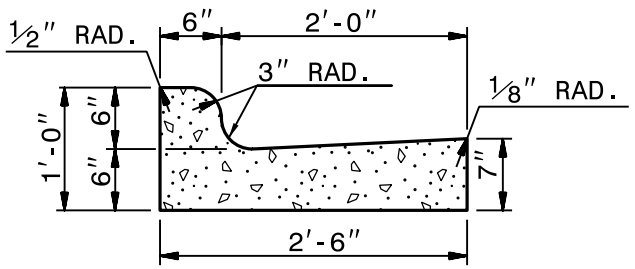
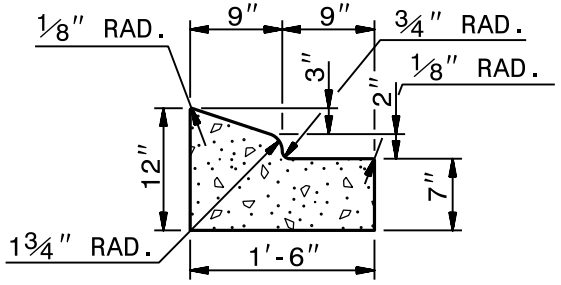
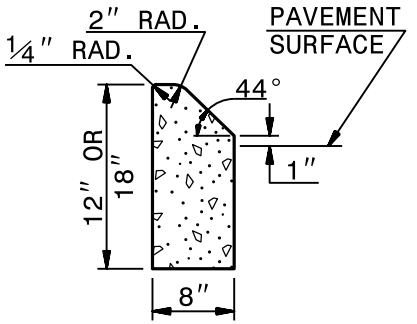


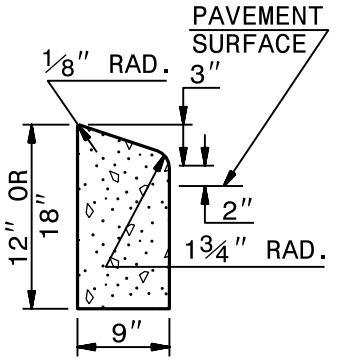
2'-6" CURB AND GUTTER



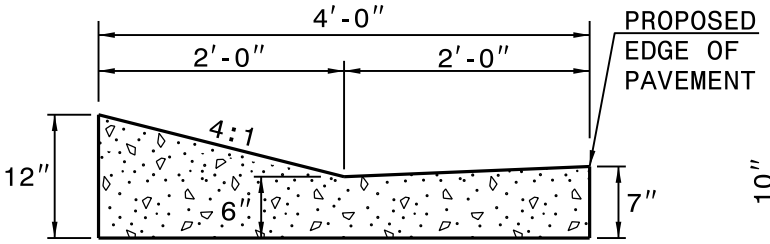
1'-6" CURB AND GUTTER



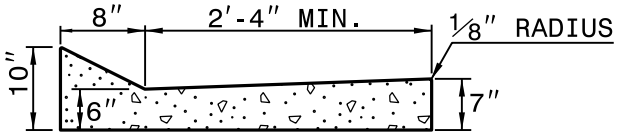
8" X 12" OR 18" CONCRETE CURB



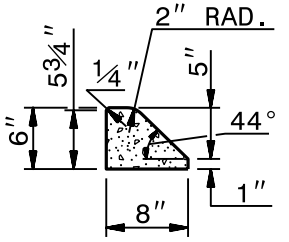
9" X 12" OR 18" CONCRETE CURB



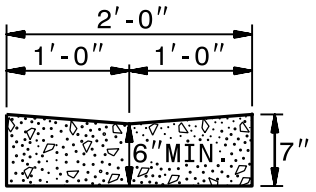
EXPRESSWAY GUTTER



SHOULDER BERM GUTTER



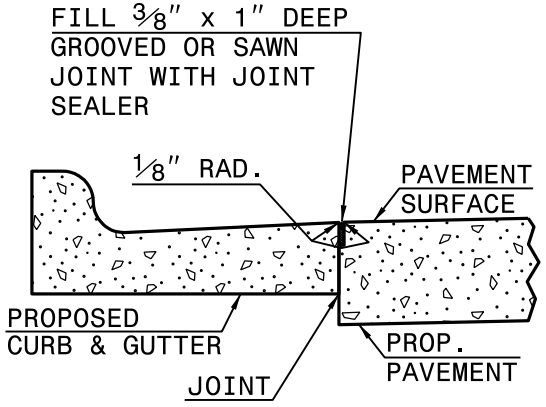
8" X 6" MEDIAN CURB



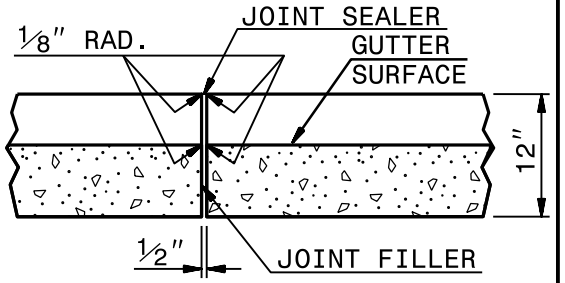
VALLEY GUTTER

SECTION VIEW OF CURBS OR CURBS AND GUTTERS

GENERAL NOTES:
- PLACE CONTRACTION JOINTS AT 10′ INTERVALS, EXCEPT THAT A 15′ SPACING MAY BE USED WHEN A MACHINE IS USED OR WHEN SATISFACTORY SUPPORT FOR THE FACE FORM CAN BE OBTAINED WITHOUT THE USE OF TEMPLATES AT 10′ INTERVALS.
- JOINT SPACING MAY BE ALTERED IF REQUIRED BY THE ENGINEER.
- CONTRACTION JOINTS MAY BE INSTALLED WITH THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. CONSTRUCT NON-TEMPLATE FORMED JOINTS A MIN. OF 1½" DEEP.
- FILL ALL CONSTRUCTION JOINTS, EXCEPT IN 8"x6" MEDIAN CURB, WITH JOINT FILLER AND SEALER.
- SPACE EXPANSION JOINTS AT 90′ INTERVALS AND ADJACENT TO ALL RIGID OBJECTS.



LONGITUDINAL JOINT



TRANSVERSE EXPANSION JOINT IN CURB AND GUTTER

SECTION VIEW OF JOINTS

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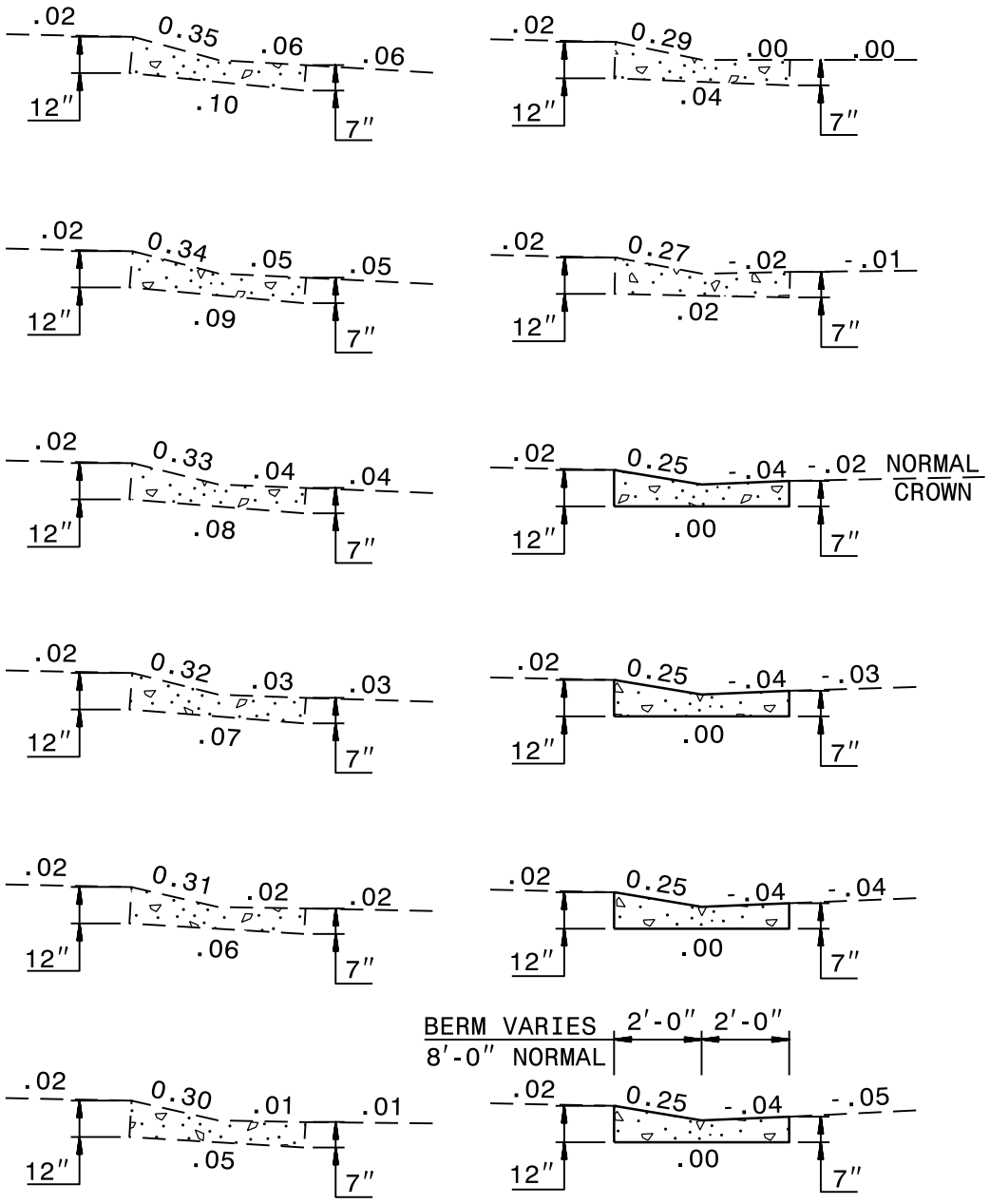
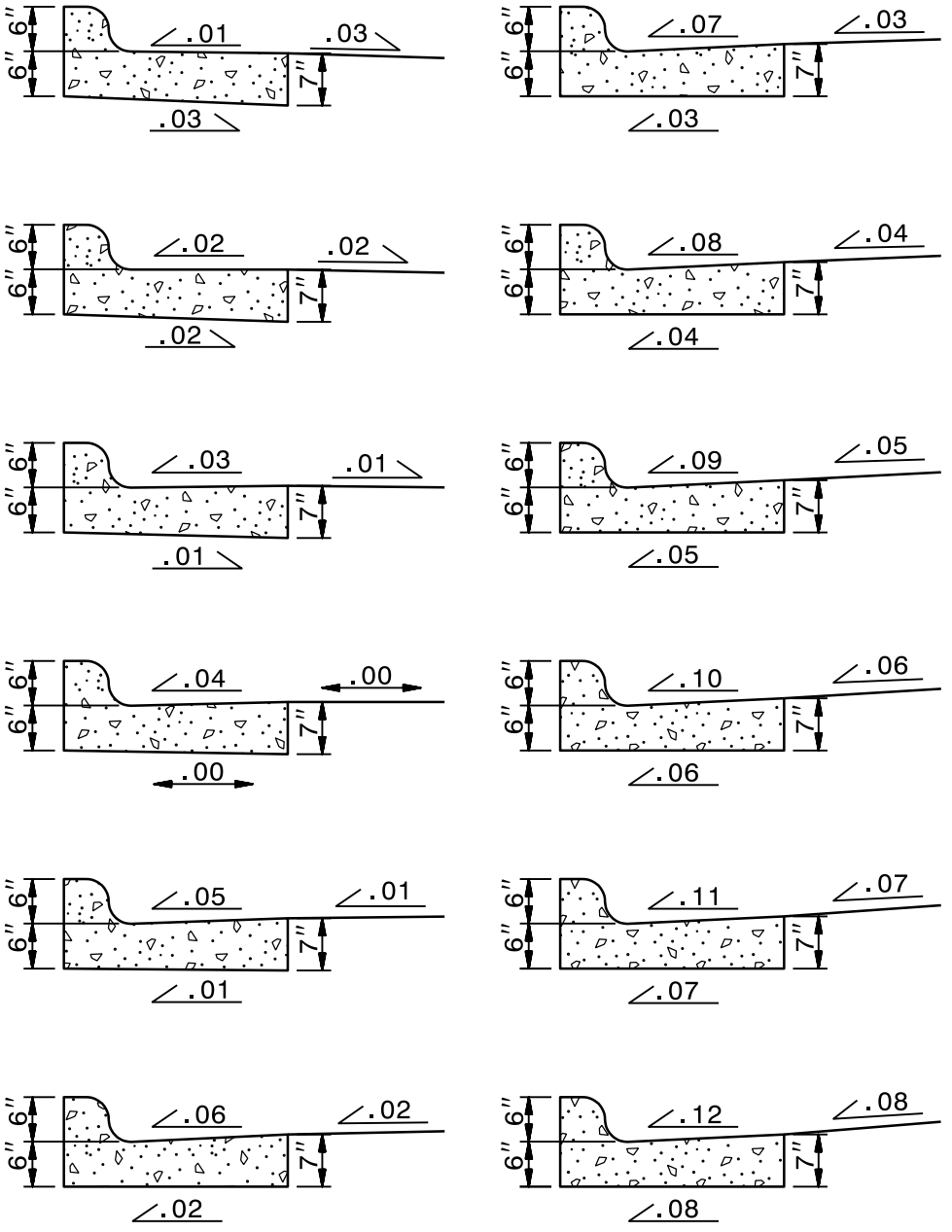
1-18

ROADWAY STANDARD DRAWING FOR

CONCRETE CURB, GUTTER AND CURB & GUTTER



SECTION VIEWS OF EXPRESSWAY GUTTER IN SUPER ELEVATION



SECTION VIEWS OF 2'-6" CURB AND GUTTER SUPERELEVATION RATES

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

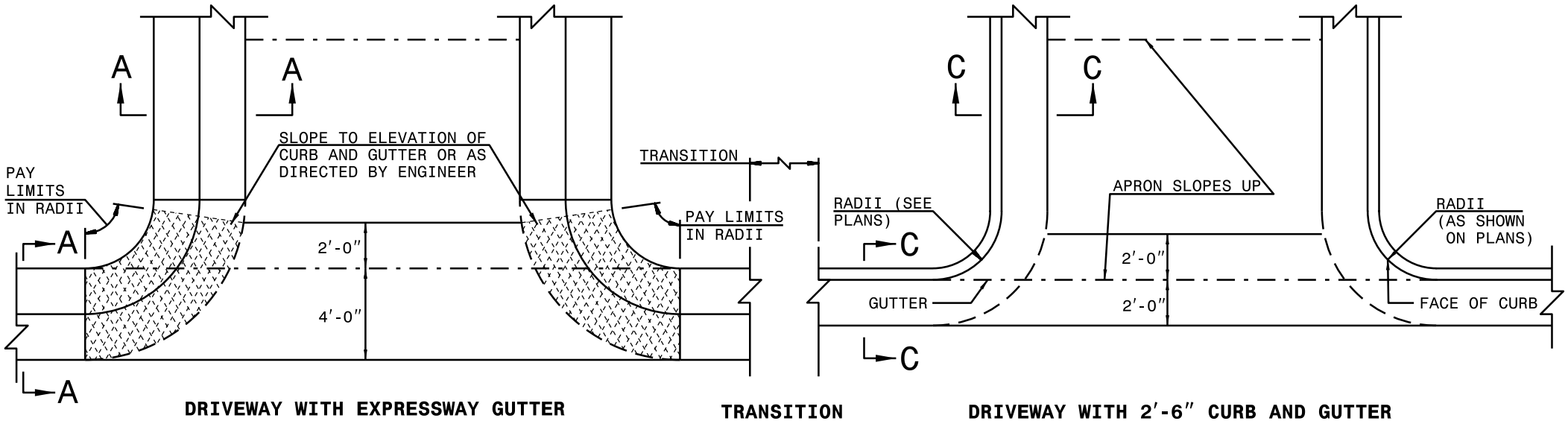
1-18

ROADWAY STANDARD DRAWING FOR

CONCRETE CURB, GUTTER AND CURB & GUTTER

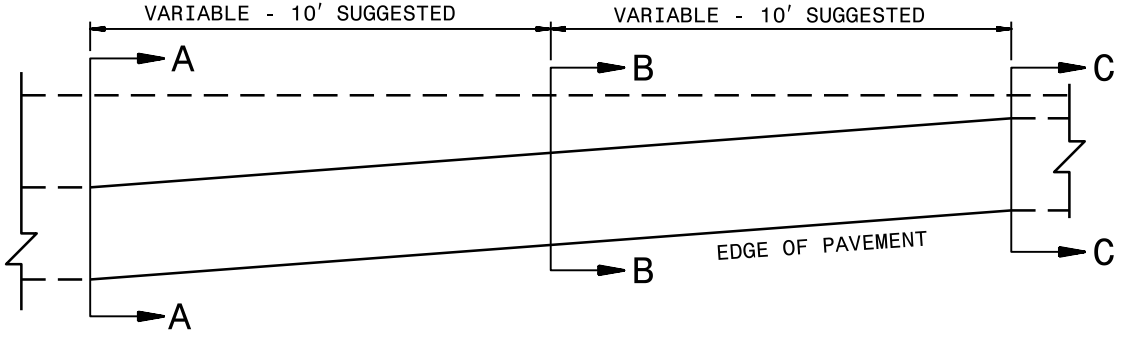
SHEET 2 OF 3

846.01



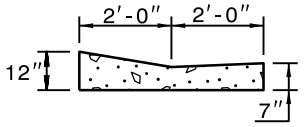
DRIVEWAY WITH EXPRESSWAY GUTTER **TRANSITION** **DRIVEWAY WITH 2'-6" CURB AND GUTTER**

PLAN VIEW OF TYPICAL CURB AND GUTTER OCCURENCES

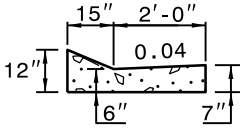


PLAN VIEW OF TRANSITION

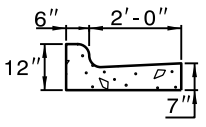
EXPRESSWAY GUTTER TO 2'-6" CURB AND GUTTER



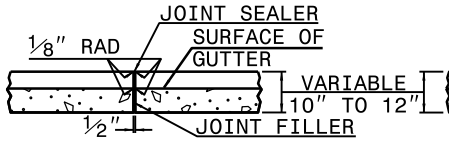
SECTION A-A
EXPRESSWAY GUTTER



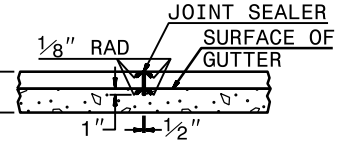
SECTION B-B
TRANSITION GUTTER



SECTION C-C
2'-6" CURB & GUTTER



EXPANSION JOINT



CONTRACTION JOINT

NOTES:
-IN THE TRANSITION FROM 4'-0" CONCRETE EXPRESSWAY GUTTER TO 2'-6" CONCRETE CURB AND GUTTER, PLACE ½" EXPANSION JOINTS AT 25' INTERVALS.
-PLACE GROOVE JOINTS 1" DEEP AT 12'-6" INTERVALS BETWEEN EXPANSION JOINTS.
-FILL AND SEAL THE TOP ½" OF THE EXPANSION JOINTS AND 1" OF CONTRACTION JOINTS WITH APPROVED JOINT SEALING COMPOUND.

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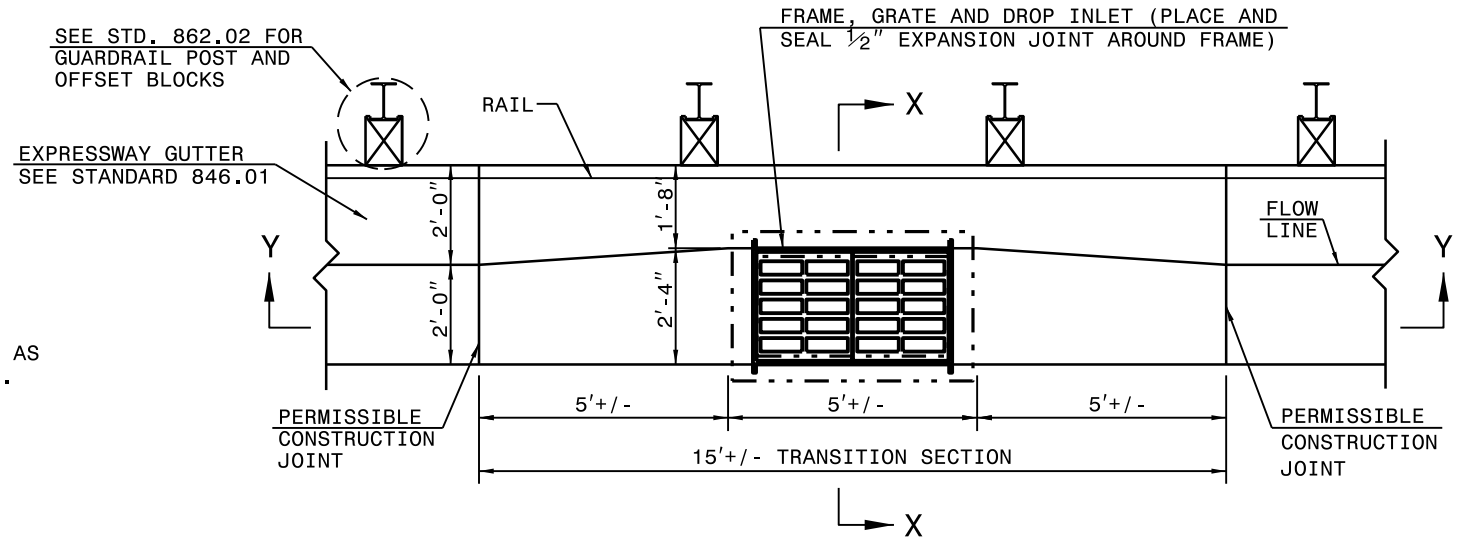
ROADWAY STANDARD DRAWING FOR

CONCRETE CURB, GUTTER AND CURB & GUTTER

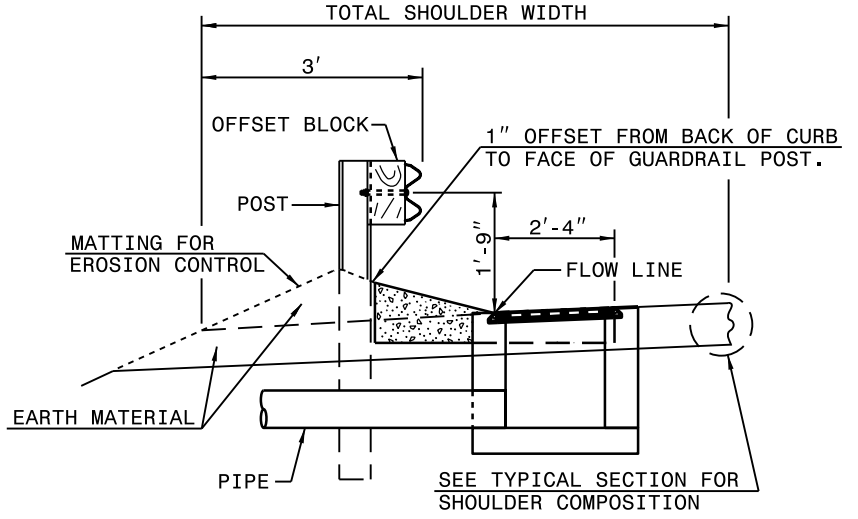
SHEET 3 OF 3

846.01

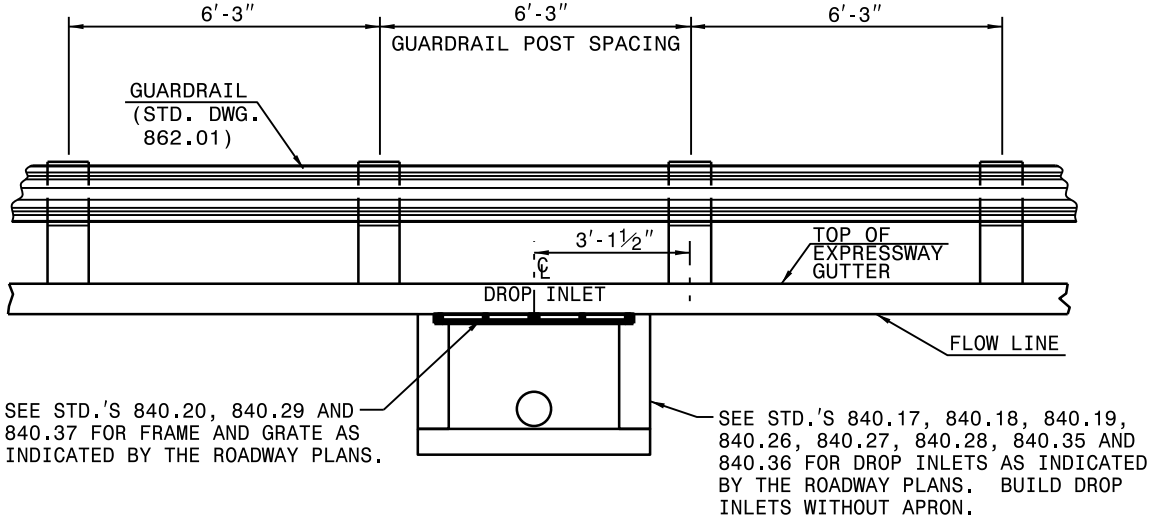


PLAN

GENERAL NOTES:
-PAY FOR TRANSITION SECTION AS CONCRETE EXPRESSWAY GUTTER.
-GUARDRAIL OPTIONAL



SECTION X-X



SECTION Y-Y

DROP INLET INSTALLATION IN EXPRESSWAY GUTTER

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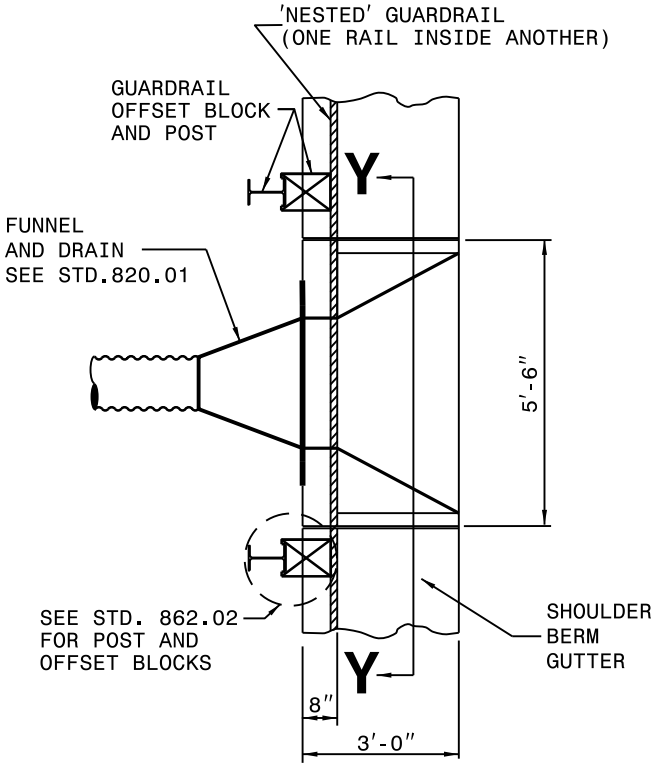
ROADWAY STANDARD DRAWING FOR

DROP INLET INSTALLATION IN EXPRESSWAY GUTTER

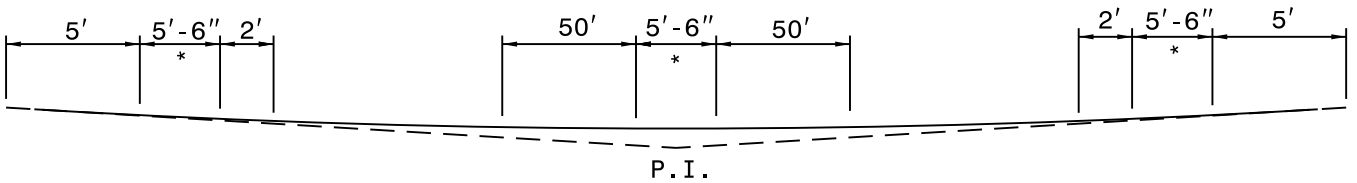
SHEET 1 OF 1

846.02

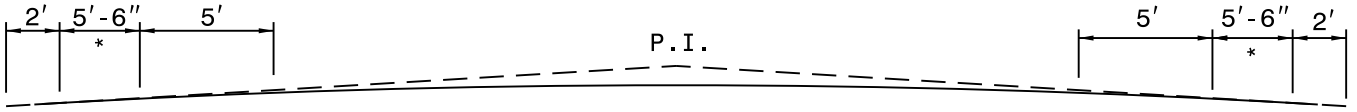
* CENTER FUNNEL DRAIN AND APRON IN THIS LOCATION.



PLAN

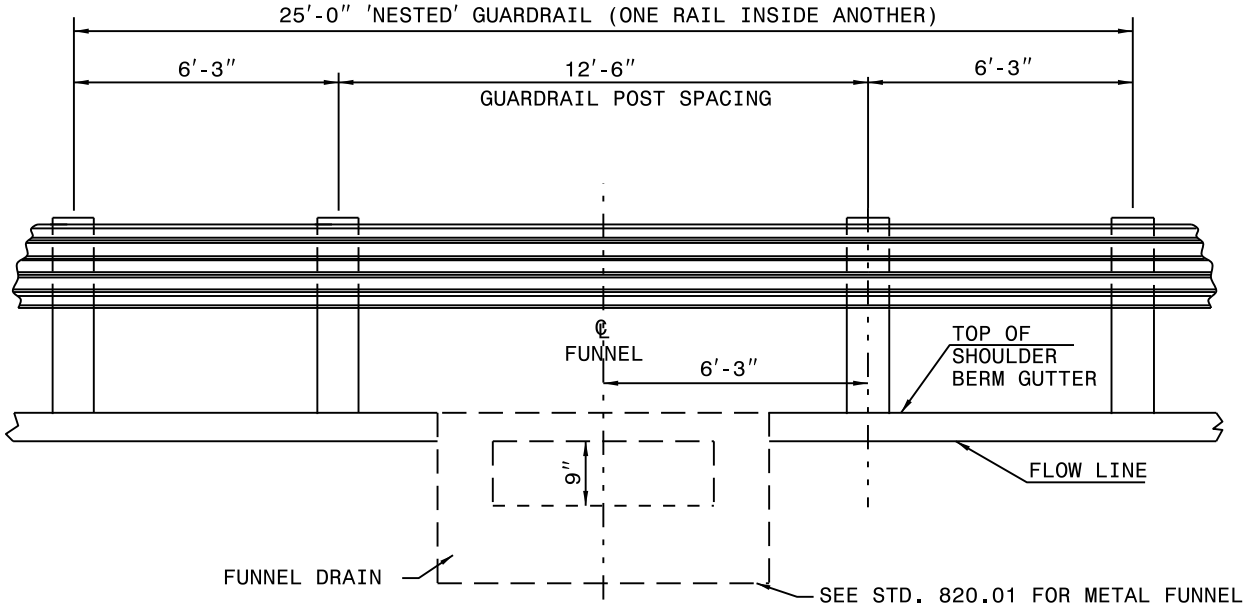


(SAG VERTICAL CURVE)



(CREST VERTICAL CURVE)

GUIDE FOR PLACING FUNNELS IN MINIMUM LENGTHS OF SHOULDER BERM GUTTER



SECTION Y-Y

FUNNEL INSTALLATION IN SHOULDER BERM GUTTER

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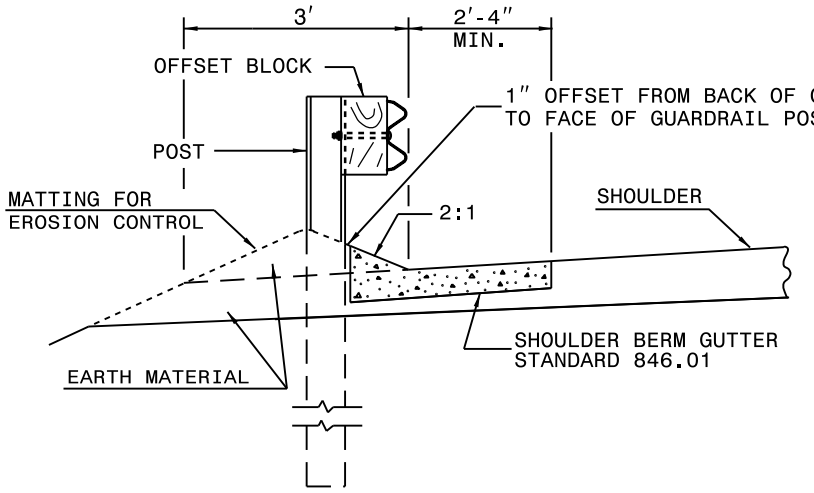
ROADWAY STANDARD DRAWING FOR

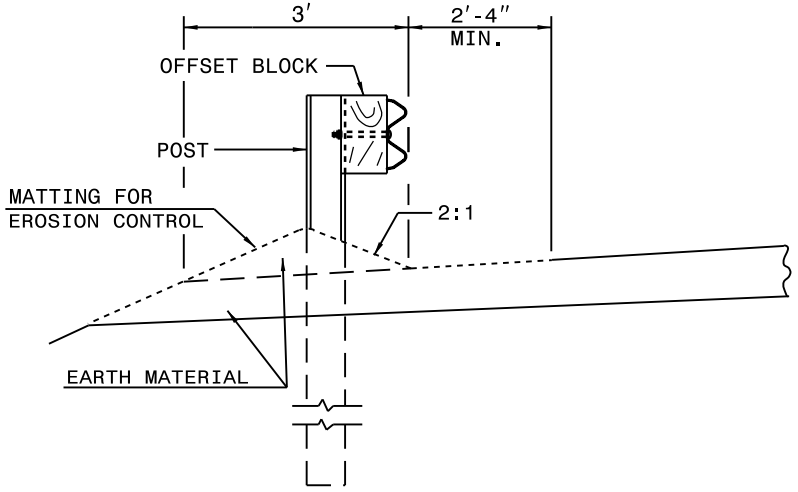
FUNNEL DRAIN INSTALLATION IN SHOULDER BERM GUTTER

SHEET 1 OF 2

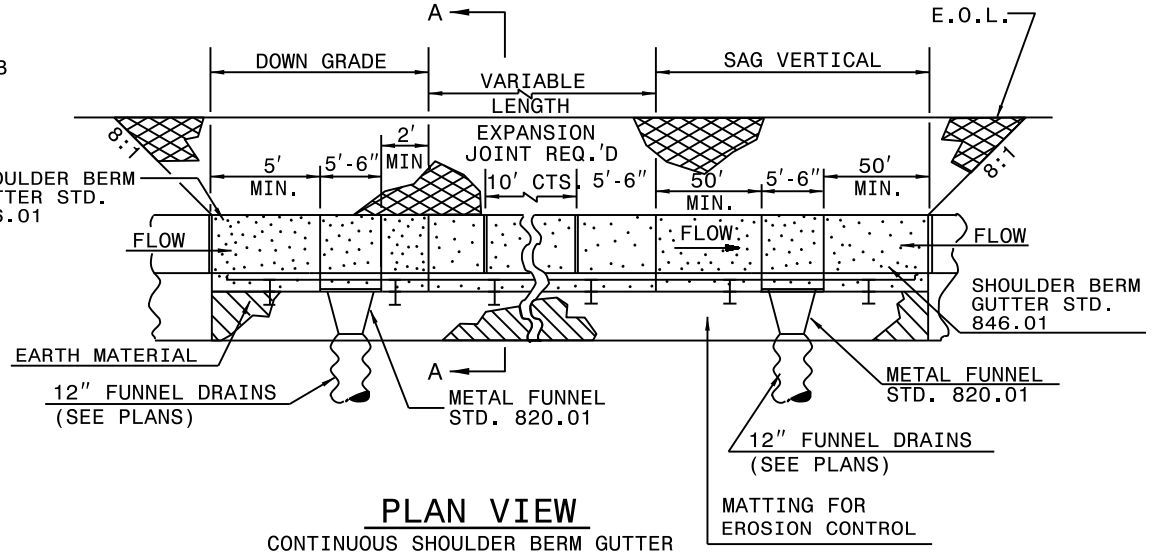
846.03



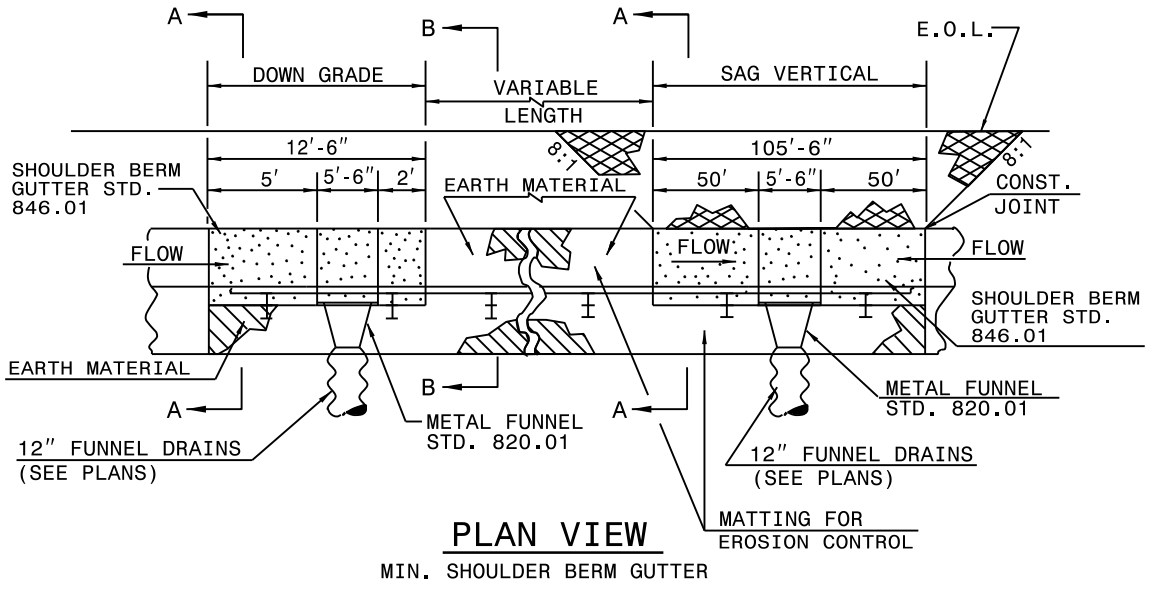
SECTION A-A
SHOULDER BERM WITH SHOULDER BERM GUTTER



SECTION B-B
SHOULDER BERM WITH MATTING
FOR EROSION CONTROL



PLAN VIEW
CONTINUOUS SHOULDER BERM GUTTER



PLAN VIEW
MIN. SHOULDER BERM GUTTER

SYMBOLS

- SHOULDER BERM GUTTER
- MATTING FOR EROSION CONTROL
- PAVED SHOULDER

SHOULDER BERM, SHOULDER BERM GUTTER AND FUNNEL DRAIN ADJACENT TO GUARDRAIL

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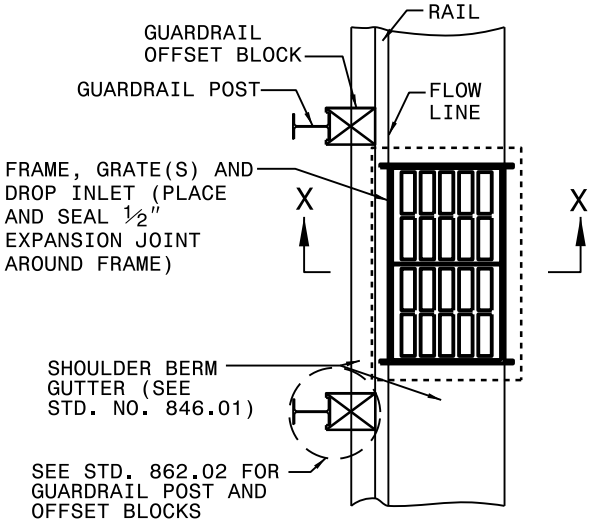
ROADWAY STANDARD DRAWING FOR

FUNNEL DRAIN INSTALLATION IN SHOULDER BERM GUTTER

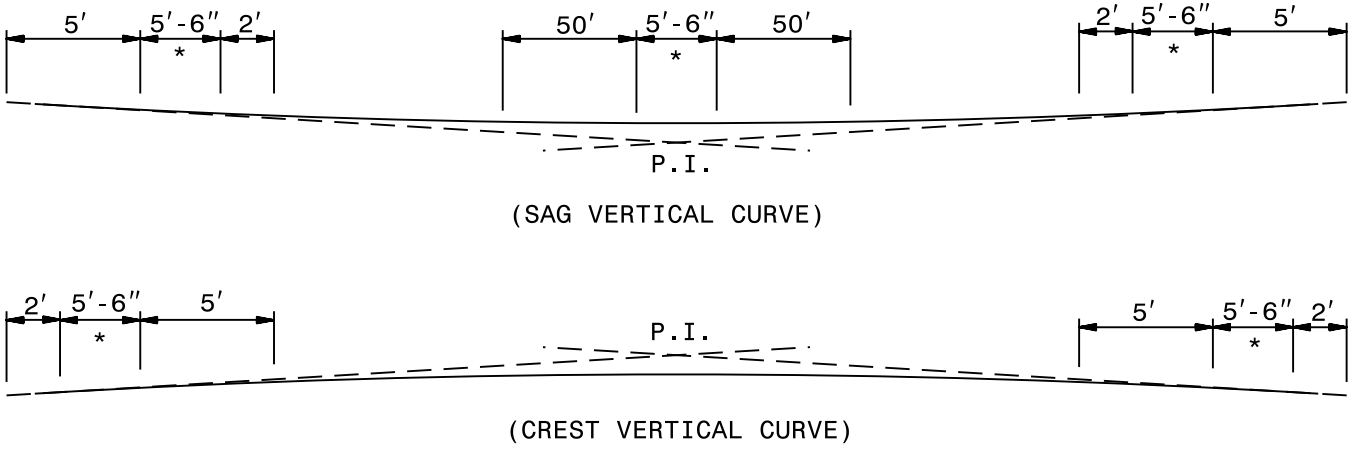
SHEET 2 OF 2

846.03

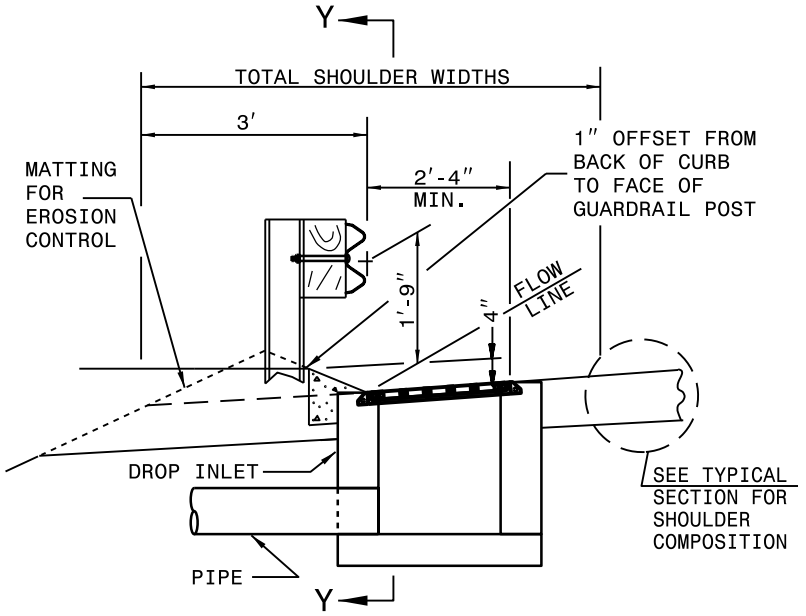
* CENTER DROP INLET IN THIS LOCATION.



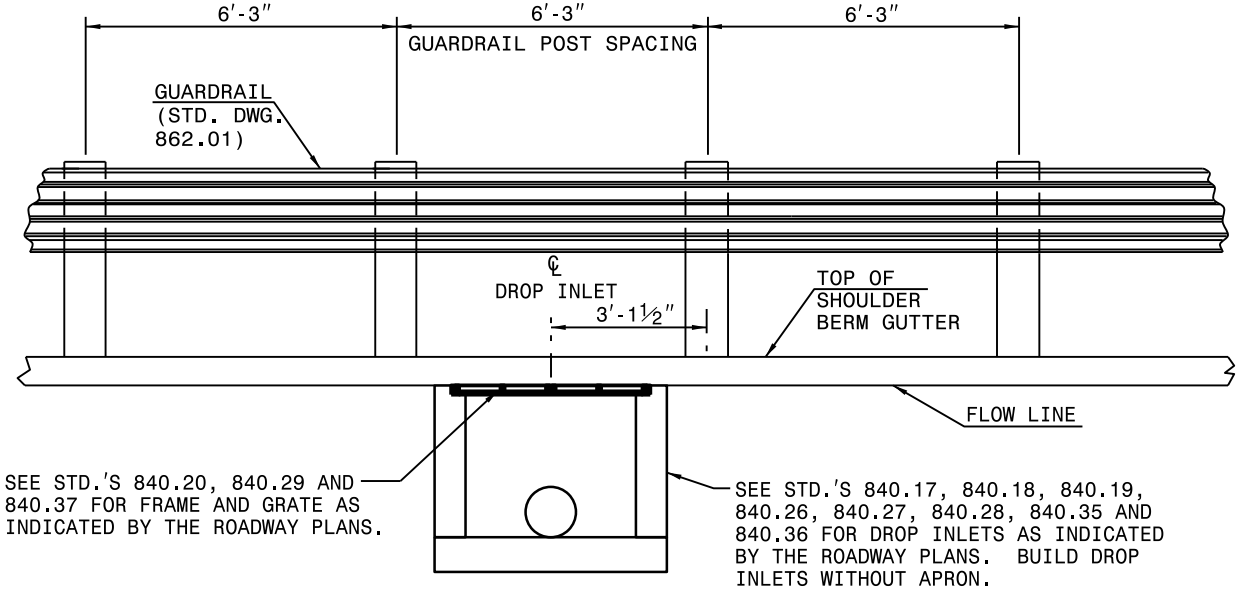
PLAN



GUIDE FOR PLACING DROP INLETS IN MINIMUM LENGTHS OF SHOULDER BERM GUTTER



SECTION X-X



SECTION Y-Y

DROP INLET INSTALLATION IN SHOULDER BERM GUTTER

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ROADWAY STANDARD DRAWING FOR

DROP INLET INSTALLATION IN SHOULDER BERM GUTTER

SHEET 1 OF 1

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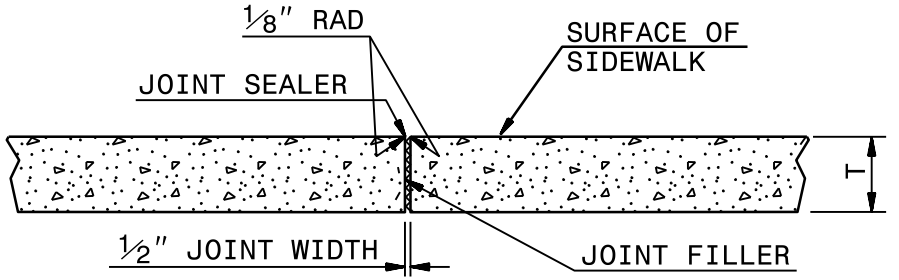
NOTES:

CONSTRUCT STANDARD SIDEWALK 5′ WIDE AND 4″ THICK UNLESS OTHERWISE DENOTED ON PLANS.

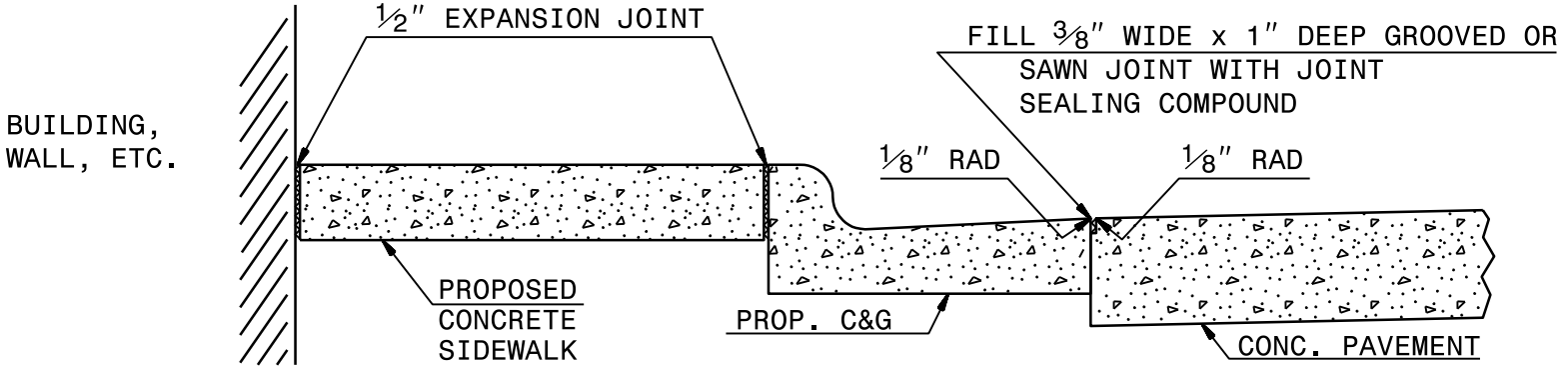
PLACE A GROOVE JOINT 1″ DEEP WITH ⅛″ RADII IN THE CONCRETE SIDEWALK AT 5′ INTERVALS. ONE ½″ EXPANSION JOINT WILL BE REQUIRED AT 50′ INTERVALS. A ½″ EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.

SEE STD. DWG. 848.05 FOR CURB RAMP LOCATION REQUIREMENTS AND CONSTRUCTION GUIDELINES.



T = SIDEWALK THICKNESS

TRANSVERSE EXPANSION JOINT IN SIDEWALK



DETAILS SHOWING JOINTS IN CONCRETE SIDEWALK

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ROADWAY STANDARD DRAWING FOR

CONCRETE SIDEWALK

SHEET 1 OF 1

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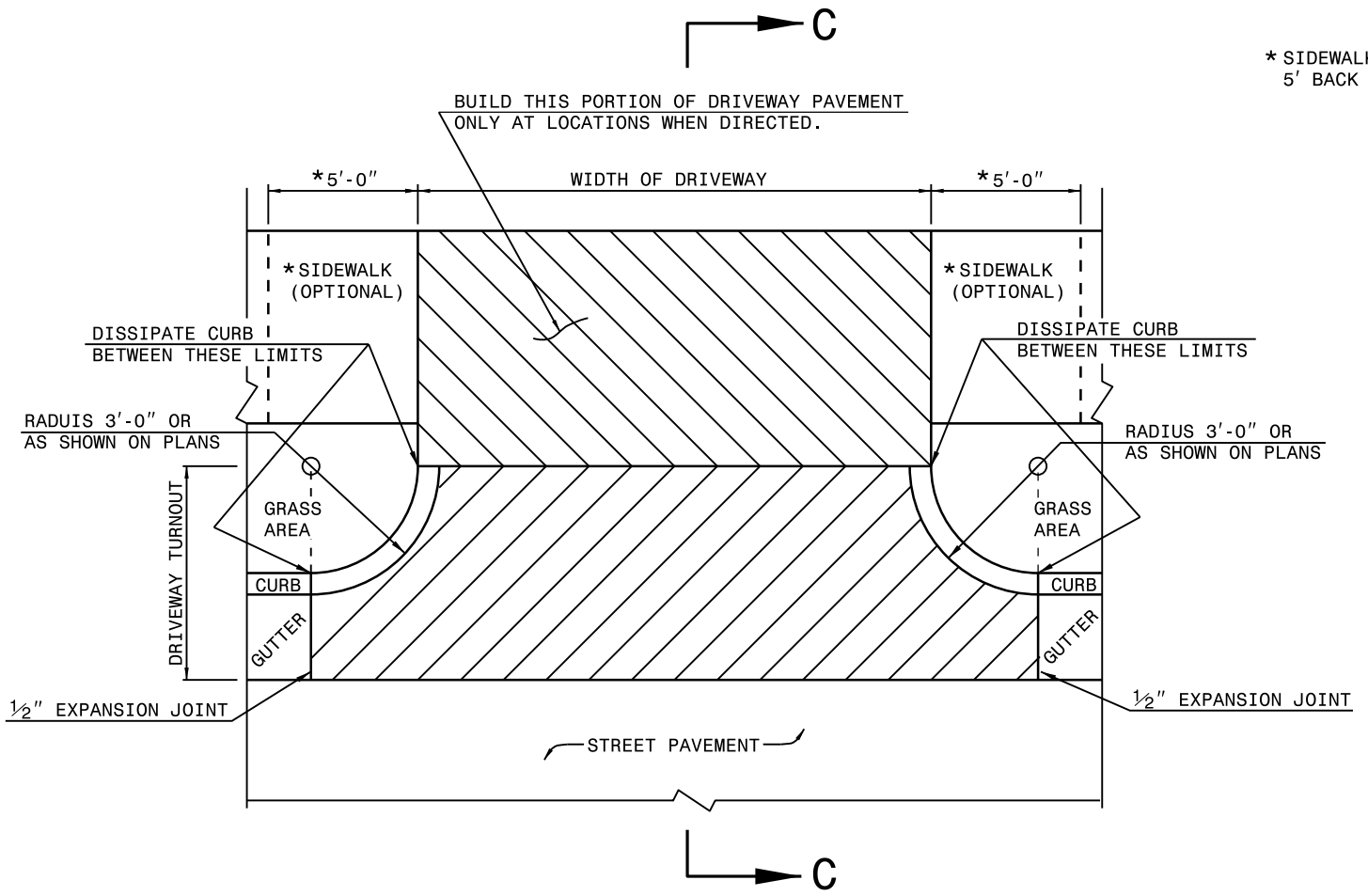
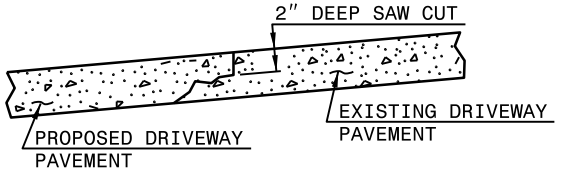


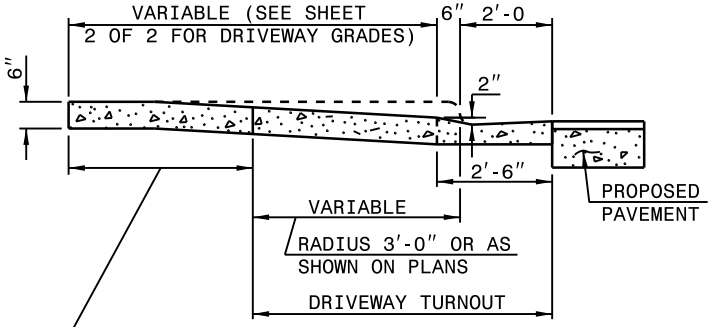
*SIDEWALK TAPERS DOWN
5′ BACK FROM DRIVEWAY.

PLAN
DETAIL OF DRIVEWAY



METHOD OF TIE IN

WHEN EXISTING DRIVEWAY PAVEMENT IS CONCRETE, SAW CUT 2″ DEEP JOINT AT THE POINT OF TIE-IN. SAW JOINT PERPENDICULAR TO EDGE OF EXISTING DRIVEWAY PAVEMENT.



SECTION C-C

STATE OF
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ROADWAY STANDARD DRAWING FOR

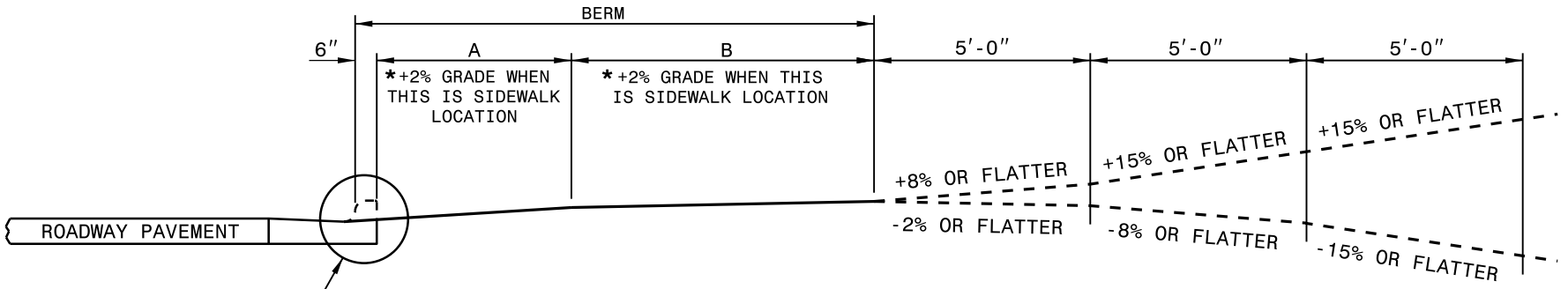
DRIVEWAY TURNOUT

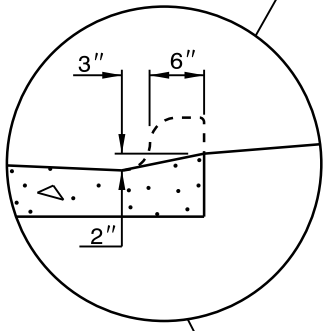
RADIUS TYPE

SHEET 1 OF 2

848.02

DESIRABLE DRIVEWAY GRADES



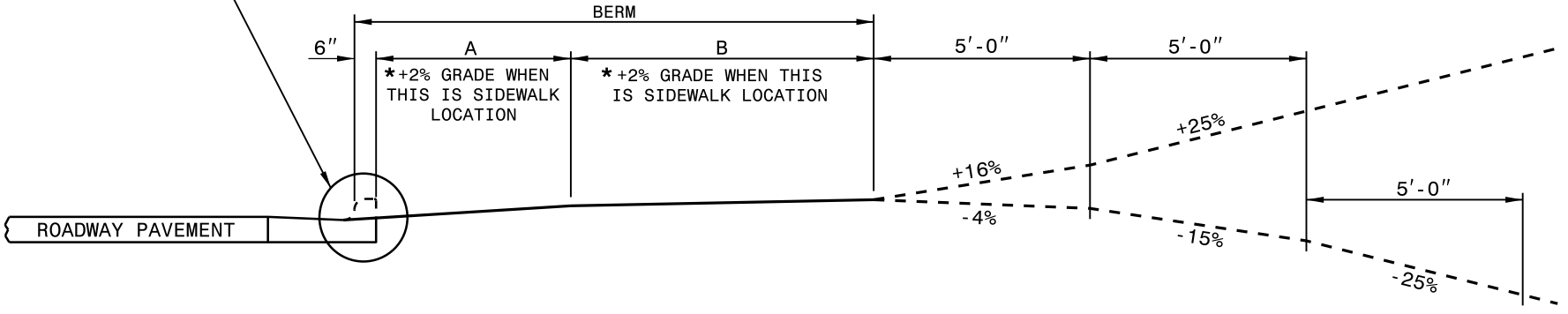


*SIDEWALK LOCATION
(DO NOT PLACE SIDEWALK ON BERMS LESS THAN 6′ WIDE.)

DESIRABLE OR MAXIMUM DRIVEWAY GRADES

BERM WIDTH	A		B	
	DIST.	GRADE	DIST.	GRADE
8′ OR LESS	5′-0″	+2%*	2′-6″	+5%
8′ OR LESS	2′-0″	+6%	5′-6″	+2%*
10′	4′-0″	+4%	5′-6″	+2%*
12′ & OVER	4′-6″	+4%	7′-0″	+2%*

MAXIMUM DRIVEWAY GRADES



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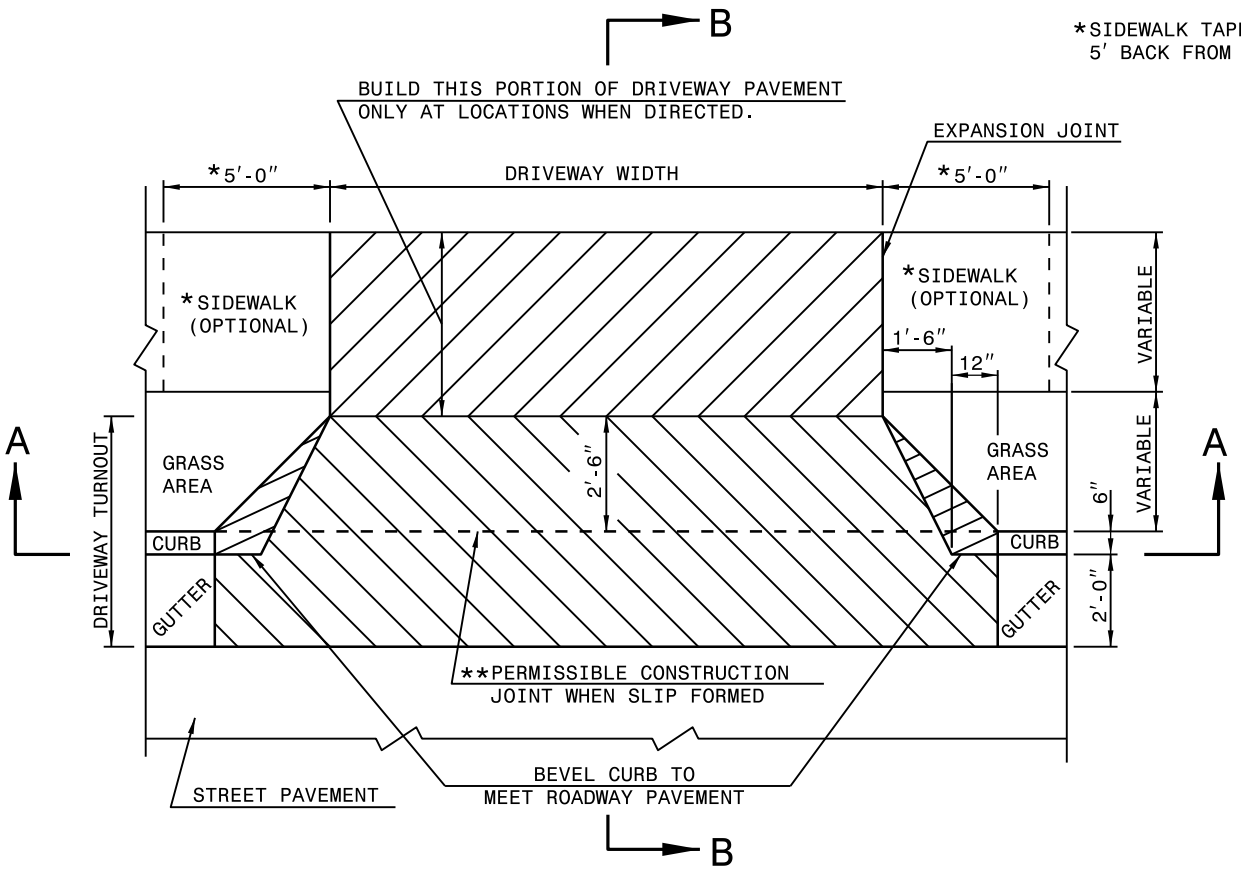
ROADWAY STANDARD DRAWING FOR

DRIVEWAY TURNOUT

DRIVEWAY GRADES

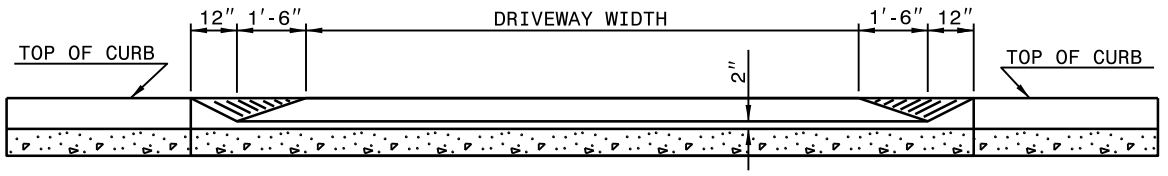
SHEET 2 OF 2

848.02

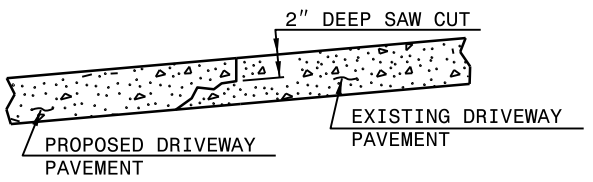


PLAN
DETAIL OF DRIVEWAY

*SIDEWALK TAPERS DOWN
5′ BACK FROM DRIVEWAY.

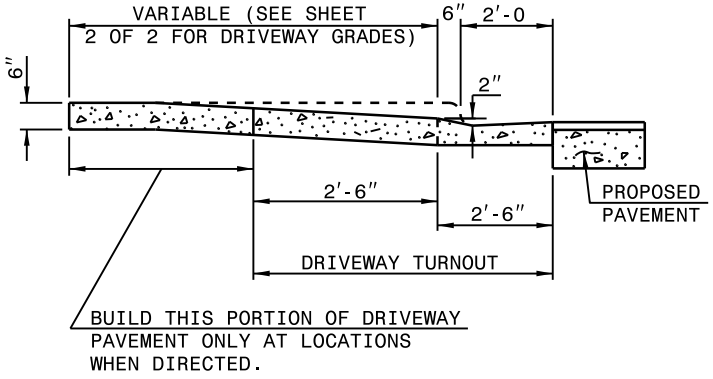


SECTION A-A



METHOD OF TIE IN

WHEN EXISTING DRIVEWAY PAVEMENT IS CONCRETE, SAW CUT 2″ DEEP JOINT AT THE POINT OF TIE-IN. SAW JOINT PERPENDICULAR TO EDGE OF EXISTING DRIVEWAY PAVEMENT.



SECTION B-B

GENERAL NOTES:

**NO CONSTRUCTION JOINT WILL BE PERMITTED IF FORMS ARE USED TO CAST DRIVEWAY. SLIP FORMING OF CURB AND GUTTER PERMITS THE USE OF CONSTRUCTION JOINT.

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ROADWAY STANDARD DRAWING FOR

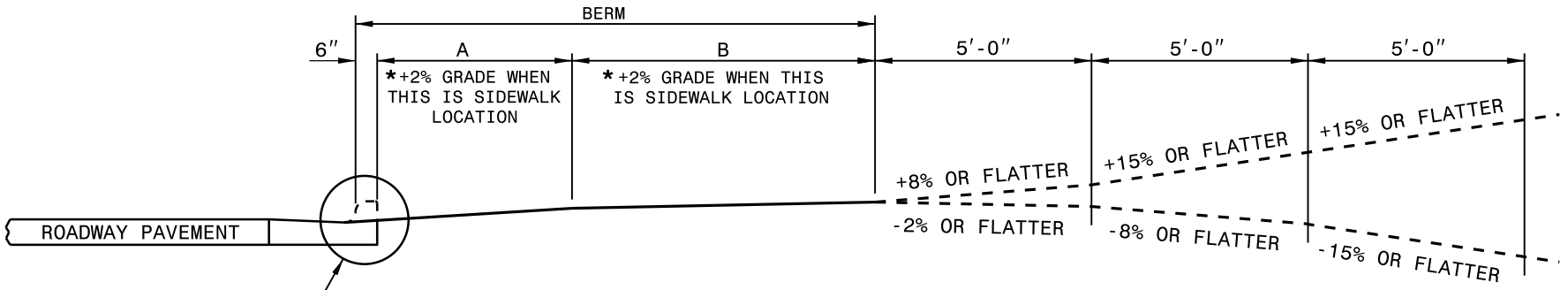
DRIVEWAY TURNOUT

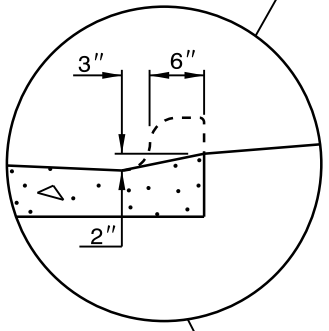
DROP CURB TYPE

SHEET 1 OF 2

848.03

DESIRABLE DRIVEWAY GRADES



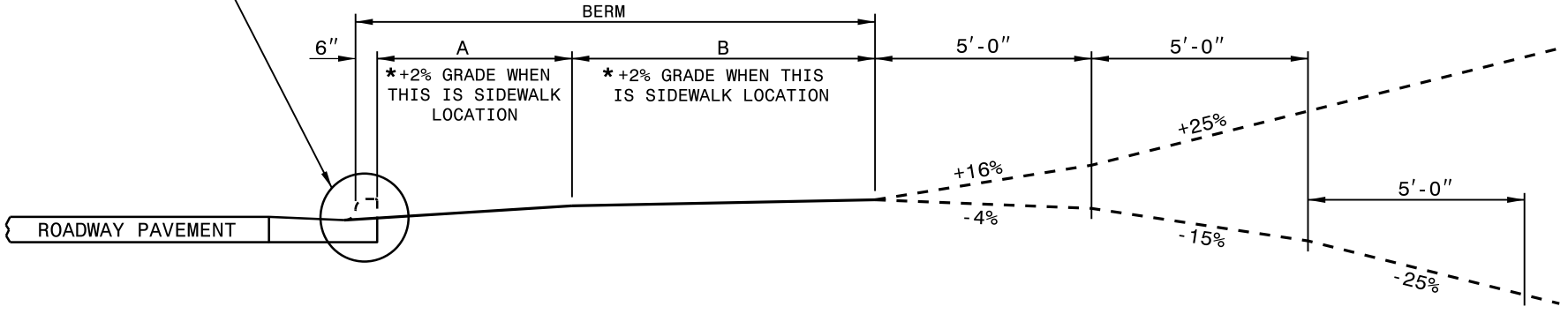


*SIDEWALK LOCATION
(DO NOT PLACE SIDEWALK ON BERMS LESS THAN 6′ WIDE.)

DESIRABLE OR MAXIMUM DRIVEWAY GRADES

BERM WIDTH	A		B	
	DIST.	GRADE	DIST.	GRADE
8′ OR LESS	5′-0″	+2%*	2′-6″	+5%
8′ OR LESS	2′-0″	+6%	5′-6″	+2%*
10′	4′-0″	+4%	5′-6″	+2%*
12′ & OVER	4′-6″	+4%	7′-0″	+2%*

MAXIMUM DRIVEWAY GRADES



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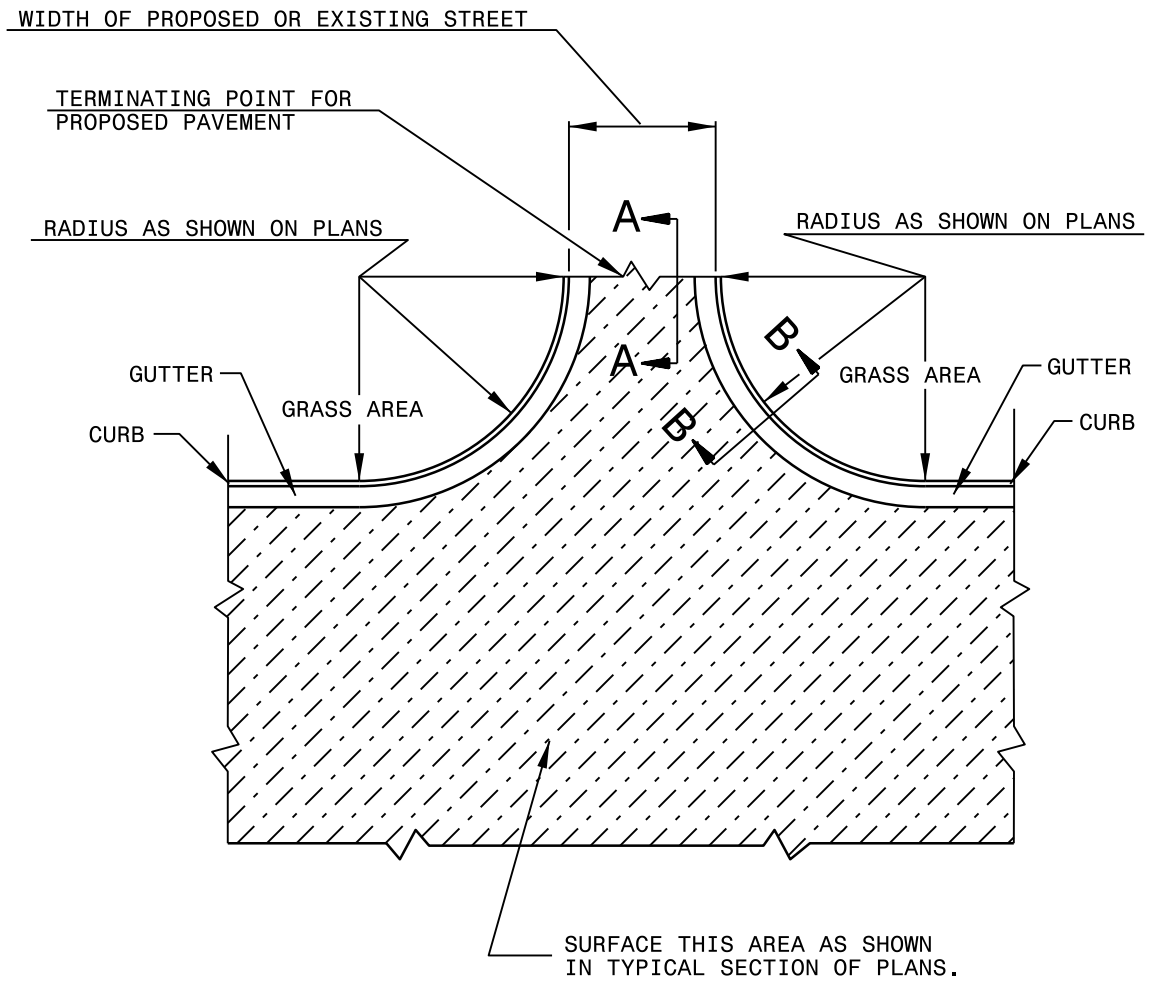
ROADWAY STANDARD DRAWING FOR
DRIVEWAY TURNOUT
DRIVEWAY GRADES

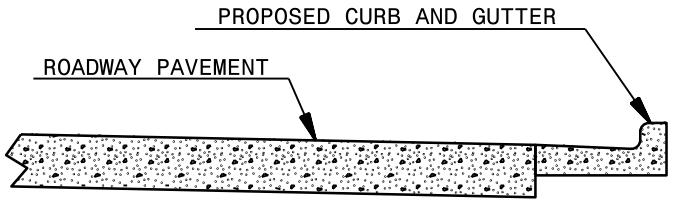
SHEET 2 OF 2

848.03

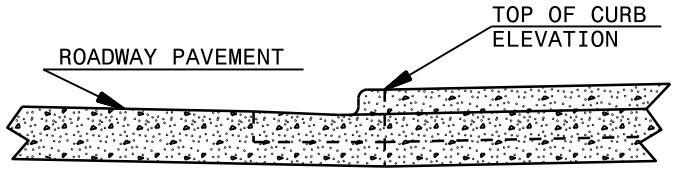


PARTIAL PLAN OF PAVED STREET TURNOUT

USE ON PROPOSED AND EXISTING STREET INTERSECTIONS OR MAJOR TYPE COMMERICAL ENTRANCES.



