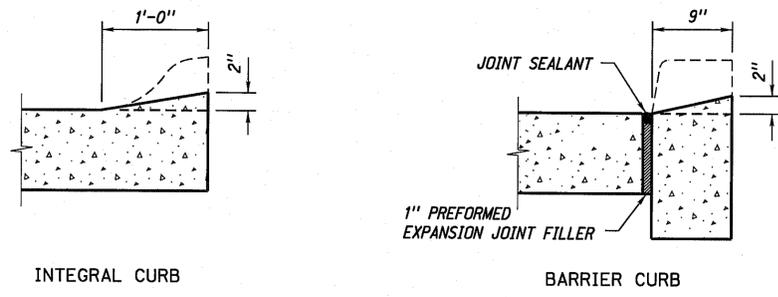
NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 301-R10

PAVEMENT DETAILS



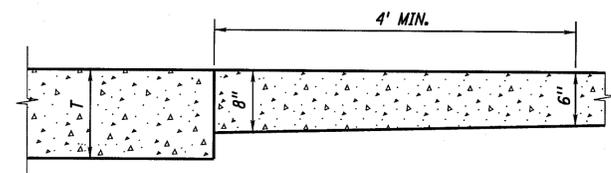
ORIGINAL:
JANUARY 31, 1974
DATE

2
3

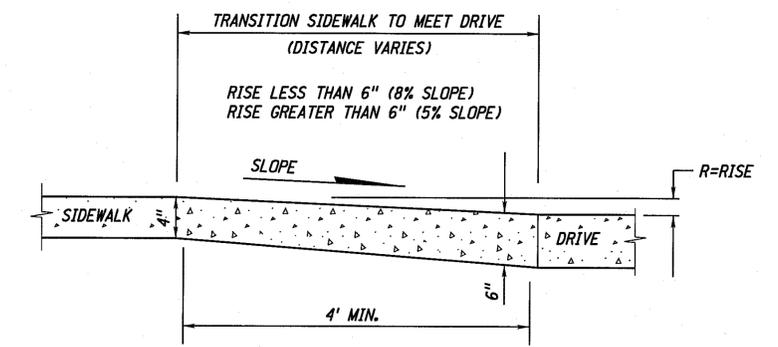


INTEGRAL CURB BARRIER CURB

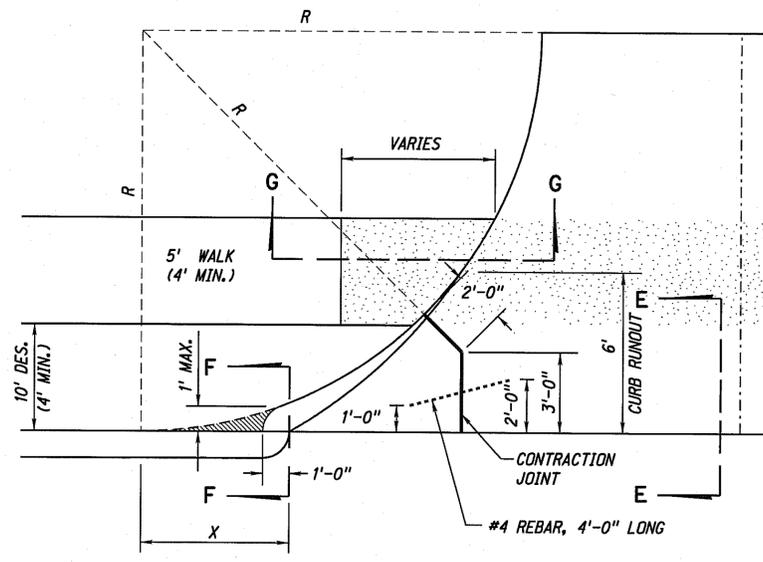
DETAILS OF CURB DROPS



SECTION E-E (RURAL DRIVEWAY)



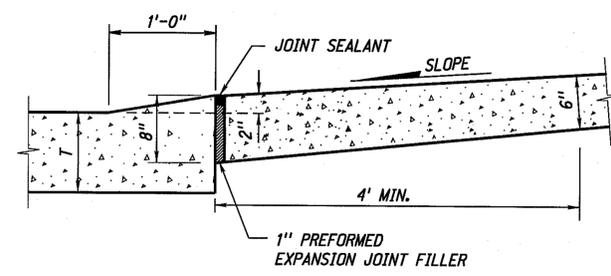
SECTION G-G



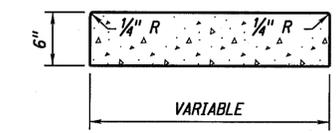
DRIVEWAY PLAN

R	X
5'	3.00'
10'	4.36'
15'	5.38'
20'	6.24'
25'	7.00'
30'	7.68'
35'	8.31'
40'	8.89'

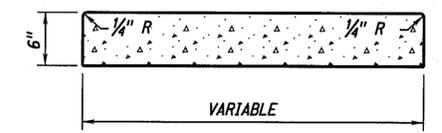
R = RADIUS
X = $\sqrt{(2R-1)}$
(X & R IN FEET)



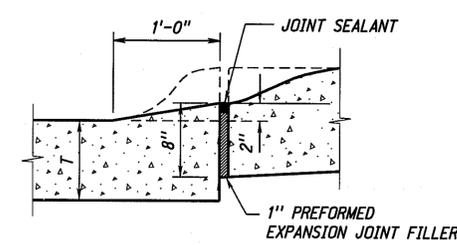
SECTION E-E (URBAN DRIVEWAY)



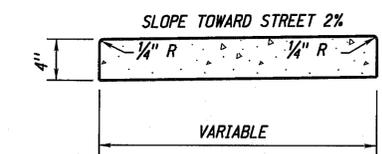
CROSSWALK



DRIVEWAY

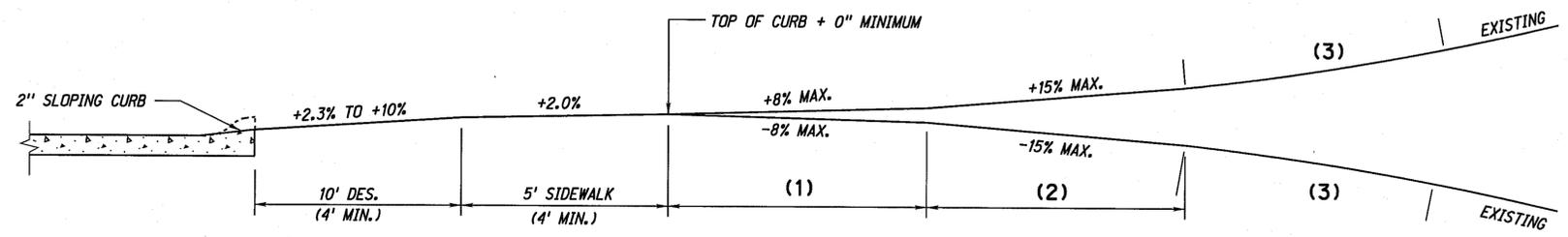


SECTION F-F (URBAN DRIVEWAY)



SIDEWALK

NOTE:
1" PREFORMED EXPANSION JOINT FILLER SHALL BE PLACED IN ALL SIDEWALKS OR CROSSWALKS AT INTERVALS OF NOT MORE THAN 50'-0", AND AT ALL POINTS WHERE SIDEWALKS OR CROSSWALKS ARE ADJACENT TO CURB. IF SIDEWALK OR CROSSWALK TO BE CONSTRUCTED IS LESS THAN 50'-0" IN LENGTH, ONE SUCH EXPANSION JOINT SHALL BE PLACED AS DIRECTED BY THE ENGINEER.



PROFILE URBAN DRIVEWAY WITH SIDEWALK
(MAXIMUM PERCENT OF GRADE)

- (1) 10' MIN. IS REQUIRED WHEN THE EXISTING GRADE IS GREATER THAN ±8%
- (2) 10' MIN. IS REQUIRED WHEN THE EXISTING GRADE IS GREATER THAN ±15%
- (3) 10' MIN. ROUNDING IS REQUIRED WHEN THE EXISTING GRADE IS GREATER THAN ±22%

NOTE: T = PAVEMENT THICKNESS

REV. NO.	DATE	DESCRIPTION OF REVISION
R10	FEB 09	MULTIPLE REVISIONS
R9	MAR.05	MULTIPLE REVISIONS
R8	MAY 01	MULTIPLE REVISIONS

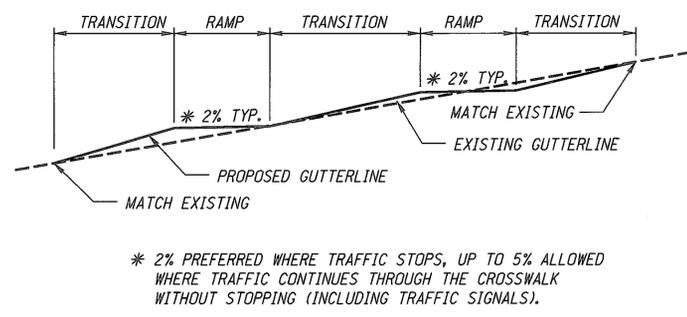
NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 301-R10

PAVEMENT DETAILS

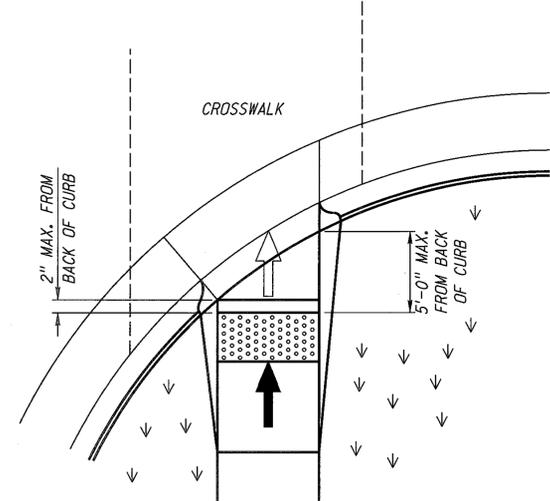


ORIGINAL:
JANUARY 31, 1974
DATE

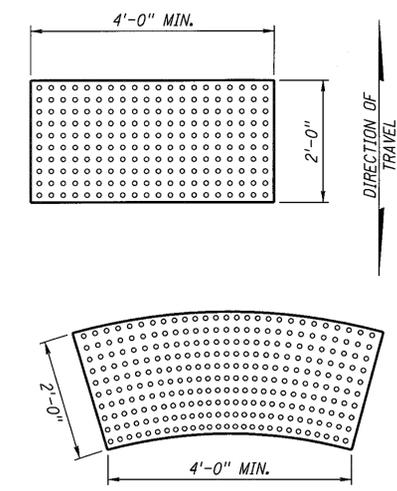
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3



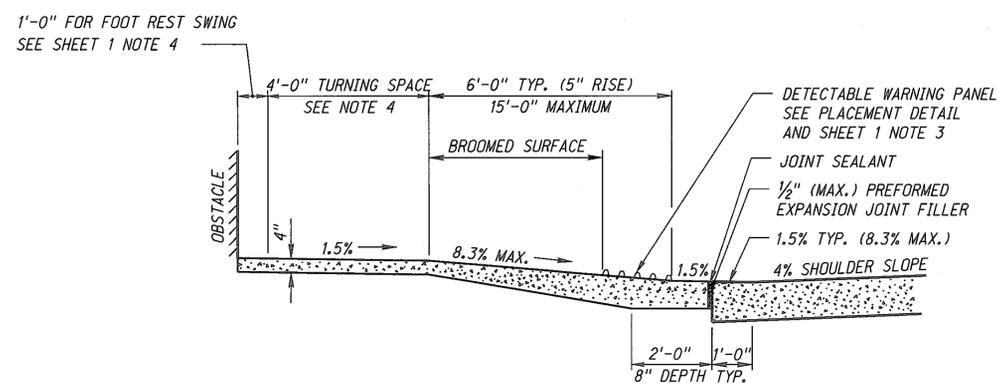
GUTTER PROFILE DETAIL



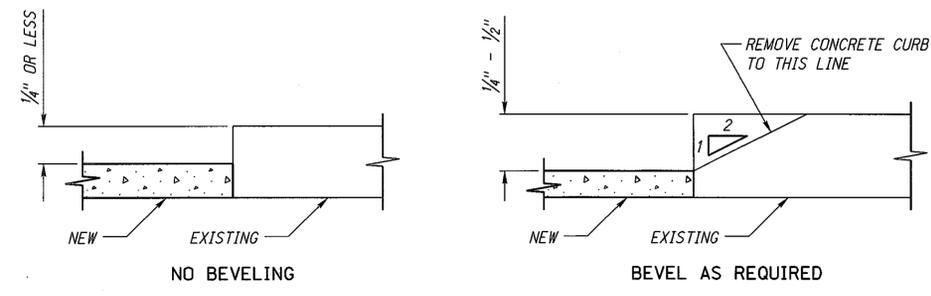
DETECTABLE WARNING PANEL PLACEMENT DETAIL



DETECTABLE WARNING PANELS

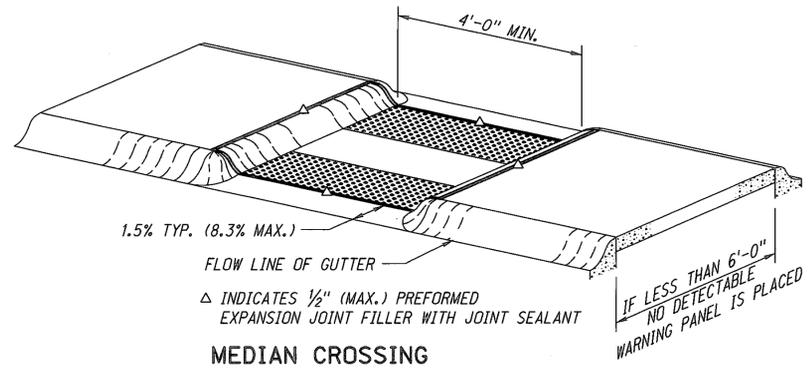


TYPICAL RAMP PROFILE

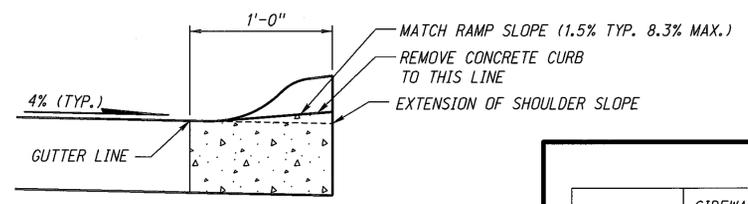


BEVELING DETAIL

WHEN EXISTING SIDEWALK DOES NOT MEET THE 2% CROSS SLOPE, BEVELING TO MEET PROWAG IS REQUIRED.
 THE SIDEWALK PANEL ABUTTING THE EXISTING SIDEWALK (WHICH MAY NOT BE 2% SLOPE): BUILD FULL WIDTH OF THE NEW SIDEWALK, ON 2% MAXIMUM CROSS SLOPE AND BEVEL THE EXISTING SIDEWALK EDGE WHERE IT DOES NOT MEET THE NEW WITHIN 1/4", THIS WORK IS SUBSIDIARY.



MEDIAN CROSSING



CURB DETAIL

NOTE: COMBINATION CONCRETE CURB AND GUTTER MAY BE REMOVED AND REPLACED IN LIEU OF MILLING.

SLOPE LEGEND

	SIDEWALK/TURNING SPACE AND RAMP CROSS SLOPE 1.5% TYPICAL, 2.0% MAX. SLOPE
	RAMP RUNNING SLOPE 8.0% TYPICAL, 8.3% MAX. SLOPE
	FLARE 90° TO RAMP 9.0% TYPICAL, 10.0% MAX. SLOPE

THE CONTRACTOR SHOULD ACCOUNT FOR CONSTRUCTION TOLERANCES TO PREVENT EXCEEDING THE MAXIMUM SLOPES. ANY SLOPES EXCEEDING THE MAXIMUMS SHALL NOT BE ACCEPTED WITHOUT PRIOR APPROVAL FROM THE ROADWAY DESIGN ENGINEER. AN EXCEPTION TO THIS IS THE TRANSITIONAL SEGMENT TO EXISTING SIDEWALK MUST CONNECT TO THE EXISTING SIDEWALK PANEL; THIS DOES NOT REQUIRE A STATEMENT OF TECHNICAL INFEASIBILITY. (REF. PROWAG CHAPTER R3 TECHNICAL REQUIREMENTS)

NOTES:

1. THE SURFACE OF ALL CURB RAMPS SHALL BE BROOMED PERPENDICULAR TO THE SLOPE OF THE CURB RAMP.
2. CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE CURB RAMP, FREE OF SAGS AND SHORT GRADE CHANGES.
3. ALL CURB RAMPS SHALL BE CONSTRUCTED WITH A DETECTABLE WARNING PANEL (DWP), 2 FT. x 4 FT. MINIMUM. PLACED WITHIN 2" OF THE BACK OF CURB.
 DETECTABLE WARNING PANEL:
 - SHALL BE PAID FOR BY THE SQ. FT.
 - SHALL BE FROM THE APPROVED PRODUCT LIST
 - SHALL BE A CONTRASTING COLOR TO THE SURROUNDING SURFACING.
 - SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP.
 NEW CURB RAMPS SHALL HAVE CAST IN CONCRETE DETECTABLE WARNING PANELS.
4. TURNING SPACE SHALL HAVE MINIMUM DIMENSIONS OF 4 FT. x 4 FT. AND SHALL BE A MINIMUM OF 1 FT. FROM ANY OBSTACLE SUCH AS A CURB OR RETAINING WALL FOR SWING OF WHEELCHAIR FOOT REST. THE SLOPE SHALL BE 2% MAXIMUM IN ANY DIRECTION.
5. THE WORK OF CONSTRUCTING CURB RAMPS SHALL BE INCLUDED IN THE QUANTITIES FOR "CONCRETE SIDEWALKS", "CONCRETE MEDIAN SURFACING" OR "CONCRETE BIKEWAY". THE WORK OF MODIFICATION OF NEW OR EXISTING CURB WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS OF WORK FOR WHICH DIRECT PAYMENT IS MADE.

LEGEND

- DETECTABLE WARNING PANEL (DWP)
- BROOMED CURB RAMP WHEN 5% TO 8.3%
- RAMP FLARE
- GRASS OR NON WALKING SURFACE
- CURB TRANSITION
- CURB FACE SLOPE 1 VERT. : 2 HORIZ.

R2	OCT 14	CHANGE PM TO ROADWAY DESIGN ENGINEER
R1	FEB 13	ALL OF PLAN REWORKED (PROWAG)
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF ROADS
 STANDARD PLAN NO. 303-R2

CURB RAMPS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

OCT 2014
 DATE

ORIGINAL:
 MARCH 22, 2010
 DATE

1/4

ROADWAY DESIGN DIVISION

Computer: DRDESIGN5

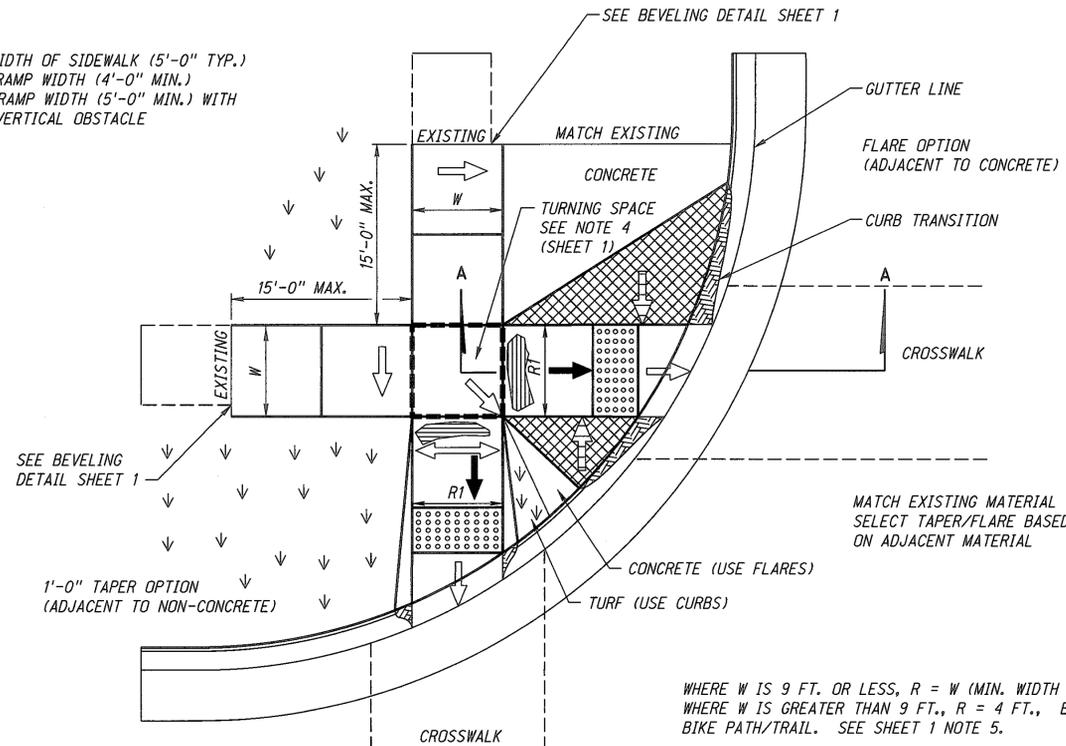
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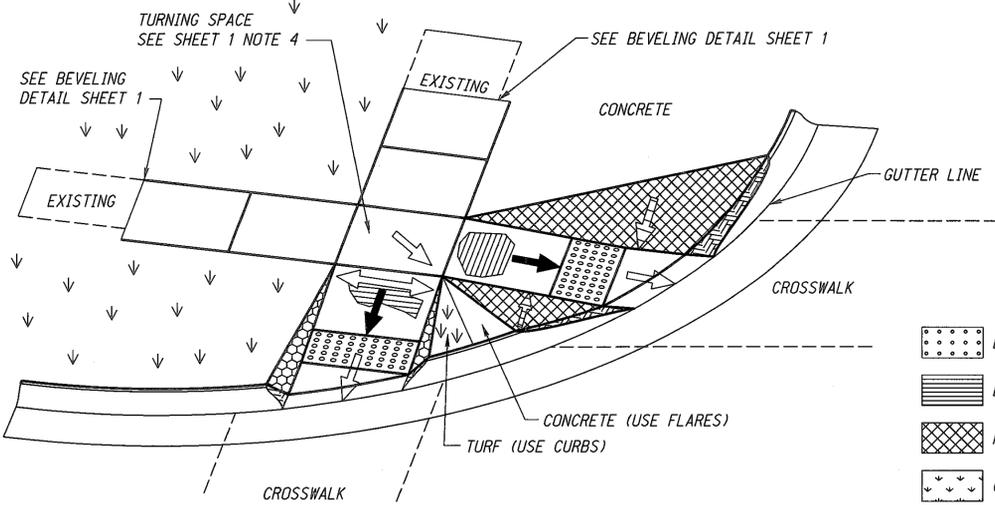
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Sheet 1 of 4

W = WIDTH OF SIDEWALK (5'-0" TYP.)
R1 = RAMP WIDTH (4'-0" MIN.)
R2 = RAMP WIDTH (5'-0" MIN.) WITH VERTICAL OBSTACLE

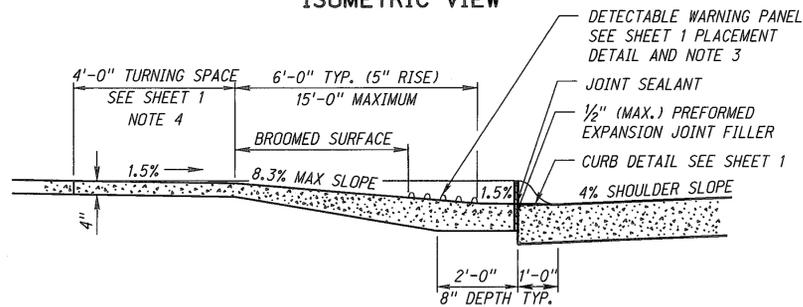


WHERE W IS 9 FT. OR LESS, R = W (MIN. WIDTH = 4 FT.)
WHERE W IS GREATER THAN 9 FT., R = 4 FT., EXCEPT BIKE PATH/TRAIL. SEE SHEET 1 NOTE 5.

TYPE A PLAN



ISOMETRIC VIEW



TYPE A CROSS SECTION SECTION A-A

LEGEND

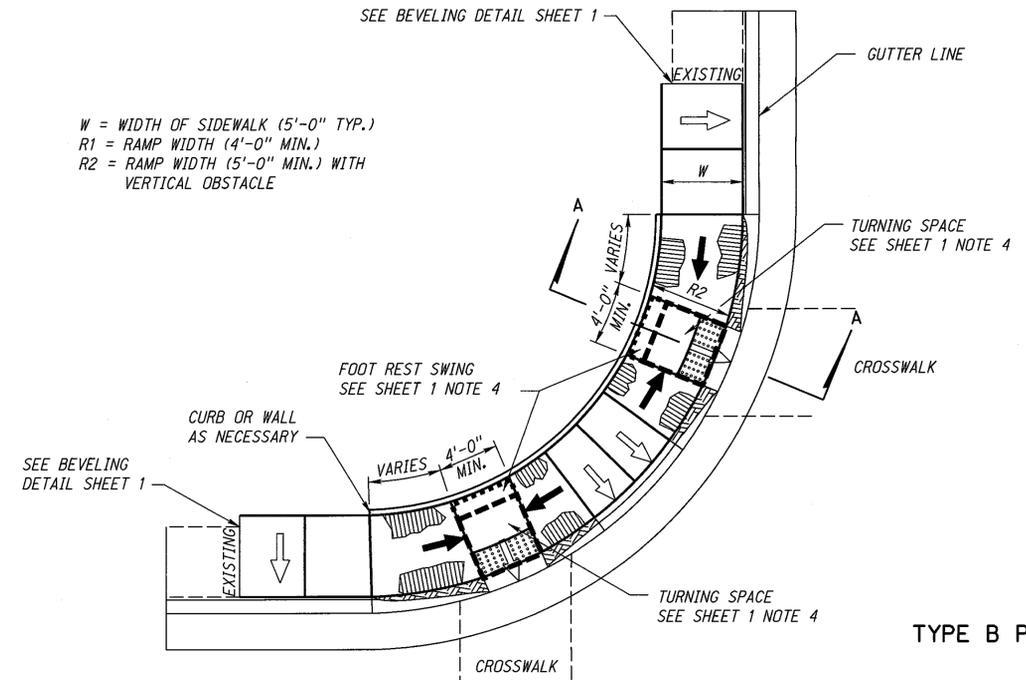
- DETECTABLE WARNING PANEL (DWP)
- BROOMED CURB RAMP WHEN 5% TO 8.3%
- RAMP FLARE
- GRASS OR NON WALKING SURFACE
- CURB TRANSITION
- CURB FACE SLOPE 1 VERT. : 2 HORIZ.

