

MINNESOTA DEPARTMENT OF TRANSPORTATION DEVELOPED BY: Design Standards ISSUED BY: Office of Project Management and Technical Support, Design Support Section	TRANSMITTAL LETTER NO. (20-03) MANUAL: Standard Plates DATED: April 22, 2020
SUBJECT: Standard Plates 8308, 8309, and 8332	

The following Standard Plates have been modified:

- 8308 – Reinforced Concrete Median Barrier Type F
- 8309 – Reinforced Concrete Median Barrier Type F & Glare Screen
- 8332 – Anchor Rod Assembly for Light Foundation - Barrier

See attached Summary of Changes for details.

INSTRUCTIONS:

- Record the transmittal letter number, date, and subject on the transmittal record sheet located in the front of the manual. The previous Transmittal Letter number issued for this manual was 20-02, dated March 16, 2020.
- Remove from the Standard Plates manual:
 - Standard Plate Index, Sheets 1-4 of 4, Numerical Index of Standard Plates
 - Standard Plate 8308B
 - Standard Plate 8309B
 - Standard Plate 8332D
- Insert into the Standard Plates manual:
 - Standard Plate Index, Sheets 1-4 of 4, Numerical Index of Standard Plates (April 14, 2020)
 - Standard Plate 8308C, Sheets 1-4 of 4 (April 14, 2020)
 - Standard Plate 8309C, Sheets 1-4 of 4 (April 14, 2020)
 - Standard Plate 8332E (April 14, 2020)
- Current Standard Plates including Transmittal Letters are available on the web at <https://standardplates.dot.state.mn.us/stdplate.aspx>
- Questions regarding this transmittal should be directed to the Design Standards Unit at DesignStandards.dot@state.mn.us



Michael Elle, P.E.
State Design Standards Engineer

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Summary of Changes
Standard Plate 8308C – Reinforced Concrete Median Barrier Type F
Transmittal Letter No. (20-03)

General

1. Plate number incremented from 8308B to 8308C.
2. Minor grammar, clarity, labeling, consistency, and format revisions

Sheet 1 of 4 (was 1 of 3) – Reinforced Concrete Median Barrier Type F – (Non-Glare Screen Type) Design 8308

1. Changed sheet number from (1 of 3) to (1 of 4)

Sheet 2 of 4 (was 2 of 3) – Reinforced Concrete Median Barrier Type F – (Non-Glare Screen Type) Design 8308 – General Construction Notes & End Anchorage

1. Changed sheet number from (2 of 3) to (2 of 4)

Sheet 3 of 4 (was 3 of 3) – Reinforced Concrete Median Barrier Type F – (Non-Glare Screen Type) Light Foundation – Monolithic Barrier Placement

Details

1. Changed sheet number from (3 of 3) to (3 of 4)
2. Revised sheet title
3. The median barrier section with light pole has been modified in length from 20'-0" to 15'-0"
4. Modifying the barrier section length has changed the spacing of the vertical reinforcement and the taper of the barrier
5. Reinforcement bar bend details and the reinforcement bar list have been updated to reflect the barrier modifications; reinforcing bar "T" was also added
6. The anchor rod cluster has been renamed anchor rod assembly, and an anchor rod template was added, both of which are further detailed on Standard Plate 8332
7. The term "Nom. Dia. Rigid PVC" has been changed to "Nom. Dia. Rigid PVC Conduit" throughout the plate

Notes

1. Notes have been updated to active voice
2. The term "Anchor Bolt Cluster" has changed to "Anchor Rod Assembly" in numbered note ② and throughout the plate
3. Eliminated note ④ regarding conduit bell ends and added note ⑤ prohibiting contraction or other barrier joints within 7'-6" of the center of the anchor rod assembly
4. Added note ⑥ regarding pairing of T and L reinforcement bars
5. Added note ⑦ regarding 3" conduit

Sheet 4 of 4 – Reinforced Concrete Median Barrier Type F – (Non-Glare Screen Type) Light Foundation – Barrier on Footing

General

1. This is a new sheet that provides light pole foundation details for a Type F median barrier placed on a footing. The details are nearly identical to sheet 8308 (3 of 4) for monolithic placement but the reinforcement details have been changed to reflect the 7" thick footing at the base of the barrier.

Summary of Changes

Standard Plate 8309C – Reinforced Concrete Median Barrier Type F & Glare Screen Transmittal Letter No. (20-03)

General

1. Plate number incremented from 8309B to 8309C
2. Minor grammar, clarity, labeling, consistency, and format revisions

Sheet 1 of 4 (was 1 of 3) – Reinforced Concrete Median Barrier Type F & Glare Screen

3. Changed sheet number from (1 of 3) to (1 of 4)

Sheet 2 of 4 (was 2 of 3) – Reinforced Concrete Median Barrier Type F & Glare Screen - General Construction Notes & End Anchorage

1. Changed sheet number from (2 of 3) to (2 of 4)

Sheet 3 of 4 (was 3 of 3) – Reinforced Concrete Median Barrier Type F – (Non-Glare Screen Type) Light Foundation – Monolithic Barrier Placement

Details

1. Revised sheet title
2. The median barrier section with light pole has been modified in length from 20'-0" to 15'-0"
3. Modifying the barrier section length has changed the spacing of the vertical reinforcement and the taper of the barrier
4. 1" chamfers have been added to the inside corners of the concrete at the anchor rod cluster location to deter cracking of the concrete
5. Horizontal "Z" bars have been added at the anchor rod cluster location to deter cracking of the concrete
6. Reinforcement bar bend details and the reinforcement bar list have been updated to reflect the barrier modifications; reinforcing bar "T" was also added
7. The anchor rod cluster has been renamed anchor rod assembly, and an anchor rod template was added, both of which are further detailed on Standard Plate 8332
8. The term "Nom. Dia. Rigid PVC" has been changed to "Nom. Dia. Rigid PVC Conduit" throughout the plate

Notes

1. Notes have been updated to active voice
2. The term "Anchor Bolt Cluster" has changed to "Anchor Rod Assembly" in numbered note ② and throughout the plate
3. Eliminated note ④ regarding conduit bell ends and added note ⑤ prohibiting contraction or other barrier joints within 7'-6" of the center of the anchor rod assembly
4. Added note ⑥ regarding pairing of T and L reinforcement bars
5. Added note ⑦ regarding 3" conduit

Sheet 4 of 4 – Reinforced Concrete Median Barrier Type F & Glare Screen – Light Foundation – Barrier on Footing

General

1. This is a new sheet (4 of 4) that provides light pole foundation details for a Type F median barrier with glare screen placed on a footing. The details are nearly identical to sheet 8309C (3 of 4) for monolithic placement but the reinforcement details have been changed to reflect the 7" thick footing at the base of the barrier.

Summary of Changes
Standard Plate 8332E - Anchor Rod Assembly for Light Foundation-Barrier
Transmittal Letter No. (20-03)

General:

1. Plate number incremented from 8332D to 8332E.
2. The standard plate has been completely revamped and updated. Previous details showing a welded or mechanical cage to hold the anchors in place have been eliminated and replaced with an anchor rod template. The light pole base details have been removed. Two new tables have been added to provide anchor rod diameter and length. The notes have been updated and rewritten using active voice.
3. Minor grammar, clarity, labeling, consistency, and format revisions.

STANDARD PLATES

BLANK.....	0000 SERIES
PAVEMENT	1000 SERIES
BLANK.....	2000 SERIES
CULVERTS AND APPURTENANCES	3000 SERIES
SEWER APPURTENANCES.....	4000 SERIES
EROSION CONTROL STRUCTURES	5000 SERIES
BLANK.....	6000 SERIES
CURB, CURB AND GUTTER, SIDEWALK	7000 SERIES
BARRICADES, SIGNALS, MARKERS, ETC.....	8000 SERIES
MISCELLANEOUS	9000 SERIES

PLATE NO.

0000 SERIES—BLANK

1000 SERIES—PAVEMENT

- 1070M Supplemental Pavement Reinforcement
- 1103K Typical Dowel Bar Assembly (2 Sheets)
- 1150R Concrete Header Joints (2 Sheets)
- 1210G Concrete Pavement Adjacent to Railway Crossing

2000 SERIES—BLANK

3000 SERIES—CULVERTS AND APPURTENANCES

- 3000M Reinforced Concrete Pipe (6 Sheets)
- 3001B Reinforced Concrete Reducer Pipe
- 3002B Reinforced Concrete Increaser Pipe
- 3006H Gasket Joint for R.C. Pipe (2 Sheets)
- 3007F Shear Reinforcement for Precast Drainage Structures
- 3014K Reinforced Concrete Pipe Arch (3 Sheets)
- 3020H Reinforced Precast Concrete Cattle Pass (60" & 72")
- 3022C Precast Concrete Safety Apron (3 Sheets)
- 3040F Corrugated Metal Pipe Culvert (Standard 2-2/3" x 1/2" Corrugation)
- 3041D Corrugated Metal Pipe (3" x 1" Corrugation)
- 3050B Design Data Structural Plate Structures (18" Corner Radius)
- 3051B Design Data Structural Plate Structures (31" Corner Radius)
- 3065C Connection between Existing Culv. & New "C" Culv. Barrel (2 Sheets)
- 3066A C.M. Extension for Box Culvert
- 3100G Concrete Apron for Reinforced Concrete Pipe
- 3110G Concrete Apron for Reinforced Concrete Pipe-Arch
- 3114H Sectional Concrete Apron for Reinforced Concrete Pipe-Arch
- 3122K Metal Apron for C.M. Pipe-Arch Culvert
- 3123J Metal Apron for C.S. Pipe
- 3124B Metal Apron Connection
- 3125A Inlet Protection for Metal Culverts (90" dia. to 96" dia.)
- 3126B Inlet Protection for Structural Plate Pipe (60" thru 96" dia. or span)
- 3127A Inlet Protection for Structural Plate Pipe (102" thru 180" dia. or span)

PLATE NO.