SECTION B-B



SECTION A-A

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

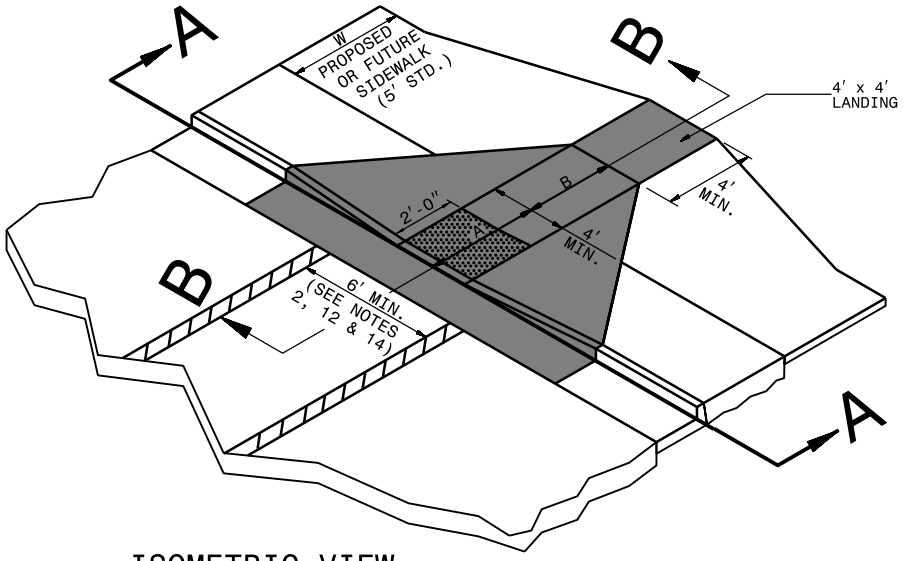
1-18

ROADWAY STANDARD DRAWING FOR

STREET TURNOUT

SHEET 1 OF 1

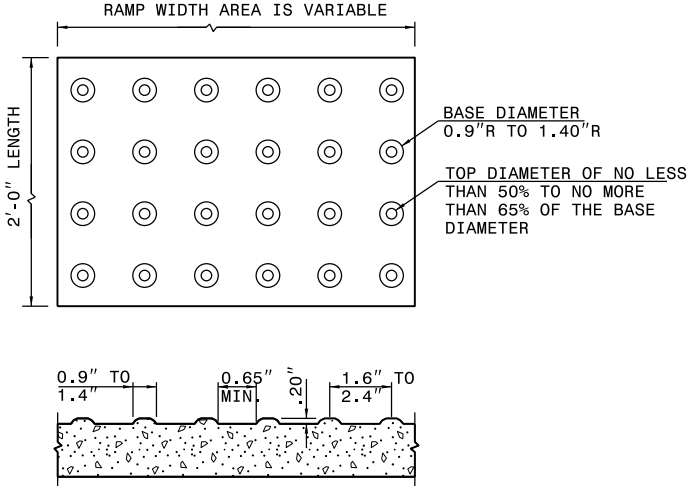
848.04



ISOMETRIC VIEW

PAY LIMITS FOR CURB RAMP

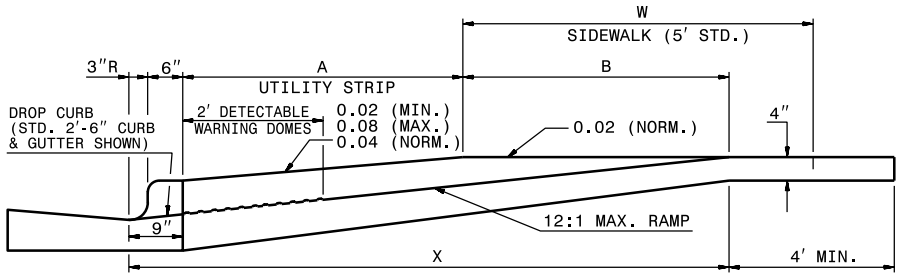
NOTES:
1. DETECTABLE WARNING DOMES WILL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. DETECTABLE WARNING DOMES WILL CONTRAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



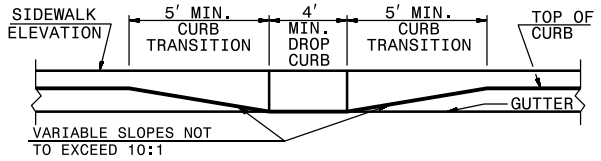
DETECTABLE WARNING DOMES

W	A	W+A+9"	X	B
5'	0.0'	5.8'	5.8'	5.0'*
6'	0.0'	6.8'	6.8'	6.0'**
7'	0.0'	7.8'	7.3'	6.5'**
8'	0.0'	8.8'	7.3'	6.5'**
5'	2.0'	7.8'	7.8'	5.0'
5'	2.5'	8.3'	8.1'	4.8'
5'	3.0'	8.8'	8.3'	4.4'
5'	3.5'	9.3'	8.4'	4.1'
5'	4.0'	9.8'	8.6'	3.8'
5'	4.5'	10.3'	8.7'	3.4'
5'	5.0'	10.8'	8.9'	3.1'

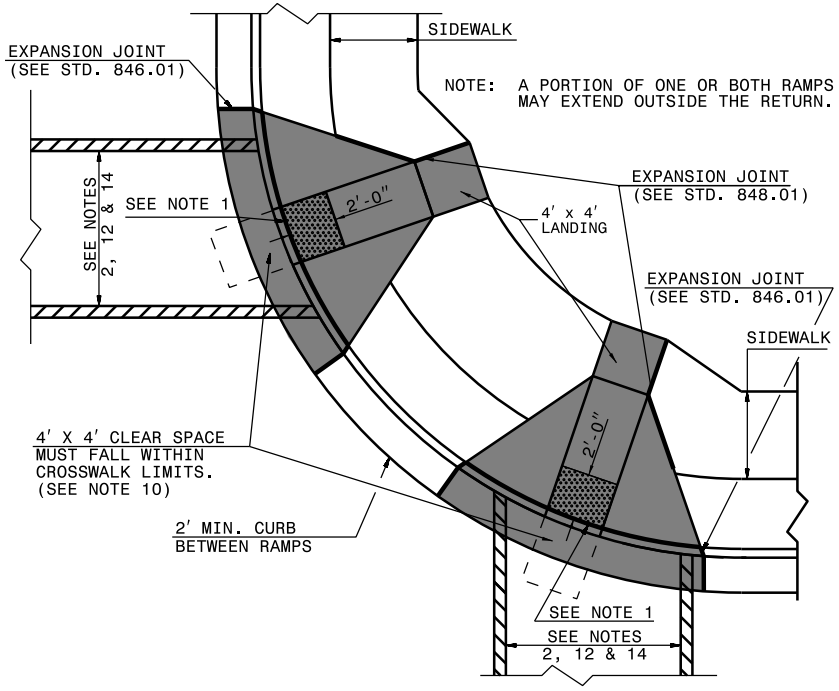
B = X-(A+9")
B = DISTANCE FROM FRONT EDGE OF SIDEWALK TO BACK POINT OF 12:1 (8.33%) SLOPE.
* BACK OF SIDEWALK DROP REQUIRED FOR ALL SIDEWALK SLOPES.
** BACK OF SIDEWALK DROP REQUIRED FOR SIDEWALK SLOPES 0.04.



SECTION B-B



SECTION A-A



PLAN VIEW

DUAL RAMPS
ANY RADII
(4' MIN. FLOOR WIDTH)

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

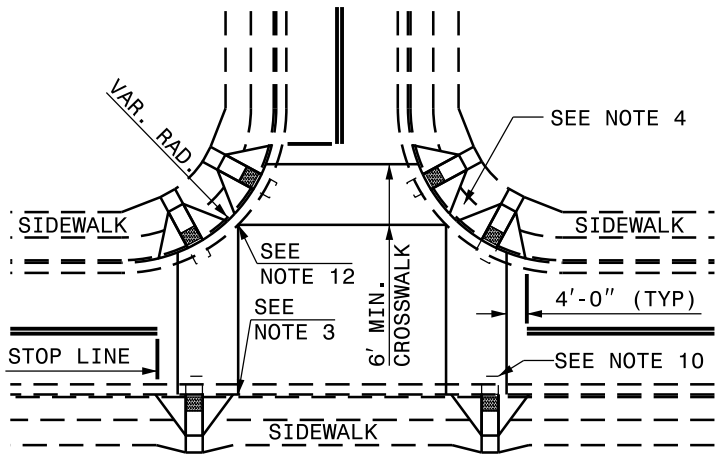
ROADWAY STANDARD DRAWING FOR

CURB RAMP

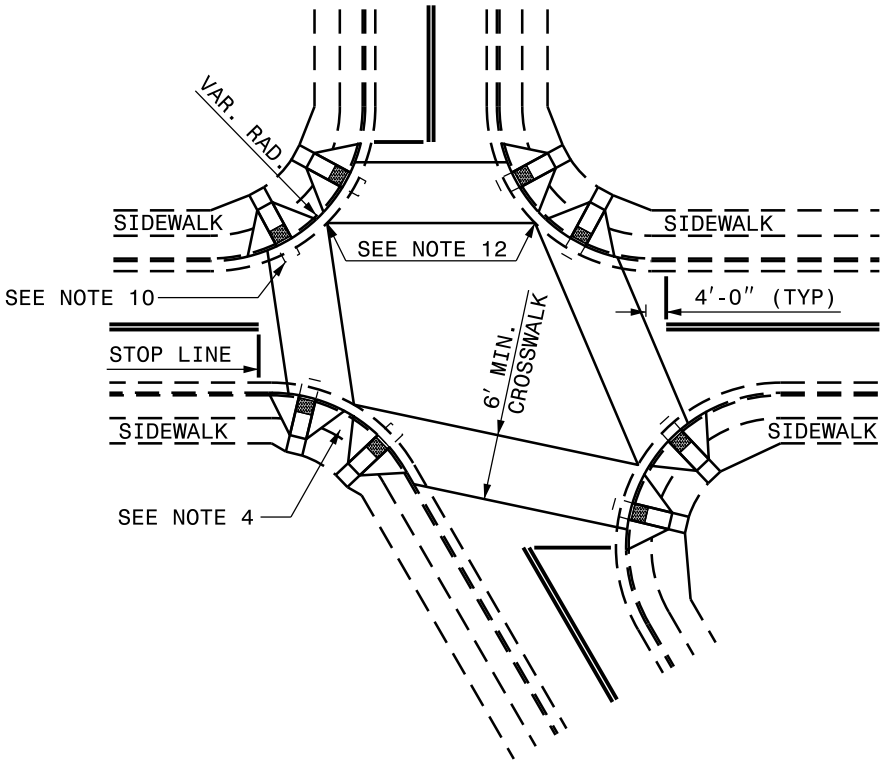
PROPOSED CURB AND GUTTER

SHEET 1 OF 3

848.05



DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS



DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES

ROADWAY PLAN SYMBOL

CR

FOR PROPOSED CURB RAMP

PROPOSED CURB RAMP W/ LANDING

PROPOSED OR FUTURE SIDEWALK

ALLOWABLE LOCATIONS

DUAL RAMP RADII.....ANY

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STATE OF NORTH CAROLINA
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RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR

CURB RAMP

PROPOSED CURB AND GUTTER

SHEET 2 OF 3

848.05

NOTES:

1. CONSTRUCT THE RAMP SURFACE TO BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.

2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE MOVING CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNING AND DELINEATION UNIT OR LOCATE AS DIRECTED BY THE ENGINEER.

3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4′x4′ CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.

4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4′ MINIMUM.

5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATE AS DIRECTED BY THE ENGINEER.

6. TERMINATE PARKING A MINIMUM OF 20′ BACK OF A PEDESTRIAN CROSSWALK.

7. CONSTRUCT CURB RAMPS A MINIMUM OF 4′ WIDE.

8. CONSTRUCT THE RUNNING SLOPE OF THE RAMP 8.33% MAXIMUM.

9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.

10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.

11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.

12. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4′x4′ WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR MEDIAN ISLANDS A MINIMUM OF 5′x5′ WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.

13. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6′ WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGHT THE ISLAND.

14. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5′X5′ LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.

15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.

16. PLACE A ½″ EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01

17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE MUTCD.

18. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

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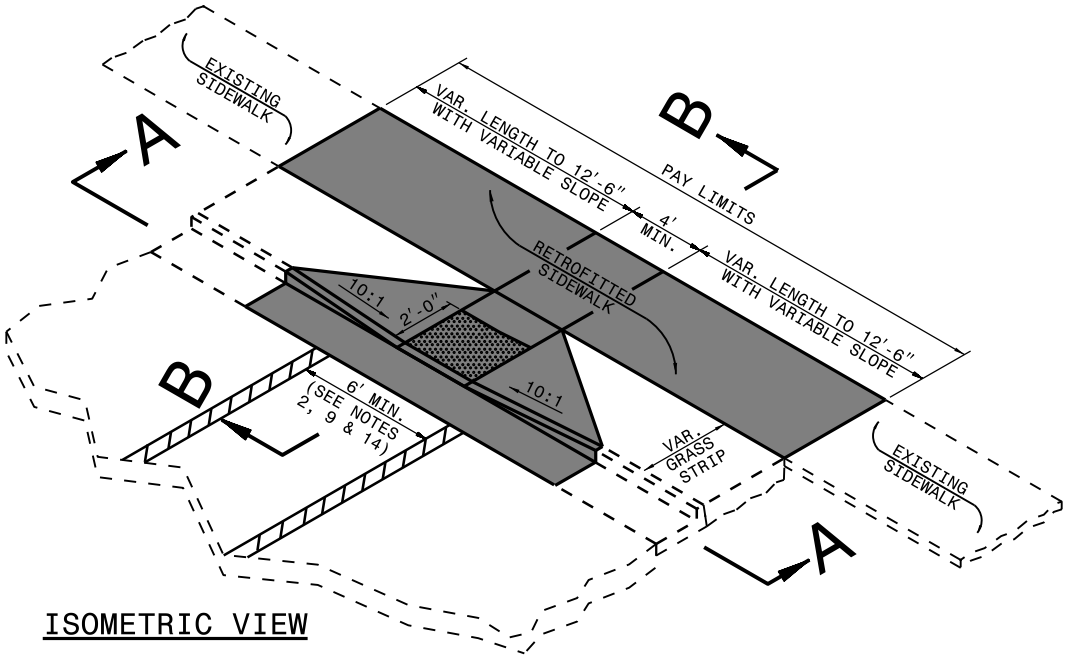
ROADWAY STANDARD DRAWING FOR

CURB RAMPS

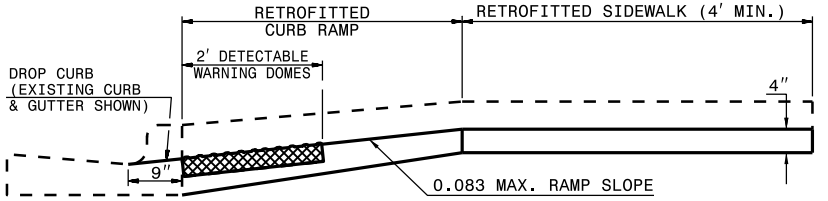
NOTES

CURB RAMP AND EXISTING SIDEWALK WITH GRASS STRIP

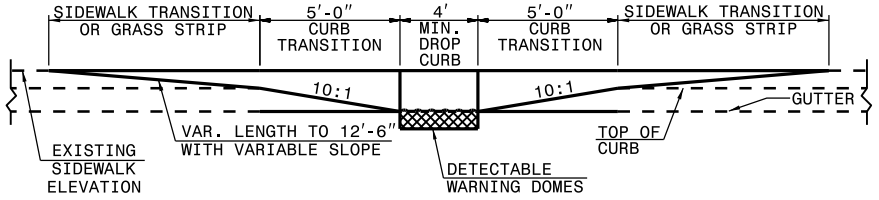


ISOMETRIC VIEW

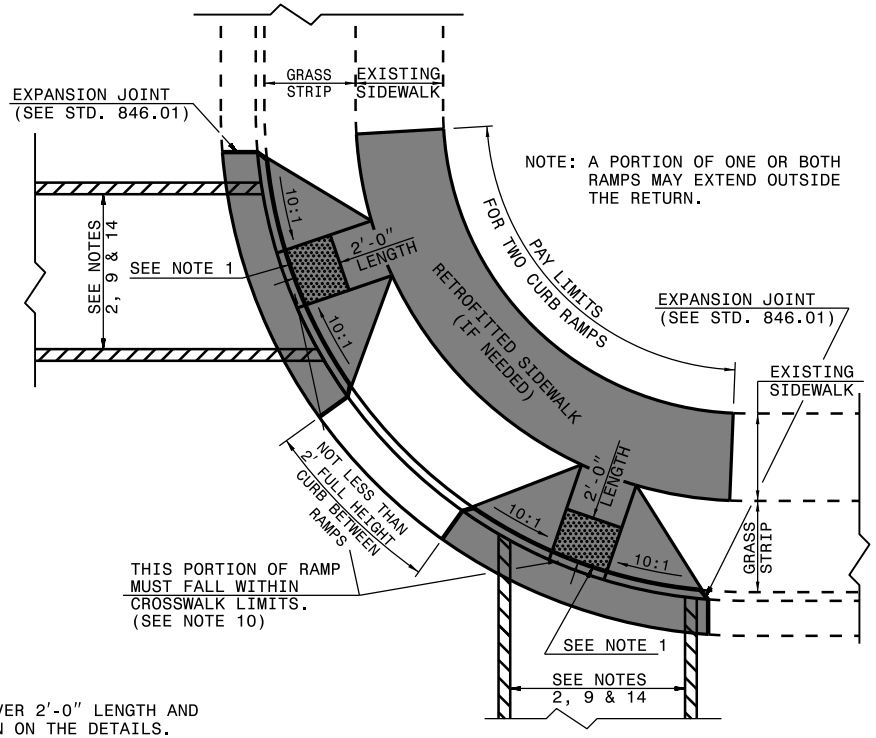
PAY LIMITS OF CURB RAMP



SECTION B-B

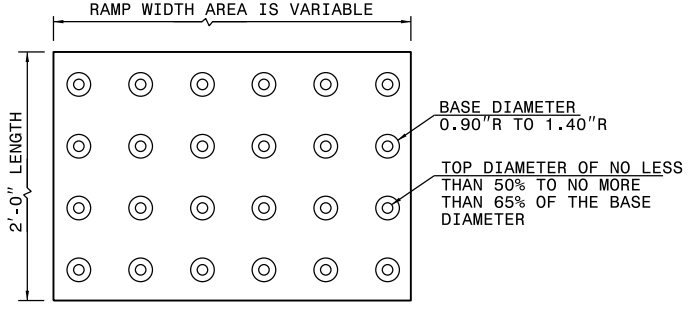


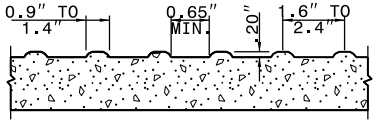
SECTION A-A



PLAN VIEW

DUAL RAMPS
ANY RADII
(40" MIN. FLOOR WIDTH)





DETECTABLE WARNING DOMES

NOTES:
1. PLACE DETECTABLE WARNING DOMES TO COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. OBTAIN VISIBLE CONTRAST WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

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ROADWAY STANDARD DRAWING FOR

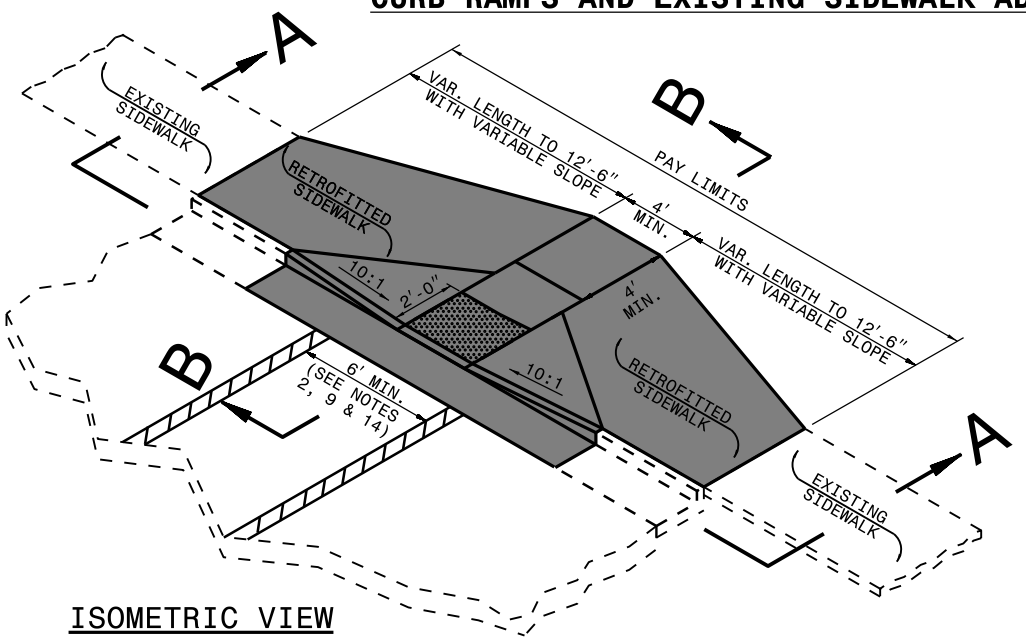
CURB RAMP

EXISTING CURB AND GUTTER

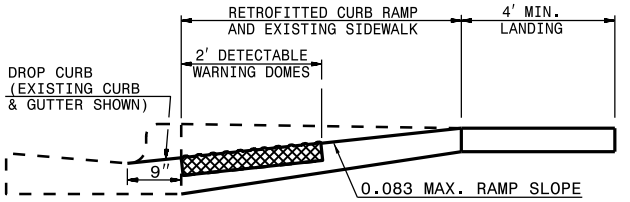
SHEET 1 OF 5

848.06

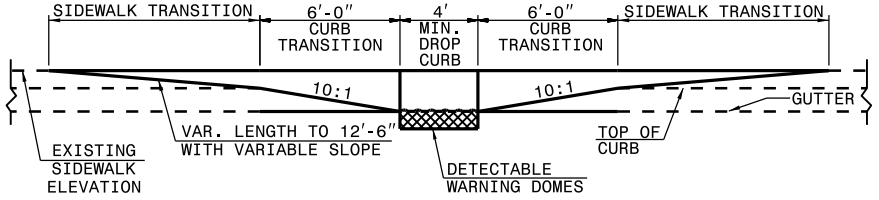
CURB RAMPS AND EXISTING SIDEWALK ADJACENT TO CURB



ISOMETRIC VIEW

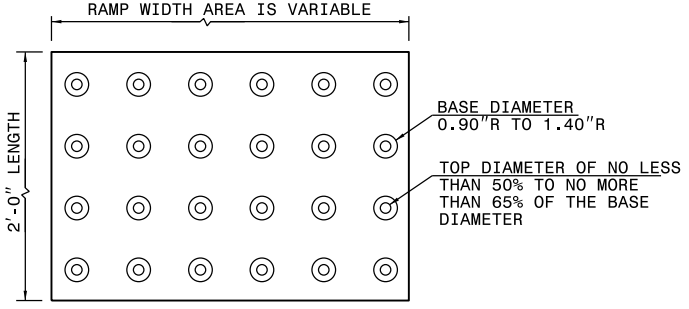


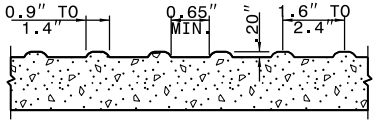
SECTION B-B



SECTION A-A

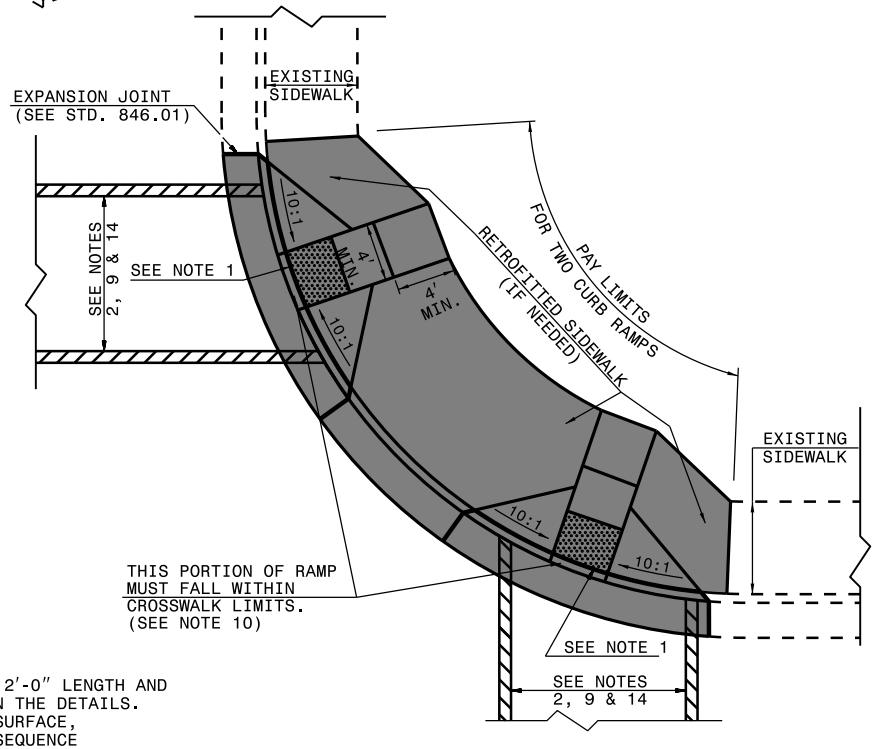
PAY LIMITS OF CURB RAMP





DETECTABLE WARNING DOMES

NOTES:
1. PLACE DETECTABLE WARNING DOMES TO COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. OBTAIN VISIBLE CONTRAST WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



PLAN VIEW

DUAL RAMPS
ANY RADII
(40" MIN. FLOOR WIDTH)

1-18

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR

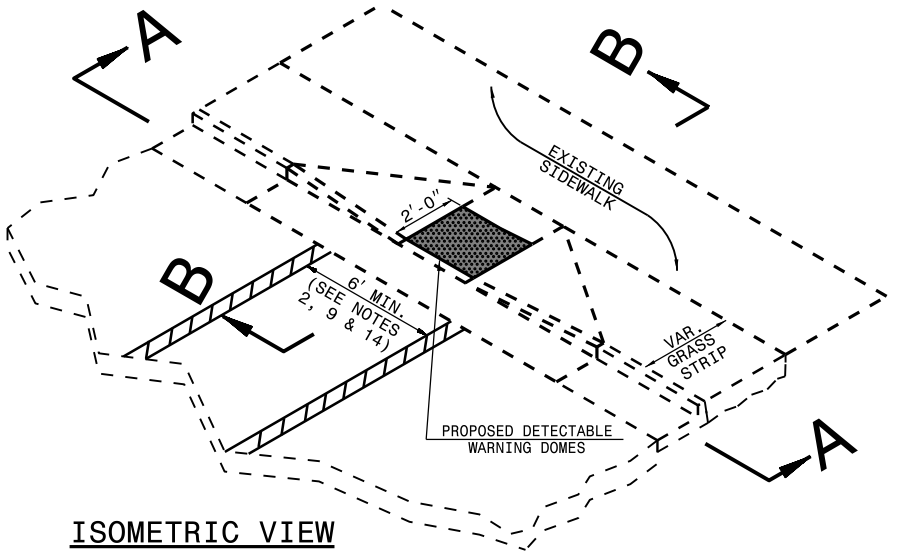
CURB RAMP

EXISTING CURB AND GUTTER

SHEET 2 OF 5

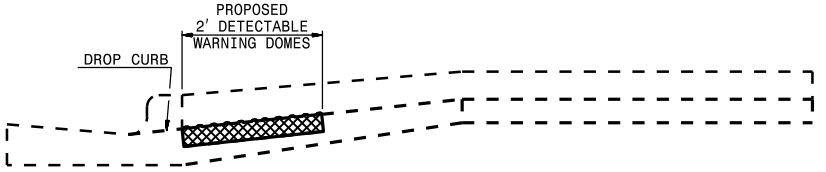
848.06

RETROFITTING DETECTABLE WARNING DOMES ONTO EXISTING CURB RAMP

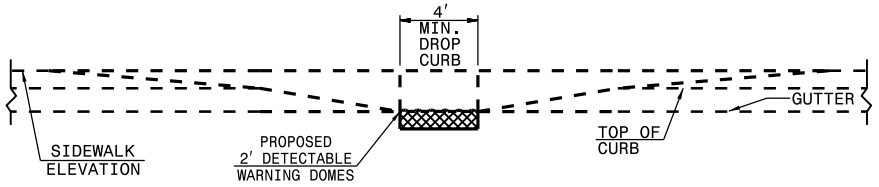


ISOMETRIC VIEW

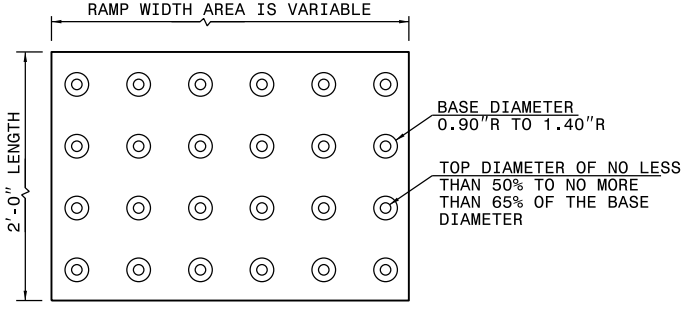
PAY LIMITS OF RETROFIT CURB RAMP

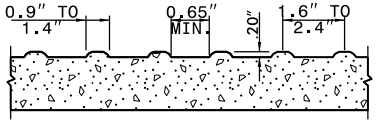


SECTION B-B



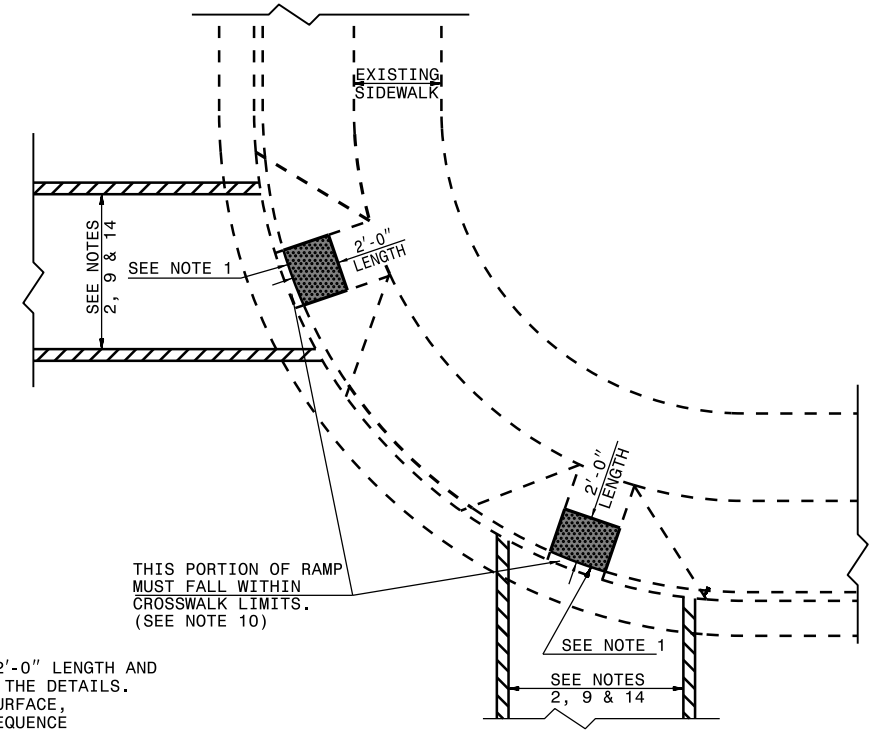
SECTION A-A





DETECTABLE WARNING DOMES

NOTES:
1. PLACE DETECTABLE WARNING DOMES TO COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. OBTAIN VISIBLE CONTRAST WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



PLAN VIEW

DUAL RAMPS
ANY RADII
(40" MIN. FLOOR WIDTH)

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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ROADWAY STANDARD DRAWING FOR

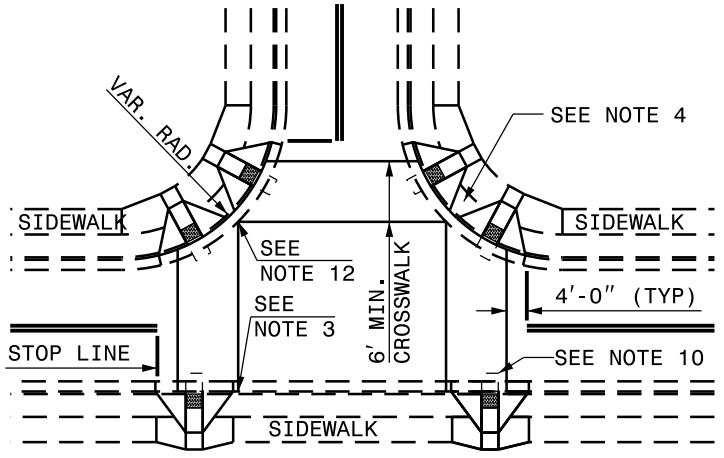
CURB RAMP

EXISTING CURB AND GUTTER

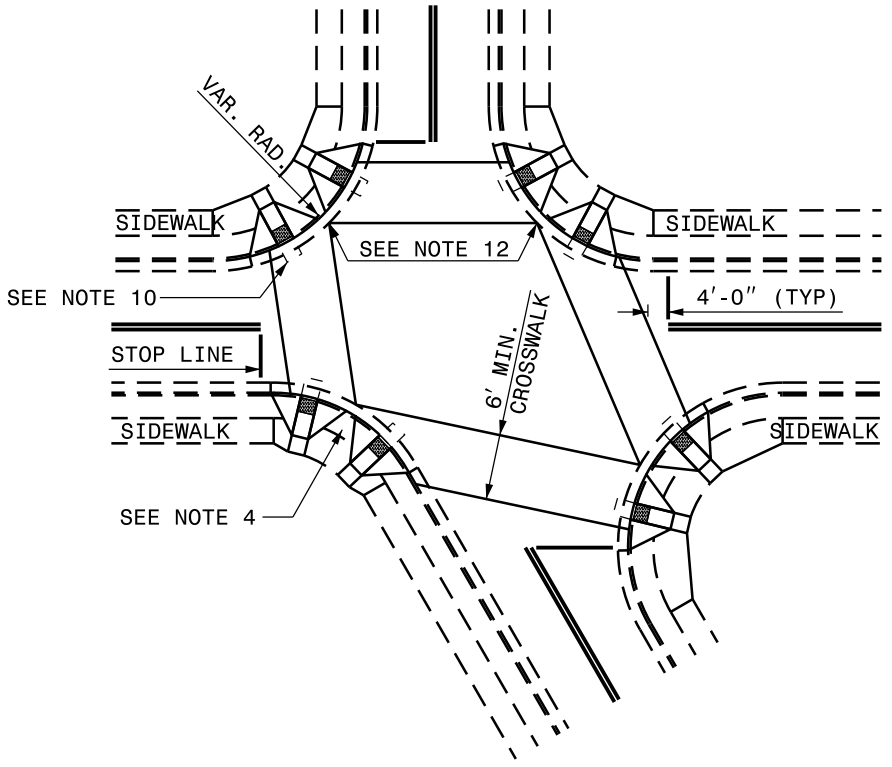
SHEET 3 OF 5

848.06

CURB RAMPS AND EXISTING SIDEWALK



DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS



DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES

RESURFACING PROJECTS

PROPOSED CURB RAMP W/ LANDING FOR RESURFACING PROJECTS

EXISTING SIDEWALK

ALLOWABLE LOCATIONS

DUAL RAMP RADII.....ANY

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
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ROADWAY STANDARD DRAWING FOR

CURB RAMP

EXISTING CURB AND GUTTER

SHEET 4 OF 5

848.06

CURB RAMP AND EXISTING SIDEWALK

NOTES:

1. CONSTRUCT THE RAMP SURFACE TO BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.

2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE MOVING CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNING AND DELINEATION UNIT OR LOCATE AS DIRECTED BY THE ENGINEER.

3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4′x4′ CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.

4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4′ MINIMUM.

5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATE AS DIRECTED BY THE ENGINEER.

6. TERMINATE PARKING A MINIMUM OF 20′ BACK OF A PEDESTRIAN CROSSWALK.

7. CONSTRUCT CURB RAMPS A MINIMUM OF 4′ WIDE.

8. CONSTRUCT THE RUNNING SLOPE OF THE RAMP 8.33% MAXIMUM.

9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.

10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.

11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.

12. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4′x4′ WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR MEDIAN ISLANDS A MINIMUM OF 5′x5′ WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.

13. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6′ WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGHT THE ISLAND.

14. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5′X5′ LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.

15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.

16. PLACE A ½″ EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01

17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE MUTCD.

18. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

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ROADWAY STANDARD DRAWING FOR
CURB RAMP
EXISTING CURB AND GUTTER

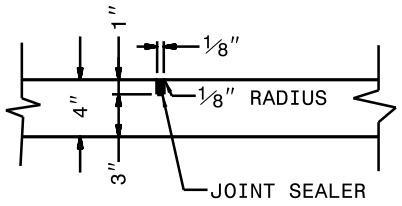
SHEET 5 OF 5
848.06

GENERAL NOTES:

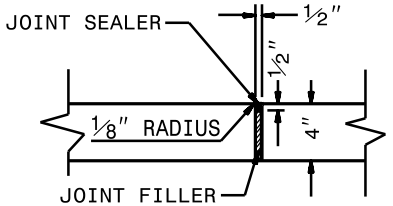
IN THE 4″ CONC. PAVED DITCHES, PLACE ½″ EXPANSION JOINTS AT 30′ INTERVALS AND AT ALL OTHER POINTS WHERE PROPOSED DITCHES ABUT RIGID OBJECTS. PLACED GROOVED JOINTS 1″ DEEP AT 10′ INTERVALS BETWEEN EXPANSION JOINTS.

CONSTRUCT WIDTH AND SHAPE OF PROPOSED 4″ CONCRETE PAVED DITCHES AS SHOWN OR AS DIRECTED BY THE ENGINEER.

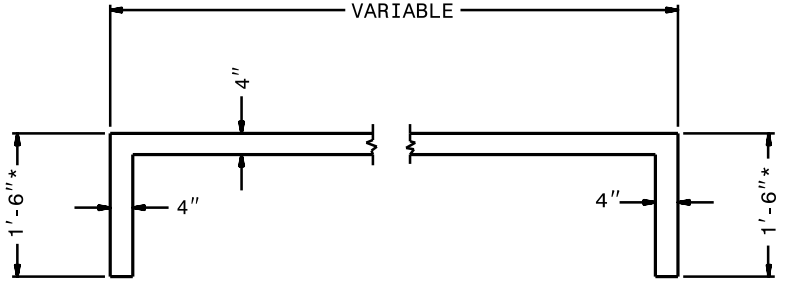
FOR DITCH GRADES ABOVE 2% EROSION CONTROL, INSTALL MATTING ON BOTH SIDES OF THE PAVING FOR A MINIMUM WIDTH OF 36″ OR AS DIRECTED BY THE ENGINEER.



SHOWING GROOVED JOINT



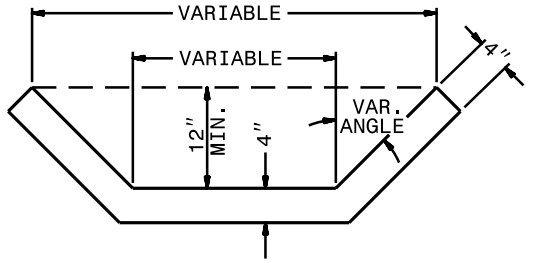
SHOWING EXPANSION JOINT



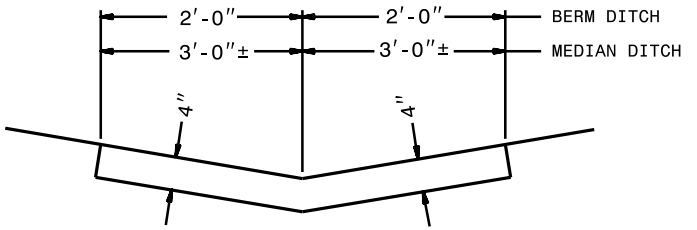
PART LONGITUDINAL SECTION OF PAVED DITCH

SHOWING 1′-6″ CURTAIN WALL REQUIRED AT EACH END

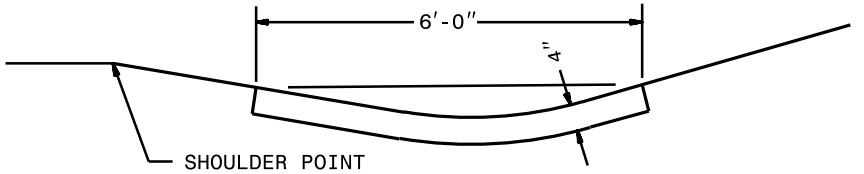
* WHEN CURTAIN WALL FOR PAVED DITCH IS LOCATED ADJACENT TO A DRAINAGE STRUCTURE AND THE PIPE FROM THE STRUCTURE INTERFERES WITH THE 1′-6″ DEPTH, THE DEPTH OF THE CURTAIN WALL MAY BE REDUCED BELOW 1′-6″ TO CLEAR THE TOP OF THE PIPE.



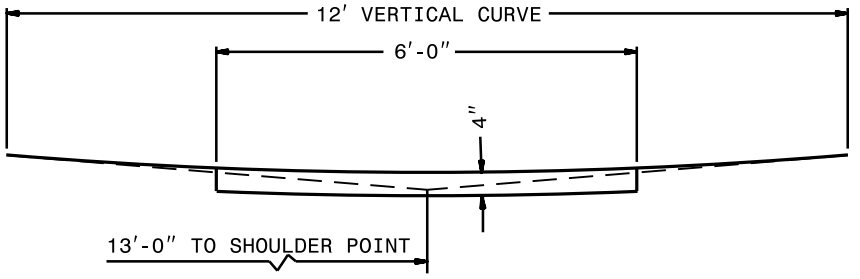
BASE DITCH OR BERM DRAINAGE OUTLET DITCH



MEDIAN OR BERM DITCH



SIDE DITCH



12′ V.C. ROADWAY DITCH

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
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RALEIGH, N.C.

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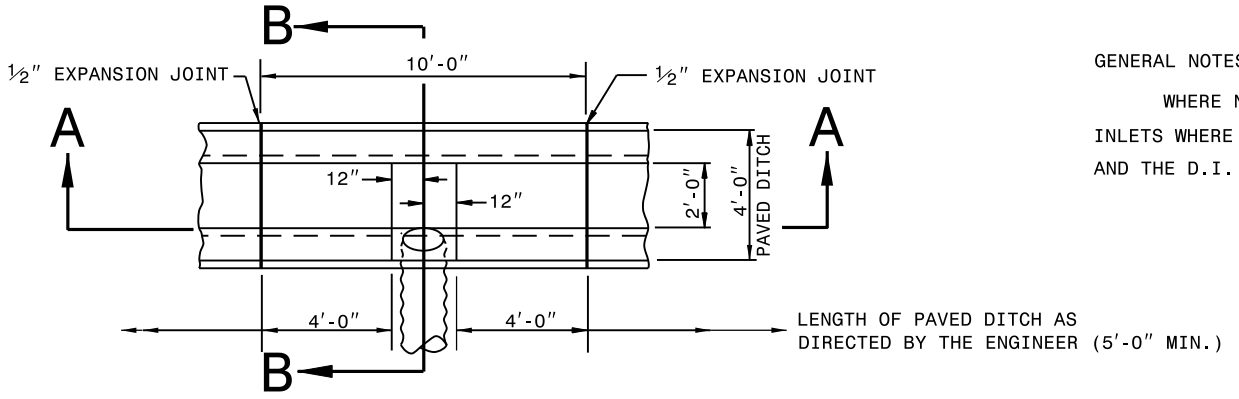
ROADWAY STANDARD DRAWING FOR

CONCRETE PAVED DITCHES

SHEET 1 OF 1

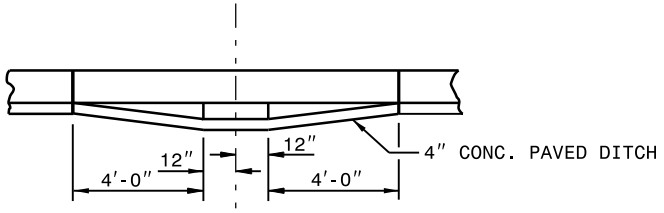
850.01



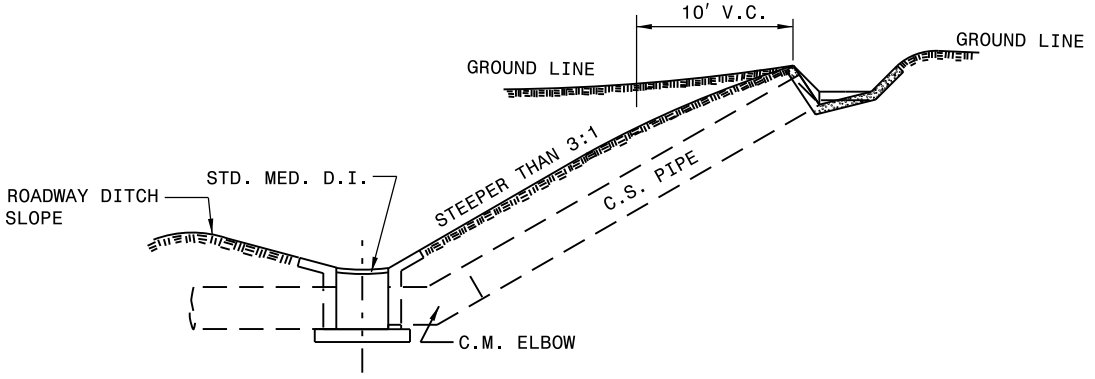
PLAN

GENERAL NOTES:

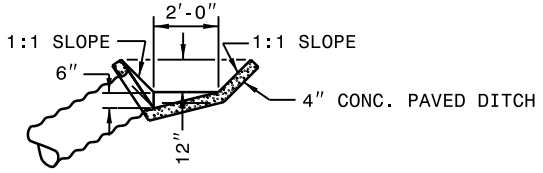
WHERE NECESSARY, ELBOWS MAY BE USED TO SKEW PIPE TO FIT INLETS WHERE THERE IS OFFSET BETWEEN THE INLET END AT BERM AND THE D.I.



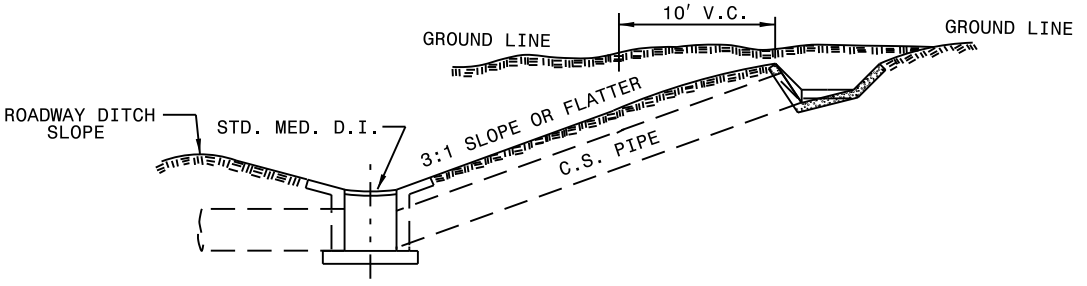
SECTION A-A



ELEVATION FOR SLOPE GREATER THAN 3:1



SECTION B-B



ELEVATION FOR SLOPE 3:1 OR LESS

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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

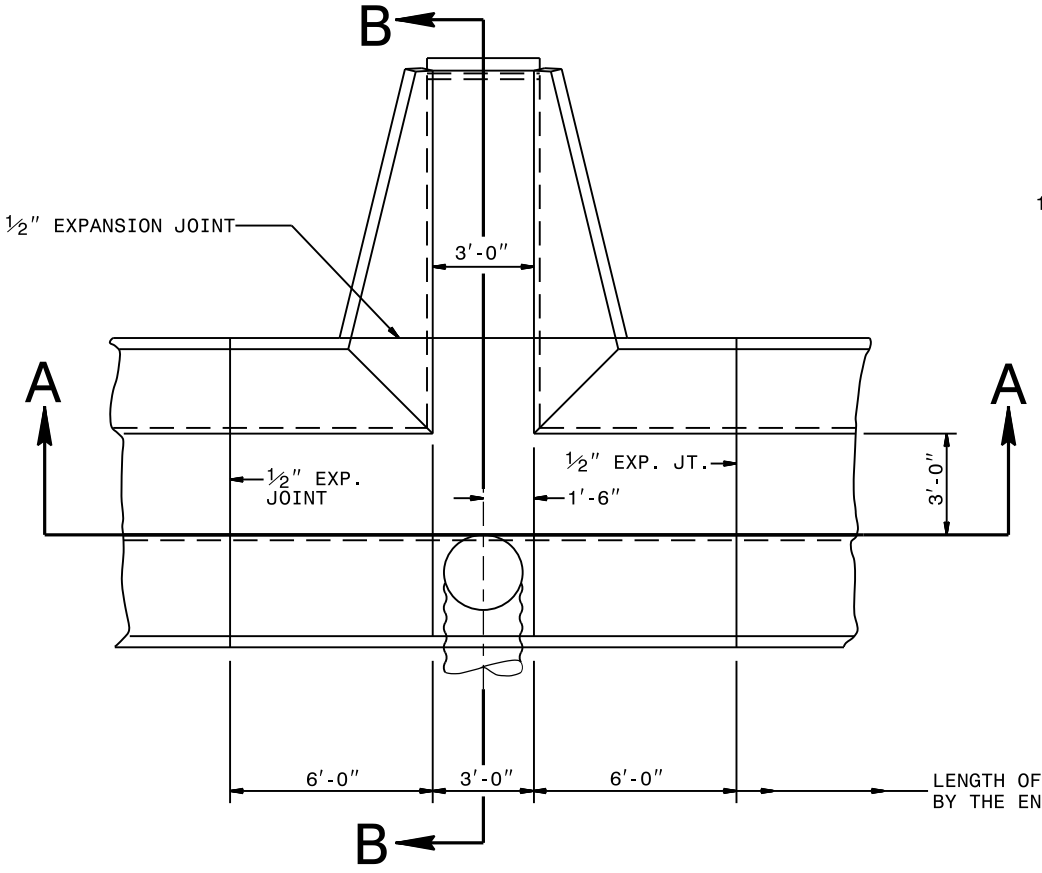
ROADWAY STANDARD DRAWING FOR

GUIDE FOR BERM DRAINAGE OUTLET

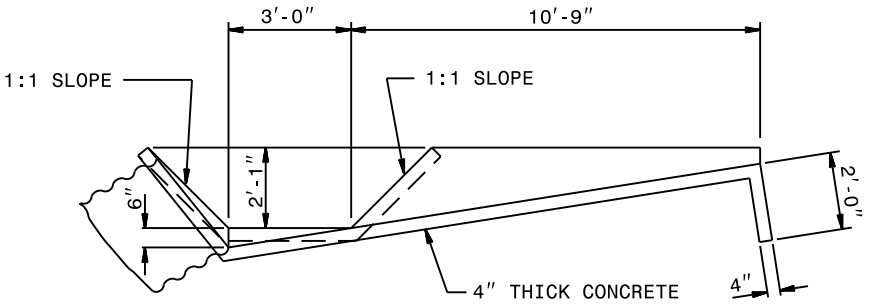
15″ AND 18″ PIPE

SHEET 1 OF 1

850.10



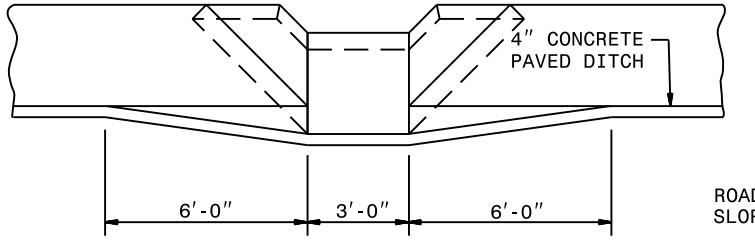
PLAN



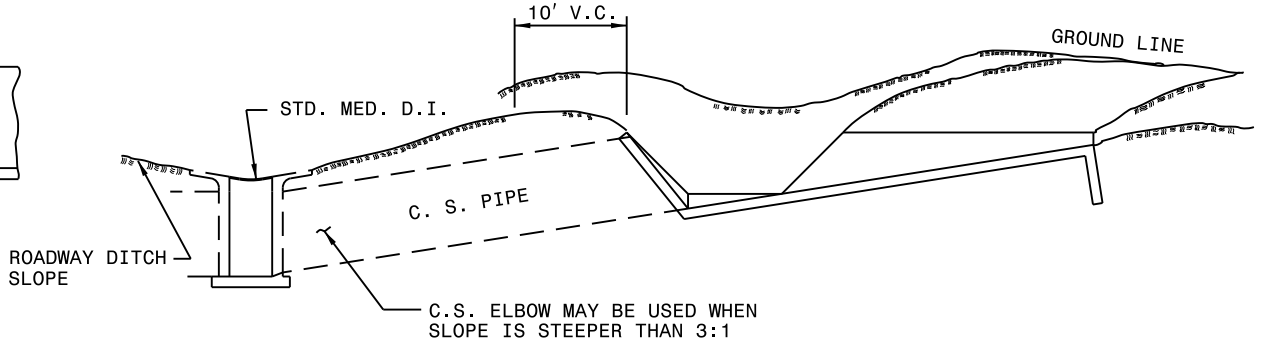
SECTION B-B

GENERAL NOTES:

WHERE NECESSARY, ELBOWS MAY BE USED TO SKEW PIPE TO FIT INLETS WHERE THERE IS OFFSET BETWEEN THE INLET END AT BERM AND THE D.I.



SECTION A-A



ELEVATION

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

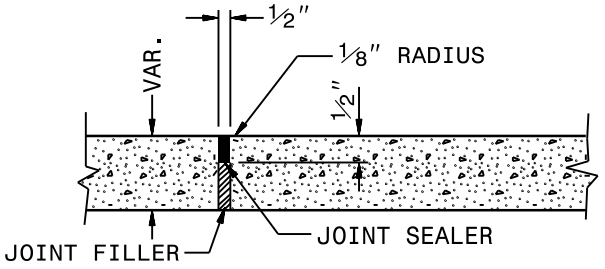
ROADWAY STANDARD DRAWING FOR

GUIDE FOR BERM DRAINAGE OUTLET

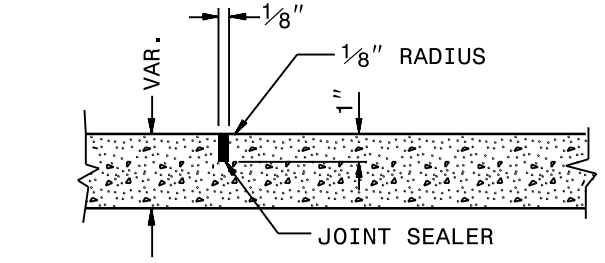
24" AND 30" PIPE

SHEET 1 OF 1

850.11



SHOWING EXPANSION JOINT



SHOWING GROOVED JOINT

PARTIAL LONGITUDINAL SECTIONS OF PAVED ISLANDS

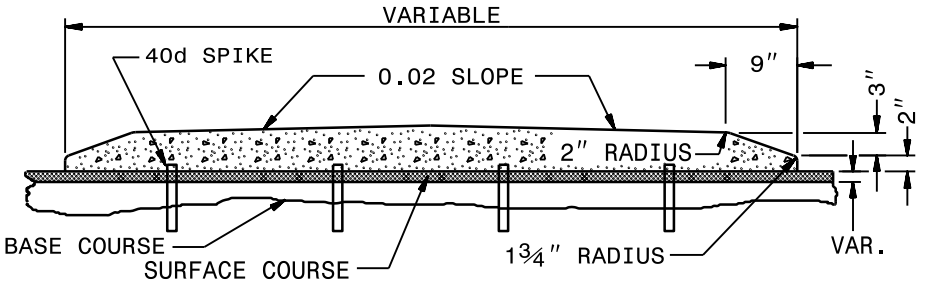
NOTE:

WHEN MONOLITHIC CONCRETE ISLAND IS ON TOP OF SURFACE COURSE, DRIVE 40d SPIKES INTO SURFACE UNDER MONOLITHIC CONCRETE ISLAND. STAGGER SPIKES ON 2′ CENTERS EACH WAY.

IN THE CONCRETE PAVEMENT (ISLAND) AND CONCRETE ISLAND (MONOLITHIC) PLACE ½″ EXPANSION JOINTS AT 30′ INTERVALS AND GROOVED JOINTS 1″ DEEP AT 10′ INTERVALS BETWEEN EXPANSION JOINTS.

LINE UP THE JOINTS IN THE CONCRETE PAVEMENT (ISLAND) WITH THE JOINTS IN THE CURB OR CURB AND GUTTER. FILL AND SEAL THE TOP ½″ OF THE EXPANSION JOINTS AND THE ENTIRE DEPTH OF GROOVED JOINTS WITH JOINT SEALER.

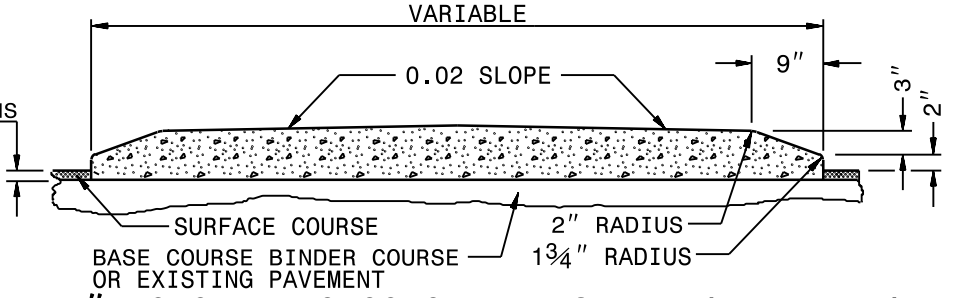
FOR JOINTS IN THE CURB AND/OR CURB AND GUTTER, SEE STANDARD NO. 846.01



5″ MONOLITHIC CONCRETE ISLAND (SURFACE MOUNTED) ON ASPHALT CONCRETE PAVEMENT

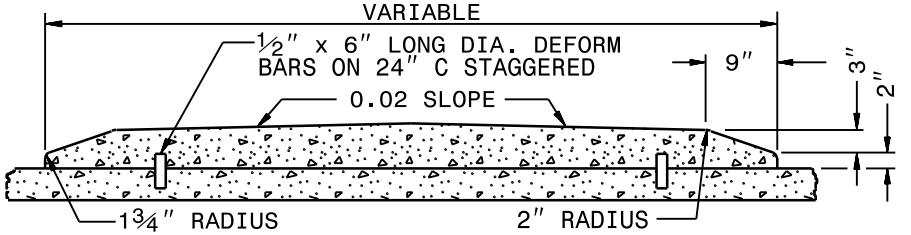
(USE ON ISLAND 4′ WIDE OR GREATER)

SEE TYPICAL SECTIONS FOR PAVEMENT DEPTH. KEY IN ON THE LAST LAYER OF PAVEMENT SURFACE COURSE

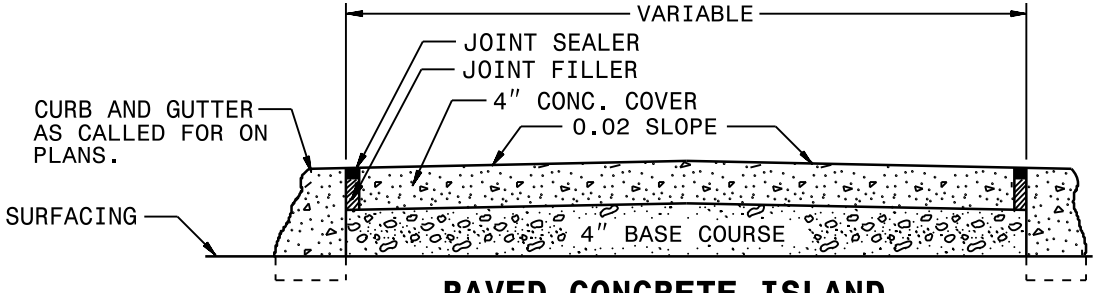


5″ MONOLITHIC CONCRETE ISLAND (KEYED IN) ON ASPHALT CONCRETE PAVEMENT

(USE ON ISLAND LESS THAN 4′ WIDE)



5″ MONOLITHIC CONCRETE ISLAND (SURFACE MOUNTED) ON CONCRETE PAVEMENT



PAVED CONCRETE ISLAND

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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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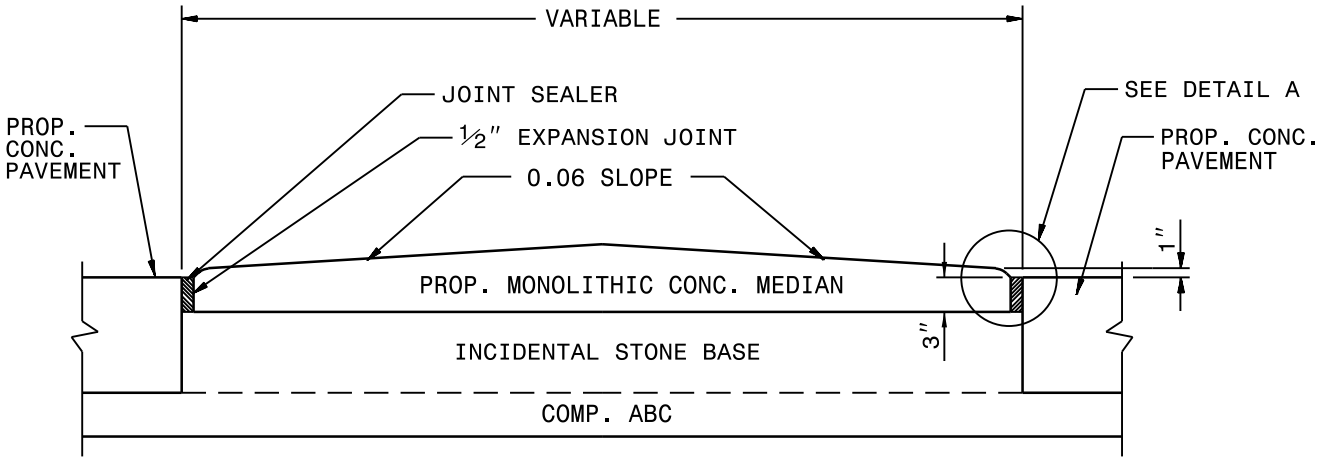
ROADWAY STANDARD DRAWING FOR

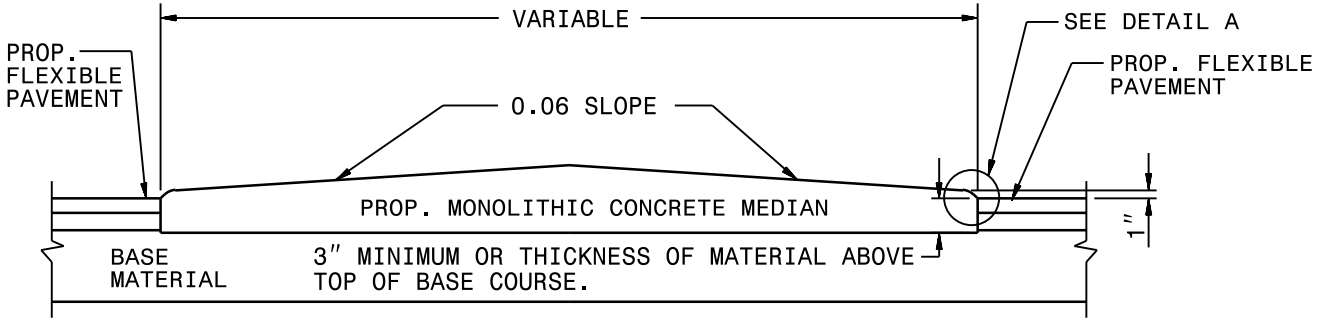
CONCRETE ISLANDS

SHEET 1 OF 1

852.01



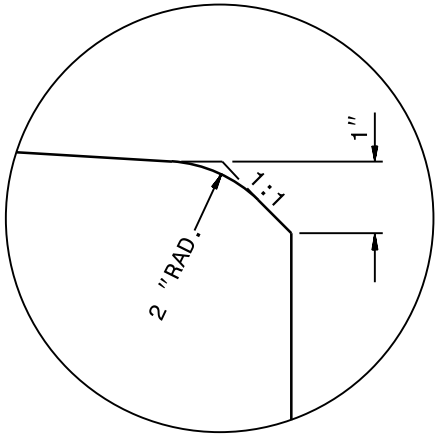
TRANSVERSE SECTION FOR CONCRETE PAVEMENT



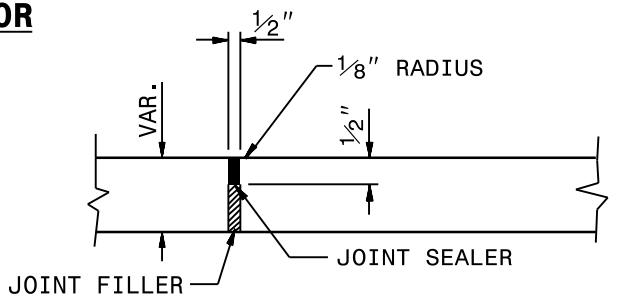
TRANSVERSE SECTION FOR FLEXIBLE PAVEMENT

GENERAL NOTES:

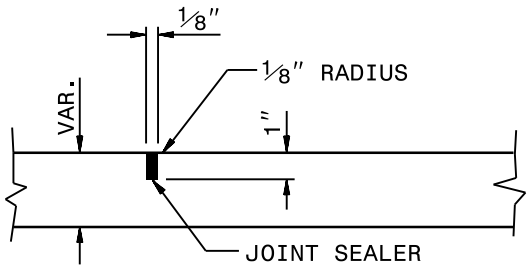
PLACE ½" EXPANSION JOINTS AT 30' INTERVALS AND AT ALL OTHER POINTS WHERE PROPOSED MEDIAN ABUTS RIGID OBJECTS. PLACE GROOVED JOINTS ½" DEEP AT 10' INTERVALS BETWEEN EXPANSION JOINTS. FILL THE TOP ½" OF EXPANSION JOINTS AND ½" GROOVED JOINTS WITH JOINT SEALER.



DETAIL - A



SHOWING EXPANSION JOINT



SHOWING GROOVED JOINT

PART LONGITUDINAL SECTIONS OF CONCRETE MEDIAN

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ROADWAY STANDARD DRAWING FOR

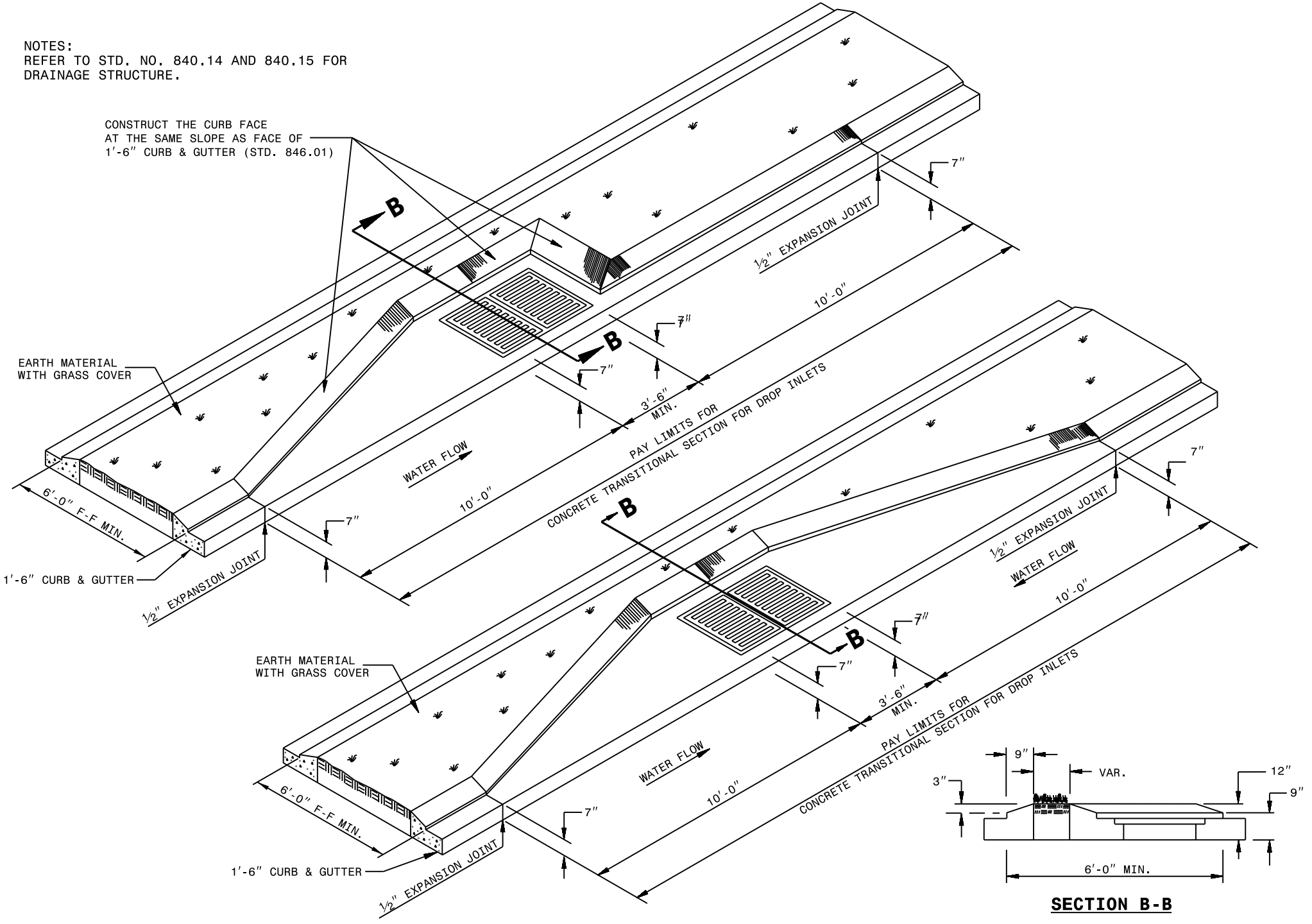
CONCRETE MOUNTABLE MEDIAN

FOR USE WITH RIGID OR FLEXIBLE PAVEMENT

SHEET 1 OF 1

852.02

NOTES:
REFER TO STD. NO. 840.14 AND 840.15 FOR DRAINAGE STRUCTURE.



