

# **MISSOURI HIGHWAYS and TRANSPORTATION COMMISSION**

**JEFFERSON CITY, MISSOURI**

**SUPPLEMENTAL PLANS TO JULY 2020 MISSOURI STANDARD  
PLANS FOR HIGHWAY CONSTRUCTION**

**EFFECTIVE April 1, 2021**

# MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

## MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

### TABLE OF CONTENTS

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE	STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE
203.00E	EXCAVATION AND EMBANKMENT - TYPICAL DETAILS	1	08/01/1998	606.60B	MIDWEST GUARDRAIL SYSTEM (MGS) - VERTICAL BARRIER TRNSITIONS	6	04/01/2020
203.02F	UNDERGRADING - TYPICAL DETAILS	2	01/01/2004	606.70B	MIDWEST GUARDRAIL SYSTEM (MGS) - THRIE BEAM RAIL ON BRIDGE	5	04/01/2018
203.10D	TABULATED EARTHWORK AND SECTION DATA	1	02/01/2009	606.80C	MIDWEST GUARDRAIL SYSTEM (MGS) - TERMINAL ANCHOR ENDS	7	07/01/2017
203.20G	SUPERELEVATION, SPIRALS AND WIDENING (UNDIVIDED HIGHWAY)	4	07/01/2017	606.81B	MASH - CRASHWORTHY END TERMINALS - TYPE A - GRADING LIMITS	1	10/01/2019
203.21K	SUPERELEVATION, SPIRALS AND WIDENING (DIVIDED HIGHWAY)	3	07/01/2017	607.10V	CHAIN-LINK FENCE	1	02/01/2007
203.22	SUPERELEVATION, SPIRALS AND WIDENING	2	07/01/2017	607.11H	CHAIN-LINK FENCE FOR RETAINING WALLS	1	06/01/2009
203.35A	MAILBOX TURNOUTS	1	08/01/1981	607.20G	WOVEN WIRE FENCE	2	07/01/2016
203.40G	TYPICAL DETAILS ON AND OFF RAMPS	2	10/01/2007	608.00J	PAVED APPROACHES	2	04/01/2020
203.41F	TYPICAL DETAILS ON AND OFF RAMPS (ROADWAY WITH 6:1 FORESLOPE)	2	01/01/1995	608.10P	CONCRETE SIDEWALK	1	04/01/2015
203.50N	TYPICAL MEDIAN OPENINGS (DIVIDED HIGHWAYS)	2	04/01/2016	608.20E	CONCRETE STAIRS	2	04/01/2015
203.61A	DRIVEWAY - TYPE I	1	07/01/2004	608.30A	CONCRETE MEDIAN STRIP	*	10/01/2020
203.62D	DRIVEWAY - TYPE II	2	04/01/2017	608.40A	HANDRAILING	*	01/01/2021
203.63B	DRIVEWAY - TYPE III	2	04/01/2017	608.50	CURB RAMPS	4	04/01/2015
203.64D	DRIVEWAY - TYPE IV	2	04/01/2017	609.00P	CONCRETE CURB, CURB AND GUTTER AND GUTTER	*	04/01/2021
203.65A	DRIVEWAY - TYPE V	1	10/01/1998	609.15D	PAVED DITCHES	1	07/01/2016
204.00D	EMBANKMENT CONTROL - MEASURING DEVICES	1	04/01/1983	609.40S	DRAIN BASIN, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS	3	01/01/2017
204.30	PORE PRESSURE MEASUREMENT DEVICES	1	03/01/1996	609.60C	ROCK DITCH LINER	1	03/01/1993
401.00B	TYPE A2 AND A3 SHOULDERS, SAFETY EDGE <sup>SM</sup>	3	04/01/2018	609.70C	ROCK LINING FOR CULVERT OUTLET	1	10/01/1981
413.20	SCRUB SEAL BROOM CONFIGURATION	1	07/01/2004	611.60R	CONCRETE SLOPE PROTECTION	1	07/01/2015
502.05P	CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15 FT. JOINT SPACING	*	10/01/2020	612.20E	SAND FILLED IMPACT ATTENUATORS	1	10/01/2018
502.10K	DOWEL SUPPORTING UNITS	2	06/01/2010	613.00T	PAVEMENT REPAIR	4	01/01/2020
504.00K	CONCRETE APPROACH PAVEMENT	*	10/01/2020	614.10T	GRATES AND BEARING PLATES	1	12/01/2005
602.00D	RIGHT-OF-WAY AND DRAIN MARKERS	2	01/01/2003	614.11D	CURVED VANE GRATE AND FRAME	*	01/01/2021
604.05D	PIPE CULVERT HEADWALLS - TYPE S	2	08/01/2006	614.30E	MANHOLE FRAMES AND COVERS	2	03/01/1996
604.10E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 18" CONCRETE PIPE	1	07/01/2001	616.10AX	TEMPORARY TRAFFIC CONTROL DEVICES	*	04/01/2021
604.11E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 24" CONCRETE PIPE	1	07/01/2001	617.10M	PERMANENT CONCRETE TRAFFIC BARRIER	*	10/01/2020
604.12E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 30" CONCRETE PIPE	1	07/01/2001	617.20F	TEMPORARY CONCRETE TRAFFIC BARRIER	*	01/01/2021
604.13E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 36" CONCRETE PIPE	1	07/01/2001	619.10J	PAVEMENT EDGE TREATMENT	1	10/01/2017
604.14E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 42" CONCRETE PIPE	1	07/01/2001	620.00L	PAVEMENT MARKING	5	10/01/2016
604.15E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 48" CONCRETE PIPE	1	07/01/2001	620.10G	TEMPORARY PAVEMENT MARKING	5	07/01/2017
604.29C	DROP INLET - TYPE X	2	04/01/2018	625.00	HOLE PATTERN FOR PAVEMENT SLAB STABILIZATION	1	10/01/1998
604.30G	CONCRETE MANHOLES	2	02/01/2009	626.00H	RUMBLE STRIPS	2	04/01/2009
604.40F	PIPE COLLARS	2	10/01/2000				
604.70	SLOTTED DRAIN	2	03/01/1994				
605.10I	PAVEMENT UNDERDRAINAGE	4	06/01/2013				
606.00AY	GUARDRAIL	7	01/01/2020				
606.01F	MEDIAN PIER PROTECTION	*	04/01/2021				
606.22U	BRIDGE ANCHOR SECTION - SAFETY BARRIER CURB ON BRIDGE	6	07/01/2016				
606.23J	BRIDGE ANCHOR SECTION (THRIE BEAM RAIL ON BRIDGE)	5	07/01/2016				
606.30L	GUARDRAIL - TERMINAL ANCHOR ENDS	*	04/01/2021				
606.31B	CRASHWORTHY END TERMINALS - TYPE A - GRADING LIMITS	1	10/01/2019				
606.40D	ONE-STRAND ACCESS RESTRAINT CABLE	2	07/01/2004				
606.41M	THREE-STRAND GUARD CABLE	*	04/01/2021				
606.50D	MIDWEST GUARDRAIL SYSTEM (MGS)	*	04/01/2021				
606.51	MIDWEST GUARDRAIL SYSTEM (MGS) - MEDIAN PIER PROTECTION	*	04/01/2021				

# MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

EFFECTIVE: 04/01/2021

## MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

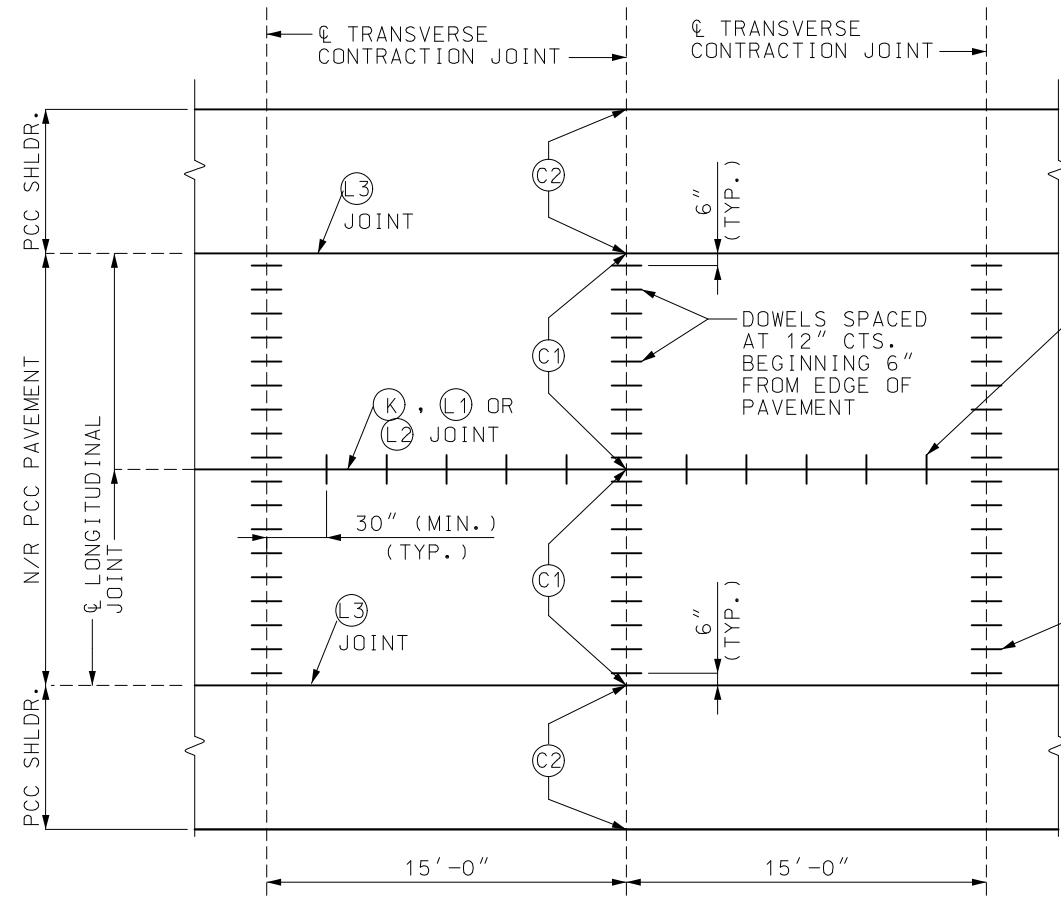
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STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE	STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE		
703.10J	CONCRETE SINGLE BOX CULVERT - STRAIGHT WINGS (SQUARED)	*	3	01/01/2021	901.30F	HIGHWAY LIGHTING - BASE MOUNTED CONTROL STATION	2	04/01/2005	
703.11J	CONCRETE SINGLE BOX CULVERT - FLARED WINGS (SQUARED)	*	3	01/01/2021	901.80D	HIGHWAY LIGHTING - POWER SUPPLY ASSEMBLY - SECONDARY SERVICE	2	04/01/2002	
703.12J	CONCRETE SINGLE BOX CULVERT - STRAIGHT WINGS (LEFT ADVANCE)	*	3	01/01/2021	901.85B	HIGHWAY LIGHTING SYMBOLS	1	04/01/2018	
703.13J	CONCRETE SINGLE BOX CULVERT - FLARED WINGS (LEFT ADVANCE)	*	3	01/01/2021	902.00P	TRAFFIC SIGNALS	2	04/01/2018	
703.14J	CONCRETE SINGLE BOX CULVERT - STRAIGHT WINGS (RIGHT ADVANCE)	*	3	01/01/2021	902.05	TRAFFIC SIGNALS - ACCESSIBLE PEDESTRIAN SIGNALS	*	2	04/01/2021
703.15E	CONCRETE SINGLE BOX CULVERT - FLARED WINGS (RIGHT ADVANCE)	*	3	01/01/2021	902.10Q	TRAFFIC SIGNALS - CONTROLLERS CONDUIT LOCATION	1	04/01/2005	
703.16	CONCRETE SINGLE BOX CULVERT - CUT SECTION	*	1	01/01/2021	902.15K	TRAFFIC SIGNALS - POWER SUPPLY ASSEMBLY	3	07/01/2004	
703.17	CONCRETE SINGLE BOX CULVERT - MEMBER SIZES AND REINFORCEMENT		14	04/01/2011	902.20G	TRAFFIC SIGNALS - CONCRETE PULL BOXES	3	04/01/2019	
703.37C	CONCRETE BOX CULVERT - EXTERIOR WING REINFORCEMENT		2	04/01/2011	902.21C	TRAFFIC SIGNALS - TELEPHONE INTERCONNECT	1	03/01/1996	
703.38A	CONCRETE BOX CULVERT - CUTTING DETAILS		2	10/01/2009	902.30P	TRAFFIC SIGNALS - POST BASES	2	10/01/2018	
703.40H	CONCRETE DOUBLE BOX CULVERT - STRAIGHT WINGS (SQUARED)	*	3	01/01/2021	902.40R	TRAFFIC SIGNALS - TUBULAR STEEL POSTS	3	04/01/2018	
703.41H	CONCRETE DOUBLE BOX CULVERT - FLARED WINGS (SQUARED)	*	3	01/01/2021	902.50M	TRAFFIC SIGNALS - INDUCTION LOOP DETECTORS	2	04/01/2020	
703.42H	CONCRETE DOUBLE BOX CULVERT - STRAIGHT WINGS (LEFT ADVANCE)	*	3	01/01/2021	902.70Q	TRAFFIC SIGNALS - RIGID SPAN WIRE DETAILS	*	2	04/01/2021
703.43H	CONCRETE DOUBLE BOX CULVERT - FLARED WINGS (LEFT ADVANCE)	*	3	01/01/2021	902.80L	TRAFFIC SIGNALS - TRAFFIC SIGNAL SYMBOLS	1	04/01/2020	
703.44H	CONCRETE DOUBLE BOX CULVERT - STRAIGHT WINGS (RIGHT ADVANCE)	*	3	01/01/2021	903.01J	STANDARD ARROW DETAILS	2	10/01/2016	
703.45C	CONCRETE DOUBLE BOX CULVERT - FLARED WINGS (RIGHT ADVANCE)	*	3	01/01/2021	903.02AP	HIGHWAY SIGNING	8	10/01/2019	
703.46	CONCRETE BOX CULVERT - CUT SECTION	*	1	01/01/2021	903.03BN	POST INSTALLATIONS AND SIGN MOUNTING DETAILS	*	16	01/01/2021
703.47	CONCRETE BOX CULVERT - MEMBER SIZES AND REINFORCEMENT		27	10/01/2011	903.04F	HIGHWAY SIGNING - WEIGH STATION	1	02/01/2012	
703.60E	CONCRETE BOX STRUCTURE - PIPE INLET		1	07/01/2001	903.05K	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE S, ONE TUBE	*	2	01/01/2021
703.80H	CONCRETE TRIPLE BOX CULVERT - STRAIGHT WINGS (SQUARED)	*	3	01/01/2021	903.06K	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE S, TWO TUBE	*	2	01/01/2021
703.81H	CONCRETE TRIPLE BOX CULVERT - FLARED WINGS (SQUARED)	*	3	01/01/2021	903.07K	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE C	*	2	01/01/2021
703.82H	CONCRETE TRIPLE BOX CULVERT - STRAIGHT WINGS (LEFT ADVANCE)	*	3	01/01/2021	903.08J	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE B	*	2	01/01/2021
703.83H	CONCRETE TRIPLE BOX CULVERT - FLARED WINGS (LEFT ADVANCE)	*	3	01/01/2021	903.10BD	OVERHEAD SIGN TRUSSES - ALUMINUM	*	6	01/01/2021
703.84H	CONCRETE TRIPLE BOX CULVERT - STRAIGHT WINGS (RIGHT ADVANCE)	*	3	01/01/2021	903.12AA	OVERHEAD SIGN TRUSSES - BUTTERFLY AND CANTILEVER STRUCTURAL STEEL	*	7	01/01/2021
703.85C	CONCRETE TRIPLE BOX CULVERT - FLARED WINGS (RIGHT ADVANCE)	*	3	01/01/2021	903.60AC	OVERHEAD SIGN TRUSSES - STRUCTURAL STEEL	*	5	01/01/2021
703.86	CONCRETE TRIPLE BOX CULVERT - CUT SECTION	*	1	01/01/2021					
703.87	CONCRETE TRIPLE BOX CULVERT - MEMBER SIZES AND REINFORCEMENT		27	12/01/2011					
706.35H	BAR SUPPORTS FOR CONCRETE REINFORCEMENT		1	07/01/2004					
712.40L	STEEL DAMS AT EXPANSION DEVICES		1	10/01/2019					
725.00C	CORRUGATED METAL PIPE INSTALLATION METHODS		5	04/01/2011					
725.31C	METAL CURTAIN WALL AND METAL INLETS		1	07/01/2004					
726.30J	RIGID CULVERT INSTALLATION METHODS		2	04/01/2015					
730.00E	THERMOPLASTIC PIPE INSTALLATION METHODS		1	04/01/2015					
731.00U	PRECAST MANHOLES		2	07/01/2016					
731.10S	PRECAST DROP INLET		8	07/01/2016					
732.00S	FLARED END SECTION		3	01/01/2021					
732.05D	BEVELED PIPE END TREATMENT	*	2	07/01/2004					
732.10H	SAFETY SLOPE END SECTION	*	3	01/01/2021					
733.00	PRECAST CONCRETE BOX CULVERT TIES		1	04/01/2018					
806.10J	TEMPORARY EROSION CONTROL MEASURES		6	04/01/2019					
808.00	TYPICAL PLANTING ILLUSTRATIONS		3	07/01/2004					
901.00AB	HIGHWAY LIGHTING - POLES, FOUNDATIONS & APPURTENANCES FOR 30' M.H.	*	4	01/01/2021					
901.01AJ	HIGHWAY LIGHTING - POLES, FOUNDATIONS & APPURTENANCES FOR 45' M.H.	*	6	01/01/2021					
901.02B	HIGHWAY LIGHTING - CABLE, CONDUIT AND TRENCHING		1	04/01/2002					

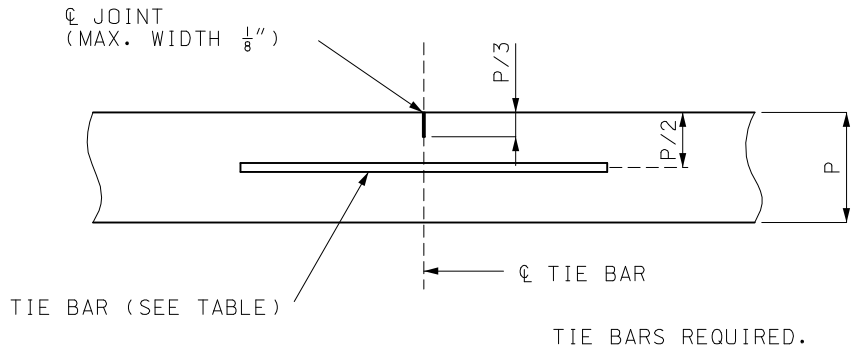
\* REVISED OR ADDED SINCE OCTOBER 2020

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**JOINT PLAN AND SPACING FOR CONTRACTION JOINTS (1)**

(1) LONGITUDINAL JOINT NOT REQUIRED AT INSIDE SHOULDER ON DIVIDED HIGHWAYS OR AT INSIDE SHOULDER OF RAMPS. FOR 4' OR LESS INSIDE SHOULDERS, DOWELS ARE REQUIRED FOR THE FIRST TWO FEET ADJACENT TO THE TRAVEL LANE.

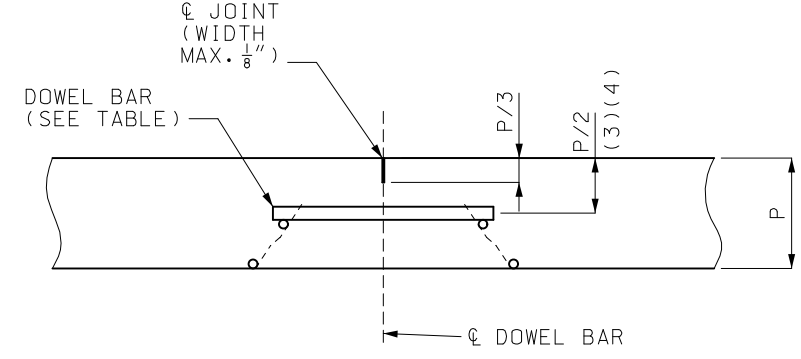


**LONGITUDINAL JOINT (L1)**

TIE BAR AND DOWEL TABLE				
PCCP THICKNESS (P)	DOWEL SIZE	TIE BAR SIZE	DOWEL SPACING	TIE BAR SPACING
LESS THAN 7"	NONE	#5X30"	NONE	30" CTR.-CTR.
7" TO 10"	1 1/4"X18"	#5X30"	12" CTR.-CTR.	30" CTR.-CTR.
GREATER THAN 10"	1 1/2"X18"	#6X40"	12" CTR.-CTR.	30" CTR.-CTR.

TIE BARS SPACED AT 30" CTS. BEGINNING 30" FROM  $\phi$  TRANSVERSE CONSTRUCTION JOINT

DOWEL BAR (TYP.)

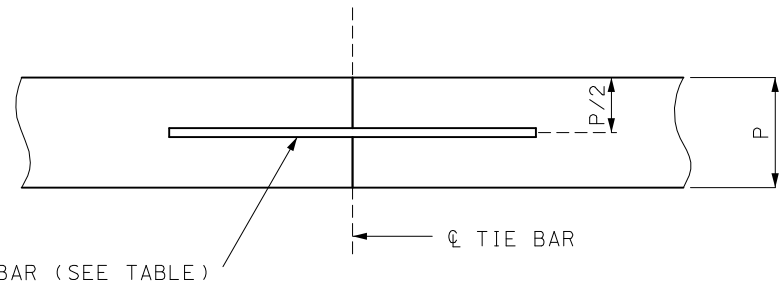


DOWELS REQUIRED. FOR PERMISSIBLE TYPES OF DOWELS SUPPORTING UNITS, SEE OTHER DRAWINGS.

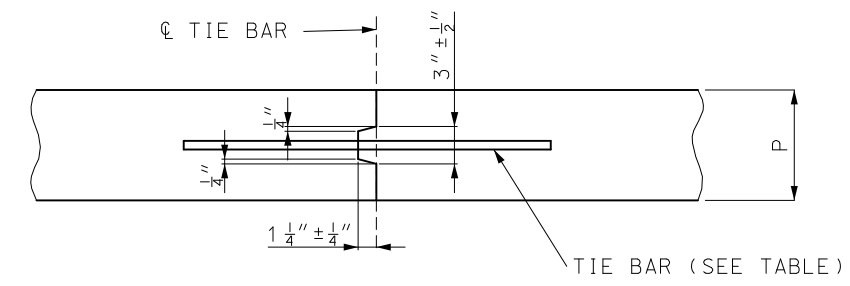
TRANSVERSE CONTRACTION JOINTS FOR CONCRETE PAVEMENT OR BASE WIDENING SHALL MATCH EXISTING JOINTS.

**TRANSVERSE CONTRACTION JOINT (C1) (2)**

- (2) DOWEL BARS ARE REQUIRED FOR ALL PAVEMENTS HAVING THE SAME THICKNESS AS THE TRAVELED WAY.
- (3) FOR PAVEMENTS HAVING THICKNESS IN 1/2" INCREMENTS, DOWEL BASKETS SHALL BE P/2 - 1/2".
- (4) DOWEL BARS MAY BE PLACED BY MECHANICAL MEANS AT THE OPTION OF THE CONTRACTOR.



**LONGITUDINAL CONSTRUCTION JOINT (L2)**



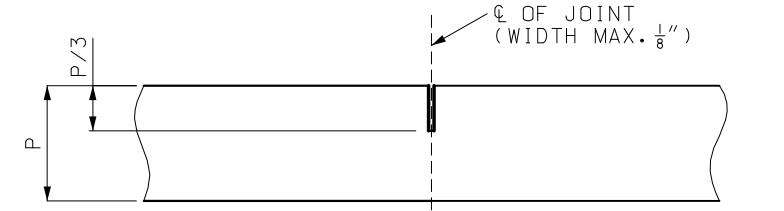
IF METAL IS USED TO FORM KEY DISCONTINUE STRIP FOR DISTANCE OF APPROXIMATELY 3" EACH SIDE OF TRANSVERSE JOINT.

TYPE (K) REQUIRES TIE BAR.

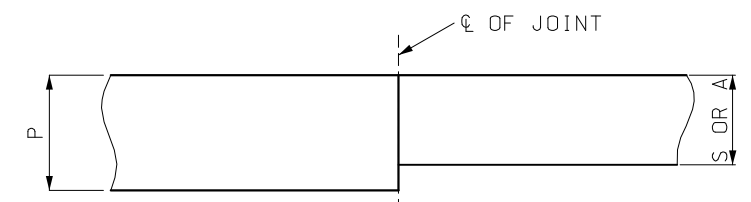
TYPE (M) CONSTRUCTED WITHOUT TIE BARS.

(K) AND (M) JOINTS SHALL NOT BE SAWED.

**TONGUE AND GROOVE JOINTS (K) AND (M)**



**TRANSVERSE CONTRACTION JOINT (C2)**



**LONGITUDINAL CONSTRUCTION JOINT FOR SHOULDER AND APPROACHES (L3)**

S = SHOULDER THICKNESS  
A = APPROACH THICKNESS

**GENERAL NOTES:**

THE FINAL POSITION OF ALL DOWELS AND TIE BARS SHALL BE PERPENDICULAR TO THE PLANE OF THE JOINT AND PARALLEL TO THE SURFACE OF THE PAVEMENT AND PARALLEL TO EACH OTHER.

(L3) JOINT FOR FULL DEPTH OR PARTIAL DEPTH SHOULDERS.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  

 105 WEST CAPITOL  
 JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  

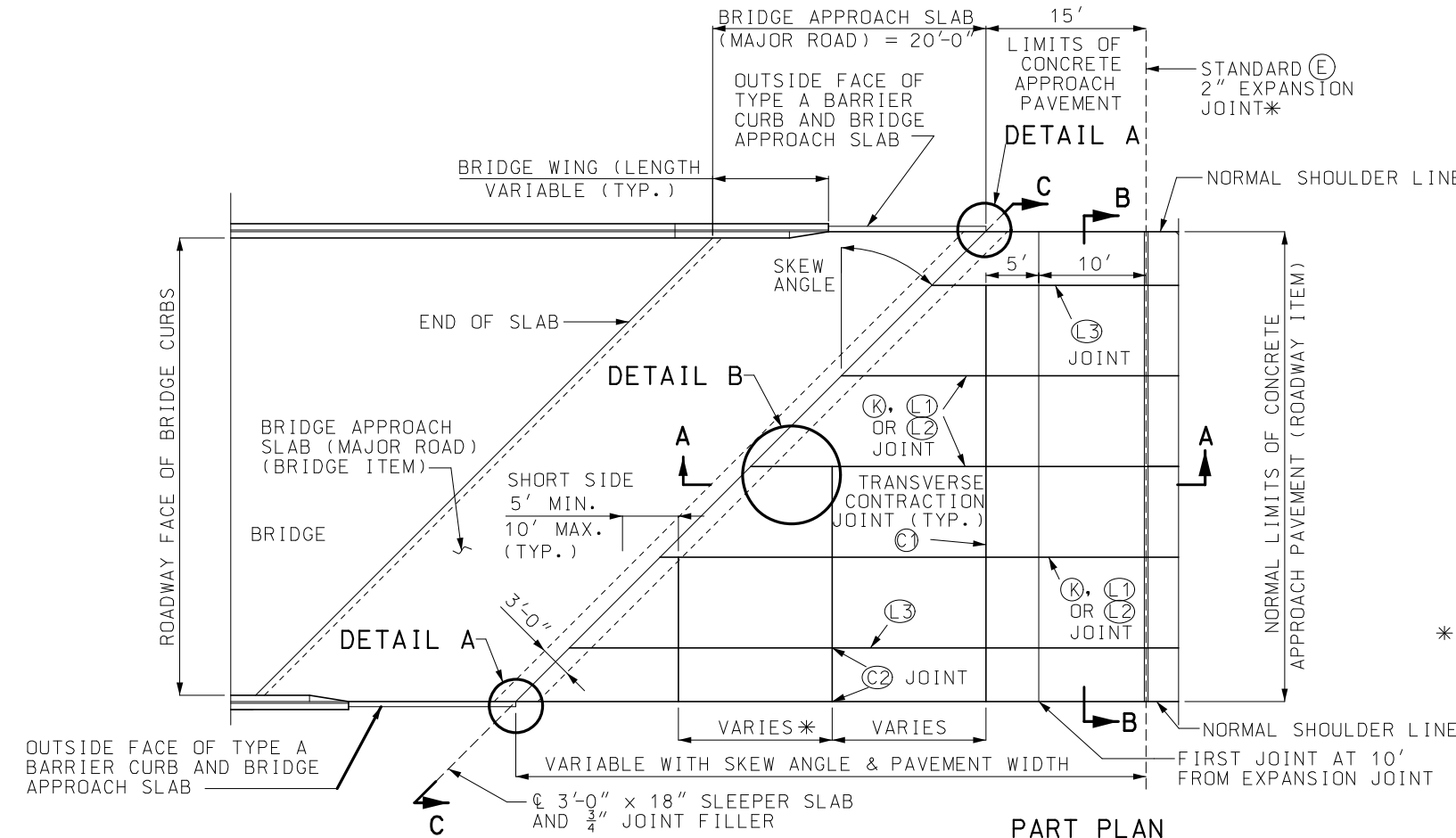
 TRAVIS D. KOESTNER  
 NUMBER PE-30042  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING**

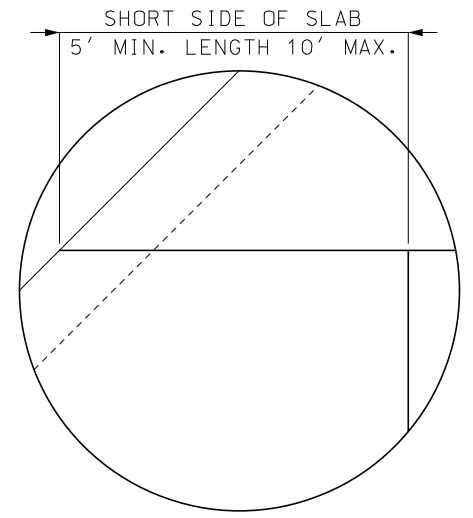
DATE EFFECTIVE: 10/01/2020	502.05P	SHEET NO. 3 OF 4
DATE PREPARED: 7/21/2020		

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

NOTE:  
SHORT SIDE OF SKEWED SLAB FOR ALL LANES NEXT TO BRIDGE APPROACH SLAB SHALL BE 5' TO 10'.

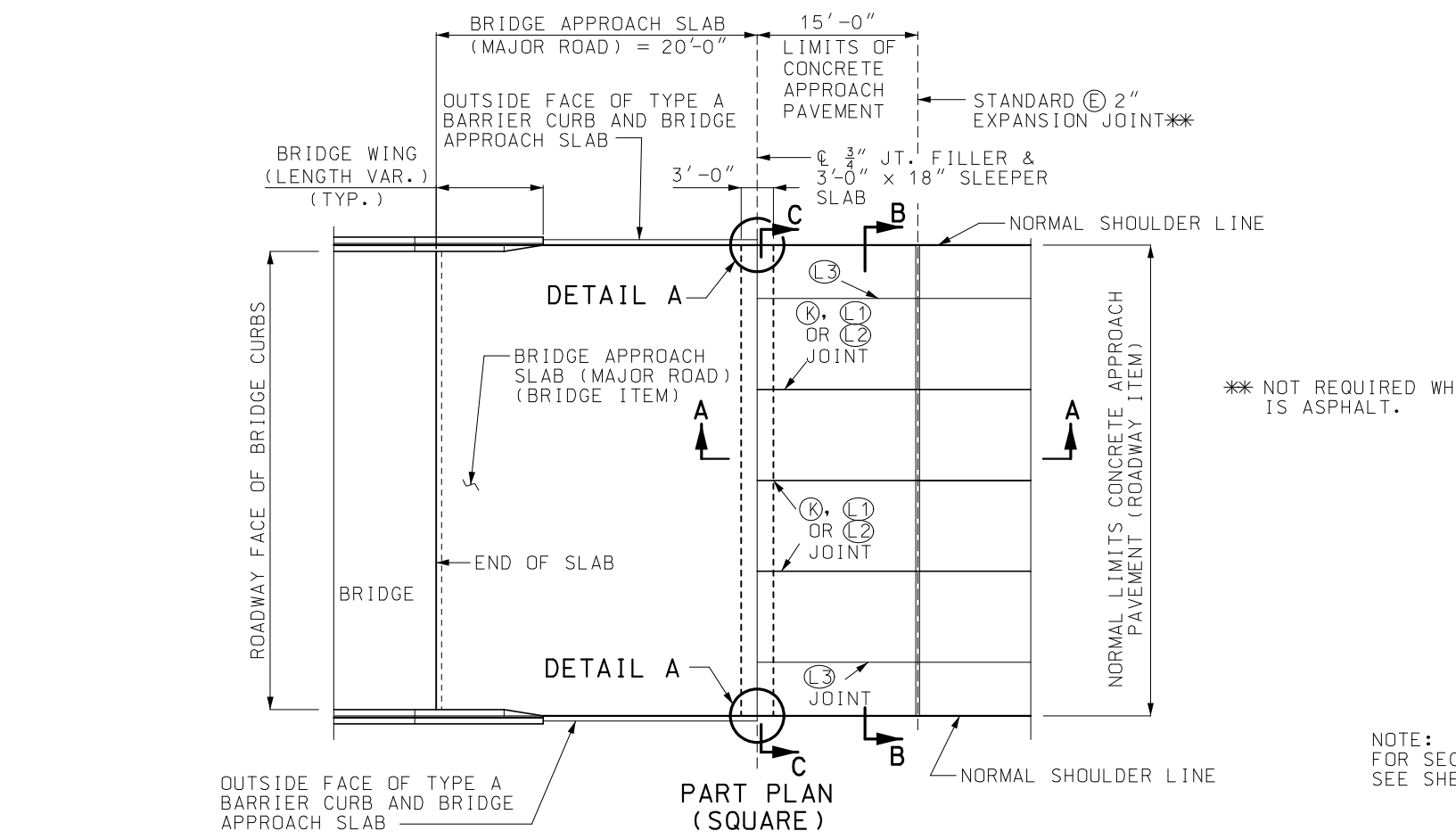


PART PLAN (SKEWED)

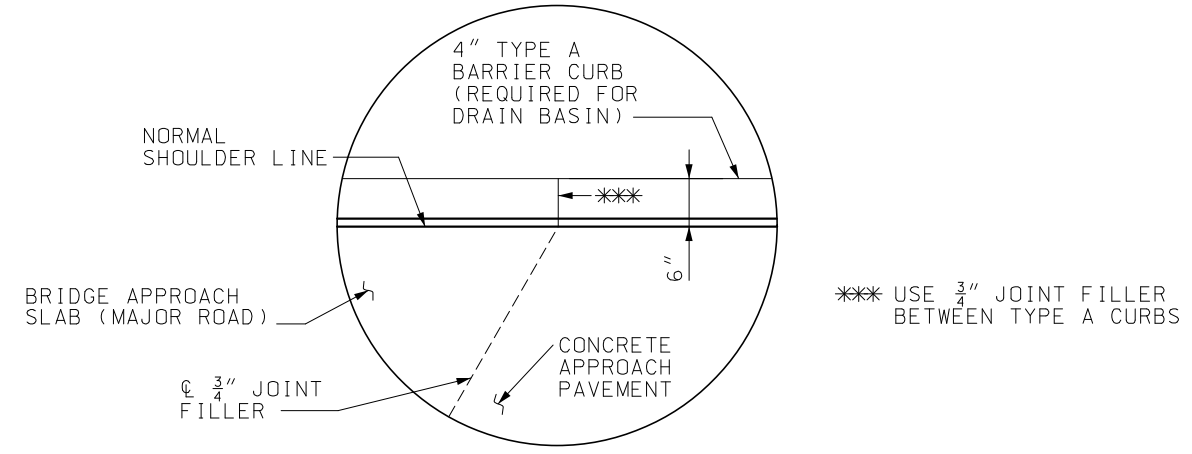


DETAIL B

\* LENGTH OF RECTANGULAR SLABS BETWEEN SKEWED SLAB AND FIRST 10' SLAB SHALL BE 10' TO 15'.



PART PLAN (SQUARE)



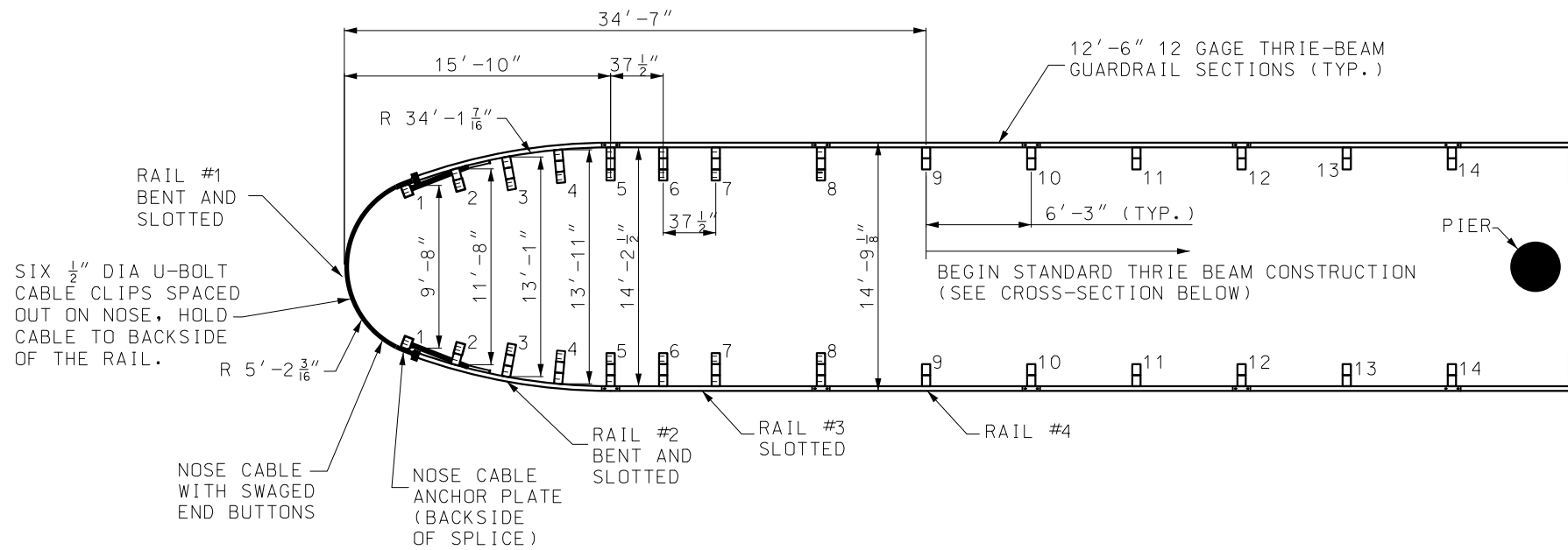
DETAIL A

\*\*\* USE 3/4" JOINT FILLER BETWEEN TYPE A CURBS

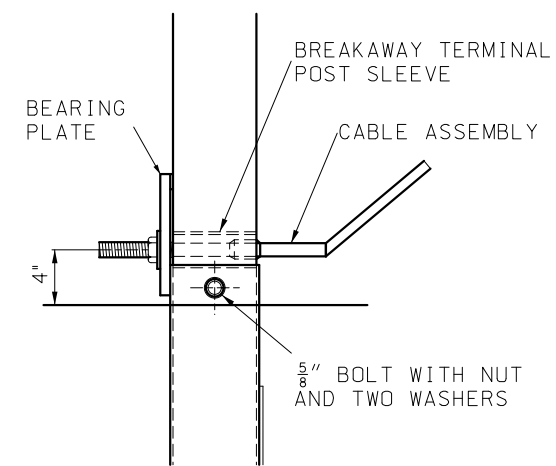
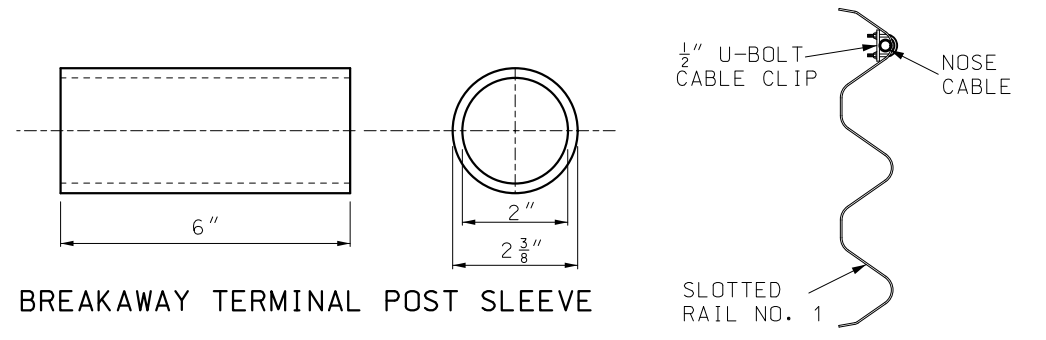
\*\* NOT REQUIRED WHEN ADJACENT PAVEMENT IS ASPHALT.

NOTE:  
FOR SECTIONS A-A, B-B AND C-C,  
SEE SHEET 3 OF 3.

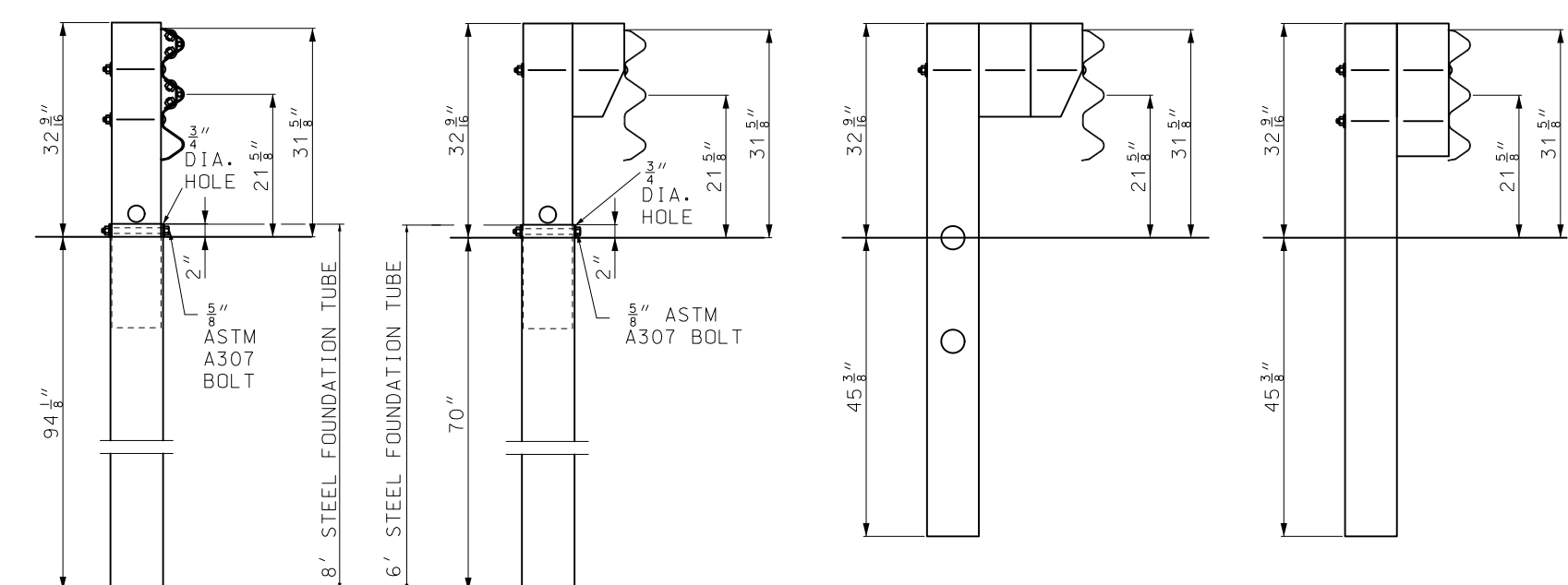
<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b></p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>TRAVIS D. KOESTNER NUMBER PE-30042 PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<p><b>CONCRETE APPROACH PAVEMENT FOR MULTI-LANE PAVEMENTS (MAJOR ROAD)</b></p>
	<p>DATE EFFECTIVE: 10/01/2020 DATE PREPARED: 7/21/2020</p> <p><b>504.00K</b></p>



DETAIL A



POST 1 DETAIL



THRIE BEAM BCT POST WITH 96 1/16" FOUNDATION TUBE POST 1

THRIE BEAM BCT POST WITH 72" FOUNDATION TUBE AND 14" TAPERED BLOCK POST 2

THRIE BEAM CRT POST 78" LONG WITH 14" BLOCK AND 14" TAPERED BLOCK POSTS 3, 4, 5, 6, 7, 8

THRIE BEAM POST 78" LONG WITH 14" BLOCK POSTS 9 AND 10

POST DETAILS

GENERAL NOTE:

RAILS NUMBERS 1, 2, 3 AND 4 ARE TYPE E GUARDRAIL. RAIL NUMBER 4 IS A STANDARD THRIE BEAM, NOT SLOTTED.

**MoDOT** MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

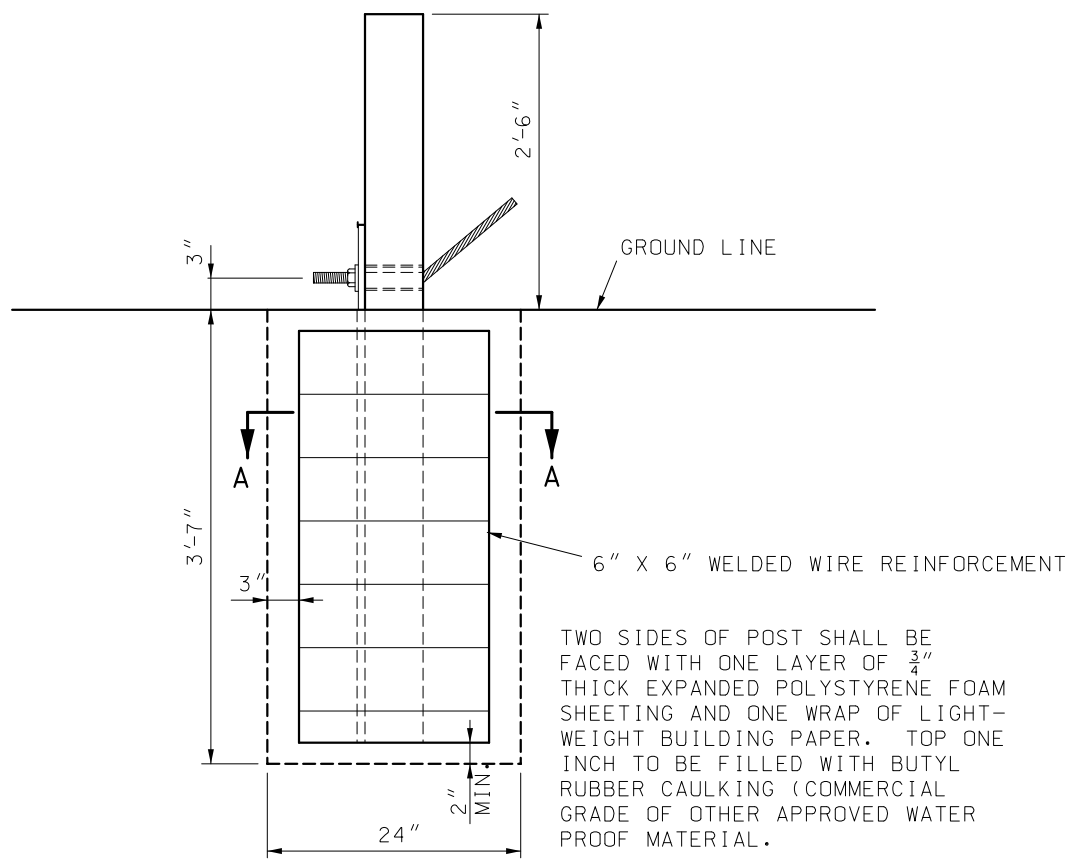
STATE OF MISSOURI  
 TRAVIS D. KOESTNER  
 NUMBER PE-30042  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**MEDIAN PIER PROTECTION BULLNOSE GUARDRAIL SYSTEM**

DATE EFFECTIVE: 04/01/2021	<b>606.01F</b>	SHEET NO. 2 OF 9
DATE PREPARED: 1/27/2021		

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

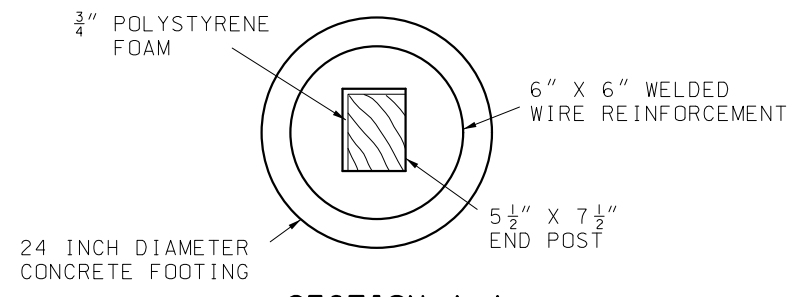
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



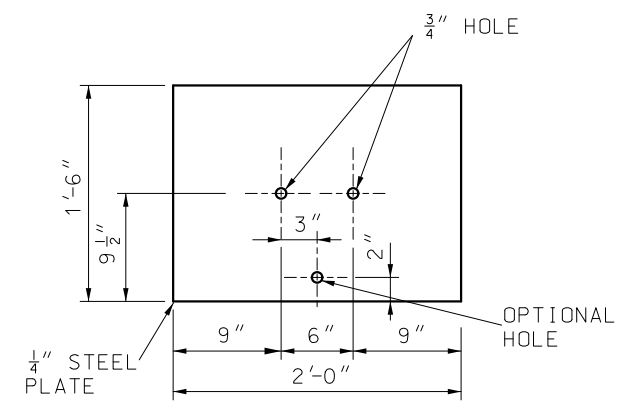
POST 1

**CONCRETE FOUNDATION FOR END ANCHORS**

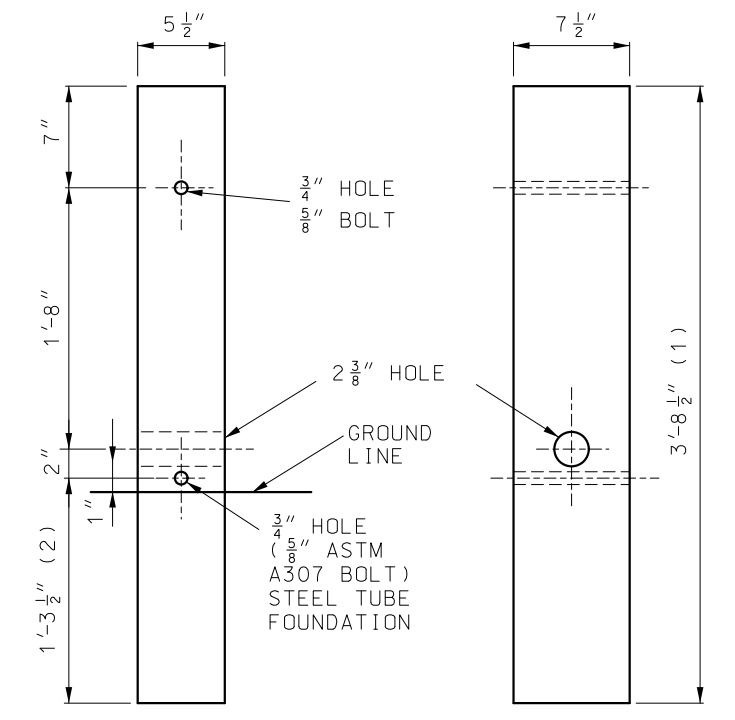
TWO SIDES OF POST SHALL BE FACED WITH ONE LAYER OF  $\frac{3}{4}$ " THICK EXPANDED POLYSTYRENE FOAM SHEETING AND ONE WRAP OF LIGHT-WEIGHT BUILDING PAPER. TOP ONE INCH TO BE FILLED WITH BUTYL RUBBER CAULKING (COMMERCIAL GRADE OF OTHER APPROVED WATER PROOF MATERIAL).



**SECTION A-A  
EXPANDED POLYSTYRENE FOAM  
INSTALLATION DETAIL**



**SOIL PLATE**

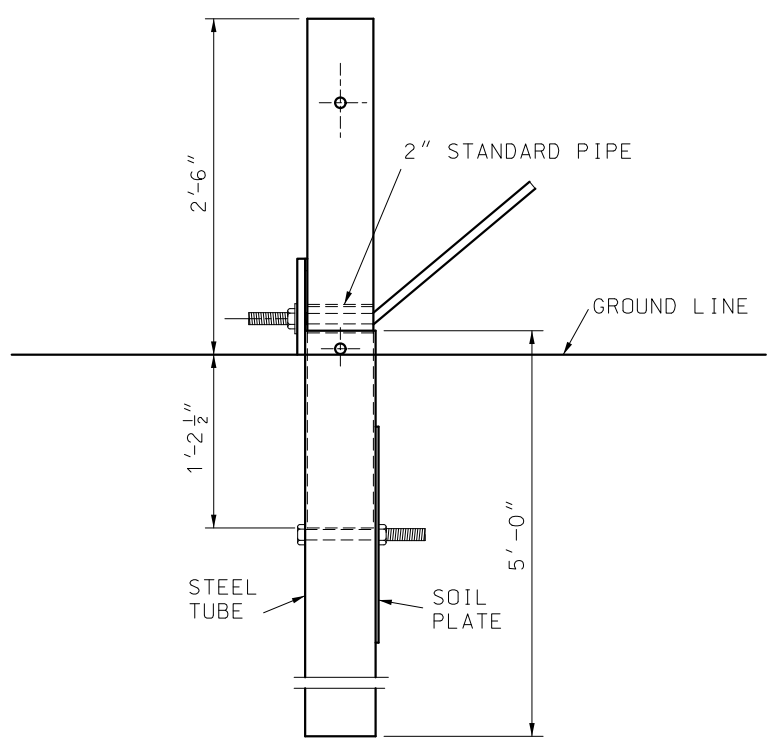


FRONT VIEW

SIDE VIEW

**WOOD BREAKAWAY POST  
SEE SECTION 1050**

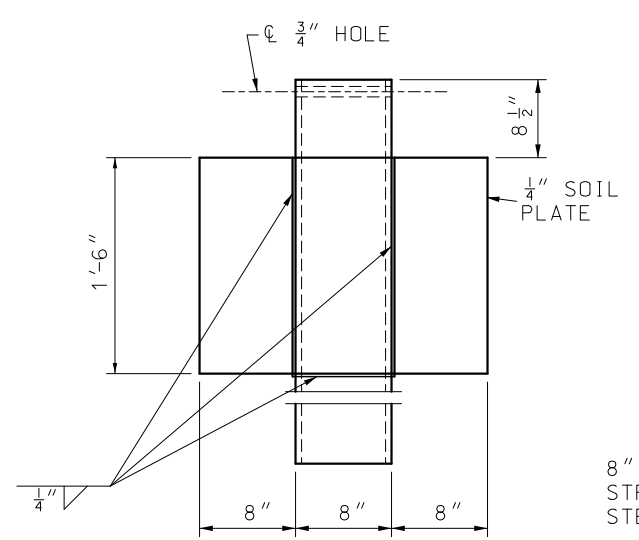
- (1) 5'-11 1/2" FOR CONCRETE FOUNDATION ALTERNATE.
- (2) 3'-8 1/2" FOR CONCRETE FOUNDATION ALTERNATE.



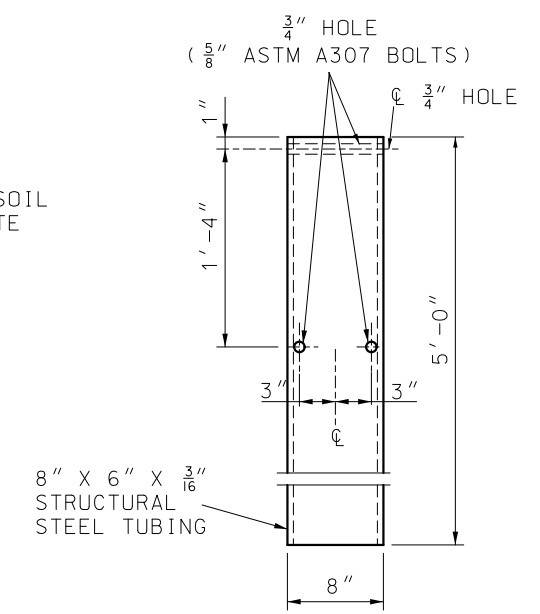
POST 1

**STEEL TUBE FOUNDATION FOR END ANCHORS**

BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1080 OF THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.



**SHOP WELDED  
SOIL PLATE CONNECTION**



**STEEL TUBE**

**GENERAL NOTES:**

THE CONTRACTOR HAS THE OPTION TO INSTALL WOOD POST 1 AND 2 IN STEEL TUBE OR CONCRETE FOUNDATION.

TRIMMING OF WOOD POST MAY BE NECESSARY FOR STEEL TUBE FOUNDATION.

STEEL TUBE FOUNDATIONS SHALL BE DRILLED AND BACK-FILLED WITH A SUITABLE MATERIAL WHEN THE SOIL PLATE IS BOLTED, AS SHOWN, TO THE STEEL TUBE. STEEL TUBE FOUNDATION MAY BE DRIVEN WHEN THE SOIL PLATE IS WELDED, AS SHOWN, TO THE STEEL TUBE.

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JEFFERSON CITY, MO 65102  
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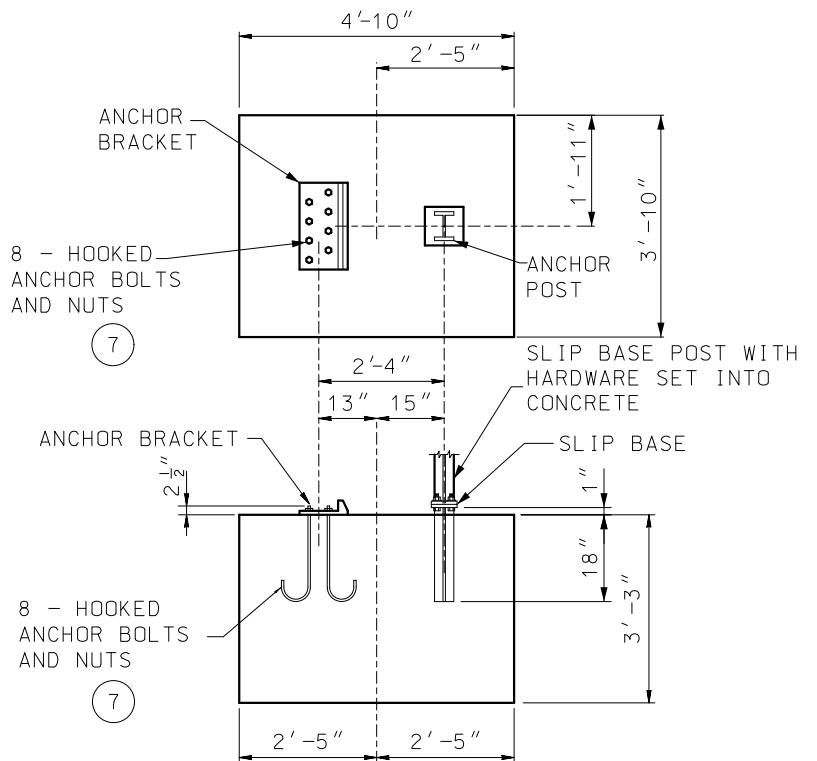
STATE OF MISSOURI  
TRAVIS D. KOESTNER  
NUMBER PE-30042  
PROFESSIONAL ENGINEER  
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**GUARDRAIL  
TERMINAL ANCHOR ENDS**

DATE EFFECTIVE: 04/01/2021	606.30L	SHEET NO. 3 OF 7
DATE PREPARED: 1/27/2021		

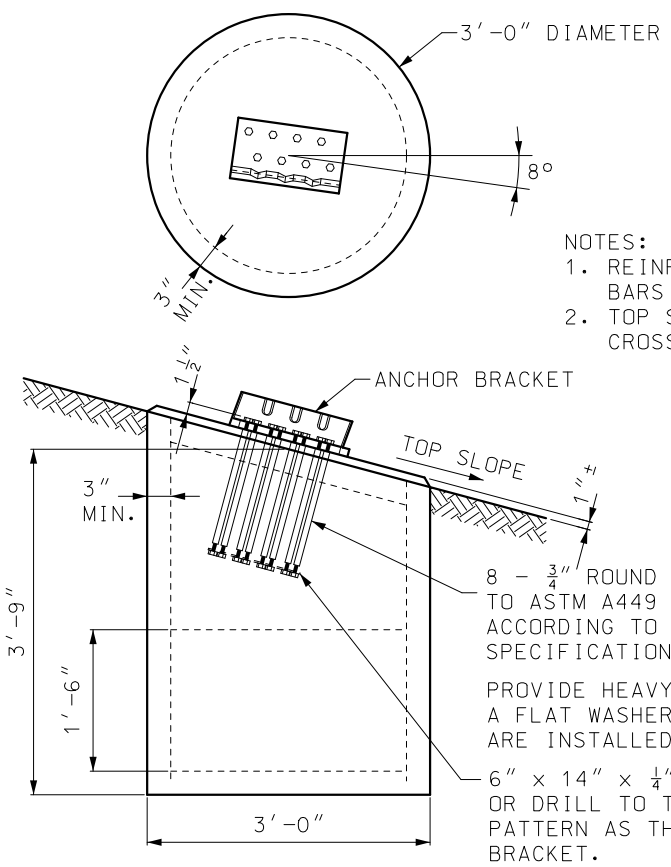
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STANDARDIZED HARDWARE	
①	WIRE ROPE
②	CABLE END FITTING
③	COMPENSATING CABLE END ASSEMBLY
④	ANCHOR BRACKET
⑤	U-BOLT CABLE CLIPS
⑥	CABLE HOOK BOLT AND NUT
⑦	HOOKED ANCHOR BOLT AND NUTS
⑧	CABLE TRANSITION BRACKET



**MEDIAN AND ROADSIDE CABLE**

- NOTES:
1. PLACE ANCHORS SO THE TOPS ARE LEVEL; WARP SLOPE TO FIT.
  2. THE CONCRETE ANCHOR BLOCK DOES NOT REQUIRE REINFORCEMENT.



**GUARD CABLE TO GUARDRAIL TRANSITION**

- NOTES:
1. REINFORCEMENT CONSISTS OF NO. 3 BARS PLACED AS SHOWN.
  2. TOP SLOPE TO MATCH ADJACENT CROSS SLOPE.
- 8 - 3/4" ROUND x 18" LONG STEEL RODS CONFORMING TO ASTM A449 WITH THE TOP 6" OF THE RODS GALVANIZED ACCORDING TO SECTION 1080 OF THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
- PROVIDE HEAVY HEX NUTS AT EACH END OF EACH ROD PLUS A FLAT WASHER AT THE TOP END. AFTER THE TOP NUTS ARE INSTALLED, PUNCH THE THREADS TO PREVENT ROTATION.
- 6" x 14" x 1/4" PLATE - PUNCH OR DRILL TO THE SAME PLAN PATTERN AS THE CABLE ANCHOR BRACKET.

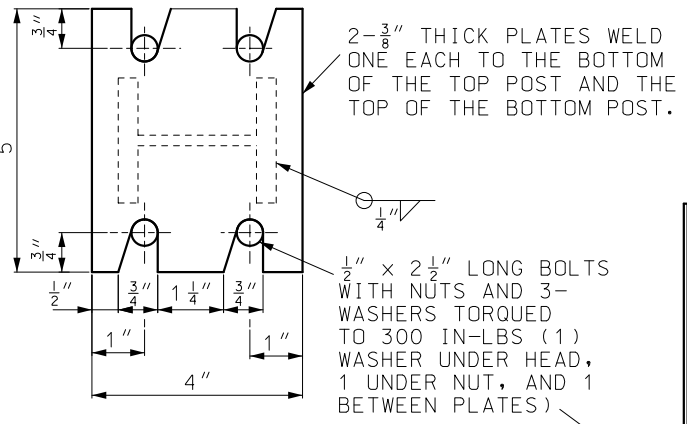
**GENERAL NOTES:**

FOR ARRANGEMENT OF SPRING AND COMPENSATING CABLE END ASSEMBLIES AND TURNBUCKLE CABLE END ASSEMBLIES, THE FOLLOWING CRITERIA SHALL APPLY: LENGTH OF CABLE RUNS TO 1000' - USE COMPENSATING CABLE END ASSEMBLY ON ONE END AND THE TURNBUCKLE CABLE END ASSEMBLY ON THE OTHER END OF EACH INDIVIDUAL CABLE. FOR LENGTHS LONGER THAN 1000' AND UP TO AND INCLUDING 2000' - USE COMPENSATING CABLE END ASSEMBLY ON EACH END OF THE INDIVIDUAL CABLE.

PRIOR TO FINAL ACCEPTANCE BY THE ENGINEER, THE FOLLOWING PROCEDURES SHALL BE USED TO TIGHTEN THE TURNBUCKLES. DEPENDING ON THE TEMPERATURE AT THE TIME OF THE ADJUSTMENT IN ACCORDANCE WITH THE FOLLOWING TABLE:

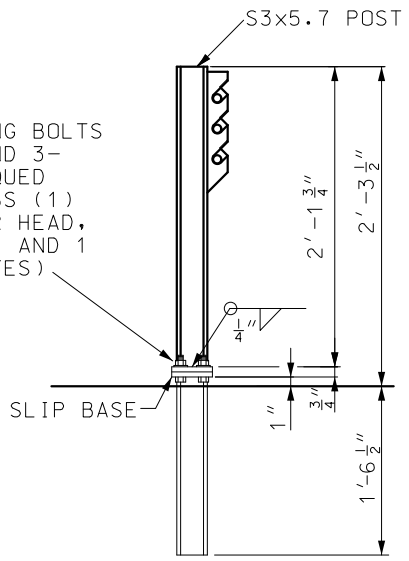
TEMPERATURE (°F)	SPRING COMPRESSION FROM UNLOADED POSITION IN EACH SPRING
120 TO 100	1"
99 TO 80	1 1/2"
79 TO 60	2"
59 TO 40	2 1/2"
39 TO 20	3"
19 TO 0	3 1/2"
-1 TO -20	4"

**TERMINAL ANCHOR ASSEMBLY**

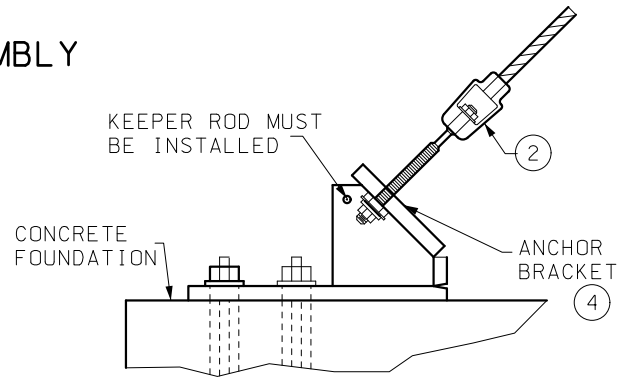


**SLIP BASE PLATE**

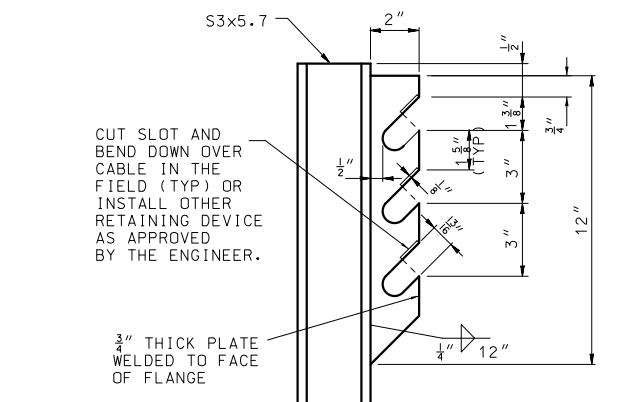
- NOTES:
1. LINE POST CABLE SPACING SHALL BE TRANSITIONED TO 3" BETWEEN THE TWO LINE POSTS IMMEDIATELY PRECEDING THE ANCHOR POST.
  2. CABLES PLACED ON BOTH POST FACES SHALL BE TRANSITIONED TO THE FRONT FACE BETWEEN THE TWO LINE POSTS IMMEDIATELY PRECEDING THE ANCHOR POST.



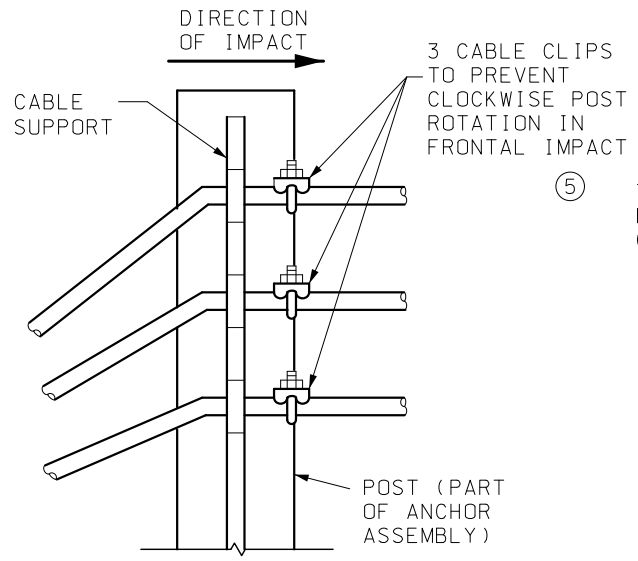
**SECTION A-A ANCHOR POST**



**DETAIL A ANCHOR BRACKET**  
DETAIL FROM SHEET 1.



**CABLE SUPPORT**



**DETAIL B CABLE CLIPS**  
DETAIL FROM SHEET 1.

- FOR DETAILS ② AND ④, SEE SHEET 5 OF 7.
- FOR DETAIL ⑤ AND ⑦, SEE SHEET 6 OF 7.

THE SPECIFICATIONS AND DIMENSIONS OF ALL HARDWARE AND FITTINGS SHALL COMPLY WITH AASHTO-AGC-ARTBA JOINT COMMITTEE TASK FORCE 13 REPORT, A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
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**THREE-STRAND GUARD CABLE**

TRAVIS D. KOESTNER  
NUMBER PE-30042  
PROFESSIONAL ENGINEER

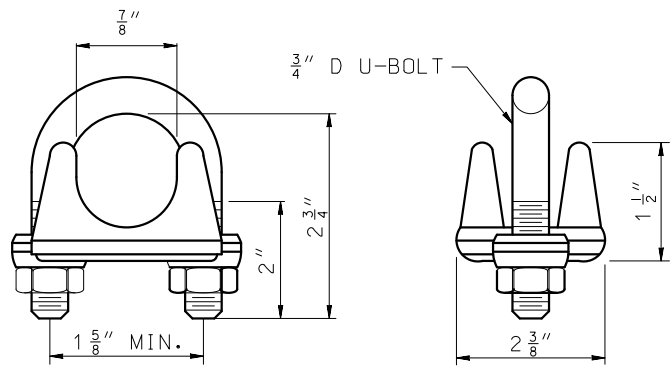
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DATE PREPARED: 1/27/2021

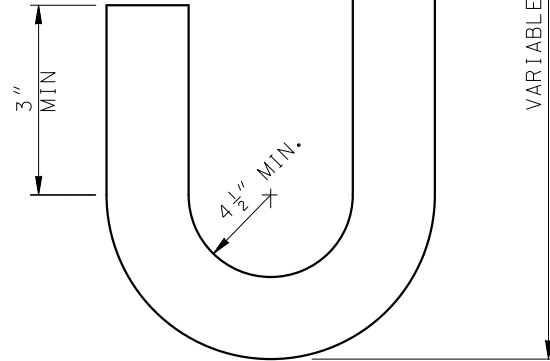
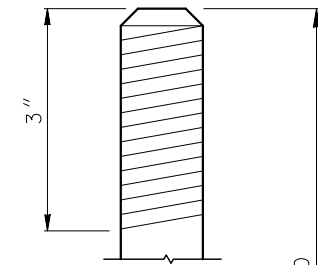
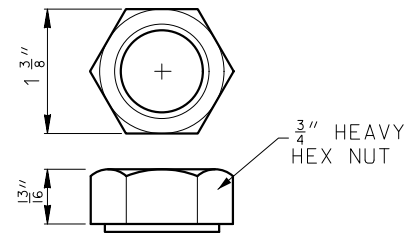
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SHEET NO.  
4 OF 7



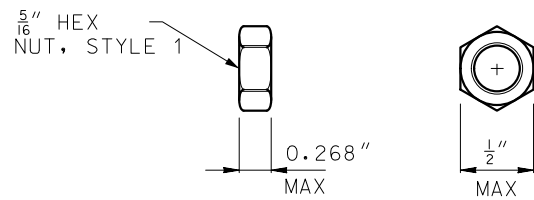
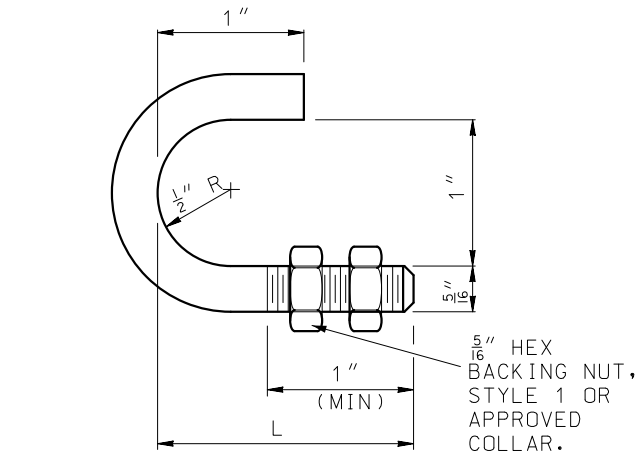


⑤ U-BOLT CABLE CLIPS

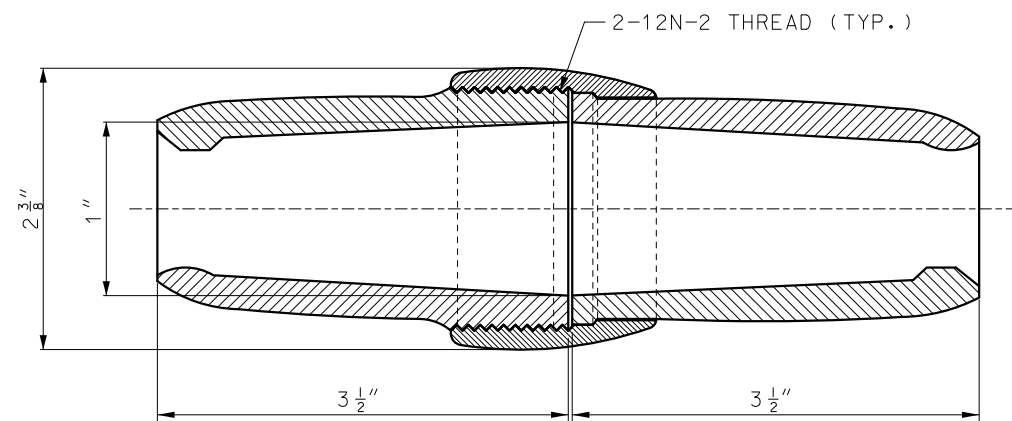


⑦ 25" HOOKED ANCHOR BOLT AND NUT

VARIABLE AS REQUIRED

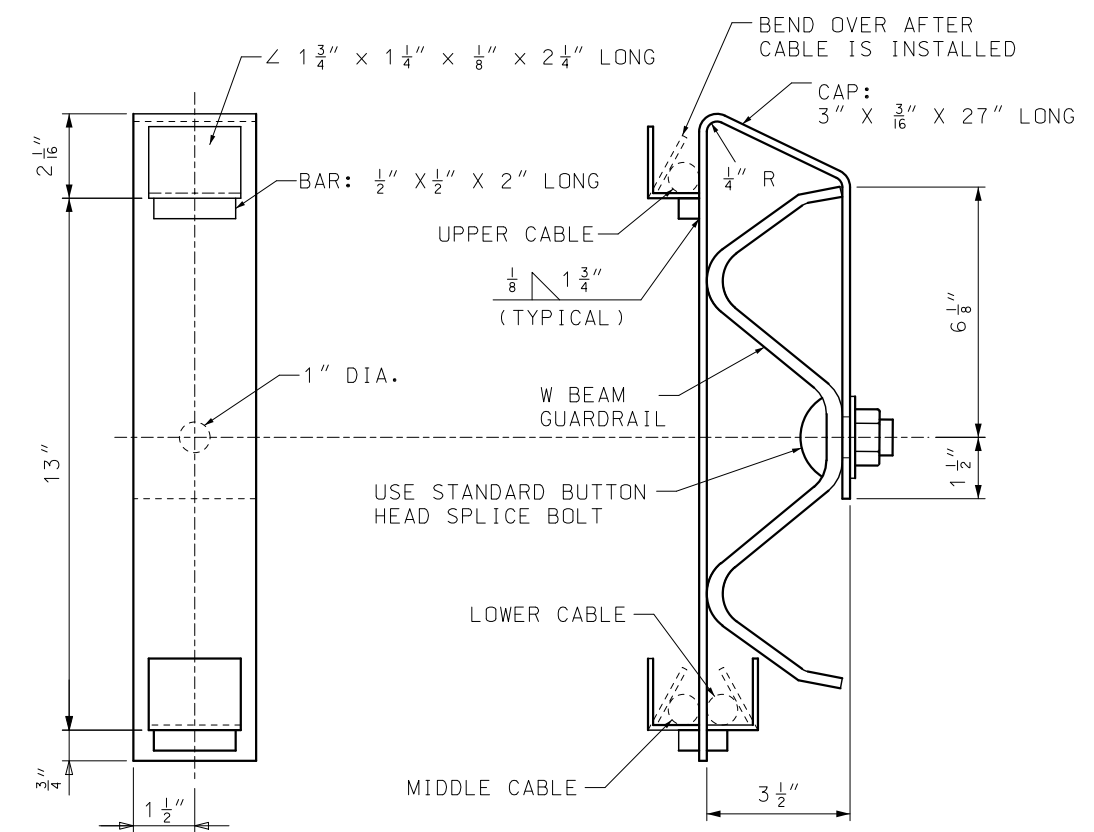


⑥ CABLE HOOK BOLT AND NUT

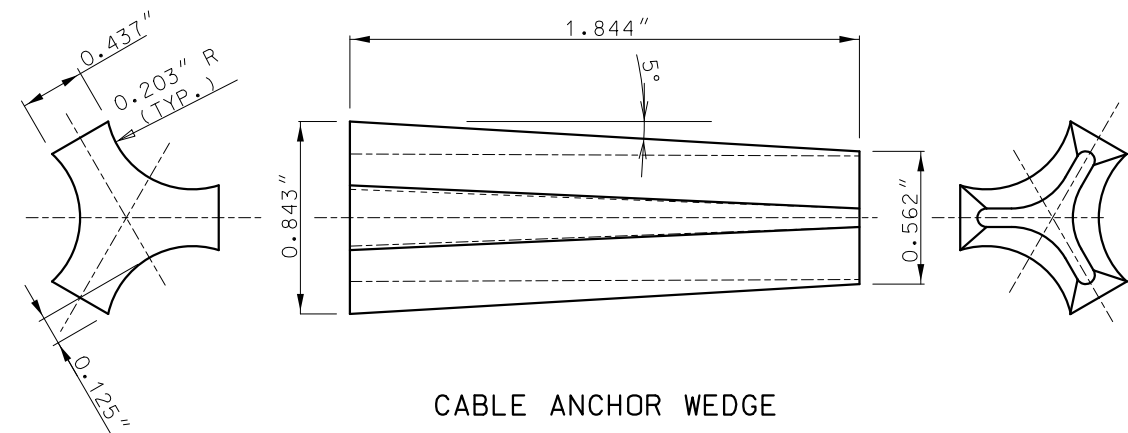


NOTE:  
FITTING SPLICE SHALL DEVELOP THE FULL  
STRENGTH OF THE CABLE (25,000 LB.).