3128H	Metal Safety Apron & Grate (2 Sheets)
3129A	Metal Apron for Corrugated Polyethylene Pipe (Use at Entrances and Driveways)
3131C	Precast Concrete Headwall for Subsurface Drains
3132A	Grate for 1:4 Precast Concrete Aprons
3133D	Riprap at RCP Outlets
3134D	Riprap at CSP Outlets
3135A	Hand-Placed Riprap at Precast Concrete Cattle Pass
3136B	Slotted Vane Drain for P.V.C. Pipe
3137B	Slotted Drain for 12" thru 30" Dia. C.M. Pipe (Stackable)
3138B	Slotted Drain for 12" thru 30" Dia. C.M. Pipe (Not Stackable)
3139B	Riprap at Precast Concrete End Sections
3142A	Outlet Screen for C.M. & S.C. Pipes
3143C	Inspection Tees
3145G	Concrete Pipe or Precast Culvert Ties
3146C	Anti-Seepage Diaphragm (For CMP and CMP-A)
3148A	Safety Slope Metal End Section for Circular & Arched Pipes (2 Sheets)
3221C	Corrugated Steel Pipe Coupling Band (3 Sheets)

4000 SERIES—SEWER APPURTENANCES

Drainage Structure and Castings (4 Sheets)

- Structure and Casting Combinations
- Standard Casting Assemblies
- List of Castings
- List of Drainage Structures

4000J	Manhole or Catch Basin (Masonry, Field Constructed) - Design A
4002F	Manhole or Catch Basin (Masonry, Field Construction) - Design C
4003B	30" Precast Catch Basin – Design N
4005M	Manhole or Catch Basin Type A & B Cone Sections Precast - Design F
4006L	Manhole or Catch Basin Precast - Designs G and H
4007C	Precast Mechanical Joint Sewer Manhole
4008E	Catch Basin (Sectional Concrete Pipe) - Design I
4009H	Manhole or Catch Basin (Sectional Concrete Pipe) - Design J
4010H	Concrete Short Cone & Adjusting Ring (Sectional Concrete)
4011E	Precast Concrete Base
4017C	Catch Basin (Concrete Pipe and Metal Pipe) - Designs PC and PM
4018B	Manhole or Catch Basin (Reducer Cone Section Precast) Design D
4020J	Manhole or Catch Basin (For Use With or Without Traffic Loads) (2 sheets)
4021F	Precast Curb Opening Catch Basin
4022A	Manhole or Catch Basin Cover (3 ft. X 2 ft. Opening)
4024A	48" Dia. Precast Shallow Depth Catch Basin - Design SD
4025B	Drop Inlets or Catch Basins - Design DI (Concrete & Metal)
4026A	Concrete Encased Concrete Adjusting Rings
4101D	Ring Casting For Manhole or Catch Basin
4108F	Adjusting Rings for Catch Basins and Manholes
4110F	Cover Casting for Manhole (For Use in all Traffic Areas) – Casting No. 715 and 716
4125D	Catch Basin Frame Casting (For Square Grate) – Casting No. 806
4126F	Catch Basin Frame Casting – Casting No. 801
4129G	Catch Basin Frame Casting (For Square Grate) - Casting No. 802A
4132G	Catch Basin Frame Casting (For Square Grate) – Casting No. 805
4133A	Curb Box Casting for Catch Basin - Casting No. 824
4134A	Curb Box Casting for Catch Basin (For Design B Curbs) - Casting No. 825
4140D	Special Grate Castings for Catch Basin (Convex and Concave) - Casting No. 720 and 721
4143E	Stool Grate & Concrete Frame (Median Drains) - Casting No. 731
4149C	Grate Casting for Catch Basin - Casting No. 810

PLATE NO.

- 4150C Grate Casting for All Pipe Drainage Structures
- 4151B Grate Casting for Catch Basin (Square Type) - Casting No. 811
- 4152C Catch Basin Grate Casting - Casting No. 814A
- 4153A Catch Basin Grate Casting - Casting No. 815
- 4154B Catch Basin Grate Casting - Casting No. 816
- 4155A ADA Grate Inlet Casting – Casting No. 817
- 4160D Curb Box Casting for Catch Basin - Casting No. 823A and 833A
- 4161F Curb Box Casting for Catch Basin - Casting No. 821B, 822 and 831A
- 4180J Manhole or Catch Basin Step

5000 SERIES—EROSION CONTROL STRUCTURES

- 5010A Reinforced Concrete Pipe Energy Dissipator

6000 SERIES—BLANK

7000 SERIES—CURB, CURB AND GUTTER, SIDEWALK

- 7000E Integrant Curbs (Design B, Design V and Design D)
- 7020K Concrete Curb (Design B, Design V, Design S, Design DR and Design BR) (2 Sheets)
- 7038A Detectable Warning Surface Truncated Domes
- 7065C Bituminous Curb
- 7100H Concrete Curb and Gutter (Design B and Design V)
- 7102K Concrete Curb and Gutter (Design D, Design S, and Design R)
- 7105C Concrete Median (Mountable Type)
- 7107I Entrance Nose (Urban Design)
- 7108G Exit Nose (Urban Design)
- 7109C Median Nose and Island (Undivided to Divided Roadway)
- 7111J Installation of Catch Basin Castings (Concrete Curb and Gutter)
- 7112C Installation & Reinforcement of Catch Basin & Manhole Castings (Concrete Integrant Curbs)
- 7113A Concrete Approach Nose Detail

8000 SERIES—BARRICADES, SIGNALS, MARKERS, ETC.

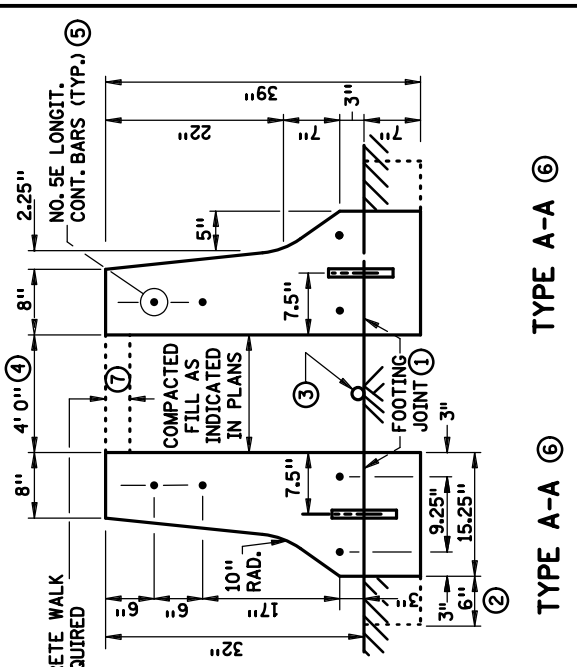
- 8000J Channelizers
- 8002G Permanent Barricade
- 8106D Equipment Pad B
- 8107A RLF Equipment Pad Foundation Layout
- 8110E Traffic Signal Bracketing (Pole Mounted)
- 8111E Traffic Signal Bracketing (Pedestal Mounted) (3 Sheets)
- 8112I Pedestal Foundation (Traffic Control Signals)
- 8117G Precast Concrete Handhole With Vehicle Load
- 8118D Service Equipment & Pole Traffic Control Signals
- 8119C Ground Mounted Cabinet Foundation
- 8120Q Pole Foundation (PA85)
- 8121H Transformer Base and Pole Base Plate (PA85, PA90 and PA100) (2 Sheets)
- 8122F Pedestal and Pedestal Base (For Traffic Control Signals Support) (2 Sheets)
- 8123G Pole and Mast Arm Luminaires and Traffic Lights Assembly (For All Pole Types) (2 Sheets)
- 8126L Pole Foundation (PA90 and PA100)
- 8127E Light Foundation - Design E, Precast/Cast-In-Place, 40 ft. Pole or Less (2 Sheets)
- 8128E Light Foundation - Design H, Precast/Cast-In-Place, 49 ft. Pole (2 Sheets)

PLATE NO.

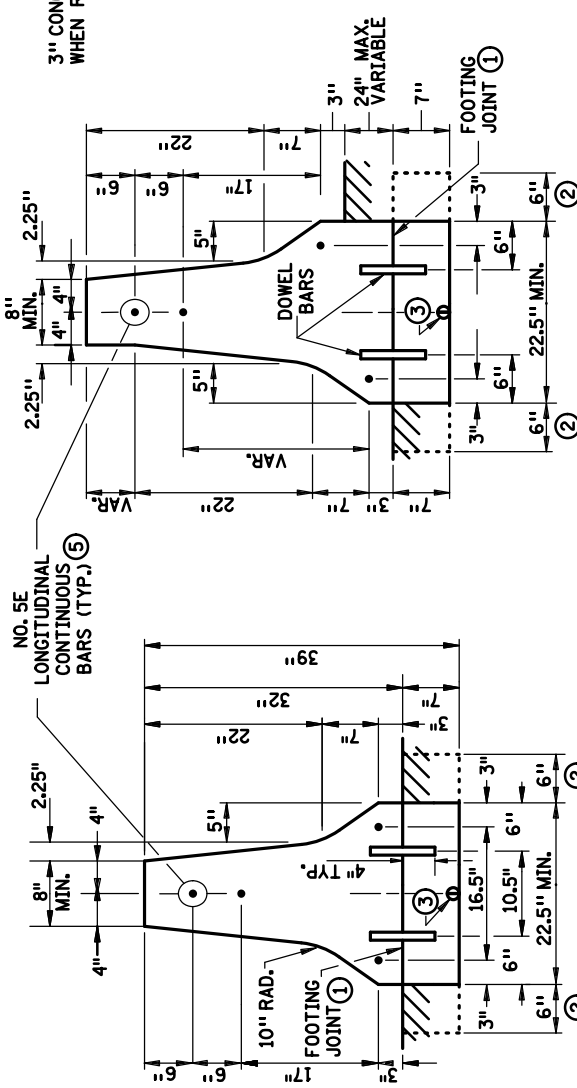
8129A	Shim and Washer (Traffic Control Signals and Roadway Lighting)
8130E	Saw Cut Loop Detectors (3 Sheets)
8132B	Preformed Rigid PVC Conduit Loop Detector (3 Sheets)
8133A	Pole and Mast Arm - Type BA (9 Sheets)
8134C	Pole Foundation - Type BA (4 Sheets)
8135A	Anchor Rod Assembly for Light Tower Foundation
8150C	Installation of Culvert Markers
8307S	W-Beam Guardrail & End Anchorages (Installation with Wood Posts) (4 Sheets)
8308C	Reinforced Concrete Median Barrier Type F (Non-Glare Screen Type) (4 Sheets)
8309C	Reinforced Concrete Median Barrier Type F & Glare Screen (4 Sheets)
8316C	Post Seat for Anchorage on Footing or Box Culverts
8318C	Guardrail Anchorage Plate for Bridges and BCT'S
8326D	Flexible Plastic Glare Screen
8329I	Eccentric Loader Breakaway Cable Terminal (ELT) (4 Sheets)
8330G	3-Cable Guardrail (With Wood Posts) (Assembly Details) (2 Sheets)
8331B	3-Cable Guardrail (With Steel Posts) (3 Sheets)
8332E	Anchor Rod Assembly for Light Foundation - Barrier
8333B	3-Cable Guardrail Anchor (Anchor Details) (4 Sheets)
8337C	Temporary Portable Precast Concrete Barrier (Type "F") (3 Sheets)
8338D	W-Beam Guardrail & End Anchorages (Installation with Steel Posts) (4 Sheets)
8339A	3-Cable (Steel Posts) to W Beam (Wood Posts) Guardrail Transition
8340A	3-Cable (Steel Posts) to W Beam (Steel Posts) Guardrail Transition
8342B	High-Tension Cable Barrier Line Post Foundation (Concrete Design)
8343A	High-Tension Cable Barrier Line Post Foundation (Steel Design)
8347B	Portable Precast Concrete Barrier Anchors
8350A	Thrie Beam Anchorage Plate
8352B	Thrie Beam Wedge Plate for Single Slope Barrier
8356A	W-Beam to Thrie-Beam Transition Guardrail
8357A	Thrie Beam Guardrail
8360A	Guardrail Post Length Marking
8361A	Guardrail Steel Post (3 Sheets)
8369A	Guardrail Blockout (2 Sheets)
8400F	Pipe Railing