SECTION B-B

STATE OF NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

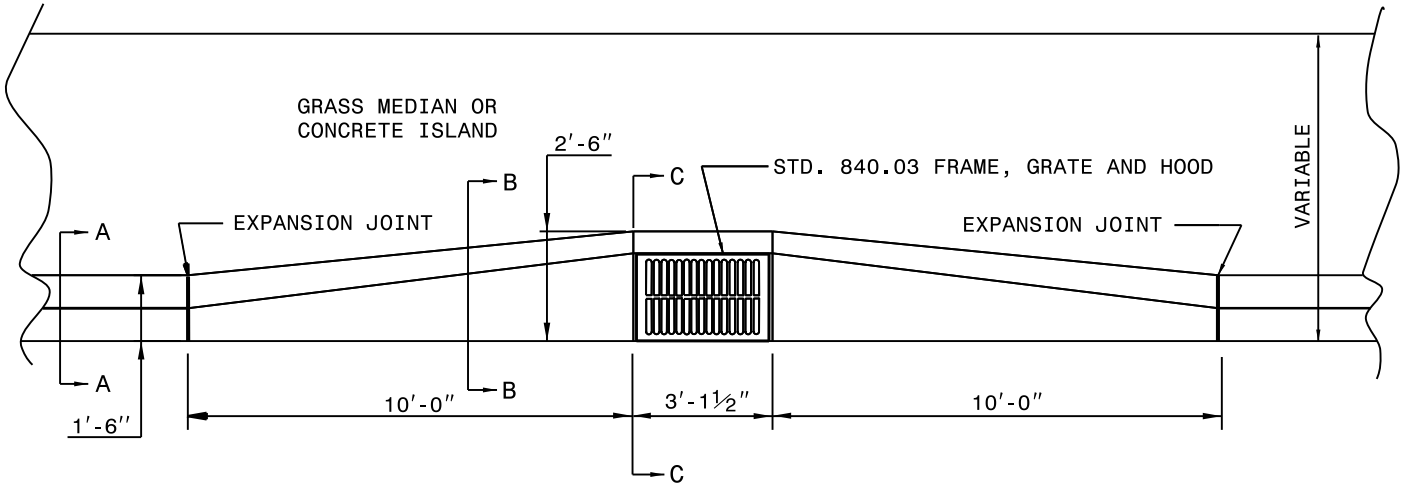
ROADWAY STANDARD DRAWING FOR

METHOD FOR PLACEMENT OF DROP INLETS IN GRASSED MEDIAN

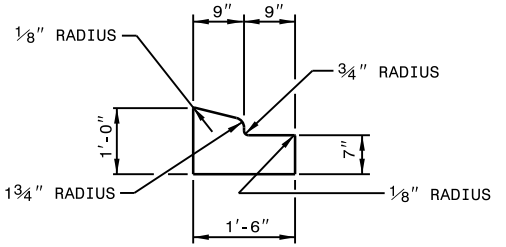
(USING 1′-6″ CURB & GUTTER)

SHEET 1 OF 1

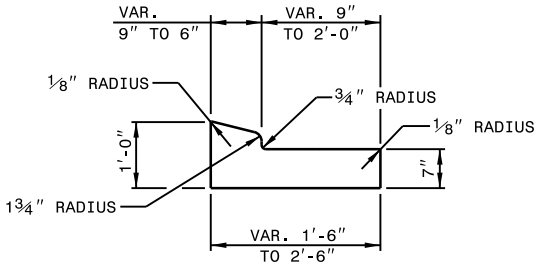
852.04



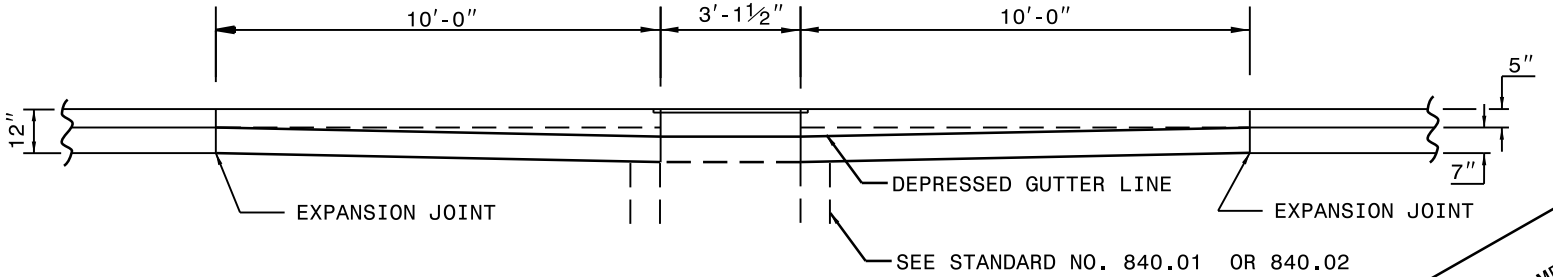
PLAN



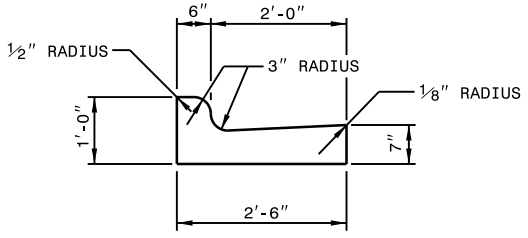
SECTION - AA



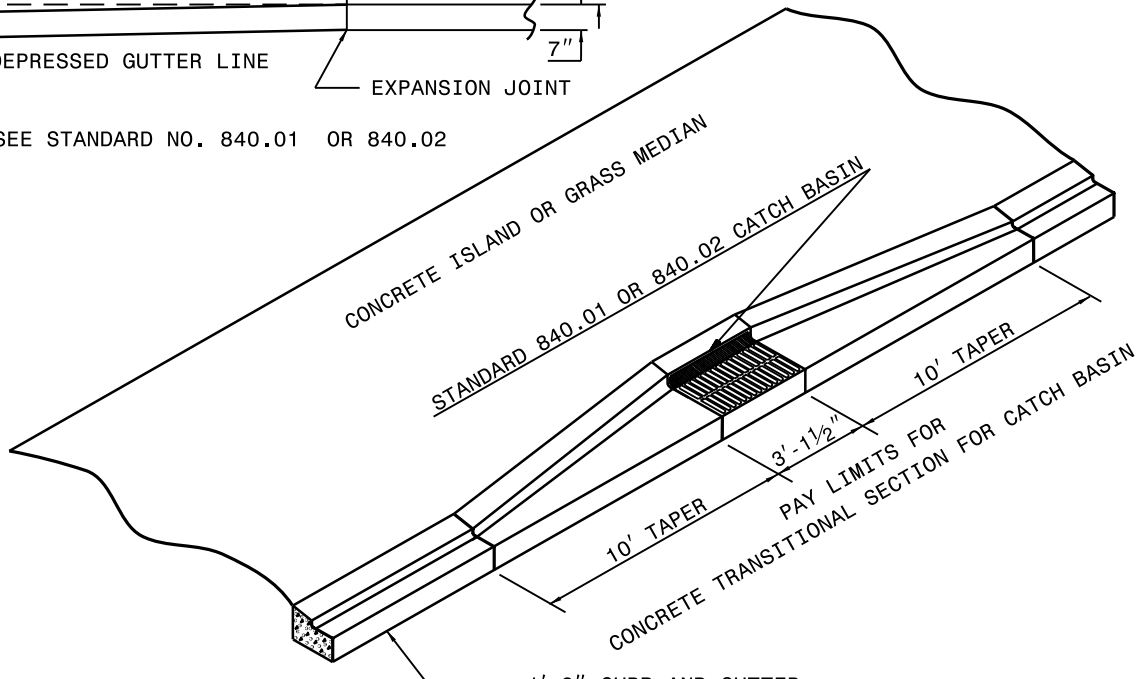
SECTION - BB



ELEVATION



SECTION - CC



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RALEIGH, N.C.

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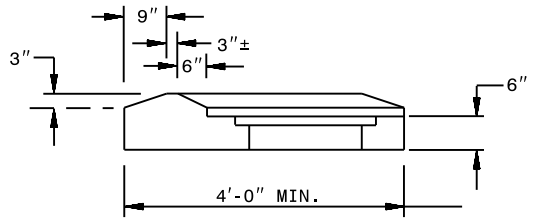
ROADWAY STANDARD DRAWING FOR

MEDIAN CURB FOR CATCH BASIN

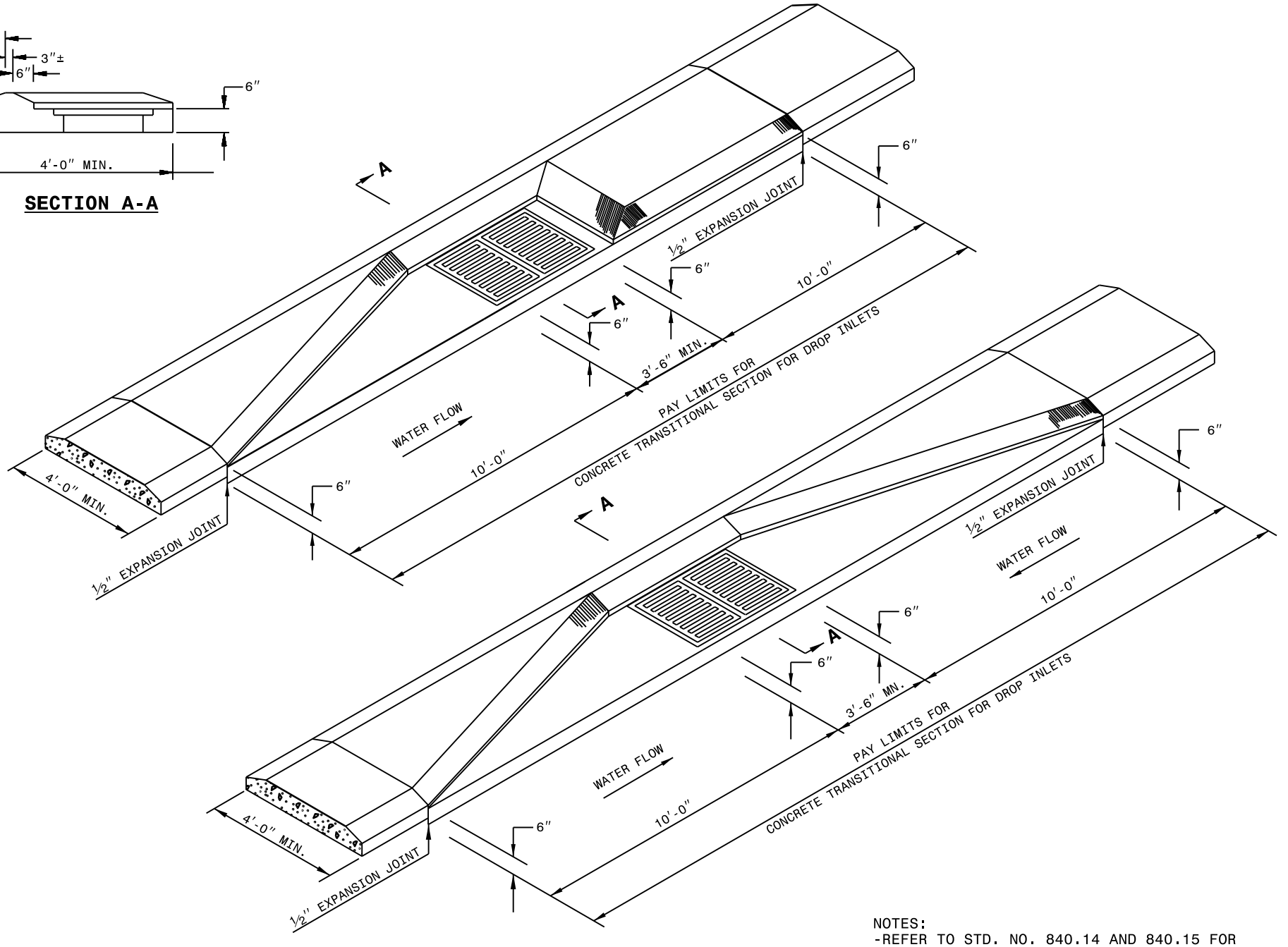
(FOR USE WITH 1′-6″ CURB AND GUTTER)

SHEET 1 OF 1

852.05



SECTION A-A



NOTES:
-REFER TO STD. NO. 840.14 AND 840.15 FOR DRAINAGE STRUCTURE.
-REFER TO STD. NO. 840.16 FOR GRATE AND FRAME.

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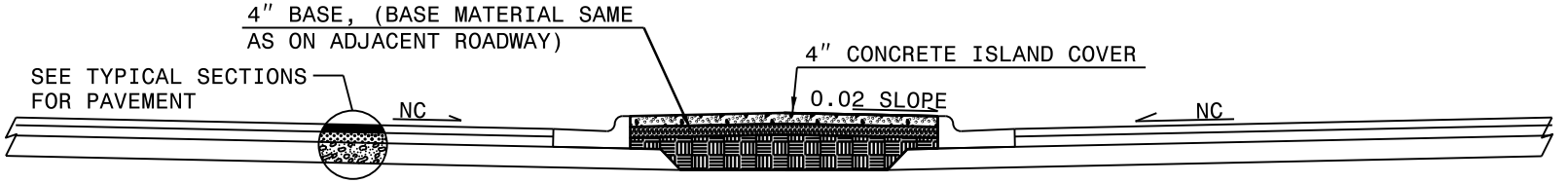
ROADWAY STANDARD DRAWING FOR

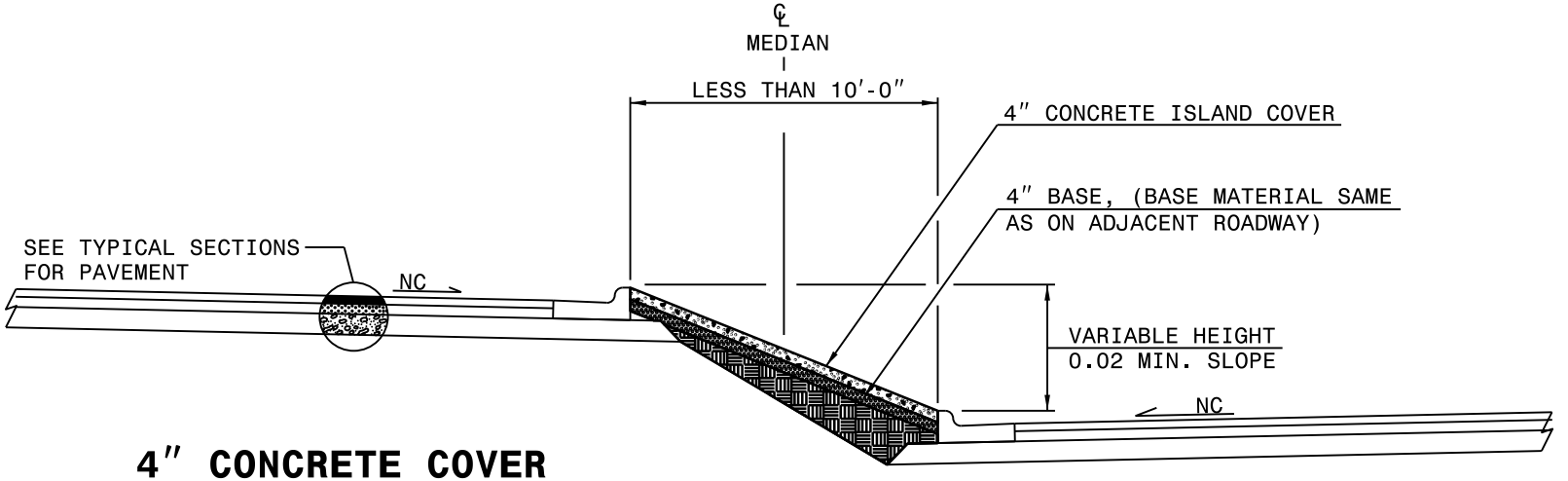
METHOD FOR PLACEMENT OF DROP INLETS IN CONCRETE ISLANDS

SHEET 1 OF 1

852.06

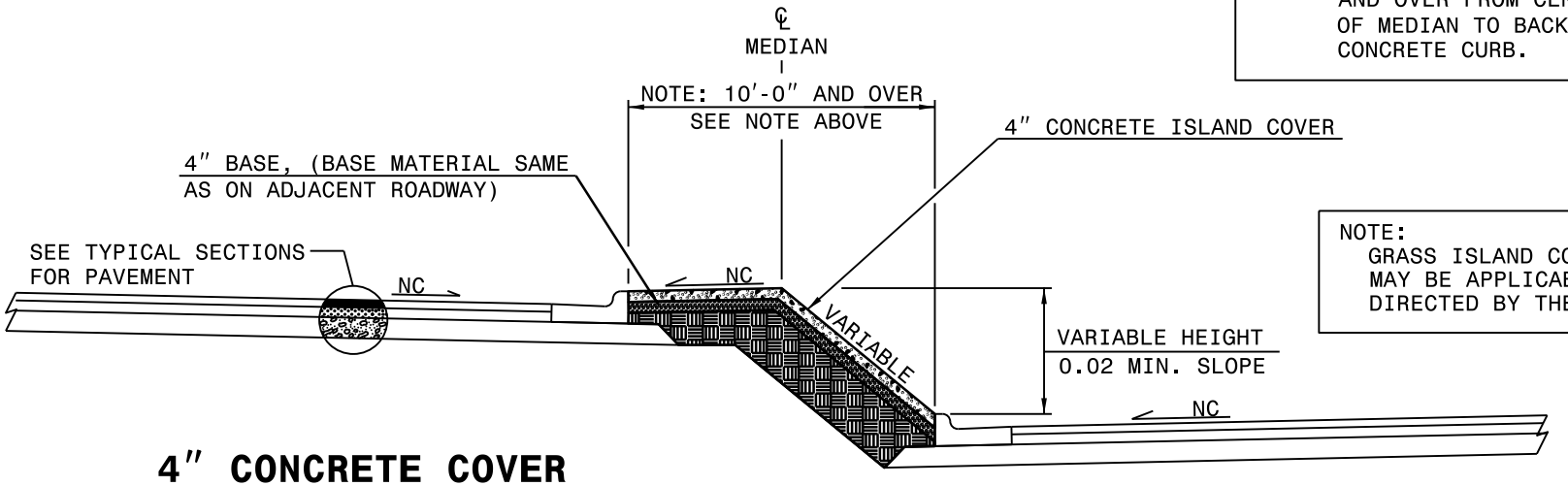


4″ CONCRETE COVER



4″ CONCRETE COVER
VARIABLE GRADE SEPARATIONS

NOTE: SLOPE MEDIAN WIDTHS 10′-0″ AND OVER FROM CENTERLINE OF MEDIAN TO BACK OF EACH CONCRETE CURB.



NOTE:
GRASS ISLAND CONSTRUCTION MAY BE APPLICABLE AS DIRECTED BY THE ENGINEER.

4″ CONCRETE COVER
VARIABLE GRADE SEPARATION

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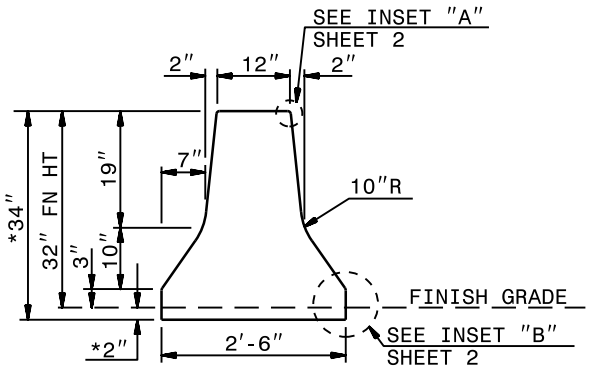
ROADWAY STANDARD DRAWING FOR

MEDIAN CONSTRUCTION

WITH CURB AND GUTTER

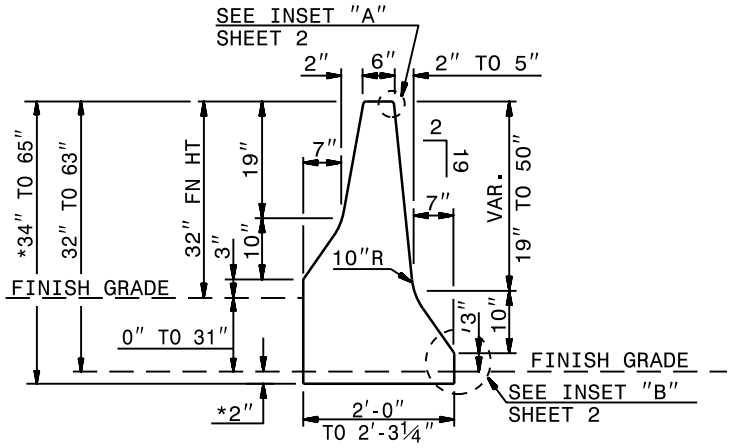
SHEET 1 OF 1

852.10



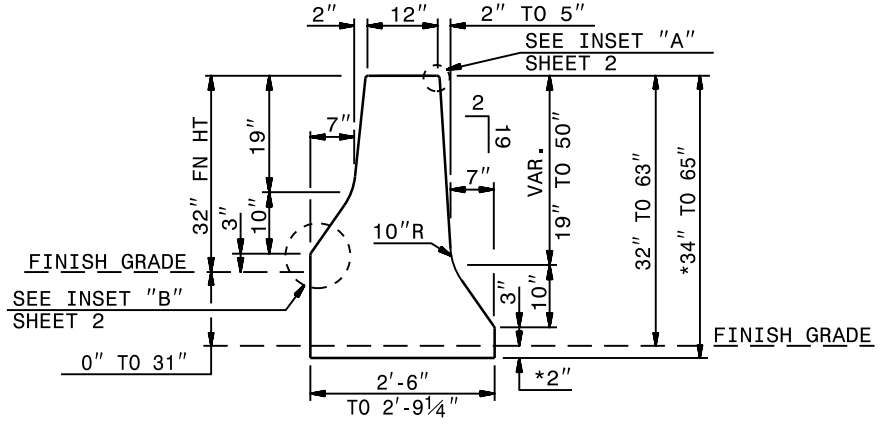
SECTION X-X

TYPE I - GLARE SCREEN PERMITTED



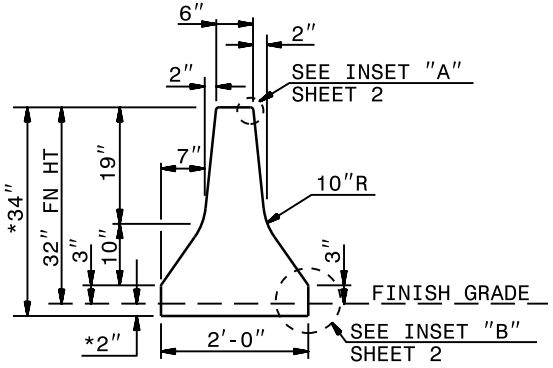
SECTION X-X

TYPE III - NO GLARE SCREEN PERMITTED



SECTION X-X

TYPE II - GLARE SCREEN PERMITTED



SECTION X-X

TYPE IV - NO GLARE SCREEN PERMITTED

NOTE:
REFER TO PLAN SHEET AND/OR TYPICAL SECTIONS FOR PROPER BARRIER ORIENTATION.

*THE 2" DIMENSION FROM FINSIH GRADE TO THE BASE IS A MINIMUM DIMENSION.
REFER TO PLAN TYPICAL SECTIONS AND PAVEMENT SCHEDULE TO DETERMINE KEY-IN DEPTH.

GENERAL NOTES:

CONSTRUCT CONCRETE BARRIER OF CLASS 'AA' CONCRETE. (SEE SPECIFICATIONS SECTION 854).

CONSTRUCT EXPANSION AND CONTRACTION JOINTS AS SHOWN ON SHEET 2.

SEAL EXPANSION JOINTS WITH JOINT FILLER. (SEE SECTION 1028 OF THE SPECIFICATIONS).

SUBMIT ALTERNATIVE METHODS FOR STEEL FABRICATION PLACEMENT FOR REVIEW.

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1-18

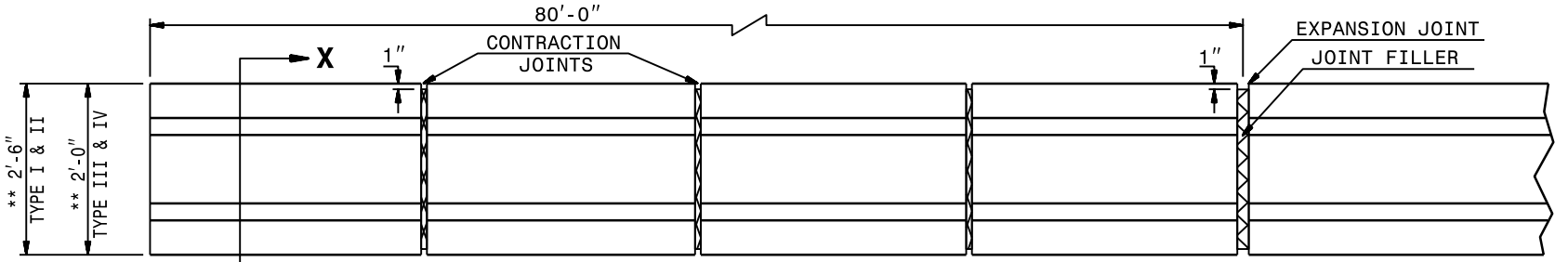
ROADWAY STANDARD DRAWING FOR

DOUBLE FACED CONCRETE BARRIER

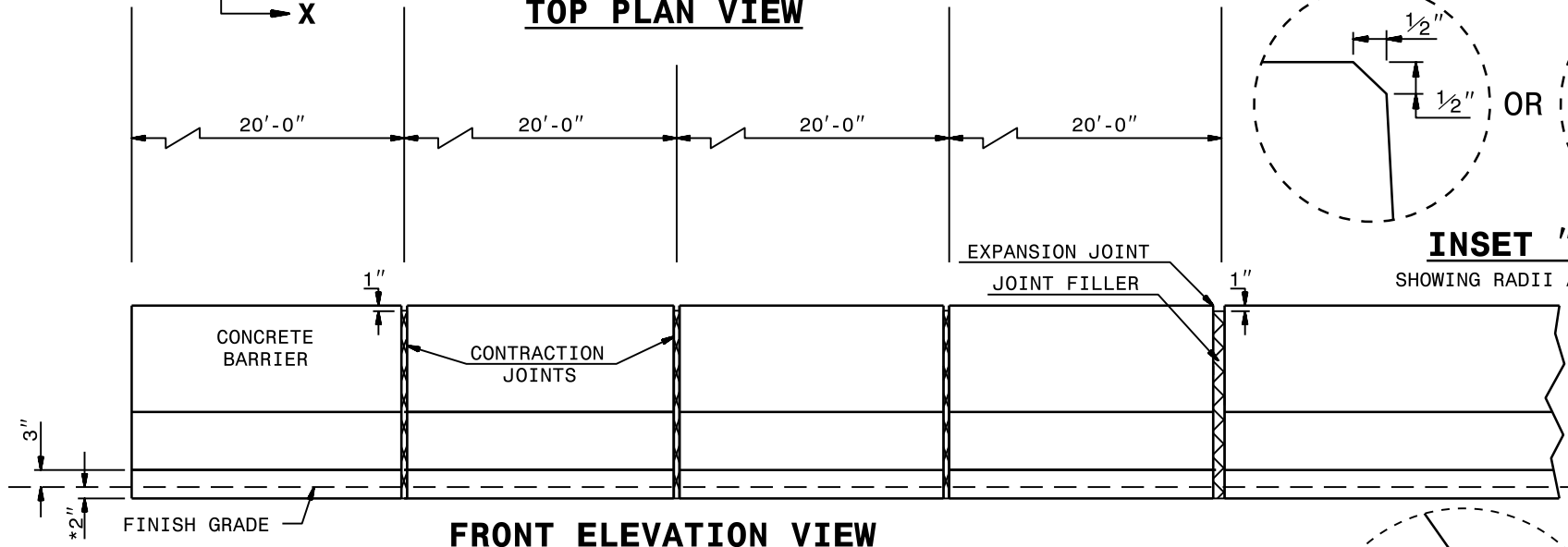
TYPES I, II, III & IV

SHEET 1 OF 4

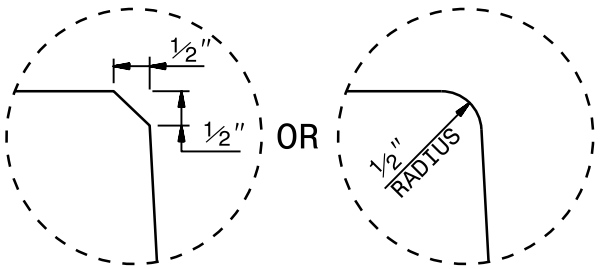
854.01



TOP PLAN VIEW

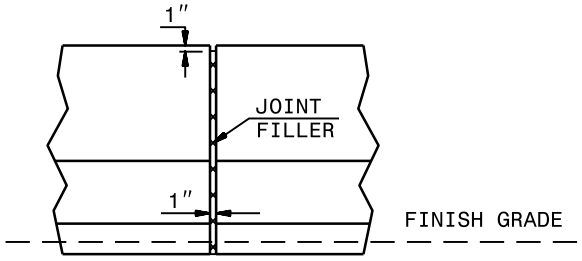


FRONT ELEVATION VIEW



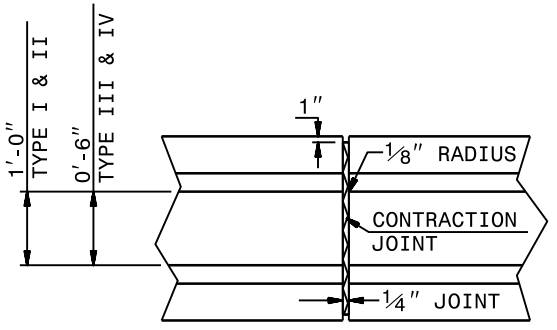
INSET "A"

SHOWING RADII AND BEVEL



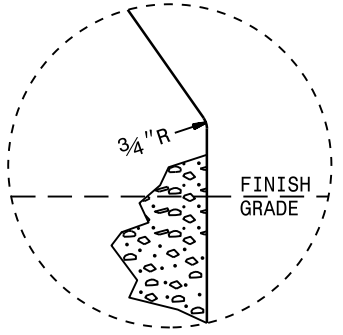
EXPANSION JOINT

PARTIAL ELEVATION VIEW



CONTRACTION JOINT

PARTIAL PLAN VIEW



INSET "B"

SHOWING RADII

NOTES:

SEE SHEET 1 FOR GENERAL NOTES.
SEE SHEETS 3 THRU 4 FOR STEEL LAYOUT OF BARRIERS.
SEE GLARE SCREEN DETAIL FOR TYPES I & II.
NO GLARE SCREEN ALLOWED WITH TYPES III & IV.

* THE 2″ DIMENSION FROM FINISH GRADE TO THE BASE IS A MINIMUM DIMENSION. REFER TO PLAN TYPICAL SECTIONS AND PAVEMENT SCHEDULE TO DETERMINE KEY-IN DEPTH.

** TYPE II AND III BARRIERS BASE MAY BE INCREASED BY A MAXIMUM OF 3¼″ INCHES.

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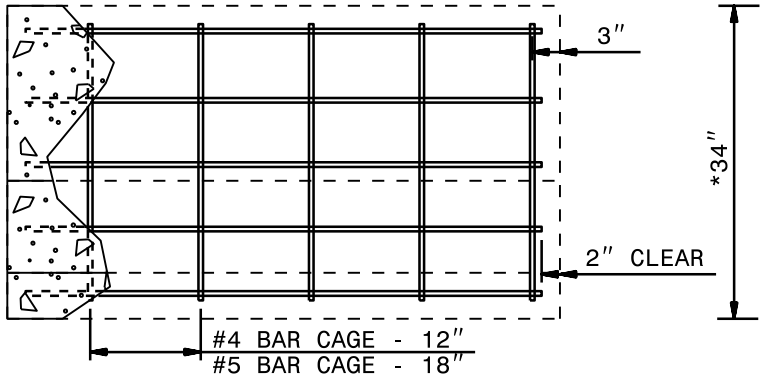
ROADWAY STANDARD DRAWING FOR

DOUBLE FACED CONCRETE BARRIER

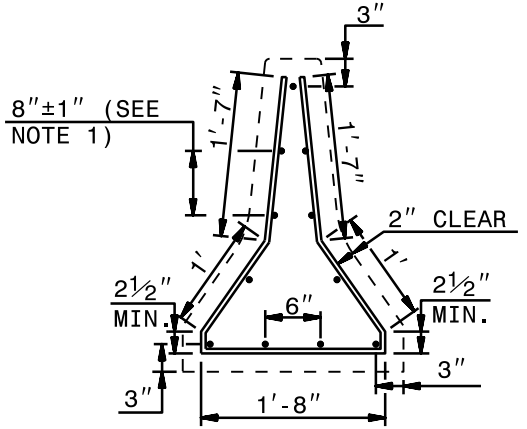
TYPES I, II, III & IV

SHEET 2 OF 4

854.01

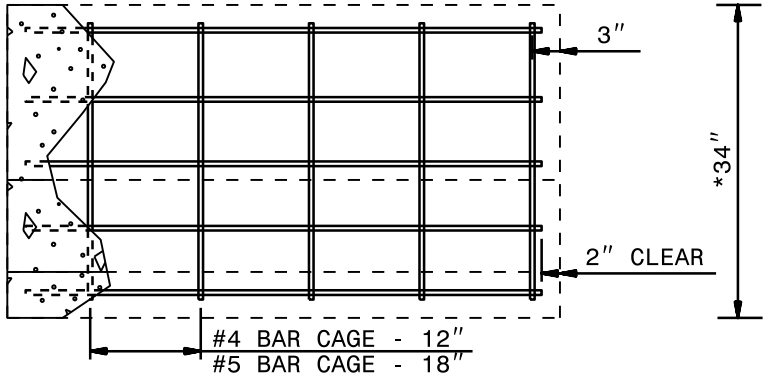


ELEVATION VIEW

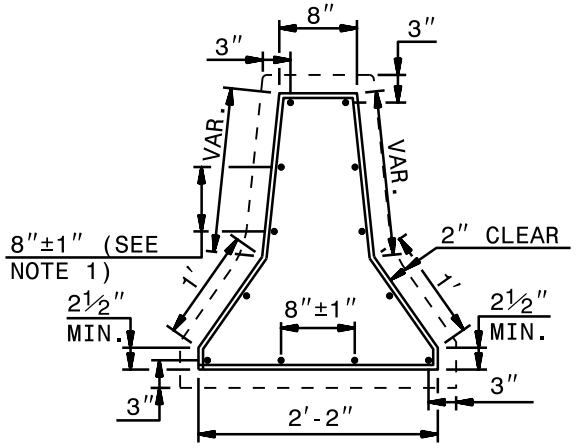


SECTION VIEW

TYPE IV
2′-0″ BASE



ELEVATION VIEW



SECTION VIEW

TYPE I
2′-6″ BASE

NOTES:

1. EVENLY SPACE HORIZONTAL REBAR 8″±1″ UNLESS OTHERWISE NOTED.
2. USE #4 BAR FOR HORIZONTAL STEEL AND #4 OR #5 BAR FOR THE VERTICAL CAGE.
3. SUBMIT CHANGES IN STEEL PLACEMENT OR SIZE TO THE ENGINEER.
4. USE SPLICE LENGTHS EQUAL TO 20 TIMES THE DIAMETER OF THE BAR.

* REFER TO PLAN TYPICAL SECTIONS AND PAVEMENT SCHEDULE TO DETERMINE KEY-IN DEPTH. DIMENSIONS SHOWN ARE BASED ON A 2″ MIN. KEY-IN DEPTH.

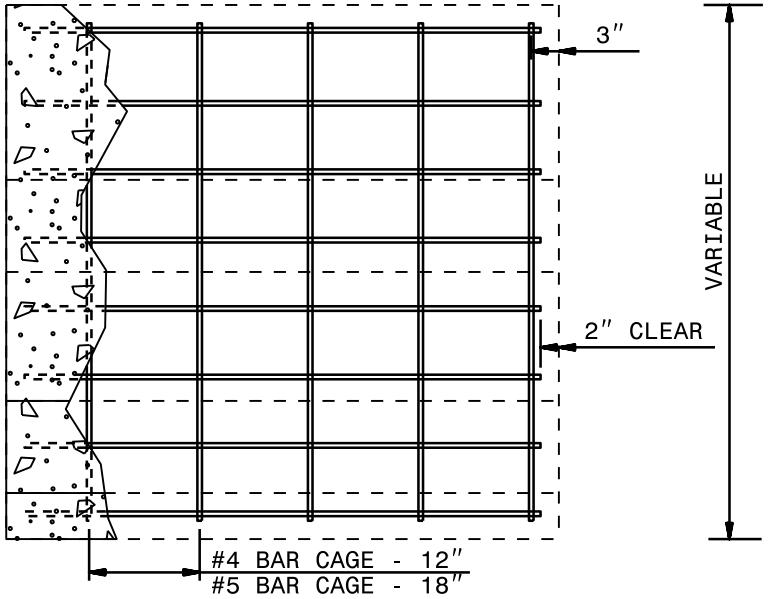
STEEL PLACEMENT FOR CAST-IN-PLACE OR SLIP-FORM CONCRETE BARRIER

1-18
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

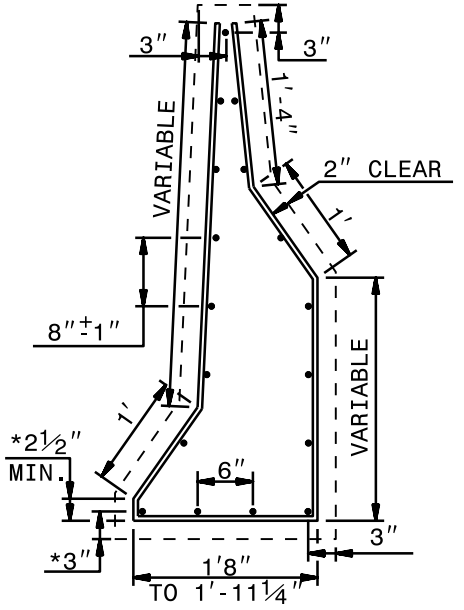
ROADWAY STANDARD DRAWING FOR

DOUBLE FACED CONCRETE BARRIER

TYPES I, II, III & IV



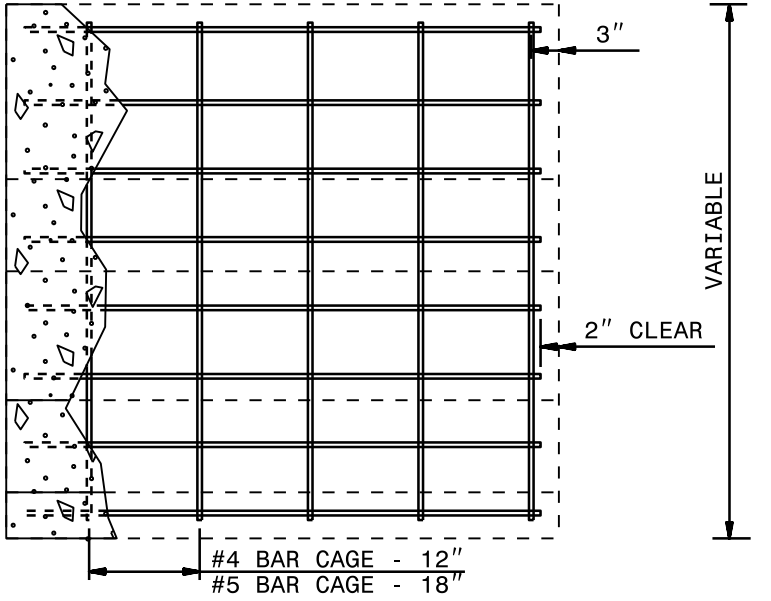
ELEVATION VIEW



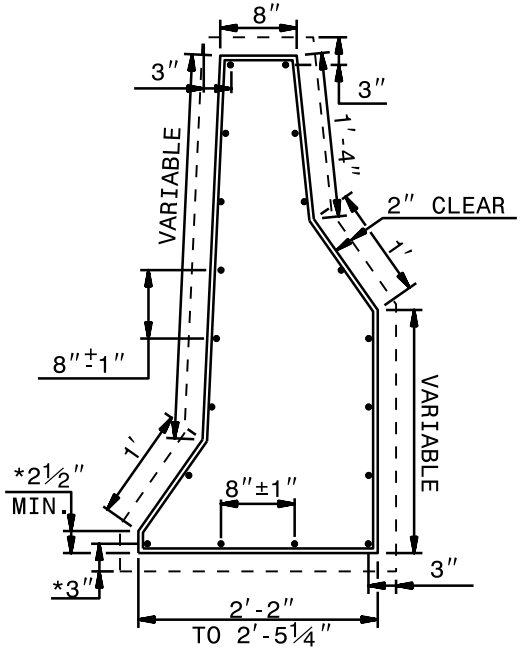
SECTION VIEW

TYPE III

MIN. 2′-0″ BASE



ELEVATION VIEW



SECTION VIEW

TYPE II

MIN. 2′-6″ BASE

NOTES:
1. EVENLY SPACE HORIZONTAL REBAR 8″±1″ UNLESS OTHERWISE NOTED.
2. USE #4 BAR HORIZONTAL STEEL AND #4 OR #5 FOR VERTICAL CAGE.
3. SUBMIT CHANGES IN STEEL PLACEMENT OR SIZE TO THE ENGINEER.
4. USE SPLICE LENGTHS EQUAL TO 20 TIMES THE DIAMETER OF THE BAR.

* REFER TO PLAN TYPICAL SECTIONS AND PAVEMENT SCHEDULE TO DETERMINE KEY-IN DEPTH. DIMENSIONS SHOWN ARE BASED ON A 2″ MIN. KEY-IN DEPTH.

STEEL PLACEMENT FOR CAST-IN-PLACE OR SLIP-FORM CONCRETE BARRIER

STATE OF NORTH CAROLINA
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1-18

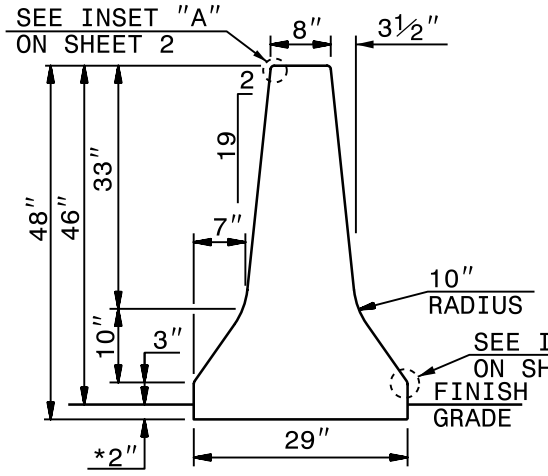
ROADWAY STANDARD DRAWING FOR

DOUBLE FACED CONCRETE BARRIER

TYPES I, II, III & IV

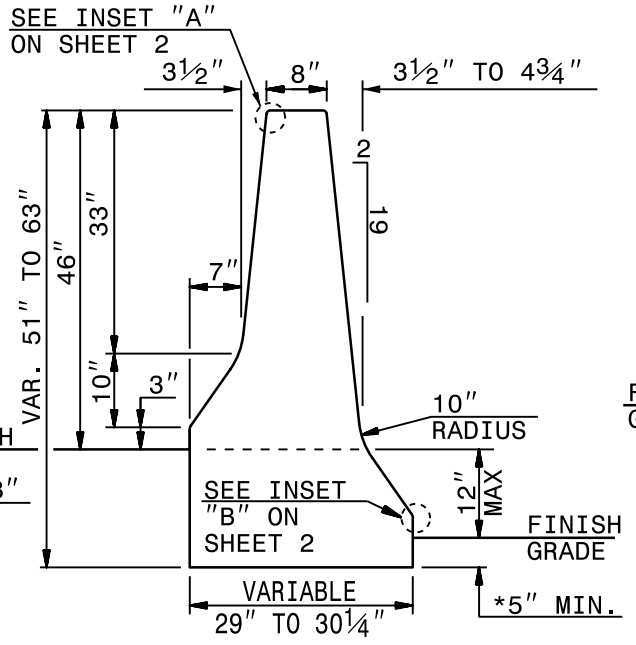
SHEET 4 OF 4

854.01



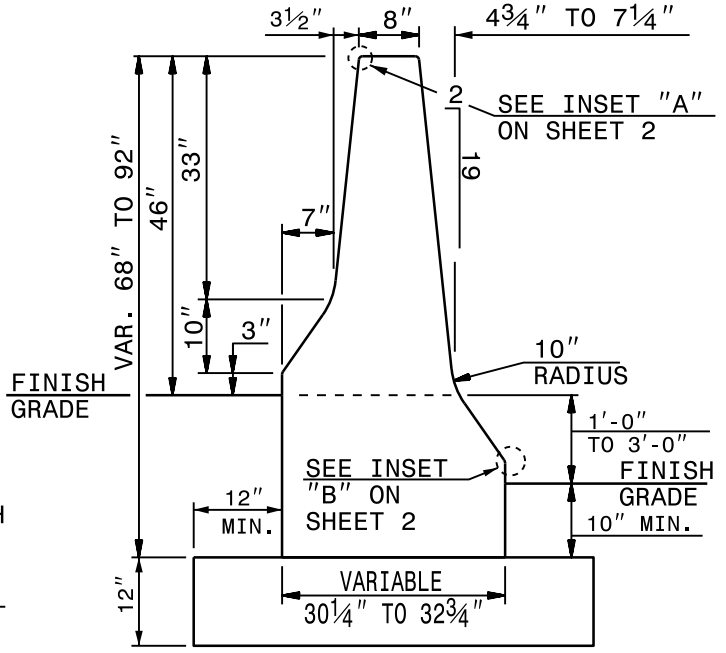
SECTION X-X

TYPE - T



SECTION X-X

TYPE - T1



SECTION X-X

TYPE - T2

NOTE:
REFER TO PLAN SHEET AND/OR TYPICAL SECTIONS FOR PROPER BARRIER ORIENTATION.

*THE 2" OR 5" DIMENSION FROM FINSIH GRADE TO THE BASE IS A MINIMUM DIMENSION. REFER TO PLAN TYPICAL SECTIONS AND PAVEMENT SCHEDULE TO DETERMINE KEY-IN DEPTH.

GENERAL NOTES :

CONSTRUCT CONCRETE BARRIER OF CLASS 'AA' CONCRETE. (SEE SECTION 854 OF SPECIFICATIONS).
CONSTRUCT EXPANSION AND CONTRACTION JOINTS AS SHOWN ON SHEET 2.

SEAL ALL EXPANSION JOINTS WITH JOINT FILLER. (SEE SECTION 1028 OF THE SPECIFICATIONS).
SUBMIT ALTERNATIVE METHODS FOR STEEL FABRICATION TO THE ENGINEER.

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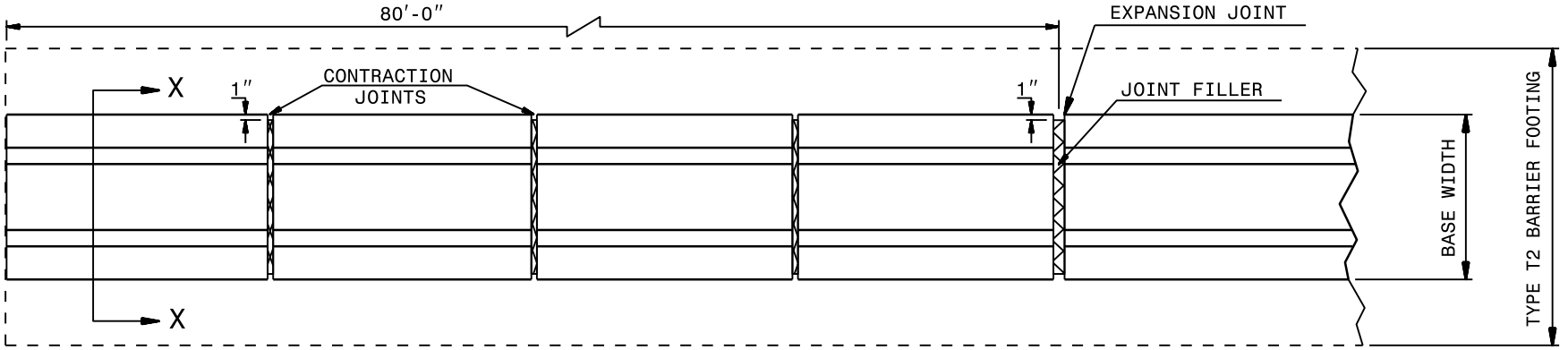
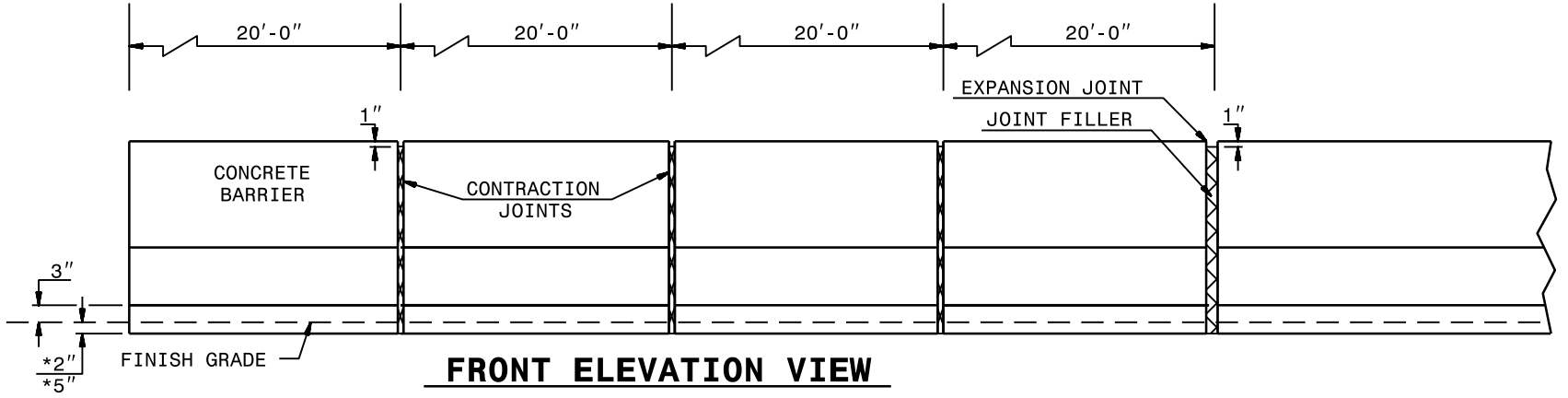
ROADWAY STANDARD DRAWING FOR

DOUBLE FACED CONCRETE BARRIER

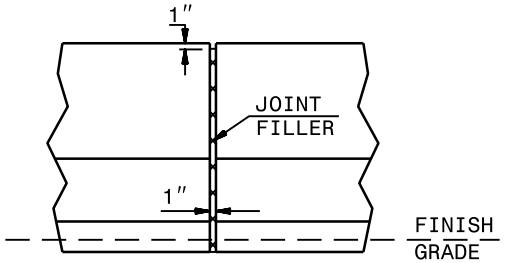
TYPE T, T1 AND T2



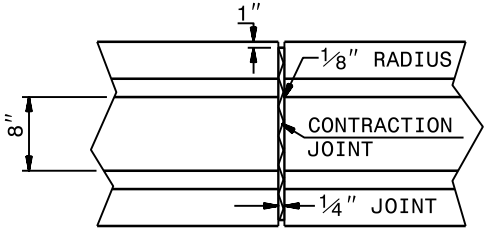
TOP PLAN VIEW



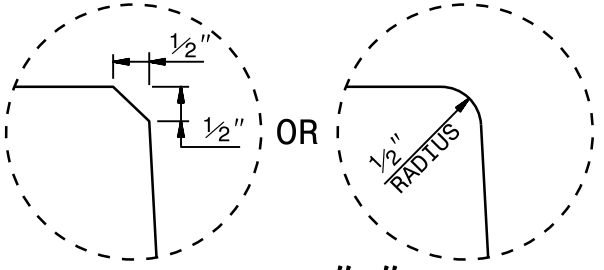
FRONT ELEVATION VIEW



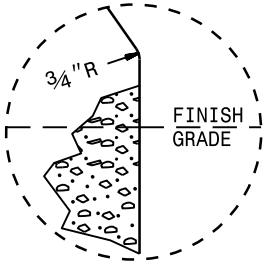
EXPANSION JOINT
PARTIAL ELEVATION VIEW



CONTRACTION JOINT
PARTIAL PLAN VIEW



INSET "A"
SHOWING RADII AND BEVEL



INSET "B"
SHOWING RADII

NOTES:
SEE SHEET 1 FOR GENERAL NOTES.
SEE SHEETS 3 THRU 4 FOR STEEL LAYOUT OF BARRIERS.

* THE 2″ AND 5″ DIMENSION FROM FINISH GRADE TO THE BASE IS A MINIMUM DIMENSION. REFER TO PLAN TYPICAL SECTIONS AND PAVEMENT SCHEDULE TO DETERMINE KEY-IN DEPTH.

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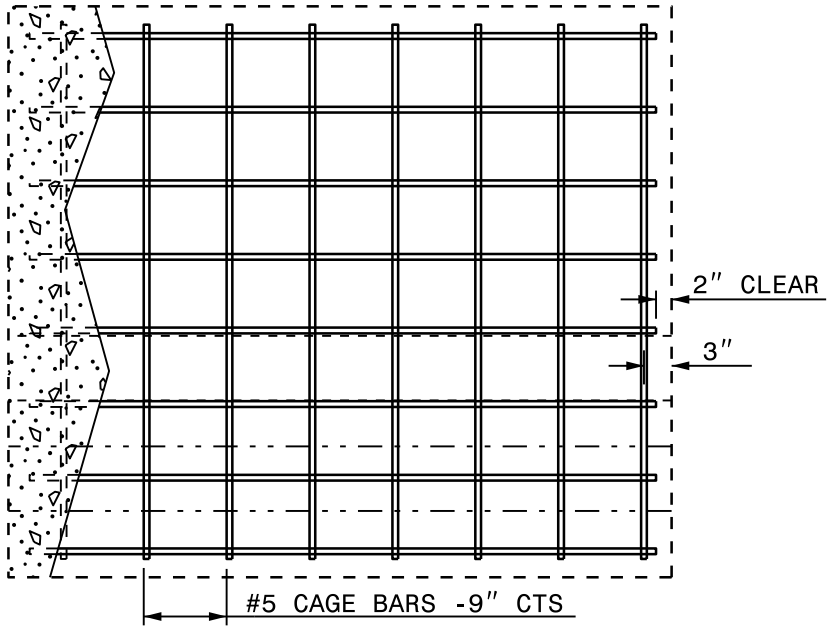
ROADWAY STANDARD DRAWING FOR

DOUBLE FACED CONCRETE BARRIER

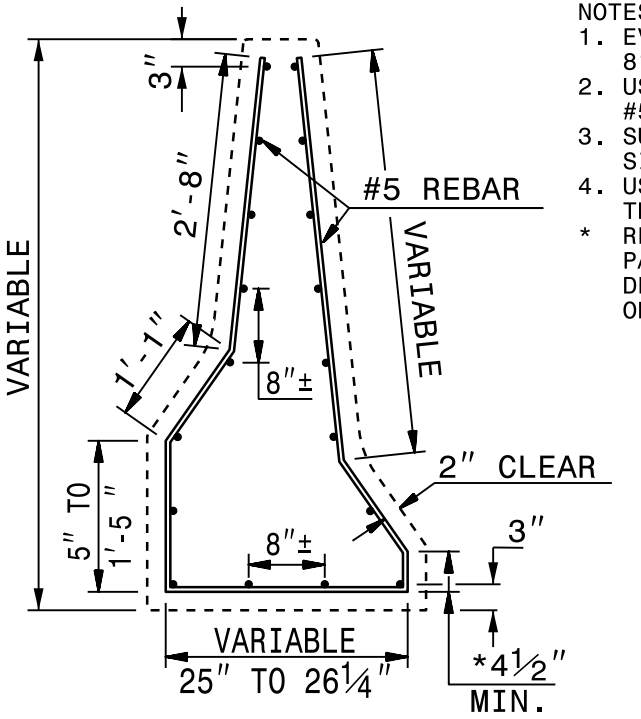
TYPE T, T1 AND T2

SHEET 2 OF 4

854.02



ELEVATION VIEW

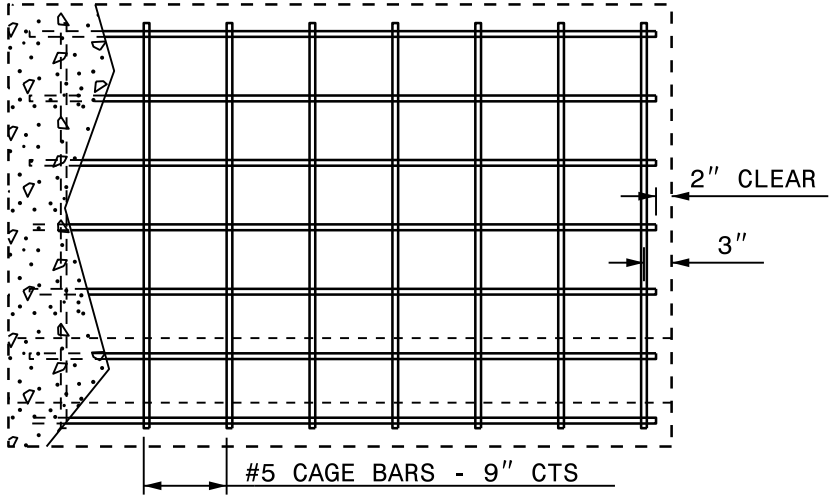


SECTION VIEW

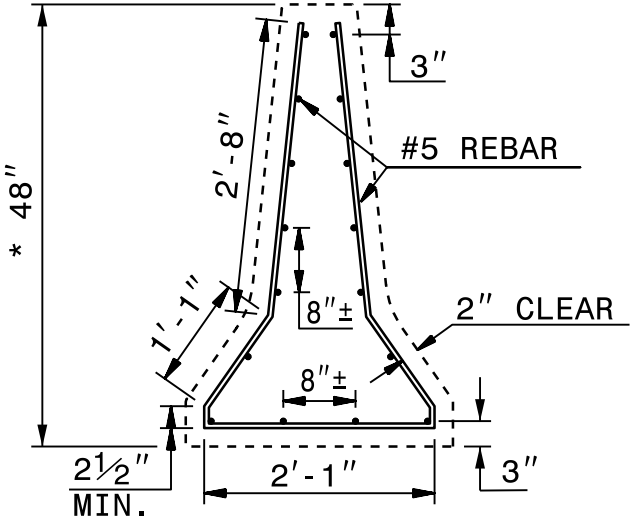
NOTES:
1. EVENLY SPACE HORIZONTAL REBAR 8"±1" UNLESS OTHERWISE NOTED.
2. USE #5 BAR FORHORIZONTAL STEEL AND #5 BAR FOR VERTICAL CAGE.
3. SUBMIT CHANGES IN STEEL PLACEMENT OR SIZE TO THE ENGINEER.
4. USE SPLICE LENGTHS EQUAL TO 20 TIMES THE DIAMETER OF THE BAR.

* REFER TO PLAN TYPICAL SECTIONS AND PAVEMENT SCHEDULE TO DETERMINE KEY-IN DEPTH. DIMENSIONS SHOWN ARE BASED ON A MIN. KEY-IN DEPTH.

TYPE T-1



ELEVATION VIEW



SECTION VIEW

TYPE T

STEEL PLACEMENT FOR CAST-IN-PLACE OR SLIP-FORM CONCRETE BARRIER

STATE OF NORTH CAROLINA
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1-18

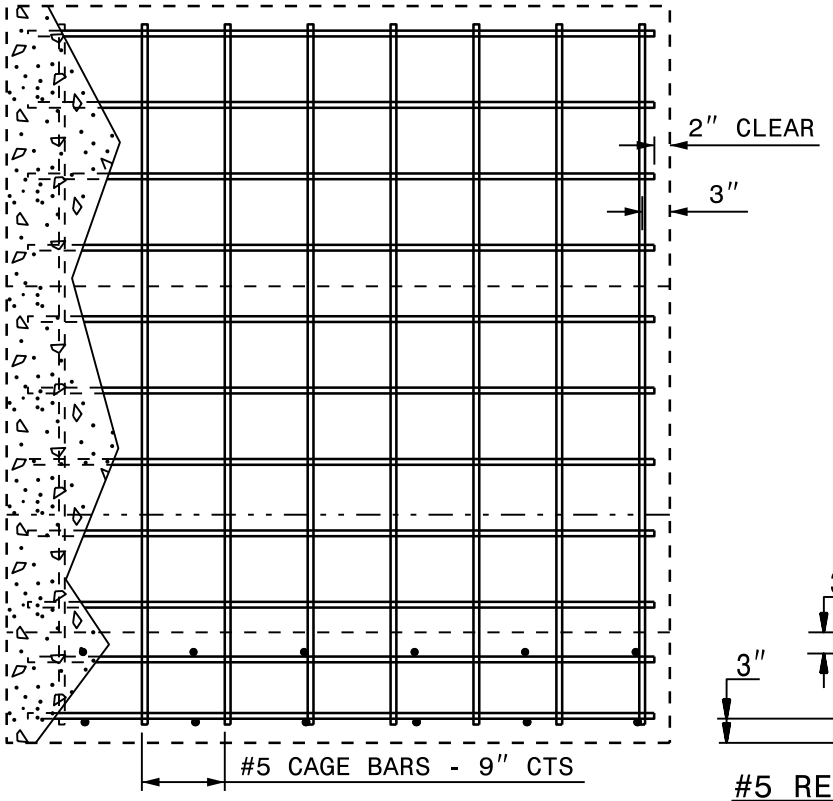
ROADWAY STANDARD DRAWING FOR

DOUBLE FACED CONCRETE BARRIER

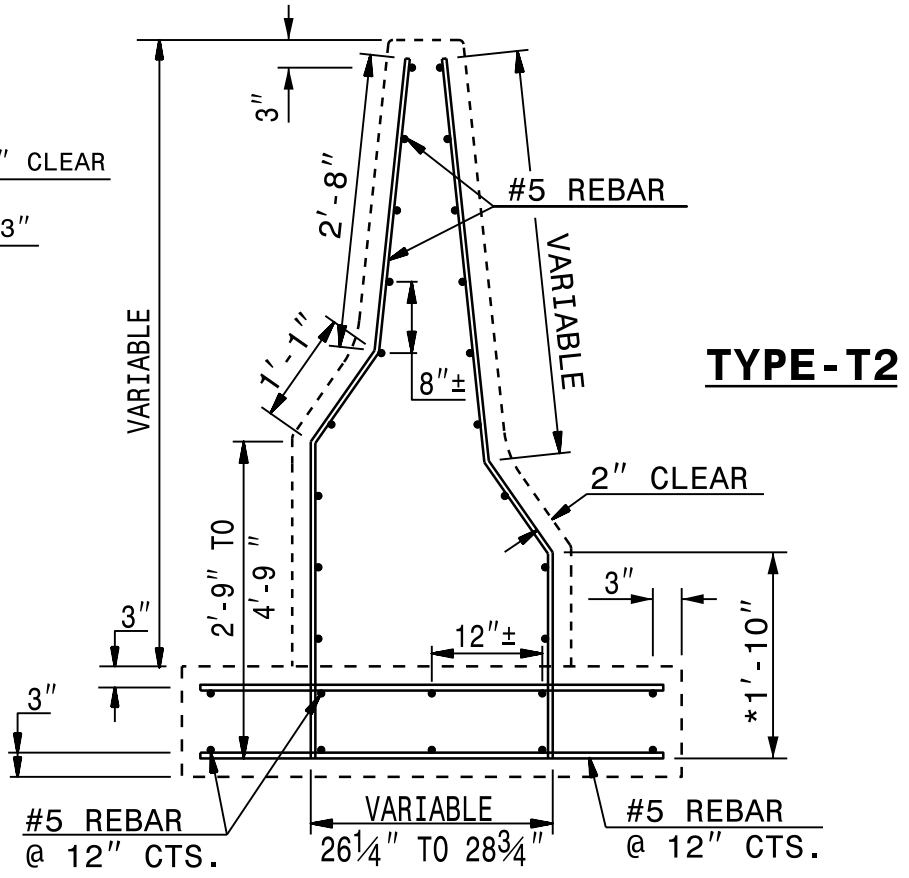
TYPE T, T1 AND T2

SHEET 3 OF 4

854.02



ELEVATION VIEW



SECTION VIEW

TYPE-T2

NOTES:

1. EVENLY SPACE HORIZONTAL REBAR 8"±1" UNLESS OTHERWISE NOTED.
2. USE #5 BAR FOR HORIZONTAL STEEL AND #5 BAR FOR THE VERTICAL CAGE.
3. SUBMIT CHANGES IN STEEL PLACEMENT OR SIZE TO THE ENGINEER.
4. USE SPLICE LENGTHS EQUAL TO 20 TIMES THE DIAMETER OF THE BAR.

* REFER TO PLAN TYPICAL SECTIONS AND PAVEMENT SCHEDULE TO DETERMINE KEY-IN DEPTH. DIMENSIONS SHOWN ARE BASED ON A MIN. KEY-IN DEPTH.

STEEL PLACEMENT FOR CAST-IN-PLACE OR SLIP-FORM CONCRETE BARRIER

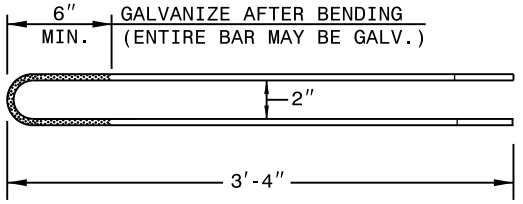
1-18

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

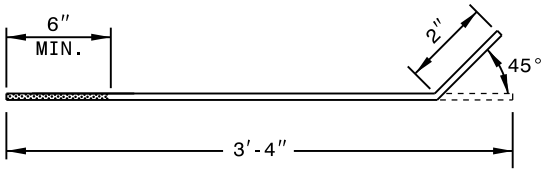
ROADWAY STANDARD DRAWING FOR

DOUBLE FACED CONCRETE BARRIER

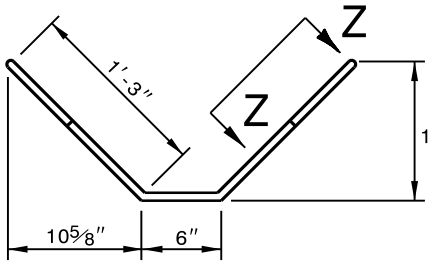
TYPE T, T1 AND T2



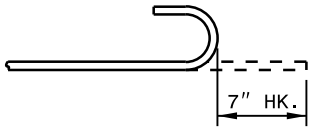
TOP VIEW



SIDE VIEW
LOOP BAR
¾″ DIA. (A36M)

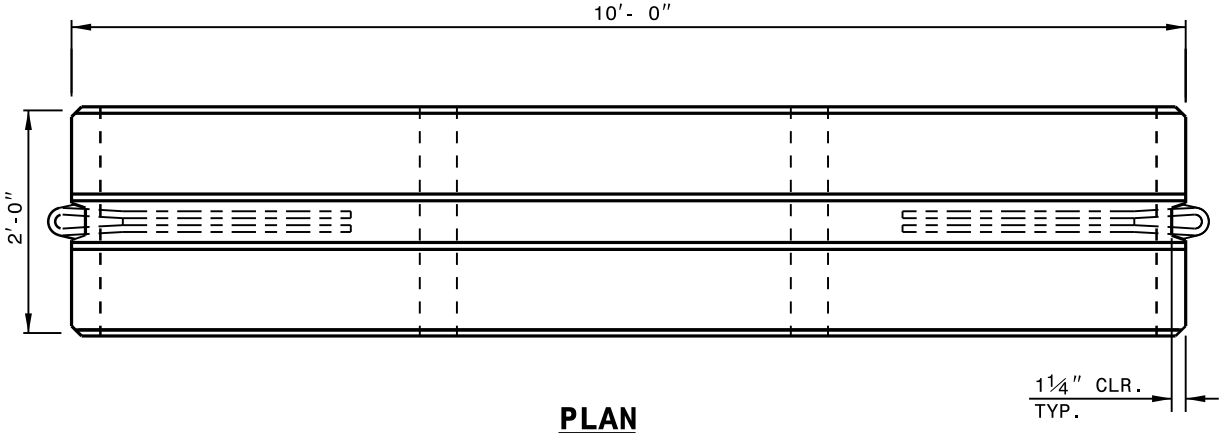


S1 BARS
#5 BARS

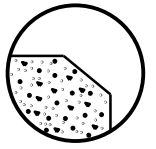


VIEW Z-Z

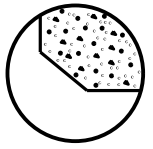
REINFORCEMENT DETAIL



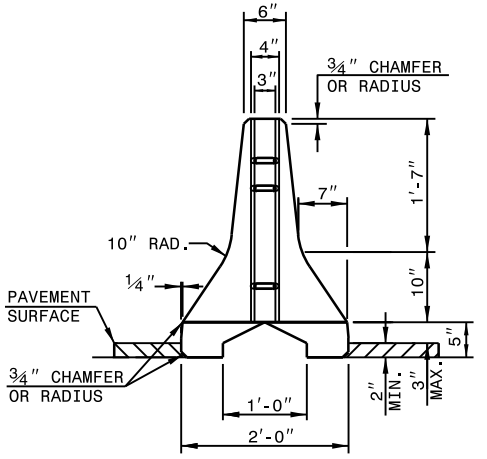
PLAN



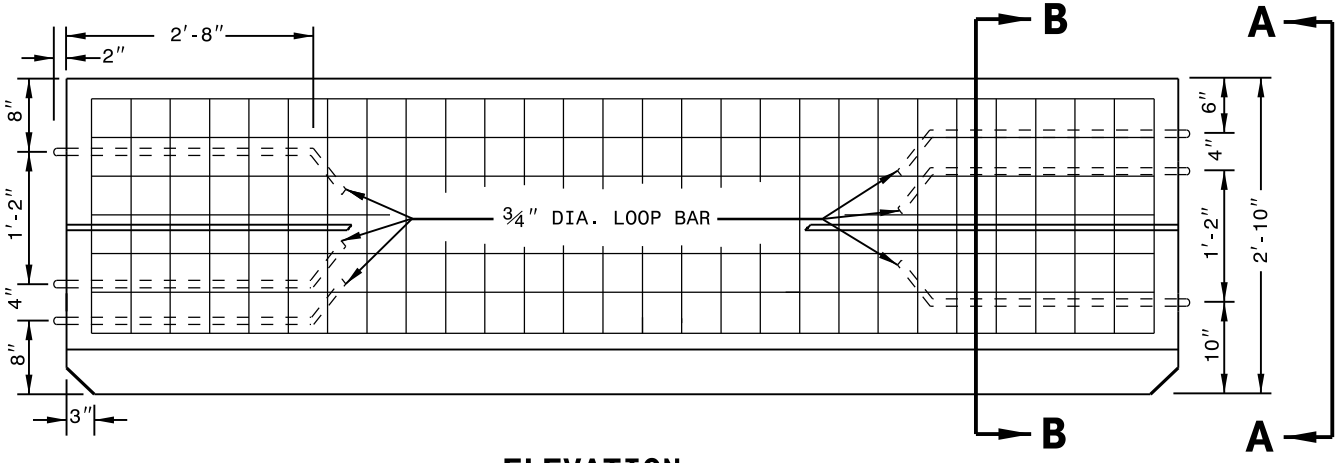
TOP



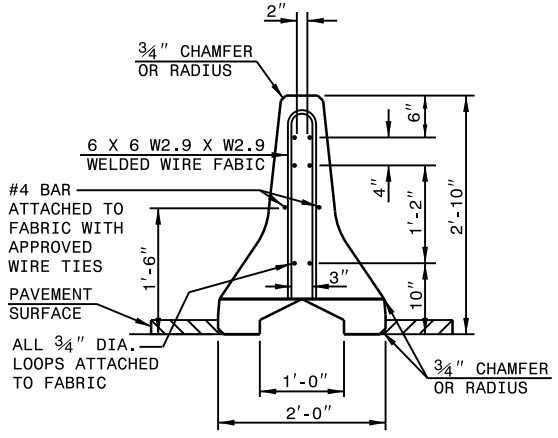
BOTTOM



END VIEW A-A



ELEVATION



SECTION B-B

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

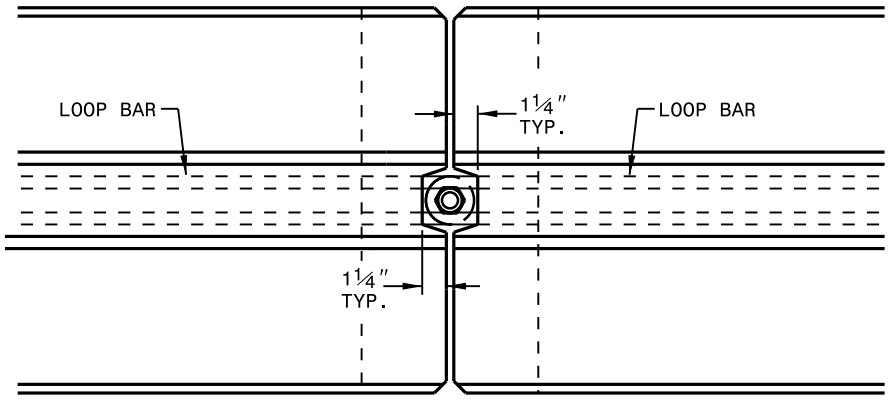
ROADWAY STANDARD DRAWING FOR

CONCRETE MEDIAN BARRIER

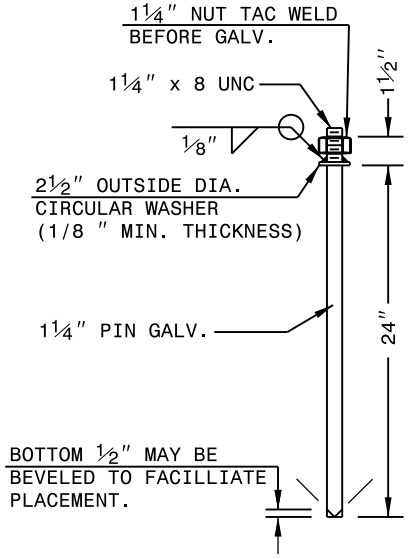
PRECAST PERMANENT

SHEET 1 OF 2

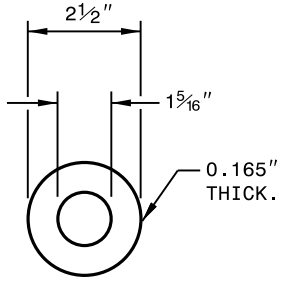
854.04



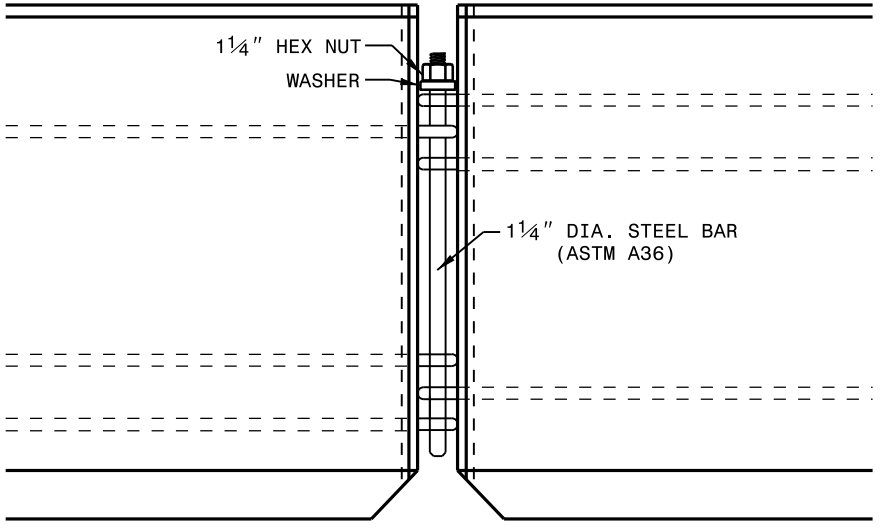
PLAN OF CONNECTION



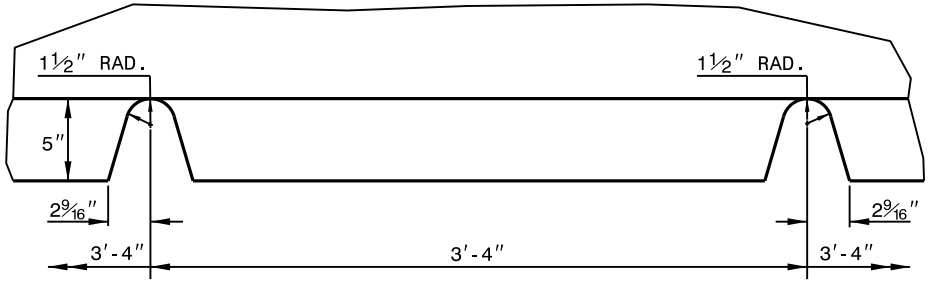
CONNECTOR PIN ASSEMBLY



PLAIN GALVANIZED STEEL WASHER FOR 1¼" PIN



ELEVATION OF CONNECTION



PART ELEVATION OF LIFT SLOT

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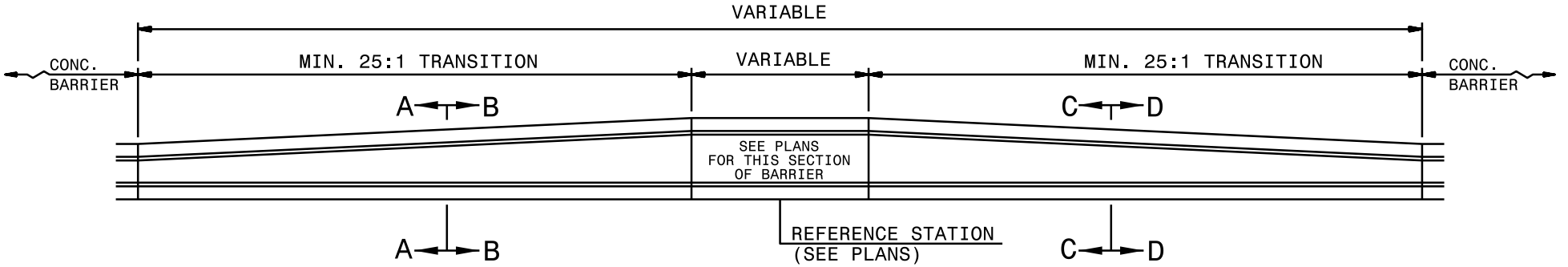
ROADWAY STANDARD DRAWING FOR

CONCRETE MEDIAN BARRIER

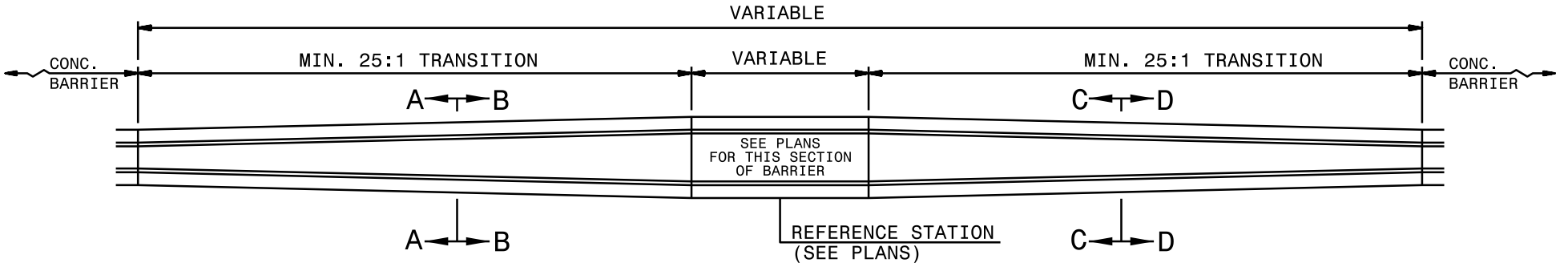
PRECAST PERMANENT

SHEET 2 OF 2

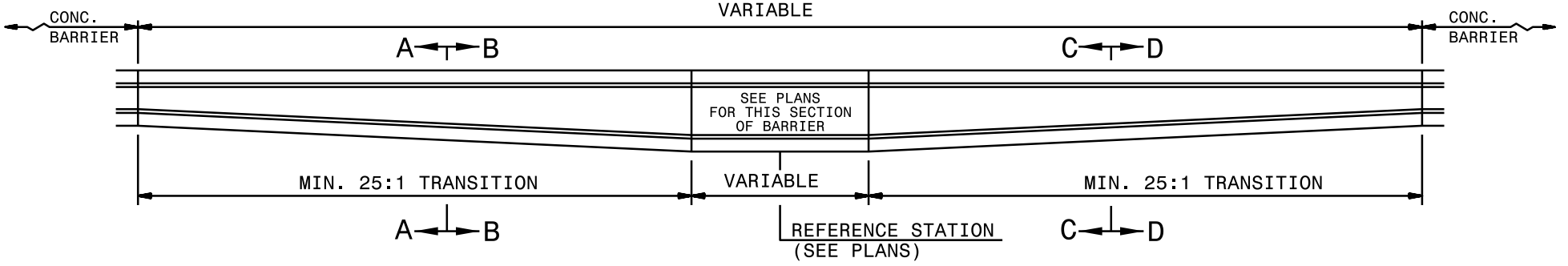
854.04



LEFT HAND TRANSITION

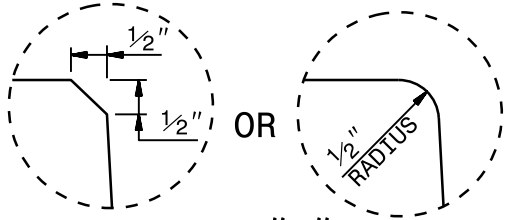


CENTER TRANSITION



RIGHT HAND TRANSTION

NOTE:
SEE PLAN TYPICAL SECTIONS TO DETERMINE SECTION VIEW DIRECTION.