SLOPE LEGEND

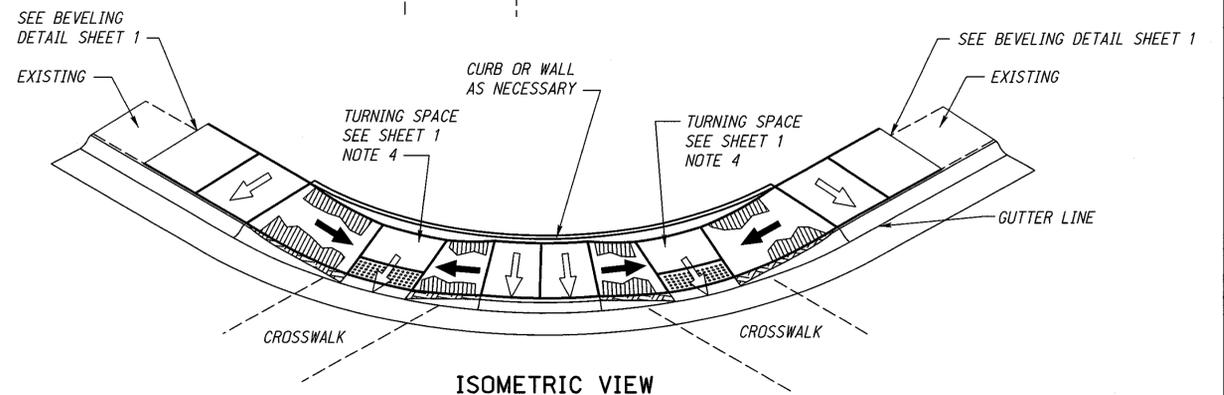
	SIDEWALK/TURNING SPACE AND RAMP CROSS SLOPE 1.5% TYPICAL, 2.0% MAX. SLOPE
	RAMP RUNNING SLOPE 8.0% TYPICAL, 8.3% MAX. SLOPE
	FLARE 90° TO RAMP 9.0% TYPICAL, 10.0% MAX. SLOPE

THE CONTRACTOR SHOULD ACCOUNT FOR CONSTRUCTION TOLERANCES TO PREVENT EXCEEDING THE MAXIMUM SLOPES. ANY SLOPES EXCEEDING THE MAXIMUMS SHALL NOT BE ACCEPTED WITHOUT PRIOR APPROVAL FROM THE ROADWAY DESIGN ENGINEER. AN EXCEPTION TO THIS IS THE TRANSITIONAL SEGMENT TO EXISTING SIDEWALK MUST CONNECT TO THE EXISTING SIDEWALK PANEL; THIS DOES NOT REQUIRE A STATEMENT OF TECHNICAL INFEASIBILITY. (REF. PROWAG CHAPTER R3 TECHNICAL REQUIREMENTS)

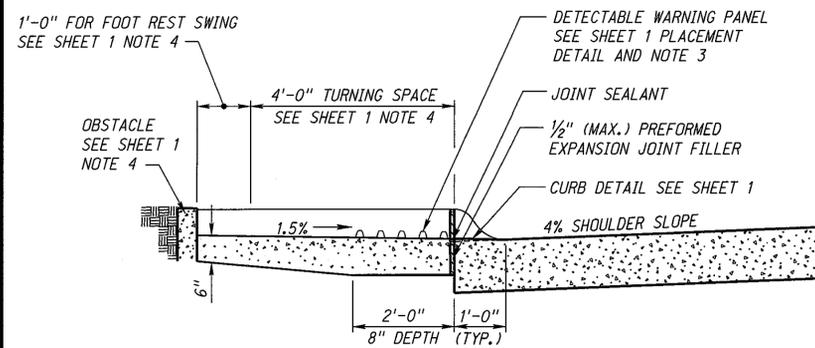
W = WIDTH OF SIDEWALK (5'-0" TYP.)
R1 = RAMP WIDTH (4'-0" MIN.)
R2 = RAMP WIDTH (5'-0" MIN.) WITH VERTICAL OBSTACLE



TYPE B PLAN



ISOMETRIC VIEW



TYPE B CROSS SECTION SECTION A-A

R2	OCT 14	CHANGE PM TO ROADWAY DESIGN ENGINEER
R1	FEB 13	ALL OF PLAN REWORKED (PROWAG)
REV. NO.	DATE	DESCRIPTION OF REVISION

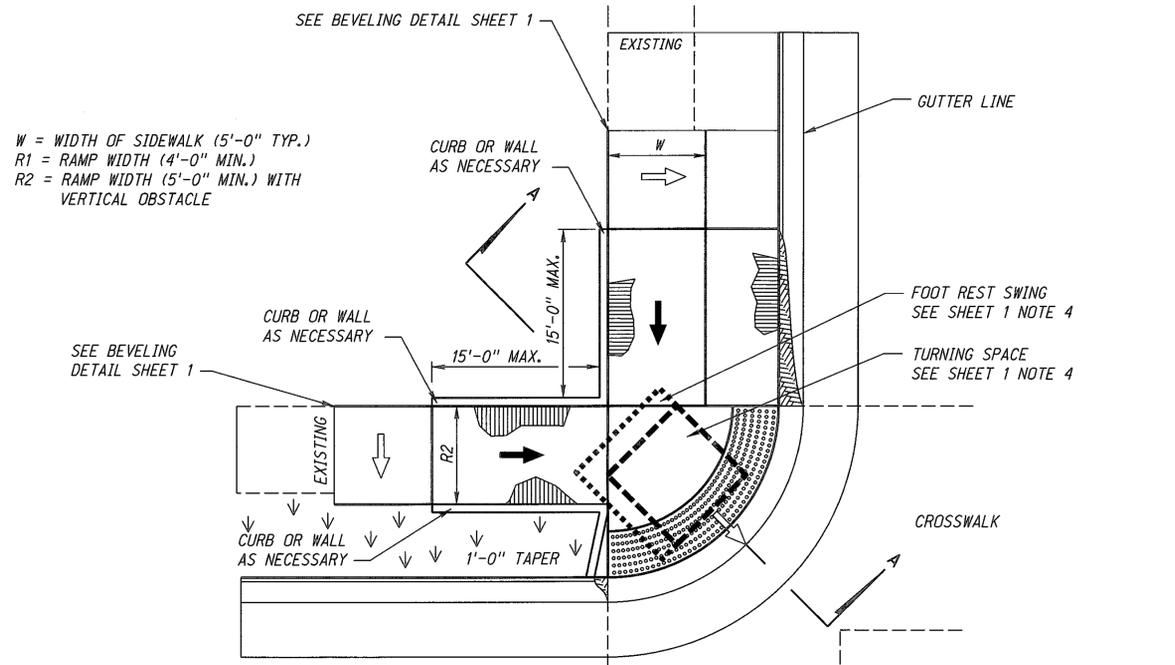
NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 303-R2

CURB RAMPS

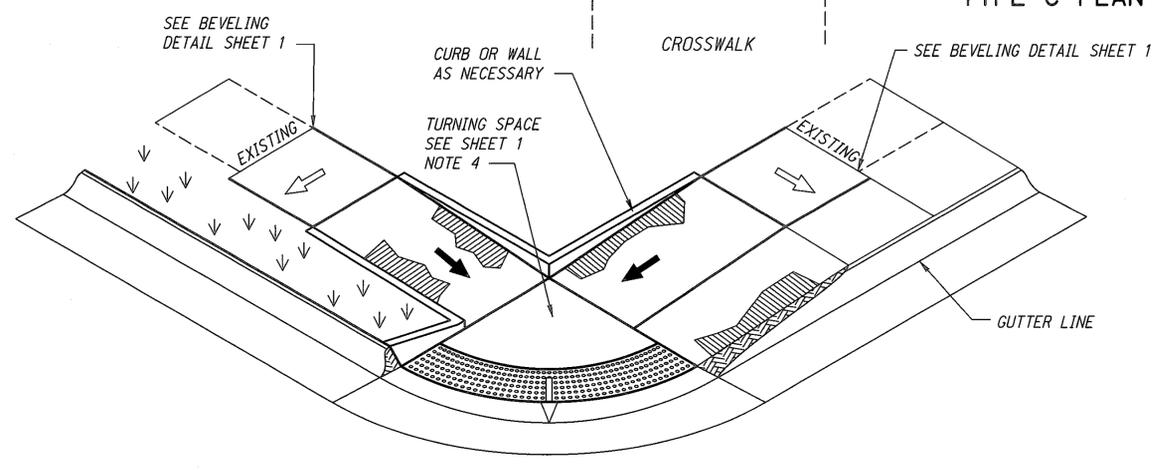
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM



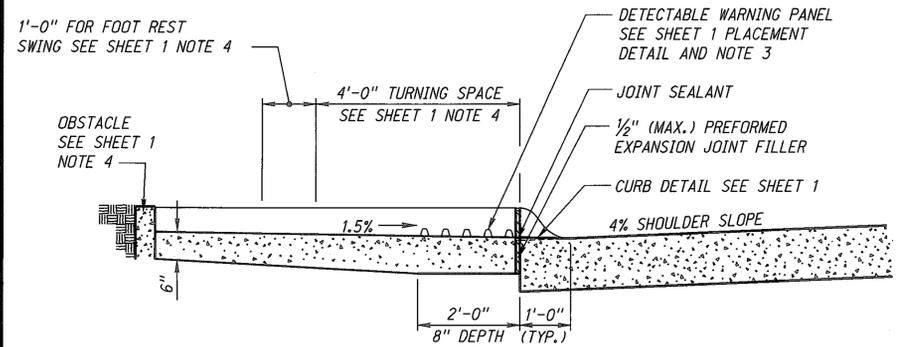
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM
DATE: OCT 2014
ORIGINAL: MARCH 22, 2010
DATE



TYPE C PLAN



ISOMETRIC VIEW

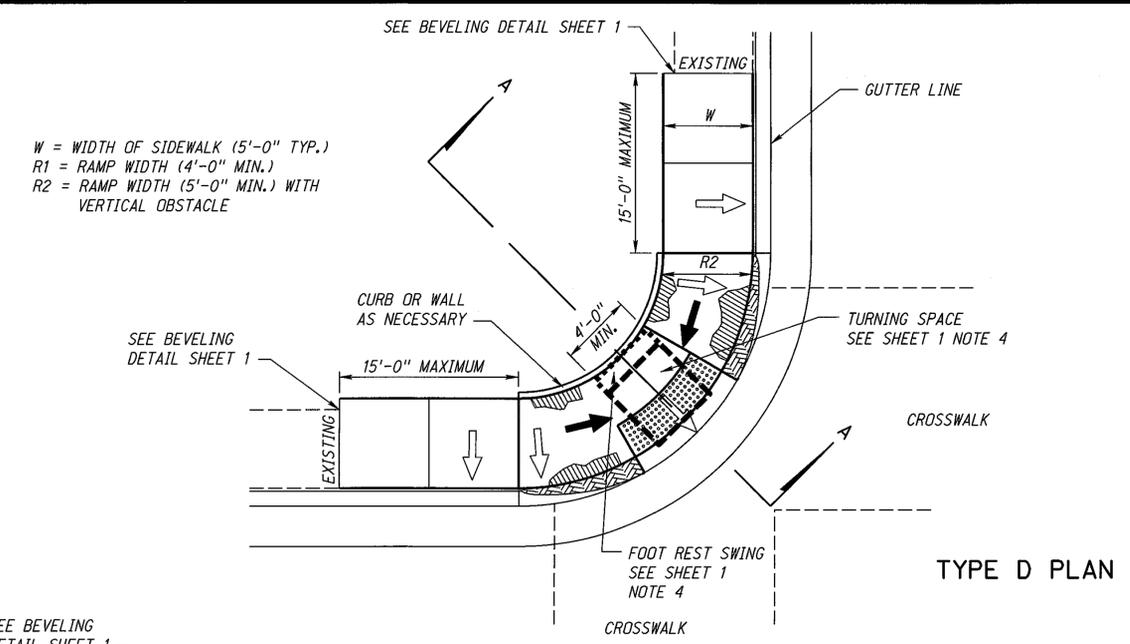


TYPE C CROSS SECTION SECTION A-A

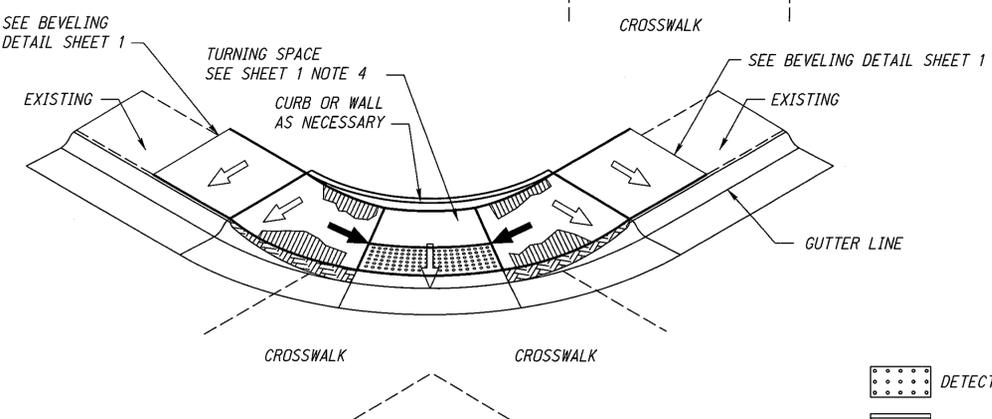
SLOPE LEGEND

	SIDEWALK/TURNING SPACE AND RAMP CROSS SLOPE 1.5% TYPICAL, 2.0% MAX. SLOPE
	RAMP RUNNING SLOPE 8.0% TYPICAL, 8.3% MAX. SLOPE
	FLARE 90° TO RAMP 9.0% TYPICAL, 10.0% MAX. SLOPE

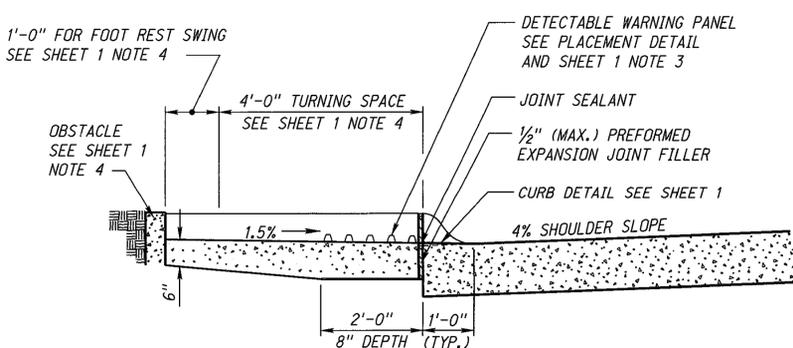
THE CONTRACTOR SHOULD ACCOUNT FOR CONSTRUCTION TOLERANCES TO PREVENT EXCEEDING THE MAXIMUM SLOPES. ANY SLOPES EXCEEDING THE MAXIMUMS SHALL NOT BE ACCEPTED WITHOUT PRIOR APPROVAL FROM THE ROADWAY DESIGN ENGINEER. AN EXCEPTION TO THIS IS THE TRANSITIONAL SEGMENT TO EXISTING SIDEWALK MUST CONNECT TO THE EXISTING SIDEWALK PANEL; THIS DOES NOT REQUIRE A STATEMENT OF TECHNICAL INFEASIBILITY. (REF. PROWAG CHAPTER R3 TECHNICAL REQUIREMENTS)



TYPE D PLAN



ISOMETRIC VIEW



TYPE D CROSS SECTION SECTION A-A

- LEGEND**
- DETECTABLE WARNING PANEL (DWP)
 - BROOMED CURB RAMP WHEN 5% TO 8.3%
 - RAMP FLARE
 - GRASS OR NON WALKING SURFACE
 - CURB TRANSITION
 - CURB FACE SLOPE 1 VERT. : 2 HORIZ.

R2	OCT 14	CHANGE PM TO ROADWAY DESIGN ENGINEER
R1	FEB 13	ALL OF PLAN REWORKED (PROWAG)
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 303-R2
CURB RAMPS

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

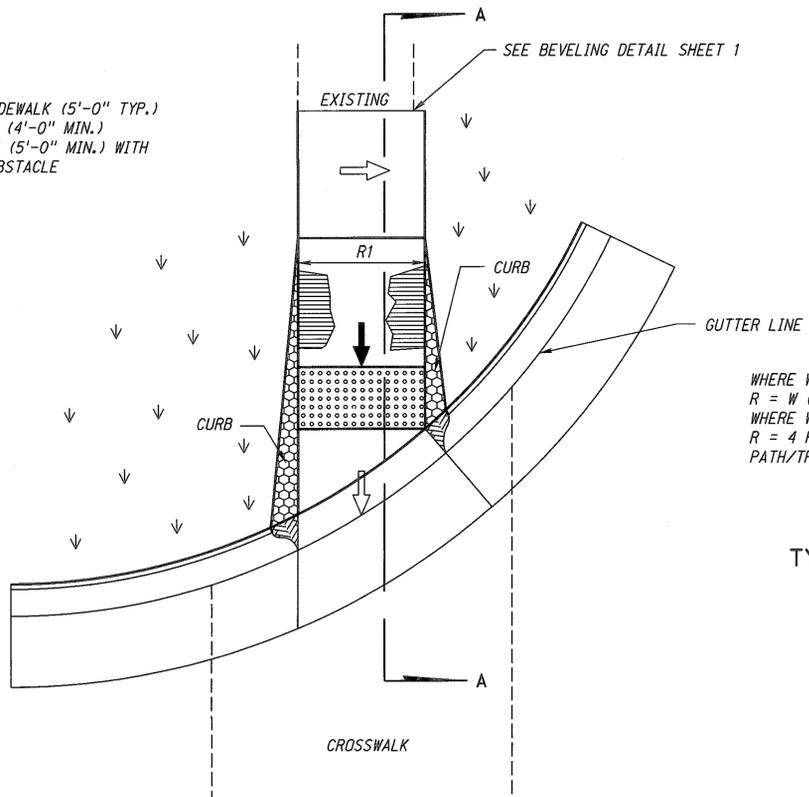
DATE: OCT 2014

DATE: MARCH 22, 2010

ORIGINAL:

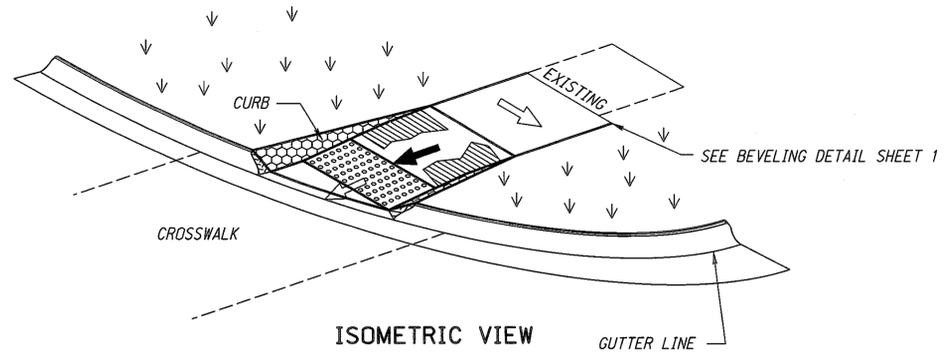
DATE:

W = WIDTH OF SIDEWALK (5'-0" TYP.)
R1 = RAMP WIDTH (4'-0" MIN.)
R2 = RAMP WIDTH (5'-0" MIN.) WITH
VERTICAL OBSTACLE

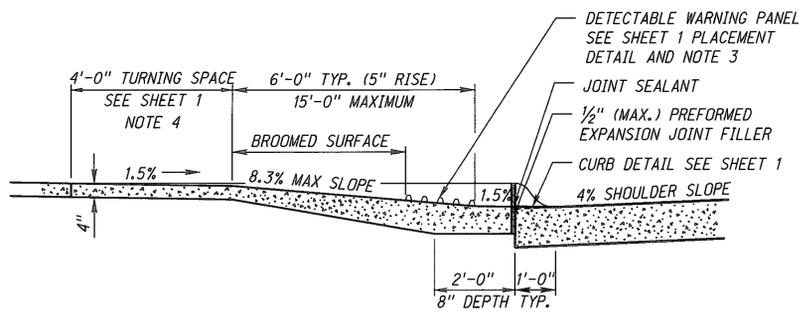


WHERE W IS 9 FT. OR LESS,
R = W (MIN. WIDTH = 4 FT.)
WHERE W IS GREATER THAN 9 FT.,
R = 4 FT., EXCEPT BIKE
PATH/TRAIL. SEE NOTE 5 (SHEET 1)

TYPE E PLAN

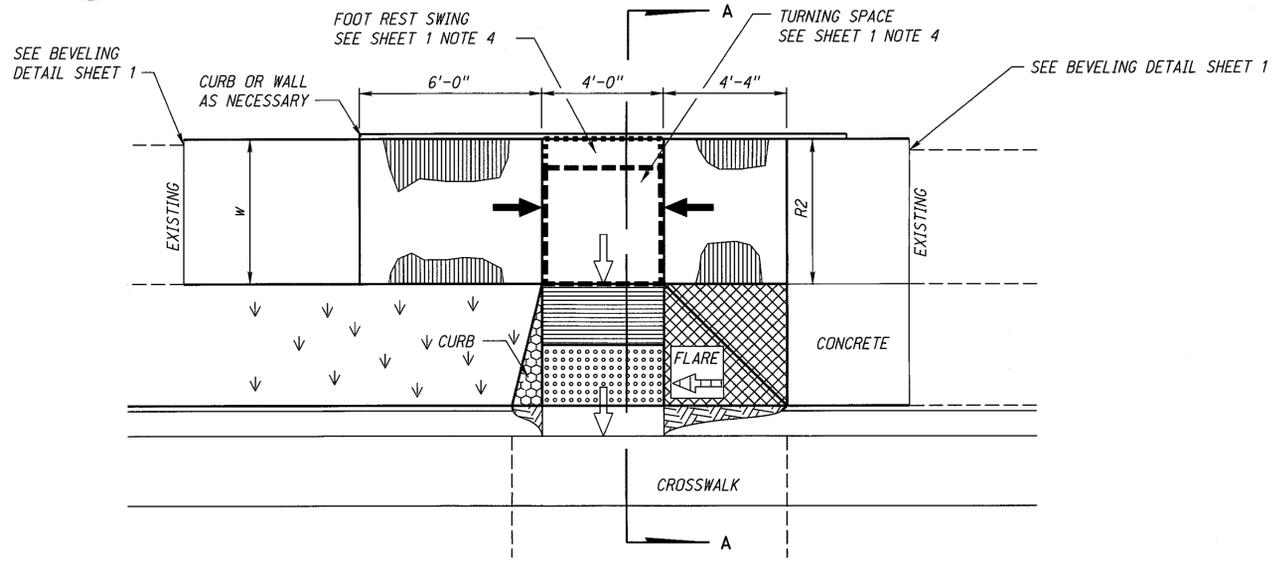


ISOMETRIC VIEW

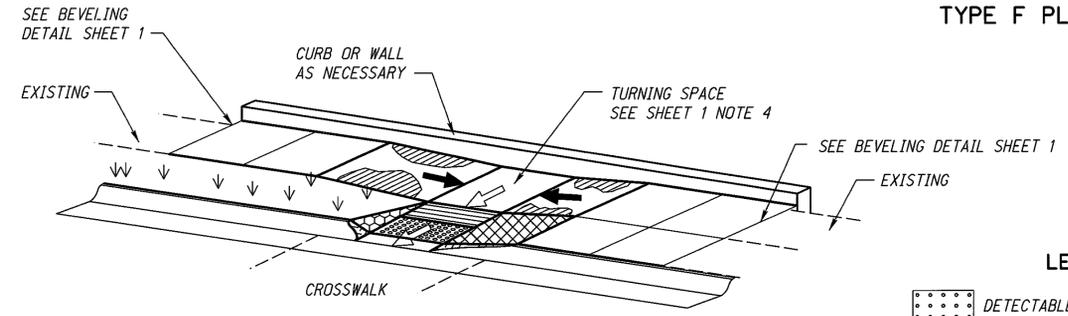


TYPE E CROSS SECTION
SECTION A-A

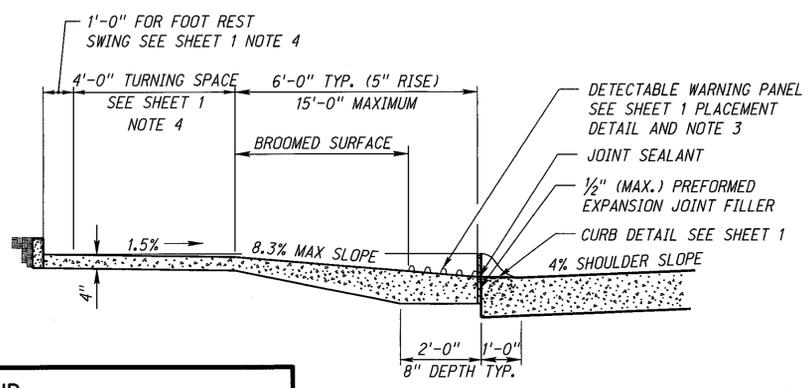
W = WIDTH OF SIDEWALK (5'-0" TYP.)
R1 = RAMP WIDTH (4'-0" MIN.)
R2 = RAMP WIDTH (5'-0" MIN.) WITH
VERTICAL OBSTACLE



TYPE F PLAN



ISOMETRIC VIEW



TYPE F CROSS SECTION
SECTION A-A

SLOPE LEGEND

	SIDEWALK/TURNING SPACE AND RAMP CROSS SLOPE 1.5% TYPICAL, 2.0% MAX. SLOPE
	RAMP RUNNING SLOPE 8.0% TYPICAL, 8.3% MAX. SLOPE
	FLARE 90° TO RAMP 9.0% TYPICAL, 10.0% MAX. SLOPE

THE CONTRACTOR SHOULD ACCOUNT FOR CONSTRUCTION TOLERANCES TO PREVENT EXCEEDING THE MAXIMUM SLOPES. ANY SLOPES EXCEEDING THE MAXIMUMS SHALL NOT BE ACCEPTED WITHOUT PRIOR APPROVAL FROM THE ROADWAY DESIGN ENGINEER. AN EXCEPTION TO THIS IS THE TRANSITIONAL SEGMENT TO EXISTING SIDEWALK MUST CONNECT TO THE EXISTING SIDEWALK PANEL; THIS DOES NOT REQUIRE A STATEMENT OF TECHNICAL INFEASIBILITY. (REF. PROWAG CHAPTER R3 TECHNICAL REQUIREMENTS)

- LEGEND**
- DETECTABLE WARNING PANEL (DWP)
 - BROOMED CURB RAMP WHEN 5% TO 8.3%
 - RAMP FLARE
 - GRASS OR NON WALKING SURFACE
 - CURB TRANSITION
 - CURB FACE SLOPE 1 VERT. : 2 HORIZ.

R2	OCT 14	CHANGE PM TO ROADWAY DESIGN ENGINEER
R1	FEB 13	ALL OF PLAN REWORKED (PROWAG)
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 303-R2
CURB RAMPS

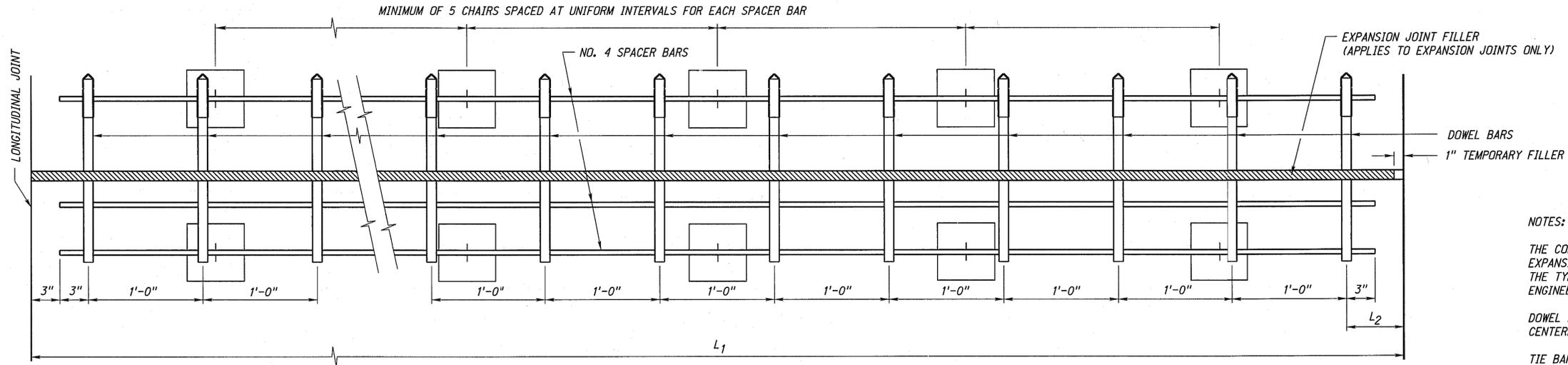
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:

DATE: OCT 2014

DATE: MARCH 22, 2010

ORIGINAL:

DATE:



DOWEL BAR HEIGHT AND DIAMETER			
PAVEMENT THICKNESS (T)	MINIMUM BAR DIA.	DOWEL BAR HEIGHT (T/2)	SKEW TOLERANCE
LESS THAN 10"	1 1/4"	T/2 ± 1/2"	1/4"
10" OR MORE	1 1/2"	T/2 ± 1/2"	1/4"

ASSEMBLY PLAN

DOWEL BAR LOCATION TABLE					
L ₁	L ₂	L ₃	#BARS	DESCRIPTION	
12'-0"	6"	5"	12	12'-0" PAVEMENT	
15'-0"	2'-6"	2'-5"	13	15'-0" PAVEMENT (INCLUDES 3'-0" SHOULDER)	
16'-0"	3'-6"	3'-5"	13	16'-0" PAVEMENT (INCLUDES 4'-0" SHOULDER)	
16'-0"	6"	5"	16	16'-0" RAMP & LOOPS	
≥14'-6"	1'-6"	1'-5"	VARIES	PAVEMENT WITH CURB	
≥14'-6"	2'-6"	2'-5"	VARIES	PAVEMENT WITH CURB	
* ≥6'-0"	6"	5"	VARIES	IRREGULAR AREAS (WIDEN, FILLETS, GORE	

NOTES:

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

DOWEL BARS SHALL BE A MINIMUM OF 17 3/4" IN LENGTH, CENTERED ON JOINTS AND BE SMOOTH BARS.