9000 SERIES—MISCELLANEOUS

9000E	Approaches and Entrances - Recommended Standards
9101B	Shaping and Sodding of Slopes at Box Culvert Ends
9303B	Geodetic Survey Disks (Aluminum) (2 Sheets)
9304A	Geodetic Survey Disks (Removable Type Disk)
9308A	Survey Monument Cap (2 Sheets)
9309G	PLS (Public Land Survey) Monument (2 Sheets)
9320G	Woven Wire Fence (Wood Post)
9321E	Woven Wire Fence (Steel Post)
9322K	Chain Link Fence (2 Sheets)
9323D	Barbed Wire Fence (Wood Post)
9324C	Barbed Wire Fence (Steel Post)
9350A	Mailbox Support (Swing-Away Type)



TYPE A-A ⑥



TYPE A STEP

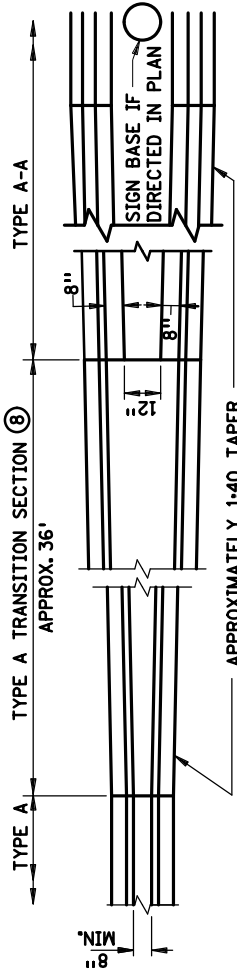
TYPE A

TYPE A-A

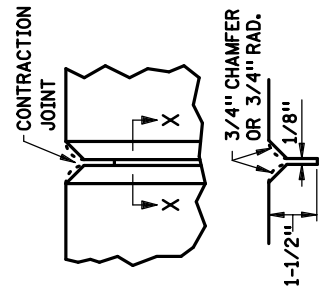
TYPE A-A ⑥

GENERAL NOTES:

- ① 0.148 CU. YDS. CONCRETE PER LIN. FT. TYPE A
- ② 0.114 CU. YDS. CONCRETE PER LIN. FT. TYPE A-A
- ③ CUBIC YARDS OF CONCRETE INCLUDES STANDARD FOOTING.
- ④ ALL BARS SHALL BE EPOXY COATED PER SPEC 3301.
- ⑤ FINISH ALL EDGES OF BARRIER WITH 1/2" VEE, EXCEPT WHERE OTHERWISE NOTED.
- ⑥ IF FOOTING IS CONSTRUCTED SEPARATELY, A FOOTING JOINT WITH 1" DIA. DOWEL BARS 8" LONG AT 2' 0" CENTERS IS REQUIRED. DUMMY TRANSVERSE JOINTS (1-1/2" MIN. DEPTH) SHALL BE PLACED IN FOOTING AND BE ALIGNED WITH CONTRACTION JOINTS IN UPPER PORTION OF BARRIER. THE SURFACE OF THE FOOTING JOINT SHALL BE ROUGH.
- ⑦ ADDITIONAL FOOTING WIDTH TO BE REQUIRED WHEN CONCRETE MEDIAN BARRIER IS ADJACENT TO BITUMINOUS PAVEMENT OR BITUMINOUS SHOULDER.
- ⑧ WHEN REQUIRED, PROVIDE A 1-1/2" NOMINAL DIAMETER PVC-TYPE I CONDUIT (SPEC. 3803) IN FIXED FORM OR SLIP FORM CONSTRUCTED BARRIER, OR 3" X 3" VOID IN PRECAST BARRIER FOR LIGHTING CONDUIT. LOCATE AS DIRECTED BY PLAN OR ENGINEER.
- ⑨ UNLESS OTHERWISE NOTED IN PLANS.
- ⑩ SEE SHEET 2 FOR BILL OF REINFORCEMENT AND CONSTRUCTION NOTES.
- ⑪ SHALL NOT USE ONE SIDE OF BARRIER TYPE A-A AS FREE-STANDING SYSTEM. MUST USE BOTH DETAILS AS SHOWN OR SINGLE BARRIER FULLY ABUTTED TO COMPACTED BACKFILL.
- ⑫ CONCRETE WALK BETWEEN TYPE A-A BARRIERS MAY BE SLOPED IF BARRIER TOPS ARE NOT THE SAME ELEVATION.
- ⑬ WHEN THE BARRIER IS PRECAST, THE TRANSITION SECTION MAY BE CAST IN THREE 12' LONG SECTIONS.



TRANSITION FROM TYPE A TO TYPE A-A



CONTRACTION JOINT NOTES:

- IF JOINT SPACING IS NOT INDICATED IN THE PLANS, THE BASIS OF JOINT SPACING IS AS FOLLOWS:
- 1) BITUMINOUS SECTION ADJACENT TO THE BARRIER, 15 FT. SPACING.
- 2) CONCRETE SECTION ADJACENT TO THE BARRIER:
 - FIXED FORM OR SLIP FORMED BARRIER CONTRACTION JOINTS SHALL ALIGN WITH JOINTS IN CONCRETE SECTION, NOT TO EXCEED 15 FT.
- 3) REINFORCING TO BE CONTINUOUS THROUGH JOINT.

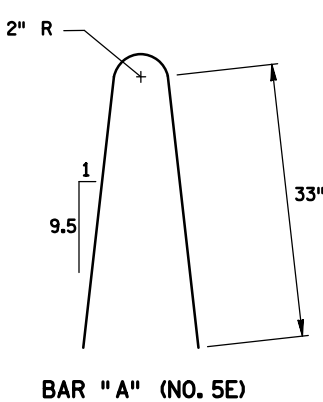
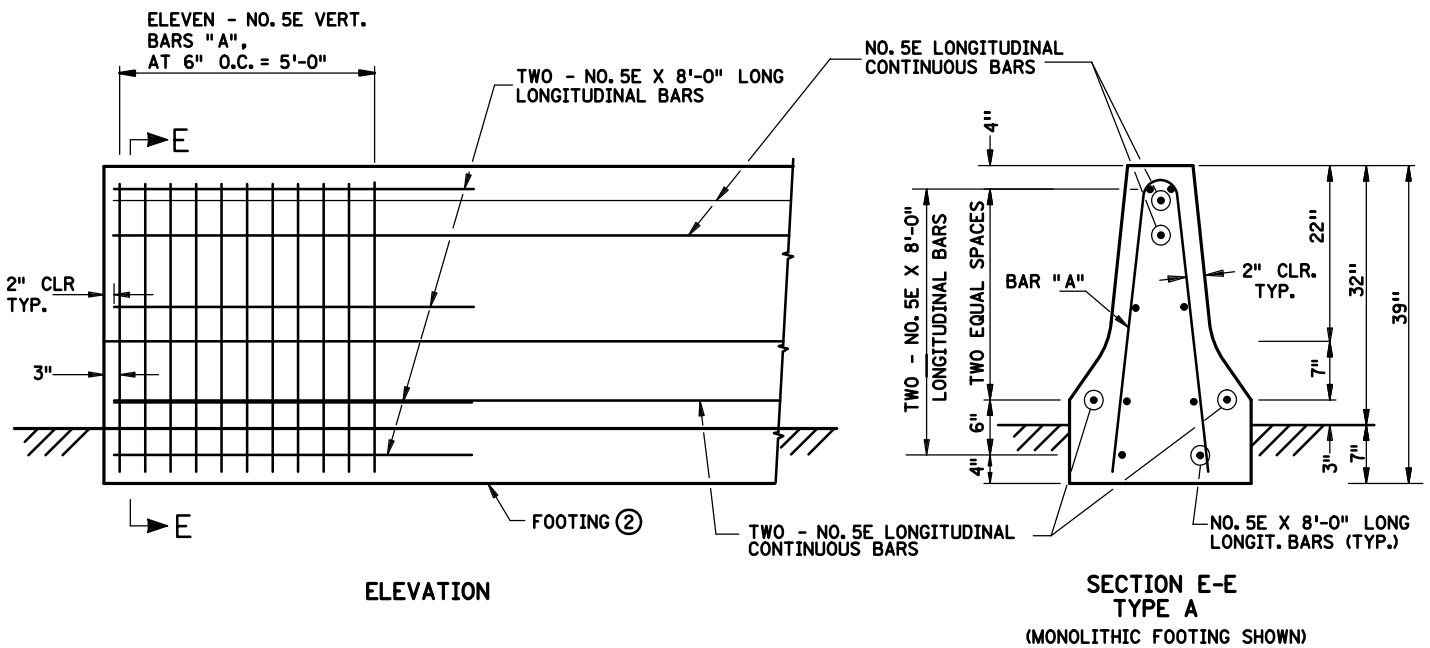
APPROVED APRIL 14, 2020

Rom Smith
STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
**REINFORCED CONCRETE MEDIAN
BARRIER TYPE F**
(NON-GLARE SCREEN TYPE)
DESIGN 8308

SPECIFICATION
REFERENCE
2533

STANDARD
PLATE
NO.
8308C
1 OF 4



END ANCHORAGE DETAIL ①

NOTES:

- ① END ANCHORAGE MUST BE PLACED AT BOTH ENDS OF THE BARRIER AND AT ANY EXPANSION JOINT/OPEN JOINT. EXPANSION JOINTS SHALL BE PROVIDED IN THE BARRIERS TO MATCH EXPANSION JOINTS IN RIGID PAVEMENT, AT BRIDGE APPROACHES, OR AT OTHER STRUCTURES, WHERE UNCONTROLLED LONGITUDINAL MOVEMENT MAY BE OBJECTIONABLE.
- ② IF FOOTING IS CONSTRUCTED SEPARATELY, A FOOTING JOINT WITH NO. 8E DOWEL BARS 8" LONG AT 2'-0" CENTERS IS REQUIRED. DUMMY TRANSVERSE JOINTS (1-1/2" MIN. DEPTH) SHALL BE PLACED IN FOOTING AND BE ALIGNED WITH CONTRACTION JOINTS IN UPPER PORTION OF BARRIER. THE SURFACE OF THE FOOTING JOINT SHALL BE ROUGH.
- ③ ALL REBARS SHALL BE GRADE 60 STEEL AND SHALL BE EPOXY COATED, PER SPEC. 3301.
- ④ MINIMUM LAP SPLICE IS 2' - 11" FOR ALL BARS.