INSET "A"

SHOWING RADII AND BEVEL

STATE OF NORTH CAROLINA
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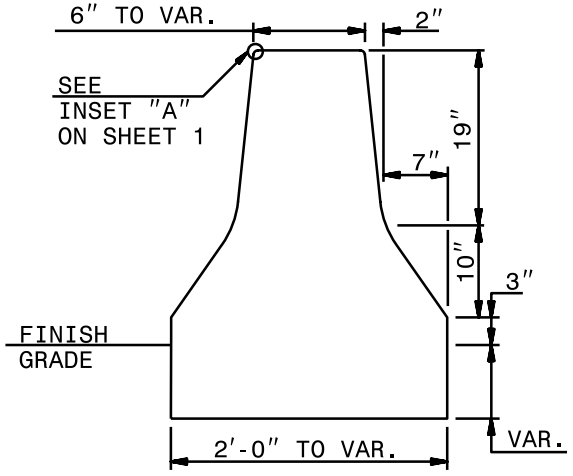
ROADWAY STANDARD DRAWING FOR

CONCRETE MEDIAN TRANSITION BARRIER

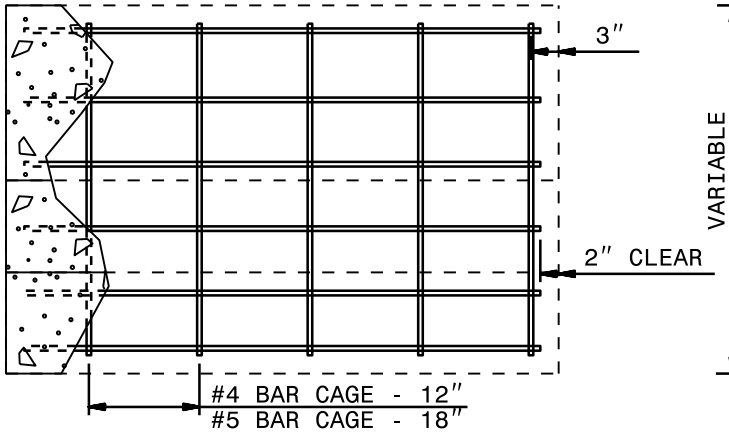
LOCATION OF OVERHEAD ASSEMBLY

SHEET 1 OF 4

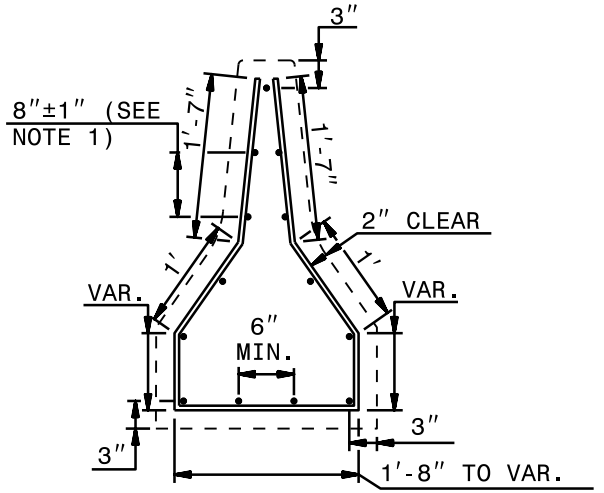
854.05



SECTION VIEW

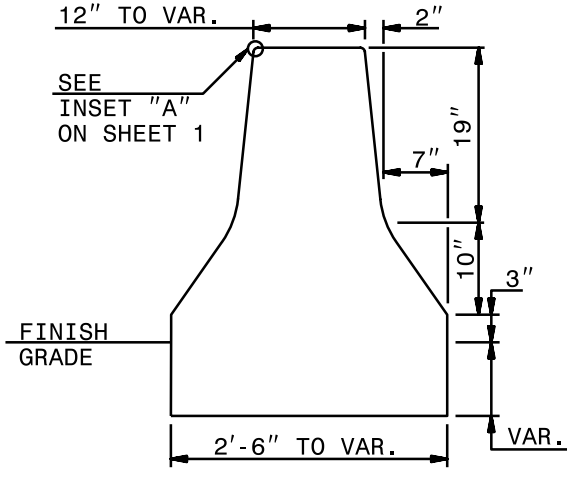


ELEVATION VIEW

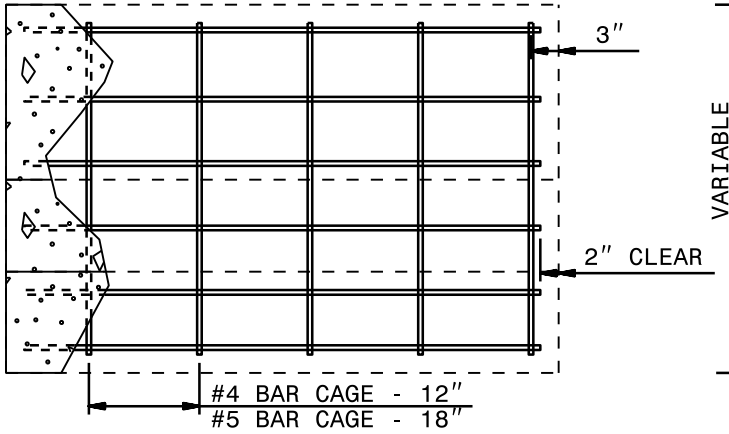


STEEL VIEW

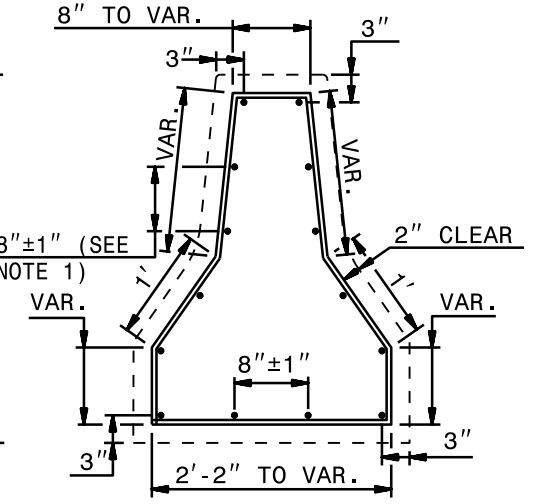
DOUBLE FACE TRANSITION BARRIER
(NO GLARE SCREEN PERMITTED)



SECTION VIEW



ELEVATION VIEW



STEEL VIEW

DOUBLE FACE TRANSITION BARRIER
(GLARE SCREEN PERMITED)

NOTES:

1. EVENLY SPACE HORIZONTAL REBAR 8″±1″ UNLESS OTHERWISE NOTED.
2. USE #4 BAR FOR HORIZONTAL STEEL AND #4 OR #5 BAR FOR THE VERTICAL CAGE.
3. SUBMIT CHANGES IN STEEL PLACEMENT OR SIZE TO THE ENGINEER.
4. CONSTRUCT THE TRANSITION BARRIER IN ACCORDANCE WITH SECTION 854 OF THE SPECIFICATIONS.

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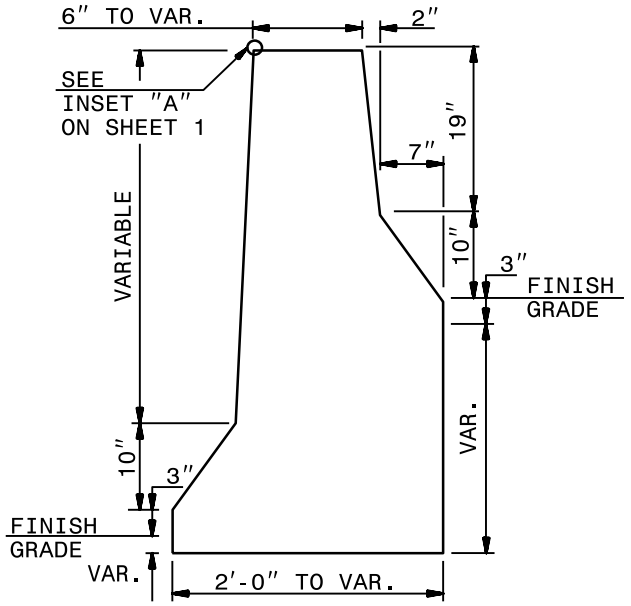
ROADWAY STANDARD DRAWING FOR

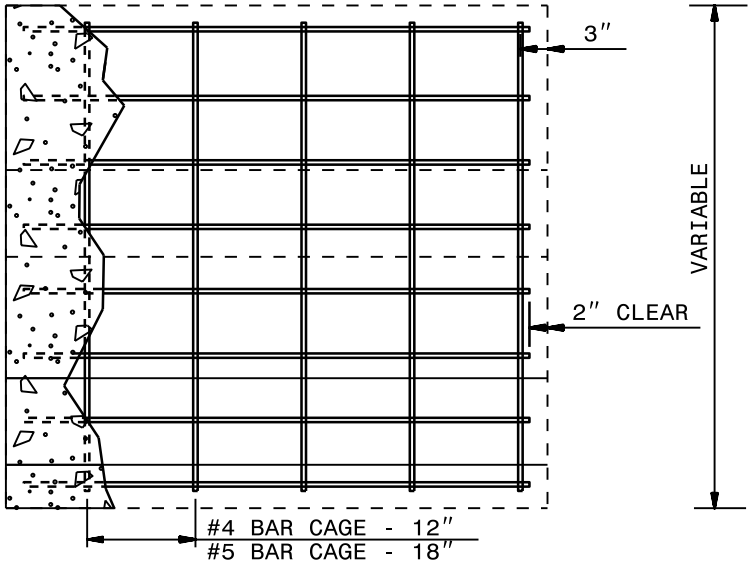
CONCRETE MEDIAN TRANSITION BARRIER

LOCATION OF OVERHEAD ASSEMBLY

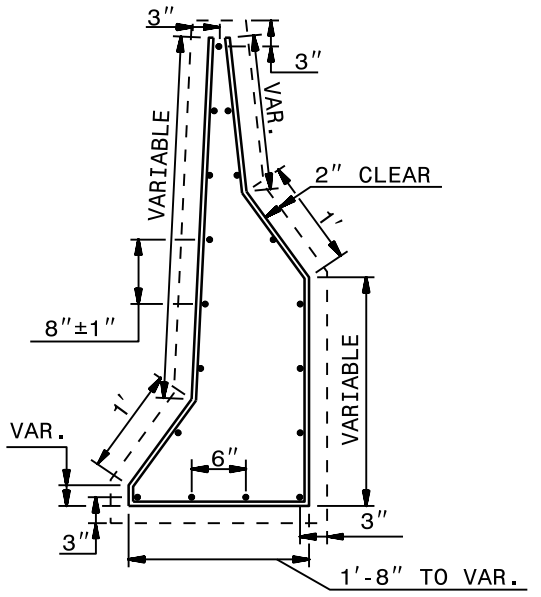
854.05



SECTION VIEW

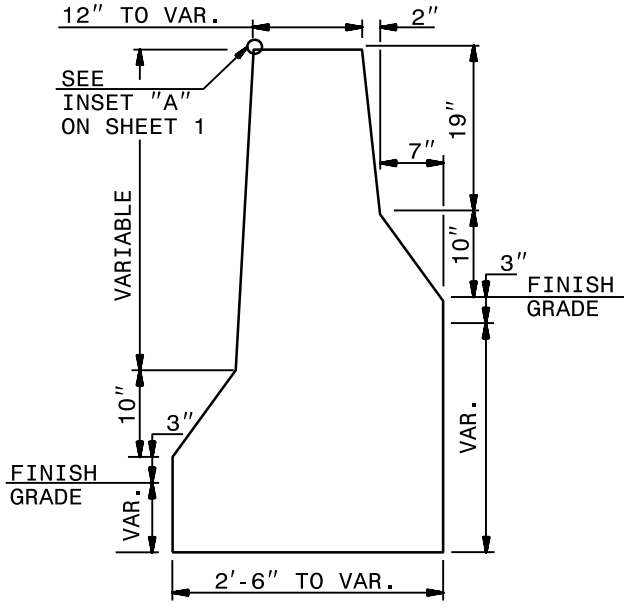


ELEVATION VIEW

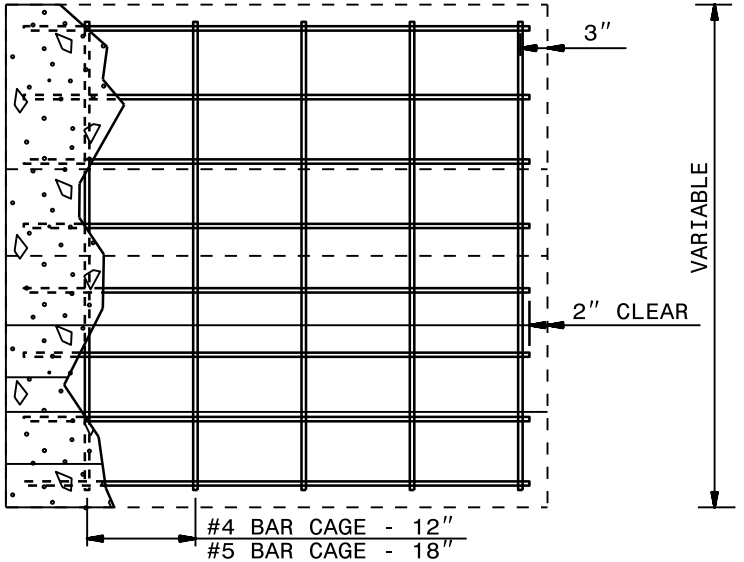


STEEL VIEW

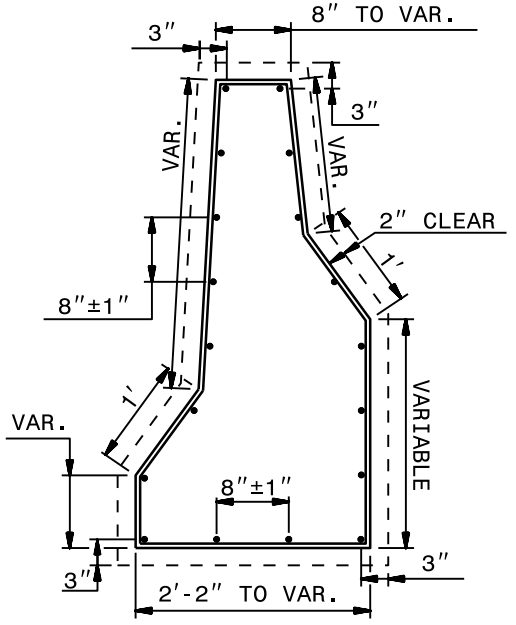
TYPE III - 2′-0″ BASE
DOUBLE FACE MEDIAN TRANSITION OFFSET BARRIER
(NO GLARE SCREEN PERMITTED)



SECTION VIEW



ELEVATION VIEW



STEEL VIEW

TYPE II - 2′-6″ BASE
DOUBLE FACE MEDIAN TRANSITION OFFSET BARRIER
(GLARE SCREEN PERMITTED)

NOTES: SEE SHEET 2.

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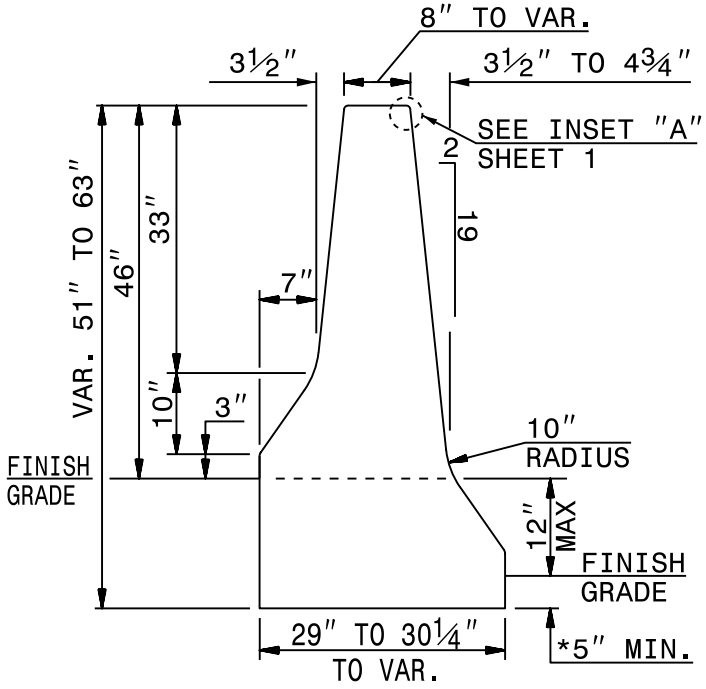
ROADWAY STANDARD DRAWING FOR

CONCRETE MEDIAN TRANSITION BARRIER

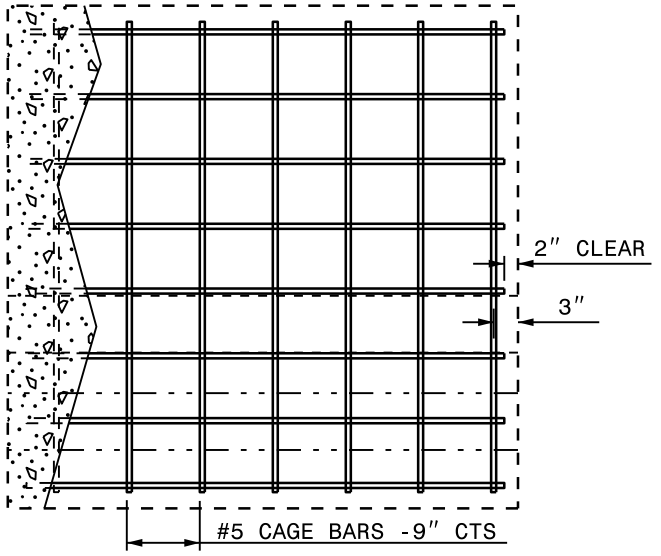
LOCATION OF OVERHEAD ASSEMBLY

SHEET 3 OF 4

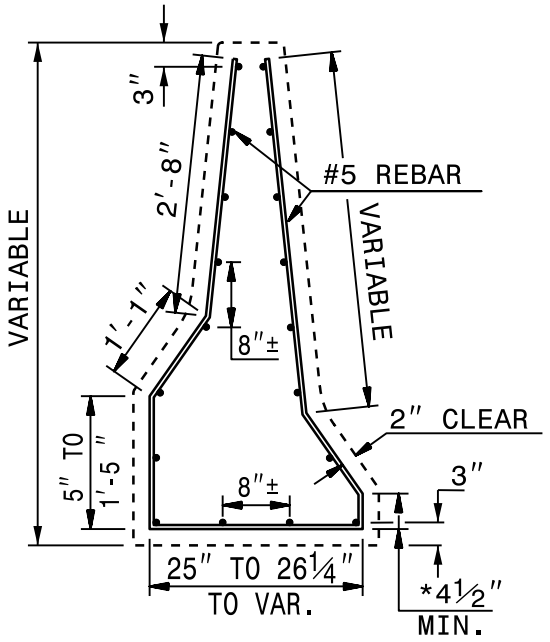
854.05



SECTION VIEW

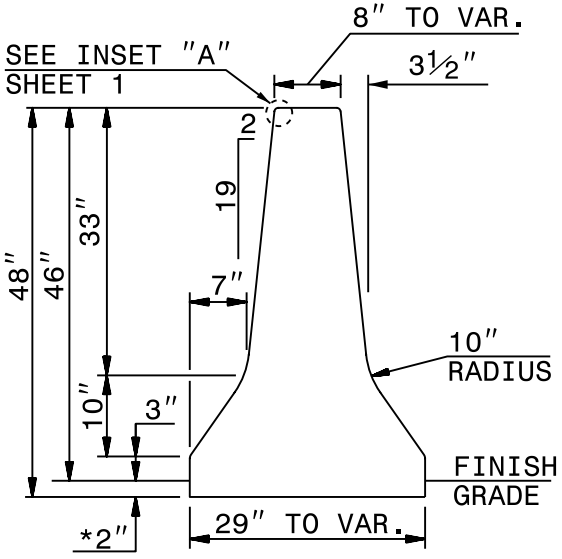


ELEVATION VIEW

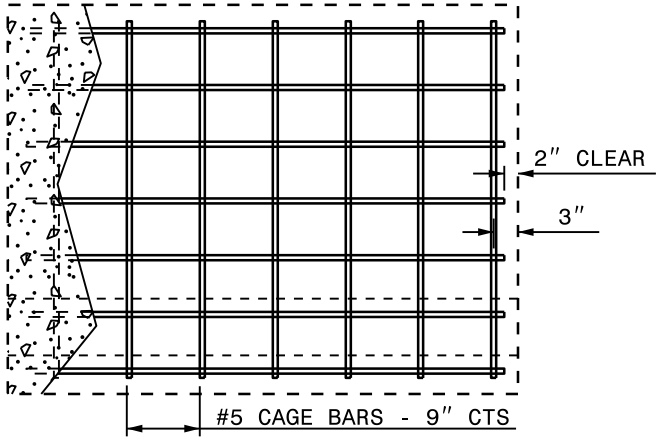


STEEL SECTION

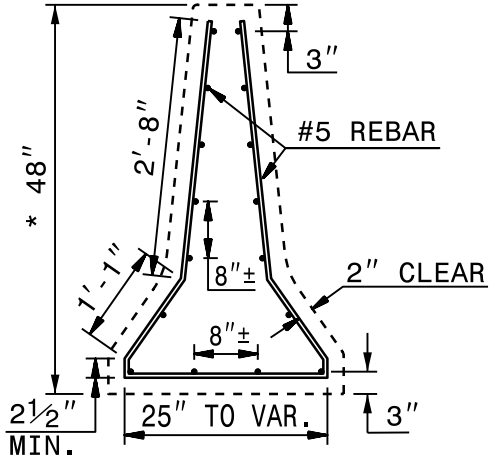
TYPE T-1 OR T-2
DOUBLE FACE MEDIAN
TRANSITION OFFSET BARRIER



SECTION VIEW



ELEVATION VIEW



STEEL SECTION

TYPE T
DOUBLE FACE MEDIAN TRANSITION BARRIER

NOTES: SEE SHEET 2.

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ROADWAY STANDARD DRAWING FOR

CONCRETE MEDIAN TRANSITION BARRIER

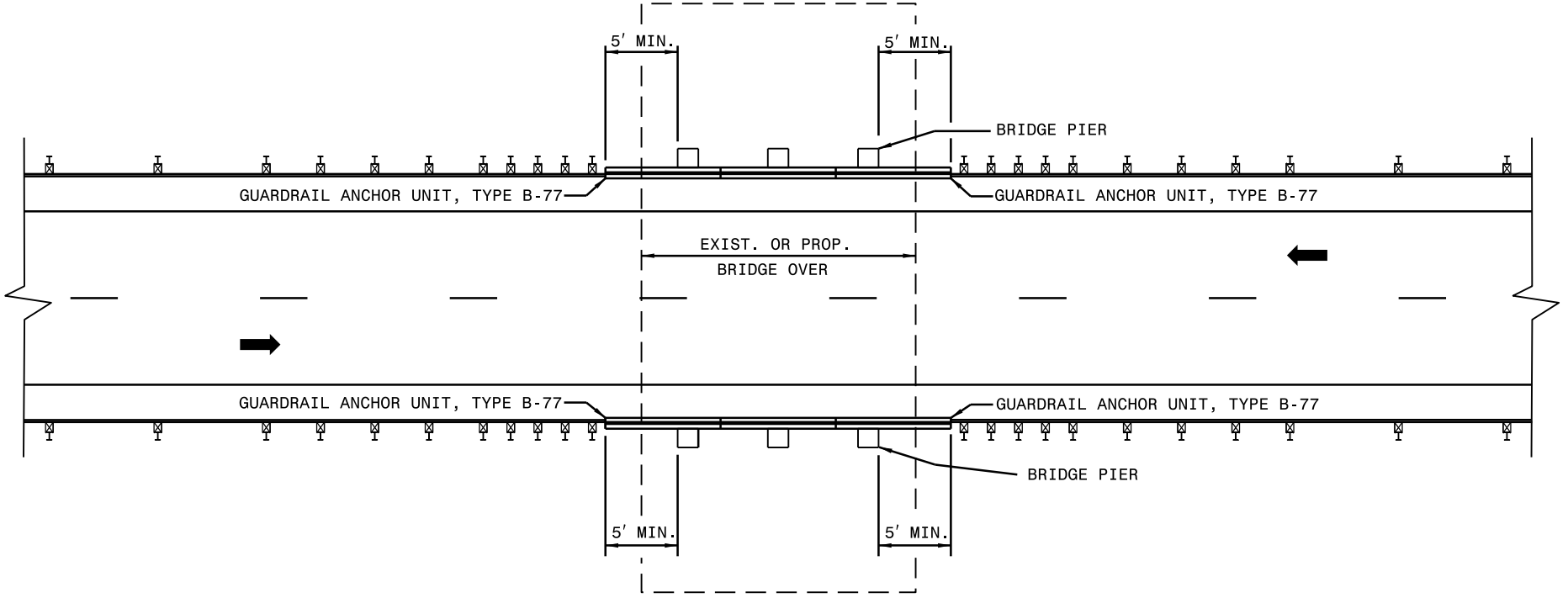
LOCATION OF OVERHEAD ASSEMBLY

SHEET 4 OF 4

854.05

NOTE:
1) THIS DRAWING IS NOT INTENDED TO SHOW TYPICAL BARRIER AND GUARDRAIL INSTALLATION.
IT DETAILS POSSIBLE BARRIER AND STRUCTURE ANCHOR COMBINATIONS FOR THIS TYPE FACILITY.

2) USE TRAILING END GUARDRAIL IF WARRANTED



GUARDRAIL AND BARRIER AT UNDIVIDED HIGHWAY BRIDGE UNDERPASS

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STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
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RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR

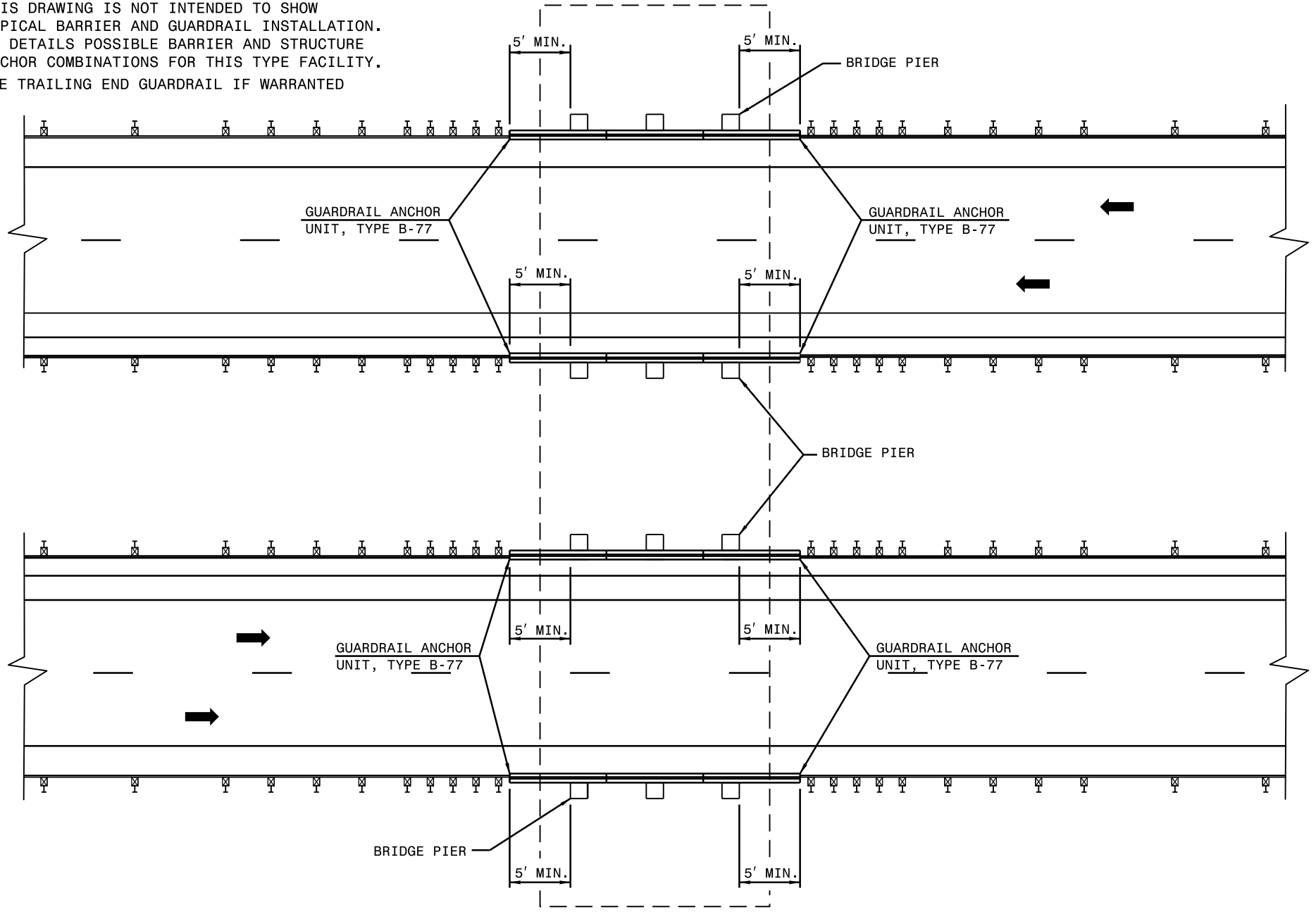
PRECAST REINFORCED CONCRETE BARRIER

41″ SINGLE FACED

SHEET 1 OF 8

857.01

NOTE:
1) THIS DRAWING IS NOT INTENDED TO SHOW TYPICAL BARRIER AND GUARDRAIL INSTALLATION. IT DETAILS POSSIBLE BARRIER AND STRUCTURE ANCHOR COMBINATIONS FOR THIS TYPE FACILITY.
2) USE TRAILING END GUARDRAIL IF WARRANTED



GUARDRAIL AND BARRIER AT DIVIDED HIGHWAY BRIDGE UNDERPASS

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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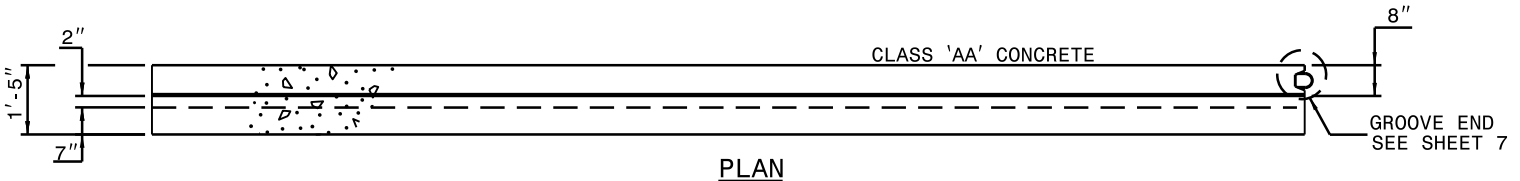
ROADWAY STANDARD DRAWING FOR

PRECAST REINFORCED CONCRETE BARRIER

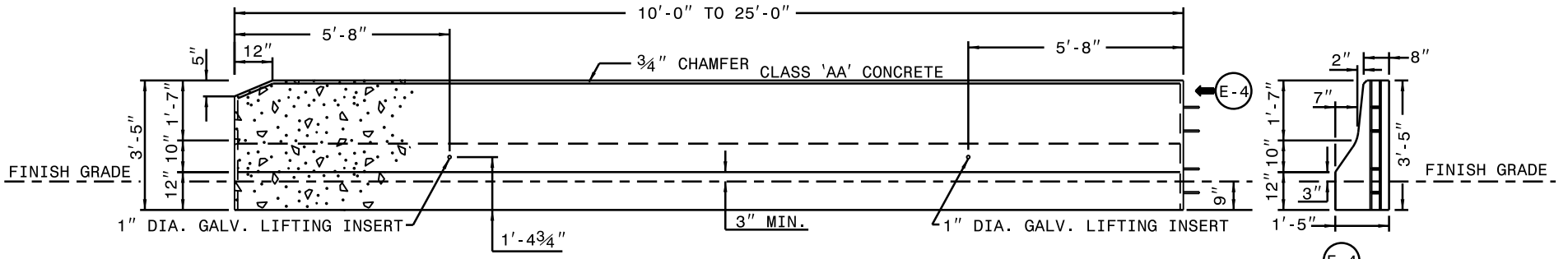
41″ SINGLE FACED

SHEET 2 OF 8

857.01

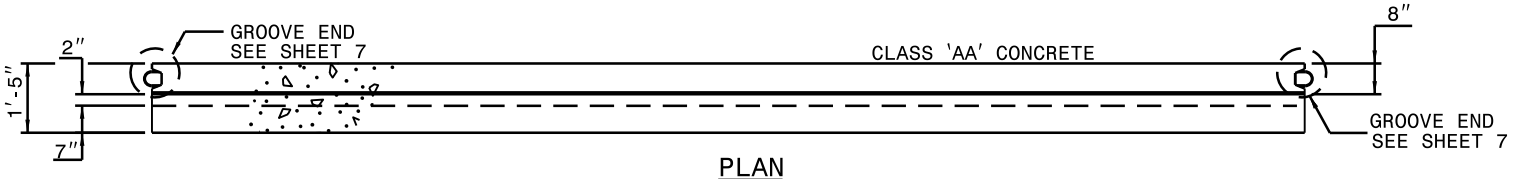


PLAN

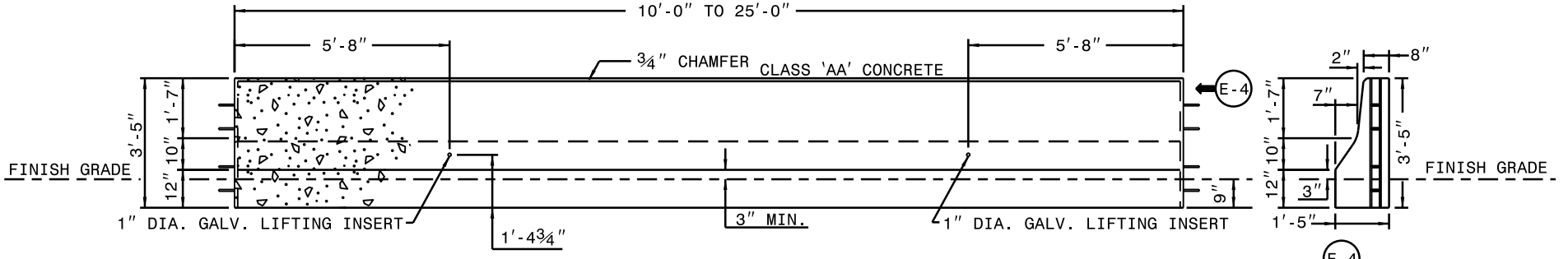


FRONT ELEVATION MIDDLE BARRIER UNIT

E-4
END
ELEVATION



PLAN



FRONT ELEVATION MIDDLE BARRIER UNIT

E-4
END
ELEVATION

STATE OF
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RALEIGH, N.C.

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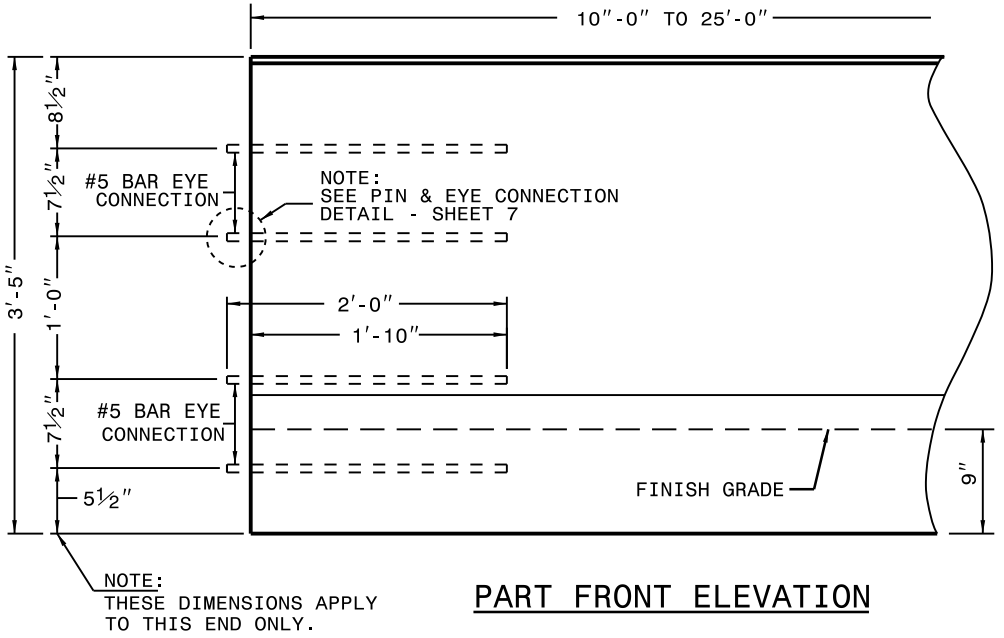
ROADWAY STANDARD DRAWING FOR

PRECAST REINFORCED CONCRETE BARRIER

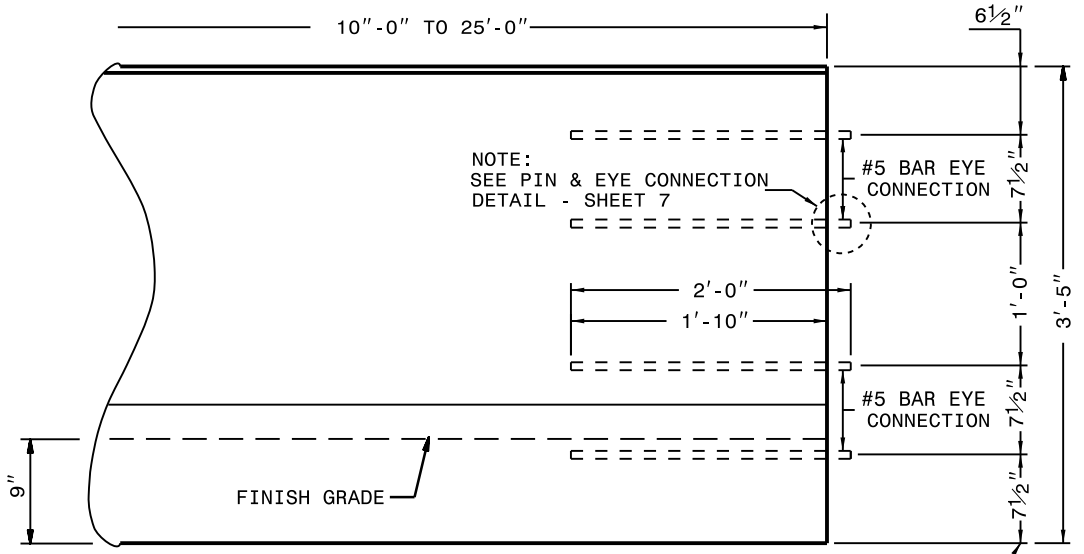
41" SINGLE FACED

SHEET 3 OF 8

857.01



PART FRONT ELEVATION



PART FRONT ELEVATION

ELEVATION VIEWS
SHOWING PLACEMENT OF EYE
BARS AT EACH END

STATE OF
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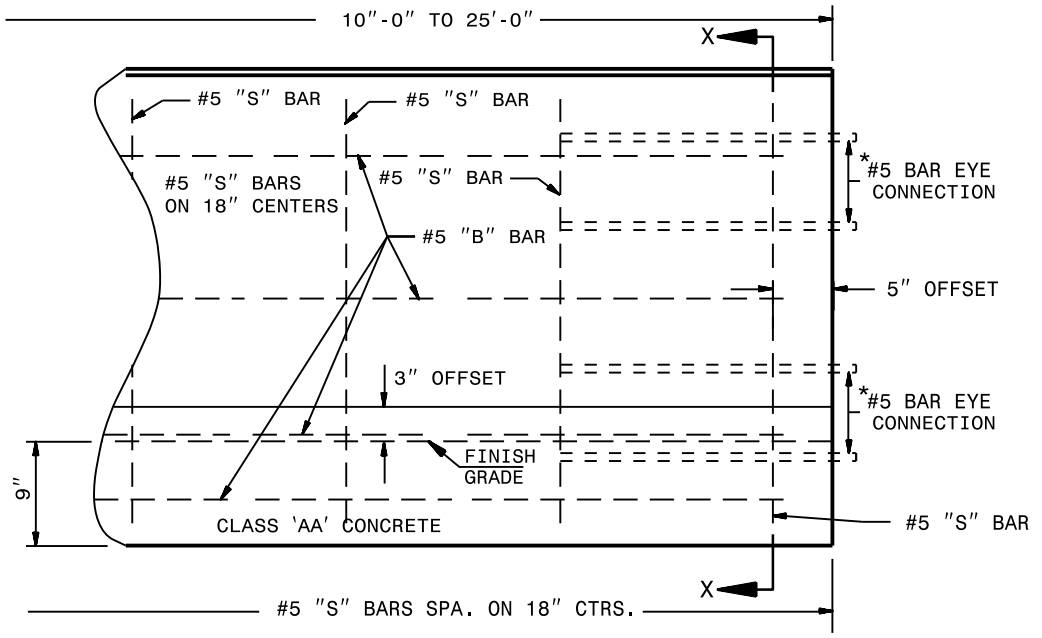
ROADWAY STANDARD DRAWING FOR

PRECAST REINFORCED CONCRETE BARRIER

41″ SINGLE FACED

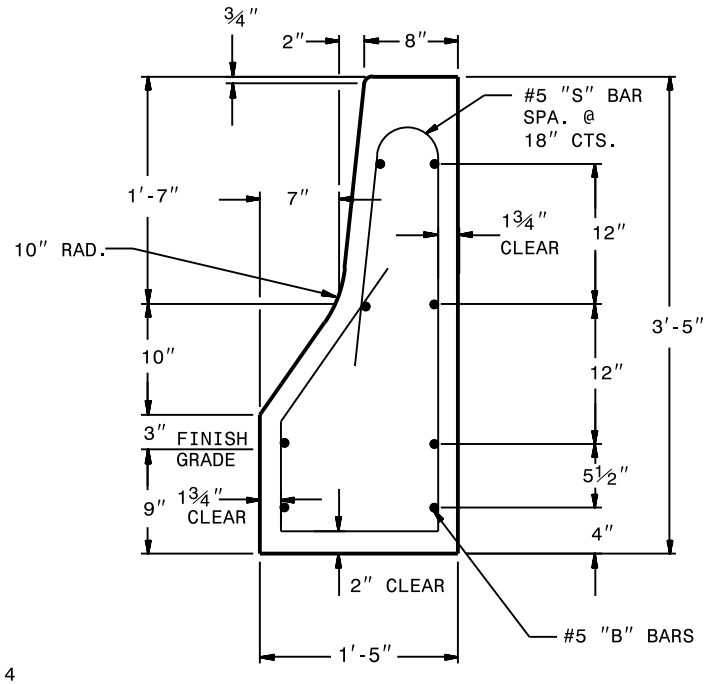
SHEET 4 OF 8

857.01

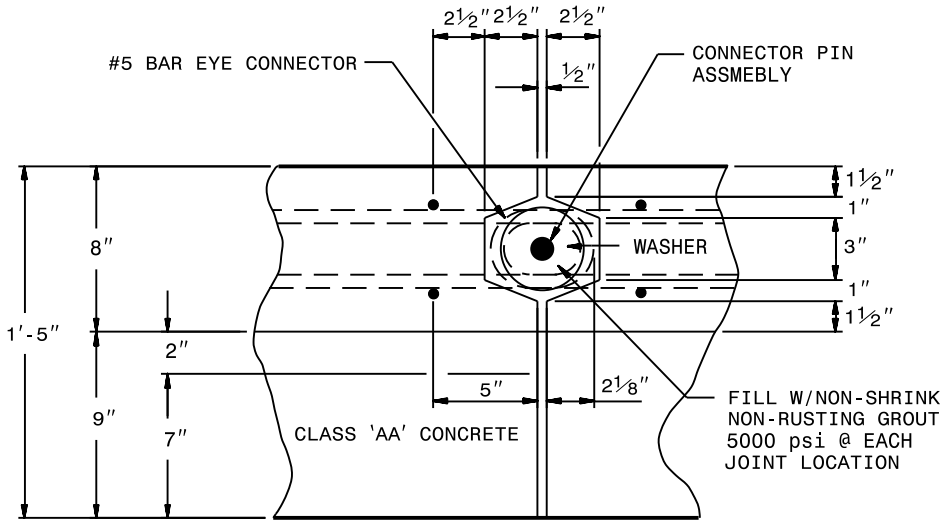


PART FRONT ELEVATION

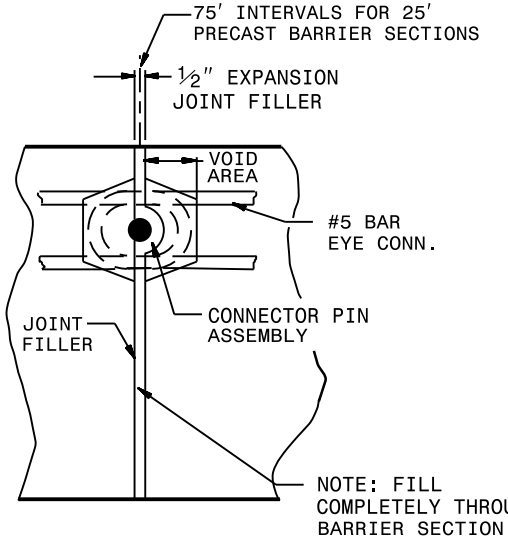
*SEE SHEET 4
FOR DIMENSIONS



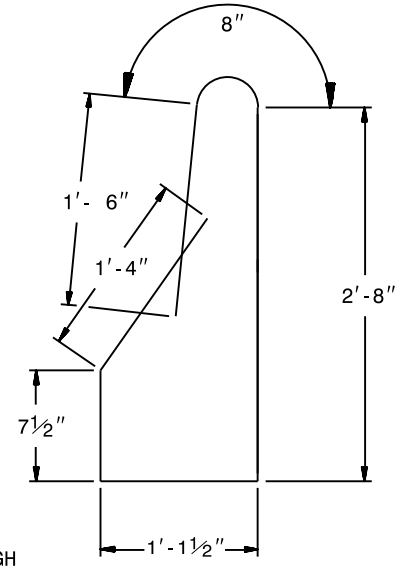
DETAIL X-X
CROSS SECTIONAL VIEW



PLAN OF BONDED CONNECTION OF PRECAST UNIT



JOINT FILLER DETAIL



S - BARS
#5 BAR

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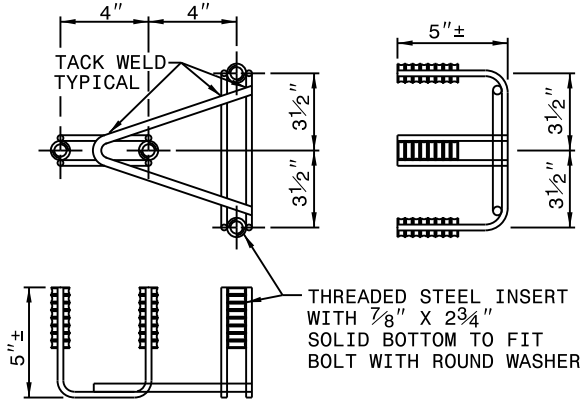
ROADWAY STANDARD DRAWING FOR

PRECAST REINFORCED CONCRETE BARRIER

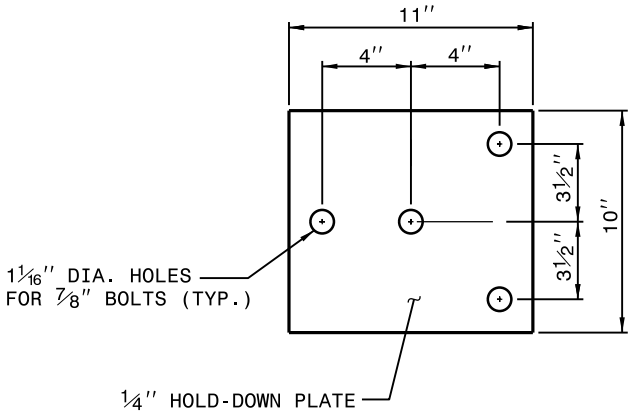
41″ SINGLE FACED

SHEET 5 OF 8

857.01



DETAIL A
4 BOLT INSERT ASSEMBLY



DETAIL B
4 BOLT HOLD DOWN PLATE

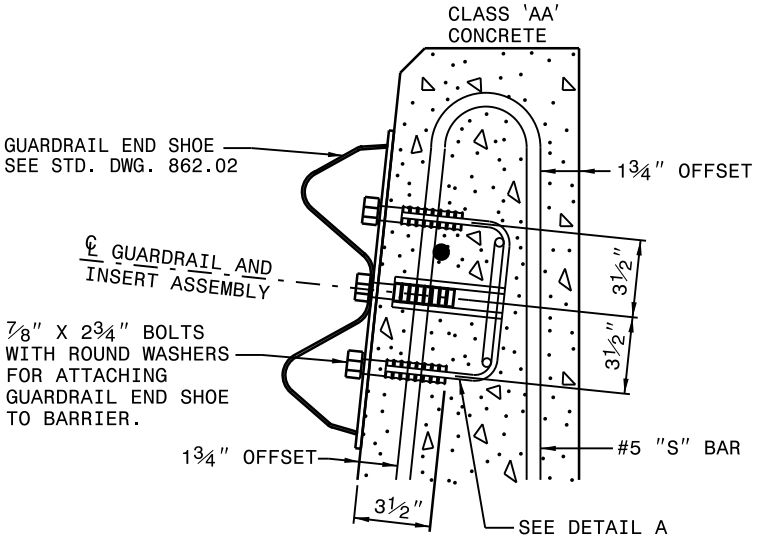
NOTES FOR 4 BOLT HOLD DOWN PLATE

USE A ¼" HOLD DOWN PLATE AND 4 - ⅞" DIA. BOLTS WITH NUTS AND WASHERS FOR GUARDRAIL ANCHOR ASSEMBLY.

USE HOLD-DOWN PLATE WHICH CONFORMS TO AASHTO M270 GRADE 36. AFTER FABRICATION, HOT DIP GALVANIZE THE HOLD-DOWN PLATE IN ACCORDANCE WITH AASHTO M111.

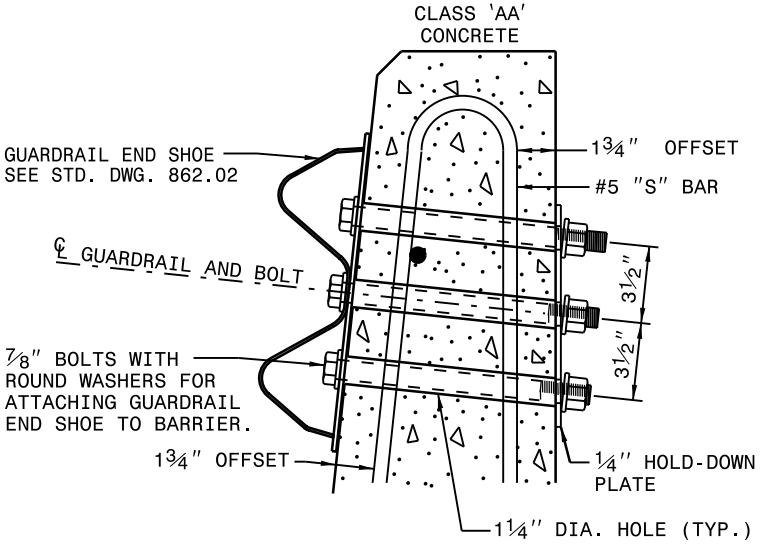
AFTER INSTALLATION, BURR THE EXPOSED THREAD OF THE BOLT.

FORM OR DRILL THE 1¼" DIA. HOLES WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. REPAIR ANY CONCRETE DAMAGED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.



PART SECTION
OF BARRIER

THRU END SHOE SECTION AND
4 BOLT INSERT ASSEMBLY



PART SECTION
OF BARRIER

THRU END SHOE SECTION AND
4 BOLT HOLD DOWN PLATE

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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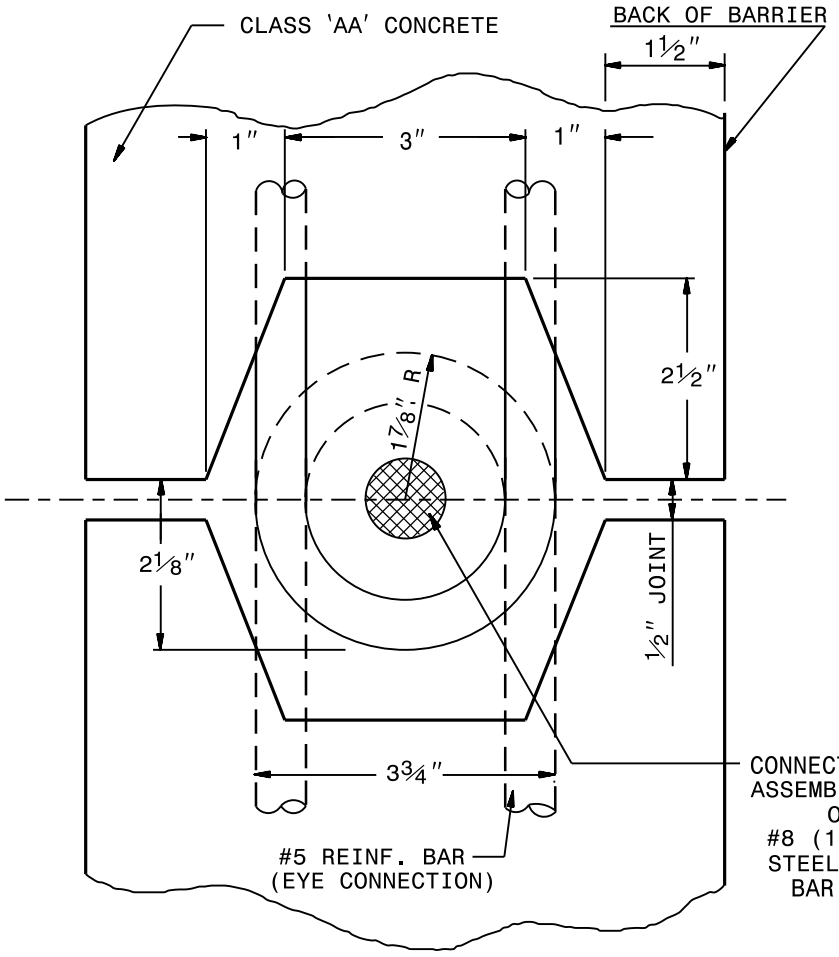
ROADWAY STANDARD DRAWING FOR

PRECAST REINFORCED CONCRETE BARRIER

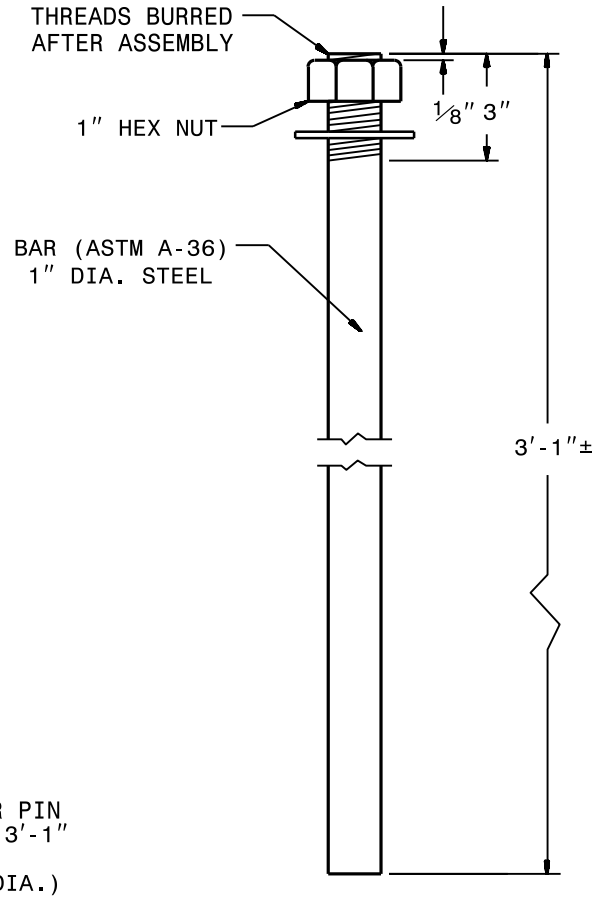
41" SINGLE FACED

SHEET 6 OF 8

857.01

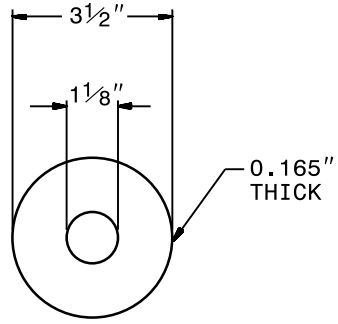


GROOVE END AND PIN & EYE CONNECTION DETAILS

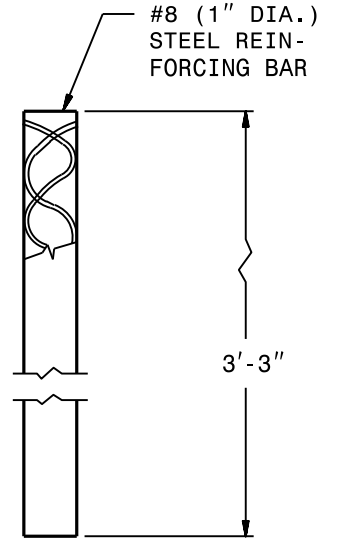


CONNECTOR PIN ASSEMBLY

OPTION #1
GALVANIZE ALL PARTS IN ACCORDANCE WITH ASTM A-153 SPEC.

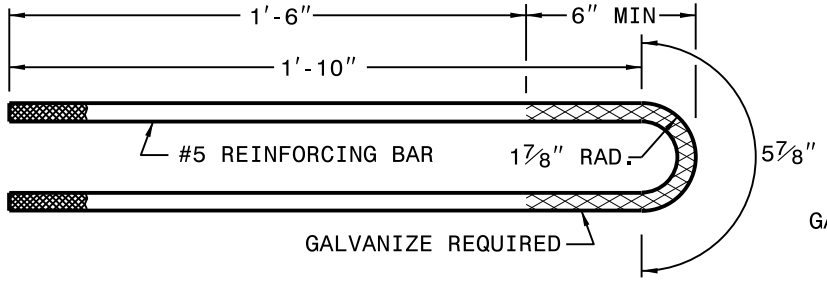


PLAIN GALVANIZED STEEL WASHER FOR 1" PIN



#8 REINFORCING STEEL BAR CONNECTOR PIN

OPTION #2
GALVANIZE ALL PARTS IN ACCORDANCE WITH ASTM A-153 SPEC.



DETAIL OF REINFORCING EYE BAR

STATE OF NORTH CAROLINA
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1-18

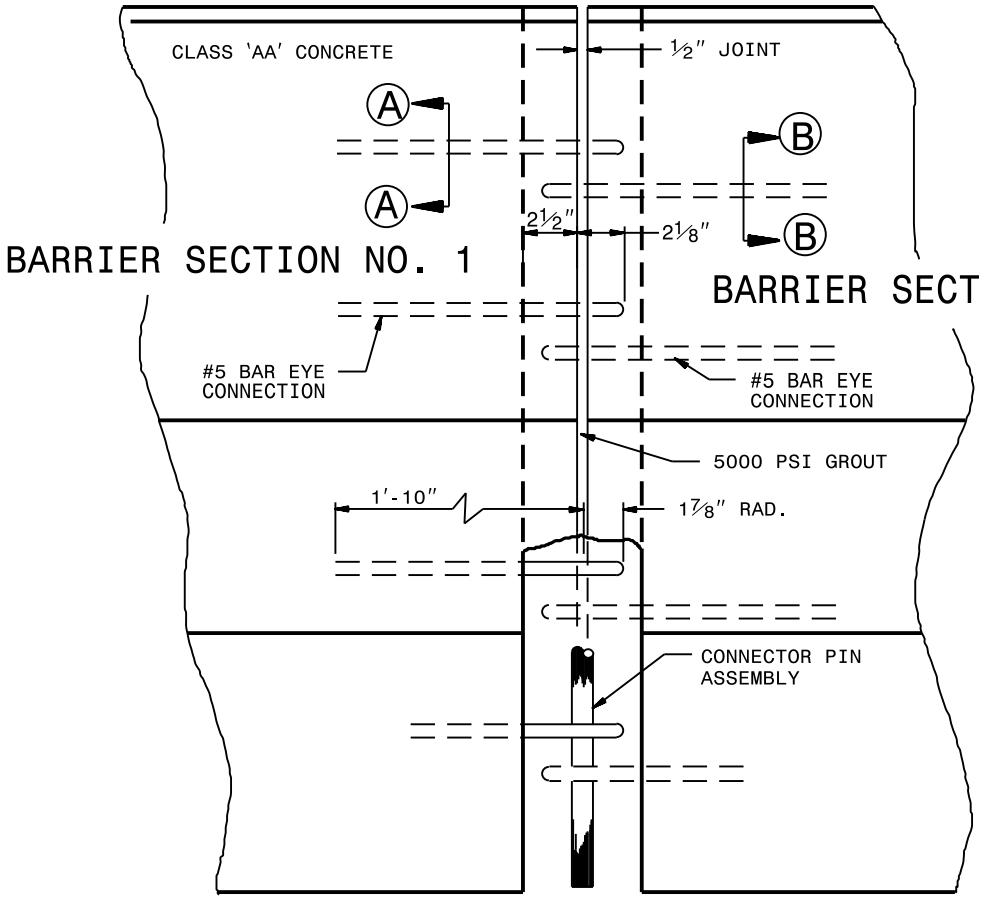
ROADWAY STANDARD DRAWING FOR

PRECAST REINFORCED CONCRETE BARRIER

41" SINGLE FACED

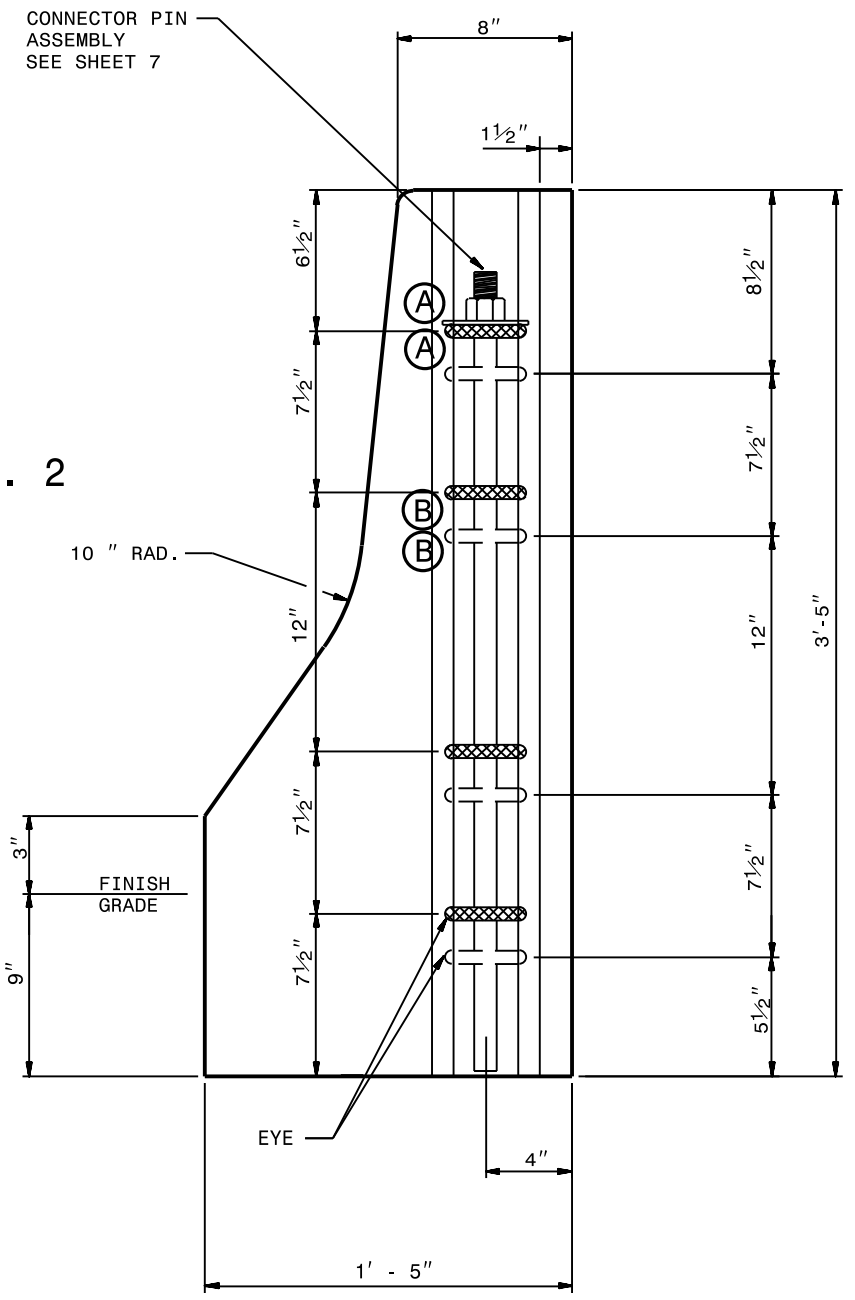
SHEET 7 OF 8

857.01



NOTE: SEE SHEET 7 FOR DETAILS OF CONNECTOR PIN ASSEMBLIES.