TIE BARS SHALL BE DEFORMED BARS.

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

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

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

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

KEY TYPE LONGITUDINAL JOINTS AND TRANSVERSE CONSTRUCTION JOINTS SHALL BE EDGED WITH 1/4" R. AT TIME OF CONCRETE PLACEMENT.

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

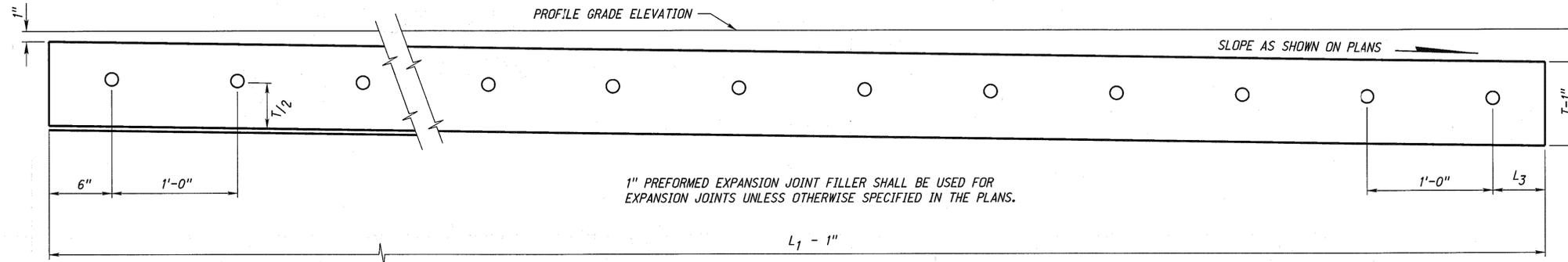
EXPANSION JOINTS SHALL BE INSTALLED AT LOCATIONS SHOWN IN THE PLANS.

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

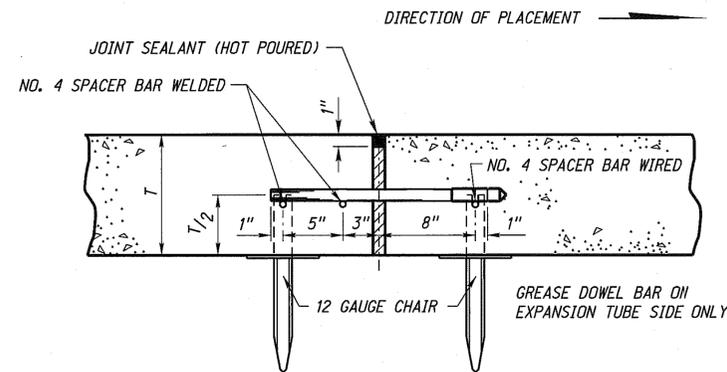
EXPANSION JOINTS SHALL NOT BE SKEWED.

T = PAVEMENT THICKNESS

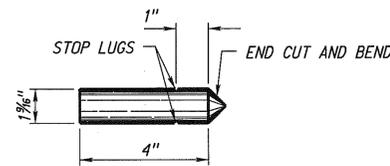
* THE DEPARTMENT REQUIRES THAT DOWEL BASKETS BE PLACED IN ALL CONTRACTION JOINTS WHICH ARE 6'-0" OR WIDER. THE DOWEL BASKETS SHALL BE PLACED TRANSVERSE TO THE DIRECTION OF THE PREDOMINANT TRAFFIC DIRECTION.



PREFORMED EXPANSION JOINT FILLER
(TO BE USED AT EXPANSION JOINTS ONLY)

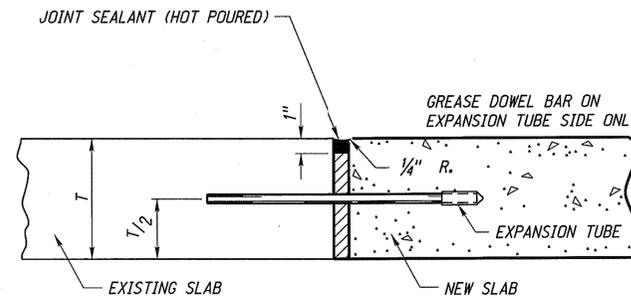


SECTION



EXPANSION TUBE

EXPANSION JOINT
(SUBSIDIARY)

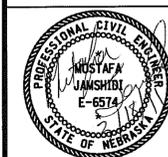


SECTION

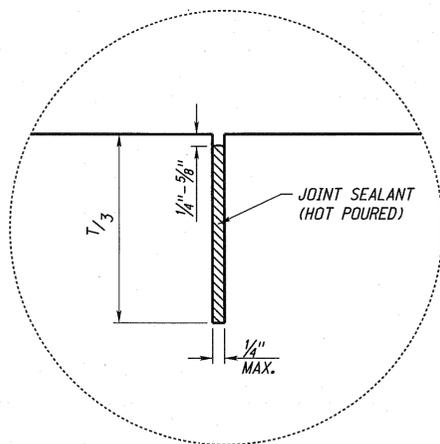
NOTES:
DOWEL BARS SHALL BE DRILLED TO A DEPTH OF 8" INTO EXISTING SLAB AND GROUTED.

R9	JUL 11	JOINT: EARLY SAW CUT
R8	OCT. 10	CHANGED TINDING INFORMATION
R7	MAR. 05	MULTIPLE CHANGES
REV. NO.	DATE	DESCRIPTION OF REVISION

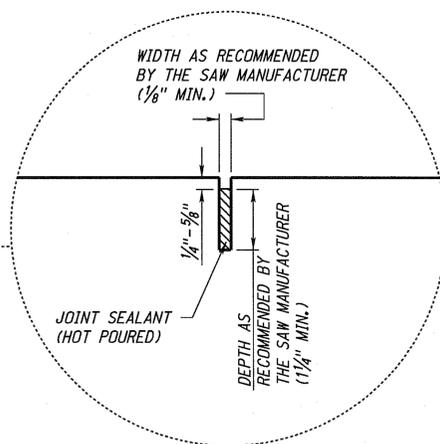
NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 329-R9
**8 TO 16 INCH
CONCRETE PAVEMENT**



FHWA APPROVED:
Walter E. Felt
3/20/2011
DATE
ORIGINAL:
OCTOBER 25, 1994
DATE



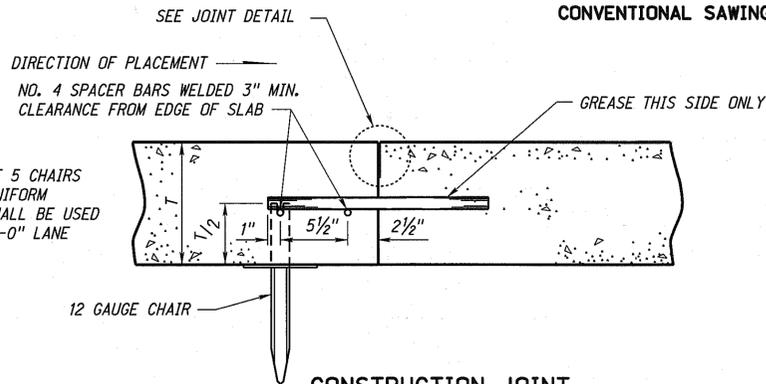
OR



CONVENTIONAL SAWING

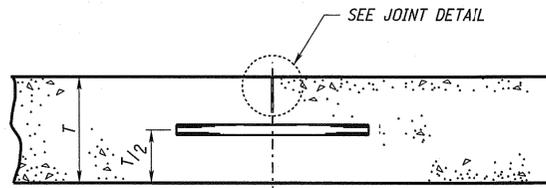
EARLY-SAW CUT

JOINT DETAIL

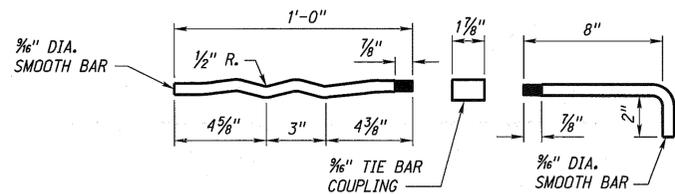


CONSTRUCTION JOINT

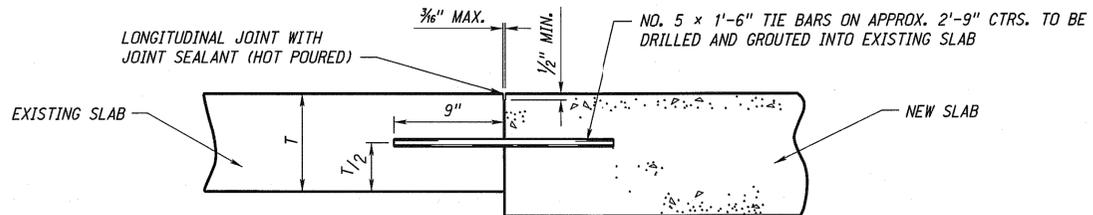
THE DOWEL BAR SPACING SHALL BE THE SAME AS SHOWN FOR THE EXPANSION JOINT. REFER TO BAR LOCATION TABLE AND THE DOWEL BAR HEIGHT AND DIAMETER TABLE ON SHEET 1 OF 4.



CONTRACTION JOINT

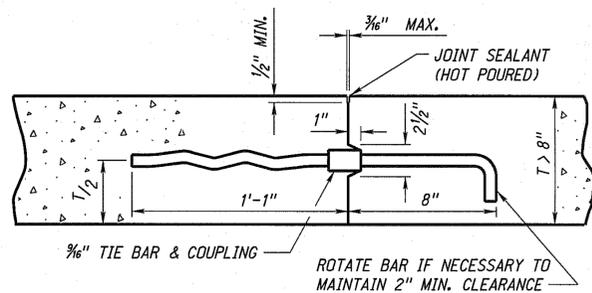


DETAILS OF "W" BAR



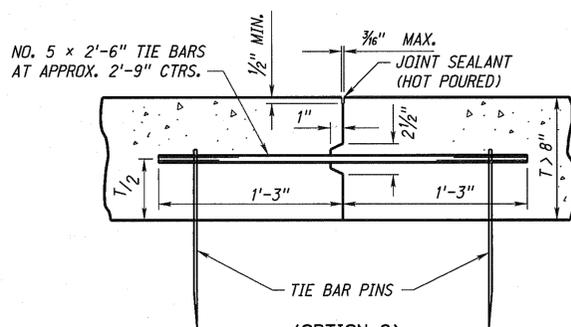
TIE BARS ARE TO BE INSTALLED WHERE NEW CONCRETE PAVEMENT IS PLACED ADJACENT TO EXISTING CONCRETE PAVEMENT

DETAILS OF TIE BAR



(OPTION 1)
KEY TYPE

NO. 5 HOOK AND W-BARS AT APPROX. 2'-9" CTRS. OR 3/8" HOOK AND W-BARS AT APPROX. 2'-9" CTRS.

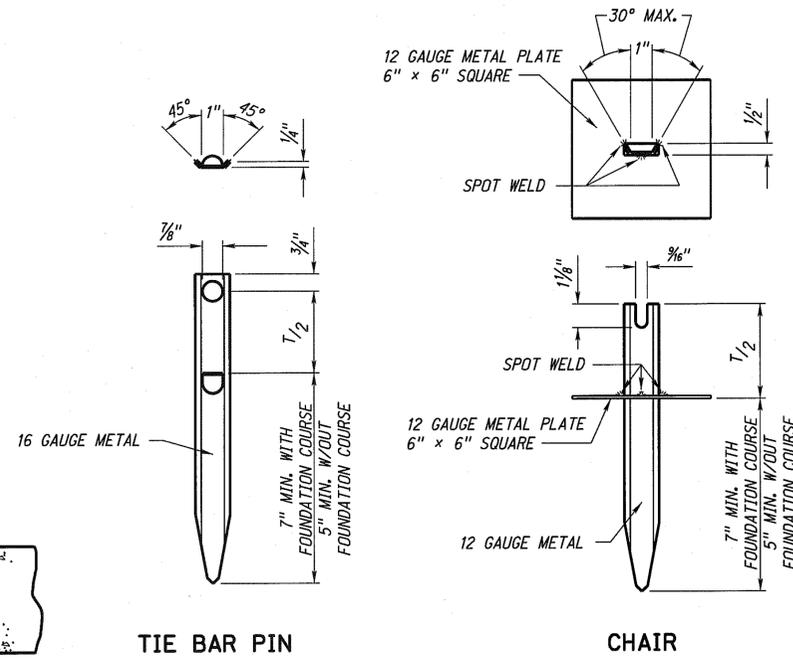


(OPTION 2)
KEY TYPE

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

LONGITUDINAL JOINTS

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



TIE BAR PIN

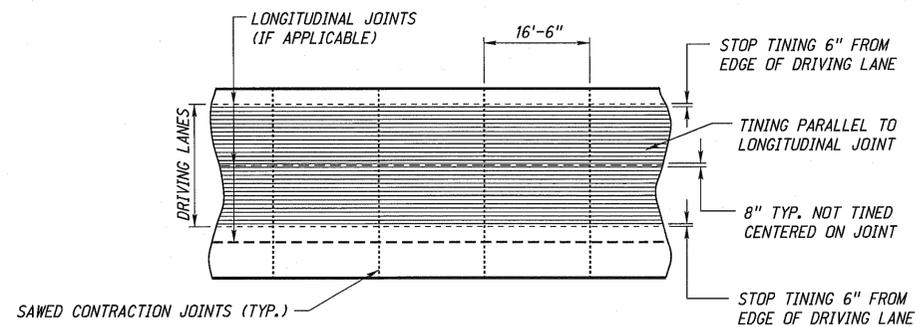
CHAIR

R9	JUL 11	JOINT: EARLY SAW CUT
R8	OCT. 10	CHANGED TYPING INFORMATION
R7	MAR. 05	MULTIPLE CHANGES
REV. NO.	DATE	DESCRIPTION OF REVISION

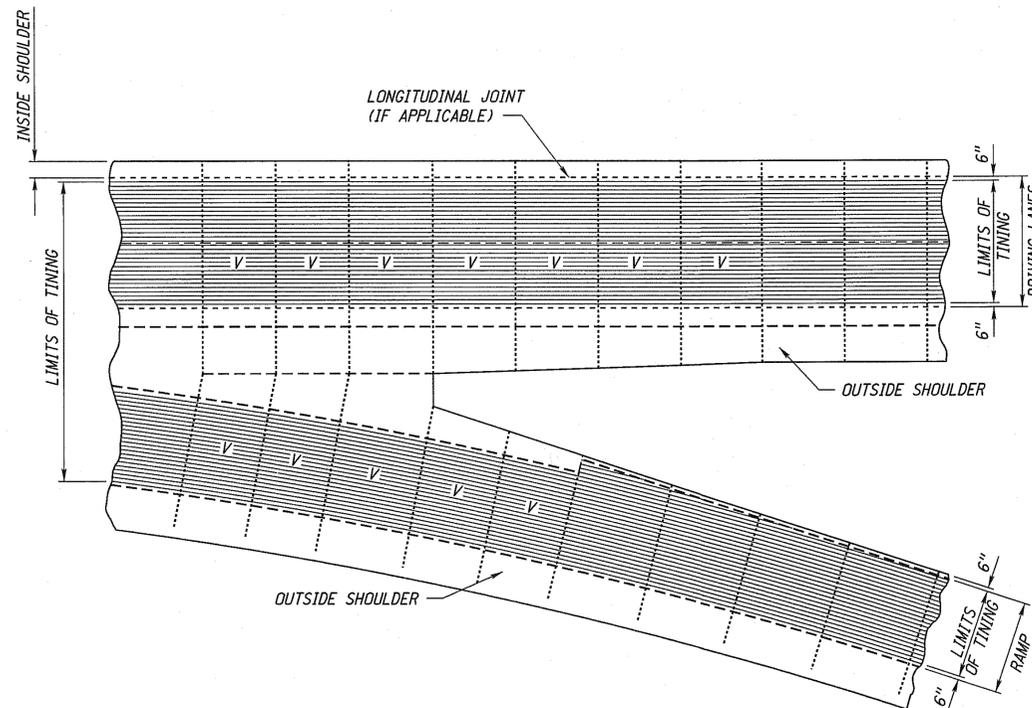
NOTE: T = PAVEMENT THICKNESS

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 329-R9
**8 TO 16 INCH
CONCRETE PAVEMENT**

	FHWA APPROVED:		2
	DATE		
ORIGINAL:		OCTOBER 25, 1994	
DATE		DATE	



TINING WITH CONCRETE SHOULDER



TINING LIMITS GORE AREA

NOTES:

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

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

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

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

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

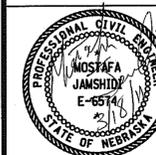
DRDESIGN55
dcr13017
16-FEB-2011 09:49

3290e09.dgn
100:1
SHEET 3 OF 4

R9	JUL 11	JOINT: EARLY SAW CUT
R8	OCT. 10	CHANGED TINING INFORMATION
R7	MAR. 05	MULTIPLE CHANGES
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 329-R9

8 TO 16 INCH
CONCRETE PAVEMENT

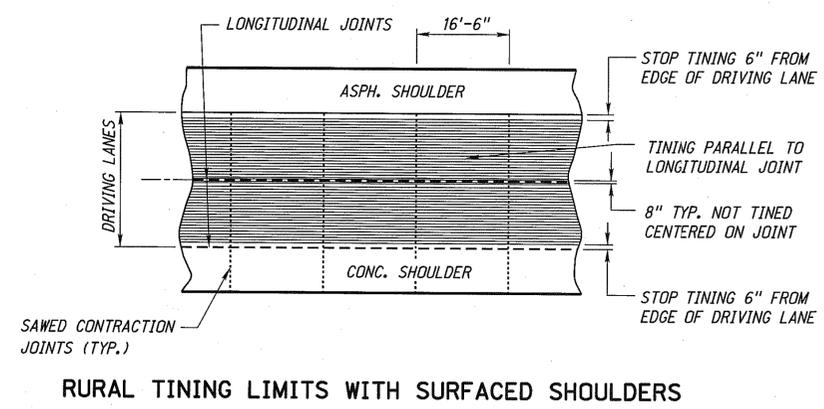
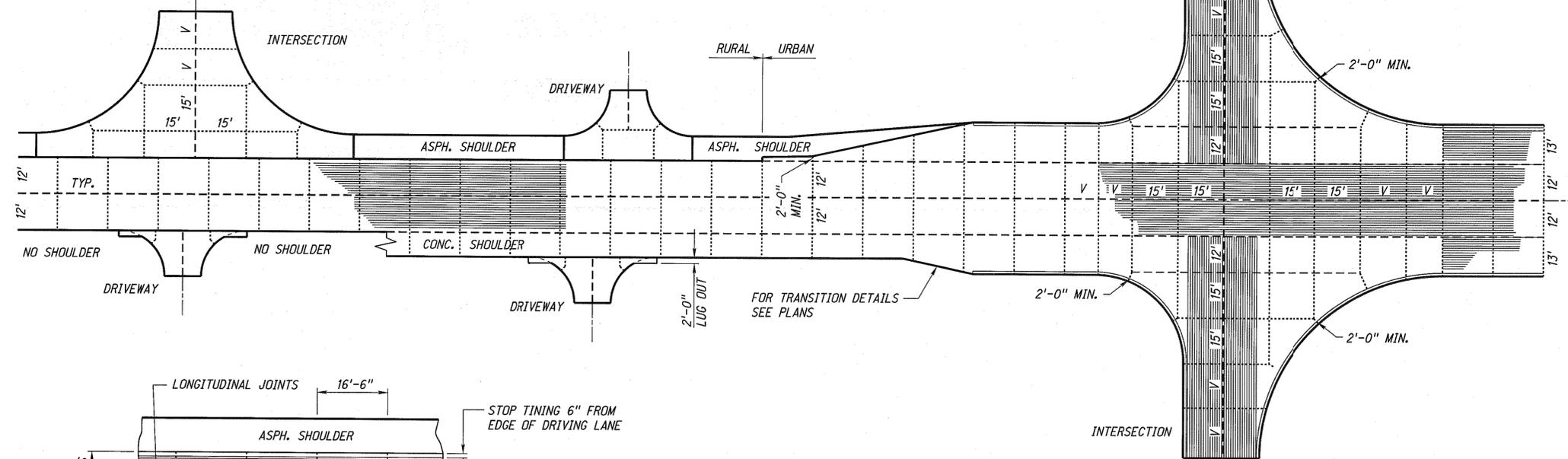
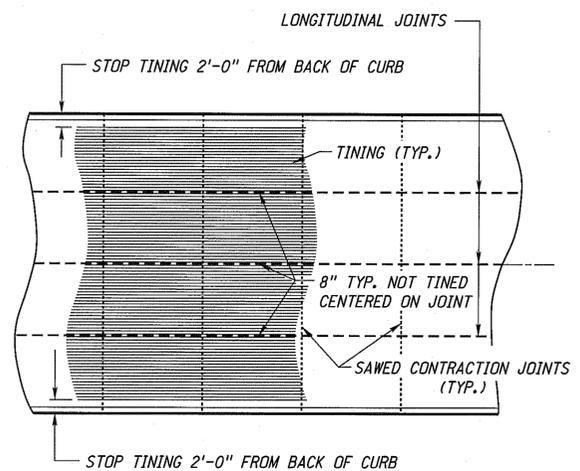
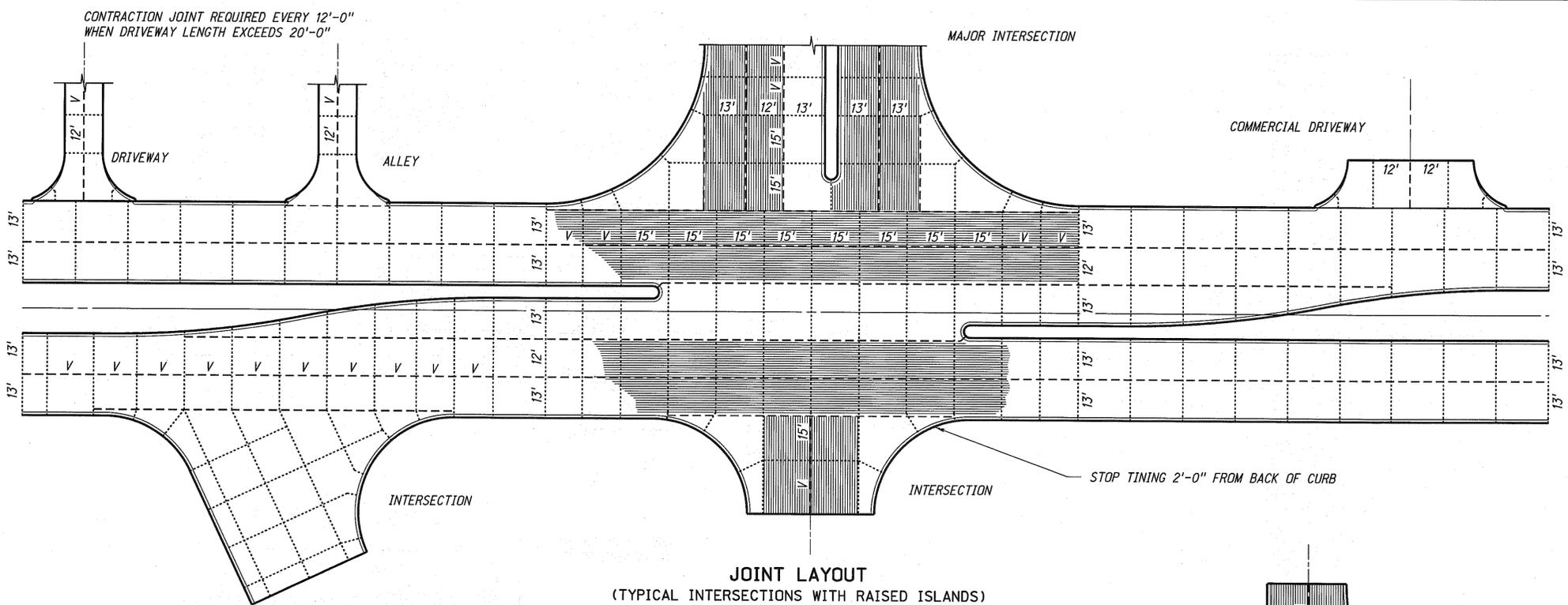


FHWA APPROVED:

Walter C. Fink
3/30/2011
DATE

ORIGINAL:
OCTOBER 25, 1994
DATE

3
4



LEGEND

..... SAWED CONTRACTION JOINT

----- LONGITUDINAL JOINT

NOTES:

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

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

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

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

R9	JUL. 11	JOINT: EARLY SAW CUT
R8	OCT. 10	CHANGED TINING INFORMATION
R7	MAR. 05	MULTIPLE CHANGES
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 329-R9

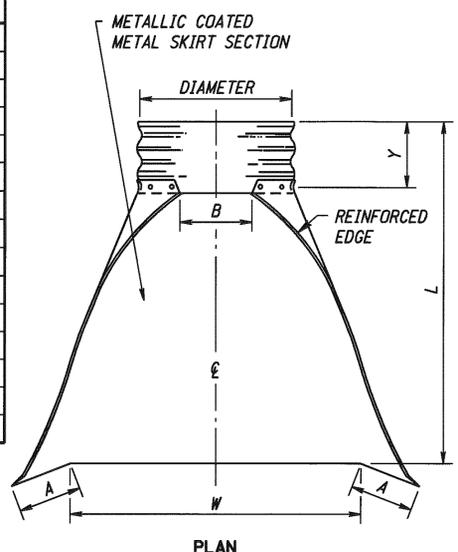
**8 TO 16 INCH
CONCRETE PAVEMENT**

FHWA APPROVED:
Mustafa Janshidi
DATE: 5/30/2011

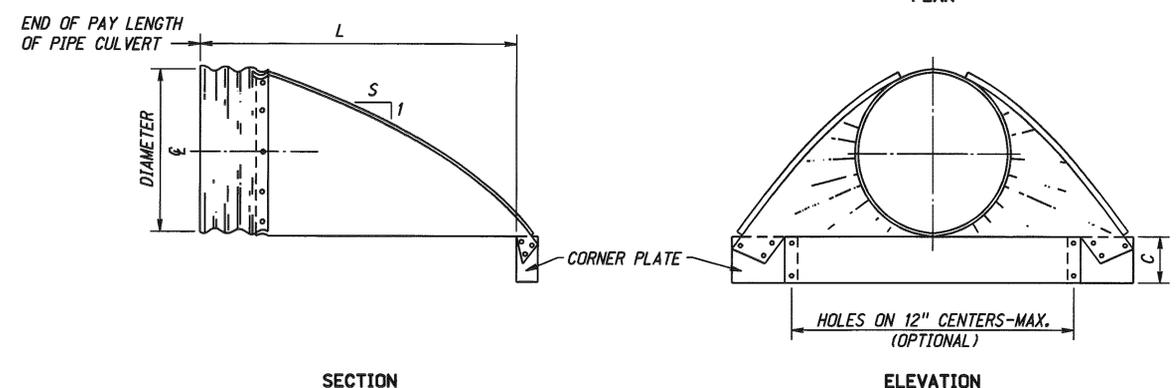
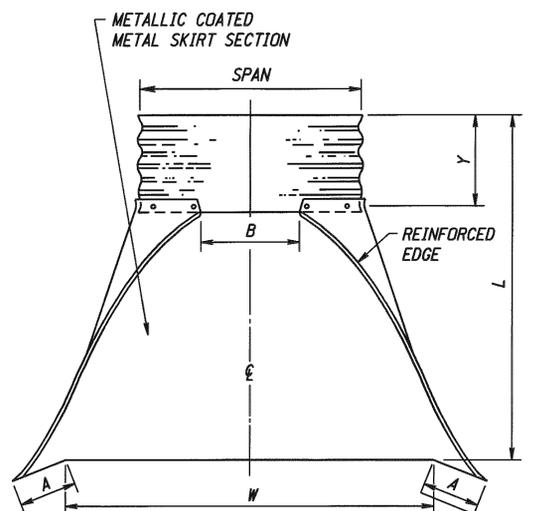
ORIGINAL:
OCTOBER 25, 1994
DATE