GENERAL CONSTRUCTION NOTES:

- A. CONSTRUCTION METHOD SHALL BE CONTRACTOR'S OPTION: CAST-IN-PLACE (FIXED FORM OR SLIP FORM) OR PRECAST.
- B. PRECAST SECTIONS SHALL WEIGH A MINIMUM OF 650 LBS./FT. (TYPE A WITH STANDARD FOOTING). PROVISIONS SHALL BE MADE FOR THE INTERCONNECTION OF INDIVIDUAL SECTIONS PROVIDING LATERAL RESISTANCE EQUIVALENT TO THAT OF THE BARRIER SECTION ITSELF.
- C. CONTRACTOR SHALL PROVIDE ALL NECESSARY SUPPORTS TO MAINTAIN LONGITUDINAL REBARS AT DIMENSIONS SHOWN ON THE PLAN DURING SLIP FORMING.
- D. CONTRACTOR SHALL PROVIDE VERTICAL SUPPORTS WITH 2' - 0" MAXIMUM SPACING TO MAINTAIN LONGITUDINAL REBARS AT DIMENSIONS SHOWN ON THE PLAN DURING FIXED FORMING.
- E. PAY QUANTITIES WILL NOT BE ADJUSTED AS A RESULT OF SELECTING ONE OF THE CONSTRUCTION METHODS.

BILL OF REINFORCEMENT ③				
BAR SIZE	LENGTH PER BAR	NO. OF BAR	BAR SHAPE	BAR LOCATION
5E	---	---	STR	LONGITUDINAL ④
5E	8'-0"	16*	STR	LONGIT. AT ENDS
5E	6'-0"	22*	BENT	VERT. AT ENDS

* NUMBERS PER TWO ENDS

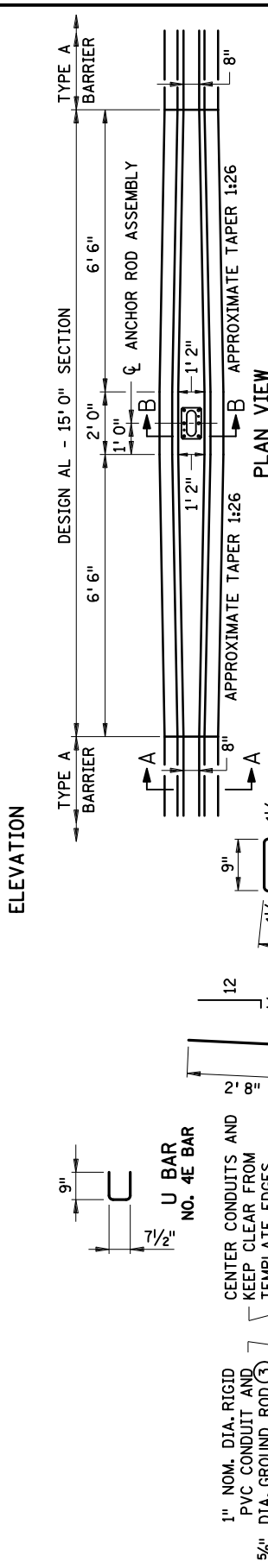
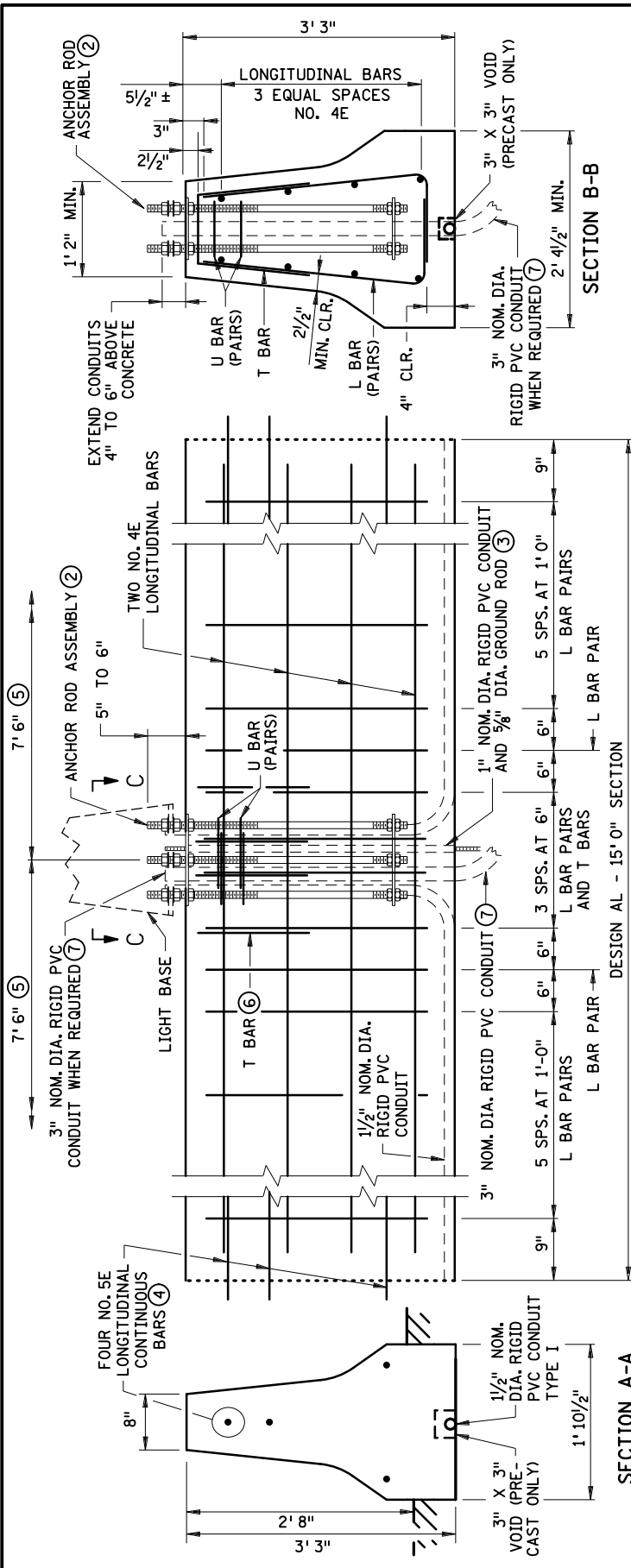
APPROVED APRIL 14, 2020

 STATE DESIGN ENGINEER

STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION
**REINFORCED CONCRETE MEDIAN
 BARRIER TYPE F**
 (NON-GLARE SCREEN TYPE) DESIGN 8308
 GENERAL CONSTRUCTION NOTES & END ANCHORAGE

SPECIFICATION
 REFERENCE
 2533

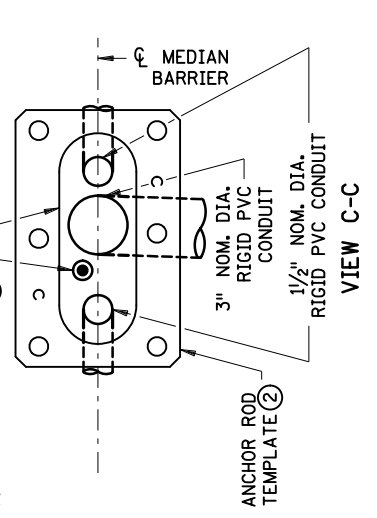
STANDARD
 PLATE
 NO.
8308C
 2 OF 4



- ① FURNISH & INSTALL EPOXY COATED REINF. BARS IN ACCORDANCE WITH 3301.
- ② REFER TO STANDARD PLATE 8332 FOR ANCHOR ROD ASSEMBLY AND TEMPLATE DETAILS.
- ③ FURNISH & INSTALL 5/8" DIA. X 15' 0" LONG GROUND ROD ELECTRODE IN 1" NOM. DIA. RIGID PVC CONDUIT (TOP OF CONDUIT FLUSH WITH TOP OF CONCRETE) OR DIRECTLY IN CONCRETE BARRIER. EXTEND THE GROUND ROD 3" - 4" ABOVE THE TOP OF CONCRETE.
- ④ EXTEND 5 NO. 5E LONGITUDINAL BARS 3' 4" MIN. INTO DESIGN AL SECTION.
- ⑤ DO NOT PLACE CONTRACTION OR OTHER BARRIER JOINTS WITHIN 7' 6" FROM THE CENTER OF THE ANCHOR ROD ASSEMBLY.
- ⑥ PAIR T BARS WITH L BARS AT LIGHT ANCHORAGE.
- ⑦ 3" CONDUIT USED WHEN CABLES ARE CROSSING UNDER THE ROADWAY.