JOINT VIEW ELEVATION



END VIEW

STATE OF NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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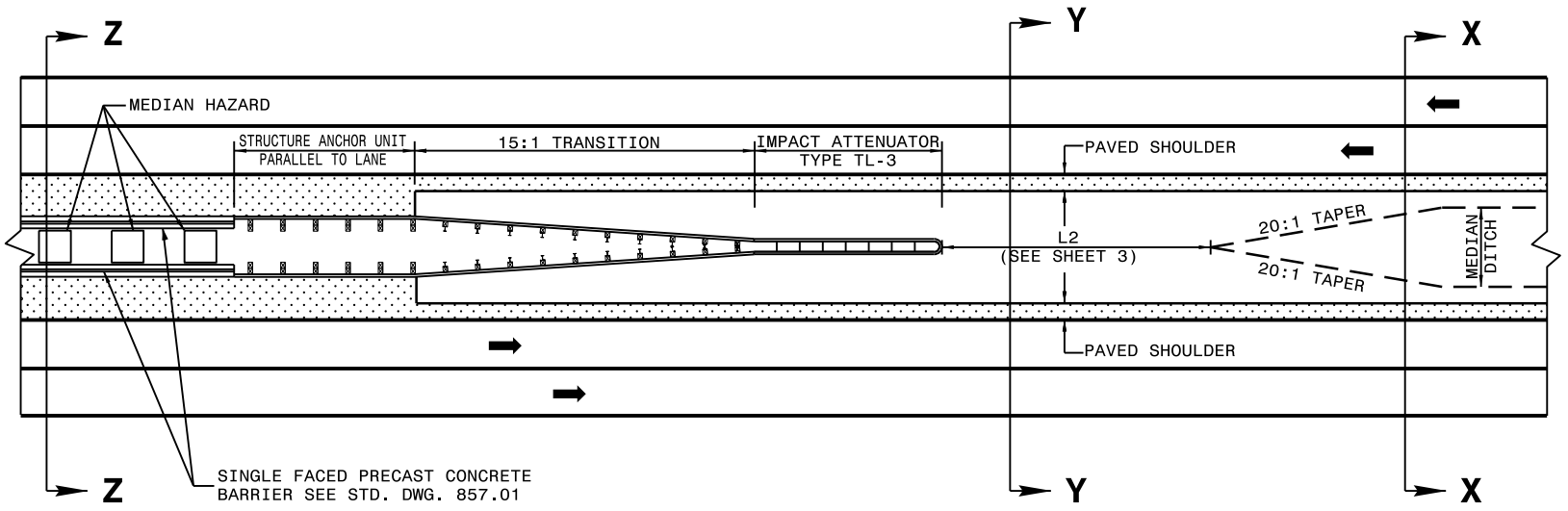
ROADWAY STANDARD DRAWING FOR

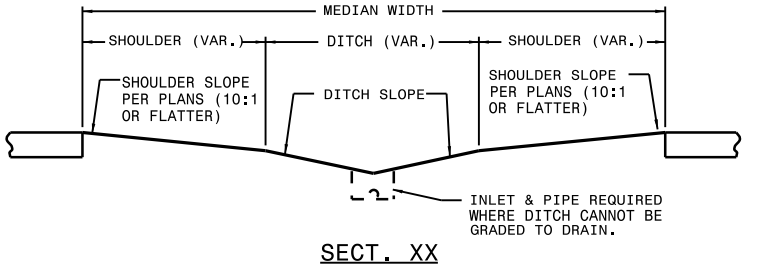
PRECAST REINFORCED CONCRETE BARRIER

41" SINGLE FACED

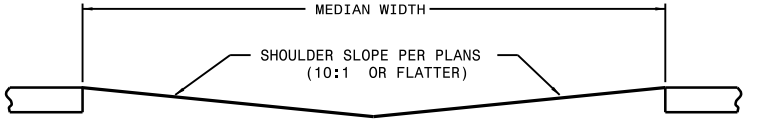
SHEET 8 OF 8

857.01

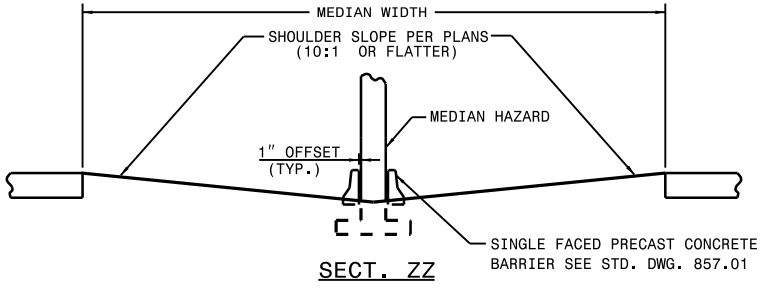




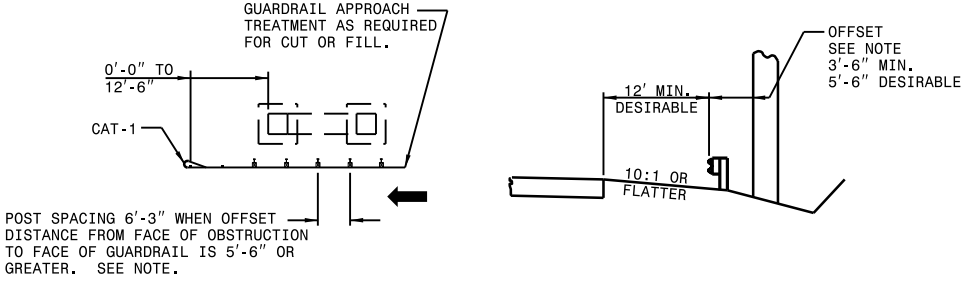
SECT. XX



SECT. YY



SECT. ZZ



NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6", BEGIN 3'-1½" POST SPACING AT A POINT 25' BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

DETAIL OF MEDIAN TREATMENT AT UNDERPASS

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RALEIGH, N.C.

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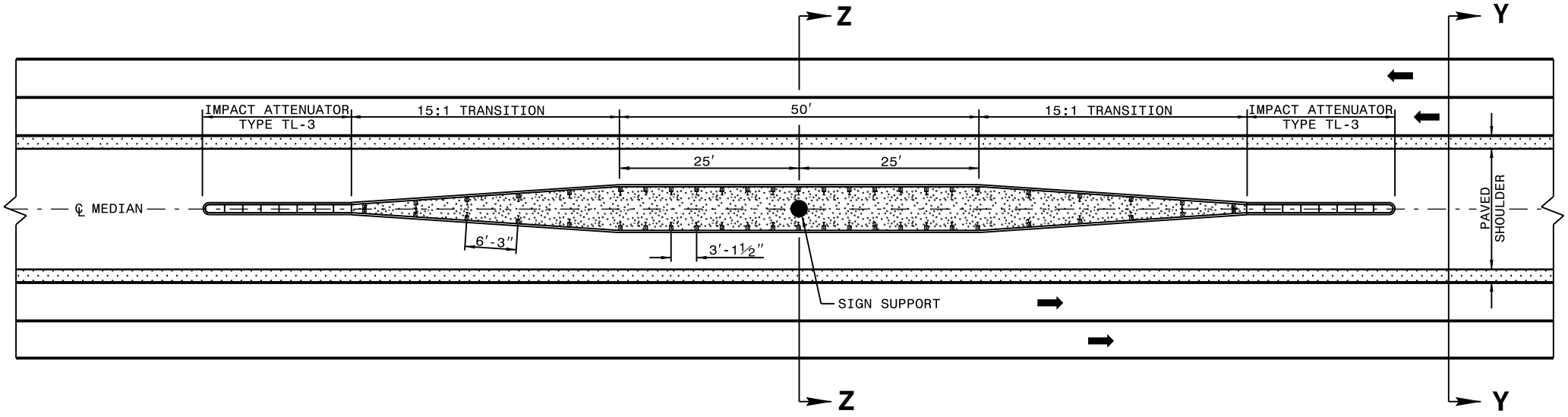
ROADWAY STANDARD DRAWING FOR

GUARDRAIL PLACEMENT

SHEET 1 OF 11

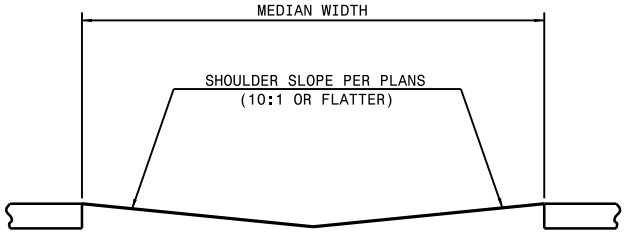
862.01



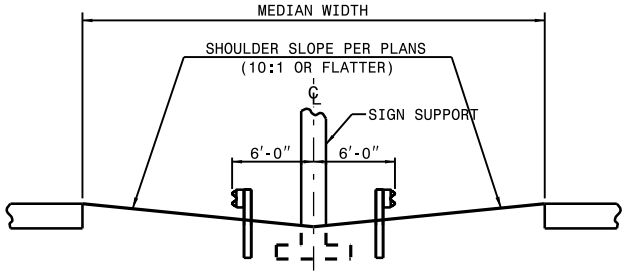
NOTE SPECIAL LAYER OF PAVEMENT .....

USE 3′-1½″ POST SPACING ON THE 50′ OF GUARDRAIL PARALLEL TO LANES AND 6′-3″ POST SPACING ON 15:1 TRANSITION SECTIONS.

GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STARDARD 862.01 SHEET 1 OF 12).



SECT. YY



SECT. ZZ

DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

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RALEIGH, N.C.

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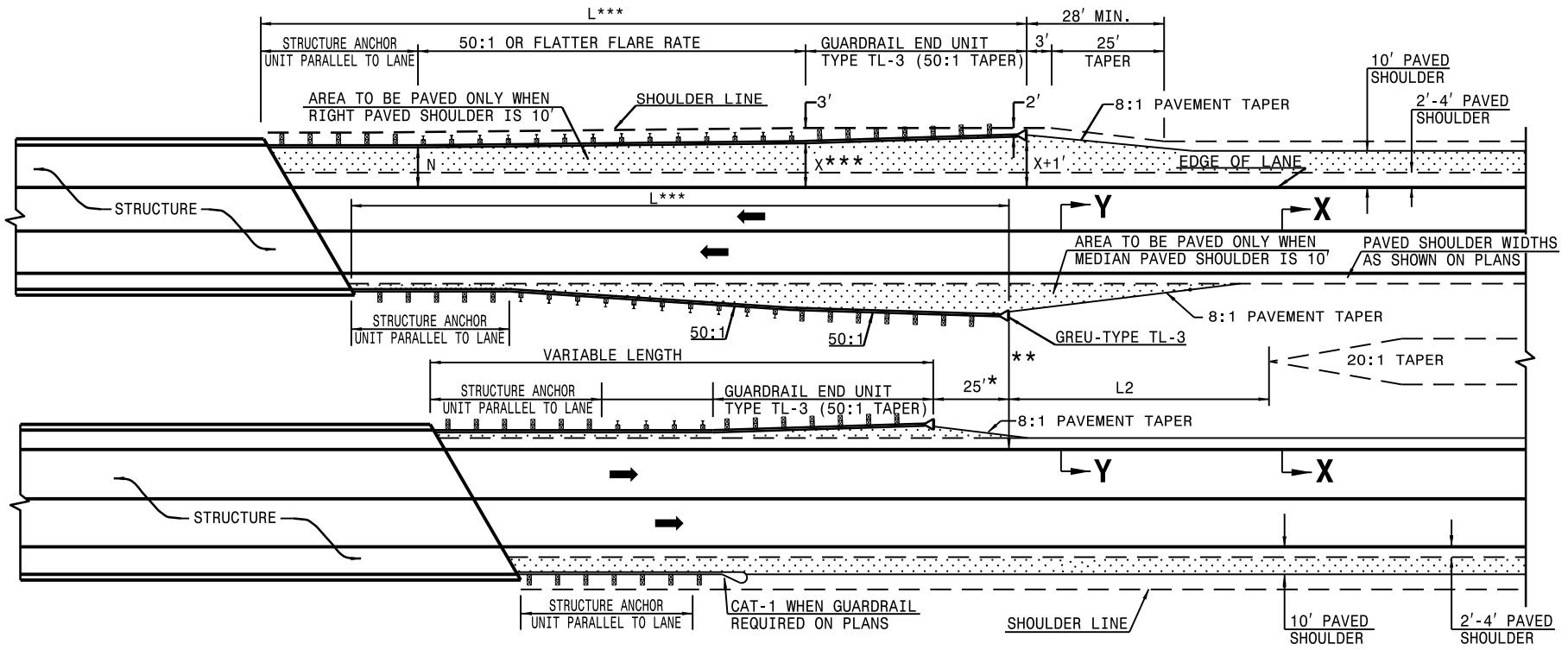
ROADWAY STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 11

862.01



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DIMENSIONS FOR LENGTH OF GUARDRAIL APPROACHING DUAL LANE BRIDGES

MEDIAN WIDTH	-L-***						-L2- DIM.
	70 MPH	60 MPH	50 MPH				
30'	300.0'	250.0'	150.0'				80.0'
36'	300.0'	250.0'	150.0'				60.0'
40' & ABOVE	300.0'	250.0'	150.0'				40.0'

NOTES: * MINOR VARIATION TO THE 25'-0" DIMENSION IS PERMISSIBLE TO ACCOMODATE THE 12'-6" IN GUARDRAIL LENGTHS.

** NO GUARDRAIL IS REQUIRED ON THE TRAILING END WHEN THIS DISTANCE EXCEEDS CLEAR ROADSIDE RECOVERY AREA FOR THE APPROPRIATE DESIGN SPEED.

*** BASED ON "X" OF 12'
USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1A).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

THE DESIGN LAYOUT FOR LENGTHS SHOWN ON THIS STANDARD ARE MINIMUM DESIGN LENGTHS.

SEE SHEET 1 OF 12 FOR SECTIONS XX, YY

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

DETAIL OF GUARDRAIL APPROACHING DUAL LANE BRIDGES

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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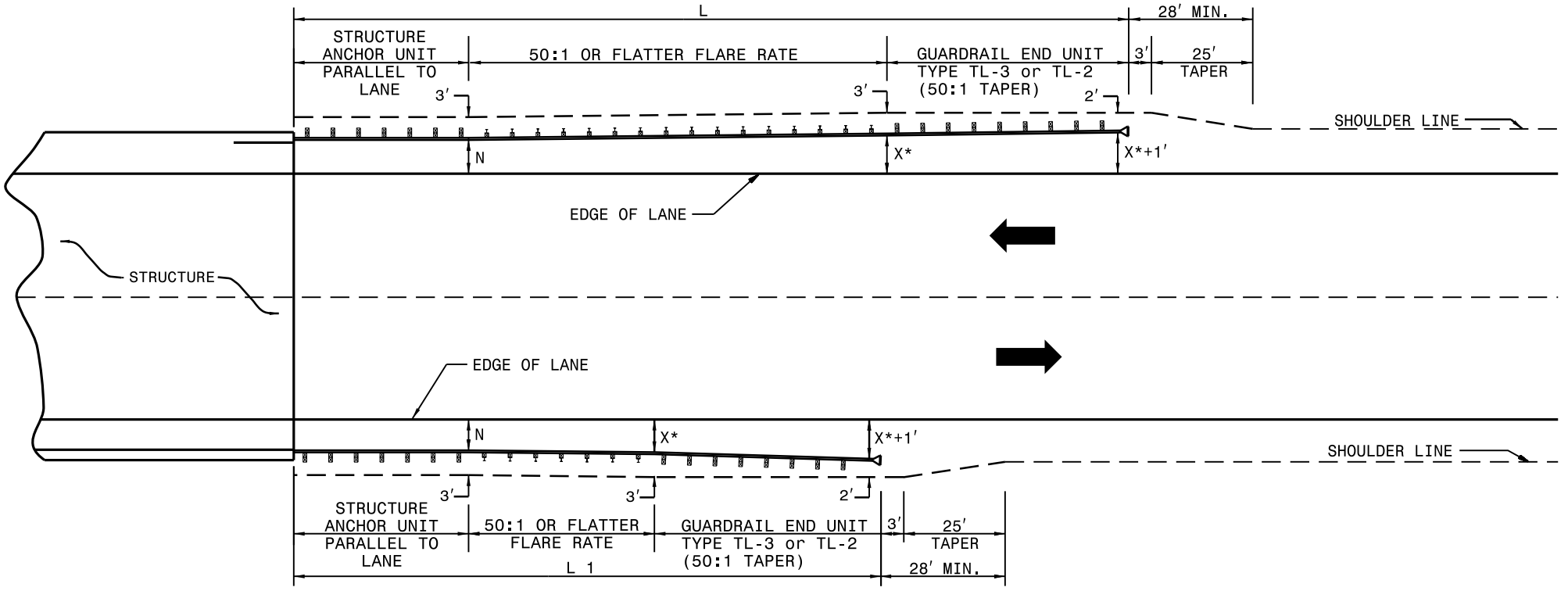
ROADWAY STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 3 OF 11

862.01



* USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

GUARDRAIL INSTALLATION AT BRIDGE APPROACHES FOR TWO-LANE, TWO-WAY TRAFFIC

DESIGN SPEED (MPH)	"L" APPROACH LENGTH (FT.)				"L1" TRAILING LENGTH (FT.)			
	DESIGN YEAR ADT		CURRENT YEAR ADT		DESIGN YEAR ADT		CURRENT YEAR ADT	
	OVER 2000	1001-2000	400-1000	UNDER 400	OVER 2000	1001-2000	400-1000	UNDER 400
70	362.5′	362.5′	350.0′	287.5′	187.5′	187.5′	175.0′	75.0′
60	300.0′	287.5	275.0′	225.0′	137.5′	137.5′	100.0′	75.0′
50	212.5′	212.5′	200.0′	162.5′	87.5′	75.0′	75.0′	75.0′
40	175.0′	150.0′	137.5′	112.5′	75.0′	75.0′	75.0′	75.0′
X *	8′	6′	4′	4′	8′	6′	4′	4′

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

STATE OF NORTH CAROLINA
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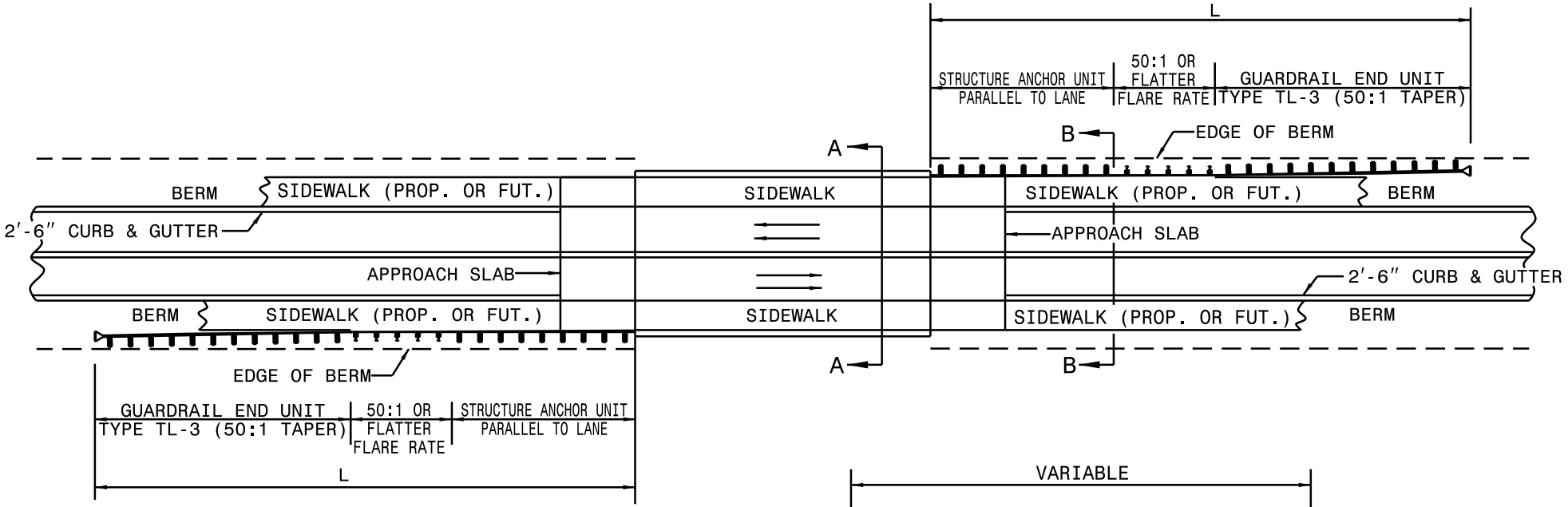
ROADWAY STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 4 OF 11

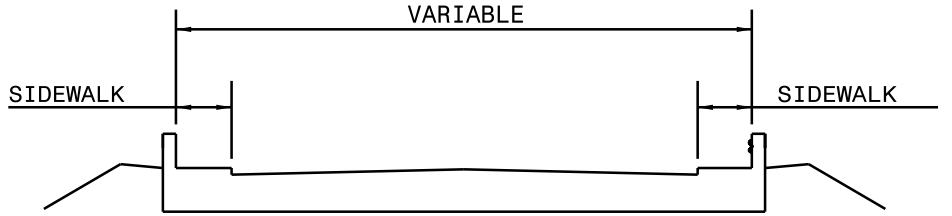
862.01



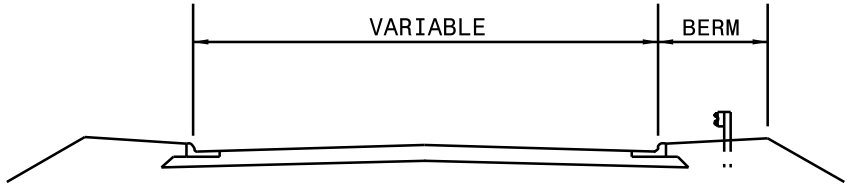
MINIMUM GUARDRAIL LENGTHS "L" REQUIRED AT BRIDGE APPROACHES ON 2′-6″ CONCRETE CURB AND GUTTER ROADWAYS	
DESIGN SPEED (MPH)	"L"
40	150′
50	225′

NOTE: "L" VALUES ARE BASED ON NO HAZARDS OTHER THAN END OF BRIDGE BEING PRESENT WITHIN THE CLEAR ZONE.

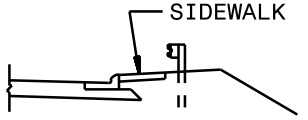
SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS.



SECTION A-A



SECTION B-B



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

STANDARD GUARDRAIL PLACEMENT AT BRIDGES WITH 2′-6″ CONCRETE CURB AND GUTTER

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RALEIGH, N.C.

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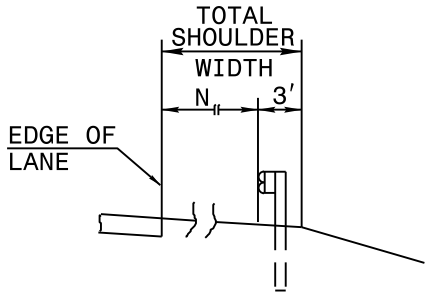
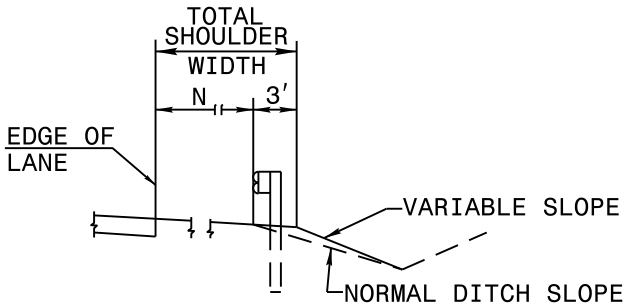
ROADWAY STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 5 OF 11

862.01

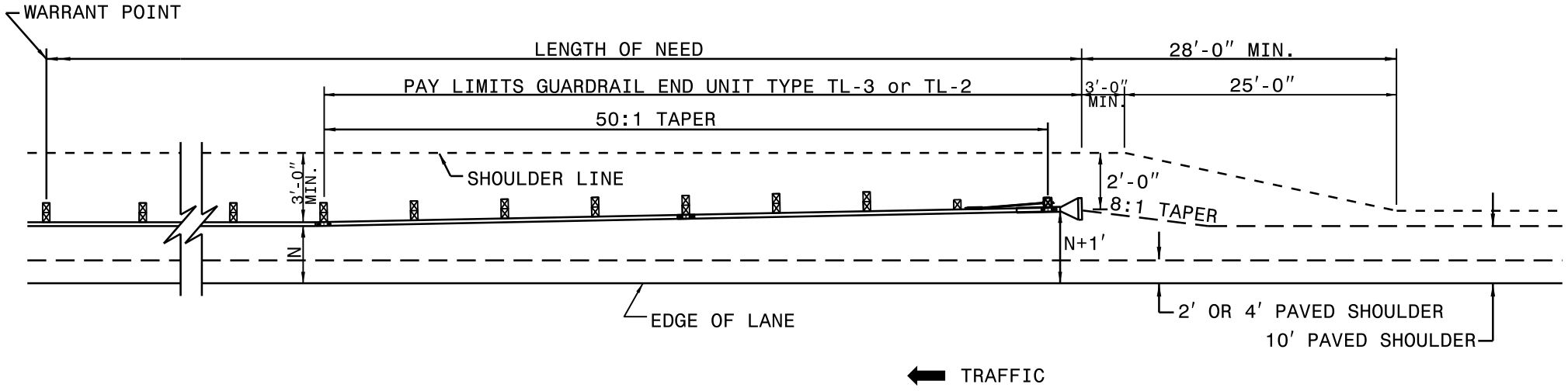


FILL SECTION



CUT SECTION

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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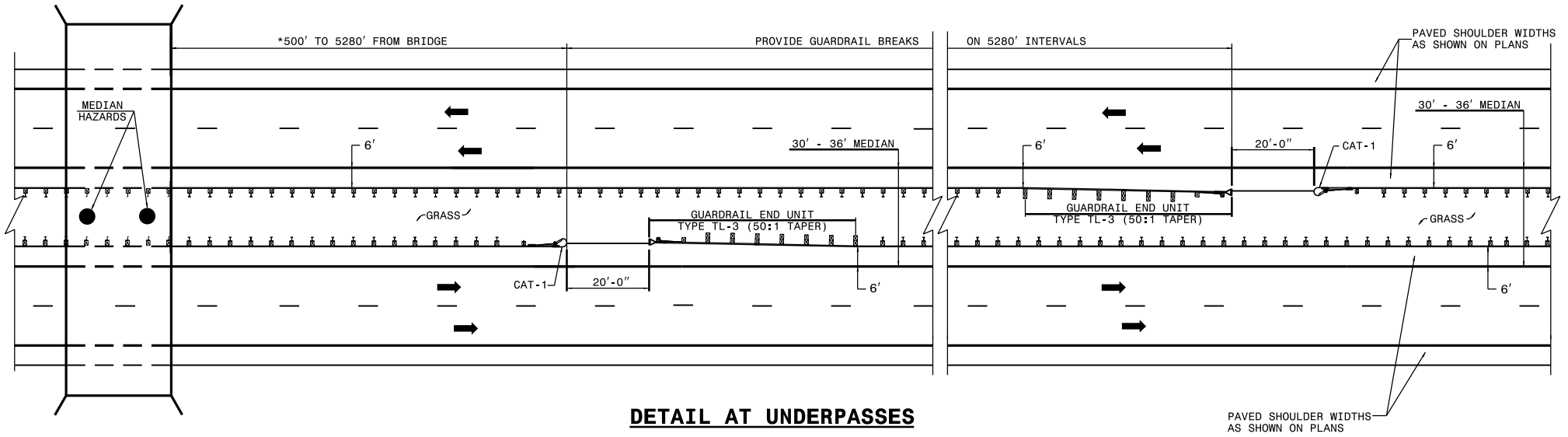
ROADWAY STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

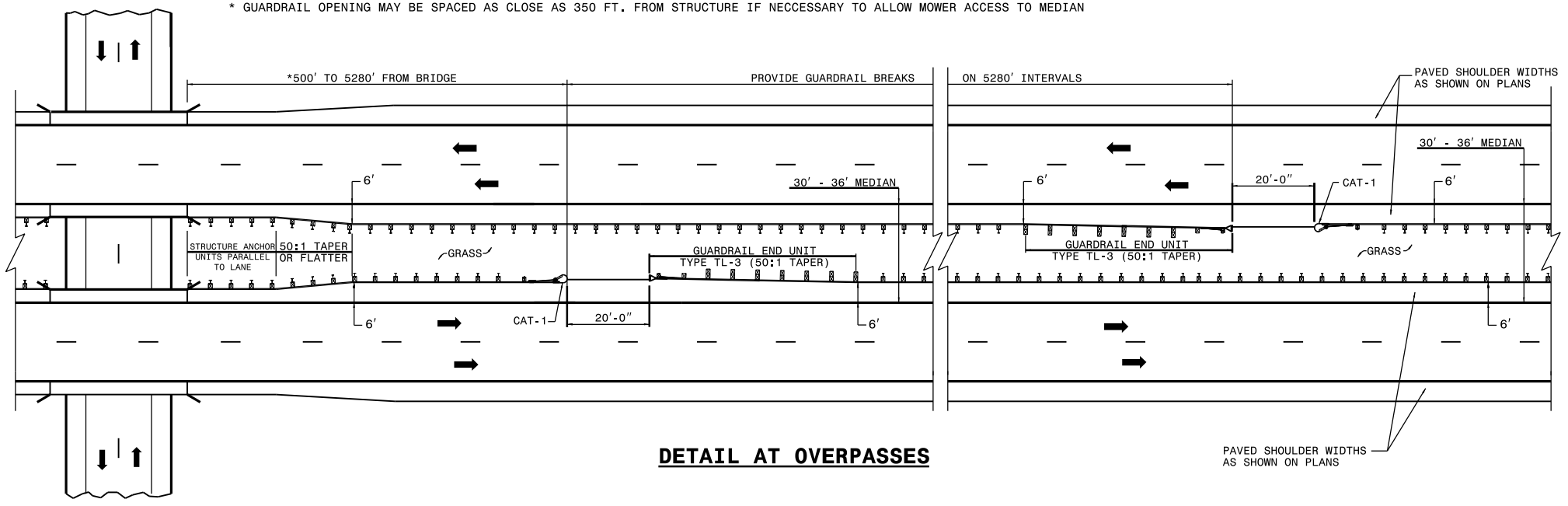
SHEET 6 OF 11

862.01



DETAIL AT UNDERPASSES

* GUARDRAIL OPENING MAY BE SPACED AS CLOSE AS 350 FT. FROM STRUCTURE IF NECCESSARY TO ALLOW MOWER ACCESS TO MEDIAN



DETAIL AT OVERPASSES

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

GUARDRAIL BREAK INTERVALS WITH 30′ - 36′ MEDIANS

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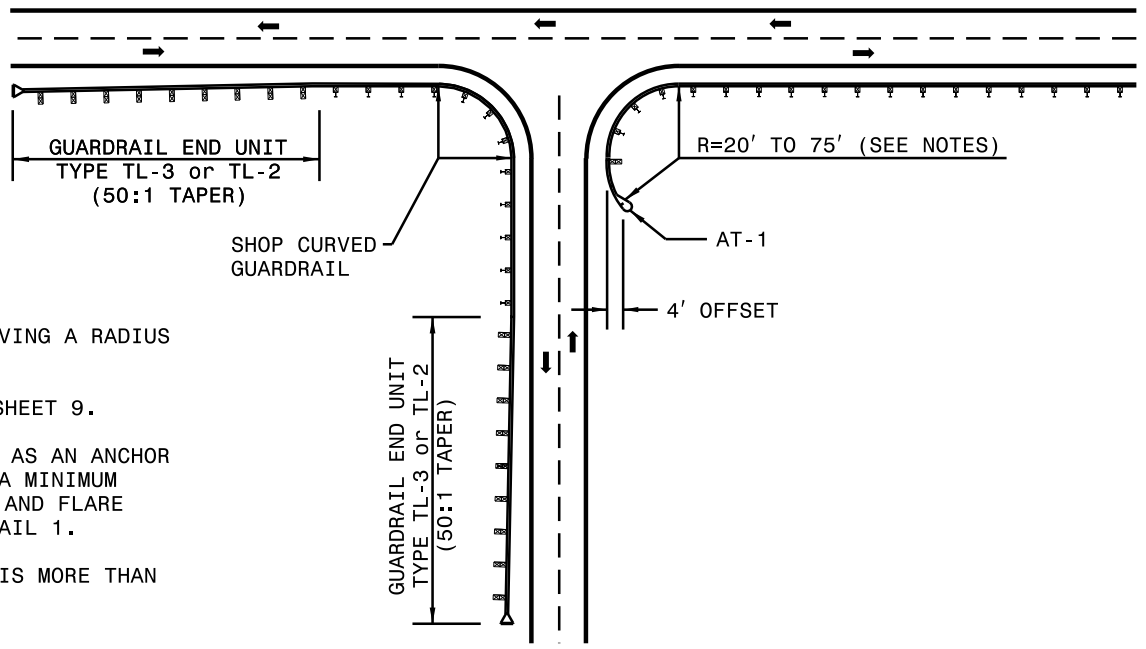
ROADWAY STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 7 OF 11

862.01



NOTES:

SHOP CURVED GUARDRAIL IS DEFINED AS HAVING A RADIUS OF 150′ OR LESS.

WHEN RADIUS IS LESS THAN 20′ REFER TO SHEET 9.

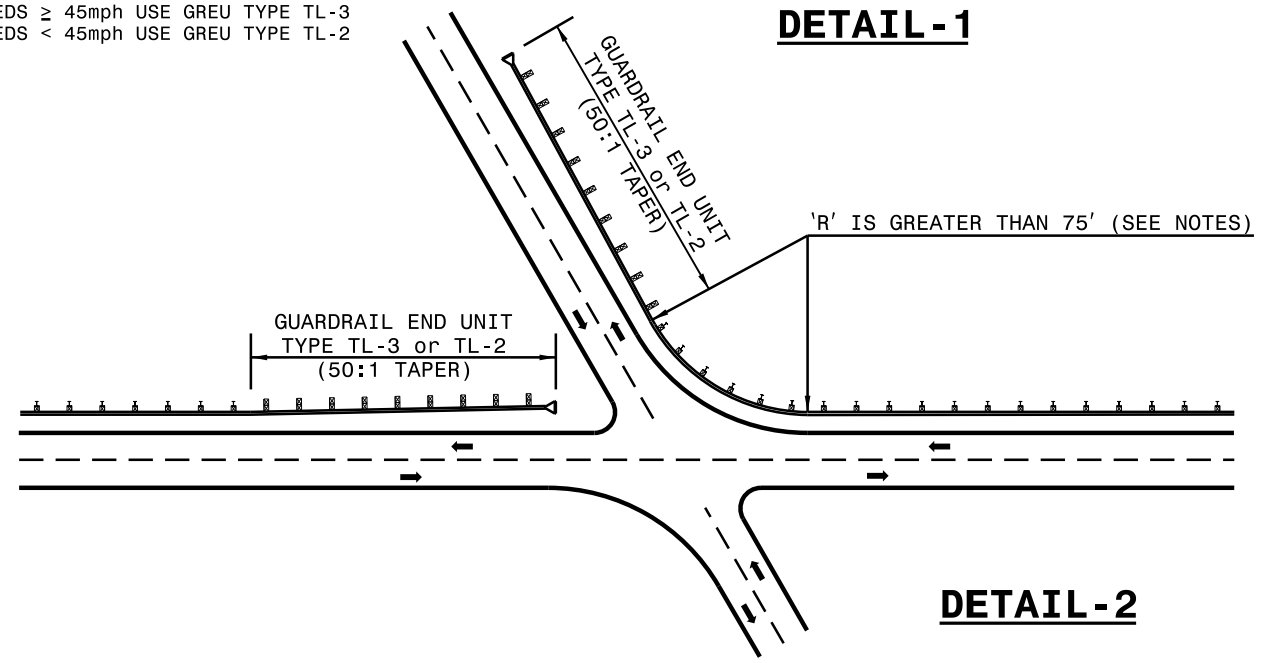
WHENEVER SHOP CURVED GUARDRAIL IS USED AS AN ANCHOR AND THE RADIUS IS FROM 20′ TO 75′, USE A MINIMUM LENGTH OF 50′ OF SHOP CURVED GUARDRAIL AND FLARE WITH AN AT-1 ANCHOR UNIT. REFER TO DETAIL 1.

WHENEVER SHOP CURVED GUARDRAIL RADIUS IS MORE THAN 75′, REFER TO DETAIL 2.

MAINTAIN CLEAR SIGHT DISTANCE.

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL-1



DETAIL-2

GUARDRAIL TREATMENT AT INTERSECTIONS

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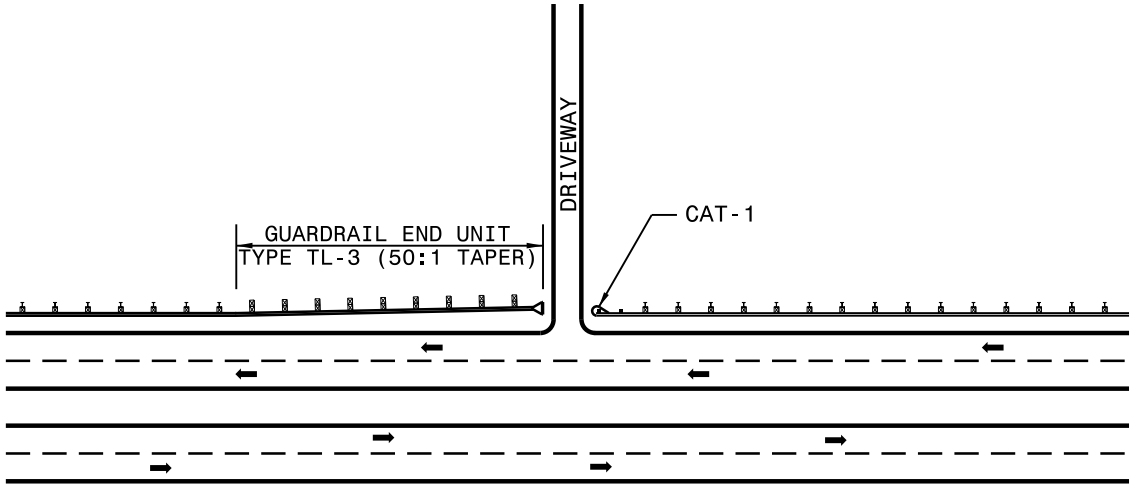
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 8 OF 11

862.01



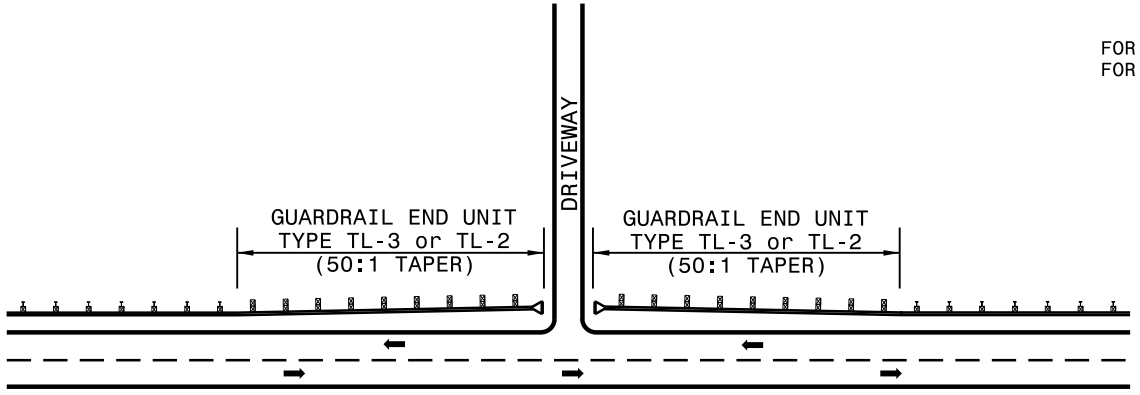
DETAIL-3

DIVIDED HIGHWAY

NOTE: USE DETAIL 3 & 4 WHENEVER 20′ OR LARGER RADIUS CANNOT BE UTILIZED.

MAINTAIN CLEAR SIGHT DISTANCE.

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2



DETAIL-4

UNDIVIDED HIGHWAY

GUARDRAIL TREATMENT AT DRIVEWAYS

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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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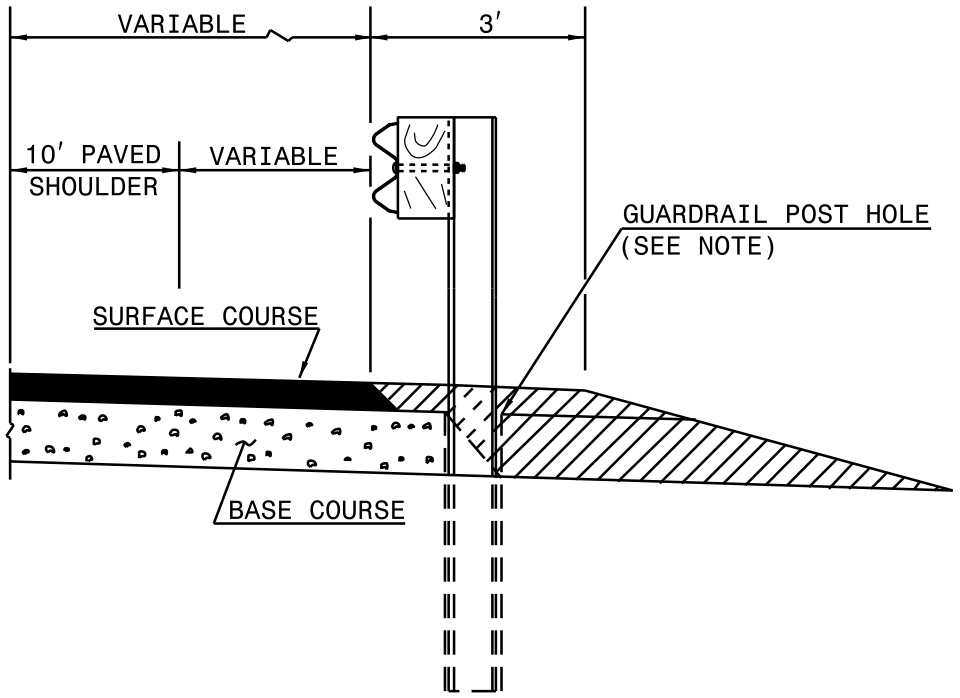
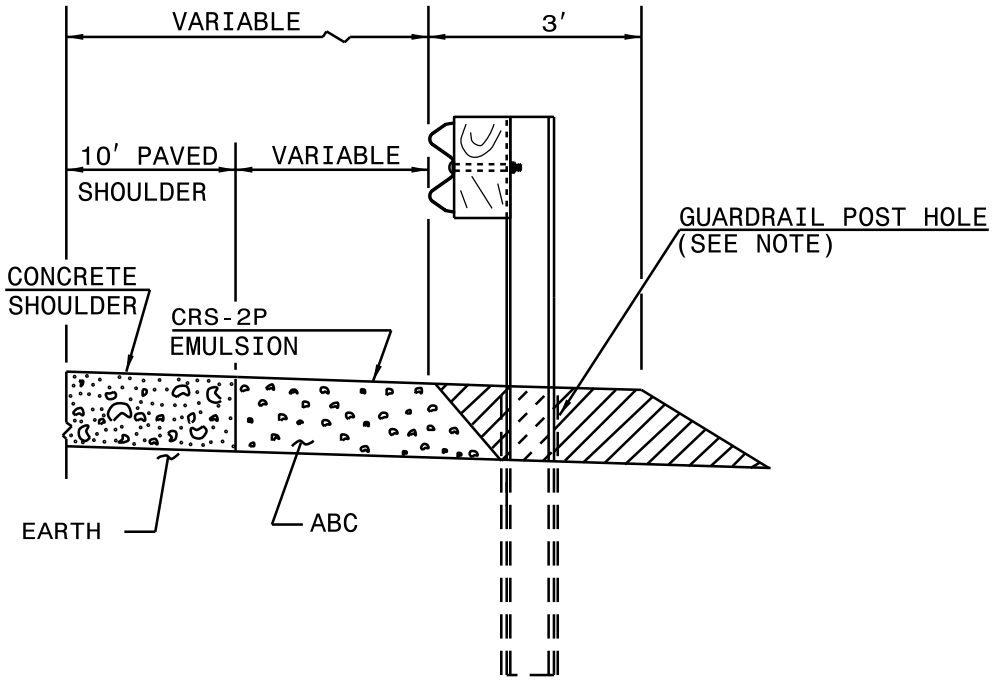
ROADWAY STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 9 OF 11

862.01



FLEXIBLE PAVED SHOULDER



CONCRETE PAVED SHOULDER

EARTH MATERIAL

NOTE:
WHEN WOODEN GUARDRAIL POSTS ARE USED, DRILL HOLES THROUGH EARTH MATERIAL AND BASE COURSE.THE POST MAY THEN BE DRIVEN TO THE PROPER DEPTH. DRILL THE HOLE OF SUFFICIENT SIZE TO ACCOMMODATE THE PARTICULAR POST BEING USED. BACKFILL AND TAMP HOLES USING THE EXCAVATED MATERIAL.

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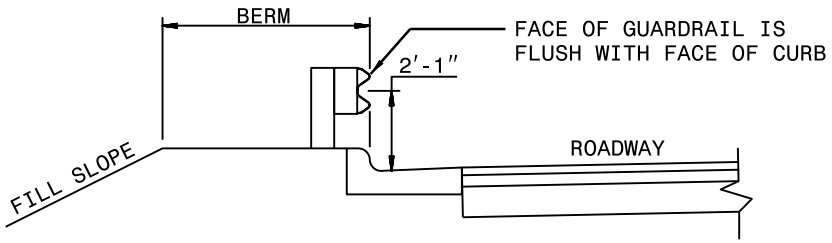
ROADWAY STANDARD DRAWING FOR

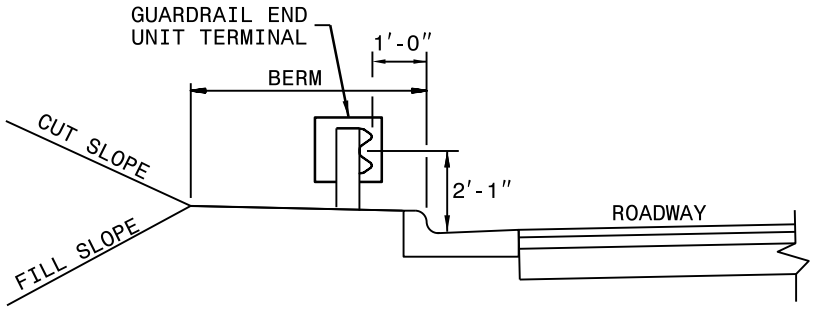
GUARDRAIL PLACEMENT

SHEET 10 OF 11

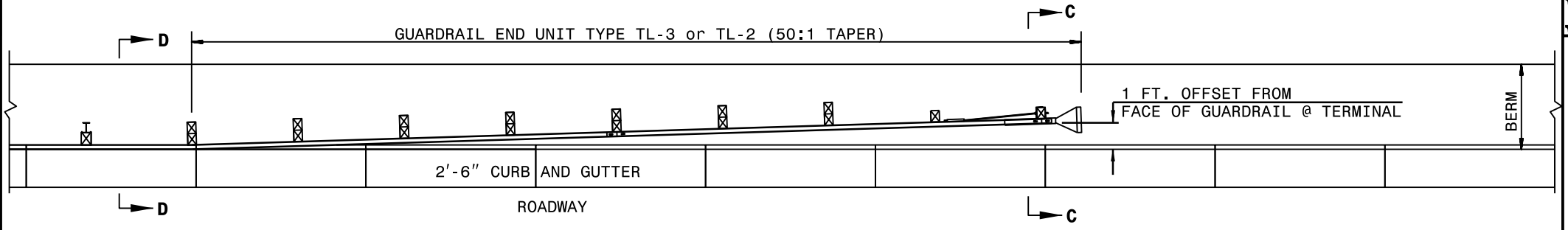
862.01



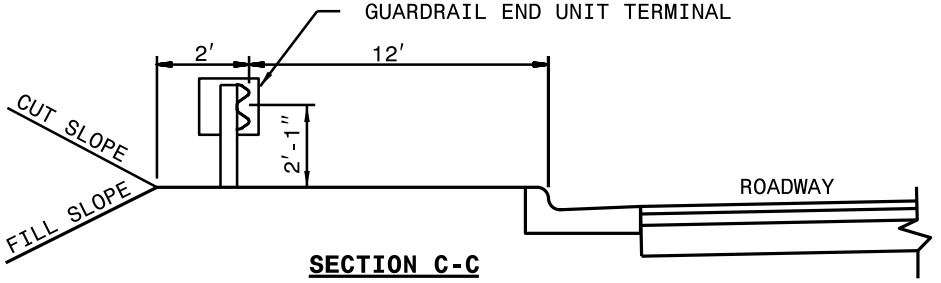
SECTION D-D



SECTION C-C

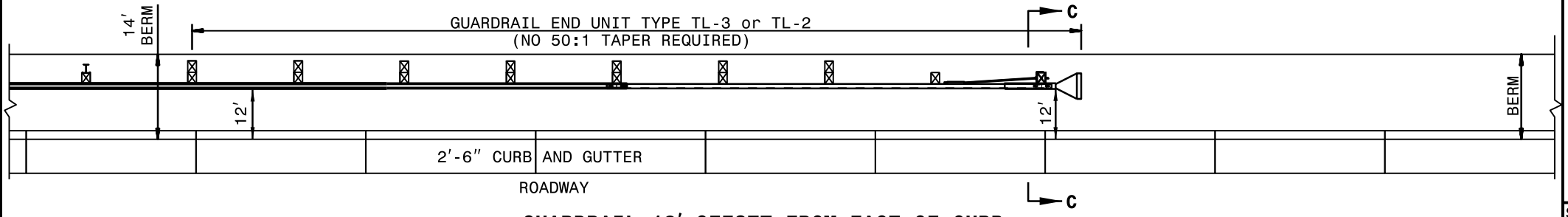


GUARDRAIL AT FACE OF CURB



SECTION C-C

FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2



GUARDRAIL 12′ OFFSET FROM FACE OF CURB

STATE OF
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RALEIGH, N.C.

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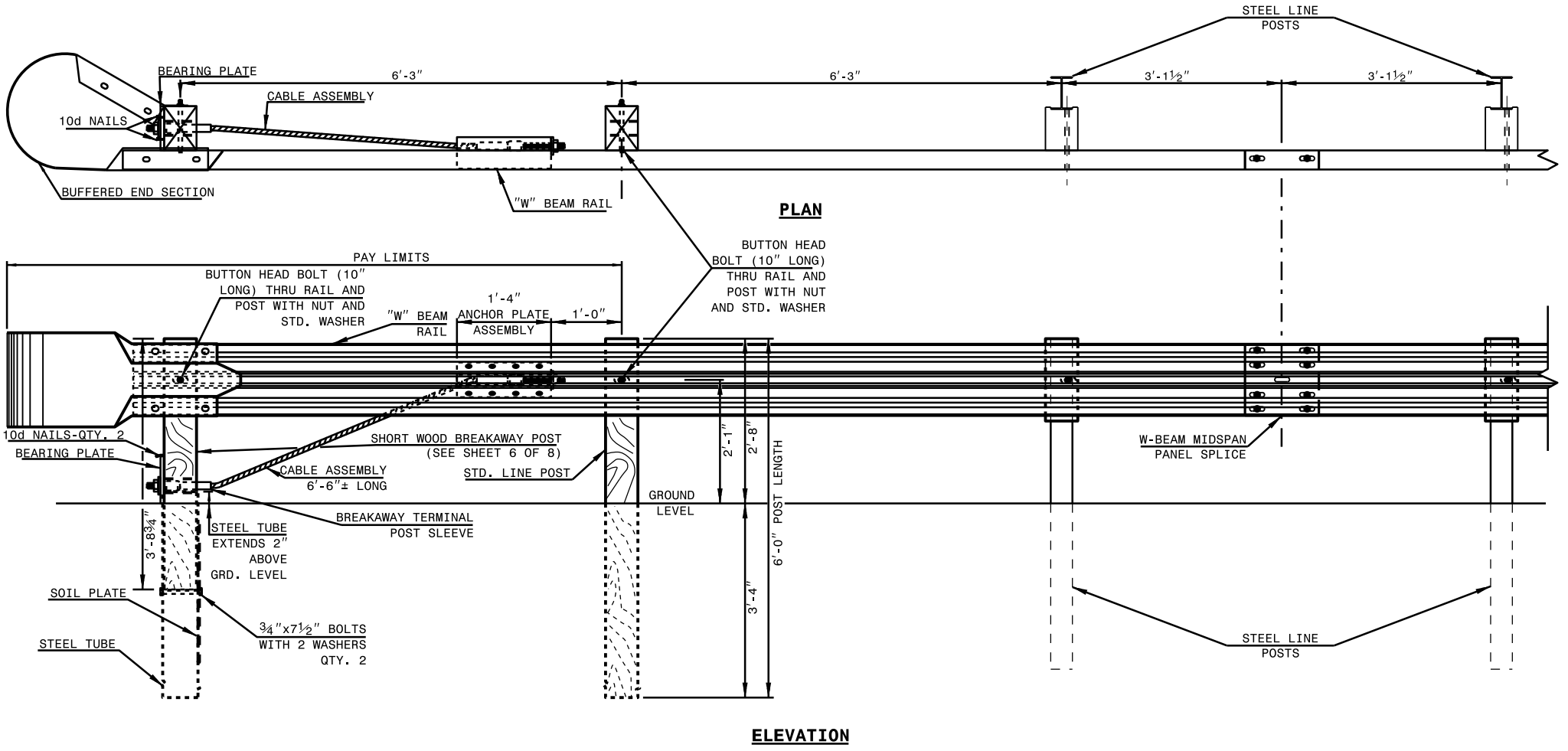
ROADWAY STANDARD DRAWING FOR

GUARDRAIL PLACEMENT

GUARDRAIL TREATMENT AT CURB AND GUTTER

SHEET 11 OF 11

862.01



TRAILING END UNIT ASSEMBLY

C.A.T.-1 SYSTEM

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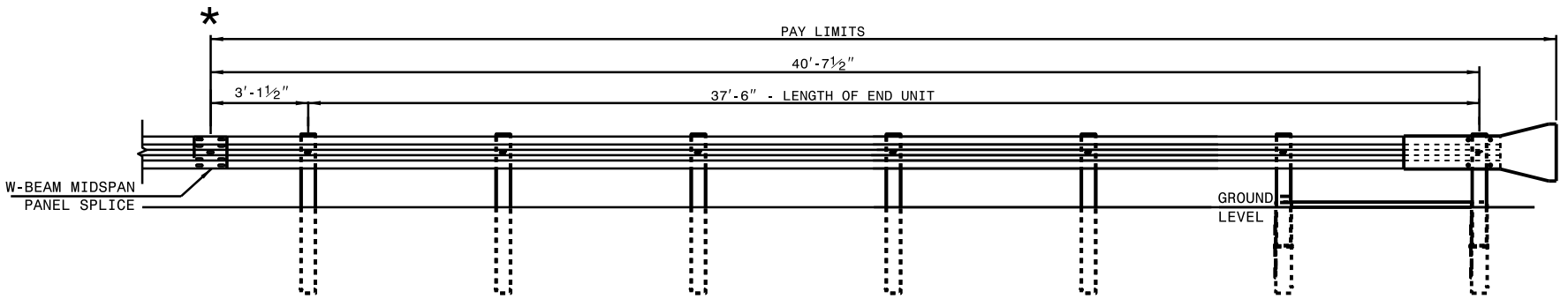
ROADWAY STANDARD DRAWING FOR

GUARDRAIL INSTALLATION

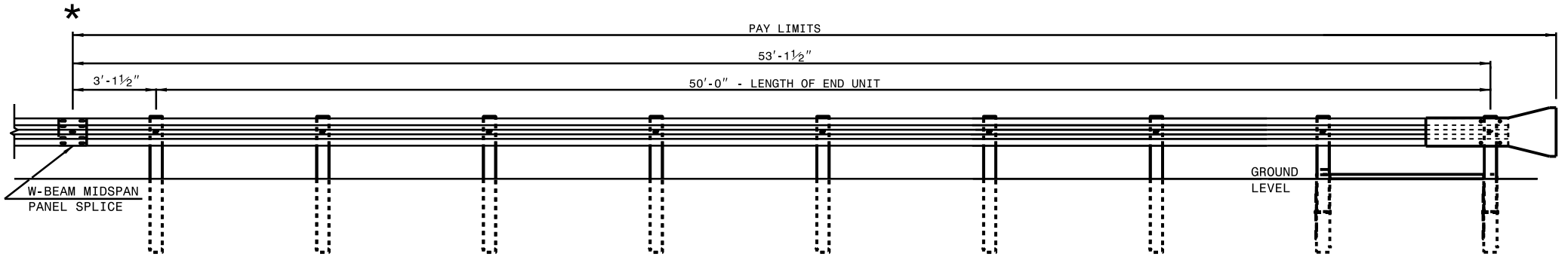
SHEET 1 OF 8

862.02



FLARED
ELEVATION VIEW

*** WHEN INSTALLING GUARDRAIL END UNITS THAT ARE 2′-1″ MOUNTING HEIGHT TO EXISTING GUARDRAIL, REMOVE THE EXISTING GUARDRAIL TO TRANSITION FROM THE EXISTING HEIGHT TO THE PROPOSED 2′-1″ HEIGHT. SEE 862.02, SHEET 4 OF 8 FOR TRANSITION DETAILS.**



TANGENT
ELEVATION VIEW

APPROACH END UNITS

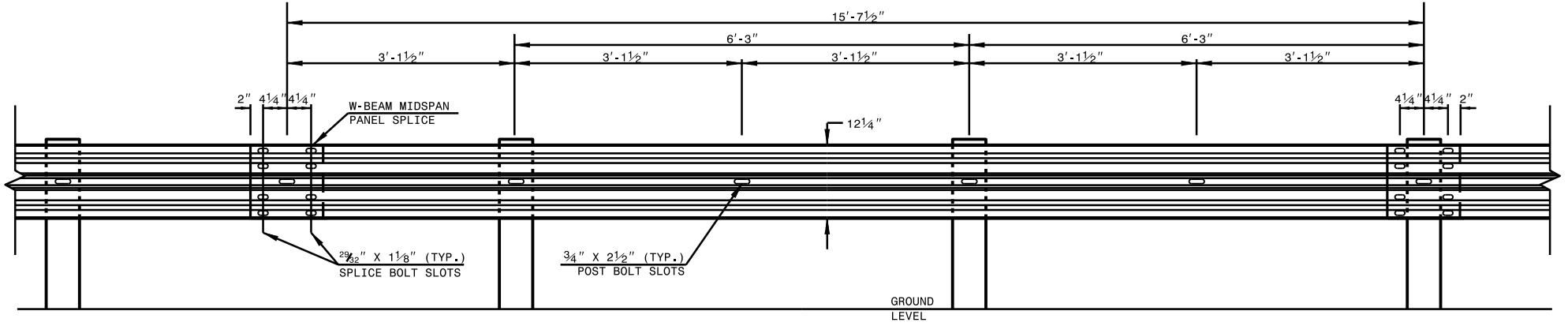
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 2 OF 8

862.02



15′-7½″ W-BEAM GUARDRAIL PANEL

NOTE: USE 5-SPACE 15′-7½″ W-BEAM GUARDRAIL PANEL AT THE DOWNSTREAM END OF AN END UNIT OR EXISTING GUARDRAIL THAT DOES NOT OFFSET THE W-BEAM PANEL SPLICE TO MIDSPAN

1-18

STATE OF
NORTH CAROLINA
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RALEIGH, N.C.

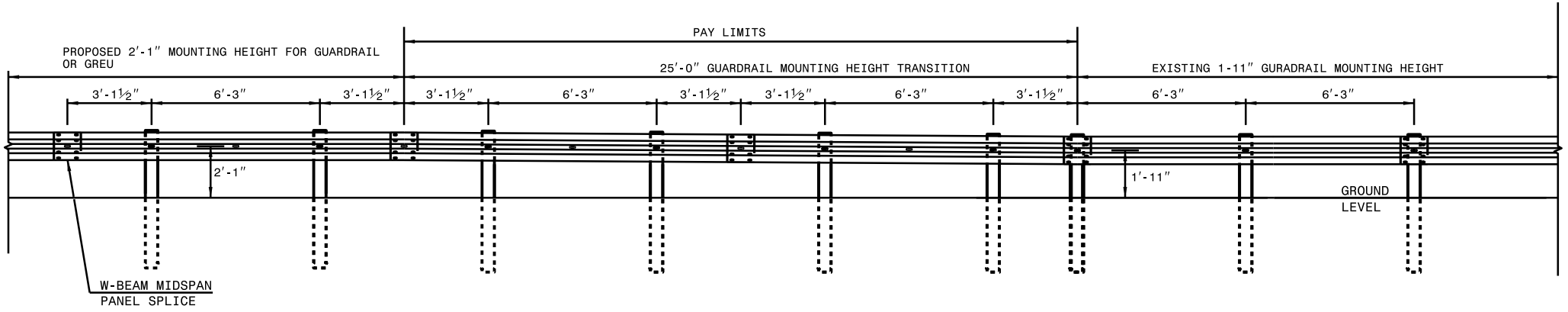
ROADWAY STANDARD DRAWING FOR

GUARDRAIL INSTALLATION

SHEET 3 OF 8

862.02

NOTE: IF EXISTING GUARDRAIL IS LOWER THAN 1′-11″, USE AN ADDITIONAL 12′-6″ LONG SECTION OF GUARDRAIL, FOR EVERY 1″ OF HEIGHT DIFFERENCE, TO TRANSITION FROM EXISTING GUARDRAIL TO PROPOSED 2′-1″ GUARDRAIL.



ELEVATION VIEW

TRANSITION FROM OR 1′-11″ TO 2′-1″ W-BEAM GUARDRAIL MOUNTING HEIGHT

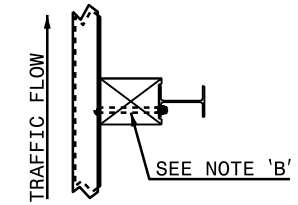
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
GUARDRAIL INSTALLATION

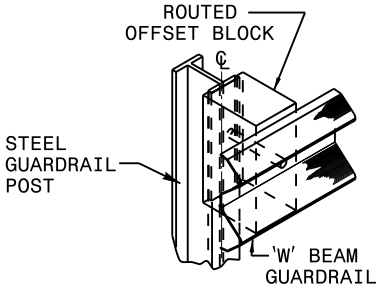
SHEET 4 OF 8

862.02

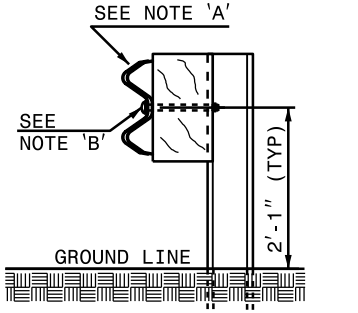


'W6' STEEL POST WITH
ROUTED OFFSET BLOCK

PLAN

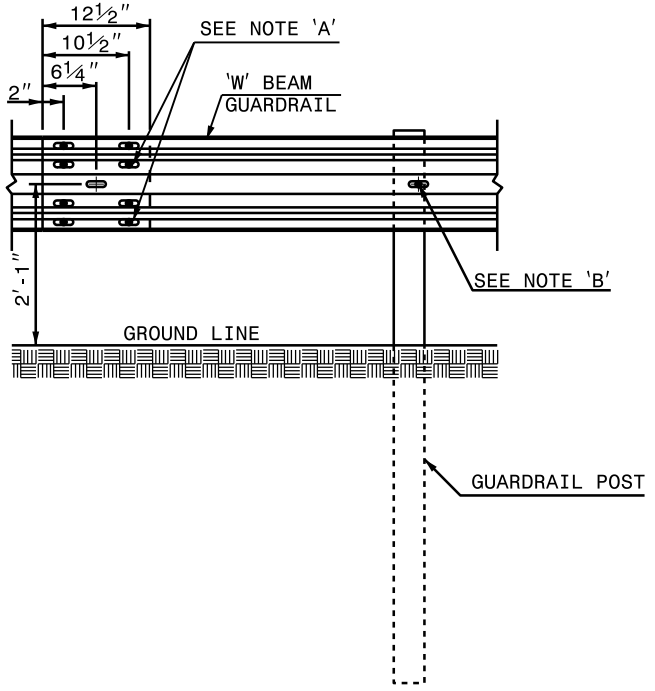


ISOMETRIC VIEW



'W6' STEEL POST WITH
ROUTED OFFSET BLOCK

SIDE



FRONT - MID SPAN SPLICE

NOTES:
A - ⅝" DIA. BUTTON HEAD SPLICE BOLT 1¼" LONG (8 REQ. PER SPLICE JOINT).
B - ⅝" DIA. BUTTON HEAD BOLT 7½"/9" LONG WITH NUT FOR BOLTING 6"/8" ROUTED OFFSET BLOCK TO STEEL POSTS.
C - FIELD PUNCHING OF HOLES INTO GUARDRAIL AS DIRECTED BY THE ENGINEER.

TYPICAL GUARDRAIL AND GUARDRAIL POST ALTERNATIVES

STATE OF
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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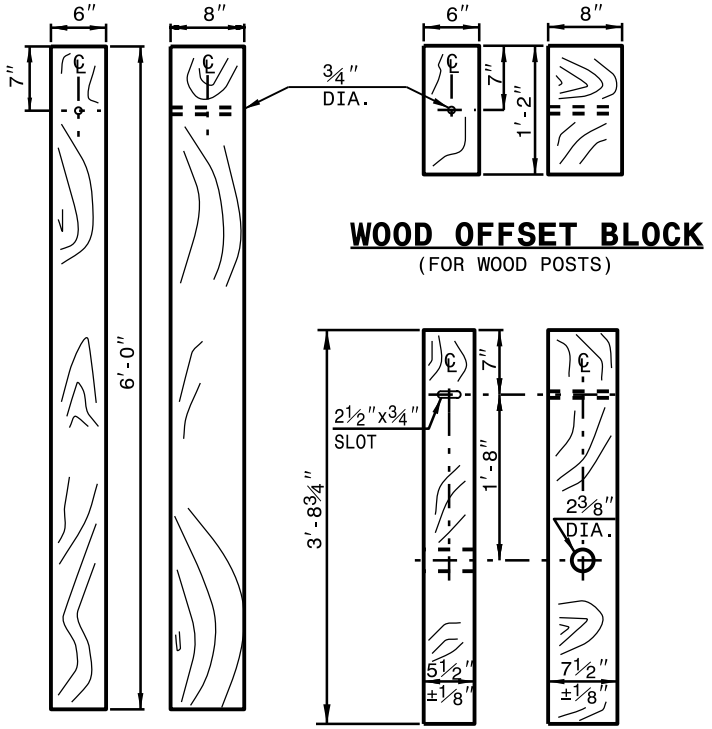
ROADWAY STANDARD DRAWING FOR

GUARDRAIL INSTALLATION

SHEET 5 OF 8

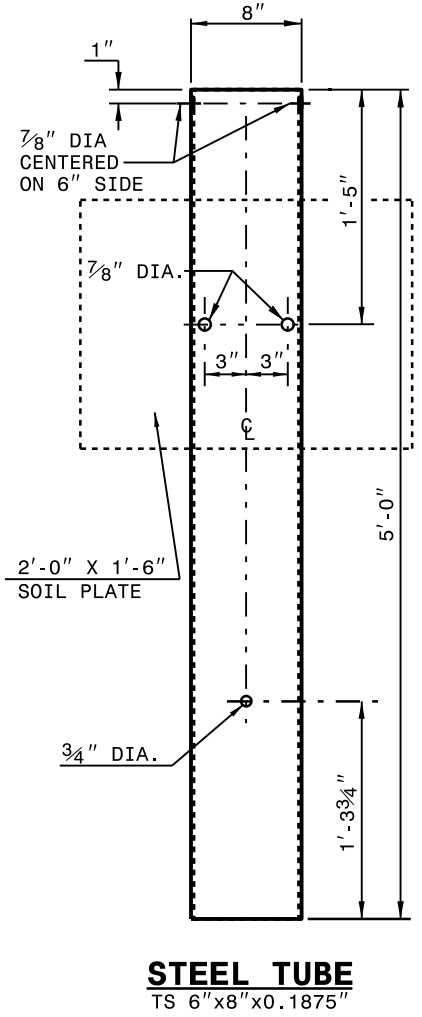
862.02



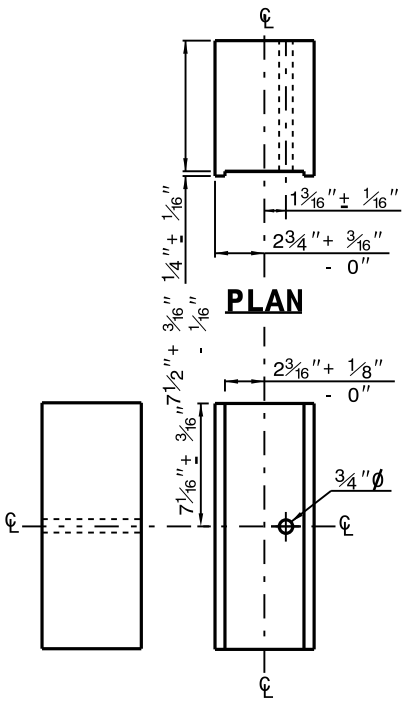
WOOD OFFSET BLOCK
(FOR WOOD POSTS)

STANDARD LINE POST

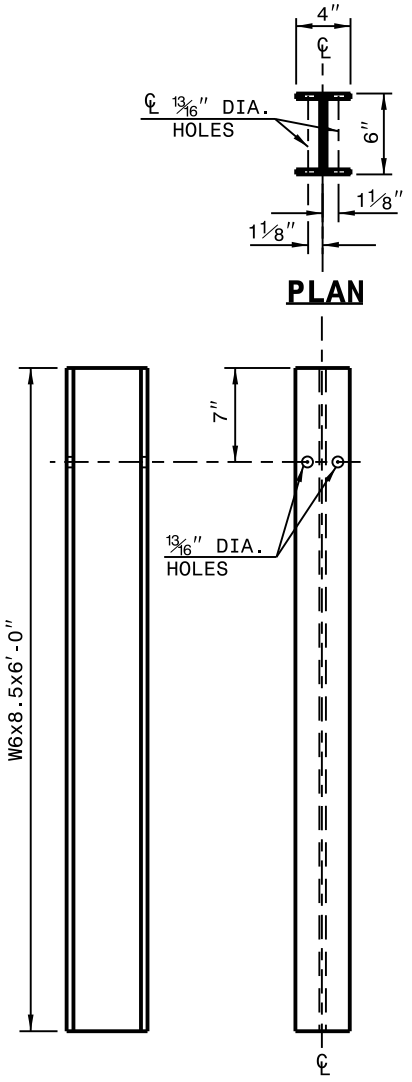
SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"



ROUTED OFFSET BLOCK



"W6" STEEL POST

SYSTEM PARTS

STATE OF
NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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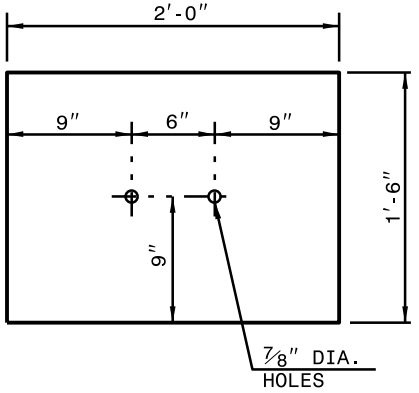
ROADWAY STANDARD DRAWING FOR
GUARDRAIL INSTALLATION

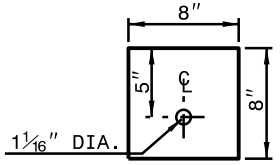
SHEET 6 OF 8

862.02



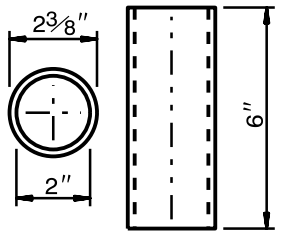
SOIL PLATE

1/4" THICK PLATE

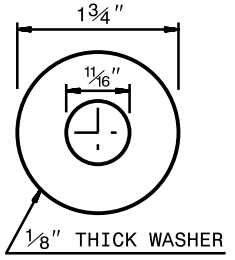


BEARING PLATE

5/8" THICK PLATE

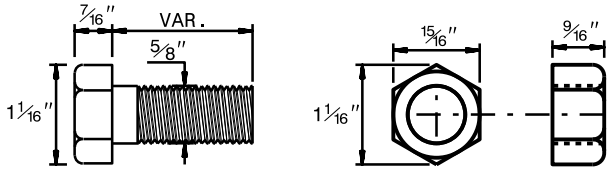


BREAKAWAY TERMINAL POST SLEEVE

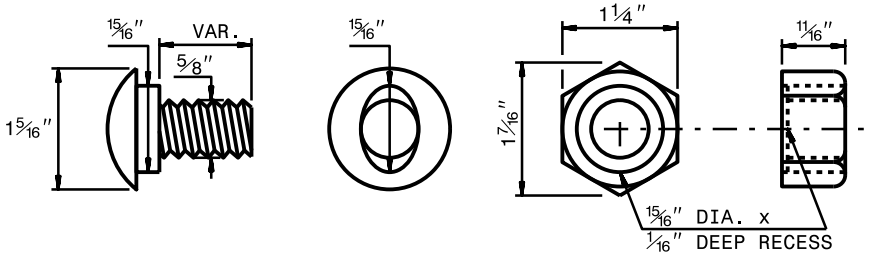


DETAIL OF STANDARD WASHER

STANDARD WASHER: TYPICAL USE UNDER NUT WITH WOOD POST

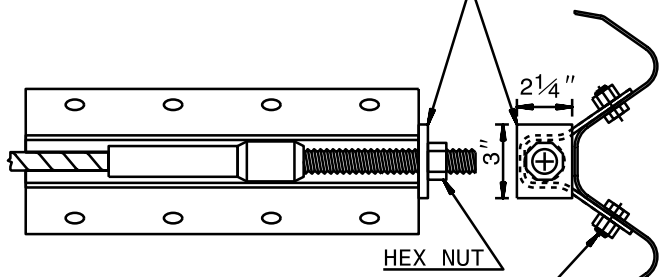


DETAIL OF STANDARD HEX BOLT AND NUT

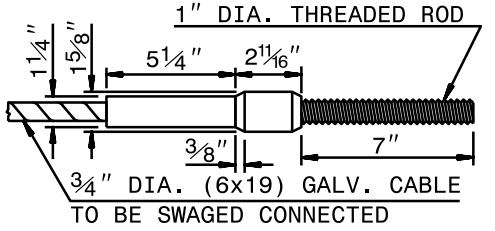


DETAIL OF BUTTON HEAD BOLT AND NUT

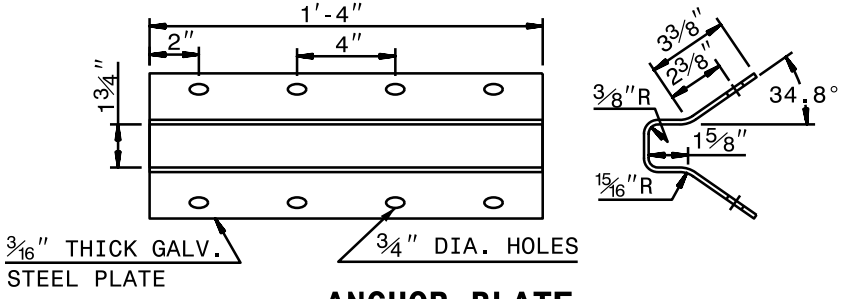
3/8" THICK END PLATE
WITH 1 1/16" DIA. HOLE
CENTERED IN PLATE.
END PLATE TO BE WELDED
TO ANCHOR PLATE.