4
4

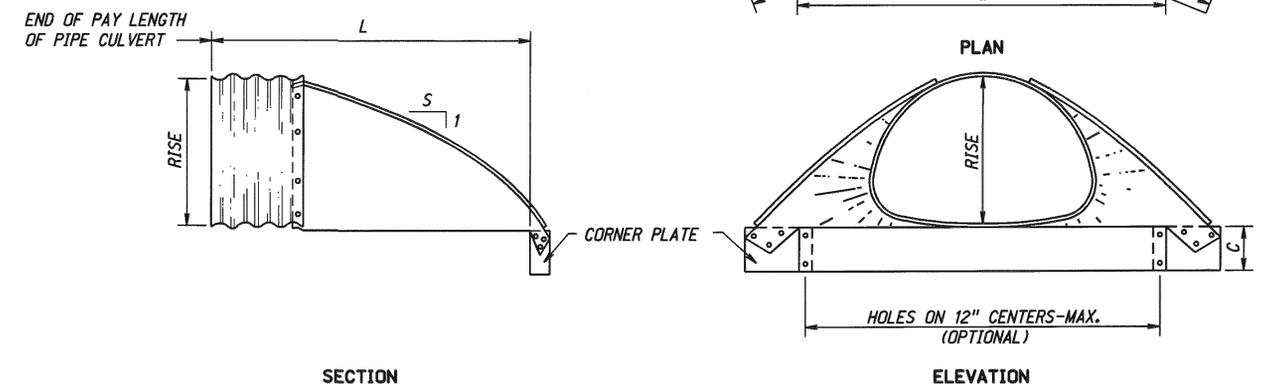
PIPE DIA.	GAUGE	NOMINAL DIMENSIONS							
		L ± 6"	W ± 2"	A MIN.	B MAX.	C MIN.	Y ± 4 1/2"	S APPROX.	
12"	16	6'-0 1/8"	2'-0"	4 3/4"	6"	6"	4'-3 7/8"	2 1/2	
15"	16	6'-1"	2'-6"	6"	8"	6"	3'-11"	2 1/2	
18"	16	6'-1"	3'-0"	7"	10"	6"	3'-8"	2 1/2	
21"	16	6'-1"	3'-8"	8 1/4"	1'-0"	6"	3'-1"	2 1/2	
24"	16	6'-1 1/2"	4'-0"	9"	1'-1"	6"	2'-8 1/2"	2 1/2	
30"	14	6'-1 3/4"	5'-0"	11"	1'-4"	6"	1'-10 3/4"	2 1/2	
36"	14	8'-1 3/4"	6'-0"	1'-2"	1'-7"	6"	3'-1 3/4"	2 1/2	
42"	12	8'-2"	7'-0"	1'-4"	1'-10"	6"	2'-5"	2 1/2	
48"	12	8'-2"	7'-6"	1'-6"	2'-3"	6"	1'-8"	2 1/4	
54"	12	8'-4"	8'-6"	1'-6"	2'-6"	6"	1'-4"	2	
60"	12	8'-3"	9'-6"	1'-6"	2'-9"	6"	1'-0"	1 3/4	
66"	12	8'-3"	10'-0"	1'-6"	3'-0"	6"	1'-0"	1 1/2	
72"	12	8'-3"	10'-6"	1'-6"	3'-3"	6"	1'-0"	1 1/3	
78"	12	8'-3"	11'-0"	1'-6"	3'-6"	6"	1'-0"	1 1/4	
84"	12	8'-3"	11'-6"	1'-6"	3'-9"	6"	1'-0"	1 1/6	



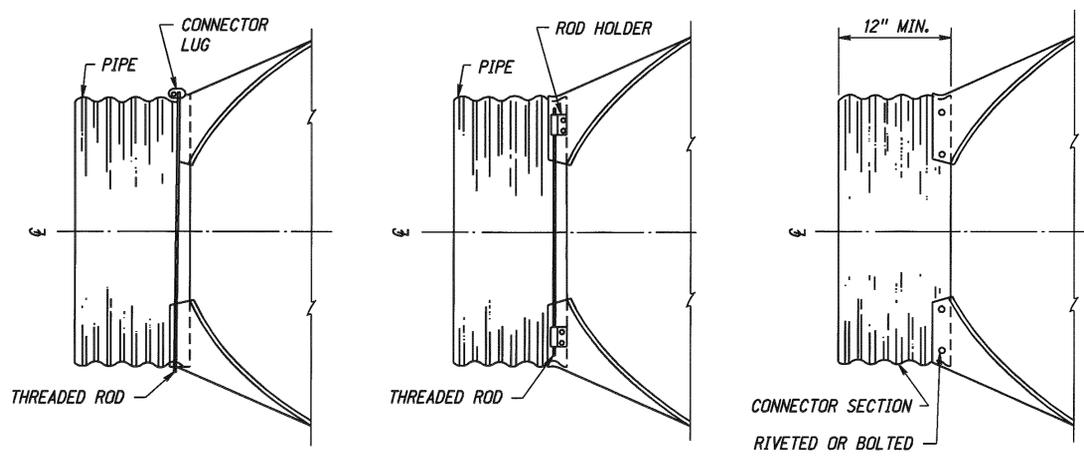
EQUIV. DIA.	SPAN	RISE	GAUGE	NOMINAL DIMENSIONS							
				L ± 6"	W MIN.	A MIN.	B MAX.	C MIN.	Y ± 4 1/2"	S APPROX.	
15"	17"	13"	16	6'-0"	2'-6"	4 1/2"	9"	6"	4'-5"	2 1/2	
18"	21"	15"	16	6'-0"	3'-0"	5 1/4"	10"	6"	4'-1"	2 1/2	
21"	24"	18"	16	6'-0"	3'-6"	6 1/4"	11 1/2"	6"	3'-8"	2 1/2	
24"	28"	20"	16	6'-0"	4'-0"	7"	1'-2"	6"	3'-4 1/2"	2 1/2	
30"	35"	24"	14	8'-0"	5'-0"	8 3/4"	1'-4"	6"	4'-9 1/2"	2 1/2	
36"	42"	29"	14	8'-0"	6'-3"	10 3/4"	1'-5 1/2"	6"	4'-2"	2 1/2	
42"	49"	33"	12	8'-0"	7'-1"	1'-0 1/4"	1'-8"	6"	3'-7"	2 1/2	
48"	57"	38"	12	8'-0"	7'-6"	1'-2"	2'-3"	6"	2'-9"	2 1/2	
54"	64"	43"	12	8'-0"	8'-6"	1'-3 3/4"	2'-6"	6"	2'-2"	2 1/4	
60"	71"	47"	12	8'-0"	9'-6"	1'-5 1/4"	2'-9"	6"	1'-7"	2 1/4	
66"	77"	52"	12	8'-0"	10'-6"	1'-6"	3'-0"	6"	1'-7"	2	
72"	83"	57"	12	8'-0"	11'-6"	1'-6"	3'-3"	6"	1'-7"	2	



**DETAILS OF METAL FLARED END SECTION
(FOR CORRUGATED METAL PIPE)**



**DETAILS OF METAL FLARED END SECTION
(FOR CORRUGATED METAL PIPE-ARCH)**



TYPICAL CONNECTIONS

FOR CORRUGATED METAL PIPE DIAMETERS OF 12" TO 24" INCLUSIVE AND CORRUGATED METAL PIPE-ARCHES WITH RISE OF 11" TO 18" INCLUSIVE, THE SKIRT SECTION MAY BE ATTACHED WITH A 1" WIDE, 12 GAUGE METAL CONNECTOR STRAP AND 1/2" x 6" BOLT AND NUT. THIS STRAP MAY BE USED ON PIPE WITH ANNULAR ENDS ONLY.

NOTES:

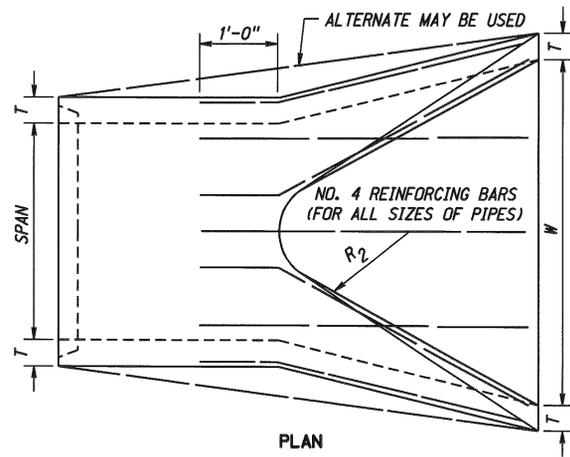
- CONNECTOR STRAP, STIFFENER ANGLES AND MISCELLANEOUS HARDWARE SHALL BE METALLIC COATED.
- THE "Y" LENGTH MAY BE FABRICATED AS PART OF THE CULVERT.
- CONNECTOR SECTIONS AND CORNER PLATES FOR CORRUGATED METAL PIPE AND PIPE-ARCH FLARED END SECTIONS SHALL BE METALLIC COATED AND OF THE SAME GAUGE AS SKIRTS AND EACH SHALL BE METALLIC COATED.
- SKIRT SECTION FOR CORRUGATED METAL PIPE DIA. OF 12" TO 24" INCLUSIVE SHALL BE MADE IN ONE PIECE.
- SKIRT SECTION FOR CORRUGATED METAL PIPE-ARCHES WITH RISE OF 11" TO 22" INCLUSIVE SHALL BE MADE IN ONE PIECE.
- SKIRT SECTION OF CORRUGATED METAL PIPE DIA. OF 30" TO 54" INCLUSIVE AND CORRUGATED METAL PIPE-ARCHES WITH RISE OF 27" TO 40" INCLUSIVE MAY BE MADE FROM TWO SHEETS JOINED BY RIVETING OR BOLTING ON CENTERLINE.
- SKIRT SECTION OF CORRUGATED METAL PIPE DIA. OF 60" AND LARGER, AND CORRUGATED METAL PIPE-ARCHES WITH RISE OF 44" AND LARGER SHALL BE MADE FROM THREE SHEETS JOINED BY RIVETING OR BOLTING AT EQUAL DISTANCES FROM CENTERLINE. THE CENTER PANEL SHALL BE FURNISHED IN 10 GAUGE MATERIAL AND THE WIDTH OF THE CENTER PANEL SHALL BE GREATER THAN 20% OF THE PIPE PERIPHERY.
- MULTIPLE SHEET SKIRT SECTIONS SHALL HAVE 2" MIN. LAP SEAMS. BOLTS OR RIVETS SHALL BE 3/8" DIA. (MIN.) AND ON 6" CENTERS (MAX.).
- TYPICAL CONNECTIONS SHOWN MAY BE USED FOR HELICAL CORRUGATED METAL PIPE.
- FOR SKIRT SECTIONS OF 60" DIA. PIPE AND LARGER, AND CORRUGATED METAL PIPE-ARCHES WITH A RISE OF 49" AND LARGER, REINFORCED EDGES TO BE SUPPLEMENTED WITH STIFFENER ANGLES PLACED JUST BELOW THE REINFORCED EDGES ON THE OUTSIDE OF THE SKIRT SECTION. THE ANGLES WILL BE 2" x 2" x 1/4". THE ANGLES TO BE ATTACHED BY 3/8" DIA. (MIN.) BOLTS AND NUTS AND ON 6" CENTERS (MAX.).

REV. NO.	DATE	DESCRIPTION OF REVISION
R3	AUG. 99	CHANGED NOTES
R2	MAR. 89	SPAN, RISE SIZES FOR CM-PIPE-ARCH
R1	MAR. 85	MULTIPLE CHANGES

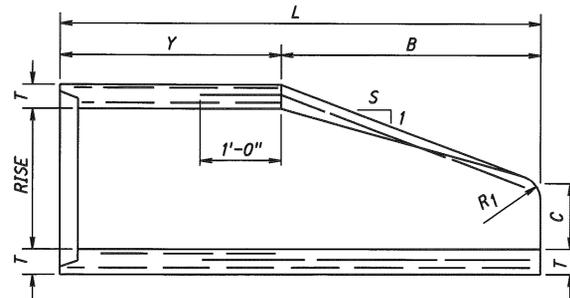
NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 410-R3
**FLARED END SECTIONS
FOR CULVERT PIPES**

APPROVED:
LYNN B. FREEMAN
E-2028
DATE
FEBRUARY 22, 1974

1
2



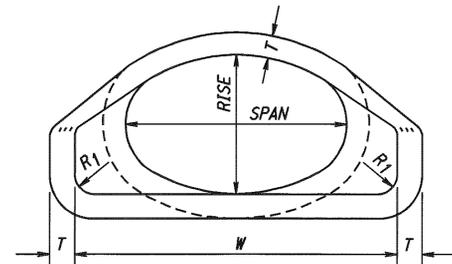
PLAN



SECTION

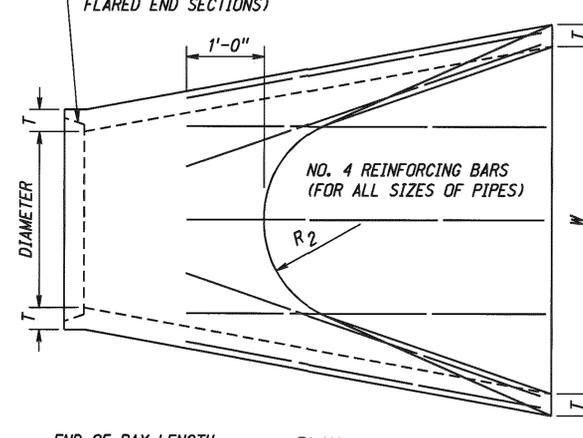
DETAILS OF CONCRETE FLARED END SECTION
(FOR REINFORCED CONCRETE ELLIPTICAL PIPE)

EQUIV. DIA.	NOMINAL DIMENSIONS										
	SPAN	RISE	L ± 6"	B	Y ± 4 1/2"	C	W ± 2"	R ₁	R ₂	S APPROX.	T MIN.
18"	23"	14"	6'-0"	2'-3"	3'-9"	8 1/2"	3'-0"	3"	6"	2.3	2 1/2"
24"	30"	19"	6'-0"	3'-3"	2'-9"	9"	4'-0"	3"	7"	2.9	3"
30"	38"	24"	6'-0"	4'-6"	1'-6"	10"	5'-0"	3"	9"	3	3 1/2"
36"	45"	29"	8'-0"	5'-0"	3'-0"	11"	6'-0"	3"	1'-0"	2.7	4"
42"	53"	34"	8'-0"	5'-0"	3'-0"	1'-4"	6'-6"	6"	1'-1"	2.6	4 1/2"
48"	60"	38"	8'-0"	5'-0"	3'-0"	1'-9"	7'-0"	6"	1'-2"	2.7	5"
54"	68"	43"	8'-0"	5'-0"	3'-0"	2'-1"	7'-6"	6"	1'-4"	2.5	5 1/2"
60"	76"	48"	8'-0"	5'-0"	3'-0"	2'-6"	8'-0"	6"	1'-6"	2.5	6"

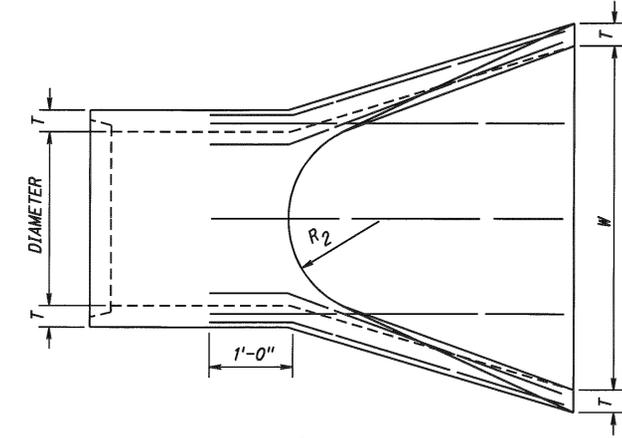


ELEVATION

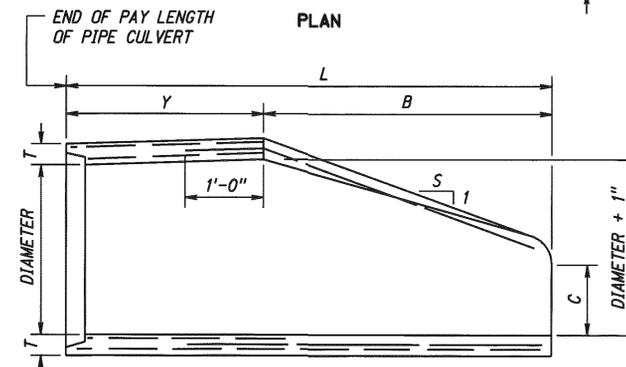
GROOVE END ON OUTLET END SECTION
TONGUE END ON INLET END SECTION
(TYPICAL FOR ALL CONCRETE
FLARED END SECTIONS)



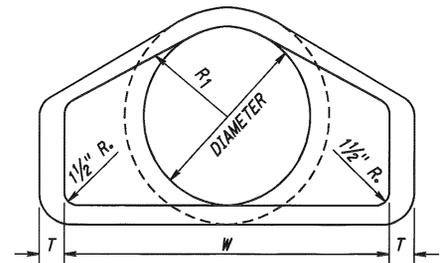
PLAN



PLAN



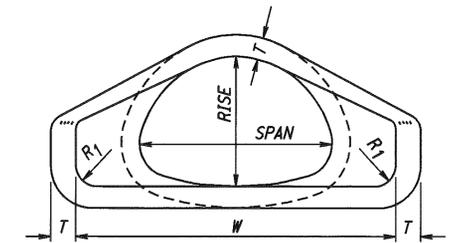
SECTION



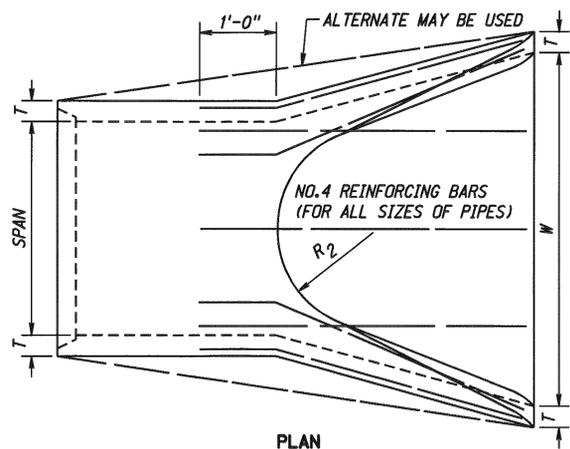
ELEVATION

DETAILS OF CONCRETE FLARED END SECTION
(FOR REINFORCED CONCRETE PIPE)

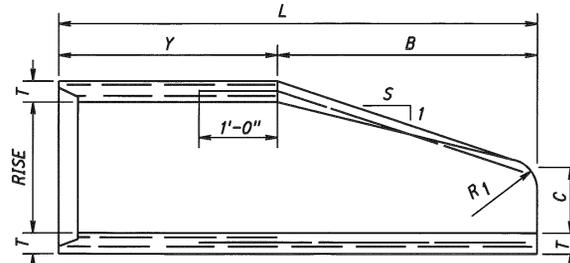
EQUIV. DIA.	NOMINAL DIMENSIONS										
	SPAN	RISE	L ± 6"	B	Y ± 4 1/2"	C	W ± 2"	R ₁	R ₂	S APPROX.	T MIN.
18"	22"	14"	6'-0"	2'-3"	3'-9"	7"	3'-0"	2"	1'-0"	2.2	2 1/2"
24"	29"	18"	6'-0"	3'-3"	2'-9"	9"	4'-0"	3"	1'-2"	2.4	3"
30"	36"	23"	8'-0"	4'-0"	4'-0"	10"	5'-0"	3"	1'-3"	2.3	3 1/2"
36"	44"	27"	8'-0"	5'-0"	3'-0"	11"	6'-0"	6"	1'-8"	2.4	4"
42"	51"	32"	8'-0"	5'-0"	3'-0"	1'-4"	6'-6"	6"	1'-10"	2.4	4 1/2"
48"	59"	36"	8'-0"	5'-0"	3'-0"	1'-9"	7'-0"	6"	1'-10"	2.3	5"
54"	65"	40"	8'-0"	5'-0"	3'-0"	2'-0"	7'-6"	6"	2'-0"	2.1	5 1/2"
60"	74"	45"	8'-0"	5'-0"	3'-0"	2'-3"	8'-0"	6"	1'-9"	2	6"
72"	88"	54"	8'-4"	6'-6"	1'-10"	2'-11"	10'-0"	6"	2'-0"	2	7"



ELEVATION



PLAN



SECTION

DETAILS OF CONCRETE FLARED END SECTION
(FOR REINFORCED CONCRETE PIPE-ARCH)

NOTES

CONCRETE FOR FLARED END SECTIONS SHALL BE IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF A.A.S.H.T.O. DESIGNATION M170, M206, AND M207, FOR CLASS II PIPE.

REINFORCEMENT IN THE "Y" SECTION SHALL BE IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF A.A.S.H.T.O. DESIGNATION M170, M206, AND M207, FOR CLASS II PIPE.

IN ADDITION TO THE REINFORCING BARS SHOWN, REINFORCEMENT IN THE "B" SECTION SHALL HAVE A CROSS-SECTIONAL AREA EQUAL TO THAT OF ONE LAYER OF STEEL IN THE "Y" SECTION.

REV. NO.	DATE	DESCRIPTION OF REVISION
R3	AUG. 99	CHANGED NOTES
R2	MAR. 89	SPAN, RISE SIZES FOR CM PIPE-ARCH
R1	MAR. 85	MULTIPLE CHANGES

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 410-R3
**FLARED END SECTIONS
FOR CULVERT PIPES**

APPROVED:
FEBRUARY 22, 1974
DATE

2
2

TABLE 1 - CONCRETE STANDARD INSTALLATIONS, SOILS AND MINIMUM COMPACTION REQUIREMENTS

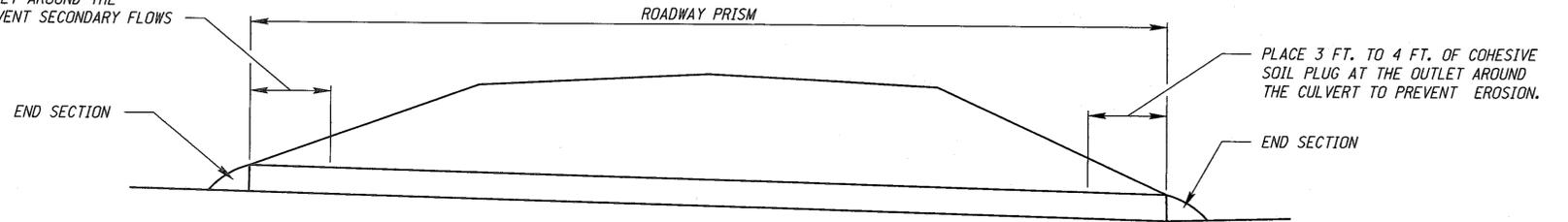
INSTALLATION TYPE	BEDDING THICKNESS	HAUNCH AND OUTER BEDDING	LOWER SIDE
TYPE 1	D ₀ /24 MINIMUM, NOT LESS THAN 3" IF ROCK FOUNDATION, USE D ₀ /12 MINIMUM, NOT LESS THAN 6".	95% SW	90% SW, 95% ML, 100% CL, OR NATURAL SOILS OF EQUAL FIRMNESS
TYPE 2		90% SW OR 95% ML	85% SW, 90% ML, 95% CL, OR NATURAL SOILS OF EQUAL FIRMNESS
*TYPE 3		85% SW, 90% ML, OR 95% CL	85% SW, 90% ML, 95% CL, OR NATURAL SOILS OF EQUAL FIRMNESS

TABLE 1 NOTES:

*THE TYPE 3 INSTALLATION (SHADED) IN TABLE 4 IS THE NDOR MINIMUM STANDARD, USING EITHER A SHAPED TRENCH ACCORDING TO THE STANDARD SPECIFICATIONS, OR AT THE OPTION OF THE CONTRACTOR, THE BEDDING WITH COMPACTIONS AS SHOWN.

MAXIMUM FILL HEIGHTS FOR THE TYPE 1, 2, AND 3 INSTALLATIONS ARE SHOWN IN TABLE 4.

PLACE 3 FT. TO 4 FT. OF COHESIVE SOIL PLUG AT THE INLET AROUND THE CULVERT TO PREVENT SECONDARY FLOWS



LIMITS OF BEDDING AND BACKFILL

EXCAVATION, BEDDING AND EMBANKMENT SEQUENCE:

TRENCH INSTALLATION:

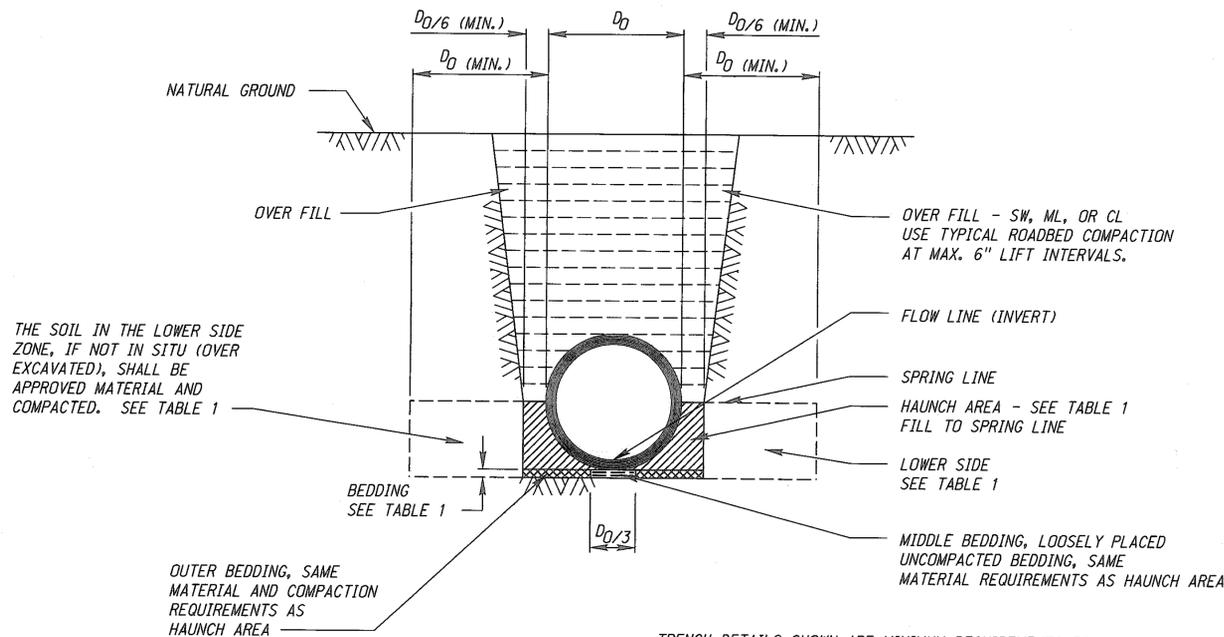
- (A) DETERMINE THE FLOW LINE AND TRENCH BOTTOM ELEVATIONS.
- (B) DETERMINE THE SHAPE OF TRENCH. DECIDE IF SHORING IS NEEDED. CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR THE SAFETY OF ALL WORKERS, EQUIPMENT AND MATERIALS IN THE TRENCH.
- (C) PLACE THE BEDDING MATERIAL (SEE CONCRETE - TABLE 1) LOOSELY.
- (D) PLACE PIPE ON THE BEDDING AND COMPACT OUTER BEDDING, (SEE TABLE 1).
- (E) PLACE AND COMPACT THE LOWER SIDE, HAUNCH AND OVERFILL MATERIAL AT 6 IN. INTERVALS.

EMBANKMENT INSTALLATION:

- (A) DETERMINE THE FLOW LINE AND SPRING LINE ELEVATION.
- (B) IF FLOW LINE IS ABOVE THE NATURAL GROUND, PLACE AN EMBANKMENT AT LEAST 300 WIDE WITH 3:1 FORESLOPES OR FLATTER AT SPRING LINE ELEVATION, COMPACTED AT ROADBED REQUIRED COMPACTION.
- (C) IF THE FLOW LINE IS BELOW THE NATURAL GROUND BUT THE SPRING LINE IS ABOVE THE NATURAL GROUND, PLACE THE EMBANKMENT SIMILAR TO THE ONE IN STEP B.
- (D) EXCAVATE TO PROPER ELEVATION.
- (E) PLACE BEDDING MATERIAL (SEE TABLE 1) LOOSELY.
- (F) PLACE THE PIPE ON THE BEDDING MATERIAL AND COMPACT OUTER BEDDING MATERIAL (SEE CONCRETE - TABLE 1).
- (G) PLACE AND COMPACT THE HAUNCH, LOWER SIDE AND OVERFILL MATERIAL AT 6 IN. INTERVALS.