CABLE SPLICE



⑧ CABLE TRANSITION BRACKET

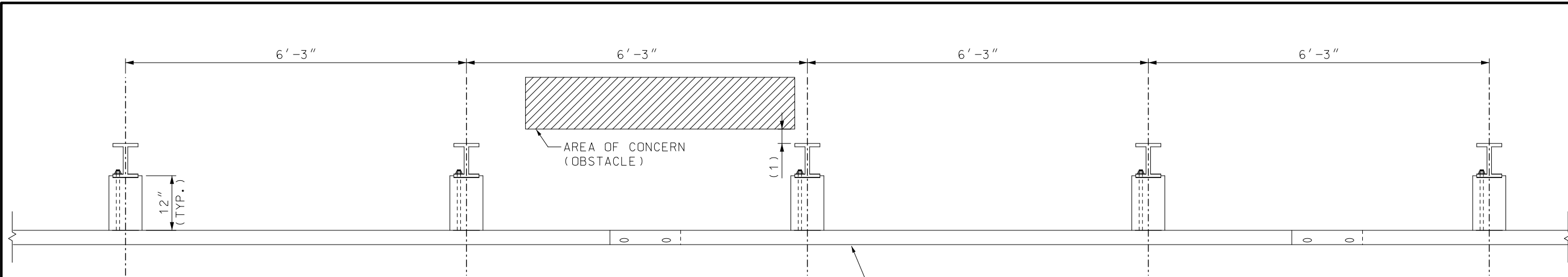


CABLE ANCHOR WEDGE

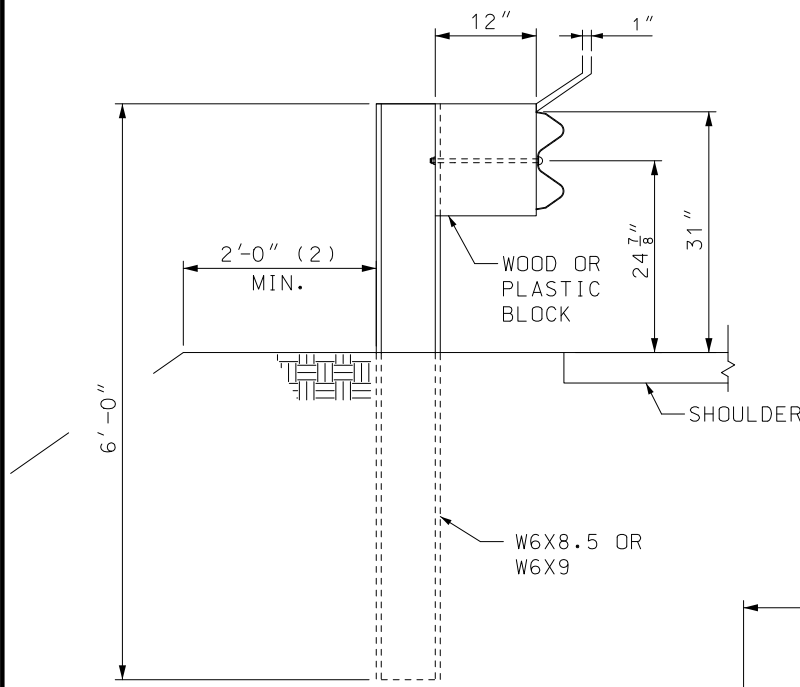
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>THREE-STRAND GUARD CABLE</b>
DATE EFFECTIVE: 04/01/2021 DATE PREPARED: 1/27/2021	<b>606.41M</b>
SHEET NO. <b>6 OF 7</b>	

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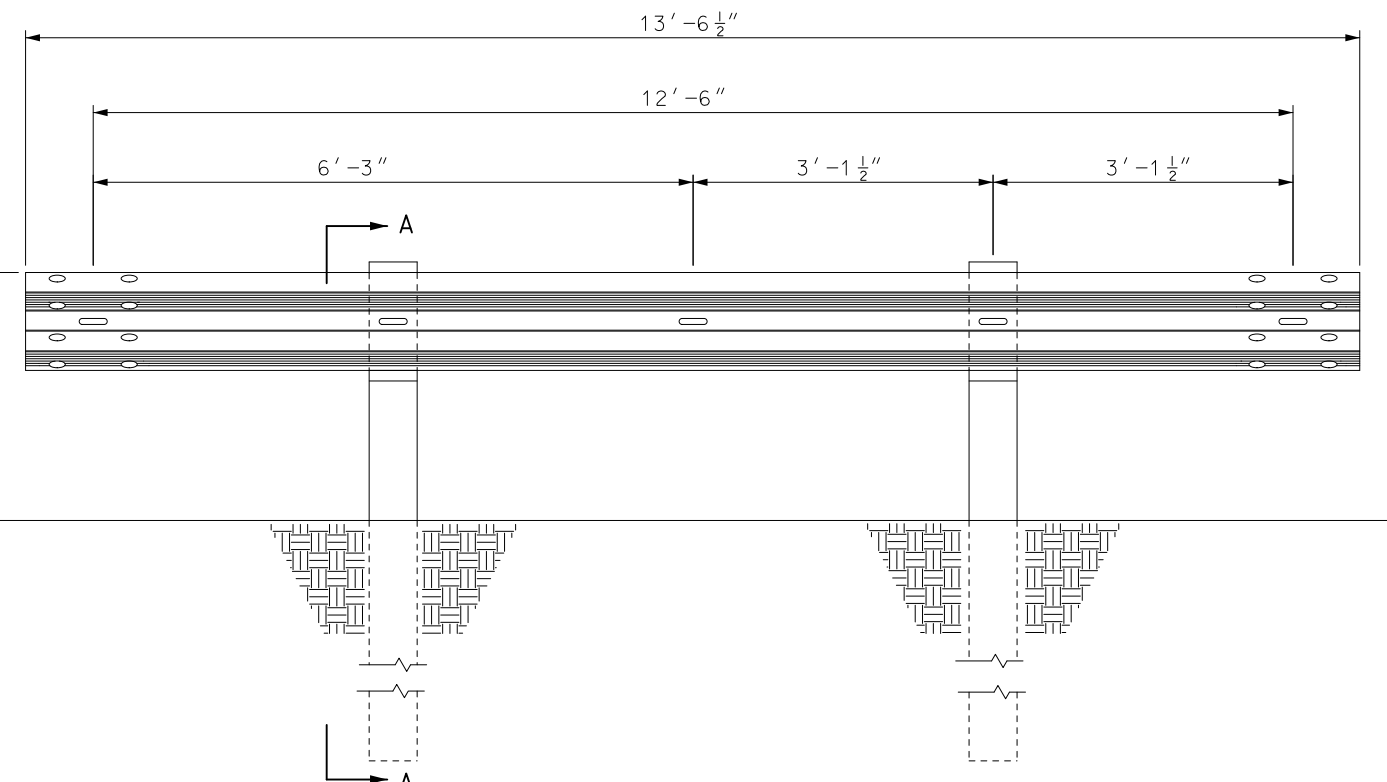
PLAN VIEW



SECTION A-A

(1) 2'-6" MINIMUM CLEARANCE TO THE FACE OF OBSTACLE WITH 6'-3" POST SPACINGS, 2'-0" MINIMUM CLEARANCE TO THE FACE OF OBSTACLE WITH 3'-1 1/2" POST SPACINGS, OR 1'-6" MINIMUM CLEARANCE TO THE FACE OF OBSTACLE WITH 1'-6 3/4" POST SPACINGS. SEE SHEET 4 OF 8 FOR POST SPACING DETAILS.

(2) WHEN SITE CONSTRAINTS PROHIBIT OR EMBANKMENT CANNOT BE CONSTRUCTED TO PROVIDE A MINIMUM OF 2 FEET BETWEEN THE BACK OF THE GUARDRAIL POST AND SLOPE BREAK POINT, 8 FOOT POSTS SHALL BE USED (SEE SHEET 6 OF 8).



ELEVATION VIEW

GENERAL NOTES:

FOR INITIAL INSTALLATION, CONSTRUCT THE GUARDRAIL WITHIN 1" OF THE STANDARD 31" HEIGHT TO THE TOP OF W-BEAM RAIL. WHEN SUBSEQUENT PROJECTS, SUCH AS RESURFACINGS, AFFECT THE HEIGHT OF EXISTING GUARDRAIL, ADJUSTMENT IS NOT REQUIRED IF THE FINISHED HEIGHT IS WITHIN 3" OF THE STANDARD HEIGHT.

THE STANDARD POST LENGTH IS 6'-0" (+3", -0" TOLERANCE).

THE SUBSTITUTION OF 8 FOOT POSTS IN LIEU OF REQUIRED GRADING, TO CONSTRUCT LESS THAN THE DESIGNED TYPICAL SECTION, SHALL NOT BE ALLOWED.

REFER TO AASHTO M 180 FOR DIMENSIONAL DETAILS OF W-BEAM, RELATED BUFFER AND END SECTIONS, BEAM SPLICES, POST AND SPLICE BOLTS, NUTS, AND TYPE 1 W-BEAM TO THRIE BEAM TRANSITION SECTIONS.

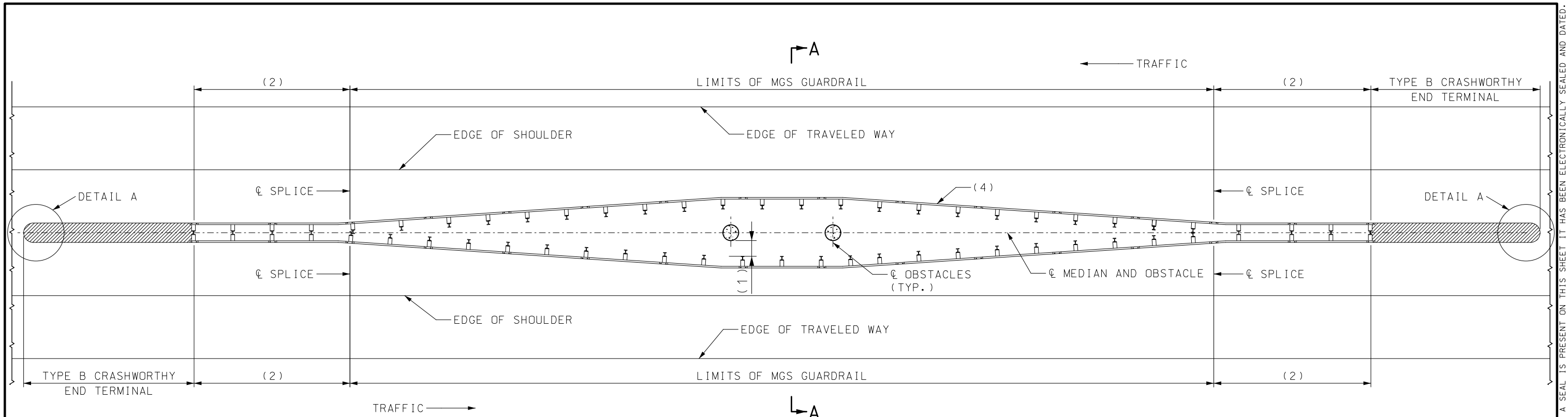
BEAM WASHERS ARE NOT TO BE USED. BOLT SHALL BE ASTM A307.

UNLESS OTHERWISE SPECIFIED, W-BEAM RAIL IS 12 GAUGE STEEL WITH AN EFFECTIVE LENGTH OF 12'-6" OR 25'-0", WITH 29/32" X 1 1/8" SPLICE BOLT SLOTS, AND 3/4" X 1/2" POST BOLT SLOTS ON 3'-1 1/2" CENTERS REGARDLESS OF POST SPACING.

FOR PROTECTIVE COATING AND MATERIAL REQUIREMENTS, SEE SEC 1040 OF THE STANDARD SPECIFICATIONS.

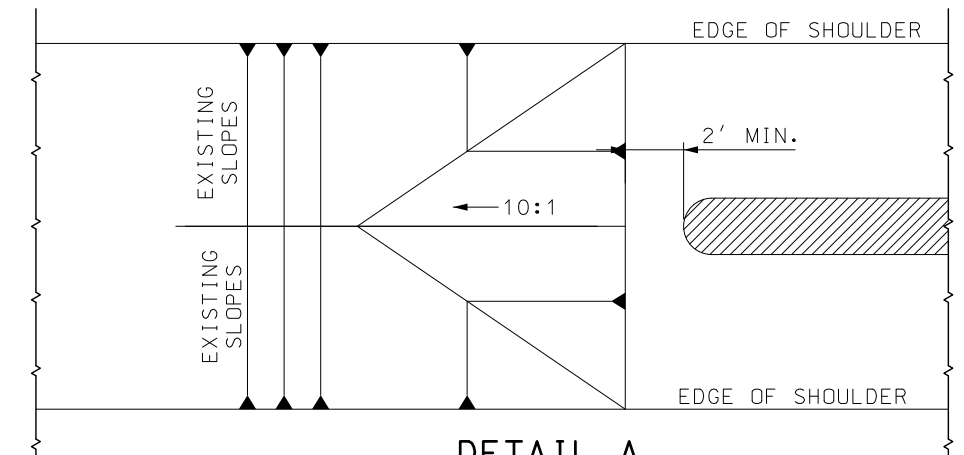
LAP SPLICES BETWEEN TWO RAILS OR BETWEEN A RAIL AND TERMINAL CONNECTOR IN THE DIRECTION OF TRAFFIC. LAP THE FLARED END SECTIONS IN THE DIRECTION OF TRAFFIC.

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	<b>MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL</b>	
	DATE EFFECTIVE: 04/01/2021 DATE PREPARED: 1/27/2021	SHEET NO. <b>606.50D</b> <b>1 OF 8</b>

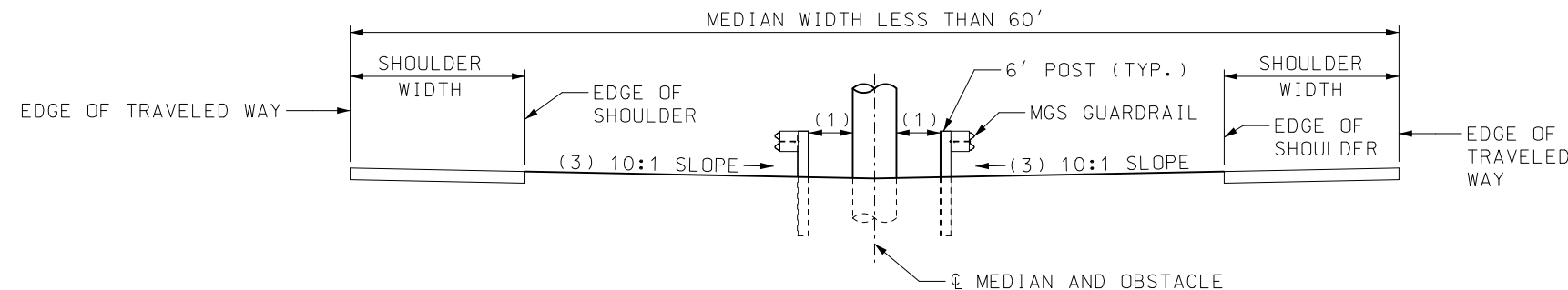


PIER AT Ø MEDIAN

- (1) 2'-6" MINIMUM CLEARANCE TO THE FACE OF OBSTACLE WITH 6'-3" POST SPACING IS PREFERRED  
 2'-0" MINIMUM CLEARANCE USE 3'-1 1/2" POST SPACING  
 1'-6" MINIMUM CLEARANCE USE 1'-6 3/4" POST SPACING  
 SEE STD. PLANS 606.50 FOR POST SPACING DETAILS.
- (2) TRANSITION DOUBLE FACED GUARDRAIL HEIGHT AND WIDTH IF NEEDED FOR TYPE B CRASHWORTHY END TERMINAL PER MANUFACTURER'S REQUIREMENTS. SEE STD. PLANS 606.50 FOR HEIGHT TRANSITION DETAILS.
- (3) CONTINUE 10:1 SLOPE TO OBSTACLE OR A MINIMUM OF 2' PAST THE BACK OF THE GUARDRAIL POST.
- (4) 15:1 FLARE RATE OR AS RECOMMENDED BY TABLE 5-9 OF THE LATEST VERSION OF THE "ROADSIDE DESIGN GUIDE".



DETAIL A  
(GRADING LIMITS)



SECTION A-A

GENERAL NOTE:

TYPE B CRASHWORTHY END TERMINAL SHALL BE MGS COMPATIBLE, LATEST VERSION AND SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

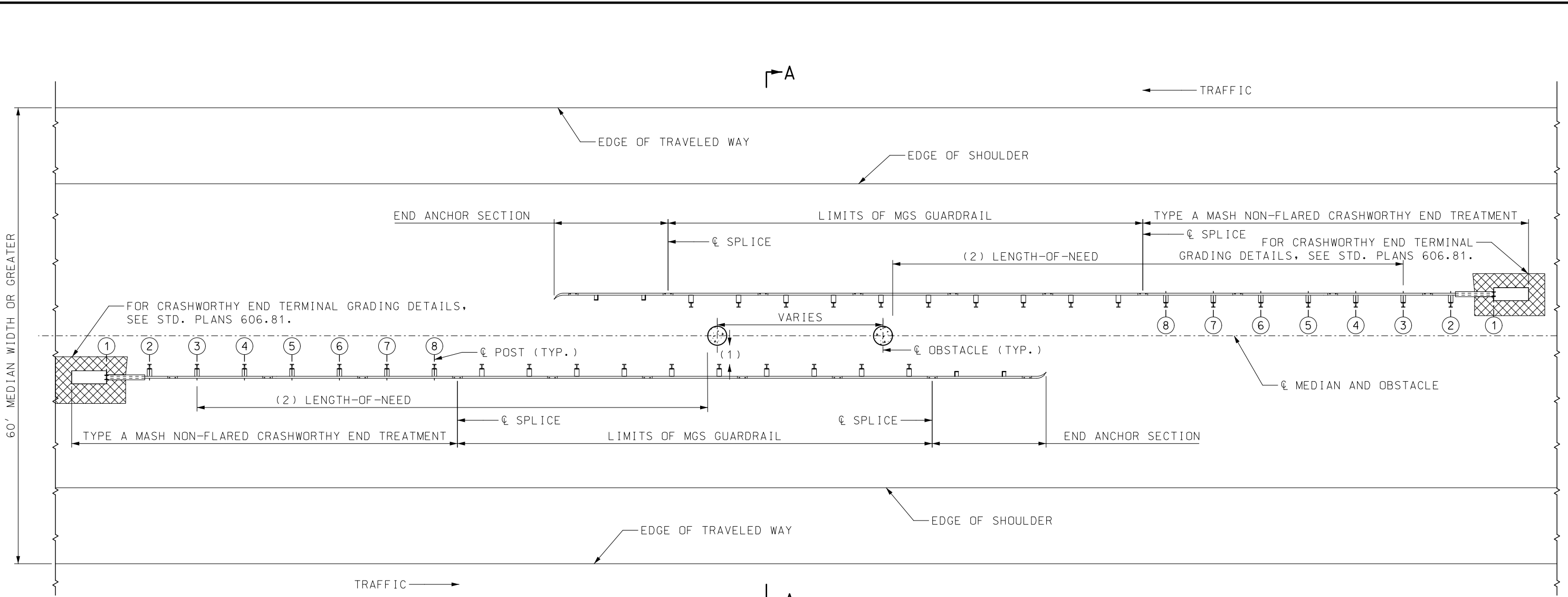
**MoDOT** MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION  
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 JEFFERSON CITY, MO 65102  
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STATE OF MISSOURI  
 TRAVIS D. KOESTNER  
 NUMBER PE-30042  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**MGS GUARDRAIL  
 MEDIAN PIER  
 PROTECTION**  
 MEDIAN LESS THAN 60'

DATE EFFECTIVE: 04/01/2021	<b>606.51</b>	SHEET NO. 1 OF 2
DATE PREPARED: 1/27/2021		

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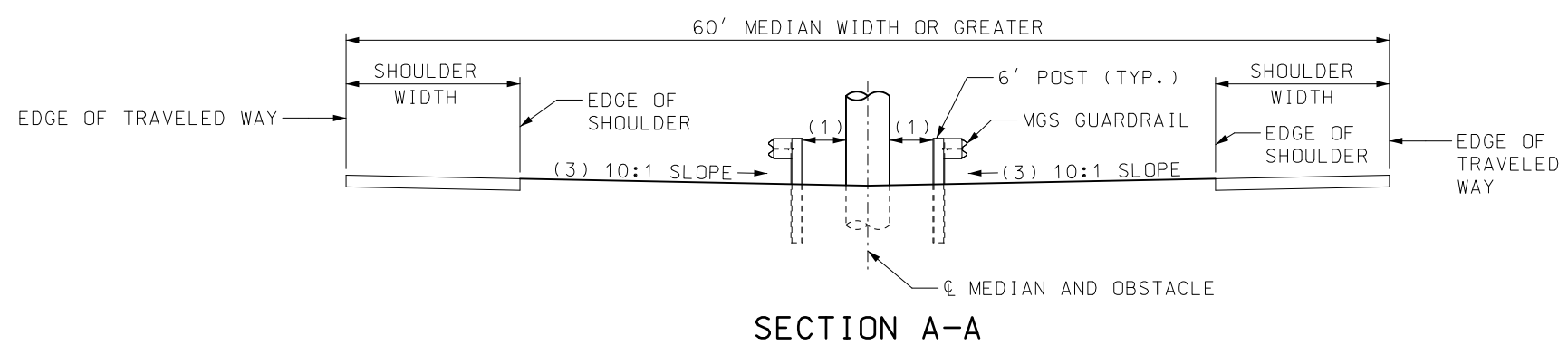


PIER AT CL MEDIAN

- (1) 2'-6" MINIMUM CLEARANCE TO THE FACE OF OBSTACLE WITH 6'-3" POST SPACING IS PREFERRED  
 2'-0" MINIMUM CLEARANCE USE 3'-11#2" POST SPACING  
 1'-6" MINIMUM CLEARANCE USE 1'-63#4" POST SPACING  
 SEE STD. PLANS 606.50 FOR POST SPACING DETAILS.
- (2) FOR LENGTH-OF-NEED, SEE THE LATEST VERSION OF THE "ROADSIDE DESIGN GUIDE 5.6.4 LENGTH-OF-NEED".
- (3) CONTINUE 10:1 SLOPE TO OBSTACLE OR A MINIMUM OF 2' PAST THE BACK OF THE GUARDRAIL POST.

GENERAL NOTE:  
 MEDIAN WIDTHS GREATER THAN 60' THAT THE PIER OBSTACLES ARE BEYOND THE CLEAR-ZONE DO NOT REQUIRE MEDIAN PIER PROTECTION. FOR CLEAR-ZONE DISTANCES, SEE THE LATEST VERSION OF THE "ROADSIDE DESIGN GUIDE 3.1 THE CLEAR-ZONE CONCEPT".

TYPE A NON-FLARED CRASHWORTHY END TERMINAL SHALL BE THE LATEST VERSION AND SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

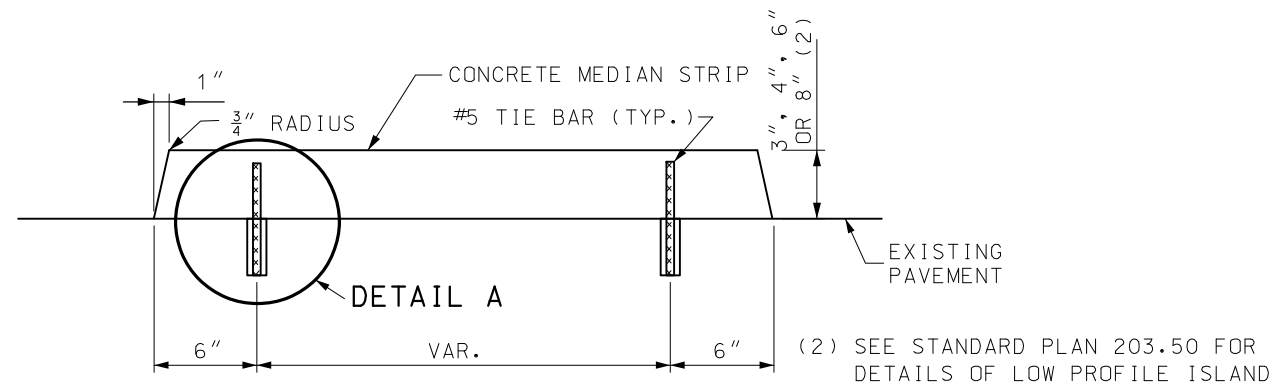


SECTION A-A

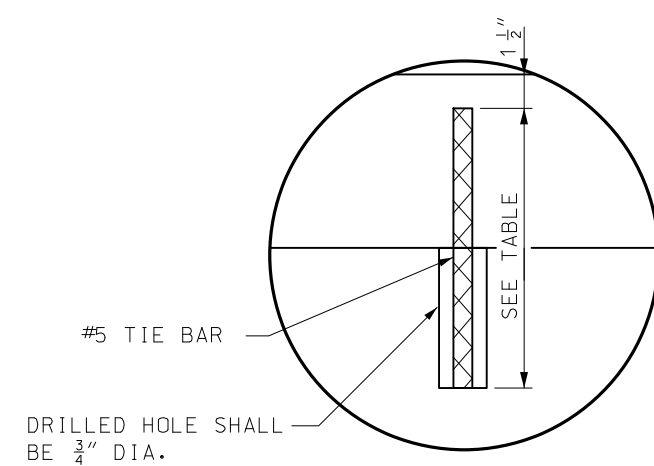
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>MGS GUARDRAIL MEDIAN PIER PROTECTION</b> 60' MEDIAN OR GREATER
DATE EFFECTIVE: 04/01/2021 DATE PREPARED: 1/27/2021	<b>606.51</b>	SHEET NO. 2 OF 2

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

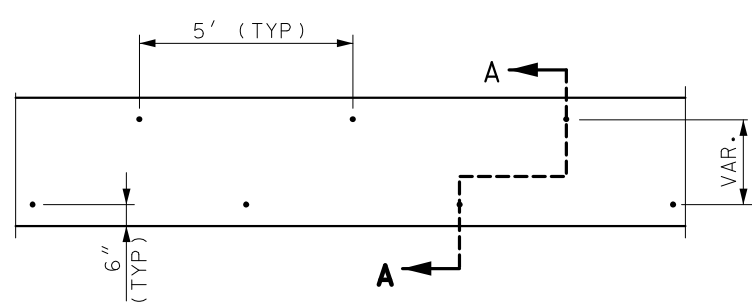


SECTION A-A  
CONCRETE MEDIAN STRIP

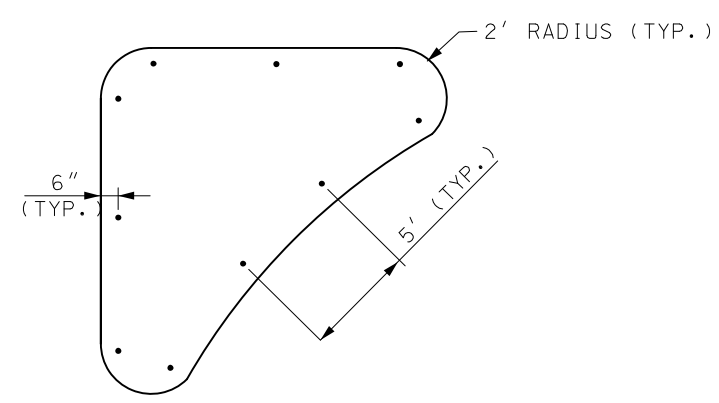


DETAIL A

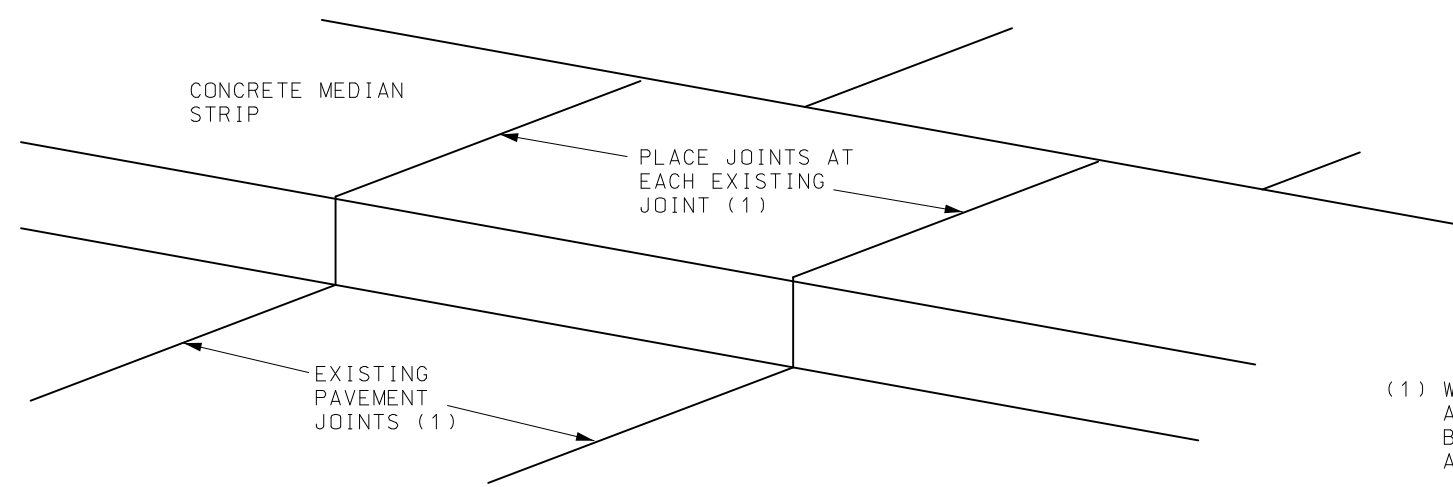
MEDIAN HEIGHT	BAR LENGTH
3"	8"
4"	9"
6"	11"
8"	13"



TIE BAR LOCATIONS FOR  
CONCRETE MEDIAN STRIP



TIE BAR LOCATIONS FOR  
CONCRETE MEDIAN STRIP (ISLAND)



CONCRETE MEDIAN STRIP JOINT LOCATION

(1) WHEN THERE ARE NO VISIBLE JOINTS IN THE ADJACENT PAVEMENT, THE JOINT SPACING WILL BE EQUAL TO THE MEDIAN STRIP WIDTH, WITH A MINIMUM SPACING OF 10'.

GENERAL NOTES:

TIE BARS SHALL BE EPOXY COATED, DEFORMED REINFORCING BARS MEETING THE REQUIREMENTS OF SECTION 710 AND 1057.

BONDING FOR TIE BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

THE FACE OF THE MEDIAN MAY BE CONSTRUCTED WITHOUT BATTER WHEN CONSTRUCTED ON A RADIUS OF 6' OR LESS.

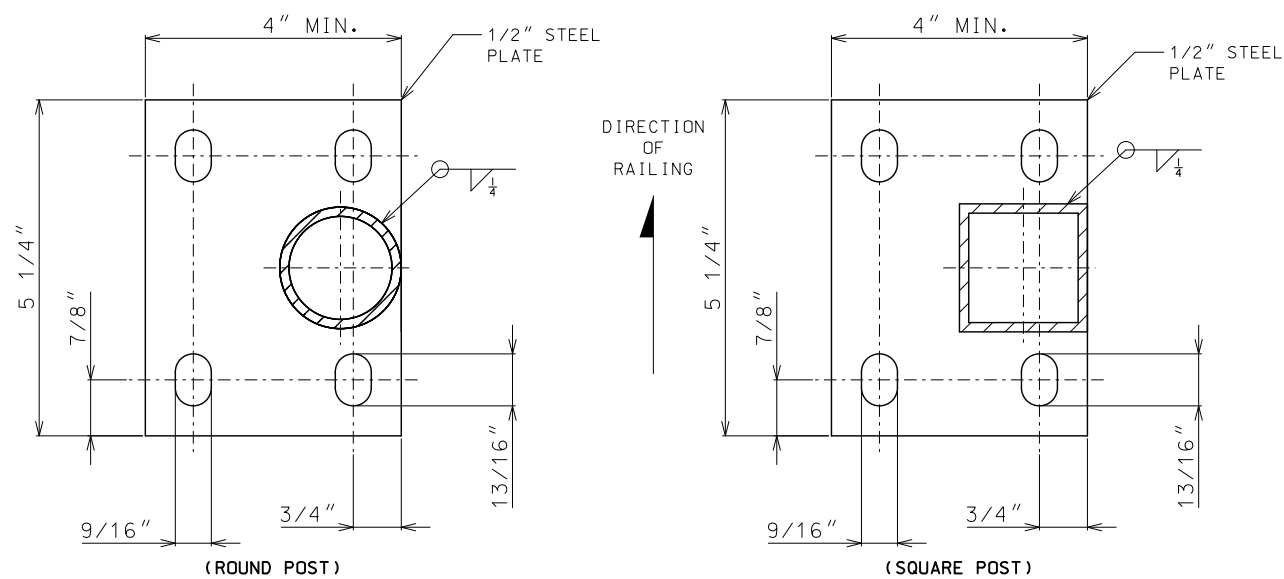
WHEN CONCRETE MEDIANS ARE CONSTRUCTED DIRECTLY BENEATH GUARDRAIL, THE MEDIAN HEIGHT WILL BE 4".

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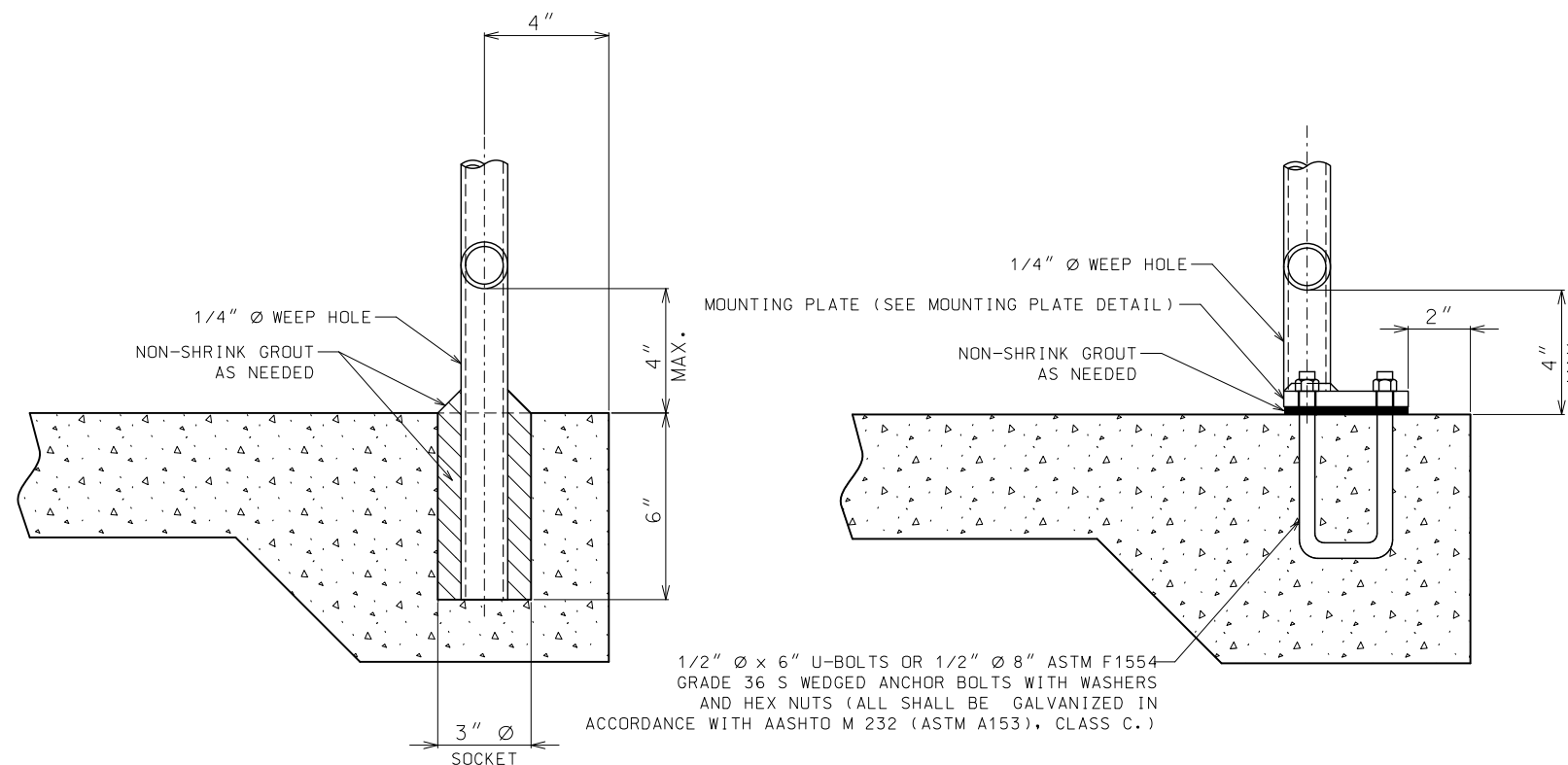
STATE OF MISSOURI  
TRAVIS D. KOESTNER  
NUMBER PE-30042  
PROFESSIONAL ENGINEER  
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**CONCRETE MEDIAN STRIP**

DATE EFFECTIVE: 10/01/2020	<b>608.30A</b>	SHEET NO. 1 OF 1
DATE PREPARED: 7/21/2020		



**MOUNTING PLATE DETAIL  
(PLAN VIEW)**



**SOCKET MOUNTING DETAIL**

**PLATE MOUNTING DETAIL**

**GENERAL NOTES:**

RAILINGS AND POSTS MAY BE EITHER ROUND OR SQUARE STEEL OF GOOD COMMERCIAL WELDABLE QUALITY OR ALUMINUM ALLOY 6061-T6 OR 6063-T6.

STEEL RAILINGS AND POSTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111.

ALL JOINTS SHALL BE CONTINUOUS WELDED AND GROUND SMOOTH.

METAL SAFETY RAIL MUST BE COMPLIANT WITH THE "AMERICAN'S WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG)". EXCEPTIONS MUST BE APPROVED BY THE ENGINEER. ALL OTHER AREAS OF NON-COMPLIANCE SHALL BE REMOVED AND CORRECTED AT THE CONTRACTOR'S EXPENSE.

ALL POSTS SHALL HAVE A 1/4" WEEP HOLE IMMEDIATELY ABOVE THE MOUNTING PLATE.

WHEN INSTALLED THE POSTS SHALL BE PLUMB AND RAILINGS SHALL MATCH THE SLOPE OF THE SIDEWALK.

HANDRAIL REQUIREMENTS		
FILL SLOPE	FILL HEIGHT	HANDRAIL
(1V:3H) OR FLATTER	—	NOT REQUIRED
(1V:3H) OR STEEPER	≥ 6 FT.	REQUIRED
(1V:2H) OR STEEPER	≥ 4 FT.	REQUIRED
(1V:1H) OR STEEPER	≥ 1 FT.	REQUIRED

RAILING AND POST SPECIFICATION				
DESCRIPTION	TYPE	SIZE ( DIA. )	WEIGHT (LBS. / FT.)	
			ALUM.	STEEL
RAILING & POST	ROUND	1 1/2"	0.940	2.720
	SQUARE	2" X 2"	1.3094	4.310
BALUSTER	ROUND	1/2"	0.2312	0.668
	RECT.	3/8" X 1/2" STL.	—	0.6375
	SQUARE	1/2" X 1/2" ALUM.	0.2944	—

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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**HANDRAILING**

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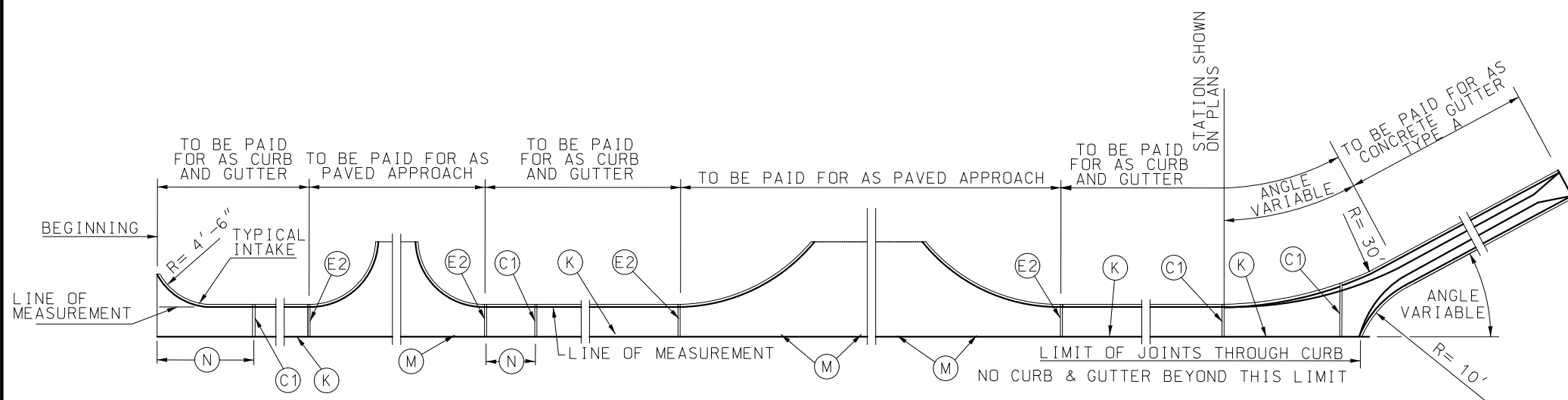
DATE EFFECTIVE: 01/01/2021

DATE PREPARED: 10/14/2020

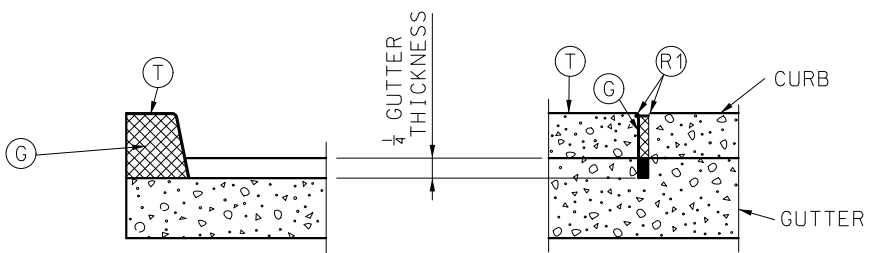
SHEET NO.  
**608.40A**  
3 OF 4

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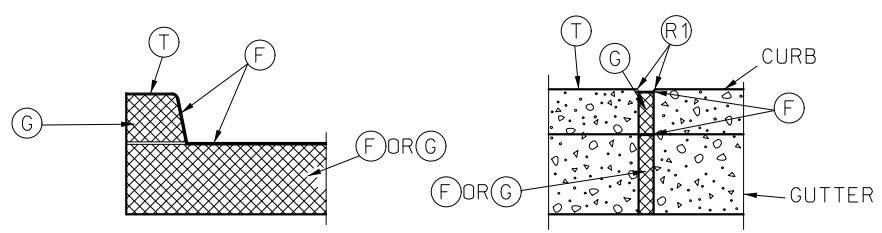
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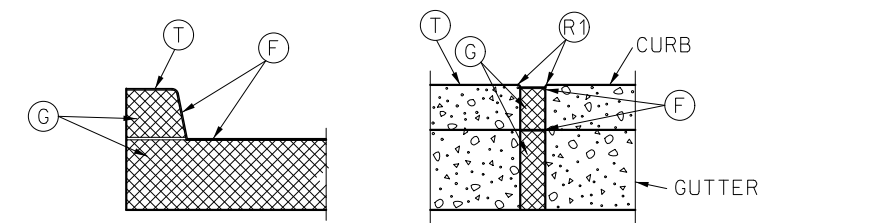
**PLAN OF MEASUREMENT OF CURB & GUTTER AND JOINT PLAN**



**(C1) JOINT**



**(E2) JOINT**



**(E1) JOINT**

**LEGEND**

- (C1) 1/8" MAXIMUM WIDTH TRANSVERSE CONTRACTION JOINT (PERFORMED OR SAWED).
- (E1) 2" TRANSVERSE EXPANSION JOINT. (PERFORMED OR SAWED)
- (E2) 1/2" TRANSVERSE EXPANSION JOINT. (PERFORMED OR SAWED)
- (F) FILLER FOR JOINTS - HOT POURED.
- (G) PREFORMED JOINT FILLER MATERIAL.
- (K) TONGUE & GROOVE JOINT WITH TIE BAR - SEE DETAIL.
- (M) TONGUE & GROOVE JOINT WITHOUT TIE BARS - SEE DETAIL.
- (N) NOT LESS THAN 10' OR MORE THAN 30'.
- (T) TOP OF CURB.
- (R1) ROUND TO 1/4" RADIUS. (EXCEPT FOR SAWED JOINTS)

**GENERAL NOTES:**

A MINIMUM 4" TYPE 1 OR 5 AGGREGATE BASE SHALL BE PLACED BENEATH ALL CURB AND GUTTER SECTIONS AND INCLUDED WITHIN THE MAINLINE BASE PAY LIMITS.

WHEN CURBS ARE CONSTRUCTED DIRECTLY BENEATH GUARDRAIL, CURB HEIGHT SHALL BE 4 INCH BARRIER CURB, AS SHOWN ON STANDARD PLAN 606.00.

CURB, GUTTER AND CURB AND CUTTER CONSTRUCTED ALONG AND ATTACHED TO CONCRETE PAVEMENT OR BASE SHALL HAVE:

1. JOINT (C1) ONE-QUARTER DEPTH OF CURB AND GUTTER THICKNESS AS A CONTINUATION OF EACH CONTRACTION JOINT IN THE BASE OR PAVEMENT.
2. JOINT (E1) AS CONTINUATION OF 2" EXPANSION JOINT (E) IN THE CONCRETE BASE OR PAVEMENT SHALL EXTEND AND CONTINUE THROUGH THE CURB, CUTTER AND CURB AND GUTTER.
3. JOINT (E2) THROUGH CURB AND CURB AND CUTTER AT THE BEGINNING AND END OF EACH PAVED APPROACH.

CURB, CURB AND GUTTER AND GUTTER CONSTRUCTED APART OR SEPARATED FROM CONCRETE BASE OR PAVEMENT OR AS A FORM FOR ASPHALTIC CONCRETE PAVEMENT SHALL HAVE A JOINT (E2) ENTIRELY THROUGH THE CURB, CURB AND GUTTER AND GUTTER, AT THE BEGINNING AND END OF EACH "PAVED APPROACH" AND A JOINT (C1) TO 1/4 DEPTH OF CURB AND GUTTER THICKNESS AT INTERVALS OF 30 FEET BETWEEN APPROACHES.

JOINTS (E1) AND (E2) THROUGH CURB SHALL BE FILLED WITH PREFORMED FILLER MATERIAL AND SEALED WITH HOT POURED FILLER FOR JOINTS.

JOINT (E1) IN GUTTER SHALL BE FILLED WITH PREFORMED FILLER AND SEALED WITH HOT FILLER MATERIAL.

JOINT (E2) IN GUTTER SHALL BE FILLED WITH PREFORMED FILLER AND SEALED WITH FILLER OR FILLED WITH HOT POURED FILLER.

PREFORMED FILLER MATERIAL SHALL BE PLACED TO PROVIDE 1" HOT POURED FILLER FOR JOINTS.

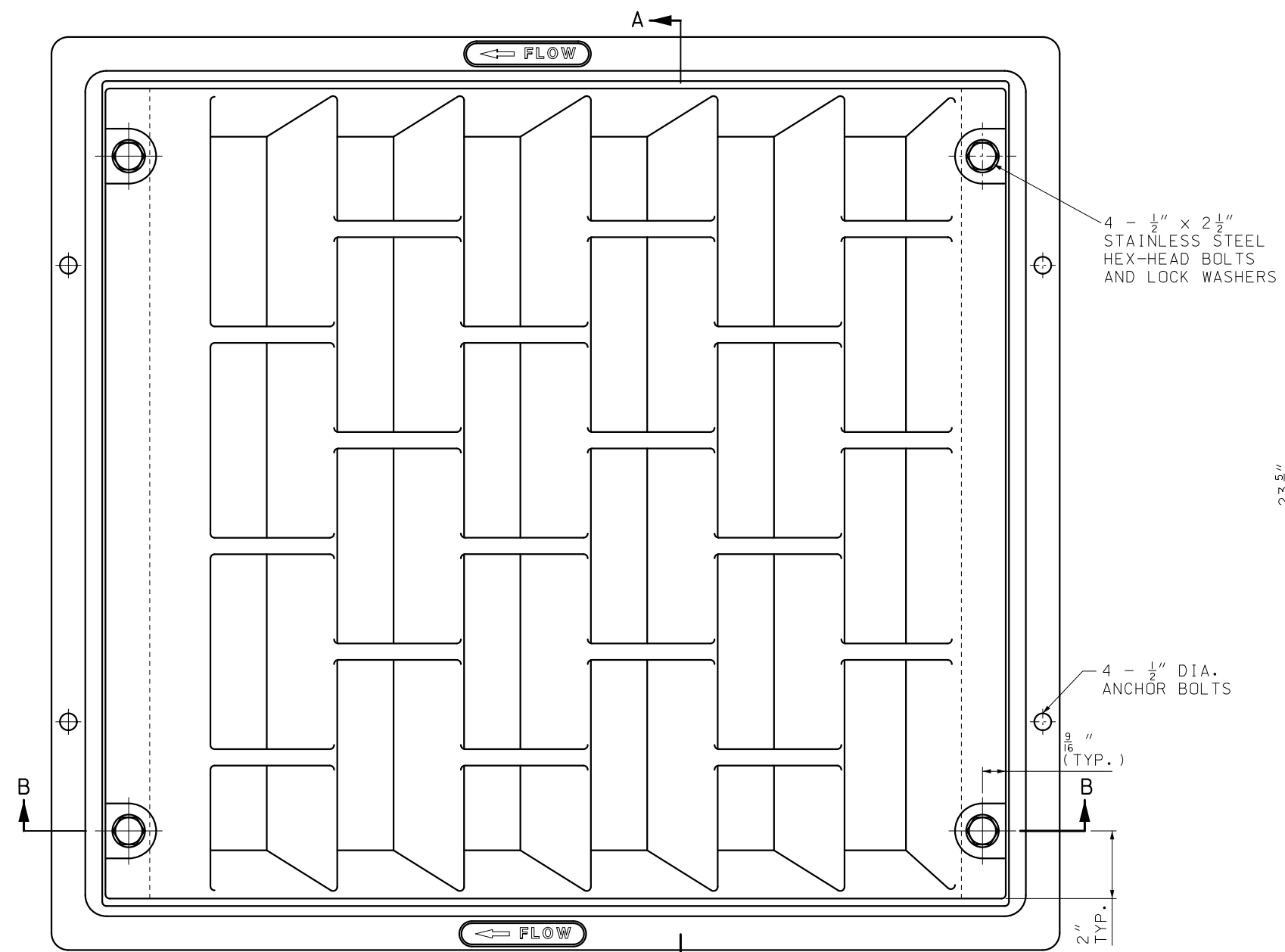
THE BARRIER CLASS CURBS MAY BE CONSTRUCTED WITHOUT BATTER WHEN CONSTRUCTED ON A RADIUS OF 6 FEET OR LESS. THE (R2) WILL BE REQUIRED.

WHERE A SIDEWALK INTERSECTS A CURB, THE SIDEWALK SHALL BE RAMPED NO STEEPER THAN 12:1 SLOPE TO PROVIDED ACCESS FOR WHEELCHAIR ACROSS APPROACHES.

PRECAST TYPE A AND B GUTTER ARE ONLY ALLOWED WHEN CONSTRUCTABILITY ISSUES MAKE CAST IN PLACE NOT PRACTICAL. PRECAST IS ONLY ALLOWED WITH THE APPROVAL OF THE ENGINEER. WHEN ALLOWED BY THE ENGINEER, TYPES A AND B GUTTER MAY BE PRECAST TO CONFORM TO THE DIMENSIONS SHOWN. THE PRECASTER SHALL SUBMIT SHOP DRAWINGS INDICATING THE SECTION LENGTH, SECTION CONNECTION, AND PROPOSED JOINT SEALING SYSTEM. WHEN PRECAST SECTIONS CANNOT CONFORM TO ANY VERTICAL OR HORIZONTAL CURVE THEN CAST IN PLACE IS THE ONLY OPTION. A COMBINATION OF CAST IN PLACE AND PRECAST GUTTER MAY BE PERMITTED.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)
	<h2 style="margin: 0;">CONCRETE CURB, CURB AND GUTTER AND GUTTER</h2>
DATE EFFECTIVE: 04/01/2021 DATE PREPARED: 1/27/2021	<b>609.00P</b>
SHEET NO. <b>1 OF 2</b>	

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



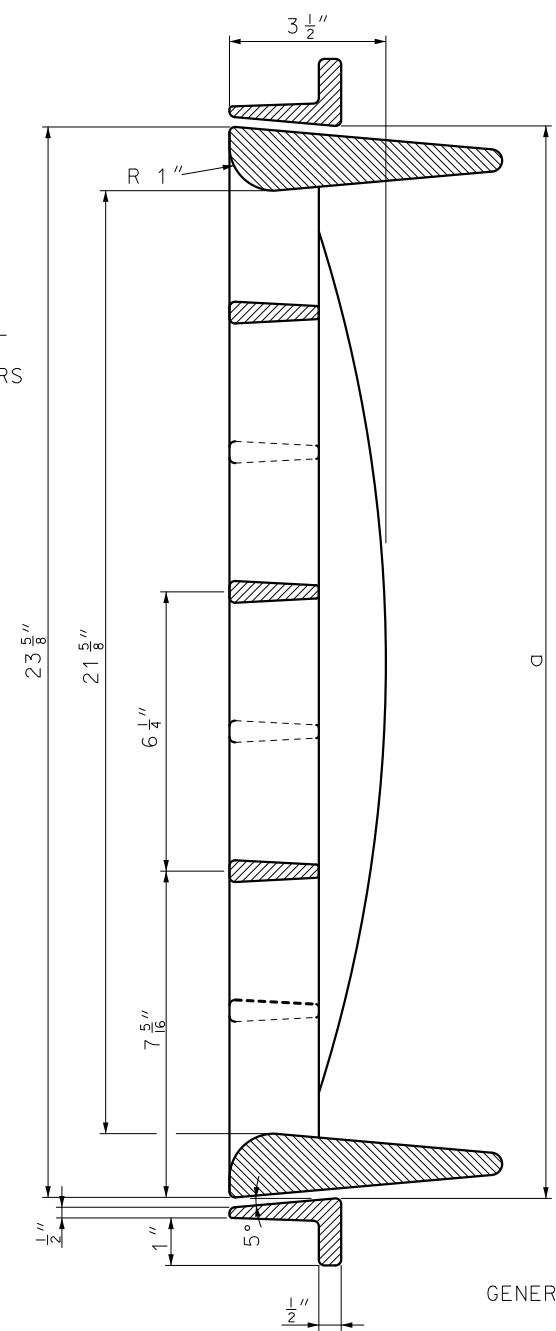
4 - 1/2" x 2 1/2" STAINLESS STEEL HEX-HEAD BOLTS AND LOCK WASHERS

4 - 1/2" DIA. ANCHOR BOLTS

9/16" (TYP.)

2" TYP.

PLAN



SECTION A-A

NOMINAL DIMENSIONS AND WEIGHTS					
OPENING		a	WEIGHT (LB.)	NUMBER OF	
WIDTH	LENGTH			ANCHOR BOLTS	STAINLESS STEEL BOLTS
2'-0"	2'-0"	24"	200	4	4
4'-0"	2'-0"	48"	348	8	8

NOTE: TWO 2' X 2' GRATES MAY BE USED IN LIEU OF SINGLE 4' X 2' GRATES.

INSTALLATION INSTRUCTIONS:

DRILL AND TAP FRAME.

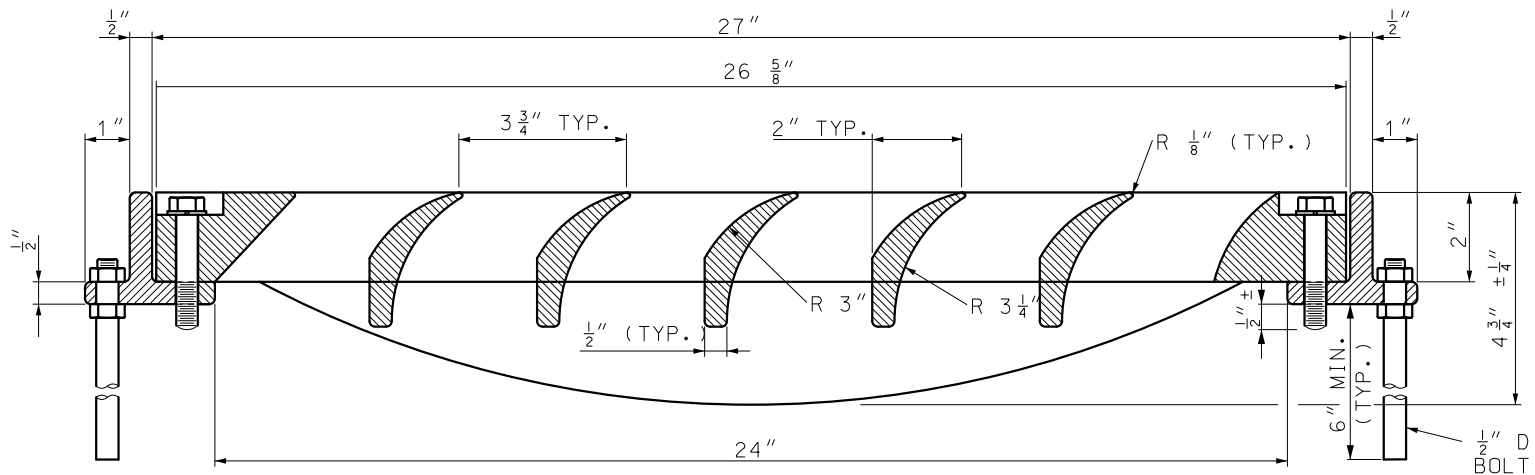
INSTALL 1/2" DIA. BOLTS WITHOUT WASHERS BEFORE CONCRETE POUR TO FORM 1/2" ± BOLT EXTENSION INTO CONCRETE BELOW FRAME. LUBRICATE EXPOSED THREADS.

AFTER CONCRETE HARDENS SUFFICIENTLY, FINAL INSTALLATION SHALL REMOVE AND REINSTALL 1/2" DIA. BOLTS AND LOCK WASHERS THROUGH GRATE AND FRAME. TORQUE 1/2" DIA. BOLTS TO 35-40 FT. LB. APPLY THREAD ADHESIVE TO ALL 1/2" DIA. STAINLESS STEEL BOLTS.

GENERAL NOTES:

GRATES TO BE CONSTRUCTED OF CAST GRAY IRON AND MEET REQUIREMENTS OF AASHTO M 306. MINOR VARIATIONS IN VANE SHAPE TO MEET MANUFACTURER'S STANDARD PRACTICE ARE PERMITTED.

MINIMUM CLEAR OPEN AREA: 2.10 SQUARE FEET.



SECTION B-B

(\* ) 1/2" DIA. ASTM F1554, GRADE 36 ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 232 (ASTM A153), CLASS C OR SHALL BE MECHANICALLY GALVANIZED. IF MECHANICALLY GALVANIZED, THE COATING THICKNESS, ADHERENCE AND QUALITY REQUIREMENTS SHALL BE IN ACCORDANCE WITH AASHTO M 232 (ASTM A153), CLASS C. DAMAGED SPALTER COATING SHALL BE REPAIRED IN ACCORDANCE WITH SEC 1081.

1/2" DIA. ANCHOR BOLT (TYP.)(\* )

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**CURVED VANE GRATE AND FRAME**

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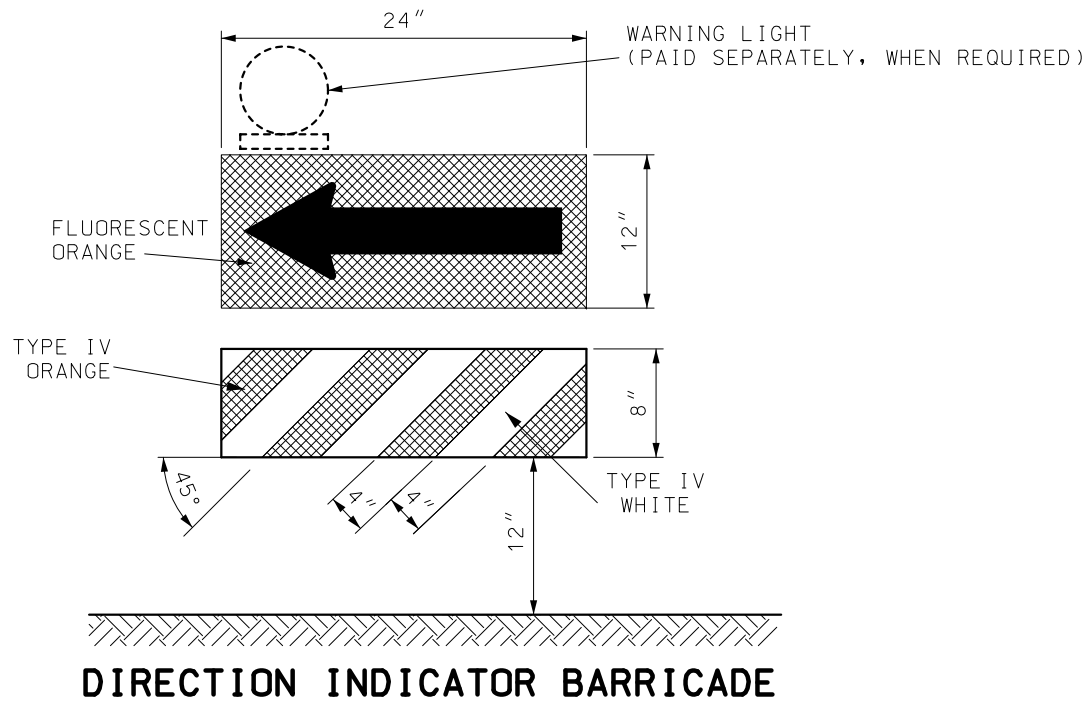
**614.11D**

SHEET NO.  
1 OF 1

DATE EFFECTIVE: 01/01/2021

DATE PREPARED: 10/14/2020



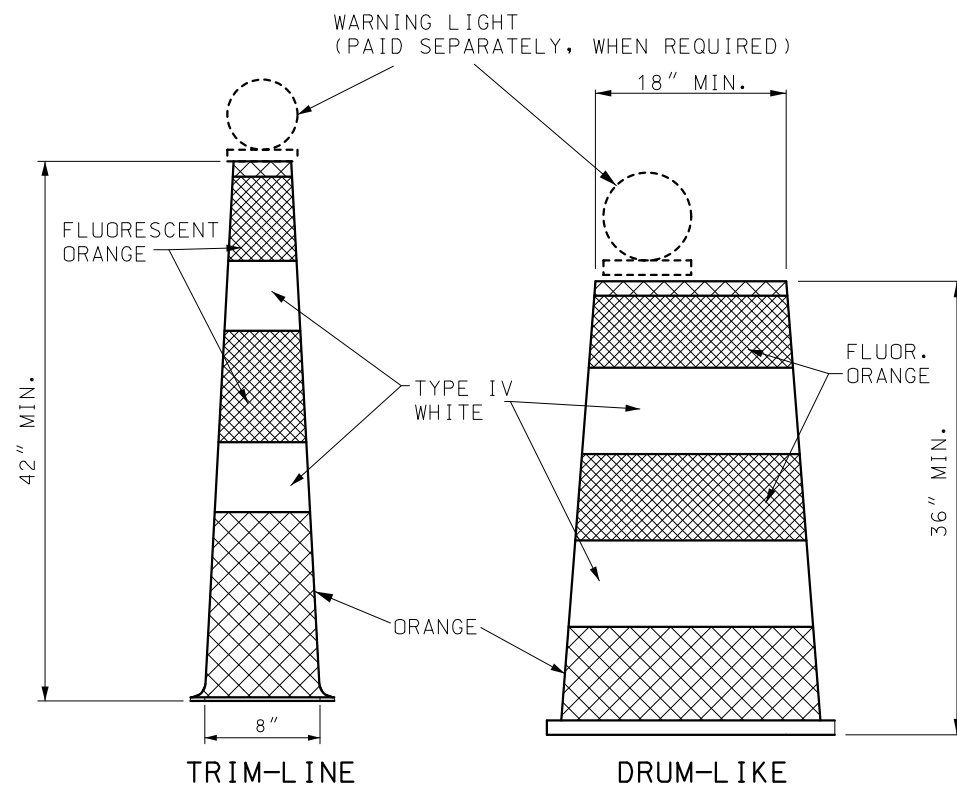


**DIRECTION INDICATOR BARRICADE**

VERTICAL DIMENSIONS DO NOT INCLUDE PROJECTIONS DESIGNED FOR EASE OF HANDLING.

DIRECTION INDICATOR BARRICADES SHALL NOT BE USED IN SHIFTING TAPERS UNLESS SHOWN ON THE PLANS.

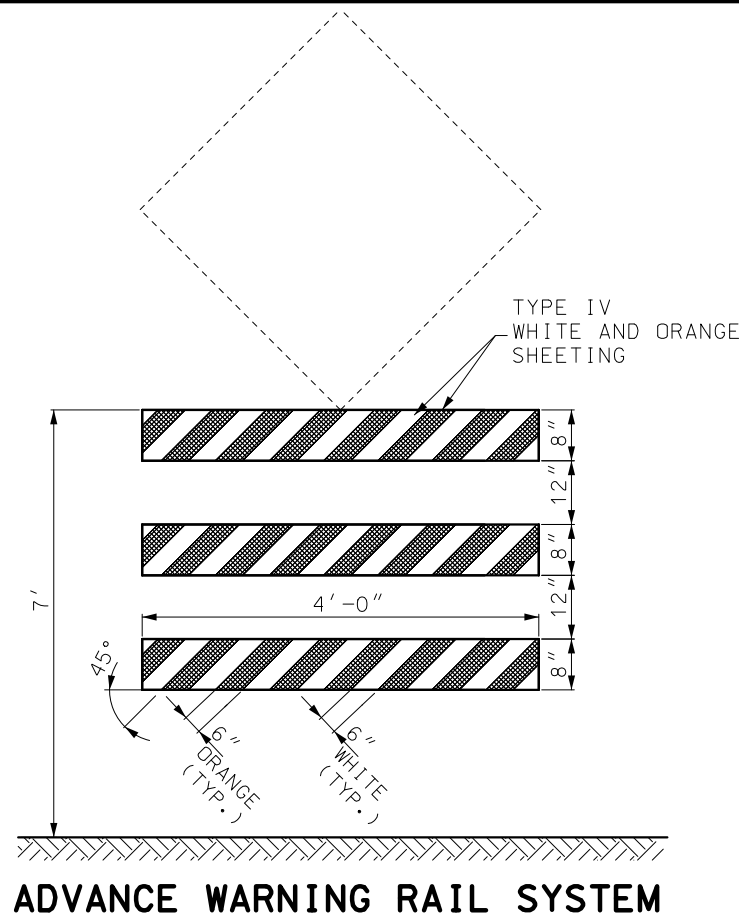
THE PANELS SHALL BE SECURELY ATTACHED TO A SUPPORT THAT IS PORTABLE, CAPABLE OF REMAINING UPRIGHT AND ENTIRELY FREE STANDING.



**CHANNELIZERS**

WHITE, ORANGE, AND FLUORESCENT ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.

STRIPES ON TRIM-LINE CHANNELIZERS SHALL BE 6" TO 8".  
STRIPES ON DRUM-LIKE CHANNELIZERS SHALL BE 4" TO 6".



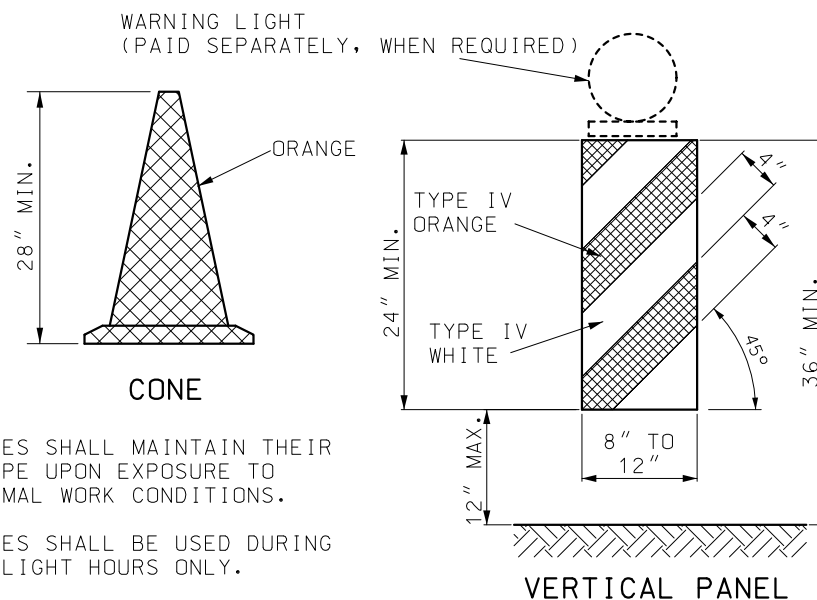
**ADVANCE WARNING RAIL SYSTEM**

MAXIMUM WEIGHT OF SIGN SHALL NOT EXCEED 25 LBS.

THE SIGN AND RAIL SYSTEM MAY BE MOUNTED AS TWO SEPARATE CRASHWORTHY DEVICES. THE RAIL SYSTEM SHALL BE LOCATED DIRECTLY IN FRONT OF THE SIGN WITH 7 TO 10 FEET SEPARATING THE TWO DEVICES.

WHERE MARKING IS NOT PROVIDED ON THE BACKSIDE, STRIPS OF 3" WIDE MODOT TYPE 7 ORANGE SHEETING MAY BE APPLIED TO THE ENDS OF EACH RAIL TO HELP DELINEATE THE DEVICE.

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.4.



**CONE**

CONES SHALL MAINTAIN THEIR SHAPE UPON EXPOSURE TO NORMAL WORK CONDITIONS.

CONES SHALL BE USED DURING DAYLIGHT HOURS ONLY.

**VERTICAL PANEL**

VERTICAL PANELS SHALL BE SECURELY ATTACHED TO A SUPPORT THAT IS PORTABLE, CAPABLE OF REMAINING UPRIGHT AND ENTIRELY FREE STANDING.

**GENERAL NOTES:**

WHITE, ORANGE, AND FLUORESCENT ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.

BALLAST FOR TRAFFIC CONTROL DEVICES SHALL CONFORM TO MANUFACTURERS' RECOMMENDATION FOR FIELD CONDITIONS WHEN APPLICABLE.

IF USED, THE WARNING LIGHT UNIT AND BATTERY COMPARTMENT SHALL BE FURNISHED BY THE DEVICE MANUFACTURER OR OTHERWISE MEET THE MANUFACTURER'S RECOMMENDATIONS FOR DESIGN AND WILL BE REQUIRED ON ALL DEVICES IN THE SERIES.

WARNING LIGHTS SHALL BE IN ACCORDANCE WITH SEC 1063.5.

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE DRUM-LIKE CHANNELIZERS IN LIEU OF TRIM-LINE CHANNELIZERS TO PROVIDE LONGITUDINAL CHANNELIZATION WITHIN THE ACTIVITY AREA WHERE NO RAMPS, INTERSECTIONS OR LIMITED LATERAL CLEARANCE EXISTS.

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE DIRECTION INDICATOR BARRICADES IN LIEU OF TRIM-LINE CHANNELIZERS IN MERGING TAPERS.

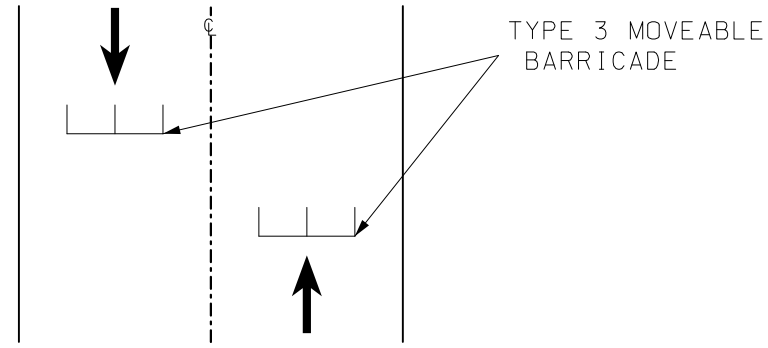
UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE VERTICAL PANELS IN LIEU OF TRIM-LINE CHANNELIZERS TO PROVIDE LONGITUDINAL CHANNELIZATION WITHIN THE ACTIVITY AREA.

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE CONES IN LIEU OF TRIM-LINE CHANNELIZERS DURING DAYTIME OPERATIONS ON MINOR ROUTES.

PANEL AND RAIL MARKINGS FOR TRAFFIC DELINEATION SHALL SLOPE DOWNWARD TOWARD THE INTENDED DIRECTION OF TRAVEL. ILLUSTRATIONS SHOWN ARE FOR INSTANCES WHERE TRAFFIC MOVES TO THE LEFT. REVERSE CONFIGURATIONS SHALL BE USED FOR TRAFFIC MOVEMENTS TO THE RIGHT. MARKINGS SHALL ONLY BE APPLIED TO THE FRONT OF EACH RAIL OR PANEL, OR MAY BE APPLIED TO BOTH THE FRONT AND BACK PROVIDING THE MARKING ON THE BACK DOES NOT CONFLICT WITH INTENDED OPPOSING TRAFFIC MOVEMENT.