ANCHOR PLATE ASSEMBLY



SWAGED CABLE



ANCHOR PLATE

CABLE ASSEMBLY

SYSTEM PARTS

STATE OF
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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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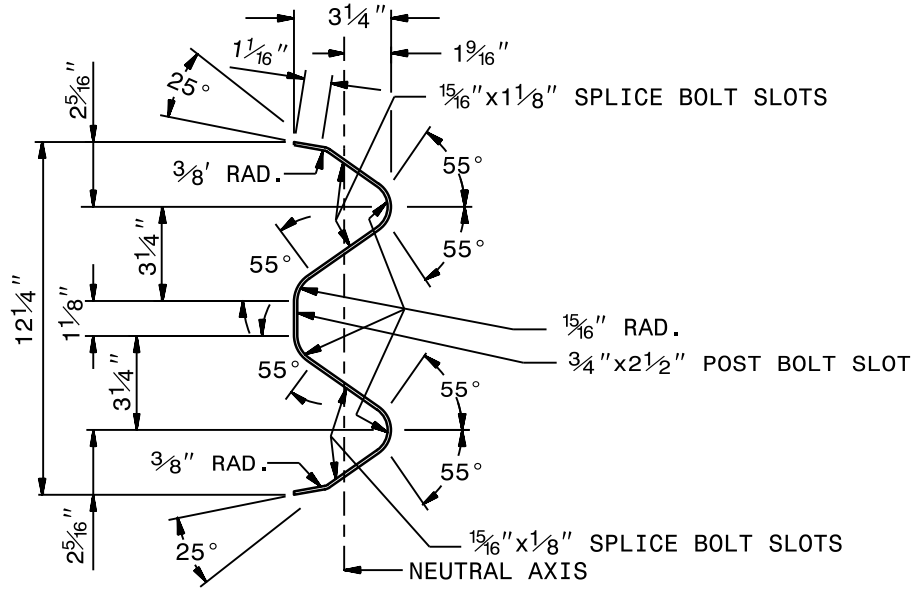
ROADWAY STANDARD DRAWING FOR

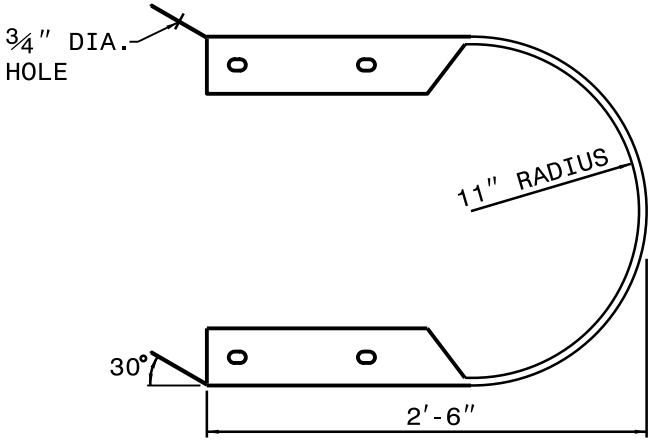
GUARDRAIL INSTALLATION

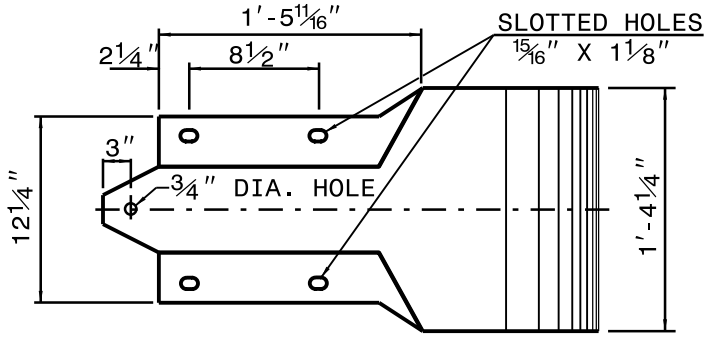
SHEET 7 OF 8

862.02

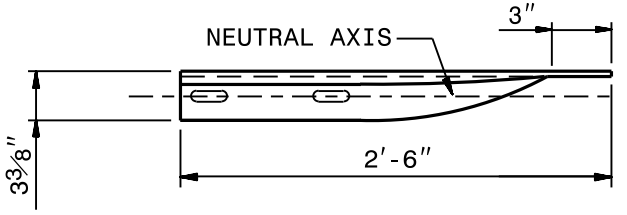


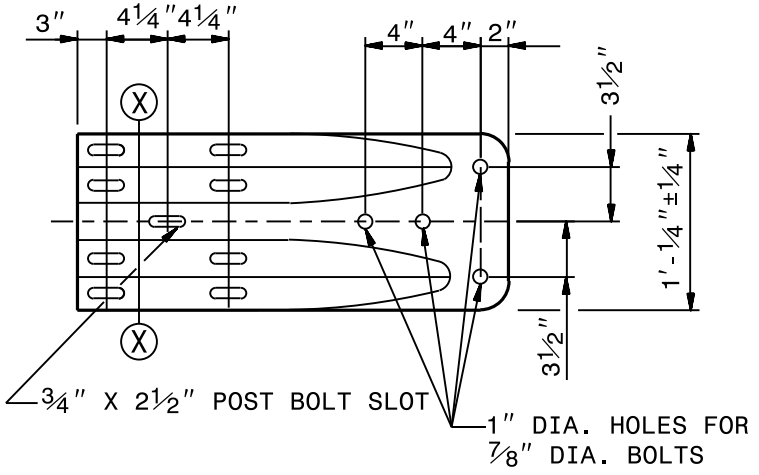
SECTION X-X





BUFFERED END SECTION





TYPICAL END SHOE

SYSTEM PARTS - GENERAL USE

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

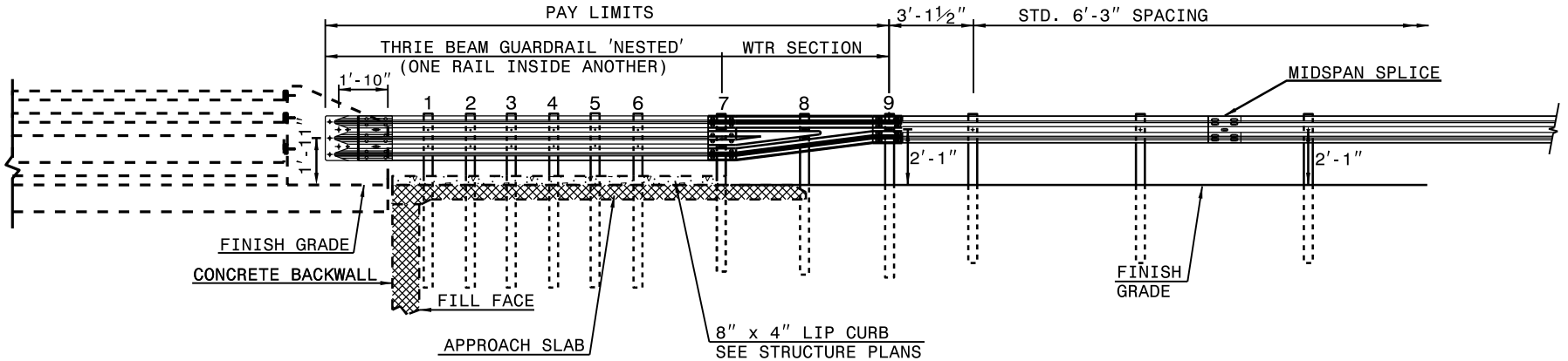
1-18

ROADWAY STANDARD DRAWING FOR

GUARDRAIL INSTALLATION

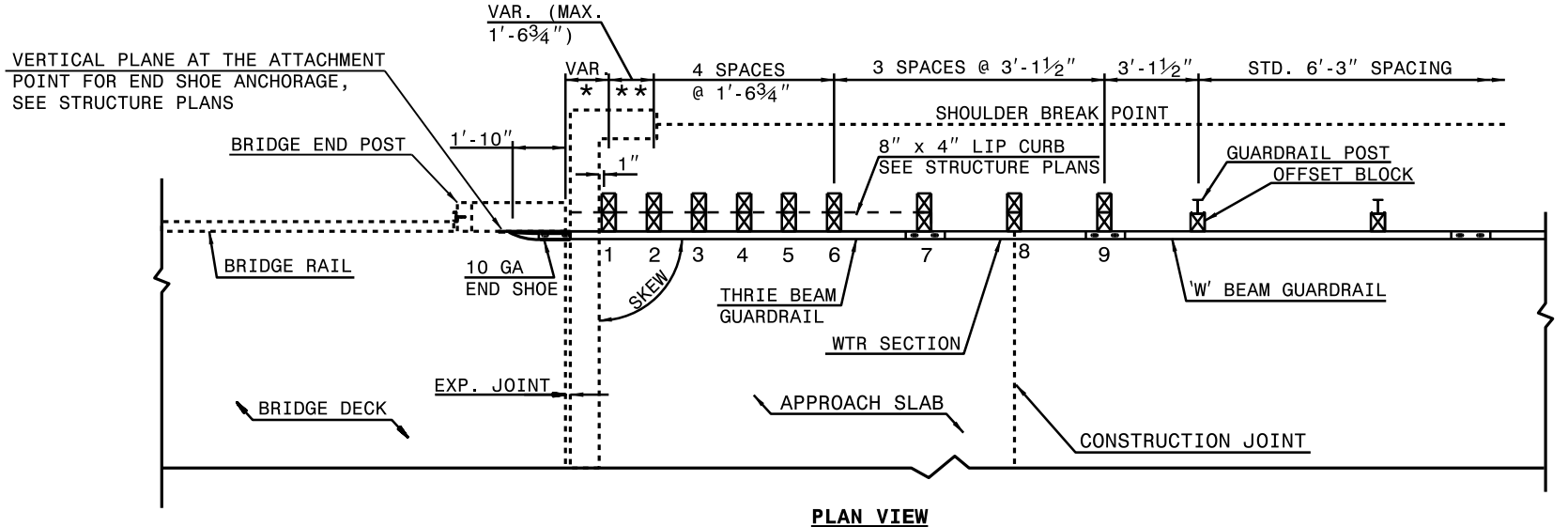
SHEET 8 OF 8

862.02



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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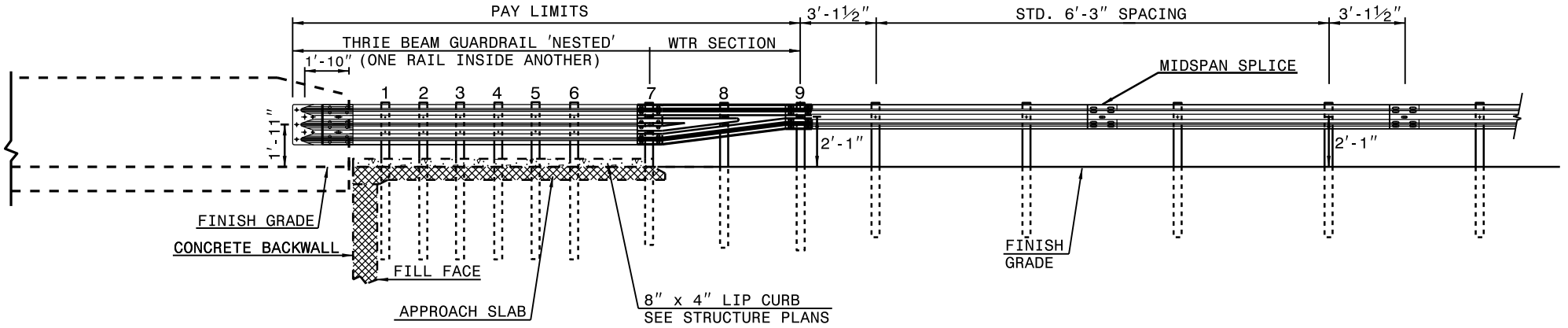
ROADWAY STANDARD DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III
FOR ATTACHMENT TO RAIL ON BRIDGE

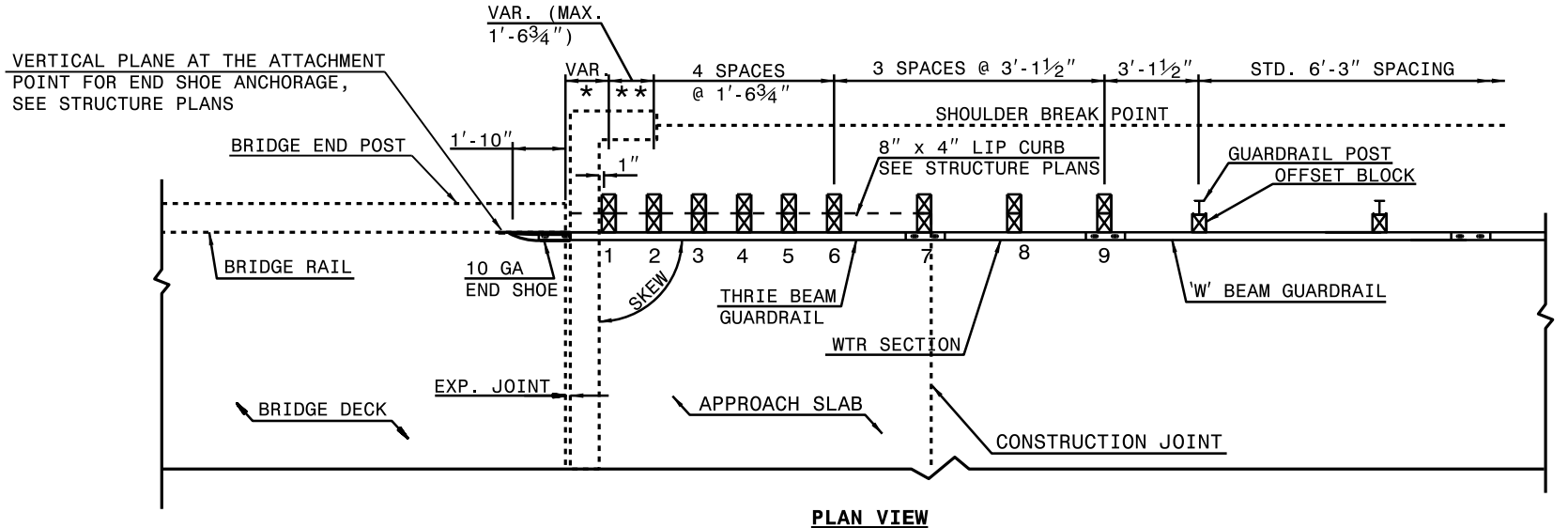
SHEET 1 OF 7

862.03



ELEVATION

NOTE:
**POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
-SHOULDER BERM GUTTER MUST BE INSTALLED TO THE LIMITS 8" x 4" LIP CURB IS SHOWN IF ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.
-MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
-LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
-SEE SHEET 5 FOR POST SECTIONS 1 THRU 9.



PLAN VIEW

GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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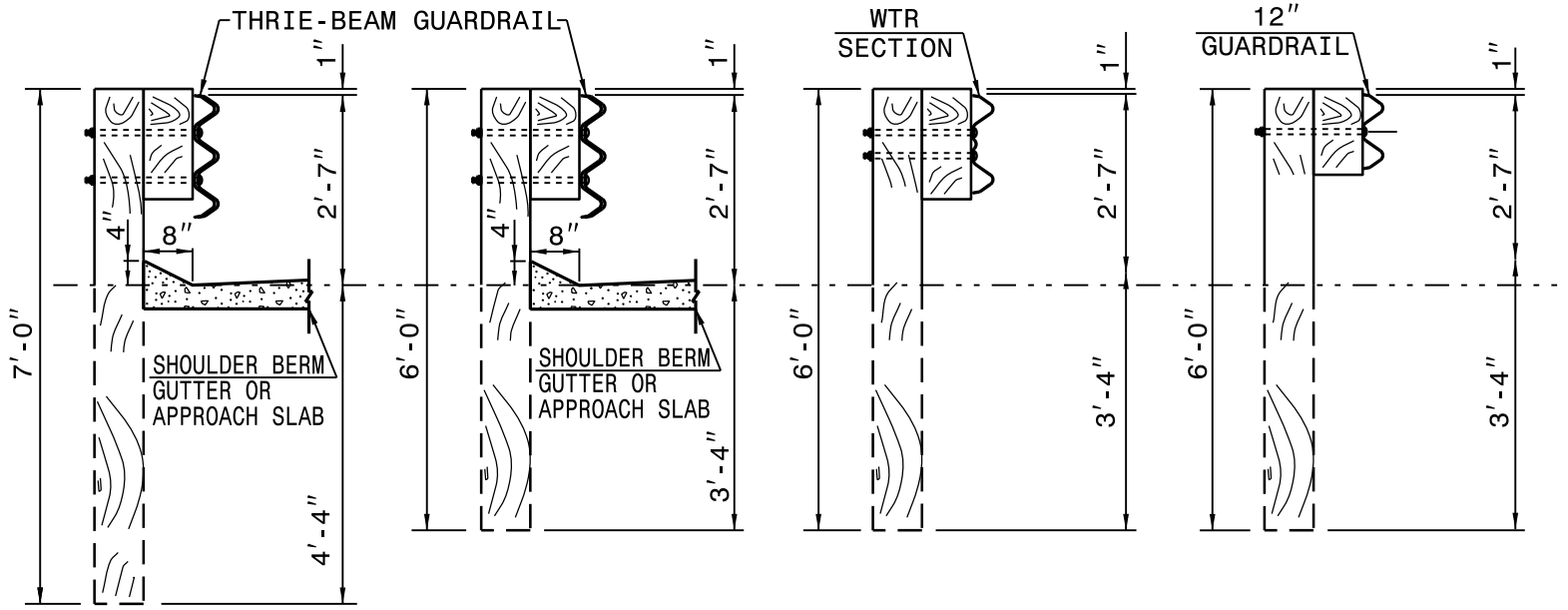
ROADWAY STANDARD DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7

862.03

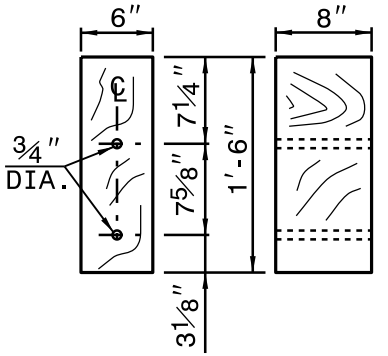


SECTION OF THRIE BEAM POSTS 1 THRU 6

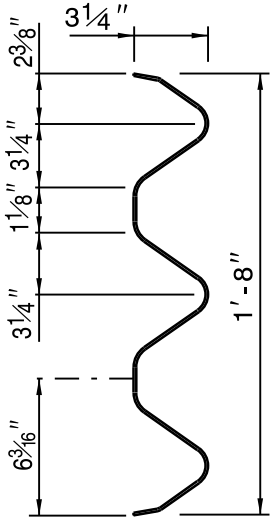
SECTION OF THRIE BEAM POST 7

SECTION OF WTR BEAM POST 8

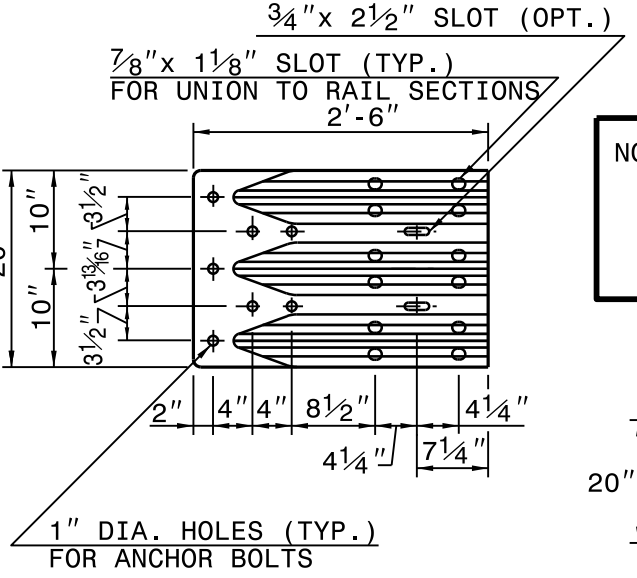
SECTION OF 'W' BEAM POST 9



THRIE BEAM OFFSET BLOCK

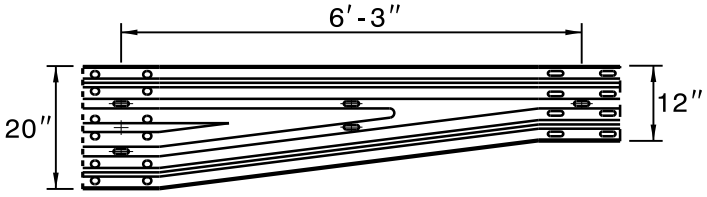


THRIE-BEAM SECTION

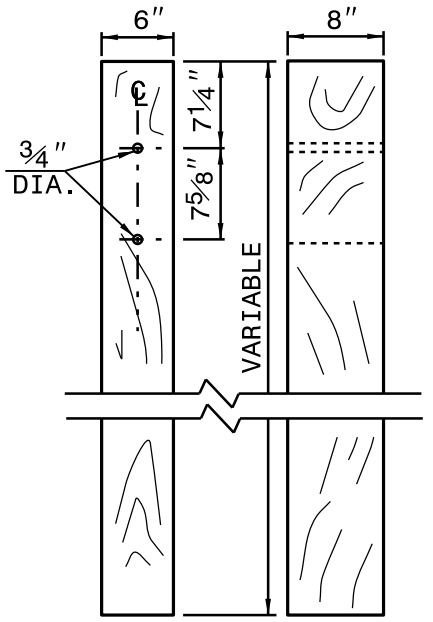


END SHOE

NOTE: THE MID POST AND OFFSET BLOCK OF THE WTR SECTION WILL REQUIRE SPECIAL BOLT HOLE DRILLING IN THE THRIE BEAM OFFSET BLOCK AND LINE POST.



WTR SECTION
ELEVATION VIEW



THRIE BEAM LINE POST

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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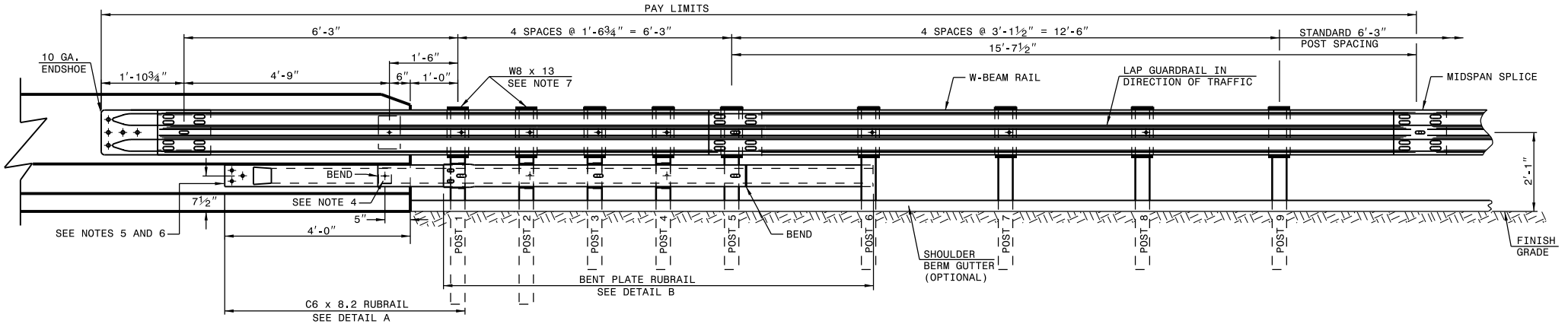
ROADWAY STANDARD DRAWING FOR

STRUCTURE ANCHOR UNITS

GUARDRAIL ANCHOR UNIT, TYPE III

SHEET 3 OF 7

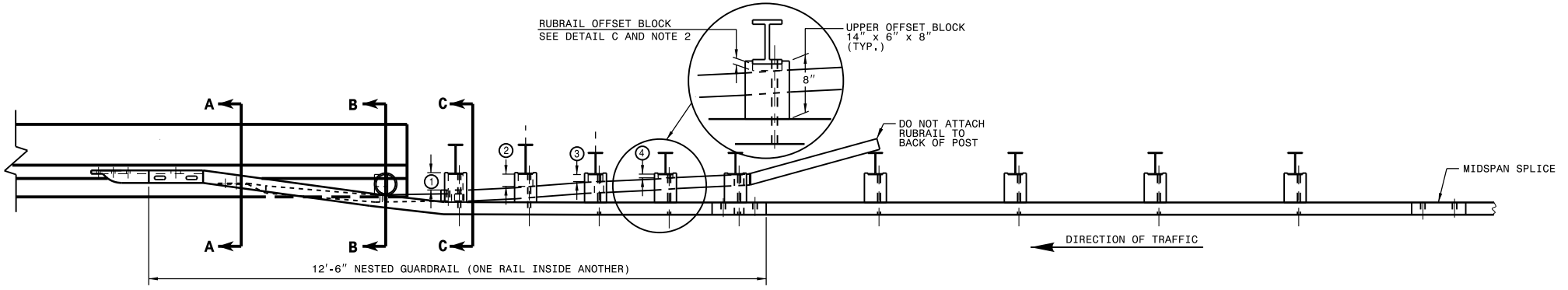
862.03



ELEVATION

GENERAL NOTES:

1) POSTS 1 THROUGH 5 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS AND/OR RUBRAIL.
2) RUBRAIL BLOCKOUTS LOCATED ON POSTS 1 THROUGH 4 ARE OFFSET DRILLED AND SECURED WITH $\frac{5}{8}$" BUTTONHEAD BOLTS (SEE CHART FOR BOLT LENGTHS). SECURE BLOCKS ONLY TO POSTS 2 AND 4. SECURE RUBRAIL AND BLOCKOUTS TO POSTS 1 AND 3. RUBRAIL IS SECURED TO POST 5 WITH A $\frac{5}{8}$" x 4½" BUTTONHEAD BOLT. RUBRAIL IS FLARED TO BACK OF POST 6 AND NOT SECURED.
3) STEEL SPACER TUBE IS A SCHEDULE 40 GALVANIZED PIPE 6" INSIDE DIAMETER x 9" LONG. ATTACH TUBE TO GUARDRAIL ONLY WITH $\frac{5}{8}$" x 1¼" LONG BUTTONHEAD BOLT AND RECTANGULAR PLATE WASHER.
4) SEE DETAIL D FOR SLOPED RUBRAIL BLOCKOUT. BLOCKOUT IS ATTACHED TO RAIL ELEMENT ONLY. USE $\frac{3}{8}$" x 3" LAG BOLT WITH FLAT WASHER.
5) SHOP FABRICATE THE C6 x 8.2 RUBRAIL END TO BE CONSISTENT WITH THE SLOPE OF THE F SHAPE AND ATTACH FLUSH WITH THE SLOPED TOE OF THE BARRIER OR BRIDGE RAIL.
6) ANCHORAGE:
   (a) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR RUBRAIL USING THREE $\frac{5}{8}$" x 6" CHEMICALLY ANCHORED BOLTS WITH WASHERS. MAXIMUM PROJECTION FOR BOLTS IS ½".
   (b) AT EXISTING BRIDGE RAIL AND NEW OR EXISTING BARRIERS, ANCHOR THE W-BEAM END SHOE USING A 4 BOLT HOLD DOWN PLATE (SEE STD. DWG. 862.04). A 4 BOLT INSERT ASSEMBLY IS ALLOWED ON PRECAST REINFORCED CONCRETE BARRIER (SEE STD. DWG. 857.01). INSTALL THE W-BEAM END SHOE BEHIND THE NESTED W-BEAM ELEMENTS.
   (c) AT NEW BRIDGE RAIL, ANCHOR THE W-BEAM END SHOE AND RUBRAIL AS DETAILED ON THE STRUCTURE PLANS.
7) POSTS 1 AND 2 ARE W8 x 13, 7'-6" LONG. ALL OTHER POSTS IN THE ANCHOR UNIT ARE W6 x 8.5.



PLAN

GUARDRAIL ANCHOR UNIT TYPE B-77

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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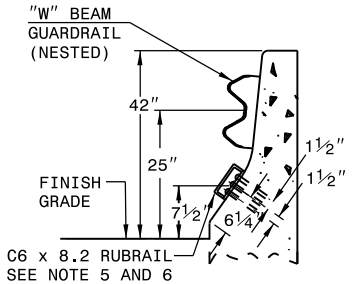
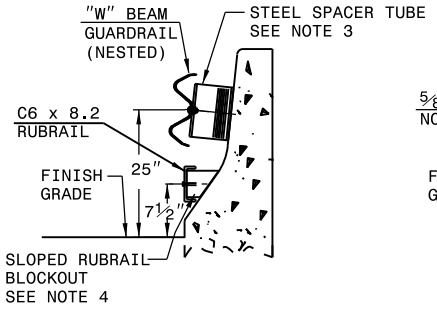
ROADWAY STANDARD DRAWING FOR
STRUCTURE ANCHOR UNIT
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 4 OF 7

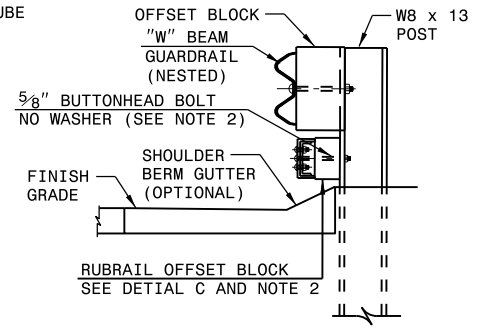
862.03



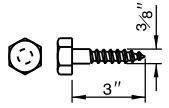
SECTION A-A



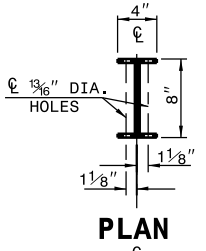
SECTION B-B



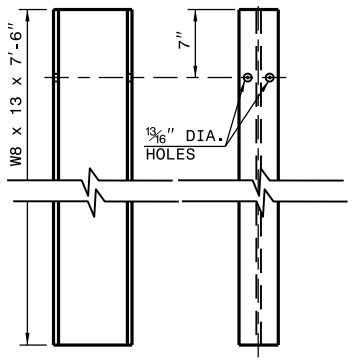
SECTION C-C



DETAIL E
LAG BOLT

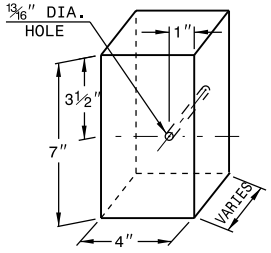


PLAN



SIDE FRONT

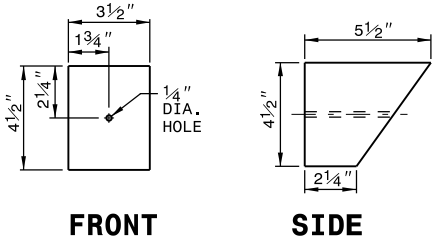
DETAIL F STEEL POST
"W8 X 13 X 7'-6"



DETAIL C
RUBRAIL BLOCKOUT

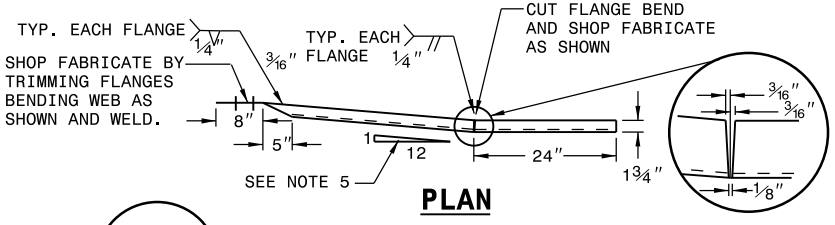
RUBRAIL BLOCKS 7" HIGH x 4" WIDE		
POST	THICKNESS	BOLT LENGTH
①	4¼"	9"
②	3¼"	5" *
③	2"	6"
④	1"	3" *

* BOLTS FOR POSTS 2 AND 4 ARE USED TO ATTACH BLOCK TO POST. RUBRAIL NOT ATTACHED TO BLOCK.

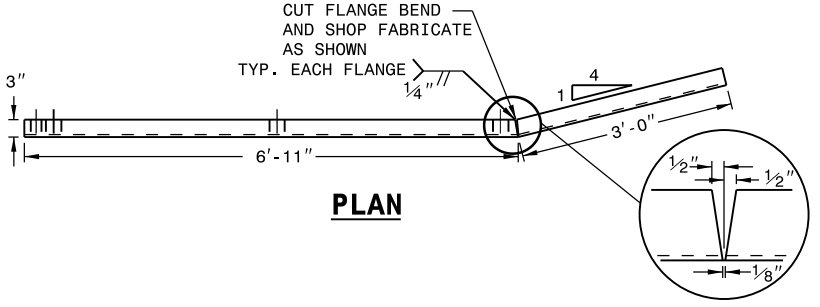


FRONT SIDE

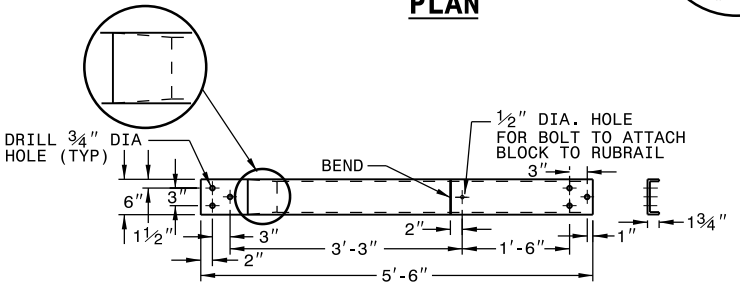
DETAIL D
SLOPED RUBRAIL BLOCKOUT



PLAN

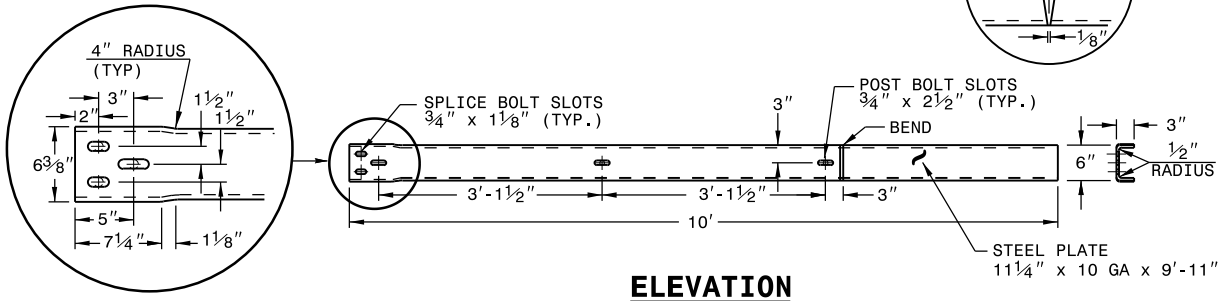


PLAN



ELEVATION

DETAIL A
C6 x 8.2 RUBRAIL



ELEVATION

DETAIL B
BENT PLATE RUBRAIL

GUARDRAIL ANCHOR UNIT TYPE B-77

STATE OF
NORTH CAROLINA
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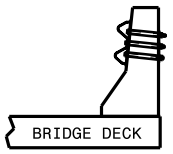
ROADWAY STANDARD DRAWING FOR

STRUCTURE ANCHOR UNIT

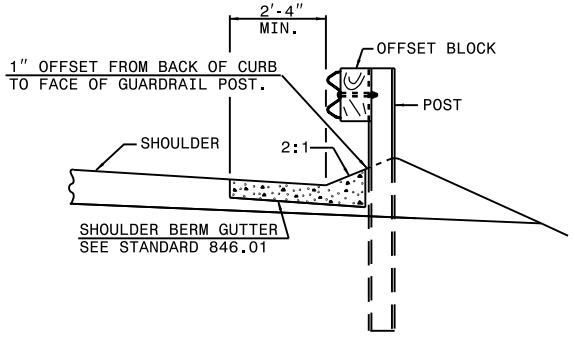
GUARDRAIL ANCHOR UNIT TYPE B-77
FOR F-SHAPE BARRIER

SHEET 5 OF 7

862.03

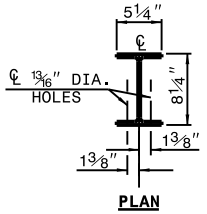


SECTION A-A

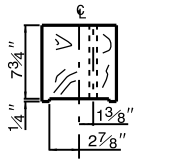


SEE STANDARD 820.04 FOR DRAINAGE INSTALLATION IN SHOULDER BERM GUTTER

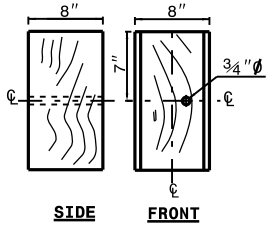
SECTION B-B



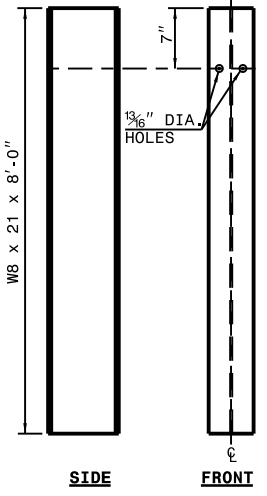
PLAN



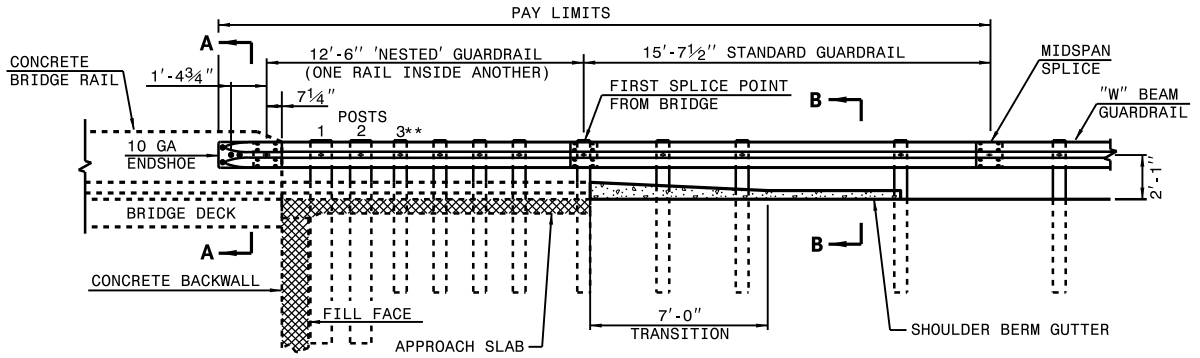
PLAN



8"X 8"X 14" ROUTED WOOD OFFSET BLOCK

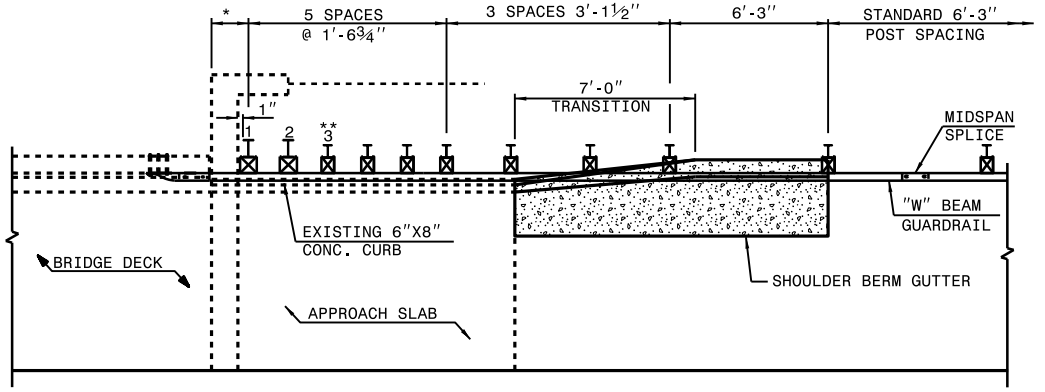


"W8 X 21 X 8'-0" STEEL POST

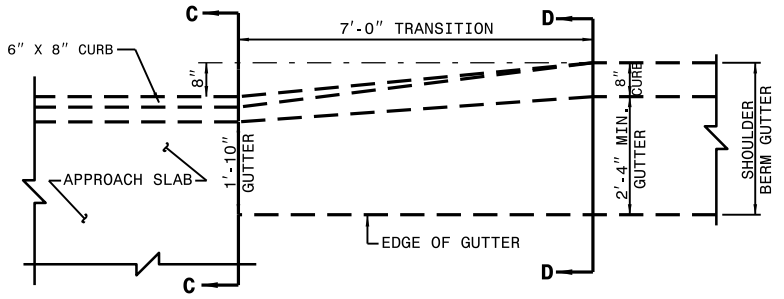


ELEVATION VIEW

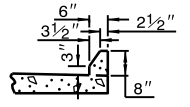
NOTE:
- **ELIMINATE POST 3 AND SHIFT POSTS 1 & 2 ON SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- *THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 11½" IF CONCRETE BACKWALL IS NOT PRESENT.
- -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).
- -USE NO WOOD POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.
- -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.
- -POSTS 1 AND 2 TO BE W8 x 21 X 8'-0" LONG STEEL POST AND 8" X 8" X 14" WOOD ROUTED OFFSET BLOCK.
- -SHOULDER BERM GUTTER IS REQUIRED IF NO CURBING EXISTS THROUGH ANCHOR UNIT PAY LIMITS.
- -ANCHOR THE W-BEAM END SHOE USING A 4 BOLT HOLD DOWN PLATE AS SHOWN IN STANDARD 862.04



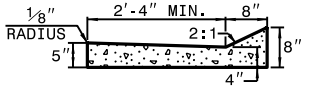
PLAN VIEW



TRANSITION APPROACH SLAB CURB TO SHOULDER BERM GUTTER



SECTION C-C APPROACH SLAB CURB



SECTION D-D SHOULDER BERM GUTTER

GUARDRAIL ANCHOR UNIT TYPE B-83

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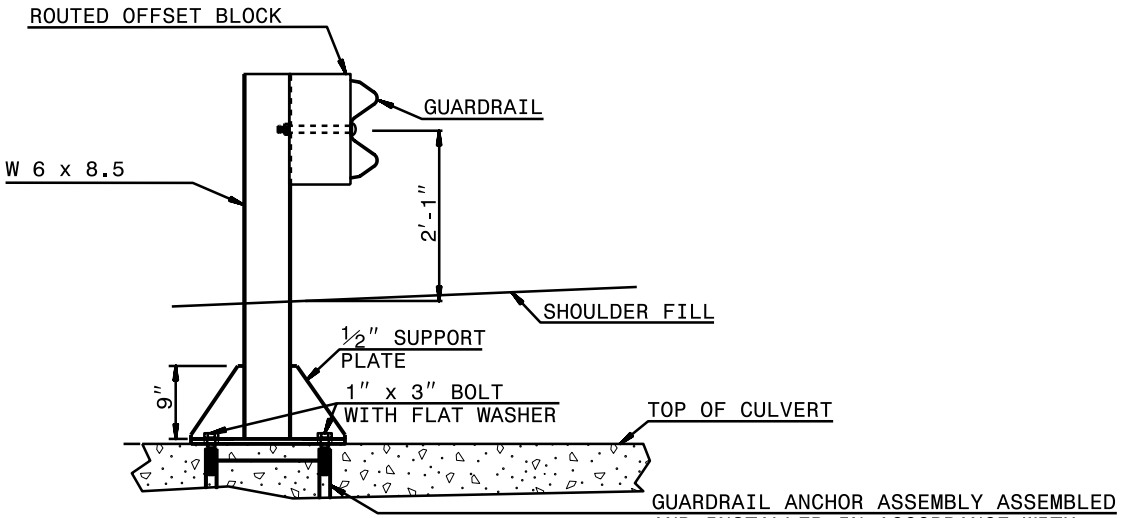
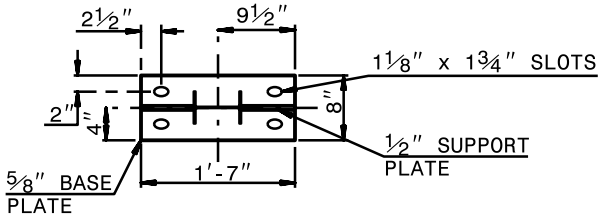
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

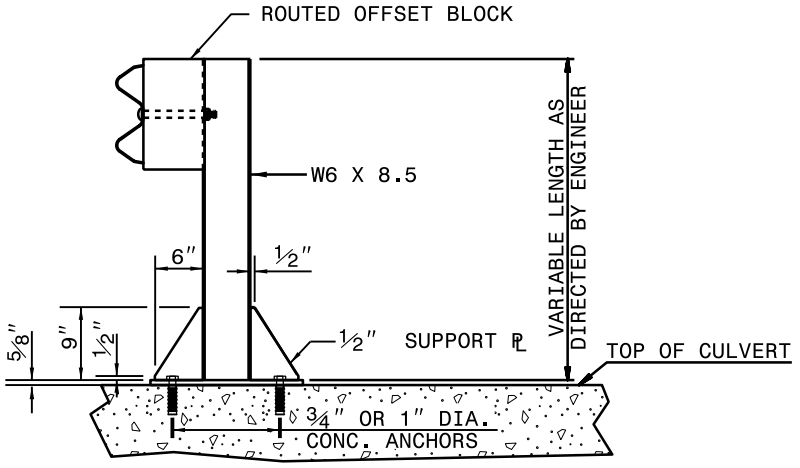
ROADWAY STANDARD DRAWING FOR
STRUCTURE ANCHOR UNITS
GUARDRAIL ANCHOR UNIT TYPE B-83



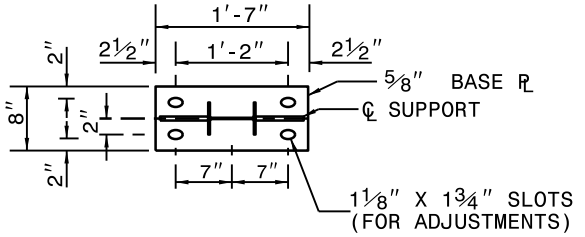
ELEVATION VIEW



PLAN VIEW



ELEVATION VIEW



PLAN VIEW

NOTES FOR:
GUARDRAIL POST ANCHORED TO STRUCTURE:
-USE FULL LENGTH ¼" BUTT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST.
-USE POST AND POST BASE PLATES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION TO CONFORM TO A.S.T.M. A-123.

NEW STRUCTURES:
-ATTACH POST TO INSERT ASSEMBLY UNITS (USING ANCHOR BOLTS SUPPLIED WITH INSERTS) WHICH HAVE BEEN CAST INTO THE STRUCTURE DURING CONSTRUCTION.

EXISTING STRUCTURES:
-USE CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AROUND A TAPERED AREA AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 2875 LBS. FOR A ¾" OR 1" DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON ¼ THE ACTUAL HOLDING POWER OF THE ANCHOR IN 3500 PSI CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.

-USE ANCHORS GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.

ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
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RALEIGH, N.C.

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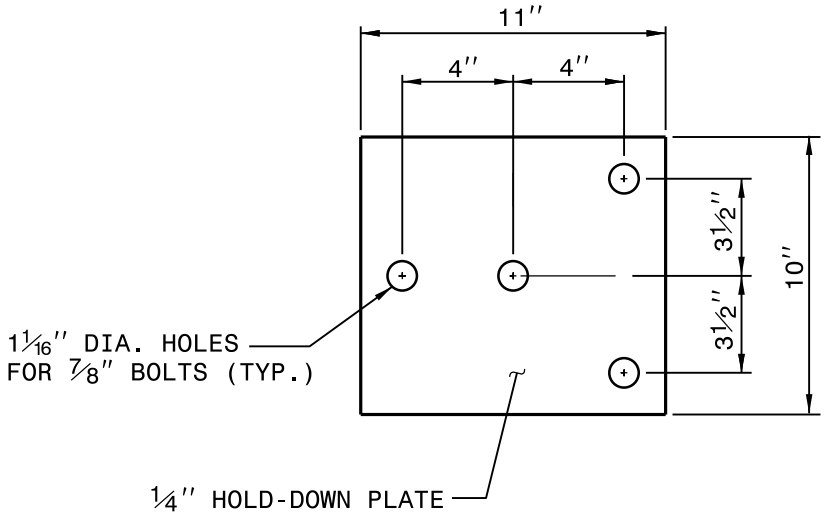
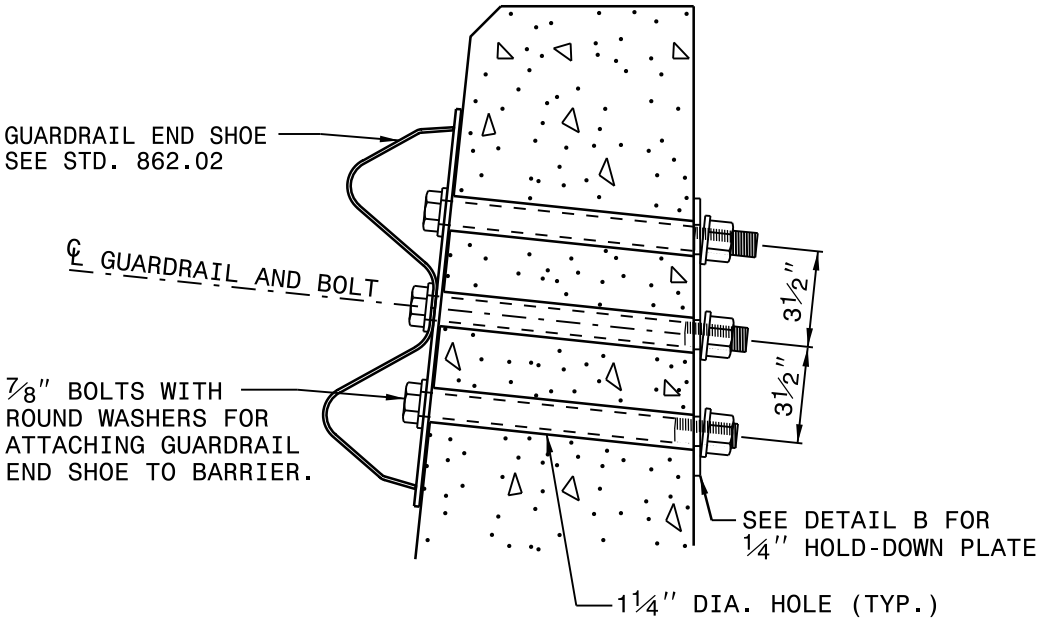
ROADWAY STANDARD DRAWING FOR
STRUCTURE ANCHOR UNITS
ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 7 OF 7

862.03



4 BOLT HOLD DOWN PLATE



PART SECTION OF BARRIER OR RAIL

THRU END SHOE SECTION AND
4 BOLT HOLD DOWN PLATE

NOTES FOR 4 BOLT HOLD DOWN PLATE

FOR GUARDRAIL ANCHOR ASSEMBLY USE ¼'' HOLD DOWN PLATE AND 4 - 7/8'' DIA. BOLTS WITH NUTS AND WASHERS.

USE HOLD-DOWN PLATE THAT CONFORMS TO AASHTO M270 GRADE 36. AFTER FABRICATION, HOT-DIP GALVANIZE THE HOLD-DOWN PLATE IN ACCORDANCE WITH AASHTO M111.

AFTER INSTALLATION, BURR THE EXPOSED THREAD OF THE BOLT WITH A SHARP POINTED TOOL. FORM OR DRILL THE 1¼'' DIA. HOLES WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. REPAIR ANY CONCRETE DAMAGED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.

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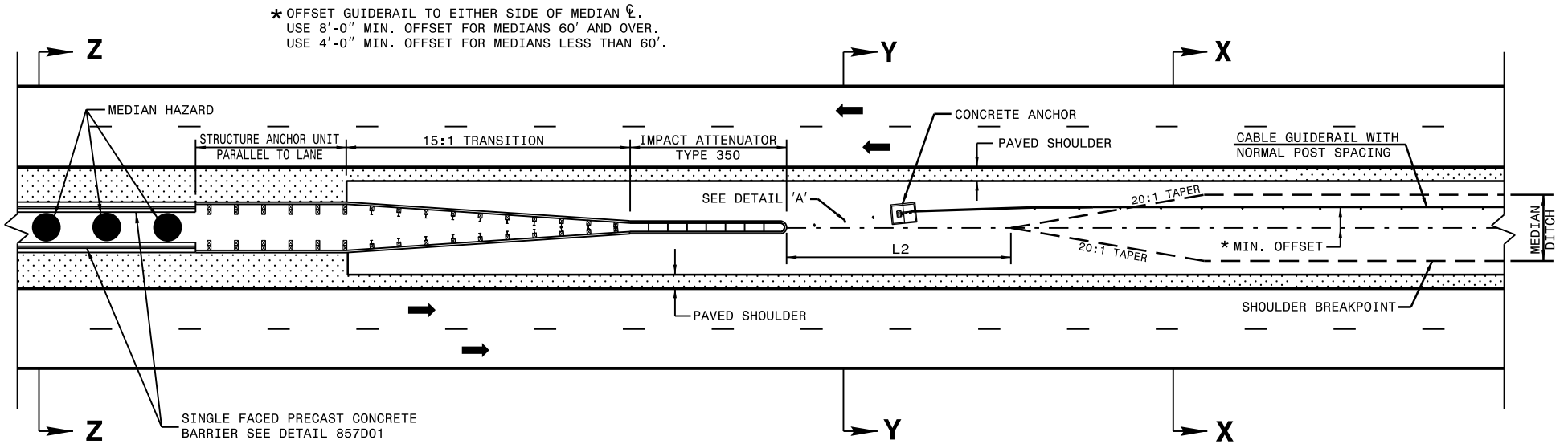
ROADWAY STANDARD DRAWING FOR

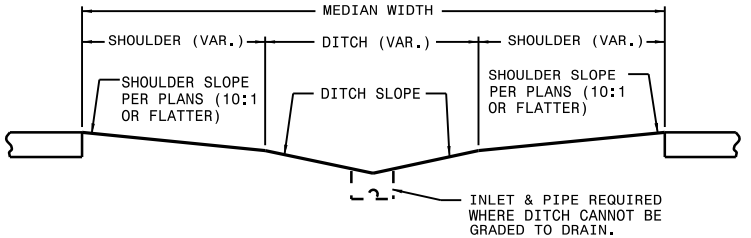
ANCHORING END OF GUARDRAIL

FOR B-77 AND B-83 ANCHOR UNITS

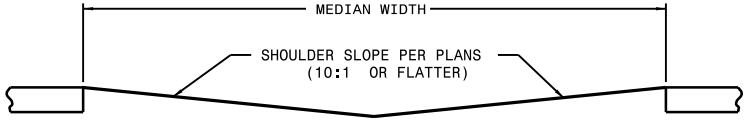
SHEET 1 OF 1

862.04

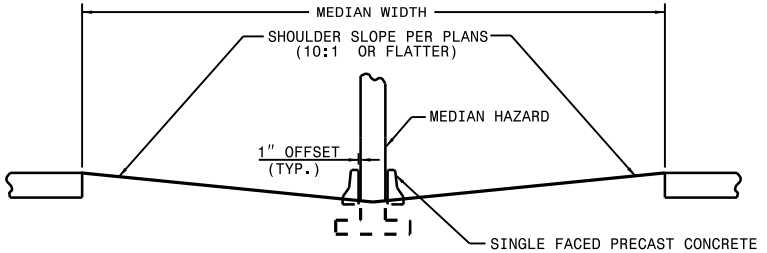




SECT. XX

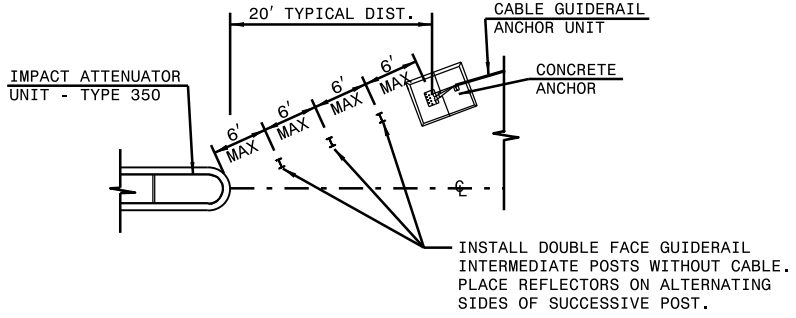


SECT. YY



SECT. ZZ

LIMITS OF -L2-	
MEDIAN WIDTH	-L2- DIMENSION
30′	80.0′
36′	60.0′
40′ & ABOVE	40.0′



NOTE: POSTS WILL ONLY BE PLACED IN ONE OF THE TWO OPENINGS AT EACH MEDIAN HAZARD UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

DETAIL 'A'

DETAIL OF TREATMENT AT MEDIAN HAZARDS

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
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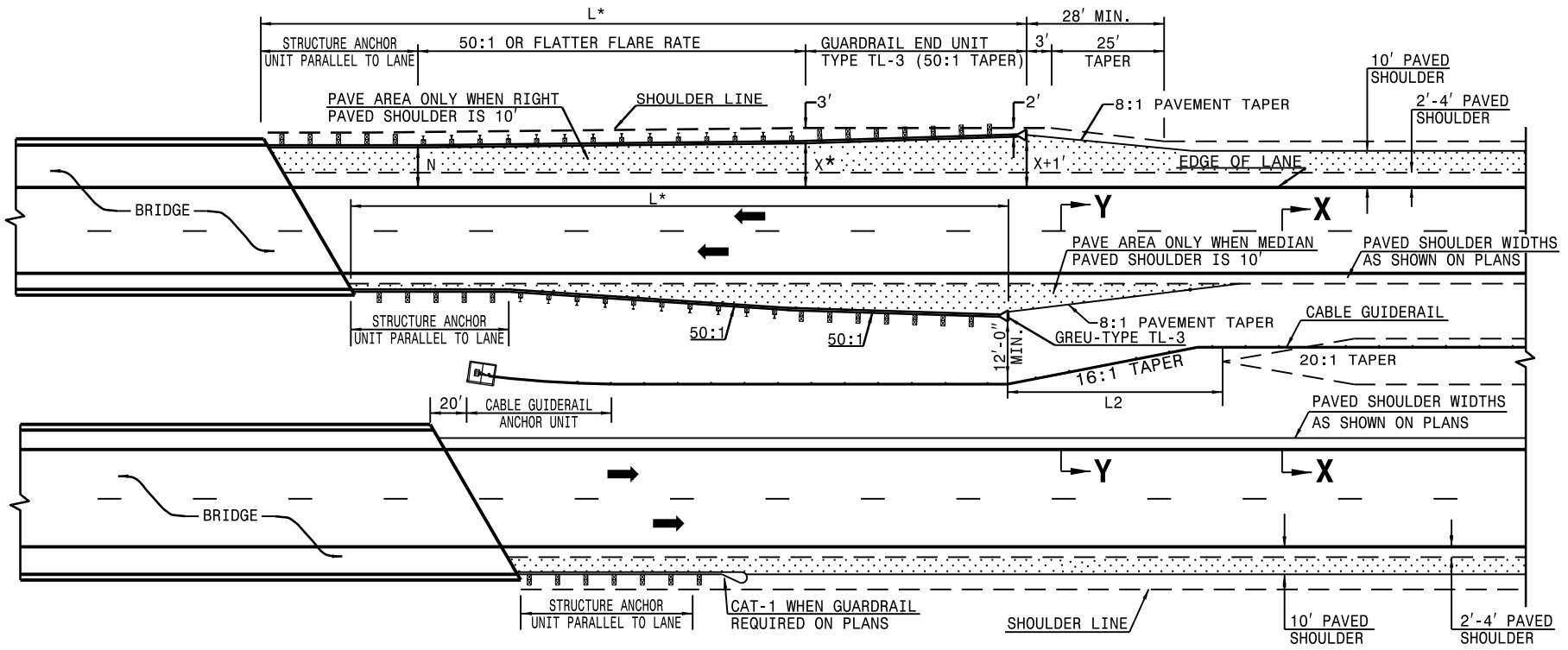
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
CABLE GUIDERAIL
MEDIAN HAZARD GUIDERAIL LAYOUT

SHEET 1 OF 12

865.01



DIMENSIONS FOR LENGTH OF GUARDRAIL APPROACHING DUAL LANE BRIDGES							
MEDIAN WIDTH	-L-*						-L2- DIM.
	70 MPH	60 MPH	50 MPH				
46' & ABOVE	300.0'	250.0'	150.0'				40.0'

NOTES: * BASED ON "X" OF 12'
USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1A).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

THE DESIGN LAYOUT FOR LENGTHS SHOWN ON THIS STANDARD ARE MINIMUM DESIGN LENGTHS.

SEE STANDARD 862.01 SHEET 1 FOR SECTIONS XX, YY

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

DETAIL OF CABLE GUIDERAIL AT DUAL LANE BRIDGES

STATE OF NORTH CAROLINA
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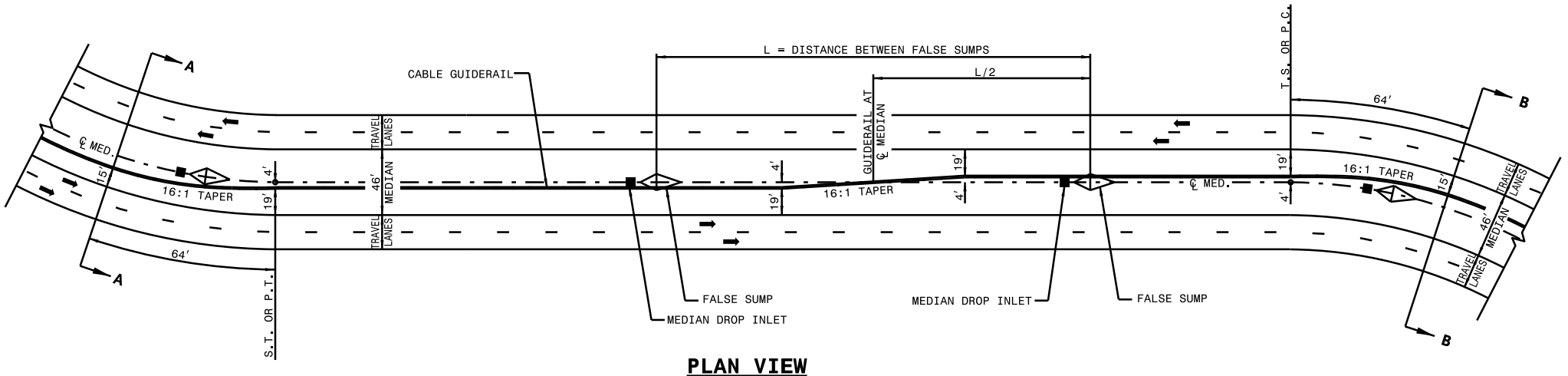
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
CABLE GUIDERAIL
DUAL LANE BRIDGES GUIDERAIL LAYOUT

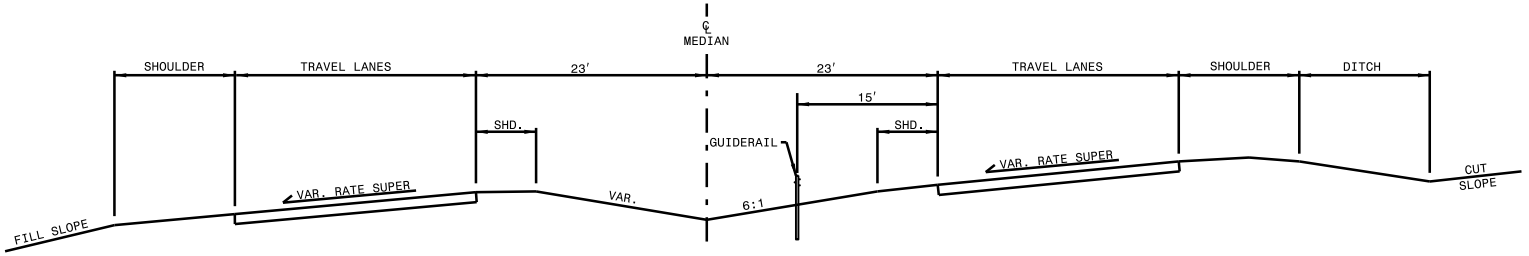
SHEET 2 OF12

865.01

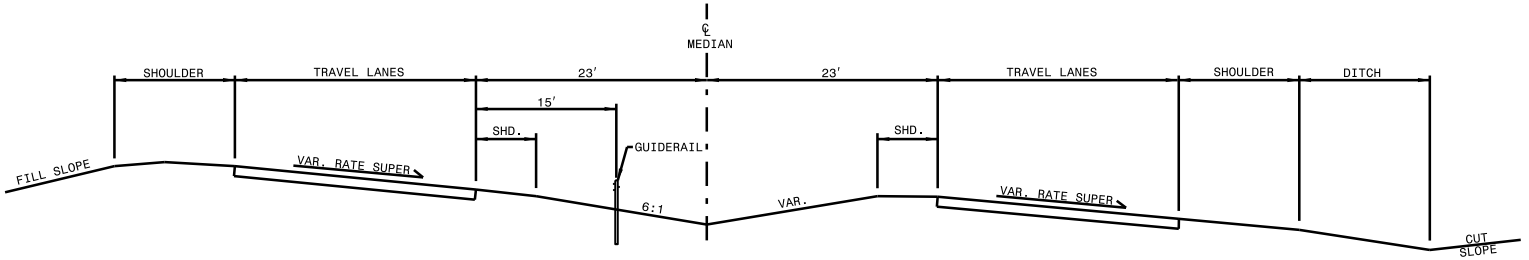


PLAN VIEW

GENERAL NOTES: 1. FALSE SUMP DETAIL IS APPLICABLE TO ALL MEDIAN WIDTHS.
2. DO NOT TRANSITION GUIDERAIL FOR SUPERELEVATION WHEN THE RATE IS 2 PERCENT OR LESS.
3. DO NOT INSTALL GUIDERAIL ON SLOPES STEEPER THAN 6:1.



SECTION A-A



SECTION B-B

46′ MEDIAN GUIDERAIL TRANSITIONS WITH SUPERELEVATION AND/OR FALSE SUMPS

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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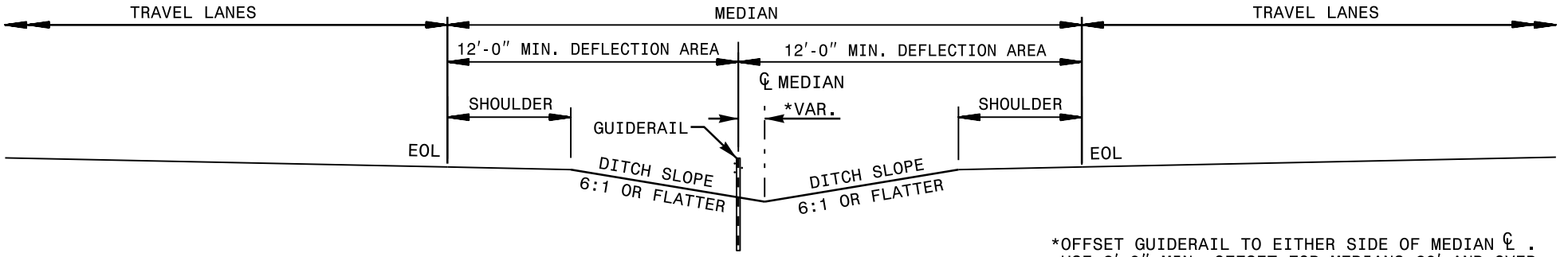
ROADWAY STANDARD DRAWING FOR

CABLE GUIDERAIL

46′ MEDIAN GUIDERAIL TRANSITIONS WITH SUPERELEVATION AND/OR FALSE SUMPS

SHEET 3 OF 12

865.01

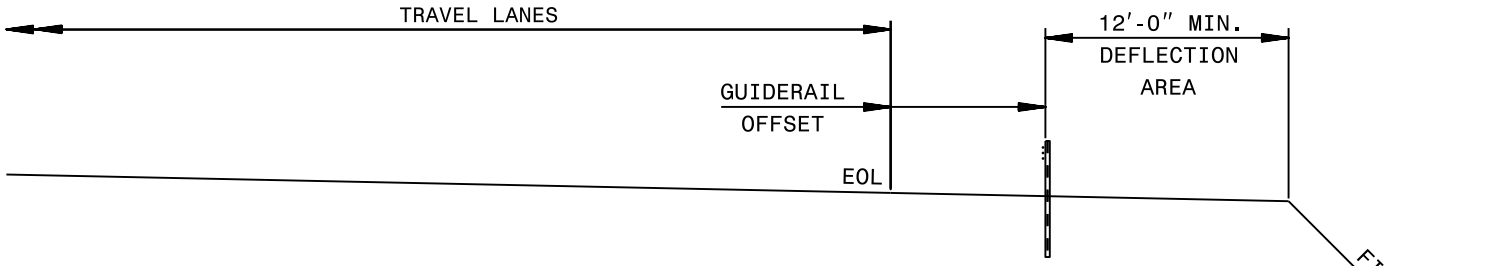


*OFFSET GUIDERAIL TO EITHER SIDE OF MEDIAN ℄ .
USE 8′-0″ MIN. OFFSET FOR MEDIANS 60′ AND OVER.
USE 4′-0″ MIN. OFFSET FOR MEDIANS LESS THAN 60′.

TYPICAL SECTION

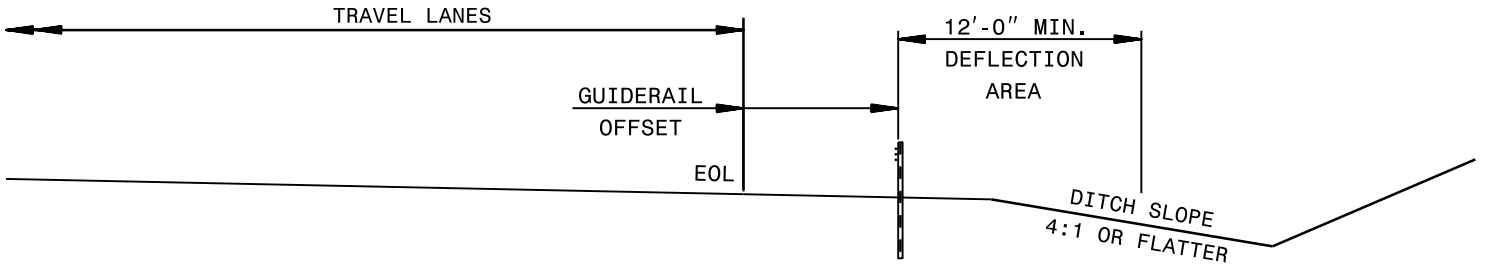
(DEFLECTION AREA ON MEDIAN SLOPES)

DOUBLE FACE GUIDERAIL APPLICATION



TYPICAL SECTION

(DEFLECTION AREA ON SHOULDER ONLY)



TYPICAL SECTION

(DEFLECTION AREA ON SHOULDER AND DITCH SLOPE)

SINGLE FACE GUIDERAIL APPLICATION

STATE OF
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DIVISION OF HIGHWAYS
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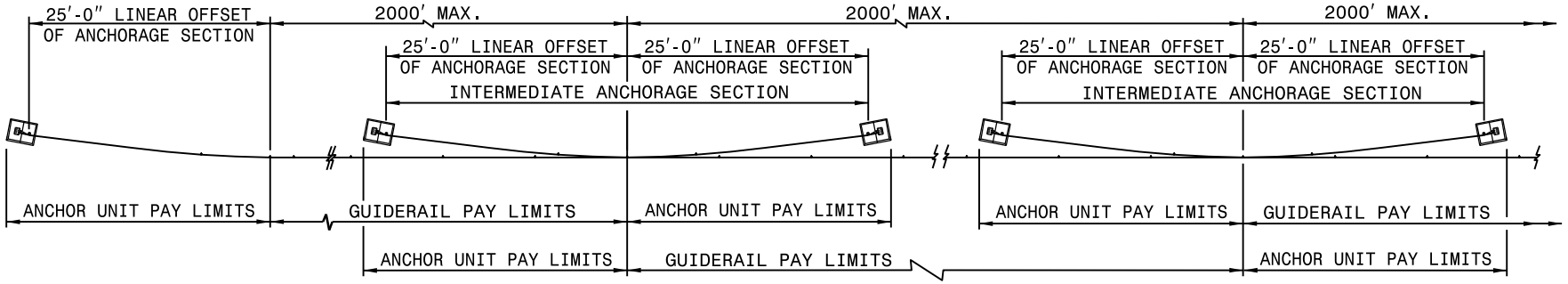
ROADWAY STANDARD DRAWING FOR

CABLE GUIDERAIL

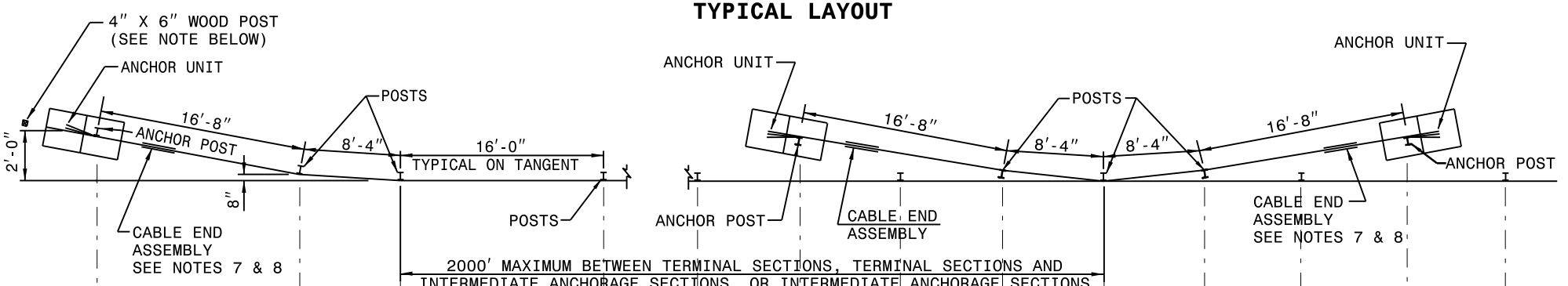
DESIGN AND PLACEMENT

SHEET 4 OF 12

865.01

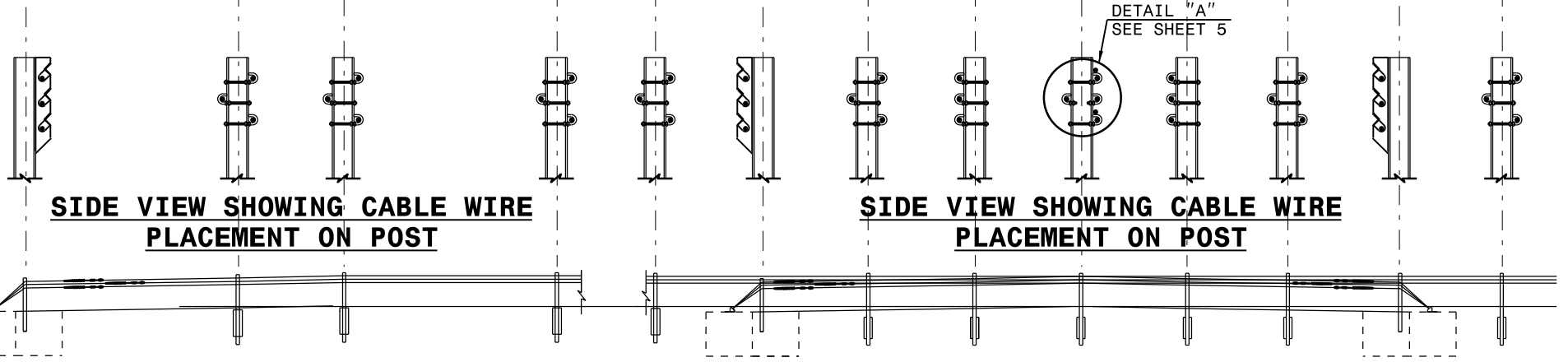


PLAN
TYPICAL LAYOUT



PLAN
TYPICAL APPROACH & TERMINAL SECTIONS

PLAN
TYPICAL INTERMEDIATE ANCHORAGE SECTION



SIDE VIEW SHOWING CABLE WIRE PLACEMENT ON POST

SIDE VIEW SHOWING CABLE WIRE PLACEMENT ON POST

WHEN USED AT A DRIVEWAY OR VEHICLE OPENING ONLY PLACE A 4″ X 6″ X 5′-4″ WOOD POST 30″ ABOVE GROUND LINE. PLACE POST 6″ AHEAD OF CONCRETE ANCHOR.
*PROVIDE OPENINGS ONLY FOR AREAS AS DESIGNATED ON ROADWAY PLAN SHEETS.