NOTES FOR TRENCH INSTALLATIONS:

1. COMPACTION AND SOIL SYMBOLS, I.E. 95% SW, REFER TO SW SOIL MATERIAL WITH MINIMUM STANDARD PROCTOR COMPACTION OF 95%.
2. THE TRENCH TOP ELEVATION SHALL BE NO LOWER THAN 1 FT. BELOW THE BOTTOM OF THE PAVEMENT BASE MATERIAL.
3. SOIL IN BEDDING AND HAUNCH ZONES SHALL BE COMPACTED TO AT LEAST THE SAME COMPACTION AS SPECIFIED FOR THE MAJORITY OF SOIL IN THE BACKFILL ZONES.
4. THE TRENCH WIDTH SHALL BE WIDER THAN SHOWN IF REQUIRED FOR ADEQUATE SPACE TO ATTAIN THE SPECIFIED COMPACTION IN THE HAUNCH AND BEDDING ZONES.
5. FOR TRENCH WALLS THAT ARE WITHIN 10 DEGREES OF VERTICAL, THE COMPACTION OR FIRMNESS OF THE SOIL IN THE TRENCH WALLS AND LOWER SIDE ZONE NEED NOT TO BE CONSIDERED.
6. FOR TRENCH WALLS WITH GREATER THAN 10 DEGREE SLOPES THAT CONSIST OF EMBANKMENT, THE LOWER SIDE SHALL BE COMPACTED TO AT LEAST THE SAME COMPACTION AS SPECIFIED FOR THE SOIL IN THE BACKFILL ZONE.



TRENCHES SHALL BE EXCAVATED IN ACCORDANCE WITH APPROVED SAFETY PRACTICE.

TYPICAL TRENCH INSTALLATION

R1	OCT. 14	UP TO 60" PLASTIC ALLOWED IN ALL OF TABLE 1 - PLASTIC
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF ROADS STANDARD PLAN NO. 411-R1 BEDDING AND BACKFILL REQUIREMENTS FOR CONCRETE PIPE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM		ORIGINAL: JUNE 6, 2008 DATE
MICK S. SYSLO, E-10045 PROFESSIONAL ENGINEER STATE OF NEBRASKA		
OCT 2014 DATE		1 4

TABLE 1 - CONCRETE STANDARD INSTALLATIONS, SOILS AND MINIMUM COMPACTION REQUIREMENTS

INSTALLATION TYPE	BEDDING THICKNESS	HAUNCH AND OUTER BEDDING	LOWER SIDE
TYPE 1	D ₀ /24 MINIMUM, NOT LESS THAN 3" IF ROCK FOUNDATION, USE D ₀ /12 MINIMUM, NOT LESS THAN 6".	95% SW	90% SW, 95% ML OR 100% CL
TYPE 2		90% SW OR 95% ML	85% SW, 90% ML OR 95% CL
*TYPE 3		85% SW, 90% ML, OR 95% CL	85% SW, 90% ML OR 95% CL

TABLE 1 NOTES:

*THE TYPE 3 INSTALLATION (SHADED) IN TABLE 4 IS THE NDOR MINIMUM STANDARD, USING EITHER A SHAPED TRENCH ACCORDING TO THE STANDARD SPECIFICATIONS, OR AT THE OPTION OF THE CONTRACTOR, THE BEDDING WITH COMPACTIONS AS SHOWN.

MAXIMUM FILL HEIGHTS FOR THE TYPE 1, 2, AND 3 INSTALLATIONS ARE SHOWN IN TABLE 4.

TABLE 2 - CONCRETE PIPE DIMENSIONS

NOMINAL PIPE DIAMETER (INCHES)	STANDARD OUTSIDE PIPE DIAMETER, D ₀ (SPAN)			
	ROUND PIPE	ARCH PIPE	H. ELLIP. PIPE	V. ELLIP. PIPE
15	19.5	22.5		
18	23	27	28.5	
21	26.5	31.5		
24	30	34.5	36.5	
27	33.5		41	
30	37	43.25	45.5	
36	44	51.75	54	38
42	51	60.13	63	44
48	58	68.5	71	49
54	65	76	80	55
60	72	85	89	61
66	79		97	67
72	86	102	106	73
78	93		114	79
84	100	118	123	85
90	107			
96	114			
102	121			
108	128			

TABLE 3 SOIL CLASSIFICATION FOR BEDDING & BACKFILL

ASTM SOIL GROUP SYMBOL D 2487	DESCRIPTION	PERCENTAGE PASSING SIEVE SIZES		
		1 1/2 IN.	NO. 4	NO. 200
SW	WELL GRADED SANDS AND GRAVELLY-SANDS: LITTLE OR NO FINES. NON PLASTIC	100%	> 50% OF "COURSE FRACTION"	< 5%
ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY-FINE-SANDS, SILTS WITH SLIGHT PLASTICITY		100%	> 50%
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELY-CLAYS, SANDY-CLAYS, SILTY-CLAYS, LEAN CLAYS			

NOTES FOR EMBANKMENT INSTALLATIONS:

1. COMPACTION AND SOIL SYMBOLS, I.E. 95% SW, REFER TO SW SOIL MATERIAL WITH A MINIMUM STANDARD PROCTOR COMPACTION OF 95%.
2. SOIL IN THE OUTER BEDDING, HAUNCH, AND LOWER SIDE ZONES, EXCEPT WITHIN THE D₀/3 MIDDLE BEDDING, SHALL BE COMPACTED TO AT LEAST THE SAME COMPACTION AS THE MAJORITY OF THE SOIL IN THE OVERFILL ZONES.
3. SUBTRENCHES
 - 3.1 A SUBTRENCH IS DEFINED AS A TRENCH WITH ITS TOP AT AN ELEVATION LOWER THAN 1 FT. BELOW THE BOTTOM OF THE PAVEMENT BASE MATERIAL.
 - 3.2 THE MINIMUM WIDTH OF A SUBTRENCH SHALL BE 1.33D₀, OR WIDER IF REQUIRED FOR ADEQUATE SPACE TO ATTAIN THE SPECIFIED COMPACTION IN THE HAUNCH AND BEDDING ZONES.
 - 3.3 FOR SUBTRENCHES WITH WALLS OF NATURAL SOIL, ANY PORTION OF THE LOWER SIDE ZONE IN THE SUBTRENCH WALL SHALL BE AT LEAST AS FIRM AS AN EQUIVALENT SOIL PLACED TO THE COMPACTION REQUIREMENTS SPECIFIED FOR THE LOWER SIDE ZONE, AND AS FIRM AS THE MAJORITY OF SOIL IN THE OVERFILL ZONE, OR SHALL BE REMOVED AND REPLACED WITH SOIL COMPACTED TO THE SPECIFIED LEVEL.

GENERAL NOTES:

WHEN IN-SITU LATERAL SOIL RESISTANCE IS NEGLIGIBLE, E.G. PEAT, MUCK, OR HIGHLY EXPANSIVE SOIL, EMBEDMENT SHALL BE PLACED AND COMPACTED AT THE DIRECTION OF THE ENGINEER.

TO PROTECT THE PIPE AND BACKFILL DURING CONSTRUCTION, PROVIDE A MINIMUM OF 36" OF COMPACTED FILL MATERIAL OVER THE TOP OF THE PIPE BEFORE ALLOWING ANY HEAVY EQUIPMENT TO TRAVERSE OVER THE PIPE. EXTREMELY HEAVY EQUIPMENT MAY REQUIRE LARGER COVER AS DETERMINED BY THE CONTRACTOR.

THE PIPE VOLUME SHOULD NOT BE SUBTRACTED FROM THE VOLUME OF EXCAVATION.

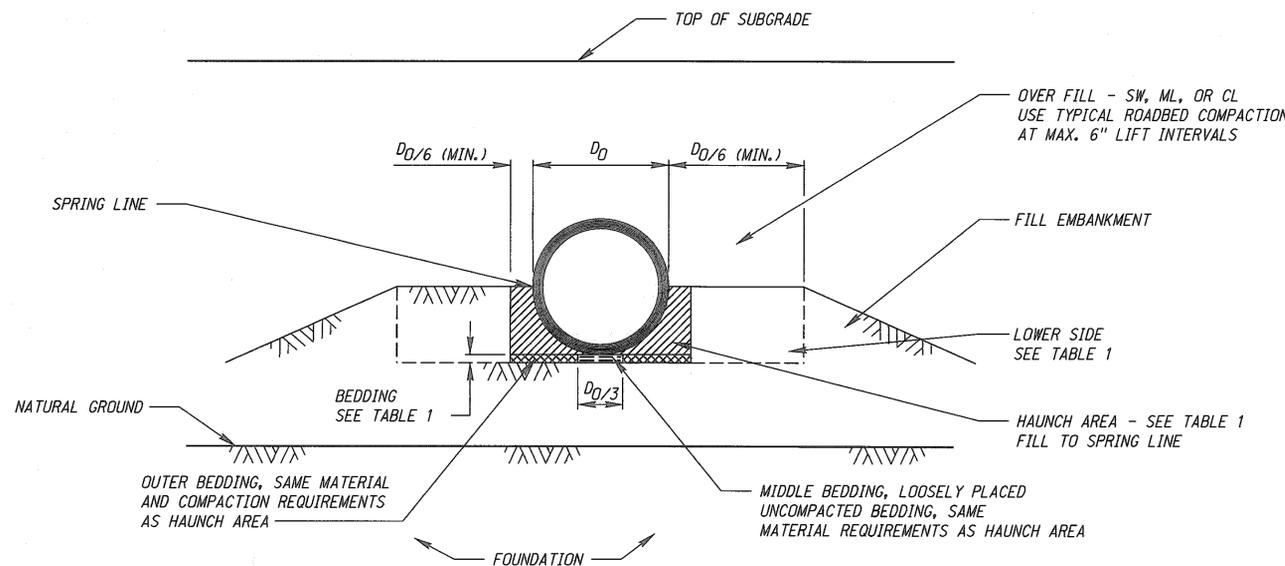
THESE DESIGN STANDARDS ARE MINIMUM. IF A MORE RESTRICTIVE DESIGN IS REQUIRED BY THE ENGINEER OR CULVERT MANUFACTURER, THEN THESE STANDARDS SHALL BE MODIFIED. CHANGES TO PAY ITEM QUANTITIES DUE TO UNFORESEEN SITE CONDITIONS SHALL BE CALCULATED AND INCORPORATED INTO THE CONTRACT THRU A CHANGE ORDER.

BOTH ENDS OF THE PIPE SHALL BE SEALED WITH COHESIVE SOIL (AROUND THE PIPE EXTENDING 3 FT. TO 4 FT. FROM EACH END) TO PROTECT AGAINST INFILTRATION AND EROSION.

BEDDING AND BACKFILL MATERIAL IS NOT PAID FOR DIRECTLY, BUT IS SUBSIDIARY TO THE LINEAR FEET OF CULVERT.

BEDDING AND BACKFILL MATERIAL SHALL MEET ASTM D 2487 (SOIL GROUPS AS SHOWN IN TABLE 3).

PERCENT COMPACTION SHALL BE DETERMINED IN ACCORDANCE WITH NDOR STANDARD TEST METHOD T 99.



TYPICAL EMBANKMENT INSTALLATION

R1	OCT. 14	UP TO 60" PLASTIC ALLOWED IN ALL OF TABLE 1 - PLASTIC
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF ROADS STANDARD PLAN NO. 411-R1 BEDDING AND BACKFILL REQUIREMENTS FOR CONCRETE PIPE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		ORIGINAL: JUNE 6, 2008 DATE
OCT 2014 DATE		2 4

TABLE 1 - CONCRETE STANDARD INSTALLATIONS, SOILS AND MINIMUM COMPACTION REQUIREMENTS

INSTALLATION TYPE	BEDDING THICKNESS	HAUNCH AND OUTER BEDDING	LOWER SIDE
TYPE 1	D ₀ /24 MINIMUM, NOT LESS THAN 3" IF ROCK FOUNDATION, USE D ₀ /12 MINIMUM, NOT LESS THAN 6".	95% SW	90% SW, 95% ML OR 100% CL
TYPE 2		90% SW OR 95% ML	85% SW, 90% ML OR 95% CL
*TYPE 3		85% SW, 90% ML, OR 95% CL	85% SW, 90% ML OR 95% CL

NOTES:

* THE TYPE 3 INSTALLATION (SHADED) IN TABLE 4 IS THE NDOR MINIMUM STANDARD, USING EITHER A SHAPED TRENCH ACCORDING TO THE STANDARD SPECIFICATIONS, OR AT THE OPTION OF THE CONTRACTOR, THE BEDDING WITH COMPACTIONS AS SHOWN.

MAXIMUM FILL HEIGHTS FOR THE TYPE 1, 2, AND 3 INSTALLATIONS ARE SHOWN IN TABLE 4.

INSTALLATION TYPE 2 AND TYPE 1 ARE IMPROVED METHODS IN ORDER TO SUPPORT HIGHER FILL HEIGHTS USING CLASS III, IV, AND V CIRCULAR CONCRETE PIPE. INSTALLATION TYPE I WILL PROVIDE THE BEST IN-SITU PERFORMANCE USING GREATER COMPACTION WITH GRANULAR BEDDING AND BACKFILL. THE CONTRACTOR WILL CHOOSE THE INSTALLATION TYPE AND CLASS OF PIPE. ACTUAL PROJECT FILL HEIGHTS MUST BE KNOWN IN ORDER TO USE TABLE 4.

ROUND EQUIVALENT, NON-CIRCULAR PIPE SUCH AS ARCH OR ELLIPTICAL PIPE, MAY BE SELECTED, PROVIDED SUCH PIPE ARE DESIGNED AND MANUFACTURED TO THE SAME D-LOADS AND ULTIMATE STRENGTHS (SEE TABLE 5) AS THE SELECTED CIRCULAR PIPE FROM THE FILL HEIGHT TABLE.

TABLE 5 D-LOADS FOR CONCRETE PIPE

PIPE CLASS	III	IV	V
D-LOAD TO PRODUCE A 0.01-IN. CRACK	1350	2000	3000
D-LOAD TO PRODUCE THE ULTIMATE LOAD	2000	3000	3750

NOTES:

LOAD ON PIPE IN POUNDS PER LINEAR FOOT = D-LOAD X INSIDE SPAN IN FEET
D-LOAD = TEST LOAD EXPRESSED IN POUNDS-FORCE PER LINEAR FOOT PER FOOT OF DIAMETER

TABLE 4 MAXIMUM FILL HEIGHTS (FEET) FOR STANDARD DESIGN (AASHTO M 170) ROUND CONCRETE PIPE

PIPE SIZE (IN.)	INSTALLATION TYPE 3* (NDOR STANDARD)			INSTALLATION TYPE 2			INSTALLATION TYPE 1		
	CLASS III	CLASS IV	CLASS V	CLASS III	CLASS IV	CLASS V	CLASS III	CLASS IV	CLASS V
15	12	15	21	15	19	26	23	28	40
18	12	17	24	16	22	30	24	32	45
21	13	19	26	16	24	32	25	37	48
24	13	19	26	17	24	33	25	32	45
27	13	17	26	17	21	34	23	26	51
30	12	14	25	15	17	32	20	21	49
36	10	16	24	13	21	31	20	31	47
42	10	15	23	13	19	29	20	29	44
48	10	14	22	13	18	29	20	28	43
54	10	14		13	17		20	27	
60	9	14		12	18		19	28	
66	9	14		12	18		19	28	
72	9	14		12	18		19	28	
78	9			12			19		
84	9			12			19		
90	9			12			20		
96	9			12			19		
102	10			13			20		
108	10			14			22		

TABLE 4 NOTES:

AASHTO M 170 SPECIFICATIONS ARE MODIFIED AS FOLLOWS:

ONLY SINGLE INNER CAGE, CIRCULAR REINFORCING IS ALLOWED FOR CLASS III, 15", 18", 21", AND 24" ROUND RCP AS SHOWN:

PIPE SIZE (IN.)	CLASS	MINIMUM CIRCUMFERENTIAL REINFORCING (IN. ² /FT. OF PIPE WALL)
15	III	0.08
18	III	0.10
21	III	0.12
24	III	0.14

APPLICABLE SPECIFICATIONS:

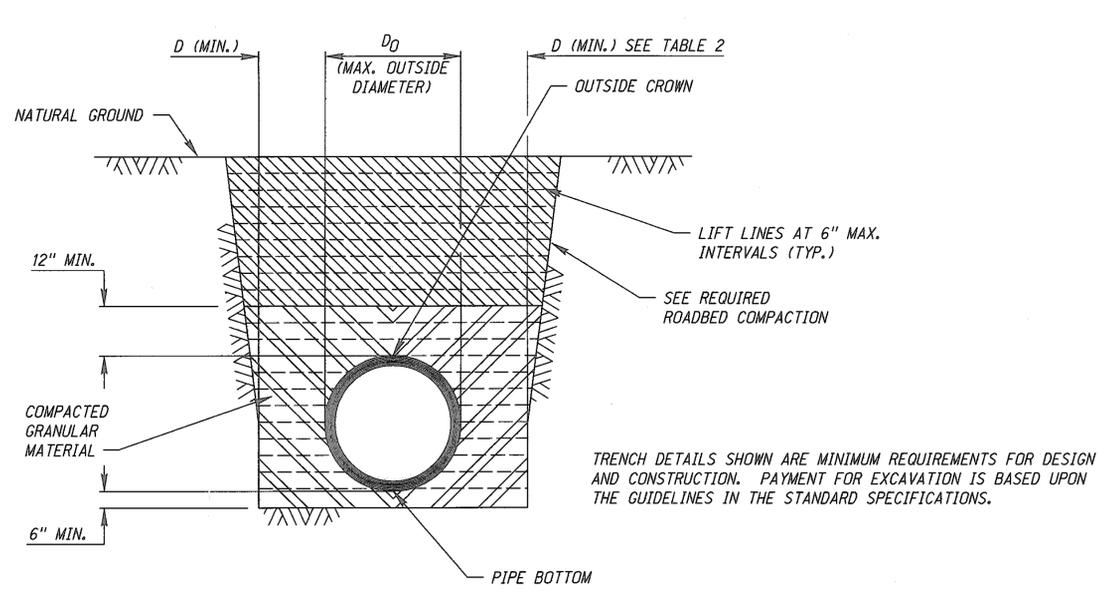
- AASHTO M 170---ROUND RCP
- AASHTO M 206---ARCH RCP
- AASHTO M 207---ELLIPTICAL RCP

GENERAL NOTES:

FILL HEIGHTS SHOWN IN TABLE 4 WERE DEVELOPED USING ASCE STANDARDS FOR DIRECT DESIGN OF BURIED PRECAST CONCRETE PIPE, MANUFACTURED IN ACCORDANCE WITH AASHTO M 170 SPECIFICATION REQUIREMENTS (SEE TABLE 4 FOOTNOTE FOR EXCEPTIONS). FILL HEIGHTS SHOWN APPLY ONLY TO ROUND PIPE (UNDER FULL FLOW CONDITIONS), USED UNDER RIGID AND FLEXIBLE PAVEMENT, WITH SOIL OVERFILL WEIGHING 120 POUNDS PER CUBIC FOOT. UNDER SPECIAL CIRCUMSTANCES (WHERE PAVEMENT IS NOT USED AND LIVE LOAD BECOMES CRITICAL, OR DIFFERENT SOIL DENSITY IS ENCOUNTERED, OR THE ONE FOOT MINIMUM CLEARANCE FROM THE BOTTOM OF THE PAVEMENT TO THE TOP OF THE PIPE CANNOT BE MAINTAINED) THESE FILL HEIGHTS MAY NEED TO BE MODIFIED. DEEPER FILL HEIGHTS MAY BE USED BY SUBMITTING A SPECIAL STANDARD INSTALLATION DIRECT DESIGN (SIDD) FOR NDOR APPROVAL.

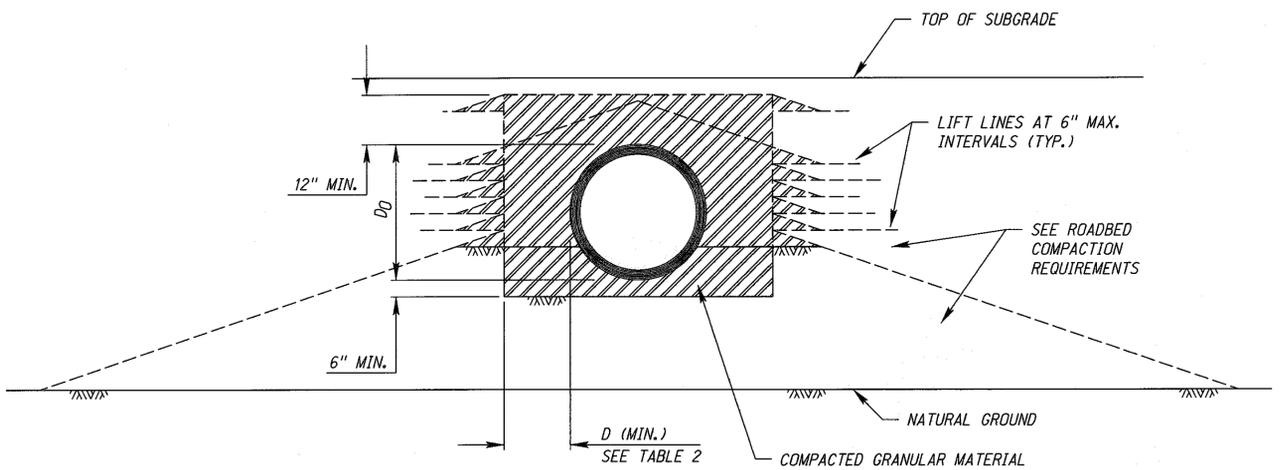
CONCRETE PIPE DESIGNS THAT ARE NOT SHOWN IN APPLICABLE AASHTO SPECIFICATIONS WILL BE CONSIDERED SPECIAL DESIGNS THAT MUST BE SUBMITTED TO NDOR FOR APPROVAL.

R1	OCT. 14	UP TO 60" PLASTIC ALLOWED IN ALL OF TABLE 1 - PLASTIC
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NEBRASKA DEPARTMENT OF ROADS STANDARD PLAN NO. 411-R1 BEDDING AND BACKFILL REQUIREMENTS FOR CONCRETE PIPE		
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DATE: OCT 2014		
ORIGINAL: JUNE 6, 2008		3 4



TRENCHES SHALL BE EXCAVATED IN ACCORDANCE WITH APPROVED SAFETY PRACTICE.

TYPICAL TRENCH INSTALLATION



TYPICAL EMBANKMENT INSTALLATION

TABLE 1 - PLASTIC SOIL CLASSIFICATION FOR GRANULAR FILL MATERIAL

SOIL GROUP SYMBOL D 2487	DESCRIPTION	% PASSING SIEVE SIZES		
		1 1/2 IN.	NO. 4	NO. 200
GW	WELL GRADED GRAVEL AND GRAVEL-SAND MIXTURES; LITTLE OR NO FINES.	100%	< 50% OF COARSE FRACTION	< 5%
GP	POORLY GRADED GRAVEL AND GRAVEL-SAND MIXTURES; LITTLE OR NO FINES.			
SW	WELL GRADED SAND AND GRAVEL-SANDS; LITTLE OR NO FINES.		> 50% OF COARSE FRACTION	
SP	POORLY GRADED SAND AND GRAVEL-SANDS; LITTLE OR NO FINES.	100%	> 50% OF COARSE FRACTION	5% TO 12%
E.G. GW-GC SP-SM	SAND AND GRAVELS WHICH ARE BORDER LINE BETWEEN CLEAN AND WITH FINES.			
GM	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURES.			
GC	CLAYEY-GRAVEL, GRAVEL-SAND-CLAY MIXTURES.	100%	> 50% OF COARSE FRACTION	12% TO 50%
SM	SILTY SANDS, SAND-SILT MIXTURES.			

TABLE 2 - PLASTIC MINIMUM D (INCHES)

NOMINAL PIPE DIAMETER (INCHES)	TRENCH INSTALLATION		EMBANKMENT INSTALLATION	
	METAL PIPE	PLASTIC PIPE	METAL PIPE	PLASTIC PIPE
15	11	11	15	15
18	12	12	18	18
24	13	13	24	24
30	15	15	24	24
36	17	17	24	24
42	24	24	24	24
48	24	24	24	24
54	24	24	24	24
60	24	24	24	24
66	24		24	
72	24		24	
78	24		24	
84	24		24	

NOTES:

INSTALLATIONS AS SHOWN ARE REQUIRED UNDER ALL SURFACED ROADWAYS. BEDDING AND BACKFILL FOR DRIVE PIPE OR OTHER PIPE OUTSIDE THE ROADWAY PRISM (OR BACK OF CURB-LINE FOR URBAN PROJECTS) MAY BE INSTALLED USING SUITABLE EXISTING SOIL, PLACED AND COMPACTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHERE IN-SITU LATERAL SOIL RESISTANCE IS NEGLIGIBLE E.G. PEAT, MUCK, OR HIGHLY EXPANSIVE SOIL, EMBEDMENT SHALL BE PLACED AND COMPACTED AT THE DIRECTION OF THE ENGINEER.

TO PROTECT THE PIPE AND BACKFILL DURING CONSTRUCTION, PROVIDE A MINIMUM OF 36" OF COMPACTED FILL MATERIAL OVER THE TOP OF THE PIPE BEFORE ALLOWING ANY HEAVY EQUIPMENT TO TRAVERSE OVER THE PIPE. EXTREMELY HEAVY EQUIPMENT MAY REQUIRE LARGER COVER AS DETERMINED BY THE CONTRACTOR.

PIPE VOLUME SHOULD NOT BE SUBTRACTED FROM THE VOLUME OF EXCAVATION.

THESE DESIGN STANDARDS ARE MINIMUM. IF A MORE RESTRICTIVE DESIGN IS REQUIRED BY THE ENGINEER OR THE CULVERT MANUFACTURER, THEN THESE STANDARDS SHALL BE MODIFIED. CHANGES TO PAY ITEM QUANTITIES DUE TO UNFORESEEN SITE CONDITIONS SHALL BE CALCULATED AND INCORPORATED INTO THE CONTRACT BY A CHANGE ORDER.

EXPOSED ENDS OF THE PIPE SHALL BE SEALED WITH COHESIVE SOIL (AROUND THE PIPE EXTENDING 3 FT. TO 4 FT. FROM EACH END) TO PROTECT AGAINST INFILTRATION AND EROSION.

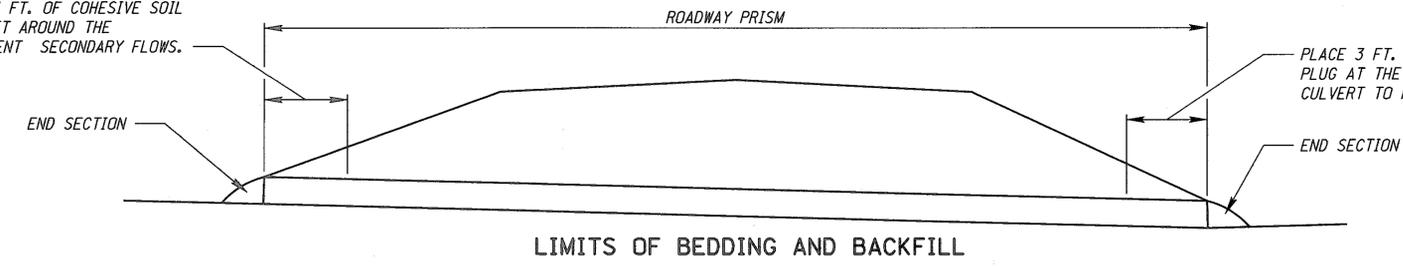
GRANULAR FILL MATERIAL IS NOT PAID FOR DIRECTLY, BUT IS SUBSIDIARY TO THE LINEAR FEET OF CULVERT.

GRANULAR MATERIAL SHALL MEET ASTM D 2487 (SOIL GROUP AS SHOWN IN TABLE 1). MATERIAL SHALL BE COMPACTED TO AT LEAST 90% PROCTOR TEST DENSITY.

PERCENT COMPACTON SHALL BE DETERMINED IN ACCORDANCE WITH NDOR STANDARD TEST METHOD T 99.