REINFORCEMENT REQUIREMENTS

BAR TYPE	BAR SIZE	BAR LENGTH	NO. PER SECTION
LONGITUDINAL	4E	14' 6"	8
L	4E	3' 6"	36
U	4E	2' 2"	4
T	4E	3' 9"	4



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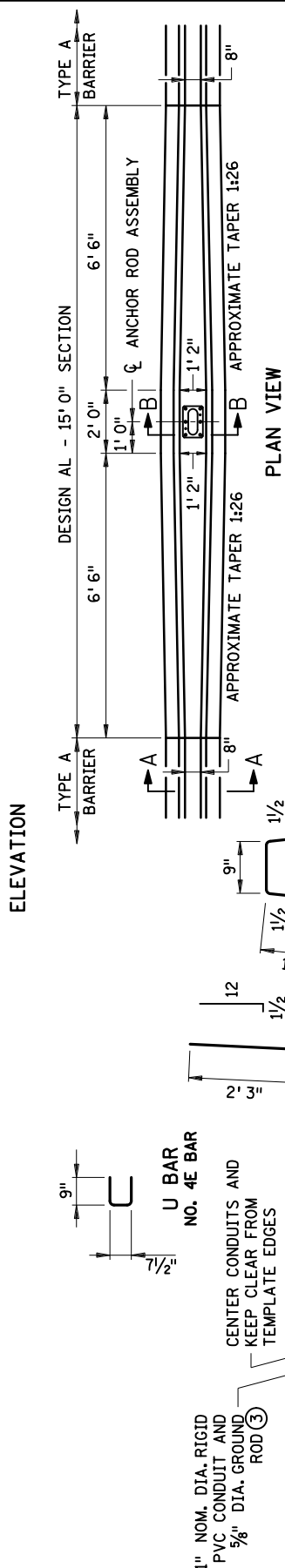
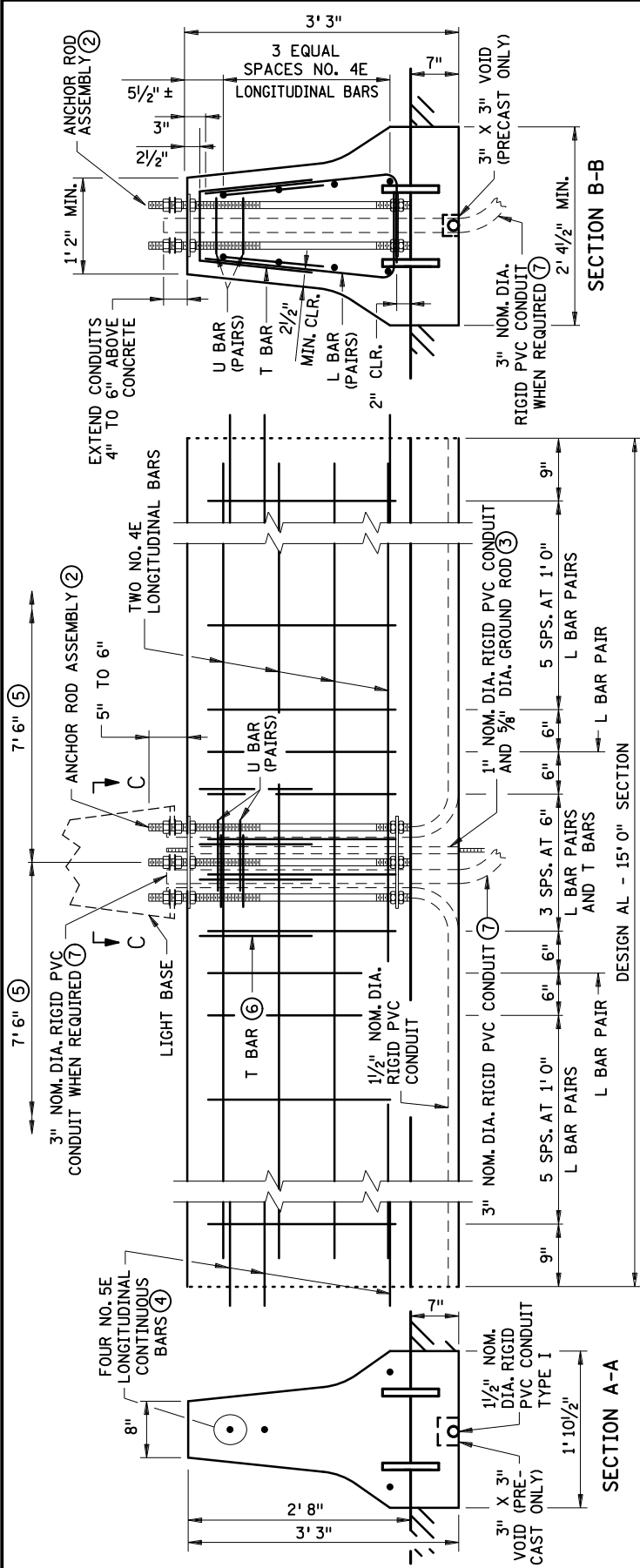
Rom Smith

STATE DESIGN ENGINEER

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
**REINFORCED CONCRETE MEDIAN
BARRIER TYPE F**
(NON-GLARE SCREEN TYPE)
LIGHT FOUNDATION - MONOLITHIC BARRIER PLACEMENT

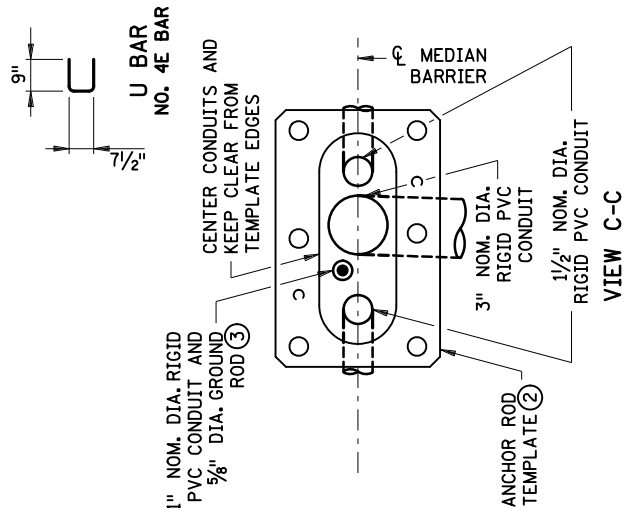
SPECIFICATION
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PLATE
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8308C
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- ① FURNISH & INSTALL EPOXY-COATED REINFORCEMENT BARS IN ACCORDANCE WITH 3301.
- ② REFER TO STANDARD PLATE 8332 FOR ANCHOR ROD ASSEMBLY AND TEMPLATE
- ③ FURNISH & INSTALL 5/8" DIA. X 15'0" LONG GROUND ROD ELECTRODE IN 1" NOMINAL DIAMETER RIGID PVC CONDUIT (TOP OF CONDUIT FLUSH WITH TOP OF CONCRETE) OR DIRECTLY IN CONCRETE BARRIER. EXTEND THE GROUND ROD 3"-4" ABOVE THE TOP OF CONCRETE.
- ④ EXTEND FIVE NO. 5E LONGITUDINAL BARS 3' 4" MINIMUM INTO DESIGN AL SECTION.
- ⑤ DO NOT PLACE CONTRACTION OR OTHER BARRIER JOINTS WITHIN 7' 6" OF THE CENTER OF THE ANCHOR ROD ASSEMBLY.
- ⑥ PAIR T BARS WITH L BARS AT LIGHT ANCHORAGE.
- ⑦ 3" CONDUIT USED WHEN CABLES ARE CROSSING UNDER THE ROADWAY.

REINFORCEMENT REQUIREMENTS ①			
BAR TYPE	BAR SIZE	BAR LENGTH	NO. PER SECTION
LONGITUDINAL	4E	14' 6"	8
L	4E	3' 1"	36
U	4E	2' 2"	4
T ⑥	4E	3' 9"	4



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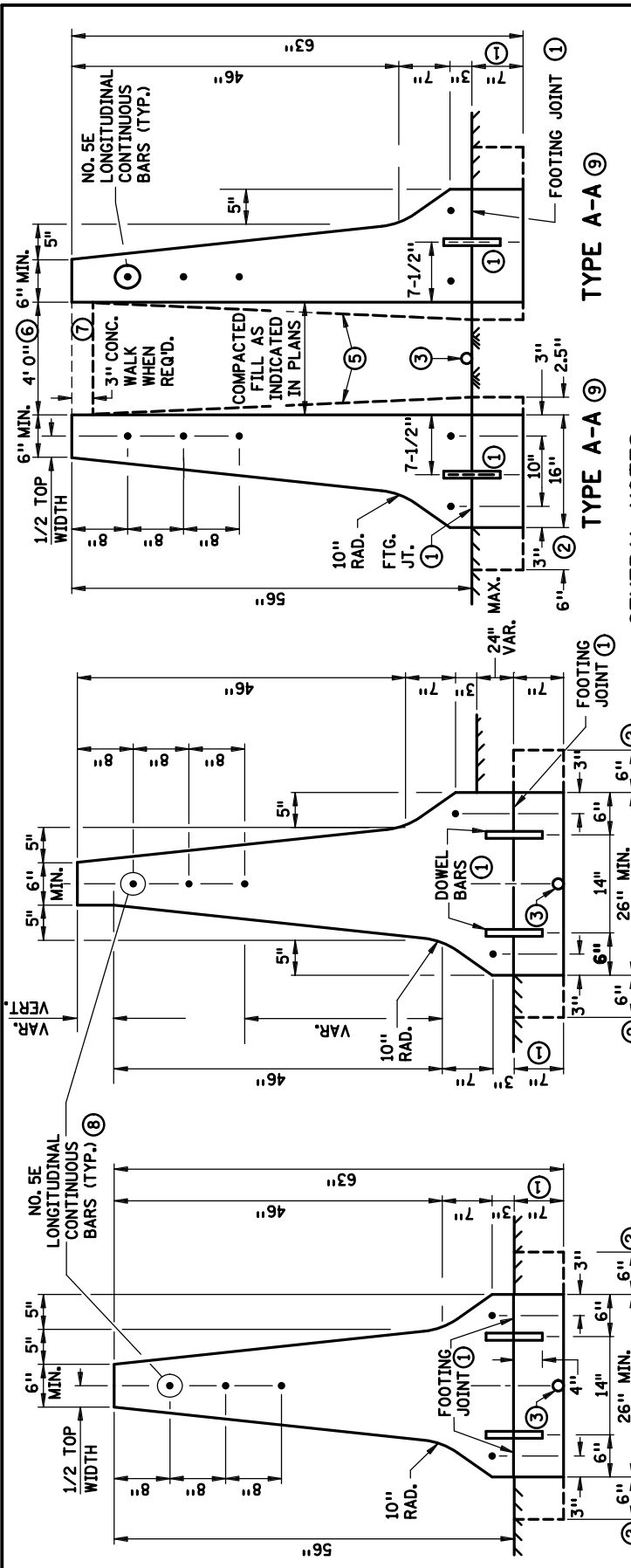
Rom S. Smith

STATE DESIGN ENGINEER

STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION
**REINFORCED CONCRETE MEDIAN
 BARRIER TYPE F**
 (NON-GLARE SCREEN TYPE)
 LIGHT FOUNDATION - BARRIER ON FOOTING

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GENERAL NOTES:

0.232 CU. YDS. CONCRETE PER LIN. FT. TYPE A
 0.165 CU. YDS. CONCRETE PER LIN. FT. TYPE A-A
 CUBIC YARDS OF CONCRETE INCLUDES STANDARD FOOTING.
 ALL BARS SHALL BE EPOXY COATED PER SPEC. 3301.
 FINISH ALL EDGES OF BARRIER WITH 1/2" VEE, EXCEPT WHERE OTHERWISE NOTED.

① IF FOOTING IS CONSTRUCTED SEPARATELY, A FOOTING JOINT WITH 1" DIA. DOWEL BARS 8" LONG AT 2' 0" CENTERS IS REQUIRED. DUMMY TRANSVERSE JOINTS (1-1/2" MIN. DEPTH) SHALL BE PLACED IN FOOTING AND BE ALIGNED WITH CONTRACTION JOINTS IN UPPER PORTION OF BARRIER. THE SURFACE OF THE FOOTING JOINT SHALL BE ROUGH.