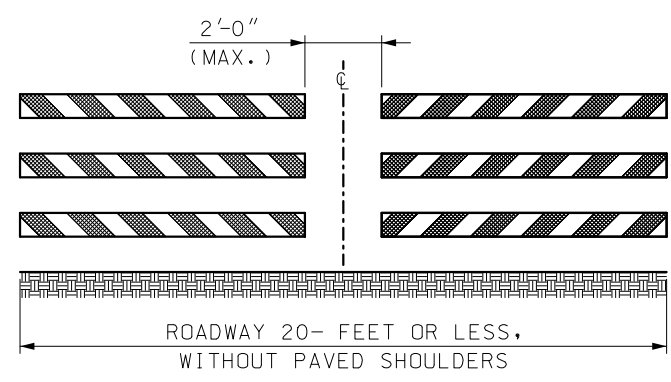
<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b></p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
	<p><b>TEMPORARY TRAFFIC CONTROL DEVICES CHANNELIZERS AND DIRECTION INDICATOR BARRICADE</b></p>
<p>DATE EFFECTIVE: 04/01/2021 DATE PREPARED: 1/27/2021</p>	<p>616.10AX</p> <p>SHEET NO. 3 OF 9</p>

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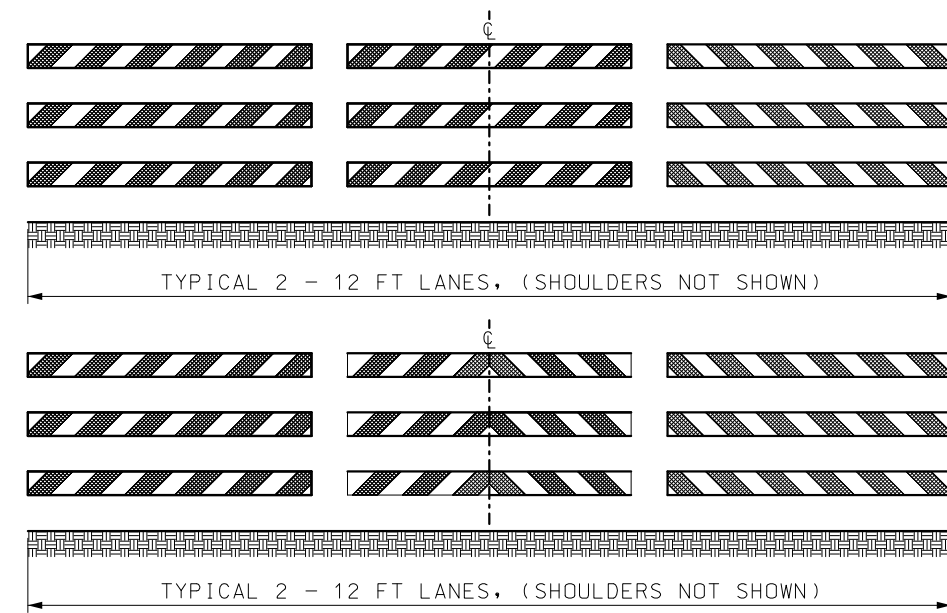


RETROREFLECTIVE MARKING ON TYPE 3 BARRICADES SHALL BE ON BOTH SIDES OF EACH RAIL AND DIRECT TRAFFIC MOVEMENT APPROPRIATELY TO ALLOW VEHICLES TO PASS THROUGH

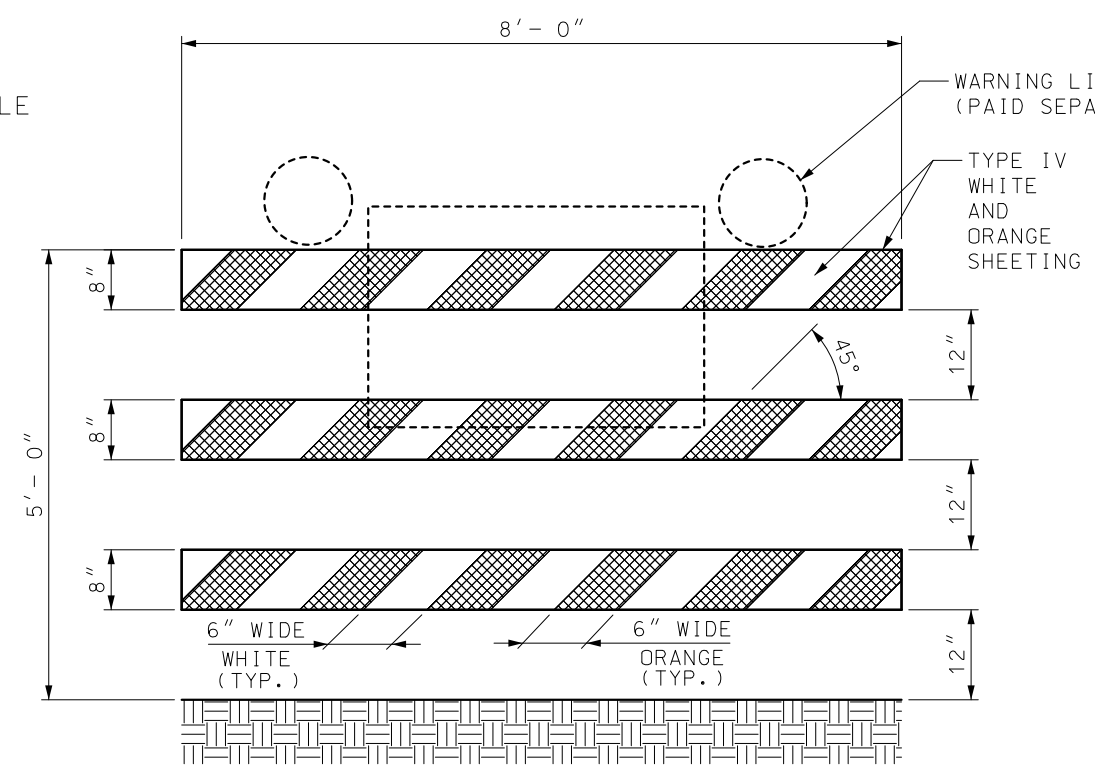
SOFT CLOSURE PLAN VIEW



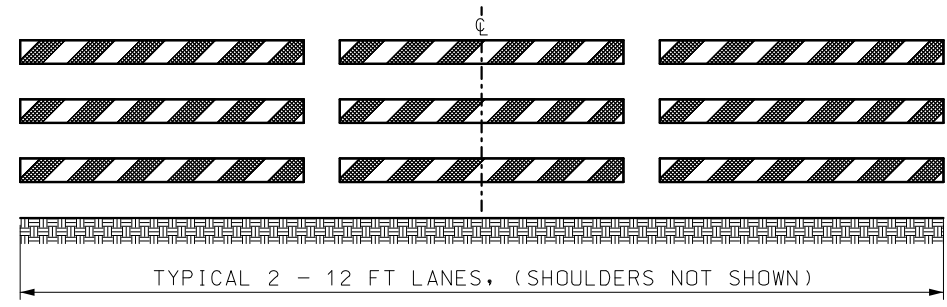
EXAMPLE 2



EXAMPLE 4

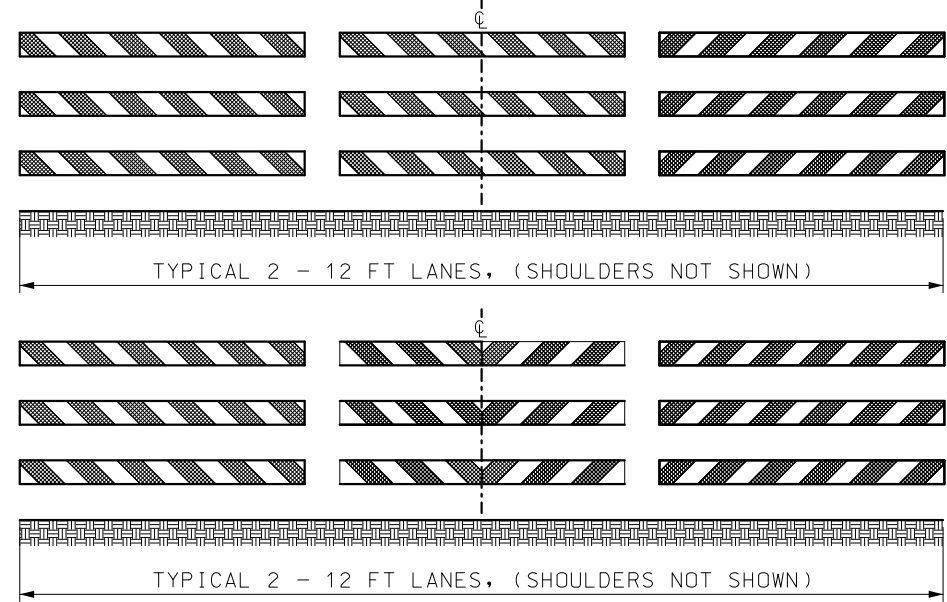


EXAMPLE 1



EXAMPLE SHOWS STRIPES SLOPING TO DIRECT VEHICULAR MOVEMENT TOWARD THE LEFT

EXAMPLE 3



EXAMPLE 5

EXAMPLE 1 - ONE TYPE 3 MOVABLE BARRICADE WILL BE REQUIRED TO COMPLETELY CLOSE EACH 8' OF PAVEMENT. PAVED SHOULDERS SHALL BE INCLUDED IN THE AREA TO BE CLOSED.

SIGNS SHALL BE LIGHT WEIGHT (ROLL-UP OR PLASTIC) AND SHOULD NOT OBSCURE MORE THAN 50 PERCENT OF THE TOP 2 RAILS OR 33 PERCENT OF ALL THREE RAILS.

WARNING LIGHTS SHALL BE LIGHT WEIGHT (3.3 LBS. OR LESS) OR HAVE BATTERY PACK MOUNTED NO HIGHER THAN 18-INCH AND SHALL NOT COVER ANY PORTION OF THE BARRICADE FACE.

IF WARNING LIGHTS ARE USED, THE LIGHTS SHOULD BE INSTALLED ON THE BARRICADES IN THE DIRECTION OF TRAFFIC.

IF SIGNS OR LIGHTS CANNOT MEET THE ABOVE REQUIREMENTS, THEY SHALL BE MOUNTED ON SEPARATE CRASHWORTHY DEVICES AT HEIGHTS SPECIFIED FOR POST MOUNTED SIGNS, LOCATED IN TABLE A ON SHEET 1. THE BARRICADE SHALL BE LOCATED IN FRONT OF THE SIGNS OR LIGHTS WITH 7 TO 10 FEET SEPARATING THE DEVICES.

TYPE 3 MOVABLE BARRICADES SHALL BE ENTIRELY FREE STANDING AND PORTABLE. MARKING SHALL ONLY BE APPLIED TO THE FRONT OF EACH RAIL OR MAY BE APPLIED TO BOTH THE FRONT AND THE BACK OF EACH RAIL PROVIDED THE MARKING ON THE BACK DOES NOT CONFLICT WITH INTENDED OPPOSING TRAFFIC MOVEMENT.

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 104.2.7.4.

EXAMPLE 2 - FOR PAVED ROADWAYS WITH A WIDTH OF 20- FEET OR LESS AND WITHOUT PAVED SHOULDERS, TWO BARRICADES ARE ACCEPTABLE.

EXAMPLE 3 - WHERE BARRICADES EXTEND ENTIRELY ACROSS A ROADWAY, STRIPES SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH ROAD USERS MUST TURN.

EXAMPLE 4 - WHERE BOTH RIGHT AND LEFT TURNS ARE PROVIDED, STRIPES SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE OR BARRICADES.

EXAMPLE 5 - WHERE NO TURNS ARE INTENDED, STRIPES POSITIONED TO SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES.

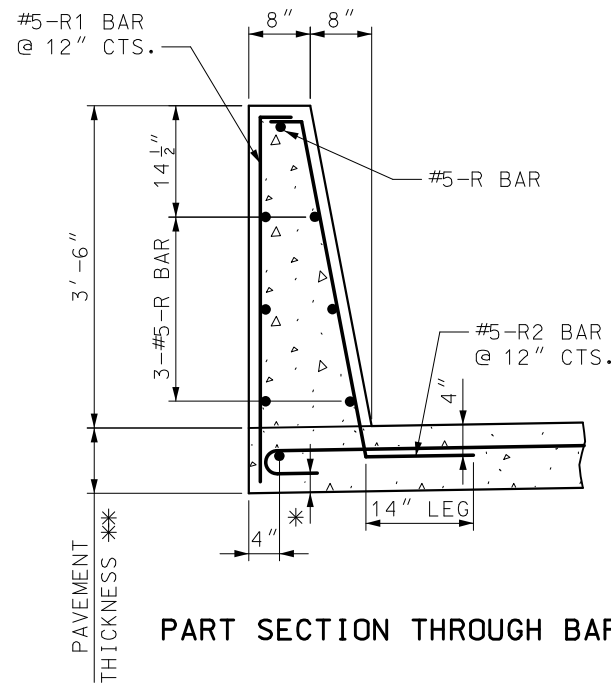
**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL  
 JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
 TRAVIS D. KOESTNER  
 NUMBER PE-30042  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

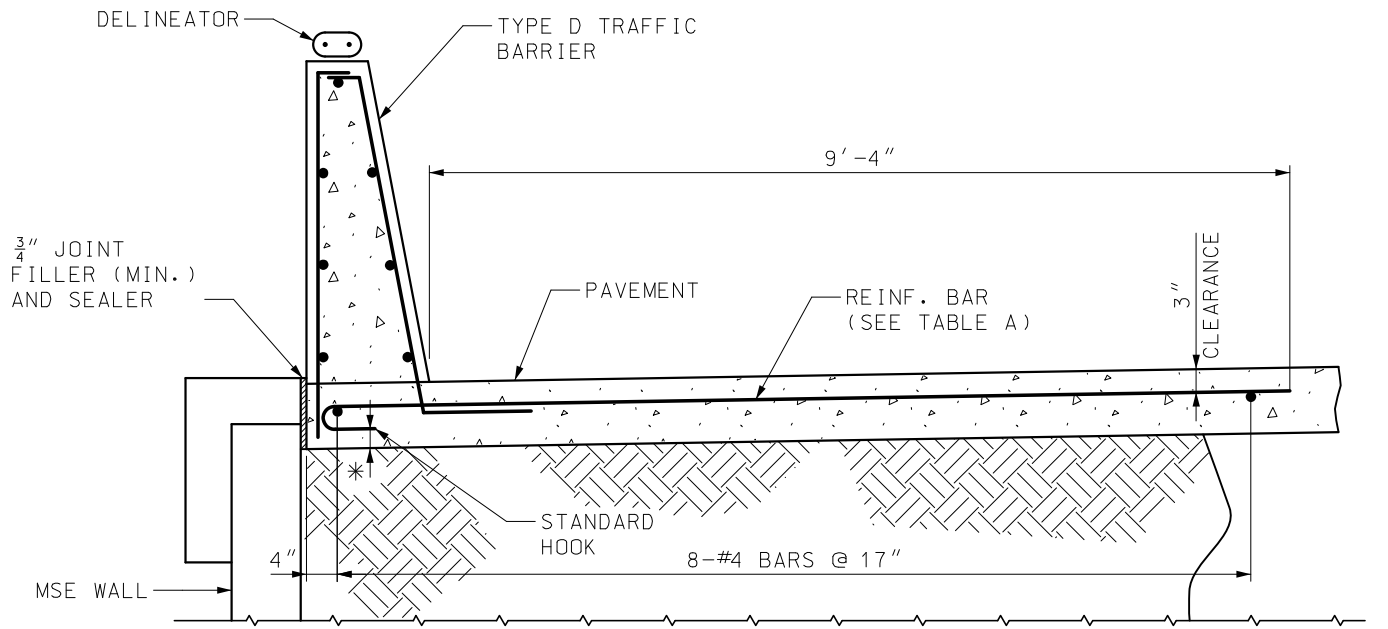
TEMPORARY TRAFFIC CONTROL DEVICES  
 TYPE 3 MOVABLE BARRICADE

DATE EFFECTIVE: 04/01/2021	616.10AX	SHEET NO. 4 OF 9
DATE PREPARED: 1/27/2021		

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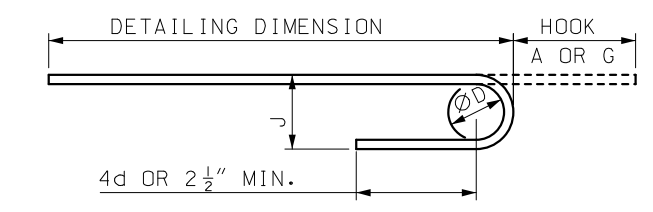
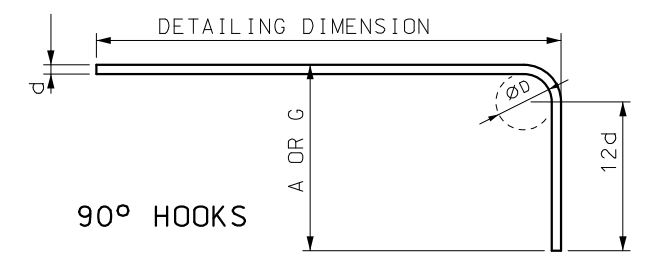


PART SECTION THROUGH BARRIER



TYPE D (MSE WALL) TRAFFIC BARRIER ON TOP OF MSE WALL

END HOOK DIMENSIONS				
BAR SIZE	D (IN.)	ALL GRADES		
		180° HOOKS		90° HOOKS
		A OR G	J	A OR G
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"



ALL STANDARD HOOKS AND BENDS OTHER THAN 180° TO BE BENT WITH THE SAME PROCEDURE AS FOR 90° STANDARD HOOKS.

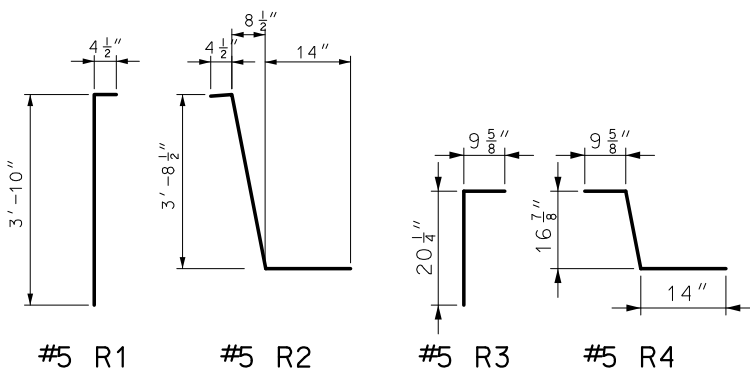
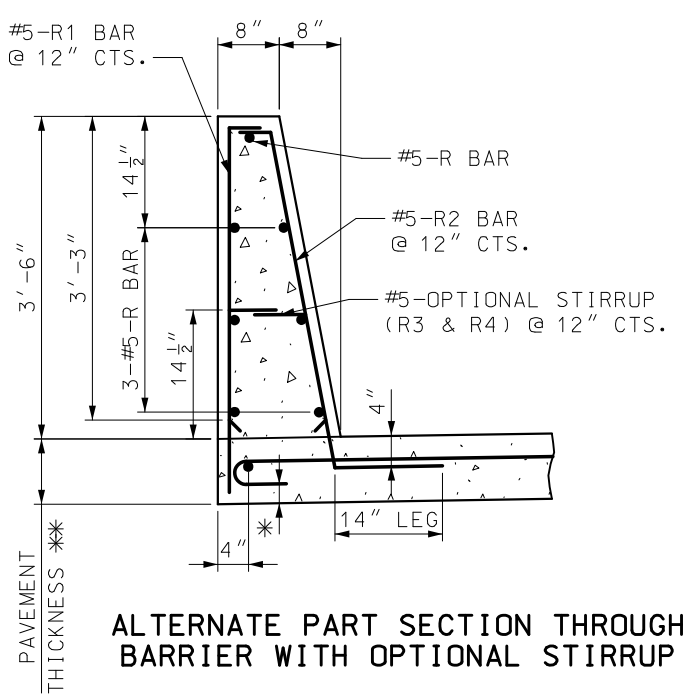


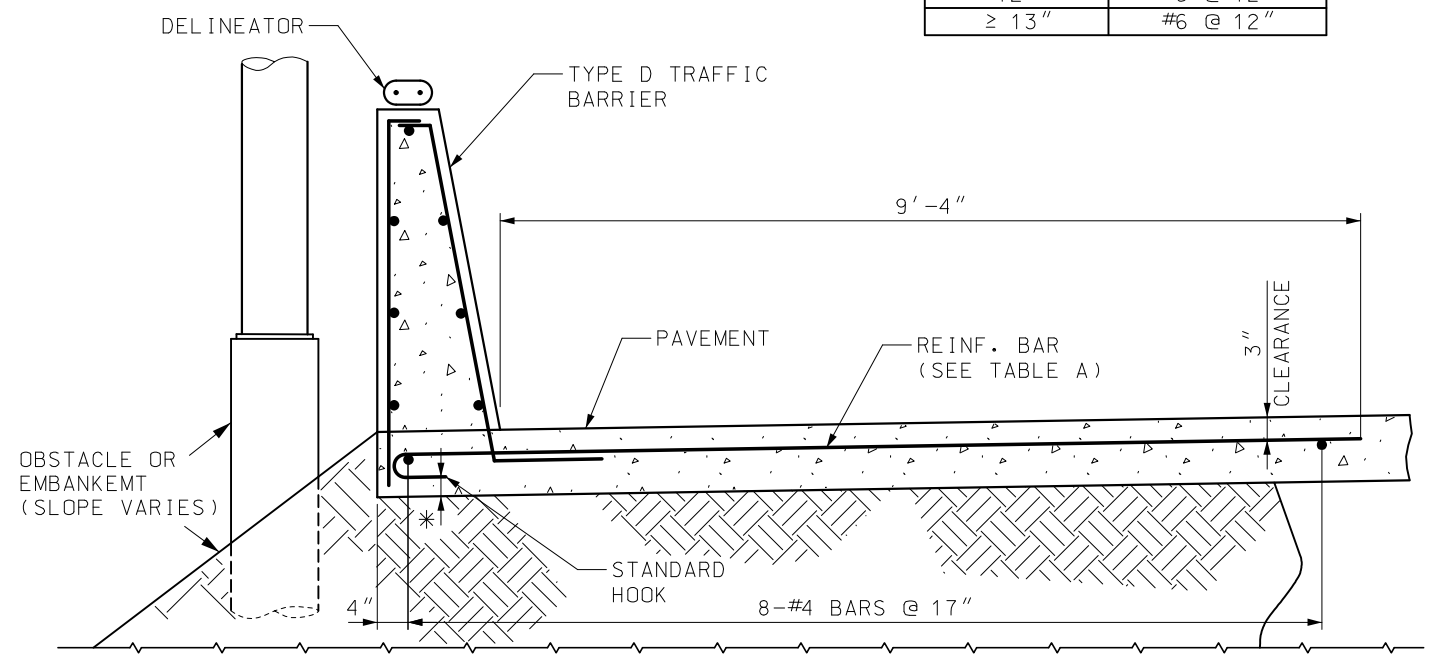
TABLE A TRANSVERSE PAVEMENT REINFORCEMENT	
PAVEMENT THICKNESS **	BAR SIZE & SPACING
8"	#5 @ 4"*
9"	#5 @ 5"*
10"	#5 @ 6"
11"	#5 @ 7"
12"	#6 @ 12"
≥ 13"	#6 @ 12"

NOTES:

- TYPE D SHALL BE USED ONLY AT LOCATIONS SHOWN ON PLANS.
- FOR CONCRETE TRAFFIC BARRIER DELINEATION DETAILS SEE STD PLAN 903.03.
- ALL REINFORCEMENT SHALL BE GRADE 60 EPOXY COATED.
- NO DIRECT PAYMENT WILL BE MADE FOR REINFORCING STEEL.
- MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2" UNLESS OTHERWISE SHOWN.
- \* TILT TRANSVERSE PAVEMENT REINFORCEMENT HOOKS FROM VERTICAL ALIGNMENT TO MAINTAIN 1 1/2" MINIMUM CLEARANCE.
- \*\* SEE ROADWAY PAVEMENT DESIGN.
- \*\*\* R1 AND R2 MAY BE REPLACED WITH ALTERNATE (3'-3") R1 AND R2 OR R5 ONLY FOR USE WITH OPTIONAL STIRRUP.



ALTERNATE PART SECTION THROUGH BARRIER WITH OPTIONAL STIRRUP



TYPE D TRAFFIC BARRIER - MOMENT SLAB\*\*

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

**PERMANENT CONCRETE TRAFFIC BARRIER**

TYPE D ATOP MSE WALL AND MOMENT SLAB

TRAVIS D. KOESTNER  
NUMBER PE-30042

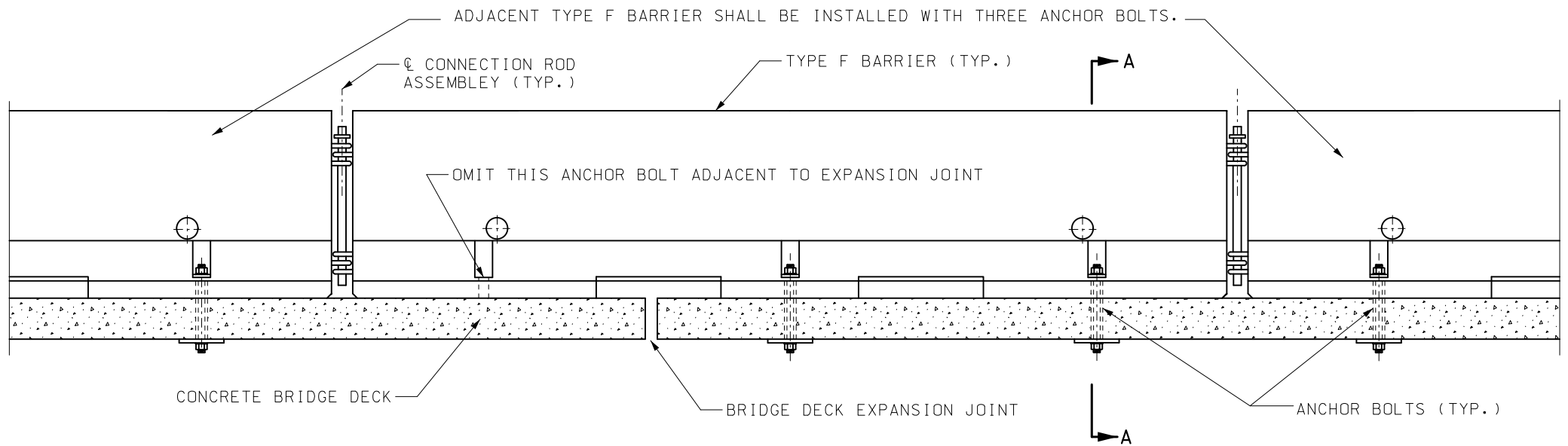
DATE EFFECTIVE: 10/01/2020

DATE PREPARED: 7/21/2020

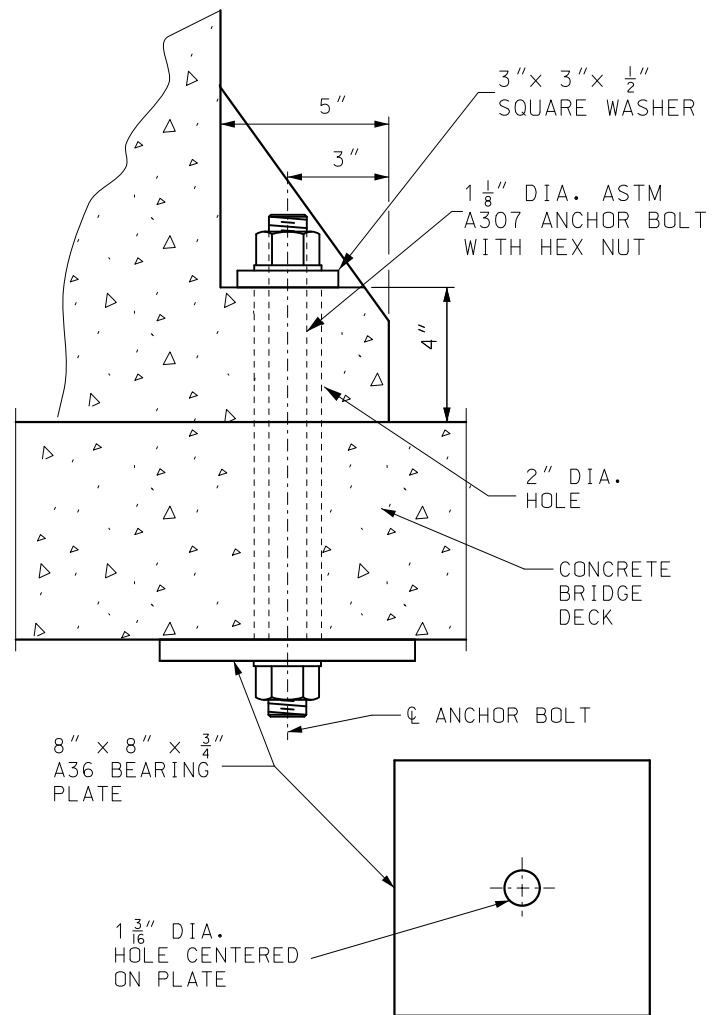
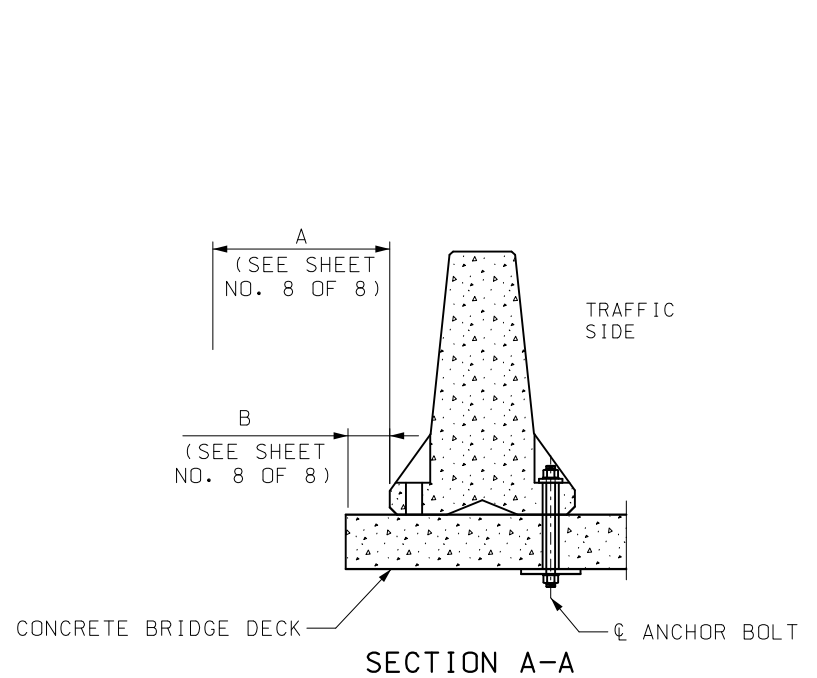
SHEET NO.

**8 OF 11**

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.




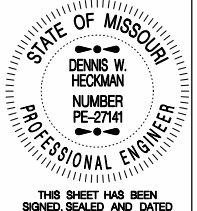
BOLT THROUGH DECK AT THERMAL EXPANSION JOINTS



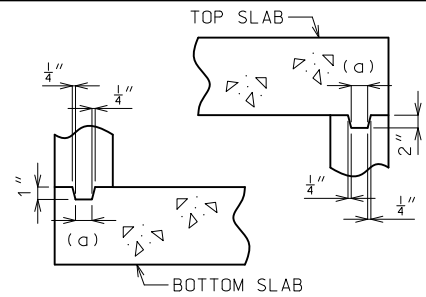
BOLT THROUGH DECK DETAIL

GENERAL NOTES:

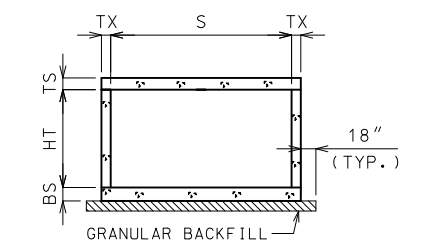
- ANCHOR BOLT SYSTEMS ARE ONLY APPLICABLE ON BRIDGE DECKS AND RIGID PAVEMENTS.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD BEFORE ORDERING NEW MATERIAL.
- SEE OTHER SHEETS FOR DETAILS NOT SHOWN.
- AFTER REMOVAL OF ANCHOR BOLTS HOLES SHALL BE FILLED WITH QUALIFIED SPECIAL MORTAR IN ACCORDANCE WITH SEC 704 OR AN EPOXY BONDING AGENT IN ACCORDANCE WITH SEC 1039.

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>TEMPORARY CONCRETE TRAFFIC BARRIER</b> ANCHORED (BOLT SYSTEM)
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>617.20F</b>
SHEET NO. 6 OF 8	

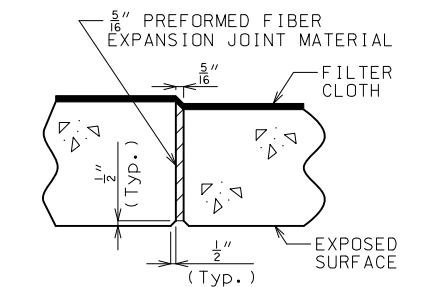
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



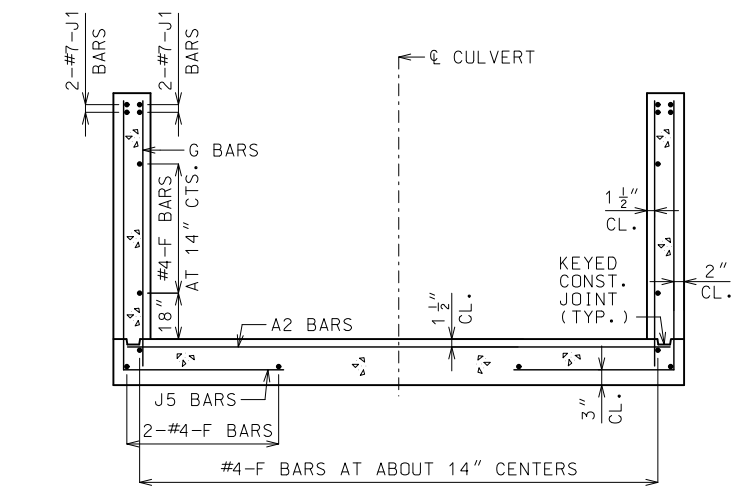
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



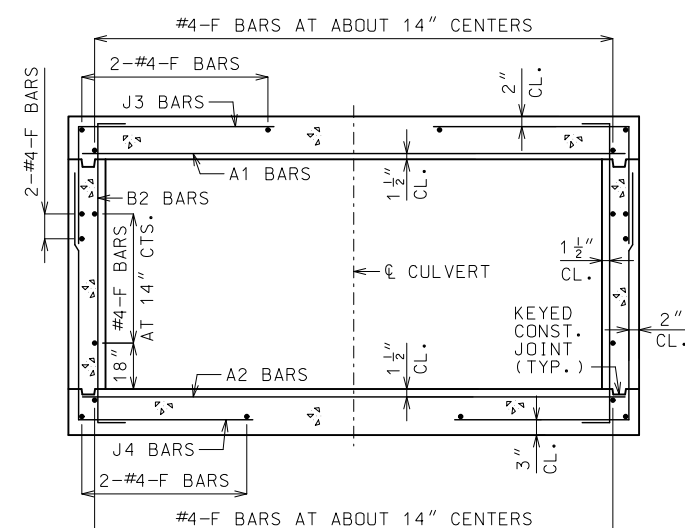
**TRANSVERSE JOINT THRU BARREL**

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

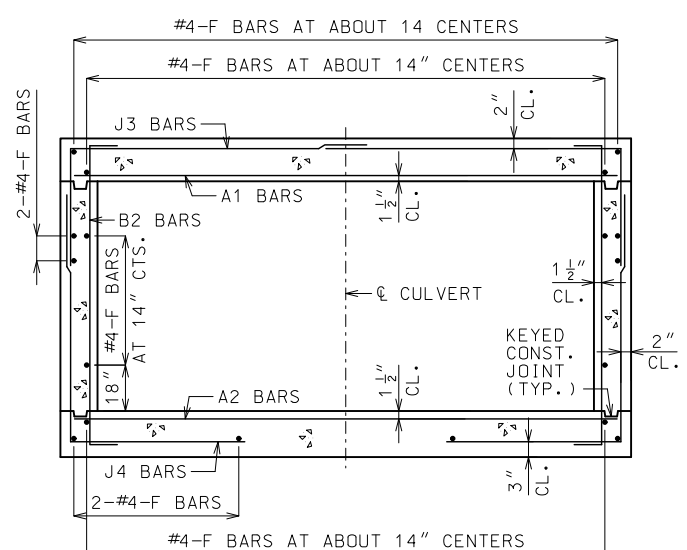
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SEPARATION GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



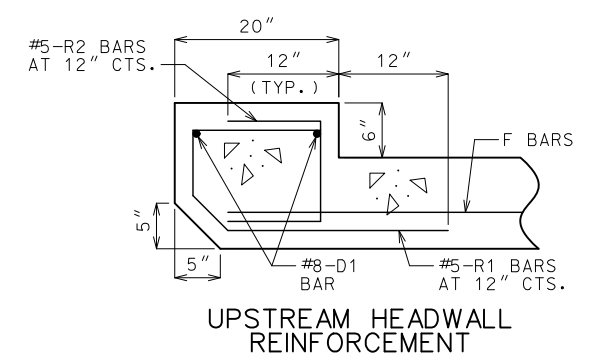
**UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT**



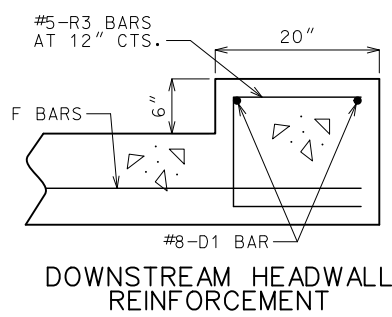
**BARREL REINFORCEMENT**  
FOR DESIGN FILLS OVER 2'-0"



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS 2'-0" OR LESS



**UPSTREAM HEADWALL REINFORCEMENT**

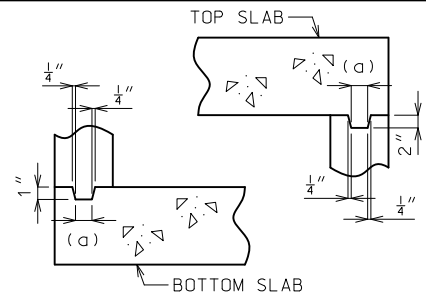


**DOWNSTREAM HEADWALL REINFORCEMENT**

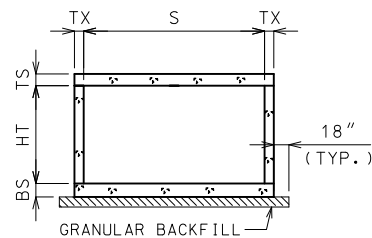
**GENERAL NOTES:**  
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.17. FOR J5 BARS, SEE 703.37.  
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.  
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.  
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2 inch.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: SQUARED WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.10J</b> SHEET NO. 3 OF 3

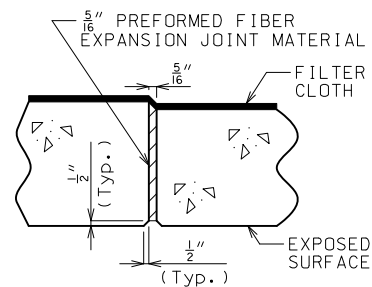
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



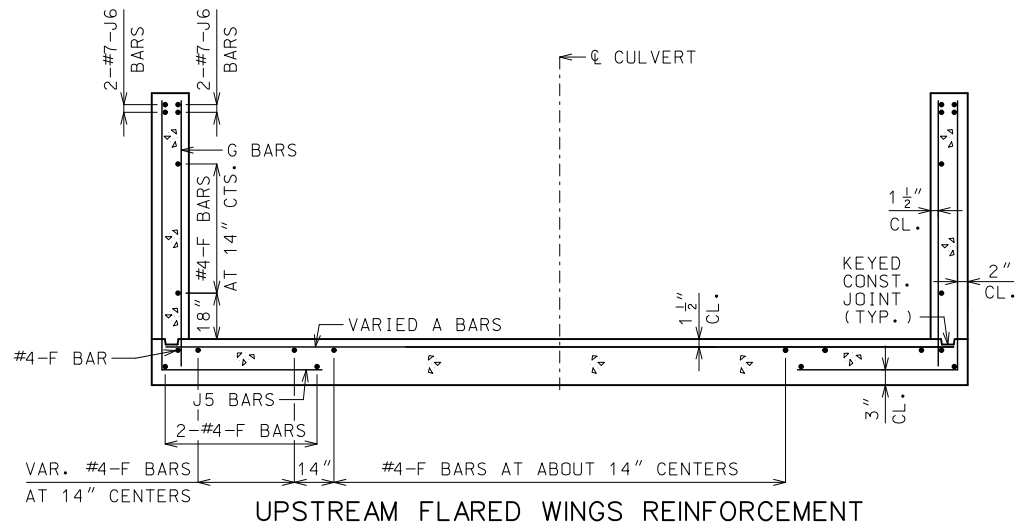
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



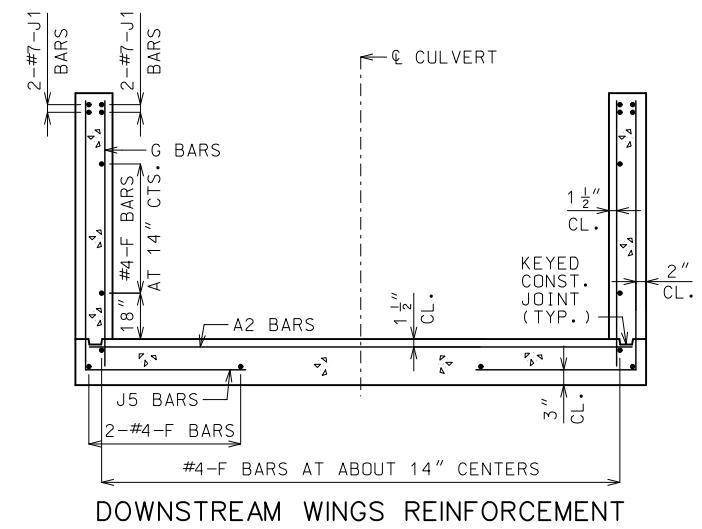
**TRANSVERSE JOINT THRU BARREL**

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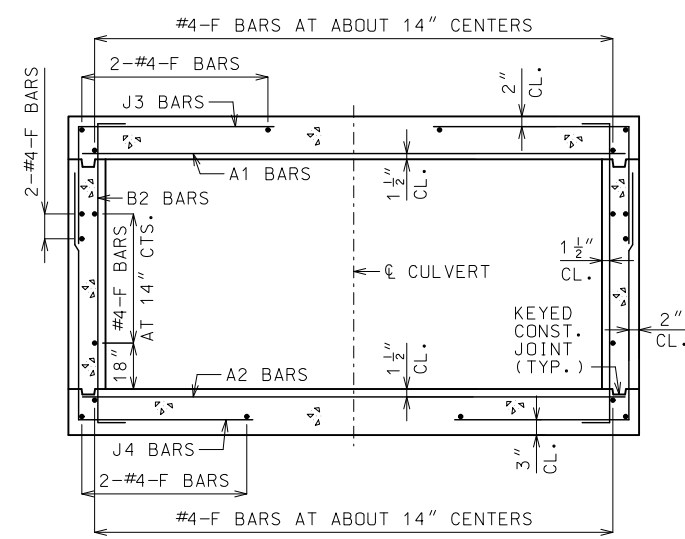
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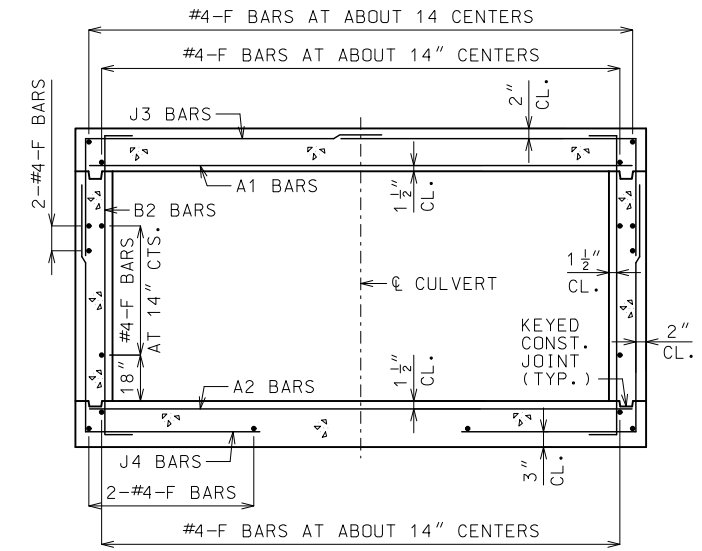
**UPSTREAM FLARED WINGS REINFORCEMENT**



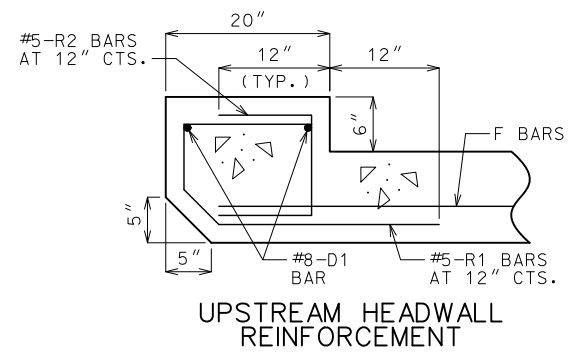
**DOWNSTREAM WINGS REINFORCEMENT**



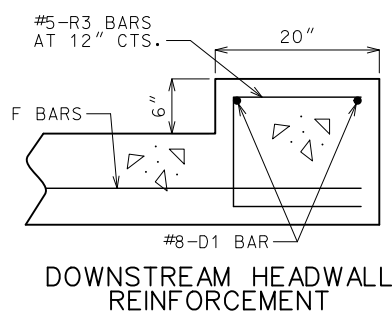
**BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"**



**BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS**



**UPSTREAM HEADWALL REINFORCEMENT**

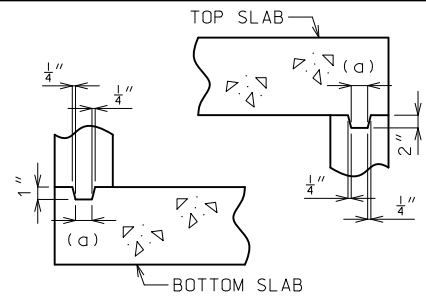


**DOWNSTREAM HEADWALL REINFORCEMENT**

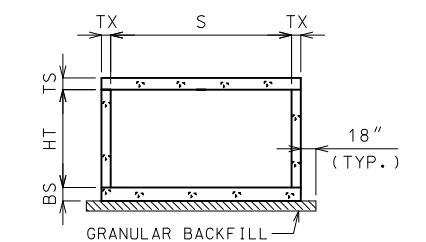
**GENERAL NOTES:**  
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BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.  
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.  
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: SQUARED WINGS: FLARED SECTIONS	
	DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.11J</b> SHEET NO. 3 OF 3

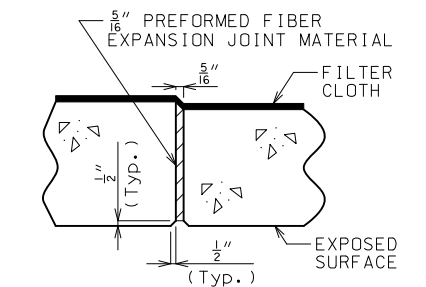
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



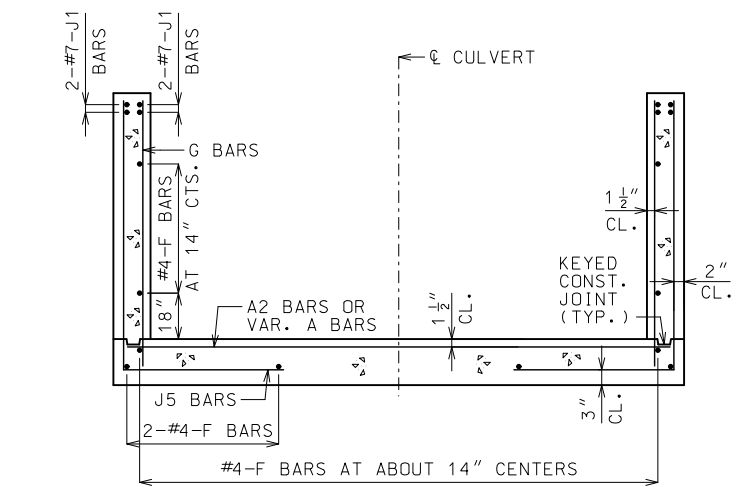
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



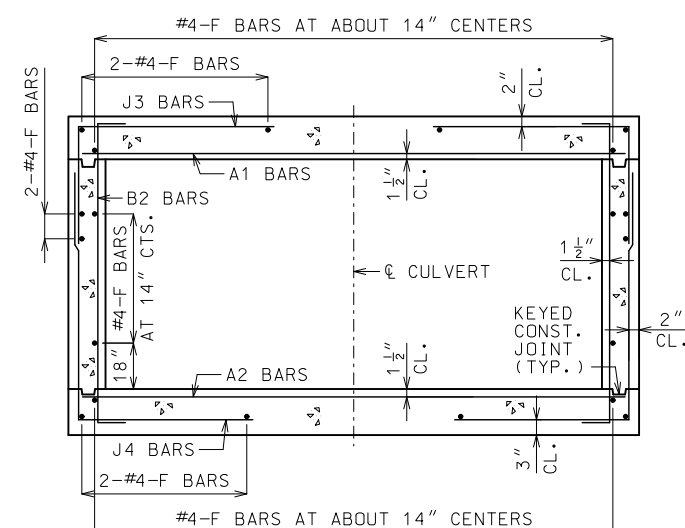
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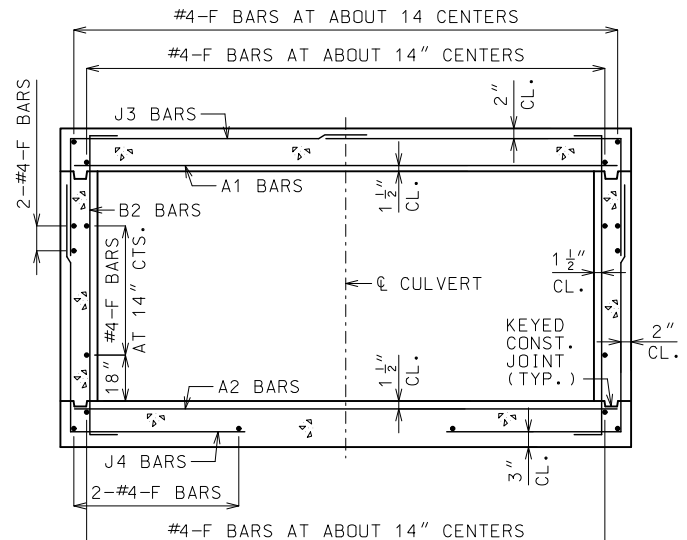
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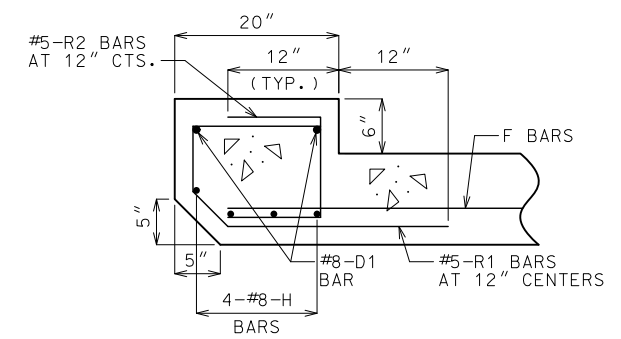
**UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT**



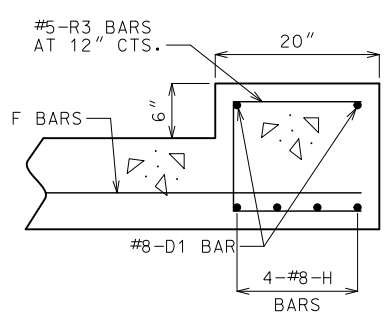
**BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"**



**BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS**



**UPSTREAM HEADWALL REINFORCEMENT**

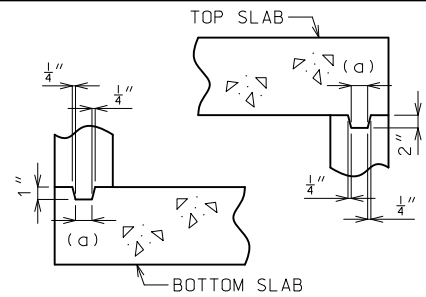


**DOWNSTREAM HEADWALL REINFORCEMENT**

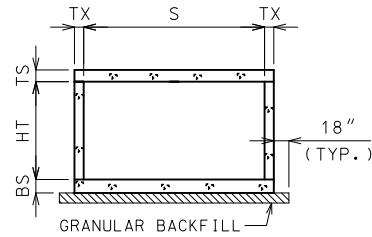
**GENERAL NOTES:**  
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	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: LEFT ADVANCE WINGS: STRAIGHT	
	<b>SECTIONS</b>	
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.12J</b>	SHEET NO. <b>3 OF 3</b>

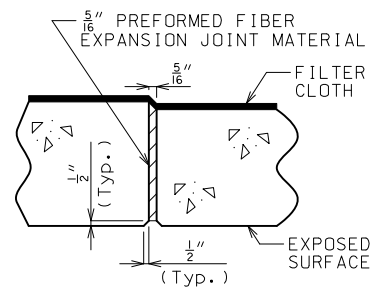
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



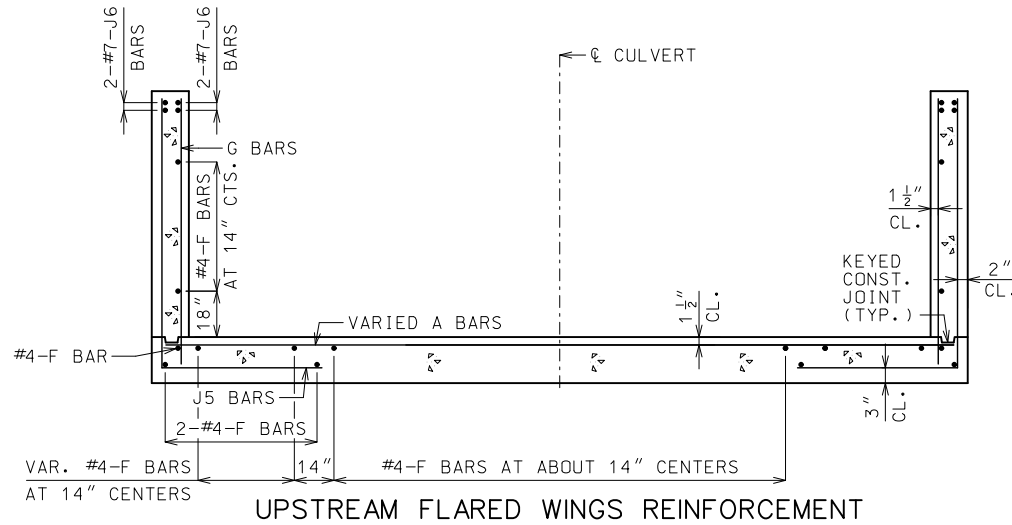
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



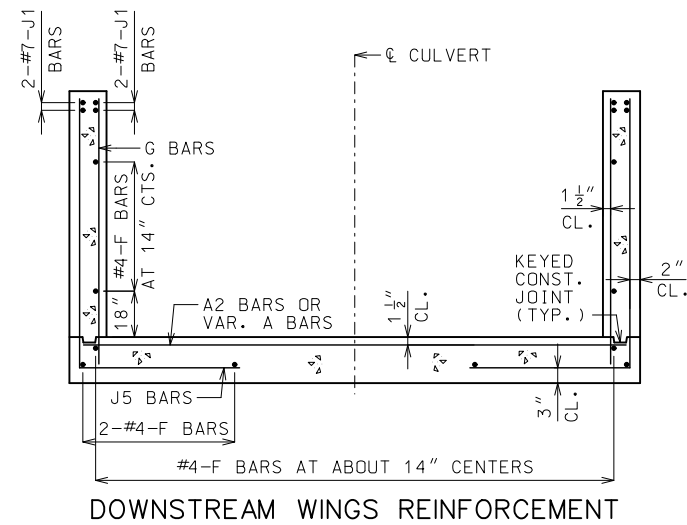
**TRANSVERSE JOINT THRU BARREL**

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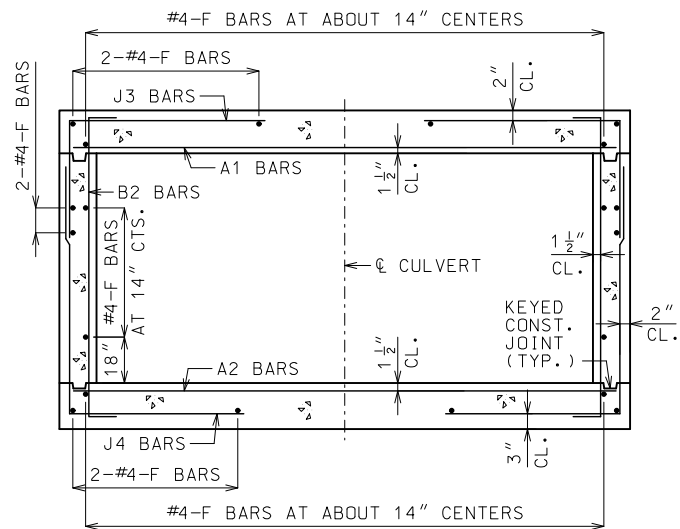
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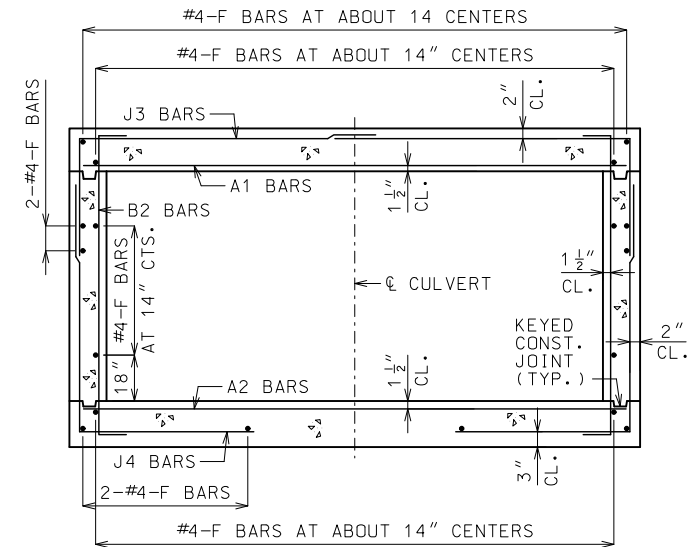
**UPSTREAM FLARED WINGS REINFORCEMENT**



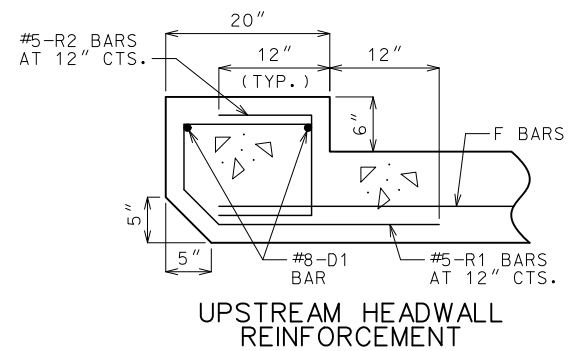
**DOWNSTREAM WINGS REINFORCEMENT**



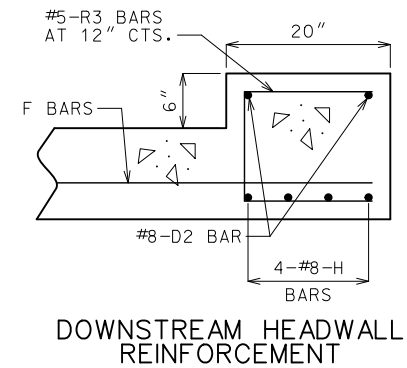
**BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"**



**BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS**



**UPSTREAM HEADWALL REINFORCEMENT**



**DOWNSTREAM HEADWALL REINFORCEMENT**

**GENERAL NOTES:**

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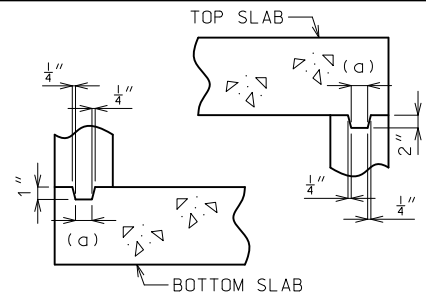
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MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

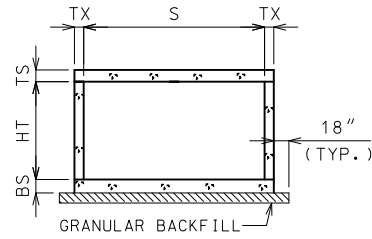
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: LEFT ADVANCE WINGS: FLARED	
	<b>SECTIONS</b>	
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.13J</b>	SHEET NO. <b>3 OF 3</b>

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

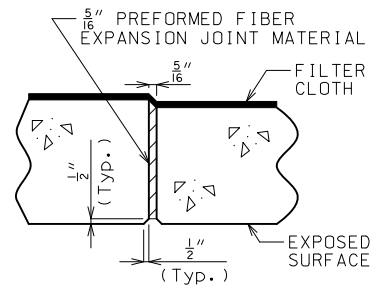




**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



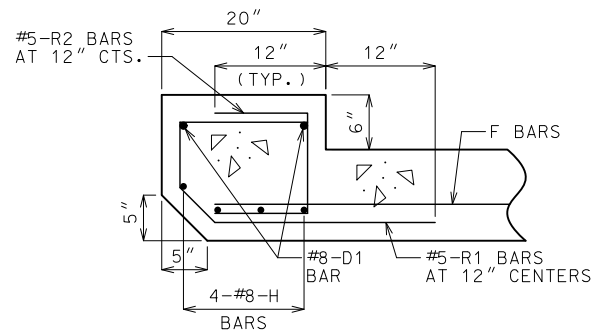
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



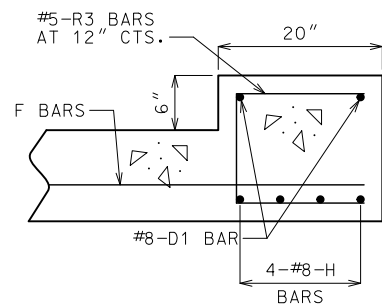
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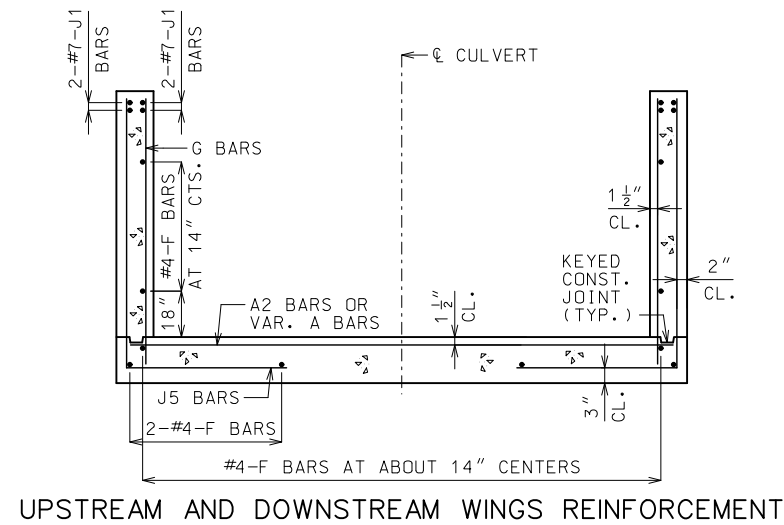
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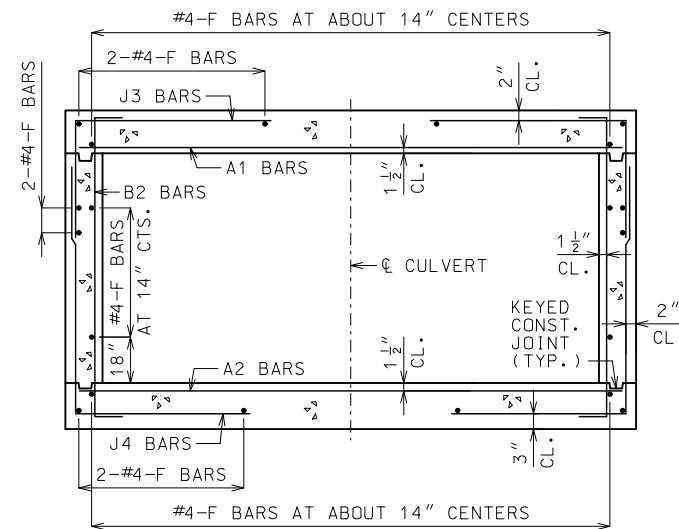
**UPSTREAM HEADWALL REINFORCEMENT**



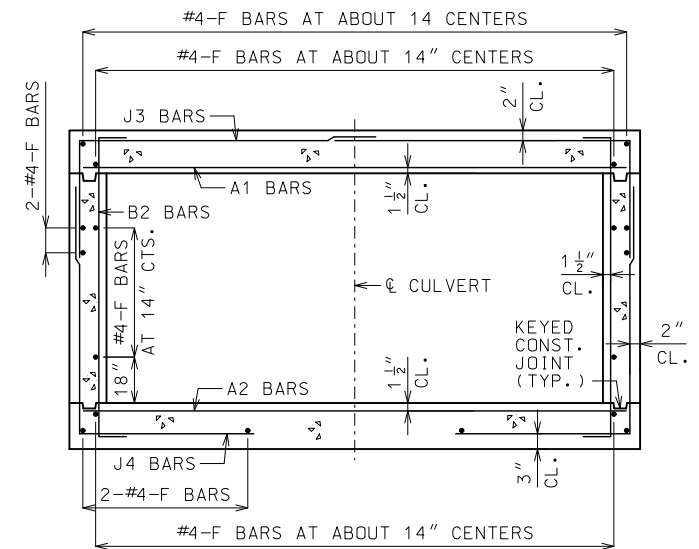
**DOWNSTREAM HEADWALL REINFORCEMENT**



**UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT**



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS OVER 2'-0"



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS 2'-0" OR LESS



**GENERAL NOTES:**

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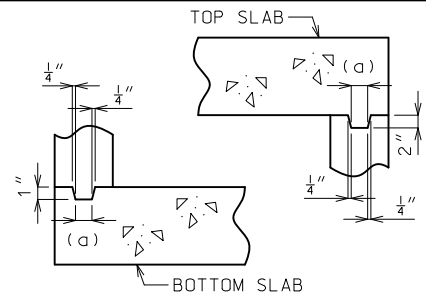
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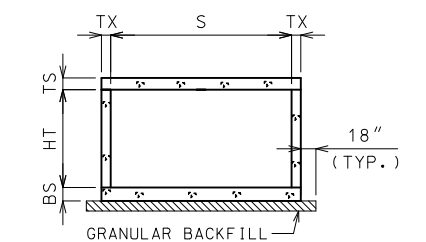
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 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: RIGHT ADVANCE WINGS: STRAIGHT  SECTIONS
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.14J</b>
	SHEET NO. <b>3 OF 3</b>

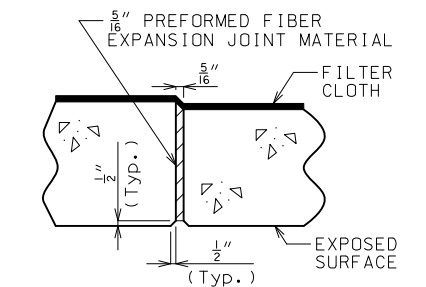
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**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



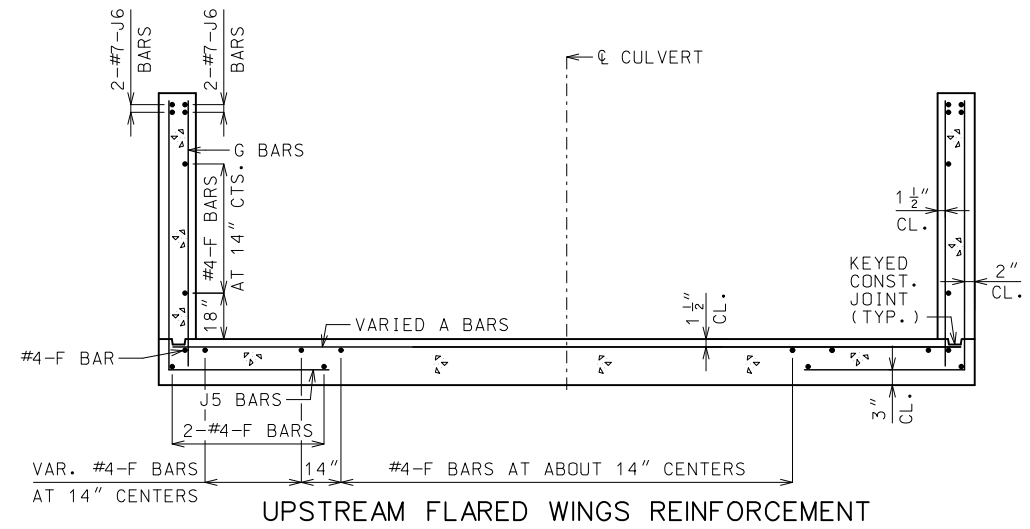
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



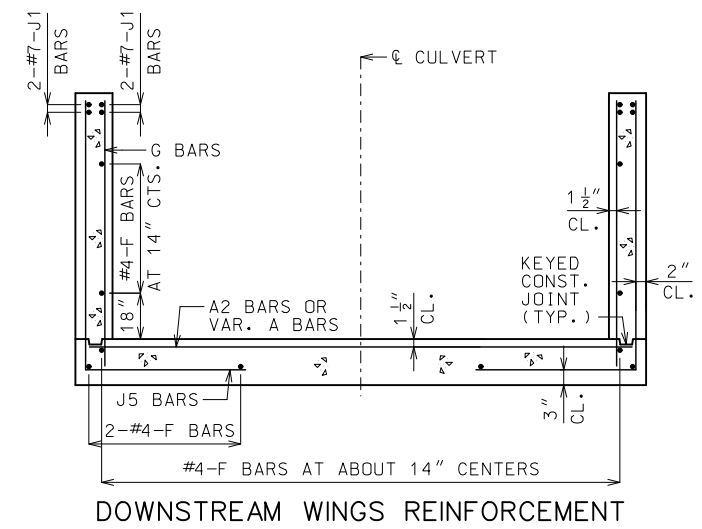
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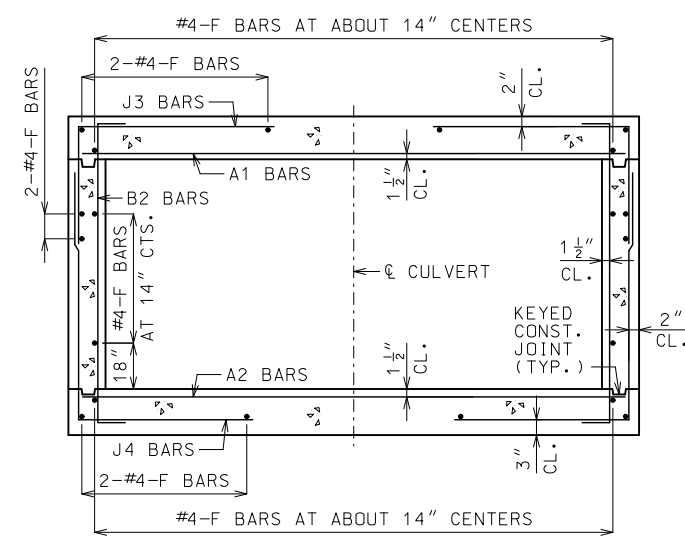
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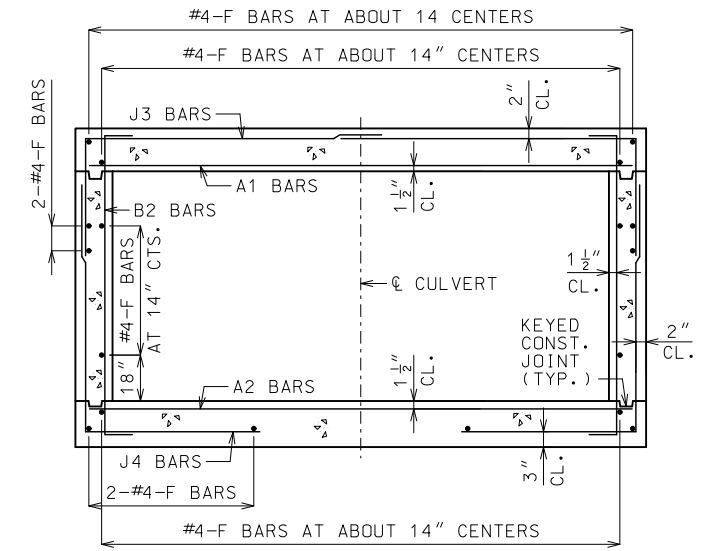
**UPSTREAM FLARED WINGS REINFORCEMENT**



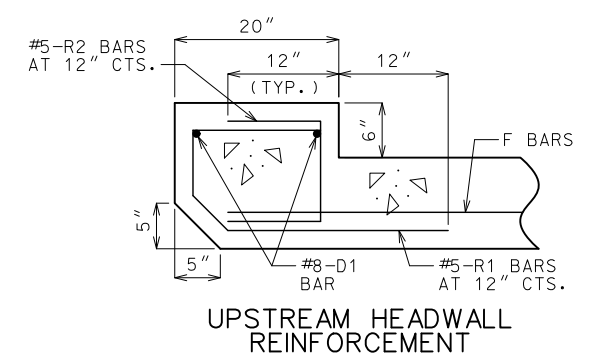
**DOWNSTREAM WINGS REINFORCEMENT**



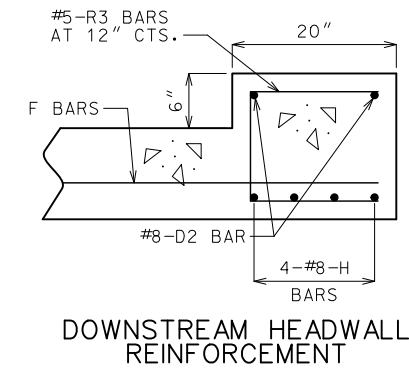
**BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"**



**BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS**



**UPSTREAM HEADWALL REINFORCEMENT**

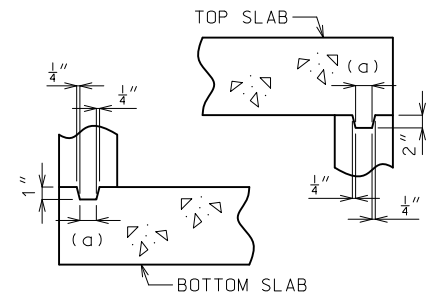


**DOWNSTREAM HEADWALL REINFORCEMENT**

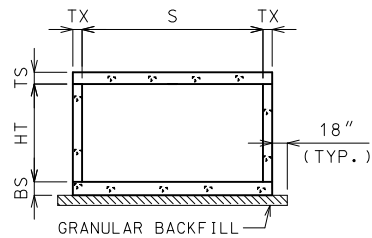
**GENERAL NOTES:**  
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.17. FOR J5 BARS, SEE 703.37.  
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.  
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.  
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2 inch.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: RIGHT ADVANCE WINGS: FLARED SECTIONS	
	DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.15E</b> SHEET NO. 3 OF 3

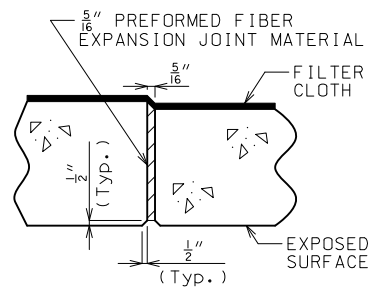
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



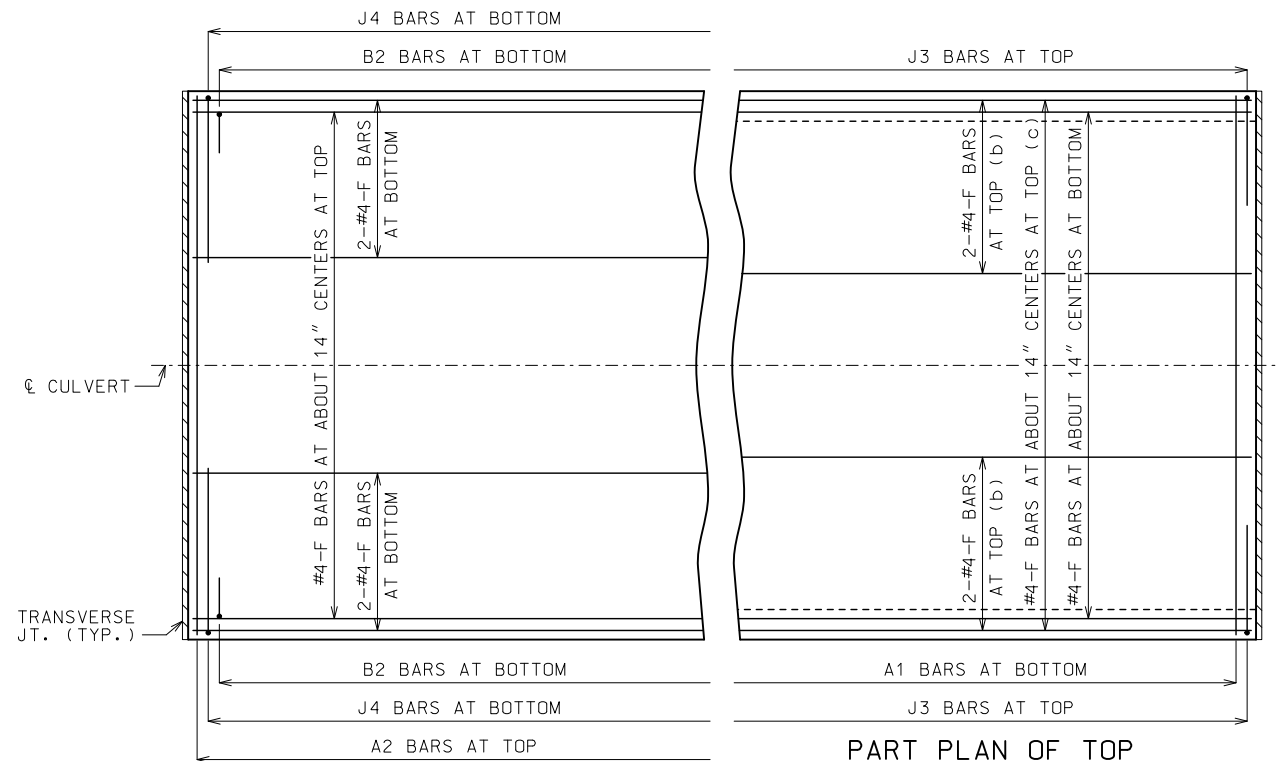
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



**TRANSVERSE JOINT THRU BARREL**

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SEPARATION GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

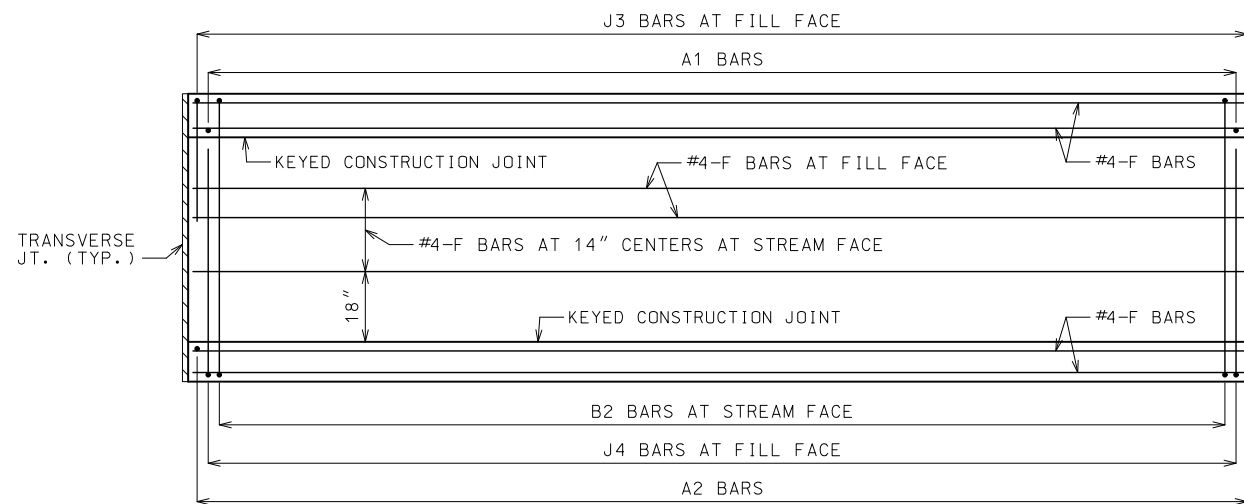


**PART PLAN OF TOP SLAB REINFORCEMENT**

(b) FOR DESIGN FILLS OVER 2'-0"  
(c) FOR DESIGN FILLS 2'-0" OR LESS



**PART PLAN OF BOTTOM SLAB REINFORCEMENT**



**ELEVATION OF WALL REINFORCEMENT**

**GENERAL NOTES**

**DESIGN SPECIFICATIONS:**  
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

**DESIGN LOADING:**  
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF  
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

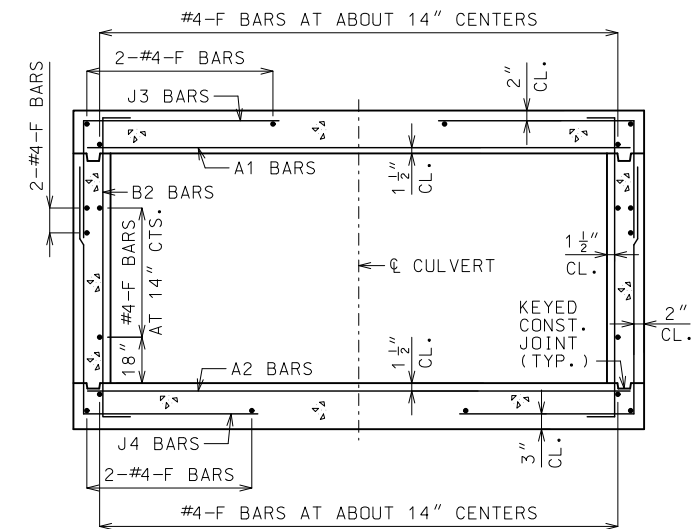
**DESIGN UNIT STRESSES:**  
CLASS B-1 CONCRETE (BOX CULVERT)  $f'_c = 4,000$  PSI  
REINFORCING STEEL (GRADE 60)  $f_y = 60,000$  PSI

**MISCELLANEOUS:**  
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS, SEE 703.17.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PART PLANS AND ELEVATION.