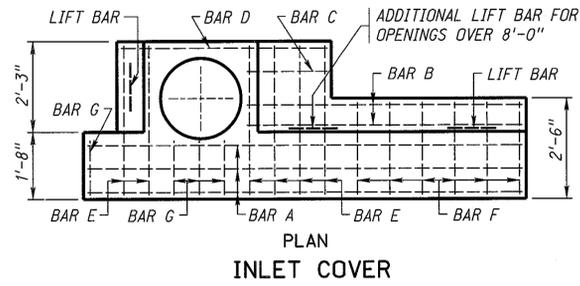
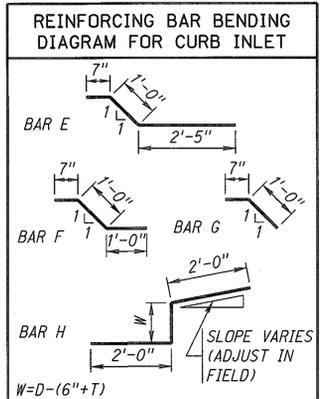
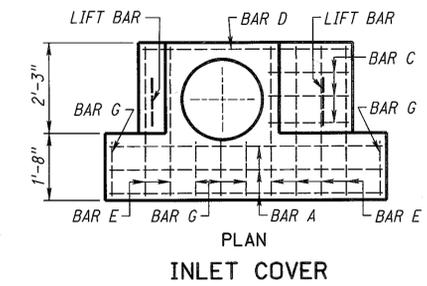
PLACE 3 FT. TO 4 FT. OF COHESIVE SOIL PLUG AT THE INLET AROUND THE CULVERT TO PREVENT SECONDARY FLOWS.

PLACE 3 FT. TO 4 FT. OF COHESIVE SOIL PLUG AT THE OUTLET AROUND THE CULVERT TO PREVENT EROSION.

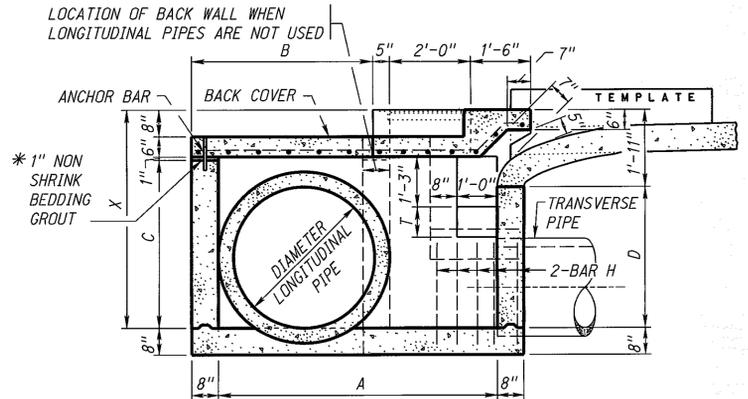
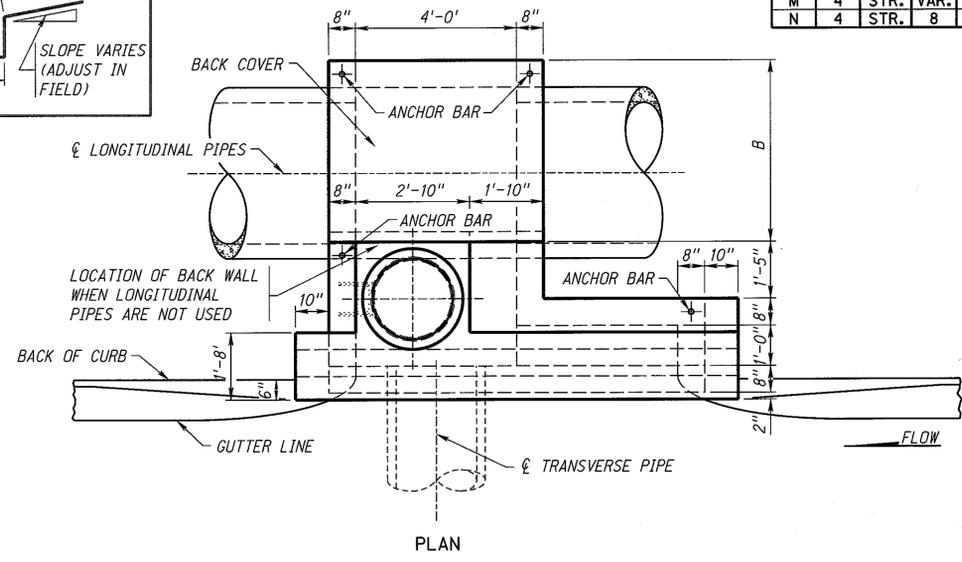
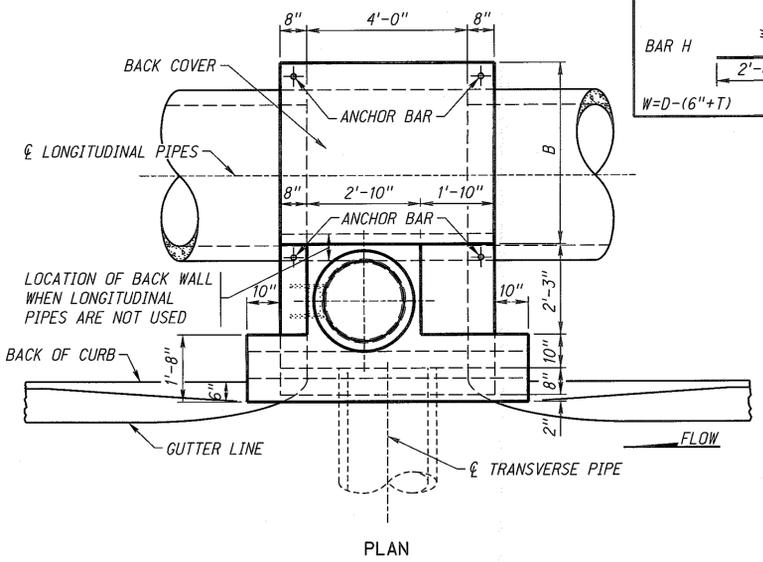


LIMITS OF BEDDING AND BACKFILL

R1	OCT. 14	UP TO 60" PLASTIC ALLOWED IN ALL OF TABLE 1 - PLASTIC
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF ROADS STANDARD PLAN NO. 411-R1 BEDDING AND BACKFILL REQUIREMENTS FOR MCCMP, PCCMP, & PLASTIC PIPE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
		DATE OCT 2014
ORIGINAL: JUNE 6, 2008 DATE		4 4

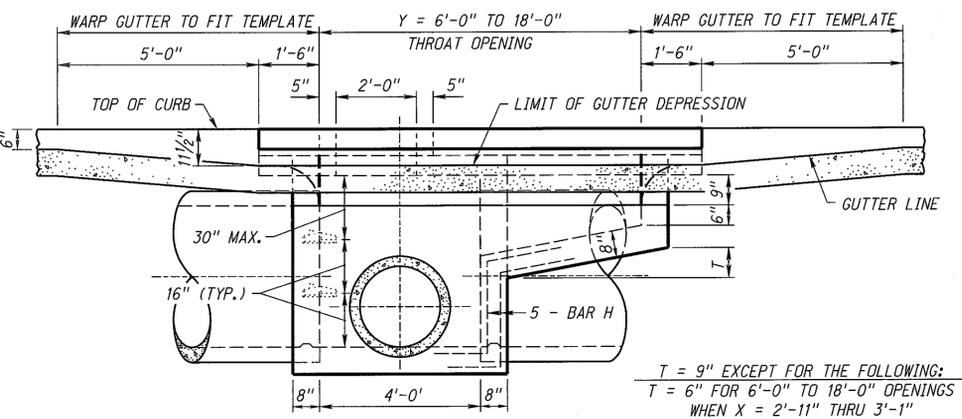
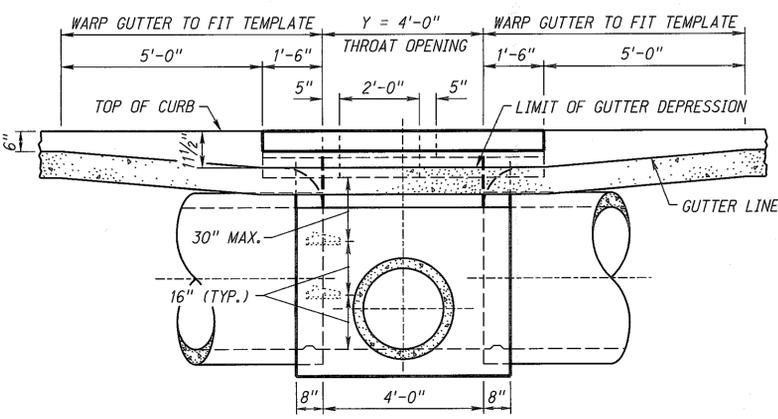


BAR	SIZE	SHAPE	Y = 4'-0"		Y = 6'-0"		Y = 8'-0"		Y = 10'-0"		Y = 12'-0"		Y = 14'-0"		Y = 16'-0"		Y = 18'-0"	
			NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
A	8	STR.	3	6'-9"	3	8'-9"	3	10'-9"	3	12'-9"	3	14'-9"	3	16'-9"	3	18'-9"	3	20'-9"
B	6	STR.	---	---	2	4'-10"	2	6'-10"	2	8'-10"	2	10'-10"	2	12'-10"	2	14'-10"	2	16'-10"
C	6	STR.	3	2'-0"	1	2'-0"	1	2'-0"	1	2'-0"	1	2'-0"	1	2'-0"	1	2'-0"	1	2'-0"
D	6	STR.	1	5'-1"	1	5'-1"	1	5'-1"	1	5'-1"	1	5'-1"	1	5'-1"	1	5'-1"	1	5'-1"
E	5	BENT	6	4'-0"	6	4'-0"	6	4'-0"	6	4'-0"	6	4'-0"	6	4'-0"	6	4'-0"	6	4'-0"
F	5	BENT	---	---	3	2'-7"	6	2'-7"	8	2'-7"	11	2'-7"	13	2'-7"	16	2'-7"	18	2'-7"
G	5	BENT	5	1'-7"	4	1'-7"	4	1'-7"	4	1'-7"	4	1'-7"	4	1'-7"	4	1'-7"	4	1'-7"
H	4	BENT	---	---	10	W=4'-0"	10	W=4'-0"	10	W=4'-0"	10	W=4'-0"	10	W=4'-0"	10	W=4'-0"	10	W=4'-0"
J	4	STR.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
K	4	STR.	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LIFT	4	BENT	VAR.	2'-6"	VAR.	2'-6"	VAR.	2'-6"	VAR.	2'-6"	VAR.	2'-6"	VAR.	2'-6"	VAR.	2'-6"	VAR.	2'-6"
M	4	STR.	VAR.	5'-1"	VAR.	5'-1"	VAR.	5'-1"	VAR.	5'-1"	VAR.	5'-1"	VAR.	5'-1"	VAR.	5'-1"	VAR.	5'-1"
N	4	STR.	8	B-3	8	B-3	8	B-3	8	B-3	8	B-3	8	B-3	8	B-3	8	B-3



LOCATION OF BACK WALL WHEN LONGITUDINAL PIPES ARE NOT USED

* GROUT SHALL BE FINISHED SUCH THAT THE TOP ELEVATION OF THE INLET LID, WHEN INSTALLED, MATCHES THE FINISHED SHOULDER SLOPE OF THE ROADWAY CROSS-SECTIONS.



T = 9" EXCEPT FOR THE FOLLOWING:
T = 6" FOR 6'-0" TO 18'-0" OPENINGS
WHEN X = 2'-11" THRU 3'-1"
T = 1'-6" FOR 14'-0" TO 18'-0" OPENINGS
WHEN X = 3'-11" THRU 7'-5"

NOTES:

THE MINIMUM COVERING, MEASURED FROM THE FACE OF CONCRETE TO THE SURFACE OF ANY REINFORCING BAR, SHALL BE 1/2".

THE QUANTITIES OF CONCRETE AND STEEL FOR CURB INLET INCLUDES THAT PORTION OF CONCRETE AND STEEL BELOW AND BACK OF THE CURB SECTION AS SHOWN ON THIS PLAN.

THE CONCRETE COVERS MAY BE CAST IN PLACE OR PRECAST.

THE CAST IRON COVERS, FRAMES SHALL BE GREY IRON CONFORMING TO THE SPECIFICATIONS. CAST IRON STEPS SHALL BE INSTALLED IN CURB INLETS AND JUNCTION BOXES WHEN THE "X" DIMENSION IS 4'-6" OR GREATER. THE FURNISHING AND PLACING OF CAST IRON STEPS SHALL BE SUBSIDIARY TO THE ITEM FOR WHICH DIRECT PAYMENT IS MADE.

THE GUTTER DEPRESSION TEMPLATE SHALL BE USED THROUGHOUT THE THROAT OPENING.

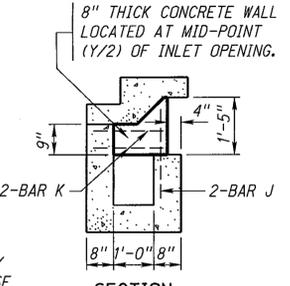
CLASS OF CONCRETE AND MINIMUM COMPRESSIVE STRENGTH AND TYPE OF STEEL FOR REINFORCING BARS SHALL CONFORM TO THE DEPARTMENT OF ROADS "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION."

THE INLET COVER SHALL BE IMPRINTED "NO DUMPING" SEE SHEET 2 OF 2.

CURB INLETS

DIA. OF LONGIT. PIPE	DIMENSIONS					QUANTITIES																NO. OF M BARS	ADDITIONAL QUANTITIES PER ONE FOOT INCREASE OF DIMENSION "X"	
	x ① (MIN.)	A ②	B	C	D	CONCRETE, CU. YDS. ③								REINFORCING STEEL, LBS.									CONCRETE CU. YDS.	REINF. STEEL LBS. ④
						Y=4'	Y=6'	Y=8'	Y=10'	Y=12'	Y=14'	Y=16'	Y=18'	Y=4'	Y=6'	Y=8'	Y=10'	Y=12'	Y=14'	Y=16'	Y=18'			
---	3'-11"	2'-8"	---	2'-8"	2'-0"	2.08	2.43	2.79	3.15	3.51	4.06	4.46	4.85	113	175	202	231	259	289	316	344	NONE	0.383	6.7
12"	2'-11"	4'-0"	1'-7"	1'-8"	1'-0"	2.14	2.51	2.86	3.21	3.56	3.95	4.30	4.65	133	186	216	245	274	310	340	364	3	0.459	6.7
15"	3'-2"	4'-3"	1'-11"	1'-3"	---	2.37	2.71	3.07	3.43	3.79	4.21	4.57	4.94	136	193	221	250	277	312	342	370	3	0.473	6.7
18"	3'-5"	4'-7"	2'-2"	2'-2"	1'-6"	2.60	2.95	3.30	3.67	4.03	4.44	4.80	5.16	141	200	228	257	284	318	349	376	4	0.490	6.7
21"	3'-8"	4'-11"	2'-6"	2'-5"	1'-9"	2.83	3.19	3.53	3.90	4.26	4.68	5.04	5.40	144	203	231	260	287	322	351	379	4	0.504	6.7
24"	3'-11"	5'-2"	2'-9"	2'-8"	2'-0"	3.06	3.41	3.76	4.12	4.49	5.04	5.43	5.83	148	210	238	267	294	324	352	379	5	0.518	6.7
27"	4'-2"	5'-6"	3'-1"	2'-11"	2'-3"	3.31	3.66	4.01	4.37	4.74	5.29	5.68	6.08	150	213	241	270	297	327	354	382	5	0.532	6.7
30"	4'-5"	5'-9"	3'-4"	3'-2"	2'-6"	3.54	3.89	4.25	4.61	4.97	5.52	5.92	6.32	151	217	244	273	301	331	358	385	5	0.547	6.7
36"	4'-11"	6'-4"	3'-11"	3'-8"	3'-0"	4.06	4.41	4.77	5.13	5.49	6.04	6.44	6.83	158	226	254	283	310	340	368	395	6	0.576	6.7
42"	5'-5"	6'-11"	4'-6"	4'-2"	3'-6"	4.60	4.95	5.31	5.67	6.03	6.58	6.98	7.38	164	236	264	293	320	350	378	405	7	0.605	6.7
48"	5'-11"	7'-6"	5'-1"	4'-8"	4'-0"	5.18	5.53	5.89	6.25	6.61	7.16	7.56	7.95	171	246	274	303	330	360	387	415	8	0.634	6.7
54"	6'-5"	8'-1"	5'-8"	5'-2"	4'-6"	5.78	6.13	6.49	6.85	7.21	7.76	8.16	8.56	174	253	280	309	337	367	394	421	8	0.663	6.7
60"	6'-11"	8'-8"	6'-3"	5'-8"	5'-0"	6.41	6.76	7.12	7.48	7.84	8.39	8.79	9.19	180	262	290	319	346	376	404	431	9	0.691	6.7
66"	7'-5"	9'-3"	6'-10"	6'-2"	5'-6"	7.07	7.42	7.78	8.14	8.50	9.05	9.45	9.85	187	272	300	329	356	386	414	441	10	0.720	6.7

- ① "X" SHALL NOT EXCEED 7'-6".
- ② "A" SHALL NOT EXCEED 10'-0".
- ③ NO DEDUCTIONS WILL BE MADE FOR PIPE OPENINGS.
- ④ NOT APPLICABLE WHERE Y = 4'-0". DIAMETER OF PIPE AND MINIMUM "X" IN THIS INLET DATA TABLE ARE BASED ON THE LONGITUDINAL PIPE. DEPTH OF THE INLET MAY BE GOVERNED BY THE TRANSVERSE PIPE (MINIMUM "D" = TRANSVERSE PIPE DIAMETER PLUS 9").



SECTION
FOR 14'-0", 16'-0" & 18'-0" INLET OPENINGS
MID-POINT COVER SUPPORT

R9	APR 14	PUT Y1-2" BACK IN JUNCTION BOX
R8	JUL 11	FACE ARMOR DETAIL
R7	JAN 07	NO DUMPING, DRAINS TO STREAM
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 443-R9

CURB INLETS AND JUNCTION BOX

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM.

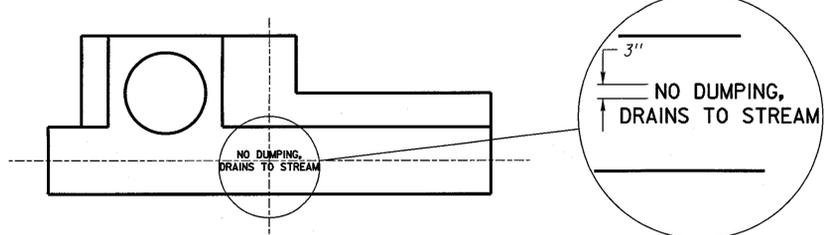
JAMES J. KNOTT
E-6035
10/08

11/6/15
DATE

ORIGINAL:
FEBRUARY 22, 1974
DATE

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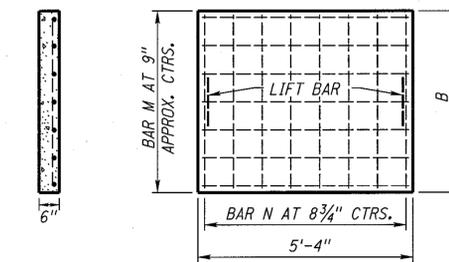


INLET COVER

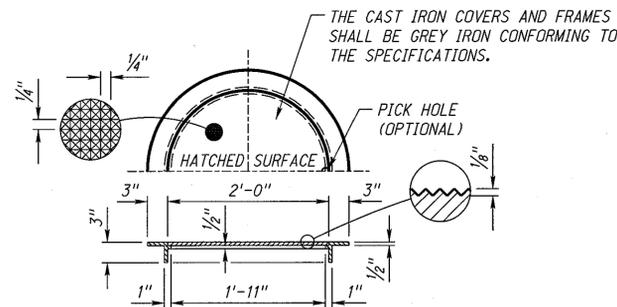
NOTE:
TEXT IS TO BE IMPRINTED INTO
CONCRETE, AT A DEPTH OF 1/4".

SIZE Y x Y ₁	X = 2'-6"		ADDITIONAL QUANTITIES OF CONCRETE (CU. YDS.) PER ONE FOOT INCREASE OF DIMENSIONS "X" **
	CONCRETE CU. YDS.*	REINFORC. STEEL LBS.	
2'-0" x 2'-0"	0.94	15	0.26
2'-0" x 2'-6"	1.06	18	0.27
2'-0" x 3'-0"	1.18	23	0.31
2'-6" x 2'-6"	1.20	19	0.31
2'-6" x 3'-0"	1.33	22	0.34
3'-0" x 3'-0"	1.47	29	0.36
3'-0" x 3'-6"	1.61	30	0.39
3'-0" x 4'-0"	1.76	34	0.41

* NO DEDUCTIONS WILL BE MADE FOR PIPE OPENINGS
** DIMENSION "X" SHALL NOT EXCEED 5'-6"

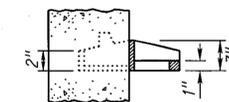


BACK COVER

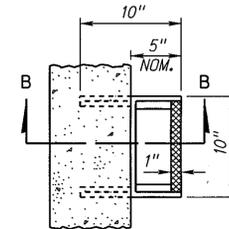


TOTAL WEIGHT = 125 LBS.

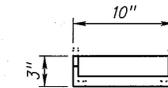
CAST IRON
COVER AND FRAME



SECTION B-B



PLAN



FRONT ELEVATION

STEPS TO BE PLACED AT 16" CENTERS

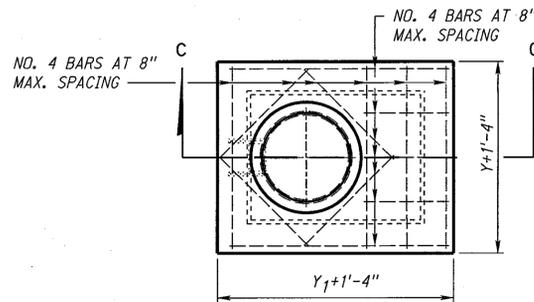
CAST IRON STEPS



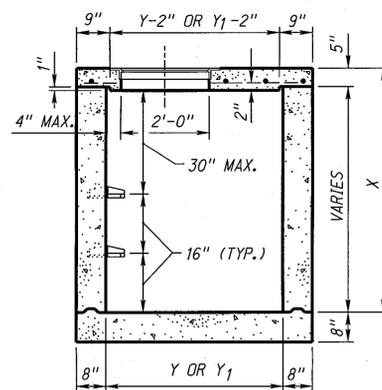
CHAMFER DETAIL

THROAT OPENING	WEIGHT (LBS.)
4'-0"	100
6'-0"	129
8'-0"	157
10'-0"	186
12'-0"	215
14'-0"	243
16'-0"	272

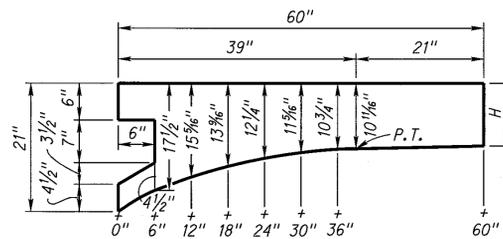
STRUCTURAL STEEL FOR FACE ARMOR



PLAN

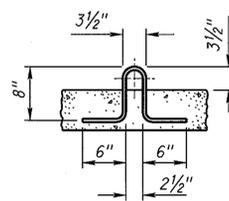


SECTION C-C
JUNCTION BOX
(NOT FOR USE UNDER TRAFFIC)

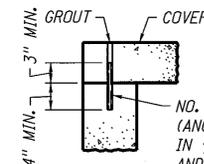


PAVING CROSS SLOPE (FT/FT)	0.01	0.02	0.03	0.04	0.05	0.06
H	10 7/16"	10 1/4"	10 1/8"	9 7/8"	9 5/8"	9 1/2"

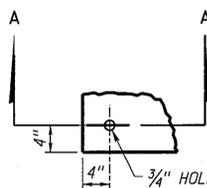
GUTTER DEPRESSION TEMPLATE



LIFT BAR



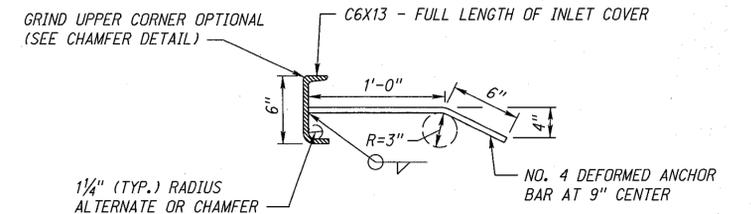
SECTION A-A



PLAN

ANCHOR BAR

NO. 4 ANCHOR BAR -
(ANCHOR BAR SHALL BE PLACED
IN 3/4" MAX. DRILLED HOLE
AND SET WITH EPOXY COMPOUND)



FACE ARMOR

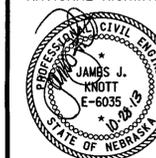
NOTE:

THE COMPLETED FACE ARMOR/ANCHOR BAR ASSEMBLY SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.

R9	APR 14	PUT Y1-2" BACK IN JUNCTION BOX
R8	JUL 11	FACE ARMOR DETAIL
R7	JAN 07	NO DUMPING, DRAINS TO STREAM
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 443-R9
CURB INLETS
AND JUNCTION BOX

ACCEPTED BY FHWA FOR USE ON THE
NATIONAL HIGHWAY SYSTEM



DATE: 11/8/13
ORIGINAL:
FEBRUARY 22, 1974
DATE

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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. CHANNELIZATION DEVICES INCLUDE BUT ARE NOT LIMITED TO CONES, TUBULAR POSTS, VERTICAL PANELS, DRUMS, BARRICADES, TRAFFIC LANE DIVIDERS, TEMPORARY RAISED ISLANDS, AND BARRIERS.

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

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

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

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

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

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

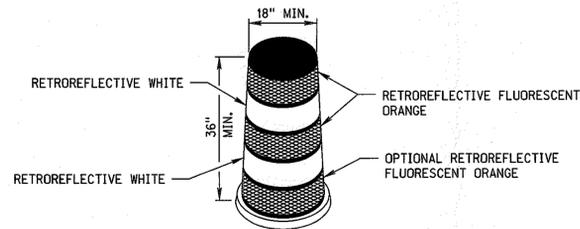
COEFFICIENT OF RETROREFLECTION (CD/LUX/M ²)			
WHITE	ORANGE	RED	YELLOW
250	100	45	170

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

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

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

REFLECTORIZED PLASTIC DRUMS



DESIGN

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

APPLICATION

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

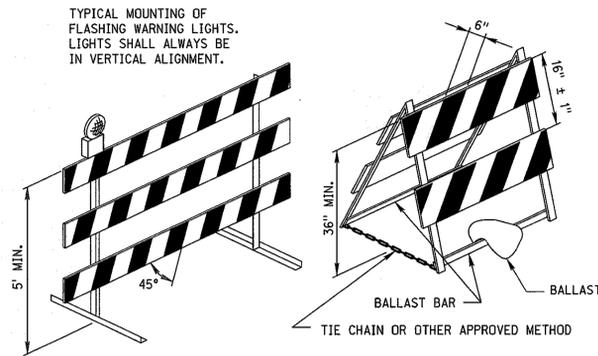
BALLAST SHALL NOT BE PLACED ON TOP OF THE DRUM. DRUMS SHOULD NOT BE WEIGHTED WITH SAND, WATER, OR ANY MATERIAL.

BARRICADES

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

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

TYPE III BARRICADE **TYPE II BARRICADE**



BALLAST SHALL NOT BE PLACED OVER ANY REFLECTIVE DEVICE

DESIGN

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

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

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

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

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

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

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

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

APPLICATION

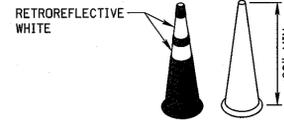
TYPE II BARRICADES ARE INTENDED FOR USE IN SITUATIONS WHERE TRAFFIC IS MAINTAINED THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE. THEY MAY BE USED INDIVIDUALLY OR IN GROUPS TO MARK A SPECIFIC CONDITION, OR THEY MAY BE USED IN A SERIES FOR CHANNELIZING TRAFFIC. ON THE INTERSTATE, FREEWAY AND EXPRESSWAY SYSTEM,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

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

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

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

CONES



DESIGN

CONES SHALL BE PREDOMINANTLY ORANGE, 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.