② ADDITIONAL FOOTING WIDTH TO BE REQUIRED WHEN CONCRETE MEDIAN BARRIER IS ADJACENT TO BITUMINOUS PAVEMENT OR BITUMINOUS SHOULDER.

③ WHEN REQUIRED, PROVIDE A 1-1/2" NOMINAL DIAMETER PVC-TYPE I CONDUIT (SPEC. 3803) IN FIXED FORM OR SLIP FORM CONSTRUCTED BARRIER, OR 3" X 3" VOID IN PRECAST BARRIER FOR LIGHTING CONDUIT. LOCATE AS DIRECTED BY PLAN OR ENGINEER.

④ WHEN THE BARRIER IS PRECAST, THE TRANSITION SECTION MAY BE CAST IN THREE 12' LONG SECTIONS.

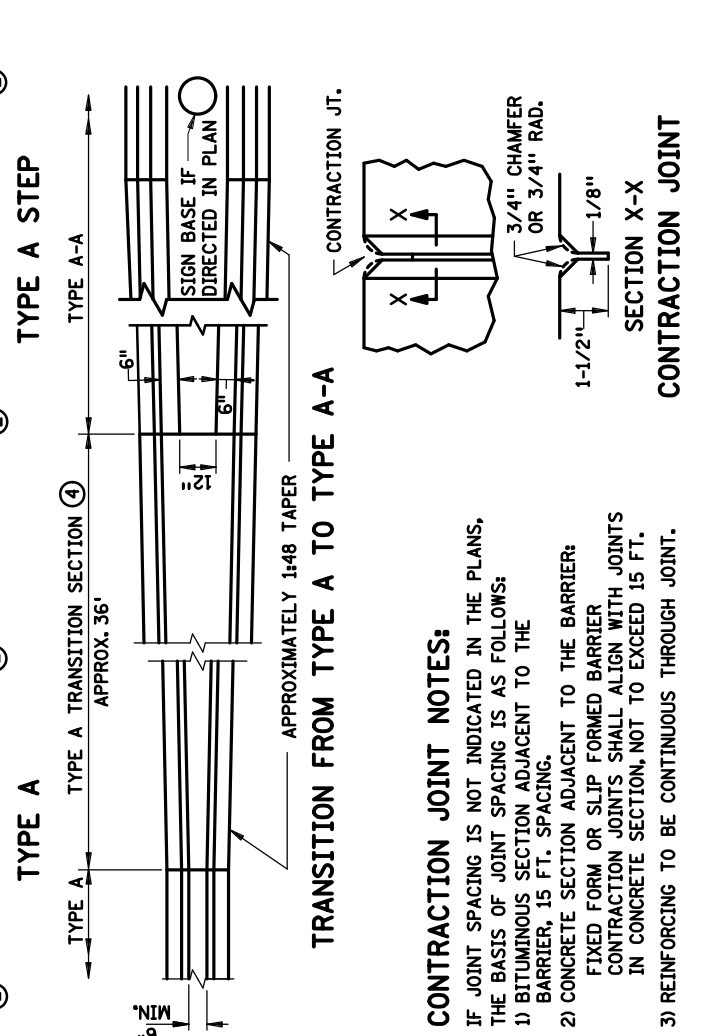
⑤ PERMISSIBLE IF SLIP FORMED.

⑥ UNLESS OTHERWISE NOTED IN PLANS.

⑦ CONCRETE WALK BETWEEN TYPE A-A BARRIERS MAY BE SLOPED IF BARRIER TOPS ARE NOT THE SAME ELEVATION.

⑧ SEE SHEET 2 FOR BILL OF REINFORCEMENT AND CONSTRUCTION NOTES.

⑨ SHALL NOT USE ONE SIDE OF BARRIER TYPE A-A AS FREE-STANDING SYSTEM. MUST USE BOTH DETAILS AS SHOWN OR SINGLE BARRIER FULLY ABUTTED TO COMPACTED BACKFILL.



CONTRACTION JOINT NOTES:

IF JOINT SPACING IS NOT INDICATED IN THE PLANS, THE BASIS OF JOINT SPACING IS AS FOLLOWS:

- 1) BITUMINOUS SECTION ADJACENT TO THE BARRIER, 15 FT. SPACING.
- 2) CONCRETE SECTION ADJACENT TO THE BARRIER: FIXED FORM OR SLIP FORMED BARRIER CONTRACTION JOINTS SHALL ALIGN WITH JOINTS IN CONCRETE SECTION, NOT TO EXCEED 15 FT.
- 3) REINFORCING TO BE CONTINUOUS THROUGH JOINT.

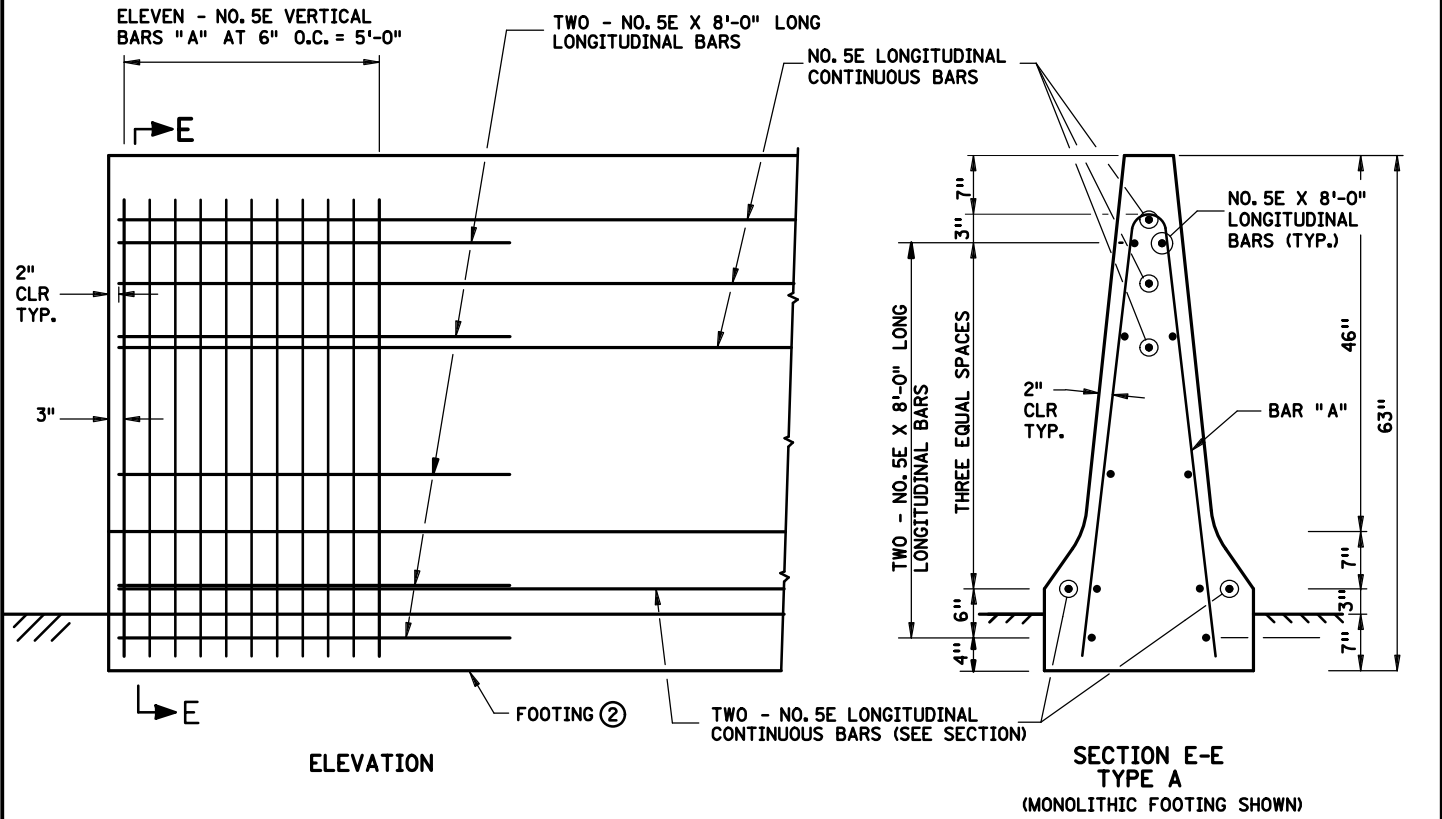
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 STATE DESIGN ENGINEER

STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION
**REINFORCED CONCRETE MEDIAN
 BARRIER TYPE F & GLARE SCREEN**
 DESIGN 8309

SPECIFICATION
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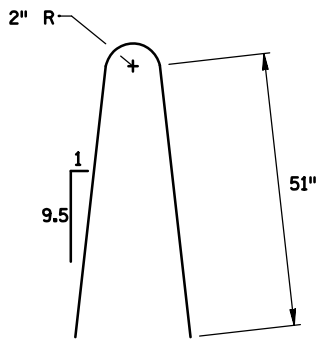
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ELEVATION

SECTION E-E
TYPE A
(MONOLITHIC FOOTING SHOWN)

END ANCHORAGE DETAIL ①



BAR "A" (NO. 5E)

NOTES:

- ① END ANCHORAGE MUST BE PLACED AT BOTH ENDS OF THE BARRIER AND AT ANY EXPANSION JOINT/OPEN JOINT. EXPANSION JOINTS SHALL BE PROVIDED IN THE BARRIERS TO MATCH EXPANSION JOINTS IN RIGID PAVEMENT, AT BRIDGE APPROACHES, OR AT OTHER STRUCTURES, WHERE UNCONTROLLED LONGITUDINAL MOVEMENT MAY BE OBJECTIONABLE.
- ② IF FOOTING IS CONSTRUCTED SEPARATELY, A FOOTING JOINT WITH NO. 8E DOWEL BARS 8" LONG AT 2'-0" CENTERS IS REQUIRED. DUMMY TRANSVERSE JOINTS (1-1/2" MIN. DEPTH WALL BE PLACED IN FOOTING AND BE ALIGNED WITH CONSTRUCTION JOINTS IN UPPER PORTION OF BARRIER. THE SURFACE OF THE FOOTING JOINT SHALL BE ROUGH.
- ③ ALL REBARS SHALL BE GRADE 60 STEEL AND SHALL BE EPOXY COATED, PER SPEC. 3301.
- ④ MINIMUM LAP SPLICE IS 2'-11" FOR ALL BARS.