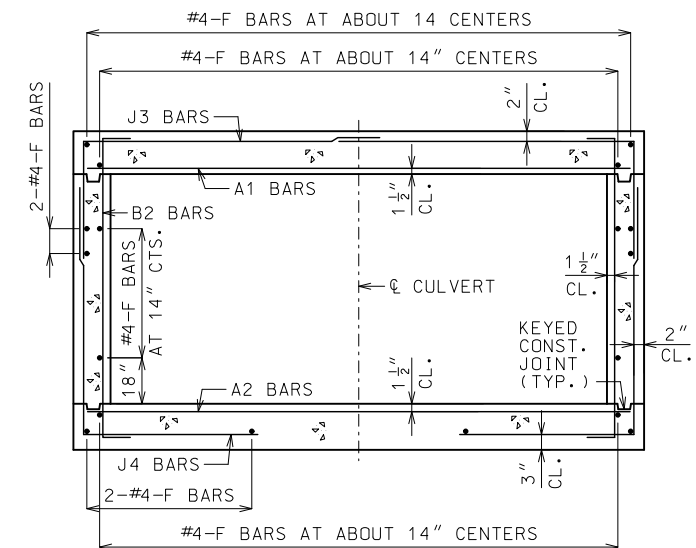
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".



**BARREL REINFORCEMENT**

FOR DESIGN FILLS OVER 2'-0"  
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.

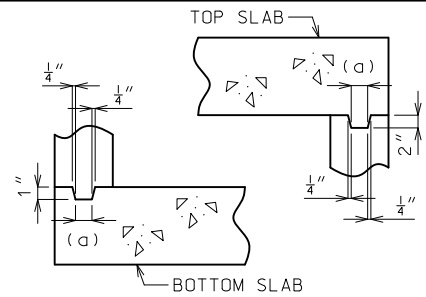


**BARREL REINFORCEMENT**

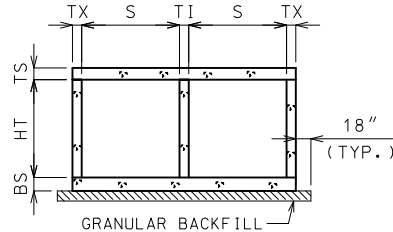
FOR DESIGN FILLS 2'-0" OR LESS  
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.

		<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>CONCRETE SINGLE BOX CULVERT</b> CUT SECTION	
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020		<b>703.16</b> SHEET NO. 1 OF 1	

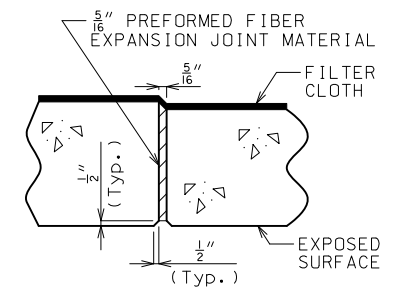
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



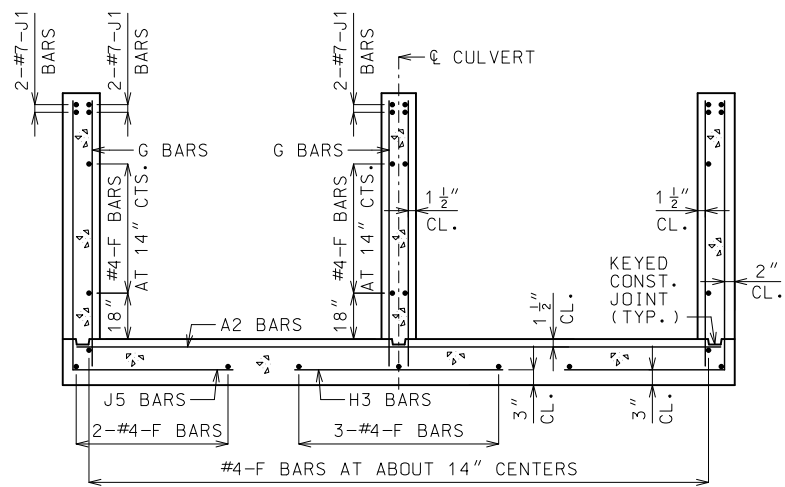
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



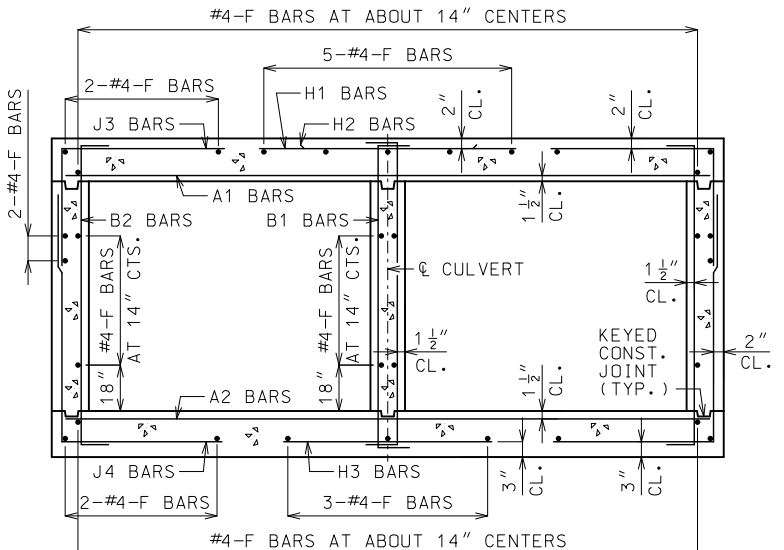
**TRANSVERSE JOINT THRU BARREL**

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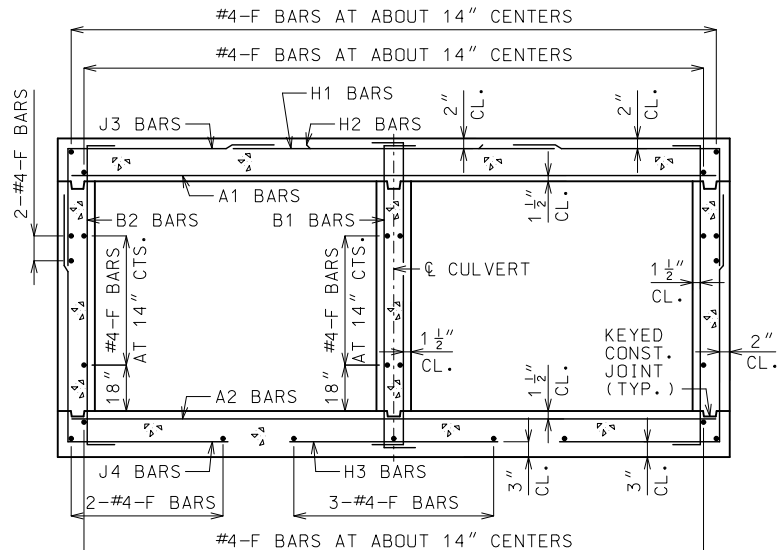
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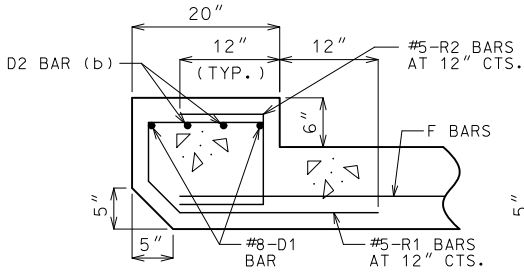
**UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT**



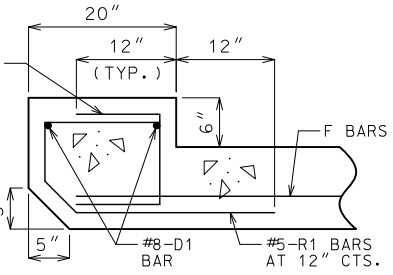
**BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"**



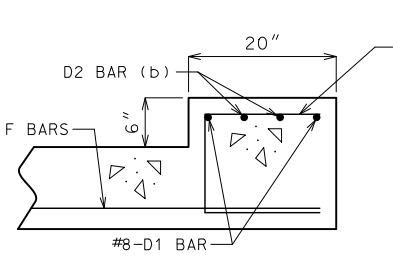
**BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS**



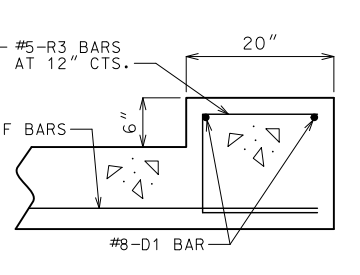
**UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL**



**UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN**



**DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL**



**DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN**

(b) #8 FOR CLEAR SPAN > 10'-0"  
#9 FOR CLEAR SPAN > 13'-0"  
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF CULVERT WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

**GENERAL NOTES:**  
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

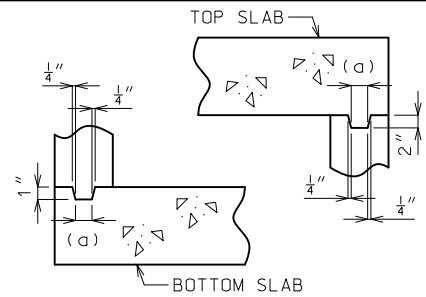
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DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

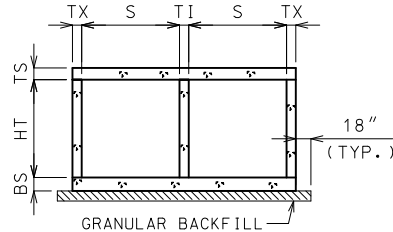
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE DOUBLE BOX CULVERT</b> SKEW: SQUARED WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.40H</b> SHEET NO. 3 OF 3

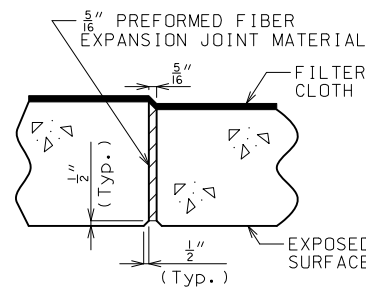
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



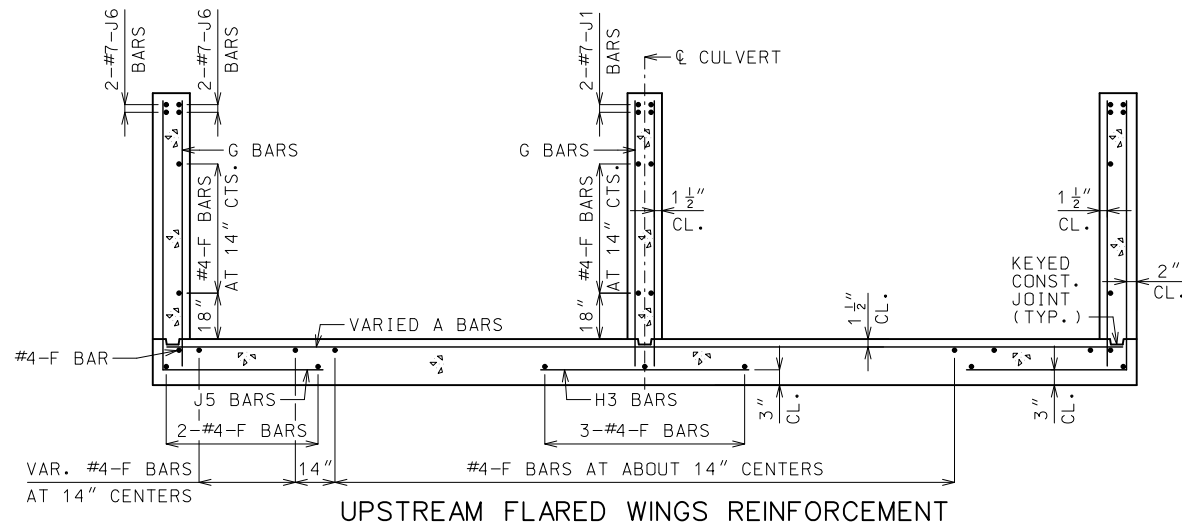
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



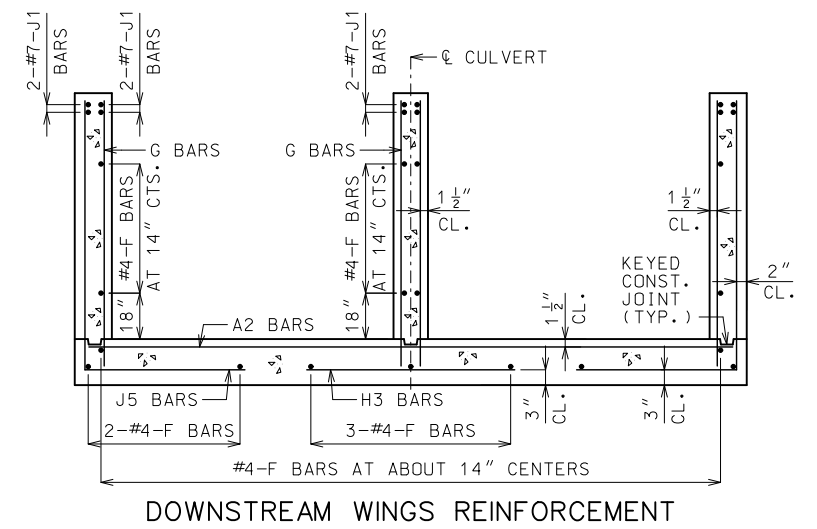
**TRANSVERSE JOINT THRU BARREL**

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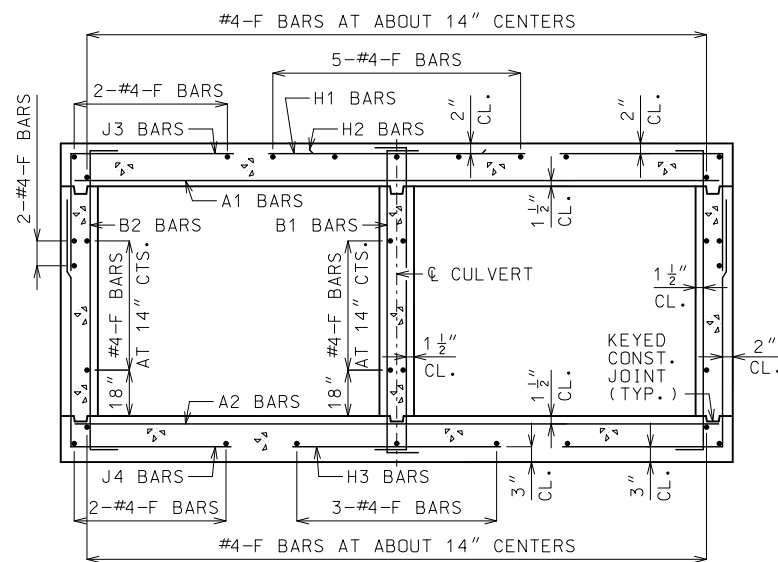
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**UPSTREAM FLARED WINGS REINFORCEMENT**

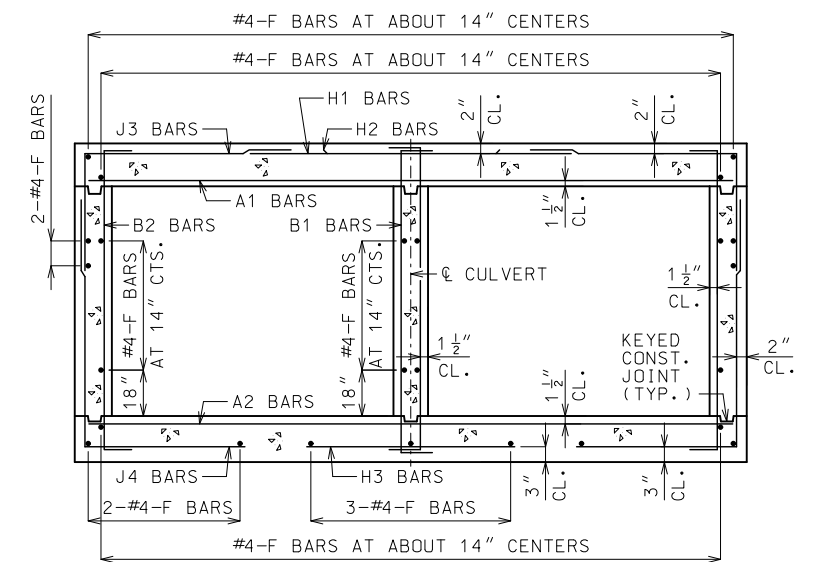


**DOWNSTREAM WINGS REINFORCEMENT**



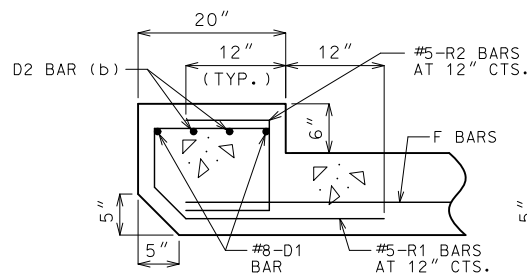
**BARREL REINFORCEMENT**

FOR DESIGN FILLS OVER 2'-0"

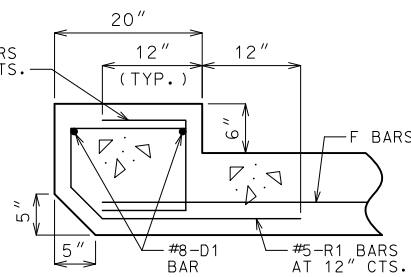


**BARREL REINFORCEMENT**

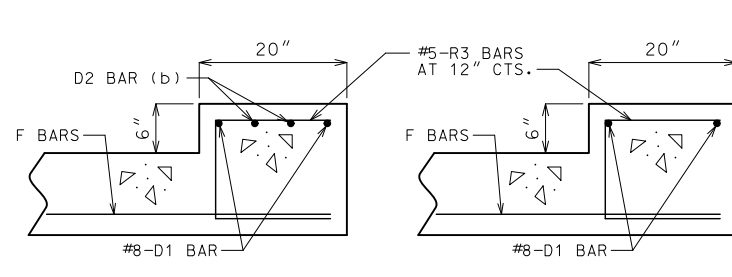
FOR DESIGN FILLS 2'-0" OR LESS



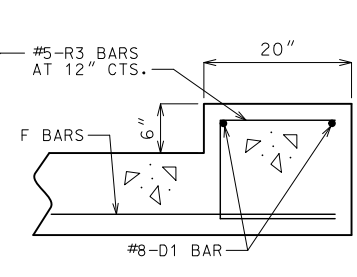
**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN



**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN

(b) #8 FOR CLEAR SPAN > 10'-0"  
#9 FOR CLEAR SPAN > 13'-0"  
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF CULVERT SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

**GENERAL NOTES:**

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

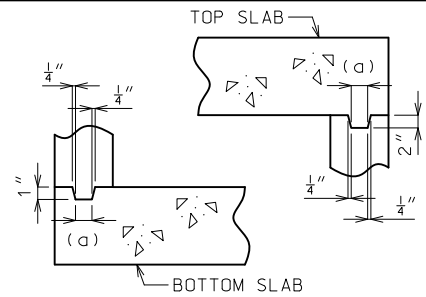
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DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

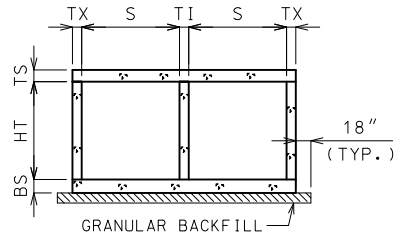
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<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b></p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
	<p><b>CONCRETE DOUBLE BOX CULVERT</b></p> <p>SKEW: SQUARED WINGS: FLARED</p> <p>SECTIONS</p>
	<p>DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020</p> <p><b>703.41H</b></p> <p>SHEET NO. 3 OF 3</p>

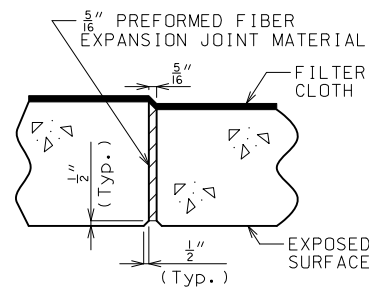
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



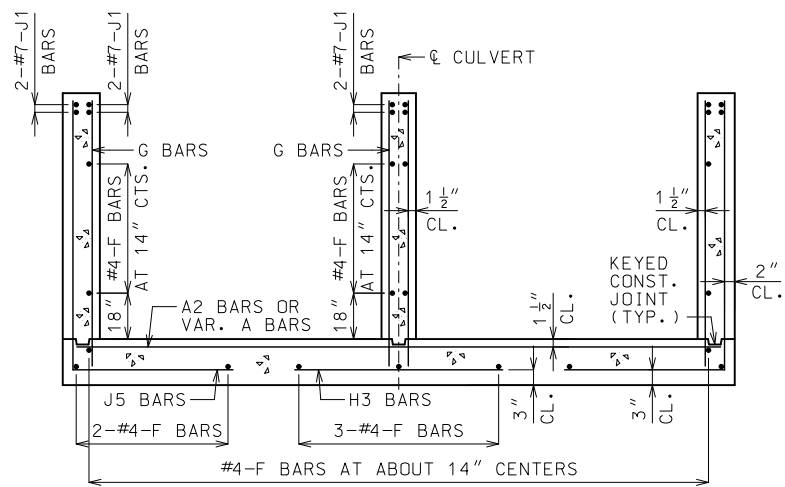
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



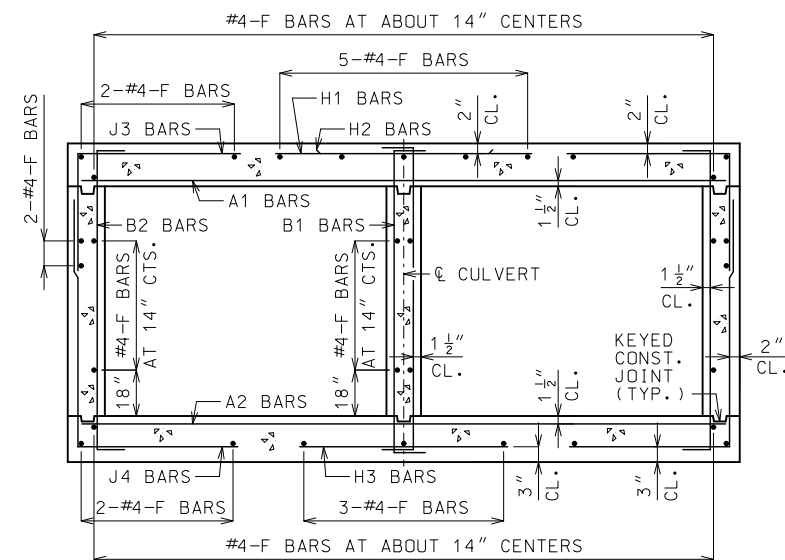
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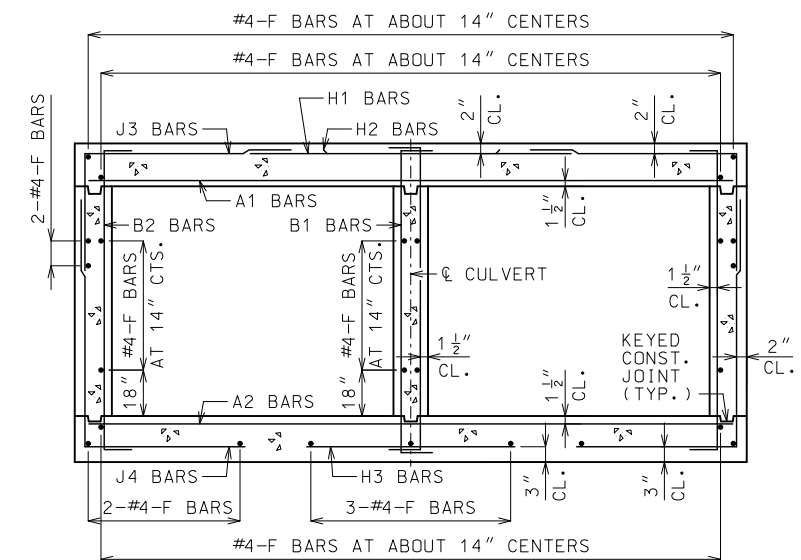
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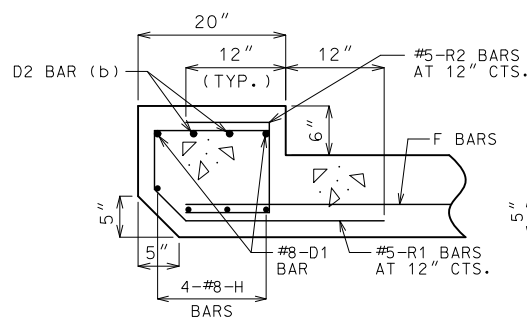
**UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT**



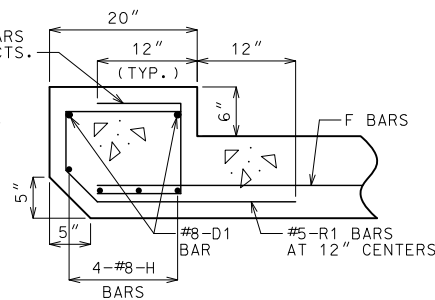
**BARREL REINFORCEMENT**  
FOR DESIGN FILLS OVER 2'-0"



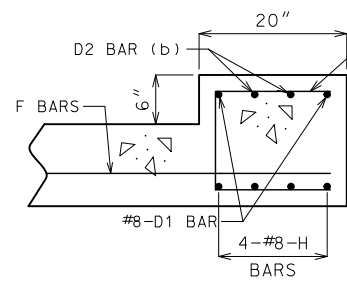
**BARREL REINFORCEMENT**  
FOR DESIGN FILLS 2'-0" OR LESS



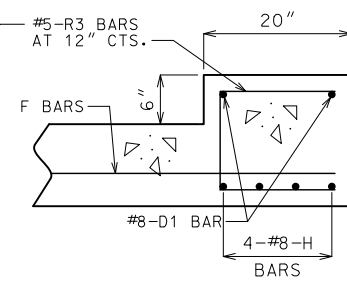
**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN



**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN

(b) #8 FOR CLEAR SPAN > 10'-0"  
#9 FOR CLEAR SPAN > 13'-0"  
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

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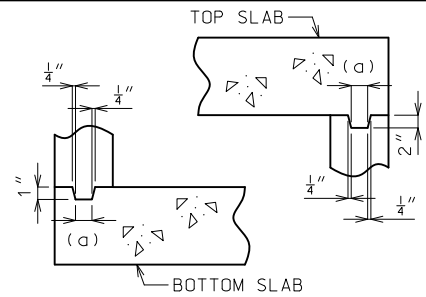
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DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

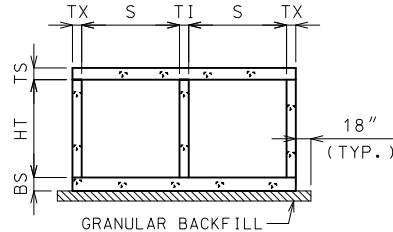
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	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE DOUBLE BOX CULVERT</b>	
	SKEW: LEFT ADVANCE WINGS: STRAIGHT	
<b>SECTIONS</b>		
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.42H</b>	SHEET NO. <b>3 OF 3</b>

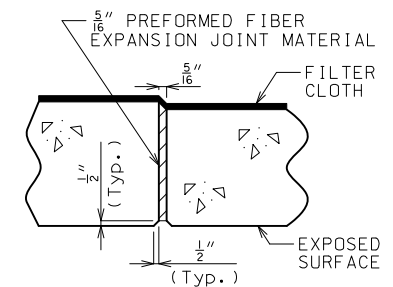
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



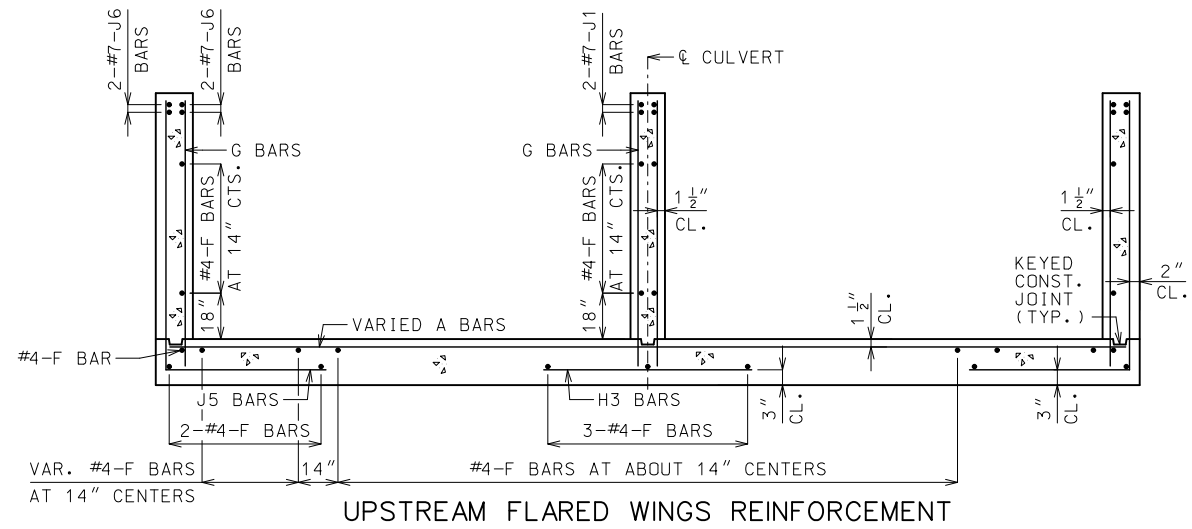
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



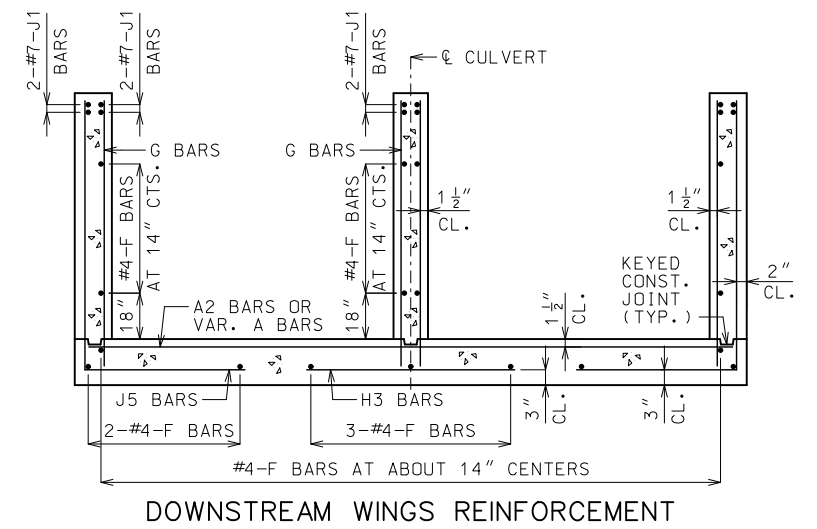
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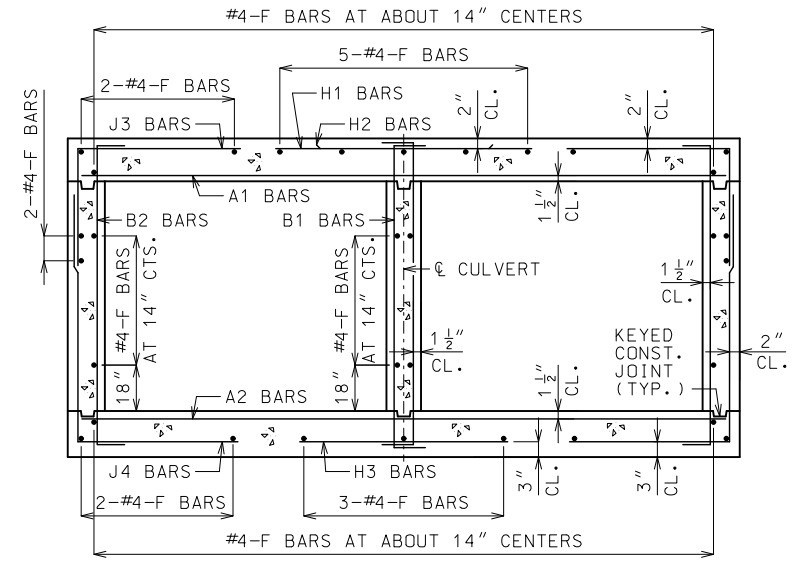
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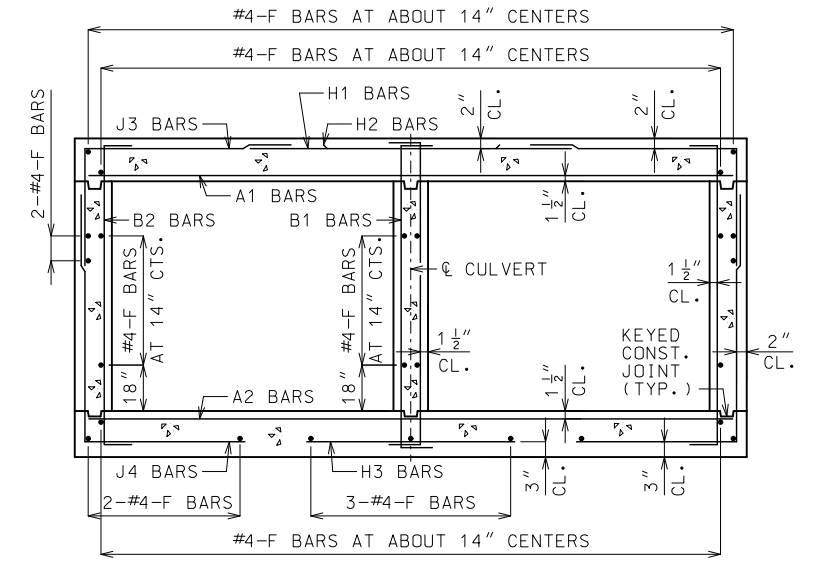
**UPSTREAM FLARED WINGS REINFORCEMENT**



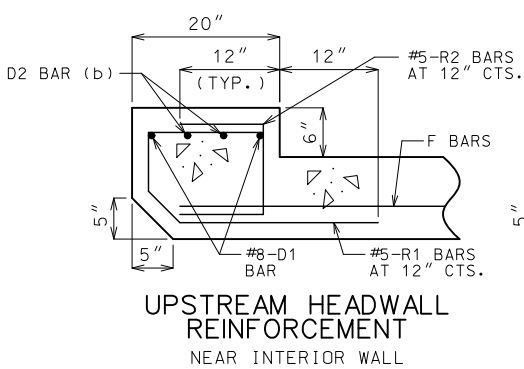
**DOWNSTREAM WINGS REINFORCEMENT**



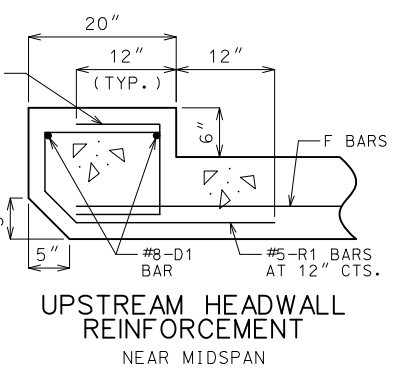
**BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"**



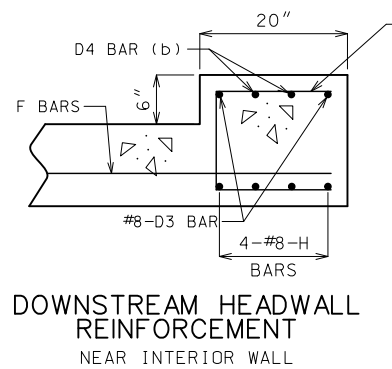
**BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS**



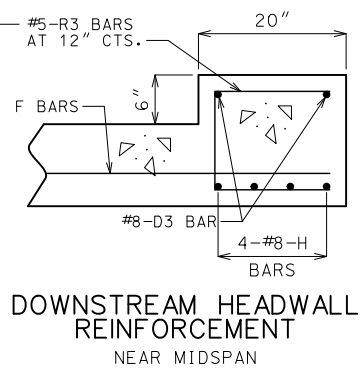
**UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL**



**UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN**



**DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL**



**DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN**

(b) #8 FOR CLEAR SPAN > 10'-0"  
#9 FOR CLEAR SPAN > 13'-0"  
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

IF D2 AND D4 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF  $\phi$  WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR  $\frac{1}{4}$  CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

**GENERAL NOTES:**

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

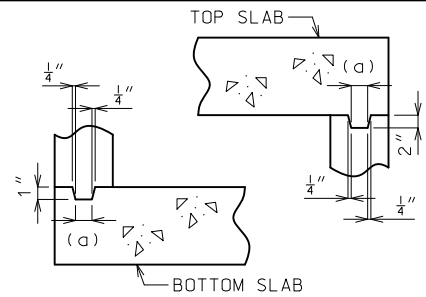
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO  $\phi$  CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

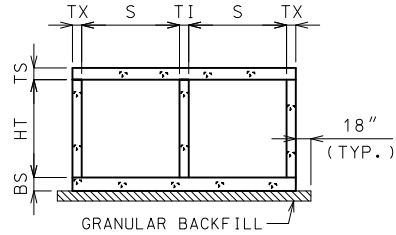
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE DOUBLE BOX CULVERT</b>	
	SKEW: LEFT ADVANCE WINGS: FLARED	
<b>SECTIONS</b>		
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.43H</b>	SHEET NO. 3 OF 3

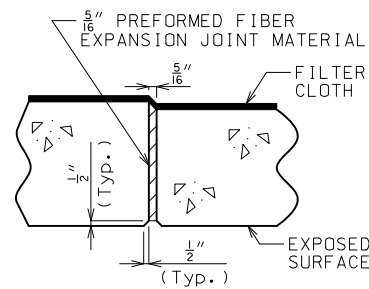
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



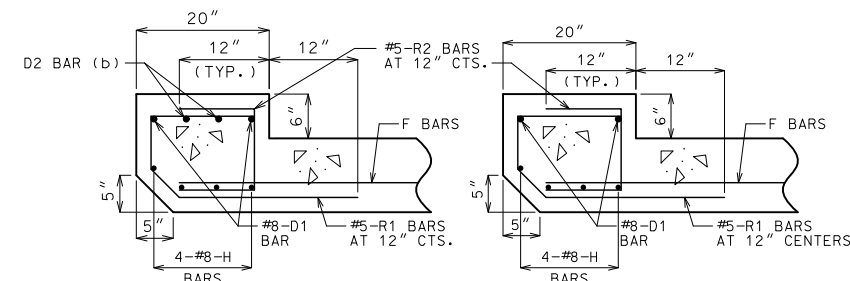
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



**TRANSVERSE JOINT THRU BARREL**

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

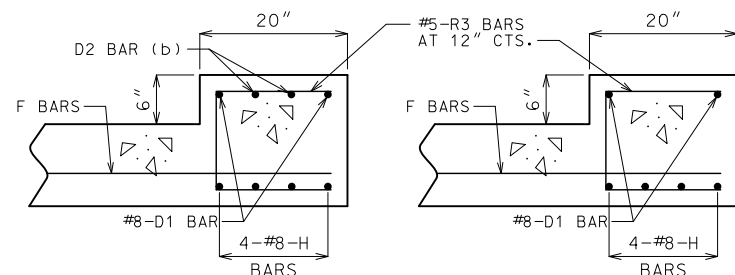
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SEPARATION GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL

**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN

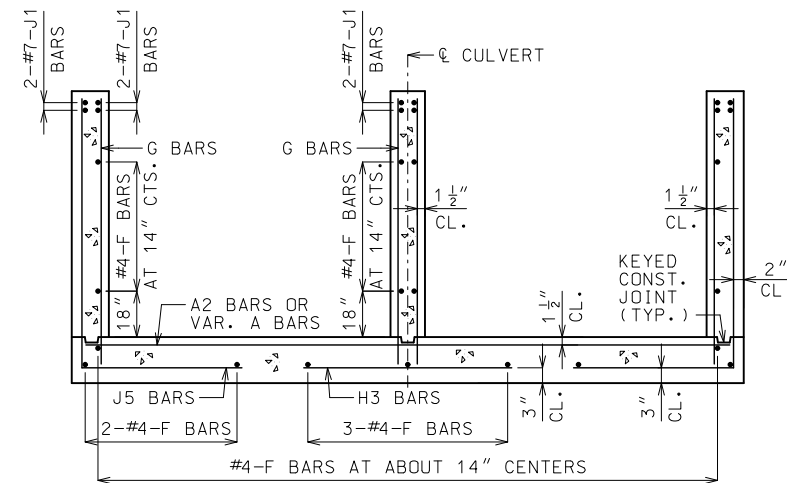
(b) #8 FOR CLEAR SPAN > 10'-0"  
#9 FOR CLEAR SPAN > 13'-0"  
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"



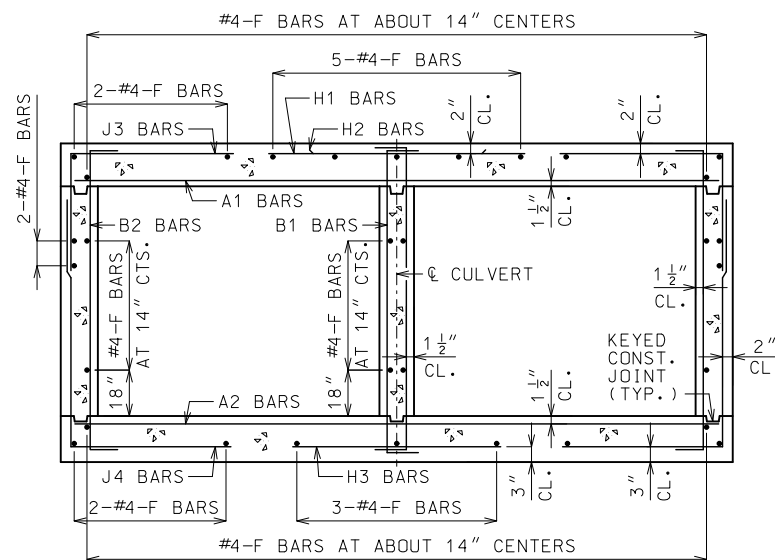
**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL

**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN

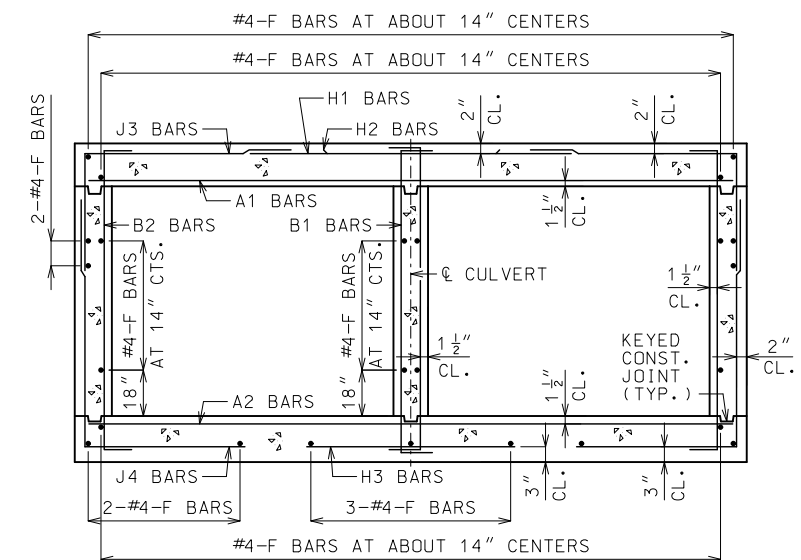
IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF  $\phi$  WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR  $\frac{1}{4}$  CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



**UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT**



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS OVER 2'-0"



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS 2'-0" OR LESS

**GENERAL NOTES:**

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO  $\phi$  CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

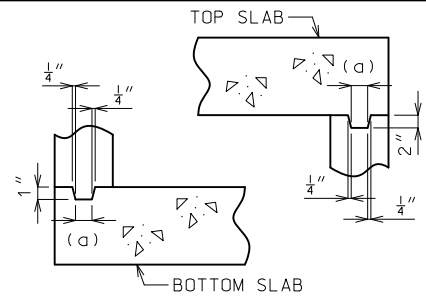
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE  $1\frac{1}{2}$ ".

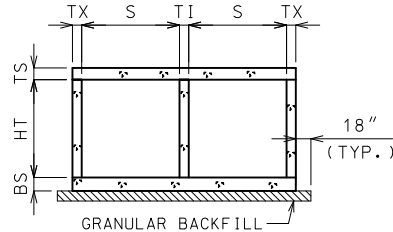
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE DOUBLE BOX CULVERT</b>	
	SKEW: RIGHT ADVANCE WINGS: STRAIGHT	
<b>SECTIONS</b>		
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.44H</b>	SHEET NO. 3 OF 3

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

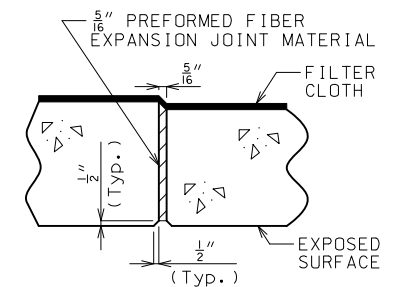




**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



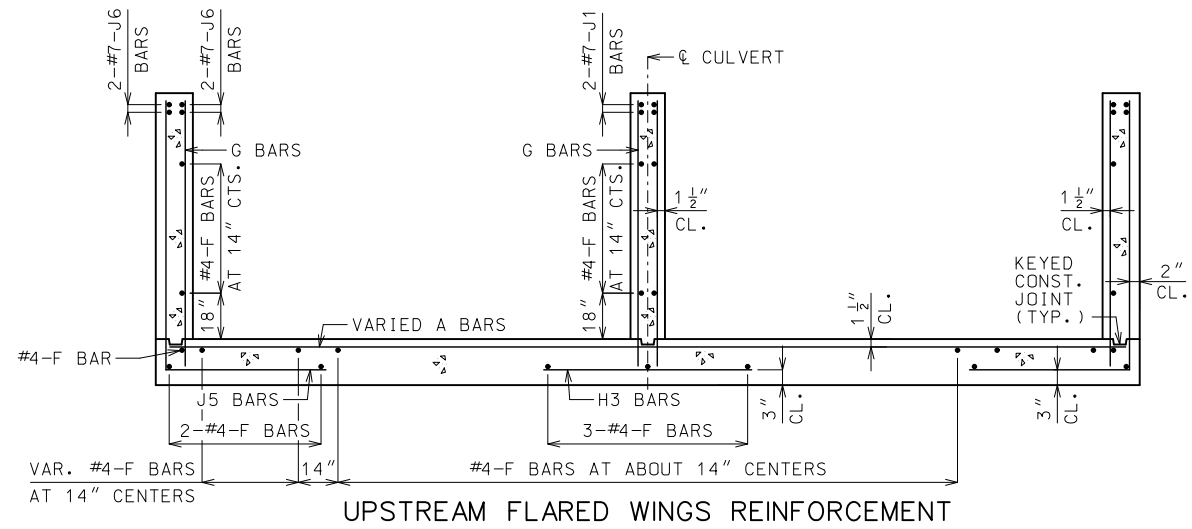
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



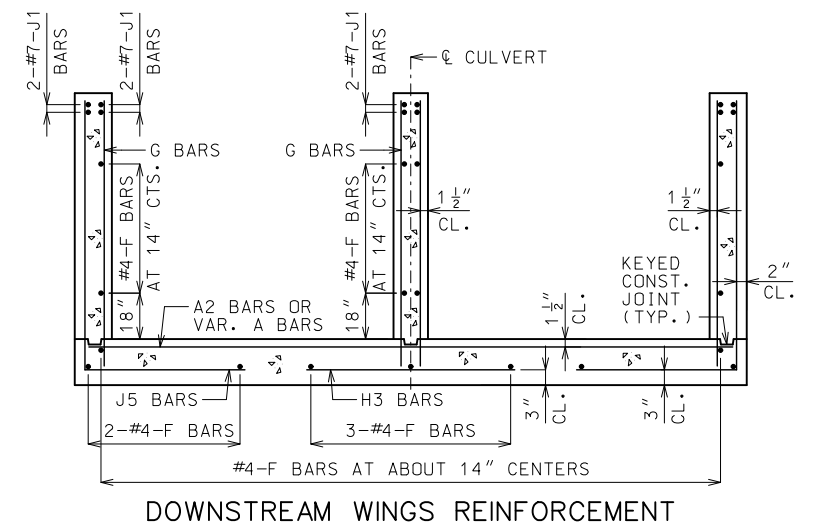
**TRANSVERSE JOINT THRU BARREL**

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

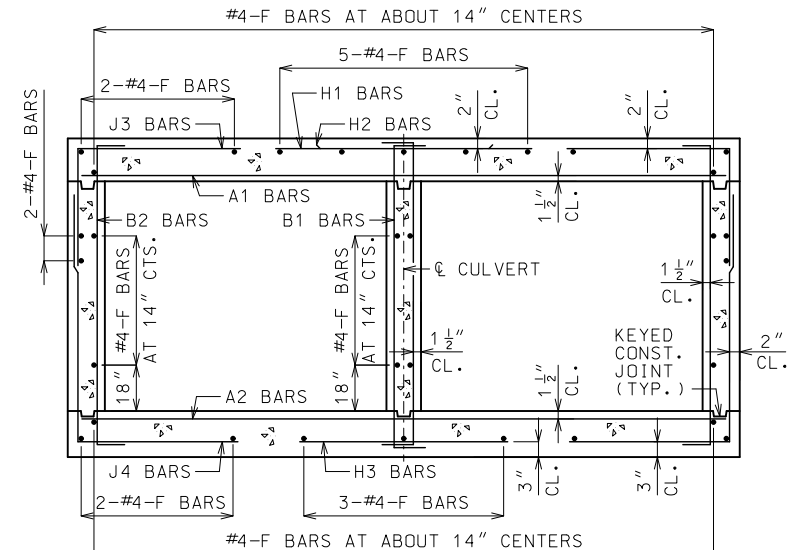
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SEPARATION GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



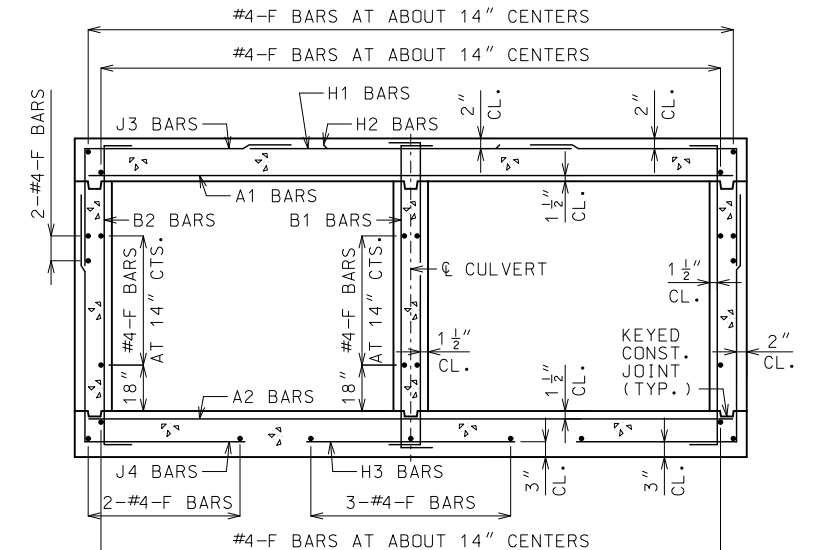
**UPSTREAM FLARED WINGS REINFORCEMENT**



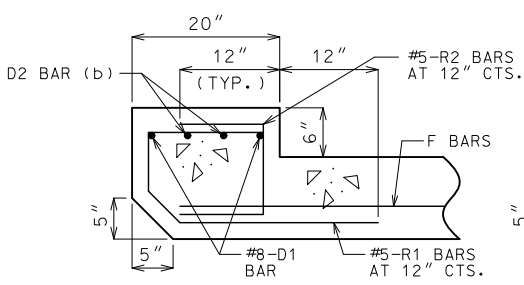
**DOWNSTREAM WINGS REINFORCEMENT**



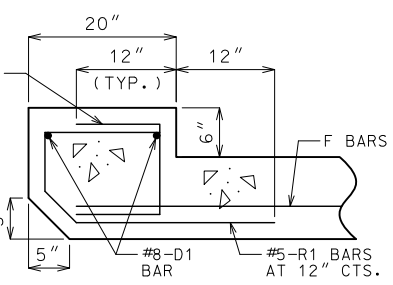
**BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"**



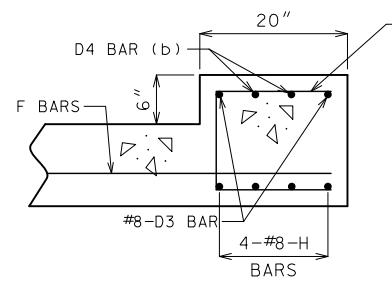
**BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS**



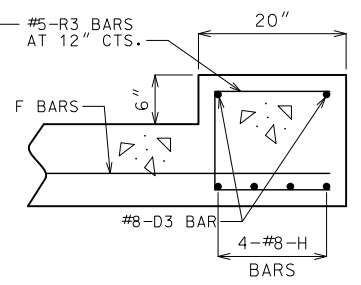
**UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL**



**UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN**



**DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL**



**DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN**

(b) #8 FOR CLEAR SPAN > 10'-0"  
#9 FOR CLEAR SPAN > 13'-0"  
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

IF D2 AND D4 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF  $\emptyset$  WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR  $\frac{1}{4}$  CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.


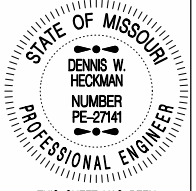
**GENERAL NOTES:**

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

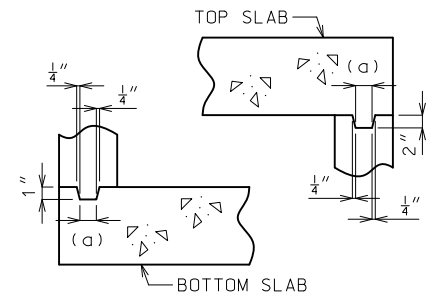
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO  $\emptyset$  CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

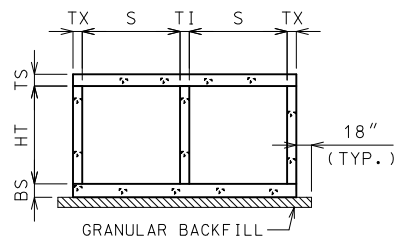
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)		
	<b>CONCRETE DOUBLE BOX CULVERT</b> SKEW: RIGHT ADVANCE WINGS: FLARED  <b>SECTIONS</b>	
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.45C</b>	SHEET NO. <b>3 OF 3</b>

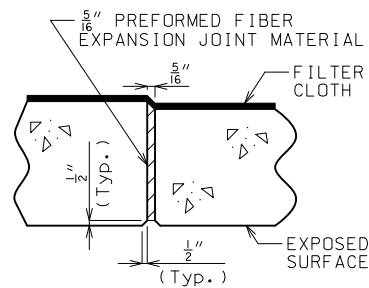
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



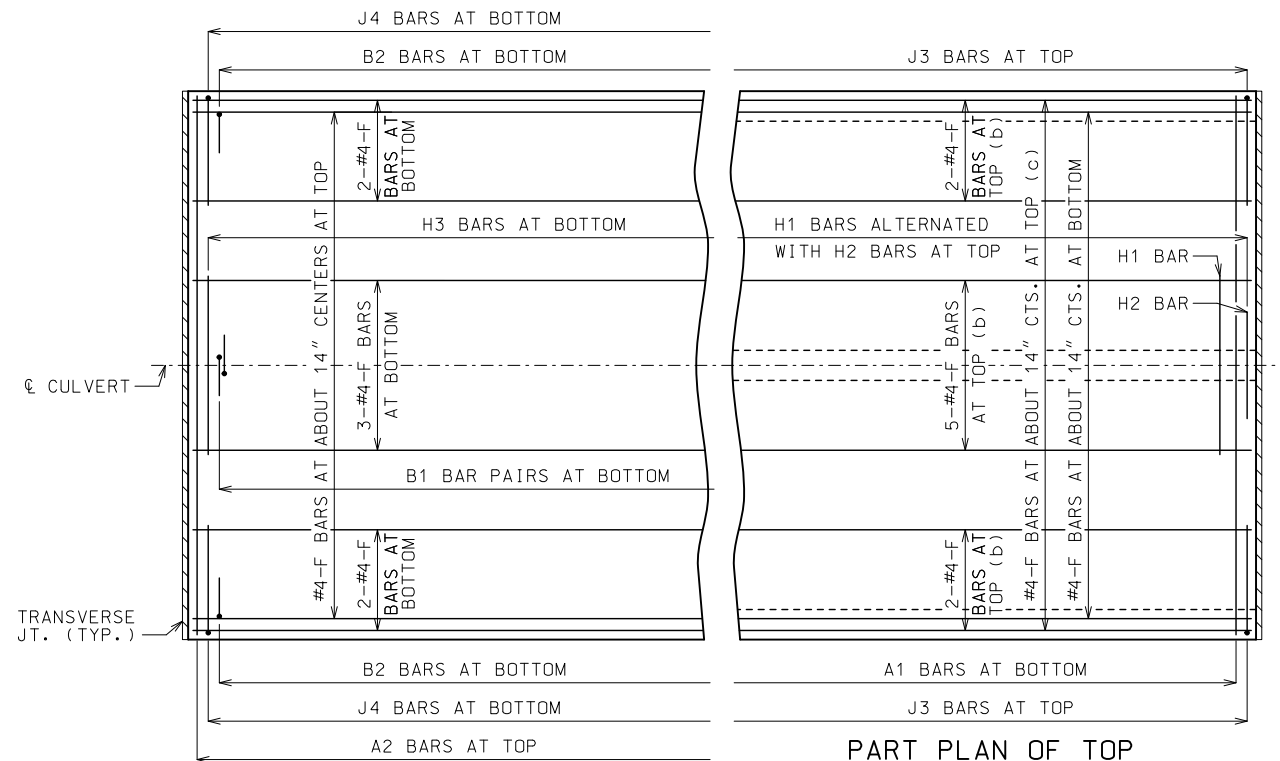
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



**TRANSVERSE JOINT THRU BARREL**

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

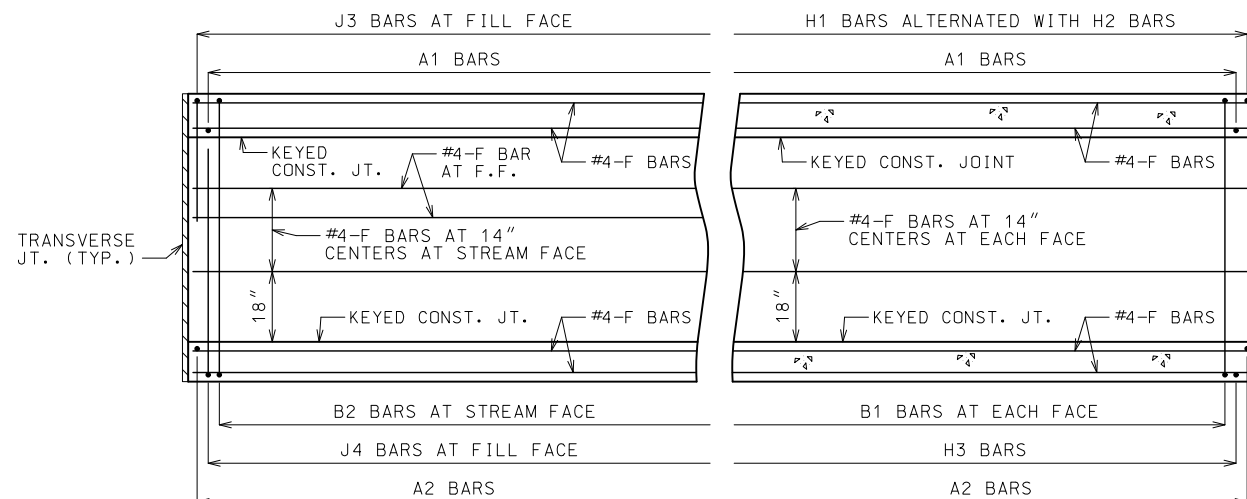
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SEPARATION GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



**PART PLAN OF BOTTOM SLAB REINFORCEMENT**

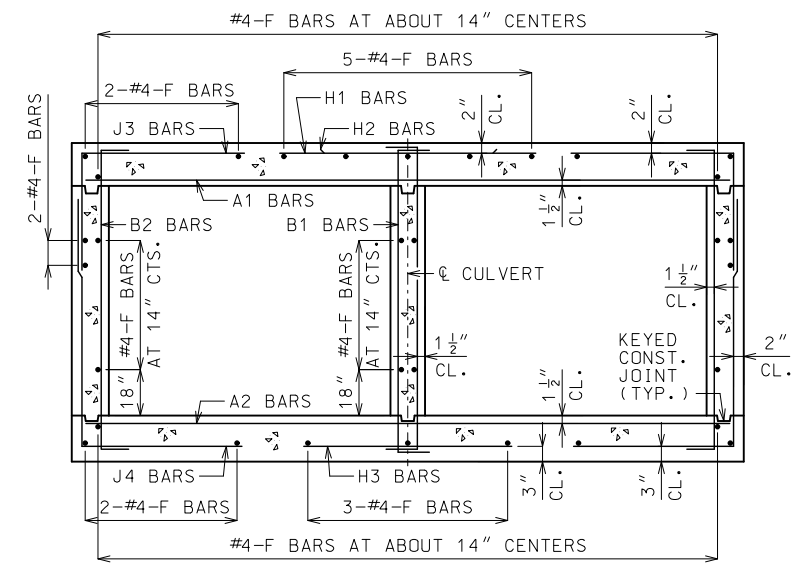
**PART PLAN OF TOP SLAB REINFORCEMENT**

(b) FOR DESIGN FILLS OVER 2'-0"  
(c) FOR DESIGN FILLS 2'-0" OR LESS



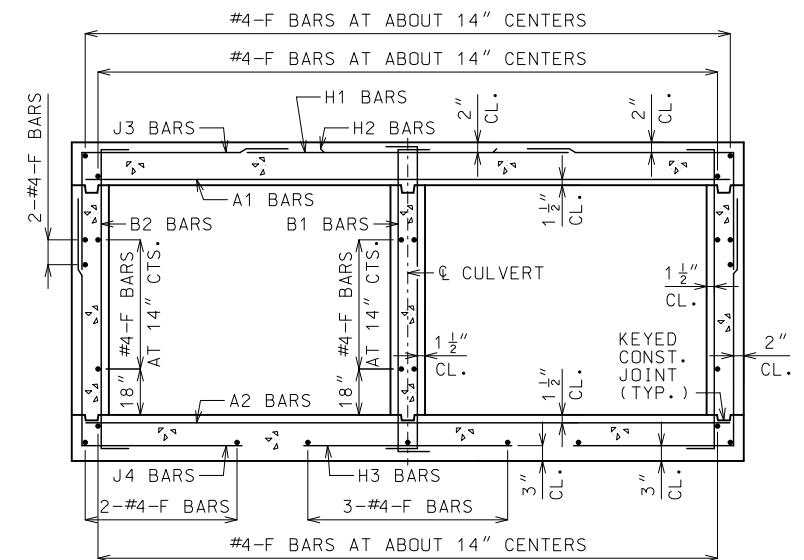
**PART ELEVATION OF EXTERIOR WALL REINFORCEMENT**

**PART SECTION NEAR INTERIOR WALL REINFORCEMENT**



**BARREL REINFORCEMENT**

FOR DESIGN FILLS OVER 2'-0"  
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.



**BARREL REINFORCEMENT**

FOR DESIGN FILLS 2'-0" OR LESS  
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.

**GENERAL NOTES**

**DESIGN SPECIFICATIONS:**  
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

**DESIGN LOADING:**  
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF  
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

**DESIGN UNIT STRESSES:**  
CLASS B-1 CONCRETE (BOX CULVERT)  $f'_c = 4,000$  PSI  
REINFORCING STEEL (GRADE 60)  $f_y = 60,000$  PSI

**MISCELLANEOUS:**  
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS, SEE 703.47.

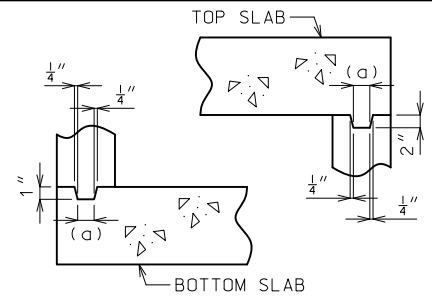
CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PART PLANS, PART ELEVATION AND PART SECTION.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

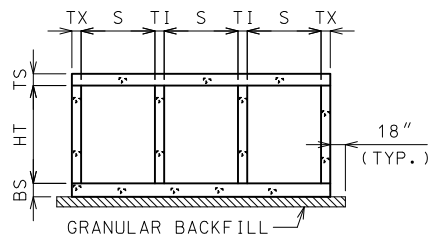
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

		<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
		105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>CONCRETE DOUBLE BOX CULVERT</b> CUT SECTION	
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020		<b>703.46</b>	
		SHEET NO. 1 OF 1	

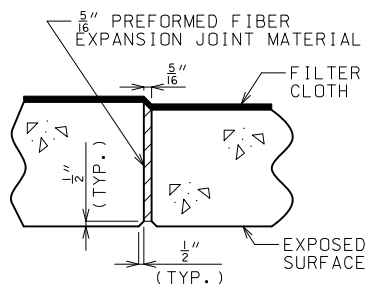
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS

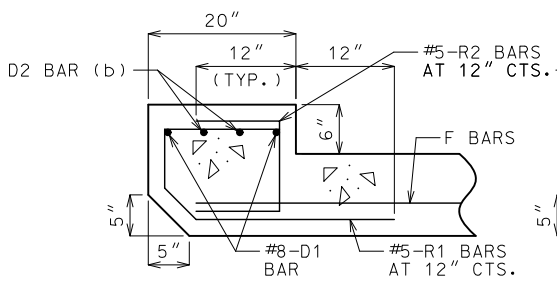


**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**

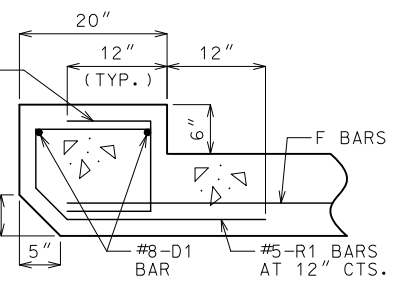


**TRANSVERSE JOINT THRU BARREL**  
PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

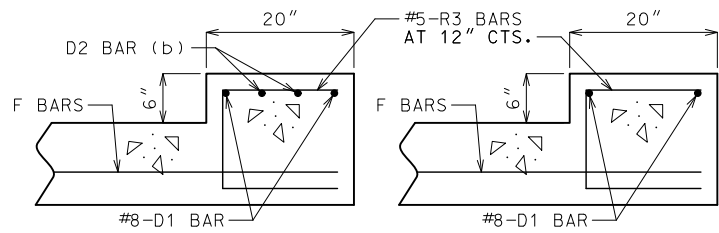
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**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



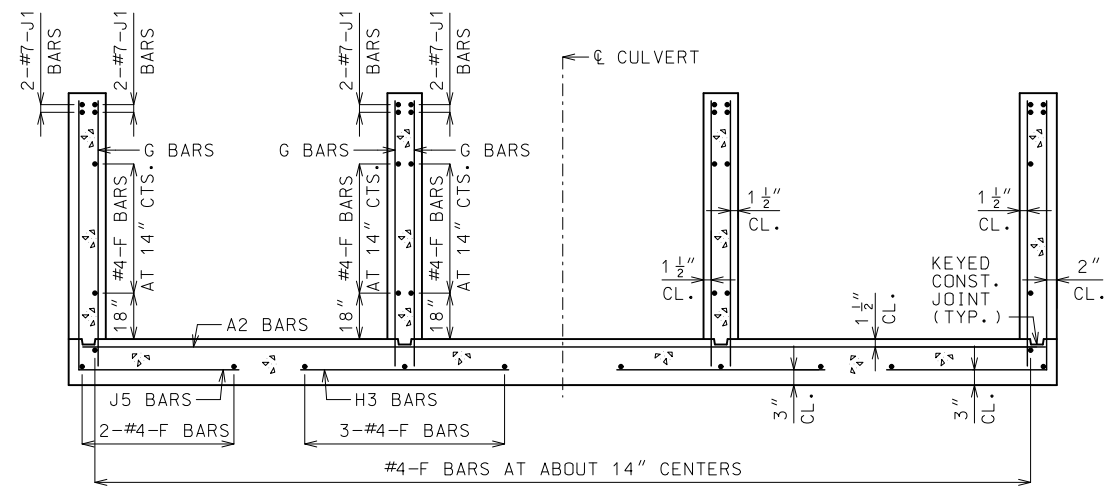
**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN



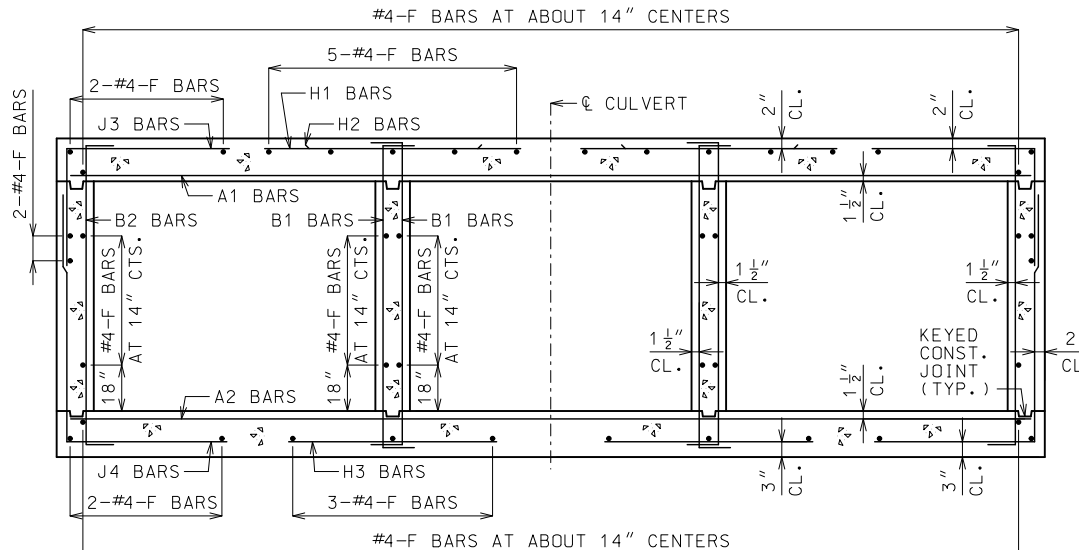
**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL

**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN

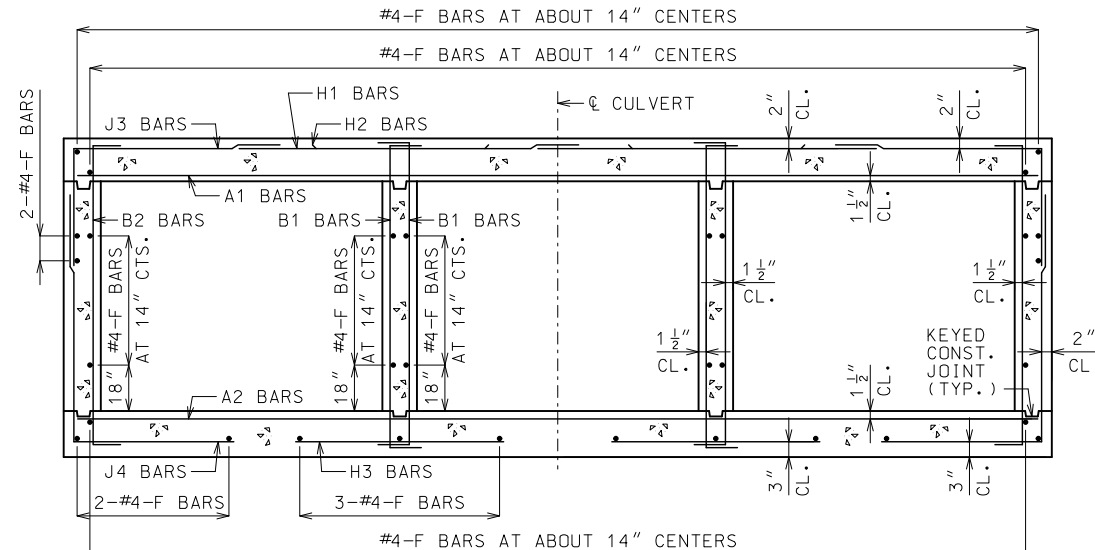
(b) NOT REQUIRED FOR CLEAR SPANS  $\leq 10'-0"$  IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF  $\phi$  WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR  $\frac{1}{4}$  CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



**UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT**



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS OVER 2'-0"

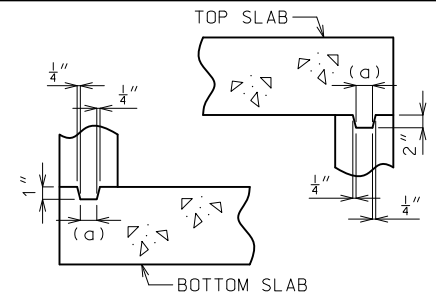


**BARREL REINFORCEMENT**  
FOR DESIGN FILLS 2'-0" OR LESS

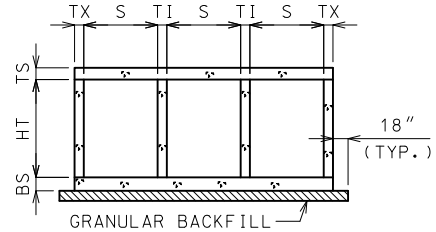
**GENERAL NOTES:**  
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.  
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO  $\phi$  CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.  
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.  
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE  $1\frac{1}{2}"$ .