ELEVATION
TYPICAL APPROACH & TERMINAL SECTIONS

ELEVATION
TYPICAL INTERMEDIATE ANCHORAGE SECTION

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STATE OF NORTH CAROLINA
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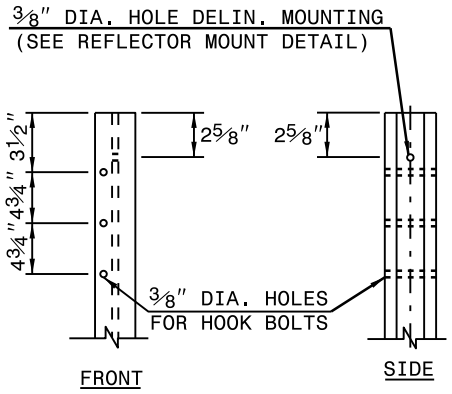
ROADWAY STANDARD DRAWING FOR

CABLE GUIDERAIL

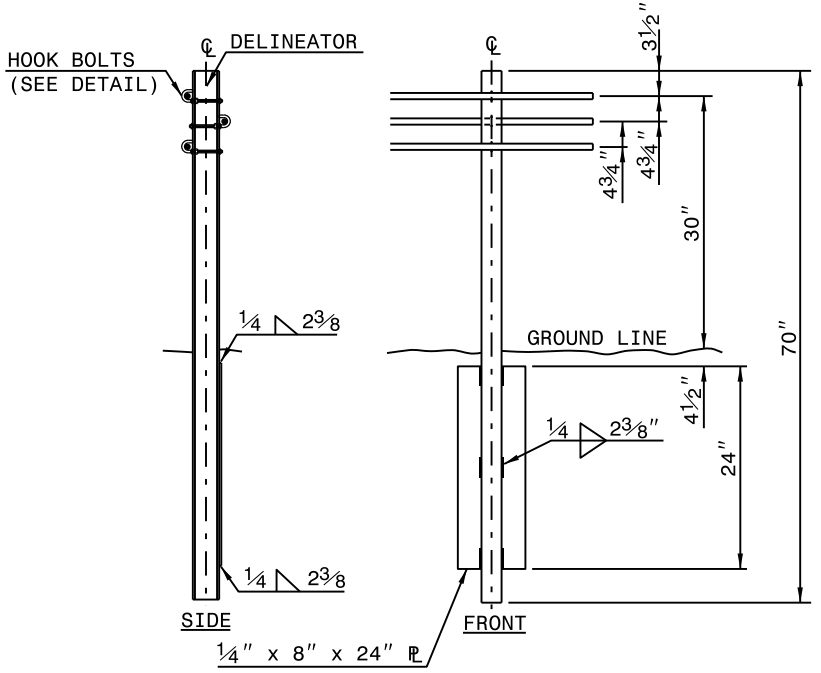
GUIDERAIL LAYOUT

SHEET 5 OF 12

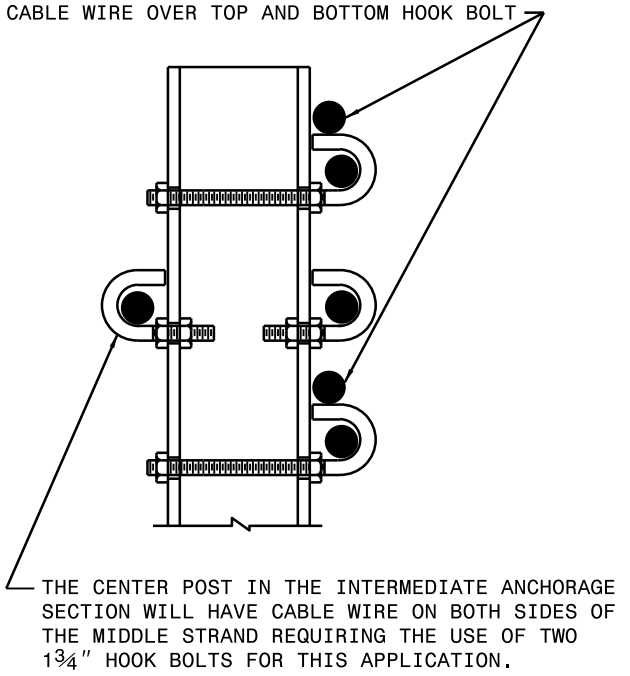
865.01



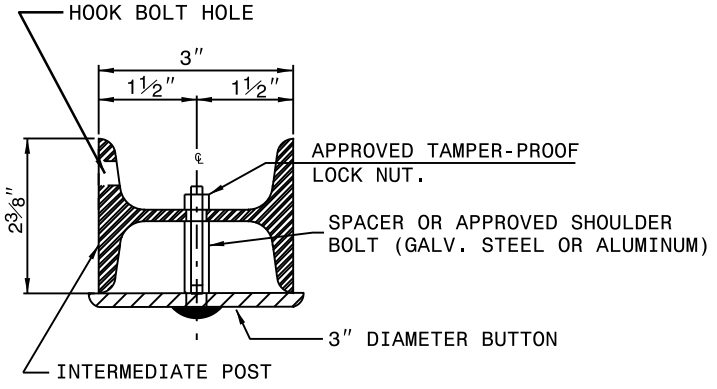
DOUBLE FACE GUIDERAIL POST HOLE PLACEMENT DETAIL INTERMEDIATE POST



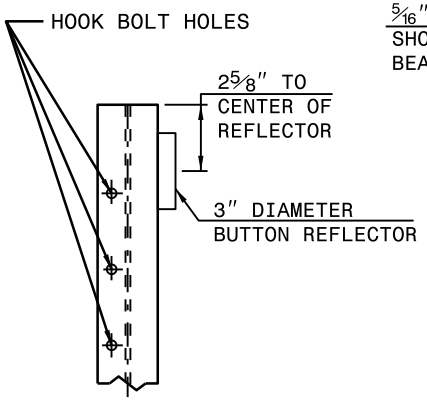
DOUBLE FACE GUIDERAIL INTERMEDIATE POST



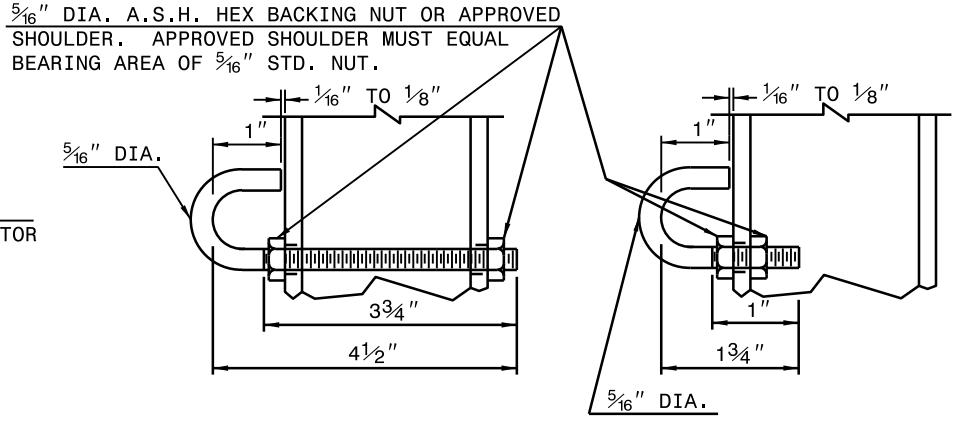
DETAIL "A" CENTER POST INTERMEDIATE ANCHORAGE SECTION



REFLECTOR MOUNT DETAIL PLAN VIEW



REFLECTOR MOUNT DETAIL ELEVATION VIEW



HOOK BOLT (ALTERNATES)

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

1-18

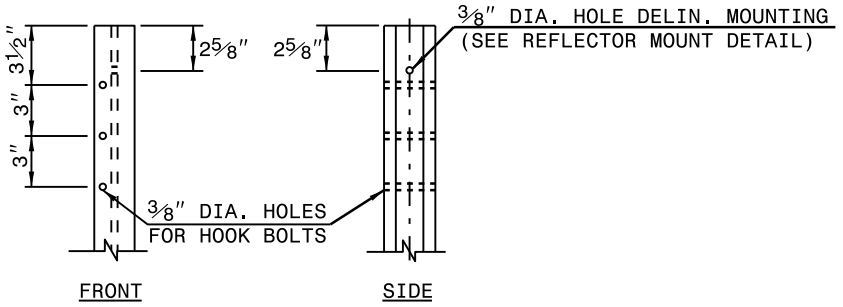
ROADWAY STANDARD DRAWING FOR

CABLE GUIDERAIL

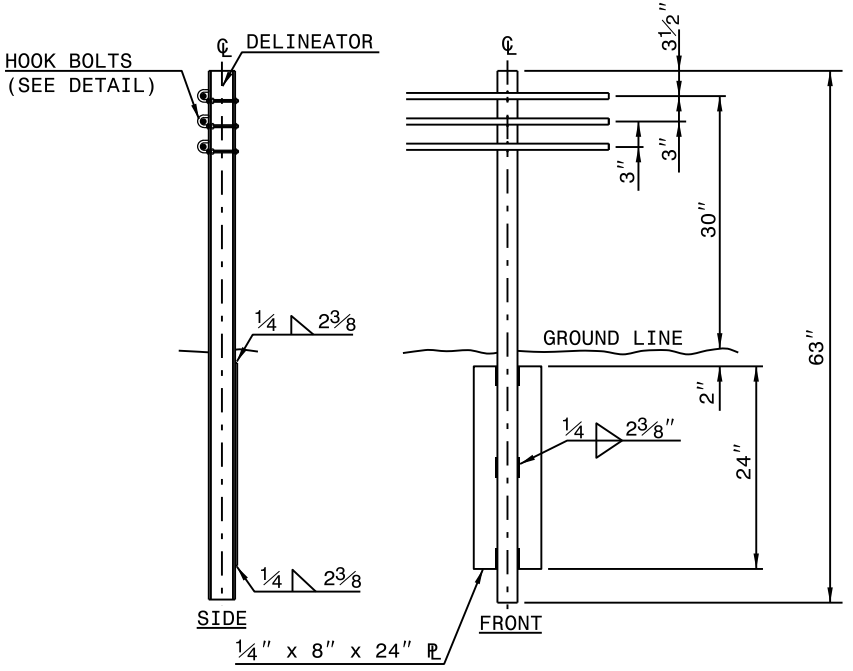
DOUBLE FACE GUIDERAIL - POST DETAILS

SHEET 6 OF 12

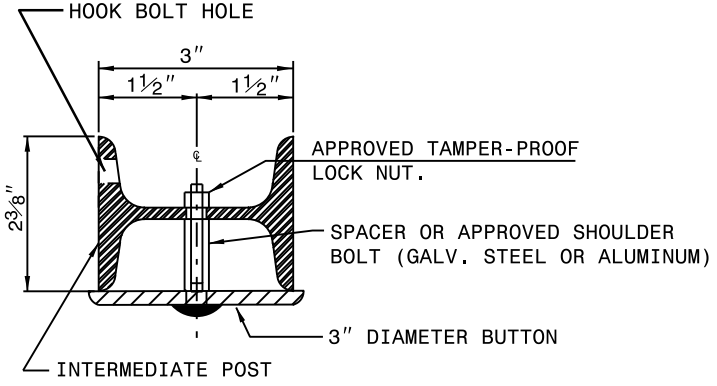
865.01



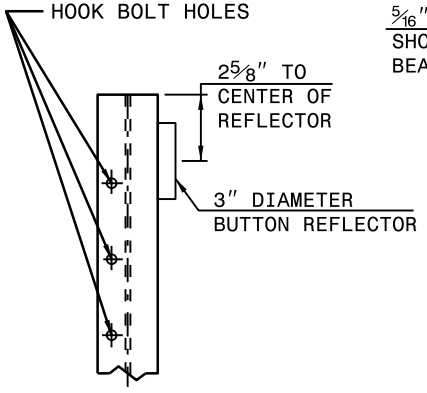
SINGLE FACE GUIDERAIL POST HOLE PLACEMENT DETAIL



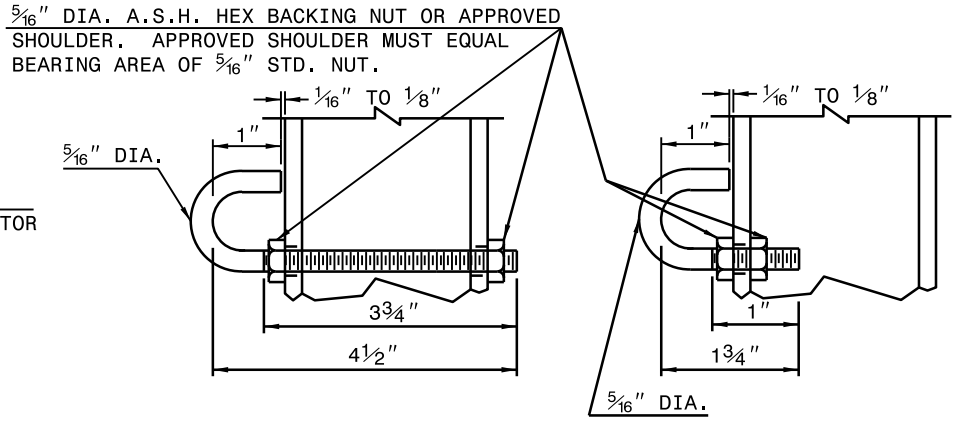
SINGLE FACE GUIDERAIL
INTERMEDIATE POST



REFLECTOR MOUNT DETAIL
PLAN VIEW



REFLECTOR MOUNT DETAIL
ELEVATION VIEW



HOOK BOLT (ALTERNATES)

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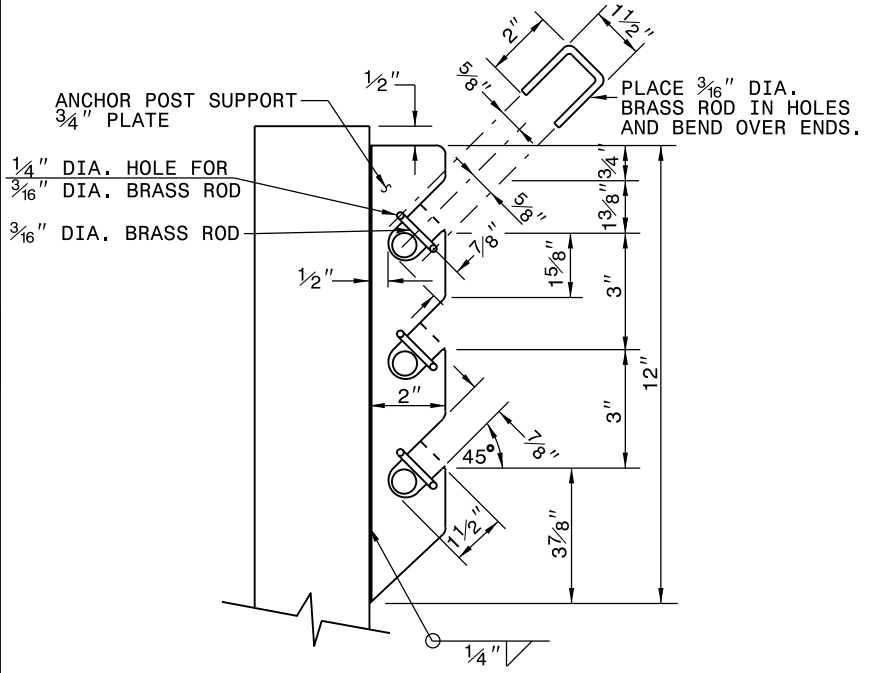
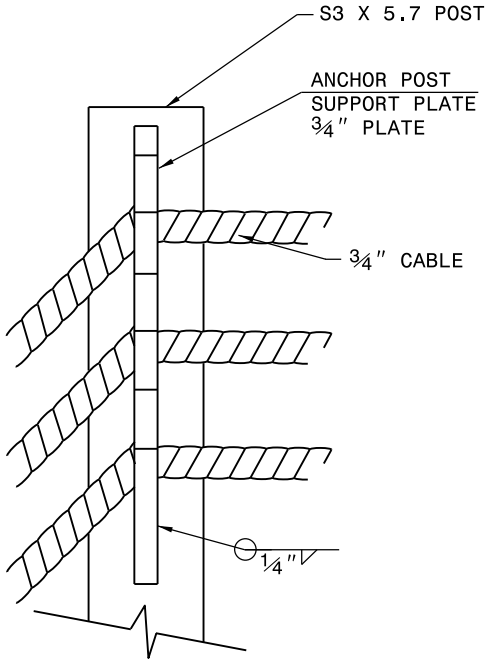
ROADWAY STANDARD DRAWING FOR
CABLE GUIDERAIL
SINGLE FACE GUIDERAIL - POST DETAILS

SHEET 7 OF 12

865.01

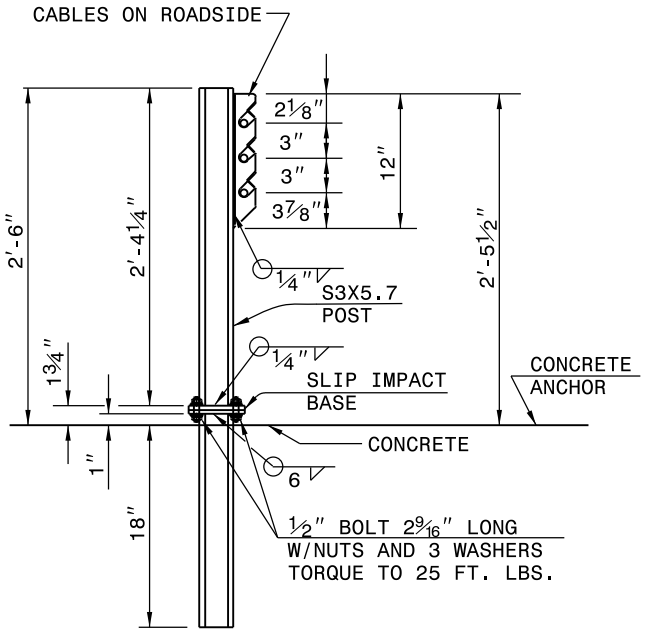


SIDE VIEW OF POST TOP

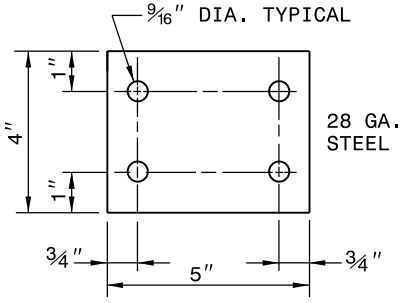


FRONT VIEW OF POST TOP

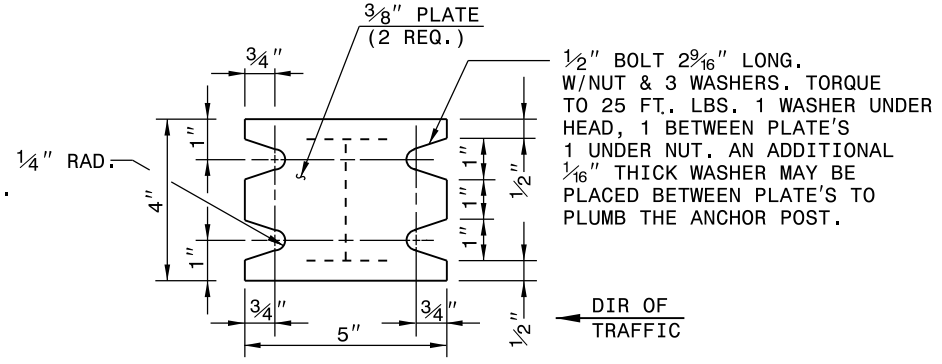
(ROAD SIDE)



ANCHOR POST DETAIL



KEEPER PLATE



SLIP IMPACT BASE

(KEEPER PLATE NOT SHOWN)

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ROADWAY STANDARD DRAWING FOR

CABLE GUIDERAIL

ANCHOR POST DETAILS

SHEET 8 OF 12

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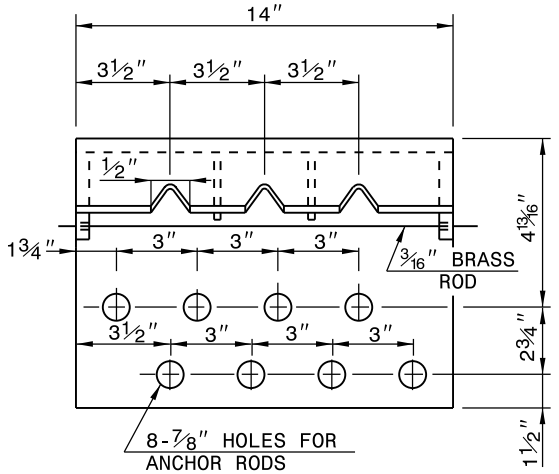
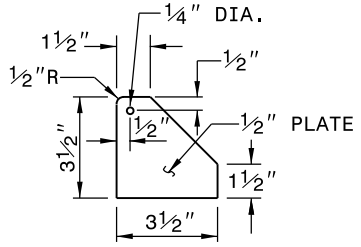
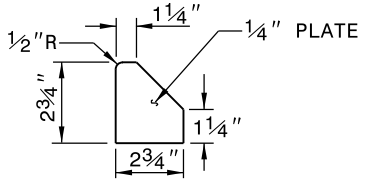
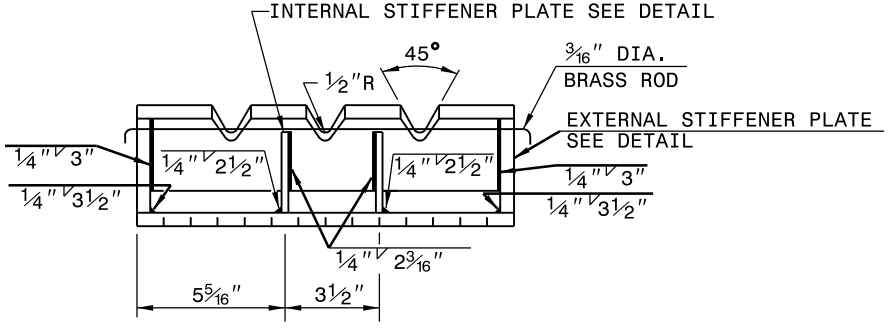




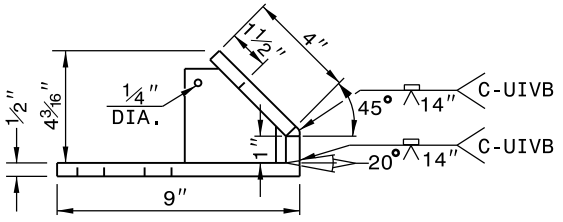
EXTERNAL STIFFENER PLATE



INTERNAL STIFFENER PLATE



ANCHOR ANGLE DETAILS



NOTE: SUBMIT ALTERNATE METHODS OF FABRICATING ANCHOR ANGLES FOR APPROVAL.

BREAKAWAY ANCHOR ANGLE

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ROADWAY STANDARD DRAWING FOR
CABLE GUIDERAIL
ANCHOR DETAILS

SHEET 9 OF 12

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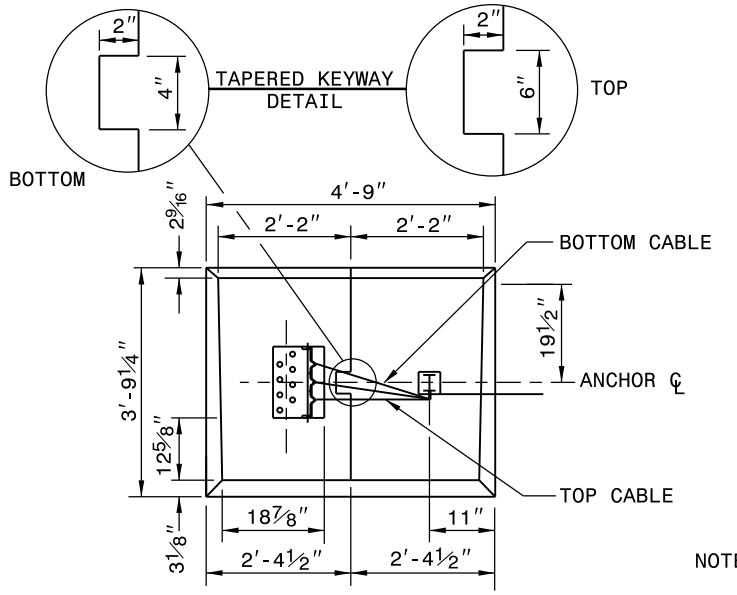
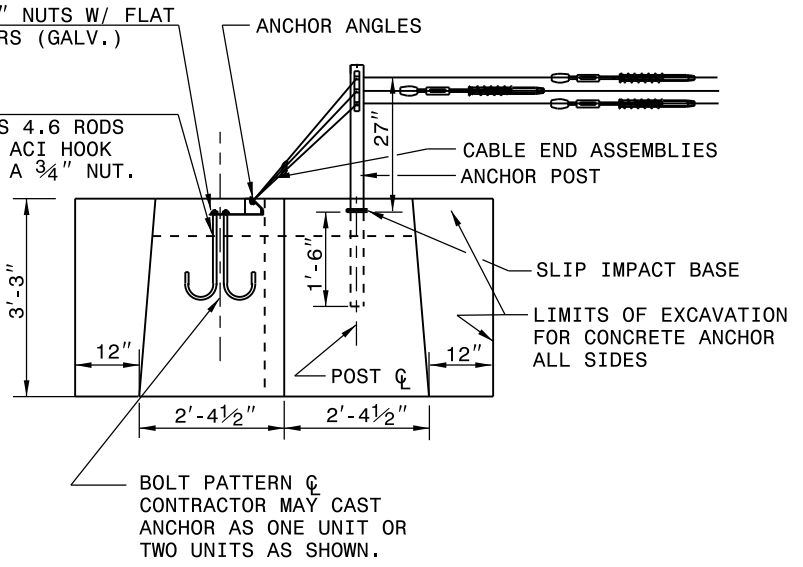


ANCHOR UNIT DETAIL
TOP VIEW LEFT HAND

(REINFORCEMENT NOT SHOWN)
TWO PIECE

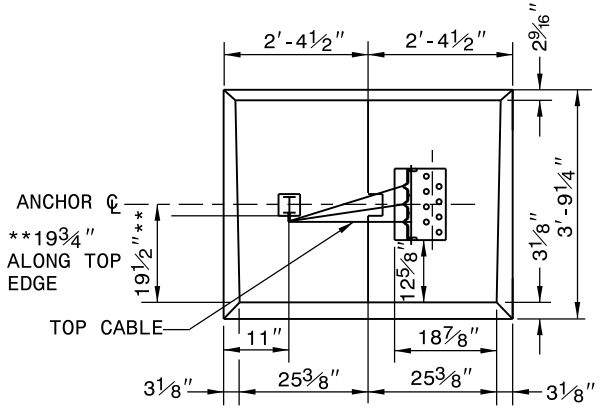
NOTE: USE ONE OR TWO PIECE ANCHOR. DIMENSIONS OF TWO PIECE ANCHOR ARE SHOWN ON DRAWING. DIMENSIONS OF ONE PIECE ANCHOR ARE 5′-0″ LONG BY 3′-0″ WIDE BY 3′-4″ HIGH.



ANCHOR UNIT DETAIL
LEFT HAND

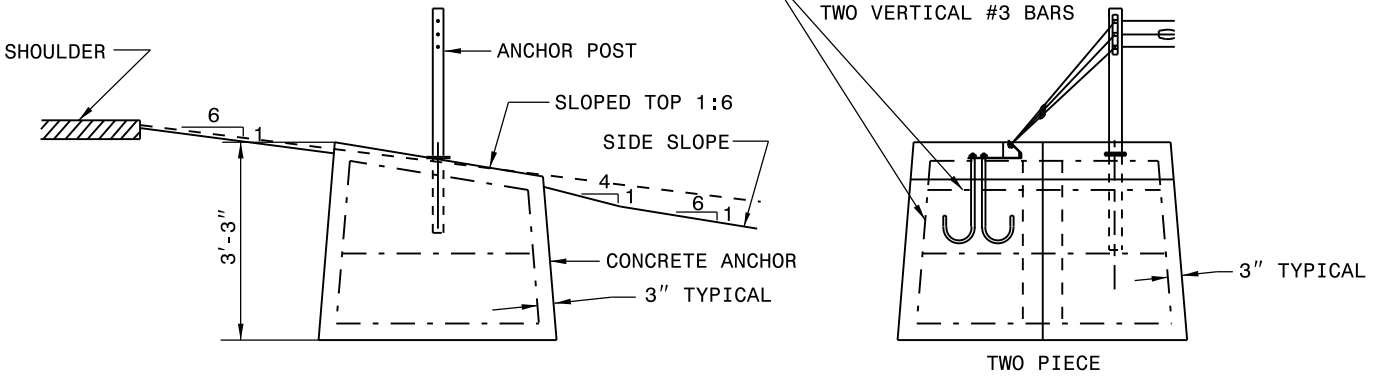
(REINFORCEMENT NOT SHOWN)

NOTE: SET THE CONCRETE ANCHOR INTO THE EXCAVATION AS DETAILED. THE BOTTOM OF THE ANCHOR MUST HAVE A FULL AND EVEN BEARING ON THE SURFACE UNDER IT SO THAT IF THE CONTRACTOR ELECTS TO PLACE THE ANCHOR IN TWO SECTIONS, THERE WILL BE LITTLE OR NO DIFFERENTIAL SETTLEMENT. IF THE CONTRACTOR ELECTS TO PLACE THE ANCHOR IN TWO SECTIONS, PLACE THE TOPS OF BOTH SECTIONS ON THE SAME PLANE. AFTER THE ANCHOR IS IN PLACE, BACKFILL THE EXCAVATION.



ANCHOR UNIT DETAIL
TOP VIEW RIGHT HAND

(REINFORCEMENT NOT SHOWN)
TWO PIECE



ANCHOR UNIT & RE-BAR INSTALLATION DETAIL

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ROADWAY STANDARD DRAWING FOR

CABLE GUIDERAIL

ANCHOR DETAILS

SHEET 10 OF 12

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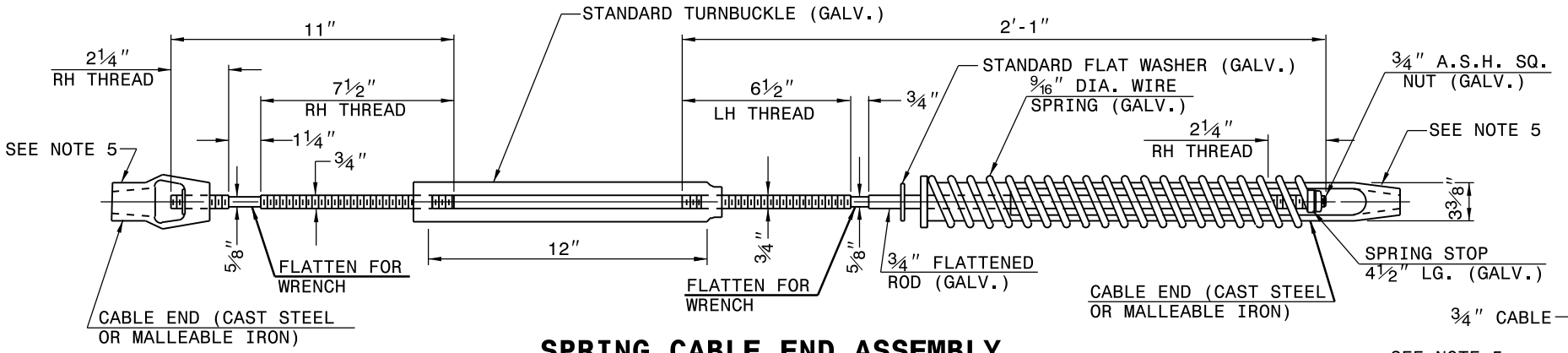
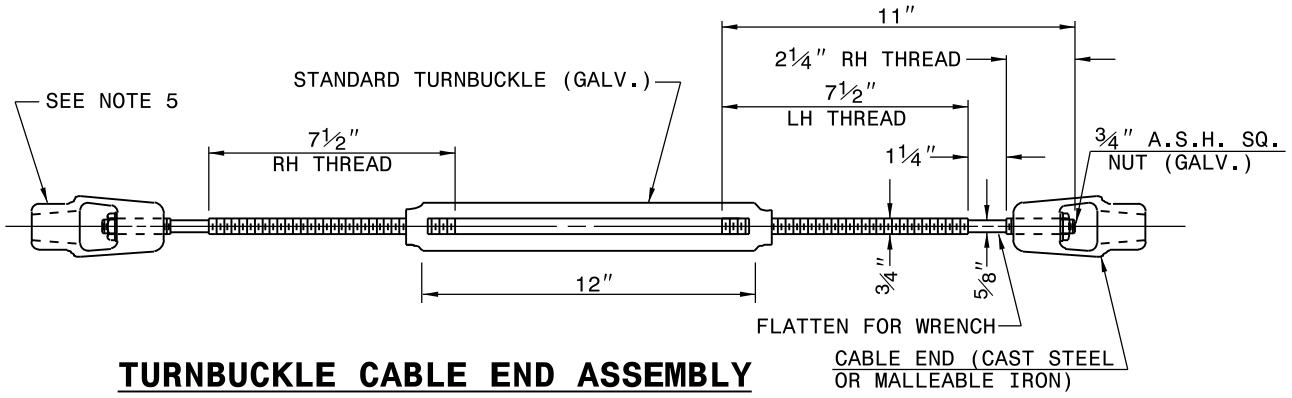
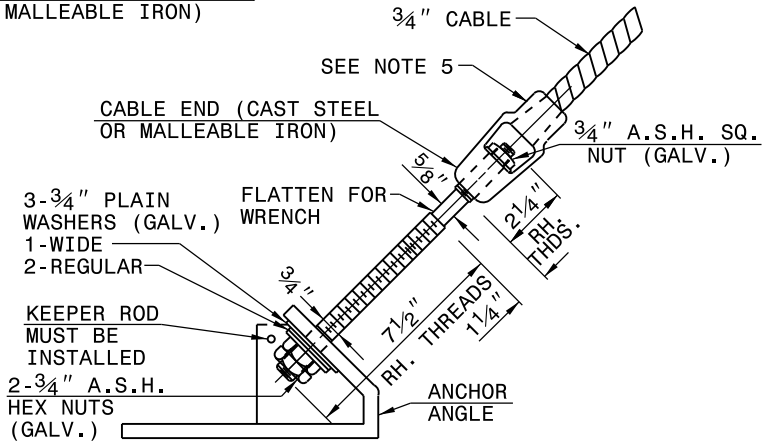


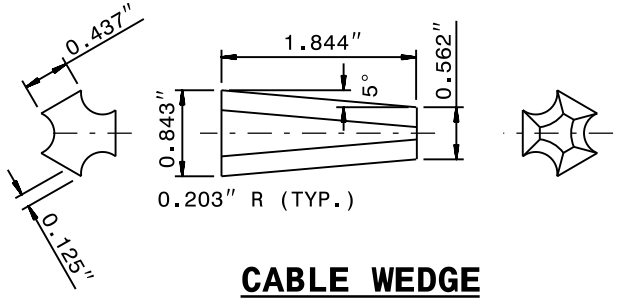
SPRING CABLE END ASSEMBLY (COMPENSATING DEVICE)



TURNBUCKLE CABLE END ASSEMBLY

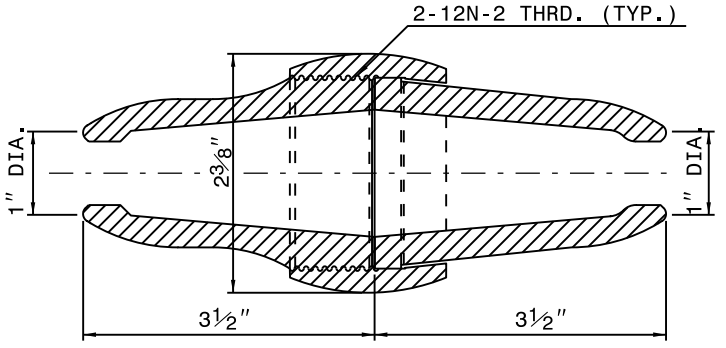


CABLE END ASSEMBLY TO ANCHOR ANGLE DETAIL



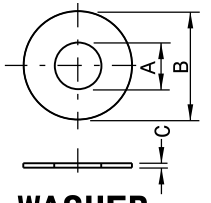
CABLE WEDGE

TYPICAL WEDGE FOR ALL SPLICES AND CABLE FITTINGS



CABLE SPLICE

NOTE: USE WITH WEDGE



WASHER

WASHER	WASHER SERIES	A INSIDE DIA.	B OUTSIDE DIA.	C THICKNESS
¾"	REGULAR	⅞"	2"	5/32"
	WIDE	⅞"	2 9/16"	3/16"
½"	NARROW	17/32"	1"	3/32"

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ROADWAY STANDARD DRAWING FOR

CABLE GUIDERAIL

ANCHOR DETAILS

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GENERAL NOTES:

1. PROVIDE ALL S3x5.7 ROLLED STEEL SECTIONS IN ACCORDANCE WITH ASTM A-6. USE POSTS, PLATES AND ANCHOR ANGLES CONFORMING TO THE REQUIREMENTS OF SECTION 862 OF THE STANDARD SPECIFICATIONS. WHERE THE RAIL IS PARALLEL TO THE EDGE OF THE TRAVEL LANE, REFLECTORIZE EVERY 6th POST (96′) (SEE STANDARD 1261.02 FOR DELINEATORS). FOR DOUBLE FACE GUIDERAIL, PLACE DELINEATOR VISIBLE ON EVERY 6th POST TO TRAFFIC IN EITHER DIRECTION. DO NOT REFLECTORIZE POSTS IN THE TYPICAL INTERMEDIATE ANCHORAGE SECTION, TYPICAL APPROACH OR TERMINAL SECTIONS.

2. PROVIDE ROUND ¾″ DIAMETER ZINC COATED CABLE WIRE CONSTRUCTED OF THREE STRANDS (7 WIRES PER STRAND) HAVING A MINIMUM TENSILE STRENGTH OF 25000 LBS. IN ACCORDANCE WITH AASHTO M-30 TYPE I CABLE, CLASS 'A' COATING.

3. PROVIDE MATERIALS INDICATED AS 'CAST STEEL' WHICH CONFORM TO AASHTO M103.

4. PROVIDE INSTALLED HOOK BOLTS WHICH DEVELOP AN ULTIMATE PULL OPEN STRENGTH OF 500 LBS TO 1000 LBS. APPLIED IN A DIRECTION NORMAL TO THE LONGITUDINAL AXIS OF THE POST.

5. DESIGN ALL FITTINGS, INCLUDING SPLICES, TO USE THE CABLE WEDGE AND DEVELOP THE FULL STRENGTH OF THE ¾″ CABLE. HOT DIP GALVANIZE ALL FITTINGS, EXCEPT THE CABLE WEDGE, ACCORDANCE WITH AASHTO M-30.

6. CRIMP ONE WIRE OF THE WIRE ROPE OVER THE BASE OF THE WEDGE TO HOLD IT FIRMLY IN PLACE AT ALL LOCATIONS WHERE THE CABLE IS CONNECTED TO A CABLE SPLICE CONNECTION.

7. DESIGNS FOR A COMBINATION OR SINGLE UNIT COMPENSATING DEVICE AND TURNBUCKLE ASSEMBLY MAY BE SUMBITTED FOR APPROVAL. COMPENSATING DEVICES MUST HAVE A SPRING RATE OF 450 LBS. PLUS OR MINUS 50 LBS. PER INCH WITH A MINIMUM TOTAL 'THROW' OF 6″.

8. APPLY THE FOLLOWING CRITERIA FOR ARRANGEMENT OF SPRING CABLE END ASSEMBLIES (COMPENSATING DEVICES) AND TURNBUCKLE CABLE END ASSEMBLIES:

   LENGTH OF CABLE RUNS:

   TO 1000′ - USE COMPENSATING DEVICE ON ONE END AND TURNBUCKLE ON THE OTHER END OF EACH INDIVIDUAL CABLE.

   1000′ TO 2000′ - USE COMPENSATING DEVICE ON EACH END OF EACH CABLE.

   OVER 2000′ - START NEW STRETCH BY INTERLACING AT LAST PARALLEL POST (TYPICAL LAYOUT).

   PRIOR TO FINAL ACCEPTANCE BY THE STATE, USE THE FOLLOWING VALUES TO TIGHTEN THE TURNBUCKLES BASED ON THE TEMPERATURE AT THE TIME OF ADJUSTMENT.

TABLE "A"

PAVEMENT ℄ CURVATURE	POST SPACING
8° OR LESS	16′
MORE THAN 8° TO 13° (440 FT. RAD.)	12′

TEMPERATURE (FAHRENHEIT)	SPRING COMPRESSION FROM UNLOADED POSITION IN EACH SPRING
110° - 120°	1″
100° - 109°	1¼″
90° - 99°	1½″
80° - 89°	1¾″
70° - 79°	2″
60° - 69°	2¼″
50° - 59°	2½″
40° - 49°	2¾″
30° - 39°	3″
20° - 29°	3¼″
10° - 19°	3½″
0° - 9°	3¾″
-10° - -1°	4″
-20° - -11°	4¼″

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ROADWAY STANDARD DRAWING FOR

CABLE GUIDERAIL

NOTES

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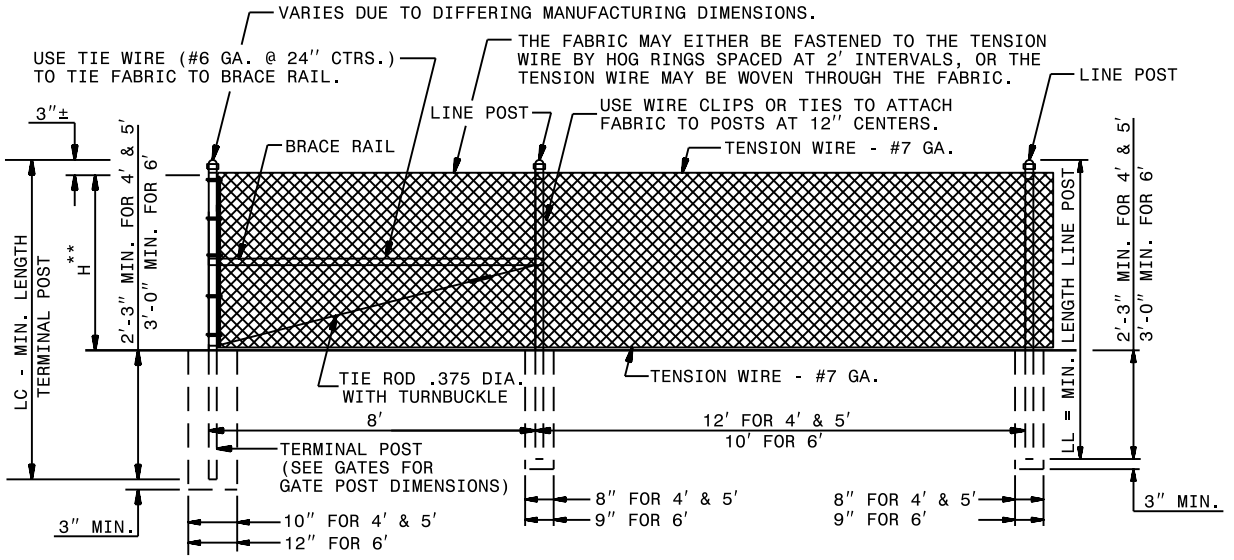
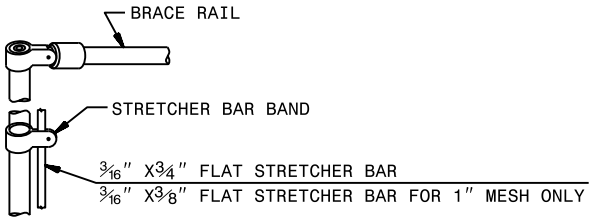
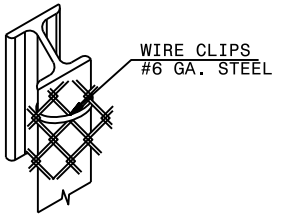


**″H″ IS THE HEIGHT OF FENCE. SEE PAY ITEM DESCRIPTION FOR REQ'D HEIGHT FOR PROJECT.

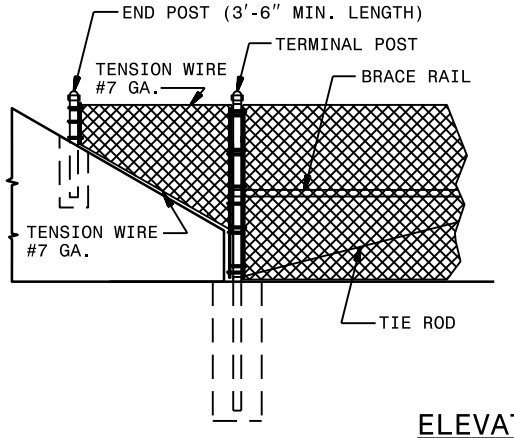
NOTE: ROLL FORMED LINE POST MAY BE DRIVEN TO A MINIMUM OF 3′-0″ IN LIEU OF CONCRETE ANCHOR, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.



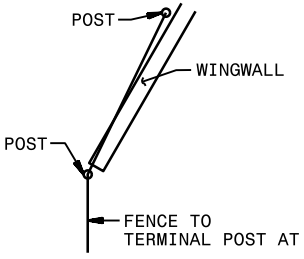
GATE OR TERMINAL POST WITH STRETCHER BAR ATTACHMENT



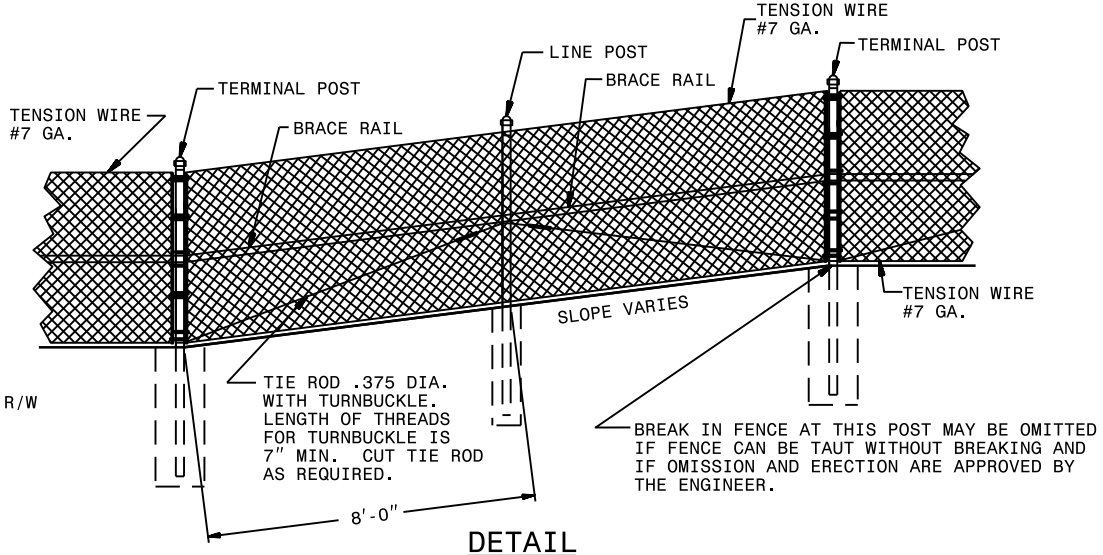
METHOD OF TYING FABRIC TO ″H″ POST



ELEVATION



METHOD OF TYING FENCE TO ENDWALL



DETAIL

METHOD OF CONSTRUCTING FENCE ON SHARP BREAK IN GRADE

NOTES:
CAPS ARE REQUIRED ON PIPE POST. CAPS ARE NOT REQUIRED ON ″H″ POST OR ROLL FORMED POST. INSTALL FENCE FABRIC ON THE SIDE FARTHEST FROM THE HIGHWAY EXCEPT THAT ON HORIZONTAL CURVES GREATER THAN THREE DEGREES, INSTALL THE FENCE TO PULL AGAINST LINE POST. CONSIDER ALL CHANGES IN DIRECTION OF FENCE LINE OF 30° OR MORE AS CORNERS.

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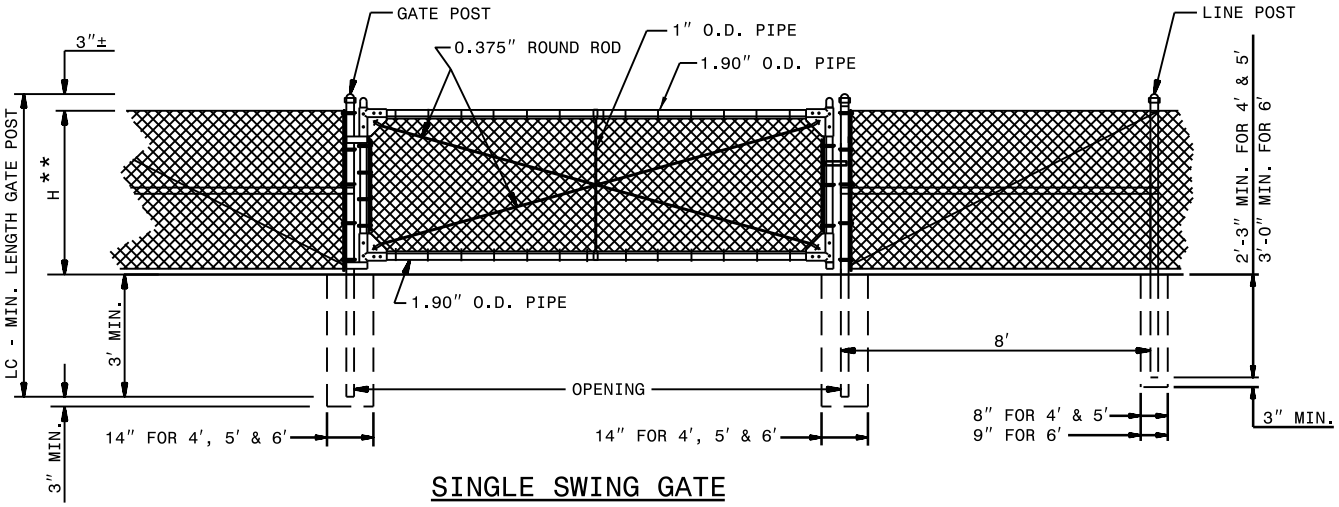
ROADWAY STANDARD DRAWING FOR

CHAIN LINK FENCE

4′, 5′ AND 6′ HIGH FENCE

SHEET 1 OF 3

866.01

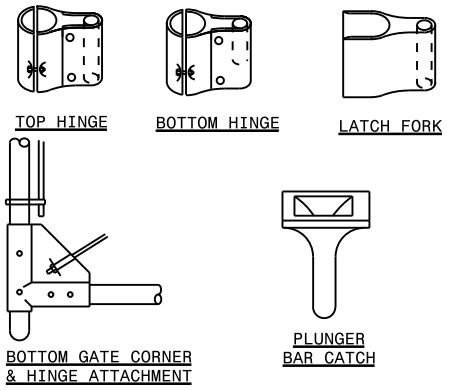


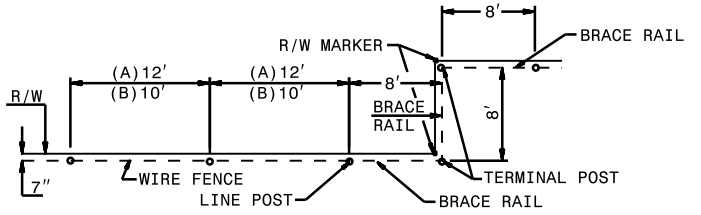
SINGLE SWING GATE

**″H″ IS THE HEIGHT OF FENCE. SEE PAY ITEM DESCRIPTION FOR REQ'D HEIGHT FOR PROJECT.

NOTE: ROLL FORMED LINE POST MAY BE DRIVEN TO A MINIMUM OF 3′-0″ IN LIEU OF CONCRETE ANCHOR, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

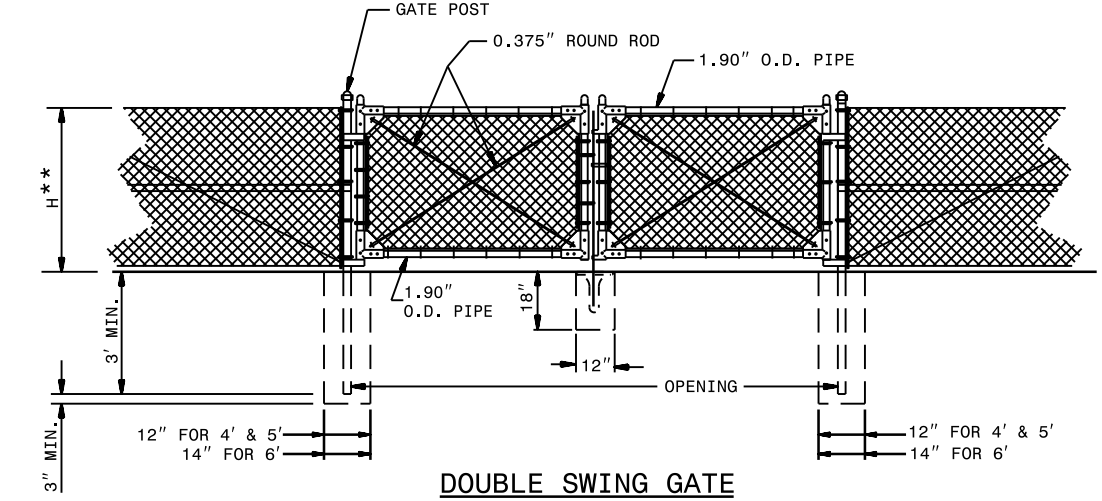
NOTE:
FENCE HARDWARE VARIES DUE TO DIFFERING MANUFACTURES SUPPLIES.





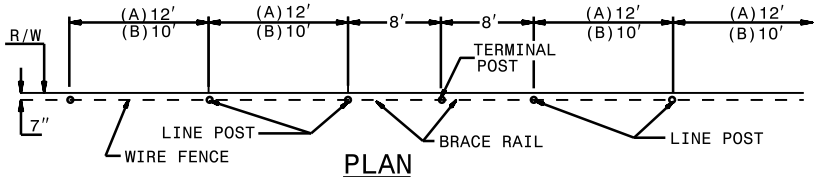
PLAN

PLACEMENT OF FENCE ALONG RIGHT OF WAY
(BRACE ALL TERMINAL POSTS AS SHOWN ABOVE)



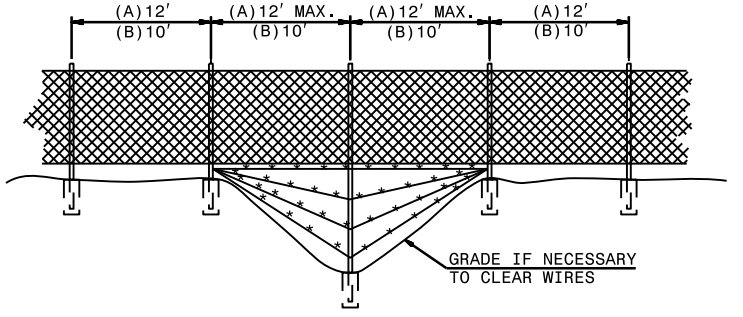
DOUBLE SWING GATE

USE WHERE SWINGING CLEARANCE IS LIMITED



PLAN

(LINE POST/TERMINAL POST SEQUENCE)



DETAIL OF DITCH CROSSING

MAXIMUM WIRE SPACING TO BE 6″.
MAXIMUM CLEARANCE BETWEEN LOWEST STRAND AND GROUND TO BE 6″.
ERECT BRACE RAILS BETWEEN TERMINAL OR GATE POSTS AT INTERVALS NOT EXCEEDING 700′ ON TANGENTS OR 350′ ON SHORT RADIUS CURVES.
ERECT ADDTIONAL TERMINAL POSTS IF DIRECTED BY THE ENGINEER.
BRACE TERMINAL POSTS FROM BOTH SIDES OF POST.

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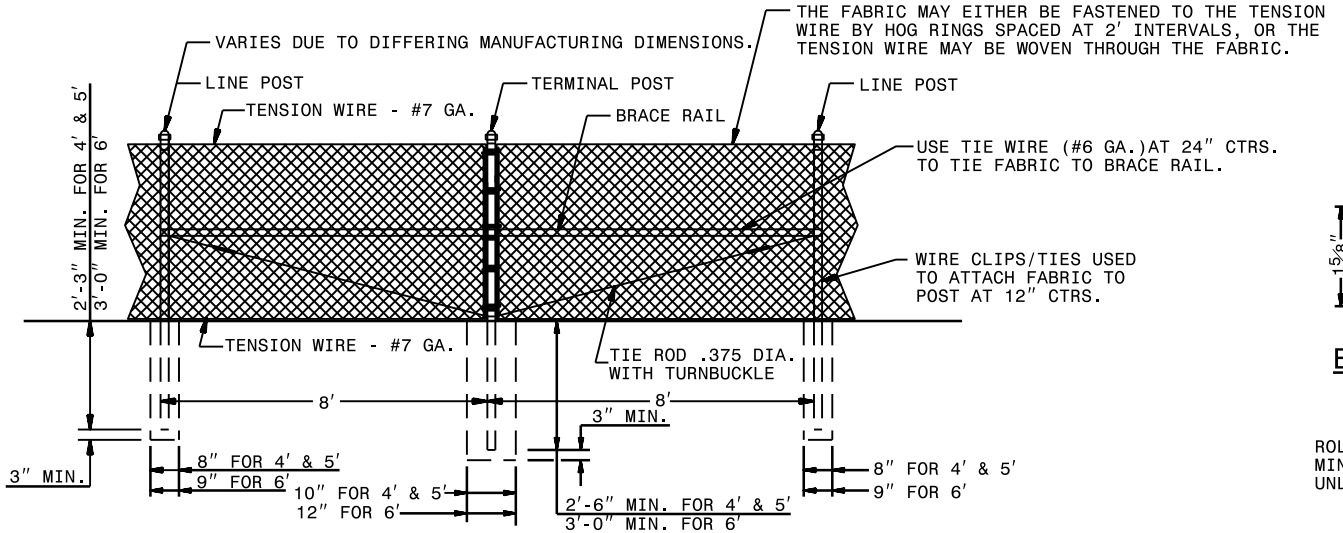
ROADWAY STANDARD DRAWING FOR

CHAIN LINK FENCE

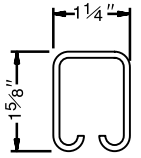
4′, 5′ AND 6′ HIGH FENCE

SHEET 2 OF 3

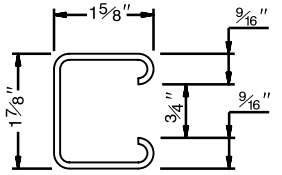
866.01



LINE BRACE DETAIL



BRACE RAIL
(ROLL FORMED)



LINE POST
(ROLL FORMED)

ROLL FORMED LINE POST MAY BE DRIVEN TO A MINIMUM OF 3′-0″ IN LIEU OF CONCRETE ANCHOR, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

** "H" IS THE HEIGHT OF FENCE. SEE PAY ITEM DESCRIPTION FOR REQ'D HEIGHT FOR PROJECT.

FABRIC	GALV. STEEL OR ALUMINUM COATED STEEL #11 GAGE			ALUMINUM ALLOY OR ALUMINUM COATED STEEL(#11 GAGE)	
FRAME COMPONENTS	GALVANIZED STEEL #11 GAGE			ALUMINUM ALLOY	
SYSTEM	G1	G2	G3	A1	A2
LINE POST	1.90″ O.D. STEEL PIPE	1.625″ X 1.875″ STEEL H	1.625″ X 1.875″ STEEL R.F.	2.375″ O.D. ALUMINUM PIPE	2.00″ X 2.50″ ALUMINUM PIPE
TERMINAL POST (END, CORNER, BRACES)	2.375″ O.D. STEEL PIPE	2.375″ O.D. STEEL PIPE	2.375″ O.D. STEEL PIPE	2.875″ O.D. ALUMINUM PIPE	2.875″ O.D. ALUMINUM PIPE
GATE POST UP THRU 6′ LEAF	2.875″ O.D. STEEL PIPE	2.875″ O.D. STEEL PIPE	2.875″ O.D. STEEL PIPE	2.875″ O.D. ALUMINUM PIPE	2.875″ O.D. ALUMINUM PIPE
GATE POST 7′ THRU 12′ LEAF	4.000″ O.D. STEEL PIPE	4.000″ O.D. STEEL PIPE	4.000″ O.D. STEEL PIPE	4.000″ O.D. ALUMINUM PIPE	4.000″ O.D. ALUMINUM PIPE
BRACE RAIL	1.660″ O.D. STEEL PIPE	1.660″ O.D. STEEL PIPE	1.250″ X 1.625″ STEEL R.F. OR 1.660″ O.D. STEEL PIPE	1.660″ O.D. ALUMINUM PIPE	1.660″ O.D. ALUMINUM PIPE

FOR 4′ AND 5′ FENCE SYSTEMS

FABRIC	GALV. STEEL OR ALUMINUM COATED STEEL #11 GAGE		
FRAME COMPONENTS	GALVANIZED STEEL		
SYSTEM	G1	G2	G3
LINE POST	2.375″ O.D. STEEL PIPE	1.625″ X 1.875″ STEEL H	1.625″ X 1.875″ STEEL R.F.
TERMINAL POST (END, CORNER, BRACES)	2.875″ O.D. STEEL PIPE	2.875″ O.D. STEEL PIPE	2.875″ O.D. STEEL PIPE
GATE POST UP THRU 6′ LEAF	2.875″ O.D. STEEL PIPE	2.875″ O.D. STEEL PIPE	2.875″ O.D. STEEL PIPE
GATE POST 7′ THRU 12′ LEAF	4.000″ O.D. STEEL PIPE	4.000″ O.D. STEEL PIPE	4.000″ O.D. STEEL PIPE
BRACE RAIL	1.660″ O.D. STEEL PIPE	1.660″ O.D. STEEL PIPE	1.250″ X 1.625″ STEEL R.F. OR 1.660″ O.D. STEEL PIPE

FOR 6′ FENCE SYSTEMS

ALLOWABLE COMPONENTS FOR FENCE SYSTEMS

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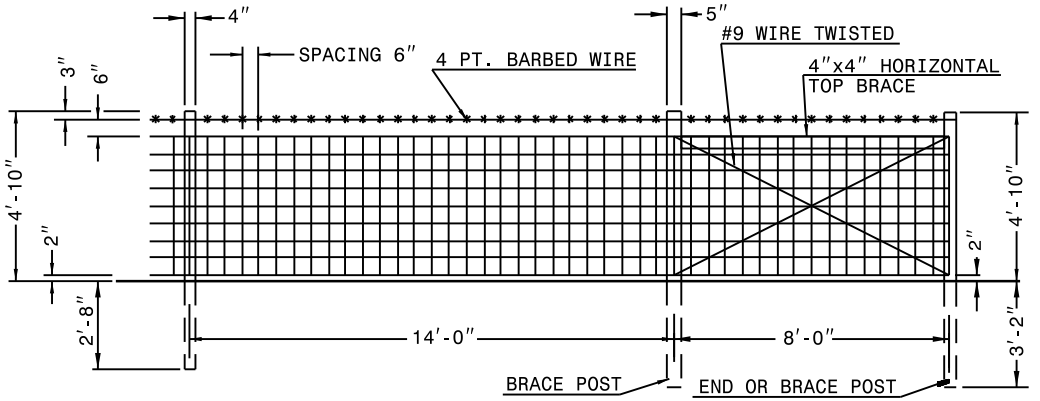
ROADWAY STANDARD DRAWING FOR

CHAIN LINK FENCE

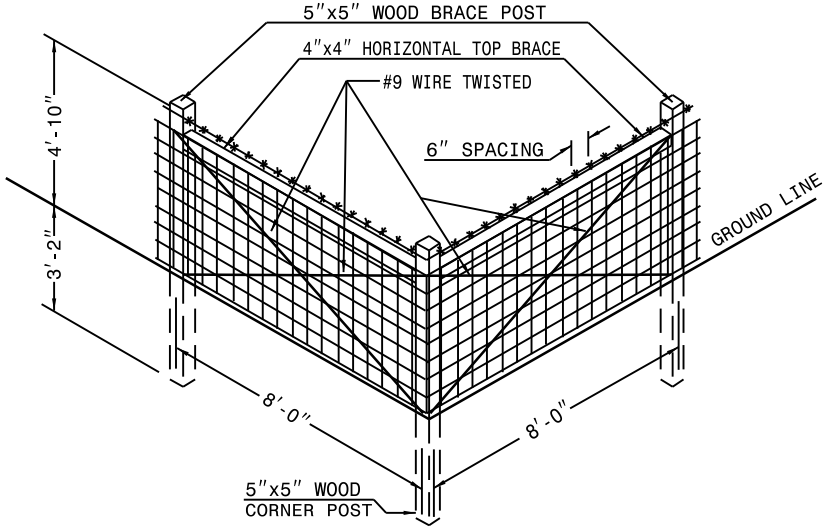
4′, 5′ AND 6′ HIGH FENCE

SHEET 3 OF 3

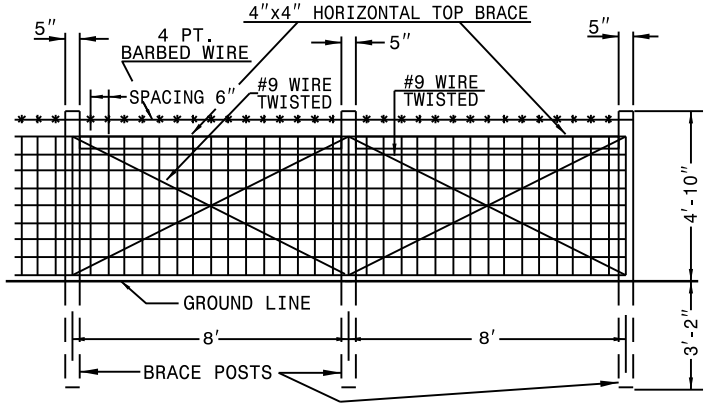
866.01



WOVEN WIRE FENCE
END OR GATE LOCATION



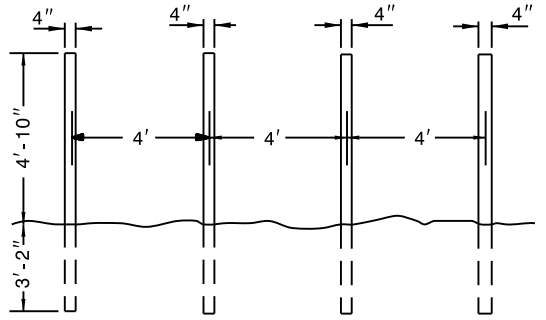
FENCE CORNER
USE WHEN CORNER ANGLE IS 15° OR GREATER



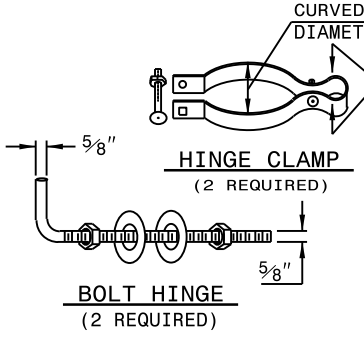
LINE BRACES
(MAXIMUM SPACING 324′)

ERECT LINE BRACES BETWEEN END, CORNER OR GATE POSTS AT INTERVALS NOT EXCEEDING 324 FEET.
THIS MAXIMUM INTERVAL MAY BE REDUCED BY THE ENGINEER ON CURVES WHERE THE DEGREE OF CURVATURE IS GREATER THAN 3 DEGREES.
PLACE LINE BRACES AT THE END OF EACH ROLL OR PIECE OF WOVEN WIRE.

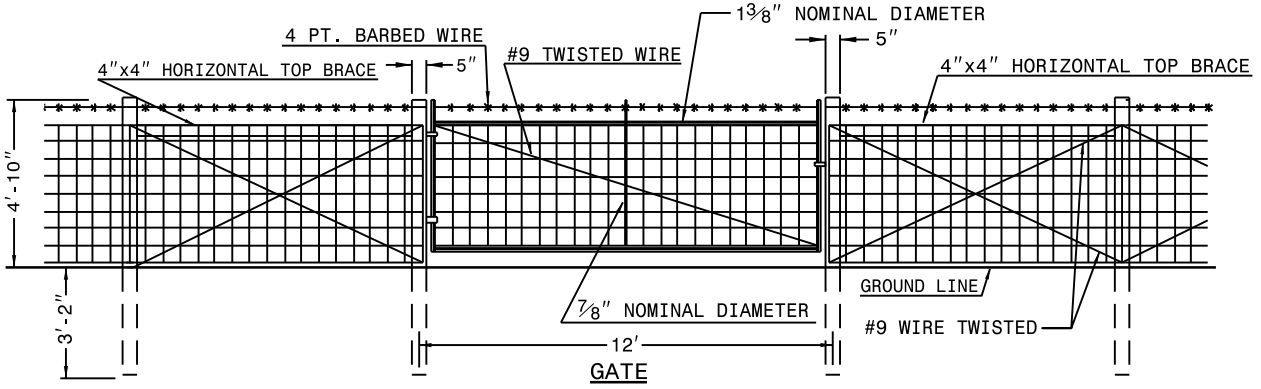
PLACE THE BRACE WIRE AROUND THE POST. DRAW WIRE TAUT BY TWISTING BETWEEN EACH POST. THIS APPLIES TO ALL BRACE WIRES. NOTCH POSTS FOR BRACES.
PLACE TWO GALVANIZED 12d OR THREE GALVANIZED 10d ON ALL BRACES AT EACH END.



POST FOR BLOCKING DRIVEWAYS
OR OTHER ENTRANCES
INSTALL IN ADDITION TO FENCE WHERE SHOWN IN PLANS OR WHERE DIRECTED BY THE ENGINEER



USE LATCH DEVICE APPROVED BY THE ENGINEER.
HINGE ASSEMBLY, AS DETAILED, IS SUGGESTED. SUBSTITUTION MAY BE MADE SUBJECT TO APPROVAL BY THE ENGINEER.
USE 1 3⁄8″ DIAMETER GALVANIZED STEEL PIPE GATE FRAME EXCEPT AS SHOWN HERE.