GENERAL CONSTRUCTION NOTES:

- A. CONSTRUCTION METHOD SHALL BE CONTRACTOR'S OPTION: CAST-IN-PLACE (FIXED FORM OR SLIP FORM) OR PRECAST.
- B. PRECAST SECTIONS SHALL WEIGH A MINIMUM OF 940 LBS./FT. (TYPE A WITH STANDARD FOOTING). PROVISIONS SHALL BE MADE FOR THE INTERCONNECTION OF INDIVIDUAL SECTIONS PROVIDING LATERAL RESISTANCE EQUIVALENT TO THAT OF THE BARRIER SECTION ITSELF.
- C. CONTRACTOR SHALL PROVIDE ALL NECESSARY SUPPORTS TO MAINTAIN LONGITUDINAL REBARS AT DIMENSIONS SHOWN ON THE PLAN DURING SLIP FORMING.
- D. CONTRACTOR SHALL PROVIDE VERTICAL SUPPORTS WITH 2'-0" MAX. SPACING TO MAINTAIN LONGITUDINAL REBARS AT DIMENSIONS SHOWN ON THE PLAN DURING FIXED FORMING.
- E. PAY QUANTITIES WILL NOT BE ADJUSTED AS A RESULT OF SELECTING ONE OF THE CONSTRUCTION METHODS.

BILL OF REINFORCEMENT ③				
BAR SIZE	LENGTH PER BAR	NO. OF BAR	BAR SHAPE	BAR LOCATION
5E	---	---	STR	LONGITUDINAL ④
5E	8'-0"	20*	STR	LONGIT. AT ENDS
5E	9'-0"	22*	BENT	VERT. AT ENDS

* NUMBERS PER TWO ENDS

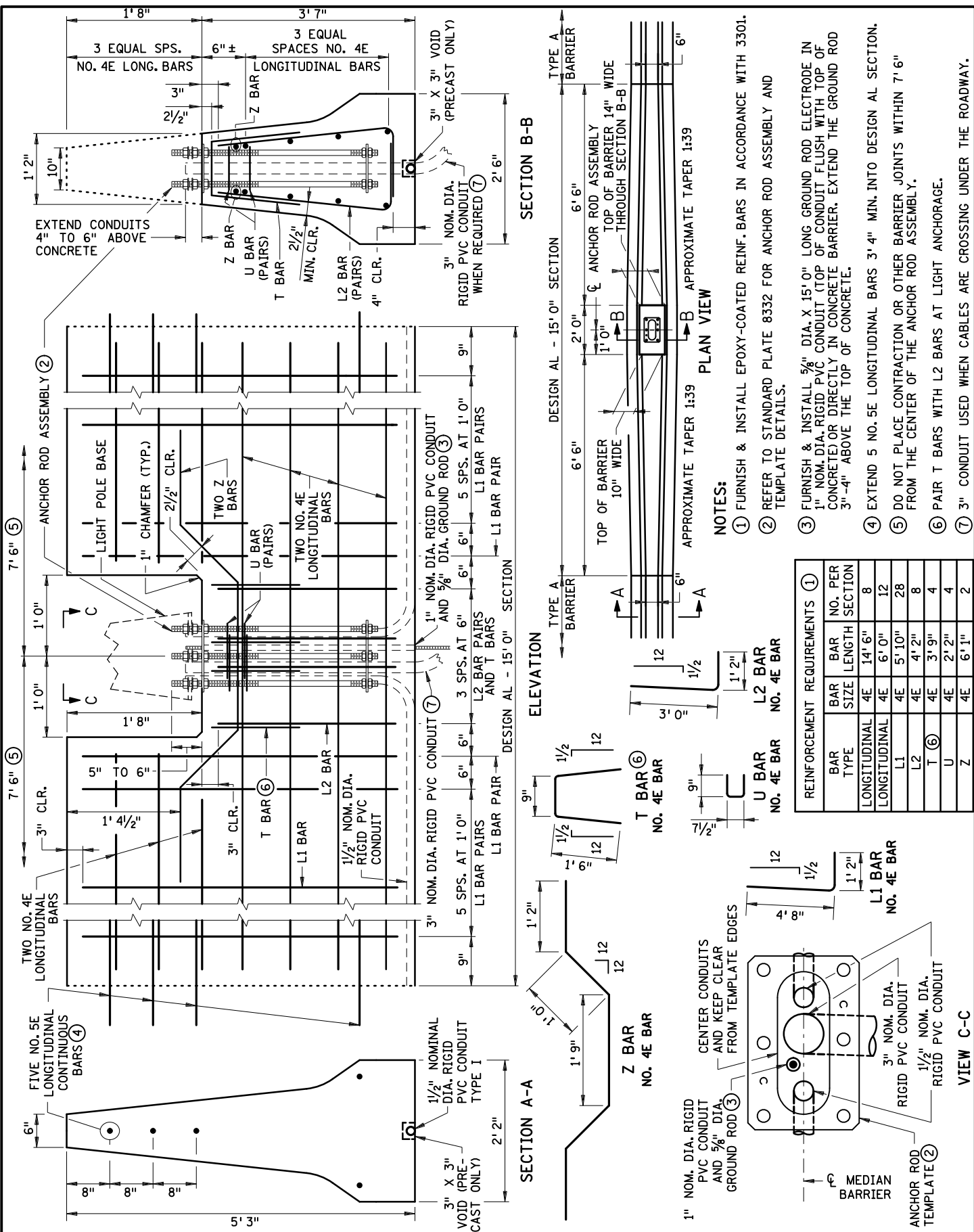
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 STATE DESIGN ENGINEER

STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION
**REINFORCED CONCRETE MEDIAN
 BARRIER TYPE F & GLARE SCREEN**
 DESIGN 8309
 GENERAL CONSTRUCTION NOTES & END ANCHORAGE

SPECIFICATION
 REFERENCE
 2533

STANDARD
 PLATE
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- NOTES:**
- FURNISH & INSTALL EPOXY-COATED REINF. BARS IN ACCORDANCE WITH 3301.
 - REFER TO STANDARD PLATE 8332 FOR ANCHOR ROD ASSEMBLY AND TEMPLATE DETAILS.
 - FURNISH & INSTALL 5/8" DIA. X 15' 0" LONG GROUND ROD ELECTRODE IN 1" NOM. DIA. RIGID PVC CONDUIT (TOP OF CONDUIT FLUSH WITH TOP OF CONCRETE) OR DIRECTLY IN CONCRETE BARRIER. EXTEND THE GROUND ROD 3'-4" ABOVE THE TOP OF CONCRETE.
 - EXTEND 5 NO. 5E LONGITUDINAL BARS 3' 4" MIN. INTO DESIGN AL SECTION.
 - DO NOT PLACE CONTRACTION OR OTHER BARRIER JOINTS WITHIN 7' 6" FROM THE CENTER OF THE ANCHOR ROD ASSEMBLY.
 - PAIR T BARS WITH L2 BARS AT LIGHT ANCHORAGE.
 - 3" CONDUIT USED WHEN CABLES ARE CROSSING UNDER THE ROADWAY.

REINFORCEMENT REQUIREMENTS			
BAR TYPE	BAR SIZE	BAR LENGTH	NO. PER SECTION
LONGITUDINAL	4E	14' 6"	8
LONGITUDINAL	4E	6' 0"	12
L1	4E	5' 10"	28
L2	4E	4' 2"	8
T	4E	3' 9"	4
U	4E	2' 2"	4
Z	4E	6' 1"	2

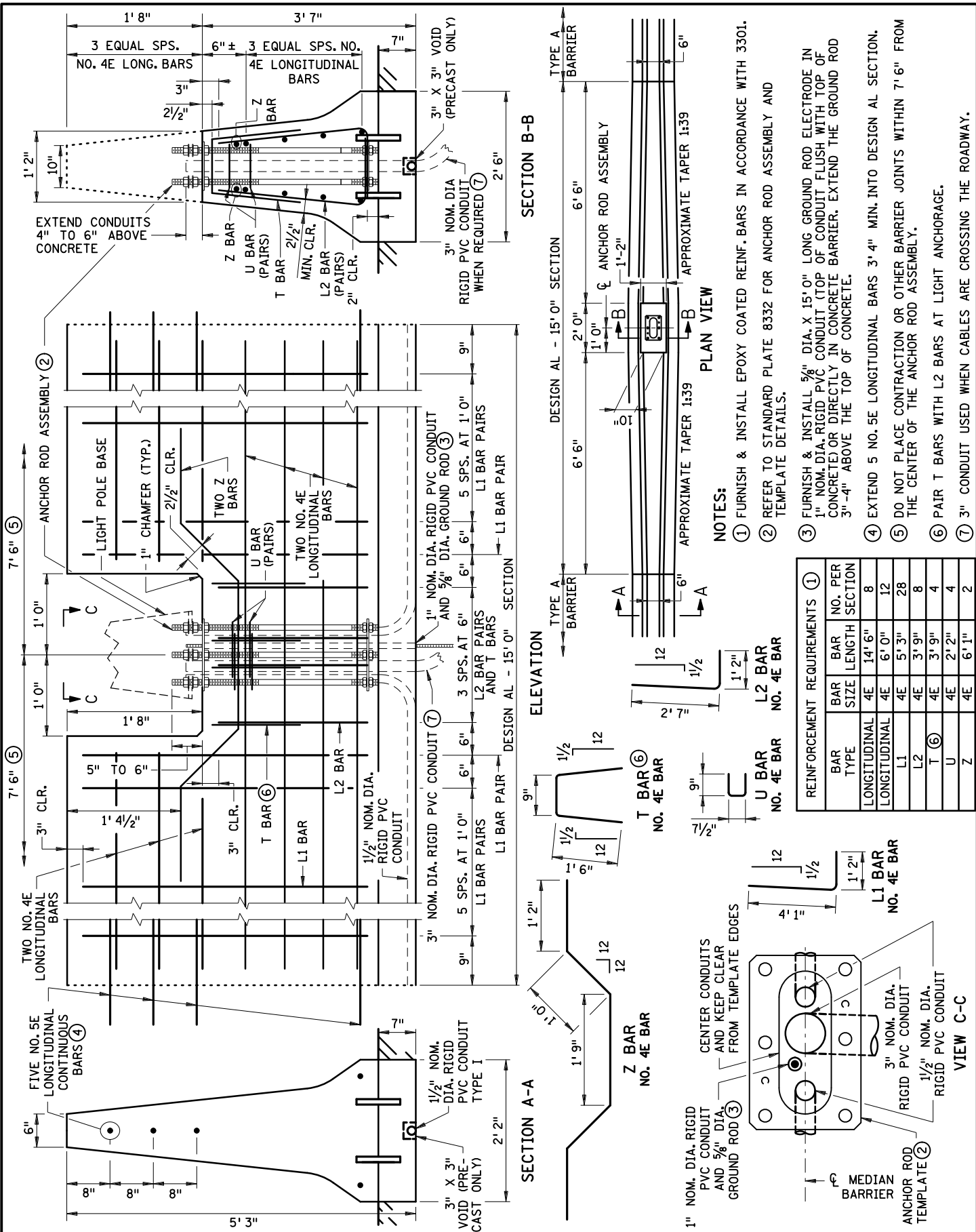
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STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE MEDIAN BARRIER TYPE F & GLARE SCREEN
 LIGHT FOUNDATION - MONOLITHIC BARRIER PLACEMENT