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE TRIPLE BOX CULVERT</b> SKEW: SQUARED WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.80H</b> SHEET NO. 3 OF 3

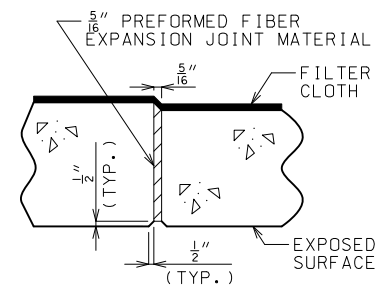
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS

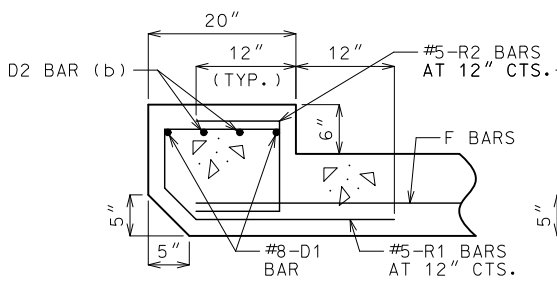


**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**

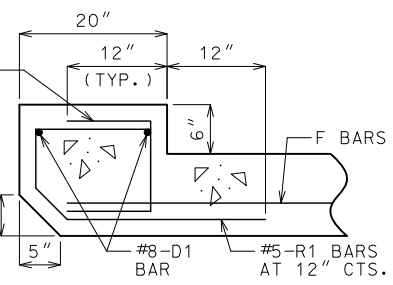


**TRANSVERSE JOINT THRU BARREL**  
PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

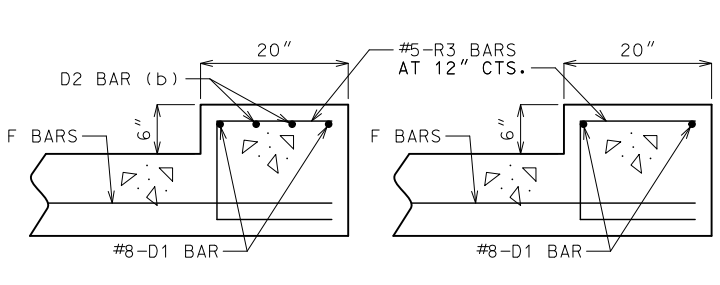
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SEPARATION GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



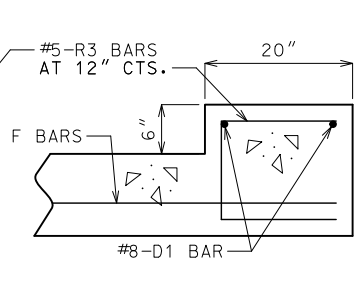
**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN



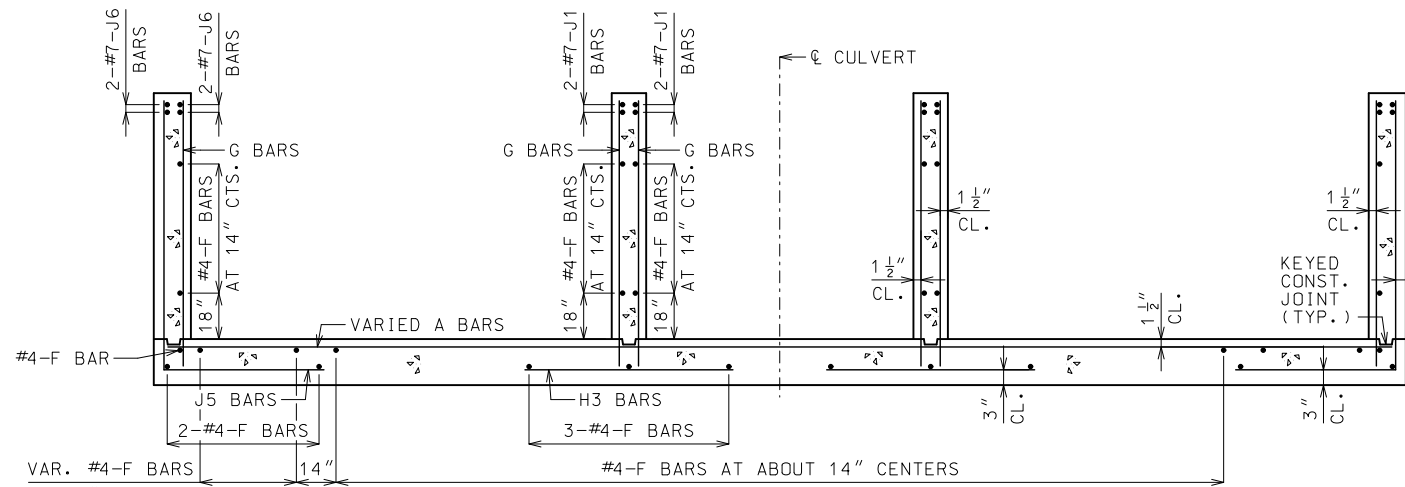
**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



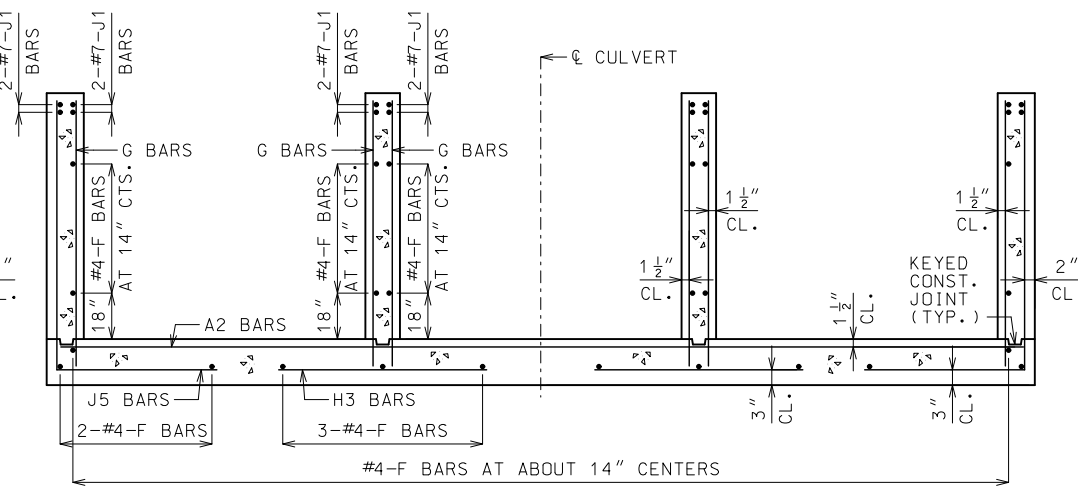
**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN

(b) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"  
#8 FOR CLEAR SPAN > 10'-0"  
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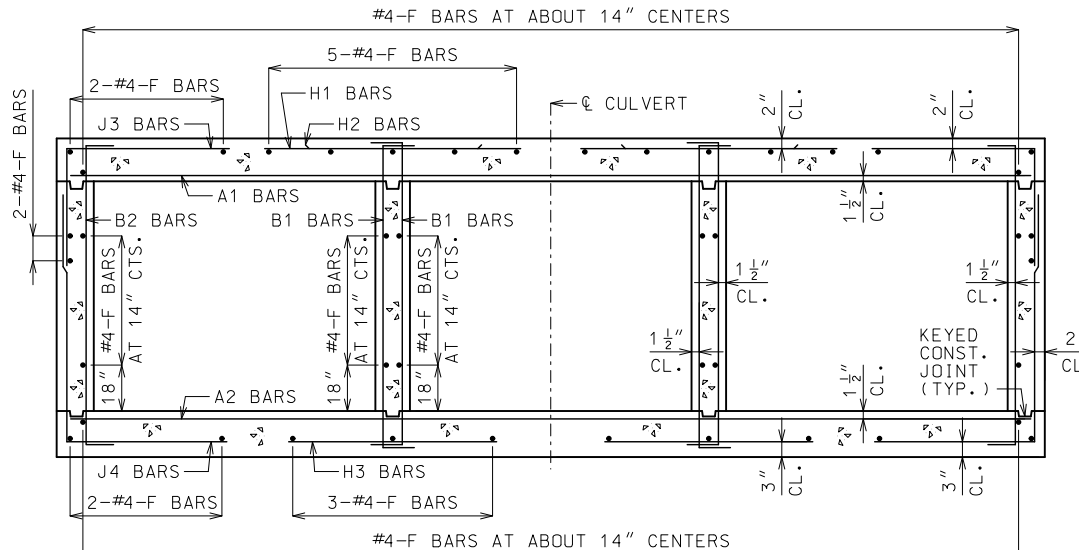
IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF  $\phi$  WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



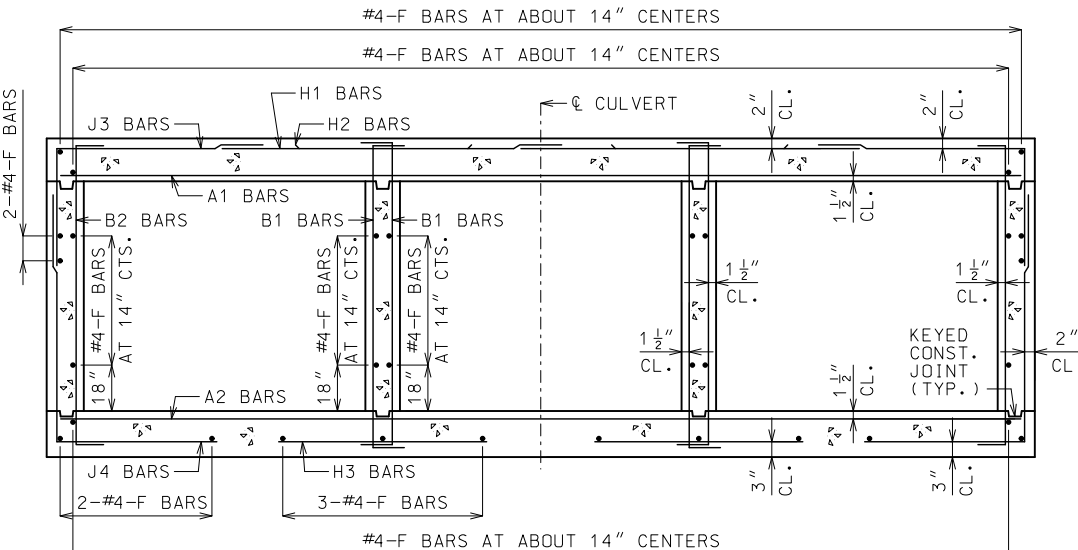
**UPSTREAM FLARED WINGS REINFORCEMENT**



**DOWNSTREAM WINGS REINFORCEMENT**



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS OVER 2'-0"

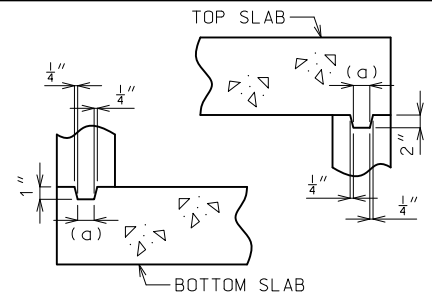


**BARREL REINFORCEMENT**  
FOR DESIGN FILLS 2'-0" OR LESS

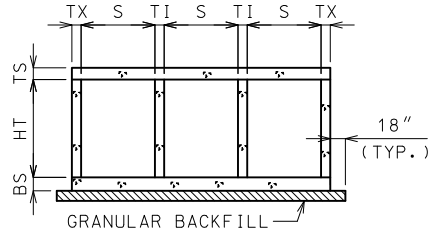
**GENERAL NOTES:**  
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	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE TRIPLE BOX CULVERT</b> SKEW: SQUARED WINGS: FLARED SECTIONS	
	DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.81H</b> SHEET NO. 3 OF 3

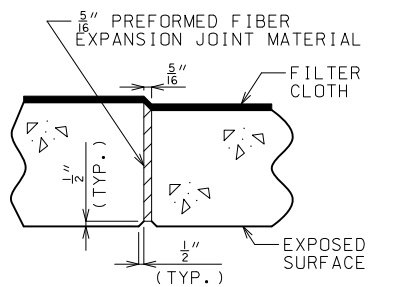
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



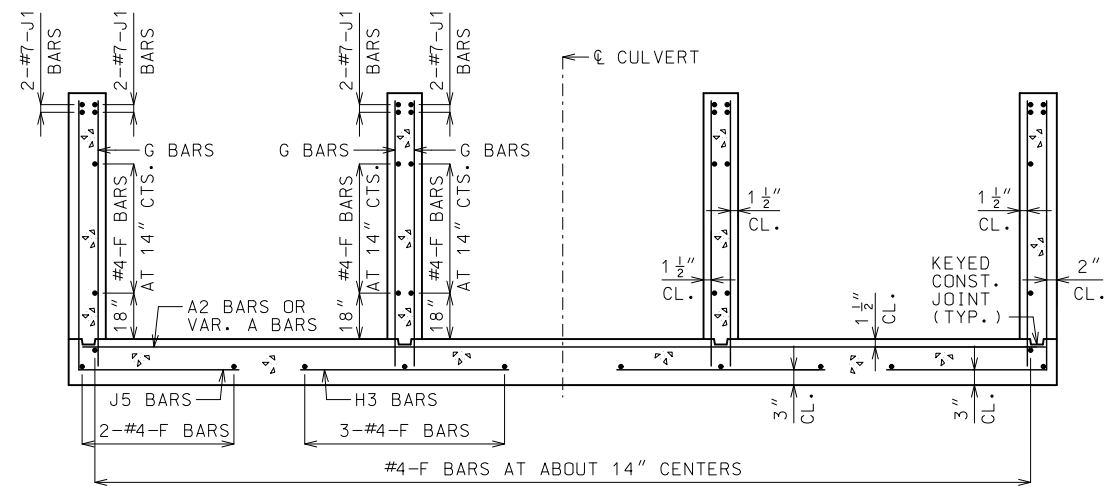
**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



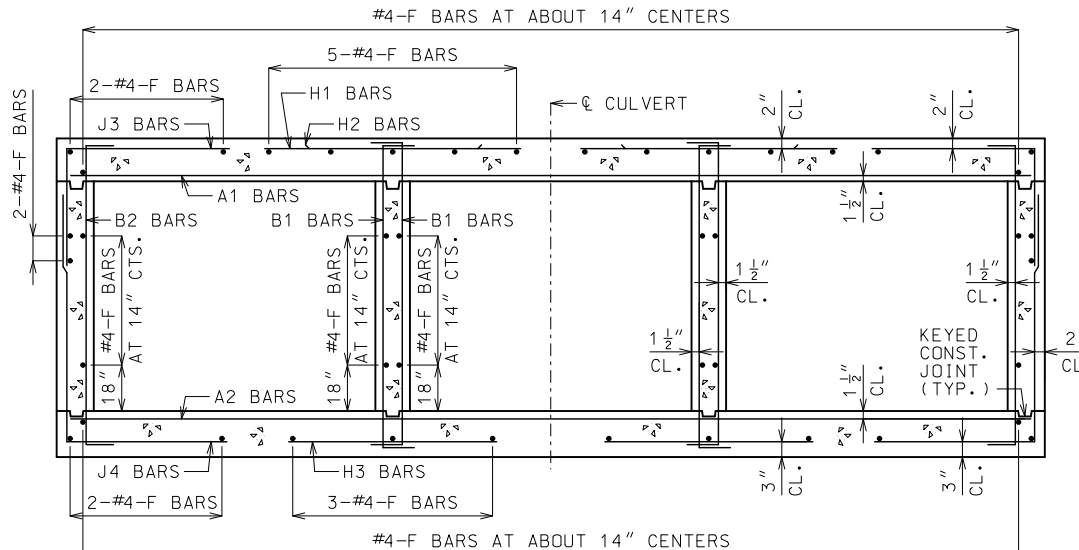
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



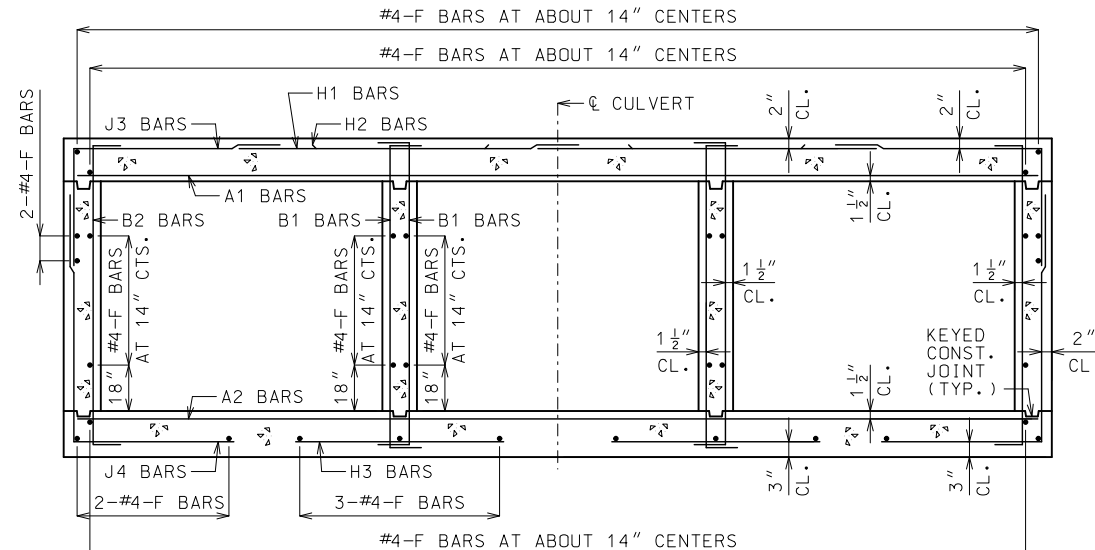
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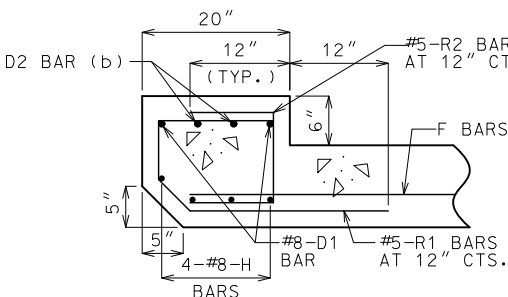
**UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT**



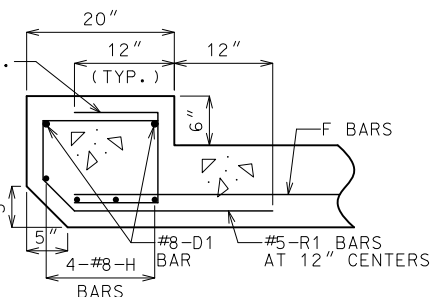
**BARREL REINFORCEMENT**  
FOR DESIGN FILLS OVER 2'-0"



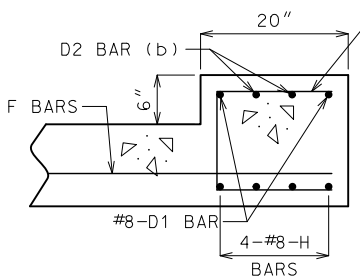
**BARREL REINFORCEMENT**  
FOR DESIGN FILLS 2'-0" OR LESS



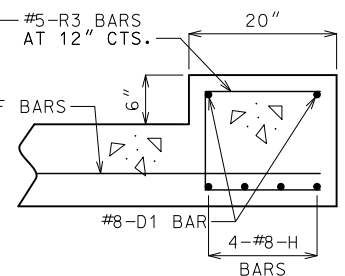
**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN



**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



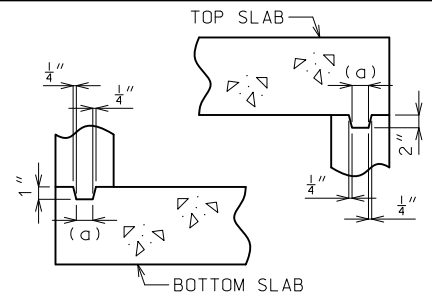
**DOWNSTREAM HEADWALL REINFORCEMENT**  
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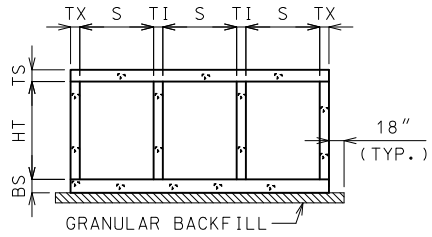
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	<b>CONCRETE TRIPLE BOX CULVERT</b> SKEW: LEFT ADVANCE WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.82H</b> SHEET NO. 3 OF 3

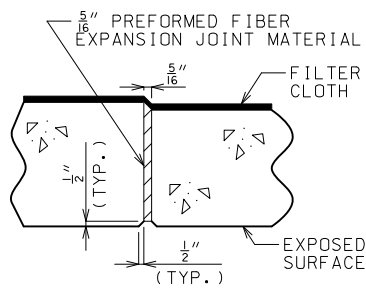
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



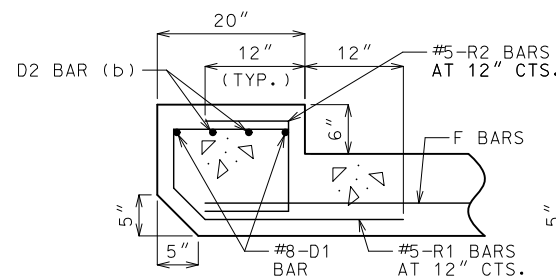
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



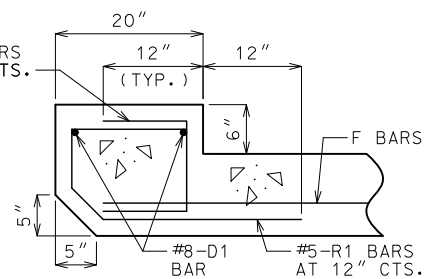
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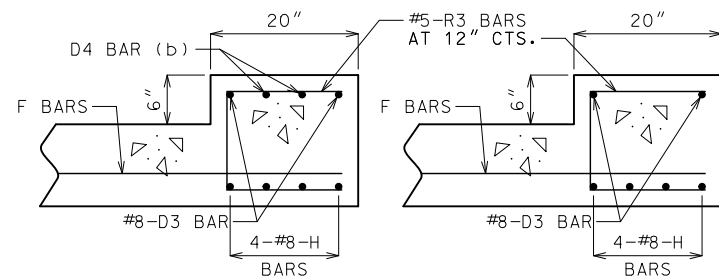
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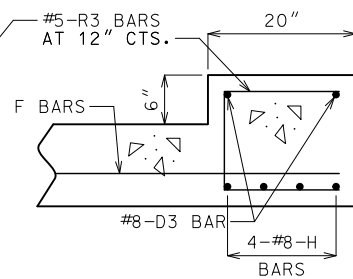
**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN



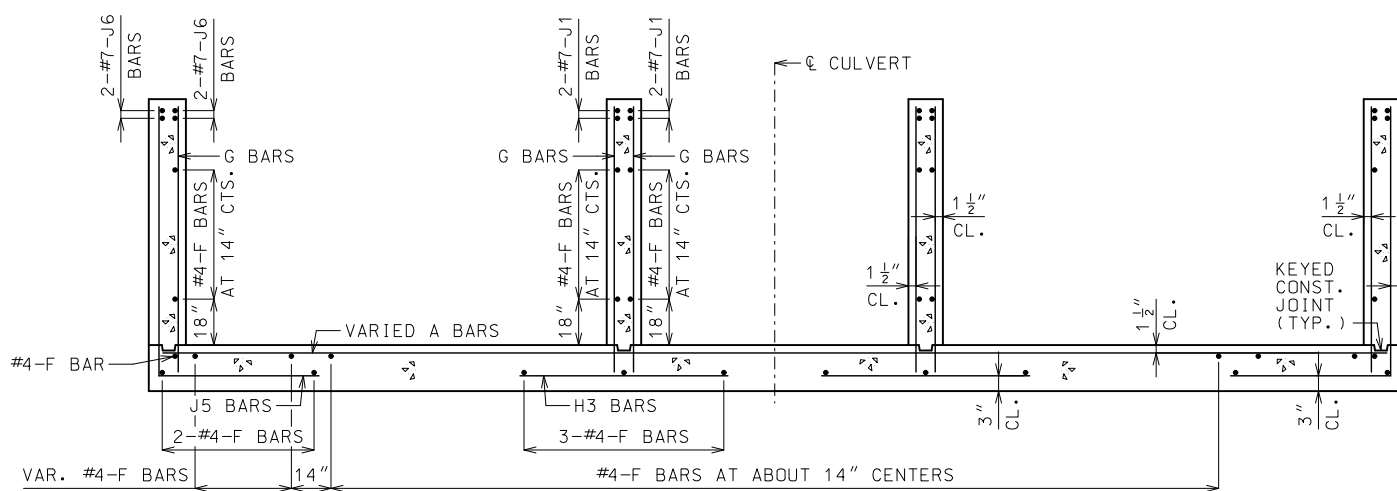
**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL



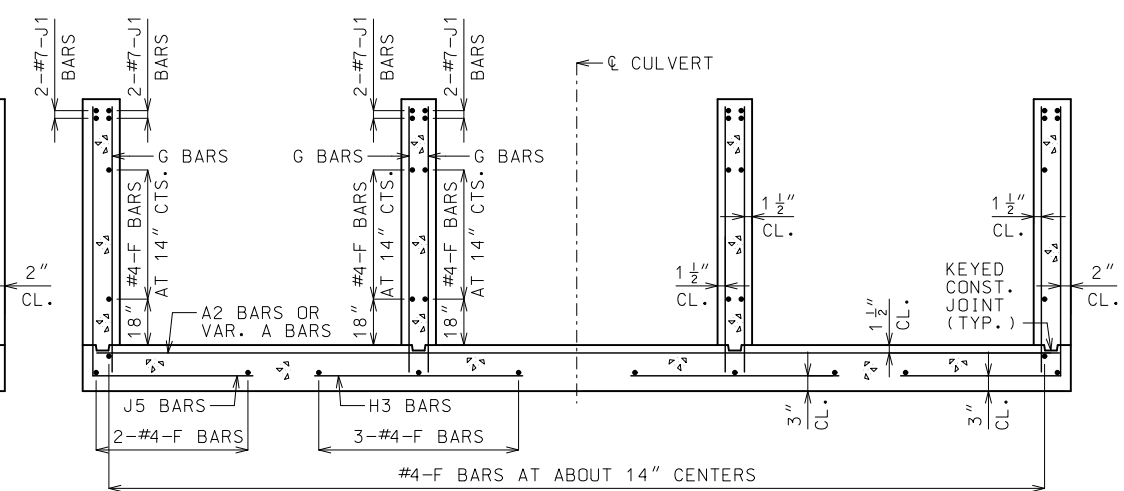
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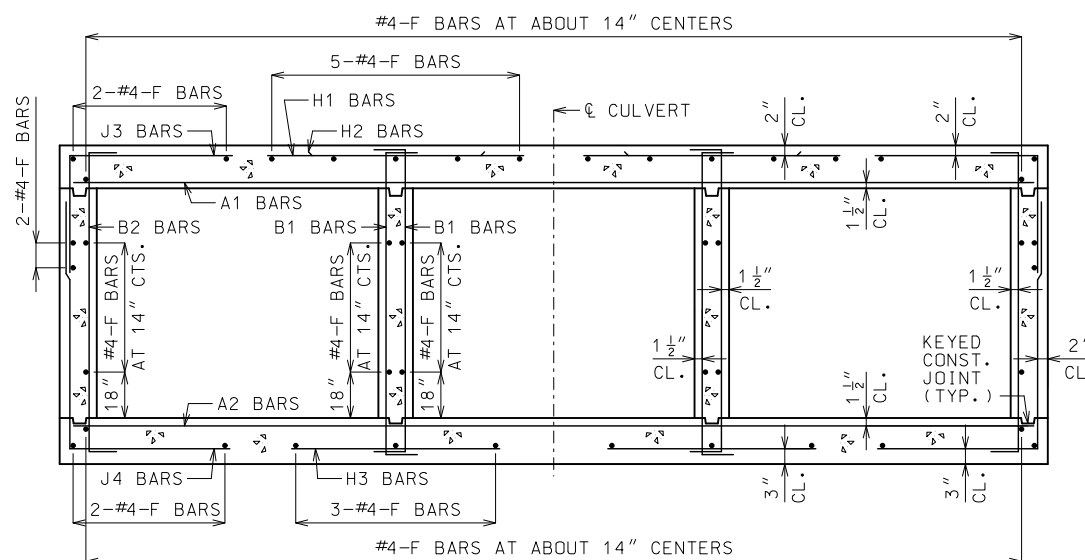
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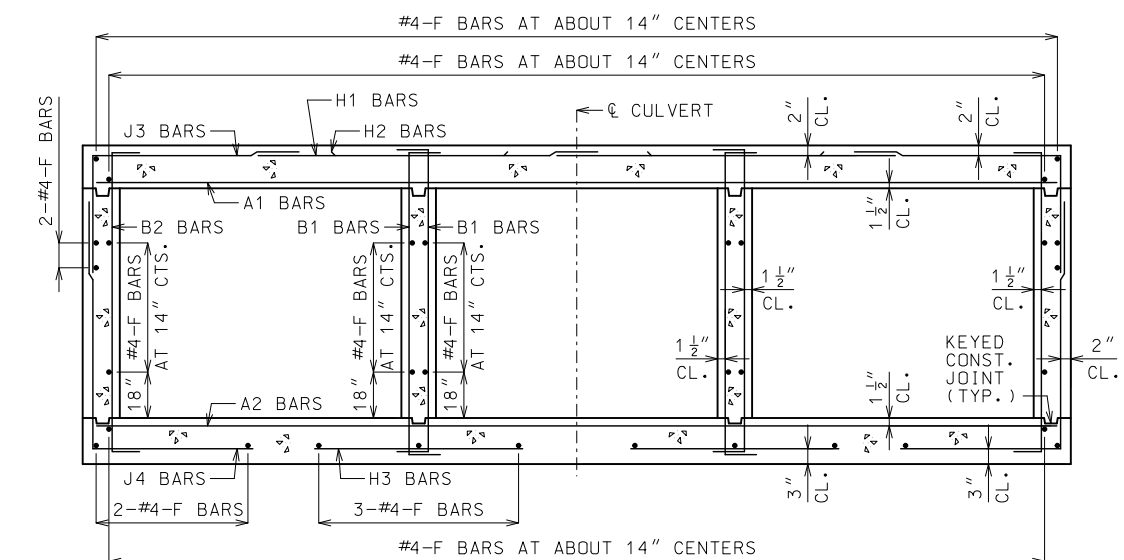
**UPSTREAM FLARED WINGS REINFORCEMENT**



**DOWNSTREAM WINGS REINFORCEMENT**



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS OVER 2'-0"



**BARREL REINFORCEMENT**  
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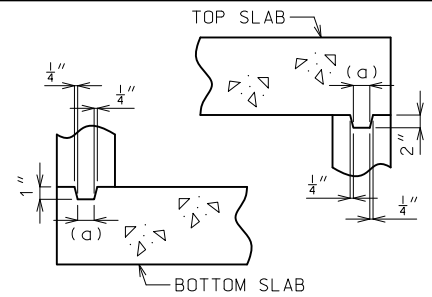
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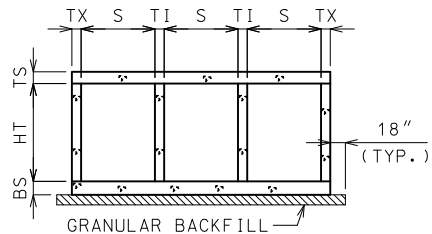
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	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE TRIPLE BOX CULVERT</b>	
	SKEW: LEFT ADVANCE WINGS: FLARED	
<b>SECTIONS</b>		
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.83H</b>	SHEET NO. 3 OF 3

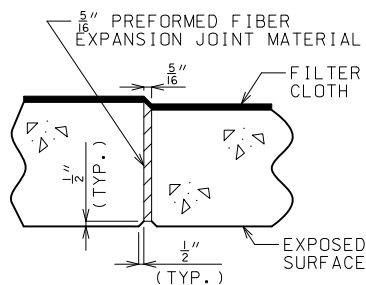
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



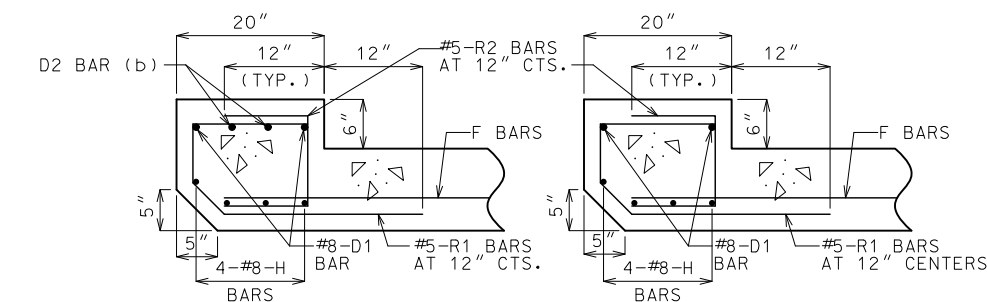
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



**TRANSVERSE JOINT THRU BARREL**

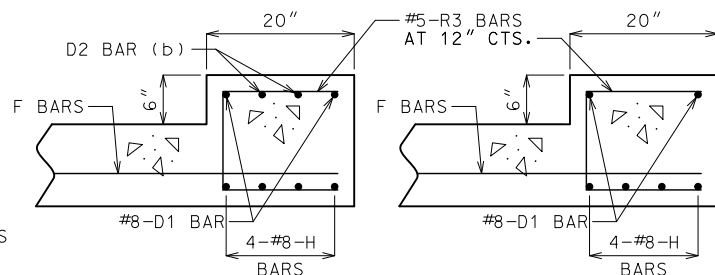
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**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL

**UPSTREAM HEADWALL REINFORCEMENT**  
NEAR MIDSPAN

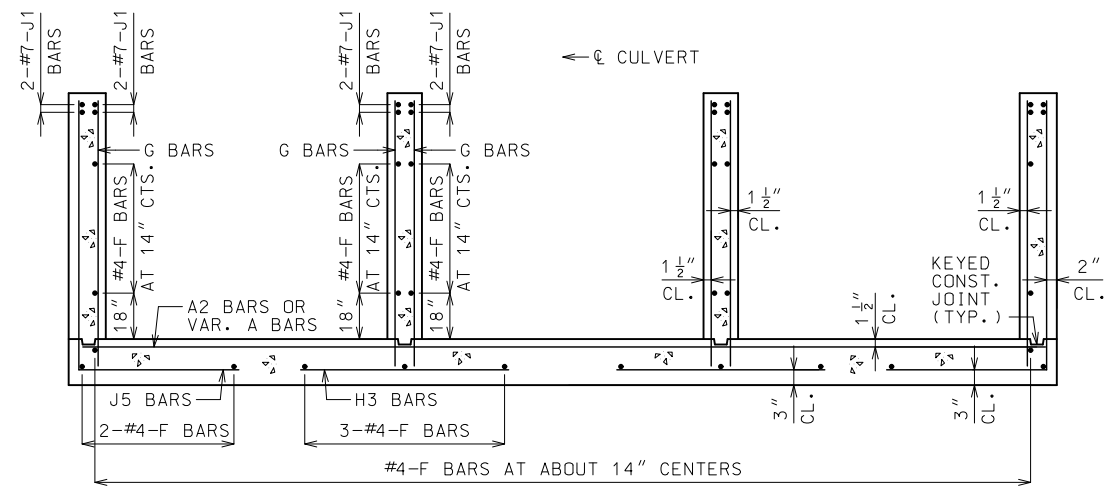


**DOWNSTREAM HEADWALL REINFORCEMENT**  
NEAR INTERIOR WALL

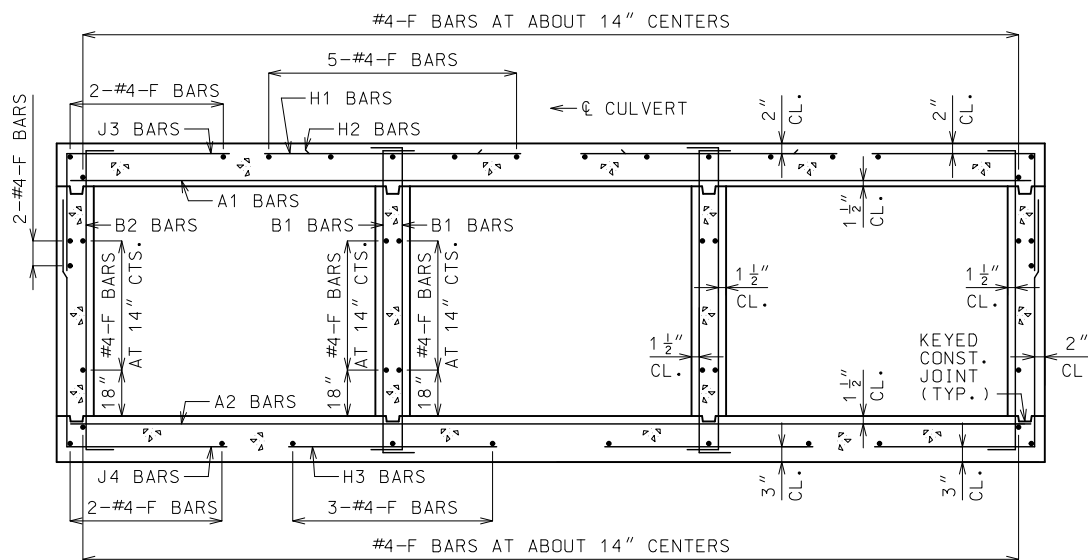
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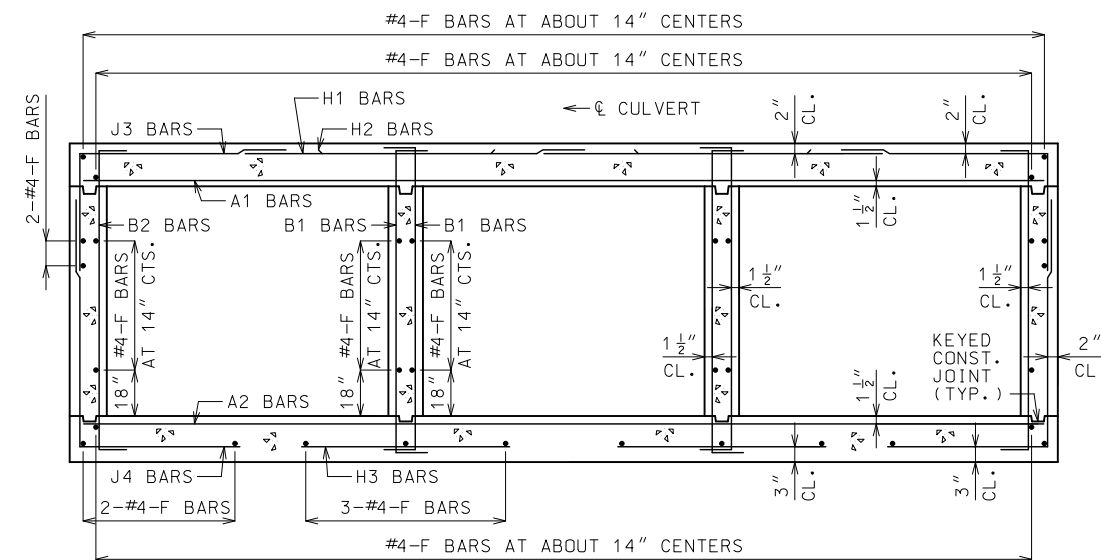
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**UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT**



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS OVER 2'-0"



**BARREL REINFORCEMENT**  
FOR DESIGN FILLS 2'-0" OR LESS

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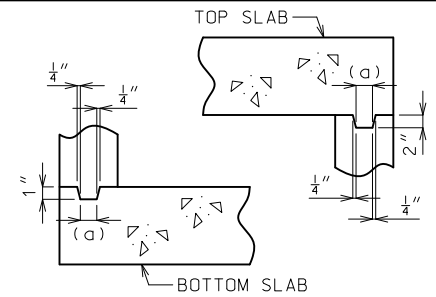
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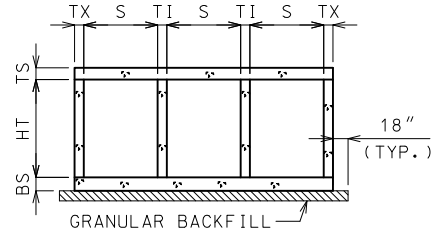
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	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE TRIPLE BOX CULVERT</b>	
	SKEW: RIGHT ADVANCE WINGS: STRAIGHT	
<b>SECTIONS</b>		
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.84H</b>	SHEET NO. 3 OF 3

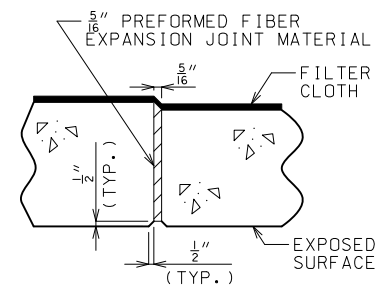
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**KEYED CONSTRUCTION JOINT**  
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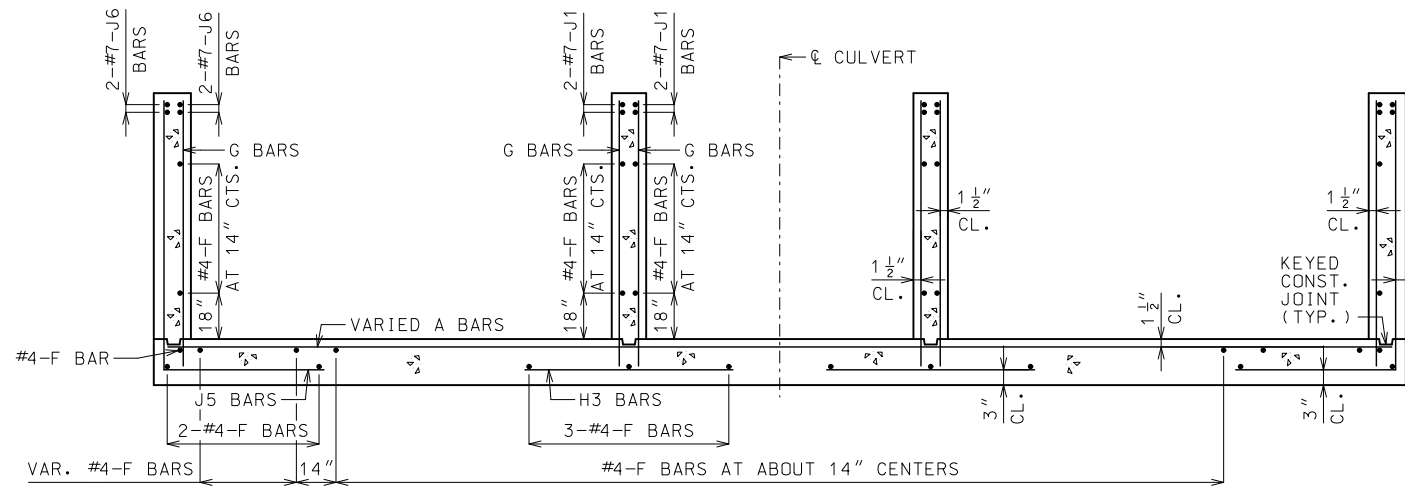
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



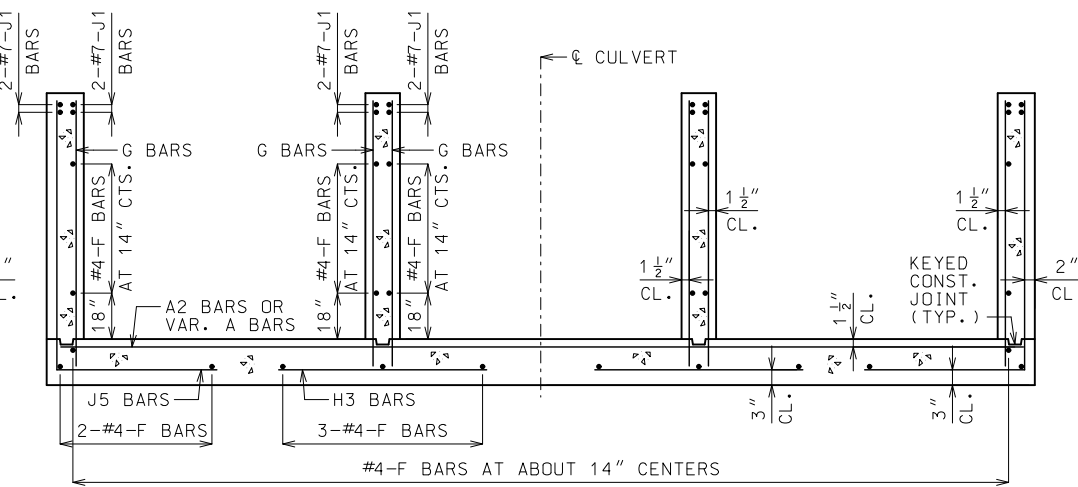
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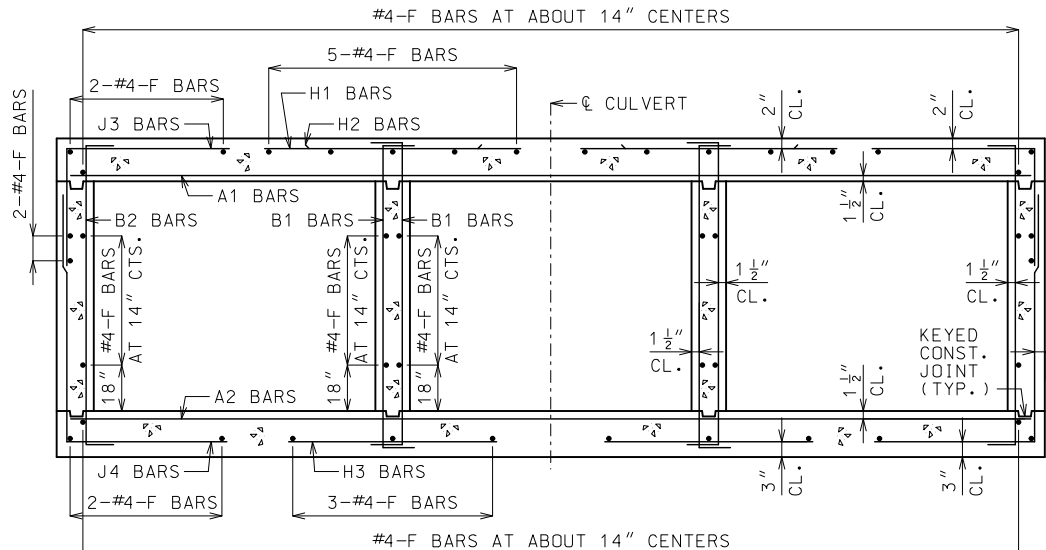
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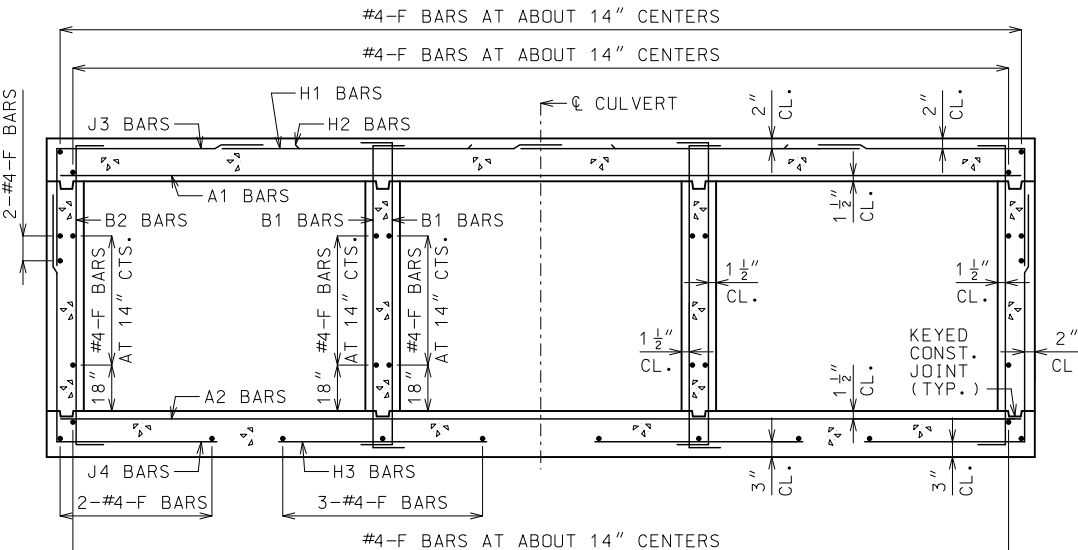
**UPSTREAM FLARED WINGS REINFORCEMENT**



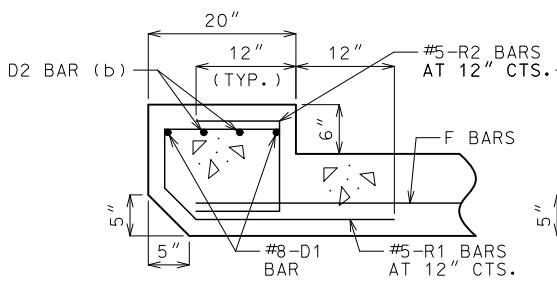
**DOWNSTREAM WINGS REINFORCEMENT**



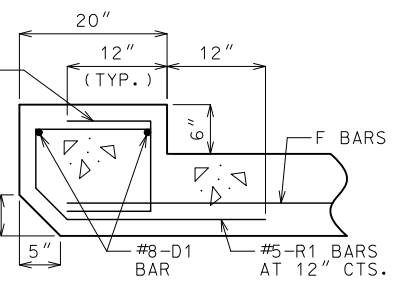
**BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"**



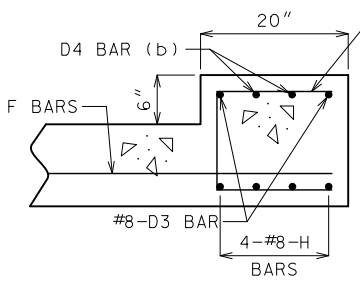
**BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS**



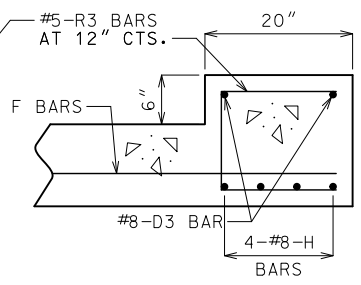
**UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL**



**UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN**



**DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL**



**DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN**

(b) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"  
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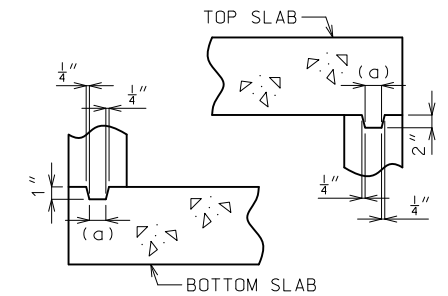
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

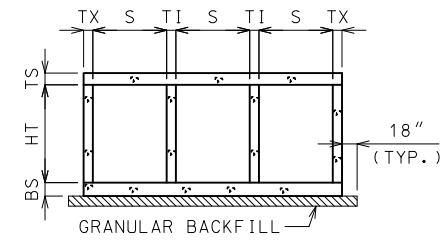
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE TRIPLE BOX CULVERT</b>	
	SKEW: RIGHT ADVANCE WINGS: FLARED	
<b>SECTIONS</b>		
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>703.85C</b>	SHEET NO. <b>3 OF 3</b>

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

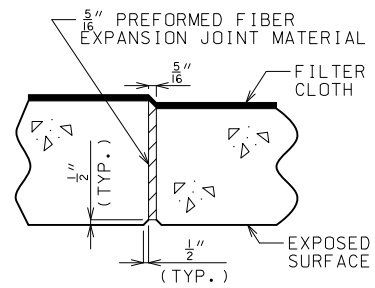




**KEYED CONSTRUCTION JOINT**  
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



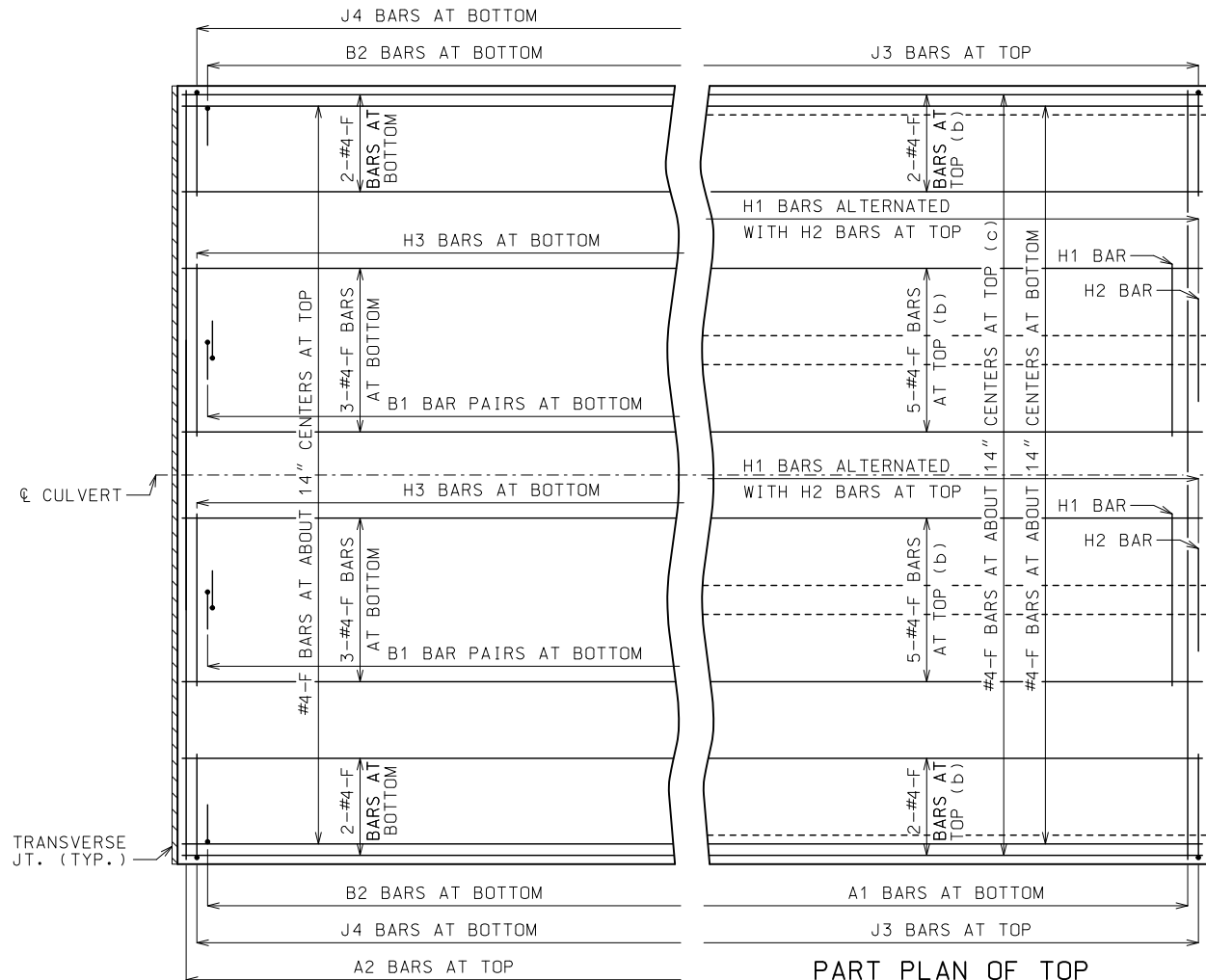
**GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS**



**TRANSVERSE JOINT THRU BARREL**

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

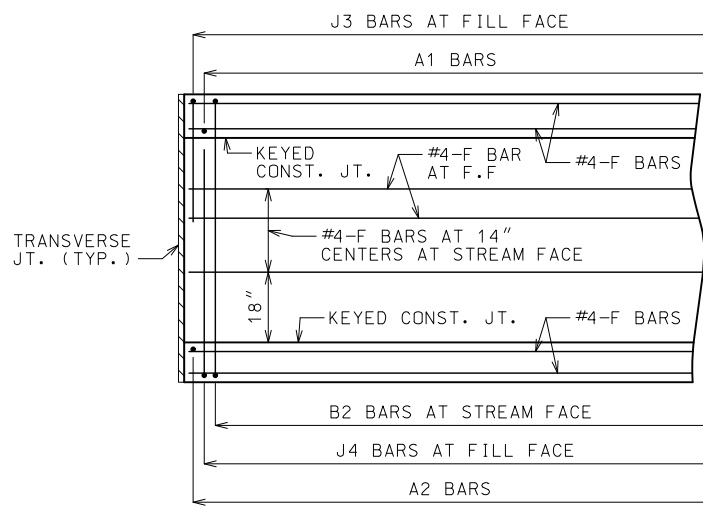
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SEPARATION GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



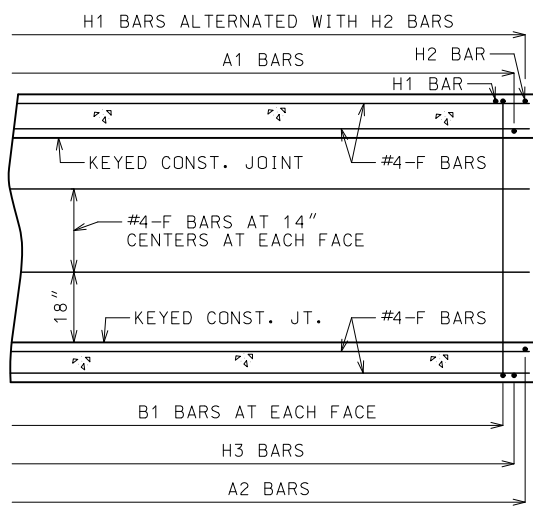
**PART PLAN OF BOTTOM SLAB REINFORCEMENT**

**PART PLAN OF TOP SLAB REINFORCEMENT**

(b) FOR DESIGN FILLS OVER 2'-0"  
(c) FOR DESIGN FILLS 2'-0" OR LESS



**PART ELEVATION OF EXTERIOR WALL REINFORCEMENT**



**PART SECTION NEAR INTERIOR WALL REINFORCEMENT**

**GENERAL NOTES**

**DESIGN SPECIFICATIONS:**  
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

**DESIGN LOADING:**  
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF  
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

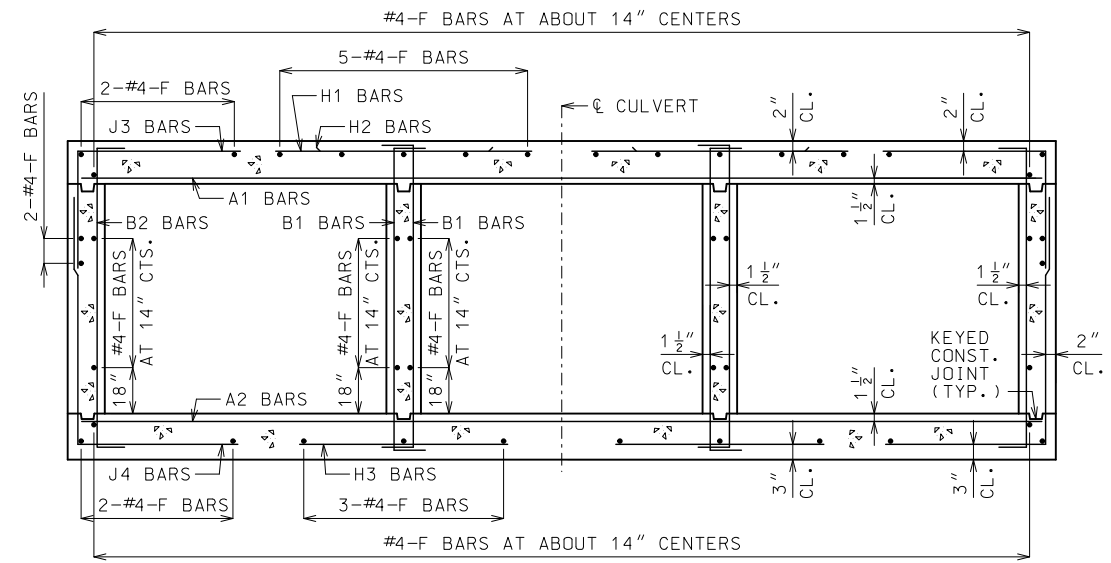
**DESIGN UNIT STRESSES:**  
CLASS B-1 CONCRETE (BOX CULVERT)  $f'_c = 4,000$  PSI  
REINFORCING STEEL (GRADE 60)  $f_y = 60,000$  PSI

**MISCELLANEOUS:**  
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS, SEE 703.87.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PART PLANS, PART ELEVATION AND PART SECTION.

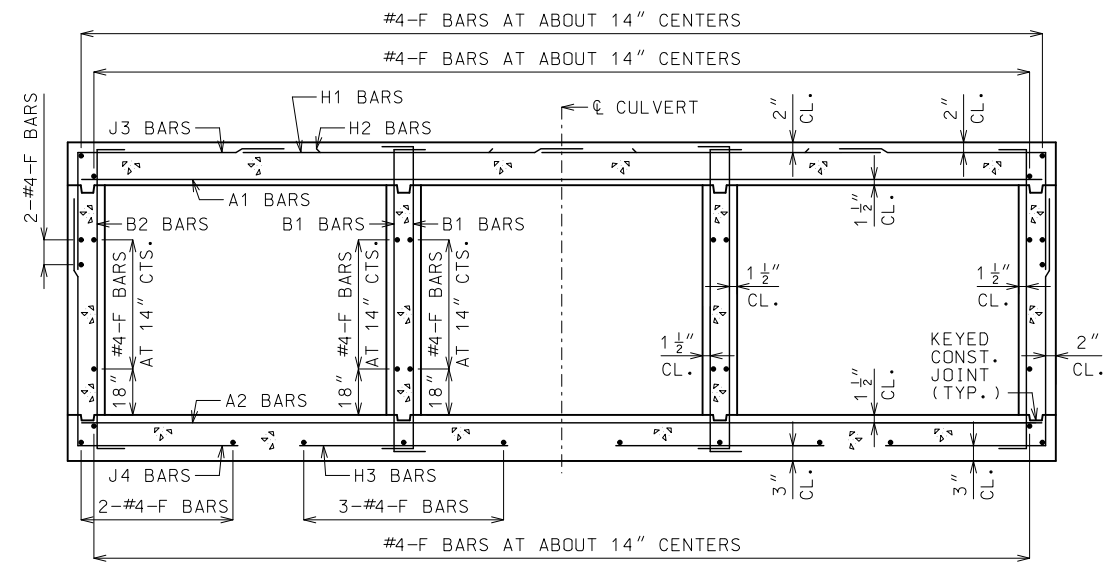
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".



**BARREL REINFORCEMENT**

FOR DESIGN FILLS OVER 2'-0"  
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.



**BARREL REINFORCEMENT**

FOR DESIGN FILLS 2'-0" OR LESS  
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
DENNIS W. HECKMAN  
NUMBER PE-27141  
PROFESSIONAL ENGINEER

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**CONCRETE TRIPLE BOX CULVERT**

CUT SECTION

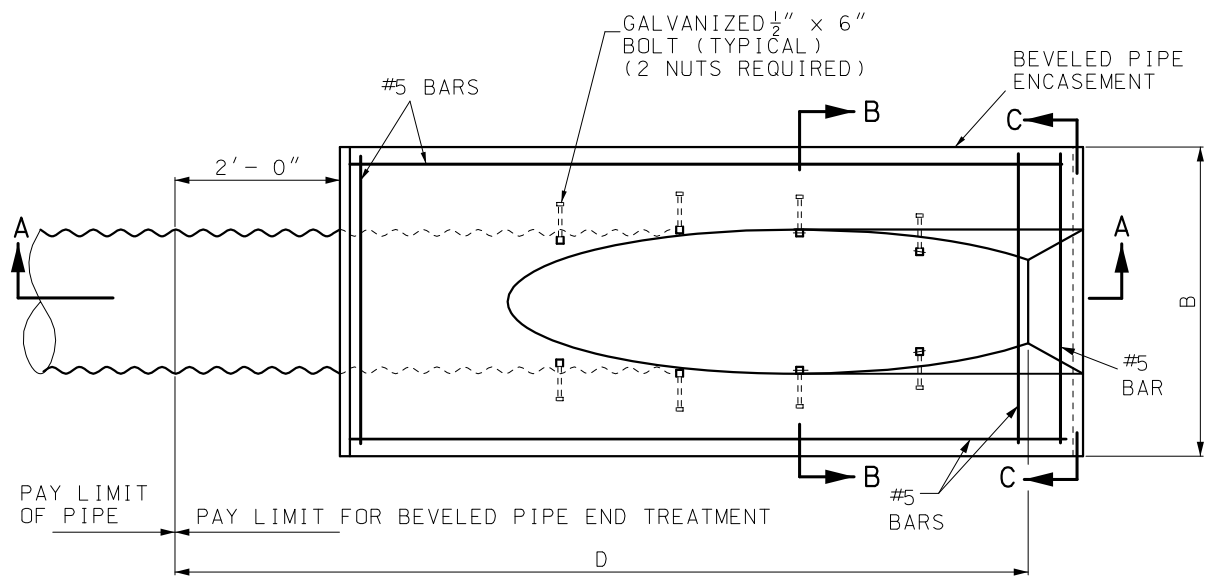
DATE EFFECTIVE: 01/01/2021  
DATE PREPARED: 10/14/2020

**703.86**

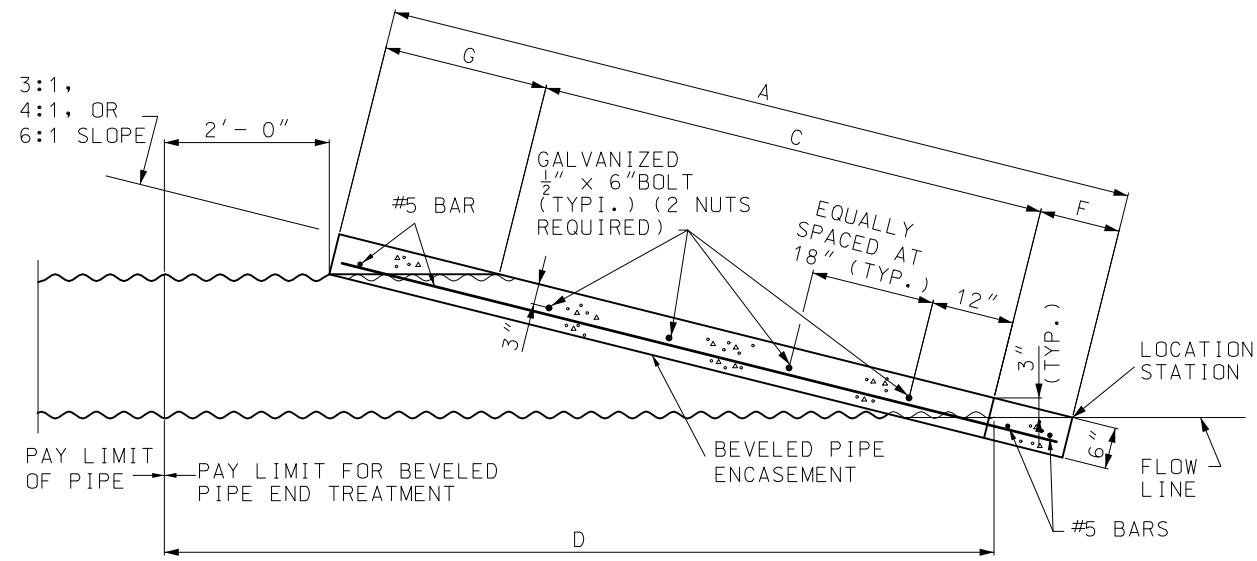
SHEET NO.  
1 OF 1

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

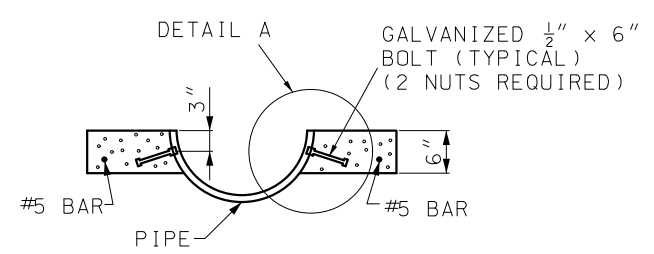
BEVELED PIPE ENCASEMENT DETAILS								
PIPE DIAMETER	SLOPE	A	B	C	D	E	F	G
15"	3:1	5'-5 1/2"	3'-3"	3'-2"	6'-7"	1	9 1/2"	18"
	4:1	7'-2"		4'-1 1/2"	8'-1 1/4"	2	12 1/2"	24"
	6:1	10'-7 1/4"		6'-1"	11'-1 1/2"	3	18 1/4"	36"
18"	3:1	6'-3"	3'-6"	3'-11 1/2"	7'-4"	2	9 1/2"	18"
	4:1	8'-2 1/4"		5'-1 3/4"	9'-1"	3	12 1/2"	24"
	6:1	12'-1 1/2"		7'-7 1/4"	12'-7 1/2"	4	18 1/4"	36"
21"	3:1	7'-1 1/2"	3'-9"	4'-9"	8'-1"	3	9 1/2"	18"
	4:1	9'-2 3/4"		6'-2 1/4"	10'-1 1/4"	3	12 1/2"	24"
	6:1	13'-7 3/4"		9'-1 1/2"	14'-1 1/2"	5	18 1/4"	36"
24"	3:1	7'-10"	4'-0"	5'-6 1/2"	8'-10"	3	9 1/2"	18"
	4:1	10'-3"		7'-2 1/2"	11'-1"	4	12 1/2"	24"
	6:1	15'-2"		10'-7 3/4"	15'-7 1/2"	6	18 1/4"	36"
27"	3:1	8'-7 1/2"	4'-3"	6'-4"	9'-7"	4	9 1/2"	18"
	4:1	11'-3 1/2"		8'-3"	12'-1 1/4"	5	12 1/2"	24"
	6:1	16'-8 1/4"		12'-2"	17'-1 1/2"	7	18 1/4"	36"
30"	3:1	9'-5"	4'-6"	7'-1 1/2"	10'-4"	4	9 1/2"	18"
	4:1	12'-3 3/4"		9'-3 3/4"	13'-1"	6	12 1/2"	24"
	6:1	18'-2 1/2"		13'-8 1/4"	18'-7 1/2"	8	18 1/4"	36"
33"	3:1	10'-2 1/4"	4'-9"	7'-10 3/4"	11'-3 1/4"	5	9 1/2"	18"
	4:1	13'-4 1/4"		10'-3 3/4"	14'-1 1/4"	6	12 1/2"	24"
	6:1	19'-8 3/4"		15'-2 1/2"	20'-1 1/2"	9	18 1/4"	36"
36"	3:1	10'-11 3/4"	5'-0"	8'-8 1/4"	11'-10"	5	9 1/2"	18"
	4:1	14'-4 1/2"		11'-4"	15'-1"	7	12 1/2"	24"
	6:1	21'-3"		16'-8 3/4"	21'-7 1/2"	10	18 1/4"	36"
42"	3:1	12'-6 3/4"	5'-6"	10'-3 1/4"	13'-4"	6	9 1/2"	18"
	4:1	16'-5 1/4"		13'-4 3/4"	17'-1 1/4"	8	12 1/2"	24"
	6:1	24'-3 1/2"		19'-9 1/4"	24'-7 1/2"	13	18 1/4"	36"
48"	3:1	14'-1 3/4"	6'-0"	11'-10 1/4"	14'-10"	7	9 1/2"	18"
	4:1	18'-6"		15'-5 1/2"	19'-1 1/4"	10	12 1/2"	24"
	6:1	27'-4"		22'-9 3/4"	27'-7 1/2"	15	18 1/4"	36"
54"	3:1	15'-8 3/4"	6'-6"	13'-5 1/4"	16'-4"	8	9 1/2"	18"
	4:1	20'-6 3/4"		17'-6 1/4"	21'-1 1/4"	11	12 1/2"	24"
	6:1	30'-4 1/2"		25'-10 1/4"	30'-7 1/2"	17	18 1/4"	36"
60"	3:1	17'-3 3/4"	7'-0"	15'-1 1/4"	17'-10"	9	9 1/2"	18"
	4:1	22'-7 1/2"		19'-7"	23'-1 1/4"	12	12 1/2"	24"
	6:1	33'-5"		28'-10 3/4"	33'-7 1/2"	19	18 1/4"	36"



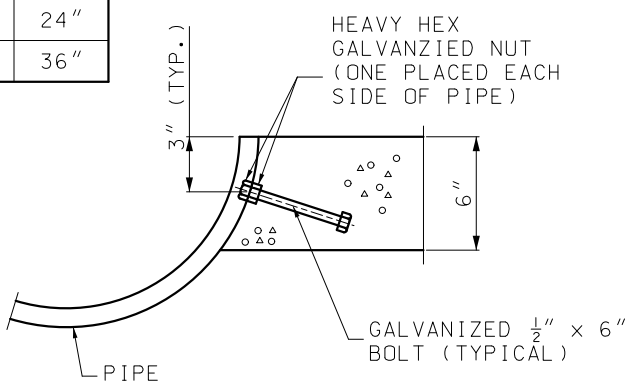
PLAN VIEW FOR HIGHWAYS



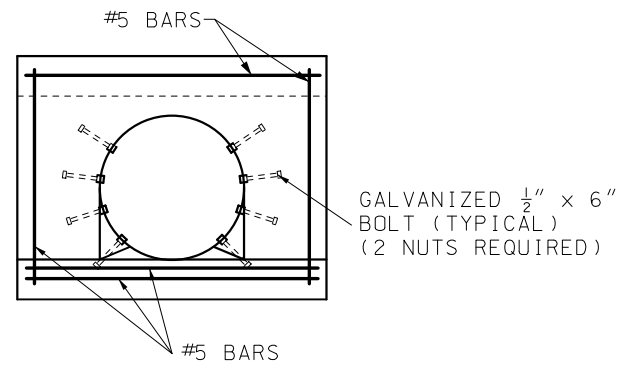
SECTION A-A



SECTION B-B



DETAIL A



SECTION C-C

GENERAL NOTES:

CONCRETE USED IN CONSTRUCTION OF THE BEVELED PIPE ENCASEMENT SHALL BE CLASS B CONCRETE OR AN APPROVED COMMERCIAL MIX MEETING REQUIREMENTS OF SECTION 501 OF THE STANDARD SPECIFICATIONS.

REINFORCING STEEL USED IN CONSTRUCTION OF THE BEVELED PIPE ENCASEMENT SHALL MEET THE REQUIREMENTS OF SECTION 1036 OF THE STANDARD SPECIFICATIONS.

BEVELED PIPE ENCASEMENT MAY BE USED WITH EITHER POLYETHYLENE OR CORRUGATED METALLIC COATED STEEL PIPE.

THE PRICE BID PER EACH FOR "BEVELED PIPE END TREATMENT" SHALL BE CONSIDERED FULL COMPENSATION FOR FURNISHING ALL MATERIALS AND INSTALLATION OF THE BEVELED PIPE SECTION AND BEVELED PIPE ENCASEMENT AS SHOWN OR AS DIRECTED BY THE ENGINEER.

THE 1/2\"/>

BEVELED PIPE SHALL BE DRILLED AT LOCATIONS SHOWN ON PLANS FOR PLACEMENT OF 1/2\"/>

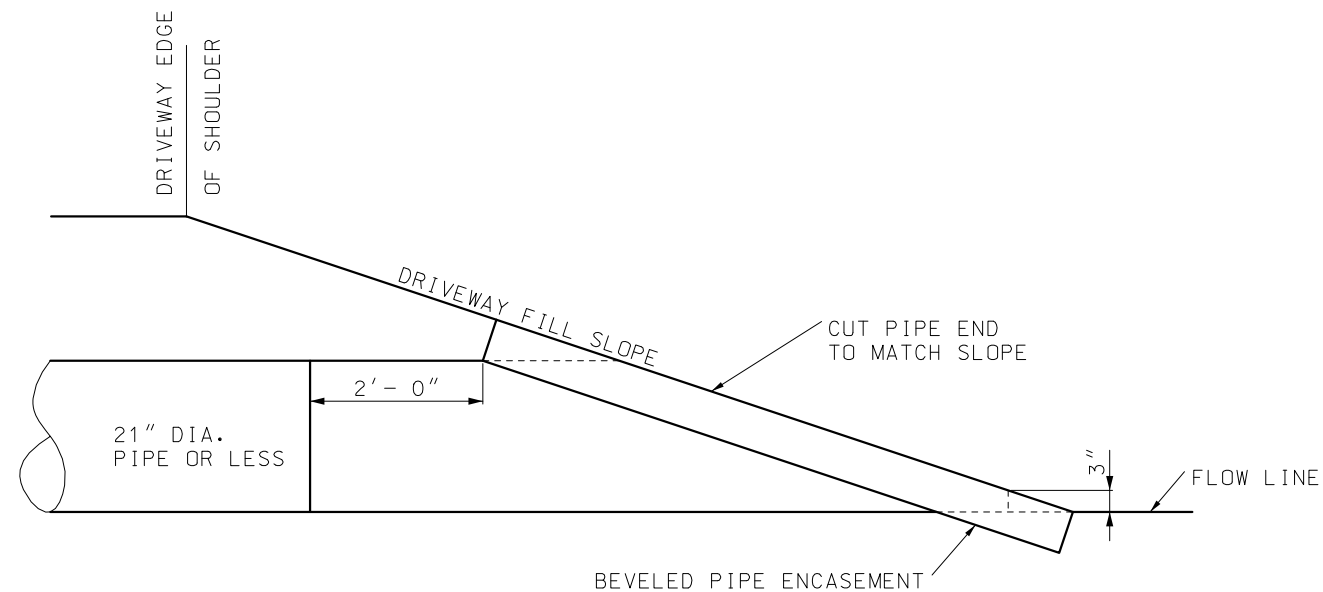
**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL  
 JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
 TRAVIS D. KOESTNER  
 NUMBER PE-30042  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**BEVELED PIPE END TREATMENT FOR HIGHWAYS**

DATE EFFECTIVE: 01/01/2021	<b>732.05D</b>	SHEET NO. 1 OF 2
DATE PREPARED: 10/14/2020		

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## PIPE END DETAILS FOR PARALLEL DRAINAGE STRUCTURES FOR DRIVEWAYS

(SINGLE PIPE INSTALLATION)

### NOTE:

FOR MULTIPLE PIPE INSTALLATIONS, END SECTIONS WITH SAFETY BARS SYSTEM OR OPTIONAL BAR GATE SYSTEM SHALL BE PROVIDED. SEE STANDARD PLAN 732.10.

SEE DRIVEWAY STANDARD PLANS FOR BEVELED END SECTION REQUIREMENTS.

### GENERAL NOTES:

CONCRETE USED IN CONSTRUCTION OF THE BEVELED PIPE ENCASEMENT SHALL BE CLASS B CONCRETE OR AN APPROVED COMMERCIAL MIX MEETING REQUIREMENTS OF SECTION 501 OF THE STANDARD SPECIFICATIONS.



REINFORCING STEEL USED IN CONSTRUCTION OF THE BEVELED PIPE ENCASEMENT SHALL MEET THE REQUIREMENTS OF SECTION 1036 OF THE STANDARD SPECIFICATIONS.

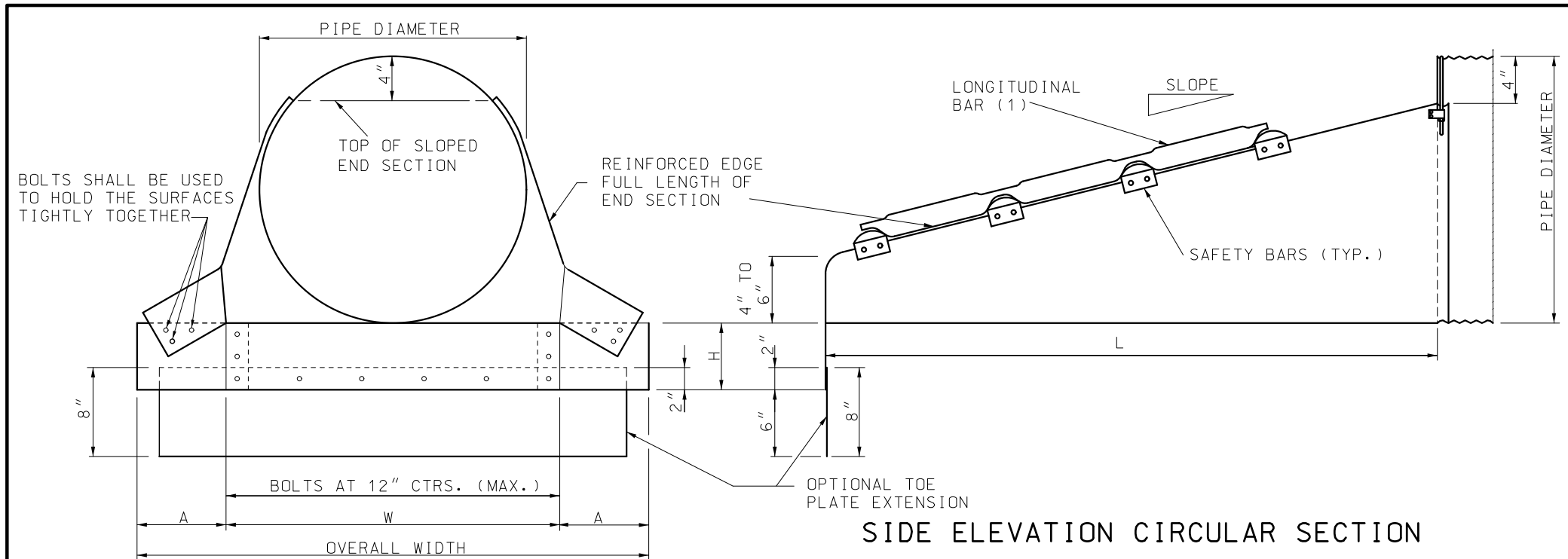
BEVELED PIPE ENCASEMENT MAY BE USED WITH EITHER POLYETHYLENE OR CORRUGATED METALLIC COATED STEEL PIPE.