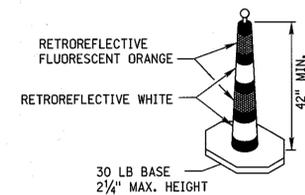
FOR NIGHTTIME USE, CONES SHALL BE RETROREFLECTIVE OR EQUIPPED WITH LIGHTING DEVICES FOR MAXIMUM VISIBILITY. RETROREFLECTION OF 28 INCH OR 36 INCH CONES SHALL BE PROVIDED BY A WHITE BAND 6 INCHES WIDE, NO MORE THAN 4 INCHES FROM THE TOP OF THE CONE, AND AN ADDITIONAL 4 INCH WIDE WHITE BAND A MINIMUM OF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



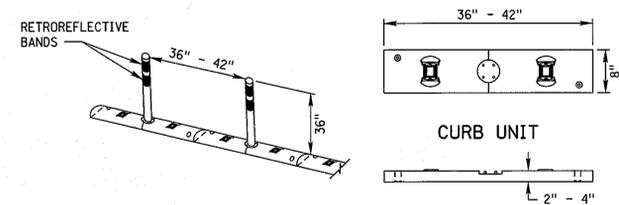
DESIGN

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.

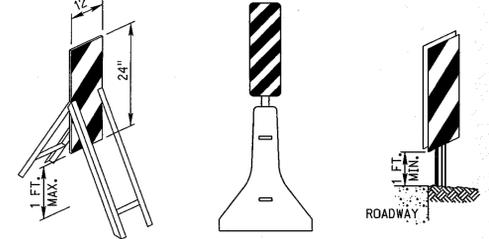
APPLICATION

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 RETROREFLECTIVE MATERIAL ON THE VERTICAL PANEL IS MORE THAN 36 INCHES, A PANEL STRIPE WIDTH OF 6 INCHES SHALL BE USED. WHERE THE HEIGHT OF THE RETROREFLECTIVE MATERIAL ON THE VERTICAL PANEL IS 36 INCHES OR LESS, A PANEL STRIPE WIDTH OF 4 INCHES SHALL BE USED. IF USED FOR TWO-WAY TRAFFIC, BACK-TO-BACK PANELS SHALL BE USED.

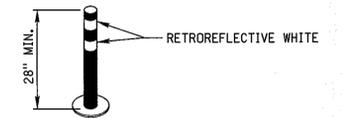
MARKINGS FOR VERTICAL PANELS SHALL BE ALTERNATING ORANGE AND WHITE RETROREFLECTORIZED STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.

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

APPLICATION

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

TUBULAR POSTS



DESIGN

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

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

APPLICATION

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

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

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

REV. NO.	DATE	DESCRIPTION OF REVISION
R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER
R4	JAN 95	REWRITE

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 920-R6
**TRAFFIC CONTROL
CONSTRUCTION AND MAINTENANCE**

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM

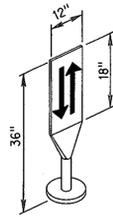
DANIEL J. WADDLE
E-6289
STATE OF NEBRASKA

JUNE 2014
DATE

ORIGINAL:
OCTOBER 1998
DATE

1
3

OPPOSING TRAFFIC LANE DIVIDERS



DESIGN

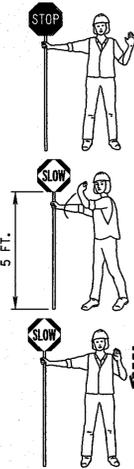
OPPOSING TRAFFIC LANE DIVIDERS SHALL BE A TWO SIDED UPRIGHT RETROREFLECTORIZED ORANGE PANEL, WITH A WIDTH OF 12 INCHES AND A HEIGHT OF 18 INCHES. THE TOP OF THE PANEL SHALL BE 36 INCHES ABOVE THE PAVEMENT. THE SYMBOL ON EACH SIDE SHALL BE TWO OPPOSING BLACK ARROWS. THE LANE DIVIDER SHALL BE MADE OF LIGHTWEIGHT 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



TO STOP TRAFFIC

TRAFFIC PROCEED

TO ALERT AND SLOW TRAFFIC

EMERGENCY USE ONLY



FLAGGER PADDLE

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

FLAGGERS

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

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

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

WORKER VISIBILITY

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

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

LIGHTING DEVICES

FUNCTION

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

BARRICADE WARNING LIGHTS DESIGN (BATTERY OPERATED)

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

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

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

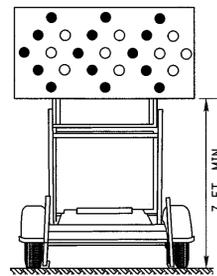
FLASHING ARROW PANEL (DISPLAY)

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

DESIGN

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

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



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

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

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

APPLICATION

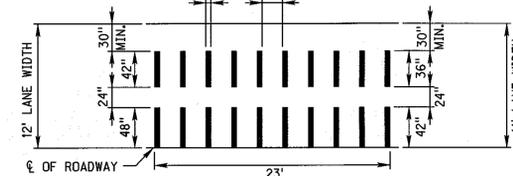
A FLASHING ARROW OR SEQUENTIAL CHEVRON MODE SHALL ONLY BE USED FOR STATIONARY OR MOVING LANE CLOSURES.

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

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

TEMPORARY RUMBLE STRIPS

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 1/2" 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	$L = WS$

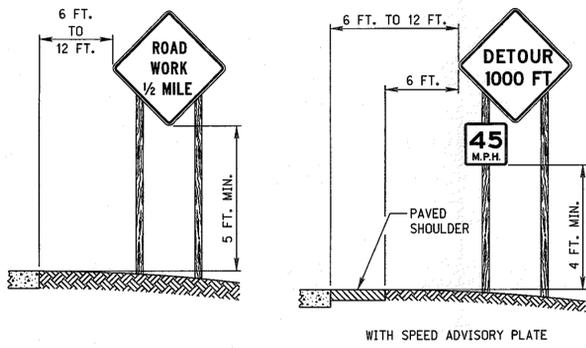
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED LIMIT PRIOR TO WORK IN MPH

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

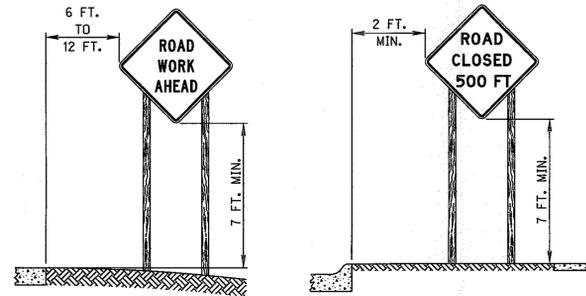
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TRAFFIC CONTROL CONSTRUCTION AND MAINTENANCE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
JUNE 2014		DATE
ORIGINAL: OCTOBER 1998		DATE

ROADSIDE SIGNS

HEIGHT AND LATERAL LOCATION OF SIGNS RURAL AREA



URBAN AREA



TYPICAL FIRST SIGN AT CONSTRUCTION SITE

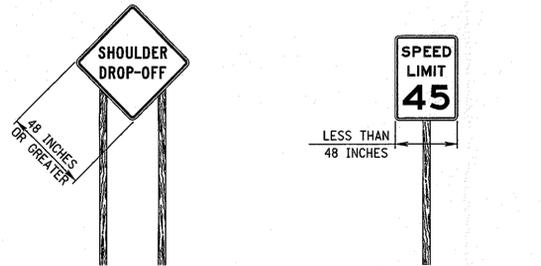


WITH TYPE "A" FLASHING WARNING LIGHT MOUNTED ABOVE TYPE III BARRICADE

PORTABLE AND TEMPORARY MOUNTING



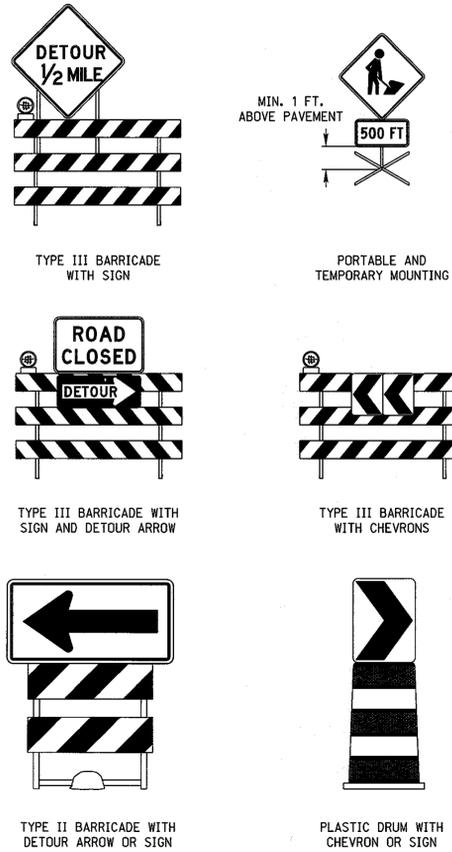
TYPICAL SIGN MOUNTINGS POST MOUNTED



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



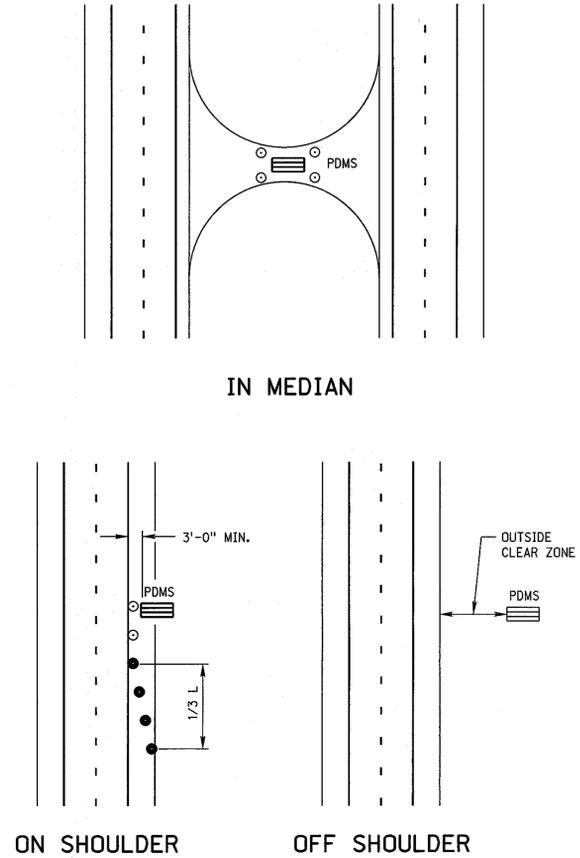
TEMPORARY SIGN SUPPORTS

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

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

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

PORTABLE DYNAMIC MESSAGE SIGN DELINEATION



PORTABLE DYNAMIC MESSAGE SIGNS (PDMS)

THE PLACEMENT OF PDMS SHOULD BE IN THE FOLLOWING ORDER:

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

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

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

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

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

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

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

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

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

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

NOTES

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

WORK ZONE SPEED LIMIT NOTES

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

TAPER FORMULA

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

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

WHERE:

L = MINIMUM LENGTH OF TAPER.

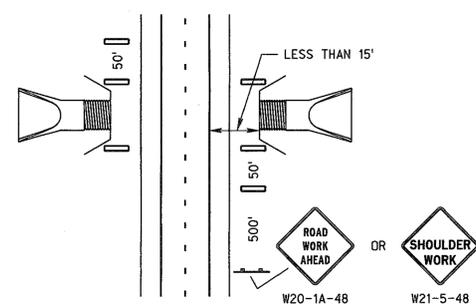
S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.

W = WIDTH OF OFFSET (LANE WIDTH).

LEGEND

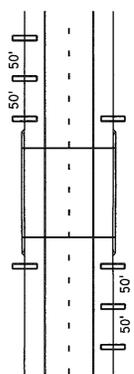
- TYPE III BARRICADE
- REFLECTORIZED PLASTIC DRUM
- REFLECTORIZED PLASTIC DRUM OR 42" CONE
- PORTABLE DYNAMIC MESSAGE SIGN

R6	JUN 14	2009 MUTCD UPDATE
R5	OCT 98	REVISE CHANNELIZATION DEVICES, TAPER
R4	JAN 95	REWRITE
REV. NO.	DATE	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF ROADS STANDARD PLAN NO. 920-R6 TRAFFIC CONTROL CONSTRUCTION AND MAINTENANCE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		 JUNE 2014 DATE
ORIGINAL: OCTOBER 1998 DATE		



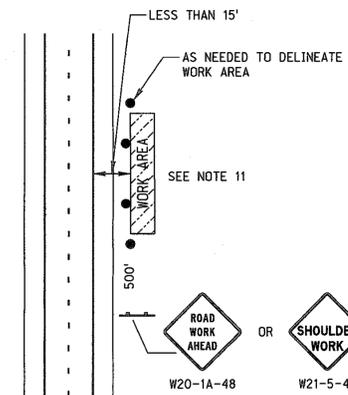
CULVERT DELINEATION

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



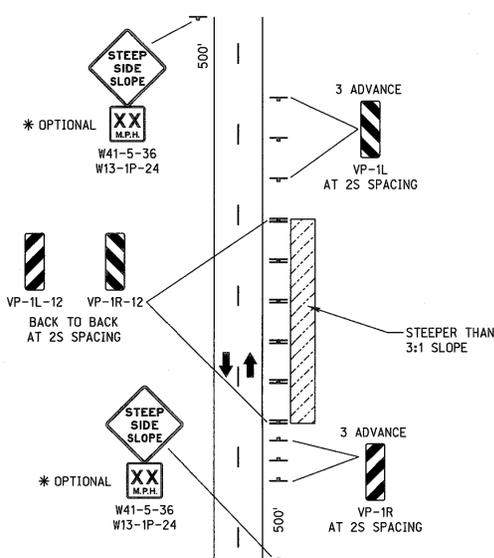
BRIDGE RAIL END DELINEATION

WHEN GUARDRAIL IS REMOVED



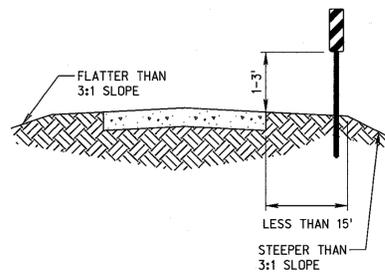
WORK BEYOND THE SHOULDER

TA-1



STEEP SLOPE DELINEATION

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



TAPER FORMULA

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

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

WHERE:

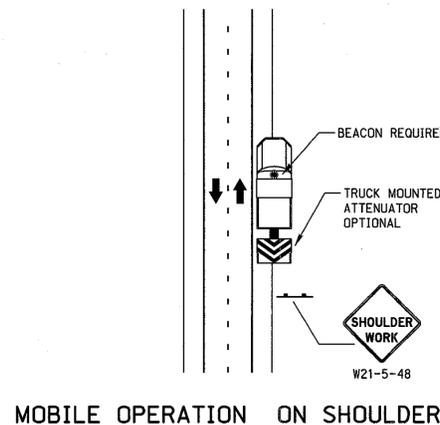
L = MINIMUM LENGTH OF TAPER.

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

W = WIDTH OF OFFSET (LANE WIDTH).

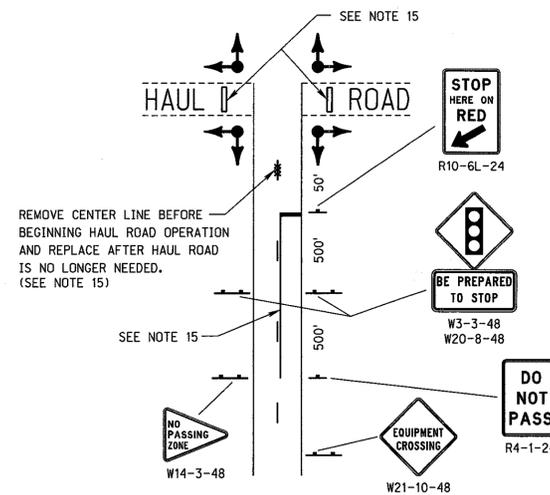
LEGEND

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



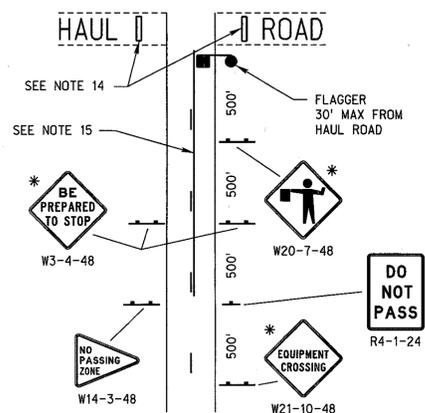
MOBILE OPERATION ON SHOULDER

NO ENCRoACHMENT ON TRAVEL LANE
TA-4



HAUL ROAD CROSSING IN CONSTRUCTION AREA USING TEMPORARY TRAFFIC SIGNAL

TA-14



HAUL ROAD CROSSING IN CONSTRUCTION AREA USING FLAGGERS

TA-14

* SIGNS ARE SUBSIDIARY TO THE FLAGGING OPERATION.

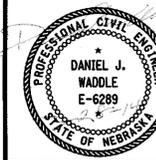
NOTES

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

R6	JUN 14	2009 MUTCD UPDATE
R5	DEC 05	2003 MUTCD UPDATE
R4	AUG 98	SIGN CHANGES, ADDITIONS
REV. NO.	DATE	DESCRIPTION OF REVISION

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 921-R6
**TRAFFIC CONTROL,
CONSTRUCTION AND MAINTENANCE**

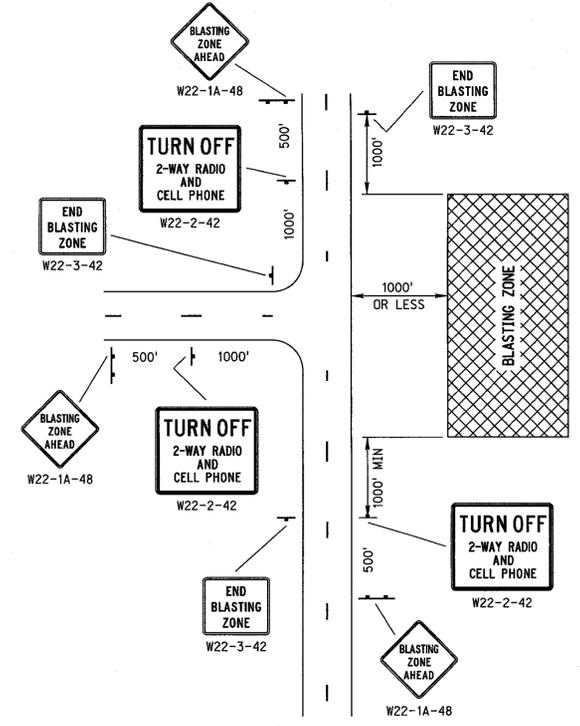
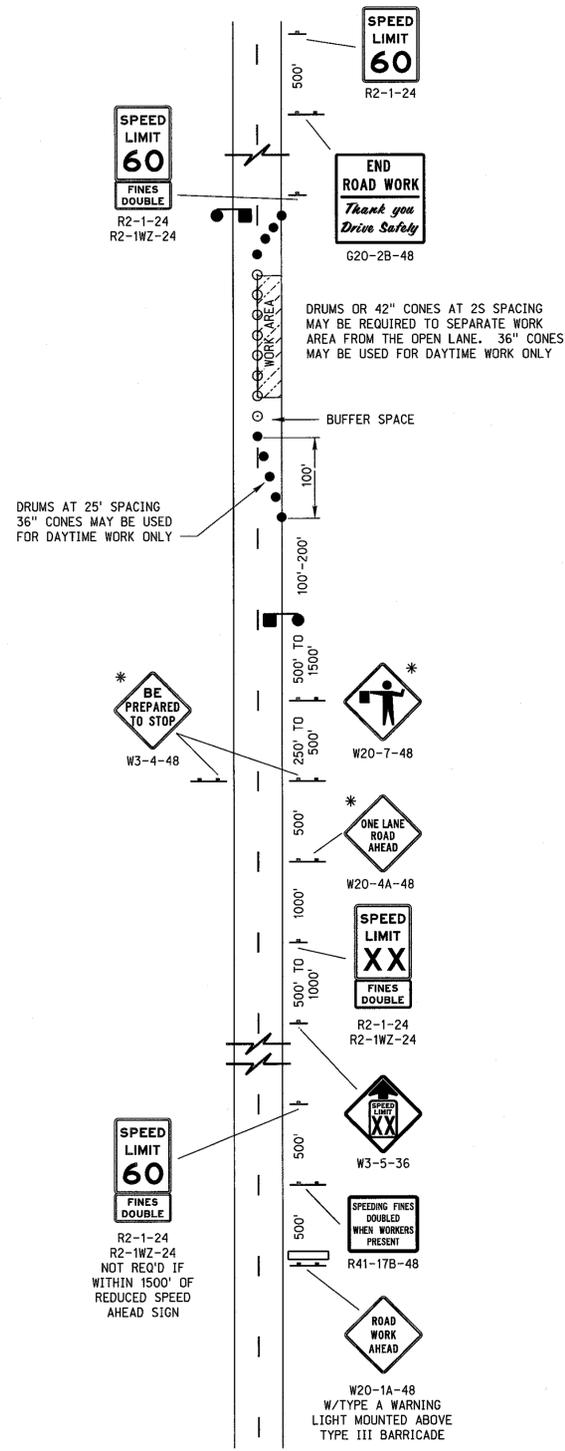
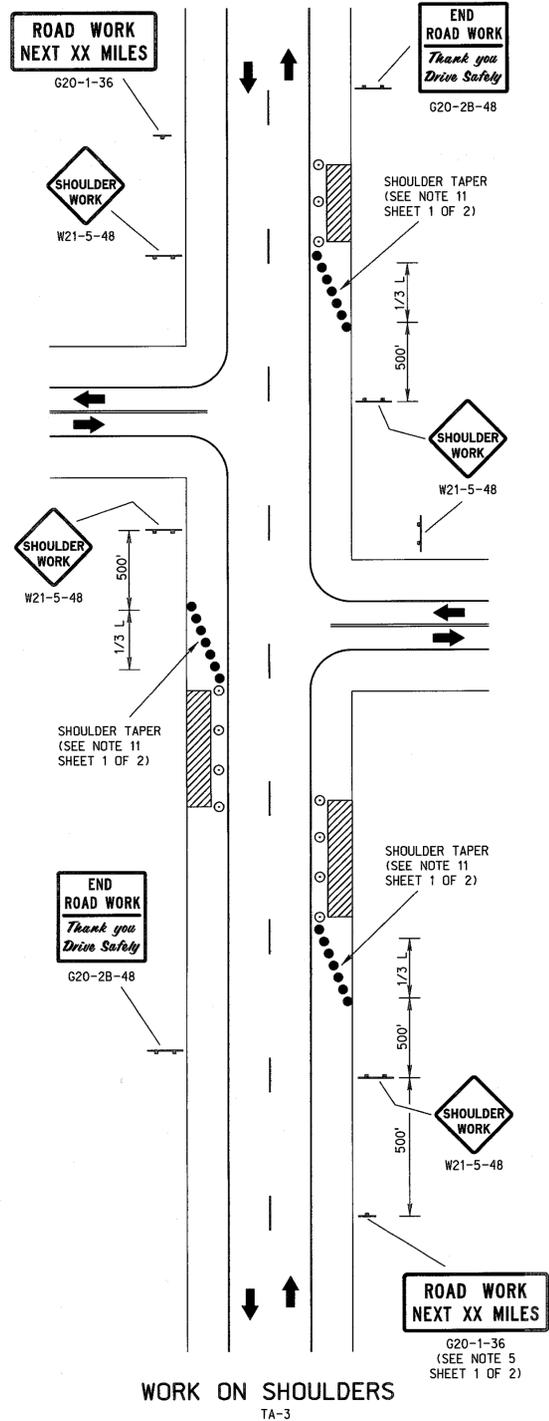
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:



JUNE 2014
DATE

ORIGINAL:
JUNE 3, 1980
DATE

1
2



TAPER FORMULA

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

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

WHERE:

L = MINIMUM LENGTH OF TAPER.

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

W = WIDTH OF OFFSET (LANE WIDTH).

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

REV. NO.	DATE	DESCRIPTION OF REVISION
R6	JUN 14	2009 MUTCD UPDATE
R5	DEC 05	2003 MUTCD UPDATE
R4	AUG 98	SIGN CHANGES, ADDITIONS

NEBRASKA DEPARTMENT OF ROADS
STANDARD PLAN NO. 921-R6
**TRAFFIC CONTROL,
CONSTRUCTION AND MAINTENANCE**

ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM: *[Signature]*

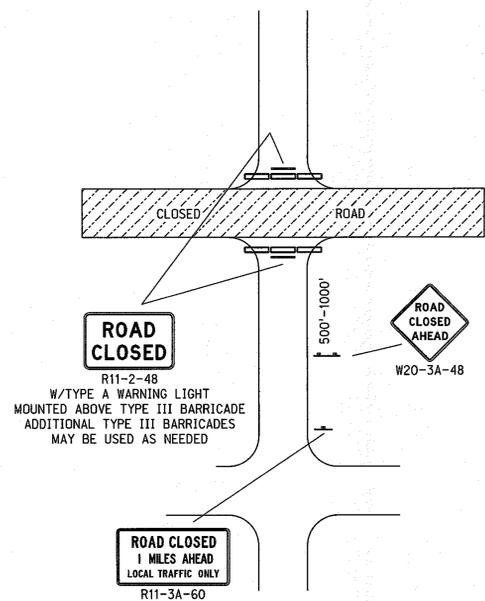
DATE: JUNE 2014

ORIGINAL: JUNE 3, 1980

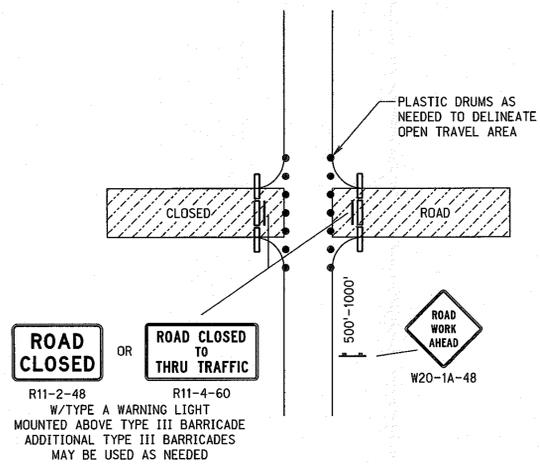
DANIEL J. WADDLE
E-6289
PROFESSIONAL CIVIL ENGINEER
STATE OF NEBRASKA

2
2

CROSS ROAD INTERSECTING CLOSED ROAD

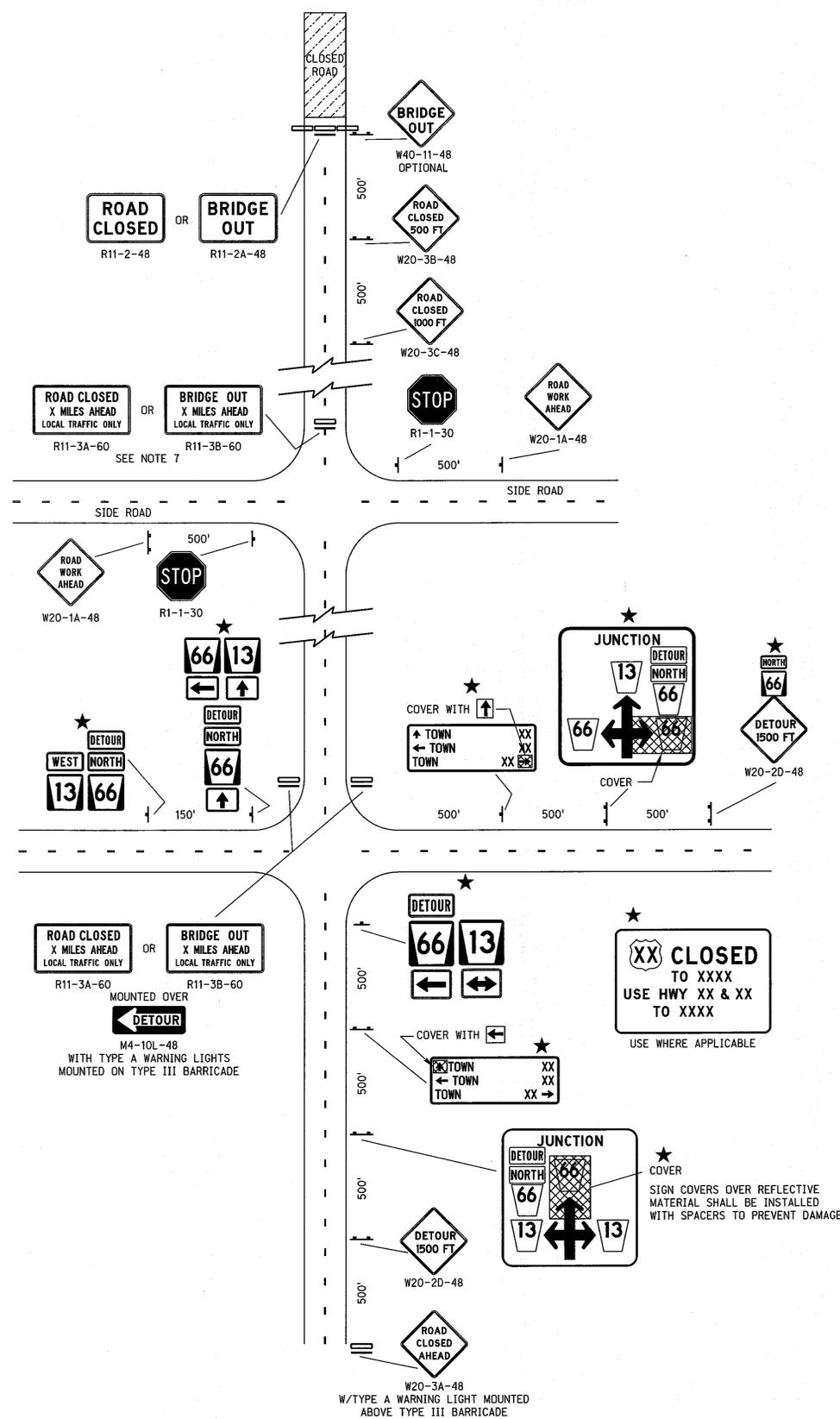


TRAFFIC NOT ALLOWED TO CROSS CLOSED ROAD



TRAFFIC ALLOWED TO CROSS CLOSED ROAD

ROAD CLOSED BEYOND JUNCTION



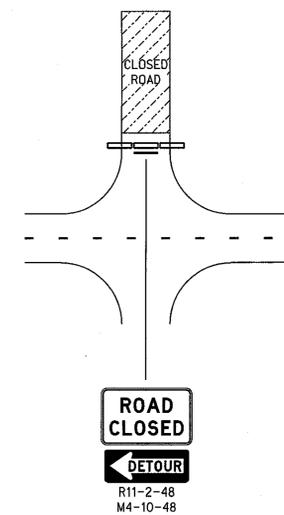
NOTES

- SIGNS SHOWN ARE USUALLY FOR ONE DIRECTION OF TRAVEL ONLY.
- THE CONTRACTOR SHALL INSTALL, MAINTAIN, AND REMOVE ALL SIGNS IN ACCORDANCE WITH THE DETAILS OF AND AT THE LOCATIONS SHOWN IN THE PLANS. SIGNS INSTALLED BY THE DEPARTMENT OF ROADS OR OTHER GOVERNMENT AGENCY SHALL BE MAINTAINED AND REMOVED BY THEIR FORCES.
- WHEN MESSAGE IS NOT PERTINENT, SIGNS SHALL BE TAKEN DOWN, COVERED OR FOLDED. TAPE IS NOT PERMITTED ON THE FACE OF THE SIGN.
- VEHICLES OR EQUIPMENT SHALL NOT BE PARKED SO AS TO OBSCURE OR DISTRACT FROM TRAFFIC CONTROL DEVICES.
- FLAGS MAY BE USED TO CALL ATTENTION TO WARNING SIGNS.
- WHEN APPROPRIATE THE SIGN R11-2B "BRIDGE OUT" MAY BE USED INSTEAD OF R11-2 "ROAD CLOSED".
- BARRICADE AND SIGN MAY BE PLACED ALONG EDGE OF ROAD IF NEEDED FOR LOCAL TRAFFIC.
- REFER TO STANDARD PLAN 920 FOR GENERAL INFORMATION NOT SHOWN.