GATE

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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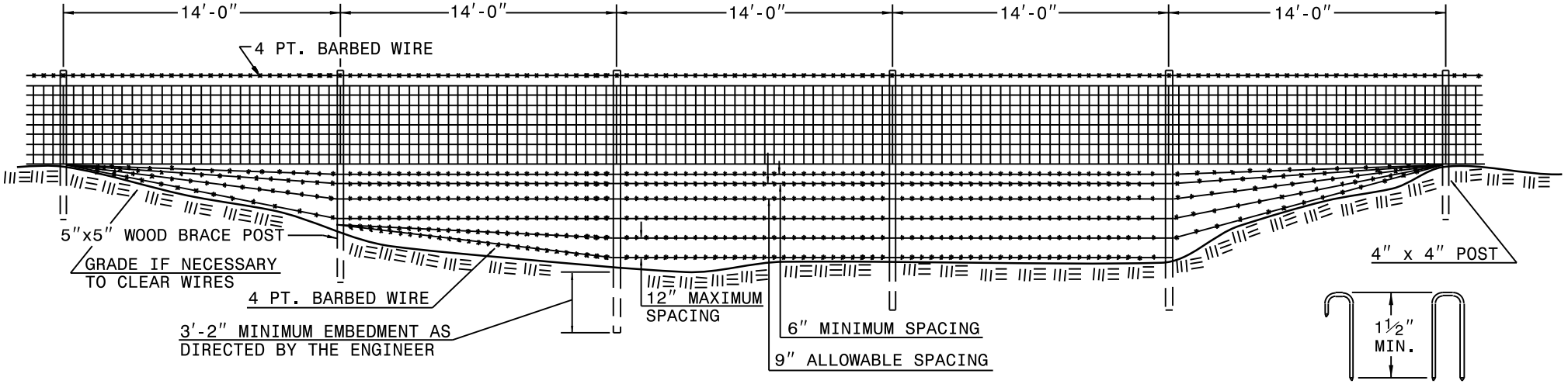
ROADWAY STANDARD DRAWING FOR
WOVEN WIRE FENCE
WITH WOOD POST

SHEET 1 OF 3

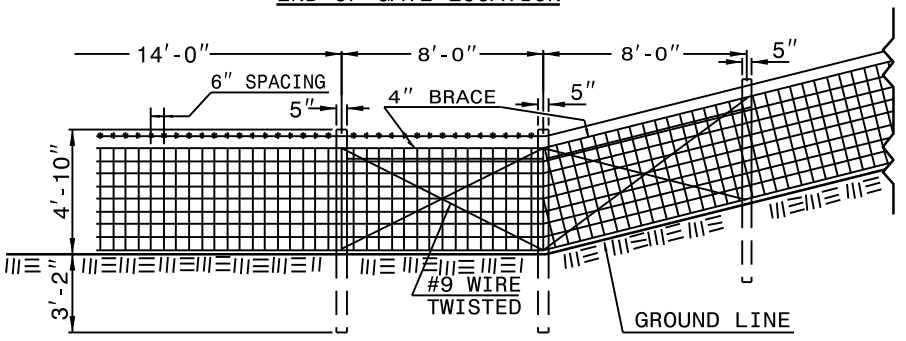
866.02

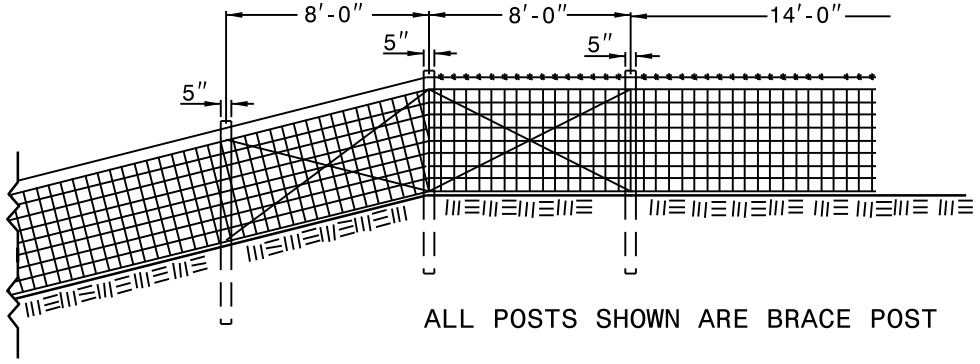


DETAIL OF DITCH CROSSING

ALTERNATE TYPES OF STAPLES
USE ONE #9 STAPLE OR TWO #16 STAPLES
AT EACH POINT OF ATTACHMENT.

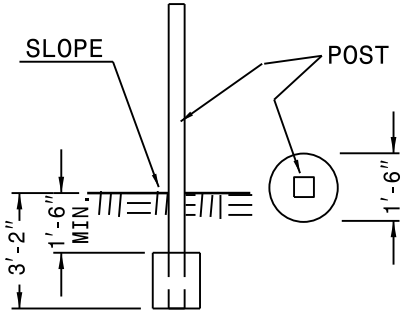
WOVEN WIRE FENCE
END OF GATE LOCATION





ALL POSTS SHOWN ARE BRACE POST

DETAIL SHOWING METHOD OF
CONSTRUCTING FENCE ON SHARP BREAK IN GRADE



DETAIL OF POST ANCHOR

USE AT GATE POSTS OR WHERE REQUIRED
BY SOIL CONDITIONS. MAY ALSO BE USED IN LIEU
OF SETTING POSTS TO A DEPTH OF 3′-2″.

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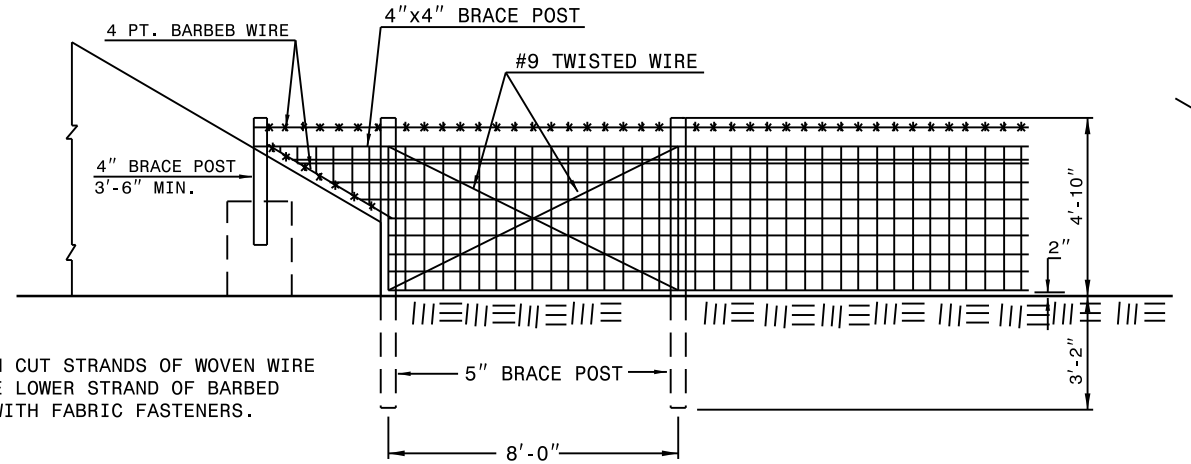
ROADWAY STANDARD DRAWING FOR
WOVEN WIRE FENCE
WITH WOOD POST

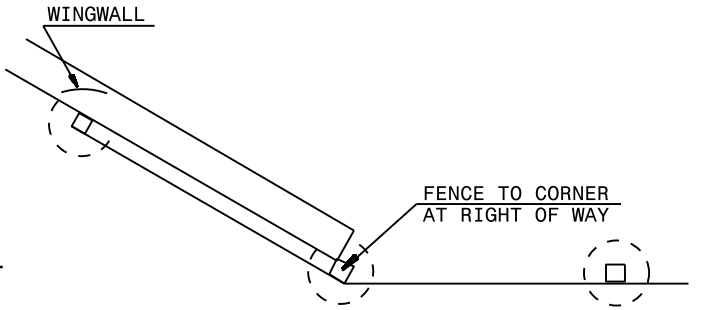
SHEET 2 OF 3

866.02



FASTEN CUT STRANDS OF WOVEN WIRE TO THE LOWER STRAND OF BARBED WIRE WITH FABRIC FASTENERS.

ELEVATION



PLAN

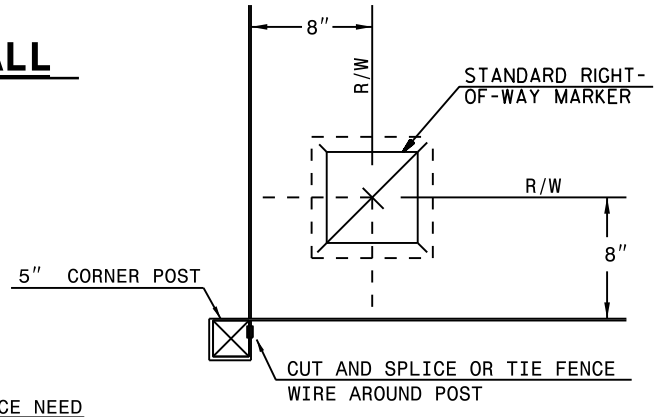
METHOD OF TYING FENCE TO HEADWALL

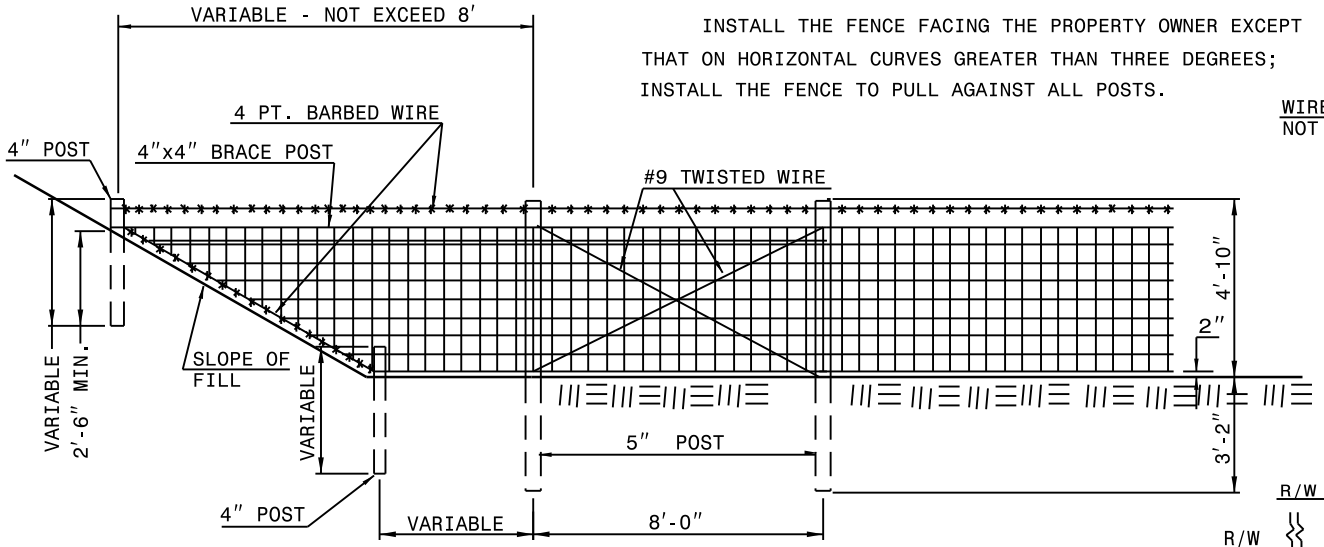
GENERAL NOTES:

ALL POSTS AND BRACES MAY BE EITHER ROUND OR SQUARE AT THE OPTION OF THE CONTRACTOR, PROVIDED THE SAME TYPE IS USED THROUGHOUT THE PROJECT FOR POST AND BRACE.

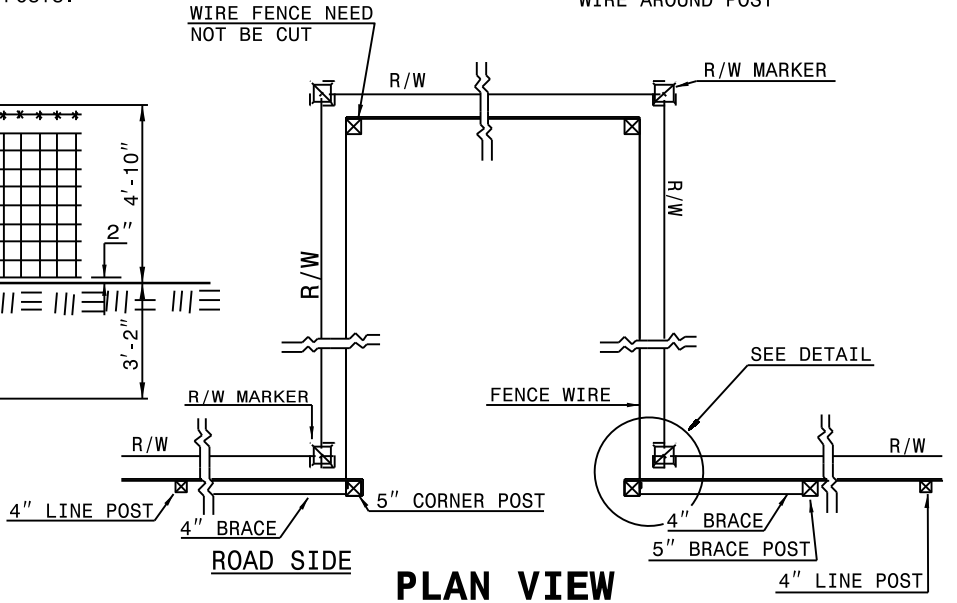
DIMENSIONS SHOWN ARE THE DIAMETER OF ROUND POSTS OR EDGE DIMENSIONS OF SQUARE POSTS.

INSTALL THE FENCE FACING THE PROPERTY OWNER EXCEPT THAT ON HORIZONTAL CURVES GREATER THAN THREE DEGREES; INSTALL THE FENCE TO PULL AGAINST ALL POSTS.





METHOD OF ERECTING FENCE FOR FILL SLOPE



PLAN VIEW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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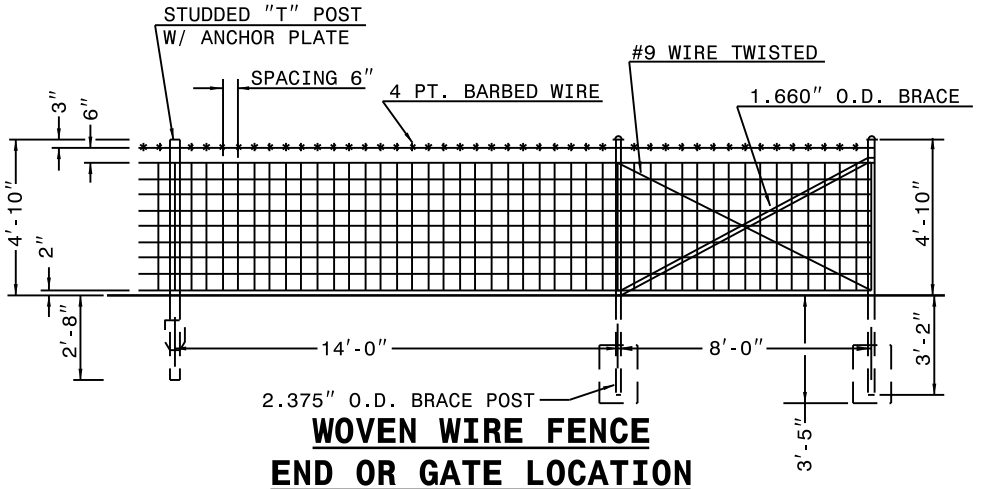
ROADWAY STANDARD DRAWING FOR

WOVEN WIRE FENCE

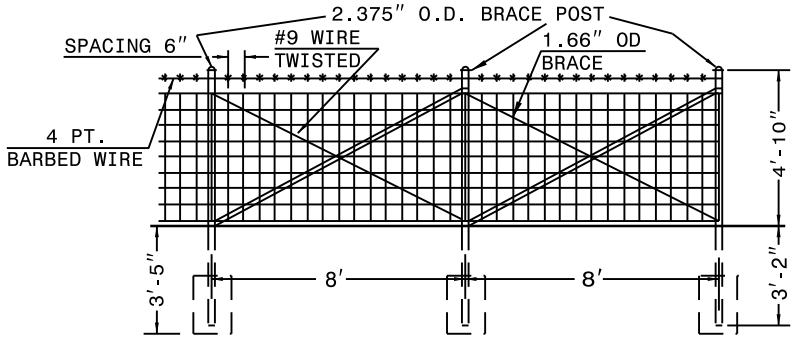
WITH WOOD POST

SHEET 3 OF 3

866.02



WOVEN WIRE FENCE END OR GATE LOCATION



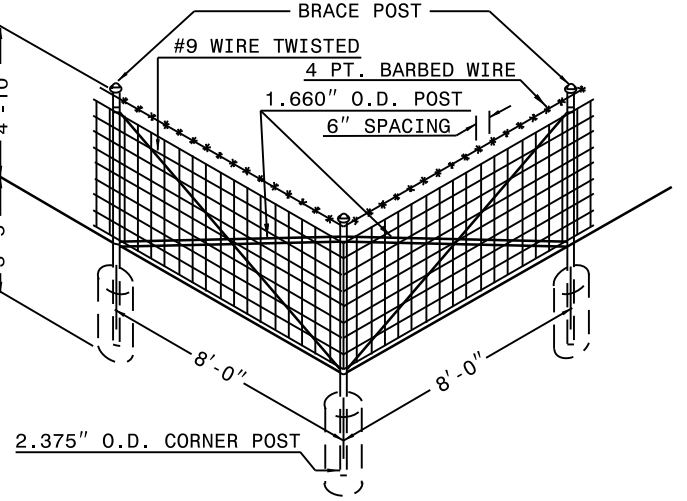
LINE BRACES

PLACE THE BRACE WIRE AROUND THE POST. DRAW THE WIRE TAUT BY TWISTING BETWEEN EACH POST. THIS APPLIES TO ALL BRACE WIRES.

ERECT LINE BRACES BETWEEN END, CORNER OR GATE POSTS AT INTERVALS NOT EXCEEDING 324 FEET.

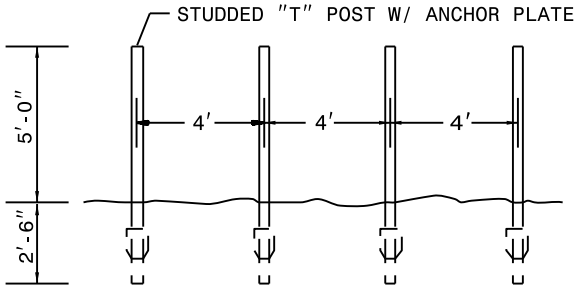
THIS MAXIMUM INTERVAL MAY BE REDUCED BY THE ENGINEER ON CURVES WHERE THE DEGREE OF CURVATURE IS GREATER THAN 3 DEGREES.

PLACE LINE BRACES AT THE END OF EACH ROLL OR PIECE OF WOVEN WIRE.



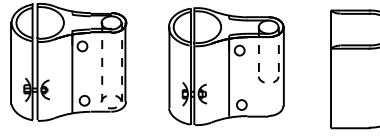
FENCE CORNER

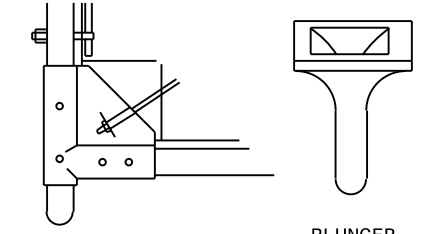
USE WHEN CORNER ANGLE IS 15° OR GREATER

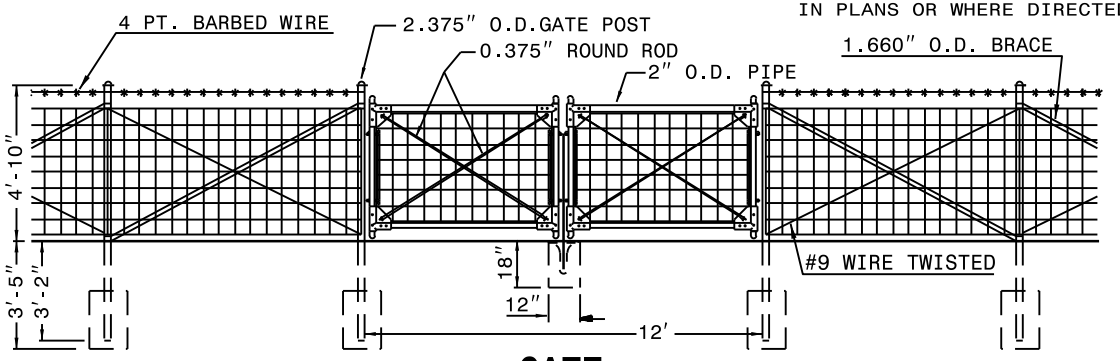


POST FOR BLOCKING DRIVEWAYS AND OTHER ENTRANCES

INSTALL IN ADDITION TO FENCE WHERE SHOWN IN PLANS OR WHERE DIRECTED BY THE ENGINEER







GATE

USE LATCH DEVICE APPROVED BY THE ENGINEER. HINGE ASSEMBLY, AS DETAILED, IS SUGGESTED. SUBSTITUTION MAY BE MADE SUBJECT TO THE APPROVAL OF THE ENGINEER.

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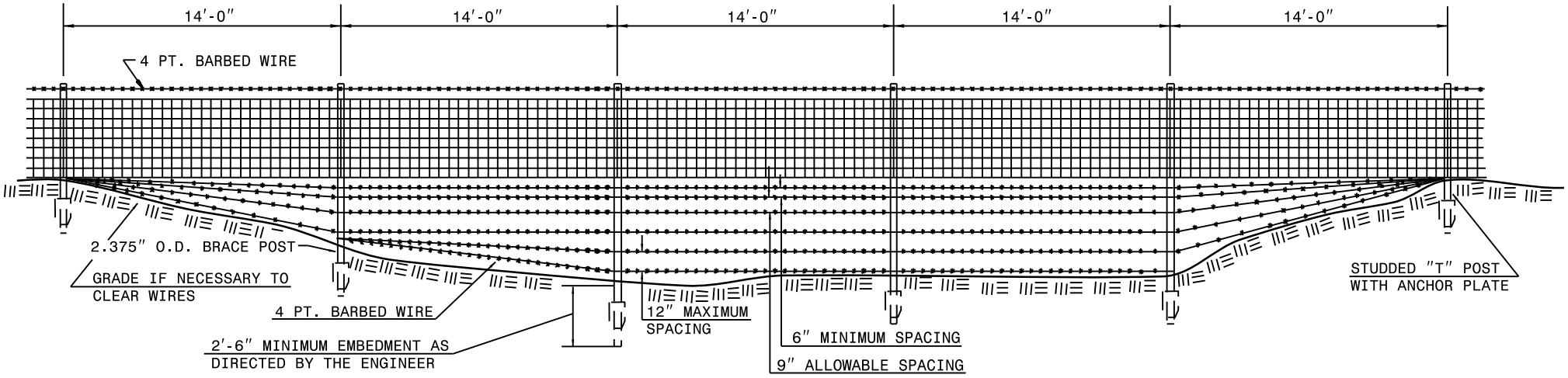
ROADWAY STANDARD DRAWING FOR

WOVEN WIRE FENCE

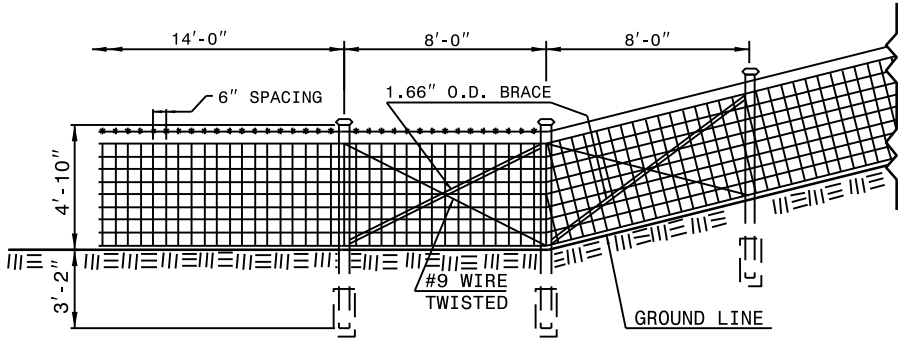
WITH STEEL POST

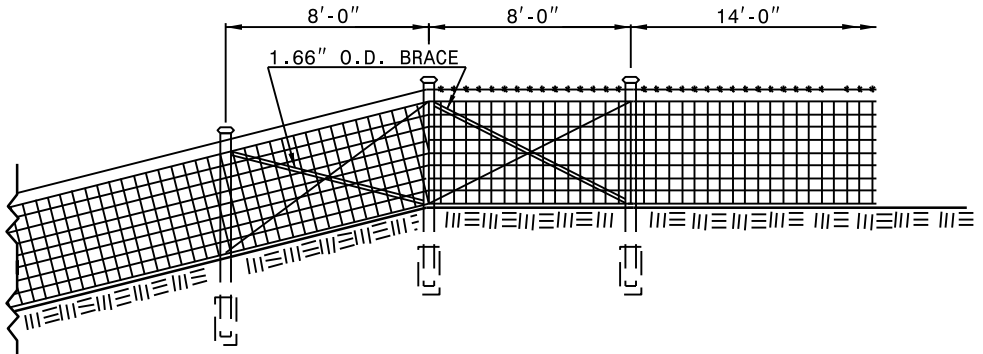
SHEET 1 OF 3

866.03



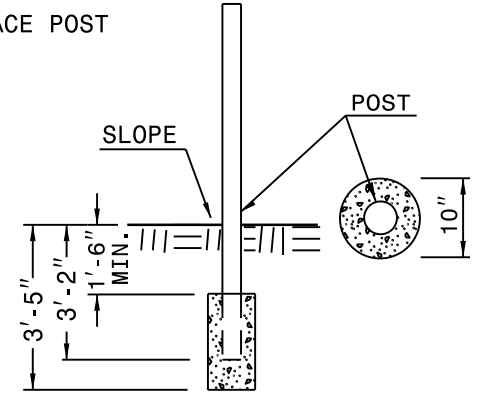
DETAIL OF DITCH CROSSING





ALL POSTS SHOWN ARE BRACE POST

DETAIL SHOWING METHOD OF CONSTRUCTING FENCE ON SHARP BREAK IN GRADE



DETAIL OF POST ANCHOR

USE CONCRETE FOOTING ON ALL CORNER, END, GATE AND BRACE POSTS.

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ROADWAY STANDARD DRAWING FOR

WOVEN WIRE FENCE

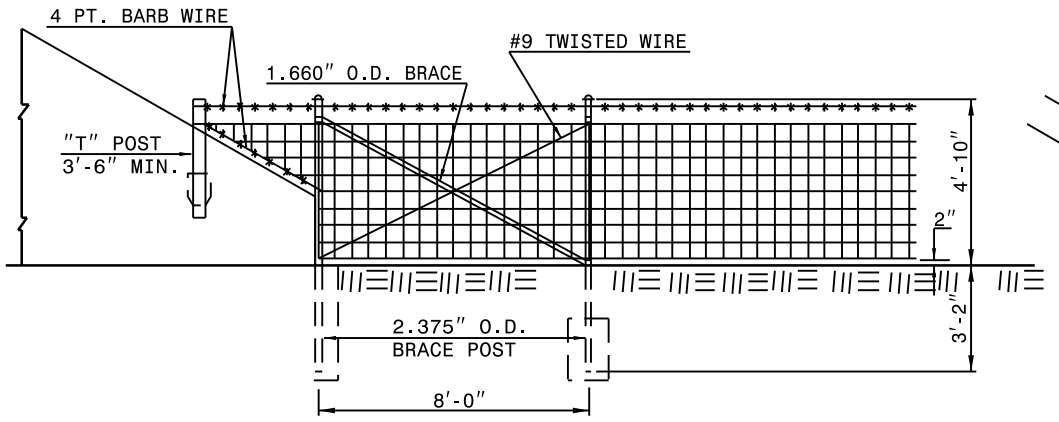
WITH STEEL POST

SHEET 2 OF 3

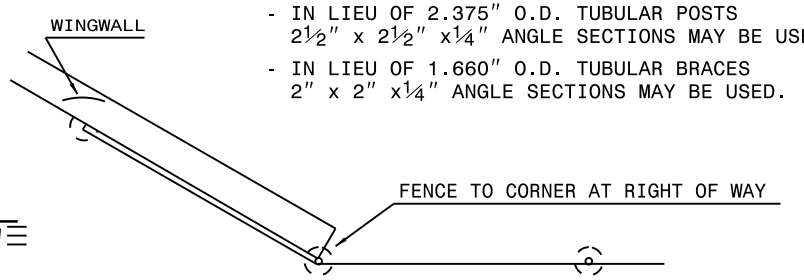
866.03

GENERAL NOTES:

- INSTALL THE FENCE FACING THE PROPERTY OWNER EXCEPT ON HORIZONTAL CURVES GREATER THAN THREE DEGREES, INSTALL THE FENCE TO PULL AGAINST ALL POSTS.
- IN LIEU OF 2.375″ O.D. TUBULAR POSTS 2½″ x 2½″ x¼″ ANGLE SECTIONS MAY BE USED.
- IN LIEU OF 1.660″ O.D. TUBULAR BRACES 2″ x 2″ x¼″ ANGLE SECTIONS MAY BE USED.

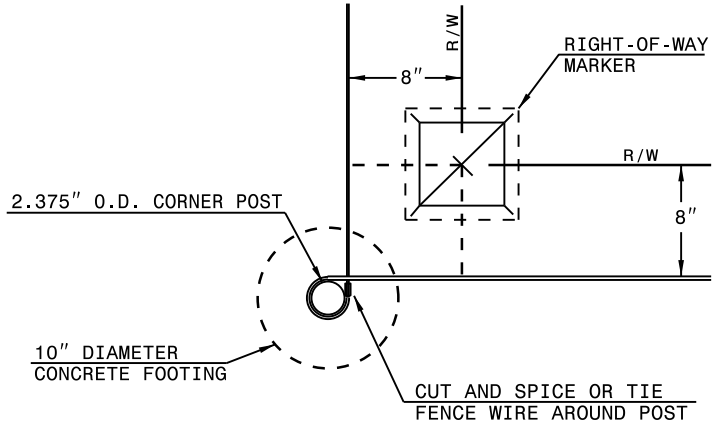


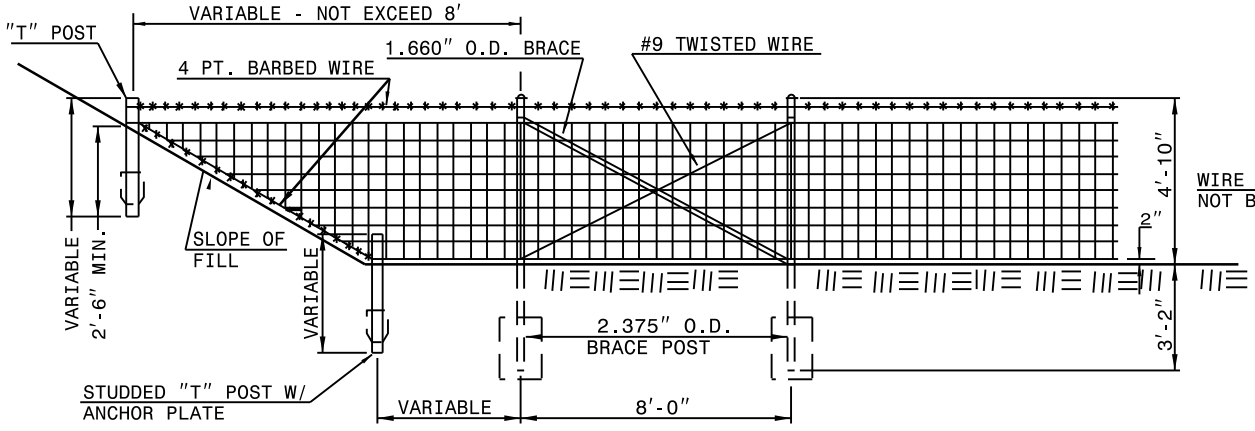
ELEVATION



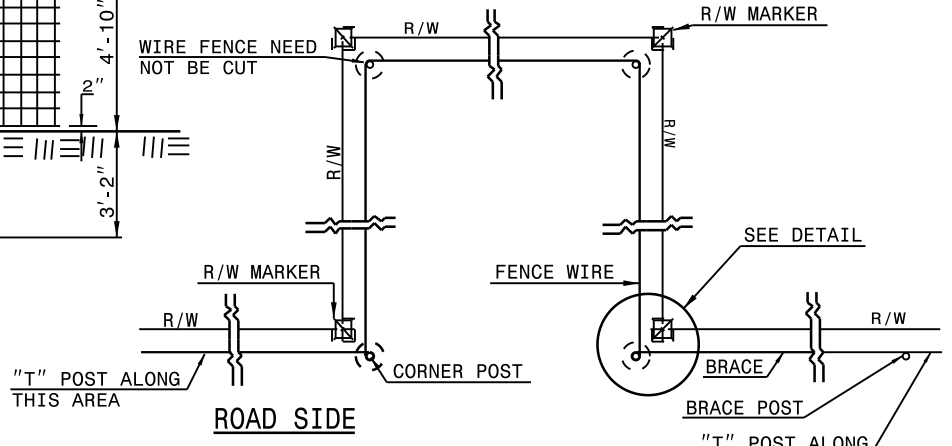
PLAN

METHOD OF TIEING FENCE TO HEADWALL





MEHTOD OF ERECTING FENCE FOR FILL SLOPE



ROAD SIDE

PLAN VIEW

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

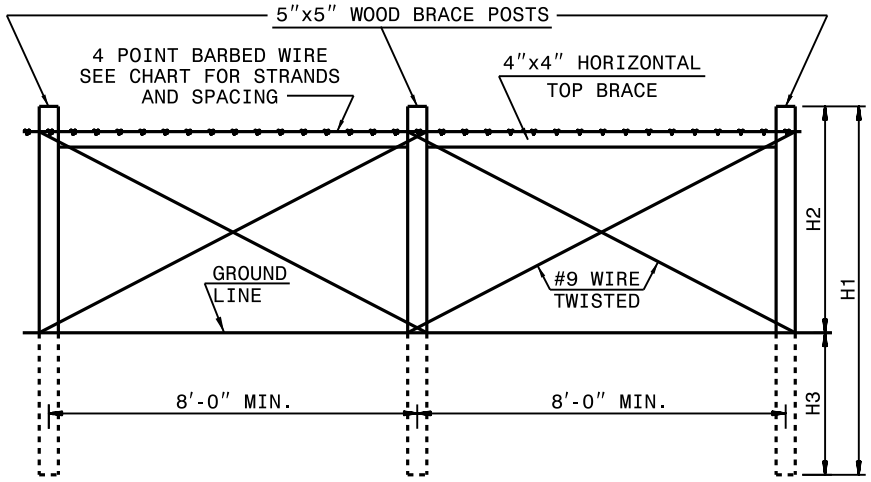
ROADWAY STANDARD DRAWING FOR

WOVEN WIRE FENCE

WITH STEEL POST

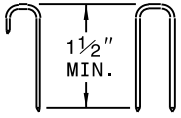
SHEET 3 OF 3

866.03



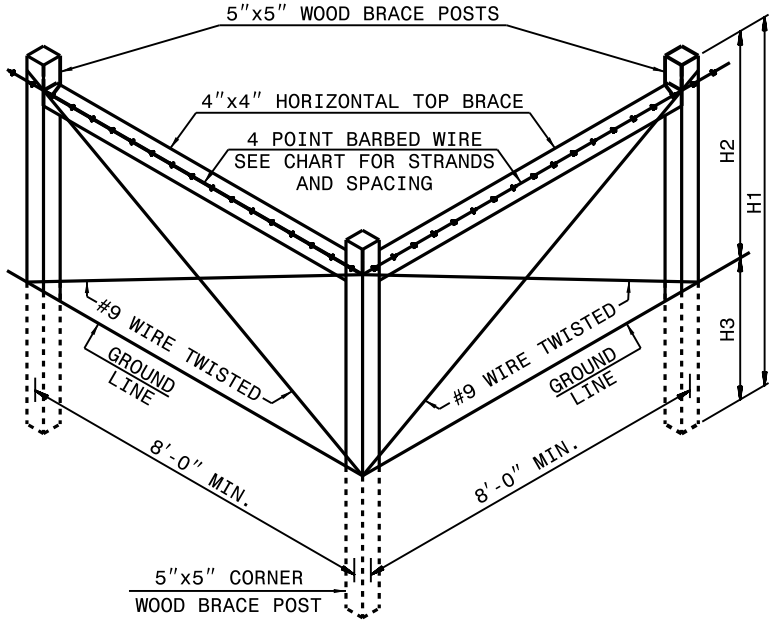
LINE BRACES

(MAXIMUM SPACING 330′)



ALTERNATE TYPES OF STAPLES

USE ONE #9 STAPLE OR TWO #16 STAPLES
AT EACH POINT OF ATTACHMENT.

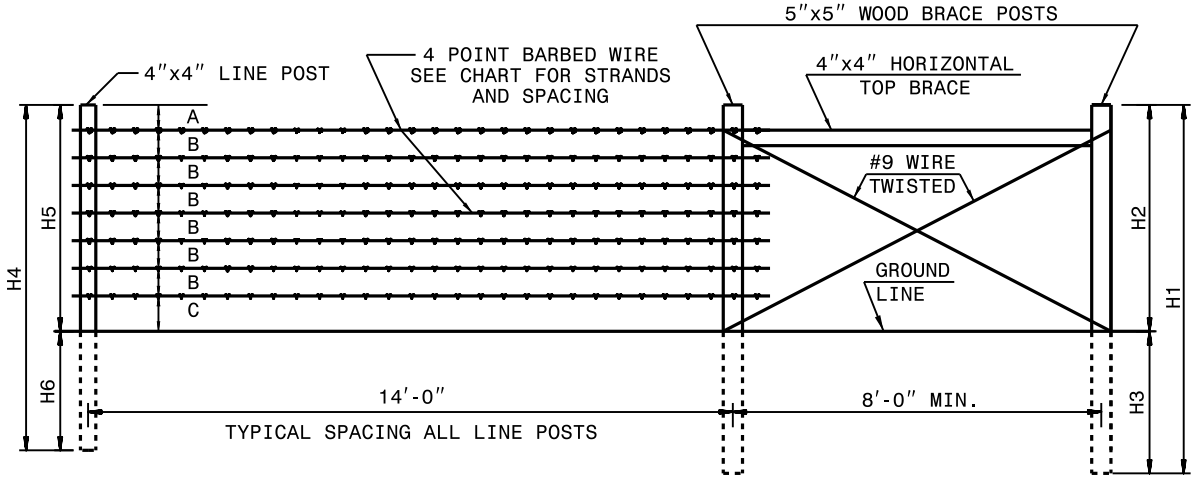


CORNER BRACE

USE WHEN CORNER ANGLE IS 15° OR GREATER

BARBED WIRE FENCE CHART

NUMBER OF BARBED WIRE STRANDS			2	3	4	5	6	7
STRAND SPACING		A	8″	4″	3″	3″	3″	3″
		B	12″	12″	15″	12″	10″	8″
		C	21″	13″	11″	8″	6″	8″
BRACE POSTS	LENGTH	H1	6′-0″	6′-0″	8′-0″	8′-0″	8′-0″	8′-0″
	EXPOSED	H2	3′-5″	3′-5″	4′-11″	4′-11″	4′-11″	4′-11″
	EMBEDMENT	H3	2′-7″	2′-7″	3′-1″	3′-1″	3′-1″	3′-1″
LINE POSTS	LENGTH	H4	6′-0″	6′-0″	7′-6″	7′-6″	7′-6″	7′-6″
	EXPOSED	H5	3′-5″	3′-5″	4′-11″	4′-11″	4′-11″	4′-11″
	EMBEDMENT	H6	2′-7″	2′-7″	2′-7″	2′-7″	2′-7″	2′-7″
HORIZONTAL BRACE		---	8′-0″	8′-0″	8′-0″	8′-0″	8′-0″	8′-0″



END OR GATE BRACES

STATE OF
NORTH CAROLINA
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RALEIGH, N.C.

1-18

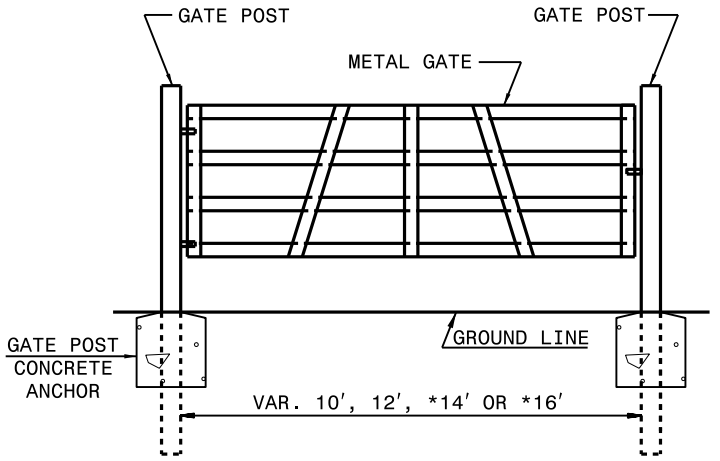
ROADWAY STANDARD DRAWING FOR

BARBED WIRE FENCE

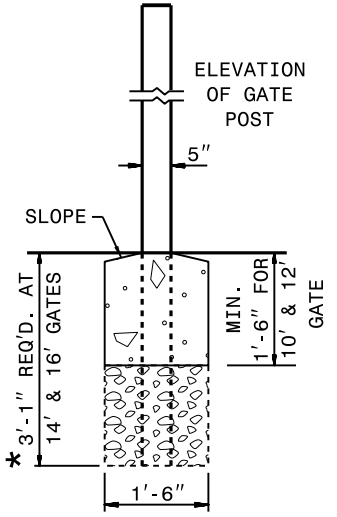
WITH WOOD POSTS

SHEET 1 OF 2

866.04



ALTERNATE CATTLE GATE



DETAIL OF GATE POST ANCHOR

USE CLASS "B" CONCRETE AT GATE POSTS OR WHERE REQUIRED BY SOIL CONDITIONS. CONCRETE MAY ALSO BE USED IN LIEU OF SETTING POSTS TO THEIR MAXIMUM DEPTH.

GENERAL NOTES:

ALL POSTS AND BRACES MAY BE EITHER ROUND OR SQUARE AT THE OPTION OF THE CONTRACTOR, PROVIDED THE SAME TYPE IS USED THROUGHOUT THE PROJECT.
DIMENSIONS SHOWN ARE THE DIAMETER OF ROUND OR EDGE DIMENSIONS OF SQUARE POSTS AND BRACES.

ERECT LINE BRACES BETWEEN END, CORNER OR GATE POSTS. PLACE LINE BRACES AT INTERVALS NOT EXCEEDING 330′ AND AT THE END OF THE BARBED WIRE ROLL.

THE 330′ INTERVAL MAY BE REDUCED BY THE ENGINEER ON CURVES WHERE THE DEGREE OF CURVATURE IS GREATER THAN 3 DEGREES.

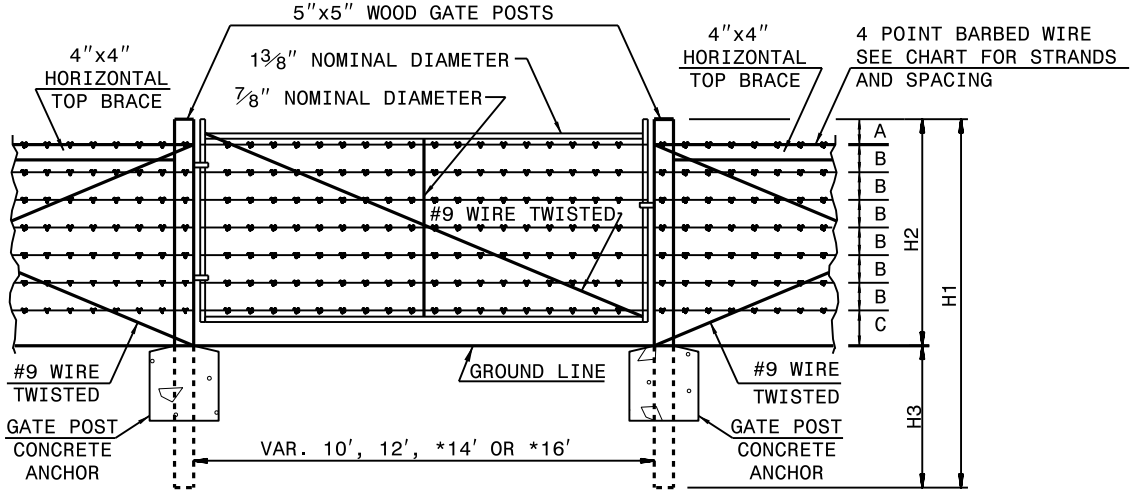
NOTCH BRACE POSTS 1″ MINIMUM FOR HORIZONTAL BRACES. PLACE TWO GALVANIZED 12d OR THREE GALVANIZED 10d NAILS AT EACH END OF ALL BRACES.

PLACE THE BRACE WIRE AROUND THE POST. DRAW ALL BRACE WIRE TAUT BY TWISTING BETWEEN EACH POST.

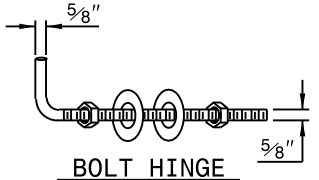
INSTALL THE FENCE FACING THE PROPERTY OWNER EXCEPT THAT ON HORIZONTAL CURVES GREATER THAN THREE DEGREES (3°) INSTALL THE FENCE TO PULL AGAINST ALL POSTS. SEE STD. 866.02 FOR FENCING AT DITCH CROSSINGS, BREAKS IN GRADES AND R/W BREAKS.

USE LATCH DEVICE APPROVED BY THE ENGINEER. HINGE ASSEMBLY AS SHOWN IS SUGGESTED. SUBSTITUTION MAY BE SUBJECT TO APPROVAL BY THE ENGINEER. USE 1 3/8″ DIAMETER GALVANIZED STEEL PIPE FOR GATE FRAME EXCEPT AS SHOWN HERE.

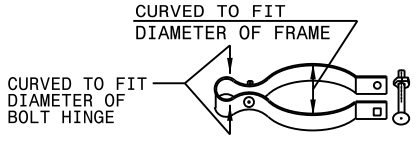
ANY COMBINATION OF GATE AND FENCE TYPE MEETING THE APPROVAL OF THE ENGINEER IS ACCEPTABLE AND IS NOT LIMITED TO THE EXAMPLES SHOWN HEREON.



GATE



BOLT HINGE
(2 REQUIRED)



HINGE CLAMP
(2 REQUIRED)

HINGE ASSEMBLY

STATE OF NORTH CAROLINA
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RALEIGH, N.C.

1-18

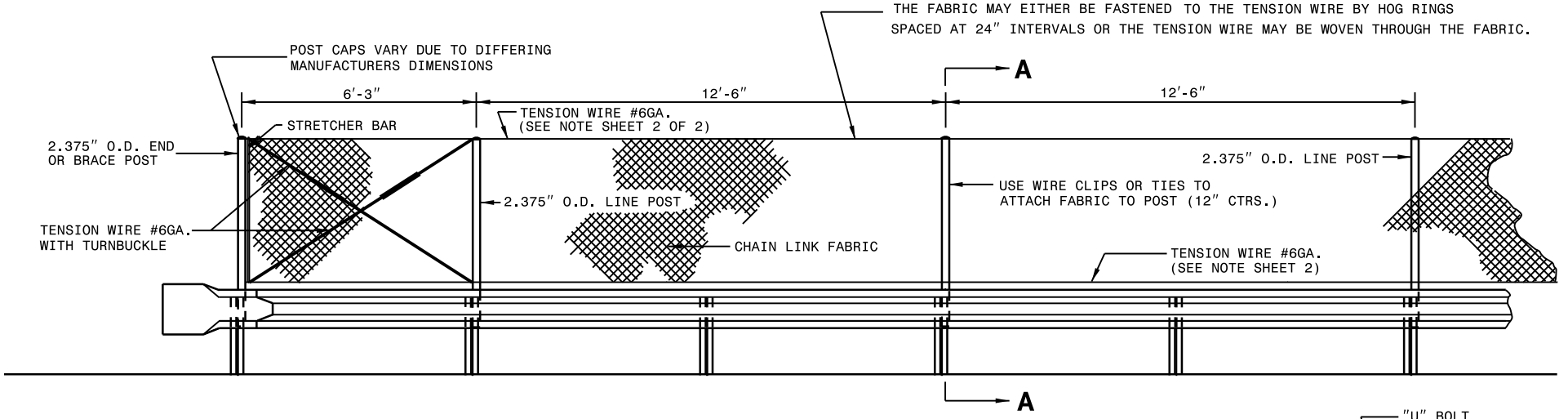
ROADWAY STANDARD DRAWING FOR

BARBED WIRE FENCE

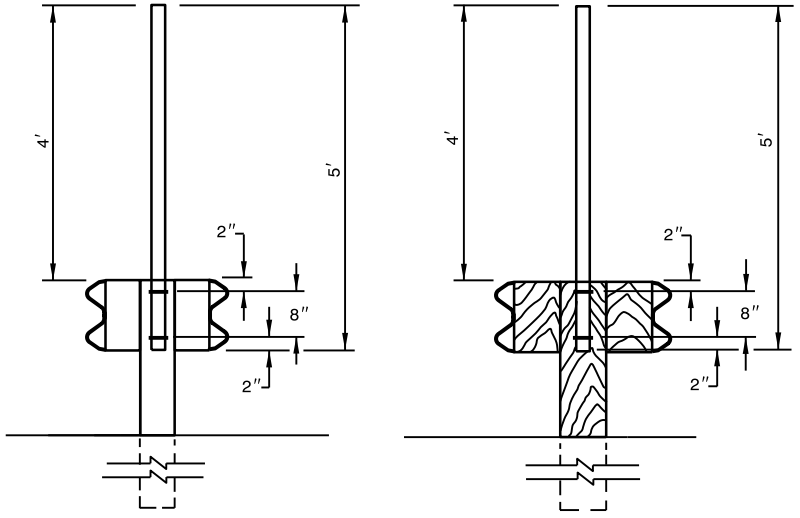
WITH WOOD POSTS

SHEET 2 OF 2

866.04

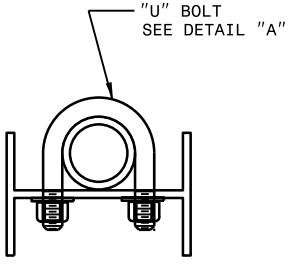


ELEVATION

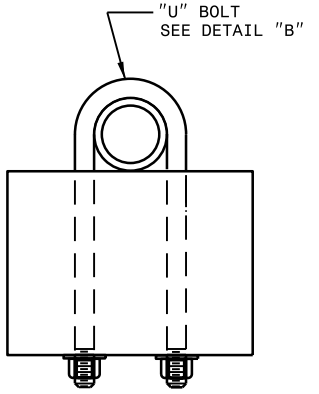


SECTION A-A

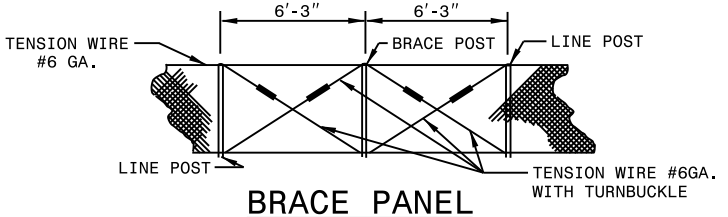
ALTERNATE SECTION A-A



POST MOUNTING TO STEEL GUARDRAIL W6 POST

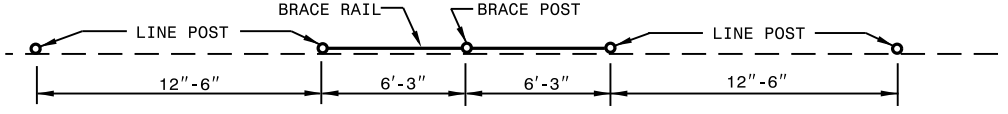


POST MOUNTING TO WOOD GUARDRAIL 6″ X 8″ POST



BRACE PANEL ELEVATION

NOTE:
ERECT BRACE PANEL BETWEEN ENDS AT INTERVALS NOT EXCEEDING 350 FT. ERECT ADDITIONAL BRACE POSTS IF SO DIRECTED BY THE ENGINEER. BRACE THE POSTS FROM BOTH SIDES OF POSTS.



PLAN OF BRACE PANEL

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

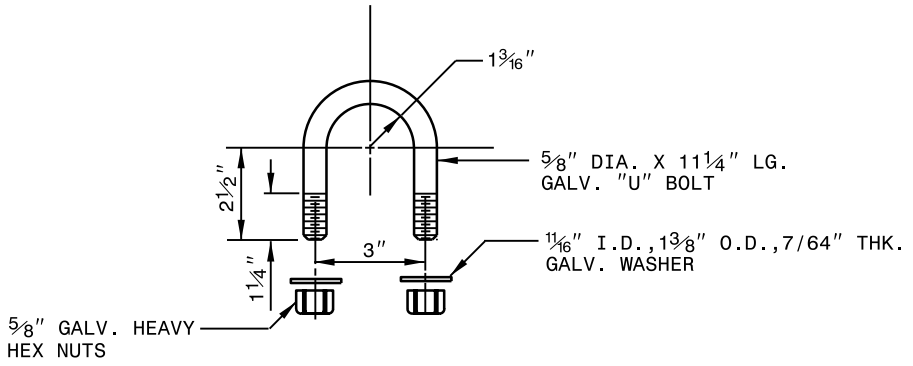
ROADWAY STANDARD DRAWING FOR

GLARE SCREEN

CHAIN LINK FABRIC/GUARDRAIL MOUNTED

SHEET 1 OF 2

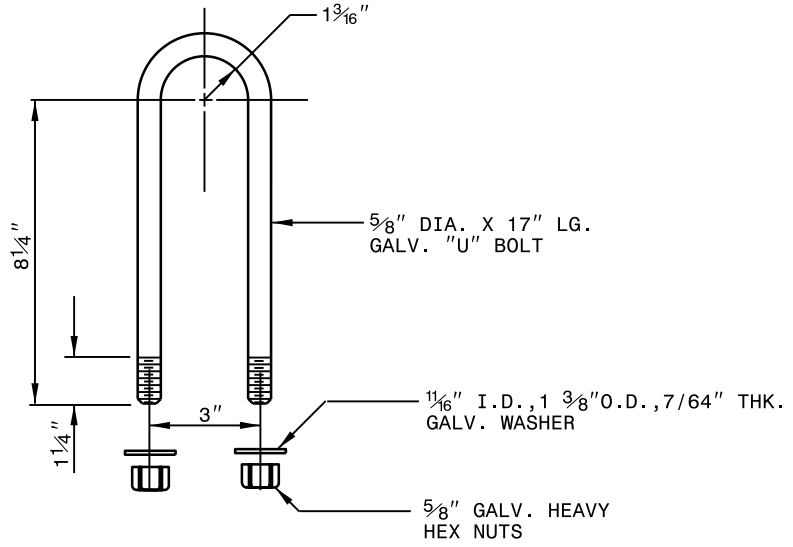
866.05



DETAIL-A

NOTES: VINYL COATED GLARE SCREEN

1. USE CHAIN LINK FABRIC 48" WIDE, 1/2" MESH, 11 1/2 GA. HOT DIPPED GALVANIZED STEEL WIRE VINYL COATED SHERWOOD GREEN.
2. USE END (BRACE) POST, LINE POST AND BRACE RAIL GALVANIZED STEEL PIPE VINYL COATED SHERWOOD GREEN.
3. USE FITTINGS AND OTHER APPURTENANCES ALUMINUM ALLOY, GALVANIZED PRESSED STEEL, MALLEABLE OR CAST STEEL VINYL COATED SHERWOOD GREEN. PAINTED FITTINGS ARE NOT ACCEPTABLE.
4. USE TENSION WIRE GALVANIZED STEEL ASTM A752 GRADE 1335 OR 5140 VINYL COATED SHERWOOD GREEN.
5. USE HOG RINGS 9 GA. AND VINYL COATED SHERWOOD GREEN.
6. USE TIRE WIRE 9 GA. GALVANIZED STEEL WIRE VINYL COATED SHERWOOD GREEN.



DETAIL-B

NOTES: GALVANIZED GLARE SCREEN

1. USE CHAIN LINK FABRIC 48" WIDE, 1/2" MESH, 11 1/2 GA. HOT DIPPED GALVANIZED STEEL WIRE.
2. USE END (BRACE) POST, LINE POST AND BRACE RAIL GALVANIZED STEEL PIPE.
3. USE FITTINGS AND OTHER APPURTENANCES GALVANIZED PRESSED STEEL, MALLEABLE OR CAST STEEL.
4. USE TENSION WIRE GALVANIZED STEEL ASTM A752 GRADE 1335 OR 5140.
5. USE HOG RINGS 9 GA.
6. USE TIRE WIRE 9 GA. GALVANIZED STEEL WIRE.

1-18

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

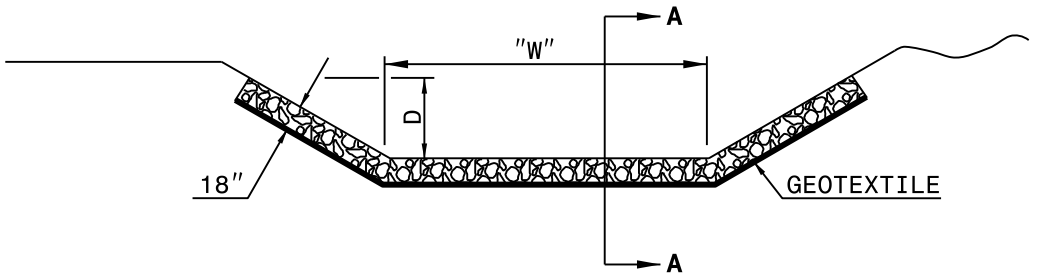
ROADWAY STANDARD DRAWING FOR

GLARE SCREEN

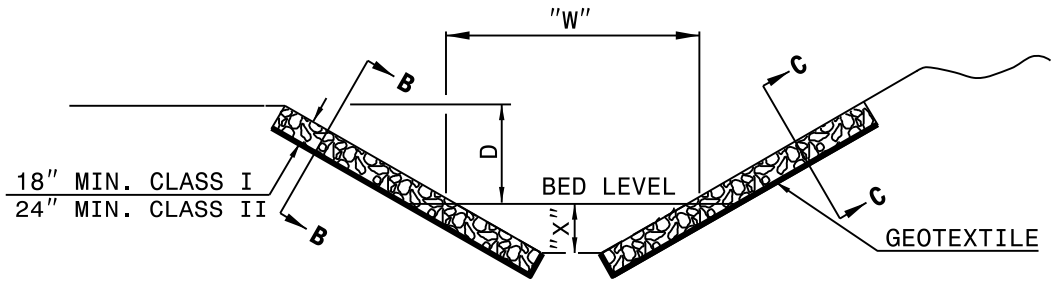
CHAIN LINK FABRIC-GUARDRAIL MOUNTED

SHEET 2 OF 2

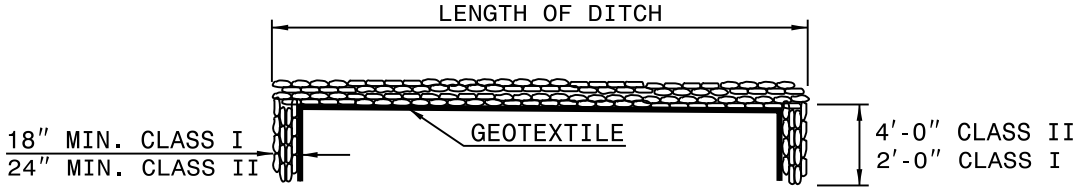
866.05



CHANNEL WITH CLASS I RIP RAP*



CHANNEL WITH CLASS I OR CLASS II RIP RAP



LONGITUDINAL SECTION A-A, B-B OR C-C

GENERAL NOTES:
1. USE RIP-RAP IN CHANNEL BED WHERE SHOWN ON PLANS.
2. IF BEDROCK IS ENCOUNTERED WITHIN THE LIMITS OF THE TOEWALL, BEGIN TOEWALL ON THE BEDROCK OR AS DIRECTED BY THE ENGINEER.
3. WHERE ONLY ONE SIDE REQUIRES RIP-RAP I OR 'II' LIST STATION AND SIDE OF SAME.

CLASS I	
*"W"	"X"
0'-5'	BED LEVEL
6'-10'	12"
11'-20'	18"

*FOR "V" DITCH "W" IS 0'

CLASS II	
"W"	"X"
ALL	36"

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STATE OF NORTH CAROLINA
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RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR

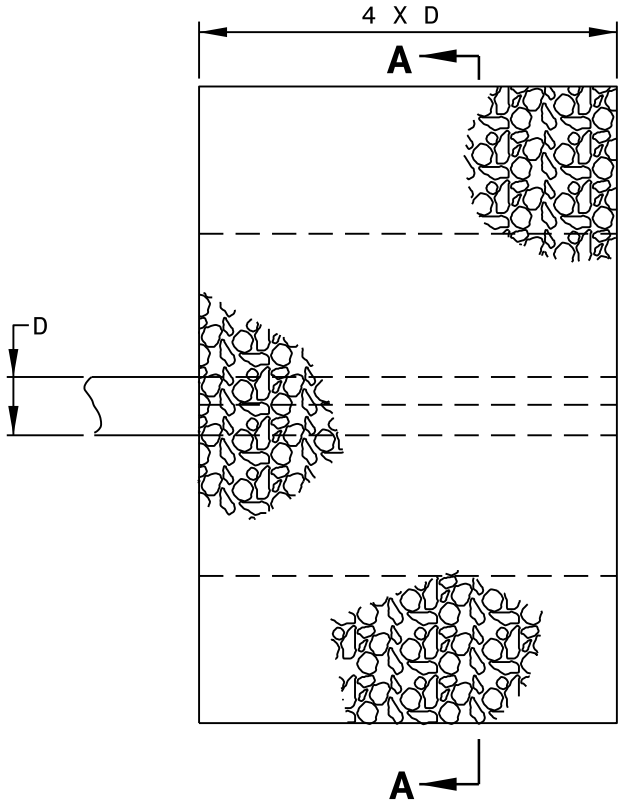
RIP RAP IN CHANNELS

SHEET 1 OF 1

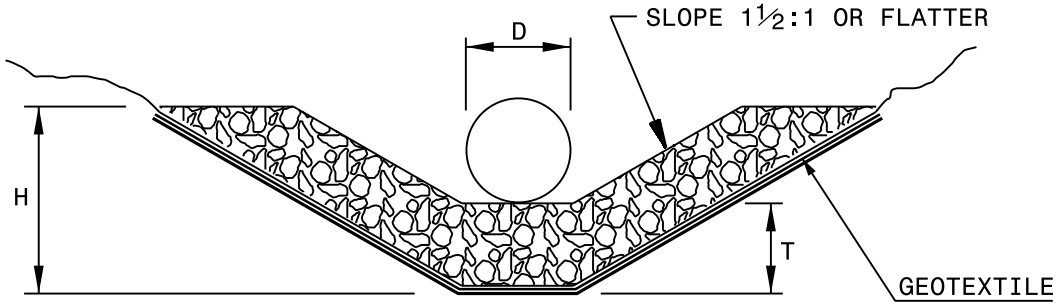
876.01

D	OUTLET W/DITCH					OUTLET W/O DITCH				
	CLASS 'B' RIP RAP		CLASS I RIP RAP			CLASS 'B' RIP RAP		CLASS I RIP RAP		
	TONS	GEO-TEXTILE (S.Y.)	S.Y.	TONS	GEO-TEXTILE (S.Y.)	TONS	GEO-TEXTILE (S.Y.)	S.Y.	TONS	GEO-TEXTILE (S.Y.)
12″	2	5	5	2	5	1	4	2	1	4
15″	2	7	7	3	7	1	5	3	2	6
18″	3	10	9	4	10	2	7	4	2	8
24″	5	14	15	7	15	3	11	7	4	12
30″	8	21	21	11	22	5	16	11	7	17
36″	11	28	29	15	30	7	22	16	10	23
42″	15	37	39	20	39	10	28	22	13	30
48″	-	-	49	26	50	-	-	28	17	38
54″	-	-	60	33	62	-	-	36	21	47
60″	-	-	73	40	75	-	-	44	26	56
66″	-	-	87	48	89	-	-	54	32	67
72″	-	-	102	57	104	-	-	64	38	78

NOTE:
FOR CALCULATION PURPOSES
CLASS 'B' RIP RAP = 100 LBS./FT^3
CLASS I RIP RAP = 105 LBS./FT^3



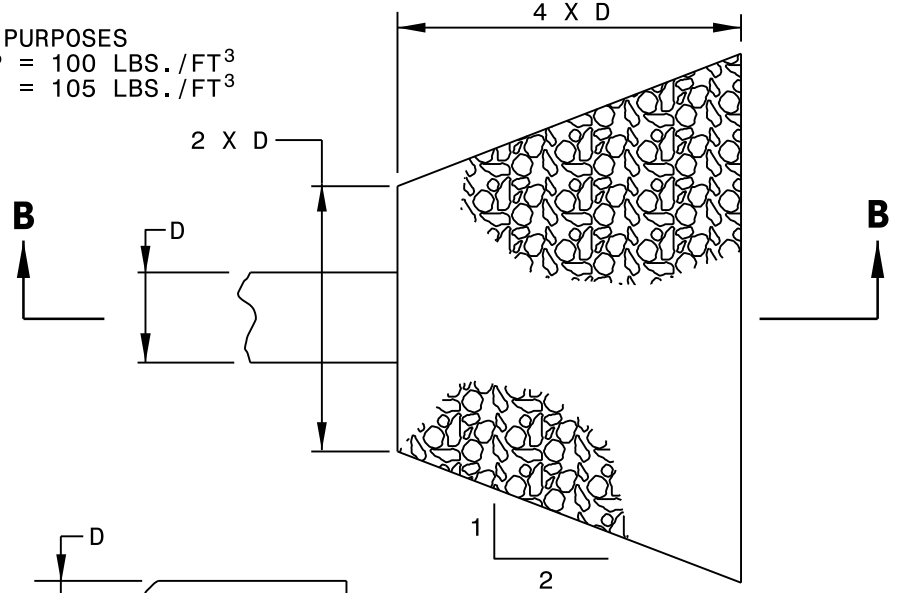
PLAN



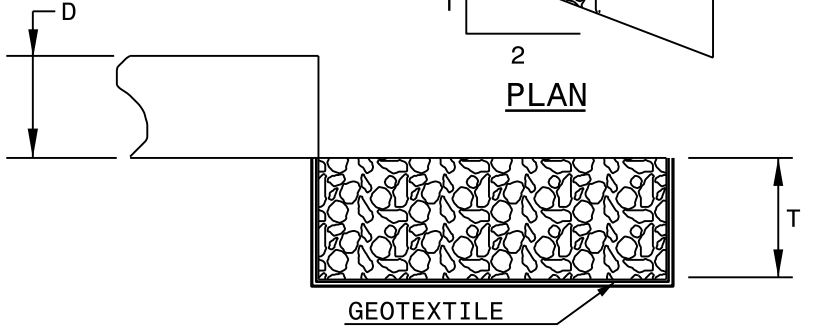
SECTION A-A

PIPE OUTLET WITH DITCH

H= RIP RAP TO TOP OF PIPE (MAX. H = D + T)
T= 15″ CLASS I RIP RAP, UNLESS OTHERWISE SHOWN ON PLANS
T= 12″ CLASS 'B' RIP RAP, UNLESS OTHERWISE SHOWN ON PLANS



PLAN



SECTION B-B

PIPE OUTLET WITHOUT DITCH

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
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RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR

GUIDE FOR RIP RAP AT PIPE OUTLETS

SHEET 1 OF 1

876.02

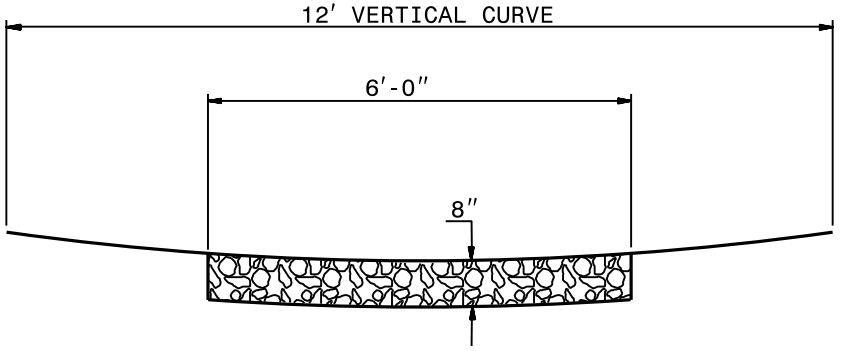
GENERAL NOTES:

-USE CLASS 'A' RIP RAP.

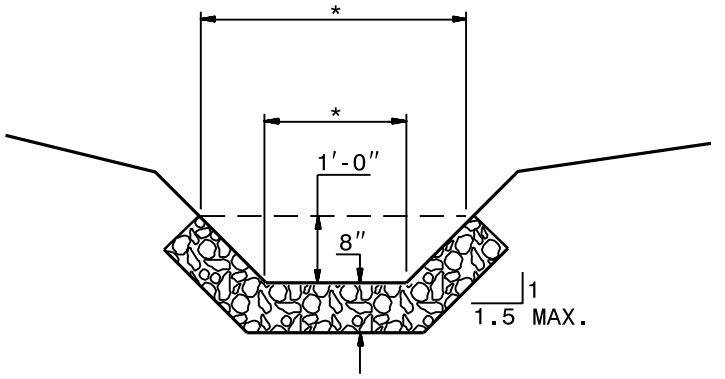
-CONSTRUCT WIDTH AND SHAPE OF THE DITCHES AS SHOWN OR DIRECTED BY THE ENGINEER.

-USE GEOTEXTILE UNDER CLASS 'A' RIP RAP IF SPECIFIED ON PLANS.

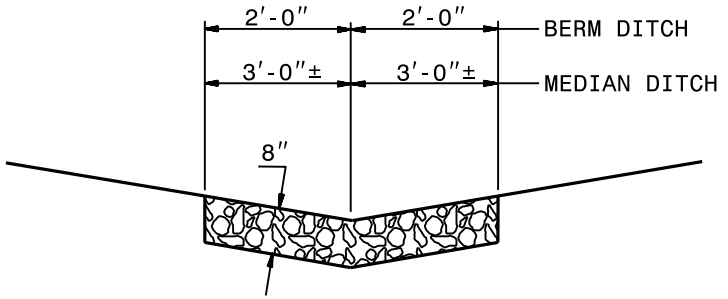
*AS SPECIFIED ON PLANS.



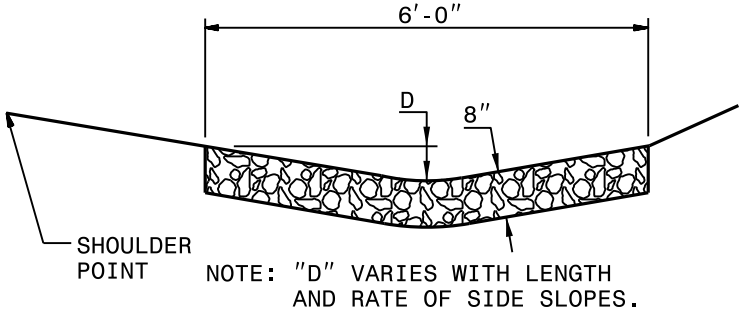
12' V.C. ROADWAY DITCH



SLOPE DRAIN, BASE DITCH OR BERM DRAINAGE OUTLET DITCH



MEDIAN OR BERM DITCH



SIDE DITCH

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR

DRAINAGE DITCHES WITH CLASS 'A' RIP RAP

SHEET 1 OF 1

876.03

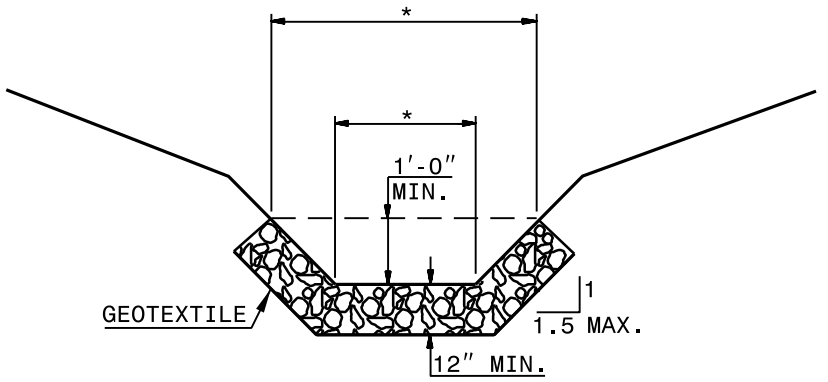
GENERAL NOTES:

-USE CLASS 'B' RIP RAP.

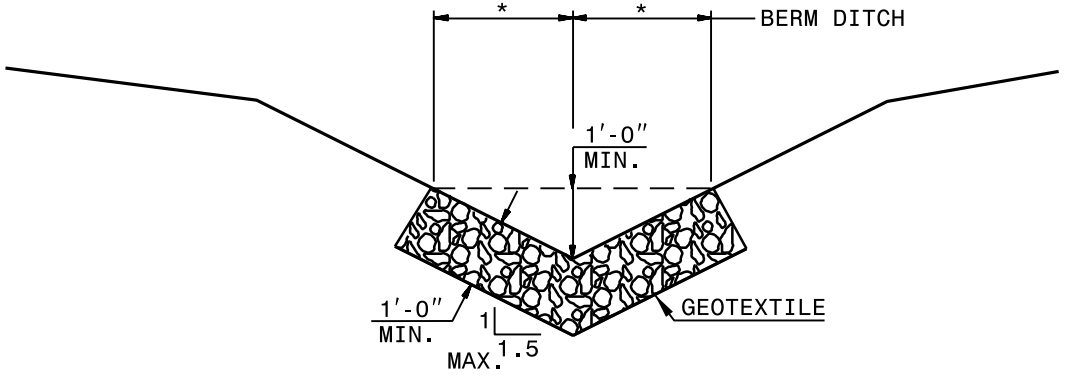
-CONSTRUCT WIDTH AND SHAPE OF THE DITCHES AS SHOWN OR DIRECTED BY THE ENGINEER.

-USE GEOTEXTILE UNDER CLASS 'B' RIP RAP IF SPECIFIED ON PLANS.

*AS SPECIFIED ON PLANS.



SIDE DRAINS, BASE DITCH OR OTHER OUTLET DITCHES



VEE DITCH

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR

DRAINAGE DITCHES WITH CLASS 'B' RIP RAP

SHEET 1 OF 1

876.04