THE PRICE BID PER EACH FOR "BEVELED PIPE END TREATMENT" SHALL BE CONSIDERED FULL COMPENSATION FOR FURNISHING ALL MATERIALS AND INSTALLATION OF THE BEVELED PIPE SECTION AND BEVELED PIPE ENCASEMENT AS SHOWN OR AS DIRECTED BY THE ENGINEER.

THE  $\frac{1}{2}$ " x 6" BOLT AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M232 (ASTM A153), CLASS C SPECIFICATIONS. LOW CARBON STEEL ANCHOR BOLTS SHALL BE ASTM F1554, GRADE 36.

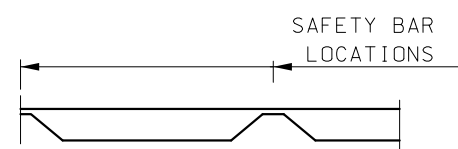
BEVELED PIPE SHALL BE DRILLED AT LOCATIONS SHOWN ON PLANS FOR PLACEMENT OF  $\frac{1}{2}$ " x 6" GALVANIZED BOLTS. THE  $\frac{1}{2}$ " x 6" GALVANIZED BOLTS SHALL BE "DOUBLE NUTTED" AS SHOWN AND PLACED IN THE VALLEY OF PIPE CORRUGATIONS.

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
 <p>STATE OF MISSOURI          TRAVIS D. KOESTNER          NUMBER PE-30042          PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<h3>BEVELED PIPE END TREATMENT FOR DRIVEWAYS</h3>
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>732.05D</b>
SHEET NO. 2 OF 2	

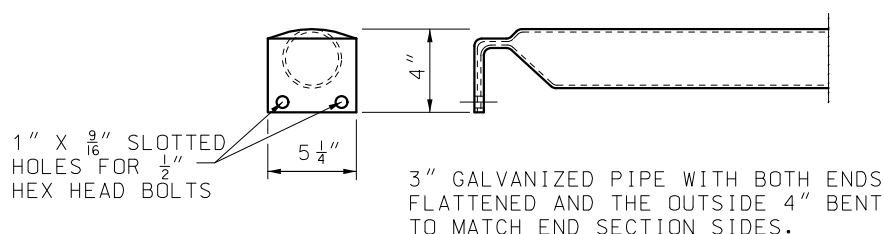


FRONT VIEW CIRCULAR PIPE

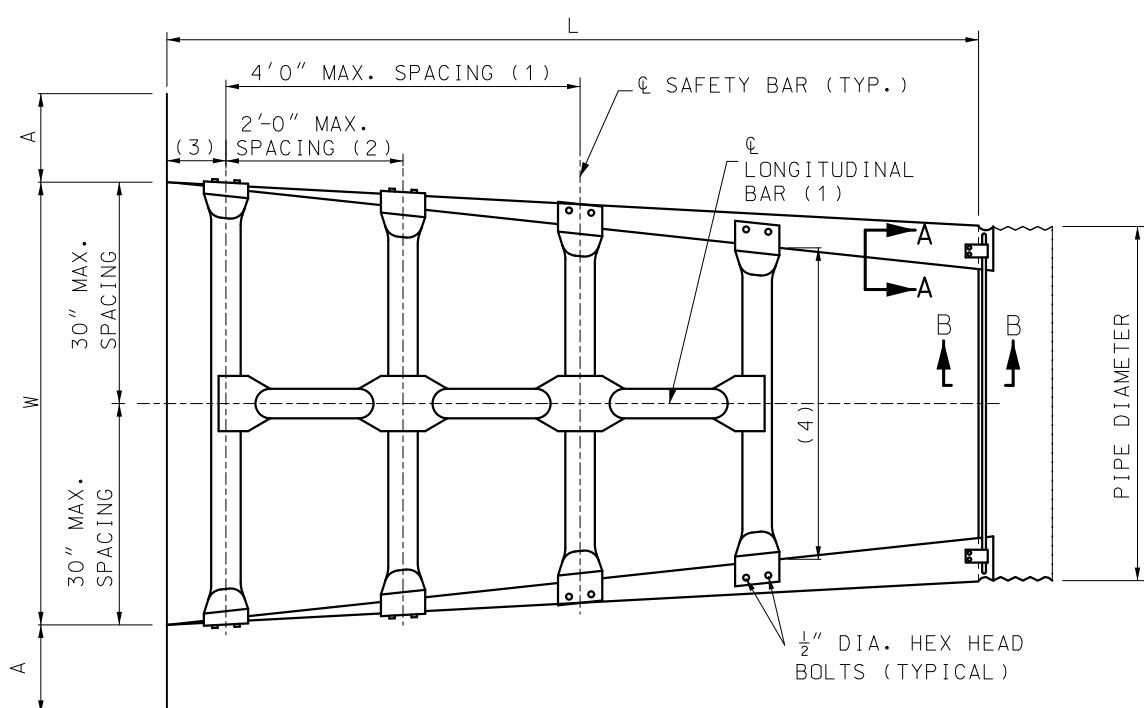
SIDE ELEVATION CIRCULAR SECTION



LONGITUDINAL BAR DETAIL



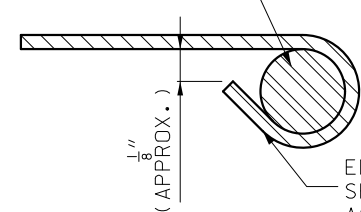
DETAIL OF SAFETY BAR



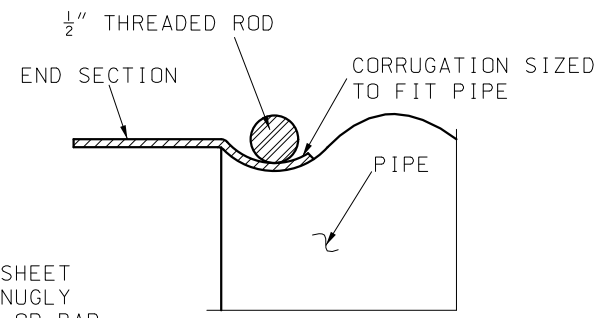
TOP VIEW CIRCULAR SECTION

LONGITUDINAL BAR, WHEN REQUIRED, SHALL BE WELDED TO SAFETY BARS TO FORM SINGLE GRATE STRUCTURE. LONGITUDINAL BAR IS NOT TO BE USED FOR PARALLEL DRAINAGE STRUCTURES.

MINIMUM 7/16" DIAMETER GALVANIZED STEEL ROD OR NO. 4 GALVANIZED REINFORCED BAR



SECTION A-A



SECTION B-B

- NOTES:
- (1) FOR CROSSROAD DRAINAGE STRUCTURES ONLY.
  - (2) FOR PARALLEL DRAINAGE STRUCTURES ONLY.
  - (3) 4" TO 6" MINIMUM
  - (4) SAFETY BARS SHALL BE PROVIDED UNTIL THE LATERAL SPAN OF THE OPENING IS LESS THAN OR EQUAL TO 30".

GENERAL NOTES:

END SECTIONS, INCLUDING ALL BOLTS, NUTS, RODS AND STRAPS, SHALL BE FABRICATED FROM GALVANIZED STEEL MEETING THE REQUIREMENTS OF SECTION 1020.

ALL BOLTS UNLESS OTHERWISE SHOWN SHALL BE ASTM A307 BOLTS.

WHEN REQUIRED, OPTIONAL TOE PLATE EXTENSION SHALL BE PUNCHED OR DRILLED AND BOLTED TO END SECTION TOE PLATE. STEEL FOR TOE PLATE EXTENSION SHALL BE SAME GAUGE AS END SECTION. DIMENSIONS SHALL BE OVERALL WIDTH LESS 6" BY 8" HIGH.

ATTACHMENT TO CIRCULAR PIPES 15" THROUGH 24" DIAMETER SHALL BE MADE WITH TYPE #1 STRAPS. ALL OTHER SIZES SHALL BE ATTACHED WITH TYPE #2 CONNECTORS.

SAFETY BARS AND LONGITUDINAL BARS SHALL BE FABRICATED FROM STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A-53 SCHEDULE 40 SPECIFICATIONS. SAFETY BARS AND LONGITUDINAL BARS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1020 OF STANDARD SPECIFICATIONS.

INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 725 AND 732 OF THE STANDARD SPECIFICATIONS.

SLOTTED HOLES FOR SAFETY BAR ATTACHMENT SHALL BE PROVIDED FOR ALL END SECTIONS.

MINOR VARIATIONS OF DETAIL WILL BE ACCEPTED TO PERMIT THE USE OF A MANUFACTURER'S STANDARD METHODS OF FABRICATION.

END SECTIONS FABRICATED FROM THICKER METAL THAN INDICATED WILL BE ACCEPTED.

ALL BOLTS SHALL BE 3/8" DIAMETER AND GALVANIZED, UNLESS OTHERWISE SHOWN.

SKIRT SECTION IS DEFINED AS THE FLARED PORTION OF THE END SECTION INCLUDING SIDE AND BOTTOM (CENTER) PANELS AND APRON.

SKIRT SECTION FOR 12" TROUGH 24" PIPES SHALL BE MADE IN ONE PIECE.

SKIRT SECTIONS FOR 30" AND LARGER PIPES MAY BE MADE FROM UP TO 2 SHEETS JOINED BY RIVETING OR BOLTING ON CENTERLINE.

SKIRT SECTIONS FROM 48" AND LARGER PIPES MAY BE MADE FROM UP TO 3 SHEETS JOINED BY RIVETING OR BOLTING EQUAL DISTANCE FROM CENTERLINE.

ALL 3 PIECE SKIRTS FOR 60" PIPES SHALL HAVE 0.109" THICK SIDES AND 0.138" THICK BOTTOM (CENTER) PANELS. WIDTH OF BOTTOM PANELS SHALL BE GREATER THAN 20% OF THE PIPE PERIPHERY CONNECTOR SECTION. CORNER PLATES AND TOE PLATES SHALL BE GALVANIZED AND OF THE SAME OR GREATER THICKNESS AS THE SKIRT.

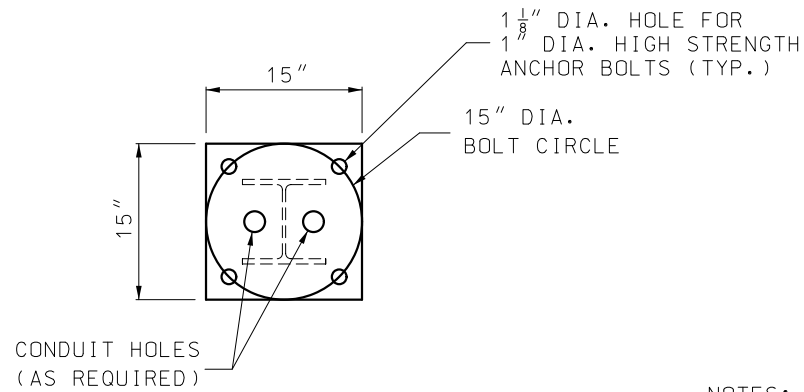
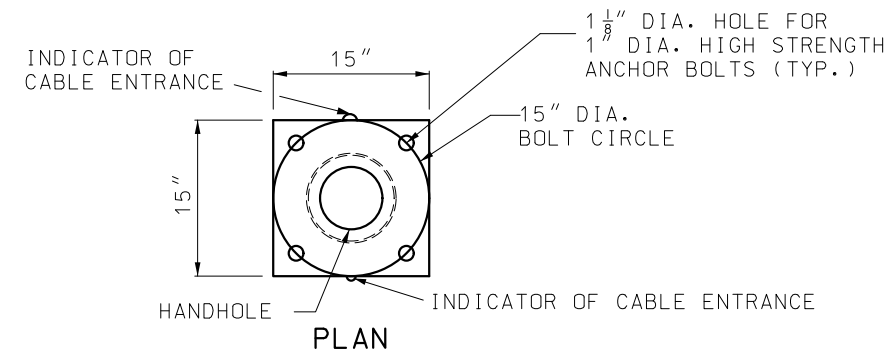
**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL  
 JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
 TRAVIS D. KOESTNER  
 NUMBER PE-30042  
 PROFESSIONAL ENGINEER  
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**SAFETY SLOPE END SECTION**

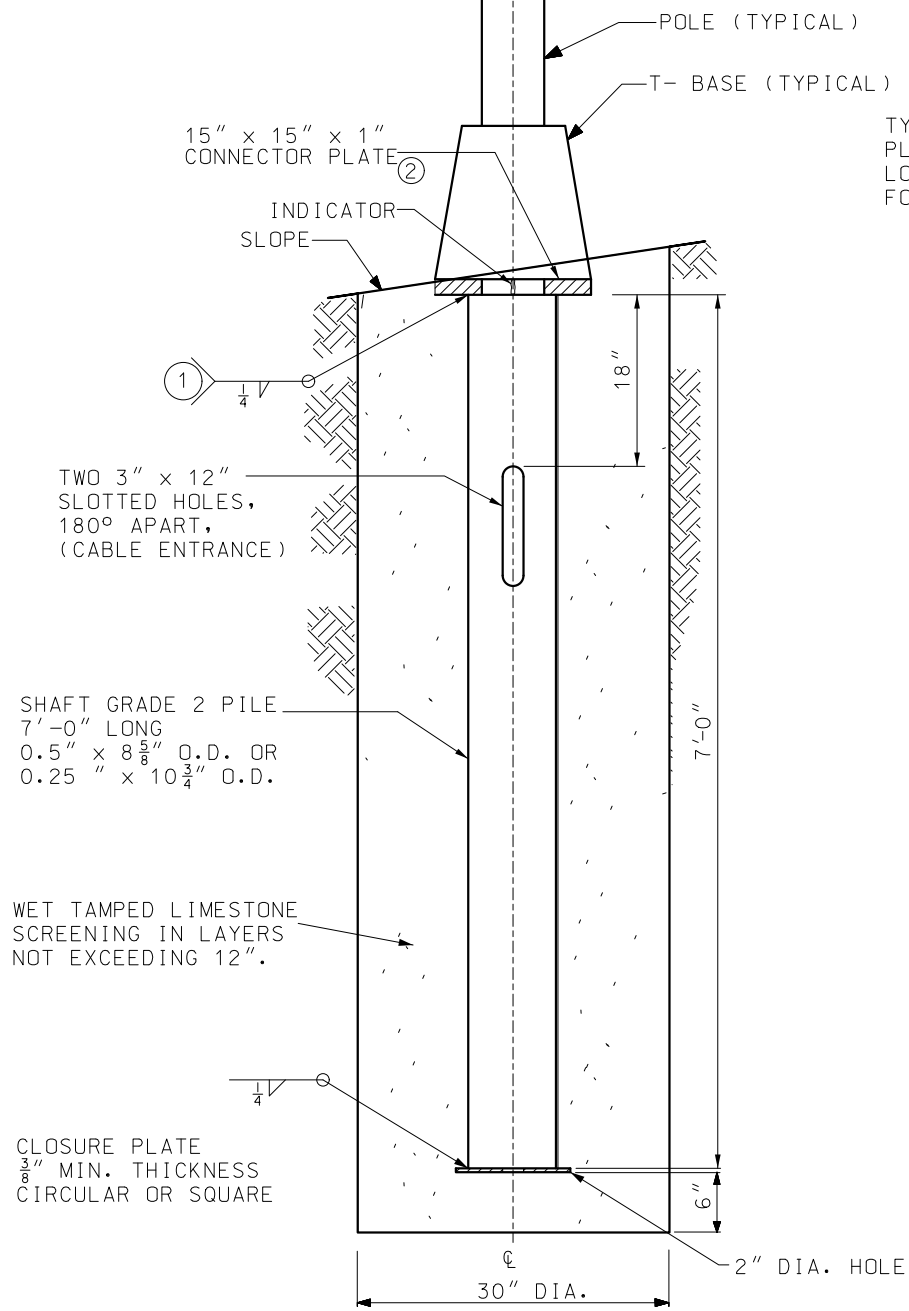
DATE EFFECTIVE: 01/01/2021	<b>732.10H</b>	SHEET NO.
DATE PREPARED: 10/14/2020		1 OF 3

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

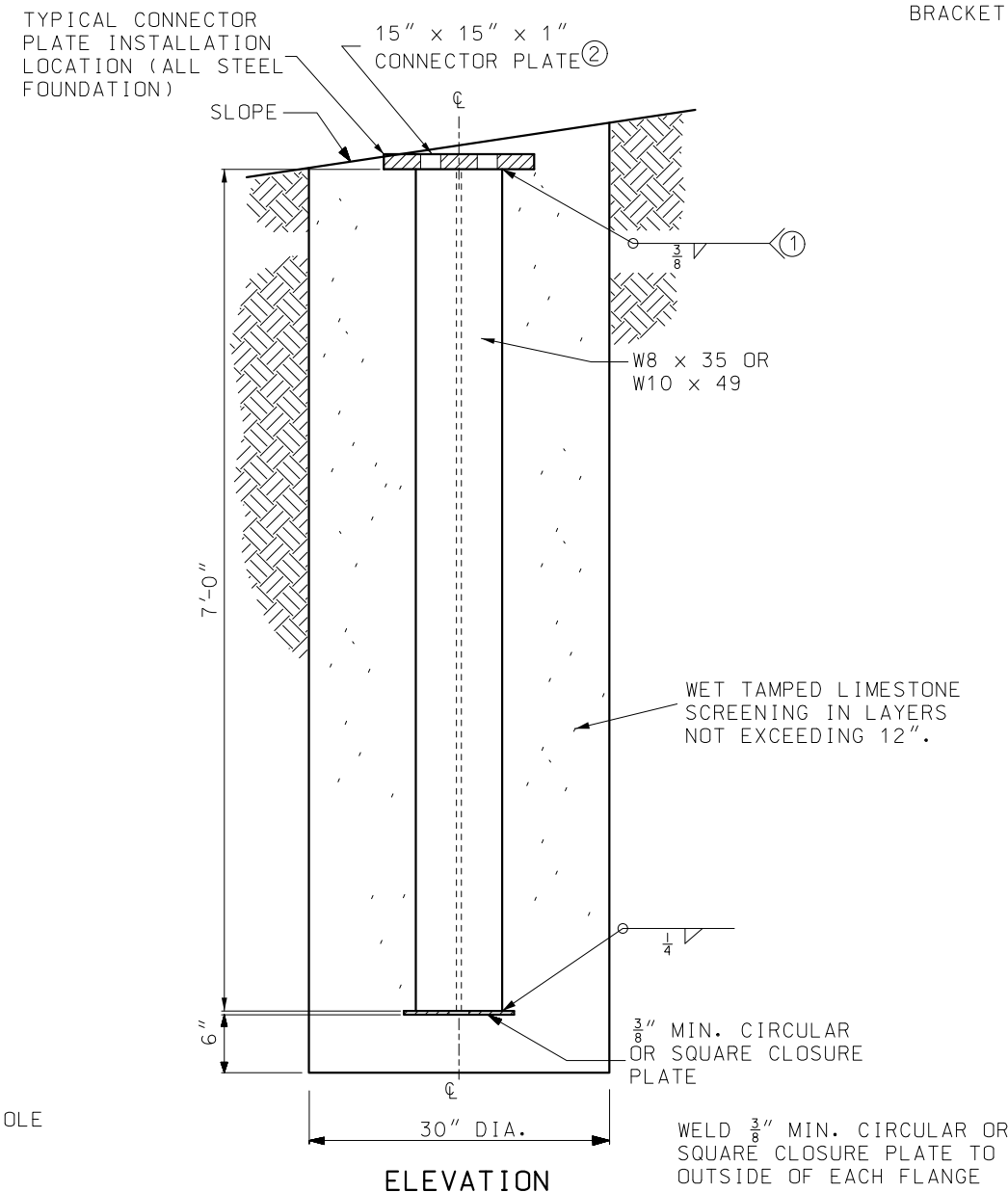


NOTES:

- ① GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.
- ② FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.



DETAILS OF CIRCULAR STEEL PILE FOUNDATION



DETAILS OF STEEL "H" PILE FOUNDATION

GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT SHOWN.

ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

**MoDOT** MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
NICOLE A. KOLB HOOD  
NUMBER PE-2001018754  
PROFESSIONAL ENGINEER

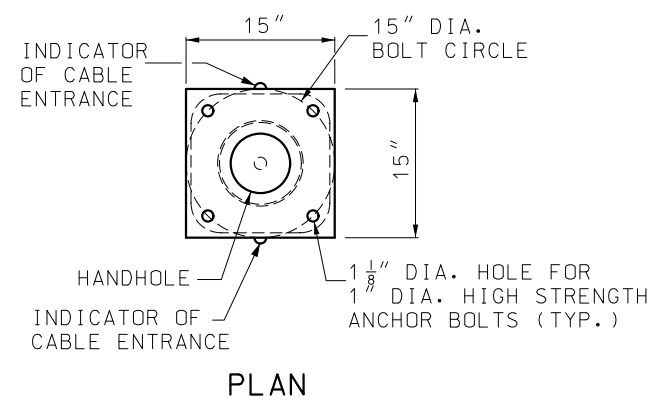
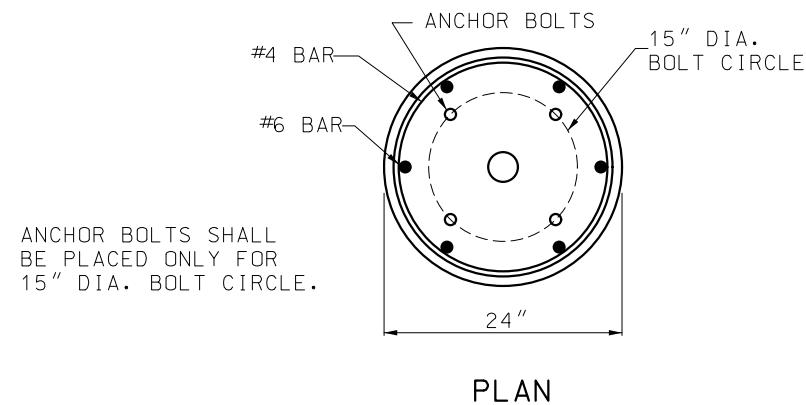
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT**

DATE EFFECTIVE: 01/01/2021  
DATE PREPARED: 10/14/2020

**901.00AB**

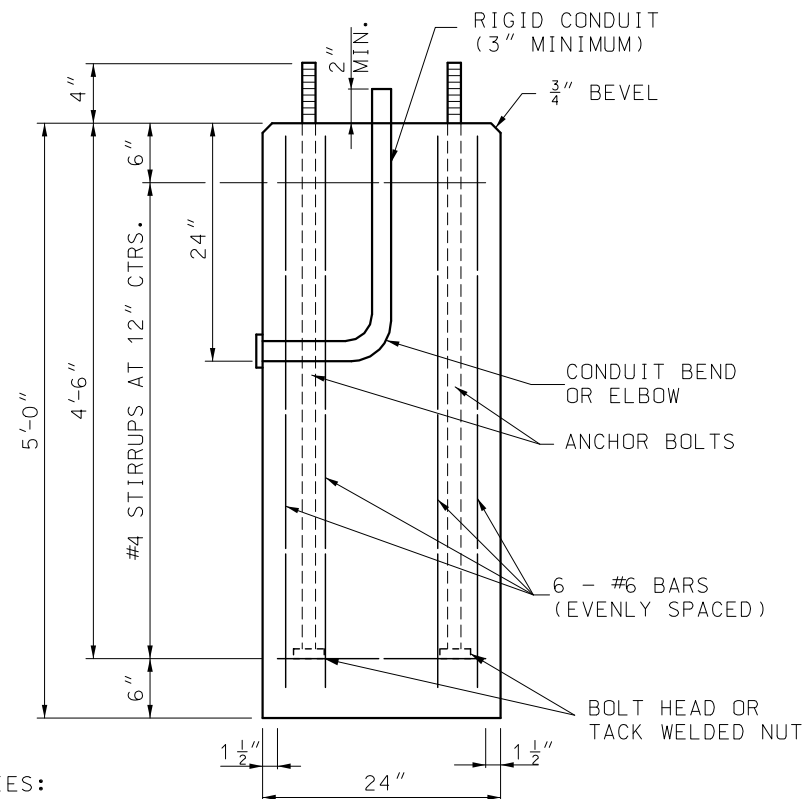
SHEET NO.  
3 OF 4



DRIVE HOLES WILL BE PERMITTED PROVIDED THAT THEY DO NOT CONFLICT WITH OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE PLATE. THE WELD BETWEEN THE PLATE AND SHAFT, OR THE BOLT HOLES.

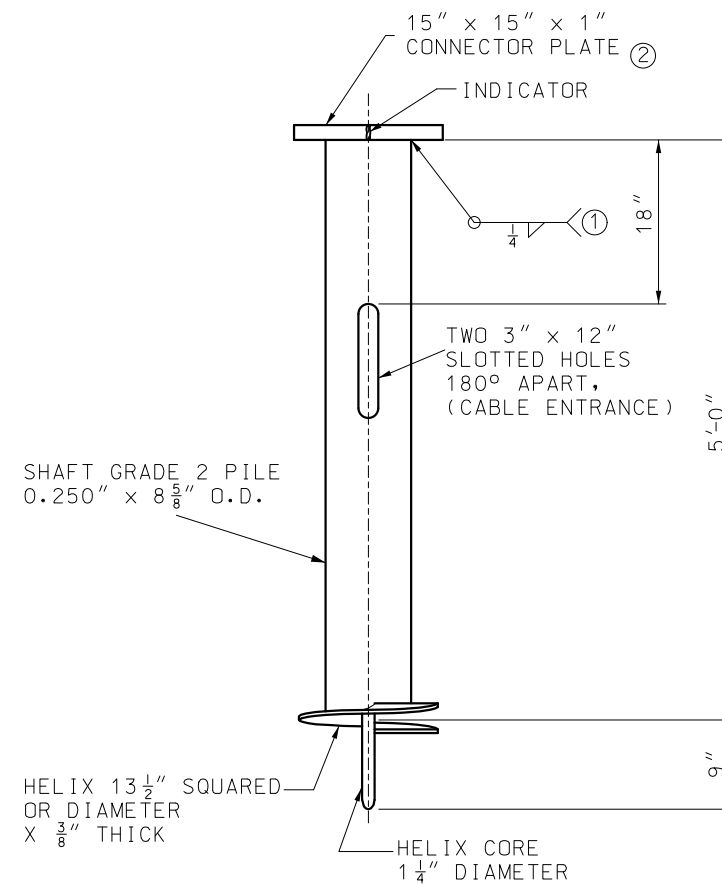
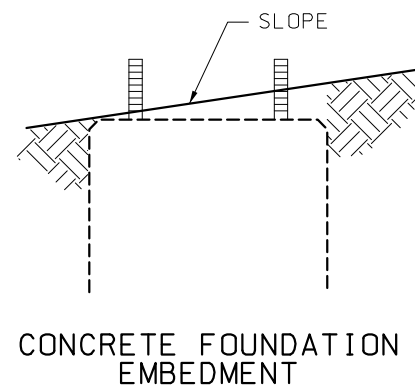
NOTES:

- ① GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.
- ② FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.
- ③ AT THE OPTION OF THE CONTRACTOR THE CONCRETE FOUNDATION MAY BE PRECAST. IF PRECAST, THEY SHALL BE SET IN DRILLED HOLES 3 FEET IN DIAMETER AND 6 INCHES DEEPER THAN THE BOTTOM OF THE CONCRETE FOUNDATION. THE BOTTOM 6 INCHES OF THE HOLE AND THE REMAINING SPACE AROUND THE FOUNDATION SHALL BE BACKFILLED WITH WET TAMPED LIMESTONE SCREENINGS IN LAYERS NOT EXCEEDING 12 INCHES.

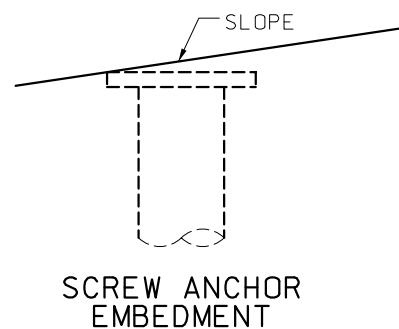


QUANTITIES:  
CONC. = 0.58 CU. YD.  
REIN. = 64 LBS.

DETAILS OF CONCRETE FOUNDATION ③



DETAILS OF SCREW ANCHOR FOUNDATION




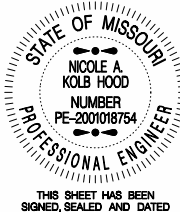
GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT SHOWN.

ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

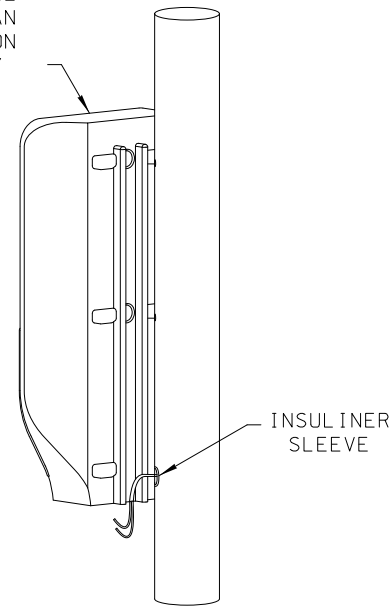
ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

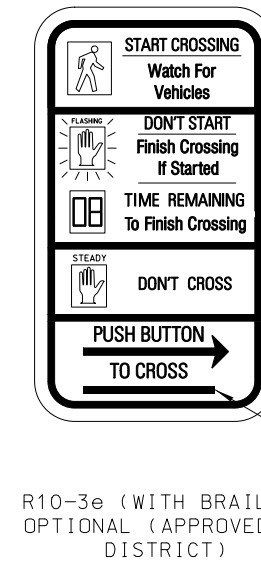
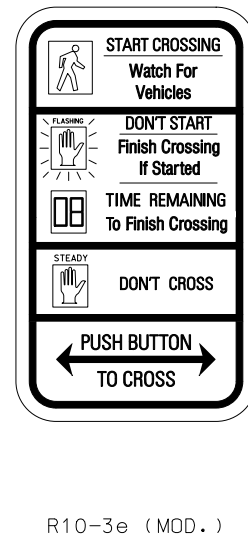
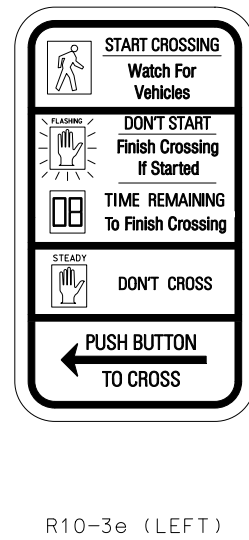
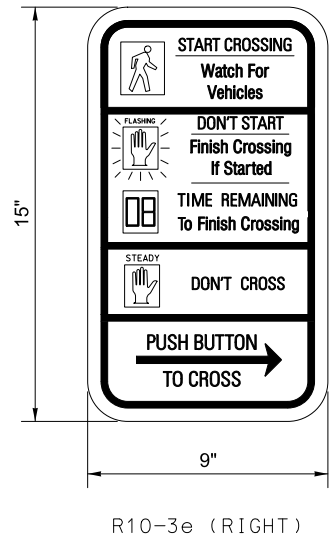
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
 <p>STATE OF MISSOURI NICOLE A. KOLB HOOD NUMBER PE-2001018754 PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<p><b>HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT</b></p>
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<p><b>901.00AB</b></p>
SHEET NO. 4 OF 4	

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

ACCESSIBLE PEDESTRIAN PUSHBUTTON ASSEMBLY

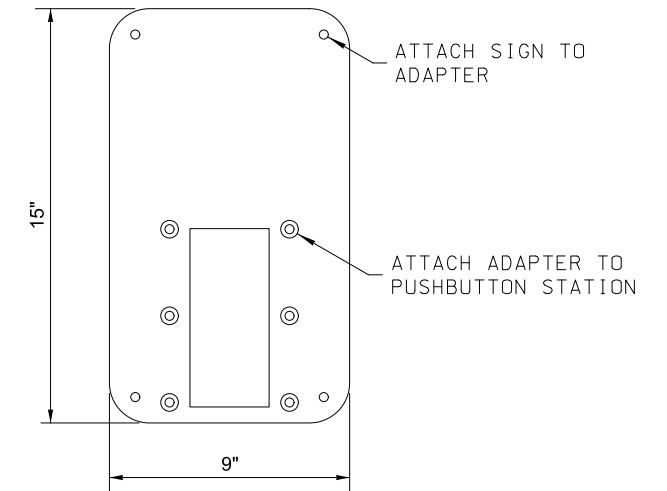


WIRE ROUTING PERSPECTIVE VIEW



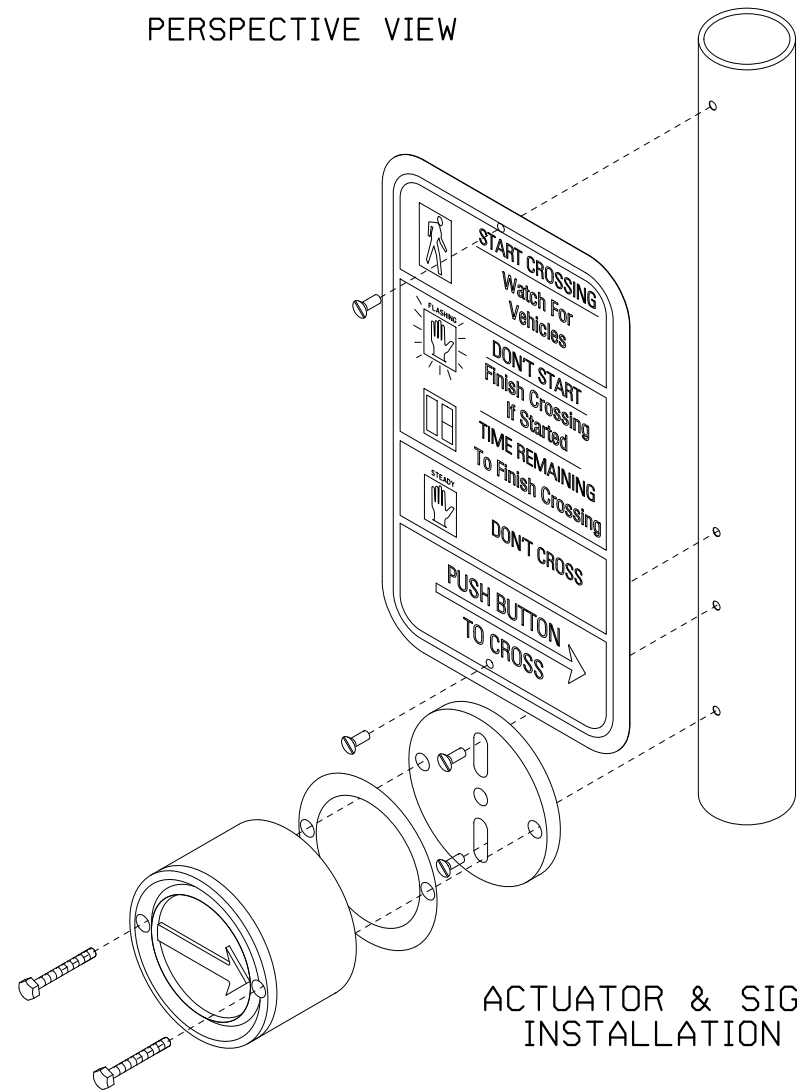
BRILLE:  
"STREET NAME"

R10-3e (WITH BRAILLE) OPTIONAL (APPROVED BY DISTRICT)

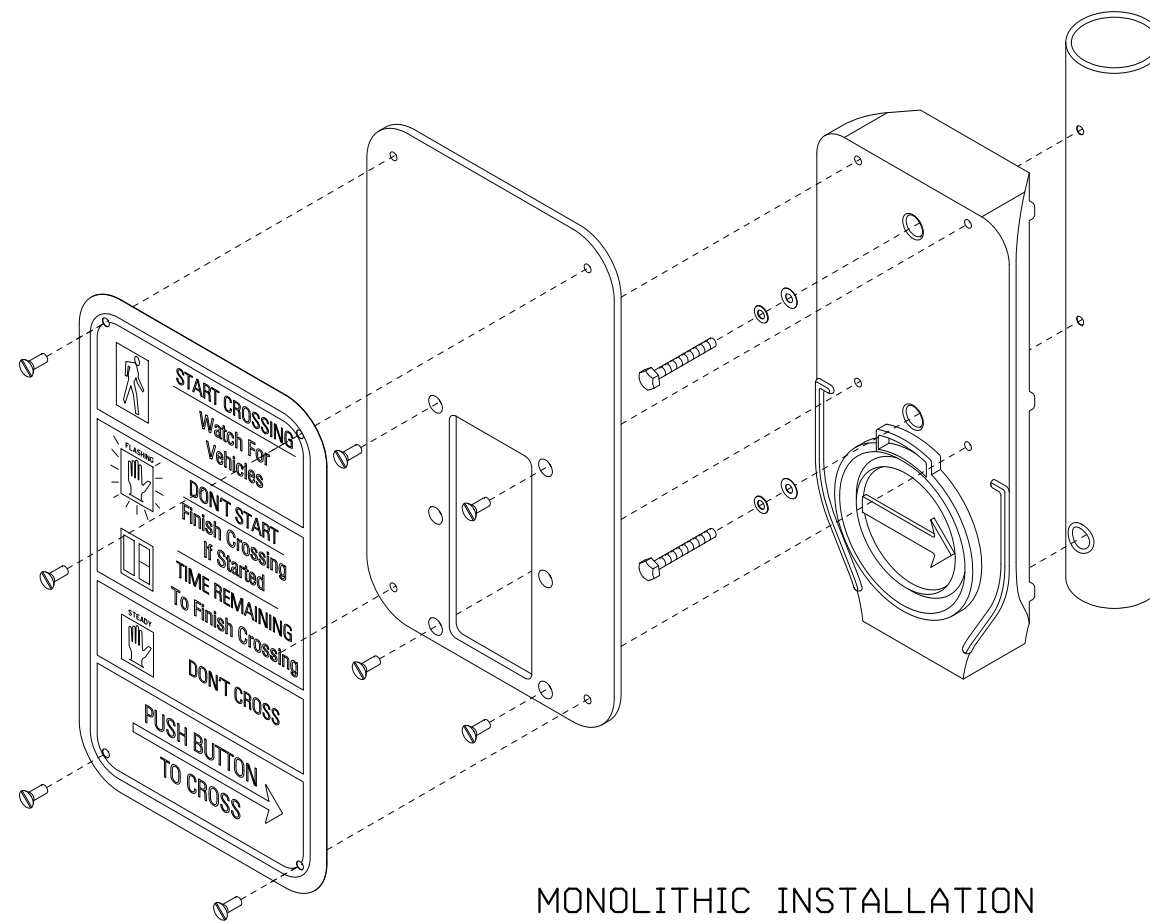


PEDESTRIAN PUSHBUTTON FRAME ADAPTER

PEDESTRIAN PUSHBUTTON INSTRUCTIONAL SIGN



ACTUATOR & SIGN INSTALLATION



MONOLITHIC INSTALLATION

ACCESSIBLE PEDESTRIAN SIGNAL ASSEMBLY

GENERAL NOTES:

ACCESSIBLE PEDESTRIAN SIGNAL ASSEMBLY MAY BE MONOLITHIC OR A SEPARATE ACTUATOR AND SIGN.

SIGNS FOR SIGNAL INSTALLATIONS, INCLUDING ALL MATERIAL REQUIRED FOR SIGN MOUNTING, SHALL BE FURNISHED BY THE CONTRACTOR. SIGNS SHALL BE MANUFACTURED IN ACCORDANCE WITH SEC 903, AND MOUNTED AS SHOWN ON THE PLANS.

ACCESSIBLE PEDESTRIAN SIGNAL ASSEMBLY CAN BE MOUNTED TO SIGNAL POLE, PEDESTRIAN POLE, OR PEDESTRIAN PUSHBUTTON POLE.

INCLUDE A 9" X 15" R10-3E SIGN WITH EACH ASSEMBLY.

REQUIRES POLE ADAPTER WHEN MOUNTING TWO UNITS ON THE SAME PEDESTRIAN POLE. ADDITIONAL MOUNTING EXTENSION BRACKETS SHALL BE PROVIDED IF A 10" MAXIMUM REACH FROM AN ACCESSIBLE SIDEWALK CANNOT BE ACHIEVED.

IF THE CURB RAMP IS NOT ALIGNED WITH THE CROSSWALK, THE ACCESSIBLE PEDESTRIAN SIGNAL ASSEMBLY SHALL POINT IN THE DIRECTION OF TRAVEL, NOT IN THE DIRECTION OF THE CURB RAMP ORIENTATION.

**MoDOT** MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION  
105 WEST CAPITOL JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
NICOLE A. KOLB HOOD  
NUMBER PE-2001018754  
PROFESSIONAL ENGINEER  
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

TRAFFIC SIGNALS  
ACCESSIBLE PEDESTRIAN SIGNALS

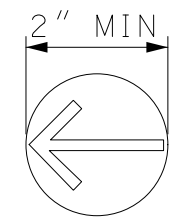
DATE EFFECTIVE: 04/01/2021  
DATE PREPARED: 2/17/2021

902.05

SHEET NO.  
1 OF 2

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



ACTUATOR DETAIL

GENERAL NOTES:

ACCESSIBLE PEDESTRIAN SIGNAL ASSEMBLY MAY BE MONOLITHIC OR A SEPARATE ACTUATOR AND SIGN.

THE ACCESSIBLE PEDESTRIAN SIGNAL PUSHBUTTON SHALL BE OF THE PRESSURE-ACTIVATED TYPE WITH ESSENTIALLY NO MOVING PARTS. IT SHALL BE "ADA" COMPLIANT AND WEATHERPROOF.

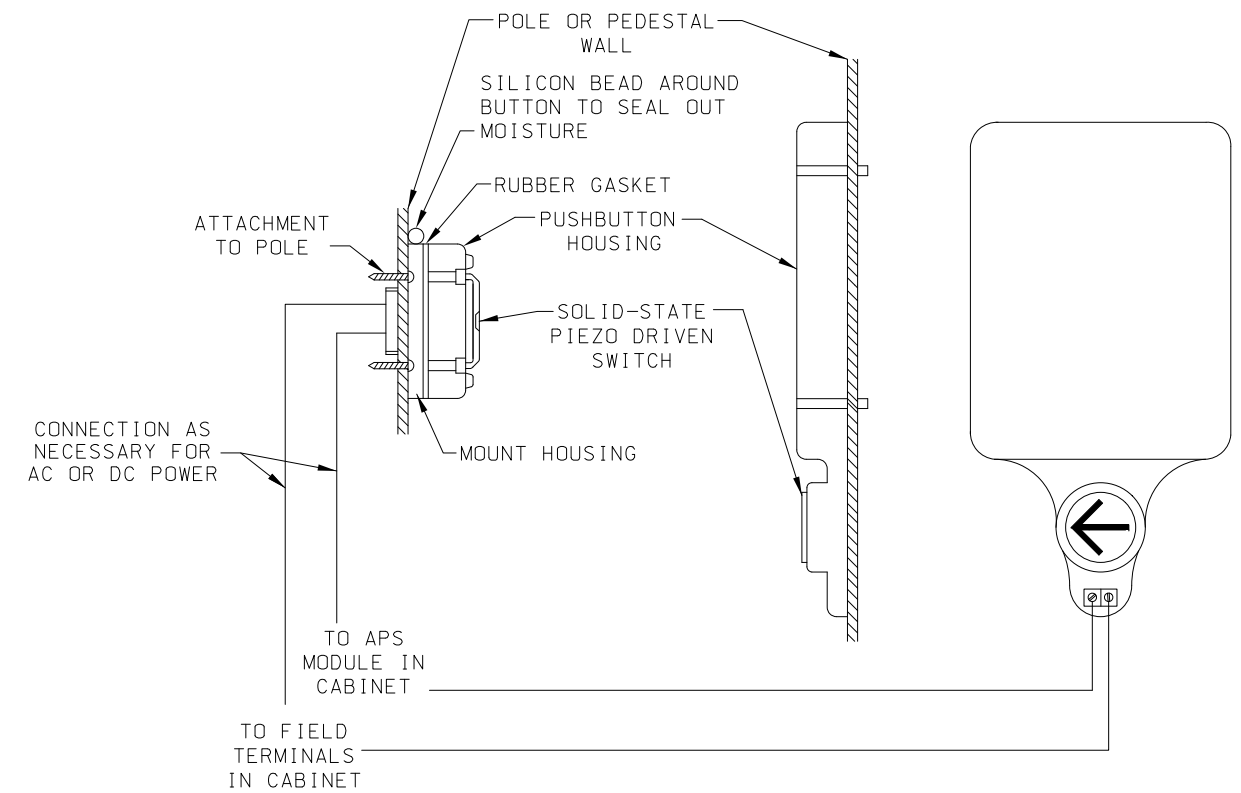
THE HOUSING SHALL BE BLACK, FIT THE CURVATURE OF THE POST TO WHICH IT IS ATTACHED AND SHALL PROVIDE A RIGID INSTALLATION. ACCESSIBLE PEDESTRIAN SIGNAL CAN BE MOUNTED TO THE SIGNAL POLE, PEDESTRIAN POLE, OR PEDESTRIAN PEDESTAL POLE.

THERE SHALL BE A TACTILE ARROW POINTING IN THE DIRECTION OF PEDESTRIAN TRAVEL CONTROLLED BY THE BUTTON.

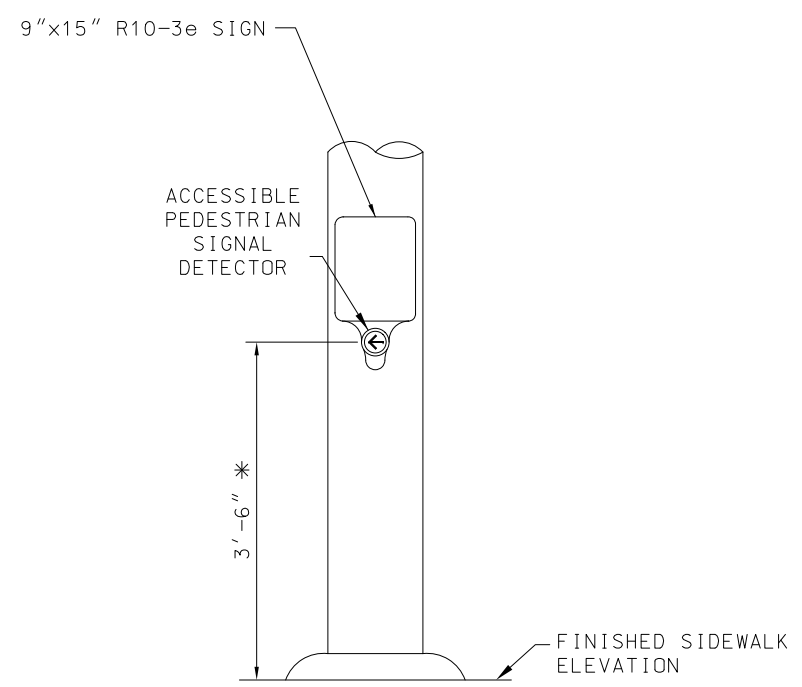
THE ACTUATOR SHALL BE A MINIMUM OF 2 INCHES IN DIAMETER, RAISED, CONTRAST VISUALLY WITH THE HOUSING AND MADE OF BRASS OR CORROSION-RESISTANT METAL ALLOY OR NON-METALLIC MATERIAL. A MAXIMUM FORCE OF 3.5 LBS SHALL BE REQUIRED TO ACTIVATE THE SWITCH. SWITCH SHALL BE OF THE SOLID-STATE ELECTRONIC, PIEZO TYPE.

THE ACCESSIBLE PEDESTRIAN SIGNAL SHALL OPERATE AT A VOLTAGE NO GREATER THAN 24 VOLTS. SOME MANUFACTURERS PROVIDE A 2-WIRE ACCESSIBLE PEDESTRIAN SIGNAL SYSTEM THAT USES THE EXISTING WIRING FROM PREVIOUSLY INSTALLED STANDARD PUSHBUTTONS. SOME MANUFACTURERS PROVIDE 3-WIRE AND 4-WIRE SYSTEMS. A 4-WIRE SYSTEM SHOULD BE SET UP JUST LIKE THE 3-WIRE SYSTEM, BUT IN THE 4-WIRE SYSTEM, AN EXTRA GROUND WIRE RUNS FROM THE PEDESTRIAN HEAD TO THE PUSHBUTTON. BOTH ARE ACCEPTABLE OPTIONS. THERE ARE SOME SYSTEMS THAT PROVIDE WIRELESS CONNECTIVITY FOR BLUETOOTH PROGRAMMING.

THE ACCESSIBLE PEDESTRIAN SIGNAL SHALL BE FULLY OPERATIONAL BETWEEN -30°F TO +165°F (-34°C TO +74°C), SHALL NOT ALLOW ICE TO FORM SUCH TO IMPEDE THE OPERATION OF THE BUTTON, AND SHALL HAVE A WEATHERPROOF SPEAKER.

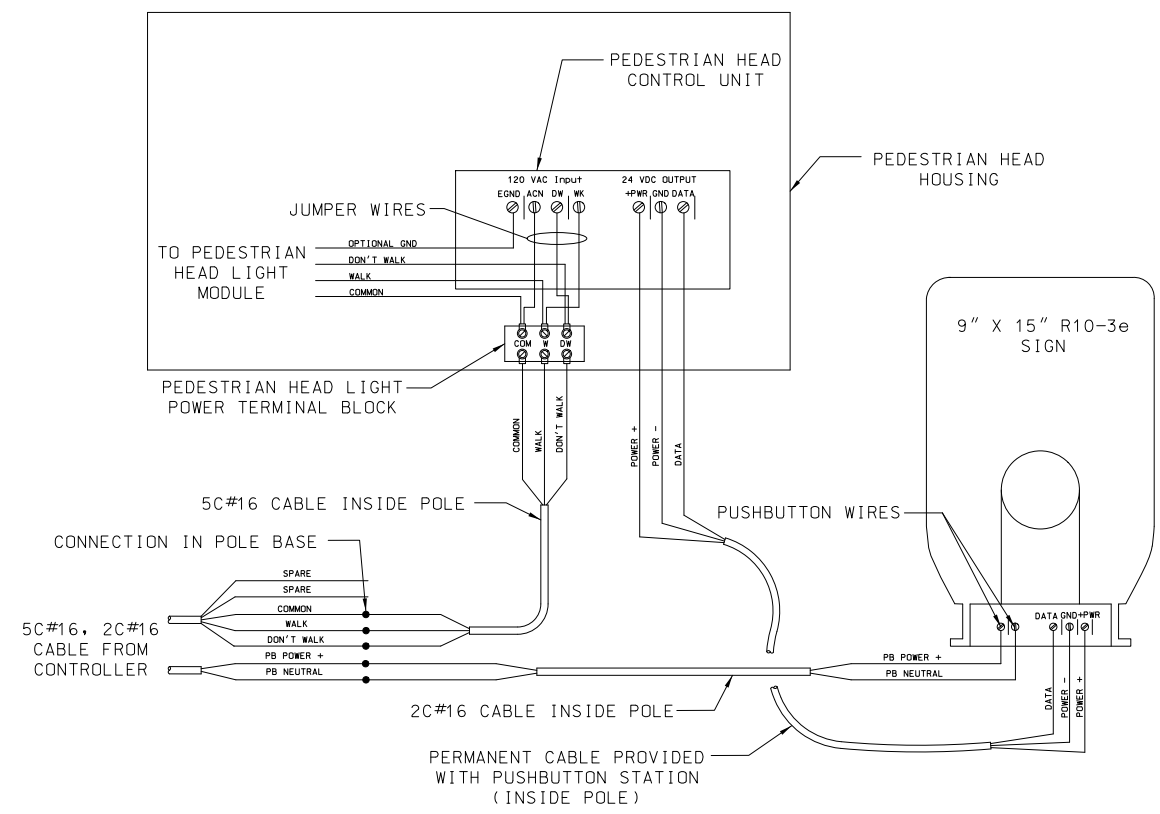


2-WIRE SYSTEM WIRING DETAILS





\* PUSHBUTTON SHOULD BE MOUNTED AS CLOSE TO 3'-6" WITHOUT GOING OVER TO SATISFY THE LIMITATIONS AND GUIDANCE OF THE MUTCD.

ACCESSIBLE PEDESTRIAN SIGNAL ASSEMBLY



3-WIRE SYSTEM WIRING DETAILS

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
  
 105 WEST CAPITOL  
 JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
  
 NICOLE A. KOLB HOOD  
 NUMBER PE-2001018754  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**TRAFFIC SIGNALS**  
**ACCESSIBLE PEDESTRIAN SIGNALS**

DATE EFFECTIVE: 04/01/2021	<b>902.05</b>	SHEET NO. 2 OF 2
DATE PREPARED: 2/17/2021		



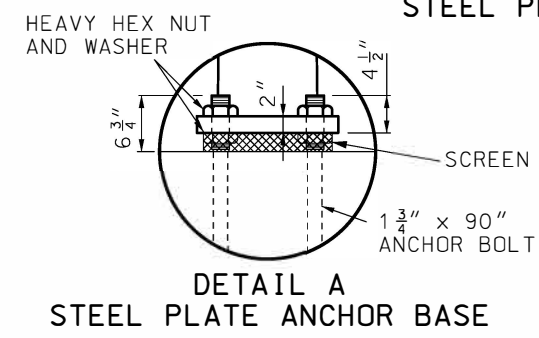
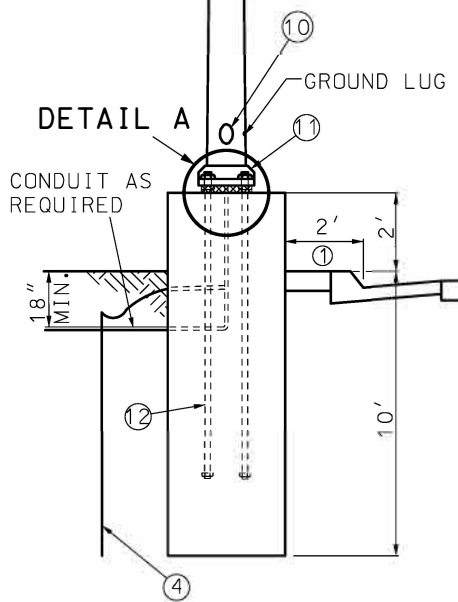
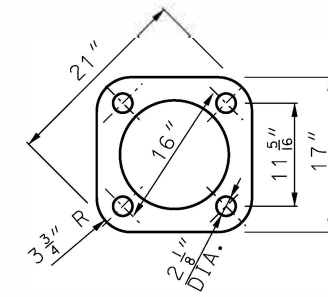
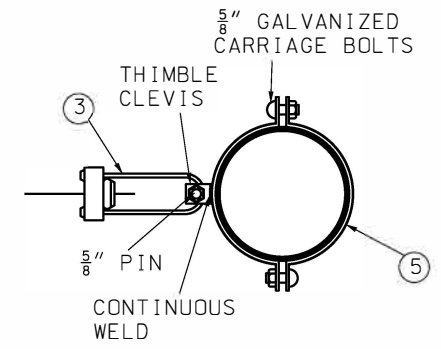
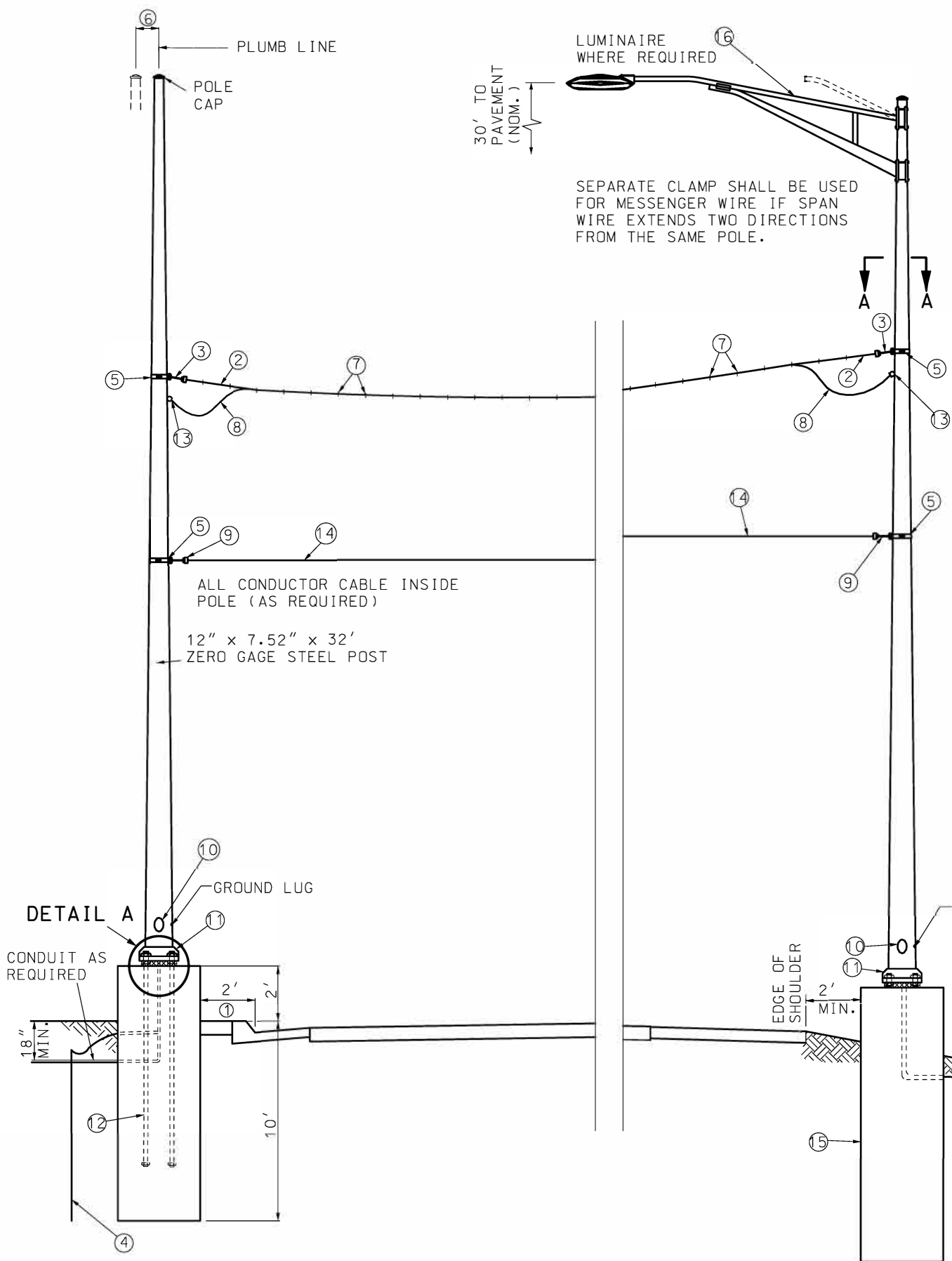
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

- ① 6" IF LOCATED WITHIN 4' OF CONCRETE MEDIAN.
- ② DOUBLE GALVANIZED  $\frac{3}{8}$ " (MIN.) STEEL MESSENGER WIRE - 7 STRAND HIGH STRENGTH GRADE.
- ③  $\frac{3}{8}$ " AUTOMATIC JAW TYPE CABLE FITTING WITH SHORT BAIL. 13,860 LBS. MINIMUM HOLDING STRENGTH.
- ④  $\frac{3}{4}$ " x 8' MIN. COPPER GROUND ROD, ONE POLE SHALL BE GROUNDED BY CONNECTING NO. 6 AWG BARE COPPER WIRE FROM GROUNDING LUG INSIDE POLE TO GROUND ROD BY MEANS OF A GALVANIZED WIRE CLAMP LOCATED INSIDE OF POLE. GROUND LUG SHALL BE ORIENTED 90° OR 180° TO HANDHOLE. IF SUBSURFACE CONDITIONS EXIST WHICH PROHIBIT THE PLACEMENT OF THE GROUND ROD IN A VERTICAL POSITION, THE ROD MAY BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45° FROM VERTICAL OR BURIED IN A TRENCH AT LEAST 30 IN. DEEP. CONNECTION TO GROUND ROD SHALL BE CADWELDED.
- ⑤ GALVANIZED  $\frac{1}{4}$ " STEEL CLEVIS CLAMP TO FASTEN TO THE POLE WITH  $\frac{5}{8}$ " GALVANIZED CARRIAGE BOLTS.
- ⑥ RAKE AS NECESSARY, 10" MAXIMUM.
- ⑦ NON-CORROSIVE METAL CABLE HANGERS AT 12" CENTERS.
- ⑧ MULTI-CONDUCTOR CABLE (AS REQUIRED).
- ⑨  $\frac{1}{4}$ " AUTOMATIC JAW TYPE CABLE FITTING WITH SHORT BAIL. 5990 LBS. MINIMUM HOLDING STRENGTH.
- ⑩ 4" x 6 $\frac{1}{2}$ " HANDHOLE AND COVER WITH REINFORCED FRAME WELDED TO POLE.
- ⑪ ONE-PIECE OR TWO-PIECE METAL BASE COVER OR INDIVIDUAL NUT COVERS.
- ⑫ FULLY GALVANIZED ANCHOR BOLT WITH BOLT HEAD OR TACK WELDED NUT ON EMBEDDED END.
- ⑬ WIRE ENTRANCE WITH INSULATED WEATHERPROOF BUSHING (AS REQUIRED).
- ⑭ DOUBLE GALVANIZED  $\frac{1}{4}$ " STEEL - 7 STRAND HIGH STRENGTH GRADE TETHER WIRE AND CLAMP WITH QUICK RELEASE PROVISIONS. INSTALL HORIZONTAL OR BELOW HORIZONTAL.
- ⑮ TYPE A-10 BASE. SEE STANDARD 902.30 FOR DETAILS.
- ⑯ LUMINAIRE AND BRACKET ARE AS SPECIFIED ON PLANS. SEE STANDARD 901.00 FOR MOUNTING DETAILS.

GENERAL NOTES:  
 DESIGN OF STRUCTURAL SUPPORTS SHALL COMPLY WITH AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS 2001 AND CURRENT INTERIMS.

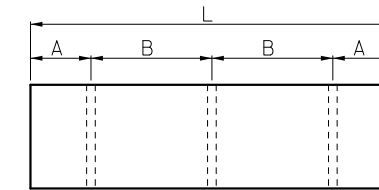
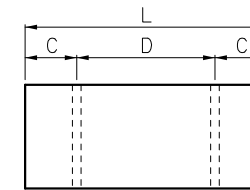
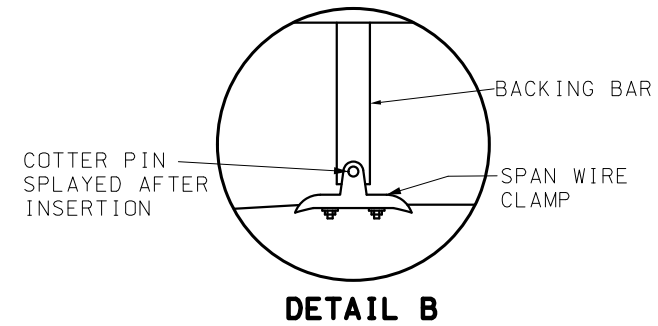
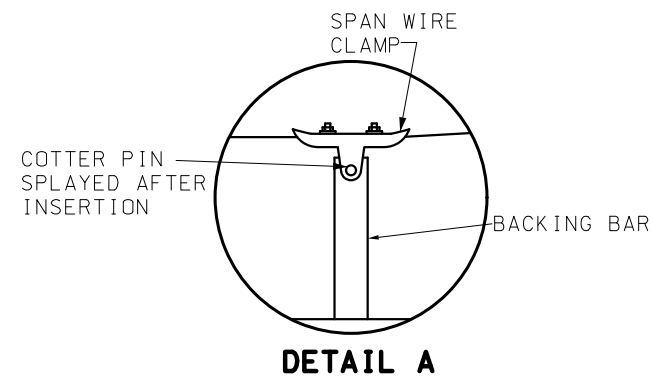
MAXIMUM SPAN LENGTH:  
 160' FOR ONE ONE OR TWO SPANS OFF POST, WITH GUY WIRE, ONE 5-SECTION HEAD SIGNAL, TWO 3-SECTION HEAD SIGNALS AND TWO SIGNS PER SPAN.  
 100' FOR ONE SPAN OFF POST, WITHOUT GUY WIRE, WITH THREE 3-SECTION HEAD SIGNALS AND TWO SIGNS PER SPAN.  
 100' FOR TWO SPANS OFF POST, WITHOUT GUY WIRE, WITH TWO 3-SECTION HEAD SIGNALS AND ONE SIGN PER SPAN.

CONCRETE POLE EMBEDMENT SHALL BE CLASS B CONCRETE.  
 SEE SHEET 1 FOR DOWN GUY INFORMATION WHEN DOWN GUY IS SPECIFIED ON PLANS.  
 EXPANSIVE GROUT SHALL BE USED BETWEEN THE POLE BASE PLATE AND THE CONCRETE BASE WHEN INDIVIDUAL NUT COVERS ARE USED. SEE STANDARD 902.40 FOR SCREEN DETAILS.



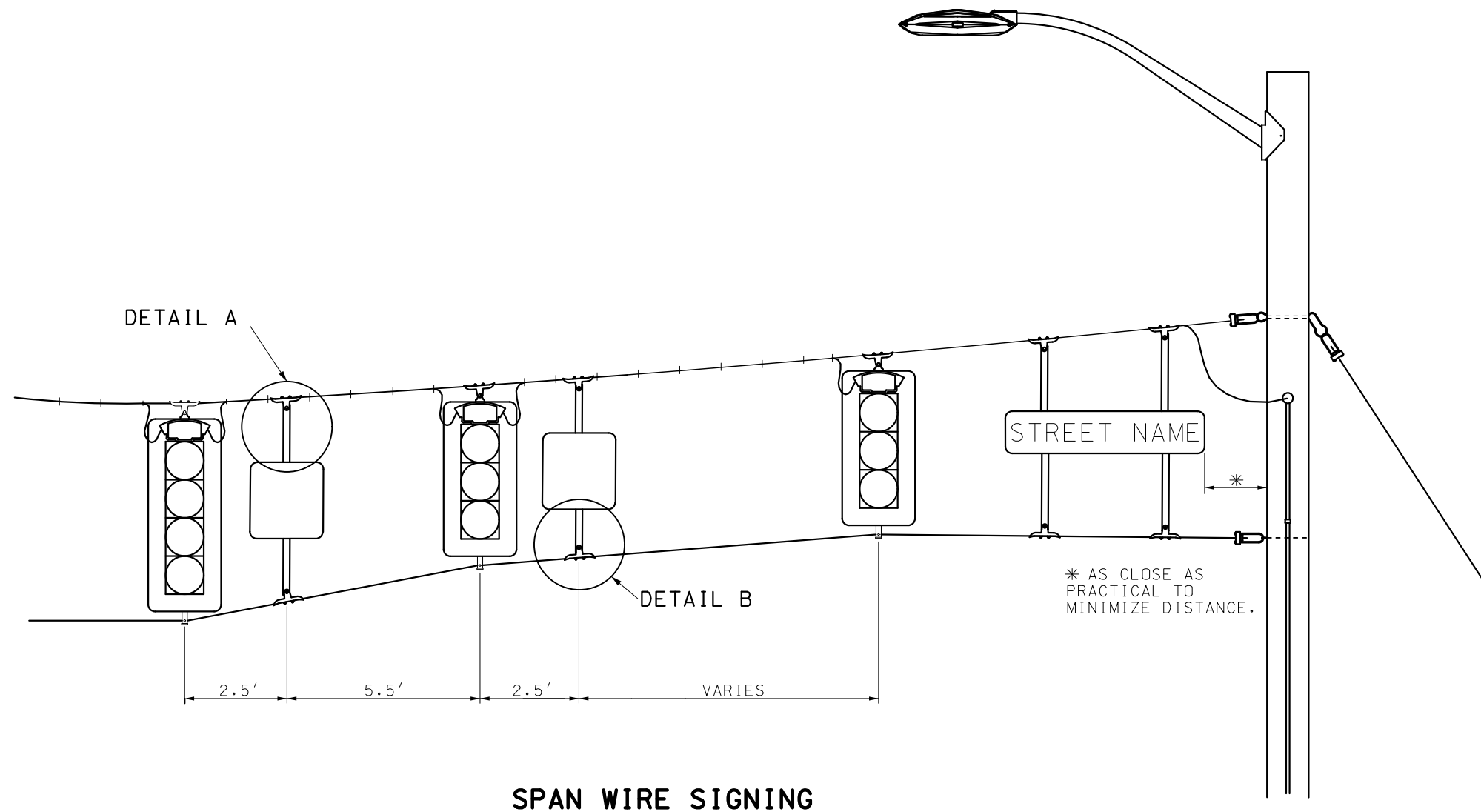
**STEEL POST DETAILS**

<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p><b>TRAFFIC SIGNALS</b>  <b>RIGID SPAN WIRE DETAILS</b></p>
DATE EFFECTIVE: 04/01/2021 DATE PREPARED: 1/27/2021	<p><b>902.70Q</b></p>
SHEET NO. <b>2 OF 3</b>	



$A = 1/6(L)$      $C = 1/5(L)$   
 $B = 1/3(L)$      $D = 3/5(L)$

**BACKING BAR PLACEMENT**



**GENERAL NOTES:**

SIGNS UP TO 30" IN WIDTH SHALL BE INSTALLED ON ONE VERTICAL BACKING BAR. SIGNS 30" TO 60" IN WIDTH SHALL BE INSTALLED ON TWO VERTICAL BACKING BARS. SIGNS WIDER THAN 60" SHALL BE INSTALLED ON THREE VERTICAL BACKING BARS.

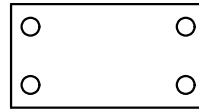
<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b></p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>STATE OF MISSOURI NICOLE A. KOLB HOOD NUMBER PE-2001018754 PROFESSIONAL ENGINEER</p> <p><small>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</small></p>	<p><b>TRAFFIC SIGNALS</b></p> <p>RIGID SPAN WIRE SIGN DETAILS</p>
<p>DATE EFFECTIVE: 04/01/2021</p> <p>DATE PREPARED: 1/27/2021</p>	<p><b>902.70Q</b></p>
<p>SHEET NO. 3 OF 3</p>	

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

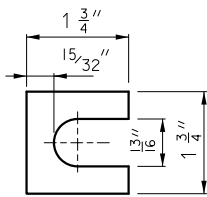
STRUCTURAL STEEL POST FOR GROUND MOUNTED SIGNS																	
POST	BOLT			WASHER			BASE CONNECTION DATA TABLE (IN.)										
	DES. NO.	NOM SIZE (IN. X LBS)	DIA IN.	LENGTH IN.	TORQUE IN. / LB.	OD IN.	ID IN.	THICK IN.	A	B	C	D	E	F	G	W	R
1	W6x9																
2	W6x15		$\frac{5}{8}$	$2\frac{3}{4}$	345	$1\frac{5}{16}$	$\frac{11}{16}$	$\frac{1}{8}$	5	2	$1\frac{1}{4}$	$2\frac{3}{4}$	$1\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$1\frac{1}{32}$
3	W8x18																
4	W10x22																
5	W10x26		$\frac{3}{4}$	$3\frac{1}{2}$	555	$1\frac{13}{32}$	$\frac{13}{16}$	$\frac{1}{8}$	6	$2\frac{1}{4}$	$1\frac{3}{8}$	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{5}{16}$	$\frac{1}{32}$
6	W12x35																

POST AND FOOTING DATA TABLE													
POST DES. NO.	NOM. SIZE	WEIGHT		STUB LENGTH	DIA.	FOOTING							
		LBS/FT	LBS/IN			LEVEL GROUND		6:1 GRADE		4:1 GRADE		3:1 OR 2:1 GRADE	
						DEPTH	C.Y.	DEPTH	C.Y.	DEPTH	C.Y.	DEPTH	C.Y.
1	W6	9.0	0.75	3'-0"	15"	3'-0"	0.14	3'-2"	0.15	3'-3"	0.16	3'-6"	0.17
2	W6	15.0	1.25	4'-0"	24"	4'-0"	0.47	4'-2"	0.50	4'-3"	0.51	4'-6"	0.54
3	W8	18.0	1.50	4'-6"	28"	4'-6"	0.71	4'-8"	0.73	4'-9"	0.74	5'-0"	0.78
4	W10	22.0	1.83	5'-0"	36"	5'-0"	1.31	5'-2"	1.36	5'-3"	1.39	5'-6"	1.45
5	W10	26.0	2.17	5'-0"	36"	5'-0"	1.31	5'-3"	1.37	5'-5"	1.43	5'-9"	1.52
6	W12	35.0	2.92	5'-6"	36"	5'-6"	1.44	5'-9"	1.52	5'-11"	1.56	6'-3"	1.65

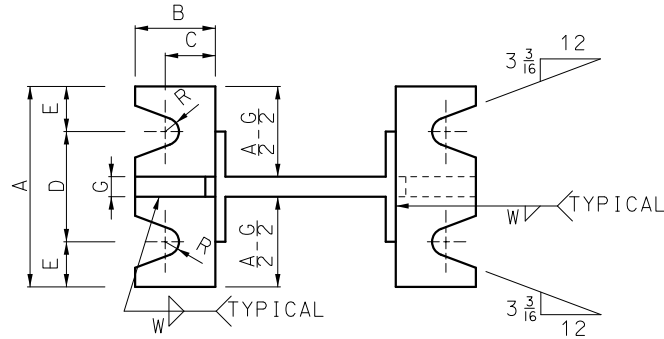
SHEET METAL BOLT RETAINER CUT FROM 30 GAGE GALVANIZED SHEET METAL. PLACE BETWEEN BASE PLATES. SIZE VARIES TO FIT PLATE. BOLT HOLES TO BE  $\frac{1}{16}$ " LARGER THAN REQUIRED BOLT SIZE.



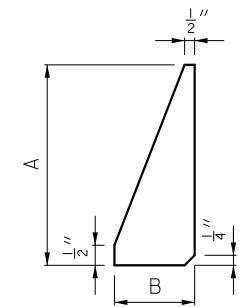
BOLT RETAINER



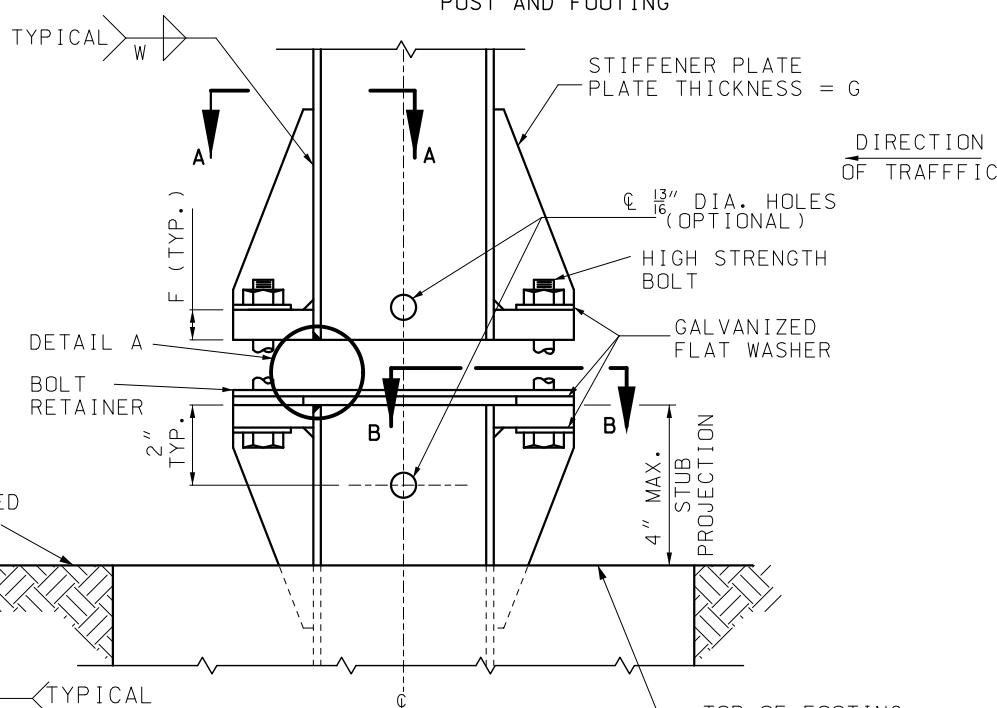
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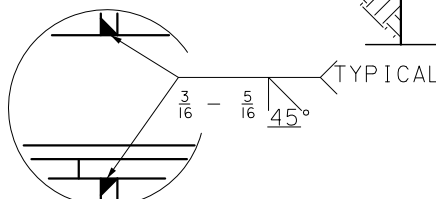
SECTION A-A SECTION B-B  
POST AND FOOTING



STIFFENER PLATE

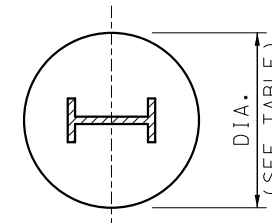


ELEVATION

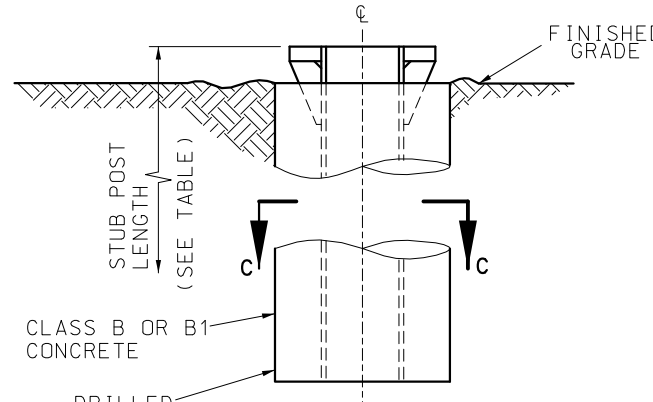


DETAIL A

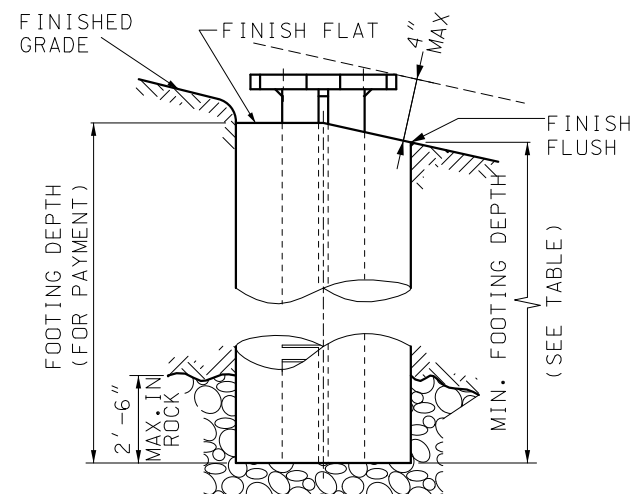
TOP OF FOOTING, FLUSH WITH FINISHED FLAT GRADE. SEE "FOOTING DETAIL" FOR FOOTINGS ON SLOPES.