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REINFORCEMENT REQUIREMENTS

BAR TYPE	BAR SIZE	BAR LENGTH	NO. PER SECTION
LONGITUDINAL	4E	14'6"	8
LONGITUDINAL	4E	6'0"	12
L1	4E	5'3"	28
L2	4E	3'9"	8
T	4E	3'9"	4
U	4E	2'2"	4
Z	4E	6'1"	2

NOTES:

- FURNISH & INSTALL EPOXY COATED REINF. BARS IN ACCORDANCE WITH 3301.
- REFER TO STANDARD PLATE 8332 FOR ANCHOR ROD ASSEMBLY AND TEMPLATE DETAILS.
- FURNISH & INSTALL 5/8" DIA. X 15'-0" LONG GROUND ROD ELECTRODE IN 1" NOM. DIA. RIGID PVC CONDUIT (TOP OF CONDUIT FLUSH WITH TOP OF CONCRETE) OR DIRECTLY IN CONCRETE BARRIER. EXTEND THE GROUND ROD 3'-4" ABOVE THE TOP OF CONCRETE.
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- DO NOT PLACE CONTRACTION OR OTHER BARRIER JOINTS WITHIN 7'6" FROM THE CENTER OF THE ANCHOR ROD ASSEMBLY.
- PAIR T BARS WITH L2 BARS AT LIGHT ANCHORAGE.
- 3" CONDUIT USED WHEN CABLES ARE CROSSING THE ROADWAY.

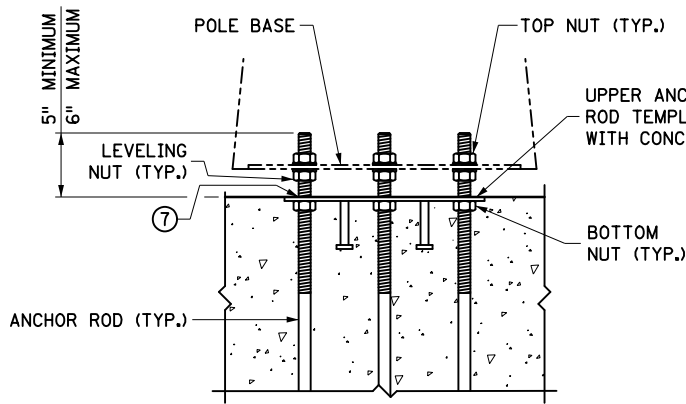
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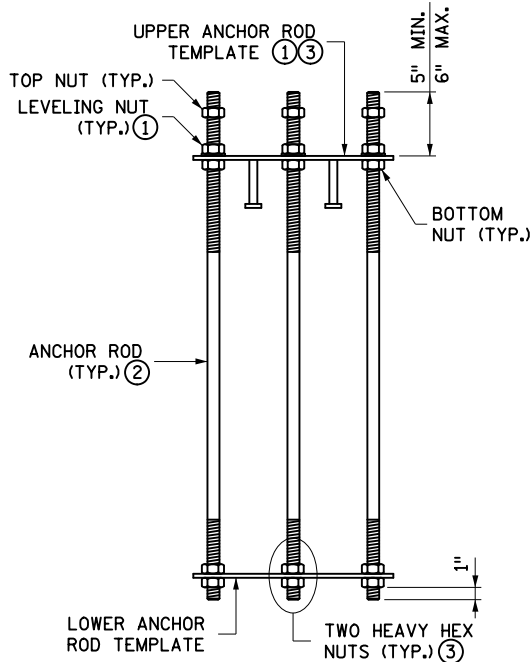
STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION
**REINFORCED CONCRETE MEDIAN
 BARRIER TYPE F & GLARE SCREEN**
 LIGHT FOUNDATION - BARRIER ON FOOTING

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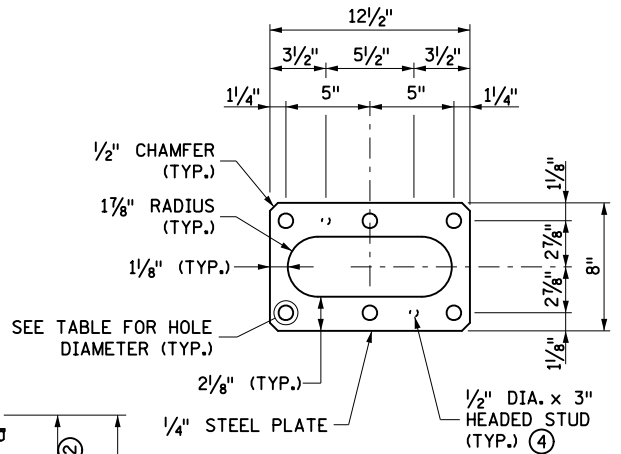
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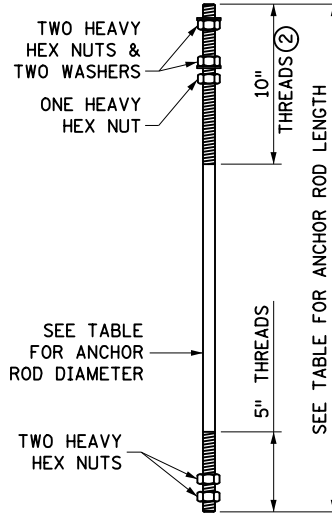
**PARTIAL ELEVATION
SHOWING ANCHOR ROD ASSEMBLY
AND HEX NUT POSITIONS AFTER
POLE INSTALLATION**



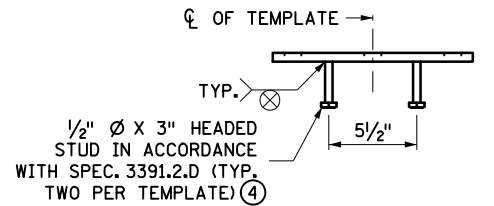
ANCHOR ROD ASSEMBLY



**ANCHOR ROD TEMPLATE
TWO REQUIRED PER ASSEMBLY**



**ANCHOR ROD & HARDWARE
SIX REQUIRED PER ASSEMBLY**



**ELEVATION VIEW
UPPER ANCHOR
ROD TEMPLATE**

NOTES:

- FURNISH AND INSTALL PLATES IN ACCORDANCE WITH SPEC. 3306, AND GALVANIZE IN ACCORDANCE WITH SPEC. 3394.
- FURNISH AND INSTALL ANCHOR RODS IN ACCORDANCE WITH SPEC. 3385.2.B. DO NOT TACK WELD.
- SUBSTITUTE MATERIALS IN ACCORDANCE WITH SPEC. 1605.
- FURNISH AND INSTALL HEAVY HEX NUTS AND FLAT WASHERS IN ACCORDANCE WITH SPEC. 3391.2.A.
- ① TEMPORARILY SECURE THE UPPER ANCHOR ROD TEMPLATE WITH THE LEVELING NUTS BEFORE CONCRETE PLACEMENT. AFTER CONCRETE PLACEMENT, LEAVE LEVELING NUTS SECURED AGAINST THE TEMPLATE UNTIL THE CLEANING AND LUBRICATING OF THE ANCHOR ROD CONNECTIONS BEFORE POLE PLACEMENT IS INITIATED.
- ② PROTECT ANCHOR ROD THREADS AND LEVELING NUTS ABOVE THE UPPER ANCHOR ROD TEMPLATE FROM CONCRETE CONTAMINATION.
- ③ USE A 12" LONG WRENCH TO SNUG TIGHTEN NUTS PULLING THE HANDLE WITH ONE ARM IN ONE SMOOTH MOTION.
- ④ HEADED STUDS IN ACCORDANCE WITH SPEC. 3391.2.D. ON UPPER ANCHOR ROD TEMPLATE ONLY.
- ⑤ FOR RETAINING WALL APPLICATIONS, PROJECT-SPECIFIC BARRIER OR PARAPET CONNECTION DETAILS ARE REQUIRED. PROVIDE 2" MINIMUM COVER FOR THE ANCHOR ROD ASSEMBLY AND VERIFY ANCHOR ROD LENGTH.
- ⑥ LOCALLY ADJUST TOP-OF-BARRIER PROFILE AS REQUIRED TO PROVIDE A LEVEL ANCHOR ROD TEMPLATE PLACEMENT.
- ⑦ REMOVE SURFACE CONTAMINANTS AND APPLY SILICONE JOINT SEALER TO THE UPPER TEMPLATE AROUND THE ANCHOR RODS AND ANCHOR ROD HOLES, AND THE INNER AND OUTER EDGES WHERE THE PLATE MEETS CONCRETE. USE AN APPROVED SILICONE JOINT SEALANT FOUND ON MnDOT'S APPROVED/QUALIFIED PRODUCTS LIST UNDER BRIDGE PRODUCTS.

STANDARD BARRIER AND PARAPET TYPES (SEE PLANS FOR TYPE)	ANCHOR ROD LENGTH (5)
CONCRETE MEDIAN BARRIER SINGLE SLOPE	3' 5"
CONCRETE MEDIAN BARRIER TYPE F	3' 1"
CONCRETE MEDIAN BARRIER TYPE F W/GLARE SCREEN	3' 5"
RETAINING WALL CONCRETE PARAPET (TYPE P-1)	2' 9"
RETAINING WALL CONCRETE PARAPET (TYPE P-4)	3' 1"
RETAINING WALL CONCRETE BARRIER (TYPE F, TL-4)	3' 1"
RETAINING WALL CONCRETE BARRIER (TYPE S, TL-4)	3' 5"

ANCHOR ROD DETAILS		
TYPE	ANCHOR ROD DIAMETER	HOLE DIAMETER
49' LIGHT POLES WITH TWIN ARMS 10' OR LONGER	1/4"	1 5/16"
OTHERS	1"	1 1/16"

APPROVED APRIL 14, 2020

 STATE DESIGN ENGINEER

STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION
**ANCHOR ROD ASSEMBLY
 FOR LIGHT FOUNDATION-BARRIER**

SPECIFICATION REFERENCE
 2545
 3306

STANDARD PLATE NO.
8332E

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