LEGEND

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

ROAD CLOSED AT JUNCTION

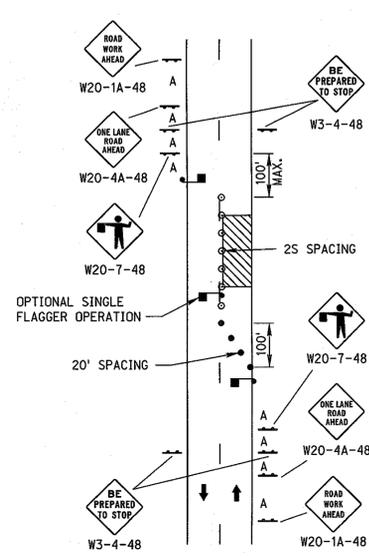


TAPER FORMULA

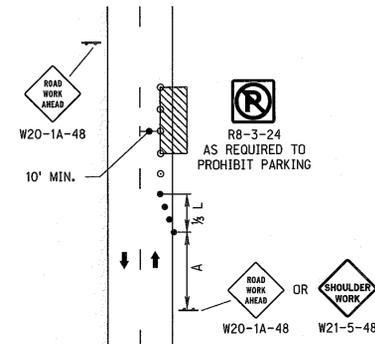
$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE.
 $L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

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

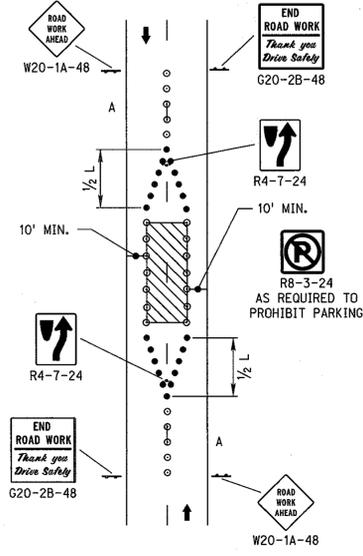
REV. NO.	DATE	DESCRIPTION OF REVISION
R1	JUN 14	2009 MUTCD UPDATES
NEBRASKA DEPARTMENT OF ROADS STANDARD PLAN NO. 923-R1 TRAFFIC CONTROL ROAD CLOSURE		
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM:		
DATE: JUNE 2014		ORIGINAL: AUGUST 1998
		DATE:



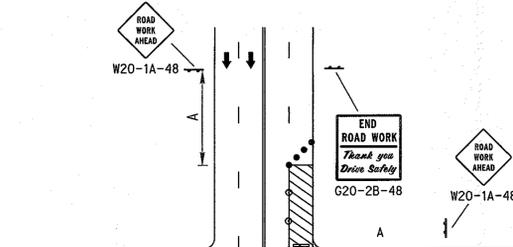
ONE LANE CLOSED WITH FLAGGER



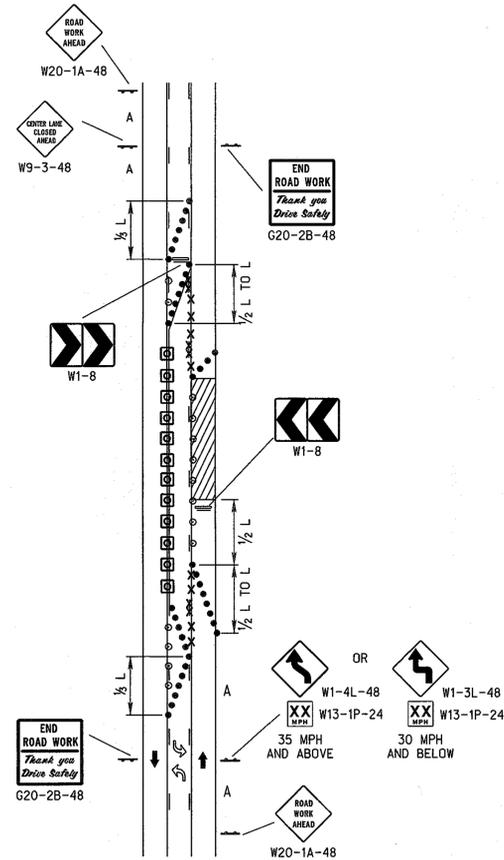
SHOULDER OR PARKING LANE CLOSED



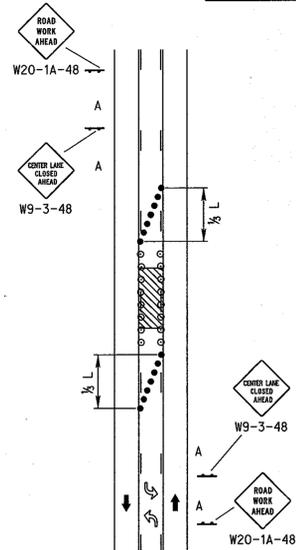
WORK IN CENTER OF ROAD WITH LOW TRAFFIC VOLUMES



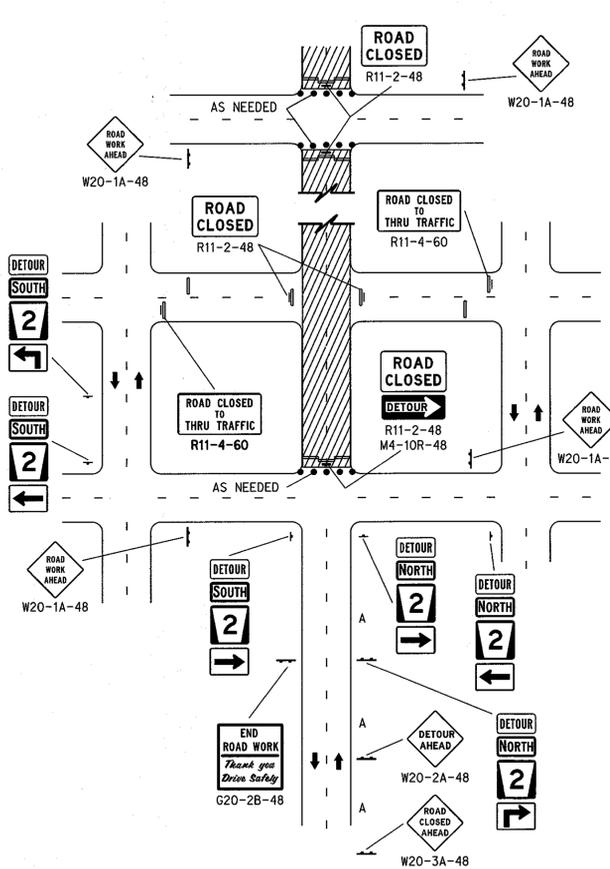
LANE CLOSED NEAR INTERSECTION (RIGHT LANE CLOSED)



3-LANE ROADWAY ONE LANE CLOSED

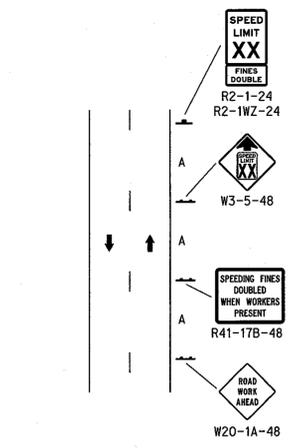


TWO-WAY LEFT TURN LANE CLOSED

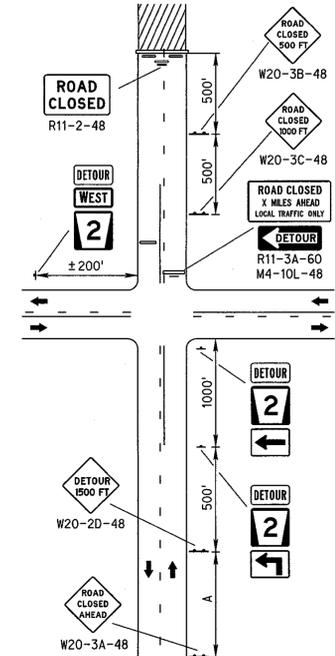


ROAD CLOSED AT DETOUR

ROAD TYPE	MINIMUM DISTANCE BETWEEN SIGNS
	A
URBAN (LOW SPEED - 25 MPH TO 40 MPH)	100'
URBAN (HIGH SPEED - 45 MPH OR HIGHER)	350'



TYPICAL ADVANCED SIGNING



ROAD CLOSED BEYOND DETOUR

- LEGEND**
- ⊠ FLASHING ARROW PANEL
 - TYPE III BARRICADE
 - REFLECTORIZED PLASTIC DRUM
 - ⊠ TUBULAR POST
 - REFLECTORIZED PLASTIC DRUM OR 42" CONE
 - SINGLE POSTED SIGN
 - DOUBLE POSTED SIGN
 - ⊠ FLAGGER
 - xxxx PAVEMENT MARKING REMOVAL

TAPER FORMULA

$L = S \times W$ FOR SPEEDS OF 45 MPH OR MORE.
 $L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 MPH OR LESS.

WHERE:

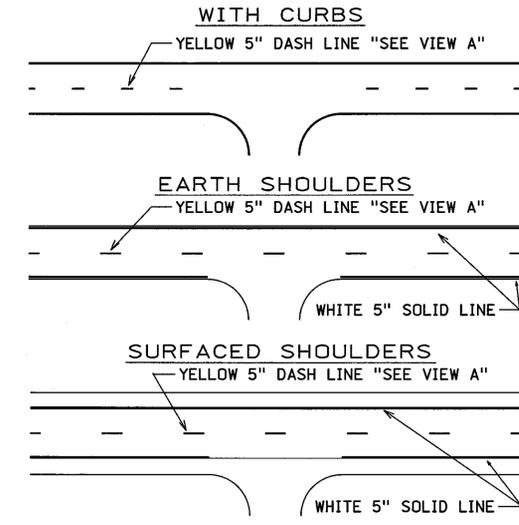
- L = MINIMUM LENGTH OF TAPER.
- S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK.
- W = WIDTH OF OFFSET (LANE WIDTH).

NOTES

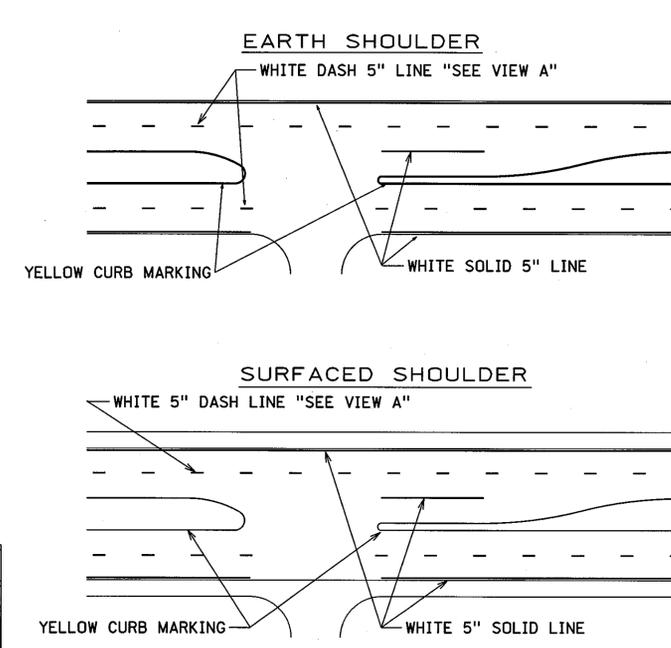
1. ALL BARRICADE AND SIGN LOCATIONS ON THIS PLAN ARE APPROXIMATE, AND MAY BE ADJUSTED TO FIT FIELD CONDITIONS. THE SIGNS SHALL BE INSTALLED SO AS NOT TO OBSCURE THE VIEW OF OTHER TRAFFIC CONTROL DEVICES.
2. MINIMUM WIDTH OF TRAVELLED LANE SHALL BE AS REQUIRED BY THE ENGINEER.
3. FLASHING ARROW PANEL REQUIRED ON ALL ROADWAYS WITH POSTED SPEED LIMIT 45 MPH OR HIGHER. THE USE OF A FLASHING ARROW PANEL IS OPTIONAL ON ROADWAYS WITH A POSTED SPEED OF 40 MPH OR LOWER.
4. LONG-TERM FLASHING ARROW PANELS IN URBAN RESIDENTIAL AREAS WHERE DIESEL ENGINE NOISE WILL BE DISRUPTIVE TO RESIDENTS, MAY BE REQUIRED TO OPERATE BY 120 VAC, OR IF SIGHT DISTANCE ALLOWS, A SOLAR POWERED ARROW PANEL MAY BE USED.
5. FOR SHORT-TERM WORK (LESS THAN 24 HOURS) SIGN G20-2B-48 (END ROAD WORK, THANK YOU, DRIVE SAFELY) MAY BE OMITTED.
6. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT (S). WHERE CHANNELIZING DEVICES ARE USED ALONG THE WORK AREA, THE SPACING MAY BE INCREASED TO THE DISTANCE IN FEET EQUAL TO THE SPEED LIMIT, DOUBLED (2 x S). SEE "TAPER FORMULA" TABLE FOR MORE INFORMATION.
7. FOR LANE CLOSURES OVER 72 HOURS, ALL CONFLICTING PAVEMENT MARKINGS SHALL BE REMOVED. ON ASPHALT SURFACES, DURABLE PAVEMENT MARKINGS MAY BE COVERED WITH APPROVED BLACK TEMPORARY PAVEMENT MARKING TAPE.
8. DESIGNATION OF SPEED SHOWN ON ADVISORY SPEED SIGNS W13-1P SHALL BE DETERMINED BY THE ENGINEER IN ACCORDANCE WITH MUTCD. THE SPEED DESIGNATION SHALL BE AS HIGH AS PRACTICAL AND FEASIBLE.

REV. NO.	R1	JUN 14 2009 MUTCD UPDATES	DESCRIPTION OF REVISION
NEBRASKA DEPARTMENT OF ROADS STANDARD PLAN NO. 924-R1 URBAN TRAFFIC CONTROL PLAN			
ACCEPTED BY FHWA FOR USE ON THE NATIONAL HIGHWAY SYSTEM			
			DATE JUNE 2014
ORIGINAL: FEBRUARY 1, 2010			DATE 1 3

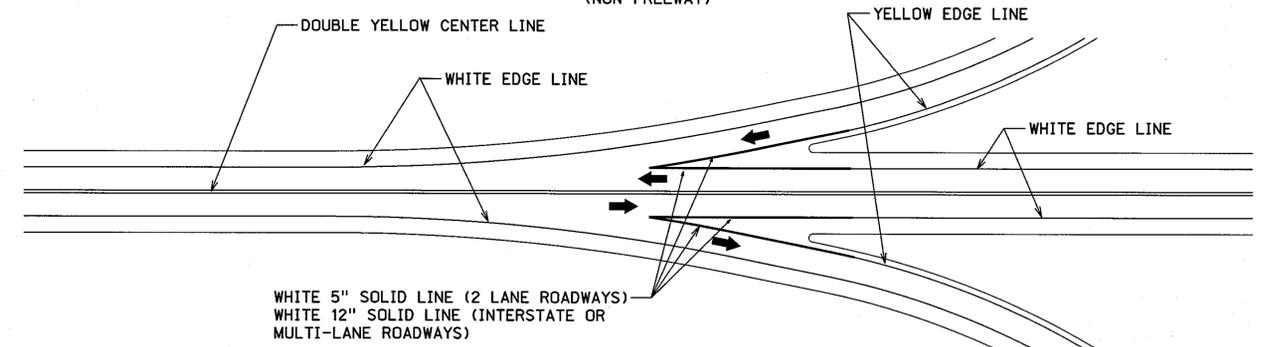
2 LANE ROADWAYS WITH CURBS



4 LANE DIVIDED ROADWAY



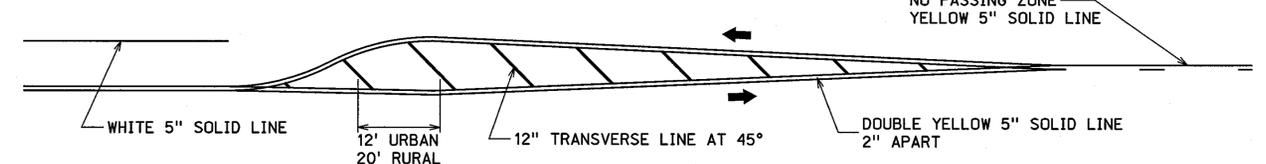
GORE MARKINGS (NON-FREEWAY)



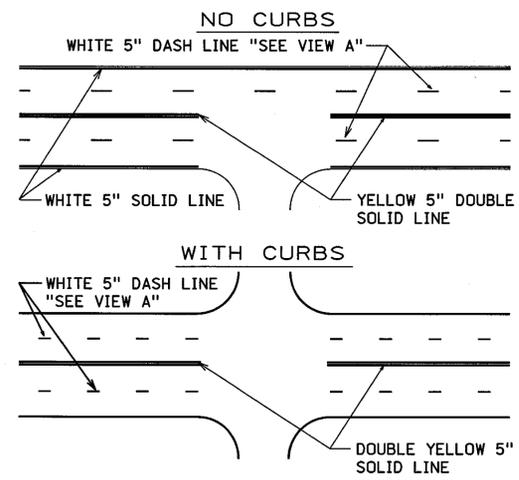
2-LANE ROADWAY REQUIRED LOCATION FOR EDGE LINES		
ROADWAY WIDTH	SHOULDER TYPE	DISTANCE FROM CENTERLINE OF ROADWAY TO OUTSIDE EDGE OF PAVEMENT EDGELINE
LESS THAN 24 FT	SURFACED	12 FT 0 IN
LESS THAN 24 FT	EARTH	PAVEMENT EDGE
24 FT	EARTH	PAVEMENT EDGE
24 FT	SURFACED	12 FT 0 IN
GREATER THAN 24 FT	EARTH	12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

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

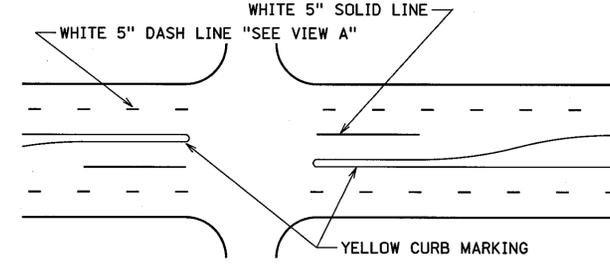
ISLAND MARKING



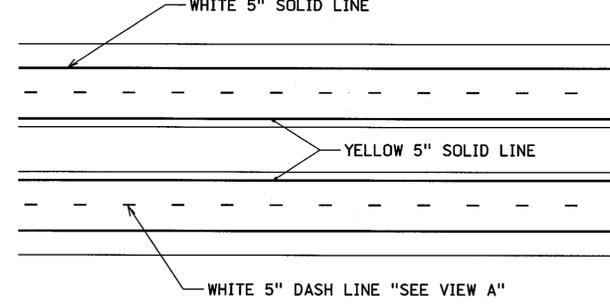
4 LANE ROADWAYS NO CURBS



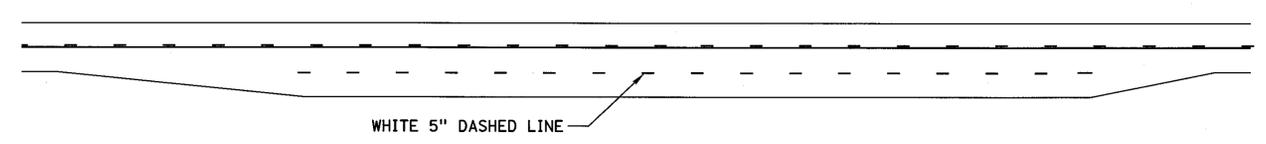
WITH CURBS



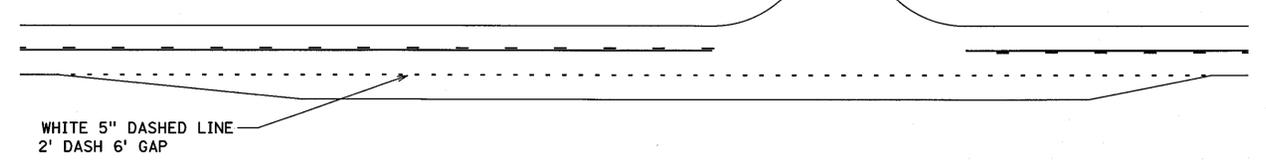
DEPRESSED MEDIAN



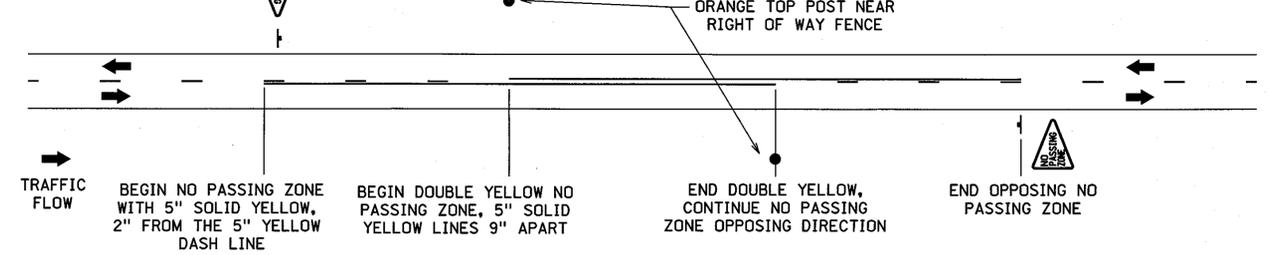
PASSING LANE MARKING



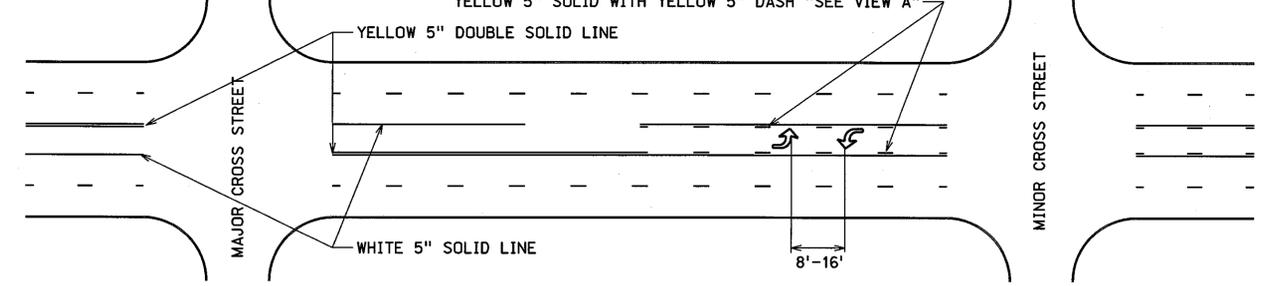
FLY-BY LANE MARKING



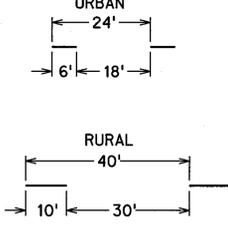
TYPICAL NO PASSING ZONE MARKINGS



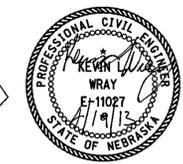
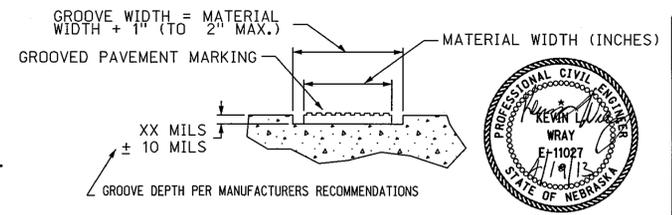
3 OR 5 LANE WITH COMMON LEFT TURN LANE



VIEW A



PERMANENT PAVEMENT MARKINGS INSTALLED IN GROOVES



NEBRASKA DEPARTMENT OF ROADS TRAFFIC ENGINEERING DIVISION			
TYPICAL PAVEMENT MARKING PLAN			
DESIGNED	TJF	5" PAVEMENT MARKING	
REVIEWED			1/1
APPROVED	DATE DRAWN	TRAFFIC ENGINEER	DATE
	12/12		

Users: dcr33240 Date: 18-APR-2013 15:49
Files: psdtpm-2_r1.dgn Scale: 1:97.2222

CHAPTER 9
BUILDING REGULATIONS
Article 15. Electrical Code

§9-1501 ELECTRICAL CODE; ADOPTED BY REFERENCE. All electric wiring, installation of electrical fixtures, apparatus, or electrical appliances for furnishing light, heat or power, or other electrical work introduced into or placed in or upon, in any way connected on, any building or structure within the limits of the City shall be in the 1993 National Electrical Code. Standard of the National Board of Fire Underwriters for Electrical Wiring and Apparatus, as recommended by the National Fire Protection Association, which is hereby adopted as the Electrical Code of this City, one (1) copy of the above adopted Code being on file in the office of the City Clerk. (*Ref 18-132 RS Neb.*) (*Amended by Ord. 955, 3/6/84; 1031, 4/7/87; 1106 1/16/90; 1189, 4/6/93; 1746, 1/5/2010*)