SECTION C-C



STUB DETAIL



FOOTING DETAIL

GENERAL NOTES:

DESIGN SPECS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS - 1985 (EXCEPT 2001 AND LATEST INTERIMS FOR STRUCTURAL STEEL POSTS).

POSTS, PERFORATED FUSE PLATE AND SPLICE PLATE TO BE GALVANIZED AFTER FABRICATION.

METAL PROJECTING BEYOND THE PLANE OF THE PLATE FACE WILL NOT BE ALLOWED.

REMOVE ALL GALVANIZING RUNS OR BEADS IN THE WASHER AREA.

ALL STRUCTURAL STEEL STIFFENER PLATES AND BASE PLATES, FOR GROUND MOUNTED SIGNS SHALL MEET THE REQUIREMENTS OF ASTM A 36 OR AASHTO M 270 GRADE 50, MINIMUM YIELD 50,000 PSI.

IN THE EVENT THE DISTANCE BETWEEN THE TOP OF THE FOOTING AND THE BOTTOM OF THE SIGN IS LESS THAN 7'-9", THE SIGN HEIGHT AND POST LENGTH IS TO BE INCREASED SUFFICIENTLY TO ACCOMMODATE THIS MINIMUM SPACING.

HINGE PLATES NOT REQUIRED ON SINGLE POST SIGNS OR ANY SIGNS USING PIPE POSTS.

NUTS ON HINGE PLATE BOLTS SHALL BE TIGHTENED TO THE REQUIRED MINIMUM BOLT TENSION VALUES SHOWN IN TABLE 1 SEC. 1080 OF THE STANDARD SPECIFICATIONS.

THE NUT SHALL BE FREE RUNNING. IF THE NUT WILL NOT SPIN ON THE BOLT BECAUSE OF GALVANIZING IRREGULARITIES, A LUBRICANT SHALL BE APPLIED.

ALL BREAKAWAY ASSEMBLY BOLTS SHALL BE TIGHTENED IN A SYSTEMATIC MANNER TO THE PRESCRIBED TORQUE SHOWN ON THIS DRAWING.

EACH BREAKAWAY ASSEMBLY BOLT SHALL BE LOOSENED AND RE-TIGHTENED TO THE REQUIRED TORQUE IN THE SAME ORDER AS THE INITIAL TIGHTENING.

THE THREADS SHALL BE BURRED AT THE NUT USING A CENTER PUNCH TO PREVENT NUT FROM LOOSENING.

POST LENGTH QUANTITY SHOWN ON PLANS INCLUDES STUB.

1" X 2 1/2" HIGH STRENGTH BOLTS FOR PIPE POSTS SHALL BE OF THE DESIGNATION AASHTO M 164 OR ASTM A 449. ALL OTHER HIGH STRENGTH BOLTS SHALL BE OF THE DESIGNATION ASTM F3125 GRADE A325.

FURNISH TWO .012"± AND TWO .0032"± THICK SHIMS PER POST FROM BRASS SHIM STOCK OR STRIP, DESIGNATION ASTM B 36. SHIM AS REQUIRED TO PLUMB POST.

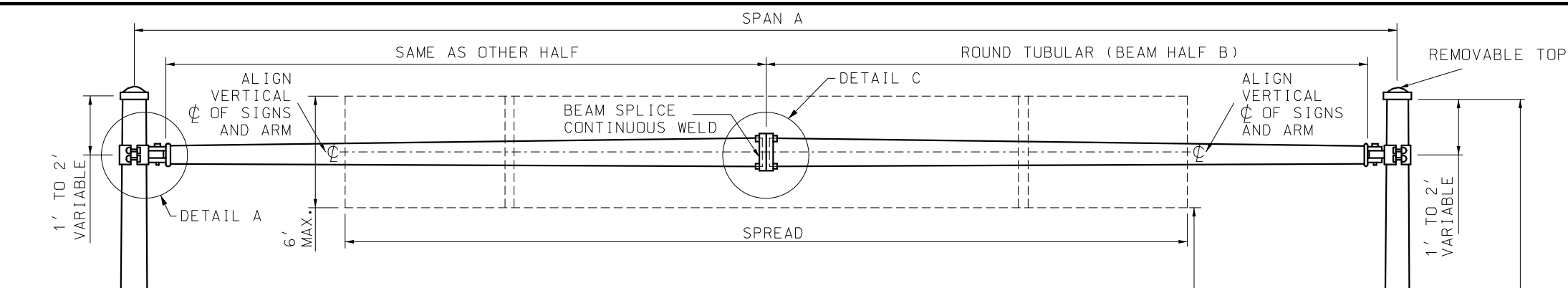
HIGH STRENGTH BOLTS WITH HEX NUT AND THREE WASHERS WITH EACH BOLT ARE TO BE GALVANIZED.

OPTIONAL HOLES (1 3/16" ROUND FOR "I" SHAPE POSTS AND 3/16" ROUND FOR PIPE POST BASE PLATES) AS SHOWN IN "ELEVATIONS" ARE TO BE USED AS AID FOR GALVANIZING ONLY.

		<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>POST INSTALLATION DETAILS</b> <b>POST AND FOOTING DETAILS</b> <b>WIDE FLANGE (WF) POSTS</b>	
DATE EFFECTIVE: 01/01/2021 DATE PREPARED: 10/14/2020	<b>903.03BN</b>	SHEET NO. <b>1 OF 16</b>	

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



SPAN A	SPREAD FEET											
	15	20	25	30	35	40	45	50	55	60	65	70
31'-6"	143	152										
35'-0"	126	138	153									
41'-3"	106	120	130	144								
41'-6"	124	134	144	155								
45'-0"	102	112	121	132	144							
51'-3"	78	88	98	108	118	129						
51'-6"	109	119	129	141	154	168						
55'-0"	88	98	108	119	131	142	155					
61'-3"	69	80	91	101	110	121	130	142				
61'-6"		115	124	133	144	157	170	182				
65'-0"		98	107	117	128	140	152	164	176			
71'-3"		80	89	98	109	121	132	144	156	164		
71'-6"		110	121	131	142	152	162	173	184	197		
75'-0"		94	104	114	124	139	144	154	165	176	187	
81'-3"		84	94	104	116	126	131	146	157	168	179	190

W=40 POUNDS PER SQUARE FOOT.

TYPE NO.	SPAN A	GA.	DIMENSIONS		END POST	
			GA.	D	GA.	D
S-1310	31'-6" THRU 41'-3"	3	8.8"	6" x 20'	3	10"
S-1310	41'-6" THRU 51'-3"	3	9.5"	6" x 25'	3	10"
S-1310	51'-6" THRU 61'-3"	3	10.5"	6.3" x 30'	3	10"
S-1312	61'-6" THRU 71'-3"	7	14"	9.1" x 35'	3	12"
S-1312	71'-6" THRU 81'-3"	7	16"	10.4" x 40'	3	12"

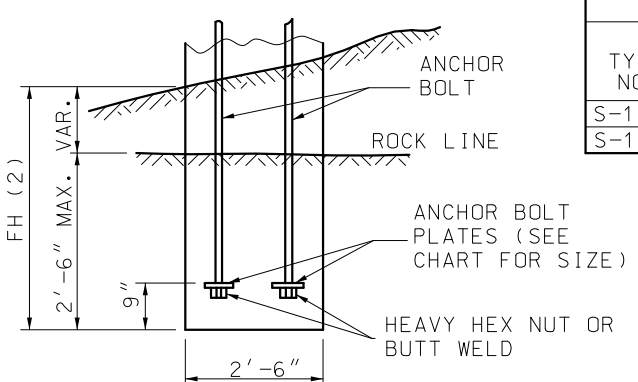
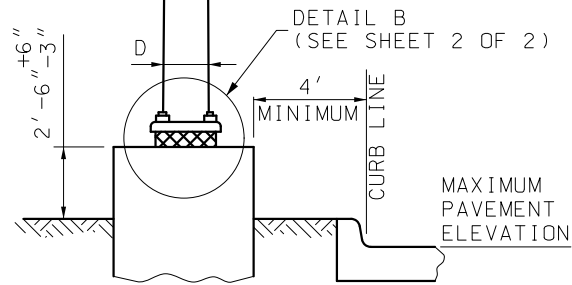
NOTES:  
DESIGN SPANS IN EVEN 3" INCREMENTS. SPECIFY SPAN A REQUIRED. FOR SPAN LENGTHS LESS THAN MAXIMUM FOR A DESIGNATED RANGE, THE LARGER DIAMETER OF THE CROSS BEAM IS HELD AND THE SMALLER DIAMETER WILL INCREASE AS LENGTH IS REDUCED. DESIGN POSTS IN EVEN 1" INCREMENTS.

TYPE NO.	DIA. FD	ESTIMATED QUANTITIES FOOTING						
		CLASS B CONCRETE		REINFORCING STEEL				
		1' DEPTH	1" DEPTH	#5	#4 (3)	TOTAL		
S-1310	2'-6"	0.1818	0.01515	6	8'-9"	10	7'-2"	103
S-1312	2'-6"	0.1818	0.01515	6	10'-3"	12	7'-2"	121

(3) ESTIMATED QUANTITY FOR REINFORCING STEEL IS BASED ON A 1V:2H SLOPE.

MODIFIED FOOTING IN SOLID ROCK		
TYPE NO.	ANCHOR BOLT (1)	ANCHOR BOLT PLATE
S-1310	1 1/2" DIA.	3 1/2" x 3 1/2" x 3/4"
S-1312	1 3/4" DIA.	3 1/2" x 3 1/2" x 3/4"

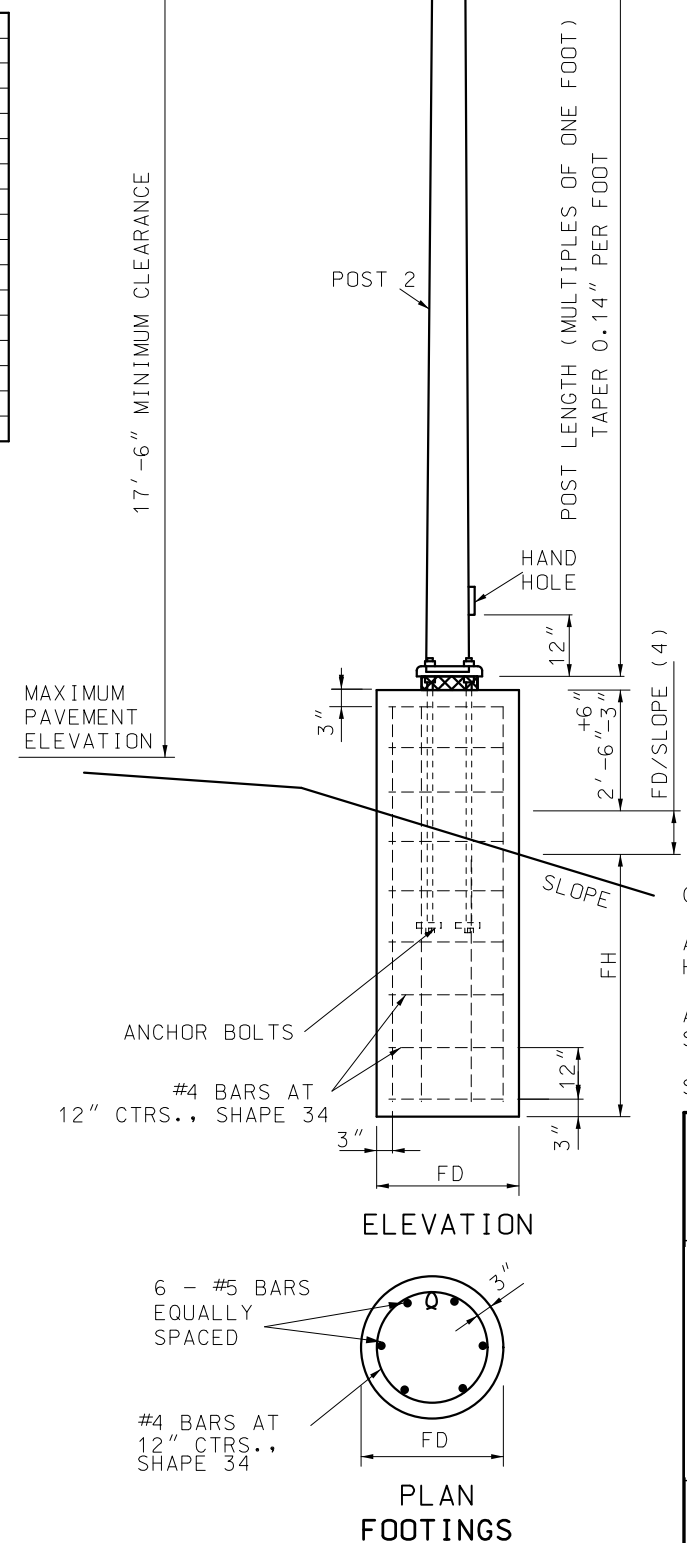
(1) ANCHOR BOLT LENGTH AS REQUIRED



REINFORCEMENT PLACED SAME AS STANDARD FOOTING. CONCRETE TO BE POURED TO EXCAVATED FACE OF ROCK.

**MODIFIED FOOTING IN SOLID ROCK**

(2) NOT TO EXCEED 5' FOR S-1310, NOT TO EXCEED 6'-6" FOR S-1312.



(4) EXAMPLE: IF SLOPE IS 1V:6H, THE DENOMINATOR IS 6

**GENERAL NOTES:**

- ALL SIGNS SHALL BE CENTERED VERTICALLY ABOUT THE HORIZONTAL C OF THE ARM.
- ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED HIGH STRENGTH ANCHOR BOLTS.
- SEE SHEET 2 OF 2 FOR DETAILS A, B AND C.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

**STATE OF MISSOURI**

NICOLE A. KOLB HOOD  
NUMBER PE-2001018754  
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

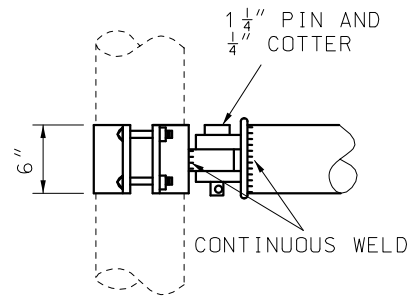
**HIGHWAY SIGNING**

TUBULAR SUPPORT STEEL  
TYPE S  
ONE TUBE

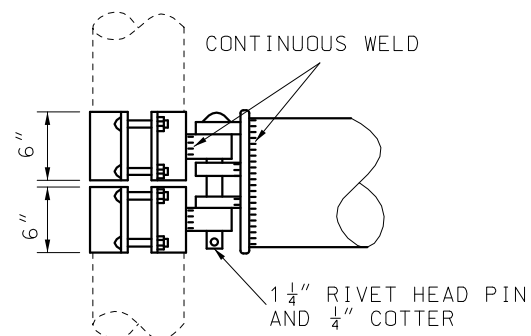
DATE EFFECTIVE: 01/01/2021  
DATE PREPARED: 10/14/2020

**903.05K**

SHEET NO.  
1 OF 2

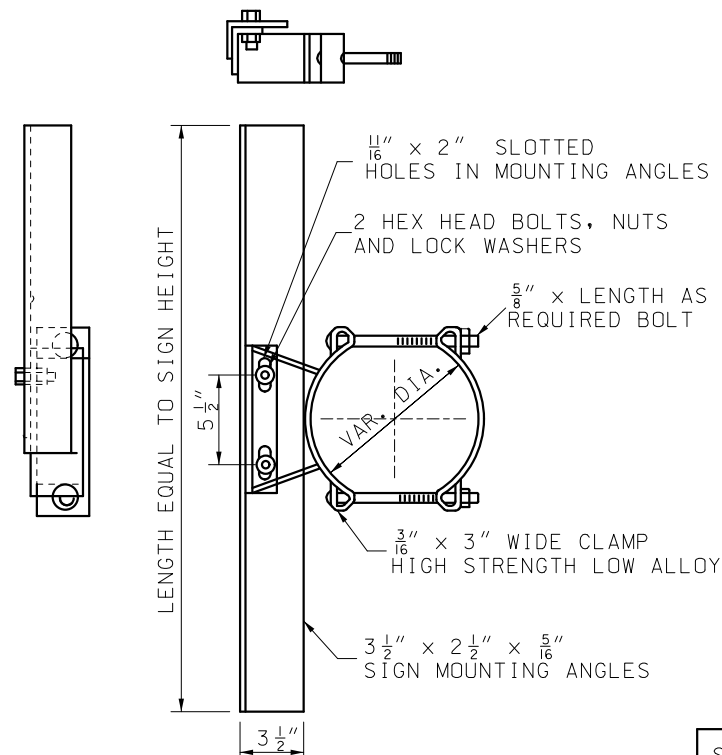


TUBE DIAMETER EQUAL TO OR LESS THAN 10 1/2" AT CENTER OF SPAN



TUBE DIAMETER GREATER THAN 10 1/2" AT CENTER OF SPAN

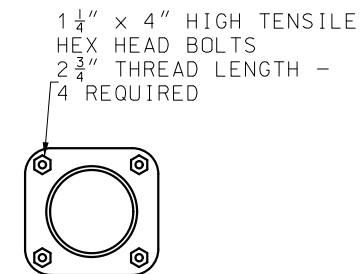
DETAIL A  
BEAM CLAMP



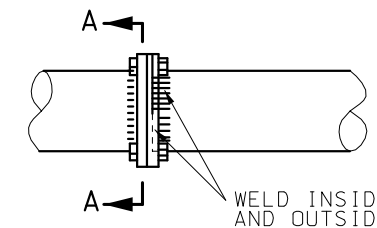
NOTE: MINIMUM OF TWO BRACKETS ARE REQUIRED FOR SIGNS OVER 42" IN LENGTH.

**GALVANIZED SIGN BRACKET ASSEMBLY**

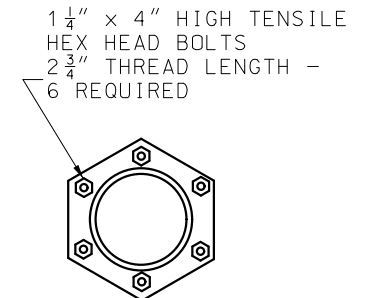
SIGN HEIGHT (INCHES)	MAXIMUM LIN. FT. OF SIGN WIDTH PER BRACKET
48 & UNDER	13
60	8
72	5



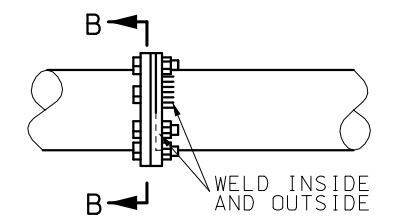
SECTION A-A



TUBE DIAMETER 9 1/2" AND UNDER



SECTION B-B

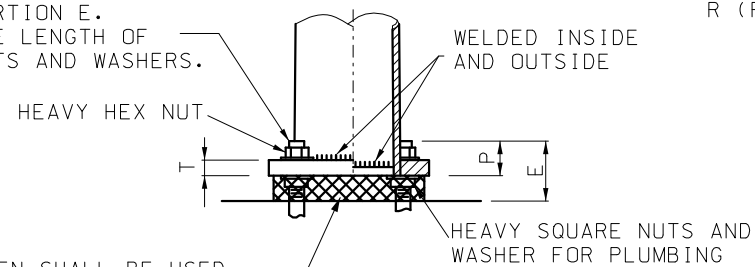


TUBE DIAMETER OVER 9 1/2"

DETAIL C  
BEAM SPLICE

POST BASE DIMENSIONS AND DATA												
TYPE NO.	BOLT CIRCLE	C	F	H	S	R	P	T	E	ANCHOR BOLT	FOOTING	
											FH	FD
S-1310	13 1/2"	17 1/2"	9 9/16"	1 3/4"	14 1/8"	3 1/8"	3 3/4"	1 1/2"	7"	1 1/2" x 60"	5'-0"	2'-6"
S-1312	16"	21"	11 5/16"	2 1/8"	17"	3 3/4"	4 1/2"	2"	7 1/2"	1 3/4" x 90"	6'-6"	2'-6"

ANCHOR BOLTS AS SPECIFIED. THREAD UPPER PORTION E. GALVANIZE ENTIRE LENGTH OF BOLT AND ALL NUTS AND WASHERS.



ELEVATION

PLAN

DETAIL B  
POST BASE

A GALVANIZED SCREEN SHALL BE USED BETWEEN THE POST BASE PLATE AND CONCRETE BASE. SCREENS SHALL BE PRESS-FORMED OF 3 OR 4 MESH, 21 GAGE OR HEAVIER. STAINLESS STEEL OR HOT-DIPPED GALVANIZED WIRE SCREEN OR APPROVED EQUIVALENT. THAT WILL PROVIDE A FRICTION-TIGHT FIT WHEN INSTALLED.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

**HIGHWAY SIGNING**

TUBULAR SUPPORT STEEL

TYPE S

ONE TUBE

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

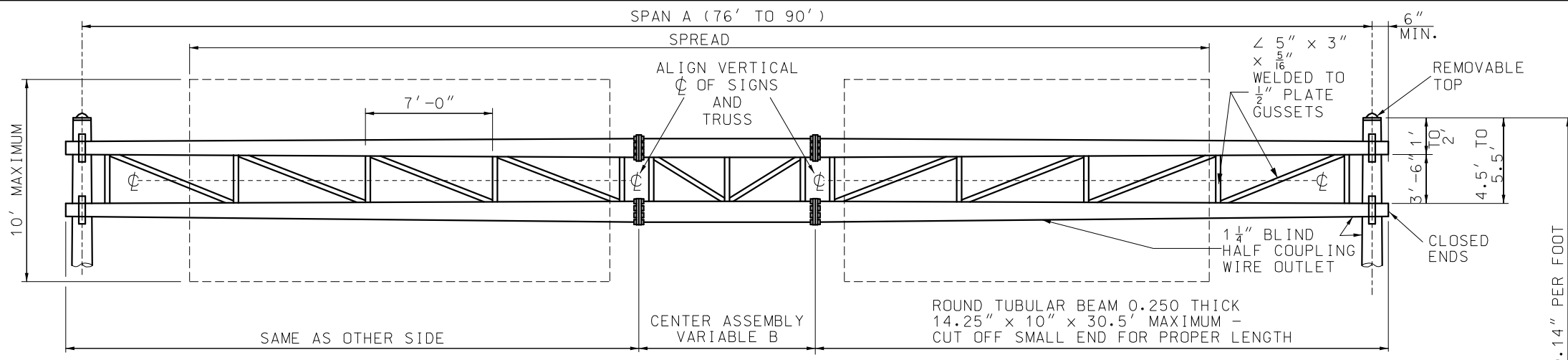
SHEET NO.  
2 OF 2

DATE EFFECTIVE: 01/01/2021

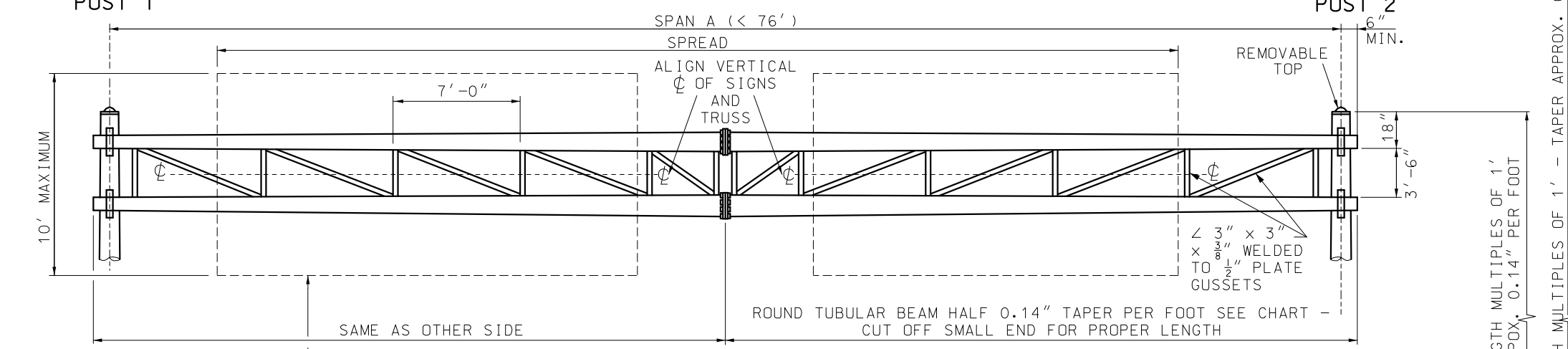
DATE PREPARED: 10/14/2020

903.05K

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



TWO END POST			
TYPE	GA	D INCHES	ALLOWABLE MOMENT-FT-LBS.
S-2315	3	15	120 000
S-2316.5	3	16.5	147 000
S-2318	3	18	177 000
S-27716	7+7	16	214 000
S-2018	0	18	222 000
S-27718	7+7	18	255 000
S-23316.5	3+3	16.5	292 000
S-23317	3+3	17	328 000
S-20018	0+0	18	453 000



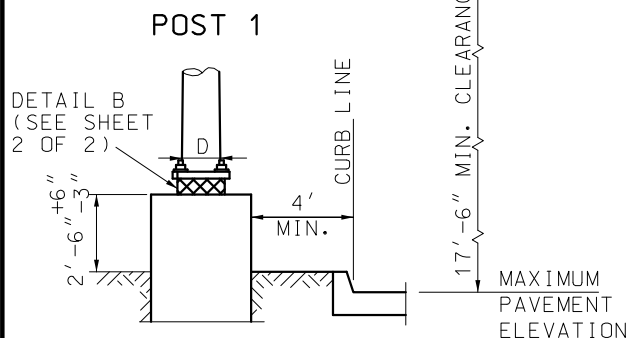
\* EXAMPLE: IF SLOPE IS 1V:6H, THE DENOMINATOR IS 6

GENERAL NOTES:

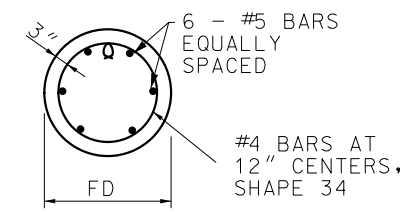
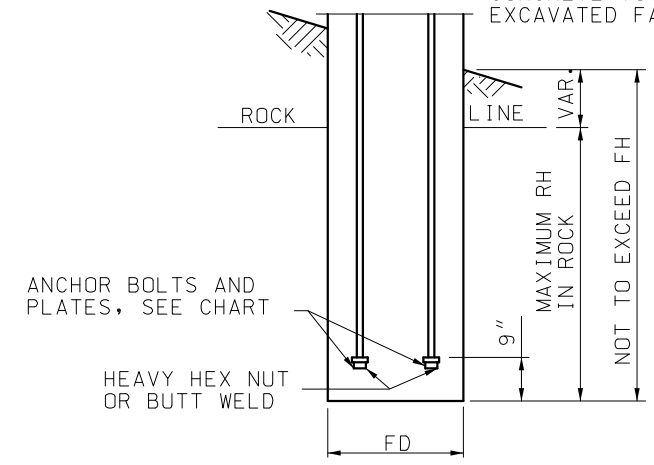
USE LONGEST POST AND SPAN A (NEXT GREATER IF NOT CHARTED) TO DETERMINE END POSTS AND STRUCTURE DESIGNS. MAXIMUM SIGN AREA FOR GIVEN SPREAD (INTERPOLATE FOR UNCHARTED SPREADS) NOT TO BE EXCEEDED. SUPPORTS DESIGNED BY END POST TYPE AND SPAN A (I.E. S-2315-40 ETC.).

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED HIGH STRENGTH ANCHOR BOLTS.

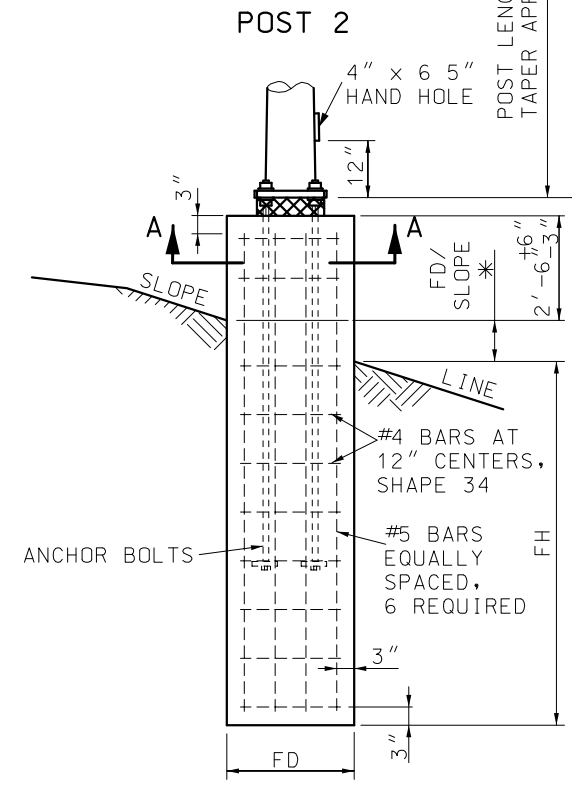
ALL SIGNS SHALL BE CENTERED VERTICALLY ABOUT THE HORIZONTAL  $\phi$  OF THE TRUSS.



REINFORCEMENT PLACED SAME AS STANDARD FOOTING, CONCRETE TO BE POURED TO EXCAVATED FACE OF ROCK.



SECTION A-A



ELEVATION

**MoDOT** MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
 NICOLE A. KOLB HOOD  
 NUMBER PE-2001018754  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

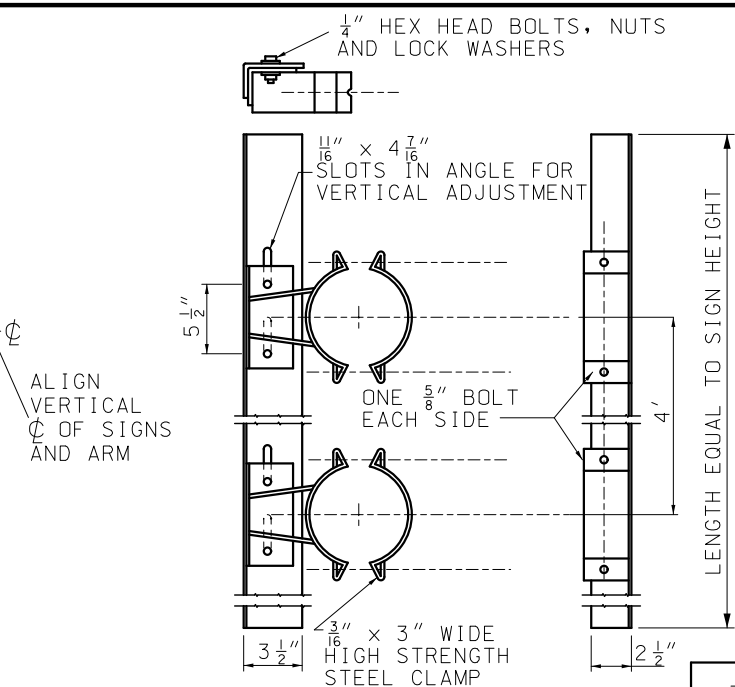
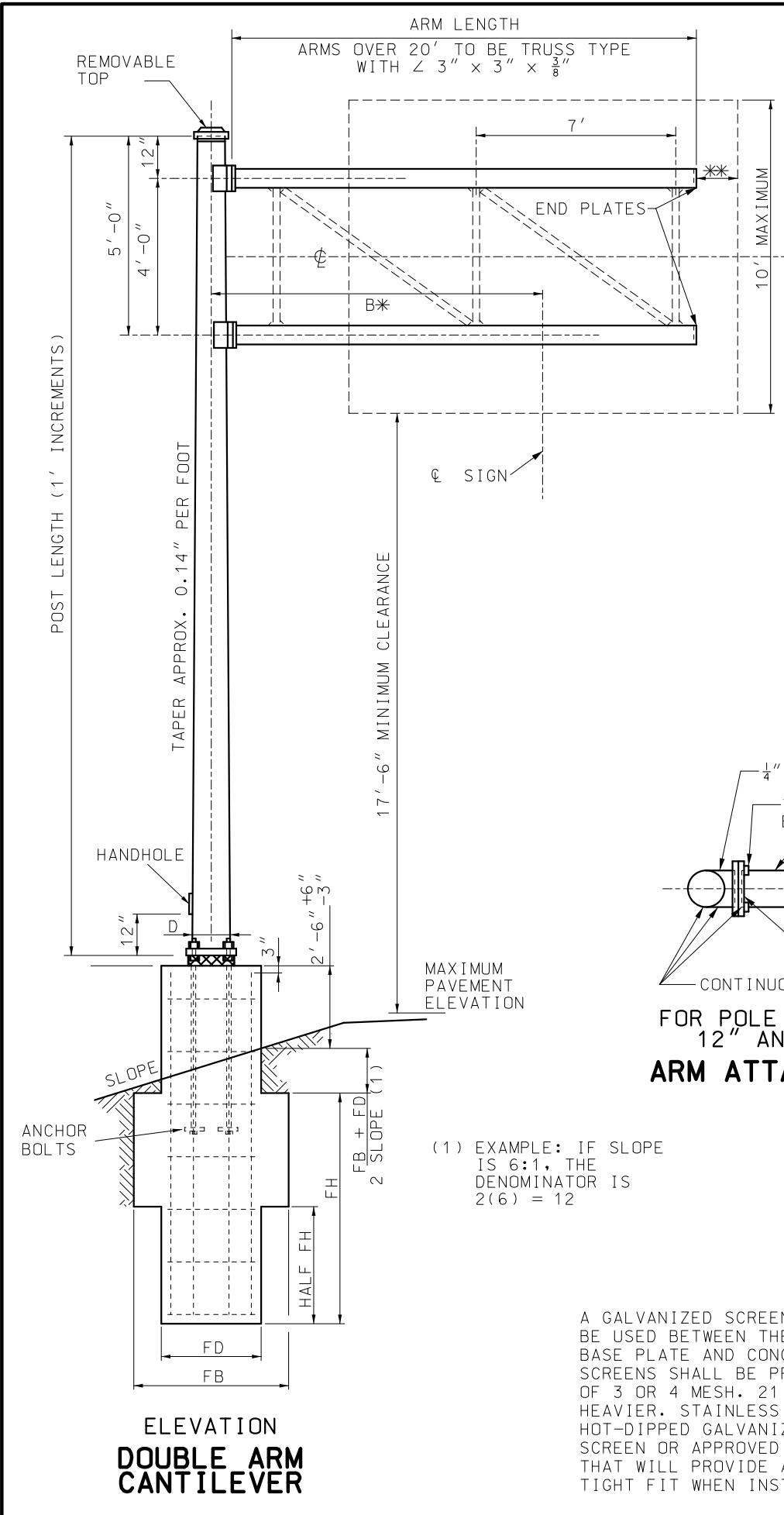
**HIGHWAY SIGNING**  
 TUBULAR SUPPORT STEEL  
 TYPE S  
 TWO TUBES

DATE EFFECTIVE: 01/01/2021	<b>903.06K</b>	SHEET NO. 1 OF 2
DATE PREPARED: 10/14/2020		

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



MINIMUM OF TWO BRACKETS REQUIRED ON SIGNS OVER 42" IN LENGTH

### GALVANIZED SIGN BRACKET ASSEMBLY

TYPE NUMBER	DIAMETER		CU. YD. CLASS B CONCRETE FOOTING				REINFORCING STEEL				
	FD	FB	FD SECTION		FB SECTION		#5		#4 (2)		TOTAL LBS.
			1' DEPTH	1" DEPTH	1' DEPTH	1" DEPTH	NO.	FT-IN	NO.	FT-IN	
C-2315	3'	4'	0.2618	0.0218	0.3729	0.0311	6	11'-3"	13	8'-9"	146
C-2318	3'-6"	5'	0.3563	0.0297	0.5507	0.0459	6	12'-2"	13	10'-4"	166
C-2018	3'-6"	5'	0.3563	0.0297	0.5507	0.0459	6	12'-8"	14	10'-4"	176

(2) ESTIMATED QUANTITY FOR REINFORCING STEEL IS BASED ON A 2:1 (H:V) SLOPE.

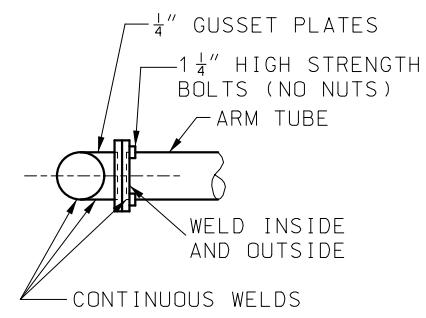
TYPE NUMBER	POST		ARM			B *	MAX. AREA SQ FT
	GA	DIA.	GA	DIMENSIONS			
C-2315-12	3	15"	7	7.5" x 5.82" x 12'		8'	130
C-2315-16	3	15"	7	9.0" x 6.76" x 16'		12'	120
C-2315-20	3	15"	3	10" x 7.2" x 20'		16'	115
C-2315-24	3	15"	3	11" x 7.64" x 24'		20'	100
C-2318-18	3	18"	7	9.0" x 6.48" x 18'		10'	145
C-2318-22	3	18"	7	11" x 7.92" x 22'		14'	150
C-2318-26	3	18"	7	12.5" x 8.86" x 26'		18'	150
C-2018-24	0	18"	7	12.5" x 9.14" x 24'		14'	205
C-2018-28	0	18"	3	12.5" x 8.58" x 28'		18'	215
C-2018-34	0	18"	0	13" x 8.24" x 34'		24'	190

SIGN HT. (IN.)	MAX. LIN. FT. OF SIGN WIDTH PER BRACKET	
	2 CLAMP TYPE	
42	16	
48	16	
60	16	
72	15	
84	11	
96	6	
108	4	
120	3	

\* FOR SIGNS WITH SIGN AREAS LESS THAN THE MAXIMUM LISTED IN THE TABLE ABOVE, B CAN BE RECALCULATED USING THE FOLLOWING EQUATION:

$$\left( \frac{\text{MAX. B FOR TRUE SIGN AREA}}{\text{TRUE SIGN AREA}} \right) \leq \left( \frac{\text{MAX. SIGN AREA}}{\text{TRUE SIGN AREA}} \right) \times \left( \frac{\text{MAX. B WITH MAX. SIGN AREA}}{\text{TRUE SIGN AREA}} \right)$$

\*\* THE CALCULATED VALUE OF B CANNOT RESULT IN A DISTANCE GREATER THAN 1/4 OF THE SIGN WIDTH



FOR POLE DIAMETER 12" AND OVER

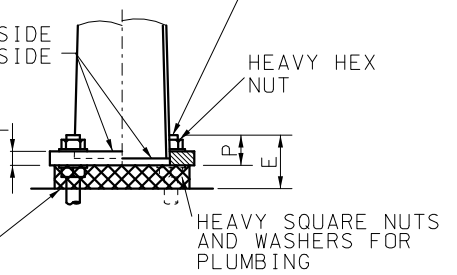
### ARM ATTACHMENT

TYPE NUMBER	POST BASE DIMENSIONS										FOOTING		
	Y	X	E	F	H	P	R	S	T	ANCHOR BOLTS	FH	FD	FB
C-1710 & C-1310	13 1/2"	17 1/2"	7"	9 9/16"	1"	3 3/4"	3 1/8"	14 1/8"	1 1/2"	1 1/2" x 60"	5'	2'	4'
C-2315	22"	28 5/8"	8 1/2"	15 1/2"	2"	4 3/4"	4 3/8"	23"	2"	2" x 96"	7'	3'	4'
C-2318	25 1/2"	33"	8 1/2"	18"	2"	4 3/4"	5 1/2"	26 1/2"	2"	2" x 96"	7'-6"	3'-6"	5'
C-2018	25 1/2"	33"	9 1/2"	18"	2"	5 1/2"	5 1/2"	26 1/2"	2 1/2"	2 1/4" x 96"	8'	3'-6"	5'

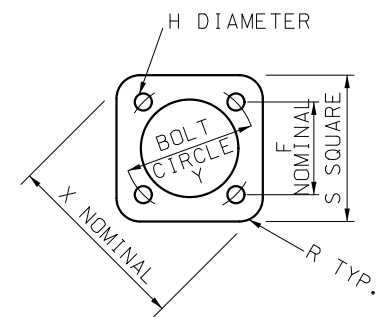
(1) EXAMPLE: IF SLOPE IS 6:1, THE DENOMINATOR IS 2(6) = 12

ANCHOR BOLTS AS SPECIFIED THREAD UPPER PORTION E. GALVANIZE ENTIRE LENGTH OF BOLT AND ALL NUTS AND WASHERS.

A GALVANIZED SCREEN SHALL BE USED BETWEEN THE POST BASE PLATE AND CONCRETE BASE. SCREENS SHALL BE PRESS-FORMED OF 3 OR 4 MESH, 21 GAGE OR HEAVIER, STAINLESS STEEL OR HOT-DIPPED GALVANIZED WIRE SCREEN OR APPROVED EQUIVALENT. THAT WILL PROVIDE A FRICTION-TIGHT FIT WHEN INSTALLED.



DETAIL A ELEVATION



PLAN POST BASE DETAIL

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

**STATE OF MISSOURI**

NICOLE A. KOLB HOOD  
NUMBER PE-2001018754  
PROFESSIONAL ENGINEER

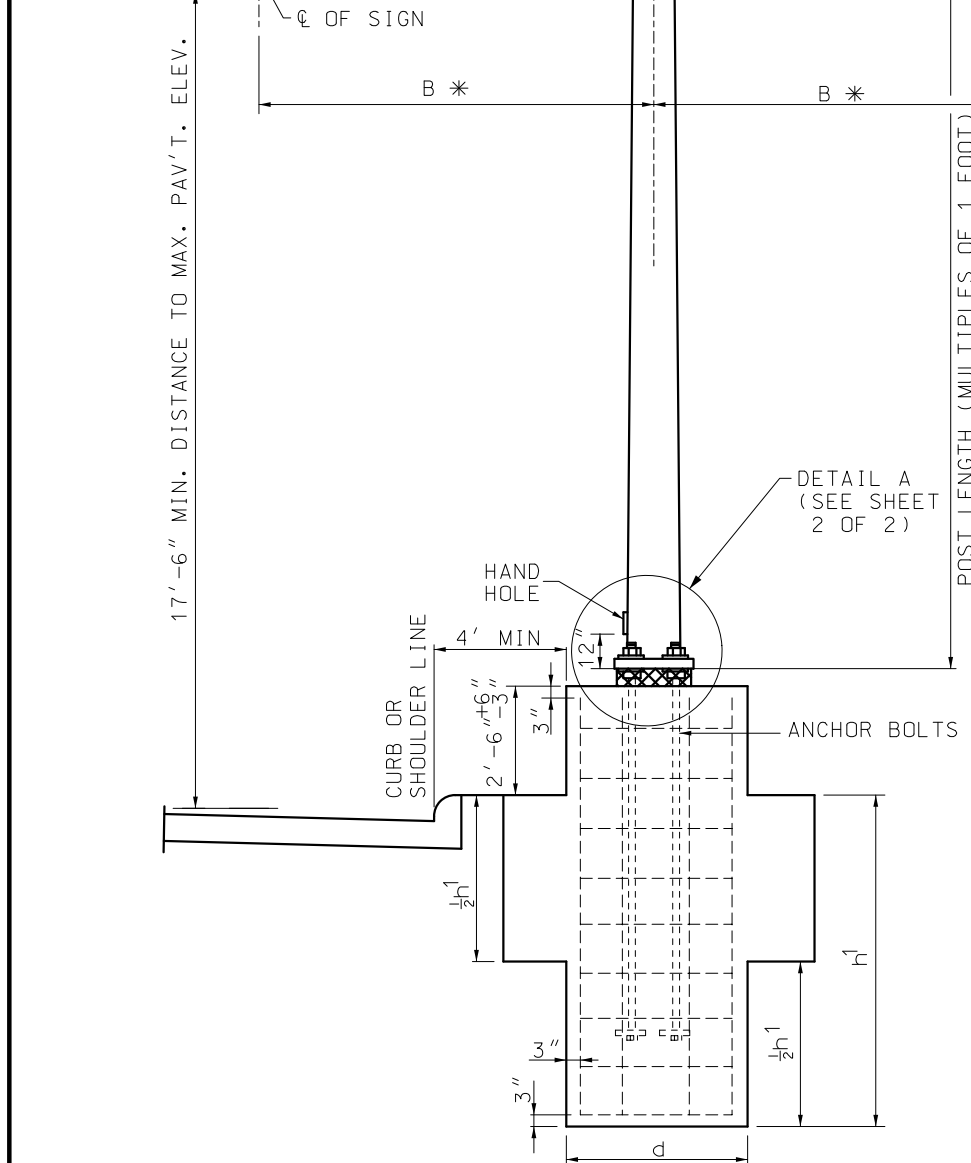
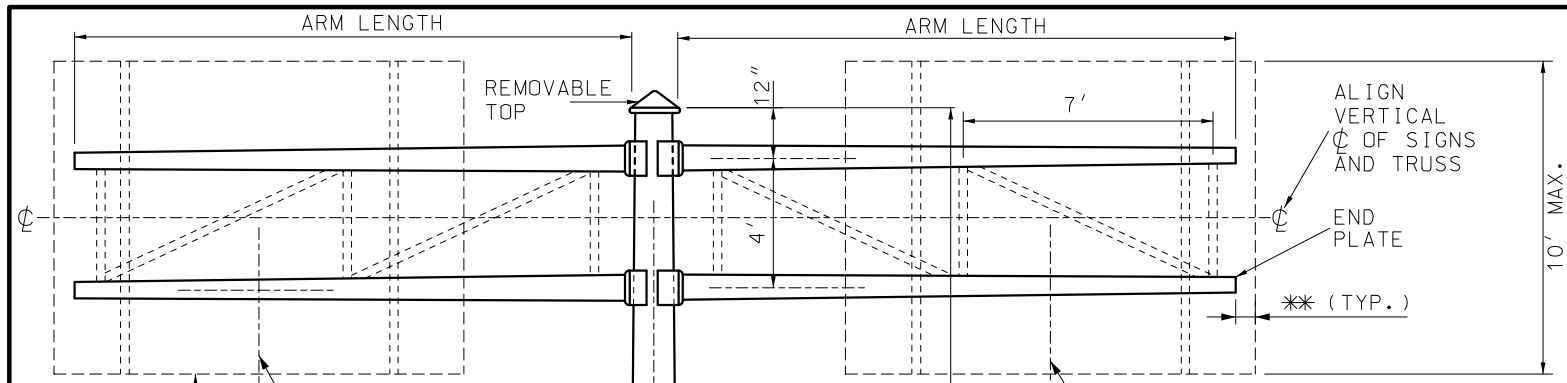
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

## HIGHWAY SIGNING TUBULAR SUPPORT STEEL TYPE C

DATE EFFECTIVE: 01/01/2021	903.07K	SHEET NO. 2 OF 2
DATE PREPARED: 10/14/2020		

ELEVATION DOUBLE ARM CANTILEVER

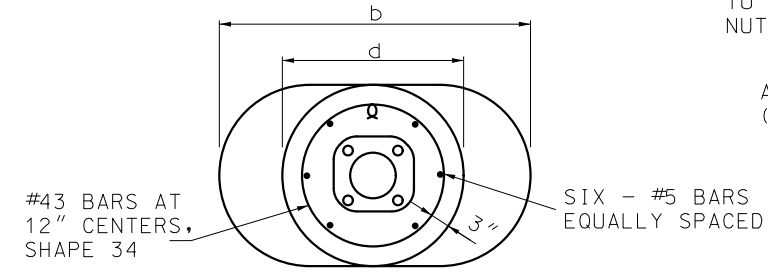




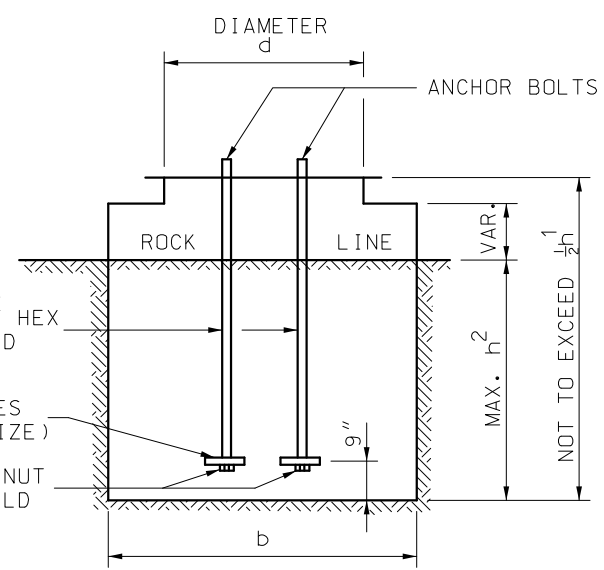
\* FOR SIGNS WITH SIGN AREAS LESS THAN THE MAXIMUM LISTED IN THE TABLE ABOVE, B CAN BE RECALCULATED USING THE FOLLOWING EQUATION:

$$\left( \text{MAX. B FOR TRUE SIGN AREA} \right) \leq \frac{\frac{1}{2} \left( \text{MAX SIGN AREA} \right) \times \left( \text{MAX. B WITH MAX. SIGN AREA} \right)}{\left( \text{TRUE SIGN AREA} \right)}$$

\*\* THE CALCULATED VALUE OF B CANNOT RESULT IN A DISTANCE GREATER THAN 1/4 OF THE SIGN WIDTH



PLAN FOOTING



FASTEN ANCHOR BOLTS TO PLATE WITH HEAVY HEX NUTS OR BY BUTT WELD

ANCHOR BOLT PLATES (SEE CHART FOR SIZE)

HEAVY HEX NUT OR BUTT WELD

REINFORCEMENT SAME AS STANDARD FOOTING

CONCRETE TO BE POURED TO EXCAVATED FACE OF ROCK

MODIFIED FOOTINGS IN SOLID ROCK

TYPE NUMBER	POST			ARM		MAX. AREA (2) SQ. FT.
	GA.	"B"*	DIA.	GA.	DIMENSIONS	
B-2018	0	8'	18"	7	7.5" x 5.82" x 12'	260
	0	12'	18"	7	9.0" x 6.76" x 16'	240
	0	16'	18"	3	10.0" x 7.2" x 20'	230
	0	20'	18"	3	11.0" x 7.64" x 24' (1)	200
B-23318	3+3	10'	18"	7	9" x 6.48" x 18'	290
	3+3	14'	18"	7	11" x 7.92" x 22' (1)	300
	3+3	18'	18"	7	12.5" x 8.86" x 26' (1)	300
B-20018	0+0	14'	18"	7	12.5" x 9.14" x 24' (1)	410
	0+0	18'	18"	3	12.5" x 8.58" x 28' (1)	430
	0+0	24'	18"	0	13" x 24" x 34' (1)	430

NOTES:

(1) ARMS OVER 20' TO BE TRUSS TYPE WITH  $\angle$  3" x 3" x 3/8" ANGLES.

(2) MAX SIGN AREA ON EACH SIDE EQUALS HALF THE TOTAL IN CHART.

W = 40# PER SQUARE FOOT

TYPE NUMBER	DIA. "d"	DIA. "b"	CLASS B CONCRETE FOOTING (C.Y.)				REINFORCING STEEL				
			"d" SECTION		"b" SECTION		#5		TOTAL LBS.		
			1' DEPTH	1' DEPTH	1' DEPTH	1' DEPTH	NO. FT.-IN.	NO. FT.-IN.			
B-2018	3'-6"	6'-0"	0.3563	0.0297	0.6800	0.0567	6	10'-0"	11	10'-4"	139
B-23318	3'-6"	7'-0"	0.3563	0.0297	0.8100	0.0675	6	10'-6"	12	10'-4"	149
B-20018	3'-6"	7'-0"	0.3563	0.0297	0.8100	0.0675	6	12'-0"	13	10'-4"	165

(3) ESTIMATED QUANTITY FOR REINFORCING STEEL IS BASED ON A 2:1 (H:V) SLOPE.

TYPE NUMBER	ANCHOR BOLT (4) (DIA.)	ANCHOR BOLT PLATE	FOOTING			CLASS B CONCRETE FOOTING CU. YD.	
			"h <sup>2</sup> "	"d"	"b"	"b" SECTION	
			1' DEPTH	1' DEPTH	1' DEPTH	1' DEPTH	1' DEPTH
B-2018	2 1/4"	4 1/2" x 4 1/2" x 3/4"	3'-6"	3'-6"	3'-6"	0.3563	0.0297
B-23318	3"	5 1/2" x 5 1/2" x 1"	4'-0"	3'-6"	4'-6"	0.4860	0.0405
B-20018	3"	5 1/2" x 5 1/2" x 1"	5'-0"	3'-6"	4'-6"	0.4860	0.0405

(4) ANCHOR BOLT LENGTH AS REQUIRED

GENERAL NOTE:

ALL SIGNS SHALL BE CENTERED VERTICALLY ABOUT THE HORIZONTAL C OF THE TRUSS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED HIGH STRENGTH ANCHOR BOLTS.

**MoDOT** MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

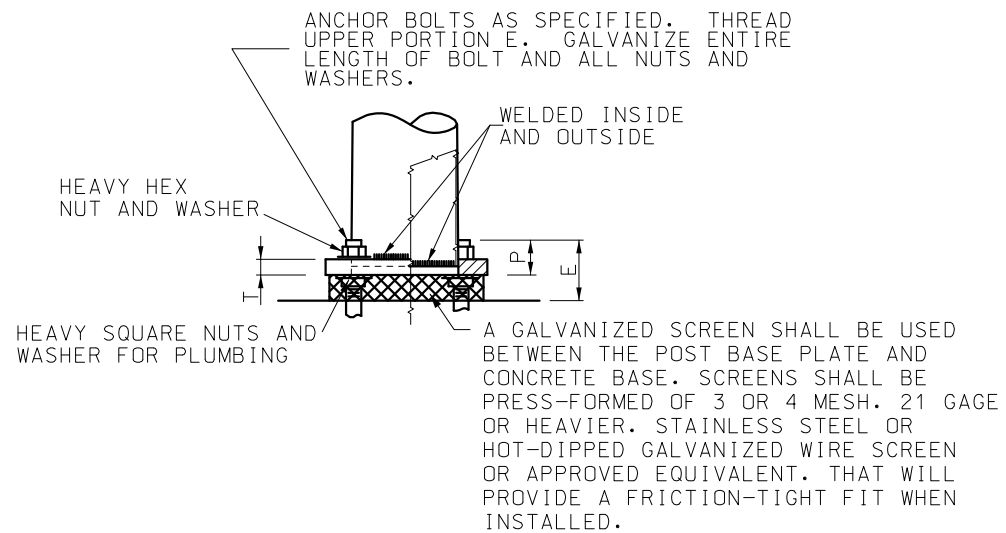
105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
NICOLE A. KOLB HOOD  
NUMBER PE-2001018754  
PROFESSIONAL ENGINEER

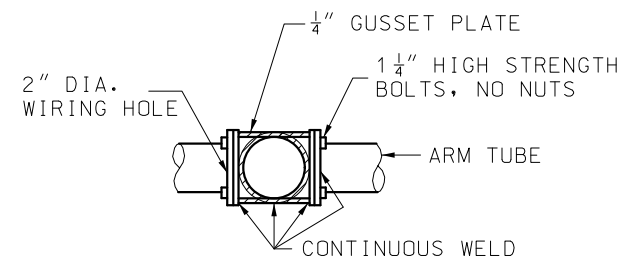
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**HIGHWAY SIGNING  
TUBULAR SUPPORT STEEL  
TYPE B**

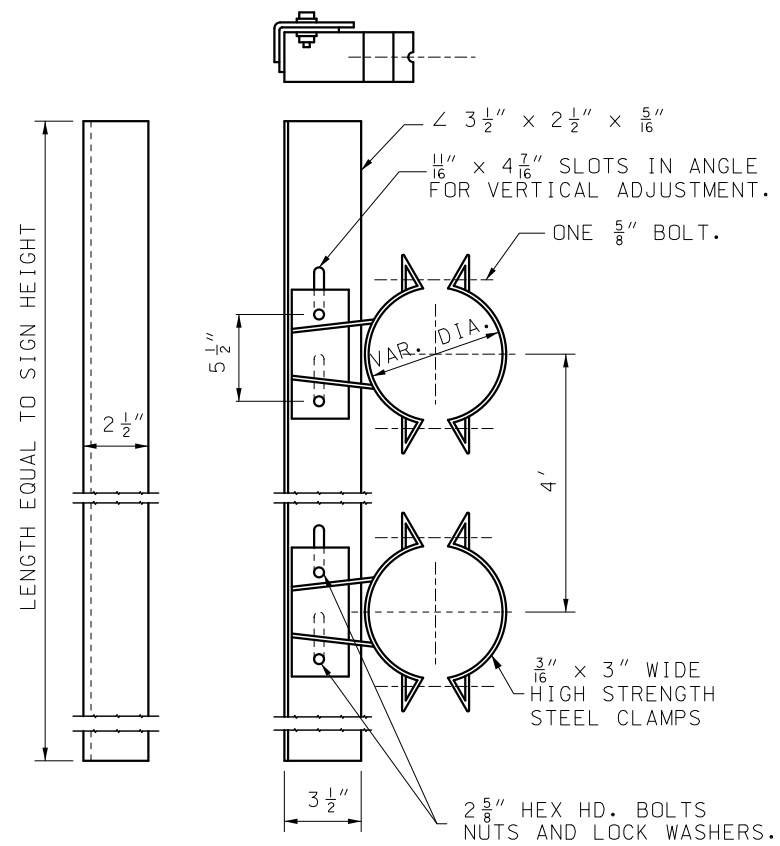
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



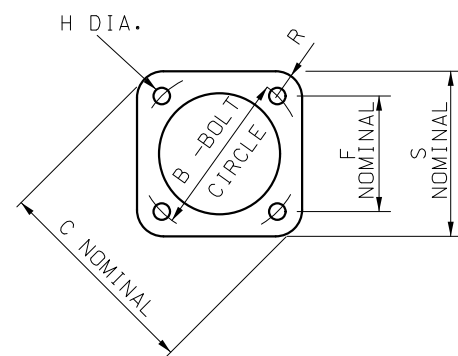
**DETAIL A  
ELEVATION BASE DETAIL**



**ARM ATTACHMENT DETAIL**



**GALVANIZED SIGN BRACKET ASSEMBLY \***



**PLAN POST BASE DETAIL**

SIGN HEIGHT INCHES	MAX. LIN. FT. OF SIGN WIDTH PER BRACKET
48 & UNDER	16
60	16
72	15
84	11
96	6
108	4
120	3

\* MINIMUM OF TWO BRACKETS REQUIRED ON SIGNS OVER 42" IN LENGTH

TYPE NUMBER	POST BASE DIMENSIONS										FOOTING		
	B	C	F	H	S	R	P	T	E	ANCHOR BOLTS	"h"	"d"	"b"
	B-2018	25 1/2"	33"	18"	2 5/8"	26 1/2"	5 1/2"	5 1/2"	2 1/2"	9 1/2"	2 1/4" x 96"	7'-6"	3'-6"
B-23318	25 1/2"	33"	18"	3 3/8"	26 1/2"	5 1/2"	7"	3"	12"	3" x 120"	8'-0"	3'-6"	7'-0"
B-20018	25 1/2"	33"	18"	3 1/8"	26 1/2"	5 1/2"	7"	3"	12"	3" x 120"	9'-6"	3'-6"	7'-0"

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NICOLE A. KOLB HOOD  
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**PROFESSIONAL ENGINEER**

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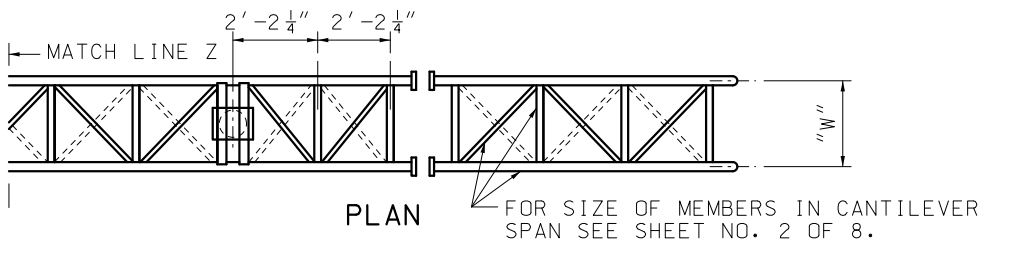
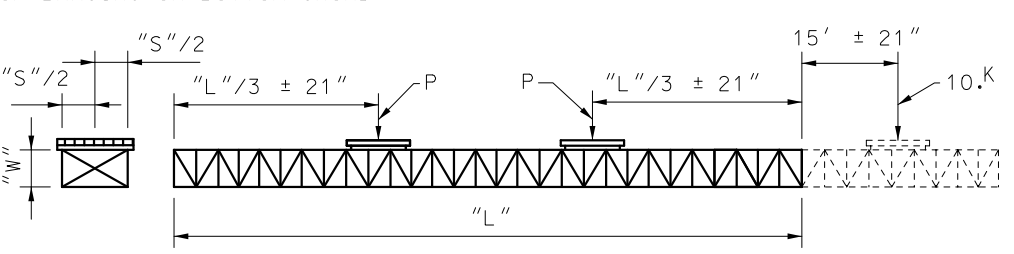
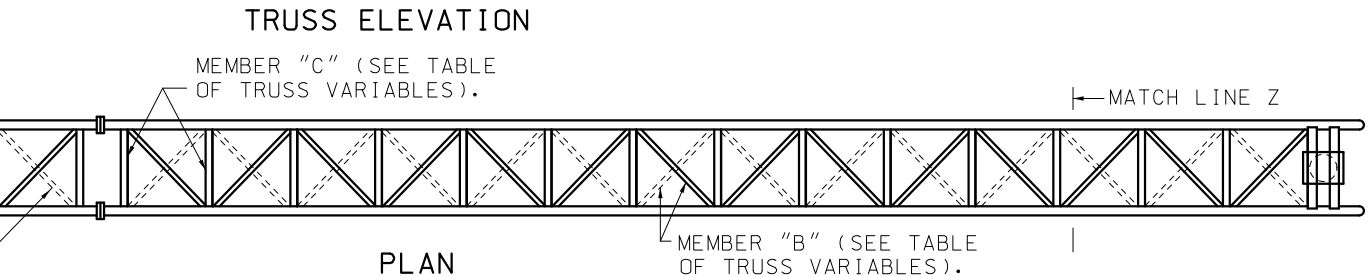
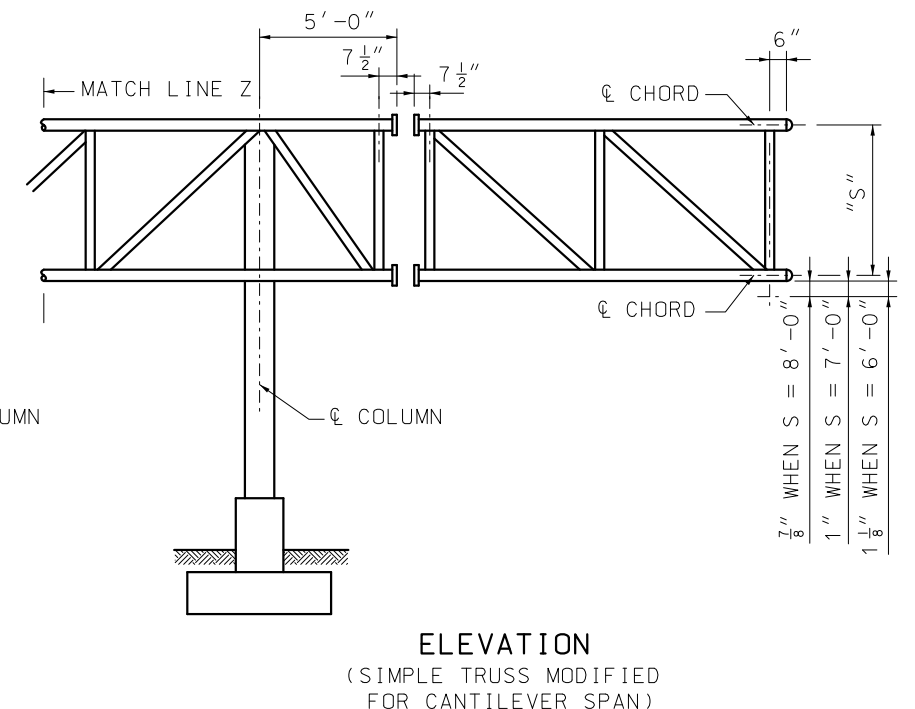
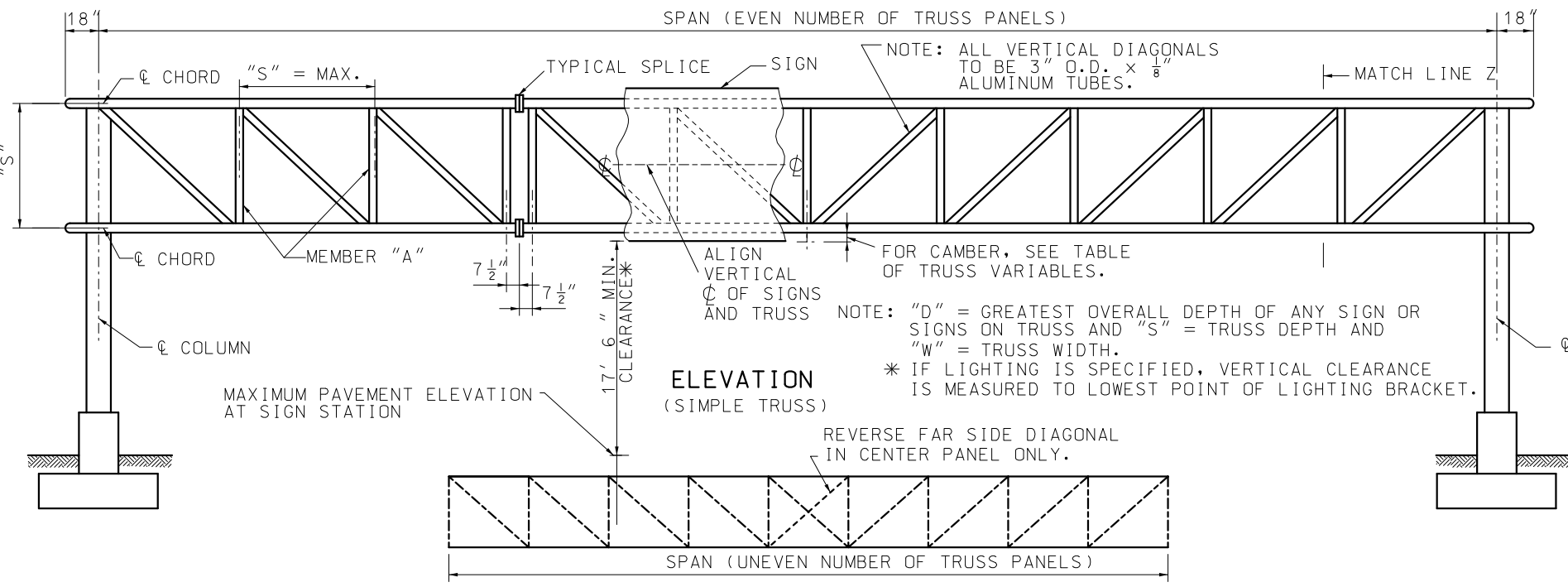
**HIGHWAY SIGNING  
TUBULAR SUPPORT STEEL  
TYPE B**

DATE EFFECTIVE: 01/01/2021  
DATE PREPARED: 10/14/2020

**903.08J**

SHEET NO.  
2 OF 2

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



$P = \frac{84\alpha W}{L} - 0.02 L$  WHERE  
 P = CONCENTRATED LOAD IN KIPS.  
 $\alpha$  = AREA OF ONE CHORD TUBE IN SQUARE INCHES.  
 (USE 0.76 $\alpha$  FOR 4" DIA. x 1/4" AND 4 1/2" DIA. x 1/4" CHORDS)  
 W = WIDTH OF TRUSS IN FEET.  
 L = SPAN LENGTH IN FEET.

SAMPLE, GIVEN:  $\alpha = 4.123$  SQ. IN.,  $W = 6'-0"$  AND  $L = 100'$ .  
 SOLUTION:  $P = \frac{84 \times 4.123 \times 6.0}{100} - 0.02 \times 100 = 20.8 - 2 = 18.8$

NOTE:  
 IF CANTILEVERED, REMOVE CONCENTRATED LOAD NEAREST CANTILEVER END AND LOAD CANTILEVER SPAN AS SHOWN ABOVE.  
 15' OR LESS CANTILEVER SPANS NEED NOT BE TESTED.  
 REPEAT ABOVE TESTS BY ROTATING 180° (TO SIMULATE WIND REVERSAL). NO VERTICAL LOAD (D.L.) TEST WILL BE REQUIRED.  
 LOADS P SHALL NOT BE MORE THAN 16° FOR SPANS LESS THAN 55 FEET AND 20°. FOR ALL OTHERS.

**SIMULATED WIND-SHOP TEST LOADING**

TRUSS VARIABLES						
SPAN	"S"	"W"	MEMBER "A"	MEMBER "B"	MEMBER "C"	SHOP CAMBER
UP TO 70'-6"	6'-0"	5'-0"	2 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	1 3/4" DIA. x 1/8"	3/4"
71' TO 80'-6"	6'-0"	6'-0"	2 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	2" DIA. x 1/8"	1 1/4"
81' TO 90'-6"	6'-0"	6'-0"	2 1/2" DIA. x 1/8"	2 3/4" DIA. x 1/8"	2" DIA. x 1/8"	1 1/2"
91' TO 100'-6"	6'-0"	6'-0"	2 1/2" DIA. x 1/8"	2 3/4" DIA. x 1/8"	2" DIA. x 1/8"	2 1/4"
101' TO 110'-6"	7'-0"	7'-0"	2 1/2" DIA. x 1/8"	3" DIA. x 1/8"	2 1/4" DIA. x 1/8"	2 1/2"
111' TO 120'-6"	7'-0"	7'-0"	2 1/2" DIA. x 1/8"	3 1/2" DIA. x 1/8"	2 1/4" DIA. x 1/8"	2 3/4"
121' TO 130'-6"	7'-0"	7'-0"	3" DIA. x 1/8"	3 1/2" DIA. x 1/8"	2 1/4" DIA. x 1/8"	3 3/4"
131' TO 140'-6"	8'-0"	7'-0"	3" DIA. x 1/8"	3 3/4" DIA. x 1/8"	2 1/2" DIA. x 1/8"	3"
141' TO 150'-6"	8'-0"	7'-0"	3" DIA. x 1/8"	3 3/4" DIA. x 1/8"	2 3/4" DIA. x 1/8"	3 3/4"
151' TO 160'-6"	8'-0"	7'-0"	3" DIA. x 1/8"	3 3/4" DIA. x 1/8"	2 3/4" DIA. x 1/8"	4 1/2"

NOTE:  
 FOR SIZE OF CHORD MEMBERS, SEE DATA SHEET. SHOP CAMBER MAY BE PARABOLIC OR STRAIGHT, BUT SHALL BE SYMMETRICAL ABOUT CENTERLINE OF SPAN.

GENERAL NOTES:  
 ALL STRUCTURAL STEEL AND COLUMN BASE PLATES ASTM A36.  
 ALL ANCHOR BOLTS SHALL BE ASTM F1554, GRADE 36.  
 PROPOSED FIELD SPLICES SHALL BE SHOWN ON SHOP DRAWINGS FOR APPROVAL OF THE ENGINEER.  
 TRUSSES SHALL BE FABRICATED WITH A MINIMUM OF SPLICING IN TRUSS CHORDS.  
 FIELD SPLICING WILL NOT BE PERMITTED WITHIN THE MIDDLE ONE-THIRD OF SPAN.  
 PERMISSIBLE VENT HOLES (MAXIMUM 1/8" DIAMETER) SHALL BE PLACED A MINIMUM OF 3" FROM WELD ON LOW SIDE OF HORIZONTAL, VERTICAL AND DIAGONAL TUBES.  
 ALL SIGNS SHALL BE CENTERED VERTICALLY ABOUT THE HORIZONTAL  $\phi$  OF THE TRUSS.  
 FOR ADDITIONAL INFORMATION SEE DATA SHEET.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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**OVERHEAD SIGN TRUSSES**

ALUMINUM

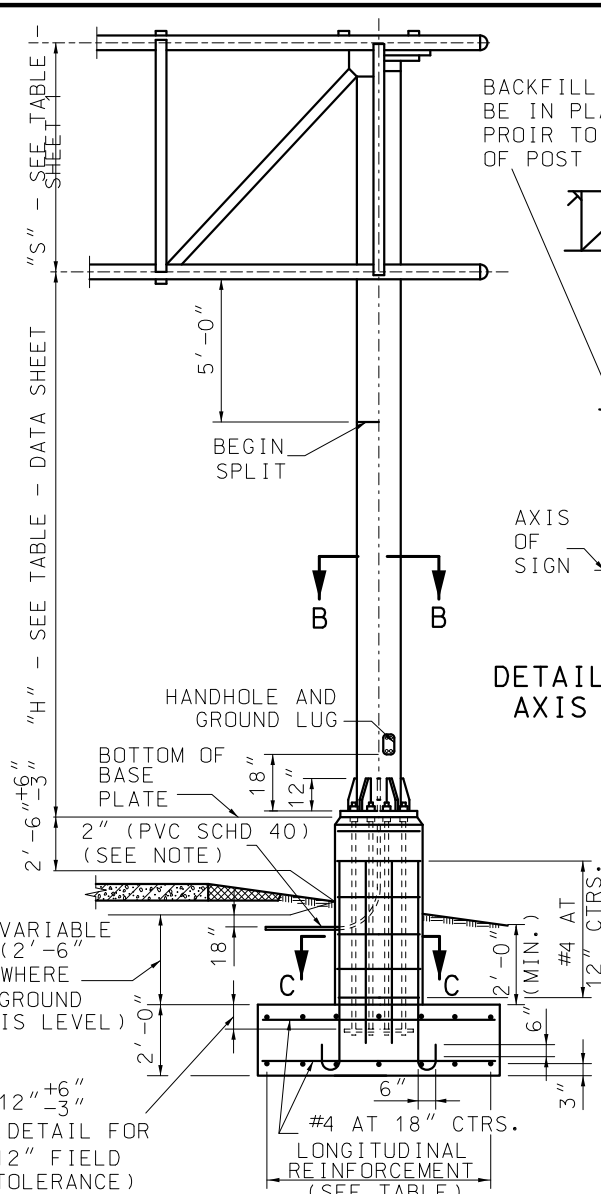
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**903.10BD**

SHEET NO.  
1 OF 6

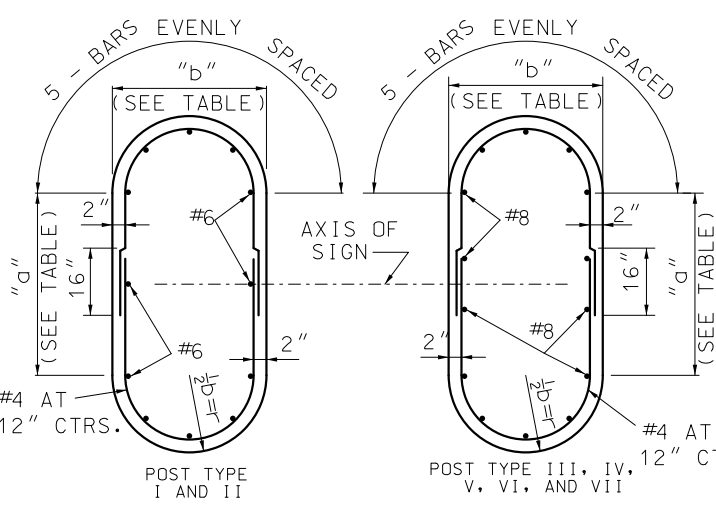
DATE EFFECTIVE: 01/01/2021  
DATE PREPARED: 10/14/2020

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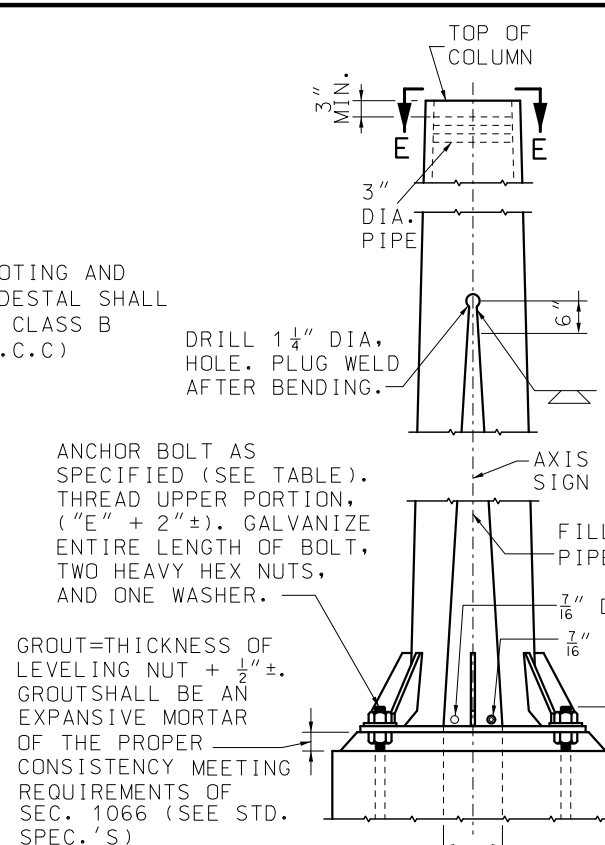
**ELEVATION**

NOTE:  
THE 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MINIMUM RADIUS BEND OF 9 1/2".

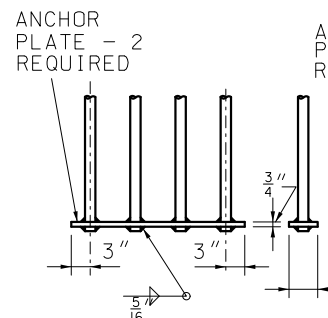


**SECTION C-C**

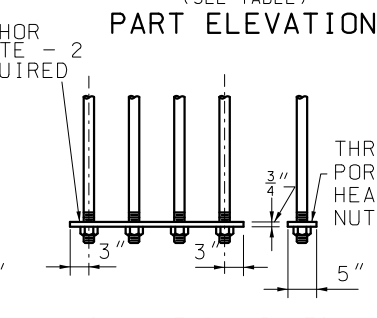
(TYPICAL SECTION SHOWING REINFORCING STEEL)  
NOTE: FOR DETAILS OF ALTERNATE PEDESTAL, SEE SHEET NO. 5 OF 6.



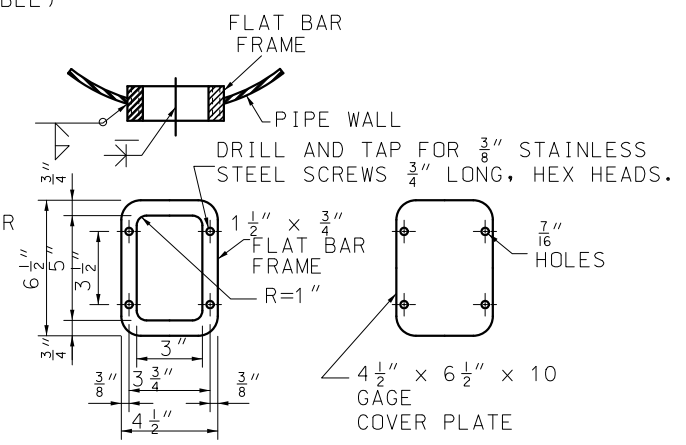
**PART ELEVATION**



**ANCHORAGE DETAIL A**



**ANCHORAGE DETAIL B (OPTIONAL)**

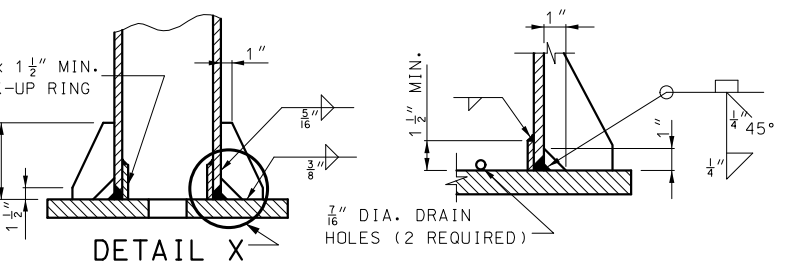


**HANDHOLE AND COVER DETAIL**

NOTE: HANDHOLE REQUIRED ONLY IN POWER COLUMN.

POST TYPE	PIPE COLUMN	DIMENSION "E"	SPLIT	BASE PLATE SIZE*	ANCHOR BOLTS DIA.	PEDESTAL SIZE*		FOOTING SIZE*	LONGITUDINAL FOOTING REINFORCEMENT		CONCRETE C.Y.
						a	b		TOP	BOTTOM	
I	12" STD. AT 65.42	8 1/2"	6"	2'-6" x 23" x 1 1/2"	6 AT 2 1/4"	4'-0"	2'-11"	7'-0" x 14'-6"	7-#5 BARS	7-#6 BARS	10.9
II	14" O.D. AT 72.09	8 1/2"	9 1/2"	3'-0" x 2'-0" x 1 1/2"	6 AT 2 1/4"	4'-4"	3'-0"	8'-0" x 16'-0"	8-#5 BARS	9-#6 BARS	13.2
III	16" O.D. AT 82.77	8 3/4"	11 1/2"	3'-4" x 2'-2" x 1 3/4"	6 AT 2 1/4"	4'-8"	3'-2"	8'-6" x 17'-6"	9-#5 BARS	9-#7 BARS	15.2
IV	18" O.D. AT 93.45	9 1/2"	12 1/2"	3'-7" x 2'-4" x 2"	6 AT 2 1/2"	5'-1"	3'-4"	9'-6" x 19'-0"	10-#5 BARS	10-#8 BARS	18.1
V	20" O.D. AT 104.13	9 1/2"	13"	3'-10" x 2'-9" x 2"	8 AT 2 1/2"	5'-4"	3'-9"	10'-0" x 20'-0"	10-#5 BARS	10-#8 BARS	20.6
VI	24" O.D. AT 125.49	9 1/2"	10 1/2"	4'-0" x 3'-3" x 2"	8 AT 2 1/2"	5'-6"	4'-3"	10'-6" x 21'-0"	11-#5 BARS	11-#8 BARS	23.3
VII	24" O.D. AT 125.49	9 1/2"	13 1/2"	4'-3" x 3'-3" x 2"	8 AT 2 1/2"	5'-9"	4'-3"	11'-0" x 22'-0"	11-#5 BARS	11-#9 BARS	25.1

\* BASE PLATES, PEDESTAL, AND FOOTINGS, LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.



**DETAIL X**

**PART SECTION A-A**

**PART SECTION E-E**

GENERAL NOTES:

A TAPERED TUBE OF EQUIVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.

ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE; ASTM SPECIFICATION A53. NO OBJECTIONABLE SEAMS WILL BE PERMITTED.

ALL STRUCTURES SHALL BE GROUNDED.

BURR THREADS ON ALL ANCHOR BOLTS.

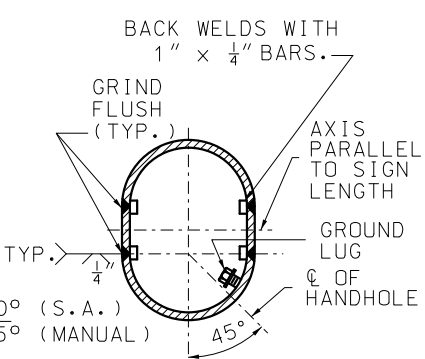
A HORIZONTAL WELDED SPLICE MAY BE FABRICATED IN THE COLUMN BETWEEN THE TOP OF PIPE AND 4'-0" BELOW THE BOTTOM CHORDS OF THE TRUSS WHEN DETAILED ON THE PIPE AND 4'-0" BELOW THE BOTTOM CHORDS OF THE TRUSS WHEN DETAILED ON THE SHOP DRAWINGS AND APPROVED BY THE ENGINEER.

GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND HOLE.

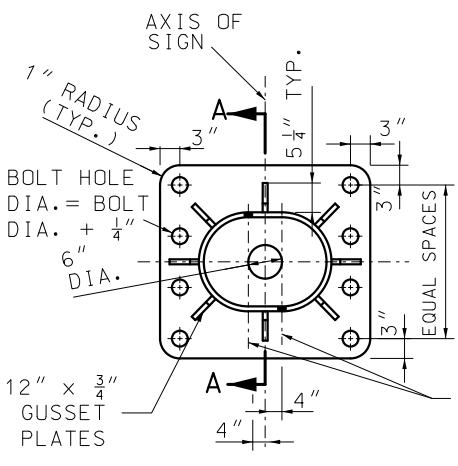
QUANTITIES FOR PEDESTAL, BASED ON NOMINAL HEIGHT OF 5'-0".

QUANTITIES FOR FOOTING, BASED ON NOMINAL DEPTH OF 2'-0".

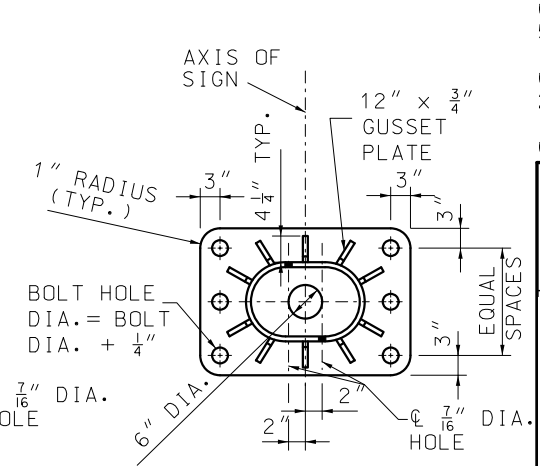
QUANTITIES SHOWN ARE FOR ONE COLUMN ONLY.



**SECTION B-B (FOR SPLIT COLUMNS ONLY)**



**8 ANCHOR TYPE**



**6 ANCHOR TYPE**

**TYPICAL BASE PLATES**

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
105 WEST CAPITOL JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

**STATE OF MISSOURI**  
NICOLE A. KOLB HOOD  
NUMBER PE-2001018754  
PROFESSIONAL ENGINEER

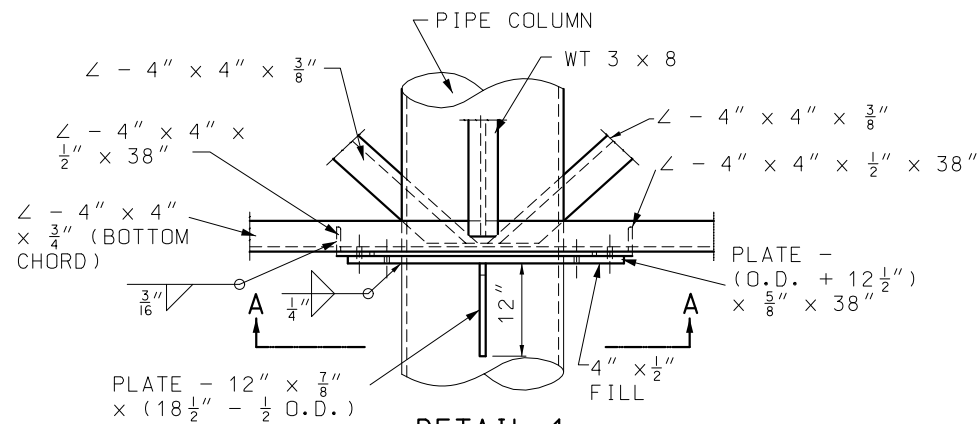
**OVERHEAD SIGN TRUSSES**  
ALUMINUM

DATE EFFECTIVE: 01/01/2021  
DATE PREPARED: 10/14/2020

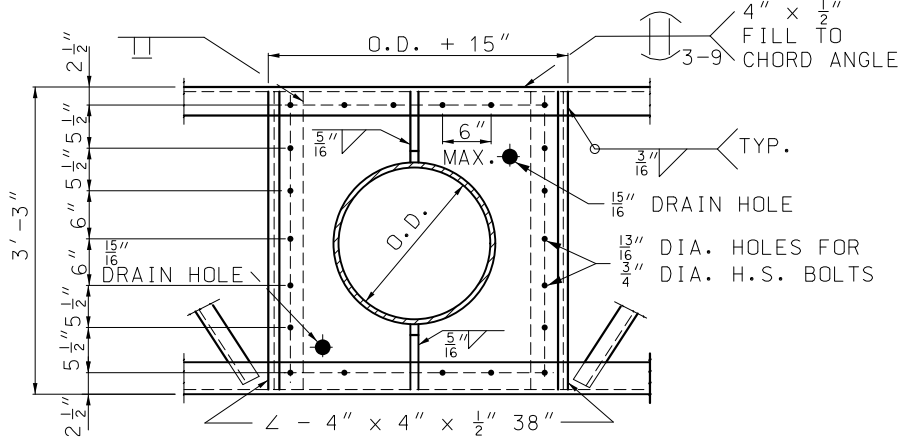
903.10BD

SHEET NO. 4 OF 6

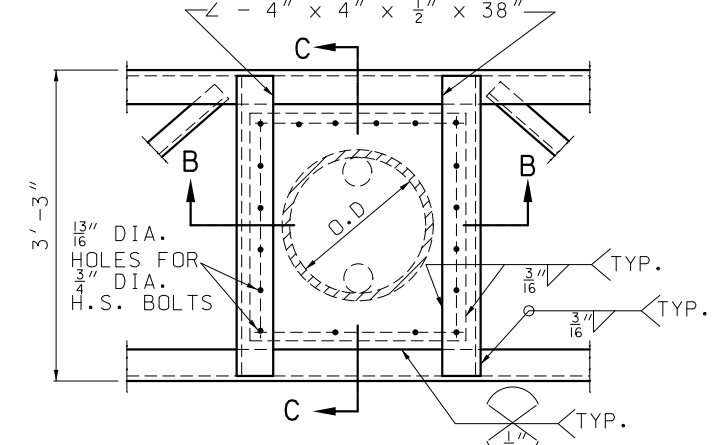
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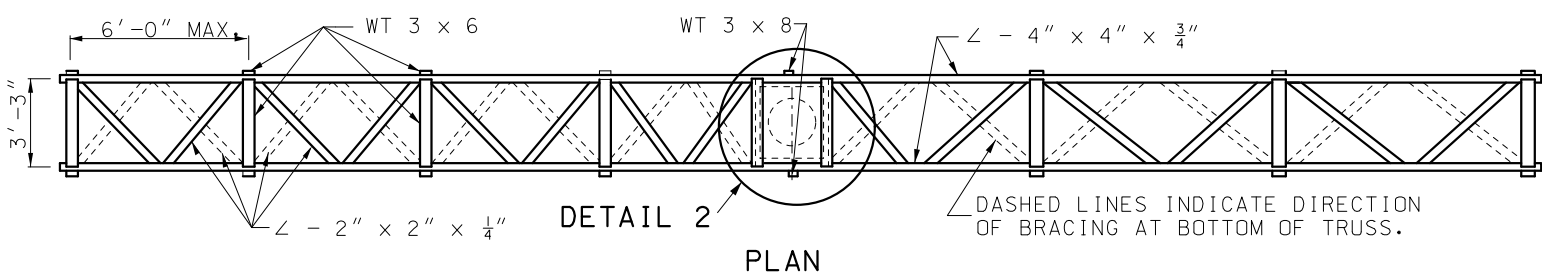
**DETAIL 1**  
TRUSS BOTTOM CONNECTION TO COLUMN



**SECTION A-A**

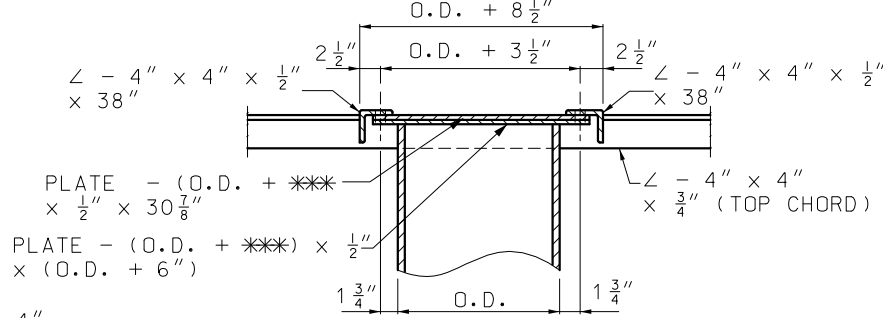


**DETAIL 2**  
TRUSS TOP CONNECTION TO COLUMN

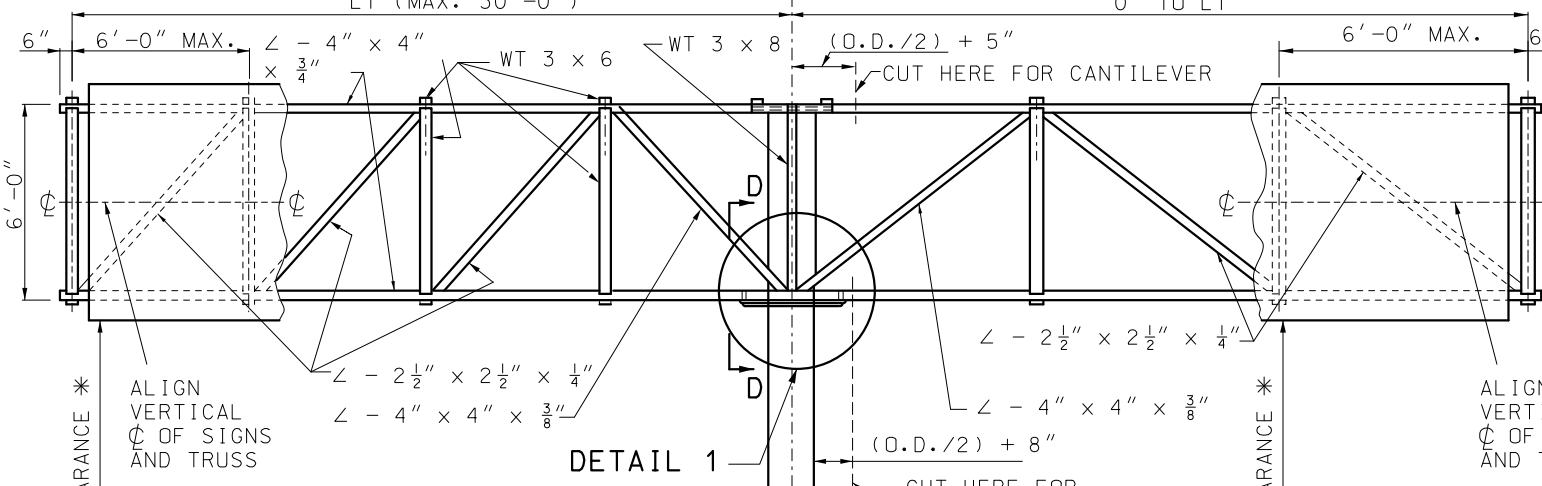


**DETAIL 2**  
**PLAN**

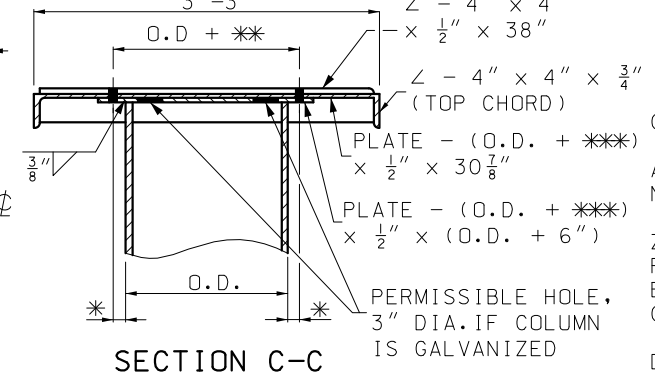
- \* 1 1/2" FOR POST TYPE VII  
1 3/4" FOR ALL OTHER POST TYPES
- \*\* 3" FOR POST TYPE VII  
3 1/2" FOR ALL OTHER POST TYPES
- \*\*\* 5 1/2" FOR POST TYPE VII  
6" FOR ALL OTHER POST TYPES



**SECTION B-B**



**DETAIL 1**

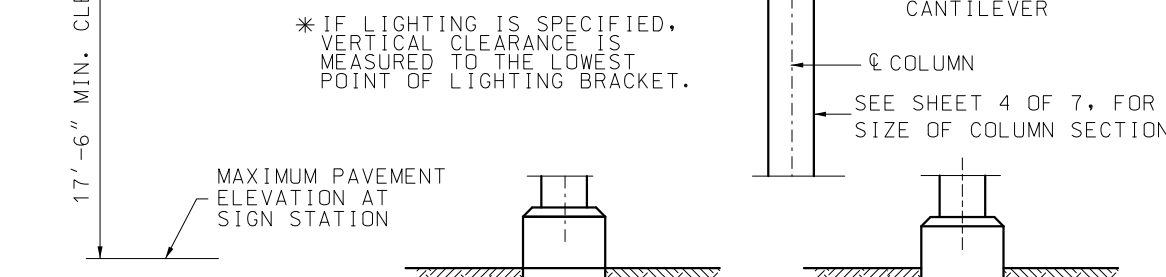


**SECTION C-C**

**GENERAL NOTES:**  
 ALL FASTENERS SHALL HAVE A HARDENED WASHER UNDER THE NUT OR BOLT HEAD, WHICHEVER IS TURNED IN TIGHTENING.  
 ZINC CHROMATE PRIMER SHALL MEET THE REQUIREMENTS OF FEDERAL SPECIFICATION TT-P-645 OR TT-P-1757 AND SHALL BE ACCEPTED ON THE BASIS OF THE LABEL SHOWING CONFORMANCE OR A MANUFACTURER'S CERTIFICATION.

DESIGN OF STRUCTURAL SUPPORTS SHALL COMPLY WITH AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS 2001 AND CURRENT INTERIMS.  
 DESIGN OF SPREAD FOOTINGS SHALL COMPLY WITH 1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.

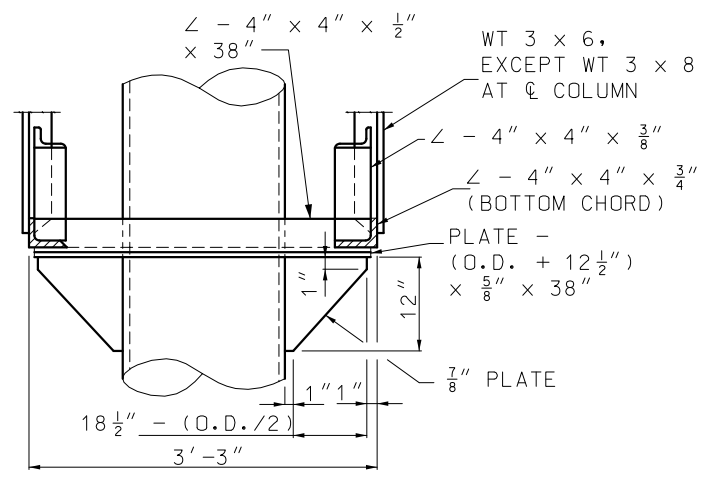
ALL SIGNS SHALL BE CENTERED VERTICALLY ABOUT THE HORIZONTAL  $\phi$  OF THE TRUSS.



**ELEVATION**  
DRILLED SHAFT OPTION

**ELEVATION**  
SPREAD FOOTING OPTION

**NOTE:**  
 TRUSSES AND COLUMN BASE PLATES: ASTM A36, ANCHOR BOLTS: ASTM F1554, GRADE 36. FOR ADDITIONAL INFORMATION, SEE DATA SHEET.



**SECTION D-D**

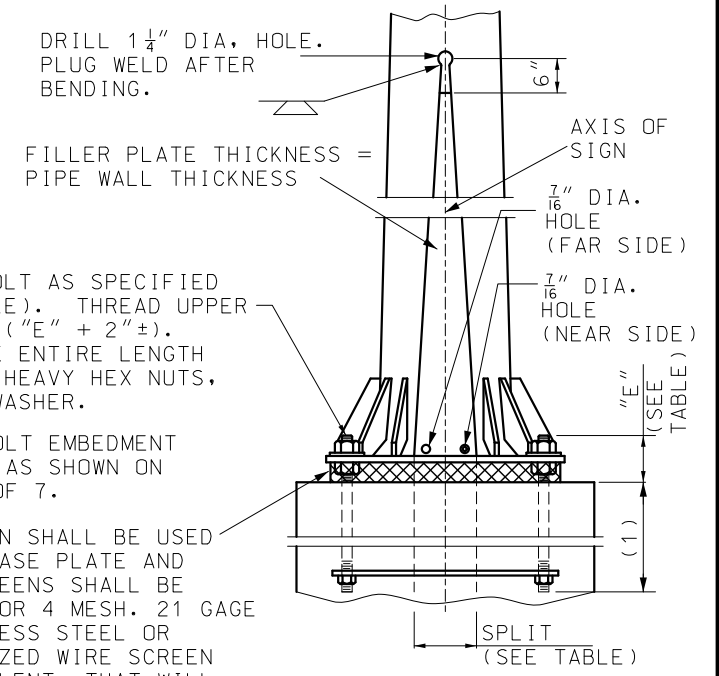
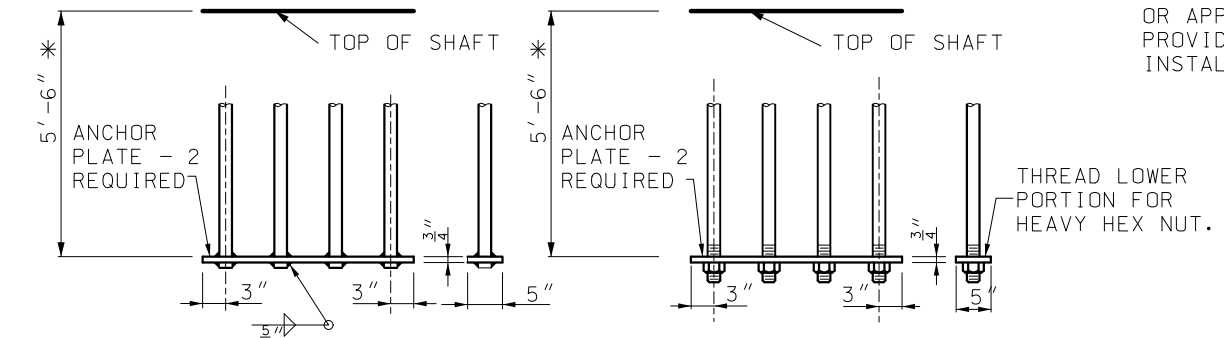
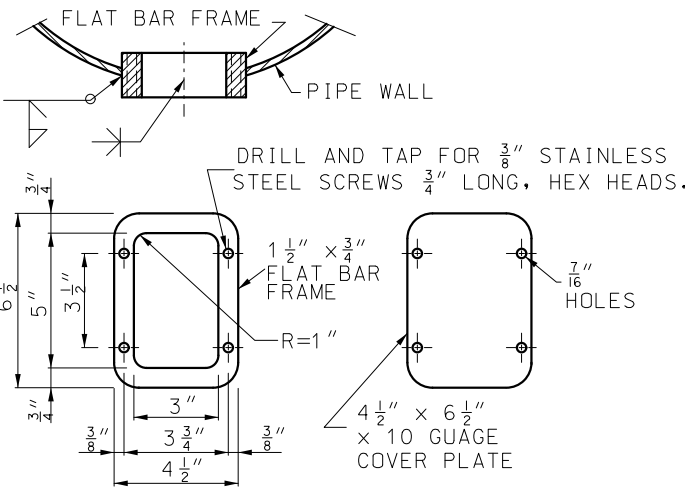
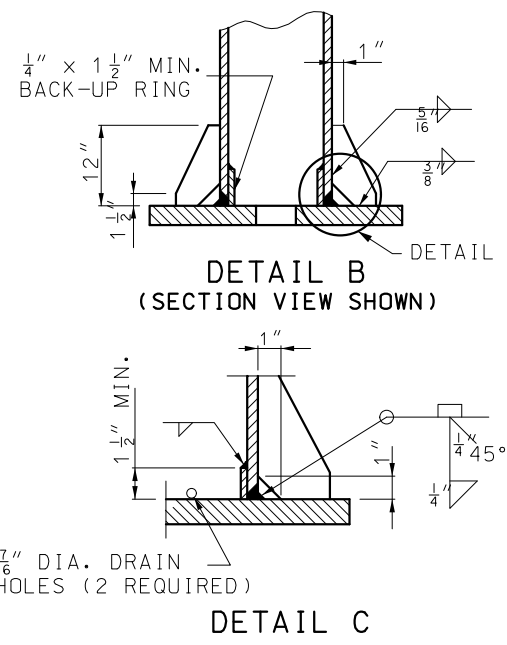
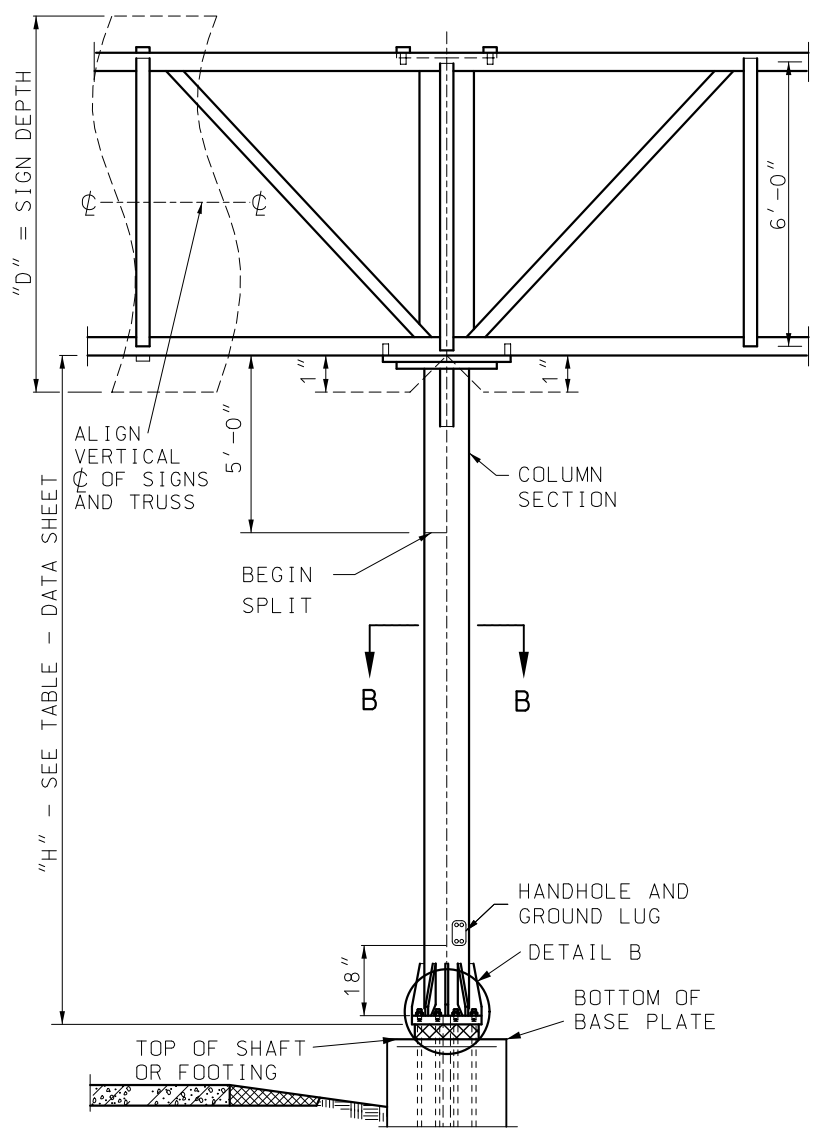
**MoDOT** MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
 NICOLE A. KOLB HOOD  
 NUMBER PE-2001018754  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**OVERHEAD SIGN TRUSSES**  
 BUTTERFLY AND CANTILEVER  
 STRUCTURAL STEEL

DATE EFFECTIVE: 01-01-2021	<b>903.12AA</b>	SHEET NO. 1 OF 7
DATE PREPARED: 10/14/2020		

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



ANCHOR BOLT AS SPECIFIED (SEE TABLE). THREAD UPPER PORTION, ("E" + 2"±). GALVANIZE ENTIRE LENGTH OF BOLT, HEAVY HEX NUTS, AND ONE WASHER.

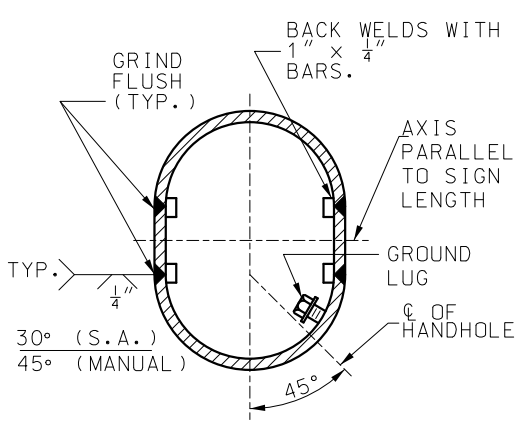
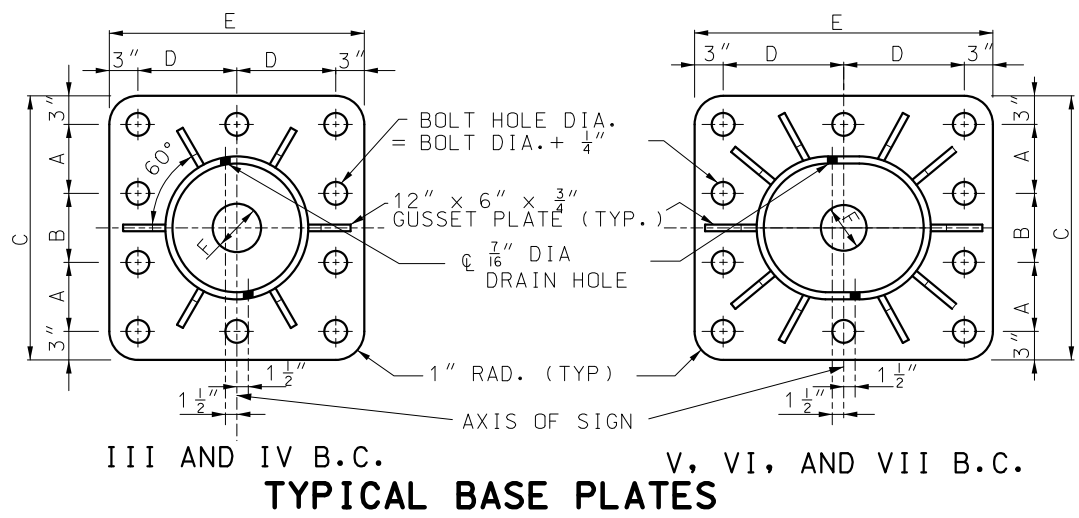
(1) ANCHOR BOLT EMBEDMENT SHALL BE AS SHOWN ON SHEET 6 OF 7.

A GALVANIZED SCREEN SHALL BE USED BETWEEN THE POST BASE PLATE AND CONCRETE BASE. SCREENS SHALL BE PRESS-FORMED OF 3 OR 4 MESH, 21 GAGE OR HEAVIER, STAINLESS STEEL OR HOT-DIPPED GALVANIZED WIRE SCREEN OR APPROVED EQUIVALENT. THAT WILL PROVIDE A FRICTION-TIGHT FIT WHEN INSTALLED.

**GENERAL NOTES:**

- SUBSTRUCTURE SHALL BE BACKFILLED PRIOR TO ERECTION OF POST.
- ASTM A 106 GRADE B STEEL PIPE OR A TAPERED TUBE OF EQUIVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.
- ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE; ASTM SPECIFICATION A53.
- ALL STRUCTURES SHALL BE GROUNDED.
- BURR THREADS ON ALL ANCHOR BOLTS.
- A HORIZONTAL WELDED SPLICE MAY BE FABRICATED IN THE COLUMN BETWEEN THE TOP OF PIPE AND 4'-0" BELOW THE BOTTOM CHORDS OF THE TRUSS WHEN DETAILED ON THE SHOP DRAWINGS AND APPROVED BY THE ENGINEER.
- GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND HOLE.
- ALL SIGNS SHALL BE CENTERED VERTICALLY ABOUT THE HORIZONTAL C OF THE TRUSS.

TYPICAL BASE PLATE (10 ANCHOR TYPE) BUTTERFLY AND CANTILEVER (B.C.)					
	III	IV	V	VI	VII
A	8"	9"	8"	9"	10 1/2"
B	10"	10"	10"	10"	11"
C	32"	34"	32"	34"	38"
D	13"	14"	16 1/2"	18"	20"
E	32"	34"	39"	42"	46"
F	6"	6"	6"	6"	6"



NOTE:  
FOR DETAILS OF OPTIONAL SUBSTRUCTURES, SEE OTHER SHEETS.  
ANCHOR BOLTS AND PLATE NOT SHOWN.

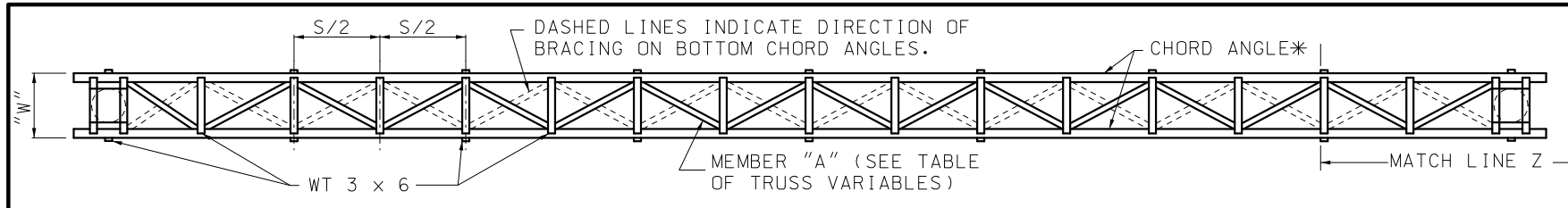
**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
 NICOLE A. KOLB HOOD  
 NUMBER PE-2001018754  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

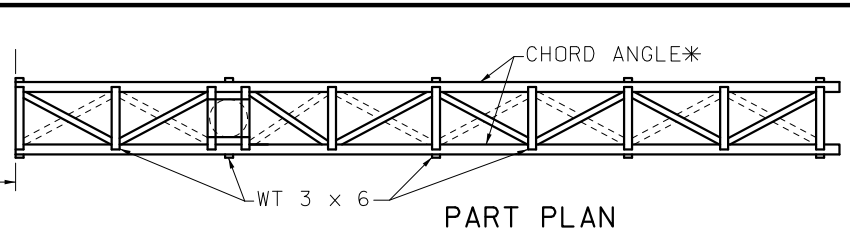
**OVERHEAD SIGN TRUSS COLUMN AND BASE PLATES**

DATE EFFECTIVE: 01-01-2021	<b>903.12AA</b>	SHEET NO. 3 OF 7
DATE PREPARED: 10/14/2020		

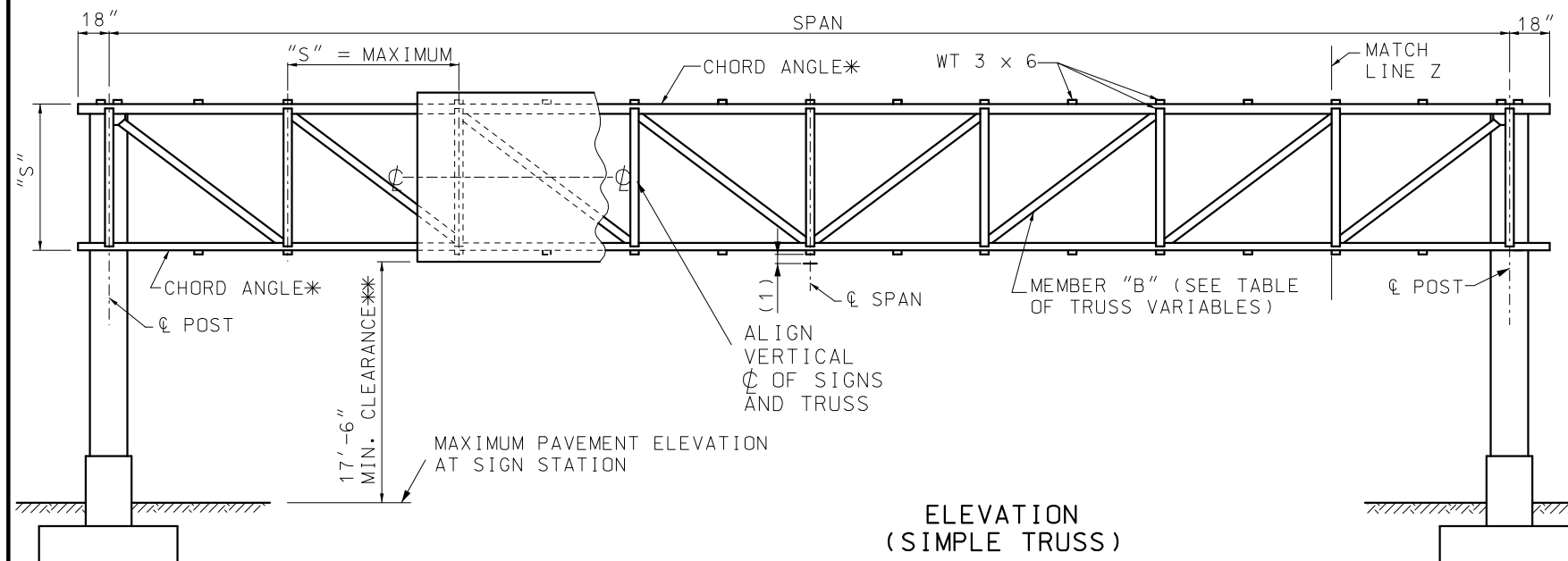
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



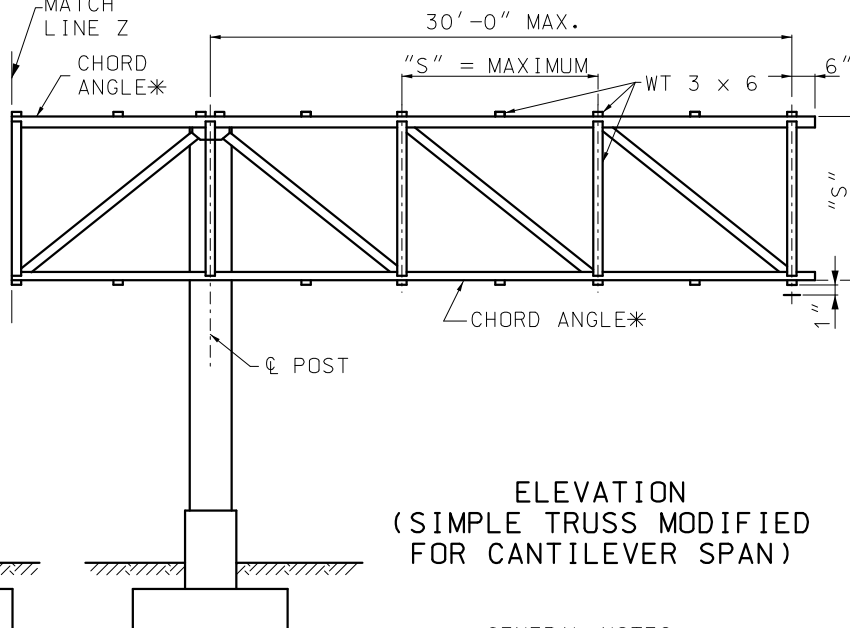
PART PLAN



PART PLAN



ELEVATION (SIMPLE TRUSS)



ELEVATION (SIMPLE TRUSS MODIFIED FOR CANTILEVER SPAN)

NOTES:

SHOP SPLICES ON CHORD ANGLES WILL BE ALLOWED ONLY BY SPECIAL PERMISSION. IF PERMISSION IS GRANTED, SUCH SPLICES MUST BE LOCATED AT THE CENTERLINE OF MAIN PANEL POINTS.

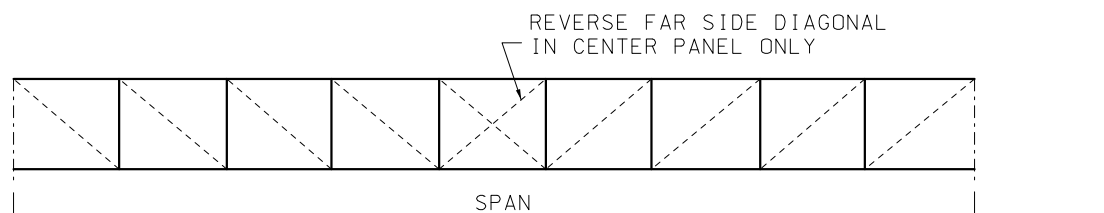
"D" = GREATEST OVERALL DEPTH OF ANY SIGN OR SIGNS ON TRUSS AND "S" = TRUSS DEPTH, AND "W" = TRUSS WIDTH.

3/4" DIA. BOLTS SHALL BE REMOVED AFTER WELDING IS COMPLETE. BOLT HOLES SHALL BE PLUGGED AND THE OUTSIDE FACE GROUND SMOOTH.

\* SEE GENERAL NOTES THIS SHEET FOR CHARPY V-NOTCH REQUIREMENTS.

\*\* IF LIGHTING IS SPECIFIED, VERTICAL CLEARANCE IS MEASURED TO LOWEST POINT OF LIGHTING BRACKET.

(1) FOR PARABOLIC CAMBER SEE TABLE OF TRUSS VARIABLES



TRUSS ELEVATION (UNEVEN NUMBER OF TRUSS PANELS)

TRUSS VARIABLES					
SPAN	"S"	"W"	MEMBER "A"	MEMBER "B"	SHOP CAMBER
UP TO 80'-6"	6'-0"	4'-0"	L 2 1/2" x 2 1/2" x 1/4"	L 2 1/2" x 2 1/2" x 1/4"	2"
81' TO 100'-6"	6'-0"	5'-0"	L 3" x 3" x 1/4"	L 2 1/2" x 2 1/2" x 1/4"	2 1/2"
101' TO 130'-6"	7'-0"	6'-0"	L 3" x 3" x 1/4"	L 3" x 3" x 1/4"	3 1/2"
131' TO 150'-6"	8'-0"	6'-0"	L 3 1/2" x 3 1/2" x 5/16"	L 3 1/2" x 3 1/2" x 5/16"	4 1/2"
151' TO 160'-6"	8'-0"	7'-0"	L 3 1/2" x 3 1/2" x 5/16"	L 3 1/2" x 3 1/2" x 5/16"	5 1/2"

NOTE: FOR SIZE OF CHORD MEMBERS SEE DATA SHEET.

GENERAL NOTES:

ALL STRUCTURAL STEEL AND COLUMN BASE PLATES ASTM A36, EXCEPT THAT CHORD ANGLES GREATER THAN 1/2" IN THICKNESS SHALL BE AASHTO M183 WITH SUPPLEMENTAL REQUIREMENTS: S5, CHARPY V-NOTCH IMPACT TEST FOR TEMPERATURE ZONE 2.

ALL ANCHOR BOLTS SHALL BE ASTM F1554, GRADE 36.

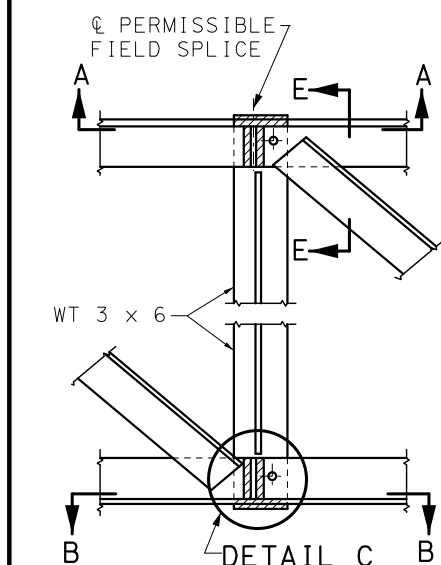
PROPOSED FIELD SPLICES SHALL BE SHOWN ON SHOP DRAWINGS FOR APPROVAL OF THE ENGINEER.

TRUSSES SHALL BE FABRICATED WITH A MINIMUM OF SPLICING IN TRUSS CHORDS. FIELD SPLICING WILL NOT BE PERMITTED WITHIN THE MIDDLE ONE-THIRD OF SPAN.

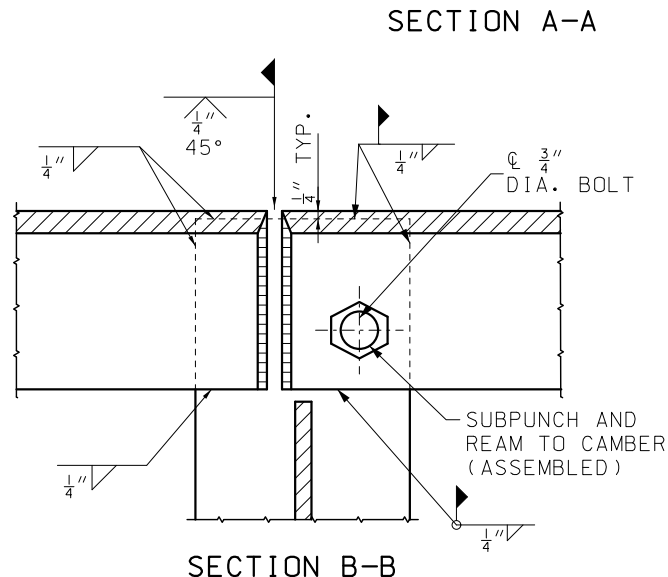
FOR ADDITIONAL INFORMATION SEE DATA SHEET.

ZINC CHROMATE PRIMER SHALL MEET THE REQUIREMENTS OF FEDERAL SPECIFICATIONS TT-P-645 OR TT-P-1757 AND SHALL BE ACCEPTED ON THE BASIS OF THE LABEL SHOWING CONFORMANCE OR A MANUFACTURER'S CERTIFICATION.

ALL SIGNS SHALL BE CENTERED VERTICALLY ABOUT THE HORIZONTAL CL OF THE TRUSS.

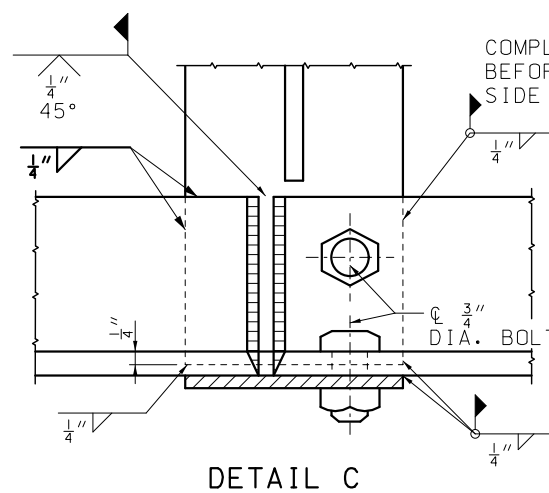


SECTION THROUGH TRUSS LOCATING SPLICES

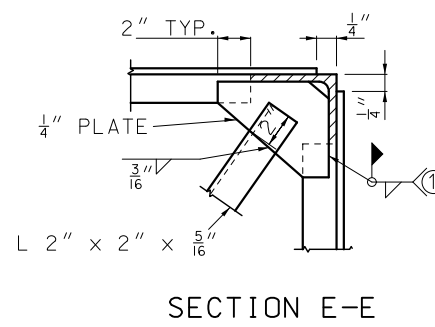


SECTION B-B

DETAIL OF FIELD SPLICES (IF ANY)



DETAIL C



SECTION E-E (FIELD SPLICE ONLY)

SEE SHEET 2

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

**STATE OF MISSOURI**  
**PROFESSIONAL ENGINEER**

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**OVERHEAD SIGN TRUSSES**

STRUCTURAL STEEL

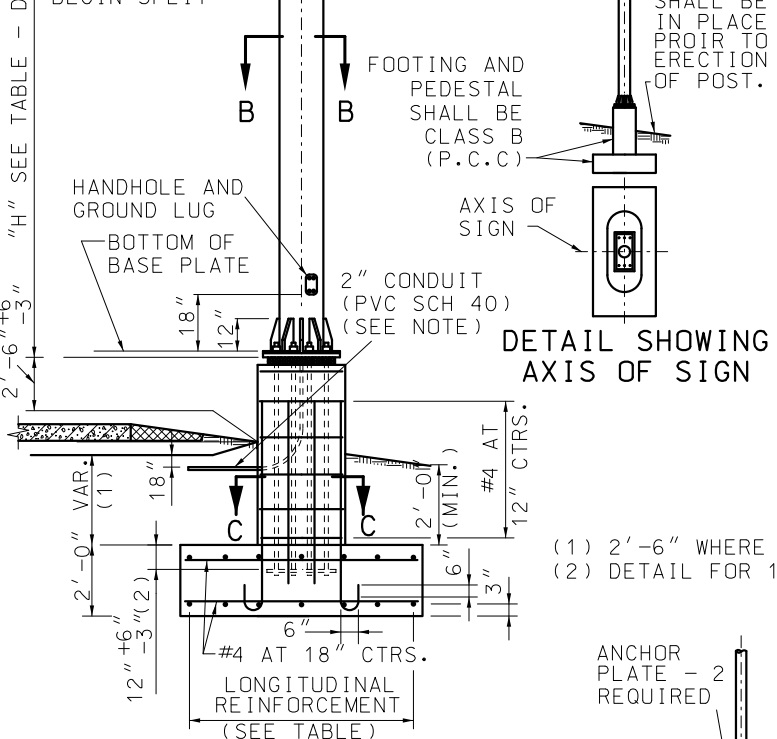
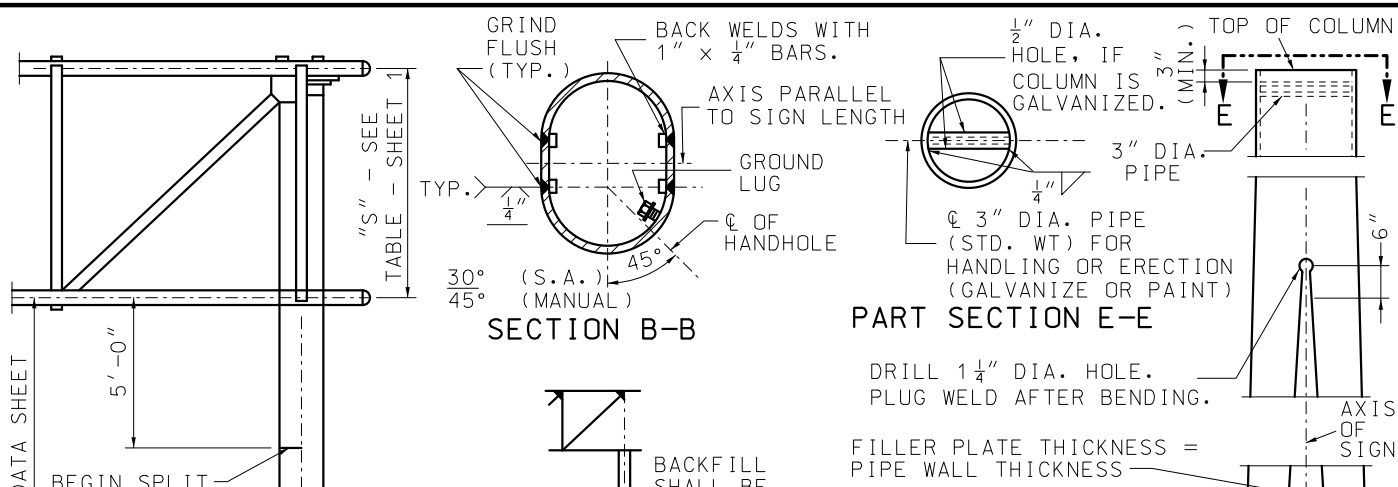
SHEET NO.  
1 OF 5

DATE EFFECTIVE: 01/01/2021

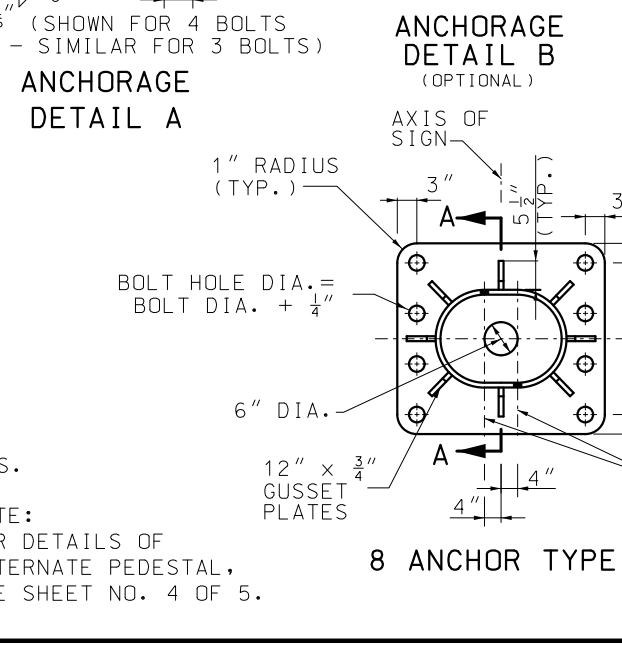
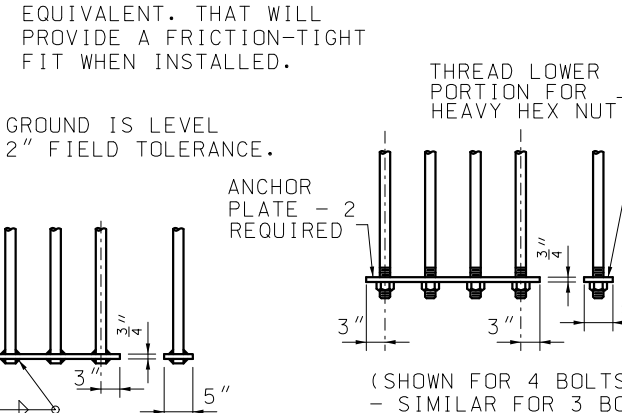
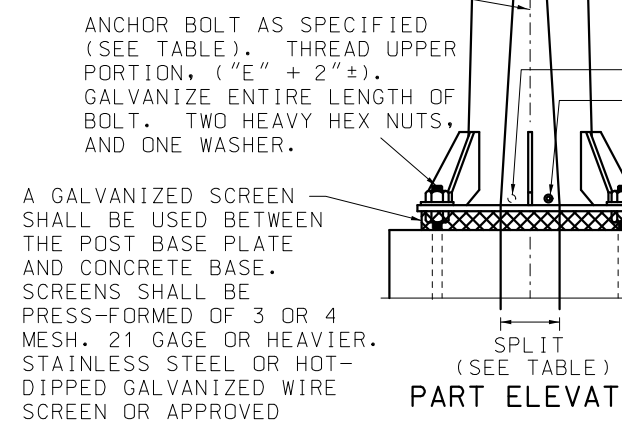
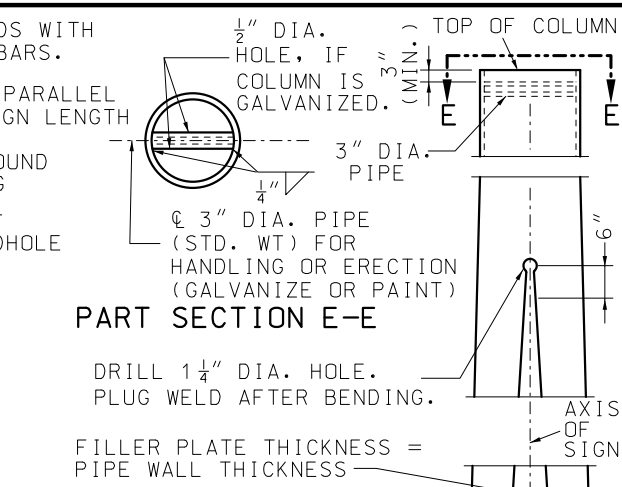
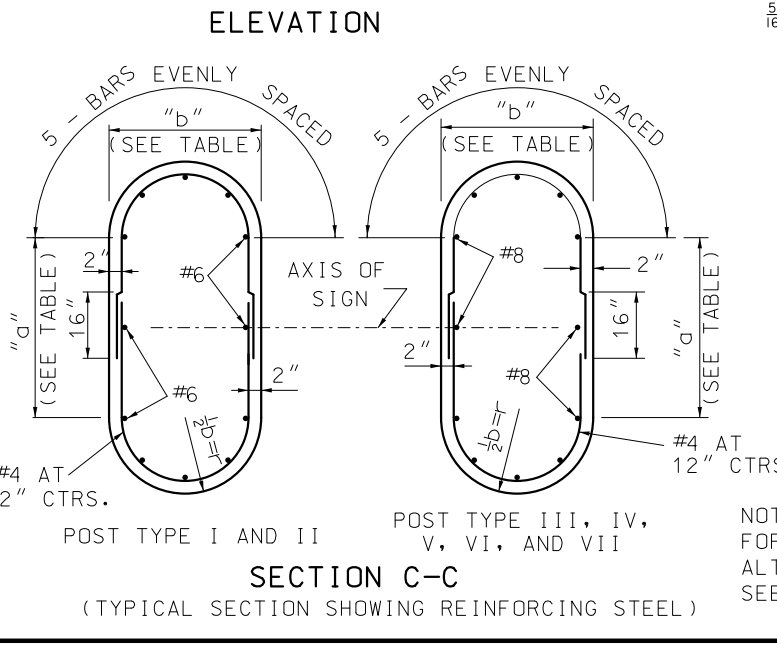
DATE PREPARED: 10/14/2020

903.60AC

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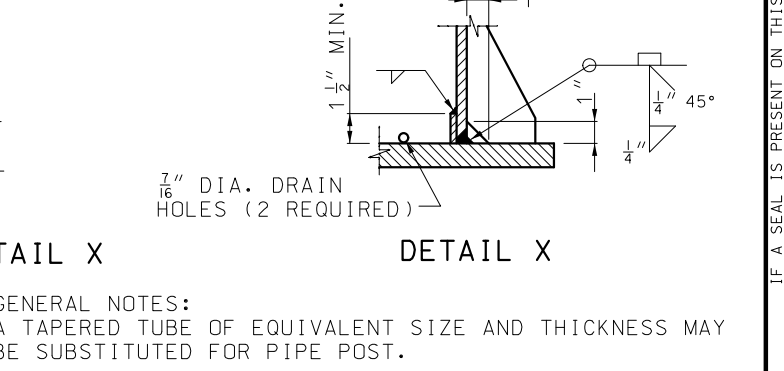
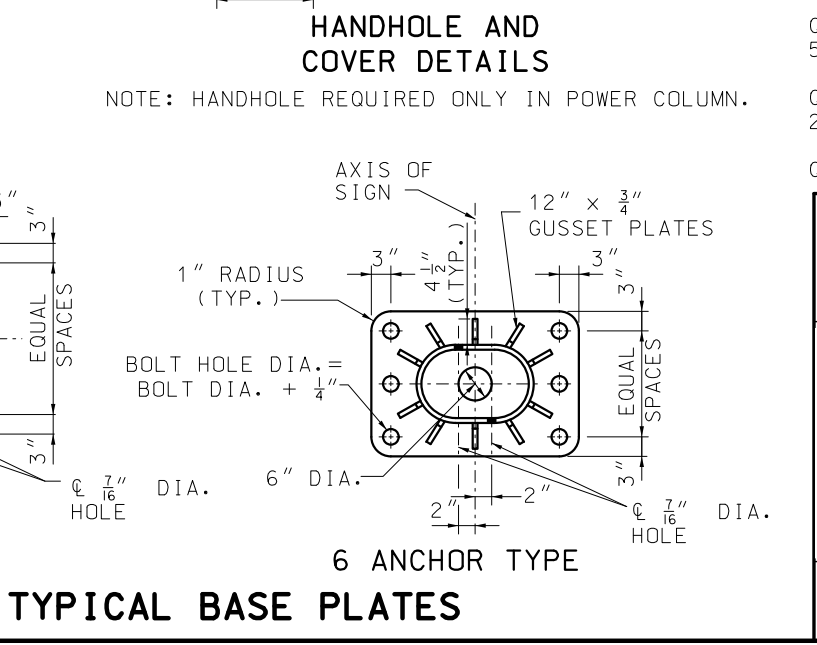
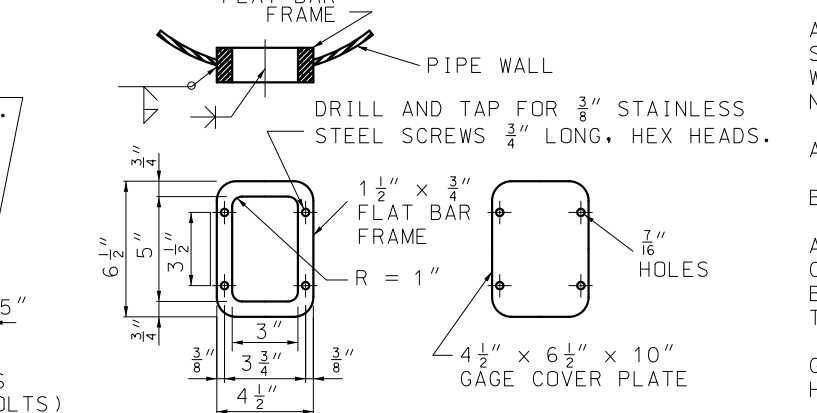
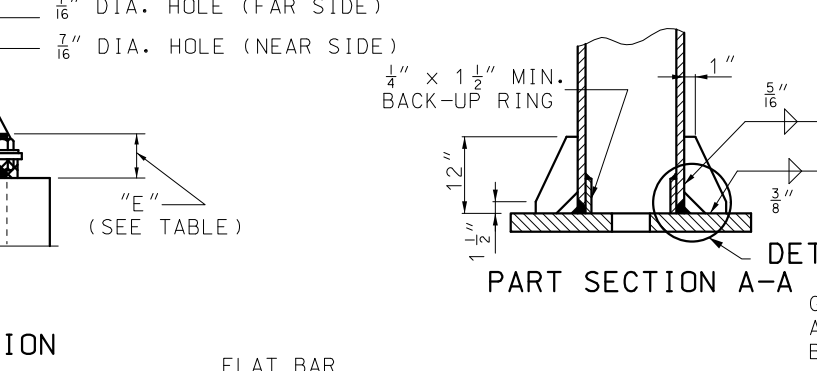


NOTE: THE 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MINIMUM RADIUS BEND OF 9 1/2".



POST TYPE	PIPE COLUMN	DIMENSION "E"	SPLIT	BASE PLATE SIZE*	ANCHOR BOLTS DIA.	PEDESTAL SIZE*		FOOTING SIZE*	LONGITUDINAL FOOTING REINFORCEMENT		CONCRETE C.Y.
						a	b		TOP	BOTTOM	
I	12" STD. AT 65.42	8 1/2"	6"	2'-6" x 23" x 1 1/2"	6 AT 2 1/4"	4'-0"	2'-11"	7'-0" x 14'-6"	7-#5 BARS	7-#6 BARS	10.9
II	14" O.D. AT 72.09	8 1/2"	9 1/2"	3'-0" x 2'-0" x 1 1/2"	6 AT 2 1/4"	4'-4"	3'-0"	8'-0" x 16'-0"	8-#5 BARS	9-#6 BARS	13.2
III	16" O.D. AT 82.77	8 3/4"	11 1/2"	3'-4" x 2'-2" x 1 3/4"	6 AT 2 1/4"	4'-8"	3'-2"	8'-6" x 17'-6"	9-#5 BARS	9-#7 BARS	15.2
IV	18" O.D. AT 93.45	9 1/2"	12 1/2"	3'-7" x 2'-4" x 2"	6 AT 2 1/2"	5'-1"	3'-4"	9'-6" x 19'-0"	10-#5 BARS	10-#8 BARS	18.1
V	20" O.D. AT 104.13	9 1/2"	13"	3'-10" x 2'-9" x 2"	8 AT 2 1/2"	5'-4"	3'-9"	10'-0" x 20'-0"	10-#5 BARS	10-#8 BARS	20.6
VI	24" O.D. AT 125.49	9 1/2"	10 1/2"	4'-0" x 3'-3" x 2"	8 AT 2 1/2"	5'-6"	4'-3"	10'-6" x 21'-0"	11-#5 BARS	11-#8 BARS	23.3
VII	24" O.D. AT 125.49	9 1/2"	13 1/2"	4'-3" x 3'-3" x 2"	8 AT 2 1/2"	5'-9"	4'-3"	11'-0" x 22'-0"	11-#5 BARS	11-#9 BARS	25.1

\* BASE PLATES, PEDESTAL, AND FOOTINGS, LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.



GENERAL NOTES:  
 A TAPERED TUBE OF EQUIVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.  
 ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE; ASTM SPECIFICATION A53. NO OBJECTIONABLE SEAMS WILL BE PERMITTED.  
 ALL STRUCTURES SHALL BE GROUNDED.  
 BURR THREADS ON ALL ANCHOR BOLTS.  
 A HORIZONTAL WELDED SPLICE MAY BE FABRICATED IN THE COLUMN BETWEEN THE TOP OF PIPE AND 4'-0" BELOW THE BOTTOM CHORDS OF THE TRUSS WHEN DETAILED ON THE SHOP DRAWINGS AND APPROVED BY THE ENGINEER.  
 GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND HOLE.  
 QUANTITIES FOR PEDESTAL, BASED ON NOMINAL HEIGHT OF 5'-0".  
 QUANTITIES FOR FOOTING, BASED ON NOMINAL DEPTH OF 2'-0".  
 QUANTITIES SHOWN ARE FOR ONE COLUMN ONLY.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

**STATE OF MISSOURI**  
 NICOLE A. KOLB HOOD  
 NUMBER PE-2001018754  
 PROFESSIONAL ENGINEER

**OVERHEAD SIGN TRUSSES**  
 STRUCTURAL STEEL

DATE EFFECTIVE: 01/01/2021  
 DATE PREPARED: 10/14/2020

**903.60AC**

SHEET NO. 3 OF 5

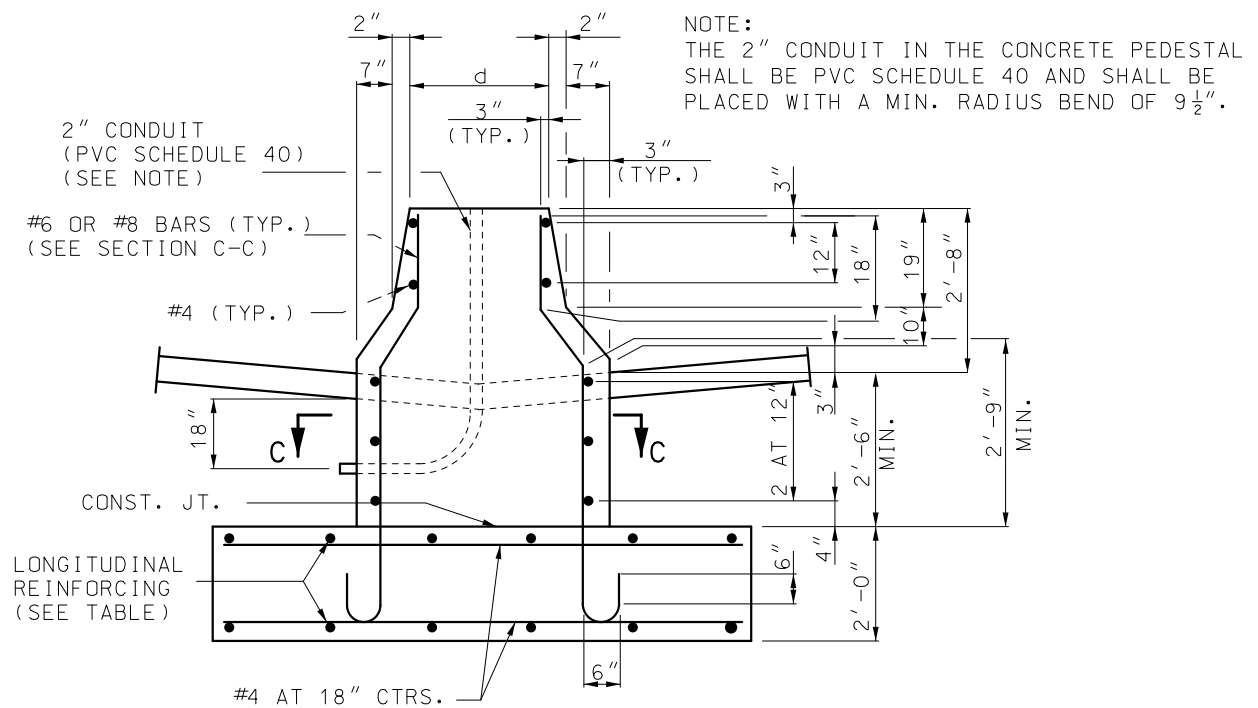
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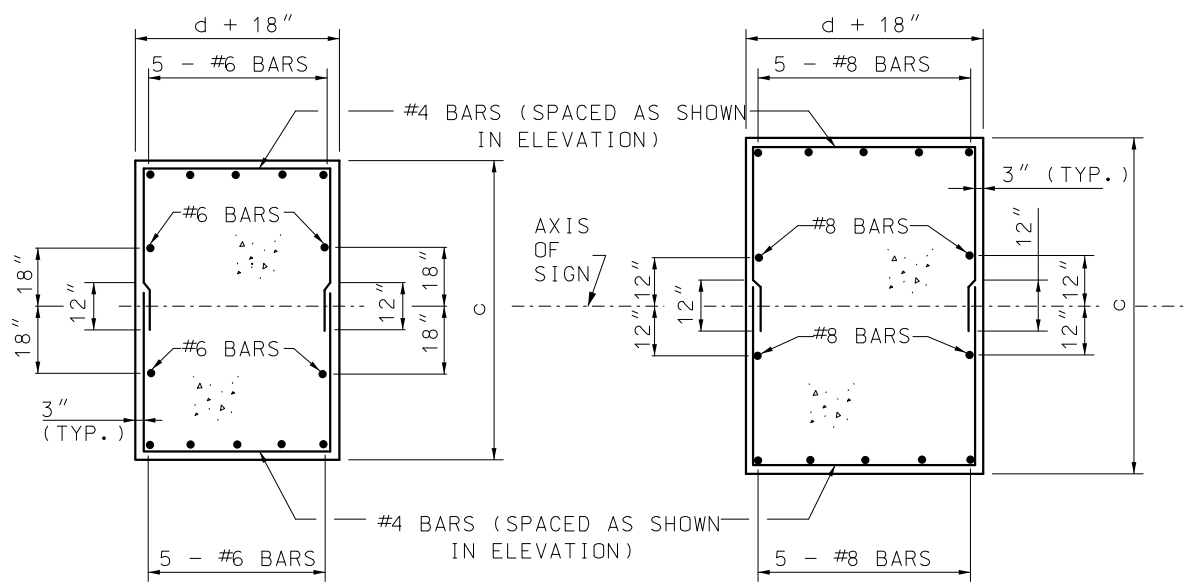
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POST TYPE	PIPE COLUMN	PEDESTAL SIZE*		FOOTING SIZE*	LONGITUDINAL FOOTING REINFORCEMENT		CONCRETE C.Y.	
		c	d		TOP	BOTTOM	TYPE A MEDIAN BARRIER	TYPE C MEDIAN BARRIER
I	12" STD. AT 65.42	5'-9"	2'-1"	7'-0" x 14'-6"	7-#5 BARS	7-#6 BARS	10.9	11.6
II	14" O.D. AT 72.09	6'-2"	2'-2"	8'-0" x 16'-0"	8-#5 BARS	9-#6 BARS	13.2	14.0
III	16" O.D. AT 82.77	6'-7"	2'-4"	8'-6" x 17'-6"	9-#5 BARS	9-#7 BARS	15.2	16.1
IV	18" O.D. AT 93.45	7'-1"	2'-6"	9'-6" x 19'-0"	10-#5 BARS	10-#8 BARS	18.1	19.1
V	20" O.D. AT 104.13	7'-8"	2'-11"	10'-0" x 20'-0"	10-#5 BARS	10-#8 BARS	20.6	21.7
VI	24" O.D. AT 125.49	8'-3"	3'-5"	10'-6" x 21'-0"	11-#5 BARS	11-#8 BARS	23.3	24.6
VII	24" O.D. AT 125.49	8'-6"	3'-5"	11'-0" x 22'-0"	11-#5 BARS	11-#9 BARS	25.1	26.5

\* BASE PLATES, PEDESTAL, AND FOOTINGS LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.



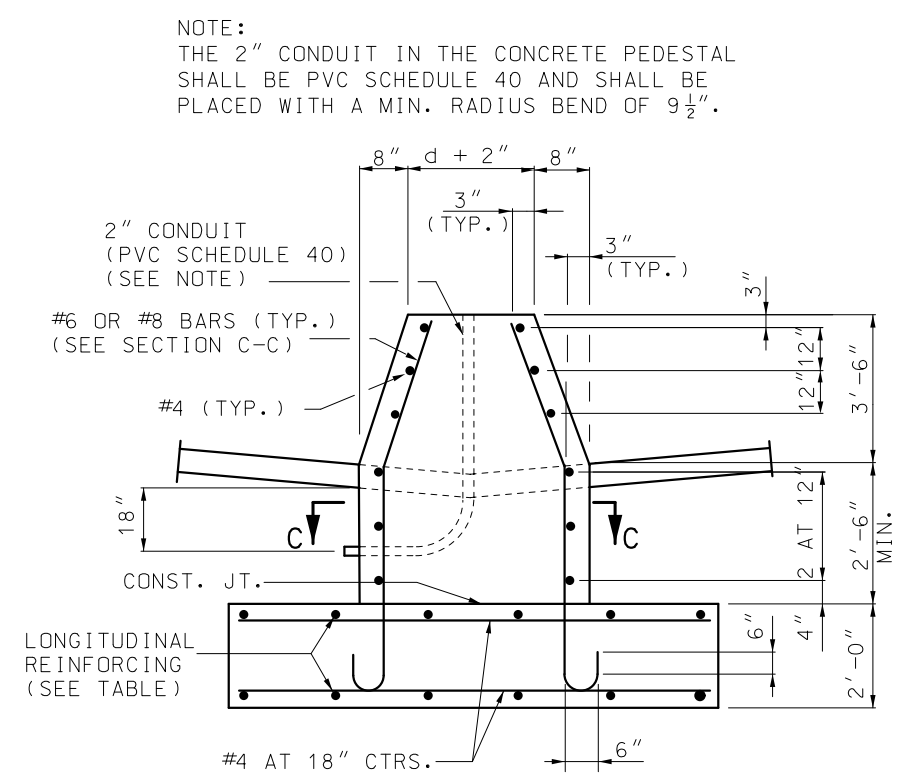
PART ELEVATION  
(TYPE A CONCRETE TRAFFIC BARRIER)



SECTION C-C  
TYPICAL SECTION SHOWING  
REINFORCING STEEL

**DETAILS OF ALTERNATE PEDESTAL**

(TO BE USED ADJACENT TO TYPE "A" OR "C" MEDIAN BARRIER)



PART ELEVATION  
(TYPE C CONCRETE TRAFFIC BARRIER)

GENERAL NOTES:

- A TAPERED TUBE OF EQUIVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.
- ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE; ASTM SPECIFICATION A53.
- NO OBJECTIONABLE SEAMS WILL BE PERMITTED.
- ALL STRUCTURES SHALL BE GROUNDED.
- BURR THREADS ON ALL ANCHOR BOLTS.
- PIPE COLUMN, BASE PLATE, ANCHOR BOLTS AND NOTES PERTAINING TO THESE ITEMS HAVE BEEN OMITTED FOR CLARITY. REFER TO SHEET 3 OF 5 FOR DETAILS OF THESE ITEMS.
- GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND HOLE.
- QUANTITIES FOR PEDESTAL ARE BASED ON NOMINAL HEIGHT OF 5'-2" (TYPE A MEDIAN BARRIER) OR 6'-0" (TYPE C MEDIAN BARRIER).
- QUANTITIES FOR FOOTING ARE BASED ON NOMINAL DEPTH OF 2'-0".
- QUANTITIES SHOWN ARE FOR ONE COLUMN ONLY.

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 NICOLE A. KOLB HOOD  
 NUMBER PE-2001018754  
 PROFESSIONAL ENGINEER  
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**OVERHEAD SIGN TRUSSES**  
STRUCTURAL STEEL

DATE EFFECTIVE: 01/01/2021	<b>903.60AC</b>	SHEET NO. 4 OF 5
DATE PREPARED: 10/14/2020		